

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 OFFICE OF WATER RESOURCES  
 OWTS & FRESHWATER WETLANDS  
 JOINT PERMIT APPROVAL

OWTS# 1811-0921 FWW# 18-0249  
 APPROVED: [Signature] DATE: 11/7/18  
 No Changes Allowed Without RIDEM Approval  
 Approval: This Permit Must Be Kept at Construction Site

SEP 11 2018

OWNER/APPLICANT:  
 LISA & RYAN CRONIN  
 11 PURGATORY ROAD  
 EXETER, RI 02822

TIMOTHY J. BEHAN  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 6276  
 8/31/18

**COMMONWEALTH ENGINEERS & CONSULTANTS, INC.**  
 400 SMITH STREET  
 PROVIDENCE, RHODE ISLAND 02908  
 401-273-6600

REVISIONS			
No.	DATE	DRWN	CHKD

**OWTS & WETLANDS APPLICATION PLAN**  
 for  
**A.P. 50, BLOCK 5, LOT 8**  
**PURGATORY ROAD**  
 in  
**EXETER, RHODE ISLAND**

SCALE: AS SHOWN SHEET NO: 1 of 2  
 DRAWN BY: DKM DESIGN BY: DKM CHECKED BY: TJB  
 DATE: 09/07/18 PROJECT NO.: 18031.00

# OWTS DESIGN, DETAILS, & NOTES

**GENERAL NOTES:**  
 THIS PLAN WAS PREPARED FOR RIDEM SEPTIC SYSTEM PERMIT ONLY AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER. THIS IS NOT THE BUILDING PERMIT PLOT PLAN.  
 ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE "RULES" ESTABLISHING MINIMUM STANDARDS RELATING TO LOCATION, DESIGN, CONSTRUCTION AND MAINTENANCE OF ONSITE WASTEWATER TREATMENT SYSTEMS", LATEST REVISION, AS REGULATED THROUGH THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (THESE ARE REFERRED TO AS THE "RULES") AND THE STATE OF RHODE ISLAND ONE & TWO FAMILY DWELLING BUILDING CODE.  
 THE PROPOSED ACTIVITIES (ARE     ) OR (ARE NOT X) UNDER THE RHODE ISLAND COASTAL RESOURCE MANAGEMENT COUNCIL'S JURISDICTION.  
 PUBLIC SEWERS (ARE     ) OR (ARE NOT X) LOCATED WITHIN 200 FEET OF THE PROPERTY LINE.  
 DRINKING WATER LINES (ARE     ) OR (ARE NOT X) LOCATED WITHIN 50 FEET OF THE PROPOSED OWTS. ALL DRINKING WATER LINES WITHIN 50 FEET OF THE PROPOSED OWTS HAVE BEEN SHOWN, IF PRESENT.  
 WATER SUPPLY IS BY (PUBLIC WATER SYSTEM     ) OR (PRIVATE WELL X). THERE (ARE X) OR (ARE NOT     ) EXISTING AND PROPOSED PRIVATE DRINKING WATER WELLS LOCATED WITHIN THE SPECIFIED SETBACK DETAILED IN TABLE 22.5 OF THE "RULES" + 100 FEET. IF WELL(S) ARE PRESENT, THEY HAVE BEEN SHOWN ON THE PLAN.  
 THERE (ARE     ) OR (ARE NOT X) EXISTING AND PROPOSED WELLS SERVING NON-POTABLE USES WITHIN 100' OF THE OWTS. IF WELL(S) ARE PRESENT, THEY HAVE BEEN SHOWN ON THE PLAN.  
