

# ROOF DRAINS

## Conventional Roof Drainage Systems

### RAINFALL CONVERSION DATA

Rainfall is expressed in inches of water per hour. For sizing purposes, it is necessary to convert "inches per hour" to "gallons per minute." The data in Figure 7 represents the conversion of rainfall in "inches per hour" to "gallons per hour per sq. ft." and "gallons per minute per sq. ft." For example, a 3 inch per hour rainfall will build up to a 3 inch depth on a flat roof in one hour, at the rate of 1.87 gallons per hour/sq. ft. or .0312 gallons per minute/sq. ft. (See Figure 7). Using a 10,000 sq. ft. roof area, the 3 inch rainfall will produce 18,700 gallons in one hour at the rate of 312 gallons per minute. See the following.

EXAMPLE:			Gallons Per Hour 10,000 x 1.87 = 18,700 G.P.H.			Gallons Per Minute 10,000 x .0312 = 312 G.P.M.		
Rainfall In Inches Per Hr.	G.P.H. Per 1 Sq. Ft.	G.P.M. Per 1 Sq. Ft.	Rainfall In Inches Per Hr.	G.P.H. Per 1 Sq. Ft.	G.P.M. Per 1 Sq. Ft.	Rainfall In Inches Per Hr.	G.P.H. Per 1 Sq. Ft.	G.P.M. Per 1 Sq. Ft.
6.0	3.740	.0624	4.3	2.680	.0447	2.6	1.621	.0270
5.9	3.678	.0614	4.2	2.618	.0437	2.5	1.558	.0260
5.8	3.615	.0603	4.1	2.556	.0426	2.4	1.496	.0250
5.7	3.553	.0593	4.0	2.493	.0416	2.3	1.434	.0239
5.6	3.491	.0582	3.9	2.431	.0406	2.2	1.371	.0229
5.5	3.428	.0572	3.8	2.369	.0395	2.1	1.309	.0218
5.4	3.366	.0562	3.7	2.306	.0385	2.0	1.247	.0208
5.3	3.304	.0551	3.6	2.244	.0374	1.9	1.184	.0198
5.2	3.241	.0541	3.5	2.182	.0364	1.8	1.122	.0187
5.1	3.179	.0530	3.4	2.119	.0354	1.7	1.060	.0177
5.0	3.117	.0520	3.3	2.057	.0343	1.6	.997	.0166
4.9	3.054	.0510	3.2	1.995	.0332	1.5	.935	.0156
4.8	2.992	.0499	3.1	1.932	.0322	1.4	.873	.0146
4.7	2.930	.0489	3.0	1.870	.0312	1.3	.810	.0135
4.6	2.867	.0478	2.9	1.808	.0302	1.2	.748	.0125
4.5	2.805	.0468	2.8	1.745	.0291	1.1	.686	.0114
4.4	2.743	.0458	2.7	1.683	.0281	1.0	.623	.0104

FIGURE 7

### SYSTEM SIZING DATA

Rainfall, when expressed in G.P.M. can be applied to the table in Figure 8 to determine the sizes of the various components of the conventional roof drainage system, including roof drains, vertical leaders and horizontal drainage piping. Using Figure 8, the 312 G.P.M. rate of rainfall would require a 5 inch roof drain and leader as well as a 6 inch horizontal drainage line if a slope of 1/4 inch per foot were selected.

FLOW CAPACITY FOR STORM DRAINAGE SYSTEMS IN GALLONS PER MINUTE				
Pipe Diameter (Inches)	Roof Drain and Vertical Leaders (G.P.M.)	Horiz. Storm Drainage Piping G.P.M.		
		Slope – Inches Per Ft.		
		1/8	1/4	1/2
2	30	-	-	-
2-1/2	54	-	-	-
3	92	34	48	69
4	192	78	110	157
5	360	139	197	278
6	563	223	315	446
8	1208	479	679	958
10	-	863	1217	1725
12	-	1388	1958	2775
15	-	2479	3500	4958

FIGURE 8