

ROOF RAIN GARDEN SIZING CALCULATIONS

- Impervious Roof Area = 2,280 s.f.
- Soil type: Sand
- Design Coefficient of Permeability = 3.5 ft/day
- Intensity = 1-inch
- Water Quality Volume Needed: 2280 s.f. x 0.083 (1") = 189 c.f.
- Proposed Rain Garden Depth = 8-inches or 0.7-feet

Surface Area at Bottom of the Garden:

$$A(f) = (WQ_v)(df) / [(k)(bf + df)(t)]$$

Where:

- A(f) = surface area of the filter bed (ft²)
- df = Filter bed depth (ft) = 1.5 ft
- k = coefficient of permeability of the filter media (use 3.5 ft/day)
- h(f) = Average height of water above the dry swale (ft) (use 0.7 ft)
- tf = design filter bed drain time (assume 1 day for design purposes)

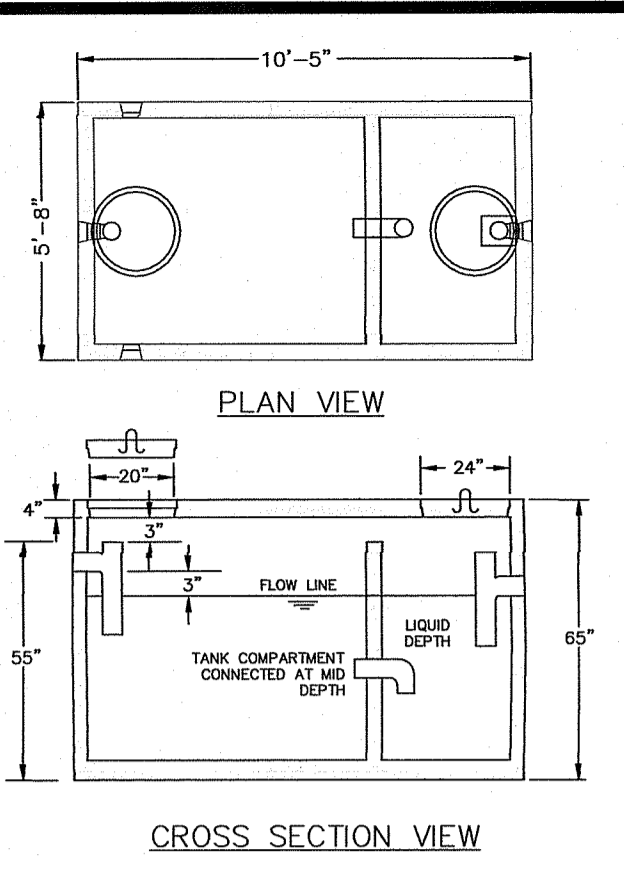
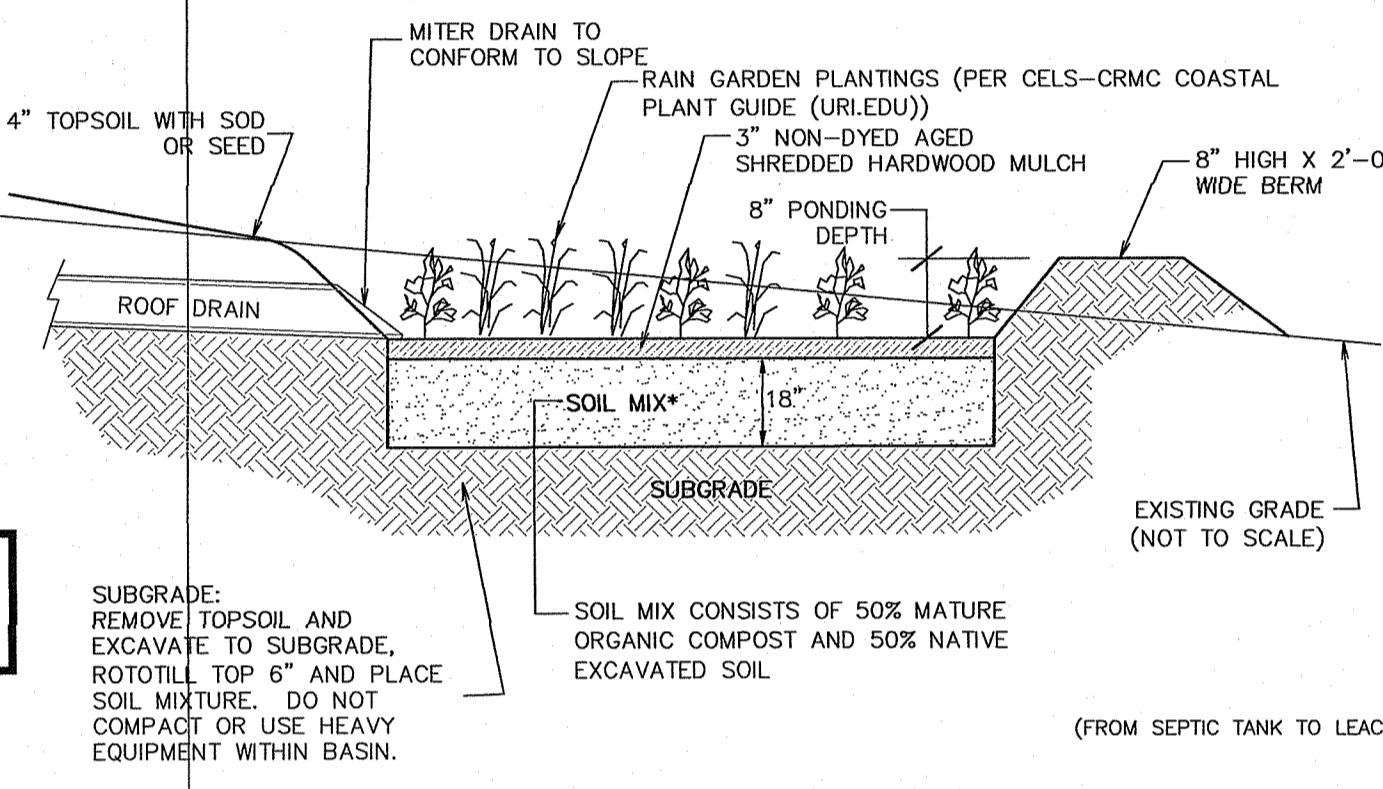
$$A(f) = (189)(1.5) / [(3.5)(0.7 + 1.0)(1.0)]$$

