

# CALCULATIONS:

FIVE (5) BEDROOMS AT 110 GALLONS PER DAY PER BEDROOM =

550 GALLONS PER DAY. PROPOSED SEPTIC TANK-#1: AVERAGE DAILY FLOW = 550 G.P.D. MINIMUM STORAGE REQUIRED: 550 G.P.D. X 200% = 1,100 GAL.-FIRST COMPARTMENT 550 G.P.D. X 100% = 550 GAL.—SECOND COMPARTMENT SEPTIC TANK PROVIDED = 2,000 GALLONS - 2-COMPARTMENT TANK PRIMARY LEACHING AREA:

TOTAL LEACHING AREA PROVIDED = (3) 50' TRENCHES, 3' WIDE x 1' DEEP (3 X 50 X 5) = 750 S.F. TOTAL DESIGN FLOW = 750 S.F. X 0.74 GALLON/S.F. = 555 GALLONS.

LEACHING AREA REQUIRED = 550 GPD / 0.74 GPD/S.F. = 744 S.F.

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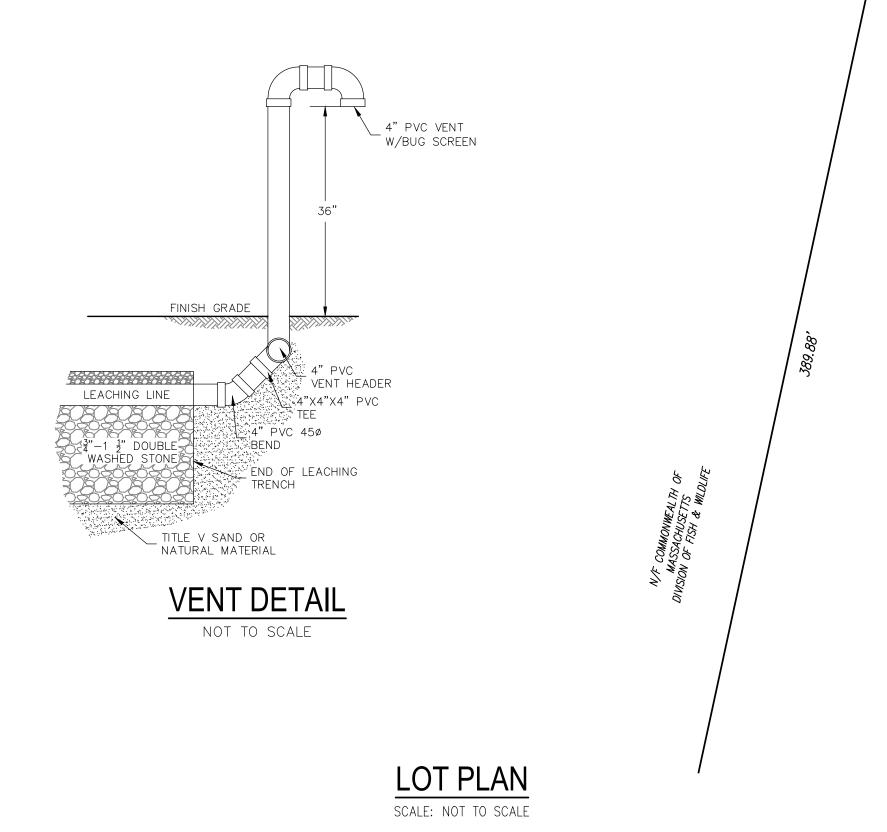
DESIGN PERCOLATION RATE = 2 M.P.I. (SOIL CLASS I)

