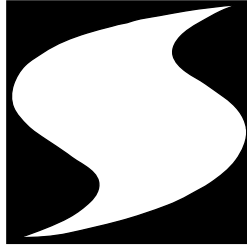


SMITH®



**CUSTOMER
DRIVEN**

RAINTROL®

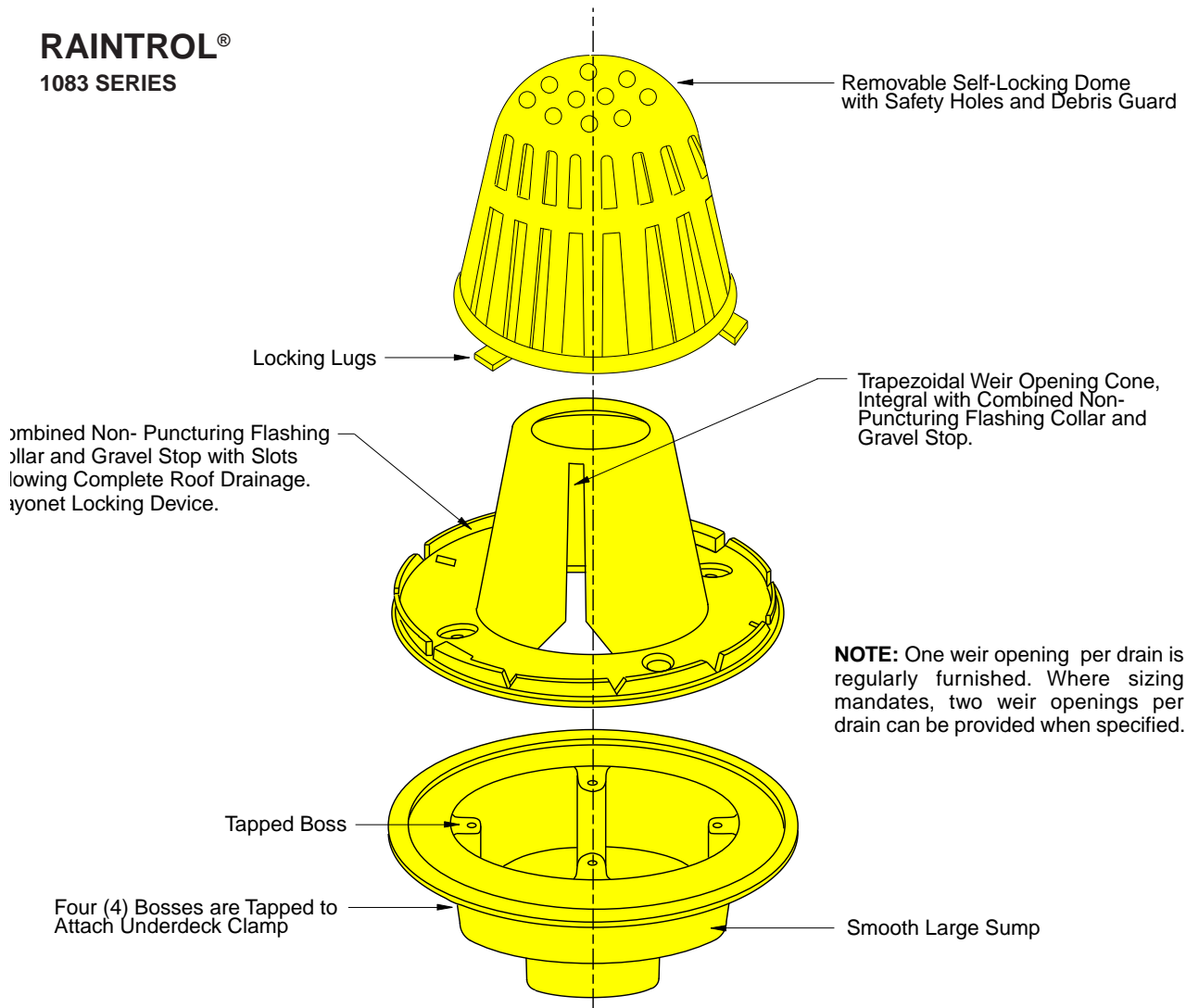
METERED RATE ROOF DRAINS



JAY R. SMITH co.

Plumbing and Drainage Products
Distributed by ACUDOR/ACORN

RAINTROL®
1083 SERIES

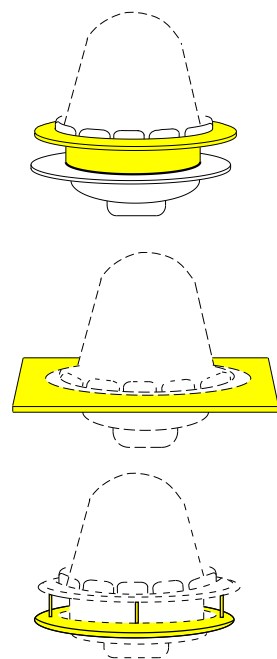


OPTIONAL VARIATIONS

SUFFIX “E” EXTENSION is specified only when insulation is used, and it is available in any height from 3/4" minimum. During construction, prior to installation of insulation, the extension can be removed to eliminate water build up. The extension is sealed by gasketing.

SUFFIX “R” SUMP RECEIVER should be specified on all but poured in place installation. It is a galvanized formed metal plate designed to accept the drain body flange. This eliminates the puddle of water surrounding many roof drain installations due to resting the flange on top of a circular hole cut in roof sheeting.

SUFFIX “C” UNDERDECK CLAMP should be specified on all but poured in place installation. Roof drains must be firmly secured to roof; otherwise, due to snow loads, rain loads, and regular expansion and contraction the drain will work in and out of the roofing, causing felts and roofing papers to flex and fail. Brittle tar will crack and leaks will occur.



RAINTROL® FLOW CONTROL DRAIN

The RAINCONTROL® roof drain was developed to offer certain advantageous features. Drains, leaders, storm sewers, etc. can be economically sized by controlling the flow of water. This will reflect in significant cost savings, both in material and labor. In addition, by controlling the drain rate, existing facilities can be utilized without overloading. Thus, new construction can be undertaken and tied into the present storm drains.

To accomplish the above, the RAINCONTROL® drain retains water on the roof. The water is allowed to build up to a predetermined height, while the excess is drained off at a known maximum rate. The amount of net build-up is a function of rainfall intensity, time, roof area, and drain flow rate. Also note that the flow rate is a function of the build-up or head of water, and not the height of the weir. As an example, water at a 2" depth will flow through either the four (4) inch high or six (6) inch high weir at the same rate.

The area rating, flow rate, and drain down time are given for various locations, consistent with the rainfall data for the localities. The data has been established for over 39 localities. Use of this data and tables will allow the engineer to lay out an efficient roof drainage system which will result in cost savings. Local codes must be observed to avoid conflict and approval problems.

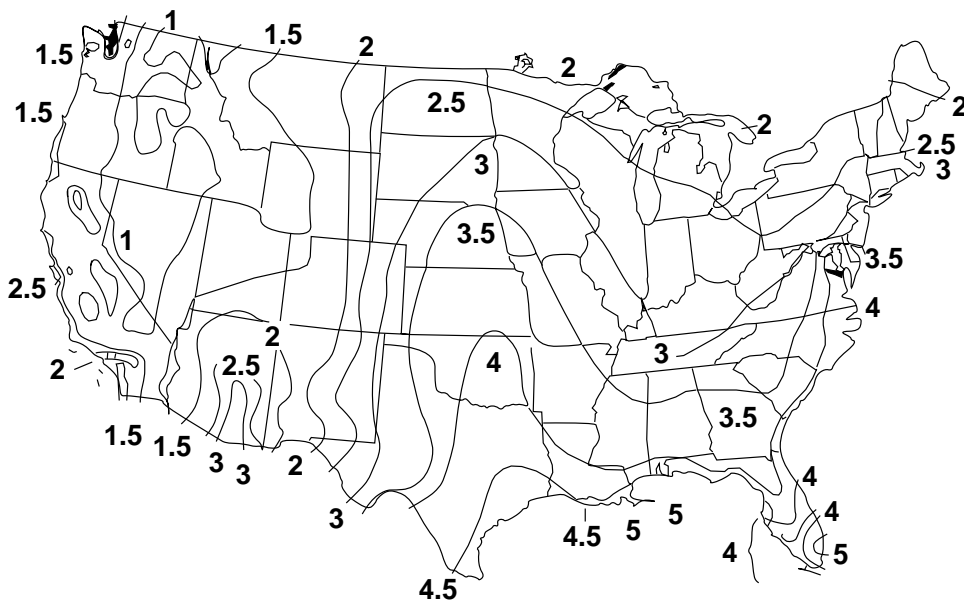
THE AREA RATING IS THE MAXIMUM AREA WHICH CAN BE HANDLED BY ONE WEIR OPENING. The corresponding flow rate and drain down time are also given. Data is presented for six (6) conditions of roof slope. This provides data for four (4) conditions for each locality.

