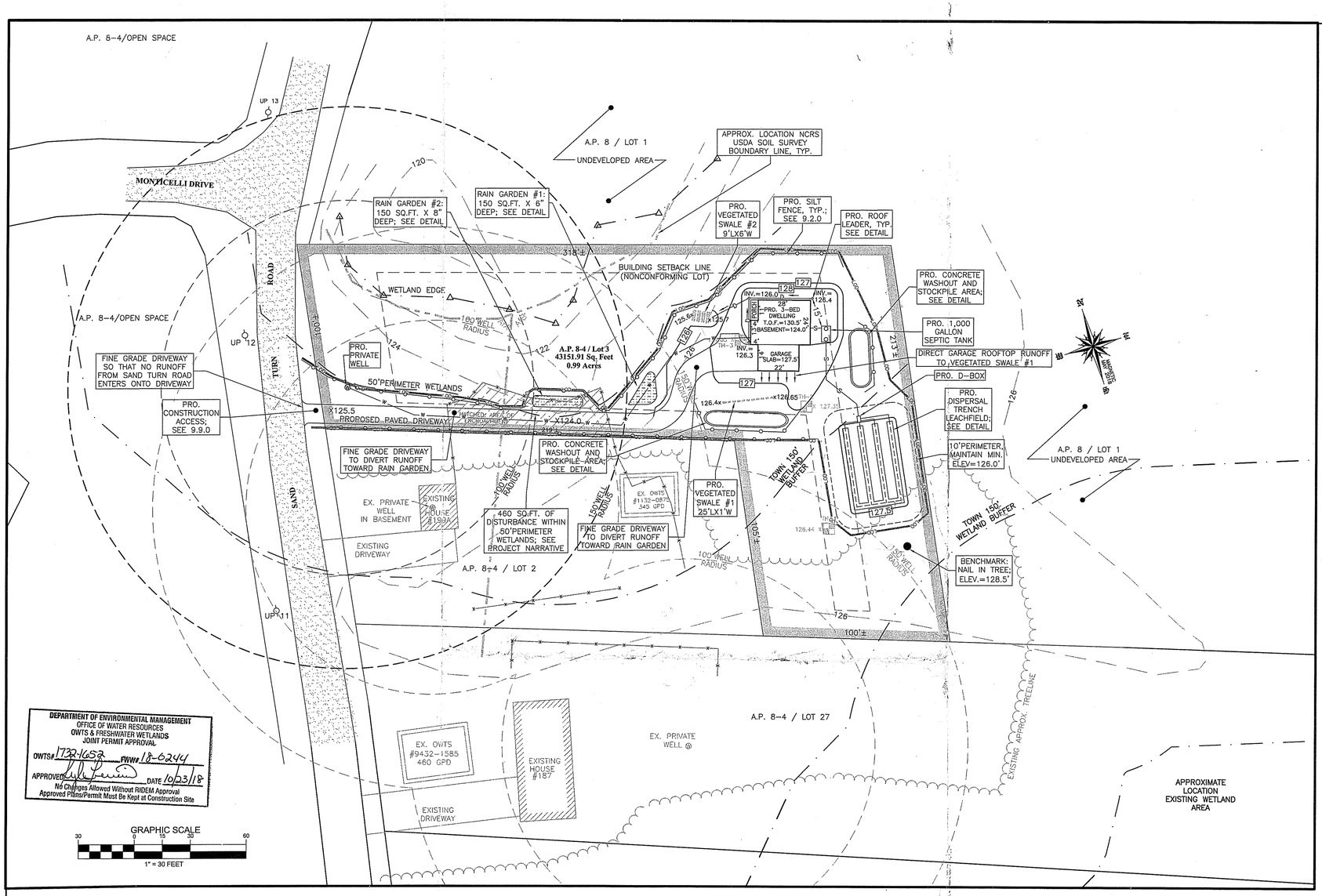


DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
OWTS & FRESHWATER WETLANDS
JOINT PERMIT APPROVAL
OWTS# 732-1653 FWW# 18-6244
APPROVED _____ DATE 10/23/18
No Changes Allowed Without RIDEM Approval
Approved Plans/Permit Must Be Kept at Construction Site

