DESIGN AND ANALYSIS OF WATER TANK USING STAADP_PRO V8i

A

PROJECT REPORT

Submitted in partial fulfilment of the requirements for the award of the degree

of

BACHELOR OF TECHNOLOGY

IN

CIVIL ENGINEERING

Under the supervision

of

Dr. Rishi Rana

(Assistant Professor-SG)

by

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to

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY

WAKNAGHAT SOLAN-173234

HIMACHAL PRADESH INDIA

MAY,2022

STUDENT DECLEARATION

I hereby declare that the work presented in the Project report entitled **"DESIGN OF WATER TANK USING STAAD_PRO V8i"** submitted for partial fulfillment of the requirements for the degree of Bachelor of Technology in Civil Engineering at **Jaypee University of Information Technology, Waknaghat** is an authentic record of my work carried out under the supervision of **Dr. Rishi Rana**. This work has not been submitted elsewhere for the reward of any other degree/diploma. I am fully responsible for the contents of my project report.

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CERTIFICATE

This is to certify that the work which is being presented in the project report titled **"DESIGN OF WATER TANK USING STAAD_PRO V8i"** in partial fulfilment of the requirements for the award of the degree of Bachelor of Technology in Civil Engineering submitted to the Department of Civil Engineering, **Jaypee University of Information Technology, Waknaghat** is an authentic record of work carried out by **Ayush Thakur(181631) , Deepak Sharma(181623)** during a period from August to December, 2021 under the supervision of **Dr. Rishi Rana** Department of Civil Engineering, Jaypee University of Information Technology, Waknaghat. The above statement made is correct to the best of our knowledge.

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ABSTRACT

Due to the huge demand, water must be stored and supplied according to the needs of the people. Water consumption changes during the day. It varies from one hour to the next. To give a consistent volume of water, we need to store water. As a result, a water tank will need to be constructed to meet the public water demand.

A water tank is a structure used to hold water for the purposes of giving drinking water to people, cooling water to businesses, and irrigational water for agricultural crops in some locations. The shape and structural position of water tanks are used to classify them. We reviewed how to use Staad pro to create and analyse water tanks, both above and below ground, in rectangle, square, and circular shapes. The study's findings highlight the significance of shape element on design loads, as well as how tank shapes influence design, stress distribution, and overall cost.

Using STAAD PRO V8i, this project explains the idea behind the construction of a water tank (elevated intze water tank with domed roof).

Keywords: water tanks, structural design and analysis, loading applications, plates stress contouring’s.

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LIST OF SYMBOLS

A is the total area of the sect ion.

Ab = Helicoidal reinforcement equivalent area

Ac = Area equivalent of sect ion

Asc = longitudinal reinforcement area (comp.) Ast = Steel Surface Area (tensile.) ac stands for concrete area. Compressive force = C D stands for depth. d = depth effective dc = compressive steel cover e stands for eccentricity. Compressive steel (dc/d) factor of depth stress = f (in general) fck is the concrete's typical compressive stress.

Fy is the steel's typical tensile strength.

H stands for height.

I stands for moment of inertia.

L=length.

l = effective column length, length, or bond length.

M stands for moment of bending. m stands for modular ratio.

n is the neutral axis depth.

R equals radius.

s = spacing between bars Vu is the ultimate shear force caused by the design load.

Shear reinforcement carries Vus=shear.

W stands for weight.

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CHAPTER-1 INTRODUCTION

1.1 GENERAL

Water, liquid petroleum, and other liquids are stored in extra tanks and storage tanks. A tank is a liquid storage facility that can be found below or above ground level. Low-level tanks are designed to hold more water. The upper tanks are supported by a platform that also functions as a platform. These high water tanks are usually low-powered and meant to transport water directly through gravity. It's also important to make sure that essential services like water delivery are not disrupted during an earthquake and that they continue to function thereafter. In such conditions, high tanks can be a very important instrument for water delivery and fire defence.

Import-free concrete is critical for constructing a concrete structure to store water and other liquids. The water cement ratio determines the permeability of any homogenous and fully compacted concrete of a given mix ratio.

Water input increases as the amount of water and cement used increases. It may be beneficial to limit the amount of water cement to reduce access, but a very low level of water cement may produce difficulties and be dangerous..

To avoid encroachment, the combination should be done with a vibrator. To reduce cracks, a cement content of 330 kg/m to 530 kg/m is recommended.

The liquid storage structure should be built with the goal of minimising cracks while keeping in mind the concrete's high strength.

Avoiding the use of thick wood shuttering, which prevents the free departure of hydration heat from the concrete pile, can help prevent cracks. By eliminating impediments to free expansion or shortening the structure, cracking can be reduced.

1.2 Earthquake Design: Considerations and Introduction

An earthquake is a natural occurrence caused by the sudden release of energy deposited in the crust, which causes earthquakes to occur. Earthquakes can be caused on the ground by earthquakes or movement, and sometimes by tsunamis, resulting in death and property destruction. Any earthquake event, whether natural or man-made, is referred to as an earthquake. Seismic waves are produced by humans.

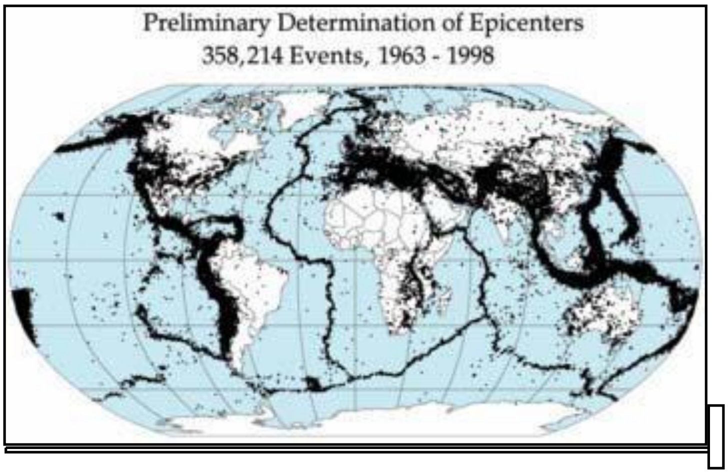

Fig 1.1 Determination of epicenters (source 14)

Different earthquake zones exist in India. India is divided into five zones, according to the IS 1893: 1984 Code. However, the IS 1893: 2002 Code divides the country into five zones: Zone 2, Zone 3, Zone 4, and Zone 5. The first location is no longer used.

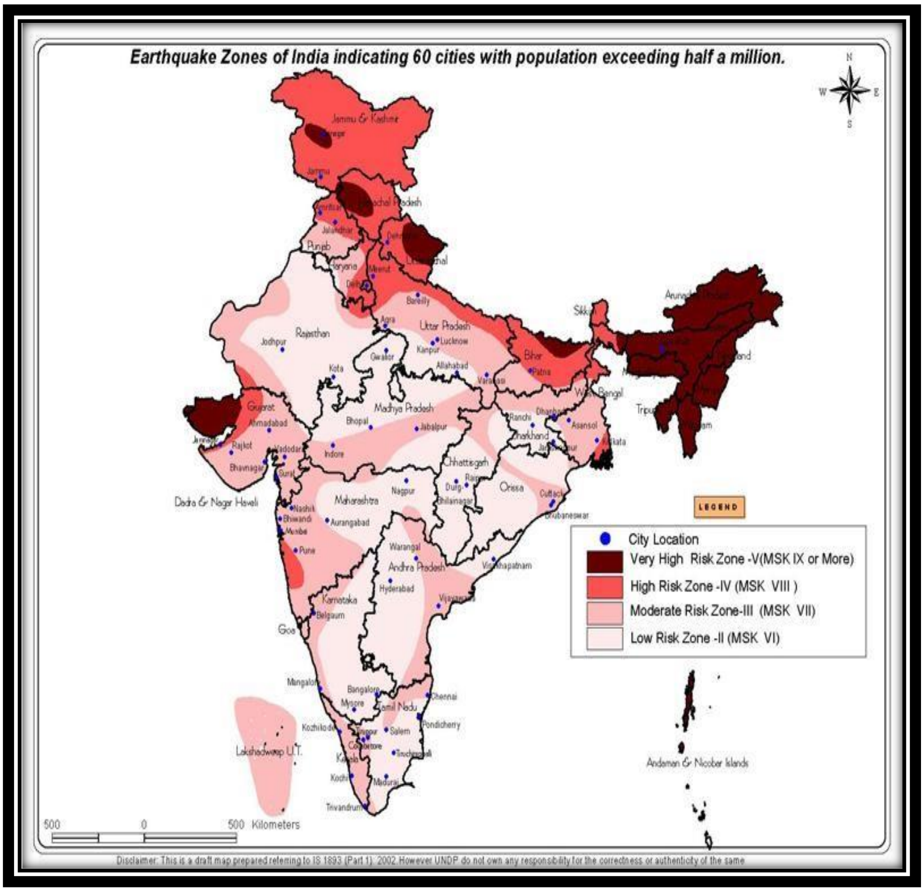

Fig 1.2.Different Earthquake Zones of India (source 14)

1.3 Need of The Study

The purpose of this project is to learn about the structure of high-water-storage tanks.

The top water tank is discussed in length in this function.

We want to use the STAAD Pro programme to construct a high-rise Intze water tank using the stress method and then read the results.

Fig 1.3 Under Ground Water Tank **Fig 1.4 Resting on Ground Tank**

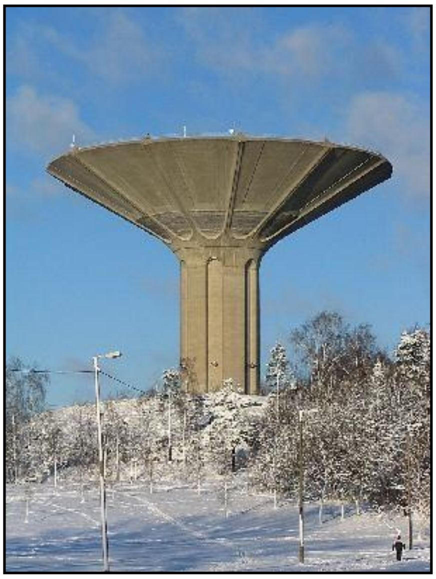

Fig 1.5 Elevated Water Tank **Fig 1.6 Conical Flask Water Tank**

CHAPTER-2 Literature Review

2.1 Introduction :

Tank construction has undergone extensive research in order to make them more efficient, cost-effective, and long-lasting. Some work is being done to see how different materials can be used by different people in different parts of the world. The basis for testing is the use of various materials and your size. As a result, that wise book review must suffice.

2.2 Literature Survey

2.2.1 Design of Intze Tank in Perspective of Revision of IS: 3370

By, Pavan S. Ekbote and Dr. Jagadish .G. Kori (2013):

During an earthquake, high water tanks can cause significant damage or collapse. This could be due to a lack of understanding of the behaviour and dynamic action of the water tank support system, as well as an inappropriate selection of tank stage geometric designs.
Due to the interaction of the liquid structure, the seismic behaviour of high water tanks is a feature of intricate occurrences. The main aim of the research was to determine how a support system (or platform) that works better under a different SAP 2000 software response system operates.

