

# DESIGN PRINCIPLES AND CALCULATIONS - LATERAL LOAD DISTRIBUTION

## LATERAL LOAD DISTRIBUTION FOR LINE LOADS

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Line loads are often encountered in construction, i.e. a concrete block wall or even a load bearing concrete block wall. It is always desirable to have a floor system that is stiff enough to allow these line loads to be distributed to adjacent joists rather than it be carried by the joist that happens to be directly under it.

The Hambro Composite Floor System provides the designer with this desirable feature.

This was conclusively proven by randomly selecting a sample of five similar adjacent joists in a bay in an apartment structure and line loading the center one.

The joists were *12 inches* deep, had a clear span of *21 feet-3 inches* and a *3 inch* thick slab. The loads were applied using brick pallets. At every load stage, steel strains as well as deflections were measured.

The distribution of load to each of the five joists can be determined by comparing deflections or stresses at similar locations in the five joists under investigation.

Tests have demonstrated that for a line load applied to a typical joist in a bay, the actual distribution of load to that joist is approximately 40% of the applied load. The distribution of load to the adjacent joist on either side is approximately 21% of the applied load and to the next adjacent joist approximately 9% of the applied load.