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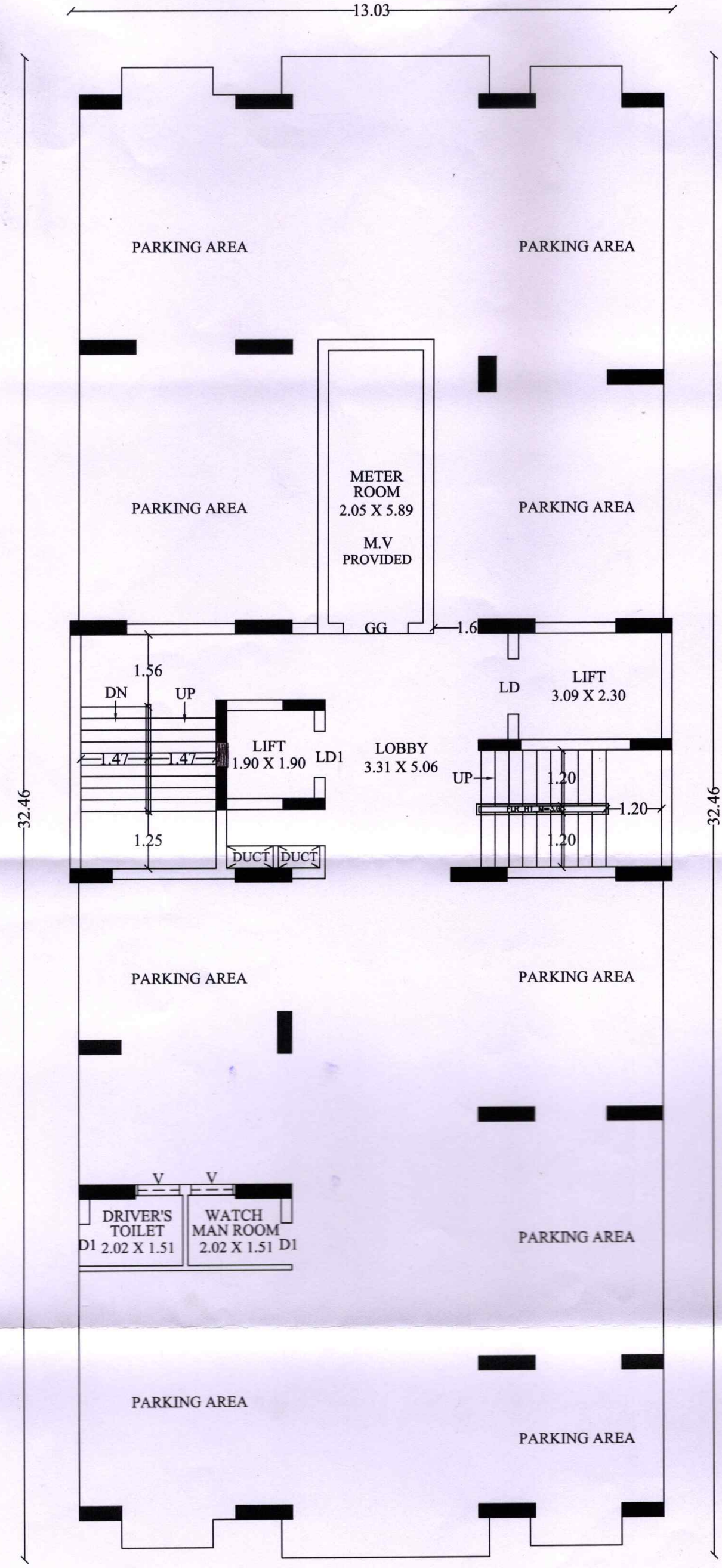
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DIGITALLY VERIFIED RECORD

SHEET-01

CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4



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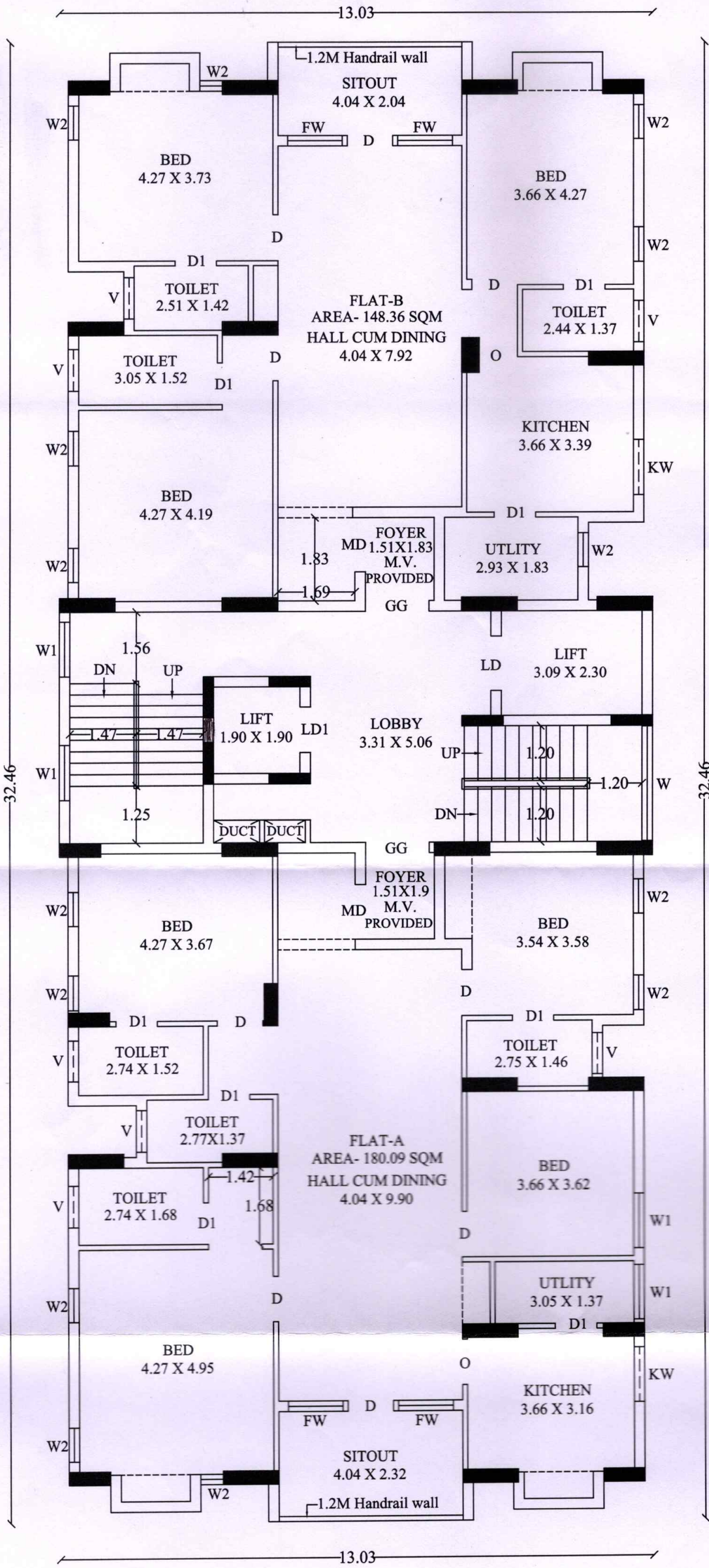
STILT FLOOR PLAN

(PARKING)

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Cell: 97893 13245

SHEET-02

CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4



TYPICAL FLOOR PLAN

FIRST, SECOND, THIRD, FOURTH, FIFTH, SIXTH, SEVENTH, EIGHT & NINENTH FLOOR

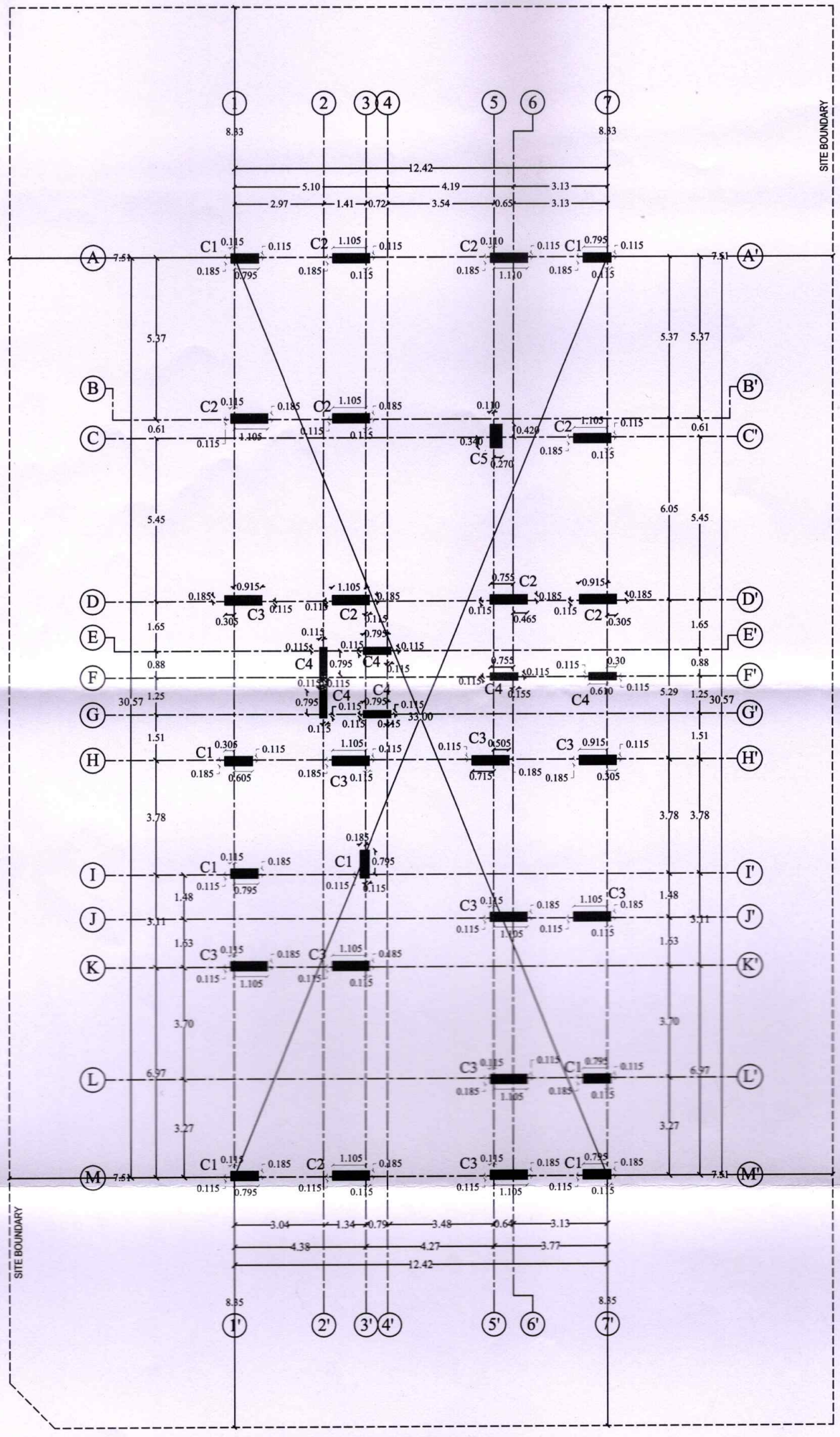
TYPICAL_FLOOR_PLAN=1,2,3,4,5,6,7,8,9

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SHEET-03

CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4

COLUMN CENTRE LINE MARKING LAYOUT



9.14M WIDE CRAWFORD COLONY MAIN ROAD

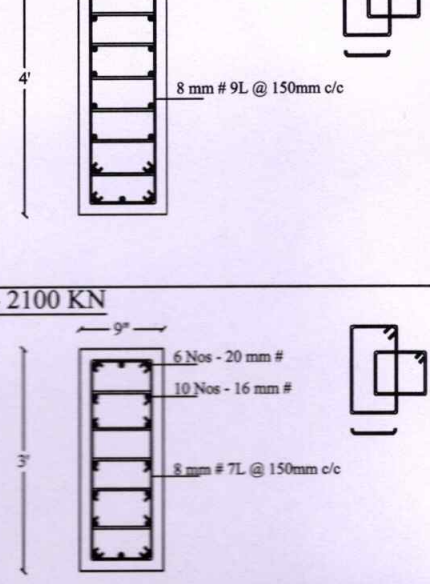
12.19M WIDE CRAWFORD COLONY MAIN ROAD

DRAWING TITLE

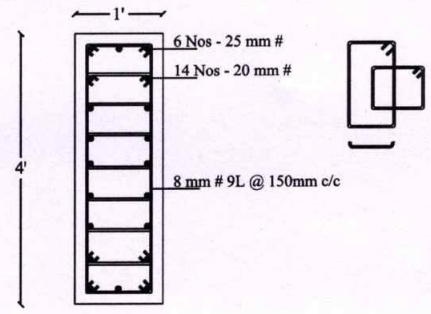
COLUMN CENTRE LINE MARKING LAYOUT

N W E S

C1 - 3111 KN



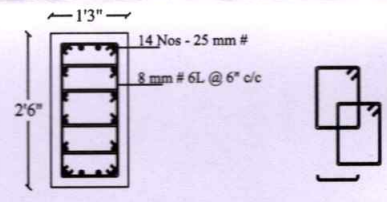
C2 - 4227 KN



C3 - 3644KN

C4 - 2100 KN

C5 - 4227 KN

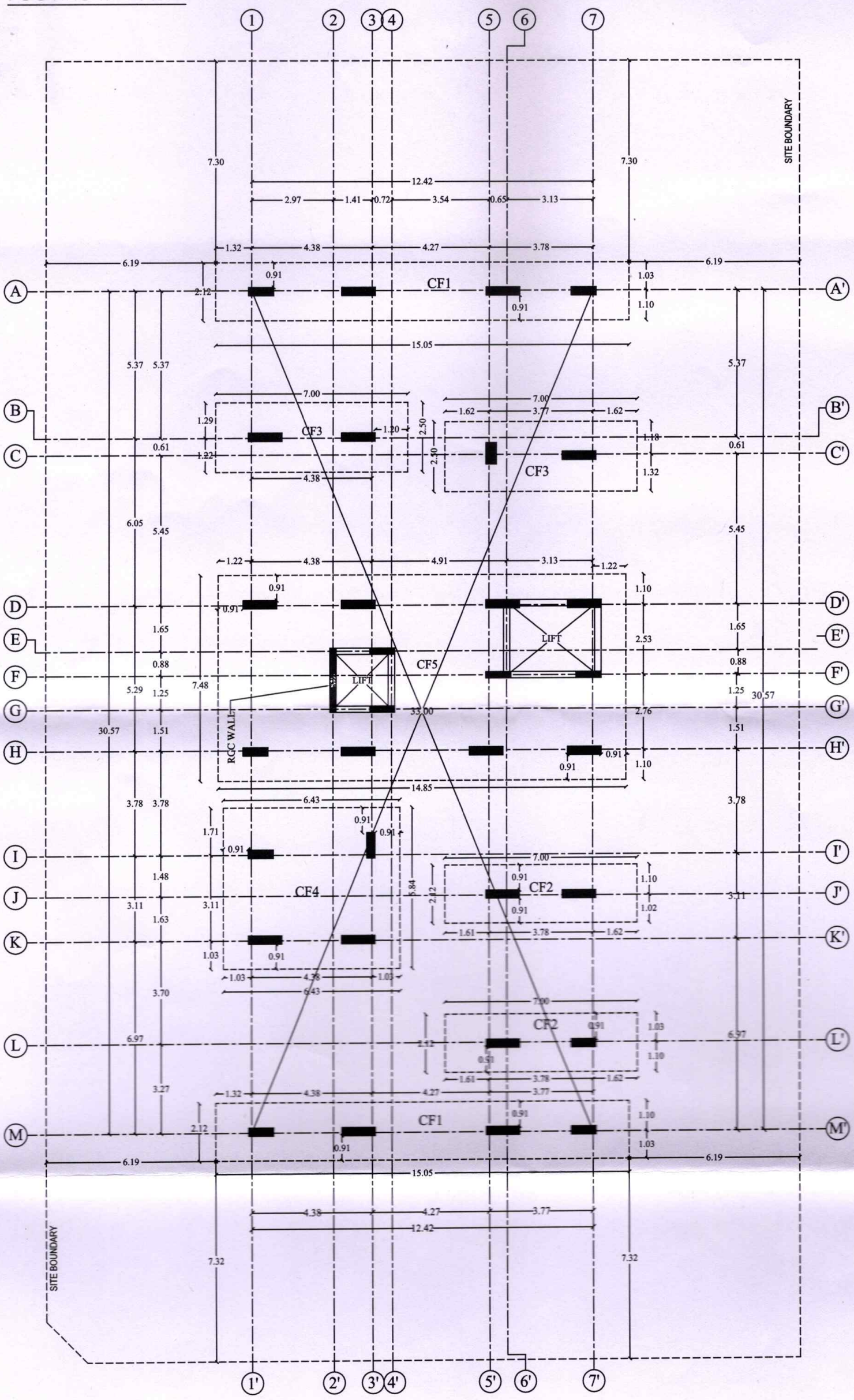


NOTE :

RCC MIX	= M35
Reinforcement	= Fe550
Clear Cover for Column	= 40mm
Clear Cover for Beam	= 25mm
Clear Cover for Footing	= 50mm

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FOOTING MARKING



CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4

DRAWING TITLE

FOOTING MARKING

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NOTES:

1. ALL DIMENSIONS ARE IN "FEET & INCHES".
2. ALL REINFORCEMENT STEEL SHALL BE HYSD (Fe 550) CONFORMING TO IS:1786-2008
3. GRADE OF CONCRETE SHALL BE M25 (MAXIMUM CEMENT CONTENT SHOULD BE 450 KGS/CU.M) (SLUMP SHOULD BE 75 TO 100MM)

GRADE	CEMENT/CUM	WATER CEMENT RATIO	SLUMP
M20	375 KGS	0.55	75 MM TO 100 MM
M25	400 KGS	0.50	
M30	425 KGS	0.45	
M35	425 KGS	0.45	
M40	450 KGS	0.40	

(NOTE:- IF SUPER PLASTICIZER IS USED, THE WATER CONTENT CAN BE REDUCED UPTO 20%)

4. CLEAR COVER FOR MAIN REINFORCEMENT
   a) Footing: 50mm, Pile: 50mm, Pile Cap: 75mm, Column: 40mm, Sump: 40mm, Shear wall: 40mm.
   b) Slab: 20mm, Beam: 25mm
5. WATER CEMENT RATIO SHOULD BE 0.55 FOR M20, 0.50 FOR M25, 0.45 FOR M30 & M35 AND 0.40 FOR M40
6. ALL KIND OF SHUTTERING PLANKS SHOULD BE PAINTED WITH GREASE OR CRUDE OIL BEFORE CONCRETING.
7. NO OPENING SHALL BE MADE IN CONCRETE WORKS.
8. VIBRATORS MUST BE USED FOR ALL CONCRETING WORKS.
9. MINIMUM 6 NOS. OF CONCRETE CUBE SHALL BE TAKEN ON EACH DAY OF CONCRETE AND IT SHALL BE TESTED IN IN ACCORDNCE WITH THE RECOMMENDATIONS OF IS 456-2000.
10. STABILITY OF THE FORM WORK RESPOMNSIBILITY OF THE CONTRACTOR.
11. BEFORE CONCRETING CHECK AND FINALIZED THE LEVEL OF TOP OF CONCRETE WORK.
12. DO NOT SCALE THE DRAWINGS, WRITTEN DIMENSIONS TO BE FOLLOWED.
13. READ STRUCTURAL DWG IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS.
14. THE CONSULTANT IS NOT RESPONSIBLE FOR THE FAILURES DUE TO IMPROPER EXECUTION OF WORK AT SITE.
15. POLYTHENE SHEETS 1000 GAUGE TO BE LAID BELOW THE FOUNDATIONS (AT TOP OF P.C.C)
16. ALL STRUCTURES BELOW THE GROUND LEVEL IN CONTACT SOIL MUST BE PAINTED WITH TWO COATS OF BITUMEN.
17. IS CODE FOR COARSE AGGREGATE - TABLE 2 OF IS 383
    IS CODE FOR FINE AGGREGATE - ZONE 1 OF IS 383
    IS CODE FOR MIX DESIGN - IS 10262 : 1982
    IS CODE FOR WATER - IS 3025 TO BE FOLLOWED.
18. ALL CONSTRUCTION JOINTS CONCRETE TO BE CHIPPED BEFORE NEW CONCRETING.

