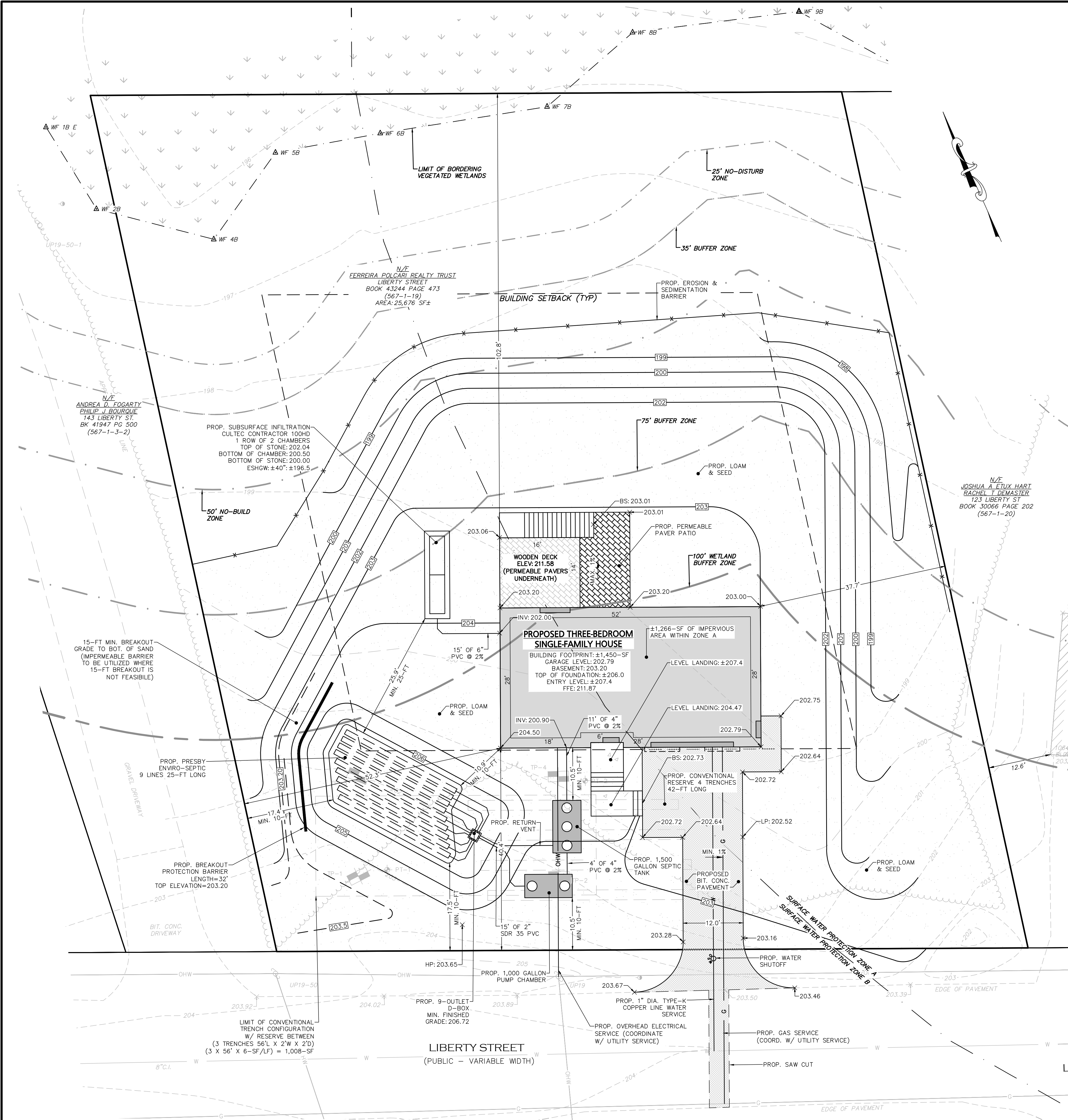




LAND USE TABLE		
LOCATION:	LIBERTY STREET, HAVERHILL, MA 01832	
ZONE:	RESIDENTIAL RURAL DENSITY (RR)	
OVERLAY:	WATER SUPPLY PROTECTION OVERLAY DISTRICT (WSPOD)	
USE:	VACANT	
	REQUIRED	PROPOSED
MINIMUM LOT AREA (SF)	80,000	25,676 ⁽¹⁾
MINIMUM LOT FRONTAGE (FT)	200	150 ⁽²⁾
MINIMUM LOT DEPTH (FT)	125	171.2
MINIMUM FRONT SETBACK (FT)	40	40.4
MINIMUM SIDE SETBACK (FT)	25	37.7
MINIMUM REAR SETBACK (FT)	40	102.8
MAX. BUILDING COVERAGE	15%	8.9%
MIN. OPEN SPACE	70%	91.21%

LAND USAGE NOTES :
1. A VARIANCE TO REQUIRED AREA HAS BEEN GRANTED FOR THIS LOT.
2. A VARIANCE TO REQUIRED FRONTAGE HAS BEEN GRANTED FOR THIS LOT.

ZONE A IMPERVIOUS AREA CALCULATIONS:
MAXIMUM ALLOWABLE IMPERVIOUS AREA WITHIN ZONE A: 2,500-SF
PROP. IMPERVIOUS AREA WITHIN ZONE A: 1,266-SF

SYSTEM SPECIFICATIONS:
USE:
PROPOSED BEDROOM COUNT:
DESIGN FLOW:
SEPTIC TANK SIZE (1500 GAL MIN.):

ENVIRO-SEPTIC DESIGN CALCULATIONS:
THE FOLLOWING DESIGN CALCULATIONS ARE BASED UPON THE DESIGN PROCEDURE SPECIFIED IN THE ENVIRO-SEPTIC MASSACHUSETTS DESIGN AND INSTALLATION MANUAL DATED SEPTEMBER, 2019.

PRESBY PRIMARY
DESIGN FLOW = 330 GAL
DESIGN PERC RATE = 15 MPG
LTAR: 0.933 (TABLE B)
LINEAR FEET (TABLE A):
CENTER TO CENTER PIPE SPACING (TABLE B):
SYSTEM LENGTH & WIDTH (TABLE C):
MINIMUM PRESBY SAND BED AREA (TABLE D):
SAND BED AREA PROVIDED:

CONVENTIONAL RESERVE:
DESIGN FLOW:
DESIGN PERCOLATION RATE:
LTAR (SANDY LOAM CLASS II SOIL):
GPD/SF
-REQUIRED:
-PROVIDED:

CONVENTIONAL TRENCH CONFIGURATION W/ RESERVE BETWEEN:
SAS SIZING (CLASS II SOIL LOADING RATE)
-REQUIRED:
-PROVIDED:
-RESERVE:

PIPE SCHEDULE:
ALL PIPING SHALL BE TIGHT JOINT PIPING TO CONSIST OF POLYVINYL CHLORIDE (P.V.C.) SCHEDULE 40, UNLESS OTHERWISE NOTED.

FOUNDATION WALL TO SEPTIC TANK:
SEPTIC TANK TO PUMP CHAMBER:
PUMP CHAMBER TO D-BOX:

CRITICAL SYSTEM ELEVATIONS:
BASEMENT FLOOR:
INVERT AT HOUSE FOUNDATION WALL:
SEPTIC TANK INVERT (IN):
SEPTIC TANK INVERT (OUT):
PUMP CHAMBER (IN):
PUMP CHAMBER (OUT):
D-BOX INVERT (IN):
D-BOX INVERT (OUT):
ENVIRO-PIPE INVERT:
TOP OF SYSTEM SAND:
BOTTOM OF PIPE:
BOTTOM OF SAND:
DESIGN ESHGW:

- NOTES:
1. LOCATION: LIBERTY STREET (PARCEL ID: 567-1-19)
 2. DEED: SOUTHERN ESSEX REGISTRY OF DEEDS BOOK 43244 PAGE 473
 3. ZONE: RURAL RESIDENTIAL (RR)
 4. USE: VACANT
 5. OWNER: FERREIRA POLCARI REALTY TRUST
ROBERT F. FERREIRA, JR., TRUSTEE
JUDIE M. POLCARI, TRUSTEE
10 MICHAEL ANTHONY ROAD
HAVERHILL, MA 01832
 6. SOILS / WETLANDS: NORSE ENVIRONMENTAL SERVICES, INC.
2100 LAKEVIEW AVE
UNIT 3A
DRACUT, MA 01826
 7. THE INTENT OF THIS PLAN IS TO REQUEST APPROVAL FOR A VARIANCE TO REQUIRED LOT AREA AND FRONTAGE FOR THE SUBJECT PARCEL.
 8. PROPERTY IS NOT LOCATED WITHIN AN AREA OF DESIGNATED FLOOD HAZARD PER FLOOD INSURANCE RATE MAP NUMBER 25009C0067G DATED JULY 8, 2025.
 9. PLAN BEARINGS ARE BASED UPON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83) - MAINLAND ZONE, PER GPS OBSERVATIONS.
 10. ALL ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM (NAVD88), PER GPS OBSERVATIONS.

- PLAN REFERENCES:
RECORDED AT THE ESSEX REGISTRY OF DEEDS NORTH DISTRICT.
1. "PLAN OF LAND IN HAVERHILL, MASS", DATED JULY 30, 1992, PREPARED BY ROBERT G. GOODWIN, RECORDED ON MAY 14, 1996, PLAN BOOK 307 PLAN 72.
 2. "FRONTAGE EXCEPTION, PLAN OF LAND" DATED MARCH 23, 2010, PREPARED BY MERRIMACK ENGINEERING SERVICES, RECORDED ON JUNE 21, 2010, PLAN BOOK 424 PLAN 60.

SOIL TEST DATA:
SOIL TESTING AND EVALUATION BY: TROY STEARNS, S.E. (# 15084)
SOIL TESTING WITNESSED BY: MARK TOLMAN (ON BEHALF OF HAVERHILL B.O.H.)

DATE OF DEEP HOLE OBSERVATION: APRIL 7, 2026
DATE OF PERC. TESTING: JUNE 29, 2026

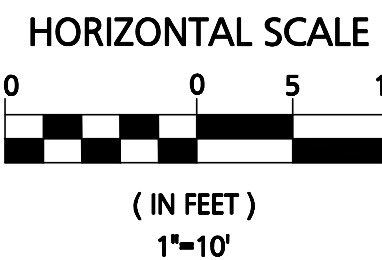
TEST PIT #1 - ELEVATION: 203.2
DEPTH HOR. COLOR REDOX. TEXTURE
0'-15" Ap 10YR3/2 --- SANDY LOAM
15'-30" Bw 10YR5/8 --- SANDY LOAM
30'-84" C 2.5Y7/6 48" (199.2)
MOTTLES @ 48"
WEAVING @ 56"

TEST PIT #2 - ELEVATION: 202.1
DEPTH HOR. COLOR REDOX. TEXTURE
0'-16" Ap 10YR3/2 --- SANDY LOAM
16'-33" Bw 10YR5/8 --- SANDY LOAM
33'-96" C 2.5Y7/6 40" (198.8)
MOTTLES @ 40"
WEAVING @ 58"

TEST PIT #3 - ELEVATION: 202.0
DEPTH HOR. COLOR REDOX. TEXTURE
0'-15" Ap 10YR3/2 --- SANDY LOAM
15'-32" Bw 10YR5/8 --- SANDY LOAM
32'-76" C 2.5Y7/6 40" (198.7)
MOTTLES @ 40"
WEAVING @ 40"

TEST PIT #4 - ELEVATION: 200.9
DEPTH HOR. COLOR REDOX. TEXTURE
0'-15" Ap 10YR3/2 --- SANDY LOAM
15'-33" Bw 10YR5/8 --- SANDY LOAM
33'-104" C 2.5Y7/6 42" (197.4)
MOTTLES @ 42"
WEAVING @ 42"

PERC TEST PT-1: 15 MPI
PERC TEST PT-2: 30 MPI



DATE	DESCRIPTION
REVISIONS	
APPLICANT:	
ROBERT F. FERREIRA	
10 MICHAEL ANTHONY ROAD HAVERHILL, MA 01832	

PROJECT:	LIBERTY STREET (567-1-19) HAVERHILL, MA 01832
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DATE ISSUED:	JULY 23, 2026
PROJECT #:	26-10884
PREPARED BY:	TJS



PROFESSIONAL ENGINEER FOR CIVIL
DESIGN CONSULTANTS, INC.

CIVIL
DESIGN
CONSULTANTS, INC.