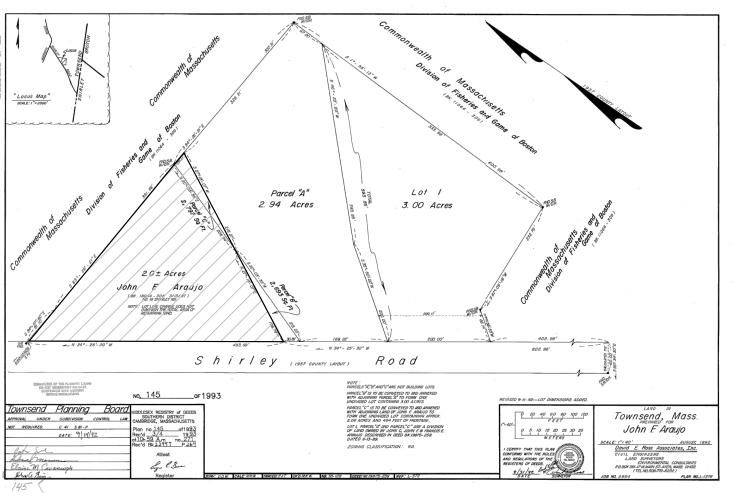
EFFLUENT LOADING RATE = 0.74 GALLONS/S.F.

PRIMARY LEACHING AREA:

DESIGN PERCOLATION RATE = 2 M.P.I. (SOIL CLASS I) EFFLUENT LOADING RATE = 0.74 GALLONS/S.F. LEACHING AREA REQUIRED = 550 GPD / 0.74 GPD/S.F. = 744 S.F. TOTAL LEACHING AREA PROVIDED = (3) 50' TRENCHES, 3' WIDE x 1' DEEP (3 X 50 X 5) = 750 S.F.

#### SCHEDULE OF ELEVATIONS: SYSTEM ELEVATIONS: PIPE DATA: TOP EL. OF FOUNDATION WALL= XXX.XX INV. EL. AT FOUNDATION WALL= 100.20\*-(SEE REPAIR NOTES) SEPTIC TANK (ST-1) - H-10 4" INV. (IN)= 99.15 4" INV. (OUT)= 98.90 GRAVITY SEWER DISTRIBUTION BOX (DB-1) 4" INV. (IN)= 97.01 4" INV. (OUT)= 96.84 S= 0.118 PRIMARY TRENCH ELEVATIONS: RESERVE TRENCH ELEVATIONS: EL. OF BOT. OF TRENCH: EL. OF BOT. OF TRENCH: EL. INV. END OF TRENCH: TRENCH: 96.67 95.42 96.67 96.42 95.42 96.42 96.67 96.42 96.67 96.42 95.42 95.42 95.42 96.67 96.42 95.42 96.67 96.42





NOTE:
ALL SYSTEM COMPONENTS ARE TO BE MARKED WITH MAGNETIC

**DISTRIBUTION BOX** 

(IN ACCORDANCE WITH 310 CMR 15.232)

PRECAST REINFORCED CONCRETE MANUFACTURER: LAMARRE PRECAST INC.

OR EQUIVALENT

SIZE = 5 OUTLET (UNUSED OUTLETS TO BE PLUGGED)

