Fire Underwriters Survey & Required Fire Flow Frequently Asked Questions

June 2025

Within the District of Saanich Engineering Specifications (Schedule H of the Subdivision Bylaw No.7452), it is stated that fire flow demand shall be in accordance with the current "Water Supply for Public Fire Protection" guide, by Fire Underwriters Survey (FUS). Please note that the District has also developed a flowchart to supplement this guide for certain Small Scale Multi-Unit Housing (SSMUH) proposals.

What is the Fire Underwriters Survey (FUS) and what is its purpose?

Fire Underwriters Survey (FUS) is financed by the Canadian Insurance Industry. They utilize technical staff of Opta Information Intelligence Corp (formally the Insurers' Advisory Organization Inc.) to complete surveys of water system purveyors and fire departments for the purpose of ranking Canadian municipalities and communities for their ability to respond to a variety of structure fire conditions. FUS provides this data and advisory services to fire insurance underwriters, actuaries and public entities.

FUS has prepared the document "Water Supply for Public Protection – A Guide to Recommended Practice in Canada 2020" as a guide for estimating the amount of water needed for effective public fire protection for typical structures in an urban setting. The intent is to provide an estimate of the minimum volume of water and flow rate for use by fire departments and water system operators.

What is the difference between FUS and the BC Building Code Fire Protection requirements?

The BC Building Code protects the building occupants by integrating measures to mitigate fire spread within the structure and suppress active fire conditions. FUS is about protecting the structures adjacent to the fire and to mitigate against the fire spreading from site to site.

How does Saanich use FUS and Water Supply for Public Protection Guide?

The FUS recommendations for Saanich identify opportunities to enhance our water system for firefighting capability. This information is considered in system infrastructure planning for capital improvements and by the Fire Department to inform equipment needs and tactical requirements.

The Water Supply for Public Protection Guide is identified as the set of calculations and parameters for use by developers in establishing the minimum Required Fire Flow (RFF)* to support their proposal in the case of both the subdivision of land and construction of a building. Saanich has adopted this practice in assessing water supply servicing requirements for development applications. This requirement can be found in Schedule H (Engineering Specifications) of the Subdivision Bylaw No. 7452.

**For SSMUH, please refer to the supplemental flowchart.*

What is Required Fire Flow (RFF) and how is it determined?

FUS defines Required Fire Flow (RFF) as the amount and rate of water application required in firefighting to confine and control fires for a specific type of building in an urban setting where there are other buildings adjacent. The RFF is based on the sum of the total area of the building for all floors, the material from which its constructed and the distance to adjacent structures.

Other factors that influence the RFF include the type of occupancy and the presence or absence of a fire sprinkler system. The detailed RFF calculation process can be found in the 2020 Edition of the FUS document "Water Supply for Public Protection – A Guide to Recommended Practice in Canada".

Are detailed Required Fire Flow (RFF) calculations required for all buildings?

In most cases, yes. The District has developed a flowchart for assessing Fire Flow Requirements specifically for SSMUH developments. For all other housing typologies, a detailed RFF calculation is required. However, FUS has a "simple method" providing pre-populated tables for determining RFF for Wood Frame or Masonry/Brick structure that meet specific exposure criteria and are limited to:

1. For one and two-family dwellings not exceeding two storeys in height and having Total Effective Area of not more than 450 m^2
2. For one and two-family dwellings not exceeding two storeys in height but having a Total Effective Area of more than 450 m^2, and for row housing.

Tables for these two conditions are provided in the 2020 Edition of the FUS document "Water Supply for Public Protection – A Guide to Recommended Practice in Canada".

These tables are general guides and may not apply in all circumstances.

Building Permit applications are subject to the site servicing requirements as noted in clauses 7.16 through 7.20 of Building Bylaw No. 9529. These clauses reference the Engineering Specifications (Schedule H) of the Subdivision Bylaw No. 7452. Refer to these documents to understand the requirements for services to support your building permit application or contact Development Services with any questions.

