

A Review: Design, Estimation and Costing of the Super structure of Circular Water Tanks Considering Different Loadings and Soil Conditions

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Abstract— Today, water consumption is more increasing day to day due to increase population, and distribution of water is difficult task. Elevated water tank constructed for storing water for better convey in huge area. The paper describes, water tank constructed in same regions having different soil condition and columns. The cost of water tank can evaluate on basis of the soil condition, columns and different size of water tank and taking account of seismic and wind effect on the water tank evolved using by working stress method.

Key words: Water Tank, Cost, Design, Soil, Quantity

I. INTRODUCTION

In the rapidly expanding world today there is ever-increasing need to preserve and store water. This will be either fresh water pumped from well or the purified water coming out from treatment facility. Whichever is the source, the water must be stored and available for the man or industry whenever needed. There is an extreme need for large, efficient and economical storage facilities. Water is the elixir of life. Hence the importance of water retaining is obvious especially in the present scenario when water indeed is becoming a scarce commodity water tank generally storing water for daily requirement. It should be constructed crack free and imperviousness of water. Classification of water tanks on basis of their structure with respect to ground, resting on ground, elevated and underground. Water tank constructed in different shapes circular, rectangular, intze, spherical and funnel.

A. Objective:

To analysis of effect on quantity in components of elevated circular water tank under seismic, wind loading, different soil conditions, columns and different size. Design of circular water tank using ESR - GSR software according to guidelines IS Code 456: 2000, IS-3370-I, II, III, IV & IS 1343.

II. LITERATURE REVIEW

Many studies are available on performance evaluation of design of water tank ,cost optimization and effect of seismic and wind with different considerations. Seismic Retrofitting of R/C Shaft Support of Elevated Tanks

Suchita Hirde and Manoj Hedao (2011): This paper shows the investigation of seismic execution of the raised water tank for different seismic zones of India for different statures and limit of raised water tank for various soil condition. The impact of stature of water tank, quake zones and soil conditions on seismic tremor power has been displayed in this paper with the assistance of the investigation of 240 models of different parameters. The investigation is completed on r.c.c. roundabout raised water tank with M-20

evaluation of cement and Fe-415 graduate of steel and SMRF are considered for examination. Raised water tank having 50,000 liters limit with arranging tallness 12m. , 16m., 20m., 24m. , 28m. Considering 4m. Stature of every board are considered.

Al-Badri (2006) introduced the base cost structure of strengthened solid corbels dependent on ACI Code (2002). The cost capacity incorporated the material expenses of cement, formwork and steel support. He demonstrated that the base absolute expense of the corbel increments with the expansion of the shear range, and diminishes with the increment of the grinding factor for solid development.

Al-Badri (2005) introduced cost enhancement of strengthened solid roundabout grain storehouse dependent on the ACI Code (2002). He demonstrated that the base expense of the storehouse increments with expanding of the point of interior erosion between put away materials, the coefficient of rubbing between put away materials and concrete, and the quantity of segments sup-porting container.

Luis A. Godoy, (2005), finishes up that:→ the harm due to locking in slight walled short round and hollow over-the-ground tanks are talked about. Different wellsprings of clapping are considered, including wind, seismic tremor, bolster settlement and vacuum during discharging of the tank. The outcomes have been gotten utilizing the PC bundles ABAQUS and ALGOR.

M.K. Shrimali and R.S. Jangid (2003): Earthquake reaction of raised fluid stockpiling steel tanks segregated by the straight elastomeric bearing in the examined under the genuine tremor ground movement. Two kinds of detached tank moles are considered in which the heading are put at the base and top of the steel tower structure. The constant fluid mass of the tanks is displayed as lumped mass known as sloshing mass, indiscreet mass and inflexible mass. The comparing solidness steady connected with these lumped have been worked out contingent on the properties of the tank divider and fluid mass.

Rosman (1992): analyzed the effect of single lateral load at the top of staging, so That the cantilever shear force is constant along the height and cantilever bending moment varies linearly. He analyzed the effect of lateral load at all ring girders, so that cantilever shear force diagram is step like and the cantilever bending moment diagram is polygonal. He has applied technical flexure theory and obtained result. When analyze bending of the column, the author considers only shear force in the frame tangential planes.

George W. housner (1963): He said that if water tank is fully filled i.e. without free board than the sloshing effect of water is neglected, if the tank is empty then no sloshing as water is absent. In above two cases water tower behaves as one mass structure. But in third case i.e. water tank is

partially filled. The effect of sloshing must be considered. In that case the water tower will behave as two- mass structure. Finally the concluded that the tank fully filled is compared with the partially filled tank then it is seen that the maximum force to which the half – full tank is subjected may be significantly less than half the force to which the full tank is subjected. The actual forces may be as little as 1/3 of the force anticipated on the basis of a completely tank.

III. CONCLUSION

The various analyzed on water tank with different consideration. Every analyzation or method has its own specifies criteria to perform it. Many of software use for design of water tank but sepl esr – gsr software can also use for design and which is only used for design of water tank. To analysis of effect on quantity in components of elevated circular water tank under seismic, wind loading, different soil conditions, columns and different size. Circular tank designed using ESR - GSR software according to guidelines IS Code.

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