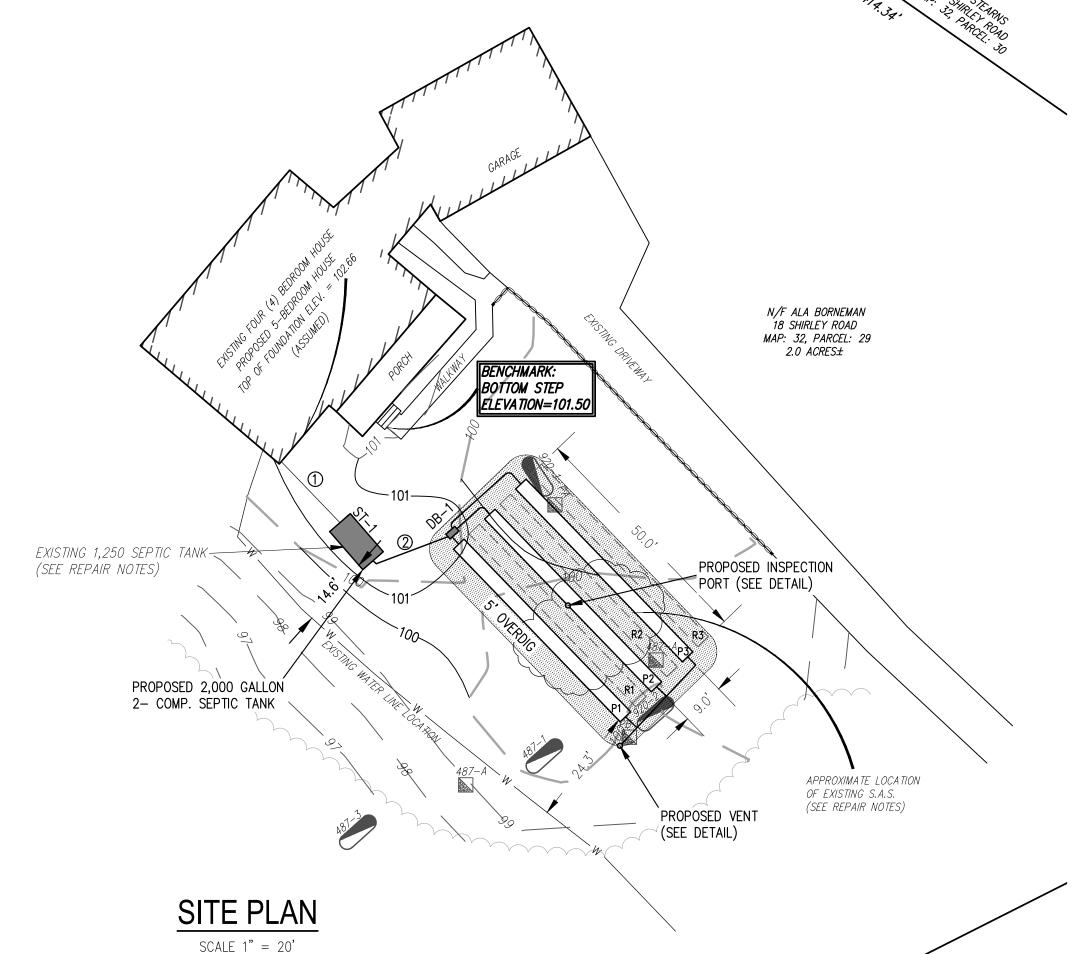
WATER TIGHT COVER (ACCESSIBLE AT FINISHED

\* TEE DEPTH INLET TEE REQUIRED
T SHALL BE IN WHEN SLOPE EXCEEDS 8%

WITH 310 CMR 15.227(6)

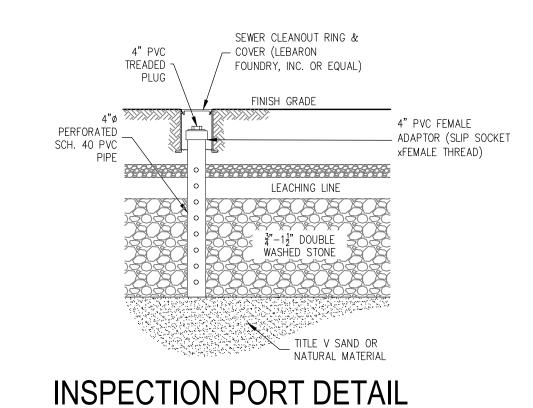
— 4" (SCH. 40) PVC SANITARY OUTLET TEE WITH

EFFLUENT TEE ON CENTERLINE OF OUTLET TOO OF TANK



#### SOIL TEST DATA ORIGINAL TESTING PERFORMED BY

CHARLES A. PERKINS CO. INC. 4/16/1987 0-24" TOP & SUB 0-24" TOP & SUB 24-102" SAND 24-96" SAND G.W.O. @ 78"



