Comox Valley REGIONAL DISTRICT

Staff report

DATE: December 5, 2014

FILE: 7200-20 / HI

TO: Chair and Members
Hornby Island fire hall renewal select committee

FROM: Debra Oakman, CMA
Chief Administration Officer

RE: Fire hall access driveway grades

Purpose
To present information to the select committee on acceptable grades for fire hall access driveways

History/background factors
In 2012, an offer of tenure from the province was accepted for a one hectare parcel of land across Central Road from the existing fire hall. The site was surveyed by a British Columbia Land Surveyor and was found to have an average slope of 5% from Central Road down to the back of the property. Fire hall staff report no complications moving fire apparatus up or down the existing driveway on the property. The proposed orientation of the new fire hall results in a driveway that slopes up to Central Road at a maximum grade of 7.5%. The civil engineer has designed the proposed driveway orientation such that it will not interfere with the fire apparatus as it moves between the fire hall and Central Road.

The table below presents a summary of acceptable grades for fire apparatus and/or emergency vehicle access from a variety of design guideline documents.

Document	Section	Acceptable grades
City of Seattle – Fire Station Program Manual	2.2 Internal Site Criteria	A maximum 2% grade up or down is suggested as a guide for on-site vehicle routes, to be confirmed on a station specific basis
Fire Chiefs Handbook	Chapter 13 – Fire Station and Facility Design	Apparatus response up or down slopes less than 1:20 (5%) is recommended
City of Kelowna Design Standards	Table 2, Geometric Standards – Emergency Access	1.0% - 15.0%
City of Calgary Fire Department Access Standard	Section Five – Street Design Parameters	8.0% maximum (maximum grade for deployment of aerial apparatus)
BC MOTI TAC Supplement	1420.08 Driveways	Driveways shall not exceed 8% within the Right-of-Way
BC Building Code 2012	3.2.5 Provisions for fire-fighting	Access route design shall have a change of gradient not more than 1 in 12.5 (8%) over a minimum distance of 15m.

International Fire Code	Appendix D – Fire Apparatus Access Roads, D103.2	Fire apparatus access roads shall not exceed 10% in grade
Hub Fire Engines	Glenn Berger personal communication	Maximum slope for fire trucks per ULC testing is 23%
California Fire Code – Street Design Standard	503.2.7	The grade of the fire apparatus access road shall be within the limits established by the fire code official based on the fire department's apparatus
Fire Underwriters Survey	Micheal Currie personal communication	Fire Underwriters Survey does not have any specific restrictions relating to slope of access for a fire hall ramp/driveway

As can be seen in the table above, there is a range of standards on acceptable slopes for fire apparatus access, from a low of 2% to a maximum of 23%. Snow cover or icy conditions are the most likely factors that would impede movement of fire apparatus up a driveway grade of 7.5%. To provide some context regarding two of the standards listed in the table above, a comparison of Canadian Climate Normals 1981-2010 Station Data for Comox, BC (the nearest climate station to Hornby Island with historical data), Kelowna, BC & Calgary, AB is provided in the table below:

Location	**Days with snow depth > 5cm.**	**Frost-free days**
Kelowna, BC	84.5	140
Calgary, AB	59.8	117
Hornby Island	11.3	211

Given these comparisons, grades acceptable for fire apparatus access in Kelowna or Calgary should be considered acceptable on Hornby Island. To mitigate potential challenges during periods of inclement weather, Hornby Island Fire Rescue implements the following procedures:

- Installs chains on fire apparatus during heavy snow events (>5cm).
- Snow-clearing contractor clears fire hall driveway on a priority basis.

When one considers the predicted impacts of climate change over the 50 year lifespan of the proposed new fire hall, the issue of snow cover or icy conditions and their potential impediment to the movement of fire apparatus from the fire hall to Central Road becomes even less of a concern. The Pacific Climate Impacts Consortium's plan2adapt tool (www.plan2adapt.ca) projects a 36% decline (from 1961-1990 baseline) in precipitation as snow for the Comox Valley by the 2050s. Plan2adapt also predicts an additional 23 frost-free days by the 2050s.

In summary, a common theme in many of the access gradient design guidelines listed in this document is consultation with the local fire department during the design process. For this proposed project, Hornby Island Fire Rescue have confirmed that the proposed driveway grades and alignment are acceptable for their department (Appendix 'A').

Recommendations from the chief administrative officer:
THAT this report be received by the committee as information regarding acceptable grades for fire hall access design.

Respectfully:

D. Oakman

Debra Oakman, CMA
Chief Administrative Officer

Prepared by:	Concurrence:
V. Van Tongeren	***T. Ian Smith***
Vince Van Tongeren Policy and sustainability analyst	T. Ian Smith, MCE General Manager of Community Services

Attachment: Appendix A – Hornby Island fire hall confirmation that proposed driveway grades are acceptable

Selena Speed

From: Hornby Island Fire Rescue <hifr@telus.net>
Sent: Thursday, December 04, 2014 1:53 PM
To: Vince Van Tongeren
Cc: Ian Smith
Subject: new fire hall driveway

Vince

I have analysed the driveway grades for the new fire hall, including the preparation of profiles showing the 2% staging area adjacent to Central Road
and suitable vertical curves, both sag and crest.
The grades and alignment are within normal operating design guidelines and are acceptable for our department.

Giff La Rose, P.Eng.
Fire Chief

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http://www.nfpa.org/~/media/Files/Safety%20information/Safety%20tip%20sheets/SmokeAlarms.pdf