344 North Main Street | Andover - MA 01810
(978) 416-0920 | www.civilcd.com

DRAWING TITLE:
SITE PLAN

DRAWING #:
C-1

1. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL DEVICE AS SHOWN ON THE PLAN. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED IN EFFECTIVE CONDITION DURING CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE TIMELY INSTALLATION, INSPECTION, MAINTENANCE, AND/OR REPLACEMENT OF ALL TEMPORARY AND PERMANENT EROSION CONTROL DEVICES TO ENSURE PROPER OPERATION THROUGHOUT THE LIFE OF THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF PERMANENT MEASURES UNTIL CONSTRUCTION OF THE PROJECT IS COMPLETED OR UNTIL IT IS ACCEPTED BY THE OWNER. THE OWNER IS RESPONSIBLE THEREAFTER.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CLEAN ROADS, CONTROL DUST, AND TAKE ALL NECESSARY MEASURES TO ENSURE THAT THE SITE AND ALL ROADS BE MAINTAINED IN A MUD AND DUST-FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. DUST CONTROL SHALL INCLUDE, BUT IS NOT LIMITED TO, WATER, CALCIUM CHLORIDE, AND/OR CRUSHED STONE OR COARSE GRAVEL.
4. ALL PROPOSED CONSTRUCTION ENTRANCES SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS AND DETAILS. ALL VEHICLE TRAFFIC ENTERING OR LEAVING THE WORK AREA SHALL PASS OVER THE CONSTRUCTION ENTRANCES TO REDUCE THE TRACKING OR FLOWING OF SEDIMENT ONTO THE SURROUNDING ROADWAYS.
5. THE CONTRACTOR SHALL INSTALL ALL PERIMETER SEDIMENT CONTROL BARRIERS AS SHOWN ON THE SITE DEVELOPMENT PLANS. SILT FENCE SHALL ALSO BE INSTALLED AROUND ANY SOIL STOCKPILE AREAS.
6. THE CONTRACTOR SHALL RESTORE DISTURBED AREAS AS CLOSELY AS POSSIBLE. AREAS DAMAGED DURING CONSTRUCTION SHALL BE RESEEDDED, RESEEDDED, OR OTHERWISE RESTORED TO THEIR ORIGINAL STATE. TREES AND OTHER EXISTING VEGETATION SHALL BE RETAINED WHEREVER FEASIBLE.
7. TEMPORARY VEGETATIVE COVER SHALL BE APPLIED TO ANY DISTURBED AREAS (INCLUDING SOIL STOCKPILE AREAS) THAT HAVE NOT YET REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED, UNLESS THE ACTIVITY IS TO RESUME WITHIN TWENTY-ONE (21) DAYS. THE RECOMMENDED TEMPORARY SEEDING DATES ARE MARCH 1 TO JUNE 15 AND AUGUST 15 TO OCTOBER 1.
8. PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. THE RECOMMENDED PERMANENT SEEDING DATES ARE APRIL 1 TO JUNE 15 AND AUGUST 15 TO OCTOBER 1.
9. AREAS WHICH HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDDED SHOULD BE MULCHED IMMEDIATELY FOLLOWING SEEDING IN ADDITION TO AREAS WHICH CANNOT BE SEEDDED WITHIN THE RECOMMENDED SEEDING DATES AND ANY SOIL STOCKPILE AREAS. TEMPORARY MULCHING SHOULD BE PERFORMED AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED UNLESS THE ACTIVITY IS TO RESUME WITHIN TWENTY-ONE (21) DAYS.
10. STRAW OR HAY MULCH, WOOD FIBER MULCH, AND HYDROMULCH ARE RECOMMENDED. THE MATERIALS USED IN MULCHING SHALL CONFORM TO THE REQUIREMENTS LISTED IN SECTION M6.0.4 OF THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES.
11. IF SEEDING CANNOT BE COMPLETED IMMEDIATELY OR WITHIN THE RECOMMENDED SEEDING DATES, USE THE TEMPORARY MULCHING MEASURE TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
12. ANY EXISTING OR PROPOSED CATCH BASINS THAT MAY BE SUBJECT TO SEDIMENTATION PROCESSES SHALL HAVE SILT SACKS INSTALLED TO PREVENT SEDIMENT FROM ENTERING THE PROPOSED STORM DRAINAGE SYSTEM PRIOR TO PERMANENT STABILIZATION OF THE DISTURBED SITE. THE PROPER INLET PROTECTION DEVICES SHALL BE INSTALLED WHERE STORM DRAIN INLETS ARE TO BE MADE OPERATIONAL BEFORE PERMANENT STABILIZATION OF ANY DISTURBED DRAINAGE AREA.
13. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CONSTRUCTED IN ACCORDANCE WITH THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES AND VOLUME TWO OF THE MASSACHUSETTS STORM WATER MANAGEMENT HANDBOOK.
14. WASTE DISPOSAL: MATERIALS WHICH COULD BE A POTENTIAL SOURCE OF STORM WATER POLLUTION SUCH AS GASOLINE, DIESEL FUEL, HYDRAULIC OIL ETC., SHALL BE STORED AT THE END OF EACH DAY IN A STORAGE TRAILER OR COVERED LOCATION AND TAKEN OFF-SITE AND PROPERLY DISPOSED OF. ALL TYPES OF WASTE GENERATED AT THIS SITE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH STATE LAW AND/OR REGULATIONS.
15. GOOD HOUSEKEEPING: THE PROJECT SITE SHALL PROVIDE FOR THE MINIMIZATION OF EXPOSURE OF CONSTRUCTION DEBRIS (INCLUDING, BUT NOT LIMITED TO, INSULATION, WIRING, PAINTS AND PAINT CANS, SOLVENTS, WALL BOARD, ETC.) TO PRECIPITATION BY MEANS OF DISPOSAL AND/OR PROPER SHELTER OR COVER. IN ADDITION, CONSTRUCTION WASTE MUST BE PROPERLY DISPOSED OF IN ORDER TO AVOID EXPOSURE TO PRECIPITATION AT THE END OF EACH WORKING DAY.
16. NO DUST WILL BE ALLOWED ON OR OFF WORK SITE. CONTRACTOR MUST CONDUCT CONTINUOUS EFFORT TO CONTROL DUST. LACK OF DUST CONTROL COULD CAUSE THE PROJECT TO BE STOPPED UNTIL ISSUES ARE RESOLVED.
17. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTROL DUST AND TAKE ALL NECESSARY MEASURES TO ENSURE ALL ROADS ARE MAINTAINED IN A DUST FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. REPETITIVE TREATMENTS SHOULD BE APPLIED AS NECESSARY.
18. REPAIRS OR REPLACEMENT OF DRAINAGE STRUCTURES, RIP RAP CHANNELS, OR OTHER ELEMENTS OF THE FACILITY SHOULD BE DONE WITHIN 14 DAYS OF DEFICIENCY REPORTS. IF AN EMERGENCY SITUATION IS IMMINENT THEN REPAIR/REPLACEMENT MUST BE DONE IMMEDIATELY TO AVERT FAILURE OR DANGER TO NEARBY RESIDENTS.
19. IMMEDIATELY PRIOR TO THE END OF CONSTRUCTION OR ACCEPTANCE BY THE OWNER, THE CONTRACTOR SHALL INSPECT ALL ON-SITE STORMWATER MANAGEMENT FACILITIES AND CLEAN AND FLUSH AS NECESSARY.
20. THE GENERAL CONTRACTOR OR NOMINEE WILL BE THE PARTY RESPONSIBLE FOR THE INSPECTION, MAINTENANCE, AND REQUIRED DOCUMENTATION OF ALL STORM WATER STRUCTURES AS OUTLINED WITHIN.

1. THE CONTRACTOR SHALL VERIFY THE PROPOSED LAYOUT WITH ITS RELATIONSHIP TO THE EXISTING SITE SURVEY. THE CONTRACTOR SHALL ALSO VERIFY ALL DIMENSIONS, SITE CONDITIONS, AND MATERIAL SPECIFICATIONS AND SHALL NOTIFY THE OWNER AND ENGINEER OF ANY ERRORS, OMISSIONS OR DISCREPANCIES BEFORE COMMENCING OR PROCEEDING WITH CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, INSPECTIONS, BONDS, ETC. AND OTHER APPROVAL RELATED ITEMS. NO CONSTRUCTION SHALL COMMENCE UNTIL SUCH PERMITS HAVE BEEN SECURED.
3. METHODS AND MATERIALS USED IN THE CONSTRUCTION OF IMPROVEMENTS FOR THIS PROJECT SHALL CONFORM TO THE CURRENT CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE MASSDOT AND THE LOCAL REGULATIONS.
4. CONTRACTOR TO CONFIRM AND VERIFY THE VALIDITY, LOCATION, MATERIAL, AND AVAILABILITY TO USE EXISTING UTILITIES ON OR NEAR THE PROJECT SITE. CONTRACTOR TO LOCATE EXISTING UTILITIES AND CONFIRM SAID UTILITIES WITH ALL APPLICABLE MUNICIPALITIES AND UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION. ONCE UTILITIES HAVE BEEN CONFIRMED IN THE FIELD BY CONTRACTOR AND VERIFIED BY APPLICABLE MUNICIPALITY AND UTILITY COMPANY AND CONNECTION HAS BEEN APPROVED BY ENTITY, ONLY THEN SHALL THE CONTRACTOR CONSTRUCT AND UTILIZE THESE UTILITIES. CONTRACTOR TO IMMEDIATELY INFORM THE ENGINEER OF RECORD OF ANY DEVIATIONS TO PLANS.
5. THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE ANY EXISTING UTILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF NECESSARY. THE EXISTENCE AND/OR LOCATION OF UTILITIES SHOWN ON THESE PLANS MAY BE ONLY APPROXIMATELY CORRECT AND THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN HEREON AND ANY OTHER EXISTING UTILITIES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING, AT HIS EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
6. THE CONTRACTOR SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION AT LEAST THREE WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS, PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION. ALL WATER, GAS, SEWER AND OTHER UTILITIES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
7. RELOCATION OF ANY UTILITIES SHALL BE AT THE OWNERS EXPENSE AND COMPLETED WITH THE UTILITY WORK. THE OWNER SHALL BE NOTIFIED AS TO THE RELOCATIONS REQUIRED PRIOR TO THE START OF CONSTRUCTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING, WITH MATCHING MATERIALS, ANY PAVEMENT, WALKS, CURBS, ETC. THAT MUST BE CUT OR THAT ARE DAMAGED DURING CONSTRUCTION.
9. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE.
10. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THESE DOCUMENTS AND SUBSEQUENT ISSUED PLAN REVISIONS. ANY DEVIATIONS FROM THESE DOCUMENTS SHALL REQUIRE NOTIFICATION TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTING ANY CHANGE. THE CONTRACTOR WILL BE WORKING AT HIS OR HER OWN RISK.

1. THIS SEPTIC DESIGN HAS BEEN PREPARED FOR THE CONSTRUCTION OF A 3 BEDROOM DWELLING AND SEWAGE DISPOSAL SYSTEM LOCATED AT 0 LIBERTY STREET IN HAVERHILL, MA IN COMPLIANCE WITH 310 CMR 15.00 AND THE RULES AND REGULATIONS OF THE HAVERHILL BOARD OF HEALTH.
2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO MASSACHUSETTS ENVIRONMENTAL CODE (310 CMR 15.00, TITLE 5), AND THE HAVERHILL BOARD OF HEALTH.
3. THERE SHALL BE NO CHANGES MADE IN THIS PLAN WITHOUT THE WRITTEN PERMISSION OF THE HAVERHILL BOARD OF HEALTH AND THE DESIGN ENGINEER.
4. ALL ERRORS, OMISSIONS, AND CHANGE OF CONDITIONS AT THE SITE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
5. THIS PLAN HAS BEEN PREPARED SPECIFICALLY AS A SEPTIC SYSTEM DESIGN AND IS NOT TO BE USED TO ESTABLISH PROPERTY LINES OR BUILDING SETBACKS. PROPERTY LINES AND BUILDING LOCATIONS ARE GRAPHIC ONLY. NO REPRESENTATION OR CERTIFICATION AS TO THE ACCURACY OF THOSE SHOWN IS IMPLIED OR INTENDED.
6. THIS SYSTEM HAS BEEN DESIGNED IN CONFORMANCE WITH THE HAVERHILL BOARD OF HEALTH REGULATIONS AND THE REQUIREMENTS OF TITLE 5, 310 CMR 15.00. NO GUARANTEE OF PERFORMANCE IS EXPRESSED OR IMPLIED.
7. TEST HOLE INFORMATION SHOWN HEREON IS LIMITED TO SOIL CONDITIONS FOUND AT THAT PARTICULAR TEST HOLE LOCATIONS AND IS NOT CONSIDERED OR IMPLIED OR EXPRESSED WARRANTY OF SOIL CONDITIONS BEYOND LIMITS OF SUCH TEST HOLES.
8. ALL KNOWN WELLS WITHIN 150' OF THE PROPOSED LEACHING AREA ARE INDICATED ON THE PLAN.
9. THE PROPOSED SYSTEM IS NOT DESIGNED FOR THE USE OR INSTALLATION OF A GARBAGE GRINDER.
10. MAGNETIC MARKING TAPE TO BE INSTALLED OVER ALL SYSTEM COMPONENTS PER 310 CMR 15.221(12).
11. BUILDING SEWER TO HAVE WATERTIGHT JOINTS, TO BE LAID ON A COMPACTED AND FIRM BASE, AND IN A CONTINUOUS GRADE ON A STRAIGHT LINE PER 310 CMR 15.22.

