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DIGITALLY VERIFIED RECORD

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ROCKMOUNT CITY CLASSIC APARTMENT
ERODE.
DESIGN CALCULATIONS

INTRODUCTION:

The structure is a **"Four – Storied Building" consisting of Silt + 4 upper floors proposed to be constructed for "GREEN CITY BUILDERS" in NEW S.F. NO. 145/3A1, 145/3A3, 145/4A1A, 145/4A1B1, 145/4A1C1, 145/4A1C2,145/4A1C3, 146/2A5A, 146/2A5B, 146/2A5C, 146/2A5D, (SITE Nos: 73,74,75,76,77,78,79 IN SWP/DTCP/ERODE/LAYOUT APPROVAL NO:24/2023) KAVUNDACHIPALAYAM VILLAGE, AT KAVUNDACHIPALAYAM PANCHAYAT, PERUNDURAI TALUK, ERODE DISTRICT.**

It is designed as Reinforced concrete framed structure supported on footings and columns. Footings are placed at 10'-0" depth below ground level and the **SBC of the soil is taken 295 kN/Sq.m**

MATERIALS USED

Following material are generally used in the design of the various components of the structure.

1. M20 & M25 grade concrete for all concrete parts of the structure.
2. Fe 500 & Fe550 grade Reinforcement steel for all Reinforced concrete members.

CODES FOLLOWED:

Following codes and specifications has been used in the design of the members of the structure.

1. IS:456 - 2000 Plain and Reinforced Concrete
2. SP: 16 Design Aids for Reinforced Concrete to IS: 456
3. IS: 875 Part1,2,4,5(1987) and Part 3(2015) Design Loads
4. IS: 1893 – 2016 Criteria for Earthquake Resistant Design of Structures
5. IS: 13920 – 2016 Ductile Detailing for Reinforced Concrete Structures Subjected to Seismic forces.

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DESIGN DATA:

1.	No. of floors	=	Silt + 4 upper floors
2.	Height of floors	=	3.00 m
3.	SBC of soil @ 10'-0"	=	295.0 kN/m²
4.	D.L. of 150 thk slab	=	3.75 kN/m²
5.	D.L. of 140 thk slab	=	3.5 kN/m²
6.	D.L. due to flooring	=	1.00 kN/m²
7.	D.L. of 230 thk walls per metre length	=	12.00 kN/m
8.	D.L. of 115 thk walls per metre length	=	6.00 kN/m
9.	L.L on rooms	=	2.00 kN/m²
10.	Design mix of Columns, Footings, Slabs, Beams	=	M25 & M20

ANALYSIS OF STRUCTURE:

The structure is analyzed by using Etab. All members are designed as Reinforced Concrete members,

Independent Footing has been provided for columns.

DESIGN OF COLUMNS:

Material – M25; Fe550

LOAD ON COLUMNS:

R1	=	3321 KN
R2	=	2335 KN
R3	=	2200 KN
R4	=	2000 KN
R5	=	1670 KN
R6	=	1350 KN
R7	=	1000 KN
R8	=	800 KN
R9	=	540 KN

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COLUMN DESIGN:

DESIGN OF COLUMN								
LOAD(P)	=	3321	KN					
Fact. Laod	=	4981.5						
fck	=	20	N/Sq.mm					
fy	=	500	N/Sq.mm					
Unsupported length of colum	=	3.3	m					
Column end conditions	=	Effectively held in position and restrained against rotation						
Recommended value of effective lenth	=	0.65 L	=	2.145	m			
Assumed area of steel	=	0.80%	=	0.08Ag				
Size of column Assumed	=	**300**	**x**	**760**				
Provided Area of concrete	=	228000						
Check for Slenderness ratio								
Effective length of colum	=	2.145	m					
Slenderness ratio	=	l/b	=	**7.15**	<	**12**		
		l/d	=	**2.82**	<	**12**		
So the column will be designed as short column								
Check for eccenricity								
Min. Eccenricity	=	(L/500)+((b/30)			=	16.60	mm	
	=				=	31.93	mm	
	=	20	mm		(As per IS 456-2000 cl 25.4)			
Eccenricity taken as (e)	=	31.93	mm					
Moment calculations						0.667		
Moment due to eccentricity	=	(P*e)	=	159075900	N.mm	=	**159.0759**	KN. M
Reinforcement calculations								
Longitudinal reinforement								
P/(fck.b.d)	=	**1.0924**						
M/(fck.b.d^2)	=	**0.046**						

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d'	=	56.00	mm	(Assumed as	32	mm	dia bars to be used)	
d'/d	=	0.2						
For these values p/fck from the chart 34 of IS hand book SP-16 - As	=	0.2	fck	=	4	%		
Min. Reinforcemnet for column	=	0.8	%					
Area of steel taken as	=	4	%					
Area of steel reqd.	=	**9120**	Sq.mm					
Provide	32	mm dia bars	6	Nos.				
Provide	25	mm dia bars	10	Nos.		HENCE OK.		
Ast. Provided	=	**9729.3**	Sq.mm >		**9120**			
Transverrse reinforcement		**-609.3**			760			
Max. Length of the Longituditional reinforcement direction =					2	>75		
No. of rods placing in one side =					226.7	mm C/C		
Spacing of Longitudition al bars other than corner =					150			
Provide	8	mm dia stirrups @						
Check for Min spacing								
150	<	300	mm	(Least lateral dimension)		**Hence O.K**		
150	<	400	mm	(16 times to the smallest dia of long. bar)				
150	<	300	mm					

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Column Design Result								
Size of Column	=	**300**	**x**	**760**				
Longitudidional Reinforcement	**32**	mm dia bars	**6**	nos. and				
	25	mm dia bars	**10**	nos.				
Transvers reinforcement	**8**	mm dia stirrups @			**150**	mm C/C		

COLUMN SCHEDULE:

COLUMN NAME	AXIAL LOAD(KN)	COLUMN SIZE	REINFORCEMENT	STIRRUPS
R1	3321	300 x 760	6Y32 + 10Y25	Y8 @ 6" c/c
R2	2335	300 x 760	14Y25	Y8 @ 6" c/c
R3	2200	230 x 760	14Y25	Y8 @ 6" c/c
R4	2000	230 x 680	12Y25	Y8 @ 6" c/c
R5	1670	230 x 610	10Y25	Y8 @ 6" c/c
R6	1350	230 x 610	10Y20	Y8 @ 6" c/c
R7	1000	230 x 460	8Y20	Y8 @ 6" c/c
R8	800	230 x 460	8Y16	Y8 @ 6" c/c
R9	540	230 x 380	4Y16 + 2Y12	Y8 @ 6" c/c

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FOOTING DESIGN:

Design of Footing									
Safe Bearing Capacity of Soil, SBC			295.00	KN/m²	Concrete, F_{ck}	25.00	MPa		
Cross- sectional width of column, b			300.00	mm	Steel, F_y	550.00	MPa		
Cross- sectional depth of column, D			760.00	mm	Clear Cover, CC	50.00	mm		
Axial Load (Service), P			**3320.00**	KN	Dia. of Steel, d_b	12.00	mm		
Footing wieght by (%) P	**10.00**	%	332.00	KN	Gross Load,	**3652.00**	KN		

Area of Footing Required, A_f	12.38	m^2	Provided, A_f	12.24	m^2			
Length of footing required, L_f	3.76	m	Provided, L_f	3.60	m	C_{LL}	1.420	
Width of footing required, B_f	3.30	m	Provided, B_f	3.40	m	C_{BB}	1.550	
Top projection from column face, K	952	mm	Depth at edge of footing, E_d			1000	mm	
Upword soil pressure,	298.37	m^2	Hence OK					

Moment along L-L axis, M_{uL}	1534.14	KN-m	Moment along B-B axis, M_{uB}	1935.43	KN-m
Resisting width in concern	2204.00		Resisting width in concern	2664.00	mm
Depth required along length, d_{req}	511.55	mm	Depth required along width,d_{req}	522.61	mm
Provide the depth of footing, D	**1000**	mm	**Available effective depth, d_{avai}**	**944.00**	mm
Actual Self weight of footing,	**306.00**	KN	Weight by % of loading (P),	**9.22**	%

Direction	A_{st} Required (mm^2)	A_{st} Minimun (mm^2)	Dia. of Bar (mm)	Sapcing (mm)		Rebar Provided
				Required	Provided	
Along L_f	3922.75	4080.00	**16**	**167.55**	**100.00**	T16 @ 100 mm
Along B_f	4960.13	4320.00	**16**	**145.93**	**100.00**	T16 @ 100 mm

A_{st} finally provided along L_f - L_f	6836.12	mm^2	Pt (%)	0.310	**1-way shear is needed to check along B-B**
A_{st} finally provided along B_f - B_f	7238.25	mm^2	Pt (%)	0.272	

$$\tau_c = 0.85\sqrt{(0.8\,fck)}\,(\sqrt{1+5\beta}-1)\,/$$

Check along Length (L_f) of Footing	*Check along Width (B_f) of Footing*
Where, $\beta = (0.8\ fck)\ /\ (6.89\ Pt)$ or 1 whichever is grater,	

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(%) R/F available	Pt =	0.31	%	(%) R/F available	Pt =	0.27	%
Therefore,	β =	7.43	-	Therefore,	β =	8.50	-
Critical Shear Capacity, Tcc=		**0.39**	MPa	Critical Shear Capacity,	Tc =	**0.37**	MPa
Shear Force along length, V_u =		724.31	KN	Shear Force along width,	V_u =	976.37	KN
Critical Section Moment, M_u =	τ_v =	172.39	KN-m	Critical Section Moment,	τ_v M_u =	295.84	KN-m
At critical section, b' & d'	2188.00	944.00	mm	Critical section b' & d'	2648.00	944.00	mm
Nominal Shear,		**0.32**	MPa	Nominal Shear,		**0.34**	MPa
Provided Depth is Safe For One Way Shear				**Provided Depth is Safe For One Way Shear**			

Effective depth at proposed section, d/2 from the face of column, d'		944.00	mm
Shear Force on Shaded Area, V_u =	4529.30	KN	Perimeter length of Shear Area,=	5896.00	mm

$$\tau_v = \frac{V_u}{(Perimeter\ length\ x\ Effective\ depth)}$$ = 0.814 MPa

IS 456-2000, Pg.No.58, Cl.31.6.3, Shear Stress @ Critical Section, = τ_c x K_S

$K_S = 0.5 + \beta c$	Where, βc =	0.39	Therefore,	K_S	=	0.89	OR	1.00

$\tau_c = K_S$ x 0.25 x $\sqrt{f_{ck}}$ = 1.000 MPa

Provided Depth is Safe For Two Way Shear

L_f	B_f	L_1	B_1	Depth (mm)		Along Length, L_f	Along Width, B_f
(mm)	(mm)	(mm)	(mm)	D_1	D_2		
3600	3400	2400	1900	500	500	T16 @ 100 mm	T16 @ 100 mm

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FOOTING SCHEDULE:

F.No	FOOTING SIZE				Bottom Mat		Top Mat	
	Step-1	Depth(	Step-2	Depth(D2)	Rebar(X)	Rebar(Y)	Rebar(X)	Rebar(Y)
F1	3.60 x 3.40	500	2.40 x 1.90	500	Y16 @ 100 C/C	Y16 @ 100 C/C	Y12 @ 150 C/C	Y12 @ 150 C/C
F2	3.20 x 2.70	750	---	---	Y16 @ 100 C/C	Y16 @ 100 C/C	Y12 @ 150 C/C	Y12 @ 150 C/C
F3	3.10 x 2.60	750	---	---	Y16 @ 115 C/C	Y16 @ 115 C/C	Y12 @ 150 C/C	Y12 @ 150 C/C
F4	3.0 x 2.50	700	---	---	Y16 @ 125 C/C	Y16 @ 125 C/C	Y10 @ 150 C/C	Y10 @ 150 C/C
F5	2.60 x 2.30	630	---	---	Y16 @ 150 C/C	Y16 @ 150 C/C	---	---
F6	2.40 x 2.10	600	---	---	Y16 @ 150 C/C	Y16 @ 150 C/C	---	---
F7	2.10 x 1.80	500	---	---	Y12 @ 150 C/C	Y12 @ 150 C/C	---	---
F8	1.85 x 1.60	450	---	---	Y12 @ 150 C/C	Y12 @ 150 C/C	---	---

MAXIMUM MOMENT ON BEAMS:

End of the span = 250 kNm

Middle of the span = 175 kNm

MAXIMUM SHEAR ON BEAM:

End of the span = 260 kN

Middle of the span = 22 kN

BEAM DESIGN:

Beam Design

Properties of Beam						Forces				
Fck	=	20	N/mm^2				at top LHS	at bottom Mid Span	at top RHS	Units
Fy	=	550	N/mm^2							
Length	=	7.3152	m			**Moment**	250	175	210	Kn.m
Size	=	230	X	610	mm	**Shear**	260	0	230	Kn

DESIGN CALCLATIONS

FACT.	at top LHS	at bottom Mid Span	at top RHS	Units	Mu Lim for Balanced section			
MOMENT	**350**	**245**	**294**	Kn.m	Mu Lim = (0.36*Xu max/d)*(1-(0.42*Xu max/d))*b*d^{2}*fck			
SHEAR	**364**	**0**	**322**	Kn	ML	=	**177.56**	Kn.m
Xu max/d	0.46	0.46	0.46					

