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Design and Analysis of a Corporate Office by Using Post Tension Methods (Stilt+12Floors) with cost Analysis of Conventional Slab and Post-Tensioned Slabs

Naan Babu Chouhan[1], Mr. Puskar Guha Biswas[2], Dr. Subash Chandra Bose[3], Mr. Shiva Shankar K M[4]
[1]*PG Student,* [3]*Associate Professor,* [4]*Assistant Professor, Department of Civil Engineering, ACS College of Engineering ACSCE*
[2]*General Manager (Design+QS) United Developers, Bengaluru*

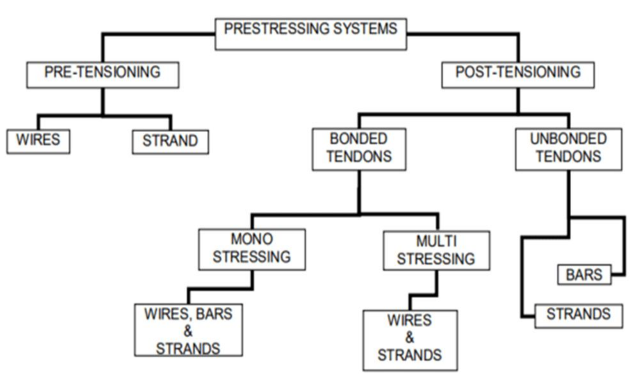
Abstract: The assignment manages with the Design and Analysis of Corporate Office structure with post-tensioned Slabs. The development has been arranged and taken apart for the customary floor. The drawings and various subtleties are inspected with Structural Consultant concerning National Building Corporation (NBC). Fundamental format is the fundamental piece of primary planning. In aggregates, etc on extra making we used the admixtures and plasticizers, etc. Along these lines, the advancement materials are changing from regular daily existence. In past times, the designs are worked with just ground floor in a manner of speaking. i.e., free house. In this undertaking we have arranged and analyzed constructed Stilt+12 floors and OHT. In different seismic zones to really investigate the changed limits because for deficiency of land and budget of land is profound and other most item is the urbanization, etc. For the improvement of the multi-story structures Offices, as of now a days we are moving to Pre-Tension and Post Tension systems, and variety in cost for regular piece and tensioned techniques chunks.
Keywords: Etabs, Excel, Autocad, Gfc Drawings.

I. INTRODUCTION

In the current compositionally world, the "standard shape" essential of precast pretensioned concrete is consistently unreasonable. To meet these compositionally troublesome applications while at this point giving a strong significant development, makers show cast set up improvement.

In current times multi-story high elevations structures are widely built. post tensioned are one of the parts in the construction of buildings. the use post tension slab provides more advantages than the 2-way slab. in this way, the present study aims to comparing numerous features like depth, material quantities, cost for 2-way and post tensioned slabs. a slab of size 24m x 36 m slab is taken from existing building and from that slab, a post-tension panels of size 15.150m x 12.5m is designed different seismic zones to track down the distinction in the base shear and sidelong powers. The Quantities of The Materials Are evaluated and budget of Construction for center and shell are Determined and Related. From The Study It Is Considered That Post Tension Methods are More Reasonable Than traditional technique.

Organogram of the structural materials

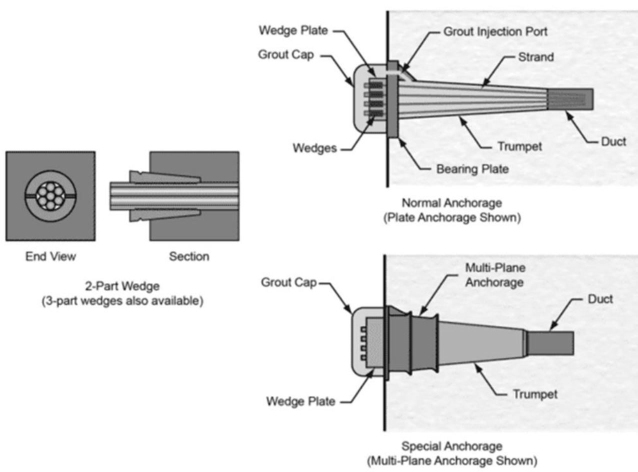


A. Principle Of Post-Tensioning

In Post strain, the ligaments are tensioned after the substantial has solidified. Normally metal or plastic channels are set inside the substantial prior to projecting. After the substantial solidified and had sufficient strength, the ligament was set inside the pipe, focused and moored against the substantial. Grout might be infused into the pipe later. This should be possible either as pre-cast or cast set up

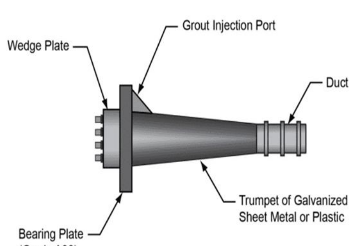
B. Post Tensioning Systems

Numerous exclusive post-tensioning frameworks are accessible. A few providers produce frameworks for ligaments made of wires, strands or bars. The most well-known frameworks found in piece and extension development are multi-strand frameworks for extremely durable post-tensioning ligaments and bar frameworks for both brief and long-lasting circumstances.



II. POST-TENSIONING SYSTEM MATERIALS AND COMPONENTS

1) Strands and Bars
2) Basic Bearing Plates



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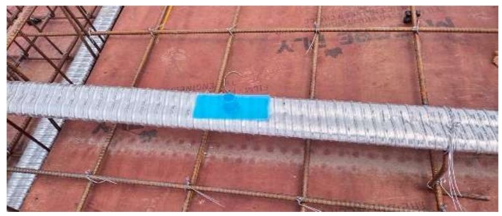
3) Wedges

4) Ducts for Tendons

5) Grouting for Tendons



A. Types Of Slabs Considered For Post-Tensioning

SOLID FLAT SLAB

1) A flat slab is a one-way or two-way section framework that normally doesn't have shafts or braces in which burden is moved straightforwardly to the supporting substantial segments and burden bearing walls otherwise called drop boards and the drop board goes about as a T-pillar on the help.
2) They further develop shear limit and firmness of the floor framework underneath vertical burdens, bringing about financial length.
3) Thin level chunks going from 5 to 9 m are the favored answer for working in-situ substantial edge structures.

B. Benefits Of Flat Slab

1) A flat slab lessens the general level of the design.
2) These pieces are equipped for lifting concentrated loads.
3) They require less formwork.

