HOPE TOWNSHIP SCHOOL **RAIN GARDEN IMPLEMENTATION PROJECT** 320 JOHANSONBURG ROAD, HOPE TOWNSHIP WARREN COUNTY, NEW JERSEY **BLOCK: 2700 LOT: 700**

PROJECT DESCRIPTION:

A RAIN GARDEN (460 S.F.) IS TO BE INSTALLED ON THE EASTERN SIDE TO HELP CAPTURE, FILTER, AND INFILTRATE STORMWATER RUNOFF FROM THE ROOF (795 S.F.)

LIST OF DRAWINGS:

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

GENERAL NOTES:

- 1. SURVEY CONDUCTED BY RUTGERS COOPERATIVE EXTENSION WATER RESOURCES PROGRAM. ALL ELEVATIONS ARE RELATIVE TO THE 100.00' BENCHMARK POINT.
- 2. EXISTING SOILS ARE UDORTHENTS 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). INFILTRATION TEST REQUIRED PRIOR TO MOBILIZATION.
- 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

LOCATION MAP (N.T.S):

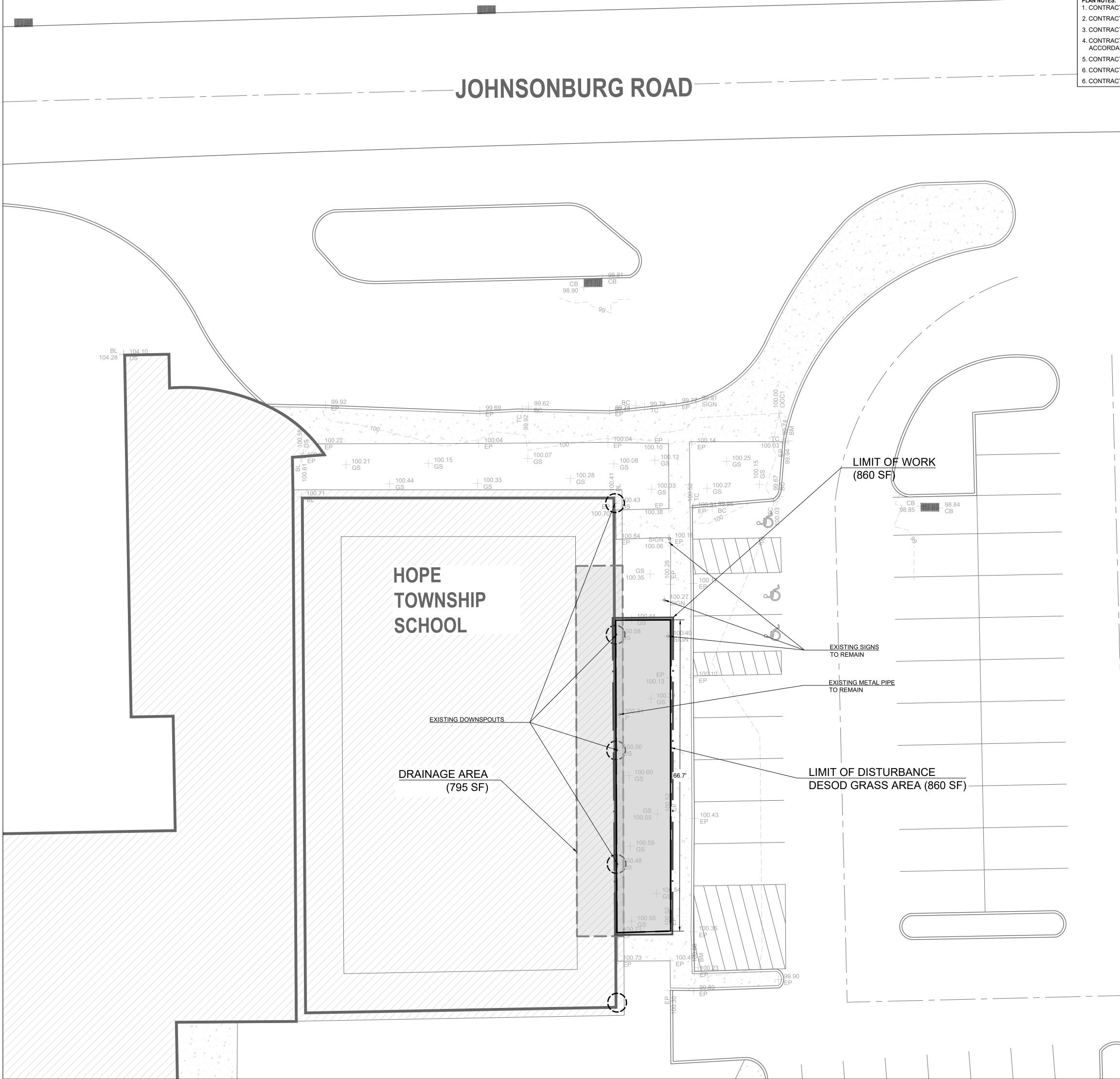


LEGEND:

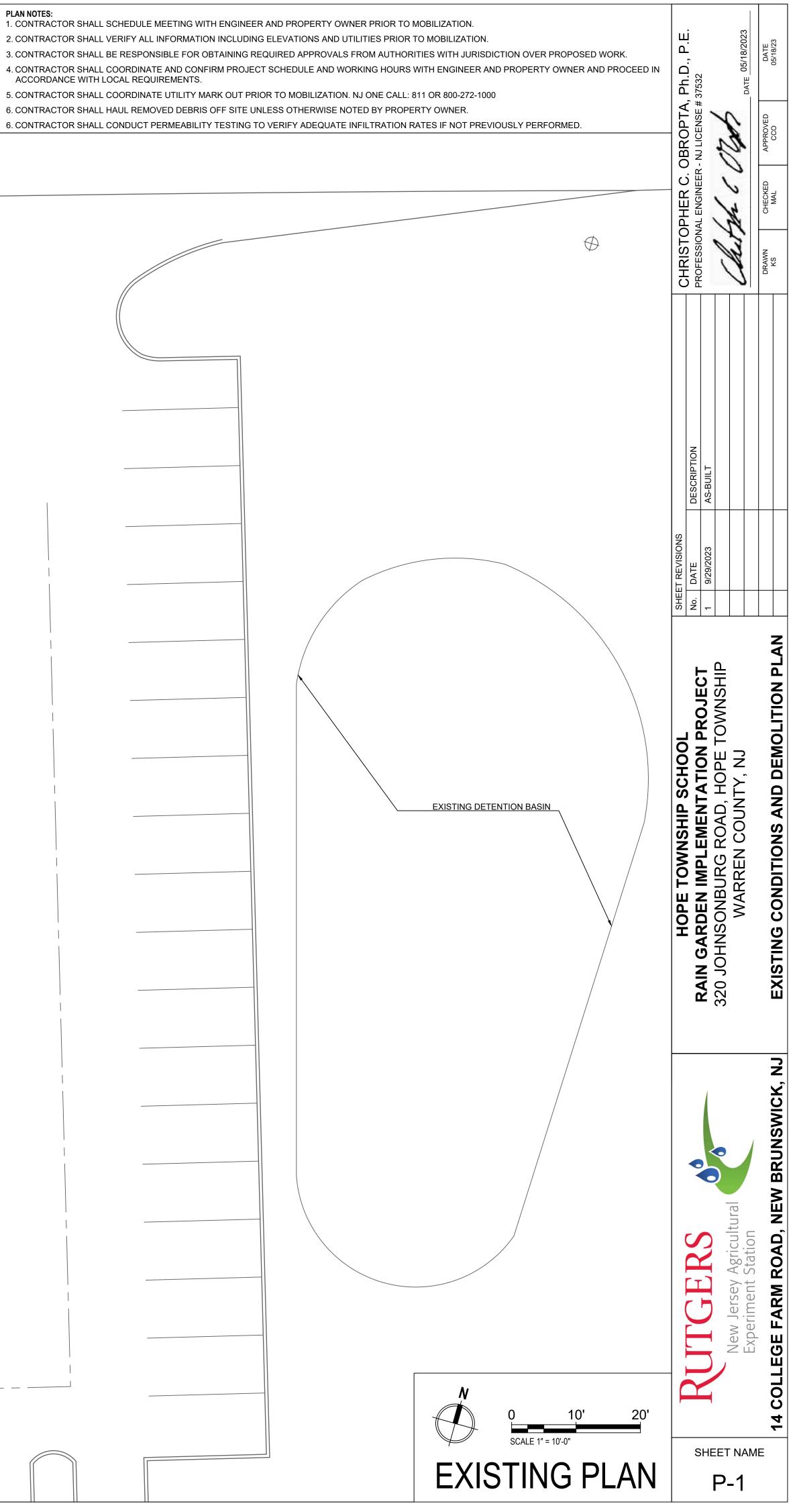
	EXISTING DRAINAGE AREA
	EDGE OF PAVEMENT
<u> </u>	EXISTING CENTERLINE
<u> </u>	EXISTING FENCE
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	EXISTING TREELINE
	EXISTING TREE/SHRUB
	EXISTING BUILDING
$\oplus$	EXISTING UTILITY POLE
بلا: ا	EXISTING LIGHT POLE
	EXISTING CATCH BASIN
100-1	EXISTING CONTOURS
	EXISTING SPOT ELEVATIONSSPOT ELEVATION CODES: BL - BUILDING LINE CB - CATCH BASINGS - GROUND SHOT MH - MANHOLE 
· · · · · · · ·	PROPERTY LINES
	PROPOSED GREEN INFRASTRUCTURE
<b>— ТОВ</b> ТОВ	PROPOSED TOP OF BERM
100	PROPOSED CONTOURS