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCHMARKS NECESSARY FOR THE WORK.
2. ALL DEBRIS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
3. A DUST EMISSION CONTROL PLAN SHALL BE DEVELOPED AND IMPLEMENTED BY THE CONTRACTOR IF CONDITIONS WARRANT.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL UTILITIES AS SHOWN ON THESE PLANS IN ACCORDANCE WITH THE APPROPRIATE UTILITY COMPANY SPECIFICATIONS. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THE APPROPRIATE UTILITY COMPANY STANDARDS FOR CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING SPECIFICATIONS OF MATERIALS AND INSTALLATION PROCEDURES AND INSTALL IN ACCORDANCE WITH APPLICABLE REGULATIONS.
5. THE CONTRACTOR IS RESPONSIBLE TO CONTACT AND DETERMINE, COORDINATE AND SCHEDULE ALL NECESSARY INSPECTIONS AND MONITORING WITH ALL APPROPRIATE UTILITY COMPANIES.
6. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ANY PERMITS AND/OR CONNECTION FEES REQUIRED TO PERFORM THE WORK.
7. ALL ELEVATIONS SHOWN ARE IN REFERENCE TO THE PROJECT BENCHMARK AND MUST BE VERIFIED BY THE GENERAL CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE RESTORATION AND CLEAN UP UPON COMPLETION OF THE PROJECT.
9. CONTRACTOR TO COORDINATE ALL BUILDING PENETRATIONS AND ROOF LEADER LOCATIONS WITH ARCHITECTURAL DOCUMENTS PRIOR TO CONSTRUCTION.

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL INSPECTIONS WITH THE APPROVING AUTHORITY AND THE DESIGNER CONSISTENT WITH SECTION 15.021(2) OF TITLE 5.
2. SUBSURFACE COMPONENTS 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.
3. AT A MINIMUM, THE DESIGNER SHALL INSPECT THE SYSTEM AFTER THE INITIAL EXCAVATION, PRIOR TO BACKFILLING, DURING BACKFILLING OPERATIONS AND DURING THE PLACEMENT OF THE IMPERVIOUS MEMBRANE IF SO PROVIDED.
4. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE THE PREPARATION OF AN AS-BUILT PLAN TO REFLECT ANY CHANGES TO THE APPROVED DESIGN PLAN AND SHOW THE EXACT LOCATION AND ELEVATION OF ALL SYSTEM COMPONENTS. IN THE EVENT NO CHANGES ARE MADE TO THE APPROVED PLAN, THE APPROVED PLANS SHOWING THE DISTANCES FROM A KNOWN STRUCTURE TO THE SYSTEM COMPONENTS SHALL BE SUBMITTED TO THE APPROVING AUTHORITY IN PLACE OF AN AS-BUILT PLAN.
5. PRIOR TO THE ISSUANCE OF THE CERTIFICATE OF COMPLIANCE, THE DISPOSAL SYSTEM INSTALLER AND DESIGNER SHALL CERTIFY IN WRITING THAT THE SYSTEM HAS BEEN CONSTRUCTED IN COMPLIANCE WITH THE APPROVED PLAN AND TITLE 5.
6. SOIL EVALUATOR CERTIFICATION:
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 RESULTS OF MY SOIL EVALUATIONS PERFORMED BY ME ARE CONSISTENT WITH THE REQUIRED TRAINING, EXPERIENCE, AND EXPERIENCE DESCRIBED IN 310 CMR 15.017. I FURTHER CERTIFY THAT THE RESULTS OF MY SOIL EVALUATION, AS INDICATED IN THE ATTACHED SOIL EVALUATION FORM, ARE ACCURATE AND IN ACCORDANCE WITH 310 CMR 15.100 THROUGH 15.107.

1. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO MASSACHUSETTS ENVIRONMENTAL CODE (310 CMR 15.00, TITLE 5) AND THE LOCAL BOARD OF HEALTH.

2. SYSTEM TO BE INSTALLED IN ACCORDANCE WITH THE PROCEDURES AND SPECIFICATIONS DESCRIBED IN THE TITLE 5, 310 CMR 15.00, THE STATE ENVIRONMENTAL CODE AS WELL AS THE LOCAL BOARD OF HEALTH REGULATIONS.

3. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THIS PLAN IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE.

4. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND "DIGSAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT LOCATION OF UTILITIES PRIOR TO CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.

5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL OF ALL SYSTEM COMPONENTS.

6. ALL ELEVATIONS AND GRADES ARE TO BE SET FROM THE TEMPORARY BENCH MARK (TBM) AS ILLUSTRATED ON THE PLAN.

7. NO DRAINS, HOT TUBS, SAUNAS, GARBAGE DISPOSALS ETC. SHALL BE INCORPORATED INTO THIS SYSTEM.

8. ANY PIPING WITHIN TEN FEET OF THE BUILDING SHALL BE INSTALLED BY A PLUMBER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS IN COMPLIANCE WITH THE STATE BUILDING AND PLUMBING CODE.

9. REMOVE ALL TOPSOIL, TREES, BUSHES, BOULDERS, AND DEBRIS FROM BENEATH THE S.A.S., FILL EXTENSION AND 3:1 SIDE SLOPES.

10. WHERE FILL IS REQUIRED TO REPLACE UNSUITABLE SOILS, THE EXCAVATION OF THE UNSUITABLE MATERIAL SHALL EXTEND A MINIMUM OF FIVE FEET LATEROALLY IN ALL DIRECTIONS BEYOND THE OUTSIDE PERIMETER OF THE SOIL ABSORPTION SYSTEM TO THE DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL, OR AS DIRECTED BY THE ENGINEER OR APPROVING AUTHORITY, AS REQUIRED BY 310 CMR 15.240 AND REPLACED WITH FILL MATERIAL.

(SEE CONSTRUCTION NOTE 11).

11. FILL MATERIAL FOR SYSTEMS CONSTRUCTED IN FILL SHALL CONSIST OF SELECT ON-SITE OR IMPORTED SOIL MATERIAL. THE FILL SHALL BE COMPRISED OF CLEAN GRANULAR SAND, BE FREE FROM ORGANIC MATTER AND DELETERIOUS SUBSTANCES, AND SHALL NOT CONTAIN REMEDIATION WASTE AS THAT TERM IS DEFINED IN 310 CMR 40.0000. MIXTURES AND LAYERS OF DIFFERENT CLASSES OF SOIL SHALL NOT BE USED. THE FILL SHALL NOT CONTAIN ANY MATERIAL LARGER THAN TWO INCHES. A SIEVE ANALYSIS, USING A #4 SIEVE, SHALL BE PERFORMED ON A REPRESENTATIVE SAMPLE OF THE FILL UP TO 43% BY WEIGHT OF THE FILL 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	EFFECTIVE PARTICLE SIZE	% THAT MUST PASS SIEVE
	#10	4.75 MM	100%
# 50		0.30 MM	10% - 100%
#100		0.15 MM	0% - 20%
#200		0.075 MM	0% - 5%

12. THE BOTTOM AND SIDES OF THE SOIL ABSORPTION SYSTEM SHALL BE EXCAVATED TO A LEVEL GRADE AND SCARIFIED. IF THE REMOVAL OF STONES, BOULDERS OR PORTIONS OF AN EXISTING SEWAGE DISPOSAL SYSTEM IS REQUIRED, CREATING LOCALIZED DEPRESSIONS, FILLING TO GRADE MUST BE WITH CLEAN FILL (SEPTIC GRAVEL), NOT ON SITE MATERIAL.

13. ALL STONE MUST BE DOUBLE WASHED AND FREE FROM FINES AND ANY ORGANIC MATERIAL AND MUST HAVE LESS THAN 0.2 PERCENT MATERIAL FINER THAN A NUMBER 200 SIEVE.

14. FINISHED GRADE OVER THE SOIL ABSORPTION SYSTEM SHALL HAVE A MINIMUM SLOPE OF 2%.

15. ALL DISTURBED AREAS ARE TO BE LOADED, SEEDED AND MAINTAINED TO PREVENT EROSION.

16. STOCK PILING OF MATERIAL OR CONSTRUCTION EQUIPMENT OVER THE SOIL ABSORPTION SYSTEM IS PROHIBITED.

17. DISTRIBUTION BOX OUTLET PIPES SHALL BE LEVEL FOR AT LEAST THE FIRST 2 FEET.

18. TIGHT JOINT PIPING TO CONSIST OF POLYVINYL CHLORIDE (P.V.C.) SCHEDULE 40, UNLESS OTHERWISE NOTED.

CONTRACTOR TO REVIEW ALL LOCAL, STATE AND FEDERAL PERMITS.
2. DELINEATE THE LIMIT OF WORK AND INSTALL EROSION CONTROL.
3. CUT AND CLEAR TREES WITHIN THE AREA OF DISTURBANCE.
4. IMPORT FILL REQUIRED. THE AREA OF THE PROPOSED LEACHING FIELD SHALL NOT BE DISTURBED OR COMPACTED IN ANY WAY PRIOR TO CONSTRUCTION OF THE SYSTEM.
5. STRIP TOP AND SUBSOIL IN AREA OF PROPOSED LEACHING FIELD. IMPORT REQUIRED SAND, CONSTRUCT FIELD, AND INSTALL COMPONENTS.
6. BRING AREA TO GRADE AND PACK AS REQUIRED, COMPOSTING SEEDING AND LANDSCAPING.
7. ALL SLOPES SHALL BE STABILIZED IMMEDIATELY AFTER GRADING. ALL DISTURBED AREAS SHALL BE STABILIZED NO LATER THAN 72-HOURS AFTER CONSTRUCTION ACTIVITIES CEASE. IF
8. EARTHWORK TEMPORARILY CEASES ON A PORTION OF OR ON THE ENTIRE SITE, AND WILL NOT RESUME WITHIN 21-DAYS, THE AREA SHALL BE STABILIZED.
9. REMOVE TEMPORARY EROSION CONTROL MEASURES ONCE ALL AREAS ARE STABILIZED WITH A SUITABLE STAND OF GRASS, PAVEMENT, OR COMPACTED GRAVELS.

