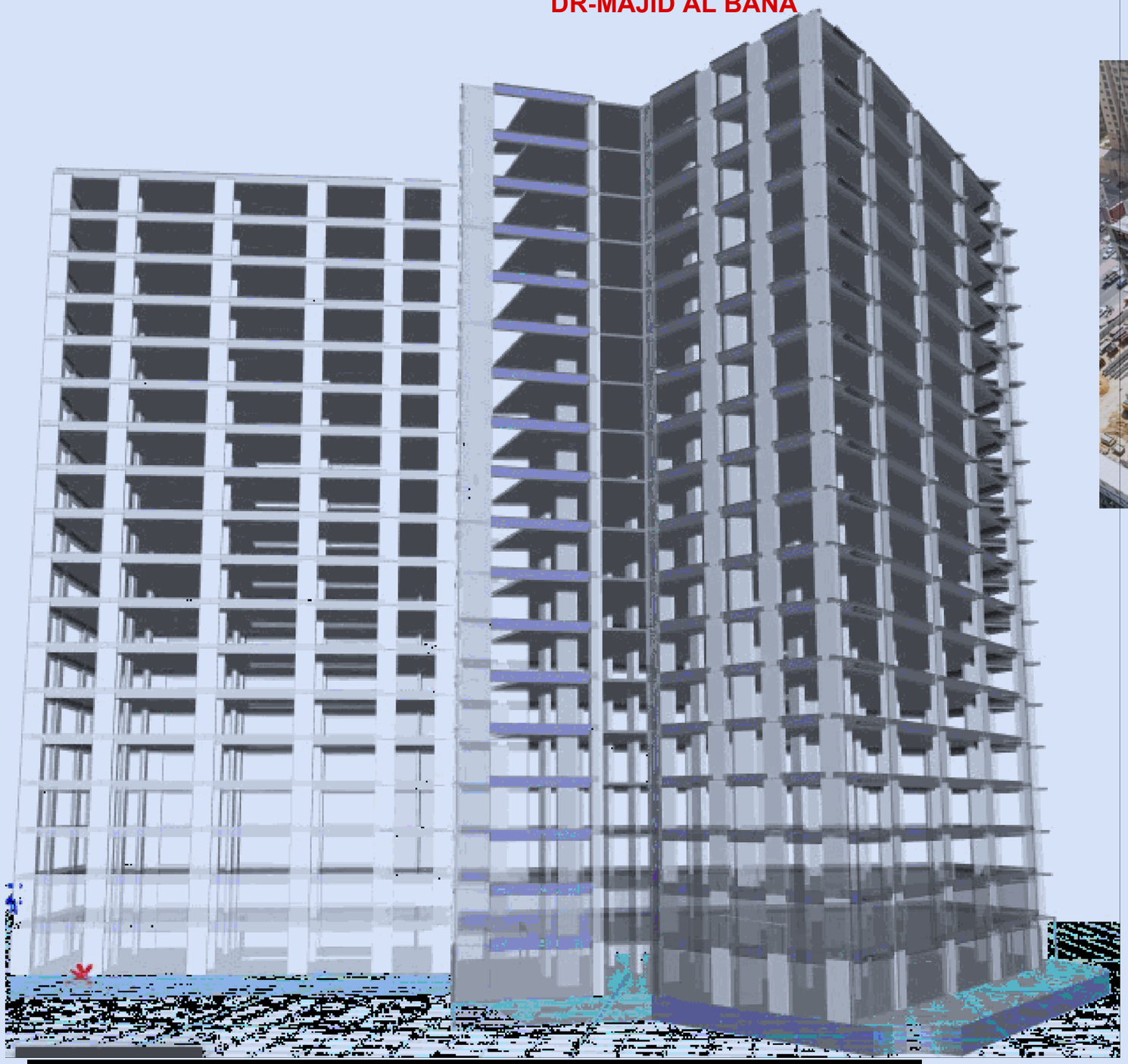
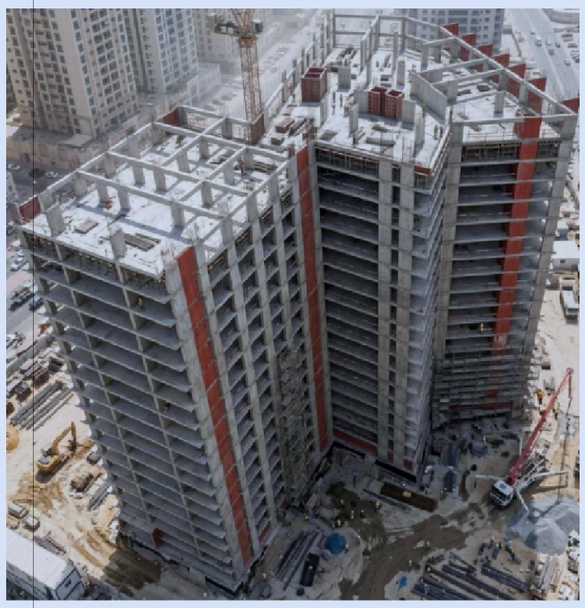
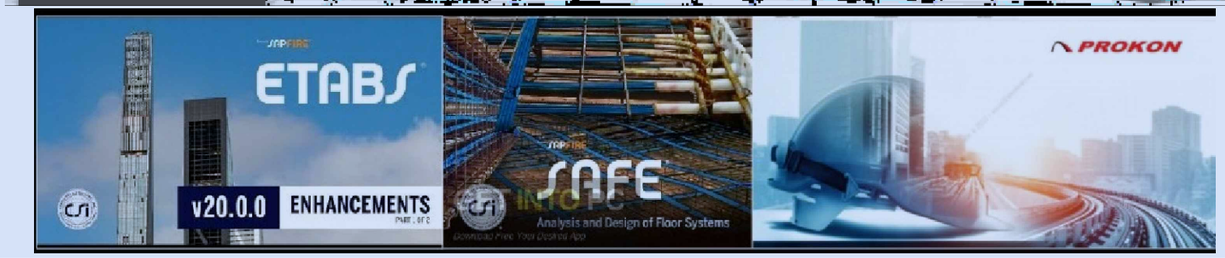






Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

Notes

THE BUILDING SYSTEM WILL BE CONSIDER AS SHEAR WALL BUILDING WITH COLUMNS AND THE SLAB WILL BE AS FLAT SLAB WITH M. BEAMS.THE SOFTWARE USED IN DESIGN (CSI ETABS 2022, AND CSI SAFE 2022&PROKON) IS THE GENERAL PROGRAM USED IN THIS DESIGN

job title

RESIDENTIAL BUILDING

DRWG. TITLE:

DESIGNED BY DR-Majid Albana
CHECKED BY
SCALE As Shown
DATE 5/2025
SHEET NO. Str. 1

GENERAL :-

1. ALL DIMENSIONS TO TAKE PRECEDENCE OVER SCALE SHOWN ON PLANS, SECTIONS AND DETAILS, (DO NOT SCALE FROM DRAWINGS).
2. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS IN METRES (UNO).
3. THE STRUCTURAL DRAWINGS SHOULD BE USED IN CONJUNCTION WITH THE ARCHITECTURAL, MECHANICAL,CIVIL,PLUMBING AND ELECTRICAL DRAWINGS.
4. ALL OPENINGS SIZE AND LOCATION SHOULD BE VERIFIED AND CHECKED WITH SERVICES DRAWINGS,WHERE OPENINGS SIZES ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS, SITE ENGINEER SHALL INTRODUCE SUCH OPENINGS WITH PROPER FRAMING INCLUDING ANY REVISION TO THE SIZES SHOWN ON THE DRAWINGS.
5. DESIGN STANDARED & LOADS :-
   - DESIGN & CONSTRUCTION OF REINFORCED CONCRETE STRUCTURES MEMBERS SHALL IN ACCORDANCE WITH ACI-318-19 (ULTIMATE STRENGTH DESIGN METHOD).
   - ALL RETANING WALL STRUCTURE SHOULD BE AS BRITISH 8 97- 110 or ACI - 93 - 318.
   - MASONARY BRICK OR CONCRETE BLOCK ACCORDING TO B.S - 5628.
6. LOADING :-
   - MINIMUM DESIGN LOAD (LIVE LOAD) ACCORDING TO IBC-09.
   - SEISMIC LOAD ACCORDING TO IRAQI SEISMIC CODE 1997.
   - WIND LOAD ACCORDING TO ASCE-07.
7. FOR TYP. SECTIONS & DETAILS SEE ST-G2.

FOUNDATION AND EARTH WORK :-

1. FOUNDATION DESIGN BASED ACCORDING TO THE SOIL REPORT PREPARED BY THE & RESEARCH ( ) 2024\ \ \ ).
2. BEARING CAPACITY ACCORDING TO THE SOIL REPORT IS (120K/m²)AT DEPTH OF (-4.00m) BELOW THE EXISTING N.G.L.
3. A WELL COMPACTED SUB-BASE LAYERS OF A TOTAL THICK AS INDICATED IN THE DWG. SHOULD BE USED UNDER FOOTING WITH FOLLOWING SPECIFICATIONS :-
   - THE DIMENSION OF THE SUB-BASE LAYERS SHOULD BE LARGER THAN THE DIMENSIONS OF THE FOUNDATION FROM ALL SIDES BY 0.25m.
   - THE VALUE OF CALIFORNIA BEARING RATIO (C.B.R) SHALL NOT BE LESS THAN (35% ASTM D) 1883 AT 95% OF THE MAXIMUM DRY DENSITY ESTABLISHED ACCORDING TO (ASTM D)1557.
   - LIQUID LIMIT ≤ 25%.
   - PLASTICITY INDEX ≤ 6%.
   - ORGANIC MATERIAL ≤ 2%.
   - SO_3 ≤ 5%.
   - TOTAL SOLUBLE SALTS ≤ 5%.
   - GYPSUM CONTENT ≤ 10.75%.
   - RELATIVE COMPACTION 95% (MODIFIED PROCTOR).
4. SULPHATE RESISTANT CEMENT TYPE 5 SHOULD BE USED IN ALL CONCERET WORK IN CONTACT WITH EARTH OR BELOW D.P.C. LEVEL.
5. BACKFILL AROUND FOOTINGS AND UTILITY TRENCH WITHIN THE BUILDING AREA SHOULD BE DONE WITH APPROVED SELECTED CLASSIFIED MATERIAL FREE OF CLAY AND SHOULD BE MECHANICALLY COMPACTED IN LAYERS, NOT EXCEEDING 250mm LOOSE THICKNESS TO 90% OF MAXIMUM PROCTOR DENSITY.

CONSTRUCTION JOINT AND WATERPROOFING :-

1. CONSTRUCTION JOINT :-
   - CONSTRUCTION JOINT IN FLOORS SHOULD BE LOCATED WITHIN THE MIDDLE THIRD OF SPANS OF SLABS ,BEAMS & GIRDERS, JOINT IN GIRDER SHOULD BE OFFSET A MINIMUM DISTANCE OF TWO TIMES THE WIDTH OF INTERSECTING BEAMS.
   - AT CONSTRUCTION JOINTS SURFACES SHOULD BE ROUGHENED BY BROOMING OUT MORTAR, EXPOSING 12mm OF COARSE AGGREGATE TWO HOURS AFTER PLACING CONCRETE.
   - CONSTRUCTION JOINTS FOR STRUCTURAL SLAB / FOUNDATION / WALLS ETC . AND VOLUME OF CASTING IN A POUR SHOULD BE APPROVED BY THE ENGINEER.
   - CONSTRUCTION JOINTS SHOULD BE DOWELED, KEYED AND THOROUGHLY CLEANED, ALL CONSTRUCTION JOINTS SHOULD BE CONSTRUCTED IN ACCORDANCE WITH THE TYPICAL CONSTRUCTION JOINT DETAILS SHOWN ON THE STRUCTURAL DRAWINGS,CONTRACTOR HAVE TO PREPARE ANY MISSING DETAILS NOT COVERED IN THE STRUCTURAL DRAWINGS AND SUBMIT FOR ENGINEER'S APPROVAL.
2. WATERPROOFING :-
   - WATER STOPS SHOULD BE USED AT ALL CONSTRUCTION,CONTRACTION & EXPANSION JOINTS,WHERE WATERPROOFING SYSTEM IS APPLIED ALL INTERSECTION PIECES OF WATER STOPS SHOULD BE FACTORY MOLDED.
   - ALL CONCRETE WORKS IN CONTACT WITH SOIL FOR NORMAL STRUCTURE SHOULD BE COATED WITH PROTECTIVE LAYER.

. all dim. from ARCH D.W.G.

REINFORCED CONCRETE :-

1. COMPRESIVE STRENGTH OF CONCRETE SHOULD BE DETERMIND BY THE TABLE BELOW :-

LOCATIONS / MEMBER TYPE	MINIMUM 28 DAYS CUBE COMPRESSIVE STRENGTH (Fcu) (MPa)	AGGREGATE MAX. SIZE
SCREED	20	10 mm
BLINDING OR LEAN CONCRETE	20	20 mm
SLABS	40	20 mm
PILES	-	20-38 mm
FOUNDATIONS	40	20 mm
COLUMNS AND SHEAR WALLS	50	20 mm
SUSPENDED SLAB, BEAMS AND WALLS	40	20 mm
WATER RETAINING STRUCTURES	-	20 mm
PLAIN CONCRETE	25	20 mm

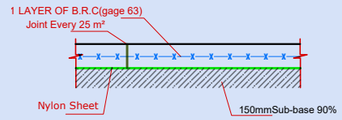
2. SULPHATE RESISTANT CEMENT TYPE 5 SHOULD BE USED IN ALL CONCERET WORK IN CONTACT WITH EARTH OR BELOW D.P.C LEVEL.
3. REINFORCMENT STEEL CONFORM TO ASTM A615& A616 OR A617 BARS SHOULD BE GRADE 400 FY=410N/mm (60000psi).
4. PLACING OF REINFORCEMENT SHOULD BE ACCORDING TO ACI-315 DETAILING MANUAL.
5. MINIMUM BARS COVER :-

MEMBER	(mm)
SLABS	25
BEAMS & GIRDERS	40
COLUMNS	40
INTERIOR WALLS	25
EXTERIOR FACE OF WALL	40
FORMED FOUNDATION	50
NON-FORMED FOUNDATION	75

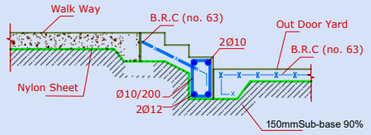
6. MINIMUM BARS SPACING :-
   - CLEAR SPACING BETWEEN PARALLEL BARS SHALL NOT BE LESS THAN BAR DIAMETER OR 4/3 OF MAXIMUM AGGREGATE SIZE BUT NOT LESS THAN 25mm.
   - CLEAR SPACING BETWEEN LAYERS OF BARS TO BE NOT LESS THAN 25mm AND THE UPPER BARS SHOULD BE OVER THE LOWER BARS .
   - IN COLUMNS CLEAR DISTANCE BETWEEN LONGITUDINAL BARS SHOULD BE NOT LESS THAN 1.5 BAR DIAMETER NOR LESS THAN 40mm.
7. MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	650	700	800	900
LAP LENGTH (mm) IN ELSE WHERE	400	600	700	800	900	1000	1250

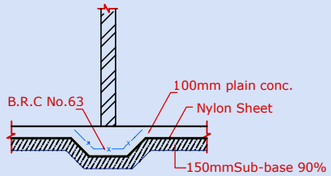
   - LAP LOCATION IN SLABS AND BEAMS :-
     * AT SUPPORT FOR BOTTOM BARS.
     * AT MID SPAN FOR TOP BARS.
   - LAP LOCATION IN FOUNDATION :-
     * AT SUPPORT FOR TOP BARS.
     * AT MID SPAN FOR BOTTOM BARS.
8. VERTICAL REINFORCEMENT IN COLUMN :-
   - WHERE COLUMN FACE ARE OFFSET 75mm OR MORE SPLICE OF VERTICAL BARS TO THE OFFSET FACE SHOULD BE MADE BY SEPARATE DOWELS OVER LAP AS SPECIFIED ABOVE.
   - WHERE A LONGITUDINAL BARS ARE OFFSET AT SPLICE THE SLOPE OF INCLINED ADJACENT PORTION SHALL NOT EXCEED 1:6 (HORIZANTAL:VERTICAL).
   - CHANGING OF REINFORCEMENT BETWEEN FLOORS WHERE SUCH SITUATION OCCURS THE REINFORCEMENT OFF SHOULD BE CUT OFF AT DISTANCE 75mm BELOW FLOOR LEVEL SPACED 100mm AND PLACED BEFOR THE POINT OF BEND.
   - WHERE LONGITUDINAL BARS OFFSET,PROVIDE 4TIES.
9. HOT & COLD WETHERING SHOULD BE ACCORDING TO ACI-305R-99.
10. ALL REINFORCING BAR BENDS TO BE MADE COLD.
11. IN ONE-WAY SLAB, SHRINKAGE & TEMPERATURE REINF. STEEL EXTENDING IN THE LONG DIRECTION SHALL BE PLACED IN THE PLACE OF, AND TIED TO THE MAIN REINF. EXTENDING IN THE SHORT DIRECTION.
12. MIXING & PLACING CONCRETE SHOULD BE DONE ACCORDING TO ACI - 318M - 19 (CHAPTER 5) CONDUIT OR PIPE SIZE SHALL NOT EXCEED 30% OF SLAB THICKNESS UNLESS SPECIFICALLY DETAILED,OTHERWISE CONCENTRATIONS OF CONDUITS OR PIPES SHOULD BE AVOIDED EXCEPT WHERE DETAILED OPENINGS ARE PROVIDED, ALL SUBJECTED TO ENGINEER'S APPROVAL.



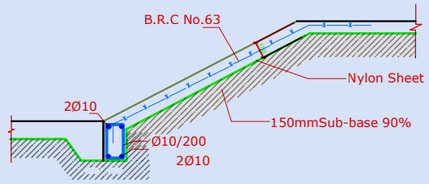
Typical Detail Of Out Door Yard



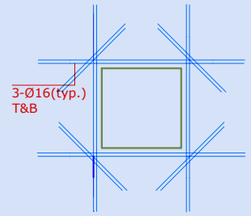
Typical Sec. For Stair On Earth



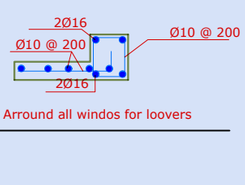
CONSTRUCTION OF PARTITION ON GROUND SLAB
provid construction joint for max.(5mx5m)



Typical Sec. Of Ramp



TYPICAL REINF. AROUND OPENNINGS UP TO 600



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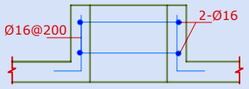
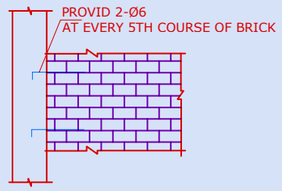
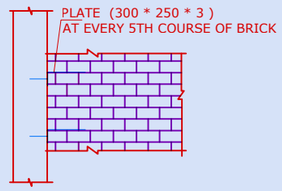


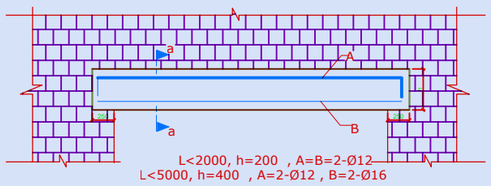
TYPICAL UP STAND DETAIL ROOF OPENNINGS



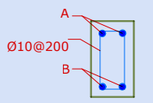
CONECTION BETWEEN BRICK WALL AND R.C. COLUMN
proposel 1



CONECTION BETWEEN BRICK WALL AND R.C. COLUMN
proposel 2



LINTEL REINFORCEMENT



SEC. (a - a)

ABBREVIATIONS :-

ADD	ADDITIONAL
ARCH	ARCHITECTURAL
B	BEAM
BOTT	BOTTOM
C1	COLUMN TYP C1
CANT	CANTILEVER
CJ	CONSTRUCTION JOIN
CL	CENTRE
C	COULMN
CONC	CONCRETE
DET	DETAIL
DIM	DIMENSION
DWG	DRAWING
D	DEPTH
E.A	EACH
E.F	EACH FACE
E.J	EXPANSION JOINT
ELEV	ELEVATION
E.W	EACH WAY
EXP	EXPANSION
F	FOOTING
F1	FOOTING TYPE-1
FDN	FOUNDATION
F.F.L	FINISH FLOOR LEVEL
GEN	GENERAL
GL	GRID LINE
LL	LIVE LOAD
MAX	MAXIMIM
MECH	MECHANICAL
MIN	MINIMUM
mm	MILLIMETRES
SEC	SECTION

no.	date	initials	revision

job title: (A)

drawing title: GENERAL NOTES

designed: ENG : DR-Majid Albana | project manager:
checked | scale | date
drawn | job no. | sheet no. 2
approved

EXCAVATION, BACK FILLING & FOUNDATION

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INVESTIGATE OR TO CHECK THE SOIL GEOTECHNICAL PROPERTIES BY HAVING SPECIALIST AND AFTER COMMENCING OF THE UNDERGROUND WORK.

2. FOOTINGS FOR BUILDING SHALL BE FOUNDED ON UNDISTURBED SOIL.
   RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ELEVATION OF FOOTING TO OBTAIN SUCH BEARING PRESSURE. UNDER NO CONDITION FOOTINGS SHOULD BE PLACED ON LOOSE, SOFT OR UNDESIRABLE MATERIAL. IF SUCH MATERIALS ARE ENCOUNTERED, THEY SHOULD BE REMOVED UNTIL FIRM LAYERS ARE ENCOUNTERED AND REQUIRED BEARING PRESSURE IS OBTAINED.

3. THE SITE SHOULD BE CLEARED OF ALL BOULDERS, DEBRIS, DECOMPOSABLE MATERIAL SUCH AS WOOD, GRASS, PLANTS, ...ETC.
   ALL EXISTING MISCELLANEOUS FILL SHOULD BE REMOVED FROM AREAS WHERE STRUCTURAL SUPPORT IS REQUIRED. ANY SOIL AT STRIPED LEVEL THAT SOFTENS DUE TO RAINFALL, GROUND WATER, DISTURBANCE OR ANY OTHER CAUSE SHOULD BE EXCAVATED AND REPLACED WITH CONTROLLED FILL. BOTTOM OF EXCAVATIONS SHOULD BE SMOOTH AND FREE OF LOOSE EARTH OR SAND. ANY LOOSE OR SOFT AREAS SHOULD BE COMPACTED TO THE REQUIRED DENSITY.

4. IF DURING CONSTRUCTION ANY SIGNIFICANT VARIATIONS FROM WHAT IS REPORTED IN THE GEOTECHNICAL SOIL REPORT, THE ENGINEERS SHOULD BE NOTIFIED TO VISIT THE SITE AND ASSESS THE SITUATION.

5. PRIOR TO PLACEMENT OF BLINDING CONCRETE FOR FOUNDATIONS, WHEREVER POSSIBLE, BOTTOM OF EXCAVATIONS SHALL BE COMPACTED BY HEAVY VIBRATORY ROLLER TO 95% MIN. OF MODIFIED PROCTER DENSITY FOR COHESIVE AND WELL GRADED SOILS. 100 MM BLINDING CONCRETE THICK E BE POURED UNDER THE RAFT FOOTINGS.

6. PROVIDE A POLYETHYLENE FILM (0.2MM) BELOW ALL GROUND LEVEL SLABS. FILM TO BE FIRMLY ANCHORED TO GROUND AND ADEQUATELY LAPPED.

7. BEFORE ANY BACKFILLING, ALL FORMS SHOULD BE REMOVED BUT IN NO CASE LESS THAN 24HOURS AFTER PLACING CONCRETE. ALL DEBRIS SHOULD BE CLEANED OUT.

8. USE WELL GRADED, NON COHESIVE SOILS FOR BACKFILLING. BACKFILL MATERIALS SHOULD NOT CONTAIN ANY ROOTS, CONSTRUCTION DEBRIS, DELETERIOUS MATERIALS, ORGANIC MATTERS, COBBLES OR BOULDERS(SIZE>80MM). THE FINES PERCENTAGE SHOULD NOT EXCEED 15% AND THE SOIL SHOULD BE NON PLASTIC.

9. IT IS EXPECTED THAT THE LAND WILL BE GRADED AND LEVELED TO THE FINAL FINISHED GRADE.

10. CLEAN SAND, FREE OF SALTS AND ORGANIC MATERIALS, AND WITH LESS THAN 10% PASSING THE NO. 200 SIEVE, IS CONSIDERED SUITABLE MATERIAL. BACKFILL MATERIALS SHOULD BE PLACED IN LOOSE LIFTS HAVING THICKNESS OF NOT MORE THAN 25 cm COMPACTED TO THE REQUIRED DENSITY, USE VIBRATORY ROLLER FOR COMPACTING GRANULAR SOILS.

    TO AVOID STRESSING THE DUCT.
    ALL STRUCTURAL FILL MATERIAL SHALL BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MAXIMUM DRY DENSITY OBTAINED BY THE MODIFIED PROCTOR TEST, USE NUCLEAR DENSITY GAUGES AS PER ASTMD-2922 TO MONITOR COMPACTION WORKS. NO BACKFILLING SHALL BE PERFORMED BEFORE CASTING OF THE SLABS THAT SUPPORT THE RETAINING WALLS.

11. FOR WALLS HAVING FILL ON BOTH SIDES, BACK FILLING OPERATION SHALL PROCEED SIMULTANEOUSLY IN EQUAL LIFTS. DIFFERENTIAL ELEVATION OF TOP OF LIFTS BETWEEN EACH SIDE SHALL NOT EXCEED 50 cm.

12. ALL CONNECTIONS OF PIPING BETWEEN THE STRUCTURES AND THE EXTERIOR BE DELAYED TO A LATER STAGE OF CONSTRUCTION AFTER WHICH MOST OF THE SETTLEMENT WOULD HAVE TAKEN PLACE, UNLESS FLEXIBLE SLEEVES ARE USED.

13. ALL SERVICE LINES SHALL BE LAID OUT IN A CLEAN SAND BED COMPACTED TO THE REQUIRED DENSITY.

14. UTILITY TRENCHING SHALL BE SUCH THAT DUCT RUNS CAN BE MADE AS STRAIGHT AS POSSIBLE, BOTH HORIZONTALLY AND VERTICALLY, AND IF A DEFLECTION MUST BE MADE IN A DUCT LINE, THE DEFLECTIONS SHOULD BE ALONG A SMOOTH AND GRADUAL CURVE

6) CONSTRUCTION JOINTS AND CONTROL JOINTS:

1. CONSTRUCTION JOINTS IN FLOOR SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF SPANS OF SLABS, BEAMS AND GIRDERS, U.N.O. ON DWGS.
2. BEAMS, GIRDERS AND HAUNCHES SHALL BE PLACED MONOLITHICALLY AS PART OF A SLAB SYSTEM, UNLESS OTHERWISE SHOWN IN DESIGN DRAWINGS OR SPECIFICATIONS.
3. CONTROL JOINTS IN SLAB ON GRADE SHALL BE SPACED AT 6.00 METERS (MAX.) INTERVAL ON BOTH DIRECTIONS. THE RESULTING PANEL SHOULD BE APPROXIMATELY SQUARE. A CHECKERED BOARD PATTERN.
4. IN WALLS HAVING FREQUENT OPENINGS, SPACING OF CONTROL JOINTS 6.00 METERS APART IS CONSIDERED MAXIMUM. THE SPACING IN WALLS WITHOUT WINDOWS SHOULD NOT BE MORE THAN 7.50 METERS AND A JOINT WITHIN 3.00 METERS OF EACH CORNER IS DESIRABLE.
5. VERTICAL CONSTRUCTION JOINT SPACING IN WALLS SHALL NOT BE MORE THAN 12.00 METERS AND LOCATED WITHIN THE MIDDLE THIRD OF THE SPAN BETWEEN COLUMNS.

