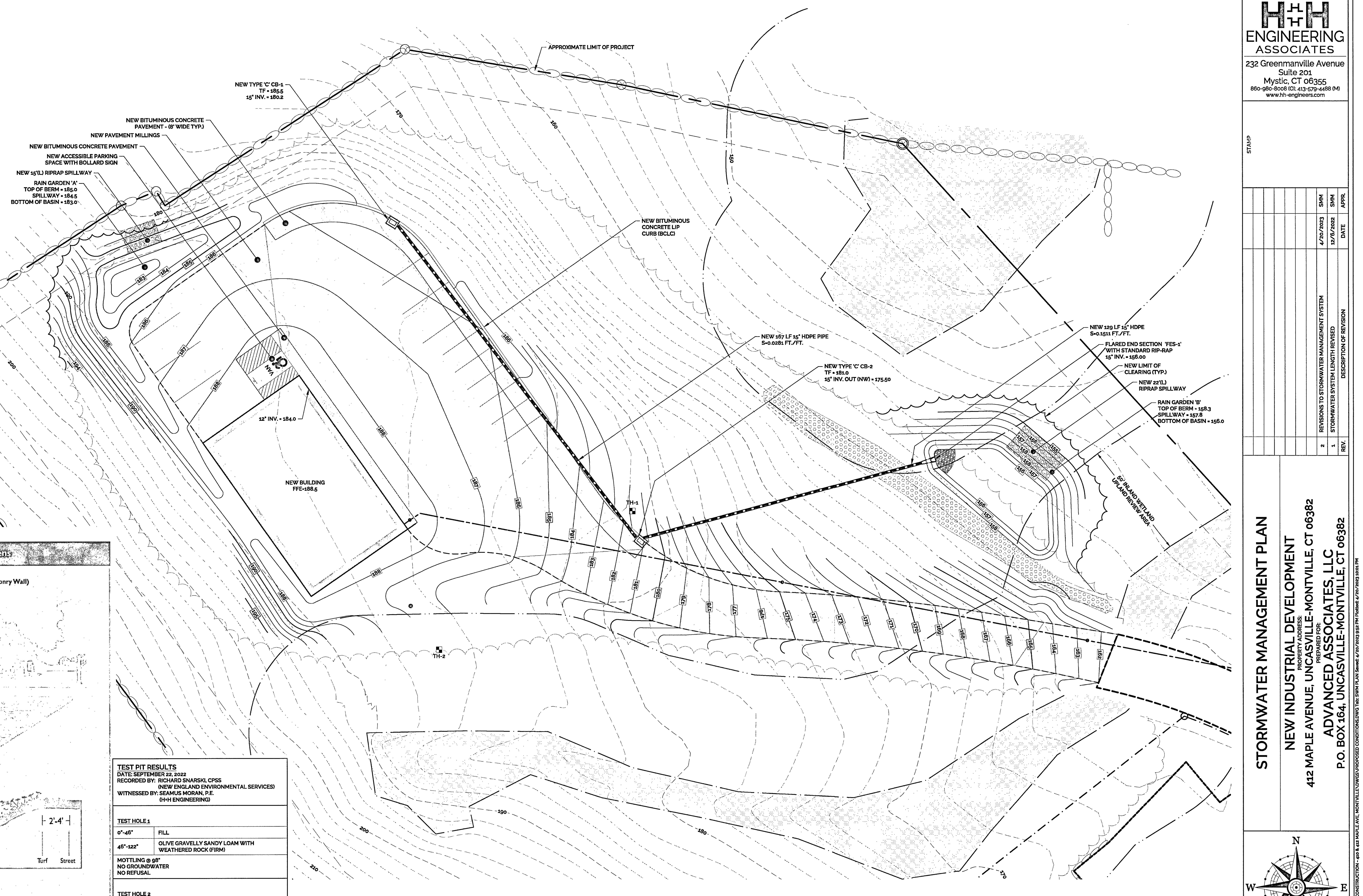
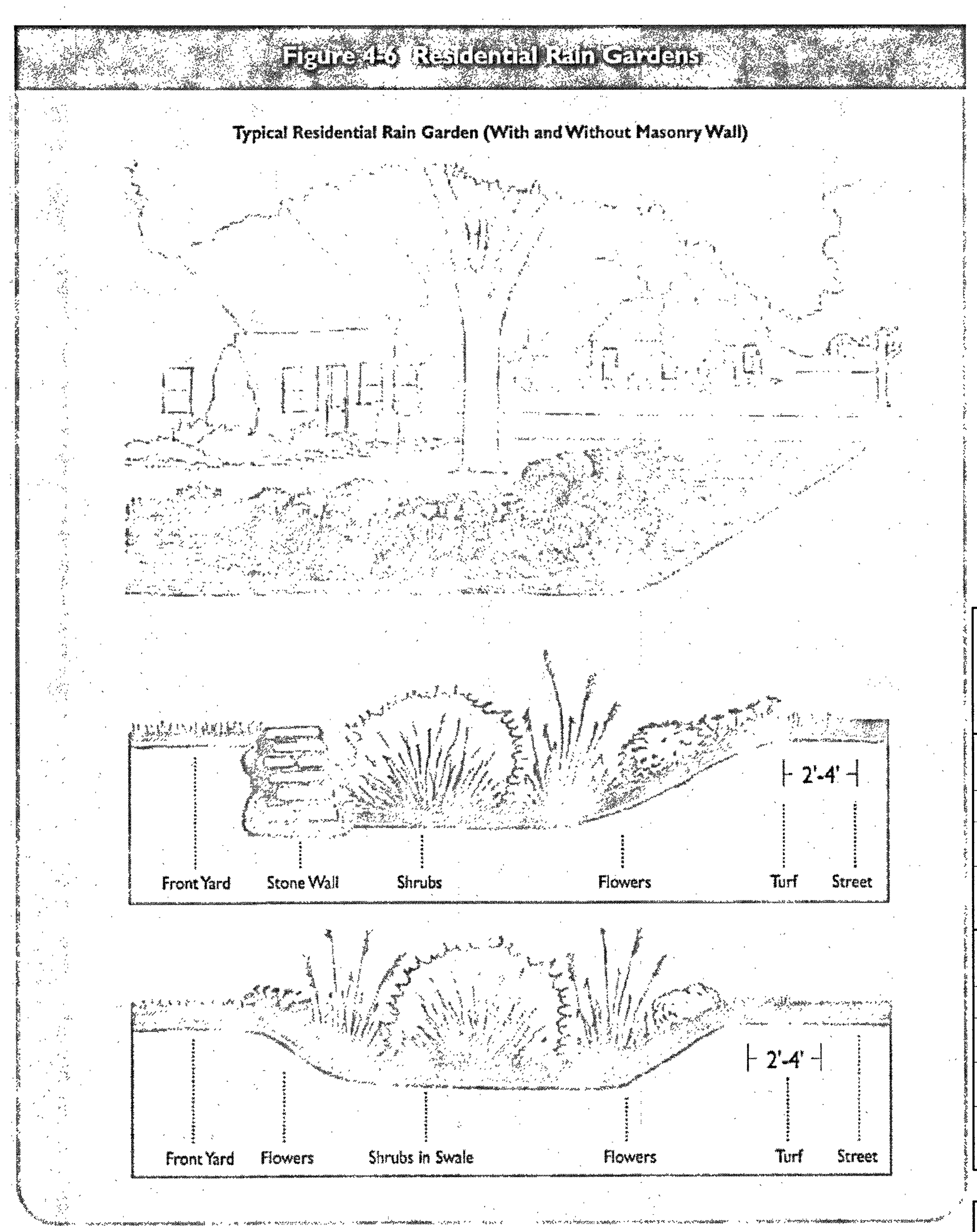
RAIN GARDEN CONSTRUCTION NOTES:

1. REMOVE EXISTING TOPSOIL, SURFACE LEAF LITTER, ETC. FROM RAIN GARDEN AREA AND STOCKPILE FOR REUSE.
2. AVOID COMPACTION OF NATURAL SOILS WITHIN BOTTOM AREA OF RAIN GARDEN BASIN BY CONSTRUCTION EQUIPMENT.
3. SCARIFY NATURAL SOILS WITHIN THE BOTTOM OF BASIN PRIOR TO PLACING STOCKPILED TOPSOIL.
4. ALL DISTURBED AREAS SHALL BE FINE GRADED WITH 6" TOPSOIL, RAKED, SEEDED AND MULCHED IN A TIMELY MANNER. TOPSOIL SHALL BE PLACED IN THE BASIN USING LIGHT EQUIPMENT. ALLOW SOIL TO SETTLE NATURALLY THROUGH RAIN EVENTS OR PRESOAK AFTER PLACEMENT.
5. PLACE A 3-INCH LAYER OF WELL-AGED SHREDDED HARDWOOD FREE OF ROOTS, SOIL AND WEEDS.
6. SEED BOTTOM OF BASIN, SIDE SLOPES AND TOP OF BERM WITH CONSERVATION/WILDLIFE MIX AT 1 LB/1,750 S.F., OR EQUIVALENT. SEEDING SHALL BE QUICKLY ESTABLISHED AND MAINTAINED TO PREVENT ANY SILT ACCUMULATION ALONG THE BOTTOM OF THE RAIN GARDEN. MINIMUM VEGETATIVE COVERAGE OF 90% SHALL BE TARGETED AND MAINTAINED.
7. RAIN GARDEN SHALL NEVER BE USED FOR SEDIMENT CONTROL DURING AN ACTIVE CONSTRUCTION PERIOD.
8. THE AREA OF THE RAIN GARDEN SHALL BE MARKED OFF BY APPROPRIATE FENCING TO PREVENT THE MOVEMENT OF CONSTRUCTION VEHICLES OVER AND THE POSSIBLE COMPACTION OF THE NATURAL SOILS.
9. DURING CONSTRUCTION, SEDIMENT SHALL BE PREVENTED FROM ENTERING THE AREAS OF THE RAIN GARDEN. THE CONTRACTOR SHALL ENSURE THAT THE AREAS DRAINING TO THE RAIN GARDEN ARE STABILIZED IN A TIMELY MANNER AND MAINTAINED OVER THE ENTIRE AREA DRAINING TO THE RAIN GARDEN.

