

## RFDS 3.00 FIRE FLOW

## 3.1; Fire Flow Determination (effective July, 1, 2010)

The following are guidelines for the determination of required fire flow in the City of Redmond. Required fire flow demand is that amount of water which must be continuously provided at a minimum of 20 psi to a project site for firefighting purposes and shall not include domestic flow. Reference the "RFDS Basic Flow Chart" for the required duration of fire flow.

### 3.1.1; Guidelines for the calculation of required fire flow

- **3.1.1.1**; The Redmond Fire Department Standard "Required Fire Flow Calculation Form" shall be used in conjunction with these guidelines to determine required fire flow. Each step shall be followed in order. Round off decimals as you follow each step. Round down the final figure to the 10s place.
- **3.1.1.2;** The RFDS "Basic Fire Flow Chart" shall be used to obtain the basic flow figure. Area shall be based on Gross Area as used by the Redmond Building Division and as follows.

**Gross Area**: The gross area means the total area of all floors, measured from the exterior face, outside dimensions or exterior column line of a building, including basements, cellars and balconies, but not including unexcavated areas. Where walls and columns are omitted in the construction of a building, such as an open shed or marquee, the exterior wall of the open side or sides, for the purpose of calculating gross area, will be the edge of the roof, including gutters."

- **3.1.1.3** A building with 50% or greater residential occupancy (except SFR, 1 or 2 dwellings) adds a 10% surcharge.
- **3.1.1.4** Buildings with fire sprinkler systems throughout are given a 50% credit.
- 3.1.1.5 For exposures, generally, a percentage is calculated for each of four sides/directions. The distance to other buildings on the same property or to property lines of adjacent property that may be built upon shall be considered the exposure distance. Where a property line is adjacent to a public right of way (i.e. street or railroad) the exposure distance may be taken to the property line on the opposite side of the right of way. The Fire Marshal may assess additional surcharges for exposures not identified above where in his opinion these would require the expenditure of water resources during a fire incident (i.e. stands of trees, equipment, combustible material or vehicle storage).
- 3.1.1.6 Basements, mezzanines, and parking garages shall be included as part of the total building area. A basement with sides greater than 50% below grade shall not accrue an exposure surcharge for that floor. If there is a 3 hour or greater horizontal (floor/ceiling) separation above type 1A construction and approved interior standpipe

October 2013 Edition Page 1 of 4

#### Redmond Fire Department Standards



- throughout the area above and below may be considered two separate buildings for fire flow purposes. No exposure factor will be calculated between these two buildings.
- **3.1.1.7** Structures divided into separate fire areas by a fire wall, as defined and installed by the Building Code, shall have each fire area calculated separately. No exposure surcharge shall be added for the portion of a building separated by such a fire wall.
- **3.1.1.8** Fire barrier walls may be used for credit under section 3.1.1.14, below.
- **3.1.1.9** Structures separated by 10 feet or less shall be considered as one building for fire flow calculation.
- **3.1.1.10** One and two family homes (3,600 square feet or less) in residential developments shall be considered to have a required fire flow of 1,500 gpm (1,000 gpm when all homes within the development are fire sprinkler equipped). For one and two family homes 3,601 square feet or more, use the "Form for the Calculation of Required Fire Flow".
- **3.1.1.11** One and two family homes located in areas of the City identified by City of Redmond Water Department as having less than 1500gpm available, may use the following formula to determine required fire flow.
  - Available gpm x 2.4 square feet = maximum gross area of structure
- **3.1.1.12** In SFR developments which are allowed to use wood shingles, a surcharge of 250 gpm is added. In SFR developments where a structure to structure distance is allowed to be 10 feet or less a surcharge of 250 gpm is added.
- **3.1.1.13** Total commercial fire flow should not exceed 3,500 gpm.
- **3.1.1.14** The Fire Marshal shall determine what other credits or features may be allowed, if any, and amount; or if design changes (i.e. building area reduction, exposure distance increases, or a change in construction type) shall be required. "Other" credits should not exceed 25%.
- **3.1.1.15** Where multiple buildings are located on one site the fire flow provided to the site shall not be less than the largest required fire flow.
- 3.1.1.16 Where future buildings or phases are anticipated the required fire flow shall be based upon the future build out. Where this is not possible or is undesirable the project developer assumes the responsibility for all future improvements necessary to provide additional fire flow prior to the additional phase or construction.

