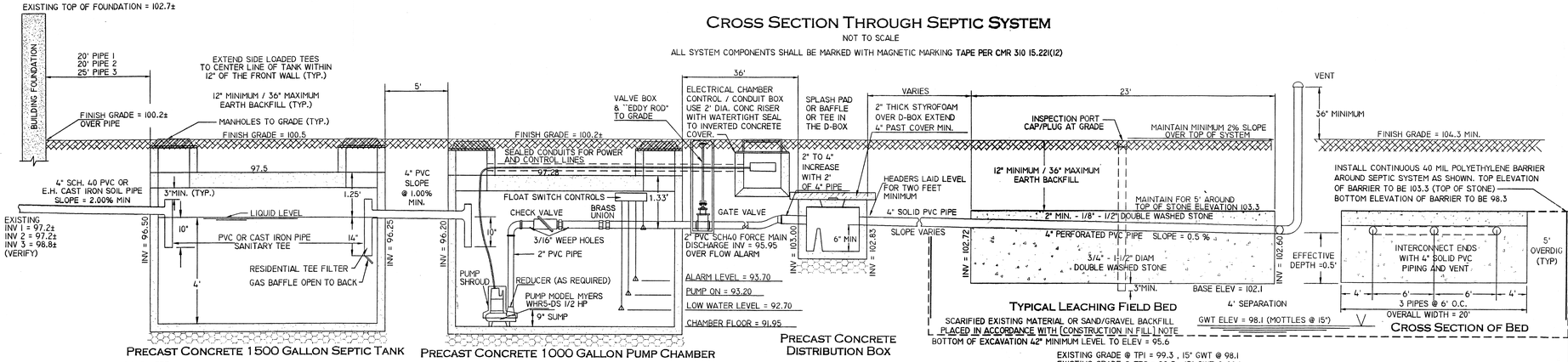
Cross Section Through Septic System

NOT TO SCALE

ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING **TAPE PER CMR 310 15.221(12)**



PRECAST CONCRETE 1500 GALLON SEPTIC TANK

PRECAST CONCRETE 1000 GALLON PUMP CHAMBER

PUMP RAIL SYSTEM AND SOME COMPONENTS NOT SHOWN FOR CLARITY

NOTE: SEPTIC TANK, PUMP CHAMBER AND D-BOX TO BE INSTALLED ON MINIMUM 6" COMPACTED CRUSHED STONE BASE.

PRECAST CONCRETE DISTRIBUTION BOX

TYPICAL LEACHING FIELD BED

CROSS SECTION OF BED

NOTE: EXISTING BUILDING ELEVATIONS WERE DETERMINED FROM BEST AVAILABLE DATA. ELEVATIONS TO BE VERIFIED IN FIELD BY CONTRACTOR PRIOR TO INSTALLATION OF THE SEPTIC TANK.

EXISTING GRADE @ TP1 = 99.3 , 15" GWT @ 98.1
EXISTING GRADE @ TP2 = 99.3 , 15" GWT @ 98.1
EXISTING GRADE @ TP3 = 100.7, 36" GWT @ 97.7
ORIGINAL LOW GRADE = 99.1 @ OVER DIG TO SET MINIMUM EXCAVATION ELEVATION