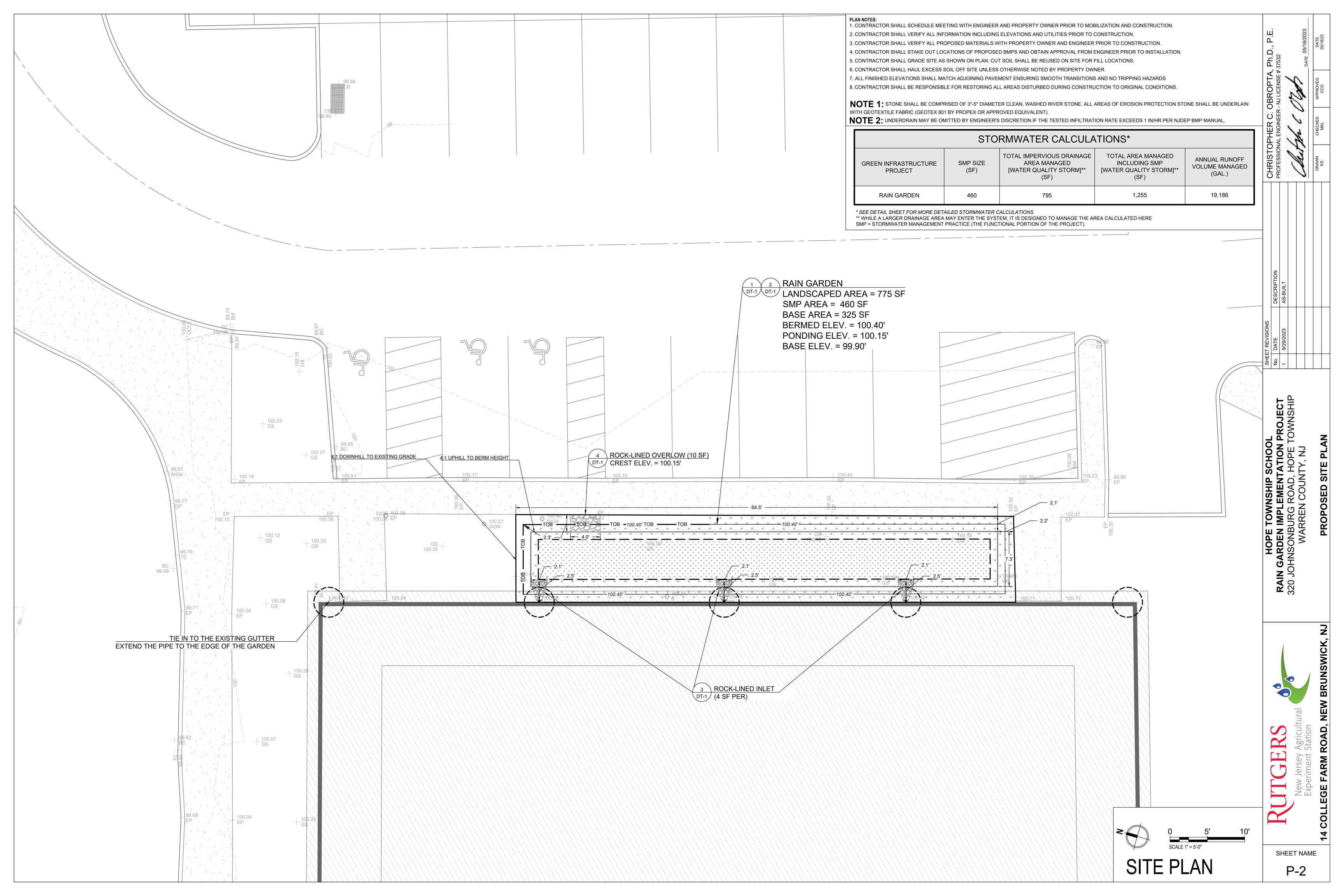
	PLAN REVISIONS	
REV. DATE	REV. SUMMARY	REV. SHEETS
9/29/2023	AS-BUILT	COVER, P-1, P-2, P-3, DT-1

