

A study on earth quake resistant steel

M. B. Venkata Rao¹

¹ Visakhapatnam Steel Plant, Visakhapatnam

² National Institute of Technology, Warangal

Email: mbvr2008@gmail.com

N. Narasaiah², A.Syamsundar¹

¹Visakhapatnam Steel Plant, Visakhapatnam

² National Institute of Technology, Warangal

ABSTRACT

Geographical statistics of India show that almost 59% of the land is vulnerable to earthquakes. Large amount of seismic energy is released in the form of shock waves causing damages to property and human life. Generally, IS 1786, Fe500 grade of steel is used for earth quake resistance. Ultimate Tensile Strength (UTS) to Yield Strength (YS) ratio of Fe500 grade bar is 1.1. Bureau of Indian standard specifies that the minimum UTS to YS ratio of 1.25. Hence development of Earth Quake Resistance grade started. This grade is designed to allow sufficient deformation before fracture. A higher UTS/YS ratio >1.25 combined with better uniform elongation allows absorbing energy in the plastic range of material.

The problems of corrosion of reinforcing bars inside concrete is one of the most important phenomena that reduce the service life of a concrete structure, and it causes a huge load on the maintenance budget of the affected structure. Once initiated the corrosion products, it has higher volume than the parent metal, it will accumulate in the space between the rebar and concrete, and since there is insufficient space to accommodate these products, cracking and spalling of the concrete cover will occur. The corrosion product or rust have a volume of 3-6 times that of the original volume of steel. The accumulation of these corrosion products will eventually lead to the cracking and spalling of the concrete cover. The poor corrosion resistance of carbon steel and the consequences of using conventional reinforcements in structures that are expected to serve in harsh environments raised the need to use rebars made from materials that are more corrosion resistant.

Results obtained regarding strength and corrosion of the samples are discussed in the paper.

Keywords: Earth Quake, rebars, UTS, YS, Corrosion