DATA DERIVATION

The data presented in this brochure is the result of extensive computer processing. Rainfall information obtained from isopluvial maps was computer matched with the flow characteristics of the weir. The results were computer plotted and tabulated producing the final pages of tables in this brochure.

The Canadian climatological studies #8 contain the isopluvials which provide the information for the Weiss Equations of Rainfall Intensity. This is more representative than other data available for design purposes. It also covers all areas, not just point locations. The weir equations were developed from test data. When the two (2) equations are solved simultaneously, the area ratings in the tables are produced. Because of the methods employed, extreme accuracy was realized. Fig. 1 is an example of an isopluvial map. Cities along the same isopluvial will have similar rainfall. This allows use of the data for locations which are not listed.

25 YEAR 1 HOUR RAINFALL (INCHES)



Example: Atlas of rainfall intensity-duration frequency data for Canada.

Fig. 1

ROOF TYPES

The roof to be drained may vary from flat to a slope of 6" rise. Rise is measured vertically from the low point or valley to the high point or ridge. (Refer to Fig. 2 on the right.)

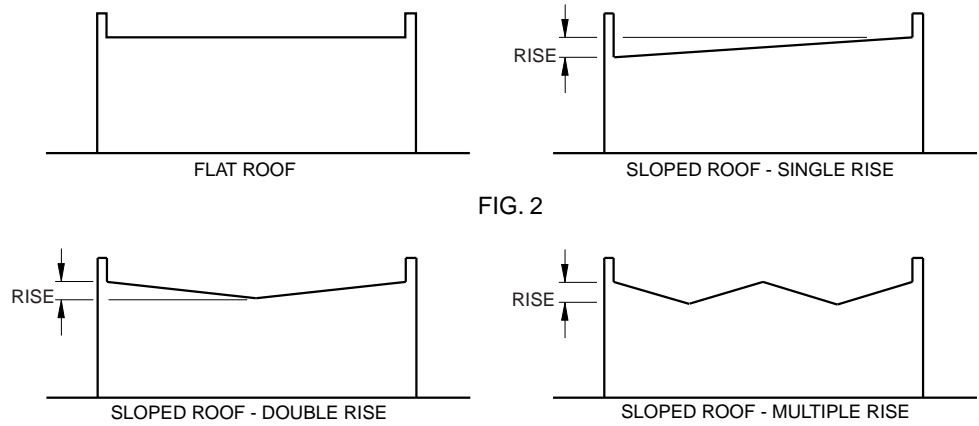
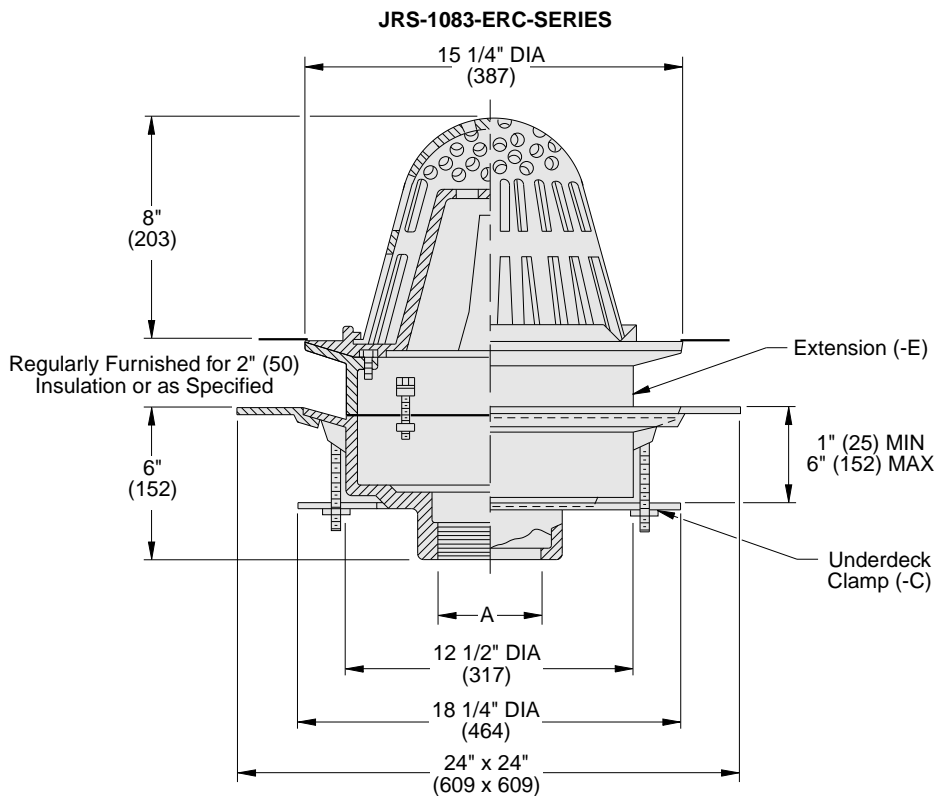


FIG. 2

RAINTROL® SPECIFICATIONS

The RAINTRON® Drain is offered with a six (6) inch weir which can be used on all roofs up to and including a sloped roof with a 6" rise. The flow rates for all RAINTRON® drains are shown on page 6.

Included in this brochure are tables of data for a number of localities. For locations not listed, use values for similar or nearby locations. For specific conditions which require more information, contact: Jay R. Smith, co., 1125 Squires Beach Road, Pickering, ON L1W 3T9.



A = 2" (50) 3" (75) or 4" (100) Caulk, Thread or NO-HUB
NOTE: Dimensions in parenthesis are mm

SUGGESTED SPECIFICATION

Jay R. Smith, co. Fig. # 1083-ERC (as shown above) with one weir opening RAINTRON® duco cast iron body with large sump and non-puncturing flashing clamping collar and gravel stop with integral cone with

weir opening, extension with neoprene gasket, underdeck clamp, galvanized roof sump receiver and large dome. RAINTRON® Roof Drains are available as follows:

6" Head of water: Fig. 1083 for Bottom Outlet and Fig. 1088 for Side Outlet

DRAIN SYSTEMS

The engineer should lay out the roof drain system consistent with the structural design strength of the roof. Normally for a flat roof with a 30 lb. sq. ft. design load, the water depth or build up would be limited to 3". This will keep the load down to approximately 15 lbs./sq. ft. For sloped roofs the allowed water depth can be greater, but only to the point where stresses will be within the design limitations. This will be up to the discretion of the engineer.

The roof drainage design can be based on a number of factors. The prime consideration could be economy, using minimum leaders and storm sewers. The allowable roof load or build up could limit the design. Or possibly, drain down time could be the limiting design criteria. In any case, knowing the maximum flow rates, which are controlled, the engineer can probably size leaders and storm sewers economically consistent with his selected design criteria.

DESIGN CONSIDERATIONS

When designing the roof drain system, the engineer must remember that the roof is being utilized as a temporary reservoir to retain some water. Flashing and waterproofing should be high enough to prevent any leakage. The engineer must also provide adequate strength for structural safety. In addition, the following considerations should be observed:

- a. On roofs under 10,000 sq. ft. use a minimum of two (2) drains.
- b. On roofs of 10,000 sq. ft. or greater, use a minimum of four (4) drains.
- c. Limit roof area to 10,000 sq. ft. per weir opening.
- d. Recommended maximum distance from roof edge to drain 50 ft. (flat roofs).
- e. Recommended maximum distance from end of valley to drain 50 ft. (sloped roofs).
- f. Recommended maximum distance between drains 100 ft.
- g. Provide adequate flashing at parapets, openings, walls, joints, etc.
- h. Limit parapet walls or provide overflow scuppers. These should be located at the anticipated maximum water depth (build-up). If located in a higher position which could result in a greater flow rate, piping must be sized accordingly.