 THERE (ARE     ) OR (ARE NOT X) EXISTING AND PROPOSED PUBLIC DRINKING WATER SUPPLY WELLS WITHIN 500 FEET OF THE PROPOSED OWTS. IF WELL(S) ARE PRESENT, THEY HAVE BEEN SHOWN ON THE PLAN. THE TYPE OF PUBLIC WELL, IF PRESENT, IS NOTED NEXT TO THE WELL.  
 THERE (ARE X) OR (ARE NOT     ) WATERCOURSES AND WETLANDS WITHIN 200 FEET OF THE PROPOSED OWTS. IF PRESENT, THE LOCATIONS ARE SHOWN ON THE PLAN.  
 THERE (ARE     ) OR (ARE NOT X) STORM OR SUBSURFACE DRAINS WITHIN 200 FEET OF THE PROPOSED OWTS. SAID DRAINS (DO N/A) OR (DO NOT N/A) DISCHARGE DIRECTLY OR INDIRECTLY INTO A CRITICAL RESOURCE AREA AS IDENTIFIED IN RULE 38 OF THE "RULES".  
 THE PROPOSED OWTS (IS     ) OR (IS NOT X) LOCATED WITHIN THE WATERSHED OF A PUBLIC WATER SUPPLY.  
 THE PROPOSED OWTS (IS     ) OR (IS NOT X) LOCATED WITHIN A CRITICAL RESOURCE AREA AS IDENTIFIED IN RULE 38 OF THE "RULES". THE DISTANCE TO THE NEAREST CRITICAL RESOURCE OF CONCERN IS N/A FEET.  
 THERE (ARE     ) OR (ARE NOT X) EXISTING OWTS WITHIN 200 FEET OF ANY PROPOSED WELL. IF PRESENT, THE LOCATION AND SIZE HAS BEEN SHOWN ON THE PLAN.  
 EXISTING OWTS WITH A DESIGN FLOW GREATER THAN 1,000 GAL/DAY (ARE     ) OR (ARE NOT X) LOCATED WITHIN 400 FEET OF THE PROPOSED WELL. IF PRESENT, THE LOCATION AND SIZE HAS BEEN SHOWN ON THE PLAN.  
 THERE (ARE X) OR (ARE NOT     ) AREAS ON SUBJECT PROPERTY WHERE SOIL HAS BEEN EXCAVATED AND/OR WHERE STORM DEPOSITED SAND IN THE BACKYARD ENVIRONMENT OR WHERE HUMAN TRANSPORTED MATERIAL HAS BEEN DEPOSITED.  
 THE POTENTIAL FOR FLOODING WITHIN 100 FEET OF THE PROPOSED OWTS DOES NOT EXIST.  
 THE PROPOSED WELL, IF APPLICABLE, (DOES     ) OR (DOES NOT X) REQUIRE A VARIANCE FROM RIDEM'S "RULES AND REGULATIONS GOVERNING THE ENFORCEMENT OF CHAPTER 46-13.2 RELATING TO THE DRILLING OF DRINKING WATER WELLS".  
 THIS APPLICATION (IS     ) OR (IS NOT X) PART OF A SUBDIVISION OF FIVE (5) LOTS OR LESS WITH EXISTING ROAD FRONTAGE.  
 THE SUBJECT PROPERTY (IS X) OR (IS NOT     ) SERVED WITH AN OWTS & PRIVATE WELL. THE NITROGEN LOADING RATE SHALL NOT EXCEED 345 GAL/DAY PER 20,000 SQUARE FEET OF PROPERTY WHEN SERVED WITH AN OWTS & PRIVATE WELL.  
 THE CONTRACTOR SHALL STAKE AND FLAG THE LEACHFIELD AREA TO PROTECT THE LEACHFIELD FROM VEHICLE TRAFFIC AND EXCESSIVE WEIGHT LOADS BEFORE AND DURING CONSTRUCTION OF THE OWTS AND THE STRUCTURE. FLAGGING SHALL REMAIN IN PLACE UNTIL ALL CONSTRUCTION ACTIVITIES AT THE SITE ARE COMPLETE.