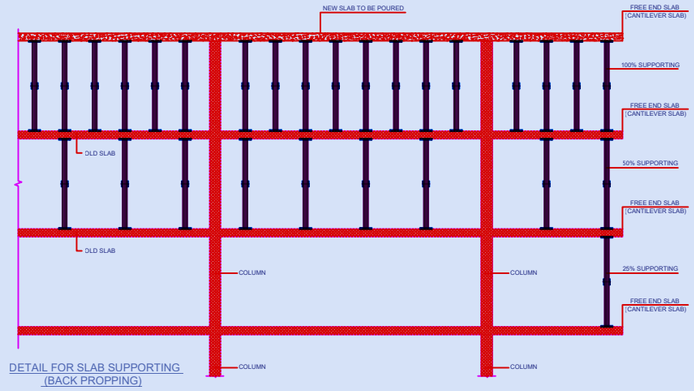
THE DESIGN LOADS

1) SUPER IMPOSED DEAD LOAD (SDL) :

FLOOR SCREED	0.80 KN/m^2
TILES	0.20 KN/m^2
False Ceiling & MECHANICAL DIVISIONS	0.50 KN/m^2
EXTERNAL & INTERNAL PARTITION WALL Bricks	2.5 KN/m
TOTAL ----------	4.00 KN/m^2

2) LIVE LOADS:

LIVE LOAD	2.5 KN/m^2
STAIRCASE	4.0 KN/m^2
PARKING	5.0 KN/m



DETAIL FOR SLAB SUPPORTING (BACK PROPPING)

3) WIND LOADS:

The main wind force resisting system (MWFRS) and all components and cladding (C&C) are determined in accordance to the ASCE (2016).
All other parameters related to wind load are estimated according to (UnifiedFacilities Criteria (UFC) 2013).
Based on aforementioned codes and standards, wind parameters for Baghdad city
Table 1.1: Wind Parameters for Baghdad that are Adopted in the Analysis.

Table 1.1

Wind Parameter	NOTATION	NOTATION	Reference
Basic Wind Speed	V	161 km/h	ASCE (2016), (Unified Facilities Criteria (UFC) 2013)
Exposure Category	B		ASCE (2016)
Topographic Factor	Kzt	1	ASCE (2016)
Gust-Effect Factor	G	0.85	ASCE (2016)
Directionality Factor	Kd	0.85	ASCE (2016)

4) SEISMIC LOADS:

Seismic Design Categories (SDCs) are adopted from ASCE (2016). All other parameters related to seismic zone are estimated according to (Iraqi seismic code (2017).

Table 1.2: Seismic Parameters for Baghdad that are Adopted in the Analysis.

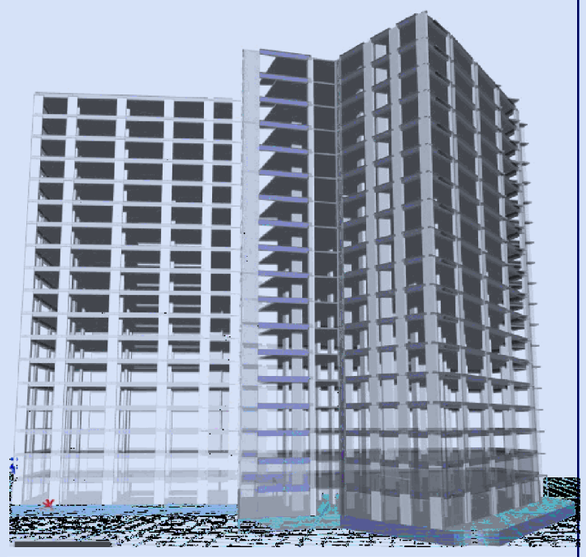
Table 1.2

seismic Parameter	NOTATION	NOTATION	Reference
Seismic Design Category	D		ASCE (2016), the soil type has been Assumed
Response Modification Coefficient	R	5	ASCE (2016)
Topographic Factor	Kzt	1	ASCE (2016)
Overstrength Factor	Ω_o	2.5	ASCE (2016)
Importance Factor	I	1	ASCE (2016)
Mapped Maximum Considered Earthquake (MCER), 5% damped, spectral response acceleration parameter at short periods	Ss	0.30	Iraqi seismic code 2017
Maximum Considered Earthquake (MCER), 5% damped, spectral response acceleration parameter at a period of 1 s	S1	0.10	Iraqi seismic code 2017
Seismic coefficient	Ca	0.12	Soil investigation report
Seismic coefficient	Cv	0.18	Soil investigation report
Undrained shear strength kN/m2	Vs	53.70	Soil investigation report
Soil type"stiff soil"	SD		Soil investigation report

GENERAL NOTES :-

Frameworks removal time :

Type of framework	Min. period before striking formworks
Vertical framework of the column	24 hrs
Vertical framework of the shear walls	2-3 days
framework of the slab and beam a. span up to 6 m a. span from 6-8 m	 14 days 20 days



drawing title

THE DESIGN LOADS

designed: ENG :DR- Majid Albana	project manager	
checked	scale: 1-100	date: 5/2025
drawn	job no. 3	sheet no. ST/D/03
approved		

A. GENERAL

A1. ALL STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE RELEVANT CIVIL, INFRASTRUCTURE, ARCHITECTURAL, MECHANICAL, ELECTRICAL DESIGN DRAWINGS, BOQ AND SPECIFICATIONS. IF ANY DISCREPANCY IS FOUND, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY BEFORE PROCEEDING WITH THE PORTION OF WORK INVOLVED.

A2. FOR MAIN SETTING LINES AND LEVELS, REFER TO THE ARCHITECTURAL DRAWINGS. ALL DIMENSIONS MUST BE VERIFIED ON SITE AND ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER FOR CLARIFICATION.

A3. ALL DIMENSIONS ARE IN MILLIMETER, UNLESS OTHERWISE NOTED, AND ALL LEVELS ARE IN METERS. DO NOT SCALE DRAWINGS READ WRITTEN DIMENSIONS ONLY.

A4. ALL SECTIONS SHALL BE COORDINATED WITH ARCHITECTURAL (AND OTHER TRADES) DRAWINGS BEFORE ERECTION OF FORMWORK. ANY DISCREPANCY SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR CLARIFICATION.

A5. CONSTRUCTION LOADS SHALL NOT EXCEED THE (SIDL+1) KN PER SQUARE METER. PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE STRUCTURE HAS NOT ATTAINED THE FULL DESIGN STRENGTH.

A6. REFER TO ARCHITECTURAL (AND OTHER TRADES) DRAWINGS FOR OPENINGS AND SLEEVES IN CONCRETE SLABS NOT SHOWN ON STRUCTURAL DRAWINGS, AND FOR SIZE AND LOCATION OF OPENINGS NOT DIMENSIONED. NO BREAKAGE IS ALLOWED IN CONCRETE AFTER CASTING.

A7. REFER TO ARCHITECTURAL (AND OTHER TRADE DRAWINGS) FOR POSITIONS AND DIMENSIONS OF OPENINGS IN REINFORCED CONCRETE WALLS AND COORDINATE WITH THOSE SHOWN ON STRUCTURAL DRAWINGS.

A8. NO OPENINGS OR SLEEVES SHALL BE PLACED IN BEAMS OR COLUMNS EXCEPT AS INDICATED ON STRUCTURAL DRAWINGS AND AS APPROVED.

A9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SETTING OUT OF THE WORKS, FOR CORRECTNESS OF LINE AND LEVEL AND FOR QUALITY CONTROL OF THE MATERIALS. THE APPROVAL OF THE ENGINEER SHALL NOT IN ANY WAY RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY AND ANY ERRORS SHALL BE RECTIFIED BY THE CONTRACTOR TO THE APPROVAL OF THE ENGINEER.

B. DESIGN CRITERIA

B1. CODES AND STANDARDS

- REINFORCED CONCRETE: BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACI 318M-19
- SEISMIC LOAD DESIGN: INTERNATIONAL BUILDING CODE (IBC 2009) IRAQI SEISMIC CODE
- WIND LOAD DESIGN: AMERICAN SOCIETY OF CIVIL ENGINEERS (ACSE 7-16)

B2. DESIGN LOADS

B2.1 LIVE LOADS

STRUCTURAL MEMBERS ARE DESIGNED TO RESIST THE TOTAL DEAD LOADS ACTING ON THEM PLUS THE FOLLOWING LIVE LOADS:

- BED ROOMS ..... 2.0 kPa
- PARKING ..... 5.0 kPa
- RAMPS ..... 5.0 kPa
- ASSEMBLY AREAS ..... 5.0 kPa
- STORAGE ..... 5.0 kPa
- LOBBY ..... 5.0 kPa
- STAIRS ..... 5.0 kPa

B2.2 SEISMIC LOADS

- MAXIMUM CONSIDERED EARTHQUAKE MOTION OF 0.2 SEC (Ss) 0.30
- MAXIMUM CONSIDERED EARTHQUAKE MOTION OF 1.0 SEC (S1) 0.10
- STRUCTURAL SYSTEM FACTOR 5.00
- IMPORTANCE FACTOR 1
- SOIL PROFILE ..... SD
- SDS 0.312
- SD1 ..... 0.16
- SEISMIC DESIGN CATEGORY C

B2.3 WIND LOADS

- BASIC WIND SPEED ..... 100 MPH
- EXPOSURE C

C. REINFORCED CONCRETE CONSTRUCTION

C1. CONCRETE

C1.1 CONCRETE GRADE AND CHARACTERISTICS

COMPRESSIVE STRENGTH OF CONCRETE, Fcu, AS DEFINED BY ASTANDARD 150mm CUBE AT 28 DAYS SHALL BE AS FOLLOWS:

A. CONCRETE IN CONTACT WITH SOIL :
- PILE RAFT AND RETAINING WALLS ..... 45 MPa
- PILES ..... 35 MPa
- BLINDING ..... 20 MPa

B. CONCRETE FROM BASEMENT FLOOR TO FIFTH FLOOR (EXCEPT THIRD FLOOR) :
- COLUMNS AND WALLS ..... 45 MPa
- SUSPENDED BEAMS & SLABS ..... 35 MPa

C. CONCRETE FOR THIRD FLOOR ONLY :
- COLUMNS AND WALLS ..... 50 MPa
- SUSPENDED BEAMS & SLABS ..... 40 MPa

D. CONCRETE FROM SIXTH FLOOR TO ROOF FLOOR :
- COLUMNS AND WALLS ..... 40 MPa
- SUSPENDED BEAMS & SLABS ..... 40 MPa

GENERAL REQUIREMENTS OF CONCRETE

NO	TESTS	TEST METHOD	SPECIFICATION LIMIT
1.	TEMPERATURE (AT PLACEMENT)	ASTM 1064	32 C° MAX.
2.	SLUMP IN mm (AT PLACEMENT)	BS 1881; pat 102	150 ± 25 mm OR AS ADVISED BY THE SUPPLIER
3.	WATER PERMEABILITY	DIN 1048	8mm MAX.

C1.2 CONCRETE ADDITIVES

- ALL CONCRETE SHALL CONTAIN AN APPROVED WATER REDUCING, PLASTICIZING ADMIXTURE. HIGH-RANGE, WATER REDUCING ADMIXTURES MAY BE UTILIZED. ALL CONCRETE PERMANENTLY EXPOSED TO THE WEATHER SHALL ALSO CONTAIN AN APPROVED AIR-ENTRAINING ADMIXTURE.
- CONCRETE ADDITIVES USED TO IMPROVE CONSISTENCY, WORKABILITY, QUALITY AND STRENGTH OF CONCRETE SHALL BE APPROVED BY THE ENGINEER.

C1.3 CONCRETE PROPERTIES

CONCRETE	CEMENT TYPE	MAX. AGGREGATE SIZE (mm)	MIN. CEMENT CONTENT (kg/m3)	MAX. W/C RATIO	GGBS/ FLY ASH	28 DAYS STRENGTH (MPa)
SUPER STRUCTURE	OPC*	20	400*	3.45*	—	AS PER C1.1
SUB STRUCTURE	OPC*	20	400*	3.45*	—	
BLINDING	OPC*	20	250*	0.6*	—	

* TO BE CONFIRMED BY SOIL SPECIALIST.

C2. CONCRETE REINFORCEMENT

C2.1 GENERAL

- REINFORCEMENT SHALL BE HIGH YIELD (YIELD STRESS = 460MPa) MARKED `T', THE CONTRACTOR SHALL PROVIDE DETAILED DRAWINGS AND SCHEDULES OF THE REINFORCEMENT REINFORCEMENT FOR THE ENGINEER'S APPROVAL, IN ACCORDANCE
- REINFORCEMENT SHALL CONFORM TO ASTM A615 STANDARDS.
- REINFORCEMENT DETAILS SHOWN ON DRAWINGS ARE INDICATIVE FOR THE PREPARATION OF THE CONTRACTOR'S WORKING DRAWINGS. THE CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS AND SCHEDULES OF THE REINFORCEMENT FOR THE ENGINEER'S APPROVAL IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
- WHERE BAR LENGTH IS NOT SPECIFIED, LONGEST PRACTICABLE BAR LENGTH SHALL BE EMPLOYED WITH STAGGERED LAP SPLICES. LAP LENGTH SHALL BE A MINIMUM OF 60 TIMES THE BAR DIAMETER, UNLESS OTHERWISE NOTED.
- ALL REINFORCING SPLICES SHALL DEVELOP 100% OF THE TENSILE CAPACITY OF THE REINFORCEMENT. ALTERNATIVE MECHANICAL SPLICES MAY BE CONSIDERED, PROVIDED THAT THEY DEVELOP FULL TENSILE STRENGTH

C2.2 MINIMUM COVER TO REINFORCEMENT

COVER TO ALL REINFORCEMENT SHALL BE AS FOLLOWS UNLESS SHOWN OTHERWISE:

	= 75mm
	= 75mm EARTH FACES, 40mm OTHER FACES
	= 75mm EARTH FACES, 40mm OTHER FACES
WATER TANK WALLS	= 50mm
SUSPENDED SLABS	= 30mm
BEAMS AND LINTELS	= 40mm
	= 60mm EARTH FACES, 40mm OTHER FACES
	= 30mm WITH THE SPECIFICATIONS.
	= 60mm EARTH FACES, 40mm OTHER FACES

EXTERNAL RELATES TO CONCRETE FACES EXPOSED TO EXTERNAL ENVIRONMENT.

D. EARTHWORKS, EXCAVATIONS AND DEWATERING

D1. WHEN EXCAVATING TO FOUNDATION LEVEL CARE SHOULD BE TAKEN NOT TO DISTURB THE UNDERLYING MATERIAL. ALL FOUNDATION EXCAVATIONS SHALL BE INSPECTED AND ANY SOFT SPOTS SHALL BE REMOVED AND REPLACED WITH GRANULAR FILL COMPACTED BEFORE CONSTRUCTION PROCEEDS. EXCAVATION SHALL AT ALL TIMES BE CARRIED OUT IN DRY CONDITIONS.

D2. THE CONTRACTOR SHALL TAKE FULL ACCOUNT OF THE SOIL INVESTIGATION INFORMATION AND HIS OWN EXPERIENCE TO DESIGN THE NECESSARY TEMPORARY WORKS. THE DESIGN TOGETHER WITH THE SHOP DRAWINGS SHALL BE SUBMITTED FOR ENGINEER'S APPROVAL PRIOR TO DEWATERING. ALL BACKFILLING SHALL BE COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AND IN ACCORDANCE WITH THE SPECIFICATIONS.

D3. IT SHALL REMAIN THE CONTRACTOR'S OBLIGATION TO PROVIDE DRY WORKING CONDITIONS BY ANY MEANS HE MIGHT SEE EFFECTIVE. EXCAVATION SHALL BE AT ALL TIMES CARRIED OUT IN DRY CONDITIONS.
PILES GROUND WATER SHALL BE MAINTAINED AT LEAST 500mm BELOW THE DEEPEST POINT IN THE EXCAVATION
PILE CAPS WHILE IT REMAINS OPEN. THE DEWATERING SYSTEM USED SHALL NOT AFFECT THE EXISTING ADJACENT
FOUNDATIONS BUILDINGS IN ANY WAY.

D4. DEWATERING SHALL NOT BE DISCONTINUED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER AND UNTIL AFTER THE CONSTRUCTION OF THE RAFT.
COLUMNS
PARAPETS
WALLS

E. WATERPROOFING

E1. GENERALLY ALL CONCRETE IN CONTACT WITH SOIL SHALL REQUIRE WATERPROOFING IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SOILS INVESTIGATIONS REPORT AND AS SHOWN IN THE TYPICAL

F. BLOCK WALL CONSTRUCTION

F1. MINIMUM COMPRESSIVE STRENGTH FOR NON-LOAD BEARING HOLLOW BLOCKS SHALL BE 3.5 MPa.
F2. MINIMUM COMPRESSIVE STRENGTH FOR NON-LOAD BEARING SOLID BLOCKS SHALL BE 7.0 MPa.
F3. THE CONCRETE HOLLOW BLOCKS SHALL BE FROM AN APPROVED MANUFACTURER WITH APPROPRIATE STRENGTH AND ADEQUATELY CURED AS PER STANDARD SPECIFICATIONS.
F4. JOINTS BETWEEN CONCRETE BLOCKWORK AND COLUMNS TO BE REINFORCED WITH 200 WIDE GALVANIZED STEEL EXPANDED METAL SECURED BOTH SIDES OF THE JOINT PRIOR TO PLASTERING. CORNER BEADS AND PLASTER STOPS SHALL BE PROVIDED AT ALL CORNERS AND EDGES.
F5. ALL BLOCK WALLS EXCEEDING 3.0 m IN CLEAR HEIGHT SHALL BE PROVIDED WITH A STIFFENER BEAM AS SHOWN IN THE TYPICAL DETAILS.
F6. ALL BLOCK WALLS WITH UNBRACED LENGTH EXCEEDING 5.0 m SHALL BE PROVIDED WITH A STIFFENER COLUMN AS SHOWN IN THE TYPICAL DETAILS.

H. CLADDING SYSTEM DESIGN

H1. THE CLADDING DESIGN SHALL INCORPORATE SUFFICIENT FLEXIBILITY TO ACCOMMODATE ALL ANTICIPATED MOVEMENTS IN THE STRUCTURE INCLUDING THOSE DUE TO THERMAL EFFECTS, LATERAL MOVEMENTS DUE TO WIND OR SEISMIC LOAD AND AXIAL SHORTENING OF COLUMNS. DETAILS.
H2. THE CURTAIN WALL DESIGN SHALL CONFORM TO THE SEISMIC DESIGN REQUIREMENTS OF IBC 2009.
H3. NOT WITHSTANDING THE ABOVE, THE CONTRACTOR SHALL CARRY OUT ANY ADDITIONAL TESTING HE DEEMS NECESSARY TO ENSURE SATISFACTORY PERFORMANCE OF THE CLADDING SYSTEM.

I. DATUM LEVEL

I1. ALL LEVELS ARE REFERENCED TO ARCHITECTURAL DATUM LEVEL.

J. GENERAL FOUNDATIONS NOTES

J1. ALL FOUNDATIONS SHALL BE CONSTRUCTED UPON WATERPROOFING SYSTEM AND A 100mm CONCRETE BLINDING SLAB WHICH HAS BEEN PLACED OVER AGGREGATE LAYER ACCORDING TO SOIL TEST RECOMMENDATIONS, OVER THE STABILIZED NATURAL SOIL.

J2. DO NOT BACKFILL AGAINST PIT OR RETAINING WALLS UNTIL THE CONCRETE HAS ATTAINED FULL DESIGN STRENGTH.

J3. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MEASURES TO PREVENT ANY WATER, FROM PENETRATING ANY PILED FOUNDATIONS OR STRUCTURAL (HYDROSTATIC) SLABS BEFORE AND AFTER PLACING CONCRETE, AND UNTIL SUCH SUBGRADES ARE FULLY PROTECTED BY THE PERMANENT BUILDING STRUCTURE.

J4. THE STRUCTURAL CONCRETE FOR EACH PILED FOOTING SHALL BE PLACED IN ONE (1) CONTINUOUS POUR WITH THE STRUCTURAL RAFT VERTICAL POUR JOINTS SHALL TYPICALLY BE LOCATED IN THE MIDDLE THIRD OF THE SPAN BETWEEN COLUMNS OR WALLS.

J5. ALL REINFORCING FOR THE FOUNDATIONS, INCLUDING WALL AND COLUMN STARTER BARS SHALL BE PROPERLY SECURED IN PLACE PRIOR TO CONCRETING.

J6. THE CONTRACTOR SHALL INSTALL THERMOCOUPLE SETS TO MONITOR AND RECORD HEAT GAIN IN THE PILED FOUNDATIONS CONCRETE DURING THE CEMENT HYDRATION PROCESS. ALL THERMOCOUPLE LOCATIONS SHALL BE COORDINATED TO INSURE THAT THE DEVICES ARE NOT DISRUPTED DURING REINFORCING AND CONCRETE PLACEMENT. EACH THERMOCOUPLE SET CONSISTS OF 5 THERMOCOUPLES AND SHALL BE LOCATED IN INDICATED AREAS OF EACH PILED FOUNDATION POUR (IN PLAN) AND POSITIONED AS FOLLOWS:
ONE (1) THERMOCOUPLE AT THE MID-HEIGHT
ONE (1) THERMOCOUPLE MIDWAY BETWEEN THE MID-HEIGHT AND THE TOP
ONE (1) THERMOCOUPLE MIDWAY BETWEEN THE MID-HEIGHT AND THE BOTTOM
ONE (1) THERMOCOUPLE AT 300MM FROM TOP
ONE (1) THERMOCOUPLE AT 300MM FROM BOTTOM
TEMPERATURE READINGS FROM EACH THERMOCOUPLE SHALL BE ELECTRONICALLY RECORDED OVER A 90-DAY PERIOD

J7. THE CONCRETE MIX DESIGN AND THE CONSTRUCTION TECHNIQUES SHALL BE PREPARED TO LIMIT THE MAXIMUM TEMPERATURE DIFFERENTIAL BETWEEN ANY TWO POINTS WITHIN THE FOUNDATION TO 20 DEGREES CELSIUS, AND A MAXIMUM CONCRETE TEMPERATURE OF 70 DEGREES CELSIUS. THE ADDITION OF ICE AS A REPLACEMENT FOR A PORTION OF MIX WATER, THE REFRIGERATION OF MIX WATER, AND THE COOLING OF AGGREGATES AND CEMENT MAY BE NECESSARY TO REDUCE CONCRETE MIX TEMPERATURE AND HEAT GAIN. THE TEMPERATURE OF THE CONCRETE AT TIME OF PLACEMENT SHALL BE TESTED AND SHALL BE NOT GREATER THAN 32 DEGREES CELSIUS. ANY CONCRETE WITH TEMPERATURE GREATER THAN 32 DEGREES CELSIUS SHALL BE REJECTED.

J8. CONSISTENCY (SLUMP) TESTS SHALL BE PERFORMED FOR EACH OF THE FIRST 5 TRUCKS SUPPLYING CONCRETE FOR THE FOUNDATIONS POURS.

J9. CONCRETE CUBE SAMPLES SHALL BE TAKEN FOR THE FOUNDATIONS. THE REQUIREMENTS ARE AS INDICATED IN THE TECHNICAL SPECIFICATION - "CAST-IN-PLACE CONCRETE".

J10. REFER TO THE SOIL INVESTIGATION REPORT No. SR 57/2019 DATED ON OCTOBER 2019 FOR ANY ADDITIONAL REQUIREMENTS.

K. REINFORCED CONCRETE BORED PILES

K1. GENERAL

K1. THE SOIL INVESTIGATION REPORT No. SR 57/2022 DATED ON OCTOBER 2022HAS BEEN PREPARED AND SHALL BE CONSIDERED PART OF THE CONSTRUCTION DOCUMENTATION. THE INFORMATION GIVEN IN THE SOIL REPORT IS SOLELY A GUIDE. RESPONSIBILITY IS ACCEPTED BY THE OWNER OR THE ENGINEER FOR ITS CORRECTNESS.

K2. ALL PILES SHALL BE BORED CAST IN SITU USING TEMPORARY STEEL CASING.

K3. ALL REINFORCING BAR SPLICES SHALL DEVELOP 100% OF THE TENSILE CAPACITY OF THE REBAR. ALTERNATIVE MECHANICAL SPLICES MAY BE CONSIDERED, PROVIDED THAT THEY DEVELOP FULL TENSILE STRENGTH.

K4. ALL PERMANENT PILING CONCRETE SHALL BE DESIGNED FOR A PUMPED TREMIE CONCRETE MIX AND AT LEAST INCLUDE WATER REDUCING PLASTIZERS AND MICROSILICA ADMIXTURES. PILE CONCRETE MIX SHALL BE DESIGNED FOR ENHANCED LONG-TERM DURABILITY.

K5. ALL PILES SHALL UTILIZE SELF-COMPACTING CONCRETE (SCC) AND SHALL BE PLACED IN ONE CONTINUOUS CONCRETE POUR USING THE TREMIE METHOD.

K6. REINFORCED CONCRETE BORED PILING OF CIRCULAR CONFIGURATION SHALL DEVELOP THE SCHEDULED MINIMUM ALLOWABLE LOAD CAPACITIES WITH A MINIMUM SAFETY FACTOR OF 2.0.

K7. PILES SHALL BE PLACED A MINIMUM OF 2.5 TIMES THE PILE DIAMETER, CENTER-TO-CENTER OF THE PILES, UNLESS NOTED OTHERWISE.

K8. THE PILE DETAILS SHOWN ARE INDICATIVE ONLY. THE PILING CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PILES THAT SATISFY THE REQUIREMENTS OF THE SPECIFICATION AND CAPABLE OF SUPPORTING THE LOADS SPECIFIED.

K9. THE BOTTOM OF EACH PILE SHALL BE CLEANED OF EXCESS LOOSE MATERIALS BY AIR LIFT PROCEDURES PRIOR TO FINAL CONCRETING.

K10. ALL CONCRETE SHALL BE PLACED UTILIZING AN APPROVED PUMPED TREMIE CONCRETE SEQUENCE. ALL CONCRETE SHALL BE PLACED TO THE TOP OF THE BORE HOLE, AND THE EXCESS CONCRETE AND LAITANCE MATERIALS TRIMMED BACK AT A LATER DATE.

K11. THE PILING CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ADDITIONAL LOAD TESTS, MATERIAL TESTING, OR NEW PILES AS THE RESULT OF ANY DEFECTIVE PILES THAT HAVE BEEN INSTALLED OR DEVIATIONS IN PILE LOCATION, VERTICALITY IN EXCESS OF THE ALLOWED TOLERENCES.

K12. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOAD CARRYING CAPACITY OF REINFORCED CONCRETE PILES, PILES ANALYSIS, DESIGN AND FINAL DRAWINGS SHALL BE PREPARED BY PILING SUB CONTRACTOR AND SHALL BE SUBMITTED FOR ENGINNER'S APPROVAL BEFORE CONSTRUCTION.