By, R.V.R.K.Prasad and Akshaya B.Kamdi (2012):

High water tanks are used to store water. BIS amended IS 3370 (parts 1 & 2) in 2009, some years after the initial 1965 edition. This new code was built with a fluid storage tank in mind. In this study, the boundary condition technique must be used in the construction of the water tank.. The idea behind the construction of a circular water tank using WSM and LSM is presented in this paper. Water tank design with LSM is very cost effective since the equipment required is little compared to WSM. Because the water tank is such an important container for holding water, the crack width of the water tank must also be calculated.

By, IITK-GSDMA (2014):

IS 1893: 1984 has a very limited stock of earthquake-resistant water tanks. These rules apply exclusively to high-water tanks; low-water tanks are not included. The impact of the sloshing vibration effect is not considered in IS 1893: 1984, even in high water tanks. Furthermore, the standards of IS 1893: 1984 have numerous limitations as compared to current international practise in seismic tank design. As a result, one discovers that India now lacks the appropriate level of design for earthquake-resistant water tanks. The existing recommendations are created to assist the designers of a water tank design project due to the lack of the Standard in the construction of an earthquake tank. These Guidelines are written in a format that is quite similar to the IS code, and the BIS may adopt it as IS 1893 in the future (Part 2). O. R. Jaiswal and colleagues (2006), The requirements of the 10 seismic codes on water tanks are reviewed and compared in this study article. This analysis demonstrates that the design of seismic stresses in various water tanks differs significantly between these codes. The reasons for this discrepancy are investigated thoroughly, and the importance of an integrated seismic design for liquid storage tanks is emphasised.

2.2.2 OPTIMUM DIAMETER OF TAPERED ELEVATED RC WATER TANK STAGING:

By, Chirag N. Patel, H. S. Patel (2015) :

IS 1893: 1984 has a very limited stock of earthquake-resistant water tanks. These rules apply exclusively to high-water tanks; low-water tanks are not included. The impact of the sloshing vibration effect is not considered in IS

1893: 1984, even in high water tanks. Moreover, the standards of IS 1893: 1984 have several limitations as compared to current international practise in seismic tank design. As a result, one finds that India now has the appropriate level of design for earthquake-resistant water tanks. The current guidelines are designed to assist the designers of a water tank design project due to the lack of the Standard in the construction of an earthquake tank. These Guidelines are written in a format that is quite similar to the IS code, and the BIS may adopt it as IS 1893 in the future (Part 2). O. R. Jaiswal and colleagues (2006), The regulations of the 10 seismic codes on water tanks are reviewed and contrasted in this study article. This analysis demonstrates that the design of seismic stresses in various water tanks differs significantly between these codes. The reasons for this discrepancy are investigated thoroughly, and the importance of an integrated seismic design for liquid storage tanks is emphasised. According to the 6 ° inclination, the stage size required to meet the 'No Differences in Column' criteria is 70% and 80% of the stage for the container container frame and shaft stage types, respectively.

2.2.3 FERROCEMENT FLOOR AND ROOF SYSTEM FOR BUILDINGS :

By, Dr. T.S. Thandavamoorty and S.Durairaj (2016) :

Pre-sprayed with 1: 2 cement mortar and cured for 7 days, a ferro cement floor panel with a clear angle of 900 mm X 600 mm was installed. After that, it was sorted into the loading frame and put through a series of tests until it failed. The last load supported by a panel was 85 kN. Two layers of chicken match were used to make the Test Machine Program. As previously stated, the model is composed of cement mortar 1: 2 and reinforcement mesh. The full sample was given a 7-day treatment. In the upload frame, the template was sorted. The weight is delivered upwardly, and the readings of each dial are recorded as the force increases. The load was raised until the panel gave out.

As a result, the most recent load measured 85 kN. This load is still distributed evenly throughout the panel, averaging 78.7 kN/m2. The minimum live load prescribed by IS 875 part 2 is only 2 kN/m2. It is reasonable, practicable, and feasible to contemplate this Ferro Cement panel

2.2.4 ANALYSIS OF SLOSHING IMPACT ON OVERHEAD LIQUID STORAGE STRUCTURES:

By: P. MUTHU VIJAY & AMAR PRAKASH (2017) :

The effects of breakdown in surplus liquid storage tanks are investigated in this paper. Because the building's bulk is concentrated on a small supporting structure, it is sensitive to horizontal pressures, such as earthquakes. The transformation of the Intzee-type water tank into dynamic forces was investigated using commercial software for both measurement and statistical analysis. The relevance of addressing the influence of the slip during design and determining the parameters of the seismic analysis design. A high-level Intzee water tank is analysed and constructed here. The study was carried out using STAAD Pro for two conditions: full tank position with solely hydrostatic effects and full tank position with sloshing impact. The analysis shows that in earthquake-prone areas, taking into account the influence of sloshing and the effect of hydrodynamic pressure on the tank container's wall during design is critical. The analyses' findings are addressed in light of the structure's value during an earthquake.

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2.2.5TRANSIENT ANALYSIS OF ELEVATED INTZEE WATER TANKFLUID- SOIL SYSTEM:

Housner (2013) Calculates the fast and evaporation fluid volume and its location above the base of the tank, as well as the convective weight of the spring, using a mild weightless model and enhanced statistics. For active construction, only one convective mass is usually considered.

Haroun and Housner (2014) developed a three-volume model that considers tank flexibility only.

Ibrahim et al. (2015) Introduced a comprehensive overview of sloshing flexibility, which includes both direct and non-linear analysis, with emphasis on cylindrical and rectangular thighs.

Karamanos et al. (2016) and Patkas and Karamanos (2017)
An improved mathematical model for calculating the effects of direct sloshing on the flexible response of horizontal and circular cylinder containers during earthquake regeneration has been developed..

Livaoglur. R. and Dogangun A. (2016) The seismic behaviour of the foundation of a foundation-propelled fluid-based tank construction with a structural framework that supports the liquid-containing tank was explored. Six different earthquake-related soil types were taken into account. The analysis included both the declining effects of fluid interactions and the soil composition of the high tanks lying on these six distinct soils.

Karamanos et al. (2016) Karamanos et al. (2016) developed a technique for the immersion analysis of immobile vessels in which seismic forces can be measured based on the "convective-impulsive" separation of a liquid vessel and a solution for the immersion analysis of immobile vessels in which seismic forces can be measured. The effects of the support structure's flexibility are also taken into account.

Livaoglu et al. (2017) They provide simplified earthquake analysis methods for high tanks that take into account the interaction of fluid, composition, and soil. Mechanical modelling approaches and a limited feature are used to analyse ten different models. The effectiveness of these 10 models in earthquake-proofing elevated tanks with four distinct subsoils is highlighted.

Sezen et al. (2018) A simple threemass model was used to do dynamic analysis. The activity of long-distance earthquake tanks damaged by the Kocaeli earthquake in Turkey in 1999 was investigated..

Dutta et al. (2019) The dynamic features of high RC tanks supported by a cylindrical shaft platform are deeply analyzed. A controlled trial test with limited testing validated the findings.

Amani et al. (2016) Using a water-based feature technique, study examined at resonant waves in a highly comparable RC-filled circular container and tested the results. The high-volume round tanks' horizontal base movement and free vibration, as well as their total flexibility, contain water at various levels. Consider how three distinct weight motions are necessary in a round tank: translation (structure), sloshing (vascular), and pipeline movement. As a result, in analysis, three degrees of freedom are required.

Muslim, M. et al. (2014) The seismic response of a liquid-filled tank was presented, as well as the difficulties of modelling conical-shaped tanks. De-fluid elements are used to model the fluid base. The proposed tank's history as well as its modal analysis.

Chaduvula, U. et al. (2017) A 1:4 scale model of a water cylinder metal cylinder was used in the experiment to increase the vibration angle (acceleration) and vibration motions of 0.1g and 0.2g. Rapid bases and base grow with increasing seismic acceleration, whereas convective base shear and base moment increase with increasing seismic acceleration but decrease with increasing angular force, according to the research. As a result, the movement observed owing to a shortage of water has a minor impact. The structure causes non-linearity since the tank pressure lowers as the tank moves.

CHAPTER-3 METHODOLOGIES

3.1Manual design

3.2 STAAD Pro design

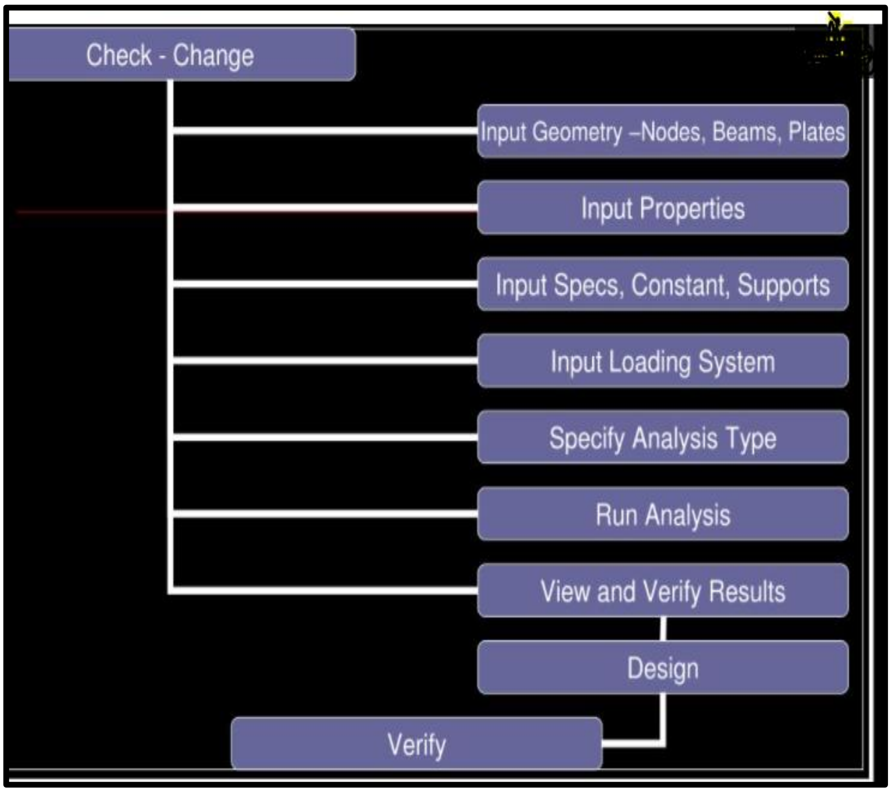

Fig 3.2 : Flow Chart of Steps Followed In Staad-Pro

3.1 Manually design of tank:

Design of an intz ee tank for a capacity of 675000 liters

Assuming height of tank floor above the G.L. is 24.67 m.

Safe bearing capacity of soil 200 kn/m2

Assuming M25 concrete

For which σ_{cbc} = 8.5 N/mm2, σ_{cc} = 6 N/mm2

Direct tension σt = 1.3 N/mm2

Tension in bending = 1.8 N/mm2

Modular ratio m = 13

For Steel stress,

Tensile stress in direct tension =115 N/mm2

Tensile stress in bending on liquid face =115 N/mm2 for t < 225 mm And 125 N/mm2 for > 225 mm.

