

Compaction of concrete



**ASSIGN
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Consolidation of plastic concrete is termed as compaction. In the process of compaction, efforts are only directed to reduce the voids in the compacted concrete. Compaction of concrete can be done either manually or mechanically. When it is done manually it is called hand compaction or tamping, and in second case it is termed as machine compaction.

Hand compaction:

Hand compaction is done with the help of steel tamping rods, or timber screeds. Marrow and deep members are compacted with tamping rods. Thin slabs and floors are tamped with the help of screeds. Compaction should be done in layers of 30 cm for mass concrete and 15 cm for reinforced concrete. Compaction should be carried out for such a time that a layer of mortar starts appearing at the compacted surface. Excessive compaction and under compaction both are harmful for concrete. Due to excessive compaction, C. A. particles sink to the bottom and cement and F. A. mortar appears at the top. This makes concrete structure heterogeneous, and hence affects strength. This method of curing is adopted in the case of precast members. It has been noticed that by keeping the wet conditions, if temperature is increased, the rate of increase of strength also increases. This enables concrete to acquire its full strength within short period and hence, curing is also finished within short period.

Machine compaction:

Machine or mechanical compaction of concrete is done with the help of vibrators. Vibrators produce vibrations which when transmitted to plastic concrete make it to flow and affect compaction. The air bubbles are forced out of concrete due to vibrations. Over vibration should not be allowed,

otherwise C. A. particles will concentrate at the lower layers and mortar will come to the surface. There are three types of vibrators in most common use:

- Internal vibrator: This vibrator is also known as immersion, poker, or needle vibrator. It consists of a power unit and a long flexible tube at the end of which a vibrating head is attached. This vibrator develops about 7000 vibrations per minute. Wherever, compaction is to be done, the vibrating head is inserted in the concrete. This vibrator is very useful for compaction of mass concrete.
- Form vibrator: This vibrator is clamped to the form-work and imparts vibrations to the concrete through form-work. This vibrator is used only if the use of internal vibrator is not practicable as in the case of thin and congested situations. It is also called external vibrator.
- Surface vibrator: It is also named as screed or pan vibrator. It is clamped to the screed, it imparts vibration to the concrete from the surface when screeding operation of the concrete is carried out. It is effective only for depths of about 20 cm and hence useful for thin horizontal surface such as pavements.