HACKETTSTOWN HIGH SCHOOL

BIORETENTION SYSTEM IMPLEMENTATION PROJECT
599 WARREN STREET, HACKETTSTOWN
WARREN COUNTY, NEW JERSEY
BLOCK: 107 LOT: 20

PROJECT DESCRIPTION:

A RAIN GARDEN (245 S.F.) WILL BE INSTALLED IN A GRASS ISLAND ON THE EASTERN CORNER OF THE BUILDING. IT WILL CAPTURE, TREAT, AND INFILTRATE THE STORMWATER RUNOFF (695 S.F.) FROM TWO DOWNSPOUTS THAT GO INTO THAT AREA.

LOCATION MAP (N.T.S):

LEGEND:

- EXISTING DRAINAGE AREA
- EDGE OF PAVEMENT
- EXISTING CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING TREE/SHRUB
- EXISTING BUILDING
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING CATCH BASIN
- EXISTING CONTOURS
- LIMIT OF WORK
- LIMIT OF DISTURBANCE
- PROPOSED GREEN INFRASTRUCTURE
- PROPOSED TOP OF BERM

LIST OF DRAWINGS:

SHEET NAME	TITLE
COVER	COVER SHEET
P-1	EXISTING CONDITIONS AND DEMOLITION PLAN
P-2	PROPOSED SITE PLAN
P-3	PLANTING PLAN
DT-1	RAIN GARDEN AND PLANTING DETAILS

GENERAL NOTES:

1. ELEVATION DATA OBTAINED FROM NOAA DIGITAL COASTAL LIDAR. ELEVATION ARE HEIGHT ABOVE MEAN SEA LEVEL SET BY NAVD 1988.
2. EXISTING SOILS ARE UDORTHENTS-URBAN LAND COMPLEX WHICH ARE CLASSIFIED AS HYDROLOGIC SOIL GROUP D WHICH HAVE POOR INFILTRATION RATES BASED ON THE NRCS WEB SOIL SURVEY (websoilsurvey.sc.egov.usda.gov).
3. ANY OVERHEAD AND UNDERGROUND UTILITIES SHOWN ARE FROM FIELD OBSERVATIONS AND ARE NOT A COMPLETE REPRESENTATION. A UTILITY MARKOUT NEEDS TO BE CONDUCTED PRIOR TO MOBILIZATION BY THOSE RESPONSIBLE FOR EXCAVATION. NJ ONE CALL: 811 OR 800-272-1000

PLAN REVISIONS		
REV. DATE	REV. SUMMARY	REV. SHEETS
9/28/2023	AS-BUILT	ALL

CHRISTOPHER C. OBROPTA, Ph.D., P.E.
PROFESSIONAL ENGINEER - NJ LICENSE # 37532

DATE 09/28/23

DRAWN KWK	CHECKED MAL	APPROVED CCO	DATE 09/28/23

SHEET REVISIONS

No.	DATE	DESCRIPTION
1	9/28/2023	AS-BUILT

HACKETTSTOWN HIGH SCHOOL
BIORETENTION SYSTEM IMPLEMENTATION PROJECT
599 WARREN STREET, HACKETTSTOWN
WARREN COUNTY, NJ
COVER SHEET

RUTGERS New Jersey Agricultural Experiment Station
14 COLLEGE FARM ROAD, NEW BRUNSWICK, NJ

SHEET NAME
COVER

PLAN NOTES:

1. CONTRACTOR SHALL SCHEDULE MEETING WITH ENGINEER AND PROPERTY OWNER PRIOR TO MOBILIZATION.
2. CONTRACTOR SHALL VERIFY ALL INFORMATION INCLUDING ELEVATIONS AND UTILITIES PRIOR TO MOBILIZATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING REQUIRED APPROVALS FROM AUTHORITIES WITH JURISDICTION OVER PROPOSED WORK.
4. CONTRACTOR SHALL COORDINATE AND CONFIRM PROJECT SCHEDULE AND WORKING HOURS WITH ENGINEER AND PROPERTY OWNER AND PROCEED IN ACCORDANCE WITH LOCAL REQUIREMENTS.
5. CONTRACTOR SHALL COORDINATE UTILITY MARK OUT PRIOR TO MOBILIZATION. NJ ONE CALL: 811 OR 800-272-1000
6. CONTRACTOR SHALL HAUL REMOVED DEBRIS OFF SITE UNLESS OTHERWISE NOTED BY PROPERTY OWNER.
6. CONTRACTOR SHALL CONDUCT PERMEABILITY TESTING TO VERIFY ADEQUATE INFILTRATION RATES IF NOT PREVIOUSLY PERFORMED.

DRAINAGE AREA
(695 S.F.)

