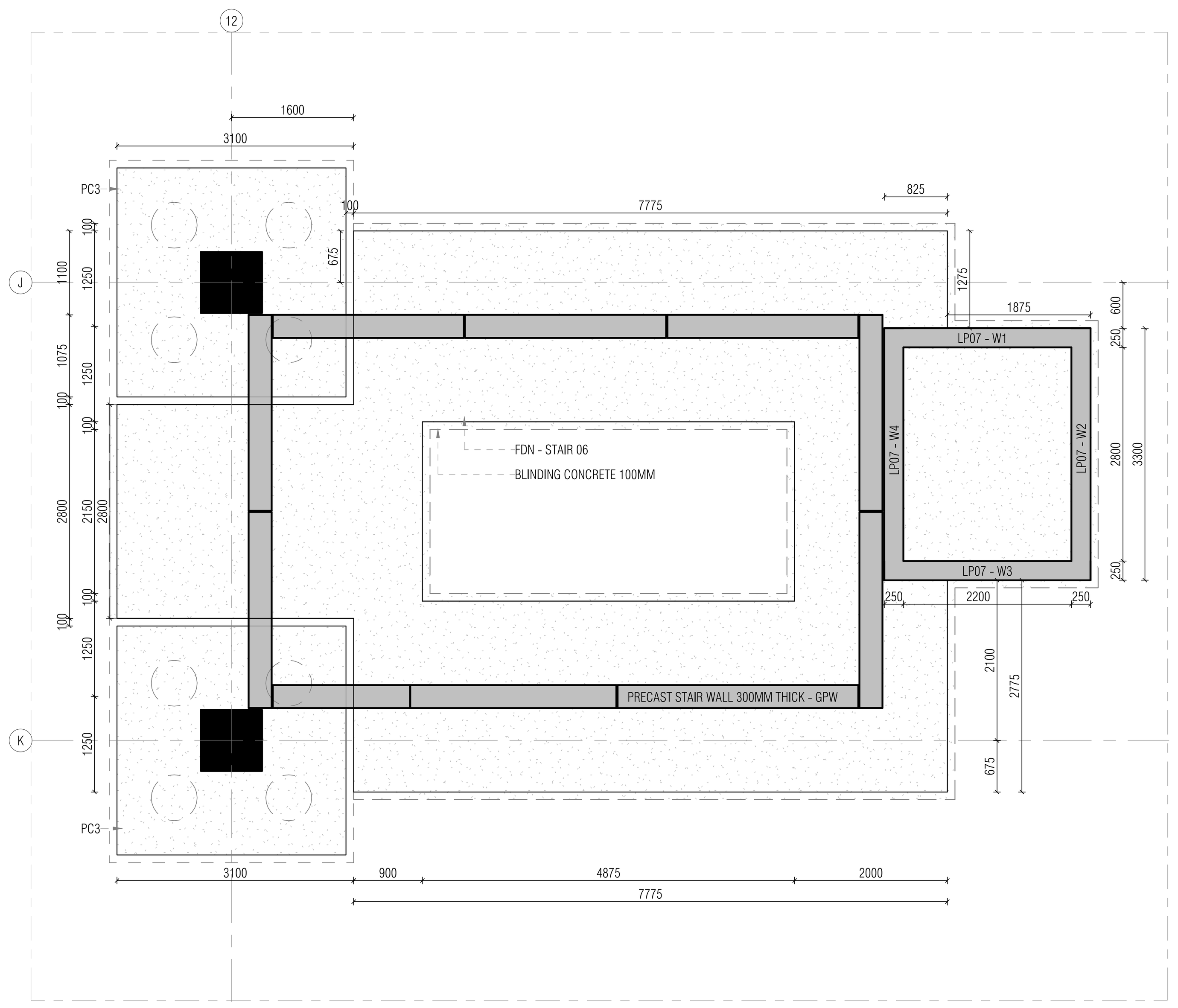
PORTFOLIO

SHAFEEKH MELANGADI

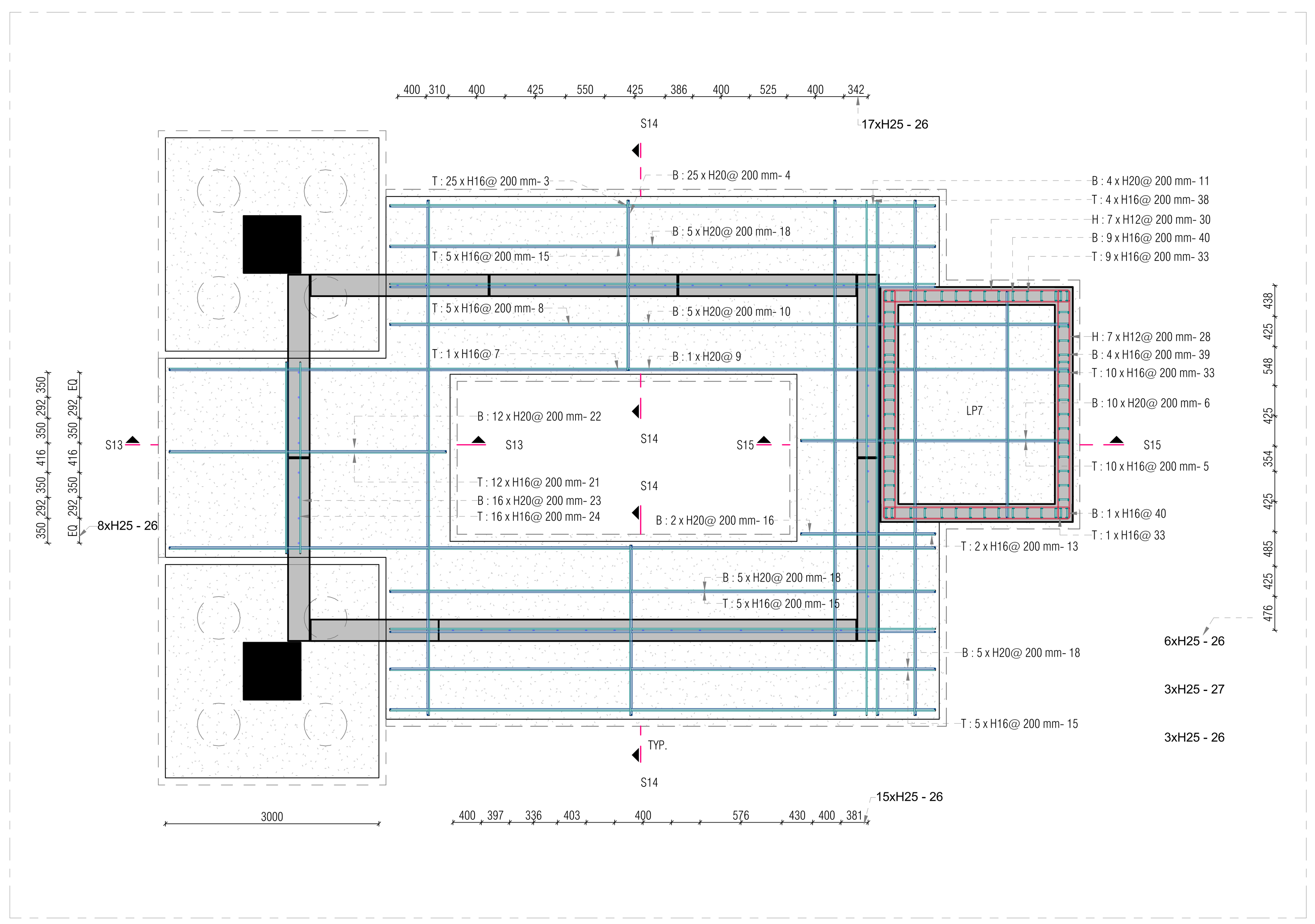
BIM Structural Engineer

REVIT DETAILING

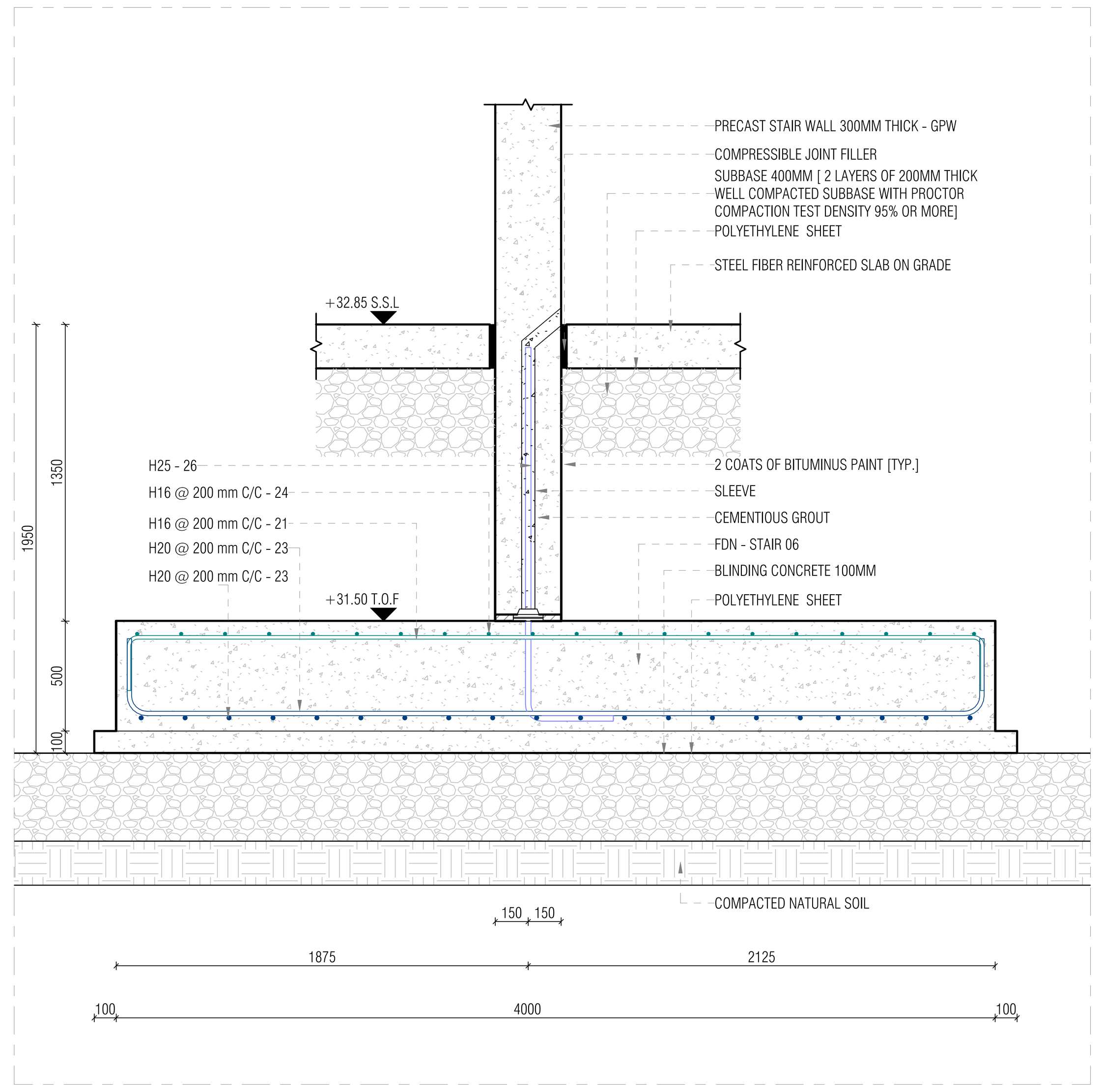
SAMPLES OF WORKS



CO - SC06-F C-SC-06 FORM WORK
1 : 50

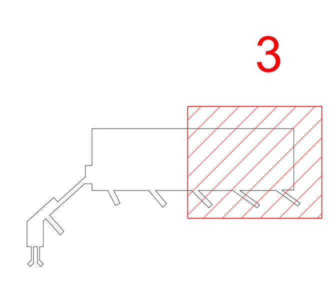


CO - SC06-R C-SC-06 REINFORCEMENT
1 : 50



3 SECTION 13
