

①

Fig # 1

This structure is a discontinuous shear wall. In case if earthquakes come, it will break at center.

Solution:

Shear wall should be eliminated to form frame structure only or shear wall should be continuous till to the end.

Fig # 2

This is a soft story building in each the lower portion is less stiffer and the upper is more stiffer. So when the upper portion loads comes on the lower portion. The lower portion will not stand with the upper portion load and will collapse.

Solution:

This structure should be provided with additional columns and additional braces. It will help the building to withstand an earthquake.

Fig # 3

Type: This structure is a Re-entrant corner building. These building is "L" shaped building.

Problem:

There are two problems in this building when an earthquake occurs.

(1) There is a problem in the building wing because of the differential motion if an earthquake occurs.

(2) The second problem which will occur is the tension.

(3)

in the building because the center of mass and center of rigidity in this form can not geometrically coincide.

Solution:

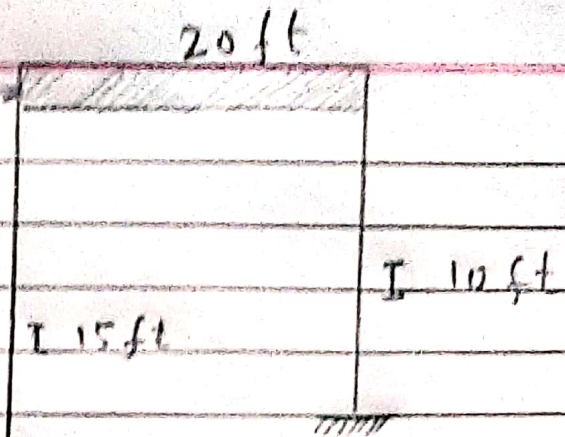
There should be separation in the two portion as it is a L shaped building, or it should be embraced or protected with stiff resistant element.

(4)

Q No: 2

Ans

$P(t)$



Given data:

$$E = 29000 \text{ ksi}$$

$$I = 1200 \text{ in}^4$$

Uniformly distributed gravity load = 7743 lb/ft

Required data

Develop equation of motion = $P(t) = P$

Solution:

$$m = \frac{w}{g} = \frac{7743 \times 20}{32.2 \text{ ft/sec}^2}$$

$$m = 4809 \text{ lb sec}^2/\text{ft}$$

Now using D'Alembert's principle of dynamic equation.

$$P(t) - m\ddot{u} - f_{s1} - f_{s2} = 0$$

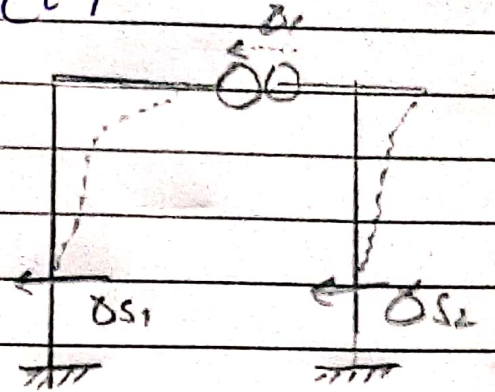
$$P(t) - m\ddot{u} - (f_{s1} + f_{s2}) = 0$$

(5)

$$(k_1 u + k_2 u) + m \ddot{u} = P(t)$$

$$(k u) + m \ddot{u} = P(t)$$

$$\therefore \text{As } k = 3759$$



$$P(t) = 4809 + 3.759 \times 10^6$$

where u and $P(t)$ are in
ft and lb.

The end

Assignment #1

Name: Hedayat Ullah Shah

ID: 7743

Section: "C"

Department: BE CIVIL

Subject: Earth Quak Enge

Instructor: Engr. Yasin Mehmood

Dated: 15 April 2020