#### **GENERAL NOTES:**

- TOPOGRAPHIC INFORMATION IS THE RESULT OF AN ON-THE-GROUND SURVEY PERFORMED BY DILLIS & ROY CIVIL DESIGN GROUP, INC. ELEVATIONS REFER TO ASSUMED DATUM (SEE BENCH MARK LOCATED ON PLOT PLAN).
- PROPERTY LINE INFORMATION TAKEN FROM RECORDED PLAN ON FILE WITH THE S. MIDDLESEX REGISTRY OF DEEDS.
- PERCOLATION TESTS PERFORMED IN ACCORDANCE WITH 310 CMR (TITLE 5) REGULATIONS 15.104 AND 15.105.
- ANY DEVIATIONS FROM THE DESIGN PLAN MUST BE APPROVED IN WRITING BY DILLIS & ROY CIVIL DESIGN GROUP, INC.
- NO PERMANENT STRUCTURES MAY BE CONSTRUCTED OVER THE RESERVE LEACHING AREA.
  THE BOARD OF HEALTH REQUIRES INSPECTION OF ALL CONSTRUCTION BY THE DESIGN ENGINEER OR BY AN AGENT OF THE BOARD OF
  HEALTH, AND THAT SUCH A PERSON CERTIFIES IN WRITING THAT ALL WORK HAS BEEN COMPLETED IN ACCORDANCE WITH THE TERMS OF THE PERMIT AND THE APPROVED PLANS.
- FOR PROPER PERFORMANCE, A SEPTIC TANK SHOULD BE INSPECTED AT LEAST ONCE EVERY YEAR AND WHEN THE TOTAL DEPTH OF SCUM AND SOLIDS EXCEEDS ONE THIRD OF LIQUID DEPTH OF THE TANK, THE TANK SHOULD BE PUMPED.
- THIS DESIGN DOES NOT ACCOMMODATE A GARBAGE DISPOSAL. CONSTRUCTION WITHIN 100 FEET OF A WETLAND RESOURCE AREA AS DEFINED IN THE MASSACHUSETTS WETLAND PROTECTION ACT AND

REGULATIONS (310 CMR 10.00) SHALL NOT BE PERFORMED UNTIL AN ORDER OF CONDITIONS OR NEGATIVE DETERMINATION OF APPLICABILITY

HAS BEEN OBTAINED FROM THE LOCAL CONSERVATION COMMISSION. 10. EXISTING UTILITES SHOWN ON THIS PLAN WERE COMPILED FROM FIELD MEASUREMENT AND RECORD PLANS. THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND SHOULD NOT BE ASSUMED TO BE CORRECT NOR SHOULD IT BE ASSUMED THAT THE UTILITIES SHOWN ARE THE ONLY UTILITES LOCATED ON OR NEAR THE SITE. THE CONTRACTOR SHALL CALL DIG SAFE 1-888-DIG-SAFE PRIOR TO CONSTRUCTION IN ACCORDANCE WITH STATE LAWS.