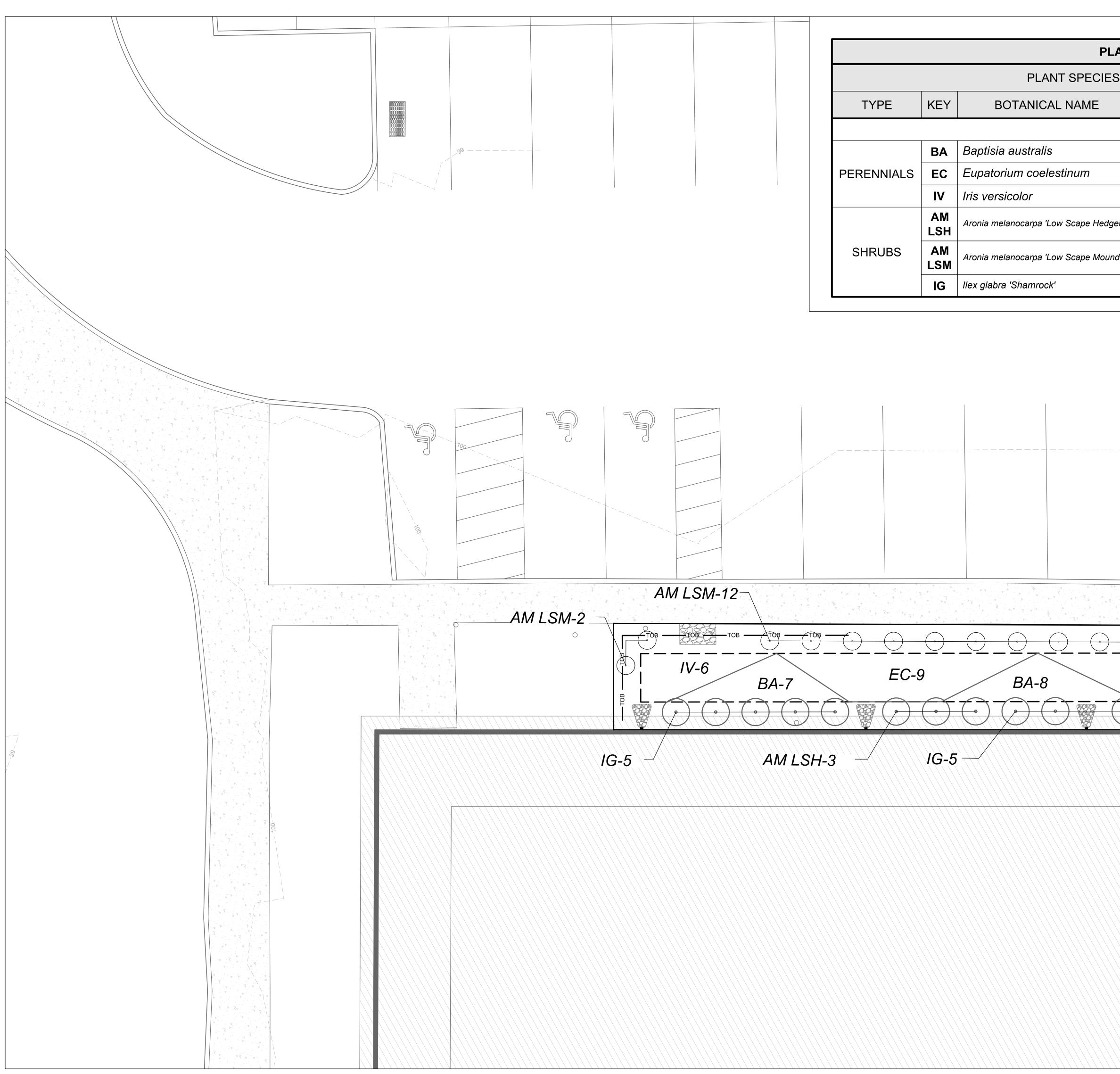
C			No. DATE	DESCRIPTION	PROFESSIONAL	I ENGINEER - N	PROFESSIONAL ENGINEER - NILLICENSE # 37532	
			1 9/29/2023	AS-BUILT				
)\		320 JOHNSONBURG ROAD, HOPE TOWNSHIP			101	110	2 4	
	Z New Jersey Agricultural	WARREN COUNTY, NJ			( Mult	nº c C	10	05/18/2022
	Experiment Station						DATE	DATE USI 10/2023
					DRAWN	CHECKED	APPROVED	DATE
	14 COLLEGE FARM ROAD, NEW BRUNSWICK, NJ	COVER SHEET			2		0000	62/81/c0



