City of Richmond

Earthquake Design in the Fraser Delta

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The design of buildings in British Columbia is based on the current edition of the British Columbia Building Code (BCBC) which, in turn, is based on the National Building Code of Canada.

The Fraser Delta is underlain by deep soils deposits that during a severe earthquake could amplify the motion, and cause liquefaction. The Code requires that these items be taken into consideration when designing buildings and structures.

The Code does not, however, specify design regulations for liquefaction, but states that such cases require special study. Because liquefaction is a major concern in the Fraser Delta, Richmond has taken an aggressive and practical approach to ensure designers have the latest available information to assist them in their designs.

At the request of the City of Richmond, guidelines for the seismic design of buildings in Richmond were developed by Drs. Byrne and Anderson in 1982 and 1987.

In response to a letter from Drs. Byrne and Anderson in late 1989, the City of Richmond arranged a meeting of geotechnical and structural engineers involved with projects in Richmond to discuss the latest theories relating to seismic design in the Fraser Delta.

After some discussion it was agreed that Drs. Byrne and Anderson would chair a Task Force to examine the seismic design practices in the Fraser Delta. As a result of the Task Force work a report was prepared to assist designers in addressing seismic design concerns by providing them with general design guidelines.

Following the philosophy of the National Building Code (and the BC Building Code), the report is intended to "provide an acceptable level of public safety, which is achieved by designing to prevent major failure and loss of life."

In the past there was a lack of adequate earthquake data for the Fraser Delta. Information on soil amplification, liquefaction and their effects on building performance was previously based on experience in other areas including recent earthquakes in California, Mexico, Japan and Alaska. There was concern that buildings in the Fraser Delta may not perform as predicted. To this end the City of Richmond maintained its aggressive and practical approach and supported a number of initiatives to further develop our understanding of soil behaviour and its impact on building construction in Richmond.

Richmond has in the past and will continue in the future to promote safe design practices. Our continued involvement in the Building Code development process and support for enhanced knowledge in the area of seismic design will continue.

I am of the opinion that the support from our City Council and the efforts of Drs. Byrne and Anderson and numerous other engineering professionals has significantly enhanced the level of safety for Richmond residents.