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12 July 2024

STRUCTURAL STABILITY CERTIFICATE FOR DESIGN

TO WHOMSOEVER IT MAY CONCERN

1. This is to certify that the proposed reconstruction of **Barva Nagar Scheme** with 360 No. Dwelling Units comprising 01 Block of Stilt + 9-floor at KB Desan Salai, Barva Nagar in R.S No.3760 Pt in Mylapore Village within the limit of Greater Chennai Corporation, Dn No. 123, Zone XI, has been structurally designed.
2. The detailed design report, which includes the method of analysis, design calculations, and structural drawings, is enclosed with this certificate. A broad description of the structure is as follows: -
 - (a) Materials M30 (Design Mix) grade concrete and Fe 500 D grade steel have been considered for structural design.
 - (b) Foundation Type Pile foundation [S+9 floors only and no additional floor is permitted].
3. The structural design has been carried out in accordance with relevant IS codes and accepted standards to withstand gravity, wind, and earthquake loads as applicable to this site condition.
4. The analysis, design calculations, and structural drawings have been thoroughly checked, certified, and proof-checked by IIT Madras and found to be safe, good, and sound.

K. Naveen KUMAR, ME (Structural Engineering)
Centre for Urbanization, Buildings & Environment (CUBE)
IIT Madras Research Park, Chennai-600 113.
Registered Structural Engineer (Grade-5)
CMAA Reg. No.: SE/2024/4/0007

PILE REINFORCEMENT



8 NOS - 20#
TIES #10 @ 150MM C/C
TYPICAL PILE SECTION
FOR 500 DIA PILE-P1

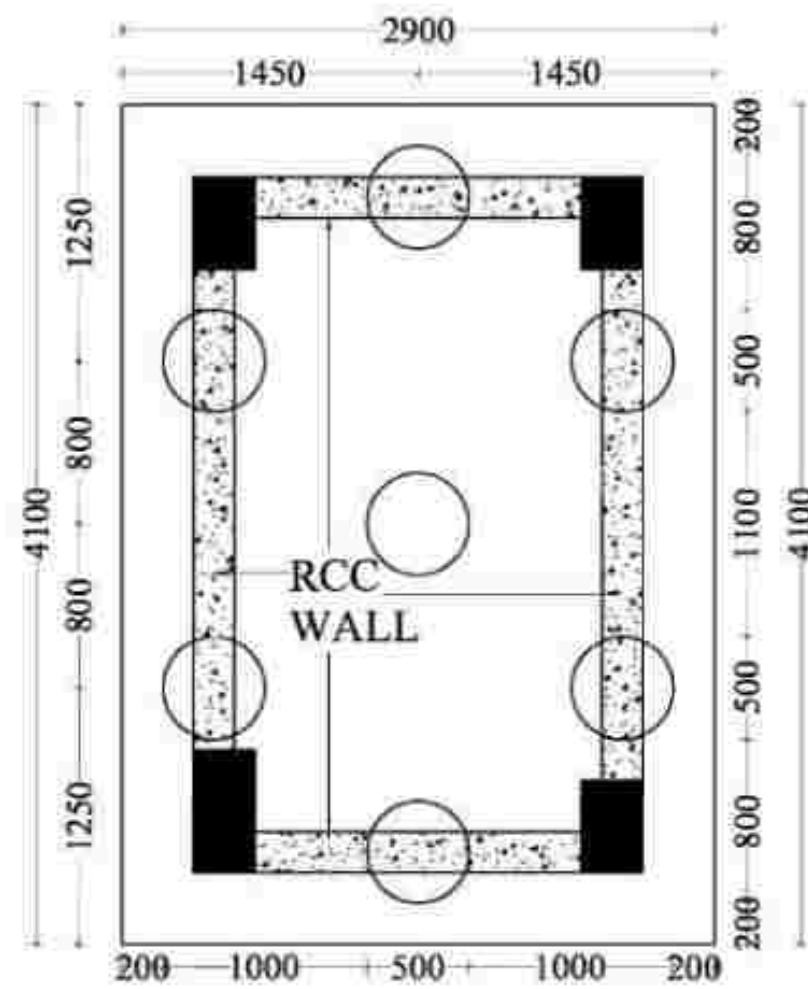
Note:
16mm dia bar Binding of Every
2.5m center to center of pile for
Installation Process

PILE REINFORCEMENT

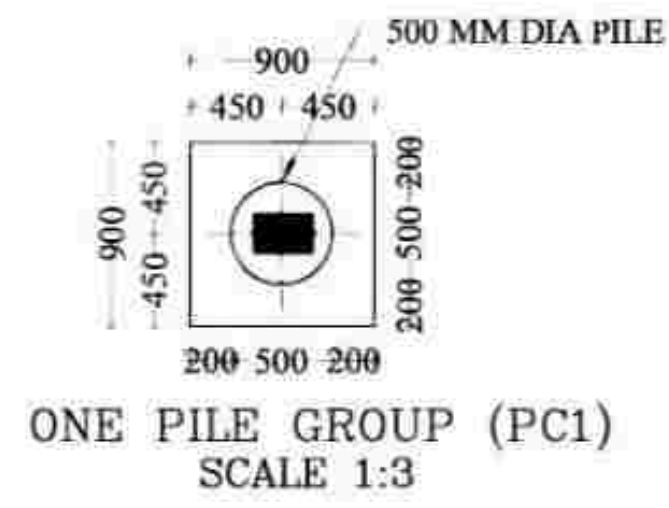


10 NOS - 20#
TIES #10 @ 150MM C/C
TYPICAL PILE SECTION
FOR 600 DIA PILE-P2

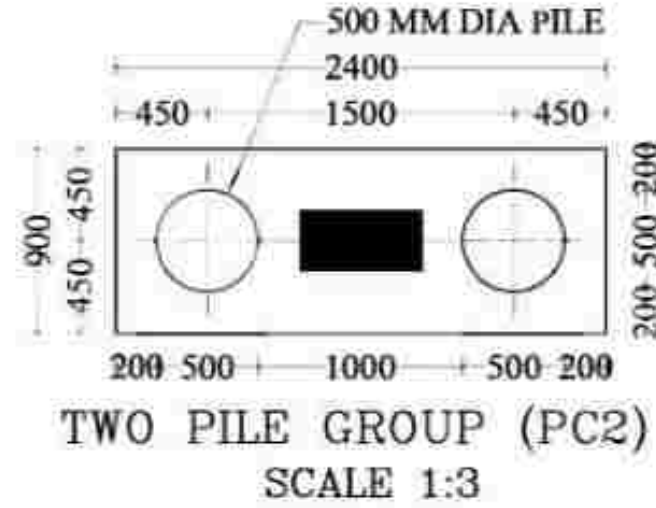
Note:
16mm dia bar Binding of Every
2.5m center to center of pile for
Installation Process



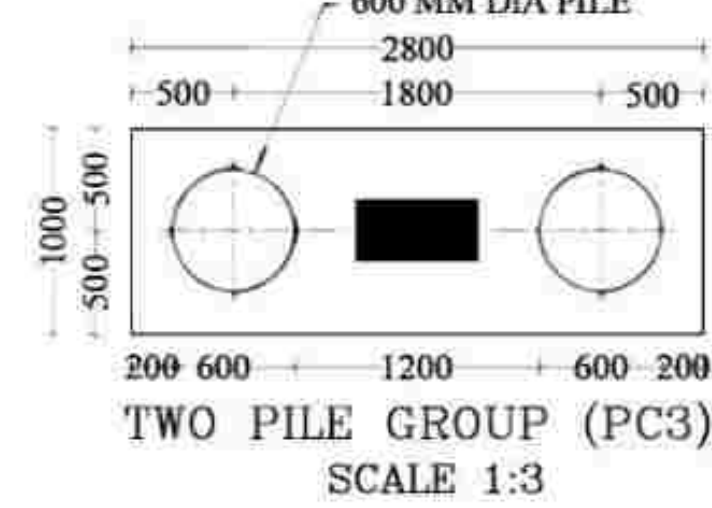
SEVEN PILE GROUP (PC4)
SCALE 1:3



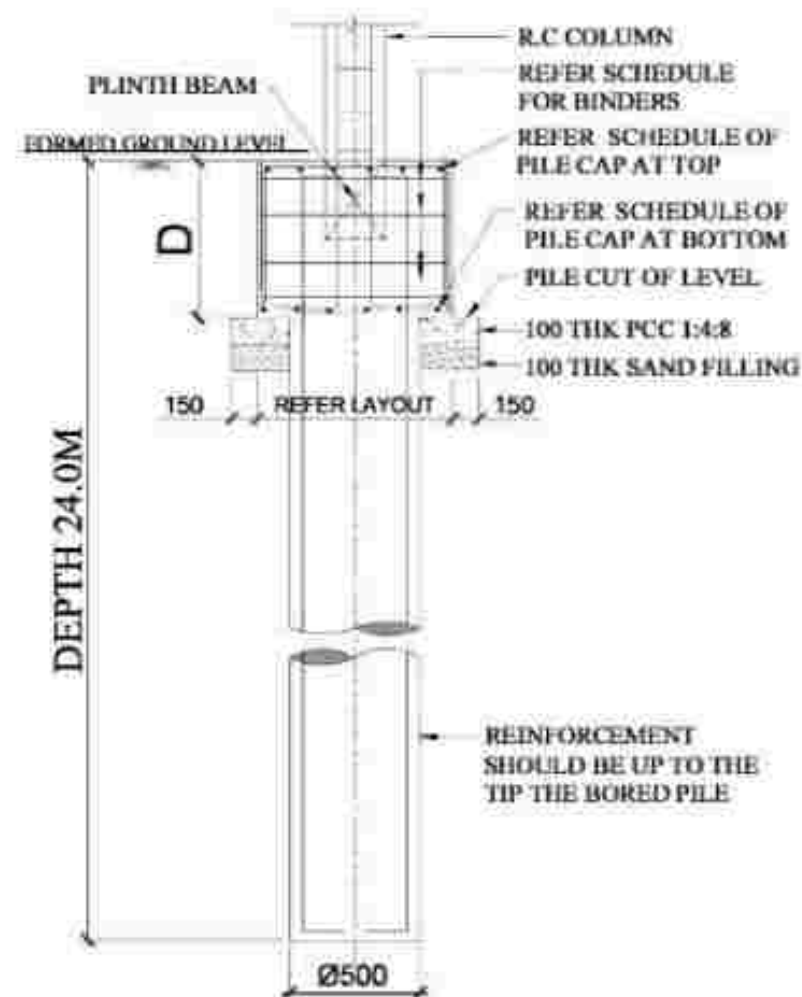
ONE PILE GROUP (PC1)
SCALE 1:3



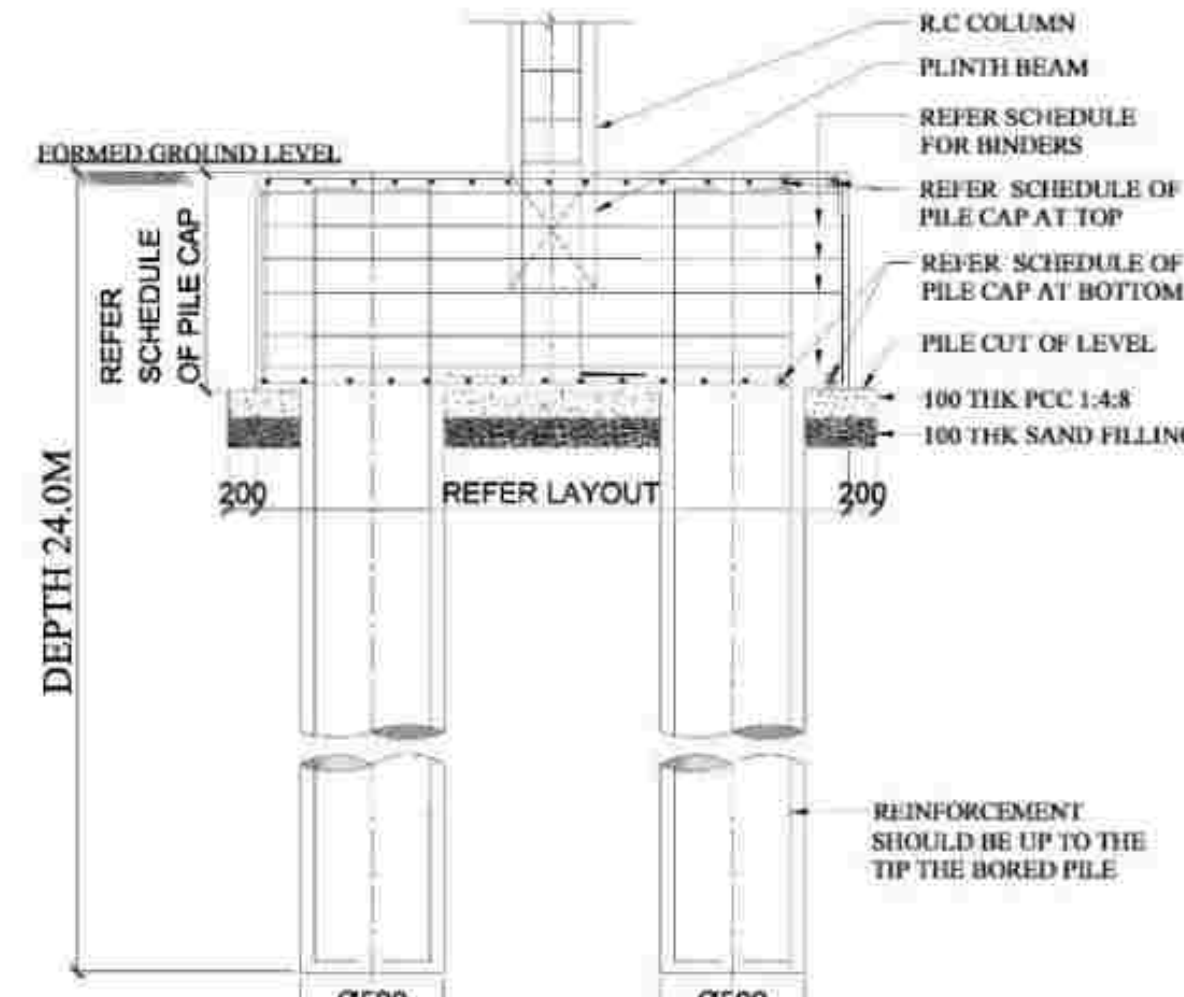
TWO PILE GROUP (PC2)
SCALE 1:3



TWO PILE GROUP (PC3)
SCALE 1:3

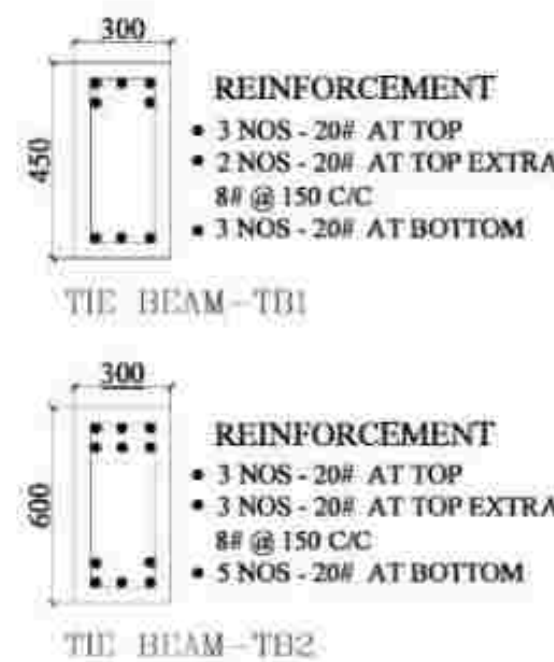


TYPICAL SECTION FOR SINGLE PILE
WITH PILE CAP PC1



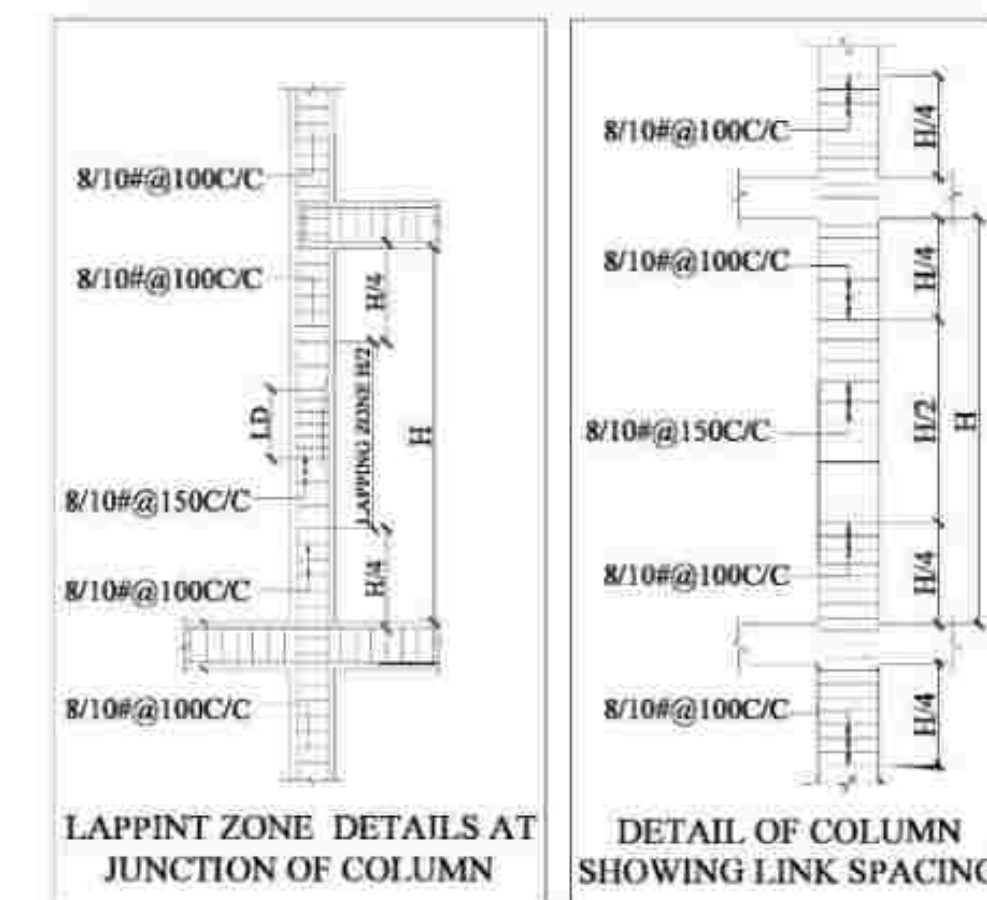
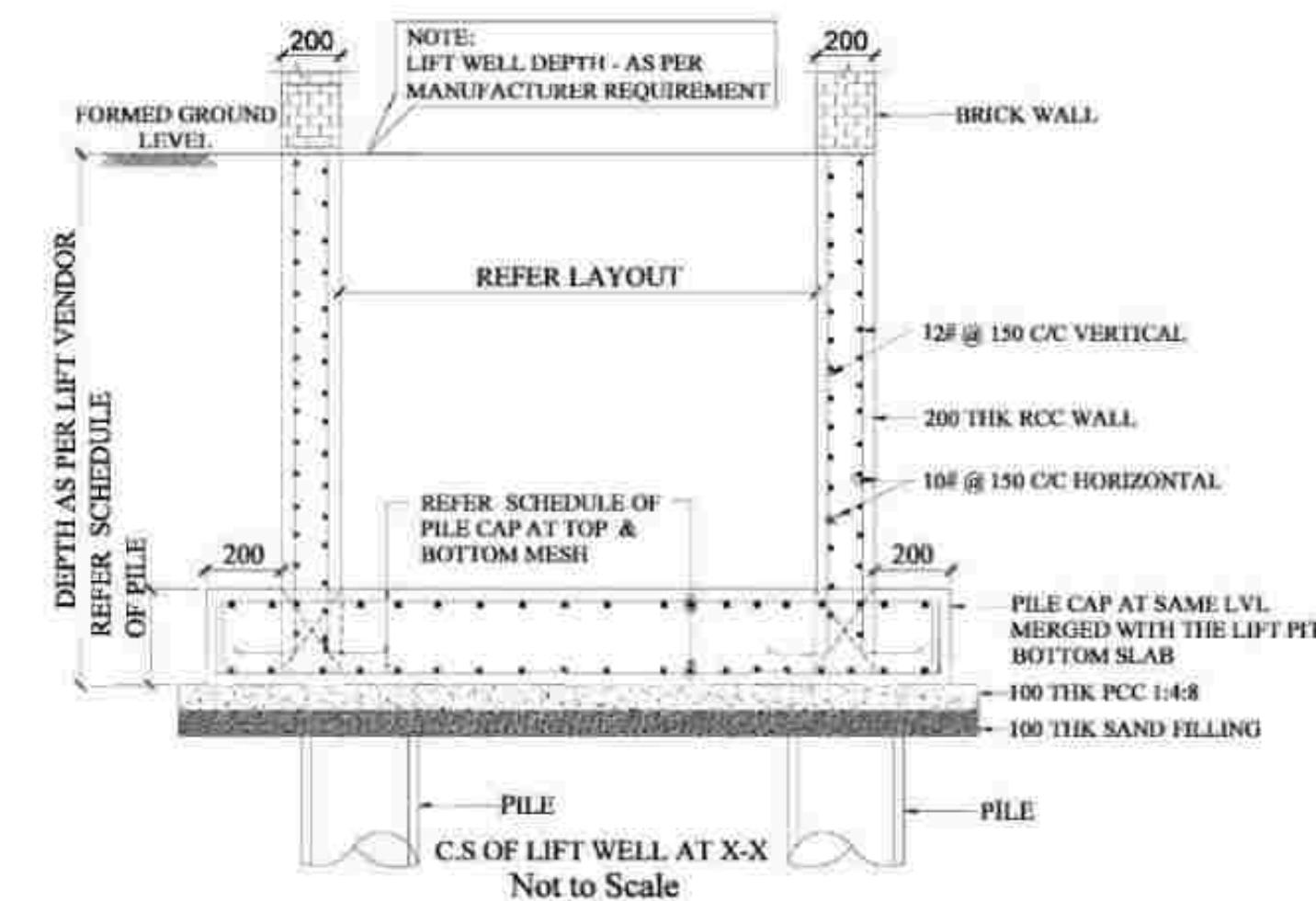
TYPICAL SECTION FOR TWO PILE WITH PILE CAP (PC2)

SCHEDULE OF RCC WALL					
S NO	NAME OF WALL	SIZE Lx X Lz	WALL THICKNESS	REINFORCEMENT	REMARKS
01	RCW1	REFER PLAN	200	VERTICAL DIRECTION 10# @ 150 C/C (INNER) 10# @ 150 C/C (OUTER)	HORIZONTAL DIRECTION 8# @ 150 C/C (INNER) 8# @ 150 C/C (OUTER)



SCHEDULE OF PILE CAP							
NAME PILE CAP	PILE CAP SIZE	PILE CAP THICKNESS	BOTTOM R/F	TOP R/F	BINDER	PILE DIA	REMARKS
PC1	900 X 900	600	16# @ 150 C/C	16# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	ONE PILE
PC2	900 X 2400	750	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	TWO PILE
PC3	1000 X 2800	750	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	600 DIA PILE	TWO PILE
PC4	2900 X 4100	900	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	SEVEN PILE

SCHEDULE OF RCC COLUMNS									
UPTO STILT FLOOR ROOF					STILT FLOOR ROOF TO TERRACE				
SL NO	NAME OF COLUMN	SIZE OF COLUMNS	SECTION	SHAPE OF TIES	REINFORCEMENT	SECTION	SHAPE OF TIES	REINFORCEMENT	NO OF COLUMNS
01	SC	300 x 600	10#	10#	4 NOS-10#	10#	10#	4 NOS-10#	03 NOS
02	C1	300 x 600	10#	10#	10 NOS-25#	10#	10#	10 NOS-25#	06 NOS
03	C2	300 x 450	10#	10#	8 NOS-20#	10#	10#	8 NOS-20#	02 NOS (BLOCK A3)
04	C3	300 x 450	10#	10#	8 NOS-25#	10#	10#	8 NOS-25#	28 NOS (BLOCK A4)
05	C4	300 x 600	10#	10#	12 NOS-25#	10#	10#	12 NOS-25#	06 NOS



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NOTES:

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- ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THIS OFFICE BEFORE EXECUTION.
- GRADE OF CONCRETE SHALL BE M35 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
- GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO LATEST INDIAN STANDARDS
- ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
- THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS
PILE / FOOTING = 50MM
RC WALLS = 25MM TO LINKS
SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION
Fe-500
M30 Ld 45d Where d is Diameter of rod
M35 Ld 40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION
Fe-500
M30 Ld 38d Where d is Diameter of rod
M35 Ld 32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN.

Dr. P. Nallathambi
ME, Ph.D (Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai - 600113
Chartered Engineer (F-117029-1)

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
TAMIL NADU URBAN HABITAT
DEVELOPMENT BOARD (TNUHDB)
NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS &
ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/S&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PLAN SHOWING THE PROPOSED RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI

DRAWING NO: TNUHDB/BHN/BLOCK A4 SHEET NO: 001 REV NO: R0

DRAWING TITLE :
PILE FOUNDATION LAYOUT & SECTION DETAILS FOR BLOCK A4

BLOCK NO: BLOCK A4 SCALE: NTS SIZE OF SHEET: A1

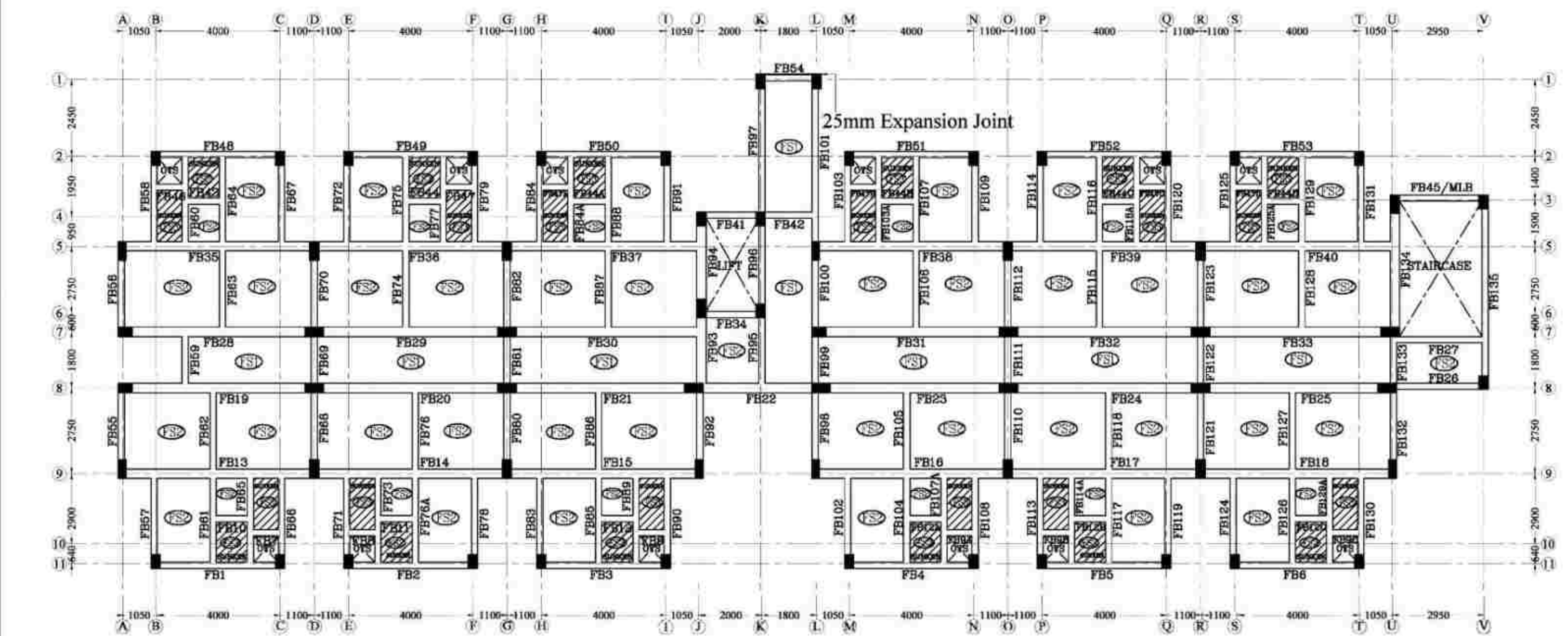
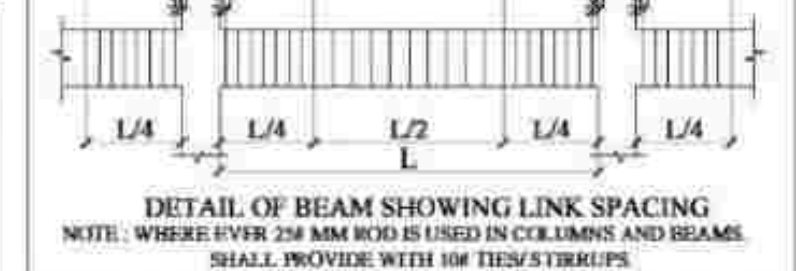
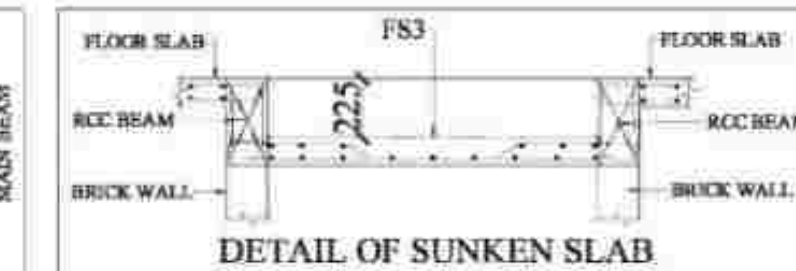
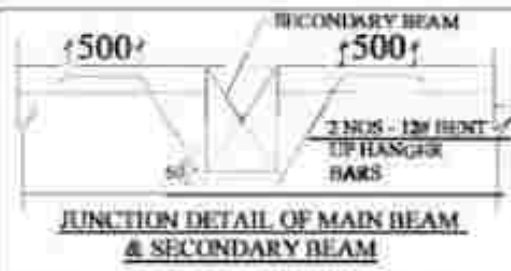
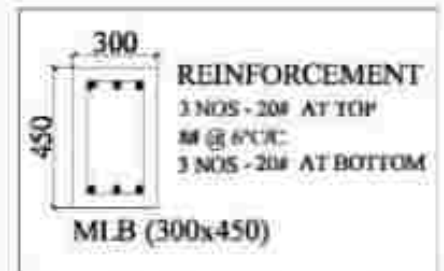
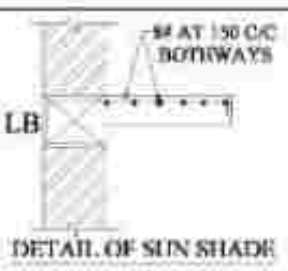
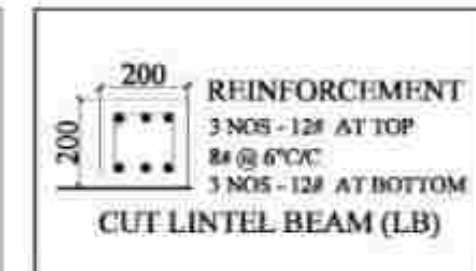
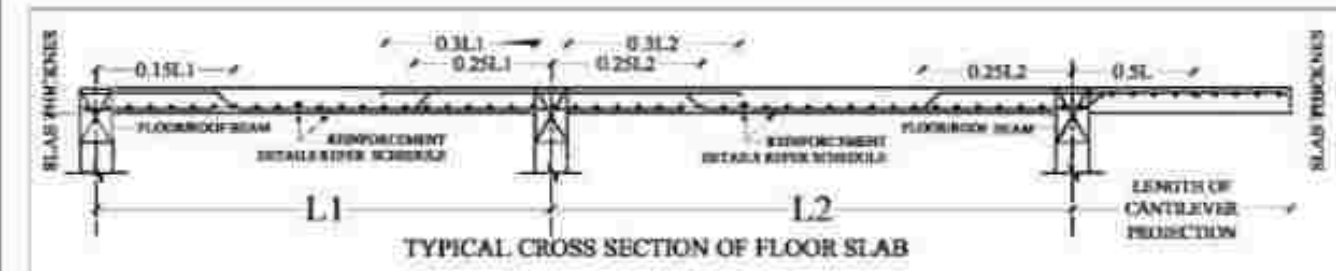
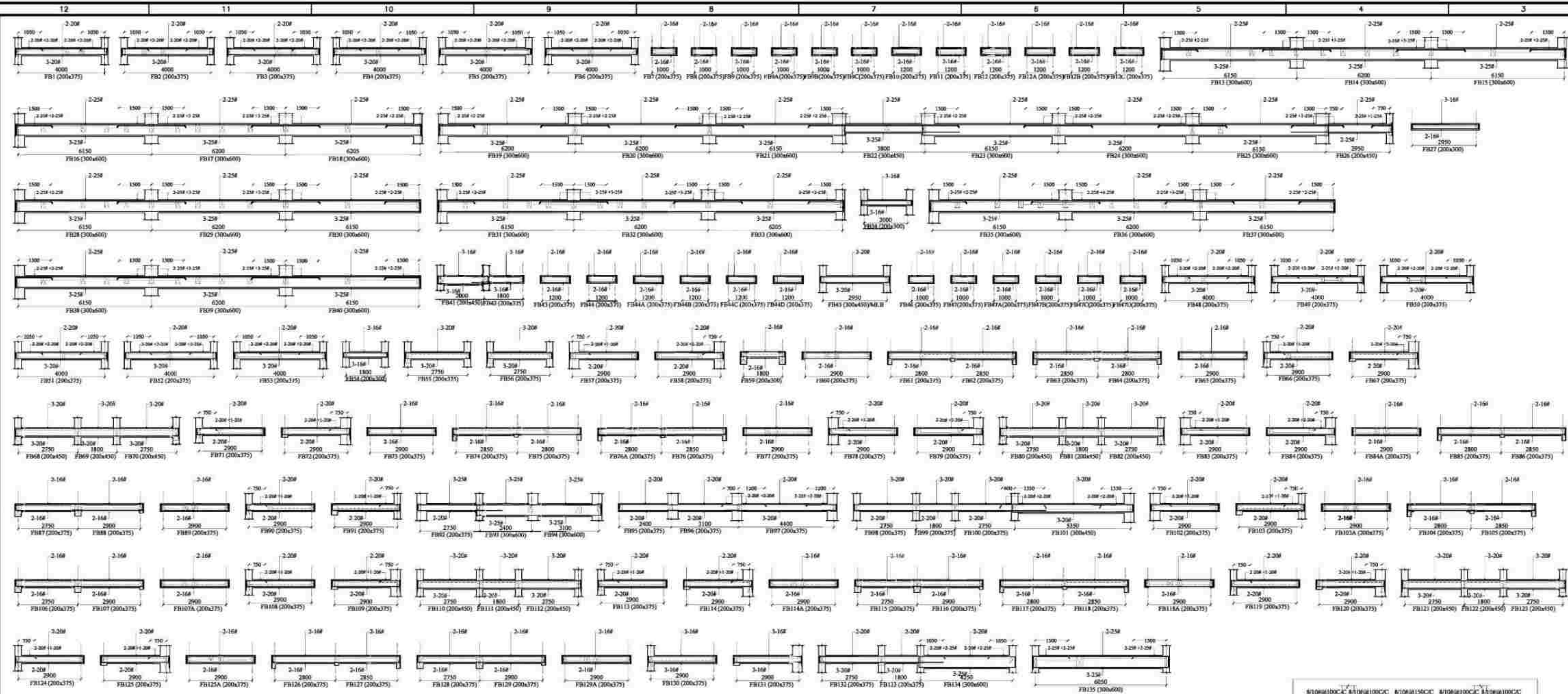
ISSUED FOR:
☒ PRELIMINARY ☒ TENDER ☐ INFORMATION ☐ APPROVAL ☐ CONSTRUCTION ☐ DATE OF ISSUE: 08-11-2022

DESIGNED BY: DRAWN BY:

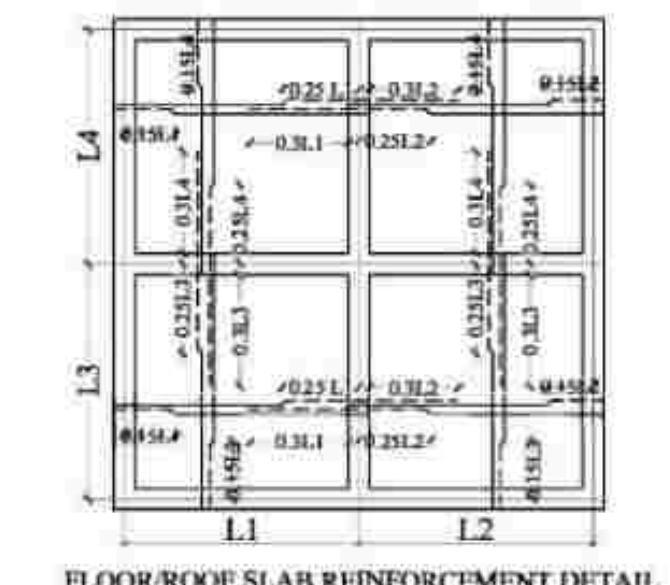
CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm

PILE FOUNDATION LAYOUT AT + 0.00 M LVL FOR BLOCK A4



SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
1	FS1	125	8#	150 C/C	8#	175 C/C	8#	300 C/C	8#	350 C/C	
2	FS2	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	
3	FS3	150	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	 225MM SUNKEN DEPTH



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PILE / FOOTING = 50MM
BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS
SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION
Fe-500D
M30 Ld 45d Where d is Diameter of rod
M35 Ld 40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION
Fe-500D
M30 Ld 36d Where d is Diameter of rod
M35 Ld 32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN.

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				
	DESCRIPTION				

NOTE: 7888888888 NGL NATURAL GROUND LEVEL.

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

Dr. P. Nallathambi
ME, Ph.D (Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai - 600113
Chartered Engineer (F-117029-1)

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
TAMIL NADU URBAN HABITAT
DEVELOPMENT BOARD (TNUHDB)
NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:

PLAN SHOWING THE PROPOSED RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI

DRAWING NO: TNUHDB/BHN/BLOCK A4	SHEET NO: 004	REV NO: R0
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DRAWING TITLE :

TYPICAL FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A4

BLOCK NO: BLOCK A4	SCALE: NTS	SIZE OF SHEET: A1
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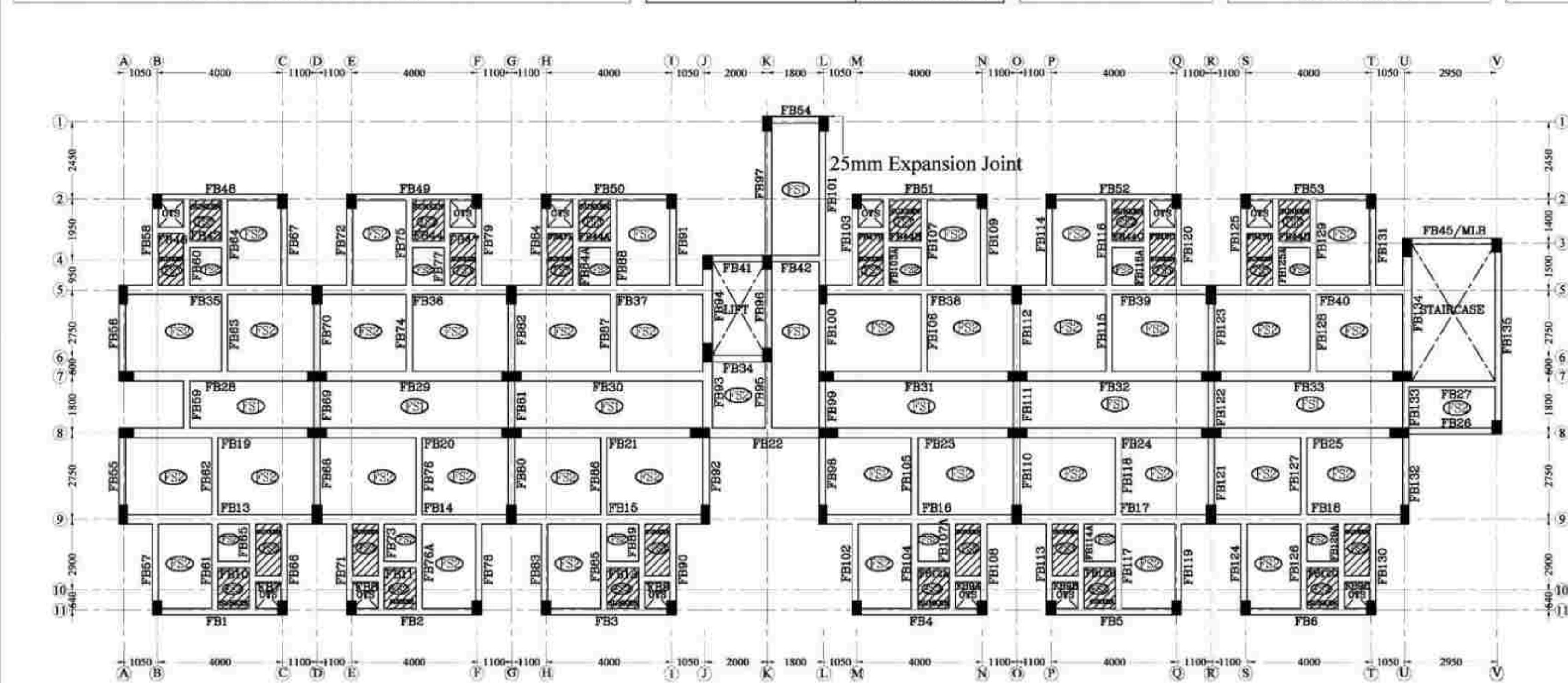
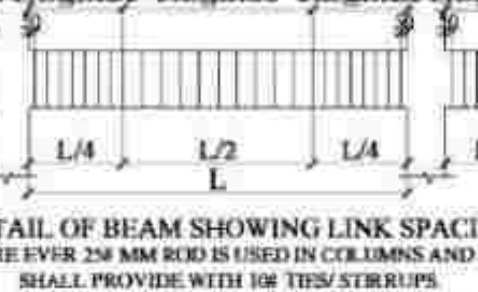
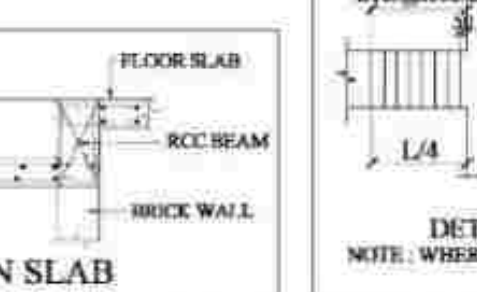
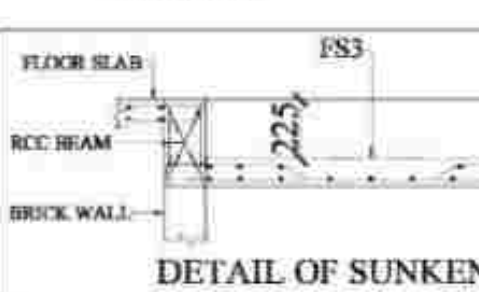
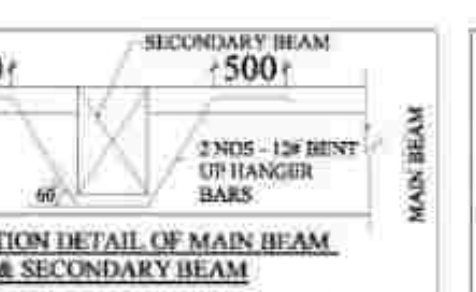
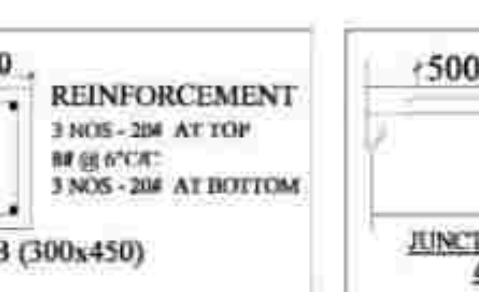
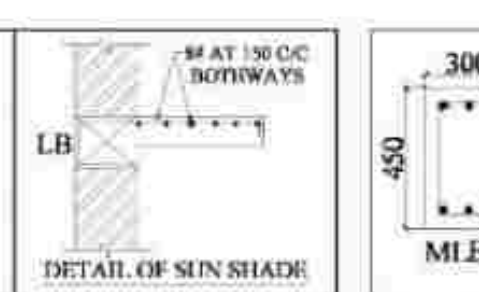
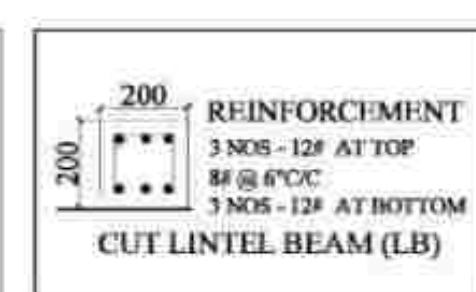
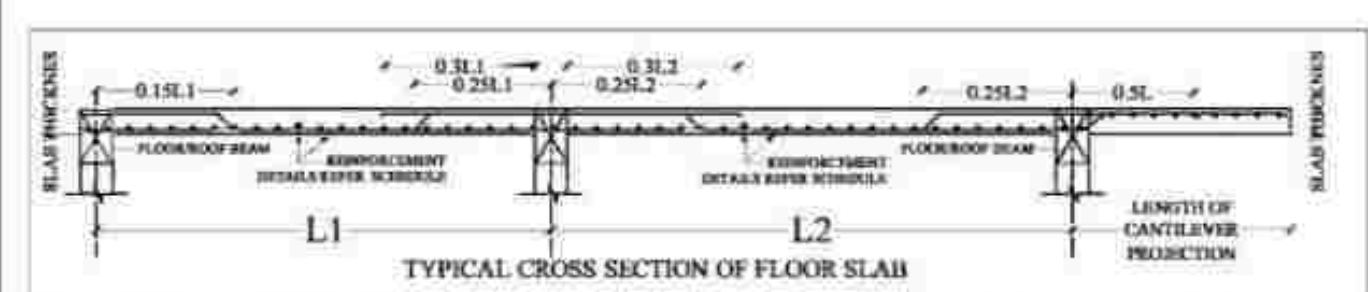
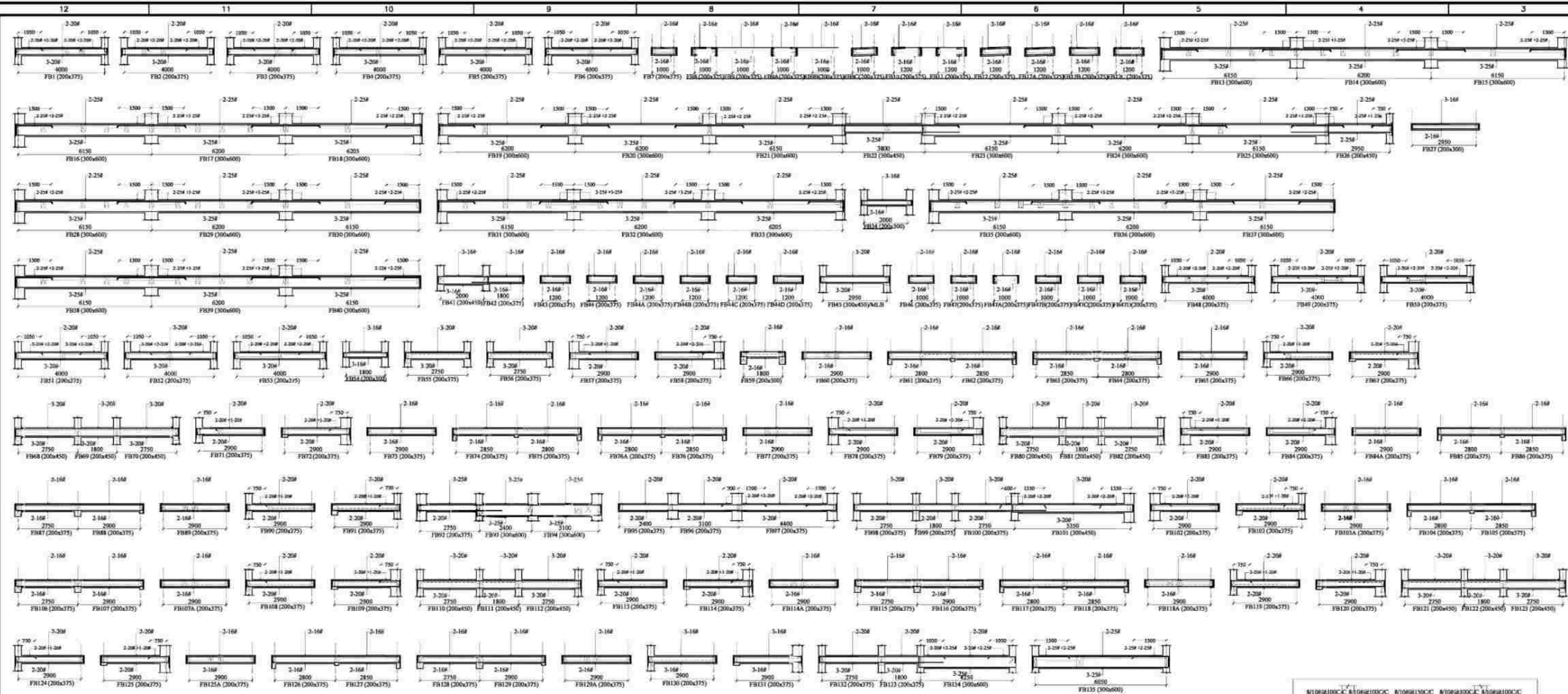
☒ PRELIMINARY ☐ APPROVAL	☒ TENDER ☐ CONSTRUCTION	☐ INFORMATION	DATE OF ISSUE 08-11-2022
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DESIGNED BY: _____ DRAWN BY: _____

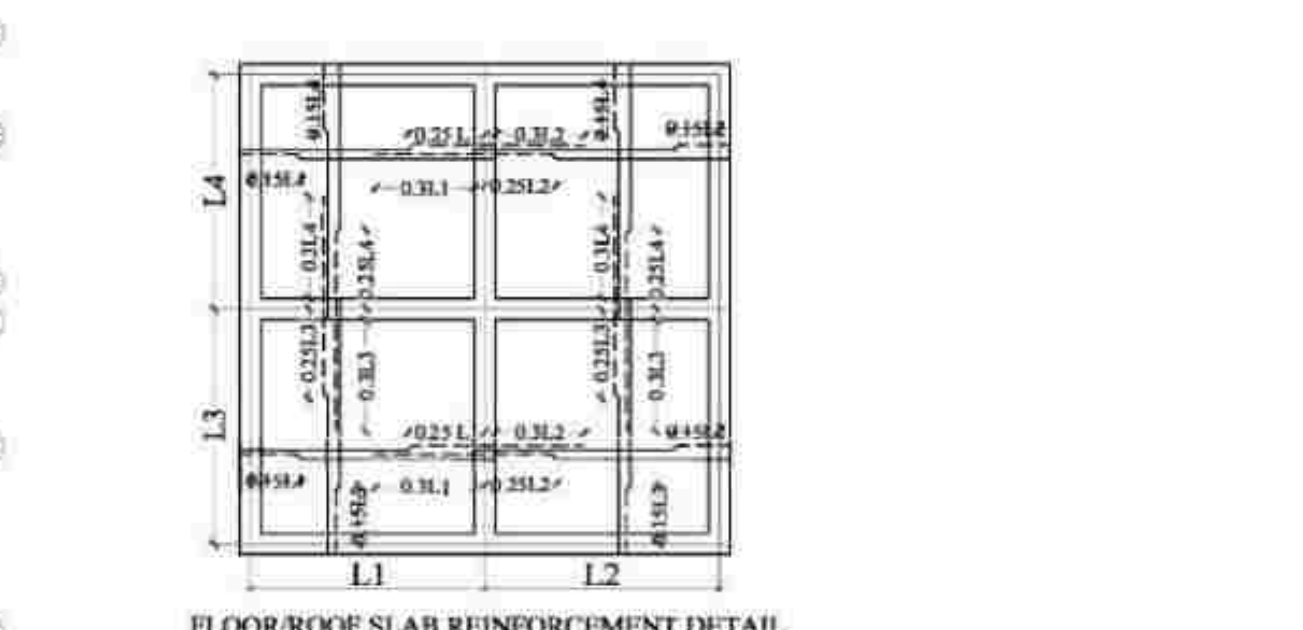
CHECKED BY: _____ APPROVED BY: _____

NOTE: ALL DIMENSION ARE IN mm

TYPICAL FLOOR BEAM LAYOUT AT FIRST FLOOR ROOF (+5850MM), SECOND FLOOR ROOF (+8800MM), THIRD FLOOR ROOF (+11750MM), FOURTH FLOOR ROOF (+14700MM), FIFTH FLOOR ROOF (+17650MM), SEVENTH FLOOR ROOF (+23550MM), EIGHT FLOOR ROOF (+26500MM) LVL FOR BLOCK A4



SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
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3	FS3	150	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	



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Fe-500D
M30 Ld 45d Where d is Diameter of rod
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Fe-500D
M30 Ld 38d Where d is Diameter of rod
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- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN.

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				
	DESCRIPTION				

NOTE: NGL NATURAL GROUND LEVEL.

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Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

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DRAWING NO: TNUHDB/BHN/BLOCK A4	SHEET NO: 005	REV NO: R0
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DRAWING TITLE :
SIXTH FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A4

BLOCK NO: BLOCK A4	SCALE: NTS	SIZE OF SHEET: A1
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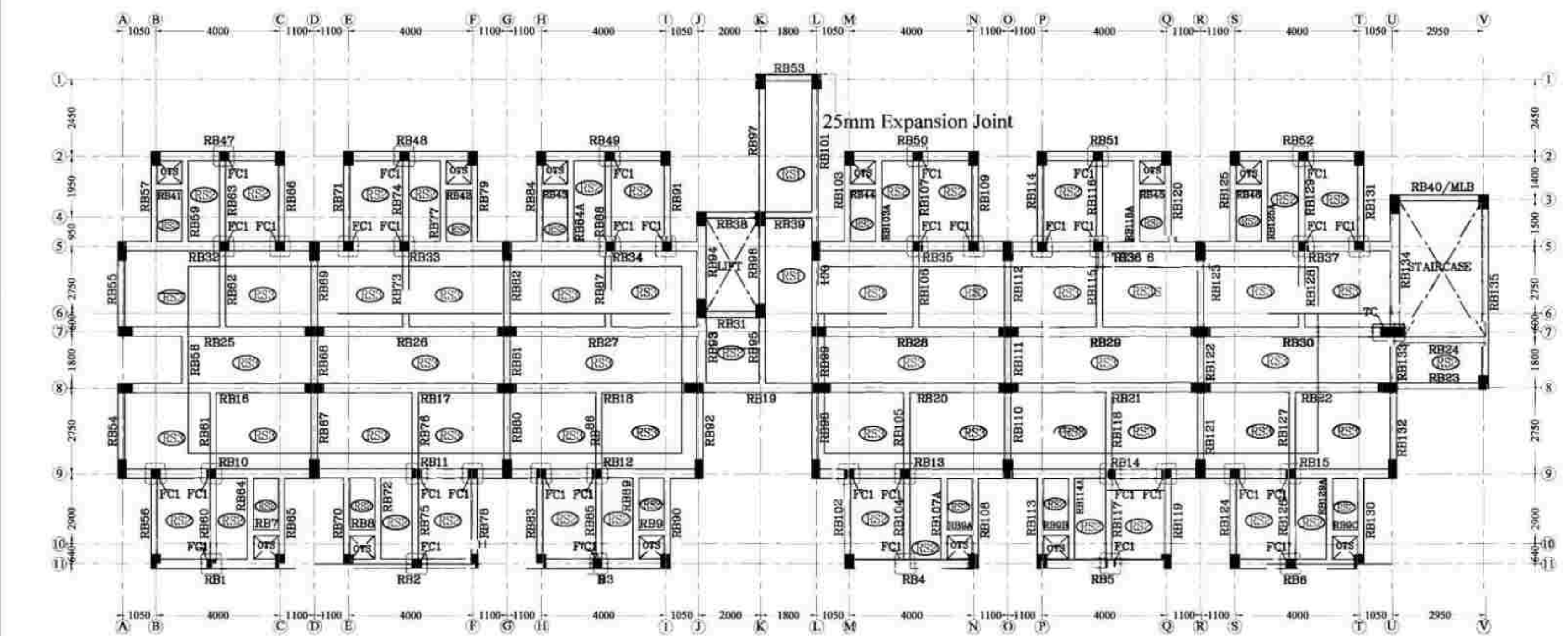
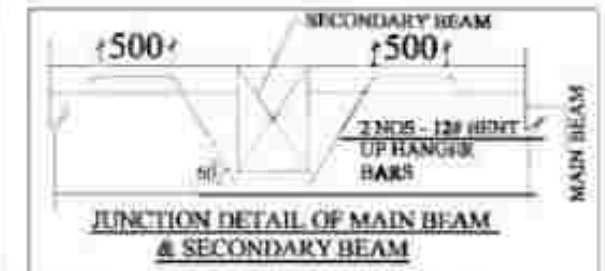
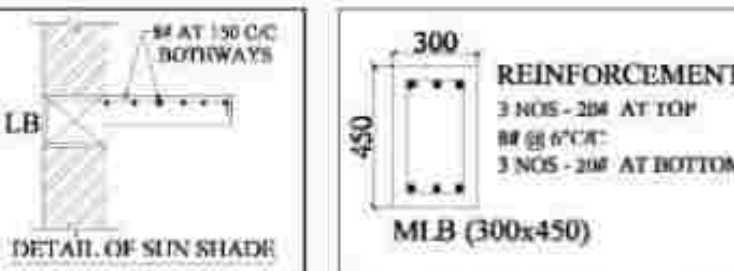
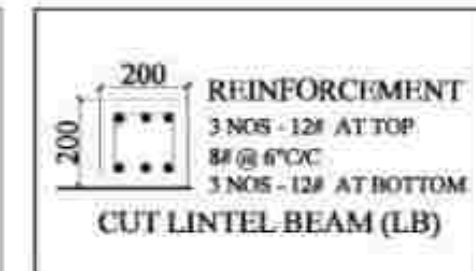
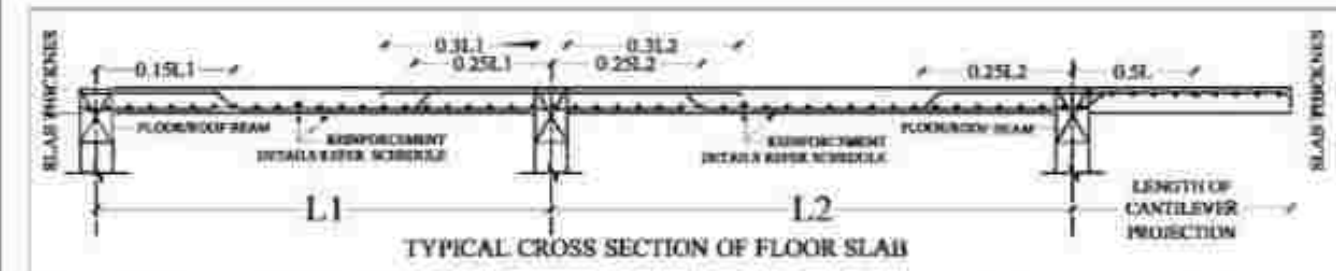
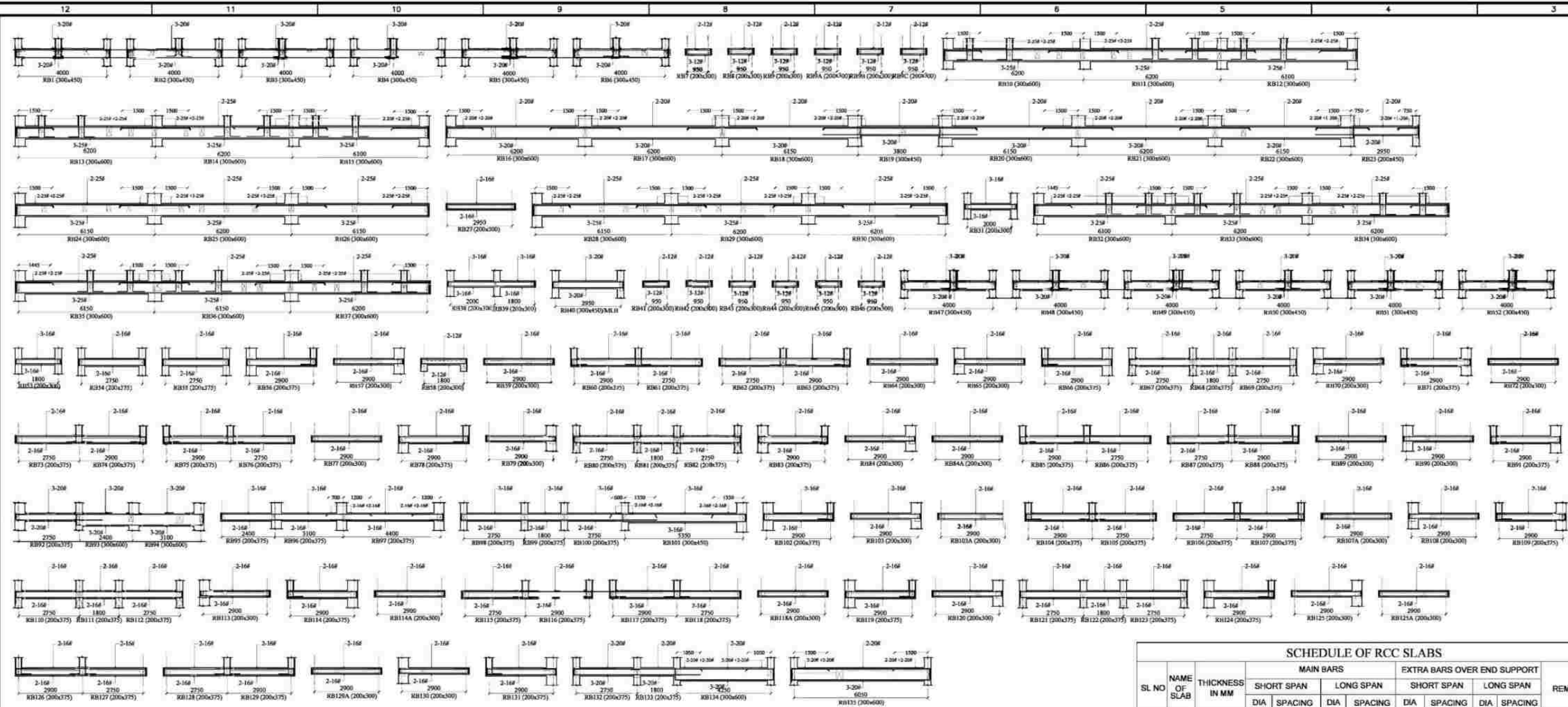
ISSUED FOR:

☒ PRELIMINARY ☐ APPROVAL	☒ TENDER ☐ CONSTRUCTION	☐ INFORMATION	DATE OF ISSUE 08-11-2022
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DESIGNED BY:	DRAWN BY:
CHECKED BY:	APPROVED BY:

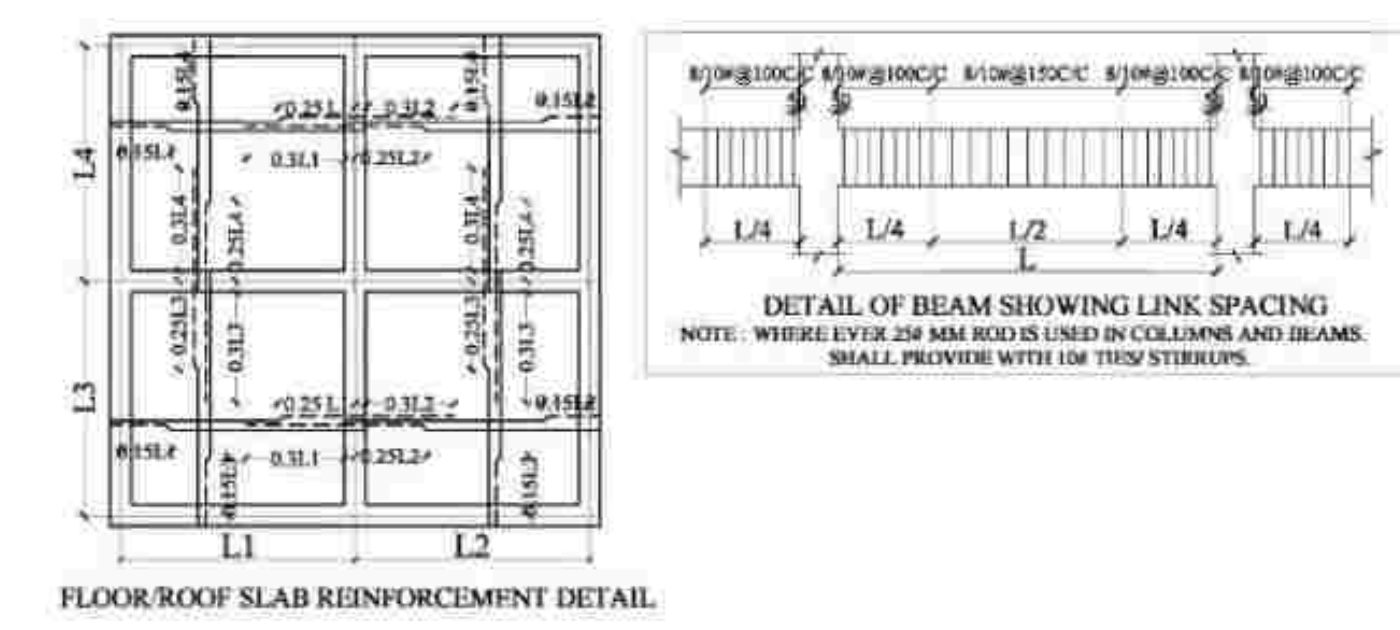
NOTE: ALL DIMENSION ARE IN mm

SIXTH FLOOR ROOF BEAM LAYOUT AT + 20600MM LVL FOR BLOCK A4



SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
01	RS1	125	8#	125 C/C	8#	175 C/C	8#	250 C/C	8#	350 C/C	
02	RS2	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	
03	RS3	150	8#	125 C/C	8#	125 C/C	8#	250 C/C	8#	250 C/C	SOLAR PANEL FLOOR AREA

SCHEDULE OF RCC FLOATING COLUMNS									
SL NO	NAME OF COLUMN	SIZE OF COLUMN	SECTION	SHAPE OF TIES	REINFORCEMENT	STIRRUPS	NEAR SUPPORT (10d)	MIDDLE SPAN (1/2)	NO OF COLUMNS
01	FC1	300 x 300			8 NOS-16#	8# @ 100 C/C	8# @ 150 C/C	36 NOS	



FOR TENDER PURPOSE ONLY

TERRACE FLOOR BEAM LAYOUT AT + 29450MM LVL FOR BLOCK A4

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- GRADE OF CONCRETE SHALL BE M30 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
- GRADE OF STEEL SHALL BE Fe-500D CONFORMING TO LATEST INDIAN STANDARDS
- ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
- THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS
PILE / FOOTING = 50MM BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION
M30 Ld 45d Where d is Diameter of rod
M35 Ld 40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION
M30 Ld 36d Where d is Diameter of rod
M35 Ld 32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING.
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN.

REVNO:	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				

NOTE: NGL NATURAL GROUND LEVEL.