LOCUS MAP
1"=500'

USDA SOIL DESCRIPITIONS

FeA: FREETOWN MUCK = CONSISTS OF VERY DEEP, VERY POORLY DRAINED ORGANIC SOILS FORMED IN MORE THAN 130 CM OF HIGHLY DECOMPOSED ORGANIC MATERIAL. THEY ARE COMMONLY IN DEPRESSIONS OR ON LEVEL UPLANDS AND ALLUVIAL PLAINS. SLOPES RANGE FROM 0 TO 2 PERCENT. SATURATED HYDRAULIC CONDUCTIVITY IS MODERATELY HIGH OR HIGH.

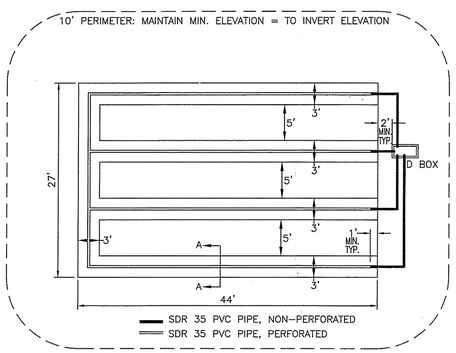
AfA AND AfB: AGAWAM FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES AND 3 TO 8 PERCENT SLOPES RESPECTIVELY = CONSISTS OF VERY DEEP, WELL DRAINED SOILS FORMED IN SANDY, WATER DEPOSITED MATERIALS. THEY ARE LEVEL TO STEEP SOILS ON OUTWASH PLAINS AND HIGH STREAM TERRACES. SLOPE RANGES FROM 0 TO 15 PERCENT. SATURATED HYDRAULIC CONDUCTIVITY IS MODERATELY HIGH OR HIGH IN THE UPPER SOLUM AND HIGH OR VERY HIGH IN THE LOWER SOLUM AND SUBSTRATUM.

AUG 22 2018

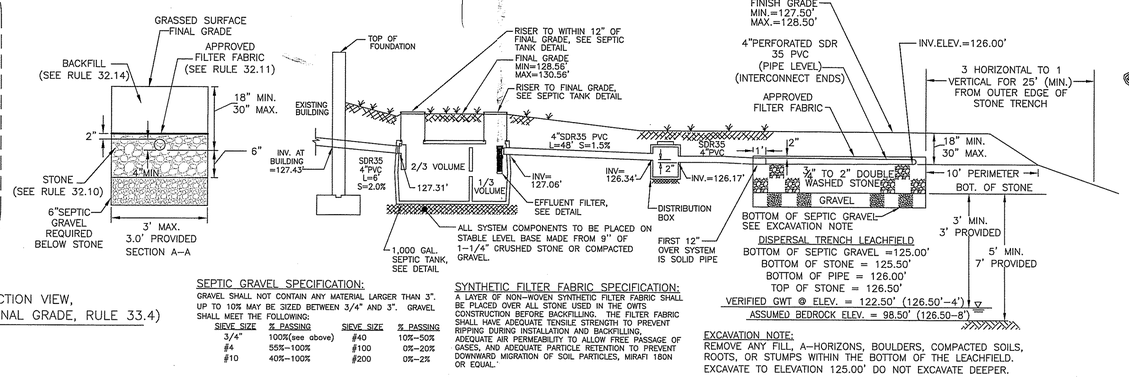
LEGEND

LOT LINE	
ABUTTER LINE	
EXISTING CONTOUR	88
TEST HOLE	
PROPOSED CONTOUR	18
PROPOSED SPOT GRADE	x99.50
PROPOSED DRAIN LINE	D
PROPOSED WATER LINE	W
PROPOSED OWTS PIPE	S
LIMIT OF DISTURBANCE	
SILT FENCE	
WETLAND PERIMETER AND BUFFER	
EXISTING TREELINE	