1 : 20

KEY PLAN



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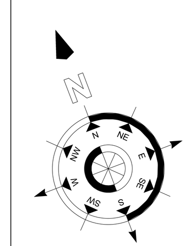
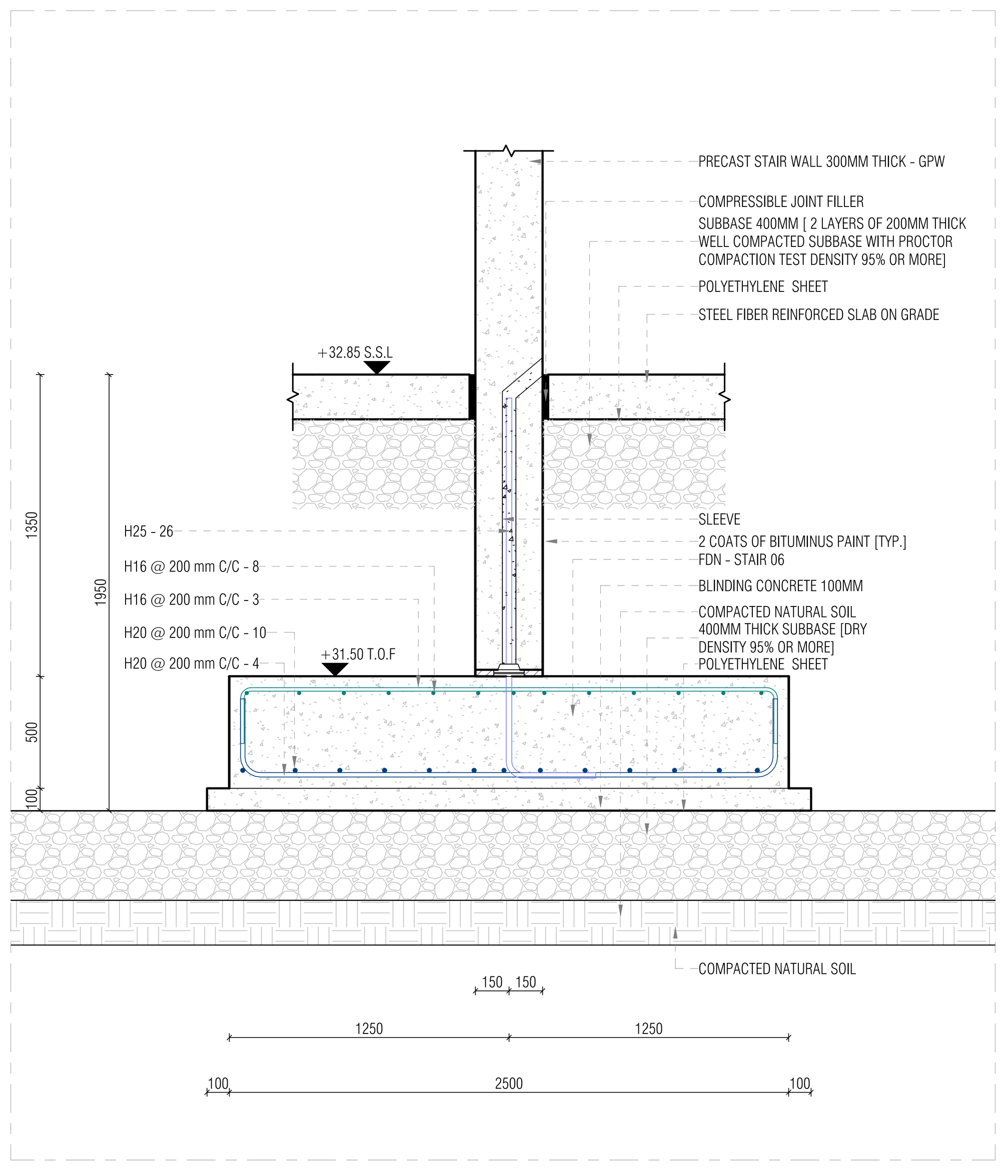
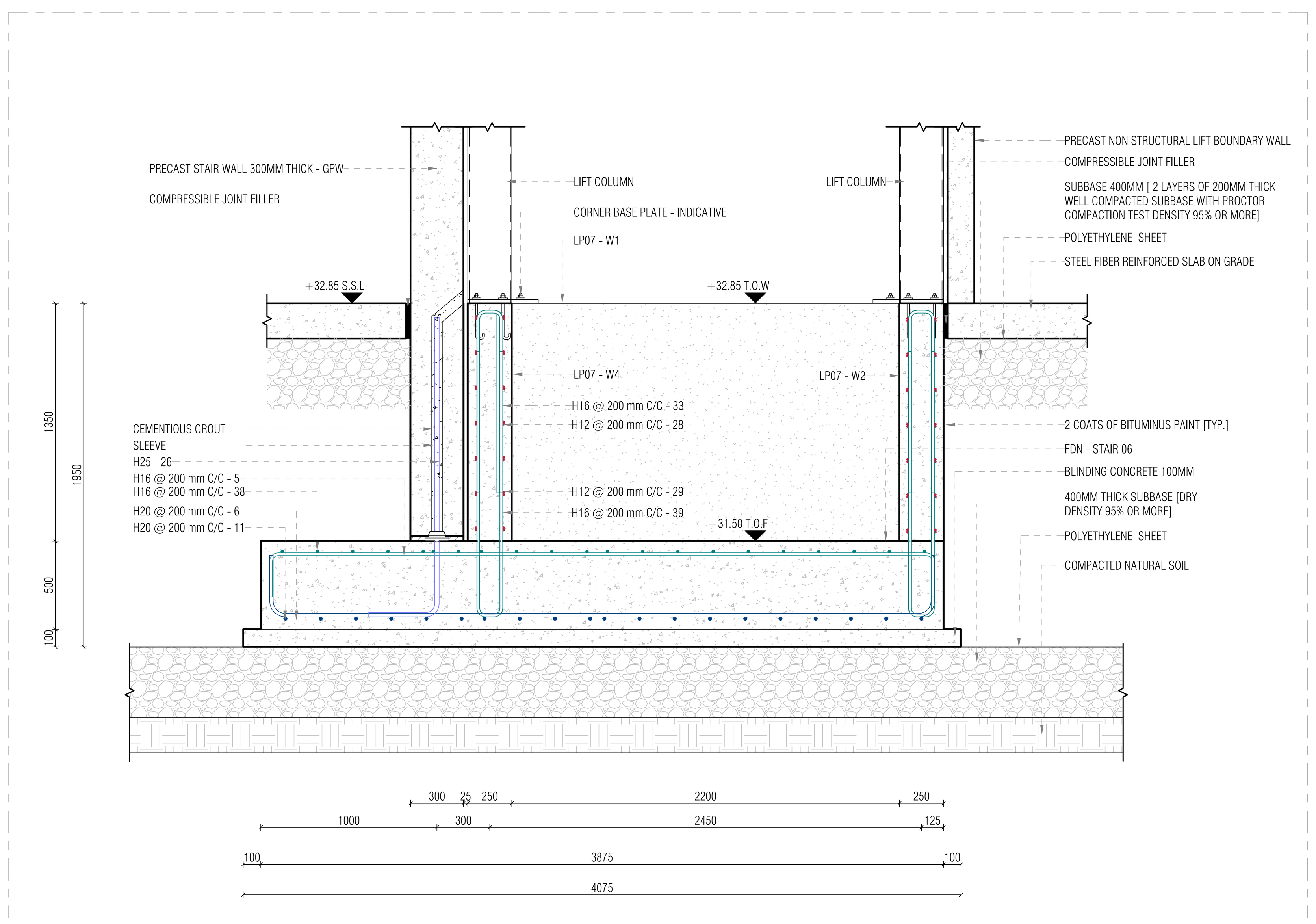


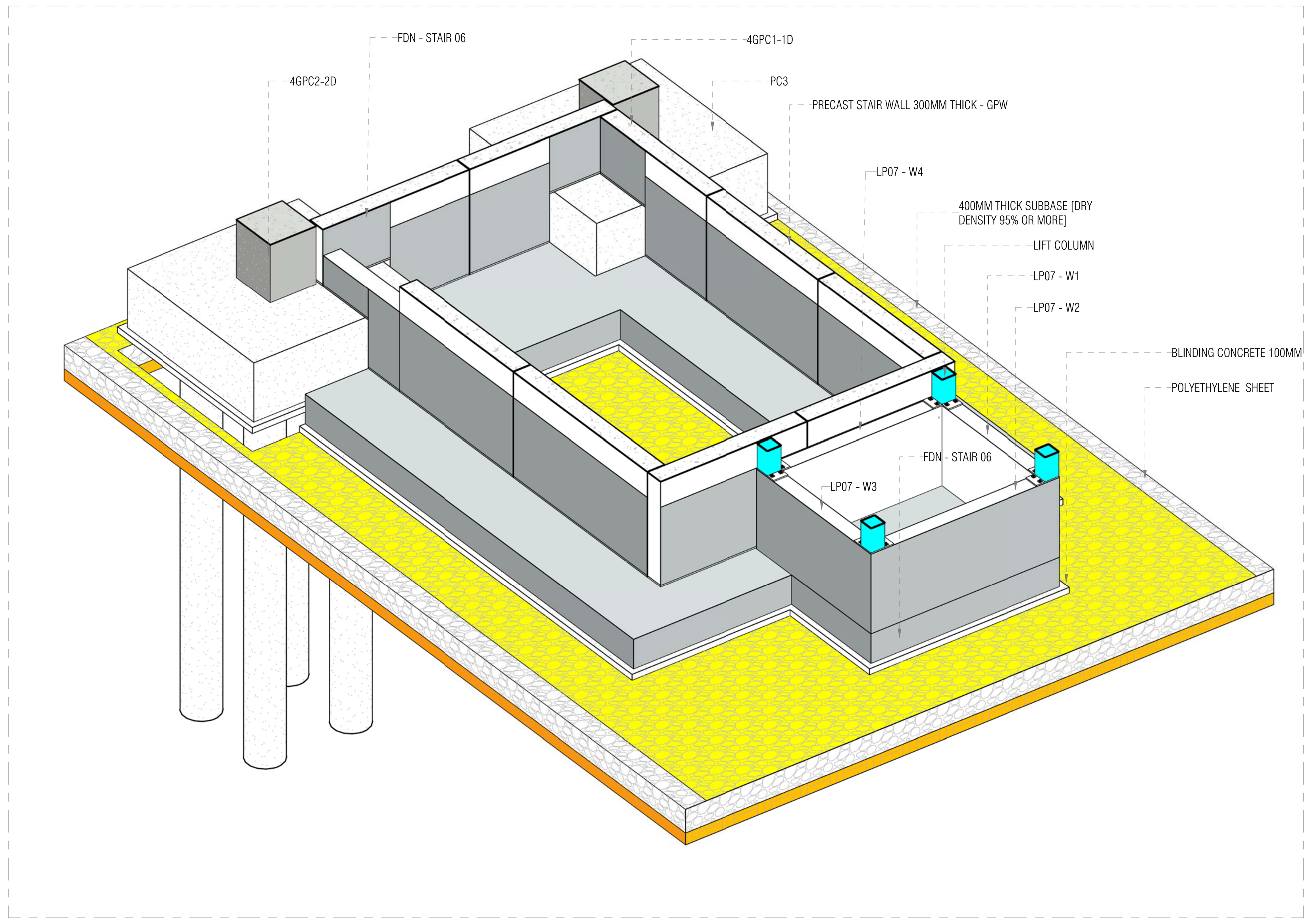
SYMBOLS



4 SECTION 14
1 : 20



5 SECTION 15
1 : 20



6 STAIR 6 FOUNDATION - 3D

KE Y NOTE LEGEND:

