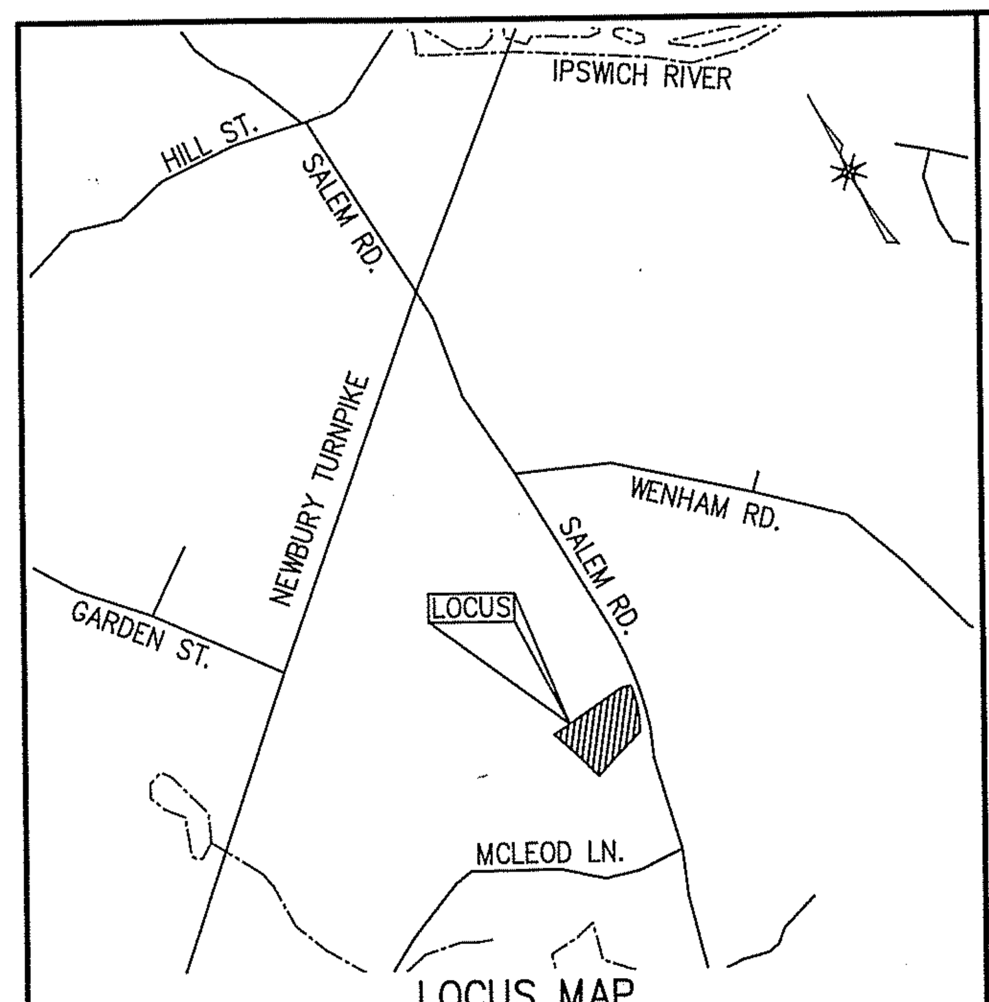
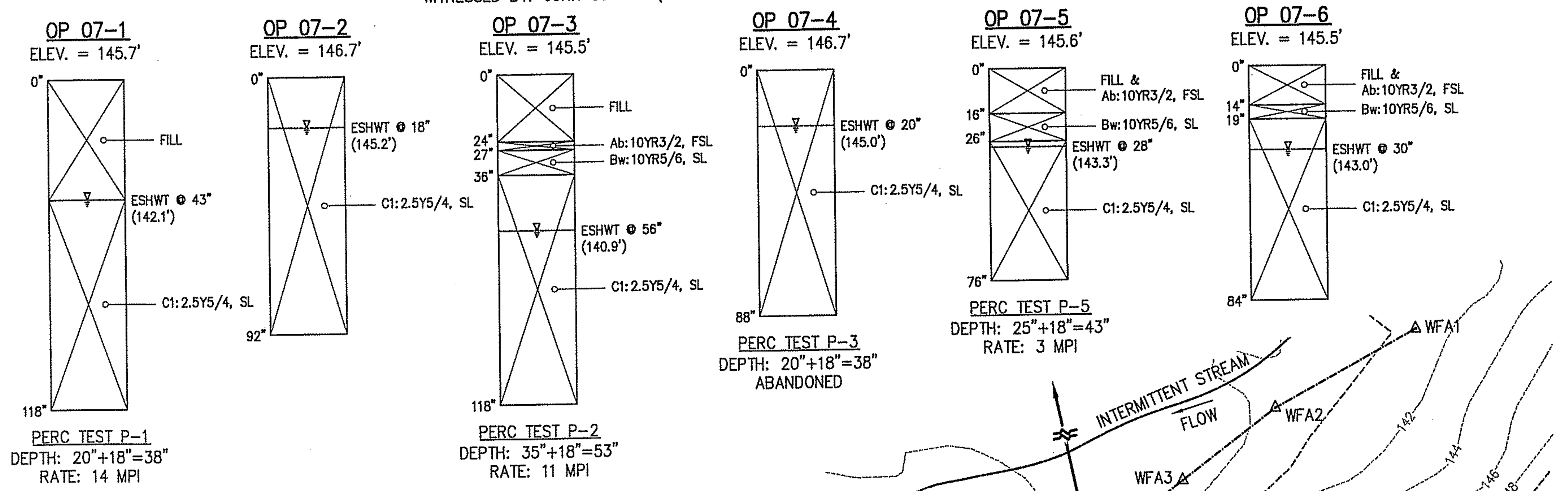