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

Dr. P. Nallathambi
ME, Ph.D (Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai - 600113
Chartered Engineer (E-117029-1)

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
TAMIL NADU URBAN HABITAT
DEVELOPMENT BOARD (TNUHDB)
NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

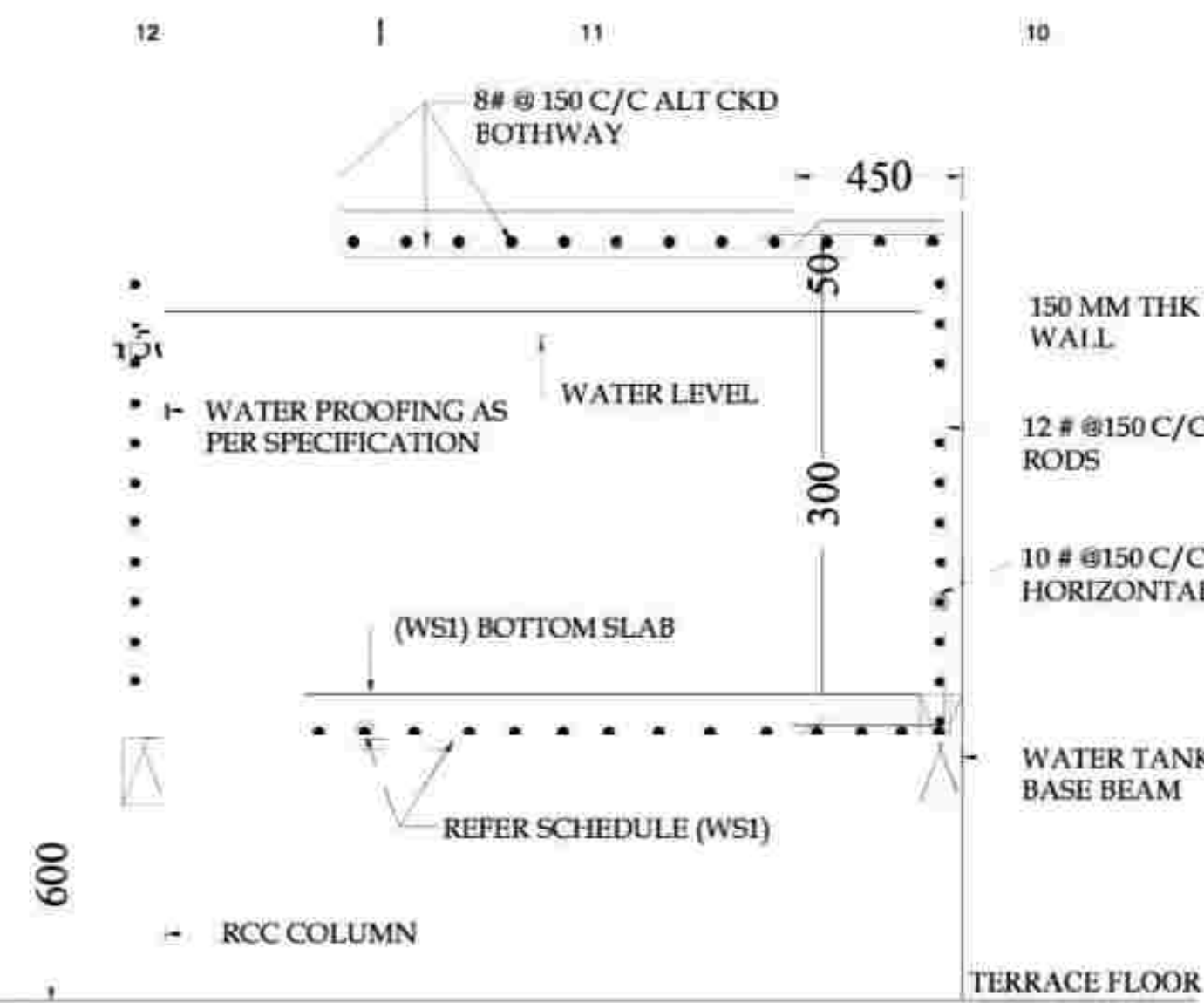
CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

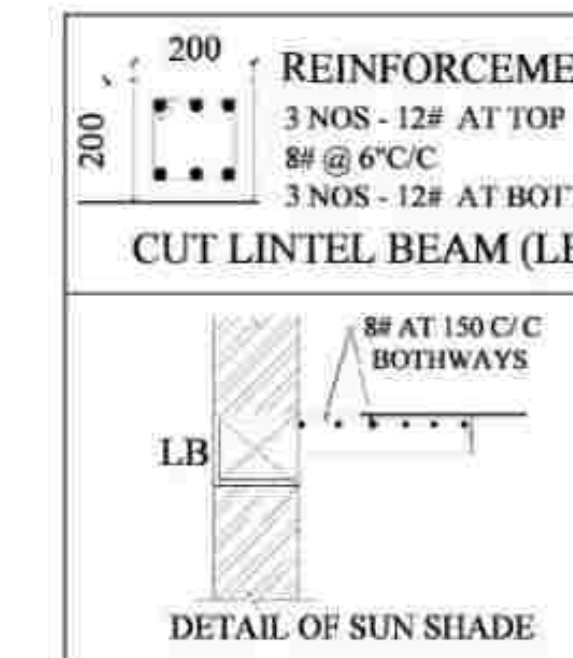
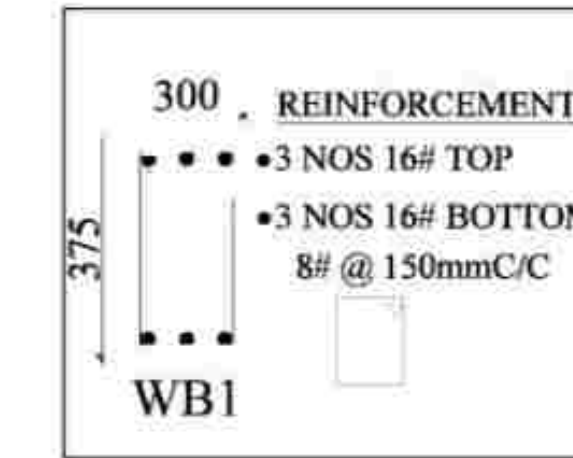
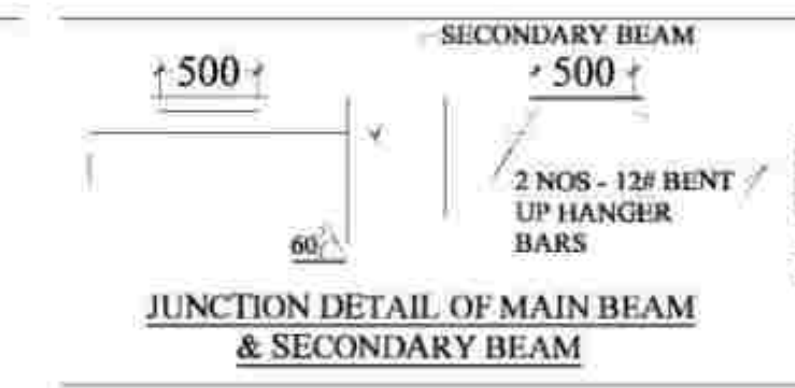
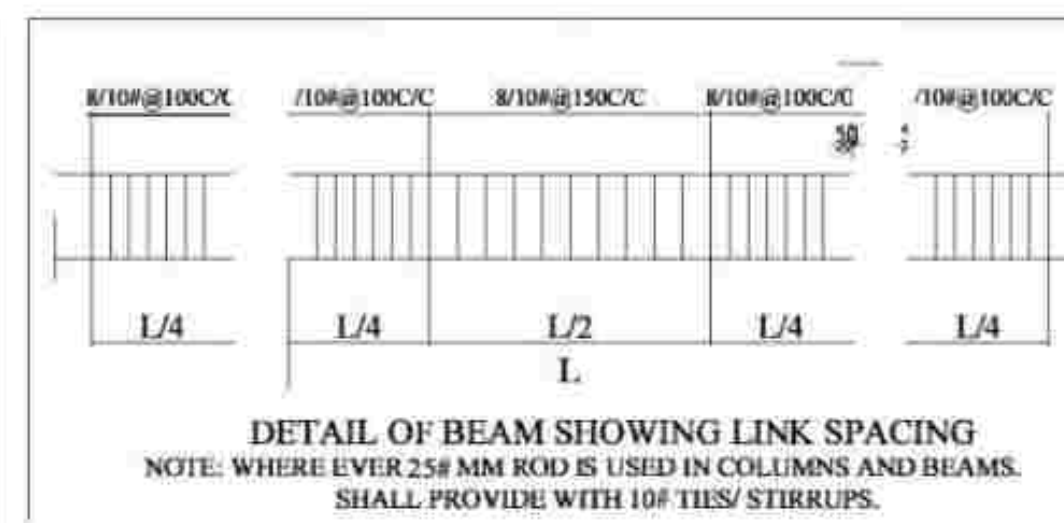
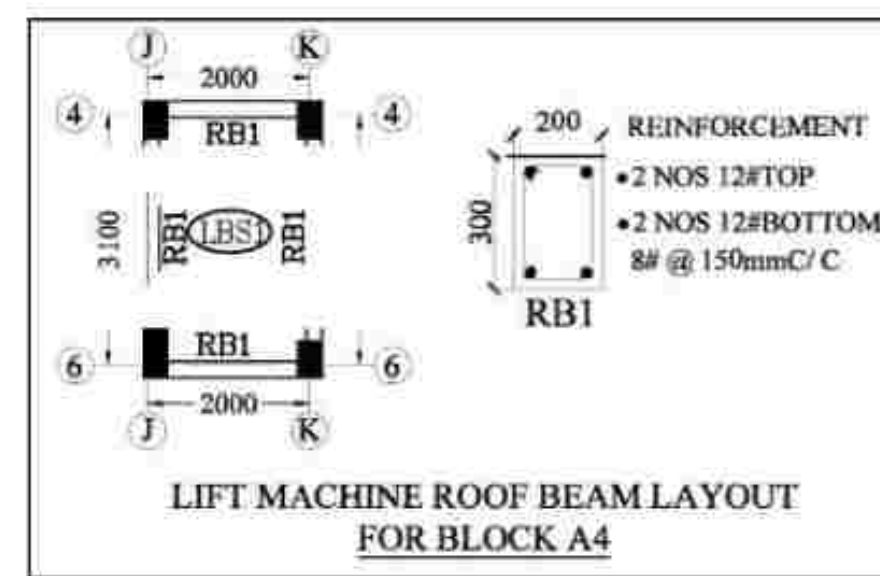
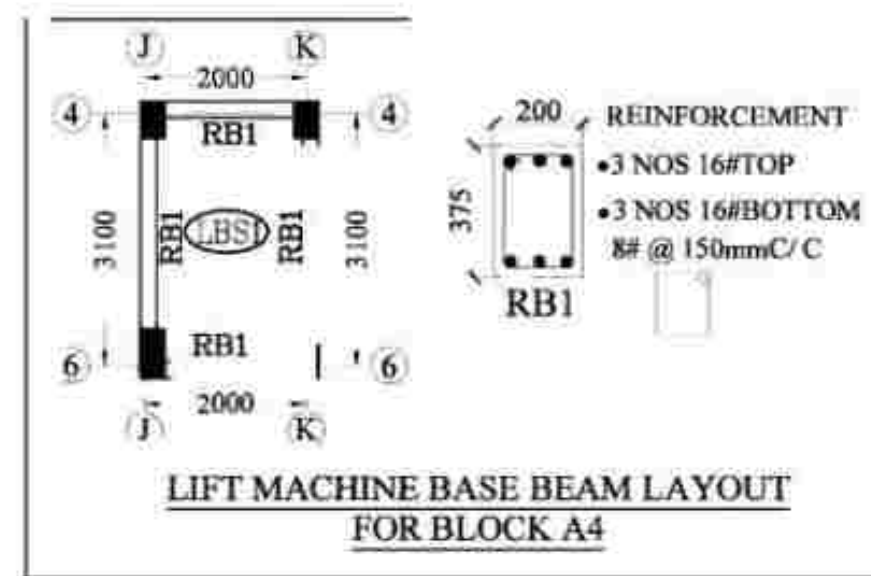
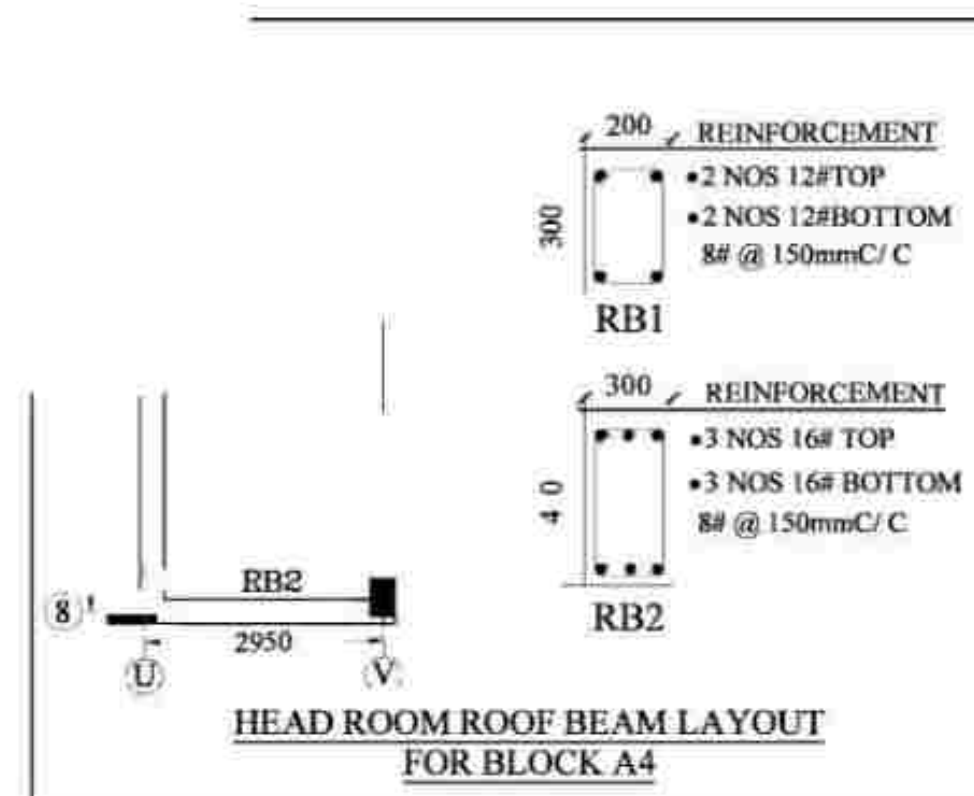
PROJECT TITLE:
PLAN SHOWING THE PROPOSED RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAR SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI

DRAWING NO: TNUHDB/BHN/BLOCK A4	SHEET NO: 008	REV NO: R0
DRAWING TITLE : TERRACE FLOOR BEAM LAYOUT & SECTION DETAILS FOR BLOCK A4		
BLOCK NO: BLOCK A4	SCALE: NTS	SIZE OF SHEET: A1
ISSUED FOR: ☒ PRELIMINARY ☒ TENDER ☐ INFORMATION ☐ APPROVAL ☐ CONSTRUCTION		
DESIGNED BY:		DATE OF ISSUE 19-09-2022
CHECKED BY:		DRAWN BY:
		APPROVED BY:

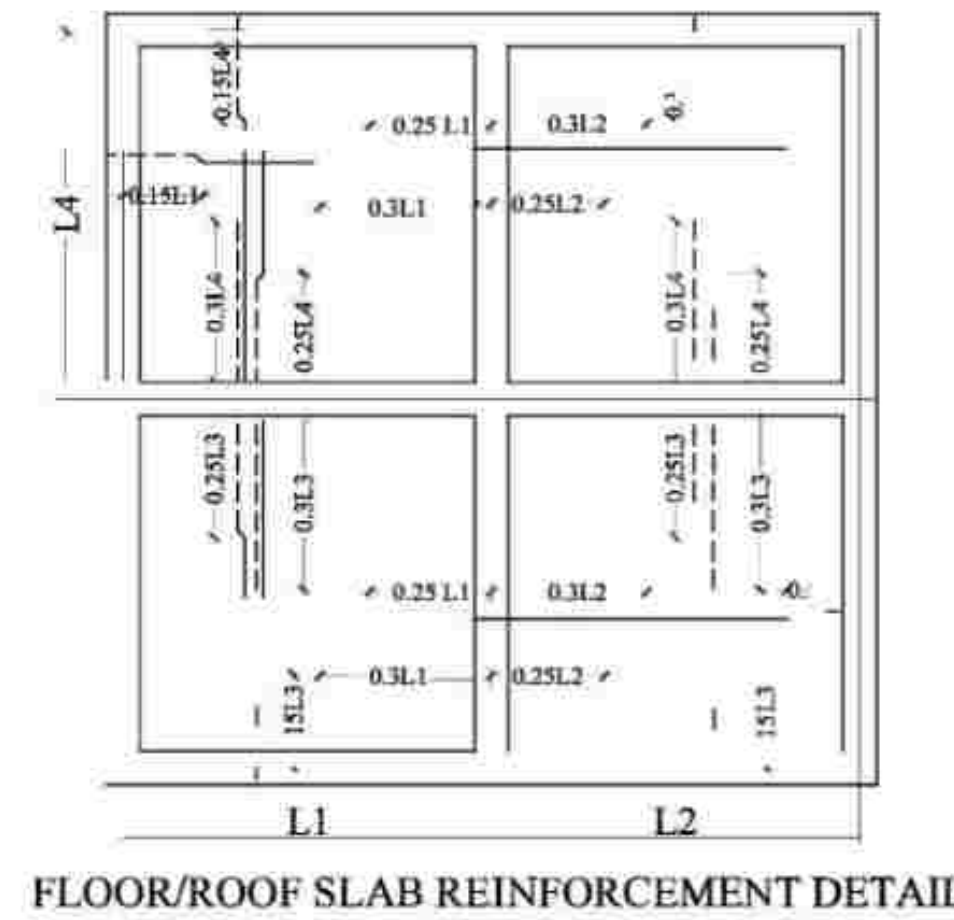
NOTE: ALL DIMENSION ARE IN mm



SECTION OF WATER TANK



FOR TENDER
PURPOSE ONLY



FLOOR/ROOF SLAB REINFORCEMENT DETAIL

SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
01	RS1	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	LIFT MACHINE BASE SLAB
02	LBS1	150	10#	150 C/C	10#	150 C/C	10#	300 C/C	10#	300 C/C	
03	WS1	150	10#	150 C/C	10#	150 C/C	10#	300 C/C	10#	300 C/C	WATER TANK BASE SLAB

SLAB THICKNESS

0.1SL1

0.2SL1

0.2SL2

0.5SL

FLOOR/ROOF BEAM

REINFORCEMENT DETAILS REFER SCHEDULE

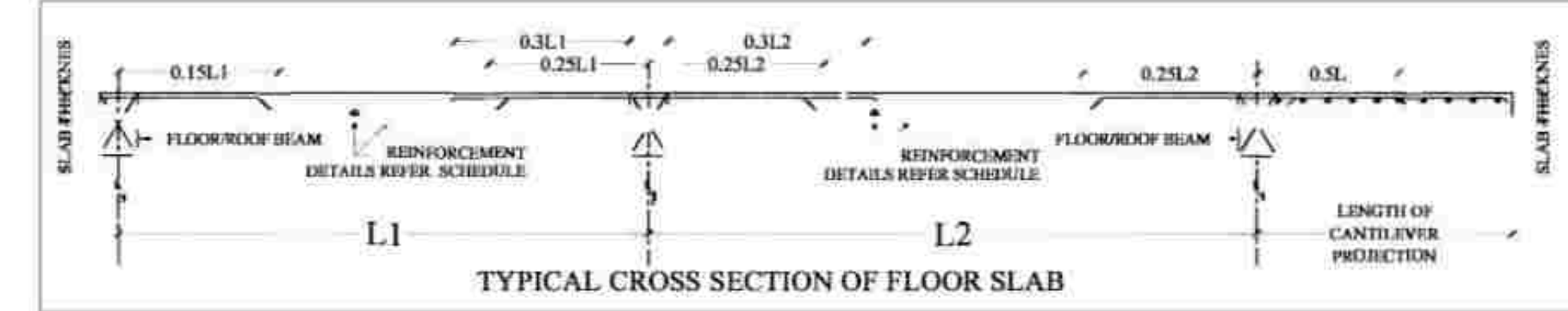
L1

L2

LENGTH OF CANTILEVER PROJECTION

TYPICAL CROSS SECTION OF FLOOR SLAB

SLAB THICKNESS



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BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS
SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION
- THE DEVELOPMENT LENGTH FOR COMPRESSION
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN.

REVNO:	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY

NOTE: **SYMBOL** **DESCRIPTION**

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PROOF-CHECKING AGENCY:

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STRUCTURAL CONSULTANT:

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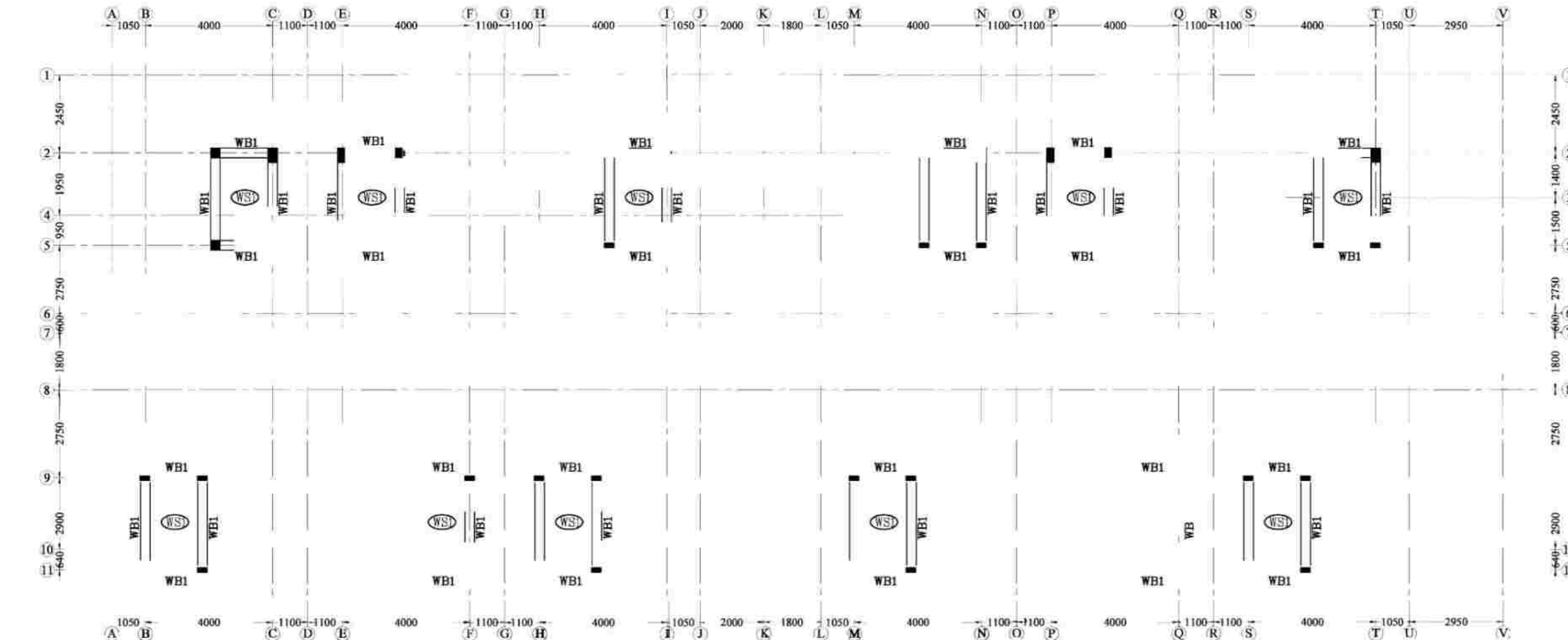
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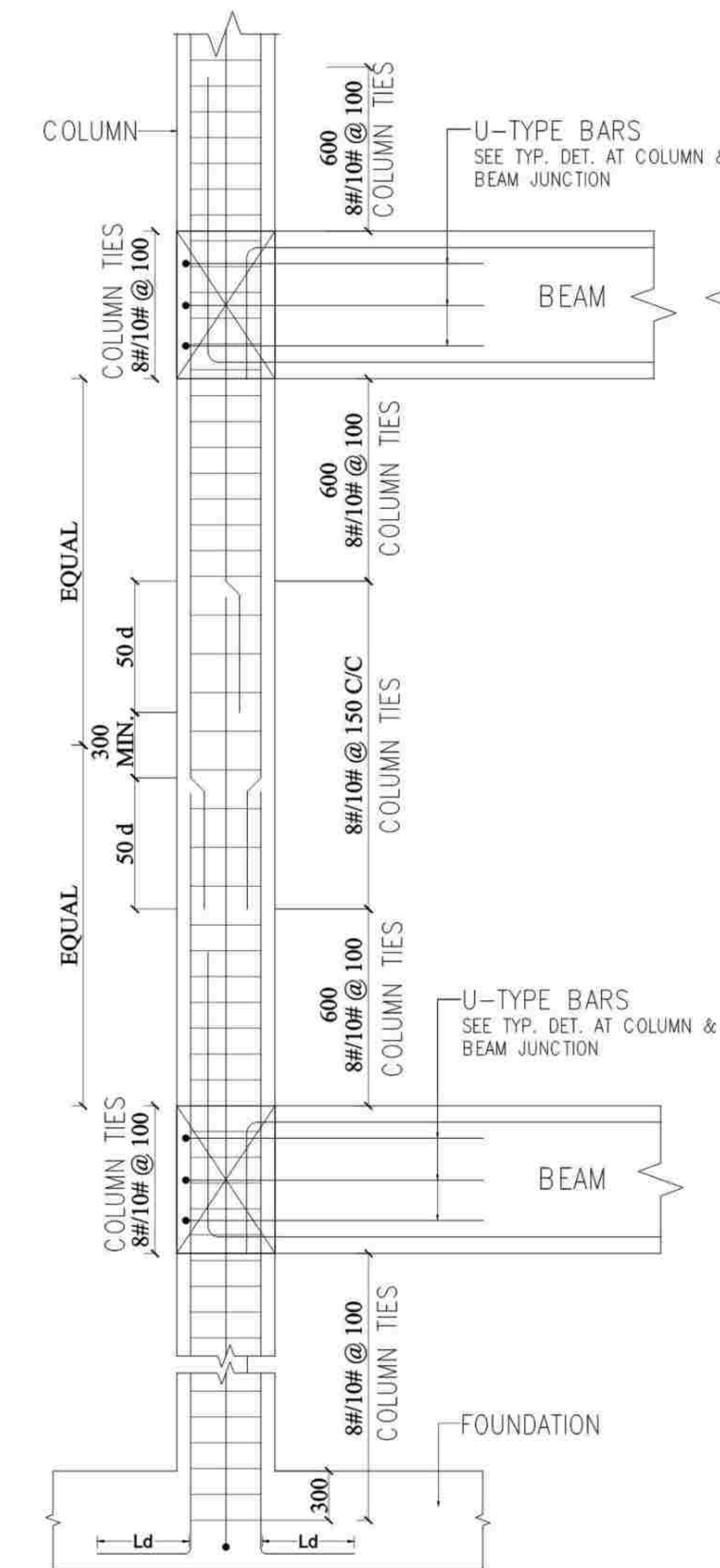
PROJECT TITLE:
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DRAWING NO: TNUHDB/BHN/BLOCK A4	SHEET NO: 007	REV NO: R0
DRAWING TITLE : WATER TANK BASE, LIFT MACHINE BASE, HEAD ROOM ROOF, LIFT MACHINE ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A4.		
BLOCK NO: BLOCK A4	SCALE: NTS	SIZE OF SHEET: A1
ISSUED FOR:		
☒ PRELIMINARY ☐ APPROVAL	☒ TENDER ☐ CONSTRUCTION	☐ INFORMATION ☐ DATE OF ISSUE 08-11-2022
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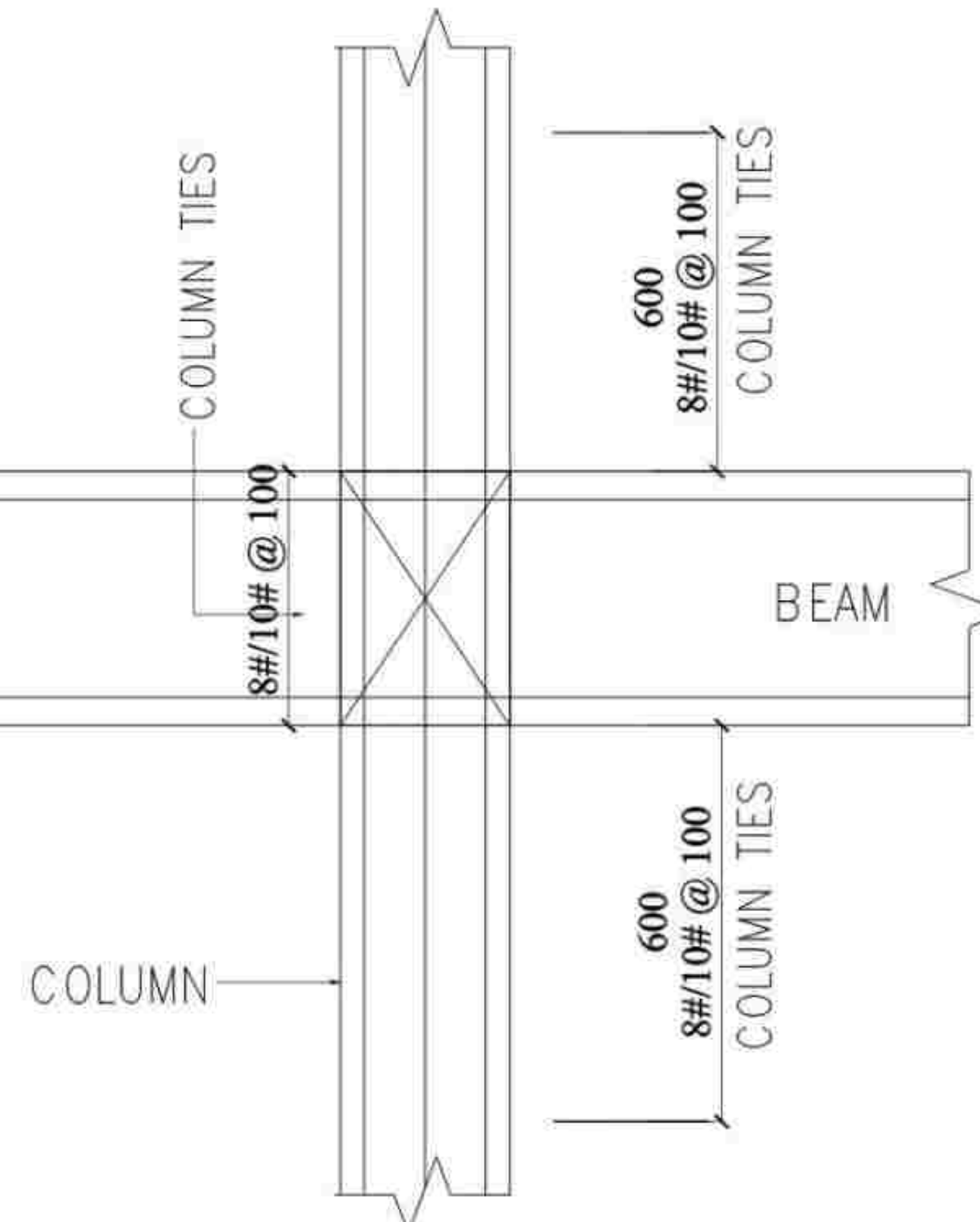
NOTE: ALL DIMENSION ARE IN mm

WATER TANK BASE BEAM LAYOUT AT + 30050MM LVL FOR BLOCK A4

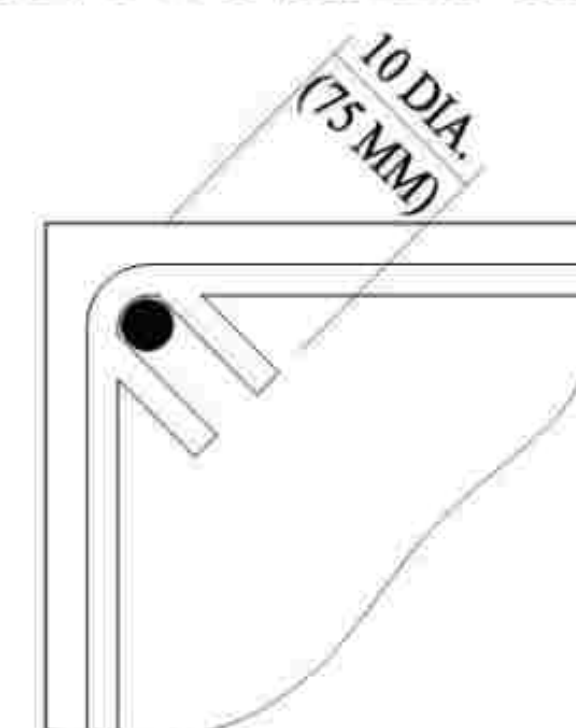




TYP.DET.OF COLUMN
(BEAM ON ONE SIDE OF COLUMN)

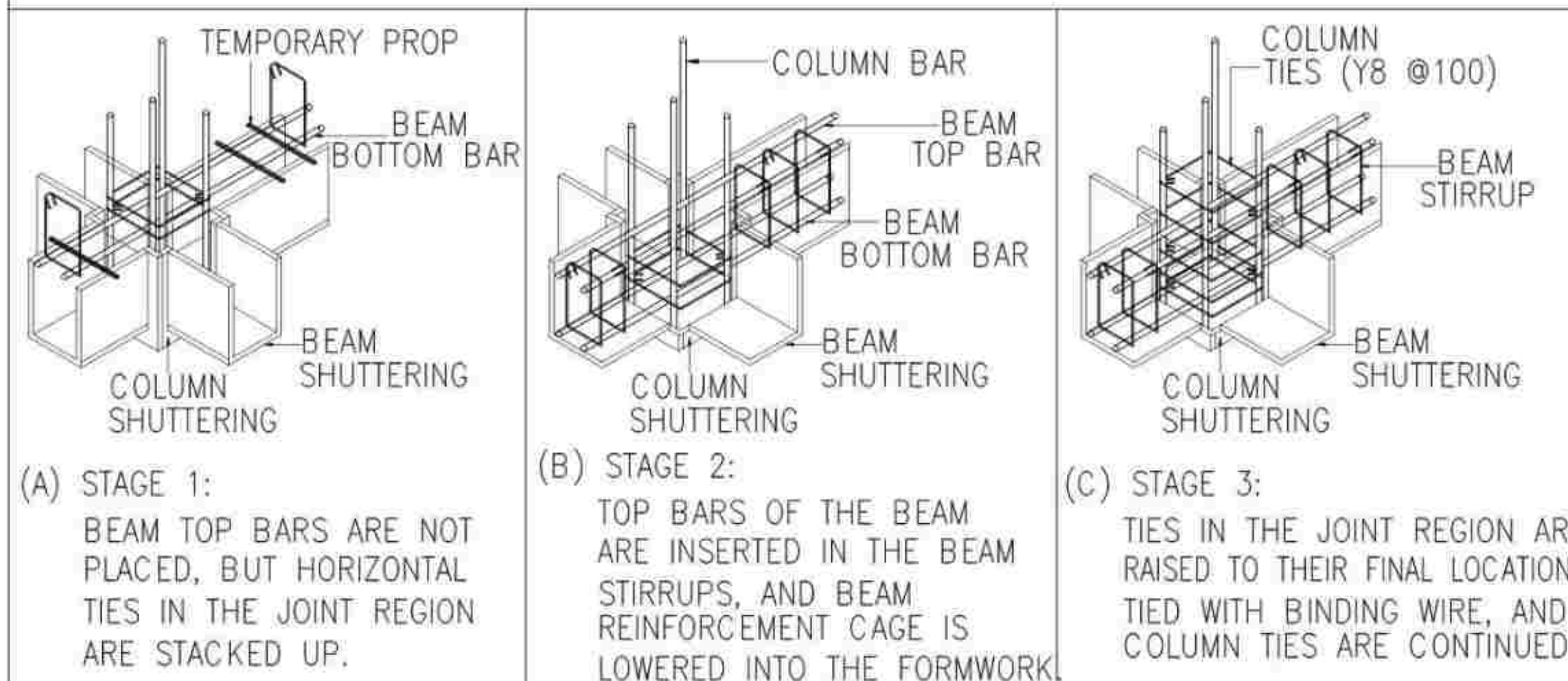


TYP.DET.OF COLUMN & BEAM JUNCTION
(BEAMS ON TWO SIDES OF COLUMN)

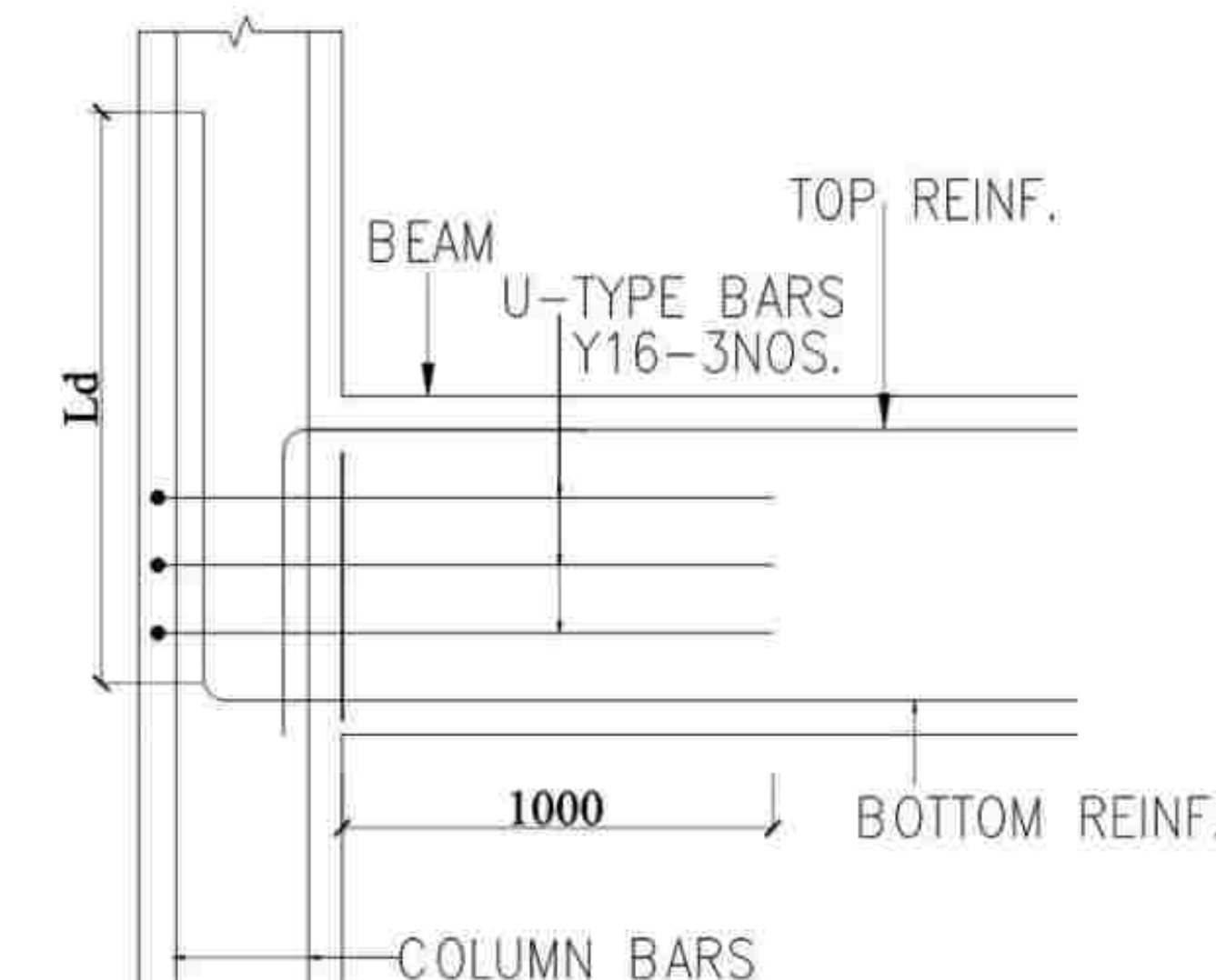


TYP.DET.OF HOOK FOR BEAM STIRRUP

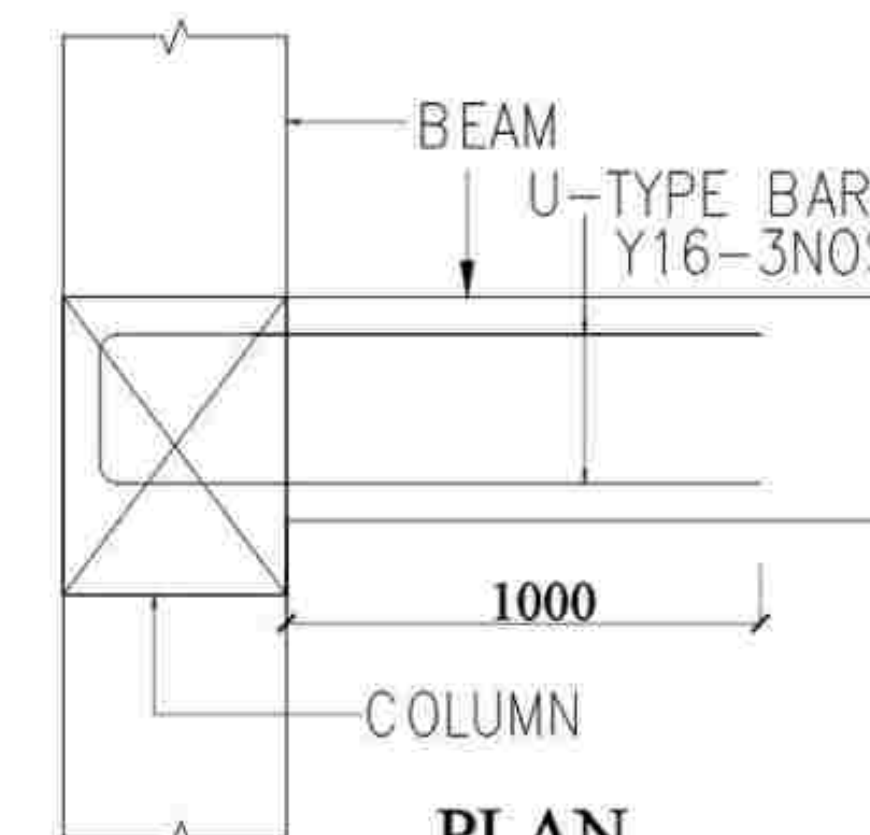
PROCEDURE FOR PLACING COLUMN TIES AT COLUMN BEAM JUNCTION



FOR TENDER PURPOSE ONLY



SECTION
TYP.DET.OF COLUMN & BEAM JUNCTION
(BEAM ON ONE SIDE OF COLUMN)



PLAN
TYP.DET.OF COLUMN & BEAM JUNCTION
(BEAM ON ONE SIDE OF COLUMN)

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Fe-500D
M30 Ld 45d Where d is Diameter of rod
M35 Ld 40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION:
Fe-500D
M30 Ld 36d Where d is Diameter of rod
M35 Ld 32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING.
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN.

REV NO:	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY
1	SYMBOL				
2	DESCRIPTION				

NOTE: NSL NATURAL GROUND LEVEL

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STRUCTURAL CONSULTANT

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THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:

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DRAWING NO:	SHEET NO:	REV NO:
TNUHDB/BHN/BLOCK A4	008	R0

DRAWING TITLE :

TYPICAL DUCTILE DETAILING FOR EARTHQUAKE RESISTANCE

BLOCK NO:	SCALE:	SIZE OF SHEET:
BLOCK A4	NTS	A1

ISSUED FOR:

PRELIMINARY	TENDER	INFORMATION	DATE OF ISSUE
☐	☒	☐	08-11-2022

DESIGNED BY:

DRAWN BY:

CHECKED BY:

APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm

GENERAL

- 1) ALL STRUCTURAL KEY PLANS AND DETAILS ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT ARCHITECTURAL DRAWINGS, SERVICE DRAWINGS, SPECIFICATIONS, BILLS OF QUANTITIES AND ALL OTHER RELEVANT DOCUMENTS. DISCREPANCIES MUST BE REPORTED IMMEDIATELY TO THE ENGINEER-IN-CHARGE.
- 2) ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NEITHER THE BARS SHALL BE COUNTED NOR THE DIMENSIONS SCALED FROM THE DRAWING.

FOUNDATIONS

- 1) FOUNDATIONS ARE DESIGNED FOR THE SBC SPECIFIED IN THE FOUNDATION DRAWING. MIX FOR ALL RCC WORKS SHALL BE AS SPECIFIED IN THE STRUCTURAL DRAWINGS.
- 2) IF ASSUMED SAFE BEARING CAPACITY OF THE SOIL IS NOT FOUND AT THE SPECIFIED FOUNDING LEVEL, THE SAME SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER-IN-CHARGE FOR FURTHER DIRECTIONS.
- 3) FORMATION LEVELS OF FOUNDATIONS SHALL BE DETERMINED BY THE ENGINEER-IN-CHARGE BASED UPON EXISTING ROAD LEVEL, WATER TABLE LEVEL AND REQUIREMENT OF PROVISION OF SERVICES.
- 4) FOUNDATIONS ARE DESIGNED TO BE AT SAME FOUNDING LEVEL. ANY VARIATIONS IN THE GROUND LEVEL BEYOND 600MM AND THE DIFFERENCE IN LEVEL OF TWO ADJACENT FOOTINGS GREATER THAN HALF OF THE CLEAR DISTANCE BETWEEN THEM SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE.
- 5) ANY LOOSE POCKETS OR PROTRUDING BOULDERS SHALL BE REMOVED BEFORE LAYING BED CONCRETE FOR FOUNDATIONS AND SHALL BE LEVELLED BY FILLING WITH PCC.
- 6) THE TOP LEVEL OF THE GRADE BEAMS OF THE EXTERNAL WALL SHALL BE 150MM BELOW GROUND LEVEL AND OTHER BEAMS OF INTERNAL WALLS SHALL BE 40MM BELOW THE PLINTH LEVEL.

CONCRETE

- 1) GRADE OF CONCRETE SHALL BE M30 AND MINIMUM CEMENT CONTENT FOR PILE SHOULD BE 400KG/CUM UNLESS OTHERWISE SPECIFIED.
- 2) ALL OPENINGS FOR PIPING AND CONDUITS ETC., SHALL BE FORMED IN POSITION BEFORE THE CASTING OF CONCRETE.
- 3) NO HOLES OR CHASES ARE PERMITTED IN THE STRUCTURAL CONCRETE MEMBERS OTHER THAN AS DETAILED OR APPROVED BY THE ENGINEER-IN-CHARGE.
- 4) THE CLEAR DEPRESSION OF SLAB FOR BATH, WASHBASIN AND E.W.C SHALL BE 300MM AND FOR L.W.C SHALL BE 500MM. DEPRESSION IN SLAB FOR BALCONY SHALL BE 20MM FROM THE ADJACENT FLOOR LEVELS. NECESSARY PROVISION FOR OUTLETS FROM TRAPS SHALL BE KEPT WHILE CASTING THE BEAMS.
- 5) WHEN THE SPAN IS MORE THAN 6.00M, PROVIDE CAMBER @ SPAN/250 FOR BEAMS AND SLABS.
- 6) THE FREE END OF CANTILEVER SLABS OR BEAMS SHALL BE RAISED BY 2% OF THE SPAN. TORSIONAL REINFORCEMENT AT DISCONTINUOUS EDGES OF TWO WAY REINFORCED SLABS SHALL BE AS PER IS 456-2000.
- 7) ALL CONCRETE IS TO BE CURED BY AN APPROVED METHOD- WATER PONDING, POLYTHENE/HESSIAN SHEET, CURING COMPOUND.

REINFORCEMENT

- 1) ALL STEEL REINFORCEMENT SHALL BE OF TMT BARS CONFORMING TO IS 1786 WITH MINIMUM YIELD STRESS / 0.2% PROOF STRESS OF 500 N/50MM.
- 2) GRADE FE 5000 FOR ALL STRUCTURES DESIGNED FOR SEISMIC RESISTANCE UNDER ZONE-III OF IS 1893-2016.
- 3) ALL REBARS SHALL BE CUT AND BENT CONFORMING TO THE LATEST EDITION OF IS 1786. MECHANICAL COUPLERS CONFORMING TO IS 18172 SHALL BE USED WHEN LONGITUDINAL STEEL BARS HAVE TO BE CONTINUED FOR BEAM SPANS LARGER THAN THEIR MANUFACTURED LENGTH.
- 4) WELDING OF REBARS WILL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER-IN-CHARGE. WELDING OF LINKS, TIES, INSERTS OR OTHER SIMILAR ELEMENTS TO VERTICAL REINFORCEMENT BARS REQUIRED AS PER DESIGN IS NOT PERMITTED, IN ANY SEISMIC ZONE.
- 5) ALL REBARS ARE TO BE FIRMLY SUPPORTED ON APPROVED CHAIRS OR CONCRETE BLOCKS PLACED AT NOT GREATER THAN 750MM CENTRES BOTH WAYS.
- 6) NOT MORE THAN 50% OF AREA OF STEEL BARS ON EITHER TOP OR BOTTOM FACE SHALL BE SPLICED AT ANY ONE SECTION. LAPPING OF REBARS SHALL AS FAR AS POSSIBLE BE AWAY FROM THE SECTIONS OF MAXIMUM STRESS AND BE STAGGERED. LAP SPLICES SHALL BE CONSIDERED AS STAGGERED, IF THE CENTRE TO CENTRE DISTANCE OF THE SPLICES IS NOT LESS THAN 1.3 TIMES THE LAP LENGTH.
- 7) LAP / MECHANICAL COUPLERS / WELDED SPLICES SHOULD NOT BE PROVIDED
- A) WITHIN A JOINT
- B) WITHIN A DISTANCE OF 2D FROM THE RC WALL, WHERE 'D' IS THE EFFECTIVE DEPTH OF THE MEMBER.
- C) WITHIN A DISTANCE 1/4 LENGTH OF MEMBER FROM THE RC WALL.
- 8) LAP LENGTH INCLUDING ANCHORAGE VALUE OF HOOKS FOR BARS IN FLEXURAL TENSION SHALL BE LD OR 30DA, WHICHEVER IS GREATER. THE STRAIGHT LENGTH OF THE LAP SHALL NOT BE LESS THAN 150A OR 200MM. WHEN BARS OF TWO DIFFERENT DIAMETERS ARE TO BE SPLICED, THE LAP LENGTH SHALL BE CALCULATED ON THE BASIS OF DIAMETER OF THE SMALLER BAR.
- 9) THE HORIZONTAL DISTANCE BETWEEN TWO PARALLEL MAIN REINFORCING BARS SHALL BE NOT LESS THAN THE DIAMETER OF THE LARGER BAR USED OR 5MM MORE THAN THE NOMINAL MAXIMUM SIZE OF COARSE AGGREGATE USED, WHICHEVER IS GREATER.

- 10) WHENEVER REINFORCEMENT IS PROVIDED IN TWO LAYERS IN BEAMS, SPACER BAR SHALL BE PROVIDED TO MAINTAIN 25MM GAP OR MAXIMUM DIA OF THE MAIN BAR WHICHEVER IS MORE BETWEEN TWO LAYERS.
- 11) IN CASE OF CANTILEVER BEAMS / SLABS THE TOP REINFORCEMENT SHALL BE TAKEN BEYOND THE INNER FACE OF THE SUPPORTS TO ATLEAST THE SPAN OF THE CANTILEVER WHEREVER POSSIBLE. IN CASE IT IS NOT POSSIBLE TO ADOPT THE ABOVE SAID PRACTICE, THE REINFORCEMENT SHALL BE PROPERLY ANCHORED INTO THE SUPPORTING MEMBER.
- 12) LAP / DEVELOPMENT LENGTH FOR MAIN REINFORCEMENT BARS (IN TENSION / COMPRESSION) FOR DIFFERENT GRADES OF CONCRETE MIX SHALL BE AS FOLLOWS:
- CONCRETE MIX Fe 5000 (FOR ZONE-III STRUCTURES)
- | M30 | 45d (TENSION) & 36d (COMP) |
|-----|----------------------------|
| M30 | 45d (TENSION) & 36d (COMP) |
- WHERE d IS THE DIAMETER OF THE BAR.

- 13) WHERE OPENINGS ARE SMALL AND THE SLAB IS NOT SUBJECTED TO ANY SPECIAL TYPE LOADING OR VIBRATION CONDITIONS, THE FOLLOWING GENERAL DETAILING RULES MAY BE FOLLOWED AROUND OPENINGS.
- A) DIAMETER OF TRIMMER BARS SHALL BE SIMILAR TO BIGGER REINFORCING BARS OF THE STRUCTURE THROUGH WHICH THE OPENING IS FORMED.
- B) NO TRIMMER BARS ARE REQUIRED FOR OPENINGS LESS THAN 200MM WIDE. NO REINFORCING BARS SHALL BE CUT BUT THESE SHALL BE ADJUSTED IN POSITION TO AVOID OPENINGS.
- C) TRIMMER BARS SHALL BE NOT LESS THAN THE NOS. OF BARS CUT BY OPENING.
- D) MINIMUM 2 NOS. EACH AT TOP AND BOTTOM AND BAR DIAMETER AS SPECIFIED ABOVE BUT NOT LESS THAN 10φ.
- E) BOTH PERPENDICULAR AND DIAGONAL TRIMMING BARS SHALL BE PROVIDED AS SHOWN IN SKETCHES.
- 14) WHENEVER THE REINFORCEMENT IS PROJECTED FROM THE STRUCTURAL MEMBERS AS A PROVISION MADE TOWARDS FUTURE EXTENSION OF THE BUILDING THE SAME SHALL BE APPROPRIATELY PROTECTED FROM CORROSION BY TREATING WITH EPOXY AFTER COMPLETELY REMOVING SCALES OR RUST, IF ANY. THIS REINFORCEMENT MAY BE ENCASED IN A CONCRETE MIX OF 1:3:6 OR LEFT EXPOSED OR PROTECTED IN ANY OTHER MANNER AS DIRECTED BY ENGINEER-IN-CHARGE.
- 15) THE NOMINAL COVER GIVEN BELOW FOR MODERATE EXPOSURE CONDITION SHALL BE MEASURED FROM THE OUTER FACE OF THE STRUCTURAL ELEMENT TO THE STIRRUPS / LINKS.
- | RAFTS | PILES | STRIP BEAM | FOOTINGS | COLUMNS | |
|-------|-------|------------|----------|------------|-------|
| -60MM | -50MM | -75MM | -60MM | -40MM | |
| BEAMS | -25MM | SLABS | -25MM | TANK WALLS | -40MM |
| | | | | TANK BASES | -50MM |

WATER AND DRAINAGE LINES WITHIN STRUCTURAL ELEMENTS:

- 1) THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DETAILS OF EXIT AND ENTRY OF PIPES THROUGH STRUCTURAL ELEMENTS.
- 2) THESE POINTS ARE TO HAVE ADDITIONAL FUSION BONDED EPOXY COATED REINFORCEMENT PLACED AROUND THE PIPE.

RC WALLS FOR BASEMENTS:

- 1) IF THE LEVEL OF THE WATER TABLE OR ANY SEEPAGE IS FOUND TO BE WITHIN THE DEPTH OF EXCAVATION, THE SAME SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE.
- 2) 100MM THICK BLINDING CONCRETE OF GRADE M15 IS TO BE PLACED BELOW THE WATER TANKS BASE SLAB.
- 3) WATER BARS ARE TO BE INCORPORATED IN ALL VERTICAL AND HORIZONTAL JOINTS.
- 4) ALL WALL KICKERS SHALL BE CAST MONOLITHICALLY WITH THE BASE SLAB.

CONSTRUCTION JOINTS:

- 1) THESE ARE TO BE PROVIDED AT LOCATIONS OF ZERO OR MINIMUM SHEAR IN BEAMS AND SLABS AND AT LOCATIONS OF MINIMUM STEEL CONGESTION.
- 2) THESE ARE TO BE PERPENDICULAR TO THE COMPRESSIVE FORCES ACROSS THE JOINT. IN MOST CASES THE JOINTS WILL HAVE TO BE PERPENDICULAR TO THE AXIS OF THE MEMBER.
- 3) ALL REINFORCING BARS INTERSECTED BY THE CONSTRUCTION JOINTS ARE TO EXTEND THROUGH THE JOINTS WITHOUT INTERCEPTION.
- 4) VERTICAL JOINTS SHALL BE FORMED WITH TIMBER FORMWORK COATED WITH AN APPROVED SURFACE RETARDER AND THE VERTICAL FACE IS TO BE WASHED TO EXPOSE THE AGGREGATE BEFORE FINAL SET OF THE CONCRETE HAS TAKEN PLACE.
- 5) HORIZONTAL JOINTS SHALL BE SCRABBLED TO REMOVE ALL LATANCE AND WEAK CONCRETE BEFORE CONCRETE FOR THE NEXT LIFT IS PLACED. NECESSARY KEYS SHALL BE PROVIDED IN THE APPROVED METHODOLOGY AS REQUIRED BY THE ENGINEER-IN-CHARGE.
- 6) WATERJET CLEANING AND FLUSHING THE JOINT WITH MORTAR OR GROUT ARE TO PRECEDE THE POURING OF FRESH CONCRETE.

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5. GRADE OF STEEL SHALL BE Fe-5000 CONFORMING TO LATEST INDIAN STANDARDS
6. ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
7. THE NOMINAL COVER COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS
- | PILE / FOOTING = 50MM | BEAMS = 25MM TO LINKS |
|--------------------------|-----------------------|
| RC WALLS = 25MM TO LINKS | SLABS = 25MM |

8. THE DEVELOPMENT LENGTH FOR TENSION

M30	Ld	45d	Where d is
M30	Ld	40d	Diameter of rod

9. THE DEVELOPMENT LENGTH FOR COMPRESSION

		Fe-500D	
M30	Ld	36d	Where d is Diameter of rod
M35	Ld	32d	

10. STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING.
11. SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN.

REVNO:	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY
	SYMBOL				
	DESCRIPTION				
NOTE	XXXXXXXXXX	NGL			
		NATURAL GROUND LEVEL			

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IIT Madras Research Park, Chennai - 600113
Chartered Engineer (E-117029-1)

PRINCIPAL DEVELOPER:

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TAMIL NADU URBAN HABITAT
DEVELOPMENT BOARD (TNUHDB)
NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS &
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MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:

PLAN SHOWING THE PROPOSED RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI

DRAWING NO: TNUHDB/BHN/BLOCK A4 SHEET NO: 009 REV NO: R0

DRAWING TITLE

BLOCK NO BLOCK A4 SCALE: NTS SIZE OF SHEET: A1

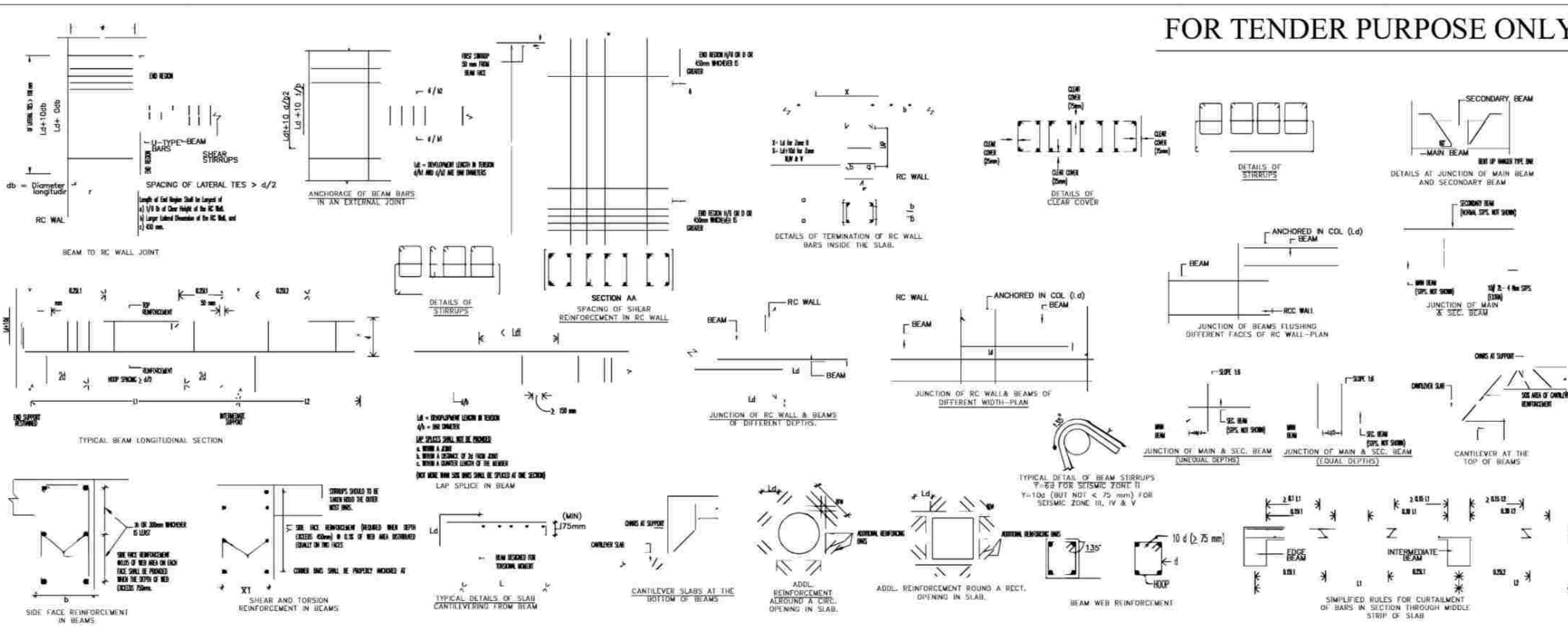
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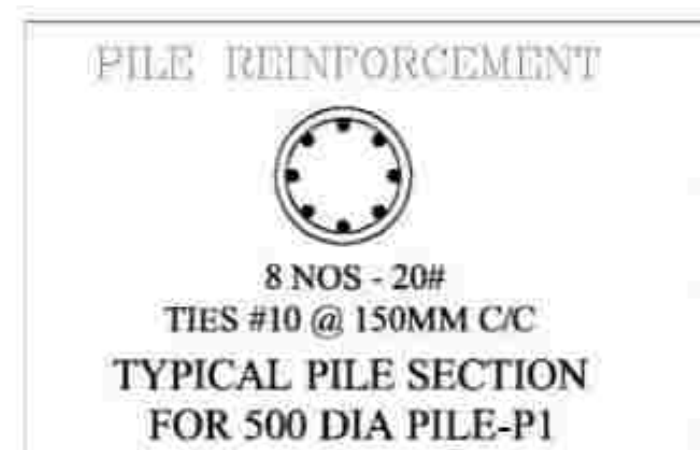
☒ PRELIMINARY ☒ TENDER ☐ INFORMATION ☐ CONSTRUCTION DATE OF ISSUE 08-11-2022

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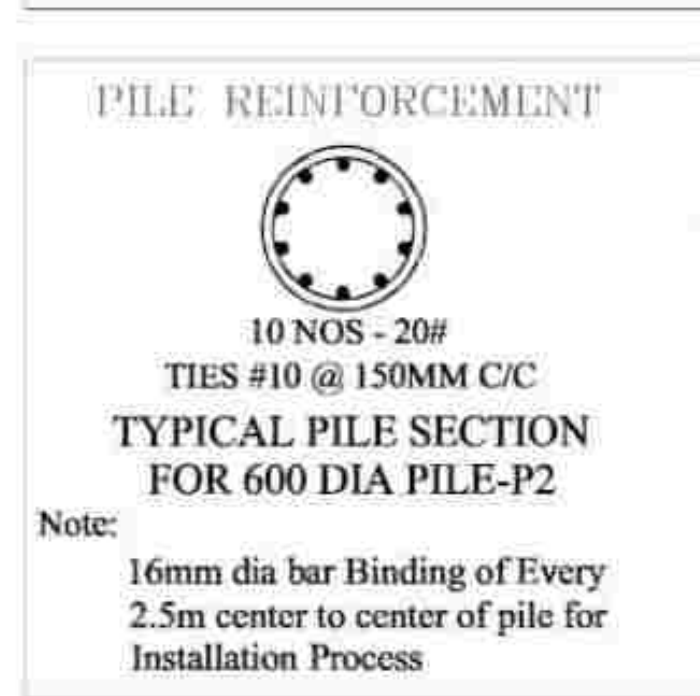
CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm

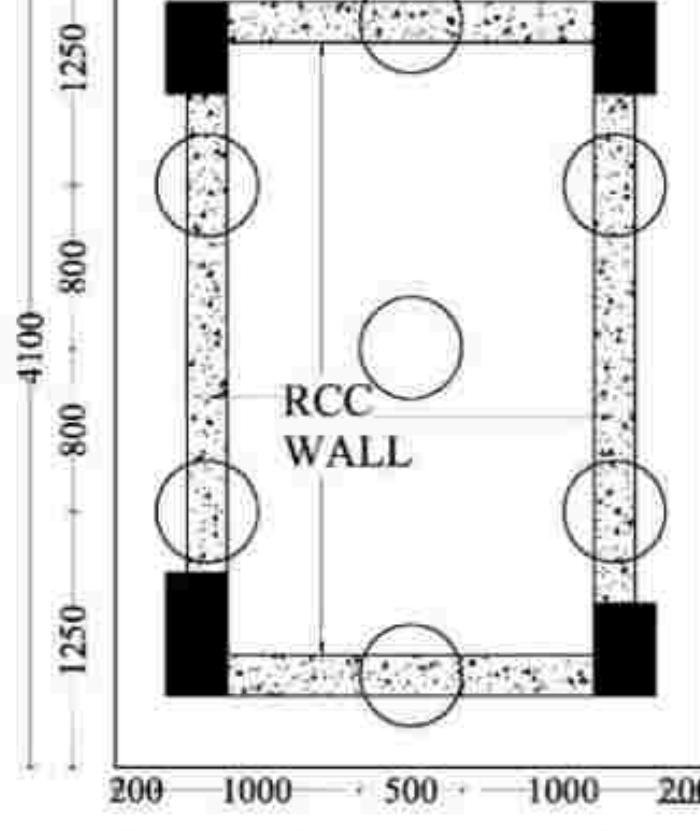




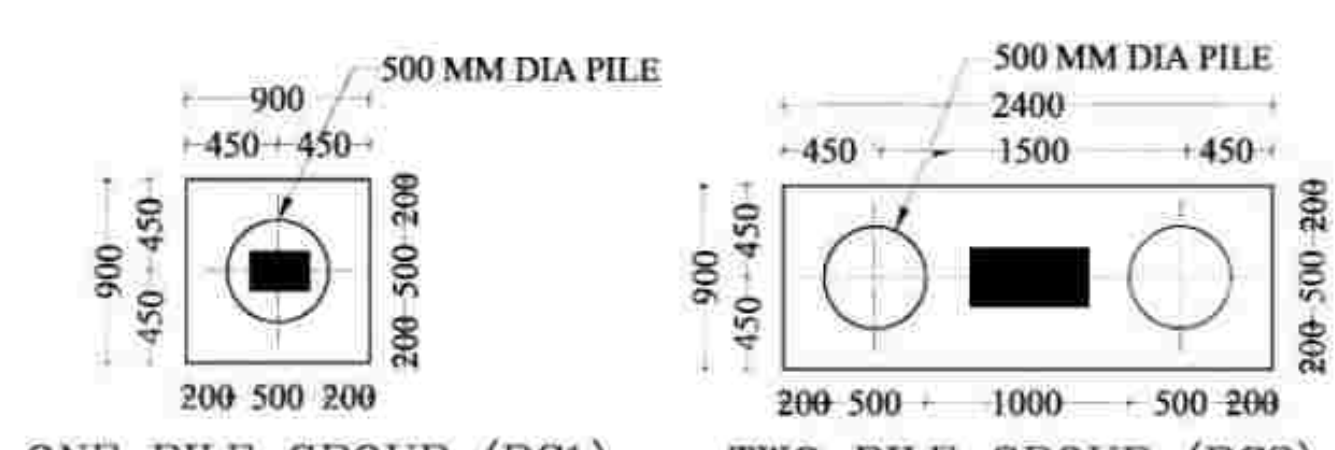
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TIES #10 @ 150MM C/C
TYPICAL PILE SECTION
FOR 500 DIA PILE-P1