APPROX.	APPROXIMATE
B.S.	BASEMENT SLAB
CB	CATCH BASIN
EL./ELEV.	ELEVATION
EX.	EXISTING
F.F.	FINAL FLOOR
GAL.	GALLON
G.S.	GARAGE SLAB
MAX.	MAXIMUM
MIN.	MINIMUM
PRO.	PROPOSED
QPA	QUALIFIED PERVIOUS AREA
T.O.F.	TOP OF FOUNDATION



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 160N OR EQUAL.

EXCAVATION NOTE:
REMOVE ANY FILL, A-HORIZONS, BOULDERS, COMPACTED SOILS, ROOTS, OR STUMPS WITHIN THE BOTTOM OF THE LEACHFIELD. EXCAVATE TO ELEVATION 125.00' DO NOT EXCAVATE DEEPER.

OWNER:
THOMAS WOJCIECHOWSKI
PO BOX 72
KINGSTON, RI 02881

APPLICANT:
MAR CONSTRUCTION, INC
22 SEXTANT LANE
NARRAGANSETT, RI 02882

TIMOTHY J. BEHAN
No. 6278
REGISTERED PROFESSIONAL ENGINEER
8-17-18

REVISIONS

No.	DATE	DRWN	CHKD

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

JOINT OWTS/WETLAND & SERSC PLAN
for
A.P. 8-4, LOT 3
SAND TURN ROAD
in
SOUTH KINGSTOWN, RHODE ISLAND

SCALE: AS SHOWN	SHEET NO: 1 of 2	
DRAWN BY: DKM	DESIGN BY: DKM	CHECKED BY: TJB
DATE: 08/17/18	PROJECT NO.: 18042.00	

OWTS DESIGN, DETAILS, & NOTES

NERAL 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 _X_) OR (ARE NOT ____) 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 _X_) OR (ARE NOT ____) STORM AN SUBSURFACE DRAINS WITHIN 200 FEET OF THE PROPOSED OWTS. SAID DRAINS (DO ____) OR (DO NOT _X_) 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'S WITHIN 200 FEET OF ANY PROPOSED WELL. IF PRESENT, THE LOCATION AND SIZE HAS BEEN SHOWN ON THE PLAN.
EXISTING OWTS'S 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 ____) OR (ARE NOT _X_) AREAS ON SUBJECT PROPERTY WHERE SOIL HAS BEEN EXCAVATED AND/OR WHERE STORM DEPOSITED SAND IN THE BACKDUNE 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.

WNER'S NOTES:

FOOD/GARBAGE GRINDERS ARE PROHIBITED FROM BEING CONNECTED TO THE SEPTIC SYSTEM.
VEHICLE PARKING OR TRAFFIC OVER THE SEPTIC TANK IS PROHIBITED.
BACKWASH WATER FROM WATER TREATMENT SYSTEMS (IF INSTALLED) SHALL NOT BE DISCHARGED INTO THE SEPTIC SYSTEM.
SEPTIC TANKS SHALL BE PUMPED OUT EVERY 24 MONTHS AND EFFLUENT FILTERS WASHED ANNUALLY UNLESS MORE FREQUENT MAINTENANCE IS DETERMINED TO BE REQUIRED BY OPERATION AND MAINTENANCE PROVIDER OF THE OWTS SYSTEM.
ONLY WASTEWATER AS DEFINED IN THE RIDEM OWTS REGULATIONS IS ALLOWED TO BE DISCHARGED INTO THE SEPTIC SYSTEM. ABSOLUTELY NO CHEMICALS, OILS, FATS, GREASE, OR PAINTS ARE ALLOWED. THIS IS NOT A GARBAGE DISPOSAL SYSTEM.
BATHTUBS GREATER THAN 100 GALLONS ARE NOT ALLOWED IN THE HOUSE.
NO TREES OR LARGE SHRUBS SHALL BE PLANTED WITHIN 10 FEET OF THE LEACHFIELD.
NO SUBSURFACE DRAINS OR SUBDRAINS SHALL BE INSTALLED WITHIN 50 FEET OF THE OWTS UNLESS IN ACCORDANCE WITH OWTS REGULATIONS.
THE DESIGN INTENT IS TO MEET THE STATE STANDARDS. THE SYSTEM OPERATION IS DEPENDENT ON PROPER USAGE, AND IT'S OPERATION IS NOT GUARANTEED BY THIS PLAN.

