LOCUS MAP

SCALE: 1" = 1,500'

CALCULATIONS:

HYDRAULIC LOADING:
MINIMUM DESIGN REQUIREMENT
FOUR (4) BEDROOMS AT 110 GALLONS PER BEDROOM = 440 GALLONS PER DAY
TOTAL DESIGN FLOW = 440 GPD (MIN.)

SEPTIC TANK SIZE:
440 G.P.D. X 200% = 880 GALLONS
SEPTIC TANK PROVIDED = 1500 GALLON (MIN.).

PRIMARY LEACHING AREA (GeoMat 3900 LEACHING SYSTEM):
DESIGN PERCOLATION RATE = 30 M/I (SOIL CLASS II) (SEE SOIL SIEVE ANALYSIS)
PERCOLATION RATE VS. LOADING RATE: 30 MPI = 0.67 GPD/S.F.
(GEOMAT 3900 = 3.42 S.F./L.F.)
LINEAR FEET REQUIRED = 656.71 S.F. / 3.42 S.F./L.F. = 192.02 TOTAL LENGTH
GEOMAT 3900 – 39" WIDE x 192.5' TOTAL LENGTH PROVIDED
EDGE TO EDGE SPACING PROVIDED = 0.40'
(4" MIN SPACING – DESIGN REFERENCE GUIDE–REV. AUG. 2016)
GEOMAT 3900 PROVIDED = 5 ROWS x 38.5' LONG x 0.40' SPACING
440 GPD / 0.67 GPD/SF = 657 S.F. SAND BED REQUIRED
MINIMUM SAND BED REQUIRED = 800 S.F. (PER TABLE 3 – DESIGN REFERENCE GUIDE–REV. AUG. 2016)
SAND BED PROVIDED = 803 S.F. (40.50' x 19.85')

CONVENTIONAL REPLACEMENT LEACHING AREA:
DESIGN PERCOLATION RATE = 30 M/I (SOIL CLASS II)
EFFLUENT LOADING RATE = 0.33 GALLONS/S.F.
LEACHING AREA REQUIRED = 440 GPD / 0.33 GPD/S.F. = 1,334 S.F.
TOTAL LEACHING AREA PROVIDED = (6) 56' TRENCHES, 2' WIDE x 1' DEEP (6 X 56 X 4) = 1,344 S.F.
TOTAL DESIGN FLOW = 1,334 S.F. X 0.33 GALLON/S.F. = 443 GALLONS

SCHEDULE OF ELEVATIONS:

SYSTEM ELEVATIONS:

THRESHOLD AT REAR DOOR EL.= 200.0± (EXISTING)
INV. EL. AT FOUNDATION WALL= 198.0± (EXISTING)*

TREATMENT UNIT (TU–1)
4" INV. (IN)= 197.76
4" INV. (OUT)= 197.51

PUMP CHAMBER (PC–1)
4" INV. (IN)= 197.47
2" INV. (OUT)= 197.22

MANIFOLD
2" INV.= 199.08

SYSTEM #1 PIPE DATA:

PIPE 1*
GRAVITY SEWER
EXISTING
L= 12'
S= 0.02

PIPE 2
GRAVITY SEWER
4" PVC (SCH. 40)
L= 2'
S= 0.02

PIPE 3
FORCE MAIN
2" PVC (SDR 21)
L= 10'

PIPE 4
MANIFOLD
2" PVC (SDR. 21)
L= 14.6'

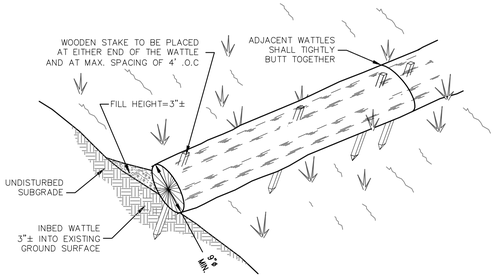
*–SEE REPAIR NOTES

SYSTEM ELEVATIONS:

LINE NO.	EL. OF FINISH GRADE:	EL. INV. OF DIST. LINE:	EL. BOTTOM OF GeoMat:	EL. OF BOT. OF SAND:
P1–5	201.3±	200.58	200.50	200.00

SYSTEM AS–BUILT ELEVATIONS:

LINE NO.	EL. INV. OF DIST. LINE:	EL. BOTTOM OF GeoMat:
P1–5	XX.XX	XX.XX

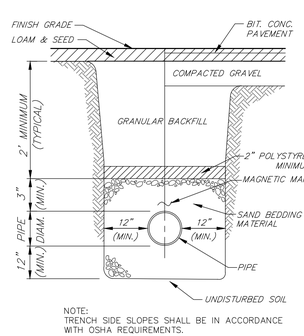


STRAW WATTLE

NOT TO SCALE

SEDIMENTATION & EROSION CONTROL NOTES:

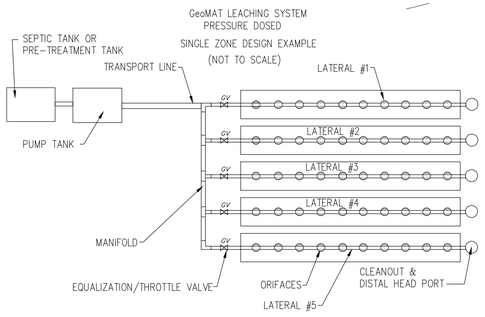
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE TOWN OF BOXBOROUGH CONSERVATION COMMISSION.
2. PRIOR TO THE COMMENCEMENT OF WORK, SEDIMENT BARRIERS SHALL BE INSTALLED ALONG THE EDGE OF PROPOSED DEVELOPMENT, AND AS INDICATED ON THE PLANS. ADDITIONAL BARRIERS, SILT FENCE OR BERMS SHALL BE LOCATED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER, HIS REPRESENTATIVES, OR THE LOCAL AUTHORITY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY AND PERMANENT SEDIMENTATION AND EROSION CONTROLS UNTIL WORK IS COMPLETE AND ALL AREAS HAVE BEEN PERMANENTLY STABILIZED. AT SUCH TIME THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL SEDIMENTATION AND EROSION CONTROL MEASURES.
4. THE CONTRACTOR SHALL INSPECT SEDIMENTATION AND EROSION CONTROLS ON A WEEKLY BASIS AND IMMEDIATELY AFTER EACH RAINFALL; REPAIRS SHALL BE MADE BY THE END OF THE WORKING DAY. ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR, AS REQUIRED BY THE LOCAL AUTHORITY OR AS DIRECTED BY THE ENGINEER.
5. THE CONTRACTOR SHALL BE PREPARED TO ALLOW WORK TO WAIT A DAY OR TWO AFTER RAIN EVENTS TO ALLOW SURFACE SOILS TO DRY.
6. SOIL STOCKPILES SHALL BE STABILIZED TO PREVENT EROSION. NO MATERIALS SUBJECT TO EROSION SHALL BE STOCKPILED OVERNIGHT WITHIN 100 FEET OF A WETLAND UNLESS COVERED.
7. DISTURBED AREAS SHALL BE STABILIZED BY LOAMING AND SEEDING, OR BY ANOTHER APPROVED METHOD, AS SOON AS POSSIBLE AFTER THE FINISHED GRADE HAS BEEN MET. IF FINAL GRADING DOES NOT OCCUR DURING THE GROWING SEASON, THESE AREAS SHALL BE MULCHED WITH HAY AND SECURED.
8. STREET SWEEPING IN THE VICINITY OF THE PROJECT AREA SHALL BE PERFORMED AS NEEDED UNTIL THE PROJECT LIMITS HAVE BEEN STABILIZED. ALL SEDIMENT TRACKED ONTO PUBLIC RIGHT–OF–WAYS OR PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.