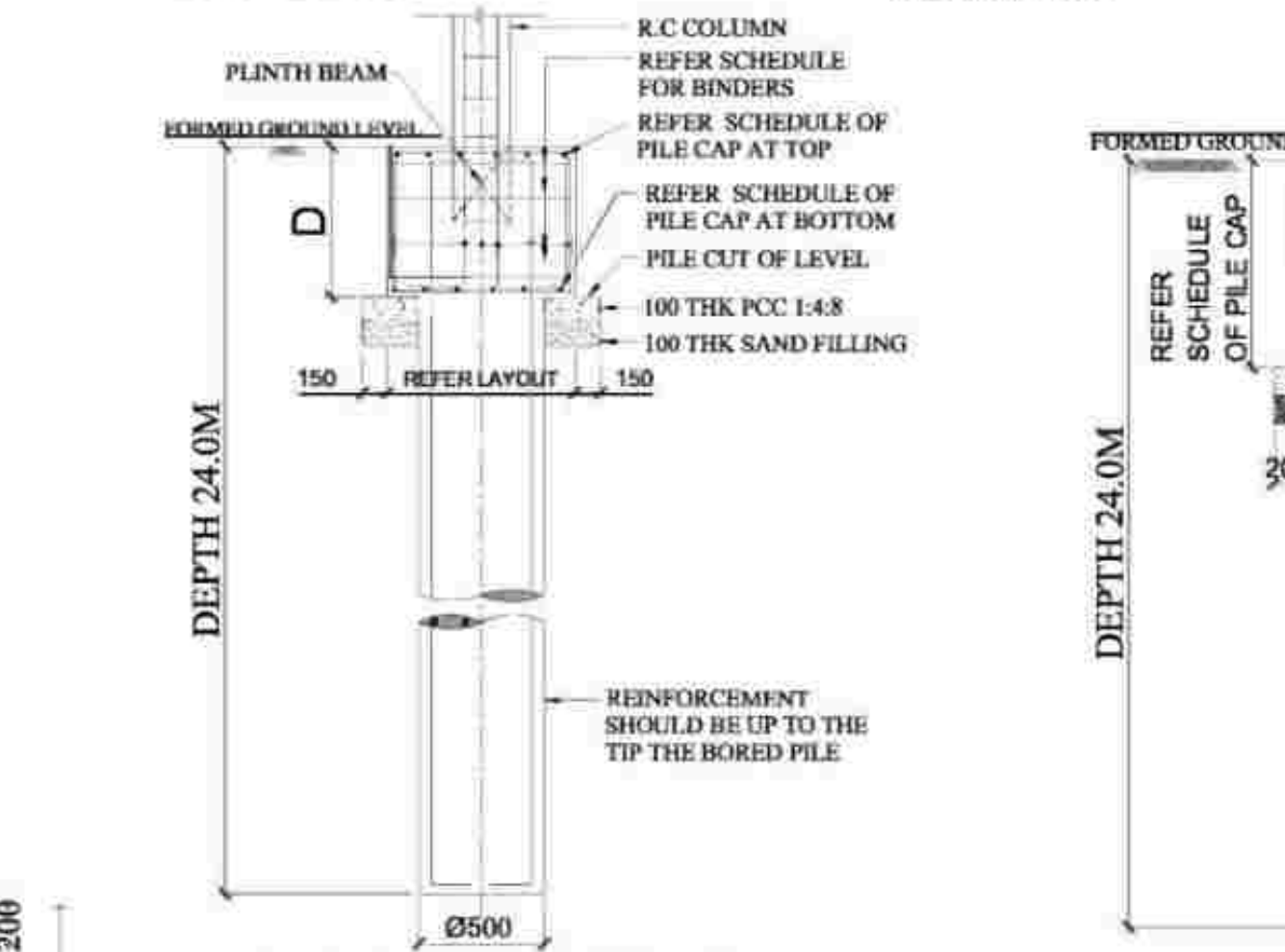
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FOR 600 DIA PILE-P2



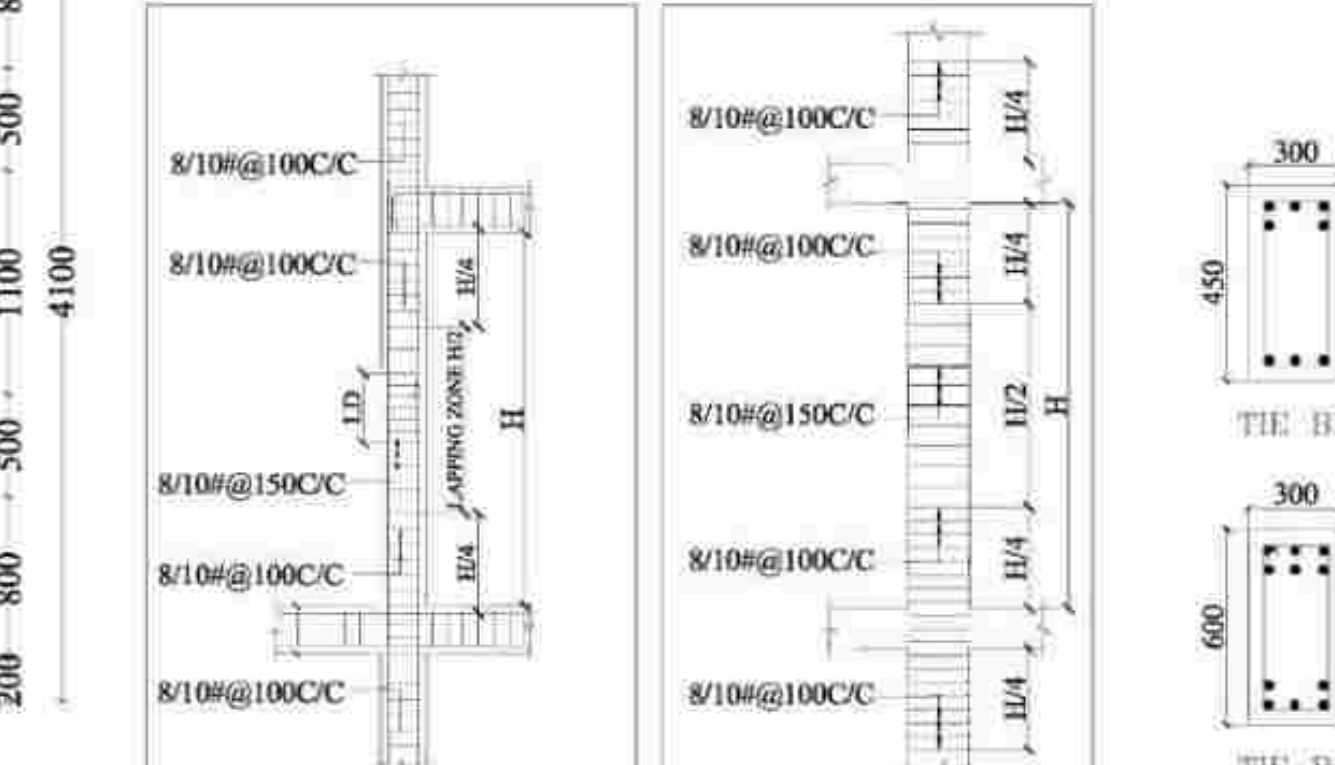
SEVEN PILE GROUP (PC4)
SCALE 1:3



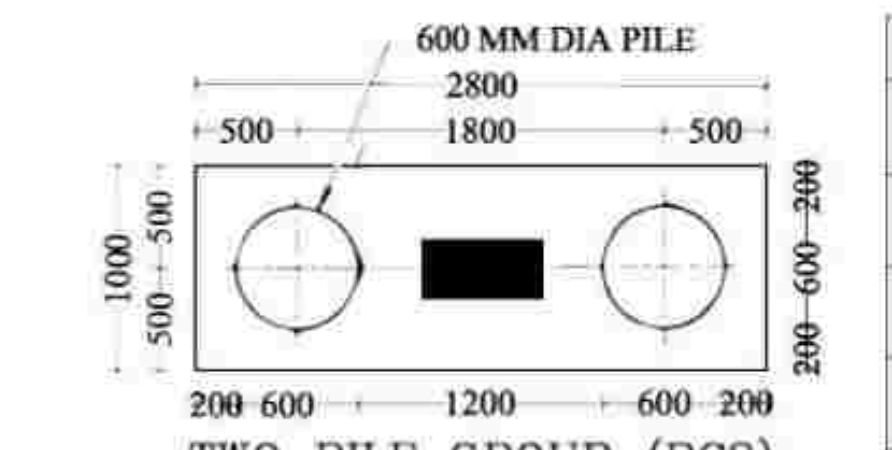
ONE PILE GROUP (PC1)
SCALE 1:3



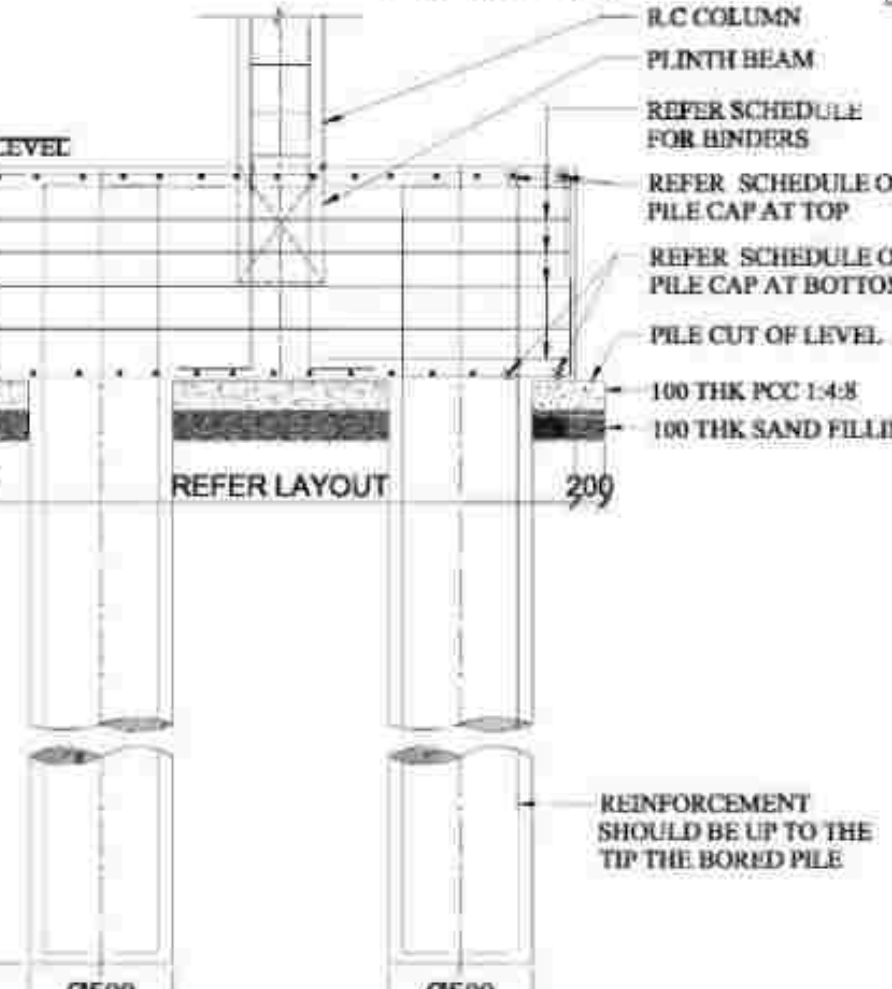
TWO PILE GROUP (PC2)
SCALE 1:3



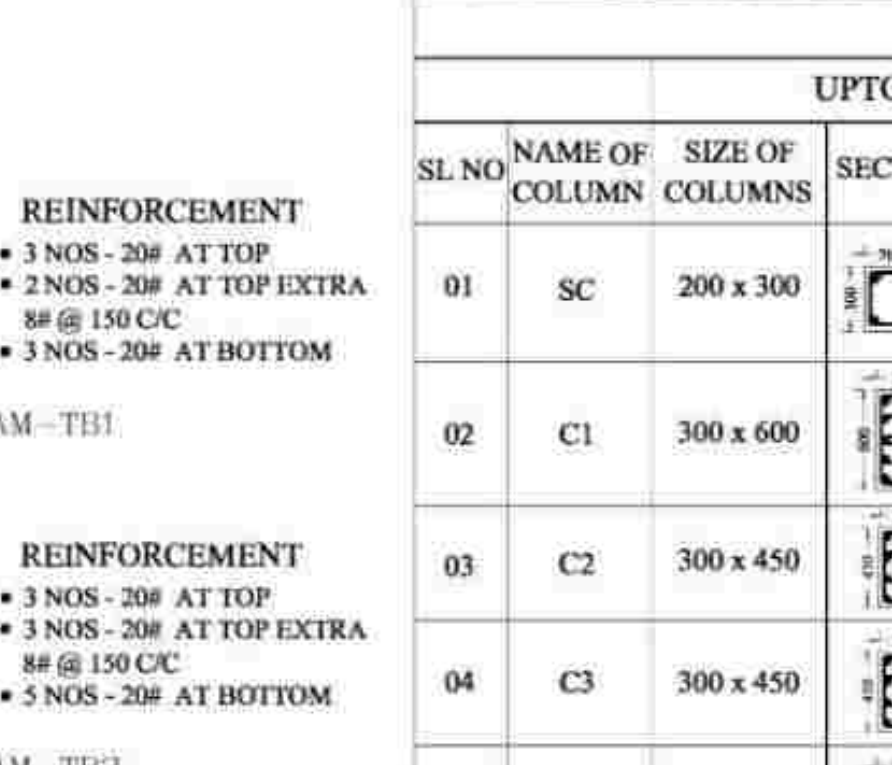
TWO PILE GROUP (PC3)
SCALE 1:3



TYPICAL SECTION FOR SINGLE PILE
WITH PILE CAP PC1

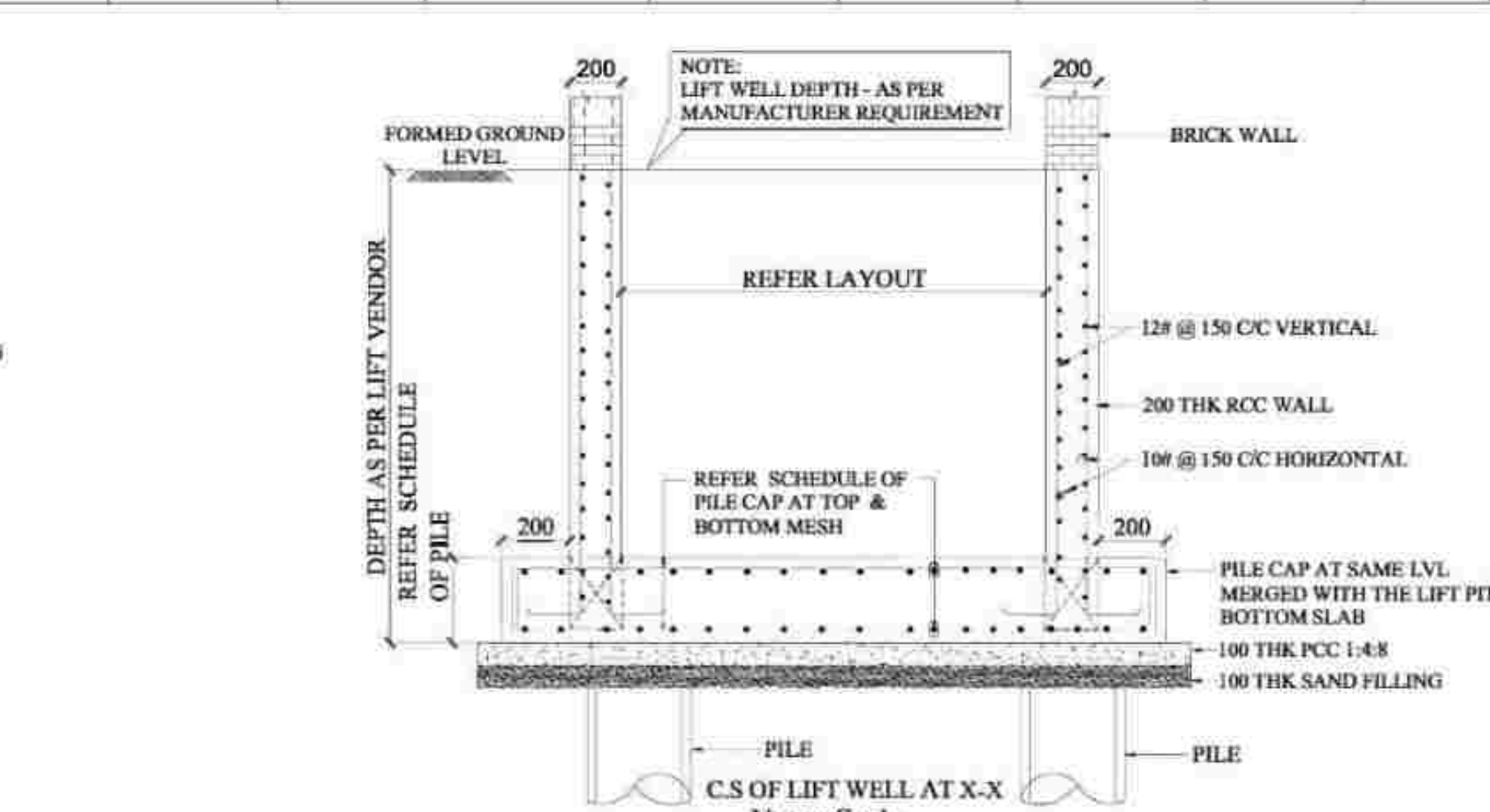


TYPICAL SECTION FOR TWO PILE WITH PILE CAP (PC2)



REINFORCEMENT

SCHEDULE OF PILE CAP							
NAME PILE CAP	PILE CAP SIZE	PILE CAP THICKNESS	BOTTOM R/F	TOP R/F	BINDER	PILE DIA	REMARKS
PC1	900 X 900	600	16# @ 150 C/C	16# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	ONE PILE
PC2	900 X 2400	750	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	TWO PILE
PC3	1000 X 2800	750	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	600 DIA PILE	TWO PILE
PC4	2900 X 4100	900	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	SEVEN PILE

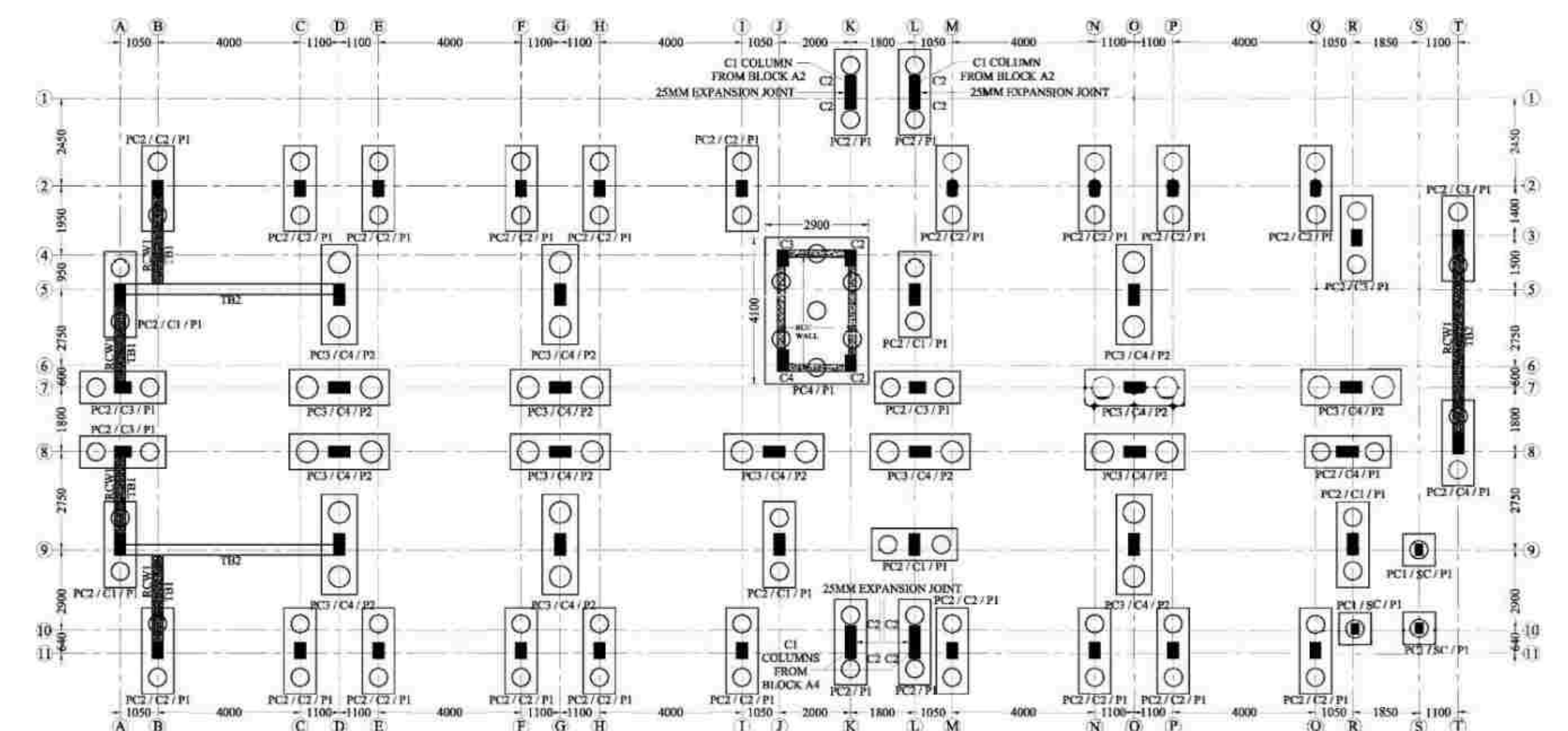


LIFT WELL

SCHEDULE OF RCC COLUMNS									
UPTO STILT FLOOR ROOF					STILT FLOOR ROOF TO TERRACE				
SL NO	NAME OF COLUMN	SIZE OF COLUMNS	SECTION	SHAPE OF TIES	REINFORCEMENT	SIZE OF COLUMNS	SECTION	SHAPE OF TIES	REINFORCEMENT
01	SC	200 x 300			4 NOS-16#	---	---	---	---
02	C1	300 x 600			10 NOS-25#	250 x 600			10 NOS-25#
03	C2	300 x 450			8 NOS-20#	---	---	---	---
04	C3	300 x 450			8 NOS-25#	---	---	---	---
05	C4	300 x 600			12 NOS-25#	---	---	---	---

SCHEDULE OF RCC WALL				
S NO	NAME OF WALL	SIZE Lx X Lz	WALL THICKNESS	REINFORCEMENT
01	RCW1	REFER PLAN	200	VERTICAL DIRECTION 10# @ 150 C/C (INNER) 10# @ 150 C/C (OUTER) HORIZONTAL DIRECTION 8# @ 150 C/C (INNER) 8# @ 150 C/C (OUTER)

FOR TENDER PURPOSE ONLY



PILE FOUNDATION LAYOUT FOR BLOCK A3

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PILE / FOOTING = 50MM BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION
Fe-5000
M30 Ld 45d Where d is Diameter of rod
M35 Ld 40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION
Fe-5000
M30 Ld 36d Where d is Diameter of rod
M35 Ld 32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO	DETAILS	DATE	DRAWN	CHECKED	APPROVED

NOTE: NGL NATURAL GROUND LEVEL

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been prepared by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

PRINCIPAL DEVELOPER:

Dr. P. Nallathambi
ME, Ph.D (Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai - 600113
Chartered Engineer (F-117029-1)

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

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MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A3	SHEET NO: 001	REV NO: R0
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DRAWING TITLE :
PILE FOUNDATION LAYOUT & SECTION DETAILS FOR BLOCK A3

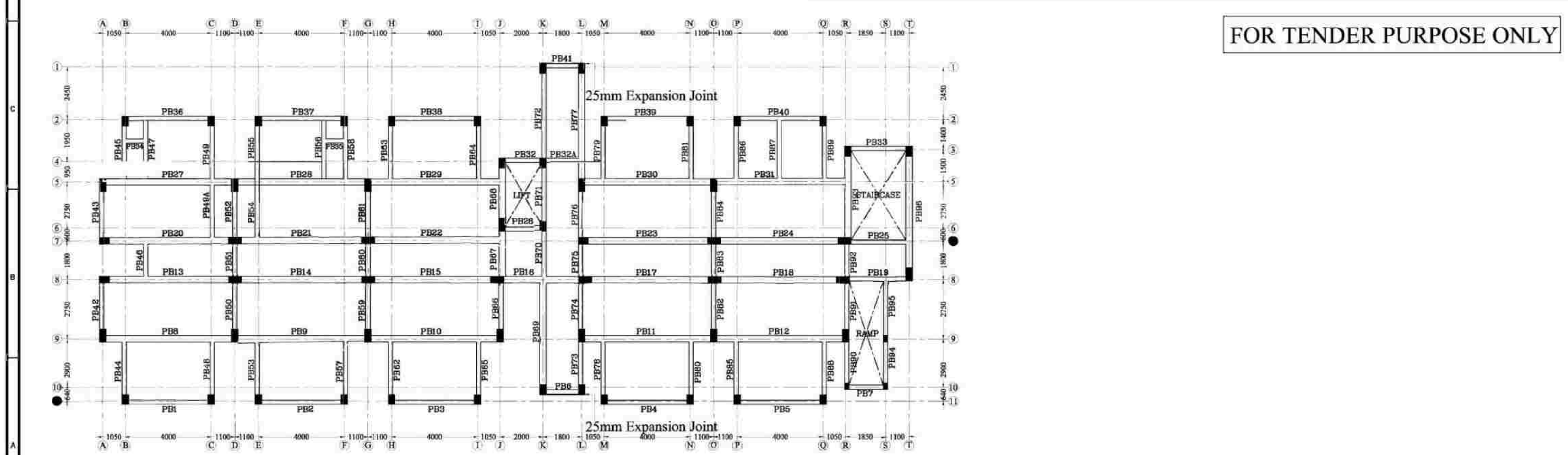
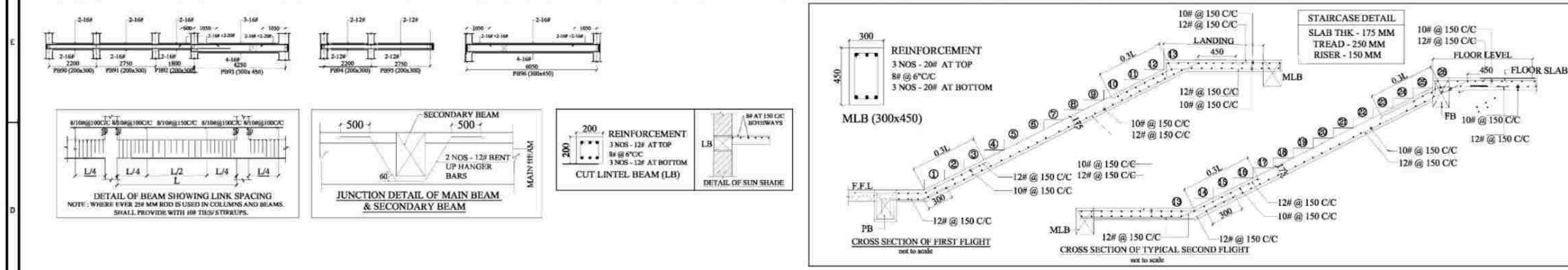
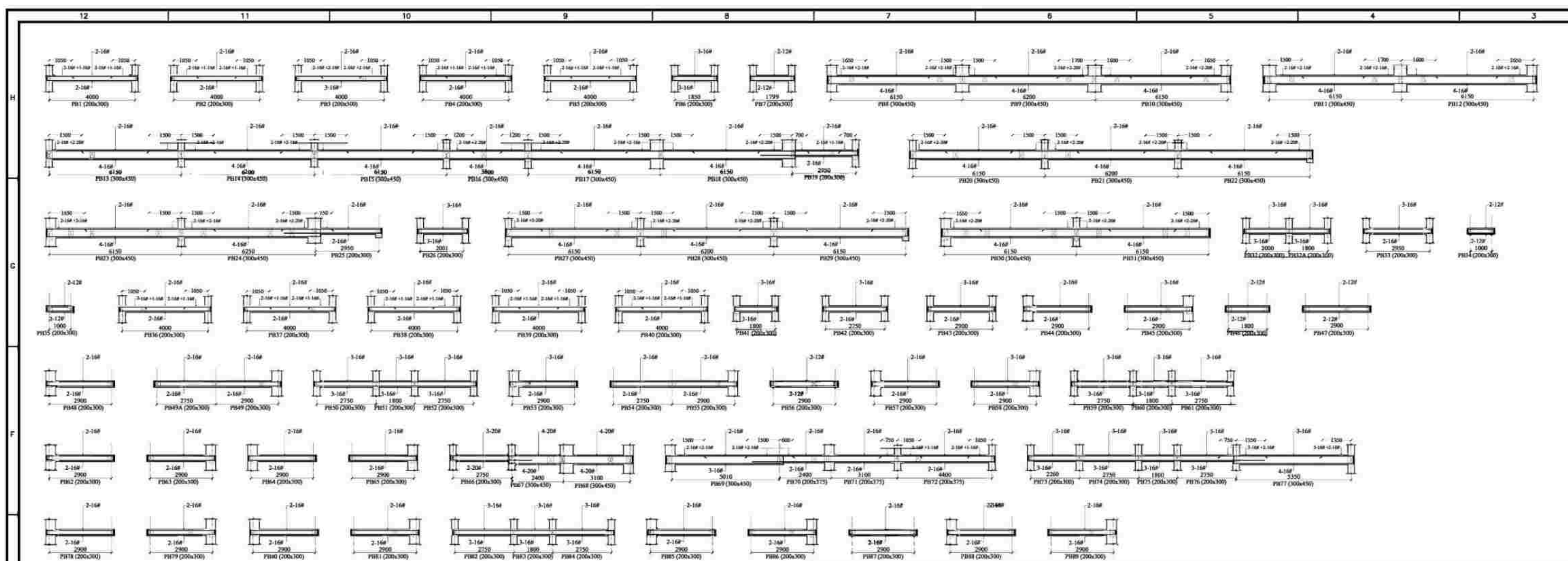
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☒ PRELIMINARY	☒ TENDER	☐ INFORMATION	DATE OF ISSUE
☐ APPROVAL	☐ CONSTRUCTION		08-11-2022

DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm



PLINTH BEAM LAYOUT AT + 0.00 M LVL FOR BLOCK A3

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RC WALLS = 25MM TO LINKS SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION

	Fe-500D
M30	Ld
M35	Ld

Where d is Diameter of rod
- THE DEVELOPMENT LENGTH FOR COMPRESSION

	Fe-500D
M30	Ld
M35	Ld

Where d is Diameter of rod
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO:	DETAILS	DATE	DRAWN	CHECKED	APPROVED

NOTE: NGL NATURAL GROUND LEVEL

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

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PRINCIPAL DEVELOPER:

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IIT Madras Research Park, Chennai - 600113
Chartered Engineer (F-117029-1)

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
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STRUCTURAL CONSULTANT:

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DRAWING NO:	SHEET NO:	REV NO:
TNUHDB/BHN/BLOCK A3	002	R0

DRAWING TITLE :
PLINTH BEAM LAYOUT & SECTION DETAILS FOR BLOCK A3

BLOCK NO:	SCALE:	SIZE OF SHEET:
BLOCK A3	NTS	A1

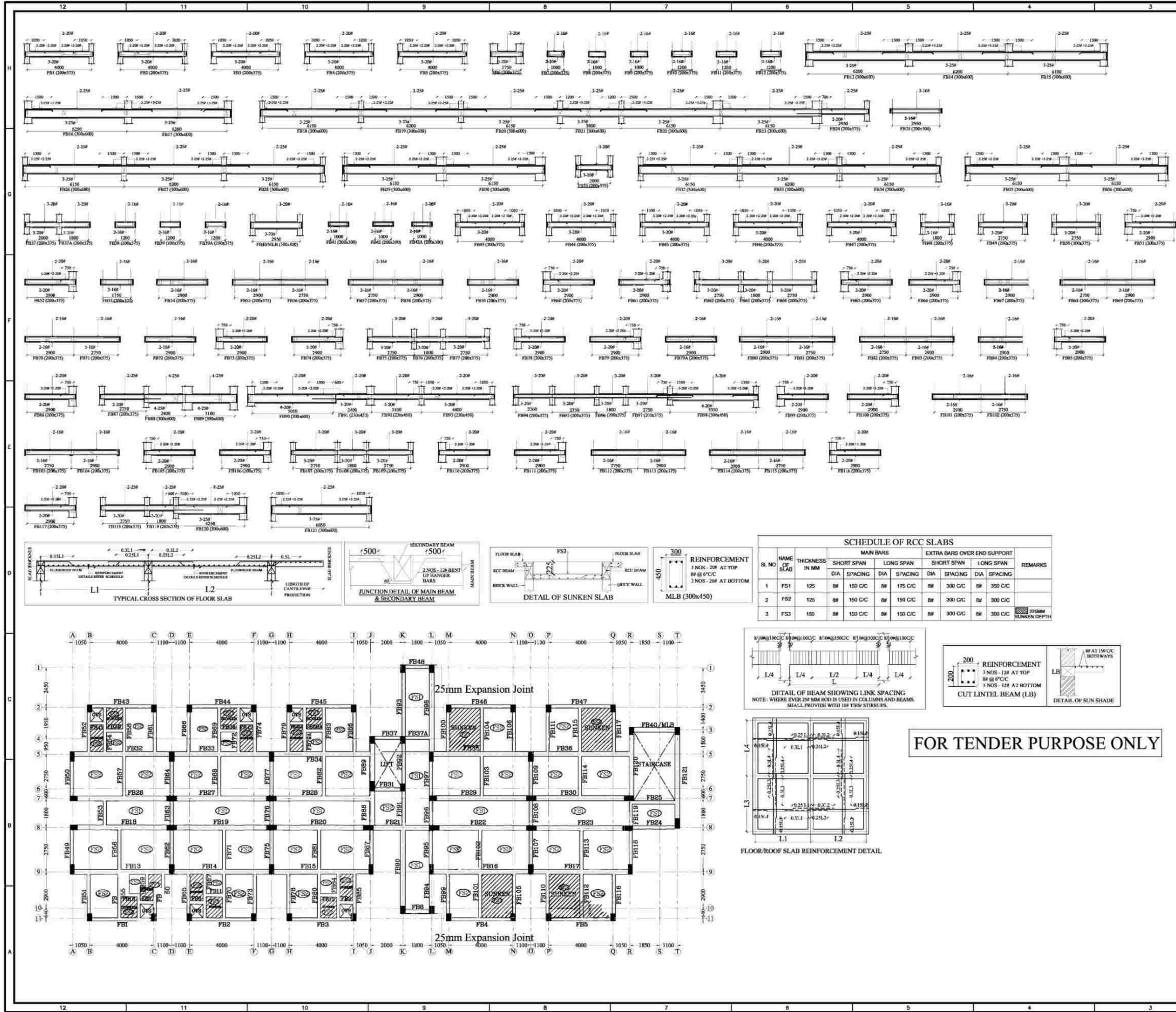
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☒ PRELIMINARY	☒ TENDER	☐ INFORMATION	DATE OF ISSUE
☐ APPROVAL	☐ CONSTRUCTION		08-11-2022

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NOTE: ALL DIMENSION ARE IN mm



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	SYMBOL				
NOTE:					

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STRUCTURAL CONSULTANT:

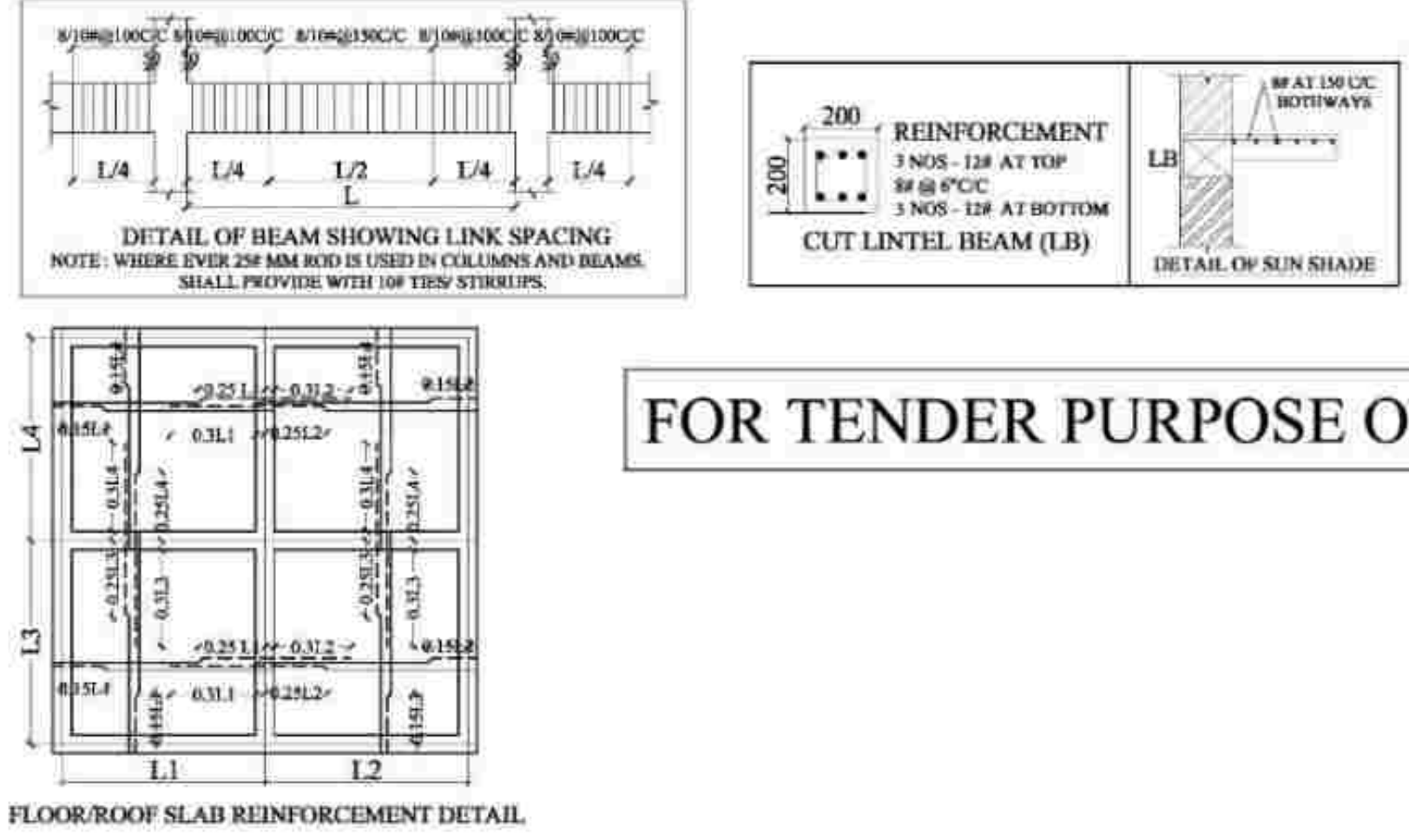
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IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TN/UBHB_BHN

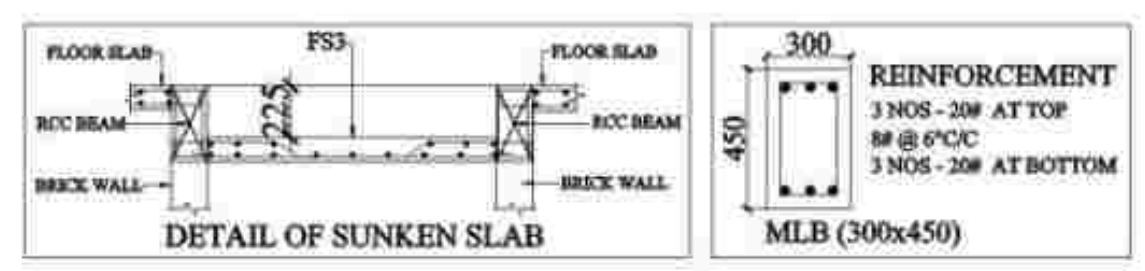
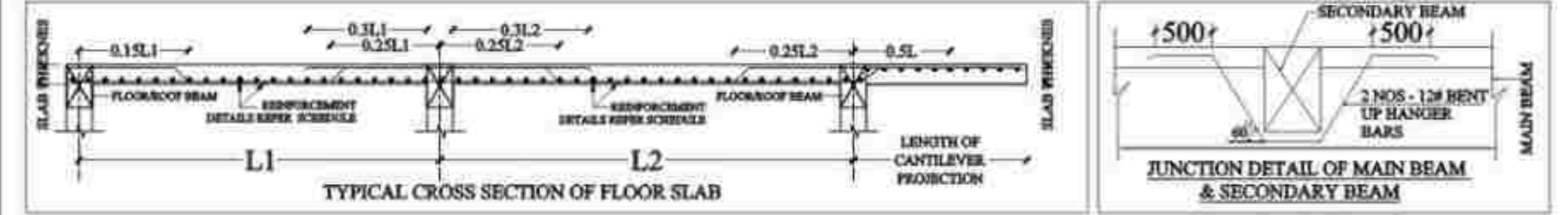
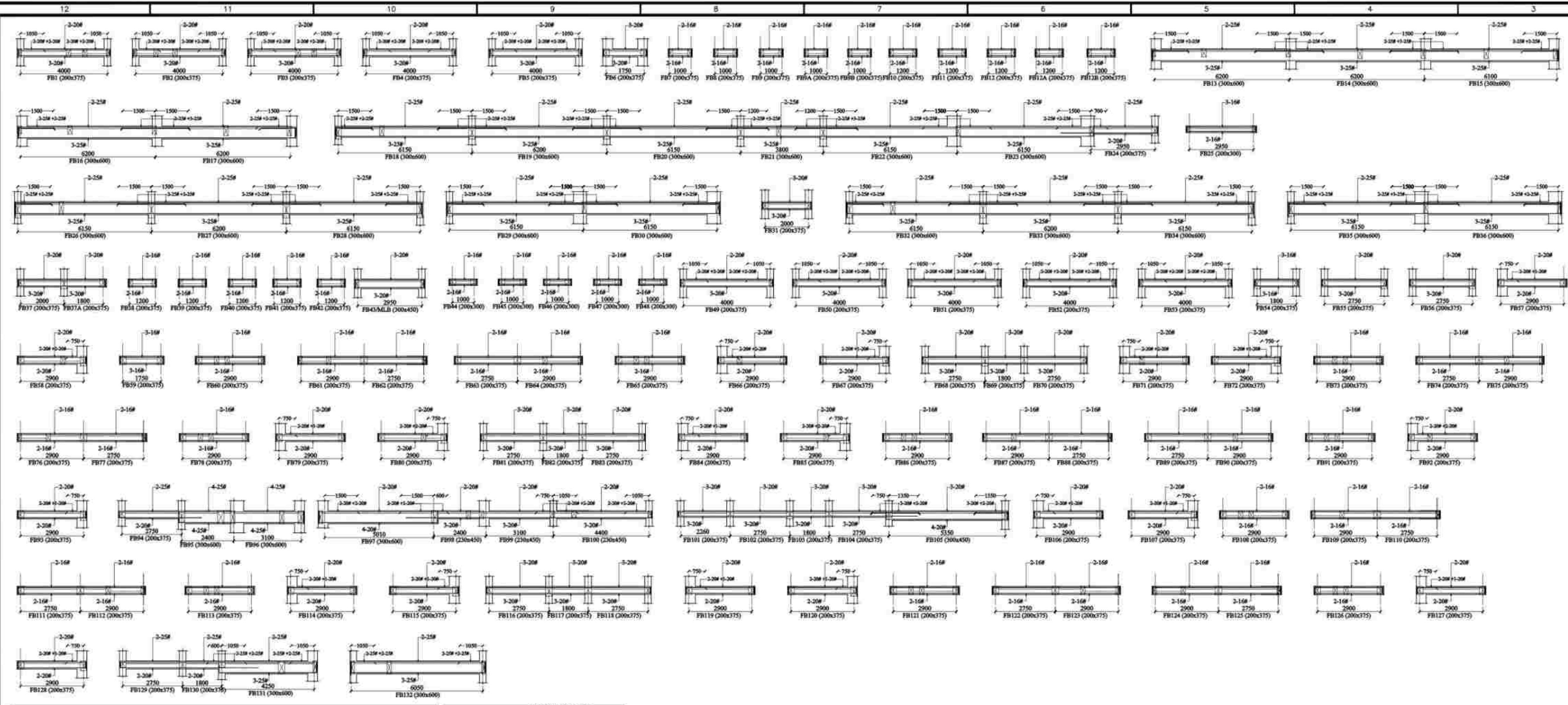
PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCK OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3700 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TN/UBHB/BLOCK A3	SHEET NO: 003	REV NO: R0
DRAWING TITLE : STILT FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A3		
BLOCK NO: BLOCK A3	SCALE: NTS	SIZE OF SHEET: A1
ISSUED FOR: ☒ PRELIMINARY ☒ TENDER ☐ INFORMATION ☐ CONSTRUCTION ☐ DATE OF ISSUE: 08-11-2022		
DESIGNED BY:		DRAWN BY:
CHECKED BY:		APPROVED BY:
NOTE: ALL DIMENSION ARE IN mm		

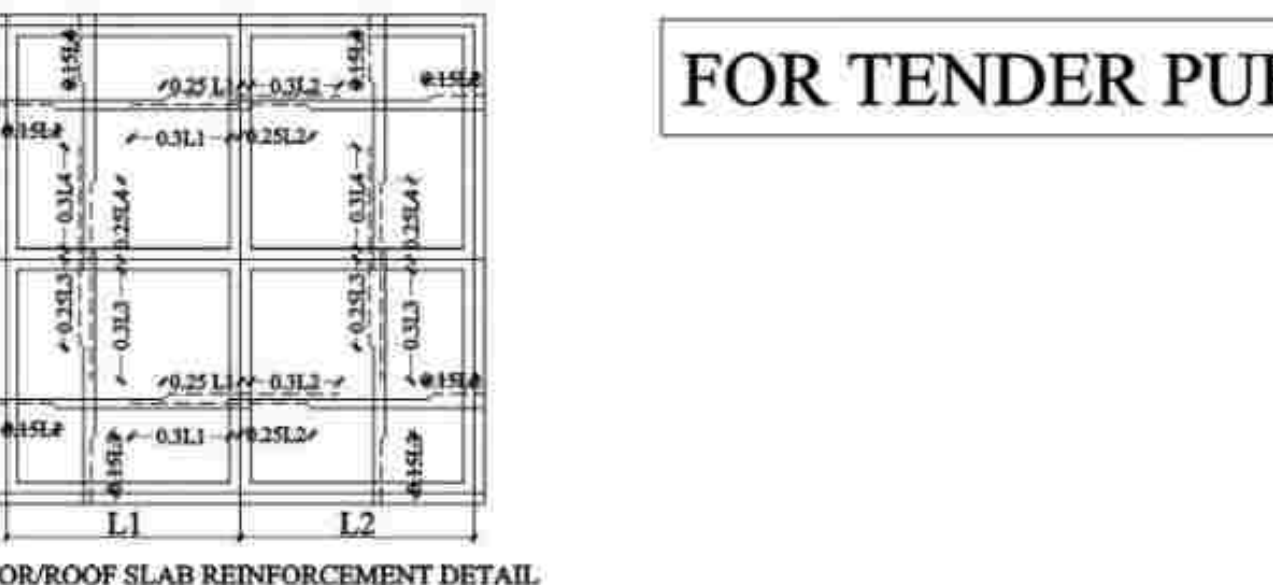
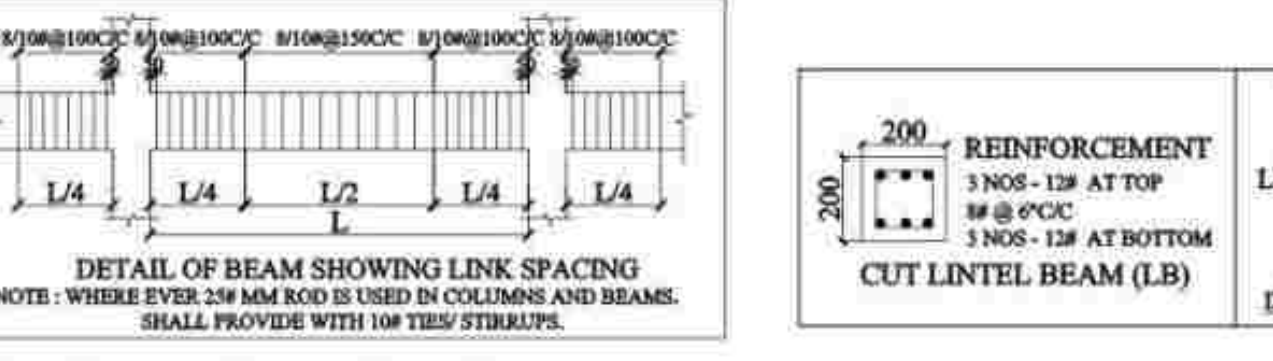
SCHEDULE OF RCC SLABS							
Sl. NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS		EXTRA BARS OVER END SUPPORT		
			SHORT SPAN	LONG SPAN	SHORT SPAN	LONG SPAN	REMARKS
			DIA	SPACING	DIA	SPACING	
1	FS1	125	8#	150 C/C	8#	175 C/C	3 NOS - 20# AT TOP 8# @ 6"C/C
2	FS2	125	8#	150 C/C	8#	150 C/C	3 NOS - 20# AT TOP 8# @ 6"C/C
3	FS3	150	8#	150 C/C	8#	150 C/C	3 NOS - 20# AT TOP 8# @ 6"C/C



FOR TENDER PURPOSE ONLY



SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
1	FS1	125	8#	150 C/C	8#	175 C/C	8#	300 C/C	8#	350 C/C	
2	FS2	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	
3	FS3	150	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	225MM SUNKEN DEPTH



FOR TENDER PURPOSE ONLY

NOTES:

- ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
- ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NEITHER THE DRAWING SHALL BE SCALED OUT NOR THE BARS SHALL BE COUNTED.
- ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THIS OFFICE BEFORE EXECUTION.
- GRADE OF CONCRETE SHALL BE M35 FOR FILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
- GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO LATEST INDIAN STANDARDS.
- ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
- THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS

FILE / FOOTING	50MM	BEAMS	25MM TO LINKS
RC WALLS	25MM TO LINKS	SLABS	25MM
- THE DEVELOPMENT LENGTH FOR TENSION

M30	Ld	45d	Where d is Diameter of rod
M35	Ld	40d	
- THE DEVELOPMENT LENGTH FOR COMPRESSION

M30	Ld	36d	Where d is Diameter of rod
M35	Ld	32d	
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA FILE IS 1000 KN & 600mm DIA FILE IS 1400 KN

REV NO:	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				

NOTE: NGL NATURAL GROUND LEVEL

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

CUBE:

STRUCTURAL CONSULTANT

Dr. P. Nallathambi
 ME, Ph.D (Structural Engg),
 Centre for Urbanization, Buildings & Environment (CUBE)
 IIT Madras Research Park, Chennai - 600113
 Chartered Engineer (F-117029-1)

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
 TAMIL NADU URBAN HABITAT
 DEVELOPMENT BOARD (TNUHDB)
 NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
 INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
 CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
 MODULE NO. 06, 6TH FLOOR, PHASE II BUILDING,
 IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
 THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
 PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A3 **SHEET NO:** 004 **REV NO:** R0

DRAWING TITLE:
 TYPICAL FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A3

BLOCK NO:	BLOCK A3	SCALE:	NTS	SIZE OF SHEET:	A1
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ISSUED FOR:

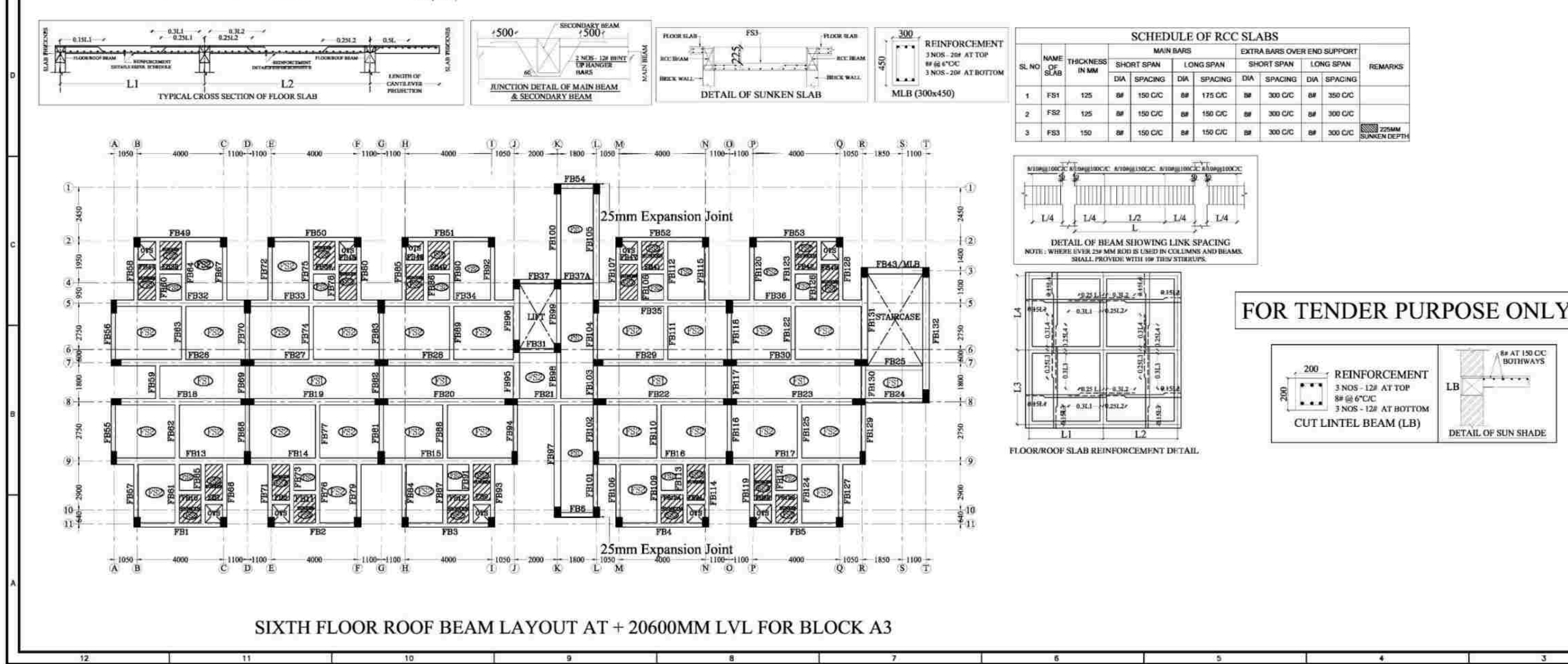
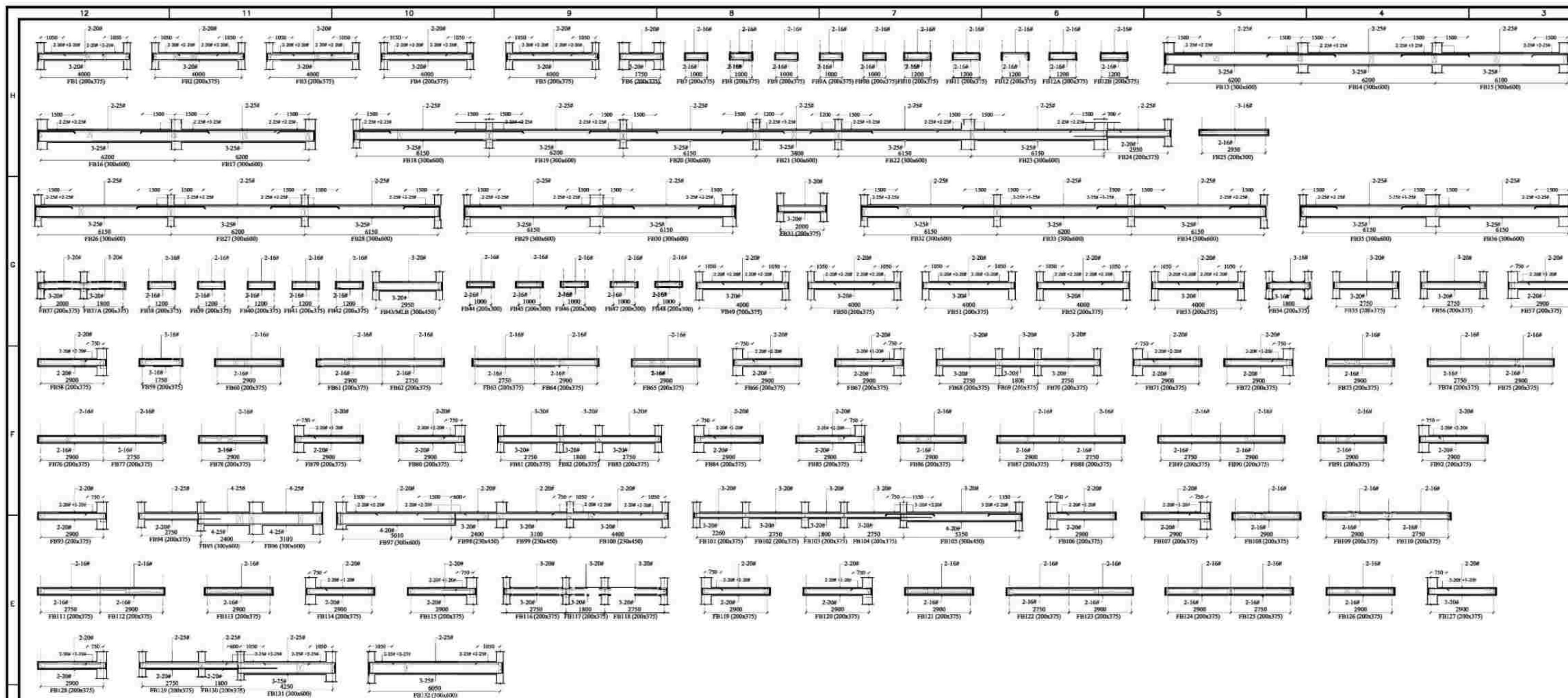
☒ PRELIMINARY	☒ TENDER	☐ INFORMATION	DATE OF ISSUE
☐ APPROVAL	☐ CONSTRUCTION		08-11-2022

DESIGNED BY: **DRAWN BY:**

CHECKED BY: **APPROVED BY:**

NOTE: ALL DIMENSION ARE IN mm

TYPICAL FLOOR BEAM LAYOUT AT FIRST FLOOR ROOF (+5850MM), SECOND FLOOR ROOF (+8800MM), THIRD FLOOR ROOF (+11750MM), FOURTH FLOOR ROOF (+14700MM), FIFTH FLOOR ROOF (+17650MM), SEVENTH FLOOR ROOF (+23550MM), EIGHT FLOOR ROOF (+26500MM) LVL FOR BLOCK A3



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RC WALLS = 25MM TO LINKS SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION

	Fe-500D	Where d is Diameter of rod
M30	Ld	45d
M35	Ld	40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION

	Fe-500D	Where d is Diameter of rod
M30	Ld	36d
M35	Ld	32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 800mm DIA PILE IS 1400 kN

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED

SYMBOL	DESCRIPTION
	NGL

NOTE: NATURAL GROUND LEVEL

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Tamil LS

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IIT Madras Research Park, Chennai - 600113
Chartered Engineer (F-117029-1)

PRINCIPAL DEVELOPER:

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TAMIL NADU URBAN HABITAT
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STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA. TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A3	SHEET NO: 005	REV NO: R0
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DRAWING TITLE :
SIXTH FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A3

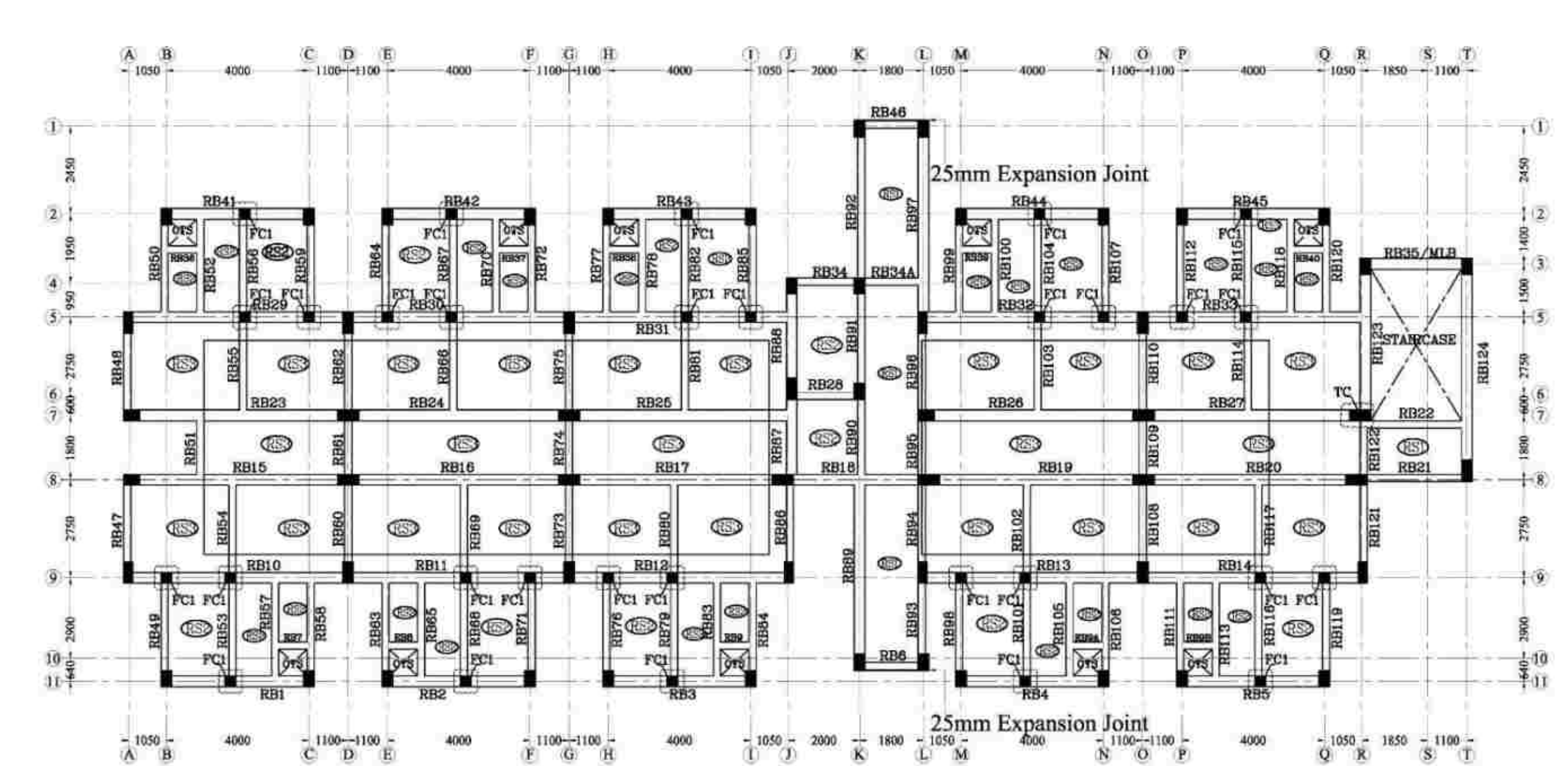
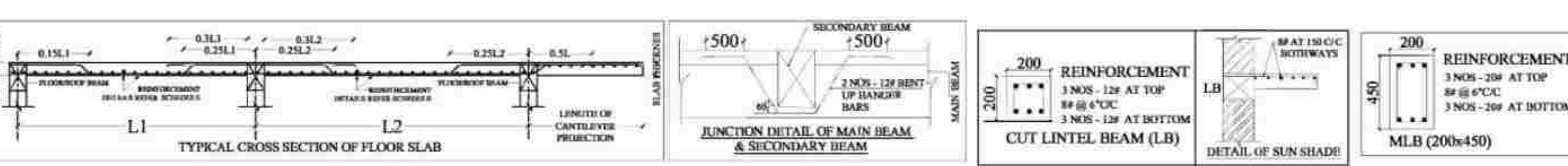
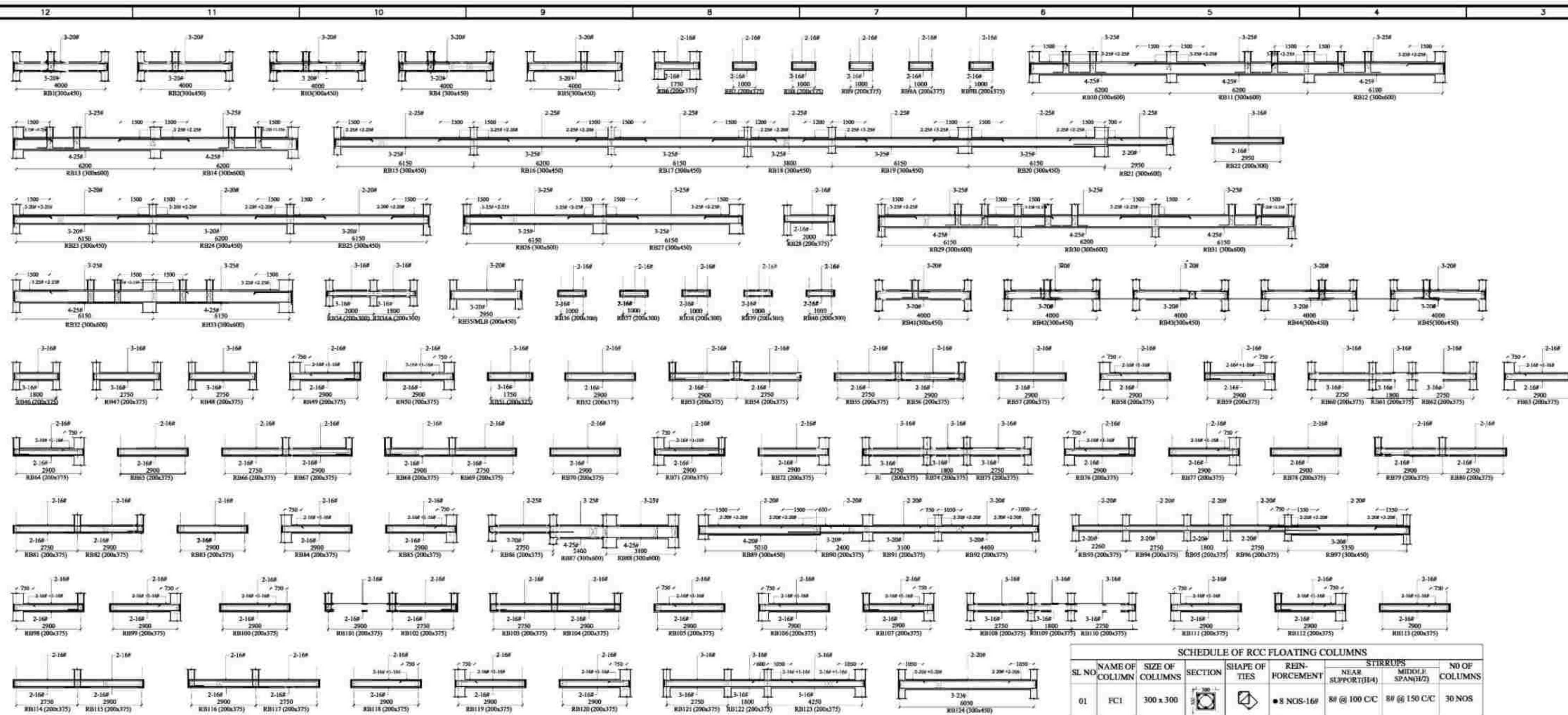
BLOCK NO: BLOCK A3	SCALE: NTS	SIZE OF SHEET: A1
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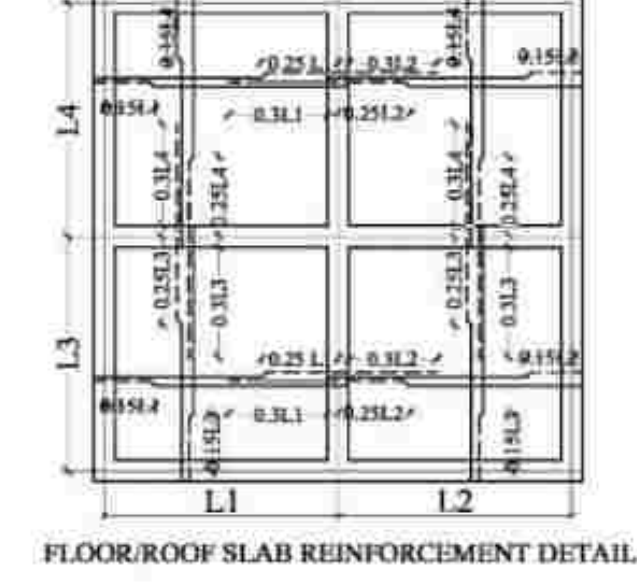
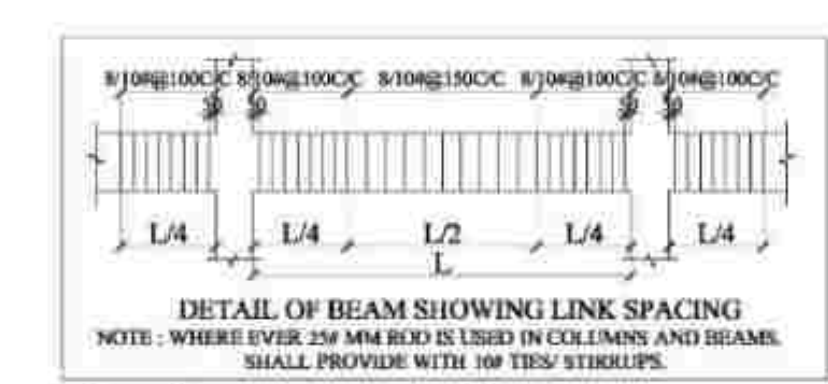
☒ PRELIMINARY	☒ TENDER	☐ INFORMATION	DATE OF ISSUE
☐ APPROVAL	☐ CONSTRUCTION		08-11-2022

DESIGNED BY:	DRAWN BY:
CHECKED BY:	APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm



SL NO.	NAME OF SLAB	THICKNESS IN MM	MAIN BARS		EXTRA BARS OVER END SUPPORT		REMARKS
			SHORT SPAN	LONG SPAN	SHORT SPAN	LONG SPAN	
01	RS1	125	8# 125 C/C	8# 175 C/C	8# 250 C/C	8# 350 C/C	
02	RS2	125	8# 150 C/C	8# 150 C/C	8# 300 C/C	8# 300 C/C	
03	RS3	150	8# 125 C/C	8# 125 C/C	8# 250 C/C	8# 250 C/C	SOLAR PANEL FLOOR AREA



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RC WALLS = 25MM TO LINKS SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION
M30 L_d 45d Where d is Diameter of rod
M35 L_d 40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION
M30 L_d 36d Where d is Diameter of rod
M35 L_d 32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED

NOTE: NGL NATURAL GROUND LEVEL

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

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Total L.S.