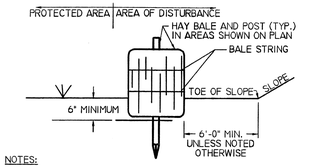
Buoyancy Calculations

1,500 GALLON SEPTIC TANK (CONCRETE PRODUCTS CPST-1500 OR EQUAL) (H-10 LOADING)
ESTIMATED G.W.T. @ SEPTIC TANK ELEV = 97.7
WEIGHT OF TANK (EMPTY): 150PCFx((10.5'x5.7'x(0.33'+0.33'))+(5.08'x2x(10.5'+5.17')x0.25')) = 11,896 LBS.
BUOYANT FORCE: 62.4PCFx(10.5'x5.7'x(97.7'GWT-(97.5'-1.25'-4'-0.33')) = 21,586 LBS.(BF)
21,586 LBS.(BF) > 11,896 LBS. TANK MAY FLOAT WHEN EMPTY.
WITH 1' OF COVER: 110PCFx((10.5'x5.7'x1')-(2x3.14x1"2x1')) = 5,893 LBS.
WITH 2' OF COVER: 110PCFx((10.5'x5.7'x2')-(2x3.14x1"2x2')) = 11,785 LBS.
21,586 LBS.(BF) < 11,896 + 11,785 = 23,681 LBS. TANK SHOULD NOT FLOAT WHEN EMPTY WITH 2' OF COVER.

1,000 GALLON PUMP CHAMBER (CONCRETE PRODUCTS CPST-1000 OR EQUAL) (H-10 LOADING)
ESTIMATED G.W.T. @ PUMP CHAMBER ELEV = 97.7
WEIGHT OF TANK (EMPTY): 150PCFx((8.5'x4.83'x(0.33'+0.33'))+(5.0'x2x(8.5'+4.17')x0.25')) = 8,816 LBS.
BUOYANT FORCE: 62.4PCFx(8.5'x4.83'x(97.7'GWT-(97.28'-1.33'-4'-0.33')) = 15,576 LBS.(BF)
15,576 LBS.(BF) > 8,816 LBS. PUMP CHAMBER MAY FLOAT WHEN EMPTY.
WITH 2' OF COVER: 110PCFx((8.5'x4.83'x2')-(2x3.14x1"2x2')) = 7,651 LBS.
15,576 LBS.(BF) < 8,816 + 7,651 = 16,467 LBS. CHAMBER SHOULD NOT FLOAT WHEN EMPTY WITH 2' OF COVER.

Pump Switch Elevation Calculations

(PUMP SWITCH ELEVATIONS BASED ON 4' LIQUID LEVEL 1,000 GALLON PUMP CHAMBER, 4 DOSES/DAY)
330 GALLONS/DAY/4 DOSES/DAY ÷ 6 GALLONS (36" LONG, 2" DIA. PRESSURE PIPE LINE) = 89 GALLONS/DOSE
PUMP ON: ELEV 92.70 + ((89 GAL/1,000 GAL) x 4') = ELEV 93.06 MIN. (USE 93.20)
RESERVE: (95.95 - 93.70) x (1,000 GAL/4') = 563 GALLONS > 330 GALLONS O.K.

