

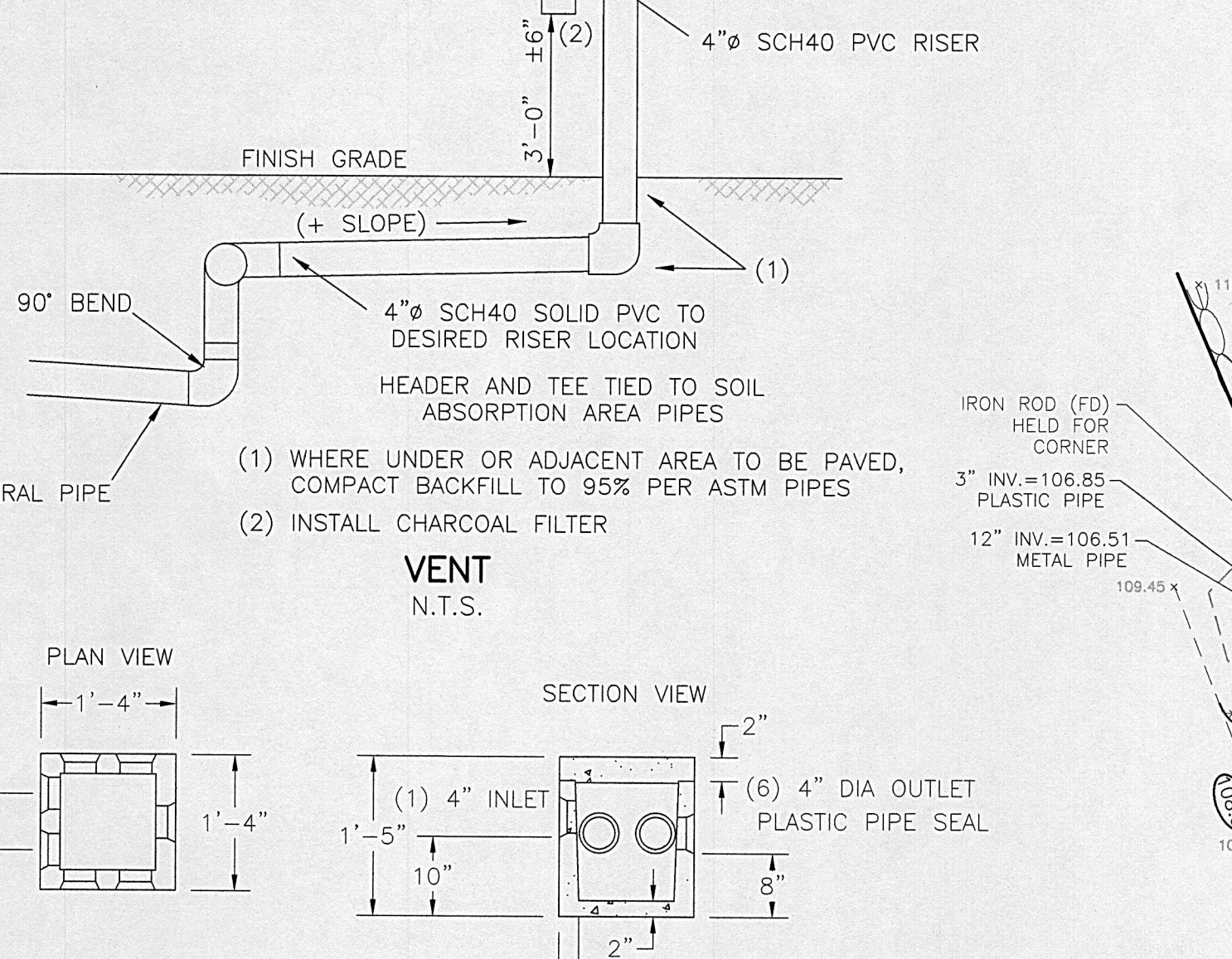
Deep Observation Hole Number: TP 20-2 Date of Testing: January 14, 2020 Soil Evaluator: Thorsen Akerley/SE14016 Board of Health: Kendall Longo										Ground Surface Elevation = 114.5 ESHGWT down 46" Elevation = 110.7±										Deep Observation Hole Number: TP 20-3 Date of Testing: January 14, 2020 Soil Evaluator: Thorsen Akerley/SE14016 Board of Health: Kendall Longo										Ground Surface Elevation = 112.3 ESHGWT down 54" Elevation = 107.8±									
Depth (in.)	Soil Horizon /Layer	Soil Matrix: Color-Moist (munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other	Depth (in.)	Soil Horizon /Layer	Soil Matrix: Color-Moist (munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other	Depth (in.)	Soil Horizon /Layer	Soil Matrix: Color-Moist (munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other				
			Depth	Color	Percent		Gravel	Cobbles & Stones							Depth	Color	Percent		Gravel	Cobbles & Stones							Depth	Color	Percent		Gravel	Cobbles & Stones				Depth	Color	Percent	Gravel
0-10	A	10YR 3/2				FSL						0-20	A	10YR 3/2				FSL							20-35	Bw	7.5YR 5/8				SL								
10-30	Bw	7.5YR 5/8				SL						35-108	C	5Y 6/4	54"	10YR 6/8	>15	gSL																					
30-118	C	5Y 6/4	46"	10YR 6/8	>15	gSL											54"	10YR 6/8	>15	gSL																			
			46"	5Y 5/1	15																																		
Percolation Test Number: P-1										Depth of Percolation Test: 36"+18"										Percolation Test Number: P-1										Depth of Percolation Test: 36"+18"									
										Measured Rate (min./in.) 17 MPI																				Measured Rate (min./in.) 17 MPI									
Deep Observation Hole Number: TP 20-4 Date of Testing: January 14, 2020 Soil Evaluator: Thorsen Akerley/SE14016 Board of Health: Kendall Longo										Ground Surface Elevation = 119.5 ESHGWT down 56" Elevation = 114.8±										Deep Observation Hole Number: TP 20-5 Date of Testing: January 14, 2020 Soil Evaluator: Thorsen Akerley/SE14016 Board of Health: Kendall Longo										Ground Surface Elevation = 116.8 ESHGWT down 52" Elevation = 112.5±									
0-9	A	10YR 3/2				FSL						0-12	A	10YR 3/2				FSL							12-28	Bw	7.5YR 5/8				SL								
9-26	Bw	7.5YR 5/8				SL						28-108	C	5Y 6/4	52"	10YR 6/8	>15	gSL																					
26-112	C	5Y 6/4	56"	10YR 6/8	>15	gSL											52"	10YR 6/8	>15	gSL																			
			56"	5Y 5/1	15																																		
Percolation Test Number: P-2										Depth of Percolation Test: 28"+18"										Percolation Test Number: P-2										Depth of Percolation Test: 28"+18"									
										Measured Rate (min./in.) 20 MPI																				Measured Rate (min./in.) 20 MPI									

