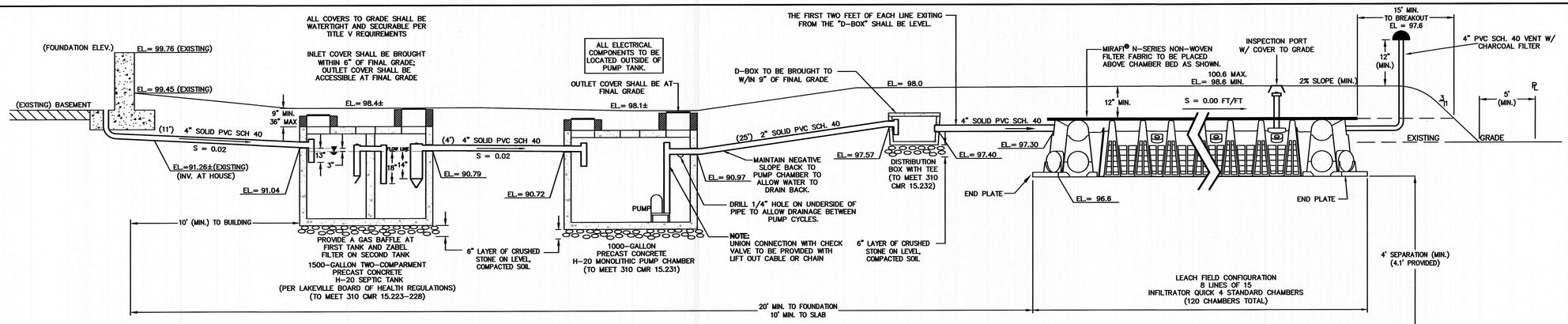
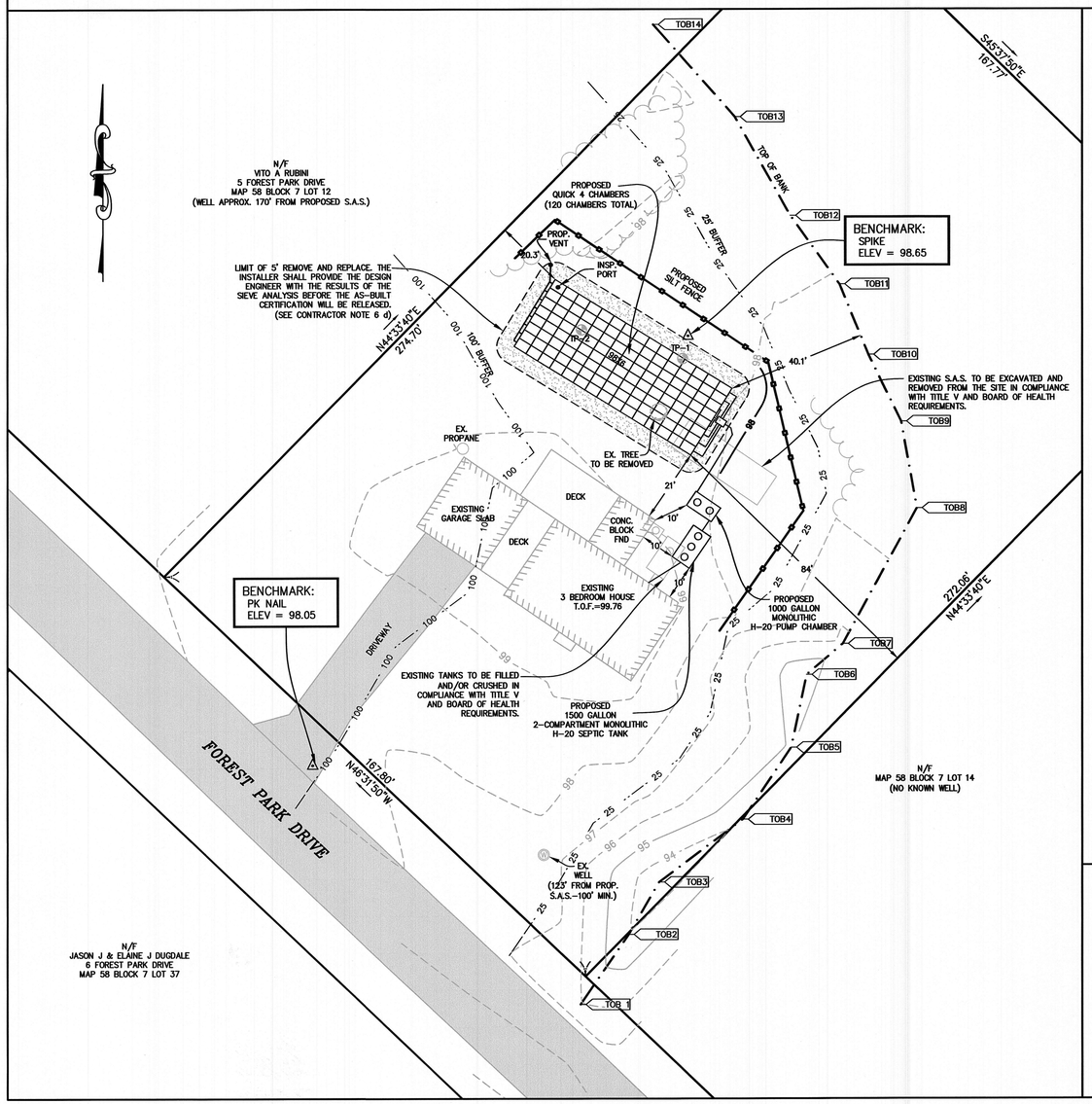