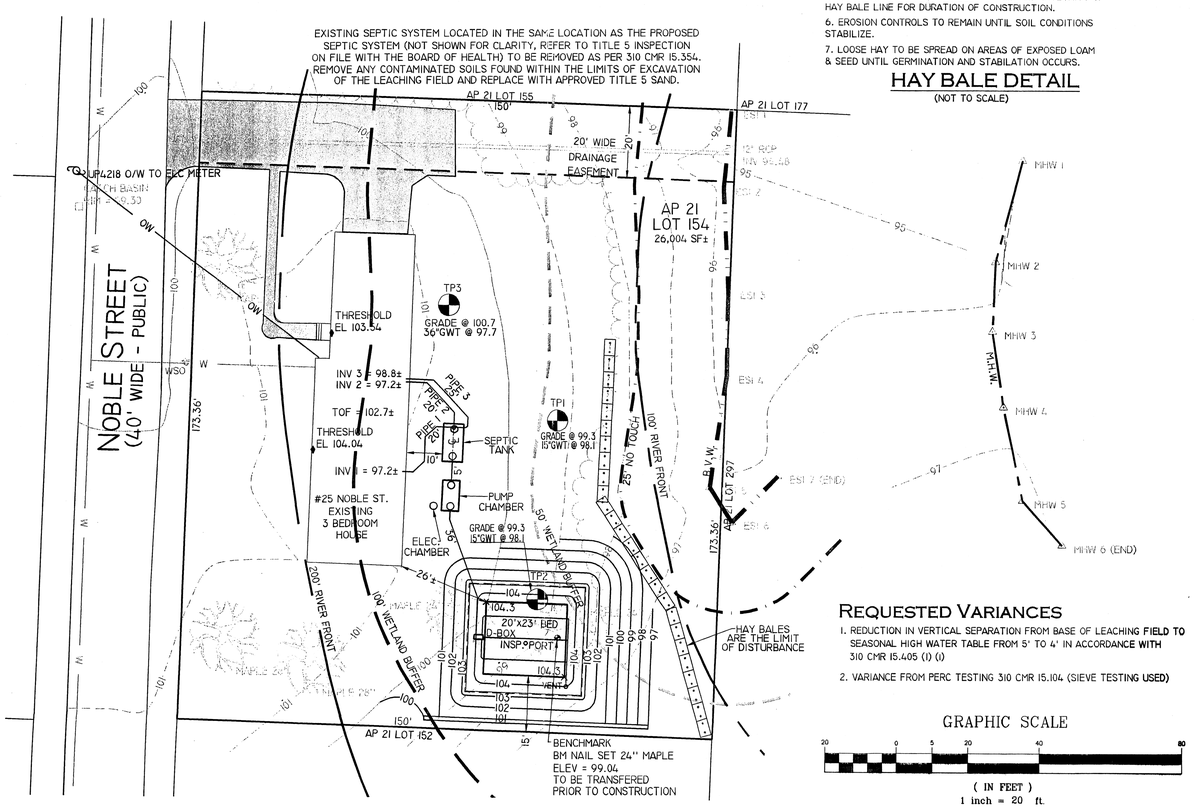


NOTES:

1. HAY BALES ARE TO BE PLACED WITHIN A 6" MINIMUM TRENCH PRIOR TO CONSTRUCTION.
2. THOROUGHLY COMPACT EXCAVATED SOILS BACK INTO THE TRENCH AFTER INSTALLATION OF EROSION CONTROL DEVICES.
3. BALE STRING SHALL BE LAID PARALLEL TO THE GROUND SURFACE.
4. EACH BALE TO BE SECURELY STAKED INTO THE GROUND WITH (2) 1"x1"x3' OAK BEAN POLE.
5. CONTRACTOR IS RESPONSIBLE TO MAINTAIN INTEGRITY OF HAY BALE LINE FOR DURATION OF CONSTRUCTION.
6. EROSION CONTROLS TO REMAIN UNTIL SOIL CONDITIONS STABILIZE.
7. LOOSE HAY TO BE SPREAD ON AREAS OF EXPOSED LOAM & SEED UNTIL GERMINATION AND STABILATION OCCURS.

HAY BALE DETAIL

(NOT TO SCALE)



Requested Variances

1. REDUCTION IN VERTICAL SEPARATION FROM BASE OF LEACHING **FIELD TO** SEASONAL HIGH WATER TABLE FROM 5' TO 4' IN ACCORDANCE **WITH** 310 CMR 15.405 (1) (i)
2. VARIANCE FROM PERC TESTING 310 CMR 15.104 (SIEVE TESTING **USED)**

GRAPHIC SCALE

20 0 5 20 40 80

(IN FEET)
1 inch = 20 ft.

Modified DEP Forms 11 & 12 - Soil Suitability Assessment & Percolation Test for On-Site Sewage Disposal

Massachusetts City or Town: SEEKONK, MA

CONTACT: BEVERLY SWEET (C) 401-440-1536

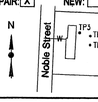
InSite Engineering Services, LLC
PROFESSIONAL ENGINEERS and LAND SURVEYORS
Insite Professional Complex, Suite #1
1539 Fall River Avenue
Seekonk, Massachusetts 02771
Phone: (508) 336-4500
Fax: (508) 336-4558

CLIENT: NAME:	Eugene Policastri, Esq.	DATE:	12-3-2009
ADDRESS:	25 Noble Street Seekonk, Massachusetts 02771	WEATHER:	40°± F RAIN
PHONE #:	(c) 301-957-0147		