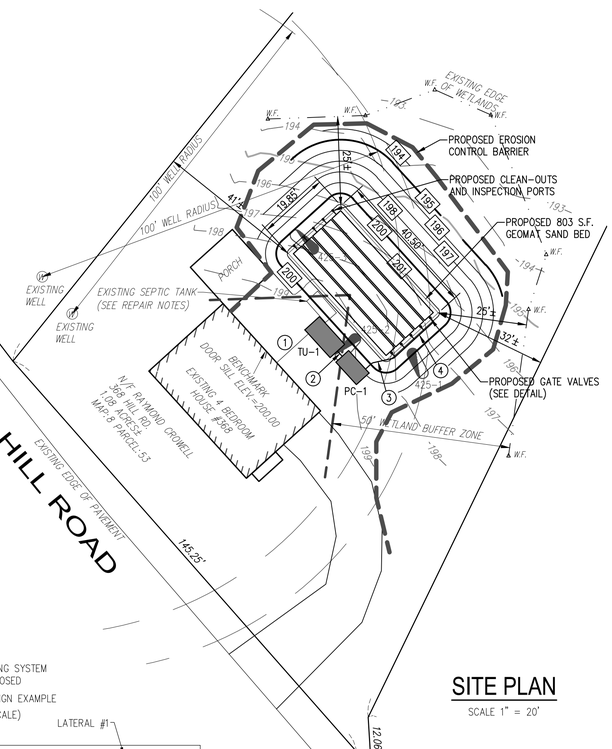


NOTE:
TRENCH SIDE SLOPES SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS.

FORCE MAIN INSULATION

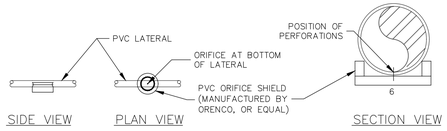
NOT TO SCALE





SITE PLAN

SCALE 1" = 20'



STANDARD ORIFICE SHIELD

NOT TO SCALE.

GENERAL NOTES:

1. TOPOGRAPHIC INFORMATION IS THE RESULT OF AN ON–THE–GROUND SURVEY PERFORMED BY DILLIS & ROY CIVIL DESIGN GROUP, INC. ELEVATIONS REFER TO AN ASSUMED DATUM (SEE BENCH MARK LOCATED ON PLOT PLAN).
2. PROPERTY LINE INFORMATION TAKEN FROM RECORDED PLAN ON FILE WITH THE MIDDLESEX SOUTH DISTRICT REGISTRY OF DEEDS.
PLAN NUMBER: 306 OF: 1964
3. PROPERTY LINES SHALL BE DETERMINED PRIOR TO CONSTRUCTION OR INSTALLATION OF ANY OF THE PROPOSED IMPROVEMENTS HEREON.
4. PERCOLATION TESTS PERFORMED IN ACCORDANCE WITH 310 CMR (TITLE 5) REGULATIONS 15.104 AND 15.105.
5. ANY DEVIATIONS FROM THE DESIGN PLAN MUST BE APPROVED IN WRITING BY DILLIS & ROY CIVIL DESIGN GROUP, INC.
6. NO PERMANENT STRUCTURES MAY BE CONSTRUCTED OVER THE RESERVE LEACHING AREA.
7. 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.
8. 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.
9. THERE ARE NO POTABLE DRINKING WATER WELLS WITHIN 150 FEET OF THE PROPOSED SEWAGE DISPOSAL SYSTEM UNLESS OTHERWISE NOTED.
10. THIS DESIGN DOES NOT ACCOMMODATE A GARBAGE DISPOSAL.
11. 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.
12. EXISTING UTILITIES 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 UTILITIES LOCATED ON OR NEAR THE SITE. THE CONTRACTOR SHALL CALL DIG SAFE 1–888–DIG–SAFE PRIOR TO CONSTRUCTION IN ACCORDANCE WITH STATE LAWS.
13. A NOTICE OF THE EXISTENCE OF THIS ALTERNATIVE SYSTEM SHALL BE RECORDED AT THE REGISTRY OF DEEDS IN THE CHAIN OF TITLE TO THE PROPERTY.
14. THE OWNER SHALL BE RESPONSIBLE FOR THE APPLICABLE PROVISIONS SET FORTH IN 310 CMR 15.287.
15. THIS PLAN HAS BEEN PREPARED TO DETAIL THE CONSTRUCTION REQUIREMENTS FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM ONLY. THIS PLAN SHALL NOT BE UTILIZED FOR ANY OTHER PURPOSE.

CONSTRUCTION NOTES:

1. CONTACT DESIGN ENGINEER PRIOR TO SYSTEM INSTALLATION. DESIGN ENGINEER MUST BE ON SITE ONCE TOPSOIL AND ORGANIC MATERIAL IS REMOVED AND PRIOR TO PLACEMENT OF ANY SAND OR FILL.
2. SYSTEM TO BE INSTALLED IN ACCORDANCE WITH PRODUCT DESIGN AND INSTALLATION MANUAL, AND STATE AND LOCAL REGULATIONS. FOR PRODUCT INFORMATION OR THE NEAREST DEALER CONTACT GEOMATRIX SYSTEMS, LLC 114 MILL ROCK ROAD EAST, OLD SAYBROOK, CT 06475 – PHONE 1–860–510–0730 – WWW.GEOMATRIXSYSTEMS.COM
3. MINIMUM OF 6" OF MEDIUM TO COARSE SAND MEETING THE REQUIREMENTS OF ASTM C–33, WITH LESS THAN 2% PASSING A # 200 SIEVE REQUIRED AROUND CIRCUMFERENCE OF GEO–MATS. (SEE DESIGN AND INSTALLATION MANUAL FOR COMPLETE SAND AND FILL SPECIFICATIONS.)
4. THE SYSTEM INSTALLER SHALL PROVIDE THE SYSTEM OWNER AND LOCAL APPROVING AUTHORITY WITH A BILL OF LADING CERTIFYING THE SYSTEM SAND FILL MEETS ASTM C–33.
5. SYSTEM SHALL NOT BE INSTALLED ON FROZEN GROUND OR LEFT UNCOVERED FOR EXTENDED PERIODS OF TIME.
6. 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.
7. BACKFILL OVER THE SOIL ABSORPTION SYSTEM, SEPTIC TANK AND OTHER SYSTEM COMPONENTS SHALL BE A MINIMUM OF 9 INCHES EXCLUDING TOPSOIL, PLACED IN LIFTS AND SUFFICIENTLY COMPACTED TO PREVENT DEPRESSIONS DUE TO SETTLING. BACKFILL OVER THE SOIL ABSORPTION SYSTEM SHALL BE FREE OF STONES AND BOULDERS GREATER THAN 6 INCHES IN SIZE.
8. THE BUILDING SEWER SHALL BE LAID ON A COMPACTED FIRM BASE.
9. ALL PIPING SHALL BE MINIMUM OF SCHEDULE 40 UNLESS OTHERWISE NOTED.
10. ALL PIPE JOINTS AND CONNECTIONS TO SYSTEM COMPONENTS SHALL BE MECHANICALLY SOUND, WATER TIGHT AND PROTECTED AGAINST DAMAGE BY ROOTS.
11. ALL BUILDING SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STATE PLUMBING CODE 248 CMR 2.00.
12. 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%
13. EFFLUENT DISTRIBUTION LINES SHALL BE LAID LEVEL.
14. FILL MATERIAL FOR SYSTEMS CONSTRUCTED IN FILL SHALL CONSIST OF SELECT ON–SITE OR IMPORTED SOILS MATERIAL THAT MEET THE MINIMUM REQUIREMENTS STATED IN 310 CMR 15.255(3).
15. WHERE FILL IS REQUIRED TO REPLACE UNSUITABLE OF IMPERMEABLE SOILS, THE EXCAVATION OF THE UNSUITABLE MATERIAL SHALL EXTEND TO THE DEPTH OF 3 INCHES INTO THE NATURALLY OCCURRING PERVIOUS MATERIAL.
16. 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 BE DEWATERED.
17. 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 (DEP).
18. ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE BURIED.
19. ALL SOIL ABSORPTION SYSTEMS SHALL HAVE A MINIMUM OF ONE (1) INSPECTION PORT CONSISTING OF A PERFORATED FOUR (4) INCH PIPE PLACED VERTICALLY TO THE NATURALLY OCCURRING SOIL OR SAND FILL BELOW THE SYSTEM SAND. THE PIPE SHALL BE CAPPED WITH A SCREW TYPE CAP AND ACCESSIBLE TO WITHIN THREE (3) INCHES OF FINISH GRADE. (SEE DETAIL)

