BULLETIN 2008-009-AD/BU **November 19, 2008**

FLOOD PROOFING POLICIES

Flood proofing policies were adopted by City Council on 05 January 1988 and were subsequently amended on 28 February 1995 and 17 April 2007. The City's flood proofing policies are intended to reduce or prevent injury, human trauma, loss of life and to minimize property damage during a flood event. The City's flood proofing policies were modelled after the Province's flood policies and procedures. The City's flood proofing policies are attached as a pdf document to this bulletin (see below) and may also be viewed at the following website:

http://www.vancouver.ca/commsvcs/guidelines/F010.pdf

The Vancouver Building By-law (VBBL) regulates the enforcement of these policies. Division C, Subsection 2.2.8. of the VBBL states the following:

> **2.2.8. BUILDINGS ON LANDS SUBJECT TO FLOODING**
>
> *2.2.8.1. Design Considerations*
>
> *1) On lands determined by the* City Engineer *to be potentially subject to flooding, the* building designer *shall give special consideration to* construction *materials and service equipment installations below the flood plain design elevations established by the Province of British Columbia or the City . [See Article 1A.6.1.9.]*

Division C, Article 1A.6.1.9. of the VBBL states the following:

> *1A.6.1.9. Permits in Designated Flood Plain*
>
> *1) In lands situated in the area of a designated flood plain the Chief Building Official may*
>
> *a) withhold the issuance of a building permit until the Chief Building Official is satisfied that the elevation or design of the building incorporates flood construction standards intended to reduce the risk of flood damage, and*
> *b) require that a covenant acknowledging the risk of flood damage be registered against the land.*

All building permit applications located within a designated flood plain area are subject to the requirements of Division C, Subsection 2.2.8. and Division C, Article 1A.6.1.9. of the VBBL.

Specific flood construction levels (FCLs) have been established for various locations throughout the City. FCLs are used to keep spaces and areas used for habitation and storage above flood levels. The FCLs are based on a one in 200 year return period and vary in elevation as a function of the location within the City and the setback distance measured from the applicable natural water boundary to the project location. Flood plain setbacks are established to keep development away from areas of potential flooding and erosion and to avoid restricting the flow capacity of a floodway.
For buildings with wood frame floor construction (timber floor joists), the FCL shall be applied to the underside of the floor joists. For buildings with concrete floor slabs the FCL may be applied to the top of

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the concrete floor slab. Specific details of the FCLs, setback requirements from the natural water boundary, wave run-up requirements, other options, relaxations, etc. may be obtained from the attached City Flood Proofing Policies document. All construction materials and services below the FCL shall be impervious to flood damage and shall remain serviceable during and after a flood event.

The building designer or owner may discover that the required FCL may be impossible or impractical to implement due to existing City infrastructure and other constraints (street locations considerably lower than the required FCL, etc.). In these cases, the Chief Building Official may waive the FCL requirements on a case by case basis. It should also be noted that a covenant will be required for all projects located within a flood plain area.

Building designers or owners who would like to confirm whether a property is subject to flooding may contact the Enquiry Centre at 604-873-7611 for confirmation.

(Original signed)

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AND CHIEF BUILDING OFFICIAL

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Attachment

City of Vancouver *Land Use and Development Policies and Guidelines*
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planning@vancouver.ca

FLOOD-PROOFING POLICIES

Adopted by City Council on January 5, 1988
Amended February 28, 1995, and April 17, 2007

On April 15, 1986, City Council endorsed specific flood-proofing policies for the Southlands flood plain. On January 27, 1987, City Council indicated its support for the existing Provincial flood-proofing standards and its extension to all new construction within the lands prone to flooding and erosion along the Fraser River, False Creek, Burrard Inlet, and English Bay. Legislative changes were subsequently made to the Vancouver Charter so the City could require implementation of the flood-proofing policies through its building permit process.

Compliance with these policies is mandatory, in accordance with Section 2.3.6 (Buildings on Lands Subject to Flooding) of Vancouver's Building By-law.

On April 17, 2007, City Council substantively amended the policies to:

(a) incorporate pertinent elements of the Provincial "Flood Hazard Land Use management Guidelines" (2004);
(b) establish policies regarding flood-proofing in the lower sections of Still Creek and False Creek Flats; and,
(c) make adjustments due to information provided by the Fraser Basin Council's "Lower Fraser River Hydraulic model" (2006).