19. NOTE FOR LAPPING:

I) AT ANY CROSS SECTION NOT MORE THAN 1/3 rd OF THE BARS SHALL BE LAPPED.
II) LAPS SHALL BE STAGGERED WITH A MINIMUM DISTANCE OF 1.30 TIMES OF LAP LENGTH.
III) LAP IN COLUMNS SHALL BE PROVIDED AT MID HEIGHT OF THE FLOOR AND NOT AT THE SLAB LEVEL.
IV) LAP IN BEAMS & SLABS SHALL BE PROVIDED AT POINT OF CONTRAFLEXUTRE.

20. CURING WORKS:

A) CURING MUST BE STARTED IN 8 HOURS AFTER CONCRETING.
B) WET GUNNY BAGS, JUTE MATING, STRAW ETC., ARE TO BE USED TO COVER THE VERTICAL SURFACE TO KEEP THE COORETE WET.
C) ALL STRUCTURES SHOULD BE CURED FOR 21 DAYS.

21. TAKE CARE ABOUT THE NEARBY BUILDINGS/WALLS AND SOIL CONDITIONS DURING EARTH WORK EXCAVATION.
22. THIS DRAWING IS VALID ONLY IF CONSULTANT CHECK AT SITE.
23. STRUCTURAL ENGINEER TAKES NO RESPONSIBILITY IN THE VIOLATION / DEVIATION OF SETBACK & FSI NORMS IN THE TNCDBR, 2019 WHATSOEVER FOR THE SAME.
24. THIS BUILDING DESIGNED FOR STILT + 9 Floors (Seismic design as per IS 1893 - 2002) - Zone - II

REMOVAL OF FORM WORKS AFTER CASTING CONCRETE

A) FOR COLUMNS & BEAM SIDES -	24 Hours
B) FOR ROOF SLABS BOTTOM	
i) CLEAR SPAN LESS THAN 4.5M -	14 DAYS
ii) CLEAR SPAN MORE THAN 4.50M -	21 DAYS
B) FOR ROOF BEAMS BOTTOM	
i) CLEAR SPAN LESS THAN 6M -	14 DAYS
ii) CLEAR SPAN MORE THAN 6M -	21 DAYS

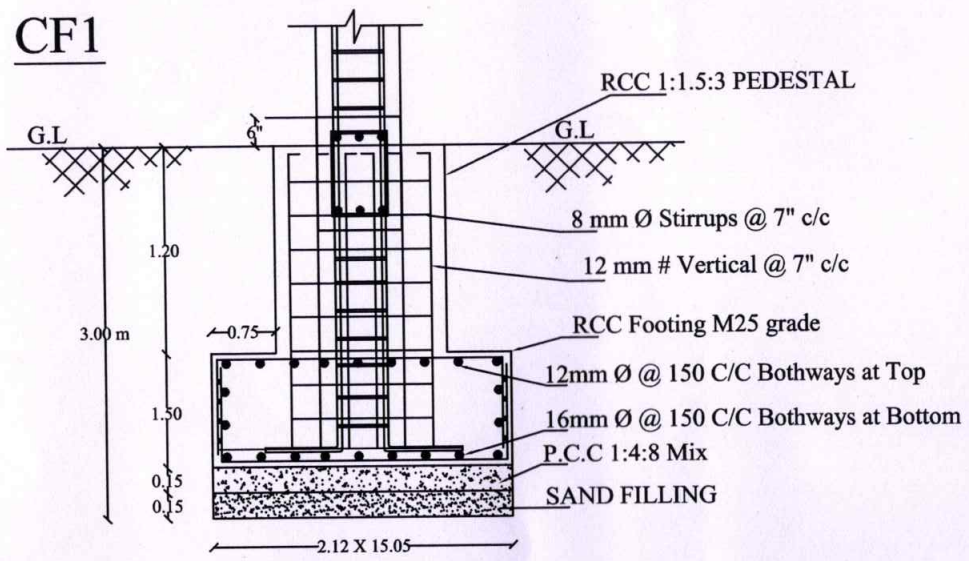
NOTE :

RCC MIX	= M35
Reinforcement	= Fe550
Clear Cover for Column	= 40mm
Clear Cover for Beam	= 25mm
Clear Cover for Footing	= 50mm

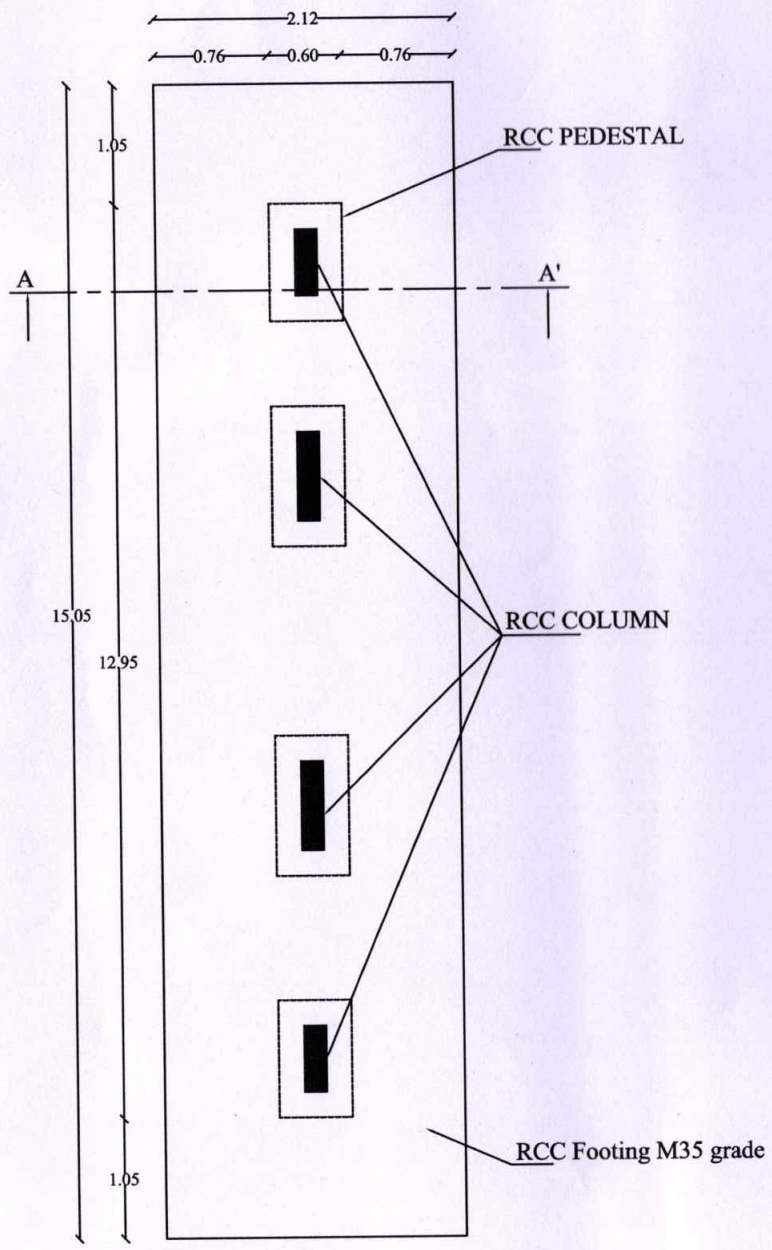
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FOOTING CROSS SECTION DETAILS

CF1

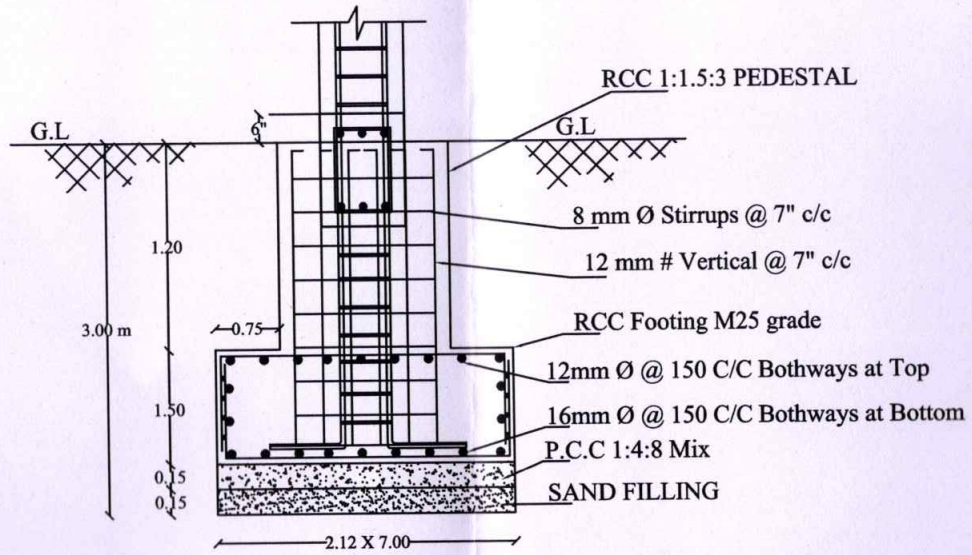


SECTION ON AA'

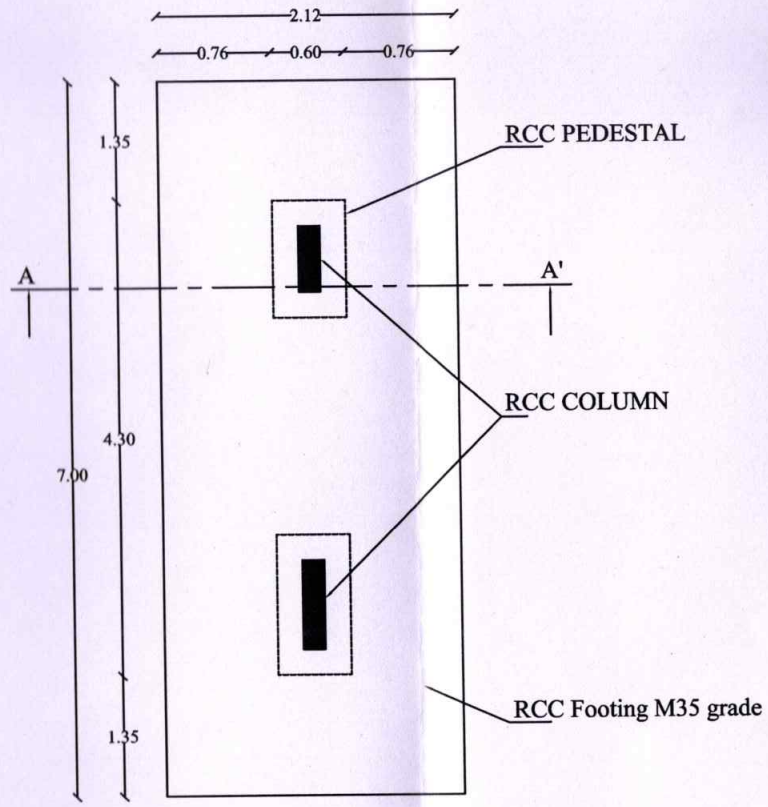


PLAN

CF2

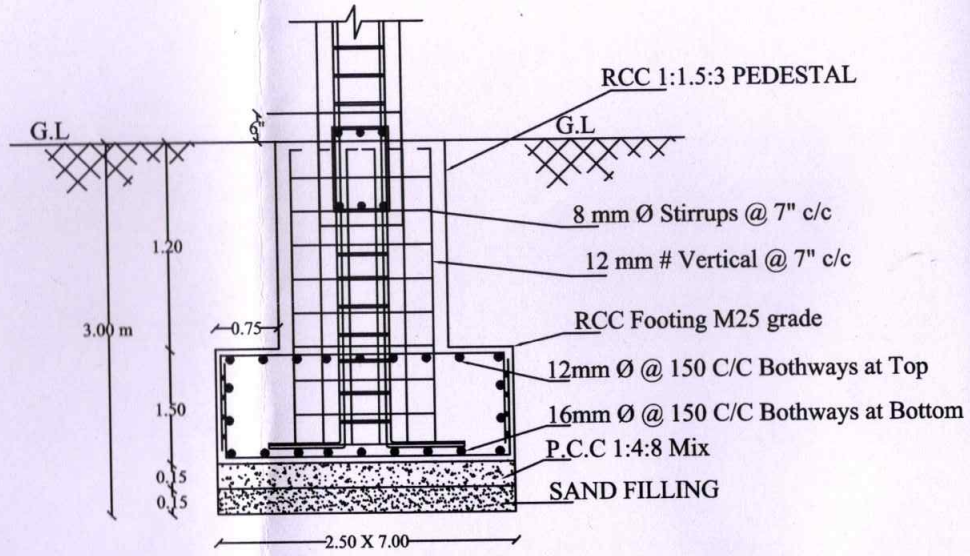


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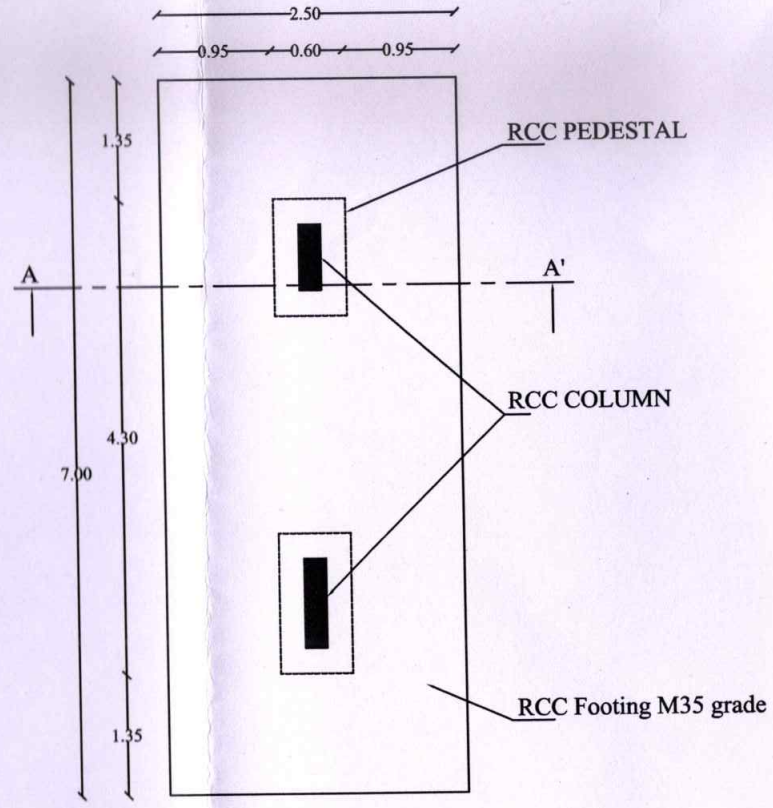


PLAN

CF3



SECTION ON AA'

