INTENT:
To clarify what minimum emergency water supply provisions are required or approved based on the fire apparatus used and operational methodology used within the City of Vancouver Fire Department’s service area.

1.0 DEFINITIONS
1.1 Fire Code Official - The Vancouver Fire Marshal
1.2 Fire flow – The minimum amount of water required for fire suppression as measured in gallons per minute at a residual pressure of twenty pounds per square inch.
1.3 Building square footage – the aggregate of all attached floor area covered by roofs, ceilings, overhangs, covered-walks, porte-cocheres and other attached overhead construction.

2.0 POLICIES
2.1 NEW CONSTRUCTION:

2.1.1 A water source capable of supplying the required fire flow, either temporary or permanent, shall be made available as soon as combustible material accumulates at the construction site.

2.1.1.1 Exception: a limited quantity of combustible material may be placed on the site for a limited period of time at an approved location on the site as determined by a Vancouver Deputy Fire Marshal or a Vancouver New Construction Fire Inspector.

2.1.2 Fire hydrants shall be placed into service prior to combustible construction. Hydrants shall be kept clear and accessible for fire protection during construction.

2.1.3 No building permits shall be issued and combustible construction shall not commence prior to the establishment of an approved water source capable of supplying the required fire flow.

2.1.4 Temporary water supply arrangements shall have prior approval of the fire code official. All water service connections shall have the approval of City Water Engineering and the City of Vancouver Community and Economic Development Department.
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2.1.5 Water shall not be taken from hydrants for construction purposes without the permission of City Water Engineering and the City of Vancouver Fire Marshal. A fire code permit is required to use water from existing public fire hydrants.

2.1.6 Valves, wrenches and other attachments used for operating hydrants shall be of a type approved by City Water Engineering.

2.1.7 Any damage to the hydrant or water system caused as a result of using improper valves, wrenches or other attachments, or construction activity, shall be immediately repaired at the developer’s expense.

2.2 EXISTING FIRE HYDRANTS

2.2.1 For the purposes of new development, existing fire hydrants capable of delivering the minimum required fire flow and within the minimum required distances shall be considered adequate for new construction projects.

2.2.1.1 EXCEPTION: Fire hydrants on the opposite side of a principal arterial or larger streets or railways from a proposed project shall not be considered for the proposed project.

2.2.2 Un-metered use of existing fire hydrants is prohibited in the City of Vancouver. Contact the City of Vancouver Operations Center to obtain a hydrant meter. A Fire Code Permit is required for the use of a fire hydrant. Contact the City of Vancouver Fire Marshal for a Fire Code Permit.

2.3 GENERAL SPECIFICATIONS

2.3.1 Public water mains shall be installed in accordance with the engineering specifications of the City of Vancouver Water Engineering and subject to such testing as specified by the Public Works Department. Standard details are available on request.

2.3.2 Fire Department Connections (FDC) and controlling valves used in connection with fire protection facilities shall be installed at locations and to specifications approved by the fire code official. FDC connections shall be American Standard thread with 2.5 inch connections. For smaller pipe systems such as NFPA 13-R, 2.5” adapters shall be installed regardless of the system demand.

2.3.3 All required fire flow, either temporary or permanent, shall be made available at a minimum flow in gallons per minute with a residual pressure of not less than twenty pounds per square inch in the mains.
2.3.4 Minimum fire flow is determined by IFC Appendix B as adopted by the Vancouver Municipal Code. Minimum fire flow is measured based on the minimum flow rate with a residual pressure of 20 pounds per square inch in the underground main.

2.4 HYDRANT QUANTITY AND DISTRIBUTION

2.4.1 Residential one and two family: The maximum hydrant spacing in one and two family residential developments shall be 600 feet between hydrants measured along a fire apparatus access lane. The distance from the most remote exterior first floor wall of any structure shall not be more than 450 feet from a fire hydrant. Where structure placement is not yet proposed, measurement shall be taken from the most remote location on the lots. Fire hydrants on the opposite side of a principal arterial or larger street shall not be considered for new projects. The first 1,500 gallons per minute of required fire flow may be taken from one fire hydrant. An additional fire hydrant shall be required for each additional 1,000 gallons per minute or fraction thereof.

