

OVERALL SITE
SCALE: 1"=200'



- REFERENCES**
- REFERENCE IS MADE TO PLANS ENTITLED; LUTHER SUBDIVISION , A.P. 5 LOT 153, A.P. 8A, LOT 3, WILLIE WOODHEAD ROAD GLOCESTER RHODE ISLAND, PREPARED BY CROSSMAN ENGINEERING, INC., OCTOBER 2006.
 - REFERENCE IS MADE TO A PLAN TITLED: NRCS BOUNDARY SURVEY, PLAT OF NRCS CONSERVATION EASEMENT NRCS AGREEMENT NUMBER 5411061701M08 ON LANDS OF EDWIN P. & DIANE M. LUTHER, PREPARED FOR: USDA-NATIONAL RESOURCE CONSERVATION SERVICE, WILLIE WOODHEAD ROAD, PROVIDENCE COUNTY, GLOCESTER, RHODE ISLAND, AREA: 30.203 ACRES, PREPARED BY: DESIGN PROFESSIONALS 21 JEFFREY DRIVE, P.O. BOX 1167, SOUTH WINDSOR, CT. 06074, REVISION 3, DATED: 5/16/18.

- NOTES**
- SOIL EVALUATIONS HAVE BEEN CONDUCTED BY CROSSMAN ENGINEERING AND WITNESSED BY RIDEM ON JANUARY 26, 2005.
 - EXISTING CONDITIONS INFORMATION, PROPERTY LINE AND EXISTING TOPOGRAPHY HAS BEEN FIELD SURVEYED BY CROSSMAN ENGINEERING.
 - THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING DRAINAGE & UTILITIES, BOTH UNDERGROUND AND OVERHEAD, BEFORE EXCAVATION BEGINS IN ACCORDANCE WITH "DIG SAFE PROGRAM LAW" ENACTED BY THE R.I. LEGISLATURE AND BY CONTACTING THE INDIVIDUAL UTILITY COMPANIES. EXCAVATION SHALL BE IN ACCORDANCE WITH ALL STATUTES, ORDINANCES, RULES AND REGULATIONS OF ANY MUNICIPALITY, STATE OR FEDERAL AGENCY THAT MAY APPLY. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
 - THE CONTRACTOR MUST VERIFY PRIOR TO CONSTRUCTION THAT ALL REQUIRED AUTHORIZATION TO PERFORM WORK HAS BEEN OBTAINED. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION OPERATIONS INCLUDING ALL ACTIONS OR OMISSIONS OF ANY SUBCONTRACTORS, AGENTS OR EMPLOYEES. THE CONTRACTOR MUST ENSURE THAT THE CONDITIONS OF ALL PERMITS, SPECIFICATIONS AND FEDERAL, STATE AND LOCAL REGULATIONS ARE STRICTLY ENFORCED. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ASPECTS OF ON-SITE SAFETY INCLUDING ANY DAMAGE TO EXISTING STRUCTURES.
 - WORK SHOWN ON THE PLANS FOR WHICH THERE ARE NO PARTICULAR CALL-OUTS, DETAILS OR SPECIFICATIONS DOES NOT RELIEVE THE CONTRACTOR FROM FURNISHING AND INSTALLING THE WORK. THE CONTRACTOR SHALL THOROUGHLY EXAMINE THE CONTRACT DOCUMENTS AND PLANS AND INSPECT THE SITE, AND THE BID PRICE SHALL INCLUDE ALL SERVICES AND MATERIALS NECESSARY TO COMPLETE THE PROJECT. ANY CHANGES TO THE PROJECT OR THE INSTALLATION OF AN ITEM FOR WHICH NO PARTICULAR CALL-OUT, DETAIL OR SPECIFICATION WAS PROVIDED MUST BE REVIEWED BY AND MUST BE ACCEPTABLE TO THE ENGINEER.
 - CONTRACTOR IS RESPONSIBLE TO VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ANY WORK.
 - THE CONTRACTOR SHALL NOT COMMENCE WORK UNTIL AN INSTALLATION INSPECTION SCHEDULE IS COORDINATED, IN WRITING, WITH THE SYSTEM DESIGNER.
 - PROVIDE A 8" CRUSHED STONE BASE LAYER BENEATH THE SEPTIC TANK, PUMP CHAMBER AND DISTRIBUTION BOX.
 - THE INLET AND OUTLET OPENING ON THE SEPTIC TANK SHALL HAVE A WATERTIGHT CAST-IN-PLACE RUBBER BOOT WITH A STAINLESS STEEL CLAMP.
 - THE SEPTIC TANK, AND DISTRIBUTION BOX SHALL HAVE MANHOLE COVERS AND RISERS TO GRADE DESIGNED FOR AN H20 LOADING (HEAVY DUTY USE).
 - THERE ARE NO FOUNDATION DRAINS OR UNDERDRAINS PROPOSED FOR THIS SITE.
 - THE OWNER SHALL RECEIVE PERMISSION FROM THE TOWN OF GLOCESTER TO CONSTRUCT THE HOUSE AND GARAGE AS SHOWN ON THIS PLAN.
 - THIS SITE IS WITHIN THE QUINEBAUG RIVER WATERSHED SUBBASIN.
 - THE SITE IS WITHIN FLOOD ZONE X, AREA OF MINIMAL HAZARD AS REFERENCED ON THE FEMA FLOOD HAZARD MAP NUMBER 44007C0120G, EFFECTIVE DATE: 3/2/2009.
 - THERE ARE NO EXISTING OWTS, WATER SUPPLIES, OR STRUCTURES WITHIN 100' OF PROPERTY LINES.