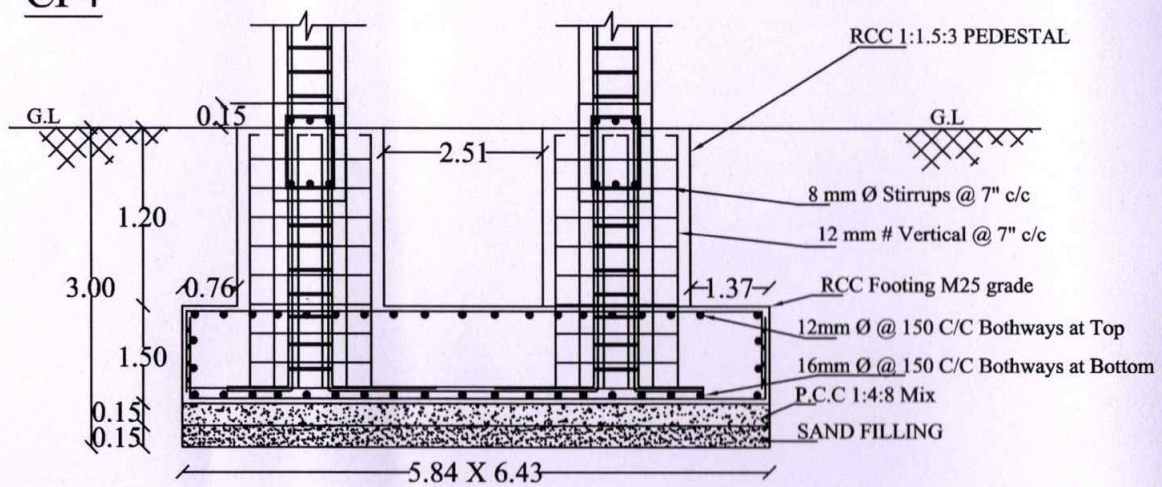


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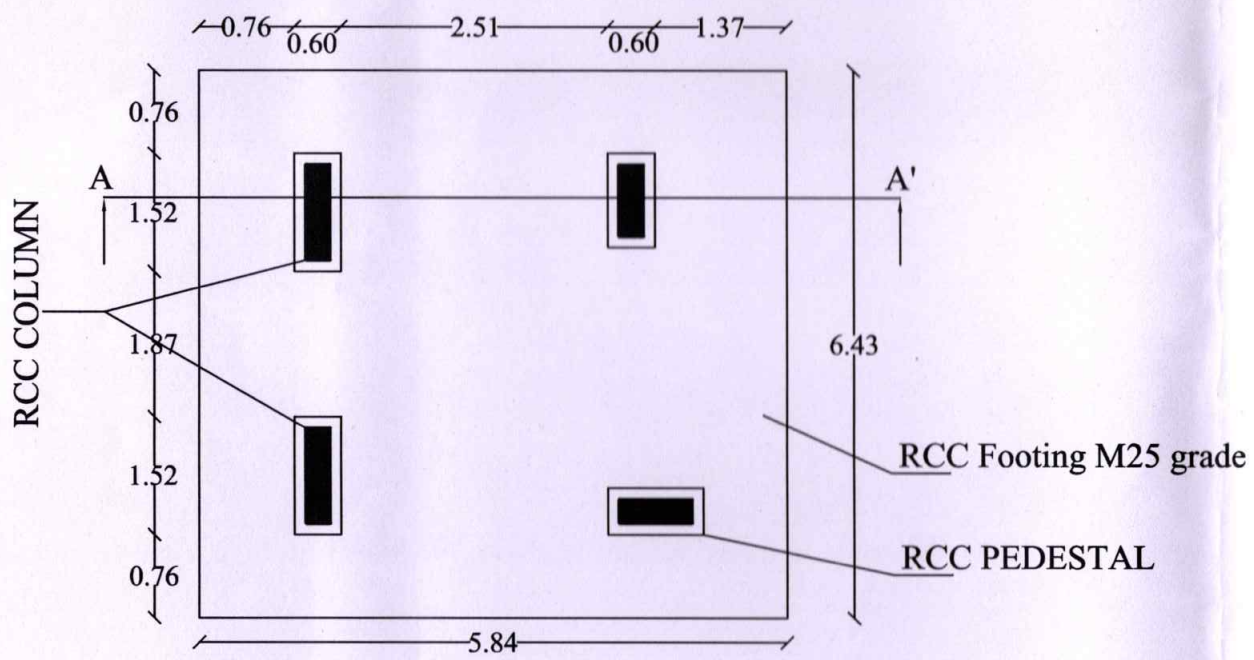
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FOOTING CROSS SECTION DETAILS

CF4

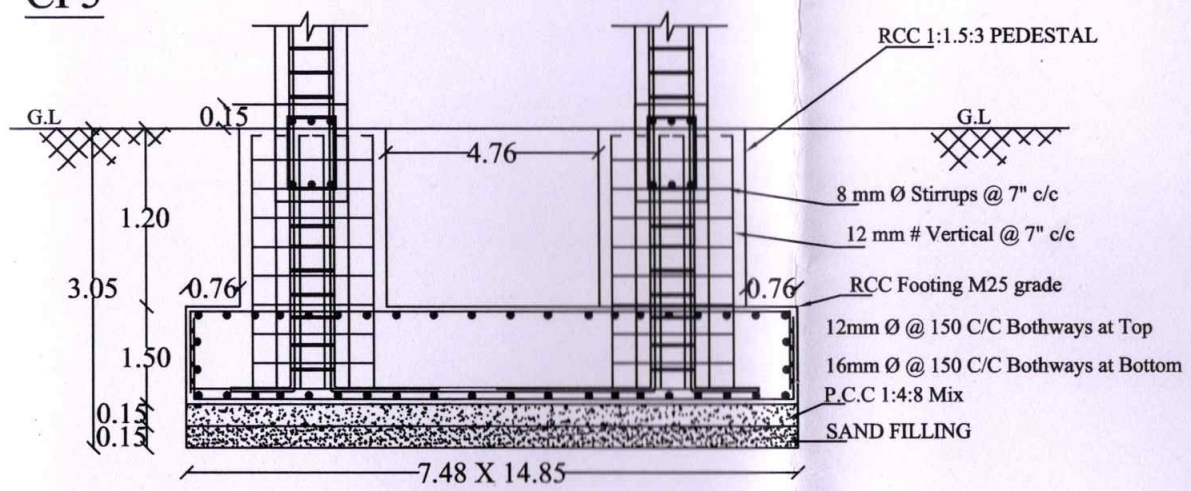


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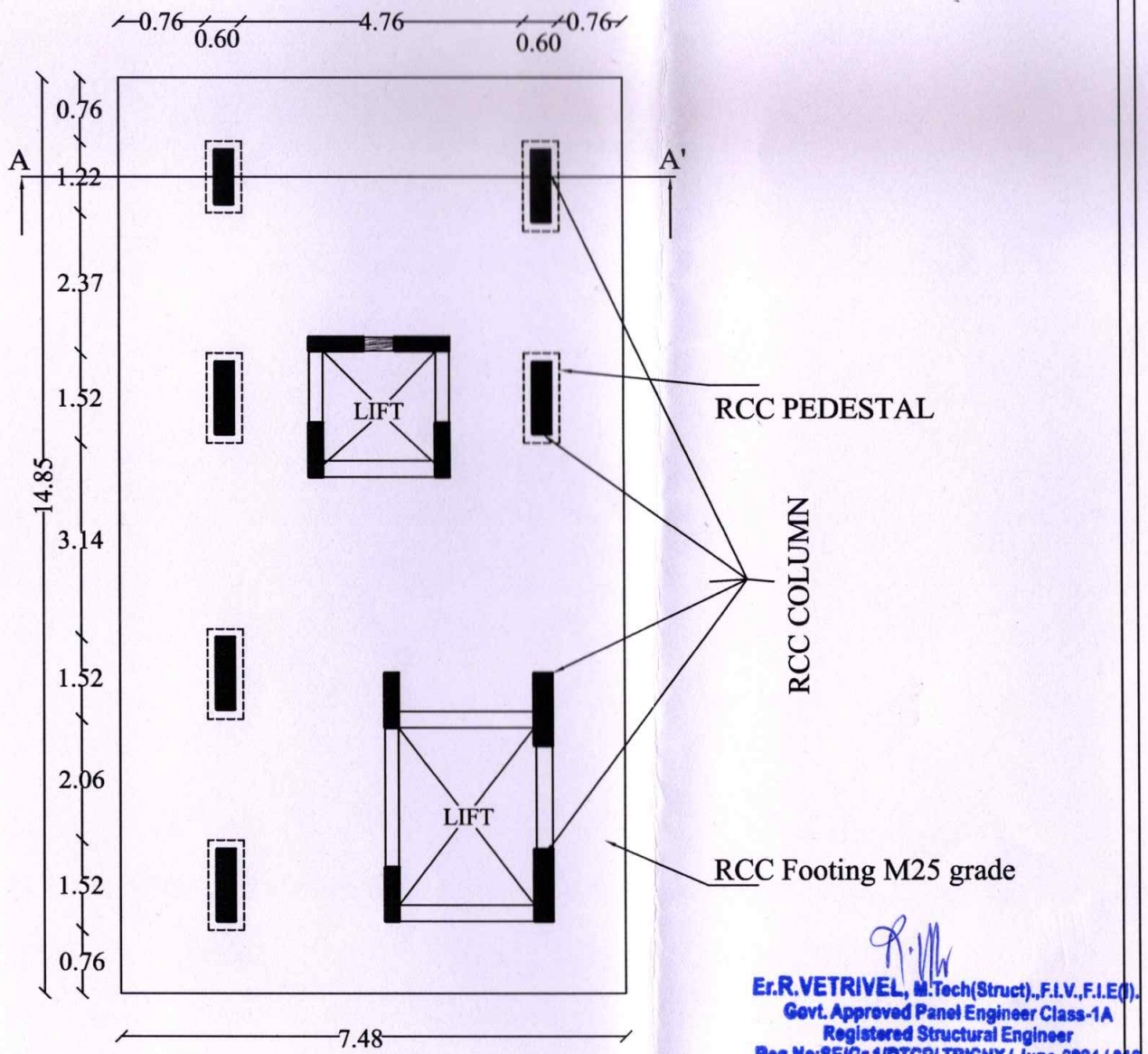


PLAN

CF5



SECTION ON AA'

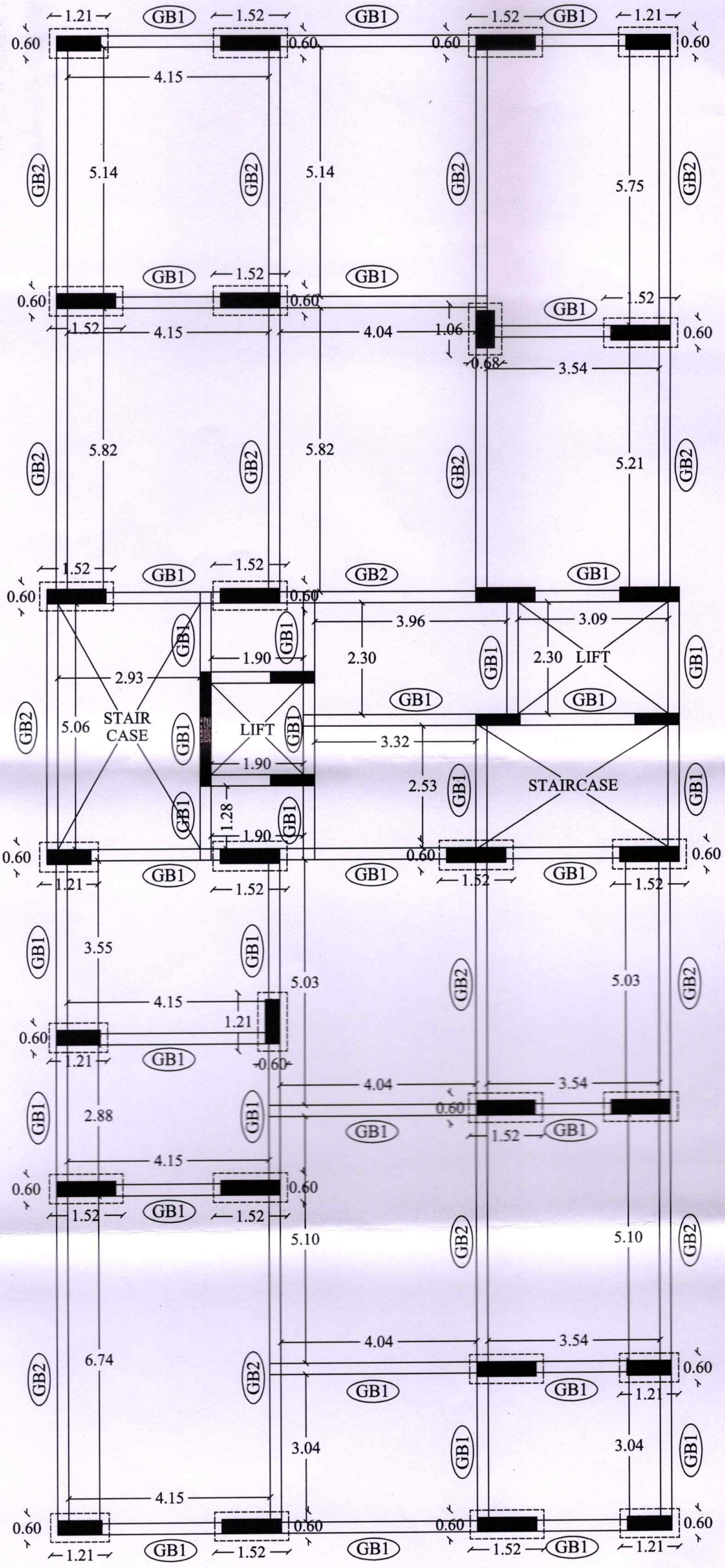


PLAN

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GRADE BEAM DESIGN

(with RCC Pedestal)



SHEET-07

CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4

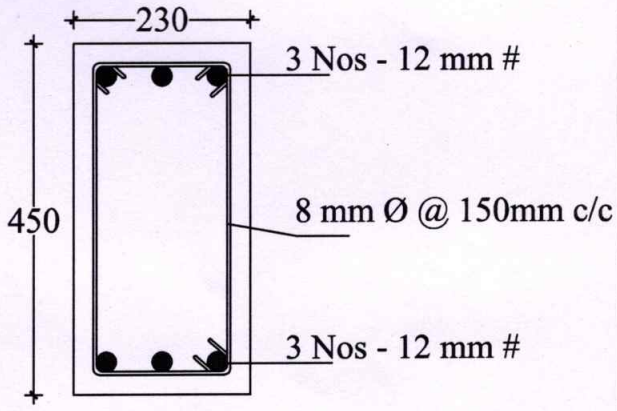
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GRADE BEAM DESIGN

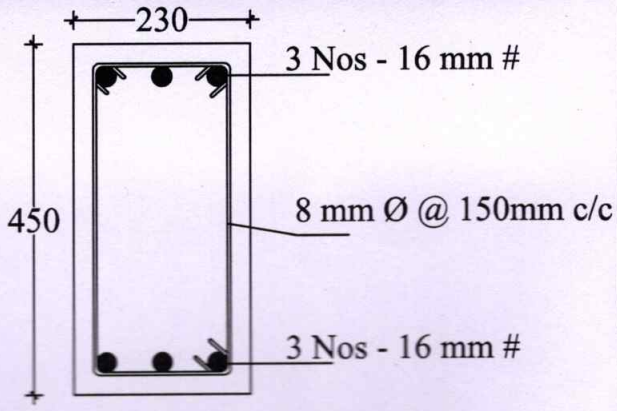
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GRADE BEAM CROSS SECTION

GB1



GB2

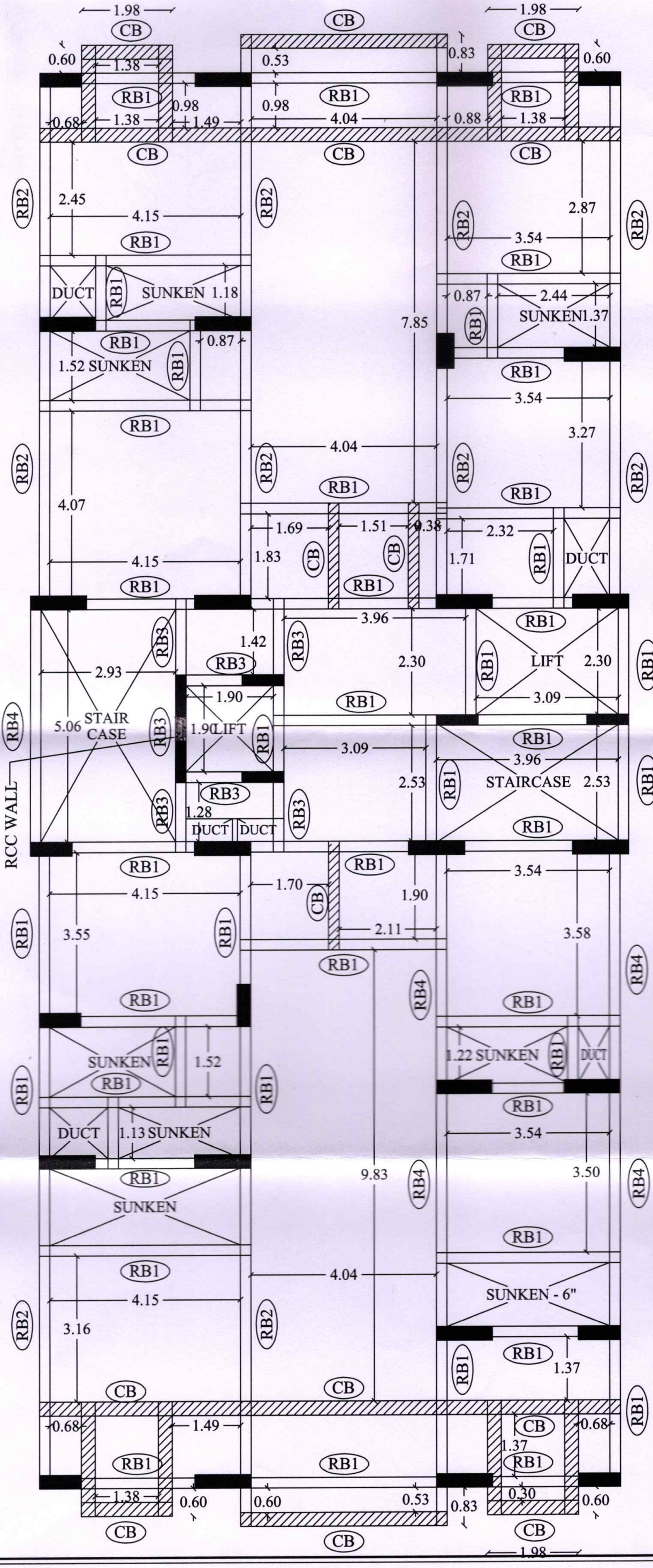


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NOTE :