SHEA
OR APPROVED EQUAL

1500 GALLON SEPTIC TANK MONOLITHIC 3" WALL
N.T.S.

Item No. M1500 Weight 11,035#
M15002C Weight 11,841#

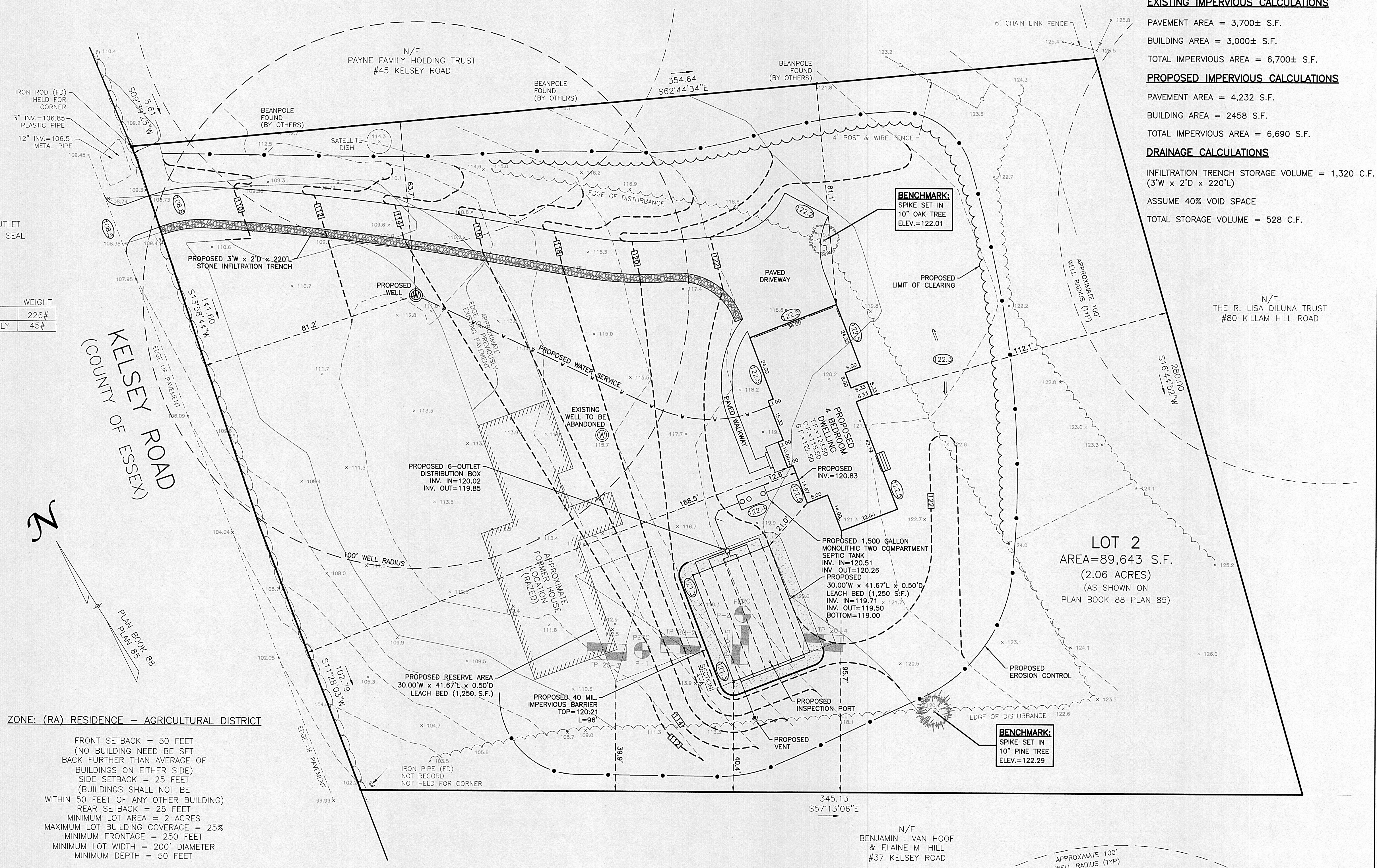
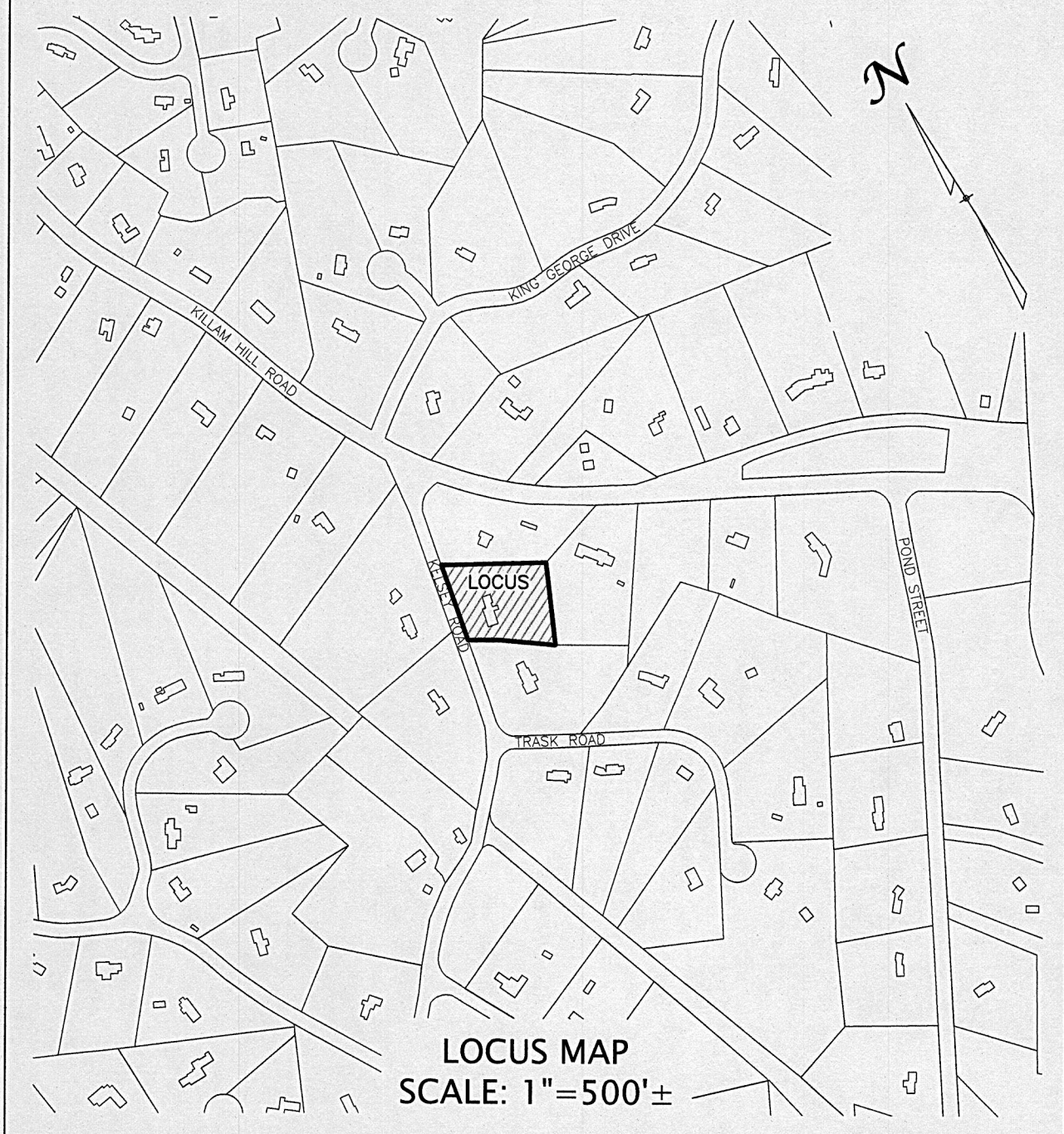
Item No. 6DB W/COVER Weight 226#
6DBC COVER ONLY Weight 45#