$$A(f) = 139 \text{ s.f. use } 150 \text{ s.f.}$$

STORMWATER TREATMENT PRACTICE

IMPERVIOUS SURFACE	AREA	METHOD	AREA REQ'D	AREA PROVIDED
ROOF TOP	2,280 S.F.	RAIN GARDEN	139 S.F.	150 S.F.
DRIVEWAY	1,118 S.F.	QPA	1,118 S.F.	1,530 S.F.

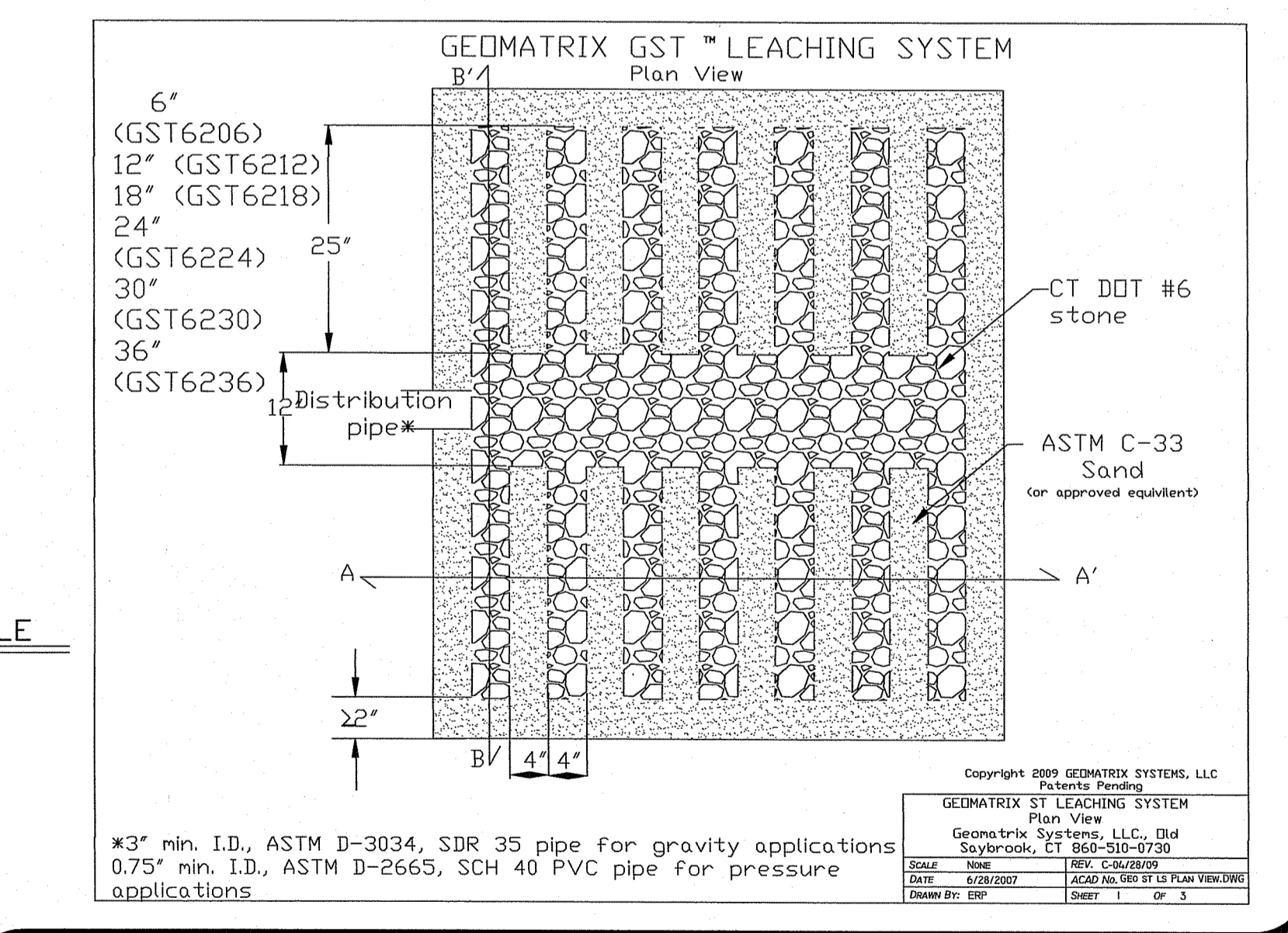
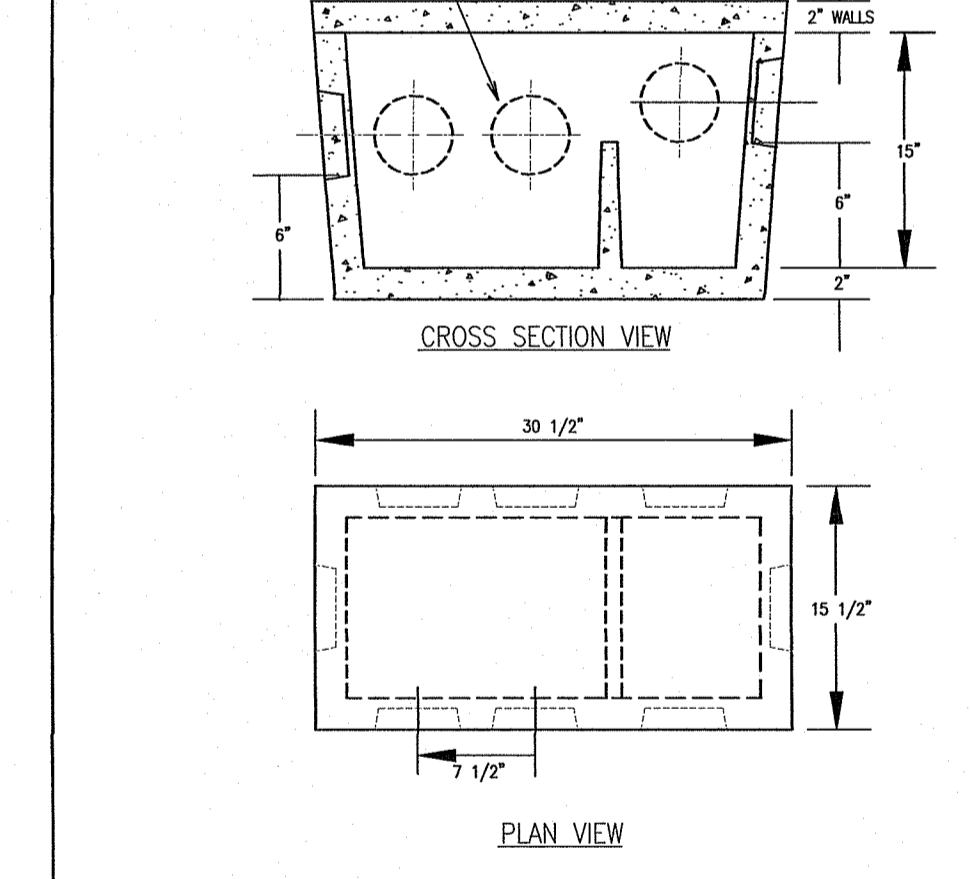
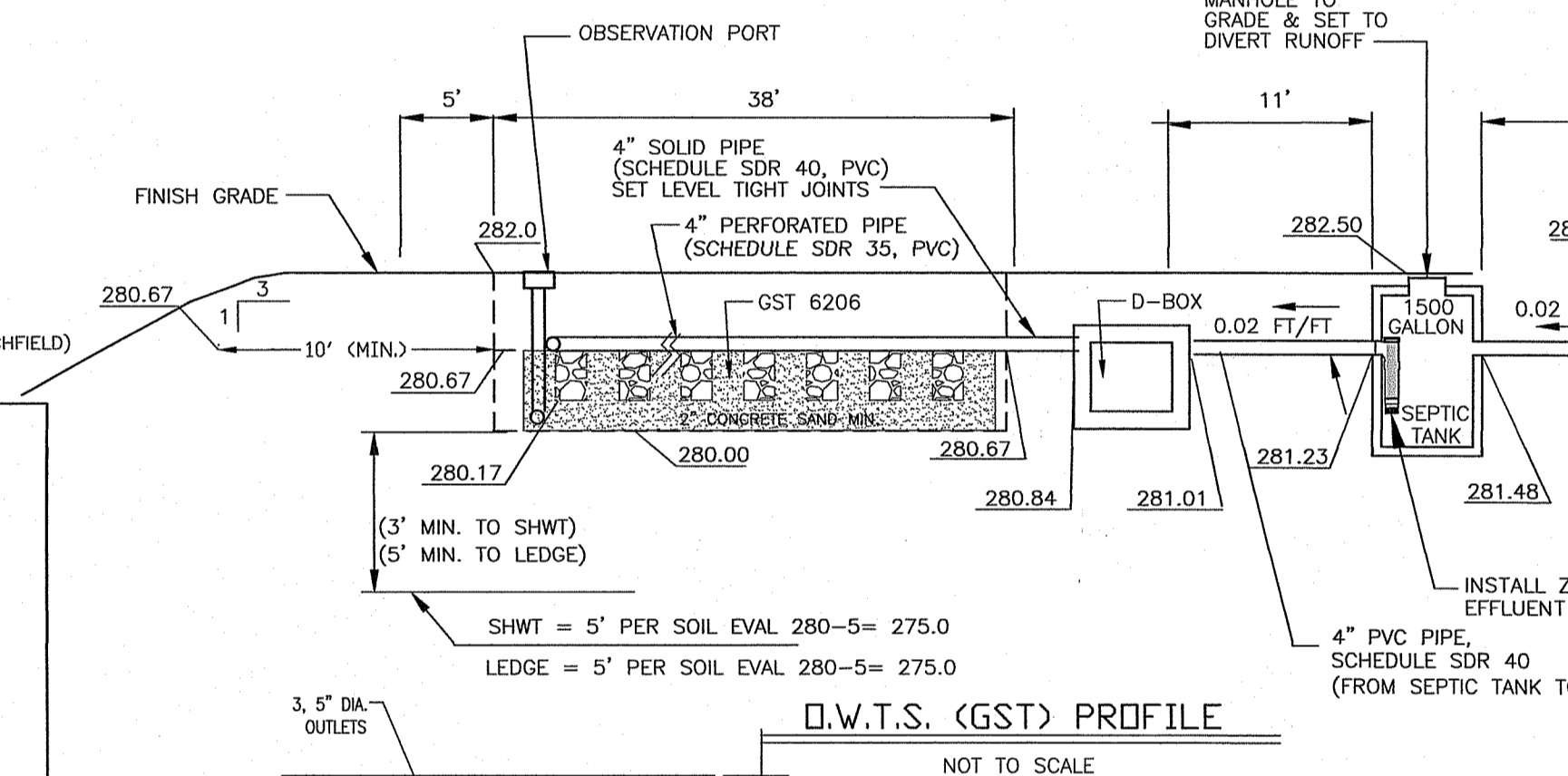
• PER SOIL EVALS FSL