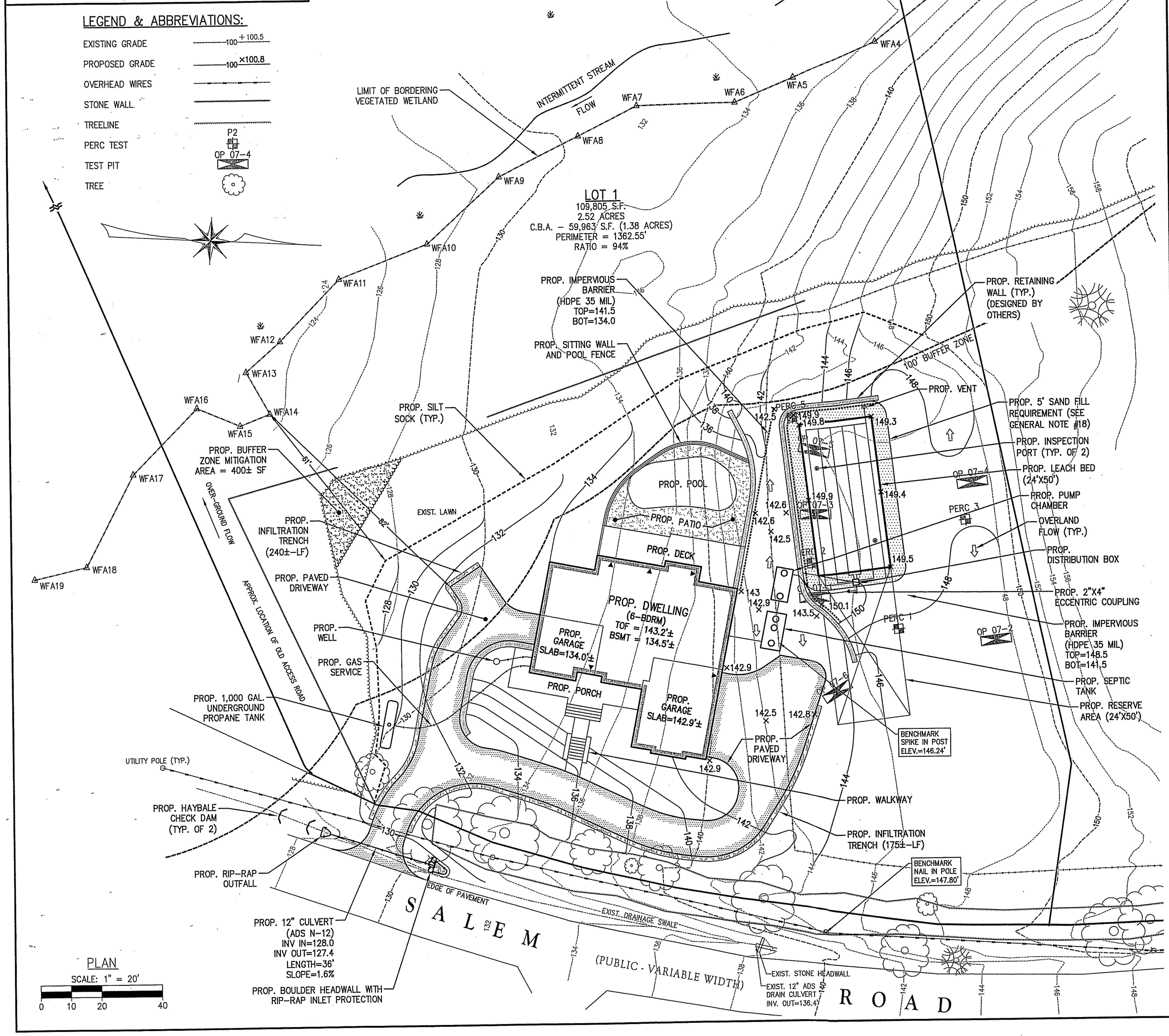


