Special Meeting Agenda
Tolland Inland Wetlands Commission

REMOTE ONLY

Thursday, December 21, 2023 at 7:00 p.m.

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1. Call to Order

2. Seating of Alternate(s)

3. Public Participation – Issues of concern not on the Agenda (2 minute limit)

4. Old Business

   4.1 **IWC 23-6 – 343 Plains Road –** Proposed improvements to existing Camp Yankee Trails. Regulated activity within the 200' upland review area is 1.10 acres/48,024sqft and regulated activity within the 50 feet of a wetland is 0.09 acres/48,024sqft. Zone: Residential Design District (RDD) Applicant: Girl Scouts of Connecticut.

5. Adjournment

To join the Zoom Meeting, either click:
https://us02web.zoom.us/j/8608713602?pwd=cXZLNG9SWVlvNkNjZU9NYUxCd2xiUT09
One tap mobile: +16469313860,,8608713602#,,,,*06084#
Or call: 1-929-205-6099 and input:
Meeting ID: 860 871 3602
Passcode: 06084

Any party needing an accommodation contact the Planning & Development Department at (860) 871-3601 or via email @mdamato@tolland.org
The Town of Tolland is an Equal Opportunity/Affirmative Action Employer.

IWC #_____

Town of Tolland
Inland Wetlands Commission

APPLICATION FOR PERMIT

OFFICE USE ONLY				
Agent Decision	$		☐	
Commission Approval	$		☐	
Other	$		☐	

An incomplete application may be denied.

1. Applicant & Owner Information

343 Plains Road
Site Address of Proposed Activity

Girl Scouts of Connecticut — 340 Washington St. Harford, CT 06106
Applicant Name — Mailing Address

860-522-0163 — mcorcoran@gsofct.org or rkopylec@gsofct.org
Phone Number — Email Address

Property Owner(s) Name *(if not the applicant)* — Mailing Address

Phone — Email Address

Applicant's Interest in the Land (*if other than owner*)

Is this property part of an approved subdivision? ☑ No ☐ Yes If **YES**, please state the name:

2. Proposed Activity Information * These questions are mandatory

Check all activities occurring within 50 feet of wetlands or 100-feet of watercourses.

☑ Remove soil	☑ Deposit fill	☐ Divert surface water
☑ Construction	☑ Grade	☑ Construct a road or driveway
☑ Remove Vegetation	☑ Restore Vegetation	☐ Place a prefabricated structure
☐ Alter a watercourse	☐ Enhance a watercourse	☐ Create a watercourse
☐ Remedy pollution	☐ Dredging or construct a dam	☐ Other

* Describe the proposed activity. (use additional paper if necessary)

Improvements are centered at the camp core and aim to improve accessibility, connectivity, and comfort for campers and staff. The main improvements include a renovated & expanded dining hall, new parking lot, new shower house, new cabins, paved access drive, and an accessible waterfront. Refer to narrative & site plans for detailed information.

* What is the proposed use? (use additional paper if necessary)

The proposed use of the site will remain a Girl Scout camp facility with the majority of activity occurring during the summer months for resident and day campers.

3. Wetland and Upland Review Area Information * These questions are mandatory

* What is the total **area** of the wetlands on the parcel? (see directions on page 7)

38.5 acres (per online mapping tool)

How often are the wetlands wet?

☑ All year ☐ Springtime only ☐ Sometimes ☐ I don't know

A **watercourse** is defined as:
Rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, vernal or intermittent, public or private.

An **upland review area** is defined as:
An area extending a minimum of 50-feet from the edge of wetlands and/or 100-feet from any watercourse (refer to regulations when doubling of an upland review area is required).

* **Square feet** of disturbance in wetland, watercourse, or upland review area. (list areas separately)

The upland review area of the wetland boundary associated with Sweetheart Lake has been depicted on all plans to the 200 foot limit due to the surrounding area having steep slopes. The regulated activity within the 200' upland review area is 1.12 acres/48,995 sf.

Regulated activity within the 50 foot upland review area of Wetland 'X' as defined in the wetland delineation report is 0.09 acres/3,781 sf

What is the **square feet** of any areas of enhancement within the upland review area?

Removal of tent platforms within Wetland 'X' URA = 0.06 acres / 2,700 sf. Tree plantings and native seed mixes proposed within the URA are approximately 0.14 acres / 6,000 sf.

An **intermittent watercourse** is defined as:
A permanent channel and bank and the occurrence of two (2) or more of the following characteristics: scour, deposits of organic material, presence of standing water for a duration longer than a particular storm event, or hydrophytic vegetation.

* **Does the wetland have a watercourse through it?** ☑ No ☐ Yes

If **YES**, how often is the watercourse present?

☐ All year ☐ Springtime only ☐ Sometimes ☐ I don't know

* **Is there a pond, lake, or river on the property?** (check all that apply)

☐ Pond ☑ Lake ☐ River ☐ None

What is the total **area** of disturbance of an open water body? 0 square feet

What is the **linear feet** of disturbance of a watercourse? 0 feet

Has the property been delineated by a Certified Soil Scientist? ☐ No ☑ Yes

If **YES**, what year did the delineation occur? 2022

What is **wetland delineation**?
Delineation is an act of locating the boundary or border of a wetland or waterbody. Delineation also includes describing the functions and values the water system provides the geographical location. In the state of Connecticut only a certified Soil Scientist is recognized as being able to perform a wetland or watercourse delineation.

4. Alternatives

* Please explain to the Commission the reason you chose this location for your proposed activity or project. What alternatives have been considered to avoid altering wetlands or watercourses? (use additional paper if necessary)

* **This question is mandatory**

The project areas have been selected based primarily on the location of existing site features.

The majority of proposed renovations and upgrades are connected to existing camp buildings, access ways and activity areas.

The proposed work has been strategically located outside upland review areas where possible and with no direct wetland or watercourse impacts.

5. Abutters

Providing abutters only applies if the application requires a public hearing. Tolland's Planning & Development Department will supply the applicant with the names and addresses of adjacent property owners. **There is a public hearing fee of $300.**

6. Site Plan Maps *Application Requirement

See page 7 below.

7. Additional Information

Supply any other information that would help in the understanding of the proposed activity.

8. A Complete Application Consists Of

1. This permit application fully filled out.
2. Site Plan Maps as described on page 7.
3. Signatures & Seals of licensed or certified professionals.
4. Filing fee
5. **One (1) electronic copy** of the application.
6. **Nine (9) hard copies** of the application.

Site Plan Maps *Application Requirement

Hand drawn or engineered plans?:

Depending on the proposed scope of work, hand drawn maps & plans may be acceptable **OR** professional survey/engineering drawings may be required. The IWWC or its duly authorized agent may waive any portion of these requirements.

Typical required site plan elements:

- ☐ A North Arrow
- ☐ A Legend
- ☐ In the lower right hand corner showing the following information (Title Block):
  - ☐ Name of Project and Address
  - ☐ Name of Applicant/Owner/Developer
  - ☐ Map Scale
  - ☐ Name or initials of who prepared the plan (if not the applicant)
  - ☐ Date prepared (or revision dates)

MAP 1: General Location Map (1 copy) – Refer to Page 7

Mapping: On-line GIS

- ☐ Use Tolland's GIS mapping system currently found on the Town's website, or on the Planning & Development webpage, click here.
- ☐ Turn on the themes and choose BOTH: "Wetlands – Delineated" and "Wetlands – Soils."
- ☐ Add Topography – For online mapping choose BOTH "Topography" and "Topography 2016".
- ☐ Click on the property of interest
- ☐ Scale the map to 1"= 200 feet – **Refer to Page 7**
- ☐ Print out the document or save electronically as a PDF

MAP 2: Existing Conditions (1 electronic / 9 hardcopies)

- ☐ **Scale:** Up to 1" = 100 feet (if conditions do not fit on a 24"x36" sheet scale can be reduced to 1"=200')
- ☐ Use either Tolland's GIS mapping system or an existing A2 Survey from your building file. Ask us.
- ☐ Follow steps 1-4 from above – For online mapping.
- ☐ Topography
- ☐ Existing property lines for entire property
- ☐ Locate all regulated areas on property: wetlands, watercourses, upland review areas 50' or 100'
- ☐ Locate the existing well & septic locations (properties with public utilities mark the general location)
- ☐ Locate significant exiting features or structures, buildings, roads, driveways, stonewalls, easements, ledges, stone outcrops, etc.
- ☐ Total acreage of the property
- ☐ Wetland delineation may be required if a delineation occurred prior to 1990. Call us.

MAP 3: Proposed Site Plan (1 electronic / 9 hardcopies)

- ☐ **Scale:** Any scale between 20 scale - 50 scale is acceptable (e.g. 1"=20 ft., 30 ft., 40 ft., 50 ft.)
- ☐ All items from Map 2 above
- ☐ Limits of disturbance (the boundary line where the proposed activity will occur including layout areas)
- ☐ Property setbacks
- ☐ Distance (linear feet) of proposed activity from property setbacks
- ☐ Area (square footage) of proposed activity within a regulated area (wetland, upland review area) if any
- ☐ Proposed buildings, structures, septic systems, roads (including logging roads), etc.
- ☐ Distance (linear feet) from proposed activity to closest regulated area
- ☐ Label edges and general areas of existing and proposed vegetation (forest, field, lawn, clearings)
- ☐ Temporary storage piles (e.g. fill, topsoil, organic soil)
- ☐ Erosion and sedimentation measures, and/or other measures planned to protect wetlands, watercourses from harmful discharges during or after the proposed activity. * **This question is mandatory**
- ☐ Signature and Seal of Surveyor, Landscape Architect or Professional Engineer * **This is mandatory**
- ☐ If wetlands have been delineated by a certified Soil Scientist the Signature and Certification Number must be on the plans * **This is mandatory**

Additional Site Plan Requirements for Projects deemed a "Significant Activity"

- ☐ A Public Hearing Fee of $300 may be required
- ☐ An Engineer or Expert review fee may be required – lack of payment are grounds for denial without prejudice for an incomplete application. Call us.
- ☐ Hydraulic modifications to wetlands or watercoureses (if any)
- ☐ Soil Scientist report including the observations of existing ecological communities, soil types

FEES

Type of Permit	Fee Amount	Total
Residential Uses – Existing Lots	$80.00 **plus** $60.00 State Fee	$140.00
Map Amendment	$300.00 **plus** $60.00 State Fee	$360.00
Modify Previous Approval	$100.00 **plus** $60.00 State Fee	$160.00
Appeal Agent Issued Permit	$80.00 **plus** $60.00 State Fee	$140.00
Wetlands Buffer Zone Markers	Fee $1.00 each	TBD
Other uses	$200.00 **plus** $60.00 State Fee	$260.00

Additional Fees:

Agent Issued Permits (Activity in Upland Review Area):

Fee $40.00 **plus** $60.00 State Fee (Total $100.00)

Plus Advertisement Costs: Applicants must advertise in Journal Inquirer at own cost.

Subdivision without new roads or storm drainage:

Fee $200.00 for first 2 lots, **plus** $50.00 for each additional lot with proposed activity in regulated area **plus** $60.00 State Fee.

Subdivision with New Roads:

$200.00 **plus** $50.00 for each additional lot with proposed activity in regulated area **plus** $200.00 for each 1,000 linear feet of road (or any part thereof) **plus** $60.00 State Fee.

Commercial, Industrial, Multi-Family Residential (as defined by Zoning Regulations) Fees:

- ☐ Up to 23,000 square feet impervious surface: $400
- ☐ 23,001 to 50,000 square feet: $400 plus $5 per 1,000 square feet in excess of 23,000 square feet
- ☐ Over 50,000 square feet: $535 plus $2 per $1,000 square feet in excess of 50,000 square feet required.

plus State Fee: $60

Public Hearing Fee: (When it is determined a Public Hearing is required)

$300.00 (in addition to above fees, if above fee is less than $500.00) –

Filing fees may include additional costs incurred by the Town of Tolland, including, but not limited to, the expense of retaining experts to analyze, review and report on areas requiring a detailed technical review in order to assist the Commission in its deliberations. Said costs will be estimated by the Commission, based on preliminary estimates from such experts, and said estimate of costs times 150% will be paid over to the Commission prior to proceeding on the application. Upon completion of the technical review and a determination of the costs incurred, any excess will be refunded to the applicants. The applicant shall not be responsible for costs incurred in excess of 150% of the Commission's estimate.

Signature and Authorization

I, as the applicant, do hereby certify that I am familiar with all the information provided in the application and I am aware, that an incomplete application form, as well as a lack of payment of all associated permit fees, are grounds for denial without prejudice by either the Commission or their designated agents.

I am aware of the penalties for obtaining a permit through deception or through inaccurate or misleading information.

I, as the owner, do hereby authorize the members and designated agents of the Inland Wetlands Commission and professionals hired by the Commission for the purpose of reviewing this application to inspect the property from this date forward until the permitted activity is completed or the application is denied.

I, as the applicant, do understand that an engineer review fee may be required and a lack of payment are grounds for denial without prejudice by either the Commission or their designated agents.

I further understand that the Commission may request further information in connection with this application and that if the proposed activity involves a significant activity, an additional filing fee of $300 be required for a public hearing.

Rocky Kopylec — Digitally signed by Rocky Kopylec Date: 2023.10.12 10:39:58 -04'00' — 10/12/2023

Signature of Applicant — Date

Signature of Owner (if different) — Date

For Office Use	
FEE TOTALS	
Amount:	
Paid:	
Agent Issued or Commission Issued:	
Date received by Land Use Department:	
Date received by Commission:	

Camp Yankee Trails
Inland Wetlands Application
Project Narrative

Camp Yankee Trails has sat idle and unused by GSofCT for several decades; however, with the sale of other camp properties the organization has decided to reinvest in Camp Yankee and relocate their only resident camp experience in Connecticut to the property. To do so, the property needs several upgrades to buildings, infrastructure, and the site.

The buildings to be upgraded or built new include renovations and additions to the dining hall, a new shower house, and four new cabins including an accessible unit. The building improvements are consolidated in the camp core and are centered around the existing dining hall. The dining hall will be renovated with a new kitchen, bathrooms, storage, and larger dining area. The building will be insulated and heated to accommodate year-round use. To further support the camp and dining hall area a new parking lot is proposed to accommodate 49 cars. GSofCT hopes that the property will not only be used as a resident camp but can also host staff events, girl scout meetings, and outside events year round. Currently the small dirt lot can accommodate, at most, a dozen vehicles.

The shower house and camp cabins will be seasonal structures constructed to the west and north of the dining hall and parking lot. Keeping each of these uses central to each other allows for ease of access, consolidates infrastructure needs, and reduces overall impacts to the site. Accessible stone dust and concrete paths will connect each of the improvement areas furthering the goal of a property for all users.

As with most summer camps a key feature is water play, so GSofCT is looking to improve the accessibility and usability of the existing waterfront on Sweetheart Lake. The current waterfront area is steep with uneven terrain and a small “beach” area that is prone to erosion. The proposed waterfront improvements will allow for ADA compliant access via a series of ramps and sloped walks which necessitate the construction of retaining walls. The retaining walls also allow for the grade of the waterfront area to be improved to increase the beach area and provide a consistent slope down to the water’s edge.

Construction is anticipated to begin in the winter of 2023 with most improvements completed by June 2024. The anticipated sequence of construction is:

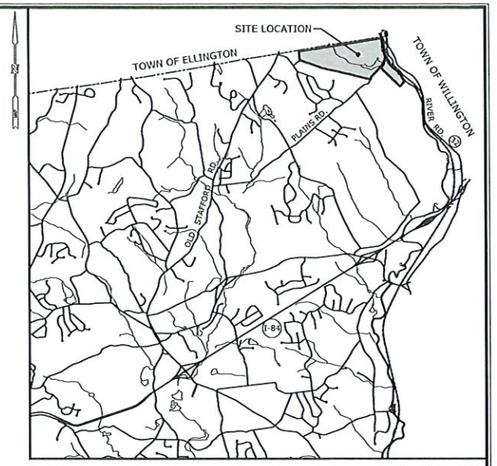
1. Install sediment and erosion controls.
2. Clear and grub trees and vegetation to the indicated clearing limits. Wherever possible, trees will be preserved. Clear cutting areas is not the goal of the project; however, some areas require full removal to accommodate the improvements. Several areas also have hazardous trees that need to be removed for safety reasons.
3. Pad out access drive and parking area to allow for construction access and compaction of subbase materials.
4. Selective demolition of dining hall
5. Installation of underground utilities surrounding building footprints and within parking lot
6. Construction of shower house and dining hall additions
7. Extension of utilities to necessary end points including septic leaching fields and drainage structures
8. Construction of cabins
9. Fine grading and installation of walking paths
10. Install landscaping
11. Finalize construction of parking lot and access road
12. Construct waterfront improvements (with lake still drawn down)
13. Remove sediment and erosion controls and clean site

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

REGULATORY DRAWINGS

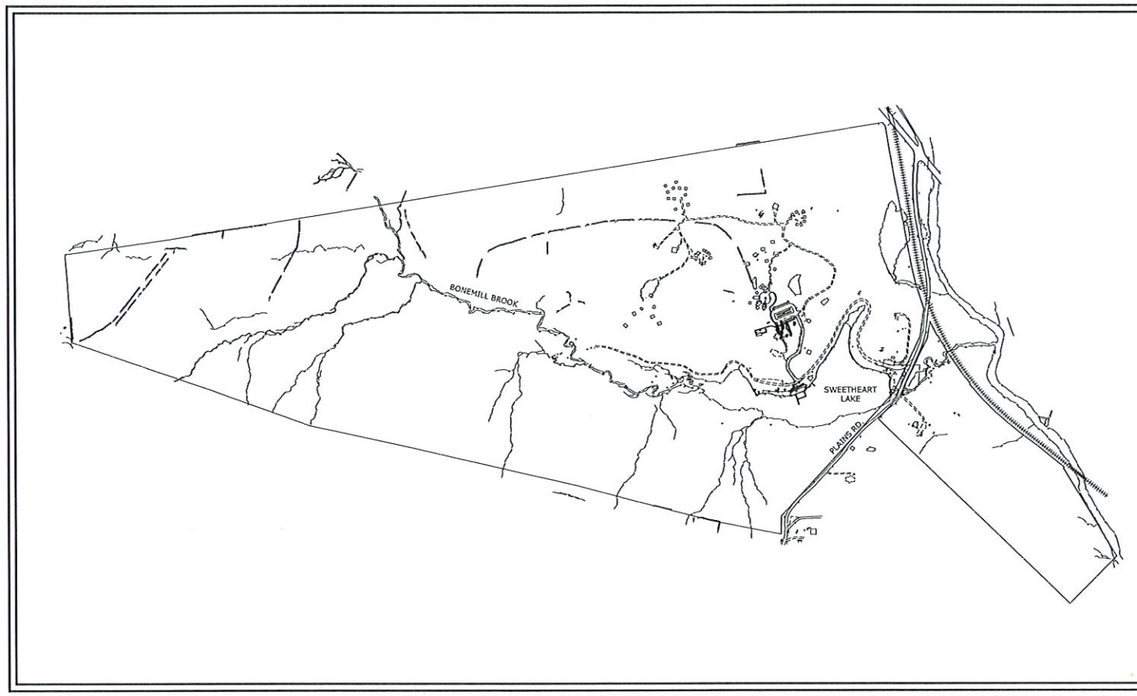
NOVEMBER 21, 2023



LOCATION MAP:

GENERAL NOTES

1. BOUNDARY INFORMATION IS BASED UPON FIELD SURVEY CONDUCTED BY: GARDNER & PETERSON ASSOCIATES, LLC TOLLAND, CONNECTICUT, TAKEN FROM A MAP ENTITLED PERIMETER SURVEY LAND OF THE GIRL SCOUTS OF CONNECTICUT, INC. 343 PLAINS ROAD, TOLLAND, CONNECTICUT, PREPARED FOR GIRL SCOUTS OF CONNECTICUT AT A SCALE OF 1"=100', DATED: 11-09-2022
2. TOPOGRAPHIC INFORMATION IS BASED ON AERIAL SURVEY CONDUCTED BY AERIAL SURVEYS INC. WATERBURY, CONNECTICUT 06708, PREPARED FOR GIRL SCOUTS OF CONNECTICUT ON APRIL 29, 2022.
3. INFORMATION REGARDING THE LOCATION OF EXISTING UTILITIES HAS BEEN BASED UPON AVAILABLE INFORMATION AND MAY BE INCOMPLETE, AND WHERE SHOWN SHOULD BE CONSIDERED APPROXIMATE. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRIOR TO BEGINNING CONSTRUCTION. CALL "CALL BEFORE YOU DIG", 1-800-922-4455. ALL UTILITY LOCATIONS THAT DO NOT MATCH THE VERTICAL OR HORIZONTAL CONTROL SHOWN ON THE PLANS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
4. SLR CONSULTING US LLC. ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF MAPS AND DATA WHICH HAVE BEEN SUPPLIED BY OTHERS.
5. INLAND WETLAND BOUNDARY WAS FLAGGED BY: MATTHEW SANFORD, REGISTERED SOIL SCIENTIST AND PRODESSIONAL WETLAND SCIENTIST, AND MEAGHAN FOGARTY, ENVIRONMENTAL SCIENTIST, BOTH OF SLR INTERNATIONAL CORPORATION ON OCTOBER 07, 2022 AS SHOWN ON DRAWING PERIMETER SURVEY LAND OF THE GIRL SCOUTS OF CONNECTICUT, INC. 343 PLAINS ROAD, TOLLAND, CONNECTICUT, DATED 11-09-2022 AND FIELD LOCATED BY GARDNER & PETERSON ASSOCIATES, LLC, 178 HARTFORD TURNPIKE TOLLAND, CONNECTICUT ON NOVEMBER 1, 2022.
6. ALL UTILITY SERVICES ARE TO BE UNDERGROUND. THE EXACT LOCATION AND SIZE OF ELECTRIC, TELEPHONE, CABLE TELEVISION AND GAS ARE TO BE DETERMINED BY THE RESPECTIVE UTILITY COMPANIES.
7. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
8. SEDIMENT AND EROSION CONTROL MEASURES AS DEPICTED ON THESE PLANS AND DESCRIBED WITHIN THE SEDIMENT AND EROSION CONTROL NARRATIVE SHALL BE IMPLEMENTED AND MAINTAINED UNTIL PERMANENT COVER AND STABILIZATION IS ESTABLISHED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL CONFORM TO THE "GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CONNECTICUT - 2002, AND IN ALL CASES BEST MANAGEMENT PRACTICES SHALL PREVAIL.
9. ALL DISTURBED AREAS SHALL RECEIVE A MINIMUM OF 6" TOPSOIL, AND BE SEEDED WITH GRASS OR SODDED, AS SHOWN ON THE PLANS.
10. ALL STORM DRAIN PIPE SHALL BE SMOOTH LINED CORRUGATED PLASTIC PIPE (SLCPP) UNLESS OTHERWISE INDICATED.
11. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS INDICATE FINISHED GRADE.
12. ALL GRAVITY SANITARY SEWER PIPE SHALL BE PVC SDR35 UNLESS OTHERWISE INDICATED.
13. ALL CONSTRUCTION MATERIALS AND METHODS SHALL CONFORM TO THE TOWN OF TOLLAND REQUIREMENTS AND TO THE APPLICABLE SECTIONS OF THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION, FORM 818 AND ADDENDUMS
14. ALL GUTTERS, ROOF DRAINS AND FOUNDATION DRAINS SHALL BE TIED INTO THE PROPOSED STORM DRAINAGE SYSTEM.
15. THE PLANS REQUIRE A CONTRACTOR'S WORKING KNOWLEDGE OF LOCAL, MUNICIPAL, WATER AUTHORITY, AND STATE CODES FOR UTILITY SYSTEMS. ANY CONFLICTS BETWEEN MATERIALS AND LOCATIONS SHOWN, AND LOCAL REQUIREMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE EXECUTION OF WORK. THE ENGINEER WILL NOT BE HELD LIABLE FOR COSTS INCURRED TO IMPLEMENT OR CORRECT WORK WHICH DOES NOT CONFORM TO LOCAL CODE.
16. ALL FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS SHOULD BE STORED IN A SECONDARY CONTAINER AND REMOVED TO A LOCKED INDOOR AREA WITH AN IMPERVIOUS FLOOR DURING NON-WORK HOURS.
17. COMPLIANCE WITH THE PERMIT CONDITIONS IS THE RESPONSIBILITY OF BOTH THE CONTRACTOR AND THE PERMITTEE.
18. PERIMETER SWALES AND RESPECTIVE SILTATION BASINS SHALL BE COMPLETED AND RESTORED PRIOR TO PROCEEDING WITH OTHER SITE CONSTRUCTION.ONST
19. THE PROPERTY OWNER MUST MAINTAIN (REPAIR/REPLACE WHEN NECESSARY) THE SILTATION CONTROL UNTIL ALL DEVELOPMENT ACTIVITY IS COMPLETED AND ALL DISTURBED AREAS ARE PERMANENTLY STABILIZED.



PROJECT SITE VICINITY MAP:

0' 350' 500'
0 1:2" 1"
SCALE 1" = 500'

ZONING DATA TABLE			
ZONE: NATURAL RESOURCE PROTECTION AREA (WITHIN RDD)			
USE: YOUTH CAMP			
	REQUIRED	EXISTING	PROPOSED
LOT AREA (SPECIAL PERMIT USE: YOUTH CAMP)	1,742,400 SF MIN. / 40 ACRES MIN.	11,135,840 SF / 255.64 ACRES	11,135,840 SF / 255.64 ACRES
LOT FRONTAGE (RDD TRADITIONAL DEVELOPMENT)	200 FT. MIN.	<200 FT.	<200 FT.
BUFFER ZONE (SECTION 16-3)	100 FT. MIN.	<100 FT.	<100 FT.
BUILDING COVERAGE (%) (RDD TRADITIONAL DEVELOPMENT)	15% MAX.	>15%	>15%

PARKING DATA - DINING HALL		
	EXISTING	PROPOSED
STANDARD SPACES	10	46
HANDICAP/ VAN ACCESSIBLE PARKING SPACES	1	3
TOTAL PARKING SPACES	11	49

PREPARED FOR:

GIRL SCOUTS OF CONNECTICUT,
340 WASHINGTON, STREET
HARTFORD, CT 06106

PREPARED BY:

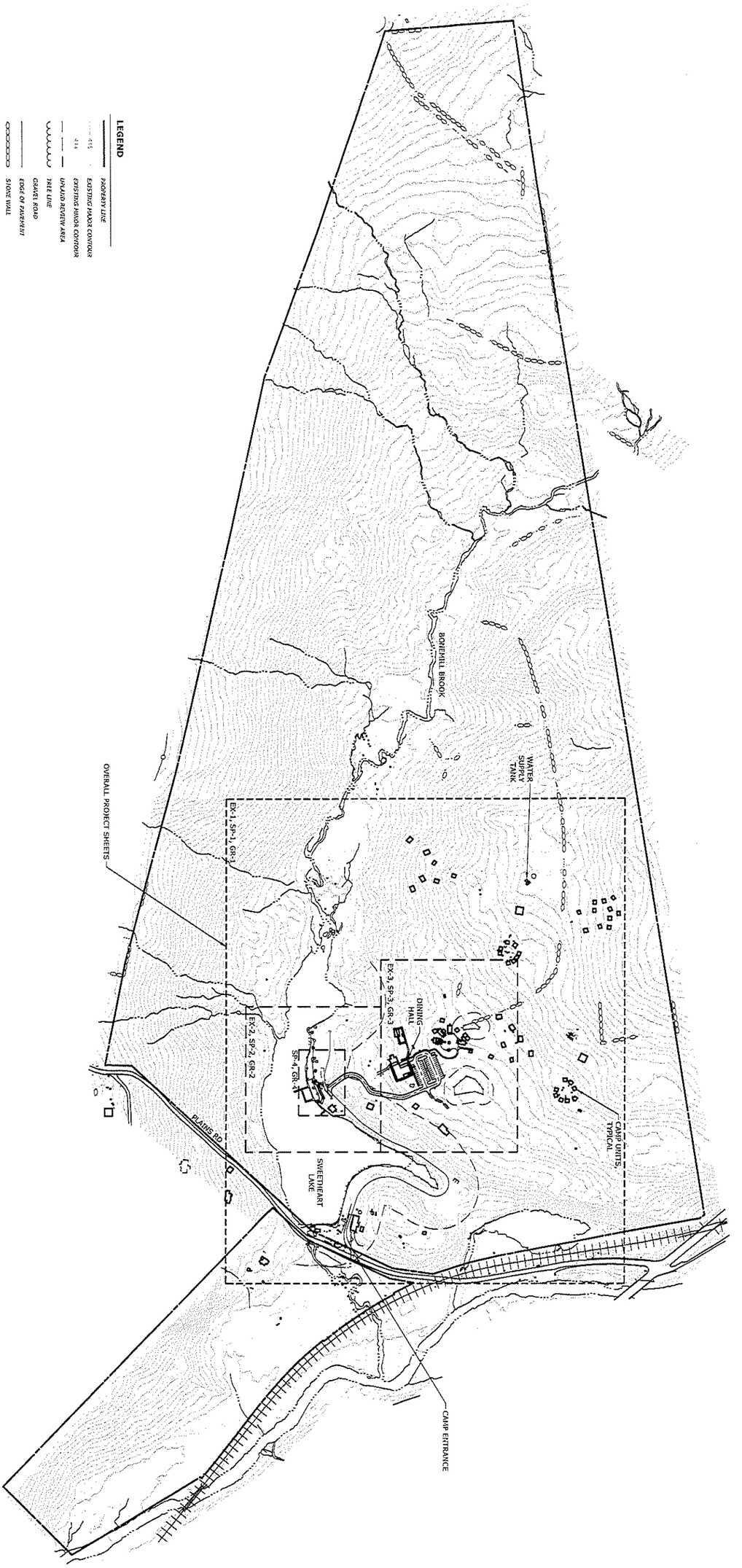
SLR
59 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

STATE OF CONNECTICUT — TODD D. PARKER — NO. 23750 — LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT — MICHAEL D. SANFORD — CERTIFIED LANDSCAPE ARCHITECT

LIST OF DRAWINGS

811 Know what's below. Call before you dig. www.cbyd.com



11 IN

SHEET	01 OF 26
PROJECT	141.13280.00006
DATE	NOVEMBER 21, 2023
SCALE	1"=250'
DESIGN	PJP
DRAWN	PJP
CHECKED	MTD

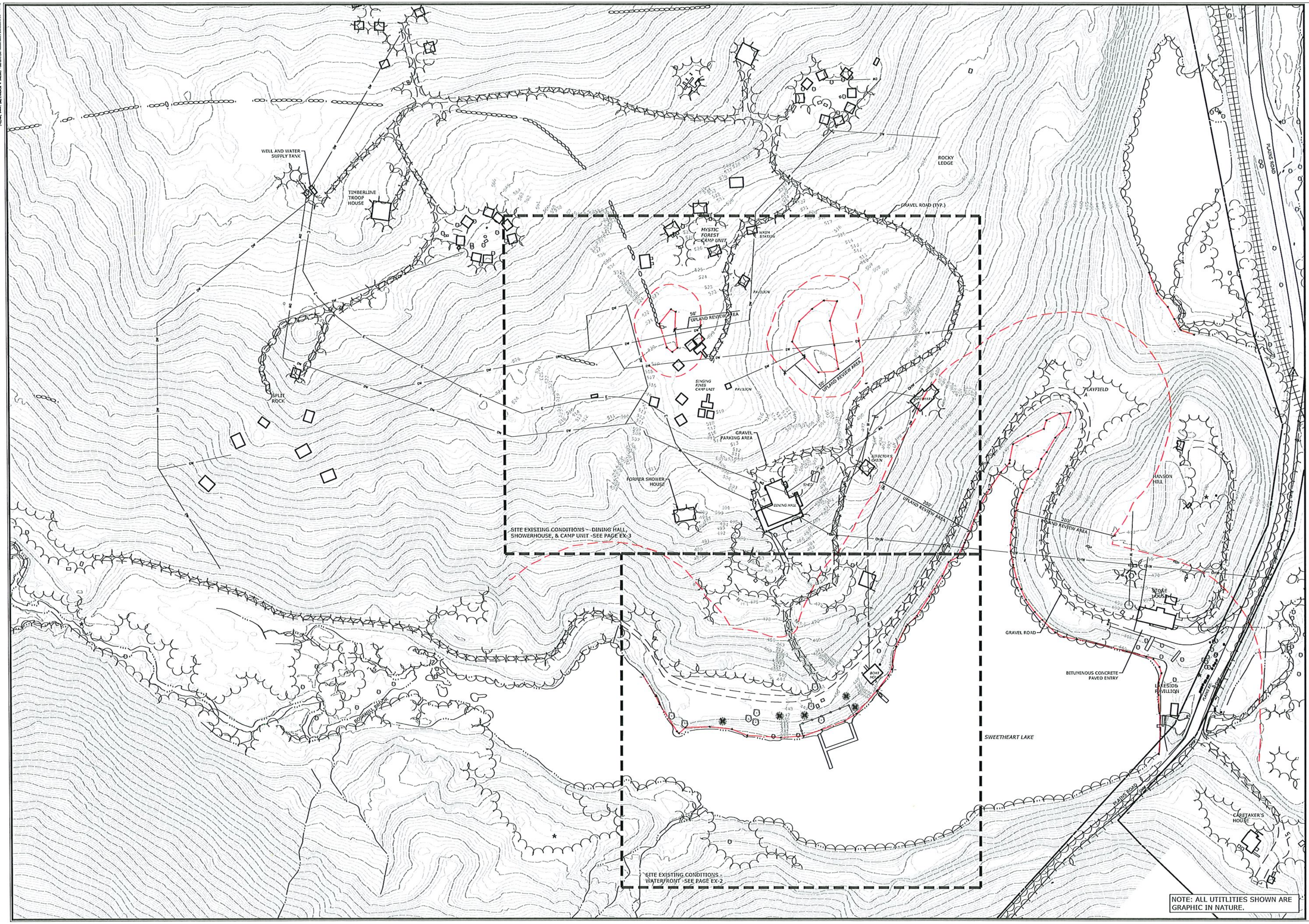
INDEX PLAN

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

DESCRIPTION	DATE	BY

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM



NOTE: ALL UTITLITIES SHOWN ARE GRAPHIC IN NATURE.

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

EXISTING CONDITIONS - OVERALL

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

PJP	PJP	MTD
DESIGNED	DRAWN	CHECKED

SCALE: 1"=80'

DATE: NOVEMBER 21, 2023

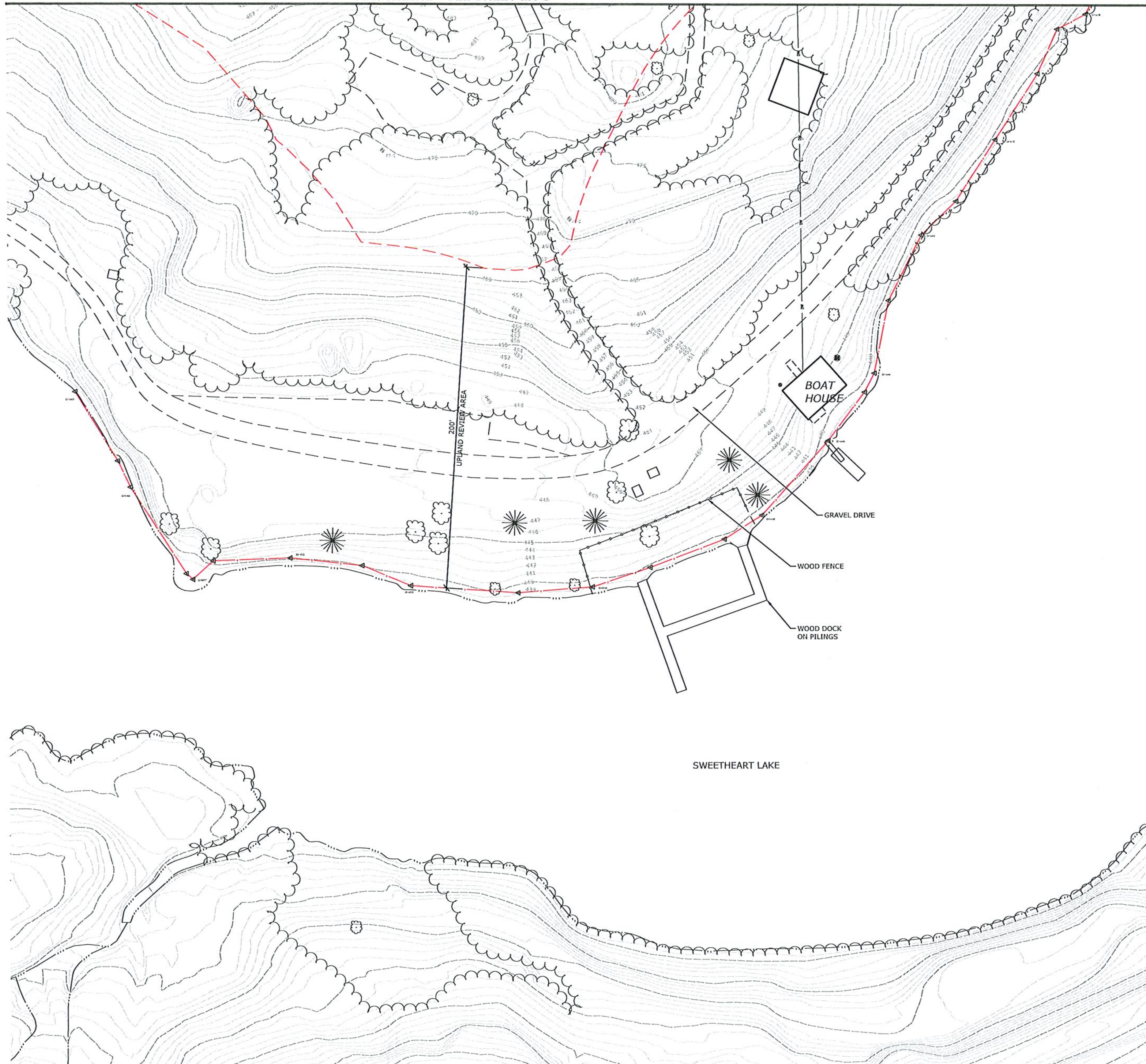
PROJECT NO. 141.13280.00006

SHEET NO. 02 OF 26

SHEET NAME: EX-1

12

MATCHLINE - SEE SHEET EX-3



SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

EXISTING CONDITIONS - WATERFRONT

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

PJP	PJP	MTD
DESIGNED	DRAWN	CHECKED

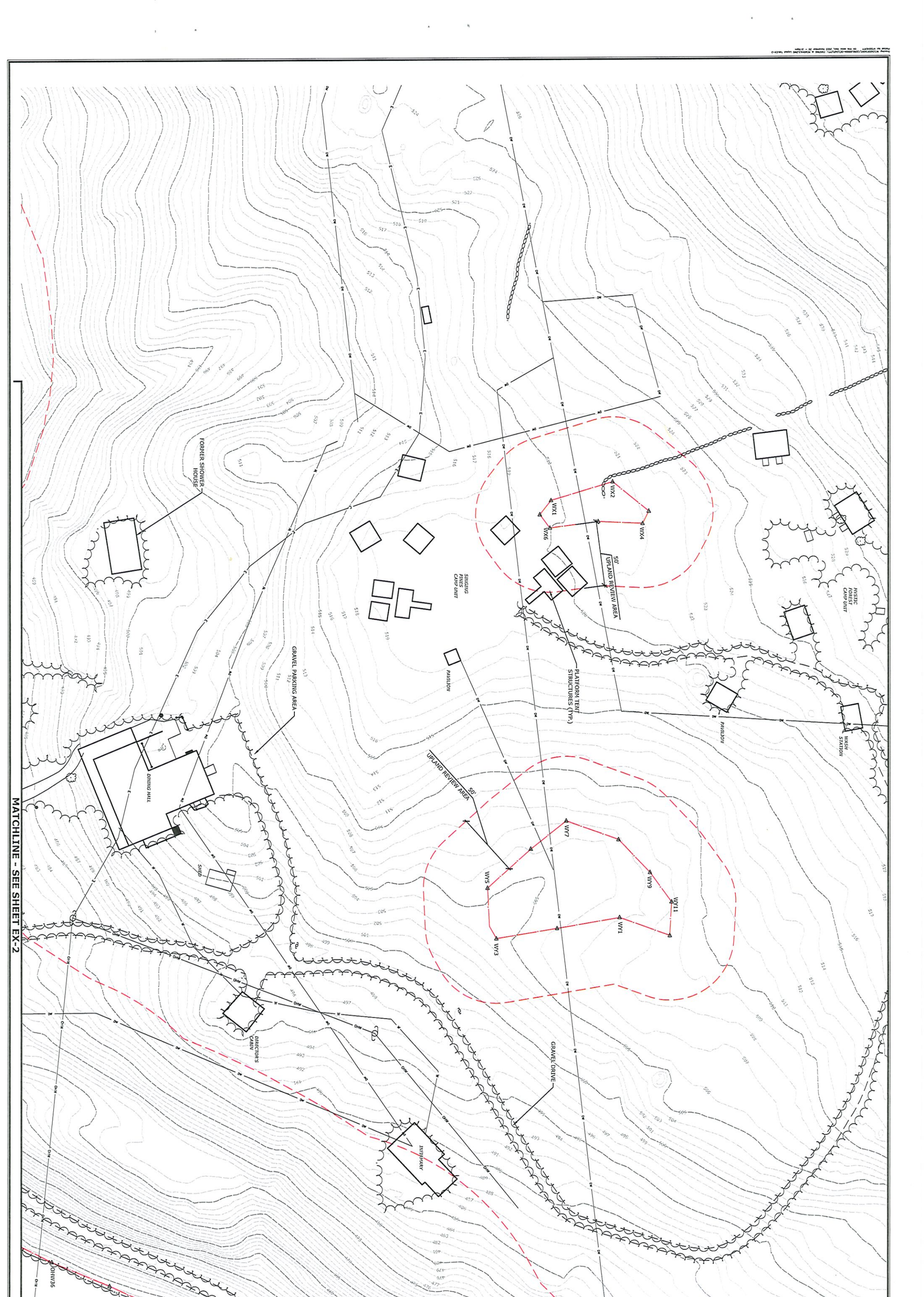
1"=30'
SCALE

NOVEMBER 21, 2023
DATE

141.13280.00006
PROJECT NO

03 OF 26
SHEET NO

EX-2
SHEET NAME



DESIGNED	PJP	
DRAWN	PJP	
CHECKED	MTD	
SCALE	1"=30'	
DATE	NOVEMBER 21, 2023	
PROJECT#	141.13280.00006	
SHEET#	04 OF 26	
SHEETNAME	EX-3	

EXISTING CONDITIONS - DINING HALL, SHOWERHOUSE, & CAMP UNIT

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

DESCRIPTION	DATE	BY

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

REGULATED ACTIVITY NO.2
0.09 ACRE / 3,781 SF
- REMOVAL OF EXISTING TENT PLATFORMS
- TREE CLEARING
- GRADING

UPLAND REVIEW AREA LIMIT (TYP.)

DINING HALL, SHOWERHOUSE, & SINGING PINES CAMP UNIT IMPROVEMENTS

FLAGGED WETLAND LIMIT (TYP.)

SEPTIC SYSTEM IMPROVEMENTS

ACCESS ROAD AND DRAINAGE IMPROVEMENTS

STORMWATER IMPROVEMENTS

WATERFRONT IMPROVEMENTS

REGULATED ACTIVITY NO.1
1.12 ACRES / 48,995 SF
- WATERFRONT IMPROVEMENTS
- ACCESS DRIVE IMPROVEMENTS
- STORMWATER DRAINAGE IMPROVEMENTS
- NEW SEPTIC FIELDS
- GRADING
- TREE CLEARING

TOTAL REGULATED ACTIVITY = 1.21 ACRES / 52,776 SF

REFER TO SUBMITTED WETLAND DELINEATION REPORT PREPARED BY SLR CONSULTING DATED JANUARY 27, 2022 FOR MORE INFORMATION.

SWEETHEART LAKE

MYSTIC FOREST CAMP UNIT
WASH STATION
PAVILION
SINGING PINES CAMP UNIT
DINING HALL
DIRECTOR'S CABIN
BOAT HOUSE
PLAYFIELD A
HAYSON HILL
STONE HOUSE
LAKESIDE PAVILION
SPORTS FIELD
CARETAKER'S HOUSE
PLAINS ROAD

WX4 WX2 WX1 WX6 50'
WY11 WY9 WY1 WY7 WY5 WY3 50'
WZ6 WZ4 WZ2 WZ1
WA9 WA11 WA6 WA13 WA4 WA2
OHW30 OHW31 OHW28 OHW26 OHW34 OHW24 OHW36 OHW22 OHW38 OHW20 OHW40 OHW18 OHW42 OHW16 OHW14 OHW12 OHW10 OHW8 OHW5 OHW44 OHW46 OHW48 OHW3 OHW1
OHW62 OHW60 OHW57 OHW55 OHW53 OHW50
200' UPLAND REVIEW AREA

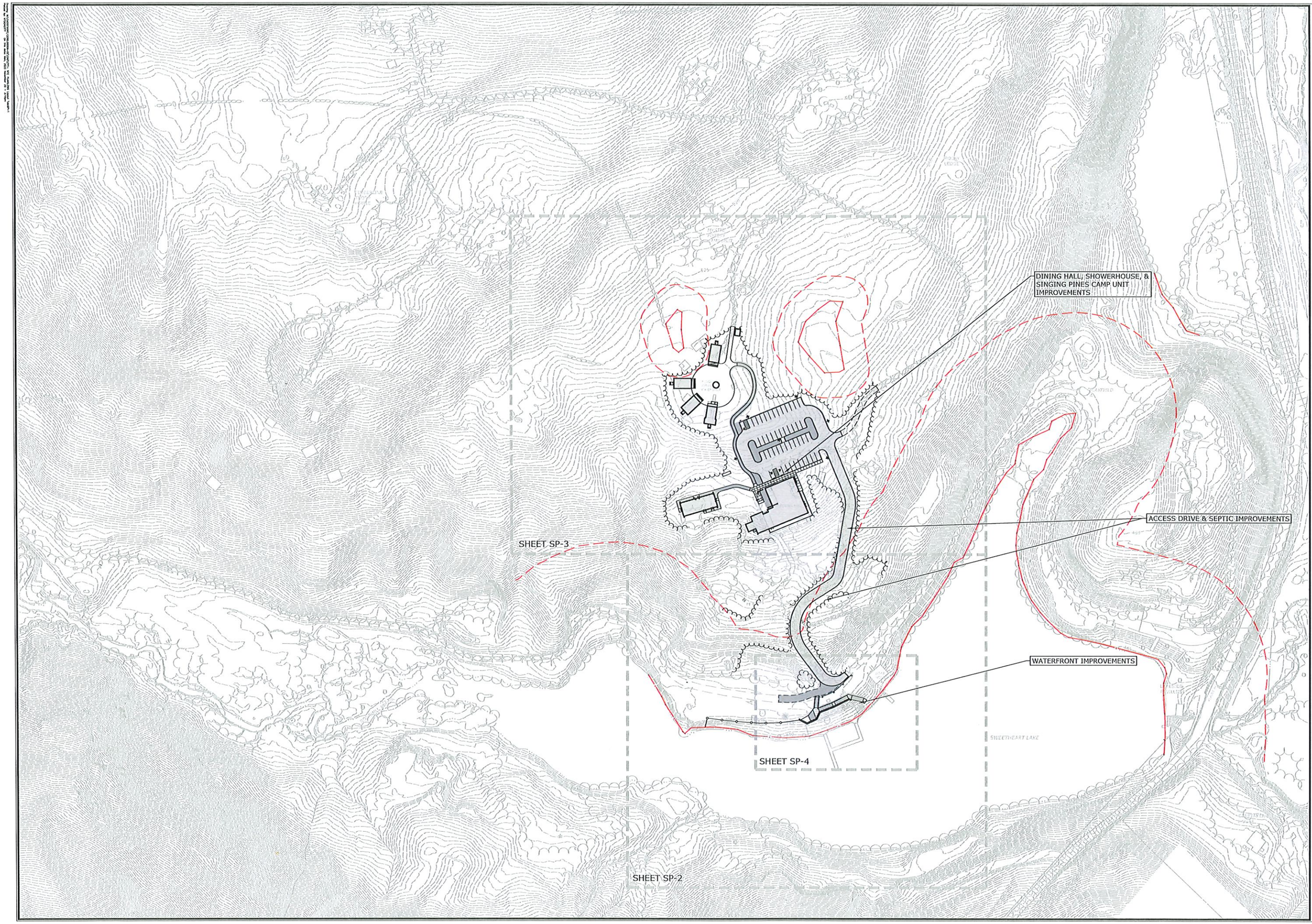
SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

REGULATED ACTIVITIES PLAN
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

SCALE: 1"=60'
DATE: SEPTEMBER 27, 2023
PROJECT NO.: 141.13280.00006
SHEET NO.: 15RA
SHEET NAME



N
W E
S
0 6' 12' 24'

SLR

59 EARLY DRIVE
CHESHIRE, CT 06410
203.271.7773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

SITE PLAN - OVERALL

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

1"=80'
SCALE

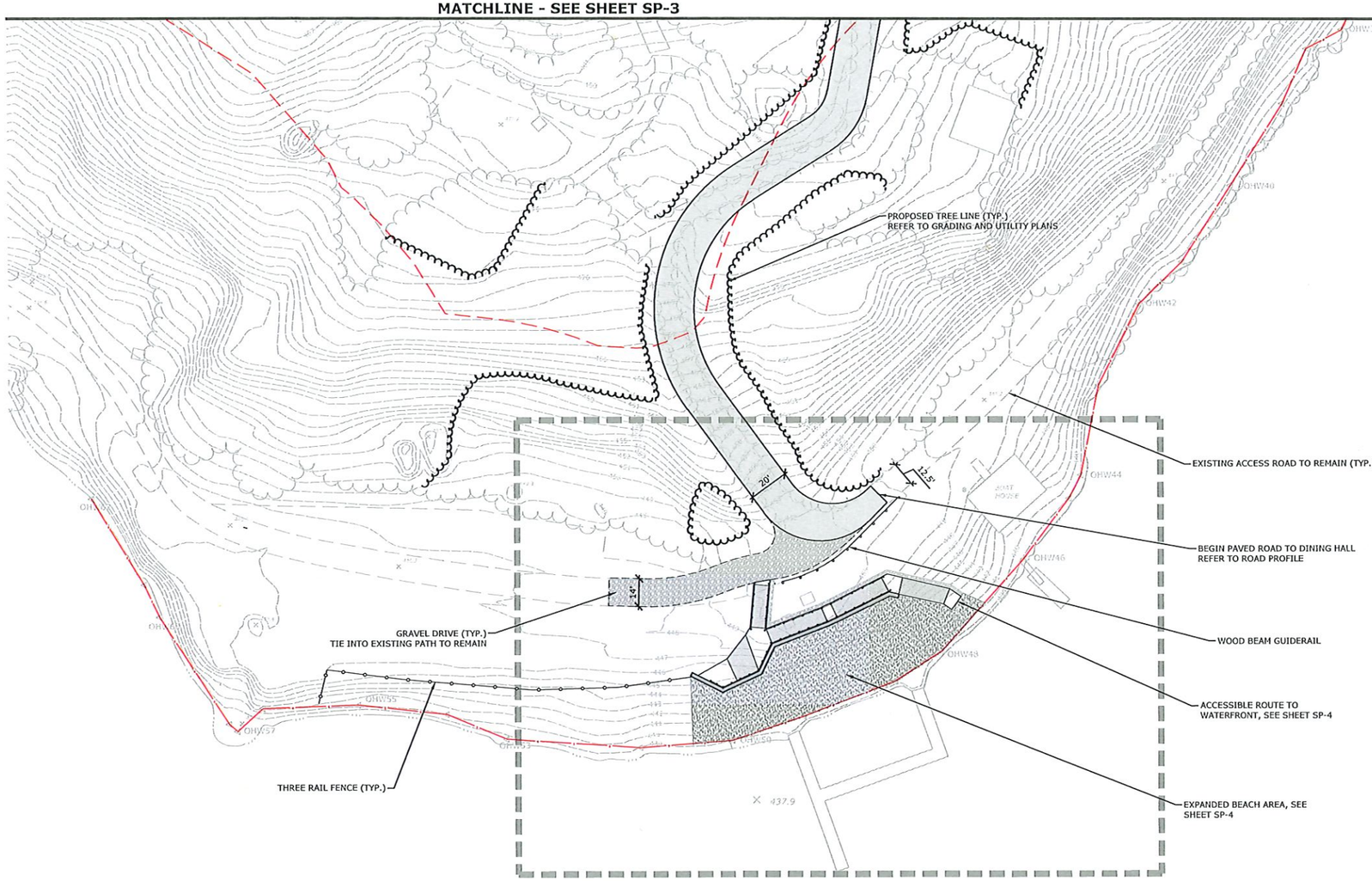
NOVEMBER 21, 2023
DATE

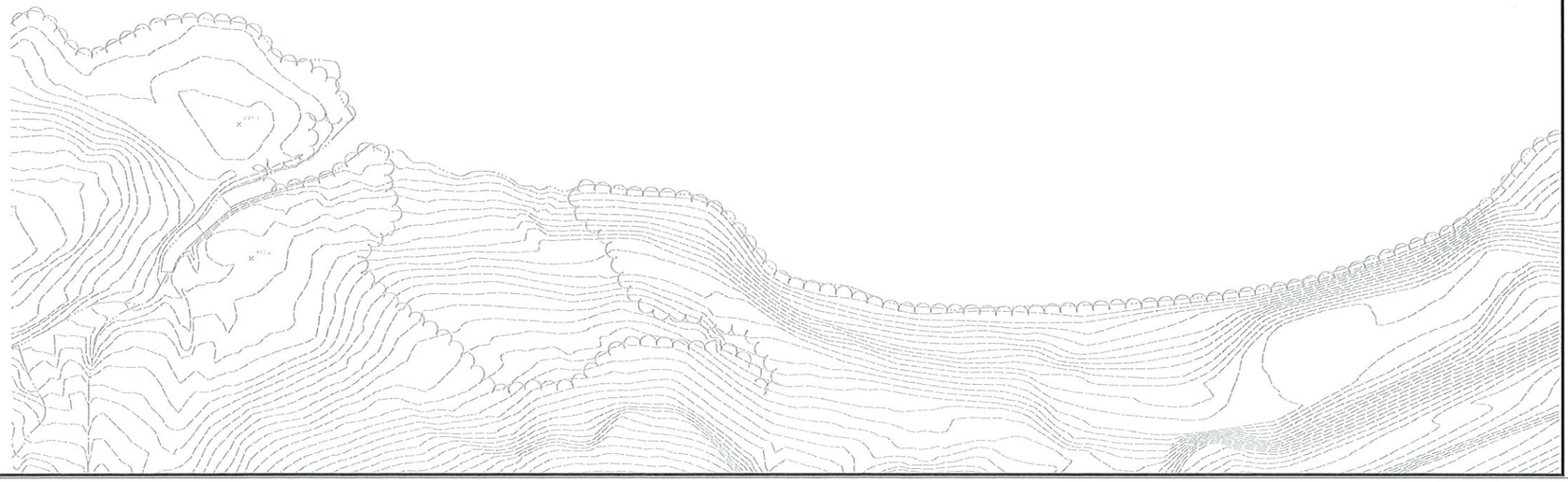
141.13280.00006
PROJECT NO.

06 OF 26
SHEET NO.

16 SP-1
SHEET NAME

MATCHLINE - SEE SHEET SP-3





SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

SITE PLAN - WATERFRONT

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

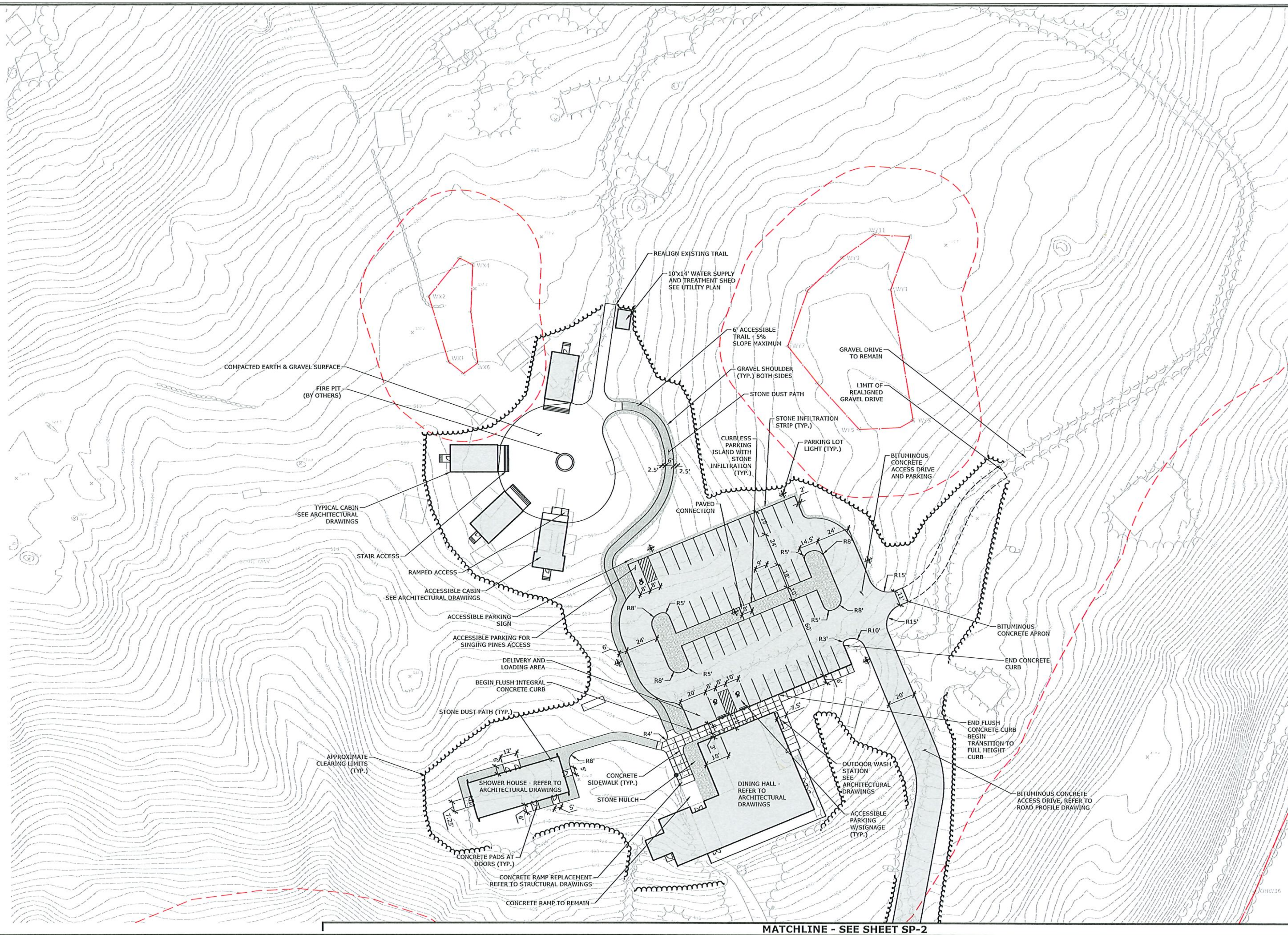
SCALE: 1"=30'

DATE: NOVEMBER 21, 2023

PROJECT NO.: 141.13280.00006

SHEET NO.: 07 OF 26

SHEET NAME: SP-2



REALIGN EXISTING TRAIL
10'x14' WATER SUPPLY AND TREATMENT SHED SEE UTILITY PLAN
6' ACCESSIBLE TRAIL - 5% SLOPE MAXIMUM
GRAVEL SHOULDER (TYP.) BOTH SIDES
STONE DUST PATH
COMPACTED EARTH & GRAVEL SURFACE
FIRE PIT (BY OTHERS)
GRAVEL DRIVE TO REMAIN
LIMIT OF REALIGNED GRAVEL DRIVE
STONE INFILTRATION STRIP (TYP.)
CURBLESS PARKING ISLAND WITH STONE INFILTRATION (TYP.)
PARKING LOT LIGHT (TYP.)
BITUMINOUS CONCRETE ACCESS DRIVE AND PARKING
PAVED CONNECTION
TYPICAL CABIN -SEE ARCHITECTURAL DRAWINGS
STAIR ACCESS
RAMPED ACCESS
ACCESSIBLE CABIN -SEE ARCHITECTURAL DRAWINGS
ACCESSIBLE PARKING SIGN
ACCESSIBLE PARKING FOR SINGING PINES ACCESS
DELIVERY AND LOADING AREA
BEGIN FLUSH INTEGRAL CONCRETE CURB
STONE DUST PATH (TYP.)
APPROXIMATE CLEARING LIMITS (TYP.)
SHOWER HOUSE - REFER TO ARCHITECTURAL DRAWINGS
CONCRETE SIDEWALK (TYP.)
STONE MULCH
DINING HALL - REFER TO ARCHITECTURAL DRAWINGS
CONCRETE PADS AT DOORS (TYP.)
CONCRETE RAMP REPLACEMENT REFER TO STRUCTURAL DRAWINGS
CONCRETE RAMP TO REMAIN
BITUMINOUS CONCRETE APRON
END CONCRETE CURB
END FLUSH CONCRETE CURB BEGIN TRANSITION TO FULL HEIGHT CURB
OUTDOOR WASH STATION SEE ARCHITECTURAL DRAWINGS
ACCESSIBLE PARKING W/SIGNAGE (TYP.)
BITUMINOUS CONCRETE ACCESS DRIVE, REFER TO ROAD PROFILE DRAWING
MATCHLINE - SEE SHEET SP-2

SITE PLAN - DINING HALL, SHOWERHOUSE, & CAMP UNIT

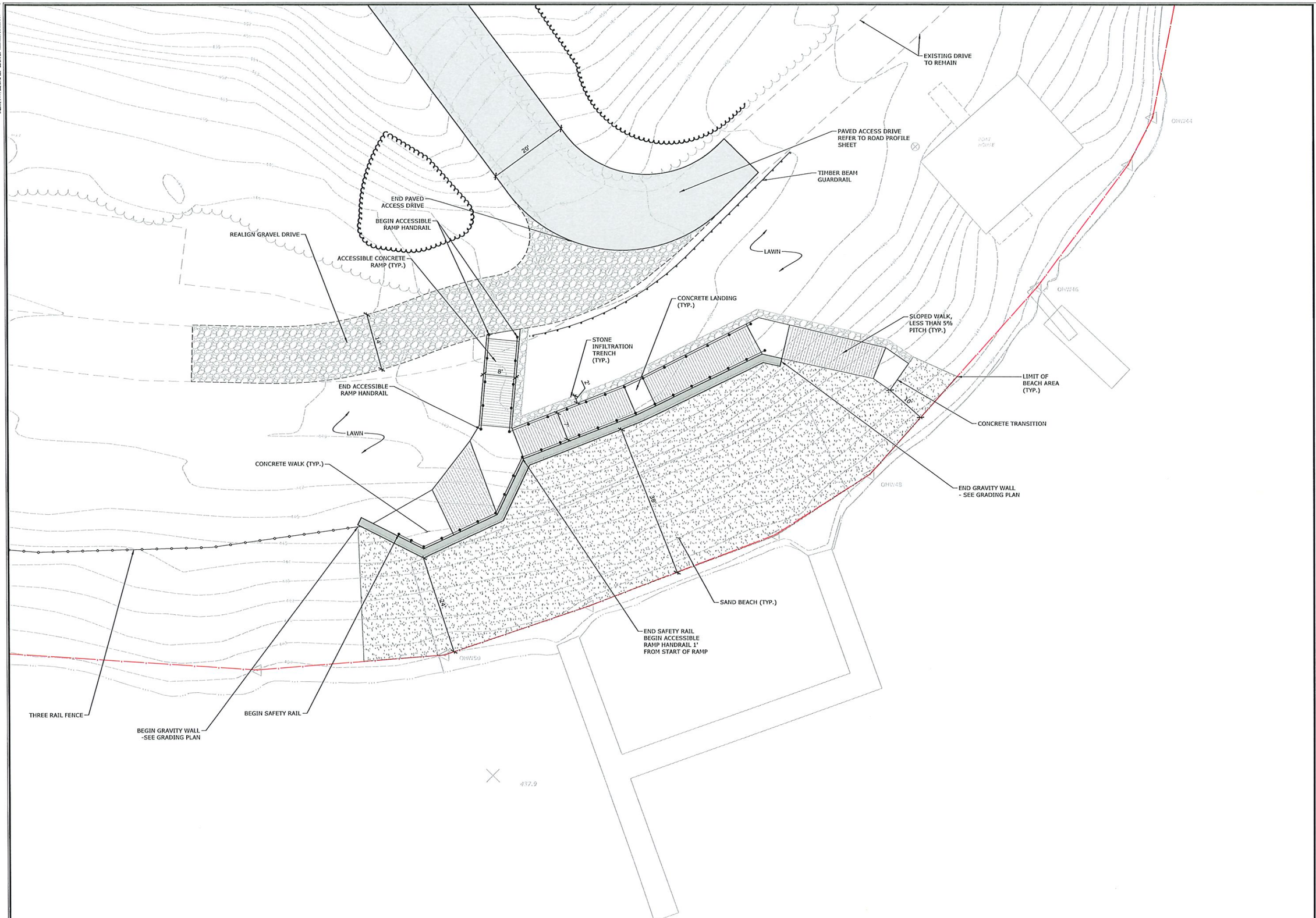
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

SCALE: 1"=30'
DATE: NOVEMBER 21, 2023
PROJECT NO. 141.13280.00006
SHEET NO. 08 OF 26
SHEET NAME: SP-3



SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION | DATE | BY

SITE PLAN - WATERFRONT ENLARGEMENT

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

SCALE: 1"=10'

DATE: NOVEMBER 21, 2023

PROJECT NO.: 141.13280.00006

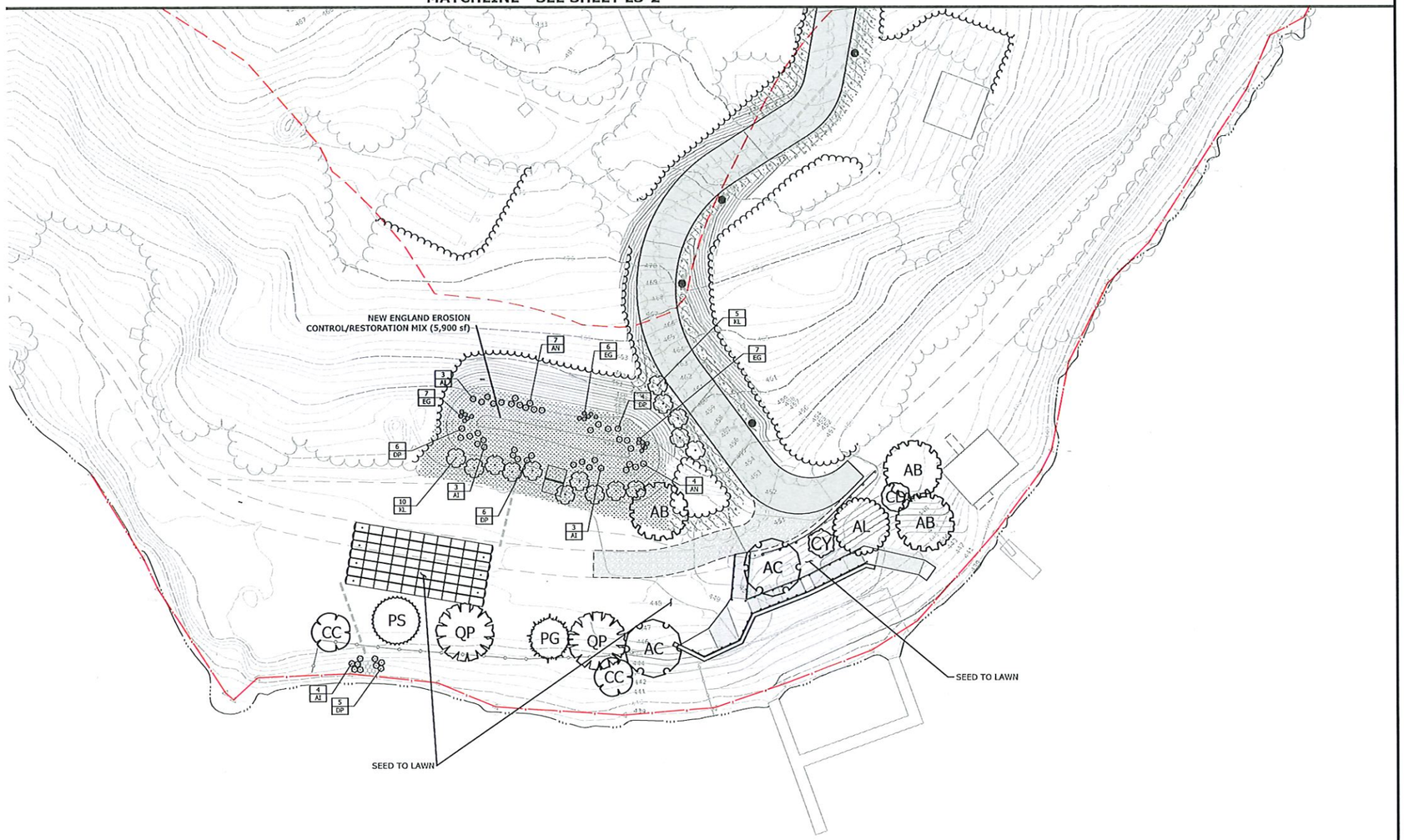
SHEET NO.: 09 OF 26

SHEET NAME: SP-4

PLANTING NOTES

1. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATING PLANT PITS.
2. SEED ALL DISTURBED AREAS TO LAWN UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL PROVIDE A 6" MINIMUM DEPTH OF SCREENED TOPSOIL, AS SPECIFIED, FOR ALL LAWN AREAS. AS NOTED ON THE DETAILS, SUBGRADE BENEATH PROPOSED LAWN AREAS SHALL BE LOOSENED OR SCARIFIED TO A MINIMUM DEPTH OF 24 INCHES.
3. ALL PLANTING BEDS SHALL HAVE 12" MINIMUM DEPTH OF TOPSOIL.
4. THE CONTRACTOR SHALL PROVIDE A 4" MIN. DEPTH OF SHREDDED BARK MULCH OVER ALL PLANTING BEDS AND TREE PLANTINGS. MULCHED PLANT BEDS SHALL EXTEND 12" FURTHER THAN THE ADJACENT PLANTINGS. NO DYED MULCH.
5. ALL PLANT MATERIAL IS SUBJECT TO INSPECTION AND APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO AND AFTER PLANTING.
6. PLANT SPECIES MAY BE ADJUSTED BASED ON AVAILABILITY AT TIME OF PLANTING. ALL PLANT MATERIAL SUBSTITUTIONS ARE SUBJECT TO REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT.
7. ALL PLANT MATERIALS SHALL CARRY A FULL GUARANTEE FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE, TO INCLUDE PROMPT TREATMENT OR REMOVAL AND REPLACEMENT OF ANY PLANTS FOUND TO BE IN AN UNHEALTHY CONDITION BY THE LANDSCAPE ARCHITECT. ALL REPLACEMENTS SHALL BE OF THE SAME KIND AND SIZE OF PLANTS SPECIFIED IN THE PLANT LIST.
8. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER PLANTING AND SHALL CONTINUE UNTIL ACCEPTANCE BY THE LANDSCAPE ARCHITECT AT THE END OF THE WARRANTY PERIOD. MAINTENANCE SHALL INCLUDE WATERING, MULCHING, TIGHTENING & REPLACING OF GUYS, REPLACEMENT OF SICK OR DEAD PLANTS, RESETTING PLANTS TO PROPER GRADE OR UPRIGHT (PLUMB) POSITION, RESTORATION OF SAUCERS, AND ALL OTHER CARE NEEDED FOR PROPER GROWTH OF THE PLANTS.
9. WHERE A SIZE RANGE IS SPECIFIED AT LEAST 50% OF PLANTS PROVIDED SHALL BE OF THE LARGER SIZE.
10. CONTRACTOR TO REMOVE TREE STAKES AFTER ONE GROWING SEASON.
11. TAKE NOTE TO PROTECT ROOT ZONES OF EXISTING TREES ROOT ZONES DURING CONSTRUCTION AS SHOWN ON PLANS.