Does the Province mandate to permit Small-Scale Multi-Use (SSMUH) building forms on all single family (RS) and duplex (RD) zoned properties mean that Available Fire Flow (AFF) is present in the roadway to support these new building forms?

Not in all cases. The SSMUH initiative introduced by the province aims to streamline land use changes by removing regulatory barriers. However, these policies do not account for the potential impacts on existing infrastructure. Most neighbourhoods in Saanich were developed 40 to 70 years ago to support predominantly single-family homes and the water services (amongst other infrastructure) were built with that population in mind. The density shifts to permit up to six (6) units where only one (1) previously existed will result in some areas not having the AFF to meet the RFF for this housing type.

The District is currently evaluating system performance in response to these and other land use changes to ensure long-term reliability and capacity. To support this process, Saanich has developed a new flowchart for assessing fire flow requirements specific to certain elopments, along with updated fire flow mapping tools to help identify available fire flows across the District. To understand the potential impacts to your development proposal, please refer to the resources available at: Small-Scale Multi-Unit Housing | District of Saanich.

How do you know if there is adequate fire flow in the street to support your development?
The Available Fire Flow (AFF) is the amount of water that can be delivered from the municipal water system under fire fighting conditions and minimum operating requirements.

Field fire hydrant tests can be performed by Saanich Public Works to assess the flow conditions in the immediate area of a proposed development. This information is applied to Saanich's digital model that replicates the functionality of the water system. Through this tool, staff are able to simulate the RFF and determine if the AFF, with due consideration of the limitations within the Guide to Recommended practice in Canada, from the hydrant test is sufficient to support the development proposal.

If your proposal relates to SSMUH, see the supplemental flowchart for assessing AFF (and mapping) and RFF.

What if my development's Required Fire Flow exceeds the Available Fire Flow?

If the AFF is more than the RFF, then the system has adequate capacity to provide fire flow from a water supply perspective; however, if the AFF is less than the RFF, then the system can't provide the fire flow the proposed building demands.

Where RFF is not available, a development proposal can consider changes to the building design to reduce the RFF. If this is not possible, the development may be required to upgrade the municipal water system in the street to provide adequate service to meet the RFF. If your proposal relates to SSMUH, see the flowchart for assessing AFF (and mapping) and RFF.

Isn't the District of Saanich water system built to provide fire flows?

When the water mains were designed, they were designed to meet the fire flow requirements at the time of construction. However, in many cases this was decades ago and in the meantime the District has grown and the RFF requirements have changed. As a result, not all areas of the District have the ability to provide these newer RFF requirements. This means that new developments may be required to provide watermain upgrades to meet this need.

What if the property falls into the red zone in Map 1 or Map 2 in the flowchart?

If your property falls within a red zone, it means that preliminary modelling indicates the available fire flow may be insufficient to support the level of development permitted under current zoning (e.g., small-scale multi-unit housing).

This does not automatically prevent development, but additional analysis will be required. In most cases, you or your engineer will need to submit a Fire Underwriters Survey (FUS)-based fire flow calculation and possibly conduct a hydrant flow test. If the available fire flow is confirmed to be deficient, changes to your building design or upgrades to the water system, such as new watermains or hydrants, may be required as a condition of development.

We recommend discussing your proposal early with District staff to understand what specific information or engineering assessments will be needed.

What do water utility fees pay for?

The fees pay for the operation, maintenance, and renewal of the existing water infrastructure. Water utility fees do not fund new infrastructure or capacity upgrades related to specific developments. The water utility fees are generated through utility billing by those rate payers that are part of the service area.

Who can help me with this process?

A qualified professional (such as a professional engineer) with specialized knowledge and experience in public fire protection can perform RFF calculations and can support applicants in understanding the requirements and viability of their project. Saanich Engineering staff are available to respond to any questions about the process for determining RFF or AFF in the water system.

- Further questions about FUS can be emailed to Engineering to the attention of James Rees, or by calling 250-475-5575.
- Questions regarding development applications and site servicing can be emailed to Development Services.

District of Saanich **|** Engineering Department **|** T. 250.475.5575 **|** E. engineering@saanich.ca