K2. PILING MATERIAL

CONCRETE STRENGTH (28 DAY CUBIC STRENGTH)	45 MPa
REINFORCING BARS	EPOXY COATED HIGH TENSILE STEEL (YIELD STRESS = 460MPa)
PILE HEAD GROUT	85 MPa CEMENT GROUT WITH MICROSILICA OR APPROVED EQUIVALENT
CEMENT TYPE	ASTM TYPE-V
MAX. WATER CEMENT RATIO	0.42
MIN CEMENT CONTENT	400 kg/m3

K3. PILE TESTING

K13. PILES TESTING SHALL CONFORM TO ACI 543 STANDARDS AND PROJECT SPECIFICATION.

K14. THE CONTRACTOR SHALL ALLOW FOR 2 PRELIMINARY PILES AS LISTED IN THE TABLE BELOW, THE LOCATION OF WHICH SHALL BE AGREED WITH THE ENGINEER. THE PRELIMINARY TEST PILES SHALL BE LOADED UNDER STATIC COMPRESSIVE LOADS TO 2 TIMES THE PILE CAPACITY.

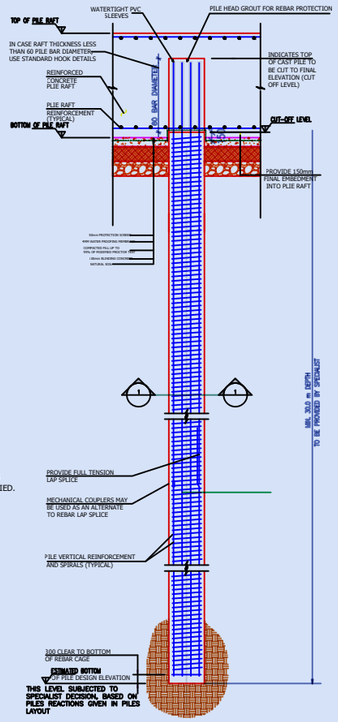
PRELIMINARY PILE LOAD TESTS		
PILE DIAMETER(mm)	TEST TYPE	TEST LOAD (kN)
1000	COMPRESSION	3000

K15. THE CONTRACTOR SHALL PERFORM COMPRESSIVE LOAD TESTS ON WORKING PILES AS LISTED IN THE TABLE BELOW. PILES SHALL BE LOADED UNDER STATIC COMPRESSIVE LOADS TO 1.25 TIMES THE PILE CAPACITY.

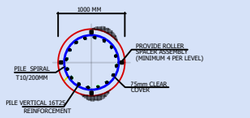
WORKING PILE LOAD TESTS			
MARK	PILE DIAMETER (mm)	TEST TYPE	TEST LOAD (kN)
P1	1000	COMPRESSION	3000

K16. STANDARD SONIC INTEGRITY TESTING AT PILE HEAD SHALL BE PERFORMED FOR 100% OF THE NON LOAD TESTED PILES.
TEST PILES , AND THE LOAD TESTING THEREOF SHALL BE ESTABLISHED AND REVIEWED PRIOR TO THE START OF PILING INSTALLATION.

K17. A COMPREHENSIVE INSTRUMENTATION, MONITORING, AND REPORTING PROGRAM FOR THE INSTALLATION OF THE



TYPICAL CAST-IN-SITU PILE ELEVATION



SECTION 1-1 (REFER TO PILE LAYOUT)

M. JOINTS

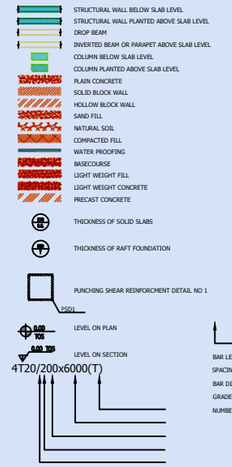
M.1 THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING PROPOSED CONSTRUCTION / CONTRACTION JOINTS LAYOUT & DETAIL FOR APPROVAL BY THE ENGINEER BEFORE CONSTRUCTION.

M.2 CONTRACTION JOINTS SHALL BE IMPLEMENTED AND PERFORMED BY MAX. 10.0m AS PER TYPICAL STRUCTURAL DETAIL.

N. ABBREVIATIONS

B	BOTTOM BARS
C1	COLUMN NUMBER 1
cm	CENTIMETER
Dia	DIAMETER
EJ	EXPANSION JOINT
ES	EACH STEP
EW	EACH WAY
FFL	FINISH FLOOR LEVEL
HOR	HORIZONTAL BARS
L	L SHAPED TOP BARS
Ls	HORIZONTAL LINKS AT
	CONCRETE WALL
Lt	HORIZONTAL LINKS AT SPECIAL
	BOUNDARY ELEMENT
M	MIDDLE BARS
m	METER
MAX	MAXIMUM
MIN	MINIMUM
mm	MILLIMETER
No.	NUMBER
N.T.S	NOT TO SCALE
PC	PLANTED COLUMN
PW	PLANTED WALL
R	MILD STEEL BARS
S	STIRRUPS
SJ	SETTLEMENT JOINT
T	TOP BARS
TOF	TOP LEVEL OF FOUNDATION
TOC	TOP LEVEL OF SLAB
TYP.	TYPICAL
T&B	TOP AND BOTTOM
U	U SHAPED BARS
VER	VERTICAL BARS
VAR.	VARIABLE
W1	SHEAR WALL NUMBER 1
T	HIGH YIELD BARS

O. ABBREVIATIONS

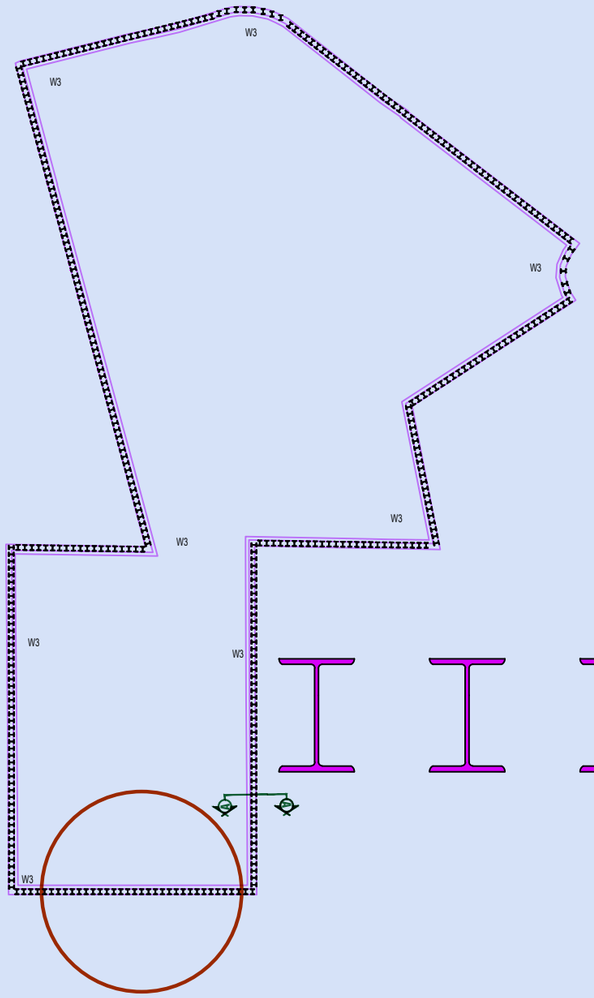


no.	date	initials	revision

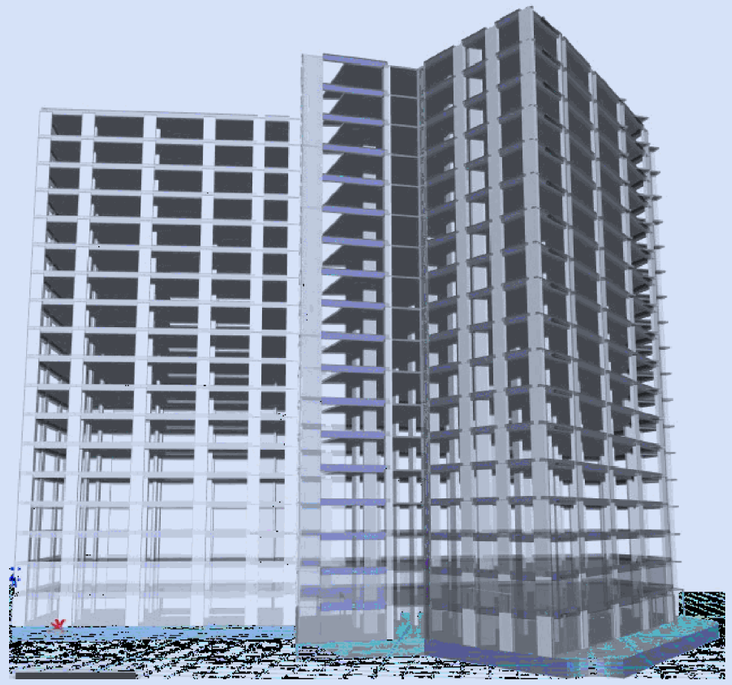
job title: (A)

drawing title: GENERAL STRUCTURAL NOTES

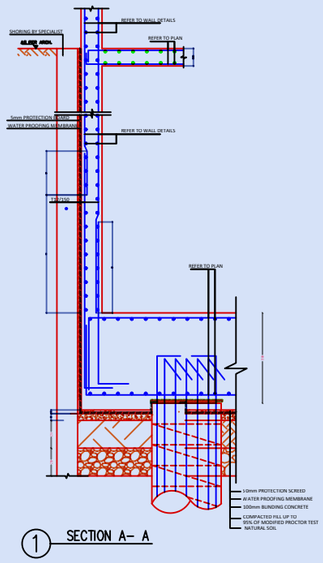
designed: ENG : DR-Majid Albana
project manager:
checked:
scale:
date:
drawn:
job no.:
sheet no.: 4
approved:



Section A



Section A



1 SECTION A– A

SHORING H PILES DETAILS

Retaining wall design proposal

drawing title		
SHORING H PILES DETAILS		
designed: ENG :DR- Majid Albana	project manager	
checked	scale: 1-100	date: 5/2025
drawn	job no.: 5	sheet no.: ST/D/03
approved		

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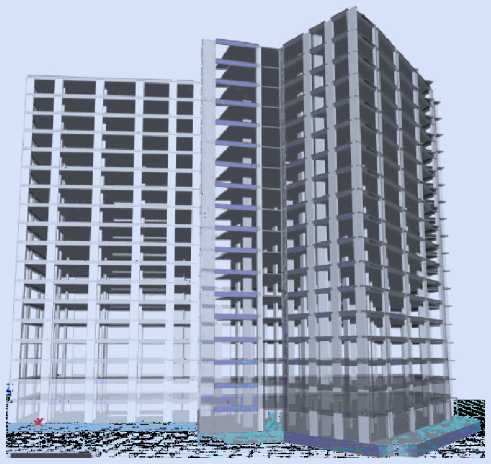
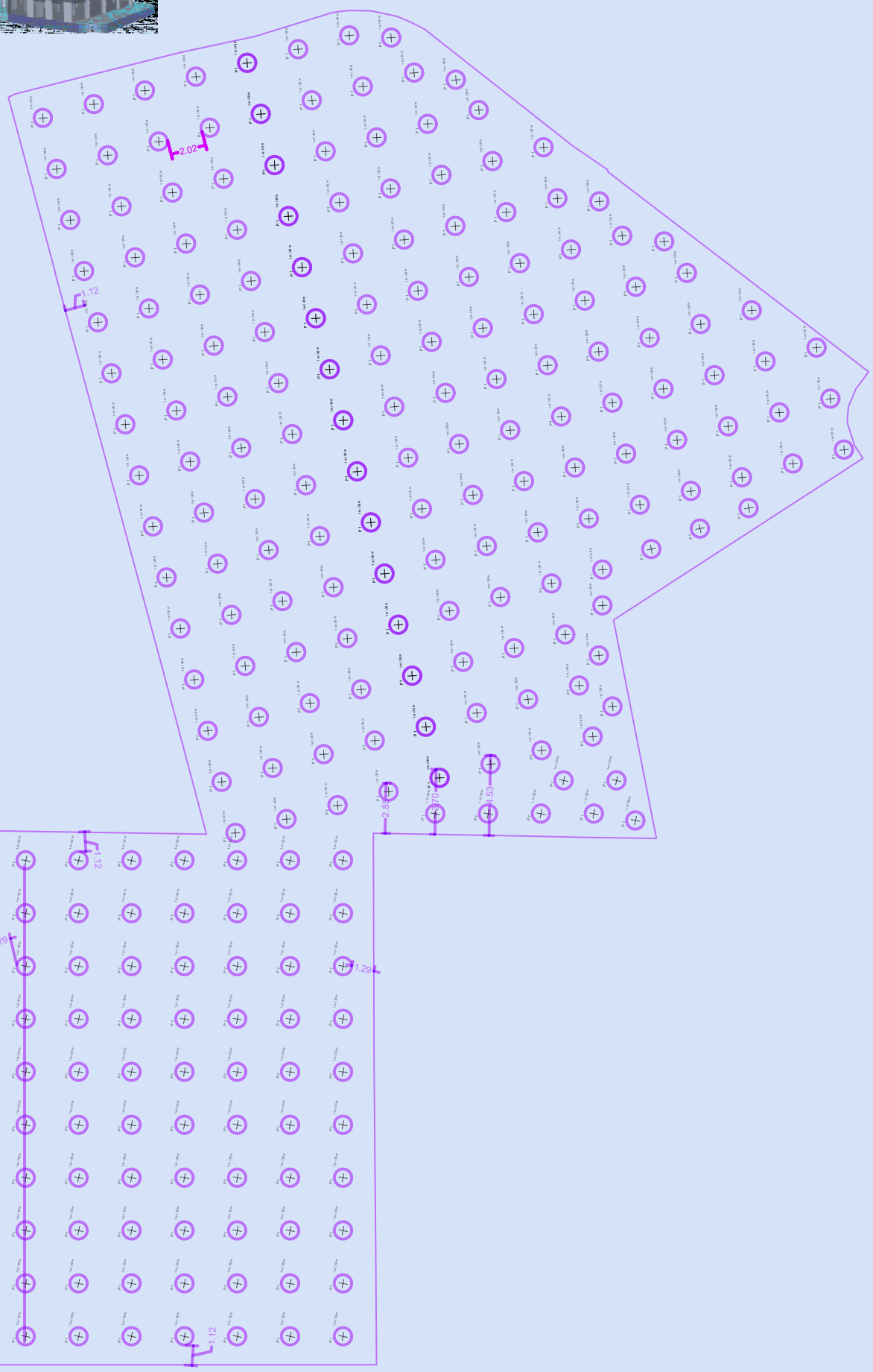
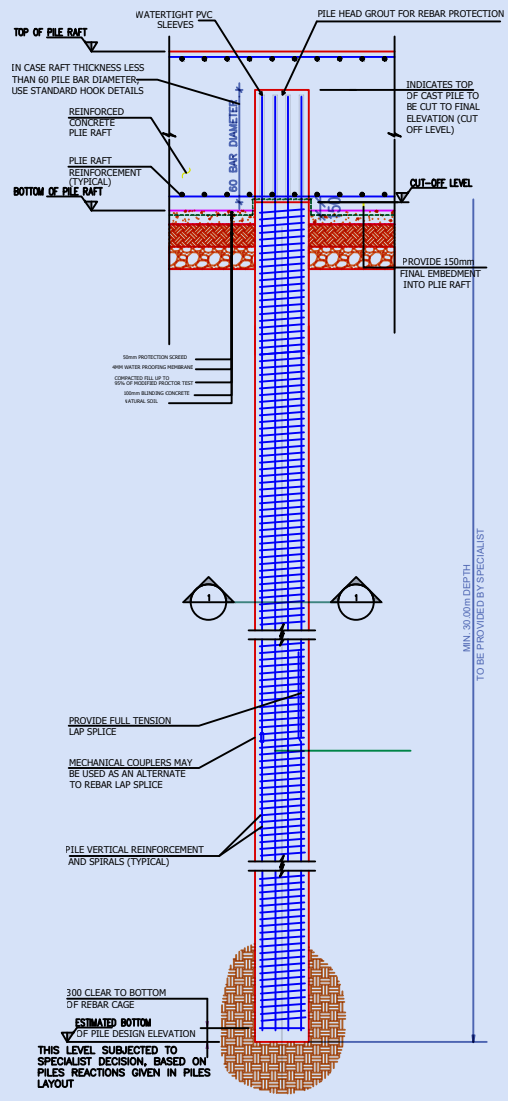
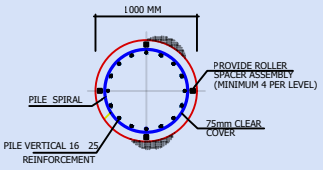






TYPICAL FRANKI PILE ELEVATION



SECTION 1-1

NO. PILES=240

PILE DIAMETER(mm)	TEST TYPE	Allowable Carrying Capacity in Compression, (Ton)
1000	COMPRESSION	300

ID	Quantity	Diameter	Length (cm)	Type	Weight (Kg)
2	3848	25	1200		113876.95
3	1924	25	880		41754.88
					155631.84
1	4810	10	1200		35586.55
4	74	10	776		354.04
					35940.59

Thin Steel Total (Ø8-Ø12) (Kg)	Thick Steel Total (Ø14=<) (Kg)
35940.59	155631.84

	1200	P2	3848Φ20
	880	P3	1924Φ20
96	1200	P1	4810Φ10
96	776	P4	74Φ10

PILES KEY PLAN

job title: (A)
drawing title: PILES KEY PLAN REINFORCEMENT&SEC.
designed: ENG : DR-Majid Albana
project manager:
checked:
drawn:
approved:
scale: 1-100
date: 5 /2025
job no.: 6
sheet no.: ST/D/04

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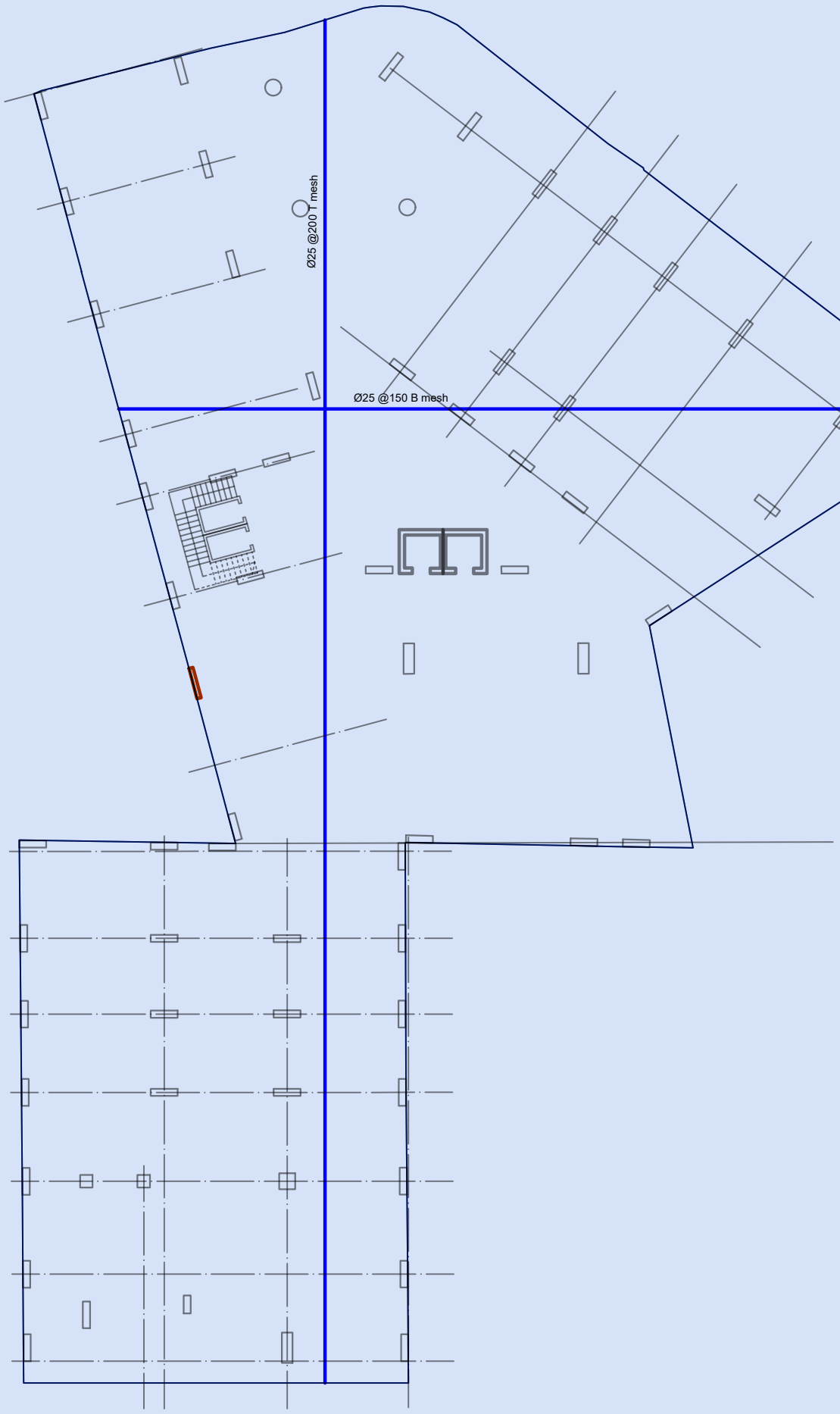
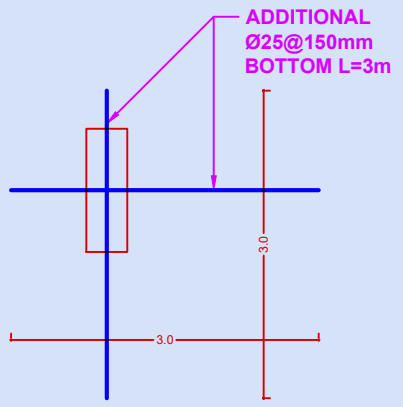


Foundation Plan

THICK. = 1500 mm

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	650	700	800	900
LAP LENGTH (mm) IN ELSE WHERE	400	600	700	800	900	1000	



for all inter columns

1250

job title	(A)
drawing title	PLAN OF FOUNDATION REINFORCEMENT&SEC.
designed	ENG : DR-Majid Albana
project manager	
checked	
scale	1-100
date	5 /2025
drawn	
job no.	7
sheet no.	ST/D/04
approved	

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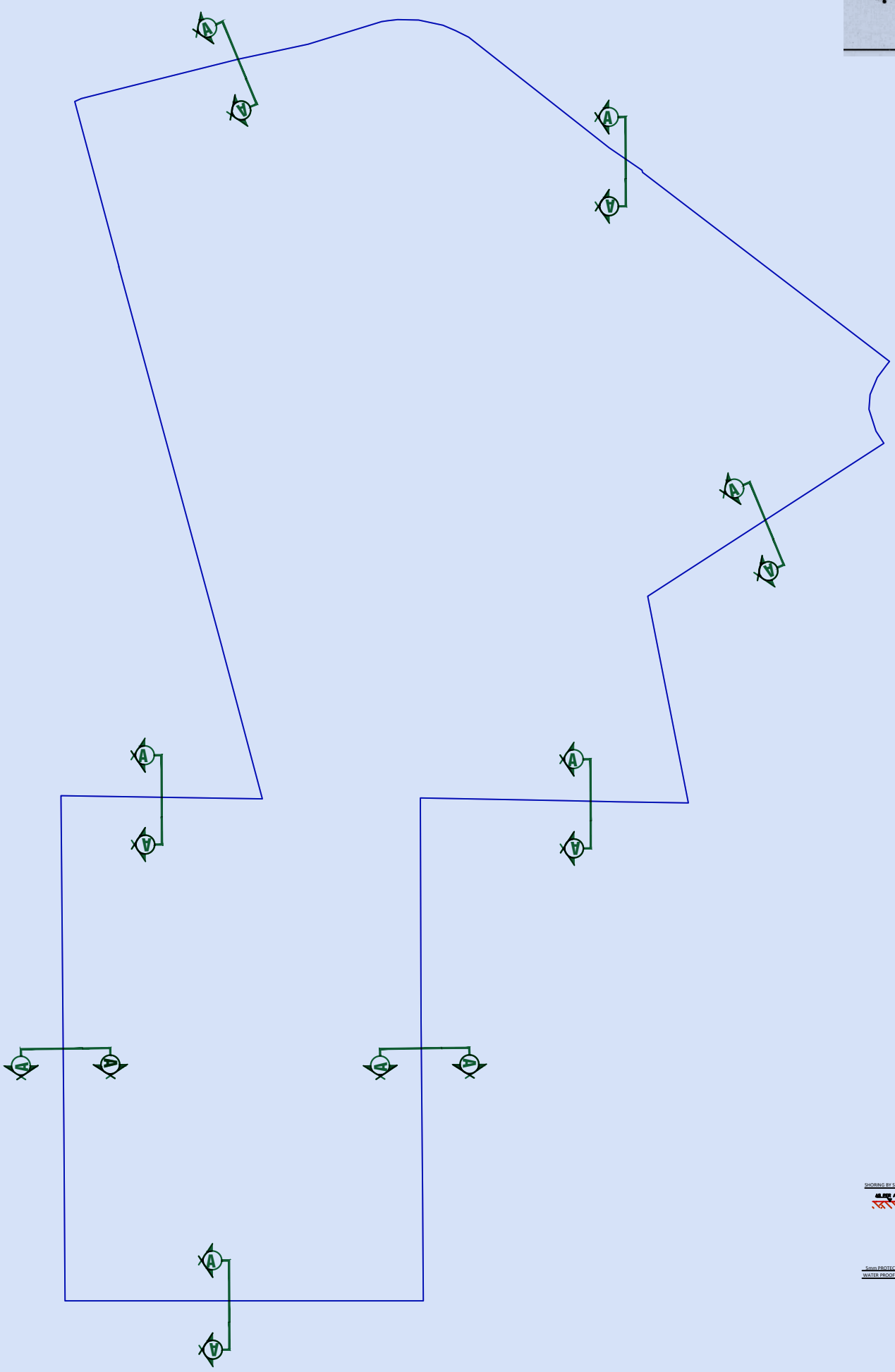

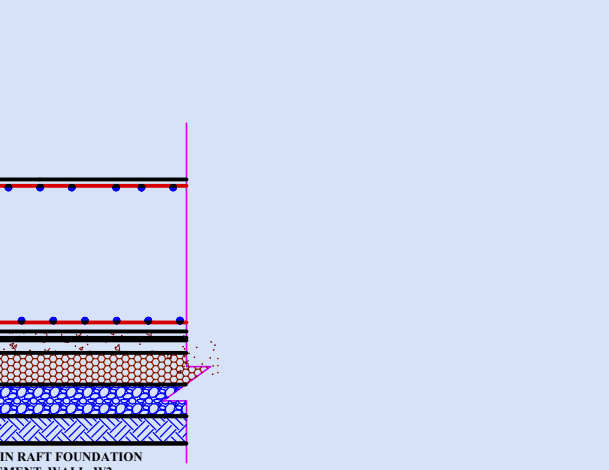

SECTION IN RAFT FOUNDATION
BASEMENT WALL W2

1 SECTION A– A

Typical Section (A-A) of raft foundation

Foundation Plan

THICK. = 1500 mm

. all dim. from ARCH D.W.G.

job title	(A)
drawing title	PLAN OF FOUNDATION REINFORCEMENT&SEC.
designed	ENG : DR-Majid Albana
project manager	
checked	
scale	1-100
date	5 /2025
drawn	
job no.	8
sheet no.	ST/D/04
approved	