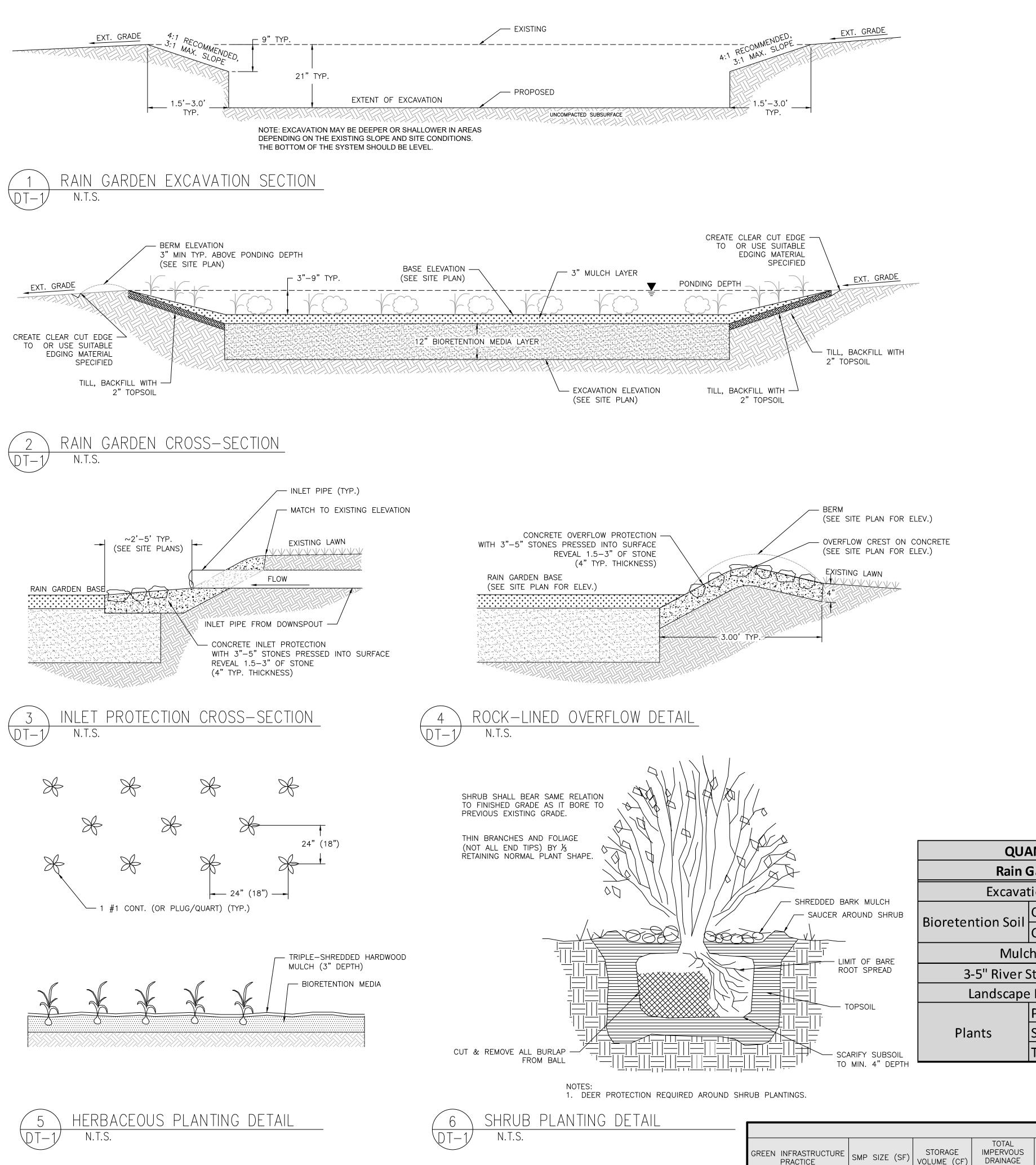
### PLAN NOTES:







			PLAN	TING SCHEDULE			h.D., P.E. 32 TE
			PLANT SPECIES				, Ph.D
	TYPE	KEY	BOTANICAL NAME	COMMON NAME	QUANTITY	SIZE	CHRISTOPHER C. OBROPTA, Ph.D., P.E PROFESSIONAL ENGINEER - NJ LICENSE # 37532
				AIN GARDEN			OBROI R - NJ LICE
		BA	Baptisia australis	FALSE BLUE INDIGO	15	#1 CONT.	ER C.
	PERENNIALS	EC	Eupatorium coelestinum	BLUE MISTFLOWER	9	#2 CONT.	
		IV	Iris versicolor	BLUE FLAG IRIS	12	#2 CONT.	HRIST OFESSIOI
		AM LSH	Aronia melanocarpa 'Low Scape Hedger'	BLACK CHOKEBERRY	3	#3 CONT.	
	SHRUBS	AM LSM	Aronia melanocarpa 'Low Scape Mound'	BLACK CHOKEBERRY	14	#3 CONT.	
		IG	llex glabra 'Shamrock'	INKBERRY HOLLY	10	#3 CONT.	
							PE TOWNSHIP SCHOOL SHEET REVISIC   DEN IMPLEMENTATION PROJECT No. DATE   DNBURG ROAD, HOPE TOWNSHIP 1 9/29/2023   WARREN COUNTY, NJ 9/29/2023
IG-5 IV-6 BA-7 BA-7 AM LSH	EC-9	9 • • •					HC RAIN GARD 320 JOHNSO
							Rundersey Agricultural Cariment Station



#### GENERAL CONSTRUCTION NOTES:

- 1. REFER TO SITE PLAN FOR ALL ELEVA
- 2. ALL WORK MUST MEET THE STANDARE 3. THE APPROVAL OF MATERIALS SHALL
- 4. THE CONTRACTOR SHALL HAVE A PRE 5. THE CONTRACTOR SHALL VERIFY ALL 6. THE CONTRACTOR SHALL PERFORM RE
- INFILTRATION CAPABILITIES FOR SYSTE PROJECT ENGINEER SHALL BE PRESE 50 % OF THE HYDRAULIC CONDUCTIVI
- 7. THE CONTRACTOR SHALL NOTIFY THE SPECIFICATIONS OR IF, IN THE CONTR
- 8. THE CONTRACTOR SHALL PERFORM AL VERSION. 9. THE CONTRACTOR SHALL AVOID DISTU
- MUST BE COORDINATED WITH THE PRO 10. THE CONTRACTOR IS TO RESTORE ALL 11. THE CONTRACTOR SHALL HAVE ALL U ENGINEER.
- 12. THE CONTRACTOR SHALL ESTABLISH 13. THE CONTRACTOR SHALL AVOID OVER 14. THE CONTRACTOR SHALL VERIFY THAT EROSION OR POTENTIAL PONDING SHA
- 15. THE CONTRACTOR SHALL DISCUSS AN 16. THE CONTRACTOR SHALL EXCAVATE T

