Site Plan Final
Special Permit

**PLPZ 2021 00494**

Dennis & Cynthia Ever
To construct two additions to the existing dwelling and corresponding site work, further exceeding the 150,000 cubic feet in building volume requiring a special permit per Sec. 6-101(a).

<table>
<thead>
<tr>
<th>LOCATION:</th>
<th>359 North Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXISTING ZONING:</td>
<td>RA-1 (1-acre minimum)</td>
</tr>
<tr>
<td>PARCEL SIZE:</td>
<td>Total = 122,055 sq.ft. (2.8020-acres)</td>
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<tr>
<td></td>
<td><strong>Zoning Lot Area = 96,137 sq.ft.</strong> +</td>
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<tr>
<td></td>
<td><strong>Open Space = 25,918</strong></td>
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<tr>
<td>UTILITIES:</td>
<td>Sewer and Public Water</td>
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</tbody>
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<thead>
<tr>
<th></th>
<th>EXISTING</th>
<th>ALLOWABLE</th>
<th>REQUESTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROSS SQUARE FEET:</td>
<td>8,848 sq.ft.</td>
<td>12,978.50 sq.ft.</td>
<td>11,692 sq.ft.</td>
</tr>
<tr>
<td>FLOOR AREA RATIO:</td>
<td>0.092</td>
<td>0.135</td>
<td>0.122</td>
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<tr>
<td>VOLUME</td>
<td>192,865.7 cu.ft.</td>
<td>Over 150,000 cu.ft. needs a Special Permit per Sec. 6-101(a) of the BZR</td>
<td>244,834.6 cu.ft.</td>
</tr>
<tr>
<td></td>
<td><strong>Ex. Dwelling = 192,101.4 cu.ft.</strong></td>
<td><strong>Ex. Shed = 764.3 cu.ft.</strong></td>
<td><strong>Ex. Shed = 764.3 cu.ft.</strong></td>
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<tr>
<td>GREEN AREA:</td>
<td>80.5%</td>
<td>72%</td>
<td>74.5%</td>
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</table>

**UPDATE:**
This application was opened together with PLPZ 2022 00022, which is for a Final Re-Subdivision at the same 2.8-acre property, during the Commission’s Public Hearing that took place on 2/15/2022. Both applications were left open for the following to be addressed:
- For the applicant to update the proposed Declaration of Restrictions to incorporate the new maintenance schedule
- For DPW to review the neighbor’s engineering effort dated 2/15/2022 by Ahneman Kirby, LLC.
- For the applicant to develop a landscape plan.
  - The applicant provided:
    - **Existing Tree Inventory Plan**
    - **Planting Plan**
    - **A point-by-point list of review comments from correspondence with the Town’s Conservation Staff and the design landscape architect, Wesley Stout Associates (WSA).**
The landscape plan includes additional plantings in the P-1 Open Space Parcel and across the site.

The owner commits to Organic Lawn Care within both open space areas.

Tree Inventory shows 19 trees that are in decline or invasive are being replaced by 27 new trees selected in consultation with the Conservation staff.

Fall clean up:

- In open space Parcel 2 will be restricted from leaf blowing to remove all leaf cover to bare soil.
- In the upland Parcel 1 will require a higher level of cleanup within the planted border. The owner will commit to maintaining the planted border with a natural or organic mulch material

- The applicant to review building materials for the monuments to delineate the open space.

- Monuments delineating both open space areas (P-1 and P-2) will be made from either marble or precast concrete and set flush with grade.

- The retaining wall shall be moved out of the open space, and no grading within the open space.

It was noted by the applicant at the meeting that the drainage design for the site was done to ensure the development of a potential pool, but at this time no pool is proposed with this application.

THE BELOW IS AN UPDATED STAFF REPORT.

APPLICATION SUMARY:
Final Site Plan and Special Permit applications are submitted by the applicant to construct two additions to the existing dwelling and corresponding site work, on a 2.8-acres property located at 359 North Street in the RA-1 Zone. The total existing floor area of the site is 8,848 sq.ft., and the applicant is proposing to increase it by 2,844 sq.ft. to be 11,692 sq.ft. The existing volume of the site is 192,865.7 cubic feet, and the application proposes to add 51,968.9 cubic feet of volume to result in 244,834.6 cu.ft. across the site, further exceeding the 150,000 cubic foot threshold of Sec. 6-101(a), requiring special permit review and approval.

ISSUES/RECOMMENDATIONS:
1. **Base map.** The site map is not yet filed on the Greenwich Land Records from application PLPZ 2020 00294 as the restrictions of the corresponding Declaration of Restriction needs input from the Commission and is presented under application PLPZ 2022 00022.

2. **Engineering** issued updated comments dated 2/23/2022 and reconfirms the application’s proposed design meets or exceeds the Town of Greenwich 2012 Drainage Manual (as amended). The decision to decrease any site runoff beyond the current Drainage Manual standard “…is at the discretion of the design engineer or as directed by the Commission based on the potential concern from the engineer representing the neighbor.” DPW requests the applicant resubmit prior to Zoning/Building Permit Approval.
3. The design engineer submitted an email response type letter to DPW on 2/17/2022 to the report by Ahneman Kirby, LLC. dated 2/15/2022.

4. The Commission should determine if the design engineer should decrease site runoff beyond the current Drainage Manual standard.

5. Conservation issued updated comments dated 2/24/2022 and notes that the current landscape plan addresses all their previous concerns and provides valuable directions for the future maintenance of the site.

6. Greenwich Land Records (GLR). It is recommended that the Declaration of Restrictions and supporting planting plans all be filed on the GLR so they are easy to find together in the future.

7. The Inland Wetlands Agency (IWWA) issued a greensheet on 9/24/2021 indicating no further effort is needed with wetlands for this application.

8. Sewer Division issued comments on 1/1/2022 and requests the applicant/owner submit a signed letter acknowledging receipt and agreement to adhere to them. The owners signed such a letter dated 2/3/2022.

9. The Zoning Enforcement Officer issued comments on 12/29/2021 and requests the applicant provide floor area drawings per Section 6-12 prior to Zoning Permit Sign-Off. The applicant submitted FAR drawings on 2/8/2022.

10. Grading within the Open space. The applicant noted during the 2/15/2022 meeting that they would move the retaining wall and no grading will be done within the open space areas.

11. Landscape Design. The applicant provided a Tree Inventory Plan, Planting Plan and a point-by-point list of review comments from correspondence with Conservation Staff and the design landscape architect.

PROPOSAL:
Final Site Plan and Special Permit applications are submitted by the applicant to construct two additions to the existing dwelling and corresponding site work, on a 2.8-acres property located at 359 North Street in the RA-1 Zone. The total existing floor area of the site is 8,848 sq.ft., and the applicant is proposing to increase it by 2,844 sq.ft. to be 11,692 sq.ft. The existing volume of the site is 192,865.7 cubic feet, and the application proposes to add 51,968.9 cubic feet of volume to result in 244,834.6 cu.ft. across the site, further exceeding the 150,000 cubic foot threshold of Sec. 6-101(a), requiring special permit review and approval.

The owner is proposing to construct two additions to the existing dwelling. The first, is a 1-story kitchen addition connecting the two separate terraces at the west (rear) elevation and adding an interior courtyard that engages the existing structure. The second addition adds a garage with a mudroom and guest bedroom directly above at the northern side. Other improvements include retaining walls, patios, subsurface stormwater management facilities with associated storm drainage piping, installation of various underground utilities and associated site grading and landscaping.
Existing site conditions include a residential dwelling, detached garage, gravel driveway, stone patios and flagstone walkways.

A special permit is required per Section 6-101(a) of the BZR, the total volume of buildings on the property is greater than 150,000 cubic feet.

**DEPARTMENT COMMENTS:**

- **DPW** - see attached memo of 2/23/2022
- **CONSERVATION** - see attached memo of 2/24/2022
- **IWWA** - see attached memo of 9/24/2021
- **ZEO** - see attached memo of 12/29/2021
- **SEWER** - see attached memo of 1/1/2022

**CONSERVATION:** The Conservation Department issued an updated memorandum on 2/24/2022 and notes that the current landscape plan addresses all their previous concerns and provides valuable directions for the future maintenance of the site. They do request that the Declaration of Restrictions and supporting planting plans all be filed on the GLR so they are easy to find together in the future.

**ZONING:** The ZEO submitted comments on 12/29/2021 and requests the applicant provide floor area drawings per Section 6-12 prior to Zoning Permit Sign-Off. The applicant submitted FAR drawings on 2/8/2022. The application proposes two additions to the existing dwelling. Neither addition looks to diminish or change a setback for the primary structure or exceed the existing structure’s height.

**DRAINAGE:** As of DPW’s comments dated 2/23/2022, DPW requests the applicant resubmit prior to Zoning/Building Permit Approval. These comments were updated and in response to a letter from the engineering firm Ahneman Kirby dated 2/15/2022 who represents a neighboring property owner at 11 Sparrow Lane. DPW notes in 3(h) of their comments:

> “Since the proposed design is meeting and exceeding some of the standards required by the TOG DM 2012 (as amended); the Engineering Division is acceptable in concept to the design since it meets the standards of the TOG DM 2012. The decision to decrease this runoff to only meet the TOG DM 2012 (as amended) RRV standard is at the discretion of the design engineer or as directed by the Commission based on the potential concern from the engineer representing the neighbor. Any consideration to further reduce the amount of RRV below the required standards of the TOG DM 2012 (as amended) will need to be agreed upon by the Commission, design engineer, and engineer representing the neighbor. This modification will require a legal document be created defining the agreement and it must be signed by all necessary parties as determined by the Law Department. The Engineering Division will not sign this document.”
The Commission should determine if the design engineer should decrease site runoff beyond the current Drainage Manual standard.

The proposed development will increase the amount of impervious cover on the site from 21,753 sq.ft. to 27,588 sq.ft. (+21.2%). Proposed drainage systems utilize both LID and BMP principles and practices. However, as noted in the Drainage Summary Report, many of the non-structural LID BMPs are deemed not applicable or practical for this project due to the site topography and the western portion of the site’s planned disturbance. 3 structural LID BMPS and 2 conventional BMPs are incorporated into the proposed development. 5 subsurface infiltration systems are proposed to retain, and infiltrate runoff collected.

**BACKGROUND:** On November 17, 2020 at a Public Hearing, the Commission found an application at 359 North Street for final re-subdivision, PLPZ 2020 00294, to combine Lots 2 and 3 of a previously approved subdivision FSB #764, into one (1) 122,055 sq.ft. (2.802-acre) parcel and to reconfigure the approved “recreation area” as two (2) open space parcels “Parcel ‘P-1’” at 20,261 sq.ft. in size and “Parcel ‘P-2’” at 5,657 sq.ft. in size was found not to be a subdivision or re-subdivision.

**APPLICABLE ZONING REGULATIONS:**
- Section 6-5 – Definitions
- 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 6-101(a) – Special Permit for Residential Zones
- Section 6-181(b) – Planting Specifications
- Section 6-183.2 – Activities Requiring A Certified Erosion and Sediment Control Plan
- Section 6-183.4 – Erosion and Sediment Control Plan
- Section 6-203 – Open Spaces, Height, and Bulk of Buildings
- Section 6-205 – Schedule of Required Open Spaces, Limiting Heights and Bulk of Bldgs.
MEMORANDUM

To: Jacalyn Pruitt, Planner II

From: Aleksandra Moch, Environmental Analyst

Date: February 24, 2022

Re: Cynthia and Dennis Ever, 359 North Street, PLPZ 2022 00022
Landscape plan by Wesley Stout Associates, dated February 23, 2022

The Conservation Commission staff had reviewed this proposal and provided comments on February 8, 2022. The main issues raised included the open space demarcation and the maintenance of both open space parcels. The revised landscape plan addresses all of the concerns and provides valuable directions for the future maintenance.

1. The proposed monuments will serve well to demarcate parcel P-1. Placed at every corner and additional two along the longer stretch of the boundary will be easy to locate and helpful in future enforcement.

2. The revised language of the Declaration of Restrictions clarifies the allowed site maintenance and refers to the proposed restoration planting plan. It is recommended the plan be filed on the Land Records as well making them easier to access.

3. The proposed landscape/open space restoration plan was further revised to address more detailed comments provided by the Conservation Commission staff. As a result, the following items were added to the plan:
   - Mulch treatment was added to all planted bed areas within both open space parcels.
   - Both sides of the stream channel were stabilized with new native plantings.
   - Supplemental native plantings were added to both open space areas to provide a denser cover, enhance the wildlife habitat and protect the soil.
   - “Organic Lawn Care” note was added to the map referring to P-1 parcel
   - The invasive Norway maples will be replaced with native red oak and two red maples to diversify the tree composition
   - Declining in health, 18 hemlocks will be replaced with 16 native Eastern white cedars and 35 native shrubs helping with plant diversity and compensating for the loss.

The above landscape plan will improve the functions and ecological values of both open space areas and addresses all previously raised concerns.

cc: Conservation Commission
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: Scott Marucci - Senior Civil Engineer

Date: 2/23/2022

COMMENTS AND CONDITIONS OF APPROVAL: Resubmit Prior to Zoning/Building Permit Approval

1. A revised Form SC-107 needs to be submitted.
2. P&Z is advised to review language of Open Space Parcel P-1; existing survey map appears to show drainage pipes encroaching into it.
3. The following information is for the Commission with regard to the letter from Ahneman Kirby dated February 15, 2022, for the site drainage as provided in the Drainage Summary Report from Rocco V. D’Andrea, Inc, date February 1, 2022, for Point of Concern A:
   a. The TOG DM 2012 (as amended) requires a zero increase in peak flow to all points of concern for the 2, 5, 10, and 25-year storm. The report shows a zero increase in peak flow to POC A for the 1, 2, 5, 10, and 25-year storms and an increase for the 50 and 100-year storms. A zero increase in peak flow for the 50 and 100-year storms is not required by the TOG DM 2012 (as amended).
   b. The TOG DM 2012 (as amended) requires that the increase in runoff reduction volume (RRV is only for 1-year storm) be provided. The report shows that the required RRV that needs to be provided is 883 CF (storage to infiltrate the runoff into the soil). The RRV provided by the design is approximately 1,008 CF during the 1-year storm to POC A.
   c. The TOG DM 2012 (as amended) does not require that the increase in runoff volume for the 2, 5, 10, 25, 50, and 100-years storms be provided.
d. The TOG DM 2012 (as amended) requires that all new and reconstructed impervious areas infiltrate or filter the water quality volume (WQV). The report shows that the required WQV that needs to be provided is 187 CF for the new addition to POC A.

e. The report shows three existing concrete galleries provide an existing total storage volume of 304 CF. The actual amount is less since the top if units is at elevation 102.30 and the yard drain grate is at elevation 101.40.

f. The design has directed some of the proposed addition that would be part of POC B into POC A. It appears this was done because of the roof gutter design. It may be possible to direct this area to POC B, but it would be directed to the three Cultec Systems that are currently designed to meet the LID BMP standards by receiving around 3,000 SF of impervious area. The Engineering Division would allow this additional area to be sent to the three Cultec Systems even though it will be above the required LID BMP standard if it helps with the potential concern from the neighboring property.

g. The design engineer is responsible for the project design and in this case as well as in most cases will design BMPs to exceed the required standards of the TOG DM 2012 (as amended).

h. Since the proposed design is meeting and exceeding some of the standards required by the TOG DM 2012 (as amended); the Engineering Division is acceptable in concept to the design since it meets the standards of the TOG DM 2012. The decision to decrease this runoff to only meet the TOG DM 2012 (as amended) RRV standard is at the discretion of the design engineer or as directed by the Commission based on the potential concern from the engineer representing the neighbor. Any consideration to further reduce the amount of RRV below the required standards of the TOG DM 2012 (as amended) will need to be agreed upon by the Commission, design engineer, and engineer representing the neighbor. This modification will require a legal document be created defining the agreement and it must be signed by all necessary parties as determined by the Law Department. The Engineering Division will not sign this document.

i. The design plans show the proposed level spreaders at the required minimum of 10-feet from the property line. The TOG DM 2012 (as amended) does not have a minimum required distance from a sewer easement.

j. It is recommended that the design engineer provide a response to the Commission with regard to the letter from Ahneman Kirby dated February 15, 2022.

4. The Drainage Summary Report is acceptable in concept for the proposed BMPs. The following revisions and additional information need to be submitted prior to zoning/building permit:

a. If the proposed pool and patio are not proposed as part of this design, they need to be removed from the drainage analysis and design. The pool and patio will need to meet the standards of the Town of Greenwich Drainage Manual at the time of submittal.

b. The existing discharge for Pond 34P: Ex. Galleries needs to be revised to 101.40 (grate).

c. The routing for RS#1, RS#2, and RS#3 needs to be revised as follows:

i. The routing in the report uses a 6” discharge from each retention system but the actual discharge is a single 8” with an invert elevation of 102.00. The routing should use a single pond with the three retention systems included and a single 8” discharge. Contact the Engineering Division if any questions.

d. The routing for Pond 29P: RS#5 does not match between the plan and the report. Review and revise as needed so they match.

e. The routing for Pond 36P: Ex. Cultecs needs to have the elevation for the pop-up emitters revised to match the elevation of the ground on the plan and also requires two pop-up emitters as shown on the plan.

f. Based on USDA Web Soil Survey the proposed site work is within soil classification “C”, which requires that a saturated hydraulic conductivity test be completed in the location of DT#1, DT#3, DT#4, at the center of proposed RS#4 BMP, and at the center of proposed RS Footing Drain BMP.

g. A deep test hole must be completed at the center of proposed RS#4 BMP and RS Footing Drain BMP.

h. DT#4 must be excavated down to elevation 97.00 to verify the required 2-foot separation to a restrictive layer is met.

i. Revise all other computations as needed.

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

a. Site Plan Sheets

i. The required minimum 10-feet from the back of retaining wall to the stone face of the Cultec Systems on all sides must be met.

ii. Show excavation and fill quantities in a table.

iii. If a catch basin grate is used with the level spreader it needs to be placed in the center of the proposed level spreader. The grate must be .25-feet lower than the top of stone of the level spreader.
DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION
SITE DEVELOPMENT REVIEW

This will direct any overflow from the catch basin to be directed into the stone bed so any discharge from the level spreader is across the entire length.

6. The draft Operations and Maintenance Plan Report must be revised as follows:
   a. Exhibit A needs a maintenance item for Groundwater Pumping System added.

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).
Date: January 1, 2022

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: PLPZ202100494: 359 North Street, Cynthia & Dennis Ever

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

Project Summary:
• Construction of two additions leading to an over-volume situation.

Sewer Division Comments:
As indicated in the Sewer Division’s prior comments dated November 12, 2020, the following comments still apply and need to be addressed:

Comments to be addressed during P&Z phase:
• Prior to obtaining P&Z approval, the applicant/owner is required to submit a signed letter acknowledging receipt of these P&Z comments and that the applicant/owner has read all the comments and agrees to adhere to the comments. A copy of this document is required to be provided to the Sewer Division. It is important for the applicant/owner to understand that failure to comply with these comments may result in delays in both Sewer and Building Permitting. The applicant/owner assumes any risk or impacts to their project schedule as a result of not complying with these requirements.

Comments to be addressed during Sewer and Building Permit phase:
• The owner/applicant has already obtained a Sewer Repair Permit but has not completed the required sewer work. Please have the owner/applicant coordinate with the Sewer Division to complete the required sewer work.

• Based on a recent inspection performed on an adjacent property, our Sewer Division Environmental Asset Engineer/Sewer Inspector observed a marked out rectangle in the yard that someone thought may be a future proposed pool. If the property owner/applicant is considering any pool installation, please make the property owner/applicant aware to confirm the location of their sanitary sewer lateral and make sure there are no conflicts. In addition, please note, any pool filtration systems must be a closed loop system and cannot backwash 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.
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. PLPZ202100494

Reviewed for Planning and Zoning Commission.

TITLE OF PLAN REVIEWED: Ever

LOCATION: 359 North Street

PLAN DATE:

ZONE: RA-1

☒ Ok for Zoning Permit Sign-off with the following revisions:
The applicant would need to provide floor area drawings per section 6-12.

☐ 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: 12/29/2021

Note: These comments do not represent Building Inspection Division approval. Plans subject to review by ZEO at time of building permit application.
PERMIT-NEED QUESTIONNAIRE

This form is NOT an IWWA Application

Project Address: 359 NORTH ST  Tax ID: 11-17345

Property Owner: EVER, DENNIS + CYNTHIA

Contact information - Email or Cell Phone: MARK@MAIDIQUE.COM

Authorized Agent: MARK MAIDIQUE

Contact information - Email or Cell Phone: MARK@MAIDIQUE.COM

Has there ever been an IWWA application for this site? YES NO  Appl #  

ACTIVITY: (Circle)  
Addition  Demolition  Deck  Garage  Interior 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: [Signature]  Date: 7-24-21

STAFF NOTES

Office Rev Date: 9-24-21  Field Inv Date: / /  WET/WC?: YES NO TIDAL: [ ]

Action Required? YES NO  If yes DR: AA AR: SIA  Staff: [Staff]

Soils Report Date: / /  Author:  soils

Comments: More than 100' from WC Xing in driveway to addition behind house.
The following comments in red reflect revisions/additions that will be made by WSA to drawing titled “Planting Plan: Open Space Parcels” (drawing # SP-1.0) dated 2/23/2022.

