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Effect Of Steel And Concrete Due Toearthquake, Wind, Selfweight & Imposed Loads On A Strcture Upto Cellar+G+4 Floors

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ABSTRACT

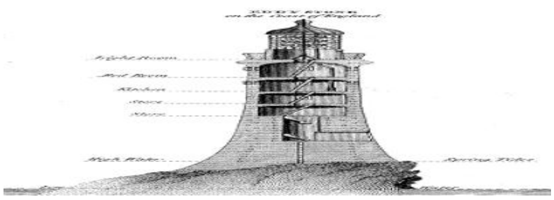
The business complex to be planned is CELLAR+ G+4 Floors each floor having a stature of 3.3mts with arrangement of lift on stair case. The unmistakable traverse of 40' in meters 12.192, the dirt condition is hard morrum at a profundity of 6' in meters 1.82 from characteristic ground level Here the task demonstrates the impact of steel and cement because of EARTHQUAKE LOADS ,WIND LOADS ,SELF WEIGHT,AND IMPOSED LOADS ON STRUCTURE UPTO CELLAR+G+4 The investigation of the structure is finished by taking the mixes of burdens like (LIVELOAD+DEADLOAD,LIVELOAD+DEADLOAD+EARTHQUAKELAOD,LIVELOAD+DEADLOAD+WINDLOAD,LIVELOAD+DEADLOAD+WINDLOAD+EARTHQUAKELOAD)The outlines are finished by taking 25load blends .The examination ,plan &detailing are finished with the assistance of "STRUDS" programming The investigation and outline of the business building is done physically and again cross checked with studs programming The principle feature of this task is demonstrates the variety in constructional amounts (solid, steel) in different individuals from the business building like shafts ,sections ,pieces ,footings, the venture has additionally given definite illustration of different auxiliary individuals, for example, pillars ,segments ,chunks ,&footings The venture additionally demonstrates the different constructional amounts by thinking about different sorts of load mixes (i.e.., DL+LL, DL+LL+WL, DL+LL+WL+EQL, DL+LL+EQL) here each heap mix demonstrates the diverse constructional amounts by applying distinctive kinds of burdens in structures With the assistance of studs programming the yields are properly shown as DXF FORMAT.

1. INTRODUCTION

Studs is a perfect programming answer for the use of basic architects for the examination of 2d&3d auxiliary and the outline of various r.c.c/steel segments, for example, chunks, pillars, segments, footings and trusses with configuration running on windows 95/98/2000/xp/nt vista and windows 7 stages. Studs have an in-constructed graphical information generator to show the geometry of building structure. The fundamental approach is to make 2d story designs (plane lattices) and furnish segments area with the assistance of which the program consequently produces 2d plane casings and 3d space outline. Fitting material and segment properties can be made or appointed from stud's libraries. Standard limit condition and diverse sorts of burdens would then be able to be connected. At each progression of the demonstrating procedure, you will get graphical confirmation of your advance. You never need to stress over committing an error as the erasing or altering of any piece of the geometry is conceivable utilizing accessible menu orders. Prompt visual criticism gives an additional level of affirmation that the model you developed concur with your expectations. At the point when your structure geometry is finished, studs perform investigation utilizing firmness lattice technique and limited component strategy for most extreme arrangement, precision, speed and dependability. Documentation is dependably an imperative piece of Investigation and outline and the windows clients interface upgrade the outcomes and streamline the exertion. Studs gave coordinate amazing printing and plotting of both content and illustrations information to record your model and results. Our undertaking essentially manages the investigation and plan of G+ 4 businesses working with basement and lift arrangement and stair case. The dirt or ground condition is considered as hard morrum surface. The investigation and outline of the business building is done physically and is additionally cross checked with the assistance of studs programming. In manual examination and outline of the business constructing the accompanying burden blends are considered: DEAD LOAD+LIVE LOAD DEAD LOAD+LIVE LOAD+WINDLOADDEADLOAD+LIVELOAD+EARTHQUAKELOAD DEAD LOAD+LIVE LOAD+WIND LOAD+EARTH QUAKE LOAD With the assistance of programming the examination and configuration is improved the situation 25 distinctive load mixes. For the plan reason the accompanying is – codes are utilized: IS 456-2000 IS 875-1987 PART-1 IS 875-1987 PART-2 IS 875 1987 PART-3 IS 1893-2002 With the assistance of studs programming the basic illustrations of each auxiliary part are produced in dxf organize. The manual exercises are contrasted and that of the product's yield and all outcomes are appropriately shown