LOCUS MAP
(SCALE: 1"=1,000'±)

SOIL LOGS

DATE PERFORMED: 6/28/07 (TEST PITS & P-1 – P-3) & 8/14/07 (P-5)
PERFORMED BY: ISAAC ROWE & GREG HOCHMUTH (NEVE-MORIN GROUP, INC.)
WITNESSED BY: JOHN COULON (TOPSFIELD BOARD OF HEALTH)





PLAN
SCALE: 1" = 20'

SITE NOTES:

1. RECORD OWNER — DAWN C. DAWSON & GREG GIBBS, 20 CHEEVER AVENUE, SAUGUS, MA 01906, BOOK 38649, PAGE 157
2. RECORD PLANS: — PROPERTY LINE INFORMATION COMPILED FROM A PLAN ENTITLED "PLAN OF LAND IN TOPSFIELD," PREPARED BY NEVE-MORIN GROUP AND DATED NOVEMBER 4, 2008 RECORDED IN ESSEX SOUTH DISTRICT REGISTRY OF DEEDS PLAN BOOK 419 PLAN 46.
3. WETLANDS: — WETLAND RESOURCE AREAS DELINEATED BY WILLIAMS & SPARAGES IN APRIL 2020 (978-539-8088).
4. WATER SUPPLY: — THERE ARE NO KNOWN DRINKING WATER SUPPLY ZONE II'S AND NO KNOWN INTERIM WELLHEAD PROTECTION ZONES ON THE SUBJECT PARCEL BASED ON THE DEPARTMENT OF ENVIRONMENTAL PROTECTION MAPS AND THE PARCEL IS NOT LOCATED WITHIN A NITROGEN SENSITIVE AREA.
5. FLOOD PLAIN: — THE PROPERTY IS SITUATED IN A ZONE 'X' AS ILLUSTRATED ON THE MOST RECENT FLOOD INSURANCE RATE MAP PANEL 25009C-0402-F WITH EFFECTIVE DATE OF JULY 3, 2012.
6. DATUM: — ELEVATIONS SHOWN HEREON ARE BASED ON AN ASSUMED USGS INTERPOLATED DATUM.

SEPTIC SYSTEM DESIGN DATA:

1. BUILDING TYPE: SINGLE FAMILY DWELLING
2. NO. OF BEDROOMS: 6 BEDROOMS (MAXIMUM 13 ROOMS)
3. DESIGN FLOW (TITLE 5): 6 X 110 GPD/BEDROOM = 660 GPD
4. DESIGN PERCOLATION RATE: CLASS II SOIL, 15 MPI, LTAR = 0.56 GPD/SF
5. GARBAGE DISPOSAL: NOT PERMITTED.

SEPTIC TANK DESIGN REQUIREMENT: MIN. 200% DESIGN FLOW
MIN. 200% DESIGN FLOW FOR FIRST COMPARTMENT = 2 X 660 GPD = 1,220 GAL MIN.
100% DESIGN FLOW FOR SECOND COMPARTMENT = 660 GAL.
TANK REQUIREMENT
USE 2,000 GAL TANK W/ 1,300 GAL FIRST COMPARTMENT, 700 GAL SECOND COMPARTMENT

6. LEACH AREA SIZE REQUIREMENT:
   (660 GPD) / (0.56 GPD/SF) = 1,179 SF (MIN)
7. LEACH BED CAPACITY:
   USE 24' X 50' = 1,200 SF
   1,200 SF X 0.56 GPD/SF = 672 GPD (OK)

GROUNDWATER RECHARGE CALCULATIONS:

SOIL TYPE: HSG C (BASED ON NRCS SOIL RESOURCE REPORT)
REQUIRED RECHARGE TARGET DEPTH: 0.25"

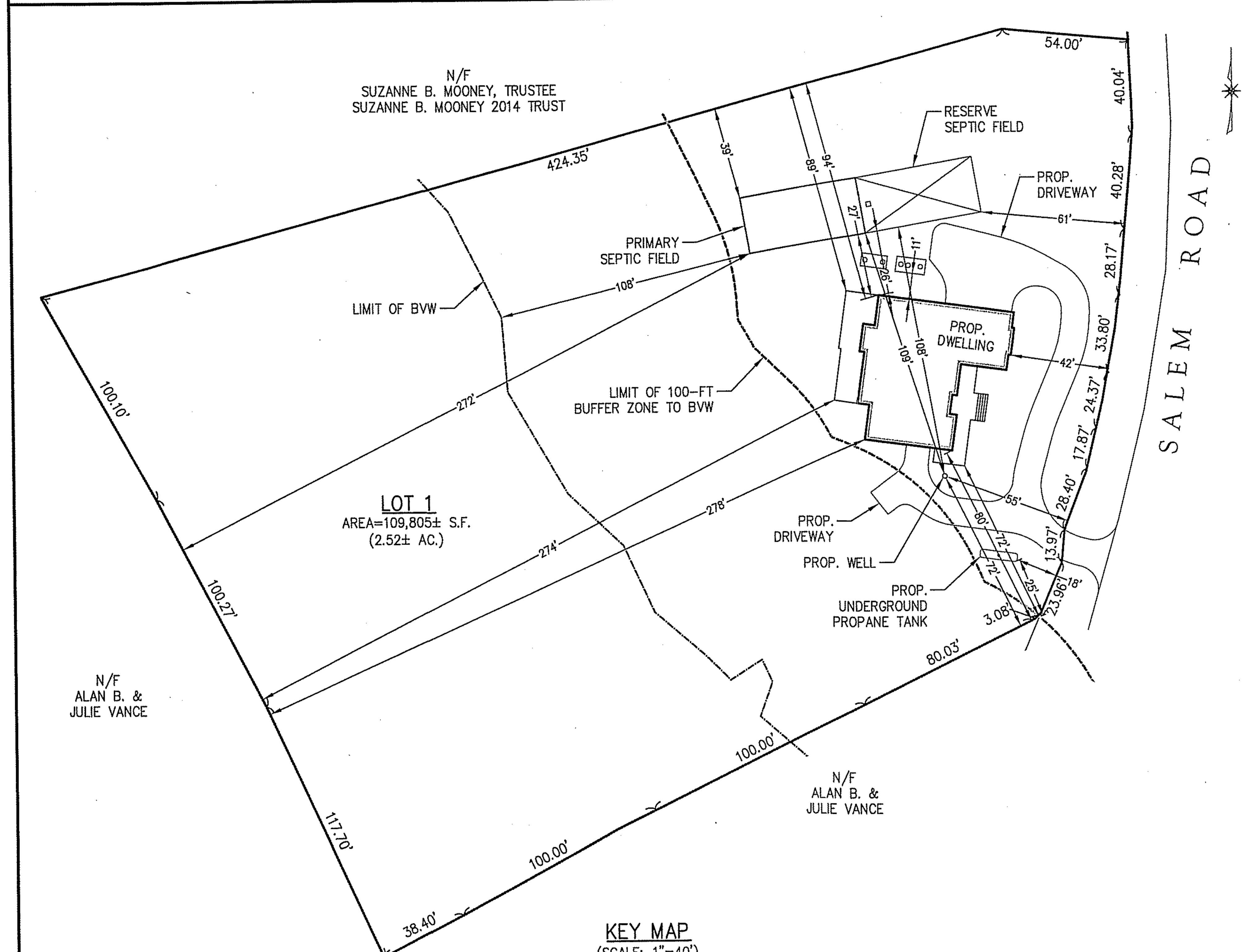
REQUIRED RECHARGE VOLUME:
ROOF: V = 3,931 SF X 0.25" X 1'/12" = 82 CF
DRIVEWAY: V = 3,871 SF X 0.25" X 1'/12" = 81 CF
PATIO: V = 1,216 SF X 0.25" X 1'/12" = 26 CF
TOTAL = 82 + 81 + 26 = 189 CF