Dr. P. Nallathambi
ME, Ph.D (Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai - 600113
Chartered Engineer (F-117029-1)

PRINCIPAL DEVELOPER:

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NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
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DRAWING NO: TNUHDB/BHN/BLOCK A3 SHEET NO: 006 REV NO: R0

DRAWING TITLE :
TERRACE FLOOR BEAM LAYOUT & SECTION DETAILS FOR BLOCK A3

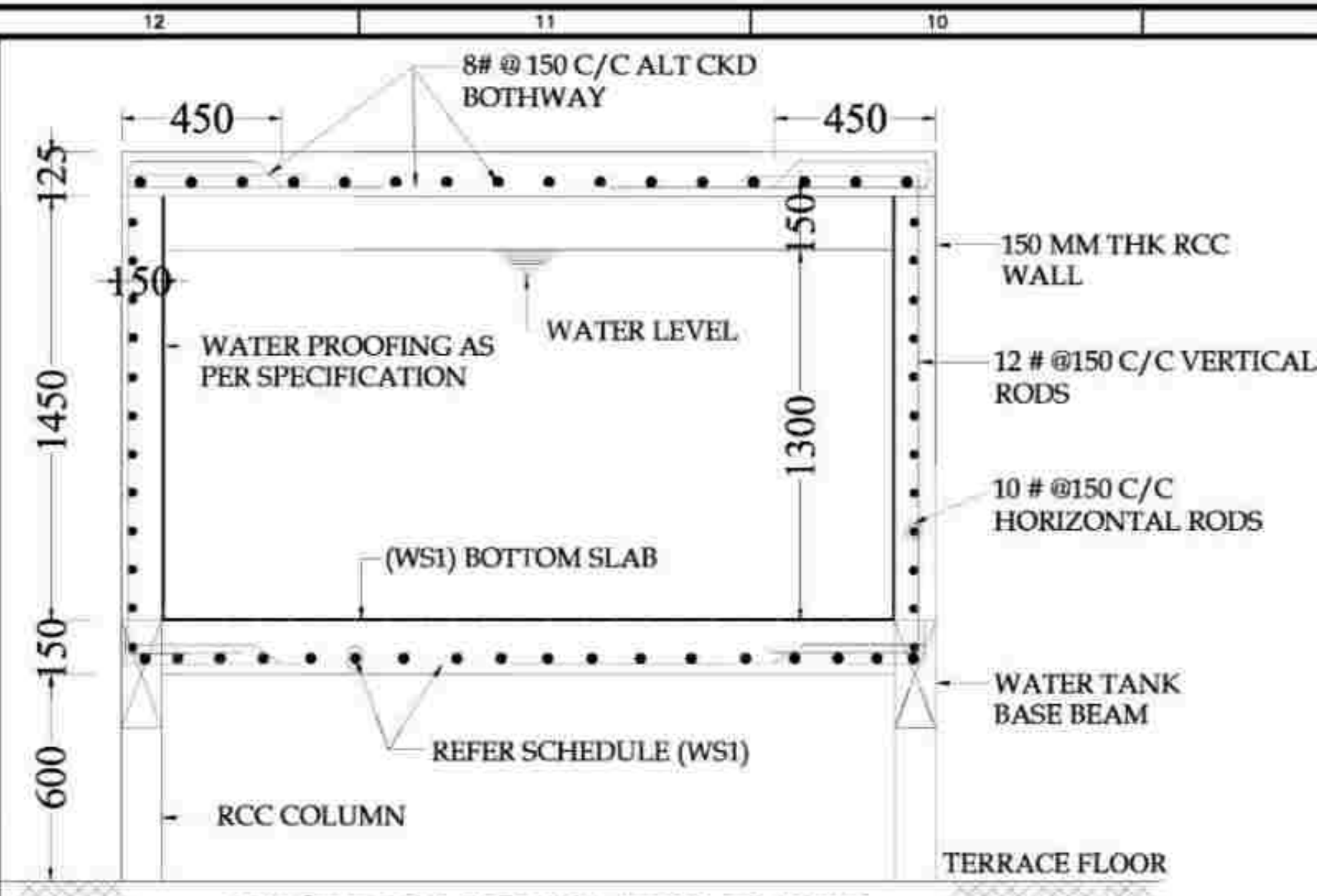
BLOCK NO: BLOCK A3 SCALE: NTS SIZE OF SHEET: A1

ISSUED FOR:
☒ PRELIMINARY ☒ TENDER ☐ INFORMATION DATE OF ISSUE: 08-11-2022
☐ APPROVAL ☐ CONSTRUCTION

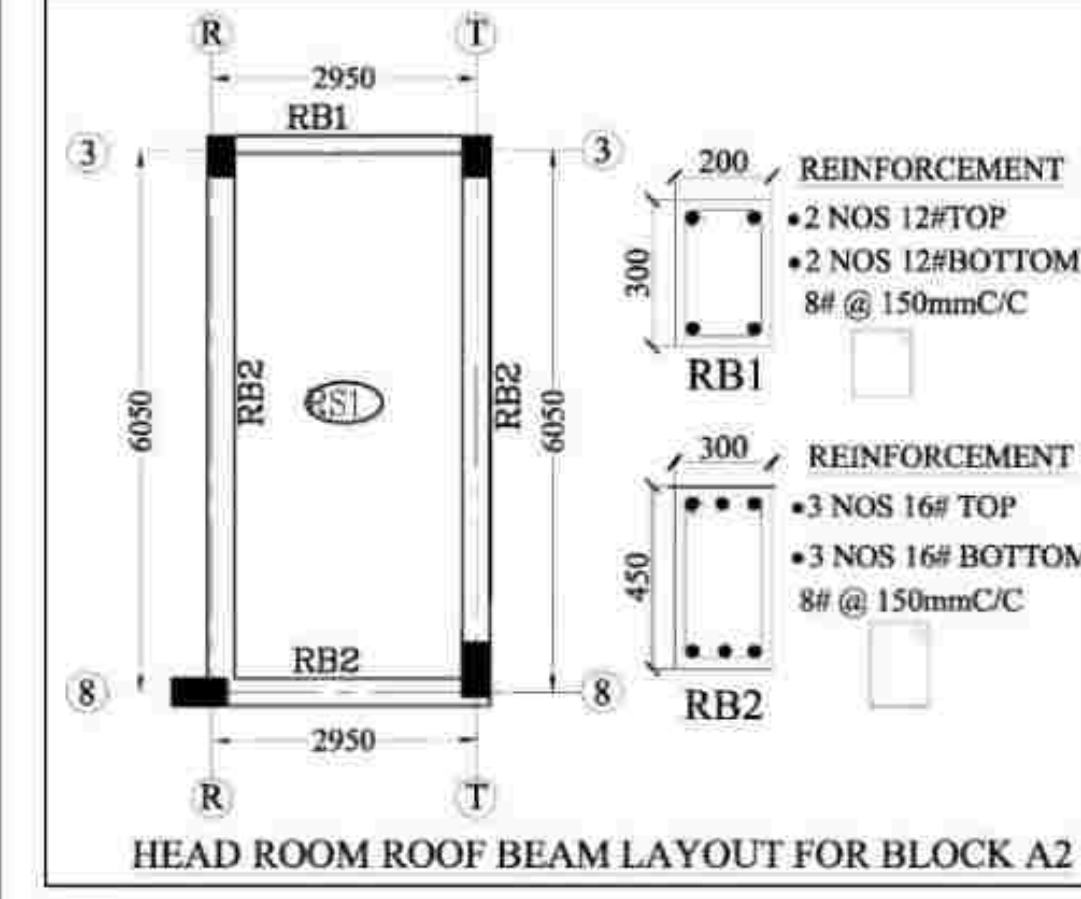
DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm

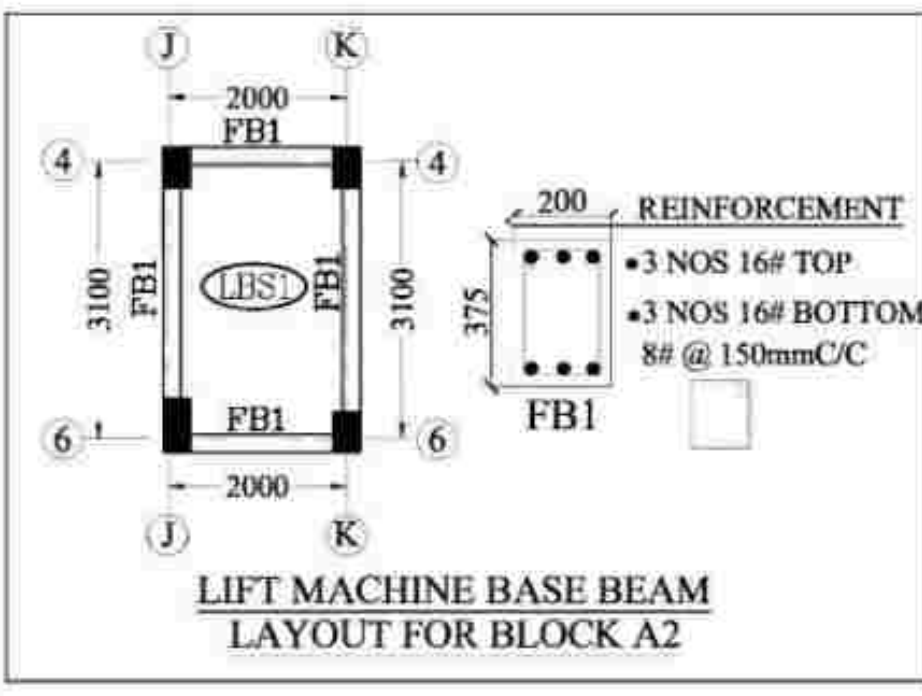
NINETH FLOOR ROOF BEAM LAYOUT AT + 29450MM LVL FOR BLOCK A3



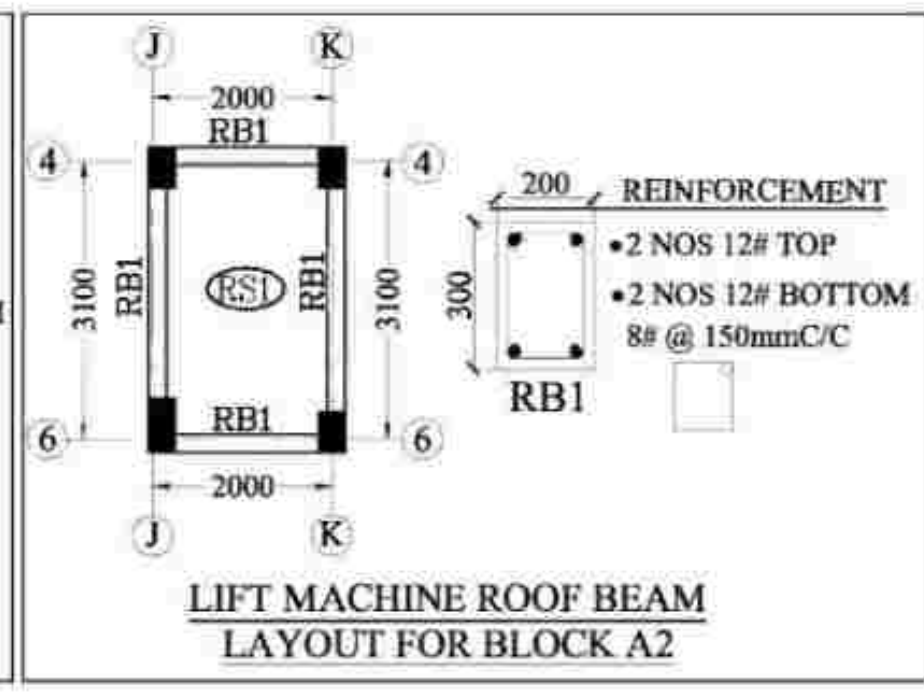
SECTION OF WATER TANK



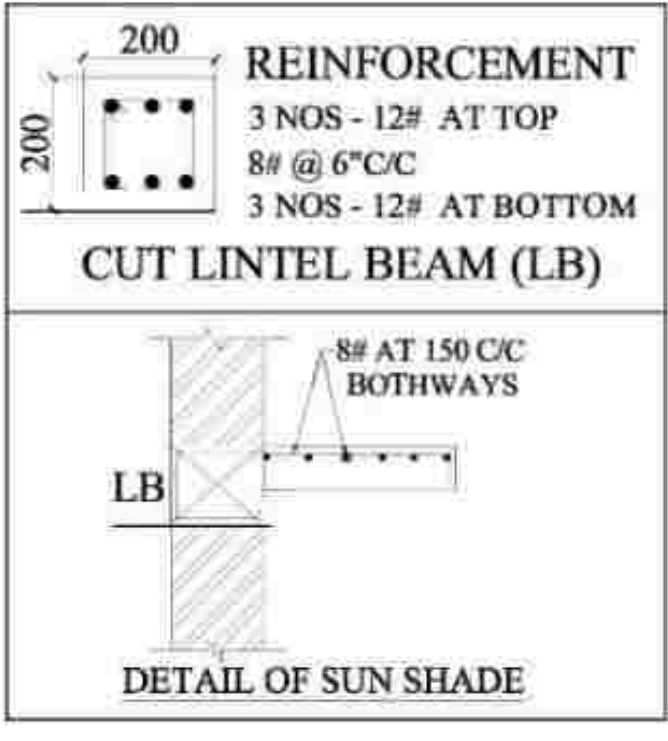
HEAD ROOM ROOF BEAM LAYOUT FOR BLOCK A2



LIFT MACHINE BASE BEAM LAYOUT FOR BLOCK A2



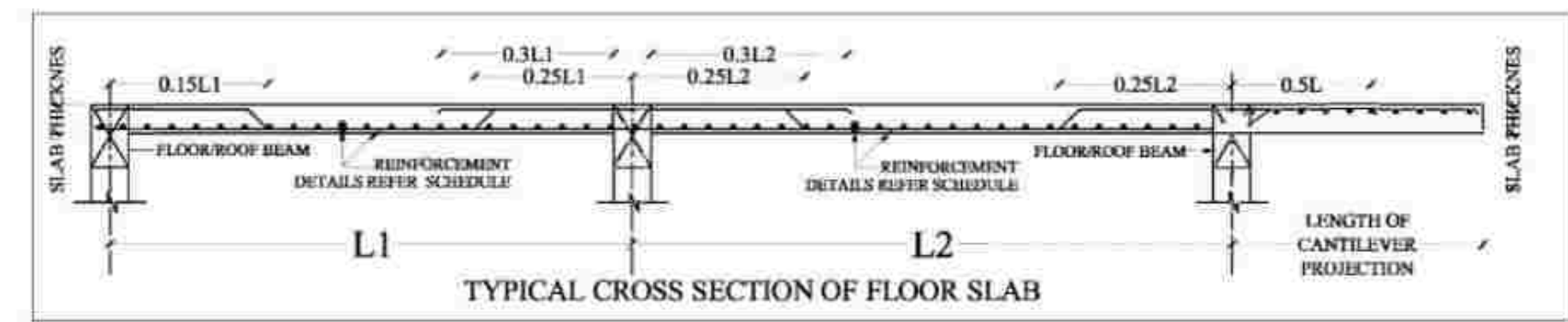
LIFT MACHINE ROOF BEAM LAYOUT FOR BLOCK A2



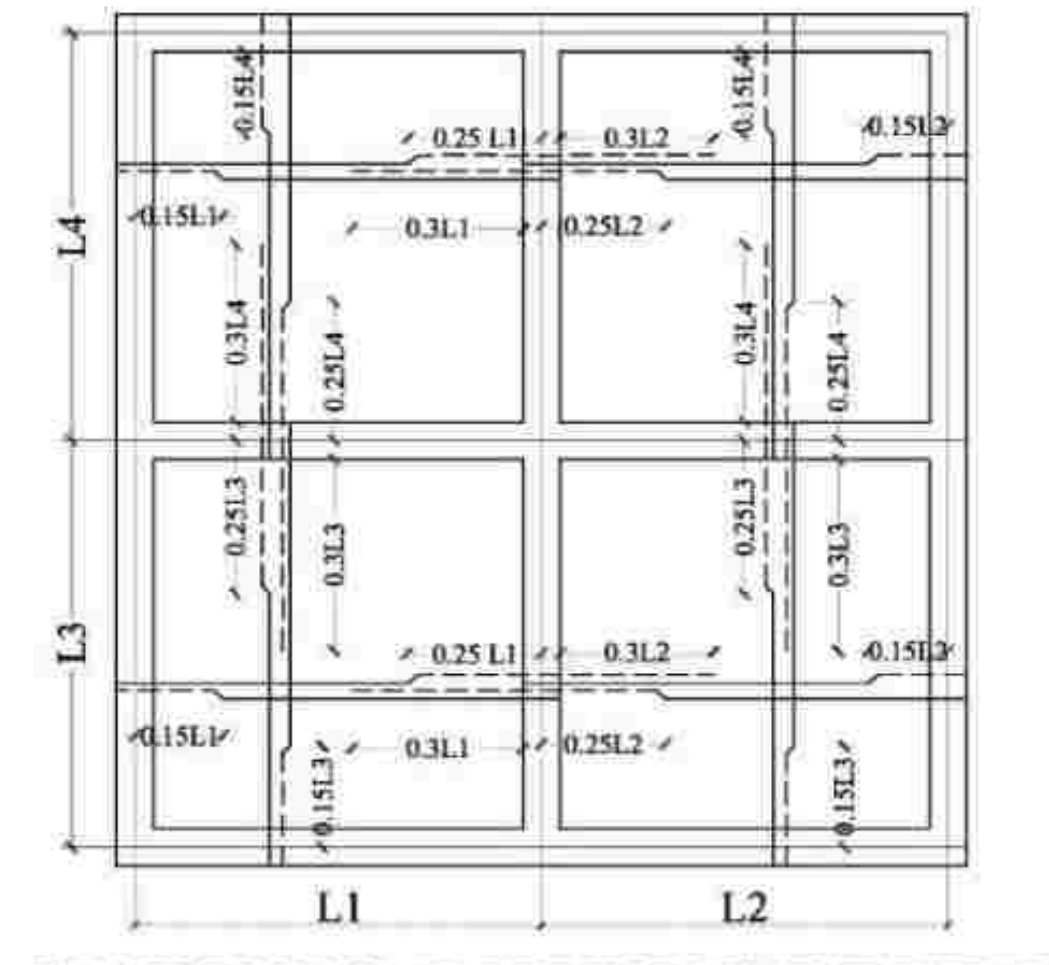
CUT LINTEL BEAM (LB)

DETAIL OF SUN SHADE

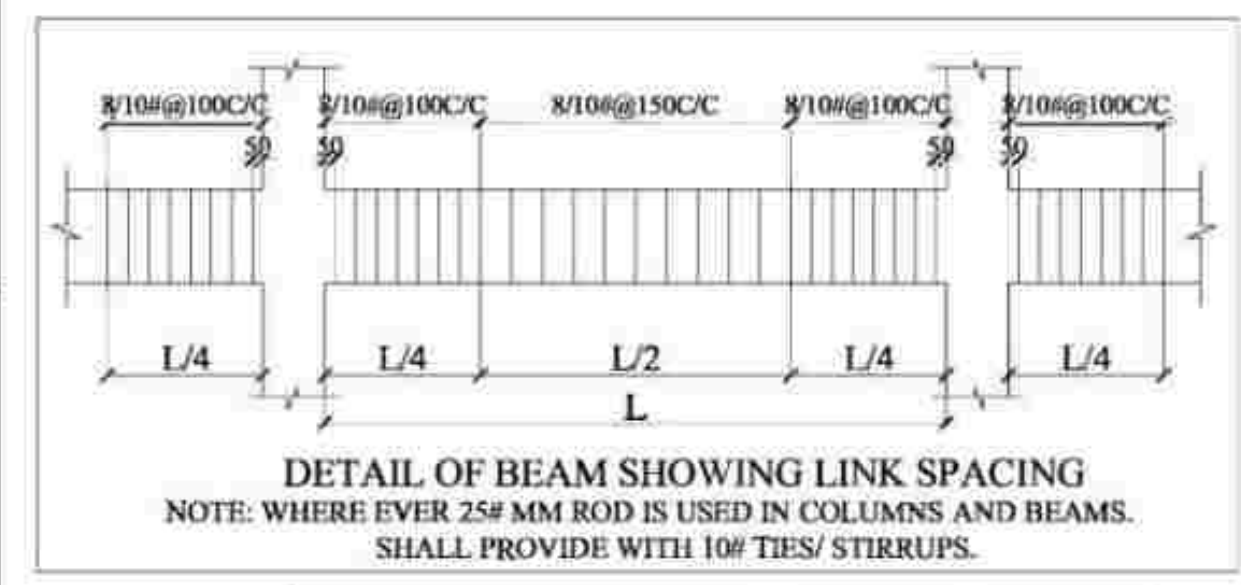
SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
01	RS1	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	LIFT MACHINE BASE SLAB WATER TANK BASE SLAB
02	LBS1	150	10#	150 C/C	10#	150 C/C	10#	300 C/C	10#	300 C/C	
03	WS1	150	10#	150 C/C	10#	150 C/C	10#	300 C/C	10#	300 C/C	



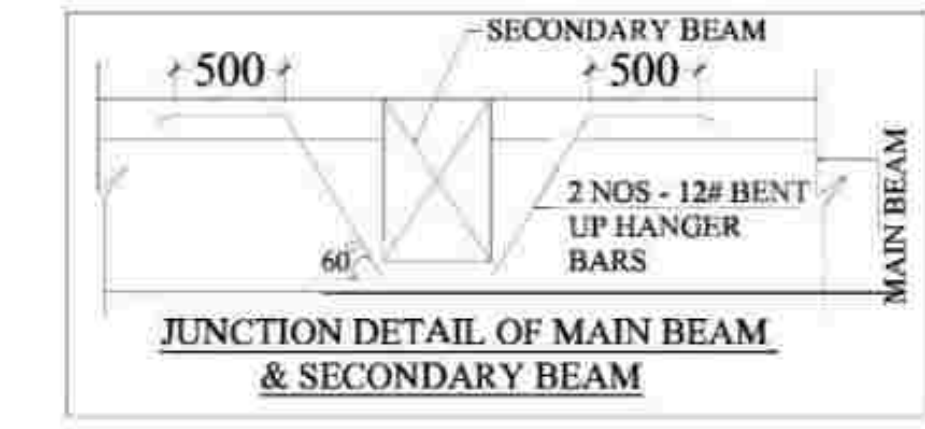
TYPICAL CROSS SECTION OF FLOOR SLAB



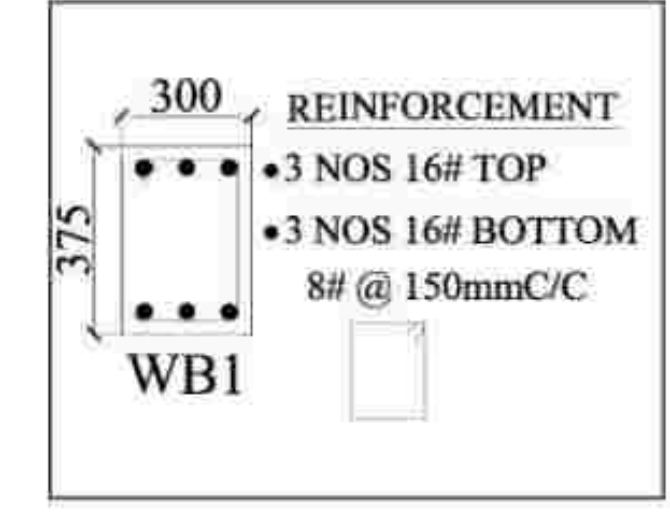
FLOOR/ROOF SLAB REINFORCEMENT DETAIL



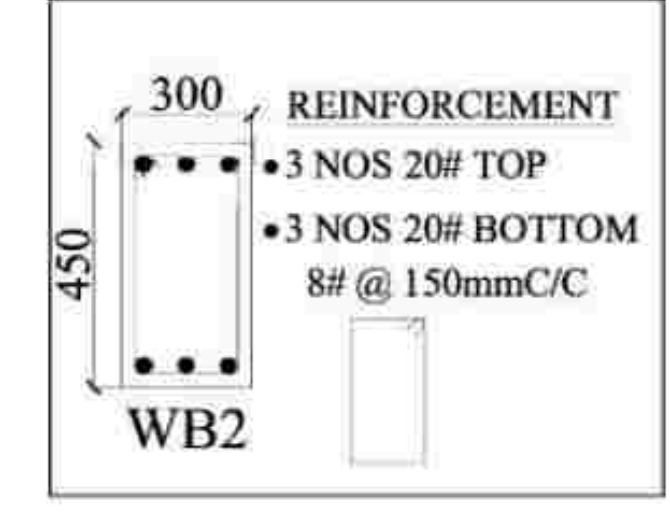
DETAIL OF BEAM SHOWING LINK SPACING
NOTE: WHERE EVER 25# MM ROD IS USED IN COLUMNS AND BEAMS, SHALL PROVIDE WITH 10# TIES/STIRRUPS.



JUNCTION DETAIL OF MAIN BEAM & SECONDARY BEAM

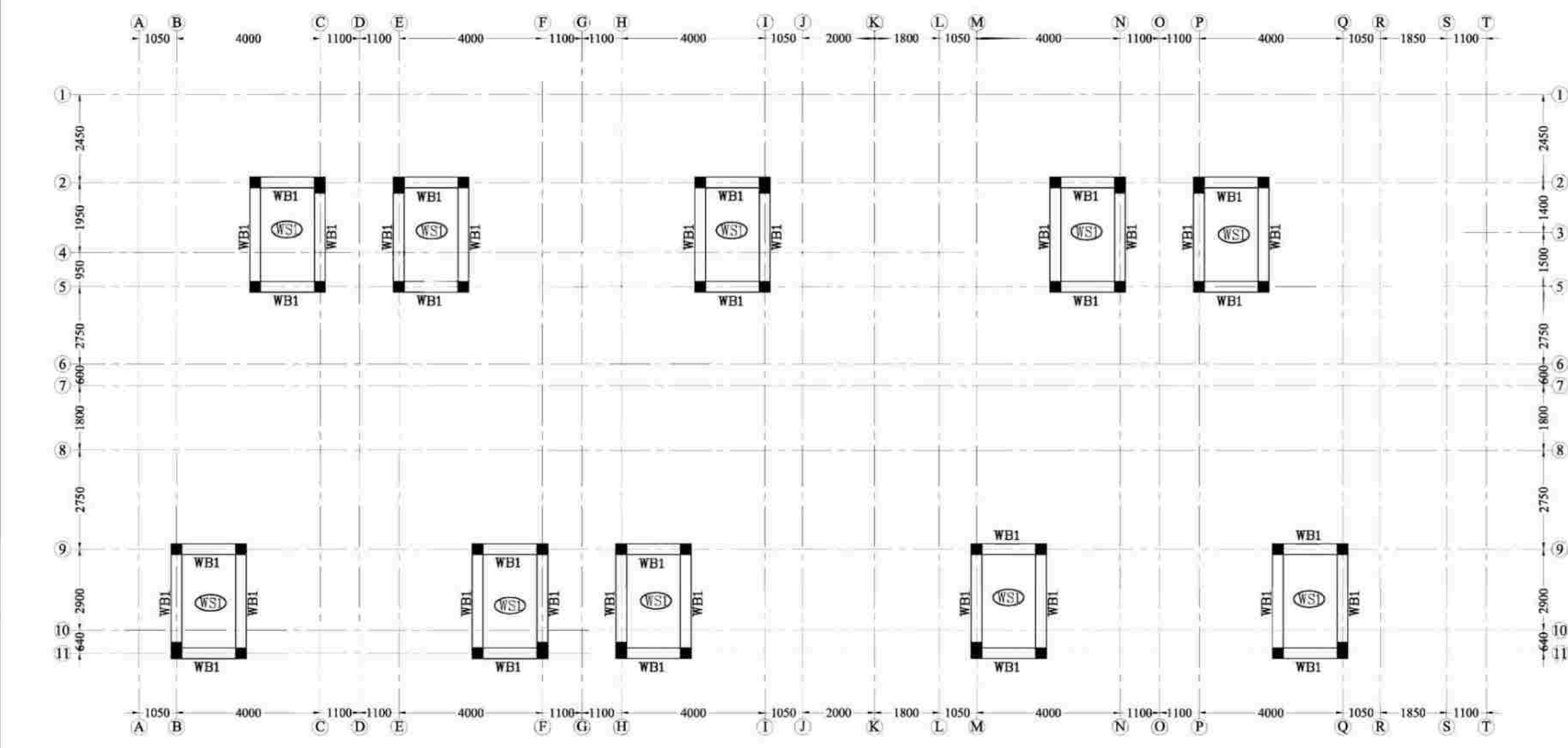


WB1



WB2

FOR TENDER PURPOSE ONLY



WATER TANK BASE BEAM LAYOUT AT + 30050MM LVL FOR BLOCK A2

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- THE DEVELOPMENT LENGTH FOR TENSION
M30 Fe-500 Where d is Diameter of rod
Ld 45d 40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION
M30 Fe-500 Where d is Diameter of rod
Ld 36d 32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
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REV NO.	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY
1					

NOTE: NGL NATURAL GROUND LEVEL

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PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

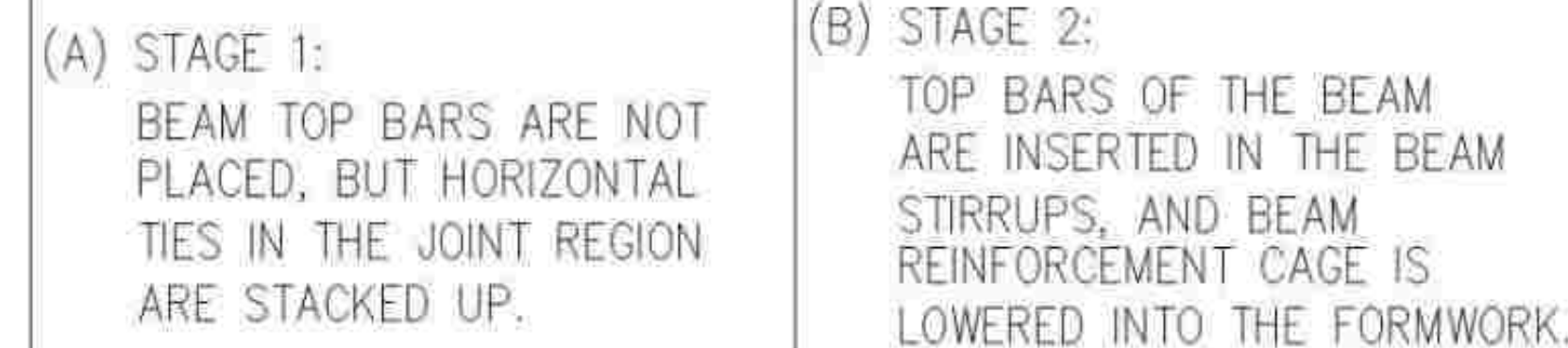
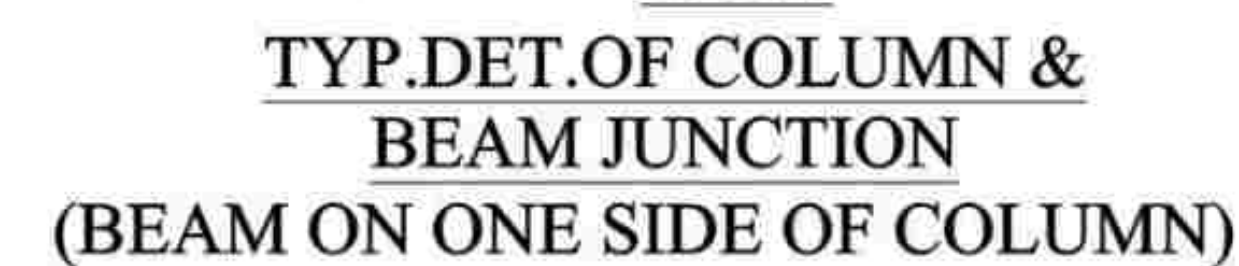
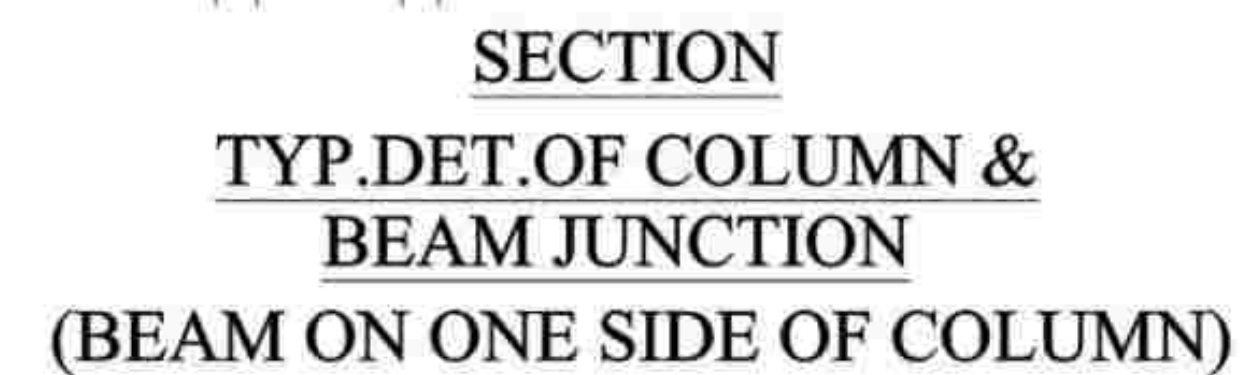
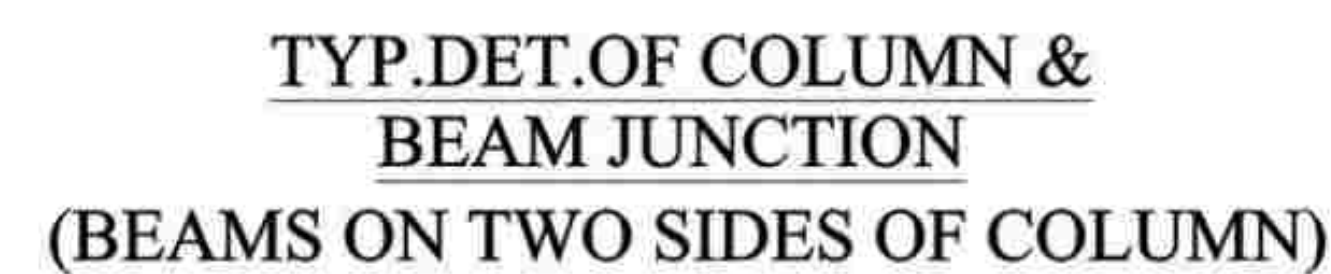
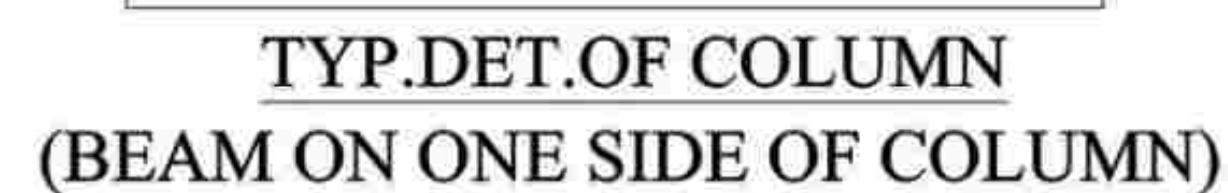
CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

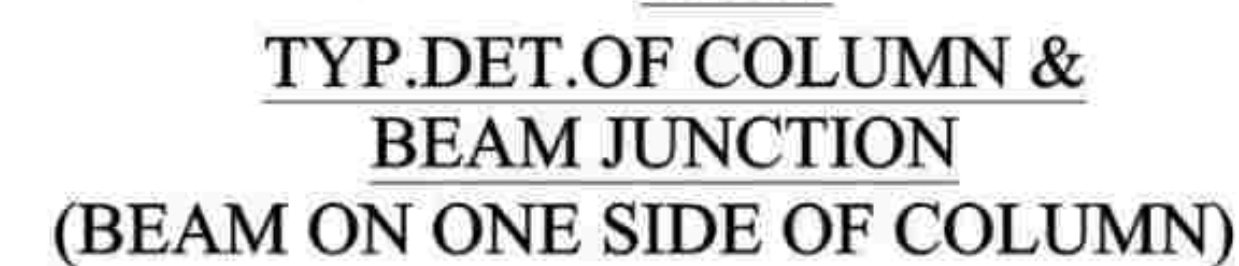
PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA, TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A3	SHEET NO: 007	REV NO: R0
DRAWING TITLE : WATER TANK BASE, LIFT MACHINE BASE, HEAD ROOM ROOF, LIFT MACHINE ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A3.		
BLOCK NO: BLOCK A3	SCALE: NTS	SIZE OF SHEET: A1
ISSUED FOR:		
☒ PRELIMINARY ☐ APPROVAL	☒ TENDER ☐ CONSTRUCTION	☐ INFORMATION ☐ DATE OF ISSUE 08-11-2022
DESIGNED BY:		DRAWN BY:
CHECKED BY:		APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm



SECTION
TYP.DET.OF COLUMN &
BEAM JUNCTION
(BEAM ON ONE SIDE OF COLUMN)



(A) STAGE 1: BEAM TOP BARS ARE NOT PLACED, BUT HORIZONTAL TIES IN THE JOINT REGION ARE STACKED UP.	(B) STAGE 2: TOP BARS OF THE BEAM ARE INSERTED IN THE BEAM STIRRUPS, AND BEAM REINFORCEMENT CAGE IS LOWERED INTO THE FORMWORK.
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REV NO:	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY		
NOTE:	SYMBOL	DESCRIPTION					
		NGL	NATURAL GROUND LEVEL				

STRUCTURAL CONSULTANT



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STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT

MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI. TAMIL NADU 600113.

PROJECT CODE: CUBE/B/C/2022-23/023/TNUHDB_BHN
PROJECT TITLE: PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A3	SHEET NO: 008	REV NO: R0
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DRAWING TITLE :
TYPICAL DUCTILE DETAILING FOR EARTHQUAKE RESISTANCE

BLOCK NO: BLOCK A3	SCALE: NTS	SIZE OF SHEET: A1
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ISSUED FOR:		DATE OF ISSUE
☒ PRELIMINARY	☒ TENDER	08-11-2022
☐ APPROVAL	☐ CONSTRUCTION	

DESIGNED BY:	DRAWN BY:
CHECKED BY:	APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm

- 1) ALL STRUCTURAL KEY PLANS AND DETAILS ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT ARCHITECTURAL DRAWINGS, SERVICE DRAWINGS, SPECIFICATIONS, BILLS OF QUANTITIES AND ALL OTHER RELEVANT DOCUMENTS. DISCREPANCIES MUST BE REPORTED IMMEDIATELY TO THE ENGINEER-IN-CHARGE.
- 2) ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NEITHER THE BARS SHALL BE COUNTED NOR THE DIMENSIONS SCALED FROM THE DRAWING.

- 1) FOUNDATIONS ARE DESIGNED FOR THE SOIL SPECIFIED IN THE FOUNDATION DRAWING. MIX FOR ALL RCC WORKS SHALL BE AS SPECIFIED IN THE STRUCTURAL DRAWINGS.
- 2) IF ASSUMED SAFE BEARING CAPACITY OF THE SOIL IS NOT FOUND AT THE SPECIFIED FOUNDING LEVEL, THE SAME SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER-IN-CHARGE FOR FURTHER DIRECTIONS.
- 3) FORMATION LEVELS OF FOUNDATIONS SHALL BE DETERMINED BY THE ENGINEER-IN-CHARGE BASED UPON EXISTING ROAD LEVEL, WATER TABLE LEVEL AND REQUIREMENT OF PROVISION OF SERVICES.
- 4) FOUNDATIONS ARE DESIGNED TO BE AT SAME FOUNDING LEVEL. ANY VARIATIONS IN THE GROUND LEVEL BEYOND 600MM AND THE DIFFERENCE IN LEVEL OF TWO ADJACENT FOOTINGS GREATER THAN HALF OF THE CLEAR DISTANCE BETWEEN THEM SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE.
- 5) ANY LOOSE POCKETS OR PROTRUDING BOULDERS SHALL BE REMOVED BEFORE LAYING BED CONCRETE FOR FOUNDATIONS AND SHALL BE LEVELLED BY FILLING WITH PCC.
- 6) THE TOP LEVEL OF THE GRADE BEAMS OF THE EXTERNAL WALL SHALL BE 150MM BELOW GROUND LEVEL AND OTHER BEAMS OF INTERNAL WALLS SHALL BE 40MM BELOW THE PLINTH LEVEL.

- 1) GRADE OF CONCRETE SHALL BE M30 AND MINIMUM CEMENT CONTENT FOR PILE SHOULD BE 400KG/CUM UNLESS OTHERWISE SPECIFIED.
- 2) ALL OPENINGS FOR PIPING AND CONDUITS ETC., SHALL BE FORMED IN POSITION BEFORE THE CASTING OF CONCRETE.
- 3) NO HOLES OR CHASES ARE PERMITTED IN THE STRUCTURAL CONCRETE MEMBERS OTHER THAN AS DETAILED OR APPROVED BY THE ENGINEER-IN-CHARGE.
- 4) THE CLEAR DEPRESSION OF SLAB FOR BATH, WASHBASIN AND E.W.C SHALL BE 300MM AND FOR L.W.C SHALL BE 500MM. DEPRESSION IN SLAB FOR BALCONY SHALL BE 200MM FROM THE ADJACENT FLOOR LEVELS. NECESSARY PROVISION FOR OUTLETS FROM TRAPS SHALL BE KEPT WHILE CASTING THE BEAMS.
- 5) WHEN THE SPAN IS MORE THAN 5.00M, PROVIDE CAMBER @ SPAN/250 FOR BEAMS AND SLABS.
- 6) THE FREE END OF CANTILEVER SLABS OR BEAMS SHALL BE RAISED BY 2% OF THE SPAN. TORSIONAL REINFORCEMENT AT DISCONTINUOUS EDGES OF TWO WAY REINFORCED SLABS SHALL BE AS PER IS 456-2000.
- 7) ALL CONCRETE IS TO BE CURED BY AN APPROVED METHOD- WATER PONDING, POLYTHENE/HESSIAN SHEET, CURING COMPOUND.

- 1) ALL STEEL REINFORCEMENT SHALL BE OF TMT BARS CONFORMING TO IS 1786 WITH MINIMUM YIELD STRESS / 0.2% PROOF STRESS OF 500 N/SQMM
- 2) GRADE FE 500D FOR ALL STRUCTURES DESIGNED FOR SEISMIC RESISTANCE UNDER ZONE-III OF IS 1893-2016.
- 3) ALL REBARS SHALL BE CUT AND BENT CONFORMING TO THE LATEST EDITION OF IS 1786. MECHANICAL COUPLERS CONFORMING TO IS 16172 SHALL BE USED WHEN LONGITUDINAL STEEL BARS HAVE TO BE CONTINUED FOR BEAM SPANS LARGER THAN THEIR MANUFACTURED LENGTH.
- 4) WELDING OF REBARS WILL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER-IN-CHARGE. WELDING OF LINKS, TIES, INSERTS OR OTHER SIMILAR ELEMENTS TO VERTICAL REINFORCEMENT BARS REQUIRED AS PER DESIGN IS NOT PERMITTED, IN ANY SEISMIC ZONE.
- 5) ALL REBARS ARE TO BE FIRMLY SUPPORTED ON APPROVED CHAIRS OR CONCRETE BLOCKS PLACED AT NOT GREATER THAN 750MM CENTRES BOTH WAYS.
- 6) NOT MORE THAN 50% OF AREA OF STEEL BARS ON EITHER TOP OR BOTTOM FACE SHALL BE SPLICED AT ANY ONE SECTION. LAPPING OF REBARS SHALL AS FAR AS POSSIBLE BE AWAY FROM THE SECTIONS OF MAXIMUM STRESS AND BE STAGGERED. LAP SPLICES SHALL BE CONSIDERED AS STAGGERED, IF THE CENTRE TO CENTRE DISTANCE OF THE SPLICES IS NOT LESS THAN 1.3 TIMES THE LAP LENGTH.
- 7) LAP / MECHANICAL COUPLERS / WELDED SPLICES SHOULD NOT BE PROVIDED
 - A) WITHIN A JOINT
 - B) WITHIN A DISTANCE OF 2D FROM THE RC WALL, WHERE 'D' IS THE EFFECTIVE DEPTH OF THE MEMBER.
 - C) WITHIN A DISTANCE 1/4 LENGTH OF MEMBER FROM THE RC WALL.
- 8) LAP LENGTH INCLUDING ANCHORAGE VALUE OF HOOKS FOR BARS IN FLEXURAL TENSION SHALL BE LD OR 300d, WHICHEVER IS GREATER. THE STRAIGHT LENGTH OF THE LAP SHALL NOT BE LESS THAN 150d OR 200dmm. WHEN BARS OF TWO DIFFERENT DIAMETERS ARE TO BE SPLICED, THE LAP LENGTH SHALL BE CALCULATED ON THE BASIS OF DIAMETER OF THE SMALLER BAR.
- 9) THE HORIZONTAL DISTANCE BETWEEN TWO PARALLEL MAIN REINFORCING BARS SHALL BE NOT LESS THAN THE DIAMETER OF THE LARGER BAR USED OR 50mm MORE THAN THE NOMINAL MAXIMUM SIZE OF COARSE AGGREGATE USED, WHICHEVER IS GREATER.

- 10) WHENEVER REINFORCEMENT IS PROVIDED IN TWO LAYERS IN BEAMS, SPACER BAR SHALL BE PROVIDED TO MAINTAIN 25MM GAP OR MAXIMUM DIA OF THE MAIN BAR WHICHEVER IS MORE BETWEEN TWO LAYERS.
- 11) IN CASE OF CANTILEVER BEAMS / SLABS THE TOP REINFORCEMENT SHALL BE TAKEN BEYOND THE INNER FACE OF THE SUPPORTS TO ATLEAST THE SPAN OF THE CANTILEVER WHEREVER POSSIBLE. IN CASE IT IS NOT POSSIBLE TO ADOPT THE ABOVE SAID PRACTICE, THE REINFORCEMENT SHALL BE PROPERLY ANCHORED INTO THE SUPPORTING MEMBER.
- 12) LAP / DEVELOPMENT LENGTH FOR MAIN REINFORCEMENT BARS (IN TENSION / COMPRESSION) FOR DIFFERENT GRADES OF CONCRETE MIX SHALL BE AS FOLLOWS:
- CONCRETE MIX F_y 500D (FOR ZONE-III STRUCTURES)
- M30 45d (TENSION) & 36d (COMP)
- WHERE d IS THE DIAMETER OF THE BAR.
- 13) WHERE OPENINGS ARE SMALL AND THE SLAB IS NOT SUBJECTED TO ANY SPECIAL TYPE LOADING OR VIBRATION CONDITIONS, THE FOLLOWING GENERAL DETAILING RULES MAY BE FOLLOWED AROUND OPENINGS.
- A) DIAMETER OF TRIMMER BARS SHALL BE SIMILAR TO BIGGER REINFORCING BARS OF THE STRUCTURE THROUGH WHICH THE OPENING IS FORMED.
- B) NO TRIMMER BARS ARE REQUIRED FOR OPENINGS LESS THAN 200MM WIDE. NO REINFORCING BARS SHALL BE CUT BUT THESE SHALL BE ADJUSTED IN POSITION TO AVOID OPENINGS.
- C) TRIMMER BARS SHALL BE NOT LESS THAN THE NOS. OF BARS CUT BY OPENING.
- D) MINIMUM 2 NOS. EACH AT TOP AND BOTTOM AND BAR DIAMETER AS SPECIFIED ABOVE BUT NOT LESS THAN 10φ.
- E) BOTH PERPENDICULAR AND DIAGONAL TRIMMING BARS SHALL BE PROVIDED AS SHOWN IN SKETCHES.
- 14) WHENEVER THE REINFORCEMENT IS PROJECTED FROM THE STRUCTURAL MEMBERS AS A PROVISION MADE TOWARDS FUTURE EXTENSION OF THE BUILDING THE SAME SHALL BE APPROPRIATELY PROTECTED FROM CORROSION BY TREATING WITH EPOXY AFTER COMPLETELY REMOVING SCALES OR RUST, IF ANY. THIS REINFORCEMENT MAY BE ENCASED IN A CONCRETE MIX OF 1:3:6 OR LEFT EXPOSED OR PROTECTED IN ANY OTHER MANNER AS DIRECTED BY ENGINEER-IN-CHARGE.
- 15) THE NOMINAL COVER GIVEN BELOW FOR MODERATE EXPOSURE CONDITION SHALL BE MEASURED FROM THE OUTER FACE OF THE STRUCTURAL ELEMENT TO THE STIRRUPS / LINKS.
- | | | | | | | | | | |
|-------|-------|-------|-------|------------|-------|------------|-------|------------|-------|
| RAFTS | —60MM | PILES | —50MM | STRIP BEAM | —75MM | FOOTINGS | —60MM | COLUMNS | —40MM |
| BEAMS | —25MM | SLABS | —25MM | WALLS | —25MM | TANK WALLS | —40MM | TANK BASES | —50MM |

- 1) THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DETAILS OF EXIT AND ENTRY OF PIPES THROUGH STRUCTURAL ELEMENTS
- 2) THESE POINTS ARE TO HAVE ADDITIONAL FUSION BONDED EPOXY COATED REINFORCEMENT PLACED AROUND THE PIPE.

- 1) IF THE LEVEL OF THE WATER TABLE OR ANY SEEPAGE IS FOUND TO BE WITHIN THE DEPTH OF EXCAVATION, THE SAME SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE.
- 2) 100MM THICK BLINDING CONCRETE OF GRADE M15 IS TO BE PLACED BELOW THE WATER TANKS BASE SLAB.
- 3) WATER BARS ARE TO BE INCORPORATED IN ALL VERTICAL AND HORIZONTAL JOINTS.
- 4) ALL WALL KICKERS SHALL BE CAST MONOLITHICALLY WITH THE BASE SLAB.

- 1) THESE ARE TO BE PROVIDED AT LOCATIONS OF ZERO OR MINIMUM SHEAR IN BEAMS AND SLABS AND AT LOCATIONS OF MINIMUM STEEL CONGESTION.
- 2) THESE ARE TO BE PERPENDICULAR TO THE COMPRESSIVE FORCES ACROSS THE JOINT. IN MOST CASES THE JOINTS WILL HAVE TO BE PERPENDICULAR TO THE AXIS OF THE MEMBER.
- 3) ALL REINFORCING BARS INTERSECTED BY THE CONSTRUCTION JOINTS ARE TO EXTEND THROUGH THE JOINTS WITHOUT INTERCEPTION.
- 4) VERTICAL JOINTS SHALL BE FORMED WITH TIMBER FORMWORK COATED WITH AN APPROVED SURFACE RETARDER AND THE VERTICAL FACE IS TO BE WASHED TO EXPOSE THE AGGREGATE BEFORE FINAL SET OF THE CONCRETE HAS TAKEN PLACE.
- 5) VERTICAL JOINTS SHALL BE CRACKED TO REMOVED ALL LATENCY AND WET CONCRETE BEFORE CONCRETE FOR THE NEXT LIFT IS PLACED. NECESSARY KEYS SHALL BE PROVIDED IN THE APPROVED METHODOLOGY AS REQUIRED BY THE ENGINEER-IN-CHARGE.
- 6) WATER/JET CLEANING AND FLUSHING THE JOINT WITH MORTAR OR GROUT ARE TO PRECEDE THE POURING OF FRESH CONCRETE.

1. ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED, NEITHER THE DRAWING SHALL BE SCALED OUT NOR THE BARS SHALL BE COUNTED.
3. ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THIS OFFICE BEFORE EXECUTION.
4. GRADE OF CONCRETE SHALL BE M35 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
5. GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO LATEST INDIAN STANDARDS
6. ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
7. THE NOMINAL COVER COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS:

PILE / FOOTING = 50MM	BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS	SLABS = 25MM

B. THE DEVELOPMENT LENGTH FOR TENSION		
	Fe-500d	
M30	Ld	45d
M35	Ld	40d

Where d is Diameter of rod

		Fe-500D	
M30	Ld	36d	Where d is Diameter of rod
M35	Ld	32d	

11. SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO:	DETAILS			DATE	DRAWN	CHECKED BY	APPROVED BY		
NOTE:	SYMBOL	DESCRIPTION							
		NGL	NATURAL GROUND LEVEL.						

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction

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PROOF-CHECKING AGENCY:

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INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
 MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
 IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
 THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP
DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL
BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA
TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN
R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER
CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A3	SHEET NO: 009	REV NO: R0
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DRAWING TITLE : GENERAL RCC NOTES

BLOCK NO: BLOCK A3	SCALE: NTS	SIZE OF SHEET: A
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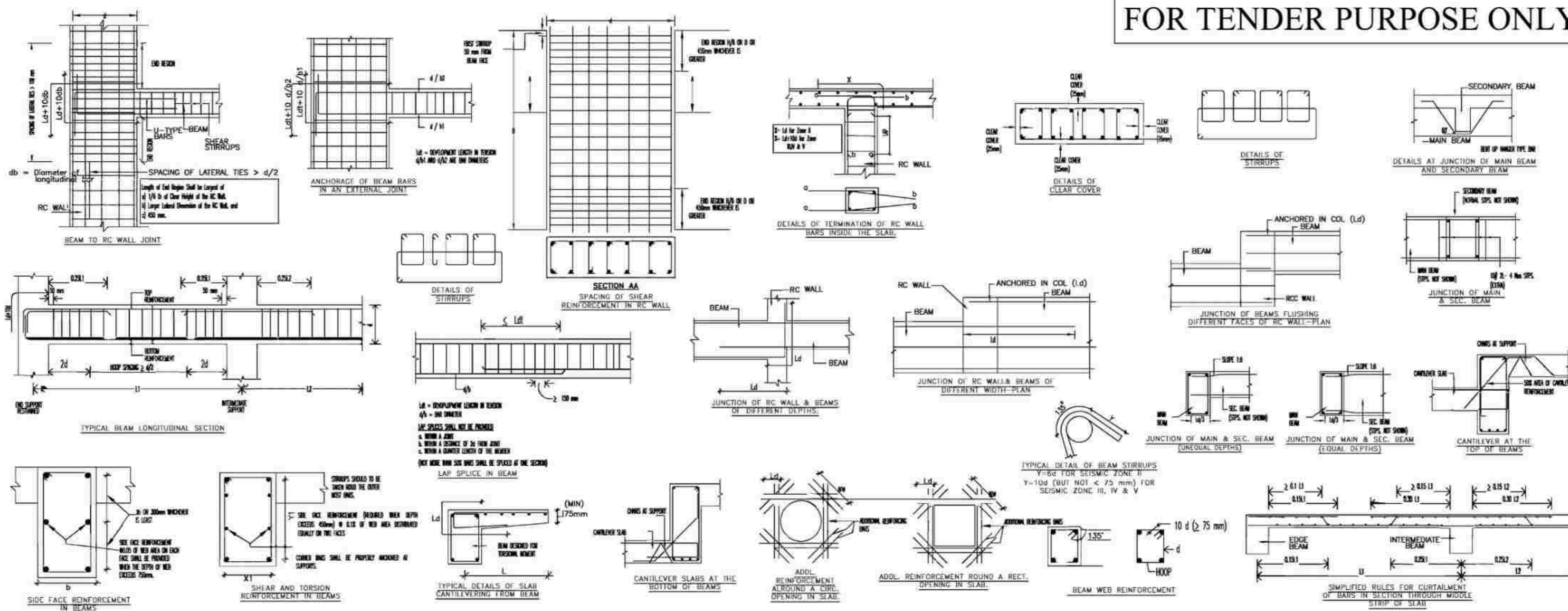
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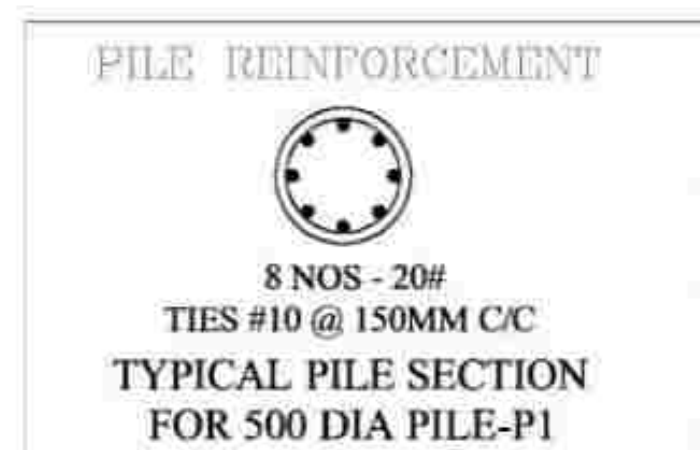
☒ PRELIMINARY	☒ TENDER	☐ INFORMATION	DATE OF ISSUE
☐ APPROVAL	☐ CONSTRUCTION		08-11-2022

DESIGNED BY:	DRAWN BY:
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CHECKED BY:	APPROVED BY:
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NOTE: ALL DIMENSION ARE IN mm





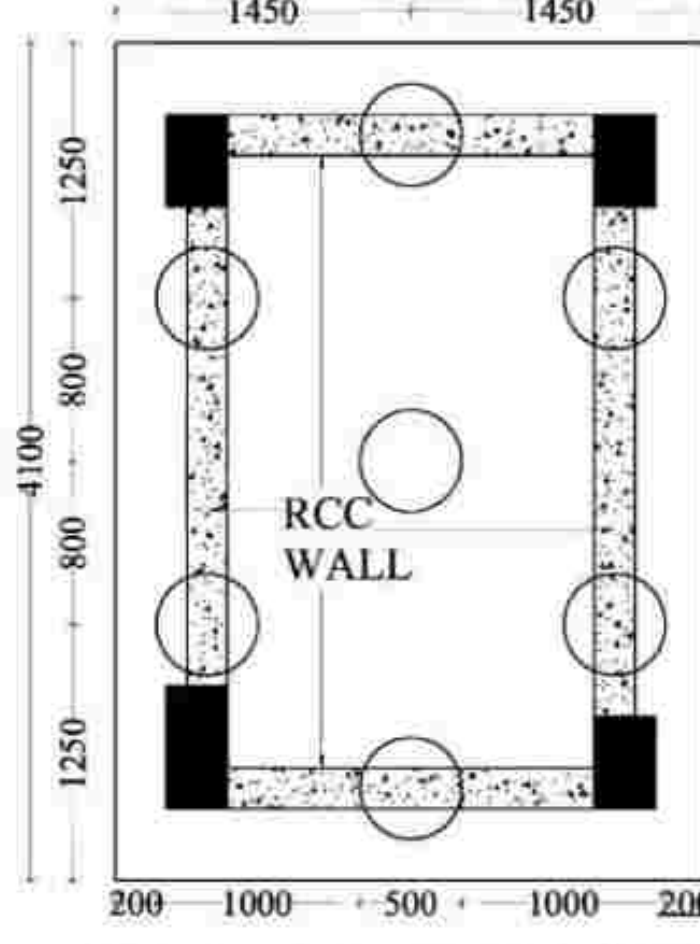
8 NOS - 20#
TIES #10 @ 150MM C/C
TYPICAL PILE SECTION
FOR 500 DIA PILE-P1

Note: 16mm dia bar Binding of Every 2.5m center to center of pile for Installation Process

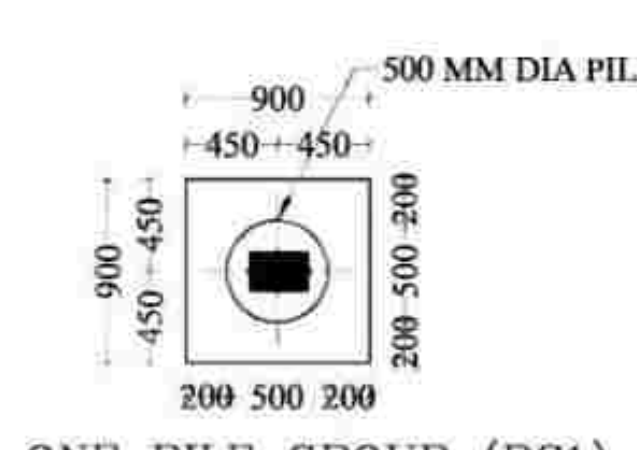


10 NOS - 20#
TIES #10 @ 150MM C/C
TYPICAL PILE SECTION
FOR 600 DIA PILE-P2

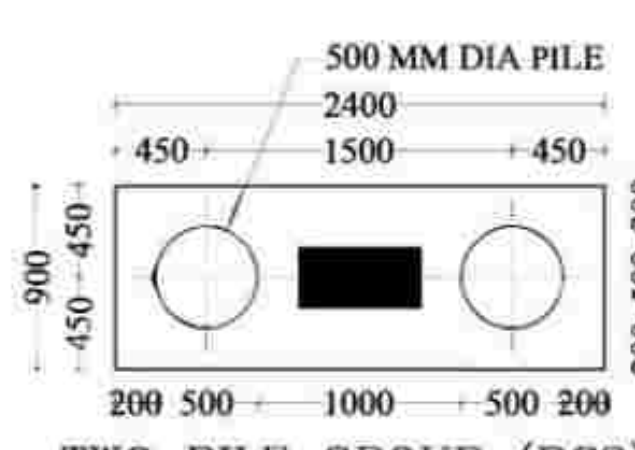
Note: 16mm dia bar Binding of Every 2.5m center to center of pile for Installation Process