SHEA
OR APPROVED EQUAL

6 OUTLET STANDARD DISTRIBUTION BOX
N.T.S.

- CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
- DESIGN CONFORMS WITH 310 CMR 15.000, DEP TITLE 5 REGS, FOR DISTRIBUTION BOXES.
- CONTRACTOR SHALL INSURE THAT ALL INLETS AND OUTLETS ARE MADE WATERTIGHT.
- CONTRACTOR SHALL INSURE THAT DISTRIBUTION BOXES ARE SET ON A MINIMUM OF 6" OF MECHANICALLY COMPACT CRUSHED STONE.
- THE INVERT ELEVATION OF ALL OUTLETS SHALL BE EQUAL TO EACH OTHER AND LOCATED AT LEAST 2" BELOW THE INVERT OF THE INLET.



ZONE: (RA) RESIDENCE - AGRICULTURAL DISTRICT

FRONT SETBACK = 50 FEET
(NO BUILDING NEED BE SET BACK FURTHER THAN AVERAGE OF BUILDINGS ON EITHER SIDE)
SIDE SETBACK = 25 FEET
(BUILDINGS SHALL NOT BE WITHIN 50 FEET OF ANY OTHER BUILDING)
REAR SETBACK = 25 FEET
MINIMUM LOT AREA = 2 ACRES
MAXIMUM LOT BUILDING COVERAGE = 25%
MINIMUM FRONTAGE = 250 FEET
MINIMUM LOT WIDTH = 200' DIAMETER
MINIMUM DEPTH = 50 FEET

EXISTING IMPERVIOUS CALCULATIONS

PAVEMENT AREA = 3,700± S.F.
BUILDING AREA = 3,000± S.F.
TOTAL IMPERVIOUS AREA = 6,700± S.F.

PROPOSED IMPERVIOUS CALCULATIONS

PAVEMENT AREA = 4,232 S.F.
BUILDING AREA = 2458 S.F.
TOTAL IMPERVIOUS AREA = 6,690 S.F.

DRAINAGE CALCULATIONS

INFILTRATION TRENCH STORAGE VOLUME = 1,320 C.F. (3'W x 2'D x 220'L)
ASSUME 40% VOID SPACE
TOTAL STORAGE VOLUME = 528 C.F.

