

A REVIEW OF RECENT RESEARCH STUDYING THE FIRE PERFORMANCE OF FRP STRENGTHENING SYSTEMS FOR CONCRETE

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ABSTRACT

Strengthening deteriorating infrastructure with fiber reinforced polymer (FRP) materials is now proven technology. However, comparatively little is known about the fire performance of FRP materials and strengthening systems for concrete, and this remains a primary factor limiting the widespread application of FRPs in building applications. This article presents a review of results from an ongoing research program investigating the behavior in fire of FRP materials and FRP-strengthened concrete structural systems. Data from both materials testing and full-scale fire tests show that fire endurance of FRP strengthened concrete members can, under certain conditions, be as good as that of unstrengthened concrete members. Research results are synthesized to provide guidance for fire-safe design of FRP strengthened concrete systems. Overall, it is demonstrated that, while currently available FRP strengthening systems are sensitive to the effects of elevated temperatures, appropriately designed and protected FRP strengthened concrete members are able to achieve satisfactory fire endurance.

INVESTIGATION OF INTRINSIC CRACKS IN TROPICAL CONDITIONS

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ABSTRACT

Results of investigation on some concrete elements distressed due to cracks are presented in this paper. The cases considered are RCC elements where cracks were observed in relatively early age of the structure. From visual observation of their nature, the cracks were diagnosed as drying shrinkage cracks. The cases investigated are located in the composite monsoon climatic zone prevalent in tropical North and Central India. Through a theoretical analysis presented, early drying shrinkage has been further confirmed as the possible cause for the developments of the cracks. The thermal stresses due to diurnal temperature variations and incident solar radiation may have aggravated the cracks. Relatively thin sections when restrained and subjected to inadequate curing at early ages are likely to exhibit such cracks in tropical conditions. Thus, an appropriate curing method for adequate number of days, if adopted depending on section thickness and ambient condition, may prevent such cracks.

CONCRETE REPAIR - "COMPATIBILITY" DEMYSTIFIED

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ABSTRACT

Considerable progress in practice and knowledge of the different aspects of concrete repair technology has been achieved within the last twenty years. However, we are still facing instances of repair works on concrete structures and even their demolition because of gross deficiencies in their performance, only after a few years of being repaired.

Concrete repair is not a "band-aid" to a structure in trouble; it is a complex engineering task, presenting unique challenges that differ from those associated with new concrete construction.

The repair process must successfully integrate new materials with old materials, forming a composite system capable of enduring exposure to service loads, exterior and internal (inside the repaired structure) environments and time.

This paper is limited to addressing one critical aspect related to design of concrete repair for performance - compatibility in repair systems. The compatibility in concrete repair is a neglected area in practice.

The term "compatibility" has become very popular in numerous fields, as well as in concrete repair. Then why do we not normally address the compatibility issues as the primary factors of repaired structures' durability at the design stages, other than because it is not traditional to do so? The main reason is the lack of knowledge in this area, misleading guidance and confusion in definition of "compatibility" as it relates to concrete repair.

This paper makes an attempt to demystify the issue of compatibility and provides detailed analysis of properties and factors to consider in design for compatibility.

A better understanding and knowledge of the meaning of compatibility in concrete repair and factors affecting it will allow the repair professional "sift the grain from husk" to design and implement a lasting repair to existing structure in trouble.

DEVELOPING THE INSPECTION PROGRAMME FOR CONCRETE STRUCTURES - A HOLISTIC APPROACH

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ABSTRACT

Like any created element, a concrete structure has a life. This life is often shortened by the deteriorating effects of different parameters. Appropriate management of concrete structures not only ensures life against such degradation but also extends its life. One important task of concrete structure management during the service period is inspection. It is necessary to develop and implement inspection program in different stages of the life cycle of concrete structure for its continued safe functioning. This paper tries to highlight the basis of developing the inspection program, rather than going into the details of the inspection procedure.

CASE STUDIES

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RESTORATION OF A HERITAGE UNIVERSITY BUILDING - A CASE STUDY

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ABSTRACT

The paper presents the factors influencing the damages and repairing methodology adopted in the restoration work of a heritage university in India.

ARRESTING LEAKAGES ON THE INSIDE WALLS OF INSPECTION GALLERY (MURAN DAM) OF UPPER INDRAVATI HYDRO ELECTRIC PROJECT, ORISSA, INDIA - A CASE STUDY

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A B S T R A C T

Water is becoming a scarcity day by day. To add to this woe there is the problem of water leakage. Arresting this water leakages with Polyurethane (PU) Injection is quite successful and has become a proven technology. The present case study highlights the step by step approach in arresting water leakages with PU Injection system.

POINT OF VIEW

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CONSERVATION INTERVENTION AT MUMBAI CAVES:FROM 1899 TO PRESENT

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A B S T R A C T

The article hopes to bring to light the several preservation policies and techniques implemented and in use for the cave sites of Mumbai. The discussion begins with a brief historical background and culminates in listing out the current situation in place at these historic monuments.