RCC MIX	= M35
Reinforcement	= Fe550
Clear Cover for Column	= 40mm
Clear Cover for Beam	= 25mm

TYPICAL FLOORS ROOF BEAM DESIGN



SHEET-08

CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4

DRAWING TITLE

TYPICAL FLOORS ROOF BEAM DESIGN

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Reg.No:S[illegible]/DTCP/ TRICHY / June-2024 / 013
B-382, Gandhiyadigal Street,
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NOTE :

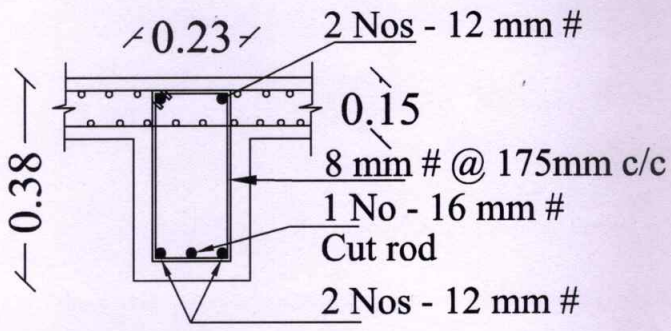
RCC MIX	= M35
Reinforcement	= FeFe550
Clear Cover for Column	= 40mm
Clear Cover for Beam	= 25mm
Clear Cover for Slab	= 20mm

ROOF BEAM REINFORCEMENT DETAILS

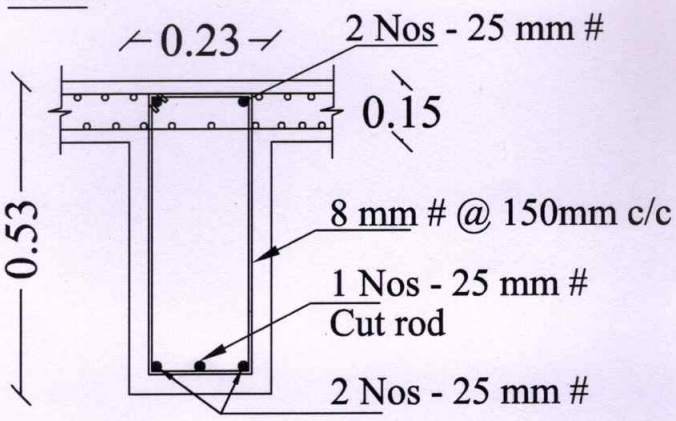
SHEET-09

CROSS SECTION @ MID SPAN

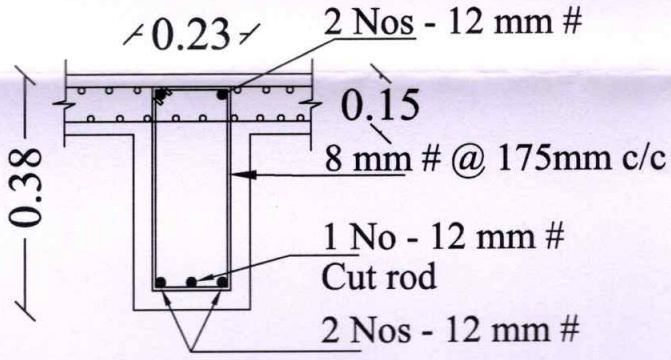
RB1



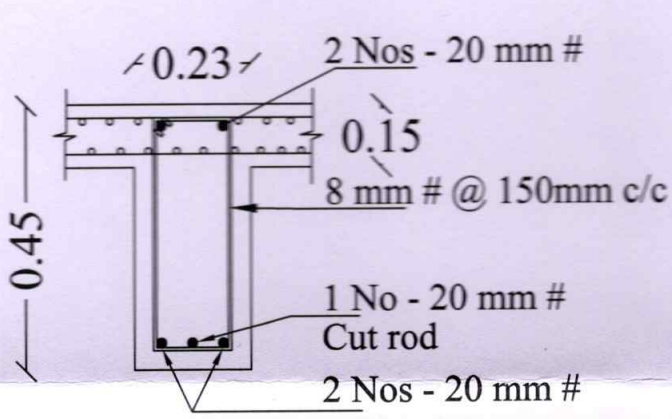
RB2



RB3

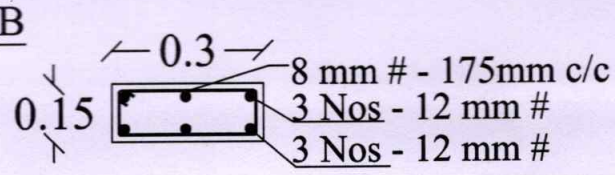


RB4



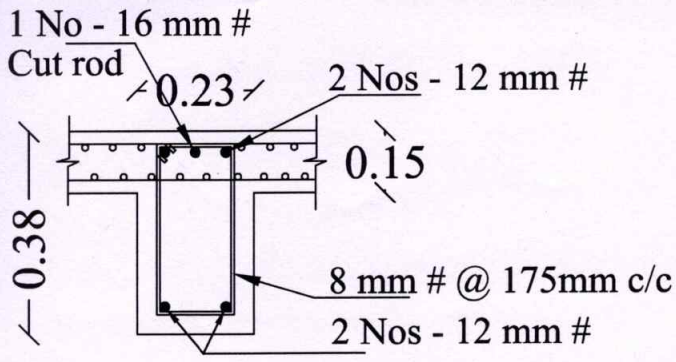
Concealed Beam

CB

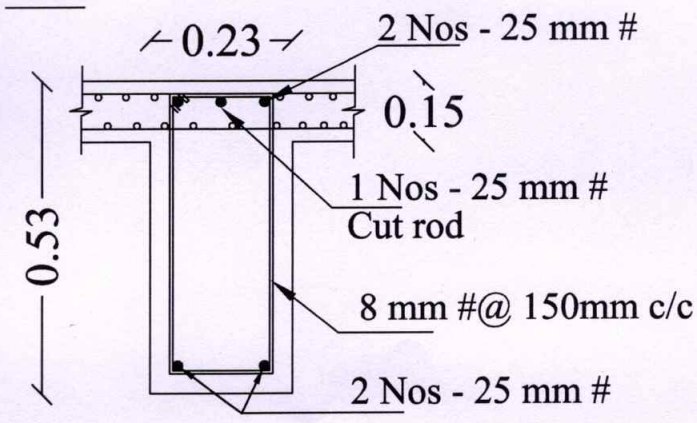


CROSS SECTION @ SUPPORT

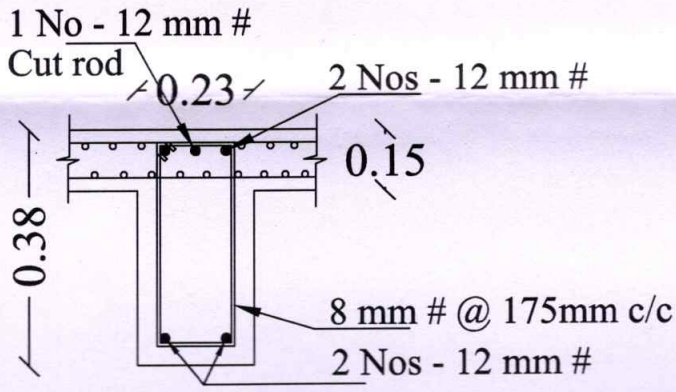
RB1



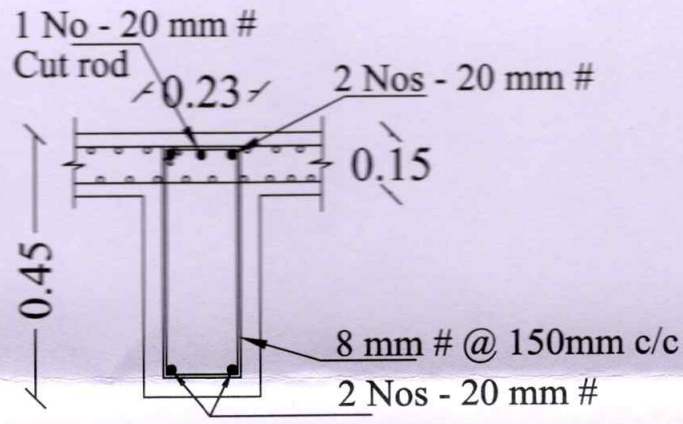
RB2



RB3



RB4

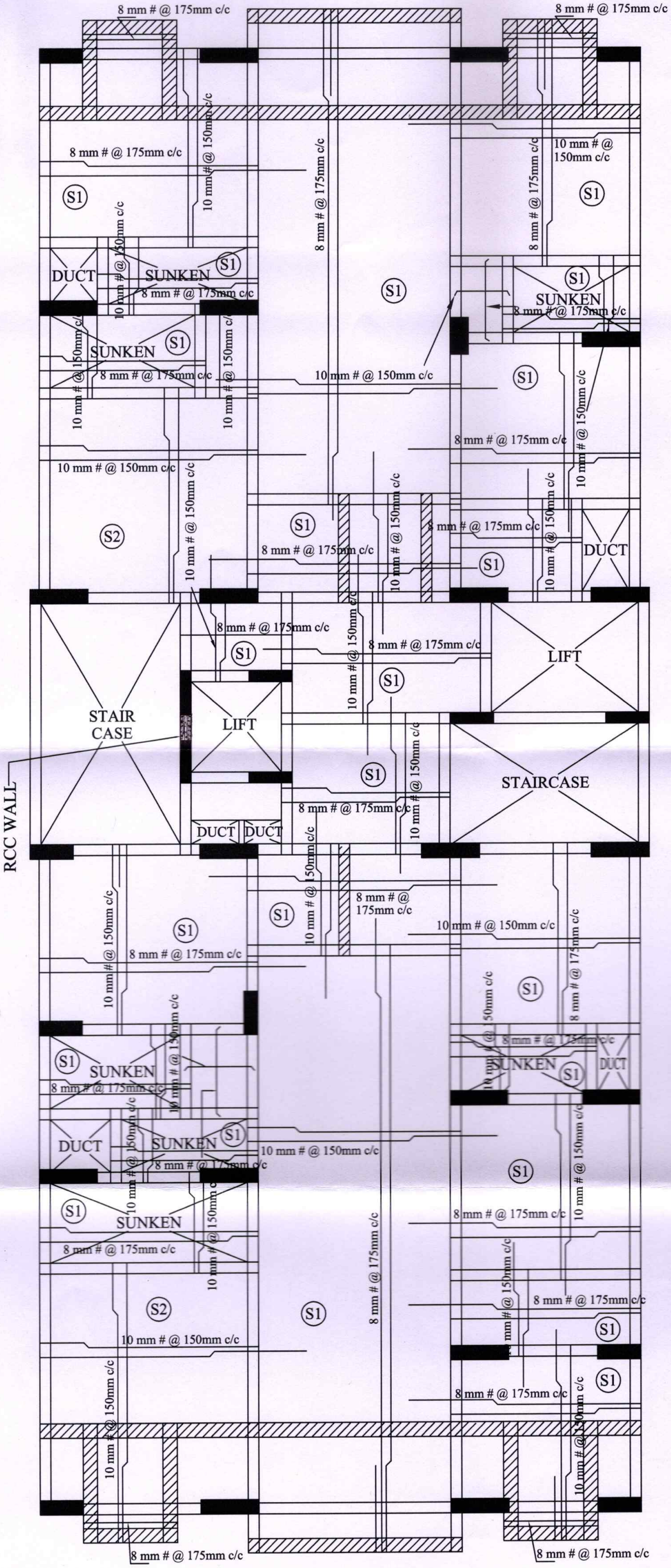


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Cell: 97893 33245

ROOF SLAB DETAILS:-

SYMBOL	SLAB THICKNESS	REINFORCEMENT DETAILS
S1	150mm	10 mm # @ 150mm c/c (shorter) 8 mm # @ 175mm c/c (longer)
S2	150mm	10 mm # @ 150mm c/c (shorter) 10 mm # @ 150mm c/c (longer)

TYPICAL FLOORS ROOF SLAB DESIGN



SHEET-10

CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4

DRAWING TITLE

TYPICAL FLOORS ROOF SLAB DESIGN

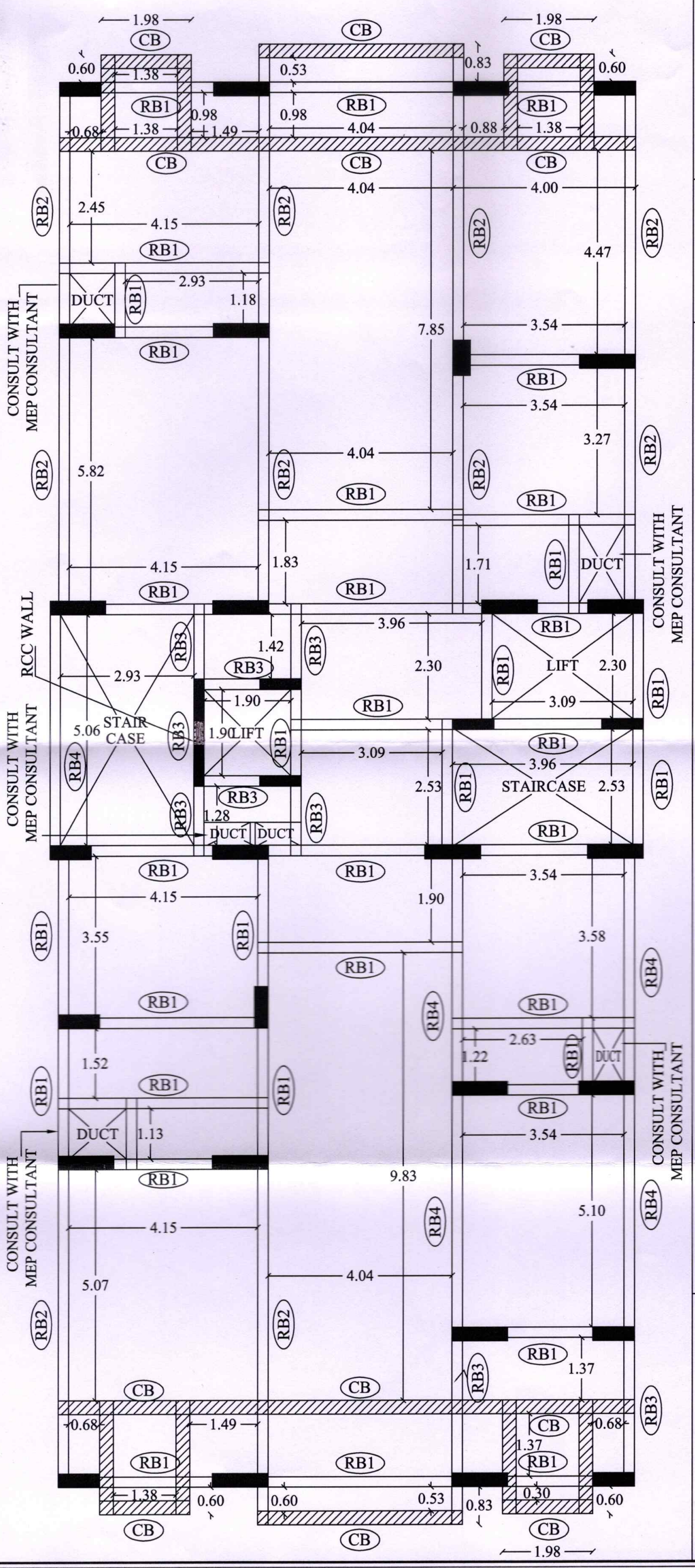
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NOTE :

RCC MIX	= M35
Reinforcement	=Fe550
Clear Cover for Column	= 40mm
Clear Cover for Beam	= 25mm
Clear Cover for Slab	= 20mm

TERRACE FLOORS ROOF SLAB DESIGN



SHEET-11

CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4

DRAWING TITLE

TERRACE FLOORS ROOF SLAB DESIGN

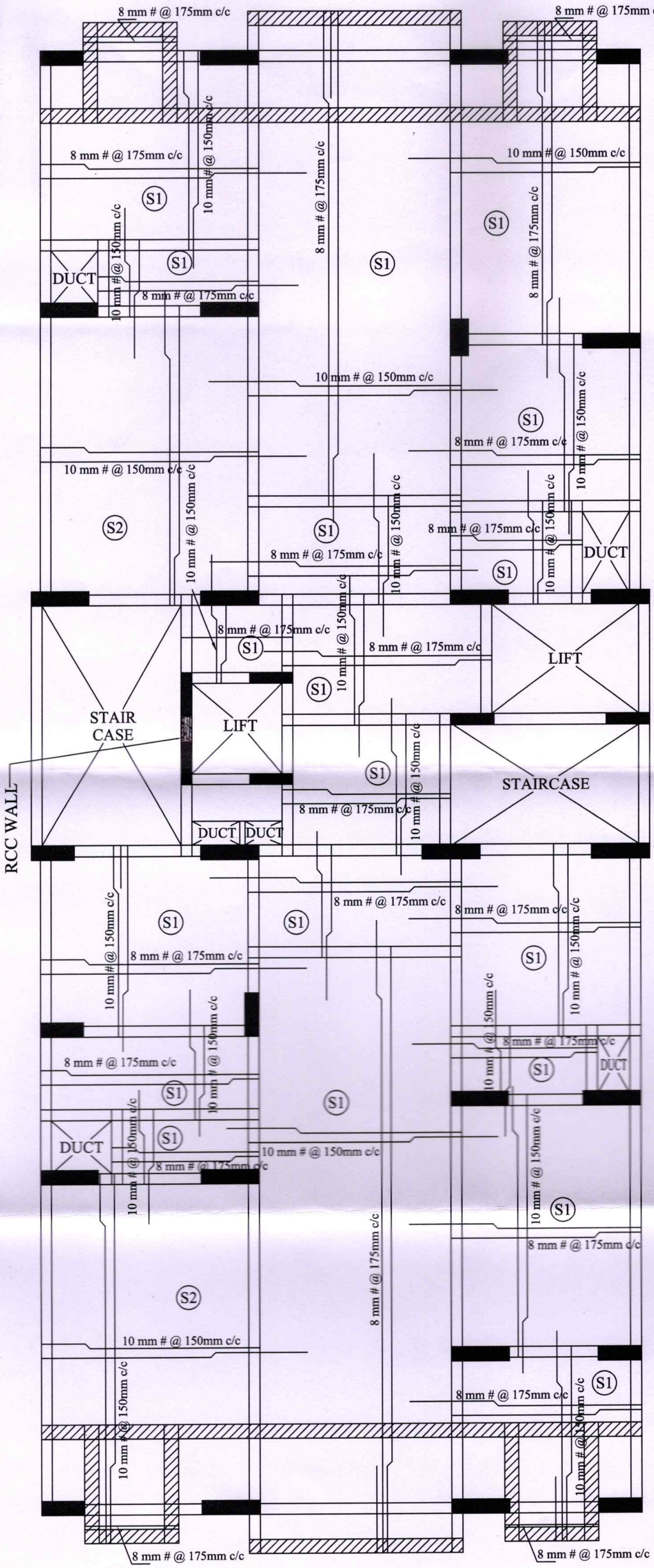
N W E S

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NOTE :

