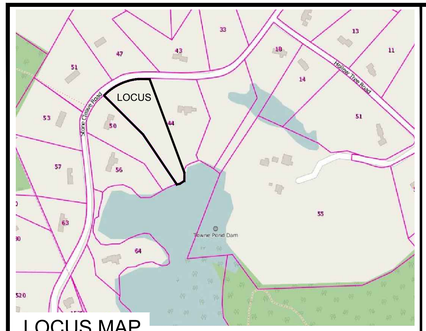
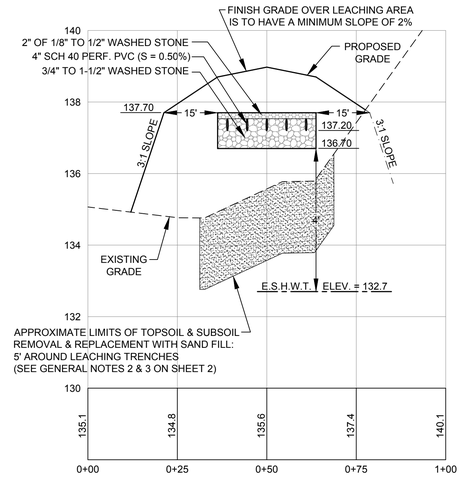


LOCUS MAP

SCALE: 1"

