



- NOTES**
- 1.) ALL FILL BENEATH THE SOIL ABSORPTION SYSTEM SHALL BE IN CONFORMANCE WITH 310 CMR 15.255 (3) AND SHALL BE WASHED SAND OR A.S.T.M. C33 CONCRETE SAND
 - 2.) THIS SYSTEM IS NOT DESIGNED FOR USE WITH A GARBAGE GRINDER.
 - 3.) REMOVE ALL TOPSOIL, ROOTS AND SUBSOIL AND REPLACE WITH SPECIFIED FILL WITHIN 5 FEET OF SYSTEM. FILL SHALL BE IN CONFORMANCE WITH CMR 15.255-(3).
 - 4.) COVER MATERIAL OVER THE SYSTEM SHALL BE FREE OF CLAY, STONES, MASONRY, STUMPS, OR WASTE CONSTRUCTION MATERIAL. THE TOP 3" SHALL BE LOAMED AND SURFACE SEEDED. MACHINERY WHICH MAY CRUSH OR DISTURB THE ALIGNMENT OF THE PIPES IN THE DISPOSAL AREA SHALL NOT BE ALLOWED.
 - 5.) FOUNDATION DRAINS ARE NOT TO BE INSTALLED WITHIN 1/2 FT. OF THE SEPTIC TANK NOR WITHIN 1/2 FT. OF THE SOIL ABSORPTION SYSTEM.
 - 6.) ALL PIPING SHALL BE LAID STRAIGHT ON CONTINUOUS GRADE AND SHALL HAVE WATER TIGHT JOINTS
 - 7.) PROPERTY LINES SHOWN WERE TAKEN FROM EXISTING PLANS AND RECORDS. SEE E.N.D.R.D. BK. 12,747 PG. 280 AND E.S.D.R.D. BK. 30,962 PG. 504
 - 8.) THE LOCATION OF EXISTING UNDERGROUND UTILITIES WAS TAKEN FROM EXISTING PLANS AND RECORDS OR FROM FIELD OBSERVATIONS AND MARKINGS AND ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE CONSTRUCTION BEGINS. THE DESIGN ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES SO THAT REMEDIAL ACTION CAN BE TAKEN.
 - 9.) THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER 48 HRS. IN ADVANCE OF BED EXCAVATION AND COMPLETION SO THAT REQUIRED INSPECTIONS CAN OCCUR.
 - 10.) THE CONTRACTOR SHALL BE FINANCIALLY RESPONSIBLE FOR THE AS-BUILT INSPECTIONS AND PLAN. THIS SERVICE SHALL BE INCLUDED AS PART OF THE CONSTRUCTION CONTRACT.
 - 11.) FOR THE REPAIR (OR UPGRADE) OF SYSTEMS, THE EXISTING S.A.S. AND SURROUNDING AND UNDERLYING SPOILED SOIL SHALL BE EXCAVATED AND REMOVED WHEREVER IT IS WITHIN 5 FT. OF THE PROPOSED SYSTEM.
 - 12.) FOR THE REPAIR (OR UPGRADE) OF SYSTEMS, THE EXISTING SEPTIC TANK SHALL BE PUMPED AND EITHER PUNCTURED AT THE BOTTOM AND FILLED WITH CLEAN SAND OR COLLAPSED AND REMOVED FROM SITE.
 - 13.) NO PRIVATE WELLS EXIST WITHIN 100 FT. NOR ANY PUBLIC WELLS OR DRINKING WATER SUPPLIES WITHIN 400 FT. OF THE SYSTEM.
 - 14.) NO WETLANDS EXIST WITHIN 50 FT. OF THE PROPOSED SYSTEM.
 - 15.) THIS SYSTEM DESIGN, ALL MATERIALS AND COMPONENTS AND ALL INSTALLATION PROCEDURES SHALL BE AND ARE INTENDED TO BE IN FULL CONFORMANCE WITH TITLE 5, MINIMUM REQUIREMENTS FOR THE SUBSURFACE DISPOSAL OF SANITARY SEWAGE, 310 CMR 15.001 THROUGH 15.505, UNLESS OTHERWISE NOTED.