- i. Consider wind effect in locating the drains, and the number of drains.
- j. Possible roof deflection due to load. This could create low spots and adversely affect drainage and/or structural safety.

SPECIFYING AND SIZING

Specifying can be done quickly and easily.

1. Determine roof area to be drained, each area that is bounded by expansion joints, ridges, and any enclosure is considered a separate roof area.
2. Divide the roof area by the area rating from the Table of Area Ratings (Table 1) to obtain the total number of weir openings.
3. Determine the number of roof drains. This is determined by the engineer and/or roof layout, using the above design considerations as a guide.
4. Divide the number of drains into the number of weir openings to obtain the number of weir openings per drain. It is not necessary that all drains have the same number of weir openings. As an example, a roof may require eight (8) weir openings, but only six (6) drains. In this case, four (4) drains could have one (1) weir opening and two (2) drains would have two (2) weir openings.

NOTE: Drains containing one weir opening are regularly furnished. Drains with two weir openings must be specified.

Table 1 from which the area rating is selected also lists the corresponding flow rate, water depth and drain down time. With this data the engineer can select the proper leader and storm sewer to accommodate the flow. Scupper or overflow protection must be set at the depth corresponding to the flow rate (Table 1). This would limit the potential build-up, flow rate, and roof loading. If the scuppers are set at a higher level, the potential build-up would be greater. The weir height is the maximum potential build-up. Leaders and storm sewers would have to be sized for the higher flow rates which correspond to the greater build-up. Also, a greater load might be placed on the roof. Refer to Table 3 on Page 6 for allowable flow rates. Select leaders and storm sewers, which will accommodate the maximum potential flow. Local codes may be the determining criteria and deviation must be approved. Examples showing the sizing method are on pages 5 and 6.

TABLES

Table 1 on pages 7 thru 9 is the area rating table for one weir and contains the principal data of this brochure. The localities are listed by provinces from East to West with their cities in alphabetical order. The data is divided according to the type of roof: Example: Flat, 2", 3", 4", 5" or 6" rise. The top figure is the area rating. Each block shows three (3) values. The left one is the maximum flow rate for the particular area, the center one, the maximum depth and the right one is the drain down time based on draining from the maximum depth to a depth of one half inch, which is the practical minimum. For values not shown in Table 1, straight line interpola-

tion will give acceptable figures. Using this table will provide practical solutions. For necessary data not listed, the factory should be contacted. All data listed is based on fifty-year (50) return period.

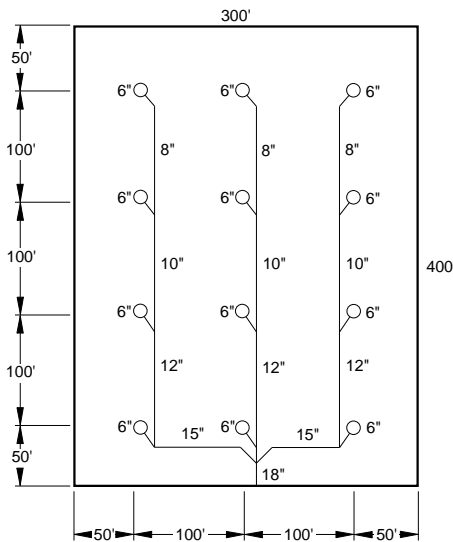
Table 2 lists flow rated for various heads in 1 inch increments.

Table 3 lists the allowable flow rates for various pipe size. Rates are given for vertical leaders and horizontal storm drains installed at four (4) different slopes. These values are consistent with the National Plumbing Code, and values obtained using Manning's formula.

EXAMPLES The following examples illustrate the advantages that can be achieved with RAINTRON[®] roof drains.

FLAT LEVEL ROOF - TORONTO

Example 1
CONVENTIONAL METHOD:



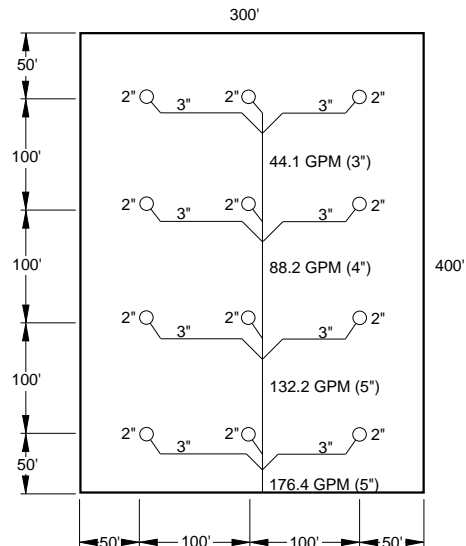
Sizing is based on National Building Code of Canada, Plumbing Services Section. This example is based on 4" per hour rainfall.

- 1 - Roof area: $300 \times 400 = 120,000 \text{ ft.}^2$
- 2 - Area rating: $10,000 \text{ ft.}^2/\text{drain}$
- 3 - Flow rate: 416 gpm
- 4 - Total flow from roof: $(12 \times 416) = 4,992 \text{ gpm}$

Pipe requirements:
 6" Dia. Pipe - 240'
 8" Dia. Pipe - 300'
 10" Dia. Pipe - 300'
 12" Dia. Pipe - 300'
 15" Dia. Pipe - 210'
 18" Dia. Pipe - 50'

Drain requirements:
 (12) 6" Fig. JRS-1010
 Roof Drains

Example 2
RAINTRON[®] METHOD:



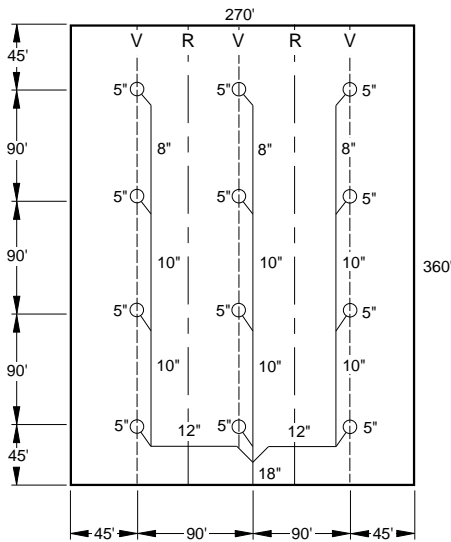
- 1 - Roof area: $300 \times 400 = 120,000 \text{ ft.}^2$
- 2 - Area rating: $10,000 \text{ ft.}^2/\text{weir opening}$
- 3 - Build-up: 3.2" - Drain down time-42 hrs.
(From Table 1 - column 10,000 sq. ft.)
- 4 - Weir openings: $120,000 \div 10,000 = 12$
- 5 - No. of drains: 12 drains with one weir opening each
- 6 - Flow rate: 17.0 gpm/per weir opening at 3.2" depth.
- 7 - Total flow from roof: $(12 \times 17.0) = 204 \text{ gpm}$

Pipe requirements:
 2" Dia. Pipe - 240'
 3" Dia. Pipe - 900'
 4" Dia. Pipe - 100'
 5" Dia. Pipe - 150'

Drain requirements:
 (12) 2" Fig. JRS-1083
 Roof Drains

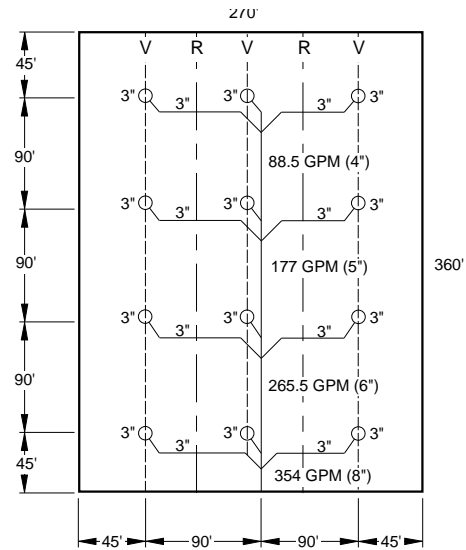
SLOPED ROOF - (6" RISE) QUEBEC CITY

Example 3 CONVENTIONAL METHOD:



V=Valley
R=Ridge

Example 4 RAINTROL® METHOD: (storm sewers 1/4" per ft. pitch)



Sizing is based on National Building Code of Canada, Plumbing Services Section. This example is based on 4" per hour rainfall.

