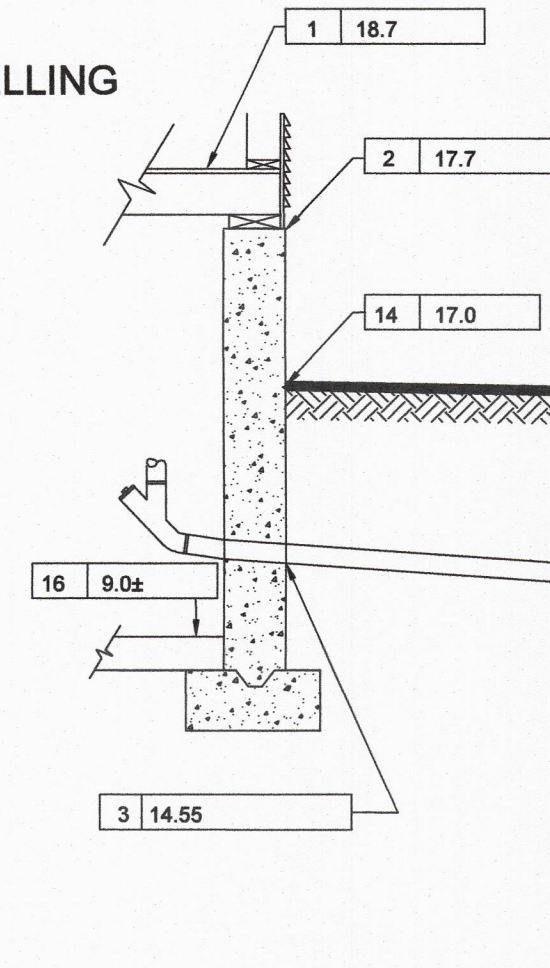


SCHEDULE OF ELEVATIONS

| | |
|----|---|
| 1 | FIRST FLOOR = |
| 2 | TOP OF FOUNDATION = |
| 3 | PIPE INV. AT FOUNDATION = |
| 4 | INV. OF PIPE AT SEPTIC TANK INLET = |
| 5 | INV. OF PIPE AT SEPTIC TANK OUTLET = |
| 6 | INV. OF PIPE AT D-BOX INLET = |
| 7 | INV. OF PIPE AT D-BOX OUTLET = |
| 8 | INV. OF PIPE AT LEACHING FIELD INLET = |
| 9 | BOTTOM OF LEACHING FIELD = |
| 10 | TOP OF STONE = |
| 11 | FINISHED GRADE OVER LEACHING FACILITY = |
| 12 | FINISHED GRADE OVER D-BOX = |
| 13 | FINISH GRADE OVER SEPTIC TANK = |
| 14 | FINISH GRADE AT FOUNDATION = |
| 15 | BOTTOM OF SEPTIC TANK = |
| 16 | TOP OF CELLAR FLOOR = |

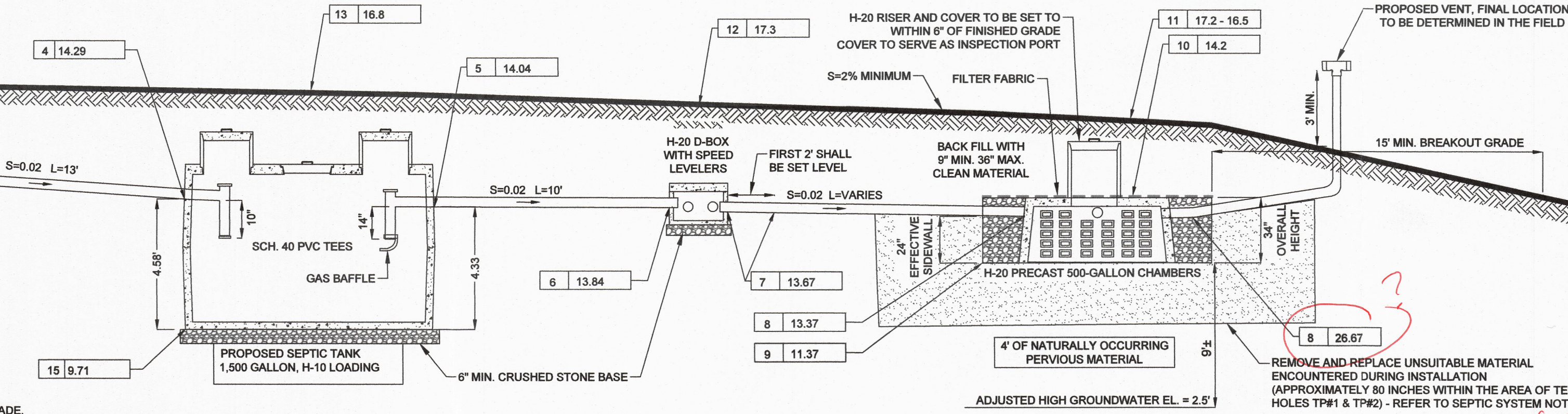
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DWELLING