**P-2 parcel**

- Tussock sedge should be replaced with either *Carex pensylvanica* or *Sesleria autumnalis* (autumn moon grass) or *Sporobolus heterolepis* (prairie dropseed). This area is too dry to support tussock sedge.
  - WSA is replacing the Tussock sedge with *Carex divulsa* (Grassland Sedge).
- The organic mulch is depicted along the north side of the stream, which is welcomed. However, this organic mulch should also encompass the P-2 open space area.
  - WSA has added notes that describe the mulch treatments for the various areas:
    - Open Space Parcel P-2
    - Area North of the Stone Channel and South of Open Space Parcel P-2
    - Planting Bed South of the Stone Channel
    - Planting Beds in Open Space Parcel P-1
- Although outside of Parcel P-2, herbaceous ground cover with deep root system is recommended along the northern side of the stream.
  - WSA has added herbaceous ground cover along the northern side of the stream.
- Supplemental plantings within the open space area will protect the soil, prevent the area from growing invasive species, and enhance the habitat.
  - WSA has added supplemental plantings as noted above.

**P-1 parcel**

- Two more monuments should be installed between M4 and M5. We are not in favor of steel rods with caps as they are difficult for observers to find without a metal detector. The monuments, being flush, will not pose a hazard.
  - WSA has added two more monuments to Open Space Parcel P-1.
- The commitment to maintain the planted bed along the property line with natural mulch cover should be placed on the plan. The map should also clearly identify areas where leaves will be left in place for mulch (P-2) and the area of natural mulch (P-1).
  - WSA has added notes to clearly identify the mulch treatments for the various areas. See response to bullet #2 under P-2 Parcel.
- Ten-foot spacing between *winterberries* (viburnums) proposed in the corner. More plants should be added to better cover the soil to limit erosion and prevent weeds from growing.
  - WSA has included (3) three additional viburnum shrubs and herbaceous groundcover to this area.
- In addition to the narrative, the map should indicate the commitment to organic land care within the open space areas and along their perimeters. The map should be filed on the land record and used as a reference for the future land maintenance.
  - WSA has included an “Organic Lawn Care” note on the Planting Plan and under item #2 in the Landscape Notes section.
• Replace the deciduous Norway maple and cherry trees with native maples and/or oaks rather than arborvitae and holly to better mimic the forest composition native to our area.
  o WSA has added (1) one Red Oak and (2) two Red Maples to diversify the tree composition.

**Site pictures**

P-2 parcel

P-1 parcel
REVISED DECLARATION OF RESTRICTIONS

WHEREAS, DENNIS EVER and CYNTHIA EVER of Greenwich, Connecticut, (hereinafter referred to as the Grantor) is the owner of certain real property in the Town of Greenwich, County of Fairfield and State of Connecticut, described and shown on a certain map entitled, “Zoning Location Survey Depicting Revision of Lot Lines at 359 North Street, Greenwich, Connecticut Prepared for Dennis Ever, Cynthia Ever”, prepared by Rocco V. D’Andrea, Inc., dated November 22, 2021, submitted to the Planning and Zoning Commission as a re-subdivision map of property located at 359 North Street, and filed in the Office of the Town Clerk of Greenwich as Number ___, hereinafter referred to as Map, said real property being composed of lots designated “Parcel A” and “Open Space Parcel P-1” and “Open Space Parcel P-2”.

WHEREAS, the property is shown as lots 2 & 3 and reserved for Park and Recreation Purposes on a three-lot subdivision map approved by the Greenwich Planning and Zoning Commission on August 4, 1978 recorded at Map 5605 in the Greenwich Land Records.

WHEREAS, Grantor is consolidating lots 2 & 3 on Map 5605 and reconfiguring the area designated as “Reserved for Park and Recreation Purposes” as “Open Space Area.”

WHEREAS, Grantor wishes to amend and replace the Declaration of Restrictions which was recorded as part of the original subdivision in Book 1093 at Page 129 of the Greenwich Land Records.

WHEREAS, said Grantor, in order to induce the Planning and Zoning Commission to approve proposed re-subdivision of Grantor’s real property as shown on said map, desire to create such covenants and restrictions as are necessary to comply with the provisions of the Subdivision Regulations of the Town of Greenwich adopted September 10, 1970, by the Planning and Zoning
Commission and approved September 14, 1970, by the Representative Town Meeting.

NOW THEREFORE, the Grantor does hereby declare the following covenants and restrictions, which covenants and restrictions shall run with the land in perpetuity and shall be binding on the Grantor, his heirs, legal representatives and assigns and all future owners of any and all of the lots within the herein described subdivision.

1. The areas designated on the Map as “Open Space Parcel P-1” and “Open Space Parcel P-2”, collectively the “Open Space” shall be forever reserved, preserved, used and maintained by the Grantor, or the association hereinafter provided for, as the case may be, solely for Open Space purposes.

2. Grantor shall subject any conveyance of either of the lots within the subdivision to the burden of these covenants and restrictions and shall, in any instrument of conveyance, express and make specific reference to this declaration by book and page number in the Greenwich Land Records. Grantor, its successors and or assigns shall have the right and obligation to enter onto the “Open Space” for purposes of maintaining, pruning and replacing the trees, shrubs and plantings thereon.

3. At the time of conveying any one of the lots shown on the Map, Grantor shall create an unincorporated Connecticut non-profit association named “359 North Street Property Owners Association” of which the only members will be the owner, or owners, from time to time of said lots and the primary purpose of which shall be to own, reserve, preserve, maintain and keep in good order and condition said “Open Space”. Said association shall have no purpose and shall conduct no business which is or may become repugnant to the covenants and restrictions contained in this declaration. Said association shall have the power to assess its members equally for all
costs necessary to perform the association's obligations hereunder. The Grantee of each of the lots shall, by acceptance of the instrument of conveyance, be deemed to have agreed to become a member of the association and to have agreed to pay such share or such costs as shall be assessed against Grantee's lot for the purposes and obligations of the association as hereinbefore described. Said association shall, with the prior review and approval of the Planning and Zoning Commission or its authorized representative, adopt, maintain and enforce reasonable regulations for the preservation, maintenance and use of such area reserved as “Open Space.” If at any time the reservation, preservation, maintenance or use of the area reserved as “Open Space” does not comply with the purposes of such reserved area or with the regulations adopted by the association pursuant hereto, the Town of Greenwich may take any and all necessary action to assure proper compliance and may assess against the association all costs incurred by the Town, including reasonable attorney's fees, for such purposes. Any such assessment not paid within thirty days after demand therefore shall bear interest from the date of demand at the rate established by law for interest upon money judgments, and the Town may bring an action at law to collect such assessment and there shall be added to the amount of such assessment, in such event, all costs incurred by the Town for such collection, including reasonable attorney's fees.

4. All members of the association shall have access to the area reserved as “Open Space”.

5. In the event the Association mentioned in paragraph 3 herein fails, neglects or refuses to pay assessments made by the Town of Greenwich on the area entitled “Open Space”, the individual lot owners in the subdivision that is subject to these restrictions shall each be jointly and individually liable for any and all taxes and assessments made by the Town of Greenwich.

In the event that any tax or assessment is not paid within thirty (30) days after
demand therefore shall bear interest from the date of demand at the rate established by law and any penalties thereon, and the Town may bring an action at law to collect such assessments and there shall be added to the amount of such assessment, in such event, all costs incurred by the Town for such collection, including reasonable attorney's fees.

6. The covenants and restrictions declared herein shall inure to the benefit of the Town of Greenwich and all property owners adjoining the subdivided real property of the Grantors described herein above and will run with the land in perpetuity and be binding on all future owners of any and all lots within the subdivision. The Town may enforce any of such covenants or restrictions by appropriate court action.

7. The restrictive covenants and agreements herein declared may not be modified, altered, amended, changed, or released without the written approval of the Town of Greenwich acting jointly by its Planning and Zoning Commission or such municipal officer or agency as may have succeeded them and with the unanimous approval of all the property owners in the subdivision as shown on the map.

8. The covenants and restrictions declared herein shall not be affected in any manner by change in zoning or land use subsequent to the final approval of the subdivision hereinbefore described.

9. “Open Space Parcel P-1” and “Open Space Parcel P-2” on the Map designated as “Open Space” shall be forever reserved, preserved, used and maintained by the Owner or the association hereinafter provided for, solely for Open Space subject to the following:

   a) No building or other structure or improvement, either temporary or permanent, shall be erected or caused to be placed on any portion of the Open Space other than sunken boulder monument demarcation denoting the Open Space boundary.
b) No topographic changes shall be made in any portion of the Open Space without the prior written approval of the Planning and Zoning Commission or designee.

c) No tree shall be removed from the Open Space Area by the Owner unless, as a result of disease or death, said tree poses a threat to the residential use of the lot and the removal of said tree is approved in writing by the Planning and Zoning Commission or designee.

d) No refuse, trash, debris, garbage, waste matter, sewage, organic yard debris (grass clippings, leaves, branches, wood chips, etc.) or other like substance or offensive material shall be placed, caused to be placed or allowed to remain in or upon the Open Space Area.

e) The Owner shall have the right to protect from erosion portions of the Open Space by planting trees, plants and shrubs where and to the extent necessary, or by other appropriate means after said planting(s) is approved in writing by the Planning and Zoning Commission or designee. Owner shall demarcate the Open Space parcel and allow the area to naturalize.

f) Owner shall install the plantings shown on a plan entitled, “Planting Plan: Open Space Parcels, Drawing #SP-1.0” prepared by Wesley Stout Associates, dated February 23, 2022, and on file in the Town of Greenwich Planning and Zoning Office under application PLPZ 2022 00022. Any additional new plantings in the Open Space parcel will use only native species. All management of the Open Space parcel will be done as to encourage biodiversity and growth of native species and discourage the growth and spread of invasive species. Any work to prevent the spread of invasive species will be done in consultation with the Planning and Zoning Commission or designee, including but not limited to the Conservation Commission staff.

g) “Open Space Parcel P-1” may be regularly mowed up to the “Edge of Lawn” shown on Map.

h) As part of the future management of the Open Space parcel, the Owner shall abide the landscaping notes shown on a plan entitled, “Planting Plan: Open Space Parcels, Drawing #SP-1.0” prepared by Wesley Stout Associates, dated February 23, 2022, and on file in the Town of Greenwich Planning and Zoning Office under application PLPZ
2022 00022. Owner will take steps necessary to control invasive species on the property, if significant removal of invasive species is needed the Owner will seek approvals of the Planning and Zoning Staff of a management plan.

10. NOTWITHSTANDING ANY OTHER REQUIREMENT CONCERNING MODIFICATION OF THIS INSTRUMENT, OR ANY DOCUMENT FILED PREVIOUSLY IN THE GREENWICH LAND RECORDS, NO MODIFICATION OR INSTRUMENT PURPORTING TO MODIFY ANY CONDITION, TERM OR PROVISION OF THIS DECLARATION OF RESTRICTIONS SHALL BE VALID UNLESS IT IS FILED ON THE GREENWICH LAND RECORDS AND APPROVED BY THE PLANNING AND ZONING COMMISSION OF THE TOWN OF GREENWICH AND THE SIGNATURE OF THE CHAIRMAN OF SUCH PLANNING AND ZONING COMMISSION APPEARS THEREON.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

[SIGNATURES TO FOLLOW]
IN WITNESS WHEREOF, I have hereunto set my hand and seal this ___day of ____________, 2022.

____________________________________  DENNIS EVER


____________________________________  CYNTHIA EVER


STATE OF CONNECTICUT  )
COUNTY OF FAIRFIELD  )  ss: Greenwich

On the ___ day of __________, 2022, before me the undersigned, personally appeared DENNIS EVER known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for purposes therein contained.

In witness whereof I hereunto set my hand.

____________________________________ Notary Public

STATE OF CONNECTICUT  )
COUNTY OF FAIRFIELD  )  ss: Greenwich

On the ___ day of __________, 2022, before me the undersigned, personally appeared CYNTHIA EVER known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that she executed the same for purposes therein contained.

In witness whereof I hereunto set my hand.

____________________________________ Notary Public
Existing Tree Inventory & Removals

Date: 02-23-2022
Scale: 1" = 20'

Symbol Legend
- Property Line
- Tree Call-Out
- Existing Evergreen Trees
- Existing Deciduous Trees
- Existing Trees to be Removed
- Existing Planting Area
- Proposed Evergreen Trees
- Proposed Deciduous Trees
- Proposed Transplanted Area
- Proposed Residence
- Open Space Area
- Monuments

Landscape Note
1. Tree locations outside of high-impact areas identified and roughly located by Wesley Stout Associates in the field on 2/16/2022.

Tree Removal Schedule:

<table>
<thead>
<tr>
<th>#</th>
<th>Tree Type</th>
<th>Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Hemlock</td>
<td>10&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T2</td>
<td>Hemlock</td>
<td>8&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T3</td>
<td>Hemlock</td>
<td>8&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T4</td>
<td>Hemlock</td>
<td>10&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T5</td>
<td>Hemlock</td>
<td>10&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T6</td>
<td>Hemlock</td>
<td>6&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T7</td>
<td>Hemlock</td>
<td>12&quot; CAL.</td>
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</tr>
<tr>
<td>T8</td>
<td>Cherry</td>
<td>10&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T9</td>
<td>Norway Maple</td>
<td>8&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T10</td>
<td>Norway Maple</td>
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<tr>
<td>T15</td>
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</tr>
<tr>
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<td>Dead and declining. Decimated by disease and invasive ivy.</td>
</tr>
<tr>
<td>T18</td>
<td>Norway Maple</td>
<td>10&quot; CAL.</td>
<td>Dead and declining. Decimated by disease and invasive ivy.</td>
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Stockpile of Recently Transplanted Plant Material from House Perimeter. To be Relocated in Final Landscape Installation.
Proposed Plant Schedule

<table>
<thead>
<tr>
<th>Size</th>
<th>Symbol</th>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Qty.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 GAL.</td>
<td>-</td>
<td>Arrowood Viburnum</td>
<td>Virburnum dentatum</td>
<td>4</td>
<td>Full, heavy flowers, nicely shaped, natural character</td>
</tr>
<tr>
<td>2 GAL.</td>
<td>-</td>
<td>Smooth Hydrangea</td>
<td>Hydrangea arborescens</td>
<td>30</td>
<td>Full, nicely shaped, matching</td>
</tr>
<tr>
<td>2 GAL.</td>
<td>-</td>
<td>American Witch-Hazel</td>
<td>Hamamelis virginiana</td>
<td>8</td>
<td>Full, heavy flowers, nicely shaped, natural character</td>
</tr>
<tr>
<td>2 GAL.</td>
<td>-</td>
<td>Red Oak</td>
<td>Quercus rubrum</td>
<td>4</td>
<td>Full, nicely shaped, matching</td>
</tr>
<tr>
<td>1 GAL.</td>
<td>-</td>
<td>Arrowwood Viburnum</td>
<td>Virburnum dentatum</td>
<td>10</td>
<td>Full, nicely shaped, natural character</td>
</tr>
<tr>
<td>1 GAL.</td>
<td>-</td>
<td>Arrowwood Viburnum</td>
<td>Virburnum dentatum</td>
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<td>Full, nicely shaped, natural character</td>
</tr>
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</tr>
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<td>1 GAL.</td>
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<td>Arrowwood Viburnum</td>
<td>Virburnum dentatum</td>
<td>10</td>
<td>Full, nicely shaped, natural character</td>
</tr>
</tbody>
</table>

Landscape Notes

1. Tree locations outside of open space were field identified and roughly located by Wesley Stout Associates in the field on 2/16/2022.
2. Denuderbush. The Owner agrees to denuderbush the Open Space as suggested, either with clay or gravel concrete, but with beds that will be provided or all corners or change of angle and two monuments will be added between M4 and M7 as shown on the plan. The Owner also agrees to commit to Organic Lawn Care for the Open Space area.
3. The Owner will provide a minimum level of cleaning within the property lines. The Owner will commit to maintaining the property lines within the property lines.
4. The Owner will maintain the Open Space Parcel P-1 as shown on the plan. The Owner will commit to maintaining the property lines within the property lines.
5. Soil Management: Any new construction will have topsoil stripped and stock piled and replaced along with soil amendments including organic matter for proper soil health.
Good morning Scott-

We represent Dennis and Cynthia Ever owners of 359 North Street. Their proposal involves construction of additions to their home on a magnificent site. The home sits at the high point of the lot and the topo drops off to the west. The majority of the property is maintained as lawn or sparsely wooded.

I have attached a copy of your comments dated February 8, 2022. Those comments are minor and they are the same as those contained in your review memo dated December 30, 2021. We submitted responses to them on February 1, 2022, through P&Z under a cover letter addressed to Juan Paredes, PE.

The Ever application is currently pending before P&Z as a Special Permit due to volume.

On Tuesday a couple of hours before the recent P&Z hearing we received a copy of a letter dated February 15, 2022 that was addressed to Katie Deluca. The letter was unsigned, but based on the email from Jacalyn Pruitt from P&Z, in which we received the letter, it appears to have been prepared by a staff engineer from the Ahneman Kirby firm, Ida Gheisi.

In her letter, Ms. Gheisi indicated that she represents an adjacent down gradient property owner at 11 Sparrow Lane, Hugh B. Vanderbilt. According to Ms. Gheisi, Mr. Vanderbilt has five sump pumps in his basement. That appears to be an indication of an existing condition due to ground water influence not directly related to any, yet to be constructed, additions or drainage systems on the Ever property.

Prior to preparing our drainage design we made a field reconnaissance of the surrounding topography and noted the difference in elevation between the Ever property and the neighboring properties to the west. In response, we decided to be more conservative in our design and store the volume for the 25-year storm. The plan includes several modules of galleries spread out across the westerly flank of the property to disperse the runoff in accordance with the Drainage Manual. Filling a portion of the southwest section of the property will provide additional storage capacity.
The current design has also been sized to accommodate a pool, which is not included in the current construction set. The pool will be presented as a separate Building Permit application before the C.of O. request for the house is submitted. The reason for delaying the pool submission is that the construction of the pool would require relocation of the existing sewer lateral, and the review process for the sewer relocation did not mesh with the timing of the review for the additions by P&Z.

In her letter, Ms. Gheisi suggested relocating the level spreader farther south to reroute the potential runoff from the level spreader to another property. Our design maintains the existing drainage patterns and I advised the Commission that the suggestion by Ms. Gheisi to reroute runoff is not permitted. Ms. Gheisi also challenged the location of the level spreader, which I advised is located ten feet from the adjacent property line as required by the Town our Drainage Manual.

The purpose of this letter is to make you aware of the letter from Ms. Gheisi and request that you send a memo to P&Z reiterating your acceptance of our Drainage Summary Report and plans. In that memo, please note that we submitted a response to your current comments on February 1, 2022, and all of the current comments have been addressed in our report and on the plans dated February 1, 2022. As noted above, your comments Dated February 8, 2022 are the same as those dated December 30, 2021, which we have responded to in full.

Please advise Jacalyn Pruitt and Pat LaRow at P&Z that you are in receipt of complete responses to your comments and that your prior statement of acceptance of the design as presented remains valid. That accommodation would be appreciated and would enable the Commission to close the hearing at their next meeting.

Thank you for your consideration.

Tony

------------------------------------------------
Anthony L. D’Andrea PE&LS
Rocco V. D’Andrea, Inc.
6 Neil Lane, P.O.Box 549
Riverside, CT 06878
(203) 637-1779
ald@rvdi.com

CAUTION: This email originated from outside the Town email system. Do not click links or open attachments unless you have verified the sender and know the content is safe.
These drawings and specifications, including the ideas and arrangements represented therein, are the property of the Architect. The Architect as Author of these documents, shall retain all common law, statutory and other reserved rights including copyright. No part thereof shall be copied, disclosed or used in connection with any other project without the specific written consent of the Architect.

Do Not Scale Drawings. Written dimensions shall take precedence over scaled dimensions. The Architect must be notified of any discrepancies or exclusions from the drawings prior to work being executed.

PROJECT NO. 2020-0048

EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR PERMIT DATE: 2021-08-18
ISSUE DATE FOR REVIEW: 2021-09-17

FAR CALCULATIONS
FIRST FLOOR
1/4" = 1'-0"
FAR 1.0
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PROJECT NO. 2020-0048
EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR PERMIT DATE: 2021-08-18
ISSUE DATE FOR REVIEW: 2021-09-17

DATE:
DESCRIPTION:
REV. #
SCALE:
FAR CALCULATIONS
SECOND FLOOR
1/4" = 1'-0"
FAR 2.0
2022-02-03

Planning & Zoning Commission
Greenwich Town Hall
101 Field Point Rd
Greenwich, CT 06830
(203) 622-7754

re: Acknowledgement of Sewer Comments
Special Permit Application(s) for Over-volume at 359 NORTH STREET (Ever residence)

To Whom It May Concern:

By means of this letter, we, as the owners of the above-referenced property, do hereby state that:

A) We have received, reviewed and understand the comments from the Sewer Division and agree to adhere to them. We understand that failure to comply with these comments may result in delays in both Sewer and Building Permitting, and assume any risk or impacts to their project schedule as a result of not complying with these requirements.

If you have any further questions, please feel free to reach out.

