

### DRY WELL SPECS AND MAINTENANCE

Material	Specification
Stone	VDOT No. 57
Observation Well/Overflow	Install a vertical 4 or 6-inch Schedule 40 PVC perforated pipe, with a pop-up emitter and anchor plate. Pipe perforations are 3/8 inches at 6 inches on center.
Anchor Plate	Install a 6" square metal plate for installations with 4" PVC pipe. Install an 8" square plate for installations with 6" PVC pipe.
Surface Cover	Install a 3-inch layer of river stone or pea gravel. Turf is acceptable when there is subsurface inflow (e.g., a roof leader).
Filter Fabric	Must be installed on the dry well sides. When turf is used as a surface cover, fabric shall be installed along the top between the stone layer and the surface cover. Use non-woven polypropylene geotextile with a flow rate of > 110 gallons/min./sq. ft. (e.g., Geotex 351 or equivalent).
Cleanout	Threaded metal rod with plate at the end installed in the observation well to facilitate cleanout.

Below is the standard maintenance schedule for dry wells to be included on plans. If a manufactured device is proposed the manufacturer's guidance can be used instead.

Maintenance Activity	Schedule
Remove leaves and debris in gutter at leaf guard.	Annually
Remove leaves and debris from observation well/overflow.	Annually
Inspect the condition of the overflow or pop-up emitter and make sure it is still capped and functioning.	Annually
Inspected and certified by a professional licensed in the State of Virginia.	Once every 5 years

Construction Installation: Projects with only dry wells to meet the sheetflow requirement (no other SWMFs are needed) need to submit a completed dry well construction inspection checklist, photos and materials tickets (Appendix G). The completed checklist does not need to be signed by a professional.