1 CO - F : CALL OUT FOR FORM WORK PLAN
2 CO - R : CALL OUT FOR REINFORCEMENT PLAN
3 WF : WALL FOUNDATION
4 EP : ESCALATOR PIT
5 LP : LIFT PIT
6 EPF :ESCALATOR PIT FOUNDATION
7 LPF : LIFT PIT FOUNDATION
8 EPW : ESCALATOR PIT WALL
9 LPW : LIFT PIT WALL
10 T.O.F : TOP OF FOUNADTION
11 T.O.W : TOP OF WALL
12 S.S.L : STRUCTURAL SLAB LEVEL
13 LPW : LIFT PIT WALL
14 SC : STAIR CASE

REBAR NOTATION IN SECTION
BAR DIA @ SPACING C/C - REBAR NUMBER

REBAR NOTATION IN PLAN
BAR POSITION : QUANTITY x BAR DIA@ SPACING- REBAR NUMBER

CLEAR COVER	
FOUNDATION	WALL
50MM	40MM

REVISIONS AND ISSUES

REVISION	DATE	BY	DESCRIPTION

SUBMITTAL STAGE

CONCEPT DESIGN STAGE		SCHEMATIC DESIGN STAGE	
DETAILED DESIGN STAGE	■	CONSTRUCTION STAGE	

PLOT NO: NAJAF
LOCATION: IRAQ/NAJAF

PROJECT TITLE:
NAJAF ALASHRAF INTERNATIONAL AIRPORT TERMINAL 2

CLIENT:
NAJAF ALASHRAF INTERNATIONAL AIRPORT

PROJECT MANAGER:

Manhal Al Habbobi Consultants DMCC
Office No. 30- 01- 2540, Jewellery and Gemplex 3, Dubai, UAE.
Phone. No.: +971 (4) 4532721 www.manhal-al-habbobi.co.uk
e-Fax No.: +442 (0) 30311291 info@manhal-al-habbobi.co.uk

DESIGN & BUILD CONTRACTOR JV
ADVANCE MANAGEMENT TECHNIC FZC CENTRAL BUILDING

LEAD CONSULTANT & STRUCTURAL DESIGN
AM TECH FZC. / UAE

DESIGN ARCHITECT
D5 ARCHITECTS / UK

BAGGAGE HANDLING SYSTEM SPECIALIST
MOTT MACDONALD / UK

MEP CONSULTANT
IAN BANHAM ASS. / UAE

FIRE ENGINEERING CONSULTANT
EXOVA WARRINGTONFIRE LTD.

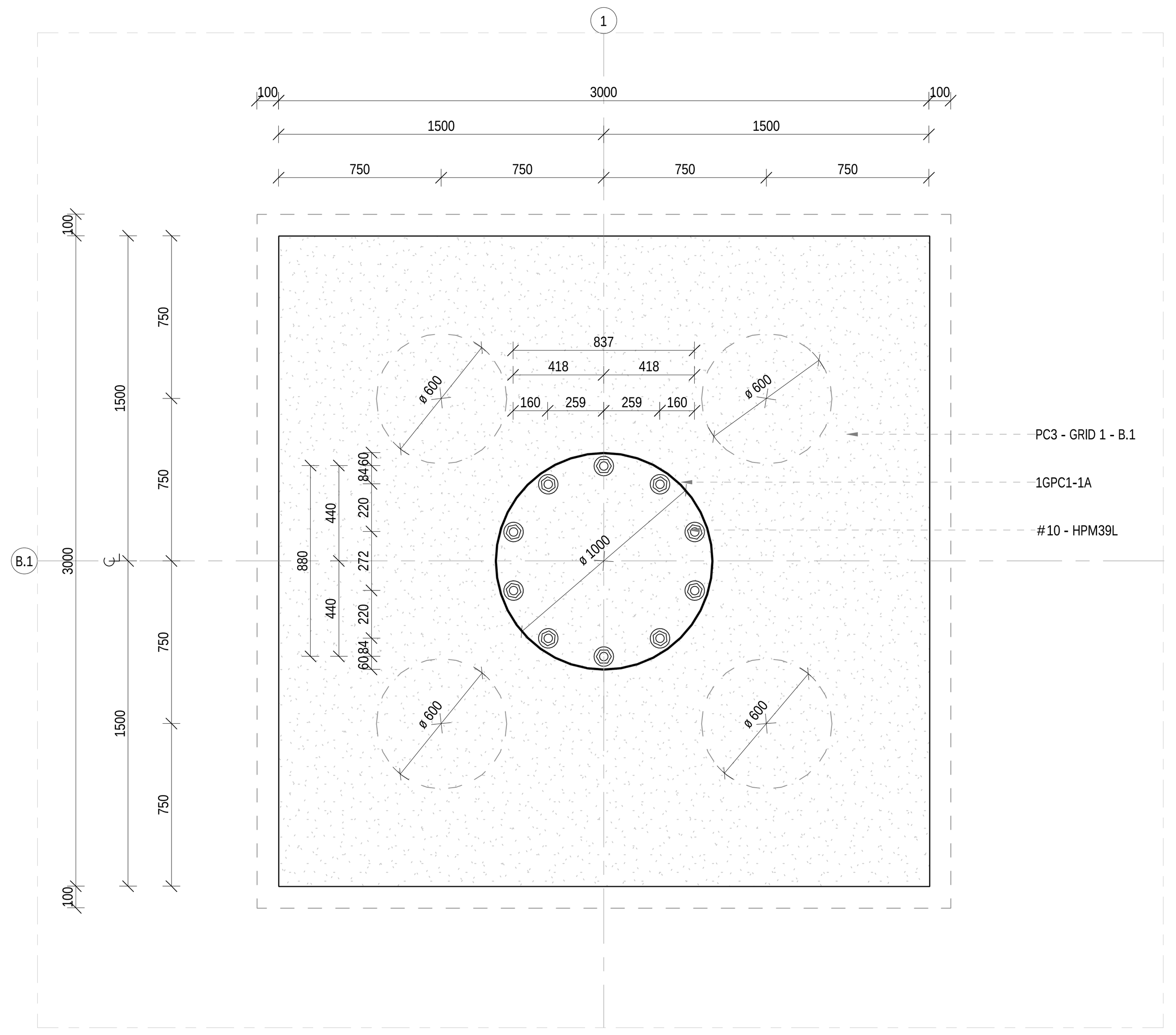
CONSULTANT
CONSULTANT

DRAWING TITLE:
CALL OUT - STAIR CASE 06 FOUNDATION DETAILS

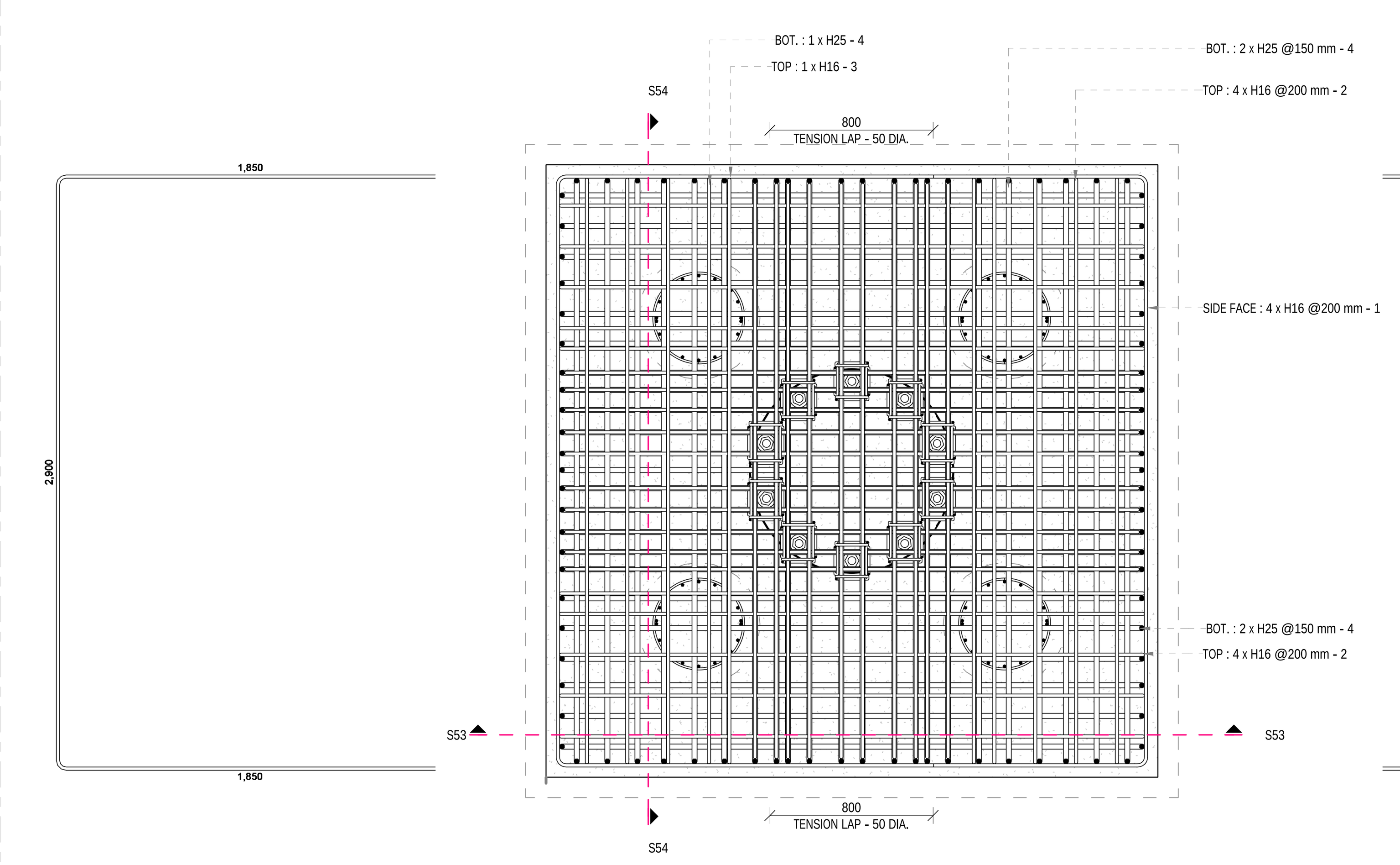
JOB NO:	DRAWING SIZE	DRAWING NO:	Rev.
IR 003	A0	AM/CB & JV -NAT2 - SB - 412	

