



SEQUENCE OF CONSTRUCTION

- Prior to clearing of trees, installing sediment control measures, or grading, a preconstruction meeting must be conducted on-site with the Montgomery County Department of Permitting Services (MCDPS) sediment control inspector (240) 777-0311 (48 hours notice), the Owners representative, and the site Engineer. In order for the meeting to occur, the applicant must provide one paper set of approved sediment control plans to the MCDPS sediment control inspector at the preconstruction meeting. If no plans are provided, the meeting shall not occur and will need to be rescheduled prior to commencing any work.
- The limits of disturbance must be field marked prior to clearing of trees, installation of sediment control measures, construction, or other land disturbing activities.
- Clear and grade for installation of sediment control devices.
- Install sediment control devices (Super Silt Fence, Stabilized Construction Entrance, and Clean Water Diversion Fence).
- Once the sediment control devices are installed, the permittee must obtain written approval from the MCDPS Sediment Control Inspector before proceeding with any additional clearing, grubbing, or grading.
- Staging, access, and stockpiling activities may not occur in the public right-of-way or beyond the approved limits of disturbance (L.O.D.) defined by this plan.
- The Stabilized Construction Entrance (SCE) is an erosion and sediment control practice and must remain in place until written permission is granted from the inspector for its removal.
- Install base courses for driveway and construct house, etc.
- Gutters and downspouts to be installed early as possible, subject to availability of materials and labor.
- Install stormwater management devices, associated piping, and removable pop-up emitters, but do not connect to downspouts at this time.
- Pave driveway, permanently stabilize all remaining areas.
- Connect downspouts to roof drain piping and stormwater management devices.
- Provide signed record set of plans to the sediment control inspector.
- Obtain written approval from Sediment Control Inspector prior to the removal of any sediment control device.

DIVERSION FENCE NON-EROSIVE CONVEYANCE COMPS

Confirm Q(10) through LI-N facility will discharge at a non-erosive velocity using FlowMaster, trapezoidal channel design for the overflow weir.

Impervious Area 4,888 SF = 0.112 acres (9.2%)
Pervious Area 46,498 SF = 1.113 acres (90.8%)
C = 0.23 I10 = 5.00 in/hr
Tc = 15 minutes A = 1.226 acres
Q10 = 0.110 cfs
Q10 = 0.23 x 5.00 x 1.226
Q10 = 1.41 CFS

TRIANGULAR CHANNEL, SOLVE FOR DEPTH:

LI Side Slope: 0.01:1 (H/V) Velocity: 1.46 fps
RI Side Slope: 24.0:1 (H/V) Flow Area: 0.96 sf
Manning's n: 0.060 (grass gutter, < 6" flow) Flow Top Width: 6.80 ft
Channel Slope: 0.0500 ft/ft Water Perimeter: 7.09 ft
Depth: 0.28 ft Critical Depth: 0.24 ft
Discharge: 1.41 cfs (see above) Critical Slope: 0.1119 ft/ft
Froude #: 0.69

Since the velocity of the discharge is less than 4 fps, 10-yr discharge is non-erosive.

E.S.D. TO THE M.E.P. STATEMENT

Environmental Site Design (E.S.D.) volume has been provided to the Maximum Extent Practicable (M.E.P.) through the use of five (5) gravel dry wells.

The application of other ESD practices, such as landscape infiltration facilities, micro bio-retention, micro infiltration trenches, rain gardens and non-rooftop disconnects credits were considered as were permeable pavers. However, due to topographic constraints such as inability to cross-slope the driveway for disconnection, driveway run-on greater than 1:1 that precludes the use of permeable pavers, and rear yard swales that prevent disconnection of the patio, these devices were determined to not be feasible. Dry wells have been utilized for as many roof areas as possible.

Although a Pe of 1.6" cannot be achieved, a Pe of 1.42" is hereby proposed and a quantity waiver is requested. Appropriate fees will be paid at the time of sediment control permit issuance.

CAS ENGINEERING DRAINAGE NOTES

- All storm drain pipe to be Schedule 40 PVC or of higher quality.
- Downspout leaders originating directly from downspouts to be 4" diameter PVC, unless noted otherwise.
- Maintain minimum 12" cover over all pipe. Pipe slopes to be 2% minimum.
- All alleyway and window well drains to sump pump - by plumber - unless noted otherwise.
- Sump pump discharge to be located so as to avoid impact to the neighboring properties and to avoid recirculation of water.
- The permittee shall install a splash block at the bottom of each downspout.
- Maintenance of gutters, downspouts, leaf filters, inlets, drain pipes, drainage swales, drywells and other drainage related items should be performed as needed, but at least twice per year.
- Drainage swales and drainage patterns shall not be impeded with trees, landscaping, fences, etc.
- Window wells shall have a minimum freboard of 6 inches and should be kept free of leaves and debris.
- Ground cover (sod, seed, etc.) shall be selected based on soil conditions, drainage, sun exposure, final grade slopes, etc. per M.D.E. specifications.
- Multi-Flow™ or equivalent drainage systems are recommended in lawn areas with a 3% slope or less.
- Gutters and downspouts to be installed early as possible, subject to availability of materials and labor.
- Sediment control devices must be inspected daily and with extra care before storm events. On disturbed sites they should be monitored during storm events.
- Areas where construction is complete, such as side and rear yards, should be permanently stabilized as early as possible and in conformance with M.D.E. specifications.
- Sump pumps serving driveways, patios, alleyways, and other large open impervious surfaces must be sized for a 100-year storm event.