REPAIR NOTES:

1. CONTRACTOR TO VERIFY EXISTING SEPTIC SYSTEM ELEVATIONS (*) PRIOR TO THE START OF CONSTRUCTION AND REPORT TO ENGINEER ANY VARIATIONS IN ELEVATIONS TO THOSE SHOWN ON THIS PLAN.
2. EXISTING BUILDING SEWER TO BE CLEANED AND INSPECTED FOR STRUCTURAL INTEGRITY, WATERTIGHTNESS, SLOPE AND GRADE, IF FOUND TO BE UN–ACCEPTABLE, REPLACE WITH NEW SCHEDULE 40 PVC BUILDING SEWER PIPE IN ACCORDANCE WITH 310 CMR 15.222.
3. EXISTING SEPTIC TANK TO BE CRUSHED AND BACKFILLED WITH CLEAN GRANULAR MATERIAL AND/OR REMOVED IN ACCORDANCE WITH THE TOWN OF BOXBOROUGH'S BOARD OF HEALTH RULES AND REGULATIONS AND A NEW 1,500 GALLON SEPTIC SHALL BE INSTALLED.
4. 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 OF BOXBOROUGH'S BOARD OF HEALTH RULES AND REGULATIONS.

SOIL TEST DATA

NAME OF APPROVING AUTHORITY: BOXBOROUGH BOARD OF HEALTH
KOLBY BEAUVAIS, N.A.B.O.H. AGENT

NAME OF SOIL EVALUATOR: DILLIS & ROY CIVIL DESIGN GROUP
WILLIAM J. "JACK" MALONEY, JR. (SE–13704)

SOIL CLASSIFICATION: CHATFIELD–HOLLIS ROCK COMPLEX
GEOLOGICAL MATERIAL: PROGLACIAL OUTWASH
LAND FORM: OUTWASH PLAIN
SOIL LIMITATIONS: NONE
GENERAL NOTES: X

PERCOLATION TEST DATA

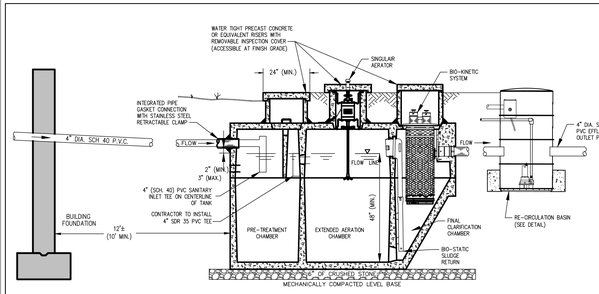
TEST PIT NO.	DATE	BOTTOM OF TEST HOLE: DEPTH FROM SURFACE	BOTTOM OF TEST HOLE: SURFACE ELEVATION	RATE: MINUTES PER INCH
425–A	4/16/2025	42"	198.0±	30 M/I*

* – SEE SOIL SIEVE ANALYSIS RESULTS AND LOCAL UPGRADE APPROVAL REQUEST

	DEPTH	HOR.	TEX.	COLOR	MOTT.	G.W.	OTHER
DEEP TEST PIT: 425–1							
DATE OF TEST: 4/16/25	0–12"	A	S.L.	10YR 3/3	NONE	NONE	CRUMB, FRIABLE
REFUSAL AT: NONE OBSERVED	12–24"	B	S.L.	10YR 5/6	NONE	NONE	S.A.B., FRIABLE
	24–60"	C	S.L.	10YR 5/3	@ 24"	@ 24"	MASSIVE, FRIABLE
(SURFACE ELEV. = 197.5±)							
ESTIMATED SEASONAL HIGH GROUND WATER	AT 24" (ELEVATION = 195.5±)						
DEEP TEST PIT: 425–2	DEPTH	HOR.	TEX.	COLOR	MOTT.	G.W.	OTHER
DATE OF TEST: 4/16/25	0–9"	H.T.M.	LOAM				
REFUSAL AT: NONE OBSERVED	9–44"	H.T.M.	SAND				
	44–96"	C	S.L.	10YR 5/3	@ 28"	@ 28"	MASSIVE, FRIABLE
(SURFACE ELEV. = 199.0±)							
ESTIMATED SEASONAL HIGH GROUND WATER	AT 28" (ELEVATION = 196.7±)						
DEEP TEST PIT: 425–3	DEPTH	HOR.	TEX.	COLOR	MOTT.	G.W.	OTHER
DATE OF TEST: 4/16/25	0–14"	H.T.M.	S.L.				
REFUSAL AT: NONE OBSERVED	14–24"	H.T.M.	S.L.				
	24–30"	H.T.M	SAND				
	30–80"	C	S.L.	10YR 5/3	@ 24"	@ 42"	MASSIVE, FRIABLE
(SURFACE ELEV. = 198.0±)							
ESTIMATED SEASONAL HIGH GROUND WATER	AT 24" (ELEVATION = 196.0±)						

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)

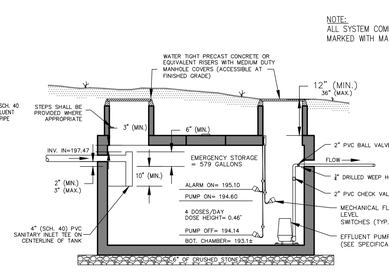


SINGULAIR TREATMENT UNIT (TU-1)

NOT TO SCALE.
(H 10 LOADING REQUIRED)
(IN ACCORDANCE WITH 310 CMR 15.223 TO 15.228 AND 15.231)
SINGULAIR MODEL 960–600 DN
CAPACITY = 1,500 GALLONS
PRECAST REINFORCED CONCRETE

BUILDING SEWER NOTES:

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.