1,500 GALLON 2-COMPARTMENT SEPTIC TANK

JOLLY PRECAST OR EQUAL NOT TO SCALE

THIS SITE IS LOCATED IN A ZONE 'X' (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS DESIGNATED ON THE "NATIONAL FLOOD INSURANCE PROGRAM, FIRM FLOOD INSURANCE RATE MAP KENT COUNTY, RHODE ISLAND (ALL JURISDICTIONS) PANEL MAP NUMBER 44003C0119G EFFECTIVE DATE: DECEMBER 3, 2010. FEDERAL EMERGENCY MANAGEMENT AGENCY."

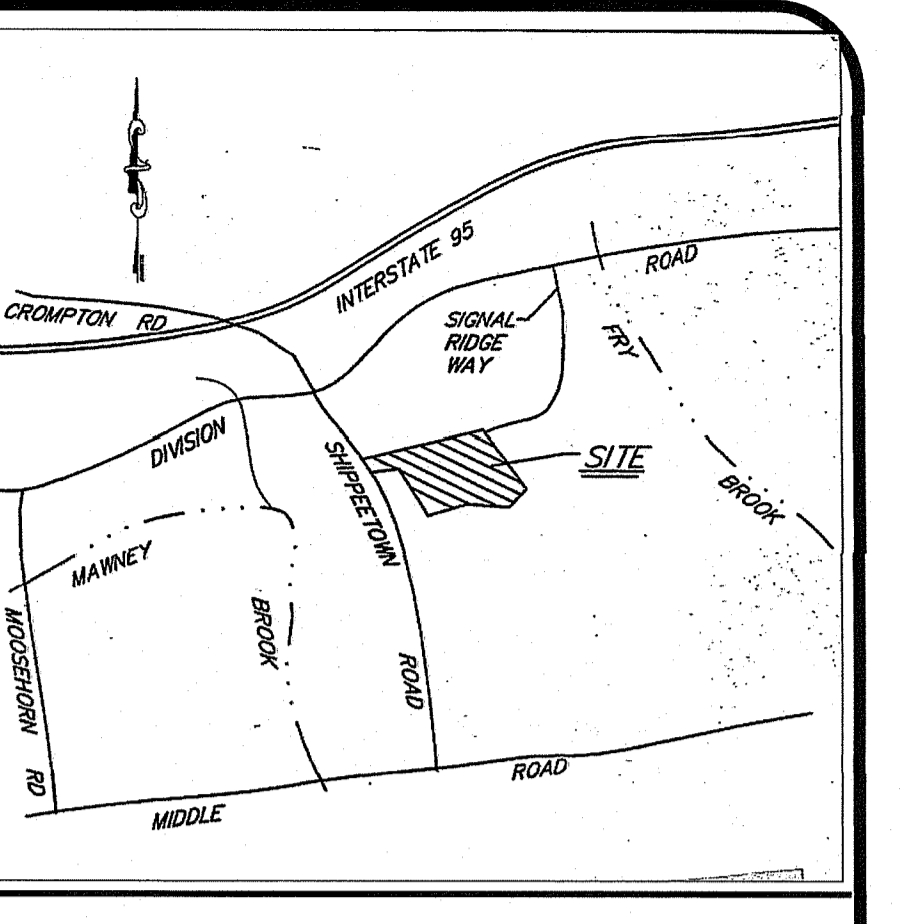
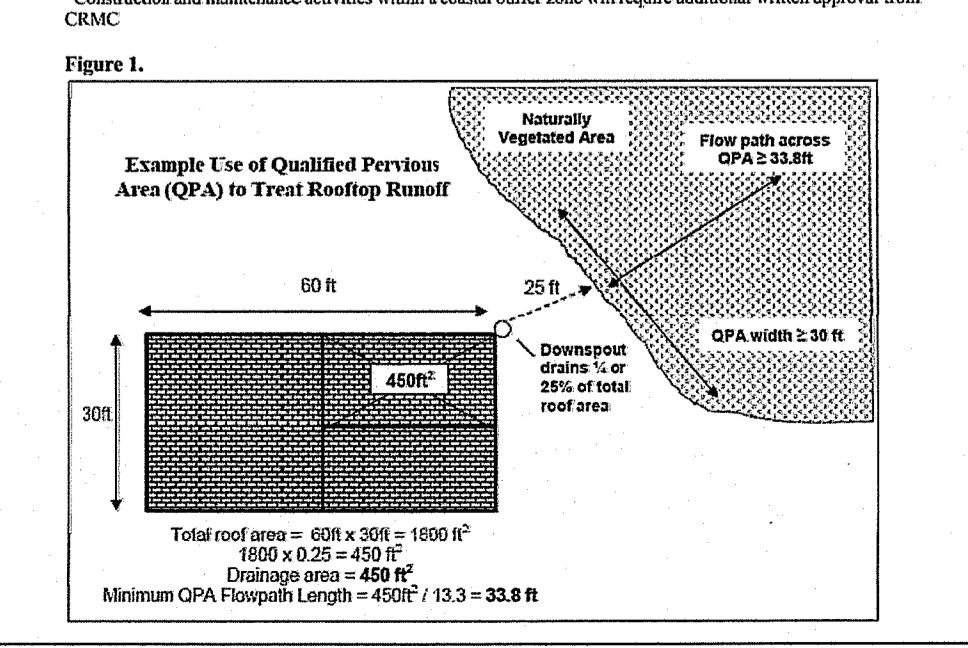


Qualifying Pervious Areas (QPAs) are natural or restored upland vegetated areas that meet specific requirements such as maximum slope and soil characteristics, which can be used to infiltrate storm water runoff. Wetland areas or coastal features may not be used as QPAs with the exception of perimeter or riverbank wetlands as defined in DEM Rules Section 4.00. For individual single-family residential lot applications, QPAs must be areas of vegetation that are not highly managed or fertilized. Lawn areas may not be used as QPAs for individual single-family residential projects. In general, QPAs are relatively flat with well-drained soils, and receive small volumes of runoff as sheet (unconcentrated) flow. To utilize this practice, simply direct storm water flow to an area that meets the criteria in Table 3 below.