CHFIELD 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. PROVIDE BERMS ALONG STREET EDGE TO KEEP STREET RUNOFF FROM ENTERING SITE.
EXCAVATION: THE LEACHFIELD TRENCHES SHALL BE STRIPPED OF ALL TOPSOIL (A HORIZONS) AND EXCAVATED TO THE ELEVATION SPECIFIED 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 SMEAR 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 SODDING, TO ESTABLISH A PERMANENT VEGETATIVE COVER TO PREVENT EROSION (EXCEPT DRIVEWAY AREA). THE LEACHFIELD SURFACE AREA SHALL BE FINE GRADED SO RUNOFF IS DIVERTED AWAY FROM LEACHFIELD AREA.

NTRACTOR'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 LECHFIELD CORNERS FOR REVIEW AND APPROVAL BY ENGINEER.
ENGINEER TO APPROVE BOTTOM OF LEACHFIELD BED PRIOR TO PLACEMENT OF GRAVEL. SCARIFY LEACHFIELD BOTTOM IMMEDIATELY PRIOR TO PLACEMENT OF GRAVEL, 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 WATERTIGHT TO TANK.
CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION. ANY 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 ABUTTING PROPERTIES SHALL BE REPAIRED BY THE CONTRACTOR.

TEST HOLE DATA:

TH 1				
0"–4"	A	SL		SOIL CAT. 3
4"–26"	Bw	SL		SOIL CAT. 3
26"–36"	CB	LS		SOIL CAT. 6
36"–96"	C	G,S		SOIL CAT. 1M
SHGWT = 48"				
TH 2				
0"–6"	Ap	SL		SOIL CAT. 3
6"–28"	Bw	SL		SOIL CAT. 3
28"–36"	CB	LS		SOIL CAT. 6
36"–96"	C	CB,S		SOIL CAT. 1M
SHGWT = 48"				
TH 3				
0"–6"	Ap	SL		SOIL CAT. 3
6"–26"	Bw	SL		SOIL CAT. 3
26"–96"	C	CB,S		SOIL CAT. 1M
SHGWT = 48"				

GENERAL SITE, SOILS & DESIGN DATA:

1. PROPOSED LEACHFIELD IS LOCATED IN THE AREA OF TEST HOLES 1.
2. EXISTING GRADE AT THE CENTER OF THE PROPOSED LEACHFIELD IS APPROXIMATELY ELEVATION 126.5'.
3. E.S.H.G.W.T. FOR THIS AREA IS 4' BELOW ORIGINAL GRADE.
4. LEDGE IS ASSUMED AT 96" BELOW ORIGINAL GRADE.
5. USE LOADING RATE = 0.61 GAL/SF/DAY. (SOIL CAT. 1M)

MINIMUM REQUIRED LEACHFIELD AREA:

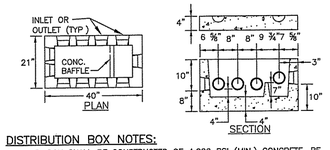
DESIGN FLOW = 3 BEDROOMS
FOW TO LEACHFIELD = 3 BEDROMS X 115 GAL/DAY/BEDROOM = 345 GAL/DAY
LOADING RATE = 0.61 GAL/SF/DAY (CATEGORY 6/1M SOIL IS THE MOST RESTRICTIVE SOIL LAYER WITHIN LEACHFIELD BOTTOM)
REQUIRED LEACHFIELD AREA = 345 / 0.61 = 566 SF