DESIGNED BY:	COORDINATED BY:	CHECKED BY:
AS	AM TECH	HH
DRAWN BY:	**DATE:**	**SCALE:**
SP	07/13/17	As indicated

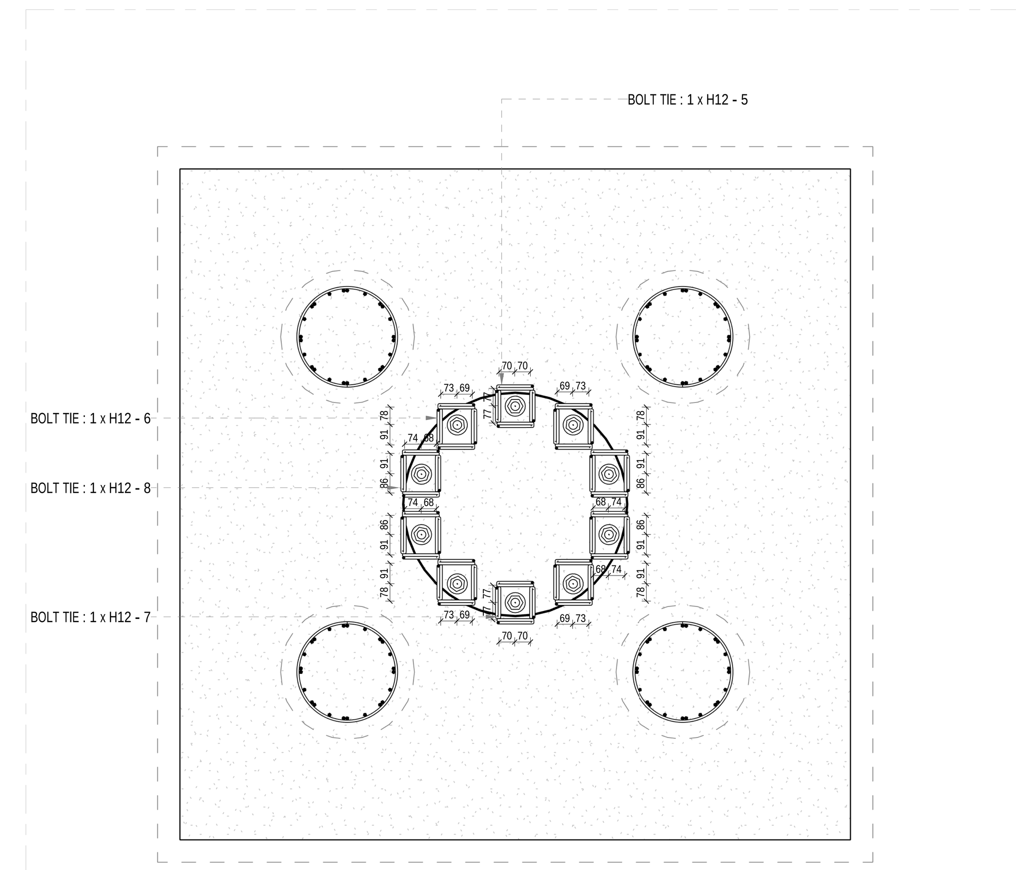
6



1 C- PC3 - IGPC-A - FORM WORK
1 : 20



2 C- PC3 - IGPC-A - REINFORCEMENT 1 OF 2
1 : 20



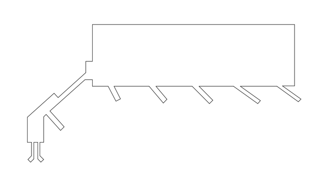
3 C- PC3 - IGPC-A - REINFORCEMENT 2 OF 2
1 : 20

REBAR NOTATION IN SECTION
BAR DIA @ SPACING C/C - REBAR NUMBER

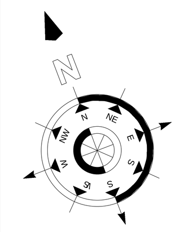
REBAR NOTATION IN PLAN
BAR POSITION : QUANTITY x BAR DIA @SPACING - REBAR NUMBER