## LEACHFIELD CONSTRUCTION NOTES/SEQUENCE:

- CLEARING:** ALL TREES, BRUSH AND STUMPS WITHIN THE AREA OF THE LEACHFIELD & WITHIN TEN (10) FEET OF THE LEACHFIELD SHALL BE REMOVED. INSTALL SOIL EROSION CONTROLS TO PREVENT SOILS FROM ERODING FROM SITE & FROM BEING TRACKED ONTO THE STREET.
- EXCAVATION:** THE LEACHFIELD TRENCHES SHALL BE STRIPPED OF ALL TOPSOIL (A HORIZONS) AND EXCAVATED TO THE ELEVATION SHOWN ON THE DRAWINGS. BOTTOM SHALL BE LEVEL. DESIGNER TO APPROVE BOTTOM PRIOR TO CONTINUING. NATIVE SOIL BETWEEN TRENCHES SHALL REMAIN. SCARIFY BOTTOM OF EXCAVATION. DO NOT COMPACT OR SNEAR BOTTOM AND SIDE WALLS OF EXCAVATION. REMOVE ALL LARGE STONES & TREE ROOTS IN SIDE WALLS.
- BACKFILL COVER:** ALL BACKFILL SHALL BE FREE OF BOULDERS AND STONES GREATER THAN SIX (6) INCHES IN DIAMETER. FROZEN CLUMPS OF EARTH, RUBBISH, MASONRY, STUMPS OR WASTE CONSTRUCTION MATERIALS. BACKFILL SHALL BE PLACED CAREFULLY TO AVOID DISPLACEMENT AND DAMAGE TO PIPING. HEAVY MACHINERY SHALL NOT BE PERMITTED TO PASS OVER THE LEACHFIELD. FINE GRADE AREA SO RUNOFF IS DIVERTED FROM LEACHFIELD SURFACE.
- ADJACENT SIDE SLOPE:** A MINIMUM TEN (10) FOOT HORIZONTAL SEPARATION DISTANCE SHALL BE PROVIDED BETWEEN THE OUTER EDGE OF THE LEACHFIELD TRENCH AND ANY GROUND SURFACE ELEVATION LESS THAN THE ELEVATION OF THE INVERT OF THE DISTRIBUTION LINE. THE ADJACENT SIDE SLOPE SHALL NOT BE STEEPER THAN 3:1 (HORIZONTAL:VERTICAL) FOR A TWENTY-FIVE (25) FOOT MINIMUM DISTANCE FROM THE EDGE OF THE STONE OF THE LEACHFIELD TRENCH OR UNTIL THE TOE OF THE SLOPE RETURNS TO THE ELEVATION OF THE ORIGINAL GRADE. THE TOE OF THE 3:1 SLOPE SHALL BE A MINIMUM OF FIVE (5) FEET FROM ANY PROPERTY LINE.
- FINISH GRADE STABILIZATION:** IMMEDIATELY AFTER COMPLETION OF FINAL GRADING, THE AREA OF DISTURBANCE DUE TO INSTALLATION OF THE OWTS SHALL BE STABILIZED BY MULCHING AND SEEDING, OR SOODING, TO ESTABLISH A PERMANENT VEGETATIVE COVER TO PREVENT EROSION (EXCEPT DRIVEWAY AREA). THE LEACHFIELD SURFACE AREA SHALL BE FINE GRADE SO RUNOFF IS DIVERTED AWAY FROM LEACHFIELD AREA.

## CONTRACTOR'S NOTES - CONSTRUCTION:

- NOTIFY ENGINEER 5 DAYS PRIOR TO START OF CONSTRUCTION.
- PRODUCT AND MATERIAL SPECIFICATION SHEETS FOR ALL COMPONENTS SHALL BE PROVIDED TO ENGINEER PRIOR TO ENGINEER NOTIFYING RIDEM FOR START OF CONSTRUCTION. THIS INCLUDES: 1) SEPTIC TANK; 2) D-BOX; 3) FILTER FABRIC; 4) STONE; 5) SEPTIC GRAVEL SURVEYOR TO STAKE OUT LEACHFIELD CORNERS FOR REVIEW AND APPROVAL BY ENGINEER.
- ENGINEER TO APPROVE BOTTOM OF LEACHFIELD BED PRIOR TO PLACEMENT OF GRAVEL.
- SCAFFOLD LEACHFIELD BOTTOM IMMEDIATELY PRIOR TO PLACEMENT OF STONE, NOT THE DAY BEFORE.
- ENGINEER TO INSPECT SEPTIC TANK PRIOR TO BACKFILLING. CONTRACTOR SHALL PROVIDE VACUUM TEST REPORT FROM TANK MANUFACTURER.
- ENGINEER TO INSPECT COMPLETED SYSTEM PRIOR TO BACKFILLING. FINE GRADE LEACHFIELD AND SEPTIC TANK AREA SO RUNOFF DOES NOT FLOW ONTO AREA FROM UPLAND AREAS DURING & AFTER CONSTRUCTION.
- ALL CONCRETE RISER SECTIONS SHALL BE MORTARED/SEALED WATER TIGHT TO TANK. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
- DISCREPANCIES BETWEEN FIELD AND DESIGN DATA SHOWN HEREON TO BE REPORTED TO THE ENGINEER.
- ANY DAMAGE OR DISTURBANCE OF LAND DUE TO CONSTRUCTION ACTIVITIES TO ADJUTING PROPERTIES SHALL BE REPAIRED BY THE CONTRACTOR.

## TEST HOLE DATA:

TH 1	48"-0"	~C	HTM/FILL
TH 2	0"-168"	C	ST/S
SHWGT = 132"			
TH 2	0"-6"	Bw	LS
TH 2	6"-156"	C	ST/S
SHWGT = 144"			

## MINIMUM REQUIRED LEACHFIELD AREA:

DESIGN FLOW = 4 BEDROOMS  
 FOW TO LEACHFIELD = 4 BEDROOMS X 115 GAL/DAY/BEDROOM = 460 GAL/DAY  
 LOADING RATE = 0.61 GAL/SF/DAY (CATEGORY 1M SOIL IS THE MOST RESTRICTIVE SOIL LAYER WITHIN LEACHFIELD BOTTOM)  
 REQUIRED LEACHFIELD AREA = 460 / 0.61 = 755 SF