RCC MIX	= M35
Reinforcement	= Fe550
Clear Cover for Column	= 40mm
Clear Cover for Beam	= 25mm
Clear Cover for Slab	= 20mm

TERRACE FLOORS ROOF SLAB DESIGN



SHEET-12

CONSTRUCTION OF RC- EMERALD CASTLE STILT + 9 FLOORS WITH 18 RESIDENTIAL FLATS AT NEW DOOR NO: 23, (OLD DOOR NO: 62), CRAWFORD COLONY MAIN ROAD, LAND COMPRISED IN T.S. NO. 24 (24/1 & 24/2), BLOCK NO.0002, WARD: AK, SURVEY NO. 136/1, LAND SITUATED AT CRAWFORD COLONY MAJARA, K.ABISHEKAPURAM VILLAGE, TIRUCHIRAPPALLI CITY CORP. KO.ABHISEKAPURAM ZONE TOWN, TIRUCHIRAPPALLI WEST TALUK, TIRUCHIRAPPALLI DISTRICT OF ZONE – 4

DRAWING TITLE

TERRACE FLOORS ROOF SLAB DESIGN

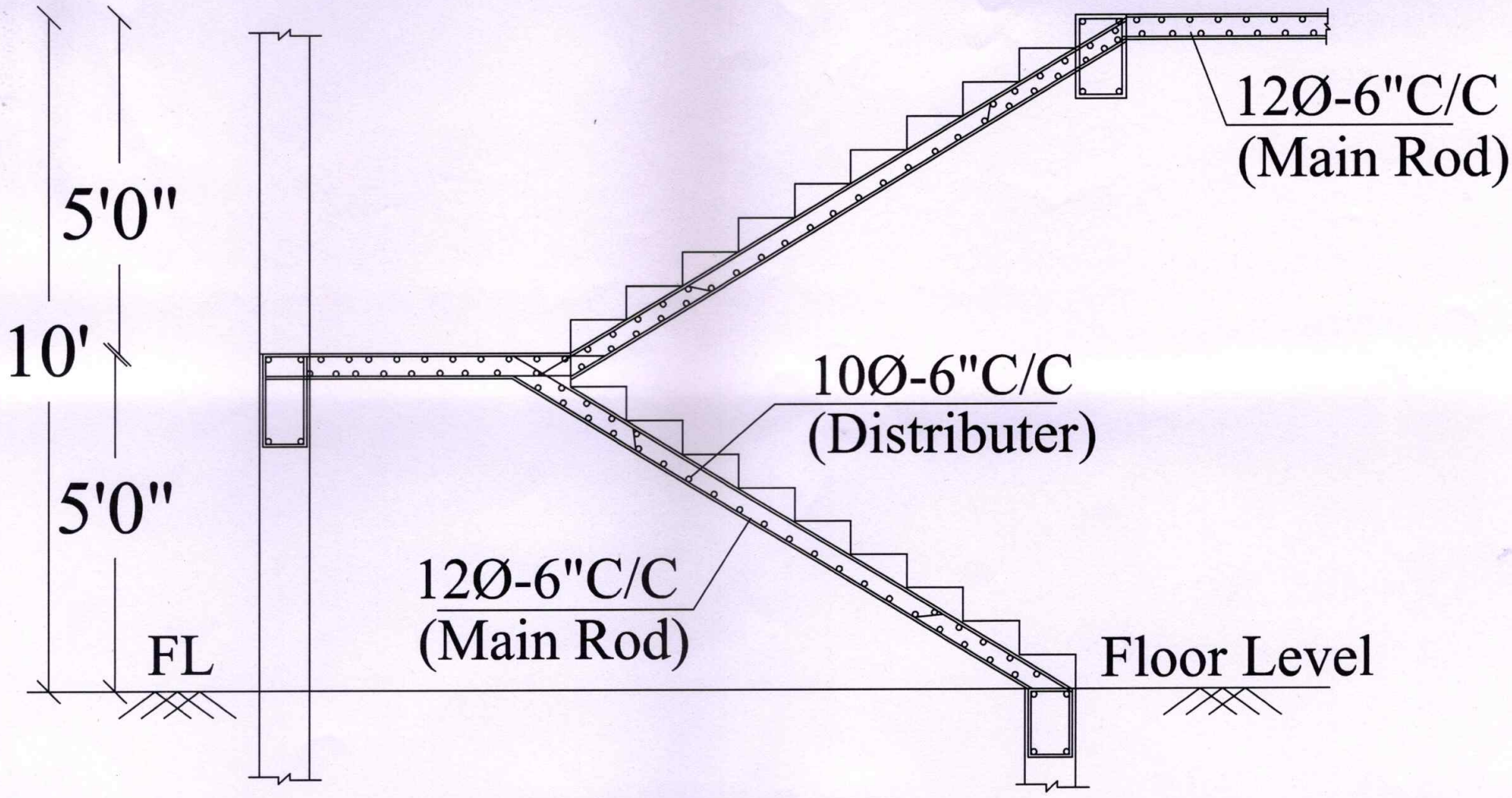
N
W E
S

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NOTE :

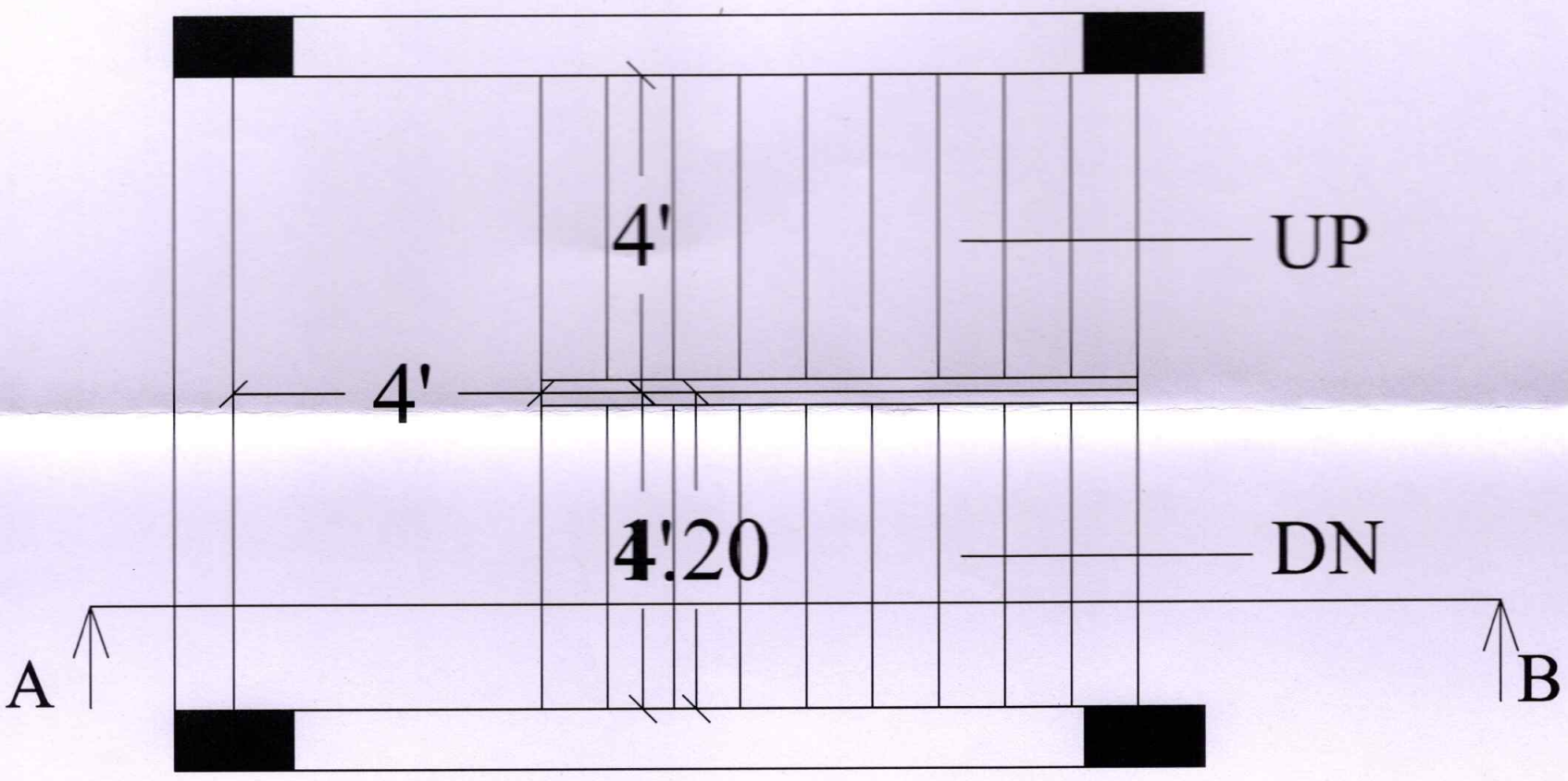
RCC MIX	= M35
Reinforcement	= Fe550
Clear Cover for Column	= 40mm
Clear Cover for Beam	= 25mm
Clear Cover for Slab	= 20mm

SHEET-13



Tread =10"
Rise = 6"
Waist = 6" tk

SECTION ON AB

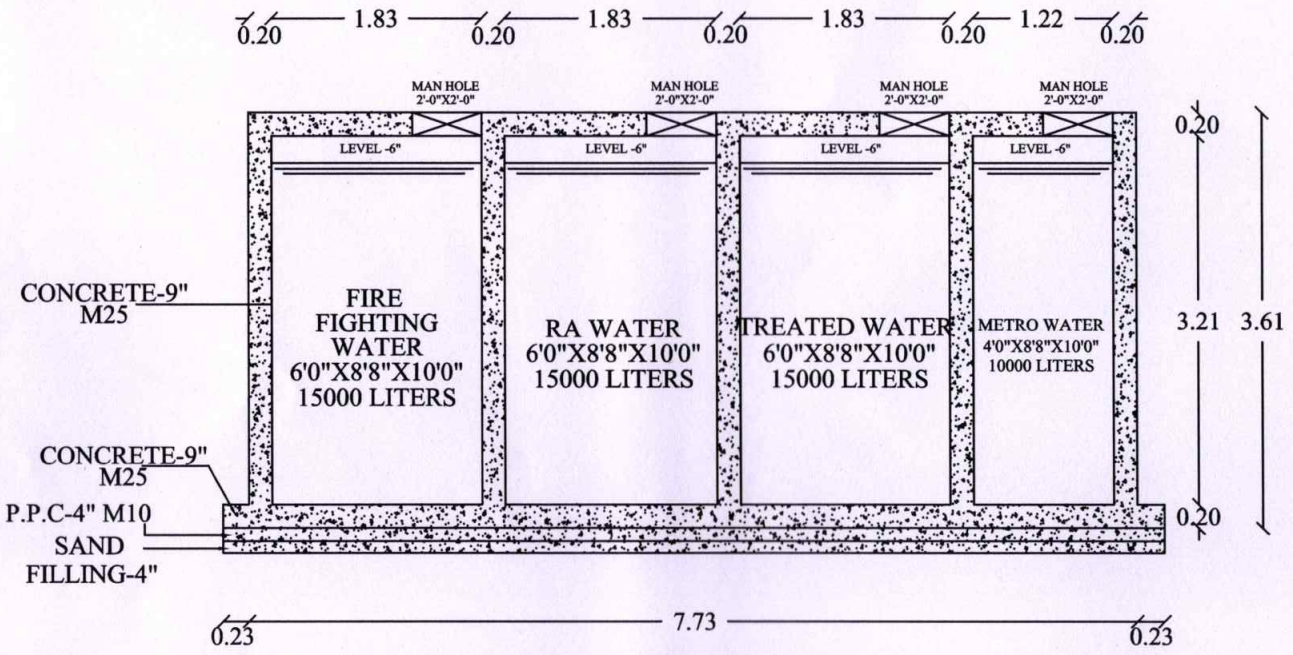


PLAN

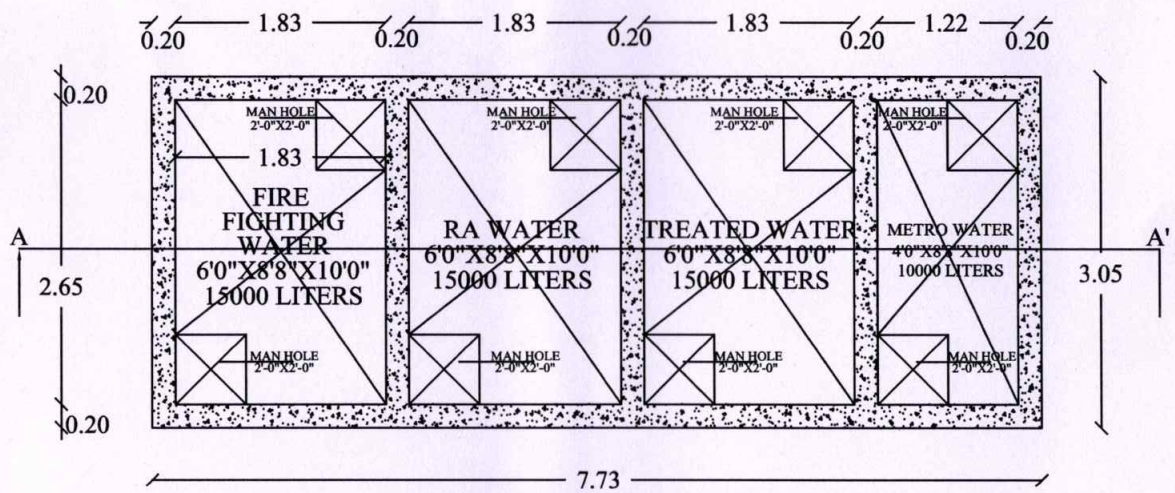
STAIRCASE DETAILS

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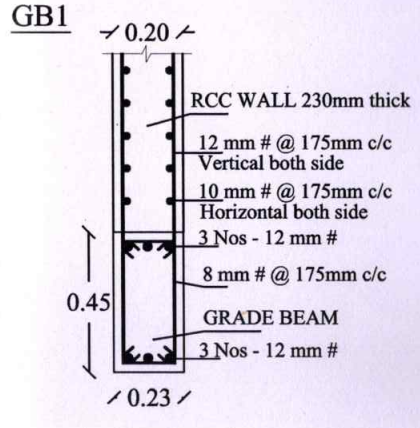
RC EMERALD CASTLE UG -SUMP DETAILS

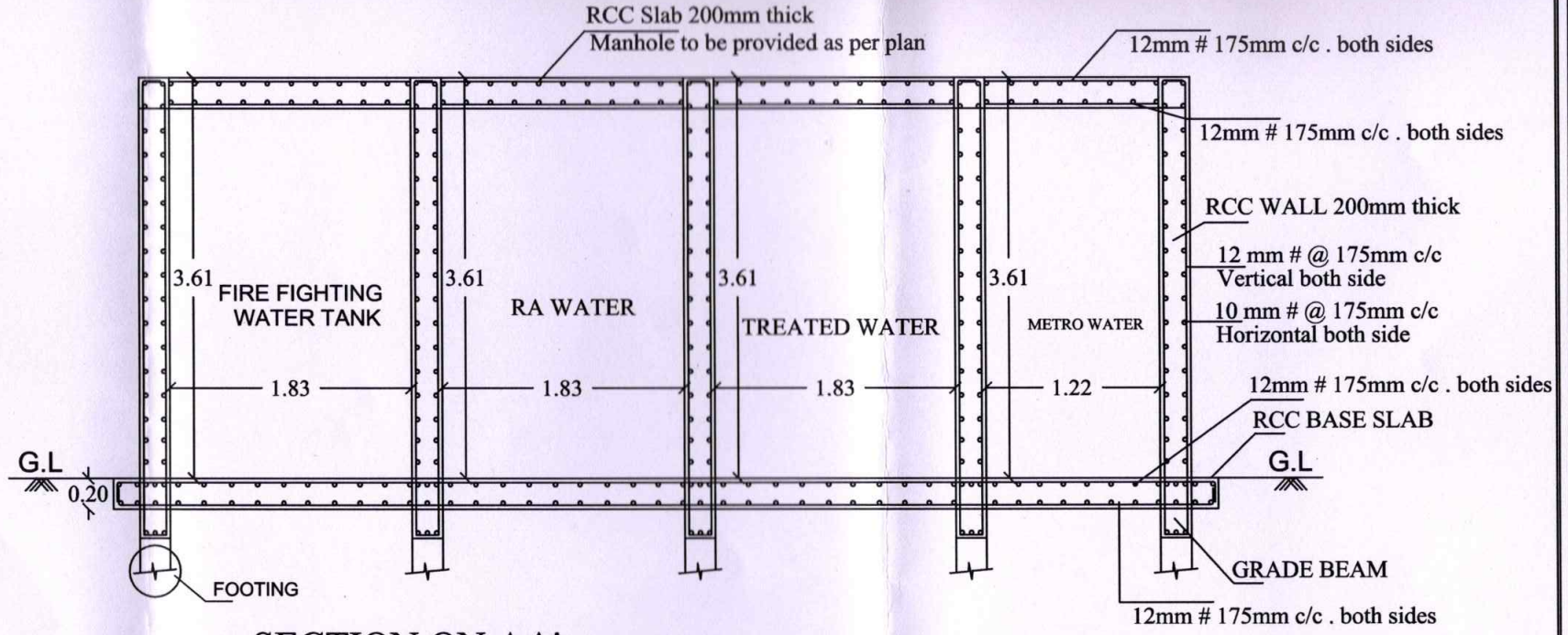


UNDER GROUND SECTION -A'-A'