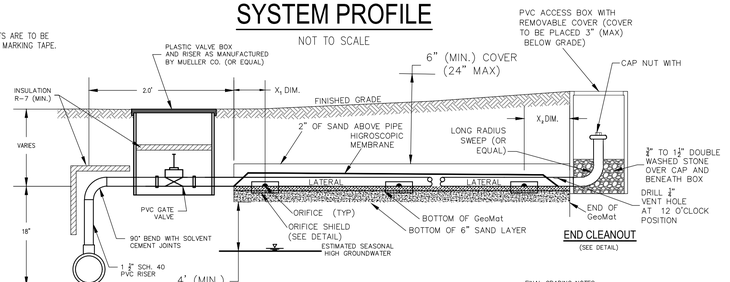
PUMP CHAMBER (PC-1)

(IN ACCORDANCE WITH 310 CMR 15.223 TO 15.228 AND 15.231)
CAPACITY = 1,000 GALLONS
PRECAST REINFORCED CONCRETE (H–10)
MANUFACTURER: LAMARRE CONCRETE PRODUCTS, INC.
OR EQUIVALENT

NOTE:
ALL SYSTEM COMPONENTS ARE TO BE MARKED WITH MAGNETIC MARKING TAPE.

SYSTEM PROFILE

NOT TO SCALE



END CLEANOUT

(SEE DETAIL)

RISER AND DISTRIBUTION LINE

(SEE DETAIL)

GeoMat LEACHING SYSTEM

(IN ACCORDANCE WITH 310 CMR 15.251)
GeoMat BOTTOM SHALL BE LEVEL FOR ENTIRE LENGTH
PRIMARY: 5 LINES REQUIRED AT 38.5' LONG
4.8" EDGE TO EDGE
FIELD AREA = 40.50' x 19.85' = 803 S.F.
SAND BED LEACH AREA

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.

LEGEND

DESCRIPTION	DRAWING ENTITY
DENOTES EXISTING CONTOUR (INDEX)	100
DENOTES EXISTING CONTOUR (INTERMEDIATE)	98
DENOTES PROPOSED CONTOUR (INDEX)	100
DENOTES PROPOSED CONTOUR (INTERMEDIATE)	98
DENOTES LIMIT OF EXCAVATION OF UNSUITABLE SOILS	5' EXC.
DENOTES PROPOSED SEWER LINE	S
DENOTES PROPOSED WATER LINE	W
DENOTES PROPOSED UNDERGROUND UTILITIES	ETC
DENOTES PROPOSED CONCRETE SEPTIC TANK	ST–1
DENOTES PROPOSED CONCRETE PUMP CHAMBER	PC–1
DENOTES PROPOSED CONCRETE DISTRIBUTION BOX	DB–1
DENOTES PROPOSED SEWER CLEANOUT	C.O.

DILLIS & ROY CIVIL DESIGN GROUP
CIVIL ENGINEERS LAND SURVEYORS WETLAND CONSULTANTS

CORPORATE OFFICE:
1 MAIN STREET, SUITE 1
LUNENBURG, MA 01462
978–779–6091
www.dillisandroy.com

CONCORD OFFICE:
100 MAIN ST., SUITE 310
CONCORD, MA 01742

OWNER:
CROWELL INVESTMENT TRUST
KEITH CROWELL – TRUSTEE
323 WARES ROAD
ASHBY, MA 01431

APPLICANT:
NICHOLS EXCAVATING, LLC
BRANDON NICHOLS
323 BURRAGE STREET
LUNENBURG, MA 01462

SCALE:
20 0 10 20 40 80
1 in. = 20 ft.

DIG SAFE 1–888–344–7233

THE SEWAGE DISPOSAL SYSTEM SHOWN HEREON HAS BEEN DESIGNED IN ACCORDANCE WITH 310 CMR 15.00 (TITLE 5), MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION SYSTEM APPROVALS AND/OR CERTIFICATIONS AND THE MANUFACTURERS SYSTEM DESIGN GUIDANCE.

COMMONWEALTH OF MASSACHUSETTS
GREGORY S. ROY
CIVIL
NO. 46070
REGISTERED PROFESSIONAL ENGINEER
STAMP DATE: 5/2/2025

DATE: 4/29/2025
DESIGN BY: CLM
DRAWN BY: CLM
CHECKED BY: GSR

SEWAGE DISPOSAL SYSTEM DESIGN
368 HILL ROAD (M: 8 P: 53)
BOXBOROUGH, MA 01719

NO.	DATE	DESCRIPTION	BY

JOB NO. 8587
DRAWING NO. 8587–SDS
SHEET NO. 1 OF 2

GENERAL PUMP NOTES

1. GENERAL–
FURNISH AND INSTALL A COMPLETE SIMPLEX PUMPING SYSTEM CONSISTING OF SUBMERSIBLE SEWAGE PUMP AND MOTOR, DISCHARGE PIPING AND VALVE, FLOAT SWITCH LEVEL CONTROLS, HIGH WATER ALARM, SIMPLEX CONTROL PANEL AND PRECAST CONCRETE PUMP CHAMBER. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS AND SHALL BE WARRANTED FOR AT LEAST ONE YEAR. THE CONTRACTOR SHALL PROVIDE A SUFFICIENT QUANTITY OF CLEAN WATER TO CONDUCT PUMP OPERATION TEST.

2. PUMP CHAMBER–
THE PUMP CHAMBER SHALL BE A REINFORCED PRECAST CONCRETE STRUCTURE. CONSTRUCTION JOINTS AND OPENINGS SHALL BE SEALED WITH A HYDRAULIC CEMENT OR OTHERWISE MADE WATERTIGHT.

3. PUMP AND MOTOR
PUMP SHALL BE A MYERS PUMP MODEL MW50, OR EQUIVALENT, SUBMERSIBLE SEWAGE PUMP CAPABLE OF PASSING 2–INCH SOLIDS. PUMP AND MOTOR SHALL BE FULLY SUBMERSIBLE AND SHALL OPERATE AT 1,625 RPM WITH A 230V, 60 CYCLE, SINGLE PHASE AC POWER SOURCE. (NOTE: ELECTRICAL CONTRACTOR SHALL VERIFY AVAILABLE VOLTAGE AT THE PUMP CONTROL PANEL PRIOR TO CONSTRUCTION.) PUMP SHALL BE RATED AS FOLLOWS:

H.P.	**0.5 H.P.**
RATE:	**38 GPM**
TDH:	**13 FEET**
MODEL:	**MYERS PUMP MODEL MW 50 OR EQUIVLENT**

PUMP SHALL BE FACTORY TESTED PRIOR TO SHIPMENT AND A CERTIFIED FACTORY TEST REPORT SHALL BE PROVIDED TO THE ENGINEER.
PUMP SLIDE RAILS SHALL BE CONSTRUCTED AS SHOWN ON PLAN. RAILS SHALL BE MODEL SRA–200 OR APPROVED EQUAL.

