

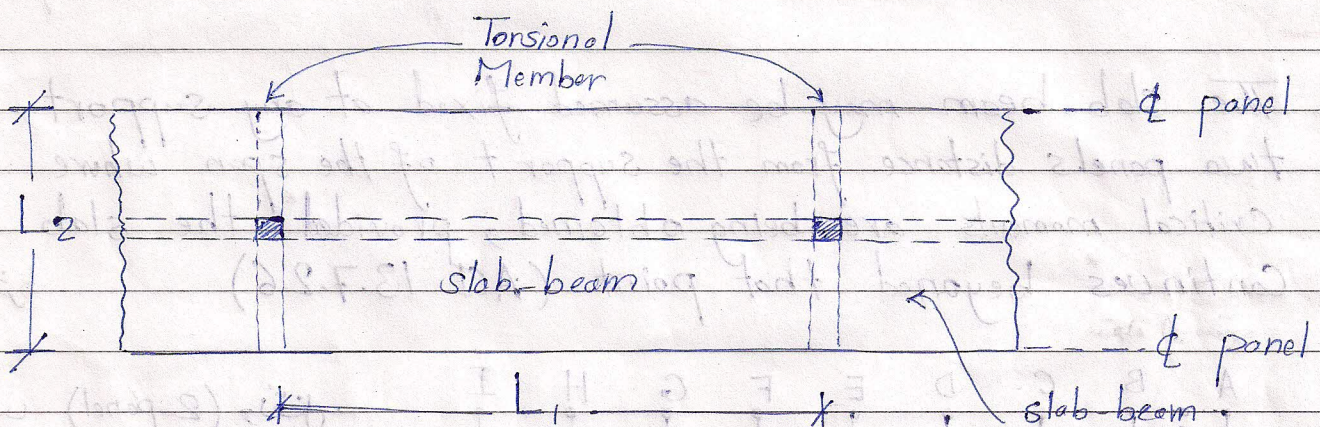
Equivalent Frame Method (EFM) ACI-13.7

A more general method for the analysis of two-way slabs that have no limitations. It assumes the analysis to be done using moment distribution method.

x procedure

Int Frame (إطار داخلي)

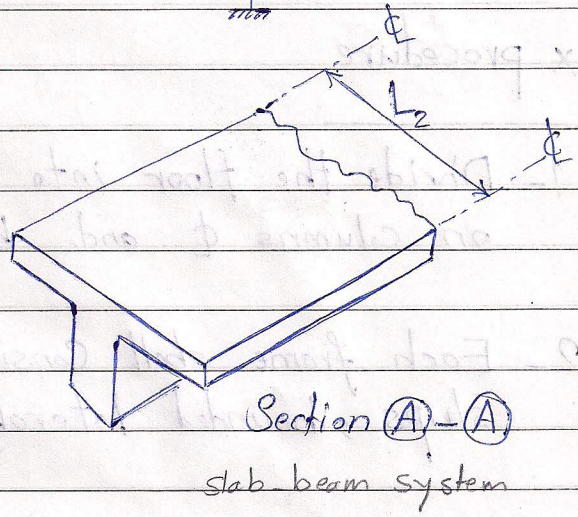
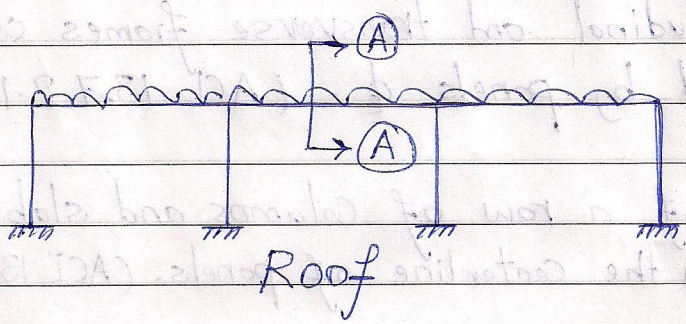
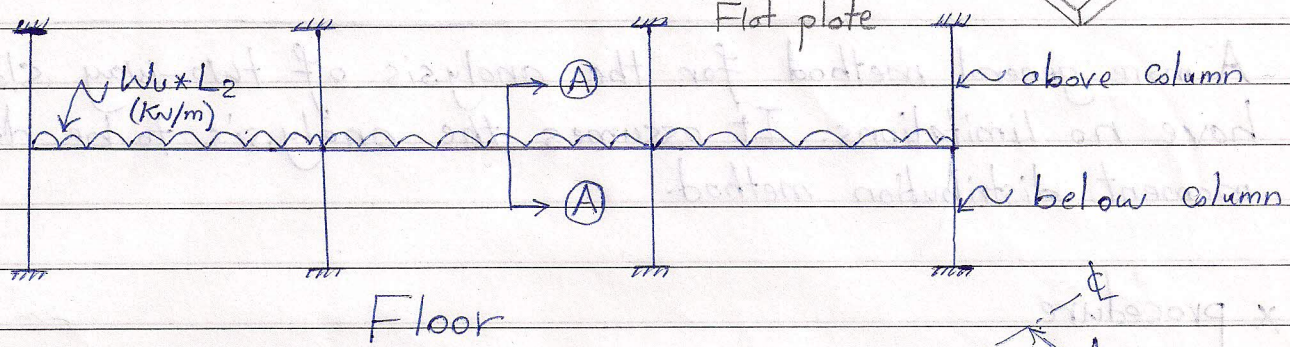
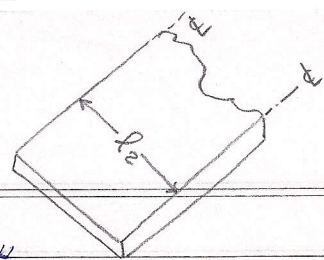
- 1- Divide the floor into longitudinal and transverse frames centered on columns & bounded by panels & (ACI 13.7.2.1)
- 2- Each frame shall consist of a row of columns and slab-beam strips, bounded laterally by the centerline of panels. (ACI 13.7.2.2)