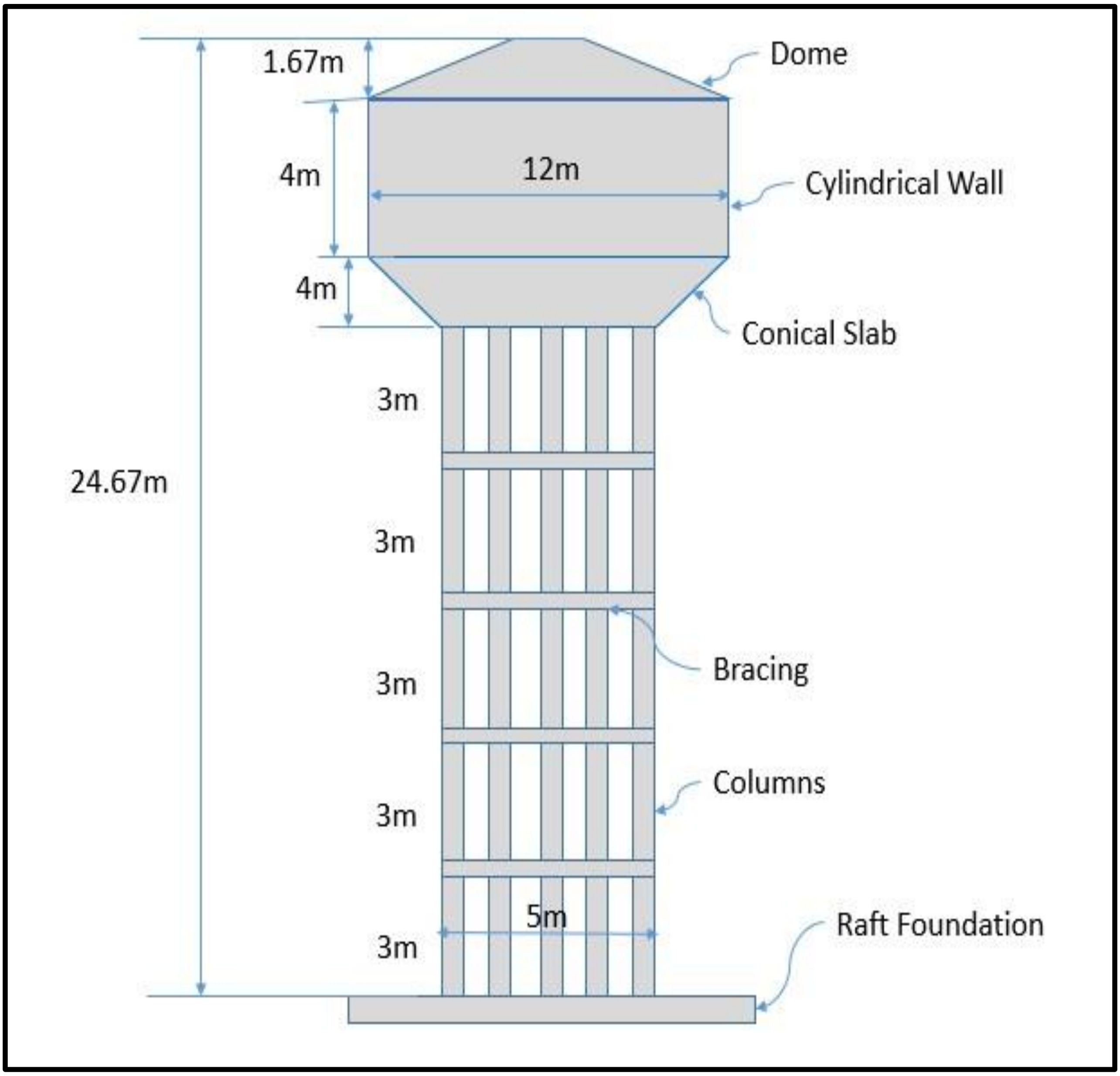

Fig 3.1 model of water tank

Solution :

For the percentage indicated in Fig. D = 12 m, the volume is 0.585 D3.

Figure 3 depicts the Tank's dimensions. 1.1 Roof Dome Design:

Assume a dome slab thickness of 100 mm = 0.1 m.

Dome self-weight = 0.1 x 1 x 24 = 2.4 kn/m2

1.5 kN/m2 live load = 0.10 kn/m2 Finishes

4 kn/m2 TOTAL LOAD

R= dome radius D= tank diameter = 12mr = central rise = 1.67 m

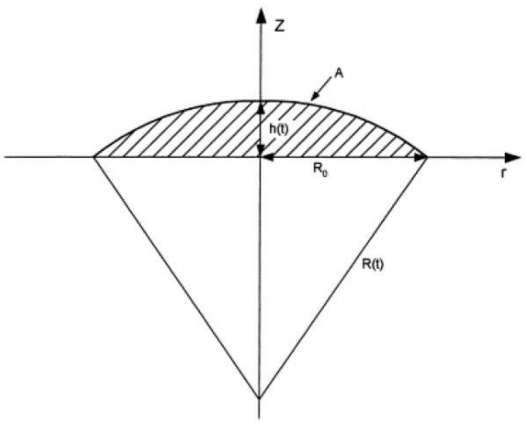

Fig 3.2 : central rise of roof dome

Rtop = 11.61 m Rtop = (R2+r2)/2r

51.8° Sin = 6/11.61

As a result, there is no strain.

T = (p x Rtop) / (1 + cos) Meridional thrust

25.102 kn/m T

Circumferential Forces = p x Rtop (cos - 1/ (1+cos)) = 15.14 kn/m

Circumferential Forces = p x Rtop (cos - 1/ (1+cos

(T x 1000) / (100 x 1000) = 0.25 N/mm2 6 N/mm2 Meridional stress SAFE

15.14 x 1000 / (100 x 1000) = 0.1514 N/mm2 6 N/mm2 Hoop Stress SAFE

The stress levels are within the acceptable range.

However, provide a minimum of 0.3 percent reinforcement in each direction.

Ast = 300 mm2 = (0.3 / 100) x 100 x 1000

Use an 8 mm bar.

50.2 mm2 = A = 3.14 x 82 / 4

Hoop bar spacing = 50.2 x 1000 / 300 = 167.33 mm

As a result, give an 8 mm bar at 167.33 mm c/c.

3.1.2 DESIGN OF CYLLINDRICAL TANK

The tank wall may be believed to be free on top and bottom because the dome roof was designed on membrane. Maximum hoop tension occurs at the base of the wall.

10 kn/m2 = W = weight of water

W x h x D / 2 = 10 x 4 x 12 / 2 = 240 kn per metre height

The needed ring area is 240000 / 150 = 1600 mm2 or 800 mm2 on both sides.

To resist hoop stress at a distance of 2 metres from the top

2 × 1600 / 4 = 800 mm2 ash

A = 78.5 mm2 when using a 10 mm bar

196.25 mm = 1000 78.5 / (800 / 2)

As a result, from top 0 to 2 m, supply 10 mm bar @ 196.25 mm c/c spacing

in both directions.

At 4 metres from the summit, resist the hoop tension

1600 mm2 = 4 x 1600 /4 =

A = 200 mm2 when using 16 mm bars

1000x200/ (1600/2) = 250 mm spacing of 16 mm bars

As a result, at 4 m from the top, give 16 mm bar @ 250 mm spacing.

Actual Ast = 2 x 1000 x 200 mm2 Actual Ast = 1600 mm2

3.1.3 DESIGN OF THE CONICAL DOME:

The average diameter of the conical dome is (12+5) / 2 = 8.5 metres,

and the average depth of the water is (4+4) / 2 = 4 metres.

The volume of water above the conical dome is equal to

3.14 x 8.5 x 4 x 4 x 10 = 4270.4 m3.

3.14 x 8x (2 x (12 – 5/2)2) Self/weight of 600 mm thick slab

6169.01 kg = 0.5 × 0.6 x 24

10439.41 kN total conical load

v2 = 10439.41 / (3.14 x 4) = 831.16 kn/m load / unit length

T = v2 x cosec = 1608.64 kn

Meridional thrust 1608.64 x 1000 / (600 x 1000) = 2.681 N/mm2 5 N/mm2

SAFE Meridional stress

Because hoop tension is directly proportional to the diameter of the conical dome section, the maximum hoop tension will be found at the top of the conical dome in this section.

P = 8.5 x 4 = 34 kn/m2 q = 600 x 24 / 1000 = 14.4 kn/m2 = 450 D = 12 m
Hoop tension = (p x cosec + q x cot) x D /2

As a result, hoop tension = 374.04 kn Whole oh, which steel must resist.

249.33 mm2 = As = 375000 / 150

Each face has a surface area of 2493.33/ 2 = 1246.66 mm2.Using 25 mm ϕ bars

A = 3.14 x $25^2/4$ = 490.62 mm^2

Spacing of bars = 1000 x 490.62 / 1246.6 = 393.54 mm

As a result, each face should have 25 mm bars at 393.54 mm c/con.

2 × 1000 x 490.62 /

393.54 = 2493.36 mm2 Actual Ast

0.20 X 600 / (100 x 1000) = 1200 mm2 Ast at bottom

Half of it should be placed near each face = 600 mm2.

A = 3.14 x 102 / 4 = 78.5 mm2 when using 10 mm bars

10 mm bar spacing = 1000 x 78.5 / 600 = 130.83 m

As a result, offer 10 mm bars at 130.83 mm c/c.

Maximum tensile stress = (374.04 x 1000 x 1000) / ((600 x 1000) + (13 x 2493.3)

= 0.0192 N/mm2 SAFE

3.1.4 DESIGN OF THE BOTTOM CIRCULAR RING:

Horizontal force on the ring beam = T1 cos = 831.16 x cos450 = 587.71 kn/m

4 x 587.71 / 2 = 1175.42 kn hoop compression in ring

Assume the ring is 500 x 1000 mm in size.

2.350 N/mm2 6 N/mm2 Hoop tension = (1175.42 x 1000) / (500 x 1000) SAFE

T1 sin = 415.57 kn/m vertical strain on ring

Self/beam ring weight = 0.5 x 1 x 24 = 12 kn/m

427.57 kn/m total load

W = 3.14 x 4 x 427.57 W = 5370.27 kn Total design load on ring girder =

W = 3.14 x 4 x 427.57

Now, circular girder is support on 18 no. of column using moment co efficient which is given in below

No. of support	Negative bending moment at support K_1	Positive bending moment at center of span K_2	Maximum twisting moment or torque K_3
18	0.0037	0.0014	0.0017

0.0037 x W x R = 49.67kn.m Maximum negative Bending Moment on Support

At mid-span, maximum positive B.M = 0.0014 x W x R = 18.79 kn.m

0.0017 x W x R = 22.82 kn.m maximum torsional moment

V =WR3.14/(4 x 2) = 5270.019 kn Self/weight at support section V

3.1.5 DESIGN OF STAGING PORTION OF THE WATER TANK:

The tank is supported by 18 columns that are arranged symmetrically over a rectangular size 2502 x 250 mm.