4. PIPING–
2–INCH (SCH 80) PVC PIPE AND FITTING SHALL BE USED FOR INTERIOR PUMP STATION DISCHARGE PIPING AND FITTINGS. THE SEWAGE FORCE MAIN SHALL BE SDR 21 (CLASS 200) PVC PIPE OF THE SIZE INDICATED ON THE PLANS. DISCHARGE LINES WITHIN THE PUMP CHAMBER SHALL INCLUDE THE FOLLOWING FOR EACH PUMP:

1) IN THE VERTICAL POSITION: A CHECK VALVE
2) IN THE HORIZONTAL POSITION: A BALL VALVE

ALL PIPING OUTSIDE THE PUMP CHAMBER AND HAVING LESS THAN 4–FEET OF SOIL COVER SHALL BE INSULATED. (SEE NOTE 8)

5. LEVEL CONTROLS–
SEALED FLOAT TYPE MECHANICAL SWITCHES SHALL BE SUPPLIED TO CONTROL THE PUMP LEVEL AND ALARM SIGNAL. THREE FLOAT SWITCHES SHALL BE USED TO CONTROL THE PUMP LEVEL: ONE EACH FOR PUMP "ON" AND PUMP "OFF". A THIRD SWITCH SHALL BE PROVIDED WITH A POWER SOURCE SEPARATE FROM THE PUMP POWER SOURCE TO ACTIVATE THE ALARM UNIT. ALL FLOAT SWITCHES SHALL BE OF THE MECHANICAL TUBE TYPE SEALED IN POLYURETHANE FLOATS. THE FLOAT LEVEL CONTROLS SHALL BE SET TO OPERATE AT THE ELEVATIONS INDICATED ON THE PLANS.

6. CONTROL PANELS–
THE SIMPLEX CONTROL PANEL SHALL BE EQUIPPED WITH RUN LIGHTS FOR THE PUMP, PROPERLY SIZED PUMP CIRCUIT BREAKERS, A TRANSFORMER TO GIVE PROPER VOLTAGE TO THE CONTROL CIRCUITS, AN ALTERNATOR RELAY AND A THREE–WAY HAND CONTROL SWITCH. THE SWITCH POSITIONS SHALL BE AS FOLLOWS:

1) PUMP OFF
2) AUTOMATIC PUMP ON
3) MANUAL PUMP ON

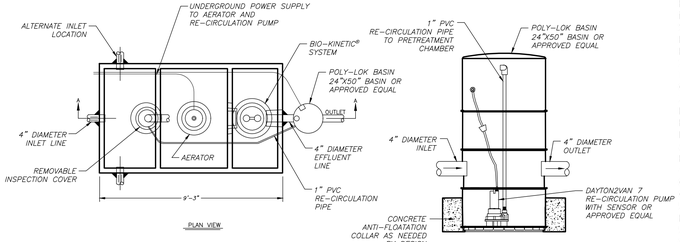
THE CONTROL PANEL SHALL BE INSTALLED IN A WEATHERPROOF ENCLOSURE MOUNTED ON A PANEL. THE ENCLOSURE SHALL COMPLY WITH ALL STATE AND LOCAL ELECTRICAL CODES.

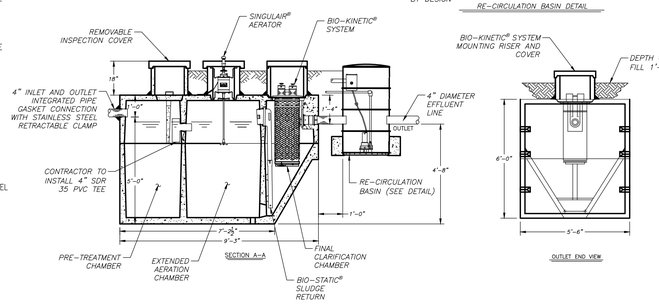
7. ALARM–
HIGH WATER ALARM SHALL BE SUPPLIED WITH BOTH AUDIBLE AND VISUAL ALARMS WITH A SEPARATE POWER SUPPLY FROM THE PUMP. THE ALARM SHALL BE HOUSED IN A WEATHERPROOF ENCLOSURE MOUNTED ON A PANEL. ALARM SILENCER BUTTON SHALL BE PROVIDED TO SILENCE THE AUDIBLE ALARM WHILE THE VISUAL ALARM REMAINS ILLUMINATED UNTIL MANUALLY RESET.

8. PIPE INSULATION–
PVC FORCE MAIN SHALL BE COVERED WITH 2–INCH THICK, RIDGED POLYSTYRENE INSULATION WHEREVER THE DEPTH OF SOIL COVER IS LESS THAN 4–FEET.

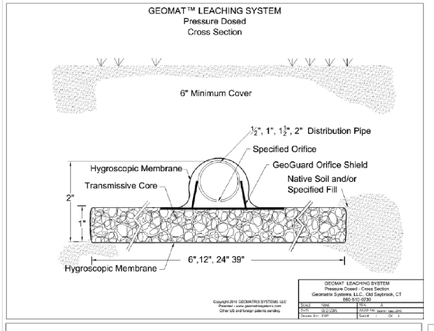
9. PUMP CHAMBER WIRING REQUIREMENTS–
ALL POWER WIRING, FLOAT WIRING, JUNCTIONS BOXES, PENETRATIONS SEALS, AND ALL OTHER ELECTRICAL APPURTENANCES REQUIRED IN THE PUMP CHAMBER SHALL BE INSTALLED IN COMPLIANCE WITH REGULATIONS PERTAINING TO CLASS 1, DIVISION 1 HAZARDOUS LOCATIONS.

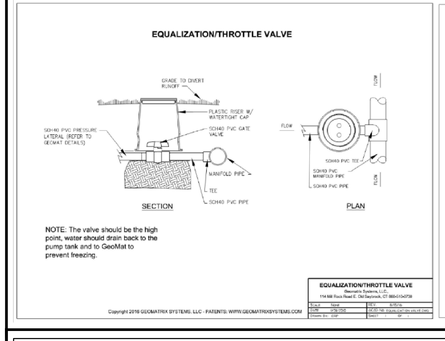
10. EFFLUENT FILTER TEE–
EFFLUENT TEE FILTER SHALL BE STF–100 PRESSURE FILTER OR EQUAL DEP APPROVED FILTER. FILTER SHALL BE RATED FOR THE FLOW SHOWN ON THE PLAN.