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MF>Mu limit, so the beam is designed as Doubly reinforced beam											
MF - ML	at top LHS	at bottom Mid Span	at top RHS	Units	Dia. Of Bars to be used						
					at top LHS		at bottom Mid Span		at top RHS		
	172.44	67.44	116.44	Kn.m	I Layer	II layer	I Layer	II layer	I Layer	II layer	
Effective depth d=	537.5	537.5	537.5	mm	Tensile zone reinforcement						
					25	25	25	25	25	25	
d'=	47.5	47.5	47.5	mm	Comp. zone reinforcement						
d' / d	0.088	0.0884	0.08837		25		25		25		
					at top LHS		at bottom Mid Span		at top RHS		
Design stress in compression reinforcement (fsc)					700*(1-(d'/Xu) =		(Xu limited to Xumax)				
					565.52		565.52		565.52		N/mm^2
Allowable stress in compression steel (0.8*0.87fy)					382.8		382.8		382.8		N/mm^2
Design stress in comp. reinforcement taken (fsc)					382.8		382.8		382.8		N/mm^2
Strain in compression steel					0.0028		0.0028		0.0028		Max. strain
Tensile Steel Calculations											
Ast for singlly reinforced beam (Ast1)					(Mu=0.87*fy*Ast*d - 0.87* fy^2 * Ast^2 / b*fck)						
					at top LHS		at bottom Mid Span		at top RHS		
(from the eqn. IS 456 Annex.G 1.01 b)					851.747		851.75		851.74717		mm^2
Compreesion Steel Calculations											
Area of comp steel (Asc)					(Mu-Mulim) / (fsc*(d-d'))						
(from the eqn. IS 456 Annex.G 1.2)					919.336		359.551		620.78399		mm^2
Area of comp steel (Asc) for max. stress					955.012		373.5037		644.87412		mm^2
Ast 2 = (Asc*fsc) / (0.87fy)					at bottom LHS		at Top Mid Span		at bottom RHS		
					764.009		298.803		515.89929		mm^2
Shear Calculations											
					LHS		MIDSPAN		RHS		
Percentage of tensile steel=					1.40		1.05		1.05		%
Tc from Table 19 of IS 456 : 2000					0.700		0.630		0.630		N/mm^2

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Tv=	2.94439	0	2.6046512	N/mm^2	
Maximum Allowed Shear stress Tc max =		2.8			
Shear strength of concrete (Tc*b*d)	86.51	77.86128	77.861281	KN	
Strength of shear reinfocement reqd. (Vus)	277.49	-77.86	244.14	KN	
Dia. Of shear reinforcement	**10**	**10**	**10**		
Shear reinforcement = Sv= (0.87*fy*Asv*d) / Vus	145.515	300	165.39539	mm C/C	
Min. shear reinforcement	816.571	816.5707	816.57065	mm C/C	
Max spacing (0.75*d)	403.125	403.125	403.125	mm C/C	
	300	300	300	mm C/C	

Check for development length						
		1.3 * M1/V+	L0	>=Ld	L0=	537.5
Ld=(0.87*fy / (4*tbd))* Dia. Of Bar=		**1246.094**	mm	<	1171.64	mm

RESULTS

Fck	=	20	Fy	=	550	Beam Size	=	230	x	610	

SUPPORT	Steel Provided						Min.Reqd spacing for stirrups	Tensile steel		Comp. Steel	
	Straight		Curtail		Stirrups			Prov.	Reqd.	Prov.	Reqd.
	Dia.	Nos.	Dia.	Nos.	Dia.	Spacing					
LHS	**25**	**2**	**25**	**2**	10	**125**	**146**	**1963**	**1616**	**981**	**955**
MIDS PAN	**25**	**2**	**25**	**1**	10	**125**	**300**	**1472**	**1151**	**981**	**374**
RHS	**25**	**2**	**25**	**1**	10	**125**	**165**	**1472**	**1368**	**981**	**645**

Check for Deflection			
Stress Developed in Steel, F_s	=	262.64	N/Sq.mm
Maximum Provided % of reinforcements, P_t	=	1.40	%
Modification Factor, K_t (M/F)	=	0.86	-
Maximum Allowed Deflection Ratio, $\delta R_{Allowed}$	=	22.38	-
Actual Deflection Ratio, δR_{Actual}	=	13.61	-
DESIGN IS SAFE IN DEFLECTION			

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ROOF BEAM SCHEDULE:

BEAM No	BEAM SIZE	REINFORCEMENT			STIRRUPS
		Bottom	Top	Extra	
RB1	230 x 460	3-Y16 + 2-Y16	2-Y16	2-Y16	Y8 @ 150 C/C
RB2	230 x 380	2-Y16 + 2-Y16	2-Y16	2-Y16	Y8 @ 150 C/C
RB3	230 x 380	2-Y16 + 2-Y16	2-Y16	3-Y16	Y8 @ 150 C/C
RB4	230 x 380	2-Y16 + 1-Y16	2-Y16	1-Y16	Y8 @ 150 C/C
RB5	230 x 380	3-Y16	3-Y16	---	Y8 @ 150 C/C
RB6	230 x 380	2-Y12 + 2-Y12	2-Y12	2-Y12	Y8 @ 150 C/C
RB7	230 x 380	3-Y12	3-Y12	---	Y8 @ 150 C/C
RB8	230 x 380	4-Y12	3-Y12	---	Y8 @ 150 C/C
RB9	230 x 460	2-Y16 + 2-Y16	3-Y16	2-Y16	Y8 @ 150 C/C
CB1	230 x Slab Tk	3-Y12	3-Y12	---	Y8 @ 150 C/C
RB10	230 x 610	2-Y25 + 1-Y25	2-Y25	2-Y25	Y10 @ 125 C/C
RB11	230 x 610	2-Y25 + 1-Y25	2-Y25	2-Y20	Y10 @ 125 C/C
RB12	230 x 610	3-Y16	3-Y16	---	Y8 @ 150 C/C
RB13	230 x 610	3-Y16 + 2-Y16	2-Y16	1-Y16	Y8 @ 150 C/C
RB14	230 x 610	2-Y16 + 2-Y16	2-Y16	2-Y16	Y8 @ 150 C/C
RB15	230 x 610	2-Y20 + 2-Y20	2-Y20	2-Y20	Y10 @ 150 C/C
RB16	230 x 460	2-Y20 + 2-Y20	2-Y20	2-Y20	Y8 @ 125 C/C
RB17	230 x 530	2-Y20 + 2-Y20	2-Y20	2-Y20	Y8 @ 125 C/C

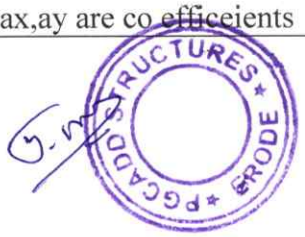
ROOF SLAB DESIGN:

Slab Design					
Size of the slab in 'm'	=	5.00	x	7.98	
Support width	=	0.3	m		
Slab tk.(Span/25)	=	200	mm		
Adopt eff. Depth	=	124	mm		
Overall Depth	=	150	mm		
Grade of concrete	=	M 20		20	N/sq.m m
Grade of steel	=	Fe 500		500	N/sq.m m

Loads						
Dead				Live	Fact. Load(1.5D.l+1.5l.l)	
Dead	Floor finish	Total				
Kn/Sq.m	Kn/Sq. m	Kn/Sq. m		Kn/Sq.m	(w) Kn/Sq.m	
3.75	1.5	5.25		2	10.875	

Design Calculations				
From IS 456:2000, Anx.D2.1				
Shorter span Bending Moment		Mx=	ax*w*lx²	ax,ay are co efficeients





Shorter span Bending Moment			My=	ay*w*lx²				
Effective Shorter span			Lx=	5.30	m			
Effective Longer span			Ly=	8.28	m			
		Ly/Lx=	1.56	<	2			
So the Slab is designed as Two way slab								
Edge Condition =		**1**	**Interior panels**					
(-)ax=	0.055		(-)ay=	0.032	Refer IS 456:2000 Table 26			
ax=	0.042		ay=	0.024				
Midspan moments			Support Moments					
Mx=	12.83	Kn.m	(-)Mx	16.72		Mx max=	**16.72**	
My=	7.33	Kn.m	(-)My	9.78		My max=	**9.78**	
Check for Depth :								
	Mmax =	0.138*fck*bd²						
	d=	Sqrt(M/(0.138*fck*b)						
	d reqd=	77.839821 2	mm	<	124			
Area of steel Calculations								
Ast for Slab			(Mu=0.87*fy*Ast*d - 0.87* fy² * Ast² / b*fck)					
			Shorter span		**Longer Span**			
			Reqd	**Provided**	**Reqd**	**Provided**		
(from the eqn. IS 456 Annex.G 1.01 b)			**292.749899**	**753.6**	**175.048022**	**523.333333**		
	At Support			**At mid span**				
	Dia of rod	**Spacing**	**% of ast**	**Dia of rod**	**Spacing**	**% of ast**		
Shorter span	**12**	**150**	**0.61**	**12**	**150**	**0.61**		
Longer span	**10**	**150**	**0.42**	**10**	**150**	**0.42**		
Torsion reinforcement								
Area of steel	**Dia of rod**	**Spacing**	Length in mm	To be Provide @ corners of the slab in both directions & both faces				
498	8	150	1060					
Check for shear								
	% of Ast=	0.61		ζc max=	1.4	N/mm²		
	ζv=	V/b*d	0.18	N/mm²	Refer IS 456 cl 40.1			
	ζc=		**0.51**	N/mm²	Refer IS 456 Table 19			
	ζv	<	ζc	< ζc max	Hence Safe			
Check for Crack width								

PGCADD STRUCTURES 13/27 8/7/25

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ε1 =Strain@lvl considered		ε2 = 1.5b(D-x)(a-x)/3AsEs(d-x)			Wcr={3*acr*εm}/{1+[2(acr-cmin)/(D-x)]}		
	acr	X	fsb	ε1 =fsb/Es	ε2	εm(ε1-ε2)	Wcrb
S span	84.6973	50.99	115.27	0.00058	0.00045	0.0001	0.015
L Span	45.0000	40.02	168.92	0.00084	0.00045	0.0004	0.054
Check for Deflection							
Stress Developed in Steel, F_s					=	112.66	N/Sq.mm
Maximum Provided % of reinforcements, P_t					=	0.61	%
Modification Factor, K_t (M/F)					=	2.21	-
Maximum Allowed Deflection Ratio, $\delta R_{Allowed}$					=	57.43	-
Actual Deflection Ratio, δR_{Actual}					=	42.74	-
DESIGN IS SAFE IN DEFLECTION							

ROOF SLAB SCHEDULE:

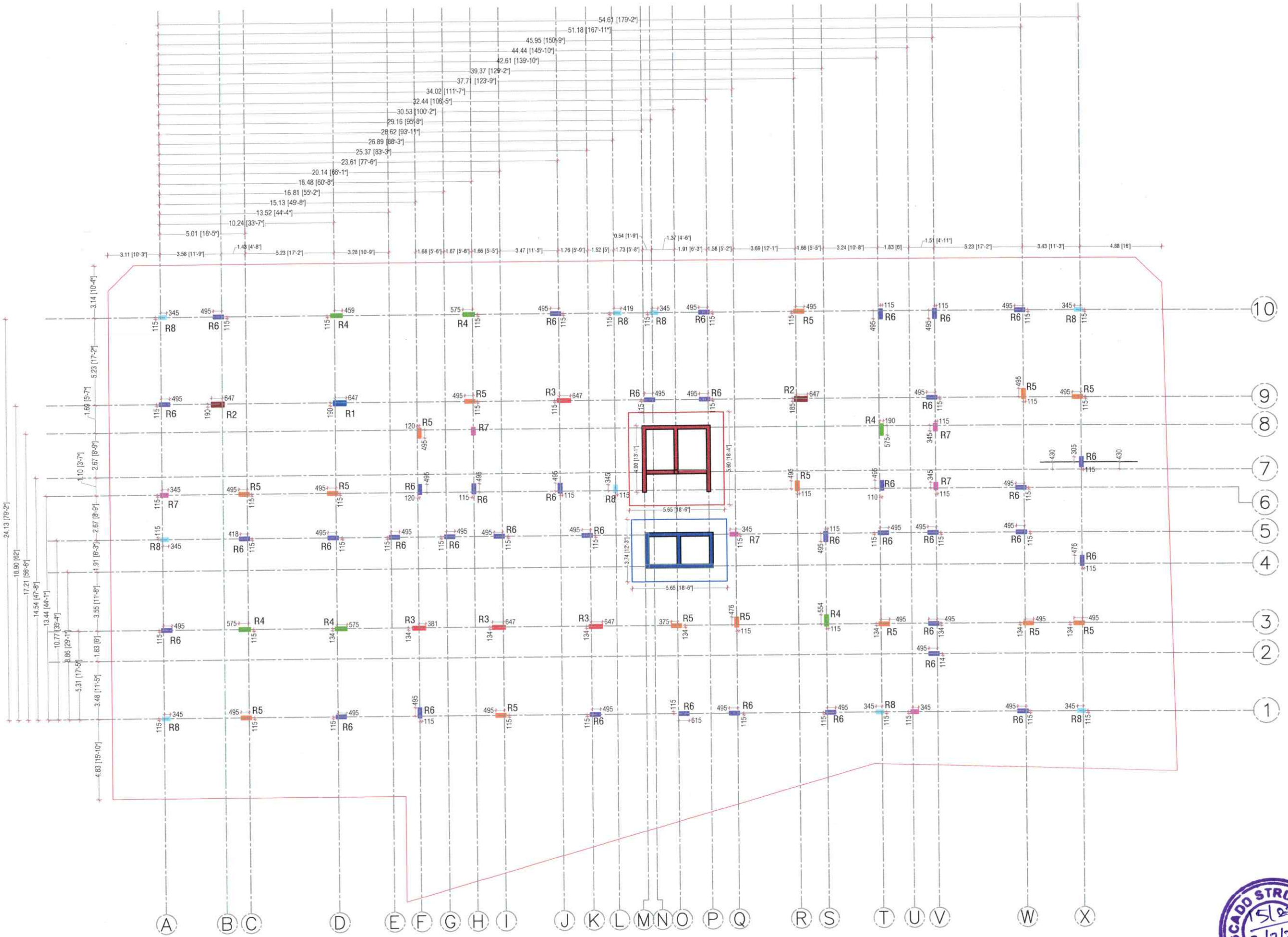
Slab No.	Tk	Type of slab	Main Reinforcement	Distributor	Shorter Span	Longer Span
S1	150	Two Way	---	---	Y12 @ 150 C/C	Y10 @ 150 C/C
S2	150	Two Way	---	---	Y10 @ 150 C/C	Y10 @ 150 C/C
S3	125	Two Way	---	---	Y8 @ 150 C/C	Y8 @ 150 C/C
S4	125	One Way	Y8 @ 150 C/C	Y8 @ 175 C/C	---	---

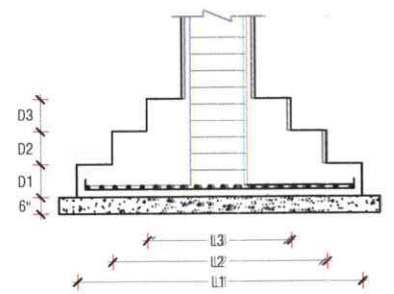
Er.R.PARAMAGURU, M.E.,A.M.I.E.,A.I.V
REGISTERED STRUCTURAL ENGINEER
PG CADD STRUCTURES
REG. No : 03 / 2019 / RSE - GR-I / ELPA
Ist FLOOR. 334, METTUR ROAD. ERODE - 638 011.
email : pgcadd@gmail.com. Mob : 94422 85533

PG CADD STRUCTURES 14/29 8/7/25 ERODE

Note:

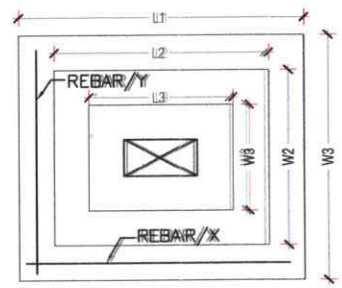
Adequate Plinth beams, Continuous Lintels are provided for the earthquake resistance. Columns are designed for horizontal shear forces. The detailing of Reinforcement is done according to provisions of IS:13920 – Indian Standard Code of Practice for ductile detailing of R.C. Structures subjected to Seismic forces.