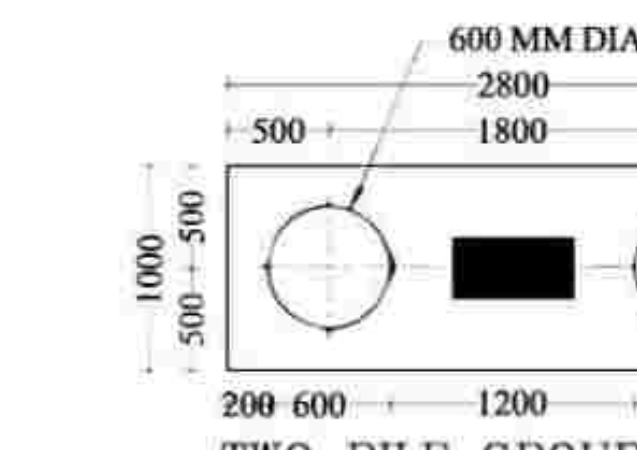
SEVEN PILE GROUP (PC4)
SCALE 1:3



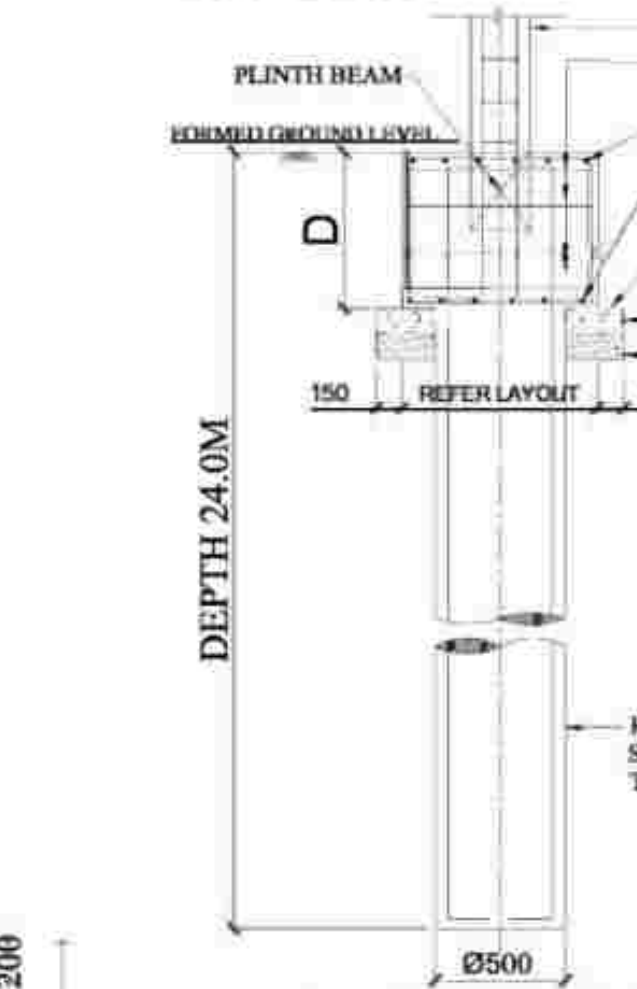
ONE PILE GROUP (PC1)
SCALE 1:3



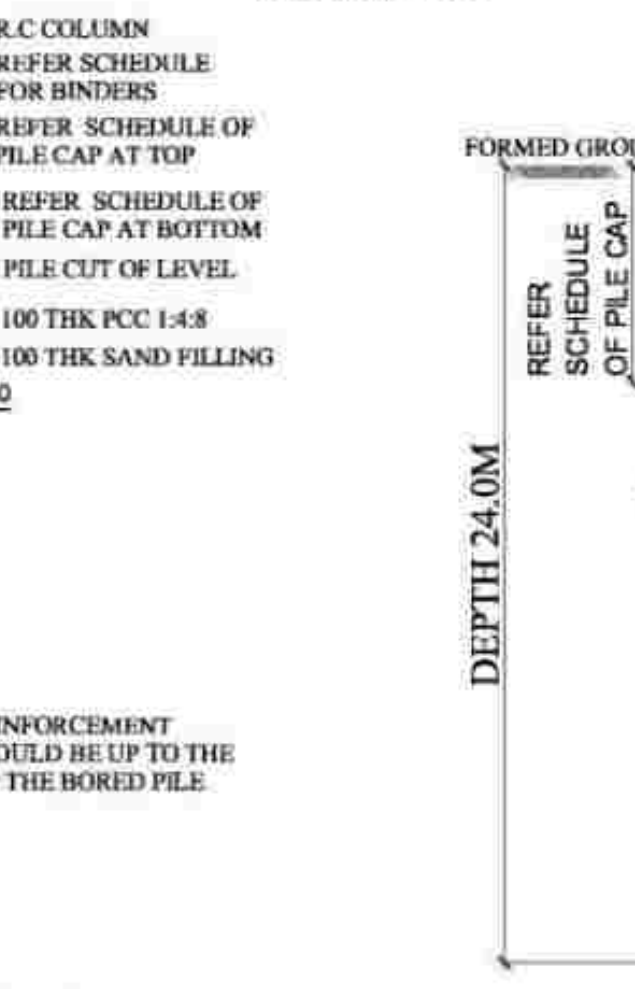
TWO PILE GROUP (PC2)
SCALE 1:3



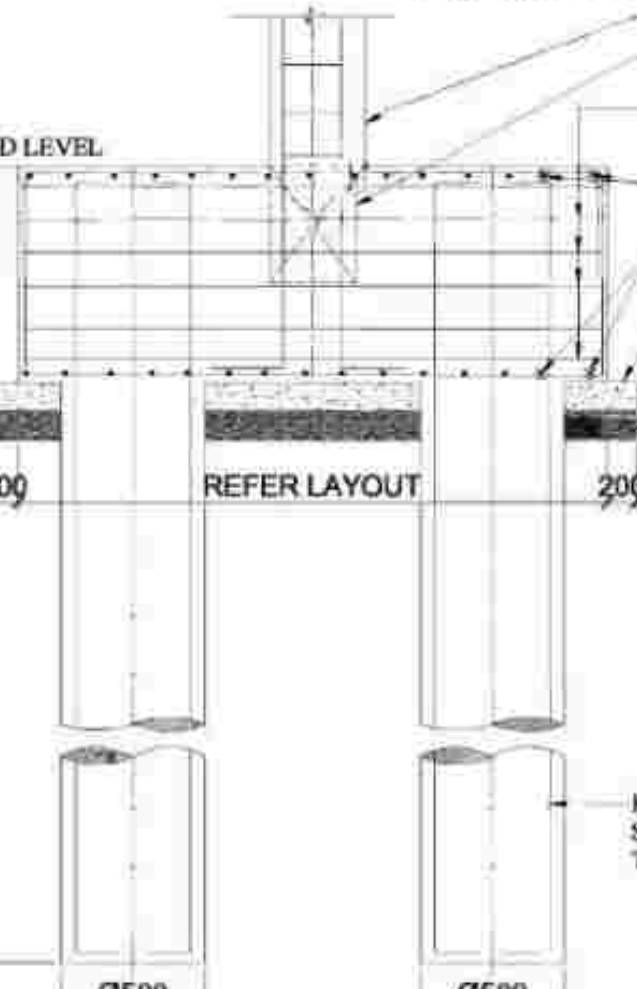
TWO PILE GROUP (PC3)
SCALE 1:3



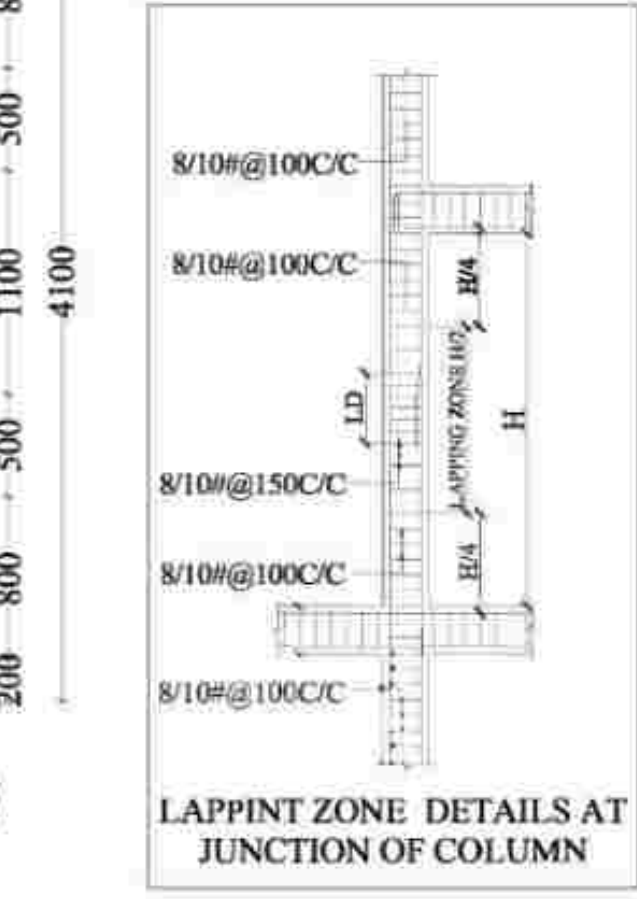
TYPICAL SECTION FOR SINGLE PILE
WITH PILE CAP PC1



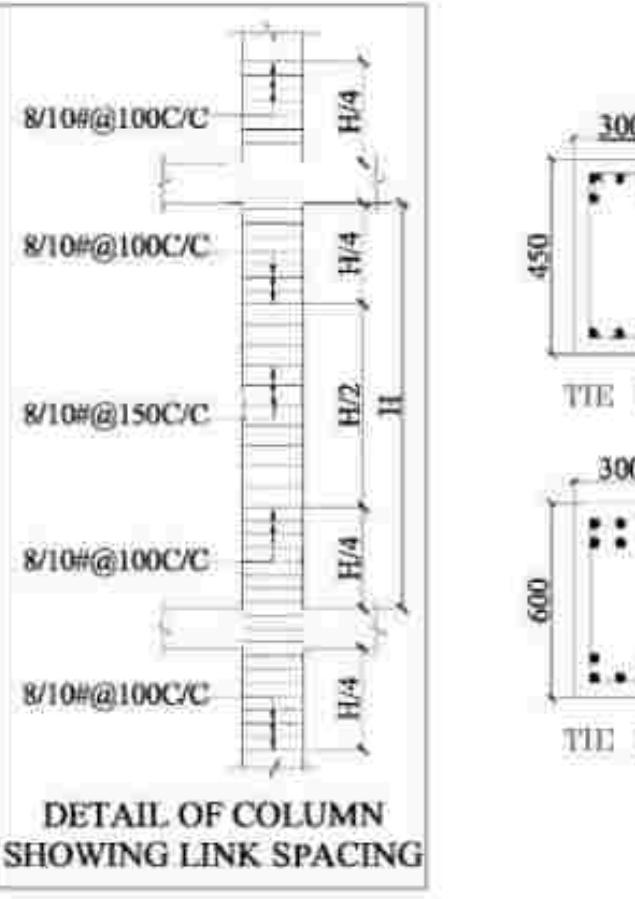
TYPICAL SECTION FOR TWO PILE WITH PILE CAP (PC2)



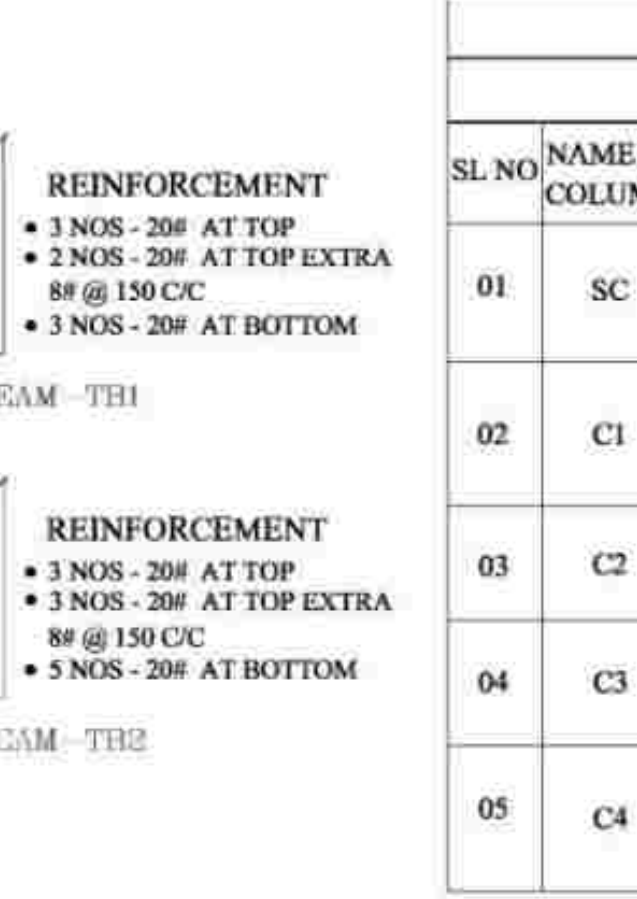
TYPICAL SECTION FOR TWO PILE WITH PILE CAP (PC3)



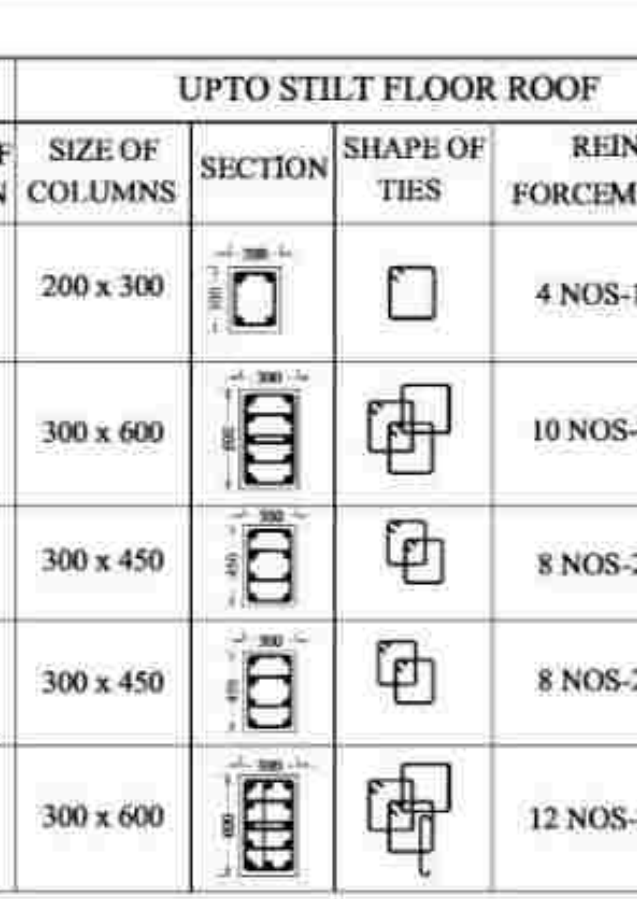
LAP ZONE DETAILS AT
JUNCTION OF COLUMN



DETAIL OF COLUMN
SHOWING LINK SPACING

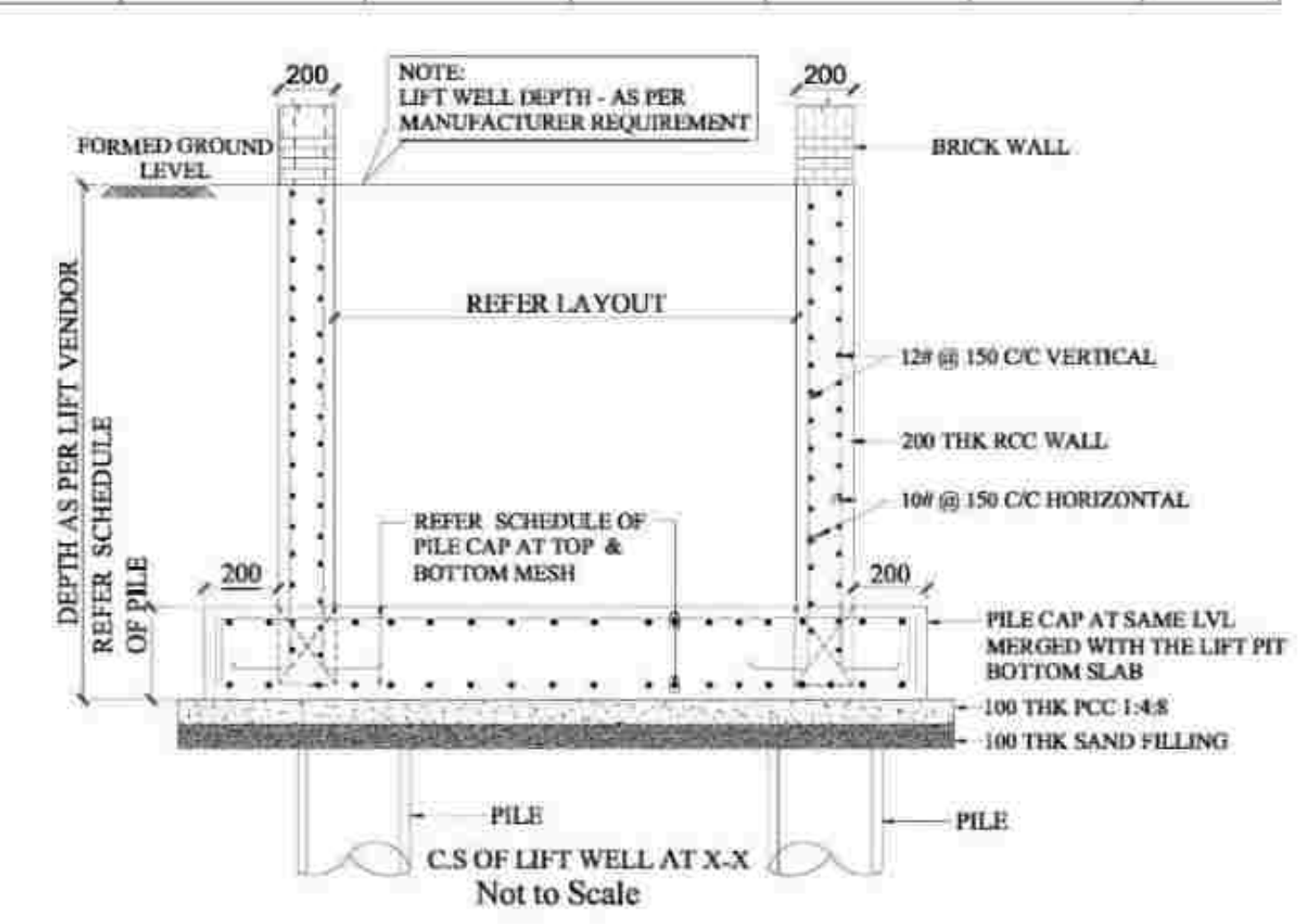


TIE BEAM - TB1



TIE BEAM - TB2

SCHEDULE OF PILE CAP							
NAME PILE CAP	PILE CAP SIZE	PILE CAP THICKNESS	BOTTOM R/F	TOP R/F	BINDER	PILE DIA	REMARKS
PC1	900 X 900	600	16# @ 150 C/C	16# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	ONE PILE
PC2	900 X 2400	750	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	TWO PILE
PC3	1000 X 2800	750	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	600 DIA PILE	TWO PILE
PC4	2900 X 4100	900	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	SEVEN PILE

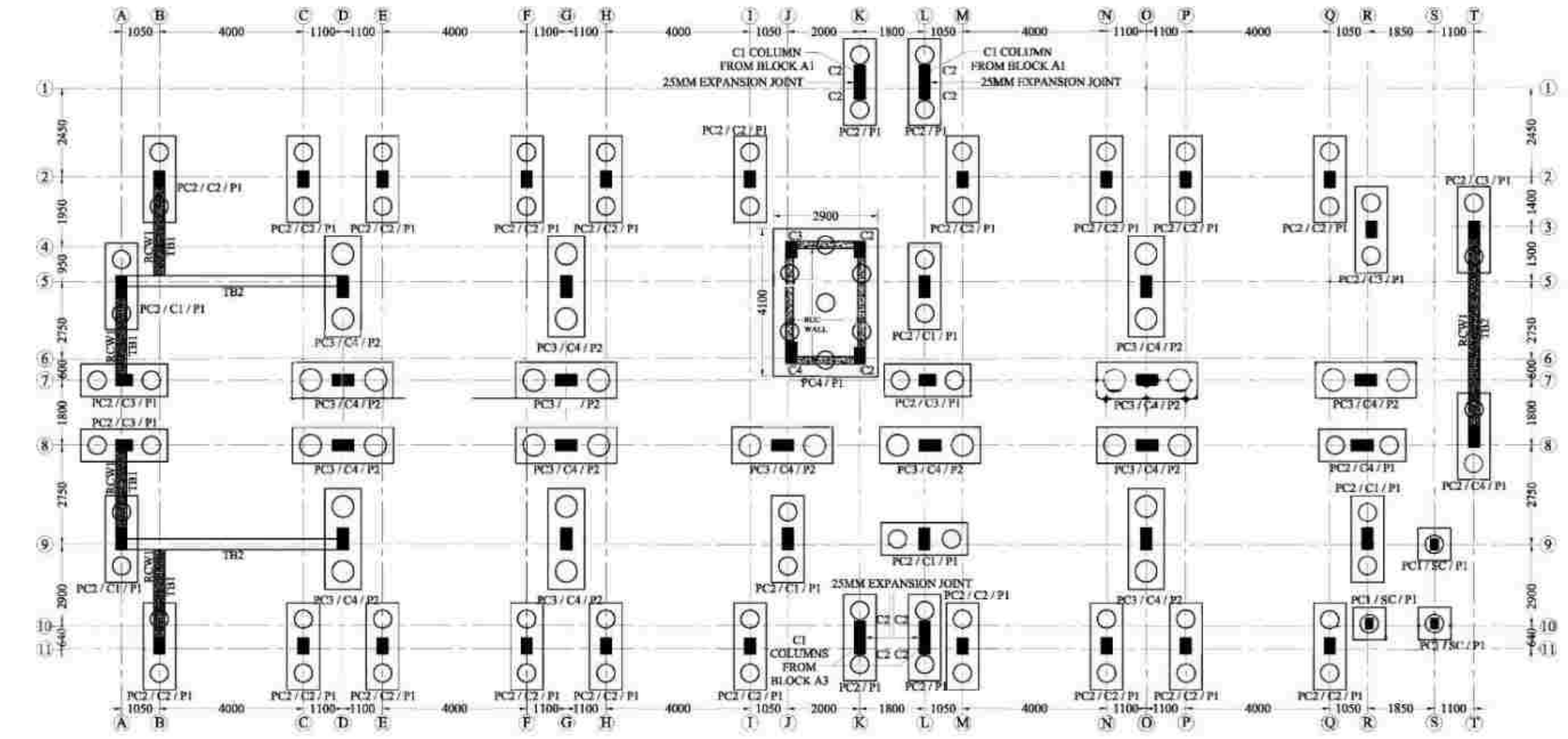


PILE FOUNDATION LAYOUT FOR BLOCK A2

SCHEDULE OF RCC COLUMNS									
UPTO STILT FLOOR ROOF					STILT FLOOR ROOF TO TERRACE				
SL NO	NAME OF COLUMN	SIZE OF COLUMNS	SECTION	SHAPE OF TIES	REIN- FORCEMENT	SIZE OF COLUMNS	SECTION	SHAPE OF TIES	REIN- FORCEMENT
01	SC	200 x 300			4 NOS-16#	---	---	---	---
02	C1	300 x 600			10 NOS-25#	250 x 600			10 NOS-25#
03	C2	300 x 450			8 NOS-20#	---	---	---	---
04	C3	300 x 450			8 NOS-25#	---	---	---	---
05	C4	300 x 600			12 NOS-25#	---	---	---	---

SCHEDULE OF RCC WALL					
S NO	NAME OF WALL	SIZE Lx X Lz	WALL THICKNESS	REINFORCEMENT	REMARKS
01	RCW1	REFER PLAN	200	VERTICAL DIRECTION 10# @ 150 C/C (INNER) 10# @ 150 C/C (OUTER)	HORIZONTAL DIRECTION 8# @ 150 C/C (INNER) 8# @ 150 C/C (OUTER)

FOR TENDER PURPOSE ONLY



PILE FOUNDATION LAYOUT FOR BLOCK A2

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NOTES:

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3. ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THIS OFFICE BEFORE EXECUTION.
4. GRADE OF CONCRETE SHALL BE M35 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
5. GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO LATEST INDIAN STANDARDS
6. ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
7. THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS
PILE / FOOTING = 50MM BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS SLABS = 25MM
8. THE DEVELOPMENT LENGTH FOR TENSION
M30 Ld 45d Where d is Diameter of rod
M35 Ld 40d
9. THE DEVELOPMENT LENGTH FOR COMPRESSION
M30 Ld 36d Where d is Diameter of rod
M35 Ld 32d
10. STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
11. SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

Dr. P. Nallathambi
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STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA. TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A2 SHEET NO: 001 REV NO: R0

DRAWING TITLE :
PILE FOUNDATION LAYOUT & SECTION DETAILS FOR BLOCK A2

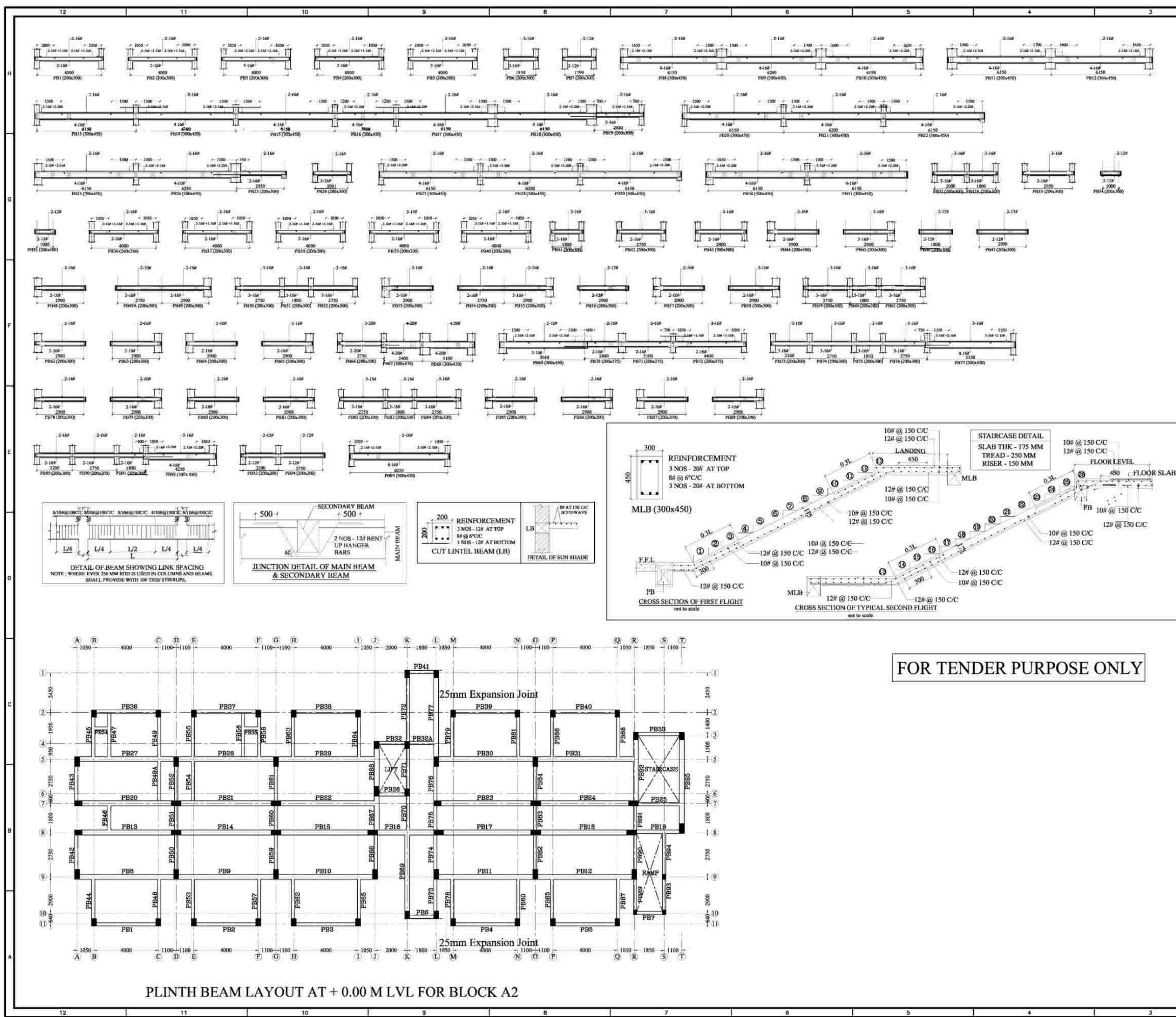
BLOCK NO: BLOCK A2 SCALE: NTS SIZE OF SHEET: A1

ISSUED FOR:
☒ PRELIMINARY ☒ TENDER ☐ INFORMATION DATE OF ISSUE: 08-11-2022
☐ APPROVAL ☐ CONSTRUCTION

DESIGNED BY: DRAWN BY:

CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm



PLINTH BEAM LAYOUT AT + 0.00 M LVL FOR BLOCK A2

NOTES:

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- ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
- THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS
PILE / FOOTING = 50MM BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION

	Fe-500D	
M30	Ld	45d
M35	Ld	40d

Where d is Diameter of rod
- THE DEVELOPMENT LENGTH FOR COMPRESSION

	Fe-500D	
M30	Ld	36d
M35	Ld	32d

Where d is Diameter of rod
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 800mm DIA PILE IS 1400 kN

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				
	DESCRIPTION				

NOTE: NGL NATURAL GROUND LEVEL

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
TAMIL NADU URBAN HABITAT
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MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+3 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3780 PL IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDBHN/BLOCK A2	SHEET NO: 002	REV NO: R0
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DRAWING TITLE :
PLINTH BEAM LAYOUT & SECTION DETAILS FOR BLOCK A2

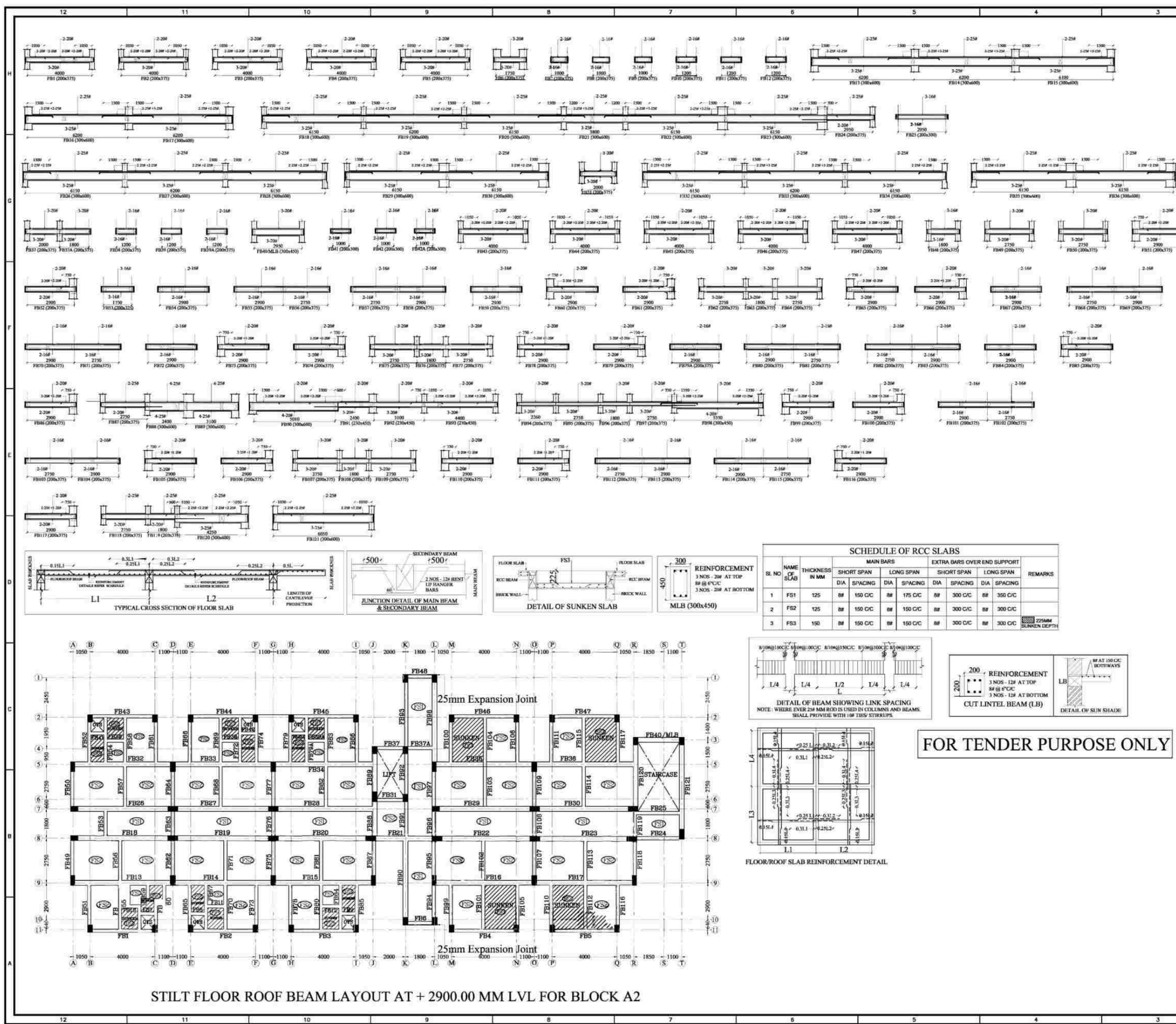
BLOCK NO: BLOCK A2	SCALE: NTS	SIZE OF SHEET: A1
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ISSUED FOR:

☒ PRELIMINARY ☐ APPROVAL	☒ TENDER ☐ CONSTRUCTION	☐ INFORMATION	DATE OF ISSUE 08-11-2022
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DESIGNED BY:	DRAWN BY:
CHECKED BY:	APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm



STILT FLOOR ROOF BEAM LAYOUT AT + 2900.00 MM LVL FOR BLOCK A2

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RC WALLS = 25MM TO LINKS SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION

	Fe-500
M30	Ld
M35	Ld

Where d is Diameter of rod
- THE DEVELOPMENT LENGTH FOR COMPRESSION

	Fe-500
M30	Ld
M35	Ld

Where d is Diameter of rod
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				

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T. N. S. S.
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Chartered Engineer (E-117029-1)

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PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

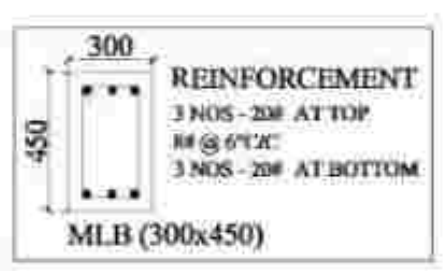
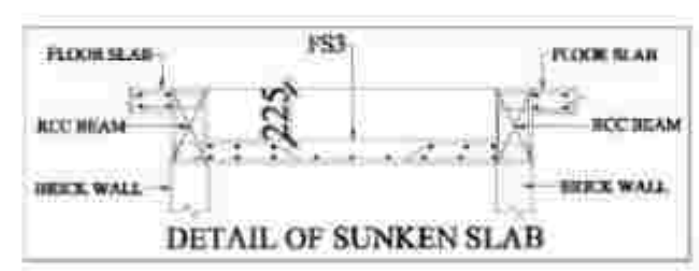
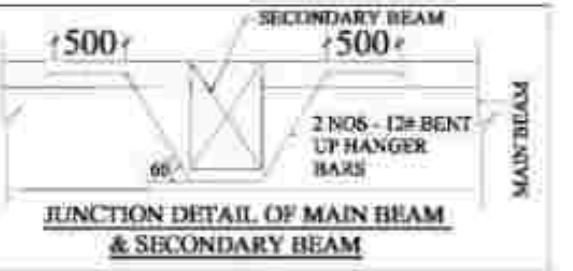
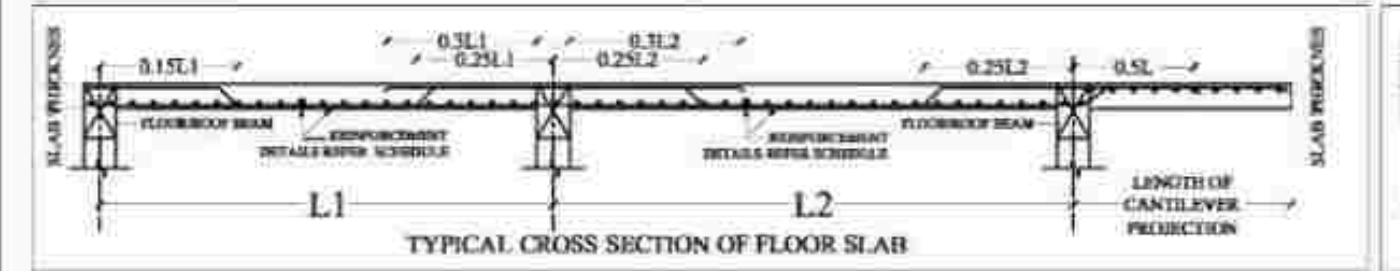
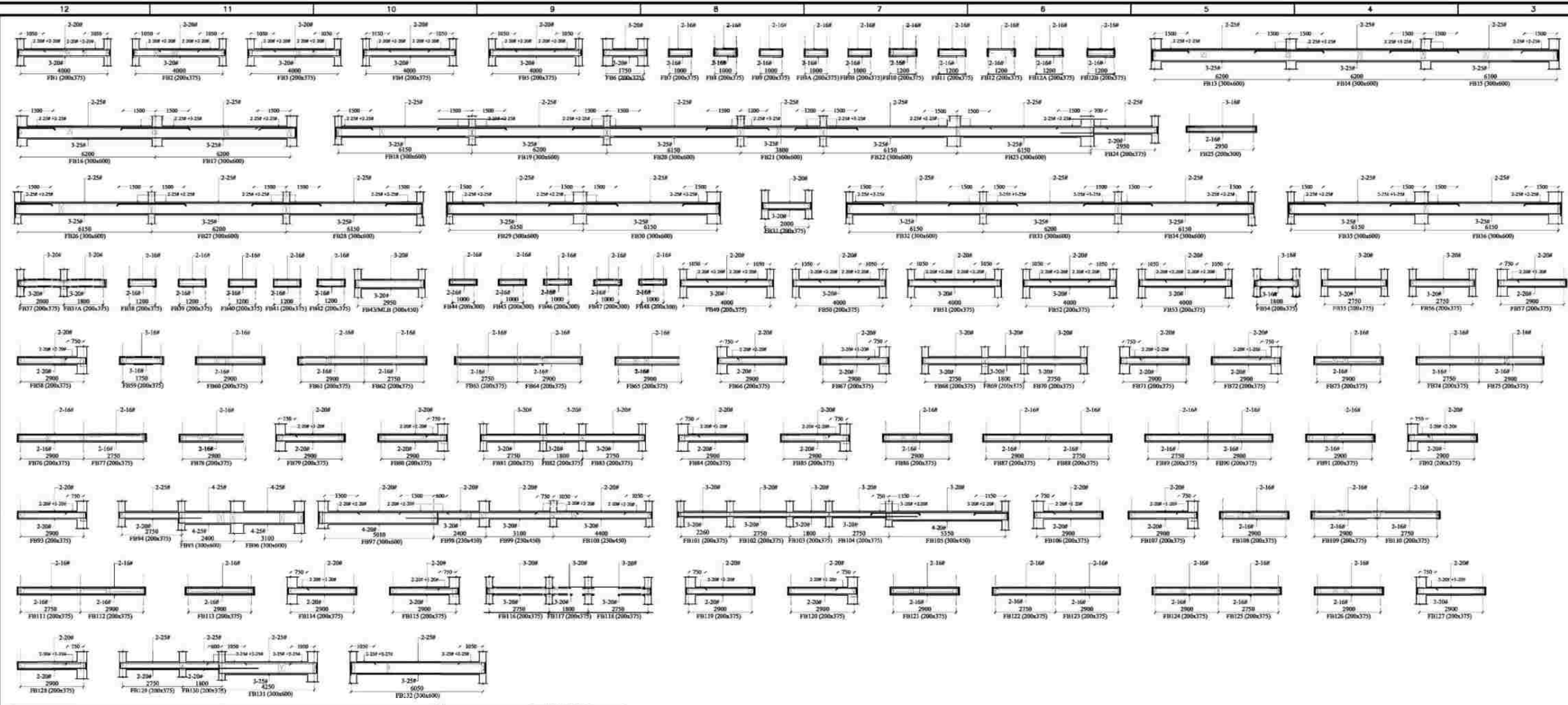
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MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

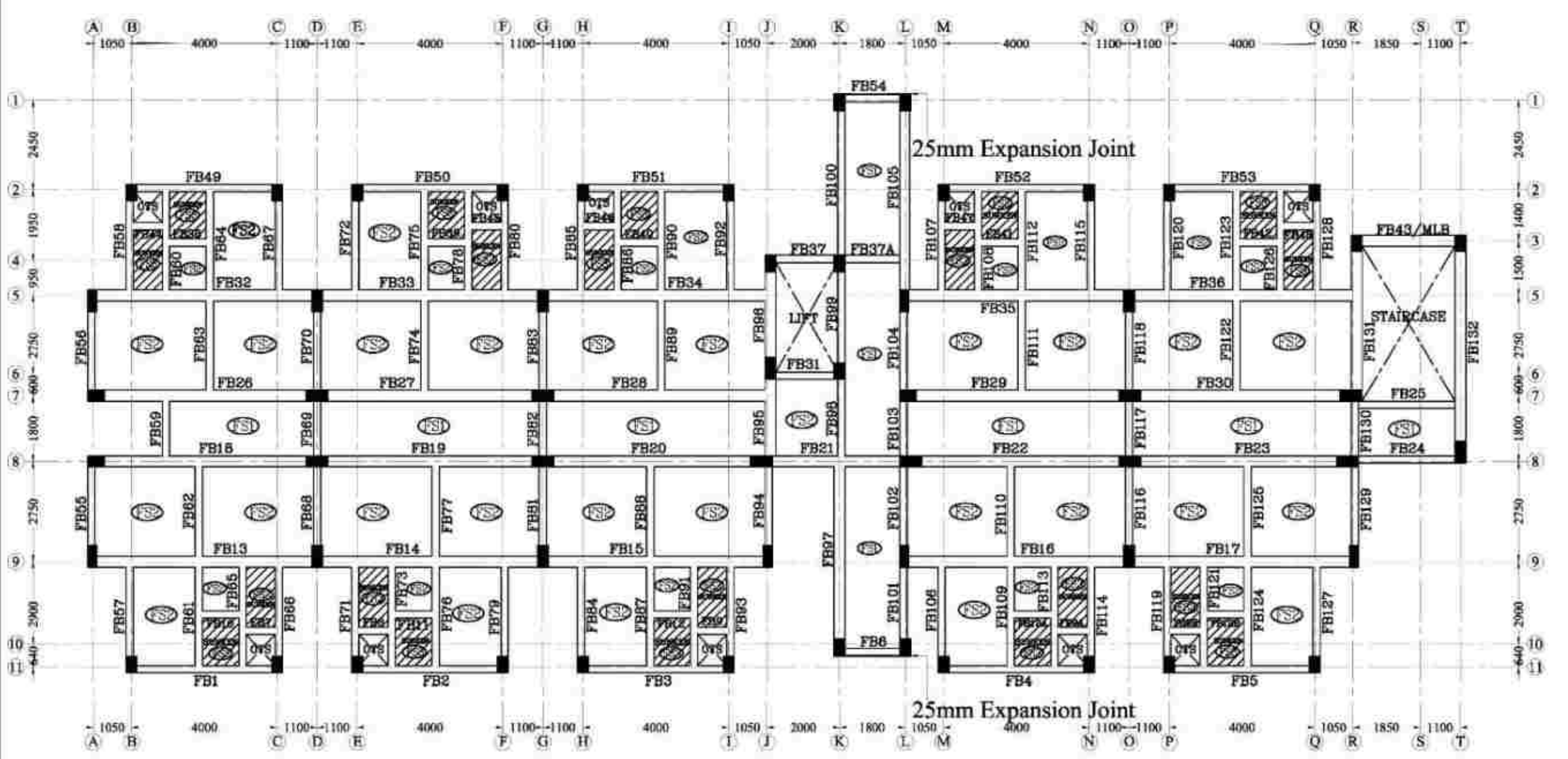
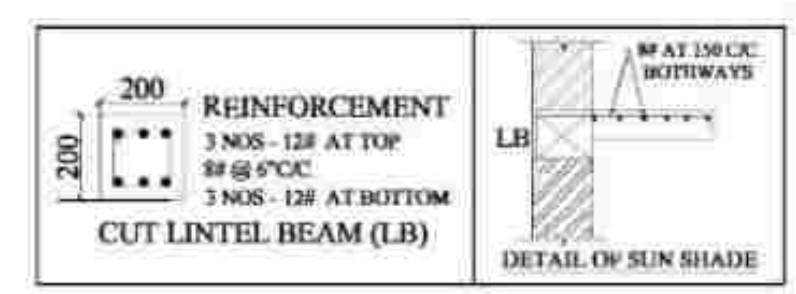
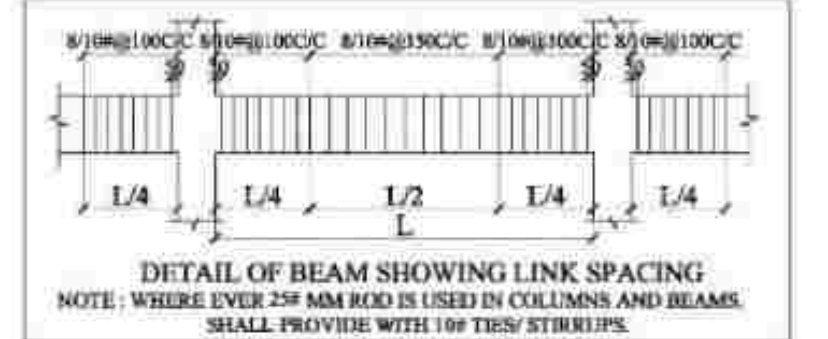
PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCK OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 369 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A2	SHEET NO: 003	REV NO: R0
DRAWING TITLE : STILT FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A2		
BLOCK NO: BLOCK A2	SCALE: NTS	SIZE OF SHEET: A1
ISSUED FOR:		
☒ PRELIMINARY	☒ TENDER	☐ INFORMATION
☐ APPROVAL	☐ CONSTRUCTION	DATE OF ISSUE 08-11-2022
DESIGNED BY:	DRAWN BY:	
CHECKED BY:	APPROVED BY:	

NOTE: ALL DIMENSION ARE IN mm



SCHEDULE OF RCC SLABS									
SL NO	NAME OF SLAB	MAIN BARS				EXTRA BARS OVER END SUPPORT			
		THICKNESS IN MM	SHORT SPAN	LONG SPAN	THICKNESS IN MM	SHORT SPAN	LONG SPAN	THICKNESS IN MM	REMARKS
			DIA	SPACING	DIA	SPACING	DIA	SPACING	
1	FS1	125	8#	150 C/C	8#	175 C/C	8#	300 C/C	8#
2	FS2	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#
3	FS3	150	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#



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5. GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO LATEST INDIAN STANDARDS.
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7. THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS
PILE / FOOTING = 50MM BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS SLABS = 25MM
8. THE DEVELOPMENT LENGTH FOR TENSION
M30 $L_d = 45d$ Where d is Diameter of rod
M35 $L_d = 40d$
9. THE DEVELOPMENT LENGTH FOR COMPRESSION
M30 $L_d = 36d$ Where d is Diameter of rod
M35 $L_d = 32d$
10. STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING.
11. SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL			BY	BY

NOTE: NGL NATURAL GROUND LEVEL

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been prepared by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
TAMIL NADU URBAN HABITAT
DEVELOPMENT BOARD (TNUHDB)
NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A2 SHEET NO: 004 REV NO: R0

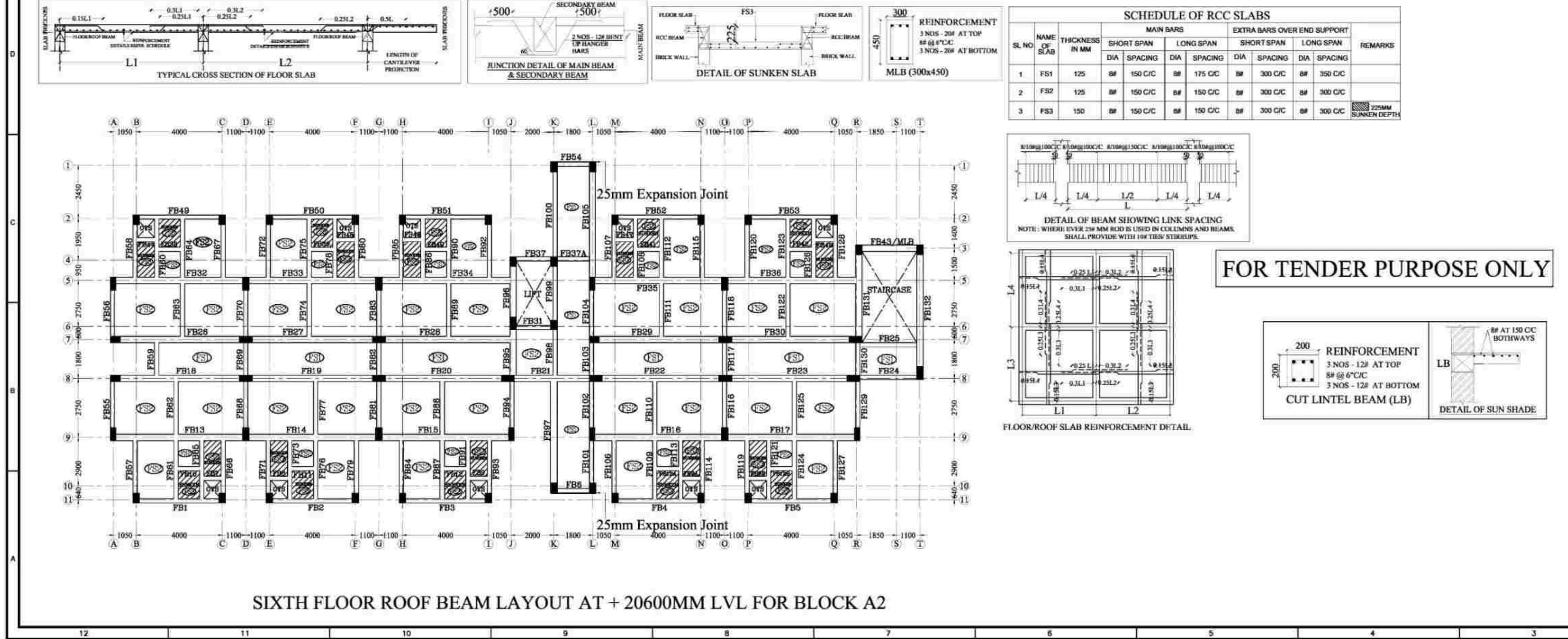
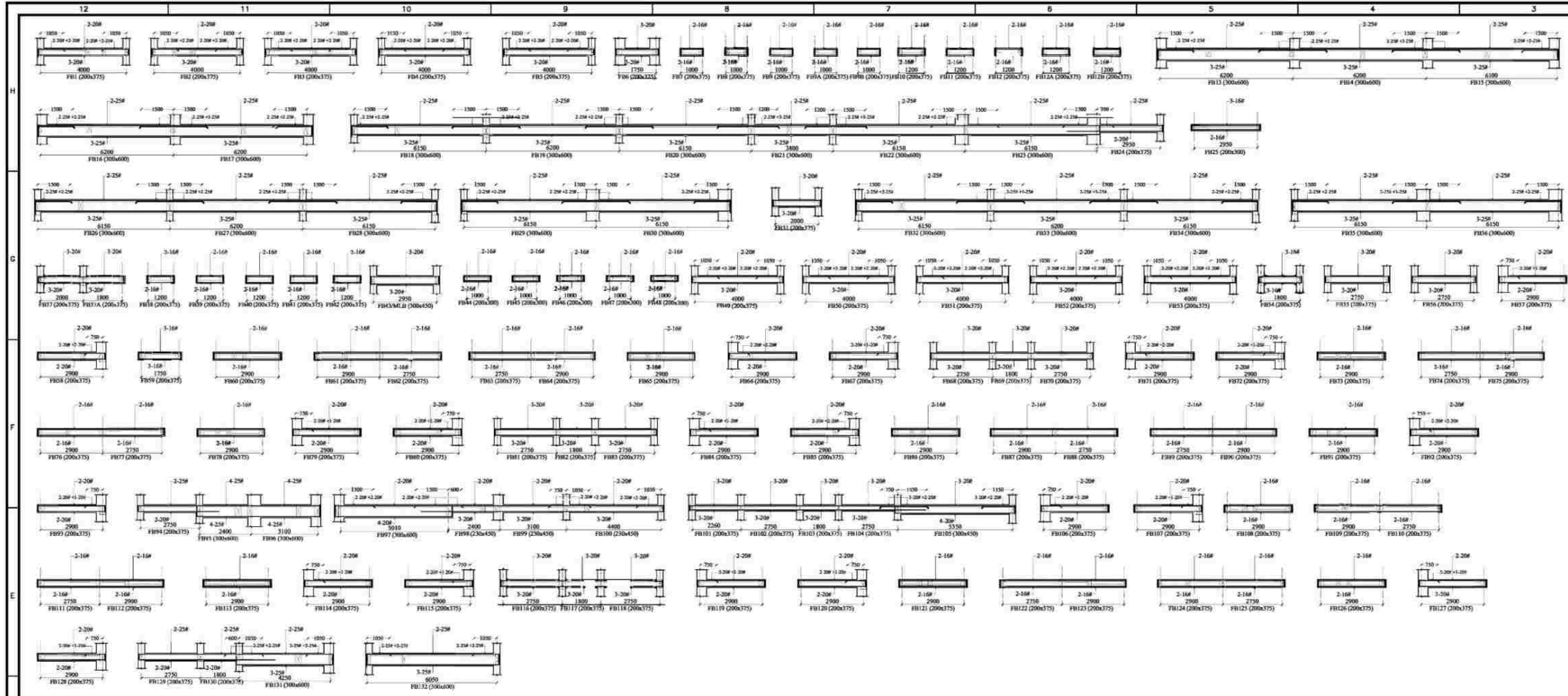
DRAWING TITLE:
TYPICAL FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A2

BLOCK NO: BLOCK A2 SCALE: NTS SIZE OF SHEET: A1

ISSUED FOR:
☒ PRELIMINARY ☒ TENDER ☐ INFORMATION DATE OF ISSUE: 08-11-2022
☐ APPROVAL ☐ CONSTRUCTION

DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm



SIXTH FLOOR ROOF BEAM LAYOUT AT +20600MM LVL FOR BLOCK A2

NOTES:

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PILE / FOOTING = 50MM BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS SLABS = 25MM
8. THE DEVELOPMENT LENGTH FOR TENSION

	Fe-500
M30	Ld 45d
M35	Ld 40d

Where d is Diameter of rod
9. THE DEVELOPMENT LENGTH FOR COMPRESSION

	Fe-500
M30	Ld 36d
M35	Ld 32d

Where d is Diameter of rod
10. STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
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NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS &
ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP
DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL
BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA
TOTALY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN
R.S.NO.3760 PL IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER
CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDBHN/BLOCK A2 **SHEET NO:** 005 **REV NO:** R0

DRAWING TITLE :
SIXTH FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A2

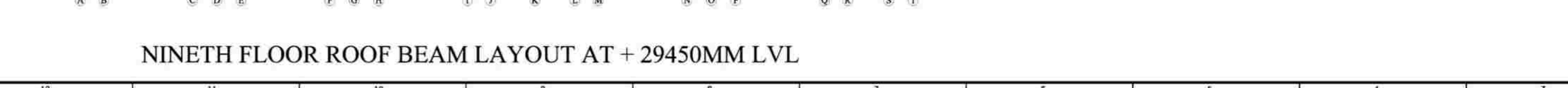
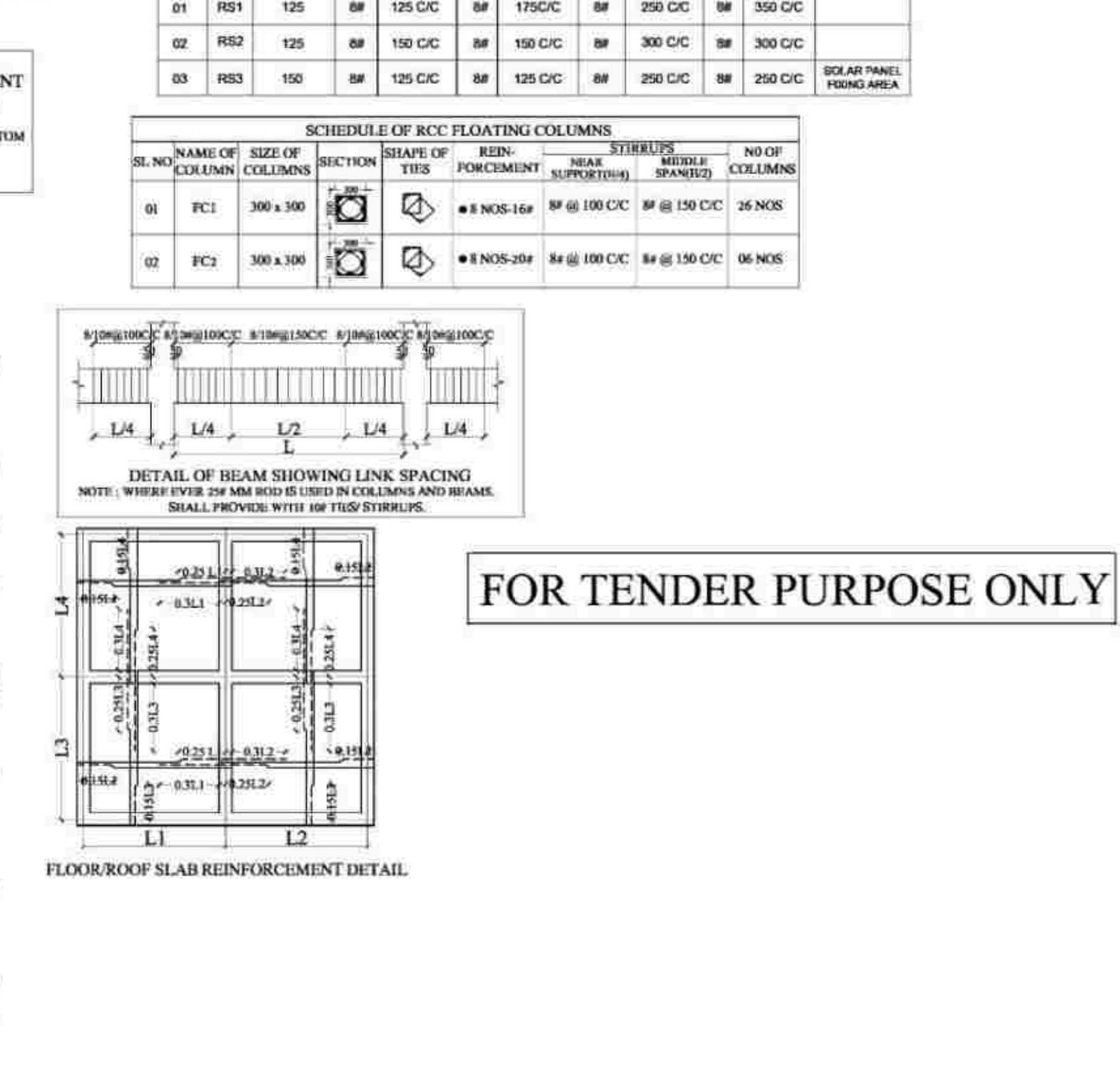
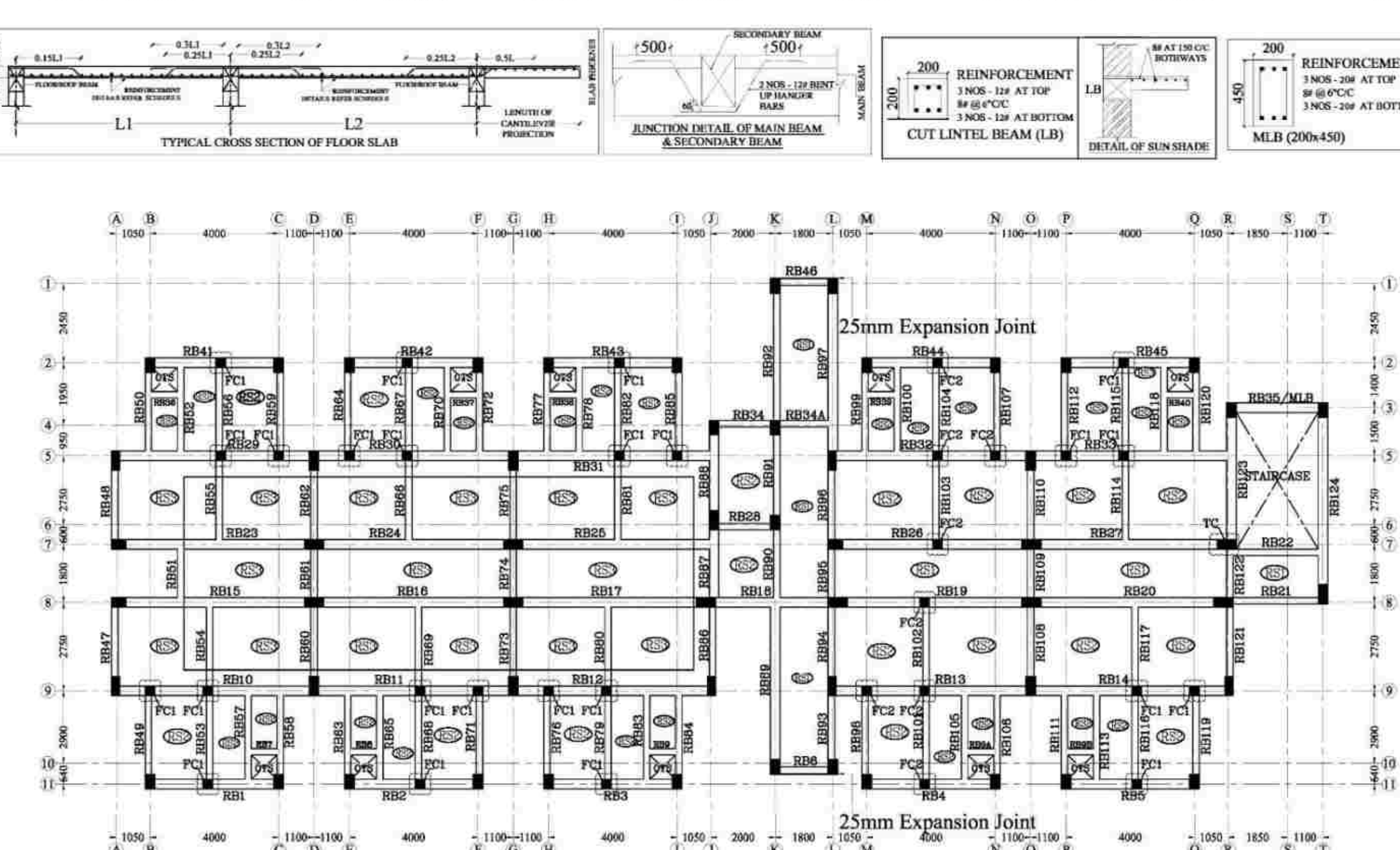
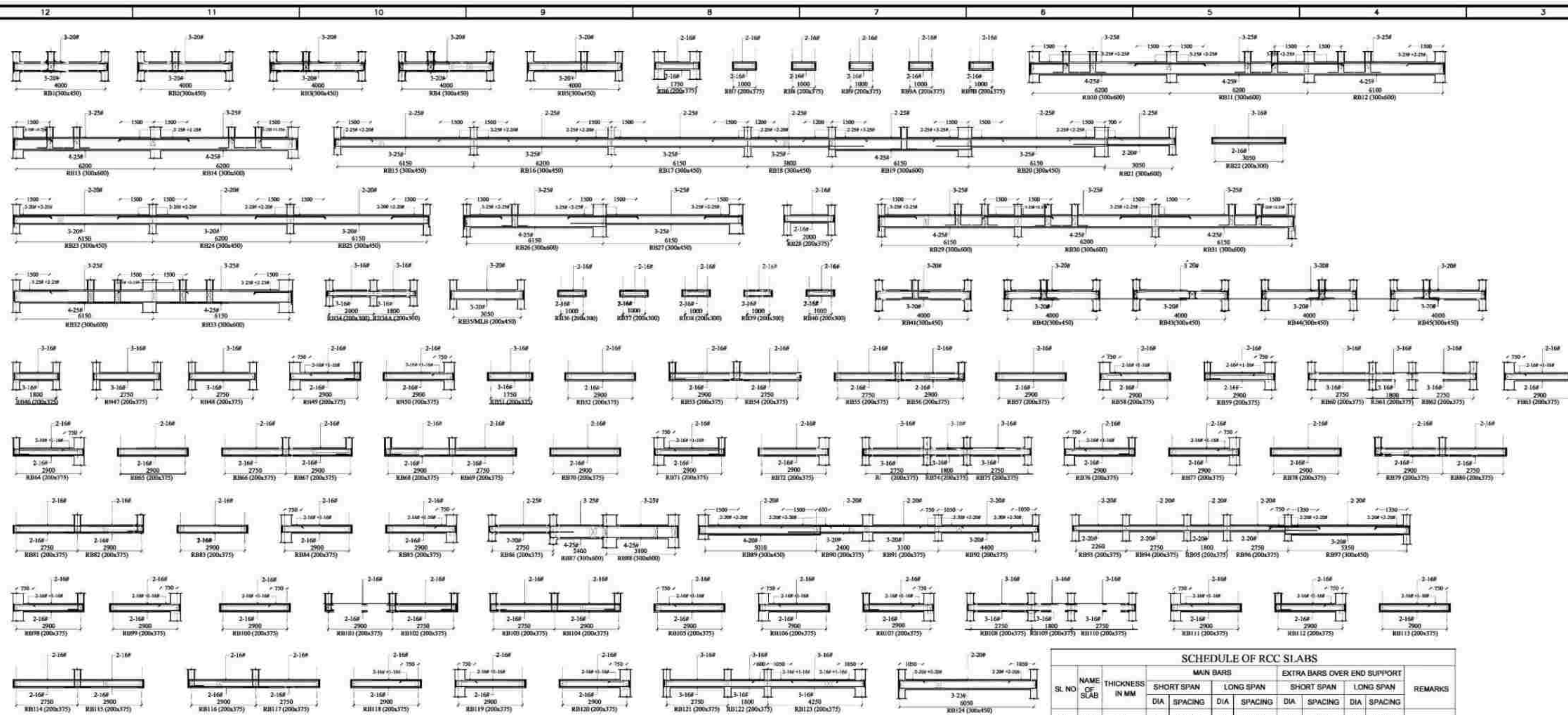
BLOCK NO: BLOCK A2 **SCALE:** NTS **SIZE OF SHEET:** A1

ISSUED FOR:
☒ PRELIMINARY ☒ TENDER ☐ INFORMATION
☐ APPROVAL ☐ CONSTRUCTION

DESIGNED BY: **DRAWN BY:** **DATE OF ISSUE:** 08-11-2022

CHECKED BY: **APPROVED BY:**

NOTE: ALL DIMENSION ARE IN mm



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REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED
1	SYMBOL				
2	DESCRIPTION				

NOTE: NGL NATURAL GROUND LEVEL

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TOTAL L.S.