Contents

Introduction

These Council policies seek to reduce or prevent injury, human trauma and loss of life, and to minimize property damage during flooding events. Experience has shown that regulating land development to keep people out of harm's way is the most practical and cost effective way of achieving these goals.

The policies draw upon provincial policies and procedures established and refined over the life of the provincial flood hazard management program.

The document is divided into five sections:

1.0 Administration – Flood Hazard Land Use management
2.0 Application – By Hazard Type
3.0 Application – Land Use Specific
4.0 Application – Implementation measures
5.0 Appendix – Definitions

Readers might find it advantageous to review the Appendix Definitions before reading Sections 1 through 4.

The Administration section details when decision-makers can manage flood hazards during the subdivision and/or building permit process.

The Application sections provide the flood proofing requirements for different types of flooding hazards and different land uses in Vancouver. These are minimum requirements that may be increased by the Subdivision Approving Officer or Chief Buiding Official, in exercising their jurisdiction. Site-specific studies containing professional evaluation and recommendations, including mapping, may be required.

The Council policies will be subject to revision as future information becomes available. For example, climate change is anticipated to result in a sea level rise. Various studies have been completed on this or are in process. A review of this work by the Fraser Basin Council, combined with continuing subsidence of the delta, led it to suggest a potential net rise of 0.6 metres over the next century. However, some experts predict much greater global sea level changes, which have not yet been translated into potential local impacts in the Fraser Basin. This suggests the current FCL of 3.5 m within 300 metres of the natural boundary (3.0 m when beyond 300 metres,) will need future review and possible revision as more conclusive scientific study is completed on climate change.

1.0 Administration - Flood Hazard Land Use

1.1 Subdivision Approval Process

Under the provisions of section 86 of the Land Title Act, the Subdivision Approving Officer - when approving a subdivision which may be subject to flooding or erosion - may require a Professional Engineer's report certifying that the land may be used safely for the intended purpose and/or require the owner of the property to enter into a covenant under section 219 of the Land Title Act to establish flood plain requirements. Similar provisions are available under the Strata Property Act and the Bare Land Strata Regulations.

Where the land proposed to be subdivided may not be used safely the Subdivision Approving Officer may refuse to approve a proposed subdivision.

1.2 Building Permit Application Process

Under the provisions of Section 2.3.6 (Buildings on Lands Subject to Flooding) of the Building By-law, the Chief Building Official – when approving a building permit on previously subdivided lands which may be subject to flooding or erosion – shall require that a building permit comply with the policies contained in this document or as otherwise superceded by Council resolution.

1.3 Covenant measures

Where, on flood prone land, consent for approval of subdivision or approval of a building permit is sought, the proponent may be required to register a restrictive covenant against the title of the property under section 219 of the Land Title Act. The covenant may specify conditions that would enable the land to be safely used for the use intended. In addition, the following conditions should be included:

1.3.1 Waiver of Liability

Where, on flood prone land, the Subdivision Approving Officer gives consent for approval of subdivision or the Chief Building Official gives consent to construction, the owner of the land should expect to be required to enter into a covenant, prior to final subdivision approval or building permit issuance, respectively. The covenant is to be registered against the land title, requiring flood-proofing of buildings and a waiver of liability in favour of the City in the event of any damage caused by flooding or erosion.

Where a situation arises in which consent to subdivision and/or a building permit would normally be refused due to a high flooding hazard, but it is nevertheless deemed appropriate to allow the subdivision and/or building permit due to extenuating circumstances, the owner may also be required to include in the 'waiver' clause a provision to cover existing buildings that are to be retained on the property.

1.3.2 Priority Charge

Covenant conditions are to be registered with priority over all other charges requested against the property, save for those in favour of the City.

1.4 Requests for modification of Flood-Proofing Covenants

Subject to review by and if acceptable to the Subdivision Approving Officer and/or the Chief Building Official and all parties signatory to the covenant, a covenant may be modified. The Subdivision Approving Officer and/or Chief Building Official may modify any covenant to best match the flood hazard provided the level of protection is not altered. This discretion extends to the reduction of elevation requirements by the freeboard, where flood plain mapping exists, provided the subject property is in the flood plain fringe area and there are no major erosion or channel avulsion hazards in the immediate vicinity.