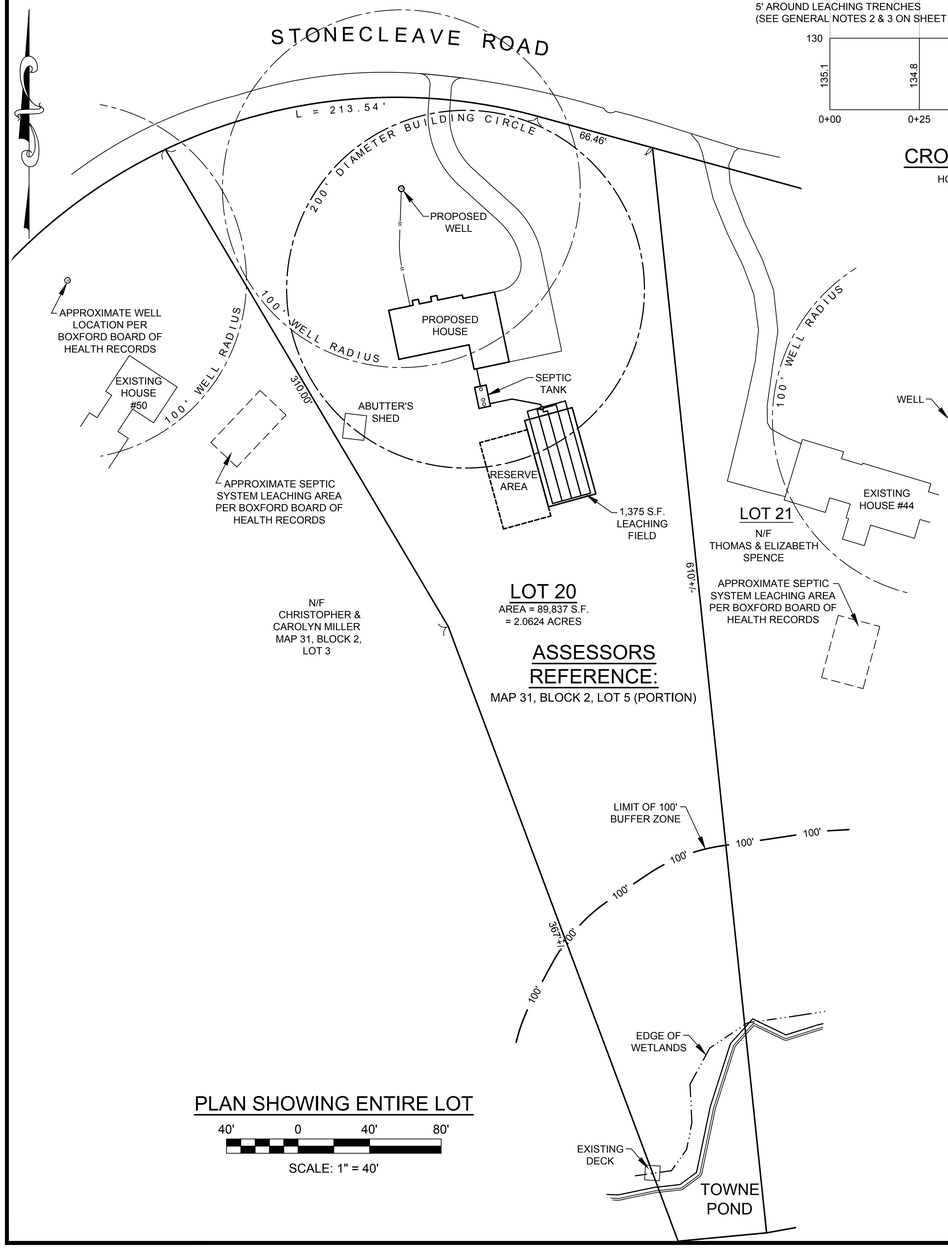
SYSTEM ELEVATIONS

INV. OF PIPE OUT OF HOUSE	138.70
INV. OF PIPE AT SEPTIC TANK INLET	138.50
INV. OF PIPE AT SEPTIC TANK OUTLET	138.25
INV. OF PIPE AT D-BOX INLET	137.80
INV. OF PIPE AT D-BOX OUTLET	137.63
INV. AT BEGINNING OF LEACHING FIELD	124.45
INV. AT END OF LEACHING FIELD	137.20
BOTTOM OF LEACHING FIELD	136.70



CROSS-SECTION A-A

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



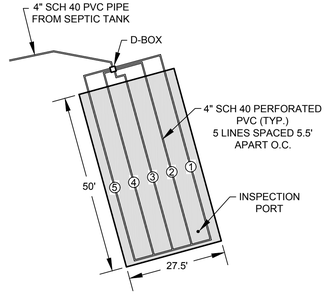
ASSESSORS REFERENCE:

MAP 31, BLOCK 2, LOT 5 (PORTION)

PLAN SHOWING ENTIRE LOT

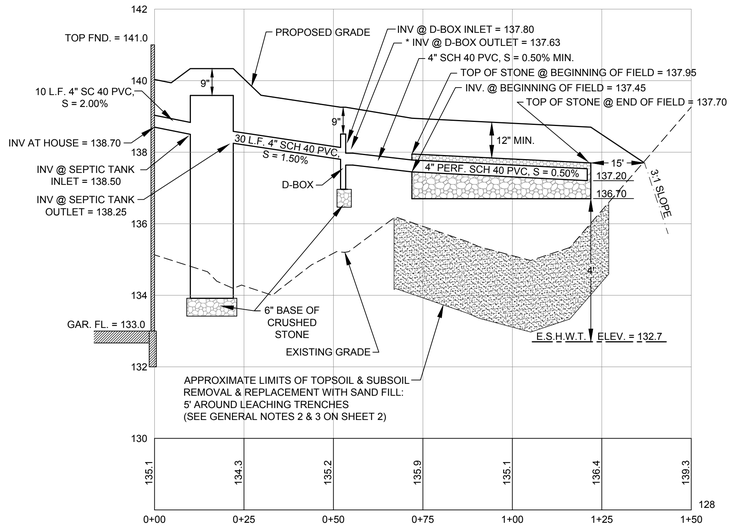
40' 0 40' 80'

SCALE: 1" = 40'