Sincerely,

Dennis Ever or Cynthia Ever
Site Plan Application

Property Address: 359 North Street  
Tax ID: 11-1732/S

Property Owner: Cynthia & Dennis Ever  
Address: 359 North Street

Email: dennissever@gmail.com  
Cell Phone: (917) 443-5581  
Other Phone: ________________

Applicant: Mark Maidique  
Address: 7 Silver Brook Road, W'port 06880

Email: mark@maidique.com  
Cell Phone: (203) 536-8998  
Other Phone: ________________

Authorized Agent: Mark Maidique  
Email: Mark Maidique  
Cell Phone: (203) 536-8998  
Other Phone: ________________

Select One: ☐ Pre-Application  ☐ Final

Zone(s): RA-1  Lot Area: 96,137

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 # ________________________________  pzSitePlanApp 2020
### Existing Site Plan

<table>
<thead>
<tr>
<th></th>
<th>EXISTING</th>
<th>PROPOSED</th>
<th>PERMITTED/REQUIRED</th>
</tr>
</thead>
</table>

#### Commercial/Office
- **Gross Floor Area**
- **Usable Floor Area**
- **Parking Spaces**

#### Commercial/Retail
- **Gross Floor Area**
- **Usable Floor Area**
- **Parking Spaces**

#### Other Uses
- **Gross Floor Area**
- **Usable Floor Area**
- **Parking Spaces**

#### Residential
- **Number of Units**: 1
- **Number of Bedrooms**: 5
- **Gross Floor Area**: 8,864
- **Parking Spaces**

#### Total Square Footage
- **Total**: 8,864
- **Proposed**: 2,828 (11,692 total)
- **Permitted/Required**: 12,853

#### Building Height
- **Existing**: 33'-6"
- **Proposed**: unchanged
- **Permitted/Required**: 2.5 Stories/40'

#### Floor Area Ratio
- **Existing**: 0.093
- **Proposed**: 0.123
- **Permitted/Required**: 0.135

#### Building Coverage
- **Existing**: 19.7%
- **Proposed**: 26.7%
- **Permitted/Required**: 95,209

#### Lot Coverage
- **Existing**: 18,732
- **Proposed**: 25,375
- **Permitted/Required**: 26,659

#### Total Parking Spaces
- **Existing**: -
- **Proposed**: -
- **Permitted/Required**: -

#### Green Area
- **Existing**: 77,405 (81.3%)
- **Proposed**: 69,833 sf (73.3%)
- **Permitted/Required**: 68,551 (72%)

#### Age of Structure
- **Existing**: 119 years (built 1902)

### Sites Plan Involves:
- ☒ Additions
- ☐ Alterations
- ☐ Demolition
- ☐ Re-Construction

pzSitePlanApp 2020
Special Permit Application

<table>
<thead>
<tr>
<th>Property Address:</th>
<th>359 North Street</th>
<th>Tax ID: 11-1732/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Owner:</td>
<td>Cynthia &amp; Dennis Ever</td>
<td>Address: 359 North Street</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:dennisever@gmail.com">dennisever@gmail.com</a></td>
<td>Cell Phone: (917) 443-5581</td>
</tr>
<tr>
<td>Applicant:</td>
<td>Mark Maidique</td>
<td>Address: 7 Silver Brook Road, W'port 06880</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:mark@maidique.com">mark@maidique.com</a></td>
<td>Cell Phone: (203) 536-8998</td>
</tr>
<tr>
<td>Authorized Agent:</td>
<td>Mark Maidique</td>
<td>Address: 7 Silver Brook Road, W'port 06880</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:mark@maidique.com">mark@maidique.com</a></td>
<td>Cell Phone: (203) 536-8998</td>
</tr>
</tbody>
</table>

Zone(s): RA-1 Lot Area: ____________

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: 359 North Street

Property Owner 1: Cynthia & Dennis Ever

Address: 359 North Street

Email: dennisever@gmail.com

Cell Phone: (917) 443-5581

Other Phone: 

Signature: ____________________________ 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: Mark Maidique

Address: 7 Silver Brook Road, W'port 06880

Email: mark@maidique.com

Cell Phone: (203) 536-8998

Other Phone: ____________________________

Signature: ____________________________ Date: _____________

Authorized Agent: Mark Maidique

Address: 7 Silver Brook Road, W'port 06880

Email: mark@maidique.com

Cell Phone: (203) 536-8998

Other Phone: ____________________________

Signature: ____________________________ Date: _____________
Site Plan Review Checklist

Property Address: 359 North Street
Anticipated Type of Application: Addition/Renovation

All applications for preliminary and final site plan approval shall be made on the appropriate forms as provided by the Planning Staff. The following items must also be provided with the application. If any of the following items are not filed at the time of application, the application may be returned to the applicant in order that it may be filed in the entirety at an appropriate future date. Required Items: (Sec. 6-14)

Please check the items submitted below:

☐ 1. Fifteen copies of a survey, folded to 9" x 12", showing existing conditions, including:
   ☐ a. Locations and dimensions of all existing buildings, structures, fences, retaining walls, utility facilities, trees of six (6) inches or more in diameter at breast height, and other similar features.
   ☐ b. Existing contours at no more than a two-foot vertical interval, unless waived by the commission Staff in circumstances where such contours may not be necessarily pertinent. The survey shall indicate topographic conditions of property immediately adjoining the subject parcel.
   ☐ c. The location of all existing watercourses, intermittent streams wetlands as required by IWWA, Flood Hazard Lines as determined by FEMA, springs and rock outcrops or a note indicating that none exist, with the sources of information listed.
   ☐ d. The zone in which the land to be developed falls and the location of any town and zone boundary lines within or adjoining the tract, and yard dimensions to existing buildings. Lot area, by zone, shall be indicated.
   ☐ e. The title of the development, date, revision date if any and nature of revision, north arrow, scale, and the name and address of owner and names of owners of adjacent land.
   ☐ f. Street and property lines, curbs, edges of pavement, sidewalks, easements, right-of-way, covenants, and deed restrictions.
   ☐ g. Traffic lights and controls, public trees, catch basins, hydrants, and power and telephone lines in adjacent streets.
   ☐ h. Certification with the signature and seal or registration number of a registered land surveyor licensed in the State of Connecticut that the drawing is substantially correct to A-2 Standards, and that the property is in a designated zone under the zoning regulations.

☐ 2. Fifteen sets of a detailed Site development plan, at a readable scale, folded to 9" x 12", prepared in accordance with all applicable Town standards including the Roadway Design and Drainage Design Manuals, and signed by a professional architect, land surveyor, or engineer licensed in the State of Connecticut, showing:
   ☐ a. Location, dimension, and elevation of all proposed buildings, structures, walls, fences.
   ☐ b. Location dimensions and surface treatment of all existing and proposed parking and loading spaces, traffic access and circulation drives, and pedestrian walks. Sidewalks are to be provided as required by the Building Zone Regulations.
   ☐ c. Approximate location of proposed utility lines, including water, gas, electricity, sewer and the location of any transformers.
   ☐ d. Note specifying source of water supply and method of sewage disposal.
   ☐ e. Existing and proposed contours at units of no more than a two-foot interval unless waived by the Commission’s staff. Cuts and fills and estimates of blasting to be submitted at time of final site plan.
   ☐ f. Location, size and type of proposed landscaping and buffer planting and the designation of those areas of natural vegetation not to be disturbed.
   ☐ g. Any other similar information determined by the Commission staff to provide for the proper enforcement of the Building Zone Regulations.
   ☐ h. Zoning statistics including: Gross Floor Area, Floor Area Ratio, Usable Floor Area, Required Parking, Actual Parking.

pzSitePlanChecklist 2020
Provided, Building Height, Building Footprint, and Area Devoted to Surface parking, Building and Drives.

- i. Provisions for compliance with Americans with Disabilities Act (Handicap Access) and State Building Code.
- j. Coastal Area Management Application for projects within the Coastal Overlay Zone.

3. Eight sets of architectural plans, signed and sealed by an architect registered in the State of Connecticut, of all floors, all exterior elevations showing existing and proposed grade conditions. Elevations are to detail architectural elements by labeling materials, color and dimensions. Each architectural elevation shall show the absolute building height as well as building height for zoning purposes. All HVAC facilities are to be shown on architectural elevations.

4. Three copies of Floor Plan Work Sheets with the dimensions and calculated floor areas for each floor prepared in accordance with Sec. 6-5(22). Consult Commission Staff for required format.

5. Three copies of “building coverage” computation sheets.

6. Three copies of “area devoted to surface parking, building, and drives” worksheets.

7. Five copies of sight distance certification reports when required by a preliminary site plan review or when advised by the commission staff pursuant to item 2(g) of this checklist.

8. Three copies of Volume calculations per 6-101.

9. Completed Traffic Impact Evaluation Form if applicable. Submission requirements are defined on the form, available at the Commission office. A traffic report may be required.

10. Ten copies of completed application form signed by applicant or authorized agent, owners and contract purchasers, as applicable.

11. Ten copies of completed Special Permit form, if required by Building Zone Regulations.

12. Fifteen copies of detailed, inclusive narrative description of the proposed project. For those projects involving amendments to the Building Zone Regulations and/or amendments to the Building Zone Regulation Map, the narrative description must provide the section number and text for the proposed amendments(s) to the BZR and an explanation providing justification for the proposal. For map changes, a scaled drawing at 1” to 400’ needs to be provided for affected areas(s).

13. Eight copies of reductions in, 11 x 17 size, or other appropriate size, providing a readable, clear plan of proposed site development and architectural plans.

14. A showing that an adequate source of potable water is available to satisfy the needs of the proposed development as per Sec. 6-15(a) (5), signed by C.A.W.C.

15. An affidavit certifying that all abutting property owners have been notified, as evidenced by the submission of a certificate of mailing or certified or registered mail receipts about said application. A schedule of names, addresses, shown on a GIS map with lot lines indicating the location of the notified property owners. Owners of lots, or portions of lots, which are across a public or private street shall be deemed to be abutting property owners. For projects which require the preliminary review by the Conservation Commission, the notice shall be sent by the applicant to abutting owners two weeks prior to any scheduled hearing date of the Conservation Commission.

16. Authorization for the agent and contract purchasers to act on behalf of the certified property owner(s).

17. A separate schematic plan at a scale no larger than 1”-100” indicating buildings, parking and drives on the site and all adjoining properties, including those across the street, and the nearest cross street.

18. Five copies of a Drainage Summary Report as per Department of Public Works and the Town Drainage Design Manual. The summary report must be prepared in accordance with the following formats: PRELIMINARY: Existing and proposed storm water distribution, existing and proposed runoff rates, capability of off-site drainage facilities to accommodate proposed runoff, capability of off-site soils to accommodate percolation or detention if proposed, and identification of proposed drainage structures. FINAL: Final structure design details, prior approval from IWWA, Engineering Division and Conservation Commission as appropriate, and all information required by the preliminary report or two copies of drainage exemption forms.

19. In accordance with Sec. 6-183.1 to 6-183.10 of the Building Zone regulations, tree protection and sedimentation and erosion control plans shall be submitted with all site plan applications.

20. All applications for final site plans shall be in the form of a survey prepared by a registered Connecticut land surveyor having metes and bounds, dimensions of all buildings, parking and drives, setbacks of all structures from property lines, setbacks between buildings, and certification that building dimensions shown thereon are the same as the approved architectural plans Architectural and drainage plans are to be references by title, date(s) and sheet numbers.

21. Required fee submitted at time of application (see fee schedule).

22. "It is the belief of the PZC staff that this application is incomplete because of the failure of the applicant to provide the materials"
referred to above. This application will be reviewed by the PZC and a decision made as to whether it is complete or incomplete at its public meeting to be held in the PZC office.

All applicants must make an appointment to submit this application with the Applications Coordinator, Peter Mangs, who can be reached by (email) Peter.Mangs@greenwichct.org or (phone) 203-622-7894.

NOTE: Any new documentation presented at Planning and Zoning Meetings shall be submitted to staff so that they can be made part of the record. Please ensure all documents can easily be removed from presentation boards.
Certificate of Mailing

An affidavit pursuant to Sec. 6-14(a)(16), certifying that all abutting property owners have been notified by mail as evidenced by a certificate of mailings or certified or registered mail receipts, about said application. Owners of lots, or portions of lots, which are across a public or private street shall be deemed to be abutting property. For projects which require preliminary review by the Conservation Commission, the notice shall be sent by the applicant two weeks prior to any scheduled hearing date by the Conservation Commission.

Submit the Following for All P+Z Applications:

EXHIBIT A

A schedule of names and addresses shown on a GIS map with lot lines indicating the location of the notified property owners. (This may be obtained from the GIS Office in Town Hall, Ground Floor)

EXHIBIT B: Sample notification letter

To whom it may concern:

Notice is hereby given that (name of the applicant) has filed an application with the Town of Greenwich Planning and Zoning Commission for (type of application) approval for (address).

This application (give a brief description of the proposed project).

Further information concerning this application may be obtained by contacting the Planning and Zoning Commission at 203-622-7894.

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

Affidavit of Notification of Application for Rezoning / Special Permit / Site Plan / Subdivision Applications

(STATE OF CONNECTICUT) (): GREENWICH
(COUNTY OF FAIRFIELD)

I, MARK ALEX MAIDIQUE, being first duly sworn, do hereby certify that on (date), 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 (date) as shown on the Town Tax Assessor’s Office records of property abutting (as said term defined in Sec. 6-14 (a)(3) of the Greenwich Building Zone Regulations) the property belonging to (owner name) for which an application for (type of application) has been filed with the Greenwich Planning and Zoning Commission.

Subscribed and sworn to
Before me on

______________________________________________

Notary Public

pzAffidavitNotification 2020
**Project Narrative:**

**Ever Residence:**
359 North Street
Greenwich, CT 06830

Dennis and Cynthia Ever are proposing residential improvements to their property located at 359 North Street in Greenwich, Connecticut. Per the submitted Zoning Location Survey, the subject property (Parcel “A”) is approximately 96,137 square feet in size with a buildable area of 95,209 square feet (with the exclusion of Parcel “X”). The property is located on the westerly side of North Street, approximately 350 feet south of Doubling Road. Under existing conditions, the parcel supports a residential dwelling (2 1/2" story building), detached garage, gravel driveway, stone patios and flagstone walks.

The owner is proposing to construct two additions to the existing dwelling. The first, is a 1-story kitchen addition connecting the two separate terraces at the west (rear) elevation and adding an interior courtyard that engages the existing structure. The second addition adds a single-story garage with a new mudroom and guest bedroom directly above at the northern side. All proposed work conforms within the limits of critical zoning elevations and grade plane requirements.

Site improvements will include the construction of retaining walls, an in-ground pool, patios, several subsurface stormwater management facilities with associated storm drainage piping, installation of various underground utilities and associated site grading and landscaping.

The proposed development will increase on-site impervious coverage by approximately 5,835 square feet and therefore increase the volume and peak rate of runoff generated during a storm event. To alleviate any potential impacts from the proposed development to downstream properties, a storm drainage conveyance system was designed to collect site runoff and direct flow through five subsurface infiltration systems prior to discharging flow downstream.

For a depiction of existing conditions and the proposed development, refer to a plan set entitled “Construction Site Plan Review Set, Dwelling Additions, Location 359 North Street Greenwich, Connecticut, prepared for Dennis Ever Cynthia Ever,” sheets 1 through 4 of 4, prepared by Rocco V. D’Andrea, Inc.

The proposed development conforms with all applicable Town of Greenwich stormwater management standards to the maximum extent practical. Please refer to the supplemental Civil Package, including the Drainage Report submitted by Rocco V. D’Andrea, Inc. for a narrative detailing the projects compliance with each stormwater management standard.
Monday, October 25, 2021

KATES, KENNETH & ALLYSON
7 SPARROW LANE
GREENWICH, CT 06830

re: Special Permit for 359 North Street (Ever Residence)

To whom it may concern:

Notice is hereby given that Dennis & Cyntha Ever have filed an application with the Town of Greenwich Planning and Zoning Commission for Special Permit (per Town Code, section 6-101, 107) approval for 359 North Street.

This application is for a residential addition to an existing single family residence.

Further information concerning this application may be obtained by contacting the Planning and Zoning Commission at 203-622-7894.

Regards,

Mark Alex Maidique, AIA MBA
CT Architecture License 11404
Monday, October 25, 2021

TRINCA, SIMON & ROSITA W /S
364 NORTH ST
GREENWICH CT 06830

re: Special Permit for 359 North Street (Ever Residence)

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Regards,

Mark Alex Maidique, AIA MBA
CT Architecture License 11404
Monday, October 25, 2021

AGREST, ALBERTO & LUZ W/S
363 NORTH ST
GREENWICH, CT 06830

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Regards,

Mark Alex Maidique, AIA MBA
CT Architecture License 11404
Monday, October 25, 2021

SMITH, GUY L IV & MARJORIE
352 NORTH STREET
GREENWICH, CT 06830

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Regards,

Mark Alex Maidique, AIA MBA
CT Architecture License 11404
Monday, October 25, 2021

VANDERBILT, HUGH B JR
11 SPARROW LANE
GREENWICH, CT 06830

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Regards,

Mark Alex Maidique, AIA MBA
CT Architecture License 11404
Monday, October 25, 2021

HAZLETT, ROBERT C III &
360 NORTH ST
GREENWICH CT 06830

re: Special Permit for 359 North Street (Ever Residence)

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Further information concerning this application may be obtained by contacting the Planning and Zoning Commission at 203-622-7894.

Regards,

Mark Alex Maidique, AIA MBA
CT Architecture License 11404
Monday, October 25, 2021

SOTERAKIS, GEORGE
361 NORTH STREET
GREENWICH, CT 06830

re: Special Permit for 359 North Street (Ever Residence)

To whom it may concern:

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Regards,

Mark Alex Maidique, AIA MBA
CT Architecture License 11404
Monday, October 25, 2021

YARETT, JORDAN E & SUSAN  
355 NORTH STREET  
GREENWICH, CT 06830

re: Special Permit for 359 North Street (Ever Residence)

To whom it may concern:

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This application is for a residential addition to an existing single family residence.

Further information concerning this application may be obtained by contacting the Planning and Zoning Commission at 203-622-7894.

Regards,

Mark Alex Maidique, AIA MBA  
CT Architecture License 11404
ABUTTER’S LIST

☑ MAILED TO 11-1734/S
KATES, KENNETH & ALLYSON
7 SPARROW LANE
GREENWICH, CT 06830

☑ MAILED TO 11-2360?
TRINCA, SIMON & ROSITA W /S
364 NORTH ST
GREENWICH CT 06830

☑ MAILED TO 11-1044?
AGREST, ALBERTO & LUZ W/S
363 NORTH ST
GREENWICH, CT 06830

☑ MAILED TO 11-1481?
SMITH, GUY L IV & MARJORIE
352 NORTH STREET
GREENWICH, CT 06830

☑ MAILED TO 11-1735/S?
VANDERBILT, HUGH B JR
11 SPARROW LANE
GREENWICH, CT 06830

☑ MAILED TO 11-1746?
CHIAPPELLONI, ROBERTO
353 NORTH ST
GREENWICH, CT 06830

☑ MAILED TO 11-2361?
HAZLETT, ROBERT C III &
360 NORTH ST
GREENWICH CT 06830

☐ MAILED TO 11-2911/S?
SOTERAKIS, GEORGE
361 NORTH STREET
GREENWICH, CT 06830

☐ MAILED TO 11-1747?
YARETT, JORDAN E & SUSAN
355 NORTH STREET
GREENWICH, CT 06830
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</table>
August 29, 2021

Greenwich Town Building Inspector
Greenwich Town Hall
101 Field Point Rd
Greenwich, CT 06830
(203) 622-7754

re: Permit application(s) for Addition/Renovation at 359 NORTH STREET

To Whom It May Concern:

By means of this letter, I, as the owner of the above-referenced property, do hereby state that:

A) Quinndico Custom Home Builders, LLC and its representatives, including but not limited to Mark Alex Maidique, are authorized to apply for any and all permits related to the above-captioned project.

If you have any further questions, please feel free to reach out.

Sincerely,
[Signatures]

Dennis Ever

or

Cynthia Ever
Hi Pat and Jackie,

Attached is an authorization letter to permit us to appear with Mark Maidique on behalf of the Evers for their special permit at 359 North Street.

As discussed, we’d like the opportunity to address the treatment of the open space with the Commission as part of their special permit review.

Please schedule us for the next hearing date and let us know if you have any questions.

Thanks,

John

John Heagney
Heagney, Lennon & Slane, LLP
31 East Elm Street
Greenwich, CT 06830
O: 203-661-8400
F: 203-661-7496
jheagney@HLScflaw.com

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CAUTION: This email originated from outside the Town email system. Do not click links or open attachments unless you have verified the sender and know the content is safe.
October 13, 2020

Planning and Zoning Commission
Town of Greenwich
101 Field Point Road
Greenwich, CT 06830

RE: 359 North Street, Greenwich, CT

To Whom It May Concern:

We hereby authorize Heagney, Lennon & Slane, LLP to act as our agent to appear before the Town of Greenwich Planning and Zoning Commission or any other Town Municipal Board in connection with the filing of applications for the above captioned property.

Dennis Ever, Applicant

Cynthia Ever, Applicant
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA) CERTIFICATION
PRE-CONSTRUCTION

Property Address: 359 North Street

Tax Account No.: 11-1732/S

Building Permit No.: 

PLANS & DRAINAGE SUMMARY REPORT INFORMATION

Engineering Firm: Rocco V. D’Andrea, Inc.