CLEAR COVER	
FOUNDATION	WALL
50MM	40MM

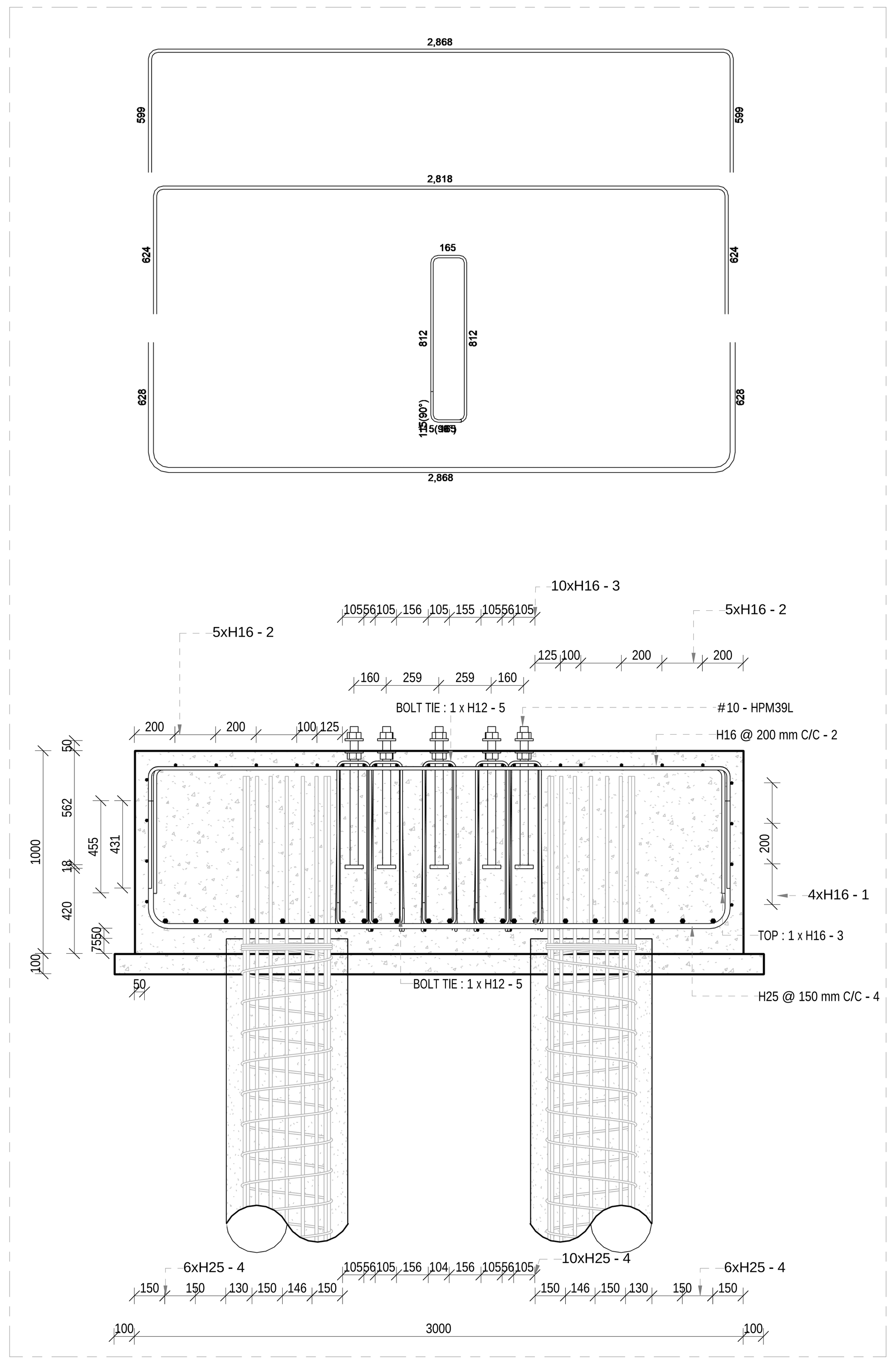
KEY PLAN



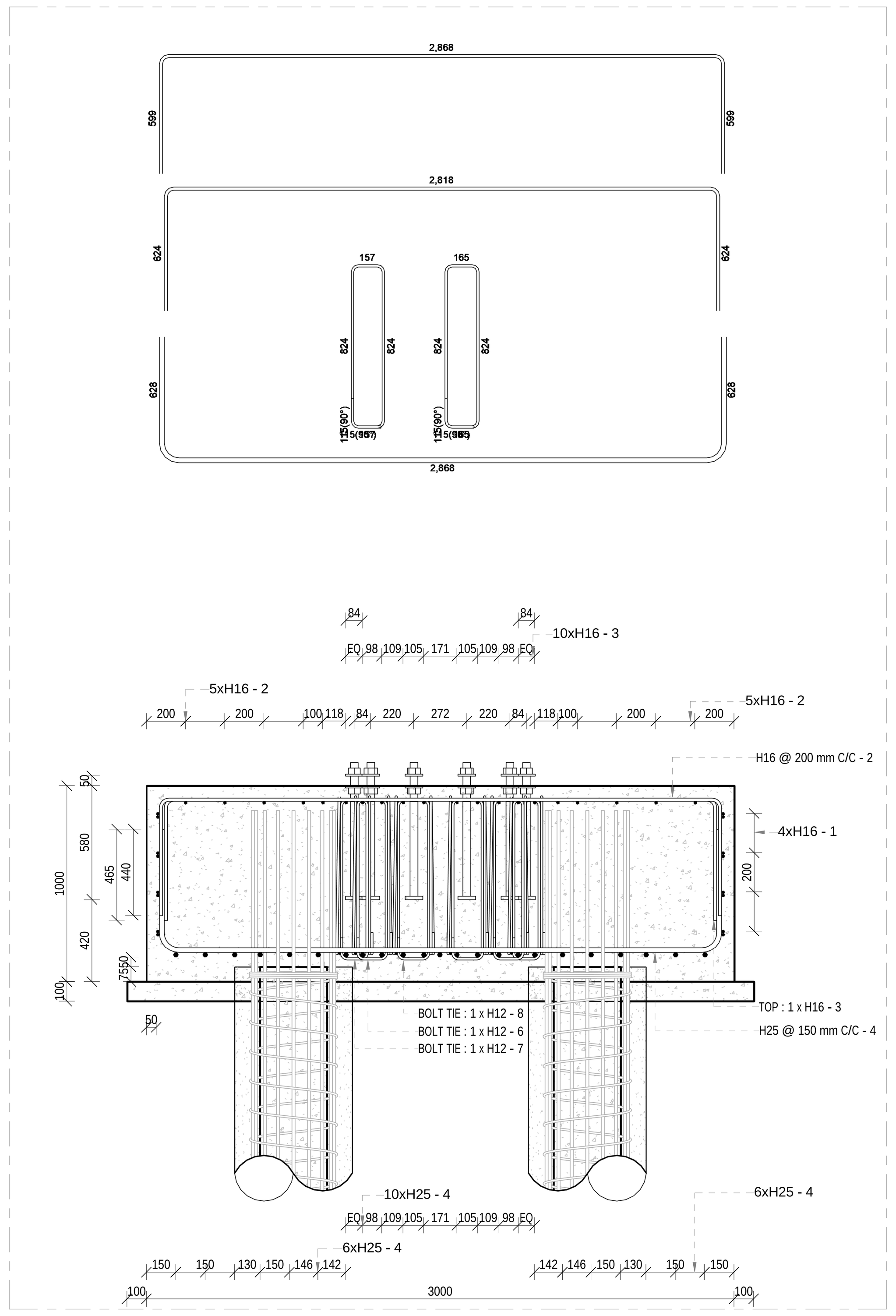
NORTH



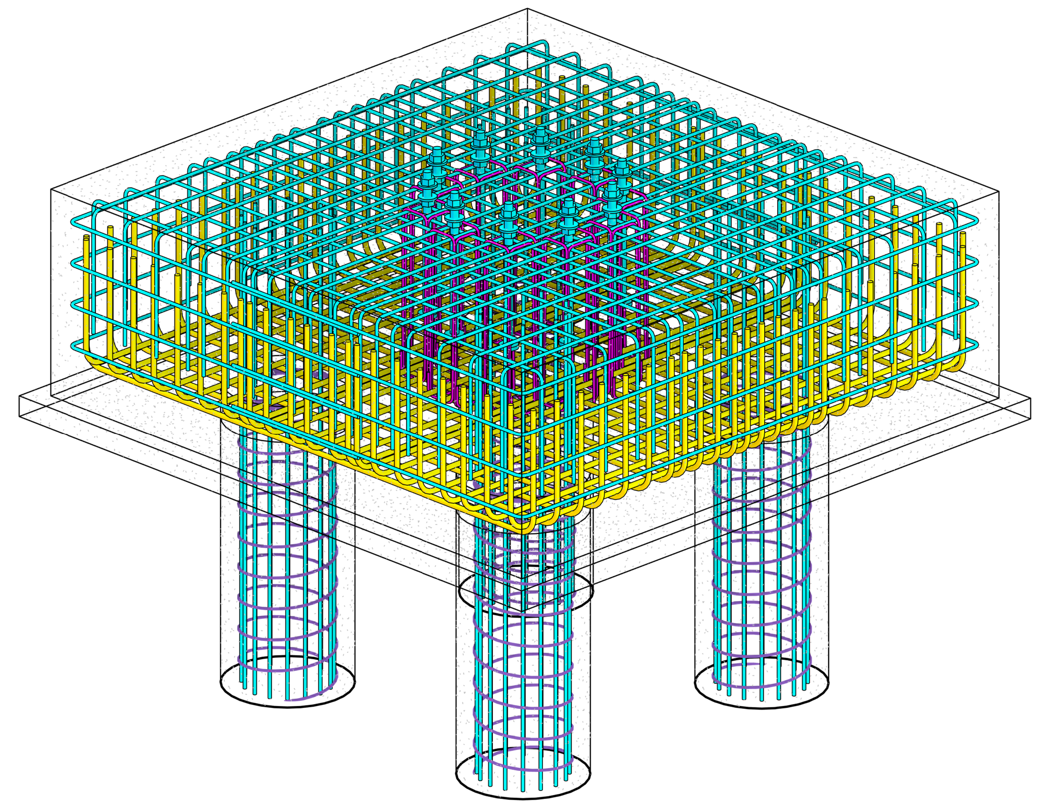
SYMBOLS



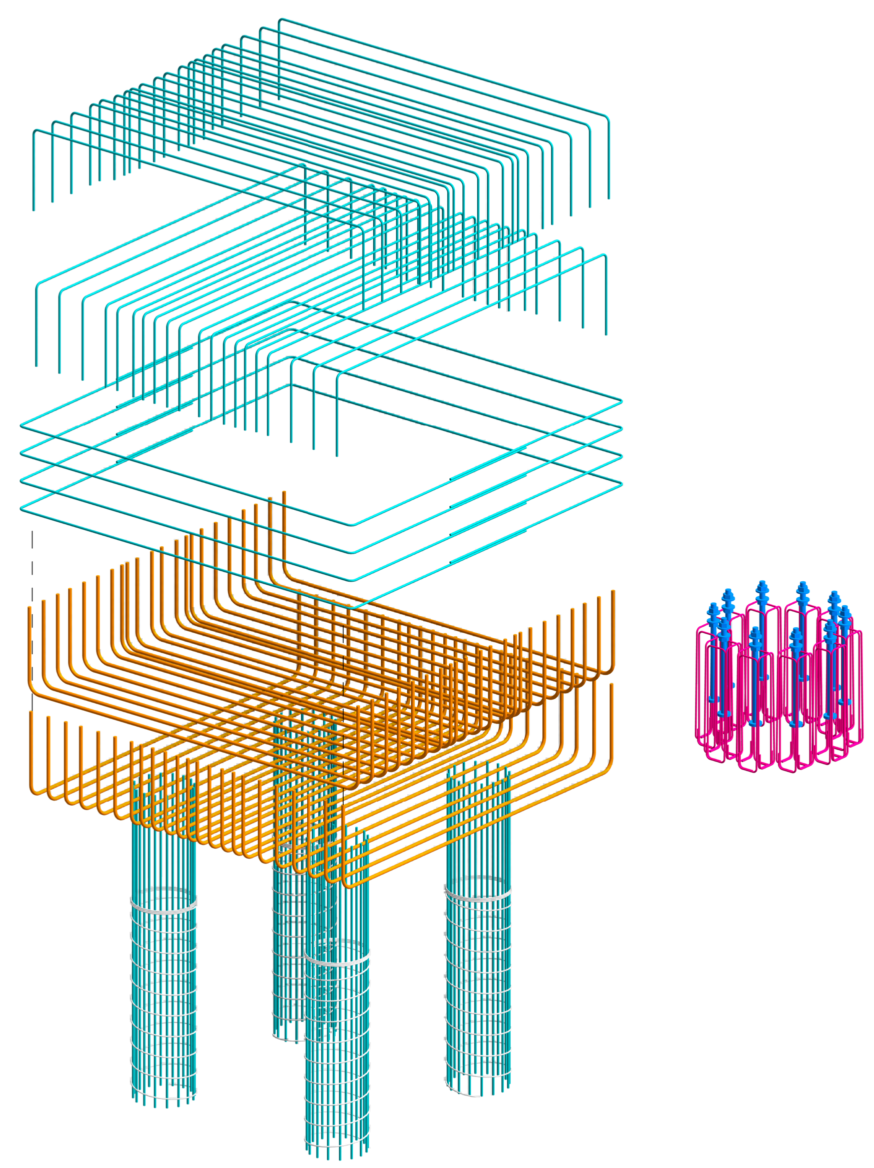
4 SECTION 53
1 : 20



5 SECTION 54
1 : 20



6 PC3- GRID 1-B.1 -1GPC-A



7 PC3- GRID 1-B.1 -1GPC-A - EXPLODED

BAR BENDING SCHEDULE - PC3 - 1 B.1

Partition	Host Mark	Peikko Connection Type	Rebar Number	Bar Diameter	Bend Diameter	Bar Position	Bar Length	Quantity By Rebar Set	Shape	Shape Image	A	B	C	D	Mass per Unit Length	Weight
PILE CAP	PC3 - GRID 1 - B.1	1GPC - A	1	16 mm	64 mm	SIDE FACE	6534 mm	8	21		1850 mm	2900 mm	1850 mm	0 mm	1.58 kg/m	82.586 kg
PILE CAP	PC3 - GRID 1 - B.1	1GPC - A	2	16 mm	64 mm	TOP	4000 mm	20	21		599 mm	2868 mm	599 mm	0 mm	1.58 kg/m	126.389 kg
PILE CAP	PC3 - GRID 1 - B.1	1GPC - A	3	16 mm	64 mm	TOP	4000 mm	20	21		624 mm	2818 mm	624 mm	0 mm	1.58 kg/m	126.393 kg
PILE CAP	PC3 - GRID 1 - B.1	1GPC - A	4	25 mm	150 mm	BOT.	4000 mm	45	21		629 mm	2868 mm	629 mm	0 mm	3.85 kg/m	692.981 kg
PILE CAP	PC3 - GRID 1 - B.1	1GPC - A	5	12 mm	48 mm	BOLT TIE	2060 mm	20	51		812 mm	165 mm	115 mm	115 mm	0.89 kg/m	36.579 kg
PILE CAP	PC3 - GRID 1 - B.1	1GPC - A	6	12 mm	48 mm	BOLT TIE	2068 mm	8	51		824 mm	157 mm	115 mm	115 mm	0.89 kg/m	14.688 kg
PILE CAP	PC3 - GRID 1 - B.1	1GPC - A	7	12 mm	48 mm	BOLT TIE	2038 mm	4	51		824 mm	142 mm	115 mm	115 mm	0.89 kg/m	7.238 kg
PILE CAP	PC3 - GRID 1 - B.1	1GPC - A	8	12 mm	48 mm	BOLT TIE	2084 mm	8	51		824 mm	165 mm	115 mm	115 mm	0.89 kg/m	14.802 kg
Grand total								133								1101.656 kg

REVISIONS AND ISSUES

REVISION	DATE	BY	DESCRIPTION

SUBMITTAL STAGE

CONCEPT DESIGN STAGE		SCHEMATIC DESIGN STAGE	
DETAILED DESIGN STAGE	■		

PLOT NO: NAJAF
LOCATION: IRAQ/NAJAF

PROJECT TITLE:
NAJAF ALASHRAF INTERNATIONAL AIRPORT TERMINAL 2

CLIENT:
NAJAF ALASHRAF INTERNATIONAL AIRPORT

PROJECT MANAGER:
Manhal Al Habbobi Consultants DMCC
Office No. 30- 01- 2540, Jewellery and Gemplex 3, Dubai, UAE.
Phone. No.: +971 (4) 4532721 www.manhal-al-habbobi.co.uk
e-Fax No.: +442 (0) 30311291 info@manhal-al-habbobi.co.uk

DESIGN & BUILD CONTRACTOR JV
ADVANCE MANAGEMENT TECHNIC FZC CENTRAL BUILDING

CONSULTANT

LEAD CONSULTANT & STRUCTURAL DESIGN
AM TECH FZC. / UAE

DESIGN ARCHITECT
D5 ARCHITECTS / UK

BAGGAGE HANDLING SYSTEM SPECIALIST
MOTT MACDONALD / UK

MEP CONSULTANT
IAN BANHAM ASS. / UAE

FIRE ENGINEERING CONSULTANT
EXOVA WARRINGTONFIRE LTD.