39.0'

19.8'

14.0'

EXISTING RECTANGLE DOWNSPOUTS
APROX. 3" x 4"

LIMIT OF DISTURBANCE
DESOD GRASS AREA (640 SF)

550'

548'

546'

544'

0 10' 20'
SCALE 1" = 10'-0"

EXISTING PLAN

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599 WARREN STREET, HACKETTSTOWN
WARREN COUNTY, NJ

EXISTING CONDITIONS AND DEMOLITION PLAN

RUTGERS New Jersey Agricultural Experiment Station

14 COLLEGE FARM ROAD, NEW BRUNSWICK, NJ

SHEET NAME
P-1

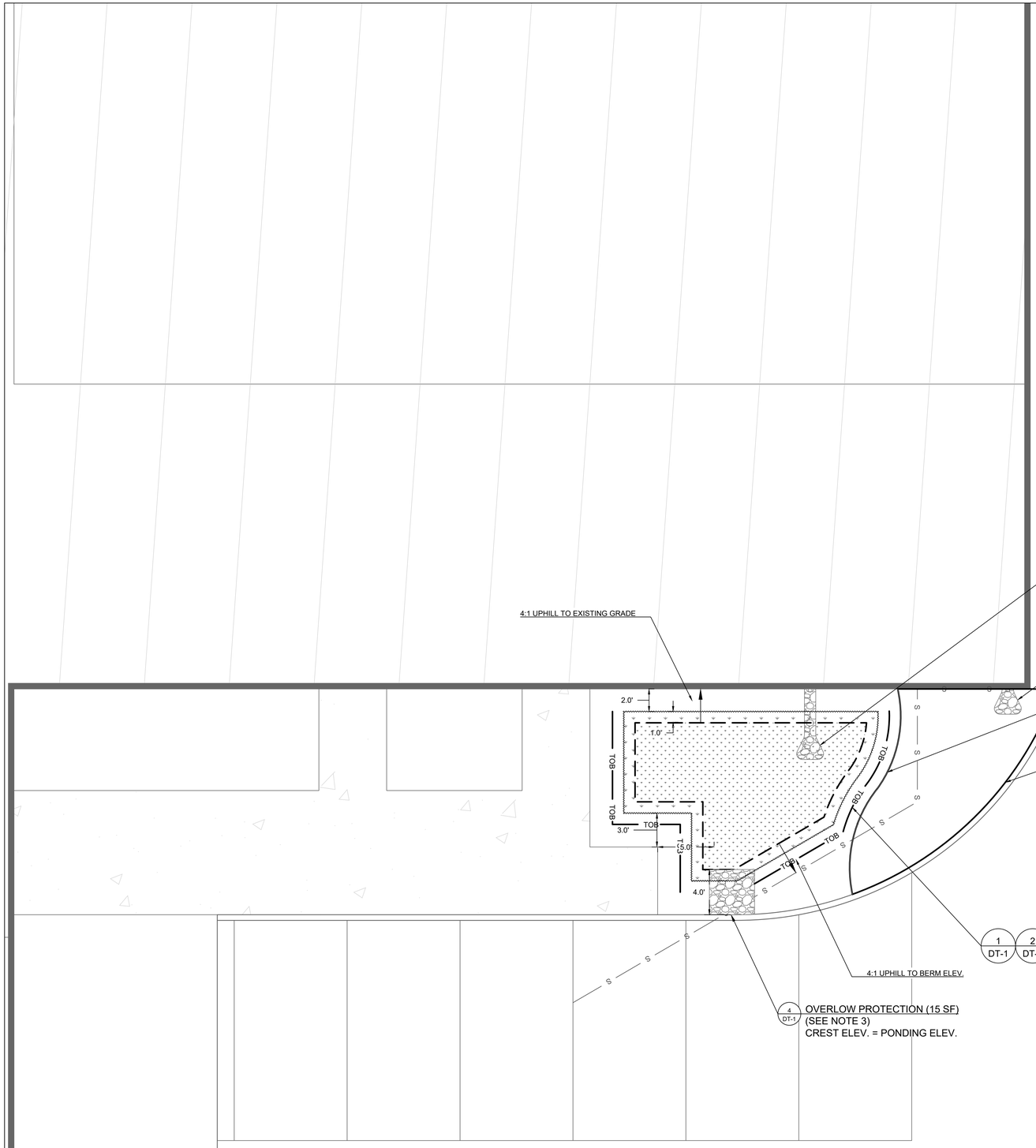
PLAN NOTES:
1. CONTRACTOR SHALL SCHEDULE MEETING WITH ENGINEER AND PROPERTY OWNER PRIOR TO MOBILIZATION AND CONSTRUCTION.
2. CONTRACTOR SHALL VERIFY ALL INFORMATION INCLUDING ELEVATIONS AND UTILITIES PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL VERIFY ALL PROPOSED MATERIALS WITH PROPERTY OWNER AND ENGINEER PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL STAKE OUT LOCATIONS OF PROPOSED BMPS AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO INSTALLATION.
5. CONTRACTOR SHALL GRADE SITE AS SHOWN ON PLAN. CUT SOIL SHALL BE REUSED ON SITE FOR FILL LOCATIONS.
6. CONTRACTOR SHALL HAUL EXCESS SOIL OFF SITE UNLESS OTHERWISE NOTED BY PROPERTY OWNER.
7. ALL FINISHED ELEVATIONS SHALL MATCH ADJOINING PAVEMENT ENSURING SMOOTH TRANSITIONS AND NO TRIPPING HAZARDS
8. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL AREAS DISTURBED DURING CONSTRUCTION TO ORIGINAL CONDITIONS.