### **CONSTRUCTION NOTES:**

- 1. FINISH GRADING SHALL BE DONE IN ACCORDANCE WITH THE PLOT PLAN. ALL DISTURBED AREAS SHALL BE COVERED WITH A MINIMUM OF 4" OF LOAM AND SEEDED WITH A NATIVE GRASS MIXTURE.
- 2. BACKFILL OVER THE SOIL ABSORPTION SYSTEM, SEPTIC TANK AND PUMP CHAMBER SHALL BE A MINIMUM OF 9 INCHES EXCLUDING TOPSOIL, PLACED IN LIFTS AND SUFFICIENTLY COMPACTED TOP PREVENT DEPRESSIONS DUE TO SETTLING. BACKFILL OVER THE SOIL ABSORPTION SYSTEM SHALL BE FREE OF STONES AND BOULDERS GREATER THAN 6 INCHES IN SIZE.
- THE BUILDING SEWER SHALL BE LAID ON A COMPACTED FIRM BASE. 4. ALL PIPING SHALL BE MINIMUM OF SCHEDULE 40 UNLESS OTHERWISE NOTED. 5. ALL PIPE JOINTS AND CONNECTIONS TO SYSTEM COMPONENTS SHALL BE MECHANICALLY SOUND, WATER TIGHT AND PROTECTED AGAINST
- 6. ALL BUILDING SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STATE PLUMBING CODE 248 CMR 2.00.
- FINAL COVER OVER THE SYSTEM SHALL BE GRADED TO REDUCE INFILTRATION OF SURFACE WATER AND MINIMIZE EROSION. FINISH GRADE SHALL HAVE A MINIMUM SLOPE OF 2%.
- EFFLUENT DISTRIBUTION LINES SHALL HAVE A SLOPE OF 0.5%. OUTLET DISTRIBUTION LINES FROM THE D-BOX SHALL BE LEVEL FOR A MINIMUM OF TWO FEET OF THEIR LENGTH.
- 10. FILL MATERIAL FOR SYSTEMS CONSTRUCTED IN FILL SHALL CONSIST OF SELECT ON-SITE OR IMPORTED SOILS THAT MEET THE MINIMUM REQUIREMENTS STATED IN 310 CMR 15.255(3).
- 11. WHERE FILL IS REQUIRED TO REPLACE UNSUITABLE OR IMPERMEABLE SOILS, THE EXCAVATION OF THE UNSUITABLE MATERIAL SHALL EXTEND A MINIMUM OF 5 FEET LATERALLY IN ALL DIRECTIONS BEYOND THE OUTER PERIMETER OF THE SOIL ABSORPTION SYSTEM TO THE DEPTH OF 3 INCHES INTO THE NATURALLY OCCURRING PERVIOUS MATERIAL. 12. THE BOTTOM SURFACE OF THE EXCAVATION SHALL BE SCARIFIED AND 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
- 13. SUBSURFACE COMPONENTS OF A SYSTEM SHALL NOT BE BACKFILLED OR OTHERWISE CONCEALED FROM VIEW UNTIL A FINAL INSPECTION HAS BEEN CONDUCTED BY THE APPROVING AUTHORITY AND PERMISSION HAS BEEN GRANTED BY THE APPROVING AUTHORITY TO BACKFILL THE SYSTEM. THE DESIGNER SHALL INSPECT THE CONSTRUCTION AFTER THE INITIAL EXCAVATION, PRIOR TO BACKFILLING, AND DURING BACKFILLING. IN ADDITION, THE FINAL INSPECTION OF THE SYSTEM SHALL BE CONDUCTED BY THE APPROVING AUTHORITY, THE SYSTEM INSTALLER AND THE DESIGNER PRIOR TO THE ISSUANCE OF A CERTIFICATE OF COMPLIANCE PURSUANT TO 310 CMR 15.021(3). ANY
- COMPONENT OF THE SYSTEM WHICH HAS BEEN COVERED WITHOUT SUCH PERMISSION SHALL BE UNCOVERED UPON THE REQUEST OF THE APPROVING AUTHORITY OR THE DESIGNER. 14. ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE
- 15. ALL SOIL ABSORPTION SYSTEMS SHALL HAVE A MINIMUM OF ONE (1) INSPECTION PORT CONSISTING OF A PERFORATED FOUR (4) INCH PIPE PLACED VERTICALLY DOWN INTO THE STONE TO THE NATURALLY OCCURRING SOIL OR SAND FILL BELOW THE STONE. THE PIPE SHALL BE CAPPED WITH A SCREW TYPE CAP AND ACCESSIBLE TO WITHIN THREE (3) INCHES OF FINISH GRADE.

#### **REPAIR NOTES:**

- CONTRACTOR TO VERIFY ELEVATION (\*) PRIOR TO THE START OF CONSTRUCTION AND REPORT TO ENGINEER ANY VARIATIONS IN ELEVATIONS
- EXISTING SYSTEM MAY BE ENCOUNTERED DURING THE INSTALLATION OF NEW SOIL ABSORPTION SYSTEM. (S.A.S.). REMOVAL, DISPOSAL AND UTILIZATION OF MATERIAL SHALL BE IN ACCORDANCE WITH THE TOWN/CITY'S BOARD OF HEALTH RULES AND REGULATIONS.
- 3. EXISTING SEPTIC TANK TO BE PUMPED, CRUSHED AND BACKFILLED WITH CLEAN GRANULAR MATERIAL AND/OR REMOVED IN ACCORDANCE WITH THE TOWN OF TOWNSEND'S BOARD OF HEALTH RULES AND REGULATIONS AND A NEW 2,000 GALLON, 2-COMPARTMENT, SEPTIC TANK