C. Inconveniences Of Flat Slab

1) In the flat plate framework, the development of huge ranges is beyond the realm of possibilities.
2) The utilization of a drop board can impede enormous mechanical ducting.
3) They are not reasonable for brick work walls (fragile backings).
4) The thickness of the level plate chunk is more prominent than that of the commonplace RCC two-way piece.

D. Flat Slab With Drop Panels

1) It helps to increase the shear strength of the slab floor.
2) It help s to increase the flat slab’s negative moment capacity.
3) It stiffens the flat slabs, consequently reduces deflections.

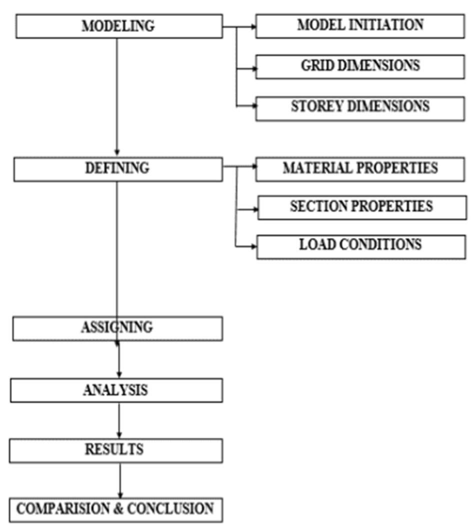
III. OBJECTIVES

1) Project examination: "Our Venture deals with the "Plan and Analysis of a Corporate Office". The structure consists of a Stilt +12 stories "Floor Area Of 1099 SQ.M Are Utilizing for Different Purposes.1 A Beam slab of size 15.150mtr X 12.5mtr As Per Indian code- 456:2000 (Limit State Method)".
2) The main Objective of current Study Is to separate Various Features Like "Profundity, Material Quantities, Cost for 2-Way and post-tensioned Slabs", From the Study economical slab Is known That Can Be Chosen for Multi-Story Structures Which Decreases budget of Construction.
3) The Objective of the project is to Compare the PT Flat slab and PT capital slab in different seismic zones.

4) To achieve the base shear and Lateral forces by manual calculations and do analysis in the etabs software.
5) To understand the Losses in PT slab while stressing the strands.
6) The Objective of the project is to comparability the percentage of steel for conventional and post tensioned slab. (Flat slab and drop slab).
7) The Objective of the project is to give the variance in cost estimation for conventional slab and post tensioned slabs. (Flat slab and drop slab).
8) Formwork consumption detailed and graphical representation for the selected PT slab and conventional slab.
9) Providing the costing of the post-tensioned materials and also the conventional building as per the present market rate provided by the CPWD.
10) The Objective of the project is to Update the immense information for future generations.
11) The objective of the project is to produce a very economical corporate office building within the reasonable budget.
12) The Objective of the project is to understand the PT concept, its materials and methodology.

A. *Code books*
1) Indian Code- 456-2000 for Plain and RC.
2) Indian Code- 875 (Part 1)-1987 for DL.
3) Indian Code- 875 (Part 2)-1987 for LL.
4) Indian Code-875 (Part 3)-1987 for WL.
5) Indian Code-1343-1980 for pre-stress concrete Structure.
6) Indian Code-1893-2002 for earthquake loads.
7) Sp:16(S&T) (1980), Design_aids to RC IS: 456-1978
8) Indian Code-1200 (Part 1 to 28) for Methods of measurement of building.
9) Indian Code-2502 (1963)- for Bending and Fixing of bars for Concrete.

B. *Methodology*
The analysis will be carried out by using ETABS software to find the steel %, consumption of concrete, displacement, maximum shear, maximum bending moment, Flexural strength.



C. *Load calculation*
1) Post tensioning strand details
2) Designing of internal typical column
3) Wind-load evaluation wind data: by confirming the building zones basics wind speeds and intensities at different height is taken from Indian Standards -875 -1987 (part-3)
4) Design wind speed
5) Design wind pressure

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6) Seismic load calculation
7) Design of the typical footing:
8) Design of post tensioned slab
9) Run analysis
10) Results

IV. ARCHITECTURAL DRAWINGS

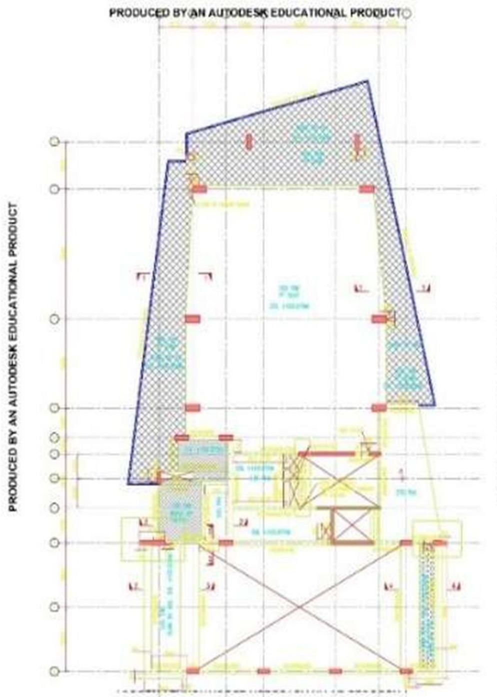

Figure: shows first floor structural plan

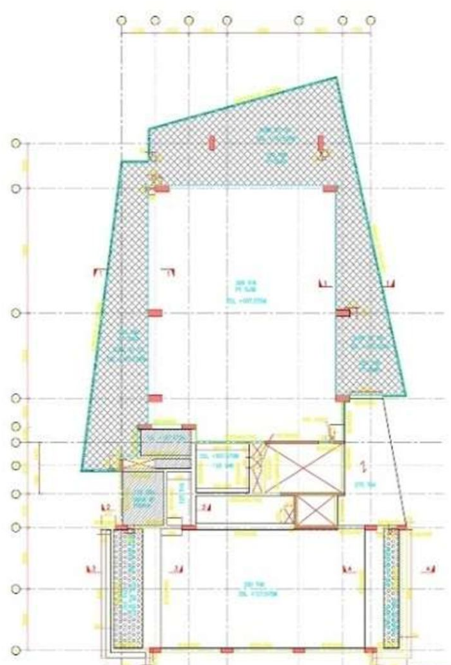

Figure: shows 2^{nd} to 12^{th} floor plan typical

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Considered Structural properties of a building for PT Flat Slab and PT Drop slab