SITE:	INSITE JOB# 09-084
STREET:	25 Noble Street
TOWN:	Seekonk, Massachusetts 02771
MAP/PLOT:	A.P. 21 / LOT 154
REPAIR:	X
NEW:	

PERFORMED BY: MICHAEL S. FARIA RI PE, MA SE708
WITNESSED BY: BETH HALLAL
EXCAVATION CO.: FISK
SURFACE STONES: NONE
VEGETATION: LAWN
LAND USE: RESIDENTIAL
DEPTH TO BEDROCK: NONE OBSERVED
SLOPE: 6% ±

SITE SKETCH:



DEEP OBSERVATION HOLE LOG

Deep Hole #	Depth from surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (munsell)	Soil Mottling (inches) Concentration Color Abundance/size/contrast	Other (Structure, Stones, Consistency, % Gravel)
TP1	0-24	FILL	VERY FINE SAND	5B7/1	15" 7.5YR5/8	FRIABLE
	24-25	A	SANDY LOAM	10YR5/3		FRIABLE
	25-36	B	LOAMY SAND	10YR5/8		LOOSE
	36-72	C1	MEDIUM-COARSE SAND	2.5Y6/3	60" 7.5YR5/8	LOOSE
	72-120	C2	COARSE SAND	7.5YR5/6		LOOSE WITH BOG IRON
TP2	0-24	FILL	VERY FINE SAND	5B7/1	15" 7.5YR5/8	FRIABLE
	24-25	A	SANDY LOAM	10YR5/3		FRIABLE
	25-36	B	LOAMY SAND	10YR5/8		LOOSE
	36-120	C1	FINE-MEDIUM SAND	2.5Y7/6	60" 7.5YR5/8	LOOSE
TP3	0-6	A	SANDY LOAM	10YR3/2		FRIABLE
	6-10	B	LOAMY SAND	10YR5/8		FRIABLE
	10-36	C1	MEDIUM-COARSE SAND	2.5Y6/3	36" 7.5YR5/8	LOOSE
	36-120	C2	FINE SAND	2.5Y6/3	60" 7.5YR5/8	LOOSE

DISTANCES FROM:(ft.) APPROXIMATE (VERIFY) Hole #	TP1	TP2	TP3
Open Water Body	>200	>200	>200
Possible Wet Area	>100	>100	>100
Drinking Water Well	>100	>100	>100
Drainageway	>50	>50	>50
Property Line	-	-	-
Other (specify)			

MOTTLING: Abundance (@ 15" & 36": f: few; c: common; m: many; @ 60": c: common; m: many) Size (1: fine; 2: medium; 3: coarse) Contrast (f: faint; d: distinct; p: prominent)

DEPTH TO GROUND WATER (in.)

Hole #	TP1	TP2	TP3
Standing Water in the Hole	60	60	60
Weeping from Pit Face	60	60	60
Est. High Ground Water	15	15	36

PERCOLATION TEST

Hole #	TP2				
Depth of Perc (inches)	60				
Start/Pre-Soak					
Time at 12"					
Time at 9"					
Time at 6"					
Time (9"-6") (Min)					
Rate (Min/Inch)	< 2				

ASSESSMENT OF DEEP HOLE:

Hole # TP1	SUITABLE X	UNSUITABLE	
Hole # TP2	SUITABLE X	UNSUITABLE	
Hole # TP3	SUITABLE X	UNSUITABLE	

ADDITIONAL TESTING NEEDED: NO

COMMENTS: TP1, TP2 & TP3 DEEP OBSERVATION HOLES ONLY, NO PERC TEST PERFORMED
*SATURATED SOILS UNABLE TO PERC, SIEVE SAMPLE TAKEN @ TP 2 @ 60" (IN THE C1 LAYER)
PER SIEVE SAMPLE (SEE SIEVE ANALYSIS BY ALDINGER): 99.30% SAND, 0.55% SILT, 0.15% CLAY
ASSIGNED EFFLUENT LOADING RATE 0.74 GPD/SF (CLASS I SOIL PER POLICY# BRP/DWM/PwP-P00-4)
REMOVAL REQUIRED TO 42" MINIMUM