SEWAGE SYSTEM PROFILE & DETAILS

NOT TO SCALE



- NOTES:**
- FURNISH RISERS TO SET COVERS WITHIN 6 INCHES OF FINISH GRADE.
 - H-10 SEPTIC TANK AND H-20 DISTRIBUTION BOX (D-BOX) AND CHAMBERS, AND SCHEDULE 40 PVC PIPE THROUGHOUT.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A TRENCH PERMIT FROM THE LOCAL MUNICIPALITY IN WHICH THE WORK IS BEING PERFORMED.
 - THE CONTRACTOR SHALL CONTACT THE DESIGNER PRIOR TO FINAL BACKFILL TO OBTAIN AS-BUILT INFORMATION OF SEPTIC SYSTEM.

USE (3) 500-GALLON CHAMBERS WITH DOUBLE WASHED CRUSHED STONE 4" AT ENDS AND BETWEEN EACH CHAMBER & 2" ALONG SIDES. EFFECTIVE DIMENSIONS: LENGTH = 41.5', WIDTH = 9.7', HEIGHT = 2.0'

Notify BOH @ excavation to verify soils

SEPTIC SYSTEM NOTES

- ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE STATE ENVIRONMENTAL CODE, TITLE 5 (310 CMR 15.00), AND THE LOCAL BOARD OF HEALTH.
- THERE SHALL BE NO CHANGES MADE IN THIS PLAN WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER AND LOCAL BOARD OF HEALTH.
- ALL ERRORS, OMISSIONS, AND CHANGE OF CONDITIONS AT THE SITE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE RELATED WORK.
- ALL DISTURBED AREAS ARE TO BE LOAMED, SEEDED AND MAINTAINED TO PREVENT EROSION.
- FOR PROPER PERFORMANCE, SEPTIC TANK SHOULD BE INSPECTED AT LEAST ONCE A YEAR AND WHEN THE TOTAL DEPTH OF SCUM AND SOLIDS EXCEEDS 1/3 THE LIQUID DEPTH OF THE TANK, THE TANK SHOULD BE PUMPED.
- THIS SYSTEM HAS BEEN DESIGNED FROM DATA REVIEWED AND ACKNOWLEDGED BY THE MASS. D.E.P. AND THE LOCAL BOARD OF HEALTH; AND CONFORMS WITH THE REQUIREMENTS OF THE STATE ENVIRONMENTAL CODE, TITLE 5. NO GUARANTEE OF PERFORMANCE IS EXPRESSED OR IMPLIED.
- TEST HOLE INFORMATION SHOWN HEREON IS LIMITED TO SOIL CONDITIONS FOUND AT THAT PARTICULAR TEST HOLE LOCATION AND IS NOT CONSIDERED AN IMPLIED OR EXPRESSED WARRANTY OF SOIL CONDITIONS BEYOND LIMITS OF SUCH TEST HOLES.
- ALL ORGANIC AND UNSUITABLE MATERIAL MUST BE REMOVED FROM THE AREA DIRECTLY UNDER AND 5 FEET BEYOND THE PROPOSED LEACHING FACILITY. THIS AREA MUST BE BACKFILLED TO THE ELEVATIONS INDICATED ON THESE PLANS WITH SELECT ON-SITE OR IMPORTED SOIL MATERIAL CONSISTING OF CLEAN GRANULAR SAND OR OTHER GRANULAR MATERIAL, FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES. MIXTURES AND LAYERS SHALL NOT BE USED. THE FILL MATERIAL SHALL CONFORM TO THE STATE ENVIRONMENTAL CODE, TITLE 5 - 310 CMR SECTION 15.25 (3) AND SHALL HAVE PERCOLATION RATE OF BETWEEN TWO AND FIVE MINUTES PER INCH, BEFORE AND AFTER PLACEMENT.
- 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.