FOOTING SECTION

(TYPICAL)



FOOTING PLAN

(TYPICAL)

Use Only :

* **M25** - Grade of Concrete
* **Fe550D** - Grade of Steel

GENERAL DETAILS :

1. ALL DRAWING SHOULD BE READ ALONG WITH THE ARCHITECTURAL DRAWINGS.
2. GRADE OF CONCRETE MIX SHALL BE M 20 (1 : 1½ : 3) CONFORMING TO I.S. 456 - 2000 UNLESS OTHERWISE SPECIFIED.
3. ALL PLAIN AND REINFORCED CEMENT CONCRETE WORK SHALL STRICTLY CONFIRM TO I.S.456 - 2000.
4. REINFORCEMENT SHALL BE Fe 500 CONFORMING TO I.S.1786-1985.
5. CLEAR COVER TO STEEL AS FOLLOWS:
   - FOR FOOTING 50 MM
   - FOR COLUMN 40 MM
   - FOR BEAM 25 MM
   - FOR SLAB 20 MM
6. ALL REINFORCEMENTS SHALL BE PLACED AND MAINTAINED IN THE POSITION SHOWN IN THE DRAWING (CROSS SECTION) BY PROVING PROPER COVER BLOCKS, SPACERS AND SUPPORTING BARS.
7. THE COVER BLOCKS SHOULD BE PREPARED BY MIX CONCRETE MIX. ALL CONCRETE WORK SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
8. QUALITY & QUANTITY OF CONSTRUCTION IS SUPERVISED.
9. LAB LENGTH VERTICAL - 40D, HORIZONTAL - 60D.
10. ALL DIMENSION ARE IN " INCHES " UNLESS OTHERWISE SPECIFIED.

COLUMN AND FOOTING LAYOUT

DISCUSSION	✓ CONSTRUCTION
Model No: 001	Scale: NIL
Time: 23/11/2024	
Designed by: PG	Drawn by: TM
Checked by: PG	
Client Title:- Rock Mount City	Drawing Title:- [illegible]
Project Title:- Industrial Building	Column Centerline and Footing Layout

STRUCTURAL CONSULTANT:

Er.R.PARAMASIVAM., M.E.,A.M.I.E.,(I.V.)

PG Cadd Structures

#1,I Floor ,224, Mettur Road,

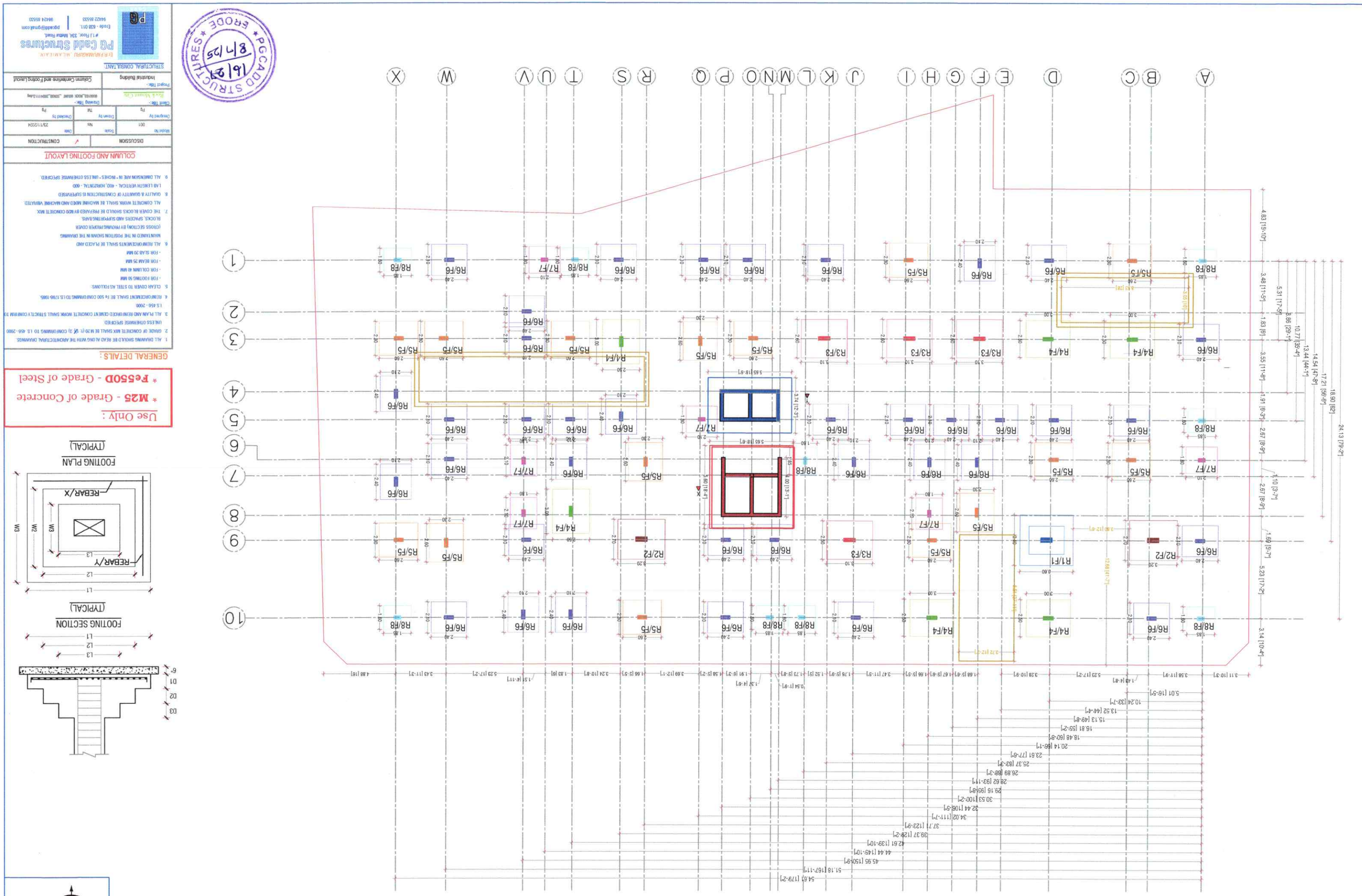
Erode - 638 011.

94422 85533

pgcadd66@gmail.com

94424 85533

PGCADD STRUCTURES ERODE 15/24 8/7/25



COLUMN AND FOOTING LAYOUT

DISCUSSION	CONSTRUCTION
	✓

Model No:	001	Date:	23/11/2024
Designed by:	PJ	Scale:	NIL
Drawn by:	TM	Checked by:	PJ

Client Title :- Drawing Title :-
Desk Mounted C.D. 0000\0_BOOK WORK _2000_2021\Jpeg

Project Title :- Industrial Building Column Centerline and Footing Layout

STRUCTURAL CONSULTANT:

PG Cadd Structures
ER.PANNAMGARU .M.E.,M.I.E.,F.I.V
1,I Floor, 33rd .Main Road,
Erode - 638 011. pgcadd@gmail.com
94422 86533 | 98424 86533

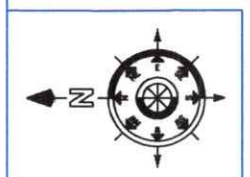
GENERAL DETAILS :

Use Only :
* **M25** - Grade of Concrete
* **Fe550D** - Grade of Steel

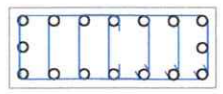
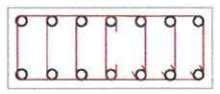
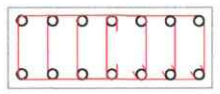
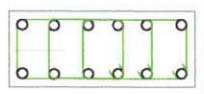
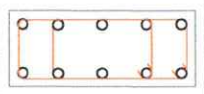
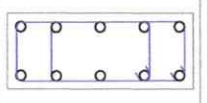
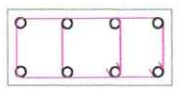
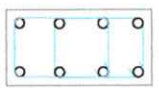
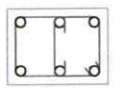
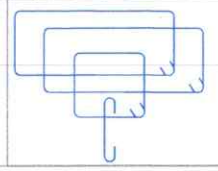
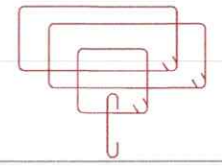
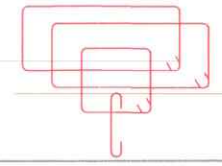
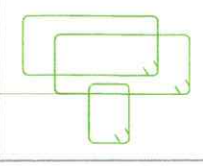
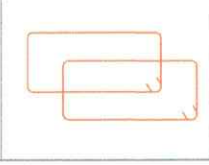
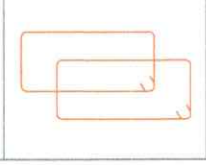
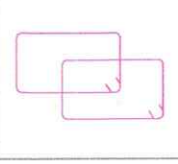
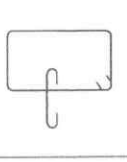
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BLOCKS, SPACERS AND SUPPORTING BARS
(CROSS SECTION) BY PROVING PROPER COVER
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8. QUALITY & QUANTITY OF CONSTRUCTION IS SUPERVISED
LAP LENGTH VERTICAL - 40D, HORIZONTAL - 60D
9. ALL DIMENSION ARE IN " INCHES - UNLESS OTHERWISE SPECIFIED.

FOOTING PLAN
(TYPICAL)

FOOTING SECTION
(TYPICAL)

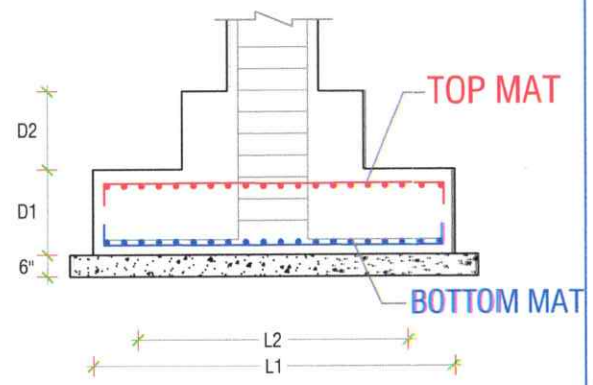


COLUMN UPTO STILT FLOOR ROOF ONLY

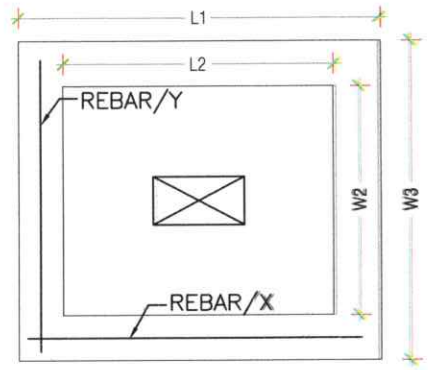
COLUMN DETAILS	Column	R1	R2	R3	R4	R5	R6	R7	R8	R9
	Size	300 x 760	300 x 760	230 x 760	230 x 680	230 x 610	230 x 610	230 x 460	230 x 460	230 x 380
	Section									
	Reiforcement Longitude	#32 - 6 + #25 - 10	#25 - 14	#25 - 14	#25 - 12	#25 - 10	#20 - 10	#20 - 8	#16 - 8	#16 - 4 + #12 - 2
	Stirupps Transverse	#8@ 6"c/c 7L	#8@ 6"c/c 7L	#8@ 6"c/c 7L	#8@ 6"c/c 6L	#8@ 6"c/c 5L	#8@ 6"c/c 6L	#8@ 6"c/c 5L	#8@ 6"c/c 4L	#8@ 6"c/c 3L
										

F O O T I N G D E T A I L S

Footing	Footing Size						BOTTOM MAT		TOP MAT	
	Length - L1	Width - W1	Depth - D1	Length - L2	Width - W2	Depth - D2	REBAR/X SHORT	REBAR/Y LONG	REBAR/X SHORT	REBAR/Y LONG
F1	3.60	3.40	500	2.40	1.90	500	#16 @ 100 C/C	#16 @ 100 C/C	#12 @ 150 C/C	#12 @ 150 C/C
F2	3.20	2.70	750	---	---	---	#16 @ 100 C/C	#16 @ 100 C/C	#12 @ 150 C/C	#12 @ 150 C/C
F3	3.10	2.60	750	---	---	---	#16 @ 115 C/C	#16 @ 115 C/C	#12 @ 150 C/C	#12 @ 150 C/C
F4	3.00	2.50	700	---	---	---	#16 @ 125 C/C	#16 @ 125 C/C	#10 @ 150 C/C	#10 @ 150 C/C
F5	2.60	2.30	630	---	---	---	#16 @ 150 C/C	#16 @ 150 C/C	---	---
F6	2.40	2.10	600	---	---	---	#16 @ 150 C/C	#16 @ 150 C/C	---	---
F7	2.10	1.80	500	---	---	---	#12 @ 150 C/C	#12 @ 150 C/C	---	---
F8	1.85	1.60	450	---	---	---	#12 @ 150 C/C	#12 @ 150 C/C	---	---



FOOTING SECTION
(TYPICAL)



FOOTING PLAN
(TYPICAL)

Use Only :

* **M25** - Grade of Concrete
* **Fe550D** - Grade of Steel

GENERAL DETAILS :

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   - FOR COLUMN 40 MM
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   - FOR SLAB 20 MM
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   ALL CONCRETE WORK SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
8. QUALITY & QUANTITY OF CONSTRUCTION IS SUPERVISED.
   LAB LENGTH VERTICAL - 40D, HORIZONTAL - 60D
9. ALL DIMENSION ARE IN " INCHES " UNLESS OTHERWISE SPECIFIED.