PROVIDED RECHARGE VOLUME:
DRIVEWAY INFILTRATION TRENCH: V = (1.5' X 1' X 415') X (0.4) = 249 CF

249 CF PROVIDED > 189 CF REQUIRED

GENERAL NOTES:

1. CONTRACTOR SHALL VERIFY THAT ALL PLUMBING, WITH THE EXCEPTION OF ANY FOUNDATION DRAINS OR WATER SOFTENERS, SHALL BE TIED INTO NEW SEPTIC SYSTEM.
2. THIS PLAN IS TO SHOW THE DESIGN OF THE SUBSURFACE SEWAGE DISPOSAL SYSTEM AND STORMWATER MANAGEMENT SYSTEM ONLY. THE SYSTEMS ARE DESIGNED FOR FLOWS AND VOLUMES ESTIMATED UNDER DESIGN CRITERIA.
3. THE SANITARY DISPOSAL SYSTEM IS DESIGNED ONLY TO ACCOMMODATE SANITARY SEWAGE ASSOCIATED WITH NORMAL DOMESTIC USAGE AND CONSISTING OF WATER-CARRIED PUTRESCIBLE WASTE.
4. THE SANITARY DISPOSAL SYSTEM IS NOT DESIGNED FOR A GARBAGE GRINDER.
5. THE PLAN SHOWS ONLY THOSE FEATURES THAT WERE VISUALLY APPARENT ON DATE OF THE TOPOGRAPHY.
6. THE INSTALLER OF THIS SYSTEM MUST BE LICENSED BY THE LOCAL BOARD OF HEALTH FOR INSTALLATION OF THE LEACHING FACILITY.
7. DISPOSAL SYSTEM AREAS ARE TO BE RAKED (SCARIFIED) BEFORE INSTALLATION OF STONE. ALL STONES EXCEEDING 2 INCHES IN EXCAVATION ARE TO BE REMOVED FROM THE LEACHING AREA BED.
8. FINISHED SURFACE OF THE LEACHING AREA SHALL BE GRADED TO ASSURE WATER RUNOFF (2% MINIMUM SLOPE).
9. ALL DISTURBED AREAS TO BE LOAMED, SEEDED, AND MAINTAINED TO PREVENT EROSION.
10. THE SEPTIC TANKS SHOULD BE PERIODICALLY INSPECTED AND MAINTAINED AND SHOULD BE PUMPED WHEN THE SLUDGE IN THE BOTTOM EXCEEDS 1/4 OF THE DEPTH.
11. ALTERNATE MANUFACTURES FOR CONCRETE STRUCTURES AND EQUIPMENT SHOWN ON THESE PLANS MAY BE USED UPON THE WRITTEN APPROVAL OF THE DESIGN ENGINEER. ALTERNATE MANUFACTURES WILL NOT BE USED IF THE USE OF THEIR EQUIPMENT REQUIRES DESIGN CHANGES.
12. NO CHANGES ARE TO BE MADE IN THE FIELD WITHOUT THE APPROVAL OF THE BOARD OF HEALTH OR ITS DESIGNEE AND THE DESIGN ENGINEER.
13. ALL WORK IS TO COMPLY WITH THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AGENCY STATE SANITARY CODE, TITLE 5 AND ANY LOCAL BOARD OF HEALTH SUPPLEMENTARY REGULATIONS.
14. THE LOCAL BOARD OF HEALTH AGENT WILL CONDUCT PERIODIC INSPECTIONS AS NEEDED.
15. THESE PLANS AND SPECIFICATIONS ARE INTENDED TO BE EXPLANATORY OF THE WORK TO BE DONE AND OF EACH OTHER, 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. THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION.
16. ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE IN ACCORDANCE WITH 310 CMR 15.221(11).
17. LOCATIONS OF ALL UTILITIES SHOULD BE CONFIRMED WITH THE UTILITY PROVIDED PRIOR TO THE COMMENCEMENT OF ANY SITE WORK. 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 FIELD LOCATION OF UTILITIES.
18. FILL REQUIREMENT: REMOVE FILL, TOPSOIL AND SUBSOIL FOR A DISTANCE OF 5 FEET BEYOND THE LEACHING FACILITY. REPLACE WITH FILL AS SPECIFIED IN 310 CMR 15.000, "TITLE 5" SECTION 15.255 (3). FOR THE BOUNDARY OF THE SAND FILL REQUIREMENT, SEE PLAN VIEW, CROSS-HATCHED AREA ON SYSTEM PROFILE. A SIEVE ANALYSIS SHALL BE PERFORMED ON THE FILL MATERIAL TO BE USED. A COPY OF THE SIEVE ANALYSIS RESULTS SHALL BE SUBMITTED TO THE BOARD OF HEALTH.