## DISPERSAL TRENCH DESIGN:

- 18" STONE BELOW INVERT & 36" WIDE TRENCH AREA: 4.2 SF/LF
- LINEAR FEET REQUIRED: 755 SF / 4.2 SF/LF = 180 LF
- TRENCH LENGTH: W/S SEPARATION & 4 TRENCHES: 180 - 15 LF = 165 LF
- 3.1. 165 LF / 4 TRENCHES = 42' PER TRENCH
- 3.2. USE 42' LONG TRENCHES
4. SYSTEM WIDTH: 4 TRENCHES X 3' WIDE + 15' = 27'
- EFFECTIVE LEACHFIELD AREA PROVIDED: 42 LF X 4.2 SF/LF X 4 = 705.6 SF
- 705.6 SF + 15 LF X 4.2 SF/LF = 788.6 SF
- PROVIDED 788 SF > 755 SF REQUIRED

## GENERAL SITE SOILS & DESIGN DATA:

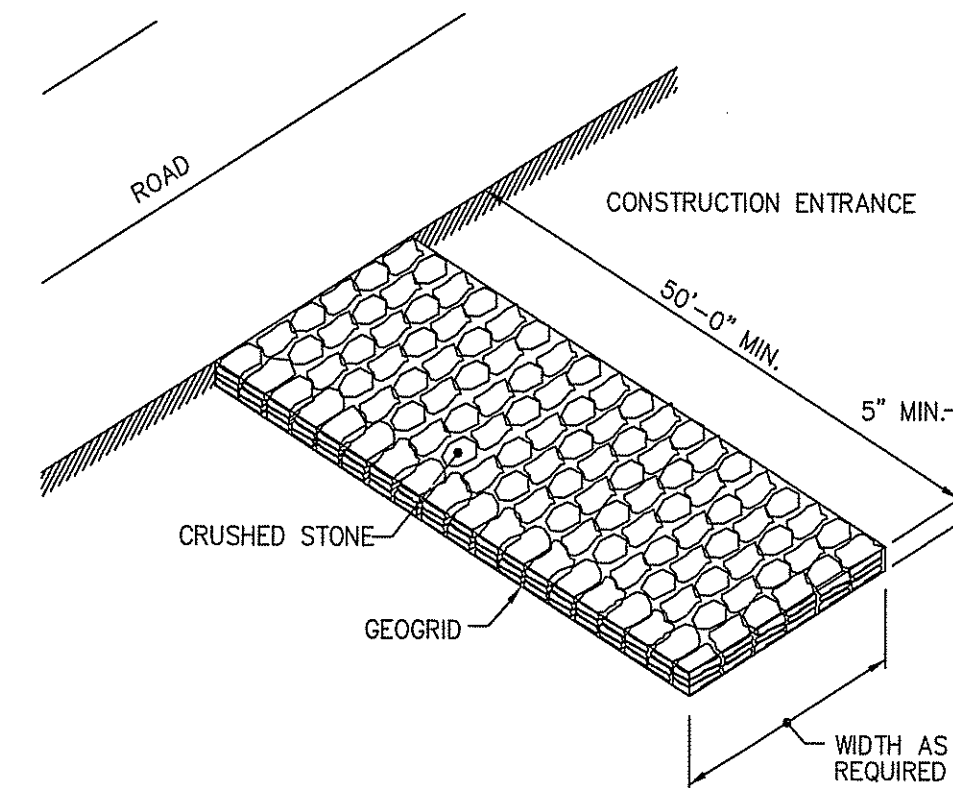
- PROPOSED LEACHFIELD IS LOCATED IN THE AREA OF TEST HOLES 1 & 2.
- EXISTING GRADE AT THE CENTER OF THE PROPOSED LEACHFIELD IS APPROXIMATELY ELEVATION 167.0'.
- E.S.H.G.W.T. FOR THIS AREA IS 132" BELOW ORIGINAL GRADE.
- LEDGE IS ASSUMED AT 156" BELOW ORIGINAL GRADE.
- USE LOADING RATE = 0.61 GAL/SF/DAY. (SOIL CAT. 1M)

## TANK SIZING CALCULATIONS:

RESIDENTIAL DWELLING = 4 BEDROOMS  
 1,250 GAL REQ'D  
 1,250 GAL PROVIDED (CODE 26.1.1)