2. LITERATURE REVIEW

JHON SMEATON (1793): Discovered a more present day technique for creating pressure driven lime for bond. He utilized limestone containing mud that was let go until the point that it transformed into clinker, which was then ground it into powder. He utilized this material in the noteworthy modifying of the Eddy stone Lighthouse in Cornwall, England.



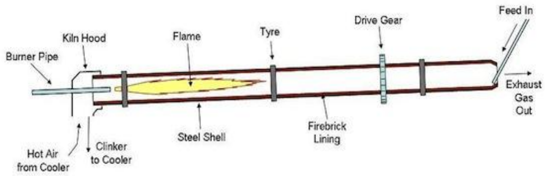
Smeaton's variant (the third) of the Eddy stone Lighthouse, finished in 1759.

Following 126 years, it flopped because of disintegration of the stone whereupon it stood. JOSEPH ASPDIN (1824): an Englishman imagined Portland bond by consuming finely ground chalk and mud in a furnace until the point that the carbon dioxide was expelled. It was named "Portland" concrete since it looked like the brilliant building stones found in Portland, England. It's broadly trusted that Asp commotion was the first to warm alumina and silica materials to the point of verification, bringing about combination. Amid verification, materials progress toward becoming glass-like. Asp commotion refined his strategy via precisely proportioning limestone and dirt, pounding them, and after that consuming the blend into clinker, which was then ground into completed bond.

Ovens: - In the beginning of Portland bond generation, ovens were vertical and stationary.IN 1885 ENGLISH ENGINEER: Developed a more effective furnace that was level, marginally tilted, and could turn. The rotating furnace gave better temperature control and completed a superior occupation of blending materials. By 1890, rotating ovens overwhelmed the market. GEORGE BARTHOLOMEW (1891): Poured the main solid road in the U.S., regardless it exists today. The solid utilized for this road tried at around 8,000 psi, which is about double the quality of present day concrete utilized as a part of private development.

The Ingalls Building in Cincinnati, Ohio

THOMAS EDISON (1909): Received a patent for the first long kiln. This kiln, installed at the Edison Portland cementWorksin,NewJersey,was150feetlong.Thiswasabou t70feetlonger than the kilns in use at the time.



A rotary kiln

RISORGIMENTO (1911): the Bridge was built in Rome. It spans 328 feet.

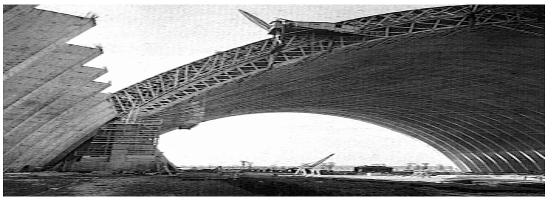
Rome's Risorgimento Bridge

ASTM (1913): The principal heap of prepared blend was conveyed in Baltimore, Maryland. After four years, the National Bureau of Standards (now the National Bureau of Standards and Technology) and the American Society for Testing and Materials (now ASTM International) setUp a standard recipe for Portland bond. MATTE **TRUCCO (1915):** assembled the five-story Fiat-LingottiAuto works in Turin utilizing strengthened cement. The building had a car test track on the rooftop

The Fiat-LingottiAuto works in Turin, Italy

EUGENE FREYSSINET (1921): Was a French engineer and pioneer in the use of reinforced- concrete construction. He built two gigantic parabolic-arched airship hangars at Orly Airport in Paris. In 1928, he was granted a patent for pre-stressed concrete.