RAIN GARDEN MAINTENANCE PLAN:

1. PORTION OF BASIN FLOOR/SIDE SLOPES THAT ARE GRASSED SHALL BE MOWED 4" TO 6" AS NEEDED. GRASS CLIPPINGS, LEAVES AND ACCUMULATED SEDIMENT AND DEBRIS SHALL BE REMOVED.
2. NO PESTICIDES OR NON-ORGANIC FERTILIZERS SHALL BE USED IN AREAS DRAINING TO THE RAIN GARDEN.
3. IF THERE IS AN ACCUMULATION OF ORGANIC DEBRIS OR SEDIMENT ON THE FLOOR OF THE BASIN OR IF PONDED WATER IS REGULARLY OBSERVED MORE THAN 48 HOURS AFTER A RAINFALL EVENT, THE TOP 6" SHALL BE REMOVED AND THE EXPOSED SOIL SURFACE ROTOTILLED TO A DEPTH OF 12". SEDIMENTATION SHOULD BE REMOVED WHEN IT IS VISIBLY DRY AND READILY SEPARATES FROM THE BASIN FLOOR TO MINIMIZE SMEARING. AFTER THIS WORK HAS BEEN DONE, THE BOTTOM OF THE RAIN GARDEN SHALL BE RESTORED TO ITS ORIGINAL CONDITION.





Source: Metropolitan Council, 2001 (Adapted from Nassauer et al., 1997) and Low Impact Development Center (www.lowimpactdevelopment.org), 2001.