MATCHLINE - SEE SHEET LS-2



PLANT SCHEDULE WATERFRONT

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONT.
PG	1	PICEA GLAUCA	WHITE SPRUCE	6` HT. MIN.	B&B
PS	1	PINUS STROBUS	WHITE PINE	6` HT. MIN.	B&B
ORNAMENTAL TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**CONT.**
CC	2	CERCIS CANADENSIS	EASTERN REDBUD	8`/10` HT.	B&B
CY	1	CERCIS CANADENSIS 'BURGUNDY HEARTS'	BURGUNDY HEARTS EASTERN REDBUD	8`/10` HT.	B&B
CD	1	CORNUS FLORIDA 'CHEROKEE CHIEF'	CHEROKEE CHIEF DOGWOOD	8`/10` HT.	B&B
SHADE TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**CONT.**
AB	3	ACER RUBRUM 'BRANDYWINE'	BRANDYWINE RED MAPLE	2.5"-3.0" CAL.	B&B
AL	1	ACER SACCHARUM 'LEGACY'	LEGACY SUGAR MAPLE	2.5"-3.0" CAL.	B&B
AC	2	ABSCULUS X CARNEA 'BRIOTII'	BRIOTII RED HORSECHESTNUT	2.5"-3.0" CAL.	B&B
QP	2	QUERCUS PALUSTRIS	PIN OAK	2.5"-3.0" CAL.	B&B
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**CONT.**
KL	15	KALMIA LATIFOLIA	MOUNTAIN LAUREL	CONT.	#3
PERENNIALS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE**	**CONT.**
AI	17	ASCLEPIAS INCARNATA	SWAMP MILKWEED	CONT.	#1
AN	11	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	CONT.	#1
DP	21	DENNSTAEDTIA PUNCTILOBULA	HAYSCENTED FERN	CONT.	#1
EG	20	EUTHAMIA GRAMINIFOLIA	GRASS-LEAFED GOLDENROD	CONT.	#1

NEW ENGLAND EROSION CONTROL/RESTORATION MIX 4,161 SF
PRODUCED BY NEW ENGLAND WETLAND PLANTS
14 PEARL LANE
SOUTH HADLEY, MA 01075
(413)-548-8000

ALL DISTURBED AREAS DESIGNATED AS LAWN SHALL BE SEEDED WITH 5311 CONSERVATION MIX BY ERNST CONSERVATION SEEDS

SLR
91 HEALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION | DATE | BY

LANDSCAPING - WATERFRONT
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

SCALE: 1"=30'
DATE: NOVEMBER 21, 2023
PROJECT NO.: 141.13280.00006
SHEET NO.: 10 OF 26
SHEET NAME: LS-1

PLANT SCHEDULE DINING HALL

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONT.
PG	2	PICEA GLAUCA	WHITE SPRUCE	6` HT. MIN.	B&B
PS	2	PINUS STROBUS	WHITE PINE	6` HT. MIN.	B&B

ORNAMENTAL TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONT.
CC	4	CERCIS CANADENSIS	EASTERN REDBUD	8`/10` HT.	B&B
CY	2	CERCIS CANADENSIS 'BURGUNDY HEARTS'	BURGUNDY HEARTS EASTERN REDBUD	8`/10` HT.	B&B
CD	1	CORNUS FLORIDA 'CHEROKEE CHIEF'	CHEROKEE CHIEF DOGWOOD	8`/10` HT.	B&B

SHADE TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONT.
AA	4	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	2.5"-3.0" CAL.	B&B
AB	4	ACER RUBRUM 'BRANDYWINE'	BRANDYWINE RED MAPLE	2.5"-3.0" CAL.	B&B
AL	2	ACER SACCHARUM 'LEGACY'	LEGACY SUGAR MAPLE	2.5"-3.0" CAL.	B&B
AC	2	AESCULUS X CARNEA 'BRIOTII'	BRIOTII RED HORSECHESTNUT	2.5"-3.0" CAL.	B&B
QP	3	QUERCUS PALUSTRIS	PIN OAK	2.5"-3.0" CAL.	B&B
UP	5	ULMUS AMERICANA 'PRINCETON'	PRINCETON AMERICAN ELM	2.5"-3.0" CAL.	B&B

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONT.
IS	6	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY HOLLY	CONT.	#3
KL	5	KALMIA LATIFOLIA	MOUNTAIN LAUREL	CONT.	#3
RM	17	RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON	CONT.	#3
VH	3	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	CONT.	#3
VN	20	VIBURNUM NUDUM 'WINTERTHUR'	WINTERTHUR VIBURNUM	CONT.	#3

RIGHT-OF-WAY NATIVE WOODS MIX W/ANNUAL RYEGRASS — 48,072 SF
PRODUCED BY ERNST CONSERVATION SEED
8884 MERCER PIKE
MEADVILLE, PA 16335
(800)-873-3321

SEE SHEET LP-1 FOR PLANTING NOTES

RIGHT-OF-WAY NATIVE WOODS MIX W/ANNUAL RYEGRASS (48,072 sf)

MATCHLINE - SEE SHEET LS-1

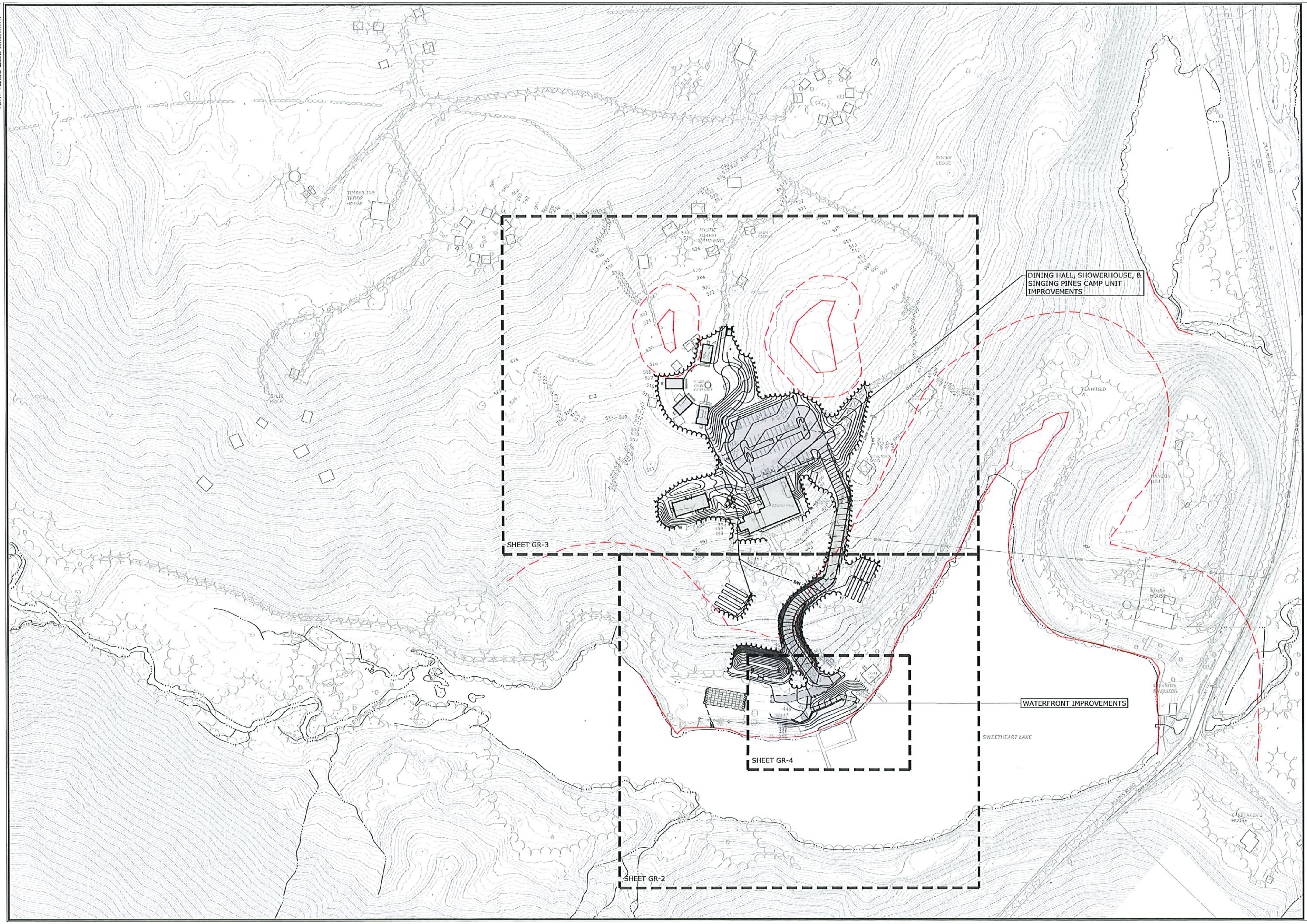
SLR
16 BRADLEY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION | DATE | BY

LANDSCAPING - DINING HALL, SHOWERHOUSE, & CAMP UNIT
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

DESIGNED	DRAWN	CHECKED
MTD	PJP	MTD

SCALE: 1"=30'
DATE: NOVEMBER 21, 2023
PROJECT NO: 141.13280.00006
SHEET NO: 11 OF 26
SHEET NAME: 21LS-2



SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

GRADING OVERALL

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

DESIGNED	DRAWN	CHECKED
MTD	PJP	MTD

SCALE: 1"=60'

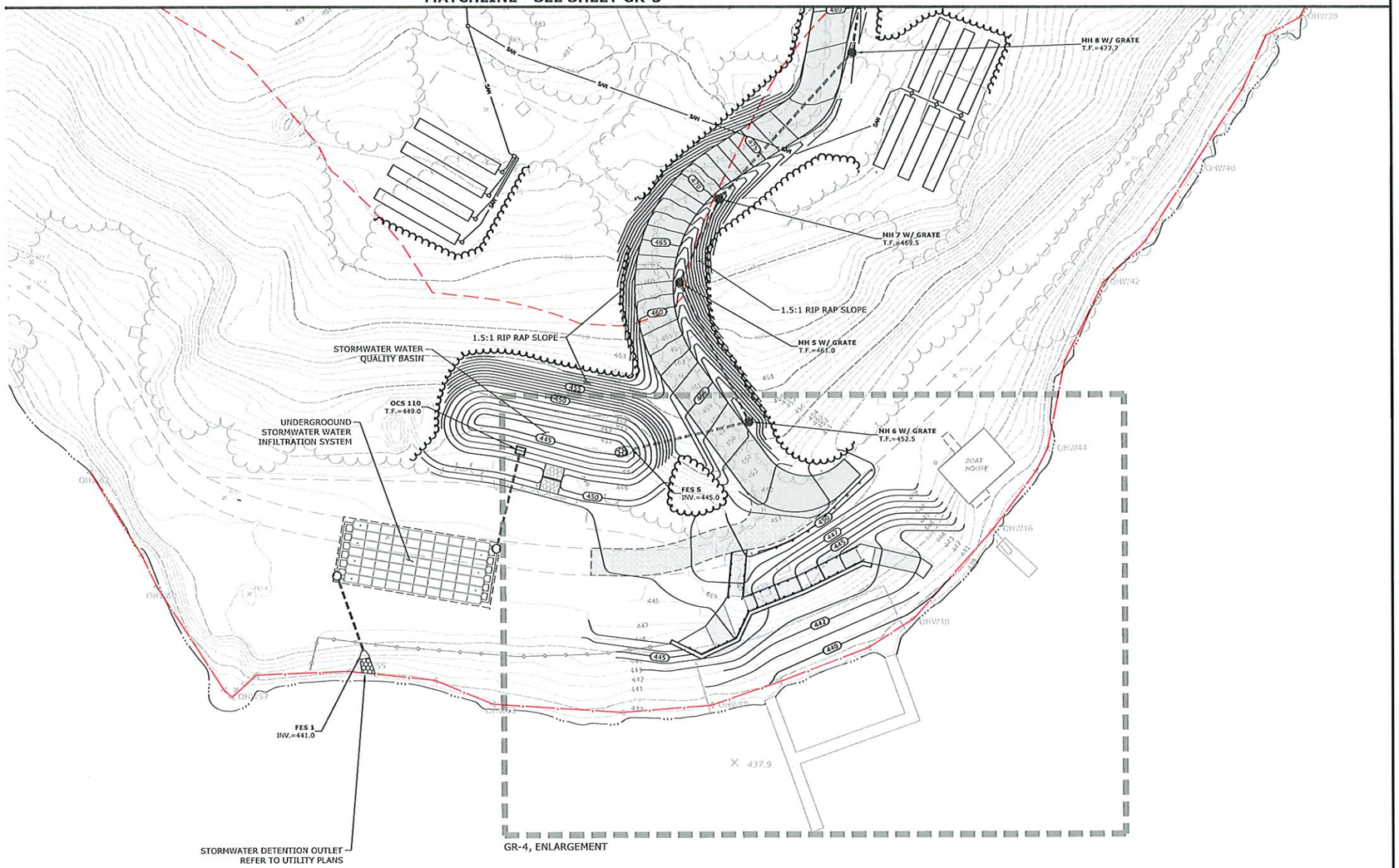
DATE: NOVEMBER 21, 2023

PROJECT NO.: 141.13280.00006

SHEET NO: 12 OF 26

SHEET NAME: GR-1

MATCHLINE - SEE SHEET GR-3



SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

GRADING, UTILITIES AND SEDIMENT AND EROSION COINTROLS
WATERFRONT
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

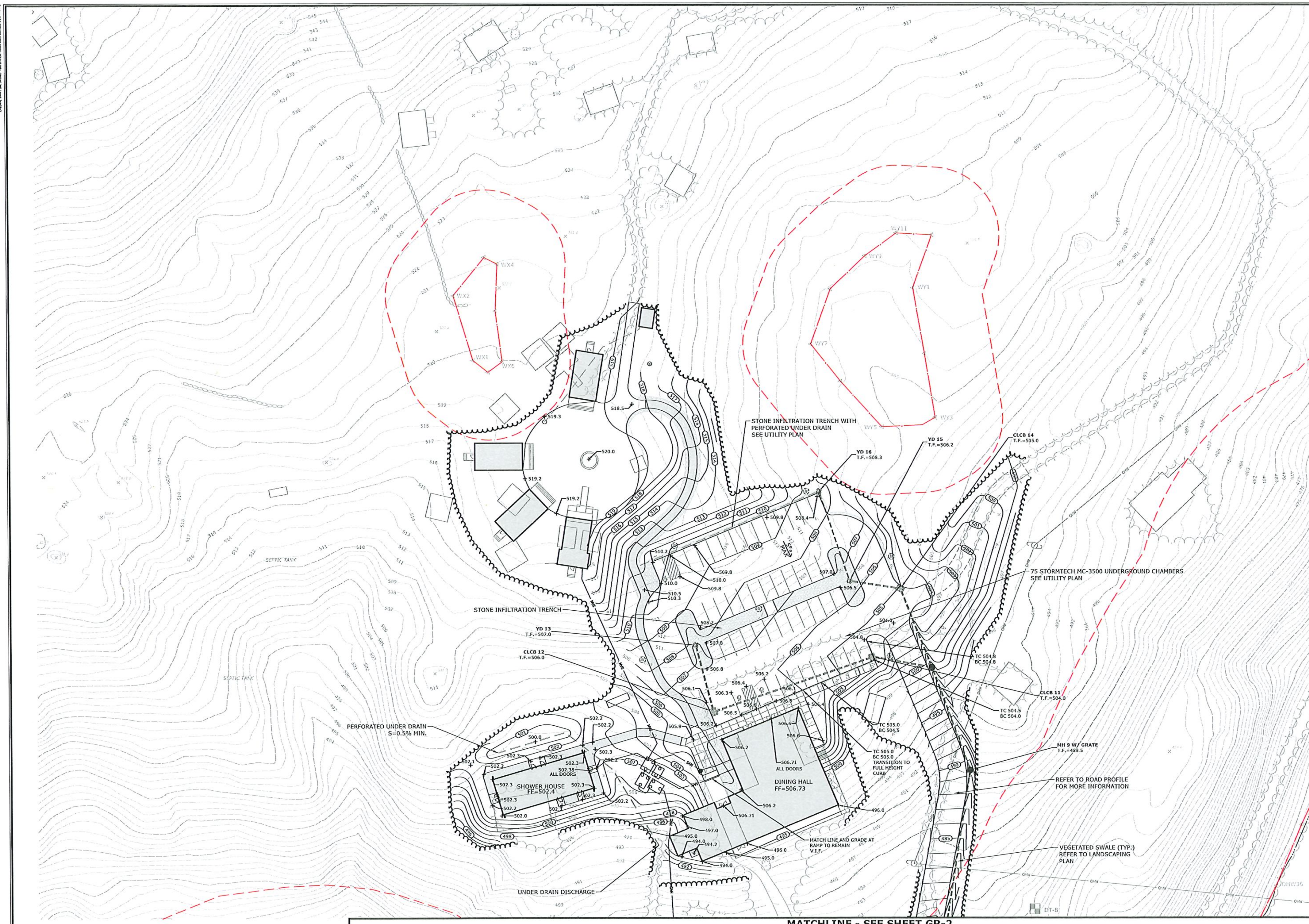
SCALE: 1"=30'

DATE: NOVEMBER 21, 2023

PROJECT NO.: 141.13280.00006

SHEET NO.: 13 OF 26

SHEET NAME: GR-2



SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

GRADING - DINING HALL, SHOWERHOUSE, & CAMP UNIT

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

DESIGNED	DRAWN	CHECKED
MTD	PJP	MTD

SCALE: 1"=30'

DATE: NOVEMBER 21, 2023

PROJECT NO.: 141.13280.00006

SHEET NO.: 14 OF 26

SHEET NAME: GR-3

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

GRADING - WATERFRONT ENLARGEMENT

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

SCALE 1"=10'

DATE NOVEMBER 21, 2023

PROJECT NO. 141.13280.00006

SHEET NO. 15 OF 26

25

SHEET NAME **GR-4**

BACKWASH DISCHARGE TO DRY WELL
SIZE AND TYPE TO BE CONFIRMED

10'x14' WATER SUPPLY AND
TREATMENT BUILDING
PROVIDE ELECTRICAL FEED

1-1/2" DINING HALL DISTRIBUTION LINE
SIZE AND TYPE TO BE CONFIRMED

WELL SUPPLY LINE
SIZE AND TYPE TO BE CONFIRMED

75'

25'

DRY WELL
75' MINIMUM FROM WELL

POTENTIAL WELL LOCATION
TO BE CONFIRMED WITH
TESTING

STONE INFILTRATION TRENCH WITH PERFORATED UNDER DRAIN
S=0.5% MIN.

SITE LIGHT, TYPICAL OF 6
SEE MEP DRAWINGS

YD 16
T.F.=503.3
INV.=505.8(S)

ACCESSIBLE CABIN DISTRIBUTION LINE
(NON-WINTERIZED)
CONNECT TO EXISTING PIPING SYSTEM
VERIFY IN FIELD

65'-8" HDPE
S=3.18%

YD 15
T.F.=506.2
INV.=503.7(N)
INV.=503.2(E)

CLCB 14
T.F.=508.0
INV.=501.5(S)
INV.=502.0(W)

59'-12" HDPE
S=10.17%

34'-12" HDPE
S=3.53%

4" SCH 40 PVC FROM
BUILDINGS TO TANKS
(TYPICAL OF 4)

(1) 1,000 GAL.
PROPANE TANK
SEE MEP PLANS

SHOWERHOUSE DISTRIBUTION LINE
(NON-WINTERIZED)
CONNECT TO EXISTING PIPING SYSTEM
VERIFY IN FIELD

YD 13
T.F.=507.0
INV.=504.0(S)

41'-12" HDPE
S=9.76%

MH 10 W/ GRATE
T.F.=499.4
INV.=495.5(W)
INV.=493.2(S)
INV.=495.5(N)

PERFORATED UNDER DRAIN
S=0.5% MIN.

CLCB 11
T.F.=504.0
INV.=501.0(W)
INV.=499.5(E)

CLCB 12
T.F.=506.0
INV.=503.0(E)
INV.=503.0(N)

122'-12" HDPE
S=1.64%

MH 9 W/ GRATE
T.F.=488.5
INV.=485.5(N)
INV.=483.5(S)

(3) 2500 GAL PRECAST
SEPTIC TANKS (3 TOTAL)

(1) 1000 GAL PRECAST
GREASE INTERCEPTOR
TANK

FIRE TANK DISTRIBUTION LINE
SIZE AND TYPE TO BE CONFIRMED

UNDER DRAIN DISCHARGE

133'-12" HDPE
S=6.62%

NOTE:
EXISTING UTILITIES SHOWN ARE
GRAPHIC IN NATURE ONLY

MATCH LINE: SEE UT-2

MATCH LINE: SEE UT-2

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

SITE PLAN - UTILITIES

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

SMM	SMM	TDR
DESIGNED	DRAWN	CHECKED

1"=20'
SCALE

NOVEMBER 21, 2023
DATE

141.13280.00006
PROJECT NO.

16 OF 26
SHEET NO.

26 UT-1
SHEET NAME

MATCH LINE: SEE UT-1

MATCH LINE: SEE UT-1

4" SDR 35 PVC

DISTRIBUTION BOX (TYP.)

SEPTIC FIELD

DT-1

DT-2

DT-3

DT-4

DT-7

DT-8

DT-9

DT-10

192 L.F. OF CURTECH CTL 48
LEACHING GALLERIES

1:1 RIP RAP SLOPE

1.5:1 RIP RAP SLOPE

STORMWATER WATER
MANAGEMENT BASIN 110
BOTTOM ELEV.=445.0
TOP OF BERM ELEV.=450.3

99'-12" HDPE
S=8.28%

MH 8 W/ GRATE
T.F.=477.7
INV.=474.7(N)
INV.=474.7(SW)

MH 7 W/ GRATE
T.F.=469.5
INV.=466.5(NE)
INV.=462.9(SW)

47'-12" HDPE
S=10.00%

MH 5 W/ GRATE
T.F.=461.0
INV.=457.0(SE)
INV.=458.2(NE)

78'-12" HDPE
S=10.00%

MH 6 W/ GRATE
T.F.=452.5
INV.=449.2(NW)
INV.=442.5(W)

83'-12" HDPE
S=1.16%

FES 3
INV.=445.0

240 L.F. OF CURTECH CTL 48
LEACHING GALLERIES

OCS 110
T.F.=449.0
INV.=446.6(S)

49'-12" HDPE
S=9.39%

MH 2
T.F.=446.4
INV.=443.0(S)

MH 3
T.F.=447.0
INV.=442.0(N)

RIPRAP EMERGENCY
SPILLWAY

PREFORMED SCOUR HOLE

40'-12" HDPE
S=5.00%

FES 1
T.F.=442.1
INV.=441.0(N)

RIPRAP SPLASH PAD

UNDERGROUND DETENTION SYSTEM 111
STORMTECH SC-740 OR APPROVED EQUAL
7 ROWS OF 10 CHAMBERS; 70 CHAMBERS TOTAL
TOP OF STONE ELEV.=445.0
TOP OF CHAMBER ELEV.=444.5
BOTTOM OF CHAMBER ELEV.=442.0
BOTTOM OF STONE ELEV.=441.5

OHW62

OHW60

OHW57

OHW53

OHW50

OHW48

OHW44

OHW42

OHW40

BOAT HOUSE

437.9

480 475 470 465 460 455 450 445 447 442 440

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DESCRIPTION	DATE	BY

SITE PLAN - UTILITIES

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

SMM	SMM	TDR
DESIGNED	DRAWN	CHECKED

SCALE: 1"=20'

DATE: NOVEMBER 21, 2023

PROJECT NO.: 141.13280.00006

SHEET NO.: 17 OF 26

SHEET NAME: UT-2

SOIL EROSION AND SEDIMENT CONTROL NARRATIVE

SEDIMENT AND EROSION CONTROL MEASURES AS DEPICTED ON THESE PLANS AND DESCRIBED WITHIN THE SEDIMENT AND EROSION CONTROL NARRATIVE SHALL BE IMPLEMENTED AND MAINTAINED UNTIL PERMANENT COVER AND STABILIZATION IS ESTABLISHED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL CONFORM TO THE "GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CONNECTICUT - 2002, TOWN OF TOLLAND REQUIREMENTS, AND IN ALL CASES BEST MANAGEMENT PRACTICES SHALL PREVAIL.

1 PURPOSE AND DESCRIPTION OF PROJECT
A.) VARIOUS IMPROVEMENTS TO CAMP YANKEE WHICH INCLUDE PARKING LOT/ROAD CONSTRUCTION AND UTILITY UPGRADES
B.) DISTURBED AREA: ±3.0 AC

2 IDENTIFICATION OF EROSION AND SEDIMENT CONTROL CONCERNS
A.) CUTS AND FILLS ASSOCIATED WITH CONSTRUCTION
B.) PROTECTION OF ONSITE DRAINAGE SYSTEMS
C.) PROTECTION OF ONSITE WETLANDS & WATERCOURSES

3 IDENTIFICATION OF OTHER POSSIBLE PERMITS
THE PERMITS REQUIRED FOR THE PROJECT ARE LOCAL PLANNING AND ZONING PERMITS.

EROSION CONTROL LEGEND

HB	HAY BALES
SFF	SEDIMENT FILTER FENCE
IP	INLET PROTECTION
STK	SOIL STOCKPILE AREA
WB	WATER BAR

SFF (TYP.)
HB (TYP.)
STK
IP (TYP.)
IP (TYP.)
WB (TYP.)

MATCH LINE: SEE SE-2

MATCH LINE: SEE SE-2

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SEDIMENT & EROSION CONTROLS

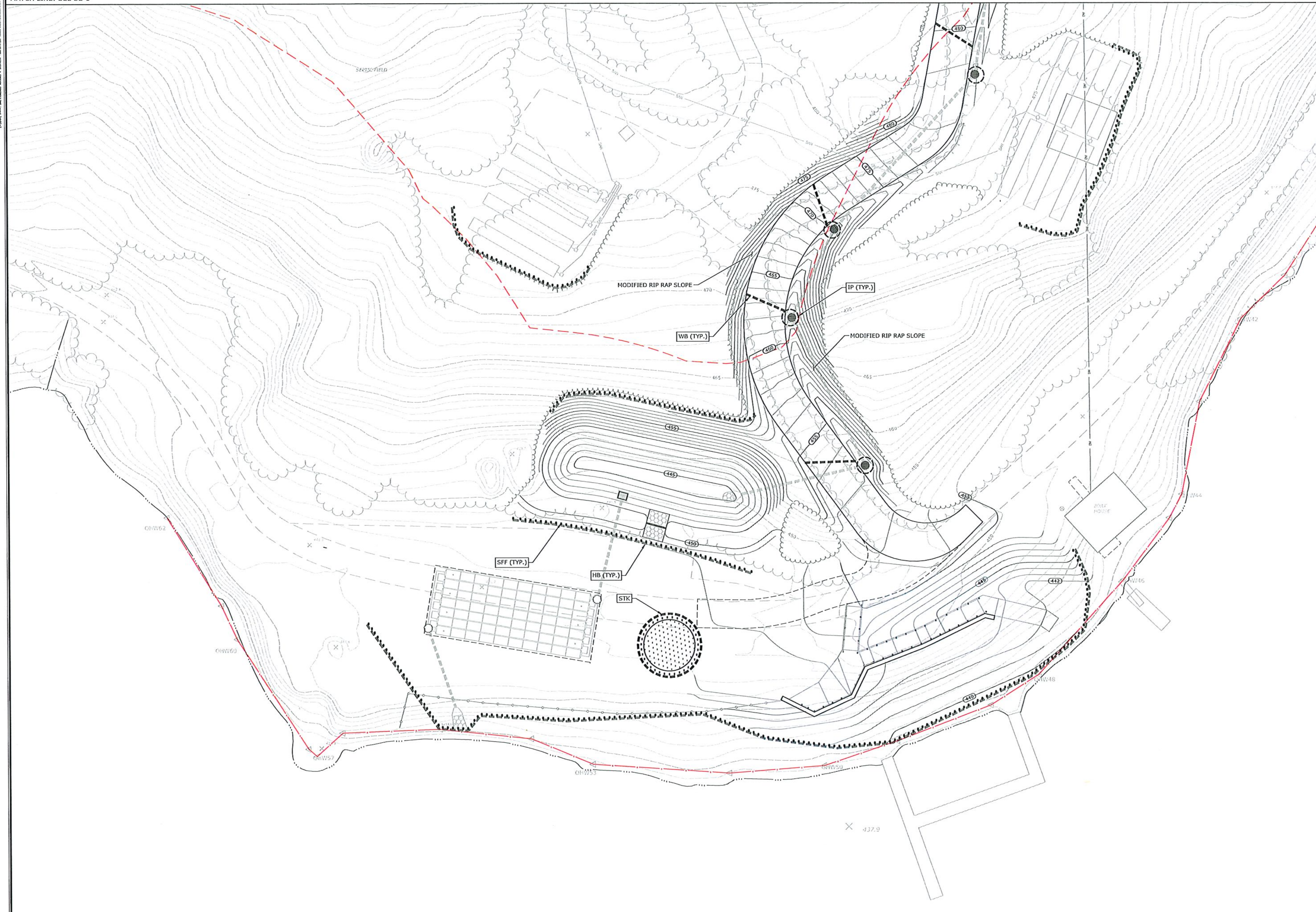
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

SMM	SMM	TDR
DESIGNED	DRAWN	CHECKED

SCALE: 1"=20'
DATE: NOVEMBER 21, 2023
PROJECT NO.: 141.13280.00006
SHEET NO.: 18 OF 26
SHEET NAME: SE-1

MATCH LINE: SEE SE-1

MATCH LINE: SEE SE-1



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DESCRIPTION	DATE	BY

SEDIMENT & EROSION CONTROLS

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

SMM	SMM	TDR
DESIGNED	DRAWN	CHECKED

SCALE 1"=20'

DATE NOVEMBER 21, 2023

PROJECT NO. 141.13280.00006

SHEET NO. 19 OF 26

SHEET NAME SE-2

SEDIMENT & EROSION CONTROL SPECIFICATIONS

GENERAL:

THESE GUIDELINES SHALL APPLY TO ALL WORK CONSISTING OF ANY AND ALL TEMPORARY AND/OR PERMANENT MEASURES TO CONTROL WATER POLLUTION AND SOIL EROSION, AS MAY BE REQUIRED, DURING THE CONSTRUCTION OF THE PROJECT.

IN GENERAL, ALL CONSTRUCTION ACTIVITIES SHALL PROCEED IN SUCH A MANNER SO AS NOT TO POLLUTE ANY WETLANDS, WATERCOURSE, WATERBODY, AND CONDUIT CARRYING WATER, ETC. THE CONTRACTOR SHALL LIMIT, INSOFAR AS POSSIBLE, THE SURFACE AREA OF EARTH MATERIALS EXPOSED BY CONSTRUCTION METHODS AND IMMEDIATELY PROVIDE PERMANENT AND TEMPORARY POLLUTION CONTROL MEASURES TO PREVENT CONTAMINATION OF ADJACENT WETLANDS, WATERCOURSES, AND WATER BODIES, AND TO PREVENT, INSOFAR AS POSSIBLE, EROSION ON THE SITE.

LAND GRADING

GENERAL:

1. THE RESHAPING OF THE GROUND SURFACE BY EXCAVATION AND FILLING OR A COMBINATION OF BOTH, TO OBTAIN PLANNED GRADES, SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:

   a. THE CUT FACE OF EARTH EXCAVATION SHALL NOT BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1).

   b. THE PERMANENT EXPOSED FACES OF FILLS SHALL NOT BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1).

   c. THE CUT FACE OF ROCK EXCAVATION SHALL NOT BE STEEPER THAN ONE HORIZONTAL TO FOUR VERTICAL (1:4).

   d. PROVISION SHOULD BE MADE TO CONDUCT SURFACE WATER SAFELY TO STORM DRAINS TO PREVENT SURFACE RUNOFF FROM DAMAGING CUT FACES AND FILL SLOPES

   e. EXCAVATIONS SHOULD NOT BE MADE SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTY WITHOUT PROTECTING SUCH PROPERTY FROM EROSION, SLIDING, SETTLING, OR CRACKING.

   f. NO FILL SHOULD BE PLACED WHERE IT WILL SLIDE OR WASH UPON THE PREMISES OF ANOTHER OWNER OR UPON ADJACENT WETLANDS, WATERCOURSES, OR WATER BODIES.

   g. PRIOR TO ANY RE-GRADING, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED AT THE ENTRANCE TO THE WORK AREA IN ORDER TO REDUCE MUD AND OTHER SEDIMENTS FROM LEAVING THE SITE.

TOPSOILING

GENERAL:

1. TOPSOIL SHALL BE SPREAD OVER ALL EXPOSED AREAS IN ORDER TO PROVIDE A SOIL MEDIUM HAVING FAVORABLE CHARACTERISTICS FOR THE ESTABLISHMENT, GROWTH, AND MAINTENANCE OF VEGETATION.
2. UPON ATTAINING FINAL SUBGRADES, SCARIFY SURFACE TO PROVIDE A GOOD BOND WITH TOPSOIL.
3. REMOVE ALL LARGE STONES, TREE LIMBS, ROOTS AND CONSTRUCTION DEBRIS.

APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS

MATERIAL:

1. TOPSOIL SHOULD HAVE PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS FAVORABLE TO THE GROWTH OF PLANTS.
2. TOPSOIL SHOULD HAVE A SANDY OR LOAMY TEXTURE.
3. TOPSOIL SHOULD BE RELATIVELY FREE OF SUBSOIL MATERIAL AND MUST BE FREE OF STONES (OVER 1" IN DIAMETER), LUMPS OF SOIL, ROOTS, TREE LIMBS, TRASH, OR CONSTRUCTION DEBRIS. IT SHOULD BE FREE OF ROOTS OR RHIZOMES SUCH AS THISTLE, NUTGRASS, AND QUACKGRASS.
4. AN ORGANIC MATTER CONTENT OF SIX PERCENT (6%) IS REQUIRED. AVOID LIGHT COLORED SUBSOIL MATERIAL.
5. SOLUBLE SALT CONTENT OF OVER 500 PARTS PER MILLION (PPM) IS LESS SUITABLE. AVOID TIDAL MARSH SOILS BECAUSE OF HIGH SALT CONTENT AND SULFUR ACIDITY.
6. THE pH SHOULD BE MORE THAN 6.0. IF LESS, ADD LIME TO INCREASE pH TO AN ACCEPTABLE LEVEL.

APPLICATION

AVOID SPREADING WHEN TOPSOIL IS WET OR FROZEN.

SPREAD TOPSOIL UNIFORMLY TO A DEPTH OF AT LEAST SIX INCHES (6"), OR TO THE DEPTH SHOWN ON THE PLANS, DETAILS AND SPECIFICATIONS.

TEMPORARY VEGETATIVE COVER

GENERAL:

1. TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED ON ALL UNPROTECTED AREAS THAT PRODUCE SEDIMENT, AREAS WHERE FINAL GRADING HAS BEEN COMPLETED, AND AREAS WHERE THE ESTIMATED PERIOD OF BARE SOIL EXPOSURE IS LESS THAN 12 MONTHS. TEMPORARY VEGETATIVE COVER SHALL BE APPLIED IF AREAS WILL NOT BE PERMANENTLY SEEDED BY SEPTEMBER 1.

SITE PREPARATION:

1. INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.
2. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.
3. APPLY DOLOMITIC LIMESTONE ACCORDING TO SOIL TEST RECOMMENDATIONS
4. APPLY FERTILIZER ACCORDING TO SOIL TEST OR AT THE RATE OF 300 LBS. OF 10-10-10 FER ACRE (7 LBS. PER 1,000 SQ. FT.) AND SECOND APPLICATION OF 200 LBS. OF 10-10-10- (5 LBS. PER 1,000 SQ. FT.) WHEN GRASS IS FOUR INCHES (4") TO SIX INCHES (6") HIGH. APPLY ONLY WHEN GRASS IS DRY.
5. UNLESS HYDROSEEDED, WORK IN LIME AND FERTILIZER TO A DEPTH OF FOUR (4") INCHES USING A DISK OR ANY SUITABLE EQUIPMENT.
6. TILLAGE SHOULD ACHIEVE A REASONABLY UNIFORM LOOSE SEEDBED. WORK ON CONTOUR IF SITE IS SLOPING.

ESTABLISHMENT:

1. SELECT APPROPRIATE SPECIES FOR THE SITUATION. NOTE RATES AND SEEDING DATES (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW). 2. APPLY SEED UNIFORMLY ACCORDING TO THE RATE INDICATED BY BROADCASTING, DRILLING, OR HYDRAULIC APPLICATION. 3. UNLESS HYDROSEEDED, COVER RYEGRASS SEEDS WITH NOT MORE THAN 1/4 INCH OF SOIL USING SUITABLE EQUIPMENT. 4. MULCH IMMEDIATELY AFTER SEEDING IF REQUIRED. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW.) APPLY STRAW OR HAY MULCH AND ANCHOR TO SLOPES GREATER THAN 3% OR WHERE CONCENTRATED FLOW WILL OCCUR.

PERMANENT VEGETATIVE COVER

GENERAL:

1. PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED AS VARIOUS SECTIONS OF THE PROJECT ARE COMPLETED IN ORDER TO STABILIZE THE SOIL, REDUCE DOWNSTREAM DAMAGE FROM SEDIMENT AND RUNOFF, AND TO ENHANCE THE AESTHETIC NATURE OF THE SITE. IT WILL BE APPLIED TO ALL CONSTRUCTION AREAS SUBJECT TO EROSION WHERE FINAL GRADING HAS BEEN COMPLETED AND A PERMANENT COVER IS NEEDED.

SITE PREPARATION:

2. INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.
3. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.
4. PERFORM ALL PLANTING OPERATIONS PARALLEL TO THE CONTOURS OF THE SLOPE.
5. APPLY TOPSOIL AS INDICATED ELSEWHERE HEREIN.
6. APPLY FERTILIZER ACCORDING TO SOIL TEST OR:

SPREAD SEEDING: WORK DEEPLY IN SOIL, BEFORE SEEDING, 300 LBS. OF 10-10-10 FERTILIZER PER ACRE (7 LBS. PER 1,000 SQ. FT.); THEN SIX (6) TO EIGHT (8) WEEKS LATER, APPLY ON THE SURFACE AN ADDITIONAL 300 LBS. OF 10-10-10 FERTILIZER PER ACRE. AFTER SEPTEMBER 1, TEMPORARY VEGETATIVE COVER SHALL BE APPLIED.

FALL SEEDING: WORK DEEPLY IN SOIL, BEFORE SEEDING, 600 LBS. OF 10-10-10 FERTILIZER PER ACRE (14 LBS. PER 1,000 SQ. FT.).

VEGETATIVE COVER SELECTION & MULCHING

TEMPORARY VEGETATIVE COVER:

PERENNIAL RYEGRASS 3 LBS./1,000 SQ.FT.
(LOLIUM PERENNE)

PERMANENT VEGETATIVE COVER:

AS SPECIFIED

TEMPORARY MULCHING:

STRAY OR HAY 70-90 LBS./1,000 SQ.FT.
(TEMPORARY VEGETATIVE AREAS)

WOOD FIBER IN HYDROMULCH SLURRY 25-50 LBS./1,000 SQ. FT.

ESTABLISHMENT:

1. SMOOTH AND FIRM SEEDBED WITH CULTIPACKER OR OTHER SIMILAR EQUIPMENT PRIOR TO SEEDING (EXCEPT WHEN HYDROSEEDING).
2. SELECT ADAPTED SEED MIXTURE FOR THE SPECIFIC SITUATION. NOTE RATES AND THE SEEDING DATES (SEE VEGETATIVE COVER SELECTION & MULCHING SPEC. BELOW).
3. APPLY SEED UNIFORMLY ACCORDING TO RATE INDICATED, BY BROADCASTING, DRILLING, OR HYDRAULIC APPLICATION.
4. COVER GRASS AND LEGUME SEED WITH NOT MORE THAN 1/4 INCH OF SOIL WITH SUITABLE EQUIPMENT (EXCEPT WHEN HYDROSEEDING).
5. MULCH IMMEDIATELY AFTER SEEDING, IF REQUIRED, ACCORDING TO TEMPORARY MULCHING SPECIFICATIONS. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW).
6. USE PROPER INOCULANT ON ALL LEGUME SEEDINGS, USE FOUR (4) TIMES NORMAL RATES WHEN HYDROSEEDING.
7. USE SOD WHERE THERE IS A HEAVY CONCENTRATION OF WATER AND IN CRITICAL AREAS WHERE IT IS IMPORTANT TO GET A QUICK VEGETATIVE COVER TO PREVENT EROSION.

MAINTENANCE:

1. TEST FOR SOIL ACIDITY EVERY THREE (3) YEARS AND LIME AS REQUIRED.
2. ON SITES WHERE GRASSES PREDOMINATE, BROADCAST ANNUALLY 500 POUNDS OF 10-10-10 FERTILIZER PER ACRE (12 LBS. PER 1,000 SQ. FT.) OR AS NEEDED ACCORDING TO ANNUAL SOIL TESTS.
3. ON SITES WHERE LEGUMES PREDOMINATE, BROADCAST EVERY THREE (3) YEARS OR AS INDICATED BY SOIL TEST 300 POUNDS OF 0-20-20 OR EQUIVALENT PER ACRE (8 LBS PER 1,000 SQ. FT.).

EROSION CHECKS

GENERAL:

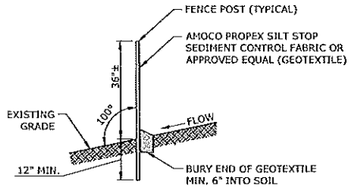
1. TEMPORARY FERVIOUS BARRIERS USING BALES OF HAY OR STRAW, HELD IN PLACE WITH STAKES DRIVEN THROUGH THE BALES AND INTO THE GROUND OR GEOTEXTILE FABRIC FASTENED TO A FENCE POST AND BURIED INTO THE GROUND, SHALL BE INSTALLED AND MAINTAINED AS REQUIRED TO CHECK EROSION AND REDUCE SEDIMENTATION.

CONSTRUCTION:

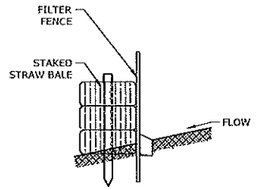
1. BALES SHOULD BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED INTO THE SOIL A MINIMUM OF FOUR (4") INCHES.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY WOOD STAKES OR REINFORCEMENT BARS DRIVEN THROUGH THE BALES AND INTO THE GROUND. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD THE PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
4. GEOTEXTILE FABRIC SHALL BE SECURELY ANCHORED AT THE TOP OF A THREE FOOT (3') HIGH FENCE AND BURIED A MINIMUM OF FOUR INCHES (4") TO THE SOIL. SEAMS BETWEEN SECTIONS OF FILTER FABRIC SHALL OVERLAP A MINIMUM OF TWO FEET (2').

INSTALLATION AND MAINTENANCE:

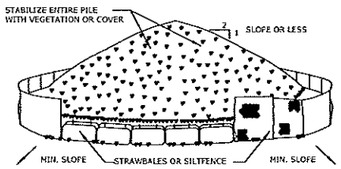
1. BALED HAY EROSION BARRIERS SHALL BE INSTALLED AT ALL STORM SEWER INLETS.
2. BALED HAY EROSION BARRIERS AND GEOTEXTILE FENCE SHALL BE INSTALLED AT THE LOCATION INDICATED ON THE PLAN AND IN ADDITIONAL AREAS AS MAY BE DEEMED APPROPRIATE DURING CONSTRUCTION.
3. ALL EROSION CHECKS SHALL BE MAINTAINED UNTIL ADJACENT AREAS ARE STABILIZED.
4. INSPECTION SHALL BE FREQUENT (AT MINIMUM MONTHLY AND BEFORE AND AFTER HEAVY RAIN) AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. EROSION CHECKS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORMWATER FLOW OR DRAINAGE.



SEDIMENT FILTER FENCE
NOT TO SCALE



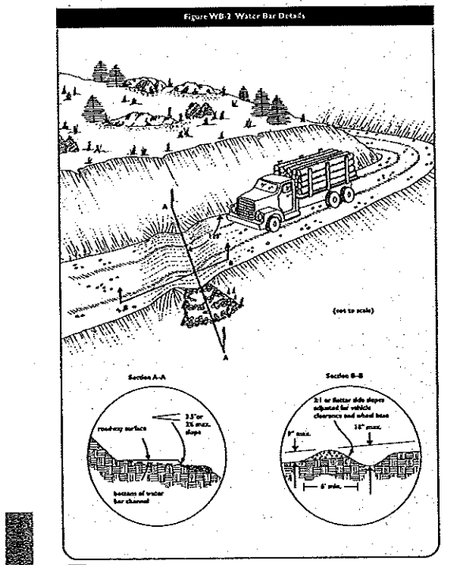
SEDIMENT FILTER FENCE AND HAY BALE
NOT TO SCALE



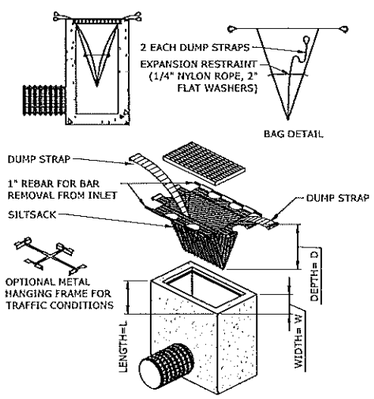
INSTALLATION NOTES

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAWBALES, THEN STABILIZED WITH VEGETATION OR COVERED.

STOCKPILE PROTECTION (STK)
NOT TO SCALE



WATER BAR (WB)
NOT TO SCALE



INLET SEDIMENT CONTROL DEVICE
NOT TO SCALE

EROSION CONTROL MAINTENANCE INTERVALS

EROSION CONTROL MEASURE	CONTROL OBJECTIVE	INSPECTION/MAINTENANCE	FAILURE INDICATORS	REMOVAL
SILT FENCE (SF) (RELATED: IP, STK)	- INTERCEPT, AND REDIRECT/DETAIN SMALL AMOUNTS OF SEDIMENT FROM SMALL DISTURBED AREAS. - DECREASE VELOCITY OF SHEET FLOW. - PROTECT SENSITIVE SLOPES OR SOILS FROM EXCESSIVE WATER FLOW.	INSPECT AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL OF 0.5 INCHES OR MORE. ACCUMULATED SEDIMENT MUST BE REMOVED ONCE ITS DEPTH IS EQUAL TO ½ THE TRENCH HEIGHT. INSPECT FREQUENTLY DURING PUMPING OPERATIONS IF USED FOR DEWATERING OPERATIONS.	- PHYSICAL DAMAGE OR DECOMPOSITION - EVIDENCE OF OVERTOPPED OR UNDERCUT FENCE - EVIDENCE OF SIGNIFICANT FLOWS EVADING CAPTURE - REPETITIVE FAILURE	SILT FENCE MAY BE REMOVED AFTER UPHILL AND SENSITIVE AREAS HAVE BEEN PERMANENTLY STABILIZED.
HAY BALES (HB)	- INTERCEPT, AND REDIRECT/DETAIN SMALL AMOUNTS OF SEDIMENT FROM SMALL DISTURBED AREAS. - DECREASE VELOCITY OF SHEET FLOW. - PROTECT SENSITIVE SLOPES OR SOILS FROM EXCESSIVE WATER FLOW.	INSPECT AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL OF 0.5 INCHES OR MORE. ACCUMULATED SEDIMENT MUST BE REMOVED ONCE THE DEPTH OF SEDIMENT IS EQUAL TO ½ THE HEIGHT OF THE BARRIER. INSPECT FREQUENTLY DURING PUMPING OPERATIONS IF USED FOR DEWATERING OPERATIONS.	- PHYSICAL DAMAGE OR DECOMPOSITION - EVIDENCE OF OVERTOPPED OR UNDERCUT FENCE - EVIDENCE OF SIGNIFICANT FLOWS EVADING CAPTURE - REPETITIVE FAILURE	HAY BALES MAY BE REMOVED AFTER UPHILL AREAS HAVE BEEN PERMANENTLY STABILIZED.
CATCH BASIN INLET PROTECTION (IP)	- PROHIBIT SILT IN CONSTRUCTION-RELATED RUNOFF FROM ENTERING STORM DRAINAGE SYSTEM.	INSPECT AFTER ANY RAIN EVENT. IF FILTER BAG INSIDE CATCH BASIN CONTAINS MORE THAN 6" OF SEDIMENT, REMOVE SEDIMENT FROM BAG. CHECK SURROUNDING SILT FENCE AND HAY BALES PER NOTED ABOVE.	- RIPPED BAG - FAILED HAY BALES / SILT FENCE - SIGNIFICANT SILT PRESENCE IN STORM DRAINAGE SYSTEM OUTFLOW.	INLET PROTECTION MAY BE REMOVED ONCE THE SITE HAS BEEN PERMANENTLY STABILIZED, AND ALL SECTIONS OF ROADWAY HAVE BEEN PERMANENTLY PAVED.
STOCKPILE PROTECTION (STK)	- RETAIN SOIL STOCKPILE IN LOCATIONS SPECIFIED, AND REDUCE WATER-TRANSPORT.	INSPECT SILT FENCE AT THE END OF EACH WORK DAY AND IMMEDIATELY REPAIR DAMAGES. PERIODIC REINFORCEMENT OF SILT FENCE, OR ADDITION OF HAY BALES MAY BE NECESSARY.	- EVIDENCE OF STOCK PILE DIMINISHING DUE TO RAIN EVENTS - FAILURE OF SILT FENCE	STOCKPILE PROTECTION MAY BE REMOVED ONCE THE STOCKPILE IS USED OR REMOVED.

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DESCRIPTION | DATE | BY

SEDIMENT & EROSION CONTROL NOTES & DETAILS

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

SMM	SMM	MTD
DESIGNED	DRAWN	CHECKED

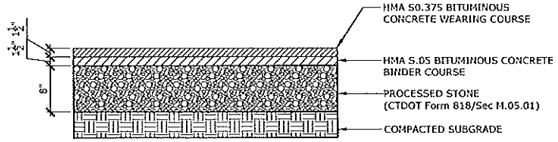
AS NOTED
SCALE

NOVEMBER 21, 2023
DATE

141.13280.00006
PROJECT NO

20 OF 26
SHEET NO

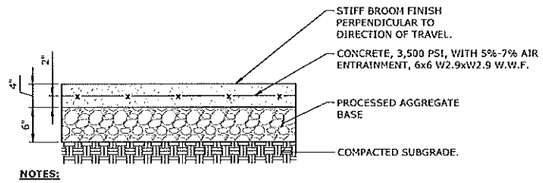
30 SE-3
SHEET NAME



BITUMINOUS CONCRETE ACCESS DRIVES AND PARKING

NOT TO SCALE

NOTE:
1. CROSS SECTION TO BE VERIFIED BY GEOTECHNICAL ENGINEER.

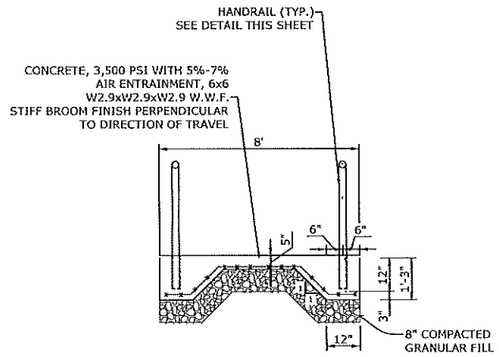


NOTES:

1. EXPANSION JOINTS 20' O.C. MAXIMUM SCORE JOINTS 5' O.C. TYPICAL.

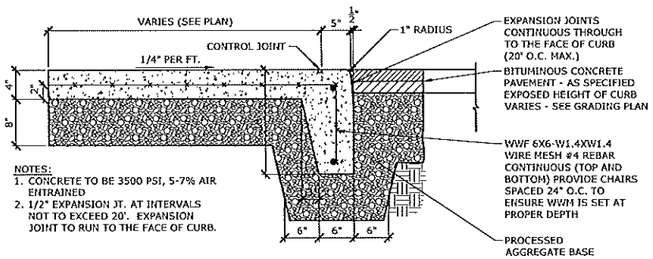
CONCRETE SIDEWALK

NOT TO SCALE



ACCESSIBLE CONCRETE RAMP

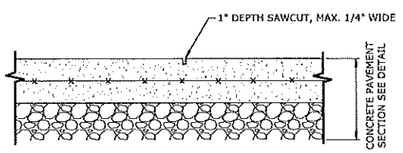
N.T.S.



NOTES:
1. CONCRETE TO BE 3500 PSI, 5-7% AIR ENTRAINED
2. 1/2" EXPANSION JT. AT INTERVALS NOT TO EXCEED 20'. EXPANSION JOINT TO RUN TO THE FACE OF CURB.

INTEGRAL CONCRETE SIDEWALK & CURB

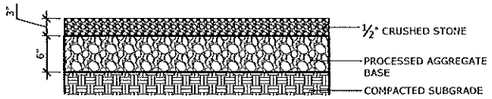
NOT TO SCALE



NOTE:
1. THIS DETAIL SHALL BE USED FOR ALL CONCRETE PAVEMENTS INCLUDING SIDEWALKS, PLAZAS, AND PADS UNLESS OTHERWISE SPECIFIED.

SCORE JOINT - SAWCUT

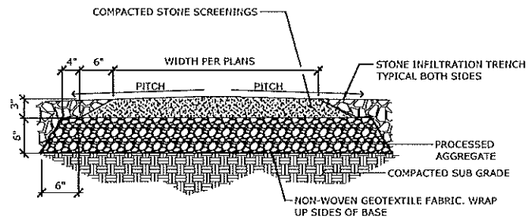
NOT TO SCALE



NOTE:
FINAL DEPTH OF CRUSHED STONE SURFACE SHALL BE 3 INCHES AFTER COMPACTION.

GRAVEL STONE SURFACE

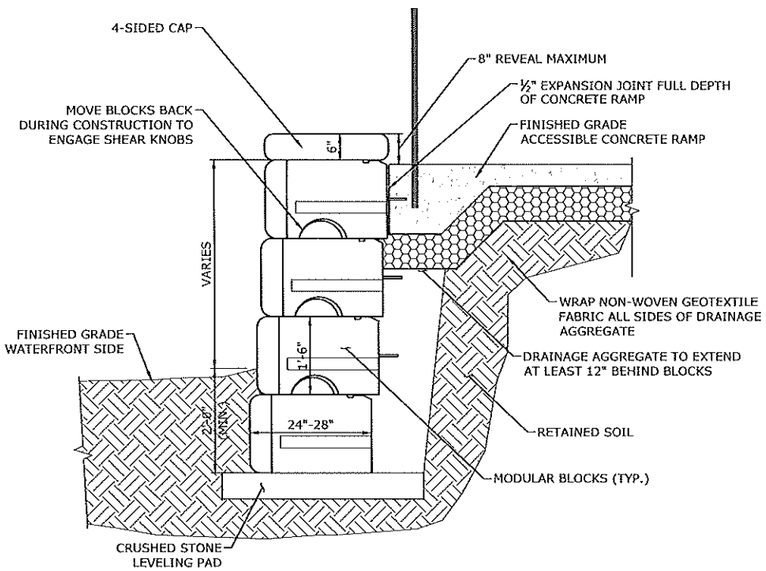
N.T.S.



NOTES:
1. PROVIDE STONE SCREENINGS SAMPLE FOR APPROVAL BY LANDSCAPE ARCHITECT.
2. TRAIL SHALL BE CROWNED TO SHED WATER.

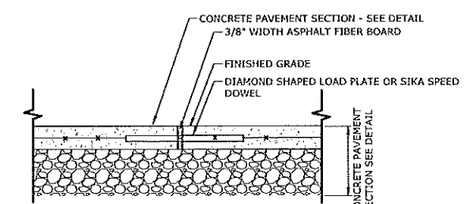
STONEDUST PATH

NOT TO SCALE



GRAVITY WALL (UN-REINFORCED)

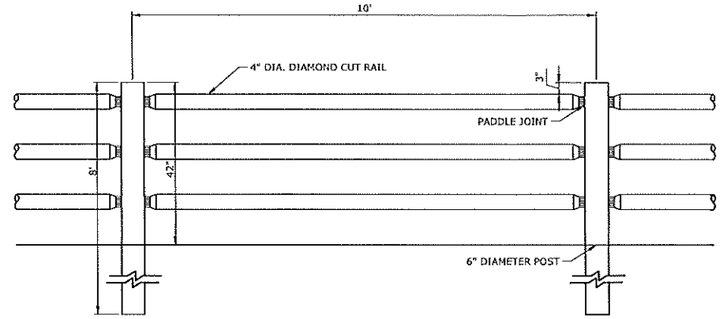
SCALE: ¾"=1'-0"



NOTE:
1. THIS DETAIL SHALL BE USED FOR ALL DECORATIVE CONCRETE PAVEMENTS INCLUDING SIDEWALKS, PLAZAS, AND PADS UNLESS OTHERWISE SPECIFIED.
2. PLACE EXPANSION JOINTS AT ALL INTERRUPTING OBJECTS, COLUMNS, AND ABUTTING STRUCTURES.

CONCRETE EXPANSION JOINT

NOT TO SCALE

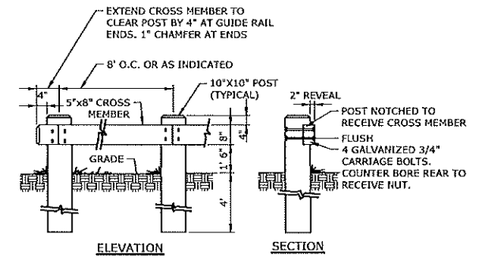


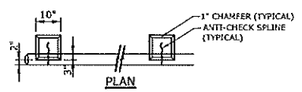
NOTES:

1. THREE RAIL FENCE USED ON EDGE OF STEEPER SLOPES AND TO RESTRICT LIGHT TRAFFIC.
2. ALL WOOD IS TO BE PRESSURE TREATED SOUTHERN YELLOW PINE OR APPROVED EQUAL.
3. SUBMIT PRODUCT FOR APPROVAL.

THREE RAIL FENCE

NOT TO SCALE



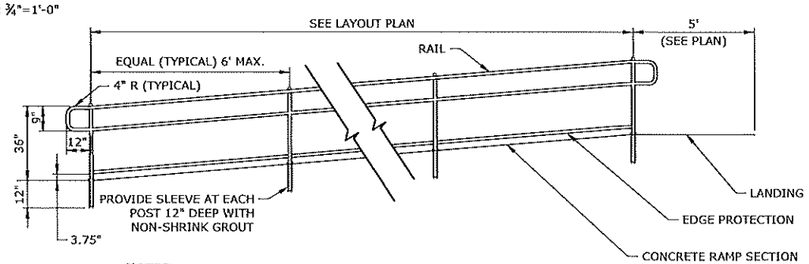


NOTES:

1. ALL WOOD TO BE PRESSURE TREATED SOUTHERN YELLOW PINE.
2. ALL RAIL AND POST LUMBER SHALL BE COMMERCIAL GRADE, NO.1 DENSE, (Fb=10.3 FPa) OR BETTER, CONFORMING TO NOMINAL SIZES AND DIMENSIONS SHOWN AND TO AASHTO SPECIFICATION M168. ALL TIMBER SHALL BE TREATED WITH A PAESSURE IMPREGNATED PRESERVATIVE IN ACCORDANCE WITH AASHTO SPECIFICATION M133.
3. BOLTS SHALL BE 3/4" DIAMETER, ASTM 307, WITH APPROPRIATE NUTS AND WASHERS (ALL HOT DIPPED GALVANIZED)
4. BACKFILL AROUND EACH POST WITH SUITABLE NATIVE MATERIAL IN 1' LIFTS.
5. CONTRACTOR TO PROVIDE 90°, 45° OR END POSTS WHERE REQUIRED.
6. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ENTIRE SYSTEM.