The parabolic-arched airship hangar at Orly Airport in Paris, France



Airship hangar construction

IN 1930: Air-entraining operators were produced that incredibly expanded solid's protection from solidifying and enhanced its workability. Air entrainment was an essential advancement in enhancing the sturdiness of current cement. Air entrainment is the utilization of specialists that, when added to concrete amid blending, make numerous air bubbles that are to a great degree little and firmly dispersed, and the vast majority of them stay in the solidified cement. Concrete solidifies through a substance procedure called hydration. For hydration to happen, concrete must have a base water-to-bond proportion of 25 sections of water to 100 sections of bond. EDUEADO TORROJA (1930): the Spanish specialist planned a low-ascent arch for the market at Algeciras, with a 3½-inch thickness that spread over 150 feet. Steel links were utilized to shape a pressure ring. At about a similar time, Italian Pier Luigi Nervi started constructing shelters for the Italian Air Force, appeared in the photograph beneath

Cast-in-place hangars for the Italian Air Force

In 1935, the Hoover Dam: was finished in the wake of pouring roughly 3,250,000 yards of cement, with an extra 1,110,000 yards utilized as a part of the power plant and other dam-related structures. Remember this was under 20 years after a standard equation for bond was built up.

Fantastic Coulee Dam:-IN 1942The Grand Coulee Dam in Washington: is the biggest solid structure at any point fabricated. It contains 12 million yards of cement. Exhuming required the expulsion of more than 22 million cubic yards of soil and stone. To decrease the measure of trucking, a transport line 2 miles in length

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was built. At establishment areas, grout was drawn into openings bored 660 to 880 feet profound (in rock) keeping in mind the end goal to fill any gaps that may debilitate the ground underneath the dam. To dodge exhuming breakdown from the heaviness of the overburden, 3-inch channels were embedded into the earth through which chilled fluid from a refrigerating plant was pumped.

The Grand Coulee Dam

DANIEL BERNOULLI, WITH JOHANN (JEAN) BERNOULLI (1667– 1748): is additionally credited with defining the hypothesis of virtual work, giving an instrument utilizing balance of powers and similarity of geometry to take care of basic issues

DANIEL BERNOULLI (1700-1782): Specifically, he built up the Euler-Bernoulli bar condition with Daniel Bernoulli and in around 1750 - the principal hypothesis basic most basic building plan. JEAN BERNOULLI (1717):wrote to Pierre Varignon clarifying the standard of virtual work, while in 1726 Daniel Bernoulli composed of the "arrangement of powers".

3. MANUAL ANALYSIS

SLAB LOADS:-Slab Load on Terrace Floor:

Live load = 1.5kn/m2(FROM IS 875 PART-2)

Dead load = thickness of slab density of cement

Dead load = 0.15 X 25 = 3.75kn/m2

Floor complete load = 20X0.05=1.02 kn/m2

Add up to stack = 4.77+1.5=6.27kn/m2

Slab Load on First Floor:-

Live load for all floor = 4kn/m2

Live load = 4kn/m2 (FOR COMMERCIAL BUILDING)(From IS875 PART-2)

Dead load = 0.15X25= 3.75kn/m2

Floor completes stack = 1.02kn/m2

Add up to stack = 4.77+4 = 8.77kn/m2

Section Load on second Floor:-

Live load = 4kn/m2

Dead load = 0.15X25 = 3.75kb/m2

Floor completes stack = 20.40X0.05 = 1.02kn/m2

Add up to stack = 4.77+4 =8.77 kn/m2

Piece Load on third Floor:-

Live load = 4kn/m2

Dead load = 0.15X25 = 3.75kn/m2

Floor completes stack = 20.40X0.05 = 1.02kn/m2

Add up to stack = 4.77+4 = 8.77kn/m2

Piece Load On4th Floor:-

Live load = 4kn/m2

Dead load= 0.15X25 = 3.75kn/m2

Floor completes stack = 20.40X0.05 = 1.02kn/m2

Add up to stack = 4.77+4 = 8.77kn/m2

Chunk Load on Cellar:-

Live load = 4kn/m2

Dead load= 0.15X25 = 3.75kn/m2

Floor completes stack = 20.40X0.05 = 1.02kn/m2

Add up to stack = 4.77+4 = 8.77kn/m2.

SELF WEIGHT OF BEAM LOADS:- Bar Load on Terrace:-

Load on Parapet divider = 0.115X1X19 = 2.185 kn/m

Self weight of Beam = 0.23X0.3X25= 1.725 kn/m

Piece stack = 4.77+1.5=6.27kn/m

Add up to stack = 10.18kn/m.

