

A Review Paper On Analysis Of Water Tank By Using Staddpro.

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Abstract: The water is the most fundamental element to a life on the earth. It is a water which covers about 71.4% of the earth. It is the most important substance in the human body. The water is also important in the agricultural and industrial sectors. Water demand is one of the key issues in water supply planning. To overcome this issue, the present water tank designs have to be modified. Circular water tank is the most effective storing facility used. This paper is an application of optimization method to the structural Analysis and design of circular elevated water tanks, considering the total economy of the tank as an objective function with the properties of the tank that are tank capacity, water depth in circular, unit weight of water and tank floor slab thickness, as design variables. A computer program has been developed to solve numerical examples. The results shows that the tank capacity taken up the minimum economy of the water in circular tank.

Keywords: Economical design Circular Water Tank, Structural design, Problem, Stress, Staddpro.

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I. INTRODUCTION

Water tank is a canister for storing water and any other liquid. The main objectives in any design of water tank are to provide safe drinkable water after storing for long time, optimizing cost, strength. Design of circular tanks is simplest in nature. For same capacity, its construction requires less concrete than rectangular tanks, thus it is economical for large capacity storage. On account of circular shape, it can be made water tight easily are no sharp corners.

Vertical cylindrical tanks are not typically used for storage of water as compare to Horizontal cylindrical tanks are typically used for transport because their low-profile creates a low center of gravity helping to maintain balance for the transport vehicle, trailer or truck. By design a water tank or container should do no harm to the water. Water is affected to a Environmental health issue in negative, influences, including bacteria, viruses, algae, changes in pH, accumulation of minerals, and accumulated gas. Earthen pots, such as matki used in South Asia, can also be used for water storage. Water tanks are an efficient way to help developing countries to store clean water. The water tank is constructed to store water for daily used, treatment of water, emergency storage and rain water storage tank etc. so, it is very important structure in human society. Water tanks are classified into two types based on position and shape of the tank. on the location the water tanks are provided are :

1. Underground water tanks
2. Tank resting on grounds
3. Oberhead water tanks.

Also, the water tanks are classified in form of shape are:

1. Circular tanks
2. Rectangular tanks
3. Intze tanks
4. Circular tank with conical bottom
5. Square tanks

circular water tank because surface area is more as compare to other water tank. So, design of circular water tank is very complex structure which involves lots of mathematical calculation and time consuming but in Staddpro software gives all parameters which are useful for design in circular water tank.

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M.S.Mhetre,G.R.Patil 2015 (1), This paper study to understand the behaviour of different staging ,under different loading conditions and strengthening the convention type of staging,Eleven different types of bracing system are applied to evaluate circular water tank.

Staadpro is the popular software used in structural engineering for 3D model.They are used in static analysis of bridges, containment structure ,embedded structure, aluminium or timber building ,and transmission towers.The knowledge of base shear and nodal displacement calculate of circular water tank understand using software they give accurate values compare to manual method.

Prof.Patel Nikunjir September 2016(2),In this paper study the analysis and design of circular water tank using staadpro. The design of circular water tank using software in limit state method for calculating dead load,sub weight hydrostatic load due to water in tank.The important role play in hydrodynamic pressure on tanks under earthquake in the design of water tank .Circular water tank required less construction materials than the rectangular water tank and it is larger storage capacity of water in tank but it is not easy to place at construction site.Analysis in paper to calculate frequency,time history,of water tank using software ,also maximum stresses has to calculate with the bending moment of the area of the steel.

Angeliki A. Zanni,Michael S.Spyridis 24 September 2020(3),This paper study seismic analysis of water tower of cylindrical or square tanks with concentric opening using detailed FEM and approximate discrete model.The aim of the paper (a)a rigorous parameter study if flushing in cylindrical or square water tank with rigid walls.(b) The seismic analysis of a water tower taking consideration of the complete fluid structure-soil.High strength concrete and increase quantities if reinforcing steel are used.Structural framework in inclined column in bottom Portion of staging as well as bracing.

Circular water tank with the concentric manhole at the santa maria novella station are constructed.Rigidity of the tank can be taken in two ways (1)boundary condition(2)assuming a wall structure with an artificially high stiffness. Liquid content water tank in circular tanks with coaxial manhole has been using FEM models.

Mainak Ghosal January 2019(4),This paper study on overhead water tank for demand and supply of water in localities people in the region where there is scarcity of water those living on the upper floors in a multi-storied buildings .Most of the people suffer from lack of water due to insufficient supply, analysis of water tank in wind load,self weight and hydrostatic load due to water. So,water tank designed with the help of Staadpro.

Mohammad Azgar September 2017(5),This paper study storage of water tank can be made in the form of tank for drinking,washing purpose.Detail if design of water tank and how to calculate water quantity and distribution of water **Priyanka M.Mankar, H.R.Nikhade 2 July 2021(6)**, In this paper study analysis in practical application perform in situated Places like yavatmal, buldhana and ramtek. Analysis the common joint,base slab ,wall,bottom rings beam,gallery column and base beam joint and effect of Stress , hoop tension ,BM are consider for design of tank. The analysis of water tank calculation is taken from plain and reinforced and effect of continuity is Carried out in circular elevated reservoir.Also analysis seismic and wind load for safety purpose.

Nakul Gupta 2021(7),This paper study on comparison of tank are elevated with diverse, abilities , seismic zone and mostly focused sloshing effect occur in water during earthquake.The action will be produced when tank is empty, partially and fully filled by using staadpro software is discussed.The analysis of moment and base shear with different abilities and graph was showed between capacity and base moment in zone.

Ajmal Jokhi March 2019(8), This paper study analysis of reaction spectrum, seismic in water tank they comparison of Rectangular, Intze ,Circular water tank .The action will be produced when tank is empty,half filled,and complete filled in earthquake. It is used in RCC frame structure in seismic activity load is taken to used IS Code 1893:2002.They are study to hold natural disaster such as seismic activity, tropical storm and so on. In this construction of water tank grade of concrete M30 and Fe415 steel grade are used.

Chirag N.Patel May 2016(9),In this paper study analytical and software base method used for construction of ground concrete circular water tank.Analysis of water tank consider IS 3370 and Pca (Portland Cement association)and study of circular water tank in terms of hoop tension and moment in different levels.They both are study used one water tank to compare the results. The graph is showed for comparison between hoop tension and moment perform in water tank.

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