- 3- Columns shall be assumed to be attached to slab-beam strips by torsional members transverse to the direction of the span for which moments are being determined. (ACI 13.7.2.3)

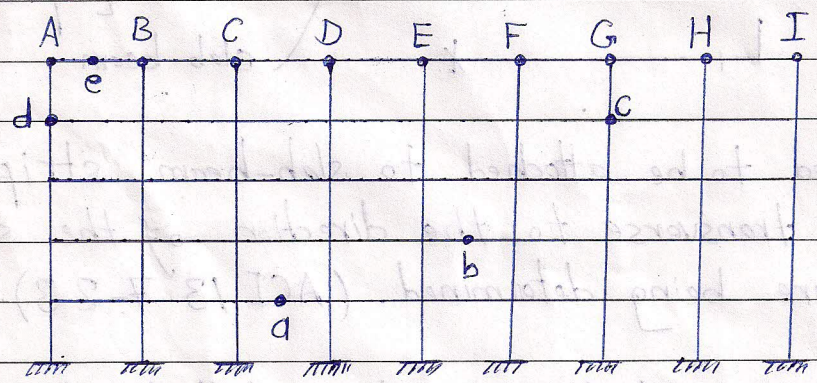
Ext Frame (إطار خارجي)

- 4- Frames adjacent and parallel to an edge shall be bounded by that edge and centerlines of adjacent panel. (ACI 13.7.2.4)
- 5- Each frame with its columns may be analyzed separately (for gravity loading) and the columns are assumed fixed at the far ends. (ACI 13.7.2.5)