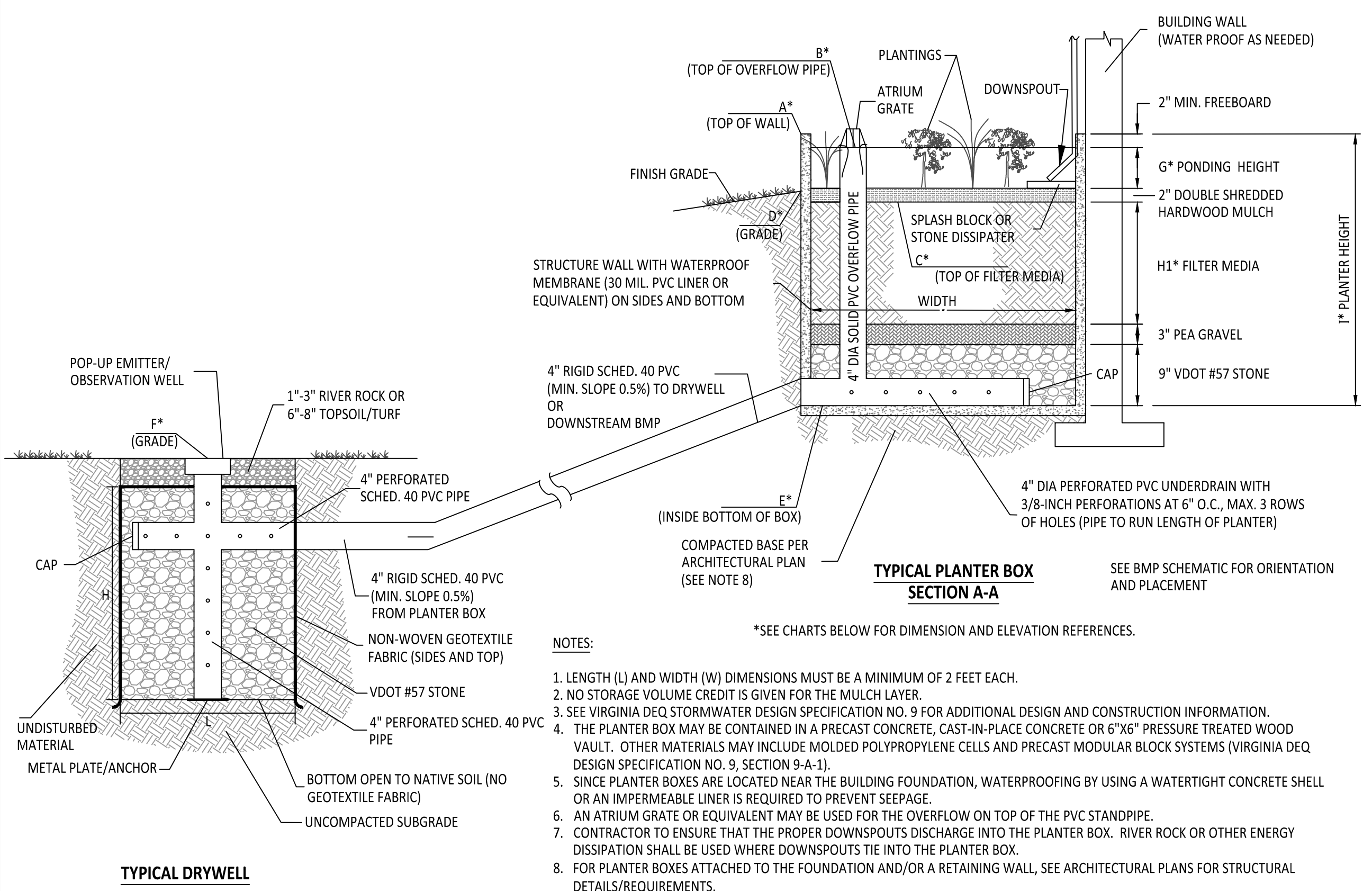
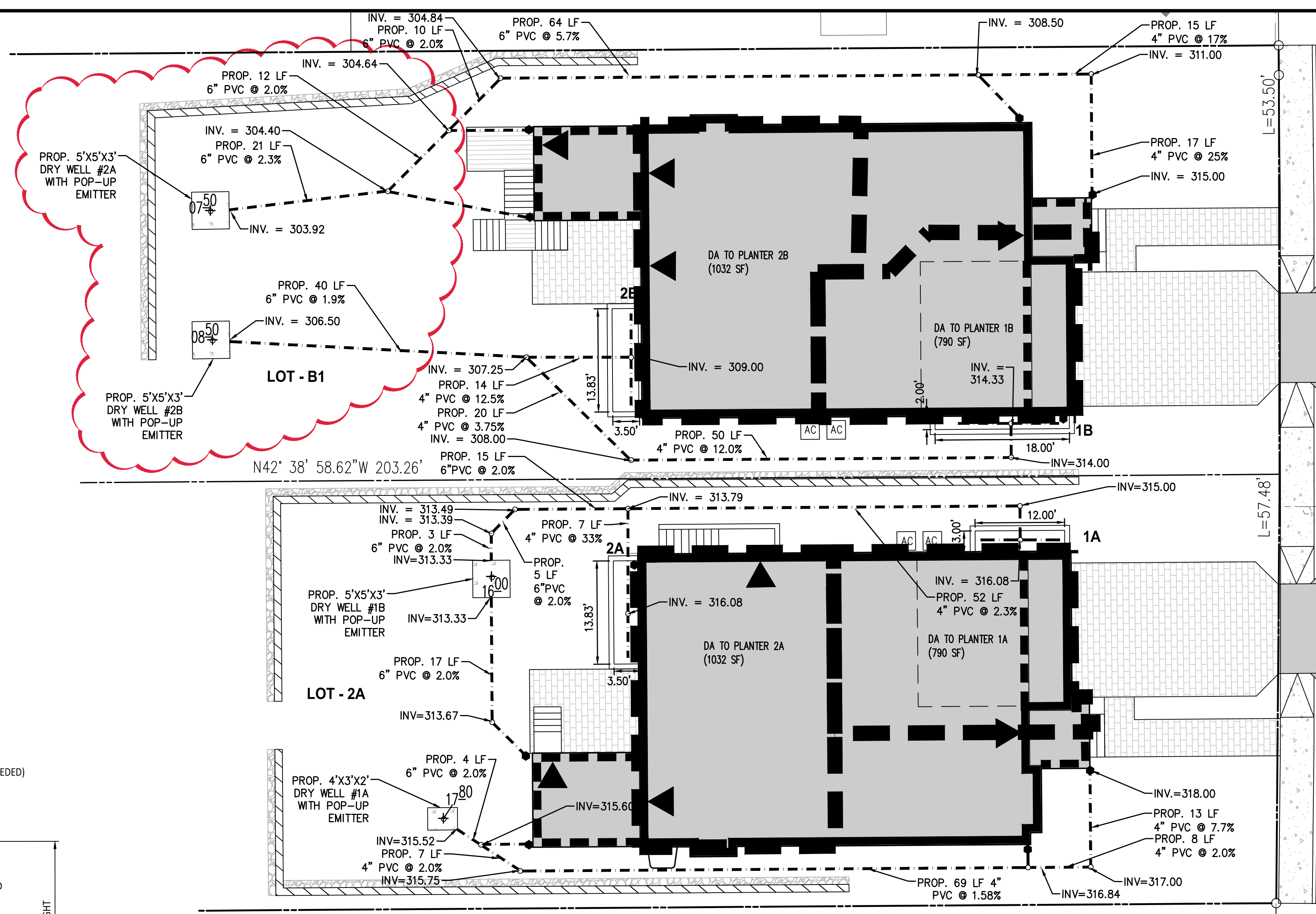
### PLANTER DESIGN