LEACHING FIELD DETAIL

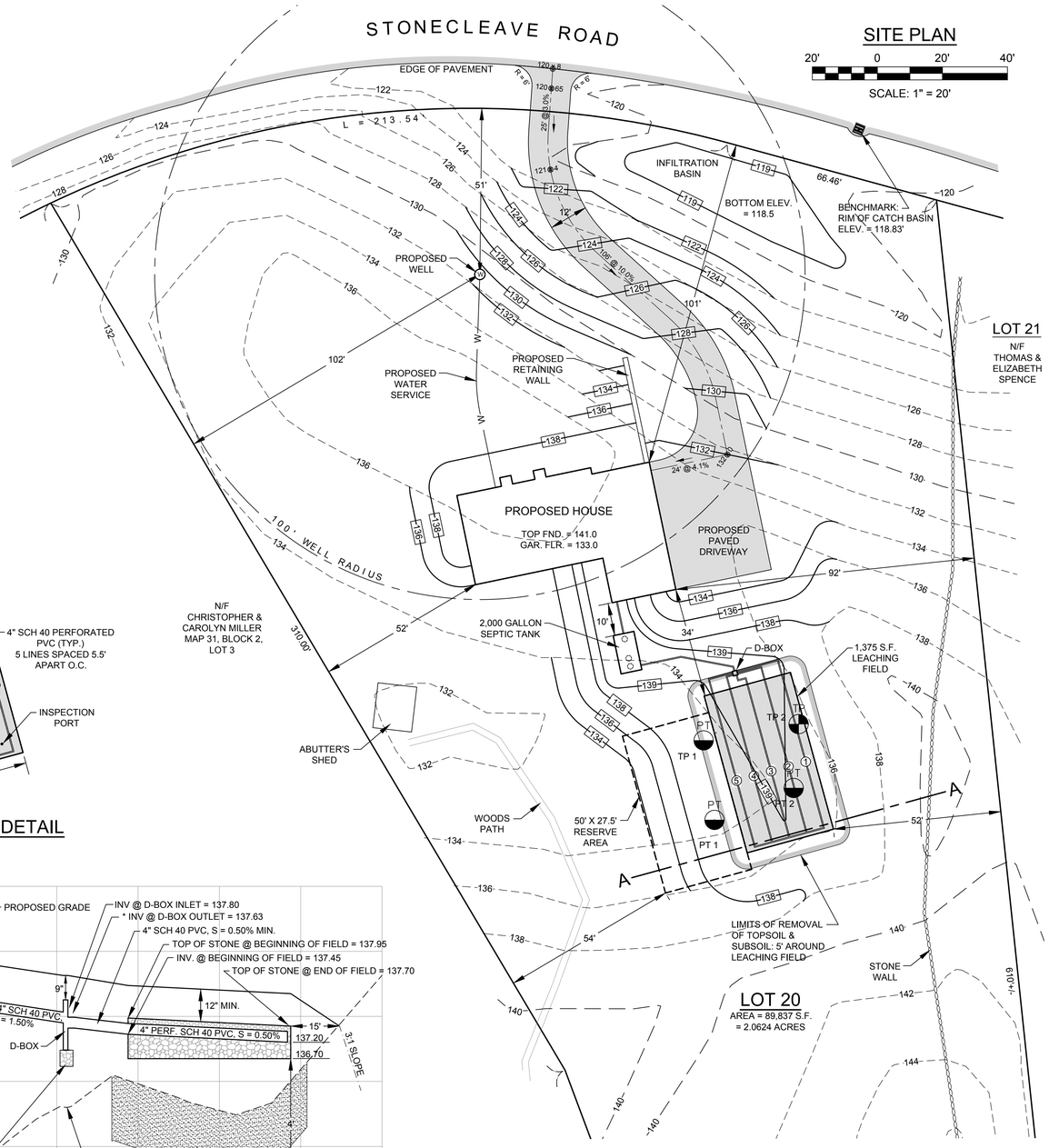
SCALE: 1" = 20'



PROFILE (THROUGH LEACH LINE #1)

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

* ALL OUTLETS FROM THE D-BOX OUTLET ARE TO BE AT THE SAME INVERT ELEVATION. THE OUTLET DISTRIBUTION LINES SHALL BE LEVEL FOR A MINIMUM OF THE FIRST TWO FEET OF THEIR LENGTH.



SITE PLAN

20' 0 20' 40'

SCALE: 1" = 20'

SEPTIC SYSTEM DESIGN

FOR

LOT 20 STONECLEAVE ROAD

IN

BOXFORD, MASS.

OWNER/APPLICANT

THOMAS SPENCE
44 STONECLEAVE DRIVE
BOXFORD, MA 01921

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PHILIP G. CHRISTIANSEN
CIVIL
No. 28955
REGISTERED PROFESSIONAL ENGINEER

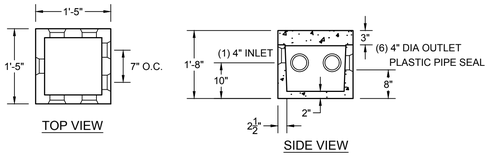
PHILIP G. CHRISTIANSEN

DATE: AUGUST 10, 2016

REV:

SHEET 1 OF 2

DWG. NO. 15051003

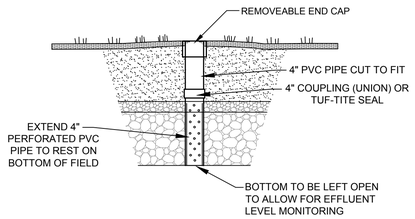


DISTRIBUTION BOX

USE SHEA CONCRETE PRODUCTS
6-OUTLET H-20 DISTRIBUTION BOX,
ITEM NO. B-6DBH

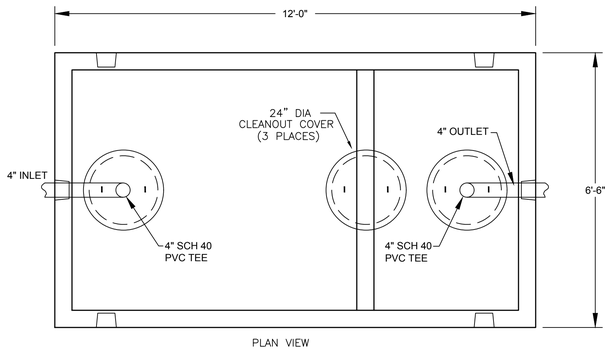
NOTES:

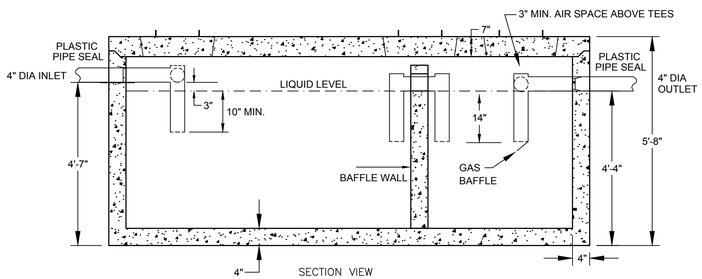
1. DISTRIBUTION BOX SHALL BE OF REINFORCED CONCRETE CONSTRUCTION & SHALL BE WATERTIGHT THROUGH MANUFACTURER'S SPECIFICATION & WARRANTY.
2. DISTRIBUTION BOX IS TO BE SET LEVEL & TRUE TO GRADE ON A LEVEL STABLE BASE WHICH HAS BEEN MECHANICALLY COMPACTED. IF THE DISTRIBUTION BOX IS PLACED IN FILL, PROPER COMPACTION IS REQUIRED TO ENSURE STABLILITY & TO PREVENT SETTLING; NATIVE GROUND WITH A SIX INCH STONE BASE IS OTHERWISE ADEQUATE.
3. AN INLET TEE EXTENDING TO ONE INCH ABOVE THE OUTLET INVERT MAY BE PROVIDED IN PLACE OF THE INLET BAFFLE.
4. DISTRIBUTION BOX SHALL BE DESIGNED & CONSTRUCTED SO AS TO WITHSTAND H-20 LOADING.
5. A RISER TO WITHIN 6 INCHES OF FINAL GRADE IS REQUIRED IF THE DISTRIBUTION BOX IS TO HAVE GREATER THAN 9 INCHES OF COVER.



INSPECTION PORT

NOT TO SCALE





SPECIFICATIONS:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. ALL REINFORCEMENT PER ASTM C1227-93.
3. TONGUE & GROOVE JOINT SEALED WITH BUTYL RESIN.

2000 GALLON TWO-COMPARTMENT SEPTIC TANK

NOTES:

1. THE SEPTIC TANK SHALL BE WATERTIGHT THROUGH MANUFACTURER'S SPECIFICATION AND WARRANTY.
2. THE SEPTIC TANK SHALL BE INSTALLED LEVEL AND TRUE TO GRADE ON A LEVEL STABLE BASE THAT HAS BEEN MECHANICALLY COMPACTED AND ON TO WHICH SIX INCHES OF CRUSHED STONE HAS BEEN PLACED TO MINIMIZE UNEVEN SETTLING. IF THE SEPTIC TANK IS PLACED IN FILL, PROPER COMPACTION IS REQUIRED TO ENSURE STABILITY AND TO PREVENT SETTLING. THE SEPTIC TANK SHALL HAVE A MINIMUM COVER OF NINE INCHES.
3. THE SEPTIC TANK, COVERS, CONNECTIONS AND PIPING SHALL BE DESIGNED AND CONSTRUCTED SO AS TO WITHSTAND A MINIMUM H-10 LOADING.