The staging is 15 metres above ground level.

Assume that the bracing height is 3 metres.

As a result, give 5 panels with a height of 3 metres

Load in column

5270.019 / 18 = 292.77 kn vertical load in each column

Each column's self/weight = 0.25 x 0.25 x 15 x 24 = 22.5 kn

0.25 x 0.25 x 5 x 3.14 x 24 = 23.55 kn bracing weight

388.82 kN total vertical load on each column

Reinforcement in column

Using 18 32 mm bars at 300 mm c/c, Ast= 18 x 3.14 x 322 / 4= 14469.12 mm2

Ac= 250 x 250 + (1.5 x 13 x 14469.12) = 344647.84 mm2

(2504 / 12) + 14469.12 x 13 x (250 – 50) = Moment of Inertia7.849 x 104 mm4 = 2

Now, the comparable MI for the entire section = 7.849 x 104 / 2= 3.92 x 104 mm4

3.2 Design in STAADPro:

Step 1: geometry design

Put all nodal and connect beam

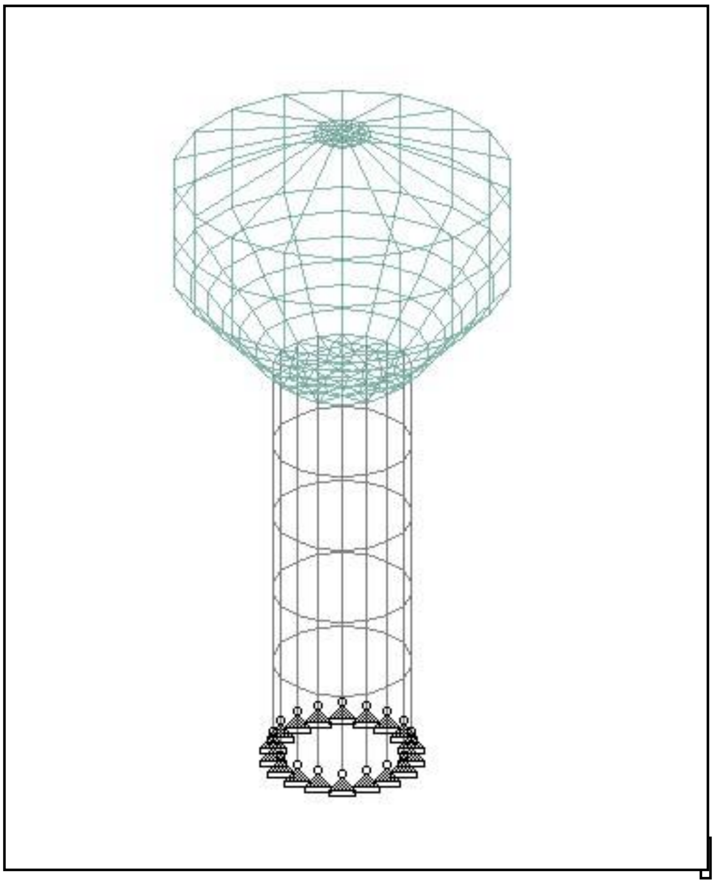

Fig 3.2.1 : Geometry Design

This is the structural image of awater tank without any load or support.

Step 2: Define an end property

In this step we have to define the end properties with prpers supports

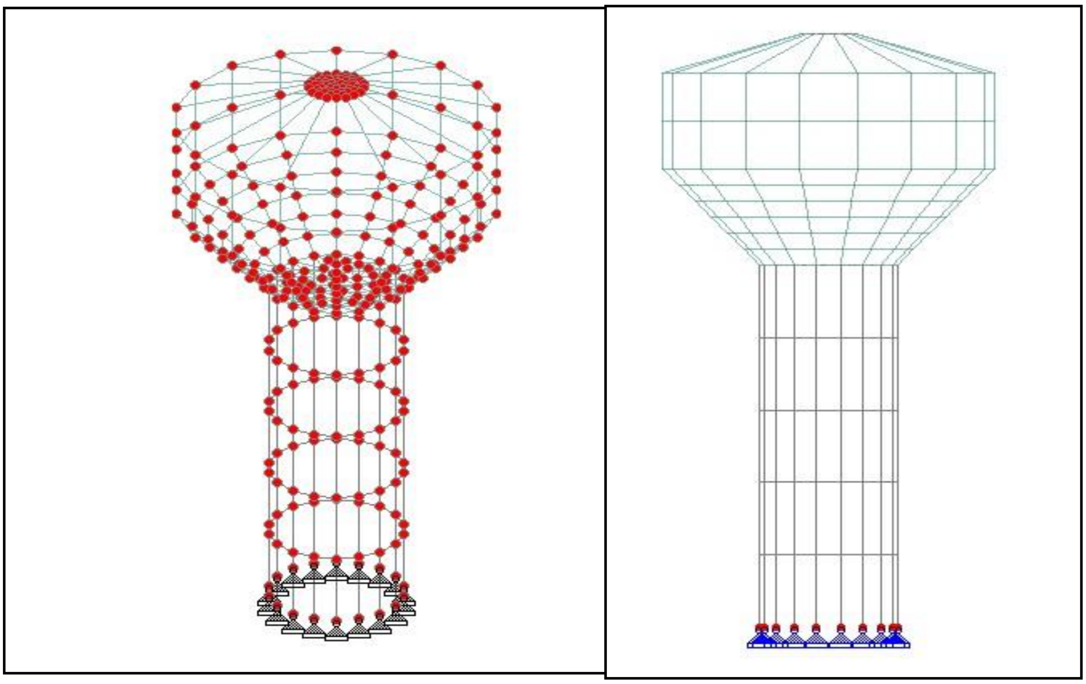

Fig 3.2.2 : End Properties

Step 3: material

Defining the material properties like young's Modulus ,shear Modulus, Critical damping etc .

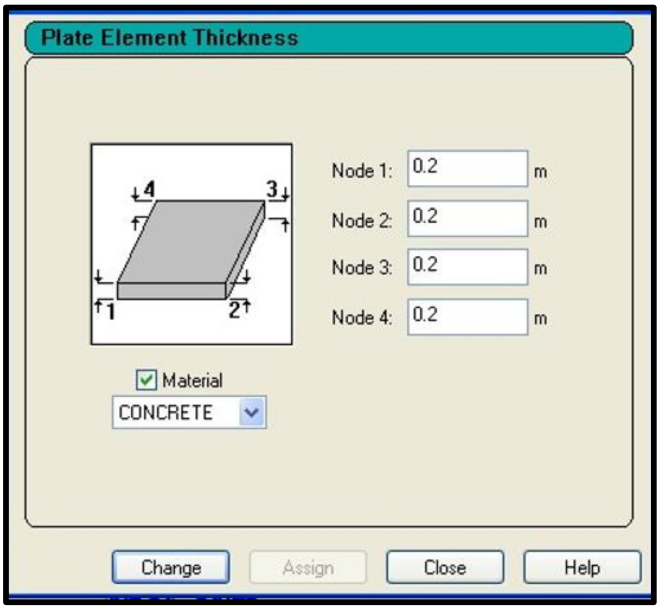

Fig 3.2.3 : Plate Element

Step 4: Defining the properties and select all the members

In this we have to define the properties like which one is the coloum which one is the beam and what type of loads are acting on that like Dead load, Live load, Wind load, Earthquake load, Self weight etc.