- THE DESIGNER HAS NOT BEEN RETAINED BY THE CLIENT TO CONSTRUCT OR SUPERVISE THE CONSTRUCTION OF THE SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ARRANGEMENTS FOR INSPECTION OF INSTALLATION OF THE SYSTEM WITH THE LOCAL BOARD OF HEALTH.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL OF ALL SYSTEM COMPONENTS.
- TIGHT JOINT PIPING MATERIAL TO CONSIST OF POLYVINYL CHLORIDE (P.V.C.) SCHEDULE 40, UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL NOTIFY THE DESIGNER ENGINEER FOR CONSTRUCTION INSPECTION AFTER EXCAVATION FOR THE LEACHING BED (PRIOR TO THE PLACEMENT OF STONE) AND ALSO AFTER PLACEMENT OF PIPE & STONE PRIOR TO BACKFILLING.
- DESIGN ENGINEER SHALL CERTIFY CONSTRUCTION OF SYSTEM AND MATERIALS INSTALLED. THE CONTRACTOR SHALL PROVIDE A SIEVE ANALYSIS OF THE FILL MATERIAL REQUIRED. AN AS-BUILT PLAN SHALL BE SUBMITTED TO THE LOCAL BOARD OF HEALTH UPON COMPLETION.
- NO RUBBER TIRE CONSTRUCTION MACHINERY SHALL DRIVE OVER THE PROPOSED SEPTIC BED EXCAVATION DURING CONSTRUCTION.
- DIG-SAFE AND ALL OTHER NECESSARY AUTHORITIES SHALL BE NOTIFIED FOR THE PROPER LOCATION OF EXISTING UTILITIES PRIOR TO ANY EXCAVATION.
- WATER SERVICE LINE SHALL BE LOCATED AND MARKED PRIOR TO ANY EXCAVATING AND 10" MIN. SETBACK DISTANCE FROM SAID SERVICE TO THE SEPTIC SYSTEM SHALL BE MAINTAINED.
- ALL WATER LINES WITHIN 10' OF SEPTIC SYSTEM COMPONENTS SHALL BE ELECTED WITHIN 4" PVC SCHEDULE 40 PIPE.

CONSERVATION NOTES

THE LIMIT OF WORK WILL CONSIST OF A ROW OF STAKED SEDIMENT STOP OR COMPOST ROLL WITH SILTATION FENCE BACKING. THE LIMIT OF WORK WILL BE INSTALLED PRIOR TO ANY WORK, EXCAVATION, CONSTRUCTION OR CLEARING OF VEGETATION, IN ORDER TO PREVENT DAMAGE TO THE INTERESTS OF THE ACT AND BYLAW. THE SEDIMENT STOP ROLL WILL BE REPLACED AS NECESSARY TO BE MAINTAINED IN GOOD CONDITION THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD. NO FILL WILL BE ALLOWED TO BE PLACED AGAINST THE LIMIT OF WORK AT ANY TIME. UPON COMPLETION OF ALL CONSTRUCTION AND STABILIZATION OF THE SITE, SEDIMENT STOP ROLL WILL BE REMOVED AND PROPERLY DISPOSED OF.

PRIOR TO ANY WORK COMMENCING, ADVANCE WRITTEN NOTIFICATION WILL BE PROVIDED TO THE LOCAL CONSERVATION COMMISSION.

NO DEBRIS, EQUIPMENT OR MATERIALS WILL BE STORED, EVEN TEMPORARILY, OUTSIDE THE DESIGNATED LIMIT OF WORK AREA WITH THE EXCEPTION OF EQUIPMENT AND MATERIALS RELATED TO PLANTINGS.

THE CONSTRUCTION SITE WILL BE CLEANED DAILY TO REMOVE ANY LOOSE DEBRIS.

ALL DISTURBED AREAS WITHIN THE LIMIT OF WORK REQUIRING RESTORATION WILL BE STABILIZED TO PREVENT EROSION. STABILIZATION WILL BE DONE IMMEDIATELY FOLLOWING COMPLETION OF CONSTRUCTION.