CONSULTANT

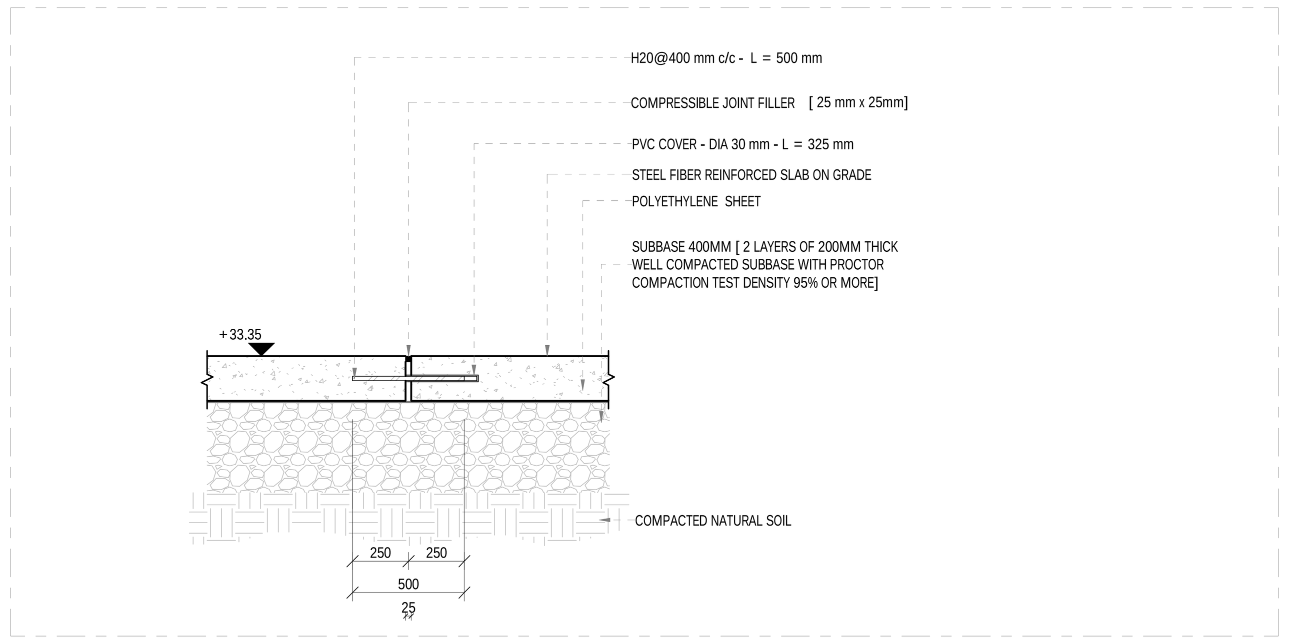
CONSULTANT

DRAWING TITLE:
PILE CAP PC 3 - 1GPC-A SHOP DRAWING SAMPLE

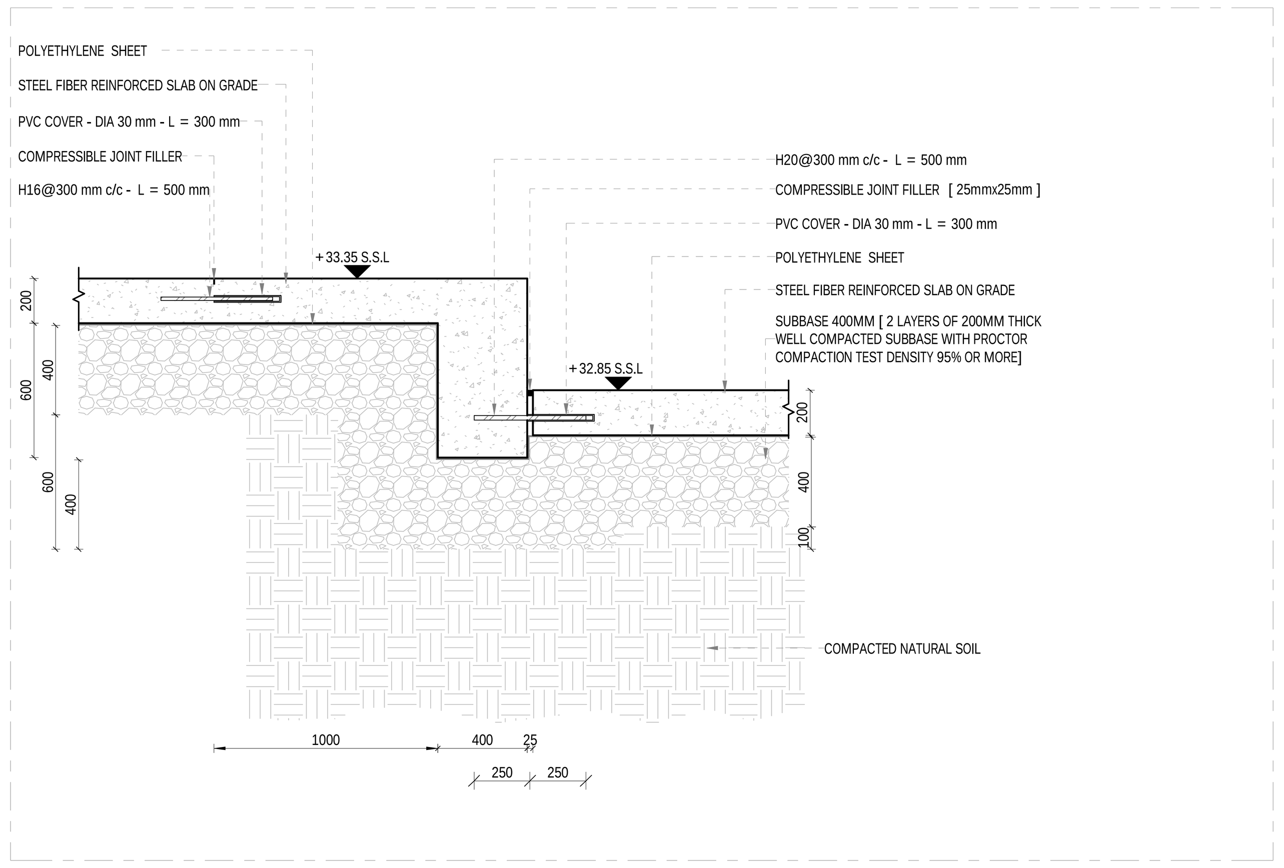
JOB NO:	DRAWING SIZE	DRAWING NO:	Rev.
IR 003	A0	AM/CB & JV -NAT2 - SB - NA	