ESD COMPUTATIONS - 9120 QUINTANA DRIVE (HYDROLOGIC SOIL GROUP B)										
TOTAL LOT AREA FOR P ₁ DETERMINATION		TOTAL LOT IMPERVIOUS AREA FOR P ₁ DETERMINATION		LOT IMPERVIOUS AREA PERCENTAGE (I) FOR P ₁ DETERMINATION		P ₁ = RAINFALL TARGET (INCHES) APPLY IMPERVIOUS COVER PERCENTAGE TO TABLE 5.3		PER SECTION 5.3.2, THE SIZE OF ANY PRACTICE IS LIMITED TO THE RUNOFF FROM THE 1-YEAR 24-HOUR STORM		
21,002 SF		5,888 SF		27.24%		1.6 IN		(Q ₁₀) VOLUME = (Area) x 2.6 in (P ₁ Max) x (P ₁) / 12		
TOTAL L.O.D. AREA FOR P ₁ & ESD ₁₀ DETERMINATION		TOTAL IMPERVIOUS AREA WITHIN L.O.D. FOR P ₁ DETERMINATION		L.O.D. IMPERVIOUS AREA PERCENTAGE (I) FOR P ₁ DETERMINATION		R ₁₀ = RUNOFF VOLUME (I) = IMPERVIOUS PERCENTAGE		VOLUME PROVIDED VIA ESD DEVICE NOT EXCEED THE Q ₁₀ MAXIMUM (1-YEAR STORM)		
19,100 SF		6,235 SF		32.65%		0.34				
Determine ESD ₁₀ REQUIRED BASED ON THE L.O.D. (LIMIT OF DISTURBANCE)										
				TARGET ESD ₁₀ = (P ₁) x (R ₁₀) x (A) / 12						
				TARGET ESD ₁₀ = 1.6 (P ₁) x 0.34 (R ₁₀) x 19100 (Area) / 12						
				TOTAL SITE ESD VOLUME REQUIRED: 865.9 CF						
DRYWELL STRUCTURE	IMPERVIOUS AREA NUMBERS	DRAINAGE AREA (SQ. FT.)	MINIMUM REQUIRED ESD ₁₀ , P ₁ = 1.6 IN (CUBIC FEET)	DRY WELL DIMENSIONS (FEET)	DRY WELL SURFACE AREA (SQUARE FEET)	TOTAL DRY WELL VOLUME (CUBIC FEET)	Q ₁₀ MAXIMUM VOLUME CHECK (1-YEAR STORM: 2.6 IN)	DRY WELL VOLUME PROVIDED (CUBIC FEET)		
DATA BELOW ROUNDED TO 1 DECIMAL PLACE, BUT FOR DRYWELLS IS 0.05 (100% IMPERVIOUS ROOF AREA)										
A ROOF	3	337 SF	ESD ₁₀ = $\frac{337(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Min = 73.6 CF	11.1 (LENGTH) 8.0 (WIDTH) 5.0 (DEPTH)	A = 11.1 (L) x 8.0 (W) A = 95.5 SF	V = 95.5 (A) x 5 (D) x 0.4 V = 191.0 CF	ESD ₁₀ = $\frac{337(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Max = 191.4 CF	191.0 CF		
	4	511 SF								
	7	82 SF								
	TOTAL	930 SF								
B ROOF	5	405 SF	ESD ₁₀ = $\frac{405(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Min = 51.6 CF	8.3 (LENGTH) 8.0 (WIDTH) 5.0 (DEPTH)	A = 8.3 (L) x 8 (W) A = 66.4 SF	V = 66.4 (A) x 5 (D) x 0.4 V = 132.8 CF	ESD ₁₀ = $\frac{405(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Max = 134.2 CF	132.8 CF		
	6	245 SF								
	TOTAL	652 SF								
	12	503 SF								
C ROOF	11	502 SF	ESD ₁₀ = $\frac{502(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Min = 39.8 CF	7.6 (LENGTH) 8.0 (WIDTH) 5.0 (DEPTH)	A = 7.6 (L) x 6.8 (W) A = 51.7 SF	V = 51.7 (A) x 5 (D) x 0.4 V = 103.4 CF	ESD ₁₀ = $\frac{502(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Max = 103.5 CF	103.4 CF		
	14	178 SF								
	TOTAL	580 SF								
	15	178 SF								
D ROOF	8	218 SF	ESD ₁₀ = $\frac{218(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Min = 61.6 CF	9.5 (LENGTH) 9.2 (WIDTH) 5.0 (DEPTH)	A = 9.5 (L) x 9.2 (W) A = 87.4 SF	V = 87.4 (A) x 5 (D) x 0.4 V = 174.8 CF	ESD ₁₀ = $\frac{218(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Max = 175.8 CF	174.8 CF		
	9	163 SF								
	TOTAL	584 SF								
	13	250 SF								
E ROOF	8	218 SF	ESD ₁₀ = $\frac{218(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Min = 64.3 CF	9.2 (LENGTH) 9.0 (WIDTH) 5.0 (DEPTH)	A = 9.2 (L) x 9 (W) A = 82.8 SF	V = 82.8 (A) x 5 (D) x 0.4 V = 165.6 CF	ESD ₁₀ = $\frac{218(1.6) \times 1.0 (P_1 \text{ Max}) \times 0.34 (R_{10})}{12}$ ESD ₁₀ Max = 167.1 CF	165.6 CF		
	9	163 SF								
	TOTAL	812 SF								
	10	431 SF								
AREAS NOT TREATED	1	1,450 SF	DRIVEWAY - NOT TREATED BY THIS PLAN, UNABLE TO DISCONNECT WALKWAYS - NOT TREATED DUE TO YARD SLOPES GREATER THAN 2% PATIO - NOT TREATED DUE TO INSUFFICIENT AREA FOR NON-ROOF TOP DISCONNECT							
	2	195 SF								
	TOTAL	1,645 SF								
TOTAL SITE IMPERVIOUS AREA		5,888 SF			ESD ₁₀ PROVIDED VIA DRY WELLS		ESD ₁₀ PROVIDED VIA DISCONNECTS		ESD ₁₀ PROVIDED VIA MICRO INFILTRATION TRENCH	
IMPERVIOUS AREA IN RIGHT-OF-WAY		5,888 SF			707.6 CF		0.0 CF		0.0 CF	
TOTAL ESD ₁₀ PROVIDED					707.6 CF		0.0 CF		0.0 CF	
IS ESD ₁₀ ADEQUATE					707.6 CF < 865.9 CF				ESD TO THE M.E.P. ON WAIVER REQUIRED	
IS P ₁ ADEQUATE					1.42 IN < 1.60 IN					