SI NO	PARTICULARS	VALUES
1	Number of Stories	Stilt +12+ Over Head Tank
2	Type	Bounded
3	Each story height	3 m
4	Total Dead Load area for the floor	12 KN/m^2
5	Weight of partition on Floor	$2KN/m^2$
6	Live load for each floor	$5KN/m^2$
7	Roof	$1.5KN/m^2$
8	Building Size	24 x 36m
9	column size	900 x 400mm,900 x 300
10	Concealed beam and conventional beam	1200 x 300mm, 300x600
11	Footing size	5120 x 5120 mm
12	Wind pressure	44 m/s
13	Seismic zones	2,3,4 & 5
14	Strands	5s
15	Type of soil	Hard Rocky soil
16	Safe bearing capacity of soil	750 kn/m^2
17	Grade of concrete	M35,340
18	Grade of steel	Fe550
19	Grade of strands	A416Gr270
20	Capitals drop size	1800 x 1300 x 550mm

Fig1: Shows the plan of the structure.

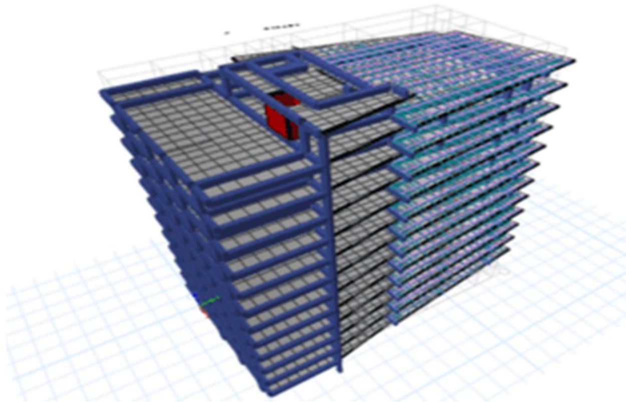

Fig2: shows the 3d diagram of the structure.

Check for the limits for the Direct Design Method
There are one range toward every path The boards are square with length proportion: 15.150/12.5 = 1.21 < 2.0
There is no counterbalanced section.
There is no distinction in progressive range lengths.
Expecting

Slabs thickness =	300mm
Dead Load=12kN/m2 WuLL	=5.5 x 1.5 = 8.5 kN/m2
Wu LL/Wu DL	= 8.5/22 =0.386< 3

Thus O.K Hence all constraints are fulfilled and
Material Properties: M35, M40, Fe550
Unit weight of cement concerning Indian Standard code- 875 (Part1)
Live Load for place of business with reference of Indian Standard code-875 (Part II)

Live Load=	5.5kN/m2 Floor Finish thickness	=	100 mm
Unit weight of P.C.C	= 24 kN/m2 Reference IS 875 (Part-01)		
Complete burden, w	= 22 kN/m2 Factored load, wu	=	33kN/m2

Post-tensioning strands details:

Extreme Tensile Stresses =	1884 N/mm2
Nominal area of strands =	98.7 mm2
Jacking_force	= 75% of the Ultimate_tensile Forces
Extreme_tensile Forces =	186 kN

Planning of inward commonplace segment
Size of Column = 900 x 400 mm
Material Properties:
Grade of Concrete, M40 Steel grade, Fe550

A. Load Calculation

Load because of self-weight and Live burden on section of stilt floor to terrace.
Section thickness from piece Ground floor and Terrace=300mm
Pillar size 1200 mm x 600 mm
Pillar thickness in floor Ground floor to Terrace = 0.6 mtr
Live burden for ground to terrace 5kN/m2 Dead burden s + 12 = 0.3 x 25 = 7.5 kN/m2
bar s + 12 =9 kN/m2 Total burden s + 12 = 22 kN/m2
Self-weight of Single section:

1 to 13	= 378 kN
G to 1	= 117 kN
Total	=495 Kn

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Nos of floors = 12 + stilt
Length along the section =15.15m
Width of the section =12.5m
Stacking to the floors =22kN/m2
Impact region of the section =12.5 x 15.150m Therefore complete burden on the segment is
=12.5 x15.150x13x22 =54161.25kn

B. *Wind_Load_Calculation*

Wind data:
By adjusting the structure zone essential breeze speed and force at various level is taken from Indian Standard code-875-1987 (Part-3)

Fundamental Wind Speed	44 m/s
Territory Category	2
Class of Structure	A
Width of the structure	24 m
length of the structure	36 m
height of the structure	47m

1) *Seismic load calculation:* By confirming structure zones, data's are calculated by referring Indian Standards 1893 – 2002.
Zone III SEISMIC ANALYSIS FOR ZONE III
DATAS; Number of Stories = STILT+ 12 Each stories height = 3 m,DL/ unit area of floor = 04 KN/m2 ,Weight of partition on floor = 02 KN/m2, Live load = 03 KN/m2, Roof = 1.51 KN/m2, Building Size = 24 x 36m,column size = 900 x 400 mm, beam size = 600 x 300 mm, solution
Design parameters omrf (R) = 3 ,Zone 3 = 0.16
Importance Factor (I) = 1 Type of soil = Hard Soil 2.

2) *Seismic weight:* Floor Area = 24 x 36 =864 m2
Eff weight @ very floor except roof = (4 + 2) + (0.25 X 3) = 6.75 KN/m2 ,Weight of beams @ every floor and roof = (0.4 x 1.2 x 300 x 25) = 3600 KN, Weight of column at each floor = (0.9 x 0.4 x 3.0 x 25 x 25.0) = 675.0 KN, Weight of the column at roof = 0.5 x 270 = 135.0 KN, Equivalent load at roof level = (4 x 864) +3600 + 135 = 3519.5 KN ,Equal load at each floor = (6.75 x 864) +3600 +270 = 9702 KN, Seismic weight of building W = 3519.5 + (9702 X 13) = 129645 KN.3.

3) *Natural period & base shear:* Fundamental natural period of vibration of Moment Resisting Frame without infill is;
Ta = 0.075h0.75 h = 13 x 3+8 = 47 m, Ta = 0.075h0.75 Ta = 0.075 x 13 0.75 = 0.513 (Sa / g) = (1/ Ta) (Sa / g) = (1/ 0.51347) = 1.948, FOR ZONE 3 Zone 3 = 0.16 FOR ZONE 1 0.1 Ah = (Z /2) X (I / R) X (Sa / g) REPLACE VALUE FROM 0.16 TO 0.1, Ah = (0.16 / 2) x (1/3) x 1.9475 = 0.0519 BASE SHEAR AND LATERAL FORCES CHANGES Base Shear Vb = W X Ah Base Shear Vb = 129645 X 0.0519 = 6728.5755 KN.