WILLIAMS & SPARGES
189 NORTH MAIN STREET
SUITE 101
MIDDLETON, MA 01948
PHONE: (978) 538-8200
FAX: (978) 538-8200
WS@WSPARGES.COM

Owner: ADVA Construction/Design, LLC
9 Kenney Road
Middleton, MA 01949

Applicant: Tim McManus
9 Kenney Road
Middleton, MA 01949
617-417-8389

Designed By: SML
Drawn By: SML
Reviewed By: PMB
Project Manager: PMB
Job File Number: BOXF-0074
Drawing File Folder: BOXF74

Drawing Issued for Review Only
 Drawing Issued for Permit
 Drawing Issued for Construction

SEAL
PETER M. BLAISDELL, JR.
CIVIL ENGINEER
No. 41613
(2/10/2020)

SANITARY DISPOSAL SYSTEM DESIGN PLAN
41 KELSEY ROAD, BOXFORD, MA

LOT 2
AREA=89,643 S.F.
(2.06 ACRES)
(AS SHOWN ON PLAN BOOK 88 PLAN 85)

SCALE: 1"=20'
FEBRUARY 6, 2020

DRAWING: S-1
SHEET 1 OF 2

PLAN NOTES:

- SOIL TESTING INFORMATION USED FOR DESIGN WAS PERFORMED ON JANUARY 14, 2020.
- ALL ELEVATIONS SHOWN ARE REFERENCED TO NAVD88.
- VEHICULAR TRAFFIC, PARKING OF VEHICLES, STOCKPILING OF MATERIALS, AND STORAGE OF EQUIPMENT OVER LEACHING AREA ARE PROHIBITED AT ALL TIMES.
- EXISTING TOPOGRAPHIC INFORMATION SHOWN IS THE RESULT FROM AN ACTUAL INSTRUMENT SURVEY CONDUCTED BY WILLIAMS & SPARAGES ON JANUARY 22, 2020.
- THIS PROJECT DOES NOT LIE WITHIN A NITROGEN SENSITIVE AREA.
- ACCORDING TO AVAILABLE MAPPING AND INFORMATION, THERE ARE NO PUBLIC OR PRIVATE DRINKING WATER SUPPLY WELLS WITHIN 100- FEET OF THE PROPOSED SEPTIC SYSTEM. IN ADDITION, THE PROPOSED SYSTEM DOES LIE WITHIN 400- FEET OF A ZONE A TO A PUBLIC WATER SUPPLY.

WILLIAMS & SPARAGES LLC HAS BEEN RETAINED TO PREPARE A SEPTIC SYSTEM DESIGN PLAN FOR THE CLIENT, BUT HAS NOT BEEN RETAINED TO CONSTRUCT OR SUPERVISE CONSTRUCTION OF THE SEPTIC SYSTEM. THEREFORE, NO GUARANTEE OR WARRANTY, EXPRESS OR IMPLIED, IS MADE TO THE CLIENT OR TO THE ULTIMATE USER RELATIVE TO ANY SYSTEM INSTALLED PURSUANT TO THIS PLAN SET.

