

HOW VIRGINIA REGULATIONS AFFECT THE VALUES OF ONE PMF

TAC Meeting
July 13, 2006

FACTORS TO CALCULATE PROBABLE MAXIMUM FLOOD (PMF)

	DESIGN VARIABLE
INCHES PER HOUR OF RAIN	PMP VALUES
FALLS ON WATERSHED AREA AND FLOWS INTO DAM RESERVOIR	TERRAIN TYPE AND SLOPE
FLOWS OUT OF SPILLWAY	SPILLWAY DESIGN
RESERVOIR RISES WHEN FLOW IN > FLOW OUT	MAXIMUM CAPACITY

TYPICAL RAINFALL VALUES FOR LOCATION IN VIRGINIA

Hydrometeorological Design Studies Center, NOAA National Weather Service

Precipitation Frequency Estimates (inches), Upper bound of the 90 % confidence interval
1 of 161 sites in VA , http://hdsc.nws.noaa.gov/hdsc/pfds/orb/va_pfds.html

ARI AVERAGE RECURRENCE INTERVAL IN YEARS	60min	6 hr	24 hr	48 hr	72 hr	96 hr
2	1.6	2.6	3.6	4.2		4.7
100	3.5	6.1	9.4	10.6		11.7
1000	4.7	8.9	15.3	16.8		18.5
PMP	10.6*	28.0	38.0	41.0	43.0	

**PMP - PROBABLE MAXIMUM PRECIPITATION (ORIGINALLY
MAXIMUM POSSIBLE PRECIPITATION), ALL SEASON 10 MI 2**

WATERSHED TERRAIN TYPE

Table 3.5

Resistance Factor for Overland Flow

Surface	N value	Source
Asphalt/Concrete*	0.05 - 0.15	a
Bare Packed Soil Free of Stone	0.10	c
Fallow - No Residue	0.008 - 0.012	b
Conventional Tillage - No Residue	0.06 - 0.12	b
Conventional Tillage - With Residue	0.16 - 0.22	b
Chisel Plow - No Residue	0.06 - 0.12	b
Chisel Plow - With Residue	0.10 - 0.16	b
Fall Disking - With Residue	0.30 - 0.50	b
No Till - No Residue	0.04 - 0.10	b
No Till (20-40 percent residue cover)	0.07 - 0.17	b
No Till (60-100 percent residue cover)	0.17 - 0.47	b
Sparse Rangeland with Debris:		
0 Percent Cover	0.09 - 0.34	b
20 Percent Cover	0.05 - 0.25	b
Sparse Vegetation		
Short Grass Prairie	0.053 - 0.13	f
Short Grass Prairie	0.10 - 0.20	f
Poor Grass Cover On Moderately Rough	0.30	c
Bare Surface		
Light Turf	0.20	a
Average Grass Cover	0.4	c
Dense Turf	0.17 - 0.80	a, c, e, f
Dense Grass	0.17 - 0.30	d
Bermuda Grass	0.30 - 0.4	d
Dense Shrubbery and Forest Litter	0.4	a

ASPHALT
0.05 – 0.10

FOREST
0.4

Legend: a) Harley (1975), b) Engman (1986), c) Hathaway (1945), d) Palmer (1946), e) Ragan and Duru (1972), f) Woolhiser (1975). (See Hjelmfelt, 1986)

*Asphalt/Concrete n value for open channel flow 0.01 - 0.016

DRAINAGE BASIN CHARACTERISTICS

4VAC50-20-240C

“The drainage area shall be determined. Present, Projected and potential future land-use conditions shall be considered in determining the runoff characteristics of the drainage area. The most severe of these conditions shall be included in the design calculations which shall be submitted as part of the design report.”

DRAINAGE BASIN CHARACTERISTICS

Proposed Draft

4VAC50-20-240C

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