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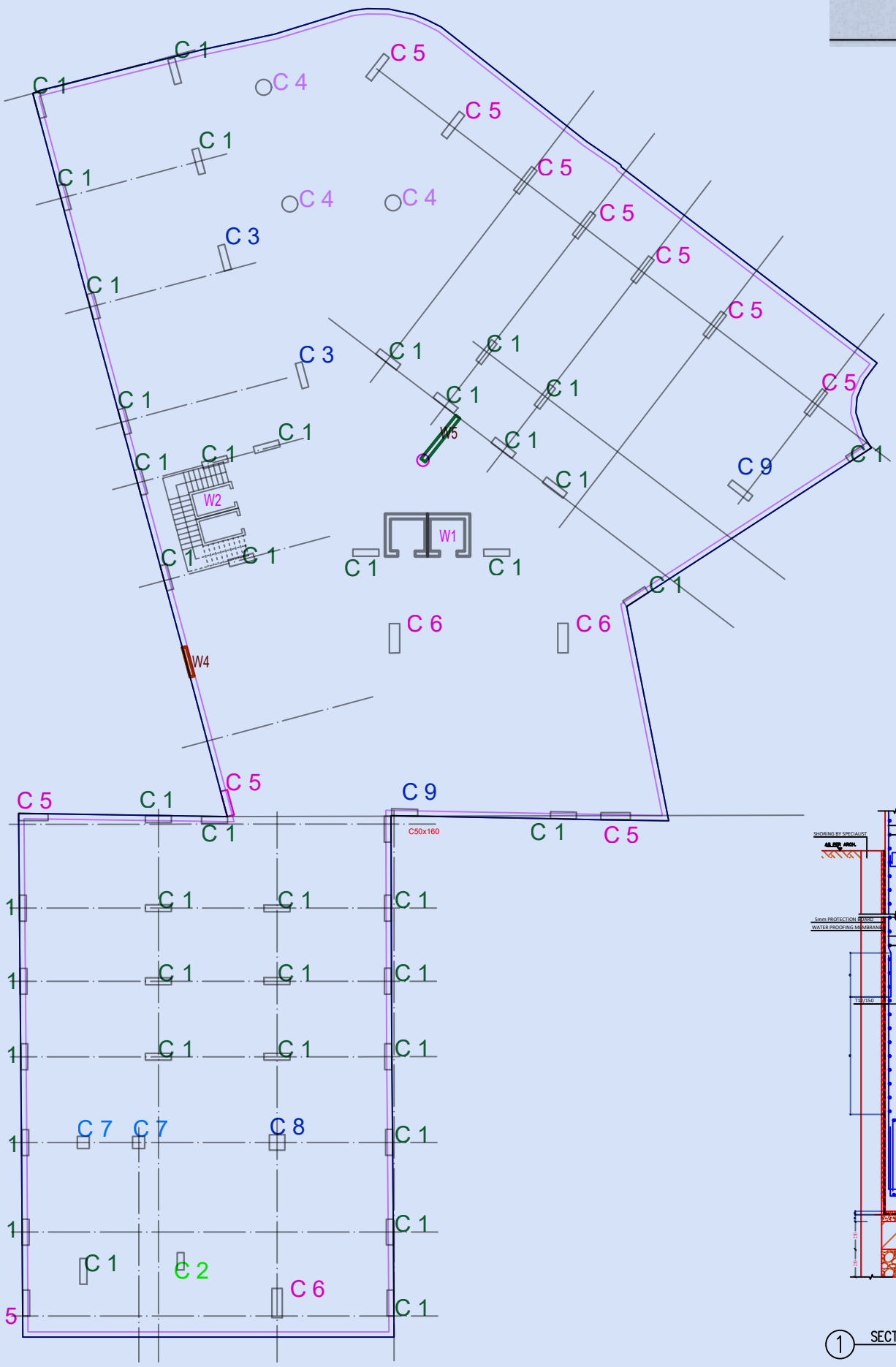

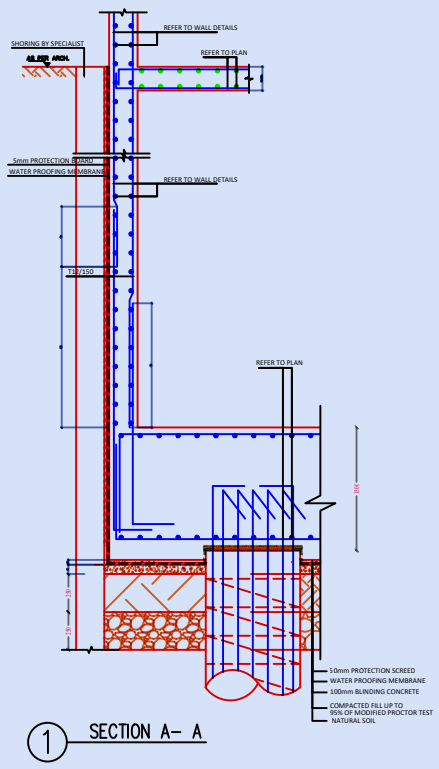

1 SECTION A- A

COLUMNS & WALL KEY PLAN

. all dim. from ARCH D.W.G.

Dr-Majid Al bana
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د. ماجد البنا

job title	(A)
drawing title	COLUMNS & WALL KEY PLAN REINFORCEMENT&SEC.
designed: ENG : DR-Majid Albana	project manager
checked	scale: 1-100 / date: 5 /2025
drawn	job no.: 9 / sheet no.: ST/D/04
approved	

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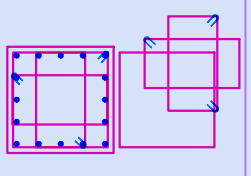
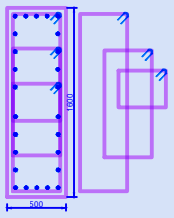
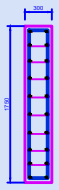
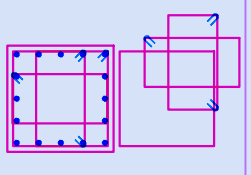
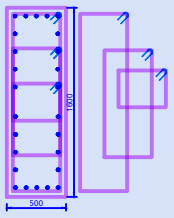
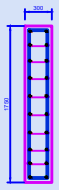
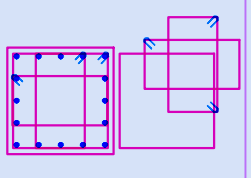
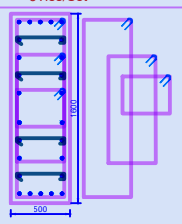
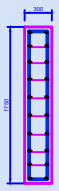
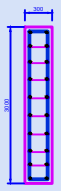
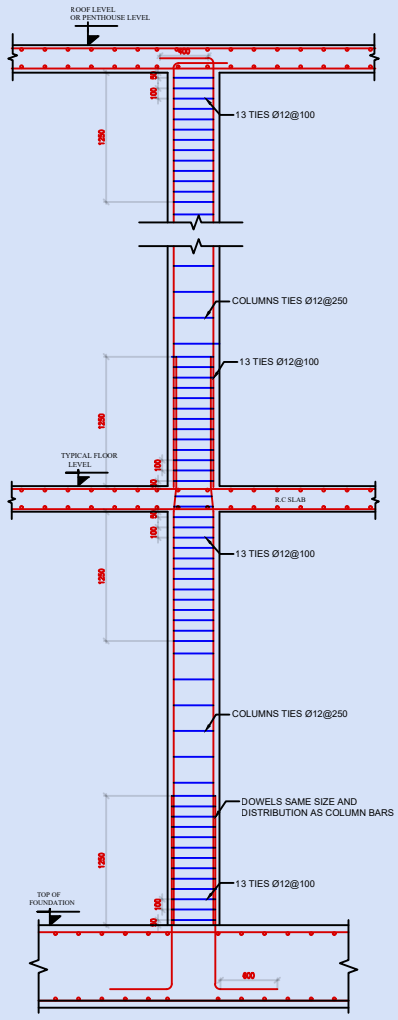
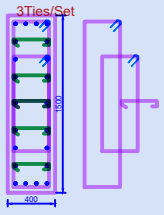
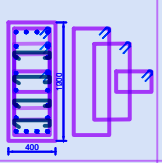
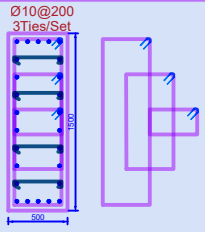
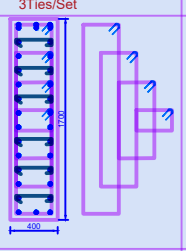
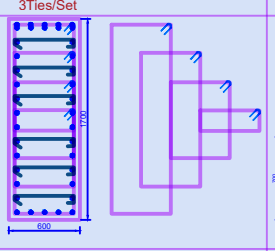
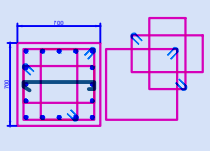
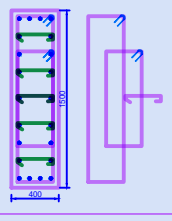
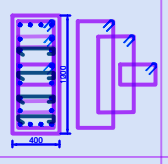
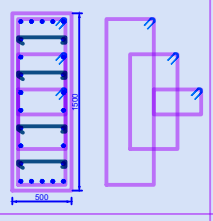
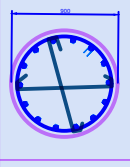
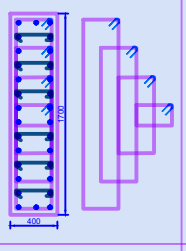
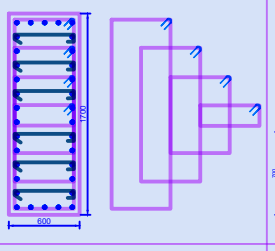
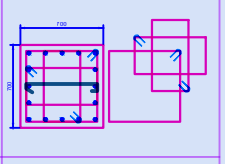
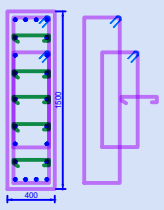
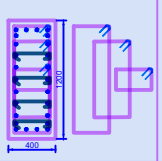
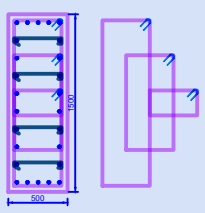
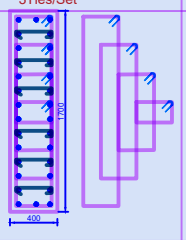
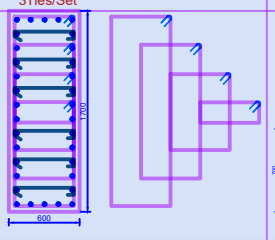
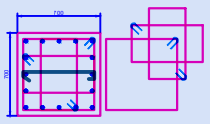
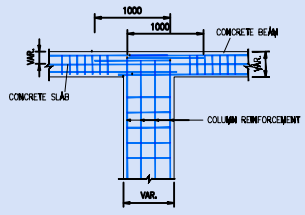
Main Bar			16 - Ø25	24 - Ø25		20 - Ø16	
Ties	Roof Floor	Fcu	Ø12@250 3Ties/Set	Ø12@250 3Ties/Set		Ø12@250 5Ties/Set	
							
Main Bar			16 - Ø25	24 - Ø25		20 - Ø16	
Ties		Fcu	Ø12@250 3Ties/Set	Ø12@250 3Ties/Set		Ø12@250 5Ties/Set	
Section	18th Floor 4th Floor 3 rd Floor 2nd Floor 1st Floor	C 50					
Main Bar			16 - Ø25	24 - Ø25	14 - Ø25	20 - Ø16	40 - Ø16
Ties			Ø12@250 3Ties/Set	Ø12@250 3Ties/Set	Ø12@250 3Ties/Set	Ø12@250 5Ties/Set	Ø12@250 11Ties/Set
Section	1st Floor Base Level foundation level	C 50					
Dowels			16 - Ø25 C 8	24 - Ø25 C 9	14 - Ø25 C10		

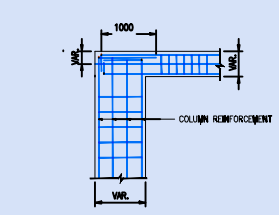


COLUMN LONGITUDINAL SECTION

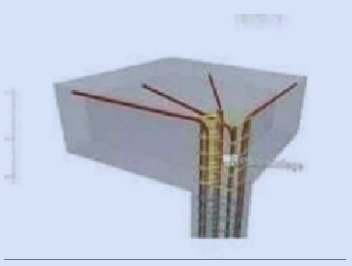
Main Bar			22 - Ø25	20 - Ø25	26 - Ø25	14 - Ø25	30 - Ø20	34 - Ø25	16 - Ø25
Ties	Roof Floor	Fcu	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set
									
Main Bar			22 - Ø25	20 - Ø25	26 - Ø25	14 - Ø25	30 - Ø20	34 - Ø25	16 - Ø25
Ties	Roof Floor	Fcu	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set
Section	5th Floor 4th Floor 3 rd Floor 2nd Floor 1st Floor	C 50							
Main Bar			22 - Ø25	20 - Ø25	26 - Ø25	14 - Ø25	30 - Ø20	34 - Ø25	16 - Ø25
Ties			Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set	Ø12@200 3Ties/Set
Section	1st Floor Base Level foundation level	C 50							
Dowels			22 - Ø25 C 1	26 - Ø25 C 2	26 - Ø25 C 3	14 - Ø25 C 4	30 - Ø20 C 5	34 - Ø25 C 6	16 - Ø25 C 7



TYPICAL INTERNAL COLUMN TO BEAM DETAIL



TYPICAL EDGE COLUMN TO BEAM DETAIL



SCHEDULE OF COLUMN

. all dim. from ARCH D.W.G.

job title	(A)
drawing title	SCHEDULE OF COLUMN REINFORCEMENT&SEC.
designed	ENG : DR-Majid Albana
project manager	
checked	
scale	1-100
date	5 /2025
drawn	
job no.	10
sheet no.	ST/D/04
approved	

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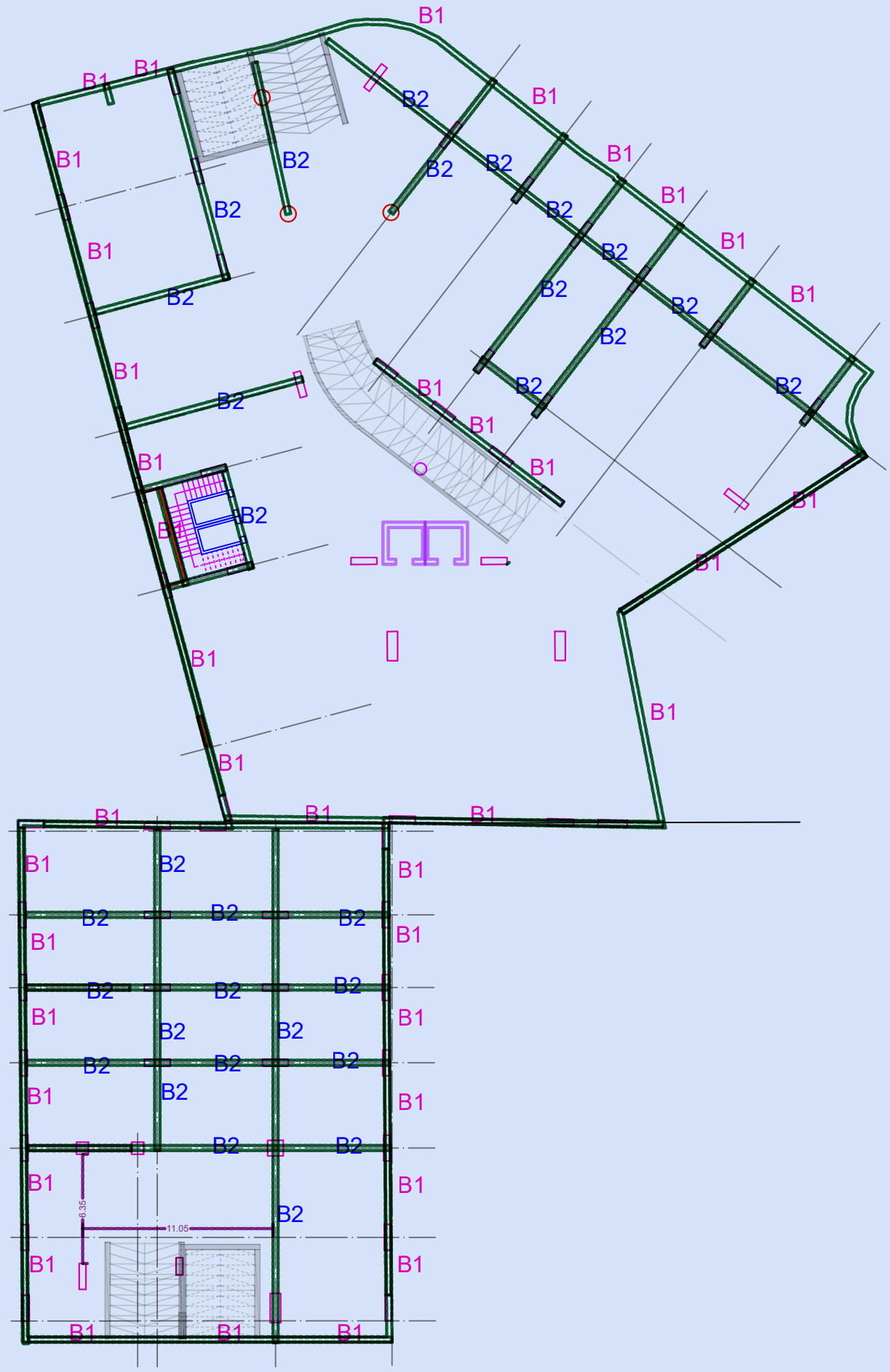


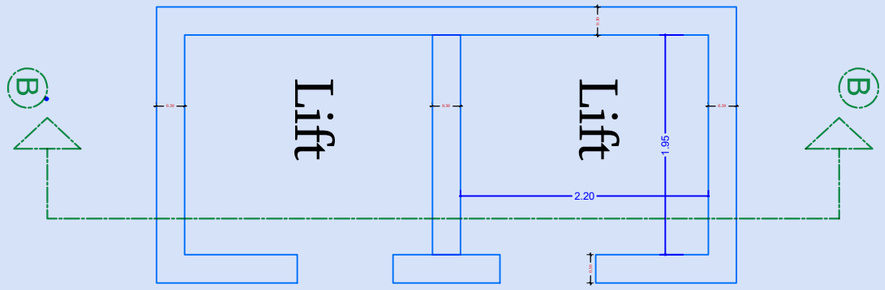
BASEMENT SLAB

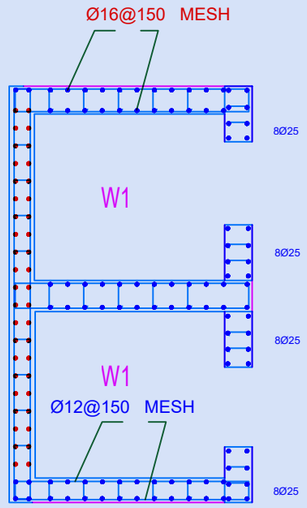
BEAM KEY PLAN

. all dim. from ARCH D.W.G.

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title	(A)
drawing title	SCHEDULE OF BEAMS REINFORCEMENT&SEC.
designed: ENG : DR-Majid Albana	project manager
checked	scale: 1-100 / date: 5 /2025
drawn	job no.: 11 / sheet no.: ST/D/04
approved	





t=300mm

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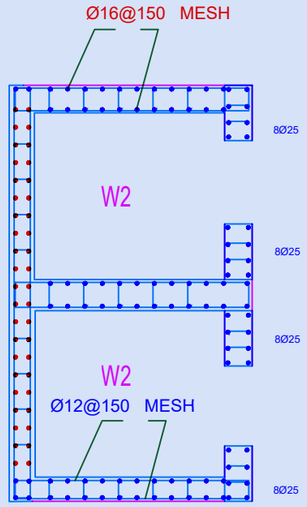

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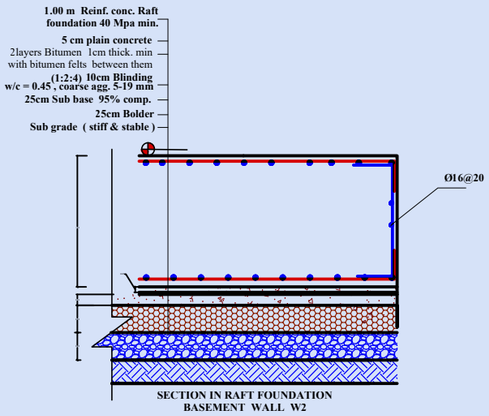
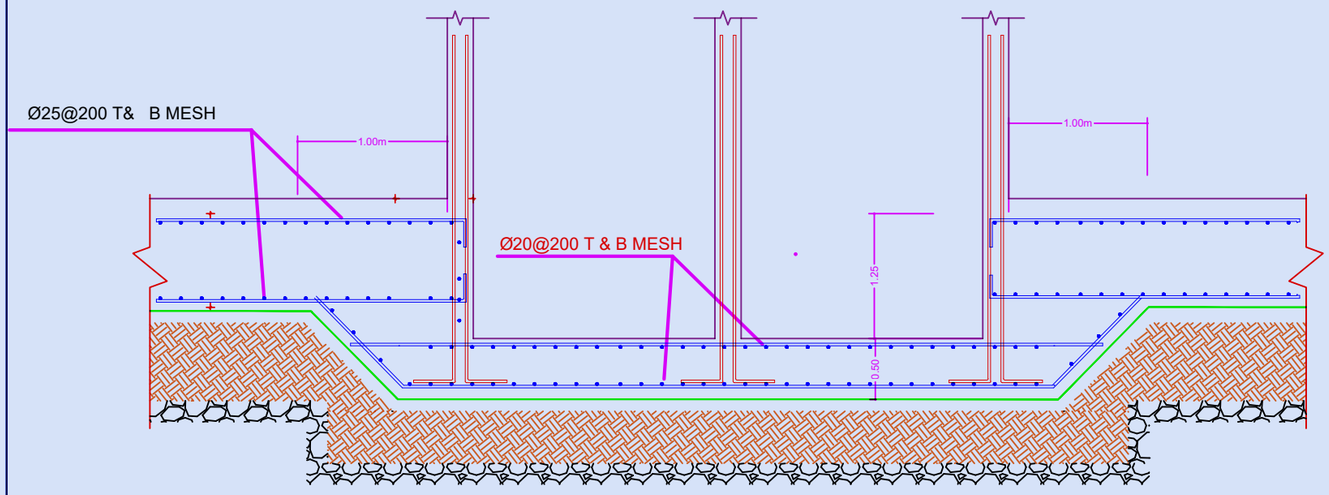


Typical Section (A-A) of raft foundation



Section B'-B'

no.	date	initials	revision

job title

(A)

drawing title

Section A'-A' lift detail

designed ENG : Majid Albana		project manager	
checked ENG : Majid Albana		scale 1-100	date 5/2025
drawn ENG : Majid Albana		job no. 9.5	sheet no. ST/D/06
approved			

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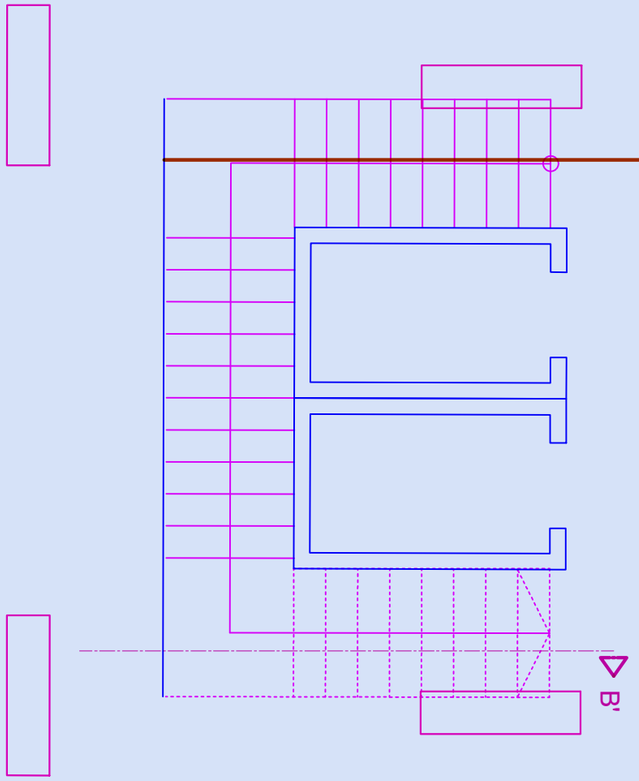
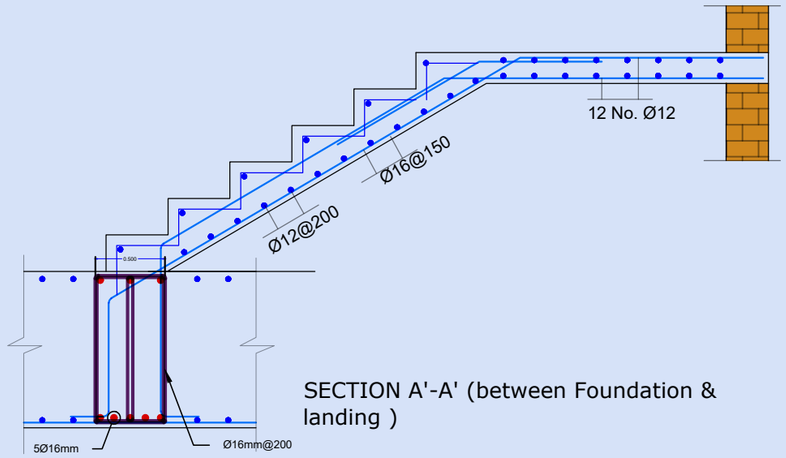
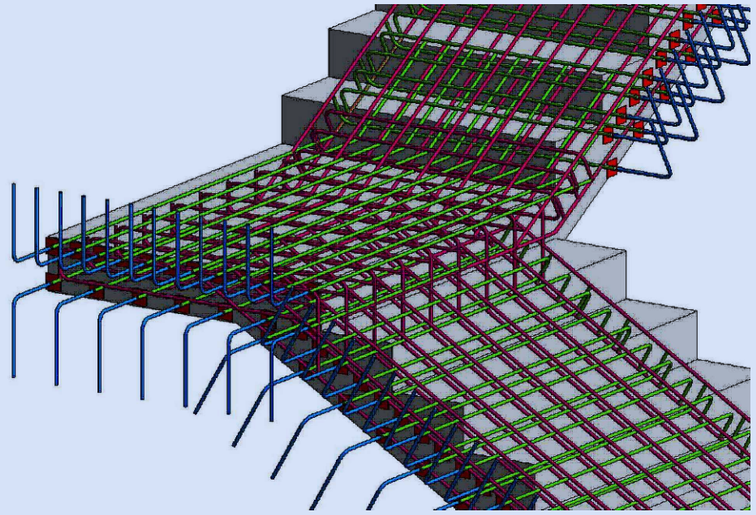
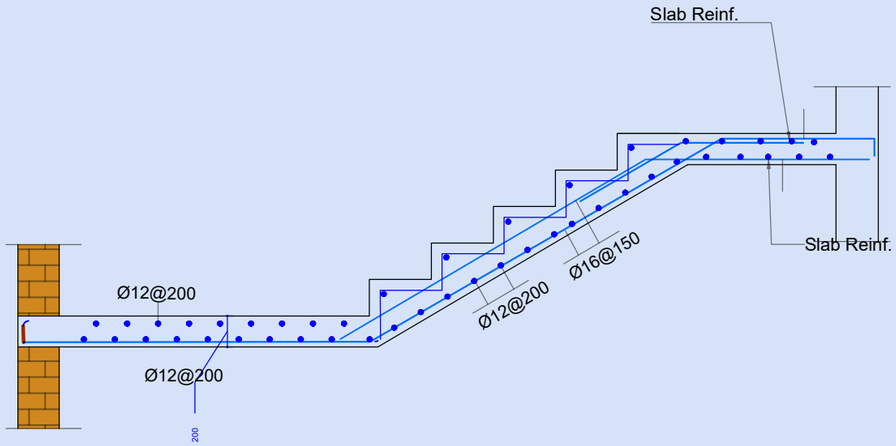


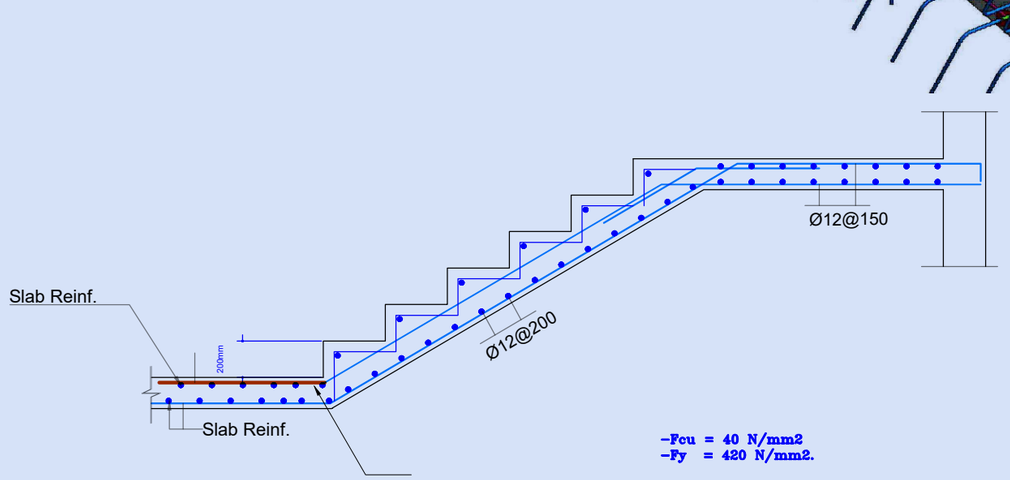


SECTION A'-A' (between Foundation & landing)





SECTION A'-A' (between slab & landing)



. all dim. from ARCH D.W.G.