October 2013 Edition Page 2 of 4

# Redmond Fire Department Standards



Required Fire Flow Calculation Form	
PROJECT:	Date:
LOCATION:	
	PHONE:
ARCHITECT:	PHONE:
BUILDING CONSTRUCTION TYPE: IA, IE	B, IIA, IIB, IIIA, IIIB, IV, VA, VB (circle one)
Number of stories:/ Footprint area:	Mezzanines/partial floors
TOTAL GROSS AREA:	
All Commercial & Single Family 3,600 square feet or greater	
Conversion Table         Feet = %       Feet = %         0'-10' = 25%       N = =         11'-25'=20%       E = =         26'-40'=15%       W= =         41'-80'=10%       S = =	x 0.5  1.75* Intage for each of four directions. Use the and then add the percent to the previous total.*)
TOTAL RECEIVED TOTAL RECEIVED TO THE FLOW AVAILABLE PER Single Family Residential Development 1. No Fire Sprinklers =1500 gpm/All Fire Sprinklers 2. Wood shingles allowed in the development 2. Less than 10 feet allowed between structure	klers = 1000 gpm
FIRE FLOW AVAILABLE PER PUBLIC V	

October 2013 Edition Page 3 of 4



#### RFDS BASIC FIRE FLOW CHART (Effective July 1, 2010) Fire Fire Duration **Flow** Flow Type VB Type IA, IB Type IIA, IIIA, IV Type IIB, IIIB, VA (GPM) (GPM) (Hydrants) 2(1)1500 0-22,700 0 - 12,700 0 - 8,200 0 - 3,600 1500 2(1)1750 22,701 - 30,200 12,701 - 17,000 8,201 - 10,900 3,601 - 4,800 1750 2(2)2000 30,201 - 38,700 17,001 - 21,800 10,901 - 13,900 4,801 - 6,200 2000 2(1)2250 38,701 - 48,300 21,801 - 27,200 13,901 - 17,400 6,201 - 7,700 2250 2(3)2500 48,301 - 59,000 27,201 - 33,250 17,401 - 21,300 7,701 - 9,400 2500 2(3)59,001 - 70,900 2750 2750 33,251 - 39,700 21,301 - 25,500 9,401 - 11,300 3(3)11,301 - 13,400 3000 70,901 - 83,700 39,701 - 47,100 25,501 - 30,100 3000 13,401 - 15,600 3(4)3250 3250 83,701 - 97,700 47,101 - 54,900 30,101 - 35,200 15,601 - 18,000 3(4)3500 3500 97,701 - 112,700 54,901 - 63,400 35,201 - 40,600 18,001 - 20,600 3(4)3750 112,701 - 128,700 63,401 - 72,400 40,601 - 46,400 3750 20,601 - 23,300 4(4)4000 128,701 - 145,900 72,401 - 82,100 46,401 - 52,500 4000 23,301 - 26,300 4(5) 145,901 - 164,200 4250 82,101 - 92,400 52,501 - 59,100 4250 26,301 - 29,300 4 (5) 4500 164,201 - 183,400 92,401 - 103,100 59,101 - 66,000 4500 29,301 - 32,600 4 (5) 66,001 - 73,300 4750 4750 183,401 - 203,700 103,101 - 114,600 32,601 - 36,000 5 (5) 5000 203,701 - 225,200 114,601 - 126,700 73,301 - 81,100 5000 36,001 - 39,600 5 (6) 5250 225,201 - 247,700 126,701 - 139,400 81,101 - 89,200 5250 39,601 - 43,400 5 (6) 5500 5500 247,701 - 271,200 139,401 - 152,600 89,201 - 97,700 43,401 - 47,400 5 (6) 5750 271,201 - 295,900 152,601 - 166,500 97,701 - 106,500 5750 47,401 - 51,500 6 (6) 6000 295,901 - greater 166,501 - greater 106.501 - 115,800 6000 51,501 - 55,700 6(7)115,801 - 125,500 6250 6250 55,701 - 60,200 6(7)6500 125,501 - 135,500 6500 60,201 - 64,800 6(7)6750 135,501 - 145,800 6750 64,801 - 69,600 7(7)7000 7000 145,801 - 156,700 69,601 - 74,600 7(8)156,701 - 167,900 7250 7250 74,601 - 79,800 7(8)7500 167,901 - 179,400 7500 79,801 - 85,100 7(8)7750 179,401 - 191,400 7750 85,101 - greater 8 (8) 8000 8000 191,401 - greater

<u>Gross Area:</u> The gross area means the total area of all floors, measured from the exterior face, outside dimensions or exterior column line of a building, including basements, cellars and balconies, but not including unexcavated areas. Where walls and columns are omitted in the construction of a building, such as an open shed or marquee, the exterior wall of the open side or sides, for the purpose of calculating gross area, will be the edge of the roof, including gutters.

October 2013 Edition Page 4 of 4