Load on First Floor:-

Divider parcel = 0.23X2.85X19 = 12.45kn/m

Self weight of bar = 0.23X0.45X25= 2.58kn/m

Piece stack = 8.77kn/m

Add up to stack = 23.8kn/m.

Load on second Floor:-

Divider partition = 0.23X2.85X19 = 12.45kn/m

Self weight of pillar = 0.23X0.45X25 = 2.58kn/m

Section stack = 8.77kn/m

Add up to stack = 23.8kn/m.

Load on third Floor:-

Divider partition = 0.23X2.85X19 = 12.45kn/m

Self weight of pillar = 0.23X0.45X25 = 2.58kn/m

Section stack = 8.77kn/m

Add up to stack = 23.8kn/m

Load on fourth Floor:-

Divider partition = 0.23X2.85X19 = 12.45kn/m

Self weight of pillar = 0.23X0.45X25 = 2.58kn/m

Section stack = 8.77kn/m

Add up to stack = 23.8kn/m

Load on Cellar:-

In basement there is no divider introduce

Self weight of bar = 023X0.45X25 = 2.58kn/m

Piece stack = 8.77kn/m

Add up to stack = 11.35kn/m.

Load on Plinth Area:-

[Slab stack = 0] Live load = 0 Dead load = 0

Floor complete = 0 {here every one of the heaps Droves to the soils}

Plinth pillar = 0.23X0.23X25 = 1.32kn/m

Divider partition = 0.23X2.85X19 = 12.45kn/m

Add up to stack = 12.45+1.32 = 13.77kn/m Say 14kn/m.

4. DESIGN OF DOG LEGGED STAIR CASE

Size of stair case ¬¬¬¬=7'X6'

Going length = 2.13×0.50

Landing = 4'

Accept tread = 300mm

Rise = 150mm, story tallness = 3.3m

Consequently tallness of each flight = 3300/2 = 1650mm

No of rises required = 1650/150 = 11

Treads = no of rises - 1 = 12 – 1 = 11.

Genuine ascent of each ascent = 1650/12 = 137.50mm

Give the bearing flight a chance to be 150mm.

Successful Horizontal Span:-

2.63+0.60+0.15/2 = 3.305m

Accept thickness of midsection section = 150mm

Heap of midriff section = 0.15X25 = 3.75kn/m2

Floor completes = 1kn/m2

Add up to stack = 4.75kn/m2.

Comparing per sq.m length on design =√(R^2+T^2)/T = √(〖150〗^2+〖300〗^2)/300 X4.75= 5.31kn/m

Dead Load of Steps = 137.50/2 = 68.75mm = 0.06875X25 = 1.718

Floor completes = 1kn/m2

Live load = 4kn/m2

Add up to stack = 12.028.

Greatest Bending Moment per meter width of stair = M =(wl^2)/8

M = 12.028X〖3.305〗^2/8 = 16.422kn/m

Factorial Moment Mu = 1.5XM

Mu = 1.5X16.422 = Mu = 24.634kn/m.

Figuring Depth By Using Grade Of Steel:-

Mu = 0.138XfckXbd^2

24.634X〖10〗^6= 0.138X20X1000Xd^2

d = √(24.634X〖10〗^6)/0.138X20X1000

d = 94.47mm

Roughly d = 100mm.

Figuring Area Of Steel:-

Mu = 0.87XfyXAstXd (1 - Ast/bXd Xfy/fck)

24.634X〖10〗^6 = 0.87X415XAstX100 (1 - Ast/1000X100 X415/20) = 36105Ast –7.49〖Ast〗^2 - 24.634X〖10〗^6 = 0 7.49〖Ast〗^2 - 36105Ast + 24.634X〖10〗^6 = 0 Ast = 822.69mm2.