**Planter # 1A**  
 AREA TO URBAN BIORETENTION STORMWATER PLANTER  
 TREAT 1" STORM RUNOFF PER DEQ SPEC. #9  
 TVBMP = 0.95 x 790 SF x 0.0833' = 63 CF  
 SIZE OF THE PLANTER = 36 SF  
 V1 (PONDING DEPTH) = 36 SF X 1" = 36 CF  
 V2 (SOIL MEDIA) = 36 SF X 1.5 X 0.25 (VOIDS) = 13 CF  
 V3 (#57 & PEA GRAVEL) = 36 SF X 1 X 0.4 (VOIDS) = 14 CF  
 TOTAL VOLUME = 63 CF PROVIDED

**Planter # 2A**  
 AREA TO URBAN BIORETENTION STORMWATER PLANTER  
 TREAT 1" STORM RUNOFF PER DEQ SPEC. #9  
 TVBMP = 0.95 x 1032 SF x 0.0833' = 82 CF  
 SIZE OF THE PLANTER = 48.4 SF  
 V1 (PONDING DEPTH) = 48.4 SF X 1" = 48 CF  
 V2 (SOIL MEDIA) = 48.4 SF X 1.5 X 0.25 (VOIDS) = 18 CF  
 V3 (#57 & PEA GRAVEL) = 48.4 SF X 1 X 0.4 (VOIDS) = 19 CF  
 TOTAL VOLUME = 85 CF PROVIDED

**Planter # 1B**  
 AREA TO URBAN BIORETENTION STORMWATER PLANTER  
 TREAT 1" STORM RUNOFF PER DEQ SPEC. #9  
 TVBMP = 0.95 x 790 SF x 0.0833' = 63 CF  
 SIZE OF THE PLANTER = 36 SF  
 V1 (PONDING DEPTH) = 36 SF X 1" = 36 CF  
 V2 (SOIL MEDIA) = 36 SF X 1.5 X 0.25 (VOIDS) = 13 CF  
 V3 (#57 & PEA GRAVEL) = 36 SF X 1 X 0.4 (VOIDS) = 14 CF  
 TOTAL VOLUME = 63 CF PROVIDED