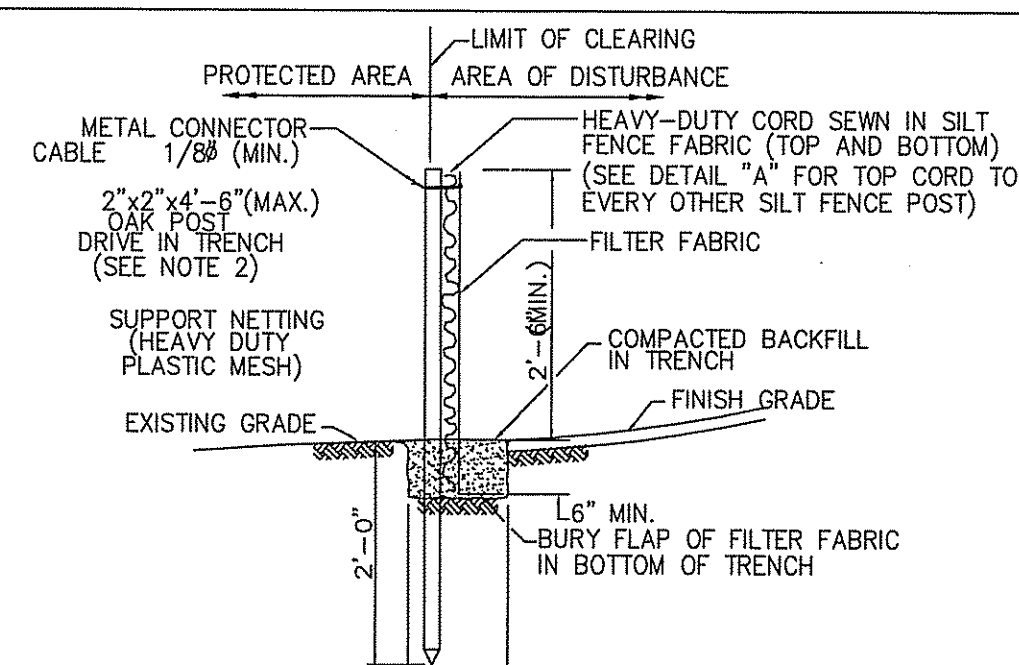
## GRADING & DRAINAGE NOTES:

- CONTRACTOR TO FINE GRADE LOT IN ACCORDANCE WITH STATE OF RHODE ISLAND ONE AND TWO FAMILY DWELLING CODE. LOT SHALL BE GRADED SO THAT ADDITIONAL ACCUMULATION OF SURFACE WATER DOES NOT OCCUR ACROSS ADJOINING PROPERTY. SURFACE DRAINAGE SHALL BE DIVERTED TO A STORM SEWER CONVEYANCE OR OTHER POINT OF COLLECTION SO AS NOT TO CREATE A HAZARD. LOTS SHALL BE GRADED SO AS TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE AWAY FROM FOUNDATION WALLS SHALL FALL A MINIMUM OF 6" WITHIN THE FIRST 10 FEET. IMPERVIOUS SURFACES (DRIVEWAY) SHALL BE SLOPED AWAY FROM HOUSE AT A SLOPE OF 2% FOR AT LEAST 10 FEET.



NOTE: SHALL BE IN ACCORDANCE WITH SECTION 211 OF THE R.I. STANDARD SPECIFICATIONS.

CONSTRUCTION ACCESS (R.I. STANDARD 9.9.0)