4. DESIGN OF LATERAL FORCES

Qi = $V_b (W_i \times h_i^2) / (\varepsilon W_i \times hi^2)$

SI NO	W_i (KN)	Height h_i (m)	$W_i \times h_i^2$	$(W_i \times h_i^2) / (\varepsilon W_i \times h_i^2)$	Q (KN)	V_i (KN)
BASEMENT 1	7500	47	16567500	0.06	374.02	374.02
BASEMENT 2	7500	43	13867500	0.06	374.02	748.04
1	9702	39	14756742	0.07	483.83	1,231.87
2	9702	36	12573792	0.07	483.83	1,715.71
3	9702	33	10565478	0.07	483.83	2,199.54
4	9702	30	8731800	0.07	483.83	2,683.37
5	9702	27	7072758	0.07	483.83	3,167.20
6	9702	24	5588352	0.07	483.83	3,651.04
7	9702	21	4278582	0.07	483.83	4,134.87
8	9702	18	3143448	0.07	483.83	4,618.70
9	9702	15	2182950	0.07	483.83	5,102.53
10	9702	12	1397088	0.07	483.83	5,586.37
11	9702	9	785862	0.07	483.83	6,070.20
12	9702	6	349272	0.07	483.83	6,554.03
13	3500	3	31500	0.03	174.54	6,728.58
	1,34,924		10,18,92,624			

Base shear = V_i
6728.5755 = 6,728.58 KN

4) *Plan Of A Section*
Mx =1751Kn-m,My=850 KN-M
eccentricity=20 mm, Mu (e)=29541 x 0.02 =591.8 kn-m Finally MX =1751KN-M ,MY=850 KN-M Section is 900 x 400

Calculation of pu/fckbd= 29540/40*400*900 1.3 evaluation of p/fck= 1.31/40 = 0.03255
Computation of uni hub second limit of the segment because of accepted rate in x course d/D = (40+16/2)/400 0.12
From Code book SP-16 diagram no 36 pg no 144,
Mux1 = Mu/fckbd2 0.38, Moment conveying limit in y heading is given by the accompanying condition Muy1 = Mu/fckbd2=0.38x40x650x650=5779.8kn-m MX/Mux1 =1750/4924.8 0.355344379 My/Muy1 =850/5779.8 0.147063912 Load conveying limit of the column=? Pux z/ag is determined. (Pg-no 105 and 71 code is 456) Pu = 20x900x400 = 7200 kn Examination condition: (from code is456 cla39.6 pgno71) (MX/Mux1) αn + (My/Muy1)αn αn esteem relies upon the pu/pz values Pu/pz =29540/7200 =4.102, in the event that the worth of αn is under 0.2, αn=1 αn is more prominent than 0.2 then αn=2 Therefore 0.2182 + 0.147 2 = 0.0691<1

5) *Plan Of The Normal Balance:* Hub load Pu= 29541 kn, Column size 900mm x 400mm ,Safe-bearing limit of the soil= 750 kn/m2, Area of the footing=(load/safe bearing limit of the soil)= 19693.333/750 =26.25771

SI NO :Wi (KN) Height greetings (m) Wi x hello 2 (Wi x hey 2)/(εWi x howdy 2) Q (KN) Vi (KN) Mu =0.38x40x900x900x400=4924.8 kn-m = 5.12 m x 5.12 m,Depth of the balance D= 6feet = 1830 mm, d=1830-50-(20/2) =1770 mm.
Nominalshearstress:Tv=vu/bd=14847.19*10^3x1.5/((2(2670+2420)x750.01)) = 1.23,
Admissible pressure: Tc = 0.25 x (square base of fc) = 0.25x (square foundation of 40) =1.58.Tv < Tc , Hence protected.

6) *Plan of post-tensioned section:* Area of pre-stressing steel Ap = 1974.5 mm2, effective profundity of segment as for first Layer ligament = 240 mm, Effective profundity of segment as for second Layer ligament = 0,Effective profundity of segment as for third Layer ligament = 0, Effective profundity of segment as for fourth Layer ligament = 0, Effective profundity (d) = 240.0 mm Effective support proportion (Ap x fp/(b x d x fck) = 0.1431

From table -11 of code Stress in Tendon as an extent of the plan strength ƒpu/(0.87 x fp) = 1.00 fpu = 1618.21 ratio of the profundity of neutral axis to that of the centroid of the ligament in the strain zone xu/d = 0.3031 xu = 161.621 Moment opposing limit of segment by Tendons = 1489.5 kN-m India - USSI default Indian Material*SAVED* Concrete - Spanning Members Top Reinforcement Cover Bottom Reinforcement Cover Reinforcement Provided = 6Y_16+5Y_32 Ast = 5226.5 mm2 Cover to Main Reinforcement = 40 mm Effective profundity to support = 560.5 mm = 1149.5 kn-m Design Moment at basic segment = 1850.5 kn-m Total Flexural limit of segment = 2638.54 kn-m Calculation of stress @ Service:- Area of web = 480000 Y1 = 100 Y2 = 400 Depth of neutral hub from top fiber Yt = 229.54 Depth of Neutral hub from base fiber Yb =370.5 Moment of Inertia of T segment Ixx = Section modulas, Zt = 1E+08 Section modulas, Zb = 9E+07 Eccentricity e = 163.5 mm Available ligament force at administration (first Layer) = 108 kn Available ligament force at administration (second Layer) = 0 kn Available ligament force at administration (third Layer) = 0 kn Available ligament force at administration (fourth Layer) = 0 kN Effective power for every strand = 108.5 kN Total compelling power @ Service P = 2160 kN Moment because of self weight = 705.5 kN-m, Moment because of very forced dead burden = 220 kN-m, Moment because of Live burden = 549.5 kN-m, Secondary Moment = -358.5 kN-m Moment because of Earthquake load = 0 kN-m, Combination for Limit condition of usefulness = Service Moment = 1116.5 kN-m 1.0 (DL + LL + PT)=33059186651,
Stress due to coordinate prestress = P/A=1.945 and for drop slab=2.3
Stress because of ligament erraticism @ Top fiber = Pe/Zt =2.45 and for drop slab= 2.65
Stress because of ligament flightiness @ Bottom fiber = Pe/Zb =3.96 and for drop slab= 4.15
Stress because of Applied_loads @ Top fiber = M/Zt=7.75 and for drop slab= 7.9
Stress because of Applied_loads @ Bottom fiber = M/Zb =12.51 and for drop piece =12.9
Stress @ outrageous top fiber Ft = -3.35 N/mm2 and for drop section = - 3.65n/mm2.
Stress @ outrageous base fiber Fb = 10.49 N/mm2 &for drop section = 11.15 n/mm2.
Negative sign indicates Tensile stress.