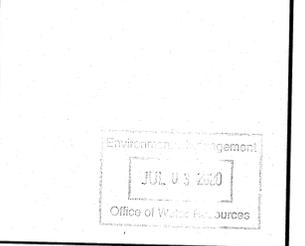
LEACHFIELD TRENCH TABLE

TRENCH No.	EXISTING GRADE	DESIGN LEDGE DEPTHS	DESIGN LEDGE ELEVATIONS	DESIGN ESHWT	BOTTOM OF GRAVEL BASE	BOTTOM OF STONE	TRENCH PIPE INVERT ELEV.	TOP OF GROUND (MIN.-MAX.)
TRENCH 1	721.50	LEDGE @ 10" (8.6 FT)	713.92	717.50	720.0	720.50	721.00	722.50-723.50
TRENCH 2	720.50	LEDGE @ 100" (8.3 FT)	712.92	716.50	719.0	719.50	720.00	721.50-722.50
TRENCH 3	718.25	LEDGE @ 100" (8.3 FT)	710.67	714.25	716.75	717.25	717.75	719.25-720.25



CROSSMAN ENGINEERING
Rhode Island: 151 Centerville Road, Warwick, RI 02886, Phone: (401) 738-5660
Massachusetts: 103 Commonwealth Avenue, North Attleboro, MA 02763, Phone: (508) 695-1700
Email: cel@crossmaneng.com

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STEVEN M. CABRAL
No. 4847
REGISTERED PROFESSIONAL ENGINEER

PROJECT TITLE:
ONSITE WASTEWATER TREATMENT SYSTEM
PLAT MAP 8A, LOT 3
WILLIE WOODHEAD ROAD
GLOCESTER, RHODE ISLAND

PREPARED FOR:
EDWIN P. and DIANE M. LUTHER
WILLIE WOODHEAD ROAD
GLOCESTER, RHODE ISLAND

DRAWING TITLE:
ONSITE WASTEWATER TREATMENT SYSTEM PLAN
DATE: MARCH 2020
SCALE: AS SHOWN
DWG. NAME: 2375-01-SITE-2.dwg

REVISIONS

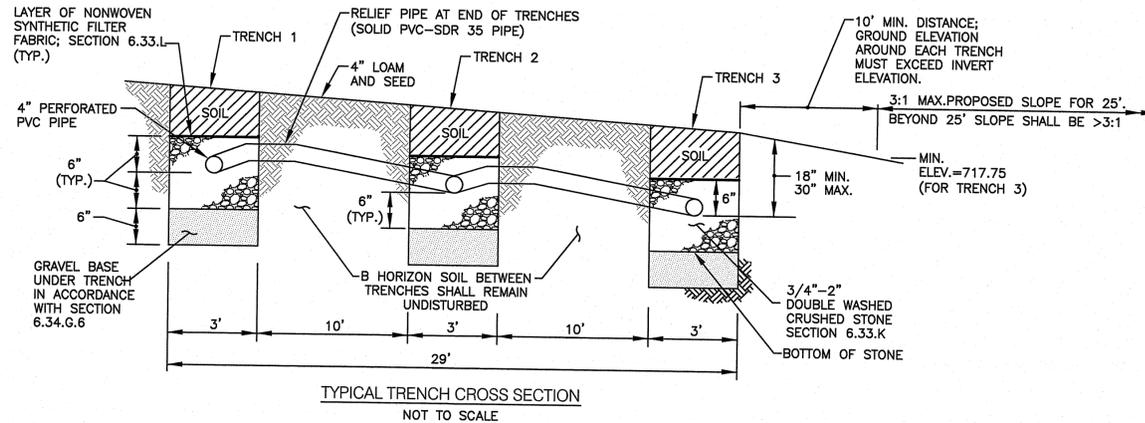
NUMBER	REMARKS	DATE
1	SWALE	06/11/20

DRAWING NUMBER:
C1
SHEET: 1 OF 3

SEPTIC TANK SIZING
 TOTAL FLOW 3 BEDROOMS X 115 GPD/BEDROOM = 345 GAL.
 REQUIRED TANK SIZE = 1,000 GALLON TANK (3 BEDROOM)
 PROVIDED TANK SIZE = 1,500 GALLON TANK

NOTE:
 AN EFFLUENT SCREEN SHALL BE INSTALLED IN THE SEPTIC TANK IN ACCORDANCE WITH RULE 6.27.G.2.