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

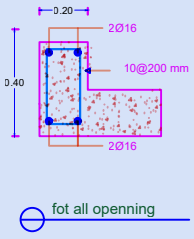
-THE BUILDING IS DESIGNED FOR BASEMENT + GROUND FLOOR + 16 FLOORS + PENT-HOUSE

no.	date	initials	revision

job title
(A)

drawing title
Stairs detail

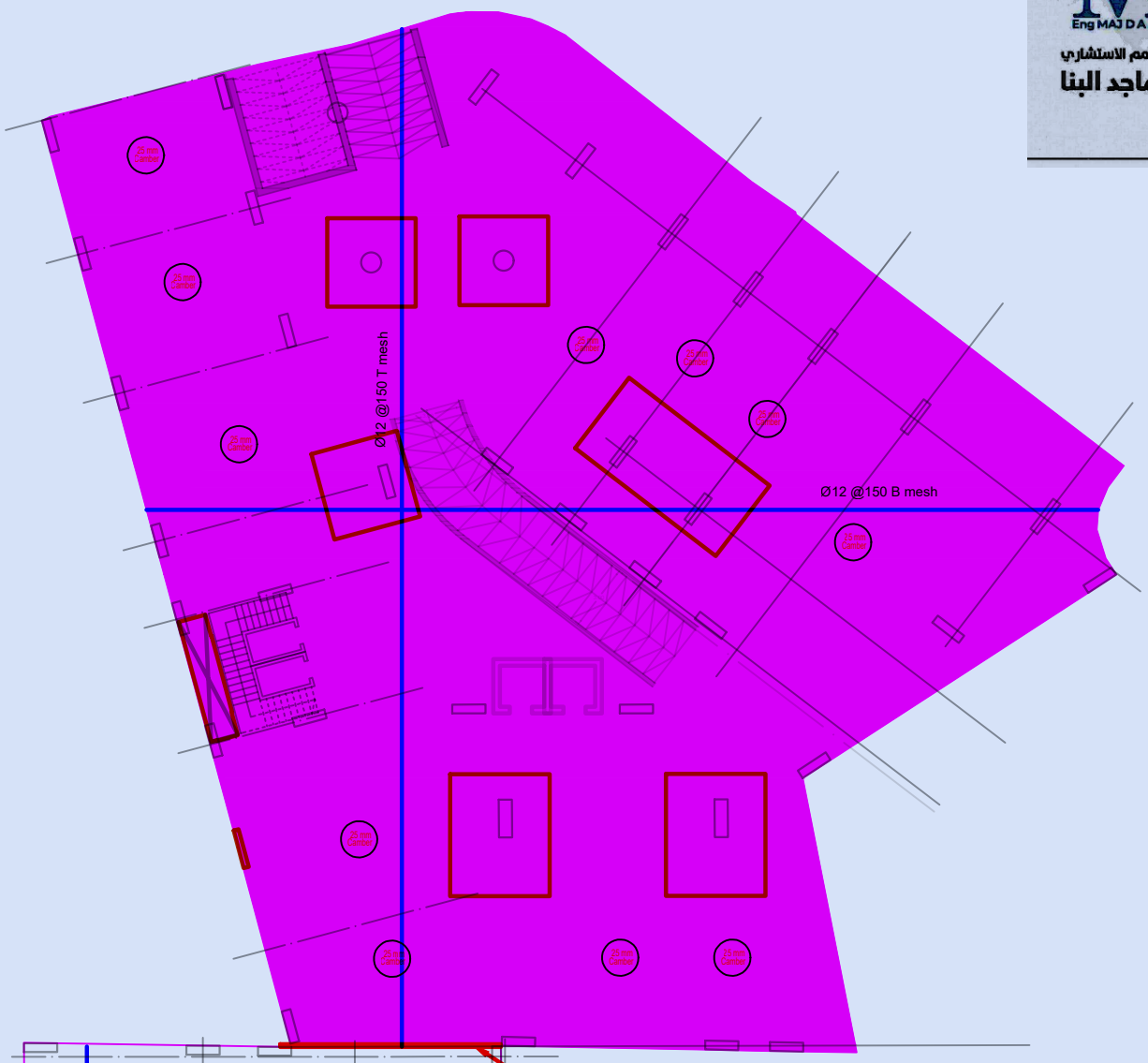
designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5/2025
drawn	job no. 9.6	sheet no. ST/D/07
approved		

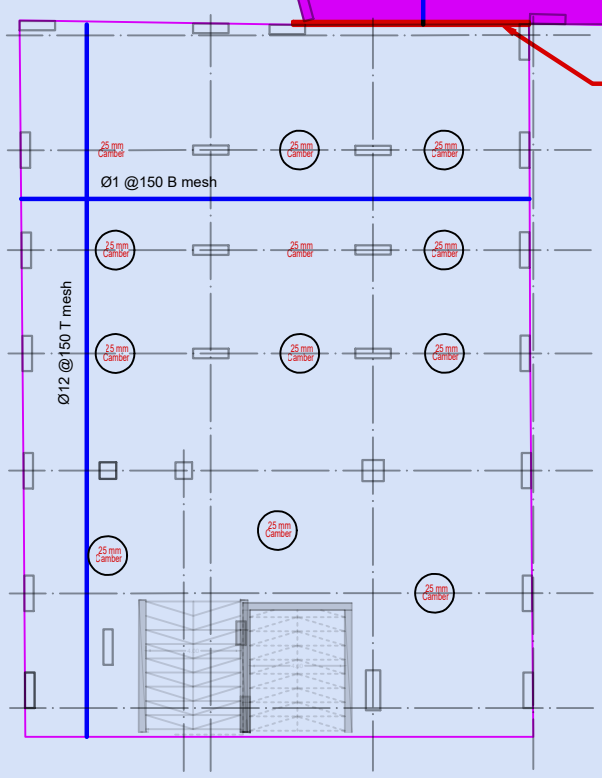


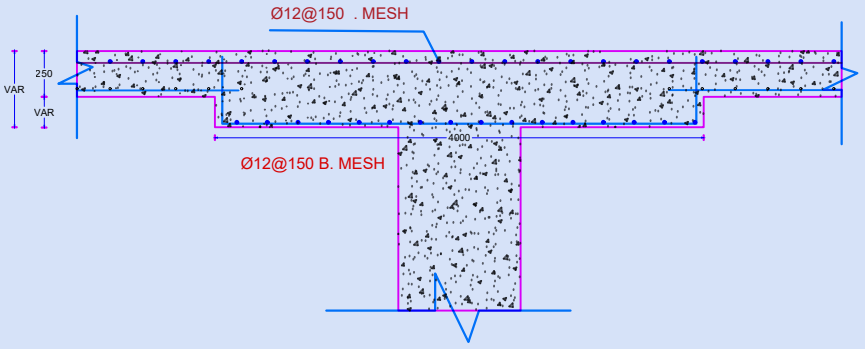
fot all openning

25 mm Camber

slab camber 25 mm



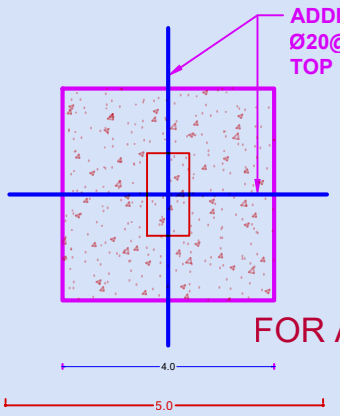




MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

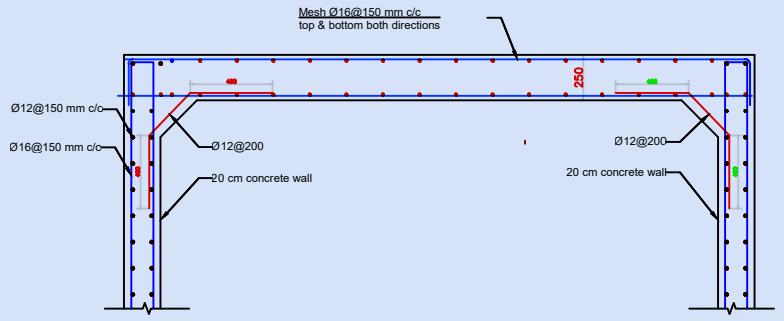
. all dim. from ARCH D.W.G.

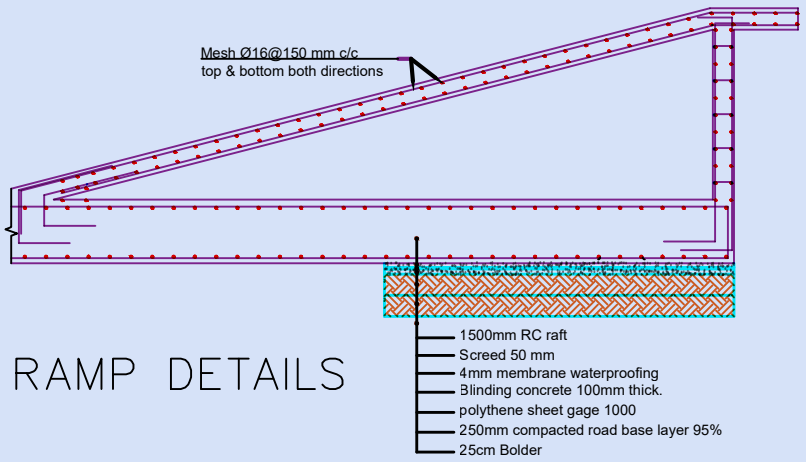


FOR ALL DROP PANLE

BASEMENT SLAB reinforcement

SLAB THICKNESS = 250 mm





RAMP DETAILS

Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

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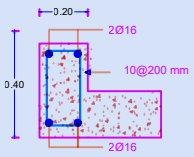
Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

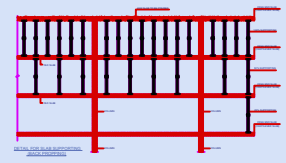
job title
(A)

drawing title
BASEMENT SLAB REINFORCEMENT&SEC.

designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 12	sheet no.: ST/D/04
approved		

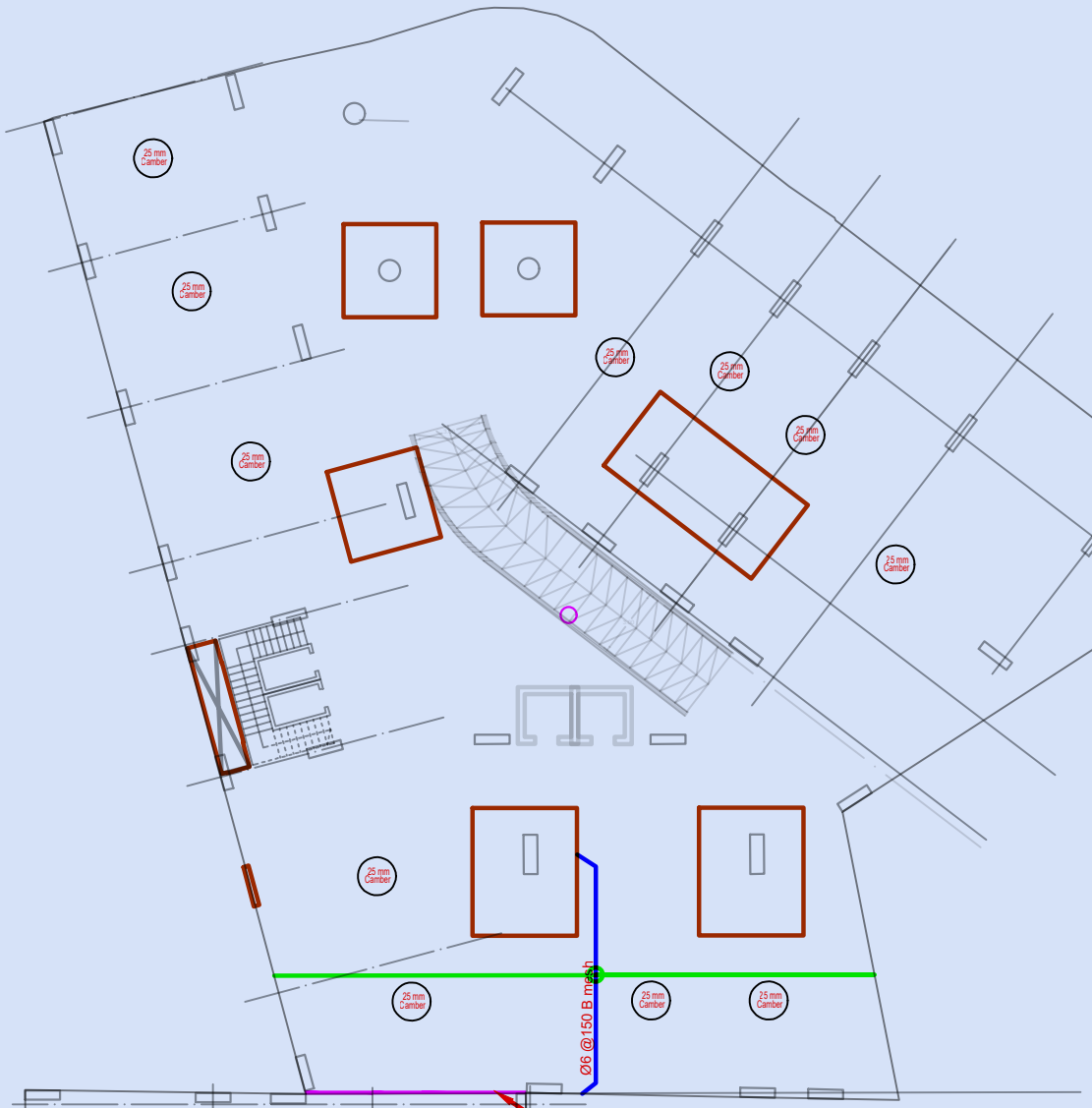


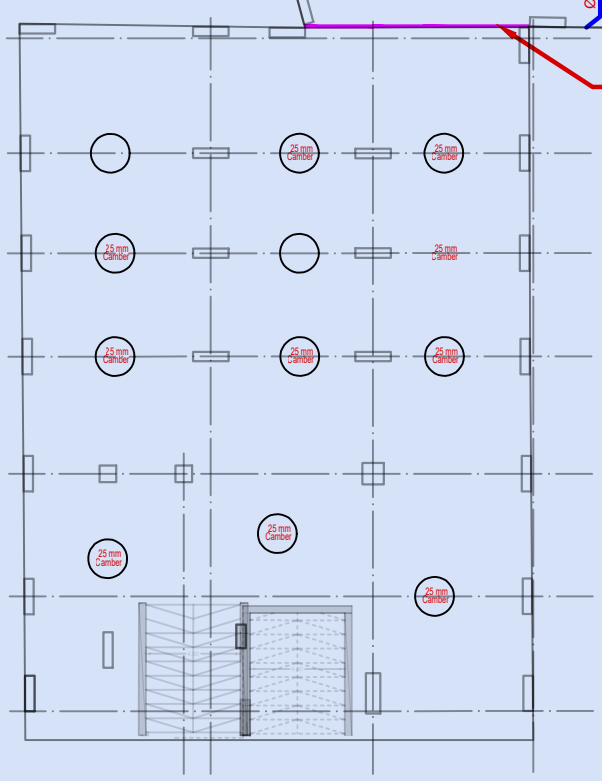
fot all openning

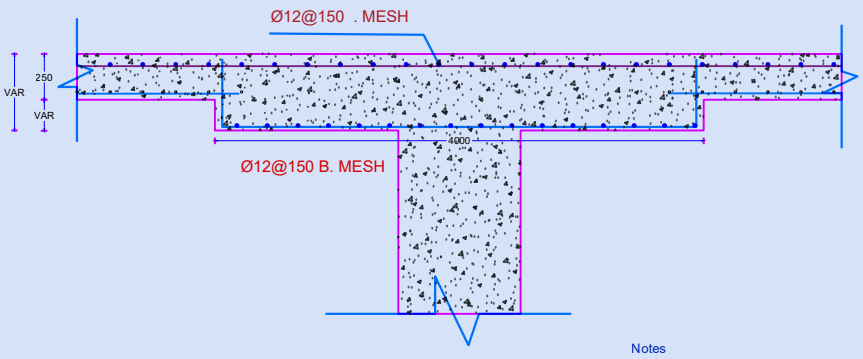


25 mm Camber

slab camber 25 mm







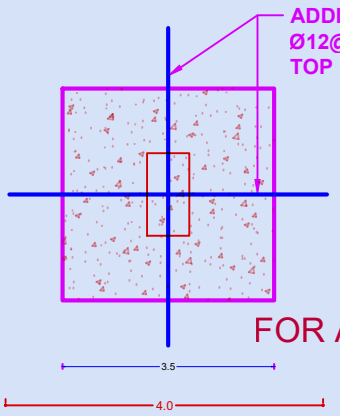
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

ADDITIONAL BOTT.



FOR ALL DROP PANLE

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	650	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

. all dim. from ARCH D.W.G.

BASEMENT SLAB reinforcement

SLAB THICKNESS = 200 mm

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

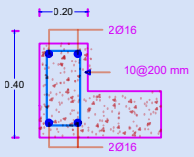
job title

(A)

drawing title

BASEMENT SLAB REINFORCEMENT&SEC.

designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 13	sheet no.: ST/D/04
approved		



fot all openning

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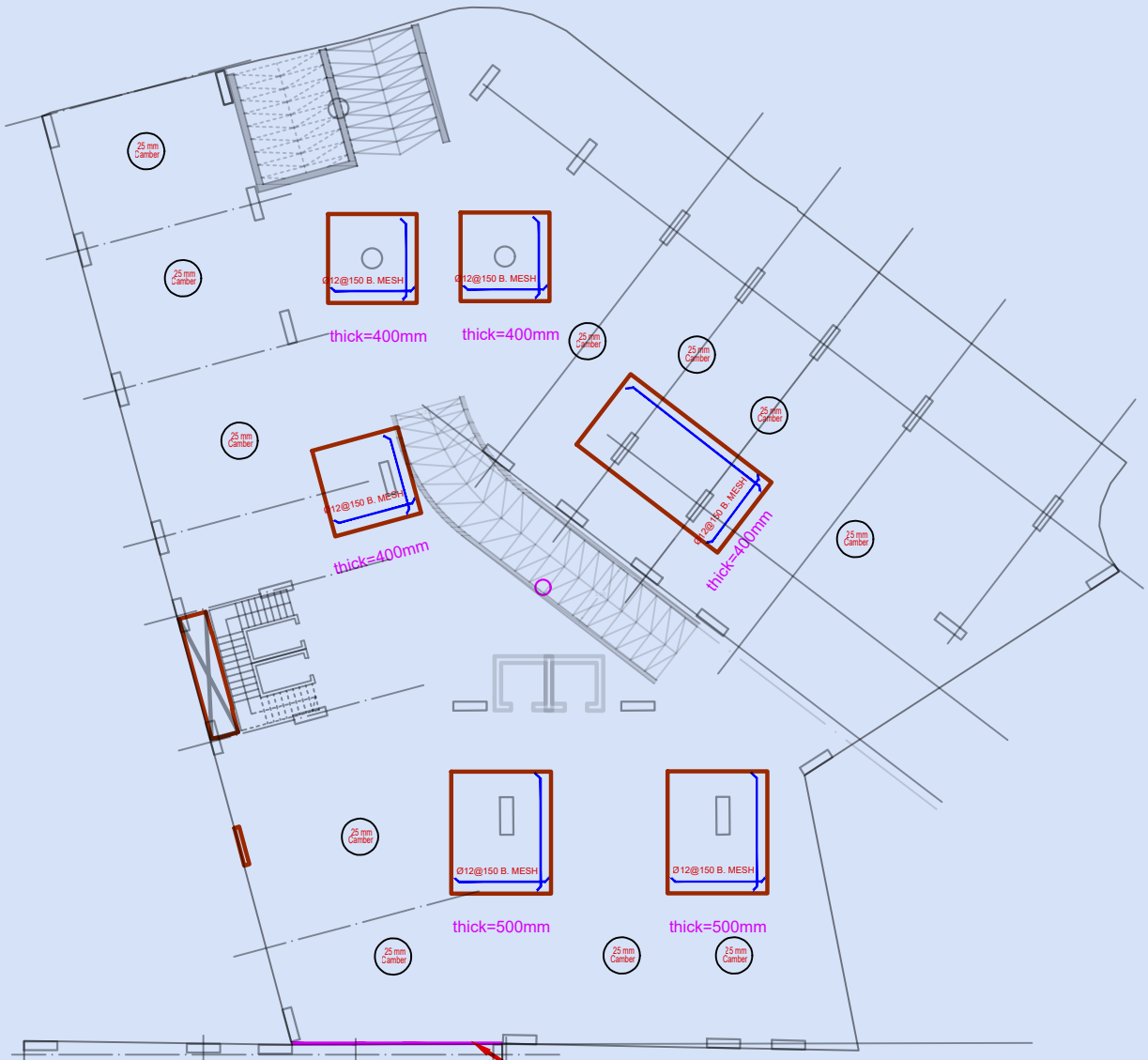
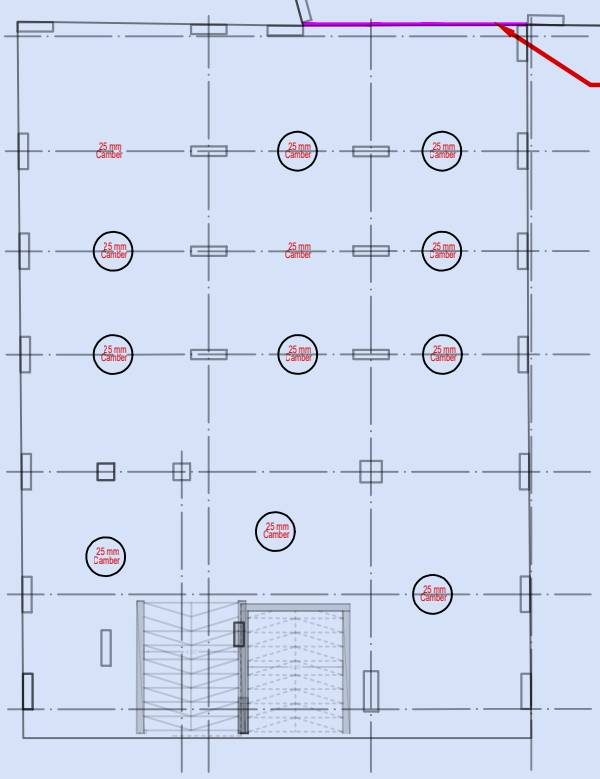
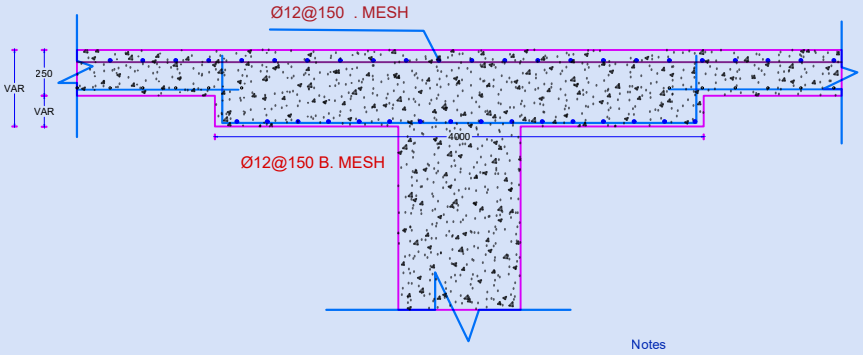
25 mm Camber slab camber 25 mm







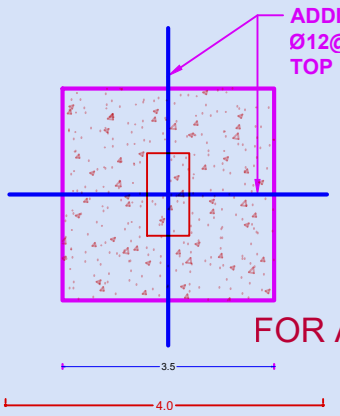
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

REINFORCEMENT&SEC DROP PANLE



FOR ALL DROP PANLE

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	650	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

. all dim. from ARCH D.W.G.

