Effect of wind load on different terrain categories

Abstract

Besides, food and clothing, shelter is a basic human need. India has been successful in meeting the food and clothing requirements of its vast population; however the problem of providing shelter of all is defying solutions. “While there has been an impressive growth in the total housing stock from 65 million in 1947 to 187.05 million in 2001, a large gap still exists between the demand and supply of housing units. The Working Group on Housing for the 9th five-year plan estimated the housing shortage in 2001 at 19.4 million units- 12.76 million in rural area and 6.64 million in urban area. The shortage of housing is acutely felt in urban areas –more so in the 35 Indian cities, which according to the 2001 census have a population of more than a million”.

Hence in order to overcome this problem construction process should be quick, tall and effective to accommodate huge population in a given area. So we have chosen this topic of “DESIGN AND CONSTRUCTION OF SHEAR WALLS”. This type of shear wall construction helps to build tall structure of about 20 floors within no time. Hence the construction process will become much quicker and efficient.

Constructions made of shear walls are high in strength ,they majorly resist the seismic force, wind forces and even can be build on soils of weak bases by adopting various ground improvement techniques. Not only the quickness in construction process but the strength parameters and effectiveness to bare horizontal loads is very high. Shear walls generally used in high earth quake prone areas, as they are highly efficient in taking the loads. Not only the earth quake loads but also winds loads which are quite high in some zones can be taken by these shear walls efficiently and effectively.

Though these types of constructions have their origin in western nations in early 90’s, this ideology has changed rapidly and spread all over the world with in no time. The form work used in this type of construction is of a new kind in Indian construction scenario.

Certain patented systems based on imported technologies such as “Mascon System” (Canada), “Mivan System” (Malaysia) have come on the Indian scene in recent years. In these systems traditional column and beam construction is eliminated and instead walls and slabs are cast in one operation at site by use of specially designed, easy to handle (with minimum labor and without use of any equipment) light weight pre-engineered aluminum forms. Rapid construction of multiple units of a repetitive type can be achieved with a sort of assembly line production by deployment of a few semi-skilled labors.

The entire operation essentially comprises fitting and erecting the portion of shuttering as already determined (the optimization in use is determined by appropriate planning) and then carrying out concreting of the walls and slabs. Props are so designed that they stay in position while de-shuttering of slabs and/or takes place. The dimensional accuracy of the formwork is of high order. Therefore any possibility of errors does not rise. Though this type of constructions are cost effective, still in order to build a better society and for satisfying present need of shelter , shear wall construction are going to be a solution to this problem of shelter in our nation.

The main idea of we taking this topic of “Design and construction of shear walls” challenging task in designing of shear walls. Shear walls have a peculiar behaviour towards various types of loads. Calculation of rigidity factor, reactions, shear center, shear force and bending moment is a topic of interest. Hence by adopting the technologies used in Cyber City, Rainbow Vista, Near IDPL road, Moosapet, to the college building of GRIET fourth block, we are going to check the building behavior.

As said by Benjamin Franklin “An investment in knowledge pays the best interest“. We would like to invest our knowledge to whatever extent we can and design the building most efficiently.