SOIL EVALUATION RESULTS

DATE OF TESTS: 5/18/2016 and 7/19/2016
SOIL EVALUATOR: Steven Erikson SE 688
WITNESS: Kendall Longo

Test Pit #1
Surface Elevation = 133.8

0-6"	Ap	FSL	10YR2/2
6-18"	BW	FSL	10YR4/6
18-90"	C1	SL	5Y5/3
OBSERVED WATER:		NO	
ESHWT		40"	

Test Pit #2
Surface Elevation = 135.6

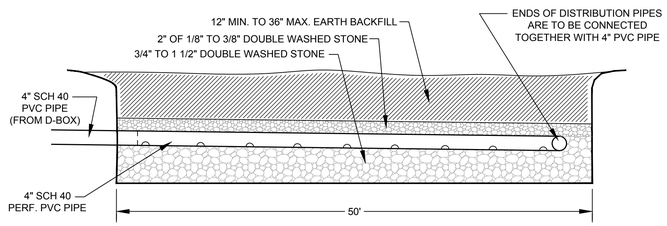
0-7"	AP	FSL	10YR2/2
7-24"	BW	FSL	5YR 4/3
24-95"	C1	SL	2.5Y 4/4
OBSERVED WATER		NO	
ESHWT		40"	

Perc Test 1: May 18, 2016

Depth of perc test:	56"
Start pre-soak	10:49
End Pre-soak	11:04
12"	11:04
9"	11:15
6"	11:32
Time 9" to 6"	17 MIN
Perc rate:	6 min/inch

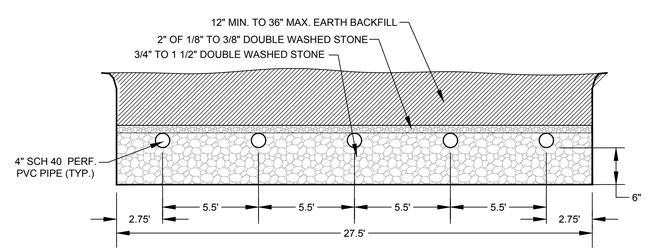
Perc Test 2: July 19, 2016

Depth of perc test:	44"
Start pre-soak	11:08
End Pre-soak	11:23
12"	11:23
9"	11:28
6"	11:35
Time 9" to 6"	7 MIN
Perc rate:	3 min/inch



LEACHING FIELD ~ LONGITUDINAL SECTION

NOT TO SCALE



LEACHING FIELD ~ CROSS SECTION

NOT TO SCALE

GENERAL NOTES

1. NO GARBAGE DISPOSALS ARE TO BE INSTALLED.
2. FILL MATERIAL FOR SYSTEMS CONSTRUCTED IN FILL SHALL CONSIST OF SELECT ON-SITE OR IMPORTED SOIL MATERIAL. THE FILL MATERIAL SHALL BE COMPRISED OF CLEAN GRANULAR SAND, FREE FROM ORGANIC MATTER & DELETERIOUS SUBSTANCES. MIXTURES & LAYERS OF DIFFERENT CLASSES OF SOILS SHALL NOT BE USED. THE FILL SHALL NOT CONTAIN ANY MATERIAL LARGER THAN 2 INCHES. A SIEVE ANALYSIS, USING A #4 SIEVE, SHALL BE PERFORMED ON A REPRESENTATIVE SAMPLE OF THE FILL. UP TO 45% BY WEIGHT OF THE SAMPLE MAY BE RETAINED ON THE #4 SIEVE. SIEVE ANALYSES ALSO SHALL BE PERFORMED ON THE FRACTION OF THE FILL SAMPLE PASSING THE #4 SIEVE, SUCH ANALYSES MUST DEMONSTRATE THAT THE MATERIAL MEETS EACH OF THE FOLLOWING SPECIFICATIONS:

SIEVE SIZE	EFFECTIVE PARTICAL SIZE	% THAT MUST PASS SIEVE
# 4	4.75 mm	100%
# 50	0.30 mm	10% - 100%
#100	0.15 mm	0% - 20%
#200	0.075 mm	0% - 5%