Design Plans Date: 9/10/2021

Drainage Report Date: 9/10/2021

PROPERTY INFORMATION FOR DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)

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<td>Under Proposed Conditions (SF)²</td>
<td>Under Proposed Conditions (SF)³</td>
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</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/duvess/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 (infiltration 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: 9/10/2021

Engineer’s Seal: ___________________________
DRAINAGE SUMMARY REPORT

For

359 North Street
Greenwich, Connecticut

Prepared For

Dennis Ever
Cynthia Ever

September 10, 2021

Anthony L. D’Andrea, PE
CT License No. 9673
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1. Project Narrative

1.1. Description and Purpose

Dennis and Cynthia Ever are proposing residential improvements to their property located at 359 North Street in Greenwich, Connecticut. The subject property is approximately 96,137 square feet in size and is located on the westerly side of North Street, approximately 350 feet south of Doubling Road. Under existing conditions, the parcel supports a residential dwelling, detached garage, gravel driveway, stone patios and flagstone walks.

This report will summarize the impacts of the proposed development on the surrounding watershed and downstream locations, and outline the proposed stormwater management plan designed to provide water quality improvements and runoff attenuation before discharging offsite.

The owner is proposing to construct two additions to the existing dwelling. Other improvements will include the construction of retaining walls, an in-ground pool, patios, several subsurface stormwater management facilities with associated storm drainage piping, installation of various underground utilities and associated site grading and landscaping.

The proposed development will increase on-site impervious coverage by approximately 5,835 square feet and therefore increase the volume and peak rate of runoff generated during a storm event. In order to alleviate any potential impacts from the proposed development to downstream properties, a storm drainage conveyance system was designed to collect site runoff and direct flow through five subsurface infiltration systems prior to discharging flow downstream.

For a depiction of existing conditions and the proposed development, refer to a plan set entitled “Construction Site Plan Review Set, Dwelling Additions, Location 359 North Street Greenwich, Connecticut, Prepared for Dennis Ever Cynthia Ever,” sheets 1 through 4 of 4, prepared by Rocco V. D’Andrea, Inc.

The proposed development conforms will all applicable Town of Greenwich stormwater management standards to the maximum extent practical. Refer to Appendix “B” for a narrative detailing the projects compliance with each stormwater management standard.

1.2. Non-Structural and Structural BMPs

Low Impact Development Site Planning and design measures were incorporated into the proposed development to the maximum extend practical. Many of the Non-Structural LID BMPs are not applicable or practical for this project due to the site topography and a majority of the western portion of the site will be disturbed due to the demolition of the existing site
features and construction of the proposed development. Refer for Section 1 of Appendix “B” for a narrative detailing each of these Non-Structural LID BMPs. Refer to Appendix “A” for the “Credits for Low Impact Development Best Management Practices Checklist” outlining the inclusions or exclusion of each non-structural BMP.

Three Structural LID BMPs and two conventional BMPs are incorporated into the proposed development. Five subsurface infiltration systems are proposed to retain and infiltrate runoff collected from the proposed dwelling addition roofs. The subsurface infiltration systems are designed to store the Water Quality Volume, provide peak runoff attenuation and infiltrate a portion of the runoff volume prior to discharging downstream.

1.3. Land Use Regulations

The subject parcel is located in the “RA-1” zone, designated for single-family dwellings. All applicable zoning setbacks and regulations will be adhered to. According to FEMA FIRM Map No. 09001C0511G (revised July 8, 2013), the parcel lies within Flood Hazard Zone “X”. Refer to Exhibit “D” for a copy of the FEMA FIRM map of the subject property. The parcel is located outside the Coastal Boundary as outline on the Planning and Zoning Coastal Boundary Map. A watercourse is located in the eastern portion of the subject property, more than 100 feet from any proposed development activities.

1.4. Site Inventory & Evaluation

Under existing conditions, the subject parcel supports a residential dwelling, detached garage, gravel driveway, stone patios and flagstone walks. All onsite pervious areas are maintained as manicured lawn or planter beds. The existing dwelling sits at the high point of the parcel, which drops in elevation to the east, south and west. Runoff from onsite areas to the east of the dwelling is tributary to the onsite watercourse and the North Street Right-of-Way. Runoff from onsite areas to the south and west of the dwelling is tributary to abutting properties. Existing drainage patterns will be maintained under post-construction conditions.

According to the NRCS Soil Survey, on-site soils to the east of the existing dwelling are classified as Woodbridge fine sandy loam with a mapping symbol of 45B and a Hydrologic Soil Group Rating of C/D. Onsite soils to the west of the existing dwelling are classified as Paxton and Montauk fine sandy loams with a mapping symbol of 84B and a Hydrologic Soil Group Rating of C. Refer to Exhibit “C” for the results of the Initial Feasibility Evaluation from the NRCS Web Soil Survey. In accordance with Appendix B of the Greenwich Drainage Manual, concept design testing was performed for the site. A soil textural analysis was completed for the site using deep test pits. Refer to Appendix “D” for results of completed soil testing.
1.5. Development Envelope

The proposed development will encompass all onsite areas to the west of the dwelling. All areas to be disturbed will be enclosed with silt fence and other erosion controls.
2. Watershed Analysis

The subject parcel was analyzed under existing and proposed conditions using HydroCAD version 10, with runoff data generated for the 1, 2, 5, 10, 25, 50 and 100-year design storm events.

In this analysis, existing and proposed site conditions were divided into various drainage basins discharging to three Points of Concern (POC). Referring to the watershed maps in Exhibits A and B, POC A and POB are designated as the abutting property owners along the western property line. POC C is designated as the abutting property owner along the southern property line.

2.1. Existing Conditions

Five drainage basins were delineated under existing conditions. Stormwater runoff from Area #1 and Area #2 are tributary to POC A. Stormwater runoff from Area #3 and Area #4 are tributary to POC B. Stormwater Runoff from Area #5 is tributary to POC C.

Refer to Exhibit “A” for a depiction of the existing conditions drainage areas and flow paths. Refer to Appendix “I” for the existing conditions ground cover in each basin and HydroCAD routing results, including the computed curve number and time of concentration.

Refer to Table 1 and Table 2 in Appendix “H” for a summary of peak runoff rates and volumes for the existing conditions drainage model.

2.2. Proposed Conditions

Under proposed conditions, the proposed development increases on-site impervious coverage by approximately 5,835 square feet as compared to existing conditions. After the construction of the proposed dwelling additions, in-ground pool, patios and storm water management systems, all disturbed areas will be graded, top soiled and seeded or planted per the landscape planting plan.

Retention Systems #1, #2, #3, #4 and #5 were designed to infiltrate the WQV and also provide peak runoff attenuation from contributing areas.

Refer to Exhibit “B” for a depiction of the proposed conditions drainage areas and flow paths. Refer to Appendix “J” for the proposed conditions ground cover in each basin and HydroCAD routing results, including the computed curve number and time of concentration.

Refer to Table 1 and Table 2 in Appendix “H” for a summary of peak runoff rates and volumes for the proposed conditions drainage model.
3. Conclusion

The proposed development will increase the amount of on-site impervious coverage and therefore increase the peak rate and volume of runoff generated during a storm event. As a result, five (5) Best Management Practices (BMP), consisting of five subsurface retention systems, are proposed to provide pre-treatment and attenuation of site generated runoff prior to discharging off-site. Implementation of the Drainage Management Plan will result in a decrease in the peak rate of runoff discharging off-site to all points of concern for all design storms up to a 25-year storm event.

Refer to Table 1 and Table 2 and Appendix “H” for additional information.

The proposed development incorporates stormwater pre-treatment, treatment, provides water quality volume storage and peak runoff attenuation to the maximum extent practical based on site conditions. If the proposed development is constructed as depicted on the development plans, it is our professional opinion there will be no adverse impacts to the neighboring properties or drainage systems due to the development of this property.
Exhibits “A & B”

Watershed Maps -
Existing and Proposed Conditions
Exhibit “C”

NRCS Web Soil Survey
MAP LEGEND

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Not rated or not available

Soil Rating Lines

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

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: https://websoilsurvey.nrcs.usda.gov/
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>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>45B</td>
<td>Woodbridge fine sandy loam, 3 to 8 percent slopes</td>
<td>C/D</td>
<td>1.7</td>
<td>63.6%</td>
</tr>
<tr>
<td>84B</td>
<td>Paxton and Montauk fine sandy loams, 3 to 8 percent slopes</td>
<td>C</td>
<td>1.0</td>
<td>36.4%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td></td>
<td><strong>2.7</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 clay pan 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
Exhibit “D”

FEMA Flood Map
This map complies with FEMA’s standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA’s basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/1/2021 at 12:33 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.
Appendix “A”

Credits for LID BMPs
## 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>
</table>
| Minimizing Soil Compaction (Section 4.4.1)        | - The "no disturbance" areas are protected by having the limits of disturbance and access clearly shown on the Stormwater Management Plan, all construction drawings, and delineated/flagged/fenced in the field.  
- "No disturbance" areas are not to be stripped of existing topsoil.  
- "No disturbance" areas are not to be stripped of existing vegetation.  
- Vehicle movement, storage, or equipment/material lay-down is not to be permitted in "no disturbance" areas.  
- Use of soil amendments and additional topsoil is permitted in other areas being disturbed. Grading may be performed using low ground pressure equipment (less than 3 pounds per square inch) to reduce the potential for soil compaction.  
- Lawn and turf grass are acceptable uses. Planted meadow is an encouraged use. | Areas that comply (i.e., "no disturbance areas") can use the foreasted cover and open space site cover runoff coefficient (R) when calculating the required Water Quality Volume. See Section 5.6.3 and Table 5-5, Site Cover Runoff Coefficients. |          |              |
| Minimizing Site Disturbance (Section 4.4.2)       | Site disturbance including earthwork and clearing of vegetation should be limited to 40 feet beyond the building perimeter, 10 feet beyond the primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond areas of proposed infiltration in order to limit compaction in the proposed infiltration area. This guidance is not intended to limit lawn areas. | Areas that comply can use the foreasted cover and open space site cover runoff coefficient (R) when calculating the required Water Quality Volume. See Section 5.6.3 and Table 5-5, Site Cover Runoff Coefficients. |          |              |
| Protecting Sensitive Natural Areas (Section 4.4.3) | Sensitive natural areas should be conserved at development sites, thereby preserving predevelopment hydrologic and water quality characteristics. The area must be permanently protected under a conservation easement. | The project proponent can subtract the conservation area from the total area in the Water Quality Volume calculation. |          |              |
| Protecting Riparian Buffers (Section 4.4.4)       | Effective treatment of stormwater runoff is achieved when pervious and impervious area runoff is discharged to a grass or forested buffer via overland flow. The use of a filter strip is recommended to treat overland flow in the green space of a development site.  
- The minimum stream buffer width (i.e., perpendicular to the stream flow path) shall be 50 feet as measured from the top bank elevation of a stream or the boundary of a wetland.  
- The maximum contributing path shall be 150 feet for pervious surfaces and 75 feet for impervious surfaces.  
- The average contributing overland slope to and across the buffer shall be less than or equal to 5%.  
- Runoff shall enter the buffer as sheet flow. A level spreader shall be utilized where local site conditions prevent sheet flow from being maintained.  
- The stream buffer remains unmanaged other than routine debris removal.  
- The buffer is protected by an acceptable conservation easement or other enforceable instrument that provides perpetual protection of the area. The easement must clearly specify how the natural area vegetation shall be | The area draining by sheet flow to a buffer can be subtracted from the total area in the Water Quality Volume calculation, and the impervious area draining to the buffer by sheet flow can be subtracted from the impervious area in the Groundwater Recharge Volume calculation and post-development impervious area in the Runoff Reduction Volume calculation. |          |              |
<table>
<thead>
<tr>
<th>LID Technique</th>
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<th>Credit</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Avoiding Disturbance of Steep Slopes (Section 4.4.5)</td>
<td>Development on steep slope areas shall be avoided. Unnecessary grading should be avoided on all slopes, as should the flattening of hills and ridges. Development shall follow the natural contours of the landscape.</td>
<td>Undisturbed steep slope areas can use the forested cover and open space site cover runoff coefficient (R) when calculating the required Water Quality Volume. See Section 5.6.3 and Table 5-5, Site Cover Runoff Coefficients.</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Siting on Permeable and Erodible Soils (Section 4.4.6)</td>
<td>Whenever possible, highly erodible soils should be left undisturbed and protected from disturbance during site construction. Gravel soils tend to be the least erodible. Also as clay and organic matter increase erodibility tends to decrease. Infiltration practices should be located on those portions of the site with the most permeable soils.</td>
<td></td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Protecting Natural Flow Pathways (Section 4.4.7)</td>
<td>Site designs should use and/or improve natural drainage pathways whenever possible to reduce or eliminate the need for stormwater pipe networks. Natural drainage pathways should be protected from significantly increased runoff volumes and rates due to development. The design should prevent the erosion and degradation of natural drainage pathways through the use of upstream volume and rate control BMPs, if necessary. Level spreaders, erosion control matting, revegetation, outlet stabilization, and check dams can also be used to protect natural drainage features.</td>
<td></td>
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<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>Reducing impervious surfaces reduces the Water Quality Volume, Runoff Reduction Volume, Groundwater Recharge Volume, and Peak Flow/Runoff Attenuation requirements.</td>
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<td>☐</td>
</tr>
<tr>
<td>Stormwater Disconnection (Section 4.4.9)</td>
<td>Disconnecting roof leaders and routing road and driveway runoff from conventional stormwater conveyance systems allows runoff to be collected and managed onsite. Runoff can be directed to vegetated areas designed for onsite storage, treatment, and volume control. All design criteria from section 4.4.9 must be met in order to obtain the credits shown.</td>
<td>Methods to compute the resultant runoff volumes and peak runoff rates from disconnected impervious areas are discussed in Section 4.6 of this manual and the design references cited therein. For simple disconnection, subtract 100% of the disconnected area from the total area in the Water Quality Volume calculation if the receiving pervious area is HSG A or B soils or 50% of the</td>
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</table>
### Credits for Low Impact Development (LID) Best Management Practices (BMPs)

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

<table>
<thead>
<tr>
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<th>Credit</th>
<th>LID Used</th>
<th>Credit Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainwater Harvesting</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.</td>
<td>Subtract 100% of the contributing drainage area from the total area in the Water Quality Volume calculation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Credits for Low Impact Development (LID) Best Management Practices (BMPs)

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A properly designed footing for the cistern must be designed if the load of the cistern at full capacity is greater than the soils will support. If it is buried, buoyancy calculations must be provided to show the cistern will not float when empty. Buoyancy calculations and flotation constraints must be provided if any part of the buried cistern is below the seasonal high water table, or if the area is subject to flooding. An appropriate pump shall be selected to provide adequate pressure for its designated uses. Above ground cisterns shall be made of a material or color that prevents light from entering the cistern, which helps prevent algae growth within the cistern. Irrigation water from a cistern shall be applied so that the water infiltrates into the ground. If for any reason the designed dedicated end use becomes unavailable because of some change, it will be required that an approved alternative end use or a properly designed BMP treatment system be installed on site to manage the roof runoff. The harvesting system shall be labeled and identified as non-potable water. The harvesting system shall meet all local and state building and plumbing codes.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix “B”

Stormwater Management Standards Narrative
Standard 1: Low Impact Development

Low Impact Development site planning and design techniques are incorporated into the proposed development to the maximum extent practical to reduce the generation of stormwater runoff and pollutant loads.

Several stormwater BMPs are proposed to provide treatment and attenuation of site generated runoff from the proposed impervious surfaces prior to discharging off-site. Refer to Appendix C for sizing of each proposed LID and non-LID BMP.

Standard 2: Protection of Natural Hydrology

A. Site Disturbance
The project disturbance area shall include only the area necessary to reasonably accommodate construction activities. Construction fence and silt fence will be positioned to allow for the construction of the proposed development but protect the on-site resources. All areas outside the silt fence and construction fence will be maintained at existing grade with natural vegetation throughout the duration of the project.

B. Soil Compaction
As indicated on the plans, construction fence will be installed around the location of the proposed stormwater infiltration systems prior to the start of site construction to prohibit heavy equipment from compacting soils in these areas. The contractor will be instructed to not place excavation equipment in the bottom of the stormwater infiltration area at any point during construction.

C. Time of Concentration
The time of concentration values under post-development conditions will be similar in nature to pre-development conditions for all onsite watersheds. Refer to Exhibit “A” and “B” for a depiction of pre and post-development time of concentration flow paths and proposed grading. Refer to Appendix “F” and “J” for pre and post-development time of concentration calculations.

D. Grading Plan
The proposed grading follows the existing contours of the landscape to the maximum extent practical to facilitate construction of proposed development. The proposed grading will maintain the natural flow pathways with respect to the subject property. Refer to the Grading Plan for a depiction of the proposed grading.

E. Compost Amended Soils
Compost amended soils are not incorporated in the proposed development.
F. Ground Disturbance
As specified on the development plans, no disturbed ground is to be left as exposed bare soil at project completion. All disturbed areas shall be covered with topsoil and stabilized with grass or vegetation.

G. Surface Water Systems
The existing on-site watercourse will be maintained under proposed conditions.

H. Roadway and Driveway Crossings (Surface Waters)
Sub-standard is not applicable to this project.

I. Roadway and Driveway Crossings (Streams)
Sub-standard is not applicable to this project.

**Standard 3: Stormwater Best Management Practices**
Several stormwater BMPs will be utilized to meet the stormwater management requirements. Refer to Appendix “C” for an in-depth analysis of the proposed systems.

A. Hydrologic and Geologic Conditions
The proposed stormwater BMPs were incorporated into the design to accommodate the unique hydrologic, geologic, and topographic conditions of the site and to take advantage of the soil’s natural ability to infiltrate stormwater.

B. Design Calculations
Design calculations for runoff reduction, water quality volume, groundwater recharge, peak flow control and pollutant reduction are provided in Appendix C.

C. Shutdown & Containment
Each structural stormwater BMP has flow enter and exit the system via a stormwater drainage structure. The inlet and outlet pipes within these structures can be plugged and will allow for shutdown of these systems if required by the approving authority.

D. Pumping of Stormwater
Pumping of stormwater is not included in the proposed development.

E. Pumping of Uncontaminated Groundwater
Pumping of uncontaminated groundwater is included in the proposed development.

**Standard 4: Runoff Volume Reduction and Groundwater Recharge**

A. Runoff Volume Reduction
The proposed development will not result in an increase in runoff volume to the Points of Concerns, during the 1-year, 24-hour design storm at the completion of construction.

Refer to Appendix “C” for Runoff Reduction Volume Calculations

B. Groundwater Recharge
The proposed drainage design is compliant with the groundwater recharge standard. Refer to Appendix “C” for calculations.
Appendix B: Stormwater Management Standards Narrative

C. Runoff Capture
This substandard is not applicable.

**Standard 5: Peak Flow Control**

A. Stream Channel Protection
This substandard is not applicable

B. Conveyance Protection
Conveyance computations for proposed storm drainage systems are provided in Appendix E.

C. Peak Runoff Attenuation
Refer to the HydroCAD Summary Table in Appendix H for a summary and comparison of peak flow rates as well as Appendices “I” and “J” for the results of the Hydrologic Analyses for existing and proposed conditions, respectively.

D. Emergency Outlet Sizing
Should the proposed stormwater management systems reach capacity, flow will exit each system via level spreader or rip rap splash pad into stabilized vegetated areas. Refer to Appendix “F” for the Outlet Sizing Calculations.

**Standard 6: Pollutant Reduction**

A. TSS Removal
The proposed drainage systems will provide removal of over 80% of the average post-construction load of Total Suspended Solids (TSS) from the contributing impervious areas. The proposed subsurface stormwater management systems will provide sufficient retention of the water quality volume from the contributing areas, and will also provide sufficient TSS Removal. Refer to Appendix “C” for Water Quality Volume and TSS Removal Efficiency Calculations.

**Standard 7: High Load Areas**

This site is not classified as being in a High Load Area. Therefore, standard 7 is not applicable.

**Standard 8: Critical Area**

This site is considered to be within a critical area due to onsite wetlands.

A. Source Control, Pollution Prevention Measures, Structural Stormwater BMPs
The proposed BMPs have been designed to collect and infiltrate the Water Quality Volume of runoff generated from tributary on-site impervious areas, thus meeting the pollutant reduction standard.

B. Higher Potential Pollutant Loads
This site is not classified as a High Load Area. Therefore this standard is not applicable to this project.

**Standard 9: Redevelopment**

A. Redevelopment Definition
This project is considered a new development since the property is currently undeveloped.

Rocco V. D’Andrea, Inc
Appendix B: Stormwater Management Standards Narrative

B. Meet the Standards
As outlined in this report, the proposed project meets the standards to the maximum extent possible, including the evaluation of LID site planning and the inclusion of stormwater BMPs.

C. Undeveloped Portions of the Property
Undeveloped portions of the property proposed to be developed comply with the Stormwater Management Standards to the maximum extend practical based on the site-specific limitations.

D. Stormwater Controls
The proposed structural stormwater BMPs have been designed to reduce pollutant loads, provide peak runoff attenuation, reduce runoff volumes, and increase groundwater recharge.

E. Infiltration through Hazardous Substances
This standard is not applicable to this project.

Standard 10: Construction Erosion and Sediment Control

A. Sedimentation and Erosion Control Plan
Refer to the Construction Site Plan Review Set, for a depiction of the proposed sedimentation and erosion control measures.