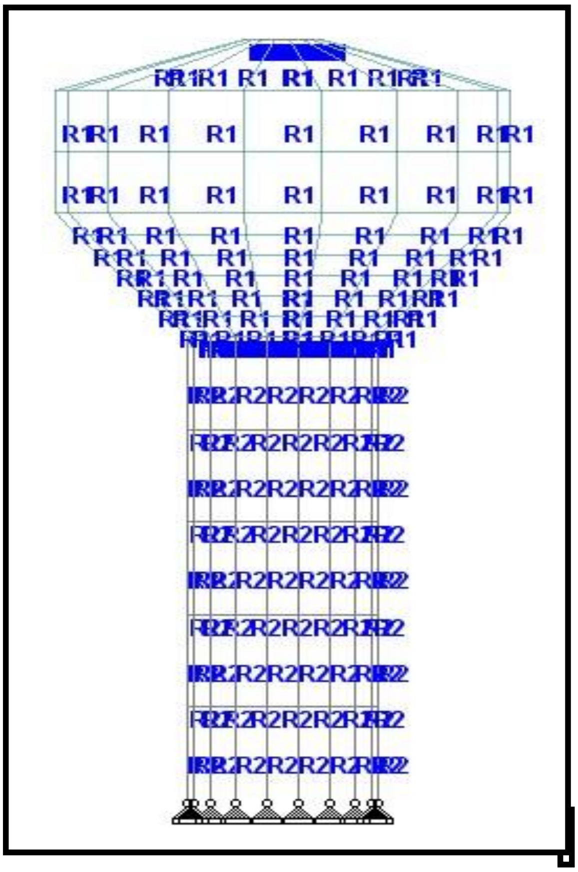

Fig 3.2.4 : Selected Members

Step 5: Combination and Loads

In this step we are going to assign the combinations and load

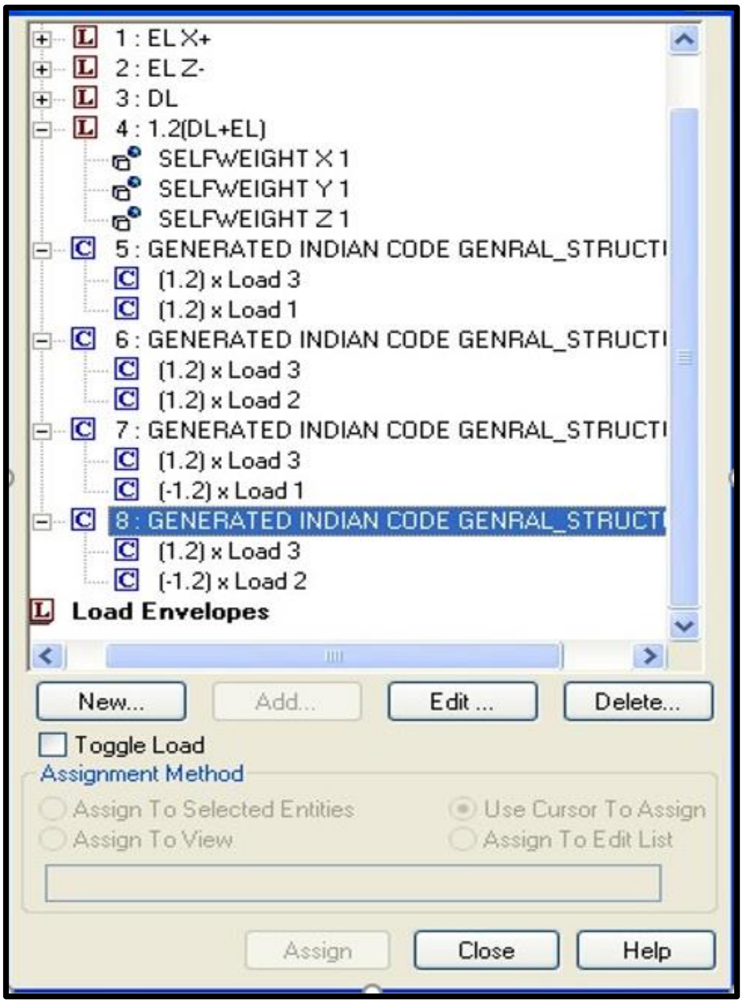

Fig 3.2.5 : Combination and Load

Step 6: Analysis and print

Add IS code and specificationIS 456

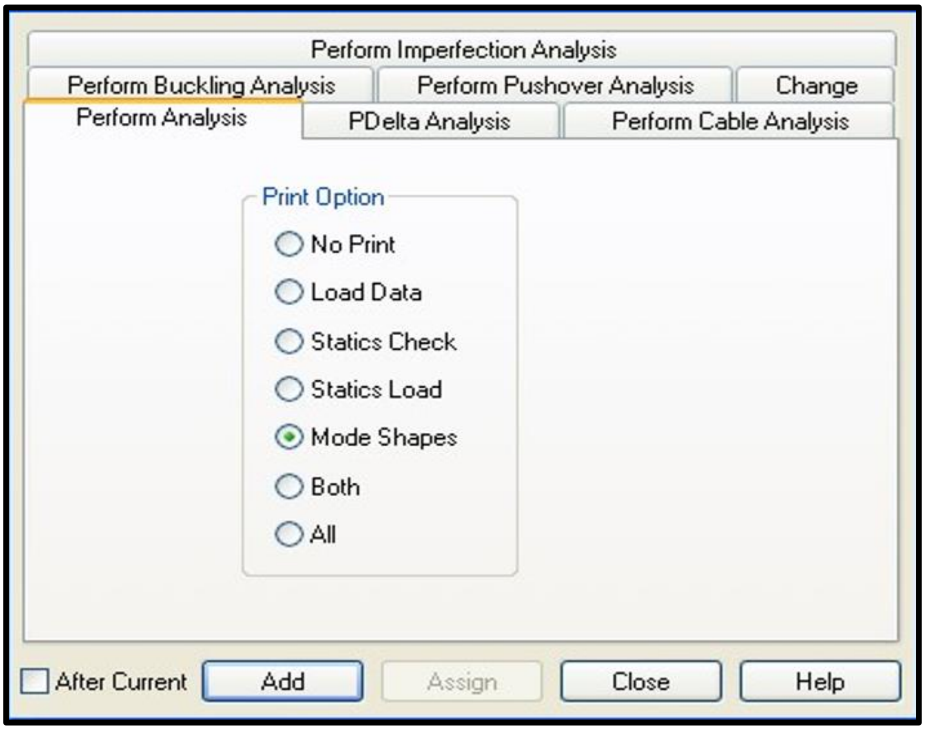

Fig 3.2.6 : Analysis and Print

Step 7: Run program

In this step we have to run the total program of analysis that analysis will give us the brief about the loads and the stresses how they effects the beams,column and the plates of the structure .

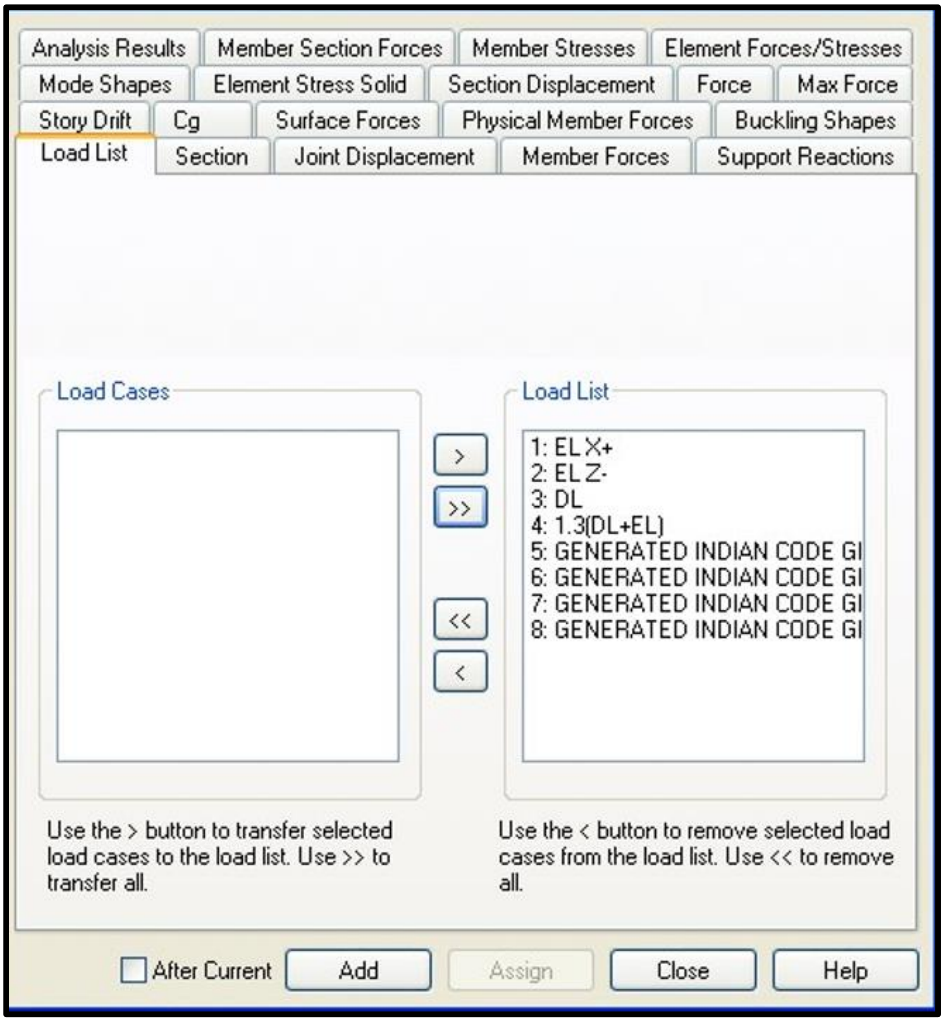

Fig 3.2.7 :Run Program

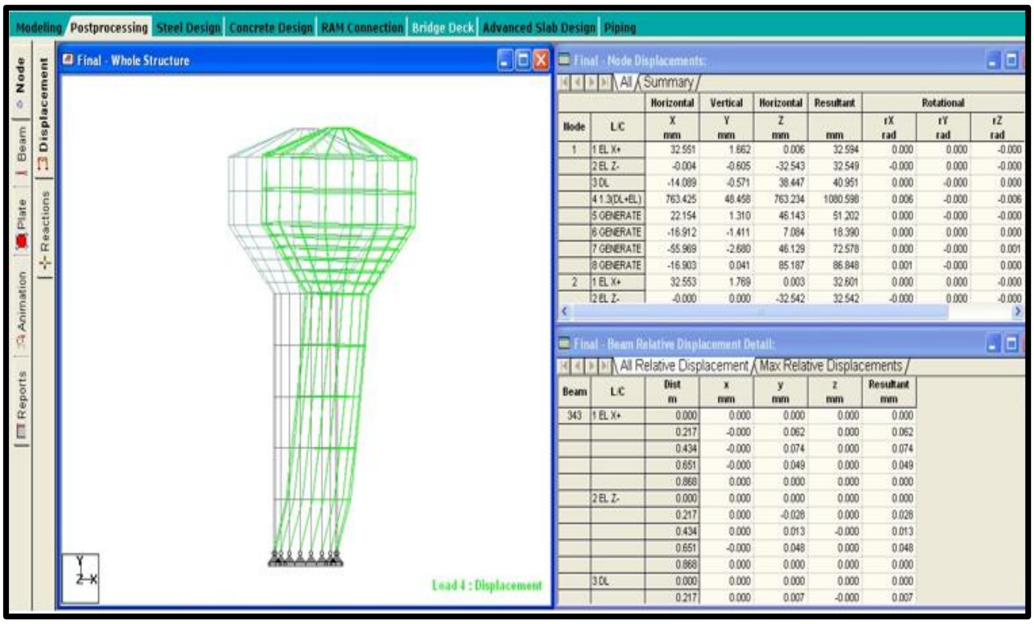

Fig 3.2.8 : Bending Moment Diagram

In this it shows about bending moment of the structure that if there is an extra stress and load acting on the structure like Earthquake load, wind load in bad condition.

Step 8: Main Pressures on Plates

In this it shows the main stresses on the plates that is how the stress is acting on the plates .

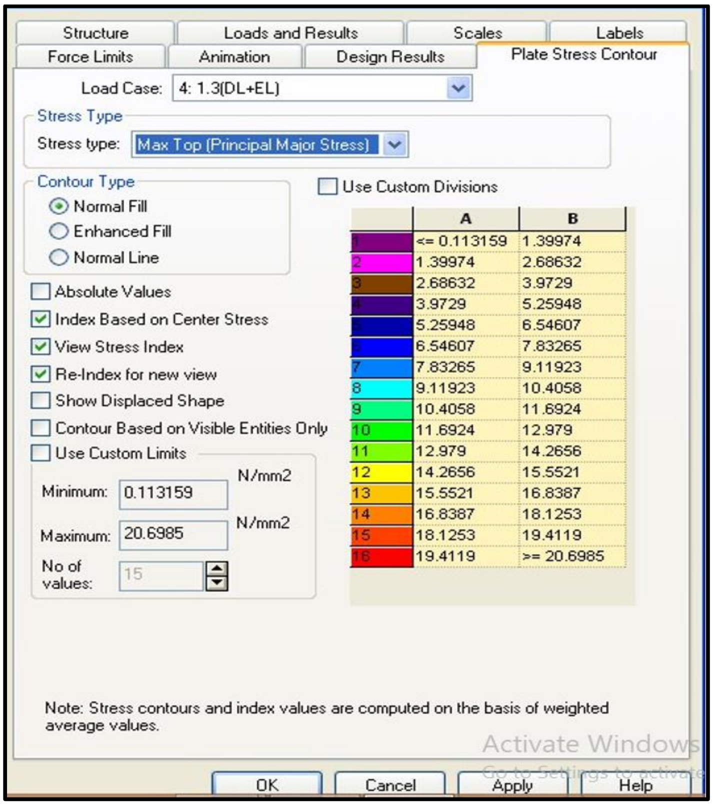

Fig 3.2.9 : Pressures on Plate

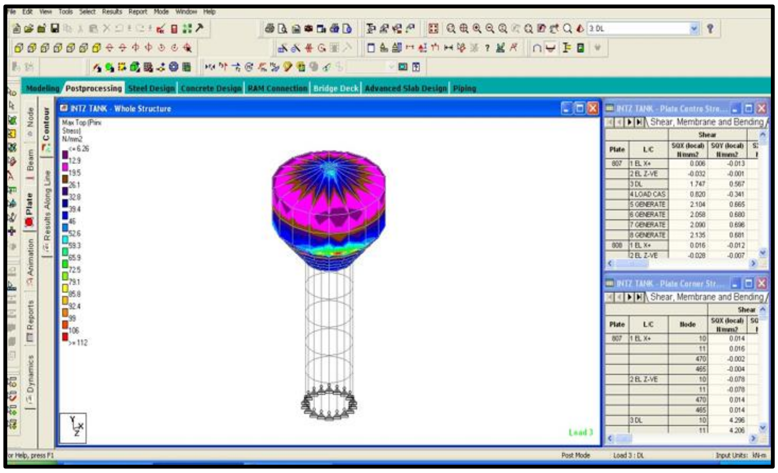

Fig 3.2.10 : Pressure on Top Dome

Pressures in Beam: It shows about the the pressure acting on the Beam .