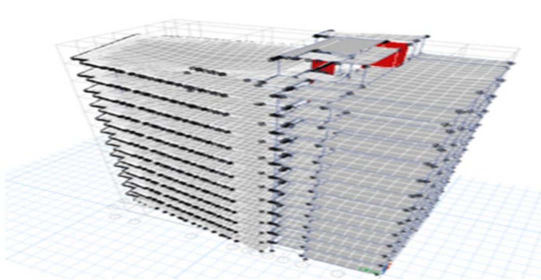
Figure 3: Shows Mesh diagram before stressing

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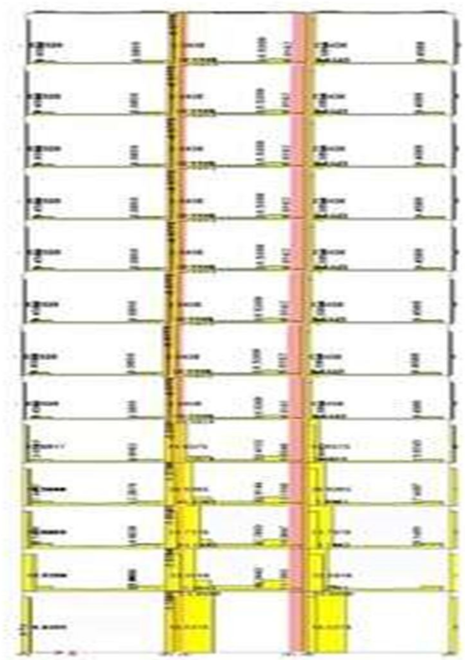

Figure: Shows shear Force 2-2

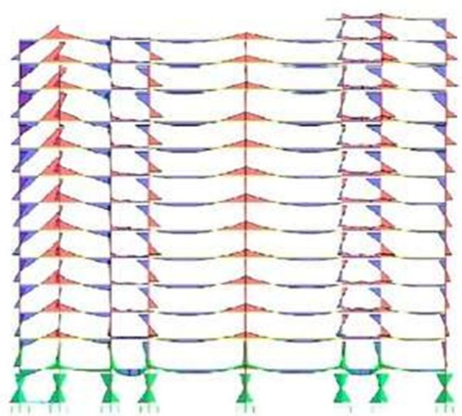

Figure 4: Shows Shear Force and Bending Moment

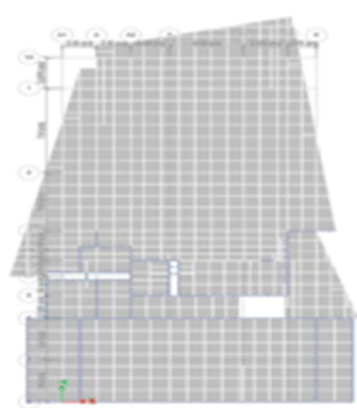

Figure 5: Shows Mesh diagram after stressing

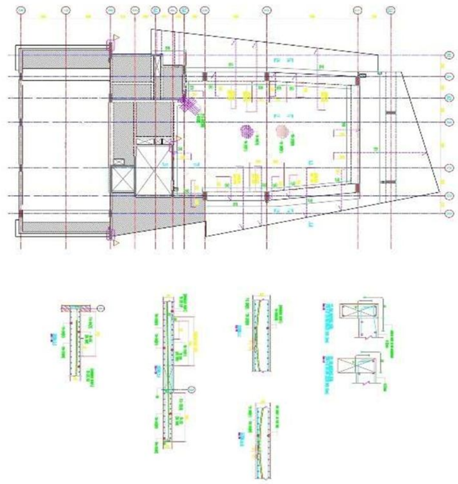

Figure 6: Shows the typical reinforcement details of the structure

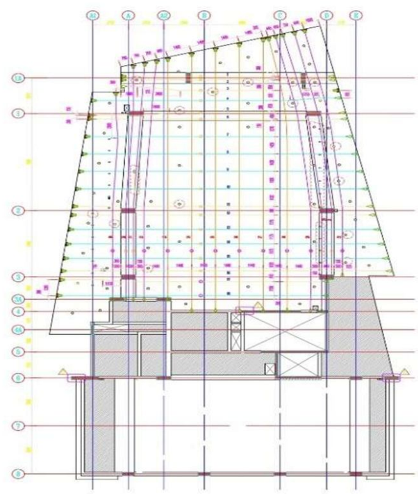

Figure 7: Shows the typical tendon layout of the structure

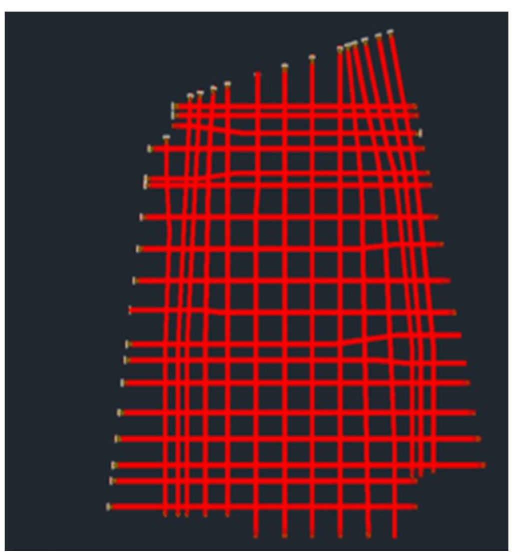

Figure: Shows the tendon line of the structure.

Losses occurred in post tensioning for flat slab and drop slab:

a) Losses happened because of erosion of the ligament in its conduit
b) Losses happened because of immediate distortion of the substantial; coming about out of non-synchronous tensioning of a few ligaments (versatile misfortune).
c) Losses happened because of Anchorage pull-in.
d) Losses happened because of conceded substantial shrinkage.
e) Losses happened because of creep disappointment of cement.
f) Losses happened because of unwinding of Prestressing steel.