COLUMN AND FOOTING LAYOUT

DISCUSSION	✓ CONSTRUCTION	
Model No: 001	Scale: Nts	Date: 28/01/2025
Designed by: Pg	Drawn by: TM	Checked by: Pg
Client Title:- Rock Mount City	Drawing Title:- 0001103_BOX MOUNT _SRIDD_20241113.dwg	
Project Title:- Industrial Building	Column Centerline and Footing Layout	

STRUCTURAL CONSULTANT:

Er.R.PARAMAGURU ., M.E.,M.I.E.,M.I.V.,
PG Cadd Structures
#1,I Floor, 334, Mettur Road,
Erode - 638 011.
94422 85533
pgcadds@gmail.com
98424 85533

PG CADD STRUCTURES * ERODE * 19/27 8/7/25



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Use Only :

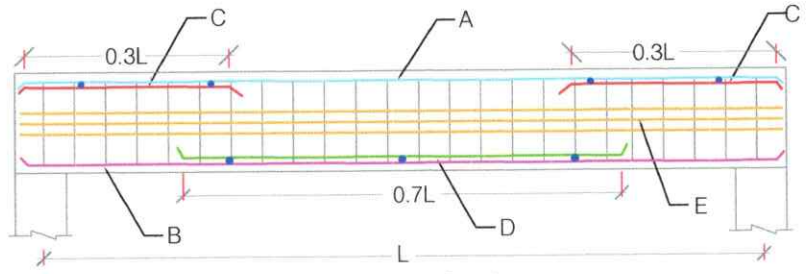
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GRADE BEAM DETAILS

Beam		GB1	GB2
Size		9" X 15"	9" X 15"
Top Reinforcement	A (Full length)	#16 - 3	#16 - 4
	C (Curtail)	===	===
Bottom Reinforcement	B (Full length)	#16 - 3	#16 - 4
	D (Curtail)	===	===
Skin Reinforcement	E (Each on Both Sides)	---	#12 - 1
Stirupps		#8 @ 6" c/c	#8 @ 6" c/c



Longitudinal Section (Typical Beam) • - Spacer Rod

PGCADD STRUCTURES 18/24 8/7/25 ERODE

PLINTH BEAM DETAILS

DISCUSSION | CONSTRUCTION ✓

Model No: 001	Scale: Nts	Date: 25/09/2024
Designed by: Pg	Drawn by: Mouli	Checked by: Pg

Client Title:- ROCK MOUNT CITY

Drawing Title:- PLINTH BEAM DETAILS

Project Title:- RESIDENTIAL BUILDING

0000103_ROCK MOUNT_20241113 Final.dwg

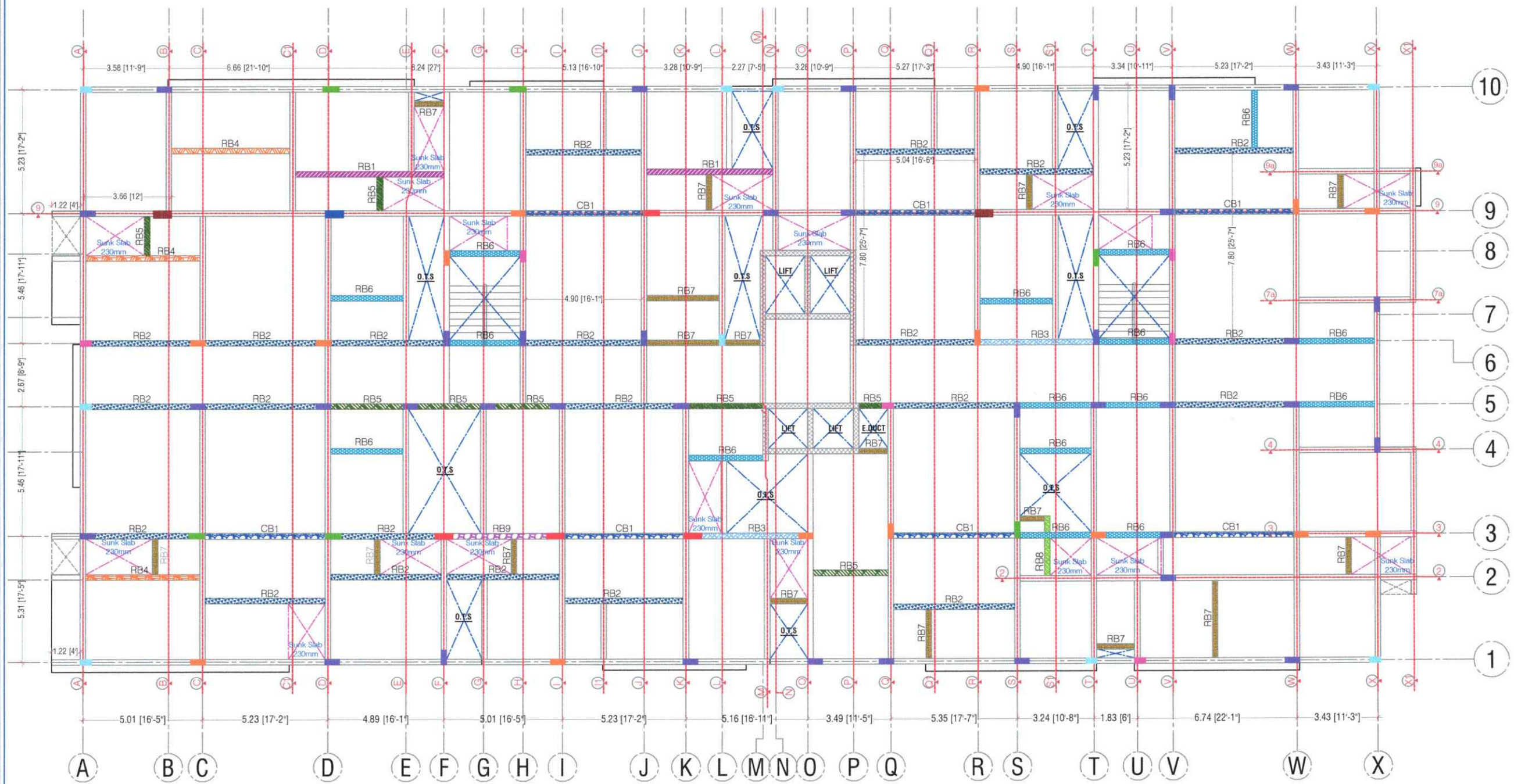
STRUCTURAL CONSULTANT:

Er.R.PARAMAGURU ..M.E.,A.M.I.E.,A.I.V.,

PG Cadd Structures

#1,I Floor, 334, Mettur Road,

Erode - 638 011. 94422 85533 | pgcadd@gmail.com 98424 85533



Sheet - 1/9

GENERAL DETAILS :

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STILT FLOOR ROOF BEAM DETAILS

DISCUSSION	CONSTRUCTION ✓

Model No	Scale	Date
001	Nts	05/04/2025
Designed by	**Drawn by**	**Checked by**
Pg	Mouli	Pg

Client Title:- ROCK MOUNT CITY

Drawing Title:- ROOF BEAM DETAILS

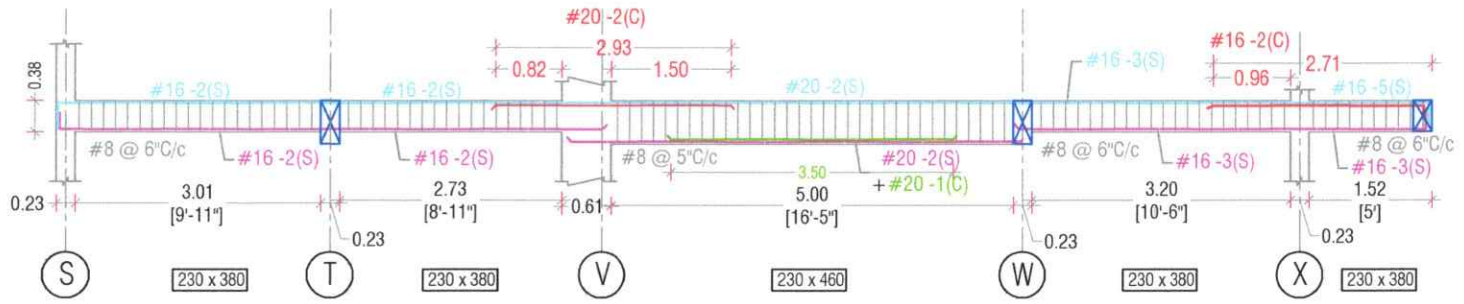
Project Title:- RESIDENTIAL BUILDING

0000103_ROCK MOUNT_20241113 Final.dwg

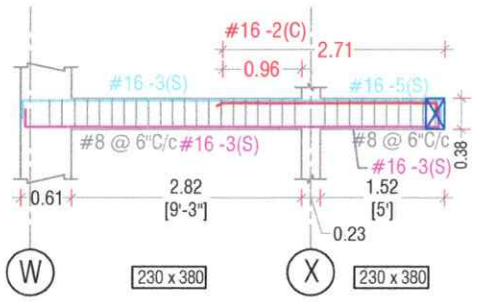
PGCADD STRUCTURES ERODE 19/27 8/7 125

STRUCTURAL CONSULTANT:

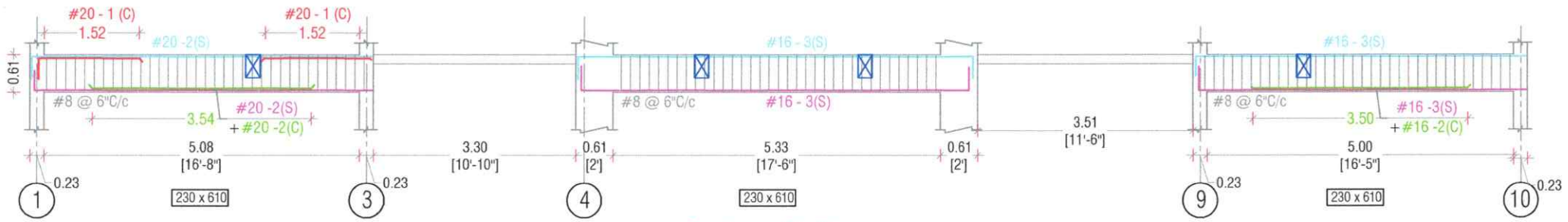
Er.R.PARAMAGURU , ME.,A.M.I.E.,A.I.V.,
PG Cadd Structures
#1,I Floor, 334, Mettur Road,
Erode - 638 011.
94422 85533
pgcadd@gmail.com
98424 85533



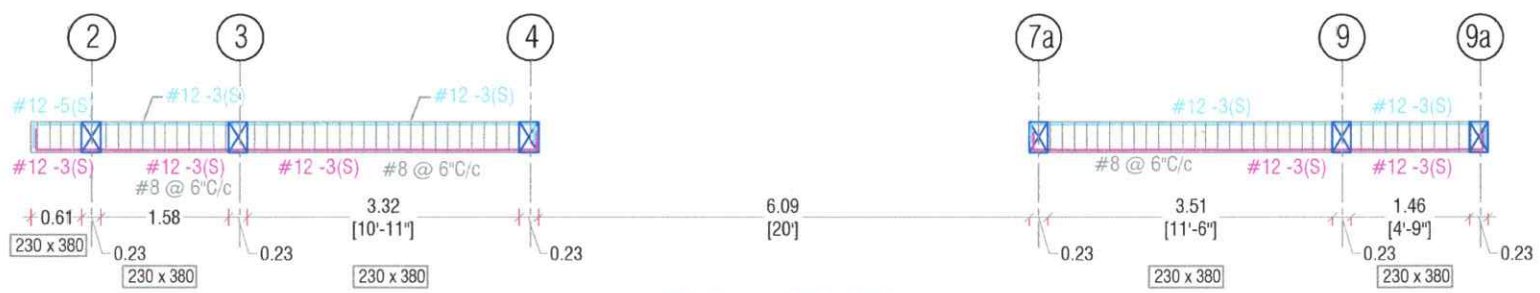
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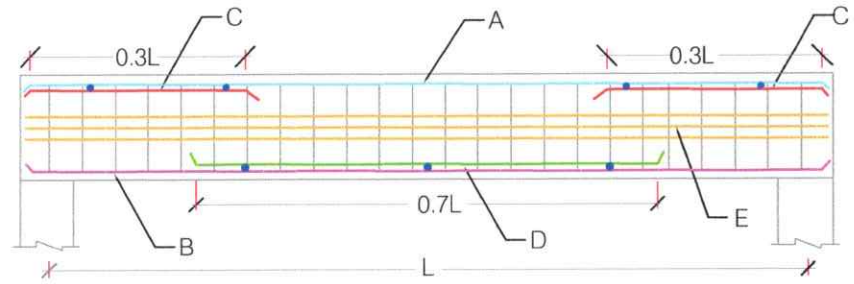
Section on - "3-3, 4 - 4, 7a-7a, 9a - 9a"



Section on "X - X"

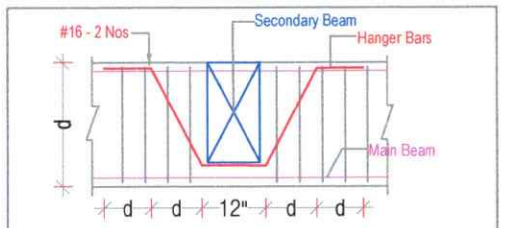


Section on "X1 - X1"



Longitudinal Section
(Typical Beam)

• - Spacer Rod



Typ. Section of Hanger Bars in Main Beam
At Secondary Beam Junction

GENERAL DETAILS :

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   - FOR BEAM 25 MM
   - FOR SLAB 20 MM
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8. QUALITY & QUANTITY OF CONSTRUCTION IS SUPERVISED LAB LENGTH VERTICAL - 40D, HORIZONTAL - 60D
9. ALL DIMENSION ARE IN " INCHES " UNLESS OTHERWISE SPECIFIED.