KEY MAP
(SCALE: 1"=40')

The Morin-Cameron GROUP, INC.
CIVIL ENGINEERS | ENVIRONMENTAL CONSULTANTS
LAND SURVEYORS | LAND USE PLANNERS
66 ELM STREET, DANVERS, MASSACHUSETTS 01923
P: 978-777-8586, F: 978-774-3488, W: WWW.MORINCAMERON.COM

COMMONWEALTH OF MASSACHUSETTS
JOHN M. MORIN
CIVIL
No. 39836
REGISTERED PROFESSIONAL ENGINEER

SURVEY BY: PM / SR
DRAFTED BY: WAS / DJP
CHECKED BY: JMM
APPROVED BY: JMM
SCALE: AS NOTED
DATE: JUNE 30, 2020

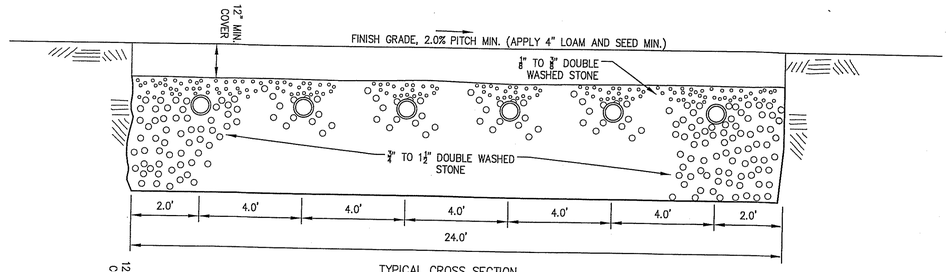
REVISIONS

NO.	DESCRIPTION	DATE

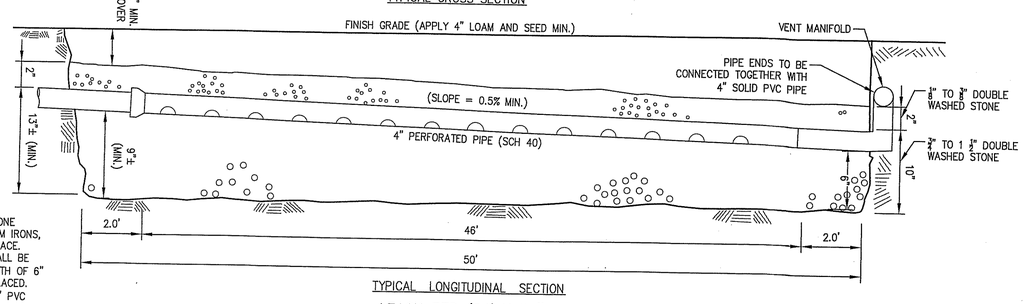
SITE PLAN OF LAND
IN
TOPSFIELD, MASSACHUSETTS
109 SALEM ROAD
(ASSESSOR'S MAP 70, LOT 18)
PREPARED FOR:
DAWN DAWSON & GREGORY GIBBS

DRAWING NO.
3961-SDP

SHEET NO.
1 OF 3



TYPICAL CROSS SECTION



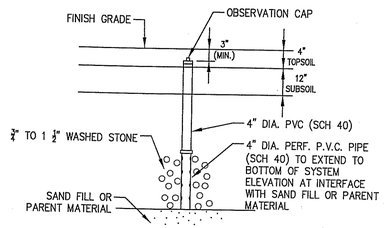
TYPICAL LONGITUDINAL SECTION

LEACH BED (24' X 50')

(NOT TO SCALE)

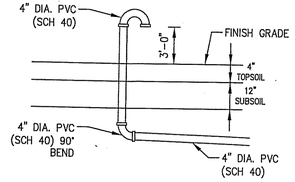
NOTES:

1. DOUBLE WASHED STONE SHALL BE FREE FROM IRONS, FINES & DUST IN PLACE.
2. BOTTOM OF BED SHALL BE SCARIFIED TO A DEPTH OF 6" BEFORE STONE IS PLACED.
3. ALL PIPING TO BE 4" PVC (SCH 40).