UNDER GROUND SUMP PLAN
TOTAL CAPACITY SUMP 55000 LITERS



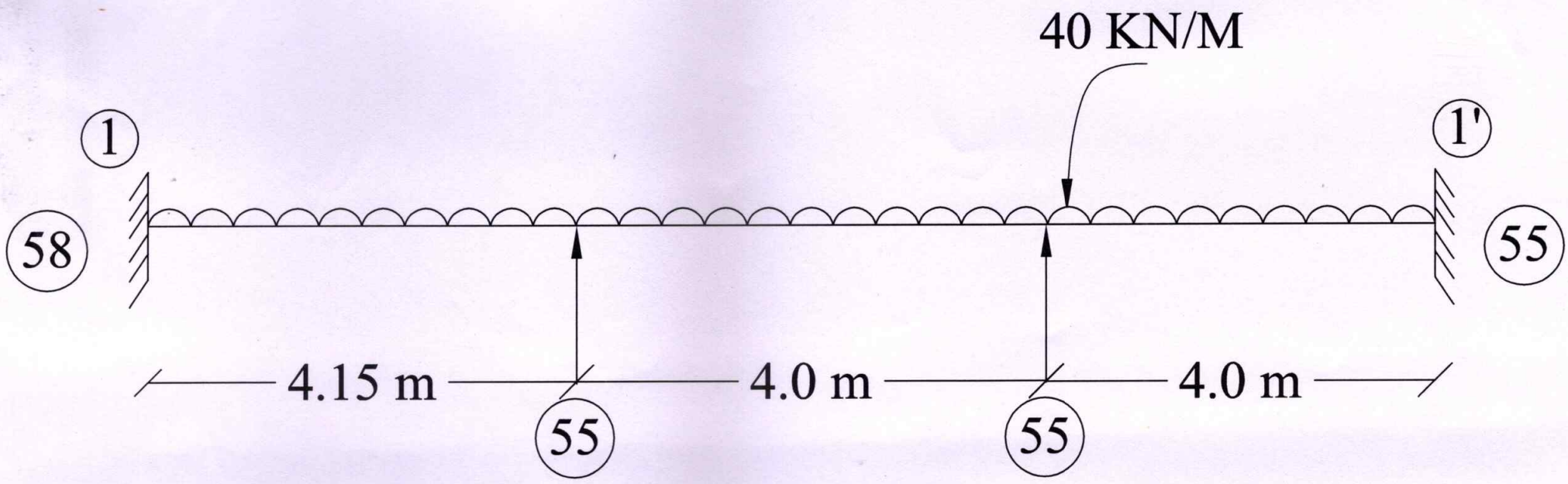


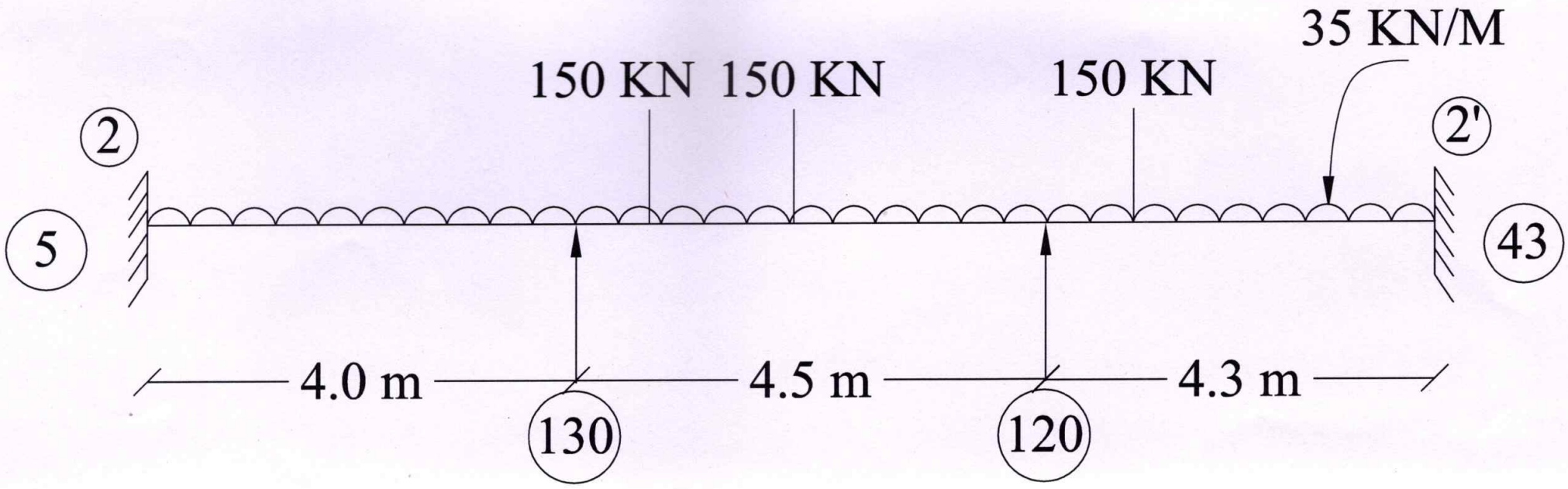
SECTION ON AA'

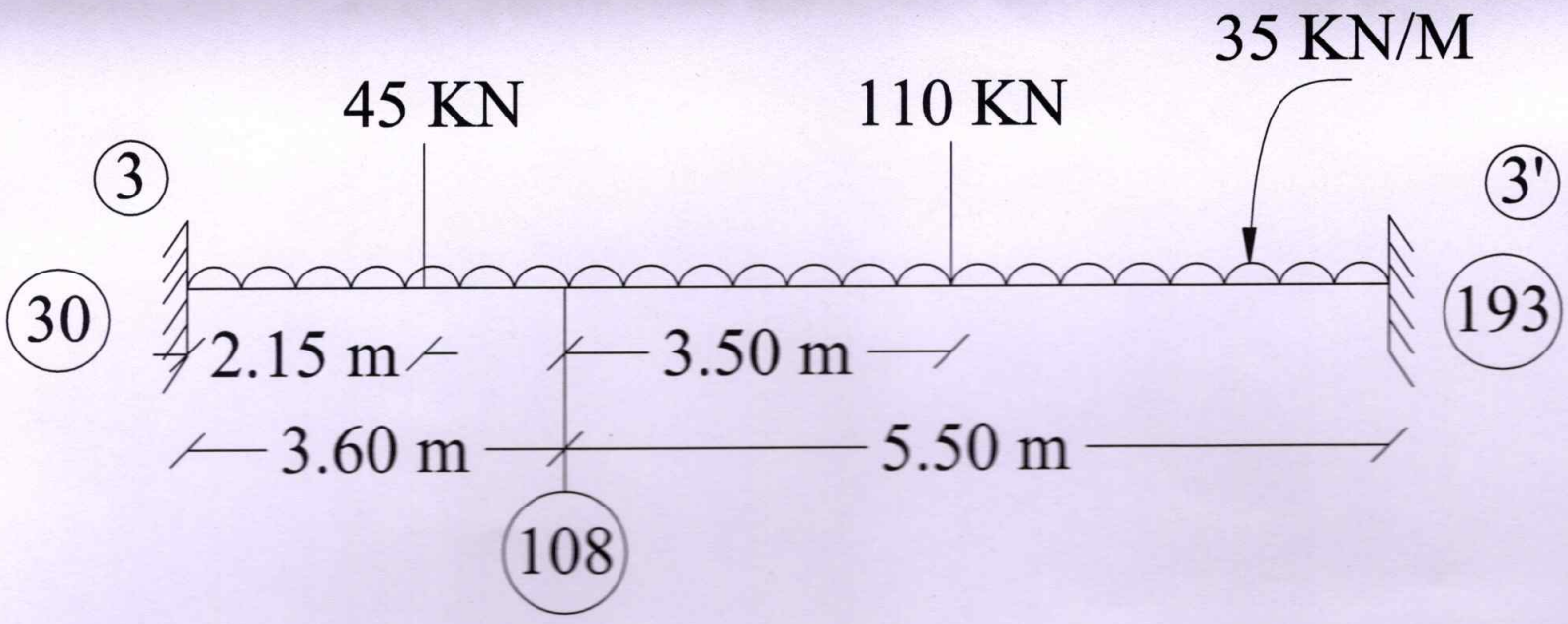
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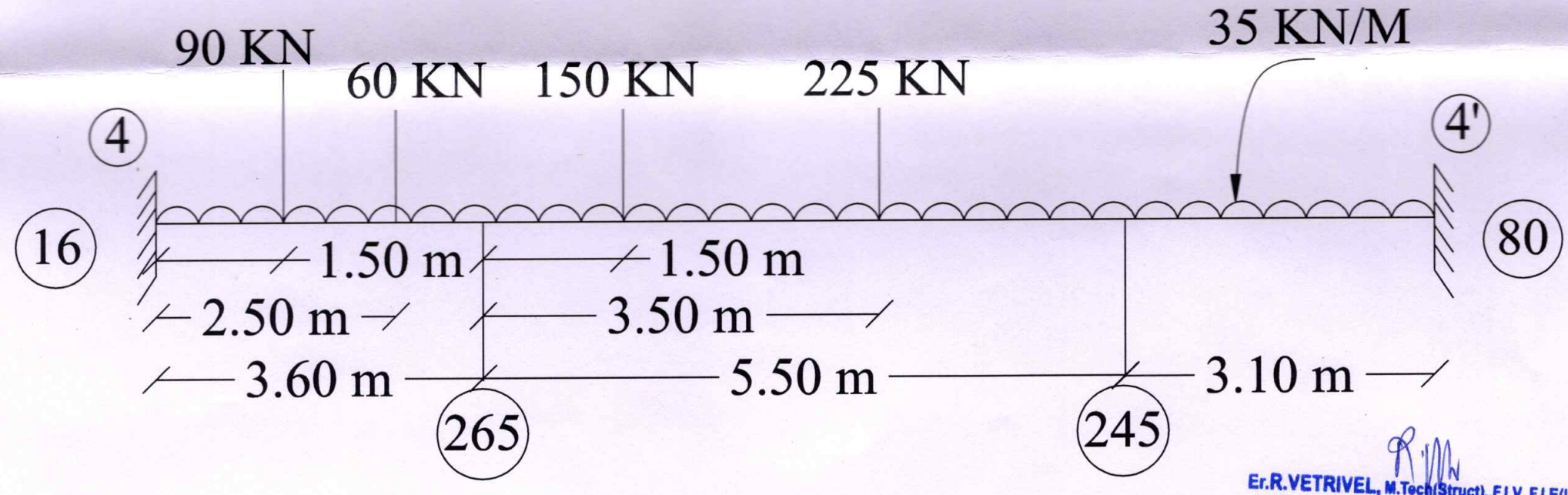
BEAM LOADS AND BENDING MOMENT ANALYSIS

SHEET-15









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1. LOADING ON SLAB

SELF WEIGHT OF SLAB = 1 X 1 X 0.15 X 25 = 3.75

LIVE LOAD = 1 X 1 X 3 = 3.00

FLOOR FINISH = 1 X 1 X 2 = 2.00

TOTAL = 8.75 KN/M^2

Say 9 KN/M^2

2. LOADING ON BEAM
(CROSS BEAM)

SELF WEIGHT = 0.23 X 0.45 X 1 X 25 = 2.58

SLAB LOAD = 3 X 8.75 = 26.25

BRICK WALL = 2.60 X 0.23 X 1 X 20 = 11.96

TOTAL = 40.79 KN/M

Say 41 KN/M

3. LOADING IN LONG SPAN BEAM

SELF WEIGHT = 0.23 X 0.53 X 1 X 25 = 3.05

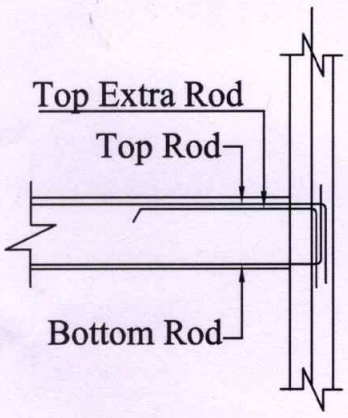
SLAB LOAD = 4 X 8.75 = 35.00

BRICK WALL = 2.60 X 0.23 X 1 X 20 = 11.96

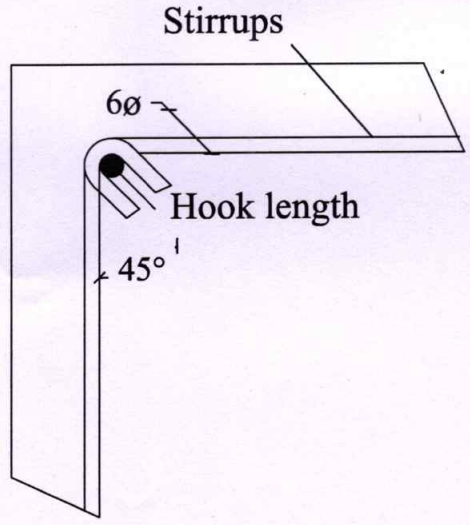
TOTAL = 50.01 KN/M

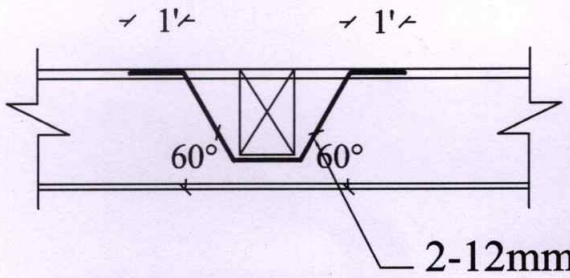
Say 50 KN/M

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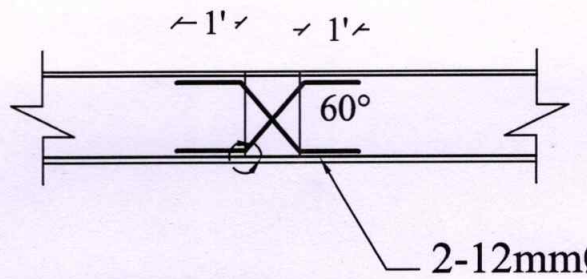


COLUMN BEAM JOINT
TYPICAL DETAILS



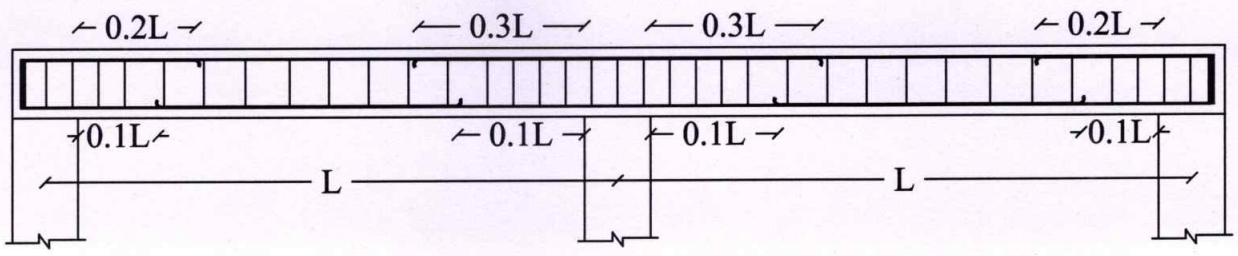


Inter Section of Main Beam &
Secondary Beam (Un Equal Depth)



Inter Section of Main Beam &
Secondary Beam (Equal Depth)

DETAILS OF CUT ROD



LONGITUDINAL SECTION

DEVELOPMENT LENGTH VALUES:

CONCRETE GRADE	STEEL GRADE	TENSION (EX: BEAM, etc.,)	COMPRESSION (EX: COLUMN, etc.,)
M 20	Fe 415	50 x d	40 x d
M 25	Fe 415	42 x d	36 x d
M 30	Fe 415	40 x d	34 x d
M 20	Fe 500	60 x d	48 x d
M 25	Fe 500	50 x d	40 x d
M 30	Fe 500	48 x d	38 x d

(MAXIMUM CEMENT CONTENT SHOULD BE 450 KGS/CU.M)
(SLUMP SHOULD BE 75 TO 100MM)