2.4.2 Commercial and multi-family: The maximum hydrant spacing in commercial and multi-family residential developments shall be 400 feet between hydrants measured along a fire apparatus access lane. The distance from the most remote exterior first floor wall of any structure shall not be more than 350 feet from a fire hydrant. Where structure placement is not yet proposed, measurement shall be taken from the most remote location on the lot. Fire hydrants on the opposite side of principal arterial streets shall not be considered for new projects. The first 1,500 gallons per minute of required fire flow may be taken from one fire hydrant. An additional fire hydrant shall be required for each additional 1,000 gallons per minute or fraction thereof.

2.4.3 Clarification of Intent: It is the intent of the spacing standards that a fire engine may drive up to half of the distance between fire hydrants and from that fire engine location use up to a maximum of 150 feet of hand line to reach the most remote first-floor exterior wall location. If this cannot be accomplished then additional fire hydrants may be required.

2.4.4 Fire Department Connections: The maximum spacing between a Fire Department Connection and the nearest accessible fire hydrant shall not exceed 150 feet. Hydrant and Fire Department connection placement shall be such that connection of the two will not obstruct Fire apparatus access to the site. Wherever possible, it is best to locate the fire hydrant adjacent to the Fire Department Connection. Fire department connections may be mounted on the building where it meets the spacing standards and is visible and accessible from an approved fire lane and it is not under a covered portion of the building.
2.4.5 New or Modified Systems: Where the existing fire flow of the local water system is inadequate, or a new system is proposed, engineering design calculations to verify fire flow availability shall be provided to the City of Vancouver Water Engineering Department by the applicant.

2.4.6 Building separation: Each portion of a building separated from other portions by one or more four-hour rated fire barrier assembly(ies) may be considered a separate building if such four-hour rated fire barrier walls and construction standards meet the requirements of International Building Code.

2.4.7 Zero-Lot-Line Developments: For attached group SFR or R-3 occupancies which cross multiple legal lots (townhomes), the entire building of units shall be the basis for determining minimum fire flow requirements unless approved 4-hour-rated fire barrier assembly(ies) are used to separate the units.

2.4.7.1 EXCEPTION: Two one-hour or one two-hour fire barrier separation between properties combined with approved fire resistive or non-combustible exterior walls and Class “A” roof.

2.4.8 Other Than Buildings: The required fire flow for occupancies or facilities other than buildings shall be determined by the AHJ based on sound engineering principles, nationally recognized good practice and such factors as topography, Fire Department access for fire suppression, the nature of the occupancy and its fire hazards and the type and nature of built-in fire protection features. The AHJ may additionally require a report, produced by a qualified engineer at the applicant’s expense, which will demonstrate what fire flow is reasonable for a proposed hazard protection.

2.4.9 Sufficiency: Based on an analysis of the hazard protected and of the existing or proposed water system, the Fire Department may require that the hydrants served by an underground main be served from two directions (looped) or two sources of water supply.

2.5 MODIFICATIONS

2.5.1 Increased Hazards - Required fire flow may be modified upward where conditions indicate an unusual susceptibility to group fires or content based hazards including but not limited to:
- Aerosol storage and handling
- Flammable or combustible liquid storage or handling
- Woodworking
- Paint spray, dipping or electrostatic operations
- Hazardous materials storage or handling
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- High-piled or rack storage of combustible materials
- Dust producing operations
- Combustible fiber storage and processing
- Toxic or highly toxic materials
- Compressed flammable or oxidizing gases
- Cryogenic fluid storage
- Materials known to have a high degree of combustibility such as rubber tires, wood products, baled paper storage, etc.

2.5.2 Modifications - In those circumstances where the required fire flow exceeds the available fire flow, modifications based on the installation of automatic fire sprinkler and/or automatic smoke detection systems may be approved by the fire code official.

2.6 OBSTRUCTION

2.6.1 Fire hydrants shall be visible from the fire lane approach unless specifically approved. The Fire Code mandates a clear unobstructed space of 3 feet around the fire hydrants. This includes encroaching vegetation, chained bicycles, parking of vehicles and temporary signs.

2.6.2 In addition to the code requirement for 3 feet of clear space around a fire hydrant, the Revised Code of Washington (RCW 46.61.570 1.b.(iii)) and the Washington Administrative Code (WAC 132N-156-550 (2)) provide for the following which is also mandated by the City of Vancouver: Fire hydrants along public or private streets - Parking shall be prohibited for a distance of fifteen (15 feet) in either direction of a fire hydrant assembly along a public or private street unless specifically approved. On-site fire hydrants shall be visible and accessible and the parking of vehicles closer than 15 feet shall be approved.

