



Lieutenant Governor's Award of Engineering Excellence

Lord Strathcona Elementary School Heritage Classroom Building – Base Isolation Seismic Upgrade



Consultant

Ausenco Engineering Canada Inc.

Prime Consultant

The Colborne Architectural Group Pacific Inc.

Owner

The Board of Education of School District #39

Category

Buildings

For more information, please contact:

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The three heritage buildings of Lord Strathcona Elementary School were assessed to have a high seismic risk. A seismic upgrade was achieved using base isolation of the three storey load bearing brick and stone building. While below-grade isolation planes have been used in other parts of the world, what was unique in this project was the above-ground isolation plane – a solution never attempted in Canada previously. The structure above the isolation plane is totally separated from that below, connected only by 30 new isolators.

Ausenco, the structural/seismic engineering specialists:

1. carried out non-linear analyses and design of the base isolation system, and all related structural work;
2. provided guidance to other team members regarding details at the isolation plane to accommodate the predicted 250 millimetre lateral movement;
3. provided construction-related services to resolve the site challenges that arose; this building had no existing drawings;
4. directed the critical load transfer to the new isolators using flat jacks, a Canada-first; achieved with less than 3 millimetre vertical movement, avoiding damage to the brittle structure.

The 3D computer analyses were another Canada-first following new provisions for base isolated buildings. This involved analyses of 21 earthquake ground motion records related to the three different types of earthquakes possible in Vancouver. The upgrade achieves an "immediate occupancy" post-earthquake performance level as well as post-earthquake heritage conservation.