V. RATE ANALYSIS

A. Purpose of Rate Analysis

1) To determine the actual cost per unit of items.
2) To examine the item for economic processes and economic uses of material
3) Involve in making the item.

VI. FINAL RESULTS

A. Direct Stress- Flat Slab-1.93, Drop Slab-2.3

Report of direct prestress, tendon eccentricity, applied loads & extreme stresses

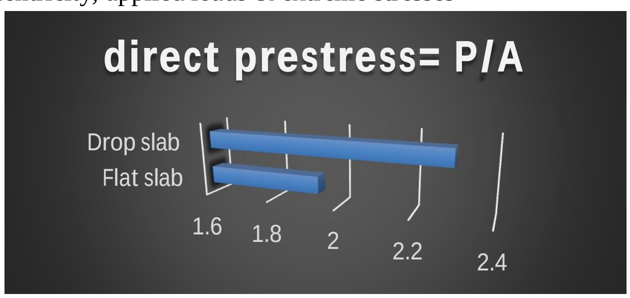

Chart: Shows Direct prestress for flat and drop slab.

B. Tendon Eccentricity= Pe/Zt

Top fiber for flat slab and drop slab- 2.45 & 2.65
Bottom fiber for flat slab and drop slab- 3.96 & 4.15

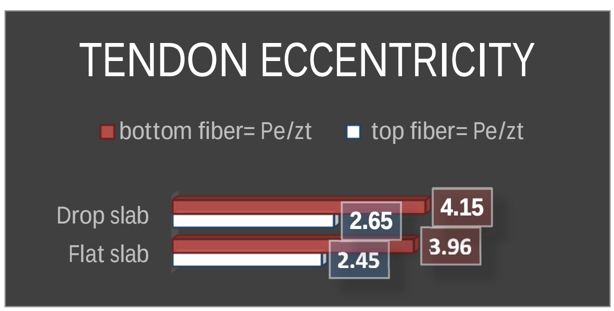

Chart: Shows Tendon eccentricity for flat and drop slab

C. Applied Loads=M/zt

Top fiber for flat slab and drop slab- 7.75 & 7.9
Bottom fiber for flat slab and drop slab- 12.51 & 12.9

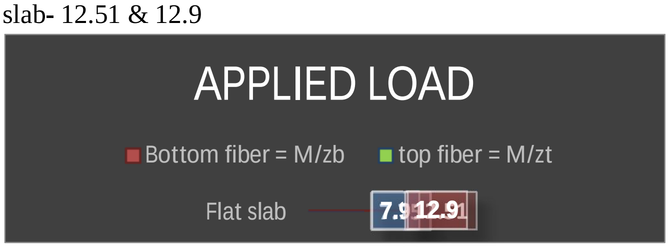

Chart: Shows the applied loads for flat and drop slab.

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D. Extreme Stresses

Extreme Top fiber for flat slab and drop slab- 10.49 & 11.15

Extreme Bottom fiber for flat slab and drop slab- -3.35 & -3.65

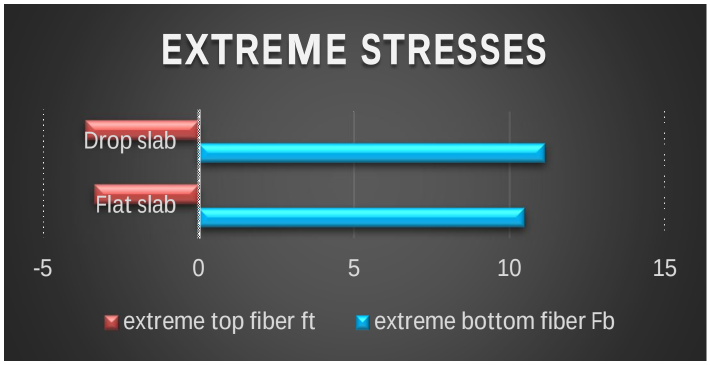

Chart: shows the extreme stresses for flat and drop slab.

Note: -ve sign indicates tensile stresses.

REPORT ON LOSSES

Noted Losses	flat slab (Mpa)	drop slab (Mpa)
friction	1245	1100
instantaneous deformation	2.5	2.5
anchorage pull	152	120
creep and shrinkage	174.5	145
relaxation of prestressing steel	45	40

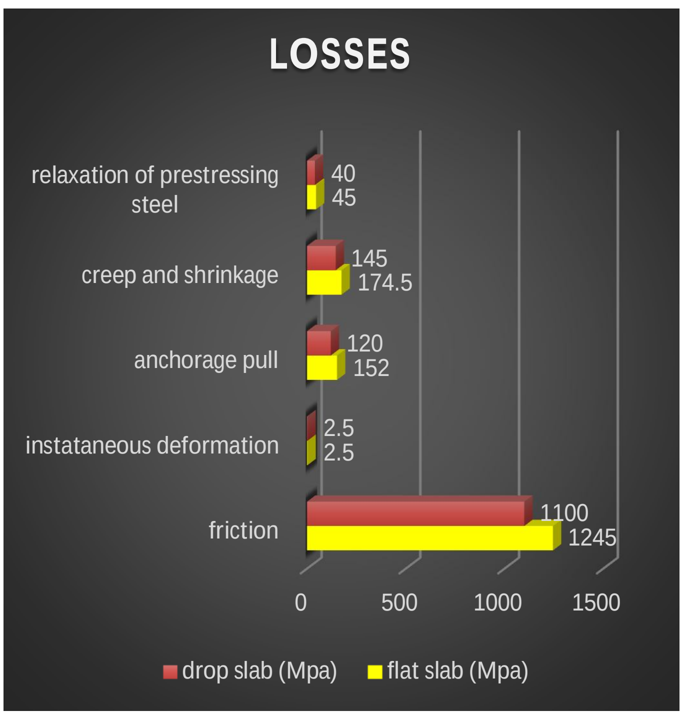

Chart: Showing stress losses for flat and drop slab

Chart Representation for Consumption of Concrete, Formwork and Reinforcement:

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Concrete consumption in cum and percentage in savings:

CONCRETE CONSUMPTION	CONCRETE IN CUM	PERCENTAGE % DIFFERENCE	RESULTS IN SAVINGS %
CONVENTIONAL METHOD	2039.34	100	NIL
FLAT SLAB	1659.34	83.91	18.63
WITH DROP FLAT SLAB	1679.34	88.47	17.65