#### RAIN GARDEN CONSTRUCTION NOTES:

- 1. RIVER STONE PROTECTION DIMENSIONS 2. RIVER STONE PROTECTION SHALL SLO
- INLET AND OUTLET PROTECTION SHALL
- 4. INLETS AND OUTLETS SHALL NOT INHI 5. 3-5 INCH RIVER STONE SHALL BE U
- RAIN GARDEN SHALL BE CONSTRUCTE 7. NON-DYED, TRIPLE-SHREDDED HARDW
- 8. PLANTING OF RAIN GARDEN AND SLOP 9. MAX COVER OVER TOP OF PIPES IF
- 10. THE CONTRACTOR SHALL EXCAVATE L SHALL BE AT A 4:1 SLOPE RECOMME DEPTH.
- 11. THE SOIL BED MATERIAL MUST CONSI
- SANDS; NO MORE THAN 15% SILT AN 12. BIORETENTION MEDIA MAY BE CREATED
- THE SIEVE ANALYSIS FOR CONCRETE 13. CONTRACTOR SHALL NOTIFY ENGINEER
- SPECIFIED IN THE PLANS. 14. PRIOR TO BACKFILLING, THE CONTRAC
- 15. CONTRACTOR SHALL OBTAIN ENGINEER
- 16. THE BIORETENTION MEDIA SHALL BE 17. ALL BIORETENTION MEDIA SHALL BE
- CROSS EXCAVATED SECTIONS. 18. THE CONTRACTOR SHALL INSTALL THE

#### PLANTING AND LANDSCAPING CONSTRUCTION

- 1. THE LANDSCAPE ARCHITECT OR ENGIN EXISTS. IF ANY AREAS TO BE LANDSC ACTION
- 2. THE LANDSCAPE ARCHITECT OR ENGIN
- 3. ALL PLANT MATERIALS SHALL CONFIRM 4. ALL PLANT MATERIAL SHALL BE PLACE
- 5. ALL PLANT MATERIAL SHALL BE AS S
- 6. THE CONTRACTOR SHALL PROVIDE THI
- 7. PREPARED TOPSOIL FOR BACKFILLING 2/3 TOPSOIL BY VOLUME.
- 8. SEED ALL REMAINING GRASS AREAS W INSTALL AT A RATE OF 350 LBS. PER 9. ANY UNDISTURBED AREA ON WHICH A
- DURING NON-GERMINATING PERIODS, REDISTURBED WITHIN 1 YEAR SHALL EITHER AT FINISHED GRADE OR WILL 10. DIVERSIONS, CHANNELS, SEDIMENTATIO
- 11. GRADED AREAS SHALL BE TEMPORARII APPLIED AT A RATE OF 3 LBS. PER
- 12. AFTER SEEDING, HAY OR STRAW MULC COULTER IMPLEMENT, OR BY STAPLING 13. SITE PREPARATION TO UPLAND AREAS
- WORK IN WHERE POSSIBLE. SEEDING 35 LBS/ACRE (PURE LIVE SEED) PLU
- 14. TOPSOIL SHALL BE A CLEAN FRIABLE
- IMPROVE DEFICIENT SOILS. TOPSOIL S 15. ESTABLISH PERMANENT SEEDING AS S
- 16. NATIVE SHRUBS, TREES, HERBACEOUS

	_
SHREDDED BARK MULCH	
SAUCER AROUND SHRUB	
SON GOOD	
LIMIT OF BARE	_
ROOT SPREAD	
	_

QUANTITY ESTIMATES						
Rain Garden Quantity						
Excava	24					
Bioretention Soil	Concrete Sand (CY)	10				
bioretention son	Compost (CY)	4				
Mulo	8					
3-5" River S	Stone (Tons)	1.0				
Landscape	Fabric <i>(SF)</i>	36				
Perennials		36				
Plants	Shrubs	27				
	Trees	0				

	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	460	232	795	WQ (1.25")	795	1,255	0.06	561	19,186
		202	,	2-YR (3.34")	795	1,255	0.08	1,975	

*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.