DISPERSAL TRENCH DESIGN:

1. 6" STONE BELOW INVERT & 36" WIDE TRENCH AREA: 3.0 SF/LF
2. LINEAR FEET REQUIRED: 566 SF / 3.0 SF/LF = 189 LF
3. TRENCH LENGH: W/5' SEPARATION & 4 TRENCHES: 189 – 15 LF = 174 LF
   3.1. 174 LF / 4 TRENCHES = 43.5' PER TRENCH
   3.2. USE 44' LONG TRENCHES
4. SYSTEM WIDTH: 4 TRENCHES X 3' WIDE + 15' = 27'
5. EFFECTIVE LEACHFIELD AREA PROVIDED: 44 LF X 3.0 SF/LF X 4 = 528 SF
   528 SF + 15 LF X 3 SF/LF = 573 SF
6. PROVIDED 573 SF > 566 SF REQUIRED

TANK SIZING CALCULATIONS:

RESIDENTIAL DWELLING = 3 BEDROOMS
1,000 GAL REQ'D;
1,000 GAL PROVIDED (CODE 26.1.1)

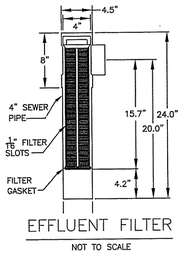


DISTRIBUTION BOX NOTES:

1. 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.
2. INLET SHALL ACCEPT 4" SCH 40 OR SDR 35 PVC PIPE.
3. OUTLETS SHALL HAVE STATE APPROVED SEALS THAT ACCEPT 4" SCH 40 OR 4" SDR 35 PVC PIPE.
4. EXTEND COVER TO WITHIN 12" OF FINISHED GRADE WITH CONCRETE RISERS AND PLACE A MARKER TO FINISH GRADE OVER THE COVER.
5. D-BOX SHALL BE PLACED ON A LEVEL AND COMPACTED BASE.
6. D-BOX SHALL HAVE A MINIMUM AREA OF 3 SQUARE FEET.
7. PROVIDE AN INLET TEE IF A CONCRETE BAFFLE IS NOT PROVIDED.
8. PIIPES SHALL EXTEND INTO THE DISTRIBUTION BOX ONE (1) INCH.
9. D-BOX AND ALL PIPE PENETRATIONS SHALL BE MADE WATER TIGHT.

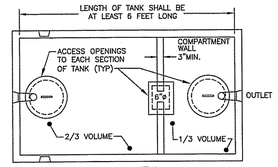
DISTRIBUTION BOX DETAIL

NOT TO SCALE



EFFLUENT FILTER

NOT TO SCALE



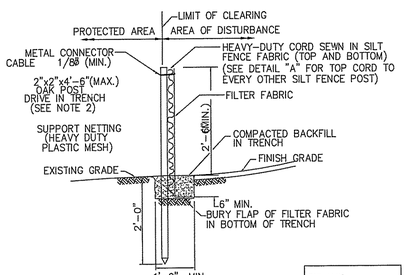
PLAN VIEW

SEPTIC TANK NOTES:

1. SEPTIC TANK SHALL BE WATER TIGHT AND CONSTRUCTED OF PRECAST REINFORCED CONCRETE.
2. PRECAST REINFORCED CONCRETE TANKS SHALL CONFORM WITH ASTM C-1227-02, LATEST EDITION.
3. 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.
4. A WARNING LABEL AT ALL OPENINGS SHALL BE PROVIDED WHICH READS "ENTRANCE INTO THE TANK COULD BE FATAL".
5. TANK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
6. TANK SHALL BE INSTALLED ON A LEVEL, STABLE BASE THAT WILL NOT SETTLE.
7. SURFACE WATER SHALL BE DIVERTED AWAY FROM THE TANK OPENINGS.
8. 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.
9. 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.
10. JOINTS OF ALL CONCRETE TANKS SHALL BE SEALED WITH A 1" DIA. BUTYL RUBBER SEALANT OR APPROVED EQUAL.