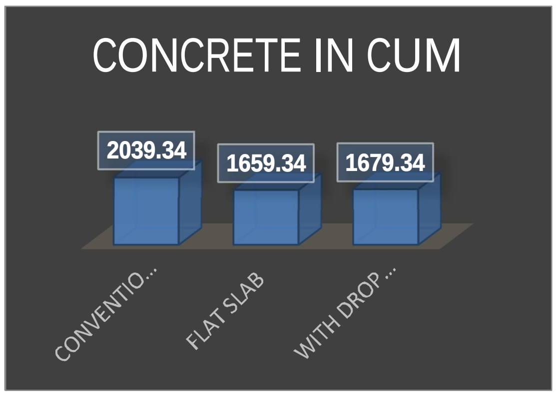

Chart: Shows the consumption of the concrete in CUM

Formwork consumption in cum and percentage in savings:

FORMWORK CONSUMPTION	FORMWORK IN SQM	PERCENTAGE % DIFFERENCE	RESULTS IN SAVINGS %
CONVENTIONAL METHOD	18650	100	NIL
FLAT SLAB	15650	83.91	16.09
WITH DROP FLAT SLAB	16500	88.47	11.53

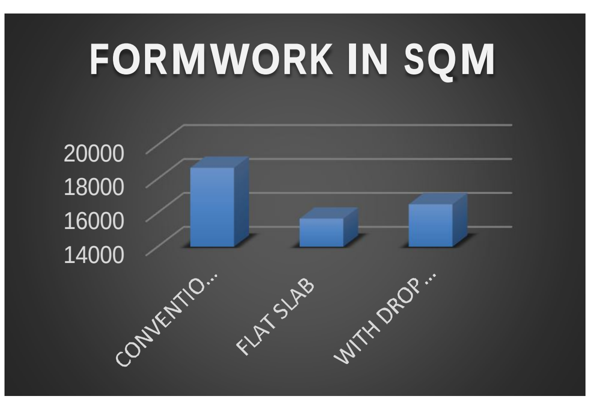

Chart :Shows the consumption of the formwork in SQM

Reinforcement consumption in cum and percentage in savings:

Fe 550 CONSUMPTION	REINFORCEMENT IN MT	PERCENTAGE % DIFFERENCE	RESULTS IN SAVINGS %
CONVENTIONAL METHOD	340	100	NIL
FLAT SLAB	240	70.59	29.41
WITH DROP FLAT SLAB	300	88.24	11.76

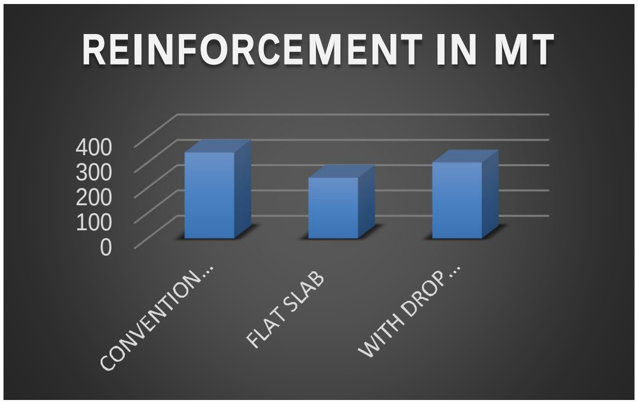

Chart: Shows the consumption of the reinforcement in MT

DIFFERENCE IN COST ESTIMATION FOR SHELL AND CORE:

METHOD	INVESTED AMOUNT
CONVENTIONAL METHOD	4,73,27,825.00
FLAT SLAB	4,26,95,825.00
WITH DROP FLAT SLAB	4,49,75,075.00

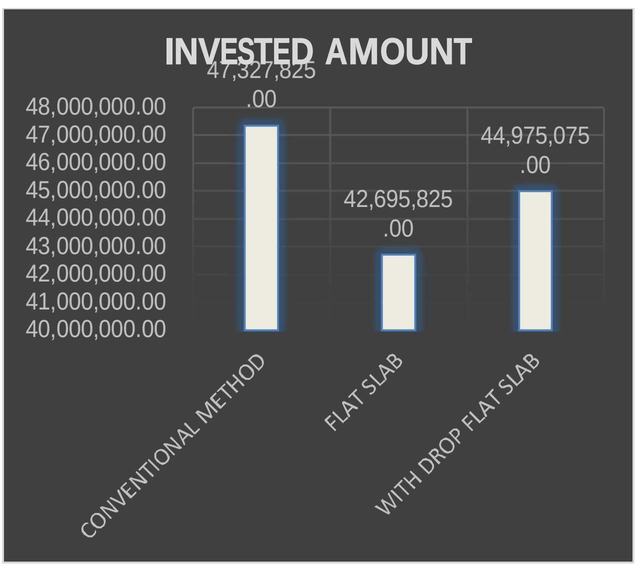

Chart: Shows difference in cost estimation for conventional and PT slabs

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. INVESTED AMOUNT

METHOD	INVESTED AMOUNT	REDUCTION IN PERCENTAGE %
CONVENTIONAL METHOD	4,73,27,825.00	100%
FLAT SLAB	4,26,95,825.00	90%
WITH DROP FLAT SLAB	4,49,75,075.00	95%

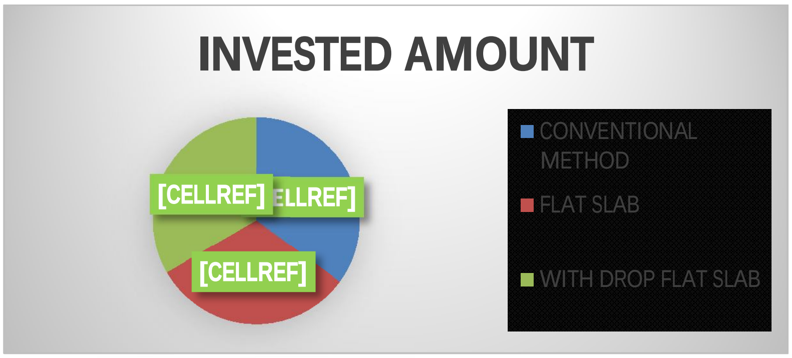

Chart: shows the difference in economical method (% of amount in savings)

1) The conventional method is much higher when compared to other methods
2) The Flat slab without drop is much economical when compared to different methods, whereas it shows 10% reduction is cost estimation and expenditure on the project and possess good strength when against conventional method.
3) The Flat slab with drop shows 5% reduction in cost estimation as compared to conventional method. Whereas it can still be more economical by reduction in depth of the slab and providing more spacing between drops c/c.