NOTE:
EXISTING INVERT OUT OF THE HOUSE TO BE VERIFIED PRIOR TO CONSTRUCTION. THE DESIGN ENGINEER MUST BE NOTIFIED OF ANY DISCREPANCIES FROM THIS PLAN.

SEPTIC SYSTEM PUMP PROFILE

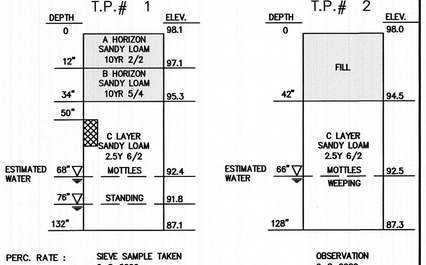
NOT TO SCALE



LOCAL UPGRADE APPROVALS REQUESTED:

1. INCREASE IN THE MAXIMUM ALLOWABLE DEPTH OF SYSTEM COMPONENTS FROM 36" TO 72" BELOW FINISH GRADE PER 310 CMR 15.405(1)(b).
2. REDUCTION OF THE REQUIRED SETBACK BETWEEN PROPOSED LEACHING FIELD AND BORDERING VEGETATED WETLANDS FROM 50' TO 40.1' PER 310 CMR 15.405(1)(e).
3. USE OF A SIEVE ANALYSIS IN LIEU OF A PERCOLATION TEST PER 310 CMR 15.405(1)(i).
4. REDUCTION OF THE REQUIREMENT OF A TWELVE INCH SEPARATION BETWEEN THE INLET AND OUTLET TEES AND HIGH GROUNDWATER, PROVIDED ALL BOOTS OR PIPE JOINTS ARE SEALED WITH HYDRAULIC CEMENT OR INSTALLED WITH WATERTIGHT SLEEVES AND THE TANK IS PROVEN WATERTIGHT PER 310 CMR 15.405(1)(j).

SOIL CLASSIFICATION
SAND = 9.52%
SILT = 76.46%
CLAY = 14.02%
CLASS III SOIL
SEE SIEVE ANALYSIS ATTACHED



PERC. RATE :
DATE OF TEST :
B.O.H. AGENT :
SOIL EVALUATOR:
SIEVE SAMPLE TAKEN
6-8-2020
ED CULLEN
KYLE DEVENISH
OBSERVATION
6-8-2020
ED CULLEN
KYLE DEVENISH

NOTE: REMOVE & REPLACE SHADED LAYERS (SEE CONTRACTOR NOTE 6)

SOIL STRATA LOGS

NOT TO SCALE

ENGINEERING STAMP

COMMONWEALTH OF MASSACHUSETTS
JASON A. YOUNGQUIST
CIVIL
No. 45872
REGISTERED PROFESSIONAL ENGINEER
6-29-20

OWNER & APPLICANT:

