

Title: Use of Fiber Reinforced Polymer (FRP) in New Construction and in Strengthening of Existing Structure.

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## **Introduction**

The construction industry is revolutionizing in two major ways. One way is the development of construction techniques, such as using automated tools in construction. The other is the advancement in high-performance construction materials, such as the introduction of high strength concrete. Among these high-performance materials is composites made from fiber reinforced polymer (FRP), which is gradually gaining acceptance from civil engineers. In recent years, research and development of fibers and matrix materials and fabrication process related to construction industry have grown rapidly. Their advantages over other conventional construction materials are their high tensile strength, light weight, ability to be molded into various shapes, and resistance to environmental conditions, etc. These properties make FRP a good alternative for innovative construction. Their application in construction includes both upgrading existing structures and building new ones, which can apply to various types of structure, for example, bridges, off-shore platforms, and buildings. However, there is one challenge in the design of FRP—there is no design code available, unlike in the case of concrete and steel structural design. The mechanical behaviors of FRP also vary depending on type of fiber, matrix, and interface used, and manufacture process. Therefore, engineer need to take special considerations when designing structures with this type of composite material.

## **Personal Interest**

Like other professionals, civil engineers need to be up-to-date in terms of technology. As research in FRP is advancing, there will soon be standardized design code. It is a good idea to prepare from now on for this growing technology. It is also interesting to study how it is currently used for strengthening and building structures as this is the basis of its future use. Because of its advantages, I think FRP will allow civil engineer to design more sophisticate, innovative and sustainable infrastructure that will benefit all of us. Although it will not replace the use of concrete or steel in construction, it will definitely be used along side steel and concrete as major engineering material in the near future.

## **Tentative Schedule**

Term project consists of two phases. The fist half will be dedicated to exploring the subject through the relevant literature, such as graduate theses. After having enough information on FRP development and its application, the second phase will be compiling this information into final report.