

Treatment of Shuttering

For work where the concrete is not to be plastered all shuttering coming in contact with the concrete should be well oiled or greased to allow easy stripping and to prevent the concrete adhering to and coming away with the wood. If the concrete is to be plastered, the plaster will adhere better if the surface is roughened; alternatively, a retarding liquid may be used on the shuttering. Special non-staining oil can be obtained for this purpose, though soft soap and water are quite satisfactory.

Loads

The load to be carried by shuttering is the weight of the wet concrete, the shutters themselves, and a live load which allows for impact, wheeling over the shutters, etc., and is therefore a construction load. The weight of the shutters can be neglected, as it is small compared with the other loads.

In casting reinforced slabs such as flat roofs, floors above ground, or beams, calculations of loading on the shuttering may be simplified by taking the weight of concrete as 144lb. per cubic foot. It is then necessary only to multiply the thickness of the floor by 12 to get the weight per square foot, or to multiply the depth of a beam by its width to get the weight per lineal foot. For example, a 5in. slab will weigh 60lb. per square foot, and a beam 10in. wide by 18in. deep will weigh 180lb. per lineal foot. Incline slabs such as may be required as an approach to an elevated floor will cause an overturning movement at the top of the posts supporting the shuttering, and this must be countered by adequate bracing.

The construction live load is generally taken at 75lb. per square foot, and will exist only during concreting and then for short periods. The piling of material on freshly-poured concrete is dangerous as the shuttering may not have been designed to take the added load. If it is known beforehand that material must be placed on the concrete the day after it is poured, the shutters should be made extra stiff to carry the extra loading with only slight deflection.

Pressure

The horizontal pressure exerted in vertical sections through the hydrostatic head of wet concrete is the pressure which causes most of the bulging and collapse of shutters. The pressure on the shuttering will depend on the rate of filling and the temperature. The faster the shutters are filled and the lower the temperature the greater will be the pressure, because the concrete does not set as quickly and thus relieve the pressure. If a wall were poured so slowly that each layer set before the next layer was poured, by the time the shuttering was full the pressure at the bottom would be no greater than at the top. This is the principle employed with sectional shuttering, which is raised at about the same rate as the concrete sets, so that each layer supports the layer above.

As the outward pressure depends mainly on the rate of pouring, column sides will be under greater pressure than wall sides, because they fill faster. Vertical sections should always

STAGES IN ERECTING SHUTTERING