(DEP CERTIFIED SOIL EVALUATOR) PRINTED: MICHAEL S. FARIA RI PE, MA SE708 SIGNED:
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 THIS SOIL EVALUATION FORM, ARE ACCURATE AND IN ACCORDANCE TO 310 CMR 15.017.
Page ___ of ___

Design Calculations

Average Daily Sewage Flow (gallons per day)

3 BEDROOM DWELLING @ 110 GPD PER BEDROOM = 330 GPD

Septic Tank Sizing (gallons)

200% AVERAGE DAILY FLOW = 2 (330) = 660 GALLONS
3 BEDROOM HOME REQUIRES 1500 GALLON TANK (MINIMUM).

Leaching Area Calculation

SOIL CLASS I (SAND) — PERC RATE IN TP2 WAS < 2 MPI; DESIGN FOR 5 MPI PER TITLE V

Required Minimum Leaching Area:

REQUIRED AREA = 330 GPD / 0.74 GPD / SF = 446 SF MINIMUM
LEACHING FIELD BED AREA: 20' x 23' = 460 SF

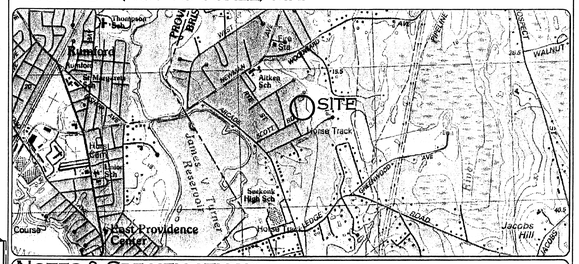
Legend

SOIL TEST PIT	TP
ORIGINAL CONTOUR	100
ORIGINAL SPOT ELEVATION	♦100
PROPOSED CONTOUR	100
PROPOSED SPOT ELEVATION	x 100

Color Legend (NOI Plan)

WETLANDS LINE
25' WETLAND BUFFER ZONE
50' WETLAND BUFFER ZONE
100' WETLAND BUFFER ZONE
STREAM MHW (MEAN HIGH WATER)
100' FROM MHW
200' FROM MHW

Location (Not to Scale) Map



Notes & Specifications

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF 310 CMR 15 (TITLE V) OF THE COMMONWEALTH OF MASSACHUSETTS AND THOSE OF THE TOWN BOARD OF HEALTH.

THE REQUIRED INSPECTION SCHEDULE DURING THE PROCESS OF CONSTRUCTION SHALL BE ARRANGED BY THE CONTRACTOR WITH THE BOARD OF HEALTH PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

SEPTIC TANK, PUMP CHAMBER, ELECTRICAL & VALVE CHAMBER AND DISTRIBUTION BOX SHALL BE STANDARD DUTY (H-10) DESIGN AS MANUFACTURED BY CONCRETE PRODUCTS, INC. OR APPROVED EQUAL. PROVIDE LOCKING COVERS AT FINISHED GRADE OR COVERS TO WITHIN 6" TO FINISHED GRADE. COVER REQUIREMENTS VARY PER TOWN, CONTRACTOR TO VERIFY WITH TOWN BOARD OF HEALTH.

ALL PIPING SHALL BE 4" DIA. SCHD. 40 NSF PVC, WITH ALL JOINTS SEALED WATERTIGHT.

ALL STONE SHALL BE DOUBLE WASHED AND FREE OF IRONS, CLAY OR FINES AND SHALL BE SATISFACTORY TO THE TOWN BOARD OF HEALTH.

THIS SYSTEM IS NOT DESIGNED TO ACCOMMODATE A GARBAGE DISPOSAL OR OTHER HIGH WATER USE UNITS.

