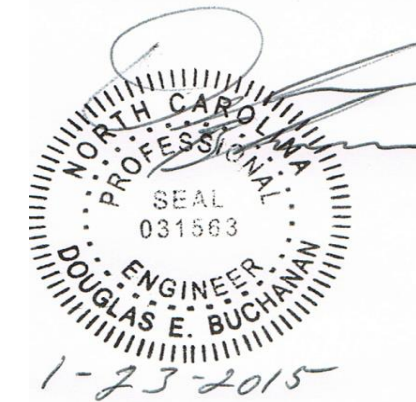


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Porter Ridge Elementary School
 Drainage Calculations
 12/2/2015

Roof	Area Sq.Ft.	Rainfall Intensity	Flow Rate Gal/min	Storm Frequency for one hour	Design Flow Rates GPM	Primary Drain							Secondary Drain - Scuppers						
						Size (inches)	Number of Drains	Maximum Flow GPM Each Drain	Flow for each Drain GPM	Depth of water on the roof inches	Live load due to the standing water psf	Notes	Number of Scupper	Size WxH Inches	Flow GPM	Hydraulic Head Inches	Roof Load from Standing Water psf	Notes	
1.01	560	3.65	21.3	100 year	21.3	3	2	90	11	0.3	1.5	OK	2	12	4	11	0.07	5.6	OK
A1.02	3,605	3.65	136.8	100 year	136.8	4	2	180	68	1.0	4.9	OK	2	12	4	68	1.11	10.9	OK
B1.02	3,605	3.65	136.8	100 year	136.8	4	2	180	68	1.0	4.9	OK	2	12	4	68	1.11	10.9	OK
1.03	1,307	3.65	49.6	100 year	49.6	4	2	180	25	0.3	1.8	OK	2	12	4	25	0.24	6.5	OK
A1.04	1,545	3.65	58.6	100 year	58.6	4	1	180	59	0.8	4.2	OK	1	12	4	127	2.80	19.7	OK
B1.04	1,936	3.65	73.5	100 year	73.5	4	1	180	73	1.0	5.3	OK							5)
A1.05	1,660	3.65	63.0	100 year	63.0	4	2	180	32	0.4	2.3	OK	2	12	4	32	0.35	7.0	OK
B1.05	1,660	3.65	63.0	100 year	63.0	4	2	180	32	0.4	2.3	OK							5)
A1.07	1,947	3.65	73.9	100 year	73.9	4	1	180	74	1.0	5.3	OK							5)
B1.07	1,617	3.65	61.4	100 year	61.4	4	1	180	61	0.9	4.4	OK	1	12	4	61	0.94	10.1	OK
C1.07	4,921	3.65	186.8	100 year	186.8	4	3	180	62	0.9	4.5	OK	3	12	4	62	0.96	10.2	OK
A	475	3.65	18.0	100 year	18.0	OK													
B	475	3.65	18.0	100 year	18.0	OK													
C	726	3.65	27.5	100 year	27.5	OK													
D	269	3.65	10.2	100 year	10.2	OK													
E	661	3.65	25.1	100 year	25.1	OK													

Secondary Drain - Over Flow							
Roof	Size (inches)	Number of Over Flows	Maximum Flow GPM per Drain	Flow for each Over Flow GPM	Depth of water on the roof inches	Live load due to the standing water psf	Notes
B1.05	4	1	180	32	1.9	10.1	OK
B1.04	6	1	270	142	2.8	14.6	OK
A1.07	6	1	270	74	2.2	11.4	OK

Analyzes for horizontal partial full round pipe									
Head in pipe (inches)	Pipe Diameter (inches)	Angle of wetted surface (Radians)	Cord Distance (inches)	Area of water in the Pipe (square inches)	Wetted Perimeter (inches)	Hydraulic Radius (A/W P)	Velocity using Manning (fpm)	Corrected Flow Rate (CFM)	Corrected Flow Rate (GPM)
2.5	4.0	2.3728	3.7081	6.5996	4.7456	1.3907	197.17	5.61	41.93
3.0	6.0	2.0944	5.196152	9.4248	6.2832	1.5000	207.37	8.42	62.98

Notes

- 1) Using a weir equation to calculate the flow through the scuppers.
- 2) Using ASCE 7-10 for the drain's flow rates
- 3) The Scuppers shall be 1" above the roof.
- 4) The Over Flow shall be 1 1/2" above the roof
- 5) See chart for over flows
- 6) 1/2 of area 1.01 A over flows onto 1.07
- 7) 1/2 of area 1.01 B over flows onto 1.04 A
- 8) 1/2 of area 1.01 B over flows onto 1.04 B
- 9) Area 1.02 B has two 3" overflows for the secondary