SEPTIC TANK DETAIL

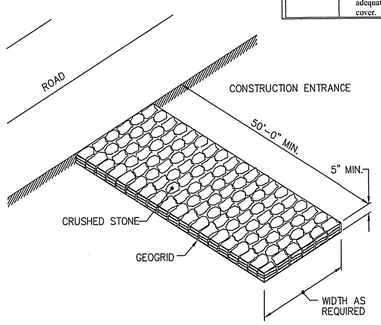
NOT TO SCALE



NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
2. 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.
3. 1"x1"x4'-6" (MIN.) POSTS PERMITTED FOR PRE-FABRICATED SILT FENCE.
4. SILT FENCE SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.

SILT FENCE DETAIL

R.I. STANDARD 9.2.0



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

CONSTRUCTION ACCESS

R.I. STANDARD 9.9.0

SOIL EROSION CONTROL & DRAINAGE, DETAILS, & NOTES

RAIN GARDEN TYPICAL DETAIL & NOTES

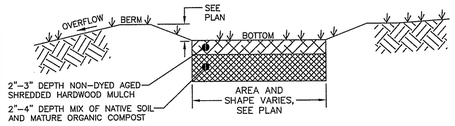
N.T.S.

Rain Garden Surface Area in Sandy Soils (Sands, Loamy Sands and Sandy Loams) (square feet)			
Drainage Area (Square feet)	for 4 inch deep garden	for 6 inch deep garden	for 8 inch deep garden
100	19	15	8
200	38	30	16
300	57	45	24
400	76	60	32
500	95	75	40
600	114	90	48
700	133	105	56
800	152	120	64
900	171	135	72
1000	190	150	80

RAIN GARDEN SIZING
SITE SOILS: SANDY
RAIN GARDEN DEPTH: 6"
THEREFORE SIZE RAIN TO BE 150 SQUARE FEET PER 1,000 SQ.FT. OF IMPERVIOUS AREA

RAIN GARDEN #1:
IMPERVIOUS AREA: PORTION OF DRIVEWAY = 1,000 SQ.FT.
REQUIRED SURFACE AREA OF RAIN GARDEN = 80 SQ.FT.
PROPOSED SIZE: 80 SQ.FT. = REQUIRED

RAIN GARDEN #2:
IMPERVIOUS AREA: PORTION OF DRIVEWAY = 1,800 SQ.FT.
REQUIRED SURFACE AREA OF RAIN GARDEN = (1,800/1,000) X 80 SQ.FT. = 144 SQ.FT.
PROPOSED SIZE: 150 SQ.FT. > REQUIRED



SECTION

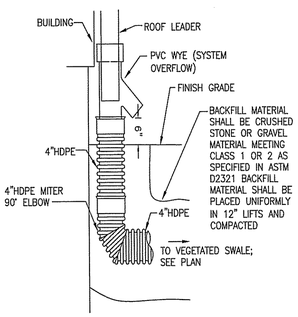
NOTES:
1. DO NOT COMPACT SOILS IN RAIN GARDEN AREA. TILL BOTTOM OF RAIN GARDEN PRIOR TO PLACEMENT OF SANDY LOAM TOPSOIL AND BIORETENTION SOIL TO PROMOTE GOOD INFILTRATION RATES.
2. FINE GRADE RAIN GARDEN SO IT HOLDS THE REQUIRED DEPTH OF RUNOFF (SEE PLAN FOR DEPTH) PRIOR TO OVERFLOWING TO STREET. DO NOT ALLOW OVERFLOWS TO DISCHARGE TO ABUTTING PROPERTIES.
3. DIRECT DRIVEWAY AREA (TO THE MAXIMUM EXTENT POSSIBLE) TO FLOW INTO RAIN GARDENS.