- 1 - Roof area: $270 \times 360 = 97,200 \text{ ft.}^2$
- 2 - Area rating: $8,100 \text{ ft.}^2/\text{drain}$
- 3 - Flow rate: 337 gpm/per drain
- 4 - Total flow from roof: $(12 \times 337) = 4,044 \text{ gpm}$

Pipe requirements:
5" Dia. Pipe - 240'
8" Dia. Pipe - 270'
10" Dia. Pipe - 540'
12" Dia. Pipe - 180'
18" Dia. Pipe - 45'

Drain requirements
(12) 5' Fig. JRS-1010
Roof Drains

- 1 - Roof area: $270 \times 360 = 97,200 \text{ ft.}^2$
- 2 - Area rating: $10,000 \text{ ft.}^2/\text{weir opening}$
- 3 - Build-up: 5.3" - Drain down time-17.5 hrs.
(From Table 1 - column 10,000 sq. ft.)
- 4 - Weir openings: $97,200 \div 10,000 = 9.72$ or 10
- 5 - No. of drains: 12 drains with one weir opening each
- 6 - Flow rate: 29.5 gpm/per weir opening at 5.3" depth
- 7 - Total flow from roof: $(12 \times 29.5) = 354 \text{ gpm}$

Pipe requirements:
3" Dia. Pipe - 720'
4" Dia. Pipe - 90'
5" Dia. Pipe - 90'
6" Dia. Pipe - 90'
8" Dia. Pipe - 45'

Drain requirements
(12) 3" Fig. JRS-1083
Roof Drains

TABLE 2

FLOW RATE VS. BUILD-UP - ONE WEIR						
Depth-inches	1	2	3	4	5	6
Flow-GPM	5.0	10.5	15.7	21.5	27.5	34.5

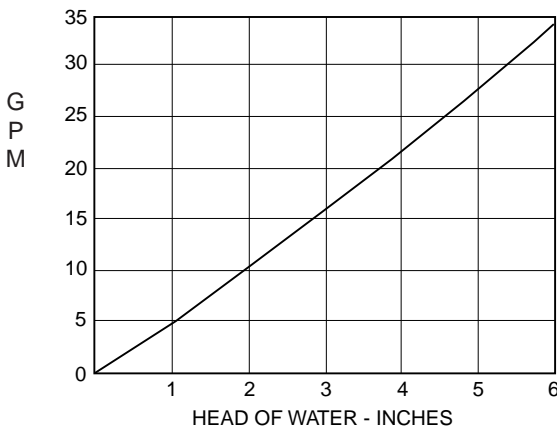


TABLE 3

ALLOWABLE FLOW FOR VERTICAL LEADERS AND HORIZONTAL STORM DRAINS

PIPE SIZE	ALLOWABLE FLOW IN GPM*				
	VERTICAL LEADER	HORIZONTAL STORM DRAIN SLOPE PER FOOT			
		1/16"	1/8"	1/4"	1/2"
2	30	-	12	17	24
3	88	22	36	49	69
4	190	50	74	105	148
5	343	90	135	190	269
6	560	160	218	310	439
8	1202	333	470	666	944
10	-	604	854	1208	1708
12	-	984	1386	1972	2783
15	-	1779	2518	3557	5054
18	-	3020	4100	5500	-

