

**SOIL EROSION AND SEDIMENT CONTROL NOTES:**

- SLOPES SHALL NOT BE LEFT UNATTENDED OR EXPOSED FOR EXCESSIVE PERIODS OF TIME SUCH AS THE INACTIVE WATER SEASON.
- ALL DISTURBED SLOPES EITHER NEWLY CREATED OR CURRENTLY EXPOSED SHALL BE SEEDED OR PROTECTED.
- PLANTABLE SOIL SHALL HAVE A SANDY LOAM TEXTURE RELATIVELY FREE OF SUBSILIC MATERIAL, STONES, ROOTS, LIMBS OF SOIL, TREE LIMBS, TRASH OR CONSTRUCTION DEBRIS, AND SHALL CONFORM WITH RHODE ISLAND'S STANDARD SPECIFICATIONS, AS AMENDED.
- THE DESIGN MIX SHALL BE COMPRISED OF THE FOLLOWING:
  - TYPE: LECA/GRASS
  - CRACKING RED FESCUE: 75
  - CENTURY BLUE GRASS: 15
  - COLORADO BLUE GRASS: 5
  - PERENNIAL BLUE GRASS: 5
- EARLY SPRING OR LATE SUMMER SEEDING IS RECOMMENDED. LIME AND FERTILIZER AS REQUIRED BY SOIL TESTING TO COMPLEMENT OR UPGRADE EXISTING CONDITIONS. THE SEED MIX SHALL BE INOCULATED WITHIN 24 HOURS BEFORE MIXING AND PLANTING WITH APPROPRIATE INOCULUM FOR EACH VARIETY. THE RECOMMENDED SEEDING DATES ARE APRIL 1ST THROUGH JUNE 15TH AND AUGUST 15TH THROUGH SEPTEMBER 30TH.
- TEMPORARY TREATMENTS SHALL CONSIST OF NORTH AMERICAN GREEN S1150 EROSION CONTROL BLANKET OR EQUAL. THEY SHALL BE INCORPORATED INTO THE WORK AS WARRANTED OR AS ORDERED BY THE ENGINEER.
- ALL TEMPORARY EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL AN ACCEPTABLE STAND OF GRASS OR APPROVED GROUND COVER IS ESTABLISHED.
- ALL FILL SHALL BE THOROUGHLY COMPACTED UPON PLACEMENT IN STRICT CONFORMANCE WITH THE RHODE ISLAND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
- STOCKPILES OF TOPSOIL SHALL NOT BE LOCATED NEAR ANY WATERWAYS. THEY SHALL HAVE SIDE SLOPES NO GREATER THAN 2:1 AND SHALL BE TEMPORARILY SEEDED OR STABILIZED.
- THE CONSTRUCTION SUPERVISOR SHALL HAVE THE OVERALL RESPONSIBILITY FOR PLAN VERIFICATION AND FOR SEEING THAT THE APPROPRIATE WORKERS ARE AWARE OF THE PROVISIONS OF THE PLAN. THE CONTRACTOR MUST REPAIR AND/OR RESEED ANY AREAS THAT DO NOT DEVELOP WITHIN A PERIOD OF SIX (6) MONTHS AND SHALL DO SO AT NO ADDITIONAL EXPENSE.
- MAXIMUM GRADED SLOPE TO BE 3:1 UNLESS NOTED OTHERWISE ON THE PLANS.
- REFERENCE THE RHODE ISLAND EROSION AND SEDIMENTATION CONTROL HANDBOOK PREPARED BY USDA SOIL CONSERVATION SERVICE AS A GUIDE.