LEACHING SYSTEM SIZING:
 TYPE OF SYSTEM: TRENCH (6" STONE BELOW PIPE)
 DESIGN PERCOLATION RATE = MIN. 10 MPI (PER SUBDIVISION SUITABILITY S13-56)
 LOADING RATE = 0.70 GALS./S.F./DAY (USE 0.61 GAL/S.F./DAY BECAUSE OF COARSE FRAGMENTS IDENTIFIED IN C1 AND C2 HORIZONS)
 MIN. LEACHING AREA REQUIRED = 345 GPD/0.61 GAL/S.F./DAY = 566 S.F.
 TOTAL TRENCH LENGTH REQUIRED = (566 S.F.) / (3 S.F./L.F.) = 189 L.F.
 TOTAL TRENCH LENGTH PROVIDED = 3 x 65' = 195 L.F.

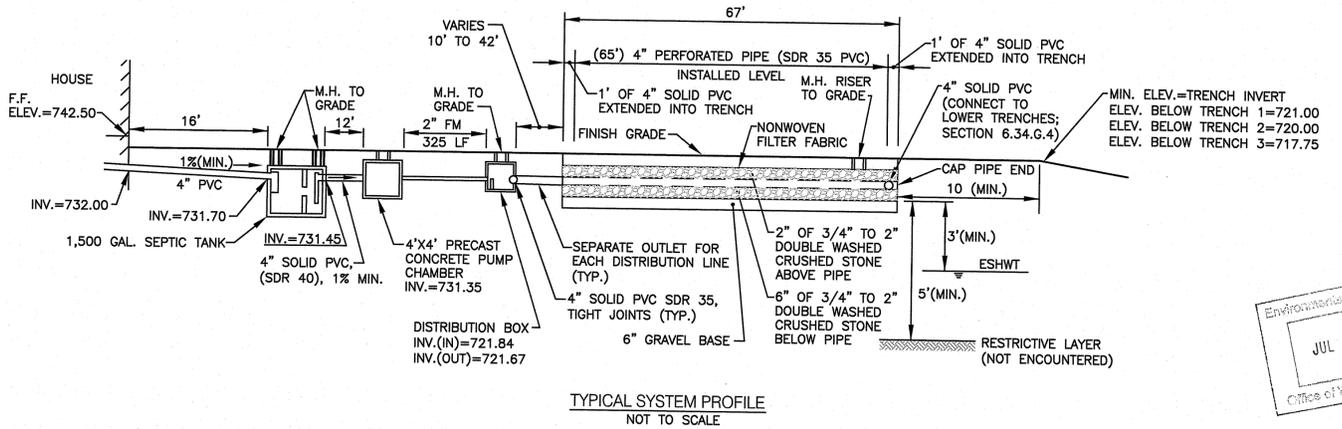


SOIL EVALUATION DATA
 SOIL EVALUATIONS WERE CONDUCTED ON JANUARY 26, 2005 AND WITNESSED BY RIDEM.

LEDGE TEST	
LOCATION	DEPTH (IN.)
3A (BA/3)	84
3B (BA/3)	70
3D (BA/3)	100
3F (BA/3)	91

TEST PIT 3C		TEST PIT 3E	
4" ORGANIC HORIZON (FIBRIC)	Oe	3" ORGANIC HORIZON (FIBRIC)	Oe
6" VERY DARK GRAY FINE SANDY LOAM	A	3" VERY DARK GRAY FINE SANDY LOAM	A
20" DARK YELLOWISH BROWN FINE SANDY LOAM	Bw1	25" DARK YELLOWISH BROWN FINE SANDY LOAM	Bw1
28" YELLOWISH BROWN FINE SANDY LOAM	Bw2	29" YELLOWISH BROWN FINE SANDY LOAM	Bw2
56" LIGHT BROWNISH GRAY GRAVELLY FINE SANDY LOAM	C1	56" LIGHT OLIVE GRAY GRAVELLY SANDY LOAM	C1
100" GRAY STONY FINE SANDY LOAM	C2	104" GRAY STONY SANDY LOAM	C2

NOTE: A SOIL EVALUATION VALIDITY STATEMENT IS PROVIDED WITH THIS APPLICATION STATING THAT FIELD CONDITIONS IN THE TEST PIT AREA HAVE REMAINED ESSENTIALLY UNCHANGED SINCE THE ORIGINAL SOIL EVALUATION TEST DATE.



