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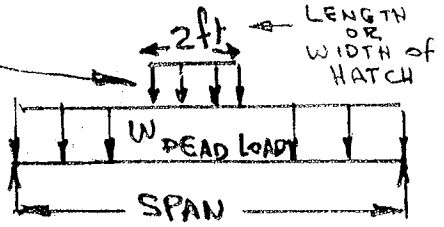
Problem: WHAT IS A RATIONAL APPROACH TO DESIGN OF TOP SLABS IN ROUND STRUCTURES WHERE A HATCH IS ON THE CENTER LINE OF THE STRUCTURE?

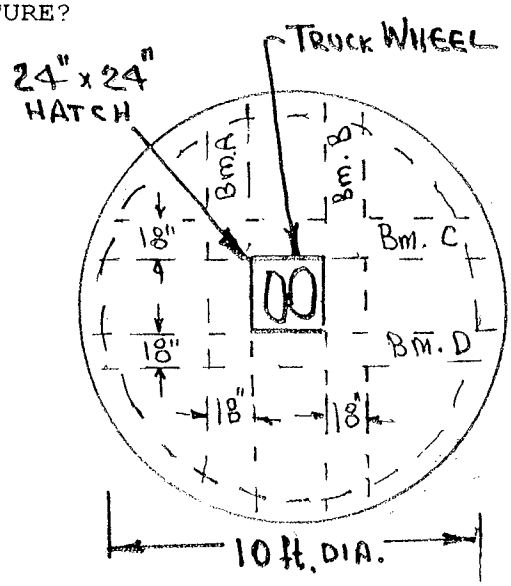
CASE I includes large slabs with a small hatch. Design for a worst case situation.

A. When truck wheel is on hatch, ¼ of load is dispersed to each Beam (A, B, C, and D).

$$W_{LIVE\ LOAD} = \frac{\text{TRUCK LOAD}}{\text{HATCH PERIMETER}} = \frac{16000\ lb.}{4 \times 2\ ft.} = 2000\ lb/ft$$



FORCE DIAGRAM

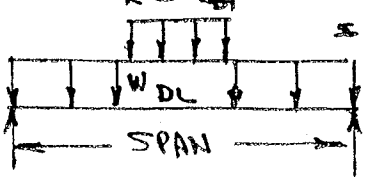


PLAN VIEW of SLAB

B. When truck wheel is adjacent to the hatch, worst situation is with wheel at center of span on Beam (A, B, C, or D).

This situation is obviously the worst possible situation. A slab designed for this situation will be stronger than a slab designed for wheel on the hatch.

$$W_{LL} = \frac{16000\ lb}{3\ ft.} = 5333\ lb/ft.$$



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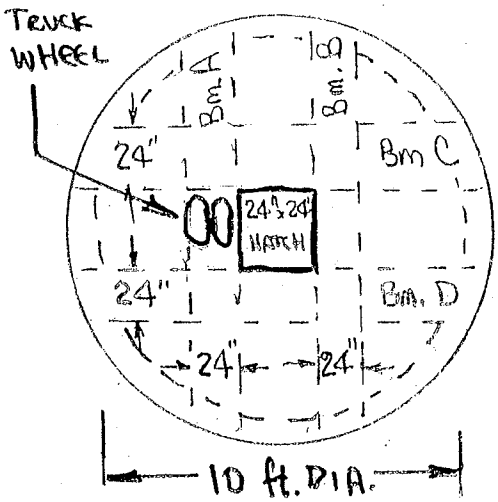

PLAN VIEW of SLAB

* 3 ft. IS BASED ON ASSUMED "RESISTING AREA" of SLAB BEING 2 ft. x 3 ft.