A ROW OF EASTERN RED CEDARS (*Juniperus Virginiana*) SHALL BE PLANTED ALONG THE EASTERN PROPERTY LINE.

GENERAL NOTES

LOCATIONS ARE BASED ON AN "ON THE GROUND" INSTRUMENT SURVEY AND ELEVATIONS BASED ON THE NAVD 1988 DATUM. COORDINATE SYSTEM USED IS THE MA-MAINLAND COORDINATE SYSTEM. DATUM: MAD 83, UNITS: U.S. SURVEY FEET.

ZONING DISTRICT: R-40, FLOODPLAIN OVERLAY DISTRICT

PROPERTY IS LOCATED WITHIN AN AREA HAVING A ZONE DESIGNATION OF AE (ELEV. 15) AND NON-HAZARD X BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NO. 25001C0511J, WITH A MAP EFFECTIVE DATE OF JULY 16, 2014.

THIS LOT IS NOT LOCATED WITHIN A DEP APPROVED ZONE II WELLDHEAD PROTECTION AREA.

THIS LOT IS NOT MAPPED WITHIN A MESA NATURAL HERITAGE AND ENDANGERED SPECIES AREA.

WIND EXPOSURE CATEGORY: ZONE C

LOT COVERAGE: LOT AREA = 18,848 S.F.

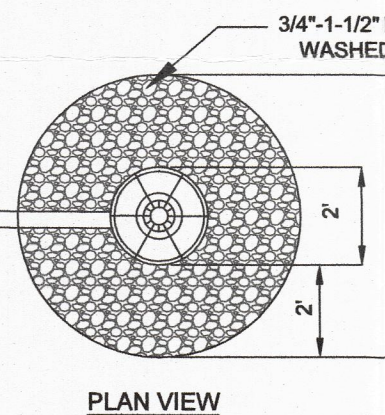
PROPOSED LOT COVERAGE BY STRUCTURES = 3,838 S.F. (20%)

DEED REFERENCE: BOOK 12341 PAGE 195

PLAN REFERENCE: BOOK 202 PAGE 11, 12

OWNER: JANET BLACK, TRUSTEE, THE BLACK FAMILY NOMINEE TRUST, 71 ELGIN ROAD, POCASSETT, MA 02559

NDS PRO FLOW-WELL

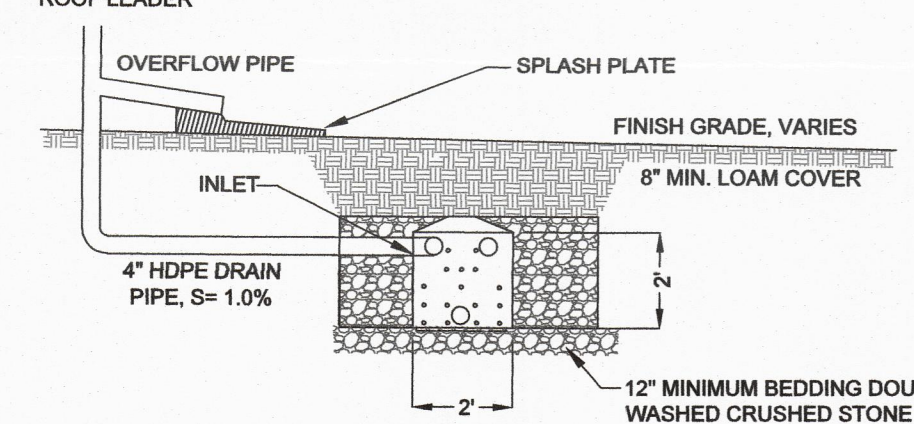


DRY WELL NOTES

A SYSTEM OF GUTTERS, DOWNSPOUTS AND DRY WELLS SHALL BE USED TO RECHARGE ROOF RUNOFF.

