

**LEGEND**

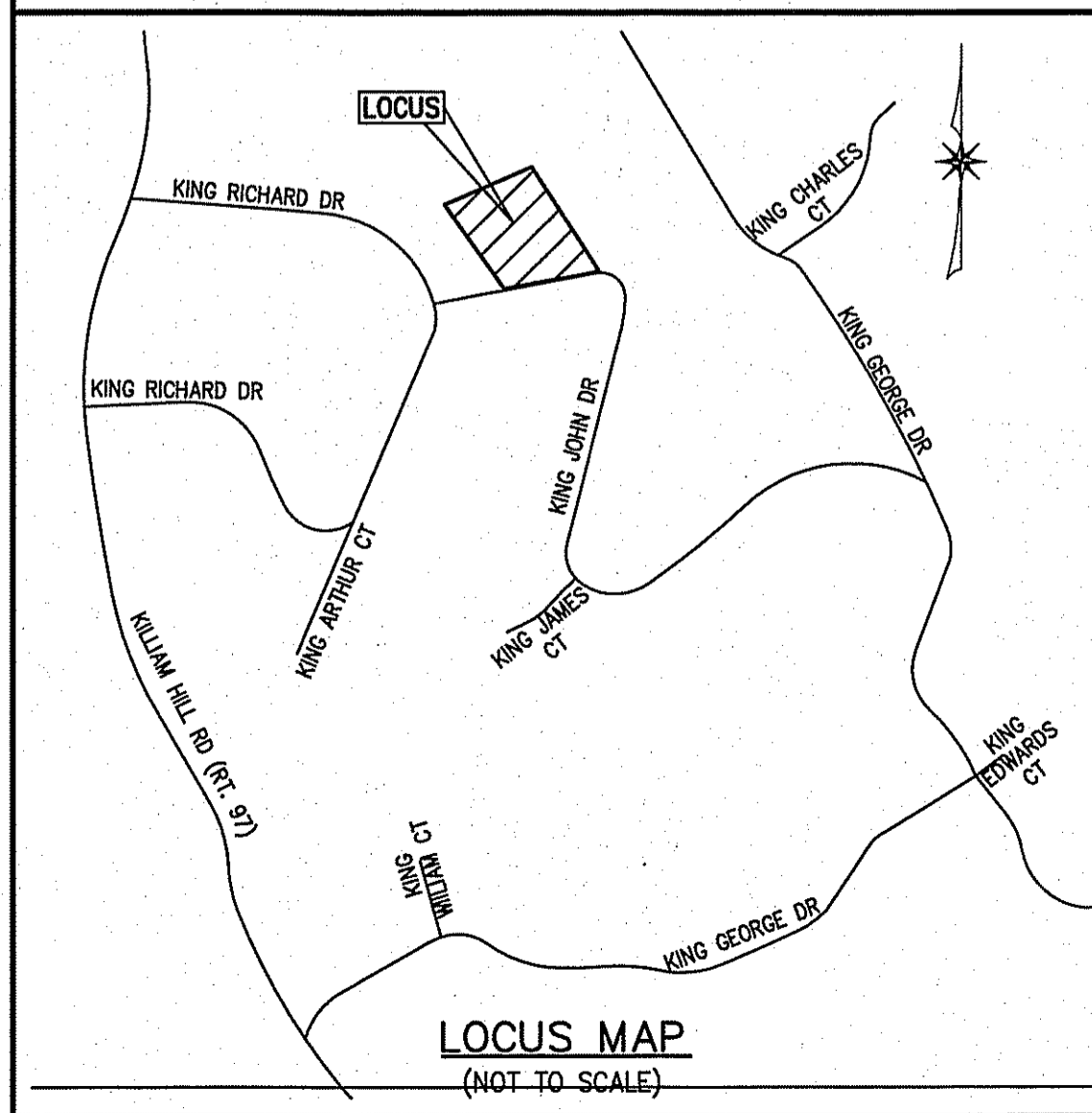
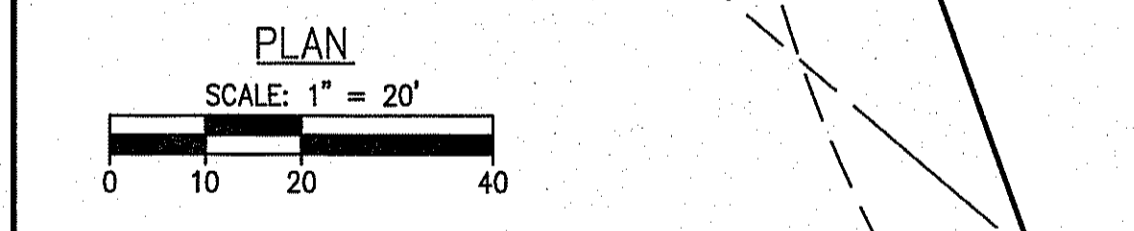
EXISTING GRADE	(Symbol)
FINISH GRADE	(Symbol)
BORDERING VEGETATED WETLAND	(Symbol)
WETLAND FLAG	(Symbol)
25' NO DISTURB	(Symbol)
75' NO BUILD	(Symbol)
100' BUFFER ZONE	(Symbol)
TEST PIT/PERC TEST	(Symbol)
SILT SOCK	(Symbol)