TIMBER GUIDE RAIL

NOT TO SCALE

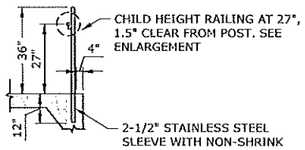


NOTES:

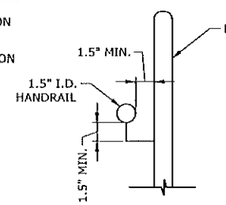
1. HANDRAILS SPECIFIED ON THIS DETAIL ARE INTENDED FOR USE AT THE CONCRETE RAMP SHOWN ON THE SITE PLAN. 1 1/2" I.D. STEEL PIPE HANDRAIL (BOTH SIDES). INTERMEDIATE POSTS SPACED EQUALLY - MAX. 6' O.C.
2. ALL WELDS TO BE GROUND SMOOTH
3. ALL STEEL TO HAVE PVC POWDER COAT COLOR: BLACK
4. HAND RAIL TYPICAL BOTH SIDES OF RAMP
5. SUBMIT SHOP DRAWING FOR APPROVAL

STEEL HAND RAIL AT RAMPS

NOT TO SCALE



SECTION



ENLARGEMENT

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION | DATE | BY

SITE DETAILS
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

PJP	PJP	MTD
DESIGNED	DRAWN	CHECKED

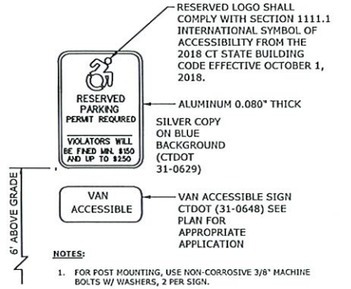
AS NOTED
SCALE

NOVEMBER 21, 2023
DATE

141.13280.00006
PROJECT NO

21 OF 26
SHEET NO

31 SD-1
SHEET NAME

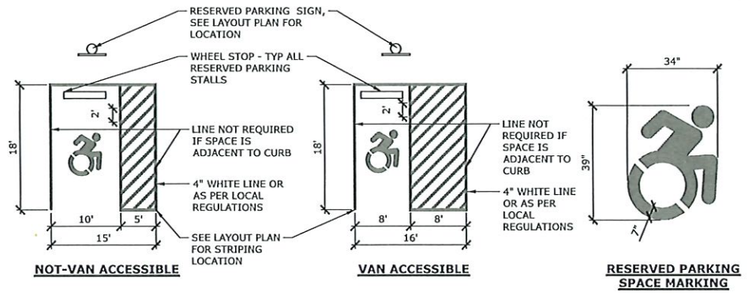


NOTES:

1. FOR POST MOUNTING, USE NON-CORROSIVE 3/8" MACHINE BOLTS W/ WASHERS, 2 PER SIGN.

RESERVED PARKING SIGN

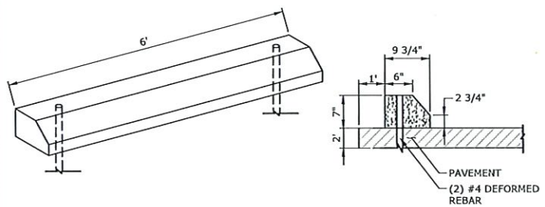
NOT TO SCALE



NOT-VAN ACCESSIBLE | VAN ACCESSIBLE | RESERVED PARKING SPACE MARKING

ACCESSIBLE PARKING STALL DETAIL

NOT TO SCALE

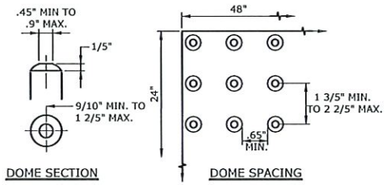


NOTES:

1. CONCRETE: 4000 PSI, 28 DAYS
2. WEIGHT, 300 LBS.
3. REINFORCEMENT, (2) #4 BARS
4. (2) 3/4" HOLES CAST IN FOR ANCHORING
5. (2) PROVIDE 5/8" x 30" REBAR FOR ANCHORING

PRECAST CONCRETE WHEEL STOP

NOT TO SCALE



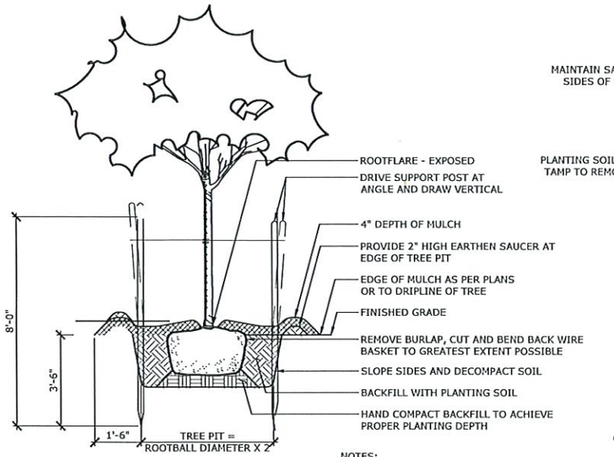
DOME SECTION | DOME SPACING

NOTES:

1. CARE SHALL BE TAKEN TO ASSURE UNIFORM GRADE ON THE RAMP, FREE OF SAGS AND ABRUPT GRADE CHANGES.
2. SIDEWALK RAMPS SHALL HAVE A COARSE BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP. THE SURFACE ALONG ACCESSIBLE ROUTES SHALL BE STABLE, FIRM AND SLIP RESISTANT IN COMPLIANCE WITH ADAAG SECTION 4.5.
3. HANDICAP RAMPS CONFORMING WITH CONNECTICUT GENERAL STATUTES, SEC. 7-118a, SHALL BE INCORPORATED IN ALL PROPOSED SIDEWALKS AT ALL STREET INTERSECTIONS, AND AT ALL OTHER LOCATIONS WHERE THE GRADE OF A DRIVEWAY OR OTHER FACILITY TAKES PRECEDENCE OVER THE GRADE OF THE PROPOSED SIDEWALK.
4. INSTALL THE EDGE OF THE DETECTABLE WARNING 6" MINIMUM FROM THE EDGE OF ROAD.
5. TO PERMIT WHEELCHAIR WHEELS TO ROLL BETWEEN DOMES, ALIGN DOMES ON A SQUARE GRID. IN THE DIRECTION OF PEDESTRIAN TRAVEL.

DETECTABLE WARNING STRIP

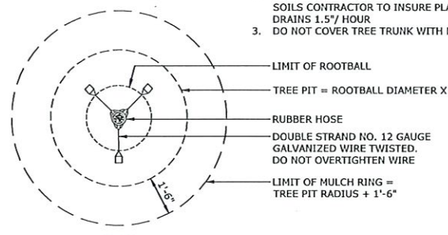
NOT TO SCALE



SECTION

NOTES:

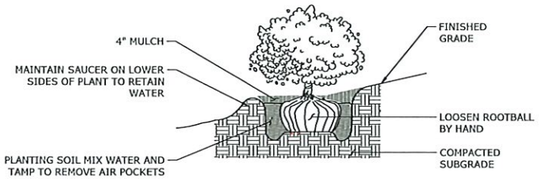
1. SUPPORT POSTS SHALL BE REMOVED BY THE CONTRACTOR ONE YEAR AFTER INSTALLATION
2. WHERE TREES ARE PLANTED IN COMPACTED SOILS CONTRACTOR TO INSURE PLANT PIT DRAINS 1.5"/ HOUR
3. DO NOT COVER TREE TRUNK WITH MULCH



PLAN

TREE PLANTING

NOT TO SCALE



NOTES:

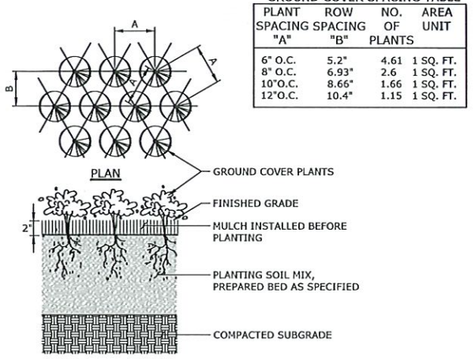
1. UNLESS OTHERWISE DIRECTED SHREDDED MULCH SHALL BE PLACED TO A LIMIT OF ONE FOOT BEYOND THE CENTER OF THE OUTERMOST SHRUBS IN SHRUB BED.

SHRUB PLANTING

NOT TO SCALE

GROUND COVER SPACING TABLE

PLANT SPACING "A"	ROW SPACING "B"	NO. OF PLANTS	AREA UNIT
6" O.C.	5.2"	4.61	1 SQ. FT.
8" O.C.	6.93"	2.6	1 SQ. FT.
10"O.C.	8.66"	1.66	1 SQ. FT.
12"O.C.	10.4"	1.15	1 SQ. FT.



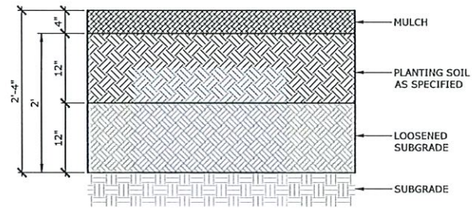
SECTION

NOTES:

1. ALL GROUND COVER TO BE PLANTED IN TRIANGULAR PATTERN. SEE DETAIL PLAN AND GROUND COVER SPACING TABLE.

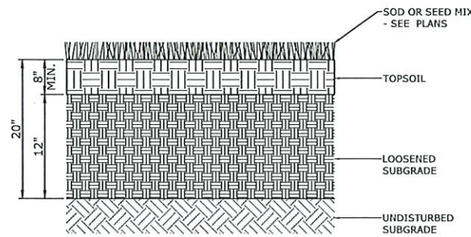
GROUND COVER/ PERENNIAL PLANTING

NOT TO SCALE



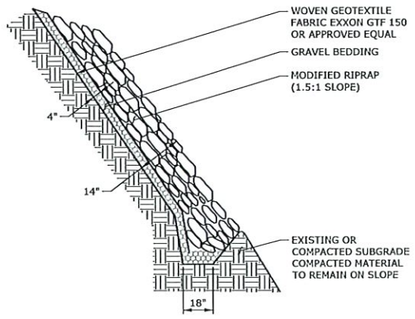
LANDSCAPE BEDS

NOT TO SCALE



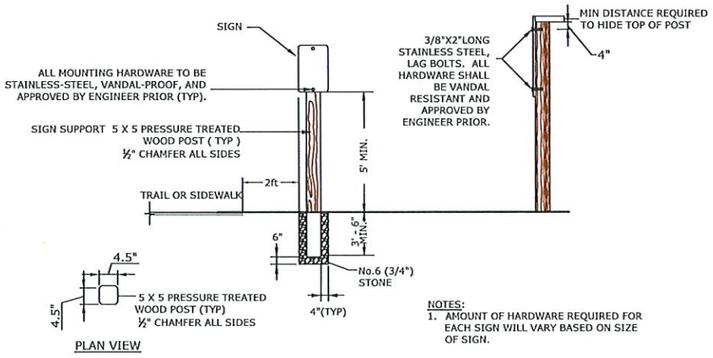
LAWN DETAIL

NOT TO SCALE



MODIFIED RIPRAP SLOPE

NOT TO SCALE



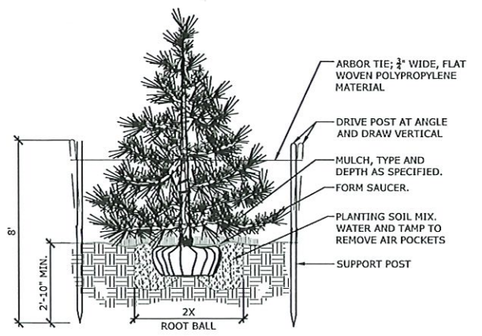
PLAN VIEW

NOTES:

1. AMOUNT OF HARDWARE REQUIRED FOR EACH SIGN WILL VARY BASED ON SIZE OF SIGN.

WOOD POST MOUNTING - SIGN FACE

N.T.S.



NOTES:

1. PROVIDE STAKING AS REQUIRED.
2. PLANT SO THAT TOP OF ROOT BALL IS EVEN WITH THE FINISHED GRADE.
3. PAINT ALL CUTS.
4. REMOVE ALL CONTAINERS AND BASKETS FROM ROOT BALL.
5. REMOVE BURLAP, CUT AND BEND BACK WIRE BASKET TO GREATEST EXTENT POSSIBLE.

EVERGREEN TREE PLANTING DETAIL

NOT TO SCALE

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CHESHIRE, CT 06410
203.271.1773
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DESCRIPTION	DATE	BY

SITE DETAILS

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

PJP DESIGNED	PJP DRAWN	MTD CHECKED

SCALE: AS NOTED

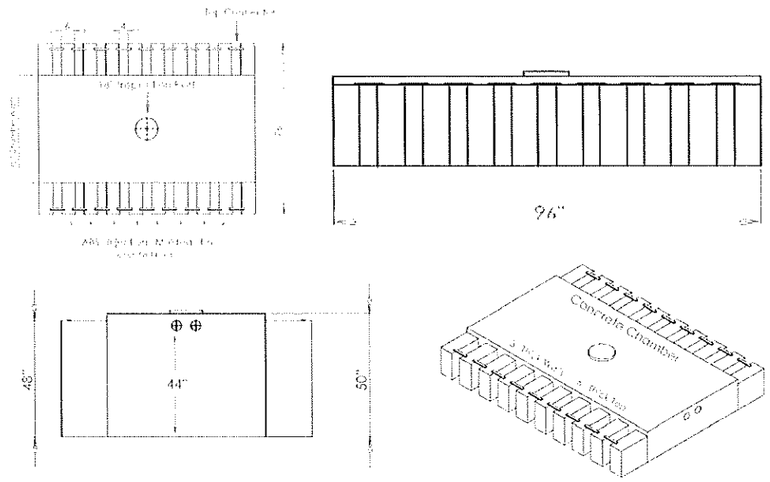
DATE: NOVEMBER 21, 2023

PROJECT NO.: 141.13280.00006

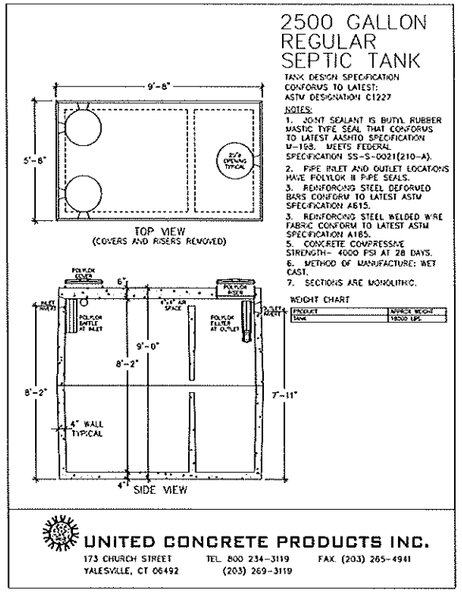
SHEET NO: 22 OF 26

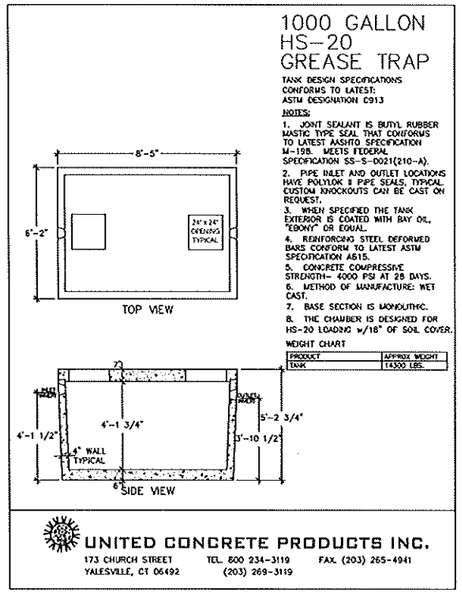
32 SD-2

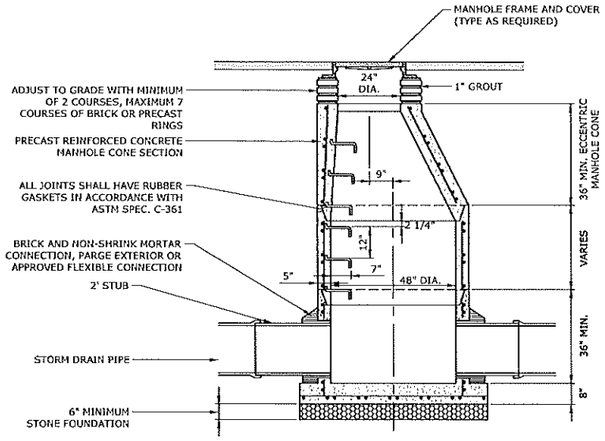
SHEET NAME



CURTECH CTL 48 LEACHING GALLERIES
NOT TO SCALE

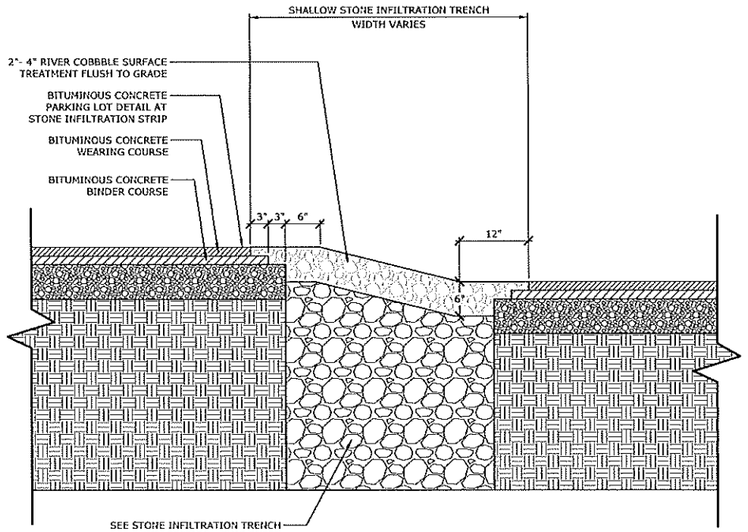




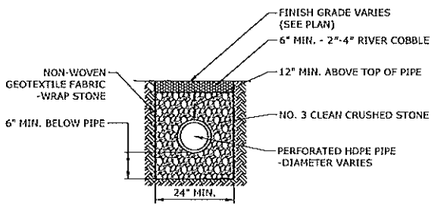


NOTES:
1. 5' OR 6' DIAMETER PRECAST BASES MAY BE REQUIRED DUE TO SIZE OR NUMBER OF PIPES AT THE MANHOLE. PRECAST REDUCERS WILL BE PLACED ABOVE THE 5' OR 6' BASES AS DIRECTED BY THE ENGINEER. WALL THICKNESS TO INCREASE BY 1" FOR EACH 1'-0" OF INSIDE DIAMETER.

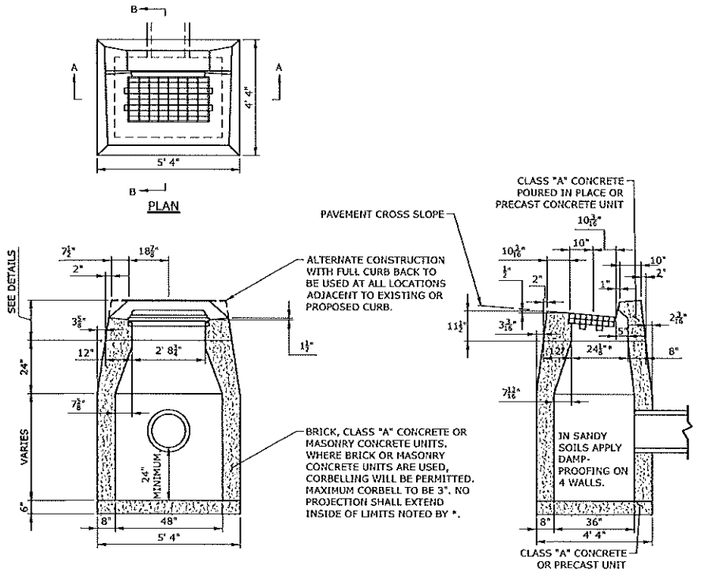
PRECAST CONCRETE STORM DRAINAGE MANHOLE
NOT TO SCALE



STONE INFILTRATION STRIP AT BITUMINOUS CONCRETE
NOT TO SCALE
P-TR-2625.32-76



STONE INFILTRATION TRENCH
TYPICAL SECTION
NOT TO SCALE



NOTES:
1. WHEN CATCH BASIN IS SET IN CONCRETE PAVEMENT, THE 1/2" SLOPE ON THE TOP SURFACE SHALL BE CHANGED TO MATCH ADJOINING PAVEMENT.
2. WHERE PRECAST CONCRETE UNIT IS USED FOR SUMP, THE TOP OF THE UNIT SHALL BE AT LEAST 6" BELOW THE BOTTOM OF THE PIPE OUTLET FROM THE CATCH BASIN.

TYPE "C" CATCH BASIN
NOT TO SCALE

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CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

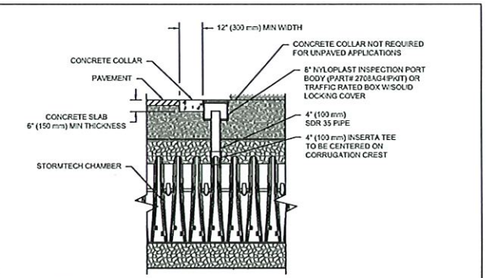
SITE DETAILS
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

PJP	PJP	MTD
DESIGNED	DRAWN	CHECKED

AS NOTED
SCALE
NOVEMBER 21, 2023
DATE
141.13280.00006
PROJECT NO
23 OF 26
SHEET NO
32 SD-3
SHEET NAME

SC-740 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4 | 4" PVC INSPECTION PORT DETAIL (SC SERIES CHAMBER)

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

1. STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.
   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4"-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON N-YLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

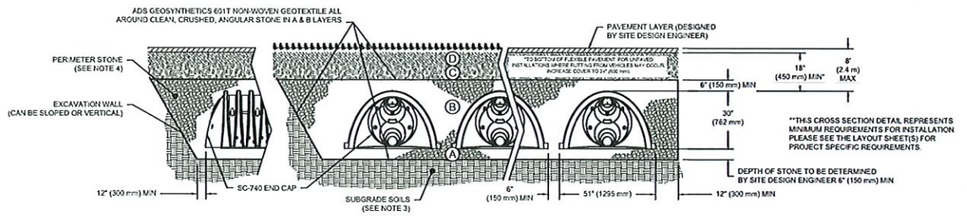
NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE (B* LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145* A-1, A-2-4, A-3 OR AASHTO M43* 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43* 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43* 3, 357, 4, 467, 5, 56, 57	**PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]**

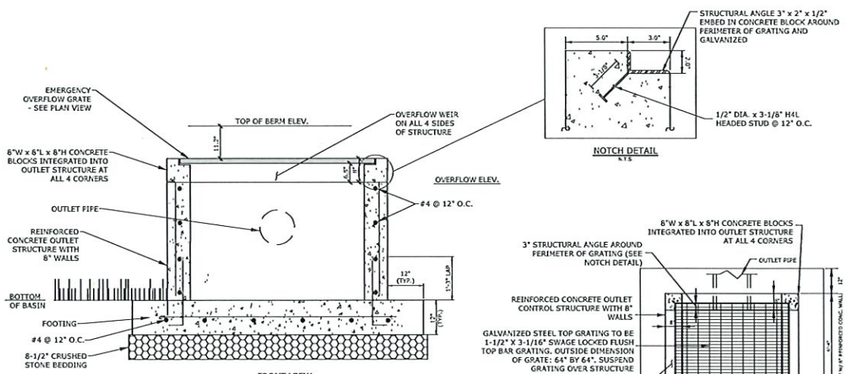
PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. **FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.**
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

1 | SC-740 CROSS SECTION DETAIL



FRONT VIEW

NOTCH DETAIL
N.T.S.

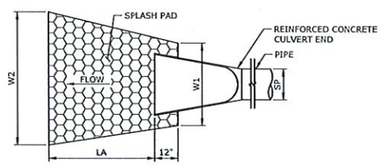
PLAN VIEW
N.T.S.

DET 110	
TOP OF BERM ELEVATION	450.3
OVERFLOW ELEVATION	448.4
100-YEAR WATER SURFACE ELEV.	449.3
OUTLET PIPE DIAMETER	12"
OUTLET PIPE INVERT	446.0
BASIN BOTTON ELEVATION	445.0

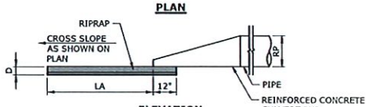
DETENTION BASIN OUTLET CONTROL STRUCTURE

SCALE: 1"=2'

STORMTECH SC-740 CHAMBERS



PLAN

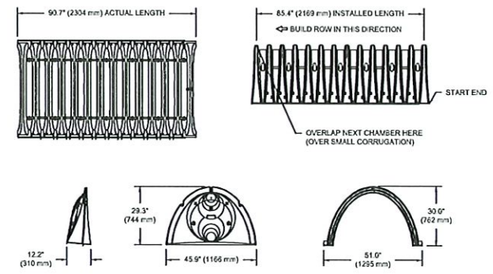


ELEVATION

OUTLET PROTECTION ID	TYPE	SP (FT)	RP (FT)	LA (FT)	W1 (FT)	W2 (FT)	D (IN)
FES 1	MODIFIED TYPE B	1.0	1.0	10.0	3.0	7.0	12

FLARED END WITH RIP RAP SPLASH PAD

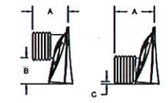
NOT TO SCALE



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs	(34.0 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUB AT BOTTOM OF END CAP WITH FLANGE END WITH "BR"
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	—
SC740EPE06B / SC740EPE06BPC			—	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	—
SC740EPE08B / SC740EPE08BPC			—	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	—
SC740EPE10B / SC740EPE10BPC			—	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	—
SC740EPE12B / SC740EPE12BPC			—	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	—
SC740EPE15B / SC740EPE15BPC			—	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	—
SC740EPE18B / SC740EPE18BPC			—	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	—	0.1" (3 mm)
SC740EPE24BR*	24" (600 mm)	18.5" (470 mm)	—	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B/SC740EPE24BR ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B/SC740EPE24BR THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

2 | SC-740 TECHNICAL SPECIFICATIONS

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

SITE DETAILS
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

PJP	PJP	MTD
DESIGNED	DRAWN	CHECKED

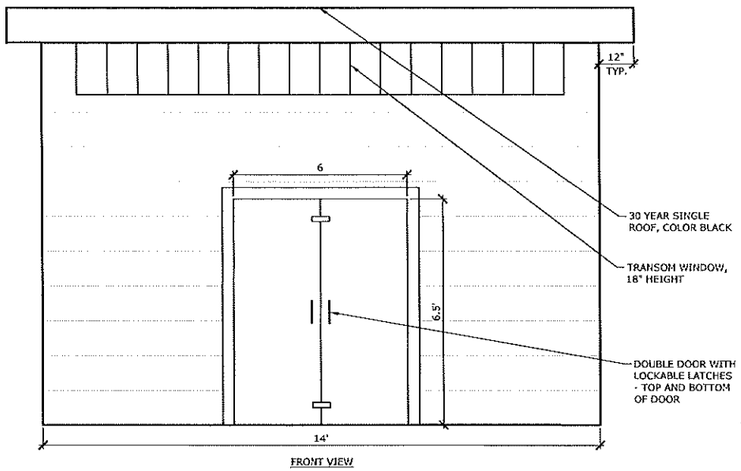
AS NOTED
SCALE

NOVEMBER 21, 2023
DATE

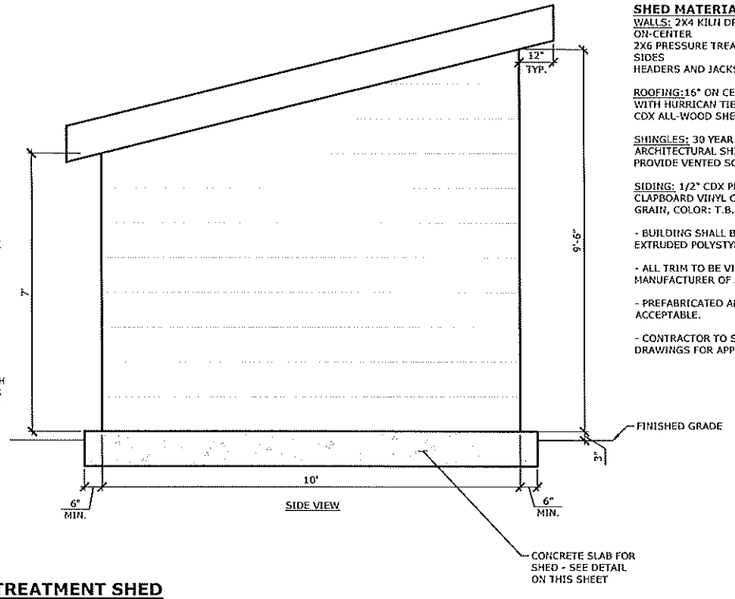
141.13280.00006
PROJECT NO.

24 OF 26
SHEET NO.

SD-4
SHEET NAME



FRONT VIEW



SIDE VIEW

SHED MATERIAL SPECIFICATIONS:

WALLS: 2X4 KILN DRIED FRAMING, 16" ON-CENTER
2X6 PRESSURE TREATED SILL PLATE ALL FOUR SIDES
HEADERS AND JACKS IN ALL DOOR FRAMES

ROOFING:16" ON CENTER 2X8 ROOF RAFTERS WITH HURRICAN TIES, DOUBLE GUSSETED, 1/2" CDX ALL-WOOD SHEATHING

SHINGLES: 30 YEAR GUARANTEE ASPHALT ARCHITECTURAL SHINGLES
PROVIDE VENTED SOFFITS

SIDING: 1/2" CDX PLYWOOD OVERLAID WITH CLAPBOARD VINYL COMPOSITE WITH WOOD GRAIN, COLOR: T.B.D.

- BUILDING SHALL BE INSULATED WITH EXTRUDED POLYSTYRENE FOAM BOARD.

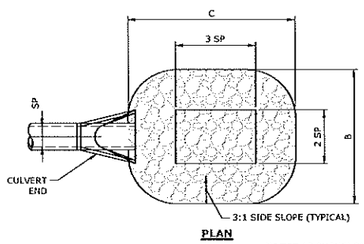
- ALL TRIM TO BE VINYL FROM THE SAME MANUFACTURER OF SIDING.

- PREFABRICATED AND KIT SHED UNITS MAY BE ACCEPTABLE.

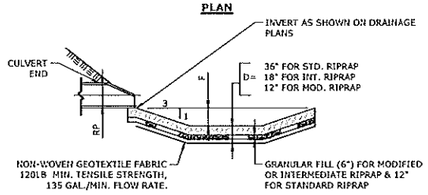
- CONTRACTOR TO SUBMIT DETAILED SHOP DRAWINGS FOR APPROVAL.

WATER SUPPLY AND TREATMENT SHED

NOT TO SCALE



PLAN

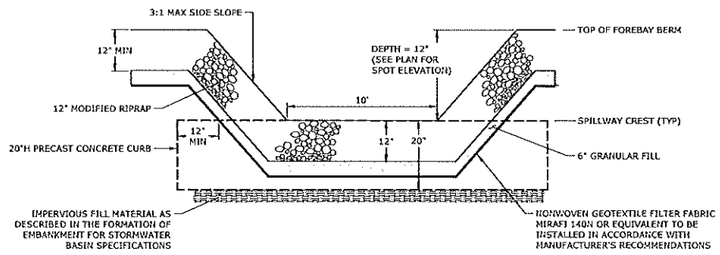


ELEVATION

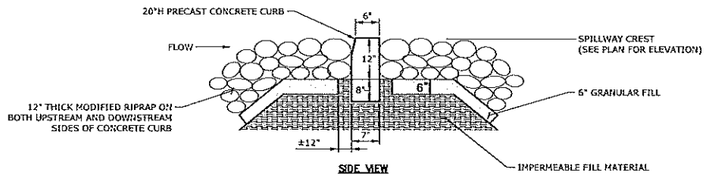
OUTLET PROTECTION ID	TYPE	SP (FT)	RP (FT)	C (FT)	B (FT)	F (FT)	D (IN)
FES 4	MODIFIED TYPE 1	1.0	1.0	6.0	5.0	0.5	12

PREFORMED SCOUR HOLE

NOT TO SCALE



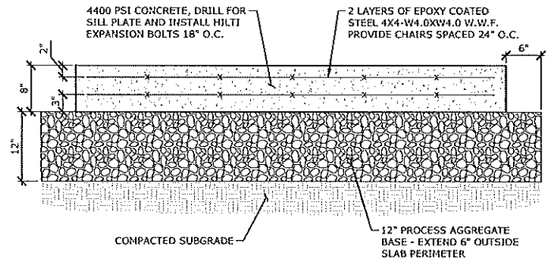
FRONT VIEW



SIDE VIEW

EMERGENCY RIPRAP SPILLWAY

NOT TO SCALE



SHED SLAB

NOT TO SCALE

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

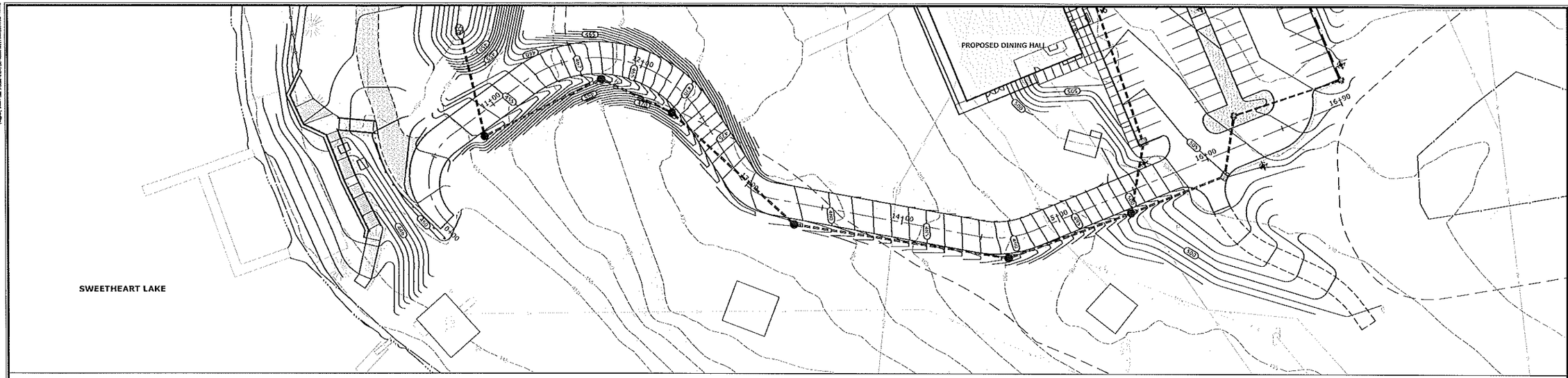
DESCRIPTION | DATE | BY

SITE DETAILS
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

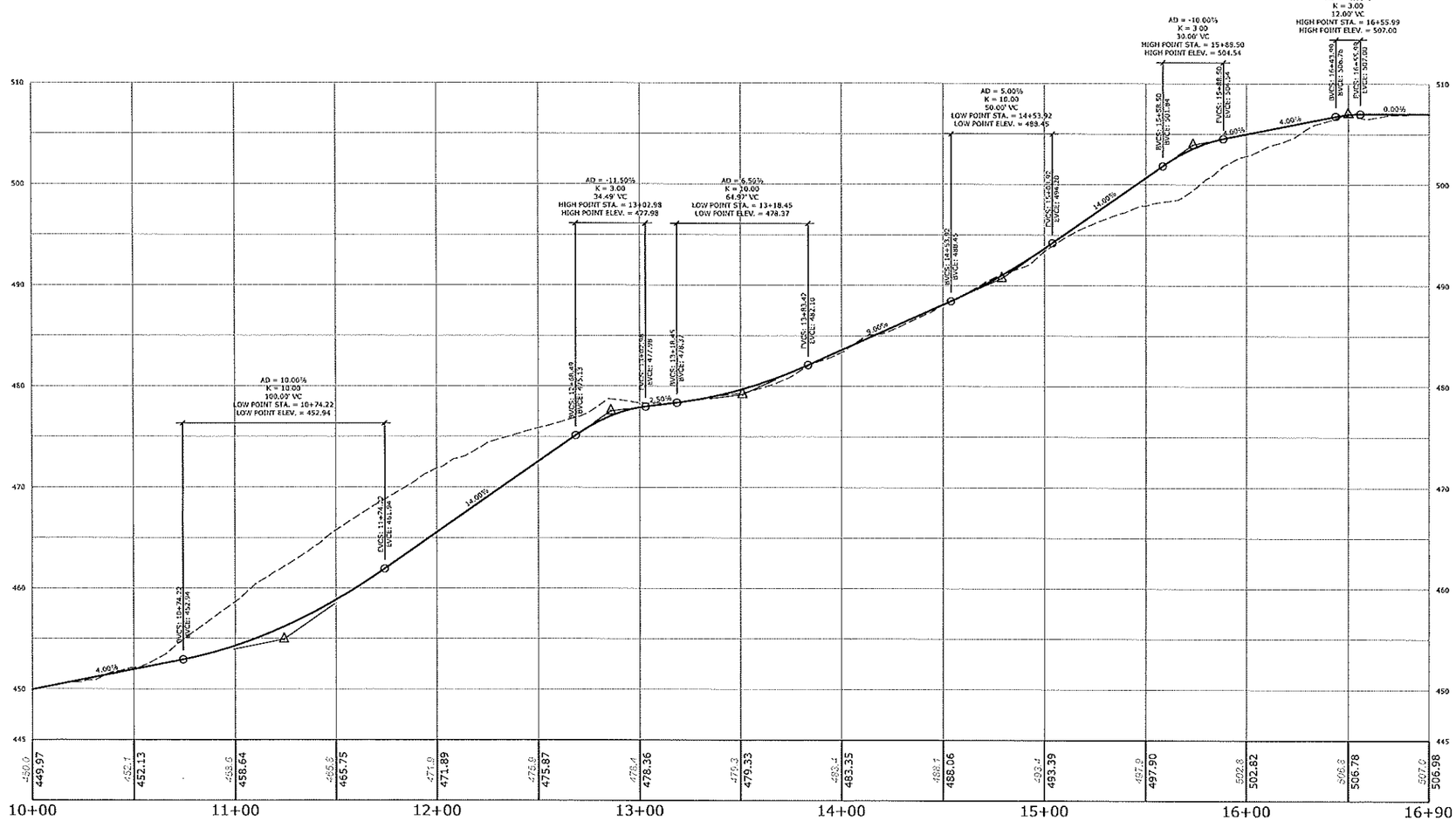
PJP	PJP	MTD
DESIGNED	DRAWN	CHECKED

SCALE: AS NOTED
DATE: NOVEMBER 21, 2023
PROJECT NO: 141.13280.00006
SHEET NO: 25 OF 26

35 SD-5
SHEET NAME



PLAN VIEW
SCALE: 1"=30'



PROFILE VIEW
SCALE: 1"=30' H, 1"=6' V

SLR

59 RIALTY DRIVE
GLASTONBURY, CT 06019
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

ROAD PROFILE

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

SMM	SMM	MTD
DESIGNED	DRAWN	CHECKED

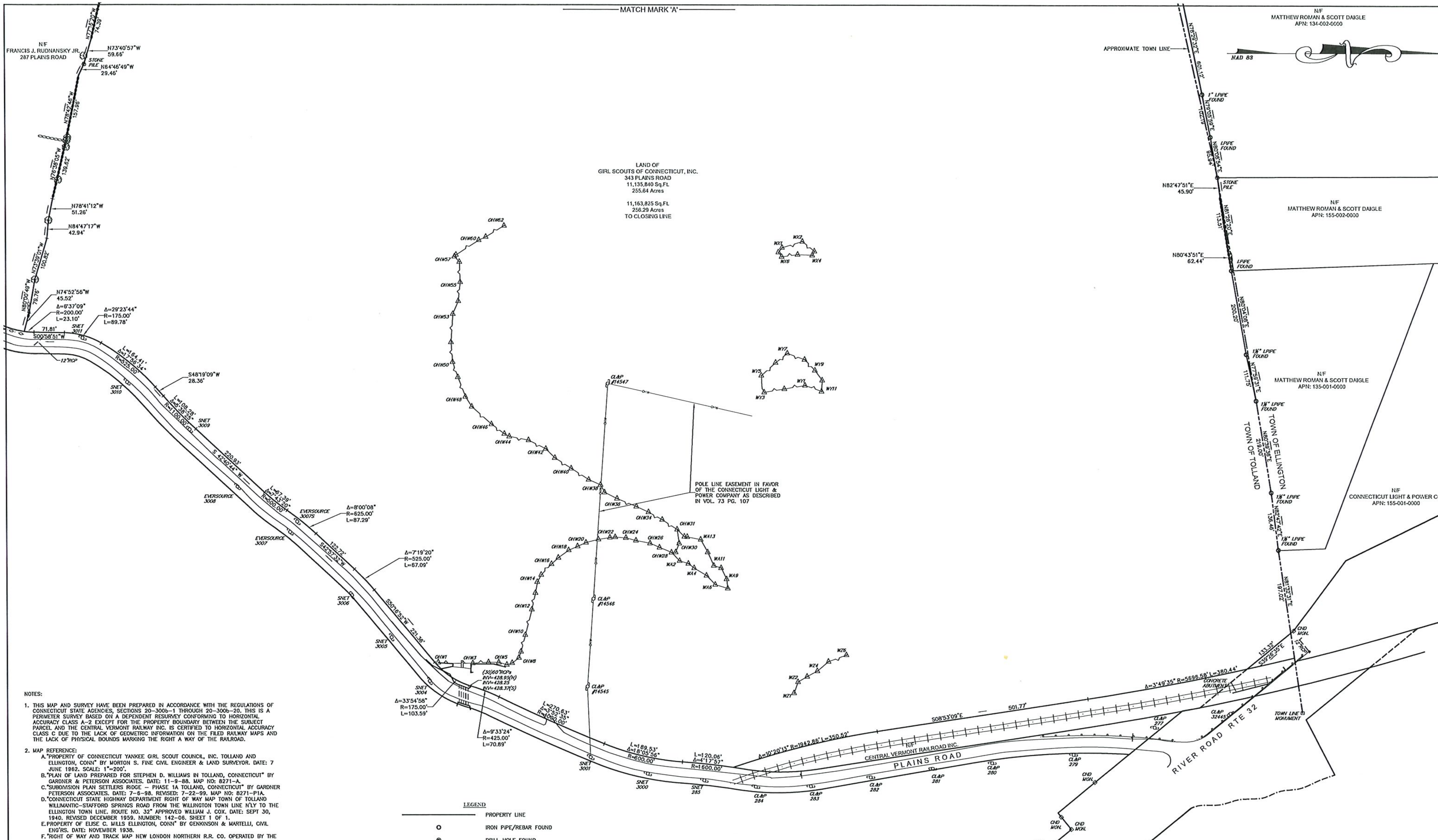
SCALE AS NOTED
SCALE

NOVEMBER 21, 2023
DATE

141.13280.00006
PROJECT NO

26 OF 26
SHEETNO

36 PR-1
SHEETNAME



NOTES:

1. THIS MAP AND SURVEY HAVE BEEN PREPARED IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20-300b-1 THROUGH 20-300b-20. THIS IS A PERIMETER SURVEY BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS A-2 EXCEPT FOR THE PROPERTY BOUNDARY BETWEEN THE SUBJECT PARCEL AND THE CENTRAL VERMONT RAILWAY INC. IS CERTIFIED TO HORIZONTAL ACCURACY CLASS C DUE TO THE LACK OF GEOMETRIC INFORMATION ON THE FILED RAILWAY MAPS AND THE LACK OF PHYSICAL BOUNDS MARKING THE RIGHT A WAY OF THE RAILROAD.

2. MAP REFERENCE:
   A. "PROPERTY OF CONNECTICUT YANKEE GIRL SCOUT COUNCIL, INC. TOLLAND AND ELLINGTON, CONN" BY MORTON S. FINE CIVIL ENGINEER & LAND SURVEYOR. DATE: 7 JUNE 1962. SCALE: 1"=200'.
   B. "PLAN OF LAND PREPARED FOR STEPHEN D. WILLIAMS IN TOLLAND, CONNECTICUT" BY GARDNER & PETERSON ASSOCIATES. DATE: 11-9-88. MAP NO: 8271-A.
   C. "SUBDIVISION PLAN SETTLERS RIDGE – PHASE 1A TOLLAND, CONNECTICUT" BY GARDNER PETERSON ASSOCIATES. DATE: 7-6-98. REVISED: 7-22-99. MAP NO: 8271-P1A.
   D. "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF TOLLAND WILLIMANTIC-STAFFORD SPRINGS ROAD FROM THE WILLINGTON TOWN LINE N'LY TO THE ELLINGTON TOWN LINE. ROUTE NO. 32" APPROVED WILLIAM J. COX. DATE: SEPT 30, 1940. REVISED DECEMBER 1959. NUMBER: 142-06. SHEET 1 OF 1.
   E. PROPERTY OF ELISE C. MILLS ELLINGTON, CONN" BY GENKINSON & MARTELLI, CIVIL ENG'RS. DATE: NOVEMBER 1938.
   F. "RIGHT OF WAY AND TRACK MAP NEW LONDON NORTHERN R.R. CO. OPERATED BY THE CENTRAL VERMONT RY. CO. STATION 2481+60 TO STATION 2534+40" BY THE OFFICE OF VALUATION ENGINEER ST. ABLANS VERMONT. SHEET V-1/48.
   G. "MAP PREPARED FOR PETER ROMAN & HELEN C. ROMAN STAFFORD SPRINGS – WILLIMANTIC ROAD ELLINGTON, CT CONN. ROUTE #32 CLASS 'D' BOUNDARY MAP" BY WILLIAM W. SYMONDS, SR. DATE: AUGUST 30, 1999.

3. BEARINGS DEPICTED ON THIS PLAN ARE BASED ON THE 1983 NORTH AMERICAN DATUM (NAD 83/87) BASED ON GPS COORDINATES PROVIDED BY SLR CONSULTING.

4. INLAND WETLANDS DEPICTED ON THIS PLAN WERE DELINEATED BY SLR CONSULTING.

I HEREBY DECLARE THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

Eric R. Peterson
ERIC R. PETERSON — L.S. 23430 REGISTRATION NO.

LEGEND

- PROPERTY LINE
- IRON PIPE/REBAR FOUND
- DRILL HOLE FOUND
- UTILITY POLE
- OVERHEAD WIRES
- EDGE PAVEMENT
- STONEWALL
- TREE WITH BLAZE OR WIRE
- STORM CULVERT
- RAILROAD TRACKS
- BROOK
- METAL BEAM RAIL
- INLAND WETLAND

STATE OF CONNECTICUT · ERIC R. PETERSON · No. 23430 · LICENSED LAND SURVEYOR

REVISIONS

PERIMETER SURVEY
LAND OF THE
GIRL SCOUTS OF CONNECTICUT, INC.
343 PLAINS ROAD
TOLLAND, CONNECTICUT

GARDNER & PETERSON ASSOCIATES, LLC
178 HARTFORD TURNPIKE
TOLLAND, CONNECTICUT
PROFESSIONAL ENGINEERS — LAND SURVEYORS

BY	SCALE	DATE	SHEET NO.	MAP NO.
E.R.P.	1"=100'	11-09-2022	1 OF 3	11075 A

g:\1Plot\11075\Survey\11-09-2022\11075A.pdf
11075\dwg\11075A.dwg

NAD 83

MATCH MARK 'B'

N:F
FRANCIS J. RUDNANSKY JR.
287 PLAINS ROAD

N72°52'57"W 200.22'
N55°24'57"W 46.66'
N12°13'09"W 12.52'
N76°51'40"W 109.24'
N70°49'32"W 75.55'
STUMP W/WIRE
N77°20'44"W 49.50'
N70°57'47"W 89.25'
N74°09'43"W 62.70'
N78°25'54"W 165.88'
N65°44'42"W 19.76'
N76°17'50"W 75.83'
N84°39'41"W 26.24'
N74°16'08"W 81.37'
N72°52'21"W 113.31'
N77°48'39"W 92.98'
N69°57'58"W 67.16'
N78°36'41"W 45.40'
N73°02'14"W 63.71'
N67°20'13"W 37.22'
N76°04'44"W 37.66'
N72°11'17"W 107.03'
N79°22'07"W 123.48'
N80°55'43"W 30.34'
N87°57'37"W 118.02'
N82°36'17"W 113.73'
N85°41'46"W 72.65'
WOOD POST
WOOD POST
N74°31'42"W 97.50'
WOOD POST
N66°41'07"W 72.15'
WOOD POST
WOOD POST
N74°06'31"W 33.69'
N76°09'48"W 43.36'
N77°37'14"W 31.78'
N72°23'54"W 124.78'

LAND OF
GIRL SCOUTS OF CONNECTICUT, INC.
343 PLAINS ROAD
11,135,840 Sq.Ft.
255.64 Acres

11,163,825 Sq.Ft.
256.29 Acres
TO CLOSING LINE

MATCH MARK 'A'

BROOK
CLOSING LINE
S43°24'39"E 760.11'
N85°42'42"E 101'±
N84°40'43"E 273.20'
N84°40'43"E 196.20'
T-BAR FOUND
S86°13'30"E 142.44'
T-BAR FOUND
N11°35'05"E 172.00'
N11°35'05"E 130.00'
N13°33'30"E 230.00'
STONE PILE
N72°24'03"E 172.56'
T-BAR FOUND
TOWN OF ELLINGTON
TOWN OF TOLLAND
N72°52'02"E 353.93'
1" PIPE FOUND
APPROXIMATE TOWN LINE

N:F
STATE OF CONNECTICUT SHENIPSIT
STATE FOREST / NYE HOLMAN STATE FOREST
APN: 153-005-0000

N:F
MATTHEW ROMAN & SCOTT DAIGLE
APN: 134-002-0000

NOTES:

1. THIS MAP AND SURVEY HAVE BEEN PREPARED IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20-300b-1 THROUGH 20-300b-20. THIS IS A PERIMETER SURVEY BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS A-2 EXCEPT FOR THE PROPERTY BOUNDARY BETWEEN THE SUBJECT PARCEL AND THE CENTRAL VERMONT RAILWAY INC. IS CERTIFIED TO HORIZONTAL ACCURACY CLASS C DUE TO THE LACK OF GEOMETRIC INFORMATION ON THE FILED RAILWAY MAPS AND THE LACK OF PHYSICAL BOUNDS MARKING THE RIGHT A WAY OF THE RAILROAD.
2. MAP REFERENCE:
   A. "PROPERTY OF CONNECTICUT YANKEE GIRL SCOUT COUNCIL, INC. TOLLAND AND ELLINGTON, CONN" BY MORTON S. FINE CIVIL ENGINEER & LAND SURVEYOR. DATE: 7 JUNE 1962. SCALE: 1"=200'.
   B. "PLAN OF LAND PREPARED FOR STEPHEN D. WILLIAMS IN TOLLAND, CONNECTICUT" BY GARDNER & PETERSON ASSOCIATES. DATE: 11-9-88. MAP NO: 8271-A.
   C. "SUBDIVISION PLAN SETTLERS RIDGE – PHASE 1A TOLLAND, CONNECTICUT" BY GARDNER PETERSON ASSOCIATES. DATE: 7-6-98. REVISED: 7-22-99. MAP NO: 8271-P1A.
   D. "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF TOLLAND WILLIMANTIC-STAFFORD SPRINGS ROAD FROM THE WILLINGTON TOWN LINE N'LY TO THE ELLINGTON TOWN LINE. ROUTE NO. 32" APPROVED WILLIAM J. COX. DATE: SEPT 30, 1940. REVISED DECEMBER 1959. NUMBER: 142-06. SHEET 1 OF 1.
   E. PROPERTY OF ELISE C. WILLS ELLINGTON, CONN" BY GENKINSON & MARTELLI, CIVIL ENG'RS. DATE: NOVEMBER 1938.
   F. "RIGHT OF WAY AND TRACK MAP NEW LONDON NORTHERN R.R. CO. OPERATED BY THE CENTRAL VERMONT RY. CO. STATION 2481+60 TO STATION 2534+40" BY THE OFFICE OF VALUATION ENGINEER ST. ABLANS VERMONT. SHEET V-1/48.
   G. "MAP PREPARED FOR PETER ROMAN & HELEN C. ROMAN STAFFORD SPRINGS – WILLIMANTIC ROAD ELLINGTON, CT CONN. ROUTE #32 CLASS 'D' BOUNDARY MAP" BY WILLIAM W. SYMONDS, SR. DATE: AUGUST 30, 1999.
3. BEARINGS DEPICTED ON THIS PLAN ARE BASED ON THE 1983 NORTH AMERICAN DATUM (NAD 83/87) BASED ON GPS COORDINATES PROVIDED BY SLR CONSULTING.
4. INLAND WETLANDS DEPICTED ON THIS PLAN WERE DELINEATED BY SLR CONSULTING.

LEGEND

- PROPERTY LINE
- IRON PIPE/REBAR FOUND
- DRILL HOLE FOUND
- UTILITY POLE
- OVERHEAD WIRES
- EDGE PAVEMENT
- STONEWALL
- TREE WITH BLAZE OR WIRE
- STORM CULVERT
- RAILROAD TRACKS
- BROOK
- METAL BEAM RAIL

60 30 0 60 120 180
GRAPHIC SCALE 1"=60'

I HEREBY DECLARE THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

Eric R. Peterson
ERIC R. PETERSON — L.S. 23430 REGISTRATION NO.

STATE OF CONNECTICUT ERIC R. PETERSON No. 23430 LICENSED LAND SURVEYOR

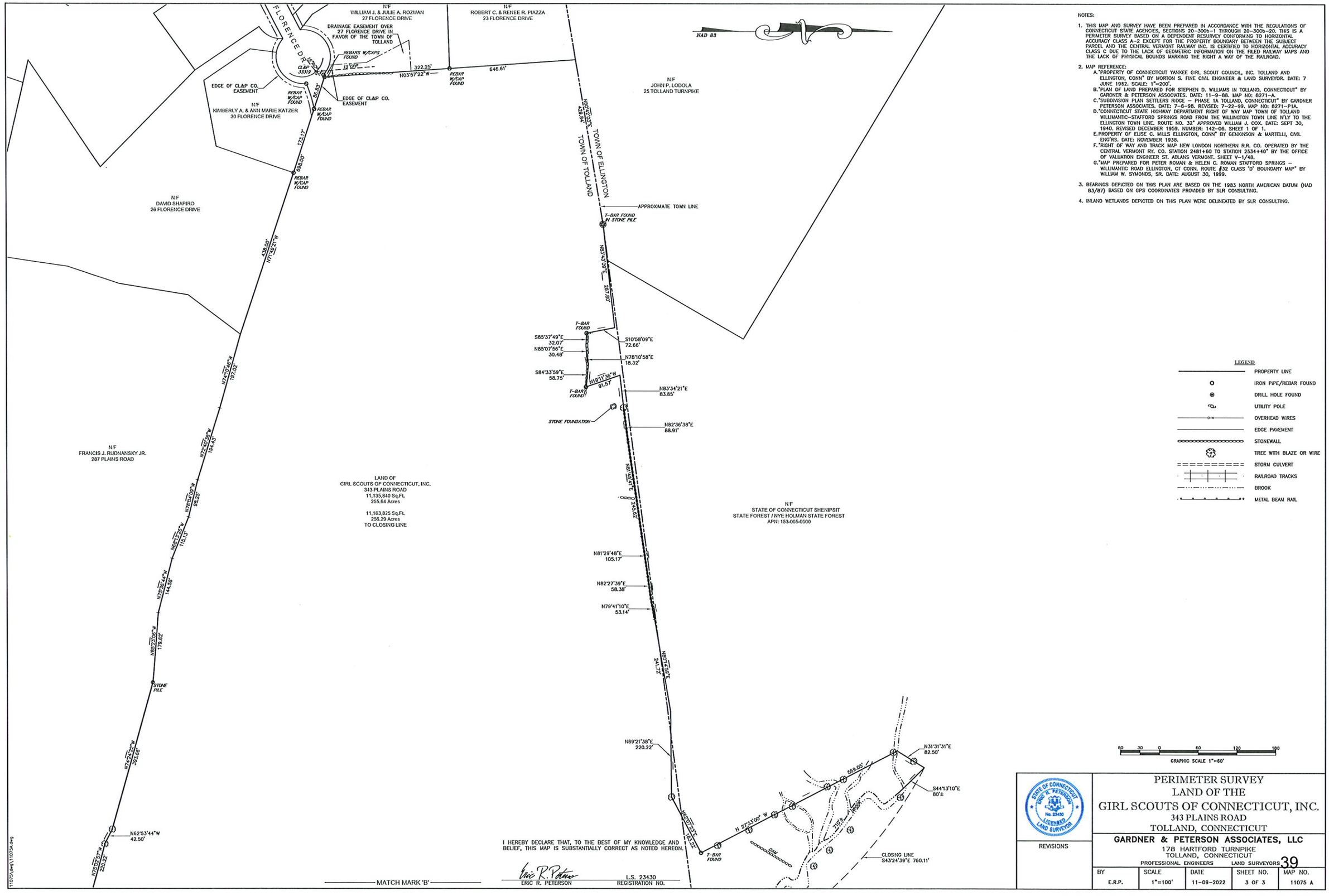
REVISIONS

PERIMETER SURVEY
LAND OF THE
GIRL SCOUTS OF CONNECTICUT, INC.
343 PLAINS ROAD
TOLLAND, CONNECTICUT

GARDNER & PETERSON ASSOCIATES, LLC
178 HARTFORD TURNPIKE
TOLLAND, CONNECTICUT
PROFESSIONAL ENGINEERS LAND SURVEYORS

BY	SCALE	DATE	SHEET NO.	W/A NO.
E.R.P.	1"=100'	11-09-2022	2 OF 3	11075 A

11075\dwg\11075A.dwg



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4. INLAND WETLANDS DEPICTED ON THIS PLAN WERE DELINEATED BY SLR CONSULTING.

LEGEND

- PROPERTY LINE
- IRON PIPE/REBAR FOUND
- DRILL HOLE FOUND
- UTILITY POLE
- OVERHEAD WIRES
- EDGE PAVEMENT
- STONEWALL
- TREE WITH BLAZE OR WIRE
- STORM CULVERT
- RAILROAD TRACKS
- BROOK
- METAL BEAM RAIL

I HEREBY DECLARE THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

Eric R. Peterson
ERIC R. PETERSON — L.S. 23430 REGISTRATION NO.

STATE OF CONNECTICUT — ERIC R. PETERSON — No. 23430 — LICENSED LAND SURVEYOR

REVISIONS

PERIMETER SURVEY
LAND OF THE
GIRL SCOUTS OF CONNECTICUT, INC.
343 PLAINS ROAD
TOLLAND, CONNECTICUT

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BY	SCALE	DATE	SHEET NO.	MAP NO.
E.R.P.	1"=100'	11-09-2022	3 OF 3	11075 A

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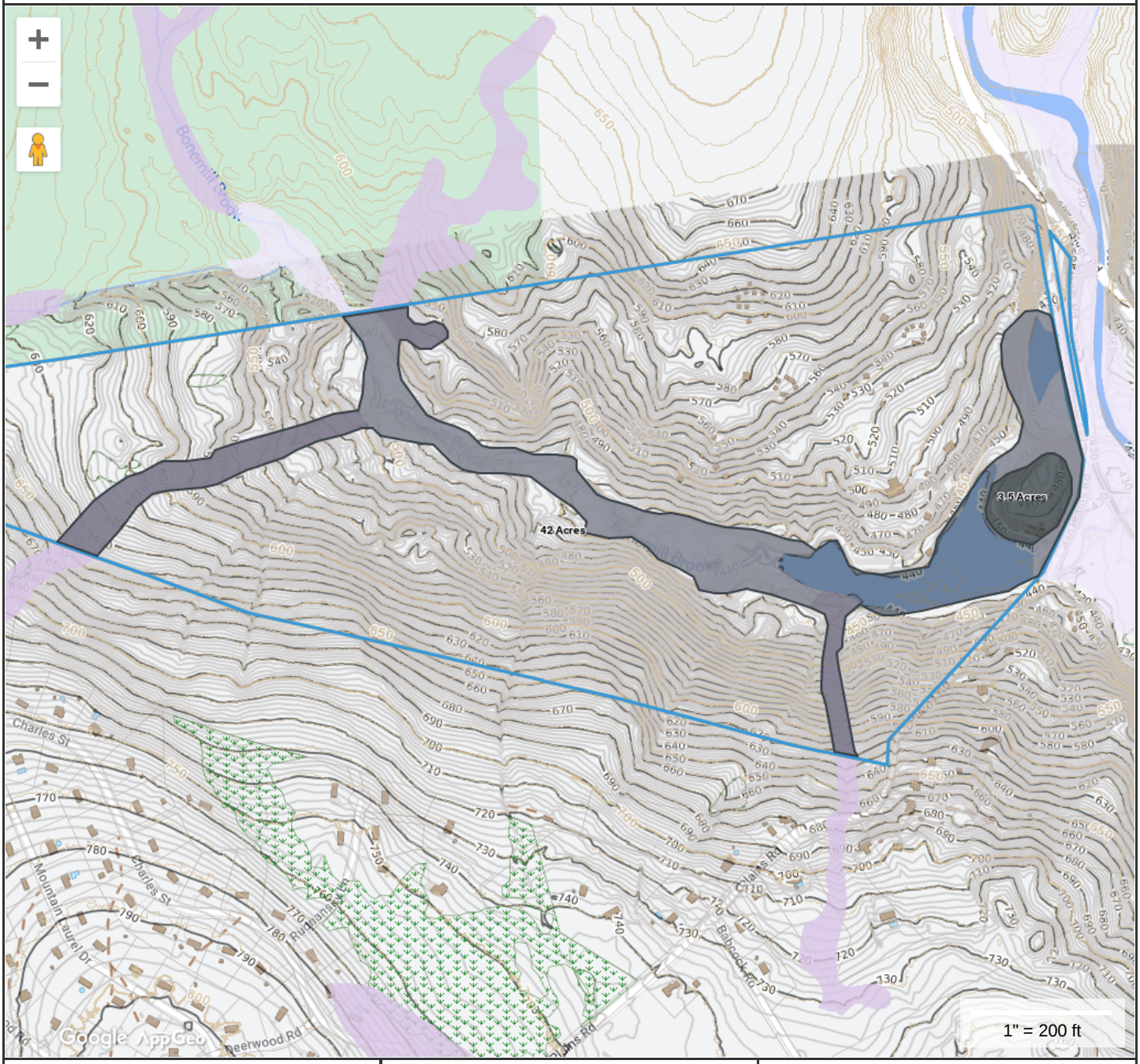


Property Information

Property ID	06/A/001
Location	343 PLAINS ROAD
Owner	GIRL SCOUTS CONN TRAILS COUNCIL

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

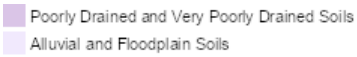
Town of Tolland, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated October 25, 2021
Data updated daily

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

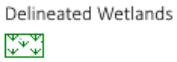
Map Theme Legends

Wetlands - Soils

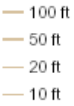


CT DEEP

Wetlands - Delineated

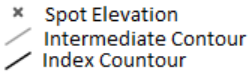


Topography 2016



CT Eco Contours 2016

Topography



January 27, 2023

Ms. Diana Mahoney
Chief Executive Officer
Hartford Service Center
340 Washington Street
Hartford, CT 06106

Re: Wetland Delineation
Camp Yankee Trails – Phase 1 Detailed Design
Girl Scouts of Connecticut
Tolland, Connecticut
SLR #141.13280.00006

Dear Ms. Mahoney,

On October 7, 2022, Matthew Sanford, Registered Soil Scientist and Professional Wetland Scientist, and Meaghan Fogarty, Environmental Scientist, both of SLR International Corporation (SLR) visited the Camp Yankee Trails site, located at 343 Plains Road in Tolland, Connecticut (**Figure 1**). The purpose of the site investigation was to determine the presence or absence of wetlands and/or watercourses and delineate boundaries of wetlands and watercourses, as defined by local, state, and federal statutes. Our investigation was limited to approximately 27 acres of the site's approximately 287-acre property, based on locations of proposed improvements. In summary, regulated resources within the study area consist of Sweetheart Lake, an adjacent forested wetland, an open water/emergent marsh wetland, and two isolated forested wetlands.

The subject site, a Girl Scouts of Connecticut camp, is located within a largely undeveloped portion of northeastern Tolland. It is accessible from the east via Plains Road and supports a number of buildings, including troop houses, a boathouse, and a dining hall. The New England Central railroad line is situated along the eastern property boundary. Approximately 200 feet off site to the east, the Willimantic River flows south between the railroad and River Road. Bonemill Brook, which flows east through the subject property, is impounded by an earthen dam at the eastern extent of Sweetheart Lake. A spillway conveys the watercourse east, where it flows for approximately 1,000 feet before draining into the Willimantic River. Topography on site generally slopes down from west to east, towards the Willimantic River. Approximate elevations within the study area range from 425 to 534 feet above mean sea level (MSL).

The site is located within the northern portion of the Willimantic River subregional watershed (basin #3100), which spans 51.2 square miles from Stafford to Windham. The Willimantic River flows south to its convergence with the Shetucket River in Windham before draining into the Thames River in Norwich. The

Thames River empties into the Long Island Sound in New London/Groton. According to the most recent Federal Emergency Management Agency (FEMA) mapping (effective April 1, 1982) no digital data is available regarding onsite flood hazards.

Wetland Delineation

Inland wetlands and watercourses within the project site were delineated in accordance with the regulations of the Town of Tolland, Connecticut, and the State of Connecticut Inland Wetlands and Watercourses Act, CGS 22a-36 through 45. State-regulated wetland areas consist of any of the soil types designated by the National Cooperative Soils Survey as poorly drained, very poorly drained, alluvial, or floodplain. Regulated watercourses consist of rivers; streams; brooks; waterways; lakes; ponds; marshes; swamps; bogs; and all other bodies of water, natural or artificial, vernal or intermittent, public or private, not regulated pursuant to Sections 22a-28 to 22a-35 inclusive (tidal wetlands). Intermittent watercourse determinations were made based on the presence of a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation. On the day of the site investigation, weather conditions were sunny with an air temperature of approximately 65°F. Site conditions were suitable for wetland delineation work.

Inland wetland delineation methods followed the 1987 U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (USACE, 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Northcentral and Northeast Region* (USACE, 2012). The classification system of the National Cooperative Soil Survey and Field Indicators of Hydric Soils in the United States (USDA, 2017) were used in this investigation. Soils were examined using a Dutch auger. Geospatial data was accessed via the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS) web soil survey mapping. The soil survey mapping is appended (**Figure 2**). The survey identifies the following soil mapping units with associated NRCS map numbers in the study area:

- Nipmuck-Brookfield complex, very rocky (72C & 72E) – Well drained
- Fluvaquents-Udifluvents complex, frequently flooded (109) – Poorly drained

In general, the soils observed within the project area were consistent with those mapped by the USDA-NRCS web soil survey. Please note that SLR did not fully delineate the upland soil types within the project area. Sequentially numbered flags delineating the boundary of the ordinary high water (OHW) line along the lake (blue) and state and federal wetlands (pink) were attached to sturdy vegetation within the study area and generally spaced every 30 to 50 feet; the locations were recorded using a handheld Global Positioning System (GPS) unit with submeter accuracy. The flag locations and numbers are depicted on the attached wetlands and watercourses map (**Figure 3**). Complete boundaries are located along the lines that

connect these sequentially numbered flags. The delineated wetland resources are described further below.

Sweetheart Lake/Bonemill Brook

The OHW boundary of Sweetheart Lake was delineated within the study area, represented by flags Ohw-1 through Ohw-62 (Figure 3). On the day of investigation, the lake's water surface elevation was significantly lower than its OHW, which can be attributed to the moderate to severe summer drought conditions affecting Connecticut this year. Bonemill Brook flows into the lake at its western extent. Two dock structures extend towards the center from the northern shore, and a riprap bar bisects the lake at its narrowest point to create a sediment forebay along its western shoreline. The earthen dam at the eastern extent contains a stone and concrete spillway, which conveys Bonemill Brook east through a triple-pipe culvert below Plains Road. The lake's substrate is comprised of silt, sand, and organic materials.

The lake is generally surrounded by upland forest, supporting a canopy of eastern white pine (*Pinus strobus*), eastern white oak (*Quercus alba*), black oak (*Quercus velutina*), northern red oak (*Quercus rubra*), sugar maple (*Acer saccharum*), and red maple (*Acer rubrum*). The margins of the lake, directly along its OHW line, support gray birch (*Betula populifolia*), black cherry (*Prunus serotina*), scrub oak (*Quercus ilicifolia*), alder (*Alnus sp.*), highbush blueberry (*Vaccinium corymbosum*), and mountain laurel (*Kalmia latifolia*). Below the OHW line, hydrophytic herbaceous vegetation has populated areas once inundated by the lake, including water purslane (*Ludwigia palustris*), rice cut grass (*Leersia oryzoides*), deer-tongue panicgrass (*Dichanthelium clandestinium*), straw-colored flatsedge (*Cyperus strigosus*), and jewelweed (*Impatiens capensis*). A small stand (approximately 20 stalks) of the highly invasive common reed (*Phragmites australis*) was observed along the northern shore of the lake, downgradient from the entry parking area. SLR recommends this stand be treated by the organization to help prevent its spread and further colonization of the lake shoreline.