NOTE 1: STONE SHALL BE COMPRISED OF 3"-5" DIAMETER CLEAN, WASHED RIVER STONE. ALL AREAS OF EROSION PROTECTION STONE SHALL BE UNDERLAIN WITH GEOTEXTILE FABRIC (GEOTEX 801 BY PROPEX OR APPROVED EQUIVALENT).

STORMWATER CALCULATIONS*

GREEN INFRASTRUCTURE PROJECT	SMP SIZE (SF)	TOTAL IMPERVIOUS DRAINAGE AREA MANAGED [WATER QUALITY STORM]** (SF)	TOTAL AREA MANAGED INCLUDING SMP [WATER QUALITY STORM]** (SF)	ANNUAL RUNOFF VOLUME MANAGED (GAL.)
RAIN GARDEN	245	695	940	16,116

* *SEE DETAIL SHEET FOR MORE DETAILED STORMWATER CALCULATIONS*
** WHILE A LARGER DRAINAGE AREA MAY ENTER THE SYSTEM, IT IS DESIGNED TO MANAGE THE AREA CALCULATED HERE
SMP = STORMWATER MANAGEMENT PRACTICE (THE FUNCTIONAL PORTION OF THE PROJECT).



3 DT-1 INLET PROTECTION (10 SF)

3 DT-1 INLET PROTECTION (4 SF)

PLASTIC LANDSCAPE EDGING (16 LF)

RESTORE TURF (80 SF)

4 DT-1 OVERLOW PROTECTION (15 SF)
(SEE NOTE 3)
CREST ELEV. = PONDING ELEV.

1 DT-1 2 DT-1 RAIN GARDEN
GARDENED AREA = 445 SF
SMP AREA = 245 SF
BASE AREA = 180 SF
BERMED ELEV. = +0.25' FROM TOC HEIGHT
PONDING ELEV. = TOP OF CURB (TOC) HEIGHT AT OVERFLOW
BASE ELEV. = -0.25' FROM TOC HEIGHT

N
0 5' 10'
SCALE 1" = 5'-0"

SITE PLAN

CHRISTOPHER C. OBROPTA, Ph.D., P.E.
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WARREN COUNTY, NJ