Review by the Subdivision Approving Officer and/or Chief Building Official may not support relaxation on technical grounds but the applicant may nevertheless have demonstrated a hardship. Setback requirements should not be reduced unless a serious hardship exists and no other reasonable option is available. A valid hardship should only be recognized where the physical characteristics of the lot (e.g., exposed bedrock, steep slope, the presence of a watercourse, etc.) and size of the lot are such that building development proposals, consistent with the City's land use and zoning by-laws, cannot occur unless the requirements are reduced.

In order to avoid setting difficult precedents these site characteristics should be unique to the subject property and environs. The economic circumstances or design and siting preferences of the owner should not be considered as grounds for hardship.

1.5 Miscellaneous Administrative measures

Where the Subdivision Approving Officer and/or Chief Building Official considers a geodetic elevation necessary, the installation of benchmarks may be a condition of consent to subdivision approval or building permit approval, respectively, in order to assist in the on-site determination of the Flood Construction Level. Alternatively, a Survey Certificate, prepared by a B.C. Land Surveyor, may be incorporated as a post-construction submission requirement in the restrictive covenant, to verify compliance with the flood-proofing setbacks and elevations required.

2.0 Application - By Hazard Type

Flood plain setbacks are established to keep development away from areas of potential erosion and avoid restricting the flow capacity of the floodway. Keeping the floodway clear of development can reduce the risk of damage to neighbouring properties and reduce disruptions to natural river processes, leading to a more balanced and economical approach to managing flood prone areas. Setbacks are measured from the natural boundary unless otherwise specified.

Flood Construction Levels (FCLs) are used to keep living spaces and areas used for the storage of goods damageable by floodwaters above flood levels. The designated flood, and the designated flood level, are used in determining the FCL.

The designated flood means a flood which may occur in any given year, of such magnitude as to equal a flood having a 200-year recurrence interval, based on a frequency analysis of unregulated historic flood records or by regional analysis where there is inadequate streamflow data available.

A designated flood level is the observed or calculated water surface elevation for the designated flood and is used to determine the Flood Construction Level.

2.1 Bluffs

Setback –
Where the building site is at the top of a steep bluff and where the toe of the bluff is subject to erosion and/or is closer than 15 metres from the natural boundary, the setback should be a horizontal distance equal to 3.0 times the height of the bluff as measured from the toe of the bluff.

For practical application, this setback condition will require site-specific interpretation and could result in the use of a minimum distance measured back from the crest of the bluff. This setback may be reduced provided the reduction is supported by a report prepared by a suitably qualified professional.

2.2 Watercourses

2.2.1 Standard requirements for ordinary watercourses

Setback –
Buildings should be setback at least 30 metres from the natural boundary of any Watercourse that may flood, such as the Fraser River. Buildings may be permitted a lesser setback than cited above, subject to:

(a) the completion of appropriate engineering studies;
(b) the construction of any necessary erosion protection works as designed by a Professional Engineer;
(c) the certification of the constructed works by a Professional Engineer;
(d) the approval of the City Engineer; and
(e) the approval of the City Building Inspector.

Where non-Standard Dikes exist, setbacks should be established in consultation with the City Engineer to provide right-of-way for any future dike improvements and/or access.

FCL where a designated flood level has been determined –
Areas used for habitation, business, or storage of goods damageable by floodwaters should be constructed within any building at an elevation such that the underside of the floor system thereof is no less than the Flood Construction Level.

The FCL for lands adjacent the Fraser River and west of the Oak Street Bridge shall be at least 3.5 m GVRD datum for any building within 300 metres of the natural boundary, and at least 3.0 m GVRD datum for any building farther than 300 metres from the natural boundary.

The FCL for lands adjacent the Fraser River and east of the Oak Street Bridge shall be at least 3.8 m GVRD datum for any building within 300 metres of the natural boundary, and at least 3.3 m GVRD datum for any building farther than 300 metres from the natural boundary.

2.2.2 Requirements for Smaller Streams

The requirements for small streams may be reduced where the following conditions exist:

- Sufficient discharge records are available to establish the designated flood and/or the designated flood can be otherwise estimated as less than 80 cubic metres per second, and
- The watercourse has no significant history of flooding and/or bank erosion, and/or
- It is deemed appropriate by the Subdivision Approving Officer and/or Chief Building Official.

Setback –

The setback requirement may be reduced to 15 metres from the natural boundary of the watercourse provided the floodway is not obstructed.