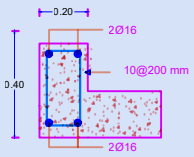
BASEMENT SLAB reinforcement

SLAB THICKNESS = 200 mm

job title
(A)

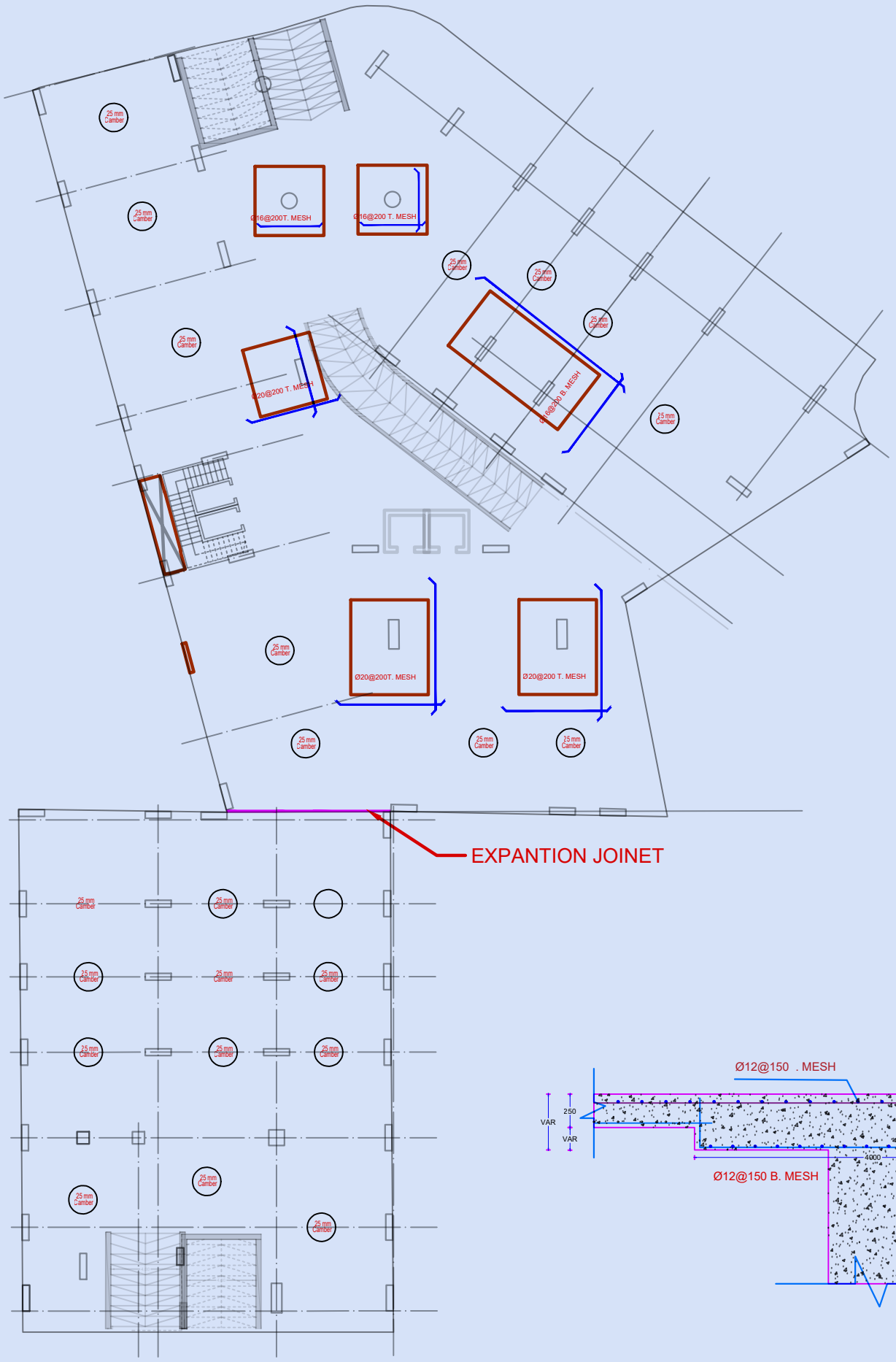
drawing title
BASEMENT SLAB
REINFORCEMENT&SEC.

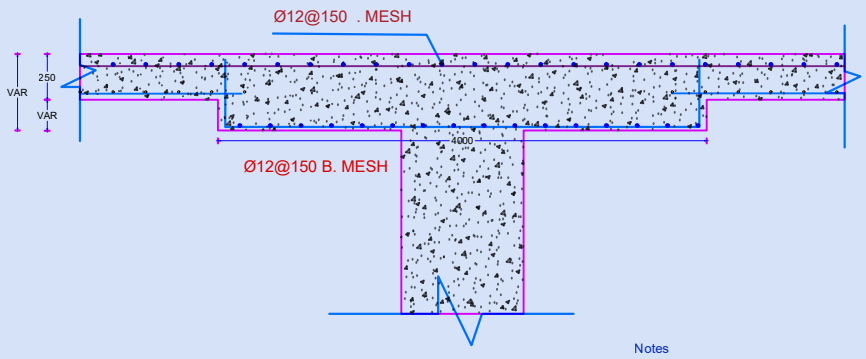
designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 14	sheet no.: ST/D/04
approved		



fot all openning

25 mm Camber slab camber 25 mm





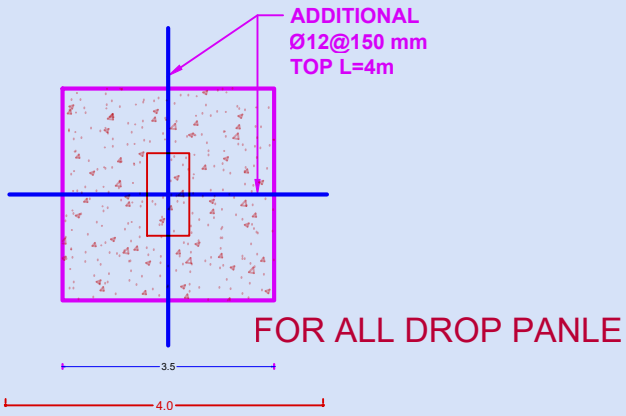
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

ADDITIONAL TOP



FOR ALL DROP PANLE

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	650	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

. all dim. from ARCH D.W.G.

BASEMENT SLAB reinforcement

SLAB THICKNESS = 200 mm

job title	(A)
drawing title	BASEMENT SLAB REINFORCEMENT&SEC.
designed	ENG : DR-Majid Albana
project manager	
checked	
scale	1-100
date	5 /2025
drawn	
job no.	15
sheet no.	ST/D/04
approved	

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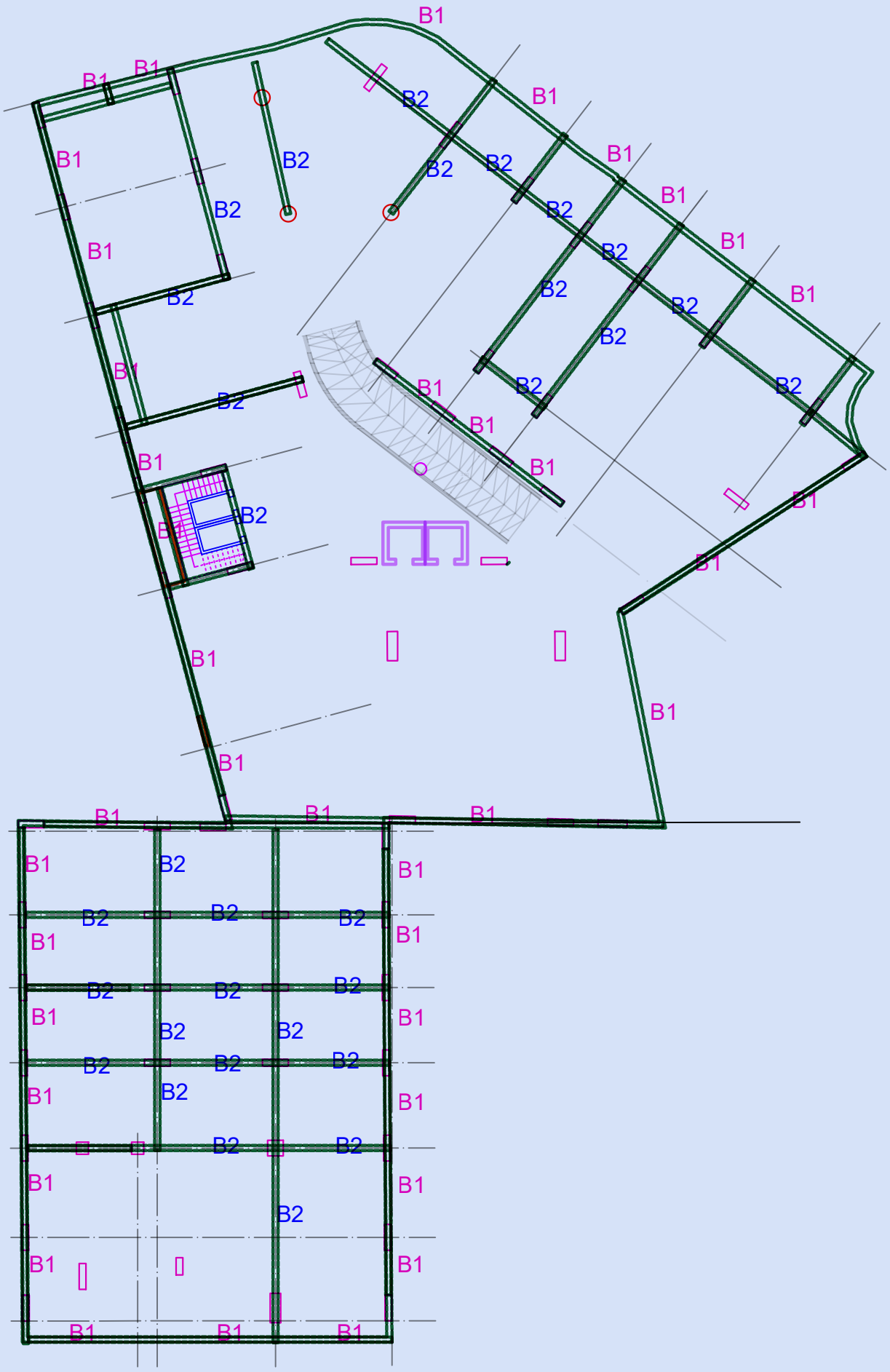


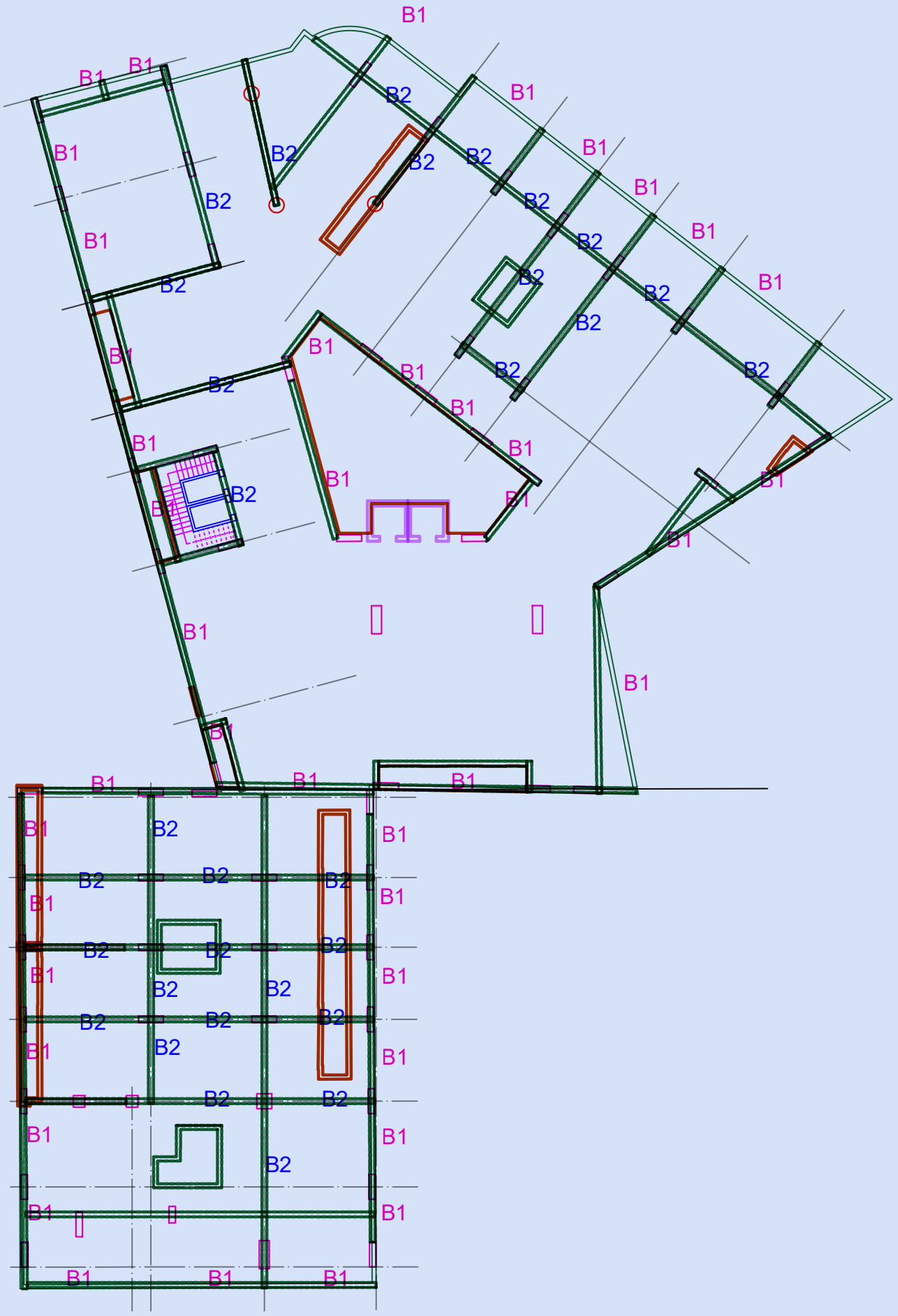
GROUND SLAB

BEAM KEY PLAN

. all dim. from ARCH D.W.G.

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title	(A)
drawing title	BEAM KEY PLAN REINFORCEMENT&SEC.
designed: ENG : DR-Majid Albana	project manager
checked	scale: 1-100 / date: 5 /2025
drawn	job no.: 16 / sheet no.: ST/D/04
approved	



1ST SLAB TYPICAL

BEAM KEY PLAN

. all dim. from ARCH D.W.G.

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title	(A)
drawing title	BEAM KEY PLAN REINFORCEMENT&SEC.
designed: ENG : DR-Majid Albana	project manager
checked	scale: 1-100 / date: 5 /2025
drawn	job no.: 17 / sheet no.: ST/D/04
approved	

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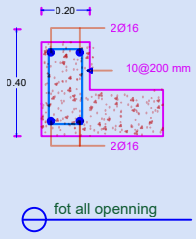
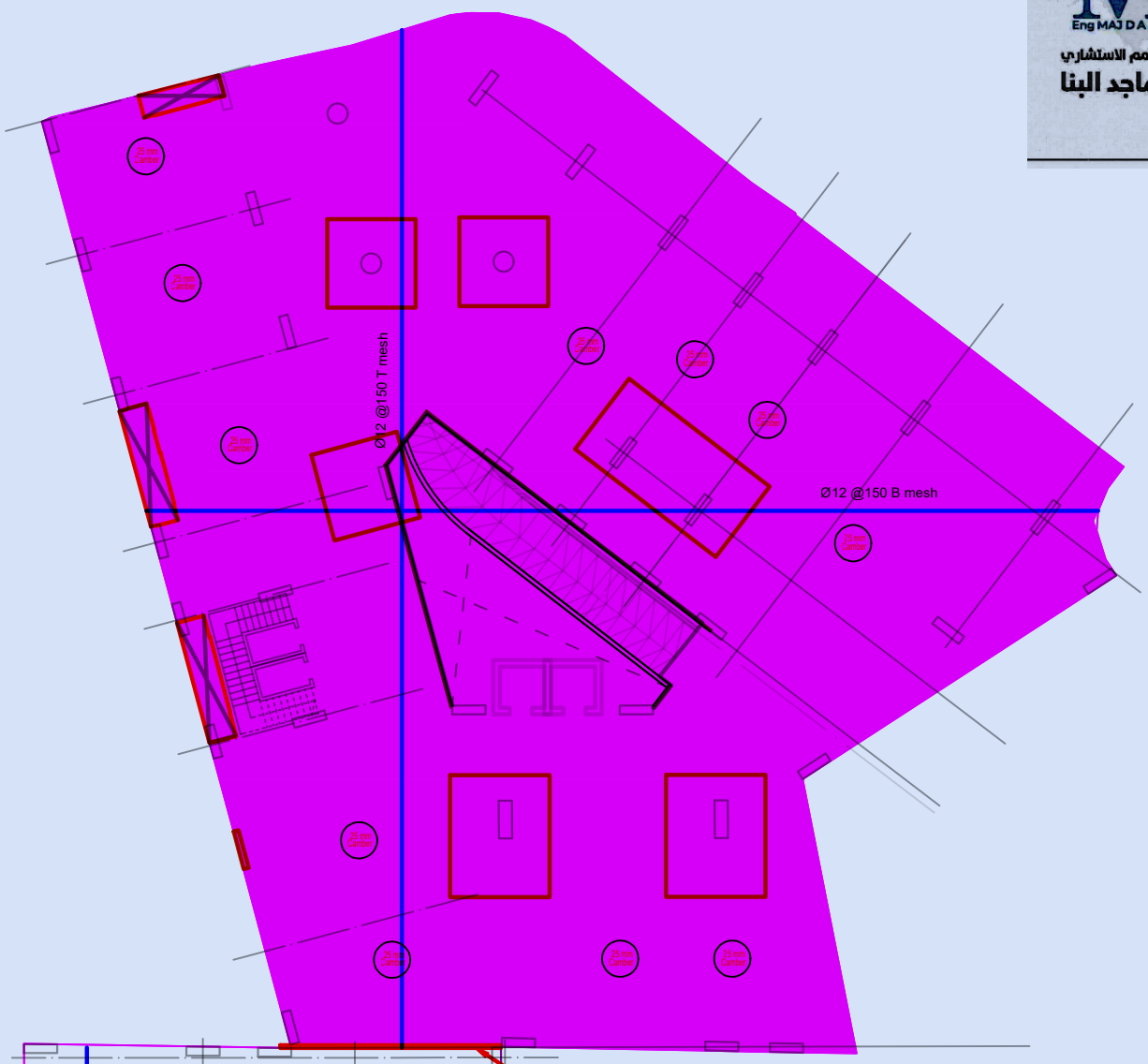
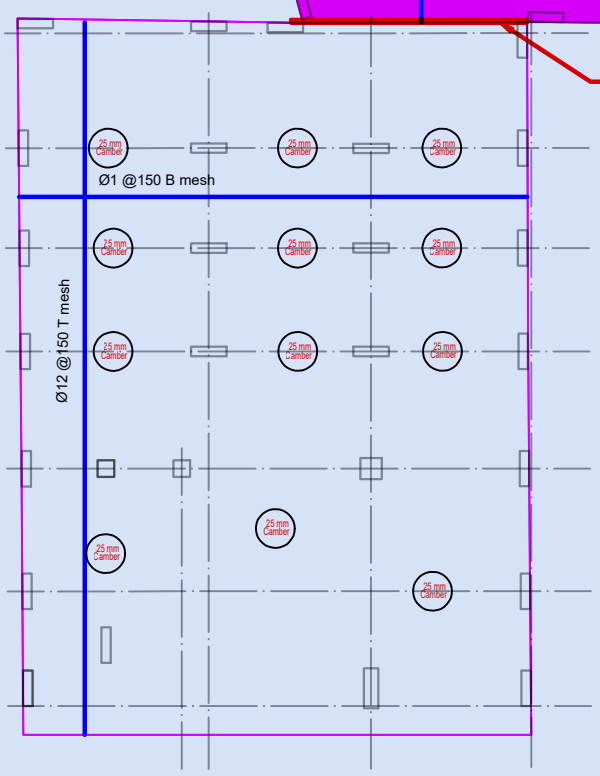
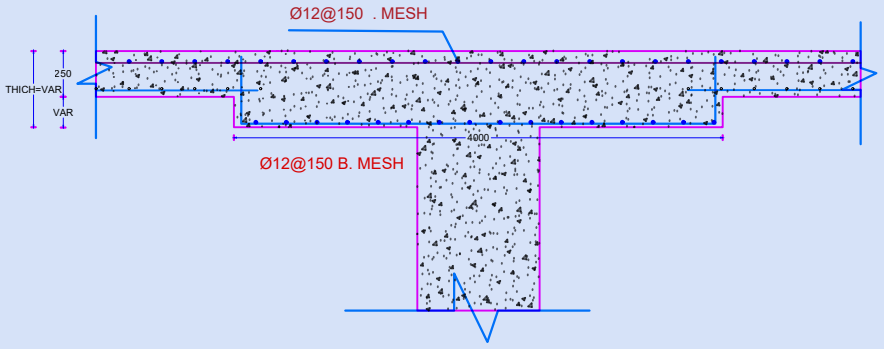


fot all openning

25 mm Camber — slab camber 25 mm



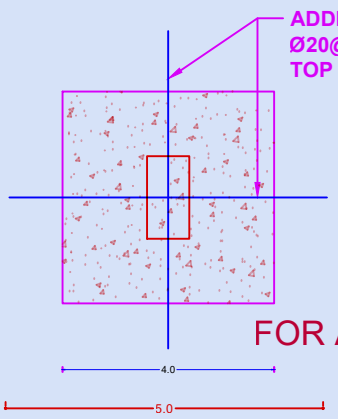




MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

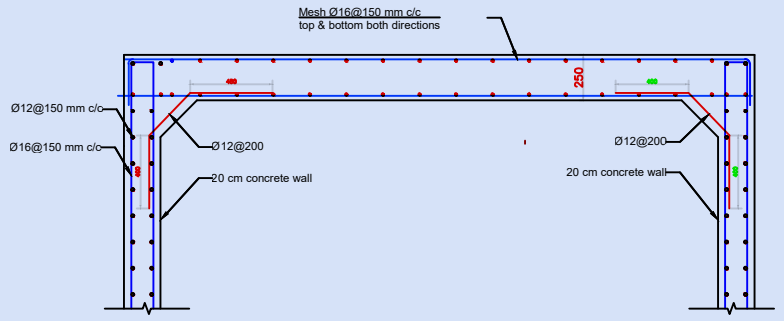
. all dim. from ARCH D.W.G.

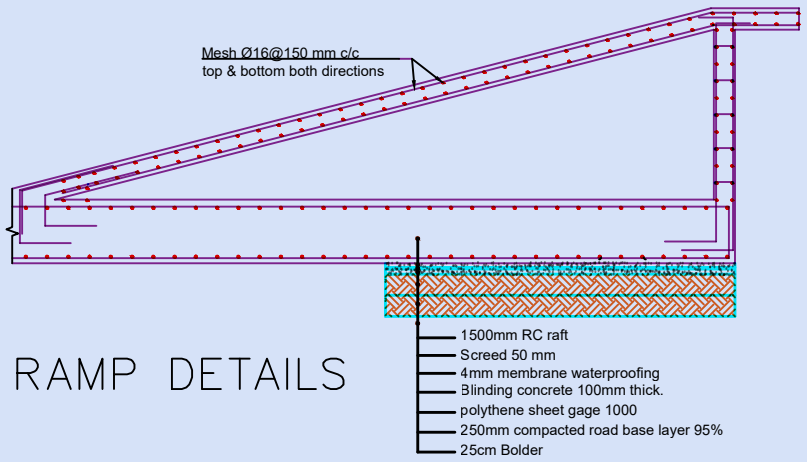


FOR ALL DROP PANLE

GROUND SLAB reinforcement

SLAB THICKNESS = 250 mm





RAMP DETAILS

Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

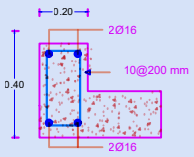
-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title
(A)

drawing title
GROUND SLAB REINFORCEMENT&SEC.

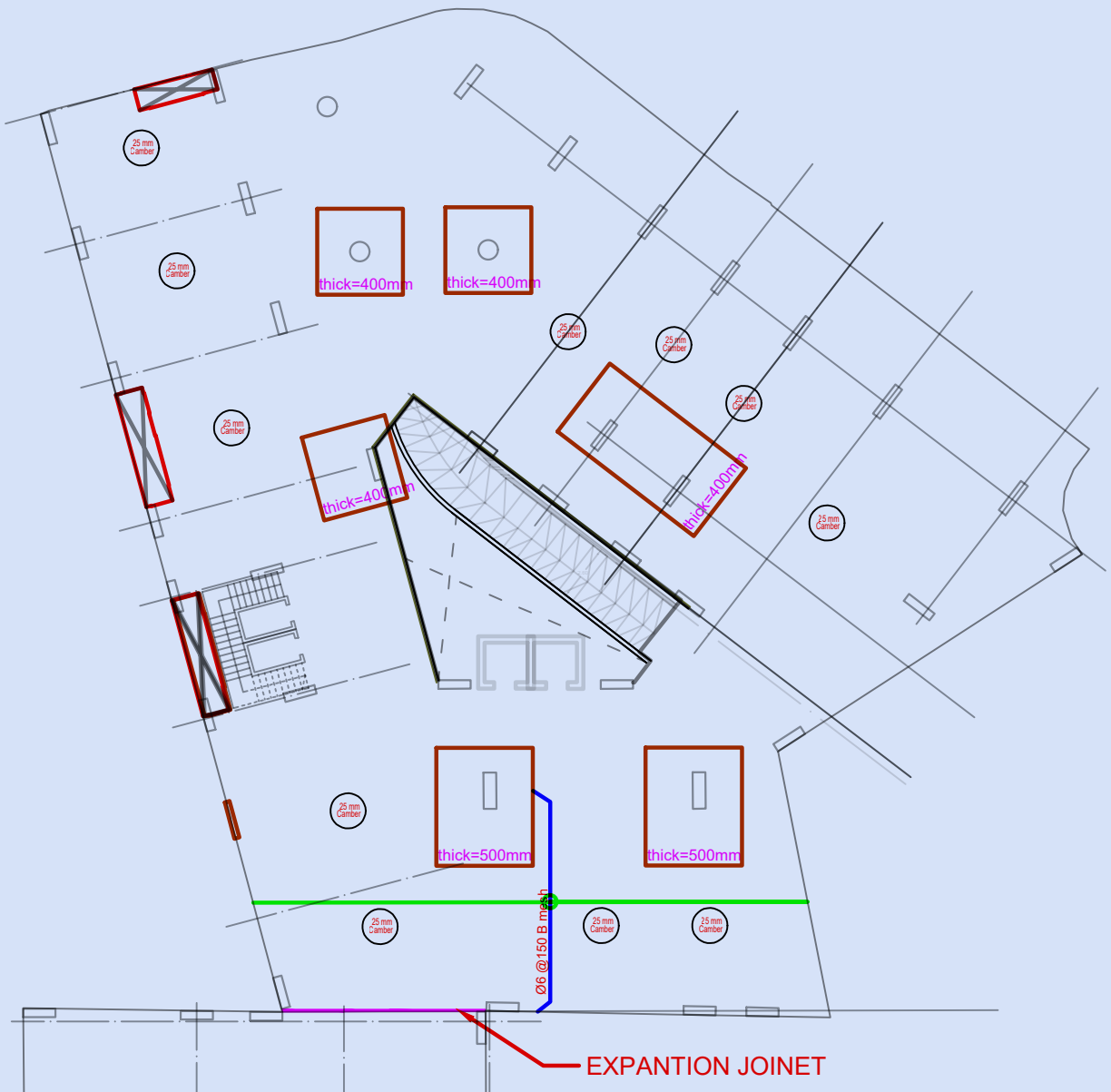
designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 18	sheet no.: ST/D/04
approved		

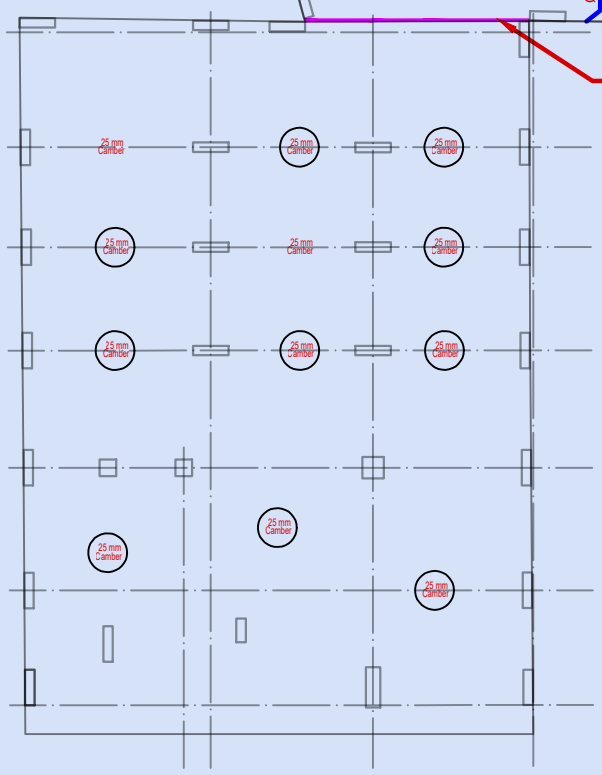


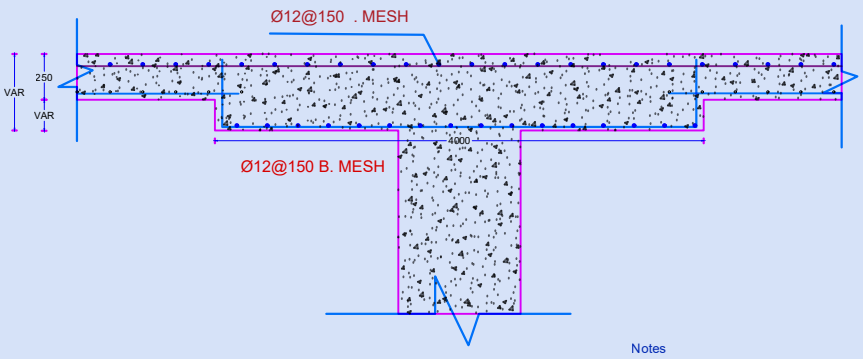
fot all openning

25 mm Camber

slab camber 25 mm







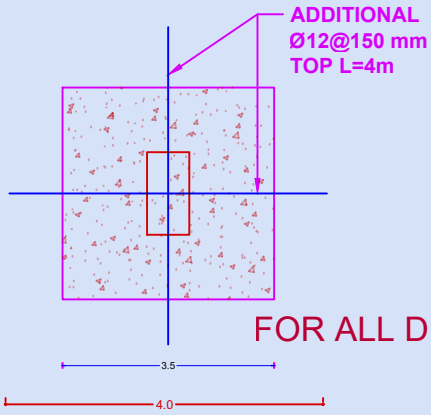
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

ADDITIONAL BOTT.