TIONS, INVERTS, DIMENSIONS, AND SHAPE OF THE PROJECT. DS OF THE ENGINEER BEFORE PAYMENT. ADDITIONAL WORK AND TESTING WILL BE NECESSARY IF STANDARDS ARE NOT SUFFICED. BE DONE BY THE PROJECT ENGINEER/LANDSCAPE ARCHITECT. CONSTRUCTION MEETING WITH THE PROJECT ENGINEER PRIOR TO ANY WORK ON SITE. INFORMATION PRIOR TO MOBILIZATION INCLUDING ELEVATIONS AND LOCATIONS OF EXISTING UTILITIES. EQUIRED TESTING TO DETERMINE SOIL PERMEABILITY AND SEASONAL HIGH WATER TABLE ELEVATION AT THE SITE TO VERIFY MS DESIGNED TO INFILTRATE. TESTING SHALL BE DONE PRIOR TO EXCAVATION AND INSTALLATION OF THE PROPOSED PROJECTS. IN DURING TESTING AND SHALL BE INFORMED OF THE RESULTS. THE TESTED INFILTRATION RATE SHALL BE AT LEAST 0.5 IN/HR OR ITY (D3385). ENGINEER IMMEDIATELY IF ANY FIELD CONDITIONS DIFFER MATERIALLY FROM THOSE REPRESENTED ON THESE DRAWINGS AND THE ACCTOR'S OPINION, SAD CONDITIONS CONFLICT WITH THE DESIGNS SHOWN HEREON. LL WORK IN CONFORMANCE WITH THE NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2019 OR LATEST WRBING EXISTING AREAS OUTSIDE SPECIFIED LIMIT OF WORK. ANY DISTURBANCE TO SIDEWALKS, LANDSCAPED VEGETATION, AND TREES OPERTY OWNER. L DISTURBED AREAS OUTSIDE SPECIFIED LIMIT OF WORK. ANY DISTURBANCE TO SIDEWALKS, LANDSCAPED VEGETATION, AND TREES COPERTY OWNER. L DISTURBED AREAS OUTSIDE PROPOSED CHANGES TO ORIGINAL CONDITIONS AFTER INSTALLATION. TILLITIES MARKED BEFORE ANY EXCAVATION. IF ANY UTILITIES INTERFERE WITH THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE ALL ELEVATIONS AND LINES AS SHOWN IN THE SITE PLAN FOR REVIEW BY THE ENGINEER BEFORE ANY CONSTRUCTION BEGINS. COMPACTING THE EXISTING MATERIALS IN ORDER TO AVID POOR INFILTRATION ON SHORT LIFTIME OF THE SYSTEM. I THE SUBGRAPE IS CONSISTENT WITH UNE, CRADE, AND ELEVATIONS AS INDICATED IN THE SITE PLAN. ANY AREAS SHOWING ALL BE REGRADED BEFORE SUBBASE INSTALLATION. I THE ELEVATIONS ON THE SITE PLAN AND DISPOSE OF ANY EXCESS MATERIALS. S ARE TYPICAL AND MAY VARY PER SITE. CONSULT THE ENGINEER AND SITE PLAN FOR DIMENSIONS ON A PER SITE BASIS. JPE								DATE	KS MAL APPROVED DATE CCO 05/18/23
PRESENT IS 4 FT OWER THAN THE ENDED TO BASE E IST OF THE FOLLO ID CLAY WITH 2% D WITH A 70% S/ AGGREGATE SAND R IMMEDIATELY IF CTOR SHALL SCAR R APPROVAL PRIO LEVEL OVER THE PLACED FROM THE PLACED FROM THE ON NOTES: NEER SHALL INSP CAPED SHOW EVID NEER SHALL APPF M TO THE AMERIC ED IN CONTINUOU SPECIFIED AND SH	C UNLES BASE EI ELEVATIO OWING M TO 5% AND ANE O (ASTM ANY EV RIFY NAT OR TO B/ NATIVE E SIDES C IF SPE EECT ALL DENCE O ROVE ALI CAN ASS JS MULC IALL BE	N WITH A 3:1 SLOPE MAXIMUM MIX, BY WEIGHT: 85 TO 95% SA CLAY CONTENT. THE ENTIRE M D 30% COMPOST MIXTURE IF IT C-33). USGA TEE/GREEN SIE IDENCE OF HIGH WATER TABLE, IVE SOIL TO PROMOTE INFILTRA ACKFILLING WITH BIORETENTION SUBGRADE TO ENSURE PROPER OF THE FACILITIES, AND IN NO CIFIED IN SITE PLANS PRIOR TO PLANTING AREAS BEFORE ANY OF POOR DRAINAGE, THE LANDSO L PLANT MATERIAL AND STAKED OCIATION OF NURSERYMEN'S AN CHED BEDS 4" IN DEPTH. MULC	PEPTH SHOWN ON THE SITE PLAN WHERE 4:1 IS NOT FEASIBLE TH ND, WITH NO MORE THAN 25% ( IX MUST THEN BE AMENDED WITH CONFORMS TO THE ABOVE. SAN VE GRADATION MIX IS PREFERAB CLAY SOILS, OR POOR DRAINAG TION INTO UNDERLYING SUBGRAD MEDIA. DRAINAGE. DEVENT SHALL ANY TRACKED OF D BACKFILLING WITH