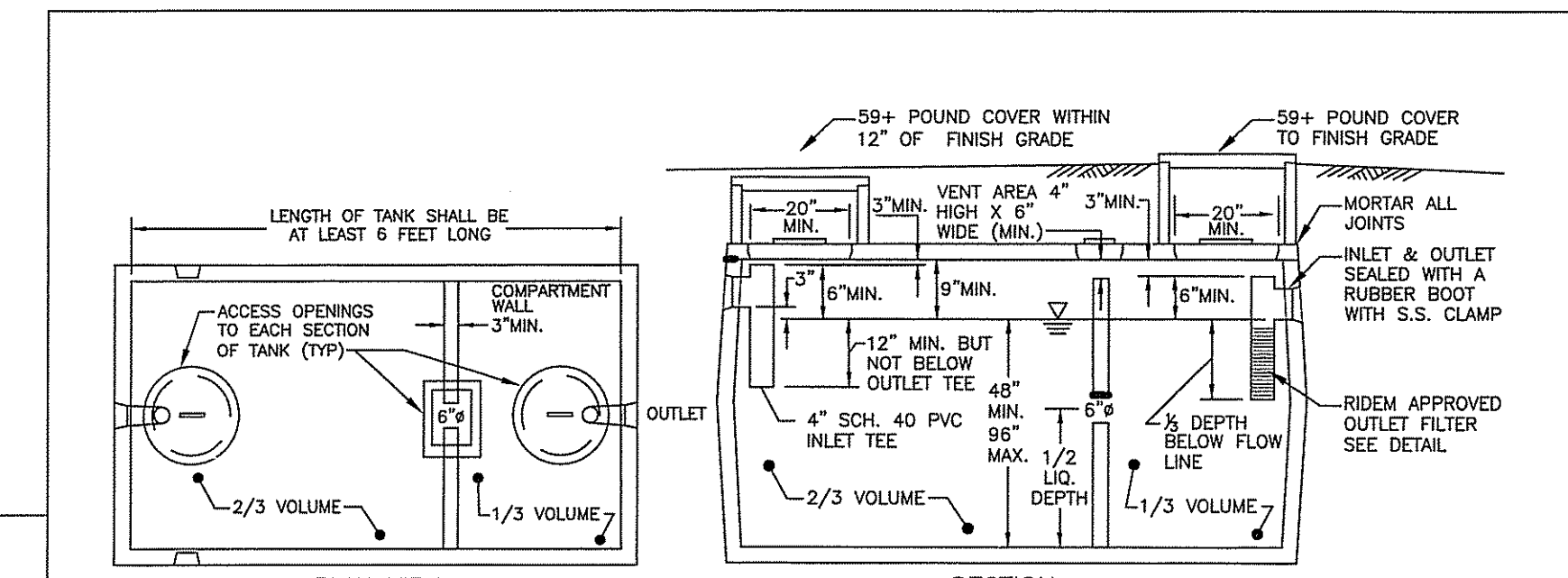
## SILT FENCE DETAIL (R.I. STANDARD 9.2.0)

- NOTES:
- SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
  - 2"x2"x4'-6" (MAX.) OAK POSTS FOR SILT FENCE SHALL BE LOCATED 8'-0" (MAX.) O.C. IN WETLAND AREAS AND (MAX.) O.C. IN WETLAND RAVINE, GULLY OR DROP-OFF AREAS AS SHOWN ON PLANS.
  - 1"x1"x4'-6" (MIN.) POSTS PERMITTED FOR PRE-FABRICATED SILT FENCE.
  - SILT FENCE SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.

## DISTRIBUTION BOX NOTES:

- D-BOX SHALL BE CONSTRUCTED OF 4,000 PSI (MIN.) CONCRETE, BE CAPABLE OF WITHSTANDING H-20 LOADINGS & A TOP LOAD CARRYING CAPACITY OF 300 LBS/ SQ. INCH.
- INLET SHALL ACCEPT 4" SCH. 40 OR SDR 35 PVC PIPE.
- OUTLETS SHALL HAVE STATE APPROVED SEALS THAT ACCEPT 4" SCH 40 OR 4" SDR 35 PVC PIPE.
- EXTEND COVER TO WITHIN 12" OF FINISHED GRADE WITH CONCRETE RISERS AND PLACE A MARKER TO FINISH GRADE OVER THE COVER.
- D-BOX SHALL BE PLACED ON A LEVEL AND COMPACTED BASE.
- D-BOX SHALL HAVE A MINIMUM AREA OF 3 SQUARE FEET.
- PROVIDE AN INLET TEE IF A CONCRETE BAFFLE IS NOT PROVIDED.
- PIPES SHALL EXTEND INTO THE DISTRIBUTION BOX ONE (1) INCH.
- D-BOX AND ALL PIPE PENETRATIONS SHALL BE MADE WATER TIGHT.

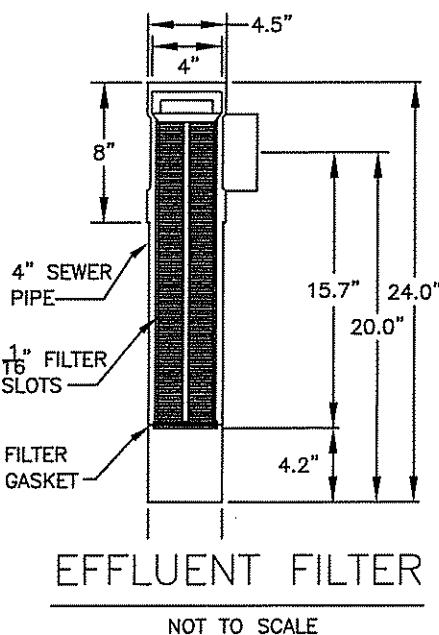
## DISTRIBUTION BOX DETAIL (NOT TO SCALE)



