

## PROJECT BRIEF

## Seismic Retrofit of a Historic Masonry Load Bearing Structure in Lutyens' Delhi with the TYFO® Fibrwrap® Composite System


 New Delhi, India  
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This historic mansion of prime heritage importance is located in the famed Lutyens' area of New Delhi, that lies in the heart of the city; the area is home to the parliament buildings, the presidential palace and government ministries. There are also 112 historic mansions that serve as private and government residences. This sprawling one-storied mansion is a load bearing brick masonry structure with a typical brick jack-arch roof. The industrialist owner's requirement for this project was to structurally upgrade and architecturally revamp the entire structure while maintaining the heritage look and value of the mansion.

The project architects and structural consultants considered the structure's seismic performance to be critical as the building was an un-reinforced lime-mortar brick structure not originally designed for this purpose. With an objective of keeping the aesthetic lines of the structure intact internally and externally, seismic retrofit using traditional materials and techniques like section enlargement with concrete and steel plate bonding was considered unsuitable. After a careful review and proposal by FYFE India Pvt Ltd, the architect and consultants selected the TYFO® Fibrwrap® Composite System as a simple yet effective strengthening approach to fulfil the enhanced seismic resistance requirement of the structure. To impart ductility to the structure, the columns were encased with lightweight TYFO® SEH Composite, adding a total of only 1.3-2.4 mm to the existing profile, yet providing strength greater than steel. Walls were strengthened with the same composite to provide in-plane shear enhancement to unreinforced brick-masonry walls.

The successful use of the TYFO® Fibrwrap® Composite System in this project demonstrates the effectiveness in using engineered composites to seismically upgrade important heritage structures.

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