5. EARTH QUAKE ANALYSIS

For first floor:-

For section stack =260.04

Shaft stack =619.437

Chunk stack =568.6

Divider stack =1975.04

Add up to LOAD =3423.117

Lumped mass =Total dead load+live stack

∑W =3423.117+605.186 = 4028.308

Vb =Cαh∑w

Vb =0.62×0.04×4028.308

Vb =99.902

For second floor:-

For segment stack =260.04

Pillar stack =619.437

Section stack =568.6

Divider stack =1975.04

Add up to LOAD =3423.117

Lumped mass =Total dead load+live stack

∑W =3423.117+605.186 = 4028.308

Vb =Cαh∑w

Vb =0.62×0.04×4028.308

Vb =99.902

For Third Floor:-

For section stack =260.04

Shaft stack =619.437

Chunk stack =568.6

Divider stack =1975.04

Add up to LOAD =3423.117

Lumped mass =Total dead load+live stack

∑W =3423.117+605.186 = 4028.308

Vb =Cαh∑w

Vb =0.62×0.04×4028.308

Vb =99.902

For Fourth Floor (For Terrace):-

For segment stack =260.04

Pillar stack =619.437

Piece stack =568.6

Divider stack =1975.04

Add up to LOAD =3423.117

Lumped mass =Total dead load+live stack

∑W =3423.117+226.92 = 3650.037

Vb =Cαh∑w

Vb =0.62×0.04×3650.037

Vb =90.520

For Ground Floor:-

For section stack =260.04

Bar stack =619.437

Piece stack =568.6

Divider stack =1975.04

Add up to LOAD =3423.117

Lumped mass =Total dead load+live stack

∑W =3423.117+605.186 = 4028.308

Vb =Cαh∑w

Vb =0.62×0.04×4028.308

Vb =99.902

For Cellar:-

There is no divider...

For section stack =260.04

Pillar stack =619.437

Section stack =568.6

Add up to LOAD =1448.077

Lumped mass =Total dead load+live stack

∑W =1448.077+605.186 = 2053.263

Vb =Cαh∑w

Vb =0.62×0.04×2053.263

Vb =50.9220

Qi=(Vb.WiHi)/(∑_(i=1)^nWiHi2)∑Wihi=4028.308X7〖.6〗^2+4028.308X10〖.9〗^2+4028.308X14〖.2〗^2+3650.037X17.5^2+4028.308X20.8^2+2053.263X24.1^2= 5576731.314

Q1=(Vb.WiHi)/(∑WiHi2)=99.902X4028.308X7.6/5576731.314 = 4.168

Q2=(Vb.WiHi)/(∑WiHi2)=(99.902X4028.308X10.9^2)/5576731.314 = 8.573

Q3=(Vb.WiHi)/(∑WiHi2)=(99.902X4028.308X14.2^2)/5576731.314 = 14.557

Q4=(Vb.WiHi)/(∑WiHi2)=(99.902X4028.308X17.5^2)/5576731.314 = 22.10

Q5=(Vb.WiHi)/(∑WiHi2)=(99.902X4028.308X20.8^2)/5576731.314 = 31.22

Q6=(Vb.WiHi)/(∑WiHi2)=(99.902X3650.037X24.1^2)/5576731.314 = 34.41

CG4 EARTHQUAKE LOAD REPORT: As per IS:1893(Part 1) - 2002

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Ahx = (z/2).(I/R).(Sax/g)

= (0.10/2).(1.00/3.00).(1.93)

= 0.03

Base shear in X Direction Vbx = Ahx x W

Vbx = 0.03 x 14293.64

Vbx = 459.88 Kn

Ahy = (z/2).(I/R).(Say/g)

= (0.10/2).(1.00/3.00).(1.93)

= 0.03

Base shear in Y Direction Vby = Ahy xW

Vby = 0.03 x 14293.64

Vby = 459.88 Kn

6. WIND LOAD COEFFFICIENTS

WIND LOAD CAN BE CALCULATED AS PER IS 875 PART-3 CLAUSE NO (5.3.1):-Vz = VBXK1XK2XK3 For Hyderabad

Vb = 444m/s (AS PER CLAUSE NO 5.2)(APPENDIX A)

K1 = 1.0, K2 = cat3, clasA = 0.91, K3 = 1.0,

Vz = VbxK1xK2xK3 = 44X1.0X0.91X1.0 = 40.4

→DESIGN WIND PRESSURE (AS PER CLAUSE NO 5.4)

Pz =0.6Xz^2 = 0.6X40.04^2 = 961.92N/m2

h/w = 12.192/12.192 = 1

h/w = 12.192/18.288 = 0.66

1<l/w<3/2.