FOR ALL DROP PANLE

GROUND SLAB reinforcement

SLAB THICKNESS = 200 mm

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

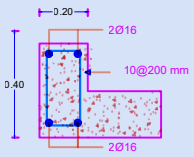
. all dim. from ARCH D.W.G.

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title
(A)

drawing title
GROUND SLAB REINFORCEMENT&SEC.

designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 19	sheet no.: ST/D/04
approved		



fot all openning

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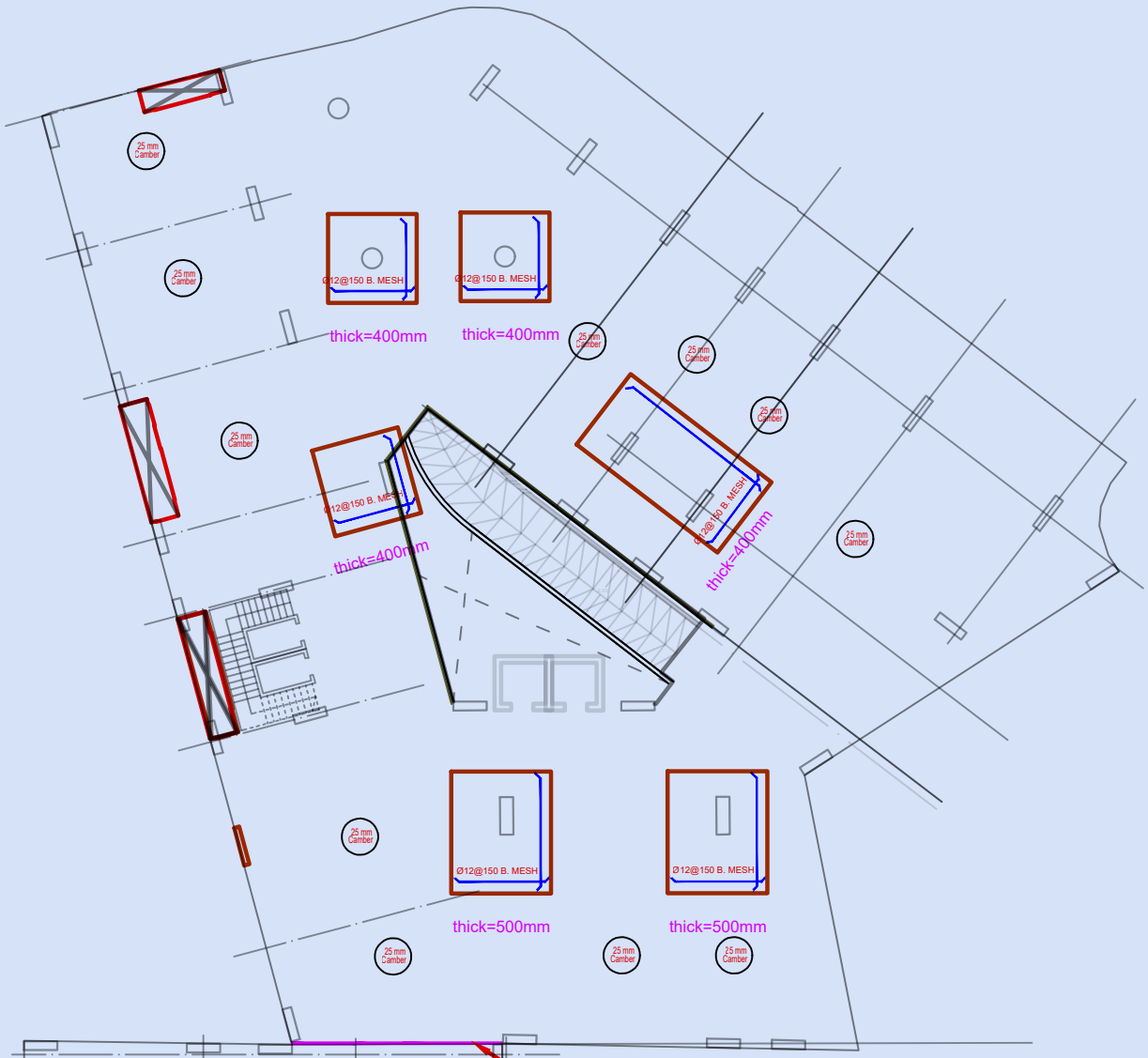
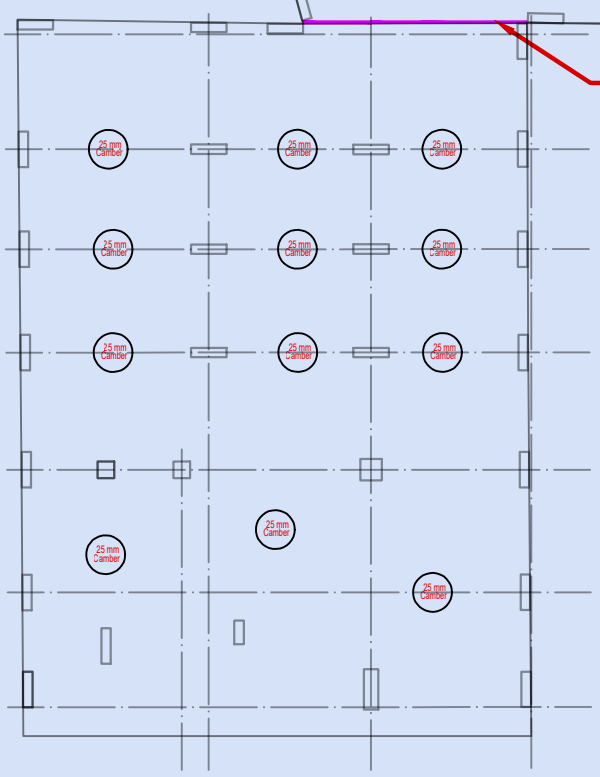
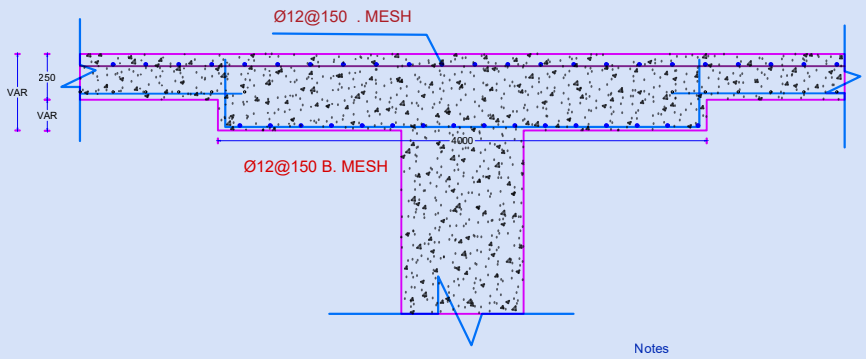
www.majidalbana.com
Info@majidalbana.com

25 mm Camber slab camber 25 mm







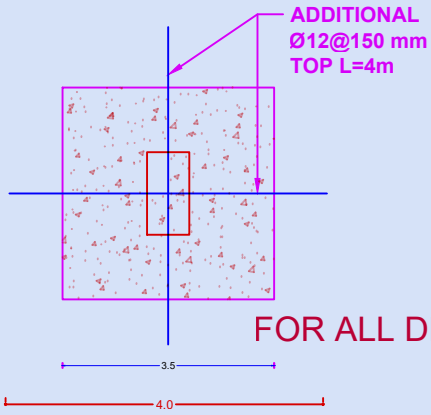
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

REINFORCEMENT&SEC DROP PANLE



FOR ALL DROP PANLE

GROUND SLAB reinforcement

SLAB THICKNESS = 200 mm

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

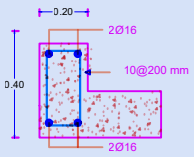
. all dim. from ARCH D.W.G.

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title
(A)

drawing title
GROUND SLAB
REINFORCEMENT&SEC.

designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 20	sheet no.: ST/D/04
approved		



fot all openning

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+964 782 595 3403
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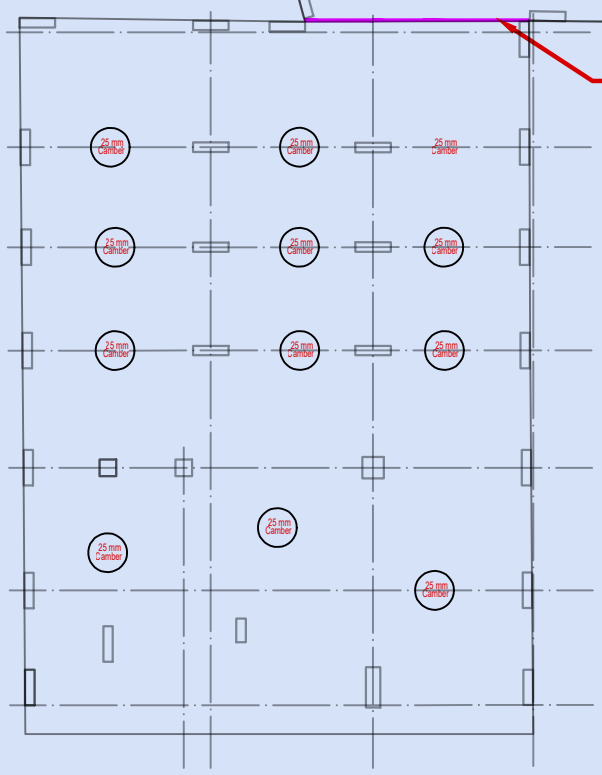
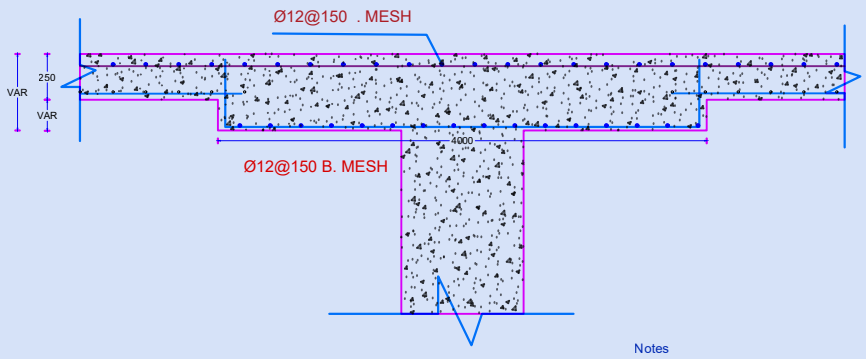
info@majidalbana.com

25 mm Camber slab camber 25 mm





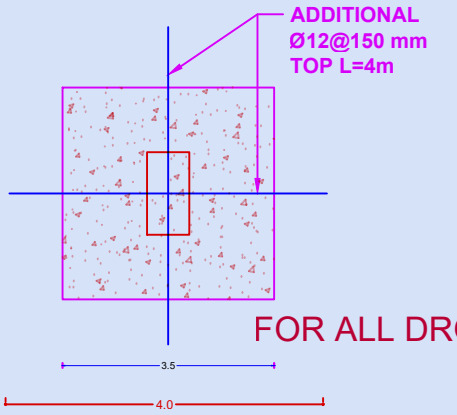
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

ADDITIONAL TOP



FOR ALL DROP PANLE

GROUND SLAB reinforcement

SLAB THICKNESS = 200 mm

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

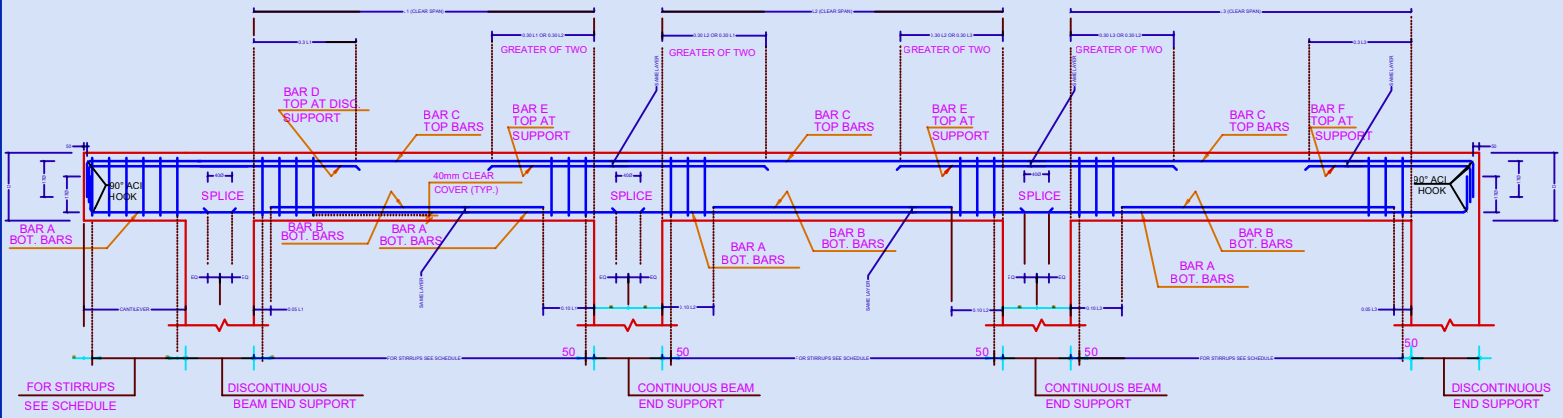
BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

. all dim. from ARCH D.W.G.

job title
(A)

drawing title
GROUND SLAB REINFORCEMENT&SEC.

designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 21	sheet no.: ST/D/04
approved		

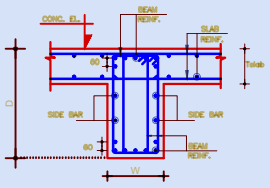


NOTES:

1. REFER TO BEAM SCHEDULE FOR No. AND SIZE OF TOP AND BOTTOM BARS REQUIRED PER BEAM.
2. PROVIDE 60mm CENTRE TO CENTRE WHEN SCHEDULES CALL FOR 2 LAYERS OF REBARS.
3. FOR CANTILEVER BEAMS OR RIBS, BARS SHOULD BE EXTENDED UP TO ONE HALF THE CANTILEVER SPAN.

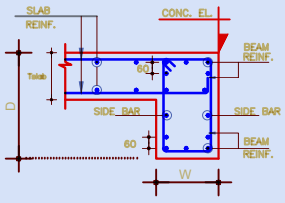
TYPICAL BEAM LONGITUDINAL SECTION

NOT TO SCALE



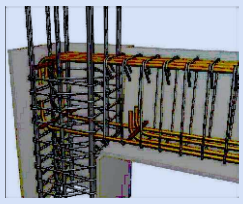
Type (1)

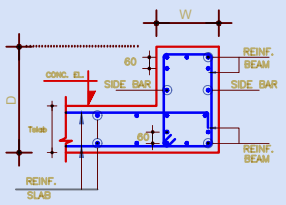
TYPICAL INTERNAL BEAM SECTION
N.T.S



Type (2)

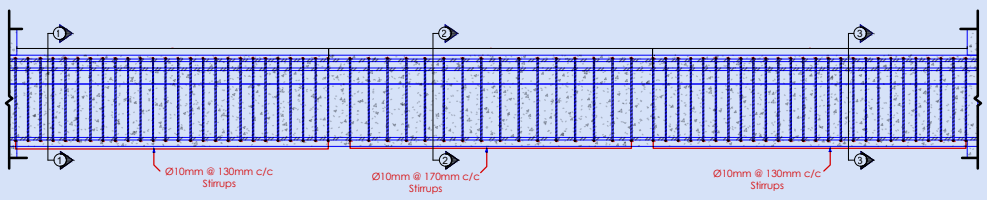
TYPICAL EDGE BEAM SECTION
N.T.S



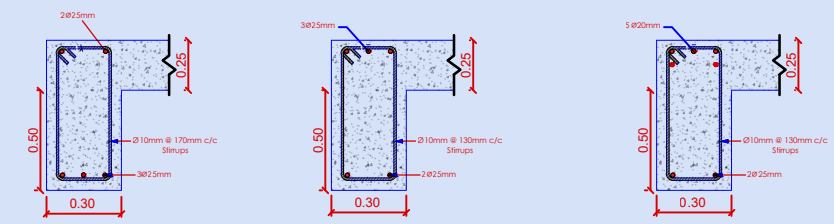


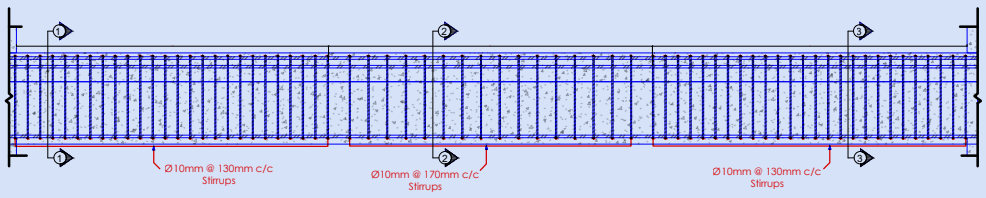
Type (4)

TYPICAL EDGE INV. BEAM SECTION
N.T.S

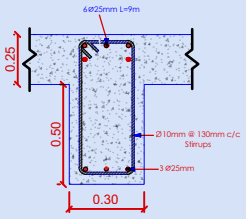


Beam1 - Longitudinal Section

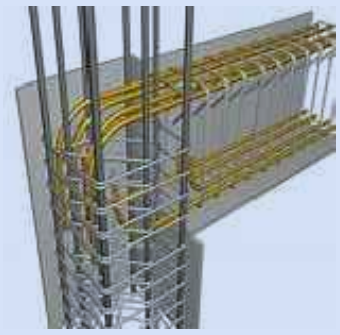




Beam2 - Longitudinal Section

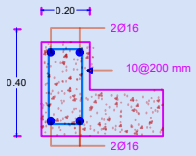


B2 Detail - at supports



. all dim. from ARCH D.W.G.

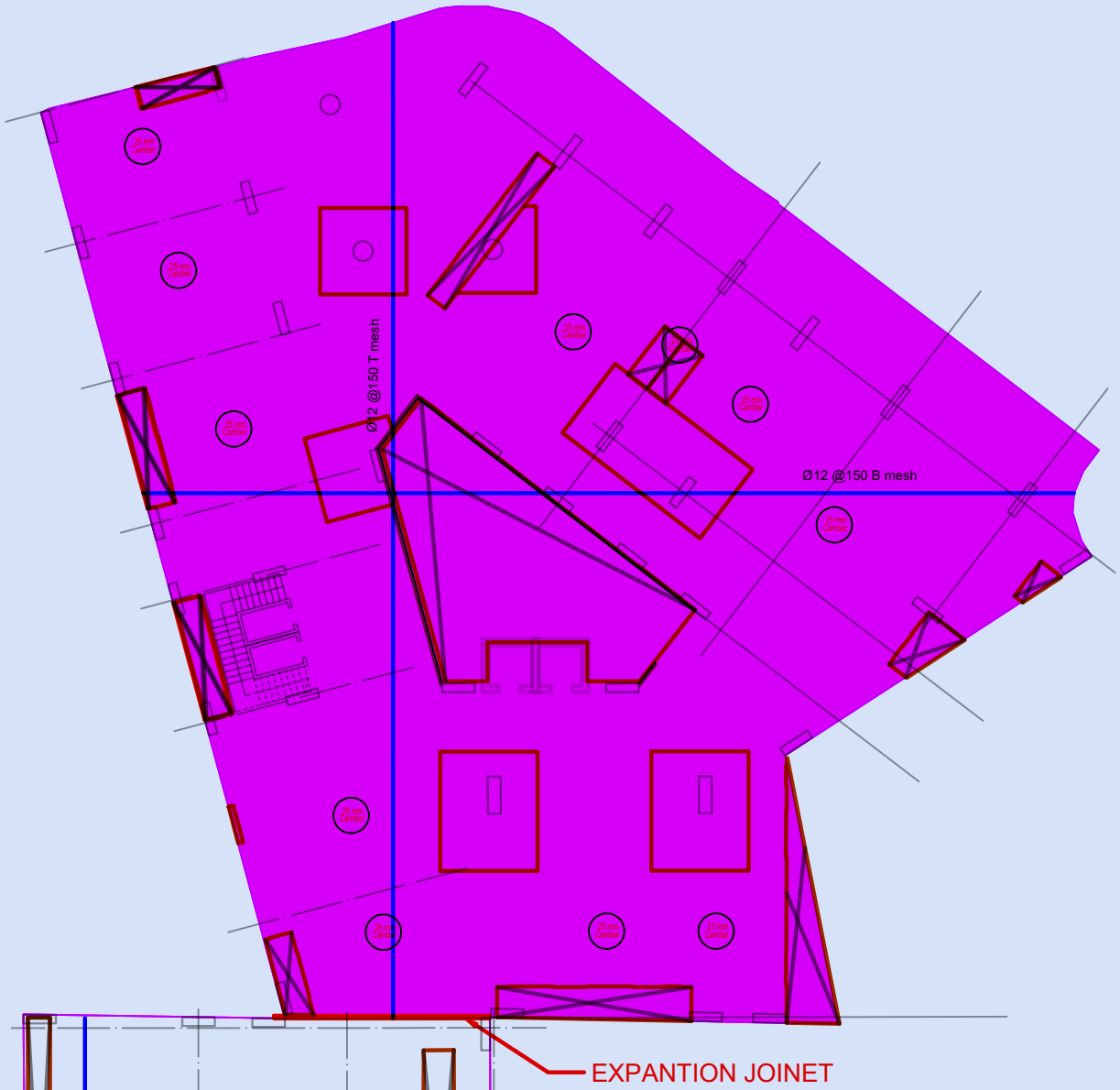
job title	(A)
drawing title	SCHEDULE OF BEAMS REINFORCEMENT&SEC.
designed: ENG : DR-Majid Albana	project manager
checked	scale: 1-100 / date: 5 /2025
drawn	job no.: 22 / sheet no.: ST/D/04
approved	

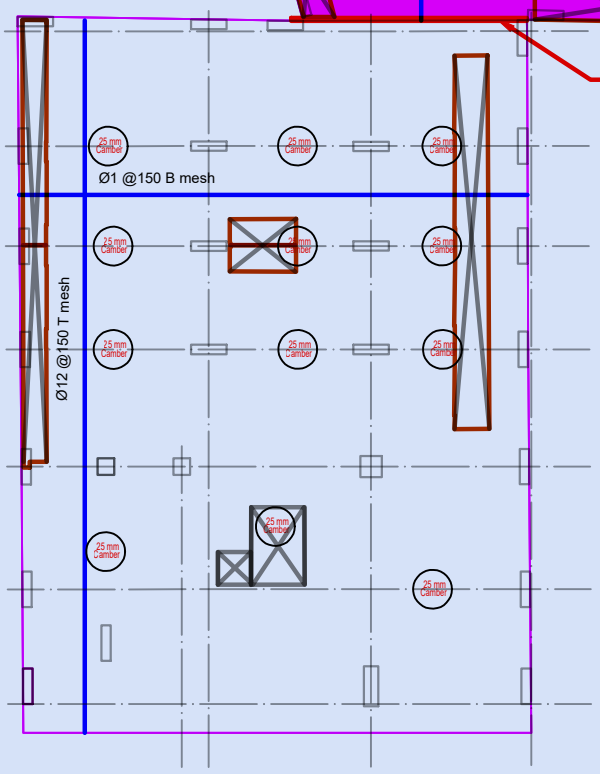


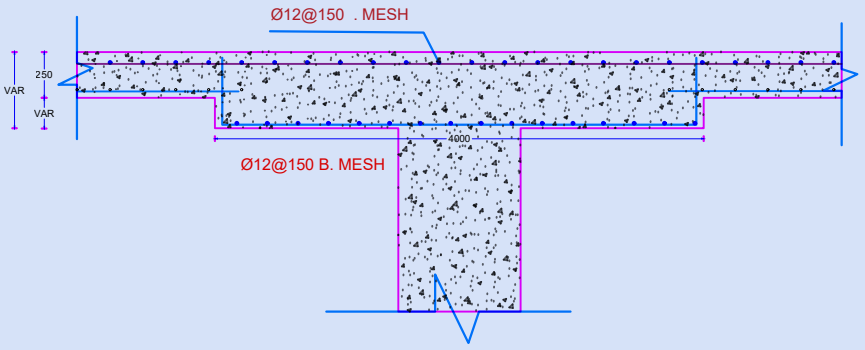
fot all openning

25 mm Camber

slab camber 25 mm



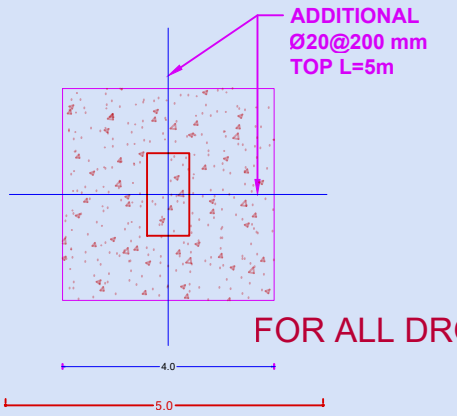




MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	300	900	1000	1250

. all dim. from ARCH D.W.G.