*From National Plumbing Code of Canada-2010

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AREA RATING TABLE 1

LOCATION	Roof Slope (in.)	2,500 SQ. FT.			5,000 SQ. FT.			7,500 SQ. FT.			10,000 SQ. FT.		
		Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time
GANDER NEWFOUND- LAND	0	11.0	2.1	8.0	13.0	2.5	18.0	14.2	2.7	29.0	15.3	2.9	40.0
	2	14.7	2.8	6.5	17.0	3.2	13.5	18.0	3.4	22.0	19.25	3.6	30.0
	3	17.0	3.2	5.0	19.25	3.6	11.0	20.3	3.8	18.5	21.5	4.0	25.0
	4	19.25	3.6	4.5	21.5	4.0	10.0	23.2	4.3	16.0	24.3	4.5	22.0
	5	21.5	4.0	4.0	23.7	4.4	9.0	25.0	4.6	14.0	26.0	4.8	19.5
	6	23.2	4.3	3.5	25.5	4.7	8.0	27.5	5.0	12.5	28.7	5.2	17.0
ST. ANDREWS NEWFOUND- LAND	0	11.0	2.1	8.0	13.0	2.5	18.5	14.2	2.7	29.5	15.3	2.9	40.0
	2	14.7	2.8	6.0	17.0	3.2	13.5	18.0	3.4	22.0	19.25	3.6	30.0
	3	17.0	3.2	5.0	19.25	3.6	11.5	20.3	3.8	18.5	21.5	4.0	25.0
	4	19.25	3.6	4.5	21.5	4.0	10.0	23.2	4.3	15.5	23.7	4.4	22.0
	5	21.0	3.9	4.0	23.7	4.4	8.5	25.0	4.6	14.0	25.5	4.7	19.5
	6	23.2	4.3	3.5	25.5	4.7	7.5	27.5	5.0	12.5	28.7	5.2	17.0
ST-JOHN'S NEWFOUND- LAND	0	12.0	2.3	8.5	13.5	2.6	19.0	14.7	2.8	30.0	16.5	3.1	43.0
	2	14.7	2.8	6.0	17.5	3.3	14.0	18.75	3.5	22.5	20.3	3.8	31.0
	3	17.5	3.3	5.0	19.25	3.6	11.5	21.0	3.9	19.0	22.0	4.1	25.0
	4	19.8	3.7	4.5	22.0	4.1	10.0	23.2	4.3	16.0	24.3	4.5	23.0
	5	21.5	4.0	4.0	24.3	4.5	9.0	25.5	4.7	14.0	26.75	4.9	20.0
	6	23.7	4.4	3.5	26.0	4.8	8.0	28.0	5.1	13.0	30.2	5.4	18.0
CHARLOTTE- TOWN P.E.I.	0	11.5	2.2	8.5	13.0	2.5	18.0	14.2	2.7	29.0	14.7	2.8	40.0
	2	15.3	2.9	6.5	17.0	3.2	14.0	18.0	3.4	22.0	19.25	3.6	30.0
	3	17.5	3.3	5.0	19.25	3.6	11.5	20.3	3.8	18.0	21.5	4.0	25.0
	4	19.8	3.7	4.5	21.8	4.05	10.0	23.2	4.3	16.0	23.7	4.4	22.0
	5	22.0	4.1	4.0	24.3	4.5	9.0	25.5	4.7	14.0	26.0	4.8	20.0
	6	24.3	4.5	3.7	26.0	4.8	8.0	28.0	5.1	13.0	28.7	5.2	18.0
HALIFAX NOVA SCOTIA	0	15.3	2.9	10.0	18.75	3.5	22.5	21.0	3.9	3.5	22.5	4.2	48.0
	2	18.75	3.5	7.5	22.0	4.1	16.0	24.3	4.5	26.5	26.0	4.8	36.0
	3	20.3	3.8	6.0	24.3	4.5	14.0	26.0	4.8	22.0	28.0	5.1	31.0
	4	23.2	4.3	5.5	26.75	4.9	12.0	29.5	5.3	19.0	30.9	5.5	26.5
	5	25.5	4.7	5.0	29.5	5.3	10.5	32.5	5.7	17.0	34.8	5.0	24.0
	6	27.5	5.0	4.0	31.8	5.6	9.5	34.8	6.0	15.0	-	-	-
SYDNEY NOVA SCOTIA	0	11.5	2.2	8.5	13.0	2.5	19.0	14.2	2.7	30.0	15.7	3.0	41.0
	2	14.7	2.8	6.5	17.0	3.2	14.0	18.75	3.5	22.0	19.8	3.7	31.0
	3	17.0	3.2	5.0	19.25	3.6	11.5	20.3	3.8	19.0	21.5	4.0	24.5
	4	19.25	3.6	4.5	21.75	4.05	10.0	23.2	4.3	15.5	24.3	4.5	22.5
	5	21.5	4.0	4.0	23.7	4.4	8.5	25.0	4.6	13.5	26.75	4.9	20.0
	6	23.7	4.4	3.5	25.5	4.7	8.0	27.75	5.05	12.5	29.5	5.3	18.0
YARMOUTH NOVA SCOTIA	0	15.3	2.9	10.0	18.75	3.5	22.5	21.0	3.9	35.0	22.5	4.2	48.0
	2	18.75	3.5	7.5	22.0	4.1	16.0	24.3	4.5	26.5	26.0	4.8	36.0
	3	20.3	3.8	6.0	24.3	4.5	14.0	26.0	4.8	22.0	28.0	5.1	31.0
	4	23.2	4.3	5.5	26.75	4.9	12.0	29.5	5.3	19.0	30.9	5.5	26.5
	5	25.5	4.7	5.0	29.5	5.3	10.5	32.5	5.7	17.0	34.8	6.0	24.0
	6	27.5	5.0	4.0	31.8	5.6	9.5	34.8	6.0	15.0	-	-	-
CAMBELL- TON NEW BRUNSWICK	0	11.0	2.1	8.0	13.0	2.5	18.5	14.2	2.7	29.5	15.3	2.9	40.0
	2	14.7	2.8	6.0	17.0	3.2	13.5	18.0	3.4	22.0	19.25	3.6	30.0
	3	17.0	3.2	5.0	19.25	3.6	11.5	20.3	3.8	18.5	21.5	4.0	25.0
	4	19.25	3.6	4.5	21.5	4.0	10.0	23.2	4.3	15.5	23.7	4.4	22.0
	5	21.0	3.9	4.0	23.7	4.4	8.5	25.0	4.6	14.0	25.5	4.7	19.5
	6	23.2	4.3	3.5	25.5	4.7	7.5	27.5	5.0	12.5	28.7	5.2	17.0
CHATHAM NEW BRUNSWICK	0	9.0	1.7	7.5	12.0	2.3	17.0	13.2	2.55	28.0	14.7	2.8	40.0
	2	12.5	2.4	5.0	14.7	2.8	12.5	16.5	3.1	21.0	18.75	3.5	29.0
	3	14.2	2.7	4.2	17.0	3.2	10.5	19.0	3.55	16.5	19.8	3.7	24.0
	4	15.7	3.0	3.5	18.75	3.5	8.5	21.0	3.9	14.0	22.0	4.1	20.5
	5	17.0	3.2	3.0	20.3	3.8	7.5	23.2	4.3	12.0	24.3	4.5	18.0
	6	18.0	3.4	2.75	22.5	4.2	6.75	24.3	4.5	11.5	25.5	4.7	16.0
MONCTON NEW BRUNSWICK	0	12.0	2.3	9.0	13.6	2.6	18.0	14.7	2.8	29.0	15.7	3.0	41.0
	2	16.5	3.1	6.5	18.0	3.4	14.0	19.0	3.55	22.0	19.8	3.7	31.0
	3	18.75	3.5	5.5	19.8	3.7	12.0	21.5	4.0	19.0	22.5	4.2	25.5
	4	21.5	4.0	5.0	22.75	4.25	10.5	24.0	4.45	16.0	24.5	4.55	22.0
	5	23.7	4.4	4.5	25.5	4.7	9.0	26.0	4.8	15.0	27.5	5.0	20.0
	6	25.5	4.7	4.0	28.0	5.1	8.5	29.5	5.3	13.5	30.9	5.5	18.0
SAINT- JOHN NEW BRUNSWICK	0	12.5	2.4	9.0	15.3	2.9	20.0	17.5	3.3	32.0	18.75	3.5	44.0
	2	15.7	3.0	6.5	18.75	3.5	14.5	21.0	3.9	24.0	22.5	4.2	32.5
	3	17.5	3.3	5.5	21.0	3.9	12.0	22.5	4.2	20.0	24.3	4.5	28.0
	4	19.8	3.7	4.5	22.5	4.2	11.0	25.0	4.6	17.0	26.75	4.9	24.0
	5	21.5	4.0	4.0	25.0	4.6	9.0	27.5	5.0	15.0	30.2	5.4	21.5
	6	23.2	4.3	3.5	27.5	5.0	8.0	30.2	5.4	14.0	31.8	5.6	19.5
CHICOUTIMI QUEBEC	0	6.0	1.2	7.0	10.0	1.9	15.0	11.0	2.1	24.0	11.75	2.25	33.0
	2	12.5	2.4	5.25	13.6	2.6	11.5	14.2	2.7	18.5	15.7	3.0	26.0
	3	14.2	2.7	4.5	15.7	3.0	10.0	17.5	3.3	16.0	18.0	3.4	22.0
	4	16.5	3.1	3.75	18.0	3.4	8.0	19.25	3.6	13.0	19.8	3.7	19.0
	5	18.0	3.4	3.25	19.8	3.7	7.0	21.5	4.0	12.0	22.0	4.1	16.0
	6	19.25	3.6	3.0	21.5	4.0	6.5	23.2	4.3	11.0	24.3	4.5	15.0
GASPE QUEBEC	0	9.0	1.7	7.5	12.0	2.3	17.0	13.25	2.55	28.0	14.7	2.8	40.0
	2	12.5	2.4	5.0	14.7	2.8	12.5	16.5	3.1	21.0	18.75	3.5	29.0
	3	14.2	2.7	4.2	17.0	3.2	10.5	19.0	3.55	16.5	19.8	3.7	24.0
	4	15.7	3.0	3.5	18.75	3.5	8.5	21.0	3.9	14.0	22.0	4.1	20.5
	5	17.0	3.2	3.0	20.3	3.8	7.5	23.2	4.3	12.0	24.3	4.5	18.0
	6	18.0	3.4	2.75	22.5	4.2	6.75	24.3	4.5	11.5	25.5	4.7	16.0

AREA RATING TABLE 1 (continued)