Wind angle	A	B	C	D Localcpe
θ°	0.7	-0.2	-0.5	-0.5
90°	-0.5	-0.5	0.7	-0.2

Case (i):-

FA = 0.7X961.92XA = 673.344

FB = - 0.2X961.92XA = - 192.384

FC = - 0.5X961.92XA = - 480.96

FD = - 0.5X961.92XA = - 480.96

Case (ii):-

FA = - 0.5X961.92XA = - 480.96

FB = - 0.5X961.92XA = - 480.96

FC = 0.7X961.92XA = 673.344

FD = - 0.2X961.92XA = - 192.384

Case (iii):-

FA = - 0.2X961.92XA = - 192.384

FB = 0.7X961.92XA = 673.344

FC = - 0.5X961.92XA = - 480.96

FD = - 0.5X961.92XA = - 480.96

Case (iv):-

FA = - 0.5X961.92XA = - 480.96

FB = - 0.5X961.92XA = - 480.96

FC = - 0.2X961.92XA = - 192.384

FD = 0.7X961.92XA = - 673.34

7. ANALYSIS RESULTS OF THE STRUCTURE

footing group	column nos.	concrete grade	steel grade	concrete volume m3				reinforcement weight (kg)			formwork m3	
				straight	slant	pedestal	total	||lar to x	||lar to y	total	each	total
fg1	c1	m20	fe415	2.934	0.000	0.272	3.206	27.34	36.600	63.945	5.088	5.088
fg2	c2	m20	fe415	3.737	0.000	0.300	4.036	35.468	44.701	80.170	6.000	6.000
fg3	c3	m20	fe415	2.655	0.000	0.244	2.899	25.103	30.963	56.065	4.725	4.725
fg4	c4	m20	fe415	3.631	0.000	0.272	3.903	35.468	43.436	78.904	5.910	5.910
fg5	c5	m20	fe415	2.473	0.000	0.244	2.716	26.723	30.630	57.353	4.450	4.450
fg6	c6	m20	fe415	3.034	0.000	0.244	3.278	34.336	38.753	73.089	5.170	5.170
fg7	c7	m20	fe415	2.362	0.000	0.244	2.606	27.966	29.964	57.930	4.350	4.350
fg8	c8	m20	fe415	3.309	0.000	0.244	3.553	39.219	41.749	80.969	5.520	5.520
fg9	c10	m20	fe415	2.906	0.000	0.244	3.150	35.557	40.063	75.620	5.060	5.060
fg10	c11	m20	fe415	2.906	0.000	0.244	3.150	31.606	35.845	67.452	5.060	5.060
fg11	c14	m20	fe415	3.039	0.000	0.244	3.282	33.582	37.954	71.536	5.290	5.290
			sum	--	--	--	35.779	--	--	763.032	--	56.623

Diameter wise Breakup of Reinforcement

Diameter (mm)	Length (m)	Weight (kg)	Cost / kg (Rs.)	Amount(Rs.)
12.00	859.45	763.032	19.00	14497.61

Concrete Summary Table

Concrete Grade	Quantity / m^3	Cost / m^3	Amount (Rs.)
M20	35.779	1515.83	54235.57

8. CALCULATING INDIVIDUAL AND OVERALL QUANTITES OF THE STRUCTURE

Footing steel quantities in kgs:-

NO .OF FLOORS	FLOOR HIEGHT	LOAD COMBINATION (LD)	LOAD COMBINATION (LDE)	LOAD COMBINATION (LDW)	LOAD COMBINATION (LDEW)
CG	@ 1.82 4.82 7.82	229.92 229.87 229.87	238.739 238.739 238.739	228.0 228.0 228.0	238.738 238.738 238.738
CG1	@ 1.82 4.82 7.82 10.82	228.377 228.377 228.377 228.377	374.099 374.099 374.099 374.099	227.538 227.538 227.538 227.538	374.099 374.099 374.099 374.099
CG2	@ 1.82 4.82 7.82 10.82 13.82	379.844 379.844 379.844 379.844 379.844	384.444 384.444 384.444 384.444 384.444	357.01 357.01 357.01 357.01 357.01	368.106 368.106 368.106 368.106 368.106
CG3	@ 1.82 4.82 7.82 10.82 13.82 16.82	461.239 461.239 461.239 461.239 461.239 461.239	509.491 509.491 509.491 509.491 509.491 509.491	461.239 461.239 461.239 461.239 461.239 461.239	545.516 545.516 545.516 545.516 545.516 545.516