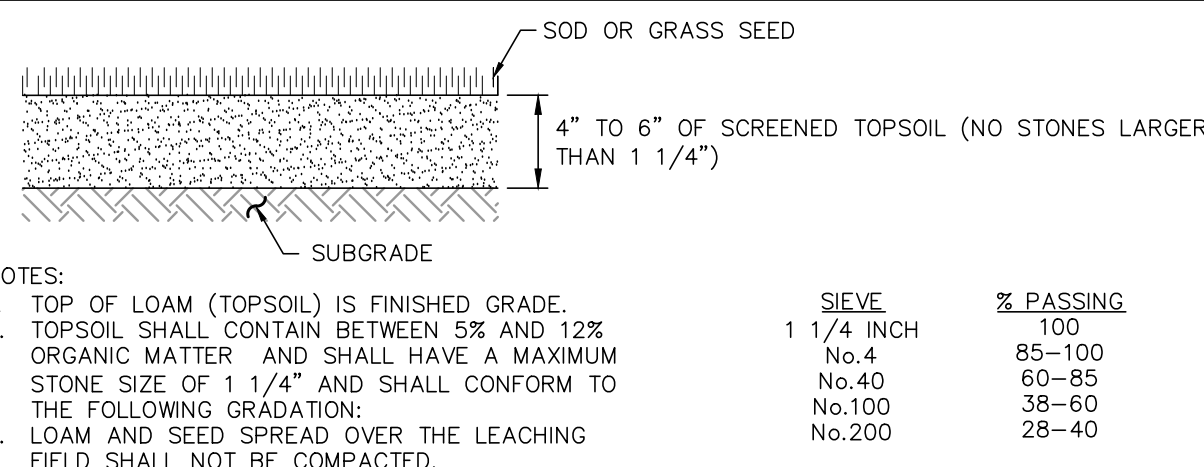
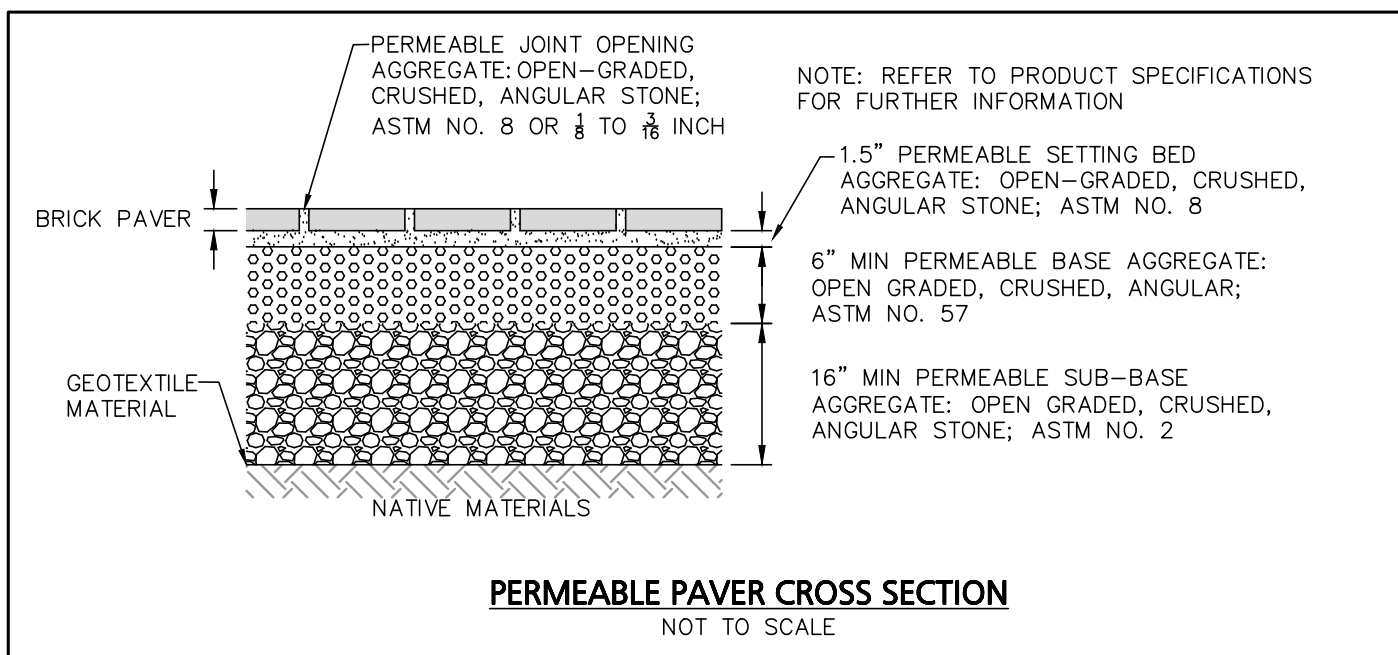


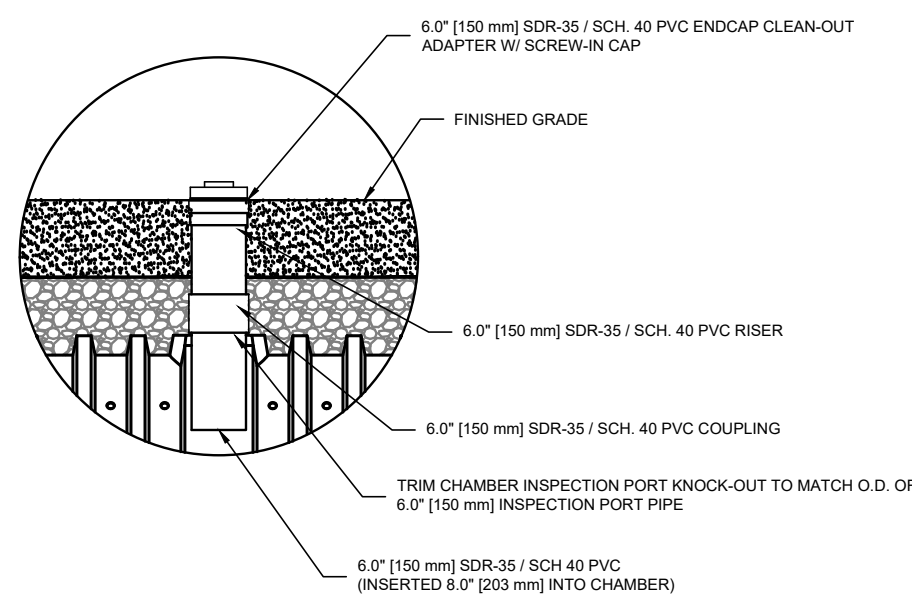
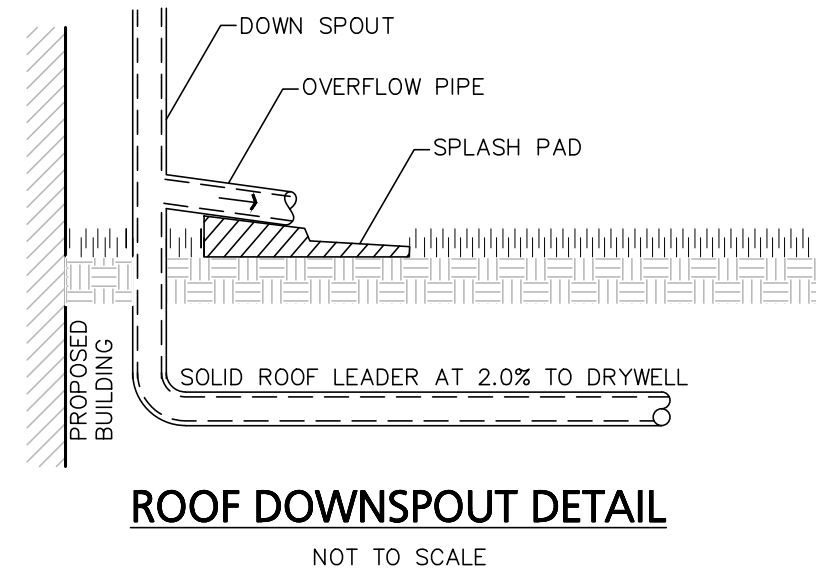
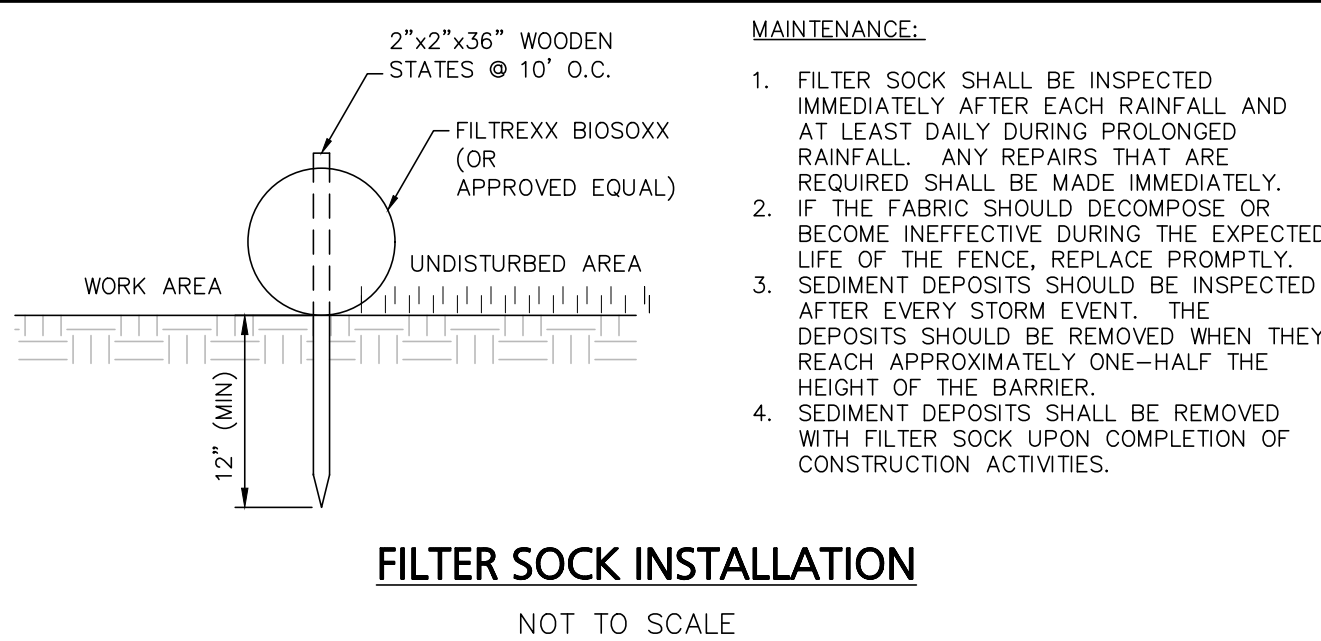
Diagram illustrating the cross-section of a pavement structure:

- FINISH COURSE** (includes the top two layers):
 - 1 1/2" BITUMINOUS CONCRETE WEARING COURSE
 - 2" BITUMINOUS CONCRETE BINDER COURSE
- BINDER COURSE** (points to the binder course layer)
- 12" COMPACTED SUBBASE MATERIAL (AASHTO NO. 2A)
- COMPACTED SUBGRADE TO 95% MAXIMUM DRY DENSITY PER ASTM D1557 WITHIN 3% ± OF OPTIMUM MOISTURE CONTENT

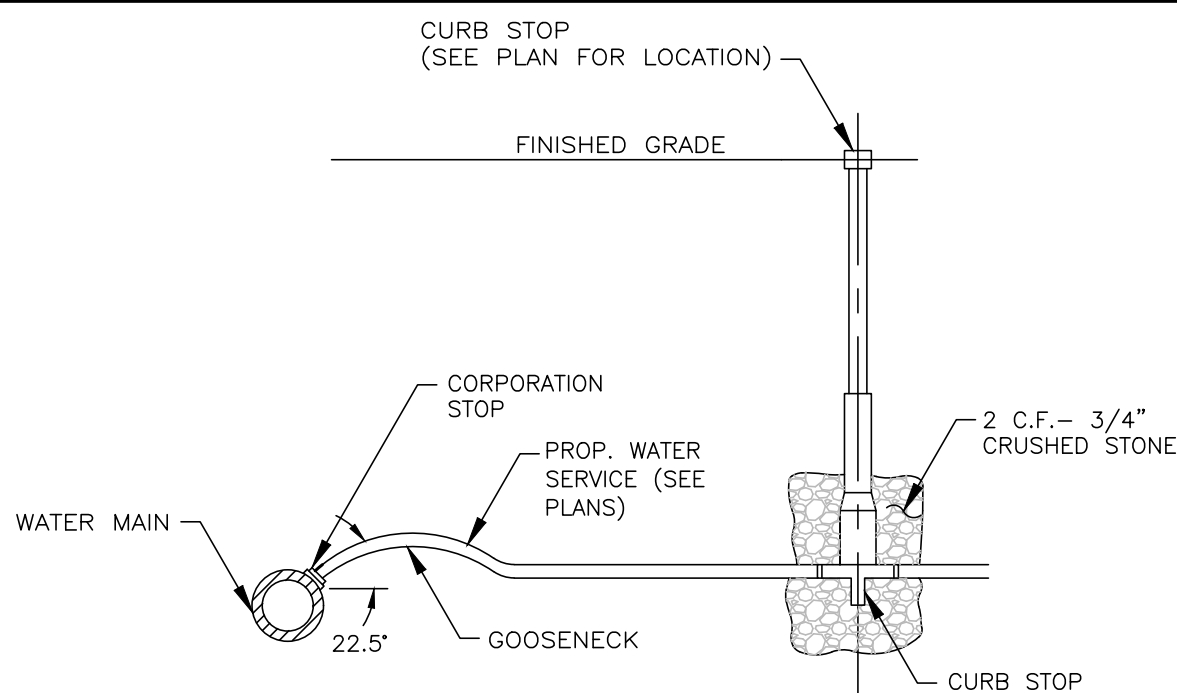
NOTES:

1. OWNER'S ENGINEER RESERVES THE RIGHT TO REQUEST COMPACTION TESTS AND/OR CORE SAMPLES IF TESTS ARE BEYOND THOSE REQUIRED BY THE SPECIFICATIONS AND PROVE CORRECT, PER ABOVE SPECIFICATION, TESTS WILL BE AT THE EXPENSE OF THE OWNER, OTHERWISE THE CONTRACTOR WILL BE RESPONSIBLE FOR TESTING COST.

TYPICAL SURFACE TREATMENT CROSS SECTIONS



CULTEC INSPECTION PORT - ZOOM DETAIL



TYPICAL WATER SERVICE CONNECTION

DATE	DESCRIPTION
REVISIONS	

OWNER / APPLICANT:
ROBERT F. FERREIRA
10 MICHAEL ANTHONY ROAD
HAVERHILL, MA 01832

PROJECT:

LIBERTY STREET
(567-1-19)
HAVERHILL, MA 01832

DATE ISSUED:	JULY 23, 2026
PROJECT #:	26-10884
PREPARED BY:	TJS

ISSUED FOR REVIEW
JULY 23, 2026

PROFESSIONAL ENGINEER FOR CIVIL DESIGN
CONSULTANTS, INC.