B. Sedimentation and Erosion Control Measures Installation and Removal
The proposed site design instructs the contractor to install all sedimentation and erosion control measures prior to commencing construction and to appropriately remove these measures at the completion of construction.

Standard 11: Construction Inspections

A. Surety
If requested 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 accordance with the approved plans.

B. Notification of Work
The proponent will be instructed to notify the approving authority before starting land-disturbing activity and before construction of the key components of the stormwater management system.

C. Stormwater Management System Inspections
The project engineer will complete periodic inspections of the stormwater management system.

D. Site Inspections
The project engineer will complete site inspections in accordance with this sub-standard and the Field Inspection Record form (SC-106). The project engineer will inspect the stormwater management system during a storm event if possible.

E. Failing Stormwater Management System
The approving authority will be notified if the system is found to be inadequate due to operational failure, regardless of its compliance with the approved plans. The design of the system shall then be corrected before final approval is granted by the approving authority.

Rocco V. D’Andrea, Inc
F. Project Completion
Upon project completion, the project’s compliance with the approved plans will be certified and all required inspection certifications will be provided to the approving authority.

**Standard 12: Operation and Maintenance**

A. Operation and Maintenance Plan
Refer to the Operations and Maintenance Plan Report prepared for the project outlining maintenance measures to ensure functionality of the proposed stormwater management system.

B. O&M Plan Components
The Operations and Maintenance Plan will identify all applicable items in Section 5 and Section 7 of the Town of Greenwich Drainage Manual.

C. O&M Plan Implementation
The Operation and Maintenance Plan Report will identify the parties legally responsible for implementing the O&M Plan.

D. O&M Plan Records
The appropriate parties will be instructed to complete and retain documents relating to installation, maintenance and repairs to the stormwater management system for at least five years.

E. Proof of O&M Plan Records
The appropriate parties will be instructed to provide records of maintenance and repairs to the approving authority during inspections and/or upon request.

F. Failure to Implement O&M Plan
The appropriate parties will be informed that failure to implement the O&M Plan can result in the municipality assuming responsibility for their implementation and securing reimbursement for associated expenses.

**Standard 13: Stormwater Management Report**
The drainage design depicted on the Development Plans for the site is congruent with the stormwater management plan outlined in this report.

**Standard 14: Illicit Discharges**
To the best of our knowledge, this office is not aware of any illicit discharges currently on-site. The proposed site design does not depict any illicit discharges to be installed.

Rocco V. D’Andrea, Inc
Appendix “C”

Stormwater Management
Standards Calculations
Runoff Reduction Volume at POC A

1-Year Design Storm Runoff Data at POC A

Pre-development runoff volume = 1,876 ft³
Post-development runoff volume (No BMPs) = 2,488 ft³
Runoff Volume stored in Retention System #4 below overflow (El.=104.0) = 524 ft³
Runoff Volume stored in Retention System #5 below overflow (El.=101.0) = 257 ft³

\[ V_{post-BMP} = V_{post} - SV_{RS5} - SV_{RS4} \]

\[ RRV = V_{post-BMP} - V_{pre} \]

Where:

RRV = Runoff reduction volume

V<sub>pre</sub> = 1-year pre-development runoff volume

V<sub>post</sub> = 1-year post-development runoff volume (No BMPs)

V<sub>post-BMP</sub> = 1-year post-development runoff volume (With BMPs)

SV<sub>RS5</sub> = Volume Stored in Retention System #5

SV<sub>RS4</sub> = Volume Stored in Retention System #4

\[ V_{post-BMP} = 2,488 - 524 - 257 = 1,707 \text{ ft}^3 \]

\[ RRV = 1,707 - 1,876 = -169 \text{ ft}^3 \]

Runoff Reduction Volume (RRV) @ POC A = -169 ft³

V<sub>post-BMP</sub> < V<sub>pre</sub>. Therefore the Runoff Volume Reduction Standard has been met.

Runoff Reduction Volume at POC B

1-Year Design Storm Runoff Data at POC B

Pre-development runoff volume = 2,052 ft³
Post-development runoff volume (No BMPs) = 2,736 ft³
Runoff Volume stored in Retention System #1 below overflow (El.=102.0) = 248 ft³
Runoff Volume stored in Retention System #2 below overflow (El.=102.0) = 248 ft³
Runoff Volume stored in Retention System #3 below overflow (El.=102.0) = 248 ft³

\[ V_{post-BMP} = V_{post} - SV_{RS1} - SV_{RS2} - SV_{RS3} \]

\[ RRV = V_{post-BMP} - V_{pre} \]
Where:

$$V_{\text{post-BMP}} = 2,212 - 248 - 248 - 248 = 1,468 \text{ ft}^3$$

$$RRV = 1,468 - 2,052 = -584 \text{ ft}$$

Runoff Reduction Volume (RRV) @ POC G = -584 ft$^3$

$$V_{\text{post-BMP}} < V_{\text{pre}} \text{ Therefore the Runoff Volume Reduction Standard has been met.}$$

---

**Runoff Reduction Volume at POC C**

1-Year Design Storm Runoff Data at POC C

Pre-development runoff volume

$$= 381 \text{ ft}^3$$

Post-development runoff volume (No BMPs)

$$= 399 \text{ ft}^3$$

$$RRV = V_{\text{post}} - V_{\text{pre}}$$

Where:

$$RRV = \text{Runoff reduction volume}$$

$$V_{\text{pre}} = \text{1-year pre-development runoff volume}$$

$$V_{\text{post}} = \text{1-year post-development runoff volume (No BMPs)}$$

$$RRV = 399 - 381 = +18 \text{ ft}^3$$

Runoff Reduction Volume (RRV) @ POC F = +18 ft$^3$

$$V_{\text{post}} > V_{\text{pre}} \text{ Therefore the Runoff Volume Reduction Standard has not been met. The increase of 18 cubic feet of runoff will be imperceptible over the duration of a storm event.}$$

---

**Groundwater Recharge Volume (GRV) Calculation**

Site Information

Existing Impervious Coverage

$$= 9,485 \text{ ft}^2$$

Proposed Impervious Coverage

$$= 15,320 \text{ ft}^2$$

Net Increase

$$= 5,835 \text{ ft}^2$$

$$GRV = \frac{\text{lin}}{12 \frac{\text{in}}{\text{ft}}} \cdot FI$$

Where:
GRV = Required groundwater recharge volume
F = Target depth factor
I = Net increase in impervious area

\[ GRV = \frac{0.25}{12} (5,835) = 122 \text{ ft}^3 \]

**Groundwater Recharge Volume (GRV) = 122 ft}^3**

The Groundwater Recharge Volume will be retained and infiltrated in Retention System #1. The storage volume below the overflow (El.=102.0) = 567 ft}^3

**Water Quality Volume (WQV) Calculations**

\[ WQV = \frac{\text{lin in}}{12 \text{ in ft}} RA \]

\[ R = \text{Volumetric Runoff Coefficient} = RvI * %I + RvT * %T + RvF * %F \]

- \( RvI = \text{Runoff Coefficient for Impervious Cover} = 0.95 \)
- \( %I = \text{Percent of Watershed Basin in Impervious Cover (Fraction)} \)
- \( RvT = \text{Runoff Coefficient for Lawn (HSG C=0.22)} \)
- \( %T = \text{Percent of Watershed Basin in Lawn Cover (Fraction)} \)
- \( RvF = \text{Runoff Coefficient for Woods/Brush (HSG C=0.04)} \)
- \( %F = \text{Percent of Watershed Basin in Woods/Brush Cover (Fraction)} \)
- \( A = \text{Watershed Area (square feet)} \)

<table>
<thead>
<tr>
<th>Watershed Basin</th>
<th>Watershed Area (sf)</th>
<th>Impervious Coverage</th>
<th>Lawn Coverage</th>
<th>Woods/Meadow Coverage</th>
<th>R (Runoff Coefficient)</th>
<th>WQV (cf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pr. Area #1</td>
<td>6,279</td>
<td>5,216</td>
<td>1,063</td>
<td>0</td>
<td>0.83</td>
<td>432</td>
</tr>
<tr>
<td>Pr. Area #1A</td>
<td>2,357</td>
<td>2,357</td>
<td>0</td>
<td>0</td>
<td>0.95</td>
<td>187</td>
</tr>
<tr>
<td>Pr. Area #3</td>
<td>711</td>
<td>711</td>
<td>0</td>
<td>0</td>
<td>0.95</td>
<td>57</td>
</tr>
<tr>
<td>Pr. Area #3A</td>
<td>3,351</td>
<td>3,351</td>
<td>0</td>
<td>0</td>
<td>0.95</td>
<td>266</td>
</tr>
</tbody>
</table>

**Pr. Area #1**: The WQV for this drainage basin will be collected and infiltrated by Retention System #5. The storage volume of Retention System #5 below the overflow is approximately 257 cubic feet. The remainder of the WQV will be stored in the downhill concrete gallery retention system.

**Pr. Area #1A**: The WQV for this drainage basin will be collected and infiltrated by Retention System #4. The storage volume of Retention system #4 below the outlet is approximately 1,041 cubic feet.

**Pr. Area #3**: The WQV for this drainage basin will be collected and infiltrated by the two existing cultec 280HD units. The storage volume of the two cultec 280HD units is approximately 85 cubic feet.

**Pr. Area #3A**: The WQV for this drainage basin will be collected and infiltrated by Retention Systems #1, #2 and #3. The storage volume of these Retention Systems below the overflow is approximately 1,701 cubic feet.
Impervious Coverage Percent LID Calculations to POC A/B

Total new impervious coverage under proposed conditions tributary to POC A/B: 5,835 sq.ft.

Area #3 (LID treatment: Existing Cultec 280HD units): 711 sq.ft.

Area #3A (LID treatment: Retention System #1, #2 & #3): 3,351 sq.ft.

Area #4 (LID treatment: Simple Disconnection Patios): 1,084 sq.ft.

Total impervious coverage treated using LID BMPs: 5,146 sq.ft.

Percent of impervious coverage treated using LID BMPs: 88.2%

Drawdown Calculations

According to the NRCS Web Soil Survey in Exhibit “C”, the site lies within a mapped area of HSG-C soils. The results of deep test pits can be found in Appendix “D”. The following draws down calculations are based on the soils observed in each test pit in the vicinity of the respective best management practice.

Retention System #1, #2 & #3 Drawdown Time:

\[
t_{\text{drawdown}} = \frac{DV}{kA}
\]

Where:

- \(DV\) = Design Volume = 567 ft\(^3\)
- \(k\) = Infiltration Rate = 1.02 in/hr (Sandy Loam)
- \(A\) = Bottom Area = 216 ft\(^2\)

\[
t_{\text{drawdown}} = \frac{567 \text{ ft}^3}{(1.02 \text{ in/hr})(1 \text{ ft}/12 \text{ in})216 \text{ ft}^2} = 30.9 \text{ hr}
\]

Retention System #1, #2 and #3 will draw down within 30.9 hrs

Retention System #4 Drawdown Time:

\[
t_{\text{drawdown}} = \frac{DV}{kA}
\]

Where:

- \(DV\) = Design Volume = 1,041 ft\(^3\)
- \(k\) = Infiltration Rate = 0.52 in/hr (Loam)
- \(A\) = Bottom Area = 408 ft\(^2\)

\[
t_{\text{drawdown}} = \frac{1,041 \text{ ft}^3}{(0.52 \text{ in/hr})(1 \text{ ft}/12 \text{ in})408 \text{ ft}^2} = 58.9 \text{ hr}
\]
Retention System #4 will draw down within 58.9 hrs

Retention System #5 Drawdown Time:

\[ t_{\text{drawdown}} = \frac{DV}{kA} \]

Where:
- \( DV \) = Design Volume = 257 ft\(^3\)
- \( k \) = Infiltration Rate = 0.52 in/hr (Loam)
- \( A \) = Bottom Area = 216 ft\(^2\)

\[ t_{\text{drawdown}} = \frac{257 \text{ ft}^3}{(0.52 \text{ in/hr})(\frac{1 \text{ ft}}{12 \text{ in}})216 \text{ ft}^2} = 27.5 \text{ hr} \]

Retention System #5 will draw down within 27.5 hrs

- **TSS Removal Efficiency Calculations**

<table>
<thead>
<tr>
<th>BVP</th>
<th>TSS Removal</th>
<th>Starting TSS</th>
<th>Amount Removed (B+C)</th>
<th>Remaining Load (C-D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infiltration System</td>
<td>90%</td>
<td>1.00</td>
<td>0.90</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Total TSS Removal = 90.0%
Appendix “D”

Soils Results Forms
SOIL EVALUATION TEST RESULTS

Project Name: Dwelling Additions
Project Address: 359 North Street

Engineering Firm's Name: Rocco V. D'Andrea, Inc.
Engineer's Name: Anthony L. D'Andrea, PE

Test Pit or Soil Boring #: TP#1

<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>102.5</td>
<td>Misc. Clean Fill</td>
<td>0</td>
</tr>
<tr>
<td>101.5</td>
<td>Original Topsoil</td>
<td>12</td>
</tr>
<tr>
<td>101.2</td>
<td>Fine Brown Loam</td>
<td>16</td>
</tr>
<tr>
<td>99.5</td>
<td>Compact Sandy Gravel w/ Fines</td>
<td>36</td>
</tr>
<tr>
<td>95.5</td>
<td></td>
<td>84</td>
</tr>
</tbody>
</table>

Saturated Hydraulic Conductivity Test Location #:

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
- Amoozemeter or Amoozgar (constant head) permeameter – Amoozgar 1992

Attach field data forms for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate: 

Elevation | Depth in Inches
--- | ---
- | Mottling (Seasonally High Groundwater) -
- | Roots -
- | Groundwater -
- | Ledge -

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

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

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Name of Test Conductor
Signature of Test Conductor
Date

Form SC-101

February 2012
SOIL EVALUATION TEST RESULTS

Project Name: Dwelling Additions
Project Address: 359 North Street

Engineering Firm's Name: Rocco V. D'Andrea, Inc.
Engineer's Name: Anthony L. D'Andrea, PE

<table>
<thead>
<tr>
<th>Test Pit or Soil Boring #: TP#2</th>
<th>Ground Elevation: 103.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation</td>
<td>Soil Texture (Percent Sand, Silt and Clay)</td>
</tr>
<tr>
<td>103</td>
<td>Misc. Clean Fill</td>
</tr>
<tr>
<td>101.0</td>
<td>Original Topsoil</td>
</tr>
<tr>
<td>100.8</td>
<td>Compact Mottled Loam</td>
</tr>
<tr>
<td>99.0</td>
<td>Compact Silt Loam w/ Sand</td>
</tr>
<tr>
<td>96.0</td>
<td></td>
</tr>
</tbody>
</table>

Saturated Hydraulic Conductivity Test Location #:

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
- Amoomezzer or Amoozezeg (constant head) permeameter – Amoozezeg 1992

Attach field data forms for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate:

Elevation | Depth in Inches |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>96.5</td>
<td>Groundwater Seep</td>
</tr>
</tbody>
</table>

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

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

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

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Name of Test Conductor ___________________________ Signature of Test Conductor ___________________________ Date ____________
# Soil Evaluation Test Results

**Project Name:** Dwelling Additions  
**Project Address:** 359 North Street

**Engineering Firm's Name:** Rocco V. D'Andrea, Inc.  
**Engineer's Name:** Anthony L. D'Andrea, PE

<table>
<thead>
<tr>
<th>Test Pit or Soil Boring #: TP#3</th>
<th>Ground Elevation: 102.2</th>
<th>Depth Range in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation</td>
<td>Soil Texture (Percent Sand, Silt and Clay)</td>
<td>Depth Range in Inches</td>
</tr>
<tr>
<td>102.2</td>
<td>Misc. Clean Fill</td>
<td>0</td>
</tr>
<tr>
<td>101.5</td>
<td>Original Topsoil</td>
<td>8</td>
</tr>
<tr>
<td>101.1</td>
<td>Fine Brown Loam</td>
<td>13</td>
</tr>
<tr>
<td>99.7</td>
<td>Mod. Compact Sandy Gravel w/ Fines</td>
<td>30</td>
</tr>
<tr>
<td>95.2</td>
<td></td>
<td>84</td>
</tr>
</tbody>
</table>

**Saturated Hydraulic Conductivity Test Location #:**

- **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
- Amoozemeter or Amoozegar (constant head) permeameter – Amoozegar 1992

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

**Calculated Saturated Hydraulic Conductivity Rate:**

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

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

## Test Certification

**I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.**

<table>
<thead>
<tr>
<th>Name of Test Conductor</th>
<th>Signature of Test Conductor</th>
<th>Date</th>
</tr>
</thead>
</table>

Form SC-101  
February 2012
SOIL EVALUATION TEST RESULTS

Project Name: Dwelling Additions
Project Address: 359 North Street

Engineering Firm's Name: Rocco V. D'Andrea, Inc.
Engineer's Name: Anthony L. D'Andrea, PE

<table>
<thead>
<tr>
<th>Test Pit or Soil Boring #: TP#4</th>
<th>Ground Elevation: 103.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation</td>
<td>Soil Texture (Percent Sand, Silt and Clay)</td>
</tr>
<tr>
<td>103.5</td>
<td>Topsoil</td>
</tr>
<tr>
<td>102.7</td>
<td>Fine Brown Loam</td>
</tr>
<tr>
<td>101.3</td>
<td>Sandy Gravel</td>
</tr>
<tr>
<td>98.5</td>
<td></td>
</tr>
</tbody>
</table>

Saturated Hydraulic Conductivity Test Location #:

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

Attach field data forms for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate:

**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.

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Depth in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Mottling (Seasonally High Groundwater)</td>
</tr>
<tr>
<td>-</td>
<td>Roots</td>
</tr>
<tr>
<td>-</td>
<td>Groundwater</td>
</tr>
<tr>
<td>-</td>
<td>Ledge</td>
</tr>
</tbody>
</table>

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

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

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Name of Test Conductor
Signature of Test Conductor
Date

Form SC-101
Appendix “E”

Pipe Conveyance Computations
STORM DRAIN SYSTEM CONVEYANCE COMPUTATIONS

The following is a summary of the computations performed to design the proposed storm drainage system drain sizes. The proposed drainage basin flows were taken from the results of the HydroCAD storm drainage analysis performed for on-site contributing areas. Refer to the Appendix "J" for a printout of the HydroCAD Hydrographs model input data, computations, and results. Refer to Exhibit “B” for a depiction of the proposed drainage basins. Runoff computations are based on the 100-year design storm frequency event. Culvert conveyance computations are based on the Manning’s Equation.

Note: 100-year storm flow rates from Proposed Conditions HydroCAD analysis

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Appendix "F"

Level Spreader Outlet
Sizing Calculations
Level Spreader Outlet Sizing Calculations

Name: Ever Residence  
Address: 359 North Street Greenwich, Connecticut  
Project: Dwelling Additions  
Date: September 10, 2021

SUMMARY:

The following is a summary of the computations performed to design the proposed storm drainage system level spreader outlet structures. The outlet flow from the proposed drainage systems was taken from the results of the HydroCAD analysis performed for the proposed development. Refer to Appendix "J" for a summary for the results of this analysis. Sizing computations are based on the 100-year design storm frequency event.

SIZING COMPUTATIONS:

The proposed level spreaders are designed to be a minimum of 13-feet long per every 1 cubic feet per second (cfs) of runoff flow with a minimum length of 20 feet, as per Town of Greenwich standards.

Level Spreader #1:

Level Spreader #1 will discharge flows collected from Retention System #1, Retention System #2 and Retention System #3. The 100-year design flow entering the level spreader will be approximately 0.08 cfs.

Length of Level Spreader = (0.08 cfs) x (13 LF per 1.0 cfs) = 1.0 ft. (Use 20 feet)

Level Spreader #2:

Level Spreader #2 will discharge flows collected from Retention System #4 and Retention System #5. The 100-year design flow entering the level spreader will be approximately 1.29 cfs.

Length of Level Spreader = (1.29 cfs) x (13 LF per 1.0 cfs) = 16.8 ft. (Use 20 feet)
Appendix “G”

Stage-Area-Storage Table
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- 6" overflow
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- Overflow: $8"$
- Inflow: $4"$

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Appendix "H"

HydroCAD Peak Flow
And Volume Summary
HydroCAD Summary
Ever Residence
359 North Street Greenwich, CT
Project ID: 280U

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<td>%$\Delta q$ ($ft^3/s$)</td>
<td>$q_{0c}$ ($ft^3/s$)</td>
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Table 1: Comparison of Existing and Proposed Peak Flow Rates for all Points of Concern.