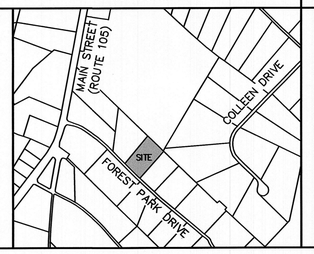
NOLL FAMILY NOMINEE TRUST
7 FOREST PARK DRIVE
LAKEVILLE, MA 02347

LEGEND

- 70 — EXISTING CONTOURS
- 70 — PROPOSED CONTOURS
- 128X0 — EXISTING ELEVATIONS
- 128X0 — PROPOSED ELEVATIONS
- TP-1 — PERC TEST HOLE
- EXISTING MONUMENTS
- GROUND WATER LEVEL
- ADJUSTED WATER LEVEL
- WF40 — WETLAND FLAG

LOCUS MAP

NOT TO SCALE



SUBSURFACE SEWAGE DISPOSAL SYSTEM UPGRADE

7 FOREST PARK DRIVE

(ASSESSORS MAP: 58 BLOCK: 7 LOT: 13)

LAKEVILLE MASSACHUSETTS

DESIGN CALCULATIONS:

1. ESTIMATED DAILY FLOW:
   3 BEDROOMS X 110 GALLONS PER BEDROOM PER DAY
   330 GALLONS PER DAY.
2. SEPTIC TANK REQUIRED CAPACITY = 1500 GALLONS
3. LEACHING AREA REQUIREMENTS: SEE SIEVE TEST RESULT
   EFFLUENT LOADING RATE = 0.15 GPD/S.F. (CLASS III)
   WITH A LEACHING FIELD
   AREA REQ'D = 330 GPD / 0.15 GPD/S.F.
   = 2200 S.F.
4. LEACHING AREA PROVIDED:
   QUICK 4 CAPACITY = 4.73 S.F./L.F.
   CAPACITY REQUIRED = 2200 SF/4.73 SF/LF = 465 L.F.
   USE 8 ROWS: 465 L.F. / 8 ROWS = 58.13 L.F./ROW
   USE (15) 4' CHAMBERS/ROW, 120 TOTAL CHAMBERS
   PROPOSED LEACHING FIELD: 12'D X 22.67'W X 60'L
   CAPACITY PROVIDED = (120) 4' CHAMBERS = 480 LF
   (480 LF)(4.73 SF/LF) = 2270 SF X 0.15 GPD/SF = 340.5 GPD

CONTRACTOR NOTES:

1. ALL CONSTRUCTION TO CONFORM TO THE REQUIREMENTS OF THE MASSACHUSETTS DEPT. OF ENVIRONMENTAL PROTECTION SANITARY CODE, TITLE 5, AND LOCAL BOARD OF HEALTH REGULATIONS.
2. THE DESIGN ENGINEER IS TO BE NOTIFIED AT LEAST 48 HOURS PRIOR TO REQUIRED INSPECTIONS.
3. ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR APPROVED EQUAL PER 310 CMR 15.221(12)
4. PER 310 CMR 15.248(2), FROM THE DATE OF THE INSTALLATION OF THE SOIL ABSORPTION SYSTEM UNTIL RECEIPT OF A CERTIFICATE OF COMPLIANCE FROM THE APPROVING AUTHORITY IN ACCORDANCE WITH 310 CMR 15.021, THE PERIMETER OF THE SOIL ABSORPTION SYSTEM SHALL BE STAKED AND FLAGED TO PREVENT THE USE OF SUCH AREA FOR ALL ACTIVITIES WHICH MIGHT DAMAGE THE SOIL ABSORPTION SYSTEM. SUCH FLAGGING IS NOT INTENDED TO PRECLUDE THE FINAL GRADING AND LANDSCAPING OF THE AREA OF THE SOIL ABSORPTION SYSTEM. STOCKPILING OF MATERIALS OR HEAVY EQUIPMENT WITHIN THE AREA IS PROHIBITED.
5. LOCATION OF UTILITIES IS APPROXIMATE AND CONTRACTORS SHALL NOTIFY DIGSAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO THE ONSET OF CONSTRUCTION TO HAVE ALL EXISTING UTILITIES LOCATED AND CLEARLY MARKED.
6. IN AREAS SHOWN ON THE PLAN, ALL TOPSOIL, SUBSOIL AND OTHER IMPERVIOUS MATERIALS SHALL BE REMOVED AND REPLACED WITH A CLEAN GRANULAR SAND, FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES, GRADED AS FOLLOWS:
   a. NO MATERIAL LARGER THAN 2 INCHES.
   b. UP TO 45% BY WEIGHT MAY BE RETAINED ON A #4 SIEVE.
   c. OF THE FRACTION PASSING THE #4 SIEVE, THE FOLLOWING CRITERIA APPLY:

SIEVE SIZE	EFFECTIVE PARTICLE 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%

   d. A SIEVE ANALYSIS OF THE MATERIAL SHALL BE PERFORMED TO DETERMINE THAT IT MEETS THE GRADATION REQUIREMENTS NOTED ABOVE. THE INSTALLER SHALL PROVIDE A COPY OF THE SIEVE ANALYSIS RESULTS TO THE DESIGN ENGINEER.
7. THIS SYSTEM IS NOT DESIGNED TO ACCOMMODATE A GARBAGE GRINDER.
8. IF A WATER PURIFICATION OR FILTRATION DEVICE IS USED, BACKWASH SHALL BE DISCHARGED TO A DRYWELL OR TO THE GROUND IN ACCORDANCE WITH 310 CMR 15.004 (8). THE BACKWASH SHOULD NOT BE DIRECTED TO THE SEPTIC SYSTEM.
9. THE SEPTIC SYSTEM OWNER SHALL HAVE THE SEPTIC TANK AND OUTLET FILTER INSPECTED ANNUALLY AND CLEANED AND PUMPED AS NECESSARY.
10. ALL SYSTEM COMPONENTS ARE DESIGNED WITH H-10 LOADING CAPACITY, UNLESS OTHERWISE NOTED. IF VEHICULAR TRAFFIC IS ANTICIPATED OVER ANY SYSTEM COMPONENT, COMPONENT MUST MEET H-20 LOADING CAPACITY REQUIREMENTS.

SITE NOTES:

1. PROPERTY LINE INFORMATION TAKEN FROM: "PLAN OF FOREST PARK, LAKEVILLE, MASS." AS RECORDED IN THE PLYMOUTH COUNTY REGISTRY OF DEEDS PLAN BOOK 15 PAGE 266.
2. TOPOGRAPHIC INFORMATION TAKEN FROM FIELD SURVEY BY OUTBACK ENGINEERING INC. IN JUNE 2020.
3. THE SYSTEM IS NOT LOCATED WITHIN A SURFACE WATER SUPPLY PROTECTION AREA. THE SYSTEM IS NOT LOCATED WITHIN A GROUNDWATER PROTECTION AREA.
4. THE SYSTEM IS NOT LOCATED WITHIN A FLOOD HAZARD ZONE. THE PROPERTY IS LOCATED ENTIRELY IN ZONE X, AREA OF MINIMAL FLOOD HAZARD, OF THE FLOOD INSURANCE RATE MAP NUMBER: 25023c0431K, EFFECTIVE DATE: 7/16/15.
5. THE SITE IS NOT WITHIN A PRIORITY HABITAT AND IS NOT WITHIN AN ESTIMATED HABITAT ACCORDING TO THE LATEST NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM ONLINE MAPS.
6. NO KNOWN WELLS ARE LOCATED WITHIN 100' OF THE PROPOSED SOIL ABSORPTION SYSTEM.