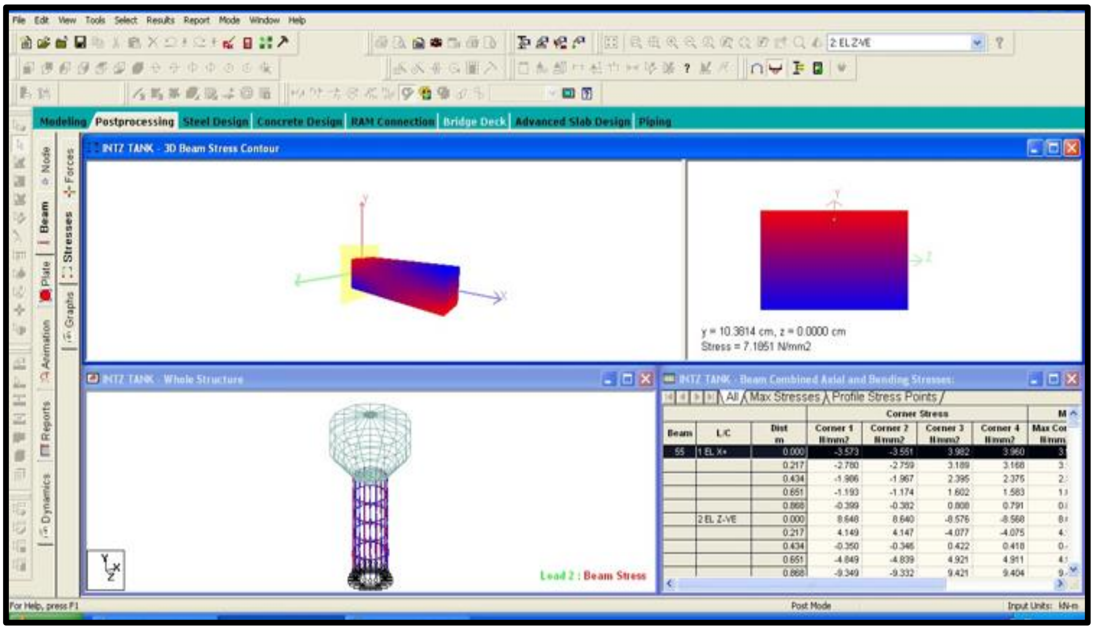

Fig 3.2.11 Pressure in Beam

Pressures in Column: It shows about the pressure acting on the Column .

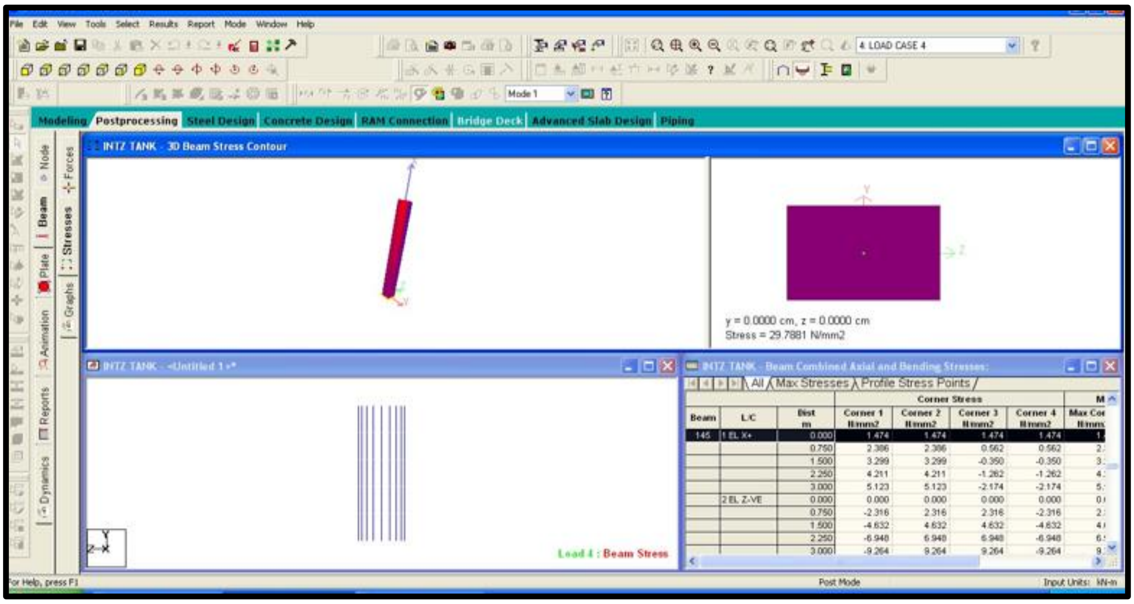

Fig 3.2.12 : Pressure in Column

Final 3D View

This is the final 3d view of the structure .

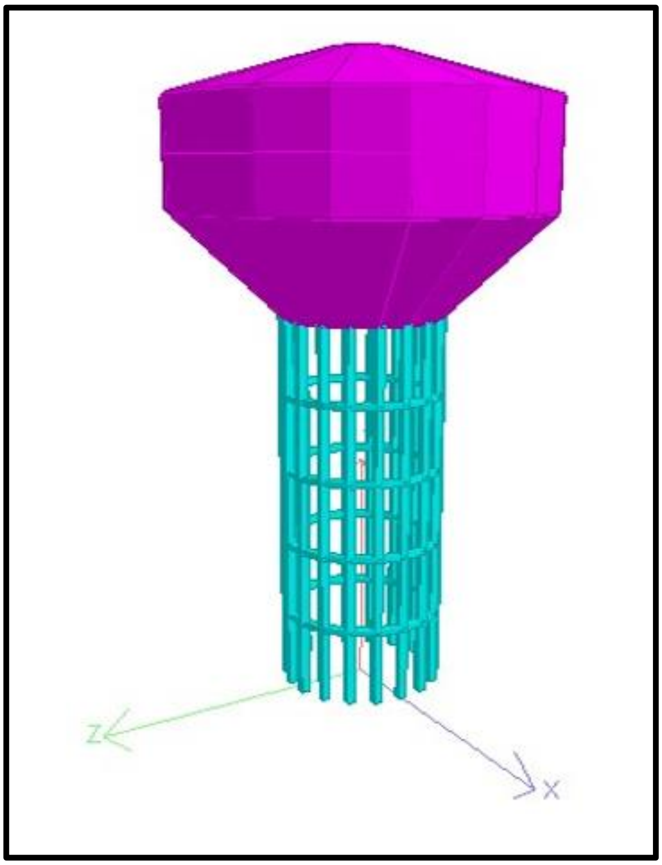

Fig 3.2.12 : Final Structure

Step 9: Report

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Materials

Mat	Name	E (kN/mm^2)	v	Density (kg/m^3)	α (1/°K)
1	STEEL	205.000	0.300	7.83E+3	12E -6
2	STAINLESSSTEEL	197.930	0.300	7.83E+3	18E -6
3	ALUMINUM	68.948	0.330	2.71E+3	23E -6
4	CONCRETE	21.718	0.170	2.4E+3	10E -6

Basic Load Cases

Number	Name
1	EL X+
2	EL Z-
3	DL
4	LOAD CASE 4

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
5	GENERATED INDIAN CODE GENRAL_S'	3	DL	1.20
		1	EL X+	1.20
6	GENERATED INDIAN CODE GENRAL_S'	3	DL	1.20
		2	EL Z-	1.20
7	GENERATED INDIAN CODE GENRAL_S'	3	DL	1.20
		1	EL X+	-1.20
8	GENERATED INDIAN CODE GENRAL_S'	3	DL	1.20
		2	EL Z-	-1.20

Load Generators

There is no data of this type.

Seismic Loading : 1 EL X+

Code	Direction	Factor
	X	1.000

Seismic Loading : 2 EL Z-

Code	Direction	Factor
	Z	-1.000

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Client	File Final.std		

Plate Loads : 3 DL

Plate	Type	Direction	Fa	Fb	X1 (m)	Y1 (m)	X2 (m)	Y2 (m)
1	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
2	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
3	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
4	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
5	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
6	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
7	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
8	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
9	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
10	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
11	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
12	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
13	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
14	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
15	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
16	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
17	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
18	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
19	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
20	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
21	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
22	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
23	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
24	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
25	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
26	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
27	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
28	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
29	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
30	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
31	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
32	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
33	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
34	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
35	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
36	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
37	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
38	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
39	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
40	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
41	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
42	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
43	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
44	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
45	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
46	TRAP N/mm2	Z	0.017	0.016	-	-	-	-

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Part		
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File Final.std		

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Job Title

Client

Plate Loads : 3 DL Cont...

Plate	Type	Direction	Fa	Fb	X1 (m)	Y1 (m)	X2 (m)	Y2 (m)
47	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
48	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
49	PRE N/mm2	Z	-0.020	-	-	-	-	-
50	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
51	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
52	PRE N/mm2	Z	-0.020	-	-	-	-	-
53	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
54	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
55	PRE N/mm2	Z	-0.020	-	-	-	-	-
56	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
57	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
58	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
59	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
60	PRE N/mm2	Z	-0.020	-	-	-	-	-
61	PRE N/mm2	Z	-0.020	-	-	-	-	-
62	PRE N/mm2	Z	-0.020	-	-	-	-	-
63	PRE N/mm2	Z	-0.020	-	-	-	-	-
64	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
65	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
66	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
67	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
68	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
69	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
70	PRE N/mm2	Z	-0.020	-	-	-	-	-
71	PRE N/mm2	Z	-0.020	-	-	-	-	-
72	PRE N/mm2	Z	-0.020	-	-	-	-	-
73	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
74	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
75	PRE N/mm2	Z	-0.020	-	-	-	-	-
76	PRE N/mm2	Z	-0.020	-	-	-	-	-
77	PRE N/mm2	Z	-0.020	-	-	-	-	-
78	PRE N/mm2	Z	-0.020	-	-	-	-	-
79	PRE N/mm2	Z	-0.020	-	-	-	-	-
80	PRE N/mm2	Z	-0.020	-	-	-	-	-
81	PRE N/mm2	Z	-0.020	-	-	-	-	-
82	PRE N/mm2	Z	-0.020	-	-	-	-	-
83	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
84	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
85	PRE N/mm2	Z	-0.020	-	-	-	-	-
86	PRE N/mm2	Z	-0.020	-	-	-	-	-
87	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
88	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
89	PRE N/mm2	Z	-0.020	-	-	-	-	-
90	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
91	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
92	PRE N/mm2	Z	-0.020	-	-	-	-	-

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Plate Loads : 3 DL Cont...