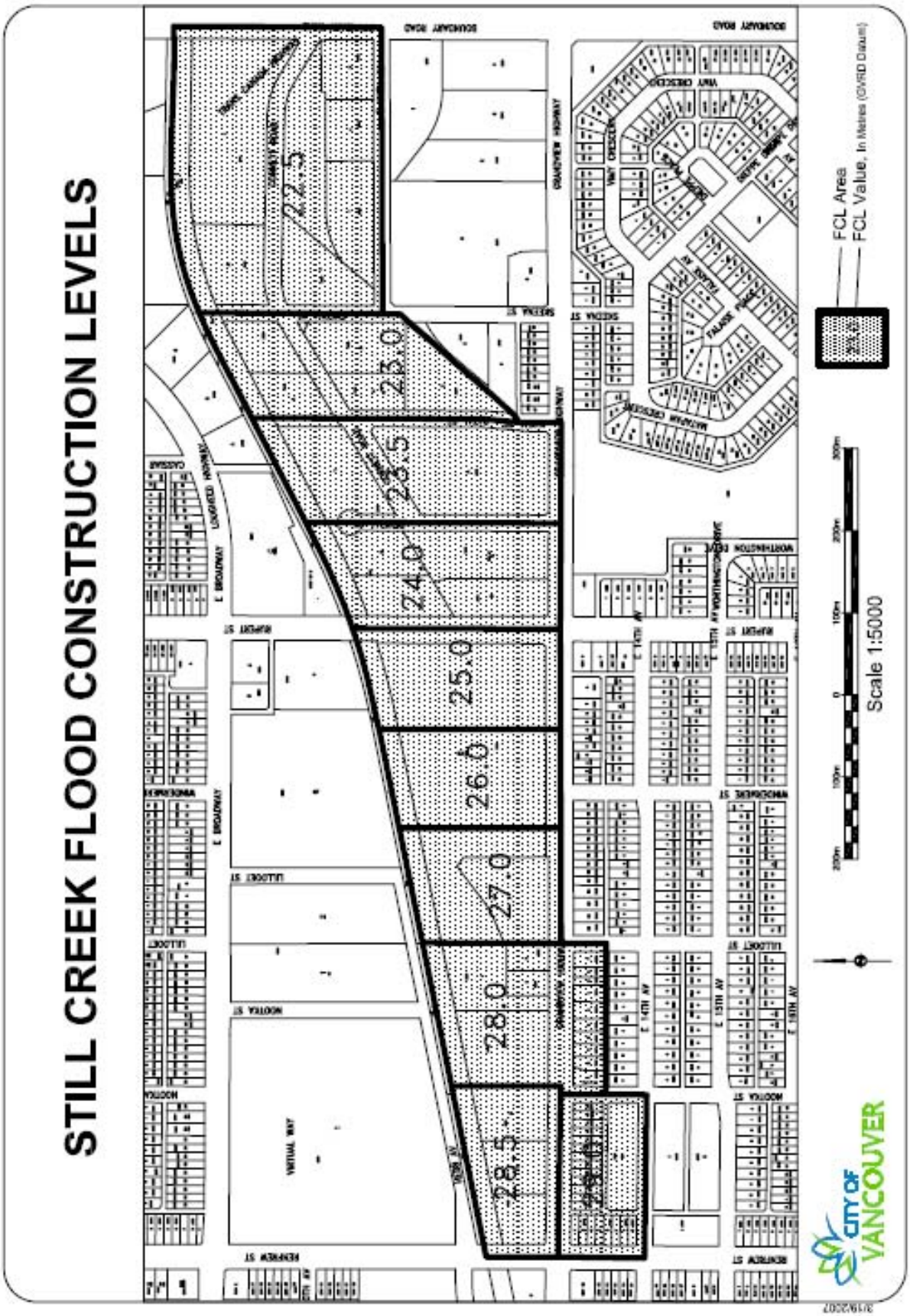
For lands within the lower sections of Still Creek as illustrated on map 1 below, buildings should be setback at least 5 metres from the natural boundary.

FCL –

The elevation of areas used for habitation, business, or storage of goods damageable by floodwaters should be established within any building at an elevation greater than 1.5 metres above the natural boundary of the watercourse.

The FCL for lands within the lower sections of Still Creek shall be no less than the applicable elevation, expressed in GVRD datum, as illustrated on map 1 below.

Map 1


STILL CREEK FLOOD CONSTRUCTION LEVELS
FCL Area
FCL Value, In Metres (GVRD Datum)
Scale 1:5000
CITY OF VANCOUVER

2.3 Straight of Georgia (The Sea)

The natural boundary for coastal areas includes the natural limit of permanent terrestrial vegetation.