DRY WELL DETAIL

NOT TO SCALE



LEGEND

| | | |
|-----------|--|---|
| CB | CONCRETE BOUND | FRAGMENTED COASTAL BANK AREA |
| SB | STONE BOUND | EDGE, TOP AND BOTTOM OF FRAGMENTED COASTAL BANK |
| HYD | HYDRANT | FLOOD ZONE |
| UT | UTILITY POLE | TREE LINE |
| GUY | GUY POLE | OVERHEAD WRES |
| GUY | GUY WIRE | STONE WALL |
| LIGHT | LIGHT POLE | POST & RAIL FENCE |
| SIGN | CONIFEROUS TREE | STOCKADE FENCE |
| DECIDUOUS | DECIDUOUS TREE | PICKET ROW |
| SURFACE | SURFACE ELEVATION | CHAIN LINK FENCE |
| PROPOSED | PROPOSED GRADE | SEPTIC PIPES |
| SOIL | SOIL TEST PTL LOCATION | SEPTIC VENT PIPES |
| GAS | GAS LINE | WATER LINE |
| AREA | AREA OF STRUCTURE INCLUDED IN LOT COVERAGE | |

PROJECT STATISTICS

- WITHIN LAND SUBJECT TO COASTAL STORM FLOWAGE
 - TOTAL DISTURBANCE 14,300± S.F.
 - PERMANENT DISTURBANCE 6,240± S.F.
- WITHIN FRAGMENTED COASTAL BANK AREA
 - TOTAL DISTURBANCE 4,800± S.F.
 - PERMANENT DISTURBANCE 3,390± S.F.



SCALE: 1" = 20'

DESIGN DATA

- TYPE OF ESTABLISHMENT: 4-BEDROOM RESIDENCE
- SEWAGE SYSTEM DESIGN FLOW: 110 GALLONS PER BEDROOM = 110 x 4 = 440 GPD
- NOTE: THIS SEPTIC SYSTEM IS NOT DESIGNED FOR A GARbage GRINDER
- SEPTIC TANK CAPACITY REQUIRED, MINIMUM OF 200% OF DESIGN FLOW OR 1,500 GALLON = 200% x 440 GALLON = 880 GALLON (USE 1,500 GALLON TANK)
- DESIGN PERCOLATION RATE: ASSIGNED LESS THAN 5 MINUTES PER INCH
- SOIL ABSORPTION SYSTEM TYPE: CHAMBER SYSTEM
- LEACHING AREA REQUIRED: MINIMUM 440 GPD / (0.74 GPD/S.F., CLASS I SOIL) = 595 S.F.
- LEACHING SYSTEM PROPOSED: 41.5' LONG x 9.7' WIDE x 2' HIGH SYSTEM
- BOTTOM AREA PROPOSED = 41.5' x 9.7' = 401.2 S.F.
- SIDE AREA PROPOSED = 2 x (41.5' x 9.7') = 204.2 S.F.
- TOTAL AREA PROPOSED = 605.4 S.F.
- LEACHING SYSTEM CAPACITY PROPOSED = 606 S.F. x 0.74 GPD/S.F. = 448 GPD

SOIL EVALUATOR'S LOG

| Depth from surface in inches | Soil Horizon | Soil Texture (USDA) | Soil Color (Munsell) | Soil Moisture and Depth | Other Relative Factors |
|---|--------------|---------------------|----------------------|-------------------------|-----------------------------|
| DEEP OBSERVATION HOLE TP#1 & TP#2, ELEVATION 12.5 | | | | | |
| 0 - 12" | 0 - 20" | Ab | FILL | | UNSATURATED |
| 12" - 16" | 20" - 24" | Ab | SANDY LOAM | 7.5 YR 3/1 | |
| 16" - 44" | 24" - 50" | B | LOAMY SAND | 2.5 YR 4/8 | |
| 44" - 60" | 50" - 62" | C1 | SANDY LOAM | 5 YR 4/6 | NO 40% GRAVEL |
| 60" - 80" | 62" - 80" | C2 | LOAMY SAND | 5 YR 5/6 | NO 40% GRAVEL |
| 80" - 140" | 80" - 140" | C3 | SAND | 5 YR 5/4 | YES 40% GRAVEL, WATER @ 12" |
| DEEP OBSERVATION HOLE TP#3, ELEVATION 13.5 | | | | | |
| 0 - 108" | | Ab | FILL | | UNSATURATED |
| 108 + | | B | | YES | UNSATURATED |
| DEEP OBSERVATION HOLE TP#4, ELEVATION 9.5 | | | | | |
| 0 - 29" | | | FILL | | |
| 29" - 34" | | Ab | SANDY LOAM | 7.5 YR 3/1 | |
| 34" - 50" | | B | LOAMY SAND | 2.5 YR 4/8 | 10% GRAVEL |
| 50" - 60" | | C1 | LOAMY SAND | 7.5 YR 5/6 | 40% GRAVEL |
| 60" - 78" | | C2 | LOAMY SAND | 5 YR 6/8 | NO 40% GRAVEL |
| 78" - 100" | | C3 | SAND | 5 YR 6/6 | YES 40% GRAVEL, WATER @ 92" |
| 100" - 112" | | C4 | COARSE SAND | 5 YR 6/6 | YES 40% GRAVEL, SATURATED |