Table 3. Minimum Criteria for Qualifying Pervious Areas on Single-Family Residential Lots

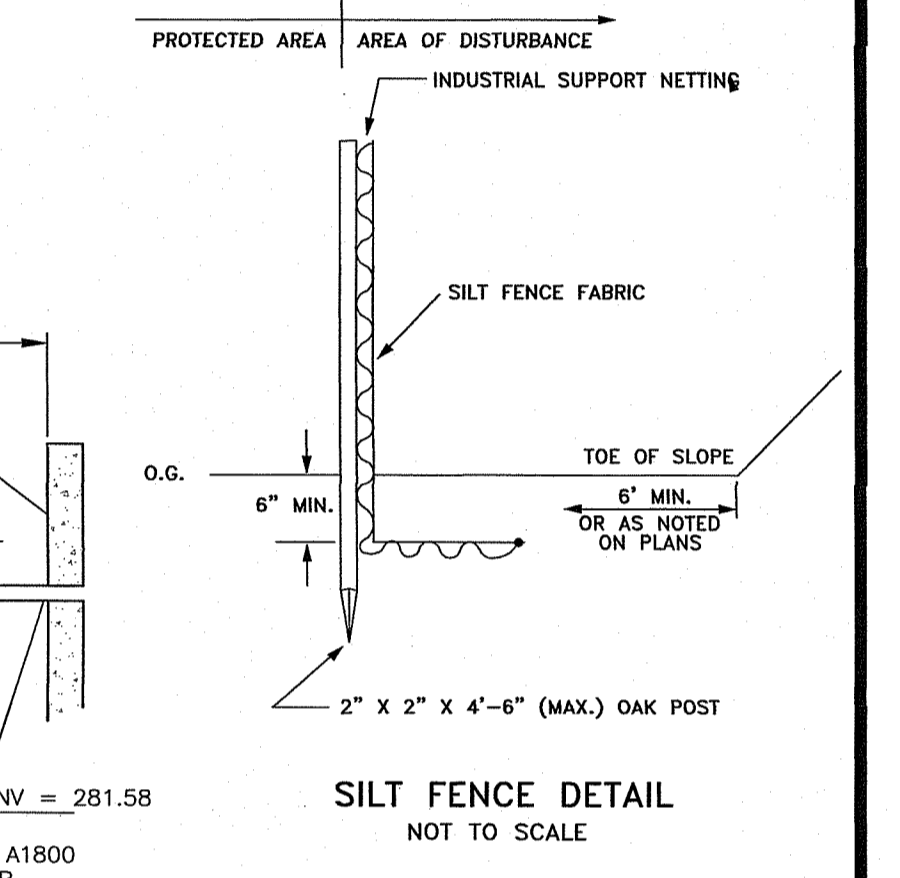
Drainage Area and Size	Location	Connectance	Construction*	Maintenance*
<ul style="list-style-type: none"> ✓ The rooftop, driveway or parking area draining to any one QPA cannot exceed 1,000 ft². ✓ For roof runoff, the length of the flow path through the QPA shall be equal to or greater than the contributing rooftop area divided by 13.3. The width of the QPA shall be equal to or greater than the length of the contributing rooftop area. ✓ For driveway runoff, the length and width of the QPA shall be no less than the length and width of the driveway. For example, if a driveway is 15 feet wide and 40 feet long, the QPA width shall be no less than 15 feet wide and 40 feet long. 	<ul style="list-style-type: none"> ✓ In locations where there is a history of groundwater seepage and/or basement flooding, QPAs should not be utilized. ✓ The flow path through the QPA must be 25 feet from any onsite wastewater treatment system (DWTS). ✓ The slope of the QPA shall be less than or equal to 5.0%. ✓ Although they may abut, there shall be no overlap between QPAs. For example, the runoff from two 1,000 ft² sections of roof must be directed to separate QPAs. They shall not be directed to the same area. 	<ul style="list-style-type: none"> ✓ Lawn areas may not be used as QPAs for individual single-family residential lots. Stormwater runoff may be conveyed across a lawn area to a QPA provided the area of lawn between the discharge point and the QPA is less than 25 feet wide. ✓ Wetlands and coastal features may not be used as QPAs, however part or all of an upland buffer zone, perimeter wetland or riverbank wetland (as defined in DEM Rules Section 4.00) may be used as a QPA. Activities such as planting or alteration of vegetation within a coastal buffer zone will require additional written approval from CRMC. ✓ To prevent basement seepage, if a minimum, runoff must be directed away from the building foundation and be infiltrated in the QPA at least 10 feet away from the foundation. ✓ Downspouts must discharge at least 10 feet away from the nearest impervious surface to prevent reconnection to any storm sewers. ✓ Downspouts must include appropriate provisions, such as a splash block or level spreader to induce non-cohesive sheet flow. ✓ Where a gutter/downspout system is not used, the rooftop runoff must be designed to sheet flow at low velocity away from the structure housing the roof, and enter the QPA as sheet flow. ✓ Runoff from driveways may be directed over soft shoulders, through curb cuts or level spreaders to QPAs. Measures must be employed at the discharge point to the QPA to prevent erosion and the runoff must enter the QPA as sheet flow. 	<ul style="list-style-type: none"> ✓ To prevent compaction of the soil in the QPA, construction vehicles must not be allowed to drive over the area. If it becomes compacted, the soil must be suitably amended, tilled, and re-vegetated once construction is complete to restore infiltration capacity. ✓ If you are restoring an area by planting to create an eligible QPA, use approved native plants from the RI Coastal Plant Guide (http://www.environmental.wednet.edu/RI_Coastal_Plant_Guide) or Appendix B of the RI Stormwater Design and Installation Standards Manual. Additional planting guidance can be found in the CRMC Coastal Buffer Zone Planning Guide (http://www.environmental.wednet.edu/RI_Coastal_Plant_Guide). 	<ul style="list-style-type: none"> ✓ The QPA must be inspected and maintained at least yearly to remove deposited sediment and address any ponding or erosion, and replant vegetation within the QPA that has died.

