Hurricane Valley, Inc.

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STORM WATER DETENTION PLAN

ACA Middle School

21815 I-30

Bryant, Arkansas

September 9, 2023

PROJECT DESCRIPTION

This project consists of grubbing and grading approximately 0.91 acres in preparation for the construction of a 2-story 15,00 SF building.. Total drainage area is approximately 3 acres.

DETENTION PLAN

The construction activity consists of grading approximately 0.91 acres of surface area; placements of fill and storm sewer pipes. The will be no detention. An in-lieu fee will be paid.

During grading silt screen will be placed around the construction area as required.

DETENTION POND CALCULATIONS

The present runoff coefficient used for the existing undisturbed areas was 0.50. The runoff coefficient of the site after construction is completed is expected to be 0.92 .

Pre-development

Flow Dist. L = 300 ft.
Slope = 3 %
Total Area = 3 acres
Coefficient (undev) = 0.50
Conc. Time (Tc) = 18 min.

Return Period (yr)	Intensity (i)	Q (undev) = Aci
2	3.6	5.4
5	4.2	6.3
10	4.7	7.05
25	5.5	8.25
50	6.1	9.15
100	6.7	10.05

Post Development

Conc. Time (Tc) = 5 min.
Coefficient (undev) = 0.92
Total Area = 3 acres

Return Period (yr)	Intensity (i)	Q (cfs) (.92)
2	5.9	16.28
5	6.8	18.77
10	7.5	20.70
25	8.5	23.46
50	9.5	26.22
100	10	27.60

Detention Pond Volume Required

Diff. = Post Development – Pre-Development

Return Period	Diff. = Post Development – Pre-Development
2	16.28 – 5.4 = 10.88
5	18.77 – 6.3 = 12.47
10	20.70 – 7.05 = 13.65
25	23.46 – 8.25 = 15.21
50	26.22 – 9.15 = 17.07
100	27.60 – 10.05 = 17.55

Total Required Volume = 17.55 x 5 x 60 = 5262 CF

In Lieu Fee Assume 50 x 50 x 1 Detention Area = 2500 CF =.0574 acre feet
5262/2500 = 2.1048 2.1048 x .0574 = .1208 ac ft
0 .1208 x $10,000/ ac-ft = $1208
Use $1192 as determine by the City Engineer.

Respectfully submitted,

Charles F. Best, P.E.

ACA Middle School
HVI
September 5, 2023