**Planter # 2B**  
 AREA TO URBAN BIORETENTION STORMWATER PLANTER  
 TREAT 1" STORM RUNOFF PER DEQ SPEC. #9  
 TVBMP = 0.95 x 1032 SF x 0.0833' = 82 CF  
 SIZE OF THE PLANTER = 48.4 SF  
 V1 (PONDING DEPTH) = 48.4 SF X 1" = 48 CF  
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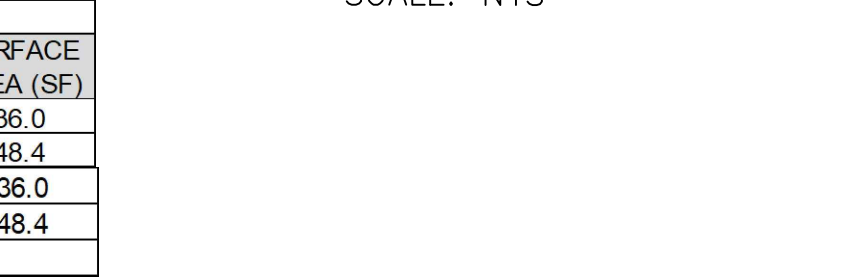
**PLANTER DESIGN DATA**

PLANTER BOX ID	ELEVATIONS						PLANTER DIMENSIONS					
	A	B	C	D	E	F	G (FT)	H1 (FT)	I (FT)	WIDTH (FT)	LENGTH (FT)	SURFACE AREA (SF)
1A	319.91	319.75	318.58	VARIABLES	316.08	316.00	1.00	1.50	3.83	3.00	12.00	36.0
2A	319.91	319.75	318.58	VARIABLES	316.08	316.00	1.00	1.50	3.83	3.50	13.83	48.4
1B	318.16	318.00	316.83	VARIABLES	314.33	306.5	1.00	1.50	3.83	2.00	18.00	36.0
2B	312.83	312.67	311.50	VARIABLES	309.00	306.5	1.00	1.50	3.83	3.50	13.83	48.4

**DRYWELL DESIGN DATA**

DRYWELL NUMBER	DRYWELL SIZING CHART				TOTAL RUNOFF (CF)	DRYWELL VOLUME PROVIDED @ 0.4 VOIDS (CF)	L (FT)	W (FT)	H (FT)	F (ELEV.)	4" INVERT IN (ELEV.)
	PERVIOUS AREA (SF)	UNTREATED ROOF AREA (SF)	ROOF AREA TO PLANTERS (SF)	(25%) PLANTER RUNOFF AFTER RRM (CF)							
1A	0	435	0	0	8	9.6	4	3	2	317.80	315.52
2A	0	187	182	22	22	30.0	5	5	3	316.00	313.33
1B	0	0	1822	22	22	30.0	5	5	3	307.50	303.92
2B	0	573	0	0	11	30.0	5	5	3	308.50	306.50

### ROOF DOWNSPOUT PIPE SCHEMATIC



- SEE SCHEMATIC ON THIS SHEET FOR DOWNSPOUTS THAT ARE TO BE PIPED TO THE DRY WELLS. ROOF GUTTERS SHALL BE SCREENED/COVERED TO PREVENT LARGE DEBRIS FROM ENTERING THE TRENCH.
- ROOF DRAIN PIPES ARE TO BE 6" PVC WITH MINIMUM 1.5 FT OF COVER AND A SLOPE OF 1.0% MIN. FINAL LOCATION, SLOPE AND COVER ARE TO BE FIELD COORDINATED.
- KEEP ROOF DRAINS DISCONNECTED UNTIL THE DRYWELL INSTALLATION IS COMPLETE AND THE SITE IS STABILIZED.

