

Chapter 6

Q1. What do you mean by soil-structure interaction?

Q2. Explain various local site effects.

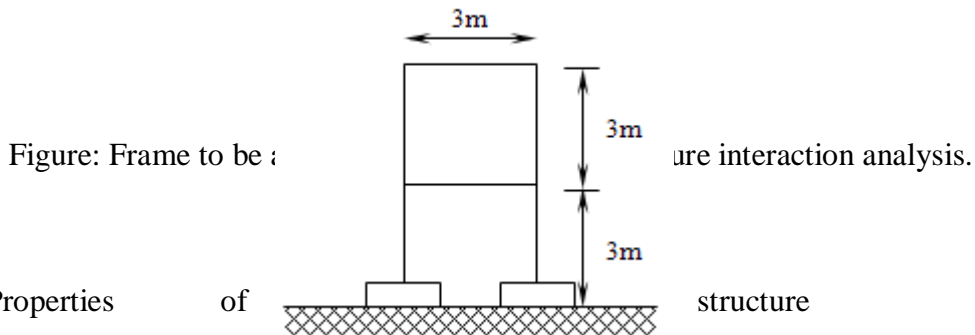
Q3. Describe kinematic interaction and inertial interaction in relation with SSI.

Q4. Analyze the frame shown in Figure 6.17 by performing soil-structure interaction analysis in ABAQUS by

- Direct Method.
- Sub-Structure Method.

The frame is supported by two isolated footings having properties as mentioned below.

1. Structural Configuration



2. Properties

Size of Beams = 300 mm x 300 mm

Size of columns = 300 mm x 300 mm

Size of foundation = 600 mm radius

3. Material properties of structure

Density ρ_{st} = 2500.00 kg/m^3

Modulus of Elasticity E_{st} = 2500.00 N/m^2

Poisson's ratio μ_{st} = 0.2

Damping ξ_{st} = 5.00 %

4. Properties of Soil

Density ρ_s = 1750.00 kg/m^3

Shear Velocity v_s = 200.00 m/sec

Poisson's ratio μ_s = 0.3

Damping ξ_s = 20.00%

5. Input Time History = El Centro Earthquake Time History (See appendix-I)

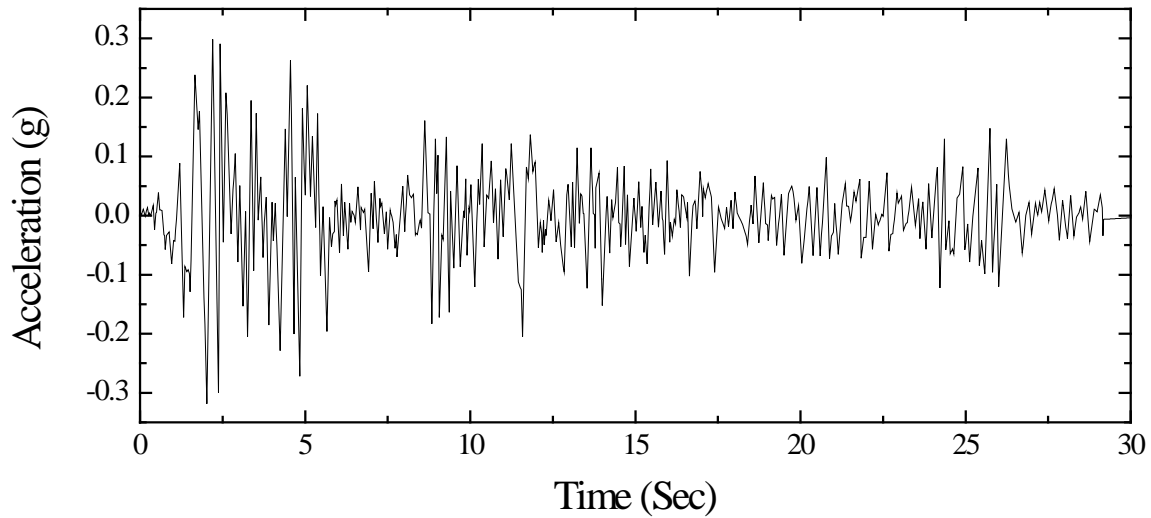


Figure: Input El-Centro Earthquake Time - history.

6. Problem Requirement = Find the time histories of relative acceleration and Rotational acceleration at the top floor of the given frame.