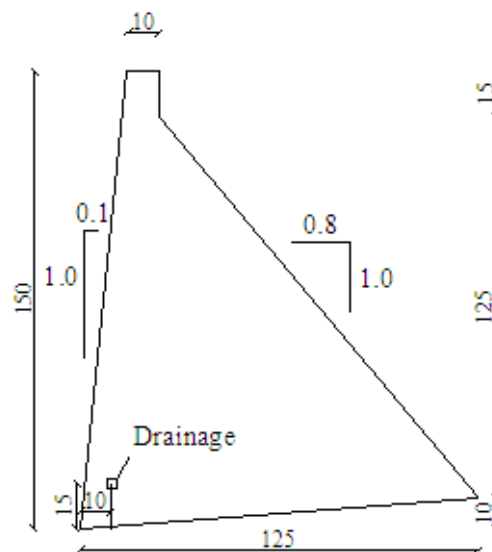

Nonlinear Seismic Analysis of Concrete Dam

A Nonlinear seismic fracture response analysis of concrete gravity dams which includes the dam-reservoir interaction is required. The tallest monolith JEGIN dam is selected for the purpose of analysis. The modulus of elasticity, the unit weight, Poisson's ratio, the tensile strength and the specific fracture energy of the concrete are taken as 28GPa, 2400kg/m³, 0.2, 2MPa and 150 N/m, respectively. The ratio of the apparent to the true tensile strength is 1.2 and the dynamic magnification factor for both the tensile strength and the specific fracture energy is taken as 1.2.

The assumptions of the problem are as following:

- Applying the stiffness proportional damping equivalent to 10% of critical damping in the first and second mode
 - Using added mass approach as representative of dam-reservoir interaction
 - Applying horizontal as seismic excitation input May 18, 1940 Imperial Valley earthquake, El Centro site record
1. Conduct the nonlinear dynamic analysis of the dam and compare the resulted crest displacement in US/DS direction with those of obtained from the previous assignment (EAGD84).
 2. Show the crack profile at the end of the analysis and discuss about the location of crack profiles within the dam body.
 3. Draw the dissipated energy due to fracture within the dam. Discuss about the results.

**Note:**

- Use concrete damage plasticity model in ABAQUS software for this assignment.
- The required earthquake record can be found in internet.