Design Question 5-Comparison between Canadian seismic design code system and American seismic design code system

- **(1)Canadian code system has one level of ground motion; American code system has two levels of Ground motion, DBE or BSE-1 and MCE or BSE-2, DBE is 10% 50 years, MCE is 2%50years.**

- **(2)Both code systems provide MCE ground motion information.**

- **(3)Both code system use elastic response acceleration spectrum**

- **(4)Canadian code uses RdRo, Rd is response modification factor for new buildings due to ductility, Ro is material over strength modification factor. American code uses R only to get seismic load for new and existing buildings, however American code uses equivalent spectral response based on equivalent damping ratio and equivalent stiffness to calculate seismic load for new and existing buildings using special seismic resistance technologies, such as base isolation and energy dissipation using added device. Canadian code system does not have this method; consequently, Canada does not have code for special seismic resistance technologies(base isolation and energy dissipation using added devices).**

- **(5)Canadian uses seismic load for strength design, uses MCE drift for drift control based on collapse prevention. American new buildings seismic code is same as Canadian. American existing building retrofit code uses DBE seismic load based on ductility and elastic acceleration spectral response for strength and drift control, uses MCE seismic load based on ductility for performance based drift control. However, when special seismic resistance technologies such as base isolation and energy dissipation using added devices are used, seimic load is determined based on equivalent damping ration and equivalent stiffness**

- **(6)Canadian code system does not have an independent seismic retrofit code, but applies new building seismic design code to existing buildings retrofit design, consequently a less economical solution will be reached compared to that of using American performance based method.**