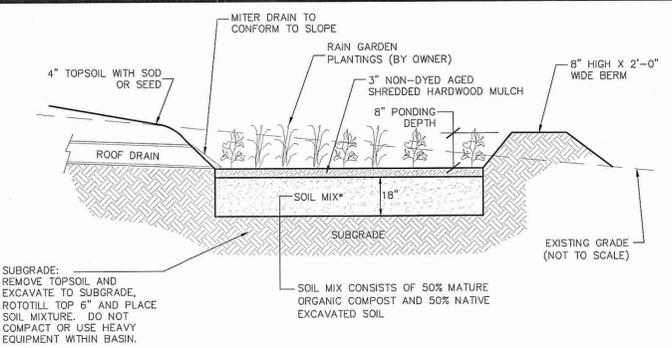
**LEGEND**

- EX. CONTOUR
- ZONE SETBACK
- ADJUTER PROPERTY LINE
- OWNER PROPERTY LINE
- PROPOSED CONTOUR
- WET SEASON EVALUATION
- PERCOLATION TEST
- LEDGE PROBES
- WETLAND FLAG

**Rain Garden Plantings:**

| LATIN NAME                  | COMMON NAME       | SIZE  | SPACING  |
|-----------------------------|-------------------|-------|----------|
| <b>GRASSES / PERENNIALS</b> |                   |       |          |
| FESTUCA OVINE GLAUCA        | BLUE FESCUE       | 1 GAL | 18" O.C. |
| PANICUM VIRGATUM            | SWITCHGRASS       | 1 GAL | 18" O.C. |
| PENNISETUM ALOPECUROIDES    | FOUNTAIN GRASS    | 1 GAL | 18" O.C. |
| RUDECKIA HIRTA              | BLACK EYED SUSAN  | 1 GAL | 18" O.C. |
| <b>SHRUBS</b>               |                   |       |          |
| CEPHALANTHUS OCCIDENTALIS   | COMMON BUTTONBUSH |       |          |
| COMPANIA PEREGRINA          | SWEET FERN        |       |          |
| LEDUM GROENLANDICUM         | LABRADOR TEA      |       |          |
| PHOTINIA MELANOCARPA        | BLACK CHOKEBERRY  |       |          |

FINAL PLANTINGS TO BE CHOSEN AND INSTALLED BY OWNER OR OWNER REPRESENTATIVE. REFERENCE THE RHODE ISLAND COASTAL PLANT GUIDE AT [www.uri.edu/cels/ceec/coastalPlants/CoastalPlantGuide](http://www.uri.edu/cels/ceec/coastalPlants/CoastalPlantGuide).



**ROOF RAIN GARDEN SIZING CALCULATIONS**

- Impervious Roof Area = 1,398 s.f.
- Soil type: Sand
- Design Coefficient of Permeability = 3.5 ft/day
- Intensity = 1-inch
- Water Quality Volume Needed: 1,398 s.f. x 0.083 (1") = 116 c.f.
- Proposed Rain Garden Depth = 8-inches or 0.7-feet

Surface Area at Bottom of the Garden:

$$A(f) = (WQv)(df) / [(k)(hf + df)(t)]$$

- 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)
  - hf = Average height of water above the dry sward (ft) (use 0.7 ft)
  - t = design filter bed drain time (assume 1 day for design purposes)

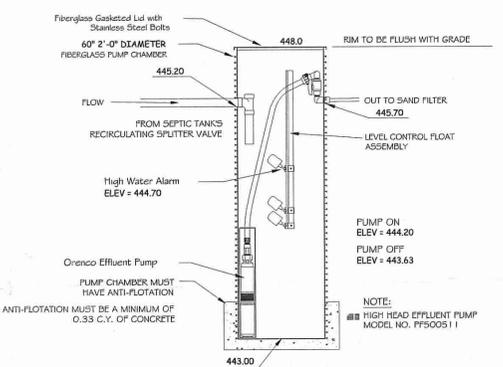
$$A(f) = (116)(1.5) / [(3.5)(0.7 + 1.0)(1.0)]$$

$$A(f) = 29.24 \text{ s.f. use } 55 \text{ s.f.}$$

**RAIN GARDEN SECTION DETAIL**

STORMWATER TREATMENT PRACTICE

| IMPERVIOUS SURFACE   | AREA       | METHOD      | AREA REQ'D | AREA PROVIDED |
|----------------------|------------|-------------|------------|---------------|
| ROOF TOP & DRIVEWAY  | 1,398 S.F. | RAIN GARDEN | 30 S.F.    | 55 S.F.       |
| * PER SOIL EVALS FSL |            |             |            |               |