LOCATION	Roof Slope (in.)	2,500 SQ. FT.			5,000 SQ. FT.			7,500 SQ. FT.			10,000 SQ. FT.		
		Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time
MONTREAL QUEBEC	0	11.5	2.2	8.5	13.0	2.5	18.0	14.2	2.7	29.0	14.7	2.8	40.0
	2	15.3	2.9	6.5	17.0	3.2	14.0	18.0	3.4	22.0	19.25	3.6	30.0
	3	17.5	3.3	5.0	19.25	3.6	11.5	20.3	3.8	18.0	21.5	4.0	25.0
	4	19.8	3.7	4.5	21.8	4.05	10.0	23.2	4.3	16.0	23.7	4.4	22.0
	5	22.0	4.1	4.0	24.3	4.5	9.0	25.5	4.7	14.0	26.0	4.8	20.0
	6	24.3	4.5	3.7	26.0	4.8	8.0	28.0	5.1	13.0	28.7	5.2	18.0
QUEBEC CITY QUEBEC	0	11.5	2.2	8.5	13.0	2.5	18.0	14.2	2.7	29.5	15.3	2.9	41.0
	2	15.3	2.9	6.5	17.5	3.3	14.0	18.75	3.5	22.0	19.25	3.6	31.0
	3	17.6	3.35	5.5	19.8	3.7	11.75	21.0	3.9	19.0	21.5	4.0	25.0
	4	20.3	3.8	4.5	22.0	4.1	10.0	23.2	4.3	16.0	24.3	4.5	22.5
	5	22.0	4.1	4.0	24.3	4.5	9.0	25.5	4.7	14.0	26.75	4.9	20.0
	6	24.3	4.5	3.75	26.0	4.8	8.0	28.0	5.1	13.0	29.5	5.3	17.5
RIMOUSKI QUEBEC	0	9.0	1.7	7.5	12.0	2.3	17.0	13.2	2.55	28.0	14.7	2.8	40.0
	2	12.5	2.4	5.0	14.7	2.8	12.5	16.5	3.1	21.0	18.75	3.5	29.0
	3	14.2	2.7	4.2	17.0	3.2	10.5	19.0	3.55	16.5	19.8	3.7	24.0
	4	15.7	3.0	3.5	18.75	3.5	8.5	21.0	3.9	14.0	22.0	4.1	20.5
	5	17.0	3.2	3.0	20.3	3.8	7.5	23.2	4.3	12.0	24.3	4.5	18.0
	6	18.0	3.4	2.75	22.5	4.2	6.75	24.3	4.5	11.5	25.5	4.7	16.0
ROUYN-NORANDA QUEBEC	0	11.5	2.2	8.5	13.0	2.5	18.0	14.2	2.7	29.0	14.7	2.8	40.0
	2	15.3	2.9	6.5	17.0	3.2	14.0	18.0	3.4	22.0	19.25	3.6	30.0
	3	17.5	3.3	5.0	19.25	3.6	11.5	20.3	3.8	18.0	21.5	4.0	25.0
	4	19.8	3.7	4.5	21.8	4.05	10.0	23.2	4.3	16.0	23.7	4.4	22.0
	5	22.0	4.1	4.0	24.3	4.5	9.0	25.5	4.7	14.0	26.0	4.8	20.0
	6	24.3	4.5	3.7	26.0	4.8	8.0	28.0	5.1	13.0	28.7	5.2	18.0
SHER-BROOKE QUEBEC	0	11.0	2.1	9.0	13.0	2.5	18.0	14.2	2.7	29.0	14.7	2.8	40.0
	2	14.7	2.8	6.5	17.0	3.2	14.0	18.0	3.4	22.0	18.75	3.5	29.5
	3	17.5	3.3	5.0	19.25	3.6	11.5	20.3	3.8	18.0	21.5	4.0	24.0
	4	19.8	3.7	4.5	21.5	4.0	10.0	23.2	4.3	15.0	23.7	4.4	22.0
	5	21.5	4.0	4.0	24.3	4.5	8.5	25.0	4.6	14.0	26.0	4.8	19.0
	6	23.7	4.4	3.5	26.0	4.8	8.0	27.5	5.0	12.0	28.7	5.2	17.0
TROIS-RIVIERES QUEBEC	0	11.0	2.1	9.0	13.0	2.5	18.0	14.2	2.7	29.0	14.7	2.8	40.0
	2	14.7	2.8	6.5	17.0	3.2	14.0	18.0	3.4	22.0	18.75	3.5	29.5
	3	17.5	3.3	5.0	19.25	3.6	11.5	20.3	3.8	18.0	21.5	4.0	24.0
	4	19.8	3.7	4.5	21.5	4.0	10.0	23.2	4.3	15.0	23.7	4.4	22.0
	5	21.5	4.0	4.0	24.3	4.5	8.5	25.0	4.6	14.0	26.0	4.8	19.0
	6	23.7	4.4	3.5	26.0	4.8	8.0	27.5	5.0	12.0	28.7	5.2	17.0
GUELPH ONTARIO	0	12.5	2.4	10.5	13.6	2.6	19.0	14.7	2.8	30.0	15.7	3.0	41.0
	2	17.0	3.2	7.0	18.25	3.45	14.5	19.25	3.6	23.0	19.8	3.7	31.0
	3	19.25	3.6	5.5	21.0	3.9	12.0	21.5	4.0	19.5	22.5	4.2	27.0
	4	21.5	4.0	5.0	23.2	4.3	10.5	24.3	4.5	16.0	25.0	4.6	23.0
	5	24.3	4.5	4.5	25.0	4.6	9.5	26.75	4.9	14.5	27.5	5.0	20.5
	6	26.0	4.8	4.0	28.0	5.1	9.0	29.5	5.3	13.0	30.9	5.5	19.0
HAMILTON ONTARIO	0	12.0	2.3	9.0	14.2	2.7	18.5	15.3	2.9	30.0	17.0	3.2	42.0
	2	15.7	3.0	6.5	18.0	3.4	14.5	19.25	3.6	23.0	20.3	3.8	31.0
	3	18.0	3.4	5.5	20.3	3.8	12.0	21.5	4.0	19.5	22.5	4.2	26.0
	4	20.3	3.8	5.0	23.2	4.3	10.5	24.3	4.5	17.0	25.0	4.6	23.0
	5	22.5	4.2	4.5	25.0	4.6	10.0	26.0	4.8	14.5	27.5	5.0	20.5
	6	25.0	4.6	4.0	27.5	5.0	8.0	29.5	5.3	13.0	30.2	5.4	19.0
KINGSTON ONTARIO	0	11.0	2.1	8.0	13.0	2.5	17.5	14.2	2.7	29.0	15.3	2.9	40.0
	2	14.7	2.8	6.0	16.5	3.1	13.5	18.0	3.4	22.0	19.0	3.55	30.0
	3	17.0	3.2	5.0	18.75	3.5	11.5	19.8	3.7	18.5	21.5	4.0	24.5
	4	19.25	3.6	4.5	21.5	4.0	10.0	22.5	4.2	16.0	23.7	4.4	22.0
	5	21.5	4.0	4.0	23.7	4.4	9.0	25.0	4.6	14.0	26.0	4.8	20.0
	6	23.2	4.3	3.5	23.2	4.3	8.0	27.5	5.0	12.0	28.7	5.2	17.0
LONDON ONTARIO	0	11.0	2.1	8.0	13.0	2.5	19.5	14.7	2.8	29.5	15.7	3.0	41.0
	2	14.7	2.8	6.0	17.0	3.2	14.0	18.75	3.5	23.0	19.25	3.6	30.0
	3	17.0	3.2	5.0	19.25	3.6	11.5	20.3	3.8	19.0	21.5	4.0	25.0
	4	19.25	3.6	4.5	21.5	4.0	10.0	23.2	4.3	16.0	23.7	4.4	21.5
	5	21.5	4.0	4.0	23.7	4.4	9.0	25.0	4.6	14.0	26.0	4.8	19.5
	6	23.2	4.3	3.5	26.0	4.3	8.0	27.5	5.0	12.5	28.7	5.2	17.0
NORTH BAY ONTARIO	0	9.0	1.7	7.0	11.5	2.2	17.0	13.0	2.5	28.0	14.7	2.8	40.0
	2	12.0	2.3	5.0	14.7	2.8	12.0	17.0	3.2	21.0	18.75	3.5	29.0
	3	13.2	2.55	4.0	16.5	3.1	10.0	18.75	3.5	16.0	19.8	3.7	24.0
	4	14.7	2.8	3.5	18.75	3.5	8.0	20.3	3.8	14.0	22.0	4.1	20.5
	5	15.7	3.0	2.75	19.8	3.7	7.0	22.0	4.1	12.0	24.0	4.45	17.5
	6	17.0	3.2	2.5	21.5	4.0	6.5	23.7	4.4	11.0	25.5	4.7	16.0
OTTAWA ONTARIO	0	11.5	2.2	8.0	12.5	2.4	18.0	13.6	2.6	29.0	14.7	2.8	39.0
	2	14.7	2.8	6.5	17.0	3.2	14.0	18.0	3.4	22.0	18.75	3.5	29.0
	3	18.0	3.4	5.5	19.25	3.6	11.5	20.3	3.8	19.0	21.0	3.9	24.0
	4	19.8	3.7	4.5	21.5	4.0	10.0	23.2	4.3	16.0	23.7	4.4	21.5
	5	22.5	4.2	4.0	23.7	4.4	9.0	25.0	4.6	14.0	26.0	4.8	19.5
	6	24.3	4.5	3.5	26.0	4.8	8.0	27.5	5.0	12.5	28.7	5.2	17.0
ST. THOMAS ONTARIO	0	11.5	2.2	8.5	13.0	2.5	19.0	14.2	2.7	30.0	15.7	3.0	41.0
	2	14.7	2.8	6.5	17.0	3.2	14.0	18.75	3.5	22.0	19.8	3.7	31.0
	3	17.0	3.2	5.0	19.25	3.6	11.5	20.3	3.8	19.0	21.5	4.0	24.5
	4	19.25	3.6	4.5	21.75	4.05	10.0	23.2	4.3	15.5	24.3	4.5	22.5
	5	21.5	4.0	4.0	23.7	4.4	8.5	25.0	4.6	13.5	26.75	4.9	20.0
	6	23.7	4.4	3.5	25.5	4.7	8.0	27.75	5.05	12.5	29.5	5.3	18.0

