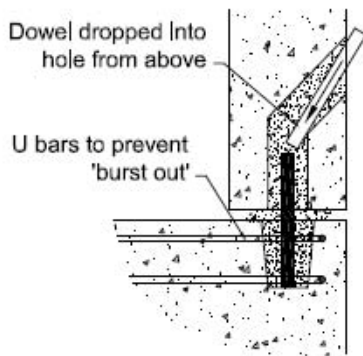


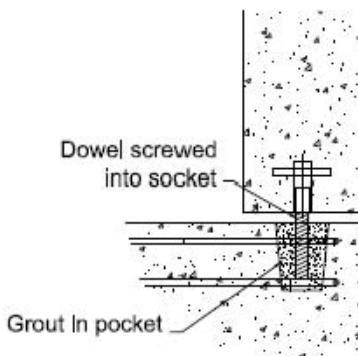
Dowels

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Dowels are a simple, efficient and very cost-effective means of providing restraint to a precast unit, particularly at the bottom. They consist of a straight rod, cast or screwed into a hole/pocket or socket on either side of the joint between two units.

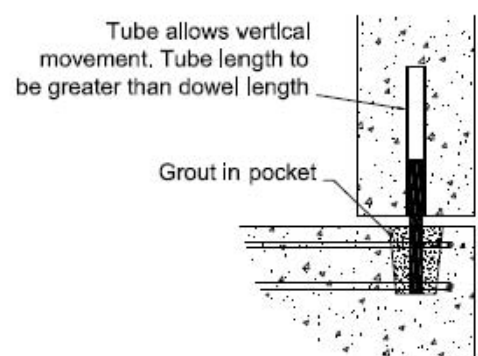


One of the most important factors to consider when detailing dowels is tolerance and movement. Tolerance is generally allowed for by allowing an oversize hole/pocket on one or both sides of the joint. This then allows adequate tolerance, and the space is filled with suitable grout after erection to provide a rigid fixing. Dowels should never be detailed into a socket or a close tolerance tube on both sides of the joint since this allows no tolerance. If the final appearance is not critical, dowels may be dropped into position from above without the need for a socket, and then fully grouted.



From a practical point of view, it is best to have the socket/tube on the upper end of a vertical dowel, and the oversize hole at the lower end. A typical example of this is where the socket is in a precast unit, and the pocket is in the supporting (usually insitu) concrete. Having it this way round means that grout can be 'poured' into the pocket where it will stay under gravity whilst setting. It is important that suitable reinforcement is placed around any sockets and pockets to prevent burst-out. Dowels in sockets cannot be used in cases where the unit is positioned by moving sideways. In these cases, a tube may be used as shown below. The dowel is held in place using tape, and then allowed to drop into the pocket once in place.

In some cases, allowance must be made for thermal movement in one or more directions across the joint. For example if units are 'hung' from above, then vertical movement can take place at the lower end. Similarly if the ends of a long unit are doweled in to a floor slab, horizontal movement may take place. Although such movements may be small in magnitude, the forces causing them can cause considerable damage if not allowed for. For vertical movement, a suitable solution is to use a tube instead of a socket at the upper end. This tube is slightly oversize, allowing the dowel to slide freely along its axis, but not across it. For horizontal movement, there are proprietary sleeves available.



When a dowel detail is incorporated into a corbel it is essential that appropriate reinforcement is provided to prevent 'burst-out'. Similarly, if dowels are to be used with insitu concrete, care must be taken that this is reinforced correctly. Edge distances can be critical, and it is vital to have close working between the designer of the precast and the designer of the insitu with regards to the position and magnitude of the loads.