DRYWELL SCHEDULE - 9120 QUINTANA DRIVE									
DRYWELL STRUCTURE	FINISHED GRADE (LOW SIDE)	FINISHED GRADE (HIGH SIDE)	ELEVATION AT TOP OF GRAVEL (1'-3" COVER)	COVER DEPTH OVER DRYWELL ON HIGH SIDE (2" MAX.)	PIPE INVERT FROM DOWNPOUTS	TOTAL DEPTH OF GRAVEL (4" MAX. DEPTH)	ELEVATION AT BOTTOM OF GRAVEL	TOTAL DEPTH OF SAND	ELEVATION AT BOTTOM OF SAND
A	246.4	247.4	244.4	3.0	243.4	4.0 ft	240.4	1.0 ft	239.4
B	244.3	245.0	243.3	2.7	242.3	4.0 ft	239.3	1.0 ft	238.3
C	244.2	245.4	242.7	2.7	241.7	4.0 ft	238.7	1.0 ft	237.7
D	246.7	247.9	245.2	2.7	244.2	4.0 ft	241.2	1.0 ft	240.2
E	247.1	247.7	245.1	2.6	244.1	4.0 ft	241.1	1.0 ft	240.1
RECOMMENDED CHAIN DOWN									
POP UP EMITTER AT DRY WELL CLEANOUTS AND A SURCHARGE PIPE AT EACH DOWNPOUT									

9120 Quintana Drive
Lot 9, Block 8, Burning Tree Estates
Building Permit Site Plan,
Stormwater Management Plan,
and Sediment Control Plan
Sediment Control Permit #: 291646

CAS JOB NO.: 23-0954
DATE: 04/20/24

DATE	REVISION
2/14/24	NO - Building Permit Site Plan Base Sheet to Client and Architect.
03/19/24	PNK - Sediment Control Permit Application Submitted.
03/20/24	PNK - SCP Updated to ePlans for Initial Plan Review by MCDPS-WRS.
04/16/24	JMO - SCP Updated for Final Approval by MCDPS-WRS.

JARED M. CARHART, P.E.
04/16/24
PROFESSIONAL ENGINEER CERTIFICATION:
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 51012, expiration date 06/07/2025, and that this plan meets MCDPS criteria for building and sediment control permit applications.

Lot 9, Block 8, Burning Tree Estates
Pilot Book 47, Plat No. 3564 Recorded 12/4/1953
Bethesda (7th) Election District, Montgomery County, MD
9120 Quintana Drive
Bethesda, Maryland 20817

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0" 0.5" 1" 1.5" 2"
NOT TO SCALE OR AS NOTED

SHEET TITLE:
Building Permit Site Plan,
SWM Plan, and
Sediment Control Plan