SOURCE: 2004 CONNECTICUT STORMWATER QUALITY MANUAL, PREPARED BY THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

RAIN GARDEN DETAIL

NOT TO SCALE

TEST PIT RESULTS

DATE: SEPTEMBER 22, 2022
RECORDED BY: RICHARD SNARSKI, CPSS
(NEW ENGLAND ENVIRONMENTAL SERVICES)
WITNESSED BY: SEAMUS MORAN, P.E.
(H+H ENGINEERING)

TEST HOLE 1	
0"-46"	FILL
46"-122"	OLIVE GRAVELLY SANDY LOAM WITH WEATHERED ROCK (FIRM)
MOTTLING @ 98" NO GROUNDWATER NO REFUSAL	

TEST HOLE 2	
0"-10"	FILL
10"-31"	DARK YELLOWISH BROWN FINE SANDY LOAM (FRIABLE)
31"-89"	OLIVE GRAVELLY SANDY LOAM WITH WEATHERED ROCK
MOTTLING @ 87" NO GROUNDWATER NO REFUSAL	

PERMEABILITY RESULTS

CONDUCTED BY: RICHARD SNARSKI, CPSS
(NEW ENGLAND ENVIRONMENTAL SERVICES)
SAMPLE COLLECTION DATE: SEPTEMBER 22, 2022
TESTING METHOD: THE FALLING HEAD METHOD

TEST HOLE	SAMPLE DEPTH (INCHES)	PERMEABILITY (FT/DAY)
1	87	9.6

RAIN GARDEN PLANT LIST

BOTANICAL NAME	COMMON NAME	QUANTITIES		SIZE
		RAIN GARDEN 'A'	RAIN GARDEN 'B'	
CEPHALANTHUS OCCIDENTALIS	BUTTON BUSH	4	4	3'-4'
CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	4	4	3'-4'
LLEX VERTICILLATA	FEMALE WINTERBERRY	10	10	3'-4'
LLEX VERTICILLATA	MALE WINTERBERRY	2	2	3'-4'

NOTE: ALL PLANTINGS SHALL BE NON-INVASIVE AND NATIVE SPECIES.

STORMWATER NARRATIVE:

PER SECTION 7.6.3 OF THE CONNECTICUT STORMWATER QUALITY MANUAL, PEAK RATE CONTROL MAY BE WAIVED BY THE LOCAL REVIEWING AUTHORITY PROVIDED THE SITE DISCHARGES TO A FOURTH ORDER RIVER OR GREATER, AND WHEN THE DEVELOPMENT AREA IS LESS THAN 5% OF THE WATERSHED AREA UPSTREAM OF THE DEVELOPMENT SITE.

THE DEVELOPMENT IS LOCATED IN THE OXOBOXO BROOK WATERSHED WHICH ENCOMPASSES AN AREA OF 6,768 ACRES. THE SITE DISCHARGES TO THE OXOBOXO BROOK, WHICH IS CLASSIFIED AS A THIRD ORDER STREAM. FROM THE LOWEST POINT WITHIN THE WATERSHED AREA UPSTREAM OF THE DEVELOPMENT SITE IS APPROXIMATELY 6,176 ACRES. THE AREA OF THE PROPOSED DEVELOPMENT IS APPROXIMATELY 2.1 ACRES, WHICH IS APPROXIMATELY 0.03% OF THE UPSTREAM SITE. THEREFORE, PEAK RATE ATTENUATION HAS NOT BEEN CONSIDERED IN THE PROPOSED STORMWATER MANAGEMENT PROVISIONS. THE PRIMARY OBJECTIVE OF THE STORMWATER MANAGEMENT SYSTEM IS WATER QUALITY TREATMENT.