- SITE NOTES:**
- RECORD OWNER: MATTHEW M. & MARIANNE C.P. RUTTER, 39 KING JOHN DRIVE, BOXFORD, MA 01921, BK. 7826, PG. 525
  - RECORD PLANS: PROPERTY LINE INFORMATION COMPILED FROM "PLAN OF KING'S FOREST, SECTION TWO, BOXFORD, MASS." PREPARED BY RAYMOND C. PRESSEY INC., DATED MARCH 26, 1960, RECORDED WITH THE SOUTHERN ESSEX REGISTRY OF DEEDS, PLAN BOOK 94, PLAN 84 AND SHOULD BE CONSIDERED APPROXIMATE.
  - WETLANDS: WETLANDS DELINEATED DEROSA ENVIRONMENTAL CONSULTING, INC., 167 MAIN ST, ROWLEY, MA. (978-948-7717) ON MAY 15, 2015.
  - WATER SUPPLY: THERE IS A KNOWN DRINKING WATER SUPPLY ZONE II AND NO KNOWN INTERIM WELLHEAD PROTECTION ZONES ON THE SUBJECT PARCEL BASED ON THE DEPARTMENT OF ENVIRONMENTAL PROTECTION MAPS.
  - FLOOD PLAIN: THE AREA OF WORK ON THE PROPERTY IS SITUATED WITHIN A FEMA ZONE X AS ILLUSTRATED ON THE MOST RECENT FLOOD INSURANCE RATE MAP PANEL 25009C-0253-F WITH EFFECTIVE DATE OF JULY 3, 2012.
  - DATUM: ELEVATION SHOWN HEREON ARE ON AN ASSUMED DATUM.
  - EXISTING CONDITIONS: EXISTING CONDITIONS INFORMATION OBTAINED FROM A FIELD SURVEY PERFORMED BY THE MORIN-CAMERON GROUP, INC. ON JULY 17, 2015.