3. WHERE FILL IS REQUIRED TO REPLACE UNSUITABLE OR IMPERMEABLE SOILS, THE EXCAVATION OF THE UNSUITABLE MATERIAL SHALL EXTEND A MINIMUM OF FIVE FEET LATERALLY IN ALL DIRECTIONS BEYOND THE OUTER PERIMETER OF THE SOIL ABSORPTION SYSTEM TO THE DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL AS REQUIRED BY 310 CMR 15.240 (SOIL ABSORPTION SYSTEMS) & REPLACED WITH FILL MATERIAL MEETING THE SPECIFICATIONS OF NOTE #2 ABOVE.
4. PRIOR TO PLACEMENT OF FILL, WHICH SHALL BE STOCKPILED AT THE EDGE OF THE EXCAVATION & FILLED IN GRADUALLY, THE BOTTOM OF THE EXCAVATION SHALL BE SCARIFIED & RELATIVELY DRY. FILL SHALL NOT BE PLACED DURING RAIN OR SNOW STORMS. IF THE WATER TABLE ELEVATION IS ABOVE THE ELEVATION OF THE BOTTOM OF THE EXCAVATION, THE EXCAVATION SHALL BE DEWATERED AS NECESSARY.
5. A TWO TO FOUR YEAR SEPTIC TANK PUMPING SCHEDULE IS RECOMMENDED TO AVOID LEACHING AREA PROBLEMS.
6. ALL PIPE INSTALLED AFTER THE SEPTIC TANK SHALL BE SCHEDULE 40 PVC. JOINTS SHALL BE ELASTOMETRIC GASKETED INTEGRAL BELL TYPE JOINTS. ASSEMBLY SHALL BE PERFORMED AS PER MANUFACTURERS SPECIFICATIONS.
7. THE BUILDING SEWER SHALL BE 4" SCH 40 PVC PIPE SURROUNDED BY A MINIMUM OF 6" GRAVEL.
8. THERE ARE NO EXISTING WELLS WITHIN 150 FEET OF THE PROPOSED LEACHING AREA.
9. A SIEVE ANALYSIS SHALL BE PERFORMED ON THE FILL MATERIAL TO BE USED. A COPY OF THE RESULTS OF THE ANALYSIS SHALL BE SUBMITTED TO THE BOARD OF HEALTH FOR APPROVAL PRIOR TO ANY PLACEMENT OF FILL.
10. THE FILL MATERIAL USED SHALL BE PLACED IN 12" MAXIMUM COMPACTED LIFTS.
11. THIS LOT IS WITHIN A NITROGEN SENSITIVE AREA (PRIVATE WELL & SEPTIC SYSTEM ON A SINGLE LOT).
12. MAGNETIC TAPE TO BE APPLIED OVER ALL SYSTEM COMPONENTS.
13. A BENCHMARK WILL BE SET IN A LOCATION NEAR THE LEACHING FACILITY PRIOR TO ANY CONSTRUCTION.
14. ALL PIPING SHALL BE A MINIMUM OF SCHEDULE 40 PVC, HAVE WATERTIGHT JOINTS, & BE LAID ON A FIRM COMPACTED BASE.
15. NO WETLANDS EXIST WITHIN 150' OF THE PROPOSED LEACHING FIELD OR RESERVE AREA.

DESIGN PARAMETERS

NO. OF BEDROOMS	5
MAX. NO. OF ROOMS	11
DESIGN FLOW	825 GAL/DAY
PERC RATE USED	6 MIN/IN
SOIL CLASS	CLASS II
LOADING RATE	0.60 GPD/SF
LEACHING AREA REQUIRED	1,375 SF
FIELD LENGTH	50 FT.
FIELD WIDTH	27.5 FT.
LEACH AREA PROVIDED	1,375 S.F.
SEPTIC TANK USED	2,000 GALLON

CALCULATIONS

LEACHING AREA REQUIRED =
825 GPD / 0.60 GPD/SF = 1,375 SF

LEACHING AREA PROVIDED =
27.5 FT. X 50 FT. = 1,375 S.F.

MIN. SEPTIC TANK CAPACITY REQUIRED
= 825 GPD X 200% = 1,650 GALLONS
(USE A 2,000 GALLON, 2-COMPARTMENT TANK)

SEPTIC SYSTEM DESIGN

FOR

LOT 20 STONECLEAVE ROAD

IN

BOXFORD, MASS.

OWNER/APPLICANT

THOMAS SPENCE
44 STONECLEAVE DRIVE
BOXFORD, MA 01921

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REGISTERED
PROFESSIONAL ENGINEER

PHILIP G. CHRISTIANSEN

DATE: AUGUST 10, 2016
REV:

SHEET 2 OF 2
DWG. NO. 15051003