AREA RATING TABLE 1 (continued)

LOCATION	Roof Slope (in.)	2,500 SQ. FT.			5,000 SQ. FT.			7,500 SQ. FT.			10,000 SQ. FT.		
		Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time	Flow Rate GPM	Water Depth (in.)	Drain Down Time
THUNDER BAY ONTARIO	0	10.0	1.9	8.0	12.0	2.3	18.0	14.2	2.7	29.0	14.7	2.8	40.0
	2	14.2	2.7	5.8	15.7	3.0	13.5	17.0	3.2	21.0	18.0	3.4	28.5
	3	16.5	3.1	5.0	18.0	3.4	11.0	19.8	3.7	18.0	20.3	3.8	24.0
	4	18.0	3.4	4.0	20.3	3.8	9.5	22.0	4.1	15.0	23.2	4.3	21.5
	5	20.3	3.8	3.5	22.5	4.2	8.0	23.7	4.4	13.0	25.0	4.6	18.0
	6	21.5	4.0	3.2	24.3	4.5	7.5	26.0	4.8	12.0	27.5	5.0	16.0
TIMMINS ONTARIO	0	11.0	2.1	8.0	13.0	2.5	18.5	14.2	2.7	29.5	15.3	2.9	40.0
	2	14.7	2.8	6.0	17.0	3.2	13.5	18.0	3.4	22.0	19.25	3.6	30.0
	3	17.0	3.2	5.0	19.25	3.6	11.5	20.3	3.8	18.5	21.5	4.0	25.0
	4	19.25	3.6	4.5	21.5	4.0	10.0	23.2	4.3	15.5	23.7	4.4	22.0
	5	21.0	3.9	4.0	23.7	4.4	8.5	25.0	4.6	14.0	25.5	4.7	19.5
	6	23.2	4.3	3.5	25.5	4.7	7.5	27.5	5.0	12.5	28.7	5.2	17.0
TORONTO ONTARIO	0	12.0	2.3	9.0	14.2	2.7	18.4	15.3	2.9	30.0	17.0	3.2	42.0
	2	15.7	3.0	6.5	18.0	3.4	14.5	19.25	3.6	23.0	20.3	3.8	31.0
	3	18.0	3.4	5.5	20.3	3.8	12.0	21.5	4.0	19.5	22.5	4.2	26.0
	4	20.3	3.8	5.0	23.2	4.3	10.5	24.3	4.5	17.0	25.0	4.6	23.0
	5	22.5	4.2	4.5	25.0	4.6	10.0	26.0	4.8	14.5	27.5	5.0	20.5
	6	25.0	4.6	4.0	27.5	5.0	8.0	29.5	5.3	13.0	30.2	5.4	19.0
WINDSOR ONTARIO	0	12.0	2.3	9.0	13.6	2.6	19.0	14.7	2.8	29.5	15.7	3.0	41.0
	2	15.7	3.0	6.5	17.5	3.3	14.0	18.75	3.5	22.0	19.8	3.7	30.5
	3	18.0	3.4	5.5	19.8	3.7	11.5	21.0	3.9	19.0	22.0	4.1	25.0
	4	20.3	3.8	5.0	22.5	4.2	10.5	23.7	4.4	16.0	24.3	4.5	22.5
	5	22.5	4.2	4.0	24.3	4.5	9.0	26.0	4.8	14.5	26.75	4.9	20.0
	6	24.3	4.5	3.5	27.5	5.0	8.0	28.7	5.2	13.0	29.5	5.3	18.0
BRANDON (RIVERS) MANITOBA	0	12.0	2.3	8.5	13.6	2.6	19.0	14.7	2.8	30.0	15.5	2.95	40.0
	2	16.5	3.1	6.75	18.0	3.4	14.0	18.75	3.5	23.0	19.8	3.7	31.0
	3	18.75	3.5	5.5	20.3	3.8	12.0	21.5	4.0	19.0	22.0	4.1	25.5
	4	21.5	4.0	5.0	23.2	4.3	10.0	23.7	4.4	16.0	24.3	4.5	22.5
	5	23.7	4.4	4.5	25.5	4.7	9.5	26.75	4.9	15.0	27.5	5.0	20.5
	6	25.5	4.7	4.0	28.0	5.1	8.5	29.5	5.3	13.0	30.2	5.4	18.0
WINNIPEG MANITOBA	0	10.0	1.9	8.0	12.0	2.3	18.0	14.2	2.7	29.0	14.7	2.8	40.0
	2	14.2	2.7	5.8	15.7	3.0	13.5	17.0	3.2	21.0	18.0	3.4	28.5
	3	10.5	3.1	5.0	18.0	3.4	11.0	19.8	3.7	18.0	20.3	3.8	24.0
	4	18.0	3.4	4.0	20.3	3.8	9.5	22.0	4.1	15.0	23.2	4.3	21.5
	5	20.3	3.8	3.5	22.5	4.2	8.0	23.7	4.4	13.0	25.0	4.6	18.0
	6	21.5	4.0	3.2	24.3	4.5	7.5	26.0	4.8	12.0	27.5	5.0	16.0
REGINA SASKATCHEWAN	0	9.0	1.7	7.0	11.5	2.2	17.0	13.0	2.5	28.0	14.7	2.8	40.0
	2	12.0	2.3	5.0	14.7	2.8	12.0	17.0	3.2	21.0	18.75	3.5	29.0
	3	13.2	2.55	4.0	16.5	3.1	10.0	18.75	3.5	16.0	19.8	3.7	24.0
	4	14.7	2.8	3.5	18.75	3.5	8.0	20.3	3.8	14.0	22.0	4.1	20.5
	5	15.7	3.0	2.75	19.8	3.7	7.0	22.0	4.1	12.0	24.0	4.45	17.5
	6	17.0	3.2	2.5	21.5	4.0	6.5	23.7	4.4	11.0	25.5	4.7	16.0
SASKATOON SASKATCHEWAN	0	10.0	1.9	7.5	11.5	2.2	17.0	12.5	2.4	27.0	13.0	2.5	36.0
	2	11.5	2.2	6.0	15.3	2.9	13.0	17.0	3.2	21.0	18.0	3.4	28.0
	3	17.0	3.2	5.0	18.0	3.4	11.0	19.25	3.6	17.0	20.3	3.8	23.0
	4	19.25	3.6	4.5	20.3	3.8	9.5	21.5	4.0	14.5	22.5	4.2	20.0
	5	21.0	3.9	4.0	22.5	4.2	8.5	23.7	4.4	13.5	25.0	4.6	18.0
	6	23.2	4.3	3.5	25.0	4.6	7.5	26.0	4.8	12.0	26.75	4.9	16.0
CALGARY ALBERTA	0	10.5	2.0	8.0	12.0	2.3	17.5	13.0	2.5	27.5	13.6	2.6	37.0
	2	14.2	2.7	6.0	15.7	3.0	13.0	17.0	3.2	21.0	18.0	3.4	28.0
	3	17.0	3.2	5.0	18.0	3.4	11.0	19.25	3.6	17.0	20.3	3.8	23.0
	4	19.25	3.6	4.5	20.3	3.8	9.5	21.5	4.0	14.5	22.5	4.2	20.0
	5	21.0	3.9	4.0	22.5	4.2	8.5	23.7	4.4	13.5	25.0	4.6	18.0
	6	22.5	4.2	3.5	25.0	4.6	7.5	26.0	4.8	12.0	27.5	5.0	16.5
EDMONTON ALBERTA	0	11.0	2.1	8.0	12.5	2.4	18.5	13.6	2.6	28.5	14.7	2.8	40.0
	2	14.7	2.8	6.0	17.0	3.2	13.5	18.0	3.4	21.5	18.75	3.5	30.5
	3	17.0	3.2	5.0	18.75	3.5	11.0	20.3	3.8	17.5	21.0	3.9	24.0
	4	19.25	3.6	4.5	21.5	4.0	10.0	23.2	4.3	15.0	23.7	4.4	21.5
	5	21.0	3.9	4.0	23.7	4.4	8.5	25.0	4.6	14.5	26.0	4.8	18.5
	6	22.5	4.2	3.5	25.0	4.6	7.5	27.5	5.0	12.5	28.0	5.1	17.0
PENTICTON B.C.	0	5.8	1.1	5.0	6.5	1.3	11.0	7.8	1.5	19.5	8.8	1.6	27.5
	2	9.0	1.7	3.5	10.5	2.0	8.0	11.5	2.2	14.0	12.0	2.3	20.0
	3	10.5	2.0	3.0	12.5	2.4	7.0	13.0	2.5	11.0	13.6	2.6	16.0
	4	12.0	2.3	2.5	13.6	2.6	6.0	14.7	2.8	10.0	15.7	3.0	14.0
	5	13.0	2.5	2.25	14.7	2.8	5.5	16.5	3.1	8.5	17.5	3.3	12.0
	6	13.6	2.6	2.0	15.7	3.0	5.0	18.0	3.4	8.0	18.75	3.5	11.05
VANCOUVER B.C.	0	9.0	1.7	7.0	11.5	2.2	17.0	13.6	2.6	28.5	15.3	2.9	40.5
	2	11.5	2.2	5.0	14.7	2.8	12.0	17.0	3.2	21.0	18.0	3.4	28.5
	3	12.5	2.4	3.5	15.7	3.0	9.5	18.0	3.4	16.0	19.8	3.7	23.5
	4	13.6	2.6	3.0	17.5	3.3	8.0	19.8	3.7	14.0	21.5	4.0	20.0
	5	14.2	2.7	2.5	18.75	3.5	7.0	21.0	3.9	11.5	23.2	4.3	17.0
	6	14.7	2.8	2.0	19.8	3.7	6.0	22.5	4.2	9.5	25.0	4.6	15.5
VICTORIA B.C.	0	8.8	1.6	7.0	11.5	2.2	17.0	13.0	2.5	28.0	14.7	2.8	40.0
	2	11.5	2.2	5.0	14.7	2.8	12.0	16.5	3.1	20.5	18.0	3.4	28.5
	3	12.5	2.4	3.5	15.7	3.0	9.5	18.0	3.4	16.0	19.25	3.6	23.0
	4	13.0	2.5	3.0	17.0	3.2	7.5	19.25	3.6	13.5	21.5	4.0	20.0
	5	14.7	2.8	2.5	18.75	3.5	7.0	21.0	3.9	11.5	23.2	4.3	17.0
	6	15.3	2.9	2.0	19.25	3.6	6.0	22.5	4.2	9.5	24.3	4.5	15.0