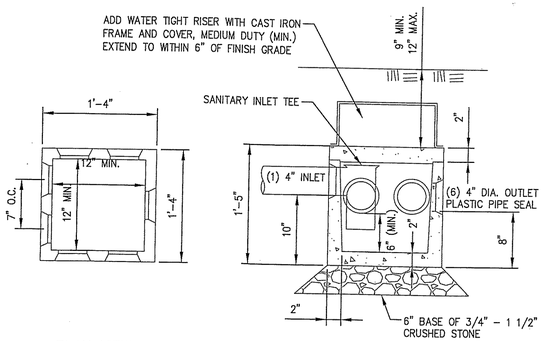
INSPECTION PORT DETAIL

(NOT TO SCALE)



VENT DETAIL

(NOT TO SCALE)



PLAN VIEW

SECTION VIEW

SHEA CONCRETE ITEM NO.	Weight
B-6DB W/COVER	226#
B-6DBC COVER ONLY	45#

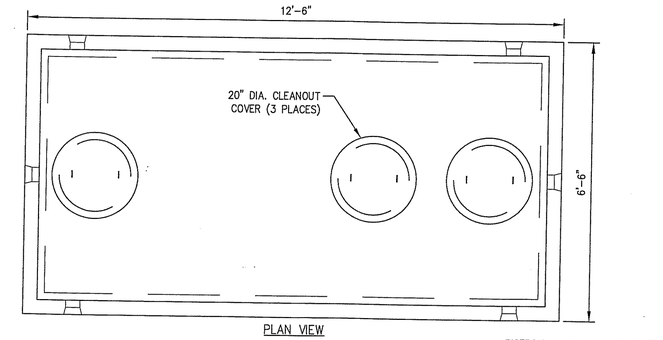
(OR APPROVED EQUAL)

NOTES:

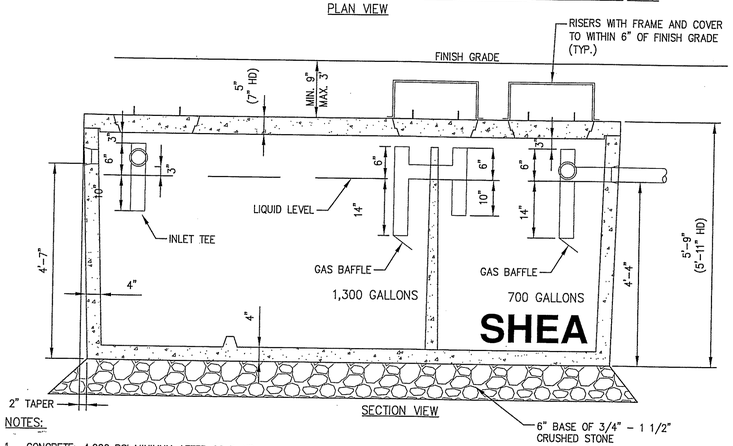
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS. TITLE 5 REGS, FOR DISTRIBUTION BOXES.
2. DESIGN CONFORMS WITH 310 CMR 15.000, DEP

6-OUTLET DISTRIBUTION BOX:

(NOT TO SCALE)



PLAN VIEW



SECTION VIEW

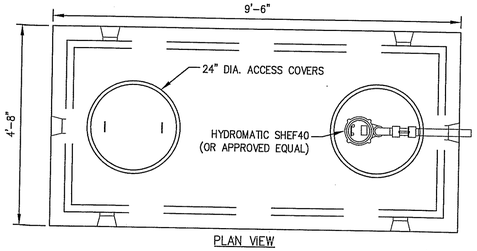
NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR SEPTIC TANKS.
3. ALL REINFORCEMENT PER ASTM C1227.
4. TEES AND GAS BAFFLE SOLD SEPARATELY.
5. TONGUE & GROOVE JOINT SEALED WITH BUTYL RESIN.
6. ALSO AVAILABLE IN H-20 LOADING.

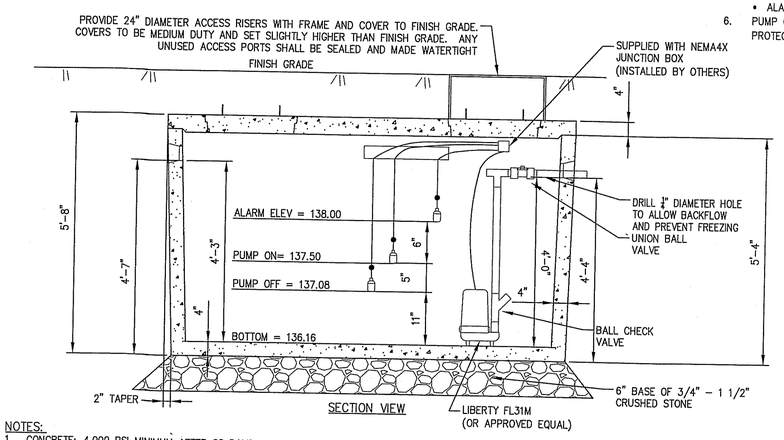
ITEM NO.	WEIGHT
TK M20002C	19,150#
TK M20002CH	21,150#

2,000 GALLON (MONOLITHIC) SEPTIC TANK

(NOT TO SCALE)



PLAN VIEW



SECTION VIEW

NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. CONSTRUCTION OF PUMP CHAMBER CONFORMS WITH DEP TITLE 5 REGS, 310 CMR, SECTION 15.226.
3. ALL REINFORCEMENT PER ASTM C1227.
4. JOINT SEALED WITH BUTYL RESIN..
5. USE SHEA MODEL #M1000 OR APPROVED EQUAL.

