Vidya Vikas Education Trust's
Universal College of Engineering
Near Bhajansons and Punyadham, Kaman Bhiwandi Road, Vasai, Palghar-401208.
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ACES
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THE BENCHMARK

Editor's Desk

We are pleased to present the March 2023 edition of Benchmark. In this edition, you will an article on the " CHENAB RAIL BRIDGE " and the contribution by Students and Faculty members of the Department of Civil Engineering highlighted in the month of February. News updates and departmental activities are part of Canvas.

Department Vision:

- To excel in every area of Civil Engineering, inculcate research oriented study to explore hidden talent.
- Providing Opportunity to display creativity, out of the box thinking & innovativeness, aimed at providing cutting edge technology for sustainable development.

Department Mission:

- Providing qualified, motivated faculties to deliver the content using updated teaching methodology, inviting industry experts from various areas to disseminate subject knowledge in Civil Engineering.
- Motivating students to undertake the Research Oriented studies, participate in competitions at all levels, grasping new techniques and methods which can be improved on further.
- Conducting and participating in seminars, workshops and training programs with a view to make the students industry ready and improve their employability factor for global career ahead.
- To create quality professionals capable of planning, designing and analytical skills for better infrastructural development in the field of Civil Engineering.

CHENAB RAIL BRIDGE

The Chenab Rail Bridge, also known as the Chenab Arch Bridge, is a magnificent engineering marvel that spans the Chenab River in the northern Indian state of Jammu and Kashmir. The bridge is part of the ambitious Jammu-Baramulla railway project, which aims to connect the Kashmir Valley to the rest of India by rail.

At a height of 359 meters (1,178 feet), the Chenab Rail Bridge is the highest railway bridge in the world. It is also one of the most challenging engineering projects ever undertaken, given the treacherous terrain, the seismic activity in the region, and the harsh weather conditions.

The exact cost of the construction of Chenab Rail Bridge is not publicly disclosed. However, it is estimated to be around Rs. 1,486 crore (approximately 201 million USD) as per reports from various sources. The construction of the bridge was a complex and challenging task that required the use of advanced technology and specialized equipment. Despite the high cost, the bridge is expected to bring significant economic benefits to the region by improving connectivity and facilitating the movement of goods and people.

The bridge, includes a 14-metre dual carriageway and a 1.2-metre-wide central verge, will have a design speed of around 100 kilometres per hour with a lifespan of 120 years.

The design and construction were awarded to Afcons Infrastructure, a part of the Shapoorji Pallonji Group, the third-largest construction group in India, with the help of IISc Bangalore. Later, the bridge was designed by consultants from Germany, Finland, and Switzerland and constructed by Indian engineers and workers. Major construction decisions were taken by Konkan Railway Corporation. The Defence Research and Development Organisation (DRDO) helped in the design of the bridge, making it blast-proof using special steel. It took over a decade to complete the project, with the final section of the bridge being installed in 2022. The bridge has a length of 1.3 kilometres (0.8 miles) and is supported by two massive concrete pylons that are anchored to the bedrock on either side of the river.

The bridge's arches are made of steel and are designed to withstand high winds, earthquakes, and even the impact of a 40-ton truck traveling at 100 km/h. The arches were prefabricated in sections and assembled on-site using cranes and other heavy equipment. The bridge has a double-deck design, with a railway track on the upper deck and a service road on the lower deck.

The Chenab Rail Bridge is not only a technical marvel but also an environmental triumph. The bridge was built with minimal disturbance to the local flora and fauna, and special care was taken to protect the fragile ecosystem of the Chenab River. The bridge's design also incorporates several measures to minimize its impact on the region's seismic activity, including flexible bearings and seismic isolation devices.

The completion of the Chenab Rail Bridge is a significant milestone for India's railway infrastructure, which has been a major focus of the government's development agenda. The bridge will not only connect the Kashmir Valley to the rest of India but also boost the region's economic growth by facilitating the movement of goods and people.

In conclusion, the Chenab Rail Bridge is a remarkable feat of engineering that showcases India's technical prowess and commitment to sustainable development. The bridge is a testament to the power of human ingenuity and a symbol of hope for the region's future.

- ***Rishabh Manish Yadav***
(T. E Civil)

To know more about Chenab Rail Bridge
Scan the QR OR Link Click Here

USE OF SELFING AND CROSSING THEORY FOR STRENGTH ALTERATION OF BLENDED MIX

INTRODUCTION

Selfing is a word credited to the blending of 2 different individual mixes of the similar mix type but of different r and t values into a single composite mass, which henceforth be called as the selfed mass, and the corresponding strength of which be termed as selfed strength.

Crossing, on the other hand, is the generalized version of selfing, where the two mixes in blending are of different types, and the corresponding terms are crossed mass and crossed strength. Selfing is a term credited to the blending (coming together) of 2 mixes, one being relatively old and the other being relatively fresh, of known strengths, each at their corresponding time lags, in certain proportion. If the two mixes in blending are of the same mix type, they are in Selfing, Otherwise, they are in Crossing.

The blending of two different mixes of the similar mix type but of different r and t values into a single composite mass which is called as selfed mass and the corresponding strength of which be termed as selfed strength. When the blending, of two mixes are of different types and the corresponding terms are crossed mass and crossed strength.

Absolute Setting -It is the blending of two partially set mixes of the similar mix type, at a certain blend ratio done at a certain time lag when each of the constituters fixes in turn is blended composite mix with certain identical blend ratio.

