

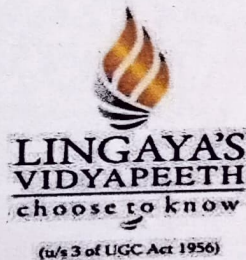
Major Crack Repairing in Pavement Quality Concrete

A Project Report Submitted
In Partial Fulfilment of the requirement
for the award of the degree of
Bachelor of Technology
In
Civil Engineering

By
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Under the Supervision of

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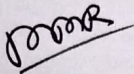
Department of Civil Engineering

Lingaya's Vidyapeeth
Faridabad (Haryana)
Session 2018-2022

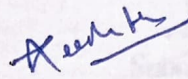
Certificate

This is to certify that the project report entitled “Major Crack Repairing in Pavement Quality Concrete” being submitted by **Hari Shankar Mahata (18CE55L)** for the partial fulfillment of the award of the degree of **BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING** by Lingaya’s Vidyapeeth, Faridabad is a record of a bonafide work carried out by them under my supervision during the year 2022.

The contents of this report have not been submitted to any other University or institute for award of any degree or diploma.



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ACKNOWLEDGMENTS

DECLARATION

I **Hari Shankar Mahata (18CE55L)** the student of Bachelor of Technology in Civil Engineering during session 2018-2022 at Lingaya's Vidyapeeth, Faridabad, Haryana, hereby declare that the work presented in this report entitled "**Major Crack Repairing in Pavement Quality Concrete**" is the outcome of our own bonafide work and is correct to the best of my knowledge and this work has been undertaken taking care of Engineering Ethics.

It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.


Submitted by:

Hari Shankar Mahata (18CE55L)

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ACKNOWLEDGMENTS

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It was a privilege to study under his supervision. His vision and broad knowledge played an important role in the project work. I also like to thank him for pushing me to the stage that I thought I could never accomplish.

Allow me to express my sincere gratitude to **Dr Maniraj M**, for his tremendous and selfless support in design of the project and time management skills while fabricating the product.

It is my great honor to have had the opportunity to work with these great minds and their remarkable characters. Their spirit of enthusiasm and commitment even in the times when we students found it hard to do is commendable.

Also, I appreciate the moral support of Susant Kumar Pattanaik during my project work.



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Abstract

Large scale construction of Bridges & Highways is going on in India and World over. They are mostly made as rigid pavements using Pavement Quality Concrete (PQC). On one hand, concrete is a very good and strong material, but it develops cracks due to temperature, shrinkage, creep etc. Until unless enough precautions are taken, some cracks do come up on concrete surface. Prominent cracks should be repaired for better performance and longer life of Highways/pavements. To repair these cracks, several materials and procedure have been developed. The efficiency of these materials and procedures depend on the type of crack, weather conditions and applicator efficiency.

Development of Surface Cracks in PQC due to temperature difference, late joint cutting, and defective curing of PQC etc. The cracks will allow water / mud /debris going into the cracks and widens them further. Shrinkage is another common reason for cracking. As concrete hardens and dries it shrinks. The chemical reaction, which causes concrete to go from the liquid or plastic state (or a solid state), requires water. This chemical reaction, or hydration, continues to occur for days and weeks after you pour the concrete.

Regardless of quality of pavement material and design, increase in the vehicular traffic and changing environmental conditions will reduce the service life of pavement which ultimately results in its failure. The causes and types of failure of pavements, particularly of rigid pavements should be understood in order to initiate proper repair and rehabilitation programme to increase their service life. The repair and restoration of rigid pavement depends on the type of distress. Cracking is the most common feature of the rigid pavement. Fatigue cracking is considered as the major cause for the failure of rigid pavements. The stress ratio between flexural tensile stress and modulus of rupture of concrete is the primary factor which decides the number of load repetitions to cause fatigue cracking. Pumping, faulting, spalling, shrinkage, polished aggregates, punch out, deterioration of joint load transfer system, linear cracking, durability cracking, corner break, alkali-aggregate reaction, pop-outs and blow-ups are some the other causes of failure of rigid pavements.

The rapid growth in rigid road construction brought about considerable expansion of road infrastructure, which subsequently fell into disrepair through lack of maintenance. The damage is often so severe that ordinary maintenance will no longer suffice, and if roads are to be fully restored, rehabilitation or even reconstruction work is necessary, at a lifecycle cost three to seven times higher than that of preventive maintenance strategies.

Here our main focus is going to be the Major Crack Repairing of PQC pavements.