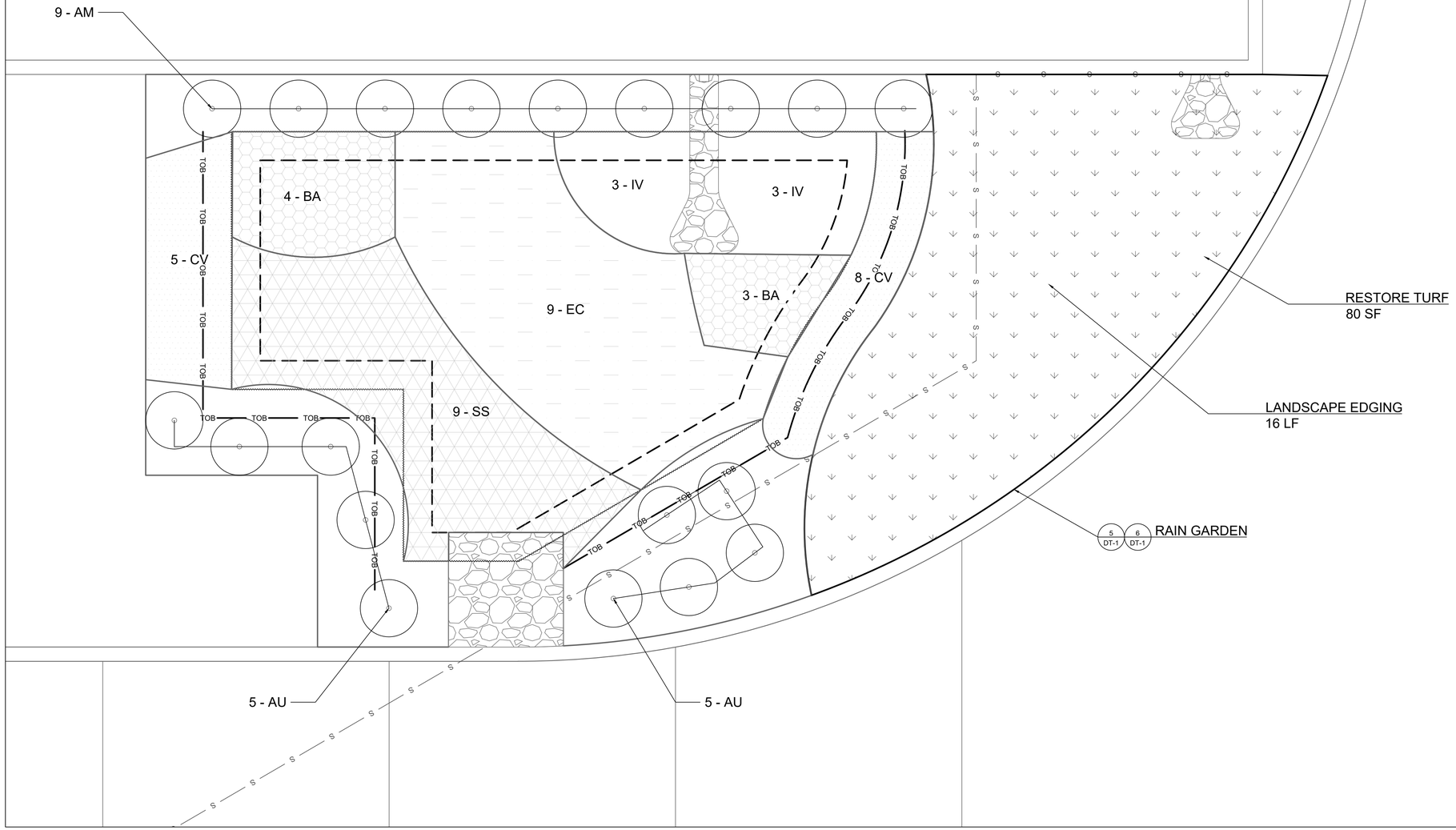
PROPOSED SITE PLAN

RUTGERS New Jersey Agricultural Experiment Station

14 COLLEGE FARM ROAD, NEW BRUNSWICK, NJ

SHEET NAME
P-2

PLANTING SCHEDULE					
PLANT SPECIES				QUANTITY	SIZE
TYPE	KEY	BOTANICAL NAME	COMMON NAME		
RAIN GARDEN					
PERENNIALS	**BA**	*Baptisia australis*	BLUE FALSE INDIGO	7	#1 CONT.
	CV	*Coropsis verticillata 'Zagreb'*	THREADLEAF COREOPSIS	13	#2 CONT.
	EC	*Eupatorium coelestinum*	BLUE MIST FLOWER	9	#2 CONT.
	IV	*Iris versicolor*	BLUE FLAG IRIS	6	#2 CONT.
	SS	*Schizachyrium scoparium 'The Blues'*	LITTLE BLUESTEM	9	#2 CONT.
SHRUBS	**AM**	*Aronia melanocarpa 'Low Scape Mound'*	BLACK CHOKEBERRY	9	#3 CONT.
	AU	*Arctostaphylos uva-ursii 'Massachusetts'*	BEARBERRY	10	#1 CONT.



N

0 2' 4'

SCALE 1" = 2'-0"

PLANTING PLAN

CHRISTOPHER C. OBROPTA, Ph.D., P.E.
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WARREN COUNTY, NJ

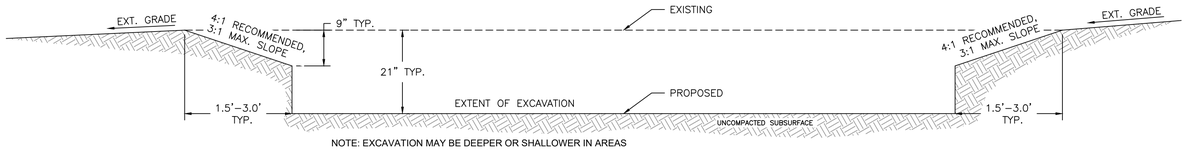
PLANTING PLAN

RUTGERS New Jersey Agricultural Experiment Station

14 COLLEGE FARM ROAD, NEW BRUNSWICK, NJ

SHEET NAME

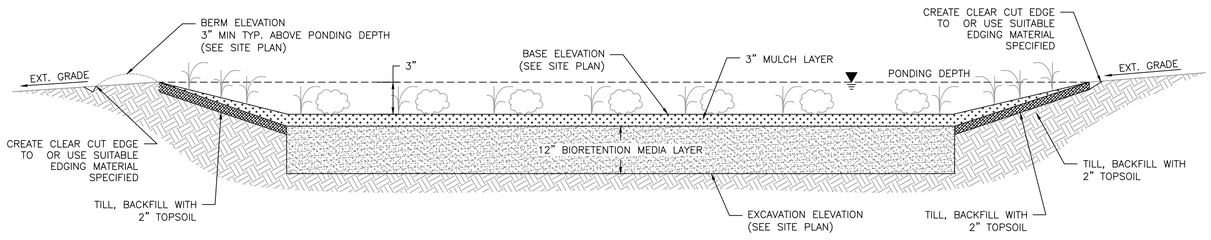
P-3



NOTE: EXCAVATION MAY BE DEEPER OR SHALLOWER IN AREAS DEPENDING ON THE EXISTING SLOPE AND SITE CONDITIONS. THE BOTTOM OF THE SYSTEM SHOULD BE LEVEL.

