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SECTION : A

Subject Earth quake

& Dynamics.

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QNO # 01

Fig (I) Discontinous Shear Wall.

Discontinous Shear Wall:

Are these Shear Wall where no Continous load path found between roof to foundation.

Effect of DisContinous Shear Wall

They are effect by earthquick During earthquake the Shear Wall break or distroyed at the Center and falldown and totally distroyed

Solution of discontinous Shear Wall

There are many Solution of the discontinous Shear wall but the most common Solution is that

- Add additional Coloum OR Shear wall Should be eliminated OR Shear Wall Should be Continious from foundation or bottom to floor or top

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Fig (II) SOFT & WEAK STORIES :-

Explanation of weak Stories :-

Soft and weak Stories are applied for building whose ground level Story is less Stiff then those above Soft stories building are less Stiff or more flexible while the above weak Stories have less Strength and Cause problem at the height

Solution of Soft & weak Stories

The Common Solution of Soft and weak Stories are to add additional Coloum, bracking and external buttresses

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Fig(III) Re-eutraul corner

Explanation:

Re-eutraut Corner are of different Shape Such as L, H, T etc but the fig (III) re-eutraut Corner is L shape

Effect of re-eutraut Corner

There are two different effect of re-eutraut Corner

Ist problem is that it produce differential motion b/w different Side/wing of the building due to stiff element in these region and cause Stress Concentration in re-eutrant Corner

2nd problem is that it produce or from torsion due to the center mass and rigidity are not geometrically concid in earthquake direction the result is rotation and the ~~pro~~ force produce as a result is difficult to analyze and predict

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Solution of re-entrant Corner

The building are Separated into Simpler Shapes or due to element make Tie the building to provide more balance resistance.

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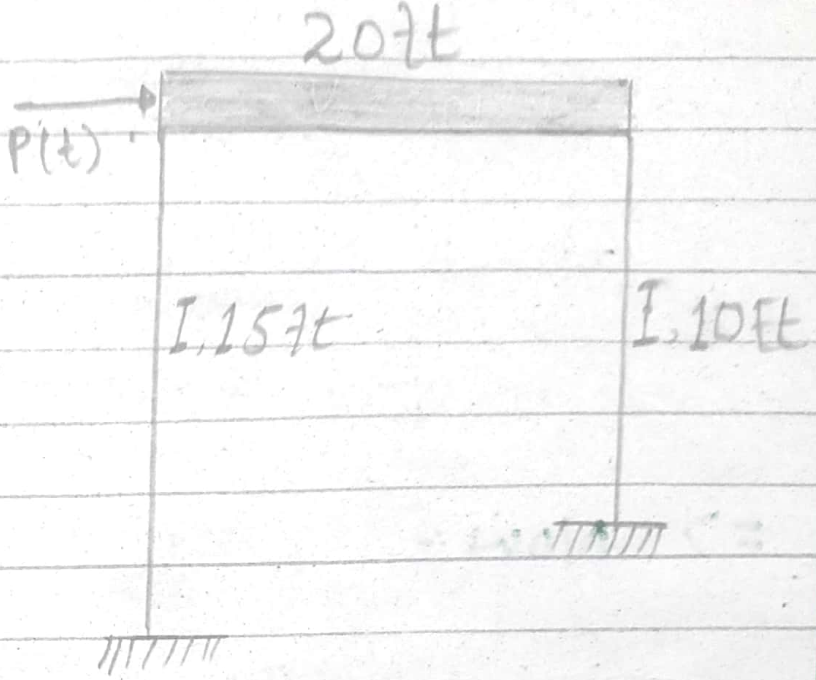
Q NO 02

ANSWER:-



Given data:

⇒ $E = 29{,}00$ ksi

⇒ $I = 1200 \ in^4$

⇒ Uniformly distributed Gravity load = 7767 lb/ft

Required data:

⇒ Develop Equation of motion = P(t) = ?

Solution:

As: $K_{eq} = K_1 + K_2$

$$\Rightarrow K = 12EI \left[\frac{1}{h_1^3} + \frac{1}{h_2^3} \right]$$

put value.

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$$= 12 \times 29000 \times 1200 \times \left[\frac{1}{(15\times12)^3} + \frac{1}{(10\times12)^3} \right]$$

$\Rightarrow$ $K = 313.29$ k/in

$K = 3759.48$ K/ft

=> **Now :-**

$$\Rightarrow m = \frac{W}{g} = \frac{7.767 \times 20}{32.2 \text{ ft/sec}^2}$$

= ~~4.8~~

$= 4.824 \text{ sec}^2/\text{ft}$

$\Rightarrow m =$ ~~4.8~~ $\boxed{4824 \text{ lb.sec}^2/\text{ft}}$

Now using D-Alembert's principle of dynamic equilibrium :-

$P(t) = Ku + m\ddot{u} \longrightarrow (1)$

As $K = 3759.48 \times 10^6$

Put value

$P(t) = 3759.48 + 4824 =$

$Pt = \boxed{4824\ddot{u} + 3759.48 \times 10^6}$

Where $\ddot{u}$ & $P(t)$ are in ft & lb respectively

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