PERCOLATION RATE = < 2 MINUTES / INCH ASSIGNED TO C3 LAYER WITHIN TP#1 & TP#2 < 2 MINUTES / INCH ASSIGNED TO C3 & C4 LAYERS WITHIN TP#4

THE SOILS ENCOUNTERED WITHIN TP#3 TO A DEPTH OF 148" NOT SUITABLE FOR A SOIL ABSORPTION SYSTEM. IF A SEPTIC LEACHING SYSTEM IS TO BE LOCATED WITHIN THE IMMEDIATE AREA OF TP#3 ADDITIONAL SOIL EXPLORATORY TESTS WILL BE NEEDED TO GREATER DEPTHS THAN 148". DEPTH TO GROUNDWATER = ENCOUNTERED @ 122" N TP#1 & TP#2, AND @ 92" IN TP#4

ADJUSTED HIGH GROUNDWATER: ADJUSTMENT WELL SDW-253; MEASURED AT 4680' ON 4/25/2019. ADJUSTMENT OF 0.7' ADJUSTED GROUNDWATER DEPTH AT TP#4 = 92" x (1/125) - 0.7 = 6.97'. SAY 7.0' DEPTH

ADJUSTED GROUNDWATER ELEVATION AT TP#4 = 9.5' - 7.0' = ELEVATION 2.5 FEET, NAVD88

OBSERVATIONS BY: RAUL LIZARDI-RIVERA, P.E.

WITNESSED BY: TERRI GUARINO, R.S.

DATE TESTED: MAY 9, 2019

LOCAL BOARD OF HEALTH REGULATION NOTES

THE PROPOSED SEPTIC SYSTEM LOCATION IS APPROXIMATELY 184± FEET FROM THE NEAREST WATERCOURSE (MEAN HIGH WATER, MHW) EXCEEDING THE LOCAL 150 FEET MINIMUM REQUIREMENT.

TO MINIMIZE INFILTRATION FROM FLOOD WATERS THE PROPOSED SEPTIC SYSTEM IS DESIGNED WITH FINISH GRADES ABOVE THE FEMA FLOOD ELEVATION 5'.

LOCAL UPGRADE APPROVAL REQUEST

| NO. | DESCRIPTION | REQUIRED | PROPOSED | VARIANCE REQUESTED |
|-----|--|----------|----------|--------------------|
| 1 | SEPTIC TANK TO FRAGMENTED COASTAL BANK | 25 FT | 0 FT. | 25 FT. |
| 2 | S.A.S. TO FRAGMENTED COASTAL BANK | 50 FT | 0 FT. | 50 FT. |

RECEIVED
JAN 29 2020
Bourne Health Department
24 Perry Avenue
Buzzards Bay, MA 02532

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| DATE | DESCRIPTION | BY | CHK |
|------|-------------|----|-----|
| | | | |

PREPARED FOR: **TIM BERNARD**
65 KINGSBURY STREET
NEEDHAM, MA 02492

PROJECT: **72 ELGIN ROAD**
BOURNE, MASSACHUSETTS

SHEET NO.: 1 OF 1
DATE: JANUARY 3, 2020
DRAWN BY: RLR
CHECKED BY: MC

PREPARED BY: **CAPE & ISLANDS ENGINEERING**
CIVIL ENGINEERING - LAND SURVEYING - ENVIRONMENTAL PERMITTING
INCORPORATED

SUMMERFIELD PARK
800 PALMOUTH ROAD SUITE 301C
MASSAPEQUET, MA 02549
508.477.7272 PHONE
508.477.9072 FAX
www.CapeEng.com

DRAWING TITLE: **SITE PLAN**
SITE & SEPTIC DESIGN

ASSESSORS INFORMATION: MAP 47.1 PARCEL 109

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