TYPICAL RAIN GARDEN DETAIL

NOT TO SCALE

Table 6. Required Elements for Rain Gardens on Single-Family Residential Lots

Location	☐ Rain gardens should be located in areas with less than a 12% slope (i.e. a 12 foot drop over a horizontal distance of 100 feet or a 6 foot drop over a distance of 50 feet). ☐ Rain gardens should be located at least 10 ft from foundations to avoid basement seepage. ☐ Rain gardens should be located at least 15 ft from onsite wastewater treatment systems and at least 25 ft from private drinking water wells (see Table 5 for additional setbacks).
Treatment	☐ The bottom of a rain garden should be level to encourage the even distribution of stormwater and increase infiltration capacity. ☐ Rain gardens should be 4 to 8 inches deep with a 2 – 4 inch amended soil layer and a 2 – 3 inch layer of non-dyed aged shredded hardwood mulch. ☐ The amended soil layer of a rain garden should be a 50/50 mixture of the excavated native soils and mature organic compost.
Vegetation	☐ Select plants for rain gardens using the Coastal Plant Guide at www.uri.edu/ecfs/ecoc/coastalPlants/CoastalPlantGuide.htm or Appendix B of the RI Stormwater Design and Installation Standards Manual. See example planting plans below.
Construction	☐ A crushed stone entrance should be installed at the inflow to prevent channeling. ☐ A berm to detain stormwater should be constructed along the downhill side of the rain garden, perpendicular to the slope of the lawn ☐ Be sure that the soil within the rain garden area does not become compacted by construction activities (i.e. heavy machinery). If soil becomes severely compacted it may need to be tilled and amended to maintain proper drainage.
Maintenance	☐ Rain gardens shall be inspected following at least the first two precipitation events of at least 1.0 inch to ensure that the system is functioning properly. Thereafter, the rain garden shall be monitored and maintained to assure proper functioning, plant growth and survival. Plants shall be replaced on an as-needed basis during the growing season. ☐ Silt/sediment shall be removed from the rain garden when the accumulation exceeds one inch, or when water ponds on the surface of the rain garden for more than 48 hours). The top few inches of material shall be removed and shall be replaced with fresh soil mixture and mulch. ☐ Pruning or replacement of woody vegetation shall occur when dead or dying vegetation is observed. ☐ Soil erosion gullies shall be repaired when they occur. ☐ Fertilizer or pesticides shall not be applied to plants within rain gardens. ☐ Perennial plants and ground covers shall be replaced as necessary to maintain an adequate vegetated ground cover. Annual plants may also be used to maintain ground cover.



ROOF LEADER DETAIL

NOT TO SCALE

VEGETATED SWALE TYPICAL DETAIL & NOTES

N.T.S.

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/runoff/pdf/rg/rgmanual.pdf. Alternatively, use sizing information and equations in Chapter 5 of the RI Stormwater Design and Installation Standards Manual at www.dem.ri.gov/pubs/regs/regs/water/swmanual.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

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

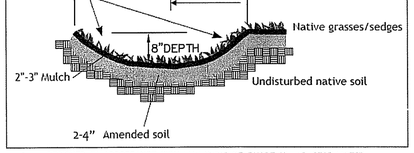
SWALE SIZING
SITE SOILS: SANDY, THEREFORE SIZE SWALE TO BE 80 SQUARE FEET PER 1,000 SQUARE FEET OF IMPERVIOUS SURFACE

VEGETATED SWALE #1:
IMPERVIOUS AREA: ROOFTOP = 308 SQ.FT.
REQUIRED SURFACE AREA OF SWALE = (308/1,000) X 80 = 25 SQ.FT.
PROPOSED SIZE: 25'L X 1'W = 25 SQ.FT. = REQUIRED