Forested Wetlands

Four federal/state-regulated wetlands were delineated throughout the study area: one forested wetland adjacent to Sweetheart Lake (**Wetland A**), two isolated forested wetlands (**Wetland X and Y**), and one open water/emergent marsh wetland (**Wetland Z**).

Wetland A is a palustrine forested wetland adjacent to Sweetheart Lake, north of to the lake's northern finger, and bounded to the north, west, and east by a camp road. It is represented by flags Wa-1 through Wa-14 and abuts flags Ohw-28 through Ohw-31. The low-lying area is dominated by yellow birch (*Betula alleghaniensis*) and red maple, with an understory comprised of Japanese barberry (*Berberis thunbergii*), highbush blueberry, multiflora rose (*Rosa multiflora*), poison ivy (*Toxicodendron radicans*), sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmundastrum cinnamomeum*), and sedges (*Carex sp.*). Stained leaves and drainage patterns confirmed persistent saturation.

Wetlands X and Y occur north of the dining hall and are represented by flags WX-1 through WX-6 and WY-1 through WY-11, respectively. They are both flat, isolated, palustrine forested wetlands supported by groundwater discharge. Stones, boulders, and microtopography throughout both wetlands contribute to their structural complexity. Neither possess a formal outlet; however, due to their geomorphic position and lack of appropriate hydrologic conditions, they are not classified as vernal pools. Both wetlands are dominated by red maple, highbush blueberry, American witch-hazel (*Hamamelis virginiana*), ferns, and sedges.

Wetland Z is a depressional system classified as palustrine open water wetland and emergent marsh. It is represented by flags WZ-1 through WZ-6 and is located in the northeast portion of the study area, north of Sweetheart Lake and just east of Plains Road. Please note, based on the defined study area, the entire boundary of this wetland system was not delineated. Vegetation along the shoreline is comprised primarily of red maple, sweet pepperbush (*Clethra alnifolia*), and highbush blueberry. The open water portion is dominated by buttonbush (*Cephalanthus occidentalis*), speckled alder (*Alnus incana*), and highbush blueberry. Herbaceous vegetation within this wetland is comprised of woolgrass (*Scirpus cyperinus*), soft rush (*Juncus effusus*), swamp beggar-ticks (*Bidens frondosa*), and sedges.

Functions and Values

SLR also assessed the study area's wetland systems based on functions and values that they perform within the localized/regional watershed, based on the USACE *Highway Methodology Workbook*. The primary functions and values of Sweetheart Lake and adjacent forested wetland (**Wetland A**) within the study area include the following:

- Recreation
- Sediment/toxicant retention
- Nutrient removal/retention/transformation
- Fish habitat
- Wildlife habitat
- Production export

The primary functions and values of the isolated forested wetland systems (**Wetlands X and Y**) within the study area include the following:

- Groundwater recharge/discharge
- Wildlife habitat (non-water dependent)

The primary functions and values of the open water/emergent marsh (**Wetland Z**) within the study area include the following:

- Sediment/toxicant retention
- Nutrient removal/retention/transformation
- Floodflow alternation
- Fish habitat
- Wildlife habitat

If you have any questions regarding this soil scientist report, please do not hesitate to contact either of the undersigned at (203) 271-1773.

Very truly yours,

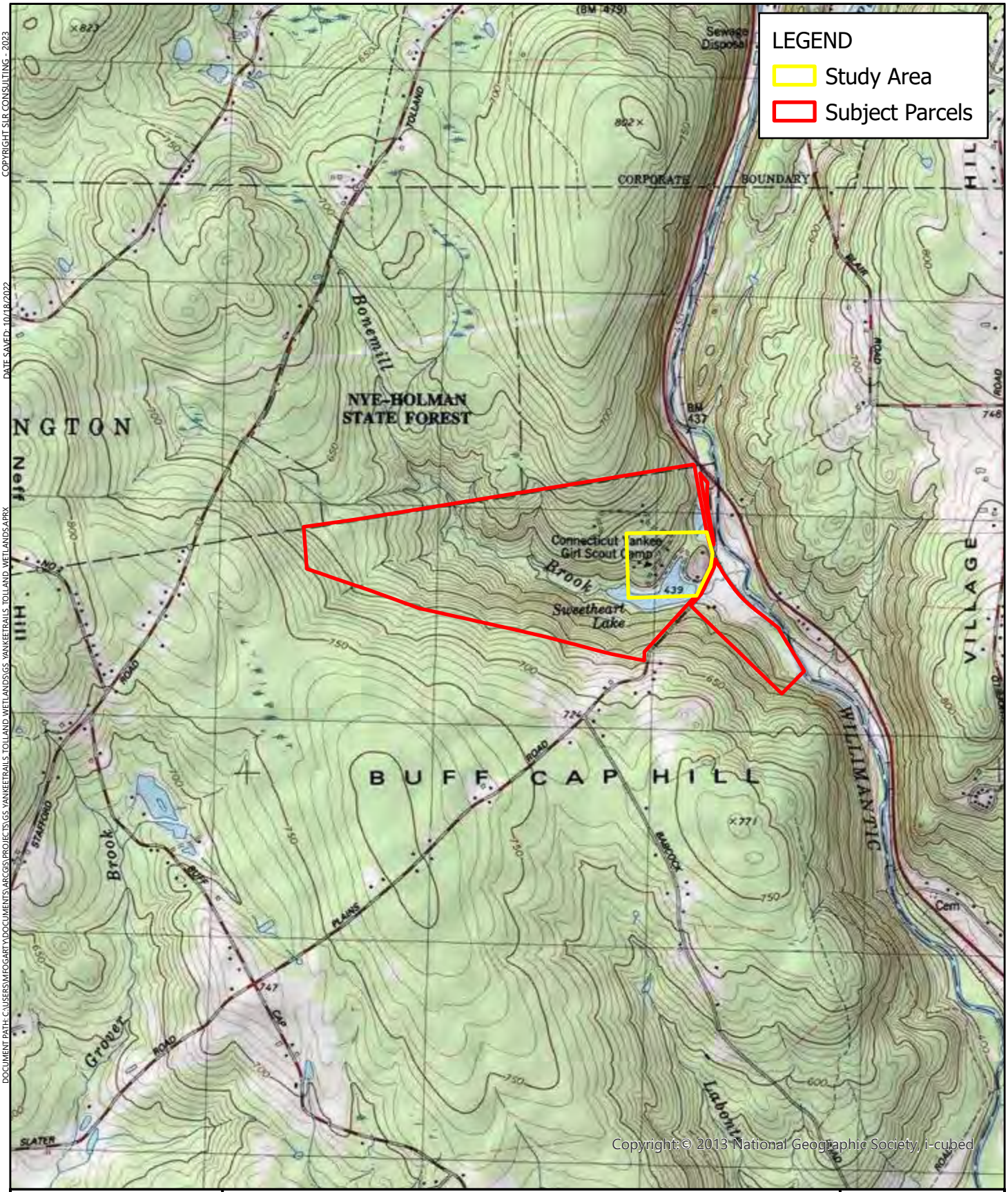
SLR International Corporation

Matthew J. Sanford, MS, PWS
US Manager of Ecology

Meaghan Fogarty
Environmental Scientist

Enclosures: Figures 1, 2, and 3
Photolog

13280.00006.j2723.ltr.docx



DATE SAVED: 10/18/2022

DOCUMENT PATH: C:\USERS\MFOGARTY\DOCUMENTS\ARCGIS\PROJECTS\GIS YANKEETRAILS TOLLAND WETLANDS\GIS YANKEETRAILS TOLLAND WETLANDS.APRX

SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

USGS LOCUS MAP

CAMP YANKEE TRAILS - PHASE 1
GIRL SCOUTS OF CONNECTICUT
343 PLAINS ROAD
TOLLAND, CT 06084

N

0 2,000
Feet

SCALE 1" = 2000'
DATE 1/26/2023
141.13280.00006
PROJ. NO.

FIG. 1

Soil Map—State of Connecticut
(Figure 2)

Map Scale: 1:2,520 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 35 70 140 210

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

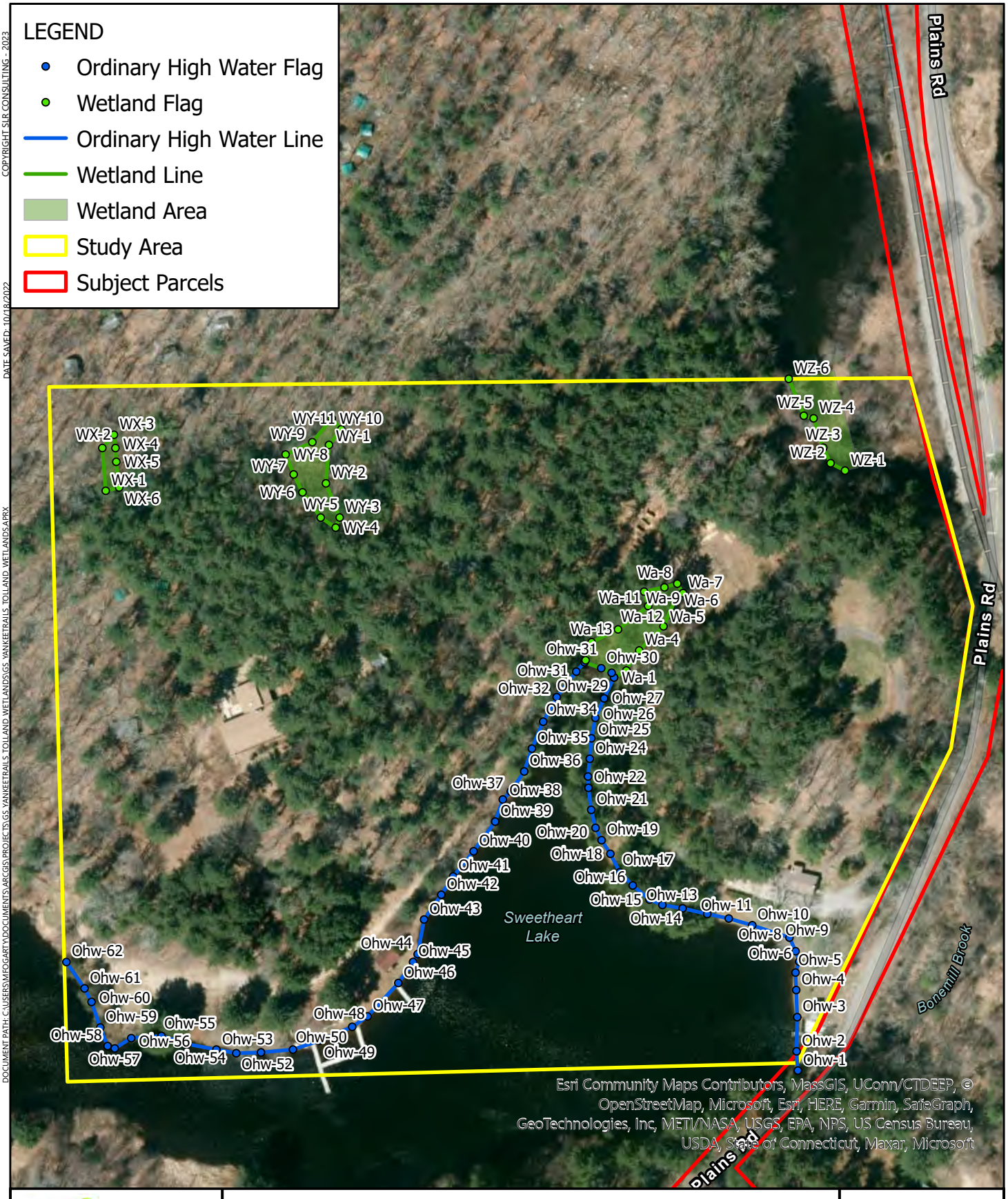
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 3, 2019—Oct 22, 2019

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	9.8	38.8%
72E	Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky	7.1	28.3%
109	Fluvaquents-Udifluvents complex, frequently flooded	3.5	14.0%
W	Water	4.8	19.0%
Totals for Area of Interest		**25.1**	**100.0%**



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DATE SAVED: 10/18/2022

DOCUMENT PATH: C:\USERS\MFOGARTY\DOCUMENTS\ARCGIS\PROJECTS\GS YANKEETRAILS TOLLAND WETLANDS\GS YANKEETRAILS TOLLAND WETLANDS.APRX

SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

WETLANDS AND WATERCOURSES

CAMP YANKEE TRAILS - PHASE 1
GIRL SCOUTS OF CONNECTICUT
343 PLAINS ROAD
TOLLAND, CT 06084

N

0 250
Feet

SCALE 1" = 250'
DATE 1/26/2023
141.13280.00006
PROJ. NO.

FIG. 3

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Girl Scouts of Connecticut	Camp Yankee Trails – Tolland, CT	141.13280.00006

Photo No.	**Date:**
1	10/7/22

Direction Photo Taken:

Southwest

Description:

Sweetheart Lake from its northeastern shore.

Photo No.	**Date:**
2	10/7/22

Direction Photo Taken:

West

Description:

Sweetheart Lake from its northwestern shore. Note the distinct break in slope and line of perennial vegetation indicating the ordinary high water line.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Girl Scouts of Connecticut	Camp Yankee Trails – Tolland, CT	141.13280.00006

Photo No.	Date:
3	10/7/22

Direction Photo Taken:

South

Description:

Riprap bar extending south into the lake from the northern shore. Exposed and vegetated due to low water levels.

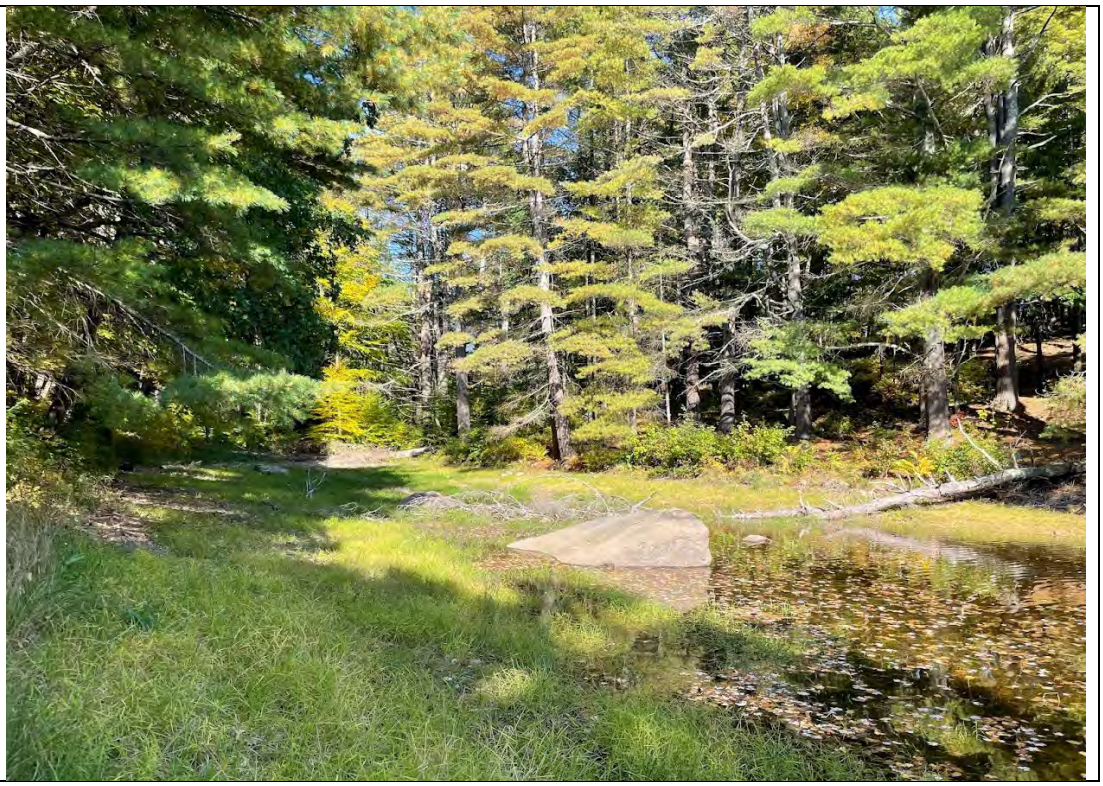
Photo No.	Date:
4	10/7/22

Direction Photo Taken:

Northeast

Description:

Northern finger of Sweetheart Lake looking towards the adjacent forested wetland.



PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Girl Scouts of Connecticut	Camp Yankee Trails – Tolland, CT	141.13280.00006

Photo No.	**Date:**
5	10/7/22

Direction Photo Taken:

South

Description:

Forested wetland adjacent to the lake, dominated by yellow birch, red maple, and Japanese barberry.

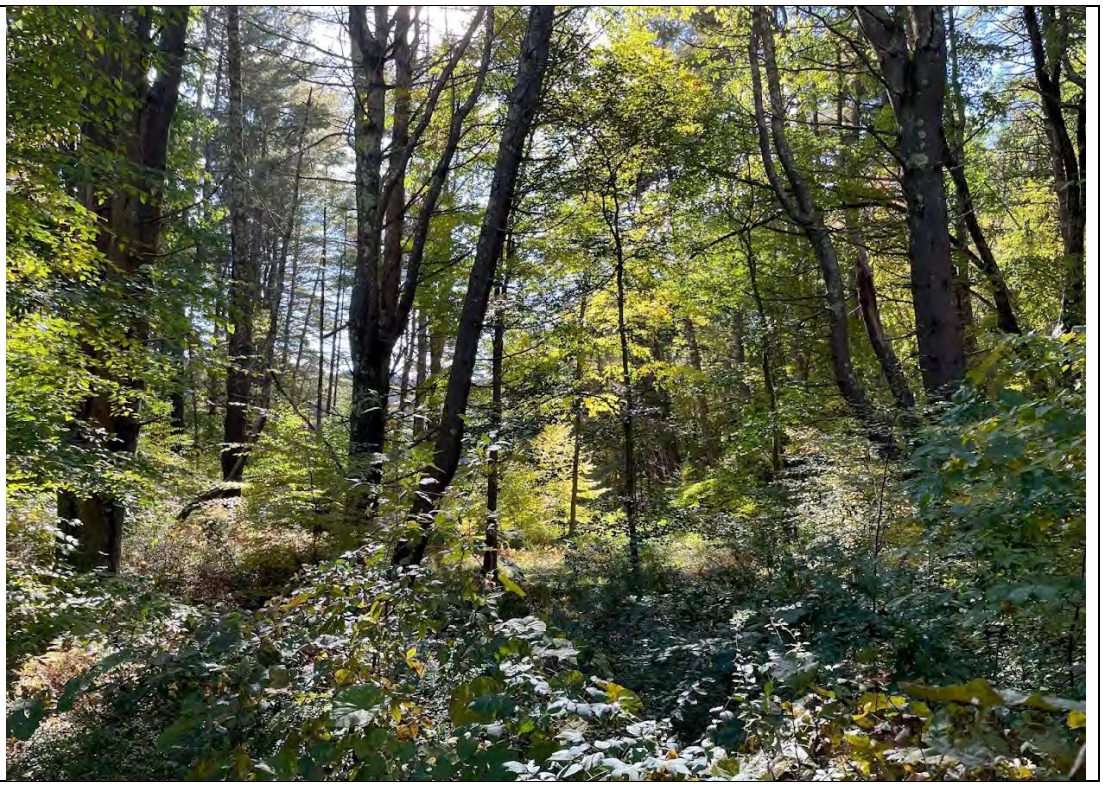
Photo No.	**Date:**
6	10/7/22

Direction Photo Taken:

North

Description:

A second view of the forested wetland adjacent to the lake.



PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Girl Scouts of Connecticut	Camp Yankee Trails – Tolland, CT	141.13280.00006

Photo No.	**Date:**
7	10/7/22

Direction Photo Taken:

Northwest

Description:

Small stand of *Phragmites australis* on the lake's north shoreline.

Photo No.	**Date:**
8	10/7/22

Direction Photo Taken:
East

Description:
Wetland WA Palustrine open water/emergent wetland

PHOTOGRAPHIC LOG

Client Name:	**Site Location:**	**Project No.**
Girl Scouts of Connecticut	Camp Yankee Trails – Tolland, CT	141.13280.00006

Photo No.	**Date:**
9	10/7/22

Direction Photo Taken:
East

Description:
Wetland X – Isolated Forested Wetland

Photo No.	**Date:**
10	10/7/22

Direction Photo Taken:
West

Description:
Wetland Y – Isolated Forested Wetland

Camp Yankee Trails Site Improvements

343 Plains Road
Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

20 Washington Avenue
North Haven, CT 06473

Prepared by:

SLR International Corporation

99 Realty Drive, Cheshire, Connecticut, 06410

SLR Project No.: 141.13280.00006.0080

November 20, 2023

Making Sustainability Happen

Drainage Report

Camp Yankee Trails Site Improvements
343 Plains Road
Tolland, Connecticut
SLR #141.13280.000006.0080

This Drainage Report has been prepared in support of the proposed upgrades to the existing Girl Scouts camp on Plains Road in the town of Tolland, Connecticut. This project includes renovations and additions to the dining hall, a new shower house, and four new cabins including an Americans with Disabilities Act (ADA) accessible unit, a new parking lot, stone dust and concrete paths, an access road, and stormwater improvements.

Figure 1 – 343 Plains Road, Map, Block, Lot (MBL): 06-A-001

Table 1 – Stormwater Data

Parcel Size Total	221 acres
Existing Impervious Area (Watershed Area)	0.74 acres
Proposed Impervious Area (Watershed Area)	1.79 acres
Soil Type (Hydrologic Soil Group)	"B" and "C"
Existing Land Use	Open space, woods, gravel, water, building, and paved/impervious cover
Proposed Land Use	Open space, woods, gravel, water, building, and paved/impervious cover
Design Storm for Stormwater Management	No increases in peak rates of runoff for the 2-, 10-, 25-, 50-, and 100-year storms; Connecticut Department of Energy & Environmental Protection (CTDEEP) water quality volume (WQV)
Water Quality Measures	Catch basins with 2-foot sumps, underground detention system, and retention/infiltration storage for WQV
Design Storm for Storm Drainage	25-year storm
Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas	Area of Minimal Flood Hazard (Zone X)
Connecticut Department of Energy & Environmental Protection Aquifer Protection Areas	None

Stormwater Management Approach

The proposed stormwater management system for the project focuses on providing water quality management while attenuating proposed peak flows. Water quality treatment in accordance with the CTDEEP requirements for WQV is provided. The proposed stormwater treatment train consists of catch basins with 2-foot sumps and retention/infiltrations storage for the WQV.

The computer program entitled *Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2023* by Autodesk, Inc. was used for designing the proposed storm drainage collection system. Storm drainage computations performed include pipe capacity and hydraulic grade line calculations. The contributing watershed to each individual catch basin inlet was delineated to determine the drainage area and land coverage. These values were used to determine the stormwater runoff to each inlet using the Rational Method. The rainfall intensities for the site were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14,

Volume 10, Precipitation Frequency Data Server (PFDS). The proposed storm drainage system is designed to provide adequate capacity to convey the 25-year storm event.

Water Quality Management

Water quality measures or Best Management Practices (BMPs) have been incorporated into the design to maintain water quality to provide protection of the areas downgradient of the proposed development. The proposed stormwater management system will include catch basins with 2-foot sumps and retention/infiltration storage for the WQV.

The proposed stormwater basin will provide retention volume along its bottom, thus creating a water quality feature within it. This serves several purposes, including stormwater renovation and first-flush retention. The vegetation will provide pollutant removal by filtering stormwater runoff and utilizing excess nutrients that may be present in the stormwater. The CTDEEP *2004 Stormwater Quality Manual* (Chapter 7) recommends methods for sizing stormwater treatment measures with WQV computations. The WQV addresses the initial stormwater runoff, also commonly referred to as the "first-flush" runoff. The WQV provides adequate volume to store the runoff associated with the first 1 inch of rainfall, which tends to contain the highest concentration of potential pollutants. Supporting calculations have been included in the Appendix of this report.

Hydrologic Analysis

A hydrologic analysis was conducted to analyze the predevelopment and postdevelopment peak-flow rates from the site. One analysis point was selected, as it receives all runoff from the site. Analysis Point A represents Sweetheart Lake. The total watershed area delineated is approximately 46.6 acres under both existing and proposed conditions.

The method of predicting the surface water runoff rates utilized in this analysis was a computer program titled *Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2019* by Autodesk, Inc., Version 2020. The *Hydrographs* program is a computer model that utilizes the methodologies set forth in the *Technical Release No. 55* (TR-55) manual and *Technical Release No. 20* (TR-20) computer model, originally developed by the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS). The *Hydrographs* computer modeling program is primarily used for conducting hydrology studies such as this one.

The *Hydrographs* computer program forecasts the rate of surface water runoff based upon several factors. The input data includes information on land use, hydrologic soil type, vegetation, contributing watershed area, time of concentration, rainfall data, storage volumes, and the hydraulic capacity of structures. The computer model predicts the amount of runoff as a function of time, with the ability to include the attenuation effect due to dams, lakes, large wetlands, floodplains, and stormwater management basins. The input data for rainfalls with statistical recurrence frequencies of 2, 10, 25, 50, and 100 years was obtained from the NOAA Atlas 14, Volume 10 database. The corresponding rainfall totals are listed below.

Storm Frequency	Rainfall (inches)
2-year	3.25
10-year	5.07
25-year	6.21
50-year	7.04
100-year	7.96

Land use for the site under existing and proposed conditions was determined from field survey and aerial photogrammetry. Land use types used in the analysis included grassed or open space, woods, water, gravel, building, and impervious (paved) cover. Soil types in the watershed were determined from the CTDEEP Geographic Information System (GIS) database of the USDA-NRCS soil survey for Tolland County, Connecticut. For the analysis, the site was determined to contain hydrologic soil types "B" and "C" as classified by USDA-NRCS. Composite runoff Curve Numbers (CN) for each subwatershed were calculated based on the different land use and soil types. The time of concentration (Tc) was estimated for each subwatershed using the TR-55 methodology and was computed by summing all travel times through the watershed as sheet flow, shallow concentrated flow, and channel flow.

The existing conditions were modeled with the *Hydrographs* program to determine the peak-flow rates for the various storm events at the analysis point. A revised model was developed incorporating the proposed site conditions, the underground chamber system, and the stormwater management basin. The flows obtained with the revised model were then compared to the results of the existing conditions model. Peak-flow rates from the project site were controlled by the storage volume provided within the stormwater management basin and the underground chamber system.

The following peak rates of runoff were obtained from the *Hydrographs* hydrology results:

Analysis Point A – Sweetheart Lake					
	Peak Runoff Rate (cubic feet per second)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Existing Conditions	7.7	37.0	61.7	81.4	104.6
Proposed Conditions	7.5	35.7	60.8	81.0	104.2

Detention Basin 110*					
	Water Surface Elevation (feet)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Proposed Conditions	448.4	448.9	449.2	449.3	449.4

***Top of Berm Elevation = 450.3**

Underground Chamber System 111**					
	Water Surface Elevation (feet)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Proposed Conditions	441.5	443.1	443.7	444.1	444.8

****Top of Stone Elevation = 445.0**

Conclusion

The results of the hydrologic analysis demonstrate that there will be no increases in peak-flow rates from the proposed development. This was achieved for storm events modeled through a planned stormwater management system with a subsurface infiltration system and stormwater management basin. The proposed development will also introduce a new stormwater treatment train consisting of catch basins with 2-foot sumps and retention/infiltration of the WQV.

All supporting documentation and stormwater-related computations are attached to this report along with the *Hydrographs* model results for stormwater management and *Hydraflow Storm Sewers* model results for the proposed storm drainage system. Illustrative watershed maps for both existing and proposed conditions are also attached to this report.

Appendices

Appendix A	United States Geological Survey Location Map
Appendix B	Federal Emergency Management Agency Flood Insurance Rate Map
Appendix C	Natural Resources Conservation Service Hydrologic Soil Group Map
Appendix D	Storm Drainage Computations
Appendix E	Water Quality Computations
Appendix F	Hydrologic Analysis – Existing Conditions
Appendix G	Hydrologic Analysis – Proposed Conditions
Appendix H	Watershed Maps

13280.00006.0080.n2023.rpt.docx

Appendix A
United States Geological Survey Location Map

Camp Yankee Trails Site Improvements

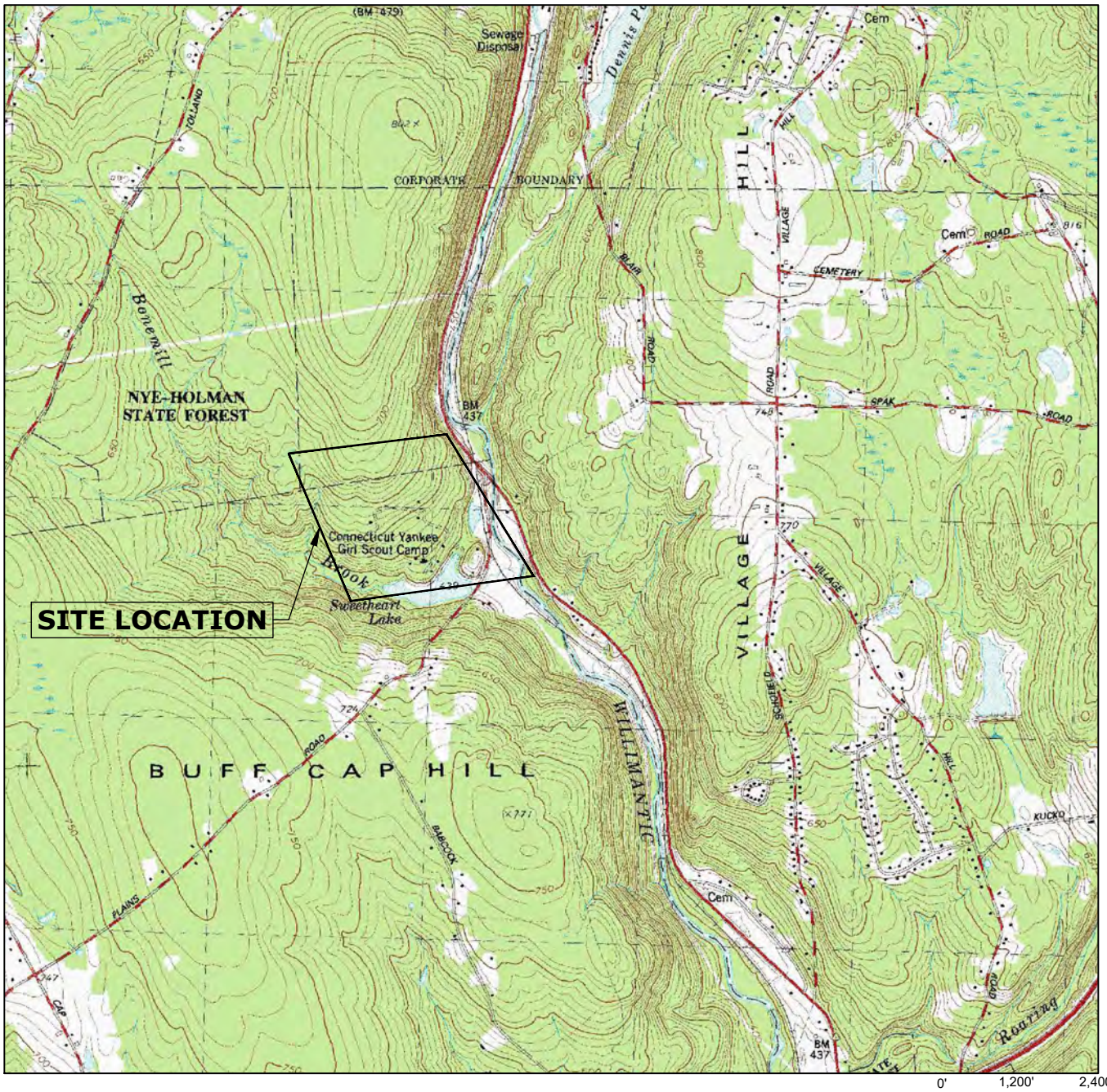
343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0080.0080

November 20, 2023



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203.271.1773
SLRCONSULTING.COM

USGS QUADRANGLE MAP, QUAD NO. 25

CAMP YANKEE TRAILS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

PROJECT PHASE:

REV: ---

DATE	NOVEMBER 13, 2023
SCALE	1"=2,400'
PROJ. NO.	13280.00006

DESIGNED	DRAWN	CHECKED
---	JLS	---

DRAWING NAME:

LOC

Appendix B
FEMA Flood Insurance Rate Map

Camp Yankee Trails Site Improvements

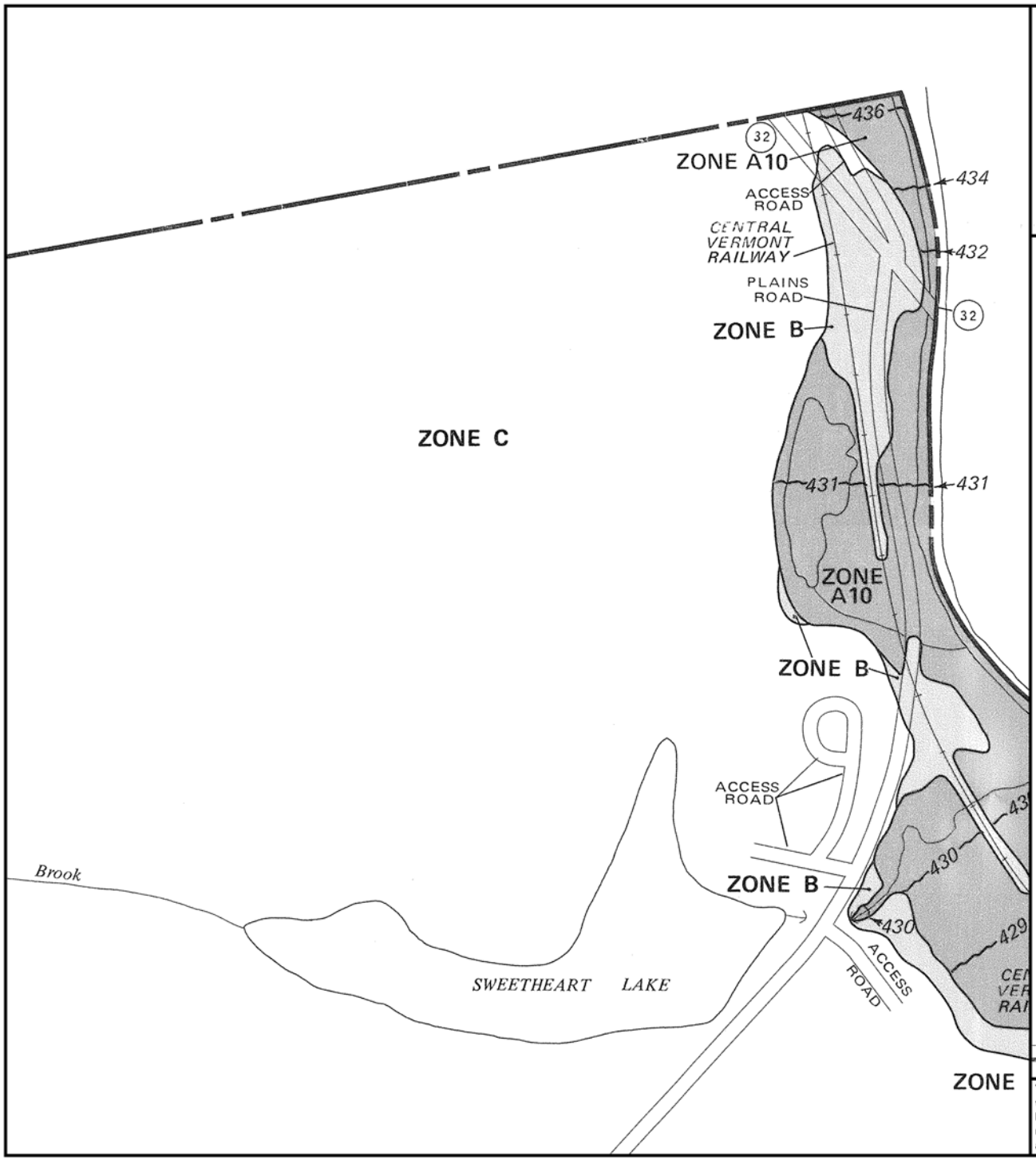
343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0080.0080

November 20, 2023



APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
TOLLAND,
CONNECTICUT
TOLLAND COUNTY

PANEL 7 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
090171 0007 A

EFFECTIVE DATE:
APRIL 1, 1982

Federal Emergency Management Agency

Appendix C
Natural Resources Conservation Service Hydrologic Soil Group Map

Camp Yankee Trails Site Improvements

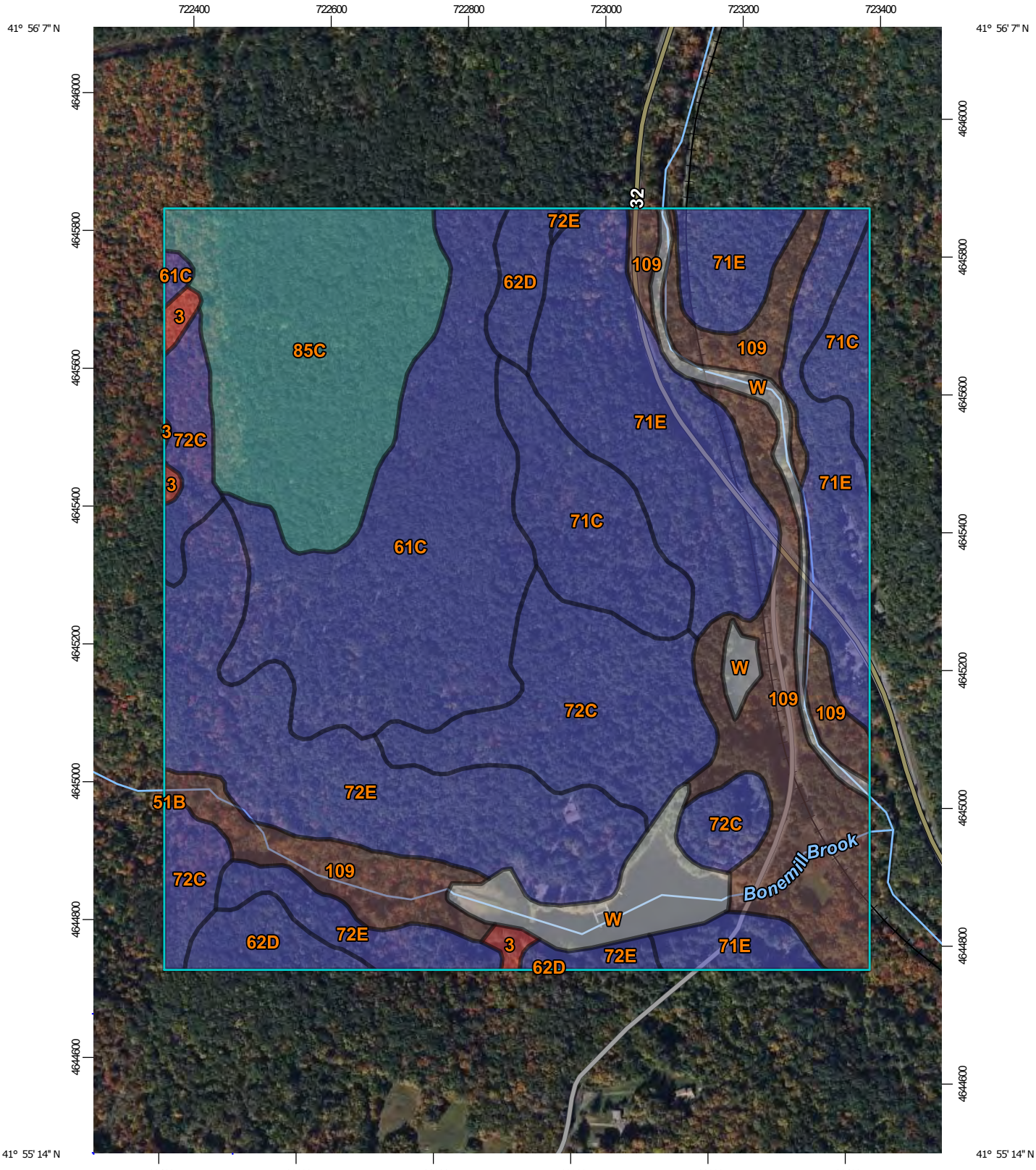
343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0080.0080

November 20, 2023



Map Scale: 1:7,960 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	1.8	0.6%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	B/D	0.0	0.0%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	B	42.9	15.2%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	B	8.4	3.0%
71C	Nipmuck-Brimfield-Rock outcrop complex, 3 to 15 percent slopes	B	17.4	6.2%
71E	Nipmuck-Brimfield-Rock outcrop complex, 15 to 45 percent slopes	B	47.9	17.0%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	B	33.5	11.9%
72E	Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky	B	40.5	14.4%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	C	35.3	12.5%
109	Fluvaquents-Udifluvents complex, frequently flooded	B/D	39.6	14.1%
W	Water		14.2	5.0%
Totals for Area of Interest			**281.6**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix D
Storm Drainage Computations

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0080.0080

November 20, 2023

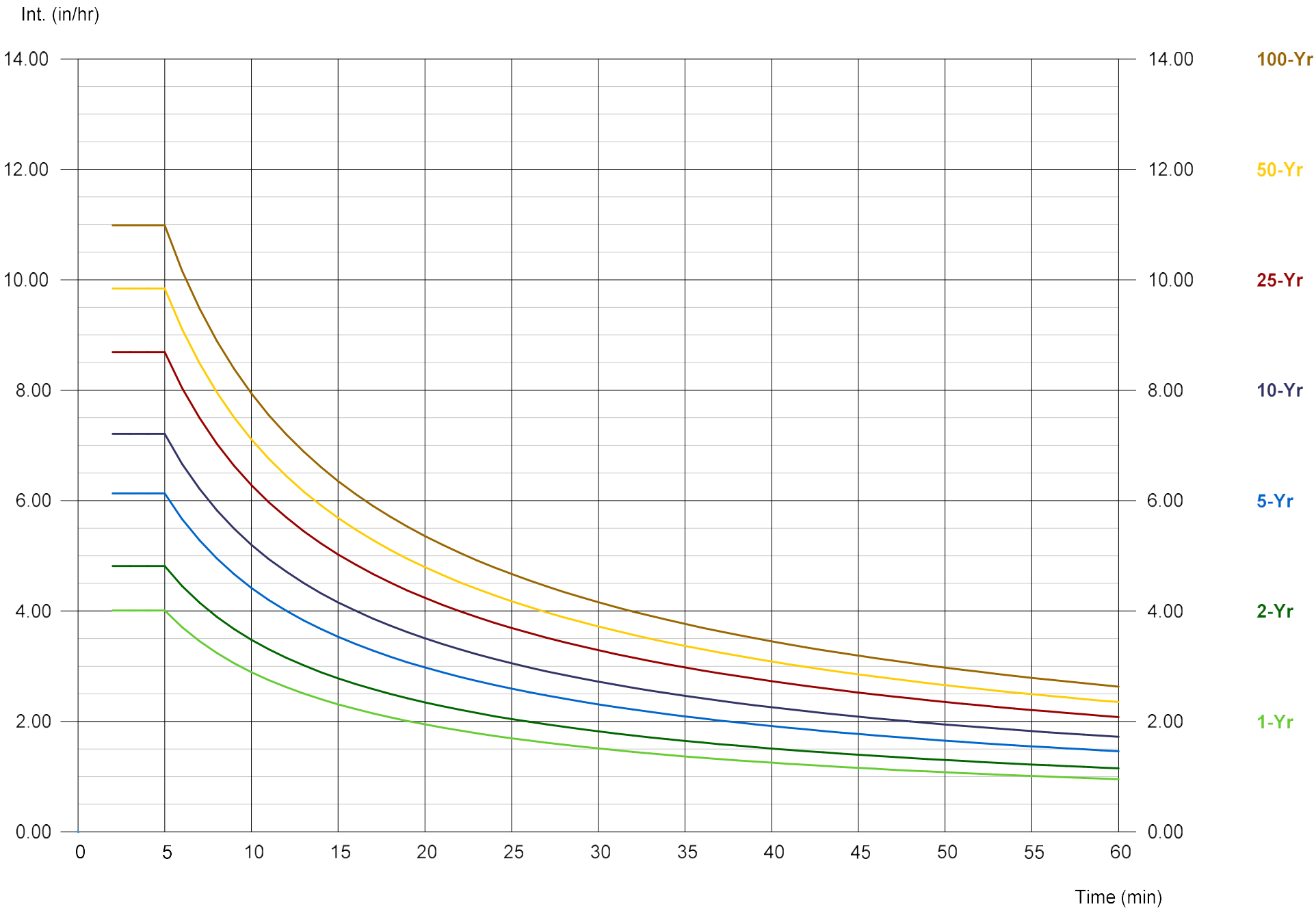
Rational Method Individual Basin Calculations

Project: Camp Yankee Trails Site Improvement By: JLS Date: 11/16/23
Location: 343 Plains Road, Tolland, CT Checked: MCB Date: 11/17/23

Basin Name	Impervious Area C=0.9 (sf)	Grassed Area C=0.3 (sf)	Gravel Area C=0.6 (sf)	Wooded Area C=0.2 (sf)	Total Area (sf)	Total Area (ac)	Weighted C	Tc (min)
System 110								
MH 5	907	848	0	32	1787	0.04	0.60	5.0
MH 6	2207	6311	512	6753	15783	0.36	0.35	5.0
MH 7	5492	5055	0	9041	19588	0.45	0.42	5.0
MH 8	3270	3165	0	0	6435	0.15	0.60	5.0
MH 9	1793	1899	219	294	4205	0.10	0.56	5.0
MH 10	969	535	0	0	1504	0.03	0.69	5.0
CLCB 11	11775	3336	0	0	15111	0.35	0.77	5.0
CLCB 12	7651	5971	0	0	13622	0.31	0.64	5.0
YD 13	432	392	0	0	824	0.02	0.61	5.0
CLCB 14	1881	347	0	0	2228	0.05	0.81	5.0
YD 15	818	343	0	0	1161	0.03	0.72	5.0
YD 16	0	603	0	0	603	0.01	0.30	5.0

Storm Sewer IDF Curves

IDF file: Tolland.IDF



NOAA Atlas 14, Volume 10, Version 3
Location name: Tolland, Connecticut, USA*
Latitude: 41.9274°, Longitude: -72.3121°
Elevation: 579 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.02** (3.06-5.27)	**4.82** (3.67-6.32)	**6.13** (4.67-8.09)	**7.22** (5.46-9.55)	**8.72** (6.41-12.0)	**9.85** (7.12-13.9)	**11.0** (7.75-16.1)	**12.3** (8.26-18.4)	**14.2** (9.17-21.9)	**15.7** (9.91-24.7)
10-min	**2.84** (2.17-3.73)	**3.41** (2.60-4.48)	**4.34** (3.30-5.72)	**5.12** (3.87-6.77)	**6.18** (4.54-8.52)	**6.98** (5.03-9.82)	**7.81** (5.49-11.4)	**8.73** (5.84-13.0)	**10.0** (6.49-15.5)	**11.1** (7.02-17.5)
15-min	**2.23** (1.70-2.92)	**2.68** (2.04-3.51)	**3.40** (2.59-4.48)	**4.01** (3.04-5.30)	**4.84** (3.56-6.68)	**5.47** (3.94-7.70)	**6.13** (4.30-8.93)	**6.85** (4.59-10.2)	**7.87** (5.09-12.2)	**8.70** (5.51-13.7)
30-min	**1.51** (1.15-1.98)	**1.82** (1.38-2.38)	**2.31** (1.76-3.04)	**2.72** (2.06-3.60)	**3.29** (2.42-4.54)	**3.72** (2.68-5.23)	**4.16** (2.92-6.07)	**4.65** (3.12-6.94)	**5.35** (3.46-8.26)	**5.91** (3.74-9.31)
60-min	**0.954** (0.729-1.25)	**1.15** (0.874-1.50)	**1.46** (1.11-1.92)	**1.72** (1.30-2.28)	**2.08** (1.53-2.87)	**2.35** (1.69-3.30)	**2.63** (1.85-3.83)	**2.94** (1.97-4.39)	**3.38** (2.19-5.22)	**3.74** (2.37-5.88)
2-hr	**0.609** (0.467-0.794)	**0.730** (0.559-0.952)	**0.927** (0.707-1.21)	**1.09** (0.828-1.43)	**1.32** (0.972-1.81)	**1.48** (1.08-2.09)	**1.66** (1.18-2.43)	**1.87** (1.26-2.78)	**2.18** (1.42-3.36)	**2.45** (1.55-3.83)
3-hr	**0.467** (0.358-0.606)	**0.559** (0.429-0.727)	**0.711** (0.544-0.927)	**0.837** (0.637-1.10)	**1.01** (0.749-1.39)	**1.14** (0.831-1.60)	**1.28** (0.912-1.87)	**1.44** (0.971-2.14)	**1.70** (1.10-2.60)	**1.92** (1.22-2.99)
6-hr	**0.296** (0.229-0.383)	**0.358** (0.276-0.462)	**0.457** (0.351-0.593)	**0.540** (0.413-0.704)	**0.654** (0.488-0.895)	**0.738** (0.541-1.03)	**0.829** (0.597-1.21)	**0.943** (0.636-1.39)	**1.12** (0.728-1.70)	**1.27** (0.811-1.97)
12-hr	**0.184** (0.143-0.236)	**0.224** (0.173-0.288)	**0.290** (0.223-0.374)	**0.344** (0.264-0.446)	**0.419** (0.314-0.570)	**0.474** (0.349-0.661)	**0.534** (0.386-0.777)	**0.609** (0.412-0.891)	**0.726** (0.474-1.10)	**0.828** (0.529-1.28)
24-hr	**0.110** (0.085-0.140)	**0.135** (0.105-0.173)	**0.177** (0.137-0.226)	**0.211** (0.163-0.272)	**0.258** (0.194-0.350)	**0.293** (0.217-0.407)	**0.331** (0.241-0.480)	**0.379** (0.257-0.552)	**0.454** (0.298-0.683)	**0.520** (0.334-0.797)
2-day	**0.062** (0.048-0.079)	**0.077** (0.060-0.098)	**0.102** (0.079-0.130)	**0.122** (0.094-0.156)	**0.150** (0.113-0.203)	**0.171** (0.127-0.236)	**0.193** (0.141-0.280)	**0.222** (0.151-0.322)	**0.268** (0.176-0.401)	**0.309** (0.199-0.470)
3-day	**0.045** (0.035-0.057)	**0.056** (0.044-0.071)	**0.074** (0.057-0.094)	**0.088** (0.069-0.113)	**0.109** (0.082-0.147)	**0.124** (0.092-0.171)	**0.140** (0.103-0.202)	**0.161** (0.110-0.233)	**0.195** (0.128-0.291)	**0.225** (0.145-0.341)
4-day	**0.036** (0.028-0.045)	**0.045** (0.035-0.056)	**0.059** (0.046-0.075)	**0.071** (0.055-0.090)	**0.087** (0.066-0.117)	**0.099** (0.074-0.136)	**0.112** (0.082-0.161)	**0.129** (0.088-0.186)	**0.156** (0.103-0.232)	**0.180** (0.116-0.272)
7-day	**0.024** (0.019-0.030)	**0.030** (0.023-0.038)	**0.039** (0.031-0.049)	**0.047** (0.036-0.059)	**0.057** (0.043-0.076)	**0.065** (0.049-0.089)	**0.073** (0.054-0.105)	**0.084** (0.058-0.121)	**0.101** (0.067-0.150)	**0.117** (0.075-0.176)
10-day	**0.019** (0.015-0.025)	**0.024** (0.019-0.030)	**0.031** (0.024-0.039)	**0.036** (0.028-0.046)	**0.044** (0.034-0.059)	**0.050** (0.037-0.068)	**0.056** (0.041-0.080)	**0.064** (0.044-0.092)	**0.076** (0.050-0.113)	**0.087** (0.056-0.131)
20-day	**0.014** (0.011-0.017)	**0.016** (0.013-0.020)	**0.020** (0.015-0.025)	**0.023** (0.018-0.029)	**0.027** (0.020-0.035)	**0.030** (0.022-0.040)	**0.033** (0.024-0.047)	**0.037** (0.026-0.053)	**0.043** (0.028-0.063)	**0.048** (0.031-0.071)
30-day	**0.011** (0.009-0.014)	**0.013** (0.010-0.016)	**0.016** (0.012-0.019)	**0.018** (0.014-0.022)	**0.020** (0.015-0.027)	**0.023** (0.017-0.030)	**0.025** (0.018-0.034)	**0.027** (0.019-0.038)	**0.030** (0.020-0.045)	**0.033** (0.021-0.049)
45-day	**0.010** (0.007-0.012)	**0.011** (0.008-0.013)	**0.012** (0.010-0.015)	**0.014** (0.011-0.017)	**0.016** (0.012-0.020)	**0.017** (0.013-0.023)	**0.019** (0.013-0.025)	**0.020** (0.014-0.028)	**0.022** (0.015-0.032)	**0.023** (0.015-0.035)
60-day	**0.008** (0.007-0.010)	**0.009** (0.007-0.011)	**0.010** (0.008-0.013)	**0.011** (0.009-0.014)	**0.013** (0.010-0.017)	**0.014** (0.010-0.019)	**0.015** (0.011-0.021)	**0.016** (0.011-0.023)	**0.017** (0.012-0.025)	**0.018** (0.012-0.027)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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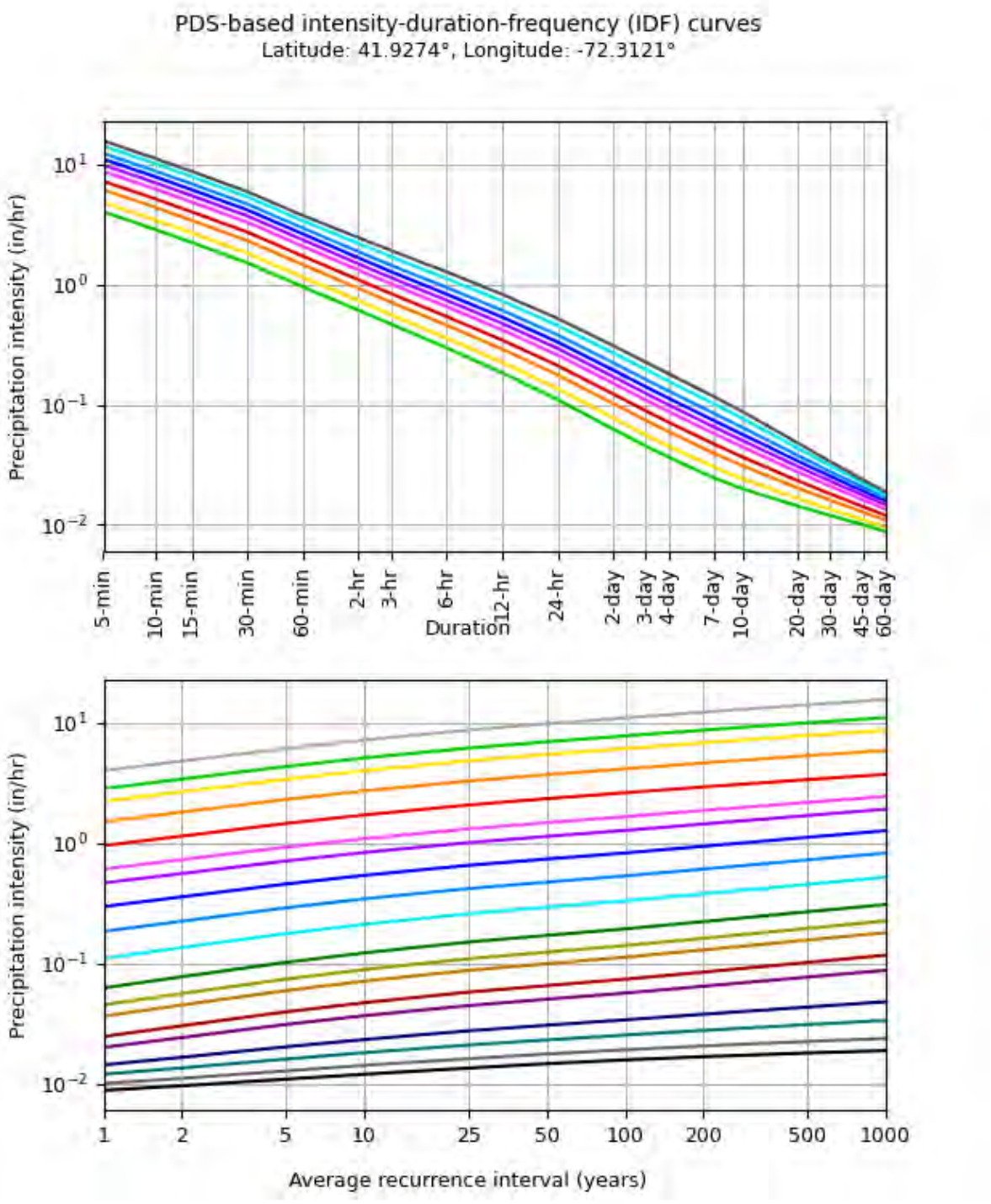
PF graphical



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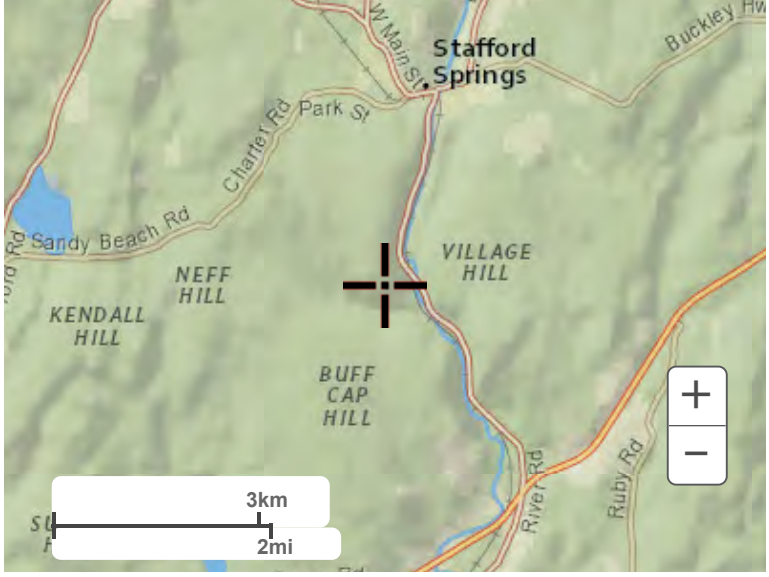
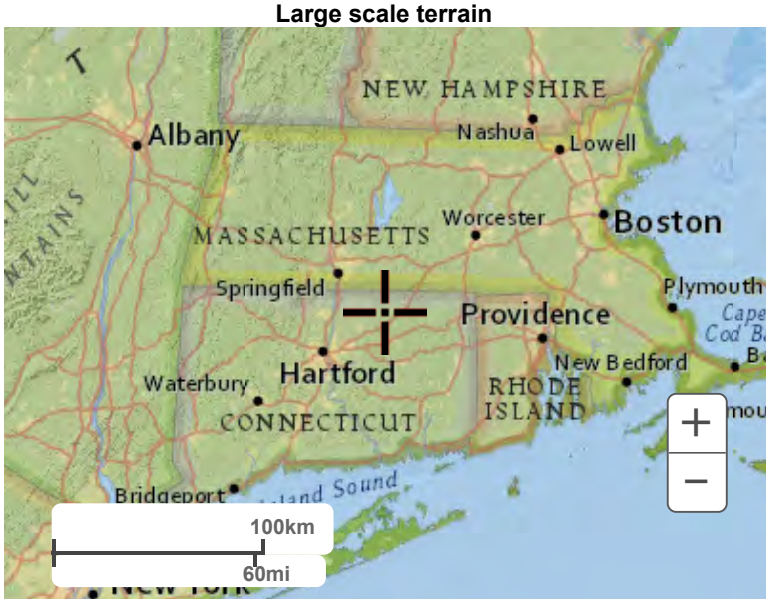
Maps & aerials

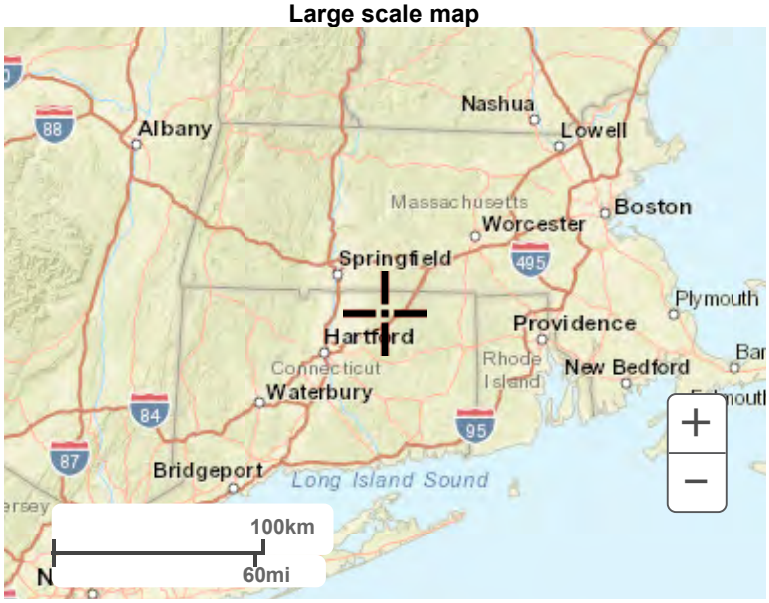
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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National Weather Service
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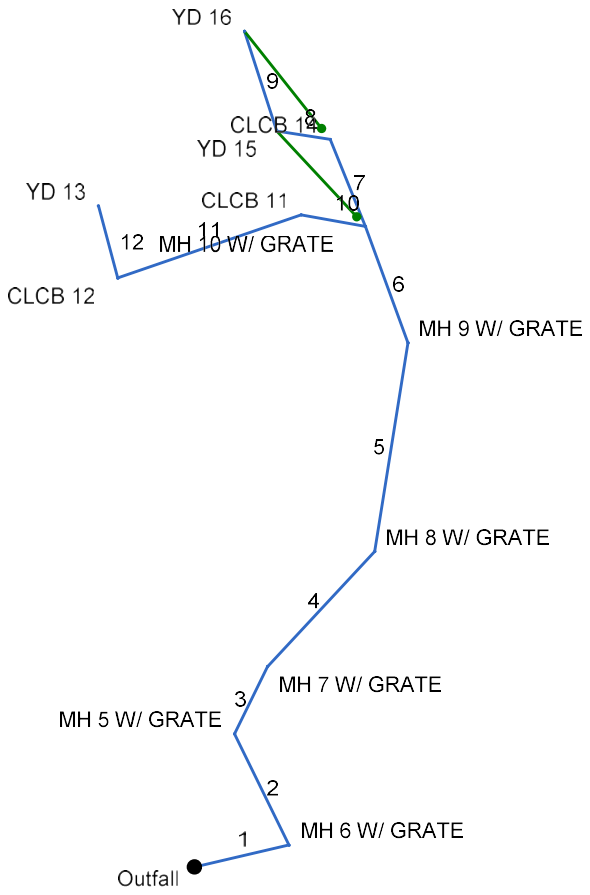
Disclaimer

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: System 110.stm	Number of lines: 12	Date: 11/17/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	61	-13	Grate	0.00	0.36	0.35	5.0	445.00	4.10	447.50	12	Cir	0.012	1.50	452.50	OUTFALL - MH 6
2	1	78	-103	Grate	0.00	0.04	0.60	5.0	449.20	10.00	457.00	12	Cir	0.012	1.23	461.00	MH 6 - MH 5
3	2	47	52	Grate	0.00	0.45	0.42	5.0	458.20	10.00	462.90	12	Cir	0.012	0.51	469.50	MH 5 - MH 7
4	3	99	17	Grate	0.00	0.15	0.60	5.0	466.50	8.28	474.70	12	Cir	0.012	0.92	477.70	MH 7 - MH 8
5	4	133	-34	Grate	0.00	0.10	0.56	5.0	474.70	6.62	483.50	12	Cir	0.012	0.81	488.50	MH 8 - MH 9
6	5	78	-29	Grate	0.00	0.03	0.69	5.0	485.50	9.87	493.20	12	Cir	0.012	1.33	499.44	MH 9 - MH 10
7	6	59	-2	Grate	0.00	0.05	0.81	5.0	495.50	10.17	501.50	12	Cir	0.012	1.32	505.00	MH 10 - CLCB 14
8	7	34	-59	DrGrt	0.00	0.03	0.72	5.0	502.00	3.53	503.20	12	Cir	0.012	1.37	506.20	CLCB 14 - YD 15
9	8	66	63	DrGrt	0.00	0.01	0.30	5.0	503.70	3.18	505.80	8	Cir	0.012	1.00	508.30	YD 15 - YD 16
10	6	41	-60	Grate	0.00	0.35	0.77	5.0	495.50	9.76	499.50	12	Cir	0.012	0.81	504.00	MH 10 - CLCB 11
11	10	122	-29	Grate	0.00	0.31	0.64	5.0	501.00	1.64	503.00	12	Cir	0.012	1.50	506.00	CLCB 11 - CLCB 12
12	11	47	94	DrGrt	0.00	0.02	0.61	5.0	503.00	2.13	504.00	12	Cir	0.012	1.00	507.00	CLCB 12 - YD 13

Project File: System 110.stm | Number of lines: 12 | Date: 11/17/2023

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	61	0.36	1.90	0.35	0.13	1.05	5.0	7.1	7.4	7.80	7.81	9.94	12	4.10	445.00	447.50	449.10	451.60	447.36	452.50	OUTFALL - MH 6
2	1	78	0.04	1.54	0.60	0.02	0.92	5.0	7.0	7.5	6.93	12.20	8.86	12	10.00	449.20	457.00	453.90	457.97	452.50	461.00	MH 6 - MH 5
3	2	47	0.45	1.50	0.42	0.19	0.90	5.0	6.9	7.5	6.78	12.20	12.33	12	10.00	458.20	462.90	458.73	463.87	461.00	469.50	MH 5 - MH 7
4	3	99	0.15	1.05	0.60	0.09	0.71	5.0	6.8	7.6	5.42	11.10	10.57	12	8.28	466.50	474.70	466.99	475.64	469.50	477.70	MH 7 - MH 8
5	4	133	0.10	0.90	0.56	0.06	0.62	5.0	6.4	7.8	4.85	9.92	6.41	12	6.62	474.70	483.50	475.64	484.41	477.70	488.50	MH 8 - MH 9
6	5	78	0.03	0.80	0.69	0.02	0.57	5.0	6.3	7.9	4.45	12.12	10.16	12	9.87	485.50	493.20	485.92	494.08	488.50	499.44	MH 9 - MH 10
7	6	59	0.05	0.09	0.81	0.04	0.07	5.0	5.8	8.1	0.53	12.30	5.22	12	10.17	495.50	501.50	495.64	501.80	499.44	505.00	MH 10 - CLCB 14
8	7	34	0.03	0.04	0.72	0.02	0.02	5.0	5.6	8.3	0.20	7.25	3.04	12	3.53	502.00	503.20	502.12	503.38	505.00	506.20	CLCB 14 - YD 15
9	8	66	0.01	0.01	0.30	0.00	0.00	5.0	5.0	8.7	0.03	2.33	1.74	8	3.18	503.70	505.80	503.75	505.87	506.20	508.30	YD 15 - YD 16
10	6	41	0.35	0.68	0.77	0.27	0.48	5.0	6.2	7.9	3.80	12.05	9.52	12	9.76	495.50	499.50	495.89	500.33	499.44	504.00	MH 10 - CLCB 11
11	10	122	0.31	0.33	0.64	0.20	0.21	5.0	5.8	8.2	1.72	4.94	4.77	12	1.64	501.00	503.00	501.41	503.56	504.00	506.00	CLCB 11 - CLCB
12	11	47	0.02	0.02	0.61	0.01	0.01	5.0	5.0	8.7	0.11	5.63	0.97	12	2.13	503.00	504.00	503.56	504.13	506.00	507.00	CLCB 12 - YD 13

