

**National Plumbing Code - Roof Drainage Capacity Calculation Procedure**

- 1) Find the roof area in m<sup>2</sup>.
- 2) Take 15 min rain water number from the National Building Code Rain Tables ([APPENDIX C – TABLE C-2 Climatic Design Data for Selected Locations in Canada](#)). These values are mm/m<sup>2</sup> of rain in a 15 minute time period. Multiplying the area by this 15 min value gives an output in L. The typical normal value is 23mm/m<sup>2</sup> is for Red Deer only.
- 3) Divide this total storm load by the number of roof drains. Refer to the table below for the maximum allowable volume permitted per drain. Please note on office and smaller shop areas 4"Ø diameter drains are standard. On larger shops and bigger open areas it is best to increase to 6"Ø. We generally recommend to avoid using 2"Ø & 3"Ø unless it is serving a small entrance or lobby. Likewise larger 8"Ø roof drain units should only be used when absolutely required.

**2.4.10.11. Hydraulic Loads on Leaders**

- 1) The hydraulic load that is drained to a *leader* shall conform to Table 2.4.10.11.

**Table 2.4.10.11.**  
**Maximum Permitted Hydraulic Load Drained to a Leader**  
 Forming Part of Article 2.4.10.11.

Circular Leader		Non-Circular Leader	
Size of Leader, inches	Maximum Hydraulic Load, L	Area of Leader, cm <sup>2</sup>	Maximum Hydraulic Load, L
2	1 700	20.3	1 520
2½	3 070	31.6	2 770
3	5 000	45.6	4 500
4	10 800	81.1	9 700
5	19 500	126.6	17 600
6	31 800	182.4	28 700
8	68 300	324.3	61 500

*We recommend only loading up to 50% of the maximums note above so that the outgoing downstream piping can be the same size while retaining an estimated 1 in 100 slope. Full loading is permissible as long as the downstream piping is properly increased one pipe diameter; or as dictated by Table 2.4.10.9.*

**Example 1 - 100x80ft Shop in Red Deer. If there are 3 drains will 4"Ø drains be suitable?**

- 1) 100ft x 80ft = 8000sf  
 Convert to m<sup>2</sup> => 8000sf \* 0.09290304 m<sup>2</sup>/sf = 743.22m<sup>2</sup>
- 2) Rain Value for Red Deer is 23mm/m<sup>2</sup>.  
 743.22m<sup>2</sup> \* 23mm = 17,094L
- 3) 17,094L / 3 drains = 5,698L per drain. As 5,698L is under the max of 9,700L we can utilize 4"Ø drains.

## Example 2 - 700x140ft Shop in Fort Mac. How many 6"Ø drains are required?

1) Calculate the area in metres:

$$700\text{ft} \times 140\text{ft} = 98,000\text{sf}$$

$$\text{Convert to m}^2 \Rightarrow 98,000\text{sf} \times 0.09290304 \text{ m}^2/\text{sf} = 9104.50\text{m}^2$$

2) Calculate the rain volume:

Rain Value for Fort Mac is 13mm/m<sup>2</sup>.

$$9104.50\text{m}^2 \times 13\text{mm} = 118,358\text{L}$$

3) What is the minimum number of drains permitted?

Flow rate for 6"Ø roof drain is 28,700L.

$$118,358\text{L} / (28,700) = 4.12; \text{ however we must round up. } 5 \text{ Drains Required}$$

Note although we are using 6"Ø drains, each drain would see 19,726L. This would require 8"Ø horizontal piping at 1:100 slope as per Table 2.4.10.9.

3) What if we are trying to maximize 6"Ø RWL (1 in 100 slope) horizontal piping for each drain?

Flow rate for 6"Ø RWL @ 1:100 slope is 12,400L.

$$118,358\text{L} / (12,400) = 9.54; \text{ however we must round up. } 10 \text{ Drains Required}$$