2.3.1. Standard Requirements

Setback –
Buildings should be setback 15 metres from the natural boundary of the sea.

Landfill or structural support for a coastal development or type of development shall be permitted a setback of 7.5 metres from the natural boundary of the sea where the sea frontage is protected from erosion by a natural bedrock formation or subject to:

(a) the completion of appropriate engineering studies;
(b) the construction of any necessary erosion protection works as designed by a Professional Engineer;
(c) the certification of the constructed works by a Professional Engineer;
(d) the approval of the City Engineer; and
(e) the approval of the City Building Inspector.

The setback may be increased on a site-specific basis such as for exposed erodible beaches and/or in areas of known erosion hazard.

FCL –
The FCL for lands adjacent False Creek shall be at least 3.5 m GVRD datum for any building within 300 metres of the natural boundary, and at least 3.0 m GVRD datum for any building farther than 300 metres from the natural boundary. (See also Section 2.4.1)

The FCL for lands adjacent Burrard Inlet and English Bay shall be at least 3.5 m GVRD datum, plus an additional elevation for wave run-up as determined by a professional engineer for any building within 15 metres of the natural boundary, and at least 3.5 m GVRD datum for any building farther than 300 metres from the natural boundary.

2.3.2 Requirements for Coastal Bluffs

Setback –
Where a proposed subdivision will create a building site at the top of a steep coastal bluff and where the toe of the bluff is subject to erosion and/or is closer than 15 metres from the natural boundary of the sea, the setback shall be a horizontal distance equal to 3.0 times the height of the bluff as measured from the toe of the bluff.

For practical application, this setback condition will require site-specific interpretation and could result in the use of a minimum distance measured back from the crest of the bluff. This setback may be reduced provided the reduction is supported by a report prepared by a suitably qualified professional.

2.3.3 Requirements for Existing Coastal Lots

Setback –
In the case of existing lots, where the above setback distances prevent construction, and where it is not possible to provide sufficient protection through works designed by a suitably qualified professional, the City Building Inspector may agree to modify setback requirements to permit construction provided this is augmented through a restrictive covenant stipulating the hazard, building requirements, and liability disclaimer.

2.4 Areas Protected by Dikes

Although very rare in Vancouver (currently only applicable to Deering Island), residential, commercial and institutional developments in areas protected by Standard Dikes are required to comply with full flood proofing requirements for their respective categories.

Setback –
Buildings should be located a minimum of 7.5 metres away from any structure for flood protection or seepage control or any dike right-of-way used for protection works. In addition, fill for floodproofing should not be placed within 7.5 metres of the inboard toe of any structure for flood protection or seepage control or the inboard side of any dike right-of-way used for protection works.

Any change to these conditions requires the approval of the Inspector of Dikes.

FCL –
Buildings in areas protected by Standard Dikes should meet minimum FCLs prescribed for the river or sea adjacent to the dike and the FCL requirements for any internal drainage (minimum ponding elevations).

2.4.1 Secondary sources of flooding

Where there are secondary sources of flooding, such as heavy rainfall, within (i.e., behind) diked areas, the appropriate requirements should be applied. These should include consideration of minimum ponding elevations behind the dike and suitable FCL to protect against internal drainage.

The FCL for lands in the False Creek Flats shall be at least 3.5 m GVRD datum, to provide for drainage of water that may otherwise pond during heavy rainfall due to an inability to drain during high tide and a winter storm surge.

Subject to advice from the City Engineer regarding ponding elevation, this may require that the FCL for any building in portions of Southlands located more than 300 metres from the natural boundary be increased to at least 3.5 m GVRD datum.

3.0 Application - Land Use Specific

The following minimum requirements should be considered to guide development away from high hazard areas and to allow development to proceed in a safe manner. These minimum requirements should be placed in the form of a covenant against land titles at the time of subdivision and/or building permit issuance.

3.1 Agriculture

3.1.1 Farm Dwellings

Whether or not the area is diked, the following apply:

Setback –
Setback requirements, based on hazard type as identified in section 2.0, shall apply.

FCL –
Farm dwelling units on parcel sizes 8.0 hectares, or greater, located within the Agricultural Land Reserve, shall be located with the underside of a wooden floor system or the top of the pad of any habitable area no lower than 1.0 metre above the natural ground elevation taken at any point on the perimeter of the building.