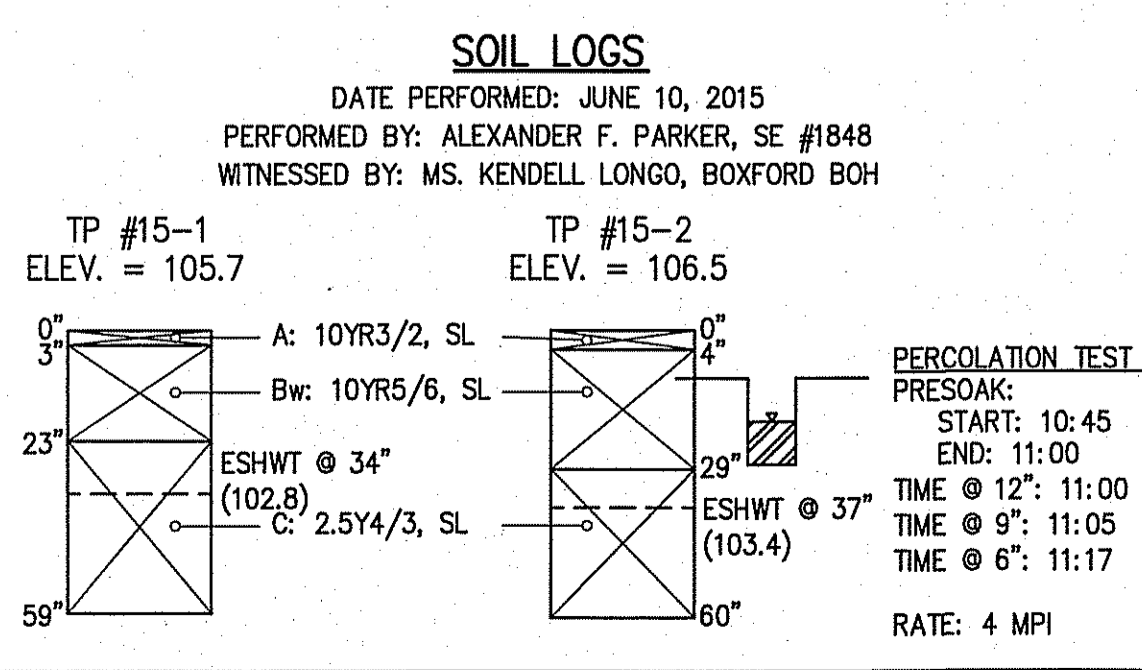
- GENERAL NOTES:**
- CONTRACTOR SHALL VERIFY THAT ALL EXISTING PLUMBING, WITH THE EXCEPTION OF ANY FOUNDATION DRAINS OR WATER SOFTENERS, SHALL BE TIED INTO NEW SEPTIC SYSTEM.
  - THIS PLAN IS TO SHOW THE DESIGN OF THE SUBSURFACE SEWAGE DISPOSAL SYSTEM ONLY. THE SYSTEM IS DESIGNED FOR FLOWS ESTIMATED UNDER DESIGN CRITERIA.
  - SYSTEM IS DESIGNED ONLY TO ACCOMMODATE SANITARY SEWAGE ASSOCIATED WITH NORMAL DOMESTIC USAGE AND CONSISTING OF WATER-CARRIED PUTRESIBLE WASTE.
  - THE SYSTEM IS DESIGNED FOR A GARBAGE GRINDER, HOWEVER THE USE OF ONE IS NOT RECOMMENDED BY THE DESIGN ENGINEER.
  - THE SYSTEM SHALL BE VENTED IN ACCORDANCE WITH THE PRESBY ENVIRO-SEPTIC DESIGN MANUAL.
  - THE PLAN SHOWS ONLY THOSE FEATURES THAT WERE VISUALLY APPARENT ON DATE OF THE TOPOGRAPHY.
  - THE INSTALLER OF THIS SYSTEM MUST BE LICENSED BY THE LOCAL BOARD OF HEALTH AND WITH PRESBY FOR INSTALLATION OF THE ENVIRO-SEPTIC LEACHING FACILITY.
  - THERE ARE NO KNOWN WELLS WITHIN 150 FEET OF THE PROPOSED SOIL ABSORPTION SYSTEM.
  - 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.
  - FINISHED SURFACE OF THE LEACHING AREA SHALL BE GRADED TO ASSURE WATER RUNOFF (2% MINIMUM SLOPE).
  - ALL DISTURBED AREAS TO BE LOAMED, SEEDED, AND MAINTAINED TO PREVENT EROSION.
  - THE SEPTIC TANK SHOULD BE PERIODICALLY INSPECTED AND MAINTAINED AND SHOULD BE PUMPED WHEN THE SLUDGE IN THE BOTTOM EXCEEDS 1/4 OF THE DEPTH.
  - 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.
  - NO CHANGES ARE TO BE MADE IN THE FIELD WITHOUT THE APPROVAL OF THE BOARD OF HEALTH OR ITS DESIGNEE AND THE DESIGN ENGINEER.
  - 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.
  - THE LOCAL BOARD OF HEALTH AGENT WILL CONDUCT PERIODIC INSPECTIONS AS NEEDED.
  - 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.
  - FILL REQUIREMENT: REMOVE TOPSOIL & 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) OR ASTM C-33 SAND (SYSTEM SAND). FOR THE BOUNDARY OF THE SAND FILL REQUIREMENT, SEE PLAN VIEW.
  - ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE IN ACCORDANCE WITH 310 CMR 15.221(11).