Problem Statement: Use of Selfing and Crossing Theory for Strength Alteration of Blended mix – If Concrete is not cast immediately after mixing, but is cast after some time is called as partially set concrete. As this concrete is cast after some duration there is loss of fresh as well as hardened properties of concrete viz. workability and strength. Therefore, to identify the blending ratio and time lag up to which concrete is workable and attains target strength. Blending of different mixes for achieving the economy in construction to avoid the wastage in construction material as the raw material is to be saved for proper environmental balance whose extraction has greater effect on environmental and ecology.

METHODOLOGY:

The investigation is carried on the behaviour of concrete when the delayed concrete is mixed with fresh concrete here, we used M20, M30, M20(old) + M20(new) and M20(old) + M30(new) strength variation by use of SBR Latex in proportion (1:1) in reference with (cement: bonding agent) as the bonding agent.

METHODOLOGY FLOW CHART OF WORK: The entire investigation and experimental work was carried out form identification of problems up to the result and discussion for problem. The following chart gives the detail work carried out with the sequence of the activities from starting to the end of investigation

CONCLUSIONS:

1. Strength of partially set concrete reduced with time lag towards end result.
2. The result of reduced compressive strength of partial set concrete can be overcome by blending with same grade or high grade of, i.e self it.
3. 10.60% increment in the strength improvement in selfing of old mix with fresh mix.
4. For crossing fresh M30 concrete with old mix it improves strength by 23% (Partial Set Concrete) & 13% increment in strength with respect to self-concrete.
5. Improvement in fresh properties of blended concrete i.e. compaction & workability with improvement in compressive strength of selfed and crossed concrete
6. Waste material like delayed concrete is by crossing in which target strength of concrete as per design is achieved by crossing with higher grade of concrete.
7. Concrete is to be attained upto delay of 180 minutes by blending with same or different grade of concrete.
8. Using bonding agent SBR latex should strength increment upto delay of 12hrs-16hrs.
9. Because of wedge action theory in comparison with other planes, out of the planes adopted for casting of interface layers, diagonal plane should maximum compressive strength of 26Mpa.
10. Target compressive strength can be obtained by using proper bonding agent in proportion with cement i.e., 1:1 (kg: liters).

By Assistant Prof. Sunil Malunjka

Industrial Visit: Morbe Dam

Monteria Resort is a well-known tourist destination located in Maharashtra, India. The resort provides an ideal location for college students to get away from the stress of their academic life and engage in fun and adventurous activities.

Day 1: The students arrived at Monteria Resort at 10 am. After check-in and breakfast, the college organized a cricket match between the TE and BE civil students. The match was highly competitive and was enjoyed by all the students. In the evening, a techno-fun activity called "Civilion Shark Tank" was played. In this activity, students pitched their ideas to a panel of judges acting as "sharks." The activity provided an opportunity for the students to showcase their creativity and entrepreneurship skills.

Day 2: The second day began with morning sports activities, including football, badminton, and tug-of-war. After the sports activities, all the students visited Morbe Dam, which is an earthen dam. The students enjoyed the scenic beauty of the place and clicked pictures. The information regarding the construction and maintenance of the dam was also of great interest to the students. In the evening, a DJ night was organized, and the students danced and had fun.

Day 3: On the final day, the college organized sports activities like Kho-Kho, chess and carrom. The students participated in these activities with great enthusiasm and enjoyed them thoroughly. After the activities, the college busses departed to return home, concluding the three-day trip.

Conclusion: The three-day visit to Monteria Resort was an enjoyable and memorable experience for the students. The activities and sports organized by the college provided the students with an opportunity to engage in team building, leadership, and adventure. The students returned to college rejuvenated and energized, ready to resume their academic journey with renewed vigor.

Third Year Civil Student

B.E Civil Student

News Bulletin

News / Education / IIT Mandi Placement (CE): Highest package, average CTC, top recruiting companies

IIT Mandi Placement (CE): Highest package, average CTC, top recruiting companies

Although it is comparatively new, IIT-Mandi has recorded an increase in the average salary for the Civil Engineering department -- from Rs 7.83 LPA in 2018 to Rs 11.43 LPA in 2022.

News / Technology / Science / Roman tomb reveals secrets of ancient concrete resilience

Premium

Roman tomb reveals secrets of ancient concrete resilience

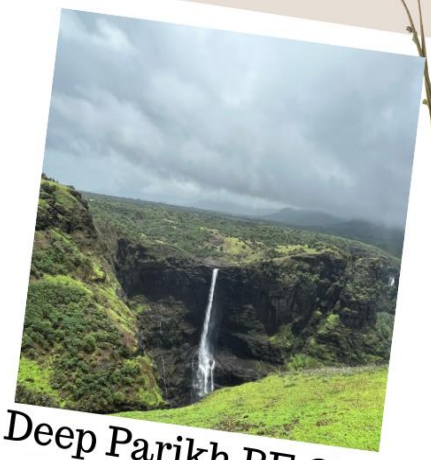
The reason behind the tomb's strength is that it was constructed from the deposits of the eruptions of the nearby Alban Hills volcano.

News / India / Larsen & Toubro Construction bags orders worth Rs 2,265 crore

Larsen & Toubro Construction bags orders worth Rs 2,265 crore

"The transportation infrastructure and water and effluent treatment businesses of L&T Construction have jointly bagged three EPC orders worth Rs 2,265 crore from Andhra Pradesh Capital Region Development Authority (APCRDA)," the engineering and construction major said in a BSE filing.

Dhanajay Dinesh BE Civil



Deep Parikh BE Civil

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Tulsi Nair BE Civil

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