DESIGN CALCULATIONS

DESIGN FLOW = 2 BEDROOMS x 165 GAL/DAY = 330 GPD.
 DESIGN PERC RATE: 11 M.P.I.
 SOIL CLASS: II
 LEACHING FIELD REQUIRED = 330 GAL. x 1/56 GPD/S.F. = 590 S.F.
 USE QUICK 4 STD. LP INFILTRATOR CHAMBER 4.73 S.F./L.F.
 590 S.F. / 4.73 S.F./L.F. = 125 L.F. (32 CHAMBERS)
 USE 36 INFILTRATOR CHAMBERS IN A 4 x 9 CONFIGURATION = 144 L.F.
 EFFECTIVE AREA PROVIDED: 4.73 S.F./L.F. x 144 L.F. = 681 S.F.
 SEPTIC TANK REQ'D: 200x x 330 GAL. = 660 GAL. BUT NOT LESS THAN 1500 GAL.
 SEPTIC TANK PROVIDED: 1500 GAL.

I CERTIFY THAT ON MAY 9, 1996, I PASSED THE EXAMINATION APPROVED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THAT THE ABOVE ANALYSIS WAS PERFORMED BY ME CONSISTENT WITH THE REQUIRED TRAINING, EXPERTISE AND EXPERIENCE DESCRIBED IN 310 CMR 15.017.

SIGNATURE: *Bill Dufresne* DATE: 9-7-16

**UPGRADE PLAN OF
SUBSURFACE SEWAGE DISPOSAL SYSTEM**
 IN
BOXFORD, MASS.
 AS PREPARED FOR
JIM & JANET FOLEY
 174 BRADFORD STREET

SCALE: AS SHOWN DATE: 9-7-16
 ASSESSORS MAP # 1 LOT 14 SUBDIVISION LOT # 10

MERRIMACK ENGINEERING SERVICES
 66 PARK STREET
 ANDOVER, MASSACHUSETTS 01810

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DEEP TEST RESULTS

NO.	DATE	BY	REVISIONS:
1	10-3-16	WRD	SEPTIC TANK DETAIL

PERC TEST RESULTS

DEPTH	SOAK TIME	PERC RATE
46" (FROM ADJACENT LOT #162)	15	11 M.P.I.
12"-9" DROP	23	
9"-6" DROP	33	

BOUYANCY CALCULATIONS

ITEM	VALUE
VOLUME OF WATER DISPLACED	4.67 Wt = 9.8 Lb = 3.3 C.F. = 145.4 C.F.
WEIGHT OF WATER DISPLACED	145.4 C.F. x 62.4 LBS / C.F. = 9,155 LBS
WT. OF 1000 GAL TANK	10,000 LBS
WEIGHT OF SOIL COVER OVER TANK	9.8 Lb x 4.67 Wt = 0.79 C.F. = 33.27 C.F.
TOTAL WEIGHT OF TANK AND SOIL	10,000 + 3,660 = 13,660 LBS
DIFFERENCE TANK WILL NOT FLOAT	

DEEP TESTS AND RESULTS ARE PROVIDED TO DEMONSTRATE SOIL SUITABILITY FOR THE PURPOSE OF COMPLIANCE WITH TITLE 5 AND WERE NOT INTENDED TO BE USED FOR CONSTRUCTION ESTIMATING. THE DEPTH OF EXCAVATION MAY NOT BE REFLECTED IN THESE RESULTS AND SHOULD BE DETERMINED IN THE FIELD BY THE CONTRACTOR. ANY USE OF THESE RESULTS FOR ESTIMATING PURPOSES SHALL BE DONE SO AT THE CONTRACTORS RISK.