

PROPER GUTTER AND DOWNSPOUT SIZING

**TABLE 1-2
RAINFALL DATA AND DRAINAGE FACTORS**

	A STORMS WHICH SHOULD BE EXCEEDED ONLY ONCE IN 10 YEARS				B STORMS WHICH SHOULD BE EXCEEDED ONLY ONCE IN 100 YEARS			
	Intensity lasting 5 minutes		Calculated roof area drained per downspout area		Intensity lasting 5 minutes		Calculated roof area drained per downspout area	
	in/hr	mm/hr	sq/ft sq in	sq m/ 100 sq mm	in/hr	mm/hr	sq/ft sq in	sq m/ 100 sq mm
ALABAMA: Birmingham	7.5	191	160	2.30	10.1	256	120	1.7
Mobile	8.2	208	150	2.10	10.8	274	110	1.6
ALASKA: Fairbanks	2.1	53	570	8.30	3.8	97	310	4.5
Juneau	1.7	43	700	10.10	2.3	57	530	7.60
ARIZONA: Phoenix	5.6	141	220	3.10	8.8	224	140	2.00
Tucson	6.1	155	200	2.80	9.1	232	130	1.90
ARKANSAS: Bentonville	7.4	187	160	2.30	10.2	259	120	1.70
Little Rock	7.4	187	160	2.30	10.0	253	120	1.70
CALIFORNIA: Los Angeles	4.9	124	250	3.50	6.7	170	180	2.60
Sacramento	2.5	64	480	6.90	3.9	100	310	4.40
San Francisco	2.7	68	450	6.4	3.7	93	330	4.70
San Diego	2.2	57	540	7.80	3.1	78	390	5.60
COLORADO: Denver	5.7	146	210	3.00	9.1	232	130	1.90
Boulder	6.4	164	190	2.70	9.4	238	130	1.80
CONNECTICUT: Hartford	6.2	158	190	2.8	8.7	221	140	2.00
DISTRICT OF COLUMBIA	7.1	180	170	2.4	9.7	247	120	1.80
FLORIDA: Jacksonville	7.9	200	150	2.20	10.1	256	120	1.70
Miami	7.7	195	160	2.20	9.8	250	120	1.80
Tampa	8.3	212	140	2.10	10.8	274	110	1.60
GEORGIA: Atlanta	7.3	186	160	2.4	9.9	251	120	1.70
HAWAII: Honolulu	8.7	221	140	2.00	12.0	305	100	1.40
Kahului	7.0	177	170	2.50	12.0	305	100	1.40
Hilo	17.4	442	70	1.00	19.2	488	60	0.90
Lihue	10.4	265	110	1.70	14.4	366	80	1.20
IDAHO: Boise	1.8	46	660	9.50	3.3	84	360	5.20
ILLINOIS: Chicago	6.8	172	180	2.60	9.3	236	130	1.90
INDIANA: Indianapolis	6.8	173	180	2.50	9.4	239	130	1.80
IOWA: Des Moines	7.3	186	160	2.40	10.3	262	120	1.70
KANSAS: Wichita	7.5	191	160	2.30	10.5	267	110	1.60
KENTUCKY: Louisville	6.9	175	170	2.50	9.4	238	130	1.80
LOUISIANA: New Orleans	8.3	211	140	2.10	10.9	277	110	1.60
MAINE: Portland	5.4	136	220	3.20	7.6	192	160	2.30
MARYLAND: Baltimore	7.1	181	170	2.40	9.7	247	120	1.80
MASSACHUSETTS: Boston	5.3	134	230	3.3	7.2	183	170	2.40
MICHIGAN: Detroit	6.4	162	190	2.70	8.9	226	140	1.90
MINNESOTA: Minneapolis	7.0	178	170	2.50	10.0	253	120	1.70

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	Intensity lasting 5 minutes		Calculated roof area drained per downspout area		Intensity lasting 5 minutes		Calculated roof area drained per downspout area	
	in/hr	mm/hr	sq/ft sq in	sq m/ 100 sq mm	in/hr	mm/hr	sq/ft sq in	sq m/ 100 sq mm
MISSOURI: Kansas City	7.4	187	160	2.30	10.4	265	110	1.70
Saint Louis	7.1	181	170	2.40	9.9	251	120	1.70
MONTANA: Helena	1.8	46	660	9.50	3.1	77	390	5.70
Missoula	1.8	46	660	9.50	2.4	61	500	7.20
NEBRASKA: Omaha	7.4	188	160	2.30	10.5	267	110	1.60
NEVADA: Reno	2.3	57	530	7.60	4.5	114	270	3.90
Las Vegas	2.1	53	570	8.3	5.2	133	230	3.30
NEW JERSEY: Trenton	6.7	170	180	2.60	9.3	236	130	1.90
NEW MEXICO: Albuquerque	4.0	102	300	4.30	6.7	171	180	2.60
Santa Fe	4.5	115	270	3.80	6.4	169	180	2.60
NEW YORK: Albany	6.5	165	190	2.70	9.1	232	130	1.90
Buffalo	6.0	152	200	2.90	8.4	213	140	2.10
New York City	6.7	169	180	2.60	9.2	235	130	1.90
NORTH CAROLINA: Raleigh	7.3	185	160	2.40	9.8	250	120	1.80
NORTH DAKOTA: Bismark	6.6	167	180	2.60	9.8	250	120	1.80
OHIO: Cincinnati	6.8	172	180	2.50	9.3	236	130	1.90
Cleveland	6.3	160	190	2.70	8.8	223	140	2.00
OKLAHOMA: Oklahoma City	7.6	193	160	2.30	10.5	267	110	1.60
OREGON: Baker	2.2	56	550	7.90	3.8	97	310	4.50
Portland	2.1	53	570	8.30	3.0	76	400	5.80
PENNSYLVANIA: Philadelphia	6.8	172	180	2.60	9.4	238	130	1.80
Pittsburgh	6.4	163	190	2.70	8.8	224	140	2.00
RHODE ISLAND: Providence	5.6	143	210	3.10	7.8	198	150	2.20
SOUTH CAROLINA: Charleston	7.2	184	170	2.40	9.4	238	130	1.80
TENNESSEE: Memphis	7.4	187	160	2.30	10.0	253	120	1.70
Knoxville	6.7	169	180	2.60	9.0	229	130	1.90
TEXAS: Fort Worth	7.6	193	193	1.60	10.5	267	110	1.60
Dallas	7.6	194	160	2.30	10.5	267	110	1.60
Houston	8.2	208	150	2.10	10.8	274	110	1.60
San Antonio	7.6	193	160	2.30	10.5	267	110	1.60
UTAH: Provo	3.0	75	410	5.80	5.2	131	230	3.30
Salt Lake City	2.8	71	430	6.20	4.3	108	280	4.10
VIRGINIA: Norfolk	7.1	181	170	2.40	9.5	242	130	1.80
WASHINGTON: Seattle	2.1	53	570	8.30	3.3	84	360	5.20
Spokane	2.1	53	570	8.30	3.5	90	340	4.90
WEST VIRGINIA: Parkersburg	6.6	168	180	2.60	9.1	230	130	1.90
WISCONSIN: Madison	6.8	172	180	2.50	9.5	241	130	1.80
Milwaukee	6.6	168	180	2.60	9.1	232	130	1.90
WYOMING: Cheyenne	5.7	146	210	3.00	9.9	252	120	1.70

These intensities are based on records and statistical projections. They may occasionally be exceeded either in the general area or at small areas within the designated city.