- SEPTIC SYSTEM DESIGN DATA:**
- BUILDING TYPE: SINGLE FAMILY DWELLING
  - NO. OF BEDROOMS: 4 BEDROOMS
  - DESIGN FLOW (BOXFORD BOH): 4 X 165 GPD/BEDROOM = 660 GPD (FOR GRINDER) DESIGN FLOW (TITLE 5): 4 X 110 GPD/BEDROOM = 440 GPD
  - DESIGN PERCOLATION RATE: CLASS II SOIL, 4.0 MPI, LTAR = 0.60 GPD/SF
  - GARBAGE DISPOSAL: DESIGNED FOR PER BOXFORD BOH REGULATIONS (USE OF GRINDER NOT RECOMMENDED BY DESIGN ENGINEER).
  - SEPTIC TANK DESIGN REQUIREMENT: (2 COMP TANK REQUIRED FOR GRINDER) MIN. 200% DESIGN FLOW (TITLE 5) FOR FIRST COMPARTMENT = 2 X 440 GPD = 880 GAL. MIN. 100% DESIGN FLOW (TITLE 5) FOR SECOND COMPARTMENT = 2 X 440 GPD = 880 GAL. USE 1,500 GAL 2-COMPARTMENT (MONOLITHIC) SEPTIC TANK
  - SOIL ABSORPTION SYSTEM REQUIREMENTS: 660 GPD / (0.60 GPD/SF) = 1,100 SF (REQUIRED) REDUCTION FOR PRESBY ENVIRO-SEPTIC: 0.6 X 1,100 SF = 660 SF
  - PER DEP GENERAL USE CERTIFICATION FOR PRESBY ENVIRO-SEPTIC LEACHING SYSTEM TABLES UTILIZED IN THE FOLLOWING SECTION ARE FROM THE PRESBY ENVIRO-SEPTIC QUICK REFERENCE GUIDE.
    - DETERMINE LINEAR FEET OF PIPE FROM TABLE A: 4-BEDROOMS, PERC RATE = 1-9 MPI, 50 LF/100GPD = 50LF/100GPD X 660 GPD = 330 LF REQUIRED
    - DETERMINE PERCENTAGE OF SLOPE ON THE PROPOSED SYSTEM: 0% FROM TABLE D: SOIL CLASS II, "4-BEDROOM", 1-5 MPI = 100SF/100GPD X 660GPD = 660 SF (MIN) AREA PROVIDED: 663 SF (OK)
    - DETERMINE PIPE LINE LAYOUT: ASSUME 37' PIPE LENGTH @ 333' OF PIPES TOTAL (9 LATERALS) CTR. TO CTR. SPACING OF 1.75'
    - OVERALL DIMENSIONS: 17'-0" X 39'-0" = 663 SF
    - CALCULATE MINIMUM SYSTEM SAND BED AREA: FROM TABLE D: SOIL CLASS II, "4-BEDROOM", 1-5 MPI = 100SF/100GPD X 660GPD = 660 SF (MIN) AREA PROVIDED: 663 SF (OK)

- CONVENTIONAL SOIL ABSORPTION SYSTEM DESIGN CALCULATIONS:**
- BUILDING TYPE: SINGLE FAMILY DWELLING
  - NO. OF BEDROOMS: 4 BEDROOMS
  - DESIGN FLOW (TITLE 5): 4 X 110 GPD/BEDROOM = 440 GPD DESIGN FLOW (BOXFORD BOH): 4 X 165 GPD/BEDROOM = 660 GPD (DESIGNED FOR GRINDER)
  - DESIGN PERCOLATION RATE: CLASS II SOIL, 4 MPI, LTAR = 0.60 GPD/SF
  - GARBAGE DISPOSAL: DESIGNED FOR PER BOXFORD BOH REGULATIONS (USE OF GRINDER NOT RECOMMENDED BY DESIGN ENGINEER).
  - LEACH AREA SIZE REQUIREMENT: (660 GPD) / (0.60 GPD/SF) = 1,100 SF (MIN)
  - LEACH BED CAPACITY: USE 22' X 50' = 1,100 SF X 0.60 GPD/SF = 660 GPD (OK)



**DISCRETIONARY CUTTING AREA CALCULATIONS:**  
 EXISTING OVERSTORY WITHIN DISCRETIONARY CUTTING AREA = 28,000 SF ±  
 PROPOSED DISCRETIONARY CUTTING AREA TO BE ALTERED = 4,500 SF ± (16% ±)



**LOCAL B.O.H. VARIANCE REQUESTS**

	STATE (TITLE 5)	LOCAL (BOH)	REQUEST
MINIMUM SETBACK DISTANCE BETWEEN LEACHING FACILITY AND WETLAND RESOURCE AREAS (BOXFORD BOARD OF HEALTH REGULATIONS, CHAPTER 201, SECTION 9(B))	50'	100'	76'
MINIMUM SETBACK DISTANCE BETWEEN LEACHING FACILITY AND WETLAND RESOURCE AREAS (BOXFORD BOARD OF HEALTH REGULATIONS, CHAPTER 201, SECTION 9(B))	50'	150'	76'