RAIN GARDEN 'A' STORWMATER CALCULATIONS:

WATER QUALITY VOLUME (WQV) CALCULATIONS:

1. WQV = (1")(R)(A)
   WHERE:
   R = 0.05 + 0.009 (% IMPERVIOUS)
   A = DRAINAGE AREA IN ACRES
2. CONTRIBUTING DRAINAGE AREA = 16,168 SQ. FT. (0.37 AC.)
3. CONTRIBUTING IMPERVIOUS COVERAGE = 3,613 SQ. FT. (0.08 AC.)
4. % IMPERVIOUS = 3,613 SQ. FT. / 16,168 SQ. FT. = 22.3%
5. THEREFORE, WQV = (1")(0.05 + (0.009 x 22.3%))(0.37 AC.)(43,560 SQ. FT./1 AC.) = 337 CU. FT.

RAIN GARDEN 'A' STORAGE CAPACITY:

1. REQUIRED: 337 CU. FT.
2. PROVIDED (BELOW SPILLWAY): 631 CU. FT.
3. PROVIDED (TOTAL): 1,068 CU. FT.
4. RAIN GARDEN 'A' RAINFALL STORAGE CAPACITY:
   631 CU. FT. (STORAGE VOLUME BELOW SPILLWAY) /337 CU. FT. (WQV) = 1.9"

RAIN GARDEN 'B' STORWMATER CALCULATIONS:

WATER QUALITY VOLUME (WQV) CALCULATIONS:

1. WQV = (1")(R)(A)
   WHERE:
   R = 0.05 + 0.009 (% IMPERVIOUS)
   A = DRAINAGE AREA IN ACRES
2. CONTRIBUTING DRAINAGE AREA = 74,665 SQ. FT. (1.71 AC.)
3. CONTRIBUTING IMPERVIOUS COVERAGE = 21,761 SQ. FT. (0.50 AC.)
4. % IMPERVIOUS = 21,761 SQ. FT. / 74,665 SQ. FT. = 29.1%
5. THEREFORE, WQV = (1")(0.05 + (0.009 x 29.1%))(1.71 AC.)(43,560 SQ. FT./1 AC.) = 1,936 CU. FT.

RAIN GARDEN 'B' STORAGE CAPACITY:

1. REQUIRED: 1,936 CU. FT.
2. PROVIDED (BELOW SPILLWAY): 1,961 CU. FT.
3. PROVIDED (TOTAL): 2,775 CU. FT.
4. RAIN GARDEN 'B' RAINFALL STORAGE CAPACITY:
   1,961 CU. FT. (STORAGE VOLUME BELOW SPILLWAY) /1,936 CU. FT. (WQV) = 1.0"

H+H ENGINEERING ASSOCIATES
232 Greenmanville Avenue
Suite 201
Mystic, CT 06355
860-980-8008 (O); 413-579-4488 (M)
www.hh-engineers.com

STAMP

REV.	DESCRIPTION OF REVISION	DATE	APPR.
2	REVISIONS TO STORMWATER MANAGEMENT SYSTEM	4/20/2023	SMM
1	STORMWATER SYSTEM LENGTH REVISED	12/6/2022	SMM

STORMWATER MANAGEMENT PLAN

NEW INDUSTRIAL DEVELOPMENT

PROPERTY ADDRESS:
412 MAPLE AVENUE, UNCASVILLE-MONTVILLE, CT 06382
PREPARED FOR:
ADVANCED ASSOCIATES, LLC
P.O. BOX 164, UNCASVILLE-MONTVILLE, CT 06382

N S W E

SCALE IN FEET: 20 10 0 20

PROJECT NO.	SCALE:
2022-0019	1" = 20'
DRAWN BY: SMM	DATE: 11/1/2022
CHECKED BY: SMM	DATE: 11/1/2022

DRAWING
SMP-1

SHEET NUMBER: 1 OF 1

Z:\SHARED\H+H ENGINEERING ASSOCIATES\PROJECTS\2022\2022-0019 - P&H CONSTRUCTION - 410 & 412 MAPLE AVE, MONTVILLE\DWGS\PROPOSED CONDITIONS.DWG Tab: SWM PLAN Saved: 4/20/2023 9:52 PM Plotted: 4/20/2023 10:01 PM