Plate	Type		Direction	Fa	Fb	X1 (m)	Y1 (m)	X2 (m)	Y2 (m)
93	PRE	N/mm2	Z	-0.020	-	-	-	-	-
94	PRE	N/mm2	Z	-0.020	-	-	-	-	-
95	PRE	N/mm2	Z	-0.020	-	-	-	-	-
96	TRAP	N/mm2	Z	0.020	0.020	-	-	-	-
97	TRAP	N/mm2	Z	0.020	0.020	-	-	-	-
98	PRE	N/mm2	Z	-0.020	-	-	-	-	-
99	PRE	N/mm2	Z	-0.020	-	-	-	-	-
100	PRE	N/mm2	Z	-0.020	-	-	-	-	-
101	PRE	N/mm2	Z	-0.020	-	-	-	-	-
102	PRE	N/mm2	Z	-0.020	-	-	-	-	-
103	PRE	N/mm2	Z	-0.020	-	-	-	-	-
104	PRE	N/mm2	Z	-0.020	-	-	-	-	-
105	PRE	N/mm2	Z	-0.020	-	-	-	-	-
106	PRE	N/mm2	Z	-0.020	-	-	-	-	-
107	PRE	N/mm2	Z	-0.020	-	-	-	-	-
108	PRE	N/mm2	Z	-0.020	-	-	-	-	-
109	PRE	N/mm2	Z	-0.020	-	-	-	-	-
110	PRE	N/mm2	Z	-0.020	-	-	-	-	-
111	PRE	N/mm2	Z	-0.020	-	-	-	-	-
112	PRE	N/mm2	Z	-0.020	-	-	-	-	-
113	PRE	N/mm2	Z	-0.020	-	-	-	-	-
114	PRE	N/mm2	Z	-0.020	-	-	-	-	-
115	PRE	N/mm2	Z	-0.020	-	-	-	-	-
116	PRE	N/mm2	Z	-0.020	-	-	-	-	-
117	PRE	N/mm2	Z	-0.020	-	-	-	-	-
118	PRE	N/mm2	Z	-0.020	-	-	-	-	-
119	PRE	N/mm2	Z	-0.020	-	-	-	-	-
120	PRE	N/mm2	Z	-0.020	-	-	-	-	-
121	PRE	N/mm2	Z	-0.020	-	-	-	-	-
122	PRE	N/mm2	Z	-0.020	-	-	-	-	-
123	PRE	N/mm2	Z	-0.020	-	-	-	-	-
124	PRE	N/mm2	Z	-0.020	-	-	-	-	-
125	PRE	N/mm2	Z	-0.020	-	-	-	-	-
126	PRE	N/mm2	Z	-0.020	-	-	-	-	-
127	PRE	N/mm2	Z	-0.020	-	-	-	-	-
128	PRE	N/mm2	Z	-0.020	-	-	-	-	-
129	PRE	N/mm2	Z	-0.020	-	-	-	-	-
130	PRE	N/mm2	Z	-0.020	-	-	-	-	-
131	PRE	N/mm2	Z	-0.020	-	-	-	-	-
132	PRE	N/mm2	Z	-0.020	-	-	-	-	-
133	PRE	N/mm2	Z	-0.020	-	-	-	-	-
134	PRE	N/mm2	Z	-0.020	-	-	-	-	-
135	PRE	N/mm2	Z	-0.020	-	-	-	-	-
136	PRE	N/mm2	Z	-0.020	-	-	-	-	-
137	PRE	N/mm2	Z	-0.020	-	-	-	-	-
138	PRE	N/mm2	Z	-0.020	-	-	-	-	-

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Plate Loads : 3 DL Cont...

Plate	Type	Direction	Fa	Fb	X1 (m)	Y1 (m)	X2 (m)	Y2 (m)
139	PRE N/mm2	Z	-0.020	-	-	-	-	-
140	PRE N/mm2	Z	-0.020	-	-	-	-	-
141	PRE N/mm2	Z	-0.020	-	-	-	-	-
142	PRE N/mm2	Z	-0.020	-	-	-	-	-
143	PRE N/mm2	Z	-0.020	-	-	-	-	-
144	PRE N/mm2	Z	-0.020	-	-	-	-	-
145	PRE N/mm2	Z	-0.020	-	-	-	-	-
146	PRE N/mm2	Z	-0.020	-	-	-	-	-
147	PRE N/mm2	Z	-0.020	-	-	-	-	-
148	PRE N/mm2	Z	-0.020	-	-	-	-	-
149	PRE N/mm2	Z	-0.020	-	-	-	-	-
150	PRE N/mm2	Z	-0.020	-	-	-	-	-
151	PRE N/mm2	Z	-0.020	-	-	-	-	-
152	PRE N/mm2	Z	-0.020	-	-	-	-	-
153	PRE N/mm2	Z	-0.020	-	-	-	-	-
154	PRE N/mm2	Z	-0.020	-	-	-	-	-
155	PRE N/mm2	Z	-0.020	-	-	-	-	-
156	PRE N/mm2	Z	-0.020	-	-	-	-	-
157	PRE N/mm2	Z	-0.020	-	-	-	-	-
158	PRE N/mm2	Z	-0.020	-	-	-	-	-
159	PRE N/mm2	Z	-0.020	-	-	-	-	-
160	PRE N/mm2	Z	-0.020	-	-	-	-	-
161	PRE N/mm2	Z	-0.020	-	-	-	-	-
162	PRE N/mm2	Z	-0.020	-	-	-	-	-
163	PRE N/mm2	Z	-0.020	-	-	-	-	-
164	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
165	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
166	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
167	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
168	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
169	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
170	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
171	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
172	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
173	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
174	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
175	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
176	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
177	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
178	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
179	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
180	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
181	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
182	PRE N/mm2	Z	-0.020	-	-	-	-	-
183	PRE N/mm2	Z	-0.020	-	-	-	-	-
184	PRE N/mm2	Z	-0.020	-	-	-	-	-

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Plate Loads : 3 DL Cont...

Plate	Type		Direction	Fa	Fb	X1 (m)	Y1 (m)	X2 (m)	Y2 (m)
185	PRE	N/mm2	Z	-0.020	-	-	-	-	-
186	PRE	N/mm2	Z	-0.020	-	-	-	-	-
187	PRE	N/mm2	Z	-0.020	-	-	-	-	-
188	PRE	N/mm2	Z	-0.020	-	-	-	-	-
189	PRE	N/mm2	Z	-0.020	-	-	-	-	-
190	PRE	N/mm2	Z	-0.020	-	-	-	-	-
191	PRE	N/mm2	Z	-0.020	-	-	-	-	-
192	PRE	N/mm2	Z	-0.020	-	-	-	-	-
193	PRE	N/mm2	Z	-0.020	-	-	-	-	-
194	PRE	N/mm2	Z	-0.020	-	-	-	-	-
195	PRE	N/mm2	Z	-0.020	-	-	-	-	-
196	PRE	N/mm2	Z	-0.020	-	-	-	-	-
197	PRE	N/mm2	Z	-0.020	-	-	-	-	-
198	PRE	N/mm2	Z	-0.020	-	-	-	-	-
199	PRE	N/mm2	Z	-0.020	-	-	-	-	-
200	PRE	N/mm2	Z	-0.020	-	-	-	-	-
201	PRE	N/mm2	Z	-0.020	-	-	-	-	-
202	PRE	N/mm2	Z	-0.020	-	-	-	-	-
203	PRE	N/mm2	Z	-0.020	-	-	-	-	-
204	PRE	N/mm2	Z	-0.020	-	-	-	-	-
205	PRE	N/mm2	Z	-0.020	-	-	-	-	-
206	PRE	N/mm2	Z	-0.020	-	-	-	-	-
207	PRE	N/mm2	Z	-0.020	-	-	-	-	-
208	PRE	N/mm2	Z	-0.020	-	-	-	-	-
209	PRE	N/mm2	Z	-0.020	-	-	-	-	-
210	PRE	N/mm2	Z	-0.020	-	-	-	-	-
211	PRE	N/mm2	Z	-0.020	-	-	-	-	-
212	PRE	N/mm2	Z	-0.020	-	-	-	-	-
213	PRE	N/mm2	Z	-0.020	-	-	-	-	-
214	PRE	N/mm2	Z	-0.020	-	-	-	-	-
215	PRE	N/mm2	Z	-0.020	-	-	-	-	-
216	PRE	N/mm2	Z	-0.020	-	-	-	-	-
217	PRE	N/mm2	Z	-0.020	-	-	-	-	-
218	PRE	N/mm2	Z	-0.020	-	-	-	-	-
219	PRE	N/mm2	Z	-0.020	-	-	-	-	-
220	PRE	N/mm2	Z	-0.020	-	-	-	-	-
221	PRE	N/mm2	Z	-0.020	-	-	-	-	-
222	PRE	N/mm2	Z	-0.020	-	-	-	-	-
223	PRE	N/mm2	Z	-0.020	-	-	-	-	-
224	PRE	N/mm2	Z	-0.020	-	-	-	-	-
225	PRE	N/mm2	Z	-0.020	-	-	-	-	-
226	PRE	N/mm2	Z	-0.020	-	-	-	-	-
227	PRE	N/mm2	Z	-0.020	-	-	-	-	-
228	PRE	N/mm2	Z	-0.020	-	-	-	-	-
229	PRE	N/mm2	Z	-0.020	-	-	-	-	-
230	PRE	N/mm2	Z	-0.020	-	-	-	-	-

Plate Loads : 3 DL Cont...