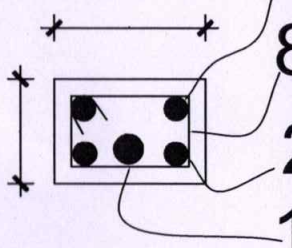
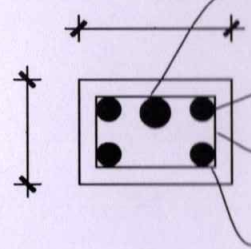
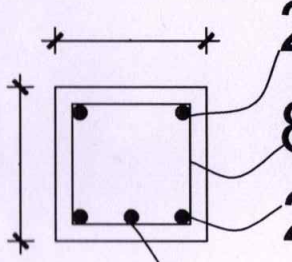
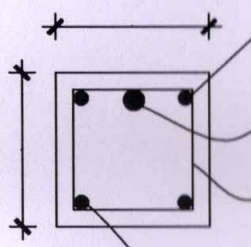
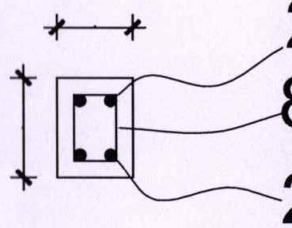
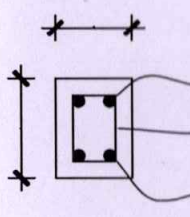
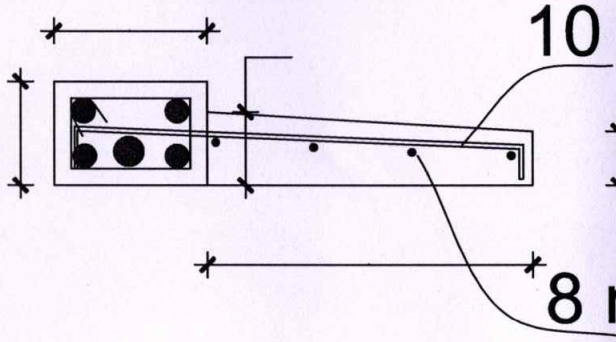
GRADE	CEMENT/CUM	WATER CEMENT RATIO	SLUMP
M20	375 KGS	0.55	75 MM TO 100 MM
M25	400 KGS	0.50	
M30	425 KGS	0.45	
M35	425 KGS	0.45	
M40	450 KGS	0.40	

(NOTE:– IF SUPER PLASTICIZER IS USED, THE WATER CONTENT CAN BE REDUCED UPTO 20%)

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LINTEL DESIGN

SHEET-18

sl.no	SPAN	MID SECTION	SUPPORT SECTION
L1	UPTO 5'0" OPEN	 2nos 10mm tmt bar 8mm # rts @ 7"c/c 2nos 10mm tmt bar 1nos 12mm cut rod	 1no 12mm cut rod 2nos 10mm tmt bar 8mm # rts @ 7"c/c 2nos 10mm tmt bar
L2	6'0" - 8'0" OPEN	 2nos 10mm # tmt bar 8mm # rts @ 7"c/c 2nos 12mm # tmt bar 1no 12mm cut rod	 2nos 10mm # tmt bar 1no 12mm cut rod 8mm # rts @ 7"c/c 2nos 10mm # tmt bar
L3	UPTO 5'0" OPEN IN 4.5" WALL	 2 nos 10 mm # rts 8 mm # rts @ 7"c/c 2 nos 10 mm # rts	 2 nos 10 mm # rts 8 mm # rts @ 7"c/c 2 nos 10 mm # rts
	LINTEL CUM SUNSHADE	 10 mm # rts @6"c/c 8 mm # rts @8"c/c	

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Annexure – XIV

[See rule 51 (3)]

Form 1

Structural Design Basis Report

(1) This report to accompany the application for Building Developments

Part1	**General Data**		
S.No.	**Description**	**Information**	**Notes**
1.	Site Address:	Door no: 23, TS.No: 24/1 & 24/2, Ward-AK, Block no: 2, Crawford Colony Main road, Zone-IV, Trichy City Corporation.	
2	Name of Owner	Dr.R.Daniel Nixon & Dr.Cindhya Manor	
3	Name of Registered Developer along with the Registration Number	Rajarathnam Construction Private Limited Regn no:	
4	Name of Registered Architect/Engineer along with the Registration Number		
5	Name of Registered Structural engineer along with the Registration Number	R.Vetrivel.M.Tech., (Struct)., Regn No:SE/Gr.1/DTCP/Trichy/June 2024/013	
6	Use of the building	Residential Apartment	
7	Number of stories above ground level (including storeys to be added later, if any)	Stilt parking + 9 Floors	
8	Number of basements below ground level	Nil	
9	Type of structure Load bearing walls R.C.C. frame R.C.C. frame and Shear Walls Steel frame	RCC Framed Structure	
10	Soil data Type of soil Design safe bearing capacity	Soft Disintegrated Rock (SDR) @ 3.30m from GL 488 KN/Sqm	IS:1893 C1.6.3.5.2 IS: 1904 IS: 1892 IS: 2131 IS: 2720
11	• Earth • Water • Brick Masonry • Plain Cement Concrete • RCC • Floor Finish • Other Fill Materials	18 KN/M^3 10 KN/ M^3 19.20 KN/ M^3 24 KN/ M^3 25 KN/ M^3 24 KN/ M^3	IS: 875 Part 1

Part 3	Reinforced concrete framed buildings		
Sl. No.	**Description**	**Information**	**Notes**
1	Type of building • Regular frames • Regular frames with Shear Walls • Irregular frames • Irregular frames with Shear Walls • Soft storey	Regular Frames with Soft Storey	IS: 1893 C1 7.1
2	Number of basements	Nil	
3	Number of floors including ground floor	Stilt + 9 Floors	
4	Horizontal floor system • Beams and slabs • Waffles • Ribbed floor • Flat slab with drops • Flat plate without drops	Beams & Slabs	
5	Soil data • Type of soil • Recommended type of foundation -Independent footings -Raft -Piles • Recommended bearing capacity of soil	Soft Disintegrated Rock below 3m from GL Combined Footing	IS: 1498

On behalf of DICP TNHB Board, the structural design calculations & generally reviewed and found in order.

Superintending Engineer, P.W.D.
Planning and Designs Circle
Chennai-5.

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TYPICAL DESIGN OF SLAB

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

SHEET-15

1. LOADING ON SLAB

SELF WEIGHT OF SLAB = 1 X 1 X 0.15 X 25 = 3.75

LIVE LOAD = 1 X 1 X 3 = 3.00

FLOOR FINISH = 1 X 1 X 2 = 2.00

TOTAL = 8.75 KN/M^2

Say 9 KN/M^2

2. LOADING ON BEAM (CROSS BEAM)

SELF WEIGHT = 0.23 X 0.45 X 1 X 25 = 2.58

SLAB LOAD = 3 X 8.75 = 26.25

BRICK WALL = 2.60 X 0.23 X 1 X 20 = 11.96

TOTAL = 40.79 KN/M

Say 41 KN/M

3. LOADING IN LONG SPAN BEAM

SELF WEIGHT = 0.23 X 0.53 X 1 X 25 = 3.05

SLAB LOAD = 4 X 8.75 = 35.00

BRICK WALL = 2.60 X 0.23 X 1 X 20 = 11.96

TOTAL = 50.01 KN/M

Say 50 KN/M

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT
PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT
PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

4. DESIGN OF FIXED SLAB (Fixed by RCC beams) GRID A3 C3 C6 A6

(Two Way Slab - Corners are held down)

Size of room =	4.38	m	x	4.38	m
Eff. Span of slab =	4.511	m	and	4.511	m
Breadth of slab (b) =	1000	mm			
Thickness of slab (D) =	150	mm			
Effective depth of slab (d) =	131	mm			
Grade of steel	= Fe	415	= fy		
Grade of Concrete =	M_{20}	fck =	20	N/m^2	
Dia of main rod =	10	mm			
Dia of Distributor =	8	mm			
ly / lx =	1.00				

Loads per m^2

Dead load	=	3750	N/m^2
Floor Finish load	=	2000	N/m^2
Live load	=	3000	N/m^2
Total Load	=	8750	N/m^2

Partial Safety Factor	=	1.5	
Factored Total Load	=	**13125**	**N/m2**

One Short Edges Discontinuous — as per IS Code 456- 2000 - page no: 91 (OR)

α_x	-ve	=	0.037	as per IS Code 456-1978 - page no:139
α_y	+ve	=	0.028	,,

Factored Moment	= α_x. w l_x^2 =	**9882.04**	**Nm**	Short Span Moment
Factored Moment	= α_y. w l_x^2 =	**7478.3**	**Nm**	Short Span Moment

Mu, lim = 0.138 x fck x b d^2 = 47364.36 Nm

d^2 = 17161

d = 131.00 mm (Effective Depth)

Overall depth of Slab (D) = 151.00 mm

$M_u / b\ d^2$ = 0.575843

Pt, from table 2 of SP16, (page 48) = 0.16524 % (OR)

Percentage of steel (p_t) = 50(1 - SQRT(1-4.6/fck x Mu/bd^2)) / (fy / fck)

= **0.16524** % = **216.46** mm^2

Minimum Percentage of steel required = 0.12 % = 180.00 mm^2

Spacing of Main rod= 362.65 mm

Maximum spacing = 3 d = 393.00 mm or 450 mm

Distribution steel = 0.12 % of cross section area = 180.00 mm^2

Spacing of Distributor rod = 279.11 mm

Spacing of Distributor rod shall not exceed 5 d = 655.00 mm or 450 mm

Provide 10# @ 150mm c/c for main rod & 8# @ 180mm c/c > above calculation.

4. DESIGN OF FIXED SLAB (Fixed by RCC beams) GRID C10 E10 E15 C15

(One Way Slab - Corners are held down)

Size of room = 4.38 m x 11.66 m
Eff. Span of slab = 4.511 m and 11.791 m
Breadth of slab (b) = 1000 mm
Thickness of slab (D) = 150 mm
Effective depth of slab (d) = 131 mm
Grade of steel = Fe 415 = fy
Grade of Concrete = M_{20} fck = 20 N/m^2
Dia of main rod = 10 mm
Dia of Distributor = 8 mm
ly / lx = 2.66

Loads per m^2

Dead load	=	3750	N/m^2
Floor Finish load	=	2000	N/m^2
Live load	=	3000	N/m^2
Total Load	=	8750	N/m^2

Partial Safety Factor = 1.5

Factored Total Load = 13125 N/m2

Interior panel **as per IS Code 456- 2000 - page no: 91 (OR)**

α_x -ve = 0.122 **as per IS Code 456-1978 - page no:139**

α_y +ve = 0.02 ,,

Factored Moment = $\alpha_x . w l_x^2$ = **32584 Nm** Short Span Moment
Factored Moment = $\alpha_y . w l_x^2$ = **5341.64 Nm** Short Span Moment

Mu, lim = 0.138 x fck x b d^2 = 47364.36 Nm

d^2 = 17161
d = 131.00 mm (Effective Depth)
Overall depth of Slab (D) = 151.00 mm

$M_u / b d^2$ = 1.898726

Pt, from table 2 of SP16, (page 48) = 0.6 % (OR)

Percentage of steel (p_t) = 50(1 - SQRT(1-4.6/fck x Mu/bd^2)) / (fy / fck)
= **0.60114 %** = **787.49** mm^2

Minimum Percentage of steel required = 0.12 % = 180.00 mm^2

Spacing of Main rod= 99.68 mm
Maximum spacing = 3 d = 393.00 mm or 450 mm

Distribution steel = 0.12 % of cross section area = 180.00 mm^2
Spacing of Distributor rod = 279.11 mm
Spacing of Distributor rod shall not exceed 5 d = 655.00 mm or 450 mm

Provide 10# @ 150mm c/c for main rod & 8# @ 180mm c/c > above calculation.

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TYPICAL ANALYSIS OF BEAMS

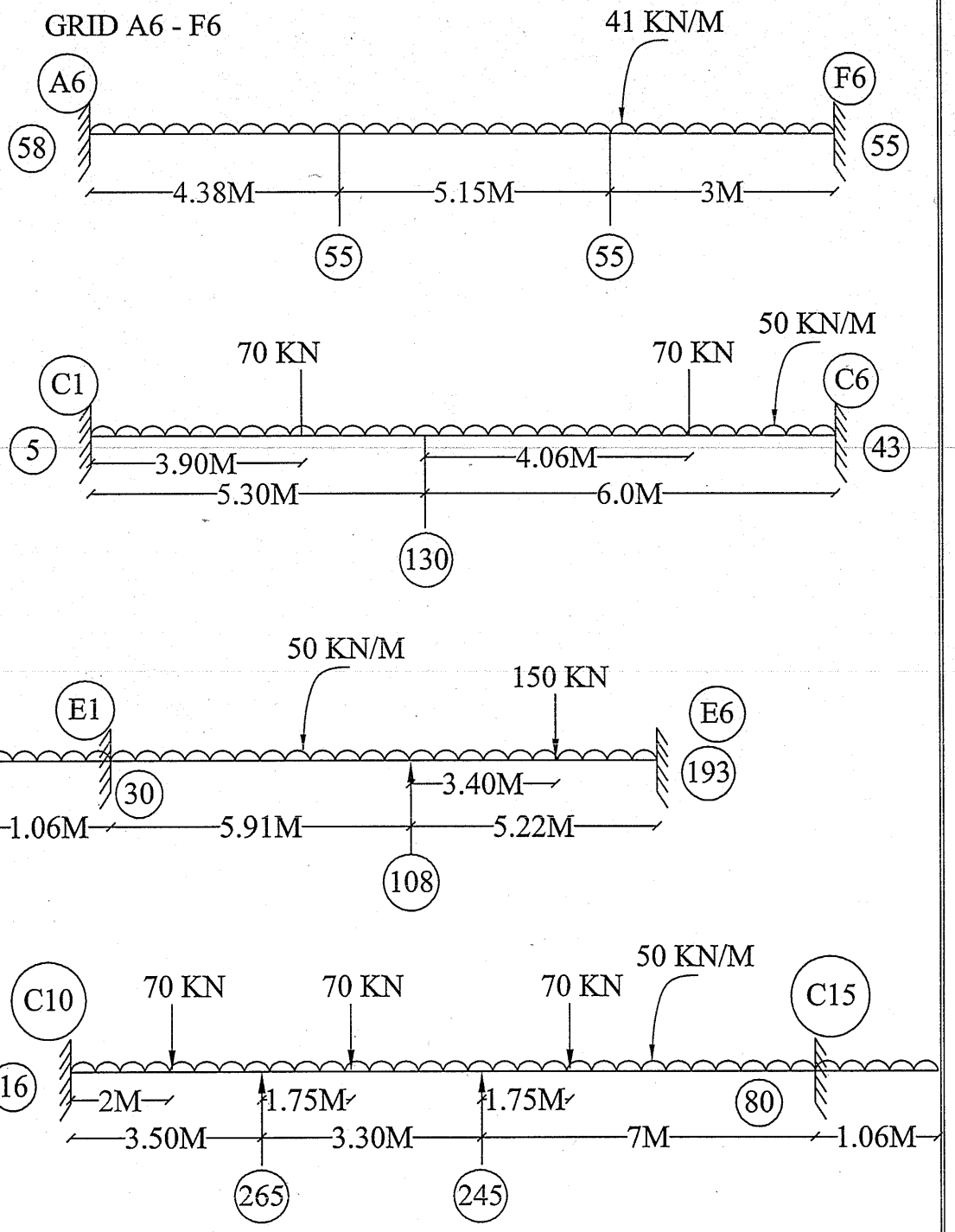
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BEAM LOADS AND BENDING MOMENT ANALYSIS

SHEET-15



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BEAM GRID A6 to F6

Span	AB		BC		CD	
Distribution Factors	A6	0.54	0.46	0.37	0.63	
			C6		E6	F6
Supports	A	B	B	C	C	D
Fixed End Moments	-65.55	65.55	-90.62	90.62	-30.75	30.75
Balance `B' by 25.07 and distribute		13.55	11.52			
Balance `C' by -59.87 and distribute				-22.04	-37.83	
Carry over to Support A & C from B	6.77			5.76		
Carry over to Support B & D from C			-11.02			-18.9155
Moments at Support after Ist Carry over	**-58.77**	**79.10**	**-90.11**	**74.34**	**-68.58**	**11.83**
Balance `B' by 11.02 and distribute		5.95	5.06			
Balance `C' by -5.76 and distribute				-2.12	-3.64	
Carry over to Support A & C from B	2.98			2.53		
Carry over to Support B & D from C			-1.06			-1.82036
Moments at Support after IInd Carryover	**-55.80**	**85.05**	**-86.11**	**74.75**	**-72.22**	**10.01**
Balance `B' by 1.06 and distribute		0.57	0.49			
Balance `C' by -2.53 and distribute				-0.93	-1.60	

Carry over to Support A & C from B	0.29			0.24		
Carry over to Support B & D from C			-0.47			-0.80002
Moments at Support after IIIrd Carryover	**-55.51**	**85.62**	**-86.09**	**74.07**	**-73.82**	**9.21**
Balance `B' by 0.47 and distribute		0.25	0.21			
Balance `C' by -0.24 and distribute				-0.09	-0.15	
Carry over to Support A & C from B	0.13			0.11		
Carry over to Support B & D from C			-0.04			-0.07699
Moments at Support after IVth Carryover	**-55.38**	**85.87**	**-85.92**	**74.08**	**-73.98**	**9.14**
Balance `B' by 0.04 and distribute		0.02	0.02			
Balance `C' by -0.11 and distribute				-0.04	-0.07	
Carry over to Support A & C from B	0.01			0.01		
Carry over to Support B & D from C			-0.02			-0.03384
Moments at Support after Vth Carryover	**-55.37**	**85.90**	**-85.92**	**74.05**	**-74.04**	**9.10**
	A6		C6	E6		F6

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BEAM GRID C10 to C15

Span	AB		BC		CD	
Distribution Factors	C10	0.49 C11	0.51	0.68 C13	0.32	C15
Supports	A	B	B	C	C	D
Fixed End Moments	-76.76	85.33	-72.40	75.89	-273.1	227.135
Balance `B' by -12.93 and distribute		-6.27	-6.65			
Balance `C' by 197.19 and distribute				134.01	63.18	
Carry over to Support A & C from B	-3.14			-3.33		
Carry over to Support B & D from C			67.00			31.588
Moments at Support after Ist Carry over	**-79.89**	**79.05**	**-12.05**	**206.57**	**-209.90**	**258.72**
Balance `B' by -67.00 and distribute		-32.52	-34.49			
Balance `C' by 3.33 and distribute				2.26	1.07	
Carry over to Support A & C from B	-16.26			-17.24		
Carry over to Support B & D from C			1.13			0.53293
Moments at Support after IInd Carryover	**-96.15**	**46.54**	**-45.41**	**191.59**	**-208.83**	**259.26**
Balance `B' by -1.13 and distribute		-0.55	-0.58			
Balance `C' by 17.24 and distribute				11.72	5.52	