SHEA CONCRETE ITEM NO. (OR EQUAL)	WEIGHT
M1000	10,800#

EMERGENCY STORAGE ABOVE ALARM FLOAT = 660 GALLONS

1,000 GALLON MONOLITHIC PUMP CHAMBER

(NOT TO SCALE)

PUMP NOTES:

1. CONTROL PANEL SHALL BE EQUIPPED WITH A RUNNING TIME METER AND EVENT COUNTER.
2. TO RECORD ACTUAL PUMP RUN TIME, THE RUNNING TIME METER SHALL BE A MINIMUM OF 3 DIGITS AND BE WIRED TO THE PUMP POWER CIRCUIT, NOT THE PUMP CONTROL CIRCUIT.
3. THE HIGH WATER ALARM SHALL BE BOTH VISUAL AND AUDIBLE.
4. THE CONTROL BOX SHALL BE WATERPROOF AND LOCKABLE, BE NEMA1 RATED (MINIMUM) AND INCLUDE THE FOLLOWING
   - HAND-OFF-AUTO SWITCH
   - MAGNETIC CONTACTOR
   - CIRCUIT BREAKER
   - "PUMP ON" PILOT LIGHT
   - RUNNING TIME METER
   - FLASHING ALARM LIGHT
   - AUDIBLE ALARM BUZZER
   - TEST AND SILENCE SWITCHES
   - DEAD FRONT INTERIOR SHIELD
   - EVENT COUNTER
5. PUMP SHALL BE WIRED TO OPERATE IN THE FOLLOWING SEQUENCE
   - PUMP OFF
   - PUMP ON
   - ALARM ON
6. PUMP CONTROLS SHALL INCLUDE INTEGRATED OVERLOAD PROTECTION AND BE CAPABLE OF 10 STARTS PER HOUR.

PUMP CALCULATIONS:

BACKFLOW CALCULATION:

22 FT X [3.14(1/12)²]SQFT = 0.48 CU FT = 3.6 GAL.

DOSE CALCULATION:

DOSE = DAILY FLOW/5 = 660 GAL/6 = 110 GAL

TOTAL DOSE = (DOSE + BACKFLOW) = 110 + 3.6 = 113.6 GAL. (15.2 CF)

DOSE HEIGHT REQ'D:

15.2 CF/(8'-10" X 4'-0") = 0.43 FT (USE 5")

ACTUAL DOSE TO SAS:

[(8'-10" X 4'-0" X 5") X 7.48 GAL/CF] – 3.6 GAL. = 106.5 GAL.

STATIC HEAD(HS):

@ COUPLING-PUMP ON = 148.40' – 137.50' = 10.90'

@ COUPLING-PUMP OFF = 148.40' – 137.08' = 11.32'

DYNAMIC HEAD (HD):

FORCE MAIN: 2" DIAMETER

EQUIVALENT LENGTH METHOD:

90° BEND + 2-45° BENDS + 1-22.5° BEND + 1 CHECK VALVE + 1 GATE VALVE + 1 UNION = 5.5' + (2)2.5 + 1.2' + 13' + 1.2' + 4.5 = 30.4'

TOTAL LENGTH = 22' + 30.4' = 52.4'

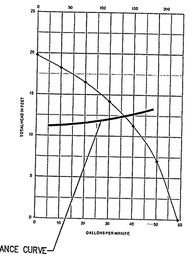
HEAD LOSS IN PIPE @ 37 GPM = 2.39 FT/100 FT

HD = 52.4' X (2.39 FT/100FT) = 1.25'

PUMP PARAMETERS:

T.D.H. = 12.1' – 12.5' @ 37 GPM

USE LIBERTY FL31M EFFLUENT PUMP OR APPROVED EQUAL.



PUMP CURVE

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COMMONWEALTH OF MASSACHUSETTS — JOHN M. MORIN — No. 39838 — REGISTERED PROFESSIONAL ENGINEER — CIVIL

SURVEY BY: PM / SR
DRAFTED BY: WAS / DJP
CHECKED BY: JMM
APPROVED BY: JMM
SCALE: AS NOTED
DATE: JUNE 30, 2020

REVISIONS

NO.	DESCRIPTION	DATE

SITE PLAN OF LAND

IN

TOPSFIELD, MASSACHUSETTS

109 SALEM ROAD

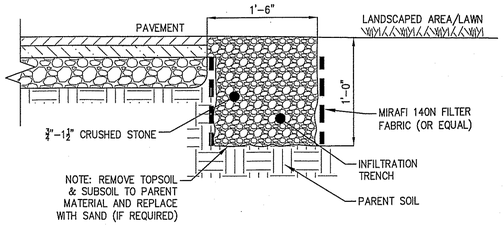
(ASSESSOR'S MAP 70, LOT 18)