**PUMP CHAMBER DETAIL - 24\"/>**

- THE RAIN GARDEN 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. 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 VEGETATION SHALL OCCUR WHEN DEAD OR DYING VEGETATION IS OBSERVED.
- GULLIES SHALL BE REPAIRED WHEN THEY OCCUR.
- FERTILIZER OR PESTICIDES SHALL NOT BE APPLIED TO PLANTS WITHIN RAIN GARDENS.
- SWALES SHALL BE INSPECTED ANNUALLY AND SHOULD BE INSPECTED AFTER LARGE STORM EVENTS.
- ERODED SIDE SLOPES AND CHANNEL BOTTOMS SHALL BE STABILIZED AS NECESSARY.

THE SUBJECT PARCEL DOES NOT LIE WITHIN A FLOOD HAZARD AREA AS SHOWN ON FEMA FLOOD INSURANCE RATE MAP NUMBER 44007C0143G, EFFECTIVE DATE MARCH 1, 2009.

**B.S.F. Demand Dosing**

30 ORIFICE @ 0.24 GAL PER ORIFICE = 7.2 GALLONS  
 30 LF @ 2\"/>

**GENERAL NOTES**

- THE OWTS INSTALLER SHALL INSTALL AND MAINTAIN ALL EROSION CONTROL MEASURES DEPICTED ON THIS PLAN.
  - THE INSTALLER SHALL NOTIFY THIS DESIGNER 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
  - THE DESIGNER SHALL BE CONTACTED IF ANY DISCREPANCIES ARE FOUND IN THE FIELD.
  - THE INSTALLER SHALL CONTACT THE DESIGNER AT LEAST 24 HOURS IN ADVANCE FOR BOTTOM AND COVER INSPECTIONS.
  - THE CONTRACTOR IS RESPONSIBLE FOR DEWATERING DURING EXCAVATION OF ALL COMPONENTS OF THE OWTS.
- OWTS NOTES**
- ALL DESIGN, CONSTRUCTION, AND MAINTENANCE REQUIREMENTS, WHETHER NOTED HEREON OR NOT, SHALL BE IN CONFORMANCE WITH RULES AND REGULATIONS ESTABLISHING MINIMUM STANDARDS RELATING TO LOCATION, DESIGN, CONSTRUCTION AND MAINTENANCE OF ONSITE WASTEWATER TREATMENT SYSTEMS: JULY, 2012 AND ALL AMENDMENTS, BY THE RHODE ISLAND DEPT. OF ENVIRONMENTAL MANAGEMENT.
  - ALL TREES, STUMPS, AND BRUSH SHALL BE REMOVED WITHIN 10 FEET OF THE SYSTEM.
  - THERE ARE NO KNOWN PRIVATE WELLS OR DRAINS EXIST, OR PROPOSED LOCATED WITHIN 200 FEET OF THE OWTS EXCEPT AS SHOWN AND NO KNOWN PUBLIC WELLS (EXIST. & PROP.) LOCATED WITHIN 500 FEET OF THE PROPOSED ISDS.
  - THERE ARE NO KNOWN SUBSURFACE DRAINS, EXISTING OR PROPOSED, WITHIN 50 FEET OF THE PROPOSED OWTS.
  - NO VEHICULAR TRAFFIC IS ALLOWED OVER THE LEACHFIELD.