Project File: System 110.stm | Number of lines: 12 | Run Date: 11/17/2023

NOTES:Intensity = 41.75 / (Inlet time + 3.80) ^ 0.72; Return period =Yrs. 25 ; c = cir e = ellip b = box

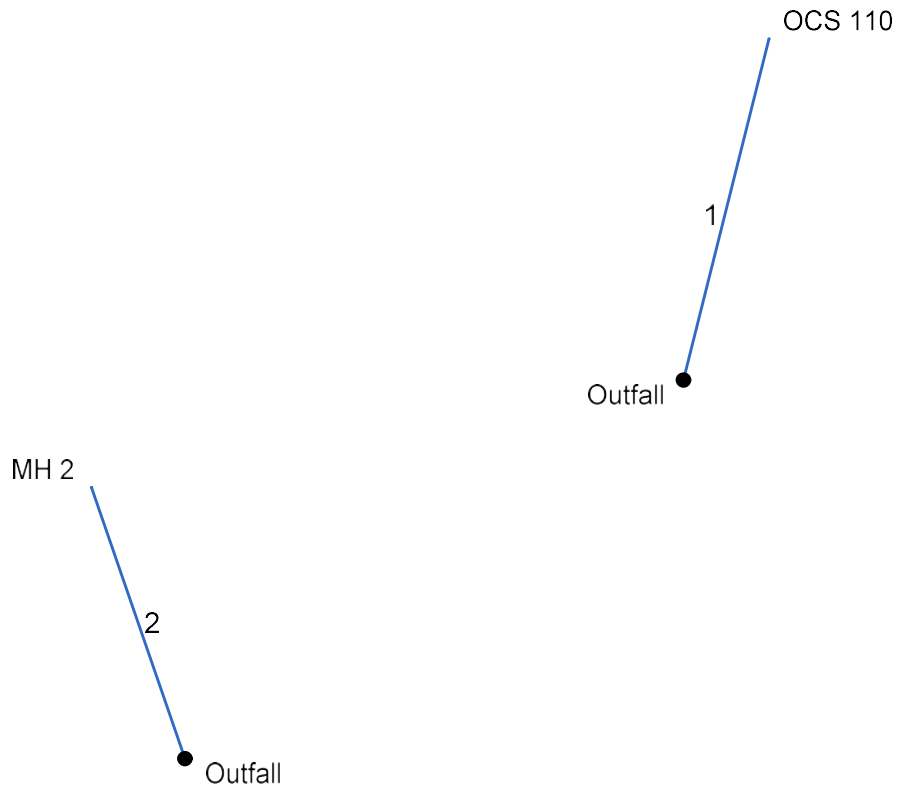
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	12	7.80	445.00	449.10	1.00	0.79	9.94	1.54	450.64	4.093	61	447.50	451.60	1.00	0.79	9.94	1.53	453.13	4.091	4.092	2.496	1.50	2.30
2	12	6.93	449.20	453.90	1.00	0.78	8.83	1.21	455.11	3.232	78	457.00	457.97 j	0.97**	0.78	8.89	1.23	459.20	2.861	3.047	n/a	1.23	n/a
3	12	6.78	458.20	458.73	0.53*	0.43	15.94	1.18	459.91	0.000	47	462.90	463.87	0.97**	0.78	8.71	1.18	465.05	0.000	0.000	n/a	0.51	0.60
4	12	5.42	466.50	466.99	0.49*	0.39	14.04	0.78	467.77	0.000	99	474.70	475.64	0.94**	0.76	7.09	0.78	476.42	0.000	0.000	n/a	0.92	n/a
5	12	4.85	474.70	475.64	0.94	0.75	6.34	0.65	476.29	0.000	133	483.50	484.41 j	0.91**	0.75	6.47	0.65	485.06	0.000	0.000	n/a	0.81	0.53
6	12	4.45	485.50	485.92	0.42*	0.31	14.24	0.57	486.49	0.000	78	493.20	494.08	0.88**	0.73	6.07	0.57	494.65	0.000	0.000	n/a	1.33	0.76
7	12	0.53	495.50	495.64	0.14*	0.07	7.80	0.11	495.75	0.000	59	501.50	501.80	0.30**	0.20	2.65	0.11	501.91	0.000	0.000	n/a	1.32	n/a
8	12	0.20	502.00	502.12	0.12*	0.05	4.04	0.06	502.18	0.000	34	503.20	503.38	0.18**	0.10	2.04	0.06	503.45	0.000	0.000	n/a	1.37	0.09
9	8	0.03	503.70	503.75	0.05*	0.01	2.22	0.02	503.77	0.000	66	505.80	505.87	0.07**	0.02	1.26	0.02	505.90	0.000	0.000	n/a	1.00	0.02
10	12	3.80	495.50	495.89	0.39*	0.28	13.59	0.46	496.35	0.000	41	499.50	500.33	0.83**	0.70	5.46	0.46	500.79	0.000	0.000	n/a	0.81	0.38
11	12	1.72	501.00	501.41	0.41*	0.30	5.72	0.23	501.63	0.000	122	503.00	503.56	0.56**	0.45	3.82	0.23	503.78	0.000	0.000	n/a	1.50	0.34
12	12	0.11	503.00	503.56	0.56	0.06	0.24	0.05	503.60	0.000	47	504.00	504.13 j	0.13**	0.06	1.71	0.05	504.18	0.000	0.000	n/a	1.00	0.05

Project File: System 110.stm | Number of lines: 12 | Run Date: 11/17/2023

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: System 120.stm	Number of lines: 2	Date: 11/17/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	49.000	-76.000	None	11.80	0.00	0.00	0.0	442.00	9.39	446.60	12	Cir	0.012	1.00	449.00	MH 3 - OCS 110
2	End	40.000	-109.000	MH	4.27	0.00	0.00	0.0	441.00	5.00	443.00	12	Cir	0.012	1.00	446.40	OUTFALL - MH 2

Project File: System 120.stm | Number of lines: 2 | Date: 11/17/2023

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	49.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	11.80	11.82	15.03	12	9.39	442.00	446.60	449.30	453.89	447.00	449.00	MH 3 - OCS 110
2	End	40.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.27	8.63	5.66	12	5.00	441.00	443.00	442.00	443.87	442.10	446.40	OUTFALL - MH 2

Project File: System 120.stm | Number of lines: 2 | Run Date: 11/17/2023

NOTES:Intensity = 52.80 / (Inlet time + 3.80) ^ 0.72; Return period =Yrs. 100 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	12	11.80	442.00	449.30	1.00	0.79	15.03	3.51	452.81	9.359	49.000	446.60	453.89	1.00**	0.79	15.02	3.51	457.40	9.355	9.357	4.585	1.00	3.51
2	12	4.27	441.00	442.00	1.00*	0.72	5.44	0.46	442.46	1.225	40.000	443.00	443.87 j	0.87**	0.72	5.89	0.54	444.41	1.119	1.172	n/a	1.00	n/a

Project File: System 120.stm | Number of lines: 2 | Run Date: 11/17/2023

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Outlet Protection Calculations

Project:	Camp Yankee Trails Site Improvement		By: JLS	Date:	11/17/23
Location:	343 Plains Road, Tolland, Connecticut		Checked: MCB	Date:	11/17/23
Outlet I.D.	**FES 1**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

FES 1

Design Criteria (100-yr Storm Event):

Q (cfs) =	4.27	R_p (ft)=	1
D (in) =	12	S_p (ft) =	1
V (fps) =	5.66	Tw (ft)=	1

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections (ft)
T_w= Tailwater depth (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	10	ft
$W1 = 3.0(S_p)$ min.	=	3	ft
W2 = 3.0(Sp)+0.4(La) min.	=	7	ft
d (Depth of Stone)	=	12	inches

Outlet Protection Calculations

Project:	Camp Yankee Trails Site Improvement		By: JLS	Date:	11/17/2023
Location:	343 Plains Road, Tolland, Connecticut		Checked: MCB	Date:	11/17/2023
Outlet I.D.	**FES 5**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

FES 5

Design Criteria (25-yr Storm Event):

Q (cfs) = 7.8	R_p (ft)=	1
D (in) = 12	S_p (ft) =	1
V (fps) = 9.94	Tw (ft)=	4.1

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections (ft)
T_w= Tailwater depth (ft)

Based on **Table 11.13.1,** A *Preformed Scour Hole* is used *One Half Pipe Rise Depression (Type I)*

Rip Rap Stone Size:

D_{50} Computed (ft)	Rip Rap Specification	D_{50} Stone Size Required
0.047	Modified	5 inches

Preformed Scour Hole Dimensions:

$F = 0.5(R_p)$	=	0.5 ft
$C = 3.0(S_p)+6.0(F)$	=	6ft
$B = 2.0(S_p)+6.0(F)$	=	5ft
d (Depth of Stone)	=	12 inches

LEGEND

DRAINAGE AREA BOUNDARY

CLCB 12 DRAINAGE AREA LABEL

SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

DRAINAGE AREA MAP - STORM DRAINAGE SYSTEM

CAMP YANKEE TRAILS SITE IMPROVEMENTS
PROJECT NAME 2
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MCB	JLS	TDR
DESIGNED	DRAWN	CHECKED

1"=30'
SCALE

NOVEMBER 17, 2023
DATE

13280.00006
PROJECT NO.

1 OF 1
SHEET NO.

CB
SHEET NAME

Appendix E
Water Quality Computations

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0080.0080

November 20, 2023

STORMWATER QUALITY CALCULATIONS
Water Quality Volume (WQV)

Basin ID	Total Area (ac.)	Impervious Area (ac.)	Percent Impervious	Volumetric Runoff Coeff., R	WQV (ac-ft)	Total Volume Required (ac-ft)	Total Volume Provided[1.] (ac-ft)
DET 110	2.31	0.93	40%	0.41	0.079	0.079	***0.195***

1. - Volume provided below overflow weir

$$\textbf{WQV} = \frac{(1.0 \text{ inches}) \times A \times R}{12}$$

Where:

WQV = Water Quality Volume in acre-feet
A = Contributing Area in acres
R = 0.05 + 0.009 (I)
I = Site Imperviousness as percent

Pond Report

Pond No. 3 - DET 110

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 445.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	445.00	530	0.000	0.000
1.00	446.00	1,067	0.018	0.018
2.00	447.00	1,664	0.031	0.049
3.00	448.00	2,317	0.045	0.095
4.00	449.00	3,027	0.061	0.156
5.00	450.00	3,793	0.078	0.234

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 446.60	0.00	0.00	0.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 9.18	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 14.00	10.00	0.00	0.00
Crest El. (ft)	= 448.40	449.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 27.400 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	445.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	0.018	446.00	0.00	---	---	---	0.00	0.00	---	---	0.677	---	0.677
2.00	0.049	447.00	0.00	---	---	---	0.00	0.00	---	---	1.055	---	1.055
3.00	0.095	448.00	0.00	---	---	---	0.00	0.00	---	---	1.470	---	1.470
4.00	0.156	449.00	5.20 ic	---	---	---	5.18 s	0.00	---	---	1.920	---	7.103
5.00	0.234	450.00	6.44 ic	---	---	---	6.42 s	26.00	---	---	2.406	---	34.83

Appendix F
Hydrologic Analysis – Existing Conditions

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0080.0080

November 20, 2023

Curve Number Calculations

Project: Camp Yankee Trails Site Improvements
Location: 343 Plains Road
Tolland, Connecticut
By: MCB Date: 10/30/23 Checked: _____ Date: _____
Circle one: ***Present*** Developed Watershed: EXWS-10

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B Soil	Woods - Good Condition	55			38.17	2099.58
B Soil	Open Space - Good Condition	61			3.92	239.19
B Soil	Gravel	85			1.62	137.56
C Soil	Woods - Good Condition	70			1.70	118.66
N/A	Paved/Impervious	98			0.11	11.22
N/A	Building	98			0.63	61.97
N/A	Water	98			0.47	45.99
				Totals =	46.63	2714.18
					(0.07285	sq mi)

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = $\frac{2714.18}{46.63}$ Use CN = **58.2**

Curve Number Calculations

Project: Camp Yankee Trails Site Improvements
Location: 343 Plains Road
Tolland, Connecticut
By: MCB Date: 10/30/23 Checked: _____ Date: _____
Circle one: Present ***Developed*** Watershed: PRWS-10

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B Soil	Woods - Good Condition	55			35.27	1939.63
B Soil	Open Space - Good Condition	61			4.75	289.50
B Soil	Gravel	85			1.43	121.86
C Soil	Woods - Good Condition	70			1.70	118.66
N/A	Paved/Impervious	98			0.34	33.35
N/A	Building	98			0.60	58.86
N/A	Water	98			0.23	22.66
				Totals =	44.31	2584.52
					(0.06924	sq mi)

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = $\frac{2584.52}{44.31}$ Use CN = 58.3

Curve Number Calculations

Project: Camp Yankee Trails Site Improvements
Location: 343 Plains Road
Tolland, Connecticut
By: MCB Date: 10/30/23 Checked: _____ Date: _____
Circle one: Present ***Developed*** Watershed: PRWS-11

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B Soil	Woods - Good Condition	55			0.54	29.52
B Soil	Open Space - Good Condition	61			0.84	51.40
B Soil	Gravel	85			0.06	51.40
N/A	Paved/Impervious	98			0.80	5.40
N/A	Building	98			0.07	78.21
	Totals =				2.31	215.92
					(0.00361	sq mi)

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{215.92}{2.31}$ Use CN = 93.4

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Camp Yankee Trails | By: MCB | Date: 10/31/23
Location: Tolland, CT | Checked: | Date:
Circle one: ***Present*** Developed | Watershed: EXWS-10
Circle one: ***T_c*** T_t | Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1.	Surface description (Table 3-1)		WOODS		
2.	Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3.	Flow Length, L (< 300ft)	ft.	100.0		
4.	Two-year 24-hr rainfall, P_2	in.	3.25		
5.	Land slope, s	ft./ft.	0.025		
6.	$T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.325	=	0.325

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E			
7.	Surface description		GRAVEL		GRASS		WOODS			
8.	Manning's roughness coeff., n		0.015		0.080		0.100			
9.	Paved or unpaved		UNVPD		UNPVD		UNPVD			
10.	Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.40			
11.	Flow Length, L	ft.	378.0		102.0		784.0			
12.	Watercourse slope, s	ft./ft.	0.050		0.088		0.162			
13.	Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	12.06		3.00		3.26			
14.	$T_t = \frac{L}{3600 * V}$	hr.	0.009	+	0.009		0.067		=	0.085

Channel flow

		Segment ID								
15.	Channel Bottom width, b	ft.								
16.	Horizontal side slope component, z (z horiz:1 vert)	ft.								
17.	Depth of flow, d	ft.								
18.	Cross sectional flow area, A (assume trapazoidal)	$ft.^2$								
19.	Wetted perimeter, P_w	ft.								
20.	Hydraulic Radius, $R = \frac{A}{P_w}$	ft.								
21.	Channel slope, s	ft./ft.								
22.	Manning's roughness coeff., n									
23.	$V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.								
24.	Flow length, L	ft.								
25.	$T_t = \frac{L}{3600 * V}$	hr.		+					=	0.000
26.	Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)							hr.		0.410

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Camp Yankee Trails | By: MCB | Date: 10/31/23
Location: Tolland, CT | Checked: | Date:
Circle one: Present ***Developed*** | Watershed: PRWS-10
Circle one: ***T_c*** T_t | Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			WOODS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		100.0		
4. Two-year 24-hr rainfall, P_2	in.		3.25		
5. Land slope, s	ft./ft.		0.025		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.325	=	0.325

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D	D-E		
7. Surface description			GRAVEL	GRASS	WOODS		
8. Manning's roughness coeff., n			0.015	0.080	0.100		
9. Paved or unpaved			UNVPD	UNPVD	UNPVD		
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.40	0.40		
11. Flow Length, L	ft.		378.0	102.0	784.0		
12. Watercourse slope, s	ft./ft.		0.050	0.088	0.162		
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		12.06	3.00	3.26		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.009	+ 0.009	0.067	=	0.085

Channel flow

		Segment ID					
15. Channel Bottom width, b	ft.						
16. Horizontal side slope component, z (z horiz:1 vert)	ft.						
17. Depth of flow, d	ft.						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$						
19. Wetted perimeter, P_w	ft.						
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.						
21. Channel slope, s	ft./ft.						
22. Manning's roughness coeff., n							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.						
24. Flow length, L	ft.						
25. $T_t = \frac{L}{3600 * V}$	hr.					=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)					hr.		0.410

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Camp Yankee Trails | By: MCB | Date: 10/31/23
Location: Tolland, CT | Checked: | Date:
Circle one: Present ***Developed*** | Watershed: PRWS-11
Circle one: ***T_c*** T_t | Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			BIT		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.015		
3. Flow Length, L (< 300ft)	ft.		43.0		
4. Two-year 24-hr rainfall, P_2	in.		3.25		
5. Land slope, s	ft./ft.		0.023		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.012	=	0.012

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D			
7. Surface description			GRASS	BIT			
8. Manning's roughness coeff., n			0.080	0.015			
9. Paved or unpaved			UNVPD	PVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.20			
11. Flow Length, L	ft.		31.0	158.0			
12. Watercourse slope, s	ft./ft.		0.194	0.044			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		4.45	7.13			
14. $T_t = \frac{L}{3600 * V}$	hr.		0.002	+ 0.006			= 0.008

Channel flow

		Segment ID	D-E	E-F	F-G	G-H	
15. Channel Bottom width, b	ft.		12" HDPE	12" HDPE	12" HDPE	12" HDPE	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		--	--	--	--	
17. Depth of flow, d	ft.		FULL	FULL	FULL	FULL	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		0.79	0.79	0.79	0.79	
19. Wetted perimeter, P_w	ft.		3.14	3.14	3.14	3.14	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.25	0.25	0.25	0.25	
21. Channel slope, s	ft./ft.		0.032	0.091	0.095	0.066	
22. Manning's roughness coeff., n			0.012	0.012	0.012	0.012	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		8.85	14.93	15.25	12.71	
24. Flow length, L	ft.		122.8	44.0	81.1	134.3	
25. $T_t = \frac{L}{3600 * V}$	hr.		0.004	0.001	0.001	0.003	= 0.009
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)	hr.						0.030

Min Tc = 0.1 hr

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Camp Yankee Trails | By: MCB | Date: 10/31/23
Location: Tolland, CT | Checked: | Date:
Circle one: Present ***Developed*** | Watershed: PRWS-11
Circle one: ***T_c*** T_t | Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID		
1.	Surface description (Table 3-1)			
2.	Manning's roughness coeff. for sheet flow, n (Table 3-1)			
3.	Flow Length, L (< 300ft)	ft.		
4.	Two-year 24-hr rainfall, P_2	in.		
5.	Land slope, s	ft./ft.		
6.	$T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID				
7.	Surface description					
8.	Manning's roughness coeff., n					
9.	Paved or unpaved					
10.	Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.				
11.	Flow Length, L	ft.				
12.	Watercourse slope, s	ft./ft.				
13.	Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.				
14.	$T_t = \frac{L}{3600 * V}$	hr.				= 0.000

Channel flow

		Segment ID	H-I	I-J	J-K	K-L	
15.	Channel Bottom width, b	ft.	12" HDPE	12" HDPE	12" HDPE	12" HDPE	
16.	Horizontal side slope component, z (z horiz:1 vert)	ft.	--	--	--	--	
17.	Depth of flow, d	ft.	FULL	FULL	FULL	FULL	
18.	Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	0.79	0.79	0.79	0.79	
19.	Wetted perimeter, P_w	ft.	3.14	3.14	3.14	3.14	
20.	Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.25	0.25	0.25	0.25	
21.	Channel slope, s	ft./ft.	0.08	0.098	0.097	0.032	
22.	Manning's roughness coeff., n		0.012	0.012	0.012	0.012	
23.	$V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	14.00	15.49	15.41	8.85	
24.	Flow length, L	ft.	102.5	48.0	80.6	62.3	
25.	$T_t = \frac{L}{3600 * V}$	hr.	0.002	0.001	0.001	0.002	= 0.006
26.	Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)	hr.					0.006

Min Tc = 0.1 hr

NOAA Atlas 14, Volume 10, Version 3
Location name: Tolland, Connecticut, USA*
Latitude: 41.9274°, Longitude: -72.3121°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.335** (0.255-0.439)	**0.402** (0.306-0.527)	**0.511** (0.389-0.674)	**0.602** (0.455-0.796)	**0.727** (0.534-1.00)	**0.821** (0.593-1.16)	**0.919** (0.646-1.34)	**1.03** (0.688-1.53)	**1.18** (0.764-1.82)	**1.30** (0.826-2.06)
10-min	**0.474** (0.362-0.621)	**0.569** (0.434-0.746)	**0.724** (0.550-0.953)	**0.853** (0.645-1.13)	**1.03** (0.756-1.42)	**1.16** (0.839-1.64)	**1.30** (0.915-1.90)	**1.46** (0.974-2.17)	**1.67** (1.08-2.58)	**1.85** (1.17-2.91)
15-min	**0.558** (0.426-0.731)	**0.669** (0.510-0.878)	**0.851** (0.647-1.12)	**1.00** (0.759-1.33)	**1.21** (0.890-1.67)	**1.37** (0.986-1.93)	**1.53** (1.08-2.23)	**1.71** (1.15-2.56)	**1.97** (1.27-3.04)	**2.18** (1.38-3.42)
30-min	**0.756** (0.577-0.991)	**0.908** (0.692-1.19)	**1.16** (0.880-1.52)	**1.36** (1.03-1.80)	**1.64** (1.21-2.27)	**1.86** (1.34-2.62)	**2.08** (1.46-3.03)	**2.33** (1.56-3.47)	**2.68** (1.73-4.13)	**2.96** (1.87-4.66)
60-min	**0.954** (0.729-1.25)	**1.15** (0.874-1.50)	**1.46** (1.11-1.92)	**1.72** (1.30-2.28)	**2.08** (1.53-2.87)	**2.35** (1.69-3.30)	**2.63** (1.85-3.83)	**2.94** (1.97-4.39)	**3.38** (2.19-5.22)	**3.74** (2.37-5.88)
2-hr	**1.22** (0.934-1.59)	**1.46** (1.12-1.90)	**1.85** (1.42-2.43)	**2.18** (1.66-2.87)	**2.63** (1.94-3.62)	**2.96** (2.16-4.17)	**3.32** (2.36-4.86)	**3.74** (2.52-5.56)	**4.37** (2.83-6.71)	**4.90** (3.11-7.66)
3-hr	**1.40** (1.08-1.82)	**1.68** (1.29-2.19)	**2.14** (1.64-2.79)	**2.52** (1.92-3.30)	**3.04** (2.25-4.17)	**3.42** (2.50-4.80)	**3.84** (2.74-5.61)	**4.34** (2.92-6.42)	**5.10** (3.31-7.81)	**5.76** (3.66-8.98)
6-hr	**1.78** (1.37-2.30)	**2.14** (1.65-2.77)	**2.74** (2.11-3.56)	**3.24** (2.47-4.22)	**3.92** (2.92-5.36)	**4.42** (3.24-6.19)	**4.97** (3.58-7.26)	**5.65** (3.81-8.31)	**6.70** (4.36-10.2)	**7.62** (4.86-11.8)
12-hr	**2.22** (1.72-2.86)	**2.71** (2.10-3.48)	**3.50** (2.70-4.51)	**4.15** (3.19-5.38)	**5.05** (3.78-6.88)	**5.71** (4.21-7.97)	**6.44** (4.66-9.37)	**7.34** (4.97-10.7)	**8.75** (5.72-13.2)	**9.98** (6.38-15.4)
24-hr	**2.64** (2.06-3.38)	**3.25** (2.53-4.16)	**4.25** (3.29-5.44)	**5.07** (3.91-6.54)	**6.21** (4.67-8.41)	**7.04** (5.22-9.78)	**7.96** (5.78-11.5)	**9.11** (6.18-13.3)	**10.9** (7.15-16.4)	**12.5** (8.02-19.1)
2-day	**3.00** (2.34-3.80)	**3.72** (2.90-4.72)	**4.90** (3.82-6.24)	**5.88** (4.55-7.53)	**7.23** (5.47-9.75)	**8.21** (6.12-11.4)	**9.30** (6.80-13.5)	**10.7** (7.28-15.5)	**12.9** (8.48-19.3)	**14.8** (9.56-22.6)
3-day	**3.26** (2.56-4.12)	**4.05** (3.17-5.12)	**5.33** (4.16-6.77)	**6.40** (4.97-8.18)	**7.87** (5.97-10.6)	**8.94** (6.68-12.3)	**10.1** (7.43-14.6)	**11.7** (7.95-16.8)	**14.1** (9.28-21.0)	**16.2** (10.5-24.6)
4-day	**3.49** (2.74-4.41)	**4.33** (3.40-5.47)	**5.70** (4.46-7.22)	**6.84** (5.32-8.71)	**8.40** (6.38-11.3)	**9.54** (7.14-13.1)	**10.8** (7.94-15.5)	**12.4** (8.50-17.9)	**15.0** (9.90-22.3)	**17.3** (11.2-26.2)
7-day	**4.14** (3.27-5.20)	**5.09** (4.01-6.40)	**6.64** (5.21-8.37)	**7.92** (6.18-10.0)	**9.69** (7.38-12.9)	**11.0** (8.24-15.0)	**12.4** (9.13-17.7)	**14.2** (9.75-20.4)	**17.1** (11.3-25.3)	**19.7** (12.7-29.6)
10-day	**4.80** (3.79-6.01)	**5.81** (4.58-7.28)	**7.45** (5.86-9.37)	**8.82** (6.90-11.1)	**10.7** (8.16-14.2)	**12.1** (9.06-16.4)	**13.6** (10.0-19.3)	**15.5** (10.6-22.1)	**18.5** (12.2-27.2)	**21.1** (13.6-31.6)
20-day	**6.87** (5.45-8.55)	**7.95** (6.30-9.90)	**9.71** (7.67-12.1)	**11.2** (8.78-14.0)	**13.2** (10.1-17.3)	**14.7** (11.0-19.7)	**16.3** (11.9-22.6)	**18.1** (12.5-25.6)	**20.8** (13.9-30.4)	**23.0** (15.0-34.3)
30-day	**8.63** (6.86-10.7)	**9.73** (7.73-12.1)	**11.5** (9.14-14.4)	**13.0** (10.3-16.3)	**15.1** (11.5-19.6)	**16.7** (12.4-22.1)	**18.3** (13.2-25.0)	**20.0** (13.8-28.1)	**22.3** (14.9-32.5)	**24.2** (15.8-35.9)
45-day	**10.8** (8.63-13.4)	**12.0** (9.52-14.8)	**13.8** (11.0-17.1)	**15.3** (12.1-19.1)	**17.4** (13.3-22.5)	**19.1** (14.2-25.0)	**20.7** (14.9-27.9)	**22.2** (15.5-31.1)	**24.2** (16.2-35.1)	**25.7** (16.8-37.9)
60-day	**12.7** (10.1-15.6)	**13.8** (11.0-17.0)	**15.7** (12.5-19.4)	**17.2** (13.6-21.5)	**19.4** (14.8-24.9)	**21.1** (15.7-27.5)	**22.7** (16.3-30.4)	**24.1** (16.8-33.7)	**25.9** (17.4-37.4)	**27.1** (17.7-39.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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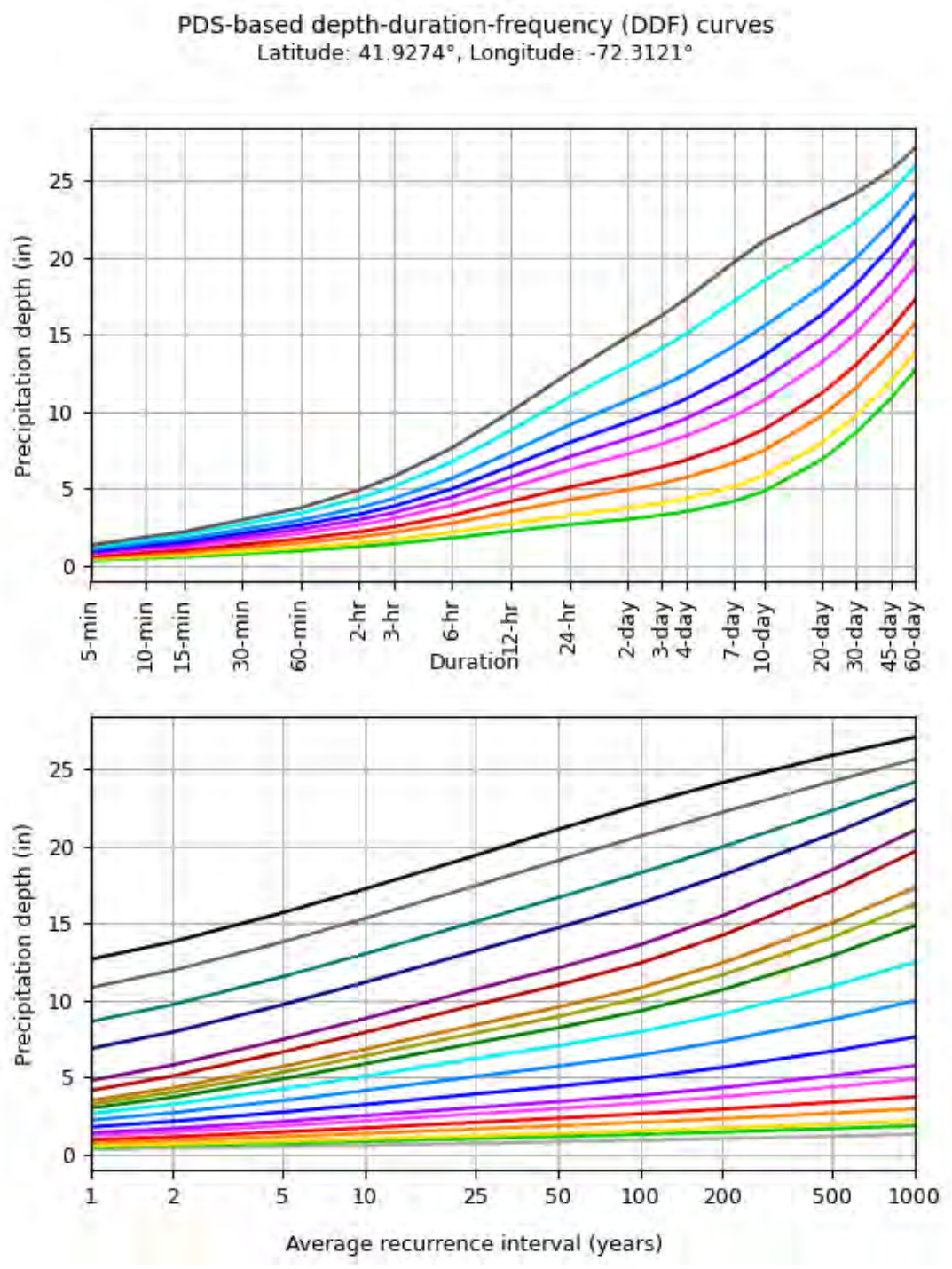
PF graphical



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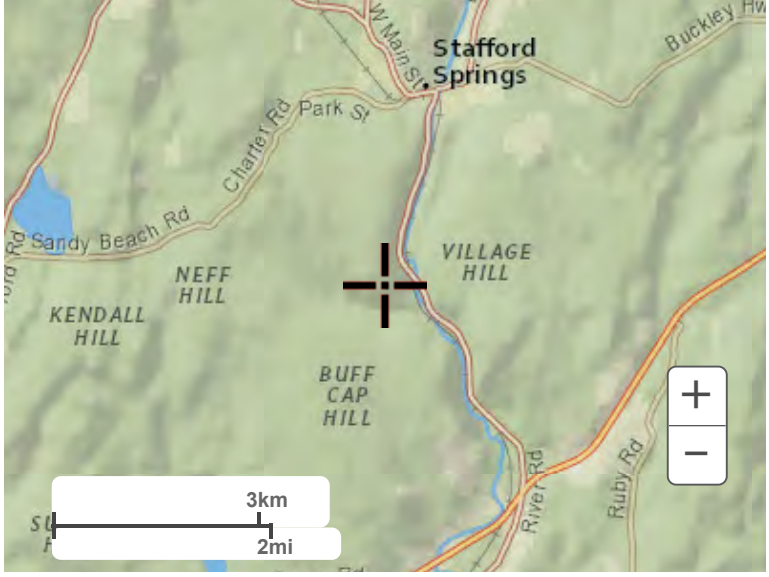
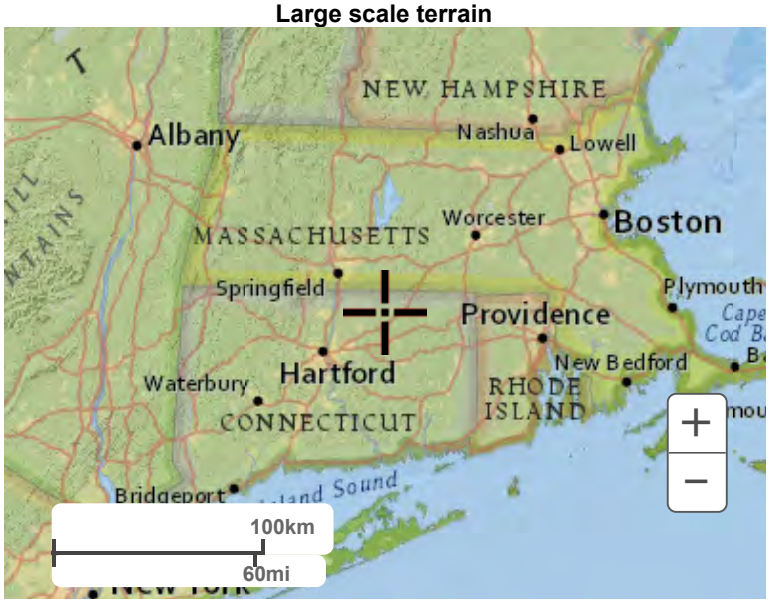
Maps & aerials

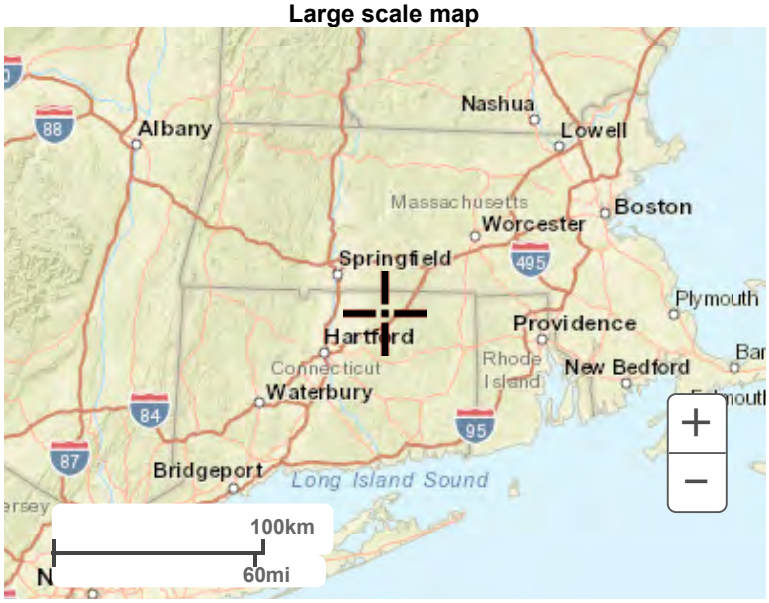
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
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Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Sample	Sample Round	L (inches)	H1(Inches)	H2(Inches)	t (min)	t (hours)	K (in/hr)	K (ft/day)
	1	3	8	6.00	1	0.017	51.429	102.857
SLR-TP-1	2	3	6.00	4.40	1	0.017	55.385	110.769
	3	3	4.40	3.10	1	0.017	62.400	124.800
	4	3	3.10	1.90	1	0.017	86.400	172.800
	5	3	1.90	0.90	1	0.017	128.571	257.143
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
				Sample Average			**76.84**	**153.67**

Sample	Sample Round	L (inches)	H1(Inches)	H2(Inches)	t (min)	t (hours)	K (in/hr)	K (ft/day)
	1	2	8	6.90	1	0.017	17.718	35.436
SLR-TP-2	2	2	6.90	6.00	1	0.017	16.744	33.488
	3	2	6.00	5.00	1	0.017	21.818	43.636
	4	2	5.00	4.25	1	0.017	19.459	38.919
	5	2	4.25	3.50	1	0.017	23.226	46.452
	6	2	3.50	2.75	1	0.017	28.800	57.600
	7	2	2.75	2.25	1	0.017	24.000	48.000
	8	2	2.25	1.50	1	0.017	48.000	96.000
	9	2	1.50	1.00	1	0.017	48.000	96.000
	10	2	1.00	0.50	1	0.017	80.000	160.000
	11							
	12							
	13							
	14							
	15							
				Sample Average			**32.78**	**65.55**

(76.84 + 32.78) / 2 = 54.8 in/hr
54.8 in/hr * 50% = 27.4 in/hr

Appendix G
Hydrologic Analysis – Proposed Conditions

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0080.0080

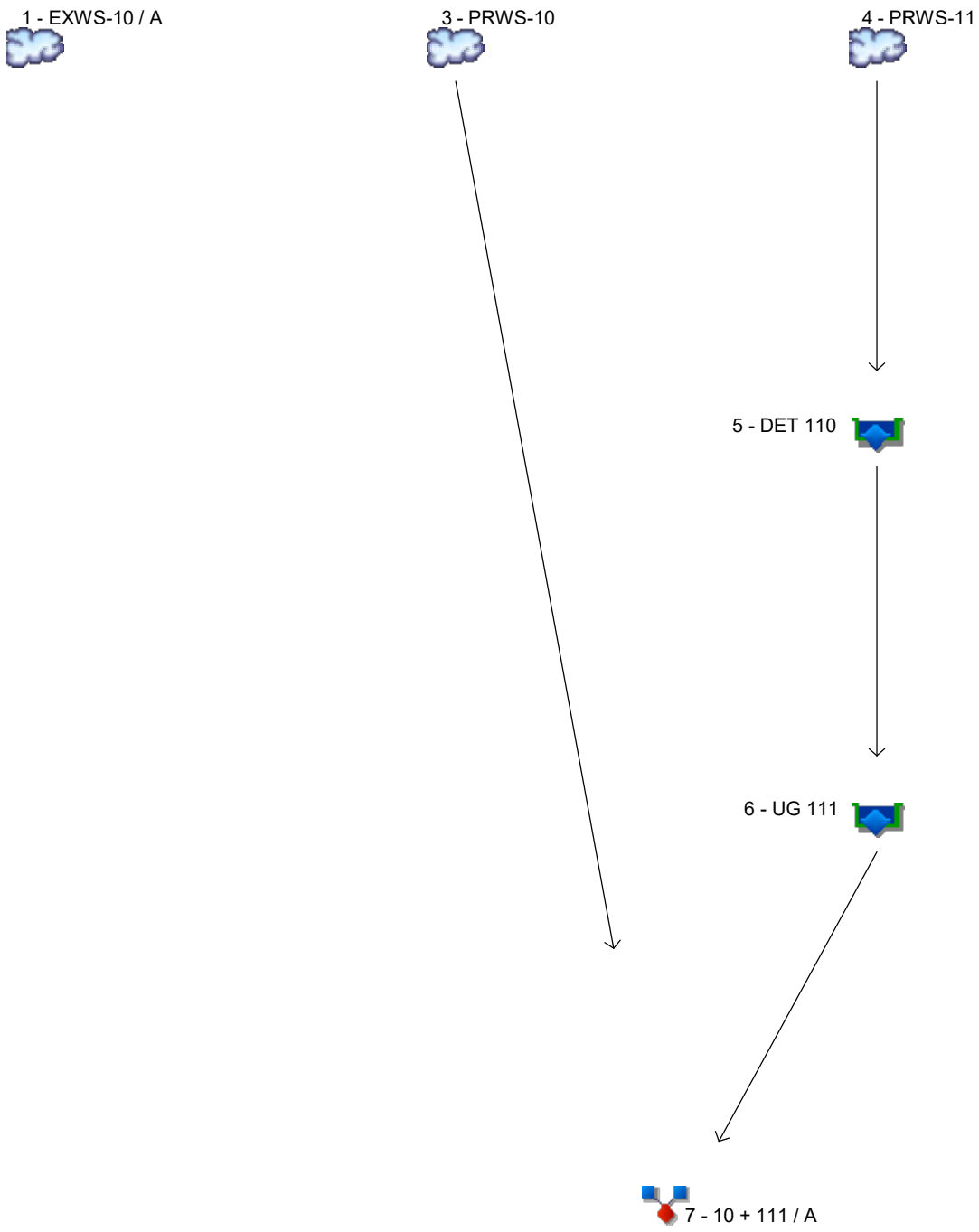
November 20, 2023

Hydrographs Peak Flowrate Summary (cfs)
Existing vs. Proposed

Storm Event	2yr		10yr		25yr		50yr		100yr	
	Exist	Prop	Exist	Prop	Exist	Prop	Exist	Prop	Exist	Prop
Point of Analysis A	7.7	7.5	37.0	35.7	61.7	60.8	81.4	81.0	104.6	104.2
DET 110 W.S. Elev. (ft.) Top of Berm Elev. = 450.4	-	448.4	-	448.9	-	449.2	-	449.3	-	449.4
UG 111 W.S. Elev. (ft.) Top of Stone Elev. = 445.0	-	441.5	-	443.1	-	443.7	-	444.1	-	444.8

Study Area	**Description**
A	Sweetheart Lake

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	EXWS-10 / A
3	SCS Runoff	PRWS-10
4	SCS Runoff	PRWS-11
5	Reservoir	DET 110
6	Reservoir	UG 111
7	Combine	10 + 111 / A

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	7.650	-------	-------	36.97	61.72	81.44	104.55	EXWS-10 / A
3	SCS Runoff	------	-------	7.496	-------	-------	35.61	59.28	78.10	100.14	PRWS-10
4	SCS Runoff	------	-------	5.736	-------	-------	9.463	11.77	13.44	15.29	PRWS-11
5	Reservoir	4	-------	0.586	-------	-------	5.049	7.606	9.791	11.79	DET 110
6	Reservoir	5	-------	0.000	-------	-------	0.037	1.785	2.858	4.269	UG 111
7	Combine	3, 6	-------	7.496	-------	-------	35.65	60.75	80.96	104.16	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	7.650	3	747	1.385	------	------	------	EXWS-10 / A
3	SCS Runoff	7.496	3	747	1.340	------	------	------	PRWS-10
4	SCS Runoff	5.736	3	726	0.457	------	------	------	PRWS-11
5	Reservoir	0.586	3	741	0.007	4	448.44	0.121	DET 110
6	Reservoir	0.000	3	n/a	0.000	5	441.52	0.000	UG 111
7	Combine	7.496	3	747	1.340	3, 6	------	------	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	36.97	3	741	4.625	------	------	------	EXWS-10 / A
3	SCS Runoff	35.61	3	741	4.443	------	------	------	PRWS-10
4	SCS Runoff	9.463	3	726	0.778	------	------	------	PRWS-11
5	Reservoir	5.049	3	732	0.133	4	448.91	0.150	DET 110
6	Reservoir	0.037	3	741	0.000	5	443.09	0.062	UG 111
7	Combine	35.65	3	741	4.443	3, 6	------	------	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	61.72	3	738	7.221	------	------	------	EXWS-10 / A
3	SCS Runoff	59.28	3	738	6.923	------	------	------	PRWS-10
4	SCS Runoff	11.77	3	726	0.981	------	------	------	PRWS-11
5	Reservoir	7.606	3	729	0.219	4	449.19	0.170	DET 110
6	Reservoir	1.785	3	744	0.035	5	443.73	0.089	UG 111
7	Combine	60.75	3	738	6.958	3, 6	------	------	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	81.44	3	738	9.305	------	------	------	EXWS-10 / A
3	SCS Runoff	78.10	3	738	8.912	------	------	------	PRWS-10
4	SCS Runoff	13.44	3	726	1.129	------	------	------	PRWS-11
5	Reservoir	9.791	3	729	0.285	4	449.30	0.179	DET 110
6	Reservoir	2.858	3	738	0.075	5	444.07	0.102	UG 111
7	Combine	80.96	3	738	8.987	3, 6	------	------	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	104.55	3	738	11.764	------	------	------	EXWS-10 / A
3	SCS Runoff	100.14	3	738	11.258	------	------	------	PRWS-10
4	SCS Runoff	15.29	3	726	1.294	------	------	------	PRWS-11
5	Reservoir	11.79	3	729	0.362	4	449.38	0.185	DET 110
6	Reservoir	4.269	3	735	0.122	5	444.77	0.121	UG 111
7	Combine	104.16	3	738	11.379	3, 6	------	------	10 + 111 / A

Pond Report

Pond No. 3 - DET 110

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 445.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	445.00	530	0.000	0.000
1.00	446.00	1,067	0.018	0.018
2.00	447.00	1,664	0.031	0.049
3.00	448.00	2,317	0.045	0.095
4.00	449.00	3,027	0.061	0.156
5.00	450.00	3,793	0.078	0.234

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 446.60	0.00	0.00	0.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 9.18	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 14.00	10.00	0.00	0.00
Crest El. (ft)	= 448.40	449.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 27.400 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	445.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	0.018	446.00	0.00	---	---	---	0.00	0.00	---	---	0.677	---	0.677
2.00	0.049	447.00	0.00	---	---	---	0.00	0.00	---	---	1.055	---	1.055
3.00	0.095	448.00	0.00	---	---	---	0.00	0.00	---	---	1.470	---	1.470
4.00	0.156	449.00	5.20 ic	---	---	---	5.18 s	0.00	---	---	1.920	---	7.103
5.00	0.234	450.00	6.44 ic	---	---	---	6.42 s	26.00	---	---	2.406	---	34.83

Pond Report

Pond No. 1 - UG 111

Pond Data

UG Chambers -Invert elev. = 442.00 ft, Rise x Span = 2.50 x 4.25 ft, Barrel Len = 7.12 ft, No. Barrels = 70, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 441.50 ft, Width = 4.25 ft, Height = 3.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	441.50	n/a	0.000	0.000
0.35	441.85	n/a	0.007	0.007
0.70	442.20	n/a	0.013	0.019
1.05	442.55	n/a	0.017	0.036
1.40	442.90	n/a	0.017	0.053
1.75	443.25	n/a	0.016	0.069
2.10	443.60	n/a	0.015	0.084
2.45	443.95	n/a	0.014	0.098
2.80	444.30	n/a	0.012	0.110
3.15	444.65	n/a	0.008	0.119
3.50	445.00	n/a	0.007	0.125

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 443.00	0.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 27.400 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	441.50	0.00	---	---	---	---	---	---	---	0.000	---	0.000
0.35	0.007	441.85	0.00	---	---	---	---	---	---	---	1.565	---	1.565
0.70	0.019	442.20	0.00	---	---	---	---	---	---	---	1.786	---	1.786
1.05	0.036	442.55	0.00	---	---	---	---	---	---	---	2.007	---	2.007
1.40	0.053	442.90	0.00	---	---	---	---	---	---	---	2.229	---	2.229
1.75	0.069	443.25	0.26 ic	---	---	---	---	---	---	---	2.450	---	2.712
2.10	0.084	443.60	1.30 ic	---	---	---	---	---	---	---	2.671	---	3.970
2.45	0.098	443.95	2.11 oc	---	---	---	---	---	---	---	2.892	---	5.001
2.80	0.110	444.30	3.36 oc	---	---	---	---	---	---	---	3.114	---	6.469
3.15	0.119	444.65	4.05 ic	---	---	---	---	---	---	---	3.335	---	7.390
3.50	0.125	445.00	4.63 ic	---	---	---	---	---	---	---	3.556	---	8.187

Appendix H
Watershed Maps

Camp Yankee Trails Site Improvements

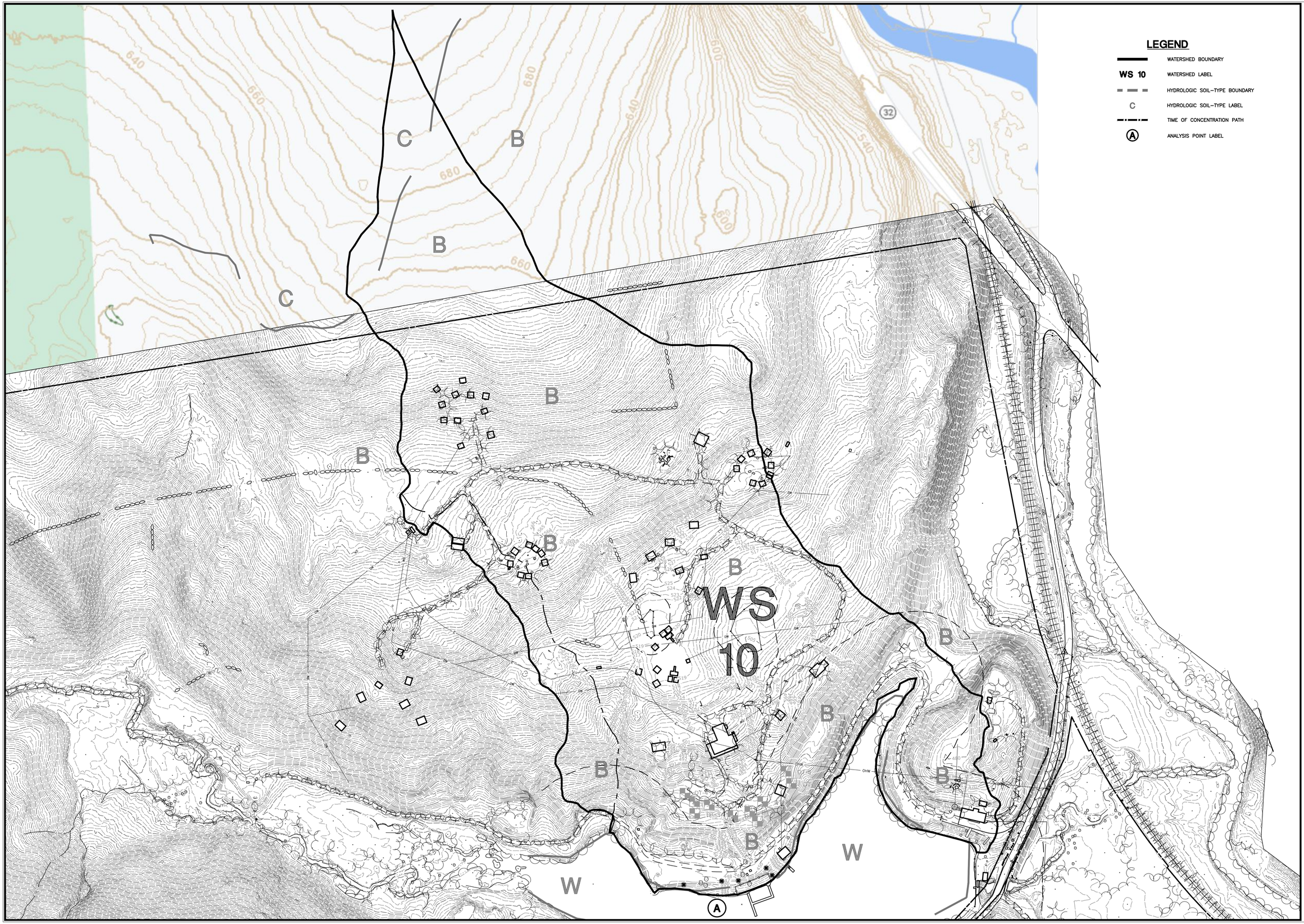
343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0080.0080

November 20, 2023



SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

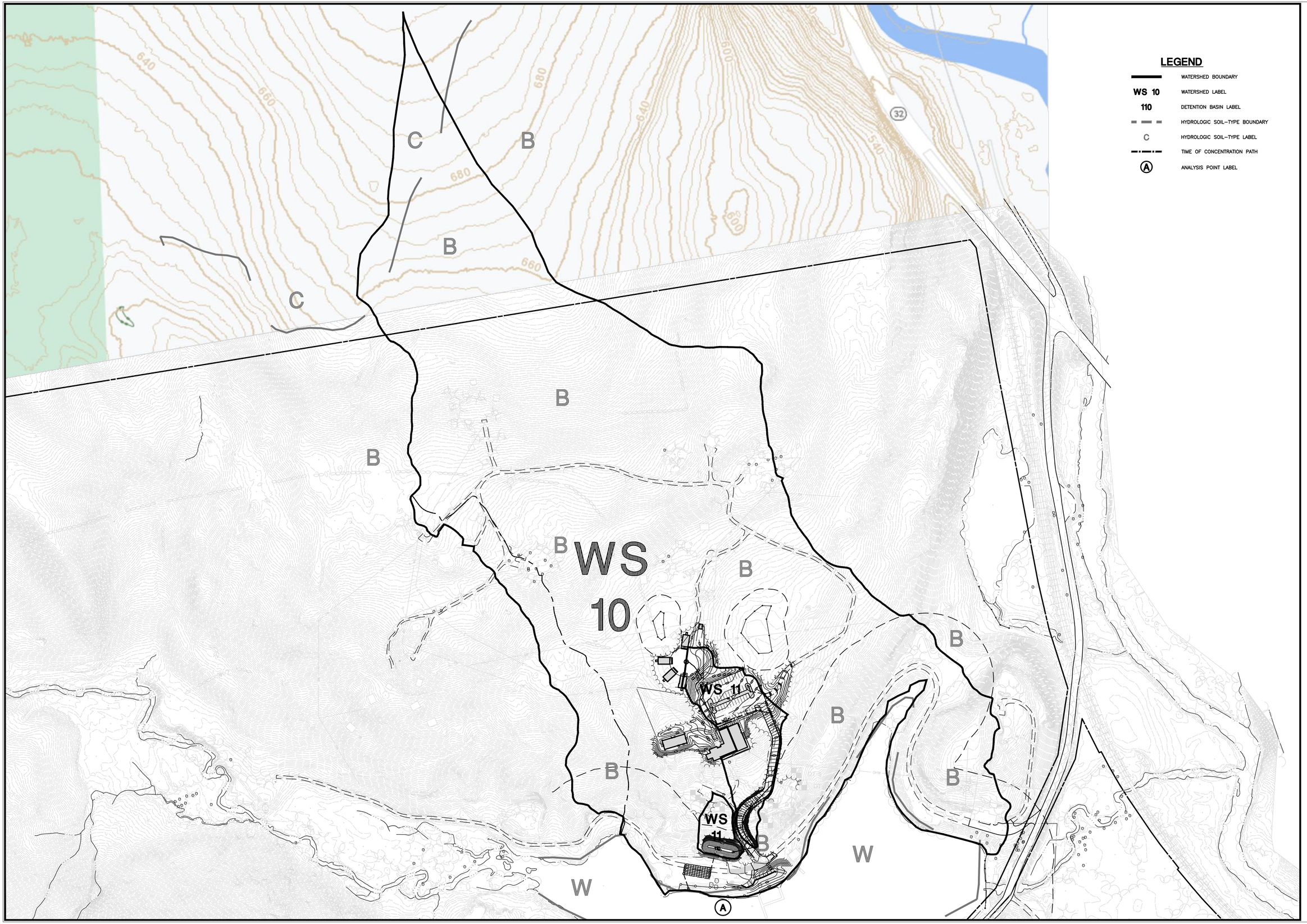
DESCRIPTION	DATE	BY

WATERSHED MAP - EXISTING CONDITIONS

CAMP YANKEE TRAILS SITE IMPROVEMENTS
PROJECT NAME 2
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MCB	MCB	TDR
DESIGNED	DRAWN	CHECKED

SCALE	1"=120'
DATE	NOVEMBER 17, 2023
PROJECT NO.	13280.00006
SHEET NO.	1 OF 2
SHEET NAME	EXWS



N
W E
S
0' 60' 120'
0 1/2" 1"

SLR
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GUILFORD, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

WATERSHED MAP - PROPOSED CONDITIONS

CAMP YANKEE TRAILS SITE IMPROVEMENTS
PROJECT NAME 2
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MCB	MCB	TDR
DESIGNED	DRAWN	CHECKED

1"=120'
SCALE

NOVEMBER 17, 2023
DATE

13280.00006
PROJECT NO.

2 OF 2
SHEET NO.

PRWS
SHEET NAME

Engineering Review

December 13, 2023

Inland Wetlands & Watercourses Commission
Town of Tolland
c/o Michael D'Amato, Interim Wetlands Agent
21 Tolland Green
Tolland, CT 06084
Via email

RE: 343 Plains Road, Camp Yankee Trails Site Improvements
IWC 23-6 Engineering Review

Commission Members:

As requested, CHA reviewed the following materials for stormwater and general engineering standards that may impact the regulated area:

Item 1	Thirty (30) sheet plan set entitled "Camp Yankee Trails Site Improvements, 343 Plains Road, Tolland, Connecticut, Regulatory Drawings", prepared for Girl Scouts of America, prepared by SLR, dated November 21, 2023
Item 2	Drainage Report, Camp Yankee Trails Site Improvements, 343 Plains Road, Tolland, Connecticut, prepared by SLR, dated November 20, 2023
Item 3	Project Narrative, Camp Yankee Trails Site Improvements, prepared by SLR
Item 4	Wetland Delineation Report, Camp Yankee Trails, prepared by SLR, dated January 27, 2023

CHA offers the following comments based on the Tolland LID and Stormwater Management Design Manual, 2004 Connecticut Stormwater Quality Manual, and general engineering practice:

1. CHA recommends the Designer provide rational for meeting the State or Tolland stormwater standards. The Drainage Report appears to only discuss water quality and quantity treatment.

2. It appears infiltration tests were performed for the stormwater basins; however, no information other than the infiltration testing rates is provided. A narrative, type of test performed, and testing locations must be provided.

3. Test pits are required for properly siting and designing the stormwater basins. This will provide required design information on soil types, depth to ledge and depth to groundwater. Test pit locations and logs must be provided. Based on soil mapping it appears the proposed stormwater basins are located within a type B soil; however, the very high infiltration rates obtained by the infiltration testing are not typical of a type B soil. Test pits must be provided to validate and determine the soil types.

4. Design and siting rational must be provided for Stormwater Basins 110 and 111 based on test pits. See Comment No. 3. Design pursuant the Tolland LID Manual or the Connecticut Stormwater Quality Manual must be provided and fully described. Calculations and descriptions such as drawdown time, depth to high groundwater, pretreatment, etc. must be provided.

5. Pretreatment is required for Stormwater Basin 110. CHA recommends a forebay within Stormwater Basin 110.

6. Although the infiltration testing supports an infiltration rate of 27.4 inches per hour, the rate will be limited by the surface soil. It does not appear that a cross section of the basin or a call out for the type of soil that will line the basin is provided. CHA recommends an engineered soil consisting of sand, loam, and compost. Typically this engineered soil provides an infiltration rate of 2.41 inches per hour. This rate would then be used as the infiltration rate in the drainage calculations for Stormwater Basin 110.

7. Drainage calculations for Stormwater Basin 110 use a weir elevation of 448.4. The elevation called for on the plans is 449.4. The calculations, results, and associated narrative must be revised accordingly.

8. The provided water quality volume based on the drainage calculations appears to be 0.156 acre-feet. The water quality chart on page 35 of the PDF indicates 0.195 acre-feet. This chart must be updated or an explanation of how the provided water quality volume was achieved must be provided.

9. No calculations or cross sections are provided for the “vegetated swale” on the eastern side of the proposed access road to the waterfront improvements. It is unclear if the proposed swale can properly convey runoff to the stormwater basins without impacting the waterfront area or Sweetheart Lake.

10. Proposed riprap is called out as both 1.5:1 and 1:1 slopes on the plan set. This call out must be consistent within the plan set.

11. Inspection ports for Stormwater Basin 111 must be labeled on the plan set.

12. Information must be provided for the beach sand construction at the waterfront improvement area. It is unclear how this area will be modified and how this may impact Sweetheart Lake.

13. CHA recommends sediment barrier be installed at the toe of slope (around the bottom) of Stormwater Basin 110 to prevent fines from reducing the infiltration capacity of the basin while the side slopes are being stabilized.

14. A sequencing plan must be provided for the construction and associated sediment and erosion control of the stormwater basins. The basins cannot be used as temporary sediment basins due to the reduction of infiltration from eroded construction fines. CHA recommends the use of a separately located temporary sediment trap to allow the construction of the stormwater basins once the upgradient site is fully stabilized.

15. A long-term stormwater operation and maintenance plan must be provided to ensure the stormwater management systems continue to function as designed. The location of the systems upgradient and adjacent to Sweetheart Lake make the implementation of this plan important to prevent stormwater system failures that will directly impact the Lake.

16. The Preformed Scour Hole Detail on Sheet SD-5 must be updated to correctly identify FES 5.

Please contact me if you have any questions regarding these comments.

Sincerely,

Chuck Eaton, P.E., LEEP-AP

Tolland Town Engineer

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

December 20, 2023

Mr. Chuck Eaton, PE, LEEP-AP
CHA
400 Capital Boulevard, Suite 301
Rocky Hill, CT 06067

SLR Project No.: 141.13280.00006

RE: Response to IWC 23-6 Review Comments
343 Plains Road - Camp Yankee Trails Site Improvements
Tolland, Connecticut

Dear Mr. Eaton,

SLR International Corporation (SLR) is in receipt of CHA's review comments dated December 13, 2023, regarding the above-referenced project. We offer the following responses to the comments contained therein:

General Comments

C1. CHA recommends the designer provide rational for meeting the State or Tolland stormwater standards. The Drainage Report appears to only discuss water quality and quantity treatment.

R1. As referenced in the Drainage Report, the design meets the requirements of the *2004 Connecticut Stormwater Quality Manual* for no increases in peak flow rates for the 2-, 10-, 25-, 50-, and 100-year storms as well as the groundwater recharge volume (GRV) and water quality volume (WQV) requirements. Additionally, runoff volume control is provided in accordance with the Town of Tolland *Low Impact Development* manual due to the infiltrative capacity of both the stormwater basin and the underground chamber system.

C2. It appears infiltration tests were performed for the stormwater basins; however, no information other than the infiltration testing rates is provided. A narrative, type of test performed, and testing locations must be provided.

R2. Test pit locations are depicted on the plan set. Falling head permeability tests conforming with American Society for Testing and Materials D5084-03 were performed in SLR's in-house laboratory for two undisturbed tube samples taken at depths of 42" and 36" respectively. Results of the permeability tests are provided in Appendix F of the Drainage Report, and 50 percent of the average rate was used for design of Stormwater Basin 110 and Underground Detention System 111.

C3. Test pits are required for properly siting and designing the stormwater basins. This will provide required design information on soil types, depth to ledge and depth to groundwater. Test pit locations and logs must be provided. Based on soil mapping it appears the proposed stormwater basins are located within a type B soil; however, the very high infiltration rates obtained by the infiltration testing are not typical of a type B soil. Test pits must be provided to validate and determine the soil types.

R3. Test pit data is included on Sheet UT-2 of the plan set.

C4. Design and siting rational must be provided for Stormwater Basins 110 and 111 based on test pits. See comment No.3. Design pursuant the Tolland LID Manual or the Connecticut Stormwater Quality Manual must be provided and fully described. Calculations and descriptions such as drawdown time, depth to high groundwater, pretreatment, etc. must be provided.

R4. Test pit locations are depicted on the plan set and are located between the locations of Stormwater Basin 110 and Underground Detention System 111. Drawdown time calculations have been provided in Appendix E of the Drainage Report. No groundwater was located in either test pit but can be inferred based on the water level in Sweetheart Lake, around Elevation 438.0. Pretreatment has been provided in the form of a sediment forebay in Stormwater Basin 110.

C5. Pretreatment is required for Stormwater Basin 110. CHA recommends a forebay within Stormwater Basin 110.

R5. A sediment forebay has been added to Stormwater Basin 110.

C6. Although the infiltration testing supports an infiltration rate of 27.4 inches per hour, the rate will be limited by the surface soil. It does not appear that a cross section of the basin or a call out for the type of soil that will line the basin is provided. CHA recommends an engineered soil consisting of sand, loam, and compost. Typically, this engineered soil provides an infiltration rate of 2.41 inches per hour. This rate would then be used as the infiltration rate in the drainage calculations for Stormwater Basin 110.

R6. A stone wick has been added to Stormwater Basin 110, which will be hydraulically connected to an infiltration stone layer beneath the topsoil layer of the basin. This stone layer will be the same area as the bottom of the basin and will interface with the native soil, supporting the use of an infiltration rate of 27.4 inches per hour. A detail has been provided on Sheet SD-5. Onsite sandy loam soils will be used for the topsoil growing medium.

C7. Drainage calculations for Stormwater Basin 110 use a weir elevation of 448.4. The elevation called for on the plans is 449.4. The calculations, results and associated narrative must be revised accordingly.

R7. The overflow weir elevation for Stormwater Basin 110 has been adjusted to 448.0. The callout on Sheet UT-2 has been adjusted to reflect this.

C8. The provided water quality volume based on the drainage calculations appears to be 0.156 acre-feet. The water quality chart on page 35 of the PDF indicates 0.195 acre-feet. This chart must be updated or an explanation of how the provided water quality volume was achieved must be provided.

R8. The required water quality volume is 0.079 acre-feet (ac-ft). The Drainage Report has been updated to show that the provided water quality volume is 0.177 ac-ft.

C9. No calculations or cross sections are provided for the “vegetated swale” on the eastern side of the proposed access road to the waterfront improvements. It is unclear if the proposed swale can properly convey runoff to the stormwater basins without impacting the waterfront area or Sweetheart Lake.

R9. Calculations for the vegetated swale have been provided in Appendix D of the Drainage Report.

C10. Proposed riprap is called out as both 1.5:1 and 1:1 slope on the plan set. This call out must be consistent within the plan set.

R10. The callouts on the plan set have been updated to reflect all 1.5:1 riprap slopes.

C11. Inspection ports for Stormwater Basin 111 must be labeled on the plan set.

R11. A callout for the inspection ports for Underground Detention System 111 has been added to Sheet UT-2.

C12. Information must be provided for the beach sand construction at the waterfront improvement area. It is unclear how this area will be modified and how this may impact Sweetheart Lake.

R12. A graphic cross section has been added to sheet GR-4 to illustrate the proposed work. Essentially, the waterfront area is being cut down in grade to allow for a more conducive gathering area for waterfront programming. A less steep waterfront allows for easier grouping of swimmers for instruction, provides a more relaxing area for seating and sunbathing, and reduces the erosive force of surface runoff. The waterfront area will be constructed with reused existing sand and gravel from the site. Large stones will be removed, and the material will be compacted to form the sloped waterfront access area.

C13. CHA recommends sediment barrier be installed at the tow of slope (around the bottom) of Stormwater Basin 110 to prevent fines from reducing the infiltration capacity of the basin while the side slopes are being stabilized.