**CONSTRUCTION INSPECTIONS:**  
 THE FOLLOWING INSPECTIONS WILL BE NECESSARY DURING CONSTRUCTION:

- INSPECT THE BOTTOM OF D-BOX AND TANKS TO ENSURE PROPER BASE.  
DATE COMPLETED: \_\_\_\_\_ INITIAL: \_\_\_\_\_
- INSPECT THE BOTTOM OF THE LEACH BED AT THE TIME IT IS SCARIFIED.  
DATE COMPLETED: \_\_\_\_\_ INITIAL: \_\_\_\_\_
- PUMP TEST.  
DATE COMPLETED: \_\_\_\_\_ INITIAL: \_\_\_\_\_
- FINAL INSPECTION OF INSTALLED ONSITE WASTEWATER SYSTEM.  
DATE COMPLETED: \_\_\_\_\_ INITIAL: \_\_\_\_\_

THE CONTRACTOR SHALL NOTIFY THE LOCAL BOARD OF HEALTH AND DESIGN ENGINEER AT LEAST 24 HOURS PRIOR TO INSPECTION TIMES.  
 THE SYSTEM SHALL NOT BE BACKFILLED WITHOUT PERMISSION FROM THE BOH.

**SAND REQUIREMENTS:**

**PRESBY ENVIRO-SEPTIC SYSTEM SAND:**  
 ALL CONFIGURATIONS OF ENVIRO-SEPTIC REQUIRE A MINIMUM OF 6" OF SYSTEM SAND SURROUNDING THE CIRCUMFERENCE OF THE PIPE.

**PERCENTAGE RESTRICTIONS:** 35% OR LESS OF THE TOTAL SAND MAY BE GRAVEL. 40%-90% OF THE TOTAL SAND IS TO BE COARSE AND VERY COARSE SAND.

**GRAVEL QUALITY RESTRICTIONS:** NO GRAVEL IS TO EXCEED 3/4" IN DIAMETER. NO GRAVEL IS TO BE SMALLER THAN 2MM (0.0787") IN DIAMETER. (IT MUST NOT PASS THROUGH A #10 SIEVE)

**COARSE SAND QUALITY RESTRICTIONS:** NO COARSE SAND SMALLER THAN 0.5MM (0.0196") IN DIAMETER. (IT MUST NOT PASS THROUGH A #35 SIEVE.)

**FINES QUALITY RESTRICTIONS:** NO MORE THAN 2% OF THE TOTAL SAND MAY PASS THROUGH A #200 SIEVE.  
 ASTM STANDARD: C-33 (CONCRETE SAND) MEETS THE ABOVE REQUIREMENTS

**TITLE V SURROUNDING SAND:**  
 THE SURROUNDING "OVERDIO" SHALL BE EITHER SYSTEM SAND OR TITLE 5 FILL AS SPECIFIED IN 310 CMR 15.255(3).

IN ACCORDANCE WITH DEP DOCUMENT "STANDARD CONDITIONS FOR ALTERNATIVE SOIL ABSORPTION SYSTEMS WITH GENERAL USE CERTIFICATION AND/OR APPROVED FOR REMEDIAL USE" REVISED SEPTEMBER 26, 2014 CONDITION II.18(C), I CERTIFY TO THE BEST OF MY KNOWLEDGE THAT THE PROPOSED DESIGN CONFORMS TO THE DEP APPROVAL, ANY PRESBY ENVIRO-SEPTIC LEACHING FACILITY DESIGN GUIDANCE, AND 310 CMR 15.000.

*John M. Morin* 8/5/15  
 DESIGN ENGINEER DATE

**The Morin-Cameron GROUP, INC.**  
 CIVIL ENGINEERS / ENVIRONMENTAL CONSULTANTS  
 LAND SURVEYORS / LAND USE PLANNERS 01883  
 447 BOSTON STREET - U.S. ROUTE 1, TOPSFIELD, MASSACHUSETTS 01868  
 P. 978-887-6588, F. 978-887-5480, W. WWW.MORINCAMERON.COM

**MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER**  
 JOHN M. MORIN  
 LICENSE NO. 30806

SURVEY BY: P.J.M./S.R.  
 DRAFTED BY: WAS  
 CHECKED BY: JMM  
 APPROVED BY: JMM  
 SCALE: AS NOTED  
 DATE: AUGUST 5, 2015

NO.	REVISION	DATE

**SANITARY DISPOSAL SYSTEM REPAIR PLAN**  
**IN**  
**BOXFORD, MASSACHUSETTS**  
**39 KING JOHN DRIVE**  
 (ASSESSOR'S MAP 20, BLOCK 7, LOT 12)  
 PREPARED FOR:  
**MARIANNE RUTTER**

DRAWING NO. **S - 3356**  
 SHEET NO. **1 OF 3**