

## Technical Review Board Memorandum

**Date:** September 2024

**Issue: Liquefaction Guidelines  
(Volume 11 of the Seismic Retrofit Guidelines)**

### **Discussion:**

Over the past several years, the Technical Review Board (TRB) has been working with leading geotechnical experts in British Columbia to update the liquefaction guidelines to better estimate liquefaction-induced soil movements following the design level seismic event. The primary focus of this work has been in Richmond as there are a large number of seismic upgrades required for Richmond School District (SD38) schools. It is important to understand the level of liquefaction related upgrades required for these schools and to provide SD38 and the Ministry of Education (EDUC) with the best information possible.

The project lead for this work on behalf of the TRBSC and EDUC, is John Sherstobitoff of Ausenco. Geotechnical expertise was primarily provided by Adam Silvester and Paul Wilson (Thurber Engineering Ltd.), with ongoing review by Upul Atukorala (WSP Canada).

In advance of the SRG2023 release, advice from the geotechnical experts is as follows:

There are important changes between SRG2020 and SRG2023 that relate to appropriate adoption of the 6<sup>th</sup> Generation Canadian Seismic Hazard Model and NBCC2020 seismic hazard values and how consequences of liquefaction are calculated.

A list of key changes between SRG2020 and SRG2023 related to evaluating Inland Richmond Schools is provided below. This list is not exhaustive and SRG2023 should be reviewed upon release.

1. To be classified as an 'Inland Floodplain School' the non-liquefiable crust thickness **beneath** the underside of footings must be 3 m or greater. Schools that do not meet this criterion must be reviewed on a case by case basis with a TRB geotechnical reviewer.
2. For schools located in Richmond and Delta, a PGA of 0.4 g must be used for assessment under NBCC 2020. This applies to liquefaction triggering and input into the Bray and Travarasrou (2007) lateral displacement equation.
3. The differential approach to using the Youd et al. (2002) method has been removed in SRG2023. Instead, use of the Youd et al. (2002) equation with a 2H cut-off and a mean acceleration of 0.25 g (for Richmond) is recommended in SRG2023 for inland floodplain schools. The mean acceleration for Richmond is provided in Table B-2 in Appendix B.
4. Examples are provided in SRG2023 for vectors of  $\Delta H$  that are non-orthogonal to the school walls and strip footings.

**Note:** SRG2023 is now scheduled to be released at a scheduled training seminar in Vancouver on Friday, December 6<sup>th</sup>, 2024.