R13. Silt fence and hay bales were added at the toe of the slope around the bottom of Stormwater Basin 110. These protections will remain in place until satisfactory vegetative cover is established on all side slopes. See Sheet SE-2.

C14. A sequencing plan must be provided for the construction and associated sediment and erosion control of the stormwater basins. The basins cannot be used as temporary sediment basins due to the reduction of infiltration from eroded construction fines. CHA recommends the use of a separately located temporary sediment trap to allow the construction of the stormwater basins once the upgradient site is fully stabilized.

R14. A construction sequence has been provided on Sheet SE-2. As discussed with the Inland Wetlands & Watercourse Commission, a temporary sediment trap has been added to the plans and will be located at Stormwater Basin 110. The bottom of the trap will be a foot higher than the bottom of Stormwater Basin 110. Sediment will be removed from the trap prior to basin construction.

C15. A long-term stormwater operation and maintenance plan must be provided to ensure the stormwater management systems continue to function as designed. The location of the systems upgradient and adjacent to Sweetheart Lake make the implementation of this plan important to prevent stormwater system failures that will directly impact the lake.

R15. A stormwater operation and maintenance plan has been included as part of the revised Drainage Report.

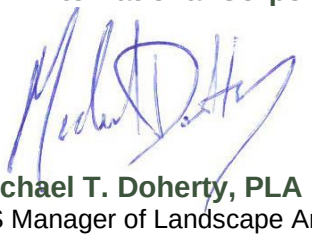
C16. The Preformed Scour Hole Detail on Sheet SD-5 must be updated to correctly identify FES 5.

R16. The preformed scour hole detail has been updated.

Please do not hesitate to contact either of the undersigned at (203) 271-1773 should you have any questions regarding this matter.

Regards,

SLR International Corporation



Michael T. Doherty, PLA
US Manager of Landscape Architecture
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Todd Ritchie, PE
Principal Civil Engineer
tritchie@slrconsulting.com

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

December 20, 2023

Mr. Michael D'Amato, Wetlands Agent
Town of Tolland
21 Tolland Green, 3rd Level
Tolland, CT 06084

SLR Project No.: 141.13280.00006

RE: 343 Plains Road - Camp Yankee Trails
Inland Wetlands & Watercourse Commission Comments
Tolland, Connecticut

Dear Mr. D'Amato,

Enclosed please find information in response to questions and concerns discussed during the December 14, 2023, Town of Tolland Inland Wetlands & Watercourse Commission regular meeting pertaining to the Girl Scouts of Connecticut permit application for proposed work at 343 Plains Road. The following discussion items were noted and are provided with a response.

C1. Should check dams be added to the vegetated swale along the access drive to the dining hall?

R1. The addition of check dams is not recommended due to the presence of the proposed drainage structures and the shallow depth of the proposed vegetative swale. The series of six open grate manholes, which are the full width of the swale, will provide the most efficient protection by capturing flows. Check dams are typically a minimum of 1 foot in height. At this height, the check dams will impede flow, leading water to overtop the swale and redirect runoff to adjacent areas that may be more prone to erosion.

C2. Should the angle of the pipe exiting Manhole #6 to Stormwater Basin 110 be altered to reduce the acute angle?

R2. The location of Manhole #6 is positioned to capture as much flow as possible before the end of the swale, which drives the angle of the pipe to the stormwater basin. The pipe conveyance computations included in the drainage report take the angle of the pipe into account for junction losses in the system. The 25-year storm is adequately conveyed by the storm drainage system.

C3. Should additional erosion protection be provided at the turn in the swale just north of the proposed detention basin?

R3. We do not believe additional protection is necessary due to the close proximity upgradient of Manhole #7, which should significantly reduce flows to Manhole #5 at the turn of the drive. Overall, the six 24"-diameter grate inlets at each manhole within the swale will collect water from the swale and introduce it to the pipe conveyance system. Very little water will bypass these inlets.

C4. Should additional erosion protection be provided at the stormwater basin spillway?

R4. The stormwater basin is designed such that water will not discharge over the spillway for up to a 100-year storm event. An additional area below the spillway has been added as shown on revised sheet UT-2.

C5. Should additional erosion protection be provided after Manhole #6 near the bottom of the dining hall access drive?

R5. The grading after Manhole #6 has been softened to allow for a flatter and wider area after the structure. A high point was also added after the structure to direct runoff back to the structure in moderate rain events. Any water that continues beyond the structure will be dissipated by a layer of crushed stone that has been added to further slow flows before reaching the paved access drive. It should also be noted that the proposed grades in this area are less steep than existing conditions.

C6. Can surface runoff be slowed at the slope between the proposed accessible beach access and the existing boat house building?

R6. A stone infiltration trench is proposed along the northern edge of the accessible ramp and sloped walkway, which will assist in diffusing and slowing upland flows. The existing topography in this area is sloped at a similar angle to the proposed and experiences limited erosion. We expect the establishment of greater vegetative cover to further limit the potential for erosive action; however, an erosion control blanket has been added to the plans for added protection until a satisfactory vegetative cover is established.

Please feel free to contact either of the undersigned should you need any further information.

Regards,

SLR International Corporation

Michael T. Doherty, PLA
US Manager of Landscape Architecture
mtdoherty@slrconsulting.com

Todd Ritchie, PE
Principal Civil Engineer
tritchie@slrconsulting.com

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Camp Yankee Trails Site Improvements

343 Plains Road
Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

20 Washington Avenue
North Haven, CT 06473

Prepared by:

SLR International Corporation

99 Realty Drive, Cheshire, Connecticut, 06410

SLR Project No.: 141.13280.00006.0060

November 20, 2023

Revised December 20, 2023

Making Sustainability Happen

Drainage Report

Camp Yankee Trails Site Improvements
343 Plains Road
Tolland, Connecticut
SLR #141.13280.000006.0060

This Drainage Report has been prepared in support of the proposed upgrades to the existing Girl Scouts camp on Plains Road in the town of Tolland, Connecticut. This project includes renovations and additions to the dining hall, a new shower house, and four new cabins including an Americans with Disabilities Act (ADA) accessible unit, a new parking lot, stone dust and concrete paths, an access road, and stormwater improvements.

Figure 1 – 343 Plains Road, Map, Block, Lot (MBL): 06-A-001

Table 1 – Stormwater Data

Parcel Size Total	221 acres
Existing Impervious Area (Watershed Area)	0.74 acres
Proposed Impervious Area (Watershed Area)	1.79 acres
Soil Type (Hydrologic Soil Group)	"B" and "C"
Existing Land Use	Open space, woods, gravel, water, building, and paved/impervious cover
Proposed Land Use	Open space, woods, gravel, water, building, and paved/impervious cover
Design Storm for Stormwater Management	No increases in peak rates of runoff for the 2-, 10-, 25-, 50-, and 100-year storms; Connecticut Department of Energy & Environmental Protection (CTDEEP) water quality volume (WQV) and groundwater recharge volume (GRV), Runoff Volume Control per Town of Tolland
Water Quality Measures	Catch basins with 2-foot sumps, underground detention system, and retention/infiltration storage for WQV
Design Storm for Storm Drainage	25-year storm
Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas	Area of Minimal Flood Hazard (Zone X)
Connecticut Department of Energy & Environmental Protection Aquifer Protection Areas	None

Stormwater Management Approach

The proposed stormwater management system for the project focuses on providing water quality management while attenuating proposed peak flows. Water quality treatment in accordance with the CTDEEP requirements for WQV is provided. The proposed stormwater treatment train consists of catch basins with 2-foot sumps and retention/infiltrations storage for the WQV.

The computer program entitled *Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2023* by Autodesk, Inc. was used for designing the proposed storm drainage collection system. Storm drainage computations performed include pipe capacity and hydraulic grade line calculations. The contributing watershed to each individual catch basin inlet was delineated to determine the drainage area and land coverage. These values were used to determine the stormwater runoff to each inlet using the Rational Method. The rainfall intensities for the site were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14,

Volume 10, Precipitation Frequency Data Server (PFDS). The proposed storm drainage system is designed to provide adequate capacity to convey the 25-year storm event.

Water Quality Management

Water quality measures or Best Management Practices (BMPs) have been incorporated into the design to maintain water quality to provide protection of the areas downgradient of the proposed development. The proposed stormwater management system will include catch basins with 2-foot sumps and retention/infiltration storage for the WQV and GRV.

The proposed stormwater basin will provide retention volume along its bottom, thus creating a water quality feature within it. This serves several purposes, including stormwater renovation and first-flush retention. The vegetation will provide pollutant removal by filtering stormwater runoff and utilizing excess nutrients that may be present in the stormwater. The CTDEEP *2004 Stormwater Quality Manual* (Chapter 7) recommends methods for sizing stormwater treatment measures with WQV and GRV computations. The WQV addresses the initial stormwater runoff, also commonly referred to as the "first-flush" runoff. The WQV provides adequate volume to store the runoff associated with the first 1 inch of rainfall, which tends to contain the highest concentration of potential pollutants. Supporting calculations have been included in the Appendix of this report.

Hydrologic Analysis

A hydrologic analysis was conducted to analyze the predevelopment and postdevelopment peak-flow rates from the site. One analysis point was selected, as it receives all runoff from the site. Analysis Point A represents Sweetheart Lake. The total watershed area delineated is approximately 46.6 acres under both existing and proposed conditions.

The method of predicting the surface water runoff rates utilized in this analysis was a computer program titled *Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2019* by Autodesk, Inc., Version 2020. The *Hydrographs* program is a computer model that utilizes the methodologies set forth in the *Technical Release No. 55* (TR-55) manual and *Technical Release No. 20* (TR-20) computer model, originally developed by the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS). The *Hydrographs* computer modeling program is primarily used for conducting hydrology studies such as this one.

The *Hydrographs* computer program forecasts the rate of surface water runoff based upon several factors. The input data includes information on land use, hydrologic soil type, vegetation, contributing watershed area, time of concentration, rainfall data, storage volumes, and the hydraulic capacity of structures. The computer model predicts the amount of runoff as a function of time, with the ability to include the attenuation effect due to dams, lakes, large wetlands, floodplains, and stormwater management basins. The input data for rainfalls with statistical recurrence frequencies of 2, 10, 25, 50, and 100 years was obtained from the NOAA Atlas 14, Volume 10 database. The corresponding rainfall totals are listed below.

Storm Frequency	Rainfall (inches)
2-year	3.25
10-year	5.07
25-year	6.21
50-year	7.04
100-year	7.96

Land use for the site under existing and proposed conditions was determined from field survey and aerial photogrammetry. Land use types used in the analysis included grassed or open space, woods, water, gravel, building, and impervious (paved) cover. Soil types in the watershed were determined from the CTDEEP Geographic Information System (GIS) database of the USDA-NRCS soil survey for Tolland County, Connecticut. For the analysis, the site was determined to contain hydrologic soil types "B" and "C" as classified by USDA-NRCS. Composite runoff Curve Numbers (CN) for each subwatershed were calculated based on the different land use and soil types. The time of concentration (Tc) was estimated for each subwatershed using the TR-55 methodology and was computed by summing all travel times through the watershed as sheet flow, shallow concentrated flow, and channel flow.

The existing conditions were modeled with the *Hydrographs* program to determine the peak-flow rates for the various storm events at the analysis point. A revised model was developed incorporating the proposed site conditions, the underground chamber system, and the stormwater management basin. The flows obtained with the revised model were then compared to the results of the existing conditions model. Peak-flow rates from the project site were controlled by the storage volume provided within the stormwater management basin and the underground chamber system.

The following peak rates and volumes of runoff were obtained from the *Hydrographs* hydrology results:

Analysis Point A – Sweetheart Lake					
	Peak Runoff Rate (cubic feet per second)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Existing Conditions	7.7	37.0	61.7	81.4	104.6
Proposed Conditions	7.5	36.2	61.7	81.2	104.2

Analysis Point A – Sweetheart Lake					
	Peak Runoff Volume (acre-feet)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Existing Conditions	1.38	4.62	7.22	9.30	11.8
Proposed Conditions	1.34	4.45	6.98	9.01	11.4

Detention Basin 110*					
	Water Surface Elevation (feet)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Proposed Conditions	447.6	448.2	448.6	448.9	449.1

***Top of Berm Elevation = 450.2**

Underground Chamber System 111**					
	Water Surface Elevation (feet)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Proposed Conditions	441.5	443.4	444.1	444.3	444.8

****Top of Stone Elevation = 445.0**

Conclusion

The results of the hydrologic analysis demonstrate that there will be no increases in peak-flow rates and volumes from the proposed development. This was achieved for storm events modeled through a planned stormwater management system with a subsurface infiltration system and stormwater management basin. The proposed development will also introduce a new stormwater treatment train consisting of catch basins with 2-foot sumps and retention/infiltration of the WQV and GRV.

All supporting documentation and stormwater-related computations are attached to this report along with the *Hydrographs* model results for stormwater management and *Hydraflow Storm Sewers* model results for the proposed storm drainage system. Illustrative watershed maps for both existing and proposed conditions are also attached to this report.

Appendices

Appendix A United States Geological Survey Location Map
Appendix B Federal Emergency Management Agency Flood Insurance Rate Map
Appendix C Natural Resources Conservation Service Hydrologic Soil Group Map
Appendix D Storm Drainage Computations
Appendix E Water Quality Computations
Appendix F Hydrologic Analysis – Input Computations
Appendix G Hydrologic Analysis – Computer Model Results
Appendix H Operations and Maintenance Manual
Appendix I Watershed Maps

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Appendix A
United States Geological Survey Location Map

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

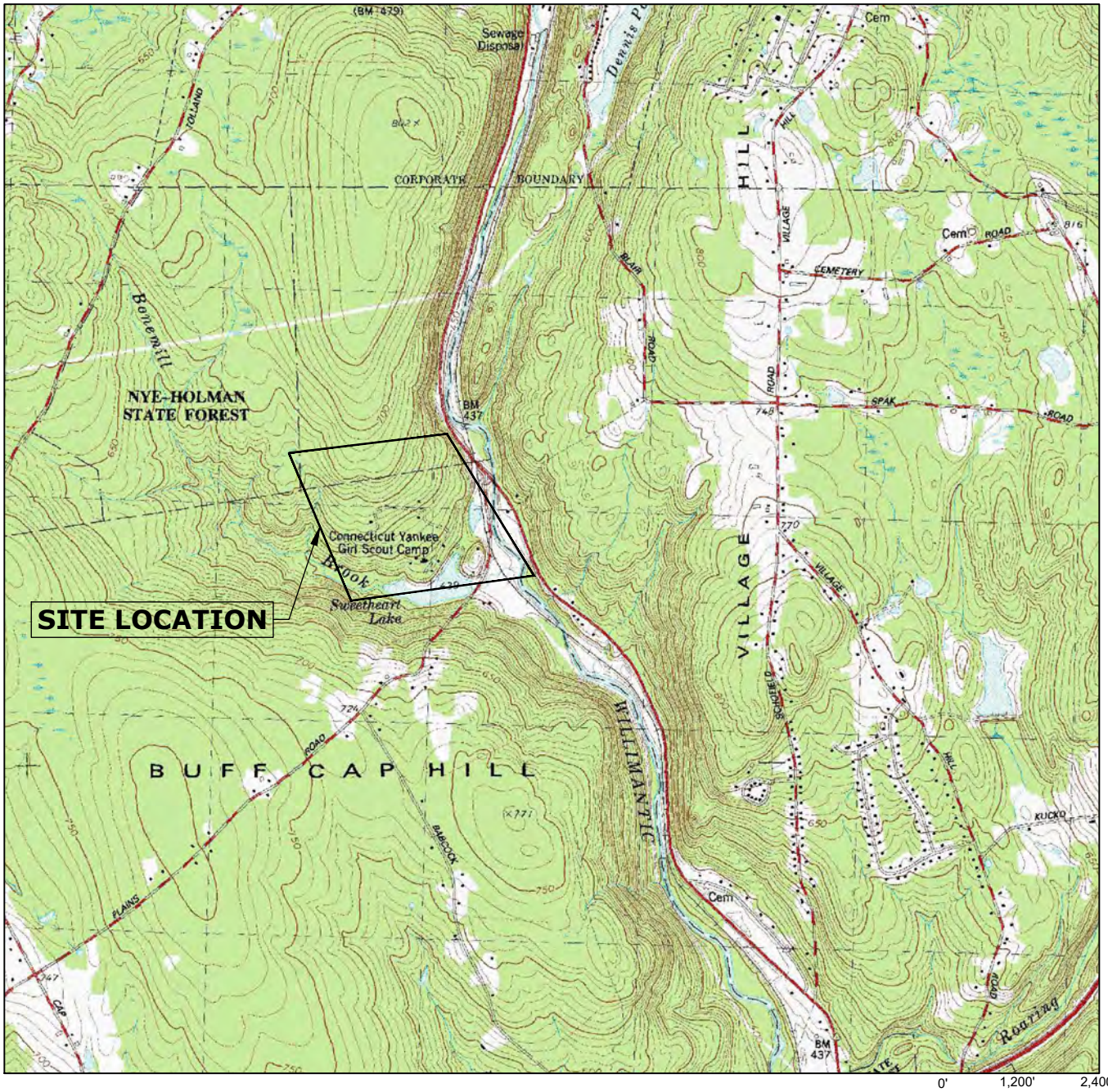
Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0060

November 20, 2023

Revised December 20, 2023



SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

USGS QUADRANGLE MAP, QUAD NO. 25

CAMP YANKEE TRAILS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

PROJECT PHASE:

REV: ---

DATE	NOVEMBER 13, 2023
SCALE	1"=2,400'
PROJ. NO.	13280.00006

DESIGNED	DRAWN	CHECKED
---	JLS	---

DRAWING NAME:

LOC

Appendix B
FEMA Flood Insurance Rate Map

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

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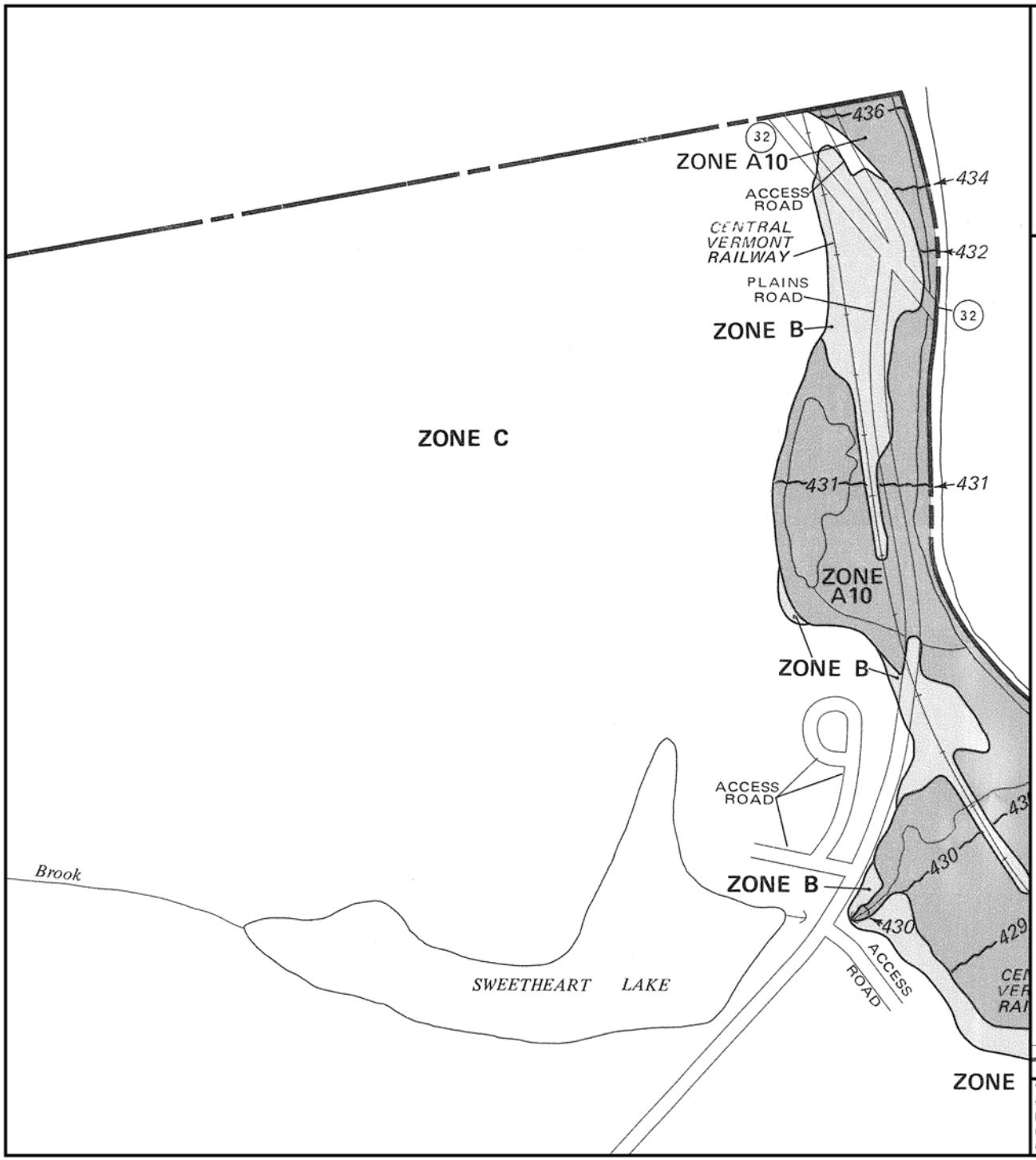

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
TOLLAND,
CONNECTICUT
TOLLAND COUNTY

PANEL 7 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
090171 0007 A

EFFECTIVE DATE:
APRIL 1, 1982

Federal Emergency Management Agency

Appendix C
Natural Resources Conservation Service Hydrologic Soil Group Map

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

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Girl Scouts of Connecticut

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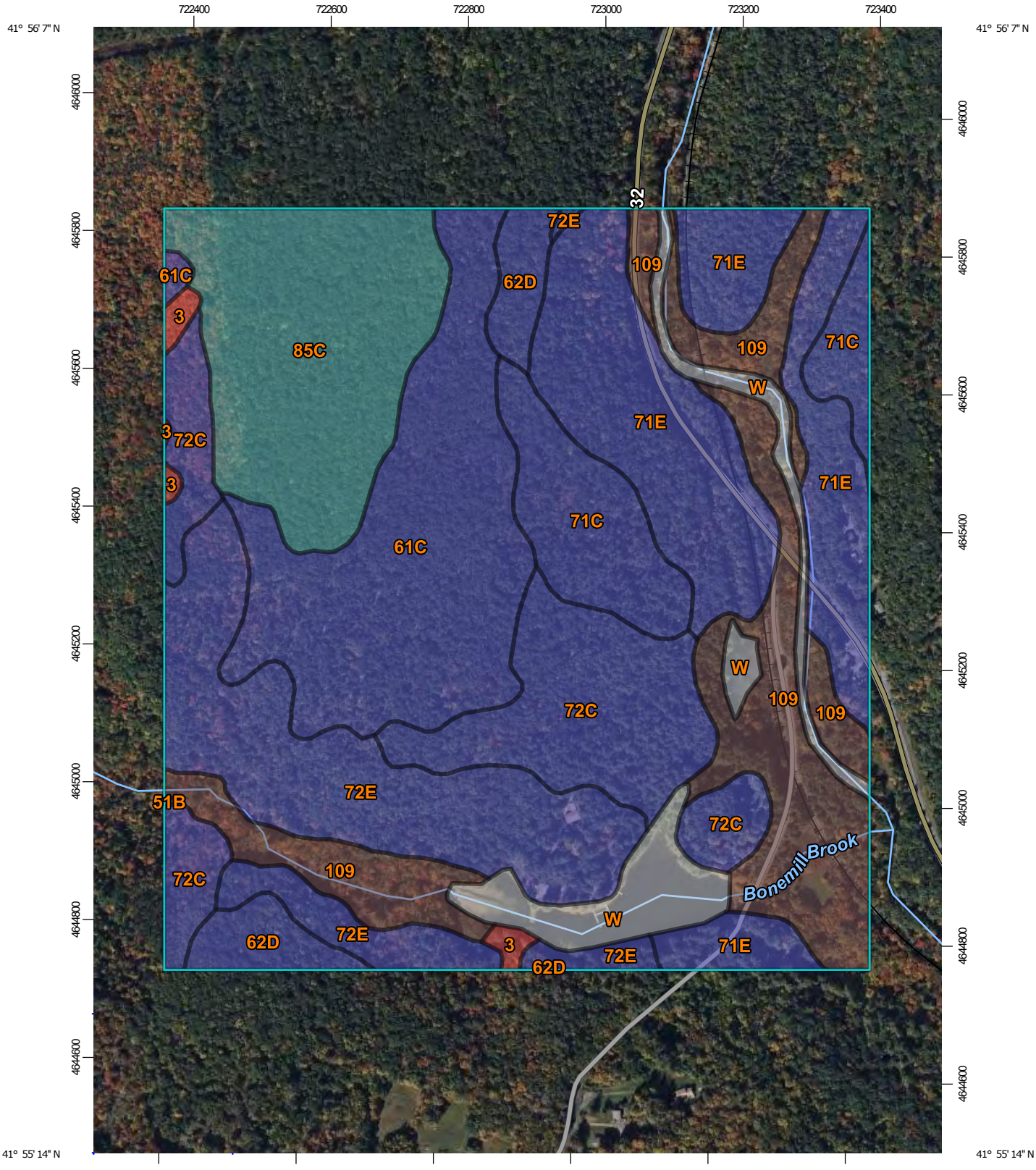
SLR



Map Scale: 1:7,960 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	1.8	0.6%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	B/D	0.0	0.0%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	B	42.9	15.2%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	B	8.4	3.0%
71C	Nipmuck-Brimfield-Rock outcrop complex, 3 to 15 percent slopes	B	17.4	6.2%
71E	Nipmuck-Brimfield-Rock outcrop complex, 15 to 45 percent slopes	B	47.9	17.0%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	B	33.5	11.9%
72E	Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky	B	40.5	14.4%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	C	35.3	12.5%
109	Fluvaquents-Udifluvents complex, frequently flooded	B/D	39.6	14.1%
W	Water		14.2	5.0%
Totals for Area of Interest			**281.6**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix D
Storm Drainage Computations

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0060

November 20, 2023

Revised December 20, 2023

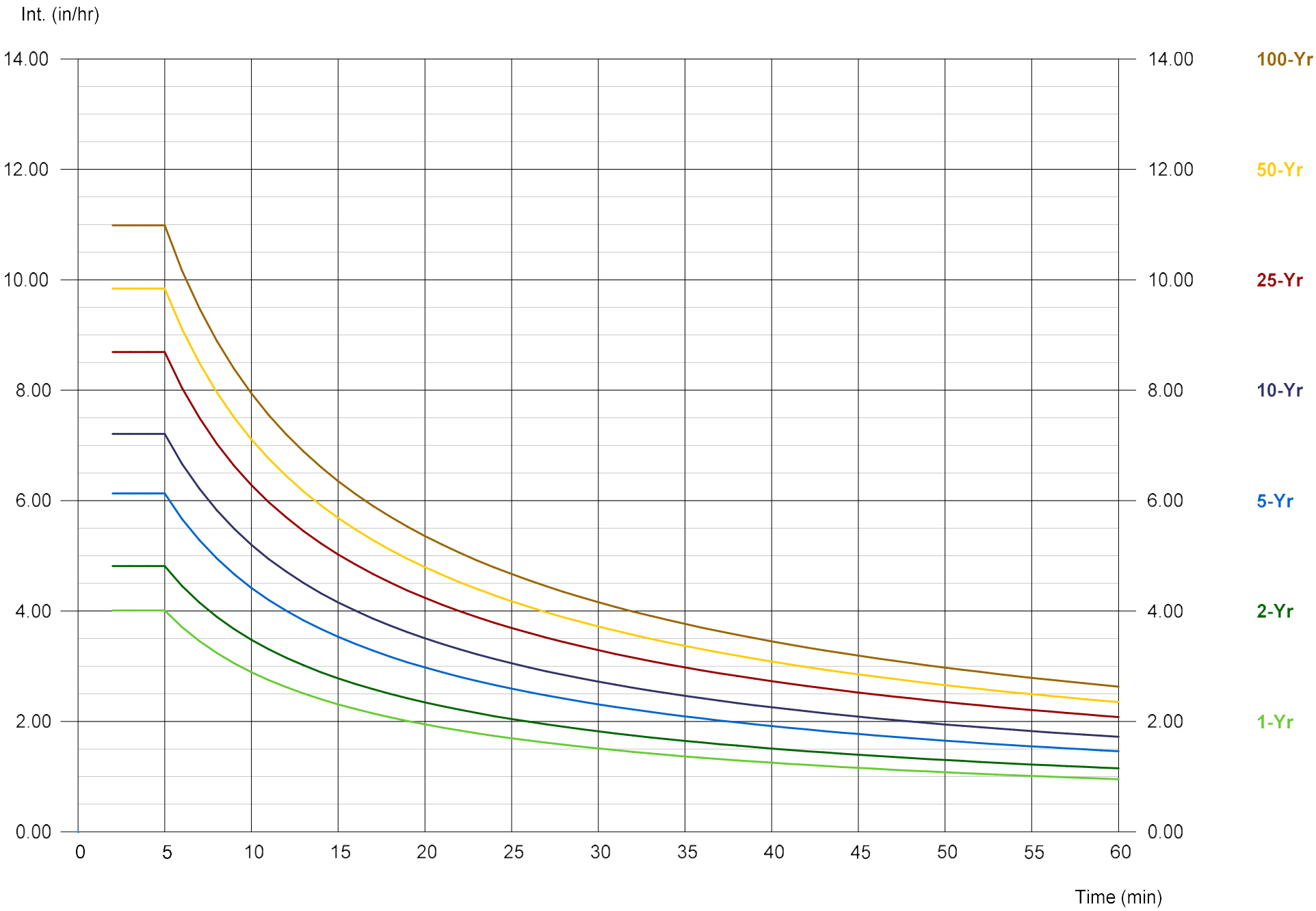
Rational Method Individual Basin Calculations

Project: Camp Yankee Trails Site Improvement By: JLS Date: 11/16/23
Location: 343 Plains Road, Tolland, CT Checked: MCB Date: 11/17/23

Basin Name	Impervious Area C=0.9 (sf)	Grassed Area C=0.3 (sf)	Gravel Area C=0.6 (sf)	Wooded Area C=0.2 (sf)	Total Area (sf)	Total Area (ac)	Weighted C	Tc (min)
System 110								
MH 5	907	848	0	32	1787	0.04	0.60	5.0
MH 6	2207	6311	512	6753	15783	0.36	0.35	5.0
MH 7	5492	5055	0	9041	19588	0.45	0.42	5.0
MH 8	3270	3165	0	0	6435	0.15	0.60	5.0
MH 9	1793	1899	219	294	4205	0.10	0.56	5.0
MH 10	969	535	0	0	1504	0.03	0.69	5.0
CLCB 11	11775	3336	0	0	15111	0.35	0.77	5.0
CLCB 12	7651	5971	0	0	13622	0.31	0.64	5.0
YD 13	432	392	0	0	824	0.02	0.61	5.0
CLCB 14	1881	347	0	0	2228	0.05	0.81	5.0
YD 15	818	343	0	0	1161	0.03	0.72	5.0
YD 16	0	603	0	0	603	0.01	0.30	5.0

Storm Sewer IDF Curves

IDF file: Tolland.IDF



NOAA Atlas 14, Volume 10, Version 3
Location name: Tolland, Connecticut, USA*
Latitude: 41.9274°, Longitude: -72.3121°
Elevation: 579 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.02** (3.06-5.27)	**4.82** (3.67-6.32)	**6.13** (4.67-8.09)	**7.22** (5.46-9.55)	**8.72** (6.41-12.0)	**9.85** (7.12-13.9)	**11.0** (7.75-16.1)	**12.3** (8.26-18.4)	**14.2** (9.17-21.9)	**15.7** (9.91-24.7)
10-min	**2.84** (2.17-3.73)	**3.41** (2.60-4.48)	**4.34** (3.30-5.72)	**5.12** (3.87-6.77)	**6.18** (4.54-8.52)	**6.98** (5.03-9.82)	**7.81** (5.49-11.4)	**8.73** (5.84-13.0)	**10.0** (6.49-15.5)	**11.1** (7.02-17.5)
15-min	**2.23** (1.70-2.92)	**2.68** (2.04-3.51)	**3.40** (2.59-4.48)	**4.01** (3.04-5.30)	**4.84** (3.56-6.68)	**5.47** (3.94-7.70)	**6.13** (4.30-8.93)	**6.85** (4.59-10.2)	**7.87** (5.09-12.2)	**8.70** (5.51-13.7)
30-min	**1.51** (1.15-1.98)	**1.82** (1.38-2.38)	**2.31** (1.76-3.04)	**2.72** (2.06-3.60)	**3.29** (2.42-4.54)	**3.72** (2.68-5.23)	**4.16** (2.92-6.07)	**4.65** (3.12-6.94)	**5.35** (3.46-8.26)	**5.91** (3.74-9.31)
60-min	**0.954** (0.729-1.25)	**1.15** (0.874-1.50)	**1.46** (1.11-1.92)	**1.72** (1.30-2.28)	**2.08** (1.53-2.87)	**2.35** (1.69-3.30)	**2.63** (1.85-3.83)	**2.94** (1.97-4.39)	**3.38** (2.19-5.22)	**3.74** (2.37-5.88)
2-hr	**0.609** (0.467-0.794)	**0.730** (0.559-0.952)	**0.927** (0.707-1.21)	**1.09** (0.828-1.43)	**1.32** (0.972-1.81)	**1.48** (1.08-2.09)	**1.66** (1.18-2.43)	**1.87** (1.26-2.78)	**2.18** (1.42-3.36)	**2.45** (1.55-3.83)
3-hr	**0.467** (0.358-0.606)	**0.559** (0.429-0.727)	**0.711** (0.544-0.927)	**0.837** (0.637-1.10)	**1.01** (0.749-1.39)	**1.14** (0.831-1.60)	**1.28** (0.912-1.87)	**1.44** (0.971-2.14)	**1.70** (1.10-2.60)	**1.92** (1.22-2.99)
6-hr	**0.296** (0.229-0.383)	**0.358** (0.276-0.462)	**0.457** (0.351-0.593)	**0.540** (0.413-0.704)	**0.654** (0.488-0.895)	**0.738** (0.541-1.03)	**0.829** (0.597-1.21)	**0.943** (0.636-1.39)	**1.12** (0.728-1.70)	**1.27** (0.811-1.97)
12-hr	**0.184** (0.143-0.236)	**0.224** (0.173-0.288)	**0.290** (0.223-0.374)	**0.344** (0.264-0.446)	**0.419** (0.314-0.570)	**0.474** (0.349-0.661)	**0.534** (0.386-0.777)	**0.609** (0.412-0.891)	**0.726** (0.474-1.10)	**0.828** (0.529-1.28)
24-hr	**0.110** (0.085-0.140)	**0.135** (0.105-0.173)	**0.177** (0.137-0.226)	**0.211** (0.163-0.272)	**0.258** (0.194-0.350)	**0.293** (0.217-0.407)	**0.331** (0.241-0.480)	**0.379** (0.257-0.552)	**0.454** (0.298-0.683)	**0.520** (0.334-0.797)
2-day	**0.062** (0.048-0.079)	**0.077** (0.060-0.098)	**0.102** (0.079-0.130)	**0.122** (0.094-0.156)	**0.150** (0.113-0.203)	**0.171** (0.127-0.236)	**0.193** (0.141-0.280)	**0.222** (0.151-0.322)	**0.268** (0.176-0.401)	**0.309** (0.199-0.470)
3-day	**0.045** (0.035-0.057)	**0.056** (0.044-0.071)	**0.074** (0.057-0.094)	**0.088** (0.069-0.113)	**0.109** (0.082-0.147)	**0.124** (0.092-0.171)	**0.140** (0.103-0.202)	**0.161** (0.110-0.233)	**0.195** (0.128-0.291)	**0.225** (0.145-0.341)
4-day	**0.036** (0.028-0.045)	**0.045** (0.035-0.056)	**0.059** (0.046-0.075)	**0.071** (0.055-0.090)	**0.087** (0.066-0.117)	**0.099** (0.074-0.136)	**0.112** (0.082-0.161)	**0.129** (0.088-0.186)	**0.156** (0.103-0.232)	**0.180** (0.116-0.272)
7-day	**0.024** (0.019-0.030)	**0.030** (0.023-0.038)	**0.039** (0.031-0.049)	**0.047** (0.036-0.059)	**0.057** (0.043-0.076)	**0.065** (0.049-0.089)	**0.073** (0.054-0.105)	**0.084** (0.058-0.121)	**0.101** (0.067-0.150)	**0.117** (0.075-0.176)
10-day	**0.019** (0.015-0.025)	**0.024** (0.019-0.030)	**0.031** (0.024-0.039)	**0.036** (0.028-0.046)	**0.044** (0.034-0.059)	**0.050** (0.037-0.068)	**0.056** (0.041-0.080)	**0.064** (0.044-0.092)	**0.076** (0.050-0.113)	**0.087** (0.056-0.131)
20-day	**0.014** (0.011-0.017)	**0.016** (0.013-0.020)	**0.020** (0.015-0.025)	**0.023** (0.018-0.029)	**0.027** (0.020-0.035)	**0.030** (0.022-0.040)	**0.033** (0.024-0.047)	**0.037** (0.026-0.053)	**0.043** (0.028-0.063)	**0.048** (0.031-0.071)
30-day	**0.011** (0.009-0.014)	**0.013** (0.010-0.016)	**0.016** (0.012-0.019)	**0.018** (0.014-0.022)	**0.020** (0.015-0.027)	**0.023** (0.017-0.030)	**0.025** (0.018-0.034)	**0.027** (0.019-0.038)	**0.030** (0.020-0.045)	**0.033** (0.021-0.049)
45-day	**0.010** (0.007-0.012)	**0.011** (0.008-0.013)	**0.012** (0.010-0.015)	**0.014** (0.011-0.017)	**0.016** (0.012-0.020)	**0.017** (0.013-0.023)	**0.019** (0.013-0.025)	**0.020** (0.014-0.028)	**0.022** (0.015-0.032)	**0.023** (0.015-0.035)
60-day	**0.008** (0.007-0.010)	**0.009** (0.007-0.011)	**0.010** (0.008-0.013)	**0.011** (0.009-0.014)	**0.013** (0.010-0.017)	**0.014** (0.010-0.019)	**0.015** (0.011-0.021)	**0.016** (0.011-0.023)	**0.017** (0.012-0.025)	**0.018** (0.012-0.027)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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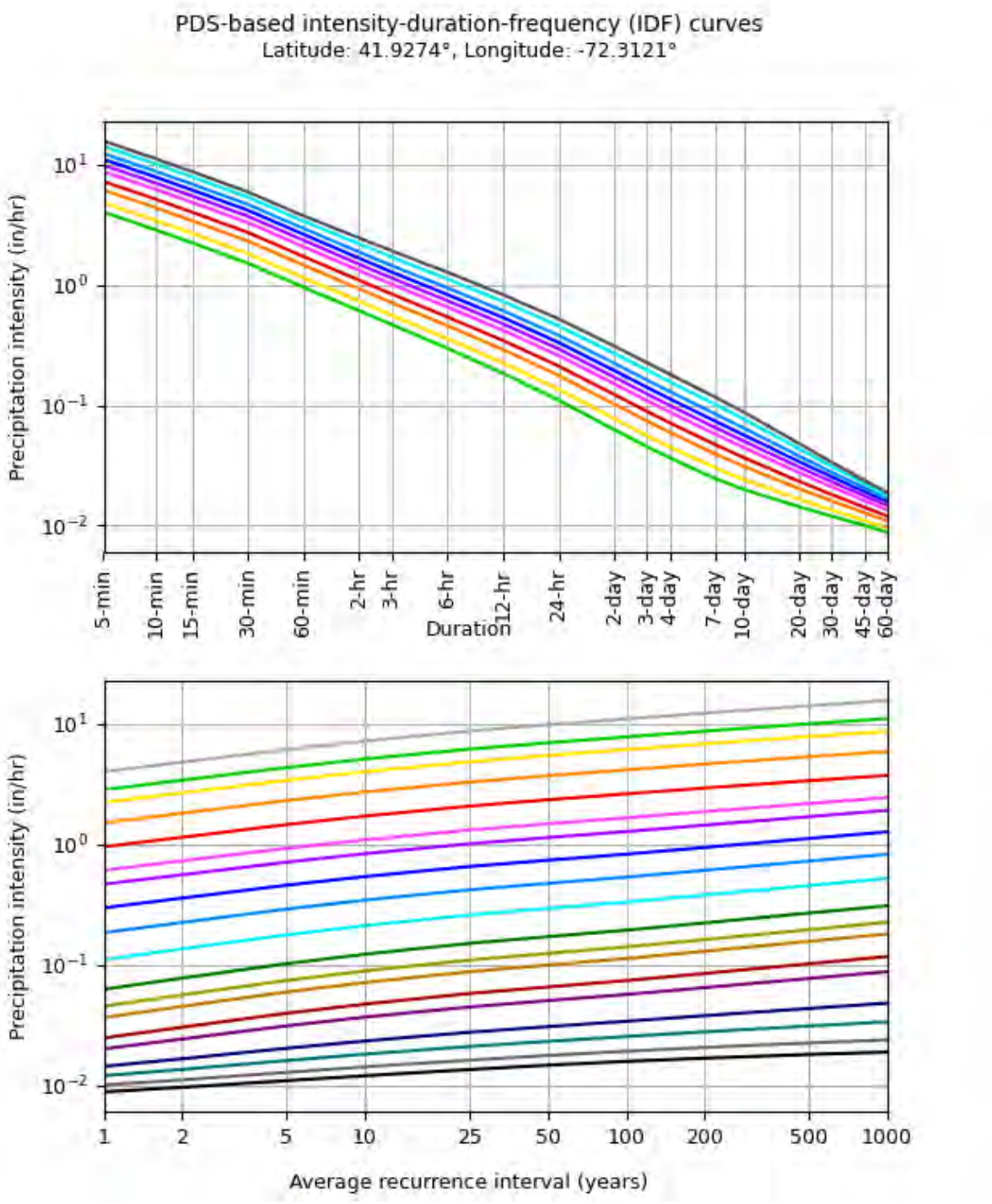
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu Aug 24 13:11:05 2023

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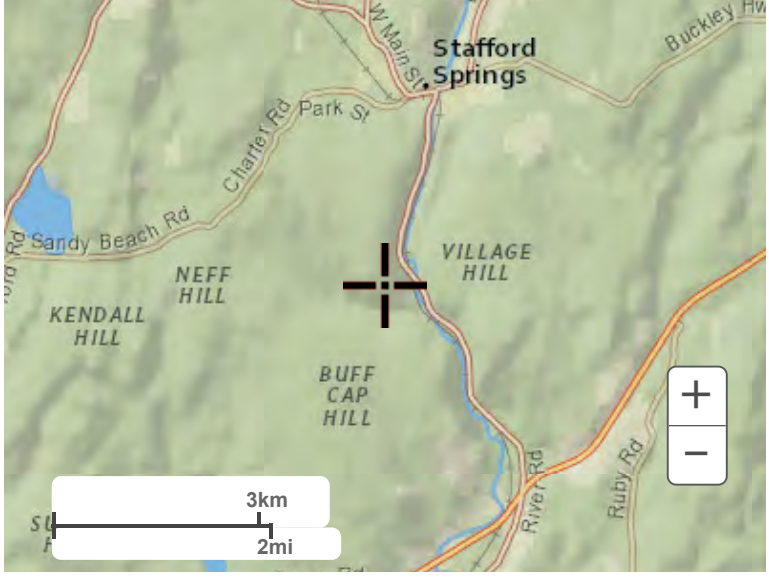
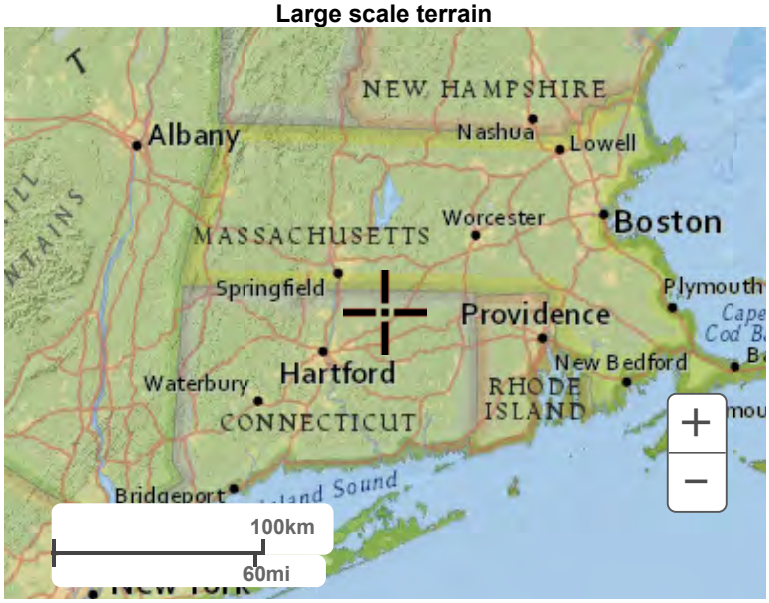
Maps & aerials

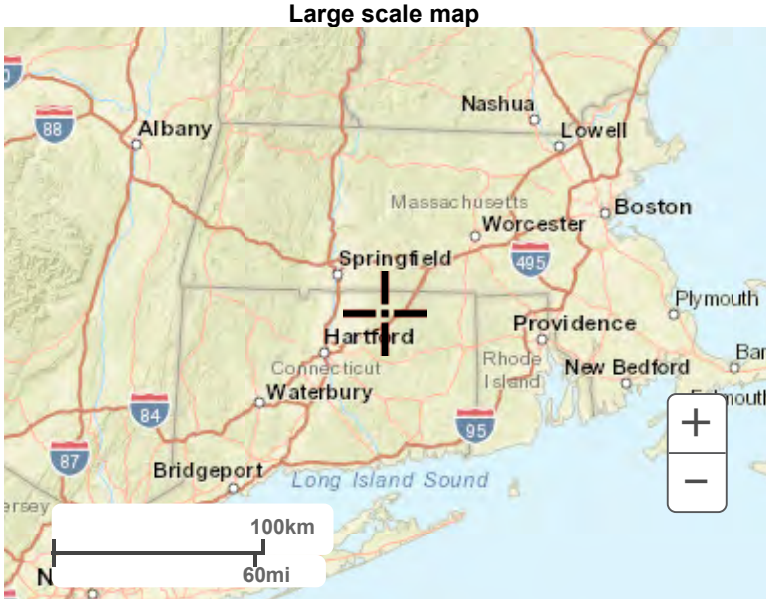
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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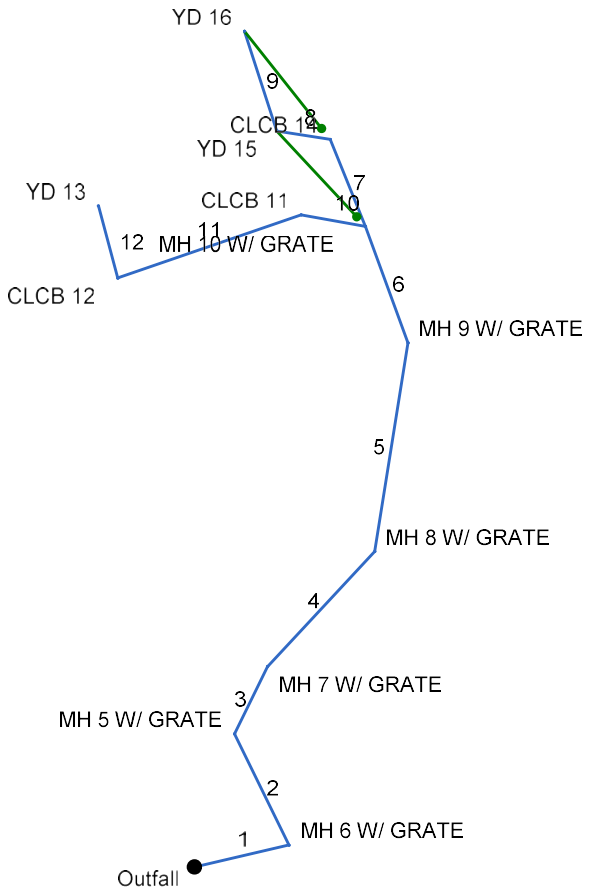
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: System 110.stm	Number of lines: 12	Date: 11/17/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	61	-13	Grate	0.00	0.36	0.35	5.0	445.00	4.10	447.50	12	Cir	0.012	1.50	452.50	OUTFALL - MH 6
2	1	78	-103	Grate	0.00	0.04	0.60	5.0	449.20	10.00	457.00	12	Cir	0.012	1.23	461.00	MH 6 - MH 5
3	2	47	52	Grate	0.00	0.45	0.42	5.0	458.20	10.00	462.90	12	Cir	0.012	0.51	469.50	MH 5 - MH 7
4	3	99	17	Grate	0.00	0.15	0.60	5.0	466.50	8.28	474.70	12	Cir	0.012	0.92	477.70	MH 7 - MH 8
5	4	133	-34	Grate	0.00	0.10	0.56	5.0	474.70	6.62	483.50	12	Cir	0.012	0.81	488.50	MH 8 - MH 9
6	5	78	-29	Grate	0.00	0.03	0.69	5.0	485.50	9.87	493.20	12	Cir	0.012	1.33	499.44	MH 9 - MH 10
7	6	59	-2	Grate	0.00	0.05	0.81	5.0	495.50	10.17	501.50	12	Cir	0.012	1.32	505.00	MH 10 - CLCB 14
8	7	34	-59	DrGrt	0.00	0.03	0.72	5.0	502.00	3.53	503.20	12	Cir	0.012	1.37	506.20	CLCB 14 - YD 15
9	8	66	63	DrGrt	0.00	0.01	0.30	5.0	503.70	3.18	505.80	8	Cir	0.012	1.00	508.30	YD 15 - YD 16
10	6	41	-60	Grate	0.00	0.35	0.77	5.0	495.50	9.76	499.50	12	Cir	0.012	0.81	504.00	MH 10 - CLCB 11
11	10	122	-29	Grate	0.00	0.31	0.64	5.0	501.00	1.64	503.00	12	Cir	0.012	1.50	506.00	CLCB 11 - CLCB 12
12	11	47	94	DrGrt	0.00	0.02	0.61	5.0	503.00	2.13	504.00	12	Cir	0.012	1.00	507.00	CLCB 12 - YD 13

Project File: System 110.stm | Number of lines: 12 | Date: 11/17/2023

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	61	0.36	1.90	0.35	0.13	1.05	5.0	7.1	7.4	7.80	7.81	9.94	12	4.10	445.00	447.50	449.10	451.60	447.36	452.50	OUTFALL - MH 6
2	1	78	0.04	1.54	0.60	0.02	0.92	5.0	7.0	7.5	6.93	12.20	8.86	12	10.00	449.20	457.00	453.90	457.97	452.50	461.00	MH 6 - MH 5
3	2	47	0.45	1.50	0.42	0.19	0.90	5.0	6.9	7.5	6.78	12.20	12.33	12	10.00	458.20	462.90	458.73	463.87	461.00	469.50	MH 5 - MH 7
4	3	99	0.15	1.05	0.60	0.09	0.71	5.0	6.8	7.6	5.42	11.10	10.57	12	8.28	466.50	474.70	466.99	475.64	469.50	477.70	MH 7 - MH 8
5	4	133	0.10	0.90	0.56	0.06	0.62	5.0	6.4	7.8	4.85	9.92	6.41	12	6.62	474.70	483.50	475.64	484.41	477.70	488.50	MH 8 - MH 9
6	5	78	0.03	0.80	0.69	0.02	0.57	5.0	6.3	7.9	4.45	12.12	10.16	12	9.87	485.50	493.20	485.92	494.08	488.50	499.44	MH 9 - MH 10
7	6	59	0.05	0.09	0.81	0.04	0.07	5.0	5.8	8.1	0.53	12.30	5.22	12	10.17	495.50	501.50	495.64	501.80	499.44	505.00	MH 10 - CLCB 14
8	7	34	0.03	0.04	0.72	0.02	0.02	5.0	5.6	8.3	0.20	7.25	3.04	12	3.53	502.00	503.20	502.12	503.38	505.00	506.20	CLCB 14 - YD 15
9	8	66	0.01	0.01	0.30	0.00	0.00	5.0	5.0	8.7	0.03	2.33	1.74	8	3.18	503.70	505.80	503.75	505.87	506.20	508.30	YD 15 - YD 16
10	6	41	0.35	0.68	0.77	0.27	0.48	5.0	6.2	7.9	3.80	12.05	9.52	12	9.76	495.50	499.50	495.89	500.33	499.44	504.00	MH 10 - CLCB 11
11	10	122	0.31	0.33	0.64	0.20	0.21	5.0	5.8	8.2	1.72	4.94	4.77	12	1.64	501.00	503.00	501.41	503.56	504.00	506.00	CLCB 11 - CLCB
12	11	47	0.02	0.02	0.61	0.01	0.01	5.0	5.0	8.7	0.11	5.63	0.97	12	2.13	503.00	504.00	503.56	504.13	506.00	507.00	CLCB 12 - YD 13

Project File: System 110.stm

Number of lines: 12

Run Date: 11/17/2023

NOTES:Intensity = 41.75 / (Inlet time + 3.80) ^ 0.72; Return period =Yrs. 25 ; c = cir e = ellip b = box

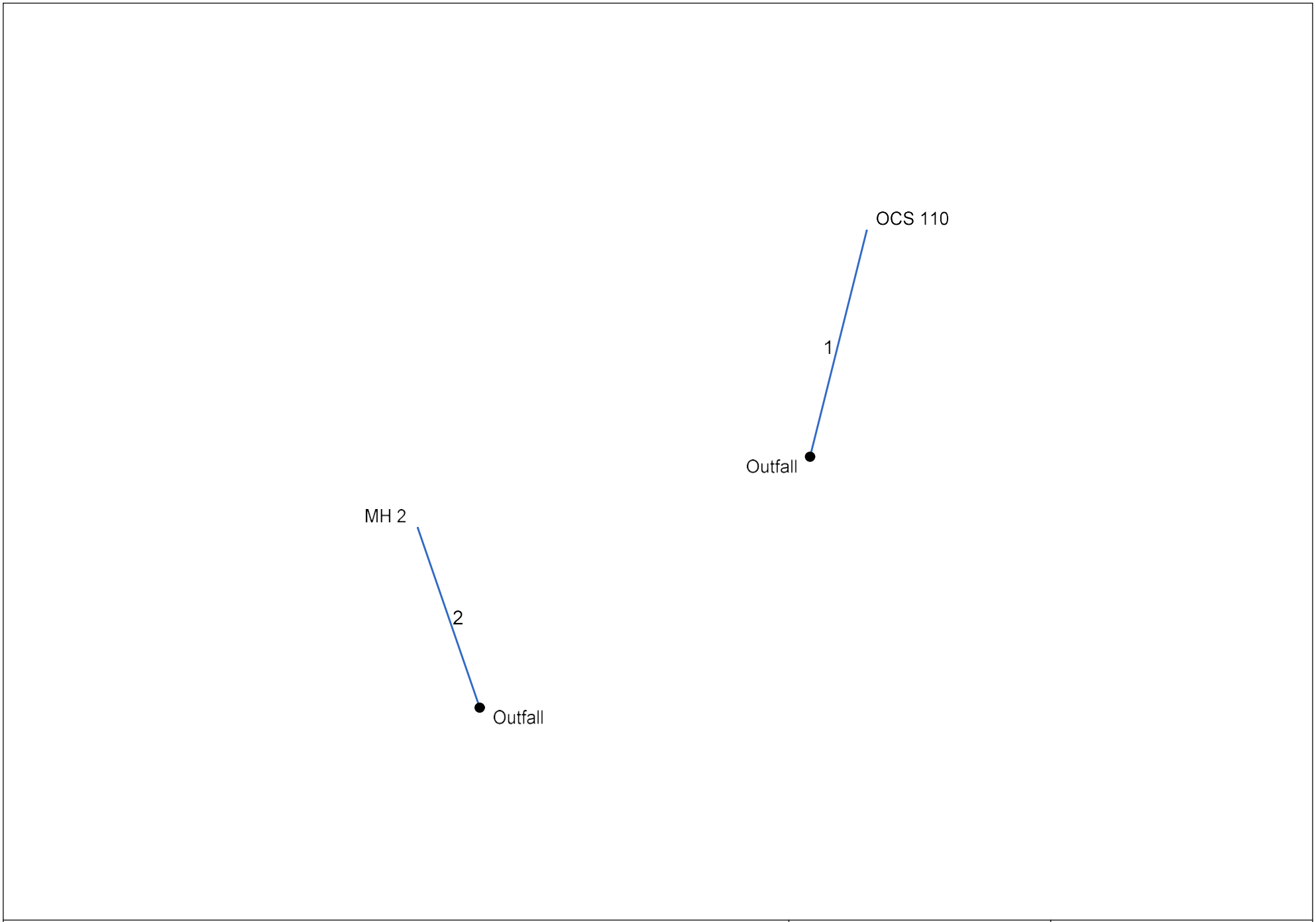
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	12	7.80	445.00	449.10	1.00	0.79	9.94	1.54	450.64	4.093	61	447.50	451.60	1.00	0.79	9.94	1.53	453.13	4.091	4.092	2.496	1.50	2.30
2	12	6.93	449.20	453.90	1.00	0.78	8.83	1.21	455.11	3.232	78	457.00	457.97 j	0.97**	0.78	8.89	1.23	459.20	2.861	3.047	n/a	1.23	n/a
3	12	6.78	458.20	458.73	0.53*	0.43	15.94	1.18	459.91	0.000	47	462.90	463.87	0.97**	0.78	8.71	1.18	465.05	0.000	0.000	n/a	0.51	0.60
4	12	5.42	466.50	466.99	0.49*	0.39	14.04	0.78	467.77	0.000	99	474.70	475.64	0.94**	0.76	7.09	0.78	476.42	0.000	0.000	n/a	0.92	n/a
5	12	4.85	474.70	475.64	0.94	0.75	6.34	0.65	476.29	0.000	133	483.50	484.41 j	0.91**	0.75	6.47	0.65	485.06	0.000	0.000	n/a	0.81	0.53
6	12	4.45	485.50	485.92	0.42*	0.31	14.24	0.57	486.49	0.000	78	493.20	494.08	0.88**	0.73	6.07	0.57	494.65	0.000	0.000	n/a	1.33	0.76
7	12	0.53	495.50	495.64	0.14*	0.07	7.80	0.11	495.75	0.000	59	501.50	501.80	0.30**	0.20	2.65	0.11	501.91	0.000	0.000	n/a	1.32	n/a
8	12	0.20	502.00	502.12	0.12*	0.05	4.04	0.06	502.18	0.000	34	503.20	503.38	0.18**	0.10	2.04	0.06	503.45	0.000	0.000	n/a	1.37	0.09
9	8	0.03	503.70	503.75	0.05*	0.01	2.22	0.02	503.77	0.000	66	505.80	505.87	0.07**	0.02	1.26	0.02	505.90	0.000	0.000	n/a	1.00	0.02
10	12	3.80	495.50	495.89	0.39*	0.28	13.59	0.46	496.35	0.000	41	499.50	500.33	0.83**	0.70	5.46	0.46	500.79	0.000	0.000	n/a	0.81	0.38
11	12	1.72	501.00	501.41	0.41*	0.30	5.72	0.23	501.63	0.000	122	503.00	503.56	0.56**	0.45	3.82	0.23	503.78	0.000	0.000	n/a	1.50	0.34
12	12	0.11	503.00	503.56	0.56	0.06	0.24	0.05	503.60	0.000	47	504.00	504.13 j	0.13**	0.06	1.71	0.05	504.18	0.000	0.000	n/a	1.00	0.05

Project File: System 110.stm | Number of lines: 12 | Run Date: 11/17/2023

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: System 120.stm	Number of lines: 2	Date: 11/17/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	49.000	-76.000	None	11.80	0.00	0.00	0.0	442.00	9.39	446.60	12	Cir	0.012	1.00	449.00	MH 3 - OCS 110
2	End	40.000	-109.000	MH	4.27	0.00	0.00	0.0	441.00	5.00	443.00	12	Cir	0.012	1.00	446.40	OUTFALL - MH 2

Project File: System 120.stm

Number of lines: 2

Date: 11/17/2023

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	49.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	11.80	11.82	15.03	12	9.39	442.00	446.60	449.30	453.89	447.00	449.00	MH 3 - OCS 110
2	End	40.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.27	8.63	5.66	12	5.00	441.00	443.00	442.00	443.87	442.10	446.40	OUTFALL - MH 2

Project File: System 120.stm | Number of lines: 2 | Run Date: 11/17/2023

NOTES:Intensity = 52.80 / (Inlet time + 3.80) ^ 0.72; Return period =Yrs. 100 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	12	11.80	442.00	449.30	1.00	0.79	15.03	3.51	452.81	9.359	49.000	446.60	453.89	1.00**	0.79	15.02	3.51	457.40	9.355	9.357	4.585	1.00	3.51
2	12	4.27	441.00	442.00	1.00*	0.72	5.44	0.46	442.46	1.225	40.000	443.00	443.87 j	0.87**	0.72	5.89	0.54	444.41	1.119	1.172	n/a	1.00	n/a

Project File: System 120.stm | Number of lines: 2 | Run Date: 11/17/2023

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Dec 19 2023

Vegetated Swale

Trapezoidal

Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 1.50, 1.50
Total Depth (ft)	= 0.50
Invert Elev (ft)	= 475.00
Slope (%)	= 16.70
N-Value	= 0.024

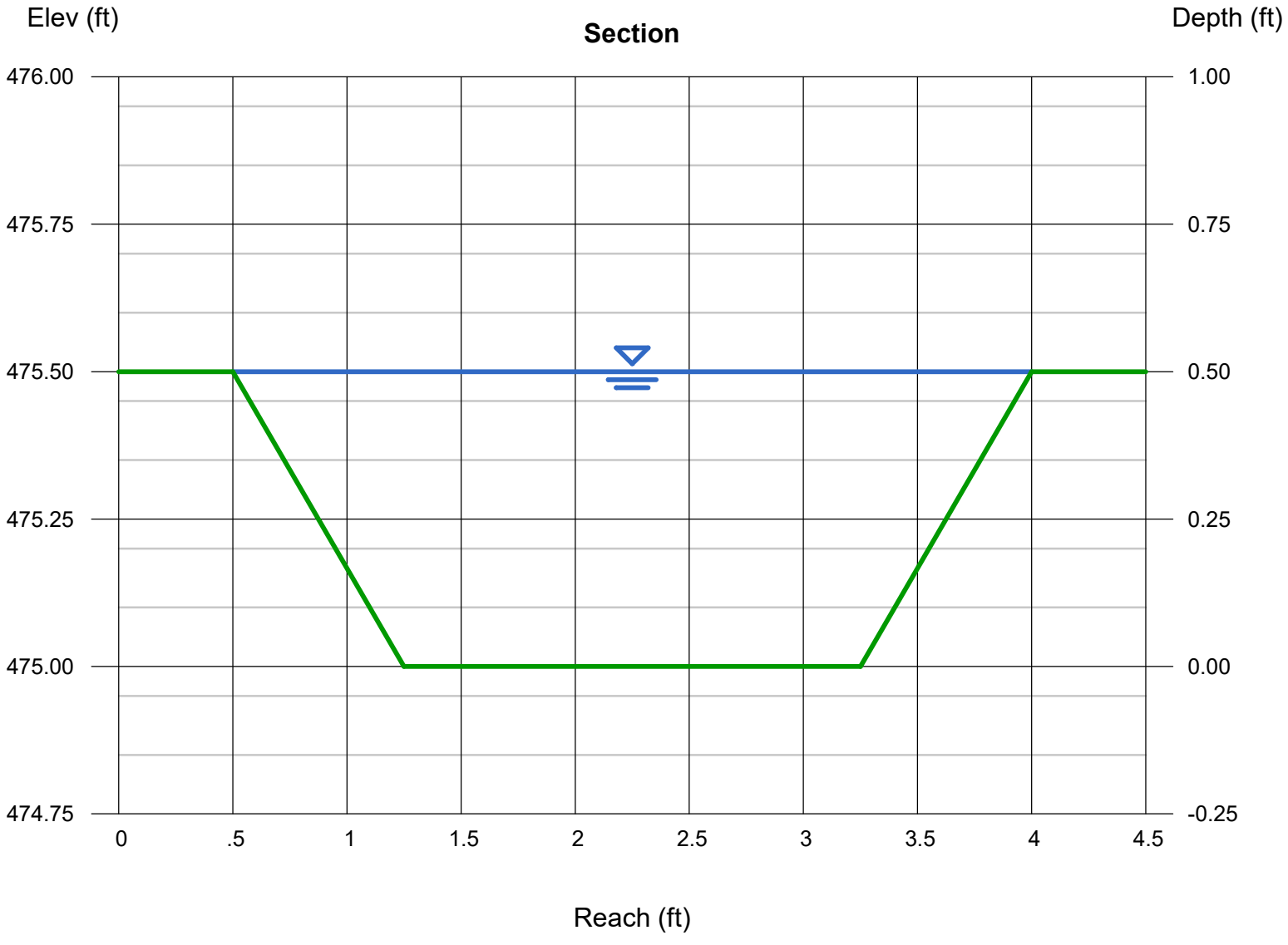
Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 17.65
Area (sqft)	= 1.38
Velocity (ft/s)	= 12.84
Wetted Perim (ft)	= 3.80
Crit Depth, Yc (ft)	= 0.50
Top Width (ft)	= 3.50
EGL (ft)	= 3.06

Total 25-Year Storm Flow to Basin is 7.48 cfs << 17.65 cfs



Outlet Protection Calculations

Project:	Camp Yankee Trails Site Improvement		By: JLS	Date:	11/17/23
Location:	343 Plains Road, Tolland, Connecticut		Checked: MCB	Date:	11/17/23
Outlet I.D.	**FES 1**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

FES 1

Design Criteria (100-yr Storm Event):

Q (cfs) =	4.27	R_p (ft)=	1
D (in) =	12	S_p (ft) =	1
V (fps) =	5.66	Tw (ft)=	1

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections (ft)
T_w= Tailwater depth (ft)

Based on **Table 11-13.1** use Type 'B' ---> TW≥ 0.5 Rp

Rip Rap Stone Size:

Velocity	Rip Rap Specification	D_{50} Stone Size
0-8 fps	Modified	5 inches

Preformed Scour Hole Dimensions:

$F(ft)=0.5(R_p)$	=	n/a
$C(ft)=3.0(S_p)+6.0(F)$	=	n/a
$B(ft)=2.0(S_p)+6.0(F)$	=	n/a

Rip Rap Splash Pad Dimensions:

L_a	=	10	ft
W1 = $3.0(S_p)$ min.	=	3	ft
W2 = 3.0(Sp)+0.4(La) min.	=	7	ft
d (Depth of Stone)	=	12	inches

Outlet Protection Calculations

Project:	Camp Yankee Trails Site Improvement		By: JLS	Date:	11/17/2023
Location:	343 Plains Road, Tolland, Connecticut		Checked: MCB	Date:	11/17/2023
Outlet I.D.	**FES 5**				