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 ONSITE WASTEWATER TREATMENT SYSTEM

PLAT MAP 8A, LOT 3
 WILLIE WOODHEAD ROAD
 GLOCESTER, RHODE ISLAND

EDWIN P. and
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 WILLIE WOODHEAD ROAD
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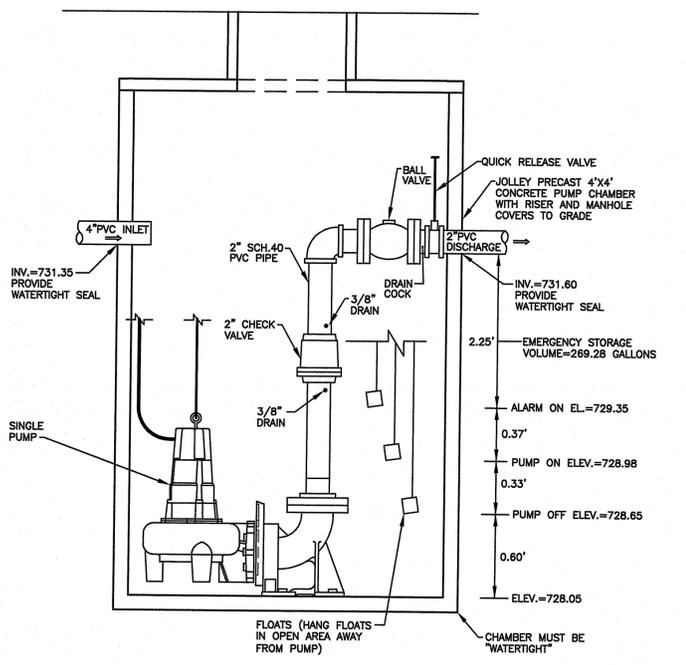
DRAWING TITLE:
 MISCELLANEOUS DETAILS PLAN No. 1

DATE: MARCH 2020
 SCALE: AS SHOWN

DWG. NAME: 2375-02-DET01.dwg

REVISIONS	NUMBER	REMARKS	DATE
△	1	SWALE	06/11/20

DRAWING NUMBER
C2
 SHEET: 2 OF 3



SCHEMATIC PUMP CHAMBER LAYOUT (4' x 4')
 NOT TO SCALE

PUMP SYSTEM NOTES:

- "PUMP STATION" PUMP SHALL BE A "GOLDS PUMP SERIES WS05B, 2" DISCHARGE, OR EQUAL.
- ALL PLUMBING AND ELECTRICAL WORK AND MATERIALS SHALL CONFORM TO ALL STATE, FEDERAL AND LOCAL CODES.
- FORCE MAIN SHALL BE 2" CL 200 PVC (MIN.) OR EQUAL.
- INSTALLATION MUST MEET MANUFACTURER'S RECOMMENDATIONS.
- A HIGH WATER LEVEL ALARM (VISIBLE AND AUDIBLE) POWERED BY CIRCUIT SEPARATE FROM THE PUMP POWER SHALL BE LOCATED IN A NORMALLY OCCUPIED AREA OF THE BUILDING.
- THE PUMP CHAMBER SHALL BE WATERTIGHT, AND ALL UNSUITABLE MATERIAL BELOW THE PUMP CHAMBER SHALL BE REMOVED AND REPLACED WITH GRAVEL BEDDING. A MINIMUM 6" LAYER OF GRAVEL SHALL BE SET LEVEL TO FORM A STABLE BASE.
- STANDBY POWER SUPPLY IS RECOMMENDED.
- DOSING VOLUME AT 8 DOSES/DAY = 43.13 GALLONS. ACTUAL DOSING VOLUME = 39.5 GALLONS OR 8.7 DOSES PER DAY. 39.5 GALLONS IS 30.8% OF DISTRIBUTION PIPE VOLUME.
- PUMP OPERATION DATA:
 PUMP RATE = 43 GPM
 DOSE VOLUME = 39.5 GALLONS
 CYCLES = 8.7 PER DAY
 CYCLE TIME = 1.09 MINUTES
- THE PUMP CHAMBER MANUFACTURER SHALL CERTIFY THAT THE PUMP CHAMBER IS WATER TIGHT OR THE CONTRACTOR SHALL COORDINATE WATER TIGHT TESTING WITH THE ENGINEER PRIOR TO PUMP USE.
- PUMP SHALL RUN TEST CYCLES WITNESSED BY THE ENGINEER PRIOR TO USE.

DOSING VOLUME (8.7 CYCLES/DAY):
 VOLUME OF 4" DISTRIBUTION LINE (LEACH FIELD)
 LENGTH = 195'
 VOLUME = (PIPE AREA x L) = 0.088 x 195 = 17.16 CF
 VOLUME = 17.16 CF = 128.35 GALLONS
 DOSING VOLUME = 39.5 GAL/CYCLE = 30.8% OF DISTRIBUTION VOLUME

ONSITE WASTEWATER TREATMENT SYSTEM NOTES:

- REMOVE TOPSOIL (A HORIZON) AND SUBSOIL (B HORIZON) AND ANY UNDESIRABLES FROM THE TRENCH AND ALL TOPSOIL WITHIN 10' OF THE TRENCH SHALL BE REMOVED. THE SUBSOIL (B HORIZON) BETWEEN TRENCHES SHALL REMAIN UNDISTURBED. REMOVE ALL TREES AND BRUSH AROUND SYSTEM PLUS (10) FEET.
- STRIPPING SHALL NOT BE DONE INTO THE WATER TABLE.
- NO VEHICULAR TRAFFIC IS ALLOWED ON LEACH FIELD.
- THERE ARE NO KNOWN EXISTING OR PROPOSED PRIVATE WELLS WITHIN 200' OF THE SYSTEM, AND THERE ARE NO KNOWN EXISTING OR PROPOSED PUBLIC WELLS WITHIN 500'.
- THE PVC PIPING FOR THE SEPTIC TANK EFFLUENT PIPE SHALL BE SCHEDULE 40 PVC PIPE.
- MINIMUM ELEVATION OF TRENCH INVERT TO BE MAINTAINED WITHIN 10 FEET OF TRENCHES. INSTALL GRAVEL BASE IN TRENCH AND ADJACENT TO TRENCHES TO ESTABLISH PROPOSED GRADES.
- SURFACE RUNOFF TO BE DIVERTED FROM SYSTEM.
- THE PIPING FOR BUILDING SEWER TO BE SOLID SDR 35 PVC PIPE OR SCHEDULE 40 PVC PIPE.
- THE LICENSED INSTALLER MUST FOLLOW THE R.I.D.E.M. "OWTS RULES AND REGULATIONS OUTLINED IN TITLE 250 - DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, CHAPTER 150 - WATER RESOURCES, SUBCHAPTER 10 - WASTEWATER & STORMWATER, PART 6 - RULES ESTABLISHING MINIMUM STANDARDS RELATING TO LOCATION, DESIGN, CONSTRUCTION AND MAINTENANCE OF ONSITE WASTEWATER TREATMENT SYSTEMS, 11/25/18."
- NO KNOWN DRAINS, PROPOSED DRAINS OR UNDERDRAINS DISCHARGING INTO A SURFACE WATER SUPPLY ARE WITHIN 200' OF LEACH FIELD. THERE ARE NO EXISTING OWTS WITHIN 400' OF PROPOSED WELL.
- PROVIDE TEE AND EFFLUENT SCREEN (SECTION 6.27.G.2) FOR SEPTIC TANK OUTLET PIPE.
- ALL DISTURBED AREAS ARE TO RECEIVE 4" OF LOAM & SEED, UNLESS OTHERWISE NOTED.
- THERE ARE NO WETLANDS WITHIN 50' OF THE PROPOSED OWTS. ALL KNOWN WATERCOURSES, WETLANDS, DRAINS AND STORMWATER MANAGEMENT SYSTEMS WITHIN 200' OF THE PROPOSED OWTS IS SHOWN.
- THE CONTRACTOR MUST ADHERE TO ALL CONSTRUCTION INSPECTION PROCEDURES AND REQUIREMENTS OF R.I.D.E.M. AND CROSSMAN ENGINEERING, INC.
- NO GARBAGE DISPOSAL GRINDER IS ALLOWED TO BE USED.
- DISTRIBUTION BOX SHALL BE A JOLLEY CONCRETE D-BOX (11 HOLE D-BOX), OR APPROVED EQUAL.
- THERE ARE NO PUBLIC SEWERS WITHIN 200' OF THE PARCEL.
- THE SITE IS NOT WITHIN THE CRITICAL RESOURCE AREA AS DEFINED BY SECTION 6.42-6.45 OF THE OWTS RULES AND REGULATIONS. THE NEAREST CRITICAL RESOURCE AREA IS THE PROVIDENCE WATER SUPPLY BOARD DRINKING WATER SUPPLY WATERSHED (SCITUATE RESERVOIR WATERSHED), LOCATED 200± SOUTHERLY TO THIS SITE.
- PIPE BENDS FOR THE TRENCH DISTRIBUTION LINE SHALL BE 45° OR LESS.
- THE OWTS INSTALLER SHALL NOTIFY THE OWTS DESIGNER OF THE CONSTRUCTION START DATE AT LEAST THREE (3) WORKING DAYS IN ADVANCE.
- NO OWTS CONSTRUCTION SHALL BEGIN UNTIL AUTHORIZED BY R.I.D.E.M. AND THE OWTS DESIGNER.
- PRIOR TO PURCHASE/ORDER OF PRODUCTS, THE INSTALLER MUST PROVIDE "SHOP DRAWINGS" FOR ALL MATERIALS (PIPE, GRAVEL, STONE, TANKS, D-BOX, FILTER FABRIC ETC.) APPROVAL MUST BE GRANTED BY THE DESIGNER PRIOR TO CONSTRUCTION.