2.7 VEGETATION

2.7.1 Trees and vegetation which, over time, could damage or physically obstruct a fire hydrant are discouraged in the City of Vancouver. Trees which are known to produce root systems that damage water piping are discouraged from being planted on lots or locations that have fire hydrants or water mains on or adjacent to them. For a list of undesirable trees and vegetation pertaining to fire hydrants, contact the City of Vancouver Urban Forester.

2.8 PRIVATE WATER SYSTEMS
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2.8.1 In those circumstances where the available fire flow is less than the required fire flow, and where the municipal water supply system can be enhanced to meet the required fire flow, private water systems are prohibited.

2.8.2 Private water systems meeting the required fire flow are permitted, provided:

2.8.2.1 They are entirely independent of the City of Vancouver municipal water system and it has been determined by the Department of Public Works it is practically infeasible to enhance the municipal supply.

2.8.2.2 The design and installation are based on sound engineering principles and nationally recognized good practice. NFPA 24, "Standard for the Installation of Private Fire Service Mains and Their Accessory Devices and Elements," shall be used when applicable.

2.8.2.3 The system shall be designed and engineered to meet the required fire flows as established by the fire code official. Engineering calculations to verify the anticipated flows shall be submitted at the time of plan review.

2.8.2.4 Upon completion of the installation, a final report shall be prepared by a registered engineer that certifies compliance with NFPA 24, and shall include flow test data and charts confirming the required fire flow is available.

2.8.2.5 Provision is made to keep reservoirs and tanks full and in a ready condition at all times.

2.8.2.6 Reservoirs and tanks shall not be permitted to required hard suction from the fire apparatus.

2.8.2.7 The water supply is capable of delivering the required fire flow for the duration of at least two hours.

2.9 PAINT – HYDRANT COLOR

2.9.1 PUBLIC FIRE HYDRANTS shall be factory painted with safety yellow high gloss equipment enamel (see Water Detail standard plan no. W-10). Public fire hydrants shall be maintained and repainted except by the City of Vancouver Public Works Department using approved paint.

2.9.2 PRIVATE FIRE HYDRANTS should be painted red with high gloss equipment enamel. Other colors may be approved using the form “Petition of Appeal to the Fire Marshal for Alternate Materials and Methods” available from the City’s web site for download. Private fire hydrant maintenance is the responsibility of the owner of the private water system.
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2.10 ALTERNATES

2.10.1 The fire plans examiner shall have the latitude to authorize alternate materials and methods limited to the installation and use of horizontal dry standpipes for fire flow supply without using a formal appeal process where one or more of the following apply:

2.10.1.1 Fire apparatus or Fire personnel access is not possible due to topography;
2.10.1.2 The cost of installing the hydrant is disproportionate to the scope of the project;
2.10.1.3 There are no reasonable alternatives to supplying public water mains for fire flow to the site or a portion of the site.
2.10.1.4 At a minimum the following shall apply to horizontal dry stand pipes when used as an alternate to providing fire hydrants to minimum spacing standards:
2.10.1.5 Applicability is limited to a single structure on a single lot.
2.10.1.6 The horizontal stand pipe shall be installed with a minimum of one approved standard fire department connection (FDC) at the apparatus access end of the pipe and shall be equipped with an approved ball-drip valve.
2.10.1.7 The FDC shall be within 150 feet of the fire hydrant and located so that the hose connection of the fire hydrant, the pumper, and the FDC will not impede access.
2.10.1.8 Hose drops shall be installed at approved locations and shall be equipped with approved ball-drip valves.
2.10.1.9 At the FDC location(s) permanent all weather signage shall be affixed to the pipe stating “DRY STANDPIPE FOR HOSE DROPS”.
2.10.1.10 The pipe shall be a minimum of 4 inches internal diameter, shall be made of an approved material and shall be stenciled at or near each hose drop “DRY STANDPIPE FOR HOSE DROPS”.

2.10.2 The fire plans examiner shall have the latitude to approve variation of up to 10 percent in the distance requirements to the remote exterior wall location without using a formal appeal process where all of the following are true:

2.10.2.1 The building is fully equipped with fire sprinkler protection in accordance with NFPA 13, 13-R or 13-D.

2.11 APPEALS

2.11.1 Interested persons may appeal the Vancouver Fire Marshal’s requirements or propose alternative methods and materials that may meet the intent of the fire code by using the form, “Petition to Appeal to the Fire Marshal”.

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