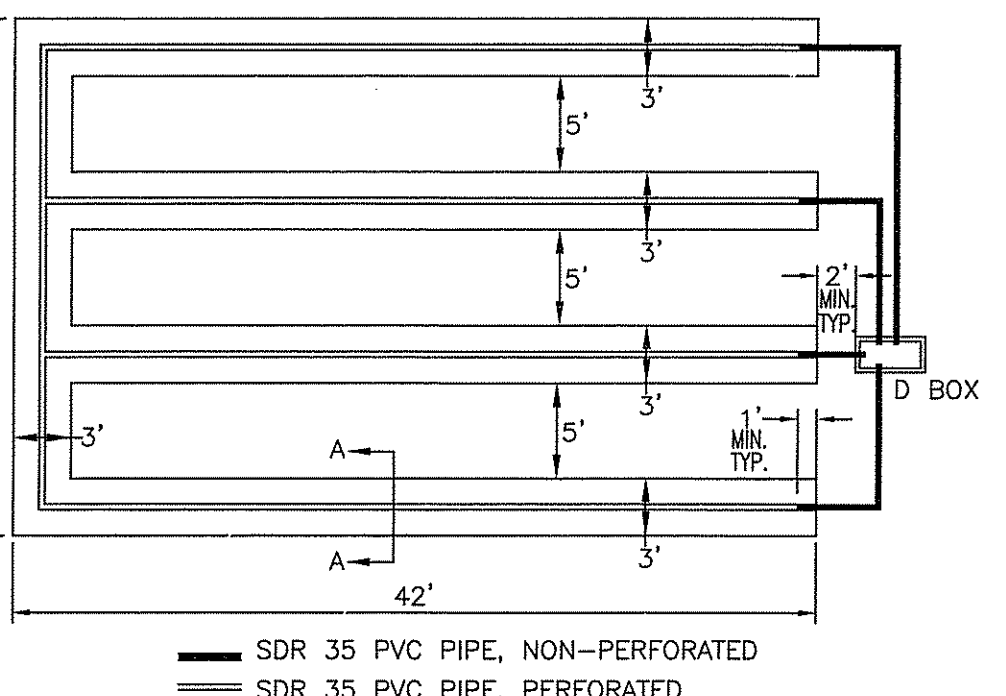
## SEPTIC TANK NOTES:

- SEPTIC TANK SHALL BE WATER TIGHT AND CONSTRUCTED OF PRECAST REINFORCED CONCRETE.
- PRECAST REINFORCED CONCRETE TANKS SHALL CONFORM WITH ASTM C-1227-02, LATEST EDITION.
- TANKS SHALL BE PERMANENTLY MARKED AT THE INLET END OF THE TANK WITH DATE OF MANUFACTURER, NAME OF MANUFACTURER, CAPACITY; AN EXTERNAL LOADS FOR WHICH TANK IS DESIGNED TO RESIST.
- A WARNING LABEL AT ALL OPENINGS SHALL BE PROVIDED WHICH READS "ENTRANCE INTO THE TANK COULD BE FATAL".
- TANK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- TANK SHALL BE INSTALLED ON A LEVEL, STABLE BASE THAT WILL NOT SETTLE.
- SURFACE WATER SHALL BE DIVERTED AWAY FROM THE TANK OPENINGS.
- TANK SHALL NOT BE DAMAGED DURING BACKFILLING. BACKFILL MATERIAL SHALL BE FREE OF LARGE STONES, STUMPS, WASTE, CONSTRUCTION MATERIAL, RUBBISH, ORGANIC MATERIAL, AND FROZEN SOILS.
- TANK AND RISERS SHALL BE TESTED FOR WATER TIGHTNESS BY EITHER VACUUM TESTING OR WATER PRESSURE TEST AS SPECIFIED IN THE "RULES". CONTRACTOR SHALL PROVIDE WRITTEN CERTIFICATION THAT THE TEST PASSED PRIOR TO C.O.C.
- JOINTS OF ALL CONCRETE TANKS SHALL BE SEALED WITH A 1" DIA. BUTYL RUBBER SEALANT OR APPROVED EQUAL.