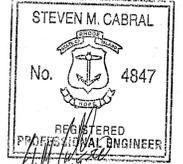
SHOP DRAWINGS FOR ALL MATERIALS (PIPE, GRAVEL, STONE, TANKS, D-BOX, FILTER FABRIC ETC.) APPROVAL MUST BE GRANTED BY THE DESIGNER PRIOR TO CONSTRUCTION.
 OFFICE OF WATER RESOURCES
 FRESHWATER WETLANDS PROGRAM
 REVIEWED SITE PLAN APPLICATION NO.: 20-0145
 DATED AUG 5 2020
 SEE LETTER OF SAME DATE.

CROSSMAN ENGINEERING

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PROJECT TITLE:
ONSITE WASTEWATER TREATMENT SYSTEM

PLAT MAP 8A, LOT 3
WILLIE WOODHEAD ROAD
GLOCESTER, RHODE ISLAND

PREPARED FOR:
EDWIN P. and DIANE M. LUTHER
WILLIE WOODHEAD ROAD
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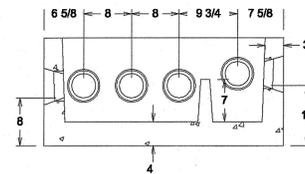
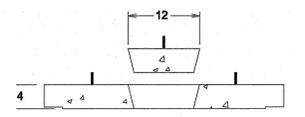
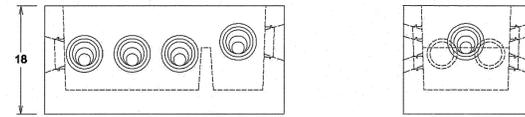
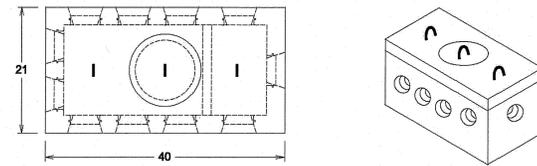
DRAWING TITLE:
MISCELLANEOUS DETAILS PLAN No. 2

DATE: MARCH 2020 SCALE: AS SHOWN
DWG. NAME: 2375-03-DET02.dwg

REVISIONS	NUMBER	REMARKS	DATE
1		SWALE	06/11/20

DRAWING NUMBER:
C3
SHEET: 3 OF 3

11 HOLE "D" BOX

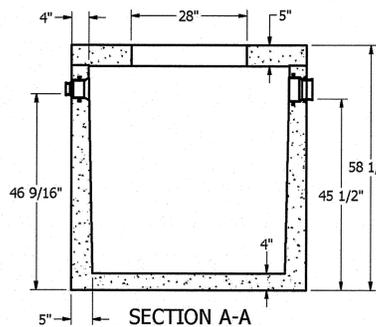
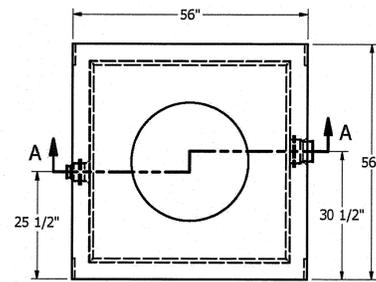


DESIGN NOTES

- 1) THREE INLETS EIGHT OUTLETS
- 2) INLETS AND OUTLETS HAVE STATE APPROVED SEALS THAT ACCEPT 4" S-40, 4" SDR-35, 3" AND 2" PIPE
- 3) TYPE II CEMENT ASTM C150-81
- 4) CONCRETE STRENGTH 5000 PSI MIN. 28 DAYS
- 5) MEETS H-20 WHEEL LOAD

JOLLEY PRECAST, INC.
860-774-9066

FILE: Db11

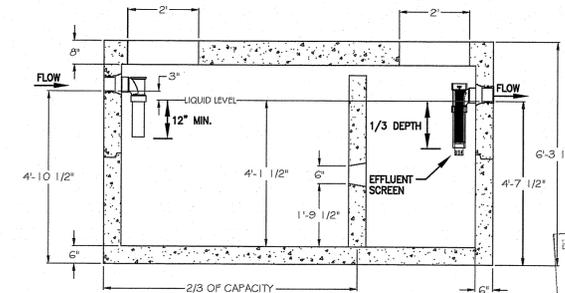
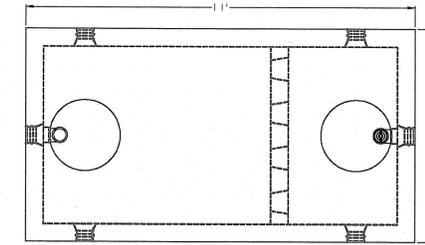


- 1) JOINT IS SEALED WITH BUTYL RUBBER SEALANT.
- 2) 4" INLET AND 2" OUTLET SEALS ARE RUBBER WITH STAINLESS STEEL CLAMPS.
- 3) MEETS CURRENT ASTM C 1227
- 4) CONCRETE STRENGTH 5,000 PSI MIN. AT 28 DAYS
- 5) TOTAL APPROX WEIGHT 6,100 LBS (TOP SECTION: 1,050 LBS) (BOTTOM SECTION: 5,050 LBS)
- 6) TOTAL CAPACITY 486 GALLONS

1-800-582-4638 www.jolleyprecast.com
JOLLEY PRECAST INC.