ROOF BEAM DETAILS

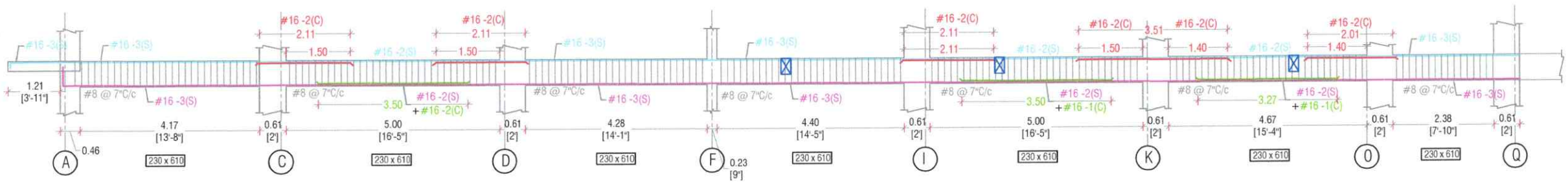
Beam		RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8	RB9	CB1
Size		230 X 460	230 x 380	230 X 380	230 x 380	230 x 380	230 x 380	230 x 380	230 x 380	230 x 460	230 x Slab Tk
Top Reinforcement	A (Full length)	#16 - 2	#16 - 2	#16 - 2	#16 - 2	#16 - 3	#12 - 2	#12 - 3	#12 - 4	#16 - 3	#16 - 3
	C (Curtail)	#16 - 2	#16 - 2	#16 - 3	#16 - 1	===	#12 - 2	===	===	#16 - 2	===
Bottom Reinforcement	B (Full length)	#16 - 3	#16 - 2	#16 - 2	#16 - 2	#16 - 3	#12 - 2	#12 - 3	#12 - 3	#16 - 2	#16 - 3
	D (Curtail)	#16 - 2	#16 - 2	#16 - 2	#16 - 1	===	#12 - 2	===	===	#16 - 2	===
Skin Reinforcement	E (Each on Both Sides)	===	===	===	===	===	===	===	===	===	===
Stirupps		#8 @ 150 c/c	#8 @ 150 c/c	#8 @ 150 c/c	#8 @ 150 c/c	#8 @ 150 c/c	#8 @ 150 c/c	#8 @ 150 c/c	#8 @ 150 c/c	#8 @ 125 c/c	#8 @ 150 c/c

PGCADD STRUCTURES ERODE 2/01/24 8/1/25

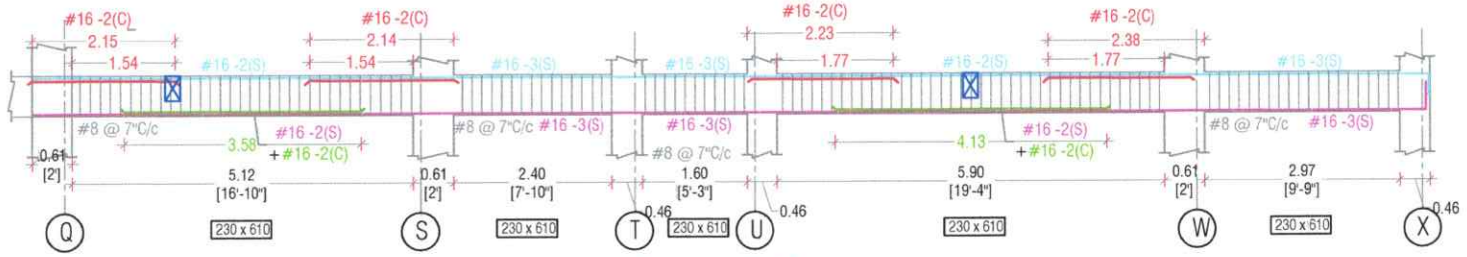
STILT FLOOR ROOF BEAM DETAILS

DISCUSSION	CONSTRUCTION ✓	
Model No: 001	Scale: Nts	Date: 05/04/2025
Designed by: Pg	Drawn by: Mouli	Checked by: Pg
Client Title:- ROCK MOUNT CITY	Drawing Title:- ROOF BEAM DETAILS	
Project Title:- RESIDENTIAL BUILDING	0000103_ROCK MOUNT_20241113 Final.dwg	

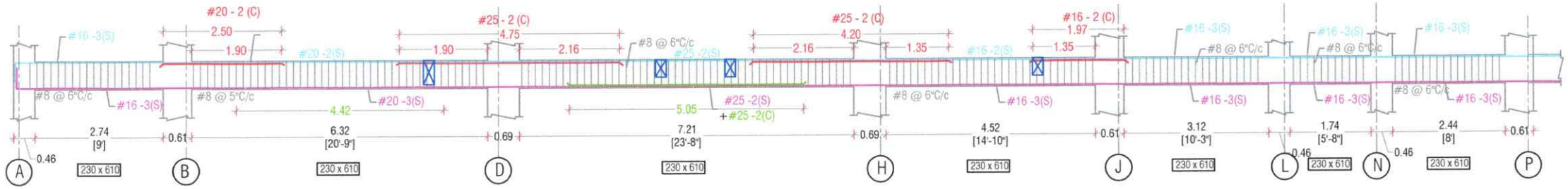
STRUCTURAL CONSULTANT:
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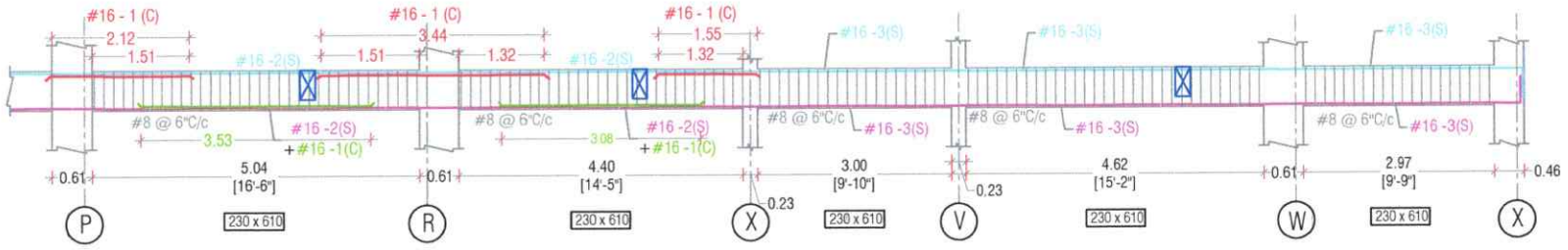
Section on "1 - 1" A-X



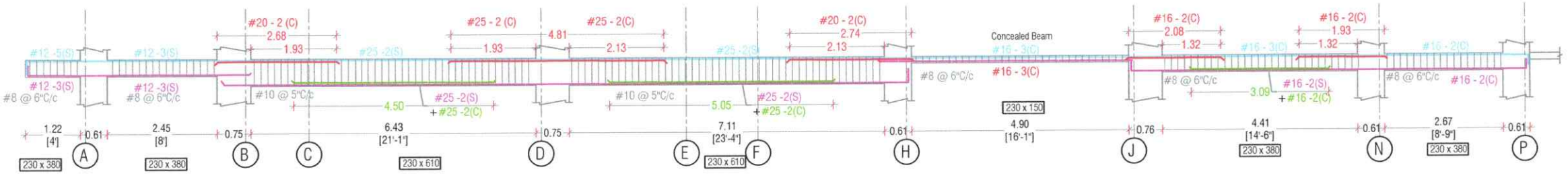
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Q-X



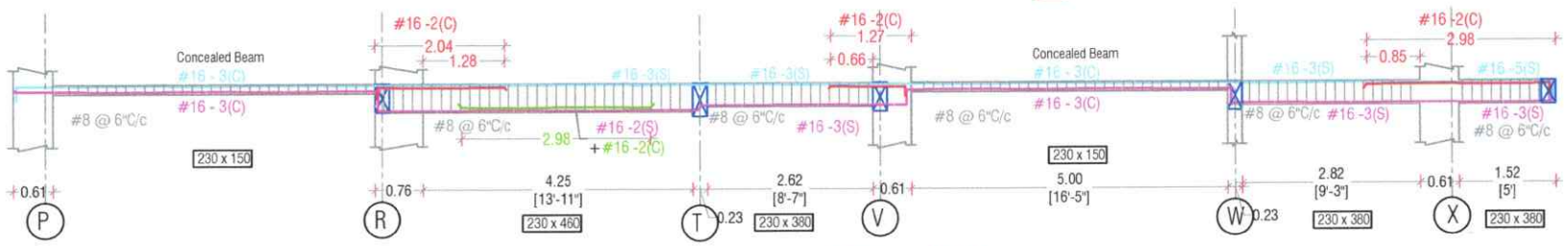
Section on "10 - 10"
A-P



Section on "10 - 10"
P-X



Section on "9 - 9"
A-P



Section on "9 - 9"
P-X

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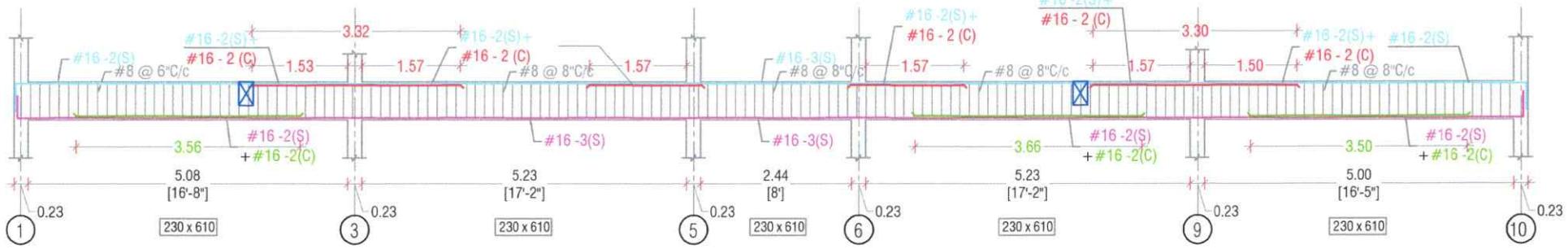
STILT FLOOR ROOF BEAM DETAILS

DISCUSSION	CONSTRUCTION ✓	
Model No: 001	Scale: Nts	Date: 05/04/2025
Designed by: Pg	Drawn by: Mouli	Checked by: Pg
Client Title:- ROCK MOUNT CITY	Drawing Title:- ROOF BEAM DETAILS	
Project Title:- RESIDENTIAL BUILDING	0000103_ROCK MOUNT_20241113 Final.dwg	

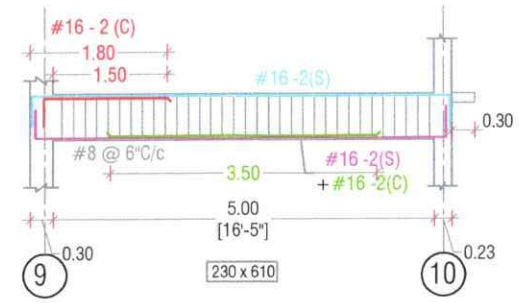
PGCADD STRUCTURES ERODE 2/127 8/7/25

STRUCTURAL CONSULTANT:

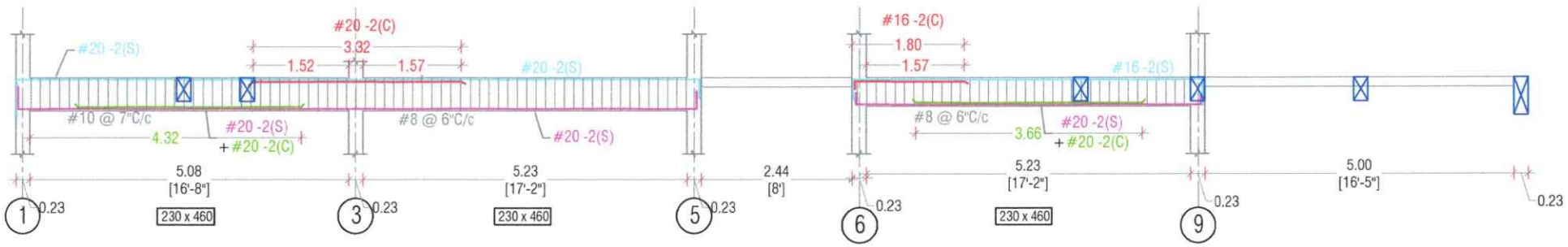
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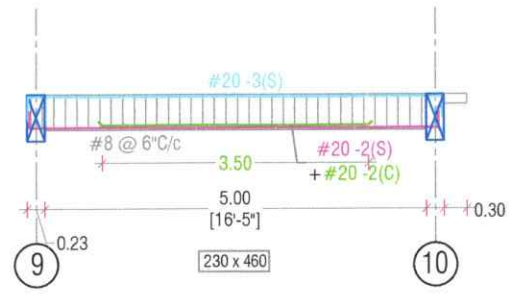
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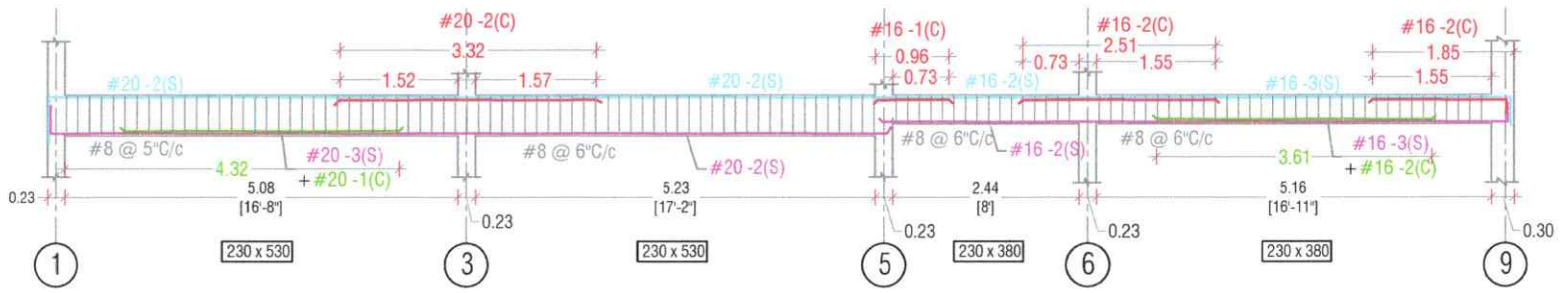
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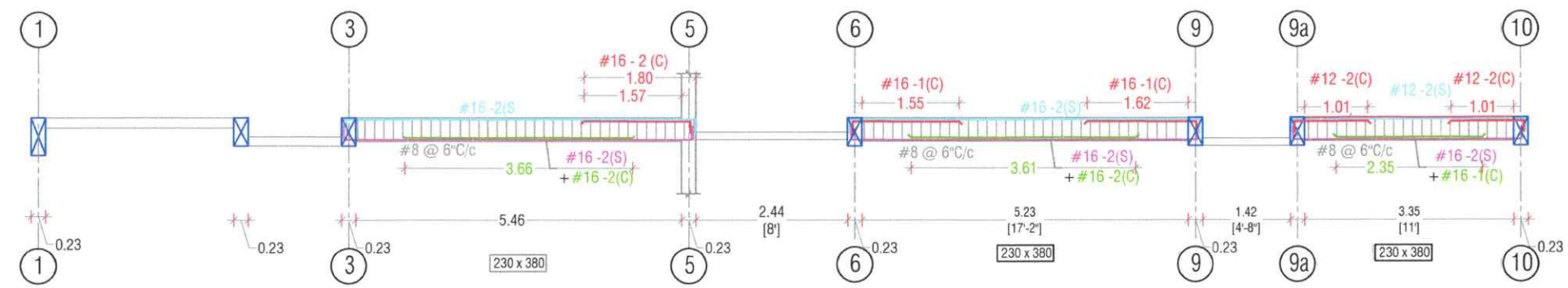
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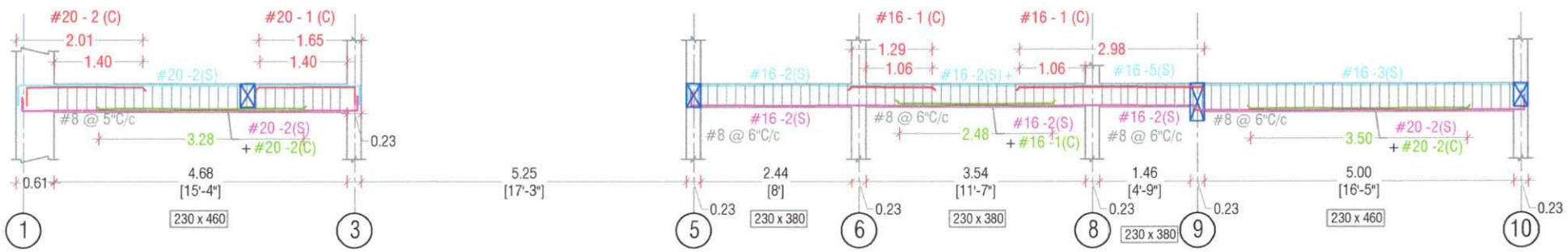
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Section on "D - D"



Section on "E - E"



Section on "F - F"

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STILT FLOOR ROOF BEAM DETAILS

DISCUSSION	CONSTRUCTION ✓

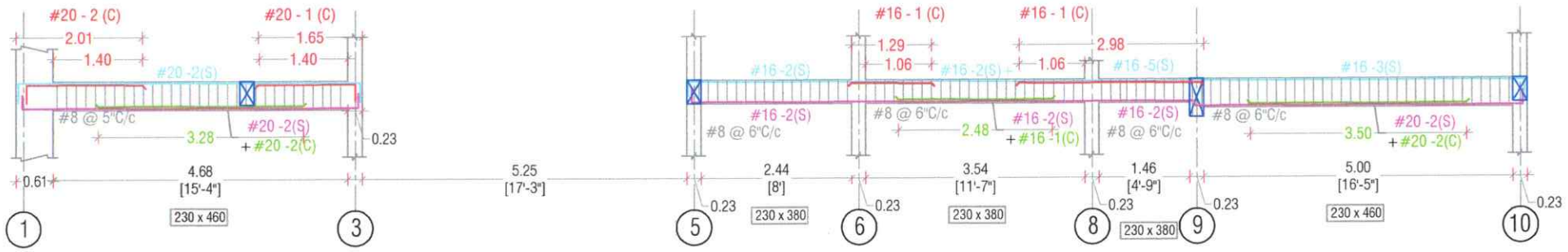
Model No	Scale	Date
001	Nts	05/04/2025
Designed by	**Drawn by**	**Checked by**
Pg	Mouli	Pg

Client Title:-	Drawing Title:-
ROCK MOUNT CITY	ROOF BEAM DETAILS
Project Title:-	
RESIDENTIAL BUILDING	0000103_ROCK MOUNT_20241113 Final.dwg

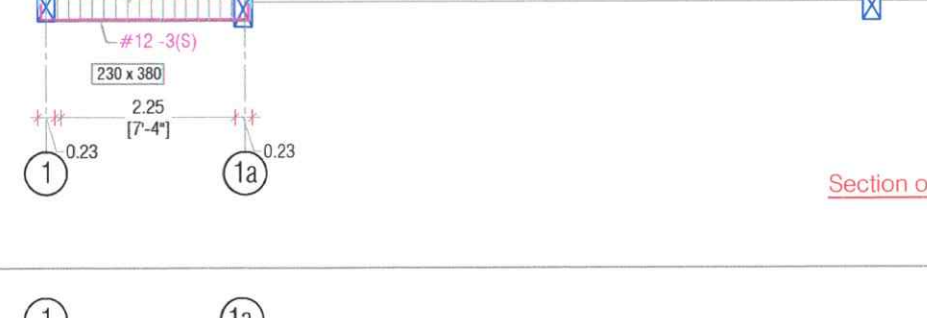
STRUCTURAL CONSULTANT:

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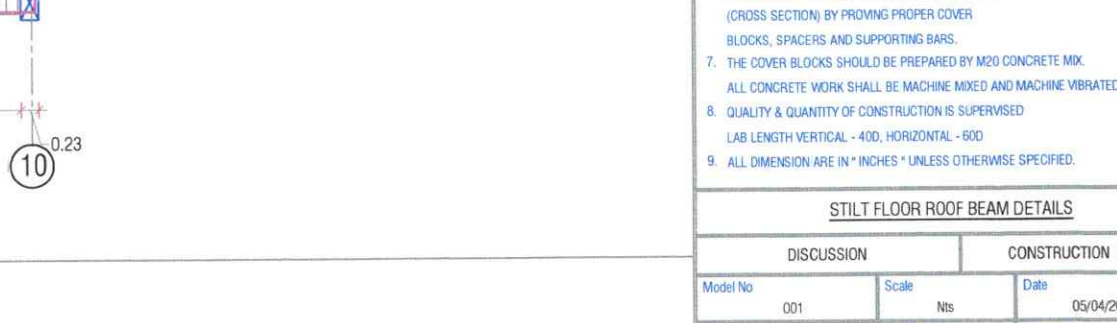
PG CADD STRUCTURES ERODE 22/27 8/7/25



Section on "F - F"



Section on "G - G"



Section on "H - H"

Section on " I - I "

Section on "I1 - I1"

Section on "J-J"

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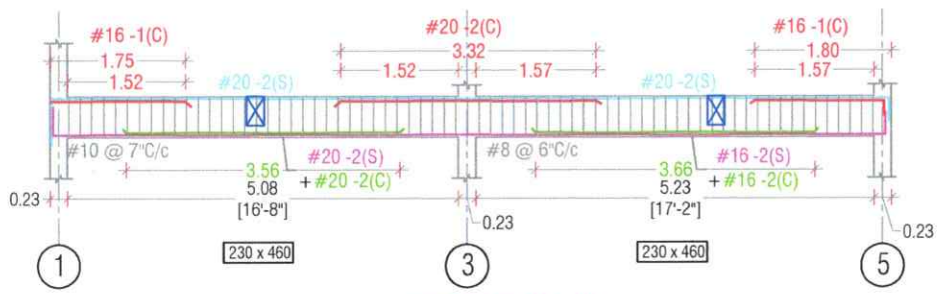
STILT FLOOR ROOF BEAM DETAILS

DISCUSSION	CONSTRUCTION ✓

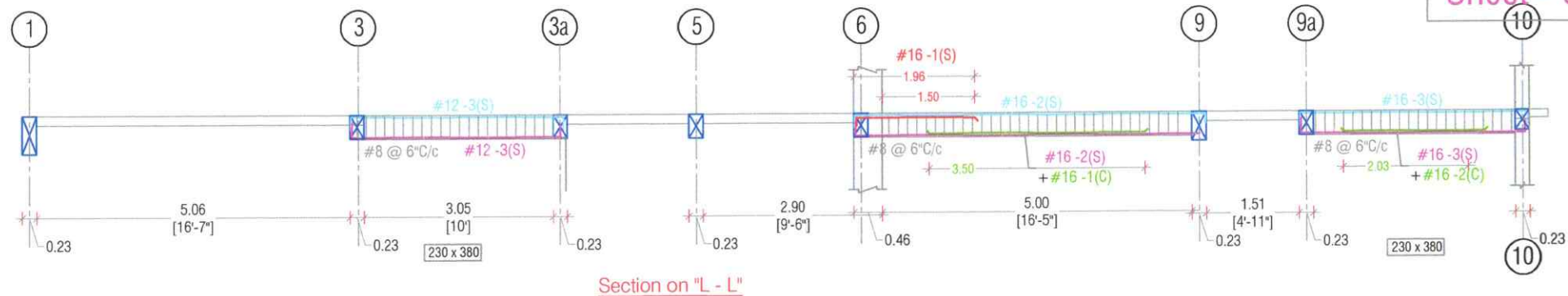
Model No	Scale	Date
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Designed by: Pg	Drawn by: Mouli	Checked by: Pg
Client Title:- ROCK MOUNT CITY	Drawing Title:- ROOF BEAM DETAILS	
Project Title:- RESIDENTIAL BUILDING	0000103_ROCK MOUNT_20241113 Final.dwg	