Note: For huge corporate and commercial complex, Capitals slabs are much more economical and practically safe with good key factors when compared to all the methods.

VII. FINAL OUTCOME

1) The base shear and lateral forces of PT building with drop is greater than the PT flat slab building, which is safer in the seismic Zones 3,4 & 5.
2) The drop slab building has smaller deflections when compared to all the slabs.
3) The steel consumption in the drop is more when compared to conventional and PT flat slab.
4) The life span of the drop panel slab in greater when compared to PT flat slab and conventional slab.
5) According the graph achieved, the Direct stresses, Tendon eccentricity, applied load and Extreme stresses in more in PT slab with drop as compared to PT Flat slab.
6) The Losses achieved in the graph is less in the PT slab with drop against the PT flat slab.
7) “Economic variation”.
8) By achieving the result, The Flat slab is more economical than the conventional slab and capital slab
9) The consumption of the formwork is less in the flat slab when compared to the capital slab and conventional slab.
10) The consumption of the concrete and steel can be still reduced by decreasing the depth of the slab in the capital PT slab.
11) The more clearance height in between the floor to floor gives the good position, for interior works.
12) Due to post-tensioning of level plate chunk, there is no much impact on hub force except for shear and second on segment increments.
13) The diversion at focus of level plate chunk is controlled more successfully by illustrative and Trapezoidal ligament than three-sided ligament.

14) Post-tensioned plan of level chunk permits almost 30% decrease in steel and 19 % decrease in concrete when contrasted with Reinforced concrete substantial level piece.
15) Result achieved against the PT flat slab allows nearly 17% reduction in formwork when compared to the conventional slab.
16) Result achieved that the consumption of concrete, formwork and reinforcement is merely same when compared both PT Flat slab and PT flat slab with drop panel.

VIII. FINAL CONCLUSION

1) The importance of the post tensioning method in the present market which is widely adopted as the best method for huge commercial complex building and corporate offices and other high-rise buildings.
2) The study of the post tensioning methods, which gives immense knowledge in the present era to be a competitor in this complex world.
3) The post tensioning methods are fast moving methods to reach the schedule of construction in time.
4) The Construction of buildings, bridges, culverts, metro-stations, metro bridges and many more are constructed in pre-tensioned and post-tensioned method.
5) Every civil engineer should have an immense knowledge regarding pre-tensioned and post tensioned, which gives a high weightage and more confidence in the present market.

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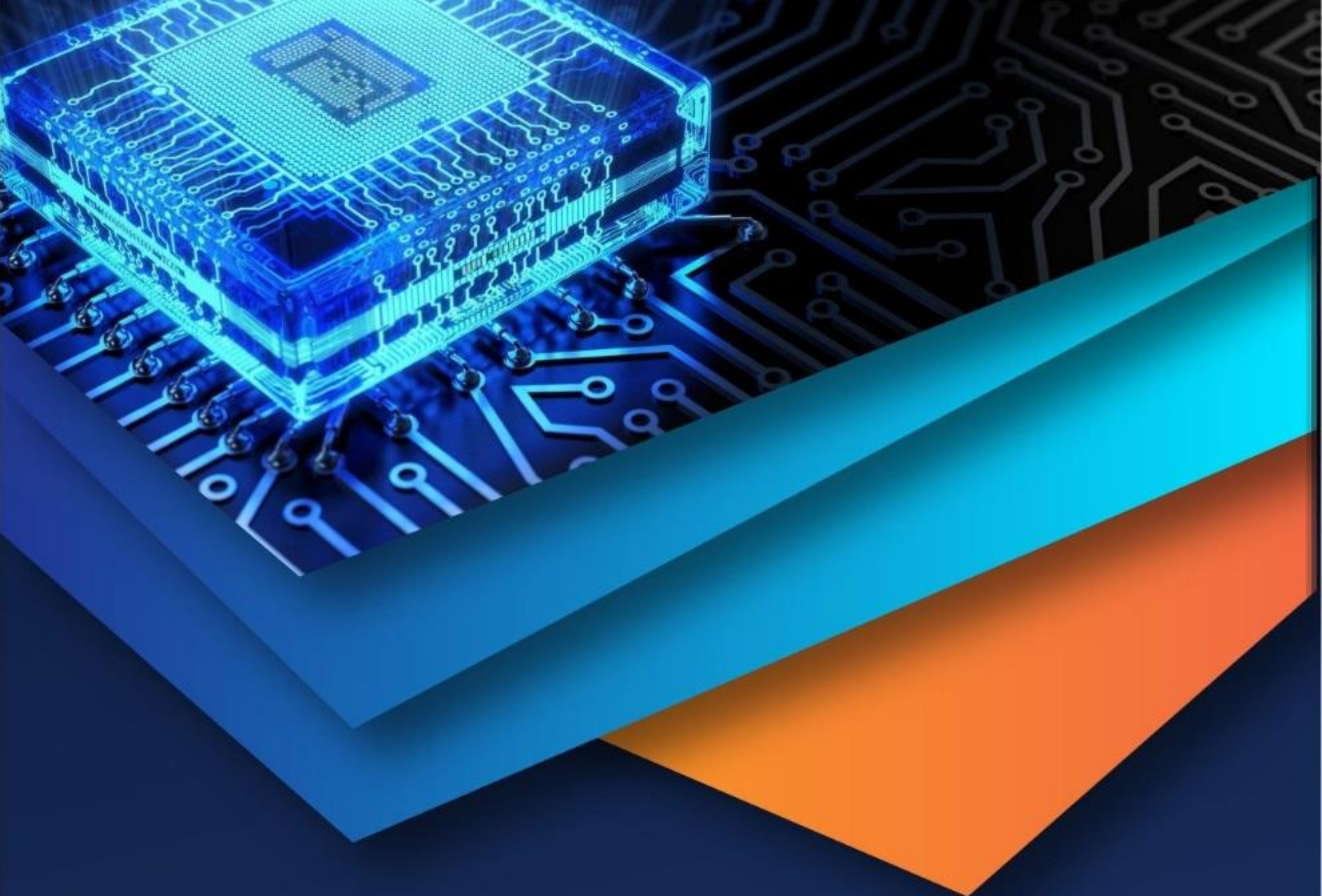

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