REVISIONS

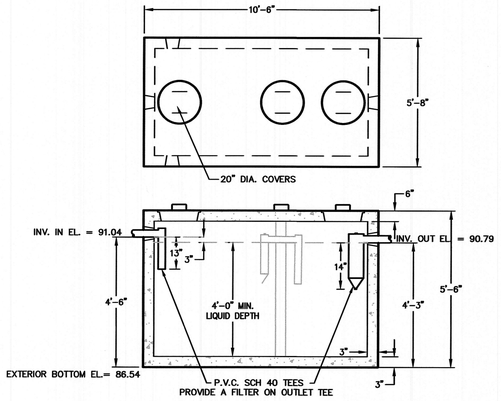
NO.	DATE	DESCRIPTION	BY

Outback Engineering Incorporated
165 EAST GROVE STREET
MIDDLEBOROUGH, MASS. 02346
TEL:1-(508) 946-9231
FAX:1-(508) 947-8873
www.outback-eng.com

FEET 0 20 40 60

SHEET NUMBER 1 OF 2
SCALE: 1"=20'
DATE: 6/29/20
DRAWING: OE3575 BOH.DWG
DRAWN: K.A.D.
CHECKED: J.A.Y.

OE-3575



1500 GAL. 2-COMPARTMENT SEPTIC TANK H-20 MONOLITHIC

NOT TO SCALE

BUOYANCY CALCULATIONS

MAXIMUM GROUNDWATER ELEVATION = 92.5

SEPTIC TANK (H-20)

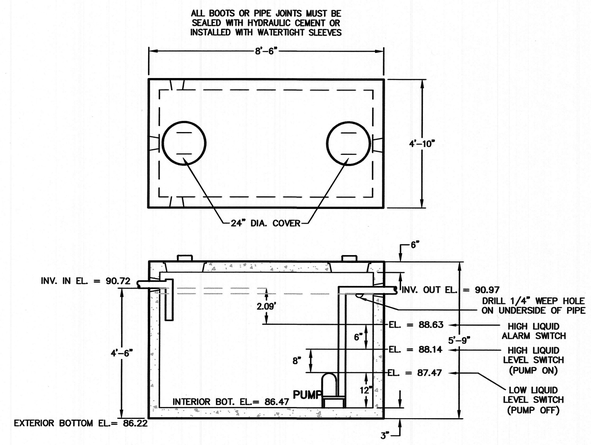
PROPOSED TANK BOTTOM ELEV.= 86.54

1. BUOYANCY FORCE ON EMPTY TANK:
   VOLUME DISPLACED = 10.5' X 5.67' X (92.5 - 86.54)
   = 354.8 C.F.
   WT. OF DISPLACED WATER = 354.8 C.F. X 62.4 #/C.F.
   = 22,141 # ↑

2. WEIGHT OF EMPTY TANK:
   VOLUME: TOP/BOTTOM = 10.5' X 5.67' X (3" + 6") = 44.65 C.F.
   ENDS = 2 X (5.17' X 4.75' X 0.25') = 12.28 C.F.
   SIDES = 2 X (10.5' X 4.75' X 0.25') = 24.94 C.F.
   TOTAL VOLUME = 81.87 C.F.
   WT. OF EMPTY TANK = 81.87 C.F. X 150 #/C.F. = 12,280 # ↓

3. WEIGHT OF SOIL ABOVE TANK:
   VOLUME = 6' DEEP X 10.5' X 5.67' = 357.2 C.F.
   WEIGHT = 357.2 C.F. X 110 #/C.F. = 39,293 # ↓

4. SUM OF FORCES:
   F.S. = (12,280 # + 39,293 #) ÷22,141 # = 2.33 FACTOR OF SAFETY
   WT. OF TANK + SOIL IS GREATER THAN WT. OF DISPLACED WATER
   ∴ OK



1000 GAL. PUMP CHAMBER H-20 MONOLITHIC

NOT TO SCALE

BUOYANCY CALCULATIONS

MAXIMUM GROUNDWATER ELEVATION = 92.5

PUMP TANK (H-20)

PROPOSED TANK BOTTOM ELEV.= 86.22

1. BUOYANCY FORCE ON EMPTY TANK:
   VOLUME DISPLACED = 8.5' X 4.83' X (92.5 - 86.22)
   = 257.8 C.F.
   WT. OF DISPLACED WATER = 257.8 C.F. X 62.4 #/C.F.
   = 16,088 # ↑