**DESIGN CRITERIA**

- PEAK FLOW = 3 BEDROOMS @ 115 GALLONS PER DAY / BEDROOM = 345 GPD
- CATEGORY 1 SYSTEM SOIL: CAT 3 USE 3.5 GAL/SP/DAY LOADING RATE
- 345 GPD / 3.5 GAL/SP/DAY = 98.6 S.F.
- USE 8' X 13' BOTTOMLESS SAND FILTER

**INVERT SCHEDULE**

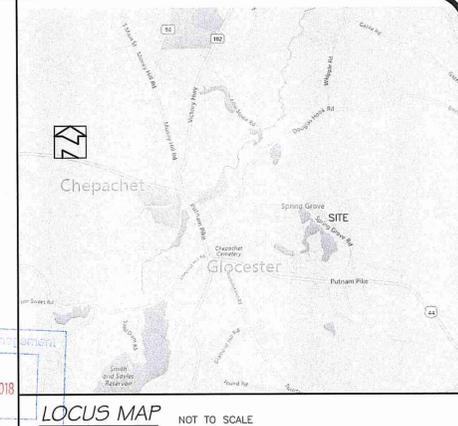
|                        |            |
|------------------------|------------|
| OUT OF DWELLING        | EL. 448.00 |
| DESIGN W/T BSF/TANK    | EL. 440.00 |
| SEPTIC TANK IN         | EL. 445.30 |
| TOP OF SEPTIC TANK     | EL. 446.13 |
| R.S.V. TO PUMP CHAMBER | EL. 445.30 |
| AX20 FILTER POD INLET  | EL. 447.50 |
| TOP OF ADVANTEK FILTER | EL. 448.00 |
| PUMP CHAMBER INLET     | EL. 445.20 |
| PUMP CHAMBER OUT       | EL. 445.70 |
| BOTTOM OF SAND         | EL. 448.00 |
| BOTTOM OF PEA GRAVEL   | EL. 448.00 |
| FLUSHING VALVE         | EL. 448.50 |
| BSF MANIFOLD           | EL. 448.50 |
| TOP OF PEA GRAVEL      | EL. 448.70 |

**PUMP CHAMBER**

|                   |            |
|-------------------|------------|
| BOTTOM OF CHAMBER | EL. 443.00 |
| REDUNDANT OFF     | EL. 443.63 |
| PUMP ON           | EL. 444.80 |
| HIGH WATER ALARM  | EL. 444.70 |

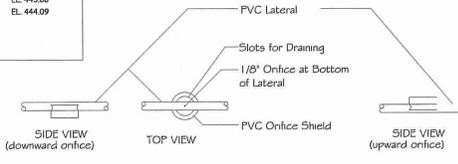
**ADVANTEK AX20 SYSTEM FLOAT LEVELS**

|                               |            |
|-------------------------------|------------|
| HIGH WATER ALARM              | EL. 445.21 |
| TOP OF BSF CASE               | EL. 446.35 |
| NORMAL LOW LIQUID LEVEL       | EL. 445.88 |
| LOW WATER ALARM/REDUNDANT OFF | EL. 444.09 |