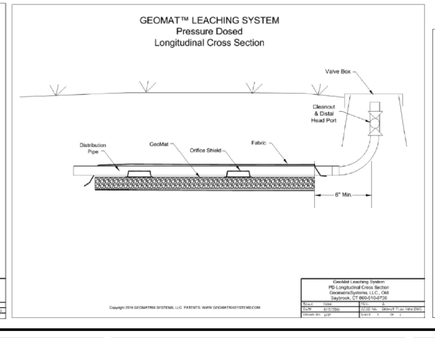


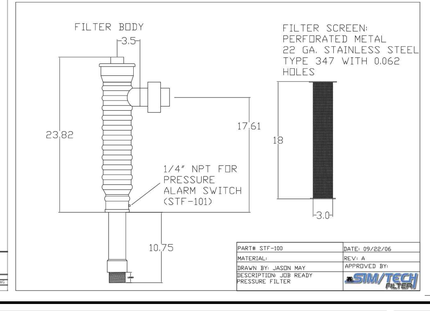


1. GENERAL–
FURNISH AND INSTALL COMPLETE NORWECO SINGULAIR MODEL 960–600 DN SYSTEM WITH ALL NECESSARY PARTS AND EQUIPMENT AS DESCRIBED IN THE OWNERS MANUAL. TREATMENT OF WASTEWATER SHALL BE ACCOMPLISHED BY THE EXTENDED AERATION PROCESS WITH NON–MECHANICAL FLOW EQUALIZATION, PRETREATMENT OF THE INFLUENT AND FILTRATION OF THE EFFLUENT. ALL TREATMENT PROCESSES SHALL BE CONTAINED WITHIN REINFORCED PRECAST CONCRETE TANKAGE METING REQUIREMENTS OF ACI STANDARD 318. THE SYSTEM SHALL BE CAPABLE OF REDUCING TOTAL NITROGEN WITHOUT THE ADDITION OF CHEMICALS, SPECIALIZED ADD–ON PROCESSES OR ADDITIONAL COMPONENTS. NITRIFICATION AND DENITRIFICATION SHALL BE ACCOMPLISHED WITH THE CHAMBERS OF THE TREATMENT SYSTEM PRIOR TO EFFLUENT DISPOSAL. THE TREATMENT SYSTEM SHALL INCLUDE PRECAST CONCRETE TANK PROVIDING SEPARATE PRETREATMENT, AERATION AND CLARIFICATION CHAMBERS. PRINCIPLE COMPONENTS SHALL BE 1725 RPM MECHANICAL AERATOR, UL LISTED SERVICE PRO CONTROL CENTER WITH MCD TECHNOLOGY, BIO STATIC SLUDGE RETURN AND BIO–KENETIC TERTIARY TREATMENT DEVICE FOR FLOW EQUALIZATION AND FINAL FILTRATION OF SYSTEM EFFLUENT.
2. OPERATING CONDITIONS–
TOTAL HOLDING CAPACITY SHALL PROVIDE A MINIMUM OF 48 HOUR RETENTION OF THE DAILY FLOW. THE PRETREATMENT CHAMBER SHALL PROVIDE AT LEAST 18 HOUR RETENTION, EXTENDED AERATION CHAMBER SHALL PROVIDE AT LEAST 24 HOUR RETENTION AND THE CLARIFICATION SHALL PROVIDE AT LEAST 6 HOUR RETENTION.
3. PRETREATMENT CHAMBER–
PRETREATMENT SHALL BE AN INTEGRAL PART OF THE WASTEWATER TREATMENT SYSTEM. ALL DOMESTIC WASTEWATER SHALL BE PRECONDITIONED AND FLOW EQUALIZED WHILE PASSING THROUGH THE PRETREATMENT CHAMBER PRIOR TO BEING INTRODUCED TO THE EXTENDED AERATION CHAMBER. THE OUTLET OF THE PRETREATMENT CHAMBER SHALL BE EQUIPPED WITH A DISCHARGE TEE THAT EXTENDS VERTICALLY INTO THE LIQUID SO THAT ONLY PRECONDITIONED EQUILIZED FLOW FROM THE CENTER AREA OF THE CHAMBER IS DISPLACED TO THE EXTENDED AERATION CHAMBER. THE DISCHARGE TEE AND TRANSFER PORT SHALL BE OF ADEQUATE SIZE TO HANDLE A PEAK FLOW FACTOR OF FOUR WITHOUT RESTRICTING THE OUTLET AND DISTURBING HYDRAULIC DISPLACEMENT TO THE EXTENDED AERATION CHAMBER. A REMOVABLE INSPECTION COVER SHALL BE CAST INTO THE TOP OF THE TANKS TO ALL TANK AND TRANSFER TEE INSPECTION. AS A SAFETY MEASURE, THE UNCOVERED OPENING SHALL BE SMALL ENOUGH TO INSURE THAT THE TANK CANNOT BE ENTERED FOR INSPECTION OR SERVICE.
4. AERATION CHAMBER–
CHAMBER SIZE SHALL BE OF SUFFICIENT SIZE TO PROVIDE A MINIMUM OF 80 CU.FT. PER POUND OF BOD. LENGTH TO WIDTH RATION SHALL PROVIDE UNIFORM MIXING AND OPTIMUM TREATMENT. CHAMBERS SHALL BE CONSTRUCTED OF REINFORCED 5,000 PSI, 28 DAY COMPRESSIVE STRENGTH PRECAST CONCRETE. CASTING SHALL BE MONOLITHIC WITH EXTERNAL AND INTERNAL WALLS.
5. FINAL CLARIFICATION CHAMBER–
FINAL CLARIFICATION CHAMBER SHALL CONSIST OF 5 FUNCTIONALLY INDEPENDENT ZONES OPERATING TOGETHER. LIQUID SHALL BE HYDRAULICALLY DISPLACED FROM THE INLET ZONE TO SLUDGE RETURN ZONE. NON–MECHANICAL EQUALIZATION OF THE FLOW THROUGH ALL 5 INDEPENDENT ZONES SHALL PROVIDE OPTIMAL SETTLING AND CLARIFICATION.
6. BIO–STATIC® SLUDGE RETURN–
SHALL BE INSTALLED INTO THE CAST IN PLACE OPENINGS IN THE AERATION/CLARIFICATION CHAMBER WALL TO PROVIDE POSITIVE RETURN OF SETTLED SOLIDS. AERATION CHAMBER HYDRAULIC CURRENTS SHALL ENTER THE SLUDGE RETURN AND BE DIRECTED INTO THE SLUDGE RETURN ZONE OF THE CLARIFICATION CHAMBER. BIO–STATIC® SLUDGE RETURN SHALL ACCOMPLISH RESUSPENSION AND RETURN OF SETTLED SOLIDS WITHOUT DISTURBING THE CLARIFIED LIQUID IN THE FINAL SETTLING ZONE AND OUTLET.
7. MECHANICAL AERATOR–
SINGULAIR AERATION SHALL BE INSTALLED IN A CONCRETE AERATOR MOUNTING CASTING ABOVE THE AERATION CHAMBER. FRESH AIR SHALL BE SUPPLIED THROUGH A MOLDED PLASTIC VENT ASSEMBLY CAST INTO THE CONCRETE ACCESS COVER ABOVE THE AERATOR. SINGULAIR AERATOR SHALL INCLUDE PLATED MOUNTING BRACKETS, NEMA 6 RATED ELECTRICAL CONNECTORS, UL RECOGNIZED FRACTIONAL HORSEPOWER MOTOR, MOLDED PLASTIC LIFTING HANDLE, MOLDED PLASTIC AIR INTAKE SCREENS, MOLDED PLASTIC FOAM RESTRICTOR, STAINLESS STEEL ASPIRATOR SHAFT AND MOLDED GLASS–FILLED NYLON ASPIRATOR TIP. THE MOTOR SHALL CONTAIN PRECISION MANUFACTURED O–RING TYPE SEALS INSTALLED BETWEEN THE MOTOR SHELL AND THE MACHINED ALUMINUM ENDBELLS TO ENSURE WATERTIGHT INTEGRITY. MOLDED VITON SHAFT SEALS SHALL BE UTILIZED TO PROTECT THE BEARINGS FROM CONTAMINATION. ONLY THE STAINLESS STEEL ASPIRATOR SHAFT AND GLASS FILLED NYLON ASPIRATOR TIP SHALL BE INSTALLED IN CONTACT WITH THE LIQUID. SUBMERGED ELECTRICAL MOTORS, BEARINGS OR FIXED AIR PIPING SHALL NOT BE SUBMERGED. AERATOR MOTORS SHALL NOT BE DESIGNED TO EXCEED MOTOR NAMEPLATE RATING WHEN INSTALLED AND OPERATED AS RECOMMENDED FOR THE SYSTEM. FRACTIONAL HORSEPOWER MOTOR AERATOR MOTOR SHALL BE EQUIPPED WITH A FOAM RESTRICTOR TO PROTECT THE MOTOR AGAINST HIGH WATER AND FOAM. THE MOTOR POLE SHALL BE 4–POLE 1725 RPM, 115 VOLT, 60 HERTZ, SINGLE PHASE, BALL BEARING CONSTRUCTED WITH A 1.0 SERVICE FACTOR. IT SHALL DRAW LESS THAN 4.0 AMPS WHEN OPERATING AT THE RATED NAMEPLATE VOLTAGE. AERATOR MOTORS WITHOUT UL LISTING SHALL NOT BE CONSIDERED FOR THIS APPLICATION.