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IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP
DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+5 FLOOR RESIDENTIAL
BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA
TOTALY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN
R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER
CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XL

DRAWING NO: TNUHDB/BHN/BLOCK A2	SHEET NO: 006	REV NO: R0
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DRAWING TITLE :
TERRACE FLOOR BEAM LAYOUT & SECTION DETAILS FOR BLOCK A2

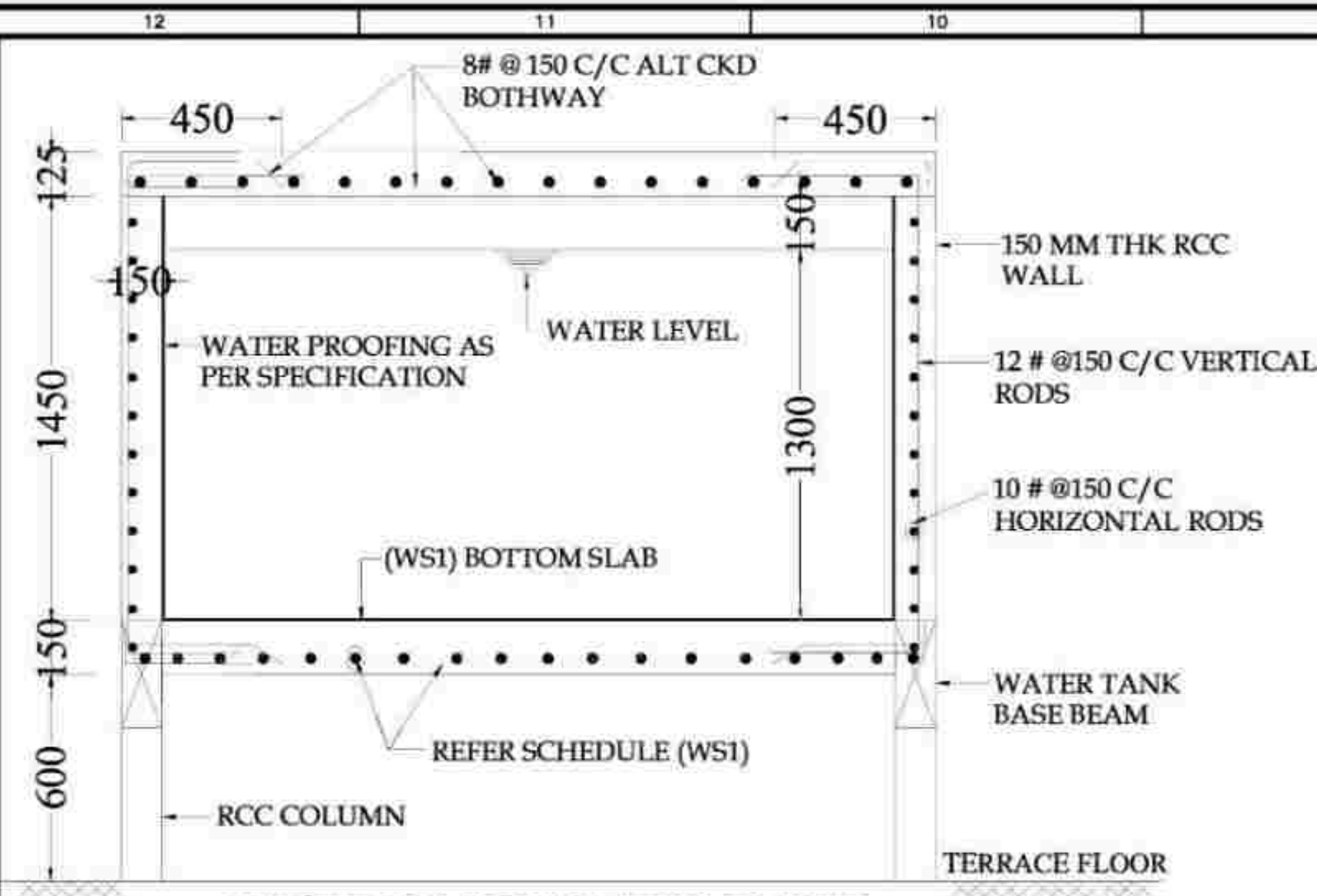
BLOCK NO: BLOCK A2	SCALE: NTS	SIZE OF SHEET: A1
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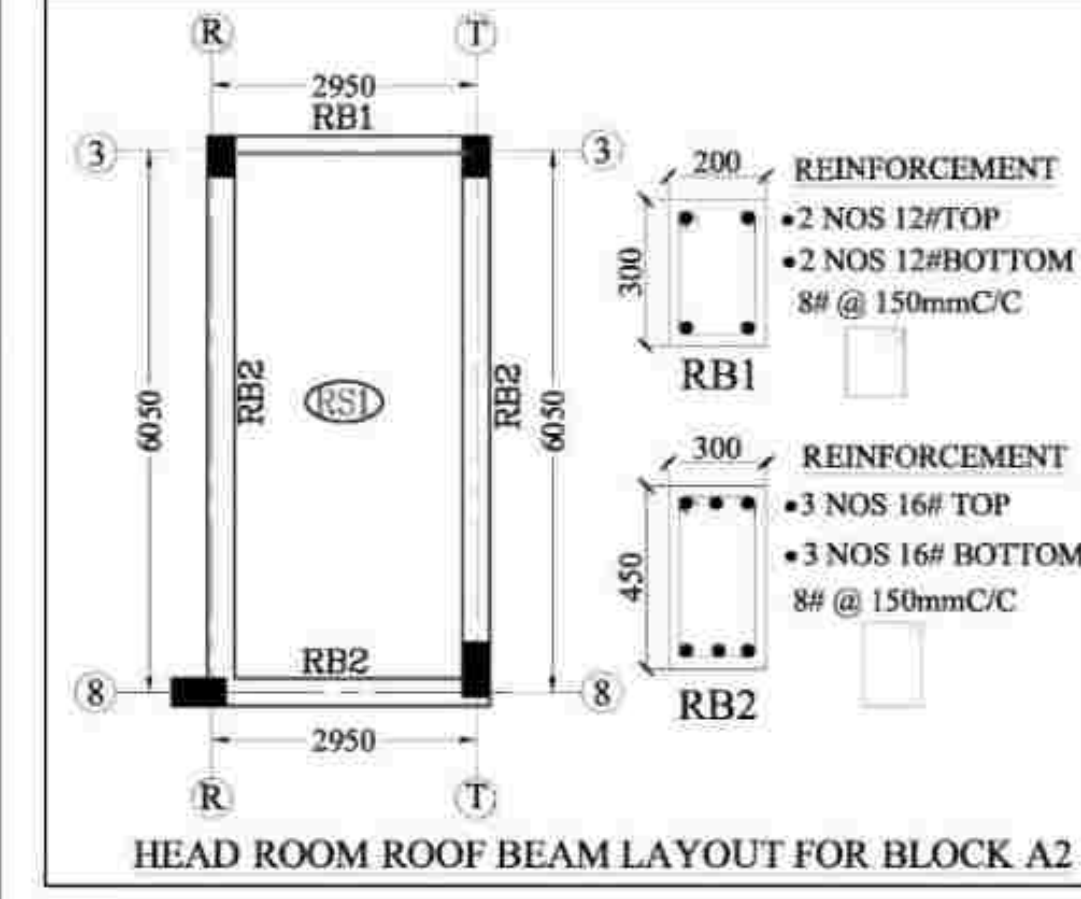
☒ PRELIMINARY	☒ TENDER	☐ INFORMATION
☐ APPROVAL	☐ CONSTRUCTION	

DESIGNED BY:	DRAWN BY:
CHECKED BY:	APPROVED BY:

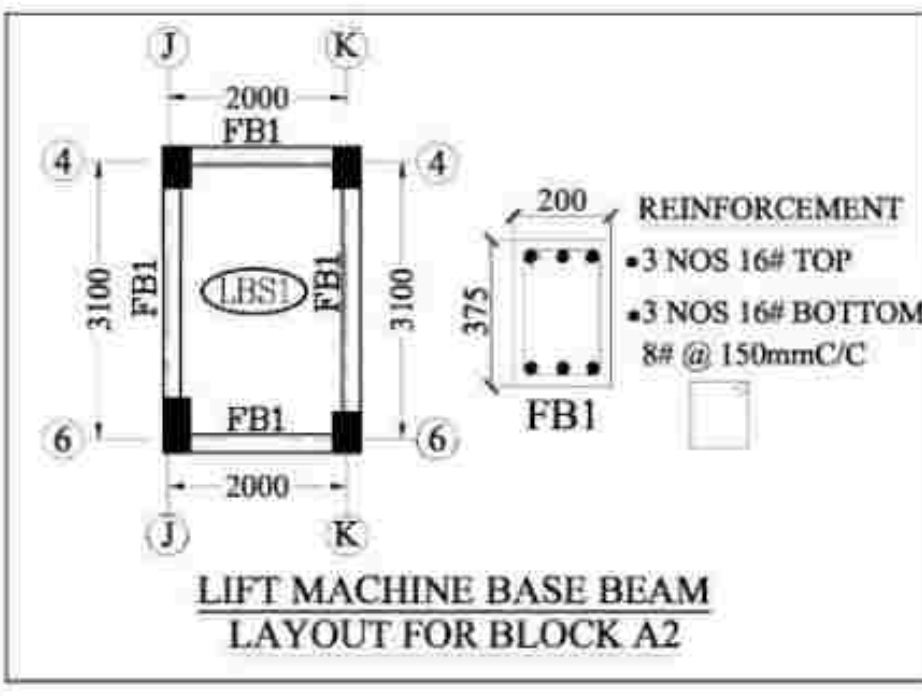
NOTE: ALL DIMENSION ARE IN mm



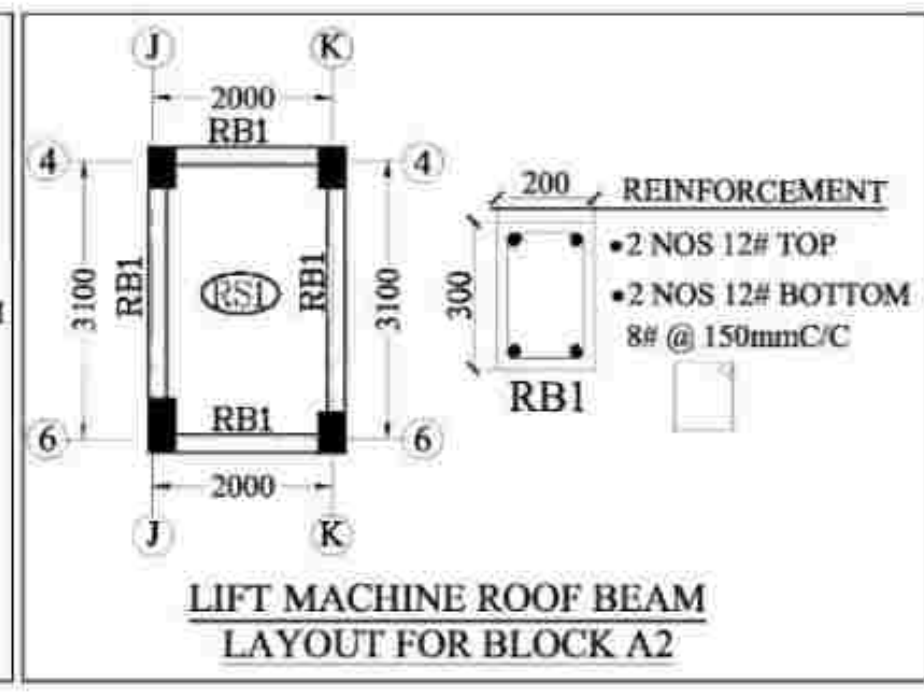
SECTION OF WATER TANK



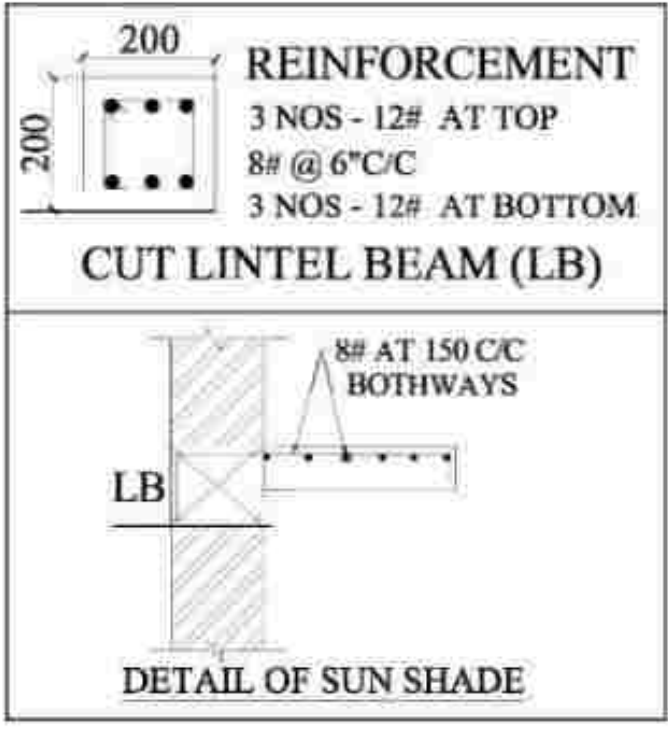
HEAD ROOM ROOF BEAM LAYOUT FOR BLOCK A2



LIFT MACHINE BASE BEAM LAYOUT FOR BLOCK A2



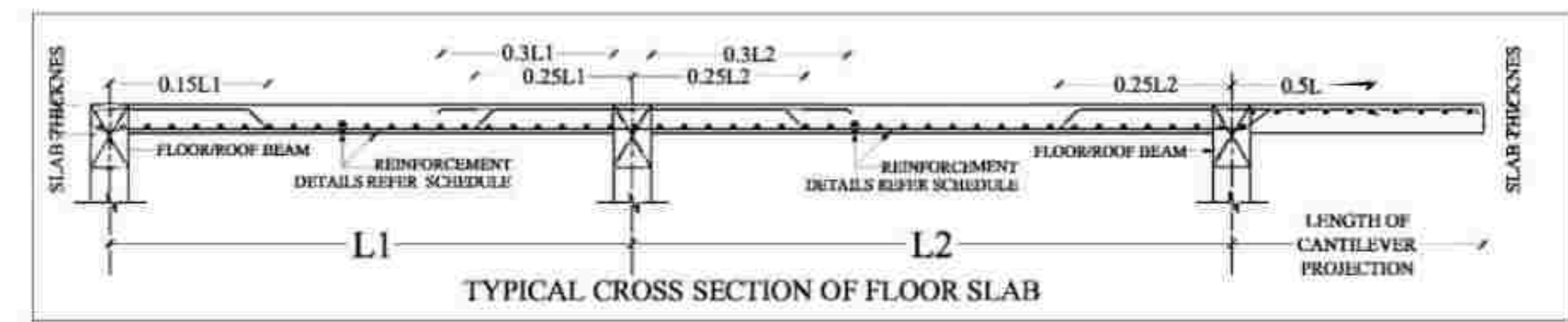
LIFT MACHINE ROOF BEAM LAYOUT FOR BLOCK A2



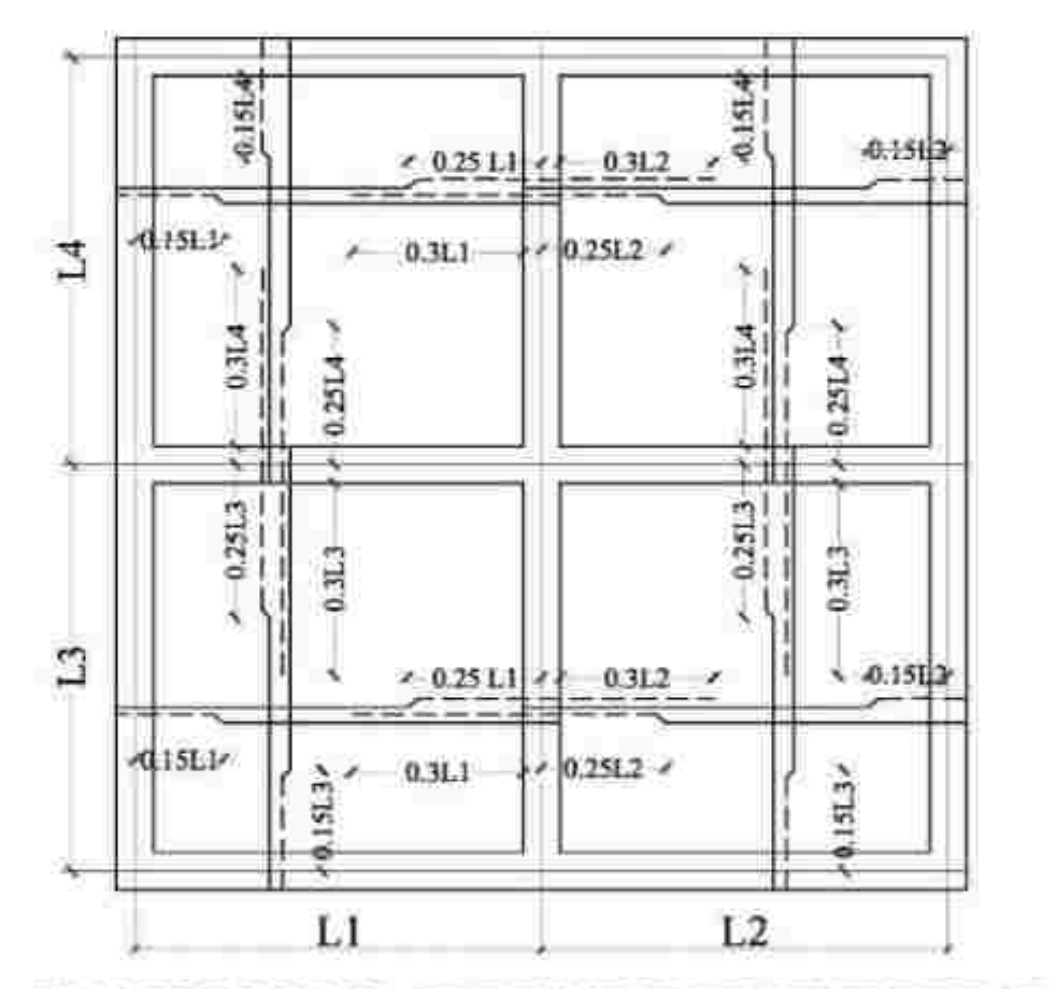
CUT LINTEL BEAM (LB)

DETAIL OF SUN SHADE

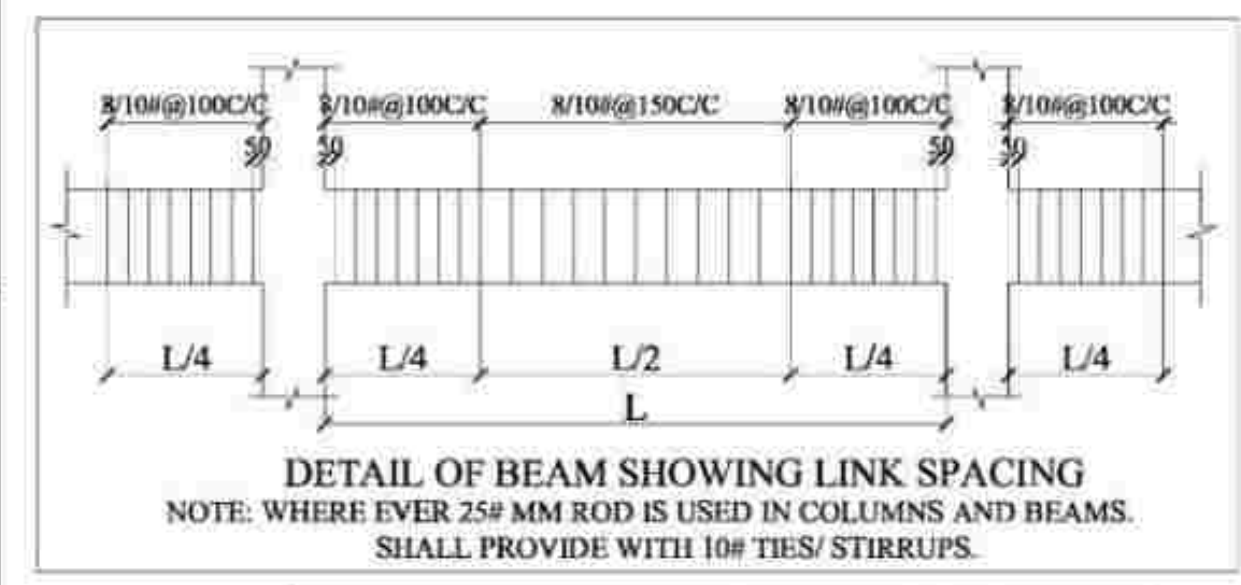
SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
01	RS1	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	LIFT MACHINE BASE SLAB WATER TANK BASE SLAB
02	LBS1	150	10#	150 C/C	10#	150 C/C	10#	300 C/C	10#	300 C/C	
03	WS1	150	10#	150 C/C	10#	150 C/C	10#	300 C/C	10#	300 C/C	



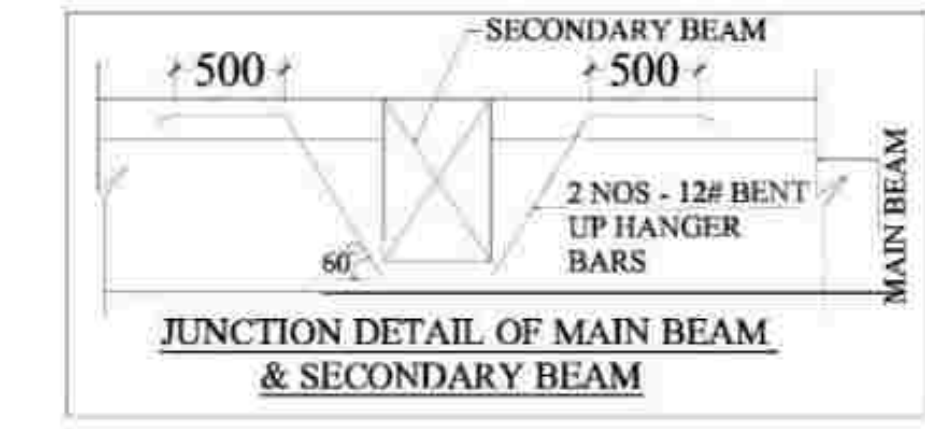
TYPICAL CROSS SECTION OF FLOOR SLAB



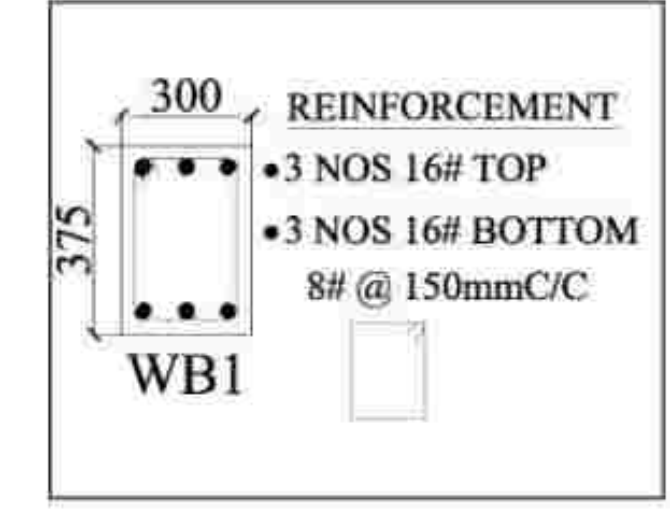
FLOOR/ROOF SLAB REINFORCEMENT DETAIL



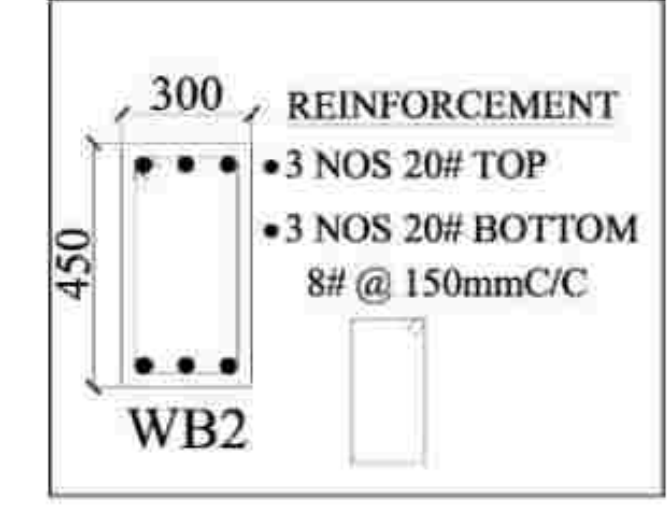
DETAIL OF BEAM SHOWING LINK SPACING
NOTE: WHERE EVER 25# MM ROD IS USED IN COLUMNS AND BEAMS, SHALL PROVIDE WITH 10# TIES/STIRRUPS.



JUNCTION DETAIL OF MAIN BEAM & SECONDARY BEAM

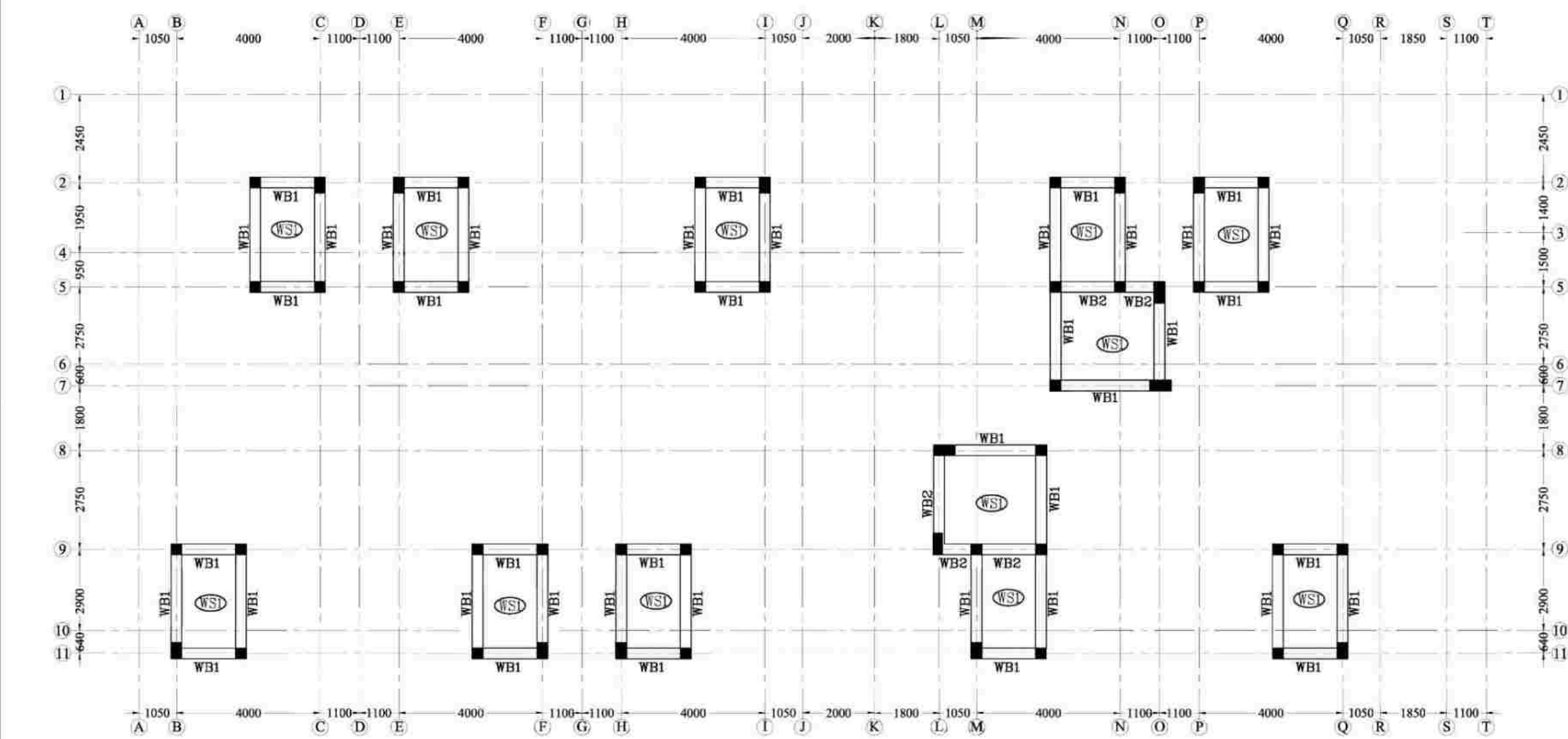


WB1



WB2

FOR TENDER PURPOSE ONLY



WATER TANK BASE BEAM LAYOUT AT + 30050MM LVL FOR BLOCK A2

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- ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THIS OFFICE BEFORE EXECUTION.
- GRADE OF CONCRETE SHALL BE M35 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
- GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO LATEST INDIAN STANDARDS
- ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
- THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS
PILE / FOOTING = 50MM BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS SLABS = 25MM
- THE DEVELOPMENT LENGTH FOR TENSION

	Fe-5000	Where d is Diameter of rod
M30	Ld	45d
M35	Ld	40d
- THE DEVELOPMENT LENGTH FOR COMPRESSION

	Fe-5000	Where d is Diameter of rod
M30	Ld	36d
M35	Ld	32d
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 800mm DIA PILE IS 1400 kN

REV NO:	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY
1					

NOTE: NGL NATURAL GROUND LEVEL

SAFETY AND STRUCTURAL STABILITY CERTIFICATE
 Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

T. P. Nallathambi
 Dr. P. Nallathambi
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 Chartered Engineer (F-117029-1)

PRINCIPAL DEVELOPER:

 OFFICE OF THE CHIEF ENGINEER,
 TAMIL NADU URBAN HABITAT
 DEVELOPMENT BOARD (TNUHDB)
 NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

 STRUCTURAL ENGINEERING DEPARTMENT,
 INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
 CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

 CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
 MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
 IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
 THARAMANI, CHENNAI, TAMIL NADU 600113

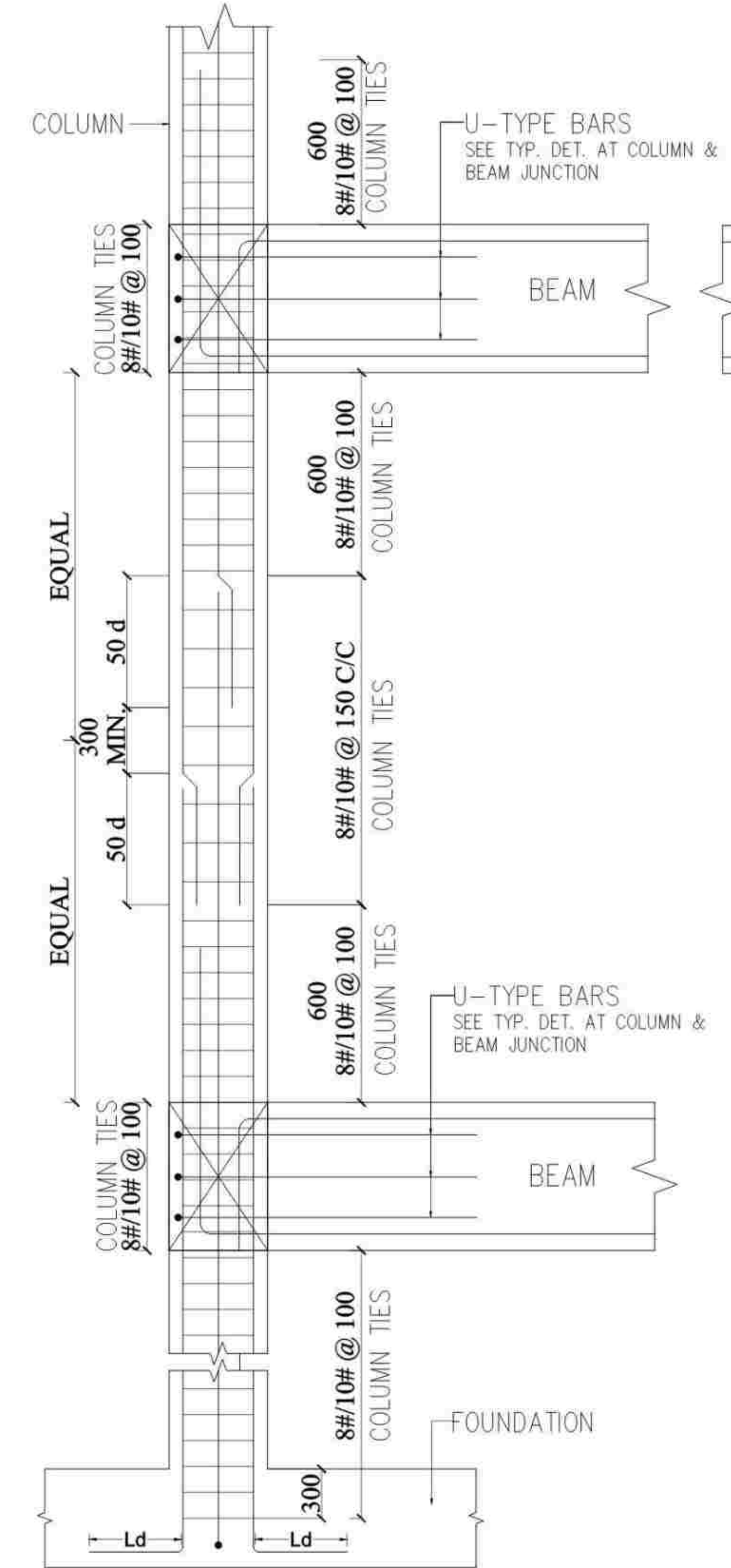
PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
 PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA. TOTALLY 360 DWELLING UNITS AT K8 DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XL.

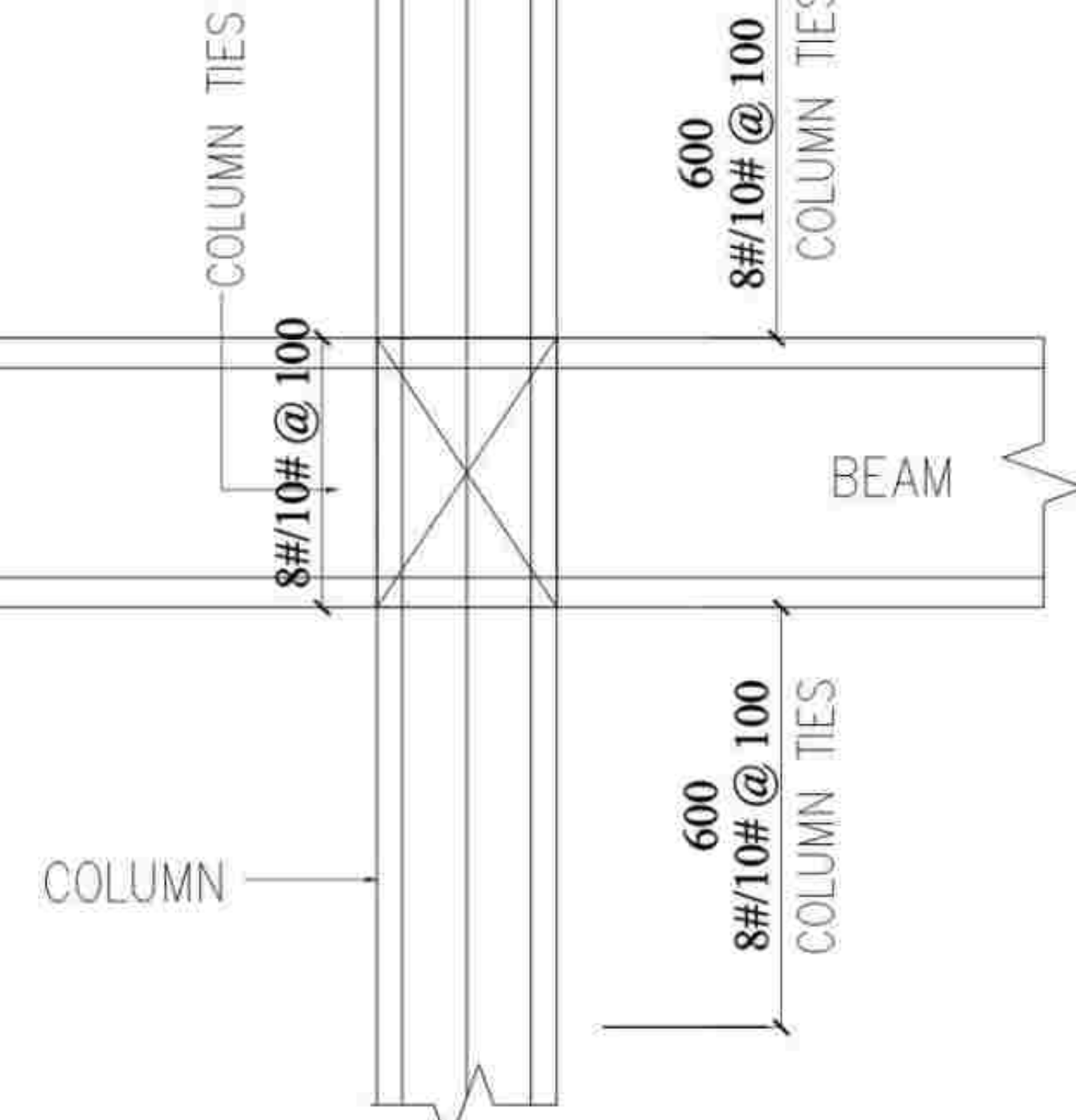
DRAWING NO: TNUHDB/BHN/BLOCK A2	SHEET NO: 007	REV NO: R0
DRAWING TITLE : WATER TANK BASE, LIFT MACHINE BASE, HEAD ROOM ROOF, LIFT MACHINE ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A2.		
BLOCK NO: BLOCK A2	SCALE: NTS	SIZE OF SHEET: A1
ISSUED FOR:		
☒ PRELIMINARY ☐ APPROVAL	☒ TENDER ☐ CONSTRUCTION	☐ INFORMATION DATE OF ISSUE: 08-11-2022
DESIGNED BY:		DRAWN BY:
CHECKED BY:		APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm

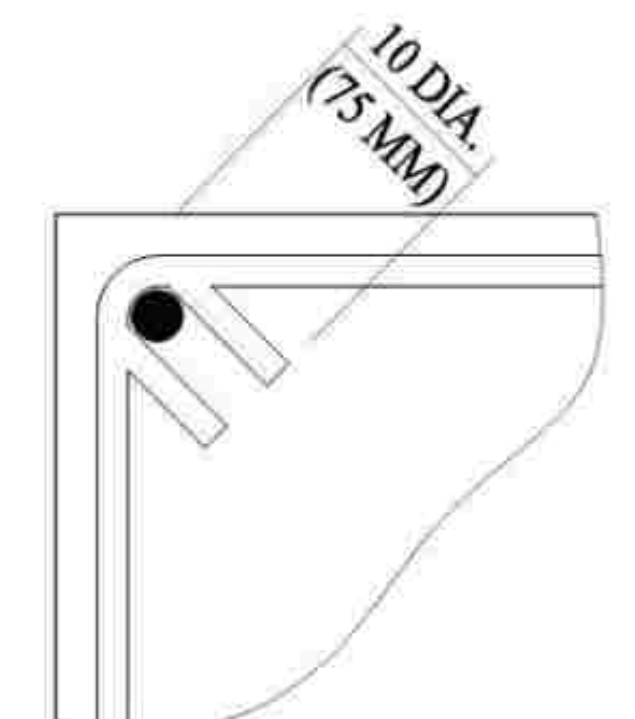
FOR TENDER PURPOSE ONLY



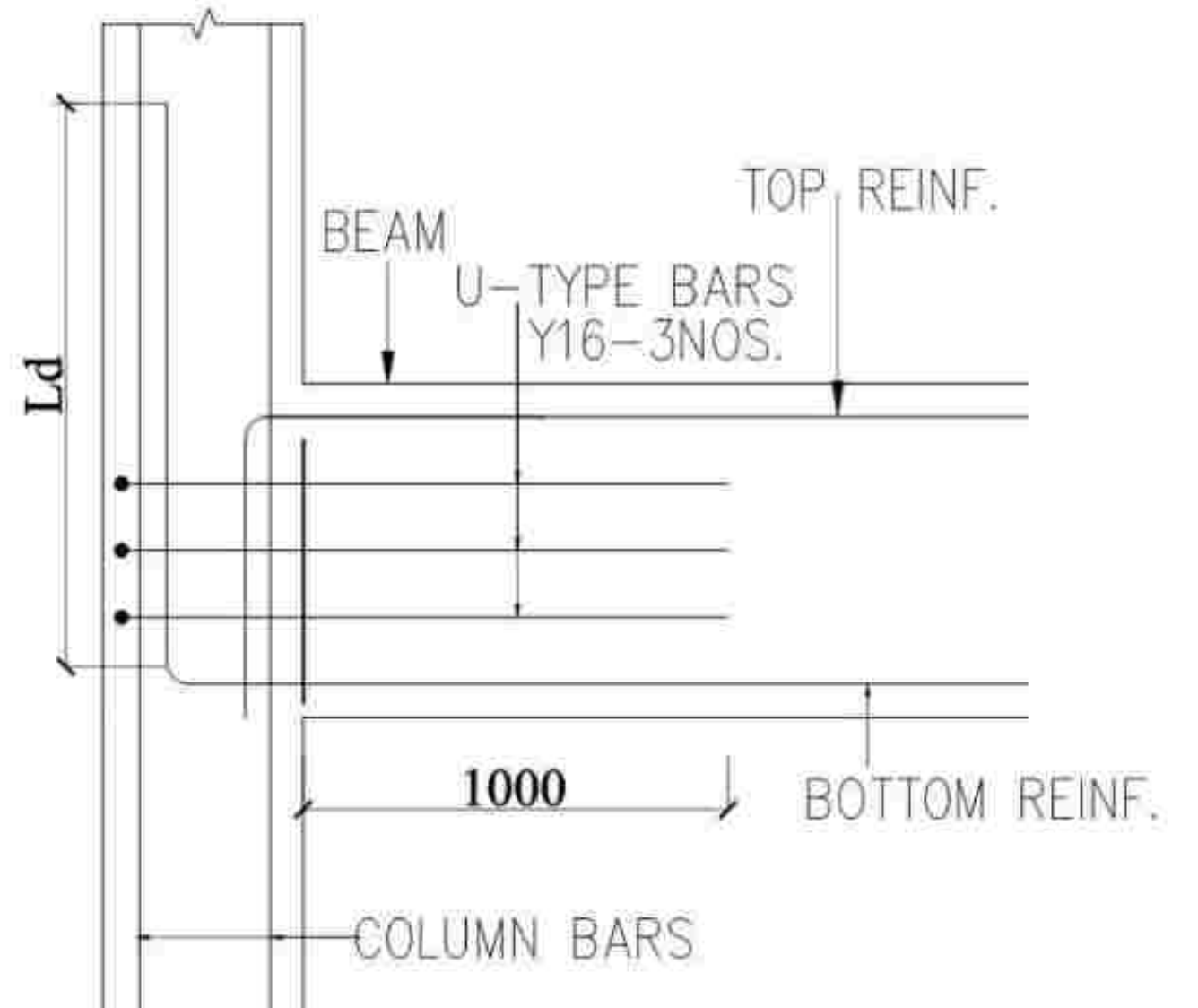
TYP.DET.OF COLUMN
(BEAM ON ONE SIDE OF COLUMN)



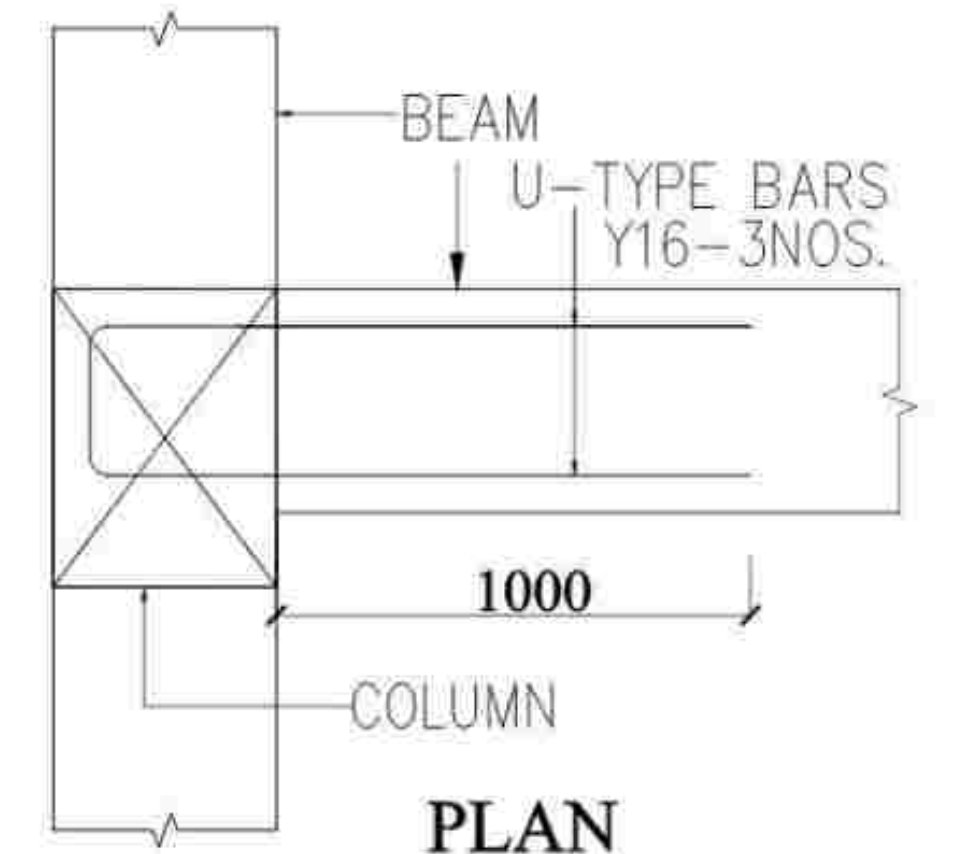
TYP.DET.OF COLUMN &
BEAM JUNCTION
(BEAMS ON TWO SIDES OF COLUMN)



TYP.DET.OF HOOK FOR
BEAM STIRRUP

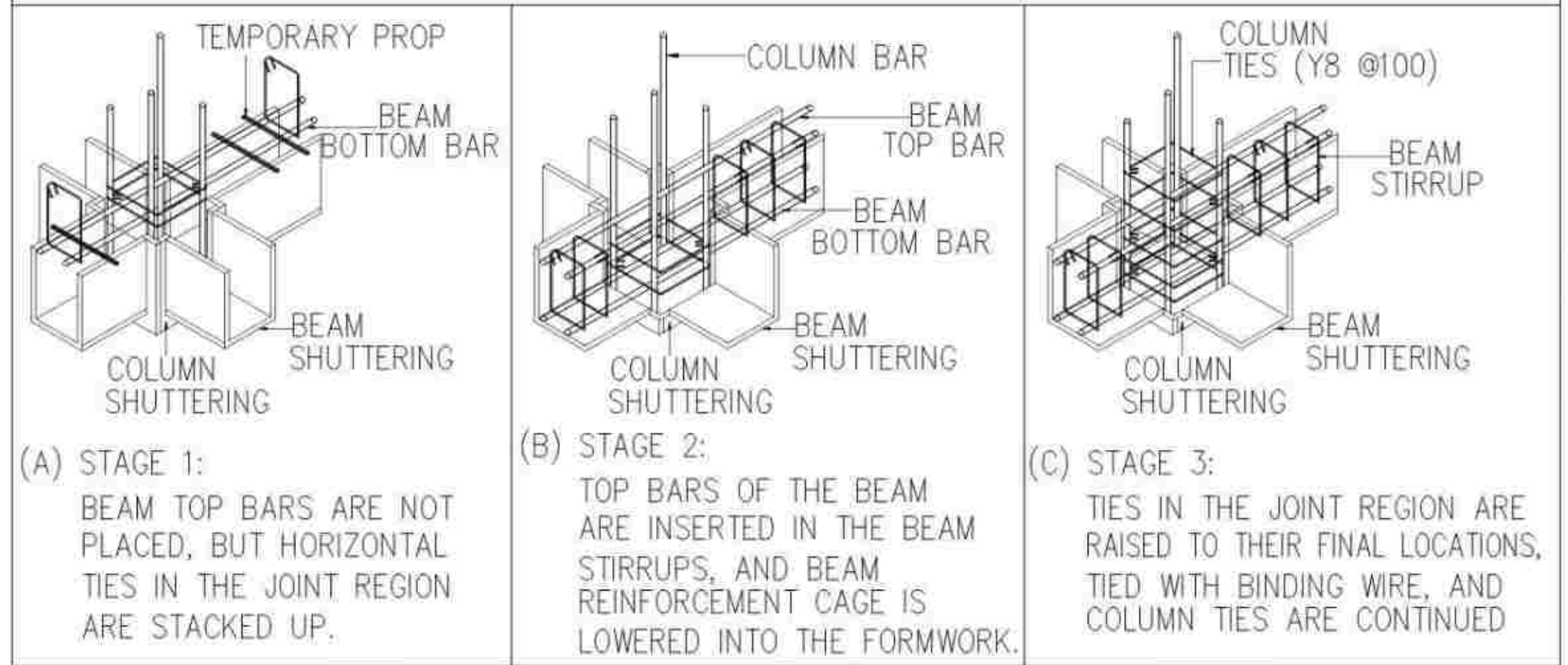


SECTION
TYP.DET.OF COLUMN &
BEAM JUNCTION
(BEAM ON ONE SIDE OF COLUMN)



PLAN
TYP.DET.OF COLUMN &
BEAM JUNCTION
(BEAM ON ONE SIDE OF COLUMN)

PROCEDURE FOR PLACING COLUMN TIES AT COLUMN BEAM JUNCTION



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M30 Fe-500D Where d is Diameter of rod
M35 Fe-500D Where d is Diameter of rod
- THE DEVELOPMENT LENGTH FOR COMPRESSION
M30 Fe-500D Where d is Diameter of rod
M35 Fe-500D Where d is Diameter of rod
- STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
- SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO:	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY
	SYMBOL				

NOTE: NGL: NATURAL GROUND LEVEL.

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

CUBE:

STRUCTURAL CONSULTANT

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INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
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DRAWING NO:	SHEET NO:	REV NO:
TNUHDB/BHN/BLOCK A2	008	R0

DRAWING TITLE :
TYPICAL DUCTILE DETAILING FOR EARTHQUAKE RESISTANCE

BLOCK NO:	SCALE:	SIZE OF SHEET:
BLOCK A2	NTS	A1

ISSUED FOR:

PRELIMINARY	RENDER	INFORMATION	DATE OF ISSUE
☐	☒	☐	08-11-2022

DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm

GENERAL

- 1) ALL STRUCTURAL KEY PLANS AND DETAILS ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT ARCHITECTURAL DRAWINGS, SERVICE DRAWINGS, SPECIFICATIONS, BILLS OF QUANTITIES AND ALL OTHER RELEVANT DOCUMENTS. DISCREPANCIES MUST BE REPORTED IMMEDIATELY TO THE ENGINEER-IN-CHARGE.
- 2) ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NEITHER THE BARS SHALL BE COUNTED NOR THE DIMENSIONS SCALED FROM THE DRAWING.

FOUNDATIONS

- 1) FOUNDATIONS ARE DESIGNED FOR THE SBC SPECIFIED IN THE FOUNDATION DRAWING. MIX FOR ALL RCC WORKS SHALL BE AS SPECIFIED IN THE STRUCTURAL DRAWINGS.
- 2) IF ASSUMED SAFE BEARING CAPACITY OF THE SOIL IS NOT FOUND AT THE SPECIFIED FOUNDING LEVEL, THE SAME SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER-IN-CHARGE FOR FURTHER DIRECTIONS.
- 3) FORMATION LEVELS OF FOUNDATIONS SHALL BE DETERMINED BY THE ENGINEER-IN-CHARGE BASED UPON EXISTING ROAD LEVEL, WATER TABLE LEVEL AND REQUIREMENT OF PROVISION OF SERVICES.
- 4) FOUNDATIONS ARE DESIGNED TO BE AT SAME FOUNDING LEVEL. ANY VARIATIONS IN THE GROUND LEVEL BEYOND 600MM AND THE DIFFERENCE IN LEVEL OF TWO ADJACENT FOOTINGS GREATER THAN HALF OF THE CLEAR DISTANCE BETWEEN THEM SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE.
- 5) ANY LOOSE POCKETS OR PROTRUDING BOULDERS SHALL BE REMOVED BEFORE LAYING BED CONCRETE FOR FOUNDATIONS AND SHALL BE LEVELLED BY FILLING WITH PCC.
- 6) THE TOP LEVEL OF THE GRADE BEAMS OF THE EXTERNAL WALL SHALL BE 150MM BELOW GROUND LEVEL AND OTHER BEAMS OF INTERNAL WALLS SHALL BE 40MM BELOW THE PLINTH LEVEL.

CONCRETE

- 1) GRADE OF CONCRETE SHALL BE M30 AND MINIMUM CEMENT CONTENT FOR PILE SHOULD BE 400KG/CUM UNLESS OTHERWISE SPECIFIED.
- 2) ALL OPENINGS FOR PIPING AND CONDUITS ETC., SHALL BE FORMED IN POSITION BEFORE THE CASTING OF CONCRETE.
- 3) NO HOLES OR CHASES ARE PERMITTED IN THE STRUCTURAL CONCRETE MEMBERS OTHER THAN AS DETAILED OR APPROVED BY THE ENGINEER-IN-CHARGE.
- 4) THE CLEAR DEPRESSION OF SLAB FOR BATH, WASHBASIN AND E.W.C SHALL BE 300MM AND FOR I.W.C SHALL BE 500MM. DEPRESSION IN SLAB FOR BALCONY SHALL BE 20MM FROM THE ADJACENT FLOOR LEVELS. NECESSARY PROVISION FOR OUTLETS FROM TRAPS SHALL BE KEPT WHILE CASTING THE BEAMS.
- 5) WHEN THE SPAN IS MORE THAN 6.00M, PROVIDE CAMBER @ SPAN/250 FOR BEAMS AND SLABS.
- 6) THE FREE END OF CANTILEVER SLABS OR BEAMS SHALL BE RAISED BY 2% OF THE SPAN. TORSIONAL REINFORCEMENT AT DISCONTINUOUS EDGES OF TWO WAY REINFORCED SLABS SHALL BE AS PER IS 456-2000.
- 7) ALL CONCRETE IS TO BE CURED BY AN APPROVED METHOD- WATER PONDING, POLYTHENE/HESSIAN SHEET, CURING COMPOUND.

REINFORCEMENT

- 1) ALL STEEL REINFORCEMENT SHALL BE OF TMT BARS CONFORMING TO IS 1786 WITH MINIMUM YIELD STRESS / 0.2% PROOF STRESS OF 500 N/50MM
- 2) GRADE FE 500D FOR ALL STRUCTURES DESIGNED FOR SEISMIC RESISTANCE UNDER ZONE-III OF IS 1893-2016.
- 3) ALL REBARS SHALL BE CUT AND BENT CONFORMING TO THE LATEST EDITION OF IS 1786. MECHANICAL COUPLERS CONFORMING TO IS 16172 SHALL BE USED WHEN LONGITUDINAL STEEL BARS HAVE TO BE CONTINUED FOR BEAM SPANS LARGER THAN THEIR MANUFACTURED LENGTH.
- 4) WELDING OF REBARS WILL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER-IN-CHARGE. WELDING OF LINKS, TIES, INSERTS OR OTHER SIMILAR ELEMENTS TO VERTICAL REINFORCEMENT BARS REQUIRED AS PER DESIGN IS NOT PERMITTED, IN ANY SEISMIC ZONE.
- 5) ALL REBARS ARE TO BE FIRMLY SUPPORTED ON APPROVED CHAIRS OR CONCRETE BLOCKS PLACED AT NOT GREATER THAN 750MM CENTRES BOTH WAYS.
- 6) NOT MORE THAN 50% OF AREA OF STEEL BARS ON EITHER TOP OR BOTTOM FACE SHALL BE SPLICED AT ANY ONE SECTION. LAPPING OF REBARS SHALL AS FAR AS POSSIBLE BE AWAY FROM THE SECTIONS OF MAXIMUM STRESS AND BE STAGGERED. LAP SPLICES SHALL BE CONSIDERED AS STAGGERED, IF THE CENTRE TO CENTRE DISTANCE OF THE SPLICES IS NOT LESS THAN 1.3 TIMES THE LAP LENGTH.
- 7) LAP / MECHANICAL COUPLERS / WELDED SPLICES SHOULD NOT BE PROVIDED
 - A) WITHIN A JOINT
 - B) WITHIN A DISTANCE OF 2D FROM THE RC WALL, WHERE 'D' IS THE EFFECTIVE DEPTH OF THE MEMBER.
 - C) WITHIN A DISTANCE 1/4 LENGTH OF MEMBER FROM THE RC WALL.
- 8) LAP LENGTH INCLUDING ANCHORAGE VALUE OF HOOKS FOR BARS IN FLEXURAL TENSION SHALL BE LD OR 300d, WHICHEVER IS GREATER. THE STRAIGHT LENGTH OF THE LAP SHALL NOT BE LESS THAN 150d OR 200MM. WHEN BARS OF TWO DIFFERENT DIAMETERS ARE TO BE SPLICED, THE LAP LENGTH SHALL BE CALCULATED ON THE BASIS OF DIAMETER OF THE SMALLER BAR.
- 9) THE HORIZONTAL DISTANCE BETWEEN TWO PARALLEL MAIN REINFORCING BARS SHALL BE NOT LESS THAN THE DIAMETER OF THE LARGER BAR USED OR 5MM MORE THAN THE NOMINAL MAXIMUM SIZE OF COARSE AGGREGATE USED, WHICHEVER IS GREATER.

- 10) WHENEVER REINFORCEMENT IS PROVIDED IN TWO LAYERS IN BEAMS, SPACER BAR SHALL BE PROVIDED TO MAINTAIN 25MM GAP OR MAXIMUM DIA OF THE MAIN BAR WHICHEVER IS MORE BETWEEN TWO LAYERS.
- 11) IN CASE OF CANTILEVER BEAMS / SLABS THE TOP REINFORCEMENT SHALL BE TAKEN BEYOND THE INNER FACE OF THE SUPPORTS TO ATLEAST THE SPAN OF THE CANTILEVER WHEREVER POSSIBLE. IN CASE IT IS NOT POSSIBLE TO ADOPT THE ABOVE SAID PRACTICE, THE REINFORCEMENT SHALL BE PROPERLY ANCHORED INTO THE SUPPORTING MEMBER.
- 12) LAP / DEVELOPMENT LENGTH FOR MAIN REINFORCEMENT BARS (IN TENSION / COMPRESSION) FOR DIFFERENT GRADES OF CONCRETE MIX SHALL BE AS FOLLOWS:
CONCRETE MIX Fe 500D (FOR ZONE-III STRUCTURES)
M30 45d (TENSION) & 36d (COMP)
WHERE d IS THE DIAMETER OF THE BAR.
- 13) WHERE OPENINGS ARE SMALL AND THE SLAB IS NOT SUBJECTED TO ANY SPECIAL TYPE LOADING OR VIBRATION CONDITIONS, THE FOLLOWING GENERAL DETAILING RULES MAY BE FOLLOWED AROUND OPENINGS.
 - A) DIAMETER OF TRIMMER BARS SHALL BE SIMILAR TO BIGGER REINFORCING BARS OF THE STRUCTURE THROUGH WHICH THE OPENING IS FORMED.
 - B) NO TRIMMER BARS ARE REQUIRED FOR OPENINGS LESS THAN 200MM WIDE. NO REINFORCING BARS SHALL BE CUT BUT THESE SHALL BE ADJUSTED IN POSITION TO AVOID OPENINGS.
 - C) TRIMMER BARS SHALL BE NOT LESS THAN THE NOS. OF BARS CUT BY OPENING.
 - D) MINIMUM 2 NOS. EACH AT TOP AND BOTTOM AND BAR DIAMETER AS SPECIFIED ABOVE BUT NOT LESS THAN 10φ.
 - E) BOTH PERPENDICULAR AND DIAGONAL TRIMMING BARS SHALL BE PROVIDED AS SHOWN IN SKETCHES.
- 14) WHENEVER THE REINFORCEMENT IS PROJECTED FROM THE STRUCTURAL MEMBERS AS A PROVISION MADE TOWARDS FUTURE EXTENSION OF THE BUILDING THE SAME SHALL BE APPROPRIATELY PROTECTED FROM CORROSION BY TREATING WITH EPOXY AFTER COMPLETELY REMOVING SCALES OR RUST, IF ANY. THIS REINFORCEMENT MAY BE ENCASED IN A CONCRETE MIX OF 1:3:6 OR LEFT EXPOSED OR PROTECTED IN ANY OTHER MANNER AS DIRECTED BY ENGINEER-IN-CHARGE.
- 15) THE NOMINAL COVER GIVEN BELOW FOR MODERATE EXPOSURE CONDITION SHALL BE MEASURED FROM THE OUTER FACE OF THE STRUCTURAL ELEMENT TO THE STIRRUPS / LINKS.

RAFTS	-60MM	PILES	-50MM	STRIP BEAM	-75MM	FOOTINGS	-60MM	COLUMNS	-40MM
BEAMS	-25MM	SLABS	-25MM	WALLS	-25MM	TANK WALLS	-40MM	TANK BASES	-50MM

WATER AND DRAINAGE LINES WITHIN STRUCTURAL ELEMENTS:

- 1) THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DETAILS OF EXIT AND ENTRY OF PIPES THROUGH STRUCTURAL ELEMENTS.
- 2) THESE POINTS ARE TO HAVE ADDITIONAL FUSION BONDED EPOXY COATED REINFORCEMENT PLACED AROUND THE PIPE.

RC WALLS FOR BASEMENTS:

- 1) IF THE LEVEL OF THE WATER TABLE OR ANY SEEPAGE IS FOUND TO BE WITHIN THE DEPTH OF EXCAVATION, THE SAME SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE.
- 2) 100MM THICK BLINDING CONCRETE OF GRADE M15 IS TO BE PLACED BELOW THE WATER TANKS BASE SLAB.
- 3) WATER BARS ARE TO BE INCORPORATED IN ALL VERTICAL AND HORIZONTAL JOINTS.
- 4) ALL WALL KICKERS SHALL BE CAST MONOLITHICALLY WITH THE BASE SLAB.

CONSTRUCTION JOINTS:

- 1) THESE ARE TO BE PROVIDED AT LOCATIONS OF ZERO OR MINIMUM SHEAR IN BEAMS AND SLABS AND AT LOCATIONS OF MINIMUM STEEL CONGESTION.
- 2) THESE ARE TO BE PERPENDICULAR TO THE COMPRESSIVE FORCES ACROSS THE JOINT. IN MOST CASES THE JOINTS WILL HAVE TO BE PERPENDICULAR TO THE AXIS OF THE MEMBER.
- 3) ALL REINFORCING BARS INTERSECTED BY THE CONSTRUCTION JOINTS ARE TO EXTEND THROUGH THE JOINTS WITHOUT INTERCEPTION.
- 4) VERTICAL JOINTS SHALL BE FORMED WITH TIMBER FORMWORK COATED WITH AN APPROVED SURFACE RETARDER AND THE VERTICAL FACE IS TO BE WASHED TO EXPOSE THE AGGREGATE BEFORE FINAL SET OF THE CONCRETE HAS TAKEN PLACE.
- 5) HORIZONTAL JOINTS SHALL BE SCRABBLED TO REMOVE ALL LAITANCE AND WEAK CONCRETE BEFORE CONCRETE FOR THE NEXT LIFT IS PLACED. NECESSARY KEYS SHALL BE PROVIDED IN THE APPROVED METHODOLOGY AS REQUIRED BY THE ENGINEER-IN-CHARGE.
- 6) WATERJET CLEANING AND FLUSHING THE JOINT WITH MORTAR OR GROUT ARE TO PRECEDE THE POURING OF FRESH CONCRETE.