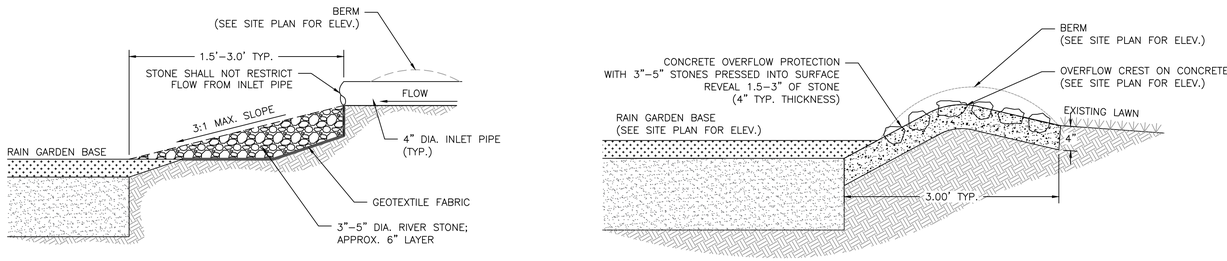
1 DT–1 RAIN GARDEN EXCAVATION SECTION

N.T.S.



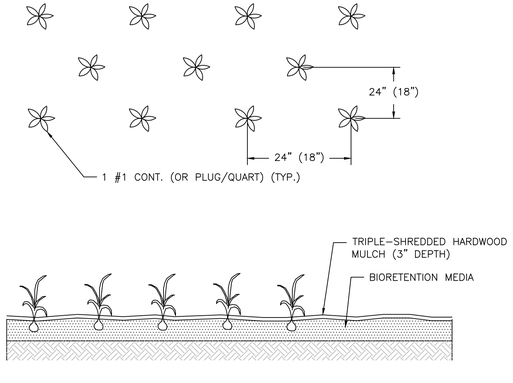
2 DT–1 RAIN GARDEN CROSS–SECTION

N.T.S.



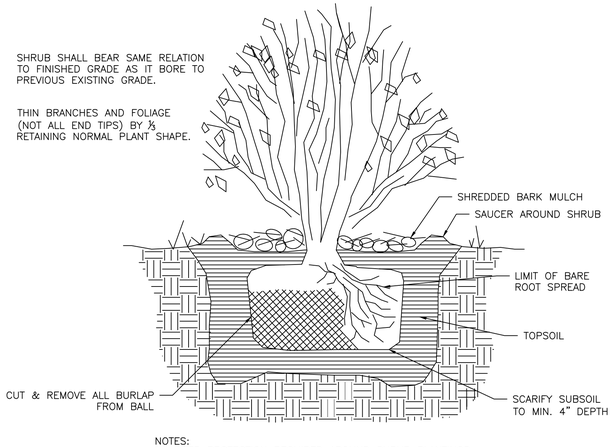
3 DT–1 INLET PROTECTION CROSS–SECTION

N.T.S.



4 DT–1 OVERFLOW PROTECTION CROSS–SECTION

N.T.S.



NOTES:
1. DEER PROTECTION REQUIRED AROUND SHRUB PLANTINGS.

5 DT–1 HERBACEOUS PLANTING DETAIL

N.T.S.

6 DT–1 SHRUB PLANTING DETAIL

N.T.S.

GENERAL CONSTRUCTION NOTES:

1. REFER TO SITE PLAN FOR ALL ELEVATIONS, INVERTS, DIMENSIONS, AND SHAPE OF THE PROJECT.
2. ALL WORK MUST MEET THE STANDARDS OF THE ENGINEER BEFORE PAYMENT. ADDITIONAL WORK AND TESTING WILL BE NECESSARY IF STANDARDS ARE NOT SUFFICED.
3. THE APPROVAL OF MATERIALS SHALL BE DONE BY THE PROJECT ENGINEER/LANDSCAPE ARCHITECT.
4. THE CONTRACTOR SHALL HAVE A PRE–CONSTRUCTION MEETING WITH THE PROJECT ENGINEER PRIOR TO ANY WORK ON SITE.
5. THE CONTRACTOR SHALL VERIFY ALL INFORMATION PRIOR TO MOBILIZATION INCLUDING ELEVATIONS AND LOCATIONS OF EXISTING UTILITIES.
6. THE CONTRACTOR SHALL PERFORM REQUIRED TESTING TO DETERMINE SOIL PERMEABILITY AND SEASONAL HIGH WATER TABLE ELEVATION AT THE SITE TO VERIFY INFILTRATION CAPABILITIES FOR SYSTEMS DESIGNED TO INFILTRATE. TESTING SHALL BE DONE PRIOR TO EXCAVATION AND INSTALLATION OF THE PROPOSED PROJECTS. PROJECT ENGINEER SHALL BE PRESENT DURING TESTING AND SHALL BE INFORMED OF THE RESULTS. THE TESTED INFILTRATION RATE SHALL BE AT LEAST 0.5 IN/HR OR 50 % OF THE HYDRAULIC CONDUCTIVITY (D3385).
7. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF ANY FIELD CONDITIONS DIFFER MATERIALLY FROM THOSE REPRESENTED ON THESE DRAWINGS AND THE SPECIFICATIONS OR IF, IN THE CONTRACTOR'S OPINION, SAID CONDITIONS CONFLICT WITH THE DESIGNS SHOWN HEREON.
8. THE CONTRACTOR SHALL PERFORM ALL WORK IN CONFORMANCE WITH THE NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2019 OR LATEST VERSION.
9. THE CONTRACTOR SHALL AVOID DISTURBING EXISTING AREAS OUTSIDE SPECIFIED LIMIT OF WORK. ANY DISTURBANCE TO SIDEWALKS, LANDSCAPED VEGETATION, AND TREES MUST BE COORDINATED WITH THE PROPERTY OWNER.
10. THE CONTRACTOR IS TO RESTORE ALL DISTURBED AREAS OUTSIDE PROPOSED CHANGES TO ORIGINAL CONDITIONS AFTER INSTALLATION.
11. THE CONTRACTOR SHALL HAVE ALL UTILITIES MARKED BEFORE ANY EXCAVATION. IF ANY UTILITIES INTERFERE WITH THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
12. THE CONTRACTOR SHALL ESTABLISH ALL ELEVATIONS AND LINES AS SHOWN IN THE SITE PLAN FOR REVIEW BY THE ENGINEER BEFORE ANY CONSTRUCTION BEGINS.
13. THE CONTRACTOR SHALL AVOID OVER COMPACTING THE EXISTING MATERIALS IN ORDER TO AVOID POOR INFILTRATION OR SHORT LIFETIME OF THE SYSTEM.
14. THE CONTRACTOR SHALL VERIFY THAT THE SUBGRADE IS CONSISTENT WITH LINE, GRADE, AND ELEVATIONS AS INDICATED IN THE SITE PLAN. ANY AREAS SHOWING EROSION OR POTENTIAL PONDING SHALL BE REGRADED BEFORE SUBBASE INSTALLATION.
15. THE CONTRACTOR SHALL DISCUSS ANY MODIFICATIONS TO THE PROJECT WITH THE ENGINEER AND PROPERTY OWNER BEFORE ACTION IS TAKEN.
16. THE CONTRACTOR SHALL EXCAVATE TO THE ELEVATIONS ON THE SITE PLAN AND DISPOSE OF ANY EXCESS MATERIALS.

RAIN GARDEN CONSTRUCTION NOTES:

1. RIVER STONE PROTECTION DIMENSIONS ARE TYPICAL AND MAY VARY PER SITE. CONSULT THE ENGINEER AND SITE PLAN FOR DIMENSIONS ON A PER SITE BASIS.
2. RIVER STONE PROTECTION SHALL SLOPE TO RAIN GARDEN BASE.
3. INLET AND OUTLET PROTECTION SHALL BE UNDERLAIN WITH GEOTEXTILE FABRIC.
4. INLETS AND OUTLETS SHALL NOT INHIBIT THE FLOW OF WATER
5. 3–5 INCH RIVER STONE SHALL BE USED FOR INLET/OUTLET PROTECTION.
6. RAIN GARDEN SHALL BE CONSTRUCTED TO DIMENSIONS INDICATED ON THE SITE PLAN.
7. NON–DYED, TRIPLE–SHREDDED HARDWOOD MULCH OR APPROVED ALTERNATIVE SHALL BE USED.
8. PLANTING OF RAIN GARDEN AND SLOPED BERM SHALL BE COMPLETED AS INDICATED ON THE SITE PLAN.
9. MAX COVER OVER TOP OF PIPES IF PRESENT IS 4 FT. UNLESS APPROVED BY ENGINEER.
10. THE CONTRACTOR SHALL EXCAVATE LOWER THAN THE BASE ELEVATION TO THE EXCAVATION DEPTH SHOWN ON THE SITE PLANS. THE SLOPES OF THE RAIN GARDEN SHALL BE AT A 4:1 SLOPE RECOMMENDED TO BASE ELEVATION WITH A 3:1 SLOPE MAXIMUM WHERE 4:1 IS NOT FEASIBLE THEN A VERTICAL DROP TO EXCAVATION DEPTH.
11. THE SOIL BED MATERIAL MUST CONSIST OF THE FOLLOWING MIX, BY WEIGHT: 85 TO 95% SAND, WITH NO MORE THAN 25% OF THE SAND AS FINE OR VERY FINE SANDS; NO MORE THAN 15% SILT AND CLAY WITH 2% TO 5% CLAY CONTENT. THE ENTIRE MIX MUST THEN BE AMENDED WITH 3 TO 7% ORGANICS, BY WEIGHT.
12. BIORETENTION MEDIA MAY BE CREATED WITH A 70% SAND AND 30% COMPOST MIXTURE IF IT CONFORMS TO THE ABOVE. SAND SHALL AT THE MINIMUM CONFORM TO THE SIEVE ANALYSIS FOR CONCRETE AGGREGATE SAND (ASTM C–33). USGA TEE/GREEN SIEVE GRADATION MIX IS PREFERABLE WHERE AVAILABLE.
13. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF ANY EVIDENCE OF HIGH WATER TABLE, CLAY SOILS, OR POOR DRAINAGE IS OBSERVED AND NO UNDERDRAIN IS SPECIFIED IN THE PLANS.
14. PRIOR TO BACKFILLING, THE CONTRACTOR SHALL SCARIFY NATIVE SOIL TO PROMOTE INFILTRATION INTO UNDERLYING SUBGRADE.
15. CONTRACTOR SHALL OBTAIN ENGINEER APPROVAL PRIOR TO BACKFILLING WITH BIORETENTION MEDIA.
16. THE BIORETENTION MEDIA SHALL BE LEVEL OVER THE NATIVE SUBGRADE TO ENSURE PROPER DRAINAGE.
17. ALL BIORETENTION MEDIA SHALL BE PLACED FROM THE SIDES OF THE FACILITIES, AND IN NO EVENT SHALL ANY TRACKED OR WHEELED EQUIPMENT BE PERMITTED TO CROSS EXCAVATED SECTIONS.
18. THE CONTRACTOR SHALL INSTALL THE OVERFLOW PIPE IF SPECIFIED IN SITE PLANS PRIOR TO BACKFILLING WITH BIORETENTION MEDIA.