8. SERVICE PRO CONTROL CENTER–
SERVICE PRO CENTER WITH MCD TECHNOLOGY SHALL PROVED MONITORING, COMPLIANCE AND DIAGNOSTIC FUNCTIONS FOR THE SINGULAIR TREATMENT USING A MICROPROCESSOR BASED PLATFORM. CONTROL CENTER SHALL CONTAIN NONVOLATILE MEMORY TO PREVENT LOSS OF PROGRAMMING IN THE EVENT OF A POWER FAILURE. PRE–WIRED CONTROLS SHALL BE MOUNTED IN A LOCKABLE NEMA RATED ENCLOSURE DESIGNED SPECIFICALLY FOR OUTDOOR USE. CONTROL CENTER SHALL BE UL LISTED AND INCLUDE FACTORY PROGRAMMED TIMER, ALARM LIGHT, RESET BUTTON, POWER SWITCH, POWER LIGHT, PHONE LIGHT, AERATOR ALARM LIGHT AND THREE AUXILIARY ALARM LIGHTS. CONTROL CENTER SHALL MONITOR ALL TREATMENT SYSTEMS INCLUDING AERATOR OVER CURRENT, AERATOR UNDER CURRENT AND OPEN MOTOR CIRCUIT. POWER TO THE AERATOR SHALL BE INTERRUPTED AND A DIAGNOSTIC SEQUENCE SHALL BEGIN AND VISUAL ALARM ACTIVATED IN THE EVENT THE CONTROL CENTER DETECTS AN ALARM. ALARM AND CONTROL CIRCUITS ARE TO BE CONNECTED TO INDEPENDENT POWER SOURCES FROM THE MAIN POWER SOURCE OF THE FACILITY.
9. AERATOR TIME CYCLE–
FACTORY PROGRAMMED TIMER BUILT INTO THE THE SERVICE PRO CONTROL CENTER SHALL PROVIDE A TOTAL OF 12 HOURS OF AERATOR OPERATION PER DAY. A NON–ADJUSTABLE TIMER SHALL CREATE A 60 MINUTE AERATION CYCLE FOLLOWED BY A 60 MINUTE ANOXIC CYCLE DURING WHICH THE AERATOR SHALL BE OFF. SYSTEMS THAT HAVE NOT BEEN PERFORMANCE CERTIFIED, AT A TIMER AERATION CYCLE, BY AN INDEPENDENT ANSI ACCREDITED TESTING LABORATORY SHALL NOT BE CONSIDERED FOR THIS APPLICATION.
10. SERVICE PRO MONITORING CENTER–
MONITORING CENTER SHALL CONTAIN A 128 BIT ENCRYPTED PASSWORD PROTECTED WEB SITE FOR INTERFACE WITH THE MONITORING CENTER DATABASE.
11. BIO–KINETIC SYSTEM–
BIO–KINETIC SYSTEM SHALL BE INSTALLED IN THE MOUNTING CASTING(S) ABOVE THE CLARIFICATION CHAMBER. EACH BIO–KINETIC SYSTEM SHALL PROVIDE NON–MECHANICAL FLOW EQUALIZATION THROUGH ALL PLANT PROCESSES INCLUDING PRETREATMENT, AERATION, CLARIFICATION, TERTIARY FILTRATION, CHLORINATION AND DECHLORINATION. THE ASSEMBLY SHALL BE SUPPLIED WITH LOCKING LUGS AND REMOVABLE MOISTURE/VAPOR SHIELD AND SHALL CONSIST OF A DESIGN FLOW AND PEAK FLOW MICRONICALLY MODLED FILTER, BAFFLED PERIMETER SETTLING ZONE, FLOW DISTRIBUTION DECK, LIFTING HANDLES, LEVEL INDICATOR, ADJUSTMENT LUGS, OPTIONAL CHLORINATION FEED TUBE, UNBAFFLED PERIMETER SETTLING ZONE, SOLIDS CONTACT ZONE, VERTICAL INLET ZONE, COMPARTMENTED SETTLING ZONE CONSISTING OF 42 BAFFLED CHAMBER PLATES, EFFLUENT STILLING WELL, FINAL DISCHARGE ZONE, ADJUSTABLE OUTLET WEIR, OPTIONAL DECHLORINATION FEED TUBE, OUTLET ZONE AND GASKETED DISCHARGE FLANGE. ALL COMPONENTS SHALL BE MANUFACTURED FROM INERT SYNTHETIC MATERIALS OR RUBBER, ASSEMBLED IN CIRCULAR FASHION AND CONNECTED TO A PLASTIC OUTLET COUPLING. THE OUTLET COUPLING SHALL ACCEPT A 4" DIAMETER, SCHEDULE 40, PVC PIPE. EACH BIO–KINETIC SYSTEM SHALL BE INSTALLED WITH THE INVERTS OF THE DESIGN FLOW EQUALIZATION PORTS LOCATED AT THE NORMAL LIQUID LEVEL OF THE CLARIFIER. IF INTERMITTENT FLOW RATES EXCEED THE CAPACITY OF THE DESIGN FLOW PORTS, FLOW SHALL BE HELD UPSTREAM UNTIL THE INTERMITTENT FLOW DISSIPATES. IF THE INTERMITTENT FLOW CONTINUES TO INCREASE, THE LIQUID LEVEL MAY REACH A PAIR OF SUSTAINED FLOW EQUALIZATION PORTS. WITH FOUR PORTS IN USE, FLOW THROUGH THE SYSTEM INCREASES WHILE CONTINUING TO PROVIDE FLOW EQUALIZATION TO ALL UPSTREAM AND DOWNSTREAM PROCESSES. PEAK FLOW EQUALIZATION PORTS ARE SUPPLIED BUT SHOULD NOT BE REQUIRED IN A PROPERLY SIZED SYSTEM. OPTIONAL BLUE CRYSTAL AND BIO–NEUTRALIZER TABLET FEED TUBES SHALL BE POSITIONED SUCH THAT THE FLOW–ACTIVATED CHEMICAL CANNOT MAKE CONTACT WITH THE LIQUID UPSTREAM OF THE FEED TUBES.
12. FLOW EQUALIZATION–
THE WASTEWATER TREATMENT SYSTEM SHALL INCLUDE A NON–MECHANICAL, DEMAND USE, FLOW EQUALIZATION DEVICE. THE DEVICE SHALL CONTROL NORMAL RESIDENTIAL FLOW RATES AND REDUCE TYPICAL RESIDENTIAL FLOW SURGES. THE FLOW EQUALIZATION RATE SHALL BE DEPENDENT UPON THE SPECIFIC LOADING PATTERN AND THE DURATION OF FLOW SURGES. AT THE 600 GALLON PER DAY DESIGN LOADING SCHEDULE OF NSF STANDARD 40 AND NSF STANDARD 245, MINIMUM PERFORMANCE OF THE DEVICE SHALL EQUALIZE DAILY FLOW AN AVERAGE OF 50%.









