MID-TERM PAPER.

SUBJECT : "EARTH QUAKE ENGI."

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SECTION : C.

Question:2. Describe the types of the configuration depicted in fig 1, 2 & 3, How they can effect seismic performence of a structure & what are their possible solutions?

Answer:- FOR FIGURE (2),

As figure 2 shows discontinous sheas walls.

=> If seismic occus and there is not a continous load path through which load transfes from roof to foundation & the result can be serious oves stressing at point of discontinous due to the above situation structure

can be damaged & collapse at critical point of the structure.

* SOLUTION :-

=> The solution to the problem of the discontinous sheas wall is to eliminate the sheas wall.

=> If the decision is made to use sheas wall then theis presence must be recognized from the beginig of schematic design & theis size & location made the subject of casful architectural & engineering coordination early.

* FOR FIGURE 2 :-

This figure shows soft & weak stresses & less stiff at ground level.

=> & above the ground level heavy & more stiffes.

* PERFORMANCE :-

The most prominent of the problems caused by several stress concentration is that of soft story. The term has commonly been applied to a building whose ground level story is less stiff then the above.

=> The building code distinguishes B/w "soft" & "weak" stories. Soft stories are less stiff or more flexible then the above weak stories have less strength.

=> A soft or weak story at any height creates a problem, but since the commulative load are greatest towards the base of the building. A discontinuity B/w first & second floor tends to result in the most serious condition.

*POSSIBLE SOLUTION:-

The solution of this type of problem in structure

to add the following structural elements.

(1) Add more column.

(2) Add bracing.

(3) Add external buttresses.

* FOR FIGURE 3:-

In figure (3) the Problem shows Re-entrant corners.

* PROBLEM:-

These are two Problem created by these shapes.

=> The first one is that they tend to produce differential motions B/w different wings of the

building that because of stiff elements that tend to be located in this region result in local stress concentration at the re-entrant corness.

=> The second type of this problem is torsion which is caused because the centre of rigid in this plan cannot be geometric conside for possible earthquake directions.

=> The result is rotating the resulting forces are very difficult to analyze & predict.

* Solution :-

There are three solutions of this problem.

=> Structurally to separate the building into simples.

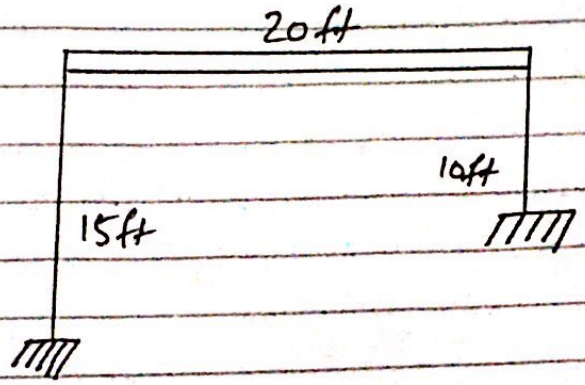
=> In the second solution to tie the building together more strongly with elements positioned to provide a more balanced resistance. This solution applies only to smaller buildings.

=> The use of splayed paths is than the right Angle recentrant corners session the stress concentration.

=> This Analogs to the way tapered beam is structural more flexiable

than abruptly noticed one.

QUESTION 2:-



$E = 29000$ ksi

$I = 1200$ in^4

load = 7744 lb/ft^2.

*Solution:-

$$K = 12EI\left[\frac{1}{(15\times12)^2} + \frac{1}{(10\times12)^2}\right]$$

$K = 313.29$ k/in.

$K = 3759$ k/ft.

$\Rightarrow m = w/g$.

$$\Rightarrow m = \frac{7744 \times 20}{32.2 \text{ ft/sec}^2}.$$

$$\Rightarrow m = 4809.9. \text{ k sec}^2/\text{ft}.$$

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

$$P(t) = 4809.9 + 3.759 \times 10^6.$$