CG4	@ 1.82	810.074	816.156	816.156	763.032
	4.82	810.074	816.156	816.156	763.032
	7.82	810.074	816.156	816.156	763.032
	10.82	810.074	816.156	816.156	763.032
	13.82	810.074	816.156	816.156	763.032
	16.82	810.074	816.156	816.156	763.032
	19.82	810.074	816.156	816.156	763.032

9. GRAPHICAL VALUES FOR BOTH INDIVIDUAL AND OVERALL

Column steel quantities in tonnes:-

no. of floors	load combination (ld)	load combination (lde)	load combination (ldw)	load combination (ldwe)
cg	2.175	2.738	2.199	2.738
cg1	3.657	3.980	3.494	3.980
cg2	5.845	7.409	5.845	6.512
cg3	9.326	11.442	9.326	12.235
cg4	10.724	16.843	10.503	14.436

Slab steel quantities in tonnes:-

n0 .0f floors	load combination (ld)	load combination (lde)	load combination (ldw)	load combination (ldwe)
cg	1.436	1.436	1.436	1.436
cg1	2.188	2.155	2.175	2.155
cg2	2.900	2.900	2.900	2.900
cg3	3.625	3.625	3.625	3.625
cg4	4.310	4.310	4.462	4.310

10. FLOOR WISE CONCRETE QTY IN M3/SFT:-

Cellar ground floor:-

conc grade	floor name	concrete qty in m3/sft
m20	cg	470.546/4800=0.098m3/sft

cellar+ground+ 1 floor:-

CONC GRADE	FLOOR NAME	CONCRETE QTY IN M3/SFT
M20	CG1	708.972/7200=0.9846M3/SFT

Floor wise steel qty in kg/sft:-

Cellar+ground floor

steel grade	floor name	steel qty in kg/sft
fe 415	cg	32465.506/4800 =6.436 kg/sft

Cellar+ground+ 1 floor:-

steel grade	floor name	steel qty in kg/sft
fe 415	cg1	54181.358/7200 =7.525kg/sft

11. OVERALL CONCRETE QTY IN M3/SFT:-

Total concrete qty for load combination (l.d) =total concrete qty /total site area:-

conc grade	load combination	concrete qty in m3/sft
m20	l.d	1301.383/4800=0.271m3/sft

Steel qty for load combination (l.d)=total steel qty /total site area:-

steel grade	load combination	steel qty in kg/sft
fe 415	l.d	94742.815/16800=5.73 kg/sft

12. REQUIRED CONCRETE QTY FOR EACH ELEMENT AS PER DESIGN:-

floor level	member details	concret qty in m^3
	footing	152.742

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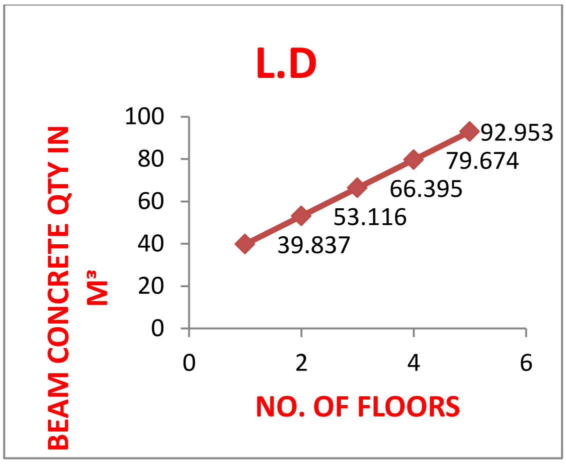
cg	columns	39.624
	beams	159.348
	slabs	118.832
total		470.546