*Based on Connecticut DOT Drainage Manual, Section 11.13

Description:

FES 5

Design Criteria (25-yr Storm Event):

Q (cfs) = 7.8	R_p (ft)=	1
D (in) = 12	S_p (ft) =	1
V (fps) = 9.94	Tw (ft)=	4.1

Q= Flow rate at discharge point in cubic feet per second (cfs)
D= Outlet pipe diameter (in)
V= Flow velocity at discharge point (ft/s)
R_p= Maximum inside pipe rise (ft)
S_p= inside diametere for circular sections of maximum inside pipe span for non-circular sections (ft)
T_w= Tailwater depth (ft)

Based on **Table 11.13.1,** A *Preformed Scour Hole* is used *One Half Pipe Rise Depression (Type I)*

Rip Rap Stone Size:

D_{50} Computed (ft)	Rip Rap Specification	D_{50} Stone Size Required
0.047	Modified	5 inches

Preformed Scour Hole Dimensions:

F = 0.5(R_p)	=	0.5 ft
C = 3.0(S_p)+6.0(F)	=	6ft
B = 2.0(S_p)+6.0(F)	=	5ft
d (Depth of Stone)	=	12 inches

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

DRAINAGE AREA MAP - STORM DRAINAGE SYSTEM

CAMP YANKEE TRAILS SITE IMPROVEMENTS
PROJECT NAME 2
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MCB	JLS	TDR
DESIGNED	DRAWN	CHECKED

1"=30'
SCALE

NOVEMBER 17, 2023
DATE

13280.00006
PROJECT NO.

1 OF 1
SHEET NO.

CB
SHEET NAME

Appendix E
Water Quality Computations

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0060

November 20, 2023

Revised December 20, 2023

SLR

STORMWATER QUALITY CALCULATIONS
Water Quality Volume (WQV)

Basin ID	Total Area (ac.)	Impervious Area (ac.)	Percent Impervious	Volumetric Runoff Coeff., R	WQV (ac-ft)	Total Volume Required (ac-ft)	Total Volume Provided[1.] (ac-ft)
DET 110	2.31	0.93	40%	0.41	0.079	0.079	***0.145***

1. - Volume provided below overflow weir

$$\textbf{WQV} = \frac{(1.0 \text{ inches}) \times A \times R}{12}$$

Where:
WQV = Water Quality Volume in acre-feet
A = Contributing Area in acres
R = 0.05 + 0.009 (I)
I = Site Imperviousness as percent

STORMWATER QUALITY CALCULATIONS
Water Quality Volume (WQV)

DET 110

Sediment Forebay

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
445.0	291	0.0	0.000	**0.000**
446.0	518	404.5	0.009	**0.009**

Main Basin

Elevation (ft)	Surface Area (ft2)	Volume (ft3)	Volume (ac-ft)	Cumulative Volume (ac-ft)
445.0	933	0.0	0.000	**0.000**
446.0	1,360	1,146.5	0.026	**0.026**
447.0	2,649	2,004.5	0.046	**0.072**
448.0	3,665	3,157.0	0.072	**0.145**

Drawdown Time = 6,316 cf / [(933 sf * 27.4 in/hr)/12] = 2.96 hours

Groundwater Recharge Volume (GRV)

GRV = F x I

Where: GRV = Groundwater Recharge in cubic feet
F = target depth factor per Hydrologic Soil Group in feet
I = net increase in impervious area (redevelopment projects)

Analysis Point A: (Contains HSG B & HSG C)

Surface	**Existing**	**Proposed**	**Difference**
Impv. (HSG B)	32,530	40,985	8,455
Impv. (HSG C)	0	0	0
Total	*32,530*	*40,985*	*8,455*

GRV =	0.029	x	8,455	=	245.20		
	0.021	x	0	=	0.00		
					245	CF	
		Total GRV Required		=	***245***	CF	
		Total GRV Provided		=	***6,273***	CF	***OK***

Appendix F
Hydrologic Analysis – Input Computations

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0060

November 20, 2023

Revised December 20, 2023

SLR

Curve Number Calculations

Project: Camp Yankee Trails Site Improvements
Location: 343 Plains Road
Tolland, Connecticut
By: MCB Date: 10/30/23 Checked: _____ Date: _____
Circle one: ***Present*** Developed Watershed: EXWS-10

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area (Acres) Sq. Ft. %	Product of CN x Area
B Soil	Woods - Good Condition	55			38.17	2099.58
B Soil	Open Space - Good Condition	61			3.92	239.19
B Soil	Gravel	85			1.62	137.56
C Soil	Woods - Good Condition	70			1.70	118.66
N/A	Paved/Impervious	98			0.11	11.22
N/A	Building	98			0.63	61.97
N/A	Water	98			0.47	45.99
				Totals =	46.63	2714.18
					(0.07285	sq mi)

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{2714.18}{46.63}$ Use CN = **58.2**

SLR

Curve Number Calculations

Project: Camp Yankee Trails Site Improvements
Location: 343 Plains Road
Tolland, Connecticut
By: MCB Date: 10/30/23 Checked: _____ Date: _____
Circle one: Present ***Developed*** Watershed: PRWS-10

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B Soil	Woods - Good Condition	55			35.27	1939.63
B Soil	Open Space - Good Condition	61			4.75	289.50
B Soil	Gravel	85			1.43	121.86
C Soil	Woods - Good Condition	70			1.70	118.66
N/A	Paved/Impervious	98			0.34	33.35
N/A	Building	98			0.60	58.86
N/A	Water	98			0.23	22.66
				Totals =	44.31	2584.52
					(0.06924	sq mi)

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{2584.52}{44.31}$ Use CN = 58.3

Curve Number Calculations

Project: Camp Yankee Trails Site Improvements
Location: 343 Plains Road
Tolland, Connecticut
By: MCB Date: 10/30/23 Checked: _____ Date: _____
Circle one: Present ***Developed*** Watershed: PRWS-11

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Value [1.] Table 2-2	Figure 2-3	Figure 2-4	Area Acres Sq. Ft. %	Product of CN x Area
B Soil	Woods - Good Condition	55			0.54	29.52
B Soil	Open Space - Good Condition	61			0.84	51.40
B Soil	Gravel	85			0.06	51.40
N/A	Paved/Impervious	98			0.80	5.40
N/A	Building	98			0.07	78.21
				Totals =	2.31	215.92
					(0.00361 sq mi)	

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{215.92}{2.31}$ Use CN = **93.4**

SLR

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Camp Yankee Trails | By: MCB | Date: 10/31/23
Location: Tolland, CT | Checked: | Date:
Circle one: ***Present*** Developed | Watershed: EXWS-10
Circle one: ***T_c*** T_t | Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			WOODS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		100.0		
4. Two-year 24-hr rainfall, P_2	in.		3.25		
5. Land slope, s	ft./ft.		0.025		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.325	=	0.325

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D	D-E		
7. Surface description			GRAVEL	GRASS	WOODS		
8. Manning's roughness coeff., n			0.015	0.080	0.100		
9. Paved or unpaved			UNVPD	UNPVD	UNPVD		
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.40	0.40		
11. Flow Length, L	ft.		378.0	102.0	784.0		
12. Watercourse slope, s	ft./ft.		0.050	0.088	0.162		
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		12.06	3.00	3.26		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.009	+ 0.009	0.067		= 0.085

Channel flow

		Segment ID					
15. Channel Bottom width, b	ft.						
16. Horizontal side slope component, z (z horiz:1 vert)	ft.						
17. Depth of flow, d	ft.						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$						
19. Wetted perimeter, P_w	ft.						
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.						
21. Channel slope, s	ft./ft.						
22. Manning's roughness coeff., n							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.						
24. Flow length, L	ft.						
25. $T_t = \frac{L}{3600 * V}$	hr.		+			=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)					hr.		0.410

SLR

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Camp Yankee Trails | By: MCB | Date: 10/31/23
Location: Tolland, CT | Checked: | Date:
Circle one: Present ***Developed*** | Watershed: PRWS-10
Circle one: ***T_c*** T_t | Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			WOODS		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		100.0		
4. Two-year 24-hr rainfall, P_2	in.		3.25		
5. Land slope, s	ft./ft.		0.025		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.325	=	0.325

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D	D-E		
7. Surface description			GRAVEL	GRASS	WOODS		
8. Manning's roughness coeff., n			0.015	0.080	0.100		
9. Paved or unpaved			UNVPD	UNPVD	UNPVD		
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.40	0.40		
11. Flow Length, L	ft.		378.0	102.0	784.0		
12. Watercourse slope, s	ft./ft.		0.050	0.088	0.162		
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		12.06	3.00	3.26		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.009	+ 0.009	0.067	=	0.085

Channel flow

		Segment ID					
15. Channel Bottom width, b	ft.						
16. Horizontal side slope component, z (z horiz:1 vert)	ft.						
17. Depth of flow, d	ft.						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$						
19. Wetted perimeter, P_w	ft.						
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.						
21. Channel slope, s	ft./ft.						
22. Manning's roughness coeff., n							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.						
24. Flow length, L	ft.						
25. $T_t = \frac{L}{3600 * V}$	hr.					=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)					hr.		0.410

SLR

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Camp Yankee Trails | By: MCB | Date: 10/31/23
Location: Tolland, CT | Checked: | Date:
Circle one: Present ***Developed*** | Watershed: PRWS-11
Circle one: ***T_c*** T_t | Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			BIT		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.015		
3. Flow Length, L (< 300ft)	ft.		43.0		
4. Two-year 24-hr rainfall, P_2	in.		3.25		
5. Land slope, s	ft./ft.		0.023		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.012	=	0.012

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C	C-D			
7. Surface description			GRASS	BIT			
8. Manning's roughness coeff., n			0.080	0.015			
9. Paved or unpaved			UNVPD	PVD			
10. Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.		0.40	0.20			
11. Flow Length, L	ft.		31.0	158.0			
12. Watercourse slope, s	ft./ft.		0.194	0.044			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		4.45	7.13			
14. $T_t = \frac{L}{3600 * V}$	hr.		0.002	+ 0.006			= 0.008

Channel flow

		Segment ID	D-E	E-F	F-G	G-H	
15. Channel Bottom width, b	ft.		12" HDPE	12" HDPE	12" HDPE	12" HDPE	
16. Horizontal side slope component, z (z horiz:1 vert)	ft.		--	--	--	--	
17. Depth of flow, d	ft.		FULL	FULL	FULL	FULL	
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		0.79	0.79	0.79	0.79	
19. Wetted perimeter, P_w	ft.		3.14	3.14	3.14	3.14	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.25	0.25	0.25	0.25	
21. Channel slope, s	ft./ft.		0.032	0.091	0.095	0.066	
22. Manning's roughness coeff., n			0.012	0.012	0.012	0.012	
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		8.85	14.93	15.25	12.71	
24. Flow length, L	ft.		122.8	44.0	81.1	134.3	
25. $T_t = \frac{L}{3600 * V}$	hr.		0.004	0.001	0.001	0.003	= 0.009
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)	hr.						~~0.030~~

Min Tc = 0.1 hr

SLR

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Camp Yankee Trails | By: MCB | Date: 10/31/23
Location: Tolland, CT | Checked: | Date:
Circle one: Present ***Developed*** | Watershed: PRWS-11
Circle one: ***T_c*** T_t | Subwatershed:

Sheet flow (applicable to T_c only)

		Segment ID		
1.	Surface description (Table 3-1)			
2.	Manning's roughness coeff. for sheet flow, n (Table 3-1)			
3.	Flow Length, L (< 300ft)	ft.		
4.	Two-year 24-hr rainfall, P_2	in.		
5.	Land slope, s	ft./ft.		
6.	$T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID				
7.	Surface description					
8.	Manning's roughness coeff., n					
9.	Paved or unpaved					
10.	Depth of flow, d (default values: d=.4 unpaved, d=.2 paved)	ft.				
11.	Flow Length, L	ft.				
12.	Watercourse slope, s	ft./ft.				
13.	Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.				
14.	$T_t = \frac{L}{3600 * V}$	hr.				= 0.000

Channel flow

		Segment ID	H-I	I-J	J-K	K-L	
15.	Channel Bottom width, b	ft.	12" HDPE	12" HDPE	12" HDPE	12" HDPE	
16.	Horizontal side slope component, z (z horiz:1 vert)	ft.	--	--	--	--	
17.	Depth of flow, d	ft.	FULL	FULL	FULL	FULL	
18.	Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	0.79	0.79	0.79	0.79	
19.	Wetted perimeter, P_w	ft.	3.14	3.14	3.14	3.14	
20.	Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.25	0.25	0.25	0.25	
21.	Channel slope, s	ft./ft.	0.08	0.098	0.097	0.032	
22.	Manning's roughness coeff., n		0.012	0.012	0.012	0.012	
23.	$V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	14.00	15.49	15.41	8.85	
24.	Flow length, L	ft.	102.5	48.0	80.6	62.3	
25.	$T_t = \frac{L}{3600 * V}$	hr.	0.002	0.001	0.001	0.002	= 0.006
26.	Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)	hr.					0.006

Min Tc = 0.1 hr

SLR

NOAA Atlas 14, Volume 10, Version 3
Location name: Tolland, Connecticut, USA*
Latitude: 41.9274°, Longitude: -72.3121°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.335** (0.255-0.439)	**0.402** (0.306-0.527)	**0.511** (0.389-0.674)	**0.602** (0.455-0.796)	**0.727** (0.534-1.00)	**0.821** (0.593-1.16)	**0.919** (0.646-1.34)	**1.03** (0.688-1.53)	**1.18** (0.764-1.82)	**1.30** (0.826-2.06)
10-min	**0.474** (0.362-0.621)	**0.569** (0.434-0.746)	**0.724** (0.550-0.953)	**0.853** (0.645-1.13)	**1.03** (0.756-1.42)	**1.16** (0.839-1.64)	**1.30** (0.915-1.90)	**1.46** (0.974-2.17)	**1.67** (1.08-2.58)	**1.85** (1.17-2.91)
15-min	**0.558** (0.426-0.731)	**0.669** (0.510-0.878)	**0.851** (0.647-1.12)	**1.00** (0.759-1.33)	**1.21** (0.890-1.67)	**1.37** (0.986-1.93)	**1.53** (1.08-2.23)	**1.71** (1.15-2.56)	**1.97** (1.27-3.04)	**2.18** (1.38-3.42)
30-min	**0.756** (0.577-0.991)	**0.908** (0.692-1.19)	**1.16** (0.880-1.52)	**1.36** (1.03-1.80)	**1.64** (1.21-2.27)	**1.86** (1.34-2.62)	**2.08** (1.46-3.03)	**2.33** (1.56-3.47)	**2.68** (1.73-4.13)	**2.96** (1.87-4.66)
60-min	**0.954** (0.729-1.25)	**1.15** (0.874-1.50)	**1.46** (1.11-1.92)	**1.72** (1.30-2.28)	**2.08** (1.53-2.87)	**2.35** (1.69-3.30)	**2.63** (1.85-3.83)	**2.94** (1.97-4.39)	**3.38** (2.19-5.22)	**3.74** (2.37-5.88)
2-hr	**1.22** (0.934-1.59)	**1.46** (1.12-1.90)	**1.85** (1.42-2.43)	**2.18** (1.66-2.87)	**2.63** (1.94-3.62)	**2.96** (2.16-4.17)	**3.32** (2.36-4.86)	**3.74** (2.52-5.56)	**4.37** (2.83-6.71)	**4.90** (3.11-7.66)
3-hr	**1.40** (1.08-1.82)	**1.68** (1.29-2.19)	**2.14** (1.64-2.79)	**2.52** (1.92-3.30)	**3.04** (2.25-4.17)	**3.42** (2.50-4.80)	**3.84** (2.74-5.61)	**4.34** (2.92-6.42)	**5.10** (3.31-7.81)	**5.76** (3.66-8.98)
6-hr	**1.78** (1.37-2.30)	**2.14** (1.65-2.77)	**2.74** (2.11-3.56)	**3.24** (2.47-4.22)	**3.92** (2.92-5.36)	**4.42** (3.24-6.19)	**4.97** (3.58-7.26)	**5.65** (3.81-8.31)	**6.70** (4.36-10.2)	**7.62** (4.86-11.8)
12-hr	**2.22** (1.72-2.86)	**2.71** (2.10-3.48)	**3.50** (2.70-4.51)	**4.15** (3.19-5.38)	**5.05** (3.78-6.88)	**5.71** (4.21-7.97)	**6.44** (4.66-9.37)	**7.34** (4.97-10.7)	**8.75** (5.72-13.2)	**9.98** (6.38-15.4)
24-hr	**2.64** (2.06-3.38)	**3.25** (2.53-4.16)	**4.25** (3.29-5.44)	**5.07** (3.91-6.54)	**6.21** (4.67-8.41)	**7.04** (5.22-9.78)	**7.96** (5.78-11.5)	**9.11** (6.18-13.3)	**10.9** (7.15-16.4)	**12.5** (8.02-19.1)
2-day	**3.00** (2.34-3.80)	**3.72** (2.90-4.72)	**4.90** (3.82-6.24)	**5.88** (4.55-7.53)	**7.23** (5.47-9.75)	**8.21** (6.12-11.4)	**9.30** (6.80-13.5)	**10.7** (7.28-15.5)	**12.9** (8.48-19.3)	**14.8** (9.56-22.6)
3-day	**3.26** (2.56-4.12)	**4.05** (3.17-5.12)	**5.33** (4.16-6.77)	**6.40** (4.97-8.18)	**7.87** (5.97-10.6)	**8.94** (6.68-12.3)	**10.1** (7.43-14.6)	**11.7** (7.95-16.8)	**14.1** (9.28-21.0)	**16.2** (10.5-24.6)
4-day	**3.49** (2.74-4.41)	**4.33** (3.40-5.47)	**5.70** (4.46-7.22)	**6.84** (5.32-8.71)	**8.40** (6.38-11.3)	**9.54** (7.14-13.1)	**10.8** (7.94-15.5)	**12.4** (8.50-17.9)	**15.0** (9.90-22.3)	**17.3** (11.2-26.2)
7-day	**4.14** (3.27-5.20)	**5.09** (4.01-6.40)	**6.64** (5.21-8.37)	**7.92** (6.18-10.0)	**9.69** (7.38-12.9)	**11.0** (8.24-15.0)	**12.4** (9.13-17.7)	**14.2** (9.75-20.4)	**17.1** (11.3-25.3)	**19.7** (12.7-29.6)
10-day	**4.80** (3.79-6.01)	**5.81** (4.58-7.28)	**7.45** (5.86-9.37)	**8.82** (6.90-11.1)	**10.7** (8.16-14.2)	**12.1** (9.06-16.4)	**13.6** (10.0-19.3)	**15.5** (10.6-22.1)	**18.5** (12.2-27.2)	**21.1** (13.6-31.6)
20-day	**6.87** (5.45-8.55)	**7.95** (6.30-9.90)	**9.71** (7.67-12.1)	**11.2** (8.78-14.0)	**13.2** (10.1-17.3)	**14.7** (11.0-19.7)	**16.3** (11.9-22.6)	**18.1** (12.5-25.6)	**20.8** (13.9-30.4)	**23.0** (15.0-34.3)
30-day	**8.63** (6.86-10.7)	**9.73** (7.73-12.1)	**11.5** (9.14-14.4)	**13.0** (10.3-16.3)	**15.1** (11.5-19.6)	**16.7** (12.4-22.1)	**18.3** (13.2-25.0)	**20.0** (13.8-28.1)	**22.3** (14.9-32.5)	**24.2** (15.8-35.9)
45-day	**10.8** (8.63-13.4)	**12.0** (9.52-14.8)	**13.8** (11.0-17.1)	**15.3** (12.1-19.1)	**17.4** (13.3-22.5)	**19.1** (14.2-25.0)	**20.7** (14.9-27.9)	**22.2** (15.5-31.1)	**24.2** (16.2-35.1)	**25.7** (16.8-37.9)
60-day	**12.7** (10.1-15.6)	**13.8** (11.0-17.0)	**15.7** (12.5-19.4)	**17.2** (13.6-21.5)	**19.4** (14.8-24.9)	**21.1** (15.7-27.5)	**22.7** (16.3-30.4)	**24.1** (16.8-33.7)	**25.9** (17.4-37.4)	**27.1** (17.7-39.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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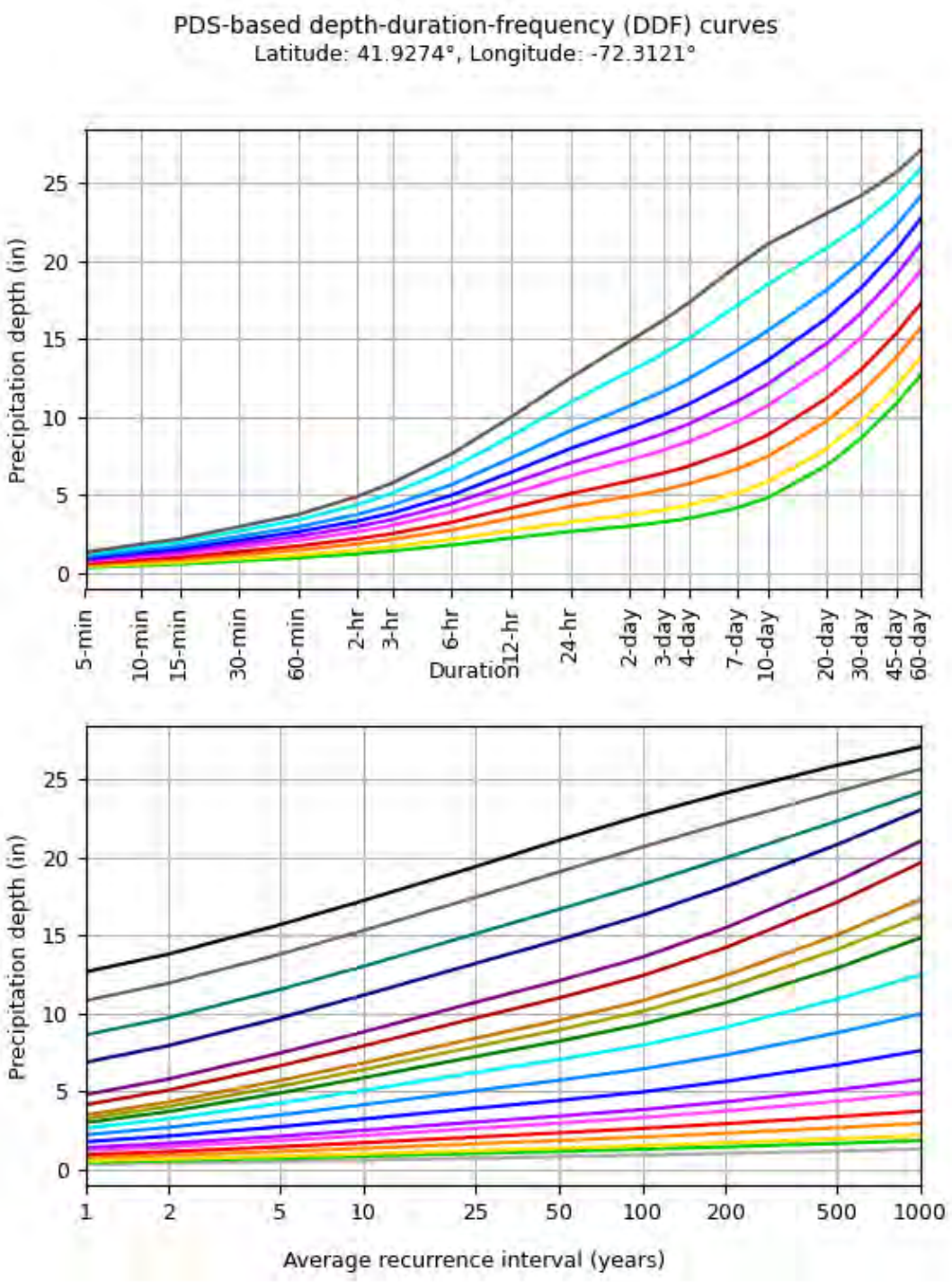
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu Aug 24 13:10:38 2023

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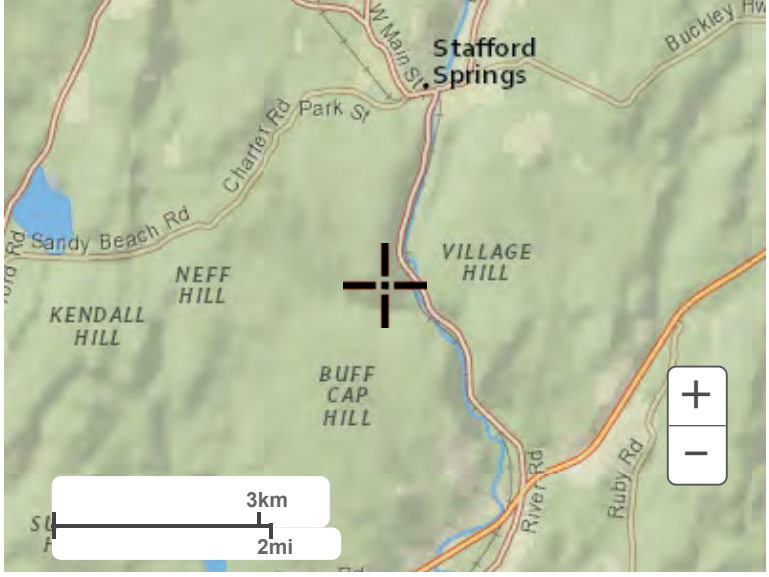
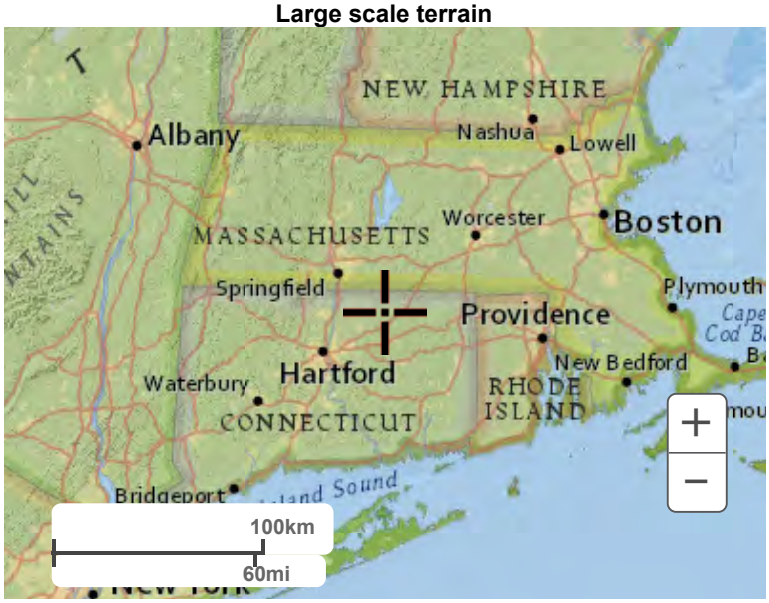
Maps & aerials

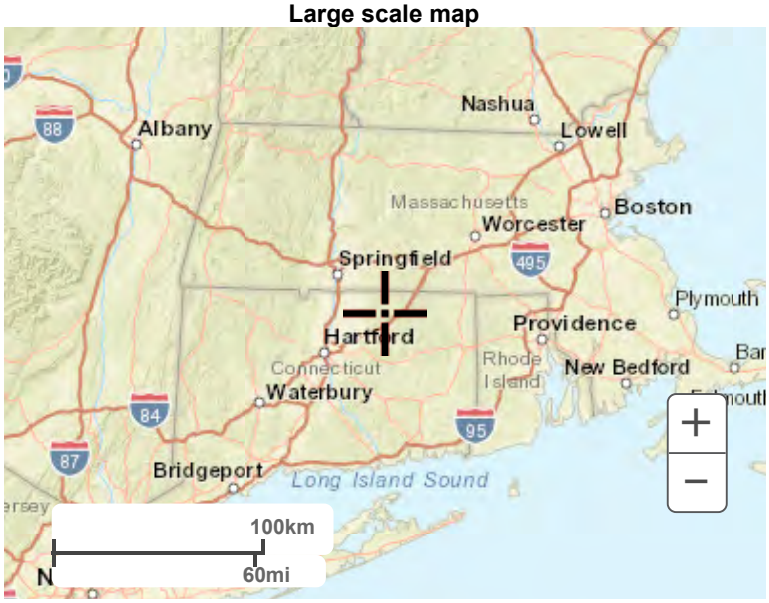
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Sample	Sample Round	L (inches)	H1(Inches)	H2(Inches)	t (min)	t (hours)	K (in/hr)	K (ft/day)
	1	3	8	6.00	1	0.017	51.429	102.857
SLR-TP-1	2	3	6.00	4.40	1	0.017	55.385	110.769
	3	3	4.40	3.10	1	0.017	62.400	124.800
	4	3	3.10	1.90	1	0.017	86.400	172.800
	5	3	1.90	0.90	1	0.017	128.571	257.143
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
				Sample Average			**76.84**	**153.67**

Sample	Sample Round	L (inches)	H1(Inches)	H2(Inches)	t (min)	t (hours)	K (in/hr)	K (ft/day)
	1	2	8	6.90	1	0.017	17.718	35.436
SLR-TP-2	2	2	6.90	6.00	1	0.017	16.744	33.488
	3	2	6.00	5.00	1	0.017	21.818	43.636
	4	2	5.00	4.25	1	0.017	19.459	38.919
	5	2	4.25	3.50	1	0.017	23.226	46.452
	6	2	3.50	2.75	1	0.017	28.800	57.600
	7	2	2.75	2.25	1	0.017	24.000	48.000
	8	2	2.25	1.50	1	0.017	48.000	96.000
	9	2	1.50	1.00	1	0.017	48.000	96.000
	10	2	1.00	0.50	1	0.017	80.000	160.000
	11							
	12							
	13							
	14							
	15							
				Sample Average			**32.78**	**65.55**

(76.84 + 32.78) / 2 = 54.8 in/hr
54.8 in/hr * 50% = 27.4 in/hr

Appendix G
Hydrologic Analysis – Computer Model Results

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0060

November 20, 2023

Revised December 20, 2023

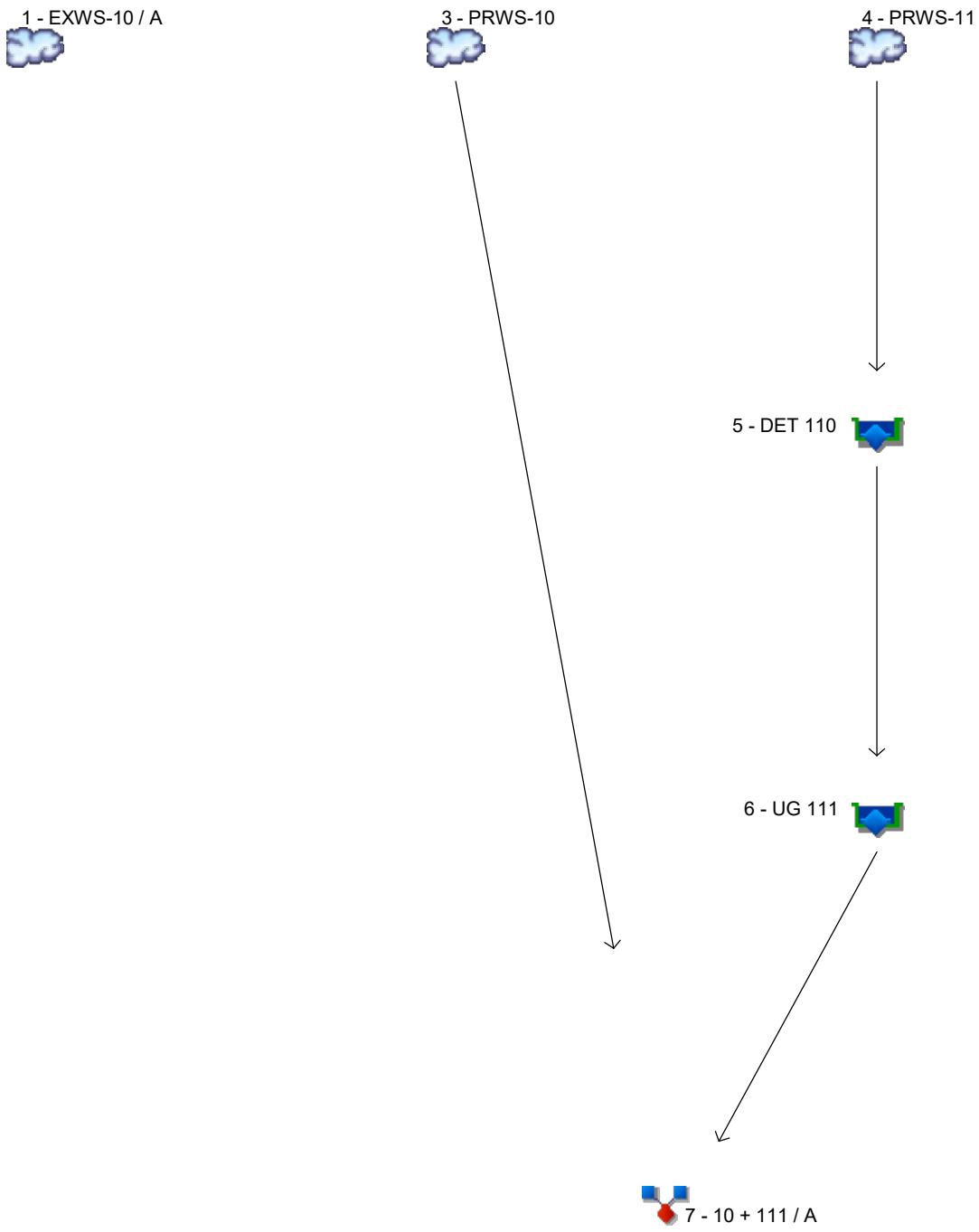
SLR

Hydrographs Peak Flowrate Summary (cfs)
Existing vs. Proposed

Storm Event	2yr		10yr		25yr		50yr		100yr	
	Exist	**Prop**	**Exist**	**Prop**	**Exist**	**Prop**	**Exist**	**Prop**	**Exist**	**Prop**
Point of Analysis A Peak Flow Rate (cfs)	7.7	7.5	37.0	36.2	61.7	61.7	81.4	81.2	104.6	104.2
Point of Analysis A Peak Runoff Volume (acre-feet)	1.4	1.3	4.6	4.5	7.2	7.0	9.3	9.0	11.8	11.4
DET 110 W.S. Elev. (ft.) Top of Berm Elev. = 450.2	-	447.6	-	448.2	-	448.6	-	448.9	-	449.1
UG 111 W.S. Elev. (ft.) Top of Stone Elev. = 445.0	-	441.5	-	443.4	-	444.0	-	444.2	-	444.7

Study Area	**Description**
A	Sweetheart Lake

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	EXWS-10 / A
3	SCS Runoff	PRWS-10
4	SCS Runoff	PRWS-11
5	Reservoir	DET 110
6	Reservoir	UG 111
7	Combine	10 + 111 / A

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	7.650	-------	-------	36.97	61.72	81.44	104.55	EXWS-10 / A
3	SCS Runoff	------	-------	7.496	-------	-------	35.61	59.28	78.10	100.14	PRWS-10
4	SCS Runoff	------	-------	5.736	-------	-------	9.463	11.77	13.44	15.29	PRWS-11
5	Reservoir	4	-------	0.000	-------	-------	3.994	4.732	5.112	6.639	DET 110
6	Reservoir	5	-------	0.000	-------	-------	0.400	2.677	3.179	4.070	UG 111
7	Combine	3, 6	-------	7.496	-------	-------	36.01	61.71	81.15	104.21	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	7.650	3	747	1.385	------	------	------	EXWS-10 / A
3	SCS Runoff	7.496	3	747	1.340	------	------	------	PRWS-10
4	SCS Runoff	5.736	3	726	0.457	------	------	------	PRWS-11
5	Reservoir	0.000	3	732	0.000	4	447.58	0.113	DET 110
6	Reservoir	0.000	3	n/a	0.000	5	441.50	0.000	UG 111
7	Combine	7.496	3	747	1.340	3, 6	------	------	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	36.97	3	741	4.625	------	------	------	EXWS-10 / A
3	SCS Runoff	35.61	3	741	4.443	------	------	------	PRWS-10
4	SCS Runoff	9.463	3	726	0.778	------	------	------	PRWS-11
5	Reservoir	3.994	3	732	0.076	4	448.23	0.165	DET 110
6	Reservoir	0.400	3	741	0.005	5	443.41	0.039	UG 111
7	Combine	36.01	3	741	4.447	3, 6	------	------	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	61.72	3	738	7.221	------	------	------	EXWS-10 / A
3	SCS Runoff	59.28	3	738	6.923	------	------	------	PRWS-10
4	SCS Runoff	11.77	3	726	0.981	------	------	------	PRWS-11
5	Reservoir	4.732	3	732	0.153	4	448.58	0.197	DET 110
6	Reservoir	2.677	3	744	0.056	5	444.10	0.053	UG 111
7	Combine	61.71	3	738	6.979	3, 6	------	------	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	81.44	3	738	9.305	------	------	------	EXWS-10 / A
3	SCS Runoff	78.10	3	738	8.912	------	------	------	PRWS-10
4	SCS Runoff	13.44	3	726	1.129	------	------	------	PRWS-11
5	Reservoir	5.112	3	732	0.208	4	448.86	0.223	DET 110
6	Reservoir	3.179	3	744	0.098	5	444.31	0.057	UG 111
7	Combine	81.15	3	738	9.009	3, 6	------	------	10 + 111 / A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	104.55	3	738	11.764	------	------	------	EXWS-10 / A
3	SCS Runoff	100.14	3	738	11.258	------	------	------	PRWS-10
4	SCS Runoff	15.29	3	726	1.294	------	------	------	PRWS-11
5	Reservoir	6.639	3	732	0.272	4	449.12	0.250	DET 110
6	Reservoir	4.070	3	738	0.144	5	444.76	0.062	UG 111
7	Combine	104.21	3	738	11.402	3, 6	------	------	10 + 111 / A

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Tuesday, 12 / 19 / 2023

Pond No. 3 - DET 110

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 445.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	445.00	933	0.000	0.000
1.00	446.00	1,360	0.026	0.026
2.00	447.00	2,649	0.045	0.071
3.00	448.00	3,665	0.072	0.144
4.00	449.00	4,459	0.093	0.237
5.00	450.00	5,310	0.112	0.349

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 446.50	0.00	0.00	0.00
Length (ft)	= 35.00	0.00	0.00	0.00
Slope (%)	= 8.57	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 14.00	10.00	0.00	0.00
Crest El. (ft)	= 448.00	449.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 27.400 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	445.00	0.00	---	---	---	0.00	0.00	---	---	0.000	---	0.000
1.00	0.026	446.00	0.00	---	---	---	0.00	0.00	---	---	0.863	---	0.863
2.00	0.071	447.00	0.00	---	---	---	0.00	0.00	---	---	1.680	---	1.680
3.00	0.144	448.00	0.00	---	---	---	0.00	0.00	---	---	2.325	---	2.325
4.00	0.237	449.00	5.34 ic	---	---	---	5.34 s	0.00	---	---	2.828	---	8.169
5.00	0.349	450.00	6.55 ic	---	---	---	6.44 s	26.00	---	---	3.368	---	35.81

Pond Report

Pond No. 1 - UG 111

Pond Data

UG Chambers -Invert elev. = 442.00 ft, Rise x Span = 2.50 x 4.25 ft, Barrel Len = 7.12 ft, No. Barrels = 36, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 441.50 ft, Width = 4.25 ft, Height = 3.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	441.50	n/a	0.000	0.000
0.35	441.85	n/a	0.004	0.004
0.70	442.20	n/a	0.007	0.010
1.05	442.55	n/a	0.009	0.019
1.40	442.90	n/a	0.009	0.027
1.75	443.25	n/a	0.008	0.035
2.10	443.60	n/a	0.008	0.043
2.45	443.95	n/a	0.007	0.050
2.80	444.30	n/a	0.006	0.057
3.15	444.65	n/a	0.004	0.061
3.50	445.00	n/a	0.004	0.064

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 443.00	0.00	0.00	0.00
Length (ft)	= 40.00	0.00	0.00	0.00
Slope (%)	= 5.00	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 27.400 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	441.50	0.00	---	---	---	---	---	---	---	0.000	---	0.000
0.35	0.004	441.85	0.00	---	---	---	---	---	---	---	0.805	---	0.805
0.70	0.010	442.20	0.00	---	---	---	---	---	---	---	0.919	---	0.919
1.05	0.019	442.55	0.00	---	---	---	---	---	---	---	1.032	---	1.032
1.40	0.027	442.90	0.00	---	---	---	---	---	---	---	1.146	---	1.146
1.75	0.035	443.25	0.26 ic	---	---	---	---	---	---	---	1.260	---	1.522
2.10	0.043	443.60	1.30 ic	---	---	---	---	---	---	---	1.374	---	2.673
2.45	0.050	443.95	2.56 ic	---	---	---	---	---	---	---	1.488	---	4.045
2.80	0.057	444.30	3.38 ic	---	---	---	---	---	---	---	1.601	---	4.983
3.15	0.061	444.65	4.05 ic	---	---	---	---	---	---	---	1.715	---	5.770
3.50	0.064	445.00	4.63 ic	---	---	---	---	---	---	---	1.829	---	6.460

Appendix H
Operation and Maintenance Manual

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0060

November 20, 2023

Revised December 20, 2023

Camp Yankee Trails Site Improvements

343 Plains Road
Tolland, Connecticut

Stormwater Operations and Maintenance Manual

Prepared for:

Girl Scouts of Connecticut

20 Washington Avenue
North Haven, CT 06473

Prepared by:

SLR International Corporation

99 Realty Drive, Cheshire, Connecticut, 06410

SLR Project No.: 141.13280.00006

December 20, 2023

Making Sustainability Happen

Stormwater Operations and Maintenance Manual

Camp Yankee Trails Site Improvements
343 Plains Road
Tolland, Connecticut
SLR #141.13280.000006

1.0 Introduction

After construction is completed, stormwater systems on the property will need to be periodically maintained. The stormwater system consists of storm drainage piping, catch basin, yard drain and manhole structures, underground chambers, and a stormwater detention basin. In order to ensure optimal performance of the system, the following stormwater maintenance program has been established. This manual provides an outline of the operation procedures but may be adjusted based upon specific site conditions.

A representative of Girl Scouts of Connecticut or designee will be responsible for the maintenance of stormwater control structures. The name and contact information of this representative are to be determined.

2.0 Storm System Elements

2.1 Stormwater Infiltration Basin

The stormwater infiltration basin should be maintained so that the system can effectively treat contributing stormwater runoff.

1. The stormwater infiltration basin shall be cleaned of debris and sediment upon the completion of construction.
2. The stormwater infiltration basin shall be inspected during spring cleanup and again just prior to the winter season. All dead plants and missing mulch shall be replaced, and any necessary pruning of vegetation shall be completed.
3. The surface of the stormwater infiltration basin shall be inspected on a quarterly basis after the first 6 months of successful operation and after heavy runoff events (i.e., >3.0” in a 24-hour period). One inspection shall occur immediately following the completion of winter sanding and sweeping operations, and one shall occur just prior to the winter season. Any accumulated debris and sediment shall be removed.

2.2 Parking Areas

The parking area shall be swept annually. Sweeping should occur in the spring between April 15 and May 15 after winter sanding.

2.3 Catch Basins (Inlets)

Drain inlets are designed with 2-foot minimum depth sumps for collecting coarse sediment. All inlets should be inspected two times per year, typically when the site is swept in the spring after winter sanding and in the fall after all the leaves have fallen.

Sediment should be removed when it extends to within 6 inches of the outlet pipe invert or not less than once per year. Cleanout with a vacuum truck is generally the best and most convenient method. The sediment shall be disposed of in an approved offsite location in accordance with town and state requirements.

2.4 Lawn and Vegetated Areas

Vegetated cover shall be maintained on all earth surfaces to minimize soil erosion. Use of fertilizer should be avoided. If fertilizers are deemed necessary they should be minimized to the greatest extent possible and should be applied with prudent application methods.

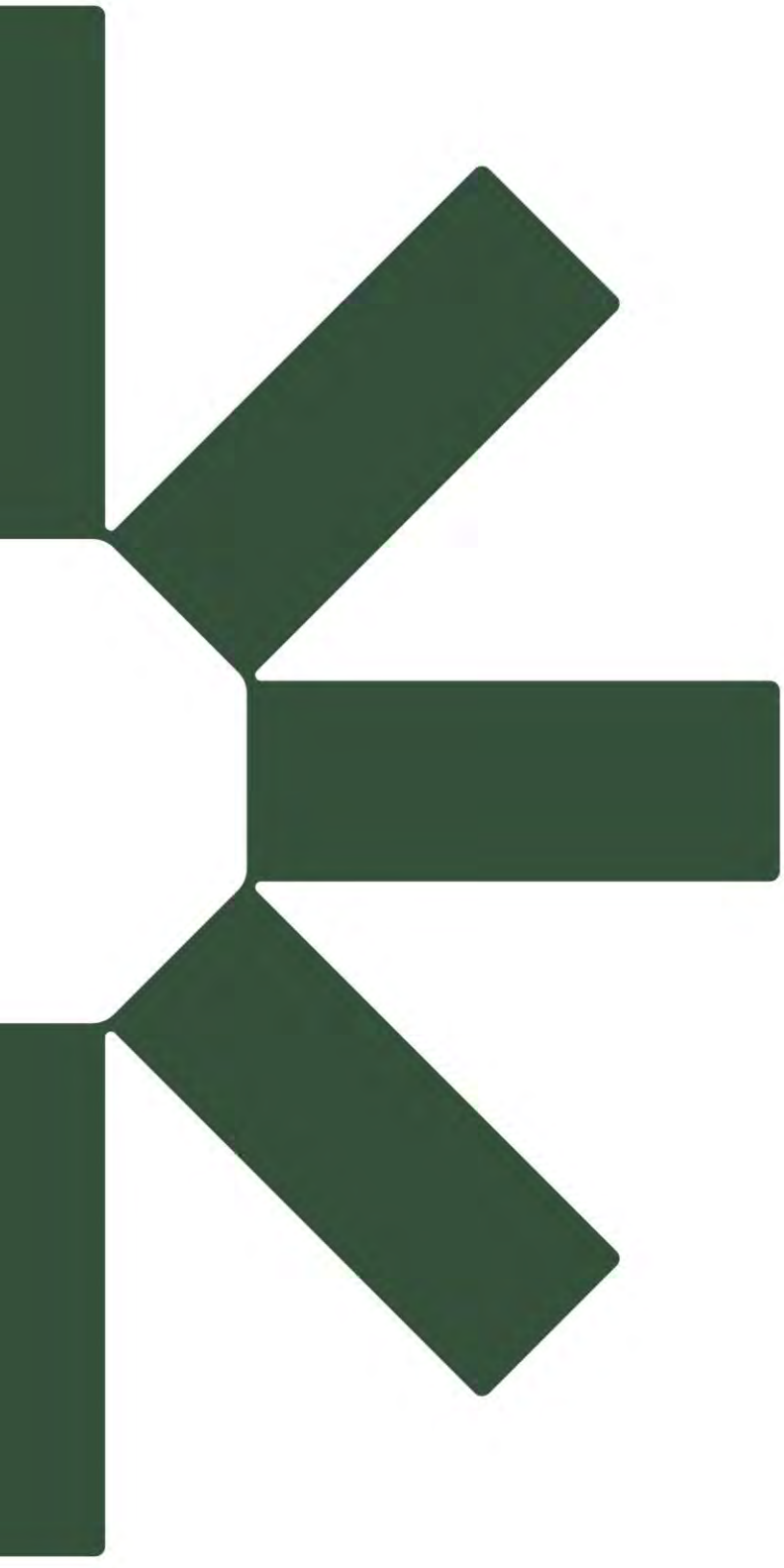
2.5 Underground Chamber Systems

The underground chamber system shall be completely cleaned of accumulated debris and sediment upon completion of construction. For the first year after construction is completed, the underground chamber system shall be inspected on a quarterly basis. Any accumulated debris shall be removed, and any repairs shall be made to the units, as required. From the second year onward, visually inspect the underground chamber system twice per year, once in the spring and once in the fall after the fall cleanup of leaves. Complete any additional maintenance required per the manufacturer's specifications.

3.0 Inspection Procedures

Inventory sheets shall be created to note any noncompliance during each inspection. Fill out notes according to the attached requirements of each structure noting shortcomings, problems, and required maintenance on each. The inventory sheets shall include the following:

1. Date of inspection
2. Name of inspector
3. Underground drainage structures/cleanouts
4. Sediment load
5. Any other item that could affect the proper function of the facility



Making Sustainability Happen

Appendix I
Watershed Maps

Camp Yankee Trails Site Improvements

343 Plains Road, Tolland, Connecticut

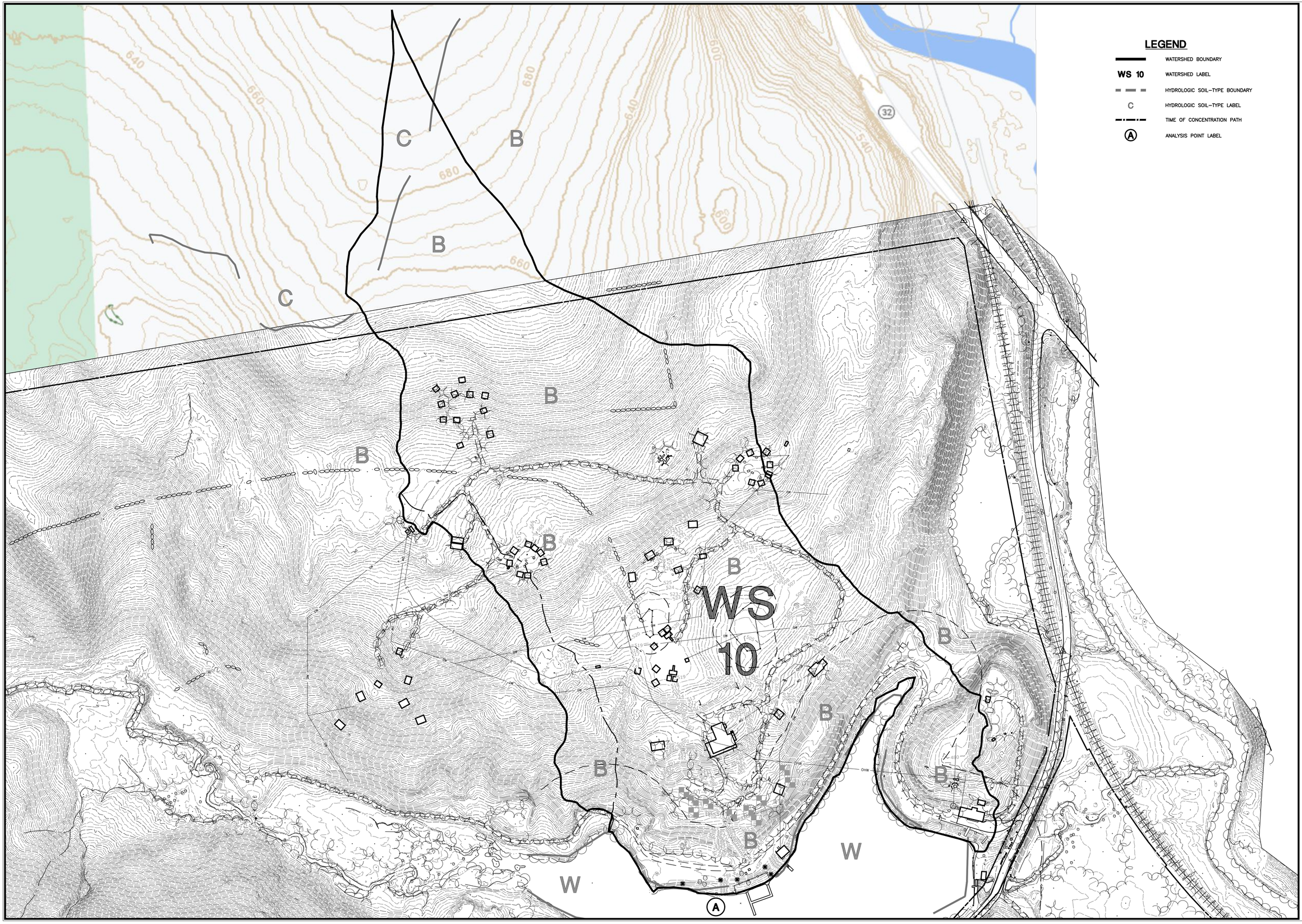
Drainage Report

Prepared for:
Girl Scouts of Connecticut

SLR Project No.: 141.13280.00006.0060

November 20, 2023

Revised December 20, 2023



SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY

WATERSHED MAP - EXISTING CONDITIONS

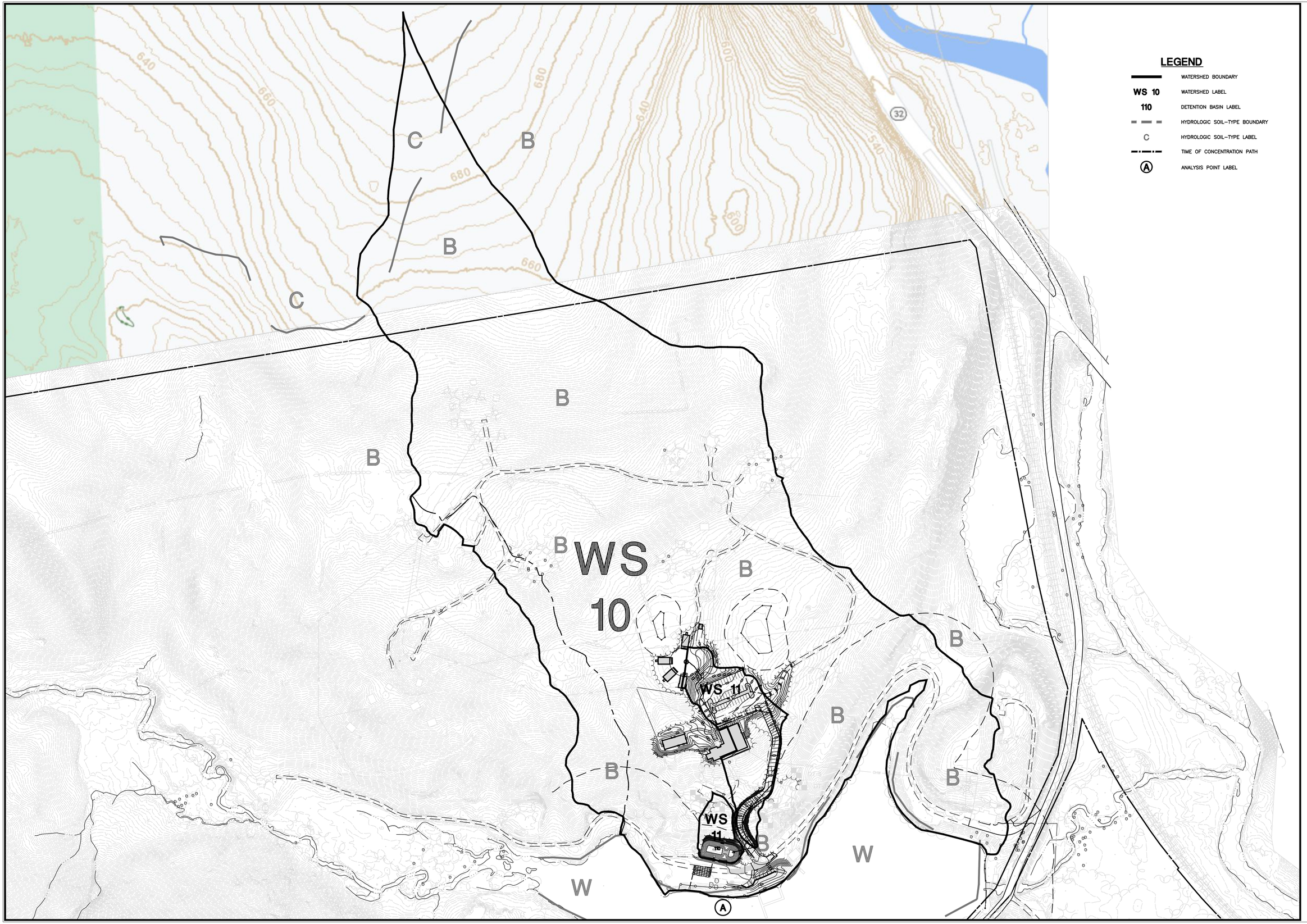
CAMP YANKEE TRAILS SITE IMPROVEMENTS

343 PLAINS ROAD

TOLLAND, CONNECTICUT

MCB	MCB	TDR
DESIGNED	DRAWN	CHECKED

SCALE	1"=120'
DATE	NOVEMBER 17, 2023
PROJECT NO.	13280.00006
SHEET NO.	1 OF 2
SHEET NAME	EXWS



SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY
MVWC COMMENTS	12/20/2023	MCB

WATERSHED MAP - PROPOSED CONDITIONS

CAMP YANKEE TRAILS SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

MCB	MCB	TDR
DESIGNED	DRAWN	CHECKED

SCALE: 1"=120'

DATE: NOVEMBER 17, 2023

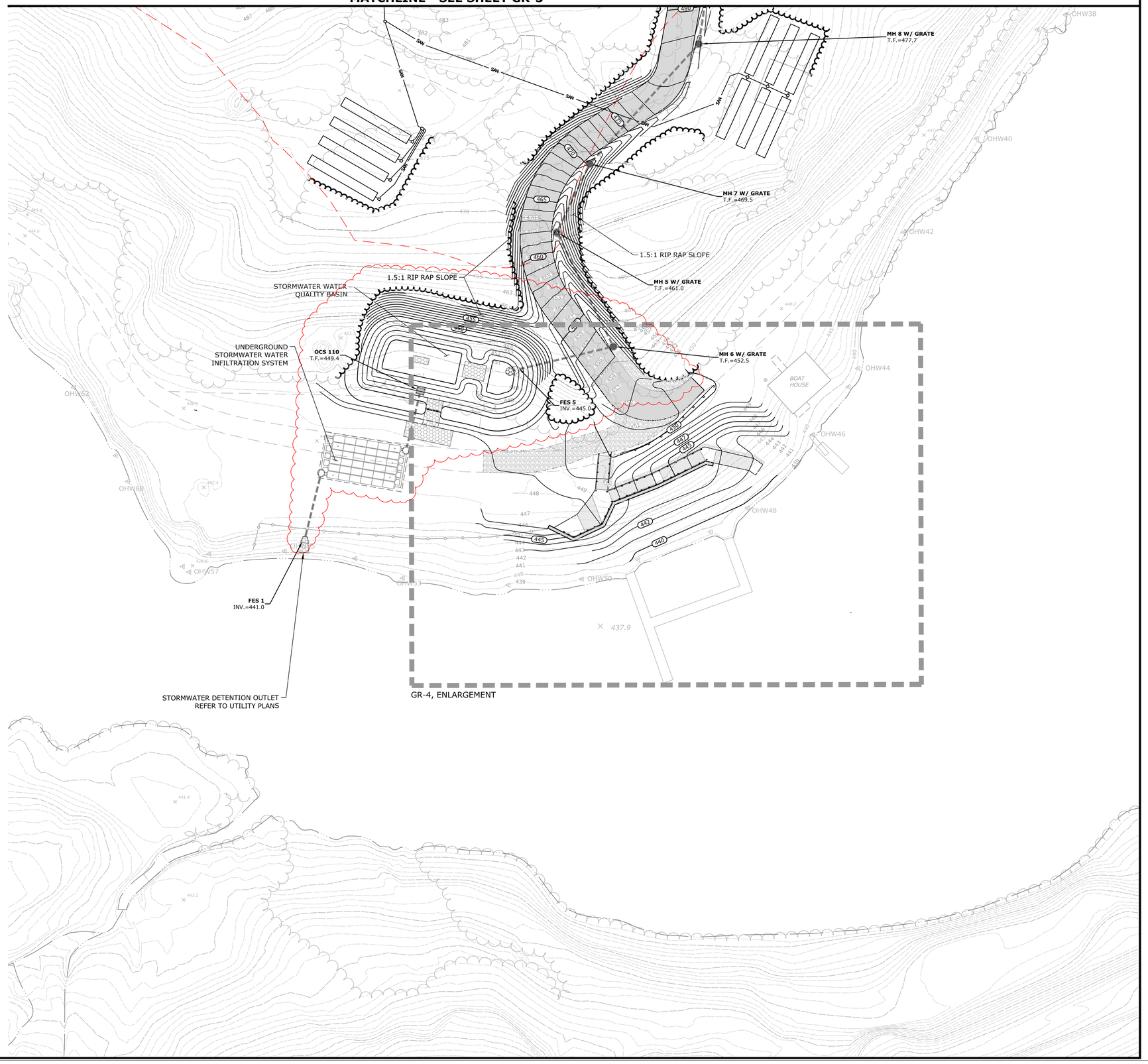
PROJECT NO.: 13280.00006

SHEET NO.: 2 OF 2

SHEET NAME: PRWS

Making Sustainability Happen

MATCHLINE - SEE SHEET GR-3



SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY
IWWC COMMENTS	12/18/2023	MTD

GRADING, UTILITIES AND SEDIMENT AND EROSION COINTROLS
WATERFRONT
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

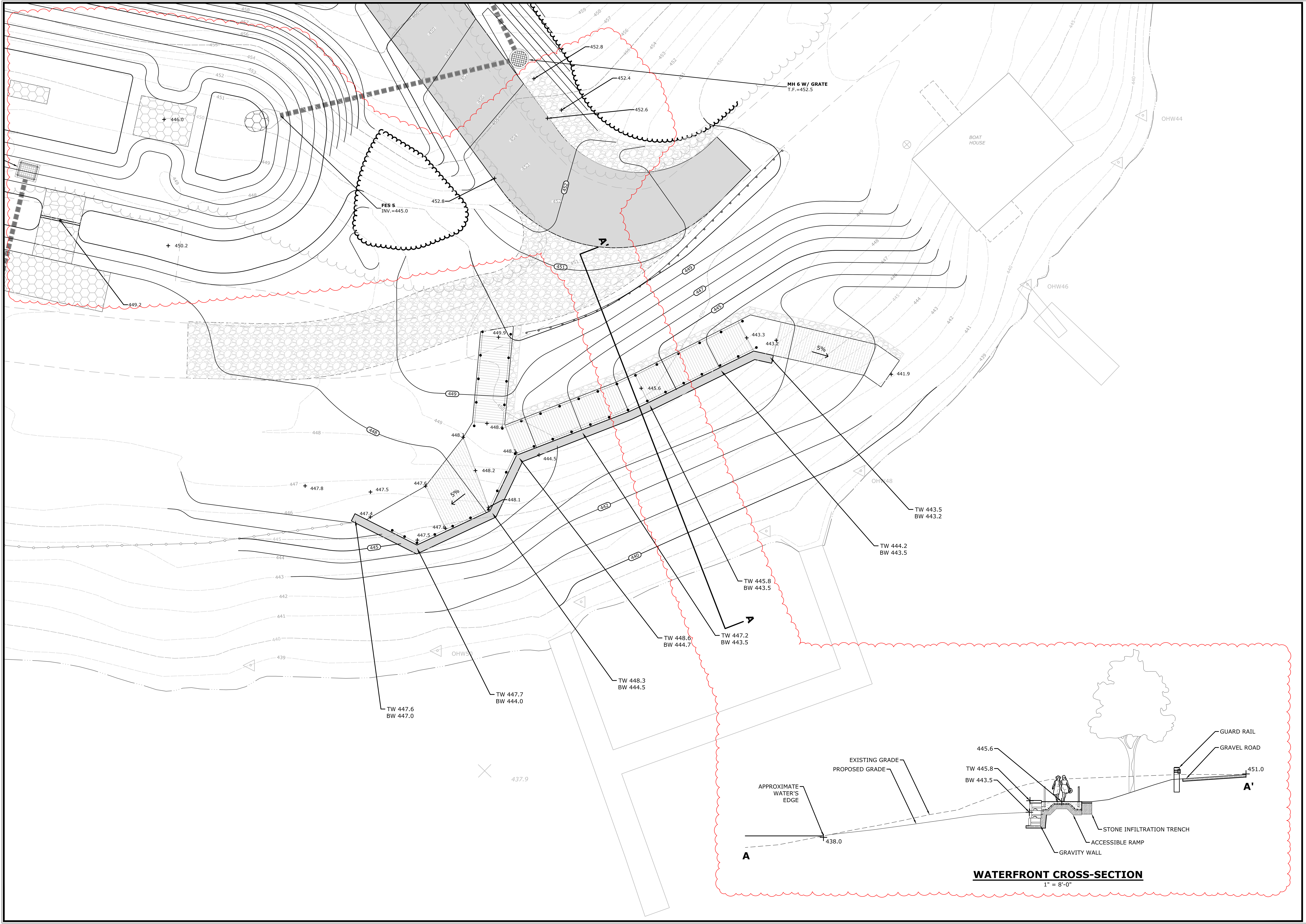
1"=30'
SCALE

NOVEMBER 21, 2023
DATE

141.13280.00006
PROJECT NO.

13 OF 26
SHEET NO.

GR-2
SHEET NAME



SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY
IWWC COMMENTS	12/18/2023	MTD

GRADING - WATERFRONT ENLARGEMENT

CAMP YANKEE TRAILS
SITE IMPROVEMENTS

343 PLAINS ROAD
TOLLAND, CONNECTICUT

MTD	PJP	MTD
DESIGNED	DRAWN	CHECKED

SCALE: 1"=10'

DATE: NOVEMBER 21, 2023

PROJECT NO.: 141.13280.00006

SHEET NO.: 15 OF 26

SHEET NAME: GR-4

MATCH LINE: SEE UT-1

MATCH LINE: SEE UT-1

4" SDR 35 PVC

DISTRIBUTION BOX (TYP.)

SEPTIC FIELD

DT-1

DT-2

DT-3

DT-4

DT-5

DT-6

DT-7

DT-8

DT-9

DT-10

192 L.F. OF CURTECH CTL 48
LEACHING GALLERIES

240 L.F. OF CURTECH CTL 48
LEACHING GALLERIES

99'-12" HDPE
S=8.28%

47'-12" HDPE
S=10.00%

59'-12" HDPE
S=4.24%

78'-12" HDPE
S=10.00%

40'-12" HDPE
S=5.25%

35'-12" HDPE
S=8.57%

MH 8 W/ GRATE
T.F.=477.7
INV.=474.7(N)
INV.=474.7(SW)

MH 7 W/ GRATE
T.F.=469.5
INV.=466.5(NE)
INV.=462.9(SW)

MH 6 W/ GRATE
T.F.=452.5
INV.=449.2(NW)
INV.=447.5(W)

MH 5 W/ GRATE
T.F.=461.0
INV.=457.0(SE)
INV.=458.2(NE)

MH 2
T.F.=444.1
INV.=443.1(S)

MH 3
T.F.=447.0
INV.=443.5(N)

FES 5
INV.=445.0

FES 1
INV.=441.0

STORMWATER WATER
MANAGEMENT BASIN 110
BOTTOM ELEV.=445.0
TOP OF BERM ELEV.=450.3

GRAVEL INFILTRATION
TRENCH (SEE DETAIL)

OCS 110 (SEE DETAIL)
OVERFLOW WEIR ELEV.=448.0
INV.=446.5(S)

INSPECTION PORT (TYP.)