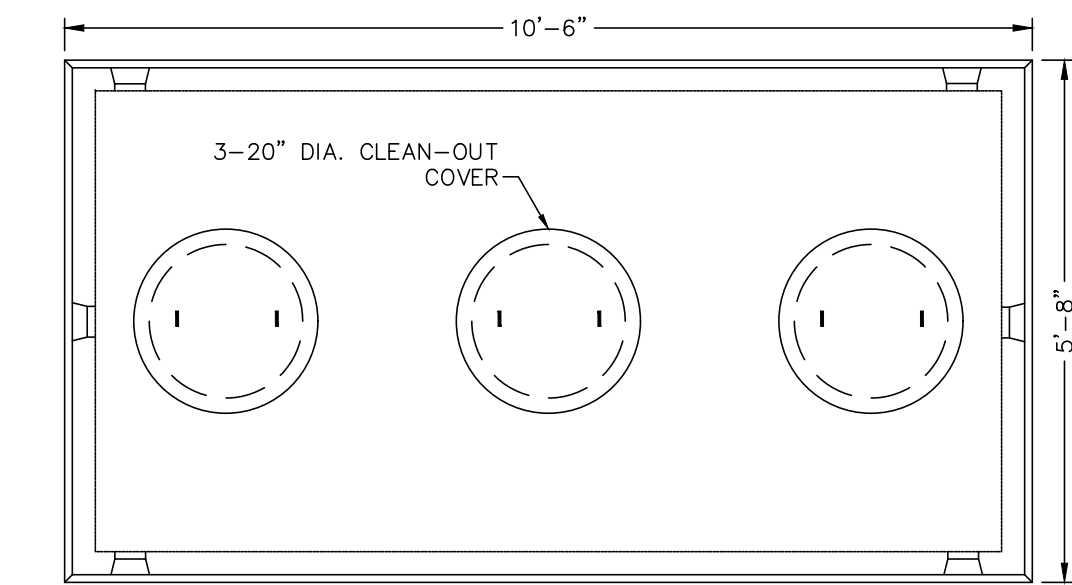
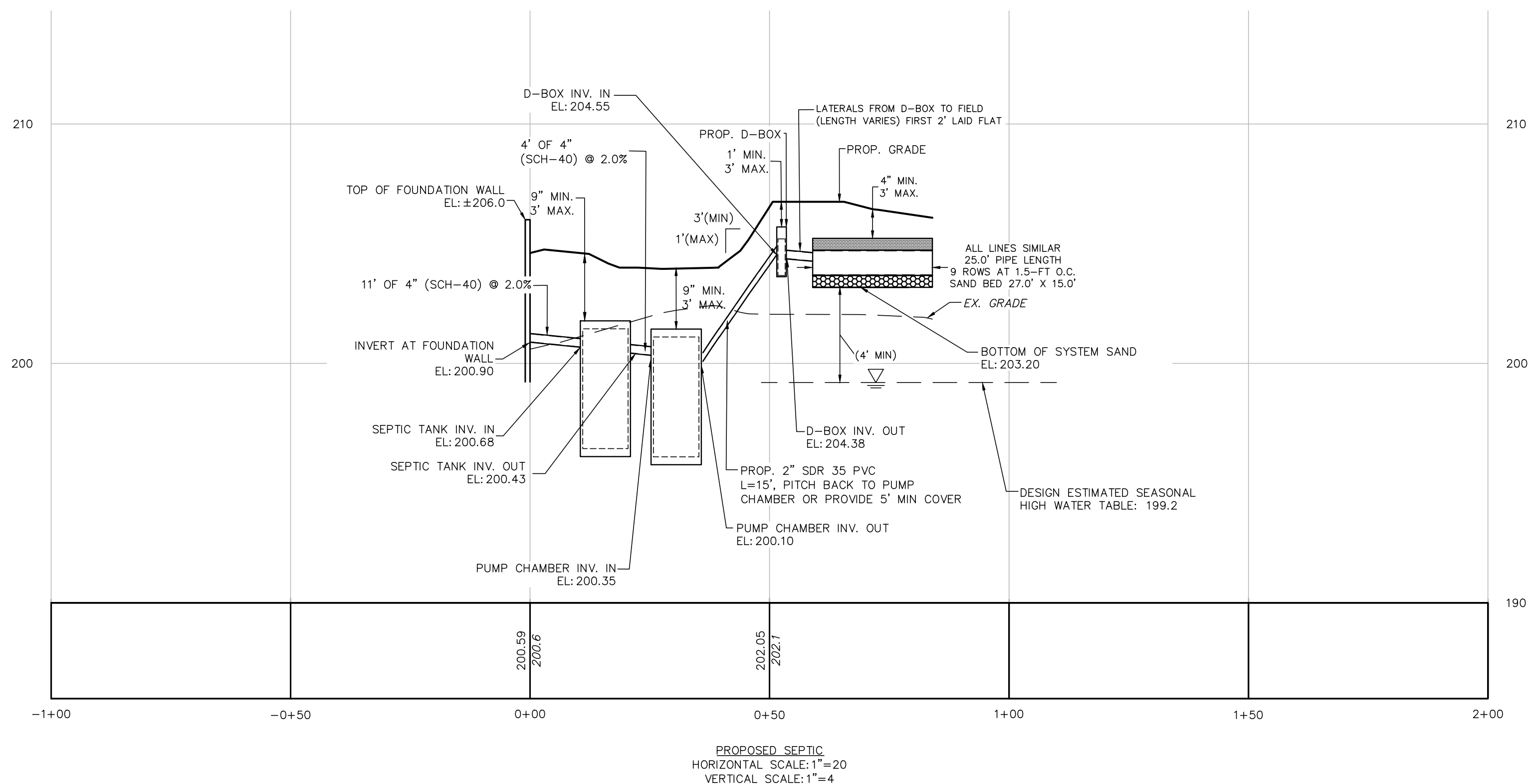
CIVIL—
DESIGN
CONSULTANTS, INC.

344 North Main Street | Andover - MA 01810
(978) 416-0920 | www.civildci.com

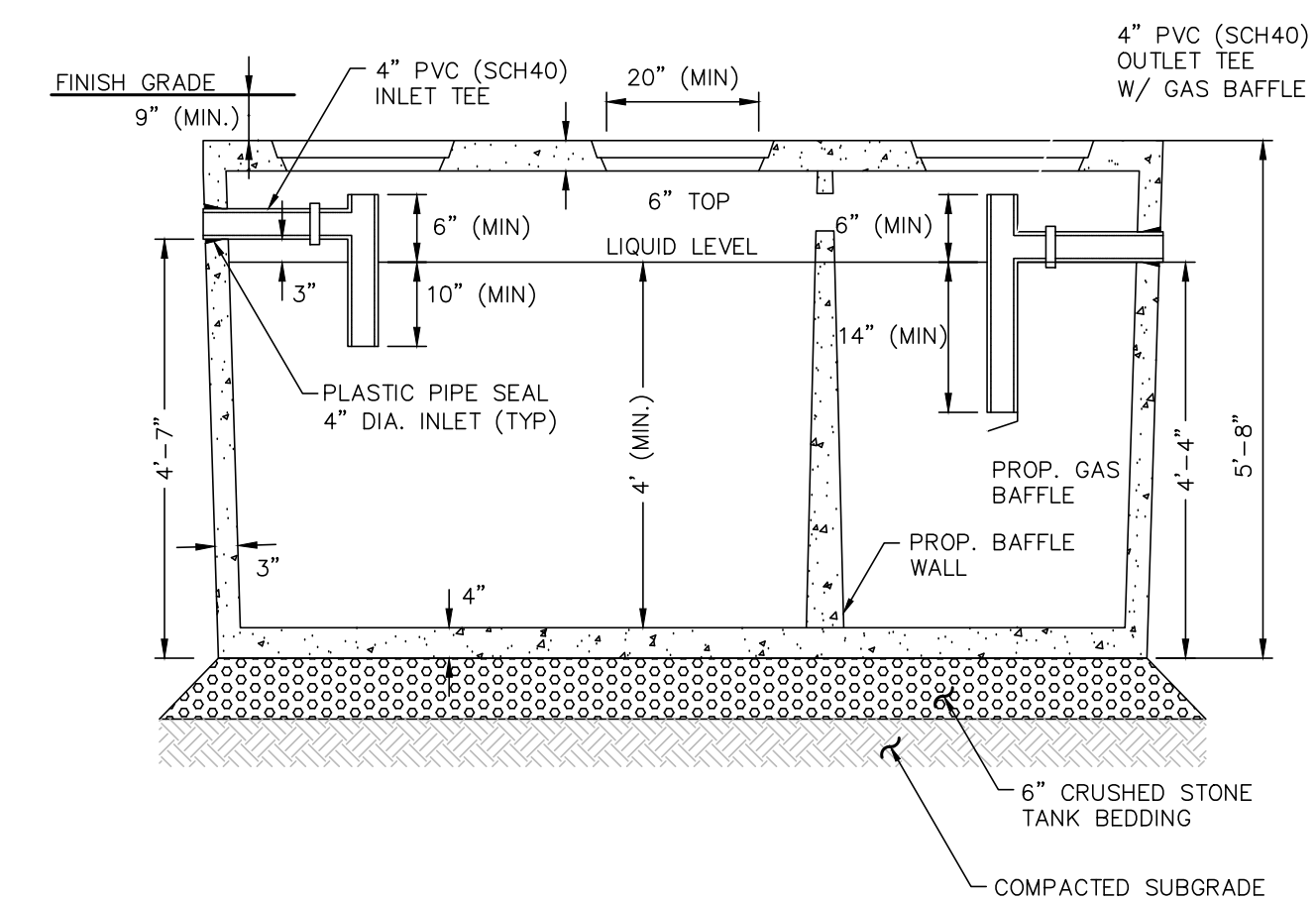
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CONSTRUCTION DETAILS