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Table 2: Comparison of Existing and Proposed Runoff Volumes for all Points of Concern.
Appendix "I"

HydroCAD Analysis
Existing Conditions
Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

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<td>100.00%</td>
<td>2,897 sf</td>
<td>2.67&quot;</td>
<td>5.0 min</td>
<td>98.0</td>
<td>0.19 cfs 644 cf</td>
</tr>
<tr>
<td>4S: Ex. Area #4</td>
<td>18,426 sf</td>
<td>5.79%</td>
<td>18,426 sf</td>
<td>0.92&quot;</td>
<td>9.6 min</td>
<td>75.4</td>
<td>0.38 cfs 1,408 cf</td>
</tr>
<tr>
<td>5S: Ex. Area #5</td>
<td>5,406 sf</td>
<td>0.00%</td>
<td>5,406 sf</td>
<td>0.85&quot;</td>
<td>5.4 min</td>
<td>74.0</td>
<td>0.12 cfs 381 cf</td>
</tr>
</tbody>
</table>

| Link 6L: POC A | Inflow=0.54 cfs 1,876 cf | Primary=0.54 cfs 1,876 cf |
| Link 7L: POC B | Inflow=0.53 cfs 2,052 cf | Primary=0.53 cfs 2,052 cf |
| Link 8L: POC C | Inflow=0.12 cfs 381 cf | Primary=0.12 cfs 381 cf |
Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 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

<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Ex. Area #</th>
<th>Runoff Area</th>
<th>Impervious</th>
<th>Runoff Depth</th>
<th>Tc</th>
<th>CN</th>
<th>Runoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>1S</td>
<td>1</td>
<td>6,553 sf</td>
<td>81.44%</td>
<td>2.69&quot;</td>
<td>5.0 min</td>
<td>93.5</td>
<td>0.47 cfs, 1,468 cf</td>
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<tr>
<td>2S</td>
<td>2</td>
<td>9,264 sf</td>
<td>2.00%</td>
<td>1.20&quot;</td>
<td>8.9 min</td>
<td>74.5</td>
<td>0.26 cfs, 927 cf</td>
</tr>
<tr>
<td>3S</td>
<td>3</td>
<td>2,897 sf</td>
<td>100.00%</td>
<td>3.17&quot;</td>
<td>5.0 min</td>
<td>98.0</td>
<td>0.23 cfs, 765 cf</td>
</tr>
<tr>
<td>4S</td>
<td>4</td>
<td>18,426 sf</td>
<td>5.79%</td>
<td>1.26&quot;</td>
<td>9.6 min</td>
<td>75.4</td>
<td>0.53 cfs, 1,929 cf</td>
</tr>
<tr>
<td>5S</td>
<td>5</td>
<td>5,406 sf</td>
<td>0.00%</td>
<td>1.17&quot;</td>
<td>5.4 min</td>
<td>74.0</td>
<td>0.17 cfs, 528 cf</td>
</tr>
</tbody>
</table>

Link 6L: POC A
Inflow=0.69 cfs 2,395 cf
Primary=0.69 cfs 2,395 cf

Link 7L: POC B
Inflow=0.71 cfs 2,693 cf
Primary=0.71 cfs 2,693 cf

Link 8L: POC C
Inflow=0.17 cfs 528 cf
Primary=0.17 cfs 528 cf
Subcatchment 1S: Ex. Area #1
Runoff Area=6,553 sf  81.44% Impervious  Runoff Depth=3.57"
Tc=5.0 min  CN=93.5  Runoff=0.62 cfs  1,947 cf

Subcatchment 2S: Ex. Area #2
Runoff Area=9,264 sf  2.00% Impervious  Runoff Depth=1.86"
Flow Length=138’  Tc=8.9 min  CN=74.5  Runoff=0.41 cfs  1,434 cf

Subcatchment 3S: Ex. Area #3
Runoff Area=2,897 sf  100.00% Impervious  Runoff Depth=4.06"
Tc=5.0 min  CN=98.0  Runoff=0.29 cfs  981 cf

Subcatchment 4S: Ex. Area #4
Runoff Area=18,426 sf  5.79% Impervious  Runoff Depth=1.93"
Flow Length=158’  Tc=9.6 min  CN=75.4  Runoff=0.84 cfs  2,956 cf

Subcatchment 5S: Ex. Area #5
Runoff Area=5,406 sf  0.00% Impervious  Runoff Depth=1.82"
Flow Length=117’  Tc=5.4 min  CN=74.0  Runoff=0.27 cfs  820 cf

Link 6L: POC A
Inflow=0.97 cfs  3,381 cf
Primary=0.97 cfs  3,381 cf

Link 7L: POC B
Inflow=1.06 cfs  3,938 cf
Primary=1.06 cfs  3,938 cf

Link 8L: POC C
Inflow=0.27 cfs  820 cf
Primary=0.27 cfs  820 cf
Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 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. Area #1
Runoff Area=6,553 sf  81.44% Impervious  Runoff Depth=4.35"
  Tc=5.0 min  CN=93.5  Runoff=0.74 cfs  2,376 cf

Subcatchment 2S: Ex. Area #2
Runoff Area=9,264 sf  2.00% Impervious  Runoff Depth=2.49"
  Flow Length=138’  Tc=8.9 min  CN=74.5  Runoff=0.56 cfs  1,920 cf

Subcatchment 3S: Ex. Area #3
Runoff Area=2,897 sf  100.00% Impervious  Runoff Depth=4.86"
  Tc=5.0 min  CN=98.0  Runoff=0.34 cfs  1,174 cf

Subcatchment 4S: Ex. Area #4
Runoff Area=18,426 sf  5.79% Impervious  Runoff Depth=2.57"
  Flow Length=158’  Tc=9.6 min  CN=75.4  Runoff=1.12 cfs  3,939 cf

Subcatchment 5S: Ex. Area #5
Runoff Area=5,406 sf  0.00% Impervious  Runoff Depth=2.44"
  Flow Length=117’  Tc=5.4 min  CN=74.0  Runoff=0.36 cfs  1,101 cf

Link 6L: POC A
  Inflow=1.23 cfs  4,296 cf
  Primary=1.23 cfs  4,296 cf

Link 7L: POC B
  Inflow=1.39 cfs  5,113 cf
  Primary=1.39 cfs  5,113 cf

Link 8L: POC C
  Inflow=0.36 cfs  1,101 cf
  Primary=0.36 cfs  1,101 cf
Summary for Subcatchment 1S: Ex. Area #1

Runoff = 0.95 cfs @ 12.07 hrs, Volume= 3,077 cf, Depth= 5.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 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>5,337</td>
<td>98.0</td>
<td>Paved parking, HSG C</td>
</tr>
<tr>
<td>1,216</td>
<td>74.0</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>6,553</td>
<td>93.5</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>1,216</td>
<td></td>
<td>18.56% Pervious Area</td>
</tr>
<tr>
<td>5,337</td>
<td></td>
<td>81.44% Impervious Area</td>
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</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>

Summary for Subcatchment 2S: Ex. Area #2

Runoff = 0.81 cfs @ 12.13 hrs, Volume= 2,760 cf, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 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>185</td>
<td>98.0</td>
<td>Roofs, HSG C</td>
</tr>
<tr>
<td>9,079</td>
<td>74.0</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>9,264</td>
<td>74.5</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>9,079</td>
<td></td>
<td>98.00% Pervious Area</td>
</tr>
<tr>
<td>185</td>
<td></td>
<td>2.00% 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>
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<tbody>
<tr>
<td>4.1</td>
<td>33</td>
<td>0.0180</td>
<td>0.13</td>
<td></td>
<td>Sheet Flow, grass</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grass: Short  n= 0.150  P2= 3.35&quot;</td>
</tr>
<tr>
<td>4.7</td>
<td>72</td>
<td>0.0625</td>
<td>0.26</td>
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<td><strong>Sheet Flow, Grass</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grass: Short  n= 0.150  P2= 3.35&quot;</td>
</tr>
<tr>
<td>0.1</td>
<td>33</td>
<td>0.0700</td>
<td>3.97</td>
<td></td>
<td><strong>Shallow Concentrated Flow, Grass</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grassed Waterway  Kv= 15.0 fps</td>
</tr>
</tbody>
</table>

8.9  138 Total

Summary for Subcatchment 3S: Ex. Area #3

Runoff = 0.43 cfs @ 12.07 hrs, Volume= 1,487 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.40"
### Summary for Subcatchment 4S: Ex. Area #4

Runoff = 1.61 cfs @ 12.13 hrs, Volume= 5,630 cf, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

### Summary for Subcatchment 5S: Ex. Area #5

Runoff = 0.52 cfs @ 12.08 hrs, Volume= 1,588 cf, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,066</td>
<td>98.0</td>
<td>Paved parking, HSG C</td>
</tr>
<tr>
<td>17,360</td>
<td>74.0</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>18,426</td>
<td>75.4</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>17,360</td>
<td>94.21%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>1,066</td>
<td>5.79%</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>
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<tbody>
<tr>
<td>5.9</td>
<td>53</td>
<td>0.0190</td>
<td>0.15</td>
<td></td>
<td><strong>Sheet Flow, Grass</strong> Grass: Short n= 0.150 P2= 3.35&quot;</td>
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<tr>
<td>3.5</td>
<td>47</td>
<td>0.0530</td>
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<td></td>
<td><strong>Sheet Flow, Grass</strong> Grass: Short n= 0.150 P2= 3.35&quot;</td>
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<tr>
<td>0.2</td>
<td>58</td>
<td>0.0950</td>
<td>4.62</td>
<td></td>
<td><strong>Shallow Concentrated Flow, Grass</strong> Grassed Waterway Kv= 15.0 fps</td>
</tr>
<tr>
<td>9.6</td>
<td>158</td>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
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<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,406</td>
<td>74.0</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>5,406</td>
<td>100.00%</td>
<td>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>5.4</td>
<td>100</td>
<td>0.0850</td>
<td>0.31</td>
<td></td>
<td><strong>Sheet Flow, Grass</strong> Grass: Short n= 0.150 P2= 3.35&quot;</td>
</tr>
<tr>
<td>0.0</td>
<td>17</td>
<td>0.1470</td>
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<td><strong>Shallow Concentrated Flow, Grass</strong> Grassed Waterway Kv= 15.0 fps</td>
</tr>
<tr>
<td>5.4</td>
<td>117</td>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>
Summary for Link 6L: POC A

Inflow Area = 15,817 sf, 34.91% Impervious, Inflow Depth = 4.43" for 25-Year event
Inflow = 1.67 cfs @ 12.09 hrs, Volume= 5,837 cf
Primary = 1.67 cfs @ 12.09 hrs, Volume= 5,837 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link 7L: POC B

Inflow Area = 21,323 sf, 18.59% Impervious, Inflow Depth = 4.01" for 25-Year event
Inflow = 1.95 cfs @ 12.12 hrs, Volume= 7,117 cf
Primary = 1.95 cfs @ 12.12 hrs, Volume= 7,117 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link 8L: POC C

Inflow Area = 5,406 sf, 0.00% Impervious, Inflow Depth = 3.52" for 25-Year event
Inflow = 0.52 cfs @ 12.08 hrs, Volume= 1,588 cf
Primary = 0.52 cfs @ 12.08 hrs, Volume= 1,588 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 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

<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Ex. Area</th>
<th>Runoff Area (sf)</th>
<th>Impervious (%)</th>
<th>Runoff Depth (in)</th>
<th>Tc (min)</th>
<th>CN</th>
<th>Runoff (cfs)</th>
<th>Storage (cf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1S:</td>
<td>#1</td>
<td>6,553</td>
<td>81.44</td>
<td>6.83</td>
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</tr>
<tr>
<td>2S:</td>
<td>#2</td>
<td>9,264</td>
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<td>4.63</td>
<td>8.9</td>
<td>74</td>
<td>1.04</td>
<td>3,571</td>
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<td>3S:</td>
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<td>2,897</td>
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<td>5.0</td>
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<td>0.51</td>
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<td>4S:</td>
<td>#4</td>
<td>18,426</td>
<td>5.79</td>
<td>4.73</td>
<td>9.6</td>
<td>75</td>
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<td>7,259</td>
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<td>5S:</td>
<td>#5</td>
<td>5,406</td>
<td>0.00</td>
<td>4.57</td>
<td>5.4</td>
<td>74</td>
<td>0.68</td>
<td>2,059</td>
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Link 6L: POC A
- Inflow=2.07 cfs 7,298 cf
- Primary=2.07 cfs 7,298 cf

Link 7L: POC B
- Inflow=2.48 cfs 9,036 cf
- Primary=2.48 cfs 9,036 cf

Link 8L: POC C
- Inflow=0.68 cfs 2,059 cf
- Primary=0.68 cfs 2,059 cf
359 North Street
Prepared by RVDI
HydroCAD® 10.00-24 s/n 07353 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 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. Area #1
Runoff Area=6,553 sf  81.44% Impervious  Runoff Depth=8.32"
  Tc=5.0 min  CN=93.5  Runoff=1.37 cfs  4,541 cf

Subcatchment 2S: Ex. Area #2
Runoff Area=9,264 sf  2.00% Impervious  Runoff Depth=5.98"
  Flow Length=138’  Tc=8.9 min  CN=74.5  Runoff=1.34 cfs  4,618 cf

Subcatchment 3S: Ex. Area #3
Runoff Area=2,897 sf  100.00% Impervious  Runoff Depth=8.86"
  Tc=5.0 min  CN=98.0  Runoff=0.62 cfs  2,139 cf

Subcatchment 4S: Ex. Area #4
Runoff Area=18,426 sf  5.79% Impervious  Runoff Depth=6.09"
  Flow Length=158’  Tc=9.6 min  CN=75.4  Runoff=2.65 cfs  9,357 cf

Subcatchment 5S: Ex. Area #5
Runoff Area=5,406 sf  0.00% Impervious  Runoff Depth=5.92"
  Flow Length=117’  Tc=5.4 min  CN=74.0  Runoff=0.87 cfs  2,667 cf

Link 6L: POC A
  Inflow=2.58 cfs  9,159 cf
  Primary=2.58 cfs  9,159 cf

Link 7L: POC B
  Inflow=3.14 cfs  11,496 cf
  Primary=3.14 cfs  11,496 cf

Link 8L: POC C
  Inflow=0.87 cfs  2,667 cf
  Primary=0.87 cfs  2,667 cf
Appendix "J"

HydroCAD Analysis
Proposed Conditions
### Subcatchment 9S: Pr Area. #4
- Runoff Area=15,082 sf
- 15.21% Impervious
- Runoff Depth=1.04"
- Flow Length=113’
- Tc=8.7 min
- CN=77.7
- Runoff=0.37 cfs 1,309 cf

### Subcatchment 10S: Pr. Area #1A
- Runoff Area=2,357 sf
- 100.00% Impervious
- Runoff Depth=2.67"
- Tc=5.0 min
- CN=98.0
- Runoff=0.16 cfs 524 cf

### Subcatchment 11S: Pr. Area #5
- Runoff Area=5,664 sf
- 0.00% Impervious
- Runoff Depth=0.85"
- Flow Length=118’
- Tc=6.9 min
- CN=74.0
- Runoff=0.12 cfs 399 cf

### Subcatchment 12S: Pr. Area #3
- Runoff Area=711 sf
- 100.00% Impervious
- Runoff Depth=2.67"
- Tc=5.0 min
- CN=98.0
- Runoff=0.05 cfs 158 cf

### Subcatchment 19S: Pr. Area #1
- Runoff Area=6,279 sf
- 83.07% Impervious
- Runoff Depth=2.24"
- Tc=5.0 min
- CN=93.9
- Runoff=0.38 cfs 1,174 cf

### Subcatchment 21S: Pr. Area #2
- Runoff Area=9,100 sf
- 15.29% Impervious
- Runoff Depth=1.04"
- Flow Length=134’
- Tc=8.9 min
- CN=77.7
- Runoff=0.22 cfs 790 cf

### Subcatchment 23S: Pr. Area #3A
- Runoff Area=3,351 sf
- 100.00% Impervious
- Runoff Depth=2.67"
- Tc=5.0 min
- CN=98.0
- Runoff=0.22 cfs 745 cf

### Pond 12P: Retention System #1
- Peak Elev=99.44’
- Storage=248 cf
- Inflow=0.07 cfs 248 cf
- Outflow=0.00 cfs 0 cf

### Pond 13P: Retention System #4
- Peak Elev=102.11’
- Storage=524 cf
- Inflow=0.16 cfs 524 cf
- 6.0” Round Culvert n=0.011 L=50.0’ S=0.0200”’
- Outflow=0.00 cfs 0 cf

### Pond 14P: Retention System #2
- Peak Elev=99.44’
- Storage=248 cf
- Inflow=0.07 cfs 248 cf
- Outflow=0.00 cfs 0 cf

### Pond 15P: Retention System #3
- Peak Elev=99.44’
- Storage=248 cf
- Inflow=0.07 cfs 248 cf
- Outflow=0.00 cfs 0 cf

### Pond 28P: Distribution SDMH
- Peak Elev=101.66’
- Storage=2 cf
- Inflow=0.22 cfs 745 cf
- Primary=0.07 cfs 248 cf
- Secondary=0.07 cfs 248 cf
- Tertiary=0.07 cfs 248 cf
- Outflow=0.22 cfs 745 cf

### Pond 29P: Retention System #5
- Peak Elev=101.65’
- Storage=348 cf
- Inflow=0.38 cfs 1,174 cf
- Outflow=0.29 cfs 917 cf

### Link 19L: POC A
- Inflow=0.51 cfs 1,707 cf
- Primary=0.51 cfs 1,707 cf

### Link 22L: POC B
- Inflow=0.41 cfs 1,467 cf
- Primary=0.41 cfs 1,467 cf

### Link 27L: POC C
- Inflow=0.12 cfs 399 cf
- Primary=0.12 cfs 399 cf
Subcatchment 9S: Pr Area. #4
Runoff Area=15,082 sf  15.21% Impervious  Runoff Depth=1.40"
Flow Length=113'  Tc=8.7 min  CN=77.7  Runoff=0.51 cfs 1,762 cf

Subcatchment 10S: Pr. Area #1A
Runoff Area=2,357 sf  100.00% Impervious  Runoff Depth=3.17"
Tc=5.0 min  CN=98.0  Runoff=0.19 cfs 622 cf

Subcatchment 11S: Pr. Area #5
Runoff Area=5,664 sf  0.00% Impervious  Runoff Depth=1.17"
Flow Length=118'  Tc=6.9 min  CN=74.0  Runoff=0.17 cfs 553 cf

Subcatchment 12S: Pr. Area #3
Runoff Area=711 sf  100.00% Impervious  Runoff Depth=3.17"
Tc=5.0 min  CN=98.0  Runoff=0.06 cfs 188 cf

Subcatchment 19S: Pr. Area #1
Runoff Area=6,279 sf  83.07% Impervious  Runoff Depth=2.73"
Tc=5.0 min  CN=93.9  Runoff=0.46 cfs 1,427 cf

Subcatchment 21S: Pr. Area #2
Runoff Area=9,100 sf  15.29% Impervious  Runoff Depth=1.40"
Flow Length=134'  Tc=8.9 min  CN=77.7  Runoff=0.31 cfs 1,063 cf

Subcatchment 23S: Pr. Area #3A
Runoff Area=3,351 sf  100.00% Impervious  Runoff Depth=3.17"
Tc=5.0 min  CN=98.0  Runoff=0.26 cfs 884 cf

Pond 12P: Retention System #1
Peak Elev=99.77'  Storage=295 cf  Inflow=0.09 cfs 295 cf
Outflow=0.00 cfs 0 cf

Pond 13P: Retention System #4
Peak Elev=102.46'  Storage=622 cf  Inflow=0.19 cfs 622 cf
6.0" Round Culvert  n=0.011  L=50.0'  S=0.0200 '/'  Outflow=0.00 cfs 0 cf

Pond 14P: Retention System #2
Peak Elev=99.77'  Storage=295 cf  Inflow=0.09 cfs 295 cf
Outflow=0.00 cfs 0 cf

Pond 15P: Retention System #3
Peak Elev=99.77'  Storage=295 cf  Inflow=0.09 cfs 295 cf
Outflow=0.00 cfs 0 cf

Pond 28P: Distribution SDMH
Peak Elev=101.68'  Storage=2 cf  Inflow=0.26 cfs 884 cf
Primary=0.09 cfs 295 cf  Secondary=0.09 cfs 295 cf  Tertiary=0.09 cfs 295 cf  Outflow=0.26 cfs 884 cf

Pond 29P: Retention System #5
Peak Elev=101.81'  Storage=372 cf  Inflow=0.46 cfs 1,427 cf
Outflow=0.34 cfs 1,171 cf

Link 19L: POC A
Inflow=0.64 cfs 2,234 cf
Primary=0.64 cfs 2,234 cf

Link 22L: POC B
Inflow=0.55 cfs 1,950 cf
Primary=0.55 cfs 1,950 cf

Link 27L: POC C
Inflow=0.17 cfs 553 cf
Primary=0.17 cfs 553 cf
Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 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 9S: Pr Area. #4
Runoff Area=15,082 sf  15.21% Impervious  Runoff Depth=2.10"
Flow Length=113'  Tc=8.7 min  CN=77.7  Runoff=0.78 cfs 2,645 cf

Subcatchment 10S: Pr. Area #1A
Runoff Area=2,357 sf  100.00% Impervious  Runoff Depth=4.06"
Tc=5.0 min  CN=98.0  Runoff=0.24 cfs 798 cf

Subcatchment 11S: Pr. Area #5
Runoff Area=5,664 sf  0.00% Impervious  Runoff Depth=1.82"
Flow Length=118'  Tc=6.9 min  CN=74.0  Runoff=0.26 cfs 859 cf

Subcatchment 12S: Pr. Area #3
Runoff Area=711 sf  100.00% Impervious  Runoff Depth=4.06"
Tc=5.0 min  CN=98.0  Runoff=0.07 cfs 241 cf