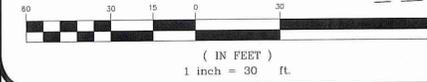
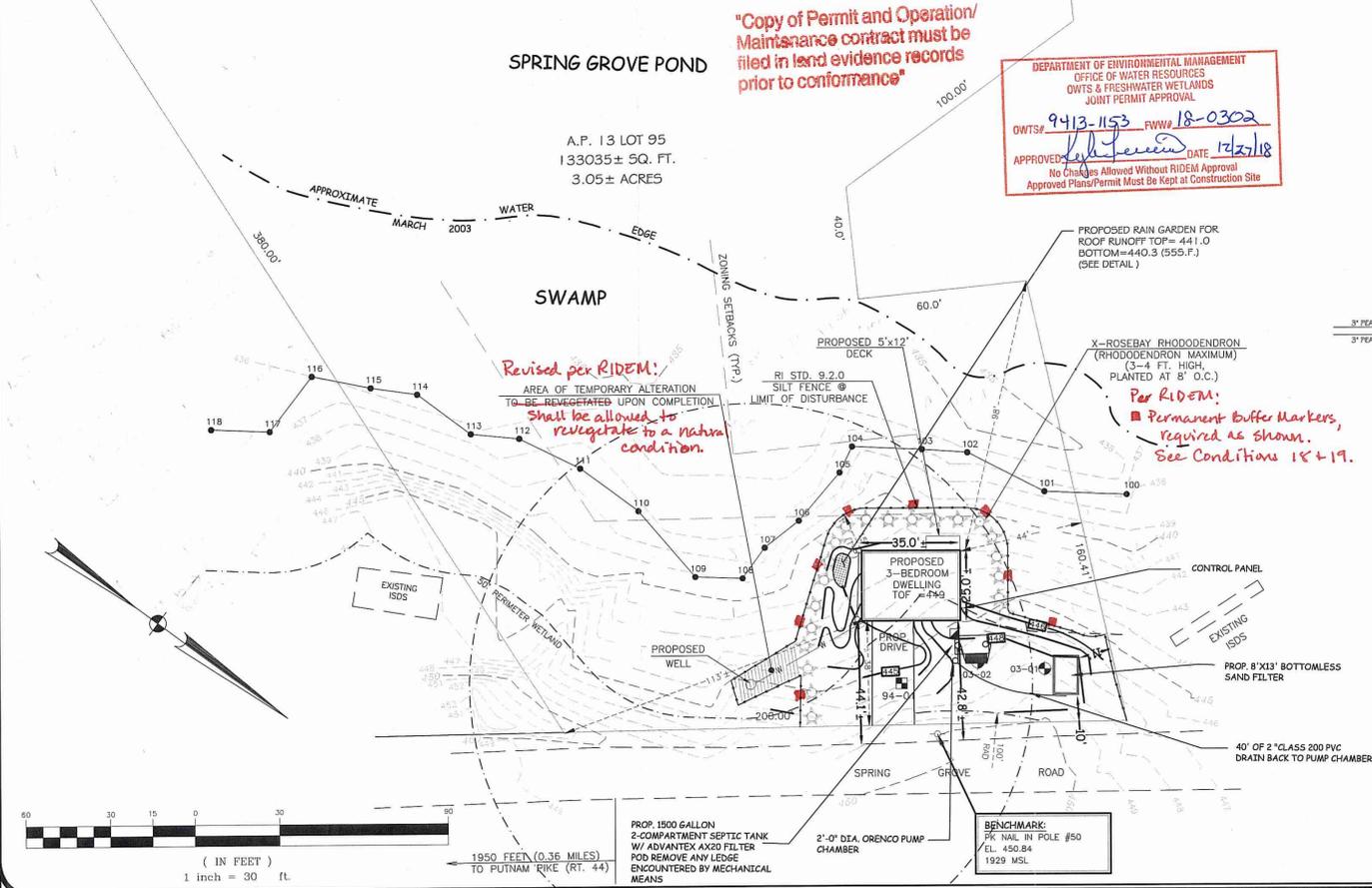