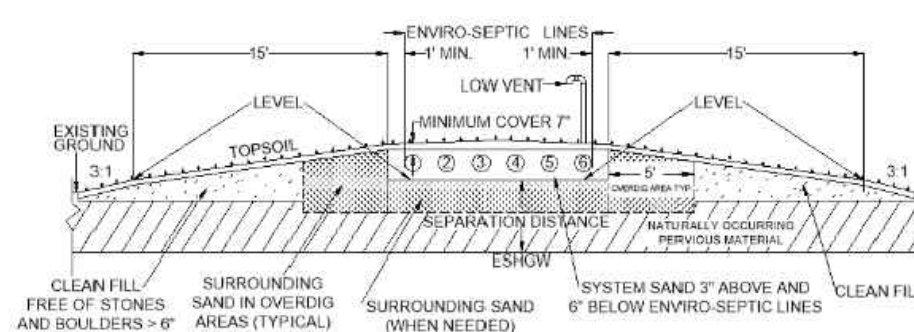
DRAWING #



SEPTIC TANK PLAN VIEW
NOT TO SCALE

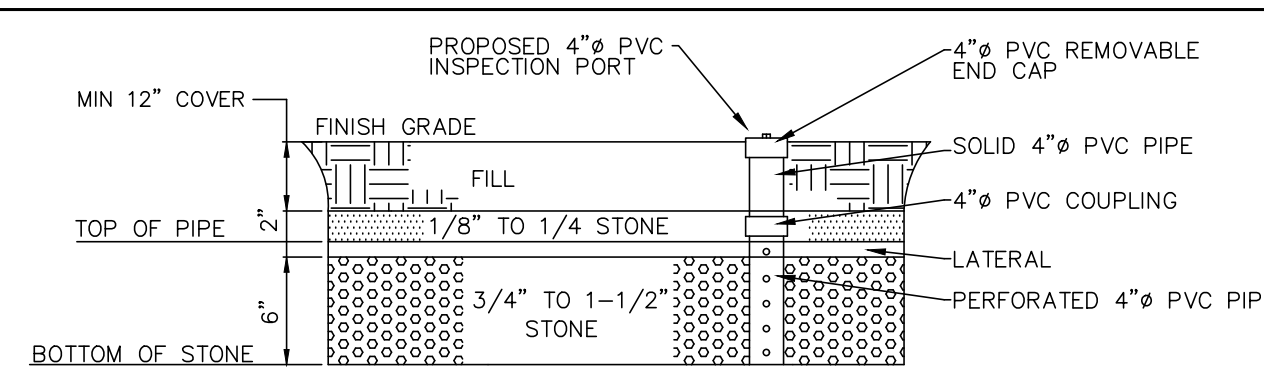


SEPTIC TANK SECTION VIEW
NOT TO SCALE

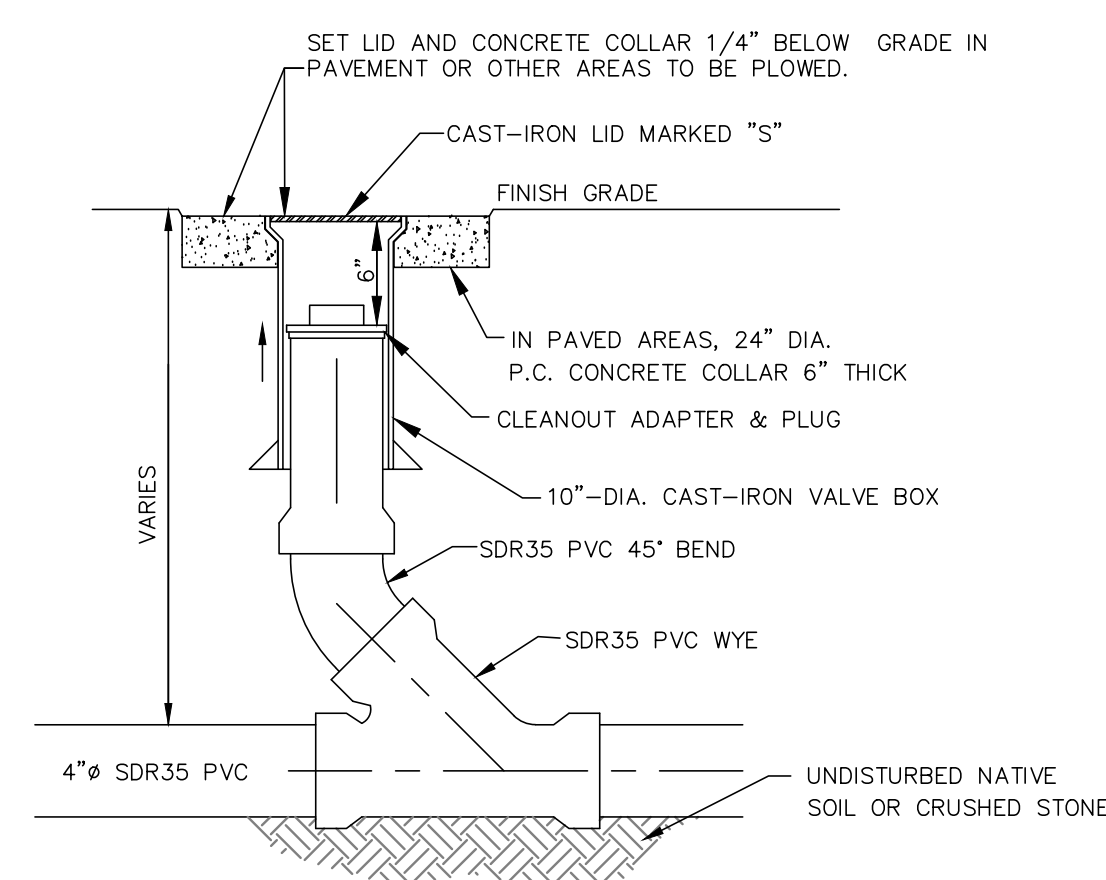


- NOTES:
1. SYSTEM SHALL BE DESIGN AND CONSTRUCTED IN ACCORDANCE WITH 310 CMR 15.255
 2. USE OF AN IMPERMEABLE BARRIER TO BE IN CONJUNCTION WITH MASSDEP'S GUIDELINES FOR DESIGN OF IMPERVIOUS BARRIERS AND SLOPE STABILIZATION FOR TITLE 5 SYSTEMS. USE OF AN IMPERMEABLE BARRIER CAN REDUCE THE 15-FT FILL EXTENSION TO 5-FT BEFORE BEGINNING THE SIDE SLOPE TAPERS OF 3:1. TITLE 5 FILL (SURROUNDING SAND) GOES TO TOP OF BARRIER. BREAKOUT ELEVATION IS BOTTOM OF THE SYSTEM BED/SOL INTERFAC (6 INCHES BELOW THE BOTTOM OF THE EPS FILL)
 3. CONTRACTOR TO REFER TO THE PRESBY WASTEWATER TREATMENT SYSTEM MASSACHUSETTS ENVIRO-SEPTIC DESIGN AND INSTALLATION MANUAL WITH COPYRIGHT DATE SEPTEMBER 2019.