3.1.1.1 Where required flood proofing is impractical

When establishing conditions for areas within the Agricultural Land Reserve, where required flood-proofing is impractical (i.e., greater than 2.5 metres elevation) and where protection is provided by Standard Dikes, owners of existing parcels of land may be given the option of adopting full flood-proofing or adopting an elevation which will provide protection against drainage problems associated with storm conditions (minimum ponding elevation). In return owners must agree to a waiver of financial assistance in the case of flood damage to be registered as a covenant against the land title.

Subdivision in areas of flooding depth greater than 2.5 metres requires that the applicant demonstrate how full flood proofing can be achieved.

3.1.2 Livestock Housing

Setback –
Setback requirements, based on hazard type as identified in section 2.0, shall apply.

FCL -
Open-sided livestock structures do not require flood proofing by elevation.

Closed-sided livestock housing not behind Standard Dikes shall be located with the underside of the wooden floor system or the top of the pad no lower than the FCL minus freeboard. Main electrical switchgear shall be no lower than the FCL.

3.1.3 Other Farm Buildings

Setback –
Setback requirements, based on hazard type as identified in section 2.0, shall apply.

FCL –
Flood proofing by elevation is left to discretion of the owner.

3.2 Public Recreation, Institutional Buildings, Parks and Open Space

Setback –
Setback requirements, based on hazard type as identified in section 2.0, shall apply to all structures in this category.

FCL –
Institutional and closed-sided recreational buildings and/or equipment damageable by floodwaters require full flood proofing.

Recreation shelters, stands and other outdoor facilities susceptible to only marginal damage by floodwaters do not require flood proofing by elevation.

3.3 Industrial Areas

Setback –
Setback requirements, based on hazard type as identified in section 2.0, shall apply.

Industrial buildings may be granted special relief from this requirement. Setback requirements for certain industrial activities, such as on-loading and off-loading facilities, where the use of the waterfront is a necessary subsidiary part of the operation and would not adversely affect a floodway or significantly increase flood elevations, may be reduced.

FCL –
Industrial uses, other than main electrical switchgear, shall be located with the underside of a wooden floor system or the top of the pad no lower than the FCL minus freeboard. Main electrical switchgear shall be no lower than the FCL.

Elevations noted should be used for the installation of fixed equipment susceptible to damage by floodwaters. An exception may be approved, by the Subdivision Approving Officer reviewing a proposed subdivision plan or the Chief Building Official reviewing a building permit application, if a suitably qualified professional determines that appropriate measures can be and are taken to provide protection against damage by flooding and erosion.

On-loading and off-loading facilities associated with water-oriented industry do not require flood-proofing. Heavy industrial development located behind a standard dike does not require flood-proofing.

3.4 Ancillary Buildings, Carports, Garages, Entryways and Renovations to Existing Buildings

FCL –
Requirements for flood-proofing through the use of elevation may be waived, at the discretion of the Chief Building Official, for:

- A renovation of an existing building or structure that does not involve an addition,
- That portion of a building or structure that is to be used as a carport, garage or entryway,
- Other minor buildings such as storage buildings, porches and domestic greenhouses.

3.5 Additions to Existing Buildings
Where a building or structure is legally non-conforming with the floodproofing requirements set out in this policy and/or established in a covenant applicable to the property, the Chief Building Official may allow an addition, at the original non-conforming floor elevation, that would increase the size of the building or structure by less than 25 percent of the floor area existing at the time of enactment of such flood-proofing requirements, provided that the degree of non-conformity regarding setback is not increased.

4.0 Application - Implementation measures

In addition to the requirements set out in sections 2.0 and 3.0, the following general conditions should apply and be included in a subdivision or building permit covenant, where applicable.

4.1 Furnaces, Electrical and Other Fixed Equipment

FCL –
Areas below the FCL shall not be used for the installation of furnaces, major electrical switchgear, or other fixed equipment susceptible to damage by floodwater.

4.2 Parking

Setback–
Setback requirements, based on hazard type as identified in section 2.0, shall apply.

FCL –
As vehicles can be moved to higher ground, flood-proofing may not be necessary to prevent damage from floodwater for parking areas, including enclosed underground parking areas, except that, in the case of an enclosed underground parking area, an unobstructed means of pedestrian ingress and egress must be provided above the FCL. In addition, signs must be posted at all points of entry notifying users that the parking garage is not protected from inundation by floodwaters.