PLANTING AND LANDSCAPING CONSTRUCTION NOTES:

1. THE LANDSCAPE ARCHITECT OR ENGINEER SHALL INSPECT ALL PLANTING AREAS BEFORE ANY TOPSOILING OR PLANTING IS BEGUN TO ENSURE THAT ADEQUATE DRAINAGE EXISTS. IF ANY AREAS TO BE LANDSCAPED SHOW EVIDENCE OF POOR DRAINAGE, THE LANDSCAPE ARCHITECT SHALL NOTIFY THE OWNER IMMEDIATELY FOR CORRECTIVE ACTION
2. THE LANDSCAPE ARCHITECT OR ENGINEER SHALL APPROVE ALL PLANT MATERIAL AND STAKED PLANT LOCATIONS PRIOR TO INSTALLATION.
3. ALL PLANT MATERIALS SHALL CONFIRM TO THE AMERICAN ASSOCIATION OF NURSERYMEN'S AMERICAN STANDARD FOR NURSERY STOCK (LATEST EDITION)
4. ALL PLANT MATERIAL SHALL BE PLACED IN CONTINUOUS MULCHED BEDS 4" IN DEPTH. MULCH SHALL BE TRIPLE SHREDDED HARDWOOD OR APPROVED ALTERNATIVE.
5. ALL PLANT MATERIAL SHALL BE AS SPECIFIED AND SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS AND COMMENTS NOTED ON THE DRAWINGS.
6. THE CONTRACTOR SHALL PROVIDE THE TOPSOIL FOR PLANTING ACCORDING TO THE PLANS AND DETAILS.
7. PREPARED TOPSOIL FOR BACKFILLING AROUND TREE BALLS SHALL BE A MIXTURE OF VOLUME OF THE FOLLOWING MATERIALS IN QUANTITIES SPECIFIED: 1/3 COMPOST, 2/3 TOPSOIL BY VOLUME.
8. SEED ALL REMAINING GRASS AREAS WITH TURF TYPE FALL FESCUE AND PERENNIAL RYEGRASS BLEND (LOFTS – SUMMER STRESS MIX II OR APPROVED EQUIVALENT). INSTALL AT A RATE OF 350 LBS. PER ACRE PER MANUFACTURERS SPECIFICATIONS.
9. ANY UNDISTURBED AREA ON WHICH ACTIVITY HAS CEASED AND WHICH WILL REMAIN EXPOSED FOR MORE THAN 10 DAYS MUST BE SEEDED AND MULCHED IMMEDIATELY. DURING NON–GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE REQUIRED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR SHALL BE SEEDED AND MULCHED WITH A QUICK GROWING TEMPORARY SEEDING MIXTURE AND MULCH. DISTURBED AREAS WHICH ARE EITHER AT FINISHED GRADE OR WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE SEEDED AND MULCHED WITH A PERMANENT SEED MIXTURE AND MULCH.
10. DIVERSIONS, CHANNELS, SEDIMENTATION BASINS, SEDIMENT TRAPS, AND STOCKPILES MUST BE SEEDED AND MULCHED IMMEDIATELY.
11. GRADED AREAS SHALL BE TEMPORARILY SEEDED AND MULCHED IMMEDIATELY FOLLOWING EARTH MOVING PROCEDURES. TEMPORARY SEED SHALL BE ANNUAL RYE GRASS APPLIED AT A RATE OF 3 LBS. PER 1000 SQ. FT.
12. AFTER SEEDING, HAY OR STRAW MULCH MUST BE APPLIED AT A RATE OF AT LEAST 3.0 TONS PER ACRE. MULCH SHALL BE ANCHORED BY EITHER CRIMPING WITH A COULTER IMPLEMENT, OR BY STAPLING BIODEGRADABLE NETTING TO THE SURFACE.
13. SITE PREPARATION TO UPLAND AREAS: APPLY 1 TON OF AGRICULTURAL–GRADE LIMESTONE PER ACRE PLUS 10–20–10 FERTILIZER AT THE RATE OF 500 LB. PER ACRE. WORK IN WHERE POSSIBLE. SEEDING OF DISTURBED UPLAND AREAS (BEYOND LIMITS OF RIPARIAN ENHANCEMENT AREA) TO BE DONE USING MIX OF FINE FESCUE AT 35 LBS/ACRE (PURE LIVE SEED) PLUS PERENNIAL RYEGRASS AT 15 LBS/ACRE (PURE LIVE SEED).
14. TOPSOIL SHALL BE A CLEAN FRIABLE LOAM WITH SUFFICIENT ORGANIC CONTENT (2.75%) TO PROMOTE PLANT VIGOR. AMENDMENTS SHALL BE ADDED AS NEEDED TO IMPROVE DEFICIENT SOILS. TOPSOIL SHALL BE RETURNED AT A LOOSE DEPTH OF FIVE INCHES TO ALLOW FOR SETTLEMENT.
15. ESTABLISH PERMANENT SEEDING AS SOON AS POSSIBLE AFTER FINAL GRADING IS COMPLETE. PERMANENT SEEDING SHALL BE SEED MIXTURE SPECIFIED.
16. NATIVE SHRUBS, TREES, HERBACEOUS PLANTS, AND SEED ARE AVAILABLE AT PINELANDS NURSERY AND SUPPLY, PLEASANT RUN NURSERY, OR PREFERRED SUPPLIER.

