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Methods Used for Reinforce and Repairing Concrete Structure

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DESCRIPTION

Structural strengthening is the process of improving the performance of structures under their current loads or the strength of structural components to carry additional loads. They include steel plates, ferro cement, sprayed concrete, fiber reinforced polymer, and ferro cement. When a building is already in place but starts to deteriorate or alterations are needed because the form isn't functioning as intended, concrete strengthening is the best method to remedy issues for long-term benefits [1]. Reinforced concrete is what results when a steel reinforcement, frequently a form of steel bar, is used to increase the strength of the construction.

External bonding and wrapping steel technology

The technique of strengthening bonded steel has a fairly simple base. A layer of steel plate surrounds the reinforced concrete construction, and the external steel plate multiplies the force to increase the component's bearing capacity. In the specific operating style, bonding procedures like anchor bolts and perfusion structural bonding steel glue can be used.

Replacement concrete strengthening technology

The term "replacement concrete strengthening technology" primarily refers to the process of replacing weaker and less durable concrete in a structure with stronger and more effective concrete. After dismantling the existing structure, pour the prepared concrete into it to successfully beat the replacement section, resulting in a reinforced concrete structure with increased strength [2]. Based on the current issues with concrete replacement construction, remedies must be developed in advance.

Concrete repair techniques

It is one of the most traditional materials and methods for reinforcing and repairing reinforced concrete structures. Repair and rehabilitation of damaged concrete structures frequently take place in a hostile climate like Mumbai, which has high levels of pollution, year-round humidity, excessive rainfall, and greater levels of chloride in the air. Structure deterioration is also brought on by ageing and continued use after the structure's intended life [3].

Acid etching, caulking, coating, traditional replacement plastic, dry pack, injection, jacketing, prepacked concrete, resurfacing thin, regular, bonded or unbounded, concreting, stitching, and stressing are among the repair methods covered.

Determine causes of concrete defects

In order to solve the issue, it is important to correctly identify the reasons of the error. The repaired structural member

would be more durable and have a longer service life without the need for maintenance if the damage's primary cause was completely removed or significantly reduced.

Structural defects because of design and detailing

In this situation, it is necessary to study the design carefully and double-check the team's proposed solutions. Following this, the techniques used to implement the fortification measures will be identical to those resulting from other faults [4].

Assess the extent of concrete damage

Understanding the severity of the damage and how it affects the structure's lifespan and usability depends on how much concrete has been damaged. An appropriate choice regarding whether to replace or repair the structural part can be made if the extent of concrete damage is determined. Taking preventative efforts to halt potential damage for the known cause of the problem also helps [5].

Tests for effectiveness of repair

Physical performance of a concrete repair must be evaluated along with other factors like whole-life costs, environmental impacts, and safety. Inadequate surface preparation, incorrect application techniques, incompatibility of the repair material with the original concrete, and other factors contribute to the failure of polymeric repair materials.

CONCLUSION

By way of a thorough examination of the common techniques used in the strengthening design of reinforced concrete structures. The effective application of reinforced concrete structure strengthening techniques can be ensured by techniques like section enlargement, expansion strengthening technology, replacement concrete strengthening technology, composite fiber material strengthening technology, To actually improve the stability of reinforced concrete structures, strengthening designers must use reasonable strengthening design schemes based on the shape characteristics of structural components and optimize the strengthening process.

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