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NOTES:

1. ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NEITHER THE DRAWING SHALL BE SCALED OUT NOR THE BARS SHALL BE COUNTED.
3. ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THIS OFFICE BEFORE EXECUTION.
4. GRADE OF CONCRETE SHALL BE M35 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
5. GRADE OF STEEL SHALL BE Fe-500D CONFORMING TO LATEST INDIAN STANDARDS
6. ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
7. THE NOMINAL COVER COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS

PILE / FOOTING = 50MM	BEAMS = 25MM TO LINKS
RC WALLS = 25MM TO LINKS	SLABS = 25MM
8. THE DEVELOPMENT LENGTH FOR TENSION

M30	45d	Where d is Diameter of rod
M35	40d	
9. THE DEVELOPMENT LENGTH FOR COMPRESSION

M30	36d	Where d is Diameter of rod
M35	32d	
10. STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING
11. SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 800mm DIA PILE IS 1400 kN

REV NO.	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY
	SYMBOL	DESCRIPTION			
NOTE:		NGL	NATURAL GROUND LEVEL		

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

Dr. P. Nallathambi
ME, Ph.D(Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai - 600113
Chartered Engineer (F-117029-1)

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
TAMIL NADU URBAN HABITAT
DEVELOPMENT BOARD (TNUHDB)
NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE:

CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:

PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A2 SHEET NO: 009 REV NO: R0

DRAWING TITLE :

GENERAL RCC NOTES

BLOCK NO: BLOCK A2 SCALE: NTS SIZE OF SHEET: A1

ISSUED FOR:

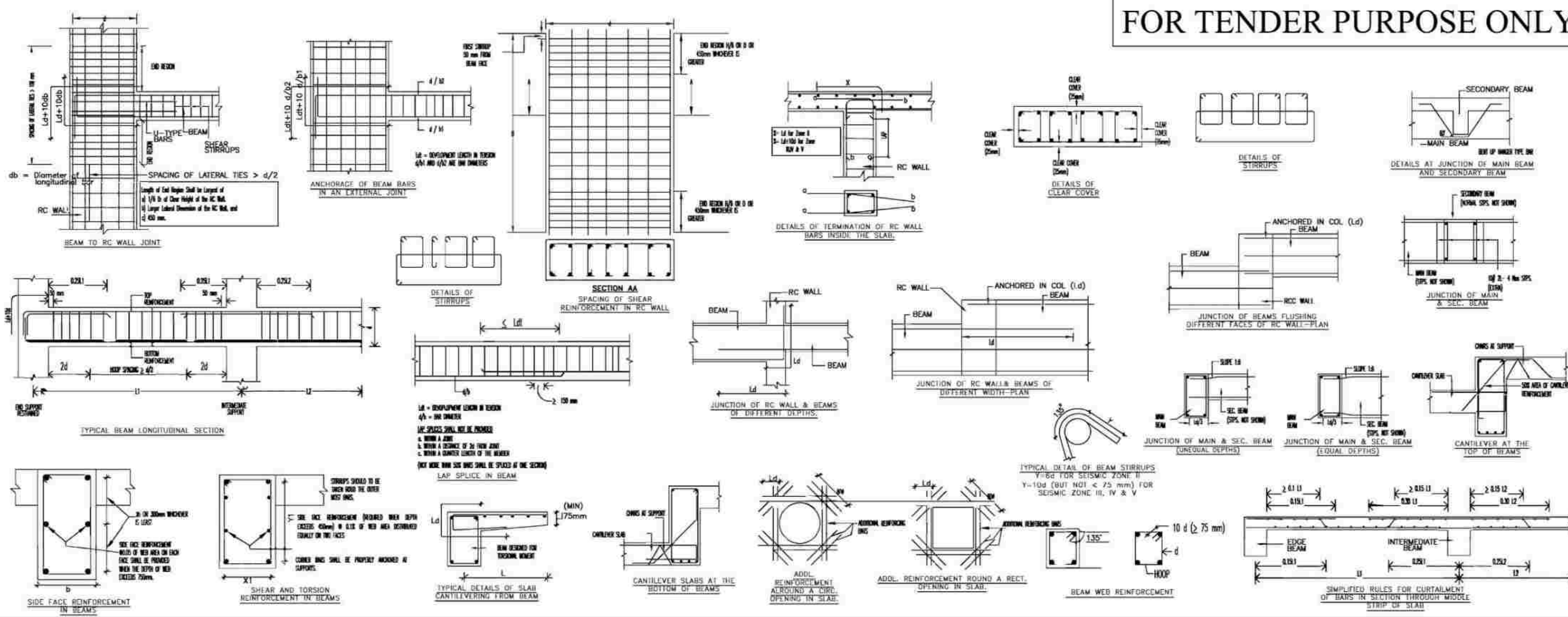
☒ PRELIMINARY ☒ TENDER ☐ INFORMATION ☐ CONSTRUCTION DATE OF ISSUE: 08-11-2022

DESIGNED BY: DRAWN BY:

CHECKED BY: APPROVED BY:

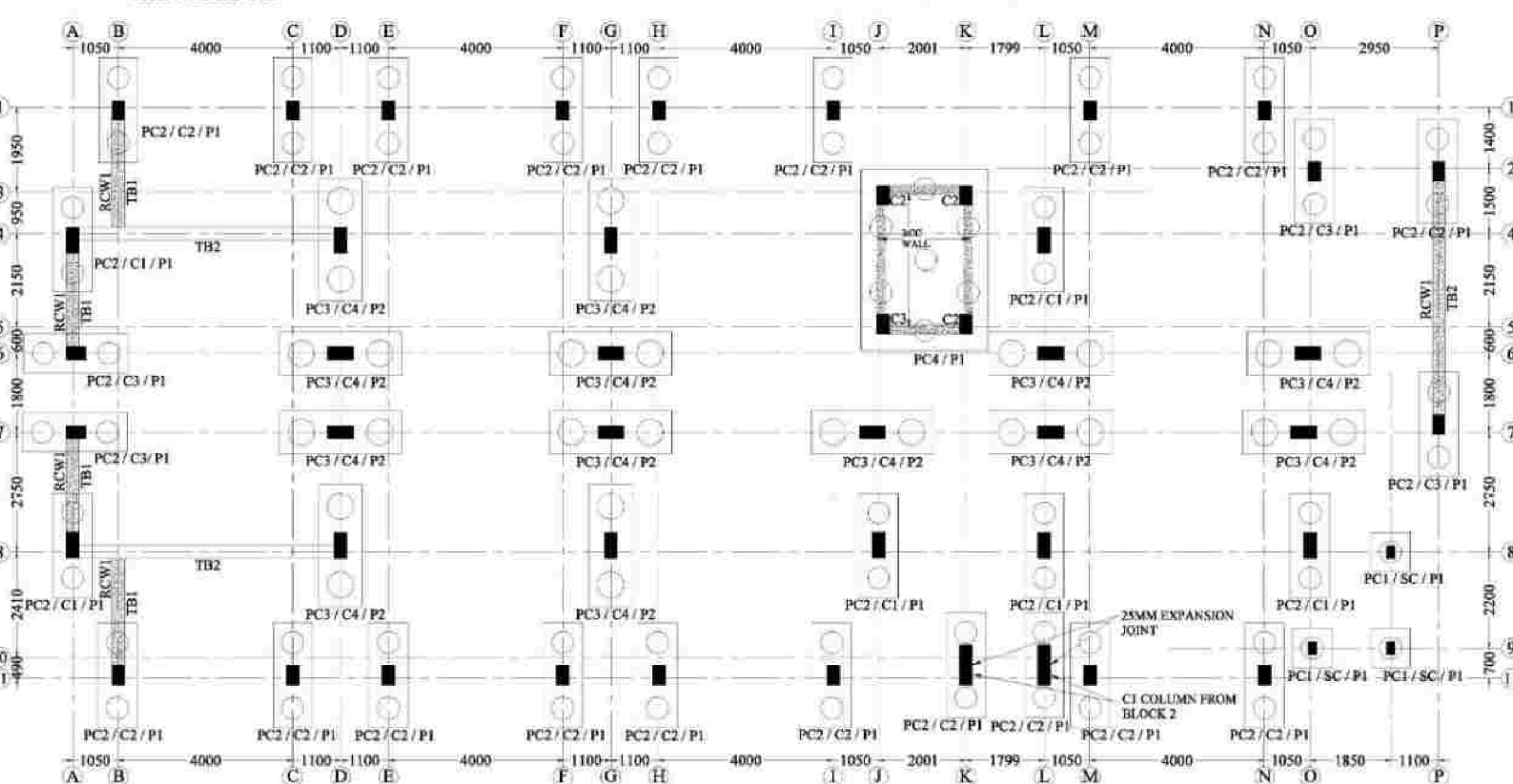
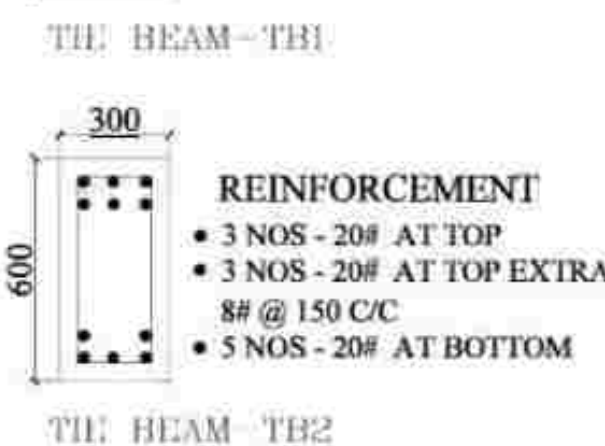
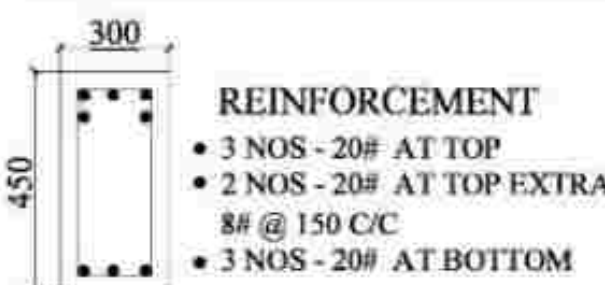
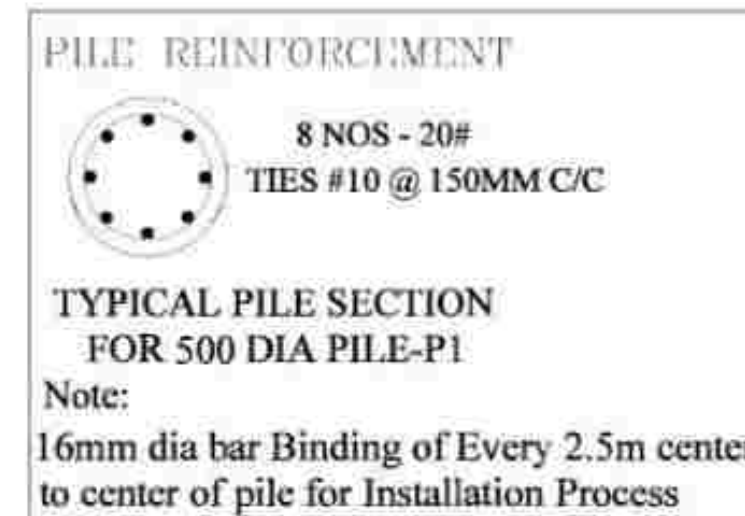
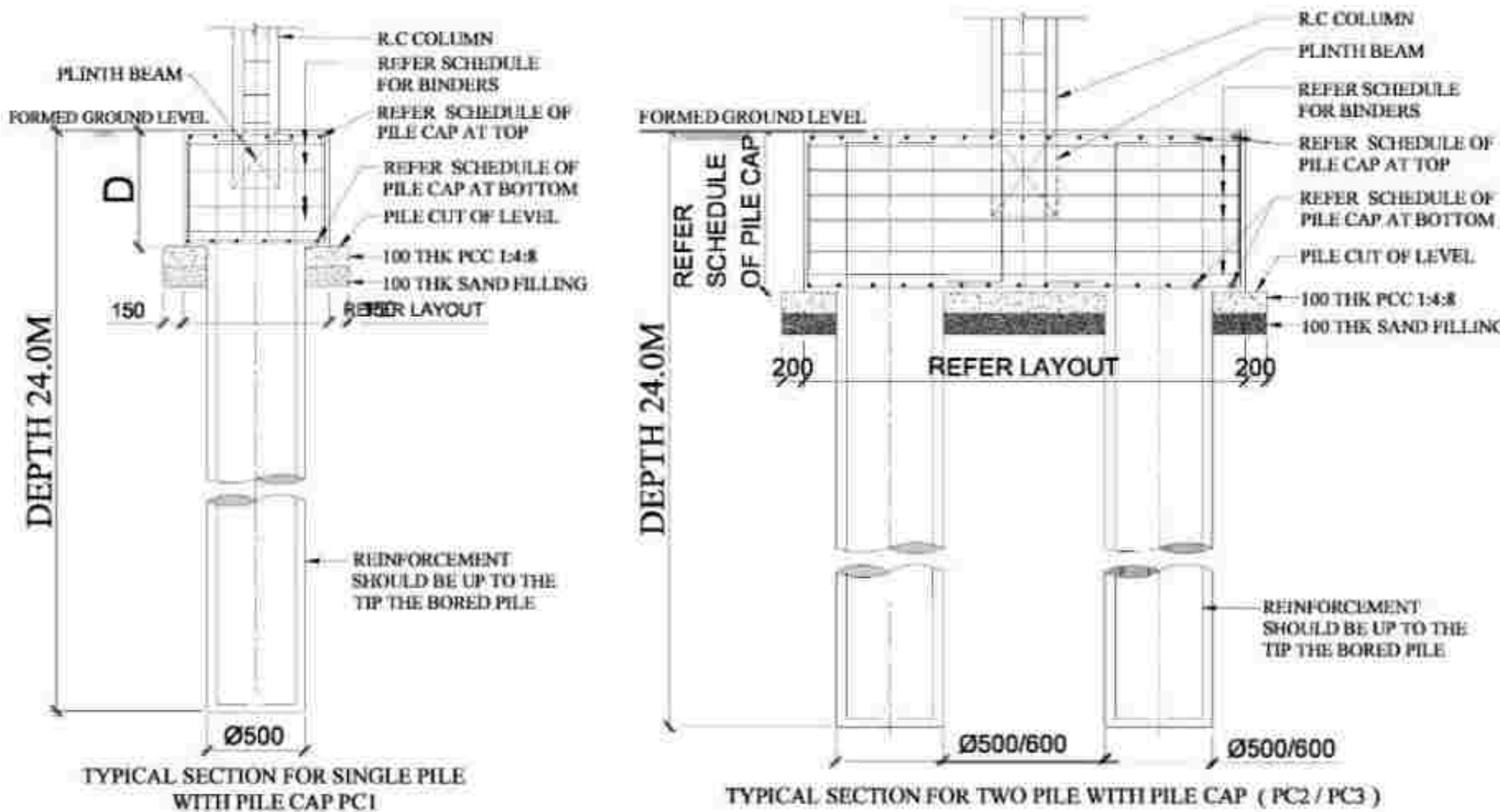
NOTE: ALL DIMENSION ARE IN mm

FOR TENDER PURPOSE ONLY



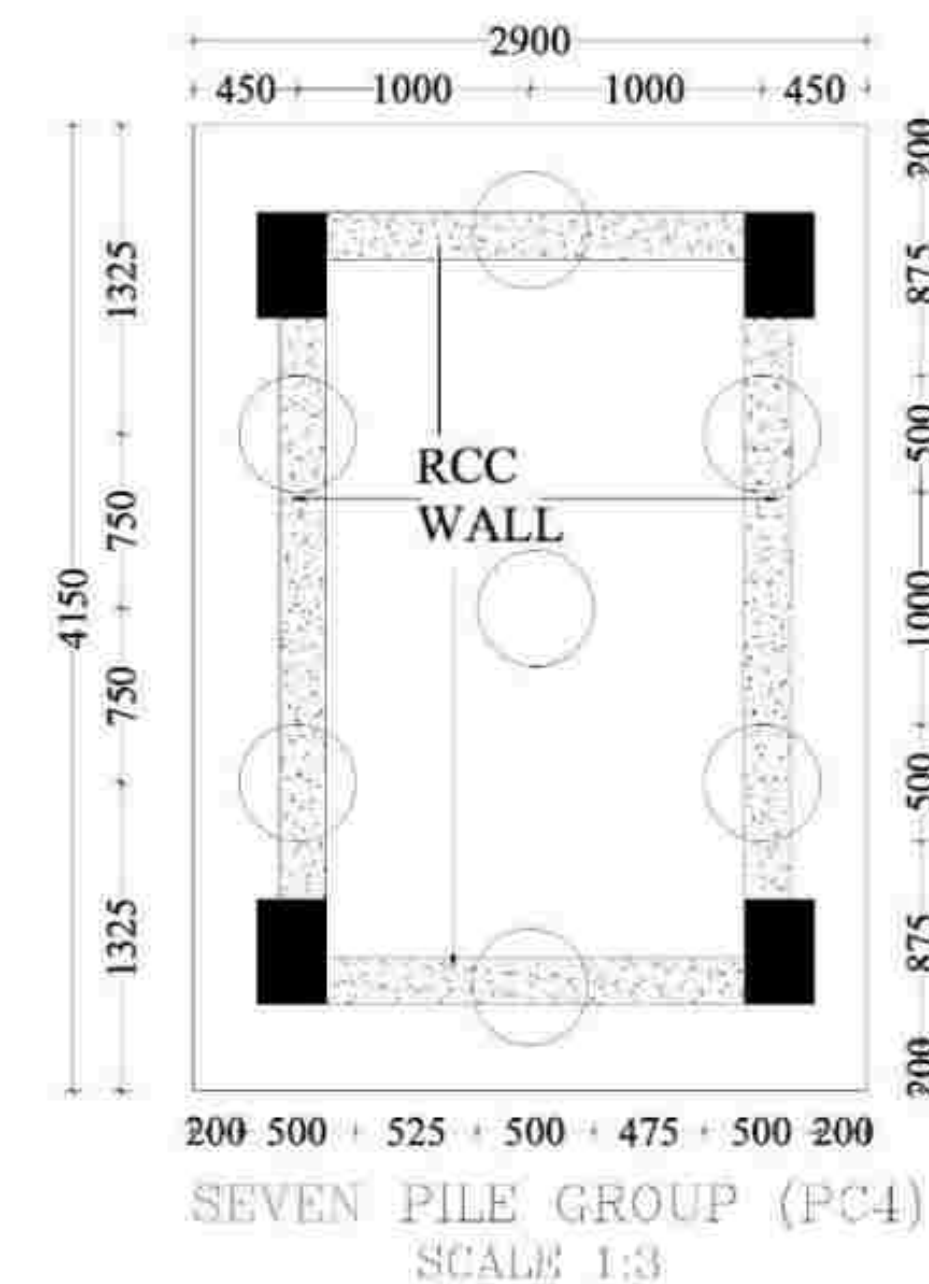
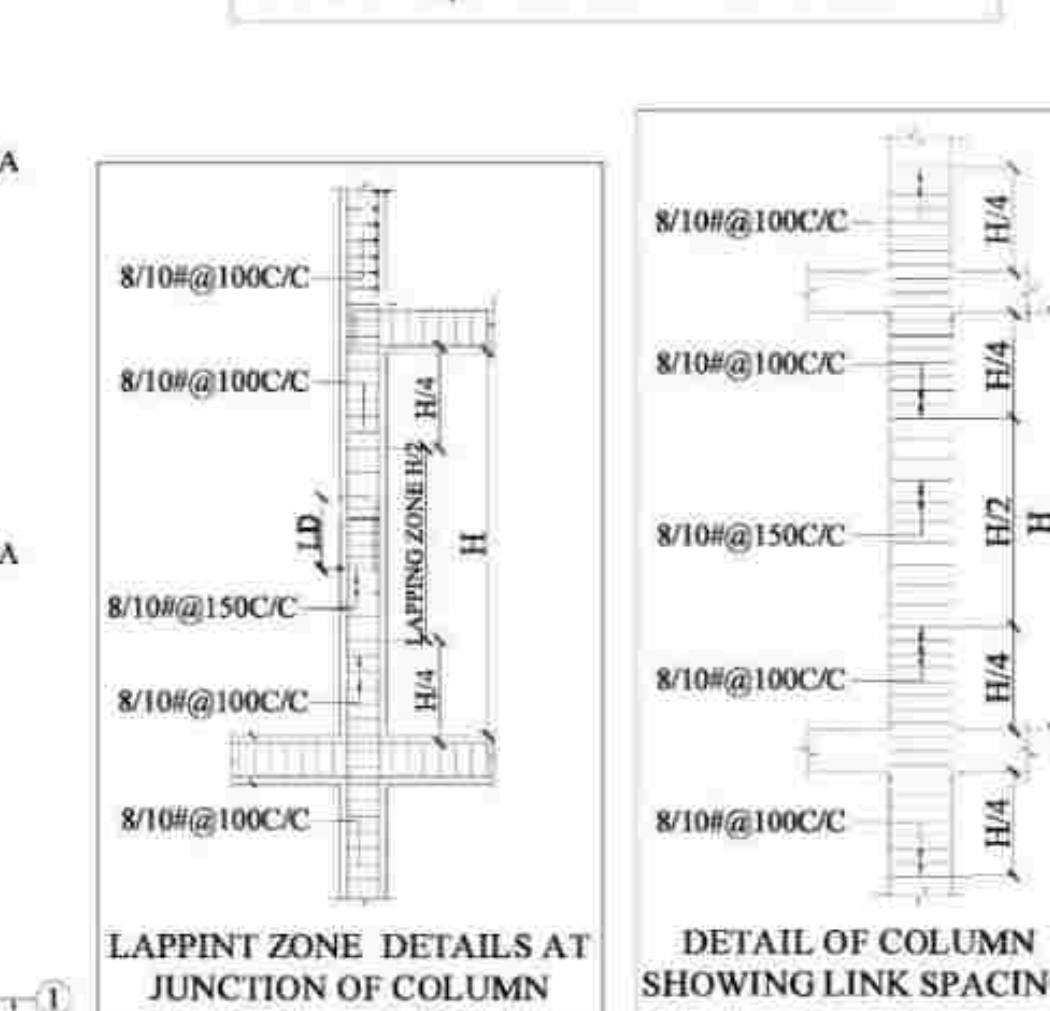
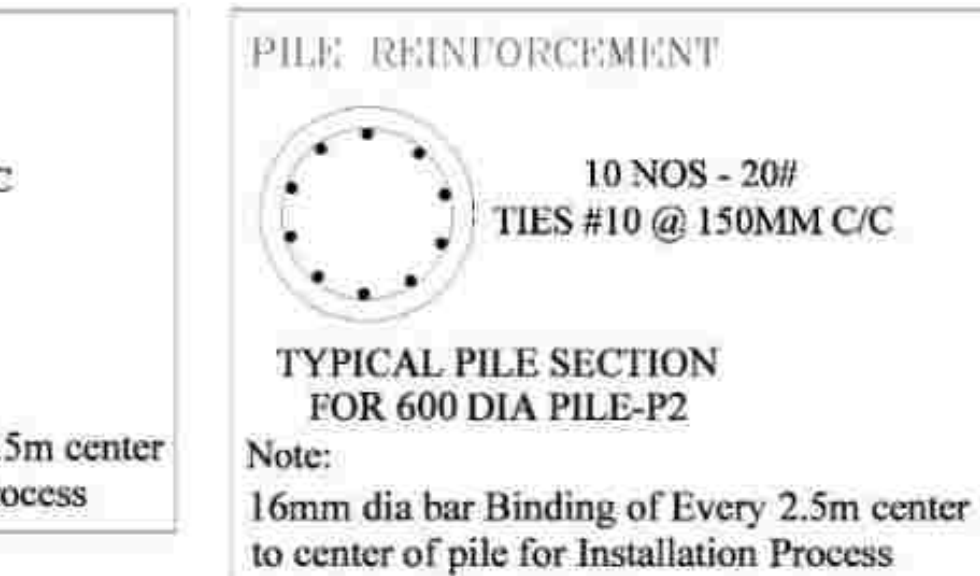
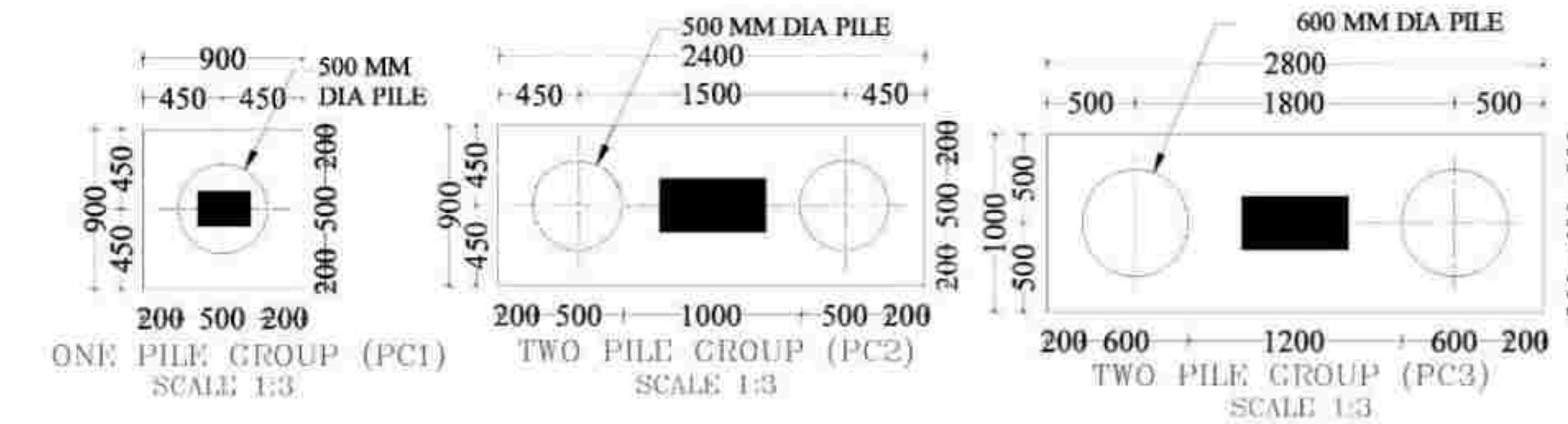
SCHEDULE OF RCC COLUMNS										
SL NO	NAME OF COLUMN	SIZE OF COLUMNS	UPTO STILT FLOOR ROOF			STILT FLOOR ROOF TO TERRACE			STIRRUPS	
			SECTION	SHAPE OF TIES	REIN-FORCEMENT	SIZE OF COLUMNS	SECTION	SHAPE OF TIES	REIN-FORCEMENT	NO OF COLUMNS
01	SC	230 x 300			4 NOS-16#	---	---	---	---	03 NOS
01	C1	300 x 600			10 NOS-25#	250 x 600			10 NOS-25#	06 NOS
02	C2	300 x 450			8 NOS-20#	---	---	---	---	22 NOS
03	C3	300 x 450			8 NOS-25#	---	---	---	---	05 NOS
04	C4	300 x 600			12 NOS-25#	---	---	---	---	13 NOS

SCHEDULE OF RCC WALL					
S NO	NAME OF WALL	SIZE Lx Lz	WALL THICKNESS	REINFORCEMENT	REMARKS
01	RCW1	REFER PLAN	200	VERTICAL DIRECTION: 10# @ 150 C/C (INNER) 10# @ 150 C/C (OUTER) HORIZONTAL DIRECTION: 8# @ 150 C/C (INNER) 8# @ 150 C/C (OUTER)	

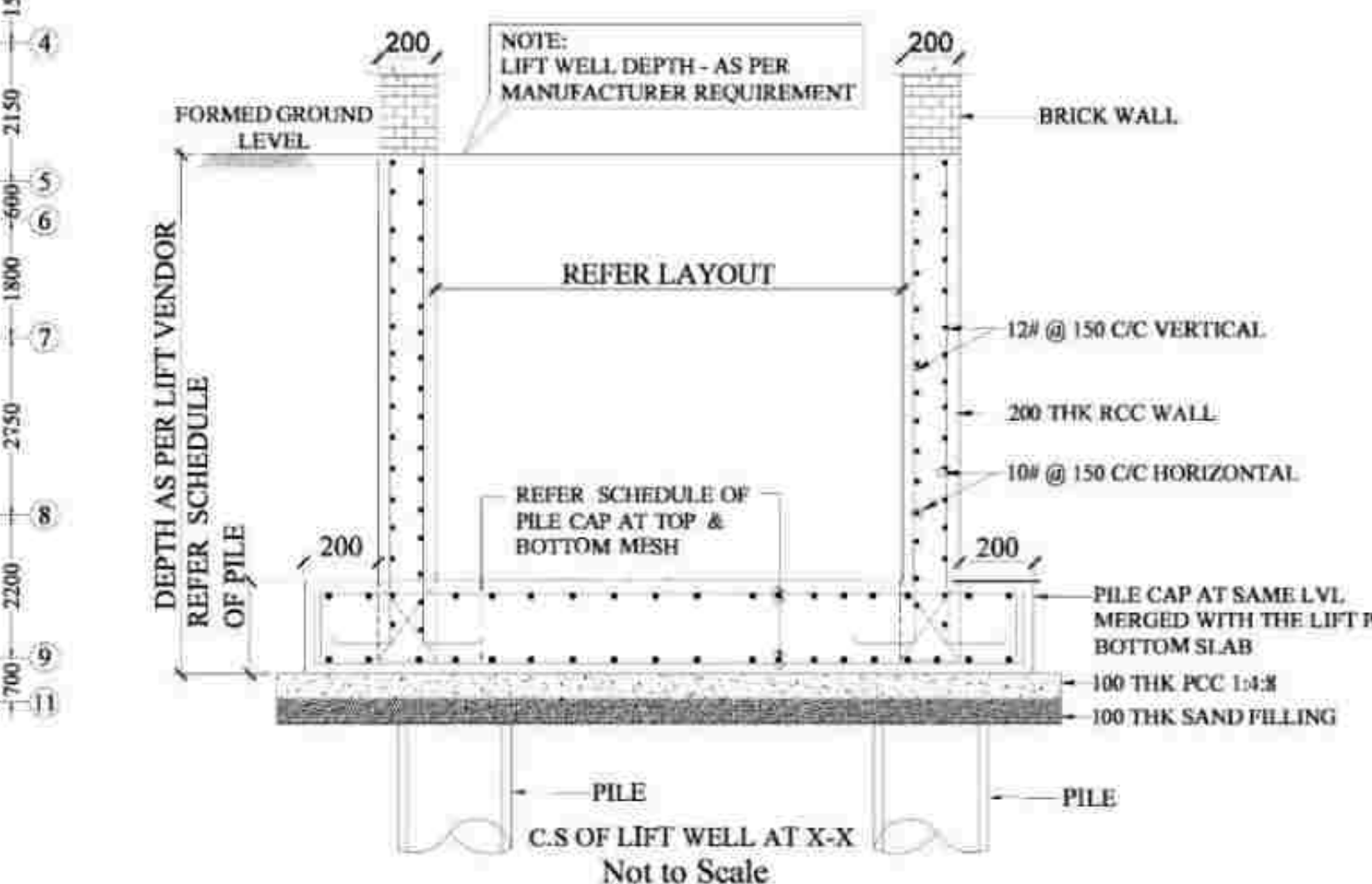


PILE FOUNDATION LAYOUT AT +0.00 M LVL FOR BLOCK 1

SCHEDULE OF PILE CAP							
NAME PILE CAP	PILE CAP SIZE	PILE CAP THICKNESS	BOTTOM R/F	TOP R/F	BINDER	PILE DIA	REMARKS
PC1	900 X 900	600	16# @ 150 C/C	16# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	ONE PILE
PC2	900 X 2400	750	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	TWO PILE
PC3	1000 X 2800	750	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	600 DIA PILE	TWO PILE
PC4	2900 X 4150	900	20# @ 150 C/C	20# @ 150 C/C	10# @ 150 C/C	500 DIA PILE	SIX PILE

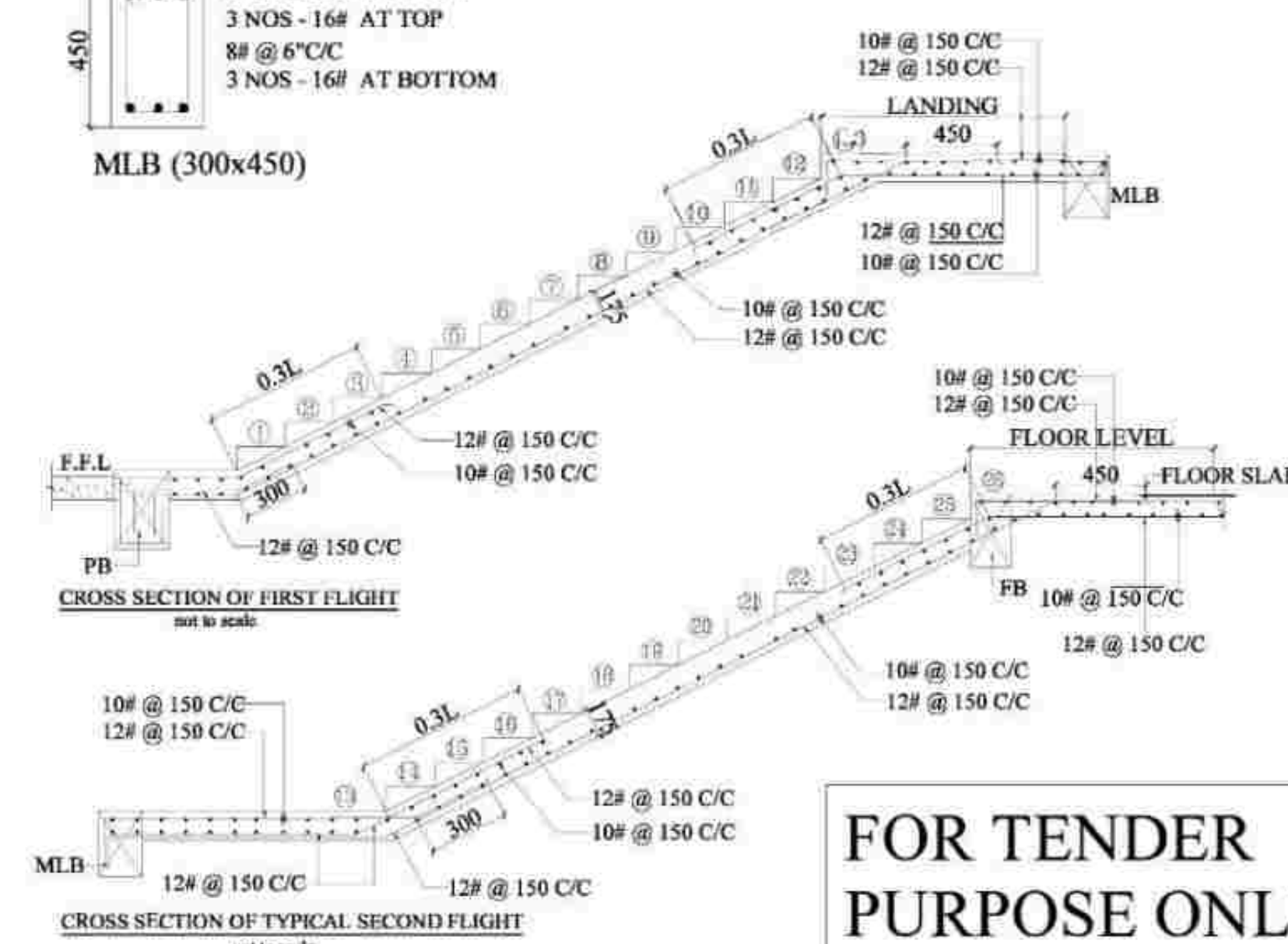
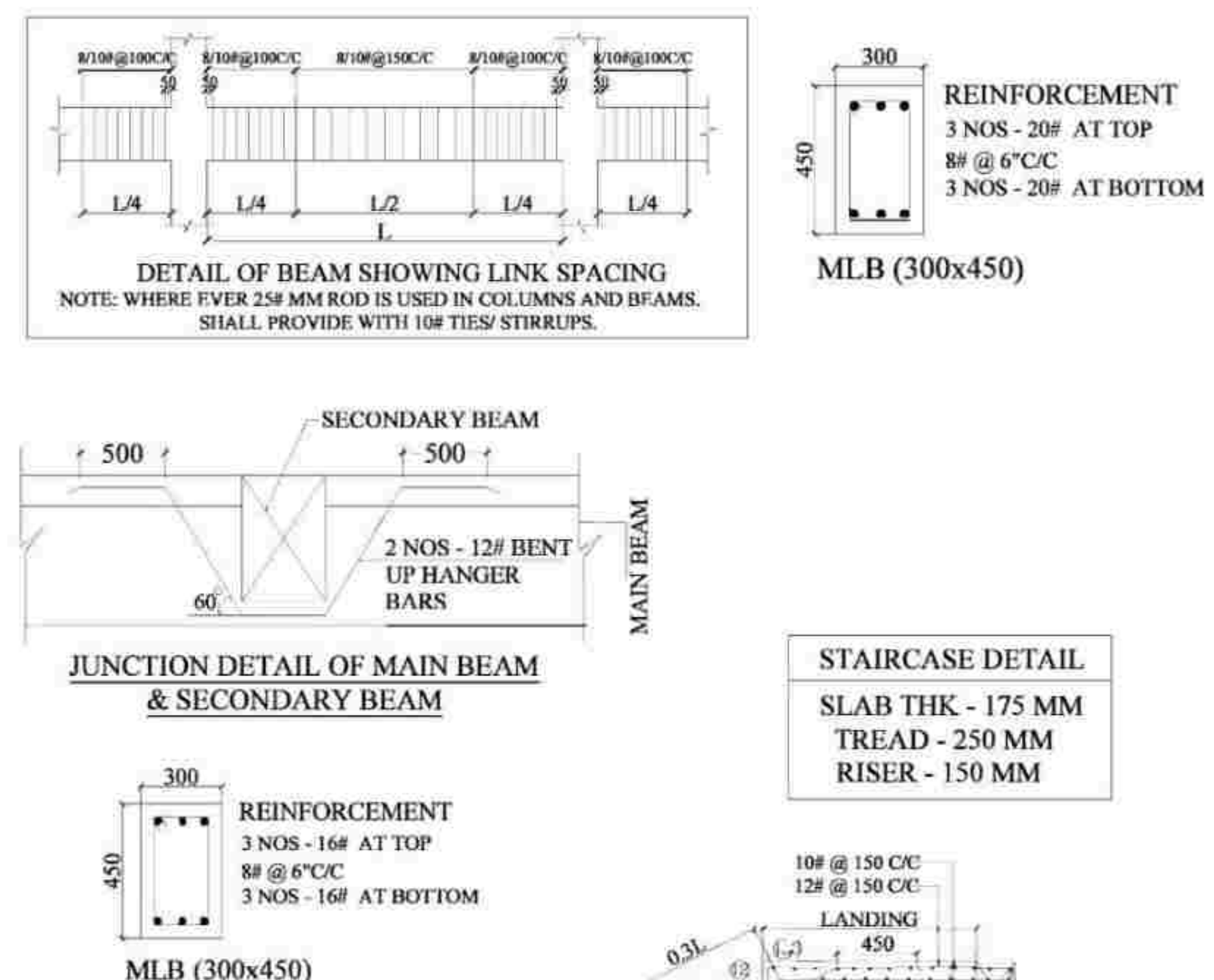


FOR TENDER PURPOSE ONLY



NOTES:

1. ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NEITHER THE DRAWING SHALL BE SCALED OUT NOR THE TIES SHALL BE COUNTED.
3. ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THIS OFFICE BEFORE EXECUTION.
4. CHAIR OF CONCRETE SHALL BE 45° FOR PILE AND 45° FOR OTHER STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
5. COLOR OF STEEL SHALL BE 70-5000 CONFORMING TO LATEST INDIAN STANDARDS.
6. ALL REINFORCEMENT SHALL BE CUT FROM HOUSE SCALES, P.S.D., COAT OF PAINT, OR ANY OTHER SUBSTANCES.
7. THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS:
PILE / PILE CAP: 50MM
BEAMS: 25MM TO 30MM
RC WALLS: 25MM TO 30MM
SLABS: 25MM
8. THE DEVELOPMENT LENGTH FOR TENSION:
B30: 45d
B35: 45d
B40: 45d
B45: 45d
B50: 45d
B55: 45d
B60: 45d
B65: 45d
B70: 45d
B75: 45d
B80: 45d
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B3300: 45d
B3305: 45d
B3310: 45d
B3315: 45d
B3320: 45d
B3325: 45d
B3330: 45d
B3335: 45d
B3340: 45d
B3345: 45d
B3350: 45d
B3355: 45d
B3360: 45d
B3365: 45d
B3370: 45d
B3375: 45d
B3380: 45d
B3385: 45d
B3390: 45d
B3395: 45d
B3400: 45d
B3405: 45d
B3410: 45d
B3415: 45d
B3420: 45d
B3425: 45d
B3430: 45d
B3435: 45d
B3440: 45d
B3445: 45d
B3450: 45d
B3455: 45d



PLINTH BEAM LAYOUT AT + 0.00 MM I.L. FOR BLOCK 1

FOR TENDER
PURPOSE ONLY

This drawing is the property of N/A Centre for Urbanisation, building and environment (CUE) and must not be used in full or in part by any person or party without our prior permission in writing. Copyright is retained by this office.

NOTES

1. ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
2. ONLY THIN WALL DIMENSIONS SHALL BE GIVEN, WHETHER THE DRAWING SHALL BE SEATED OUT OR NOT. THE WALL SHALL BE COUNTED.
3. ANY DISCREPANCY BETWEEN THE DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE CLIENT BEFORE EXECUTION.
4. GROUND OF CO. NOTE SHALL BE MS. FOR FILL AND MS. FOR OTHER STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
5. GROUND OF SLOPE SHALL BE 50% CO. OR MORE (A. RESISTION IN ST. ALUMINUM).
6. ALL REINFORCEMENT SHALL BE CUT FROM SLOPE SEATING WEST, CO. OR PAINT, OR BY ANY OTHER SURDIA NOTE.
7. THE TROUBLE COVER COVER FOR MAN-HOLE COVER IN R/W AS FOLLOWS
- | | |
|---------------------------|---------------------------|
| PIPE / COATING = 50mm | DIAMETER = 25mm CO. LINES |
| RC WALLS = 25mm CO. LINES | SLABS = 25mm |
8. THE DEVELOPMENT LENGTH FOR TENSION
- | | |
|--------|----------------------------------|
| w=50mm | |
| M20 | d 45c Where d is diameter of rod |
| M25 | d 45c |
9. THE DEVELOPMENT LENGTH FOR COMPRESSION
- | | |
|--------|----------------------------------|
| w=50mm | |
| M20 | d 25c Where d is diameter of rod |
| M25 | d 32c |
10. STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING.
11. SALT LOAD CORROSION DENSITY OF 50mm DIA PIPE IS 1000 kg/m³ 50mm DIA P.B. IS 1400 kg/m³

REV NO:	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY	
NOTE:	SYMBOL	DESCRIPTION				
		NGL	NATURAL GROUND LEVEL			

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

Dr. P. Nallathambi
ME, Ph.D (Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai – 600113.
Chartered Engineer (E-117029-1)

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
TAMIL NADU URBAN HABITAT
DEVELOPMENT BOARD (TNUHDB)
NO.5 KAMARAJAR SALAI, CHENNAI-600005

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	52
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PROOF-CHECKING AGENCY:

 STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

100

STRUCTURAL CONSULTANT:

 **CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT**

MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,

THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CURE/R3C/2022-23/M23/TN/HD/BN

PROJECT CODE: CODE/DATE/2022-23/MS/INSTRUMENTS_01/11

PROJECT TITLE:

PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP

DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 250 DWELLING UNITS AND ONE UNIT FOR REFUGEE ADP

TOTALLY 360 DWELLING UNITS AT KE DASAN SALAI, BARVA NAGAR

R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER

CHENNAI CORPORATION, CORPORATION DIVISION NO 123, ZONE XI.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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DRAWING NO: TNUHDB/BHN/BLOCK A1	SHEET NO: 002	REV NO: R0
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DRAWING TITLE :

PLINTH BEAM LAYOUT & SECTION DETAILS FOR BLOCK A1

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BLOCK NO:	BLOCK A1	SCALE: NTS	SIZE OF SHEET:
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ISSUED FOR:		
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ISSUED FOR:	
<i>[Signature]</i>	<i>[Signature]</i>

☒ PRELIMINARY	☒ TENDER	☐ INFORMATION	DATE OF ISSUE
☐ CORRECTION	☐ DOCUMENTATION		08.11.2020

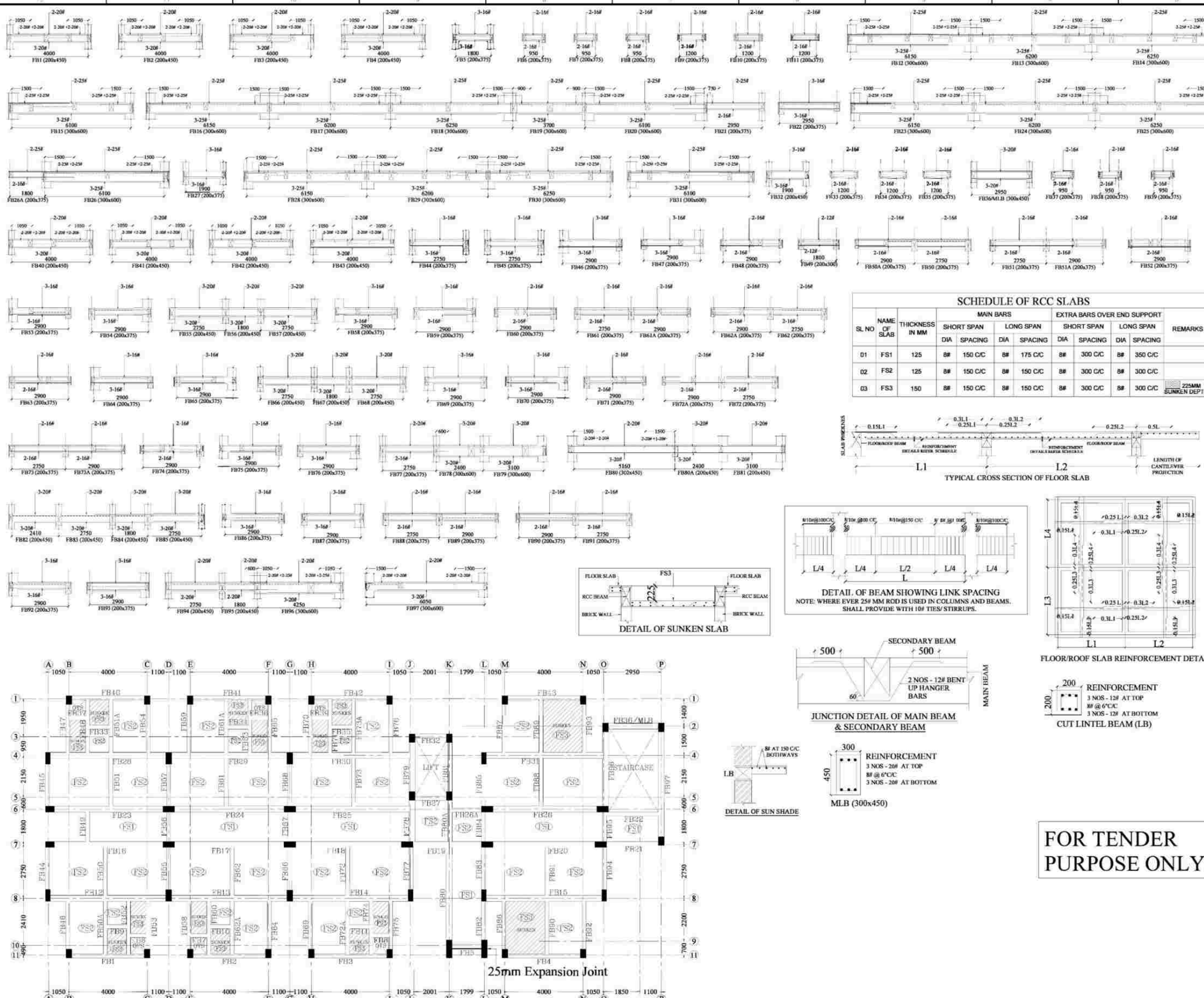
☐ APPROVAL	☐ CONSTRUCTION	08-11-2022
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DESIGNED BY: _____ DRAWN BY: _____

CHECKED BY:	APPROVED BY:
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NOTE: ALL DIMENSION ARE IN mm

	7	7
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STILT FLOOR ROOF BEAM LAYOUT AT + 2900.00 MM LVL

NOTES:

1. ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED, NEITHER THE DRAWING SHALL BE SCALED OUT NOR THE BEAMS SHALL BE COUNTED.
3. ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE OFFICE BEFORE EXECUTION.
4. GRADE OF CONCRETE SHALL BE M30 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
5. GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO (LATEST) IS STANDARDS.
6. ALL REINFORCEMENT SHALL BE FROM (LATEST) SCALES, WITH COAT OF PAINT, OR ANY OTHER SUBSTANCES.
7. THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS:
PILE / FOOTING = 50MM BEAMS = 25MM TO 30MM
SLAB WALLS = 25MM TO 30MM SLABS = 25MM
8. THE DEVELOPMENT LENGTH FOR TENSION:

M30	25	45d	Where d is
M35	30	45d	Diameter of rod
9. THE DEVELOPMENT LENGTH FOR COMPRESSION:

M30	25	35d	Where d is
M35	30	35d	Diameter of rod
10. STRUCTURE IS ASSURED AS PER ARCHITECTURE DRAWING.
11. SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 800mm DIA PILE IS 1400 kN.

SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
01	FS1	125	8#	150 C/C	8#	175 C/C	8#	300 C/C	8#	350 C/C	
02	FS2	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	
03	FS3	150	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	 25MM SUNKEN DEPTH

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				
	DESCRIPTION				
NOTE:	NGL: NATURAL GROUND LEVEL				

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

DR. P. NALLATHAMBI
ME, Ph.D (Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai - 600113
Chartered Engineer (F-117029-1)

PRINCIPAL DEVELOPER:

OFFICE OF THE CHIEF ENGINEER,
TAMIL NADU URBAN HABITAT
DEVELOPMENT BOARD (TNUHDB)
NO.5 KAMARAJAR SALAI, CHENNAI-600005

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

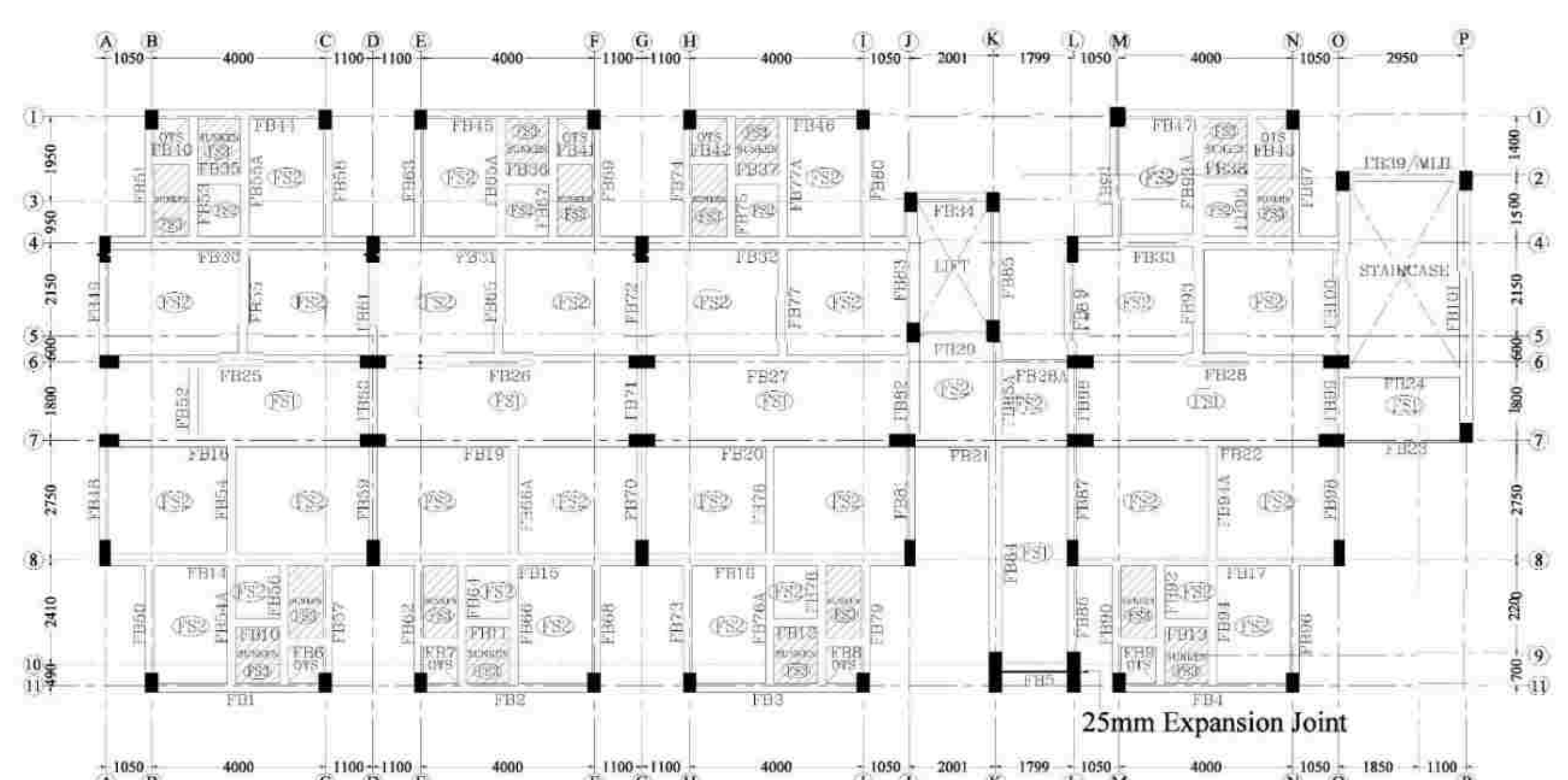
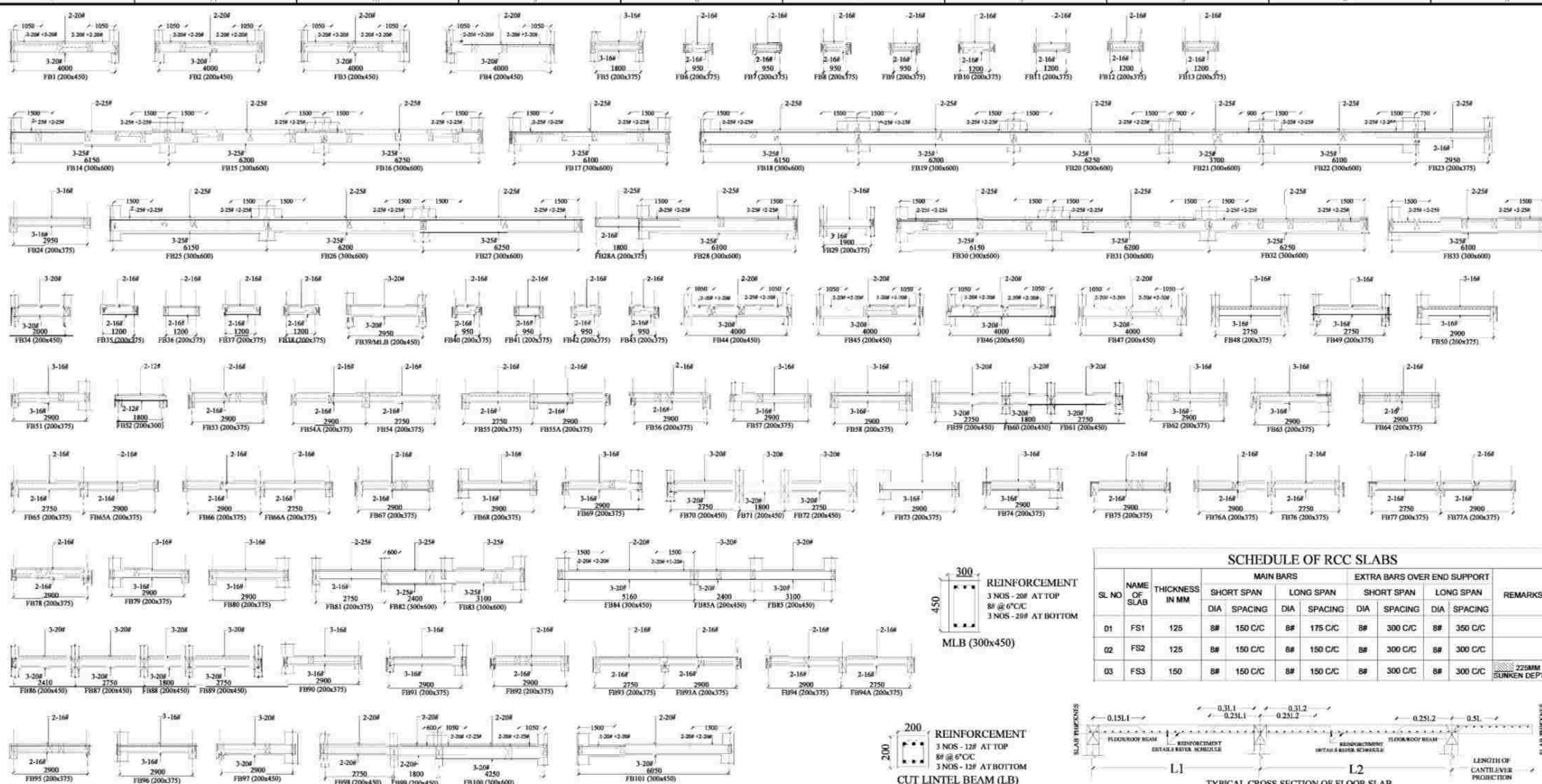
CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCK OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

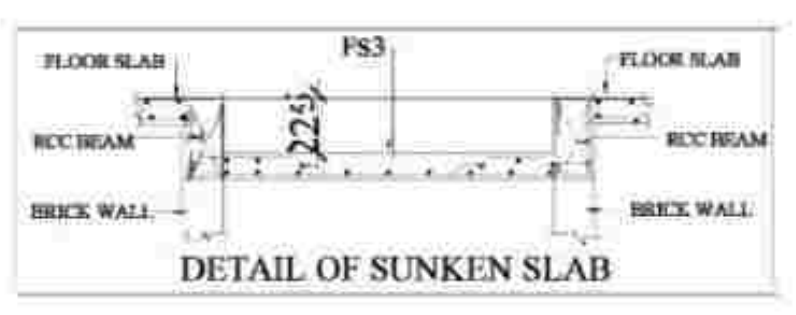
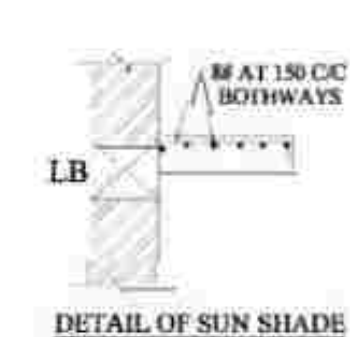
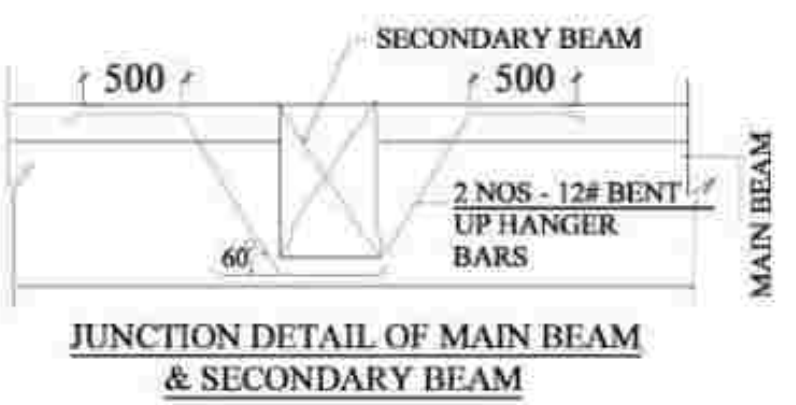
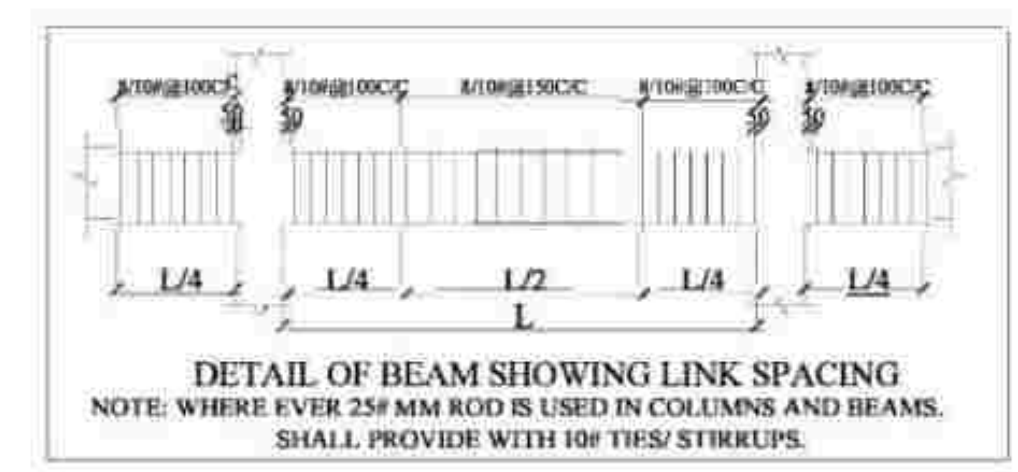
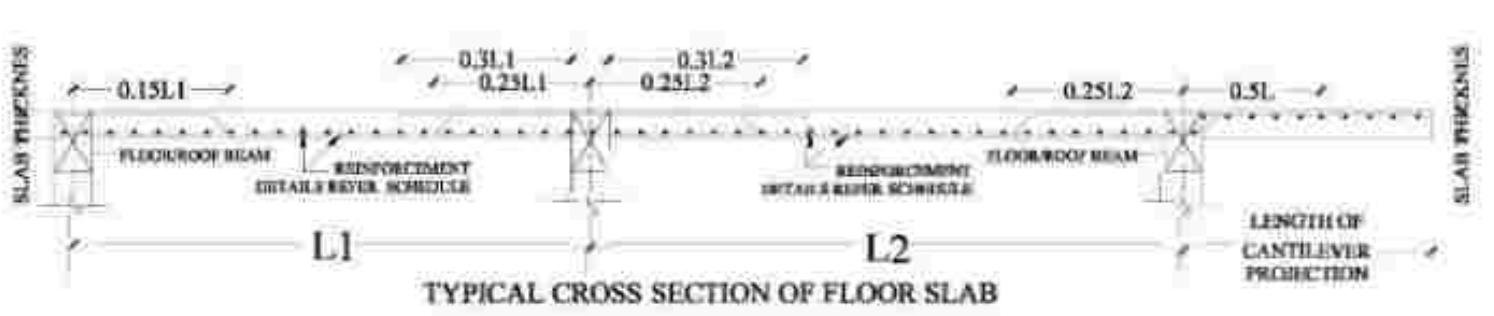
DRAWING NO.: TNUHDB/BHN/BLOCK A1	SHEET NO.: 003	REV NO.: R0
DRAWING TITLE: STILT FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A1		
BLOCK NO.: BLOCK A1	SCALE: NTS	SIZE OF SHEET: A1
ISSUED FOR: ☒ PRELIMINARY ☒ TENDER ☐ INFORMATION ☐ APPROVAL ☐ CONSTRUCTION		
DESIGNED BY:	DRAWN BY:	DATE OF ISSUE: 08-11-2022
CHECKED BY:	APPROVED BY:	
NOTE: ALL DIMENSION ARE IN mm		

FOR TENDER
PURPOSE ONLY



TYPICAL FLOOR BEAM LAYOUT AT FIRST FLOOR ROOF (+5850MM), SECOND FLOOR ROOF (+8800MM), THIRD FLOOR ROOF (+11750MM), FOURTH FLOOR ROOF (+14700MM), FIFTH FLOOR ROOF (+17650MM), SEVENTH FLOOR ROOF (+23550MM), EIGHTH FLOOR ROOF (+26500MM) LVL

SCHEDULE OF RCC SLABS											
SL. NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
01	FS1	125	8#	150 C/C	8#	175 C/C	8#	300 C/C	8#	350 C/C	
02	FS2	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	
03	FS3	150	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	225MM SUNKEN DEPTH



FOR TENDER PURPOSE ONLY

NOTES:

- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- ONLY 90° BENDS SHALL BE FOLLOWED, NEITHER OF DRAWING SHALL BE SLANTED OUT FOR THE REASON OF CONSTRUCTION.
- ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE ARCHITECT'S OFFICE.
- LOADS OF CONCRETE SHALL BE MAINTAINED FOR 48 HRS FOR CURE PERIODS.
- LOADS OF STEEL SHALL BE MAINTAINED FOR 48 HRS FOR CURE PERIODS.
- ALL DIMENSIONS SHALL BE FROM THE EXISTING LEVEL, UNLESS OTHERWISE SPECIFIED.
- THE NORMAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS:
 FLOOR / ROOFING - 50MM
 BEAMS - 25MM
 WALLS - 25MM
 SLABS - 25MM
- THE DEVELOPMENT LENGTH FOR TENSION:
 L_{TD} = 35d
 L_{TD} = 45d
 L_{TD} = 45d
 Where d is the diameter of rod
- THE DEVELOPMENT LENGTH FOR COMPRESSION:
 L_{CD} = 35d
 L_{CD} = 45d
 L_{CD} = 45d
 Where d is the diameter of rod
- STRUCTURE IS DESIGNED AS PER IS 456:2000 AND IS 1343:2000.
- SAFE LOAD CAPACITY OF 300MM DIA PILES IS 1000 kN & 600MM DIA PILE IS 1400 kN.

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED

NOTE: NGL - NATURAL GROUND LEVEL.

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

PRINCIPAL DEVELOPER:

Dr. P. Nallathambi
 ME, Ph.D (Structural Engg),
 Centre for Urbanization, Buildings & Environment [CUBE]
 IIT Madras Research Park, Chennai - 600113
 Chartered Engineer (E-117029-1)

PROOF-CHECKING AGENCY:

STRUCTURAL ENGINEERING DEPARTMENT,
 INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
 CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
 MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
 IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
 THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/BBQ/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
 PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 358 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PL IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDBHN/BLOCK A1 SHEET NO: 004 REV NO: R0

DRAWING TITLE:
 TYPICAL FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A1

BLOCK NO: BLOCK A1 SCALE: NTS SIZE OF SHEET: A1

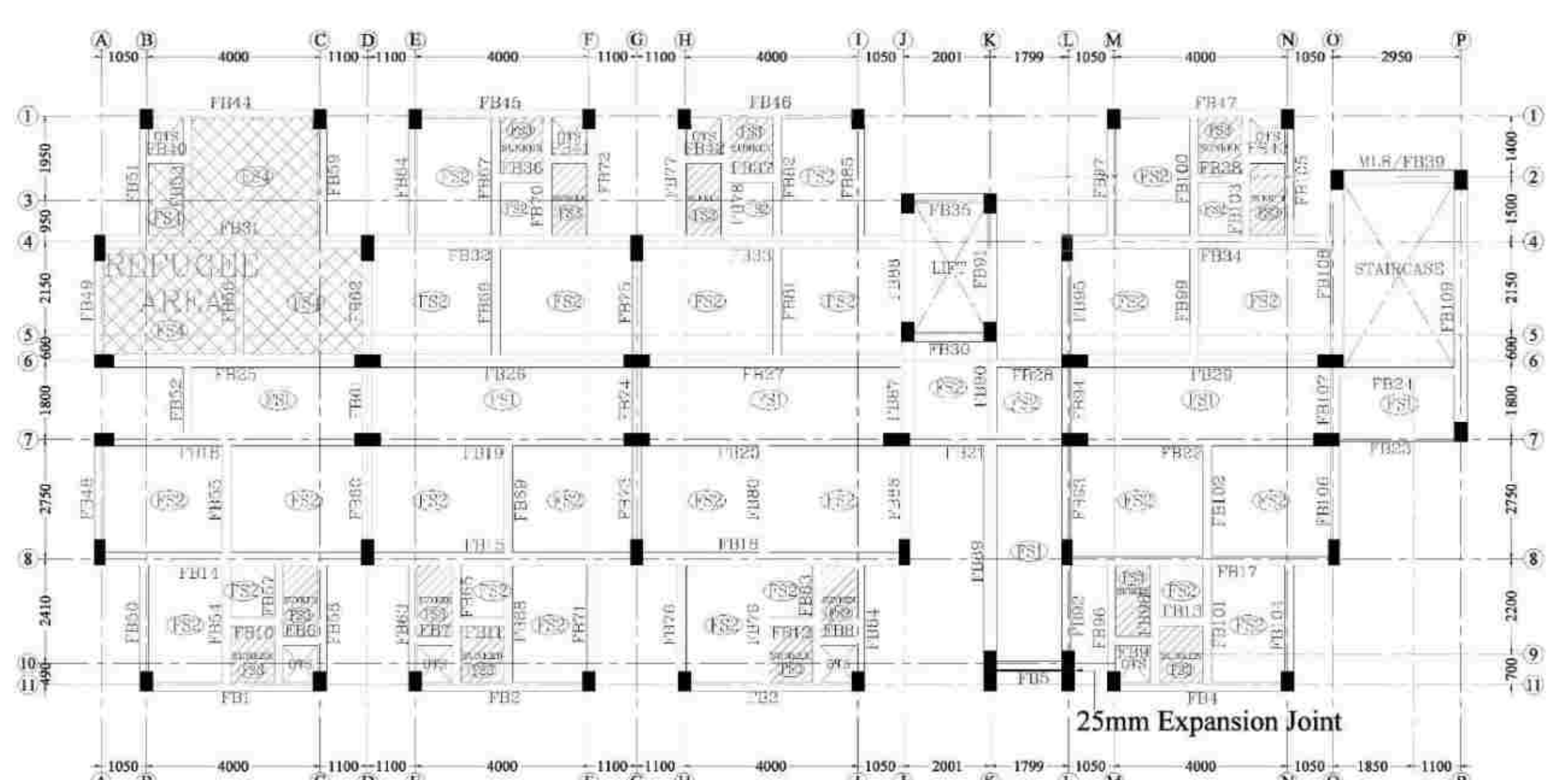
ISSUED FOR:

PRELIMINARY TENDER INFORMATION DATE OF ISSUE: 19-09-2022

DESIGNED BY: DRAWN BY:

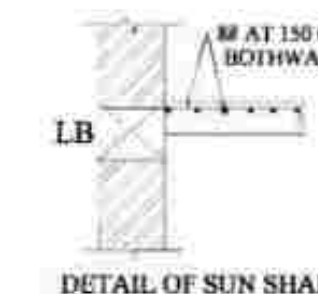
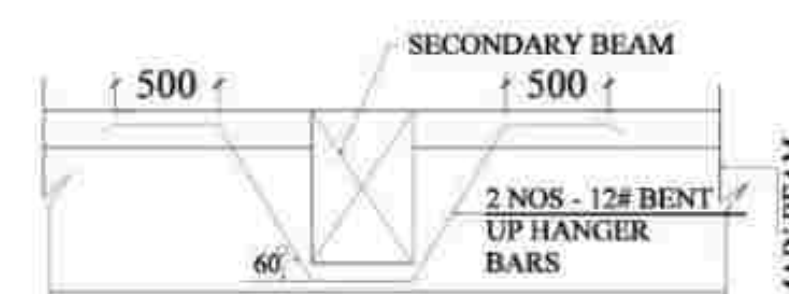
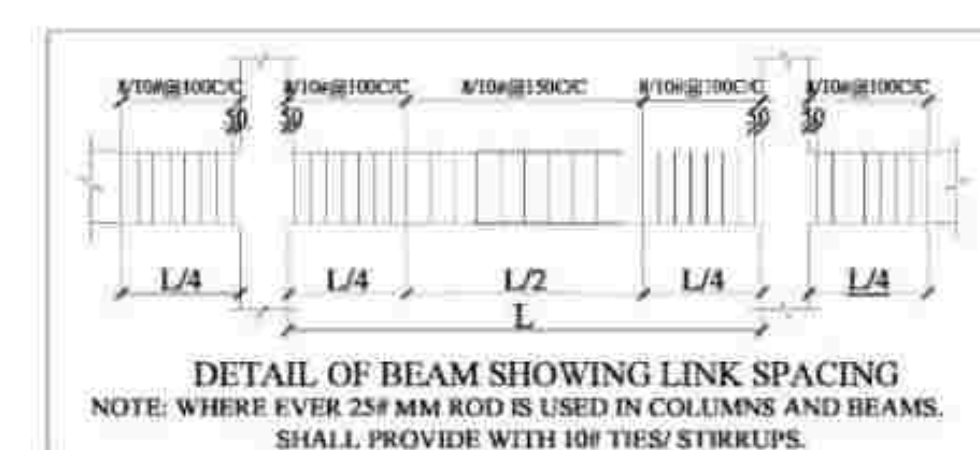
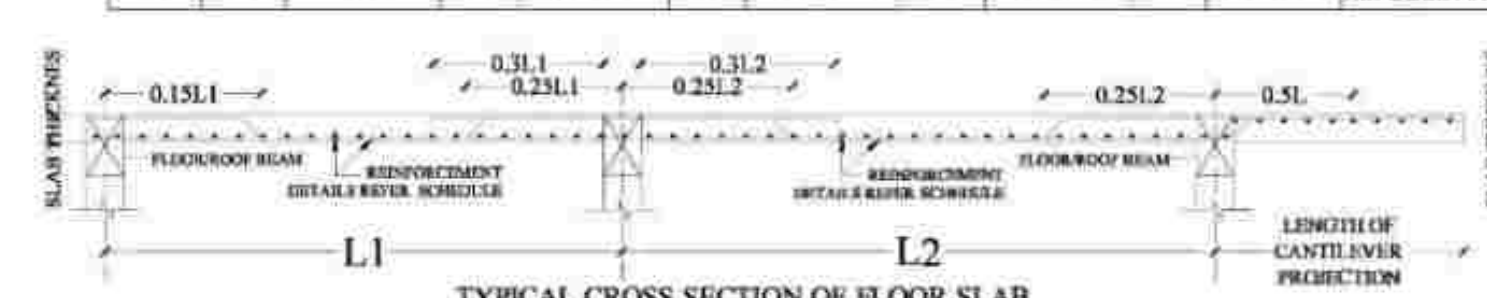
CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm



The diagram shows two reinforcement layouts. The top layout is for an MLB (300x450) with a width of 300 and height of 450. It specifies 3 nos - 20# at the top and 3 nos - 20# at the bottom, with 8# @ 6" C/C. The bottom layout is for a Lintel Beam (LB) with a height of 200. It specifies 3 nos - 12# at the top and 3 nos - 12# at the bottom, with 8# @ 6" C/C.

Figure 1 is a technical drawing of a typical cross-section of a floor slab. It shows two main sections, L1 and L2, separated by a vertical line. Section L1 is on the left and section L2 is on the right. The drawing includes dimensions for the cantilever projections and the reinforcement details. The cantilever projection for L1 is 0.15L1, and for L2 it is 0.5L. The reinforcement details are shown with dimensions 0.31.1, 0.25L1, 0.31.2, 0.25L2, and 0.25L2. The drawing also shows the floor/door beam and the reinforcement details for the cantilever projection.



FOR TENDER
PURPOSE ONLY

NOTES:

1. ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
2. ONLY WITHIN DIMENSIONS SHALL BE FOLLOWED, NEITHER OF DRAWING SHALL BE SEATED OUT NOR THE RATIO SHALL BE COUNTED.
3. ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURE DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE OFFICE BEFORE EXECUTION.
4. COVER OF CONCRETE SHALL BE M20 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
5. COVER OF STEEL SHALL BE 25-50MM CONFORMING TO LATEST ISIRI STANDARDS.
6. ALL REINFORCEMENT SHALL BE RFTY FROM LOCAL SOURCE, SAST, COAL OF PAKISTAN, OR OF ANY OTHER SUGGESTION.
7. THE MINIMUM COVER COEFFICIENT FOR MAIN REINFORCEMENT ARE AS FOLLOWS

PILE / FOOTING = 50MM	BEAMS = 25MM TO 40MM
NO. WALLS = 25MM TO 40MM	SLABS = 25MM

8. THE DEVELOPMENT LENGTH FOR TENSION

		$\sigma = 300N$
M20	d	45c
M25	d	45c

Where c is the diameter of rod

9. THE DEVELOPMENT LENGTH FOR COMPRESSION

		$\sigma = 200N$
M20	d	35c
M25	d	35c

Where c is the diameter of rod

10. STRUCTURE IS DESIGNED FOR PIER AND- INTERNAL DRAWING
11. SAT. DRY CARRYING CAPACITY OF 500MM DIA PILE IS 1000 T. & 600MM DIA PILE IS 1400 T.