**BOTTOMLESS SAND FILTER (BSF) NOTES**

- THE PROPOSED BOTTOMLESS SAND FILTER (BSF) SHALL BE STAFFED OUT AND PROTECTED PRIOR TO ANY SITE PREPARATION ACTIVITIES, OVER DIGGING THE SAND FILTER SHOULD BE AVOIDED. MINIMAL BACKFILLING ON BOTTOM AND SIDES PROVIDES A MORE STABLE ENCLOSURE.
- SOD, VEGETATION AND DEAD OR DECAYING ORGANIC LITTER SHALL BE REMOVED FROM THE LINE IN PLACE DURING INSTALLATION. TREATED WOOD IS NOT ALLOWED. DURING CONSTRUCTION OF THE SAND FILTER, IT IS IMPORTANT THAT SAND BE PLACED BETWEEN THE DCAVATED SOIL AND THE SUPPORT FRAME. ALL NAILS OR STAPLES USED MUST HAVE THEIR SHARP ENDS POINT AWAY FROM THE LINE.
- A PERMETER SUPPORT FRAME OF PLYWOOD AND 2x4 CONSTRUCTION IS USED TO HOLD THE LINE IN PLACE DURING INSTALLATION. TREATED WOOD IS NOT NECESSARY. DURING CONSTRUCTION OF THE SAND FILTER, IT IS IMPORTANT THAT SAND BE PLACED BETWEEN THE DCAVATED SOIL AND THE SUPPORT FRAME. ALL NAILS OR STAPLES USED MUST HAVE THEIR SHARP ENDS POINT AWAY FROM THE LINE.
- A PERMANENT TOP FRAME STRUCTURE (SUCH AS DECAY RESISTANT LANDSCAPE TIMBERS) MUST BE PROVIDED ON ANY PORTION OF A BSF THAT IS INSTALLED ABOVE GRADE. BELOW GRADE USE OF TIMBERS IS PROHIBITED TO PREVENT SOIL SWELLING AFTER TIMBERS HAVE ROTTED.
- MAINTAIN 5 FOOT LEVEL PERMETER AROUND BSF.
- THE 30 MIL PVC LINER IS UNFOLDED FROM THE CENTER OF THE EXCAVATION AND DRAPE OVER THE TOP EDGES OF THE PERMETER SUPPORT FRAME. CARE MUST BE TAKEN TO ENSURE THAT THE LINER IS IN FULL CONTACT WITH SIDES AND THAT NO BRIDGING OCCURS.
- FILTER SAND IS PLACED AND COMPACTED WHILE IT IS DAMP. IF THE SAND IS NOT DAMP, IT WILL NOT COMPACT WELL AND SETTLEMENT MAY CAUSE DISLOCATION AND BREAKAGE OF THE DISTRIBUTION LATERALS. THE SAND SURFACE MUST BE FLAT. SEE THE APPROPRIATE SAND GRADATION GRAPH FOR SPECIFICATIONS.
- THREE INCHES OF 3/8 INCH PEA STONE IS PLACED ON TOP OF THE COMPACTED SAND, DISTURBING THE SAND AS LITTLE AS POSSIBLE. SEE PEA STONE SPEC. AFTER THE LATERALS ARE INSTALLED AND PRESSURE TEST IS PERFORMED, PLACE PEA STONE OVER THE DISTRIBUTION LATERALS TO PROVIDE 3 INCHES DEPTH OF PEA STONE OVER ALL UPPER ORIFICE SHIELDS. NO FILTER FABRIC OF ANY KIND SHOULD BE PLACED BETWEEN THE SAND AND OVERLYING PEA STONE.
- THE LINES PVC BOOT PERMITS A WATER TIGHT PENETRATION OF THE LINE FOR THE TRANSPORT PIPE DELIVERING EFFLUENT TO THE SAND FILTERS DISTRIBUTION SYSTEM. IN THE EVENT THE GROUND WATER REACHES THAT ELEVATION, THE BOOT WILL PREVENT INFILTRATION. THE MANUFACTURERS GUIDE MUST BE FOLLOWED EXACTLY WHEN INSTALLING THE PVC BOOT.