THE PROPOSED SEPTIC SYSTEM IS NOT LOCATED WITHIN THE CONE OF INFLUENCE OF ANY MUNICIPAL WELL NOR ARE THERE ANY PRIVATE WELLS LOCATED WITHIN 100 FEET (RADIALLY) OF THE PROPOSED SYSTEM.

EXCAVATE ALL TOP, SUB AND ANY OTHER SOILS ENCOUNTERED DOWN TO THE BOTTOM OF EXCAVATION AS SHOWN IN THE CROSS SECTION AND FOR A HORIZONTAL DISTANCE OF 5' ON ALL SIDES OF THE PROPOSED SYSTEM. BACKFILL TO THE TOP OF STONE WITH SELECT ON-SITE OR IMPORTED SOIL MATERIAL CONSISTING OF CLEAN GRANULAR SAND, FREE OF ORGANIC MATTER OR OTHER DELETERIOUS SUBSTANCES AND MEETING THE SIEVE SIZE REQUIREMENTS OF 310 CMR 15.255(3) & (5) (CONSTRUCTION IN FILL).

ELEVATIONS SHOWN ON THIS PLAN ARE BASED ON AN ASSIGNED DATUM.

CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO THE CONTINUATION OF CONSTRUCTION

THE SITE DOES NOT LIE IN A CRITICAL FLOOD ZONE PER FEMA MAP 25005C0204F EFFECTIVE DATE: JULY 7, 2009.

I CERTIFY THAT THE EXISTING WATER SERVICE SHOWN ON THIS PLAN IS IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE SEEKONK WATER DISTRICT. THE PLAN LOCATION REFLECTS LOCATION SHOWN ON RECORD FIELD LOCATION CARD ALONG WITH SITE FIELD MEASUREMENTS.

Pump & Chamber Notes

BASED ON SPECIFIED PUMP CURVE AND SYSTEM CURVE INTERSECTION: PUMP SHALL BE MYERS MODEL WHRS-DS 1/2 HORSEPOWER WITH CAPACITY OF 65 GPM @ A TOTAL DYNAMIC HEAD (TDH) OF 18 FEET. POWER SUPPLY SHALL BE 115 VOLT, SINGLE PHASE. PUMP SYSTEM SHALL BE SIMPLEX OPERATION. WITH VORTEX TYPE IMPELLER. ALTERNATIVE PUMP TO BE EQUAL OR BETTER TO SPECIFIED PUMP.

PUMP CONTROLS SHALL BE MYERS CE-115 TYPE. CONTROL PANEL TO BE MOUNTED IN MECHANICAL ROOM OR OTHER CONVENIENT LOCATION IN BUILDING AND ENCLOSED IN A NEMA 1 BOX WITH MAIN CIRCUIT BREAKER THAT LOCKS COVER, MAGNETIC CONTACTOR FOR PUMP, OVERRIDE RELAY, H-O-A SWITCH, RUNNING LIGHT AND BUZZER ALARM WITH ON-OFF-TEST SWITCH. FLOAT SWITCHES SHALL BE SET IN PUMP CHAMBER TO OPERATE AT WATER LEVELS SHOWN. ALL POWER AND CONTROL CIRCUITS SHALL BE ENCASED IN WATERTIGHT CONDUITS AND CONTROL BOX. MANUAL OVER-RIDE SWITCH FOR THE PUMP IS REQUIRED. SEPARATE CIRCUIT FOR ALARM SYSTEM IS REQUIRED.

ELECTRICAL CONNECTIONS FOR PUMP AND FLOAT CONTROLS SHALL BE INSTALLED IN SEPARATE ELECTRICAL CHAMBER AS SHOWN.

ELECTRICAL CHAMBER SHALL BE PRECAST CONCRETE 24" DIAMETER RISER WITH A WATERTIGHT SEAL TO INVERTED CONC. COVER AND WATER TIGHT MANHOLE TO GRADE AS SHOWN.