PREFORMED SCOUR HOLE

SLR-1

SLR-2

SEE SOIL TESTING DATA
THIS SHEET

RIPRAP EMERGENCY
SPILLWAY

RIPRAP SPLASH PAD

UNDERGROUND DETENTION SYSTEM 111
STORMTECH SC-740 OR APPROVED EQUAL
6 ROWS OF 6 CHAMBERS; 36 CHAMBERS TOTAL
TOP OF STONE ELEV.=445.0
TOP OF CHAMBER ELEV.=444.5
BOTTOM OF CHAMBER ELEV.=442.0
BOTTOM OF STONE ELEV.=441.5

BOAT
HOUSE

OHW40 OHW42 OHW44 OHW46 OHW48 OHW50 OHW53 OHW55 OHW57 OHW60 OHW62

SOIL TESTING DATA:

TEST PIT: SLR-1
0"-4" GRAVEL
4"-16" BROWN SANDY LOAM
16"-82" TAN FINE TO MEDIUM SAND
NO LEDGE
NO GROUNDWATER
UNDISTURBED TUBE PERMEABILITY SAMPLE AT 42"

TEST PIT: SLR-2
0"-2" GRAVEL
2"-18" FILL
18"-32" TOPSOIL
32"-86" TAN FINE TO MEDIUM SAND
NO LEDGE
NO GROUNDWATER
UNDISTURBED TUBE PERMEABILITY SAMPLE AT 36"

SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY
IWWC COMMENTS	12/20/2023	MCB

SITE PLAN - UTILITIES

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

SMM	SMM	TDR
DESIGNED	DRAWN	CHECKED

1"=20'
SCALE

NOVEMBER 21, 2023
DATE

141.13280.00006
PROJECT NO.

17 OF 26
SHEET NO.

UT-2
SHEET NAME

SOIL EROSION AND SEDIMENT CONTROL NARRATIVE

SEDIMENT AND EROSION CONTROL MEASURES AS DEPICTED ON THESE PLANS AND DESCRIBED WITHIN THE SEDIMENT AND EROSION CONTROL NARRATIVE SHALL BE IMPLEMENTED AND MAINTAINED UNTIL PERMANENT COVER AND STABILIZATION IS ESTABLISHED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL CONFORM TO THE "GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CONNECTICUT - 2002, TOWN OF TOLLAND REQUIREMENTS, AND IN ALL CASES BEST MANAGEMENT PRACTICES SHALL PREVAIL.

1.PURPOSE AND DESCRIPTION OF PROJECT
A.) VARIOUS IMPROVEMENTS TO CAMP YANKEE WHICH INCLUDE PARKING LOT/ROAD CONSTRUCTION AND UTILITY UPGRADES
B.) DISTURBED AREA: ±3.0 AC

2.IDENTIFICATION OF EROSION AND SEDIMENT CONTROL CONCERNS
A.) CUTS AND FILLS ASSOCIATED WITH CONSTRUCTION
B.) PROTECTION OF ONSITE DRAINAGE SYSTEMS
C.) PROTECTION OF ONSITE WETLANDS & WATERCOURSES

3.IDENTIFICATION OF OTHER POSSIBLE PERMITS
THE PERMITS REQUIRED FOR THE PROJECT ARE LOCAL PLANNING AND ZONING PERMITS.

EROSION CONTROL LEGEND

HB	HAY BALES
SFF	SEDIMENT FILTER FENCE
IP	INLET PROTECTION
STK	SOIL STOCKPILE AREA
WB	WATER BAR
ECB	EROSION CONTROL BLANKET
TST	TEMPORARY SEDIMENT TRAP
DB	DIVERSION BERM
	RIP RAP OVERFLOW DISCHARGE
	TEMPORARY CONTOUR FOR TST

HB TYP.
SFF TYP
STK
IP TYP.
WB TYP.
SINGING PINES CAMP UNIT
PAVILION
DIRECTOR'S CABIN

MATCH LINE: SEE SE-2

MATCH LINE: SEE SE-2

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
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DESCRIPTION	DATE	BY
IWWC COMMENTS	12/20/2023	SMM

SEDIMENT & EROSION CONTROLS

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

DESIGNED	DRAWN	CHECKED
SMM	SMM	TDR

SCALE: 1"=20'
DATE: NOVEMBER 21, 2023
PROJECT NO.: 141.13280.00006
SHEET NO.: 18 OF 26
SHEET NAME: SE-1

CONSTRUCTION SEQUENCE

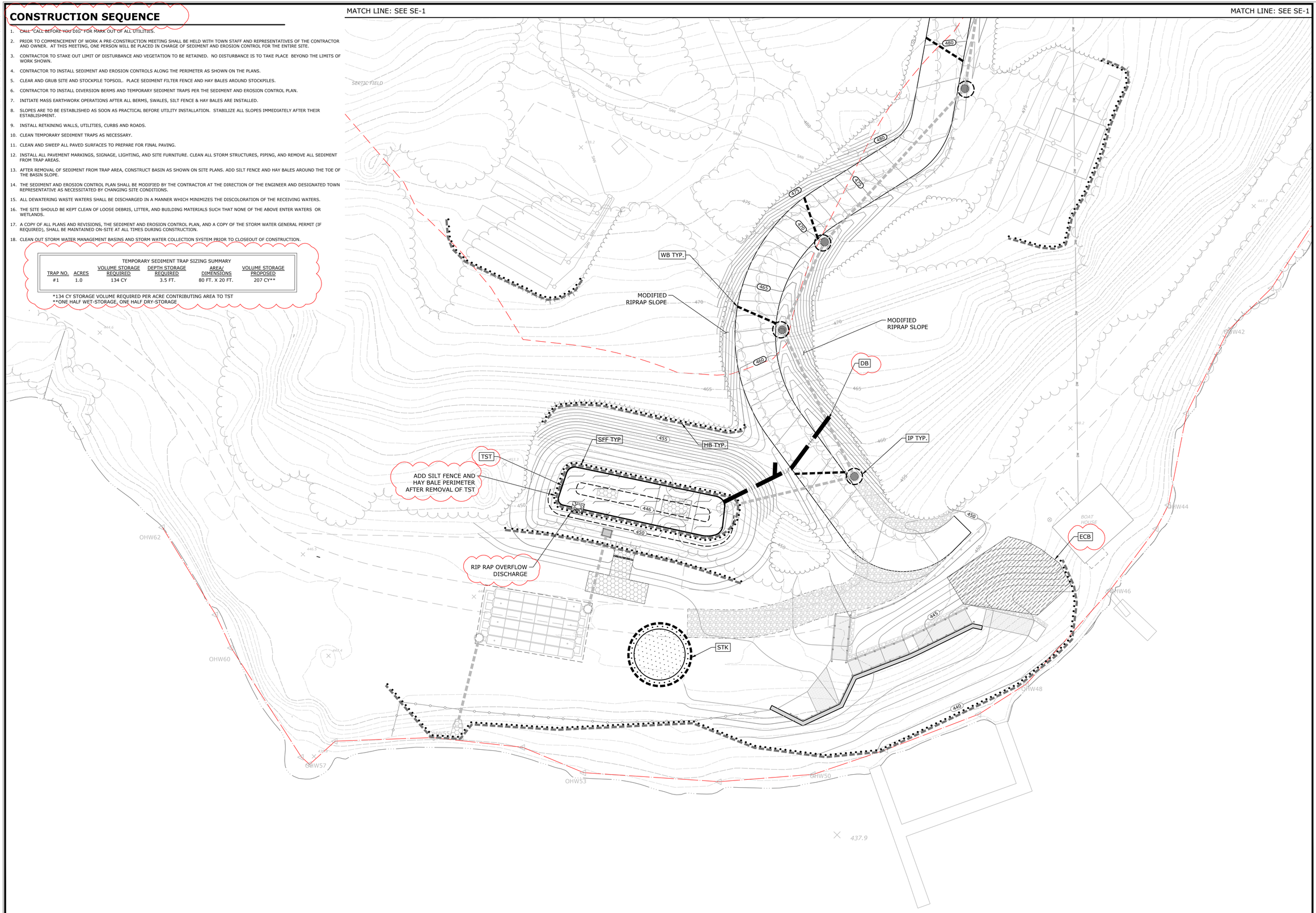
1. CALL "CALL BEFORE YOU DIG" FOR MARK OUT OF ALL UTILITIES.
2. PRIOR TO COMMENCEMENT OF WORK A PRE-CONSTRUCTION MEETING SHALL BE HELD WITH TOWN STAFF AND REPRESENTATIVES OF THE CONTRACTOR AND OWNER. AT THIS MEETING, ONE PERSON WILL BE PLACED IN CHARGE OF SEDIMENT AND EROSION CONTROL FOR THE ENTIRE SITE.
3. CONTRACTOR TO STAKE OUT LIMIT OF DISTURBANCE AND VEGETATION TO BE RETAINED. NO DISTURBANCE IS TO TAKE PLACE BEYOND THE LIMITS OF WORK SHOWN.
4. CONTRACTOR TO INSTALL SEDIMENT AND EROSION CONTROLS ALONG THE PERIMETER AS SHOWN ON THE PLANS.
5. CLEAR AND GRUB SITE AND STOCKPILE TOPSOIL. PLACE SEDIMENT FILTER FENCE AND HAY BALES AROUND STOCKPILES.
6. CONTRACTOR TO INSTALL DIVERSION BERMS AND TEMPORARY SEDIMENT TRAPS PER THE SEDIMENT AND EROSION CONTROL PLAN.
7. INITIATE MASS EARTHWORK OPERATIONS AFTER ALL BERMS, SWALES, SILT FENCE & HAY BALES ARE INSTALLED.
8. SLOPES ARE TO BE ESTABLISHED AS SOON AS PRACTICAL BEFORE UTILITY INSTALLATION. STABILIZE ALL SLOPES IMMEDIATELY AFTER THEIR ESTABLISHMENT.
9. INSTALL RETAINING WALLS, UTILITIES, CURBS AND ROADS.
10. CLEAN TEMPORARY SEDIMENT TRAPS AS NECESSARY.
11. CLEAN AND SWEEP ALL PAVED SURFACES TO PREPARE FOR FINAL PAVING.
12. INSTALL ALL PAVEMENT MARKINGS, SIGNAGE, LIGHTING, AND SITE FURNITURE. CLEAN ALL STORM STRUCTURES, PIPING, AND REMOVE ALL SEDIMENT FROM TRAP AREAS.
13. AFTER REMOVAL OF SEDIMENT FROM TRAP AREA, CONSTRUCT BASIN AS SHOWN ON SITE PLANS. ADD SILT FENCE AND HAY BALES AROUND THE TOE OF THE BASIN SLOPE.
14. THE SEDIMENT AND EROSION CONTROL PLAN SHALL BE MODIFIED BY THE CONTRACTOR AT THE DIRECTION OF THE ENGINEER AND DESIGNATED TOWN REPRESENTATIVE AS NECESSITATED BY CHANGING SITE CONDITIONS.
15. ALL DEWATERING WASTE WATERS SHALL BE DISCHARGED IN A MANNER WHICH MINIMIZES THE DISCOLORATION OF THE RECEIVING WATERS.
16. THE SITE SHOULD BE KEPT CLEAN OF LOOSE DEBRIS, LITTER, AND BUILDING MATERIALS SUCH THAT NONE OF THE ABOVE ENTER WATERS OR WETLANDS.
17. A COPY OF ALL PLANS AND REVISIONS, THE SEDIMENT AND EROSION CONTROL PLAN, AND A COPY OF THE STORM WATER GENERAL PERMIT (IF REQUIRED), SHALL BE MAINTAINED ON-SITE AT ALL TIMES DURING CONSTRUCTION.
18. CLEAN OUT STORM WATER MANAGEMENT BASINS AND STORM WATER COLLECTION SYSTEM PRIOR TO CLOSEOUT OF CONSTRUCTION.

TEMPORARY SEDIMENT TRAP SIZING SUMMARY

TRAP NO.	ACRES	VOLUME STORAGE REQUIRED	DEPTH STORAGE REQUIRED	AREA/ DIMENSIONS	VOLUME STORAGE PROPOSED
#1	1.0	134 CY	3.5 FT.	80 FT. X 20 FT.	207 CY**

*134 CY STORAGE VOLUME REQUIRED PER ACRE CONTRIBUTING AREA TO TST
**ONE HALF WET-STORAGE, ONE HALF DRY-STORAGE

MATCH LINE: SEE SE-1
MATCH LINE: SEE SE-1



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SEDIMENT & EROSION CONTROLS

CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

DESIGNED	DRAWN	CHECKED
SMM	SMM	TDR

SCALE: 1"=20'
DATE: NOVEMBER 21, 2023
PROJECT NO.: 141.13280.00006
SHEET NO.: 19 OF 26
SHEET NAME: SE-2

SEDIMENT & EROSION CONTROL SPECIFICATIONS

GENERAL:

THESE GUIDELINES SHALL APPLY TO ALL WORK CONSISTING OF ANY AND ALL TEMPORARY AND/OR PERMANENT MEASURES TO CONTROL WATER POLLUTION AND SOIL EROSION, AS MAY BE REQUIRED, DURING THE CONSTRUCTION OF THE PROJECT.

IN GENERAL, ALL CONSTRUCTION ACTIVITIES SHALL PROCEED IN SUCH A MANNER SO AS NOT TO POLLUTE ANY WETLANDS, WATERCOURSE, WATERBODY, AND CONDUIT CARRYING WATER, ETC. THE CONTRACTOR SHALL LIMIT, INSOFAR AS POSSIBLE, THE SURFACE AREA OF EARTH MATERIALS EXPOSED BY CONSTRUCTION METHODS AND IMMEDIATELY PROVIDE PERMANENT AND TEMPORARY POLLUTION CONTROL MEASURES TO PREVENT CONTAMINATION OF ADJACENT WETLANDS, WATERCOURSES, AND WATER BODIES, AND TO PREVENT, INSOFAR AS POSSIBLE, EROSION ON THE SITE.

LAND GRADING

GENERAL:

1. THE RESHAPING OF THE GROUND SURFACE BY EXCAVATION AND FILLING OR A COMBINATION OF BOTH, TO OBTAIN PLANNED GRADES, SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:

   a. THE CUT FACE OF EARTH EXCAVATION SHALL NOT BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1).

   b. THE PERMANENT EXPOSED FACES OF FILLS SHALL NOT BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1).

   c. THE CUT FACE OF ROCK EXCAVATION SHALL NOT BE STEEPER THAN ONE HORIZONTAL TO FOUR VERTICAL (1:4).

   d. PROVISION SHOULD BE MADE TO CONDUCT SURFACE WATER SAFELY TO STORM DRAINS TO PREVENT SURFACE RUNOFF FROM DAMAGING CUT FACES AND FILL SLOPES

   e. EXCAVATIONS SHOULD NOT BE MADE SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTY WITHOUT PROTECTING SUCH PROPERTY FROM EROSION, SLIDING, SETTLING, OR CRACKING.

   f. NO FILL SHOULD BE PLACED WHERE IT WILL SLIDE OR WASH UPON THE PREMISES OF ANOTHER OWNER OR UPON ADJACENT WETLANDS, WATERCOURSES, OR WATER BODIES.

   g. PRIOR TO ANY RE-GRADING, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED AT THE ENTRANCE TO THE WORK AREA IN ORDER TO REDUCE MUD AND OTHER SEDIMENTS FROM LEAVING THE SITE.

TOPSOILING

GENERAL:

1. TOPSOIL SHALL BE SPREAD OVER ALL EXPOSED AREAS IN ORDER TO PROVIDE A SOIL MEDIUM HAVING FAVORABLE CHARACTERISTICS FOR THE ESTABLISHMENT, GROWTH, AND MAINTENANCE OF VEGETATION.

2. UPON ATTAINING FINAL SUBGRADES, SCARIFY SURFACE TO PROVIDE A GOOD BOND WITH TOPSOIL.

3. REMOVE ALL LARGE STONES, TREE LIMBS, ROOTS AND CONSTRUCTION DEBRIS.

APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS

MATERIAL:

1. TOPSOIL SHOULD HAVE PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS FAVORABLE TO THE GROWTH OF PLANTS.

2. TOPSOIL SHOULD HAVE A SANDY OR LOAMY TEXTURE.

3. TOPSOIL SHOULD BE RELATIVELY FREE OF SUBSOIL MATERIAL AND MUST BE FREE OF STONES (OVER 1" IN DIAMETER), LUMPS OF SOIL, ROOTS, TREE LIMBS, TRASH, OR CONSTRUCTION DEBRIS. IT SHOULD BE FREE OF ROOTS OR RHIZOMES SUCH AS THISTLE, NUTGRASS, AND QUACKGRASS.

4. AN ORGANIC MATTER CONTENT OF SIX PERCENT (6%) IS REQUIRED. AVOID LIGHT COLORED SUBSOIL MATERIAL.

5. SOLUBLE SALT CONTENT OF OVER 500 PARTS PER MILLION (PPM) IS LESS SUITABLE. AVOID TIDAL MARSH SOILS BECAUSE OF HIGH SALT CONTENT AND SULFUR ACIDITY.

6. THE pH SHOULD BE MORE THAN 6.0. IF LESS, ADD LIME TO INCREASE pH TO AN ACCEPTABLE LEVEL.

APPLICATION

AVOID SPREADING WHEN TOPSOIL IS WET OR FROZEN.

SPREAD TOPSOIL UNIFORMLY TO A DEPTH OF AT LEAST SIX INCHES (6"), OR TO THE DEPTH SHOWN ON THE PLANS, DETAILS AND SPECIFICATIONS.

TEMPORARY VEGETATIVE COVER

GENERAL:

1. TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED ON ALL UNPROTECTED AREAS THAT PRODUCE SEDIMENT, AREAS WHERE FINAL GRADING HAS BEEN COMPLETED, AND AREAS WHERE THE ESTIMATED PERIOD OF BARE SOIL EXPOSURE IS LESS THAN 12 MONTHS. TEMPORARY VEGETATIVE COVER SHALL BE APPLIED IF AREAS WILL NOT BE PERMANENTLY SEEDED BY SEPTEMBER 1.

SITE PREPARATION:

1. INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.

2. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.

3. APPLY DOLOMITIC LIMESTONE ACCORDING TO SOIL TEST RECOMMENDATIONS

4. APPLY FERTILIZER ACCORDING TO SOIL TEST OR AT THE RATE OF 300 LBS. OF 10-10-10 PER ACRE (7 LBS. PER 1,000 SQ. FT.) AND SECOND APPLICATION OF 200 LBS. OF 10-10-10- (5 LBS. PER 1,000 SQ. FT.) WHEN GRASS IS FOUR INCHES (4") TO SIX INCHES (6") HIGH. APPLY ONLY WHEN GRASS IS DRY.

5. UNLESS HYDROSEEDED, WORK IN LIME AND FERTILIZER TO A DEPTH OF FOUR (4") INCHES USING A DISK OR ANY SUITABLE EQUIPMENT.

6. TILLAGE SHOULD ACHIEVE A REASONABLY UNIFORM LOOSE SEEDBED. WORK ON CONTOUR IF SITE IS SLOPING.

ESTABLISHMENT:

1. SELECT APPROPRIATE SPECIES FOR THE SITUATION. NOTE RATES AND SEEDING DATES (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW). 2. APPLY SEED UNIFORMLY ACCORDING TO THE RATE INDICATED BY BROADCASTING, DRILLING, OR HYDRAULIC APPLICATION. 3. UNLESS HYDROSEEDED, COVER RYEGRASS SEEDS WITH NOT MORE THAN 1/4 INCH OF SOIL USING SUITABLE EQUIPMENT. 4. MULCH IMMEDIATELY AFTER SEEDING IF REQUIRED. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW.) APPLY STRAW OR HAY MULCH AND ANCHOR TO SLOPES GREATER THAN 3% OR WHERE CONCENTRATED FLOW WILL OCCUR.

PERMANENT VEGETATIVE COVER

GENERAL:

1. PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED AS VARIOUS SECTIONS OF THE PROJECT ARE COMPLETED IN ORDER TO STABILIZE THE SOIL, REDUCE DOWNSTREAM DAMAGE FROM SEDIMENT AND RUNOFF, AND TO ENHANCE THE AESTHETIC NATURE OF THE SITE. IT WILL BE APPLIED TO ALL CONSTRUCTION AREAS SUBJECT TO EROSION WHERE FINAL GRADING HAS BEEN COMPLETED AND A PERMANENT COVER IS NEEDED.

SITE PREPARATION:

2. INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.

3. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.

4. PERFORM ALL PLANTING OPERATIONS PARALLEL TO THE CONTOURS OF THE SLOPE.

5. APPLY TOPSOIL AS INDICATED ELSEWHERE HEREIN.

6. APPLY FERTILIZER ACCORDING TO SOIL TEST OR:

SPREAD SEEDING: WORK DEEPLY IN SOIL, BEFORE SEEDING, 300 LBS. OF 10-10-10 FERTILIZER PER ACRE (7 LBS. PER 1,000 SQ. FT.); THEN SIX (6) TO EIGHT (8) WEEKS LATER, APPLY ON THE SURFACE AN ADDITIONAL 300 LBS. OF 10-10-10 FERTILIZER PER ACRE. AFTER SEPTEMBER 1, TEMPORARY VEGETATIVE COVER SHALL BE APPLIED.

FALL SEEDING: WORK DEEPLY IN SOIL, BEFORE SEEDING, 600 LBS. OF 10-10-10 FERTILIZER PER ACRE (14 LBS. PER 1,000 SQ. FT.).

VEGETATIVE COVER SELECTION & MULCHING

TEMPORARY VEGETATIVE COVER:

PERENNIAL RYEGRASS 3 LBS./1,000 SQ.FT.
(IOLUIUM PERENNE)

PERMANENT VEGETATIVE COVER:

AS SPECIFIED

TEMPORARY MULCHING:

STRAY OR HAY 70-90 LBS./1,000 SQ.FT.
(TEMPORARY VEGETATIVE AREAS)

WOOD FIBER IN HYDROMULCH SLURRY 25-50 LBS./1,000 SQ. FT.

ESTABLISHMENT:

1. SMOOTH AND FIRM SEEDBED WITH CULTIPACKER OR OTHER SIMILAR EQUIPMENT PRIOR TO SEEDING (EXCEPT WHEN HYDROSEEDING).

2. SELECT ADAPTED SEED MIXTURE FOR THE SPECIFIC SITUATION. NOTE RATES AND THE SEEDING DATES (SEE VEGETATIVE COVER SELECTION & MULCHING SPEC. BELOW).

3. APPLY SEED UNIFORMLY ACCORDING TO RATE INDICATED, BY BROADCASTING, DRILLING, OR HYDRAULIC APPLICATION.

4. COVER GRASS AND LEGUME SEED WITH NOT MORE THAN 1/4 INCH OF SOIL WITH SUITABLE EQUIPMENT (EXCEPT WHEN HYDROSEEDING).

5. MULCH IMMEDIATELY AFTER SEEDING, IF REQUIRED, ACCORDING TO TEMPORARY MULCHING SPECIFICATIONS. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW).

6. USE PROPER INOCULANT ON ALL LEGUME SEEDINGS, USE FOUR (4) TIMES NORMAL RATES WHEN HYDROSEEDING.

7. USE SOD WHERE THERE IS A HEAVY CONCENTRATION OF WATER AND IN CRITICAL AREAS WHERE IT IS IMPORTANT TO GET A QUICK VEGETATIVE COVER TO PREVENT EROSION.

MAINTENANCE:

1. TEST FOR SOIL ACIDITY EVERY THREE (3) YEARS AND LIME AS REQUIRED.

2. ON SITES WHERE GRASSES PREDOMINATE, BROADCAST ANNUALLY 500 POUNDS OF 10-10-10 FERTILIZER PER ACRE (12 LBS. PER 1,000 SQ. FT.) OR AS NEEDED ACCORDING TO ANNUAL SOIL TESTS.

3. ON SITES WHERE LEGUMES PREDOMINATE, BROADCAST EVERY THREE (3) YEARS OR AS INDICATED BY SOIL TEST 300 POUNDS OF 0-20-20 OR EQUIVALENT PER ACRE (8 LBS PER 1,000 SQ. FT.).

EROSION CHECKS

GENERAL:

1. TEMPORARY PERVIOUS BARRIERS USING BALES OF HAY OR STRAW, HELD IN PLACE WITH STAKES DRIVEN THROUGH THE BALES AND INTO THE GROUND OR GEOTEXTILE FABRIC FASTENED TO A FENCE POST AND BURIED INTO THE GROUND, SHALL BE INSTALLED AND MAINTAINED AS REQUIRED TO CHECK EROSION AND REDUCE SEDIMENTATION.

CONSTRUCTION:

1. BALES SHOULD BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.

2. EACH BALE SHALL BE EMBEDDED INTO THE SOIL A MINIMUM OF FOUR (4") INCHES.

3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY WOOD STAKES OR REINFORCEMENT BARS DRIVEN THROUGH THE BALES AND INTO THE GROUND. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD THE PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.

4. GEOTEXTILE FABRIC SHALL BE SECURELY ANCHORED AT THE TOP OF A THREE FOOT (3') HIGH FENCE AND BURIED A MINIMUM OF FOUR INCHES (4") TO THE SOIL. SEAMS BETWEEN SECTIONS OF FILTER FABRIC SHALL OVERLAP A MINIMUM OF TWO FEET (2').

INSTALLATION AND MAINTENANCE:

1. BALED HAY EROSION BARRIERS SHALL BE INSTALLED AT ALL STORM SEWER INLETS.

2. BALED HAY EROSION BARRIERS AND GEOTEXTILE FENCE SHALL BE INSTALLED AT THE LOCATION INDICATED ON THE PLAN AND IN ADDITIONAL AREAS AS MAY BE DEEMED APPROPRIATE DURING CONSTRUCTION.

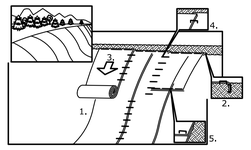
3. ALL EROSION CHECKS SHALL BE MAINTAINED UNTIL ADJACENT AREAS ARE STABILIZED.

4. INSPECTION SHALL BE FREQUENT (AT MINIMUM MONTHLY AND BEFORE AND AFTER HEAVY RAIN) AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

5. EROSION CHECKS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORMWATER FLOW OR DRAINAGE.

EROSION CONTROL MAINTENANCE INTERVALS

EROSION CONTROL MEASURE	CONTROL OBJECTIVE	INSPECTION/MAINTENANCE	FAILURE INDICATORS	REMOVAL
TEMPORARY SEDIMENT TRAP (TST)	- DETAIN SEDIMENT-LADEN RUNOFF FROM SMALL DISTURBED AREAS LONG ENOUGH TO ALLOW A MAJORITY OF THE SEDIMENT TO SETTLE OUT.	INSPECT AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL OF 0.5 INCHES OR MORE. STONE OUTLET SHOULD BE AT LEAST 0.5 FEET BELOW CREST OF EMBANKMENT. SEDIMENT MUST BE REMOVED WHEN ACCUMULATION REACHES ½ OF THE REQUIRED WET STORAGE.	- TURBID WATER - EXCESSIVE SEDIMENT ACCUMULATION - OVERTOPPING EVIDENCE	TST MAY BE REMOVED ONCE THE CONTRIBUTING DRAINAGE AREA IS PERMANENTLY STABILIZED.
SILT FENCE (SF) (RELATED: IP, STK)	- INTERCEPT, AND REDIRECT/DETAIN SMALL AMOUNTS OF SEDIMENT FROM SMALL DISTURBED AREAS. - DECREASE VELOCITY OF SHEET FLOW. - PROTECT SENSITIVE SLOPES OR SOILS FROM EXCESSIVE WATER FLOW.	INSPECT AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL OF 0.5 INCHES OR MORE. ACCUMULATED SEDIMENT MUST BE REMOVED ONCE ITS DEPTH IS EQUAL TO ½ THE TRENCH HEIGHT. INSPECT FREQUENTLY DURING PUMPING OPERATIONS IF USED FOR DEWATERING OPERATIONS.	- PHYSICAL DAMAGE OR DECOMPOSITION - EVIDENCE OF OVERTOPPED OR UNDERCUT FENCE - EVIDENCE OF SIGNIFICANT FLOWS EVADING CAPTURE - REPETITIVE FAILURE	SILT FENCE MAY BE REMOVED AFTER UPHILL AND SENSITIVE AREAS HAVE BEEN PERMANENTLY STABILIZED.
HAY BALES (HB)	- INTERCEPT, AND REDIRECT/DETAIN SMALL AMOUNTS OF SEDIMENT FROM SMALL DISTURBED AREAS. - DECREASE VELOCITY OF SHEET FLOW. - PROTECT SENSITIVE SLOPES OR SOILS FROM EXCESSIVE WATER FLOW.	INSPECT AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL OF 0.5 INCHES OR MORE. ACCUMULATED SEDIMENT MUST BE REMOVED ONCE THE DEPTH OF SEDIMENT IS WITHIN 3" OF THE TOP OF THE BARRIER. INSPECT FREQUENTLY DURING PUMPING OPERATIONS IF USED FOR DEWATERING OPERATIONS.	- PHYSICAL DAMAGE OR DECOMPOSITION - EVIDENCE OF OVERTOPPED OR UNDERCUT FENCE - EVIDENCE OF SIGNIFICANT FLOWS EVADING CAPTURE - REPETITIVE FAILURE	HAY BALES MAY BE REMOVED AFTER UPHILL AREAS HAVE BEEN PERMANENTLY STABILIZED.
TEMPORARY DIVERSION BERM/SWALE (TBS) OR TEMPORARY SWALE (TBS)	- MINIMIZE VELOCITY AND CONCENTRATION OF SHEET FLOW ACROSS CONSTRUCTION SITE TO A SEDIMENT TRAPPING FACILITY. - DIVERT WATER ORIGINATING FROM UNDISTURBED AREA AWAY FROM CONSTRUCTION.	WHEN LOCATED WITHIN CLOSE PROXIMITY TO ONGOING CONSTRUCTION ACTIVITIES, INSPECT AT THE END OF EACH WORK DAY AND IMMEDIATELY REPAIR DAMAGES. OTHERWISE INSPECT AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL OF 0.5 INCHES OR MORE. REPAIR THE TEMPORARY MEASURE AND ANY OTHER ASSOCIATED MEASURES WITHIN 24 HOURS.	- PHYSICAL DAMAGE - EXCESSIVE SCOURING/EROSION - REPETITIVE FAILURE	TEMPORARY DIVERSIONS MAY BE REMOVED ONCE CONSTRUCTION HAS CEASED AND THE CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED.
CATCH BASIN INLET PROTECTION (IP)	- PROHIBIT SILT IN CONSTRUCTION-RELATED RUNOFF FROM ENTERING STORM DRAINAGE SYSTEM.	INSPECT AFTER ANY RAIN EVENT. IF FILTER BAG INSIDE CATCH BASIN CONTAINS MORE THAN 6" OF SEDIMENT, REMOVE SEDIMENT FROM BAG. CHECK SURROUNDING SILT FENCE AND HAY BALES PER NOTED ABOVE.	- RIPPED BAG - FAILED HAY BALES / SILT FENCE - SIGNIFICANT SILT PRESENCE IN STORM DRAINAGE SYSTEM OUTFLOW.	INLET PROTECTION MAY BE REMOVED ONCE THE SITE HAS BEEN PERMANENTLY STABILIZED, AND ALL SECTIONS OF ROADWAY HAVE BEEN PERMANENTLY PAVED.
STOCKPILE PROTECTION (STK)	- RETAIN SOIL STOCKPILE IN LOCATIONS SPECIFIED, AND REDUCE WATER-TRANSPORT.	INSPECT SILT FENCE AT THE END OF EACH WORK DAY AND IMMEDIATELY REPAIR DAMAGES. PERIODIC REINFORCEMENT OF SILT FENCE, OR ADDITION OF HAY BALES MAY BE NECESSARY.	- EVIDENCE OF STOCK PILE DIMINISHING DUE TO RAIN EVENTS - FAILURE OF SILT FENCE	STOCKPILE PROTECTION MAY BE REMOVED ONCE THE STOCKPILE IS USED OR REMOVED.

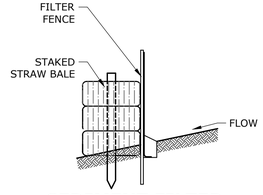


NOTES:

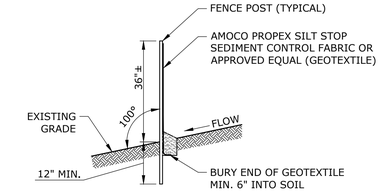
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING SCC225, DO NOT SEED PREPARED AREA. SCC225 MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP, STAPLE THROUGH OVERLAP AREA, APPROXIMATELY 12" APART.

REFER TO GENERAL STAPLE PATTERN GUIDE IN NORTH AMERICAN GREEN CATALOG FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.

APPLICATION OF EROSION CONTROL BLANKET ON SLOPES
NOT TO SCALE



SEDIMENT FILTER FENCE AND HAY BALE
NOT TO SCALE



SEDIMENT FILTER FENCE
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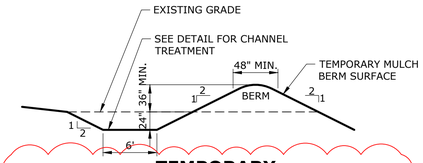

TEMPORARY DIVERSION BERM AND SWALE
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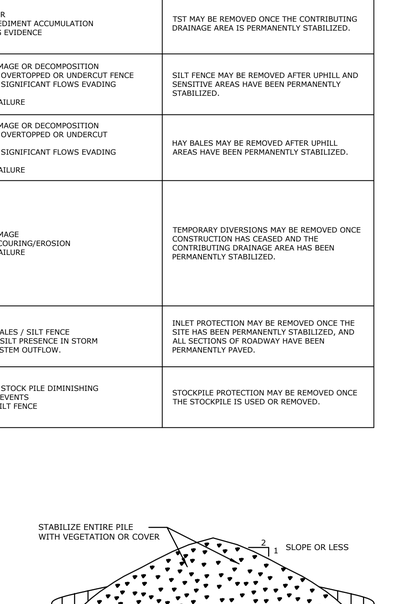
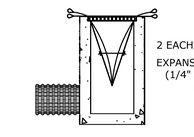
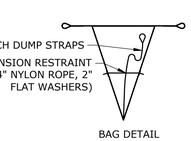


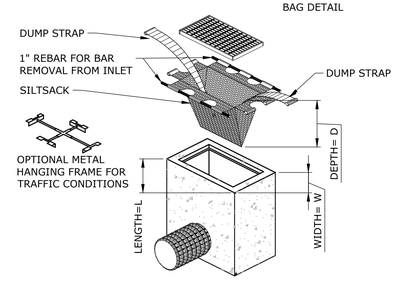
INSTALLATION NOTES

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAWBALES, THEN STABILIZED WITH VEGETATION OR COVERED.

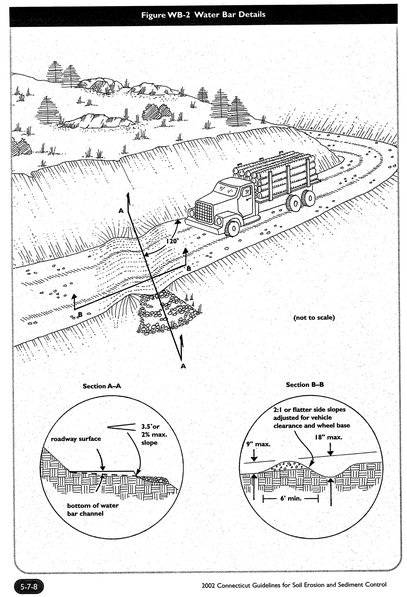
STOCKPILE PROTECTION (STK)
NOT TO SCALE



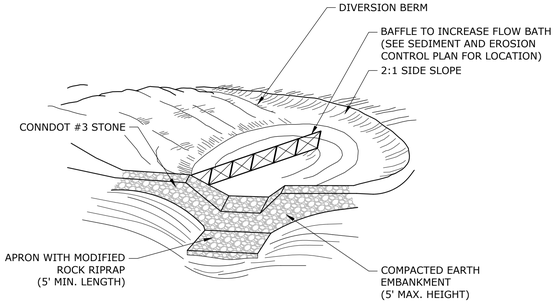




INLET SEDIMENT CONTROL DEVICE
NOT TO SCALE



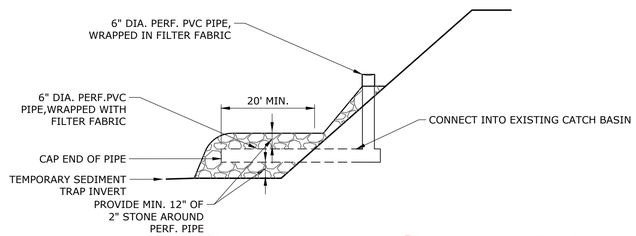
WATER BAR (WB)
NOT TO SCALE



NOTES:

1. REFER TO SEDIMENT & EROSION CONTROL PLAN FOR APPROXIMATE DIMENSIONS AND REQUIRED VOLUME.

TEMPORARY SEDIMENT TRAP
NOT TO SCALE



TEMPORARY DEWATERING UNDERDRAIN FOR TEMPORARY SEDIMENT TRAPS
NOT TO SCALE

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY
IWWC COMMENTS	12/20/2023	SMM

SEDIMENT & EROSION CONTROL NOTES & DETAILS

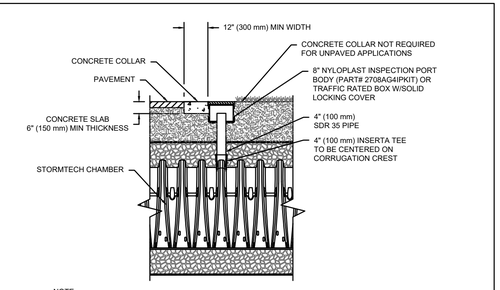
CAMP YANKEE TRAILS SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

DESIGNED	DRAWN	CHECKED
SMM	SMM	MTD

SCALE: AS NOTED
DATE: NOVEMBER 21, 2023
PROJECT NO.: 141.13280.00006
SHEET NO.: 20 OF 26
SHEET NAME: SE-3

SC-740 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4 4" PVC INSPECTION PORT DETAIL (SC SERIES CHAMBER)

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

1. STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.
   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

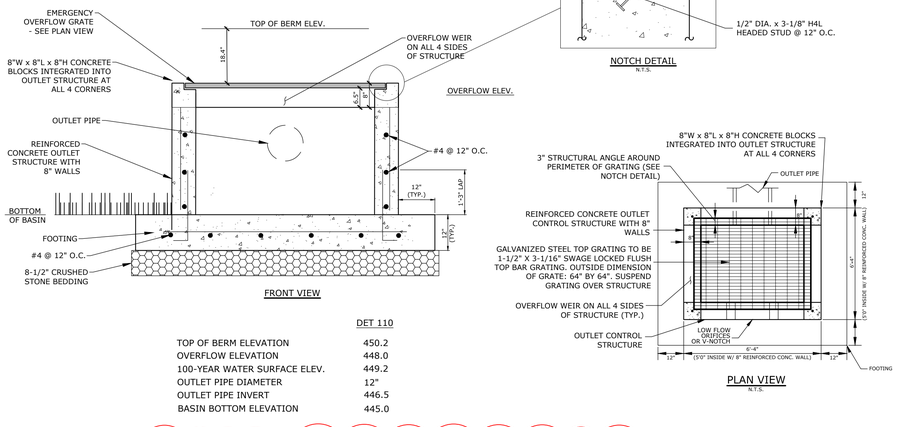
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

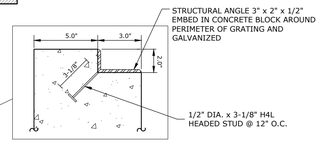
STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



FRONT VIEW



NOTCH DETAIL
N.T.S.

PLAN VIEW
N.T.S.

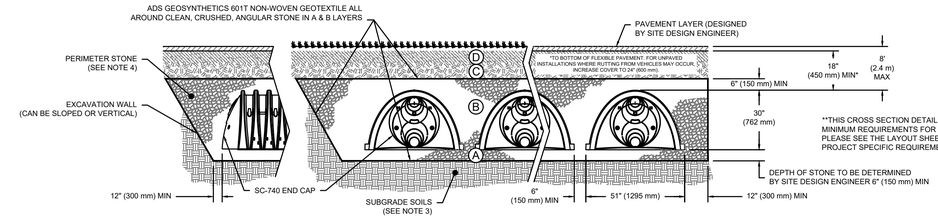
	DET 110
TOP OF BERM ELEVATION	450.2
OVERFLOW ELEVATION	448.0
100-YEAR WATER SURFACE ELEV.	449.2
OUTLET PIPE DIAMETER	12"
OUTLET PIPE INVERT	446.5
BASIN BOTTOM ELEVATION	445.0

DETENTION BASIN OUTLET CONTROL STRUCTURE
SCALE: 1"=2'

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



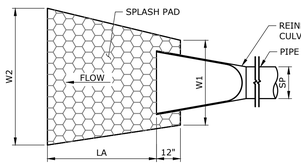
**THIS CROSS SECTION DETAIL REPRESENTS MINIMUM REQUIREMENTS FOR INSTALLATION. PLEASE SEE THE LAYOUT SHEET(S) FOR PROJECT SPECIFIC REQUIREMENTS.

NOTES:

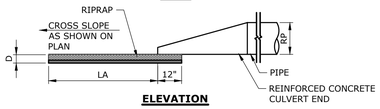
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

1 SC-740 CROSS SECTION DETAIL

STORMTECH SC-740 CHAMBERS



PLAN

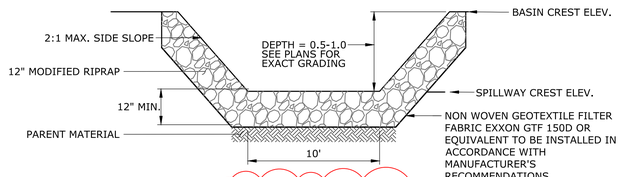


ELEVATION

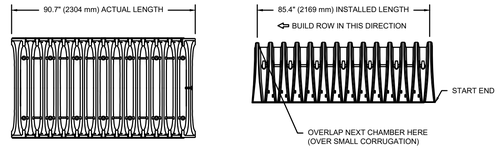
OUTLET PROTECTION ID	TYPE	SP (FT)	RP (FT)	LA (FT)	W1 (FT)	W2 (FT)	D (IN)
FES 1	MODIFIED TYPE B	1.0	1.0	10.0	3.0	7.0	12

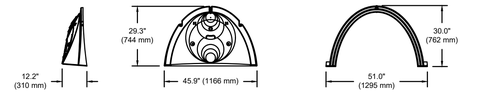
FLARED END WITH RIP RAP SPLASH PAD

NOT TO SCALE



FOREBAY SPILLWAY
NOT TO SCALE

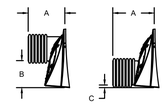




NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)
SC740EPE24BR*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B/SC740EPE24BR ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B/SC740EPE24BR THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

2 SC-740 TECHNICAL SPECIFICATIONS

SLR
99 REALTY DRIVE
CANTON, CT 06019
203.719.1712
SLRCONSULTING.COM

DESCRIPTION	DATE	BY
IWWC COMMENTS	12/20/2023	MCB

SITE DETAILS
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

PJP	PJP	MTD
DESIGNED	DRAWN	CHECKED

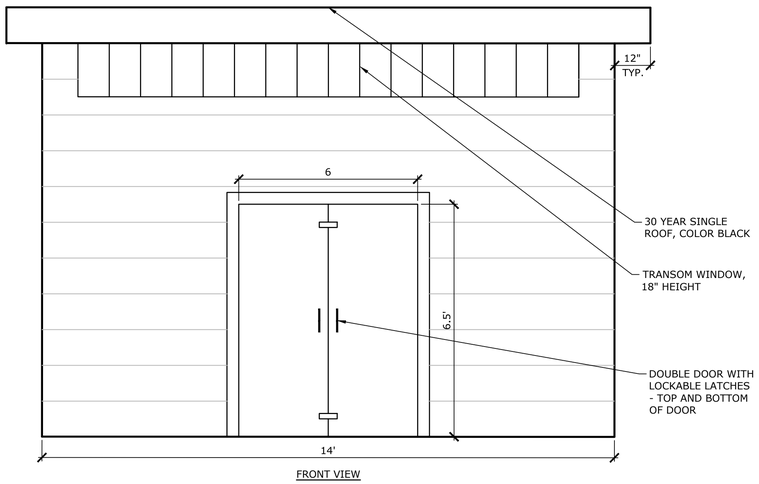
AS NOTED
SCALE

NOVEMBER 21, 2023
DATE

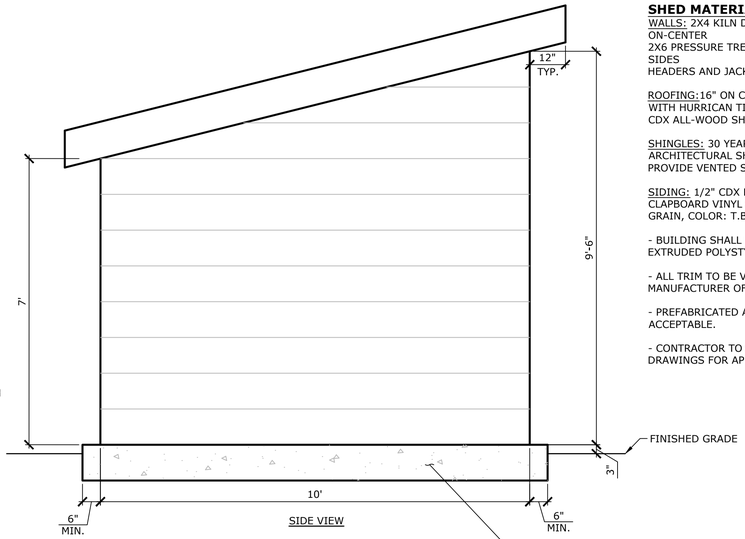
141.13280.00006
PROJECT NO.

24 OF 26
SHEET NO.

SD-4
SHEET NAME



FRONT VIEW



SIDE VIEW

SHED MATERIAL SPECIFICATIONS:

WALLS: 2X4 KILN DRIED FRAMING, 16" ON-CENTER
2X6 PRESSURE TREATED SILL PLATE ALL FOUR SIDES
HEADERS AND JACKS IN ALL DOOR FRAMES

ROOFING:16" ON CENTER 2X8 ROOF RAFTERS WITH HURRICAN TIES, DOUBLE GUSSETED, 1/2" CDX ALL-WOOD SHEATHING

SHINGLES: 30 YEAR GUARANTEE ASPHALT ARCHITECTURAL SHINGLES
PROVIDE VENTED SOFFITS

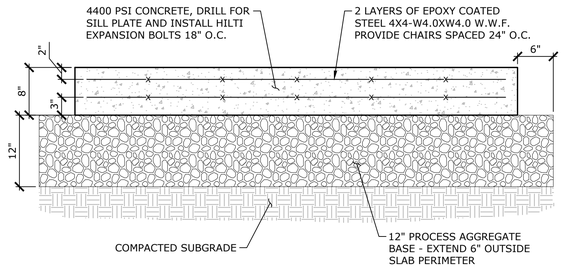
SIDING: 1/2" CDX PLYWOOD OVERLAID WITH CLAPBOARD VINYL COMPOSITE WITH WOOD GRAIN, COLOR: T.B.D.

- BUILDING SHALL BE INSULATED WITH EXTRUDED POLYSTYRENE FOAM BOARD.

- ALL TRIM TO BE VINYL FROM THE SAME MANUFACTURER OF SIDING.

- PREFABRICATED AND KIT SHED UNITS MAY BE ACCEPTABLE.

- CONTRACTOR TO SUBMIT DETAILED SHOP DRAWINGS FOR APPROVAL.

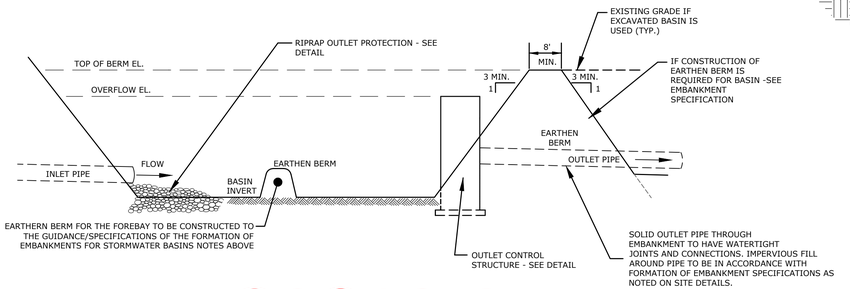


SHED SLAB

NOT TO SCALE

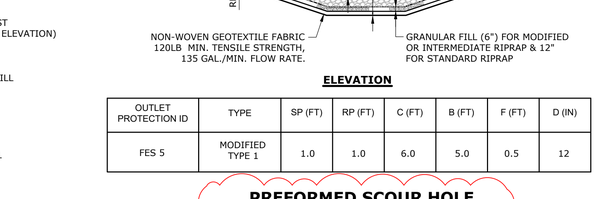
WATER SUPPLY AND TREATMENT SHED

NOT TO SCALE



TYPICAL RETENTION BASIN

NOT TO SCALE



NOTES:

1. AREA OF CRUSHED STONE IS EQUAL TO BOTTOM OF BASIN AREA.

STORMWATER BASIN 110 INFILTRATION STONE

NOT TO SCALE

FORMATION OF EMBANKMENTS FOR STORMWATER BASINS

1. MATERIALS

ALL FILL MATERIALS SHALL BE OBTAINED FROM REQUIRED EXCAVATIONS OR DESIGNATED BORROW AREAS. FILL MATERIAL SHALL CONTAIN NO FROZEN MATERIAL, SOD, BRUSH, ROOTS, OR OTHER ORGANIC MATERIAL. EARTH EMBANKMENTS SHALL CONTAIN NO STONES OR ROCK PARTICLES OVER THREE INCHES IN DIAMETER.

THE MATERIAL USED IN THE CENTER PORTION OF THE EMBANKMENT SHALL BE THE MOST IMPERVIOUS MATERIAL OBTAINED FROM THE BORROW AREAS IF REQUIRED. THE MORE PERVIOUS MATERIALS SHALL BE USED IN THE OUTER PORTION OF THE EMBANKMENT AS SHOWN ON THE PLANS.

A. IMPERVIOUS FILL MATERIALS

IMPERVIOUS FILL SHALL BE A GLACIAL TILL, AND TO BE PROVIDED FROM AN OFFSITE SOURCE IN THE QUANTITIES REQUIRED FOR COMPLETION. FILL TO BE APPROVED BY THE ENGINEER. GLACIAL TILL SHALL CONSIST OF HARD AND DURABLE PARTICLES OR FRAGMENTS AND SHALL BE FREE FROM ORGANIC MATTER AND OTHER OBJECTIONABLE MATERIALS. GLACIAL TILL SHALL GENERALLY CONFORM TO THE FOLLOWING GRADATION LIMITS:

U.S. STANDARD SIEVE SIZE	PERCENTAGE PASSING BY WEIGHT
3 INCH	100
NO. 4	60-95
NO. 10	50-95
NO. 40	30-75
NO. 100	20-65
NO. 200	10-40

2. EMBANKMENT FOUNDATION PREPARATION

AREAS WHERE EMBANKMENTS ARE TO BE FORMED SHALL BE CLEARED AND GRUBBED OF ALL TOPSOIL AND OTHER ORGANIC MATERIALS TO A DEPTH OF AT LEAST 24 INCHES. UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS, FOUNDATION AREAS SHALL BE SCARIFIED TO A DEPTH OF THREE INCHES PRIOR TO PLACEMENT OF FILL MATERIAL.

3. PLACEMENT

NO FILL SHALL BE PLACED UNTIL THE FOUNDATION PREPARATION AND EXCAVATIONS IN THE FOUNDATION HAVE BEEN COMPLETED. NO FILL SHALL BE PLACED ON A FROZEN SURFACE NOR SHALL FROZEN MATERIAL BE INCORPORATED.

A. EMBANKMENT

MATERIAL SHALL BE PLACED IN HORIZONTAL LAYERS. THE THICKNESS OF LAYERS SHALL BE SIX INCHES. DURING CONSTRUCTION, THE SURFACE OF THE FILL SHALL HAVE A CROWN OR CROSS-SLOPE OF NOT LESS THAN TWO PERCENT. EACH LAYER OR LIFT SHALL EXTEND OVER THE ENTIRE AREA OF THE FILL.

THE FILL SHALL BE FREE FROM LENSES, POCKETS, STREAKS, OR LAYERS OF MATERIAL DIFFERING SUBSTANTIALLY IN TEXTURE OR GRADATION FROM THE SURROUNDING MATERIAL. THE MORE PERVIOUS MATERIAL SHALL BE PLACED IN THE OUTSIDE PORTION OF THE EMBANKMENT OR AS INDICATED ON THE DRAWINGS. THE FINISHED FILL SHALL BE SHAPED AND GRADED TO THE LINES AND GRADE SHOWN ON THE DRAWINGS.

B. BACKFILL AT THE PIPE OUTLET

BACKFILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED THREE INCHES IN THICKNESS AND SHALL BE BROUGHT UP UNIFORMLY AROUND THE OUTLET PIPE AND FLARED END SECTION

4. MOISTURE CONTROL

THE MOISTURE CONTENT OF MATERIALS IN THE EMBANKMENT SHALL BE CONTROLLED TO MEET THE REQUIREMENTS OF SECTION 5, "COMPACTION OF EMBANKMENT." WHEN NECESSARY, MOISTURE SHALL BE ADDED BY USE OF APPROVED SPRINKLING EQUIPMENT. WATER SHALL BE ADDED UNIFORMLY AND EACH LAYER SHALL BE THOROUGHLY DISKED OR HARROWED TO PROVIDE ROPER MIXING. ANY LAYER FOUND TOO WET FOR PROPER COMPACTION SHALL BE ALLOWED TO DRY BEFORE ROLLING. PLACING OR ROLLING OF MATERIAL ON EARTH FILLS WILL NOT BE PERMITTED DURING OR IMMEDIATELY AFTER RAINFALLS WHICH INCREASE THE MOISTURE CONTENT BEYOND THE LIMIT OF SATISFACTORY COMPACTION. THE EARTH FILL SHALL BE BROUGHT UP UNIFORMLY AND ITS TOP SHALL BE KEPT GRADED AND SLOPED SO THAT A MINIMUM OF RAINWATER WILL BE RETAINED THEREON. COMPACTED EARTH FILL DAMAGED BY WASHING SHALL BE ACCEPTABLY REPLACED BY THE CONTRACTOR.

5. COMPACTION

A. EMBANKMENT

EMBANKMENT MATERIAL SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY AT NEAR OPTIMUM MOISTURE CONTENT AND BY THE COMPACTION EQUIPMENT SPECIFIED HEREIN. THE COMPACTION EQUIPMENT SHALL TRAVERSE THE ENTIRE SURFACE OF EACH LAYER OF FILL MATERIAL.

APPROVED TAMPING ROLLERS SHALL BE USED FOR COMPACTING ALL PARTS OF THE EMBANKMENTS WHICH THEY CAN EFFECTIVELY REACH. THE CONTRACTOR SHALL DEMONSTRATE THE EFFECTIVENESS OF THE ROLLER BY ACTUAL SOIL COMPACTION RESULTS OF THE SOIL TO BE USED IN THE EMBANKMENT WITH LABORATORY WORK PERFORMED BY AN APPROVED SOIL TESTING LABORATORY.

B. BACKFILL AT OUTLET CONDUIT

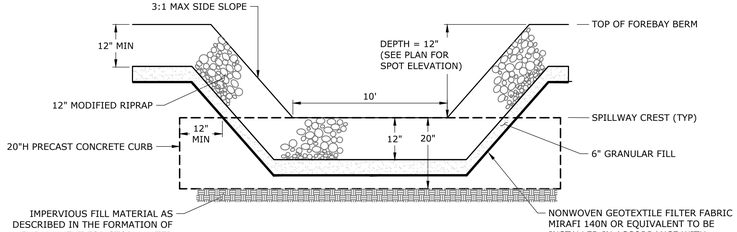
BACKFILL SHALL BE COMPACTED BY HAND TAMPING WITH MECHANICAL TAMPERS. HEAVY EQUIPMENT SHALL NOT BE OPERATED WITHIN TWO FEET OF ANY STRUCTURE. EQUIPMENT SHALL NOT BE ALLOWED TO OPERATE OVER THE OUTLET CONDUITS UNTIL THERE IS 24 INCHES OF FILL OVER THE PIPE CONDUITS.

6. FINISHING EMBANKMENTS

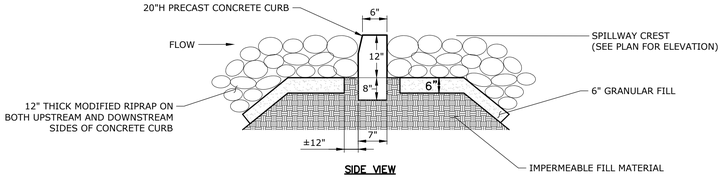
THE EMBANKMENTS SHALL BE CONSTRUCTED TO THE ELEVATIONS, LINES, GRADES AND CROSS-SECTIONS AS SHOWN ON THE DRAWINGS. THE EMBANKMENTS SHALL BE MAINTAINED IN A MANNER SATISFACTORY TO THE ENGINEER AND SURFACES SHALL BE COMPACT AND ACCURATELY GRADED BEFORE TOPSOIL IS PLACED ON THEM. THE CONTRACTOR SHALL CHECK THE EMBANKMENT SLOPES WITH STRING LINES TO INSURE THAT THEY CONFORM TO THE SLOPES GIVEN ON THE PLANS AND ARE UNIFORM FOR THE ENTIRE LENGTH OF THE SLOPE.

7. CONTROL OF WATER

THE PROJECT SITE IS SUBJECT TO HIGH WATER TABLE. THE CONTRACTOR SHALL USE TEMPORARY PIPES OR PUMPS TO ASSURE PLACEMENT OF SELECT FILL IN DRY CONDITIONS.



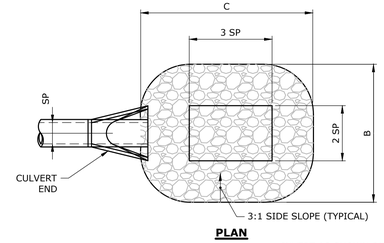
FRONT VIEW



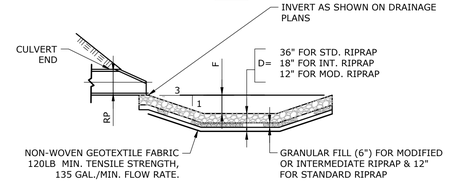
SIDE VIEW

EMERGENCY RIPRAP SPILLWAY

NOT TO SCALE



PLAN



ELEVATION

OUTLET PROTECTION ID	TYPE	SP (FT)	RP (FT)	C (FT)	B (FT)	F (FT)	D (IN)
FES 5	MODIFIED TYPE 1	1.0	1.0	6.0	5.0	0.5	12

PREFORMED SCOUR HOLE

NOT TO SCALE

SLR
99 REALTY DRIVE
CHESHIRE CT 06410
203.271.1773
SLRCONSULTING.COM

DESCRIPTION	DATE	BY
IWWC COMMENTS	12/20/2023	MCB

SITE DETAILS
CAMP YANKEE TRAILS
SITE IMPROVEMENTS
343 PLAINS ROAD
TOLLAND, CONNECTICUT

PJP	PJP	MTD
DESIGNED	DRAWN	CHECKED

AS NOTED
SCALE

NOVEMBER 21, 2023
DATE

141.13280.00006
PROJECT NO.

25 OF 26
SHEET NO.

SD-5
SHEET NAME

Engineering Review

December 21, 2023

Inland Wetlands & Watercourses Commission
Town of Tolland
c/o Michael D'Amato, Interim Wetlands Agent
21 Tolland Green
Tolland, CT 06084
Via email

RE: 343 Plains Road, Camp Yankee Trails Site Improvements
IWC 23-6 Engineering Review

Commission Members:

As requested, CHA reviewed the following materials for stormwater and general engineering standards that may impact the regulated area:

Item 1 — Eight (8) revised plan sheets entitled "Camp Yankee Trails Site Improvements, 343 Plains Road, Tolland, Connecticut", sheets GR-2, GR-4, UT-2, SE-1, SE-2, SE-3, SD-4, and SD-5, prepared for Girl Scouts of America, prepared by SLR, dated November 21, 2023, revised December 20, 2023

Item 2 — Drainage Report, Camp Yankee Trails Site Improvements, 343 Plains Road, Tolland, Connecticut, prepared by SLR, dated November 20, 2023, revised December 20, 2023

Item 3 — Tolland Inland Wetlands & Watercourses Commission Comment Response Letter, addressed to Michael D'Amato, prepared by SLR, dated December 20, 2023

Item 4 — CHA Comment Response Letter, addressed to Chuck Eaton, prepared by SLR, dated December 20, 2023

CHA offers the following comments based on the Tolland LID and Stormwater Management Design Manual, 2004 Connecticut Stormwater Quality Manual, and general engineering practice:

CHA's previous review comments are included below in normal text. Updates to those comments are included in *italics*. Any new comments, based on the revised application materials, are included in **bold** text.

1. CHA recommends the Designer provide rational for meeting the State or Tolland stormwater standards. The Drainage Report appears to only discuss water quality and quantity treatment.
   The Designer revised the Drainage Report to include additional stormwater standards. This comment is addressed.

2. It appears infiltration tests were performed for the stormwater basins; however, no information other than the infiltration testing rates is provided. A narrative, type of test performed, and testing locations must be provided.
   Information regarding the infiltration testing was provided in the response to comment letter; however, it should be added to the Drainage Report for the Town's record and documentation.

3. Test pits are required for properly siting and designing the stormwater basins. This will provide required design information on soil types, depth to ledge and depth to groundwater. Test pit locations and logs must be provided. Based on soil mapping it appears the proposed stormwater basins are located within a type B soil; however, the very high infiltration rates obtained by the infiltration testing are not typical of a type B soil. Test pits must be provided to validate and determine the soil types.
   Test pit locations and log information have been added to the plans. A test pit is required prior to construction for Detention System 111 to verify the depth to high groundwater or ledge. The current test pits only extend 0.8-feet below the bottom of the system. Test pits must be provided to ensure the systems are designed pursuant to the Connecticut Stormwater Quality Manual. A note requiring this must be added to the plans and the results provided to the Town prior to construction.

4. Design and siting rational must be provided for Stormwater Basins 110 and 111 based on test pits. See Comment No. 3. Design pursuant the Tolland LID Manual or the Connecticut Stormwater Quality Manual must be provided and fully described. Calculations and descriptions such as drawdown time, depth to high groundwater, pretreatment, etc. must be provided.
   Provided. See Comment No. 3. This comment is addressed.

5. Pretreatment is required for Stormwater Basin 110. CHA recommends a forebay within Stormwater Basin 110.
   Provided. This comment is addressed.

6. Although the infiltration testing supports an infiltration rate of 27.4 inches per hour, the rate will be limited by the surface soil. It does not appear that a cross section of the basin or a call out for the type of soil that will line the basin is provided. CHA recommends an engineered soil consisting of sand, loam, and compost. Typically this engineered soil provides an infiltration rate of 2.41 inches per hour. This rate would then be used as the infiltration rate in the drainage calculations for Stormwater Basin 110.
   The Designer revised the bottom design and provided a cross section of Stormwater Basin 110. The revised design will allow the use of the 27.4 inches per hour infiltration rate. This comment is addressed.

7. Drainage calculations for Stormwater Basin 110 use a weir elevation of 448.4. The elevation called for on the plans is 449.4. The calculations, results, and associated narrative must be revised accordingly.
   The Designer revised the elevations for Stormwater Basin 110; however, the following discrepancies still exist:
   - ***Emergency weir elevation: plan 449.2, calculations 449.0***
   - ***Overflow grate elevation: Plan Sheet GR-2 449.4, correct elevation 448.0***
   - ***Stormwater Basin 110 Infiltration Stone Detail: Sheet SD-5 Bottom Elev 448.0, correct elevation 445.0***

8. The provided water quality volume based on the drainage calculations appears to be 0.156 acre-feet. The water quality chart on page 35 of the PDF indicates 0.195 acre-feet. This chart must be updated or an explanation of how the provided water quality volume was achieved must be provided.
   Provided. The correct water quality volume provided of 0.145 acre-feet is shown in the revised Drainage Report. This comment is addressed.

9. No calculations or cross sections are provided for the "vegetated swale" on the eastern side of the proposed access road to the waterfront improvements. It is unclear if the proposed swale can properly convey runoff to the stormwater basins without impacting the waterfront area or Sweetheart Lake.
   Calculations are provided indicating the vegetated swale will not overtop through a 25-year storm event; however, it is unclear if the proposed vegetation can sustain the proposed velocity of stormwater runoff without the swale eroding. Calculations must be provided indicating the vegetated swale will be stable through the design storm event.

10. Proposed riprap is called out as both 1.5:1 and 1:1 slopes on the plan set. This call out must be consistent within the plan set.
    The revised plans call for 1.5:1. This comment is addressed.

11. Inspection ports for Stormwater Basin 111 must be labeled on the plan set.
    Provided. This comment is addressed.

12. Information must be provided for the beach sand construction at the waterfront improvement area. It is unclear how this area will be modified and how this may impact Sweetheart Lake.
    The Designer provided an explanation of the beach sand construction in the response letter and added a cross section of the area in the revised plans. CHA suggests providing a callout or detail on the plans indicating the materials for the sand beach (similar to the response letter description) if that method and/or material is acceptable to the Commission. Currently the plans only callout for "sand beach".

13. CHA recommends sediment barrier be installed at the toe of slope (around the bottom) of Stormwater Basin 110 to prevent fines from reducing the infiltration capacity of the basin while the side slopes are being stabilized.
    Provided; however, with the addition of the "stone wick" in the bottom of Stormwater Basin 110, CHA recommends also installing sediment barrier at the edge of the wick to prevent topsoil

from the bottom of the basin from entering the wick and clogging the infiltration system during the stabilization period.

14. A sequencing plan must be provided for the construction and associated sediment and erosion control of the stormwater basins. The basins cannot be used as temporary sediment basins due to the reduction of infiltration from eroded construction fines. CHA recommends the use of a separately located temporary sediment trap to allow the construction of the stormwater basins once the upgradient site is fully stabilized.
    The Temporary Dewatering Underdrain for Temporary Sediment Traps Detail on Sheet SE-3 indicates the underdrain will be connected to an existing catch basin. This callout must be clarified as it does not appear there are existing catch basins within the vicinity of the temporary sediment trap. Otherwise, this comment is addressed.

15. A long-term stormwater operation and maintenance plan must be provided to ensure the stormwater management systems continue to function as designed. The location of the systems upgradient and adjacent to Sweetheart Lake make the implementation of this plan important to prevent stormwater system failures that will directly impact the Lake.
    The proposed vegetated swale, and stone infiltration strips/islands must be added to the long-term stormwater operation and maintenance plan.

16. The Preformed Scour Hole Detail on Sheet SD-5 must be updated to correctly identify FES 5.
    Provided. This comment is addressed.

Please contact me if you have any questions regarding these comments.

Sincerely,

Chuck Eaton, P.E., LEEP-AP

Tolland Town Engineer

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