	BOARD OF HEA LF, NABOH AGE		S	OIL I	rest	D/	AIA	WILL	DILLIS & F IAM J. "JACK" M	ROY CIVIL DES ALONEY, JR. (	
IN-SEASON	GROUND WATE	R TESTIN	G - (IF RE	Q'D)				PERCOL	_ATION TEST DAT	A	
TEST PIT NO.		SURFACE DEPTH TO OBSERVED GROUNDWATER		G.WATER ELEVATION	TES PIT NO.	T	DAT	E	BOTTOM OF TE DEPTH FROM SURFACE	SURFACE ELEVATION	RATE: MINUTES PER INCH
					PA		9/29/	2020	60"	100.0±	2 MPI
					PB		9/29/	2020	60"	100.0±	2 MPI
					48	7-A	4/16/	87	68"	BY C.A.P. INC.	2 MPI
					48	7-B	4/16/	87	68"	BY C.A.P. INC.	2 MPI
	EST PIT: 920-1		HOR.	TEX.	COLOR	MOTT		G.W.	OTHER	1	
	EST: 9/29/20 T: NONE	0-36"	A & FILL			NONE		NONE	CRUMB, FRIABLE		
REFUSAL AT		36-115"	C1	S&G	10YR 5/4	NONE		NONE	MASSIVE, LOOSE		
	OBSERVED	115–120"	C2	S.L.	10YR 5/3	<b>©</b> 115"		NONE	MASSIVE, FRIABLE		
(SURFACE ELEV.											
ESTIMATED SEAS	ONAL HIGH GROUND	WATER		AT 115	(ELEVATION	= 90.4±	:)				
DEEP TEST F	PIT: 920-2	DEPTH	HOR.	TEX.	COLOR	OLOR MOTT		G.W.	OTHER		
		0-9"	A	S.L.	10YR 3/4	NONE		NONE	CRUMB, FRIABLE		
		9-44"	SAND FILL			NONE		NONE	MASSIVE, LOOSE		
REFUSAL AT	OBSERVED	44-50"	В	L.S.	10YR 5/6	NONE		NONE	S.A.B., FRIABLE		
		50-128"	С	S&G	10YR 5/4	@128"		NONE	MASSIVE, LOOSE		

I CERTIFY THAT I AM CURRENTLY APPROVED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION PURSUANT TO 310 CMR 15.017 TO CONDUCT SOIL EVALUATIONS AND THAT THE ABOVE ANALYSIS HAS BEEN PERFORMED BY ME CONSISTENT WITH THE REQUIRED TRAINING, EXPERTISE, AND EXPERIENCE DESCRIBED IN 310 CMR 15.017. I FURTHER CERTIFY THAT THE RESULTS OF MY SOIL EVALUATION, AS INDICATED ON THE ATTACHED SOIL EVALUATION FORM, ARE ACCURATE IN ACCORDANCE WITH 310 CMR 15.100 THROUGH 15.107

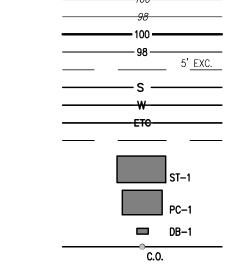
LICENSED SOIL EVALUATOR:
WILLIAM J. "JACK" MALONEY, JR (S.E.# 13704)

# **LEGEND**

DESCRIPTION DENOTES EXISTING CONTOUR (INDEX) DENOTES EXISTING CONTOUR (INTERMEDIATE) DENOTES PROPOSED CONTOUR (INDEX) DENOTES PROPOSED CONTOUR (INTERMEDIATE) DENOTES LIMIT OF EXCAVATION OF UNSUITABLE SOILS DENOTES PROPOSED SEWER LINE DENOTES PROPOSED WATER LINE DENOTES PROPOSED UNDERGROUND UTILITIES DENOTES PROPOSED BUILDING ENVELOPE DENOTES PROPOSED CONCRETE SEPTIC TANK

DENOTES PROPOSED CONCRETE PUMP CHAMBER

DENOTES PROPOSED CONCRETE DISTRIBUTION BOX DENOTES PROPOSED SEWER CLEANOUT



DRAWING ENTITY

# DILLIS & ROY CIVIL DESIGN GROUP

4" (SCH. 40) PVC SANITARY INLET TEE ON CENTERLINE

LAND SURVEYORS CIVIL ENGINEERS 1 MAIN STREET, SUITE 1 LUNENBURG, MA 01462

**BUILDING SEWER NOTES:** 

4" DIA. SCH 40 P.V.C.