Carry over to Support A & C from B	-0.27			-0.29		
Carry over to Support B & D from C			5.86			2.76237
Moments at Support after III[rd] Carryover	**-96.43**	**45.99**	**-40.13**	**203.02**	**-203.31**	**262.02**
Balance `B' by -5.86 and distribute		-2.84	-3.02			
Balance `C' by 0.29 and distribute				0.20	0.09	
Carry over to Support A & C from B	-1.42			-1.51		
Carry over to Support B & D from C			0.10			0.04661
Moments at Support after IV[th] Carryover	**-97.85**	**43.14**	**-43.05**	**201.71**	**-203.21**	**262.07**
Balance `B' by -0.10 and distribute		-0.05	-0.05			
Balance `C' by 1.51 and distribute				1.02	0.48	
Carry over to Support A & C from B	-0.02			-0.03		
Carry over to Support B & D from C			0.51			0.24157
Moments at Support after V[th] Carryover	**-97.87**	**43.10**	**-42.58**	**202.70**	**-202.73**	**262.31**

C10 C11 C13 C15

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BEAM GRID C1 to C6

Span	AB		BC	
Distribution Factors		0.53	0.47	
Supports	A	B	B	C
Fixed End Moments	-136.09	170.11	-179.71	212.18
Balance `B' by 9.61 and distribute		5.10	4.51	
Carry over to Support A & C from B	2.55			2.25
Final Moments at Support	-133.54	175.21	-175.21	214.43

C1 C3 C6

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BEAM GRID E1 to E6

Span	AB		BC	
Distribution Factors	E1	0.47 E4	0.53	E6
Supports	A	B	B	C
Fixed End Moments	-188.88	145.53	-175.53	229.35
Balance `B' by 30.00 and distribute		14.07	15.93	
Carry over to Support A & C from B	7.03			7.96
Final Moments at Support	-181.85	159.60	-159.60	237.32
	E1	E4		E6

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TYPICAL COLUMN DESIGNS

COMBINED AXIAL & UNIAXIAL BENDING - Short Column - C2

Given Data

	B		D	
Column Size =	1220 mm	x	300 mm	

Un-Supported Length of Column (L) ie (from floor to beam bottom) = 3000 mm

Effective length=0.8L= 3000 mm

Cover to the reinforcement = 40 mm

Dia of Main bar = 12 mm

d' = 46 mm

D = 300 mm Column size (adjacent to reinforcement)

d' / D = 0.15 (take next higher value)

Actual Load on the column = 4227 KN

Pu = 6340500 N Factored load

fy = 550 N/mm^2

fck = 35 N/mm^2

B = 1220 mm

e_{min} = l/500+B/30 = 46.67 mm or 20 mm

e_{min} = l/500+ D/30 = 16.00 mm or 20 mm

take maximum of these two values = 46.67 mm

Mu = Pu. $e_{min.}$ = 295911135 Nmm or 295.911135 KNM

Pu / fck. b D = 0.495

Mu / fck b D^2 = 0.077

Refer Chart corresponding to d' / D value & arrangement of reinforcemets from interaction curve in the SP 16 and findout the value of p/fck.

p/fck = 0.057 take from interaction curve corresponding to Pu/fck b d & Mu/fck b D^2

chart 48 Page no: 134 in SP 16

p (%) = fck x Value of p/fck

p(%) = 1.995 % of Cross section of column

Ast = (p(%) / 100) x b x D = 7301.7 mm^2

Number of 25 dia rod = 14.88 say 8 nos

Minimum Percentage of Steel = 0.8% of cross section of column = 2928 mm^2

Maximum percentage of steel = 6 % of cross section of column. = 21960 mm^2

Minimum dia of Lateral ties = 1/4 of dia of main rod =	3 mm	or 8 mm
Dia of Stirrups =	8 mm	Maximum
Spacing shall not exceed 16 times of dia of main rod =	192 mm	of above
Spacing shall not exceed 48 times of dia of Stirrups =	384 mm	
Spacing of Stirrups @ Column beam Joint Shall not exceed	150 mm	
Provide Minimum of above Spacing =	150 mm	

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TYPICAL FOOTING DESIGNS

Design of RCC Footing (Combined Footing) CF3

(for column laid in the boundary ie, edge of footing & edge of Column are same line)

Load on the Column A	=	4227	KN					
Load on Column B		4227	KN					
Size of Column A	=	1220	mm	x	300	mm	(note:- give smaller size of column in IInd)	
Size of Column B		1220	mm	x	300	mm		
Safe Bearing Capacity of Soil	=	488	KN / m^2	@ 3.30M				
Moment of Resistance constant (Q)	=	0.87						
Length between Column c/c	=	3.35	m					
Allowable shear stress as per IS Code	=	0.22	N/mm2					
RCC Mix Ratio	=	1:1:2		f_{ck} =	25	N / mm^2		
(f_y) of Steel	=	550	N / mm^2					
Stress in steel (~st)	=	330	N / mm^2					
Load on the footing	=	8454	KN					
Self Weight of footing @ 10% of load on column	=	845.4	KN					
Total Load on the Footing	=	**9299.4**	**KN**					
Area of the Footing	=	9299.4	/	488	=	19.056	m^2	
Assume rectangular / square footing,	=	length	=	7.2	m	Width	=	2.65 m
Projection on the left side of axis of column A			=	-0.35165642	m			
Projection on the left side of axis of column B			=	-0.35165642				
Upward stress due to axial load	=	443.64	KN/m^2					

Maximum Bending Moment under Column A = -0.35 x 7.2 x 443.6364 x -0.18

Bending Moment under Column A	=	**197.50 KNM**	Sagging Moment

Maximum Bending Moment under Column B		-0.35	x	7.20	x	443.6364	x	-0.18

Bending Moment under Column B	=	**197.50 KNM**	Sagging Moment

Maximum Hogging Moment Occur @ Zero Shear = **1.32 m** **from left end**
Maximum Hogging Moment Occur @ Zero Shear = **4283.34 KNM** (Negative Bending Moment)

$Q \times b \times d^2 = BM$

d^2 = 683802.4 or **say d = 1445 mm**
d = 826.92 mm

A_{st} for column A =	**460.20 mm^2**
A_{st} for column B =	**460.20 mm^2**
A_{st} for Hogging BM	**9981 mm^2**

Transverse Projection under column A 2.99 m

Transverse Bending Moment in the neighbourhood of each column = 1983.08 KNM

A_{st} Transverse = 4620.78 mm^2
Dia of rod = 16 mm
Spacing of 12mm dia bars = 43.4905 mm c/c

Shear force on LHS of Column A =	-1123 KN	upward load
Shear force on RHS of Column A =	-5350 KN	down ward
Shear force on RHS of Column B =	1123.3 KN	down ward
Shear force on LHS of Column B =	5350.3 KN	up ward

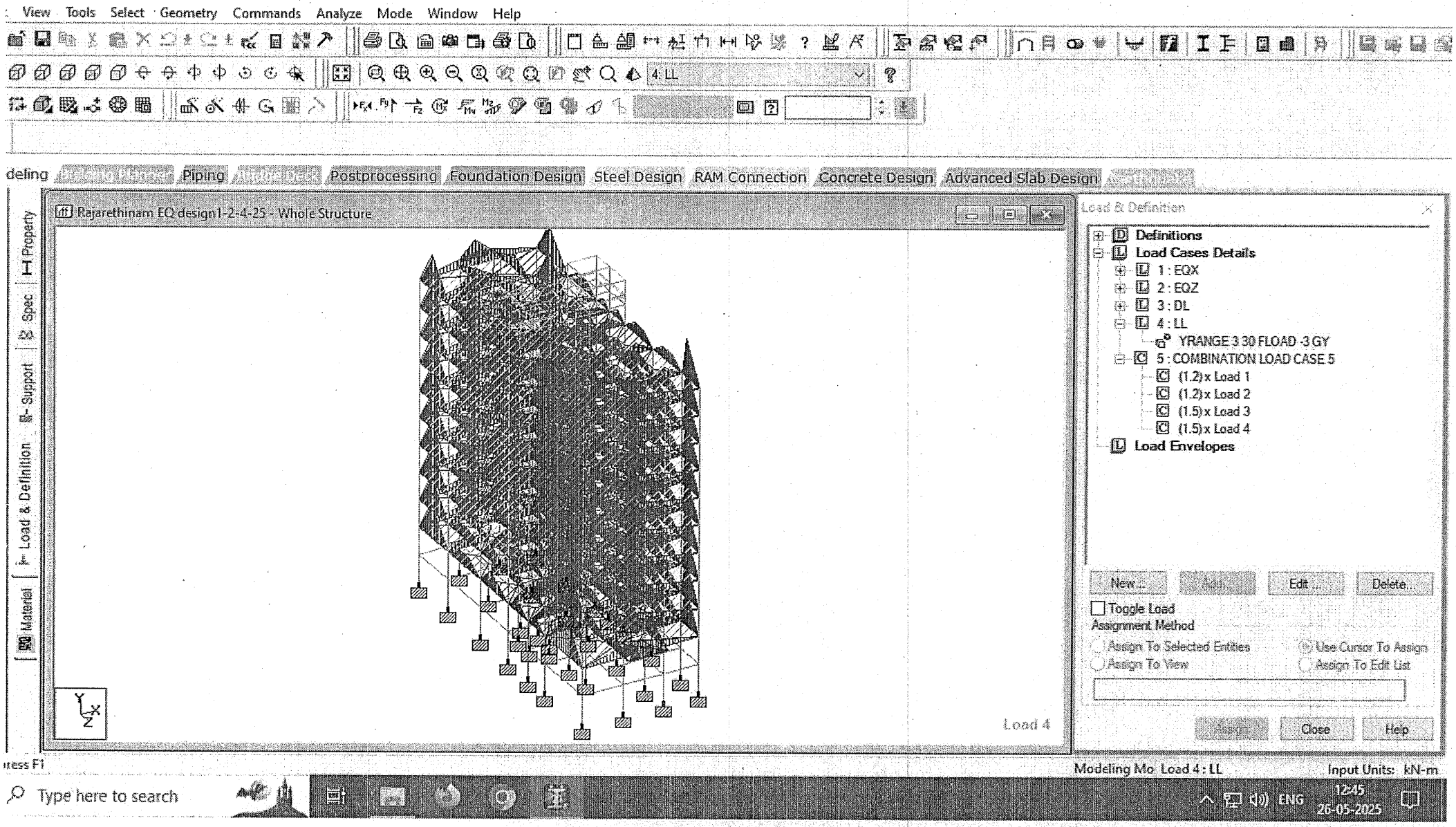
Shear to be resisted by Stirrups =	-3E+06 N	on LHS of Column A
Shear to be resisted by Stirrups =	3E+06 N	on RHS of Column A
Shear to be resisted by Stirrups =	-3E+06 N	on RHS of Column B
Shear to be resisted by Stirrups =	3E+06 N	on LHS of Column B

Dia of Shear rod = 12 mm

Spacing of 12 legged 10mm dia Vertical Stirrups =	-189.57 mm	on LHS of Column A
Spacing of 12 legged 10mm dia Vertical Stirrups =	211.29 mm	on RHS of Column A
Spacing of 12 legged 10mm dia Vertical Stirrups =	-189.57 mm	on RHS of Column B
Spacing of 12 legged 10mm dia Vertical Stirrups =	211.29 mm	on LHS of Column B

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STAAD PRO ANALYSIS


View Tools Select Geometry Commands Analyze Mode Window Help
4:LL
deling Piping Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design
Property
Spec
Support
Load & Definition
Material
Rajarethinam EQ design1-2-4-25 - Whole Structure
Load 4
Load & Definition
Definitions
Load Cases Details
1 : EQX
2 : EQZ
3 : DL
4 : LL
YRANGE 3 30 FLOAD -3 GY
5 : COMBINATION LOAD CASE 5
(1.2)x Load 1
(1.2)x Load 2
(1.5)x Load 3
(1.5)x Load 4
Load Envelopes
New...
Edit...
Delete...
Toggle Load
Assignment Method
Assign To Selected Entities
Use Cursor To Assign
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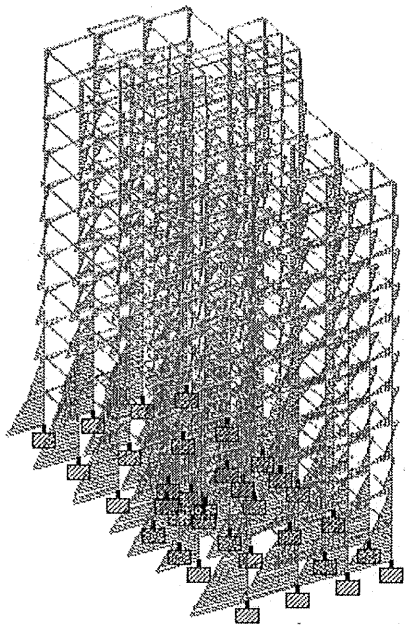
TAAD.Pro V8i (SELECTseries 6) - Rajarethinam EQ design-Nine inch column

Edit View Tools Select Results Report Mode Window Help

Modeling Building Planner Piping Piping Data Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design Structure Wizard

Node Beam Plate Animation Reports Forces Stresses Graphs

Rajarethinam EQ design-Nine inch column - Whole Structure



Load 1 : Bending Z

Rajarethinam EQ design-Nine inch column - Beam End Forces

All Summary Envelope

Beam	L/C	Node	Fx kN	Fy kN	Fz kN	Mx kNm	My kNm	Mz kNm
1	1 EQX	1	-337.556	69.075	0.622	-0.325	1.231	-125.54
		38	337.556	-69.075	-0.622	0.325	-3.090	332.65
	2 EQZ	1	-292.407	-3.850	55.797	-0.053	36.122	8.80
		38	292.407	3.850	-55.797	0.053	-203.174	-20.35
	3 DL	1	1241.905	-13.466	-11.788	0.060	27.978	-4.41
		38	-1305.521	13.466	11.788	-0.060	7.350	-36.02
	4 LL	1	289.010	-0.503	0.577	0.090	-2.450	-0.53
		38	-289.010	0.503	-0.577	-0.090	0.721	-0.97
	5 COMBINATI	1	1540.418	57.315	50.886	-0.228	83.115	-147.50

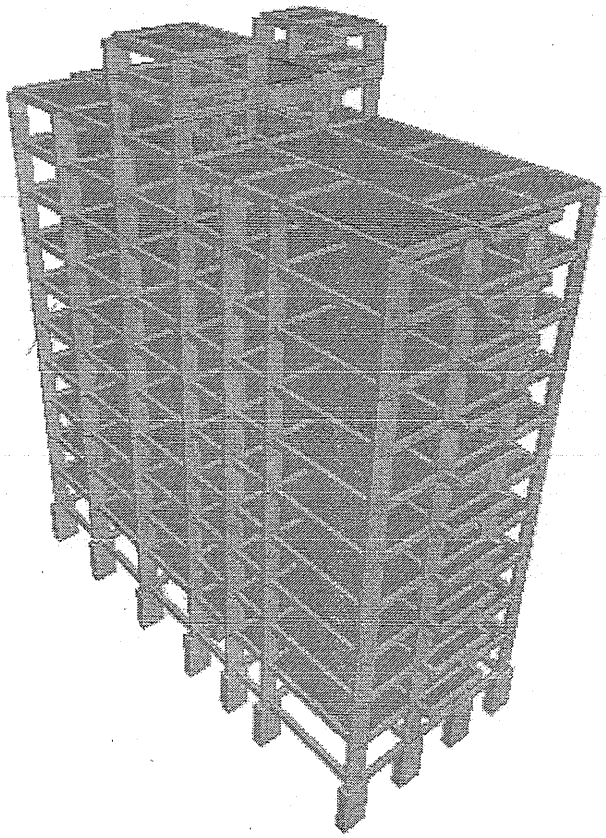
Rajarethinam EQ design-Nine inch column - Beam Force Detail

All Max Axial Forces Max Bending Moments Max Shear Forces

Beam	L/C	Dist m	Fx kN	Fy kN	Fz kN	Mx kNm	My kNm	Mz kNm
1	1 EQX	0.000	-337.556	69.075	0.622	-0.325	1.231	-125.54
		0.750	-337.556	69.075	0.622	-0.325	1.695	-177.32
		1.500	-337.556	69.075	0.622	-0.325	2.160	-229.09
		2.250	-337.556	69.075	0.622	-0.325	2.625	-280.87
		3.000	-337.556	69.075	0.622	-0.325	3.090	-332.65
	2 EQZ	0.000	-292.407	-3.850	55.797	-0.053	36.122	8.80
		0.750	-292.407	-3.850	55.797	-0.053	77.882	11.69
		1.500	-292.407	-3.850	55.797	-0.053	119.641	14.58
		2.250	-292.407	-3.850	55.797	-0.053	161.401	17.46

Help, press F1

Post Mode Load 1 : EQX Input Units: kN-m



Rajarethinam EQ design1-2-4-25 - STAAD Output Viewer

File Edit View Help

NOTES
WARNING
RESULTS
CONCRETE DESIGN

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 STAAD SPACE                                                -- PAGE NO.    12



 ************************************************************
 *                                                          *
 * TIME PERIOD FOR X 1893 LOADING =     0.75000 SEC         *
 * SA/G PER 1893=     0.900, LOAD FACTOR= 1.000             *
 * FACTOR V  PER 1893 AT GL=     0.0360 X  58303.79         *
 * FACTOR V  PER 1893 AT 30 M=     0.0180 X  58303.79       *
 *       FACTOR V  PER 1893=     0.0342 X  58303.79         *
 *                                                          *
 ************************************************************



 ************************************************************
 *                                                          *
 * TIME PERIOD FOR Z 1893 LOADING =     0.48000 SEC         *
 * SA/G PER 1893=     0.900, LOAD FACTOR= 1.000             *
 * FACTOR V  PER 1893 AT GL=     0.0360 X  58303.79         *
 * FACTOR V  PER 1893 AT 30 M=     0.0180 X  58303.79       *
 *       FACTOR V  PER 1893=     0.0342 X  58303.79         *
 *                                                          *
 ************************************************************

 ++ Adjusting Displacements.
 ++ Adjusting Displacements.
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Total Page: 714 CAP NUM

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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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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.