QUANTITY ESTIMATES		
Rain Garden		Quantity
Excavation *(CY)*		11
Bioretention Soil	Concrete Sand *(CY)*	5
	Compost (CY)	2
Mulch *(CY)*		4
3-5" River Stone *(Tons)*		1
Landscape Fabric *(SF)*		29
Plants	Perennials	44
	Shrubs	19

PLANTING SCHEDULE					
PLANT SPECIES				QUANTITY	SIZE
TYPE	KEY	BOTANICAL NAME	COMMON NAME		
RAIN GARDEN					
PERENNIALS	BA	*Baptisia australis*	BLUE FALSE INDIGO	7	#1 CONT.
	CV	*Coropsis verticillata 'Zagreb'*	THREADLEAF COREOPSIS	13	#2 CONT.
	EC	*Eupatorium coelestinum*	BLUE MIST FLOWER	9	#2 CONT.
	IV	*Iris versicolor*	BLUE FLAG IRIS	6	#2 CONT.
	SS	*Schizachyrium scoparium 'The Blues'*	LITTLE BLUESTEM	9	#2 CONT.
SHRUBS	AM	*Aronia melanocarpa 'Low Scape Mound'*	BLACK CHOKEBERRY	9	#3 CONT.
	AU	*Arctostaphylos uva-ursii 'Massachusetts'*	BEARBERRY	10	#1 CONT.

STORMWATER CALCULATIONS*									
GREEN INFRASTRUCTURE PRACTICE	SMP SIZE (SF)	STORAGE VOLUME (CF)	TOTAL IMPERVOUS DRAINAGE AREA (SF)	STORM TYPE	MANAGED IMPERVIOUS DRAINAGE AREA MANAGED (SF)	TOTAL AREA MANAGED INCLUDING SMP (SF)	PEAK RUNOFF REDUCTION (CFS)	RUNOFF VOLUME MANAGED (GAL)	ANNUAL RUNOFF VOLUME MANAGED (GAL/YR)
RAIN GARDEN	245	180	695	WQ (1.25")	695	940	0.05	471	16,116
				2–YR (3.34")	695	940	0.07	1,578	

*CALCULATIONS ARE PERFORMED USING THE SCS METHODOLOGY USING HYDROCAD. CALCULATIONS LOOK AT A PRE-INSTALLATION AND POST-INSTALLATION CASE TO DETERMINE MANAGED VALUES. AN APPROPRIATE CN IS USED IN THE PRE-CASE FOR THE GRASSED AREA. ALL IMPERVIOUS COVER IS ASSUMED A CN OF 98 AND THE RAIN GARDEN IS ASSUMED 98 IN THE POST CASE. AN ANNUAL RAINFALL OF 45 INCHES IS ASSUMED, AND THE ANNUAL RUNOFF VALUE IS APPROXIMATED ASSUMING ALL STORMS OCCUR AS WATER QUALITY STORMS AND 95% ARE CAPTURED.

POLLUTANT REMOVALS		
TOTAL PHOSPHORUS (LB/YR)	TOTAL NITROGEN (LB/YR)	TOTAL SUSPENDED SOLIDS REMOVED (LB/YR)
0.01	0.05	1.72

CHRISTOPHER C. OBROPTA, Ph.D., P.E.
PROFESSIONAL ENGINEER - NJ LICENSE # 37532

DATE 09/28/23

PLAN REVISIONS		
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BIORETENTION SYSTEM IMPLEMENTATION PROJECT
599 WARREN STREET, HACKETTSTOWN
WARREN COUNTY, NJ

RAIN GARDEN AND PLANTING DETAILS

RUTGERS New Jersey Agricultural Experiment Station

14 COLLEGE FARM ROAD, NEW BRUNSWICK, NJ

SHEET NAME
DT-1