1. SEWER LINE MUST BE LAID ON A FIRM COMPACTED BASE

2. PIPE MUST BE SLOPED AT A MIN. OF 1% (2% PREFERRED)

3. PIPE MUST BE LAID ON A CONTINUOUS UNIFORM GRADIENT.

APPLICANT: WETLAND CONSULTANTS

PHONE: (978) 779-6091

www.dillisandroy.com

6" OF CRUSHED STONE

MECHANICALLY COMPACTED LEVEL BASE

DUAL COMPARTMENT SEPTIC TANK (IN ACCORDANCE WITH 310 CMR 15.223 TO 15.228)

CAPACITY = 2,000 GALLONS-2 COMPARTMENT

PRECAST REINFORCED CONCRETE (H-10)

MANUFACTURER: LAMARRE PRECAST INC.

(NOT TO SCALE)

WATER TIGHT PRECAST CONCRETE OR EQUIVALENT RISERS WITH MEDIUM DUTY

COMPARTMENT #2

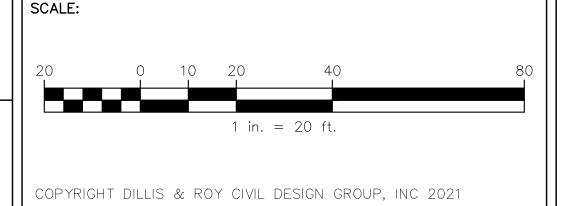
ALAN BORNEMAN

18 SHIRLEY ROAD TOWNSEND, MASSACHUSETTS

ALAN BORNEMAN

18 SHIRLEY ROAD

TOWNSEND, MASSACHUSETTS



FINAL GRADING NOTES:
1. 2% SLOPE MUST BE PROVIDED OVER AND AROUND SYSTEM.

2. SURFACE DRAINAGE MUST BE AWAY FROM SYSTEM.

3. GRADING MUST BE DONE TO PREVENT PONDING.

SYSTEM PROFILE

NOT TO SCALE

RANGING FROM  $\frac{3}{4}$ " TO  $1\frac{1}{2}$ "

FREE OF IRON , FINES AND

LEACHING TRENCH

(IN ACCORDANCE WITH 310 CMR 15.251)

LEACHING TRENCH BOTTOM SHALL BE LEVEL FOR ENTIRE LENGTH

PRIMARY: 2 TRENCHES REQUIRED AT 9' O.C.

RESERVE: 2 TRENCHES REQUIRED AT 9' O.C..

MIN. OF 9" COVER OVER SYSTEM MAX. OF 36" OF COVER OVER SYSTEM

ESTIMATED SEASONAL HIGH

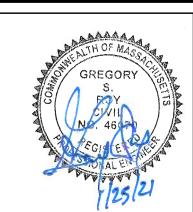
MIN. OF 9" COVER OVER SYSTEM

CLEAN BACKFILL // MAX. OF 36" OF COVER OVER SYSTEM

L= 50' (PRIMARY)

L= 50' (RESERVE)





NOT TO SCALE

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l	DATE:		
	11/12/2020		
l	DESIGN BY:		
	WJM		L
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	DRAWN BY:		
	WJM		
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DATE: 11/12/2020	
DESIGN BY: WJM	
DRAWN BY:	
WJM	
CHECKED BY:	

	SEWA	GE DIS	SPOSA	L SY	STE	M DES	IGN
-	18 SH	IRLEY	ROAD	(M:	32,	PCL:	29)
TOWNSEND, MASSACHUSETTS							
NO.	DATE	DESCRIPTION					

18 SHIRLEY ROAD (M: 32, PCL: 29) TOWNSEND, MASSACHUSETTS							
NO.	DATE	DESCRIPTION					
1.	1/25/2021	REVISED AS PER COMMENTS FROM NABOH-SINGLE TANK, TBM, TANK GRADES,	WJM				
		SYSTEM VENT, TANK FILTER.					

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