PREPARED FOR:

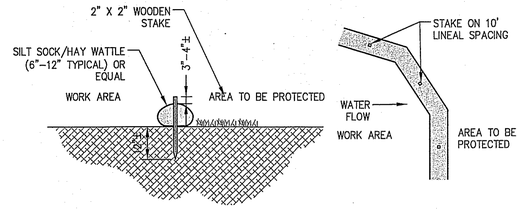
DAWN DAWSON & GREGORY GIBBS

DRAWING NO. 3961-SDP

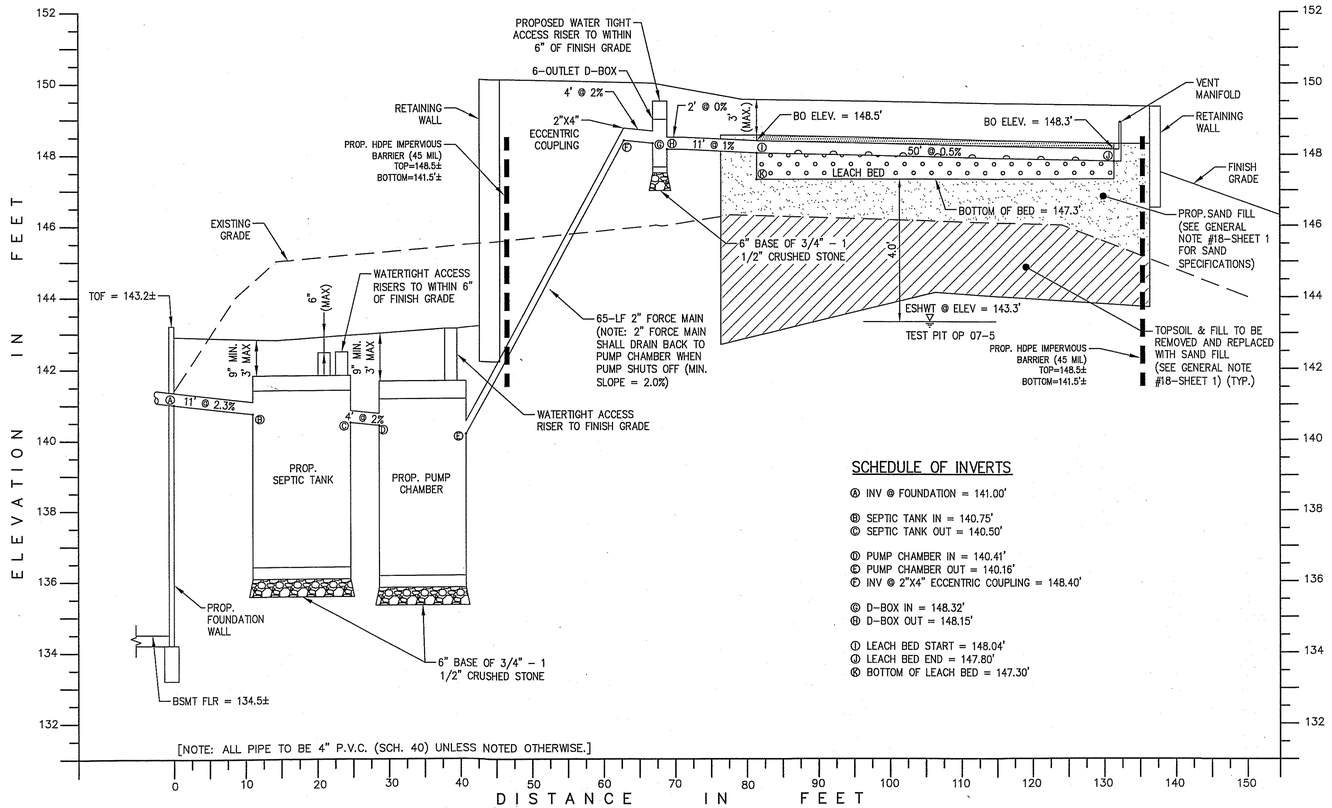
SHEET NO. 2 OF 3



CRUSHED STONE INFILTRATION TRENCH DETAIL
NOT TO SCALE



SILT SOCK
(NOT TO SCALE)



SCHEDULE OF INVERTS

Ⓐ INV @ FOUNDATION = 141.00'

Ⓑ SEPTIC TANK IN = 140.75'
Ⓒ SEPTIC TANK OUT = 140.50'

Ⓓ PUMP CHAMBER IN = 140.41'
Ⓔ PUMP CHAMBER OUT = 140.16'
Ⓕ INV @ 2"X4" ECCENTRIC COUPLING = 148.40'

Ⓖ D-BOX IN = 148.32'
Ⓗ D-BOX OUT = 148.15'

Ⓘ LEACH BED START = 148.04'
Ⓙ LEACH BED END = 147.80'
Ⓚ BOTTOM OF LEACH BED = 147.30'

SYSTEM PROFILE
V: 1"=2'
H: 1"=10'

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P: 978-777-3585, F: 978-777-3485, W: WWW.MORINCAMERON.COM

COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER JOHN M. MORIN CIVIL No. 39858

SURVEY BY: PM / SR
DRAFTED BY: WAS / DJP
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PREPARED FOR:
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SHEET NO.
3 OF 3