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PROTOTYPE HYDRAULIC BRIDGE DESIGN

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ABSTRACT

Composite materials have emerged as a promising alternative to traditional bridge materials due to their corrosion resistance, durability, and high strength-to-weight ratio. A recent research study aimed to investigate the efficacy of composite materials in bridge construction and analyze how the bridge responds to various tests. In the study, composite materials formed the core of the bridge structure, providing essential support and enhancing overall durability. These materials were bound together using epoxy resin, which compressed them into a rectangular shape. To further enhance durability, plywood was also incorporated into the bridge design. To evaluate the performance of the composite prototype bridge, a loading capacity test was conducted. This test aimed to assess the bridge's ability to withstand static loading conditions. The results revealed that the bridge exhibited low deflection and distortion, indicating its high stiffness and rigidity. This demonstrated the effectiveness of composite materials in providing structural support. In addition to the loading capacity test, a series of shaking tests were

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performed to evaluate the earthquake resistance of the composite bridge prototype. These tests subjected the bridge to simulated seismic forces. Remarkably, the prototype bridge showed no significant signs of difficulty or severe damage following the shock or earthquake test. This suggests that the energy generated by the seismic forces was successfully absorbed and dissipated by the composite materials. Based on these findings, the researchers recommend conducting further tests to obtain more accurate results regarding the efficacy of composite materials in bridge construction. They also propose exploring alternative materials to replace other traditional bridge components. By continuously researching and experimenting with different materials, engineers can further optimize bridge designs, improve their performance, and ensure the safety and longevity of these critical infrastructure elements. The research study highlighted the potential of composite materials in bridge construction. The composite prototype bridge demonstrated excellent performance in terms of durability and earthquake resistance. These findings encourage further exploration and experimentation to harness the full benefits of composite materials and discover more efficient and sustainable alternatives for bridge construction.

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