FOR ALL DROP PANLE

FIRST SLAB +2 TO 18 SLAB reinforcement

SLAB THICKNESS = 250 mm

Notes

- Fcu = 40 N/mm2
- Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title

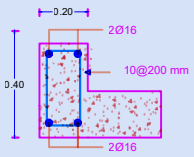
(A)

drawing title

FIRST SLAB +2 TO 18 SLAB reinforcement

REINFORCEMENT&SEC.

designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 23	sheet no.: ST/D/04
approved		



fot all openning

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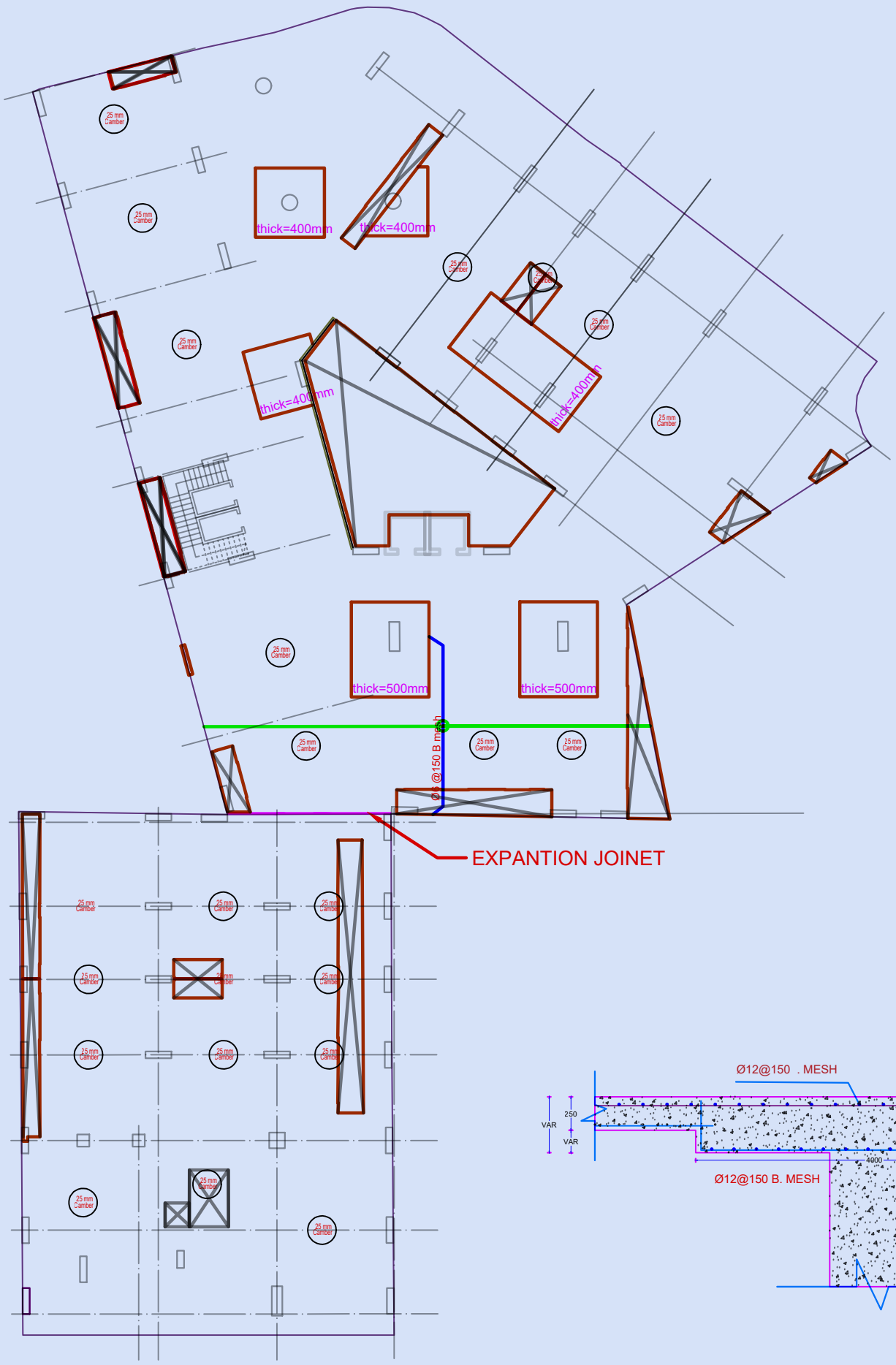
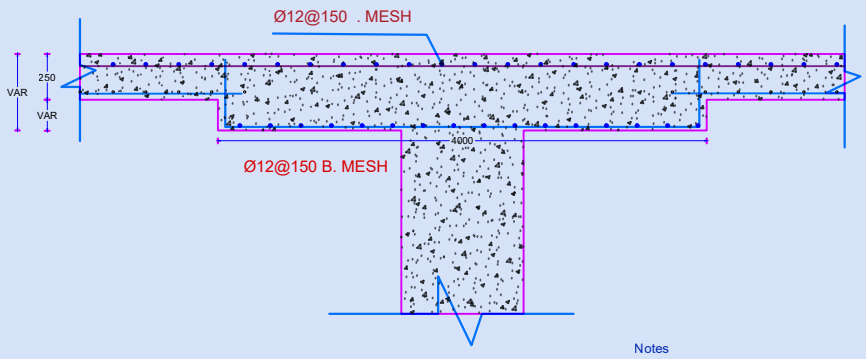
info@majidalbana.com

25 mm Camber slab camber 25 mm





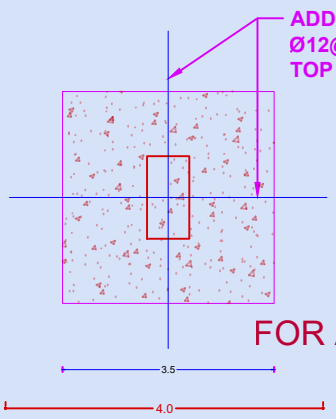
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

ADDITIONAL BOTT.



FOR ALL DROP PANLE

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

. all dim. from ARCH D.W.G.

FIRST SLAB +2 TO 18 SLAB reinforcement

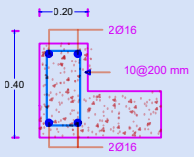
SLAB THICKNESS = 200 mm

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title
(A)

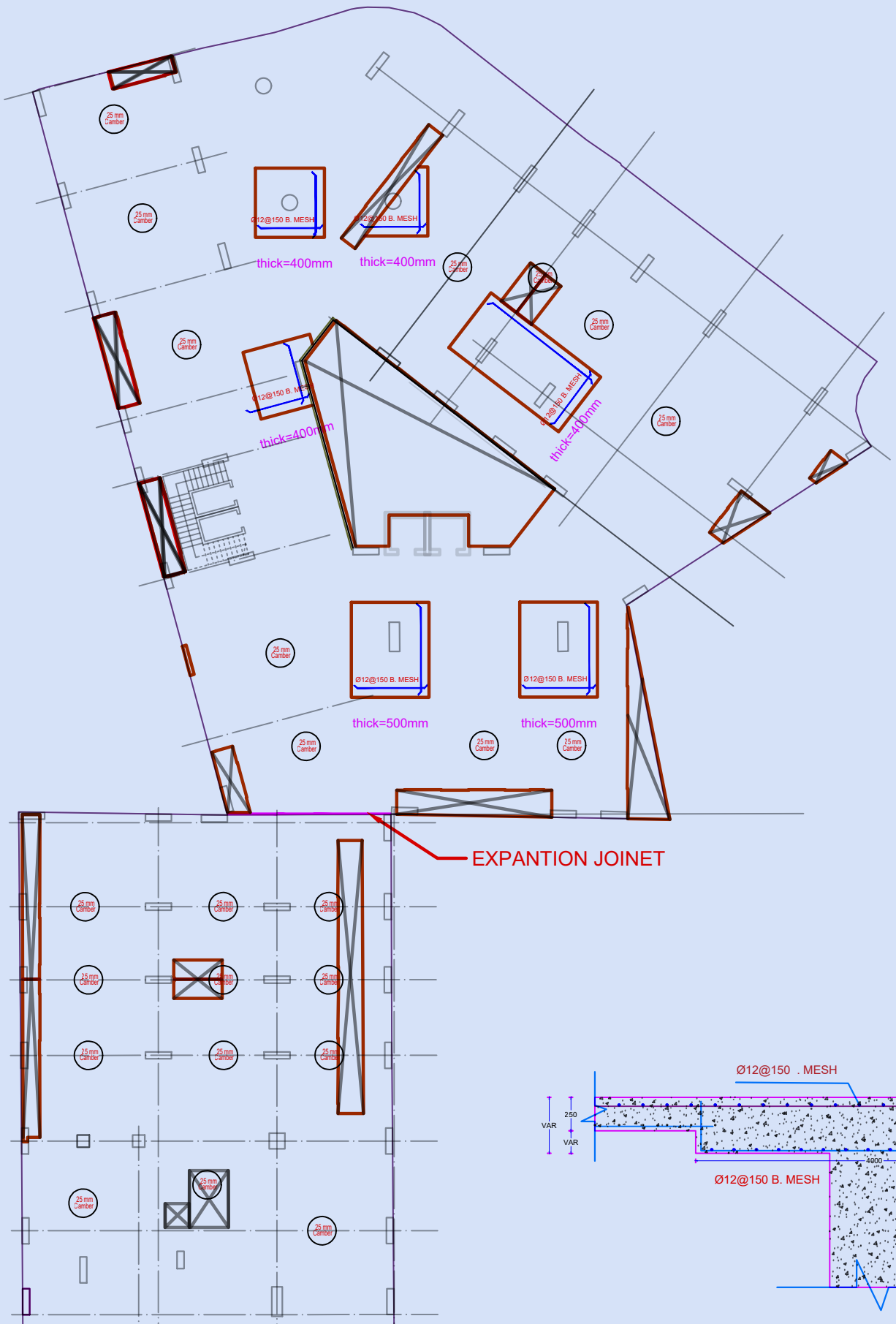
drawing title
FIRST SLAB +2 TO 18 SLAB reinforcement
REINFORCEMENT&SEC.

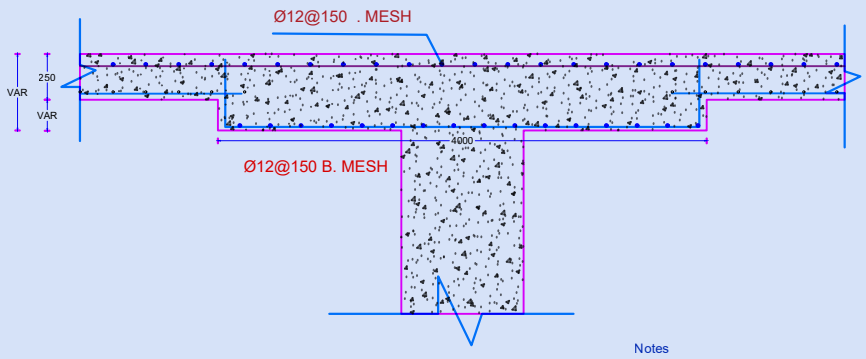
designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 24	sheet no.: ST/D/04
approved		



fot all openning

25 mm Camber slab camber 25 mm





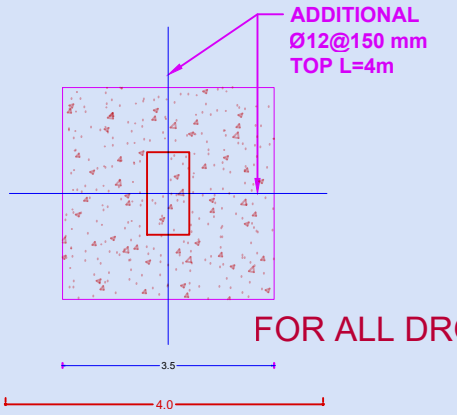
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

REINFORCEMENT&SEC DROP PANLE



FOR ALL DROP PANLE

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

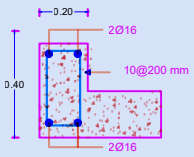
. all dim. from ARCH D.W.G.

FIRST SLAB +2 TO 18 SLAB reinforcement

SLAB THICKNESS = 200 mm

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title	(A)
drawing title	FIRST SLAB +2 TO 18 SLAB reinforcement
designed	ENG : DR-Majid Albana
project manager	
checked	
scale	1-100
date	5 /2025
drawn	
job no.	25
sheet no.	ST/D/04
approved	



fot all openning

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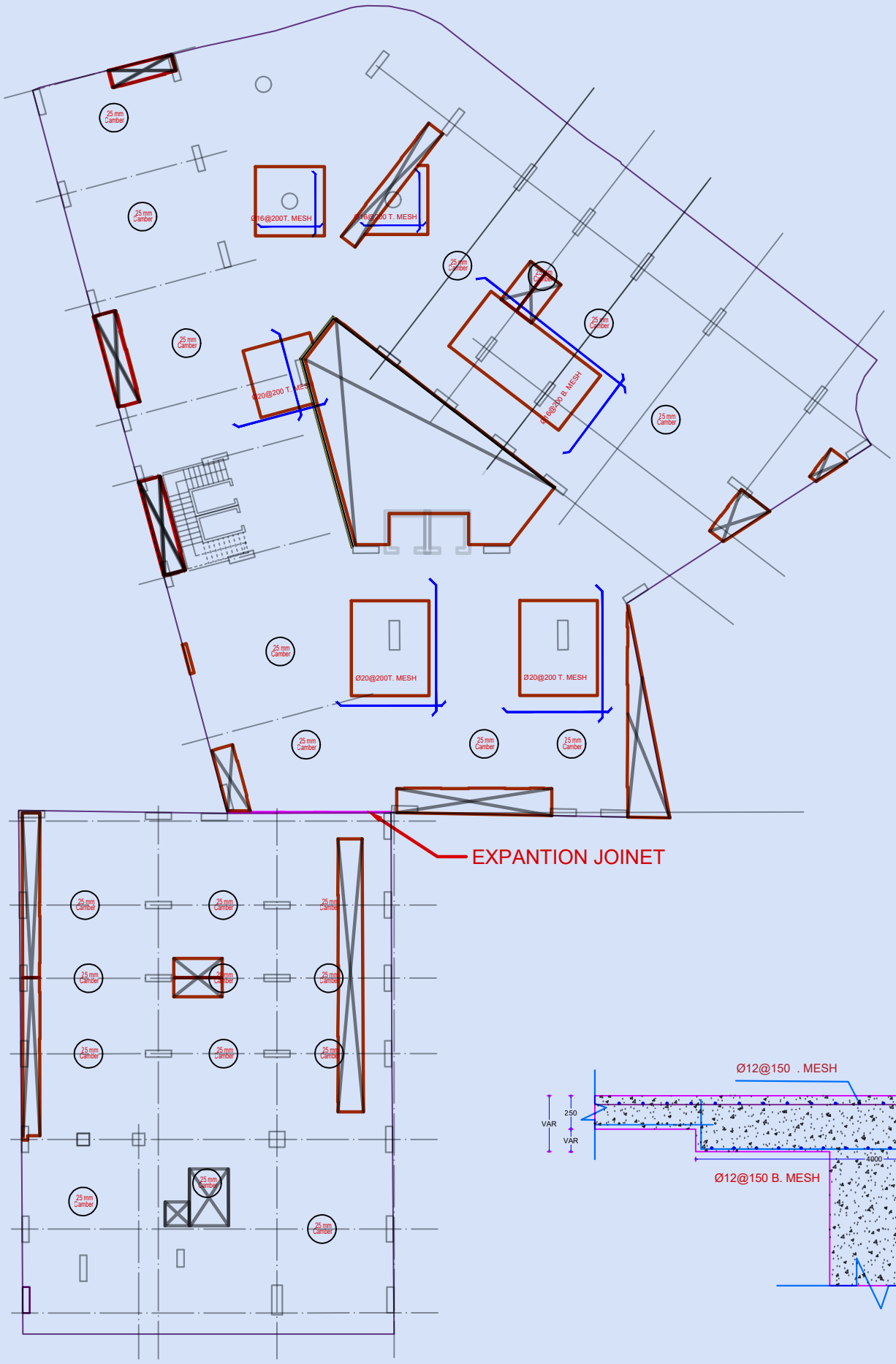
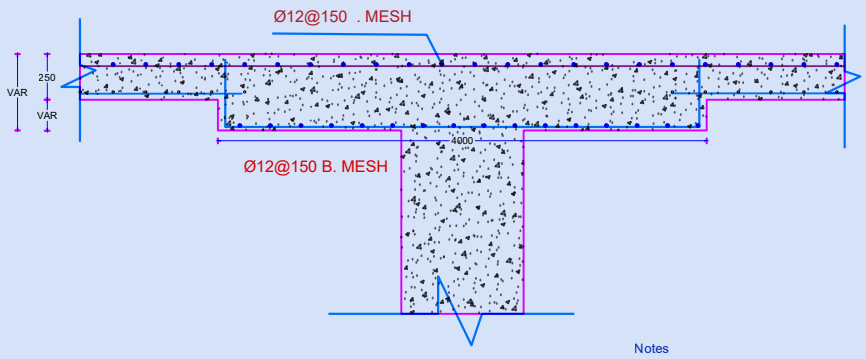
+964 770 272 4811
+964 782 595 3403
www.majidalbana.com
info@majidalbana.com

25 mm Camber slab camber 25 mm





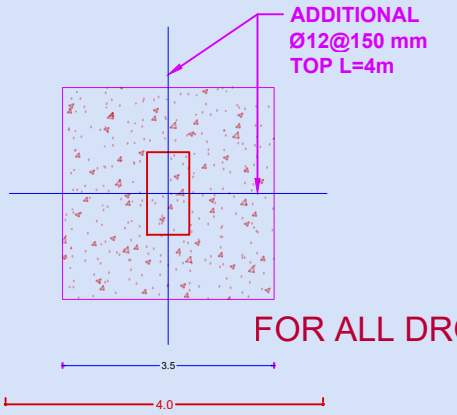
Notes

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

ADDITIONAL TOP



FOR ALL DROP PANLE

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	550	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	600	700	800	900	1000	1250

. all dim. from ARCH D.W.G.

FIRST SLAB +2 TO 18 SLAB reinforcement

SLAB THICKNESS = 200 mm

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title
(A)

drawing title
FIRST SLAB +2 TO 18 SLAB reinforcement
REINFORCEMENT&SEC.

designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 26	sheet no.: ST/D/04
approved		

Eng MAJ D A bana
المصمم الاستشاري
د. ماجد البنا
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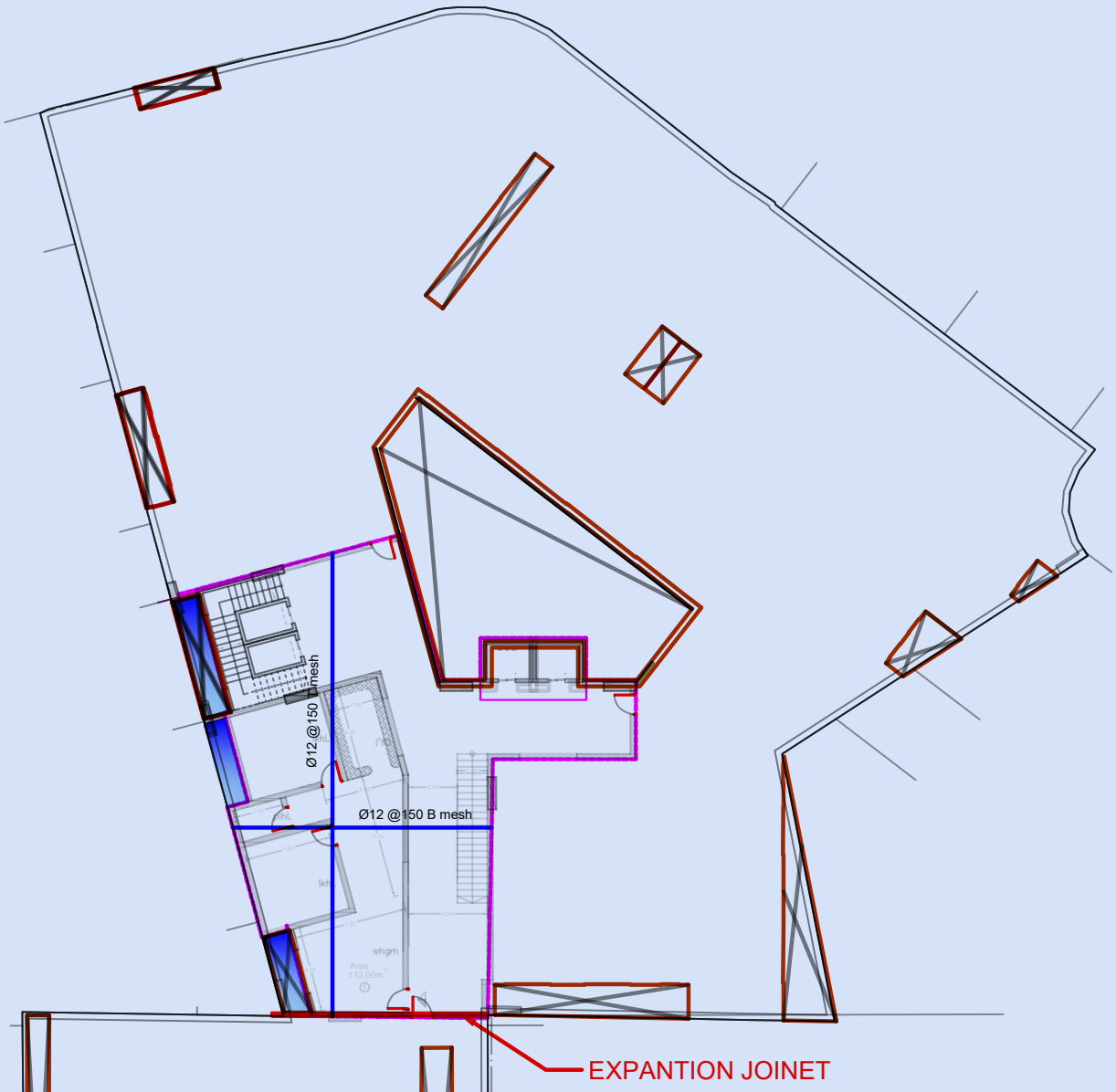
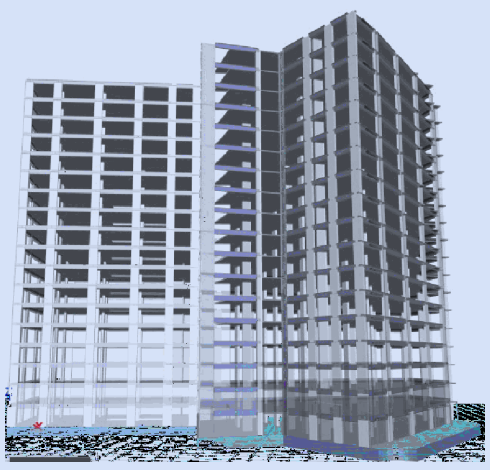
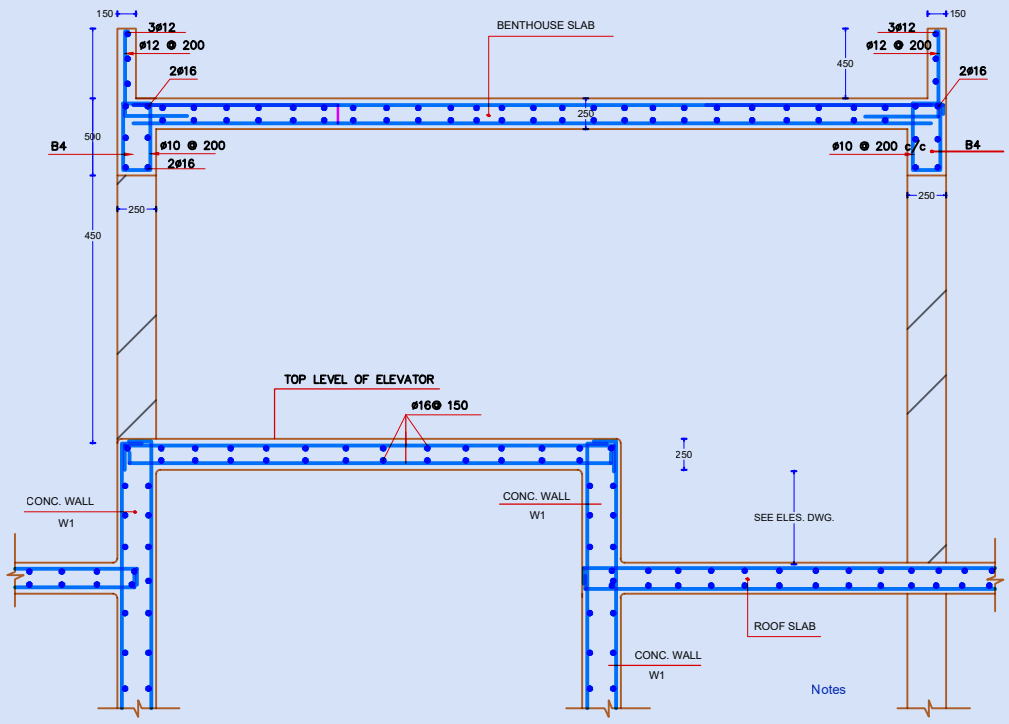
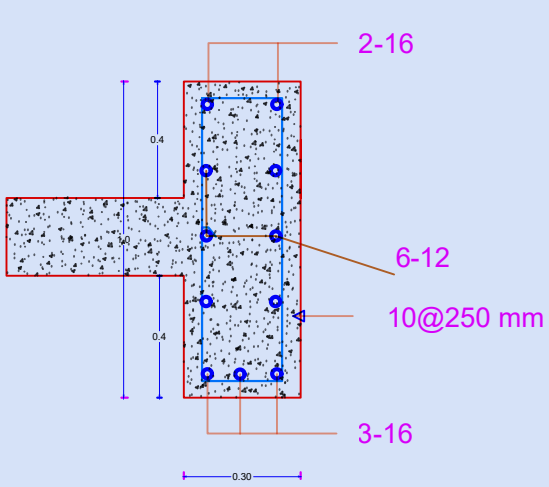
25 mm Camber

slab camber 25 mm









sec. 2-2

sec. 5-5

-Fcu = 40 N/mm2
-Fy = 420 N/mm2.

CONCRETE COVERS

-SLABS	= 25 mm
-BEAMS	= 40 mm
-COLUMNS	= 40 mm
-WALLS	= 25 mm
-SLAB ON GRADE	= 50 mm
-RAFT FOUNDATION	= 75 mm

PENTHOUSE SLAB reinforcement

SLAB THICKNESS = 250 mm

MINIMUM LAP LENGTH (UNLESS NOTED ON DRAWINGS) SHOULD BE AS TABLE BELWO :-

BAR DIA.(mm)	10	12	16	18	20	22	25
LAP LENGTH (mm) IN COLUMNS	400	500	600	650	700	800	900
LAP LENGTH (mm) IN SLAB & BEAMS	400	500	700	800	900	1000	1250

. all dim. from ARCH D.W.G.

Dr-Majid Al bana
المصمم الاستشاري
د. ماجد البنا

job title
(A)

drawing title
PENTHOUSE
REINFORCEMENT&SEC.

designed: ENG : DR-Majid Albana	project manager	
checked	scale: 1-100	date: 5 /2025
drawn	job no.: 27	sheet no.: ST/D/04
approved		