2. WEIGHT OF EMPTY TANK:
   VOLUME: TOP/BOTTOM = 8.5' X 4.83' X (3" + 6") = 30.79 C.F.
   ENDS = 2 X (4.33' X 5.00' X 0.25') = 10.83 C.F.
   SIDES = 2 X (8.50' X 5.00' X 0.25') = 21.25 C.F.
   TOTAL VOLUME = 62.87 C.F.
   WT. OF EMPTY TANK = 62.87 C.F. X 150 #/C.F. = 9,431 # ↓

3. WEIGHT OF SOIL ABOVE TANK:
   VOLUME = 6' DEEP X 8.5' X 4.83' = 250.4 C.F.
   WEIGHT = 250.4 C.F. X 110 #/C.F. = 27,548 # ↓

4. SUM OF FORCES:
   F.S. = (9,431 # + 27,548 #) ÷16,088 # = 2.29 FACTOR OF SAFETY
   WT. OF TANK + SOIL IS GREATER THAN WT. OF DISPLACED WATER
   ∴ OK

PUMP CALCULATIONS

DESIGN FLOW = 330 GPD

LEACHING SYSTEM: 13"D X 22.67'W X 60'L LEACHING FIELD WITH 120 CHAMBERS

VOLUME OF DELIVERY PIPE = 3.14 X (1/12 FT)^2 X 29 FT = 0.6 C.F.
= 0.6 C.F. X 7.48 GAL/C.F. = 4.7 GAL.

EACH DOSE WILL EQUAL 1/2 DAILY FLOW VOLUME (PLUS VOLUME OF DELIVERY PIPE)
(165 + 4.7) GALLONS/(7.48 GAL./C.F.) = 22.7 C.F.

AREA OF PUMP CHAMBER = (4'-4")(8-0") = 34.67 S.F.

DEPTH PUMPED PER CYCLE = (22.65 C.F/34.67 S.F.) = 0.65' (8")

AMOUNT OF HEAD REQUIRED = (INVERT INTO D-BOX) - (ELEVATION OF INTERIOR BOTTOM OF PUMP TANK)
= 97.57 - 86.47 = 11.1'

FRICTION LOSS
USE A 2" SCH. 40 FORCE MAIN
TRY PUMPING AT ± 40 GPM
EQUIVALENT PIPE LENGTH FOR 90° BEND = 5.5'
EQUIVALENT PIPE LENGTH FOR 45° BEND = 2.5'
TOTAL LENGTH OF PIPE = 27' + 1(5.5)' + 1(2.5)' = 35'
FRICTION LOSS PER 100' OF PIPE = 3.11
TOTAL LOSS DUE TO FRICTION = (0.35')(3.11)
= 1.09'

TOTAL DYNAMIC HEAD = 11.1' + 1.09' = 12.2'

EMERGENCY STORAGE CAPACITY CALCULATION
STORAGE NEEDED = 330 GALLONS
(330 GAL.) X (1 C.F./7.48 GAL.) = 44.12 C.F.

AREA OF TANK = (8') (4'-4") = 34.67 S.F.

REQUIRED EMERGENCY STORAGE DEPTH = (44.12 C.F./34.67 S.F.)
= 1.27'

DEPTH PROVIDED = 2.09'

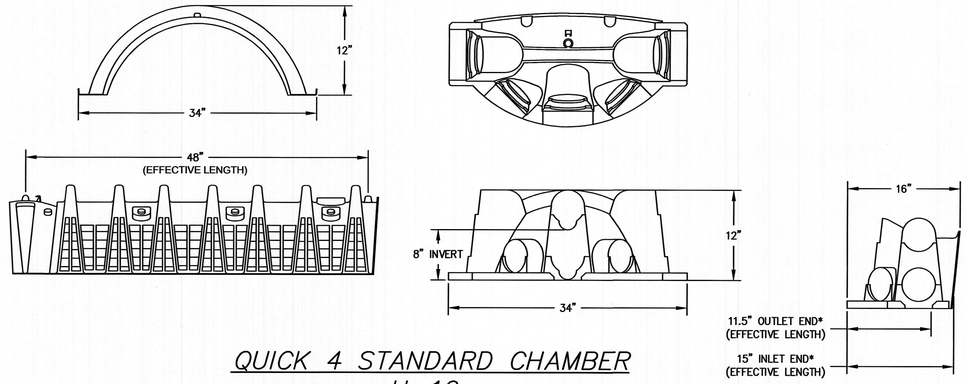
PUMP NOTES:

1) USE A BARNES PUMP MODEL SE411 SERIES WITH A 4.25" IMPELLAR DIAMETER. ANY OTHER PUMP MUST BE APPROVED BY THE DESIGN ENGINEER. PUMPS MUST BE CAPABLE OF LIFTING A 12.2' HEAD AND PASSING 1 1/4" SOLIDS. PUMP MOTOR SHALL BE FULLY SUBMERSIBLE AND HAVE THE FOLLOWING CAPABILITIES: 4/10 HORSEPOWER, 115V, 60 CYCLE, 1725 RPM, 40 GALLONS PER MINUTE FOR 12.2' DYNAMIC HEAD. PUMPS MAY BE PURCHASED FROM WILLIAMSON NEW ENGLAND ELECTRIC MOTOR SERVICE CORP LOCATED AT 111 BOSTON STREET EVERETT, MA. 02149. TELEPHONE # (617) 394-5060

2.) PUMP SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS BY A QUALIFIED INSTALLER. ALL ELECTRICAL CONNECTIONS SHALL BE LOCATED OUTSIDE THE TANK.

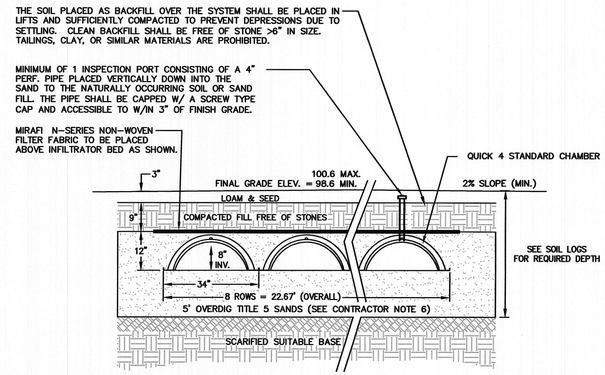
3.) PUMP CHAMBER CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH 310 CMR 15.221 AND 15.226. CHAMBER SHALL BE EQUIPPED WITH TWO 24 INCH MANHOLE LOCATED WITHIN 6" OF FINAL GRADE. THE PUMP CHAMBER SHALL BE EQUIPPED WITH ON AND OFF FLOTATION SWITCHES AND HAVE EMERGENCY STORAGE CAPACITY ABOVE THE OPERATING LEVEL CAPABLE OF STORING THE DAILY DESIGN FLOW OF THE SYSTEM.

4.) THE PUMP MUST BE EQUIPPED WITH A HIGH WATER ALARM. THE ALARM SHALL BE LOCATED IN THE BUILDING SERVED AND BE POWERED BY A CIRCUIT SEPARATE FROM THE CIRCUIT TO THE PUMPS.



QUICK 4 STANDARD CHAMBER H-10

NOT TO SCALE



QUICK 4 CHAMBER BED CONFIGURATION

NOT TO SCALE

OWNER & APPLICANT:

NOLL FAMILY NOMINEE TRUST
7 FOREST PARK DRIVE
LAKEVILLE, MA 02347

REVISIONS			
NO.	DATE	DESCRIPTION	BY

ENGINEERING STAMP

COMMONWEALTH OF MASSACHUSETTS
JASON A. YOUNGQUIST
CIVIL
No. 45572
REGISTERED PROFESSIONAL ENGINEER
6-24-20

SUBSURFACE SEWAGE DISPOSAL SYSTEM UPGRADE

7 FOREST PARK DRIVE

(ASSESSORS MAP: 58 BLOCK: 7 LOT: 13)

LAKEVILLE MASSACHUSETTS

Outback Engineering Incorporated
165 EAST GROVE STREET
MIDDLEBOROUGH, MASS. 02346
TEL:1-(508) 946-9231
FAX:1-(508) 947-8873
www.outback-eng.com

SHEET NUMBER	2 OF 2
SCALE:	N.T.S.
DATE:	6/29/20
DRAWING:	OE3575 BOH.DWG
DRAWN:	K.A.D.
CHECKED:	J.A.Y.
	OE-3575