REV NO:	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY		
NOTE:	SYMBOL	DESCRIPTION					
		NGL	NATURAL GROUND LEVEL				

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

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IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMASI, CHENNAI, TAMIL NADU 600113.

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP
DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL
BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA
TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN
NO.00/3760 PL. IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER
CHENNAI CORPORATION, CORPORATION DIVISION NO.123 ZONE XI

DRAWING NO: TNUHDB/BHN/BLOCK A1 SHEET NO: 005 REV NO: R0

DRAWING TITLE :
SIXTH FLOOR ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A1

BLOCK NO: BLOCK A1	SCALE: NTS	SIZE OF SHEET: A
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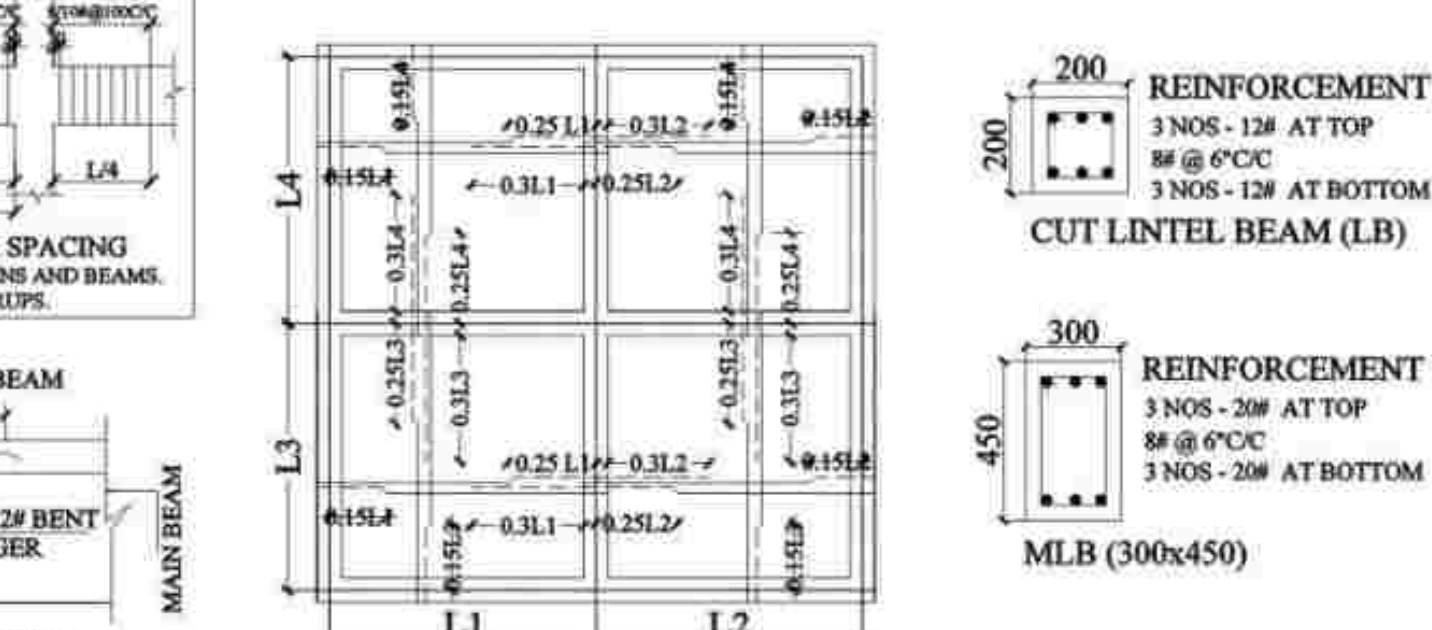
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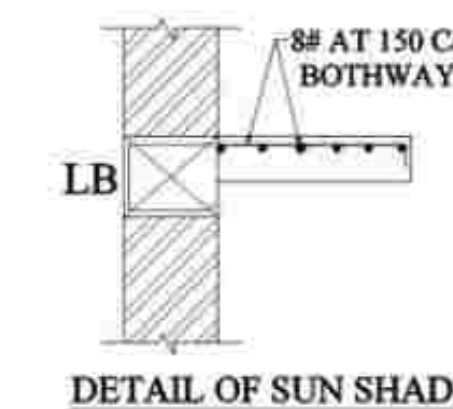
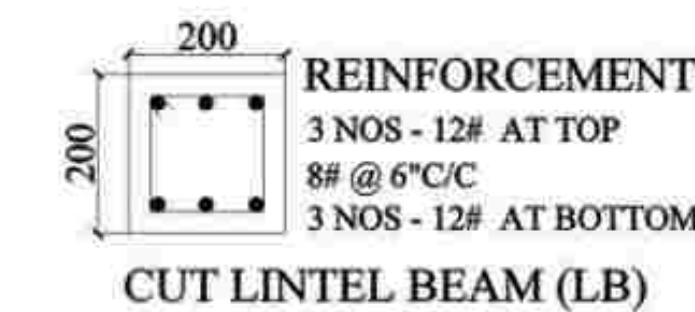
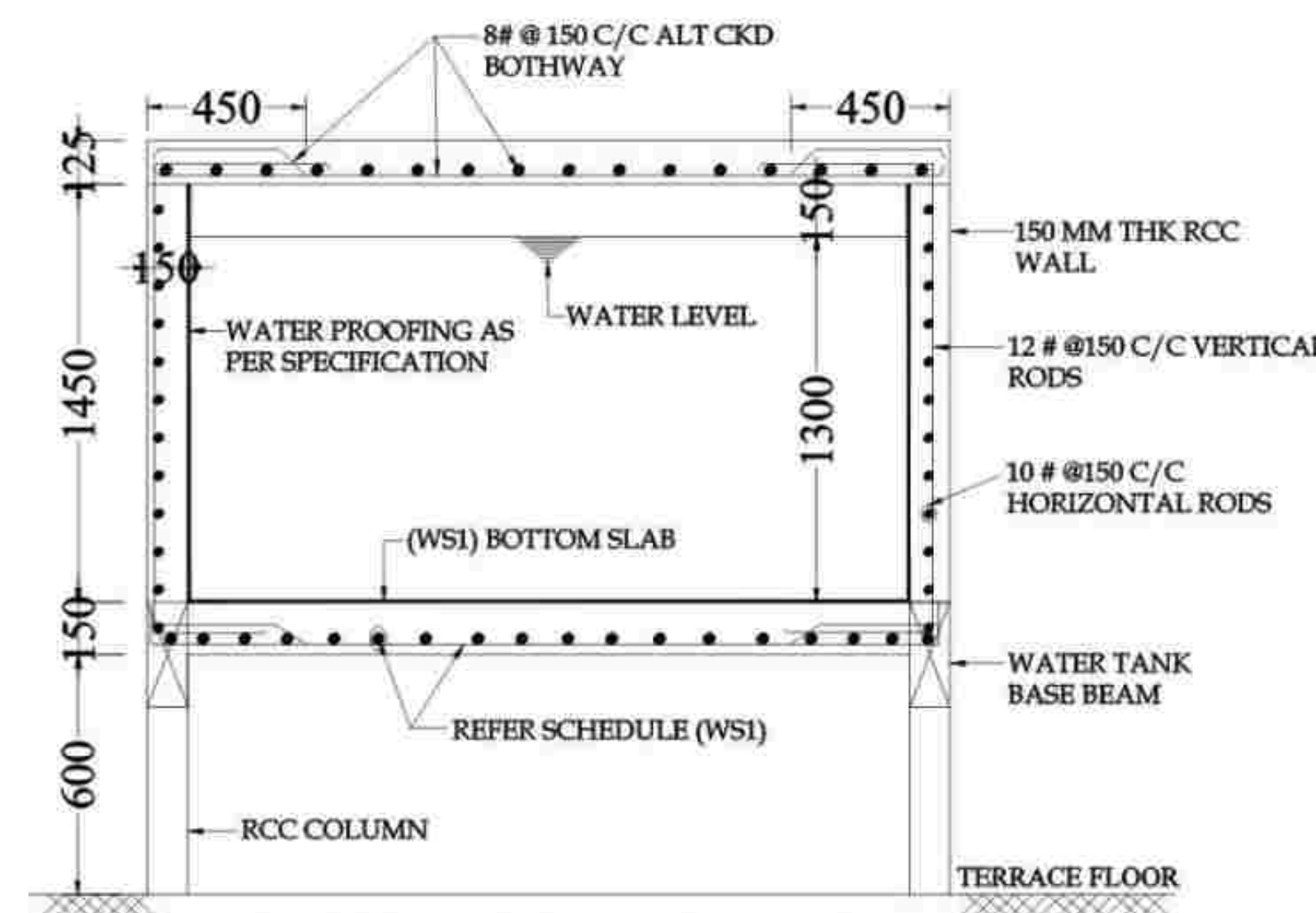
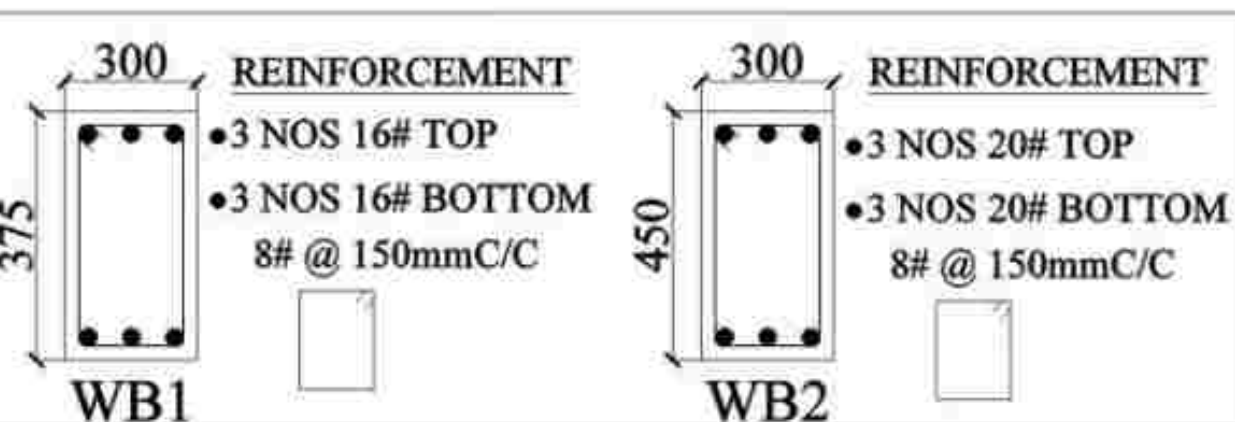
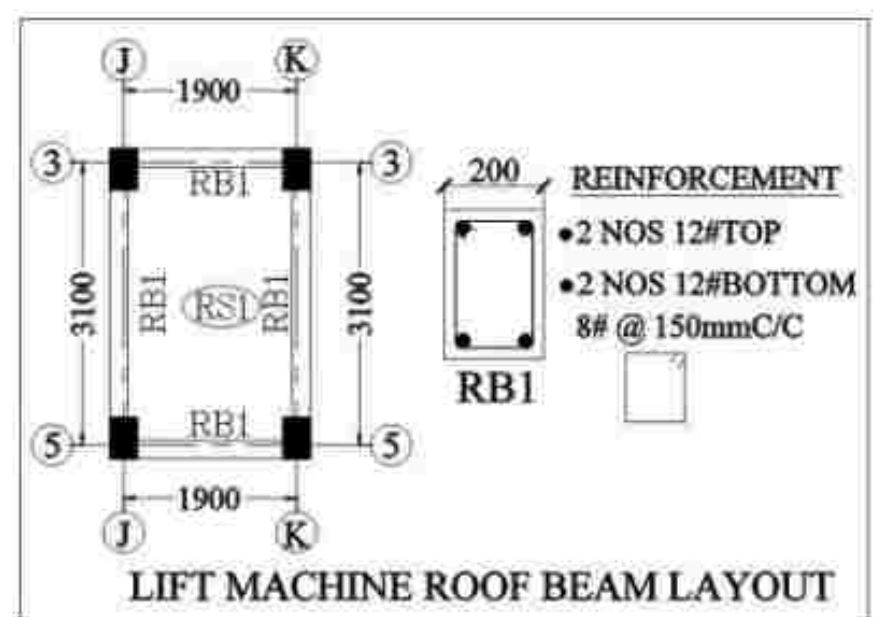
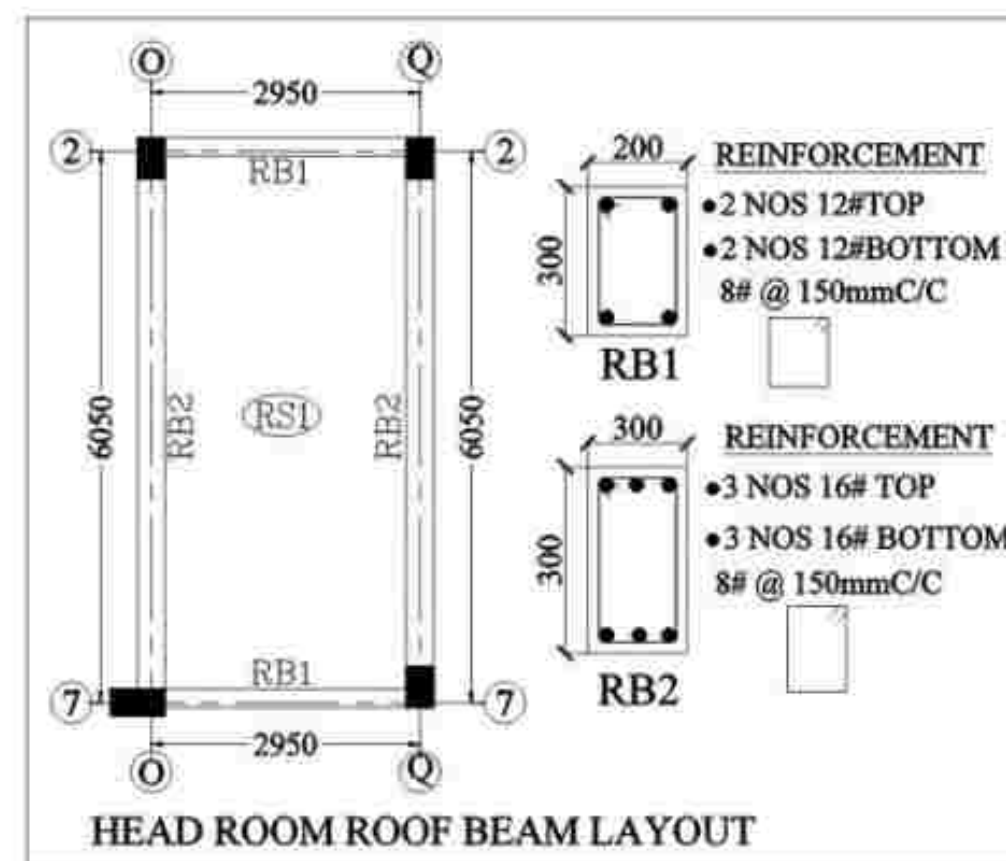
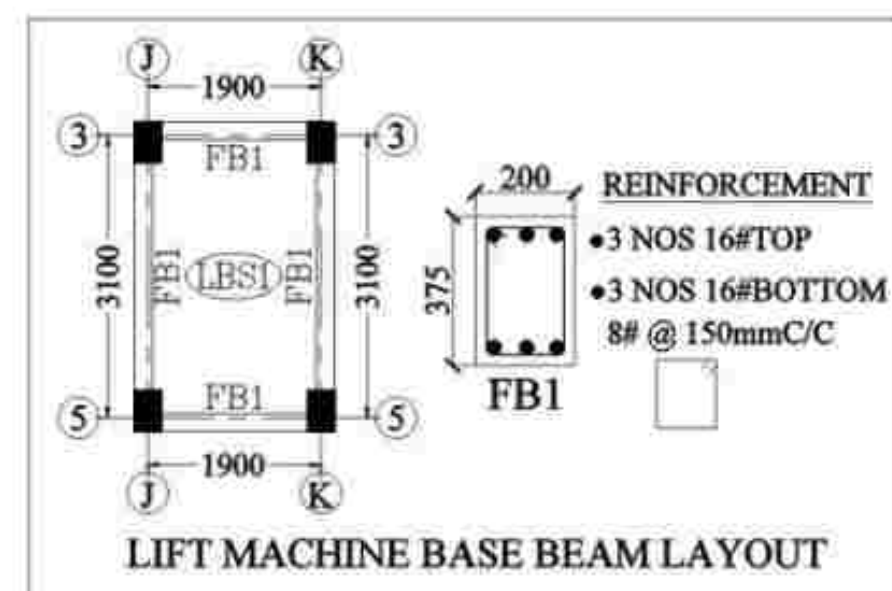
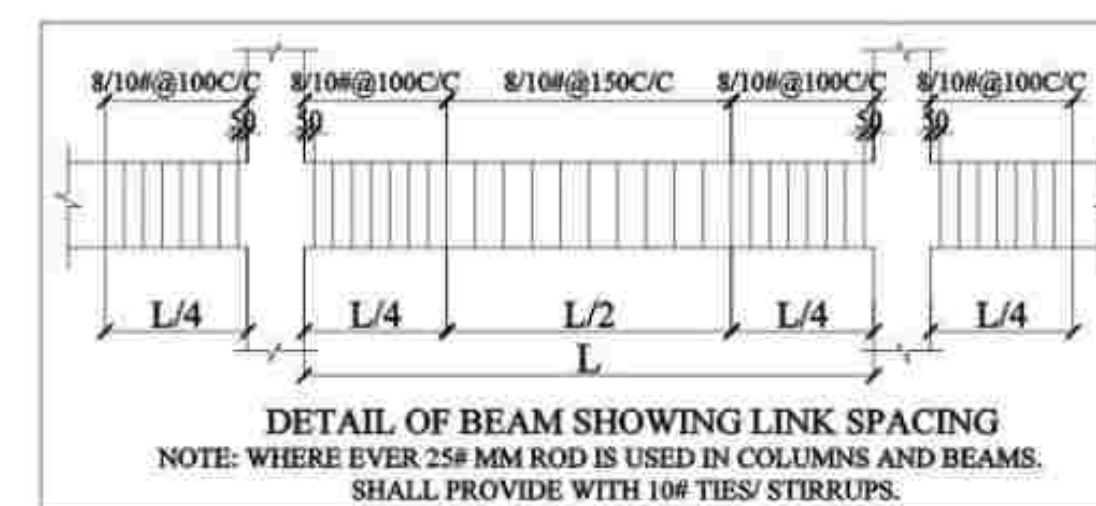
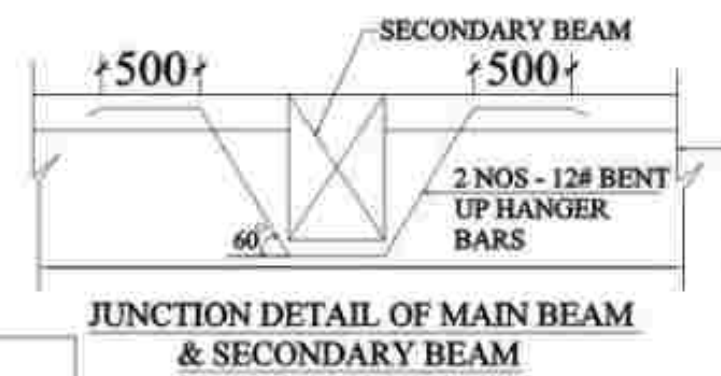
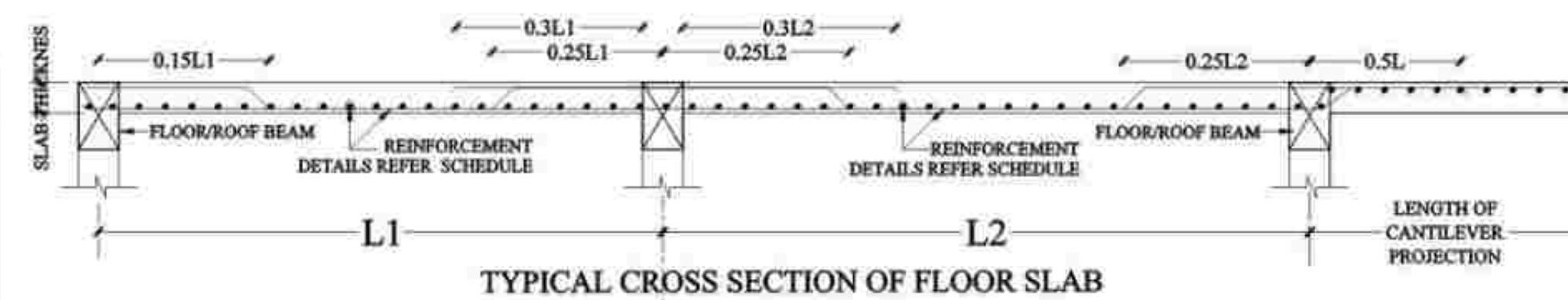


SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
01	RS1	125	8#	125 C/C	8#	175 C/C	8#	250 C/C	8#	350 C/C	SOLAR PANEL FIXING AREA
02	RS2	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	
03	RS3	150	8#	125 C/C	8#	125 C/C	8#	300 C/C	8#	300 C/C	

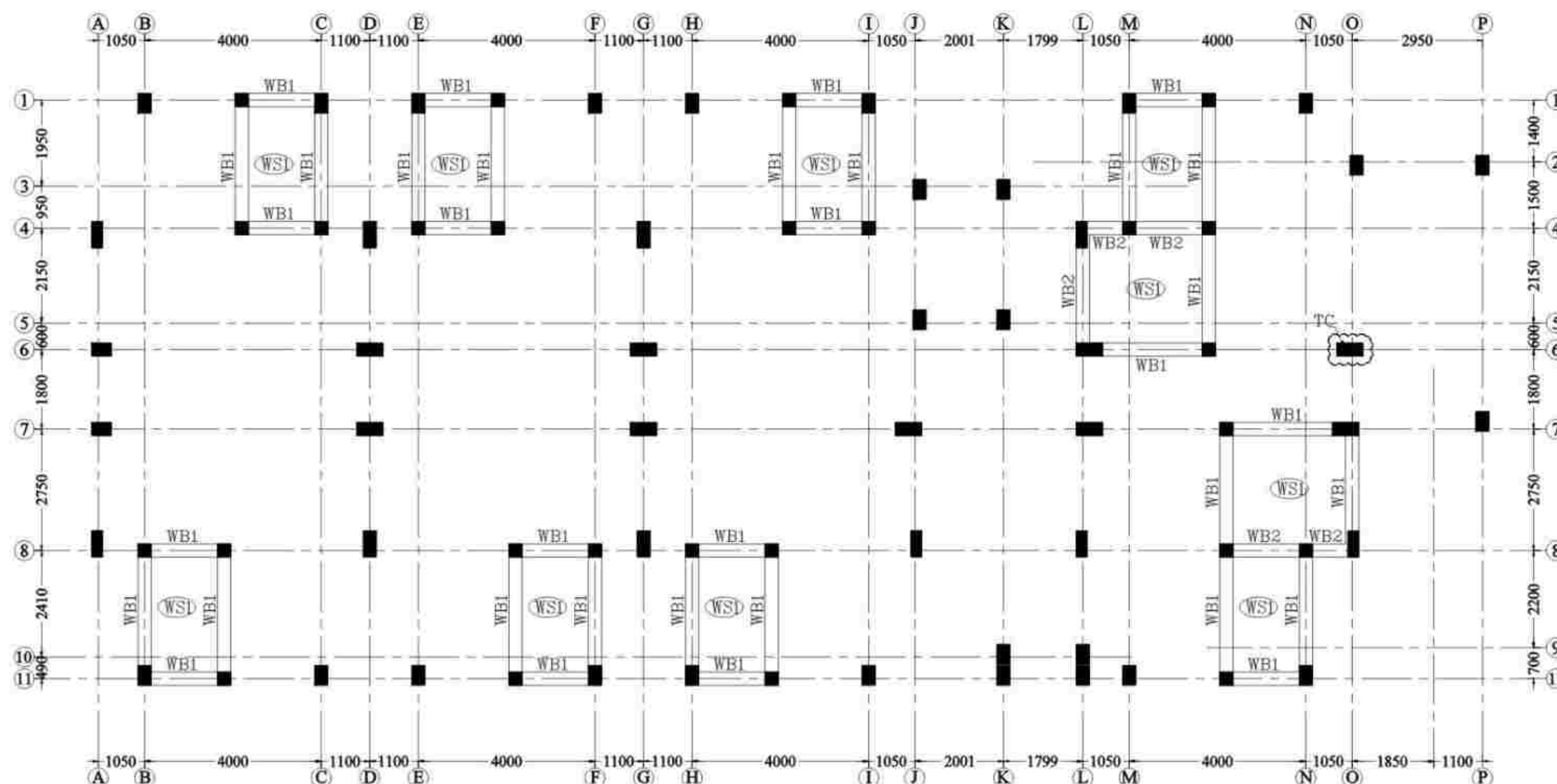


FOR TENDER
PURPOSE ONLY

SCHEDULE OF RCC SLABS											
SL NO	NAME OF SLAB	THICKNESS IN MM	MAIN BARS				EXTRA BARS OVER END SUPPORT				REMARKS
			SHORT SPAN		LONG SPAN		SHORT SPAN		LONG SPAN		
			DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	
01	RS1	125	8#	150 C/C	8#	150 C/C	8#	300 C/C	8#	300 C/C	
02	LBS1	150	10#	150 C/C	10#	150 C/C	10#	300 C/C	10#	300 C/C	LIFT MACHINE BASE SLAB
03	WS1	150	10#	150 C/C	10#	150 C/C	10#	300 C/C	10#	300 C/C	WATER TANK BASE SLAB



SECTION OF WATER TANK



WATER TANK BASE BEAM LAYOUT AT + 30050 MM LVL FOR BLOCK 1

FOR TENDER
PURPOSE ONLY

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 - ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. NEITHER THE DRAWING SHALL BE SCALED OUT NOR THE BARS SHALL BE COUNTED.
 - ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THIS OFFICE BEFORE EXECUTION.
 - GRADE OF CONCRETE SHALL BE M35 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
 - GRADE OF STEEL SHALL BE Fe-500 CONFORMING TO LATEST INDIAN STANDARDS.
 - ALL REINFORCEMENT SHALL BE FREE FROM LOOSE SCALES, RUST, COAT OF PAINT, OIL OR ANY OTHER SUBSTANCES.
 - THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS:
PILE / FOOTING = 50MM, BEAMS = 25MM TO LINKS, RC WALLS = 25MM TO LINKS, SLABS = 25MM
 - THE DEVELOPMENT LENGTH FOR TENSION:
M30: $L_d = 45d$ Where d is Diameter of rod
M35: $L_d = 45d$
 - THE DEVELOPMENT LENGTH FOR COMPRESSION:
M30: $L_d = 36d$ Where d is Diameter of rod
M35: $L_d = 32d$
 - STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING.
 - SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO:	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				
	DESCRIPTION				
NOTE:	NGL				
	NATURAL GROUND LEVEL				

SAFETY AND STRUCTURAL STABILITY CERTIFICATE
Certified that the structural designs and drawings have been perused by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.
CUBE:

STRUCTURAL CONSULTANT

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Centre for Urbanization, Buildings & Environment [CUBE]
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STRUCTURAL ENGINEERING DEPARTMENT,
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI, TAMIL NADU-600036

STRUCTURAL CONSULTANT:

CENTER FOR URBANIZATION, BUILDINGS & ENVIRONMENT
MODULE NO. 8C, 8TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022-23/023/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123,ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A1 SHEET NO: 007 REV NO: R0

DRAWING TITLE: WATER TANK BASE, LIFT MACHINE BASE, HEAD ROOM ROOF, LIFT MACHINE ROOF BEAM LAYOUT & SECTION DETAILS FOR BLOCK A1.

BLOCK NO: BLOCK A1 SCALE: NTS SIZE OF SHEET: A1

ISSUED FOR:

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☐ APPROVAL ☐ CONSTRUCTION 08-11-2022

DESIGNED BY: DRAWN BY:

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NOTE: ALL DIMENSION ARE IN mm

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 5. GRADE OF STEEL SHALL BE FE 500 CONFORMING TO LATEST INDIAN STANDARDS.
 6. ALL REINFORCEMENT SHALL BE CUT FROM LATEST SCALES, M30, 30MM OF PILE, OR ON ANY OTHER SUBSTANCES.
 7. THE NOMINAL COVER FOR MAIN REINFORCEMENT ARE AS FOLLOWS:

PILE / FOOTING	50MM	BEAMS	25MM TO 150MM
SLAB	25MM TO 50MM	SLAB	25MM
 8. THE DEVELOPMENT LENGTH FOR TENSION:

M30	30	45d	where d is the diameter of bar
M35	35	45d	where d is the diameter of bar
 9. THE DEVELOPMENT LENGTH FOR COMPRESSION:

M30	30	35d	where d is the diameter of bar
M35	35	35d	where d is the diameter of bar
 10. STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING.
 11. SAFE LOAD CARRYING CAPACITY OF 600mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN.

REV NO.	DETAILS	DATE	DRAWN	CHECKED BY	APPROVED BY
	SYMBOL				
	DESCRIPTION				
NOTE:	NGL				
	NATURAL GROUND LEVEL				

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 PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT K8 DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PI IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123, ZONE XI.

DRAWING NO.: TNUHDB/BHN/BLOCK A1 **SHEET NO.:** 008 **REV NO.:** R0

DRAWING TITLE:
 TYPICAL DUCTILE DETAILING FOR EARTHQUAKE RESISTANCE

BLOCK NO.: BLOCK A1 **SCALE:** NTS **SIZE OF SHEET:** A1

ISSUED FOR:

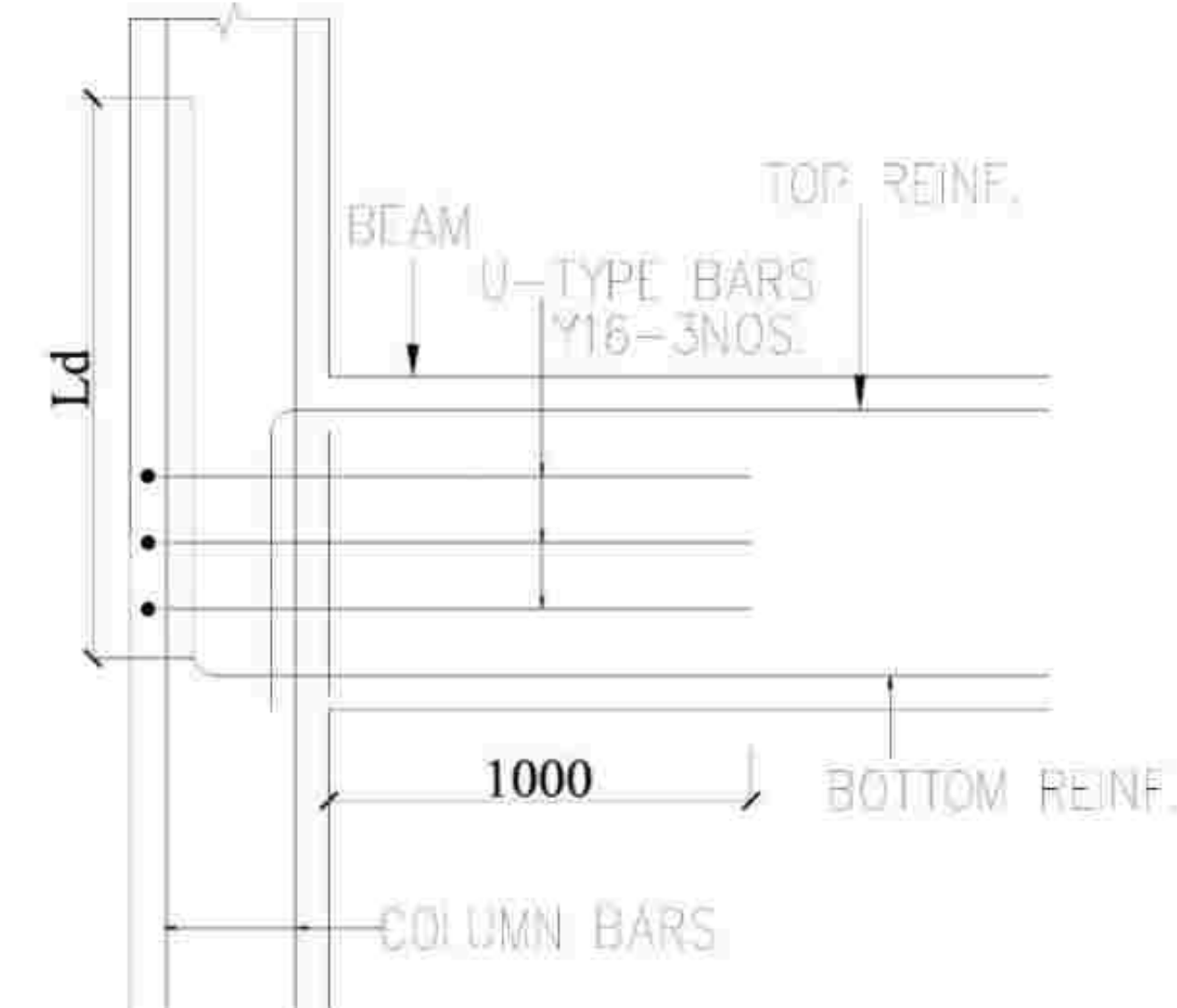
☒ PRELIMINARY ☒ TENDER ☐ INFORMATION **DATE OF ISSUE:** 08-11-2022

☐ APPROVAL ☐ CONSTRUCTION

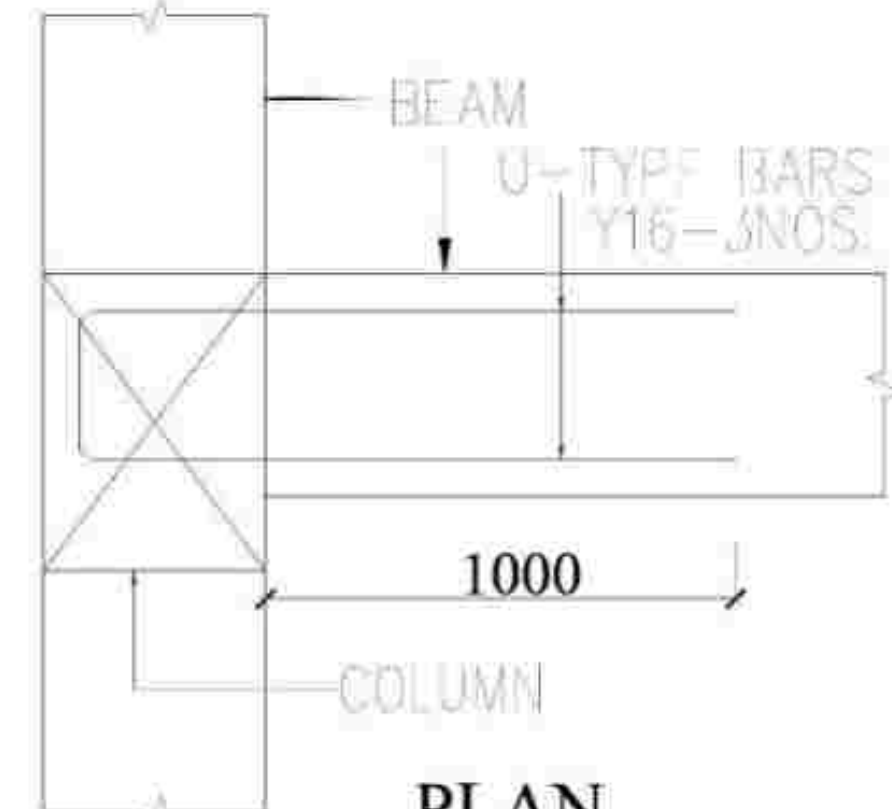
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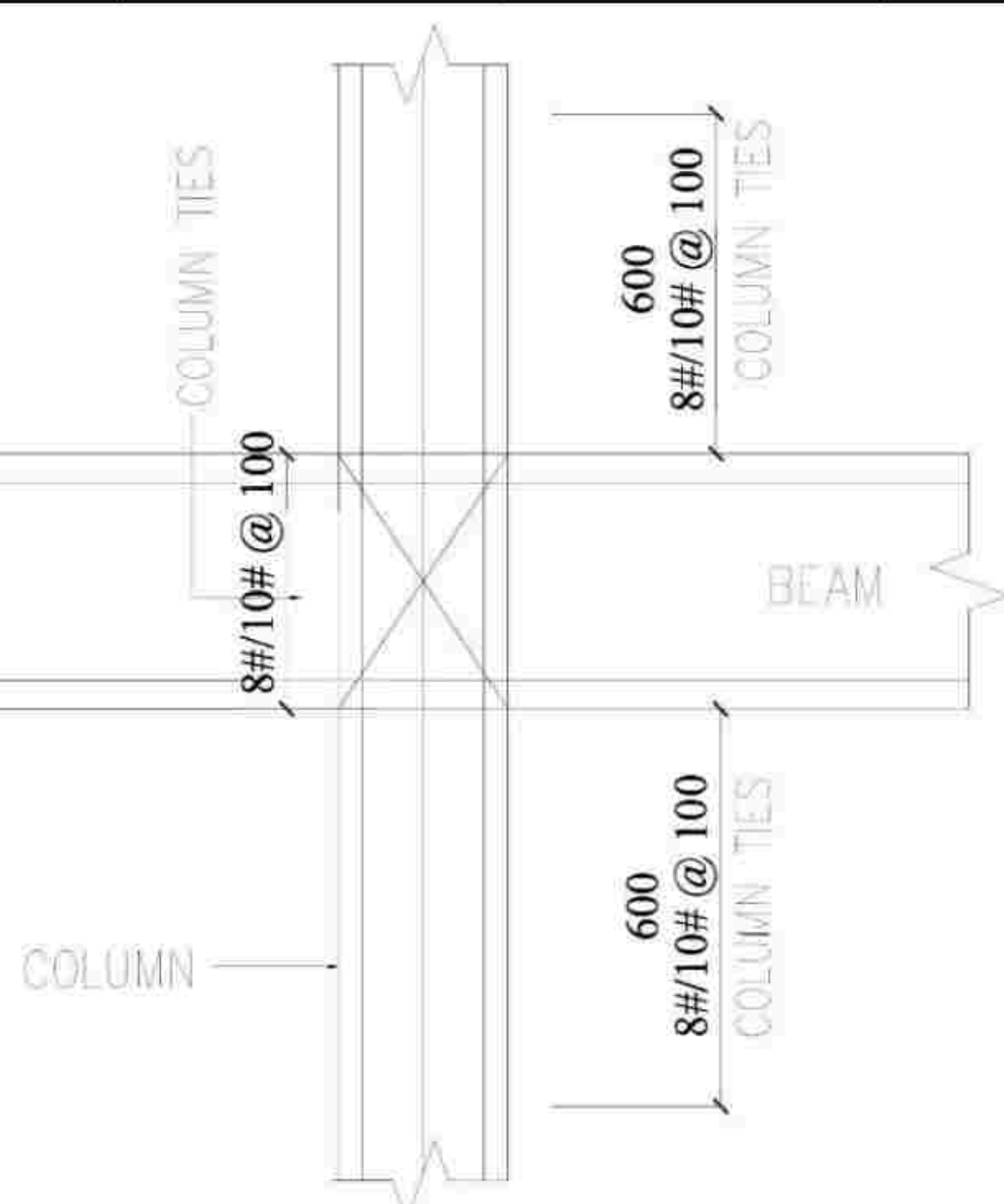
NOTE: ALL DIMENSION ARE IN mm



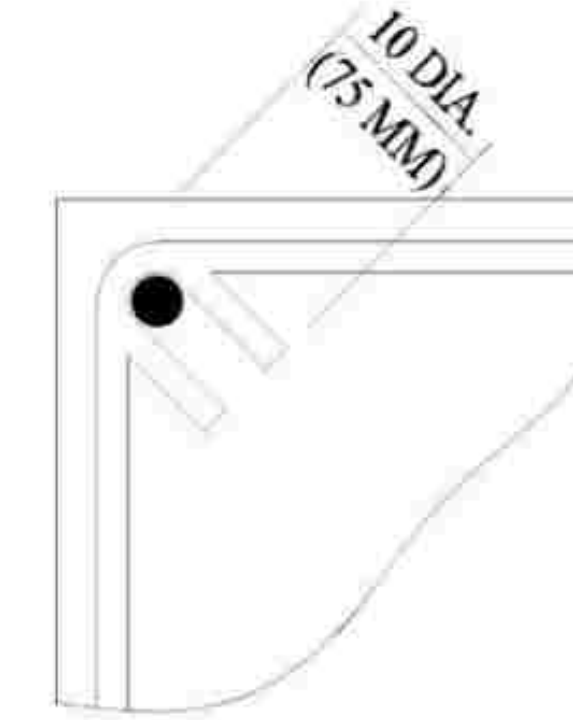
SECTION
TYP.DET.OF COLUMN & BEAM JUNCTION
 (BEAM ON ONE SIDE OF COLUMN)



PLAN
TYP.DET.OF COLUMN & BEAM JUNCTION
 (BEAM ON ONE SIDE OF COLUMN)

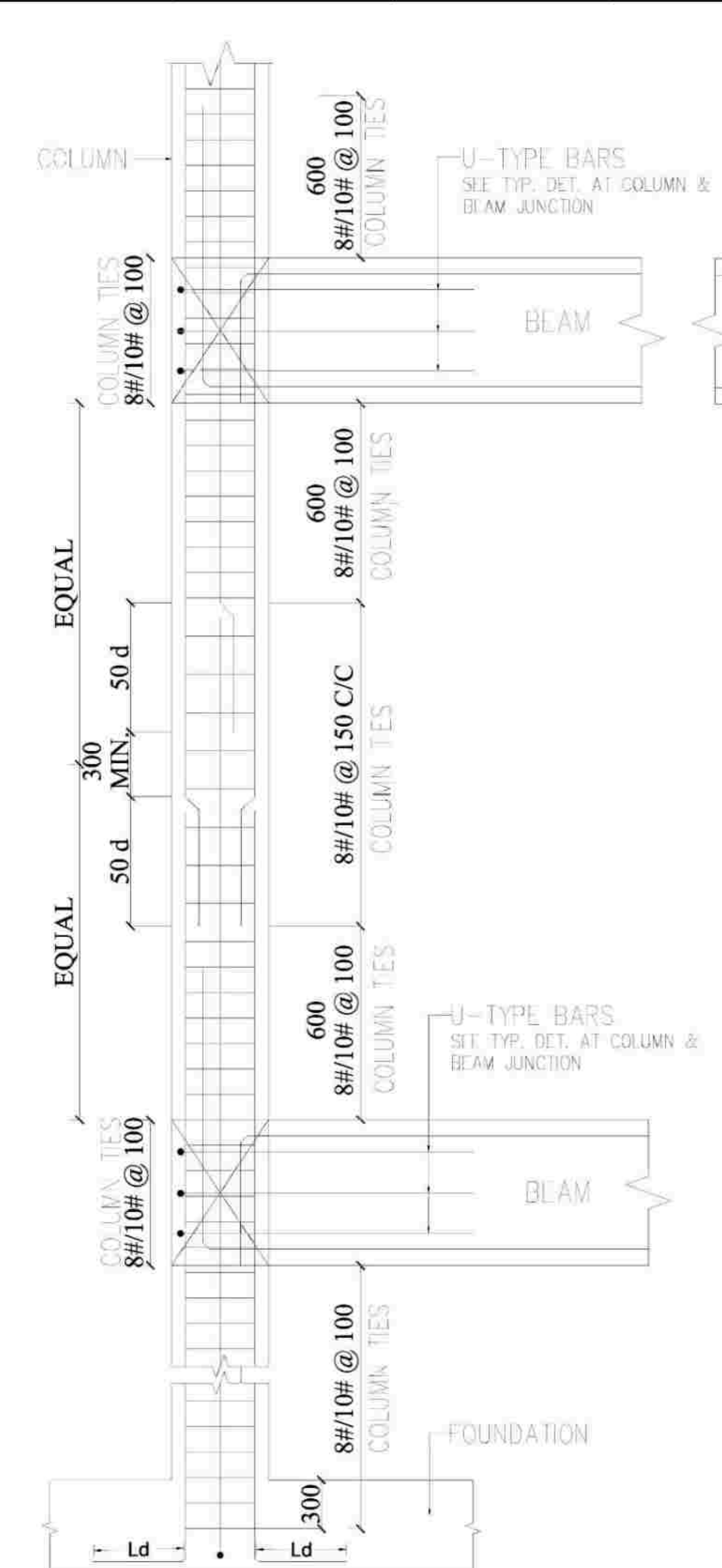
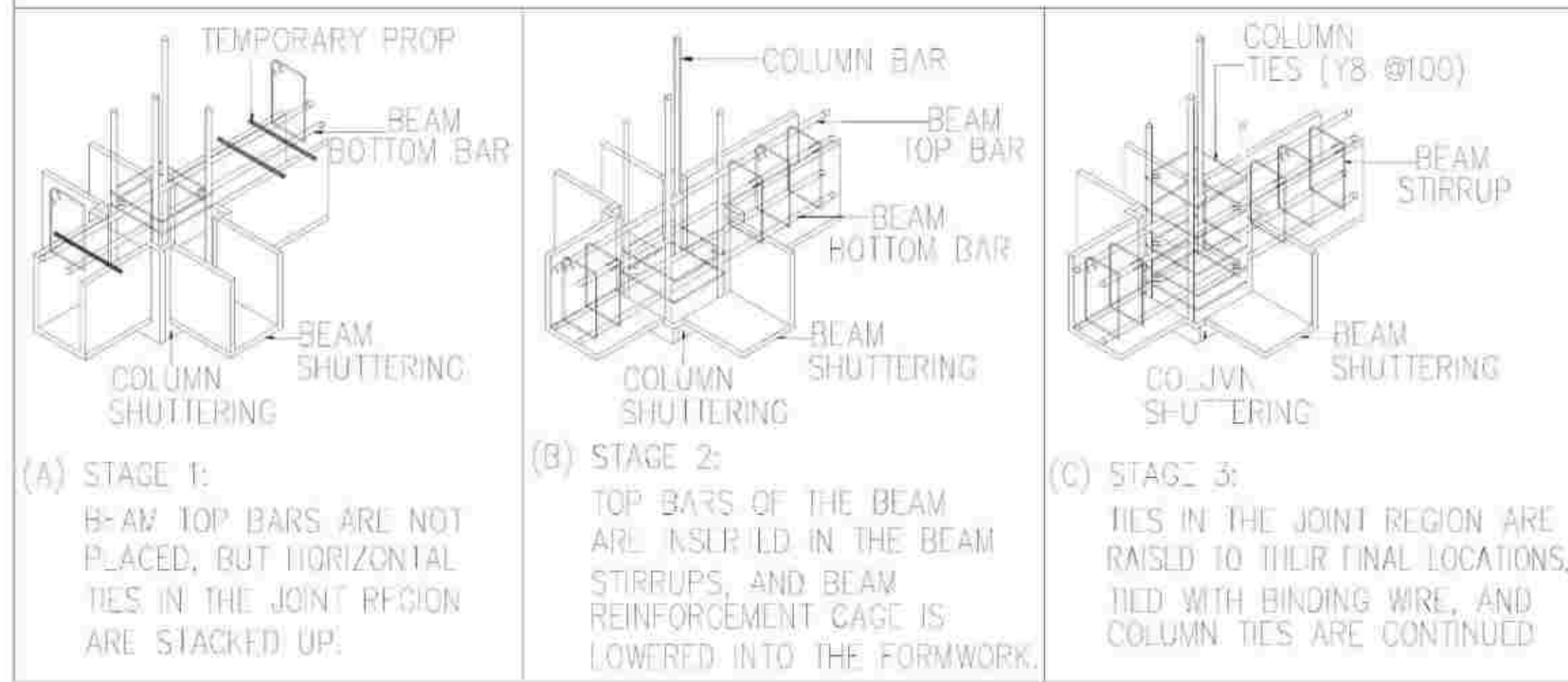


TYP.DET.OF COLUMN & BEAM JUNCTION
 (BEAMS ON TWO SIDES OF COLUMN)



TYP.DET.OF HOOK FOR BEAM STIRRUP

PROCEDURE FOR PLACING COLUMN TIES AT COLUMN BEAM JUNCTION



TYP.DET.OF COLUMN
 (BEAM ON ONE SIDE OF COLUMN)

GENERAL

- 1) ALL STRUCTURAL DETAIL PLANS AND DETAILS ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT ARCHITECTURAL DRAWINGS, SERVICE DRAWINGS, SPECIFICATIONS, BILLS OF QUANTITIES AND ALL OTHER RELEVANT DOCUMENTS. DISCREPANCIES MUST BE REPORTED IMMEDIATELY TO THE ENGINEER-IN-CHARGE.
- 2) ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NEITHER THE BARS SHALL BE COUNTED NOR THE DIMENSIONS SCALED FROM THE DRAWING.

FOUNDATIONS

- 1) FOUNDATIONS ARE DESIGNED FOR THE SBC SPECIFIED IN THE FOUNDATION DRAWING. MIX FOR ALL RCC WORKS SHALL BE AS SPECIFIED IN THE STRUCTURAL DRAWINGS.
- 2) IF ASSUMED SAFE BEARING CAPACITY OF THE SOIL IS NOT FOUND AT THE SPECIFIED FOUNDING LEVEL, THE SAME SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER-IN-CHARGE FOR FURTHER DIRECTIONS.
- 3) FOUNDATION LEVELS OF FOUNDATIONS SHALL BE DETERMINED BY THE ENGINEER-IN-CHARGE, BASED UPON EXISTING ROAD LEVEL, WATER TABLE LEVEL AND REQUIREMENT OF PROVISION OF SERVICES.
- 4) FOUNDATIONS ARE DESIGNED TO BE AT SAME FOUNDING LEVEL. ANY VARIATIONS IN THE GROUND LEVEL BEYOND 600MM AND THE DIFFERENCE IN LEVEL OF TWO ADJACENT FOOTINGS GREATER THAN 10% OF THE CLEAR DISTANCE BETWEEN THEM SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE.
- 5) ANY LOOSE ROCKS OR PROTRUDING Boulders SHALL BE REMOVED BEFORE LAYING BED CONCRETE FOR FOUNDATIONS AND SHALL BE LEVELLED BY FILLING WITH RCC.
- 6) THE TOP LEVEL OF THE GRADE BEAMS OF THE EXTERNAL WALL SHALL BE 50MM BELOW GROUND LEVEL AND OTHER BEAMS OF INTERNAL WALLS SHALL BE 40MM BELOW THE FINISH LEVEL.

CONCRETE

- 1) GRADE OF CONCRETE SHALL BE M30 AND MINIMUM CEMENT CONTENT FOR RCC SHOULD BE 400KG/CUM UNLESS OTHERWISE SPECIFIED.
- 2) ALL OPENINGS FOR PIPES AND CONDUITS ETC. SHALL BE FORMED IN POSITION BEFORE THE CASTING OF CONCRETE.
- 3) NO HOLES OR CHARGES ARE PERMITTED IN THE STRUCTURAL CONCRETE MEMBERS OTHER THAN AS DETAILLED OR APPROVED BY THE ENGINEER-IN-CHARGE.
- 4) THE CLEAR DEPRESSION OF SLAB FOR BATH, WASHBASIN AND J.W.C SHALL BE 300MM AND FOR L.V.C SHALL BE 500MM. DEPRESSION IN SLAB FOR BALCONY SHALL BE 25MM FROM THE ADJACENT FLOOR LEVELS. NECESSARY PROVISION FOR DOWELS FROM BEAMS SHALL BE LEFT WHILE CASTING THE BEAMS.
- 5) WHEN THE SPAN IS MORE THAN 6.00M, PROVIDE CAMBER @ 1MM/250 FOR BEAMS AND SLABS.
- 6) THE FREE END OF CANTILEVER SLABS OR BEAMS SHALL BE RAISED BY 2% OF THE SPAN. TORSIONAL REINFORCEMENT AT DISCONTINUOUS EDGES OF TWO WAY REINFORCED SLABS SHALL BE AS PER IS 456-2000.
- 7) ALL CONCRETE IS TO BE CURED BY AN APPROVED METHOD: WATER POURING, POLYTHENE/PLASTIC SHEET, CURING COMPOUND.

REINFORCEMENT

- 1) ALL STEEL REINFORCEMENT SHALL BE OF TMT BARS CONFORMING TO IS 1786 WITH MINIMUM YIELD STRESS / 0.2% PROOF STRESS OF 500 N/MM².
- 2) GRADE FE 500D FOR ALL STRUCTURES DESIGNED FOR SEISMIC RESISTANCE UNDER ZONE-III OF IS 1893-2016.
- 3) ALL REBARS SHALL BE CUT AND BENT CONFORMING TO THE LATEST EDITION OF IS 1786. MECHANICAL COUPPLERS CONFORMING TO IS 18172 SHALL BE USED WHEN LONGITUDINAL STEEL BARS HAVE TO BE CONTINUED FOR BEAM SPANS LARGER THAN THEIR MANUFACTURED LENGTH.
- 4) WELDING OF REBARS WILL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER-IN-CHARGE. WELDING OF LAPS, TIES, BENTS OR OTHER SIMILAR ELEMENTS TO VERTICAL REINFORCEMENT BARS INTRODUCED AS PER DESIGN IS NOT PERMITTED IN ANY SEISMIC ZONE.
- 5) ALL REBARS ARE TO BE FIRMLY SUPPORTED ON APPROVED CHAIRS OR CONCRETE BLOCKS PLACED AT NOT GREATER THAN 750MM CENTRES BOTH WAYS.
- 6) NOT MORE THAN 50% OF AREA OF TIES OR OTHER TOP OR BOTTOM END SHALL BE SPLICED AT ANY ONE SECTION. LAPPING OF REBARS SHALL BE AS FAR AS POSSIBLE BE AWAY FROM THE SECTIONS OF MAXIMUM STRESS AND BE STAGGERED. LAP SPICES SHALL BE CONSIDERED AS STAGGERED, IF THE CENTRE TO CENTRE DISTANCE OF THE SPICES IS NOT LESS THAN 1.3 TIMES THE LAP LENGTH.
- 7) LAP / MECHANICAL COUPPLERS / WELDED SPICES SHOULD NOT BE PROVIDED
 - a) WITHIN A JOINT
 - b) WITHIN A DISTANCE OF 2D FROM THE RE-WALL, WHERE D IS THE EFFECTIVE DEPTH OF THE MEMBER.
 - c) WITHIN A DISTANCE 1/4 L LENGTH OF MEMBER FROM THE RE WALL.
- 8) LAP LENGTH INCLUDING ANCHORAGE VALUE OF HOOKS FOR BARS IN FLEXURAL TENSION SHALL BE 40D OR 300MM WHICHEVER IS GREATER. THE STRAIGHT LENGTH OF THE LAP SHALL NOT BE LESS THAN 150MM OR 200MM. WHEN BARS OF TWO DIFFERENT DIAMETERS ARE TO BE SPLICED, THE LAP LENGTH SHALL BE CALCULATED ON THE BASIS OF DIAMETER OF THE SMALLER BAR.
- 9) THE HORIZONTAL DISTANCE BETWEEN TWO PARALLEL MAIN REINFORCING BARS SHALL BE NOT LESS THAN THE DIAMETER OF THE LARGER BAR USED OR 25MM MORE THAN THE NOMINAL MAXIMUM SIZE OF COARSE AGGREGATE USED, WHICHEVER IS GREATER.

- 10) WHENEVER REINFORCEMENT IS PROVIDED IN TWO LAYERS IN BEAMS, SPACER BAR SHALL BE PROVIDED TO MAINTAIN 25MM GAP OR MAXIMUM DIA OF THE MAIN BAR WHICHEVER IS MORE BETWEEN TWO LAYERS.
- 11) IN CASE OF CANTILEVER BEAMS / SLABS THE TOP REINFORCEMENT SHALL BE BENT BEYOND THE LOWER FACE OF THE SUPPORTS TO ADEQUATE THE SPAN OF THE CANTILEVER. WHEREVER POSSIBLE, IN CASE IT IS NOT POSSIBLE TO ADOPT THE ABOVE SAID PRACTICE, THE REINFORCEMENT SHALL BE PROPERLY ANCHORED INTO THE SUPPORTING MEMBER.
- 12) LAP / DEVELOPMENT LENGTH FOR MAIN REINFORCEMENT BARS (IN TENSION / COMPRESSION) FOR DIFFERENT GRADES OF CONCRETE MIX SHALL BE AS FOLLOWS:

CONCRETE MIX	FE 500D (FOR ZONE II STRUCTURES)
M30	45d (TENSION) & 35d (COMP)

 WHERE d IS THE DIAMETER OF THE BAR.
- 13) WHEN OPENINGS ARE SMALL AND THE SLAB IS NOT SUBJECTED TO ANY SPECIAL TIE LOADING OR MEMORANDUM CONDITIONS, THE FOLLOWING GENERAL DETAILING RULES MAY BE FOLLOWED AROUND OPENINGS.
 - a) DIAMETER OF HOLLOW BARS SHALL BE SUITABLE TO HOVER REINFORCING BARS OF THE STRUCTURE THROUGH WHICH THE OPENING IS FORMED.
 - b) NO REINFORCING BARS ARE REQUIRED FOR OPENINGS LESS THAN 200MM WIDE. NO REINFORCING BARS SHALL BE CUT BUT THESE SHALL BE ADJUSTED IN POSITION TO AVOID OPENINGS.
 - c) REINFORCING BARS SHALL BE NOT LESS THAN THE NOS. OF BARS CUT BY OPENING.
 - d) MINIMUM 2 NOS. EACH AT TOP AND BOTTOM AND TWO DIAMETER AS SPECIFIED ABOVE BUT NOT LESS THAN 10d.
 - e) BOTH PERPENDICULAR AND DIAGONAL REINFORCING BARS SHALL BE PROVIDED AS SHOWN IN SKETCHES.
- 14) WHENEVER THE REINFORCEMENT IS PROJECTED FROM THE STRUCTURAL MEMBERS AS A PROVISION MADE TOWARDS FUTURE EXTENSION OF THE BUILDING THE SAME SHALL BE APPROPRIATELY PROTECTED FROM CORROSION BY TREATING WITH EPOXY AFTER COMPLETELY REMOVING SCALES OR RUST, IF ANY. THIS REINFORCEMENT MAY BE ENGAGED IN A CONCRETE MIX OF 1:3:6 OR LEFT EXPOSED OR PROTECTED IN ANY OTHER MANNER AS DIRECTED BY ENGINEER-IN-CHARGE.
- 15) THE NOMINAL COVER GIVEN BELOW FOR MODERATE EXPOSURE CONDITION SHALL BE MEASURED FROM THE OUTER FACE OF THE STRUCTURAL ELEMENT TO THE STEEL BARS / LINKS.

MEMBERS	SLABS	PILES	STAIR BEAM	TRUSS	FOOTINGS	COLUMNS	INCL. BASES
SLABS	25MM	40MM	25MM	25MM	40MM	40MM	50MM

WATER AND DRAINAGE LINES WITHIN STRUCTURAL ELEMENTS

- 1) THE CONTRACTOR SHALL SUBMIT FOR APPROVAL DETAILS OF THE AND ENTRY OF PIPES THROUGH STRUCTURAL ELEMENTS.
- 2) THESE POINTS ARE TO HAVE ADDITIONAL FUSION BONDED EPOXY COATED REINFORCEMENT PLACED AROUND THE PIPE.

RE WALLS FOR BASEMENTS

- 1) IF THE LEVEL OF THE WATER TABLE FOR ANY SPACE IS FOUND TO BE WITHIN THE DEPTH OF EXCAVATION, THE SAME SHALL BE BROUGHT TO THE NOTICE OF ENGINEER-IN-CHARGE.
- 2) 100MM THICK REINFORCED CONCRETE OF GRADE M15 IS TO BE PLACED BELOW THE WATER TABLE BASE SLAB.
- 3) WATER BARS ARE TO BE INCORPORATED IN ALL VERTICAL AND HORIZONTAL JOINTS.
- 4) ALL WALL JOINTS SHALL BE CAST INTO TIE-BARS WITH THE BASE SLAB.

CONSTRUCTION JOINTS

- 1) THESE ARE TO BE PROVIDED AT LOCATIONS OF ZERO OR MINIMUM SHEAR IN BEAMS AND SLABS AND AT LOCATIONS OF MINIMUM STEEL CONCENTRATION.
- 2) THESE ARE TO BE PERPENDICULAR TO THE COMPRESSION FORCES ACROSS THE JOINT. IN MOST CASES THE JOINTS WILL HAVE TO BE PERPENDICULAR TO THE AXIS OF THE MEMBER.
- 3) ALL REINFORCING BARS INTERSECTED BY THE CONSTRUCTION JOINTS ARE TO EXTEND THROUGH THE JOINTS WITHOUT INTERRUPTION.
- 4) VERTICAL JOINTS SHALL BE FORMED WITH UNDER FORMWORK COATED WITH AN APPROVED SURFACE RETARDER AND THE VERTICAL FACE IS TO BE WAXED TO EXPOSE THE AGGREGATE BEFORE FINAL SET OF THE CONCRETE HAS TAKEN PLACE.
- 5) HORIZONTAL JOINTS SHALL BE SCRABBLED TO REMOVE ALL LATENT AND WEAK CONCRETE BEFORE CONCRETE FOR THE NEXT FET IS PLACED. NECESSARY TIES SHALL BE PROVIDED IN THE APPROVED METHODOLOGY AS REQUIRED BY THE ENGINEER-IN-CHARGE.
- 6) WITHOUT CLEANING AND FLUSHING THE JOINT WITH MORTAR OR GROUT ART. TO PREVENT THE POORING OF FRESH CONCRETE.

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NOTES:

1. ALL DIMENSIONS ARE IN "MM" UNLESS OTHERWISE SPECIFIED.
2. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED, NEITHER THE DRAWING SHALL BE SCALED NOR THE BARS SHALL BE COUNTED.
3. ANY DISCREPANCY FOUND BETWEEN THIS DRAWING AND THE ARCHITECTURAL DRAWING SHALL BE BROUGHT TO THE NOTICE OF THE OFFICE BEFORE EXECUTION.
4. GRADE OF CONCRETE SHALL BE M30 FOR PILE AND M30 FOR OTHERS STRUCTURAL ELEMENTS UNLESS OTHERWISE NOTED.
5. GRADE OF STEEL SHALL BE FE-500D CONFORMING TO LATEST INDIAN STANDARDS.
6. ALL REINFORCEMENT SHALL BE 10% FROM FUTURE SCALES, RUST, COAT OF PAINT, OR ANY OTHER SUBSTANCES.
7. THE NOMINAL COVER GIVEN FOR MAIN REINFORCEMENT ARE AS FOLLOWS:

PILE / FOOTING	SLABS	STAIRS	TRUSS
40MM	25MM	25MM	25MM

8. THE DEVELOPMENT LENGTH FOR TENSION

MIX	d	45d	Where d is diameter of bar
M30	4	45d	
M35	4	45d	

9. THE DEVELOPMENT LENGTH FOR COMPRESSION

MIX	d	35d	Where d is diameter of bar
M30	4	35d	
M35	4	35d	

10. STRUCTURE IS DESIGNED AS PER ARCHITECTURAL DRAWING

11. SAFE LOAD CARRYING CAPACITY OF 500mm DIA PILE IS 1000 kN & 600mm DIA PILE IS 1400 kN

REV NO.	DETAILS	DATE	DRAWN	CHECKED	APPROVED
	SYMBOL				
	DESCRIPTION				
NOTE:	NGL				
	NATURAL GROUND LEVEL				

SAFETY AND STRUCTURAL STABILITY CERTIFICATE

Certified that the structural designs and drawings have been prepared by me keeping in view the relevant IS codes and Sound Engineering practice these structural drawings are good for construction.

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MODULE NO. 6C, 6TH FLOOR, PHASE II BUILDING,
IIT MADRAS RESEARCH PARK, KANAGAM ROAD,
THARAMANI, CHENNAI, TAMIL NADU 600113

PROJECT CODE: CUBE/B&C/2022/23/23/TNUHDB_BHN

PROJECT TITLE:
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUP DEVELOPMENT WITH D1 BLOCKS OF STILT FLOOR-9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGEE AREA TOTALLY 360 DWELLING UNITS AT K8 DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 P1 IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123, ZONE XI.

DRAWING NO: TNUHDB/BHN/BLOCK A1 SHEET NO: 009 REV NO: R0

DRAWING TITLE: GENERAL RCC NOTES

BLOCK NO: BLOCK A1 SCALE: NTS SIZE OF SHEET: A1

ISSUED FOR:

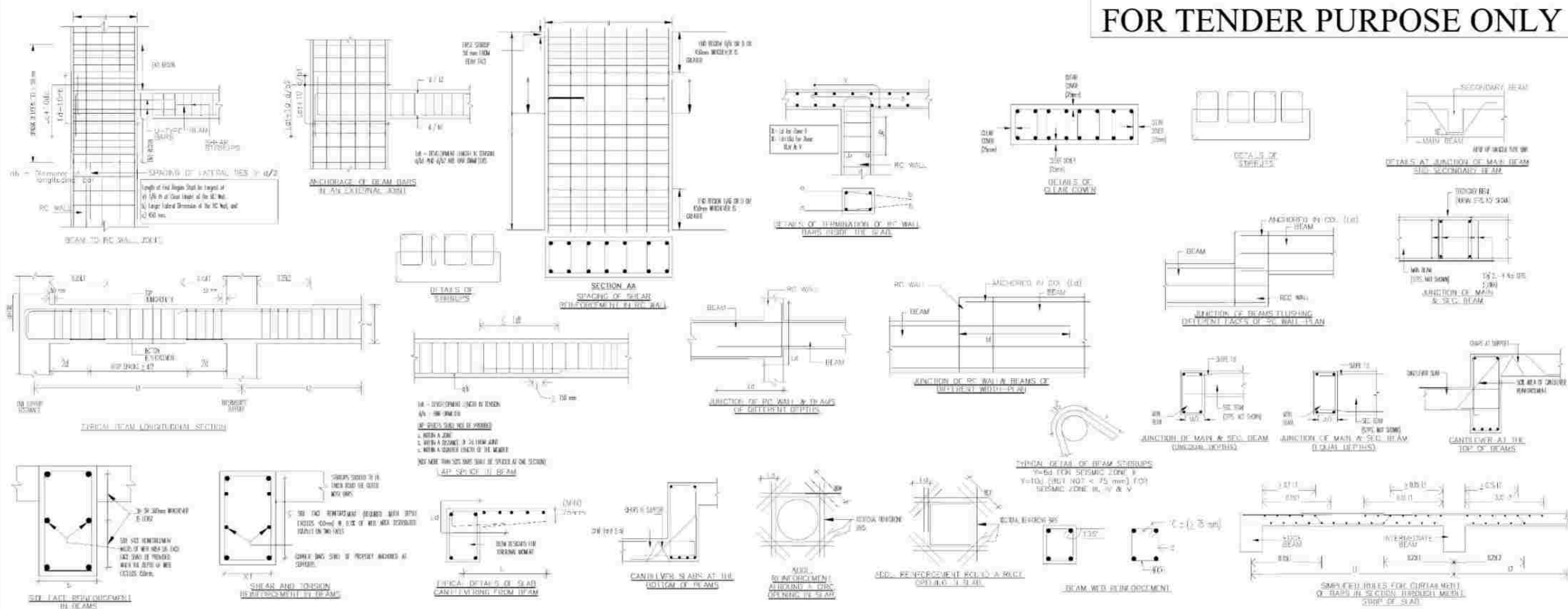
PRELIMINARY [] TENDER [] INFORMATION [] DATE OF ISSUE: 08-11-2022

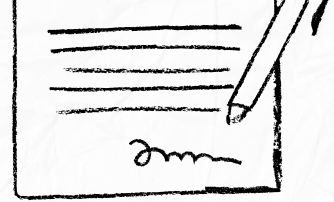
DESIGNED BY: DRAWN BY:

CHECKED BY: APPROVED BY:

NOTE: ALL DIMENSION ARE IN mm

FOR TENDER PURPOSE ONLY





our services doesn't just end there



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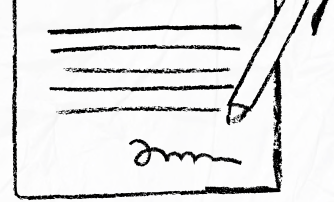
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