PGCADD STRUCTURES ERODE 23/24 8/7/25

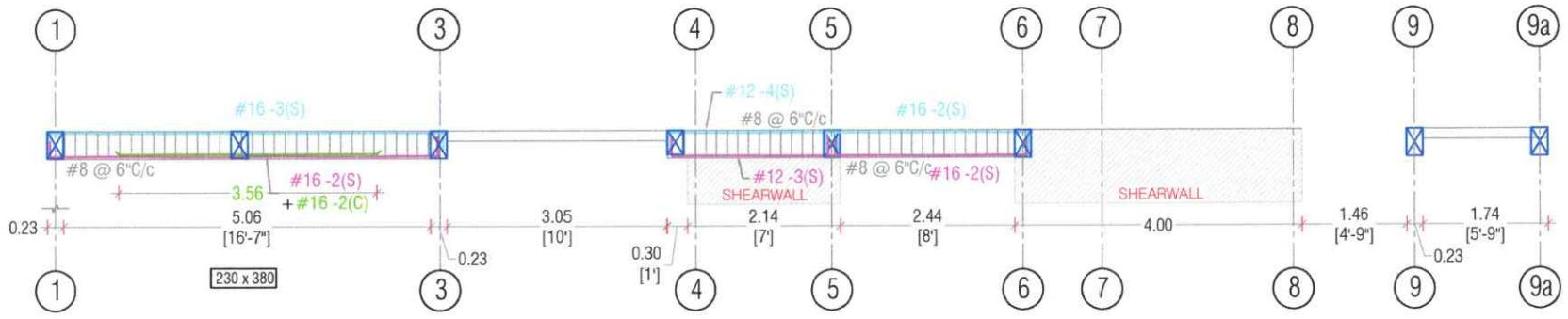
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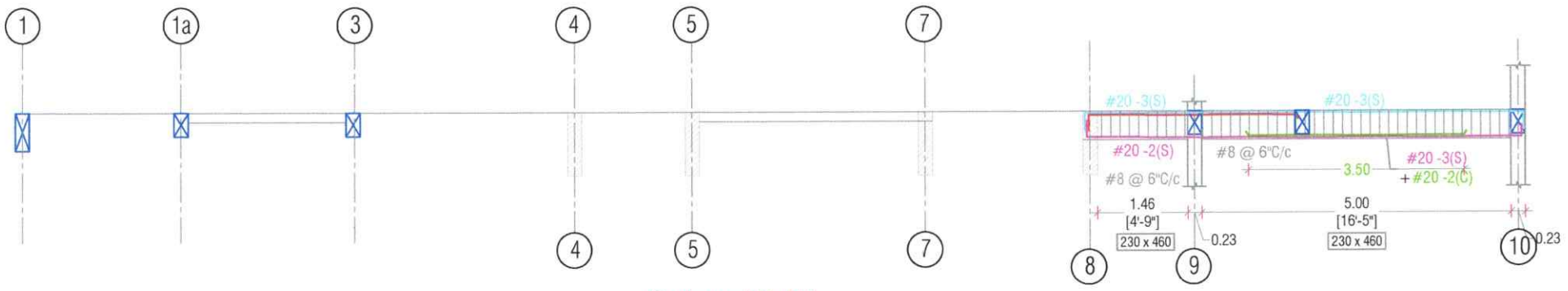
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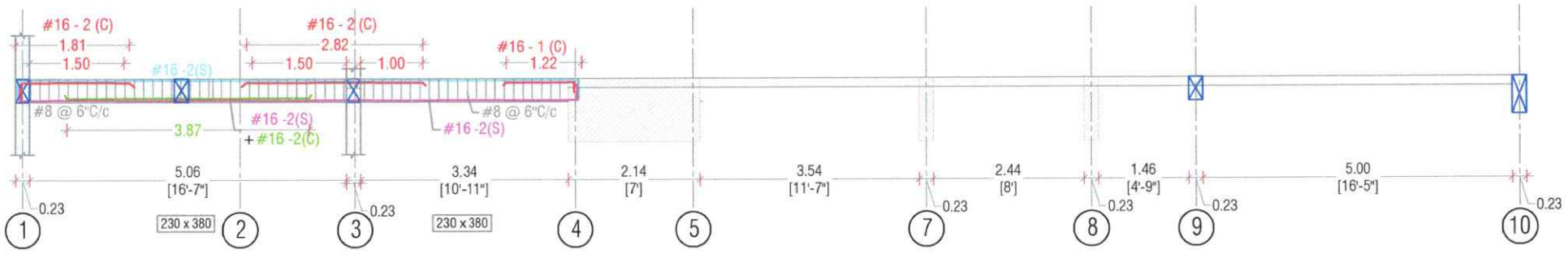
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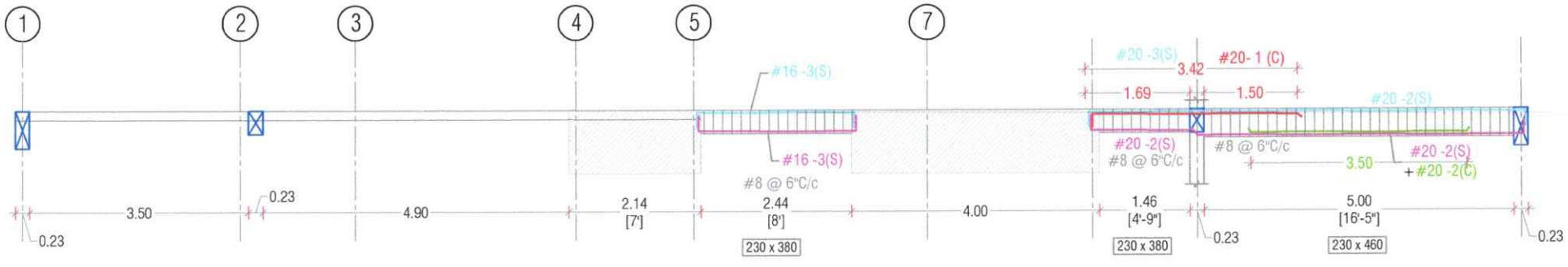
Section on " M - M "



Section on " N - N "



Section on " O - O "



Section on " P - P "

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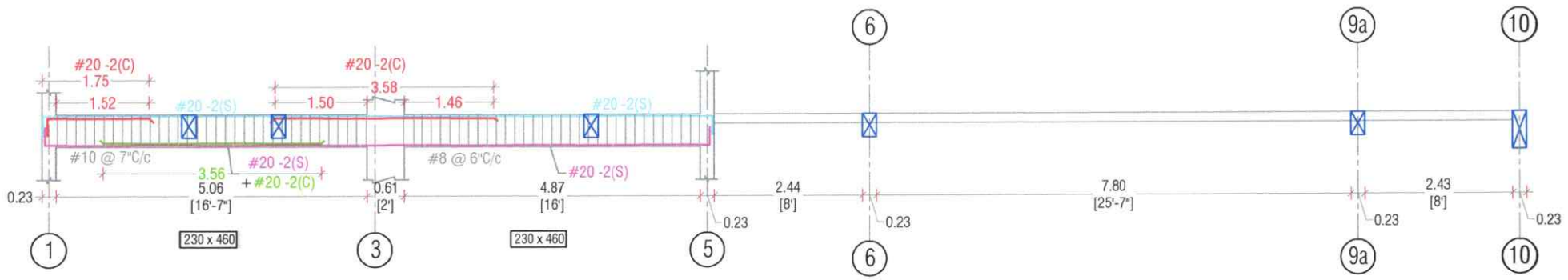
STILT FLOOR ROOF BEAM DETAILS

DISCUSSION	CONSTRUCTION ✓

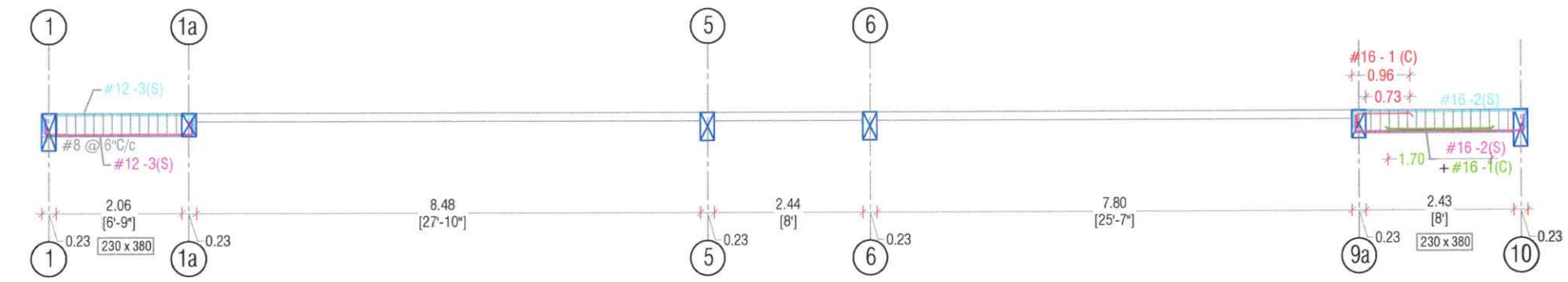
Model No	Scale	Date
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Designed by: Pg	Drawn by: Mouli	Checked by: Pg
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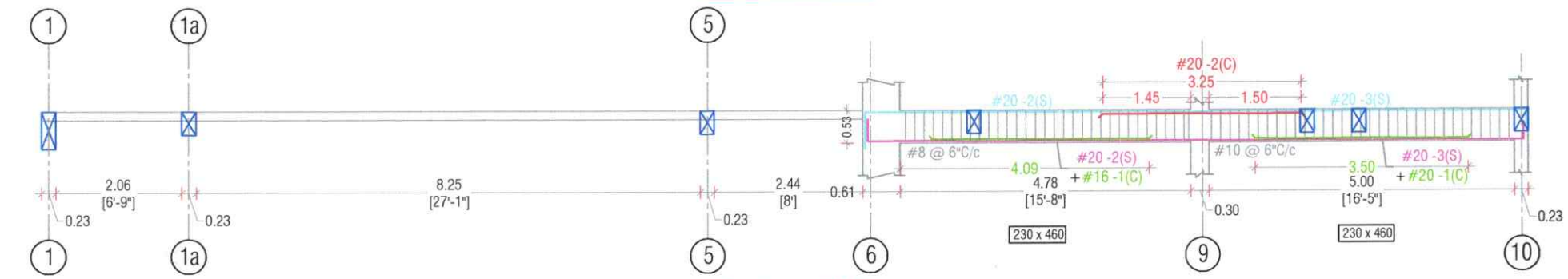
PGCADD STRUCTURES 24/25 8/7/25 ERODE



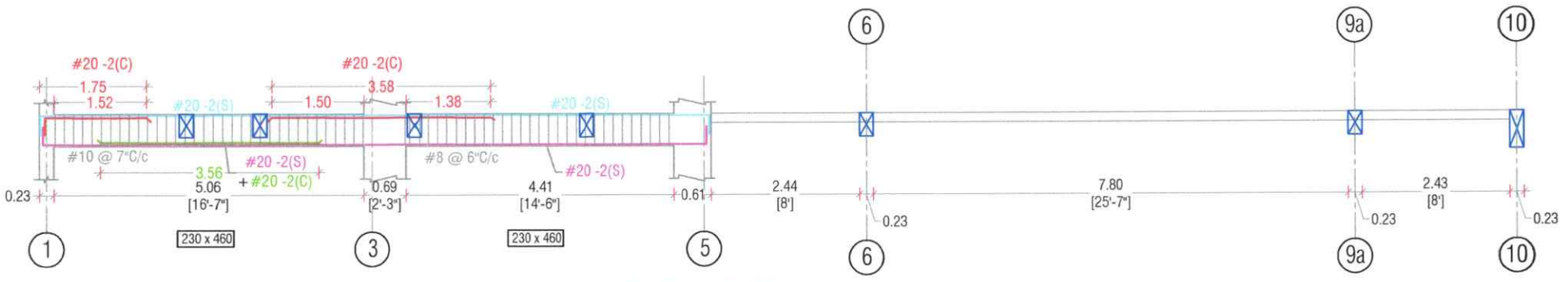
Section on "Q - Q"



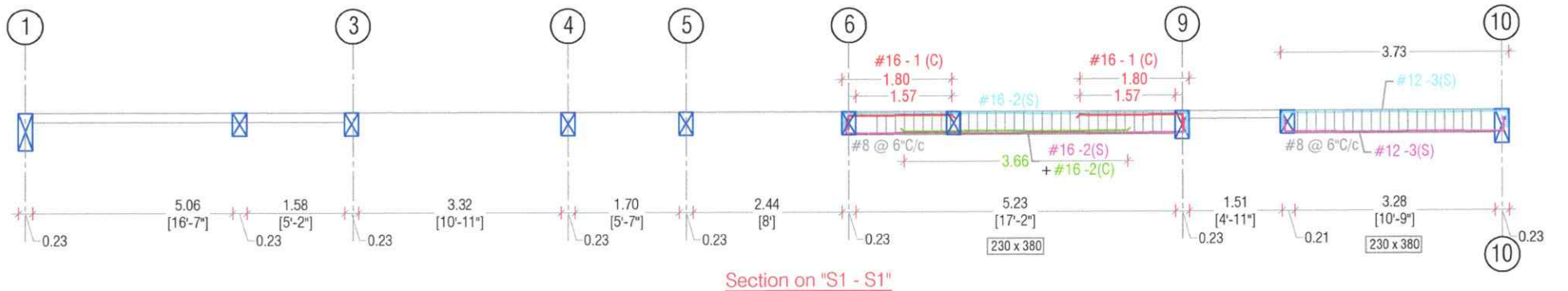
Section on "Q1 - Q1"



Section on "R - R"



Section on "S - S"



Section on "S1 - S1"

GENERAL DETAILS :

1. ALL DRAWING SHOULD BE READ ALONG WITH THE ARCHITECTURAL DRAWINGS.
2. GRADE OF CONCRETE MIX SHALL BE M 20 (1: 1½ :3) CONFORMING TO I.S. 456 – 2000 UNLESS OTHERWISE SPECIFIED.
3. ALL PLAIN AND REINFORCED CEMENT CONCRETE WORK SHALL STRICTLY CONFIRM TO I.S.456 - 2000.
4. REINFORCEMENT SHALL BE Fe 500 CONFORMING TO I.S.1786-1985.
5. CLEAR COVER TO STEEL AS FOLLOWS:
   - FOR FOOTING 50 MM
   - FOR COLUMN 40 MM
   - FOR BEAM 25 MM
   - FOR SLAB 20 MM
6. ALL REINFORCEMENTS SHALL BE PLACED AND MAINTAINED IN THE POSITION SHOWN IN THE DRAWING (CROSS SECTION) BY PROVING PROPER COVER BLOCKS, SPACERS AND SUPPORTING BARS.
7. THE COVER BLOCKS SHOULD BE PREPARED BY M20 CONCRETE MIX. ALL CONCRETE WORK SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
8. QUALITY & QUANTITY OF CONSTRUCTION IS SUPERVISED
9. LAB LENGTH VERTICAL - 40D, HORIZONTAL - 60D
10. ALL DIMENSION ARE IN " INCHES " UNLESS OTHERWISE SPECIFIED.