### PLANTER BOX MAINTENANCE

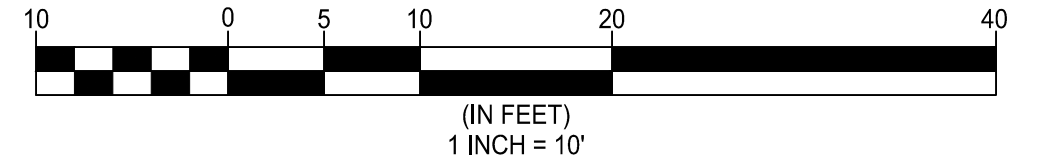
Planter Box Maintenance Schedule

Maintenance	Frequency
Spot weeding, erosion repair, trash removal, and mulch raking	Twice during growing season
Add reinforcement planting to maintain the desired vegetation density	As needed
Remove invasive plants using recommended control methods	As needed
Stabilize the contributing drainage area to prevent erosion	As needed
Spring inspection and cleanup	Annually
Supplement mulch to maintain a 2-3 inch layer	Annually
Prune trees and shrubs	Annually
Examine for the ponding depth and adjust accordingly	Annually
Inspect inflows and overflow for erosion	Annually
Inspect for structural deficiencies and repair	Annually
Remove sediment in pre-treatment cells and inflow points	Once every 2 to 3 years
Replace the mulch layer	Every 3 years
Inspected and certified by a professional licensed in the State of Virginia	Once every 5 years

### PLANTER BOX MATERIAL SPECS

Planter Box Material Specifications

Material	Specification	Notes
Waterproofing	Watertight shell or impermeable liner	Use a thirty mil (minimum) PVC Geomembrane liner or equivalent.
Filter Media Composition	Filter Media to contain: • 80%-90% sand with >75% being coarse to very coarse • 10%-20% soil fines • 3%-5% organic matter in the form of plant based compost meeting Clearinghouse Design Specification #4, Section 6.5	The volume of filter media based on 110% of the plan volume, to account for settling or compaction.
Filter Media Testing	Plant available P within Low+ (L+) to Medium (M) per DCR 2014 Nutrient Management Criteria (18-40 mg/kg P for the Mehlich III procedure) and CEC >5	The media must be procured from approved filter media vendors.
Mulch Layer	Use aged, shredded hardwood bark mulch	Lay a 2 to 3 inch layer on the surface of the filter bed.
Choking Layer	3 inch layer of pea gravel or VDOT #8 stone which is laid over the underdrain stone.	12 inches for the underdrain
Stone Jacket for Underdrain and/or Storage Layer	1 inch stone should be double-washed and clean and free of all fines (e.g., VDOT #57 stone).	12 inches for the underdrain
Underdrains and Overflows	Use 4 inch rigid schedule 40 PVC pipe with 3/8-inch perforations at 6 inches on center, maximum of 3 rows of perforations; position each underdrain on a 1% or 2% slope.	Lay the perforated pipe under the length of the planter box, and install non-perforated pipe as needed to connect with the storm drain system. Install T's and Y's as needed, depending on the underdrain configuration. Extend overflow pipes to the surface with vented caps.
Plant Materials	1 quart-sized perennial installed per 1-2 sf and/or 1 3-gallon shrub installed per 7.5 sf over entire ponding area	Choose either herbaceous and/or shrubs



- NOTES:
- NOTE LEAF SCREENS TO BE INSTALLED AT ALL DOWNSPOUTS FOR PRETREATMENT PURPOSES.

### WATER PROOFING NOTES

NOTE: WALTER L. PHILLIPS, INC. IS NOT RESPONSIBLE FOR WATER PROOFING DESIGN REQUIRED AT BUILDING FOUNDATION. CONTRACTOR AND OWNER TO PROVIDE PROPER WATERPROOFING ESPECIALLY NEAR PROPOSED BMP FACILITIES.

NOTE: ARLINGTON COUNTY DOES NOT REVIEW THE WATERPROOFING DESIGN AND THE OWNER/DEVELOPER AGREES TO HOLD ARLINGTON COUNTY HARMLESS IN THE EVENT OF FAILURE.



**BMP DETAILS - URBAN BIO-RETENTION**

**WALTER L. PHILLIPS INCORPORATED** ESTABLISHED 1945

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 Landscape Architects • Arborists  
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**ARLINGTON, VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**  
 4219/4221 LORCOM LANE  
 THE PROPERTY OF R.A. PHILLIPS  
 GRADING PLAN  
 4219/4221 LORCOM LANE, ARLINGTON, VIRGINIA 22207

SCALE: 1" = 10'  
 SUBMITTED DATE 03/05/2019  
 05/07/2019  
 06/24/2019  
 07/17/2019

DRAWN CR  
 CHECKED TP/BKW

APPROVED DATE  
 DIRECTOR OF ENVIRONMENTAL SERVICES

SHEET: **C-0703**