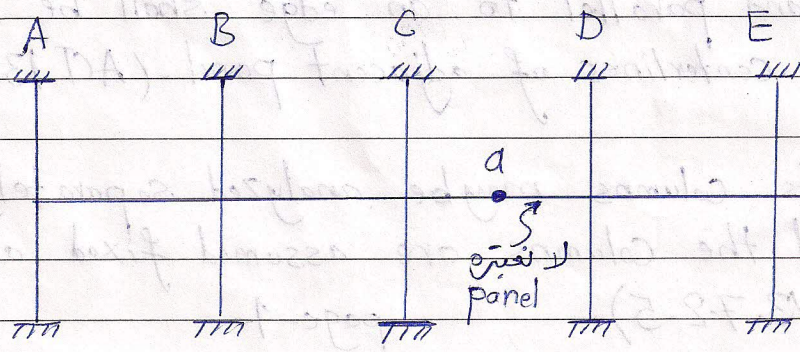


Section A-A
slab beam system

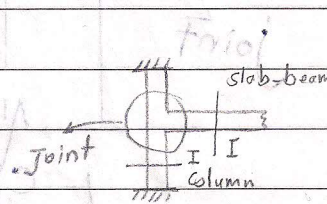
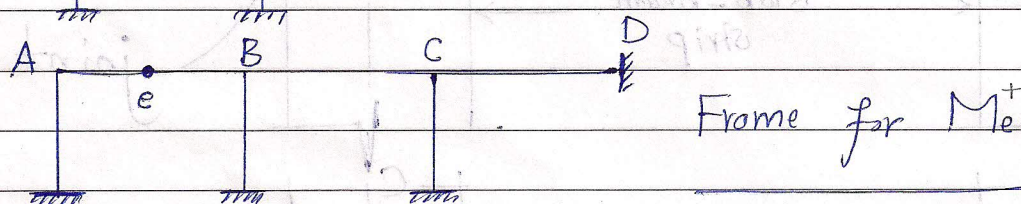
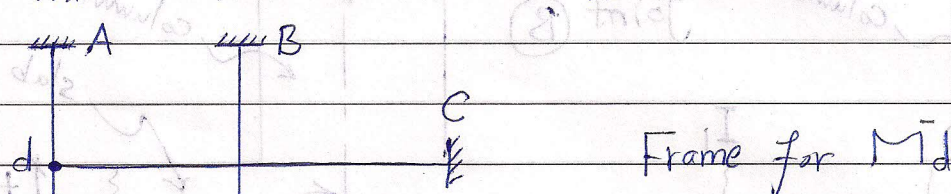
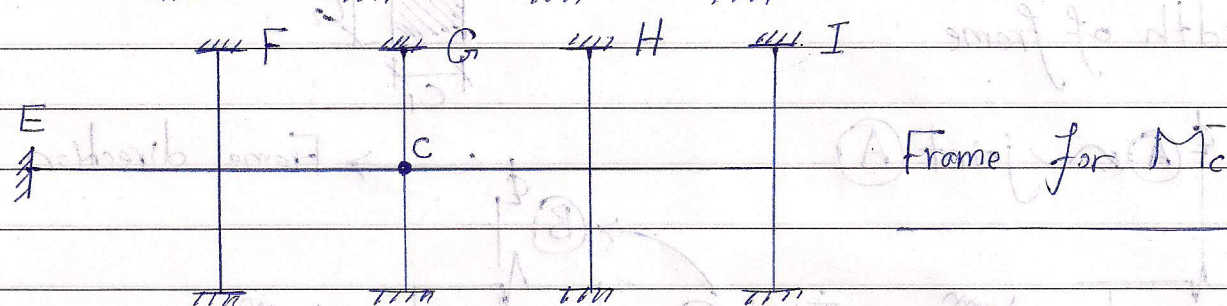
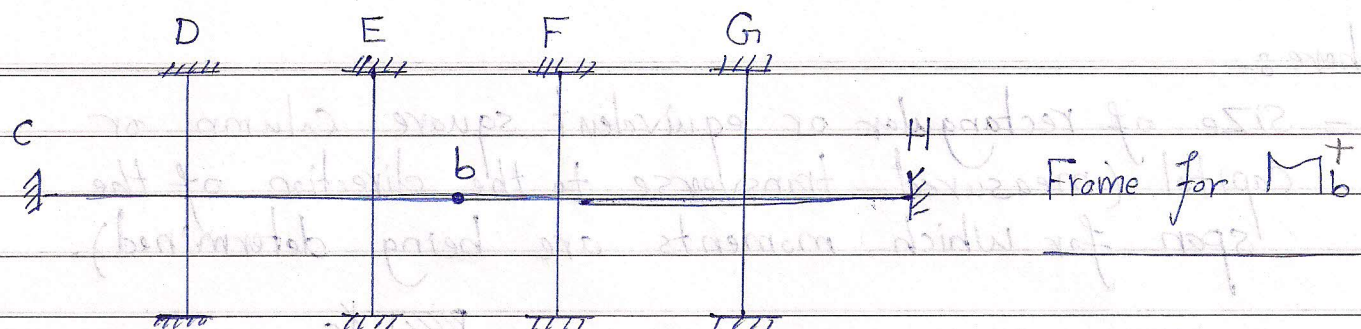
6- The slab-beam may be assumed fixed at any support two panels distance from the support of the span where critical moments are being obtained, provided* the slab continues* beyond that point. (ACI 13.7.2.6)



حساب (2-panel) ونقطة
* * * * * إذا كانت النقطة في المنتصف
نقطة ونقطة بعد (2-panel)



Frame for M_a^+



7- Moment of inertia (I) of the slab-beam or column at any cross-section outside of joints or column capitals may be based on gross area of concrete (ACI 13-7-3-1)

$$h \begin{array}{|c|} \hline \text{ } \\ \hline \end{array} \begin{array}{|c|} \hline \text{ } \\ \hline \end{array} \begin{array}{|c|} \hline \text{ } \\ \hline \end{array} \begin{array}{|c|} \hline \text{ } \\ \hline \end{array} \rightarrow I_{\text{rect.}} = \frac{bh^3}{12}$$

8- The moment of inertia of slab-beam strip between the center of the column and the face of the column (bracket or capital) is to be assumed equal to that the slab-beam at the face of the column or bracket or capital divided by the quantity $(1 - \frac{C_2}{L_2})^2$ (ACI 13-7.3-3)

Where:-

C_2 = Size of rectangular or equivalent square column or capital (measured transverse to the direction of the span for which moments are being determined).

L_2 = Width of frame