- THE PLAN SHOWS ONLY THOSE FEATURES THAT WERE VISUALLY APPARENT ON THE DATE OF TOPOGRAPHY. THE ABSENCE OF SUBSURFACE STRUCTURES UTILITIES, ETC. DOES NOT MEAN THAT THEY DO NOT EXIST.
- THE FINISHED SURFACE OF THE LEACHING AREA SHALL BE GRADED TO ASSURE SURFACE WATER RUNOFF (2% MINIMUM SLOPE IN ACCORDANCE WITH TITLE 5).
- THE CONTRACTOR SHALL NOTIFY THE DESIGNER OF ANY SITE CONDITION THAT DIFFERS FROM THOSE INDICATED ON THE DESIGN PLAN.
- IF ANY PART OF THIS DESIGN IS TO BE ALTERED IN ANY WAY, THE DESIGNER AS WELL AS THE APPROVING AUTHORITIES SHALL BE NOTIFIED IN WRITING PRIOR CONSTRUCTION.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR HORIZONTAL AND VERTICAL CONTROL OF ALL SYSTEM COMPONENTS. THE GENERAL CONTRACTOR IS RESPONSIBLE TO CHECK BETWEEN A MINIMUM OF TWO (2) VERTICAL CONTROL BENCHMARKS.
- THESE PLANS AND SPECIFICATIONS ARE INTENDED TO BE EXPLANATORY OF THE WORK TO BE DONE, BUT SHOULD ANY OMISSION, ERRORS, OR DISCREPANCIES APPEAR, THEY SHALL BE SUBJECT TO CORRECTION AND INTERPRETATION BY THE DESIGN ENGINEER, THEREBY DEFINING AND FULFILLING THE INTENT OF THE PLANS.
- ALTERNATE MANUFACTURERS FOR CONCRETE STRUCTURES AND EQUIPMENT SHOWN ON THESE PLANS MAY BE USED UPON WRITTEN APPROVAL OF THE DESIGNER. ALTERNATE MANUFACTURERS WILL NOT BE USED IF THE USE OF THEIR EQUIPMENT REQUIRES DESIGN CHANGES.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING DIG SAFE SYSTEM, INC. (1-888-344-7233 OR 811) TO LOCATE UTILITIES.
- THE SYSTEM IS DESIGNED ONLY TO ACCOMMODATE SANITARY SEWAGE ASSOCIATED WITH NORMAL DOMESTIC USAGE AND CONSISTING OF WATER-CARRIED PUTRESCIBLE WASTE.
- DISPOSAL SYSTEM AREAS ARE TO BE RAKED (SCARIFIED) BEFORE INSTALLATION OF STONE. ALL STONES EXCEEDING 2 INCHES IN DIAMETER AND ALL FOREIGN MATERIAL ENCOUNTERED DURING EXCAVATION ARE TO BE REMOVED FROM THE LEACHING AREA BED SURFACE.
- THIS PLAN SHOWS THE DESIGN OF THE SUBSURFACE SEWAGE DISPOSAL SYSTEM ONLY. THE SYSTEM IS DESIGNED FOR FLOWS ESTIMATED UNDER DESIGN CRITERIA.
- ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM AFTER THEY ARE BURIED.
- THE SOIL ABSORPTION SYSTEM SHALL HAVE A MINIMUM OF 1 INSPECTION PORT CONSISTING OF A PERFORATED 4 INCH PIPE PLACED VERTICALLY DOWN INTO THE STONE TO THE NATURALLY OCCURRING SOIL OR SAND FILL BELOW THE STONE. THE PIPE SHALL BE CAPPED WITH A SCREW TYPE CAP WITH A VALVE COVER BOX AT FINISH GRADE.
- ALL WORK AND MATERIALS SHALL COMPLY WITH THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION STATE ENVIRONMENTAL CODE, TITLE 5 AND LOCAL BOARD OF HEALTH SUPPLEMENTARY REGULATIONS AS REQUIRED.
- NO GARBAGE GRINDER SHALL BE INSTALLED AS PART OF THIS DESIGN.
- THE SYSTEM SHALL BE VENTED THROUGH BUILDING PLUMBING AS REQUIRED BY THE BUILDING AND/OR PLUMBING CODE.
- THE INSTALLER OF THIS SYSTEM MUST BE LICENSED BY THE LOCAL BOARD OF HEALTH.
- APPLICABLE ZONING BYLAWS AND/OR OTHER LOCAL REGULATIONS SHALL BE CONFIRMED BY THE OWNER PRIOR TO CONSTRUCTION.
- THE SEPTIC TANK SHALL BE PERIODICALLY INSPECTED AND MAINTAINED AND SHOULD BE PUMPED WHENEVER THE TOP OF THE SLUDGE LAYER IS WITHIN 12-INCHES OF THE BOTTOM OF THE OUTLET TEE OR WHEN THE TOP OF THE SCUM LAYER IS WITHIN 2-INCHES OF THE TOP OF THE OUTLET TEE OR THE BOTTOM OF THE SCUM LAYER IS WITHIN 2-INCHES OF THE BOTTOM OF THE OUTLET TEE.
- COMPONENTS NOT TO BE BACKFILLED WITHOUT INSPECTION BY BOARD OF HEALTH AND PERMISSION OBTAINED BY BOARD OF HEALTH.
- DESIGNER TO SUBMIT AN AS-BUILT PLAN OF SYSTEM WITHIN 30 DAYS OF FINAL INSPECTION OF THE SYSTEM.
- EXCAVATE ALL TOPSOIL, SUBSOIL, AND ANY OTHER UNSUITABLE MATERIAL. FILL MATERIAL FOR SYSTEMS CONSTRUCTED IN FILL SHALL CONSIST OF CLEAN GRANULAR SAND, FREE FROM ORGANIC MATTER AND DELETERIOUS SUBSTANCES.
- FILL MATERIAL SHALL NOT CONTAIN ANY MATERIAL LARGER THAN 2 INCHES. THE FILL MATERIAL SHALL COMPLY WITH THE STATE ENVIRONMENTAL CODE, TITLE 5, 310 CMR 15.255 (3) AS REVISED.
- CONTRACTOR TO SUPPLY TO THE CITY OR TOWN WITH A CURRENT SIEVE TEST ANALYSES REPORT AT THEIR EXPENSE IF REQUIRED BY THE LOCAL APPROVING AUTHORITY.

MATERIAL NOTES:

AGGREGATE FOR SOIL ABSORPTION SYSTEM:

- CLEAN DOUBLE WASHED STONE SHALL BE FREE OF IRON PARTICLES, FINES AND DUST IN PLACE.
- BASE AGGREGATE IN LEACH AREA SHALL CONSIST OF 3/4" TO 1-1/2" DOUBLE WASHED STONE AS DESCRIBED ABOVE.
- A MINIMUM 2-INCH LAYER OF DOUBLE WASHED STONE RANGING FROM 1/8 TO 1/2 INCH DIAMETER AS DESCRIBED IN NOTE 1 ABOVE SHALL COVER THE BASE AGGREGATE. GEOTEXTILE FABRIC MAY BE SUBSTITUTED FOR THE MINIMUM 2-INCH LAYER OF DOUBLE WASHED STONE.

SOIL ABSORPTION SYSTEM (SAS) SIZING CALCULATIONS:

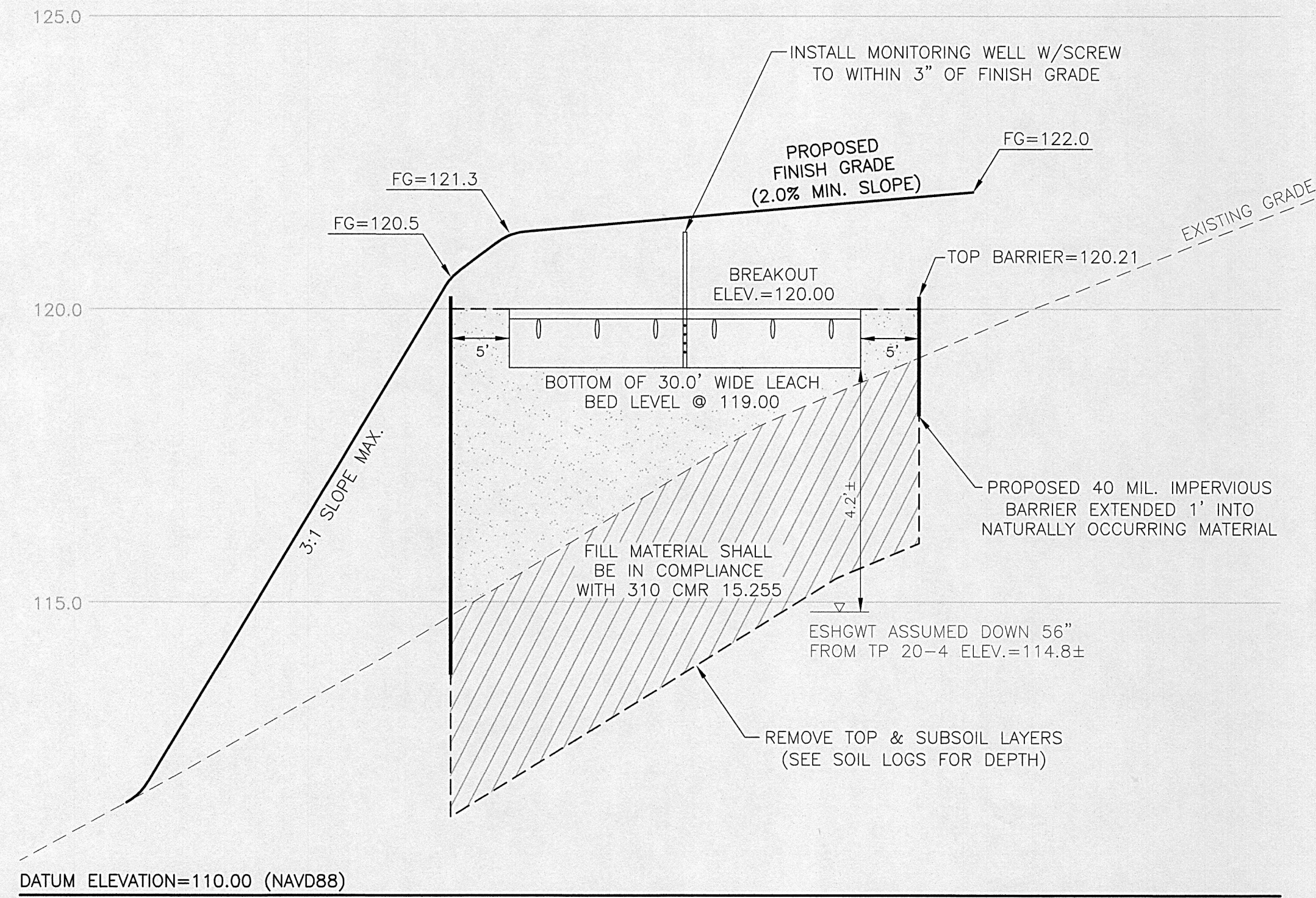
SEWAGE FLOWS SINGLE FAMILY DWELLING:

NUMBER OF BEDROOMS = 4 BR
 DESIGN FLOW = 165 GPD/BR
 DAILY FLOW = (165 GPD/BR * 4 BR) = 660 GPD

SEPTIC TANK REQUIRED:
 (2*660 GPD) = 1,320 GPD, USE 1,500 GAL. SEPTIC TANK

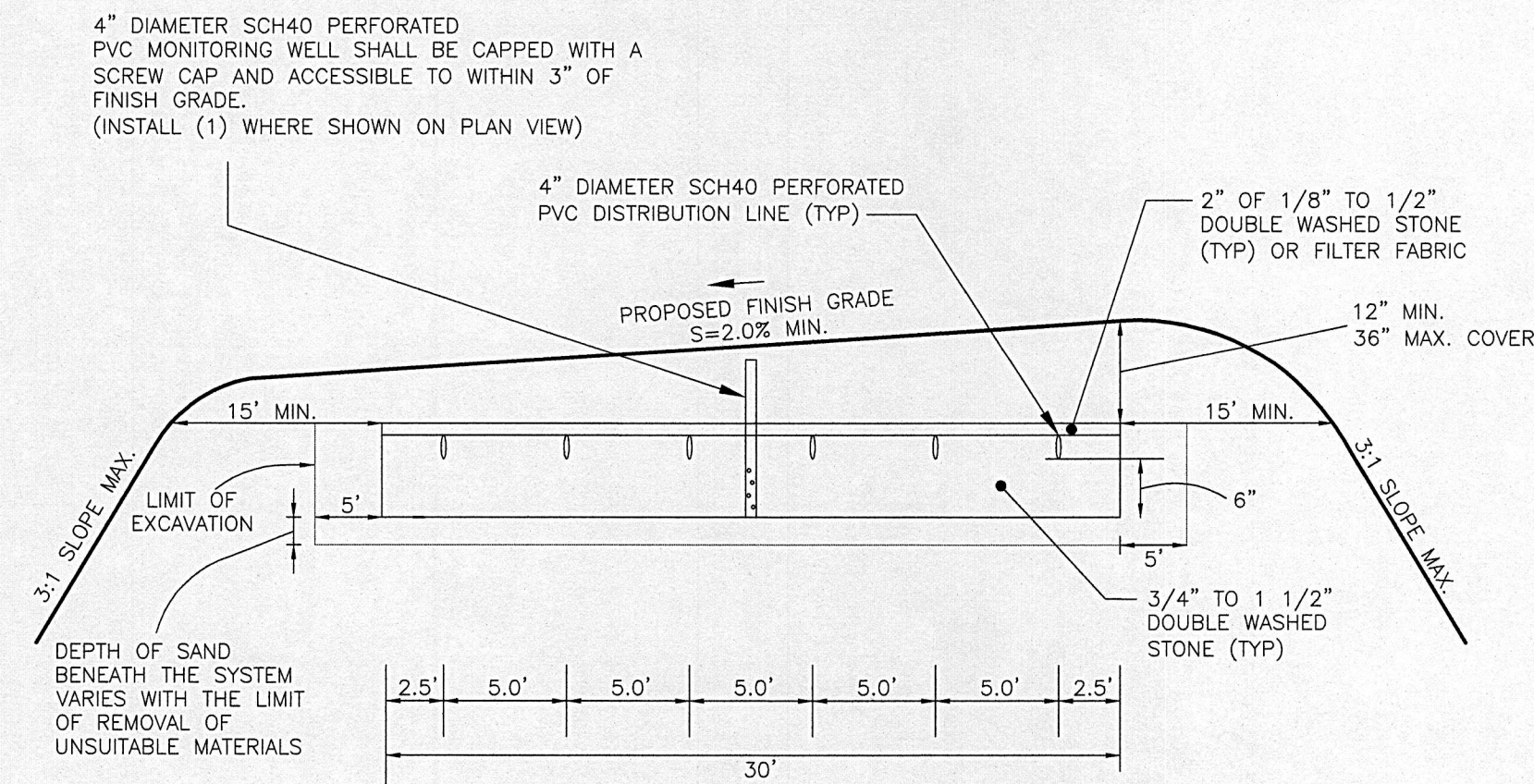
PRIMARY LEACHING AREA REQUIRED:
 FOR CLASS II SOIL WITH A PERCOLATION RATE OF 20 MINUTES PER INCH = 660 GPD/0.53 GPD/S.F. = 1,245.3 S.F.
 LEACHING AREA PROVIDED = LEACH BED 30.00'W x 41.67'L x 0.50'D = 1,250.1 S.F.