4.3 Elevation by Landfill

Where landfill is used to raise the natural ground elevation, it should be adequately compacted and the toe of the landfill slope should be no closer to the natural boundary than the prescribed setback. In addition, the face of the landfill slope should be adequately protected against erosion from flood flows, wave action, ice or other debris.

The fill must not adversely impact neighbouring properties by increasing the surface water elevation or directing flows toward those properties.

4.3.1 Blenheim Flats

- Land filling (on any existing or newly created parcel) should be a minimum of 0.9 m above the elevation of the street fronting the site. This filling standard need only extend horizontally 4.5 metres beyond the foundation wall and includes an area sufficient to contain the required septic field.
- To protect the amenity of the low-lying area, it is considered advisable to meet the FCL by structural means above elevation 2.6 m GVRD datum. However, where adjacent streets are above elevation 2.5 m GVRD datum, the FCL could be achieved totally by filling.
- Run-off from development sites is to be retained during rainstorms and not be discharged onto adjacent lands at any greater rate than it was prior to development.

4.3.2 Dunbar Flats (West Southlands)

- Land filling (on any existing or newly created parcel) should be a minimum of 0.46 m above the elevation of the street fronting the property.
- The underside of any floor system or top of any concrete slab of any area used for habitation, business, or storage of goods damageable by flood waters shall be no lower than elevation 3.0 m GVRD datum.
- To protect the amenity of the low-lying area, and at the same time not to deny adequate flood protection, the FCL should be met by structural means above elevation 2.6 m GVRD datum, and the maximum height of fill should be limited to elevation of 2.6 m GVRD datum. However, where adjacent streets are above elevation 2.5 m GVRD datum, the FCL could be achieved totally by filling.

4.4 Depth of Flooding

Subdivision in areas of flooding depth greater than 2.5 metres requires that the applicant demonstrate how full flood-proofing can be achieved and how safe ingress and egress can be achieved during the flood.

4.5 Flood Velocities

Subdivision in areas where flood velocities are in excess of 1.0 metre per second requires that the applicant demonstrate how safe ingress and egress can be achieved during the flood.

4.6 Training Works

Works are to be designed by a professional engineer. A professional engineer must certify constructed works.

4.6.1 Training Works to Protect One Property

An ongoing maintenance program may be assured through the addition of relevant requirements to the standard flood proofing covenant registered under section 219 of the Land Title Act, if the training works are:

- Built on private property, and
- Intended to protect only the property of the person (including a strata corporation) owning the training works and the property on which they are located.

4.6.2 Training Works to Protect multiple Properties

If the training works, when constructed, will protect multiple properties of more than one person, then an ongoing operation and maintenance program and registered easements and access to structures must be assured. In addition, the training works require the approval of the Inspector of Dikes.

Approvals under the provincial Water Act and federal Fisheries Act are also normally required.

An approved Operation and maintenance manual for the training works is to be prepared as a condition of subdivision approval and a copy is to be sent to the Inspector of Dikes.

4.7 Erosion Protection Works

Where erosion protection works are required, the approving officer should require details of the design, construction, operation and maintenance of erosion protection works prior to final approval of a subdivision or a relaxation of the requirements in a covenant. Works are to be designed by a professional engineer. A professional engineer must certify constructed works.

4.7.1 Erosion Protection Works to Protect One Property

An ongoing maintenance program may be assured through the addition of relevant requirements to the standard flood proofing covenant registered under section 219 of the Land Title Act, if the erosion protection works are:

- Built on private property, and
- Intended to protect only the property of the person (including a strata corporation) owning the erosion protection works and the property on which they are located.

4.7.2 Erosion Protection Works to Protect multiple Properties

If the erosion protection works, when constructed, will protect multiple properties of more than one person, then an ongoing operation and maintenance program and registered easements and access to structures must be assured by the local government.

Approvals under the provincial Water Act and federal Fisheries Act are also normally required.

An approved Operation and maintenance manual for the local government is to be prepared as a condition of approval.

5.0 Appendix – Definitions

Commercial Use - A use providing for the sale or rental of goods or services, for personal services, or for the servicing and repair of goods; and includes retail sales, wholesaling in conjunction with retail sales, commercial and government offices, personal services, commercial schools, household services and household repairs.

Debris Flow - The rapid downslope movement descending steep pre-existing drainage channels of water-saturated soil and debris by true flow processes.

