METCON STEEL update

January-March 2018

Roofs That Last

Roofing shingles have been in use in the US and Europe for many decades now. Today they are becoming the preferred choice in Kerala too..Read More..

Ask the expert

1) Why does TMT steel of genuine brands sometimes break at the work site?
(Arushi Das, Mumbai)

The main reasons for breakage of TMT steel bars at the worksite are improper handling and bending. Fe 415 TMT steel bars have a soft inner core that makes them ductile and a hard outer layer that gives them tensile strength. Other grades such as Fe 500 and Fe 550 are manufactured by increasing the quenching time to make the hard outer layer thicker. But then the size of the soft inner core reduces, and the steel bar loses ductility. The loss of ductility renders them highly vulnerable to breakage when they are bent.

Extra care is needed while bending such grades of TMT steel. The bending should be gradual and slow, without jerks. The minimum bend diameters for different bar sizes have to be adhered to. All these can be achieved only by using bar bending machines. Bending with the aid of a plain pipe and workbench leads to the formation of cracks on both sides of the TMT bar and severely affects performance.

Re-bending of TMT rebars is inadvisable but maybe sometimes unavoidable. In such cases, the bars should be pre-heated and re-bent using suitable equipment by specialist reinforcement fabricators.

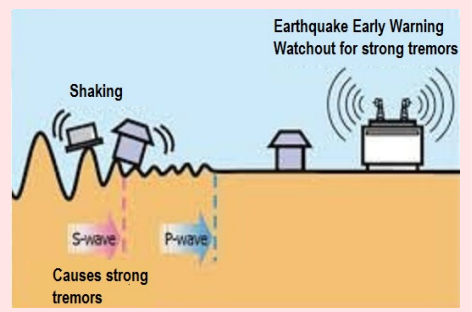
2) Could you elaborate on the bend and rebend test of TMT steel bars?
(Varghese Paul, Vellore Institute of Technology, Tamilnadu)

Bend test: Since reinforcing steel bars are of high strength, and the ribs on the bar surface act as stress concentrators, they may fracture on the bend if the bend radius is too tight. A bend test is used to determine the behaviour of a steel rebar when subjected to plastic deformation by applying a load until a 180 degree angle of bend is reached, and the sides of the rebar are parallel to each other. The test is usually carried out at room temperature. After testing, both the inner and outer surfaces at the bent portions of the rebar are examined for cracks or other defects.

Re-bend test : This test measures the effect of strain-ageing on steel. When steel is bent, it undergoes cold deformation and dislocations occur in its structure. As time passes, carbon and nitrogen atoms enter these dislocations and forms precipitates at temperatures of 80-250 degree Celsius. This process makes the steel harder and less ductile and is called strain-ageing.

In the re-bend test, a TMT rebar (the sample used for the bend test should not be reused) is bent through plastic deformation to an included angle of 135 degree, by applying a uniform, smooth load against a suitable mandrel. The bent rebar is aged by keeping it immersed in boiling water (100 degree Celsius) for 30 minutes and then allowed to cool. The cooled rebar is re-bent to have an included angle of 157.5 degree and inspected for defects.

Have a question about steel? Mail it to teammetcon@gmail.com and our experts will answer it through Steel Update



Early Earthquake Warning System

Researchers at IIT Roorkee develop an Early Earthquake Warning System to warn people to move to safety.. Read More..

Kerala takes steps to meet sand shortage

The Kerala government is taking serious steps to meet the acute shortage of sand and address the serious environmental implications of river sand mining. It has

India's largest floating solar plant setup in Wayanad

decided to permit import of sand to the state from countries such as Malaysia, Vietnam and Cambodia.

The state Mining and Geology department would issue permits to persons who wish to carry out sand imports. The Central government had earlier sanctioned import of sand through the Kochi port.

The state government is also planning to process the silt obtained during dredging at the ports, separate sand from the mixture and make it available for construction. Currently the dredged silt is being dumped in the sea. The government had earlier entered into a partnership with Rajadhani Minerals to collect river sand that has been deposited in the estuary at Ponnani. The sand so collected is washed to rid it of the salt content. The state government will fix the price of sand and take 35 per cent of the sale proceeds.

Kerala's total requirement of construction quality sand is estimated at 3 crore tonnes. Domestic supply of sand has been only able to meet a small part of this demand. Consequently the price of sand has increased sharply pushing the construction sector into a crisis.

The panels have been installed on 18 floating platforms, made of ferrocement floaters, that occupy 6,000 square metres of the water surface of the reservoir. A 11kV floating substation has also been set up on the reservoir. The panels will produce nearly 7.5 lakh units of power annually. Underwater cables will transfer the power produced at the plant.

The water level in the reservoir varies 21 m between the summer and monsoon seasons. The panels are mounted on special anchoring systems that take care of the variations in water level as well as high-speed wind conditions.

The plant is expected to produce more energy than grounded solar plants thanks to the cooling effect of water on the panels and the lower amount of dust that would accumulate on them.

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