## SEPTIC TANK DETAIL (NOT TO SCALE)



## EFFLUENT FILTER (NOT TO SCALE)



DISPERSAL TRENCH PLAN & SECTION VIEW, (INVERT OF DISTRIBUTION LINES BELOW ORIGINAL GRADE, RULE 33.4) NOT TO SCALE

## SEPTIC GRAVEL SPECIFICATION:

GRAVEL SHALL NOT CONTAIN ANY MATERIAL LARGER THAN 3". UP TO 10% MAY BE SIZED BETWEEN 3/4" AND 3". GRAVEL SHALL MEET THE FOLLOWING:

SIEVE SIZE	% PASSING	SIEVE SIZE	% PASSING
3/4"	100% (see above)	#40	10%-50%
#4	55%-100%	#100	0%-20%
#10	40%-100%	#200	0%-2%

## SYNTHETIC FILTER FABRIC SPECIFICATION:

A LAYER OF NON-WOVEN SYNTHETIC FILTER FABRIC SHALL BE PLACED OVER ALL STONE USED IN THE OWTS CONSTRUCTION BEFORE BACKFILLING. THE FILTER FABRIC SHALL HAVE ADEQUATE TENSILE STRENGTH TO PREVENT RIPPING DURING INSTALLATION AND BACKFILLING. ADEQUATE AIR PERMEABILITY TO ALLOW FREE PASSAGE OF GASES, AND ADEQUATE PARTICLE RETENTION TO PREVENT DOWNWARD MIGRATION OF SOIL PARTICLES, MIRAFI 180N OR EQUAL.

EXCAVATION NOTE:  
 REMOVE ANY FILL, A-HORIZONS, BOULDERS, COMPACTED SOILS, ROOTS, OR STUMPS WITHIN THE BOTTOM OF THE LEACHFIELD AND REPLACE WITH SEPTIC GRAVEL IF NECESSARY.

# SOIL EROSION CONTROL & DRAINAGE, DETAILS, & NOTES

## Stormwater Management Practices for Individual Single-Family Residential Lots

### A. Qualifying Pervious Areas

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	Conveyance	Construction*	Maintenance*
<ul style="list-style-type: none"> <li>The rooftop, driveway or parking area draining to any one QPA cannot exceed 1,000 ft<sup>2</sup>.</li> <li>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.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>In locations where there is a history of groundwater seepage and/or basement flooding, QPAs should not be utilized.</li> <li>The flow path through the QPA must be 25 feet from any onsite wastewater treatment system (OWTS).</li> <li>The slope of the QPA shall be less than or equal to 5.0%.</li> <li>Although they may abut, there shall be no overlap between QPAs. For example, the runoff from two 1,000 ft<sup>2</sup> sections of roof must be directed to separate QPAs. They shall not be directed to the same area.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>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 CRM.</li> <li>To prevent basement seepage, at a minimum, runoff must be directed away from the building foundation and be infiltrated at the QPA at least 10 feet away from the foundation.</li> <li>Downspouts must discharge at least 10 feet from the nearest impervious surface to prevent reconnection to any storm sewers.</li> <li>Downspouts must include appropriate provisions, such as a splash block or level spreader to induce non-erosive sheet flow.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>If you are restoring an area by planting to create an eligible QPA, use approved native plants from the RI Coastal Plant Guide (<a href="http://www.uri.edu/celc/coastalPlans/CoastalPlantGuide.htm">www.uri.edu/celc/coastalPlans/CoastalPlantGuide.htm</a>) or Appendix B of the RI Stormwater Design and Installation Standards Manual. Additional planting guidelines can be found in the CRM Coastal Buffer Zone Planting Guide (<a href="http://www.crmc-ri.gov/coastallandscapes/Coastal_Buffer_Planting_Guide.pdf">http://www.crmc-ri.gov/coastallandscapes/Coastal_Buffer_Planting_Guide.pdf</a>).</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> </ul>

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

REFERENCES:  
 STATE OF RHODE ISLAND STORMWATER MANAGEMENT GUIDANCE FOR INDIVIDUAL SINGLE-FAMILY RESIDENTIAL LOT DEVELOPMENT

QPA SIZING  
 SITE SOILS: SANDY  
 NOT MORE THAN 1,000 SQ.FT. OF IMPERVIOUS SURFACE MAY BE DIRECTED TO A SINGLE QPA

PROPOSED DRIVEWAY AREA: 4,000 SQ.FT.  
 4 - 1,000 SQ.FT. SECTIONS OF 12'X33' DRIVEWAY SPACE IS ACCOMMODATED BY QPAS. - MINIMUM QPA DIMENSIONS: 12'X33'

PROPOSED HOUSE ROOFTOP AREA: 3,000 SQ.FT.  
 3 - 1,000 SQ.FT. SECTIONS OF 36'X28'W ROOFTOP AREA IS ACCOMMODATED BY QPAS. - MINIMUM QPA FLOWPATH = 1,000/13.3 = 76' - MINIMUM QPA WIDTH = 36'

## QPA NOTES AND SIZING

TIMOTHY J. BEHAN  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 6078  
 8/31/18

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 EXETER, RHODE ISLAND

SCALE: AS SHOWN	SHEET NO: 2 of 2
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