VEGETATED SWALE #2:
IMPERVIOUS AREA: ROOFTOP = 672 SQ.FT.
REQUIRED SURFACE AREA OF SWALE = (672/1,000) X 80 = 54 SQ.FT.
PROPOSED SIZE: 9'L X 6'W = 54 SQ.FT. = REQUIRED

SWALE MAINTENANCE NOTES:

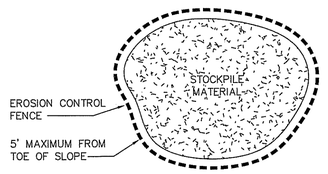
1. VEGETATED SWALES SHALL BE INSPECTED ANNUALLY AND AFTER LARGE STORM EVENTS.
2. ERODED SIDE SLOPES AND CHANNEL BOTTOMS SHALL BE STABILIZED AS NECESSARY.
3. IF THE SURFACE OF THE SWALE BECOMES CLOGGED TO THE POINT THAT STANDING WATER IS OBSERVED ON THE SURFACE 48 HOURS AFTER THE PRECIPITATION EVENTS, THE BOTTOM SHALL BE ROTO-TILLED OR CULTIVATED TO BREAK UP ANY HARD-PACKED SEDIMENT, AND THEN RESEEDED.
4. VEGETATION IN SWALES SHALL BE MOWED AS REQUIRED TO MAINTAIN MINIMUM GRASS HEIGHTS IN THE 4 TO 6 INCH RANGE.
5. EVERY FIVE YEARS, THAN CHANNEL BOTTOM OF SWALES SHOULD BE SCRAPED TO REMOVE SEDIMENT AND TO ENSURE ORIGINAL CROSS SECTION AND INFILTRATION RATE, AND SHOULD BE SEEDED TO RESTORE GROUND COVER, WHERE NECESSARY.



1. DESIGNED IN ACCORDANCE WITH THE STATE OF RHODE ISLAND STORMWATER MANAGEMENT GUIDANCE FOR INDIVIDUAL SINGLE-FAMILY RESIDENTIAL LOT DEVELOPMENT.
2. VEGETATED SWALES SHALL HAVE A MAXIMUM SLOPE (LONGITUDINAL) OF 4.0%.

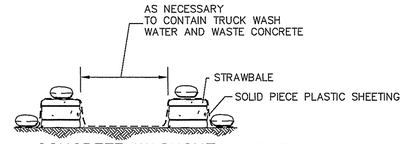
GRADING & DRAINAGE NOTES:

1. 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 SUFACES (DRIVEWAY) SHALL BE SLOPED AWAY FROM HOUSE AT A SLOPE OF 2% FOR AT LEAST 10 FEET.
2. FINE GRADE PROPERTY TO PREVENT STREET RUNOFF FROM ENTERING SUBJECT PROPERTY.



STOCKPILE DETAIL

NOT TO SCALE



CONCRETE WASHOUT

NOT TO SCALE

OWNER:
THOMAS WOJCIECHOWSKI
PO BOX 72
KINGSTON, RI 02881

APPLICANT:
MAR CONSTRUCTION, INC
22 SEXTANT LANE
NARRAGANSETT, RI 02882

TIMOTHY J. BEHAN
No. 6278
REGISTERED PROFESSIONAL ENGINEER
8/17/18

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

REVISIONS

No.	DATE	DRWN	CHKD

JOINT OWTS/WETLAND & SERSC PLAN

for

A.P. 8-4, LOT 3

SAND TURN ROAD

in

SOUTH KINGSTOWN, RHODE ISLAND

SCALE: AS SHOWN		SHEET NO: 2 of 2
DRAWN BY: DKM	DESIGN BY: DKM	CHECKED BY: TJB
DATE: 08/17/18		PROJECT NO.: 18042.00