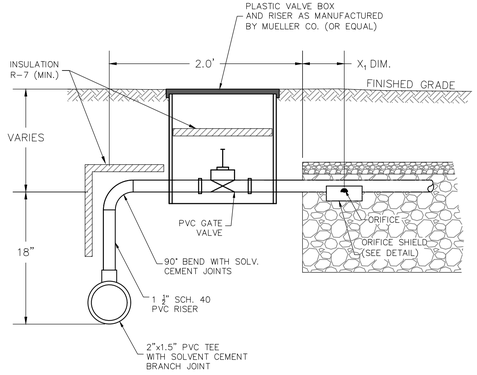
PRESSURE DISTRUBUTION TESTING REQUIREMENTS:

1. CONTRACTOR SHALL PROVIDE ADEQUATE WATER AND ALL MATERIALS FOR THE PERFORMANCE OF A FLOW TEST.
2. LAST ORIFICE ON EACH LATERAL SHALL BE LEFT UNCOVERED WITH NO SHIELD FOR FLOW TESTING.
3. FLOW TESTING SHALL BE WITNESSED BY THE BOARD OF HEALTH AGENT AND THE ENGINEER.
4. CONTRACTOR TO ADJUST GATE VALVES AS REQUIRED TO PROVIDE 3' OF DISTAL HEAD AT END OF EACH LATERAL (MEASURED FROM THE LATERAL INVERT). (TOLERANCE ±10%).

ORIFICE SPACING TABLE:

LATERAL ID	ORF. ø	# OF ORIF.	O.C. SPACING	X_1 DIM.	X_2 DIM.
1P	3/16"ø	11*	3.50' O.C.	7"	35"
2P	3/16"ø	11*	3.50' O.C.	14"	28"
3P	3/16"ø	11*	3.50' O.C.	21"	21"
4P	3/16"ø	11*	3.50' O.C.	28"	14"
5P	3/16"ø	11*	3.50' O.C.	35"	7"

* ALL ORIFICES TO BE POSITIONED IN THE DOWNWARD (6 O'CLOCK) EXCEPT FOR THE LAST ORIFICE ON EACH LINE WHICH SHALL BE POSITIONED IN THE UPWARD POSITION (12 O'CLOCK).



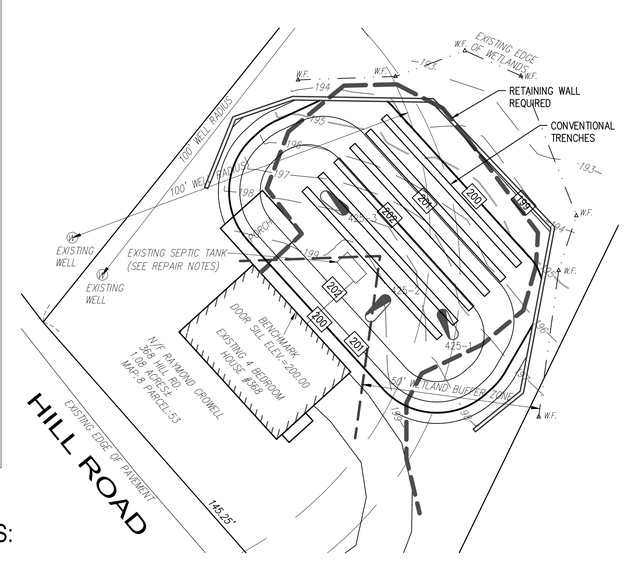
RISER AND DISTRIBUTION LINE DETAIL

NOT TO SCALE

"NOT FOR CONSTRUCTION"
CONVENTIONAL RESERVE AREA CALCULATIONS:

HYDRAULIC LOADING:
FOUR (4) BEDROOMS AT 110 GALLONS PER DAY PER BEDROOM = 440 GALLONS PER DAY

RESERVE LEACHING AREA (CONVENTIONAL SYSTEM):
DESIGN PERCOLATION RATE = 30 M/I. (SOIL CLASS II)
EFFLUENT LOADING RATE = 0.33 GALLONS/S.F.
LEACHING AREA REQUIRED = 440 GPD / 0.33 GPD/S.F. = 1,334 S.F.
TOTAL LEACHING AREA PROVIDED = (6) 56' TRENCHES, 2' WIDE x 1' DEEP (6 X 56 X 4) = 1,344 S.F.
TOTAL DESIGN FLOW = 1,344 S.F. X 0.33 GALLON/S.F. = 443 GALLONS



"NOT FOR CONSTRUCTION"
CONVENTIONAL TITLE 5 LAYOUT

1" = 20'

DILLIS & ROY CIVIL DESIGN GROUP
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ASHBY, MA 01431

APPLICANT:
NICHOLS EXCAVATING, LLC
BRANDON NICHOLS
323 BURRAGE STREET
LUNENBURG, MA 01462

SCALE:

DIG SAFE 1–888–344–7233

THE SEWAGE DISPOSAL SYSTEM SHOWN HEREON HAS BEEN DESIGNED IN ACCORDANCE WITH 310 CMR 15.00 (TITLE 5), MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION SYSTEM APPROVALS AND/OR CERTIFICATIONS AND THE MANUFACTURERS SYSTEM DESIGN GUIDANCE.

COMMONWEALTH OF MASSACHUSETTS GREGORY S. ROY CIVIL NO. 46070 REGISTERED PROFESSIONAL ENGINEER
STAMP DATE: 5/2/2025

DATE: 4/29/2025
DESIGN BY: CLM
DRAWN BY: CLM
CHECKED BY: GSR

SEWAGE DISPOSAL SYSTEM DESIGN
368 HILL ROAD (M: 8 P: 53)
BOXBOROUGH, MA 01719

NO.	DATE	DESCRIPTION	BY

JOB NO. 8587
DRAWING NO. 8587–SDS
SHEET NO. 2 OF 2