



## The Expert >>

### Floor Loadings at Joints >>

**Although there is more to floors than joints - and I will be dealing with other topics later, joints are the most significant design consideration in floors.**

At the edges of slabs, the load carrying capacity is only half of the capacity at the centre of the slab. By the centre of the slab we mean a distance away that is known as the radius of relative stiffness. This varies according to a number of factors and there is a complex calculation involved. However, as a rule of thumb, we are looking at about 600 to 750mm from the edge. Load capacity increases as you move away from the edge over this distance.

Corners of slabs are theoretically even weaker and are only able to carry about 25% of the centre load without breaking off. Fortunately, real corners are only found in the corners of buildings and they are not usually loaded, but we need to consider the points where joints cross - intersections. Provided there is sufficient structural connection between the faces of the joints at these intersections, designers can treat these corners in the same way as edges.

You can see that it makes no sense to be loading a floor unnecessarily at the edges of

panels i.e. alongside the joints!

Loads come in two types. The first are static loads such as racking legs and mezzanine legs. The second are dynamic loads from mechanical handling equipment, such as reach trucks, very narrow aisle trucks and counterbalance trucks.

The static loads should be placed as far away from joints as possible. For racking legs, 300mm is a good target and for mezzanine legs 600mm. Sadly, racking systems tend to get erected with little or no care taken on positioning. It might be suggested that racking bay lengths are fixed and cannot be changed. This is nonsense. One third, half or two third bay lengths can be incorporated as required to keep legs off joints. A row of racking of 60 metres might need just one such bay to achieve the desired result. Similarly when looking across aisles, increasing the back to back spacing of perhaps one in four of the racks can push the legs away from the joints.

In contrast, the dynamic loads obviously have to cross joints to move goods around. In most racked areas, the wheel loads can be as high as those of the racking legs - particularly as moving loads create more stresses on the floor.



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So the designer has to calculate carefully the loads that can be carried right on the edge. This is where the structure and condition of the joint mechanism is important - a factor known as load transfer capacity or in simple terms, the facility for the load at an edge to be shared by the edge of the next floor panel. More on load transfer and ground support in the next edition.

#### Face Consultants

Contact: Tony Hulett

Tel: 07989 708514

W: [www.face-consultants.com](http://www.face-consultants.com)