Plate	Type		Direction	Fa	Fb	X1 (m)	Y1 (m)	X2 (m)	Y2 (m)
231	PRE	N/mm2	Z	-0.020	-	-	-	-	-
232	PRE	N/mm2	Z	-0.020	-	-	-	-	-
233	PRE	N/mm2	Z	-0.020	-	-	-	-	-
234	PRE	N/mm2	Z	-0.020	-	-	-	-	-
235	PRE	N/mm2	Z	-0.020	-	-	-	-	-
236	PRE	N/mm2	Z	-0.020	-	-	-	-	-
237	PRE	N/mm2	Z	-0.020	-	-	-	-	-
238	PRE	N/mm2	Z	-0.020	-	-	-	-	-
239	PRE	N/mm2	Z	-0.020	-	-	-	-	-
240	PRE	N/mm2	Z	-0.020	-	-	-	-	-
241	PRE	N/mm2	Z	-0.020	-	-	-	-	-
242	PRE	N/mm2	Z	-0.020	-	-	-	-	-
243	PRE	N/mm2	Z	-0.020	-	-	-	-	-
244	PRE	N/mm2	Z	-0.020	-	-	-	-	-
245	PRE	N/mm2	Z	-0.020	-	-	-	-	-
246	PRE	N/mm2	Z	-0.020	-	-	-	-	-
247	PRE	N/mm2	Z	-0.020	-	-	-	-	-
248	PRE	N/mm2	Z	-0.020	-	-	-	-	-
249	TRAP	N/mm2	Z	0.020	0.020	-	-	-	-
250	TRAP	N/mm2	Z	0.020	0.020	-	-	-	-
251	PRE	N/mm2	Z	-0.020	-	-	-	-	-
252	PRE	N/mm2	Z	-0.020	-	-	-	-	-
253	PRE	N/mm2	Z	-0.020	-	-	-	-	-
254	TRAP	N/mm2	Z	0.019	0.017	-	-	-	-
255	TRAP	N/mm2	Z	0.019	0.017	-	-	-	-
256	PRE	N/mm2	Z	-0.020	-	-	-	-	-
257	TRAP	N/mm2	Z	0.003	0.003	-	-	-	-
258	TRAP	N/mm2	Z	0.003	0.003	-	-	-	-
259	PRE	N/mm2	Z	-0.020	-	-	-	-	-
260	PRE	N/mm2	Z	-0.020	-	-	-	-	-
261	PRE	N/mm2	Z	-0.020	-	-	-	-	-
262	TRAP	N/mm2	Z	0.017	0.016	-	-	-	-
263	TRAP	N/mm2	Z	0.017	0.016	-	-	-	-
264	PRE	N/mm2	Z	-0.020	-	-	-	-	-
265	PRE	N/mm2	Z	-0.020	-	-	-	-	-
266	PRE	N/mm2	Z	-0.020	-	-	-	-	-
267	PRE	N/mm2	Z	-0.020	-	-	-	-	-
268	PRE	N/mm2	Z	-0.020	-	-	-	-	-
269	PRE	N/mm2	Z	-0.020	-	-	-	-	-
270	TRAP	N/mm2	Z	0.016	0.014	-	-	-	-
271	TRAP	N/mm2	Z	0.016	0.014	-	-	-	-
272	PRE	N/mm2	Z	-0.020	-	-	-	-	-
273	PRE	N/mm2	Z	-0.020	-	-	-	-	-
274	TRAP	N/mm2	Z	0.014	0.013	-	-	-	-
275	TRAP	N/mm2	Z	0.014	0.013	-	-	-	-
276	TRAP	N/mm2	Z	0.020	0.020	-	-	-	-

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		By		
Client		File Final.std	D...	

Plate Loads : 3 DL Cont...

Plate	Type	Direction	Fa	Fb	X1 (m)	Y1 (m)	X2 (m)	Y2 (m)
277	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
278	PRE N/mm2	Z	-0.020	-	-	-	-	-
279	PRE N/mm2	Z	-0.020	-	-	-	-	-
280	PRE N/mm2	Z	-0.020	-	-	-	-	-
281	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
282	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
283	PRE N/mm2	Z	-0.020	-	-	-	-	-
284	PRE N/mm2	Z	-0.020	-	-	-	-	-
285	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
286	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
287	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
288	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
289	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
290	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
291	PRE N/mm2	Z	-0.020	-	-	-	-	-
292	PRE N/mm2	Z	-0.020	-	-	-	-	-
293	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
294	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
295	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
296	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
297	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
298	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
299	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
300	TRAP N/mm2	Z	0.020	0.020	-	-	-	-
301	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
302	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
303	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
304	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
305	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
306	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
307	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
308	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
309	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
310	TRAP N/mm2	Z	0.019	0.017	-	-	-	-
311	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
312	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
313	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
314	TRAP N/mm2	Z	0.003	0.003	-	-	-	-
315	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
316	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
317	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
318	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
319	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
320	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
321	TRAP N/mm2	Z	0.017	0.016	-	-	-	-
322	TRAP N/mm2	Z	0.017	0.016	-	-	-	-

Software licensed to	Job No	Sheet No 9	Rev
Job Title	Part		
	Ref		
	By		
Client	File Final.std		

Plate Loads : 3 DL Cont...

Plate	Type	Direction	Fa	Fb	X1 (m)	Y1 (m)	X2 (m)	Y2 (m)
323	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
324	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
325	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
326	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
327	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
328	TRAP N/mm2	Z	0.016	0.014	-	-	-	-
329	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
330	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
331	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
332	TRAP N/mm2	Z	0.014	0.013	-	-	-	-
333	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
334	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
335	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
336	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
337	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
338	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
339	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
340	TRAP N/mm2	Z	0.012	0.012	-	-	-	-
341	TRAP N/mm2	Z	0.008	0.008	-	-	-	-
342	TRAP N/mm2	Z	0.008	0.008	-	-	-	-

Selfweight : 3 DL

Direction	Factor
Y	-1.000

Selfweight : 4 LOAD CASE 4

Direction	Factor
X	1.000
Y	1.000
Z	1.000

CHAPTER -4 RESULTS

1. We used three various structures of circular water tanks in the process, and we first created the water tank manually using IS 3370-2009. We use this information to construct and analyse the structure using STAAD. Pro Circular water tank structures were designed using specific dimensions for the same capacity.

2. As we all know, beams and columns contribute nearly all of the building's load through transferring dead and live loads. As a result, we began designing the structure in STAAD. Pro..

3. As the structure's capacity grows, so does the amount of materials required. However, a less-than-perfect proportionality finding was observed, i.e., a proportional increase in capacity did not always imply a comparable increase in the materials required.

4. A report was created for all types of water tanks after this thorough examination:

5. All members of the structure appear to be secure. STAAD.Pro calculates the total volume of concrete for beams and plates.

6. In addition, in the case of steel STAAD. Only for beams and plates does Pro provide the total weight of reinforcement steel.

CHAPTER-5 CASE STUDY

For considering case study about elevated intze tank we are consider intze tank which is constructing at GPGC Bilaspur .

4.1 DATA

Type of Tank	Elevated Tank
Location of Site	Near GPGC Bilaspur
Complete Dimension	
➢ Length	12+8 m
➢ Height	8 m
➢ Dia. Of Dom	15.55 m
➢ Dia. Of Bottom Cylinder	8 m (inside)
Volume of Tank	1 ML (1000000 lt)
Grade of concrete	M30

Fig 4.1 : Data

4.2 Section of Tank:

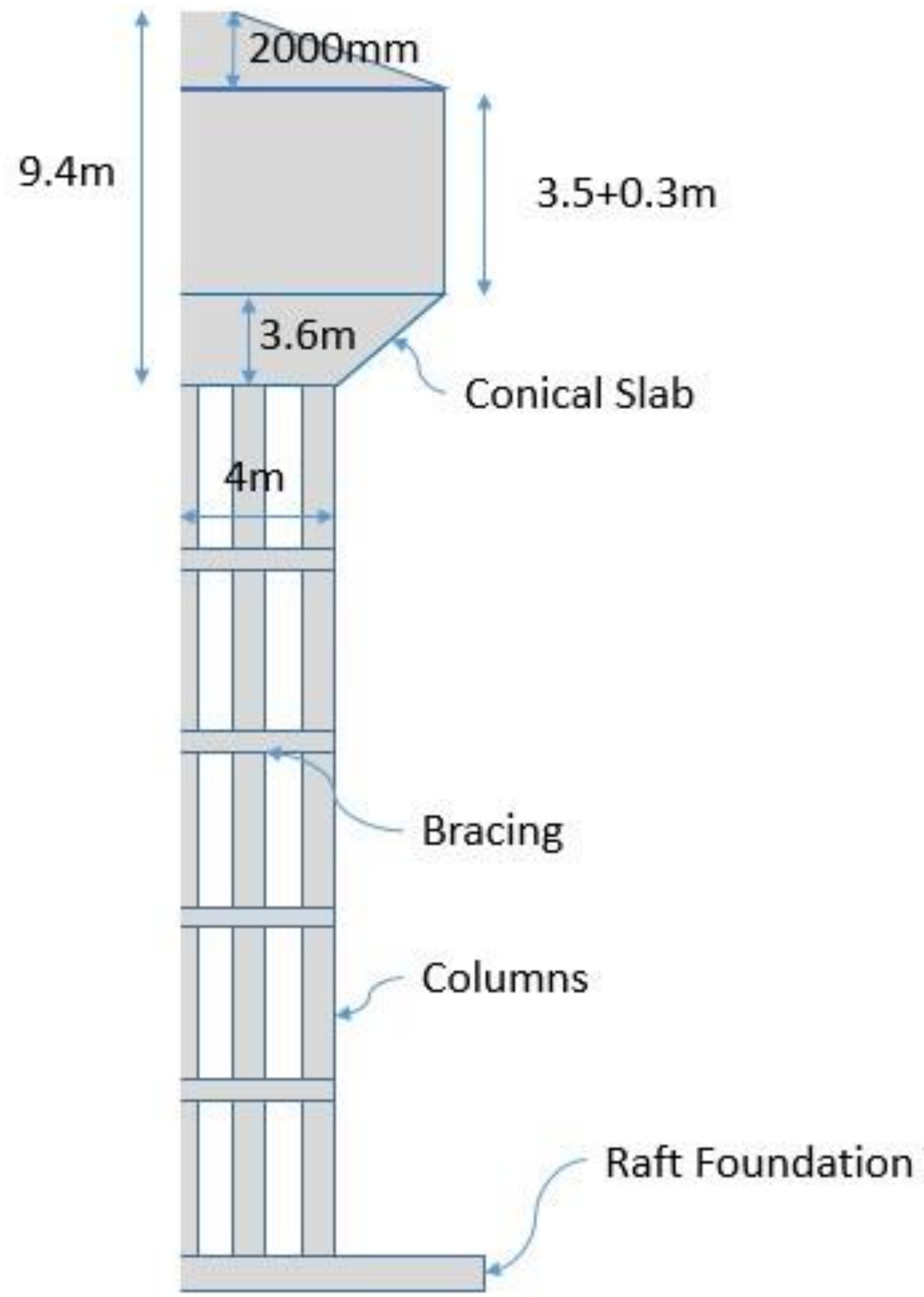

Fig 4.2 : section of water tank

4.3 Specifications of Aji Intze tank:

- So, For Aji Intze Tank These all Data is to be considered and the seismic zone III Wise Earthquake related study can be done.

- Consider Hard Soil Properties for Foundation and select raft foundation for tank

- Consider elevated intze tank so by gravity water fall can be done for supplying .

- For Grade of concrete M30 Grade is selected

- Quantity of water can be stored in tank is 1 ML(1000000 ltrs)

CHAPTER-6 CONCLUSION

Elevated Intze water tank of 675000 liter capacity with 15 m staging has been design considering M25 concrete. However, M30 is used for container and M25 for the staging.

Detailed structural drawing have been prepared. Nodal displacement, forces, stress in staging and other part, these all data has been calculated by using STAAD Pro v8i.

The tank is stable for hydrostatic analysis, but not when sloshing is included in the study, when the critical element values surpass the limitation values.

After the designing of inzte type elevated water tank by using STAAD Pro v8i and manually method we can conclude that the design is safe.

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