Compaction of Concrete

Structural Guide

Why Vibration of Concrete Required

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To reduce the air contained in the concrete. Generally, **5%-8%** of voids from total volume contains in the concrete mix. With the vibration, it reduces significantly.

To consolidate concrete adequately.

To avoid segregation

To avoid bleeding

Concrete Vibration Methods

- Form Vibration
- Surface Vibration
- Internal Vibration
- Rebar Vibration
- Concrete Vibrating Table

Form Vibration

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Vibration of formwork will be done

Mostly used when other methods are not applicable

Vibrator fixed into the formwork

Make sure the adequacy

Precast element concreting

Tunnel Concreting

In large concreting work

Surface Vibration

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- Vibrating will be done through the concrete surface
- Not applicable for thick concrete 150-250mm
- Limited depth can only vibrate
- Adequate density or hardness is required to vibrate

Internal Vibration

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The most popular method used in construction

It is a simple method and easy to handle

Call as porker vibrator

Rebar Shaker

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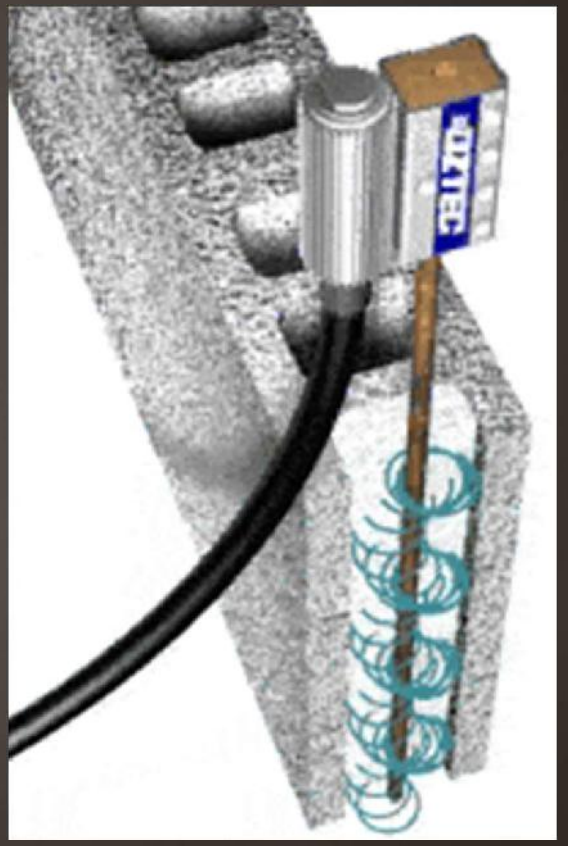
- Used in special occasions
- Use when other methods are not applicable
- Vibration of rebar will be done
- Can not be used for large pours



Concrete Vibrating Table

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Used to vibrate the concrete

Suitable for small concrete

Used in precast construction

Best Practices

The concrete could be vibrated about 10s-15s. The skill of the operator is very important.

Overlap the previous circle with the new circle every time. In addition, the layers shall also vibrate manner that they are overlapped. The porker vibrator shall at least be inserted 150mm into the previous layer.

Vibration could be stopped when the entrapped air no longer escaped and the surface is leveled.

Puling out the porker vibrator could be done not more than 75mm per second. The ideal speed of pulling out the porker vibrator is 25mm per second.

The vibrator shall not be used to move the concrete to the correct place.

Improper Vibration Issues

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Having entrapped air in the concrete increase the voids. It reduced the density of the concrete. It increases the porosity of the concrete.

As a result, concrete permeability increases. It could affect the durability of concrete. In addition, it could lead to the corrosion of reinforcement.

Further, high porous concrete could be carbonated, and as a result reinforcement corrosion could be an issue.

Higher voids in the concrete make lesser the strength of the concrete.

Formation of the Honeycombs especially in areas with reinforcement conjectures

Sand streaking caused by the heavy bleeding and mortar loss

The appearance of Placement Lines

Cold Joints in the concrete

Subsidence Cracking

Thank you

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