*Construction and maintenance activities within a coastal buffer zone will require additional written approval from CRMC.



DESIGN CALCULATION

- 4 BEDROOMS X 115 GALLONS PER BED/DAY = 460 GALLONS PER DAY
- USE LOADING RATE = 0.61 GAL/S.F./DAY
- 460 GPD / 0.61 GAL/S.F./DAY = 754 S.F. LEACHING AREA REQUIRED
- 754 USE GST 6206 / 10.3 S.F. PER LINIER FT = 73.2 LF. USE 76 LF 783 SF
- 3" STONE VOLUME = 14 CY
- C-33 SAND VOLUME = 17 CY



SITE PLAN & DETAILS

COMBINED APPLICATION

A.P. 12E LOT 511

50 HIDDEN LANE EAST GREENWICH, RI

PREPARED FOR: DAVID STRAUSS

110 WATCH HILL EAST GREENWICH, RI 02818

ADVANCED CIVIL DESIGN, INC.

CIVIL ENGINEERS

88 PEEPTOAD ROAD SCITUATE, RI 02857

P1: (401) 644-8656

P2: (401) 473-4404

NICHOLAS J. PIAMPIANO

No. 6512

REGISTERED PROFESSIONAL ENGINEER (CIVIL)

D. 3059

NO.	DATE	DESCRIPTION
1	4/25/23	PER RIDEM

DATE: DECEMBER 8, 2022

SCALE: AS NOTED

DESIGN/CHECK BY: B.C.S.R.

SHEET NO. 1

RI Environmental Management

APR 26 2023

Office of Water Resources