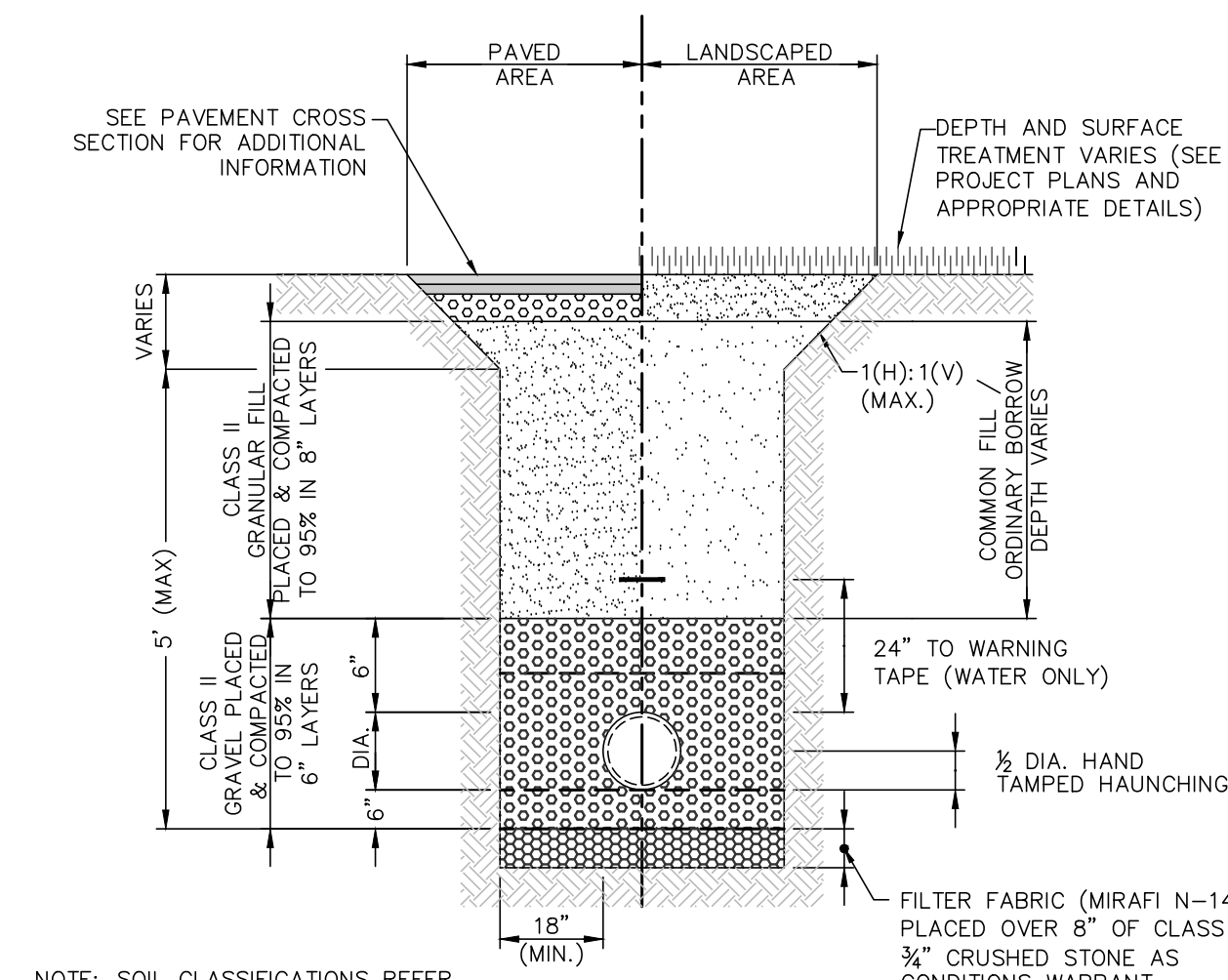
PRESBY ENVIRO-SEPTIC LEACH BED DETAIL
NOT TO SCALE



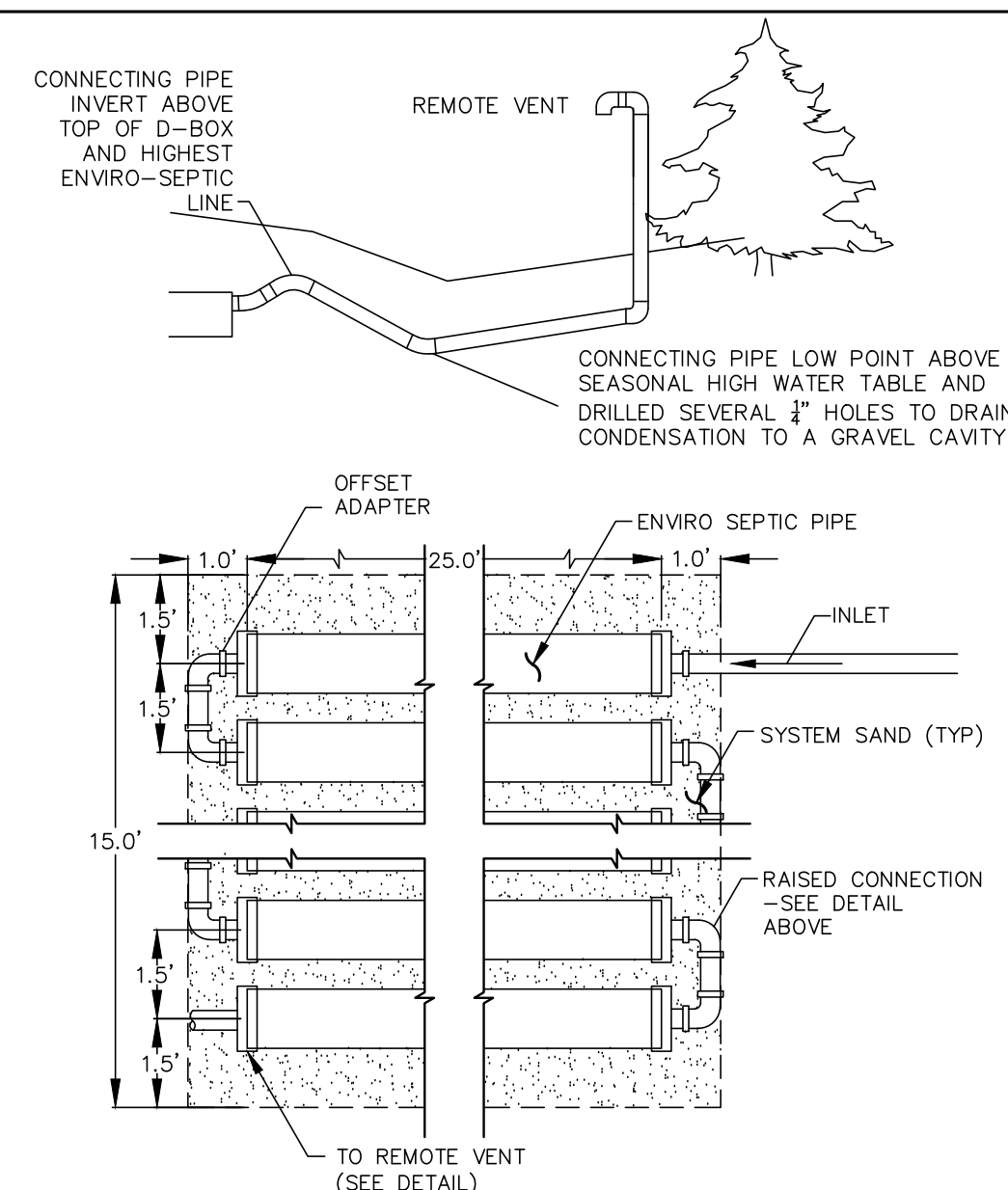
INSPECTION PORT DETAIL
NOT TO SCALE



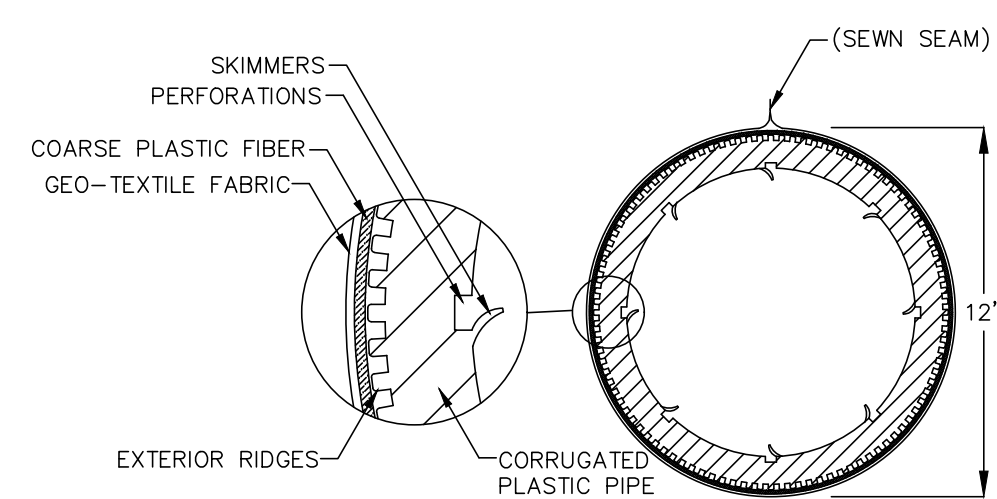
TYPICAL SEWER CLEANOUT
NOT TO SCALE



TYPICAL UTILITY TRENCH DETAIL
NOT TO SCALE



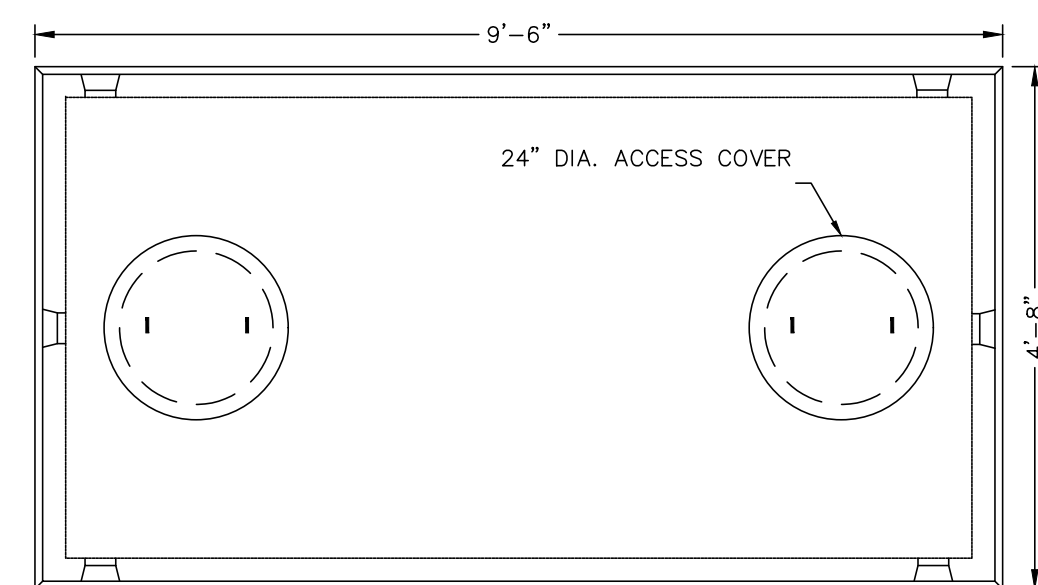
SYSTEM CONFIGURATION AND VENT DETAIL
NOT TO SCALE



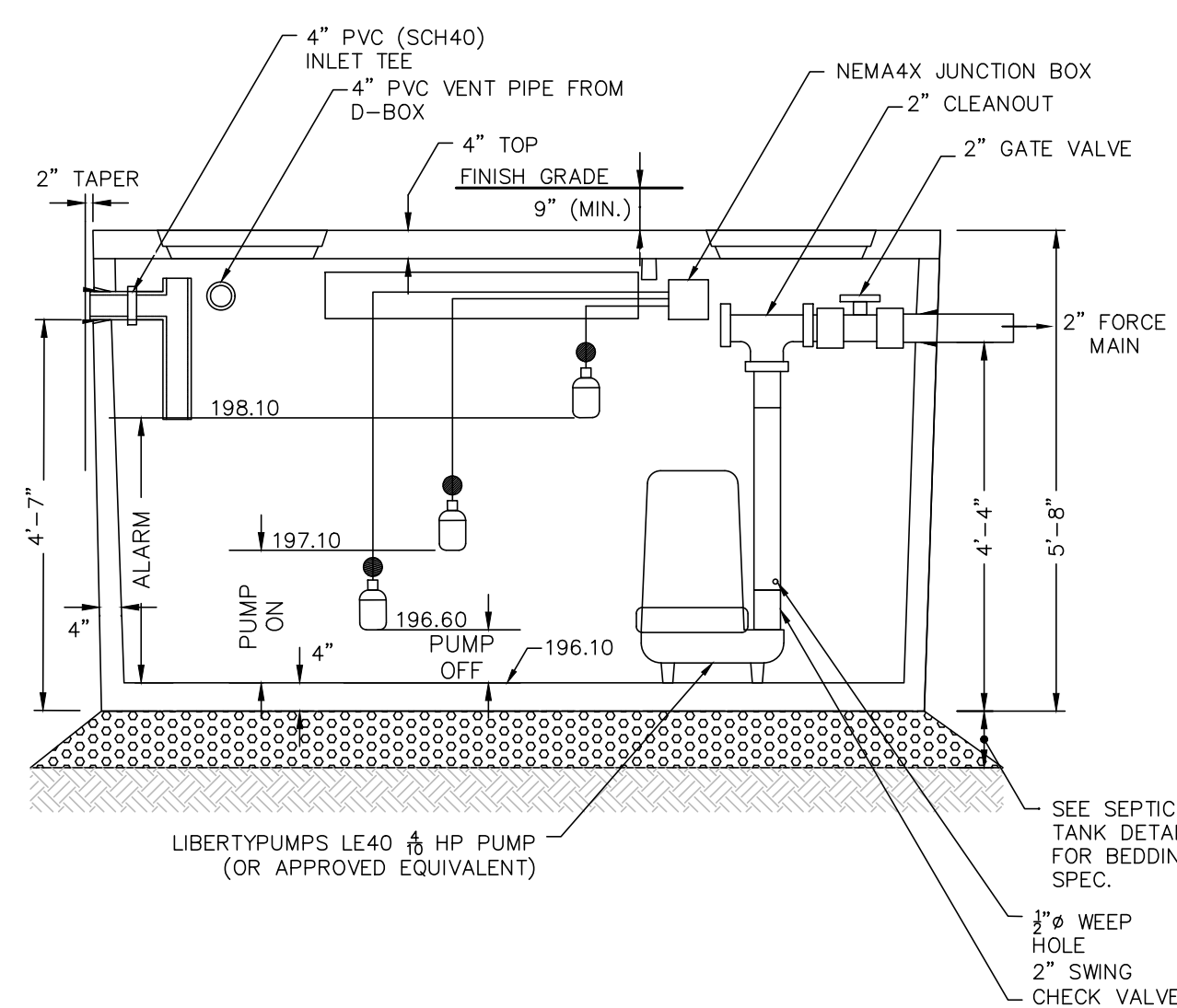
NOTE:
PROVIDE FILTER FABRIC LAYER OVER SYSTEM SAND WITH A GRAB TENSILE
STRENGTH GREATER THAN 315 LBS. FOR H-20 LOADING.

ENVIRO-SEPTIC LEACHING SYSTEM

ENVIRO-SEPTIC US PATENTS 5,954,451; 5,606,786 CANADIAN PATENT 2,185,087; OTHER PATENTS PENDING



PUMP CHAMBER PLAN VIEW
NOT TO SCALE



- NOTES:
1. SEE SHEA CONCRETE 1,000 GALLON MONOLITHIC PUMP CHAMBER (SKU M1000) OR APPROVED EQUAL.
 2. CONCRETE: 4,000 PSI MINIMUM AT 28 DAYS.
 3. DESIGN CONFORMS WITH 311 CFR 15,000, DEP TITLE 5 REGS, FOR PUMP CHAMBERS.
 4. ALL REINFORCEMENT PER ASTM C1227.
 5. JOINTS SEALED WITH BUTYL GUM.
 6. PROVIDE MANHOLE HOLE RISER TO WITHIN 6" OF THE FINISHED SURFACE IN THE EVENT THE TANK IS IN EXCESS OF 9" BELOW GRADE.

1,000 GALLON MONOLITHIC PUMP CHAMBER DETAIL

DATE	DESCRIPTION
REVISIONS	

OWNER / APPLICANT:

ROBERT F. FERREIRA

10 MICHAEL ANTHONY ROAD
HAVERHILL, MA 01832

PROJECT:

LIBERTY STREET

(567-1-19)

HAVERHILL, MA 01832

DATE ISSUED:	JULY 23, 2026
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PROJECT #:	26-10884
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PREPARED BY:	TJS
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PROFESSIONAL ENGINEER FOR CIVIL DESIGN
CONSULTANTS, INC.



CIVIL
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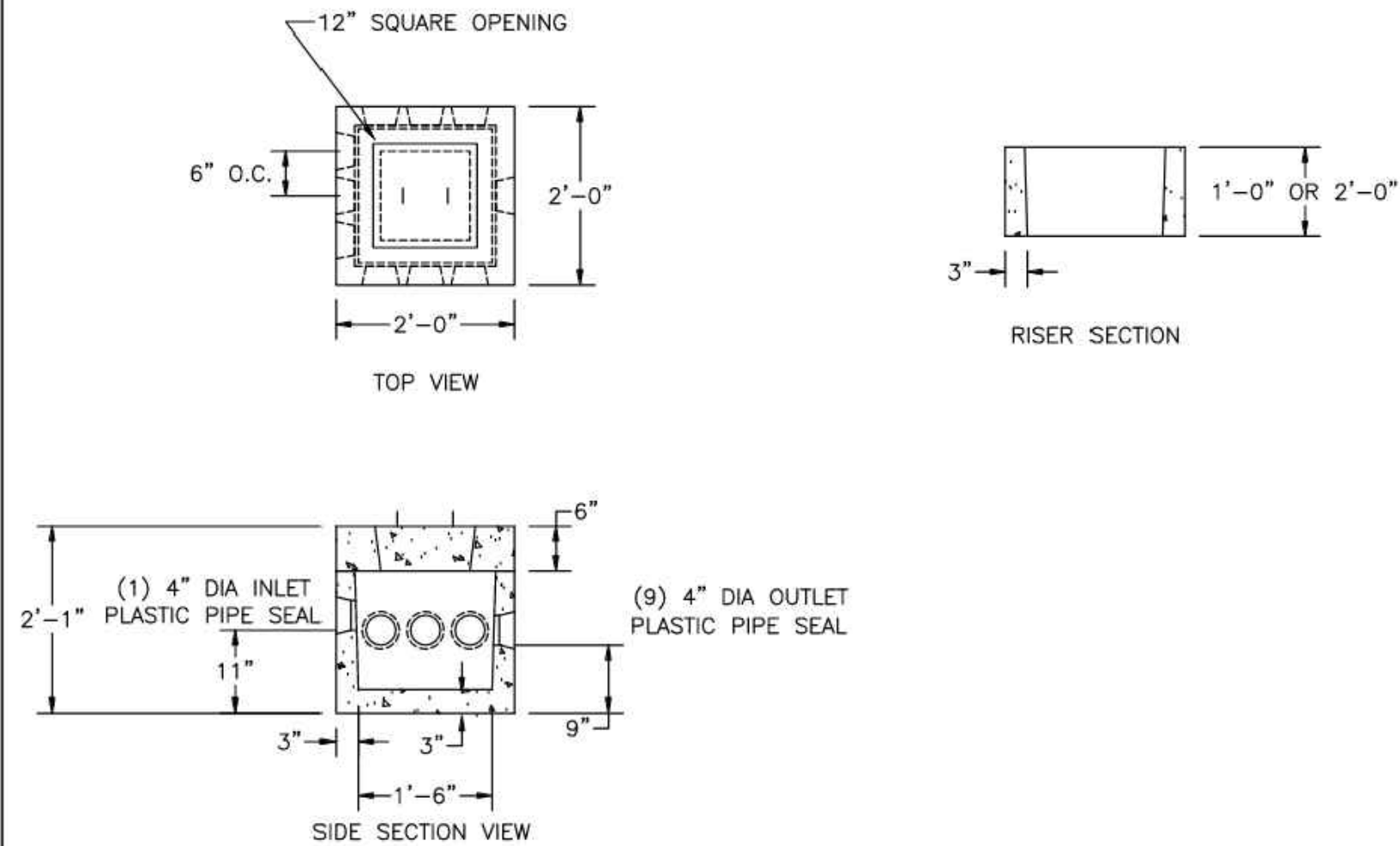
DRAWING TITLE:

CONSTRUCTION DETAILS

DRAWING #:

D-2

DISTRIBUTION BOX
9 OUTLET



ITEM NO.	9DBH	W/COVER	687#	WEIGHT
	9DBHC	COVER ONLY	296#	
	9DBR12	RISER SECTION 12"	221#	
	9DBR24	RISER SECTION 24"	442#	

NOTES:

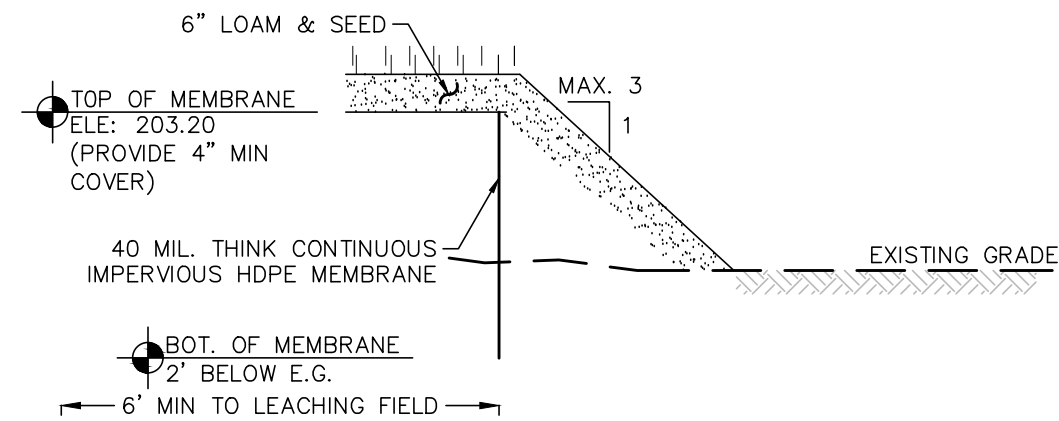
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN CONFORMS WITH 310 CMR 15.000, DEP TITLE 5 REGS, FOR DISTRIBUTION BOXES.
3. 9 OUTLET D-BOX DESIGNED FOR AASHTO HS-20 LOADING, COVER 1 TO 5 FEET.
4. 9 OUTLET D-BOX OPTIONAL 18" ROUND OR SQUARE CAST IRON COVER AVAILABLE IN PLACE OF CONCRETE COVER.

SHEA PRODUCT ID: SEE TABLES	PREPARED FOR: FILE NAME: db9out.dwg	
WEIGHT (LBS): SEE TABLES	DRAWN BY: ARO DATE: 06/01/18 PAGE: D3	
773 Salem Street-Wilmington, MA 153 Cranberry Hwy-Rochester, MA 87 Haverhill Road-Amesbury, MA 160 Old Turnpike Rd-Nottingham, NH		

Specifications subject to change without notice

DISTRIBUTION BOX DETAIL

NOT TO SCALE



NOTE:
1. DETAIL PROVIDED FOR GENERAL INFORMATION ONLY. STAMPED FINAL DESIGN OF MODULAR WALL SYSTEM TO BE PROVIDED BY WALL MANUFACTURER BASED ON GEOTECHNICAL ENGINEERS RECOMMENDATIONS. FINAL DESIGN IS TO INCLUDE PROFILES OF EXISTING AND PROPOSED GRADES.

BREAKOUT PROTECTION BARRIER DETAIL

NOT TO SCALE



USER INPUTS

Project Name:	0 Liberty Street
Engineer:	Troy Stearns
Project Location:	Massachusetts
Measurement Type:	Imperial
Chamber Model:	Contactar 100HD
Required Storage Volume:	61 cf
Available Length:	20 ft
Available Width:	20 ft
Stone Above Chambers:	6 in
Stone Below Chambers:	6 in
Base Stone Elevation:	200 ft
Stone Porosity:	40%
Maximum Allowable Finished Grade	213.54 ft
Minimum Allowable Finished Grade	202.71 ft
Outlet Control Structure:	No

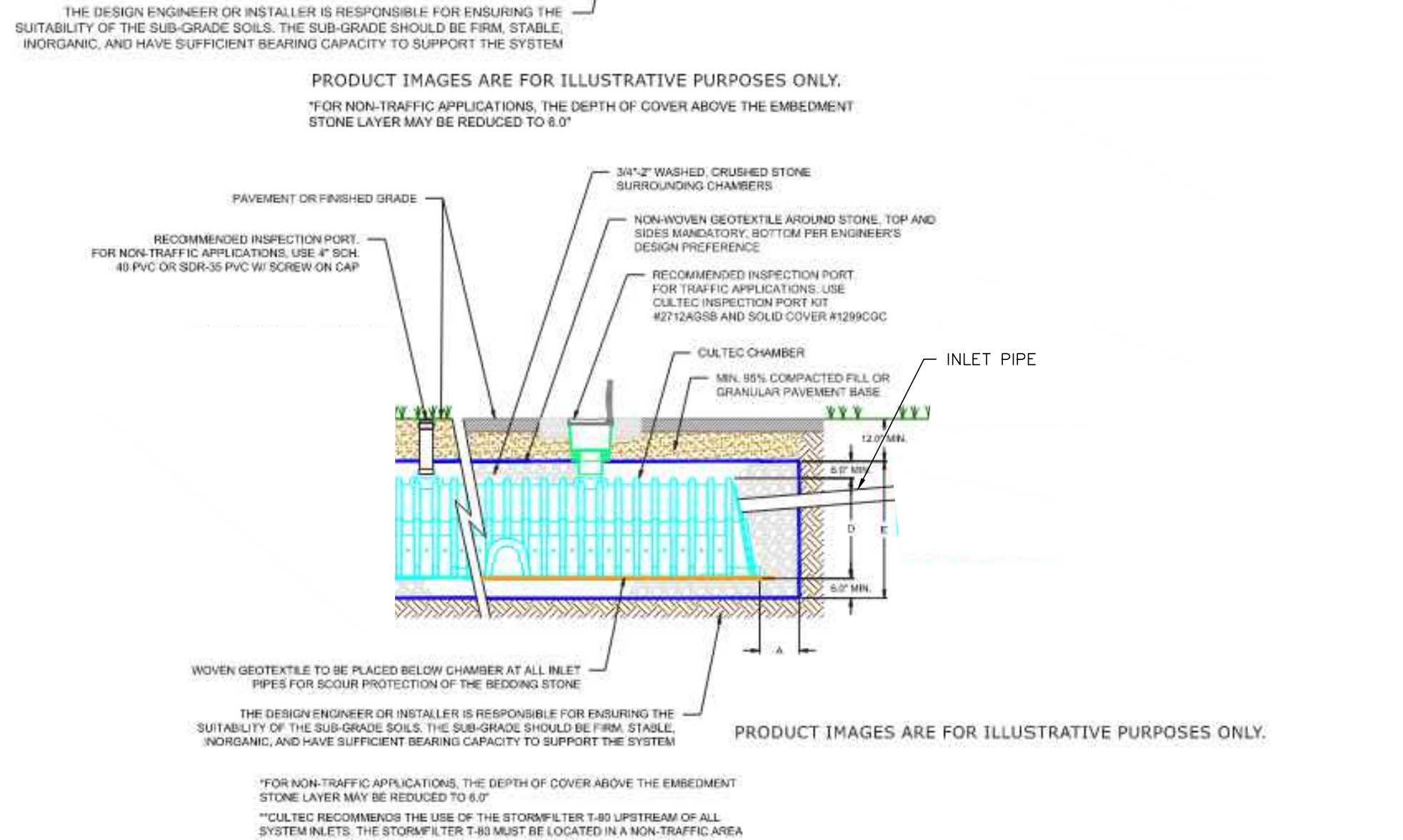
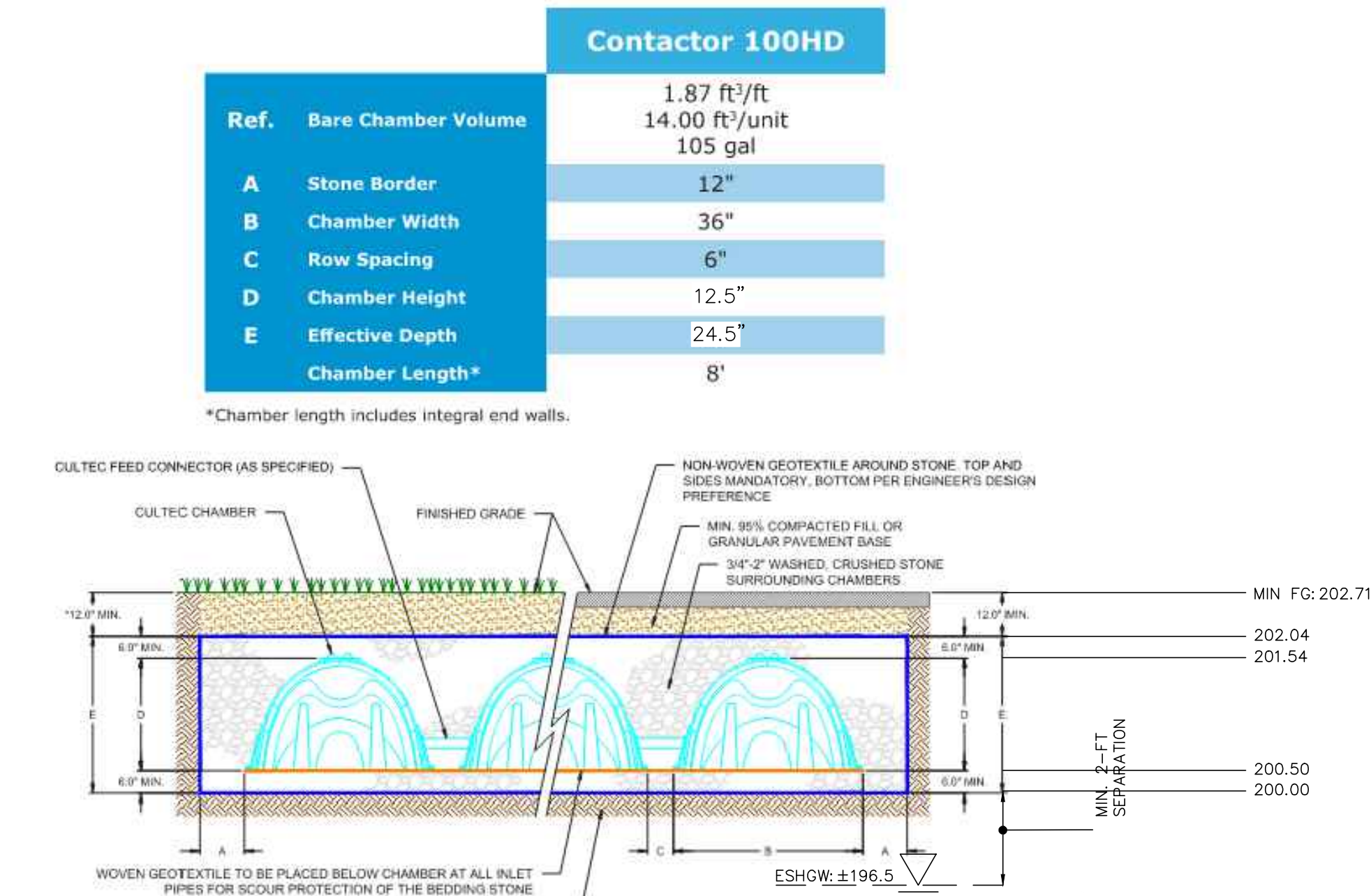
RESULTS

Installed Storage Volume:	88.82 cf
Storage Volume Per Chamber:	14 cf
Chamber Rows:	1
Maximum Length:	17.50 ft
Maximum Width:	5 ft
Approx. Bed Area Required:	87.50 sf

SYSTEM COMPONENTS - NOT FOR CONSTRUCTION

Number of Chambers Required:	2
Number of End Caps Required:	2
Number of Feed Connectors Required:	0
Amount of Stone Required:	6 cy
Volume of Excavation (Not Including Fill):	7 cy
Non-woven Geotextile Required:	49 sy
Woven Geotextile Required (Beneath Internal Manifold):	11 ft
Woven Geotextile Required (Cultec Separator Row / ADS Isolator Row Plus):	20 ft
Total Woven Geotextile Required:	31 ft

Typical Residential Drainage Details



For more information, contact CULTEC at (203) 775-4416 or visit www.cultec.com.

© CULTEC September 2024 SUB100HD 09-24 100HD RES1 submittal

CULTEC CONTRACTOR 100HD CHAMBER DETAIL

NOT TO SCALE

3

OWNER / APPLICANT:

ROBERT F. FERREIRA

10 MICHAEL ANTHONY ROAD
HAVERHILL, MA 01832

PROJECT:

LIBERTY STREET

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DRAWING TITLE:

CONSTRUCTION
DETAILS

DRAWING #:

D-3