Subcatchment 19S: Pr. Area #1
Runoff Area=6.279 sf  83.07% Impervious  Runoff Depth=3.61"
Tc=5.0 min  CN=93.9  Runoff=0.59 cfs 1,888 cf

Subcatchment 21S: Pr. Area #2
Runoff Area=9,100 sf  15.29% Impervious  Runoff Depth=2.10"
Flow Length=134'  Tc=8.9 min  CN=77.7  Runoff=0.47 cfs 1,596 cf

Subcatchment 23S: Pr. Area #3A
Runoff Area=3,351 sf  100.00% Impervious  Runoff Depth=4.06"
Tc=5.0 min  CN=98.0  Runoff=0.33 cfs 1,135 cf

Pond 12P: Retention System #1
Peak Elev=100.36' Storage=378 cf  Inflow=0.11 cfs 378 cf
Outflow=0.00 cfs 0 cf

Pond 13P: Retention System #4
Peak Elev=103.11' Storage=798 cf  Inflow=0.24 cfs 798 cf
6.0" Round Culvert n=0.011 L=50.0' S=0.0200 '/' Outflow=0.00 cfs 0 cf

Pond 14P: Retention System #2
Peak Elev=100.36' Storage=378 cf  Inflow=0.11 cfs 378 cf
Outflow=0.00 cfs 0 cf

Pond 15P: Retention System #3
Peak Elev=100.36' Storage=378 cf  Inflow=0.11 cfs 378 cf
Outflow=0.00 cfs 0 cf

Pond 28P: Distribution SDMH
Primary=0.11 cfs 378 cf  Secondary=0.11 cfs 378 cf  Tertiary=0.11 cfs 378 cf
Peak Elev=101.70' Storage=3 cf  Inflow=0.33 cfs 1,135 cf
Outflow=0.33 cfs 1,135 cf

Pond 29P: Retention System #5
Peak Elev=102.15' Storage=420 cf  Inflow=0.59 cfs 1,888 cf
Outflow=0.42 cfs 1,631 cf

Link 19L: POC A
Inflow=0.88 cfs 3,227 cf
Primary=0.88 cfs 3,227 cf

Link 22L: POC B
Inflow=0.83 cfs 2,886 cf
Primary=0.83 cfs 2,886 cf

Link 27L: POC C
Inflow=0.26 cfs 859 cf
Primary=0.26 cfs 859 cf
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<thead>
<tr>
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<th>Area</th>
<th>Runoff Area</th>
<th>Impervious</th>
<th>Runoff Depth</th>
<th>Tc</th>
<th>CN</th>
<th>Runoff</th>
<th>Flow Length</th>
<th>Peak Elev</th>
<th>Storage</th>
<th>Inflow</th>
<th>Outflow</th>
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<td>15.21%</td>
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<td>77.7</td>
<td>1.02 cfs</td>
<td>3,481 cf</td>
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<td>Subcatchment 10S: Pr. Area #1A</td>
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<td>100.00%</td>
<td>4.86&quot;</td>
<td>5.0 min</td>
<td>98.0</td>
<td>0.28 cfs</td>
<td>955 cf</td>
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<tr>
<td>Subcatchment 11S: Pr. Area #5</td>
<td>5,664 sf</td>
<td>0.00%</td>
<td>2.44&quot;</td>
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<td>6.9 min</td>
<td>74.0</td>
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<td>83.07%</td>
<td>4.40&quot;</td>
<td>5.0 min</td>
<td>93.9</td>
<td>0.72 cfs</td>
<td>2,300 cf</td>
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<tr>
<td>Subcatchment 21S: Pr. Area #2</td>
<td>9,100 sf</td>
<td>15.29%</td>
<td>2.77&quot;</td>
<td>134'</td>
<td>8.9 min</td>
<td>77.7</td>
<td>0.61 cfs</td>
<td>2,100 cf</td>
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<tr>
<td>Subcatchment 23S: Pr. Area #3A</td>
<td>3,351 sf</td>
<td>100.00%</td>
<td>4.86&quot;</td>
<td>5.0 min</td>
<td>98.0</td>
<td>0.40 cfs</td>
<td>1,358 cf</td>
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<td></td>
</tr>
<tr>
<td>Pond 12P: Retention System #1</td>
<td>100.88'</td>
<td>453 cf</td>
<td>0.13 cfs</td>
<td>453 cf</td>
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<tr>
<td>Pond 13P: Retention System #4</td>
<td>103.68'</td>
<td>955 cf</td>
<td>0.28 cfs</td>
<td>955 cf</td>
<td>6.0&quot; Round Culvert n=0.011 L=50.0' S=0.0200 '/'</td>
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<tr>
<td>Pond 14P: Retention System #2</td>
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<td>453 cf</td>
<td>0.13 cfs</td>
<td>453 cf</td>
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</tr>
<tr>
<td>Pond 15P: Retention System #3</td>
<td>100.88'</td>
<td>453 cf</td>
<td>0.13 cfs</td>
<td>453 cf</td>
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<tr>
<td>Pond 28P: Distribution SDMH</td>
<td>101.72'</td>
<td>3 cf</td>
<td>0.40 cfs</td>
<td>1,358 cf</td>
<td>Primary=0.13 cfs Secondary=0.13 cfs Tertiary=0.13 cfs</td>
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</tr>
<tr>
<td>Pond 29P: Retention System #5</td>
<td>102.48'</td>
<td>466 cf</td>
<td>0.72 cfs</td>
<td>2,300 cf</td>
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</tr>
<tr>
<td>Link 19L: POC A</td>
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<tr>
<td>Link 22L: POC B</td>
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<tr>
<td>Link 27L: POC C</td>
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</table>
**Summary for Subcatchment 9S: Pr Area. #4**

Runoff = 1.44 cfs @ 12.12 hrs, Volume= 4,906 cf, Depth= 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 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>2,294</td>
<td>98.0</td>
<td>Paved parking, HSG C</td>
</tr>
<tr>
<td>12,788</td>
<td>74.0</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>15,082</td>
<td>77.7</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>12,788</td>
<td>84.79% Pervious Area</td>
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</tr>
<tr>
<td>2,294</td>
<td>15.21% Impervious Area</td>
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</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>
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<tbody>
<tr>
<td>7.9</td>
<td>89</td>
<td>0.0260</td>
<td>0.19</td>
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<td><strong>Sheet Flow, Grass</strong></td>
</tr>
<tr>
<td></td>
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<td>Grass: Short  n= 0.150   P2= 3.35&quot;</td>
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<tr>
<td>0.7</td>
<td>7</td>
<td>0.0710</td>
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<td><strong>Sheet Flow, Grass</strong></td>
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<tr>
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<td>3.64</td>
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<td><strong>Shallow Concentrated Flow, Grass</strong></td>
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<tr>
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<td></td>
<td>Grassed Waterway  Kv= 15.0 fps</td>
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<tr>
<td>8.7</td>
<td>113</td>
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<td>Total</td>
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**Summary for Subcatchment 10S: Pr. Area #1A**

Runoff = 0.35 cfs @ 12.07 hrs, Volume= 1,210 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 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>2,357</td>
<td>98.0</td>
<td>Roofs, HSG C</td>
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<tr>
<td>2,357</td>
<td>100.00% Impervious Area</td>
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</tr>
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</table>

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

**Summary for Subcatchment 11S: Pr. Area #5**

Runoff = 0.52 cfs @ 12.10 hrs, Volume= 1,663 cf, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 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>5,664</td>
<td>74.0</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
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<tr>
<td>5,664</td>
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<td>100.00% Pervious Area</td>
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</tbody>
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<table>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<tr>
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<td>Sheet Flow, Grass</td>
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<td></td>
<td></td>
<td>Grass: Short n= 0.150 P2= 3.35&quot;</td>
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<tr>
<td>2.9</td>
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<td>0.1060</td>
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<td>Sheet Flow, Grass</td>
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<td>Grass: Short n= 0.150 P2= 3.35&quot;</td>
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<td>Shallow Concentrated Flow, Grass</td>
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<td>Grassed Waterway Kv= 15.0 fps</td>
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<tr>
<td>6.9</td>
<td>118</td>
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<td>Total</td>
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</table>

**Summary for Subcatchment 12S: Pr. Area #3**

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 365 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.40"

<table>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>711</td>
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<td>Roofs, HSG C</td>
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<td>711</td>
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<td>100.00% Impervious Area</td>
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</table>

<table>
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<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<tbody>
<tr>
<td>5.0</td>
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<td>Direct Entry,</td>
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**Summary for Subcatchment 19S: Pr. Area #1**

Runoff = 0.91 cfs @ 12.07 hrs, Volume= 2,973 cf, Depth= 5.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.40"

<table>
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<th>CN</th>
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<tr>
<td>1,063</td>
<td>74.0</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
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<tr>
<td>6,279</td>
<td>93.9</td>
<td>Weighted Average</td>
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<td>1,063</td>
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<td>5,216</td>
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<td>83.07% Impervious Area</td>
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<table>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
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<td>5.0</td>
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<td>Direct Entry,</td>
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Summary for Subcatchment 21S: Pr. Area #2

Runoff = 0.86 cfs @ 12.13 hrs, Volume= 2,960 cf, Depth= 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.40"

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<th>Description</th>
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<tr>
<td>7,709</td>
<td>74.0</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>9,100</td>
<td>77.7</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>7,709</td>
<td></td>
<td>84.71% Pervious Area</td>
</tr>
<tr>
<td>1,391</td>
<td></td>
<td>15.29% 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>3.1</td>
<td>26</td>
<td>0.0230</td>
<td>0.14</td>
<td></td>
<td><strong>Sheet Flow, Grass</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grass: Short n= 0.150 P2= 3.35&quot;</td>
</tr>
<tr>
<td>4.2</td>
<td>50</td>
<td>0.0400</td>
<td>0.20</td>
<td></td>
<td><strong>Sheet Flow, Grass</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grass: Short n= 0.150 P2= 3.35&quot;</td>
</tr>
<tr>
<td>1.5</td>
<td>25</td>
<td>0.1200</td>
<td>0.27</td>
<td></td>
<td><strong>Sheet Flow, Grass</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grass: Short n= 0.150 P2= 3.35&quot;</td>
</tr>
<tr>
<td>0.1</td>
<td>33</td>
<td>0.0610</td>
<td>3.70</td>
<td></td>
<td><strong>Shallow Concentrated Flow, Grass</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grassed Waterway Kv= 15.0 fps</td>
</tr>
</tbody>
</table>

8.9 134 Total

Summary for Subcatchment 23S: Pr. Area #3A

Runoff = 0.50 cfs @ 12.07 hrs, Volume= 1,721 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 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>3,351</td>
<td>98.0</td>
<td>Roofs, HSG C</td>
</tr>
<tr>
<td>3,351</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><strong>Direct Entry,</strong></td>
</tr>
</tbody>
</table>

Summary for Pond 12P: Retention System #1

Inflow Area = 3,351 sf, 100.00% Impervious, Inflow Depth = 2.05" for 25-Year event
Inflow = 0.17 cfs @ 12.07 hrs, Volume= 571 cf
Outflow = 0.00 cfs @ 23.70 hrs, Volume= 4 cf, Atten= 99%, Lag= 698.0 min
Primary = 0.00 cfs @ 23.70 hrs, Volume= 4 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 102.02' @ 23.70 hrs  Surf.Area= 431 sf  Storage= 568 cf

Plug-Flow detention time= 1,316.0 min calculated for 4 cf (1% of inflow)
Center-of-Mass det. time= 688.4 min (1,429.9 - 741.5)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>97.50'</td>
<td>193 cf</td>
<td>11.97'W x 18.00'L x 4.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>969 cf Overall - 487 cf Embedded = 483 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>98.00'</td>
<td>374 cf</td>
<td>Concrete Galley 4x8x4 x 4 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inside= 42.0&quot;W x 43.0&quot;H =&gt; 12.47 sf x 7.50'L = 93.6 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Outside= 52.8&quot;W x 48.0&quot;H =&gt; 15.20 sf x 8.00'L = 121.6 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 Chambers in 2 Rows</td>
</tr>
<tr>
<td>#3</td>
<td>102.00'</td>
<td>11 cf</td>
<td>12.00'W x 18.00'L x 0.50'H SOIL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>108 cf Overall x 10.0% Voids</td>
</tr>
</tbody>
</table>

578 cf  Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 102.00' 6.0" Vert. Orifice/Grate C= 0.600

Primary Outflow Max=0.00 cfs @ 23.70 hrs HW=102.02' TW=0.00' (Dynamic Tailwater)
1=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.50 fps)

Summary for Pond 13P: Retention System #4

Inflow Area = 2,357 sf, 100.00% Impervious, Inflow Depth = 6.16" for 25-Year event

<table>
<thead>
<tr>
<th>Inflow</th>
<th>Volume</th>
<th>1,210 cf</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 0.35 cfs @ 12.07 hrs, Volume=</td>
<td>168 cf, Atten= 98%, Lag= 253.2 min</td>
<td></td>
</tr>
<tr>
<td>= 0.01 cfs @ 16.29 hrs, Volume=</td>
<td>168 cf</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>0.01 cfs @ 16.29 hrs, Volume=</td>
<td>168 cf</td>
</tr>
</tbody>
</table>

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 104.05' @ 16.29 hrs  Surf.Area= 407 sf  Storage= 1,056 cf

Plug-Flow detention time= 756.1 min calculated for 168 cf (14% of inflow)
Center-of-Mass det. time= 422.6 min (1,165.9 - 743.3)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>100.00'</td>
<td>343 cf</td>
<td>11.97'W x 34.00'L x 4.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,831 cf Overall - 973 cf Embedded = 858 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>100.50'</td>
<td>748 cf</td>
<td>Concrete Galley 4x8x4 x 8 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inside= 42.0&quot;W x 43.0&quot;H =&gt; 12.47 sf x 7.50'L = 93.6 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Outside= 52.8&quot;W x 48.0&quot;H =&gt; 15.20 sf x 8.00'L = 121.6 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8 Chambers in 2 Rows</td>
</tr>
</tbody>
</table>

1,092 cf  Total Available Storage

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Devices
#1 Primary 104.00' 6.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 104.00' / 103.00'  S= 0.0200 '/'  Cc= 0.900  
n= 0.011,  Flow Area= 0.20 sf

**Primary OutFlow**  Max=0.01 cfs @ 16.29 hrs  HW=104.05'  TW=0.00'  (Dynamic Tailwater)  
——1=Culvert  (Inlet Controls 0.01 cfs @ 0.78 fps)

### Summary for Pond 14P: Retention System #2

<table>
<thead>
<tr>
<th>Inflow</th>
<th>Outflow</th>
<th>Primary</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.17 cfs @ 12.07 hrs, Volume= 571 cf</td>
<td>0.00 cfs @ 23.70 hrs, Volume= 4 cf, Atten= 99%, Lag= 698.0 min</td>
<td>0.00 cfs @ 23.70 hrs, Volume= 4 cf</td>
</tr>
</tbody>
</table>

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
Peak Elev= 102.02' @ 23.70 hrs  Surf.Area= 431 sf  Storage= 568 cf

Plug-Flow detention time= 1,316.0 min calculated for 4 cf (1% of inflow)  
Center-of-Mass det. time= 688.4 min ( 1,429.9 - 741.5 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>97.50'</td>
<td>193 cf</td>
<td>11.97&quot;W x 18.00'L x 4.50'H Field A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>969 cf Overall - 487 cf Embedded = 483 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>98.00'</td>
<td>374 cf</td>
<td>Concrete Galley 4x8x4 x 4 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inside= 42.0&quot;W x 43.0&quot;H =&gt; 12.47 sf x 7.50'L = 93.6 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Outside= 52.8&quot;W x 48.0&quot;H =&gt; 15.20 sf x 8.00'L = 121.6 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 Chambers in 2 Rows</td>
</tr>
<tr>
<td>#3</td>
<td>102.00'</td>
<td>11 cf</td>
<td>12.00&quot;W x 18.00'L x 0.50'H SOIL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>108 cf Overall x 10.0% Voids</td>
</tr>
</tbody>
</table>

578 cf  Total Available Storage

Storage Group A created with Chamber Wizard

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>102.00'</td>
<td>6.0&quot; Vert. Orifice/Grate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C= 0.600</td>
</tr>
</tbody>
</table>

**Primary OutFlow**  Max=0.00 cfs @ 23.70 hrs  HW=102.02'  TW=0.00'  (Dynamic Tailwater)  
——1=Orifice/Grate  (Orifice Controls 0.00 cfs @ 0.50 fps)

### Summary for Pond 15P: Retention System #3

<table>
<thead>
<tr>
<th>Inflow</th>
<th>Outflow</th>
<th>Primary</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.17 cfs @ 12.07 hrs, Volume= 571 cf</td>
<td>0.00 cfs @ 23.70 hrs, Volume= 4 cf, Atten= 99%, Lag= 698.0 min</td>
<td>0.00 cfs @ 23.70 hrs, Volume= 4 cf</td>
</tr>
</tbody>
</table>

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2  
Peak Elev= 102.02' @ 23.70 hrs  Surf.Area= 431 sf  Storage= 568 cf

Plug-Flow detention time= 1,316.0 min calculated for 4 cf (1% of inflow)  
Center-of-Mass det. time= 688.4 min ( 1,429.9 - 741.5 )
Table:

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1A</td>
<td>97.50’</td>
<td>193 cf</td>
<td>11.97'W x 18.00'L x 4.50'H Field A&lt;br&gt;969 cf Overall - 487 cf Embedded = 483 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2A</td>
<td>98.00’</td>
<td>374 cf</td>
<td>Concrete Galley 4x8x4 x 4 Inside #1&lt;br&gt;Inside= 42.0”W x 43.0”H =&gt; 12.47 sf x 7.50’L = 93.6 cf&lt;br&gt;Outside= 52.8”W x 48.0”H =&gt; 15.20 sf x 8.00’L = 121.6 cf&lt;br&gt;4 Chambers in 2 Rows</td>
</tr>
<tr>
<td>#3</td>
<td>102.00’</td>
<td>11 cf</td>
<td>12.00'W x 18.00'L x 0.50'H SOIL&lt;br&gt;108 cf Overall x 10.0% Voids</td>
</tr>
</tbody>
</table>

Total Available Storage = 578 cf

Storage Group A created with Chamber Wizard

Routing:

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>102.00’</td>
<td>6.0” Vert. Orifice/Grate C= 0.600</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=0.00 cfs @ 23.70 hrs HW=102.02’ TW=0.00’ (Dynamic Tailwater)

Summary for Pond 28P: Distribution SDMH

Inflow Area = 3,351 sf, 100.00% Impervious, Inflow Depth = 6.16” for 25-Year event

Inflow = 0.50 cfs @ 12.07 hrs, Volume= 1,721 cf
Outflow = 0.50 cfs @ 12.07 hrs, Volume= 1,714 cf, Atten= 0%, Lag= 0.1 min
Primary = 0.17 cfs @ 12.07 hrs, Volume= 571 cf
Secondary = 0.17 cfs @ 12.07 hrs, Volume= 571 cf
Tertiary = 0.17 cfs @ 12.07 hrs, Volume= 571 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 102.02’ @ 23.60 hrs Surf.Area= 13 sf Storage= 7 cf

Plug-Flow detention time= 0.9 min calculated for 1,714 cf (100% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Table:

<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>101.50’</td>
<td>19 cf</td>
<td>4.00’D x 1.50’H Vertical Cone/Cylinder</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>101.50’</td>
<td>6.0” Round 6” TO RS#1&lt;br&gt;L= 20.0’ CPP, square edge headwall, Ke= 0.500&lt;br&gt;Inlet / Outlet Invert= 101.50’ / 101.00’ S= 0.0250 '/' Cc= 0.900&lt;br&gt;n= 0.011, Flow Area= 0.20 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Secondary</td>
<td>101.50’</td>
<td>6.0” Round 6” TO RS#2&lt;br&gt;L= 20.0’ CPP, square edge headwall, Ke= 0.500&lt;br&gt;Inlet / Outlet Invert= 101.50’ / 101.00’ S= 0.0250 '/' Cc= 0.900&lt;br&gt;n= 0.011, Flow Area= 0.20 sf</td>
</tr>
<tr>
<td>#3</td>
<td>Tertiary</td>
<td>101.50’</td>
<td>6.0” Round 6” TO RS#3&lt;br&gt;L= 20.0’ CPP, square edge headwall, Ke= 0.500&lt;br&gt;Inlet / Outlet Invert= 101.50’ / 101.00’ S= 0.0250 '/' Cc= 0.900&lt;br&gt;n= 0.011, Flow Area= 0.20 sf</td>
</tr>
</tbody>
</table>
Primary OutFlow Max = 0.17 cfs @ 12.07 hrs HW = 101.75' TW = 99.61' (Dynamic Tailwater)
↑ 1 = 6" TO RS#1 (Inlet Controls 0.17 cfs @ 1.70 fps)

Secondary OutFlow Max = 0.17 cfs @ 12.07 hrs HW = 101.75' TW = 99.61' (Dynamic Tailwater)
↑ 2 = 6" TO RS#2 (Inlet Controls 0.17 cfs @ 1.70 fps)

Tertiary OutFlow Max = 0.17 cfs @ 12.07 hrs HW = 101.75' TW = 99.61' (Dynamic Tailwater)
↑ 3 = 6" TO RS#3 (Inlet Controls 0.17 cfs @ 1.70 fps)