RESERVE LEACHING AREA REQUIRED:
 FOR CLASS II SOIL WITH A PERCOLATION RATE OF 17 MINUTES PER INCH = 660 GPD/0.53 GPD/S.F. = 1,245.3 S.F.
 LEACHING AREA PROVIDED = LEACH BED 30.00'W x 41.67'L x 0.50'D = 1,250.1 S.F.

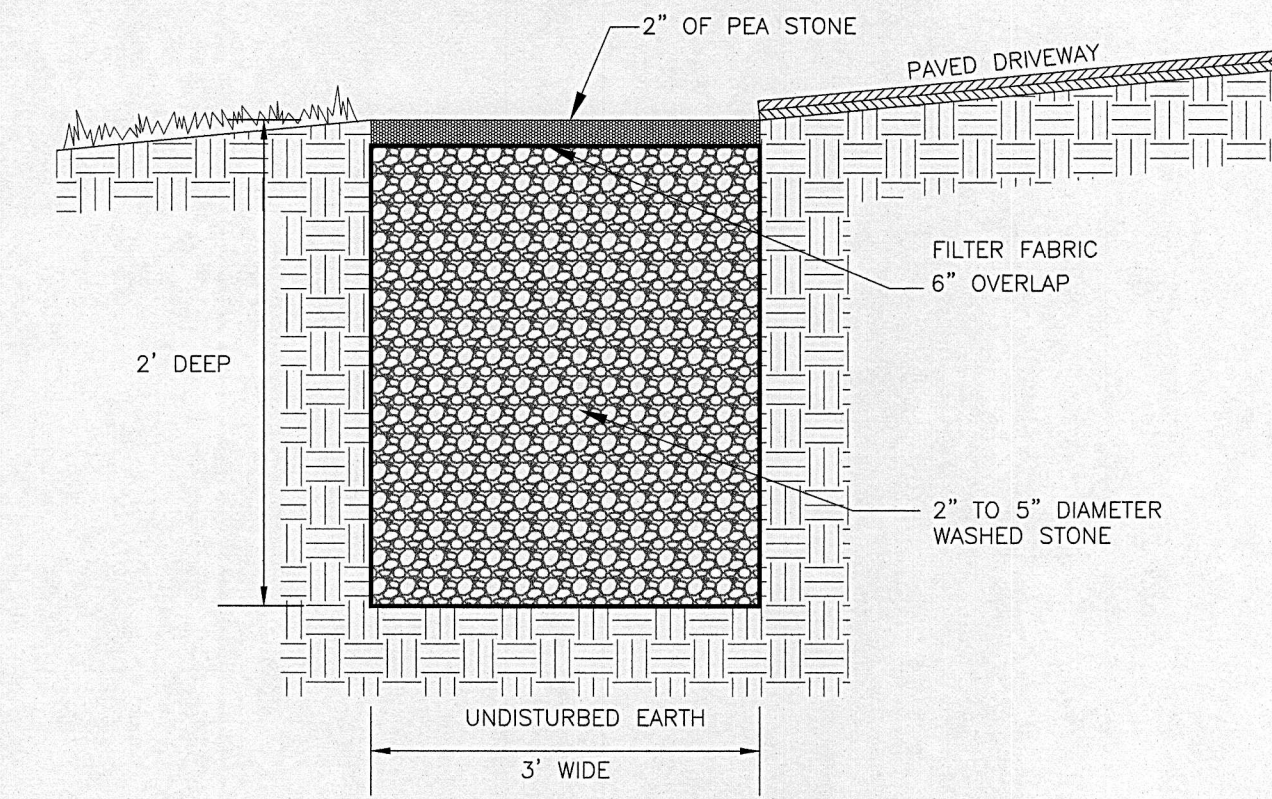


SECTION A-A

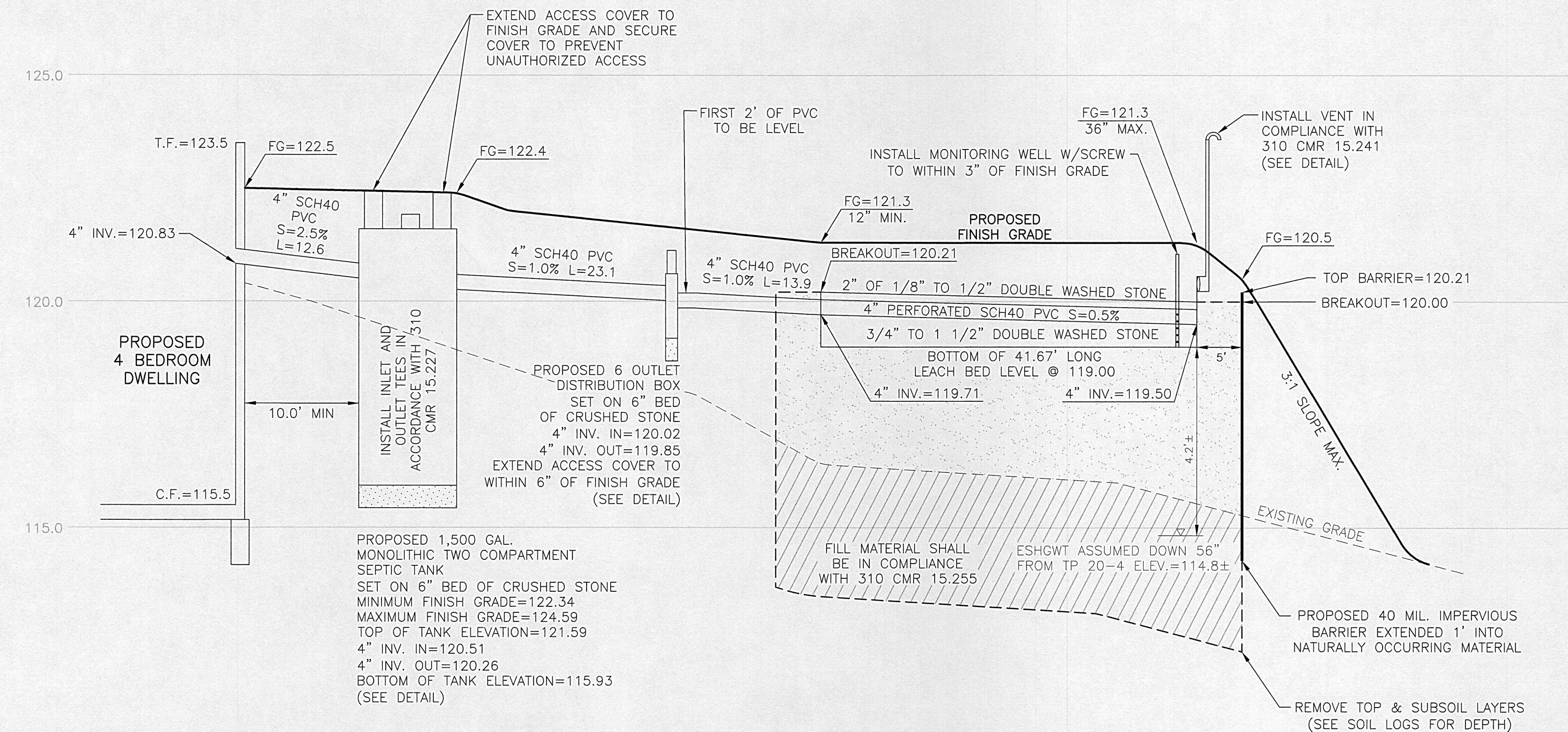
SYSTEM PROFILE



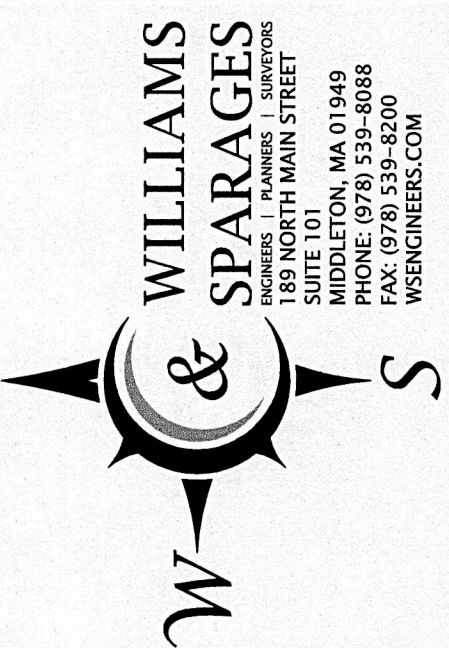
LEACHING FIELD DETAIL
(41.67'L x 30.00'W)
N.T.S.



STONE INFILTRATION TRENCH DETAIL
N.T.S.

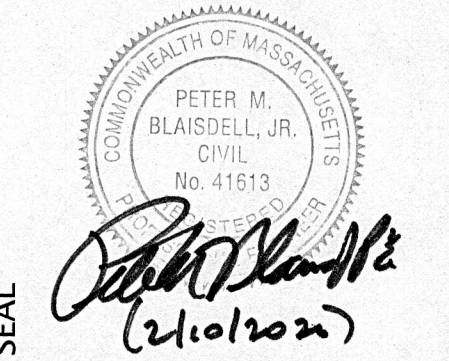


SYSTEM PROFILE



Owner: ADVA Construction/Design, LLC
 9 Kenney Road
 Middleton, MA 01949
 Applicant: Tim McManus
 9 Kenney Road
 Middleton, MA 01949
 617-417-8389

Designed By: SML
 Drawn By: SML
 Reviewed By: PMB
 Project Manager: PMB
 Job File Number: BOXF-0074
 Drawing File Folder: BOXF74



SANITARY DISPOSAL SYSTEM DESIGN PLAN
 41 KELSEY ROAD, BOXFORD, MA

6	20'	SCALE: 1" = 10' HOR. 1" = 2' VER.	FEBRUARY 6, 2020
5	10'		
4	5'	DRAWING: S-2	SHEET 2 OF 2
3	0'		