ELECTRICAL CONTRACTOR SHALL SIZE WIRING FROM BUILDING TO CHAMBER TO PROVIDE SUFFICIENT POWER SUPPLY AND CONTROL CIRCUITS.

STANDBY POWER SOURCE IS NOT REQUIRED FOR THIS LOCATION, BUT MAY BE PROVIDED AT THE OWNER'S OPTION.

ALL PIPING SHALL BE PVC OR SDR PLASTIC WITH WATERTIGHT JOINTS AND VALVING AS SHOWN ON THE DETAIL. VALVING SHALL BE SET ON DISCHARGE LINE IN CONVENIENT LOCATIONS WITHIN CHAMBER AS DETERMINED BY SPATIAL LIMITATIONS AND ACCESS, OR OUTSIDE OF THE CHAMBER AS REQUIRED PER MUNICIPALITY (AS SHOWN IN THE DETAIL). EFFLUENT IN 2" PRESSURE LINE TO FLOW BACK INTO PUMP CHAMBER BETWEEN DOSES BY WEEP HOLE AS SHOWN. NO LOW POINTS IN PRESSURE LINE.

ALL WORK SHALL BE IN STRICT CONFORMANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES AND THE MANUFACTURER'S SPECIFICATIONS.

CONTRACTOR TO NOTIFY TOWN ELECTRICAL INSPECTOR TO CERTIFY INSTALLATION.

USE EXPLOSION PROOF MEASURES: AIR TIGHT CONDUITS SEALED AT BOTH ENDS, PRESSURE RELIEF VALVES, SILICONE SEALED ELECTRICAL CONNECTIONS, ECT...(AS REQUIRED)

PROVIDE STAINLESS STEEL PUMP RAIL SYSTEM FOR EASY INSTALLATION AND MAINTENANCE.

USE A BRASS QUICK CONNECT UNION FOR EASY INSTALLATION AND MAINTENANCE.

PROVIDE A PUMP SHROUD AND ADEQUATE SUMP TO KEEP THE PUMP COOL DURING OPERATION AND MINIMIZE CORROSION OF PUMP COMPONENTS.

USE A TANDEM DOUBLE SEALED PUMP WITH ALARM DETECTION FOR THE PRIMARY SEAL BREAK.

INSTALL A HIGH LEVEL ALARM AT INVERT OUT OF PUMP CHAMBER TO DETECT CHAMBER FAILURE AND RESERVE OVERFLOW.

ALL SYSTEM COMPONENTS TO BE INSTALLED PER MANUFACTURES SPECIFICATIONS.

TEST PUMP FLOAT SWITCHES FOR PROPER OPERATION.

VENT SEPTIC TANK & PUMP CHAMBER (AS REQUIRED).

CLEAR WATER TEST REQUIRED. ADJUST GATE VALVE AS REQUIRED TO CONTROL DISCHARGE RATE.

PUMP MANUFACTURE TO VERIFY PUMP SYSTEM ADEQUACY, USE ALTERNATE AS REQUIRED.

Septic System Repair Design and NOI Plan

SE 69-678

PAUL D. CARLSON CIVIL NO. 40595 COMMONWEALTH OF MASSACHUSETTS

PROFESSIONAL SEAL

"NOBLE STREET"
25 NOBLE STREET, SEEKONK, MASSACHUSETTS 02771
ASSESSORS MAP 21 LOT 154

Applicant: EUGENE POLICASTRI, ESQ.
25 NOBLE STREET, SEEKONK, MASSACHUSETTS 02771
Contact: BEVERLY SWEET (C) 401-440-1536

Job #	Scale:	Design By:	Date:
09-084	1" = 20'	MSF	JANUARY 6, 2010

Revised:

PROFESSIONAL ENGINEERS AND LAND SURVEYORS
INSITE PROFESSIONAL COMPLEX, SUITE 1
1539 FALL RIVER AVENUE
SEEKONK, MA 02771
PHONE: (508) 336-4500
FAX: (508) 336-4558

SHEET 1 OF 1

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