Summary for Pond 29P: Retention System #5

Inflow Area = 6,279 sf, 83.07% Impervious, Inflow Depth = 5.68" for 25-Year event
Inflow = 0.91 cfs @ 12.07 hrs, Volume = 2,973 cf
Outflow = 0.62 cfs @ 12.15 hrs, Volume = 2,716 cf, Atten= 32%, Lag= 4.6 min
Primary = 0.62 cfs @ 12.15 hrs, Volume = 2,716 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 103.04' @ 12.15 hrs Surf.Area= 215 sf Storage= 546 cf

Plug-Flow detention time= 82.9 min calculated for 2,715 cf (91% of inflow)
Center-of-Mass det. time = 38.8 min (805.2 - 766.4 )

<table>
<thead>
<tr>
<th>Storage Description</th>
<th>Volume</th>
<th>Invert</th>
<th>Available Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.97'W x 18.00'L x 4.50'H Field A</td>
<td>193 cf</td>
<td>99.00'</td>
<td>193 cf</td>
<td>Concrete Galley 4x8x4 x 4 Inside #1</td>
</tr>
<tr>
<td>969 cf Overall - 487 cf Embedded = 483 cf x 40.0% Voids</td>
<td>374 cf</td>
<td>99.50'</td>
<td>374 cf</td>
<td>42.0&quot;W x 43.0&quot;H =&gt; 12.47 sf x 7.50'L = 93.6 cf</td>
</tr>
<tr>
<td>Inside= 42.8&quot;W x 48.0&quot;H =&gt; 15.20 sf x 8.00'L = 121.6 cf</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Chambers in 2 Rows</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Available Storage</td>
<td>567 cf</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Storage Group A created with Chamber Wizard

Device Routing Invert Outlet Outfit Devices
#1 Primary 101.00' 6.0" Round Culvert
L= 33.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 101.00' / 98.50' S= 0.0758 '/' Cc= 0.900
n= 0.011, Flow Area= 0.20 sf

#2 Device 1 101.00' 4.0" Vert. Orifice/Grate C= 0.600

#3 Device 1 103.00' 6.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max = 0.62 cfs @ 12.15 hrs HW = 103.04' TW = 0.00' (Dynamic Tailwater)
↑ 1 = Culvert (Passes 0.62 cfs of 1.27 cfs potential flow)
↑ 2 = Orifice/Grate (Orifice Controls 0.58 cfs @ 6.60 fps)
↑ 3 = Orifice/Grate (Weir Controls 0.05 cfs @ 0.68 fps)
Summary for Link 19L: POC A

Inflow Area = 17,736 sf, 50.54% Impervious, Inflow Depth = 3.95" for 25-Year event
Inflow = 1.47 cfs @ 12.14 hrs, Volume= 5,844 cf
Primary = 1.47 cfs @ 12.14 hrs, Volume= 5,844 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link 22L: POC B

Inflow Area = 19,144 sf, 33.20% Impervious, Inflow Depth = 3.31" for 25-Year event
Inflow = 1.53 cfs @ 12.12 hrs, Volume= 5,283 cf
Primary = 1.53 cfs @ 12.12 hrs, Volume= 5,283 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link 27L: POC C

Inflow Area = 5,664 sf, 0.00% Impervious, Inflow Depth = 3.52" for 25-Year event
Inflow = 0.52 cfs @ 12.10 hrs, Volume= 1,663 cf
Primary = 0.52 cfs @ 12.10 hrs, Volume= 1,663 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Subcatchment 9S: Pr Area. #4
Runoff Area=15,082 sf  15.21% Impervious  Runoff Depth=4.99"
Flow Length=113’  Tc=8.7 min  CN=77.7  Runoff=1.83 cfs 6,270 cf

Subcatchment 10S: Pr. Area #1A
Runoff Area=2,357 sf  100.00% Impervious  Runoff Depth=7.36"
Tc=5.0 min  CN=98.0  Runoff=0.42 cfs 1,446 cf

Subcatchment 11S: Pr. Area #5
Runoff Area=5,664 sf  0.00% Impervious  Runoff Depth=4.57"
Flow Length=118’  Tc=6.9 min  CN=74.0  Runoff=0.67 cfs 2,157 cf

Subcatchment 12S: Pr. Area #3
Runoff Area=711 sf  100.00% Impervious  Runoff Depth=7.36"
Tc=5.0 min  CN=98.0  Runoff=0.13 cfs 436 cf

Subcatchment 19S: Pr. Area #1
Runoff Area=6,279 sf  83.07% Impervious  Runoff Depth=6.87"
Tc=5.0 min  CN=93.9  Runoff=1.09 cfs 3,596 cf

Subcatchment 21S: Pr. Area #2
Runoff Area=9,100 sf  15.29% Impervious  Runoff Depth=4.99"
Flow Length=134’  Tc=8.9 min  CN=77.7  Runoff=1.10 cfs 3,783 cf

Subcatchment 23S: Pr. Area #3A
Runoff Area=3,351 sf  100.00% Impervious  Runoff Depth=7.36"
Tc=5.0 min  CN=98.0  Runoff=0.59 cfs 2,055 cf

Pond 12P: Retention System #1
Peak Elev=102.05’ Storage=568 cf Inflow=0.20 cfs 683 cf
Outflow=0.01 cfs 116 cf

Pond 13P: Retention System #4
Peak Elev=104.10’ Storage=1,064 cf Inflow=0.42 cfs 1,446 cf
6.0" Round Culvert n=0.011 L=50.0’ S=0.0200 ’/’ Outflow=0.03 cfs 404 cf

Pond 14P: Retention System #2
Peak Elev=102.05’ Storage=568 cf Inflow=0.20 cfs 683 cf
Outflow=0.01 cfs 116 cf

Pond 15P: Retention System #3
Peak Elev=102.05’ Storage=568 cf Inflow=0.20 cfs 683 cf
Outflow=0.01 cfs 116 cf

Pond 28P: Distribution SDMH
Peak Elev=102.05’ Storage=7 cf Inflow=0.59 cfs 2,055 cf
Primary=0.20 cfs 683 cf  Secondary=0.20 cfs 683 cf  Tertiary=0.20 cfs 683 cf
Outflow=0.59 cfs 2,049 cf

Pond 29P: Retention System #5
Peak Elev=103.25’ Storage=557 cf Inflow=1.09 cfs 3,596 cf
Outflow=1.09 cfs 3,339 cf

Link 19L: POC A
Inflow=2.11 cfs 7,526 cf
Primary=2.11 cfs 7,526 cf

Link 22L: POC B
Inflow=1.94 cfs 7,053 cf
Primary=1.94 cfs 7,053 cf

Link 27L: POC C
Inflow=0.67 cfs 2,157 cf
Primary=0.67 cfs 2,157 cf
Subcatchment 9S: Pr Area. #4
Runoff Area=15,082 sf 15.21% Impervious Runoff Depth=6.38"
Flow Length=113’ Tc=8.7 min CN=77.7 Runoff=2.33 cfs 8,017 cf

Subcatchment 10S: Pr. Area #1A
Runoff Area=2,357 sf 100.00% Impervious Runoff Depth=8.86"
Tc=5.0 min CN=98.0 Runoff=0.50 cfs 1,740 cf

Subcatchment 11S: Pr. Area #5
Runoff Area=5,664 sf 0.00% Impervious Runoff Depth=5.92"
Flow Length=118’ Tc=6.9 min CN=74.0 Runoff=0.87 cfs 2,794 cf

Subcatchment 12S: Pr. Area #3
Runoff Area=711 sf 100.00% Impervious Runoff Depth=8.86"
Tc=5.0 min CN=98.0 Runoff=0.15 cfs 525 cf

Subcatchment 19S: Pr. Area #1
Runoff Area=6,279 sf 83.07% Impervious Runoff Depth=8.36"
Tc=5.0 min CN=93.9 Runoff=1.32 cfs 4,377 cf

Subcatchment 21S: Pr. Area #2
Runoff Area=9,100 sf 15.29% Impervious Runoff Depth=6.38"
Flow Length=134’ Tc=8.9 min CN=77.7 Runoff=1.39 cfs 4,837 cf

Subcatchment 23S: Pr. Area #3A
Runoff Area=3,351 sf 100.00% Impervious Runoff Depth=8.86"
Tc=5.0 min CN=98.0 Runoff=0.71 cfs 2,474 cf

Pond 12P: Retention System #1
Peak Elev=102.10' Storage=569 cf Inflow=0.24 cfs 823 cf
Outflow=0.03 cfs 255 cf

Pond 13P: Retention System #4
Peak Elev=104.25' Storage=1,075 cf Inflow=0.50 cfs 1,740 cf
6.0' Round Culvert n=0.011 L=50.0' S=0.0200 '/' Outflow=0.17 cfs 698 cf

Pond 14P: Retention System #2
Peak Elev=102.10' Storage=569 cf Inflow=0.24 cfs 823 cf
Outflow=0.03 cfs 255 cf

Pond 15P: Retention System #3
Peak Elev=102.10' Storage=569 cf Inflow=0.24 cfs 823 cf
Outflow=0.03 cfs 255 cf

Pond 28P: Distribution SDMH
Peak Elev=102.10' Storage=8 cf Inflow=0.71 cfs 2,474 cf
Primary=0.24 cfs 823 cf Secondary=0.24 cfs 823 cf Tertiary=0.24 cfs 823 cf Outflow=0.71 cfs 2,468 cf

Pond 29P: Retention System #5
Peak Elev=103.48' Storage=567 cf Inflow=1.32 cfs 4,377 cf
Outflow=1.29 cfs 4,120 cf

Link 19L: POC A
Inflow=2.62 cfs 9,655 cf
Primary=2.62 cfs 9,655 cf

Link 22L: POC B
Inflow=2.45 cfs 9,308 cf
Primary=2.45 cfs 9,308 cf

Link 27L: POC C
Inflow=0.87 cfs 2,794 cf
Primary=0.87 cfs 2,794 cf
OPERATIONS AND MAINTENANCE
PLAN REPORT

For

359 North Street
Greenwich, Connecticut

Prepared For

Dennis Ever
Cynthia Ever

September 10, 2021
Stormwater Management Practices
Maintenance Declaration
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

Dennis & Cynthia Ever

[Owner(s) Name]

359 North Street

[Address]

dhereinafter referred to as “Owner(s)” of the “Property” as more fully described in a deed recorded in Book 7823 at Page 230 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 September 10, 2021.

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

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

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

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

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

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

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

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

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

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

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

8. The Owner(s) hereby conveys to the Town of Greenwich an easement over, on and in the Property for the purpose of access to the stormwater management practice(s) for the inspection, maintenance and repair thereof, should the Owner(s) fail to properly inspect, maintain and repair the practice(s). The Town of Greenwich’s execution of any repair or maintenance does not alter the Owner(s) responsibility to maintain in future.
9. The Owner(s) agrees that this Declaration shall be recorded and that the land described in a deed recorded in Book 7823 at Page 230 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"

Operation and Maintenance
Plan With Log
Exhibit A
Operations and Maintenance Plan
359 North Street

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the existing and proposed stormwater components installed at 359 North Street are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance.

Recommended Frequency of Service:

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

Qualified Inspector:

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

Service Procedures:

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

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

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

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

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

6. Roof Gutters:
   a. Remove accumulated debris and inspect for damage. Any damage should be repaired as required.
Disposal of Debris and Sediment:

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

Maintenance Records:

The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times.
Operations and Maintenance Log (Page 1 of 3)
359 North Street

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)
359 North Street

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

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:
Operations and Maintenance Log (Page 3 of 3)
359 North Street

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

Signature of Inspector:  
Date:
CONSTRUCTION SITE PLAN REVIEW SET
"DWELLING ADDITIONS"
LOCATION
359 NORTH STREET
GREENWICH, CONNECTICUT
PREPARED FOR
DENNIS EVER
CYNTHIA EVER

**SHEET INDEX**

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<td>LOW IMPACT DEVELOPMENT PLAN</td>
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<td>9-10-21</td>
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</tbody>
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ENGINEERING PLANS PREPARED BY:

ROCCO V. D’ANDREA, INC.
ANTHONY L. D’ANDREA, PC & LS No. 18776

ONLY COPIES OF THIS SET, BEARING AN ORIGINAL
STAMP OF THE ENGINEER’S / SURVEYOR’S EMBOSSED
SEAL, SHALL BE CONSIDERED TO BE TRUE, VALID COPIES.
EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUED FOR BUILDING PERMIT
2021-08-18

ARCHITECT:
Brooks & Falotico Associates, LLP
199 Elm Street New Canaan, CT 06840
info@brooksandfalotico.com
203.966.8440
These drawings and specifications, including the ideas and arrangements represented therein, are the property of the Architect. The Architect as Author of these documents, shall retain all common law, statutory and other reserved rights including copyright. No part thereof shall be copied, disclosed or used in connection with any other project without the specific written consent of the Architect.

Do Not Scale Drawings. Written dimensions shall take precedence over scaled dimensions. The Architect must be notified of any discrepancies or exclusions from the drawings prior to work being executed.

PROJECT NO. 2020-0048

EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR
PERMIT DATE: 2021-08-18

DATE:
DESCRIPTION:
REV. #
SCALE:
GENERAL NOTES
N/A
010
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PROJECT NO. 2020-0048
EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE:
DESCRIPTION:
REV. #
SCALE:
ARCHITECTURAL SITE PLAN
1" = 20'-0"
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PROJECT NO. 2020-0048
EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR
PERMIT DATE: 2021-08-18

DATE:
DESCRIPTION:
REV. #
SCALE:
EXISTING PLANS
1/8" = 1'-0"
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PROJECT NO. 2020-0048

EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR
PERMIT DATE: 2021-08-18

DATE:
DESCRIPTION:
REV. #
SCALE: 1/8" = 1'-0"
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PROJECT NO. 2020-0048

EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE: DESCRIPTION: REV. 

SCALE: FOUNDATION PLAN 1/4" = 1'-0" 099
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PROJECT NO. 2020-0048
EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE: 2021-08-27
DESCRIPTION: ADDENDUM #1 W&D PRICING

SCALE: 1/4" = 1'-0" 100
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PROJECT NO. 2020-0048
EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR 
PERMIT DATE: 2021-08-18

DATE: 2021-08-27
DESCRIPTION: ADDENDUM #1 W&D PRICING

SCALE: 1/4" = 1'-0"
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PROJECT NO. 2020-0048

EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR
REV. #
SCALE:
SECOND FLOOR PLAN
1/4" = 1'-0"

DATE: 2021-08-27
DESCRIPTION: ADDENDUM #1 W&D PRICING
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PROJECT NO. 2020-0048
EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830
ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE: DESCRIPTION: REV. # SCALE: ROOF PLAN 1/4" = 1'-0" 104
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PROJECT NO. 2020-0048

EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR
PERMIT DATE: 2021-08-18

DATE:
DESCRIPTION:
REV. #
SCALE:
EXTERIOR ELEVATIONS
1/4" = 1'-0"
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ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE: 2021-08-27

DESCRIPTION: ADDENDUM #1 W&D PRICING

SCALE: 1/4" = 1'-0"
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ISSUE DATE FOR
PERMIT DATE: 2021-08-18

DATE:
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REV. #
SCALE:
EXTERIOR ELEVATIONS
1/4" = 1'-0"
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ISSUE DATE FOR

PERMIT DATE: 2021-08-18

DATE: DESCRIPTION: REV. #

SCALE: BUILDING SECTIONS

1/4" = 1'-0" 301
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359 NORTH STREET
GREENWICH, CT 06830
ISSUE DATE FOR PERMIT DATE: 2021-08-18
DATE:
DESCRIPTION:
REV. #
SCALE: 1/4" = 1'-0"
BUILDING SECTIONS
304
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ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE: DESCRIPTION: REV. # SCALE: TYPICAL DETAILS N/A 500
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ISSUE DATE FOR
PERMIT DATE: 2021-08-18

DATE: 
DESCRIPTION: 
REV. # 
SCALE: 
SECOND FLOOR PLAN 
ATTIC FLOOR FRAMING 
1/4" = 1'-0" 
802
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GREENWICH, CT 06830

ISSUE DATE FOR
PERMIT DATE: 2021-08-18

DATE:
DESCRIPTION:
REV. #

SCALE:
ATTIC/ROOF PLAN
ROOF FRAMING
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359 NORTH STREET
GREENWICH, CT 06830
ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE: DESCRIPTION: REV. #

SCALE: STRUCTURAL DETAILS 3/4" = 1'-0"
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ISSUE DATE FOR PERMIT DATE: 2021-08-18

DESCRIPTION:

REV. # SCALE:
3/4" = 1'-0"

805
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ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE: DESCRIPTION: REV. #

SCALE: VOLUME CALCULATIONS

MAIN HOUSE AS NOTED VOL-2
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EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR PERMIT DATE: 2021-08-18

DATE: DESCRIPTION: REV. 

SCALE: VOLUME CALCULATIONS

MAIN HOUSE AS NOTED VOL-3
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EVER RESIDENCE
359 NORTH STREET
GREENWICH, CT 06830

ISSUE DATE FOR
PERMIT DATE: 2021-08-18

DATE: DESCRIPTION: REV. #

SCALE: VOLUME CALCULATIONS
MAIN HOUSE 1/4" = 1'-0" VOL-4
February 15, 2022

Greenwich Planning and Zoning
Ms. Katie DeLuca
101 Field Point Road, Greenwich, CT 06830

Re: 359 North Street
Application #2021-00494

Dear Ms. DeLuca,

We represent Mr. Vanderbilt who resides at 11 Sparrow Ln and adjoins the captioned project application. We object to the proposed stormwater management system in its current configuration. Upon review, we found the following objectionable:

The existing watershed map shows that Area #2 and Area #1 consisting of 15,817 sqft drain toward Vanderbilt property which is indicated as POC A on the plans. Under proposed condition, Area #2, #1A and #1 will be drained toward POC A which will be 17,736 sqft. Therefore, 1919 sqft additional impervious area will be considered in the proposed watershed map to drain toward Vanderbilt property.

Surface runoff will be mitigated using retention systems; however, the amount of groundwater recharge will increase which potentially elevates the Vanderbilt groundwater elevation. 128 cf of water used to infiltrate through the concrete gallery located behind the Vanderbilt property. Based on the inverts shown on the plans, 204.8 cf (1.6’ of recharge from system #5) and 896 cf (3.5’ of recharge from system #4) will be infiltrating as groundwater recharge volume which did not exist previously. Therefore 972 cf of more groundwater recharge volume will be introduced toward Vanderbilt property (POC A).

Mr. Vanderbilt has a severe groundwater issue and has experienced flooding in his basement several times in the past six years despite a 5-pump dewatering system.

According to the submitted drainage report, more volume of water is being directed toward the Vanderbilt property (POC A) than any other neighbor.

There used to be only 1 concrete gallery behind Vanderbilt property and 3 cultec units further south in the back yard. With the proposed development, 25 concrete galleries are added to the site in addition to the 4 existing storage units which will impact the downstream neighbor groundwater table.

Below is for 25-year storm for our area of interest. The volume shown is prior to installing BMPs.

<table>
<thead>
<tr>
<th>Area #</th>
<th>Area(sqft)</th>
<th>Impervious</th>
<th>Runoff Depth</th>
<th>CN</th>
<th>Tc</th>
<th>q</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex #1</td>
<td>6553</td>
<td>81.44%</td>
<td>5.64”</td>
<td>93.5</td>
<td>5 min</td>
<td>0.95 cfs</td>
<td>3077 cf</td>
</tr>
</tbody>
</table>
8 concrete galleries referred to as retention system #4 and 4 concrete galleries referred to as retention system #5 are proposed to mitigate the rate of runoff caused by the proposed development. System #4 collect water from proposed garage and system #5 collects water from paver drive and portion of the building marked as existing garage through roof leaders and a catch basin at the center of the paver drive. Ultimately, when the systems are filled, they will be drained to level spreader 3’x3’x20’ which is located 10 feet away from the back of Vanderbilt property. The level spreader at the back of the Vanderbilt must be relocated to accommodate a safe distance from the sewer easement and protect adjoining neighbors.

According to drainage report, the total rate of runoff will be reduced up to 25-year storm at POC A in our area of interest, which is Area 1, 1A and 2 on the proposed watershed map. However, for 50-year storm and 100-year storm, both rate of runoff and volume will increase.

<table>
<thead>
<tr>
<th>Storm</th>
<th>(q_{eo}(\text{cfs}))</th>
<th>(q_{po}(\text{cfs}))</th>
<th>(V_{eo}(\text{cf}))</th>
<th>(V_{po}(\text{cf}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-year</td>
<td>0.97</td>
<td>0.88</td>
<td>3381</td>
<td>3227 (1631 from System #5 +0 from system #4 +1596)</td>
</tr>
<tr>
<td>25-year</td>
<td>1.67</td>
<td>1.47</td>
<td>5837</td>
<td>5844 (2716 from system #5 +168 from system #4 +2960 area #2)</td>
</tr>
<tr>
<td>50-year</td>
<td>2.07</td>
<td>2.11</td>
<td>7298</td>
<td>7526</td>
</tr>
<tr>
<td>100-year</td>
<td>2.58</td>
<td>2.62</td>
<td>9159</td>
<td>9655</td>
</tr>
</tbody>
</table>

The junction box (JB-1) elevations controlling system 5 must be clarified. The first invert is lower than the sump elevation.

In conclusion, the stormwater dewatering system #4 and #5 including the level spreader should be relocated away from the Vanderbilt property (POC A).