Designated Flood - A flood, which may occur in any given year, of such magnitude as to equal a flood having a 200-year recurrence interval, based on a frequency analysis of unregulated historic flood.

Designated Flood Level - The observed or calculated elevation for the Designated Flood and is used in the calculation of the Flood Construction Level.

Disposition - Disposition of Crown land by certificate of purchase, grant, lease, licence of occupation, right-of-way, or easement under the Land Act.

Flood Construction Level - The Designated Flood Level plus the allowance for freeboard, used to establish the elevation of the underside of a wooden floor system or top of concrete slab for habitable buildings.

Flood plain - A lowland area, whether diked, flood proofed, or not which, by reasons of land elevation, is susceptible to flooding from an adjoining watercourse, ocean, lake or other body of water and for administration purposes is taken to be that area submerged by the Designated Flood plus freeboard.

Flood-proofing - The alteration of land or structures either physically or in use to reduce flood damage and includes the use of building setbacks from water bodies to maintain a floodway and to allow for potential erosion. Flood-proofing may be achieved by all or a combination of the following:

1. building on fill, provided such fill does not interfere with flood flows of the watercourse, and is adequately protected against floodwater erosion;
2. building raised by structural means such as foundation walls, columns, etc.;
3. a combination of fill and structural means.

Floodway - The channel of the watercourse and those portions of the flood plains that are reasonably required to discharge the flood flow of a Designated Flood. A minimum required floodway shall be equal to the width of the channel within the natural boundary plus a minimum setback of thirty metres from the natural boundary on each side of the channel or channels unless otherwise approved.

Freeboard - A vertical distance added to the Designated Flood Level (used to establish the Flood Construction Level).

Habitable Area - Any room or space within a building or structure that is or can be used for human occupancy, commercial sales, or storage of goods, possessions or equipment (including furnaces) which would be subject to damage if flooded.

Heavy Industry - Includes such uses as manufacturing or processing of wood and paper products, metal, heavy electrical, non-metallic mineral products, petroleum and coal products, industrial chemicals and by-products, and allied products.

Inspector of Dikes - An official of the ministry of Water, Land and Air Protection as defined under the Dike maintenance Act, RSBC 1996, chapter 95.

Institutional Use - A use providing for public functions and includes federal, provincial, regional and municipal offices, schools, churches, colleges, hospitals, community centres, libraries, museums, jails, courts of law and similar facilities; and specifically excludes public storage and works yards, and public utility uses.

Light or Service Industry - Includes such uses as assembly, fabrication and light manufacturing, warehousing, wholesaling and food processing.

Minimum Ponding Elevation - A minimum construction level assigned to reduce possible flood damage due to ponding of local drainage during a severe local storm.

Natural Boundary - The visible high watermark of any lake, river, stream or other body of water where the presence and action of the water are so common and usual and so long continued in all ordinary years as to mark upon the soil of the bed of the lake, river, stream or other body of water a character distinct from that of the banks thereof, in respect to vegetation, as well as in respect to the nature of the soil itself (Land Act, section 1). For coastal areas, the natural boundary shall include the natural limit of permanent terrestrial vegetation.

Non-conforming - Any existing building located on flood prone land that does not meet flood proofing requirements set out in this policy.

Professional Engineer - A person who is registered or licensed under the provisions of the Engineers and Geoscientists Act, RSBC 1996, chapter 116.

Recreation Use - A use providing for indoor or outdoor recreation and includes parks, playgrounds, and sports facilities.

Recreation Vehicle - Any structure, trailer or vehicle used or designed to be used for living or sleeping purposes and which is designed or intended to be mobile on land, whether or not self-propelled.

Setback - A withdrawal of a building or landfill from the natural boundary or other reference line to maintain a floodway and to allow for potential land erosion.

Standard Dikes - Those dikes built to a minimum crest elevation equal to the Flood Construction Level and meeting standards of design and construction approved by the ministry of Water, Land and Air Protection and maintained by an ongoing authority such as a local government body.

Subdivision Approving Officer - The appropriate person appointed under the Land Title Act.

Training Works - Any wall, dike or protective structure used to prevent a stream from leaving its channel at a given location. This includes any debris flow training structures including basins, trash racks, or other works.

Watercourse - Any natural or man-made depression with well defined banks and a bed 0.6 metres or more below the surrounding land serving to give direction to a current of water at least six (6) months of the year or having a drainage area of 2 square kilometres or more upstream of the point of consideration.