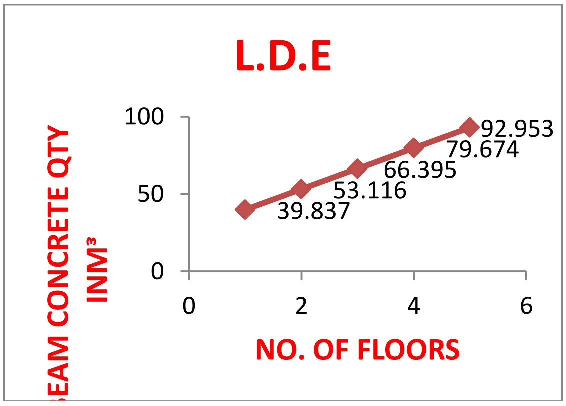
13. REQUIRED STEEL QTY FOR EACH ELEMENT AS PER DESIGN:-

floor level	member details	steel qty in kg/m3
cg	footing	2806.244
	columns	9853.14
	beams	14058.298
	slabs	5747.8245
total		32465.506
floor level	member details	steel qty in kg/m3
cg1	footings	4816.452
	columns	15113.6
	beams	25576.273
	slabs	8675.033
total		54181.358

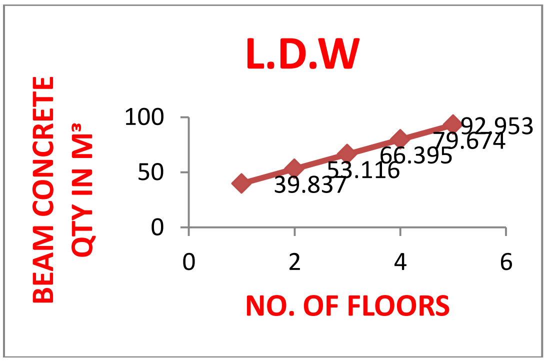
14. GRAPH OF CONCRETE REQUIRED FOR BEAMS FOR L.D CASE FOR VARIOUS FLOORS



Graph of concrete required for beams for l.d.e case for various floors



Graph of concrete required for beams for l.d.w case for various floors:-



Graph of concrete required for beams for l.d.w.e case for various floors:-

Where

l.d → live load and dead load
l.d.e → live load dead load and earthquake load
l.d.w → live load, dead load, and wind load
l.d.w.→ live load, dead load, wind load and earthquake load.

15. CONCLUSION

The utilization of cement for shafts for the heap case L.D, L.D,E, L.D.W, L.D.W.E, can be anticipated with a straight line y=mx+c where m and x changes for stack cases There is a chunk would not be produced the results of EARTHQUAKE LOAD and WIND LOAD as it would be composed without that impact.

floor level	member details	concrete qty in m^3 with %
cg	footings	152.742 (43.42)
	columns	39.624 (11.26)
	beams	159.348 (45.3)
total		**351.114 (99.986)**

floor level	member details	concret qty in m^3 with %
cg1	footings	266.46 (50.20)
	columns	51.8 (9.76)
	beams	212.464 (40.03)
total		**530.724 (99.99)**

floor level	member details	steel qty in kgs with %
cg2	footing	7493.445 (11.358)
	columns	25613.3 (38.32)
	beams	32865.631 (49.81)
total		**65972.376 (99.98)**

floor level	member details	steel qty in kgs with %
cg3	footing	11864.91 (12.20)
	columns	42330.78(43.53)
	beams	43035.767 (44.26)
total		**97231.457 (99.99)**

floor level	member details	steel qty in kgs with%
cg4	footing	22437.926 (18.55)
	columns	46507.3 (38.467)
	beams	57954.63 (42.97)
total		**120899.856 (99.99)**

16. FUTURE SCOPE OF PROJECT

The venture can be intended for most noticeably awful load mix. Stair case configuration has not done in the product so new programming can be intended for the plan of stair case. Same undertaking should be possible for various soil conditions.

The same task should be possible by considering shear divider for the structure (i.e., no segments exhibit). This task should be possible for various evaluations of bond. The same task should be possible for various evaluations of steel blends like for ex: rather than M20 we can do a similar venture with M25, M30.

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