

Modern Approach to Structural Strengthening

Conmix has launched a system of structural strengthening with carbon and glass fibre.

Construction industry forms a vital component of any economy. Development of infrastructure like rails, roads, bridges, tunnels, dams, airports etc, commercial sectors like residential towers, recreational amenities, malls etc and industrial production units require huge financial investment and serious planning. With the evolution of the Green Building concept, it is evident that construction industry is reaching new levels of advancement in the global scenario.

In the current environmental scenario, concrete structures are exposed to many aggressive elements like industrial pollutants, harmful gases, chemicals etc and adverse weather conditions. Effects of these elements coupled with impact and abrasion, deteriorate the concrete structures. Demolishing the damaged structure and rebuilding is not only an expensive activity, but also a major waste of resources. Hence, concrete repair systems become inevitable to rehabilitate the damaged concrete structures so that their usable life span can be extended.

Sometimes, there is a change in the purpose of utilisation of the structure, resulting in change of loading pattern. This in turn necessitates change in designs wherein strengthening of existing columns, beams and slabs are needed. Conventional practice involves jacketing and fixing the steel plates to increase the





section of the element. Jacketing involves fixing of additional reinforcement, shuttering and pouring micro concrete. This is not only a tedious and time consuming method, but also results in reducing clear span or reduced carpet area. Steel plates are likely to corrode over a period of time. Also it is difficult to apply plasters and renders over steel plates. Both the above methods result in increased dead load over the existing structure.

To overcome these challenges, new system of strengthening structural elements with carbon and glass fibres has come into existence. Though carbon fibres were being used since decades in aircraft, electronics, automobiles, computers etc, its utilisation in construction industry is relatively new.

Conmix Construction Chemicals has made these techniques available through their products like **ReCon Wrap CF** (carbon fibre wrapping system), **ReCon Wrap GF** (glass fibre wrapping system) and **ReCon Plate CFL** (preformed carbon laminates).

ReCon Wrap CF along with thermoset resin (ReCon Wrap Saturant) can be used to improve the load bearing capacity of column through confinement by 100 per cent to 300 per cent. ReCon Plate CFL, popularly known as externally bonded FRP laminates can be used to increase the shear and flexural strength of beams.

ReCon Plate CFL consists of carbon plates of various sizes. Smaller sizes (width) can be used as NSM (near surface mounted) technique. In this technique, carbon plates or rods are inserted in grooves cut in concrete cover of the element. These are fixed with specially developed epoxy adhesive, ReCon Plate adhesive or **NanoGrout SG Paste**.

Structural strengthening with ReCon

Wrap CF and ReCon Plate CFL is fast gaining popularity due to its distinct advantages. These materials are corrosion resistant. They can be applied on elements with any shape and size. They can be applied with ease in areas that are difficult to access. Installation is very fast which reduces effective down time. They are applied in very minimal thickness (in millimetres) which results in very high load to thickness ratio. These materials do improve the load bearing capacity of the structural elements significantly without increasing the dead load on the structure. ReCon Plate CFL laminate acts as additional reinforcement, which helps in overcoming design deficiency. These materials can be plastered and painted over easily.

ReCon Wrap CF has been used on many critical projects in UAE and abroad for strengthening of basement columns of up to 40 storied, tall towers, G+2

structures, etc. ReCon Plate CFL has been used to stop the deflection of slabs and strengthening of beams.

Conmix Construction Chemicals division manufactures a comprehensive range of repair products, floorings, non-shrink grouts, waterproofing, sealants, curing compounds, admixtures, mould release agents, bonding agents, tile adhesives and tile grouts. The company follows a quality management system certified to **ISO 9001**, maintaining quality assurance in design, development, production, installation and service. Conmix products comply with all international standards and are used in more than 32 countries. Supported by modern and substantial manufacturing units, well equipped R&D facility, state of art laboratories, experienced qualified engineers, competent technical support department and proactive sales team, Conmix is an ideal partner for all construction needs. 