STILT FLOOR ROOF BEAM DETAILS

DISCUSSION	CONSTRUCTION ✓

Model No	Scale	Date
001	Nts	05/04/2025
Designed by	**Drawn by**	**Checked by**
Pg	Mouli	Pg

Client Title:- ROCK MOUNT CITY

Drawing Title:- ROOF BEAM DETAILS

Project Title:- RESIDENTIAL BUILDING

0000103_ROCK MOUNT_20241113 Final.dwg

STRUCTURAL CONSULTANT:

Er.R.PARAMAGURU., M.E.,A.M.I.E.,A.I.V.,

PG Cadd Structures

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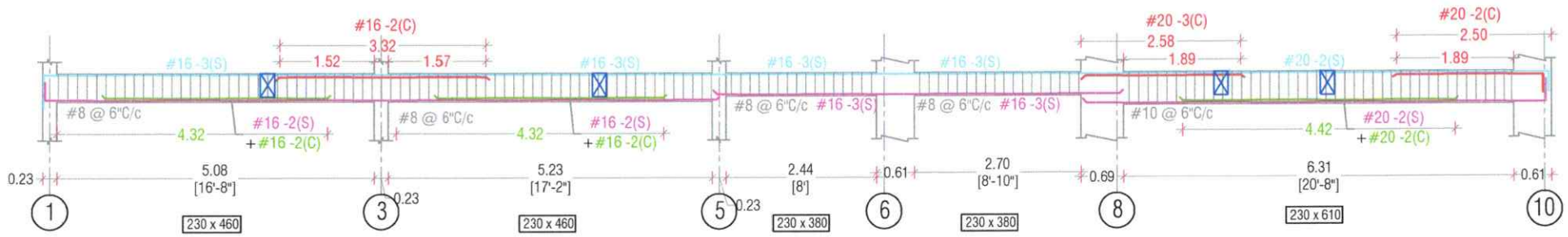
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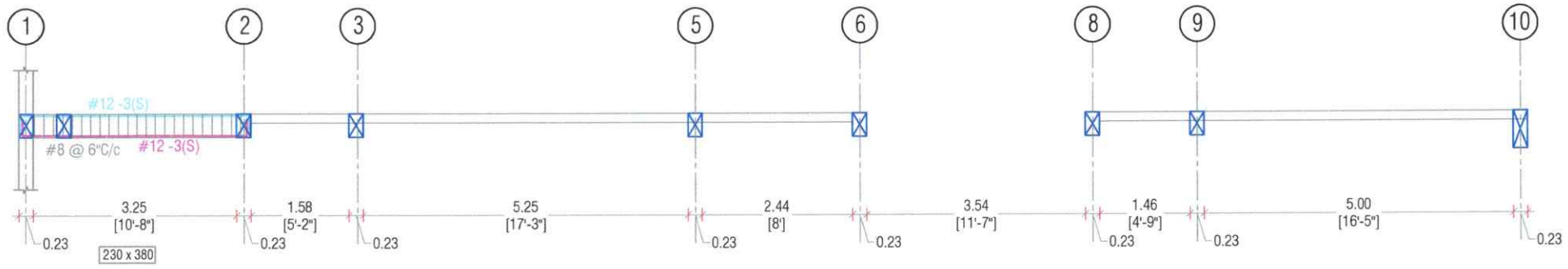
pgcaddt@gmail.com

98424 85533

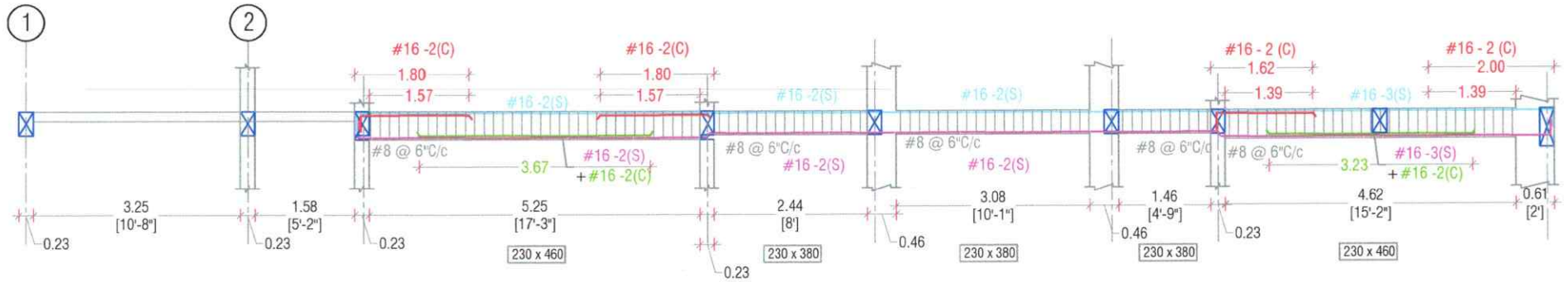
PGCADD STRUCTURES ERODE 25/24 8/7/25



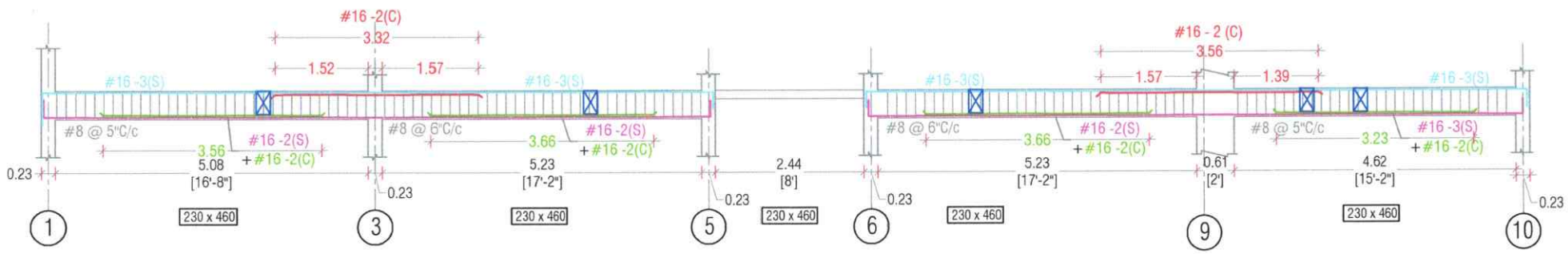
Section on "T - T"



Section on "U - U"



Section on "V - V"



Section on "W - W"

GENERAL DETAILS :

1. ALL DRAWING SHOULD BE READ ALONG WITH THE ARCHITECTURAL DRAWINGS.
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7. THE COVER BLOCKS SHOULD BE PREPARED BY M20 CONCRETE MIX. ALL CONCRETE WORK SHALL BE MACHINE MIXED AND MACHINE VIBRATED.
8. QUALITY & QUANTITY OF CONSTRUCTION IS SUPERVISED LAB LENGTH VERTICAL - 40D, HORIZONTAL - 60D
9. ALL DIMENSION ARE IN " INCHES " UNLESS OTHERWISE SPECIFIED.

STILT FLOOR ROOF BEAM DETAILS

DISCUSSION	CONSTRUCTION ✓

Model No	Scale	Date
001	Nts	05/04/2025
Designed by	Drawn by	Checked by
Pg	Mouli	Pg

Client Title:- ROCK MOUNT CITY

Drawing Title:- ROOF BEAM DETAILS

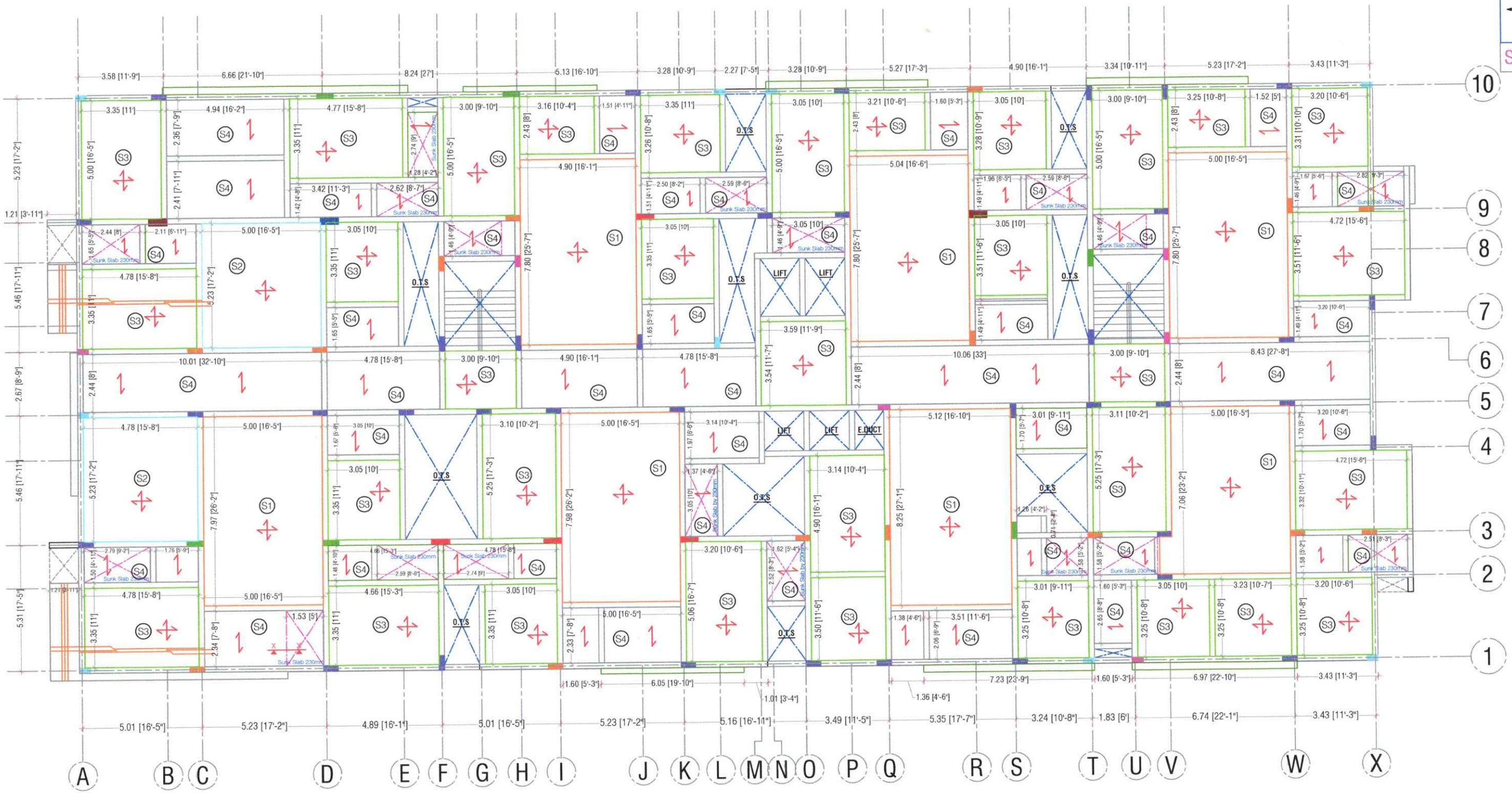
Project Title:- RESIDENTIAL BUILDING

0000103_ROCK MOUNT_20241113 Final.dwg

PGCADD STRUCTURES ERODE 26/24 8/7/25

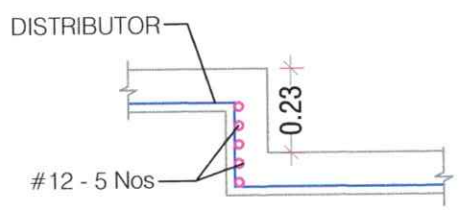
STRUCTURAL CONSULTANT:
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Sheet - 9/9



Slab Details

Slab Nos.	Tk	Type of Slab	Main Reinforcement	Distributor	Shorter Span	Longer Span
S1	150 mm	Two way	---	---	#12 @150c/c	#10 @150c/c
S2	150 mm	Two way	---	---	#10 @150c/c	#10 @150c/c
S3	125 mm	Two way	---	---	#8 @150 c/c	#8 @150 c/c
S4	125 mm	One way	#8 @150c/c	#8 @175c/c	---	---



SECTION ON "XX"
(TYPICAL ON SUNKEN PORTION)

PGCADD STRUCTURES 27/27 8/7/25 ERODE

STILT FLOOR ROOF SLAB DETAILS

DISCUSSION	CONSTRUCTION ✓	
Model No: 001	Scale: Nts	Date: 05/04/2025
Designed by: Pg	Drawn by: Mouli	Checked by: Pg
Client Title:- ROCK MOUNT CITY	Drawing Title:- SLAB LAYOUT DETAILS	
Project Title:- RESIDENTIAL BUILDING	0000103_ROCK MOUNT_20241113 Final.dwg	

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THE LANDLENS SUITE

Eight ways to know a piece of land before you pay for it.

This report covers one part of the picture. These cover the rest, drawn from the same government records, for any property in Tamil Nadu.

LandLens One
Ask anything about a property and get an answer grounded in live government records, with the sources shown.
/landlens/one

Verify My Land
Every record check run on one property and returned as a single report.
/landlens/verify-my-land

Legal Opinion
An advocate's written opinion on the title, built on the records we pull for it.
/landlens

One Map
Every layer on one map: the parcel, its boundary, zoning, water bodies and what sits around it.
/landlens/one/map

PriceMap
What land actually changed hands for around this plot, taken from the registered deeds.
/landlens/pricemap

Build Scope
What you are allowed to build here: floor space, height, coverage and setbacks.
/landlens/build-scope

Property Tracker
Watch a property and hear about it when something new is registered against it.
/landlens/property-tracker

Deal Room
Run the transaction in one place: documents, stamping, signatures and the parties.
/landlens/deal-room

FREE TOOLS · NO ACCOUNT NEEDED

Twenty-four checks you can run yourself, at no cost.

Records and verification

The registers themselves, read for you.

- Encumbrance Certificate
- Patta and Chitta
- Field Measurement Sketch
- EC Analyzer
- Bank charge check
- Court case search
- Seller background check
- Approval check by survey

Value and duty

What it is worth and what it costs to register.

- Guideline value by street
- Guideline value by survey
- Stamp duty and registration fees
- Capital gains
- Floor space index
- Area unit converter

Zoning and land use

What the plan says can happen on this land.

- Land use zone finder
- CMDA land use check
- Coastal regulation zone
- Master plan check
- Water bodies finder
- Airport height clearance

Registers and directories

Who holds it, and which office keeps the record.

- Find your registering office
- Temple property check
- Waqf property check
- RERA register

Every free tool
/tools

Services we run for you
/services

The LandLens suite
/landlens/one

Verified RealEstate™

Every claim in this document traces back to a government record.

- Legal opinions, due diligence and title verification
- Building plan, layout and sub-division approvals
- Completion and occupancy certificates, regularisation
- Escrow, negotiation and NRI property management
- Land survey, soil testing, architecture and construction

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+91 9996 12 9996

Prepared from the registers named on the page each finding sits on. Where a register could not be read, this document says so in its place rather than leaving the gap to be read as a clean result.