- THE 1/2 INCH DIAMETER ORIFICES SHOULD BE DRILLED WITH A DRILL PRESS OR DRILL GUIDE USING A NEW 1/8 INCH DRILL BIT AND SHOULD NOT HAVE ANY VISIBLE BURRS. ALL PVC LINES SHOULD BE GUIDED ACCORDING TO THE MANUFACTURERS INSTRUCTIONS.
- ORIFICE SHIELDS ARE PLACED ON THE LATERALS TO PREVENT THE PEA GRAVEL FROM BLOCKING THE FLOW OUT OF THE ORIFICES AND TO OBTAIN BETTER EFFLUENT DISTRIBUTION OVER THE SAND. COLD WEATHER ORIFICE SHIELDS SHOULD BE USED IN COLD WEATHER CLIMATES TO PREVENT THE FREEZING OF THE LATERALS.
- AS PART OF THE COLD WEATHER REQUIREMENT, TWO (2) OF THE ORIFICES IN EACH DISTRIBUTION LATERAL MUST BE DRILLED POINTING UPWARD AND THE REST ARE DRILLED POINTING DOWNWARD. UPPOINTING ORIFICES SHALL BE LOCATED AT POINTS APPROXIMATELY 1/3 AND 2/3 ALONG THE LENGTH OF EACH DISTRIBUTION LATERAL. INSTALL COLD WEATHER ORIFICE SHIELDS AT ALL ORIFICES (UPWARD AND DOWNWARD POINTING).
- THE ELECTRICAL SPICE BOX MUST BE UL OR CSA LISTED AND CORROSION-PROOF WITH THE PROPER NUMBER OF CORD GRIPS INSTALLED. HEAT SHRINK AND OR WATERPROOF WIRE NUTS MUST BE USED ON THE INDIVIDUAL WIRE SPICES. WITHIN THE BOX TO ENSURE THE INTEGRITY OF THE SPICES IF THE BOX BECOMES FLOODED. SUFFICIENT LENGTH OF WIRES MUST BE PROVIDED IN THE BOX TO ALLOW FOR FUTURE REPAIRS.
- THE ELECTRICAL CONDUIT MUST BE UL OR CSA LISTED AND MUST BE INSTALLED USING PROPER CONDUIT SEALANT AS RECOMMENDED BY THE MANUFACTURER. SILICONE IS NOT ALLOWED. THE SEAL PREVENTS WATER FROM DRAINING INTO THE SPICE BOX AND GASES FROM ESCAPING THE TANK.
- THE ELECTRICAL CONDUIT MUST BE UL OR CSA LISTED. THERE ARE ELECTRICAL CODE RULES RESTRICTING THE NUMBER OF BENDS BETWEEN PANELS AND JUNCTION BOXES. REFER TO NEC 1998 SECTION 347-14.
- INSTALL LED INSULATION ON ALL LIDS TO PREVENT FREEZING.
- THE CLASS 200 TRANSPORT PIPE SHALL BE ALLOWED TO DRAIN BACK COMPLETELY, TO PUMP CHAMBER. MAXIMIZE PITCH OF TRANSPORT PIPE TO ACHIEVE DRAINBACK AND PROVIDE FURTHER FREEZE PROTECTION AS CONDITIONS WARRANT.
- IN AREAS WHERE THE BSF MAY BE ACCESSIBLE TO CHILDREN, THE PEA STONE SURFACE MAY BE COVERED WITH A BRICK WAVE FILTER FABRIC AND AN ADDITIONAL LAYER OF PEA STONE OR LARGER WASHED STONE, NO GREATER THAN 2\"/>



**COLD WEATHER ORIFICE DETAIL**



**OWTS SITE PLAN & DETAILS**  
**OWTS DESIGN**  
 A.P. 13 LOT 95  
 SPRING GROVE ROAD, GLOCESTER, RI

PREPARED FOR:  
 PAUL THERRIEN

**ADVANCED CIVIL DESIGN, INC.**  
 CIVIL ENGINEERS

88 PEEPTOD RD  
 SCITUATE, RI 02857

NO. DATE DESCRIPTION

NICHOLAS J. PIAMPANO  
 REGISTERED PROFESSIONAL ENGINEER (CIVIL)  
 D 3059

DATE: JULY 30, 2018  
 SCALE: AS NOTED  
 DESIGN/CHECK BY: C.S.R.

SHEET NO. **1**

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