CONSTRUCTION VARIATIONS INSTALLATION, APPLICATION, ACCESSORIES

FIG. 1083

AS ILLUSTRATED-Drain body set in poured roof deck slab (B). Flashing (A) is secured by a non-puncturing type flashing ring which also has a combined gravel stop to prevent roof finish from washing into leader

FIG. 1083-C

AS ILLUSTRATED-with Underdeck Clamp -C - Where roof drain openings are pre-sleeved in the slab. The Underdeck Clamp provides a positive anchoring of the drain body to the roof deck. Also applicable to any other slab or deck conditioning where positive anchorage is required.

FIG. 1083-ERC

AS ILLUSTRATED-Addition of Extension Sleeve -E to the drain body compensates for any specified amount of insulation required above the roof slab (or deck). Removal of the extension sleeve permits roof drainage during construction.

FIG. 1083-RC

AS ILLUSTRATED-With Drain Body Sump Receiver -R. This provides a convenient seat for the drain body flange on wood type decks or other slabs. The drain body sump receiver also has wide application where oversized deck openings are encountered.

FIG. 1083-RC

AS ILLUSTRATED-Application of Roof Drain Body Sump Receiver -R is laid on insulation and receives drain body flange. Underdeck Clamp -C provides positive securing of assembly to steel deck.

TECHNICAL DATA

All roofs are subject to the effects of the elements and because of this, care must be exercised to see that they are treated properly.

Sun, rain, and snow, together with temperature changes, can cause a great deal of damage to the roof if it is not properly prepared.

JAY R. SMITH, co. has undertaken to supply the architect and engineer, as well as the roofing contractors and owner, with a well designed product, properly made of good materials, that will last the life of the building.

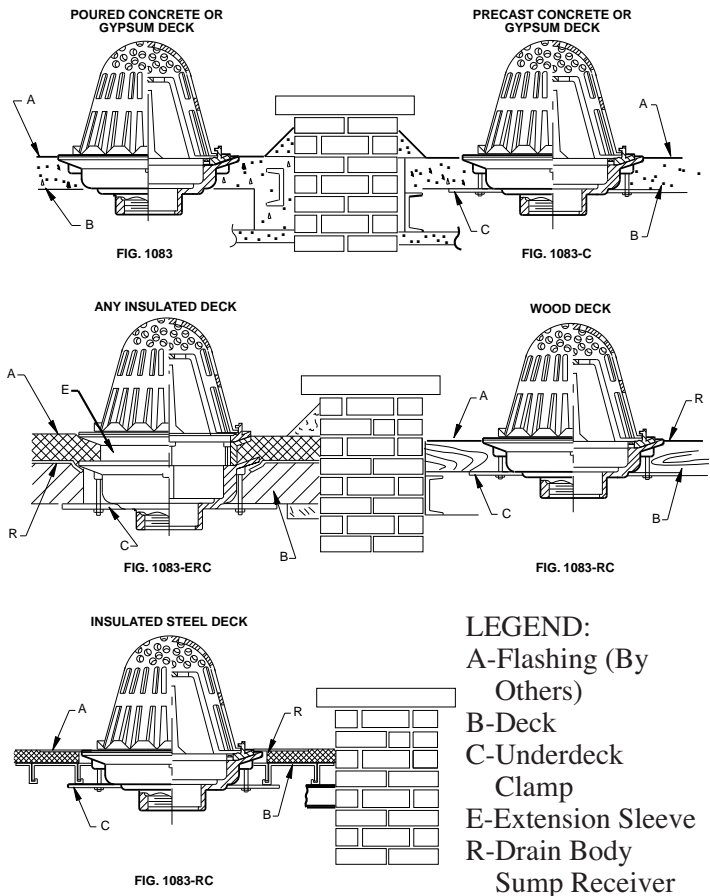
We will continue through sound engineering study, to promote new items to improve drainage, and when made, will promote them through additional literature, brochures, and catalogs.

Starting with JAY R. SMITH, co. products, the designer of roofs must first consider local rainfall tables when planning his job.

With this as a start, local codes must be studied for requirements necessary for the area being considered. With these guides, the roof drains can be properly sized and located.

LOCAL CODES

Various local codes call for many different requirements to suit local conditions. The local plumbing code which is in force should always be checked for varia-



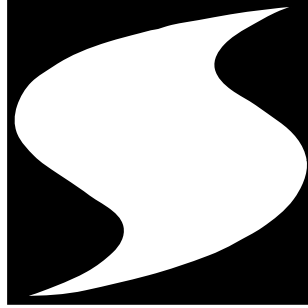
tions which are required. Thus modification of the rainfall and leader size figures may be in order in some areas. Roof design will remain a prerogative of the engineer. He must consider structural safety, reliability, service and other normal factors. These should be in accordance with local codes and requirements and any deviations specifically approved. On some roofs, deflections may impede run off and cause excessive loads.

SIZING AND LOCATION

Determining size, number and location of roof drains is important. Sizing data is shown on page 4. Location of each drain is determined by the physical shape and setup of the building. The building plans must be studied (both roof and inside) so that roof drains are properly spaced for even drainage. When locating drains, one must be careful not to interfere with equipment on the roof. Leaders should also be planned so that they will not interfere with walls and equipment on the floors below. If necessary, depending on the construction of the roof or in an area subject to wide temperature ranges, expansion joints may be considered. This will prevent unnecessary damage to the roof.

Remember, the best designed job can be the poorest if poor material is used. Always specify and get JAY R. SMITH, co. roof drains and accessories for your roofing job.

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