BIORETENTIO D BACKFILLING WITH BIORETENTIO D BACKFILLING OR PLANTING IS BE CAPE ARCHITECT SHALL NOTIFY T PLANT LOCATIONS PRIOR TO INS MERICAN STANDARD FOR NURSER' H SHALL BE TRIPLE SHREDDED TH THE DETAILS AND COMMENTS	HEN A VERTICAL D OF THE SAND AS H 3 TO 7% ORGAN ID SHALL AT THE LE WHERE AVAILAE E IS OBSERVED AN E. R WHEELED EQUIPN N MEDIA. GUN TO ENSURE THE OWNER IMMED STALLATION. Y STOCK (LATEST HARDWOOD OR AP	ROP TO EXCAVATION FINE OR VERY FINE VICS, BY WEIGHT. MINIMUM CONFORM TO BLE. ND NO UNDERDRAIN IS MENT BE PERMITTED TO THAT ADEQUATE DRAINAGE VATELY FOR CORRECTIVE EDITION) PROVED ALTERNATIVE.	PLAN REVISIONS No. DATE DESCRIPTION	HIP 1 9/29/2023 AS		AILS
AROUND TREE BALLS SHALL BE A MIXTURE OF VOLUME OF THE FOLLOWING MATERIALS IN QUANTITIES SPECIFIED: 1/3 COMPOST, WITH TURF TYPE FALL FESCUE AND PERENNIAL RYEGRASS BLEND (LOFTS – SUMMER STRESS MIX II OR APPROVED EQUIVALENT). R ACRE PER MANUFACTURERS SPECIFICATIONS. ACTIVITY HAS CEASED AND WHICH WILL REMAIN EXPOSED FOR MORE THAN 10 DAYS MUST BE SEEDED AND MULCHED IMMEDIATELY. MULCH MUST BE APPLIED AT THE REQUIRED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE BE SEEDED AND MULCHED WITH A QUICK GROWING TEMPORARY SEEDING MIXTURE AND MULCH. DISTURBED AREAS WHICH ARE NOT BE REDISTURBED WITHIN 1 YEAR MUST BE SEEDED AND MULCHED WITH A PERMANENT SEED MIXTURE AND MULCH. DN BASINS, SEDIMENT TRAPS, AND STOCKPILES MUST BE SEEDED AND MULCHED IMMEDIATELY. LY SEEDED AND MULCHED IMMEDIATELY FOLLOWING EARTH MOVING PROCEDURES. TEMPORARY SEED SHALL BE ANNUAL RYE GRASS 1000 SQ. FT. CH MUST BE APPLIED AT A RATE OF AT LEAST 3.0 TONS PER ACRE. MULCH SHALL BE ANCHORED BY EITHER CRIMPING WITH A G BIODEGRADABLE NETTING TO THE SURFACE. S: APPLY 1 TON OF AGRICULTURAL-GRADE LIMESTONE PER ACRE PLUS 10–20–10 FERTILIZER AT THE RATE OF 500 LB. PER ACRE. G OF DISTURBED UPLAND AREAS (BEYOND LIMITS OF RIPARIAN ENHANCEMENT AREA) TO BE DONE USING MIX OF FINE FESCUE AT JS PERENNIAL RYEGRASS AT 15 LBS/ACRE (PURE LIVE SEED). LOAM WITH SUFFICIENT ORGANIC CONTENT (2.75%) TO PROMOTE PLANT VIGOR. AMENDMENTS SHALL BE ADDED AS NEEDED TO SHALL BE RETURNED AT A LOOSE DEPTH OF FIVE INCHES TO ALLOW FOR SETLEMENT. SOON AS POSSIBLE AFTER FINAL GRADING IS COMPLETE. PERMANENT SEEDING SHALL BE SEED MIXTURE SPECIFIED. S PLANTS, AND SEED ARE AVAILABLE AT PINELANDS NURSERY AND SUPPLY, PLEASANT RUN NURSERY, OR PREFERRED SUPPLIER.							320 JOHNSONBURG ROAD, HOPE TOWNS		RAIN GARDEN AND PLANTING DETA
		PLA	NTING SCHEDULE						
PLANT SPECIES QUANTITY SIZE									R
TYPE	KEY	BOTANICAL NAME	COMMON NAME						
PERENNIALS	BA EC IV	Baptisia australis Eupatorium coelestinum Iris versicolor	RAIN GARDEN FALSE BLUE INDIGO BLUE MISTFLOWER BLUE FLAG IRIS	15 9 12	#1 CONT. #2 CONT. #2 CONT.		,0,0		<b>N BRUNSWICK</b>
	AM LSH	Aronia melanocarpa 'Low Scape Hedger'	BLACK CHOKEBERRY	3	#3 CONT.		) Iltural		), NEW
SHRUBS	AM LSM	Aronia melanocarpa 'Low Scape Mound'	BLACK CHOKEBERRY	14	#3 CONT.		Agricu	Station	ROAD,
	IG	llex glabra 'Shamrock'	INKBERRY HOLLY	10	#3 CONT.			nent S	RM R

	POLLUTANT REMOVALS										
тот	AL PHOSPHORUS (LB/YR)	TOTAL NITROGEN (LB/YR)	TOTAL SUSPENDED SOLIDS REMOVED (LB/YR)								
	0.02	0.12	3.29								

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COLLEGE

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SHEET NAME

DT-1