DESIGN AND ESTIMATION OF INTZE TANK

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Abstract- Because of enormous need by the general public, water has to be stored and supplied per their needs. Water demand isn't constant throughout the day. It fluctuates hour to hour. so as to provide constant amount of water, we need to store water. So to fulfill the general public water demand, storage tank have to be constructed. Storage reservoirs and overhead tanks are wont to store water, liquid petroleum, petroleum products and similar liquids. The force analysis of the reservoirs or tanks is about the identical regardless of the chemical nature of the merchandise. All tanks are designed as crack free structures to eliminate any leakage. This project gives in short, the idea behind the planning of liquid retaining structure (Elevated circular storage tank with domed roof and conical base) using working stress method. Elements are design in working stress method.

1. INTRODUCTION- A storage tank is employed to store water to tide over the daily requirement. within the construction of concrete structure for the storage of water and other liquids the imperviousness of concrete is most essential .The permeability of any uniform and thoroughly compacted concrete of given mix proportions is principally enthusiastic about water cement ratio .The increase in water cement ratio results in increase within the permeability .The decrease in water cement ratio will therefore be desirable to decrease the permeability, but greatly reduced water cement ratio may cause compaction difficulties and sway be harmful also. Design of liquid retaining structure must be based on the avoidance of cracking within the concrete having regard to its durability. Cracks is prevented by avoiding the utilization of thick timber shuttering which prevent the easy escape of warmth of hydration from the concrete mass the chance of cracking may be minimized by reducing the restraints on free expansion or contraction of the structure.

1.2 Objectives

1. to create a study about the analysis and style of water tanks.

2. to create a study about the rules for the design of liquid retaining Structure per is code.

3. to understand about the planning philosophy for the safe and economical design of storage tank.

 4. To develop programs for the planning of storage tank of flexible base and rigid base and therefore the under ground tank to avoid the tedious calculations.

5. In the end, the programs are validated with the results of manual calculation given in concrete Structure.

2. PRINCIPLES OF INTZE TANK - In water retaining structure a dense impermeable concrete is required therefore, proportion of fine and coarse aggregates to cement should be like to allow high quality concrete.

Design of liquid retaining structure is different from ordinary R.C.C. structures because it requires that concrete mustn't crack and hence tensile stresses in concrete should be within permissible limits. A concrete member of liquid retaining structure is intended on the standard principles ignoring tensile resistance of concrete in bending.

3. METHODOLOGY The various methods adopted for estimating future populations are given below. the actual method to be adopted for a selected case or for a selected city depends largely on the factors discussed within the methods, and the selection is left to the discretions and intelligence of the designer.

1. Incremental Increase Method

2. Decreasing Rate of Growth Method

3. Simple Graphical Method

4. Comparative Graphical Method

5. Ratio Method

6. Logistic Curve Method

7. Arithmetic Increase Method

8. Geometric Increase Method.

3.1 storage tank Classification: The classification of a reservoir is predicated on the situation on which it's to be built and also on the form of the reservoir supported the situation the water tanks are classified into three ways:

1. Underground water tanks

2. Tank resting on grounds

3. Elevated or overhead water tanks. Also, the water tanks are classified supported shape: a) Circular tanks b) Rectangular tanks c) Intze tanks d) Circular tank with conical bottom e) Spherical tanks.

4. CONCEPT OF INTZE storage tank In the cases of enormous diameter tanks a cost-effective alternative would be to cut back its diameter at its bottom by conical dome. Such a tank is understood as Intze tank and it's commonly used. The main advantage of such a tank is that the outward thrust from the highest of the conical part is resisted by the ring beam at the underside of cylindrical wall while the difference between the inward thrust from the underside of conical dome and therefore the outward thrust from the underside dome are resisted by ring beam at the underside of conical dome. The proportions of the conical dome and bottom dome are so arranged that the outward thrust from bottom dome balances the inward thrust because of the conical dome.

4.1 Structural components of INTZE water tanks:

1. Top spherical dome

2. Top ring beam

3. Circular side walls

4. Bottom ring beam

5. Conical dome

6. Bottom spherical dome

7. Bottom circular girder

8. Foundations

9. Tower with columns and braces

4.2 DOMES A dome could also be defined as a skinny shell generated by the revolution of an everyday curve about one in all its axes. The shape of the dome depends on the kind of the curve and therefore the direction of the axis of revolution. In spherical and conidial domes, surface is described by revolving an arc of a circle. The Centre of the circle may be on the axis of rotation (spherical dome) or outside the axis (conidial dome). Both types may or may not have asymmetrical lantern opening through the top. the sting of the shell around its base is usually supplied with edge member cast integrally with the shell. Domes are utilized in sort of structures, as in the roof of circular areas, in circular tanks, in hangers, exhibition halls, auditoriums, planetarium and bottom of tanks, bins and bunkers. Domes could also be constructed of masonry, steel, timber and ferroconcrete. However, reinforced domes are more common nowadays since they'll be constructed over large spans

membrane theory for analysis of shells of revolution will be developed neglecting effect of bending moment, twisting moment and shear and assuming that the masses are carried wholly by axial stresses. This however applies at points of shell which are removed far off from the discontinuous edge. At the sides, the results thus obtained maybe indicated but aren't accurate.

5. CONCLUSION Storage of water within the style of tanks for drinking and washing purposes, swimming pools for exercise and enjoyment, and sewage sedimentation tanks are gaining increasing importance within the present day life. For small capacities we select rectangular water tanks while for bigger capacities we offer circular water tanks. Design of cistern may be a very tedious method. Without power also we are able to consume water by gravitational force. Intze tank is made to minimize the project cost why because lower dome in this construction resists the horizontal thrust. This research paper is aiming at the installation scheme; design of Intze cistern & a general programmed estimation of concrete materials by excel programming. Here explore to only base and Top Dome stages of installation scheme has been done to judge quantity of concrete materials.

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