4 x 4 PUMP CHAMBER

1 500 GALLON TWO COMPARTMENT H2O SEPTIC TANK



NOTE: THE SEPTIC TANK IS DESIGNED TO WITHSTAND H-20 LOADING. THE SOIL WEIGHT OVER THE SEPTIC TANK FOR THIS DESIGN IS LESS THAN H-20 LOADING. THEREFORE, THIS 1500 GALLON TWO-COMPARTMENT H-20 SEPTIC TANK IS ACCEPTABLE FOR THIS SITE.

DESIGN NOTES:

- 1) ALL JOINTS ARE SEALED WITH BUTYL RUBBER SEALANT.
- 2) ALL INLETS AND OUTLETS HAVE WATER TIGHT STATE APPROVED SEALS
- 3) AVAILABLE OUTLET FILTER SHOWN
- 4) MEETS CURRENT ASTM C 1227
- 5) CONCRETE STRENGTH 5000 PSI MIN. AT 28 DAYS
- 6) MEETS H-20 WHEEL LOAD REQUIREMENTS.
- 7) REBAR: ASTM A-615 GRADE 60

463 PUTNAM RD DANIELSON CT 06239
www.jolleyprecast.com

JOLLEY PRECAST INC.
1-800-582-4638

VEGETATED SWALE NOTES:

PAGES FROM STATE OF RHODE ISLAND STORMWATER MANAGEMENT GUIDANCE FOR SINGLE-FAMILY RESIDENTIAL LOT DEVELOPMENT

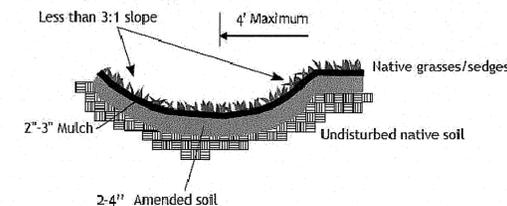
B. Vegetated Swales

Vegetated swales are open vegetated channels that are designed to capture and treat stormwater runoff. They are similar in concept and construction to a rain garden, except for their long, narrow shape and longitudinal slope. They are typically vegetated with grasses (see Appendix B, Section B.6 of the RI Stormwater Design and Installation Standards Manual for planting guidance). They may be used as a stand-alone stormwater management practice or as a conveyance to other practices.

Table 4. Required Elements for Vegetated Swales on Single-Family Residential Lots

Conveyance	Treatment	Vegetation	Maintenance
<ul style="list-style-type: none"> Vegetated swales shall be designed with moderate side slopes flatter than 3:1 for most conditions. Vegetated swales shall have a maximum longitudinal slope of 4% (e.g. 4 foot drop over a horizontal distance of 100 feet). 	<ul style="list-style-type: none"> The average surface ponding depth shall be no more than 8 inches deep. The bottom width shall be no less than 2 feet and no greater than 8 feet wide A maximum ponding depth of 1 ft should be maintained at the longitudinal midpoint of the vegetated swale and a maximum depth of 18 inches at the end point. Swales should contain a 2 - 4 inch amended soil layer and a 2 - 3 inch mulch layer. The amended soil layer of a vegetated swale should be a 50/50 mixture of the excavated native soils and mature organic compost. 	<ul style="list-style-type: none"> Grasses or sedges are typically used in vegetated swales, but other native plants can be used as well. Please refer to the RI Coastal Plant Guide (www.uri.edu/cels/ccoc/coastalPlants/CoastalPlantGuide.htm) and modify the selection for native plants suited to rain gardens. 	<ul style="list-style-type: none"> Vegetated swales shall be inspected annually and should be inspected after large storm events. Eroded side slopes and channel bottoms shall be stabilized as necessary. If the surface of the dry swale becomes clogged to the point that standing water is observed on the surface 48 hours after precipitation events, the bottom shall be re-to-filled or cultivated to break up any hard-packed sediment, and then reseeded. Vegetation in dry swales shall be mowed as required to maintain minimum grass heights in the 4-6 inch range. Every five years, the channel bottom of dry swales should be scraped to remove sediment and to restore original cross section and infiltration rate, and should be seeded to restore ground cover, where necessary.

Figure 2. Vegetated Swale, Typical Cross-Section



(Figure adapted from Vermont Department of Environmental Conservation's Vermont LID Guide for Residential and Small Sites www.vermontquality.com/2011/01/01/2011-01-01/vermont-lid-guide-for-residential-and-small-sites/)

Sizing a Vegetated Swale:

Determine the area (in square feet) of impervious surface that will drain to the swale. This is the drainage area. Use Table 5 below to choose a pre-calculated size for an 8 inch deep swale based on the drainage area and soil texture. To do this, you may need to round up your drainage area size (don't round down to avoid under-sizing your swale). Remember that your swale should be at least 2 but less than 8 feet wide at the bottom, and the sides should have a slope no steeper than 3:1. The sizing recommendations below are based on sizing guidance in the University of Wisconsin Extension publication, "Rain Gardens: a how-to manual for homeowners," which can be accessed at www.dnr.state.wi.us/nr/0002/0219/021901.pdf. Alternatively, use a sizing information and equations in Chapter 5 of the RI Stormwater Design and Installation Standards Manual at www.dem.ri.gov/publications/crosswaterswmanual.pdf. Be sure to demonstrate which sizing method was used on your submitted application.

Table 5. Vegetated Swale Sizing Guidance

Drainage Area (in square feet)	Bottom surface Area (in square feet) for an 8 in. deep swale:	
	Sandy Soils*	Silty Soils*
200	16	32
400	32	64
600	48	96
800	64	128
1000	80	160

*In lieu of a soil texture determination, use the calculated surface areas for silty soils

VEGETATED SWALE SEED MIX

APPLICATION RATE = 15-25 LBS. / ACRE (SEASONALLY FLOODED MIX) (BASIN BOTTOM AREA)

- 20% FOX SEDGE, PA ECOTYPE (CAREX VULPINOIDEA, PA ECOTYPE)
- 16% VIRGINIA WILD RYE, PA ECOTYPE (ELYMUS VIRGINICUS, PA ECOTYPE)
- 15% RIVERBANK WILD RYE, PA ECOTYPE (ELYMUS RIPARIUS, PA ECOTYPE)
- 15% JAPANESE MILLET (ECHINOCHLOA CRUSGALLI VAR. FRUMENTACEA)
- 15% DEER TONGUE, "TIOGA" (PANICUM CLANDESTINUM (DICANTHELIUM C.), "TIOGA")
- 9% BLUNT BROOM SEDGE, PA ECOTYPE (CAREX SCOPARIA, PA ECOTYPE)
- 5% SWITCHGRASS, "CAVE-IN-ROCK" (PANICUM VIRGATUM, "CAVE-IN-ROCK")
- 2% GREEN BULRUSH, PA ECOTYPE (SCIRPUS ATROVIRENS, PA ECOTYPE)
- 2% ARL SEDGE, PA ECOTYPE (CAREX STIPATA, PA ECOTYPE)
- 1% AUTUMN BENTGRASS, APB (AGROSTIS PERENNANS, APB)

TOPSOIL MIX FOR BASINS

PLANTING SOIL SHALL MEET THE BELOW COMPOSITION;

SAND: 85-88%
SOIL FINES: 8-12% (NO MORE THAN 2% CLAY)
ORGANIC MATTER: 3-5%

NOTES

1. THE VEGETATED SWALE HAS BEEN DESIGNED IN ACCORDANCE WITH THE STATE OF RHODE ISLAND STORMWATER MANAGEMENT GUIDANCE FOR SINGLE-FAMILY RESIDENTIAL LOT DEVELOPMENT DOCUMENT. THE CONTRACTOR SHALL FOLLOW THE ABOVE REFERENCED INFORMATION FOR CONSTRUCTION. COORDINATE WITH ENGINEER.
2. ROOFTOP RUNOFF WILL BE TREATED BY A VEGETATED SWALE AND DRIVEWAY AREAS ARE PROPOSED TO BE GRAVEL TO PROVIDE A LOW IMPACT DESIGN TO PROMOTE RECHARGE AND INFILTRATION.

VEGETATED SWALE SIZING CALCULATIONS:

CALCULATIONS FOR 8" DEEP SWALE PER TABLE 5

SWALE #1
PROPOSED ROOF AREA (1/2 HOUSE & 1/2 GARAGE) = 1,488 SF
EXISTING SANDY SOILS ONSITE: REQUIRE BOTTOM SWALE AREA = 80 SF / 1,000 SF OF DRAINAGE AREA

REQUIRED BOTTOM SURFACE AREA = 1,488 SF X 80 SF / 1,000 SF = 119 SF

PROVIDED VEGETATED SWALE WITH BOTTOM DIMENSIONS = 32' L X 5' W
PROVIDED BOTTOM SURFACE AREA = 160 SF

SWALE #2
PROPOSED ROOF AREA (1/2 HOUSE) = 1,200 SF
EXISTING SANDY SOILS ONSITE: REQUIRE BOTTOM SWALE AREA = 80 SF / 1,000 SF OF DRAINAGE AREA

REQUIRED BOTTOM SURFACE AREA = 1,200 SF X 80 SF / 1,000 SF = 96 SF

PROVIDED VEGETATED SWALE WITH BOTTOM DIMENSIONS = 32' L X 3' W
PROVIDED BOTTOM SURFACE AREA = 96 SF

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
REVIEWED SITE PLAN APPLICATION NO. 20-014
DATED AUG 5 2020
SEE LETTER OF SAME DATE.
Stacy L. Freeman