DESIGNED BY:	COORDINATED BY:	CHECKED BY:
AS	AM TECH	HH
DRAWN BY:	DATE:	SCALE:
SP	09/13/17	1 : 20

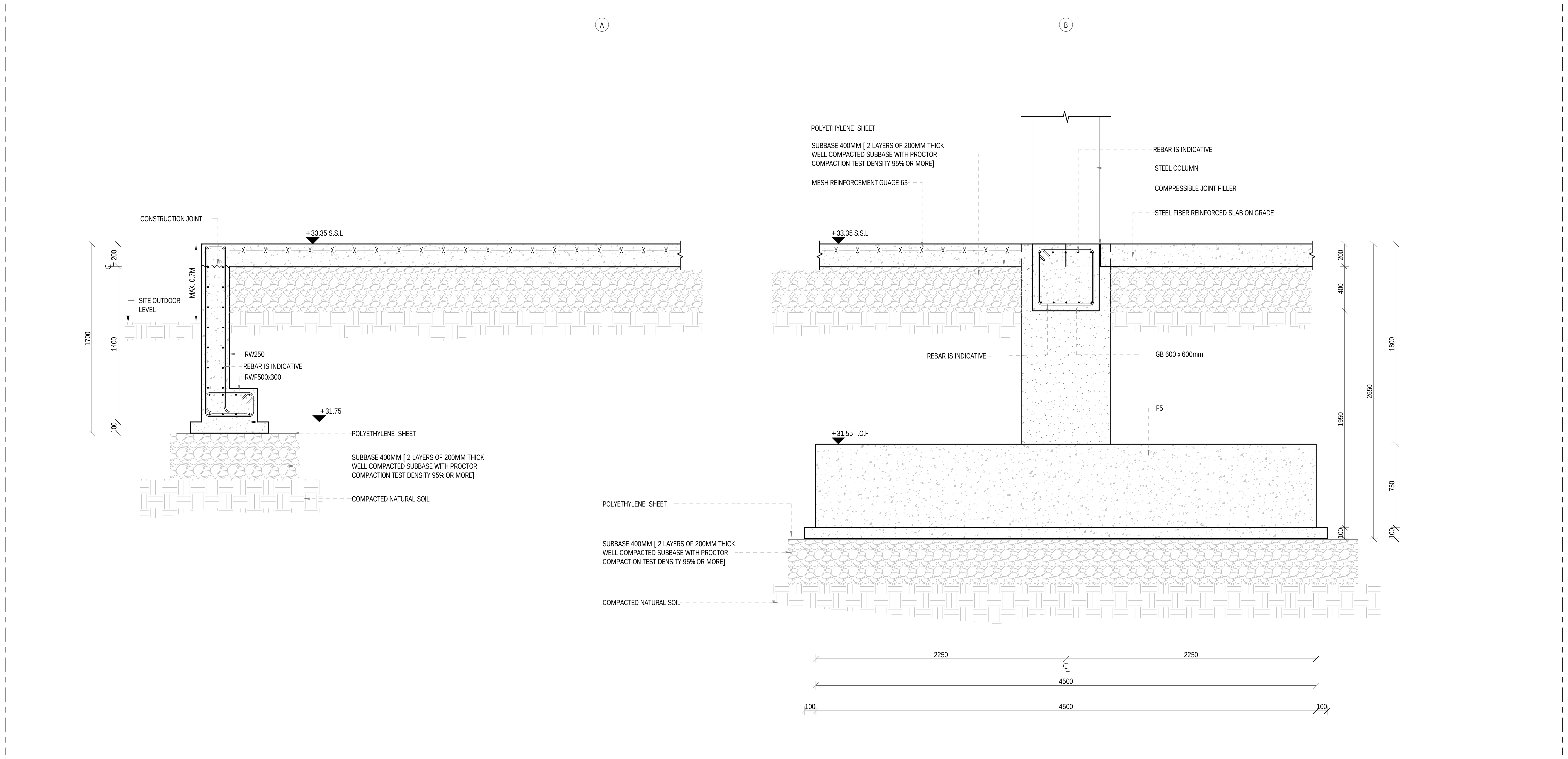
G



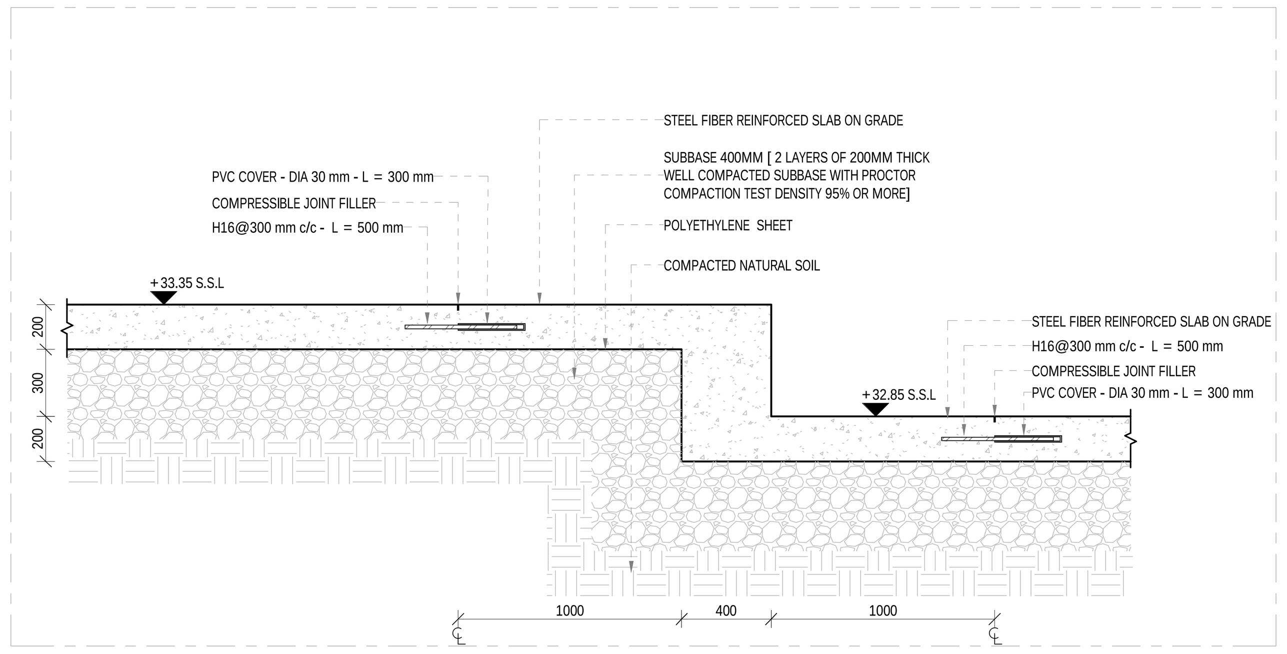
1 SECTION L
1 : 20



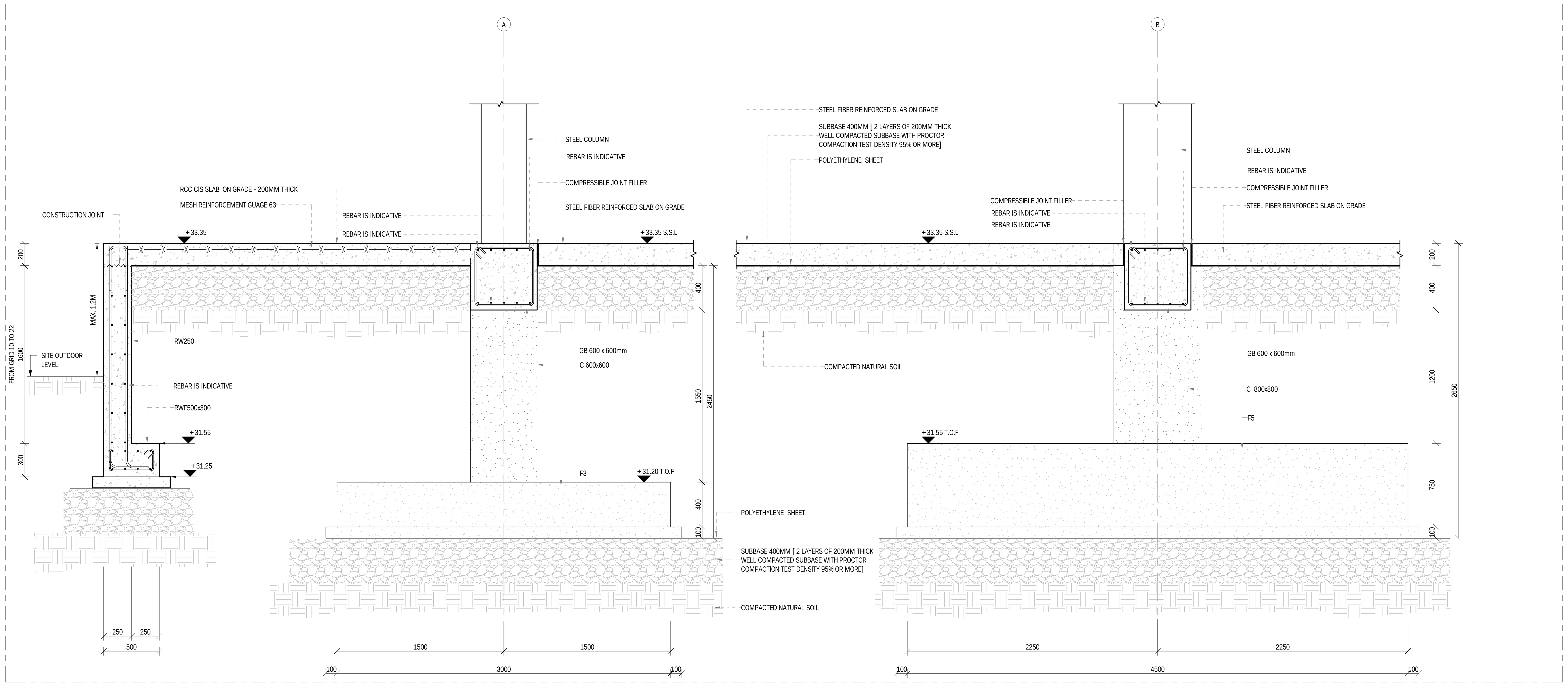
2 SECTION M
1 : 20



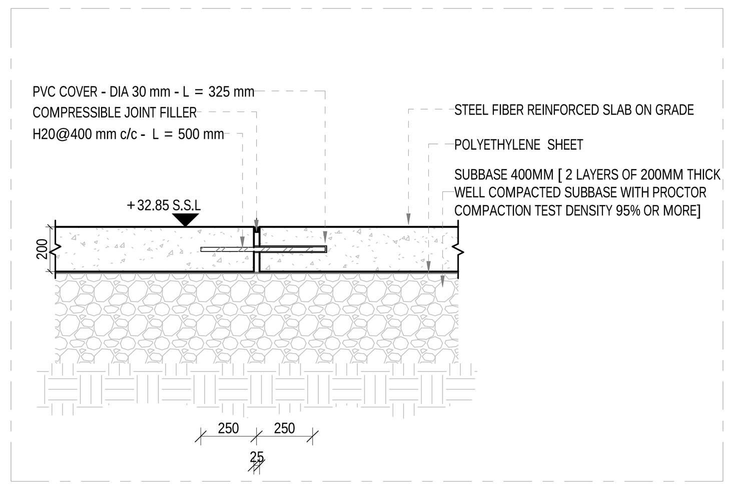
3 SECTION N
1 : 20



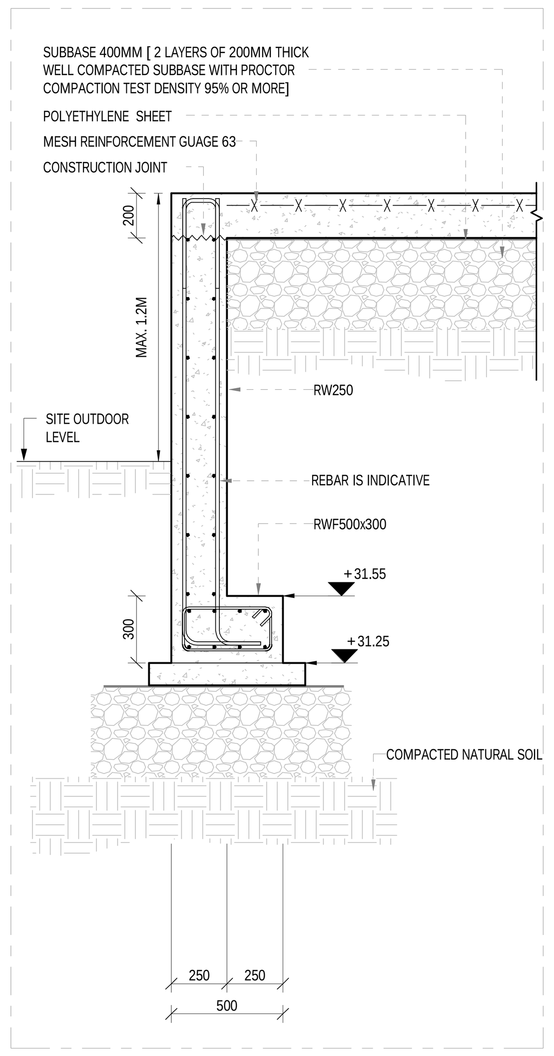
4 SECTION P
1 : 20



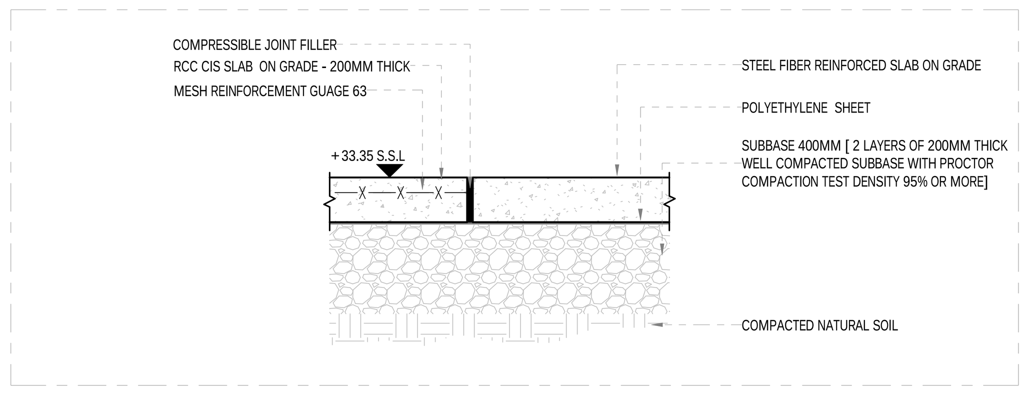
5 SECTION Q
1 : 20



7 SECTION S
1 : 20



8 SECTION T
1 : 20

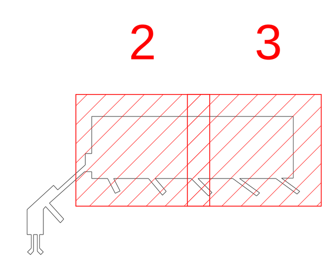


6 SECTION R
1 : 20

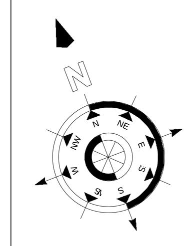
GENERAL NOTES:

1. ALL STEEL STRUCTURAL DETAILS WILL BE SUBMITTED IN DETAIL DESIGN STAGE.
2. FOR SCHEMATIC DESIGN STAGE PURPOSE, ONLY THE DESIGN CRITERIA, THE PROPOSED STRUCTURAL SYSTEMS AND THE STRUCTURAL MEMBERS SIZES, ARRANGEMENT ARE TO BE CHECKED. FURTHER DETAILS SUCH AS ,BUT NOT LIMITED TO, THE SLAB ON GRADE REINFORCEMENT DETAILS WILL BE SUBMITTED IN DETAIL DESIGN STAGE.
3. THE WIDTH OF THE EXPANSION JOINT WILL 25MM AND IT WILL BE IN THE SAME PLACES OF STRUCTURAL EXPANSION JOINT.
4. SLAB ON GRADE SHOULD BE FREE FROM ANY RESTRAINS, HENCE, IT WILL BE ISOLATED FROM COLUMNS, PEDESTALS, WALLS, PIT, GRADE BEAMS....ETC. TO GIVE HORIZONTAL & VERTICAL MOVEMENT FREEDOM ACCORDING TO ACI 302.1R-9.
5. ACCORDING TO ACI 302.1R-9, CONSTRUCTION JOINT SPACING SHOULD BE IN RANGE OF 24-36 TIMES SLAB THICKNESS. THEREFORE, IN OUR CASE IT IS 6M.
6. SAW CUT SHOULD BE EXECUTED IN THE OTHER DIRECTION (PERPENDICULAR TO THE CONSTRUCTION JOINT) AT A SPACING EQUAL TO 6M. DEPTH OF SAW-CUT TO BE 1/3 OF SLABS THICKNESS OR 25MM, WITH A WIDTH OF 4-6 MM. SAW-CUT TO BE DONE NOT LATER THAN 36 HOURS OF CONCRETE AGE.
7. THICKENING AT SLABS EDGE TO CARRY WALLS, GROUND BEAMS, BEAMS FOR THE DIFFERENT LEVELS SHOULD BE ISOLATED FROM THE SLAB ON GRADE.

KEY PLAN



NORTH



SYMBOLS

REVISIONS AND ISSUES

REVISION	DATE	BY	DESCRIPTION
R - 00	27-8-2017	SP	Issued For Approval

SUBMITTAL STAGE

CONCEPT DESIGN STAGE	SCHEMATIC DESIGN STAGE
DETAILED DESIGN STAGE	

PLOT NO: NAJAF
LOCATION: IRAQ/NAJAF

PROJECT TITLE: NAJAF ALASHRAF INTERNATIONAL AIRPORT TERMINAL 2

CLIENT: NAJAF ALASHRAF INTERNATIONAL AIRPORT

PROJECT MANAGER: Manhal Al Habbobi Consultants

DESIGN & BUILD CONTRACTOR JV
ADVANCE MANAGEMENT TECHNIC FZC
CENTRAL BUILDING

LEAD CONSULTANT & STRUCTURAL DESIGN
AM TECH FZC. / UAE

DESIGN ARCHITECT
D5 ARCHITECTS / UK

BAGGAGE HANDLING SYSTEM SPECIALIST
MOTT MACDONALD / UK

MEP CONSULTANT
IAN BANHAM ASS. / UAE

FIRE ENGINEERING CONSULTANT
EXOVA WARRINGTONFIRE LTD.

CONSULTANT

CONSULTANT

DRAWING TITLE:
SLAB ON GRADE TYPICAL DETAILS

JOB NO:	DRAWING SIZE	DRAWING NO:	Rev.
IR 003	A0	AM/CB & JV -NAT2 - SF - 420	R - 00

DESIGNED BY:	COORDINATED BY:	CHECKED BY:
AS	AM TECH	HH
DRAWN BY:	DATE:	SCALE:
SP	27/8/17	As indicated

G

KEY PLAN

ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METERS ONLY; UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE THE DRAWING FOLLOW THE FIGURED DIMENSIONS ONLY.

PROVIDE A LAP SPLICE OF 40 TIMES DIA OF SMALLER BAR WHEREVER LAPPING IS NEEDED.

READ THIS DRG. ALONG WITH ARCHITECTURAL DRG.IN CASE OF ANY DISCREPANCY BEING NOTiCED IT SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF THE CONSULTANT BEFORE COMMENCING THE WORK.

THE CLEAR COVER SHOWN IN TABLE BELOW SHALL BE FROM THE OUTER FACE OF THE STRUCUTRAL ELEMENT TO THE STIRRUPS FOR PEDASTAL, COLUMNS,BEAMS & TO THE MAIN REINFORCEMENT IN CASE OF FOOTING AND SLABS.

ITEM	GRADE OF CONCRETE	GRADE OF STEEL	COVER
FOOTINGS	M20	Fe415	50mm
PEDESTAL	M20	Fe415	40mm
COLUMN	M20	Fe415	40mm
TIE BEAM	M20	Fe415	40mm
ROOF BEAM	M20	Fe415	25mm
FLOOR SLAB	M20	Fe415	15mm
ROOF SLAB	M20	Fe415	15mm
PCC	M15		
PLASTERING	1:6		

PURPOSE:

ISSUED FOR APPROVAL

CLIENT:

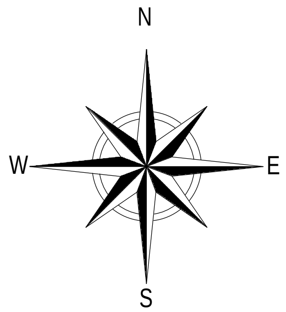
Mr. Abdul Latheef

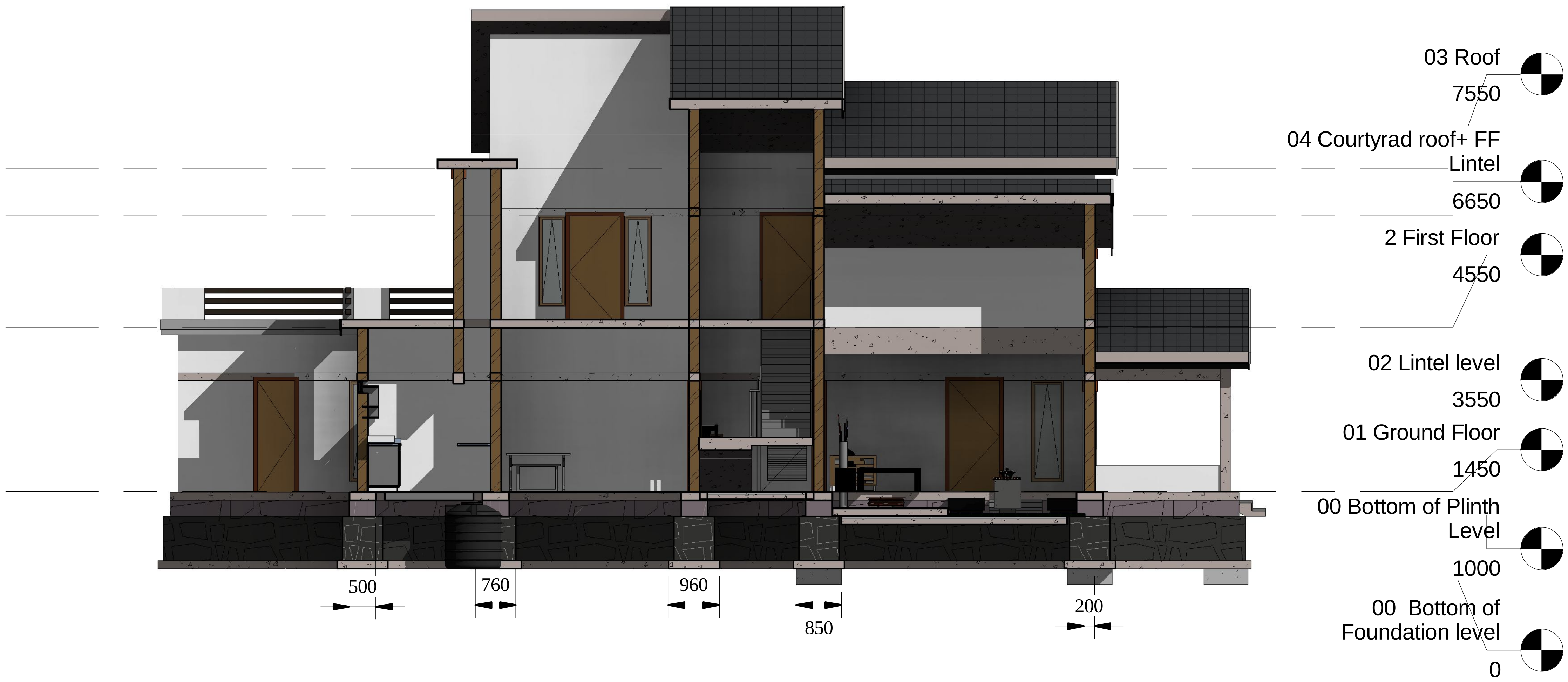
PROJECT:

PROPOSED RESIDENTAIL PROJECT AT MANDALAM KUNNU

TITLE: **Ground Floor Plan**

DRAWN	CHECKED	SCALE	JOB. NO	DATE
Author		1 : 100	1	8/10/2015 9:51:33 PM
COMPANY	TYP	SHEET . NO	REV. NO	DRG STATUS
	ST	A6		FA





1 Longitudinal Section

1 : 100

KEY PLAN

ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METERS ONLY; UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE THE DRAWING FOLLOW THE FIGURED DIMENSIONS ONLY.

PROVIDE A LAP SPLICE OF 40 TIMES DIA OF SMALLER BAR WHEREVER LAPPING IS NEEDED.

READ THIS DRG. ALONG WITH ARCHITECTURAL DRG.IN CASE OF ANY DISCREPANCY BEING NOTiCED IT SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF THE CONSULTANT BEFORE COMMENCING THE WORK.

THE CLEAR COVER SHOWN IN TABLE BELOW SHALL BE FROM THE OUTER FACE OF THE STRUCUTRAL ELEMENT TO THE STIRRUPS FOR PEDASTAL, COLUMNS,BEAMS & TO THE MAIN REINFORCEMENT IN CASE OF FOOTING AND SLABS.

ITEM	GRADE OF CONCRETE	GRADE OF STEEL	COVER
FOOTINGS	M20	Fe415	50mm
PEDESTAL	M20	Fe415	40mm
COLUMN	M20	Fe415	40mm
TIE BEAM	M20	Fe415	40mm
ROOF BEAM	M20	Fe415	25mm
FLOOR SLAB	M20	Fe415	15mm
ROOF SLAB	M20	Fe415	15mm
PCC	M15		
PLASTERING	1:6		

PURPOSE:

ISSUED FOR APPROVAL

CLIENT:

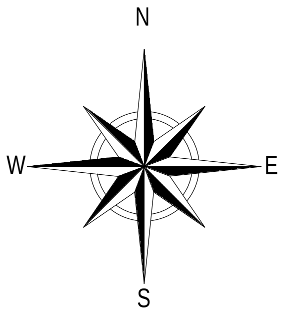
Mr. Abdul Latheef

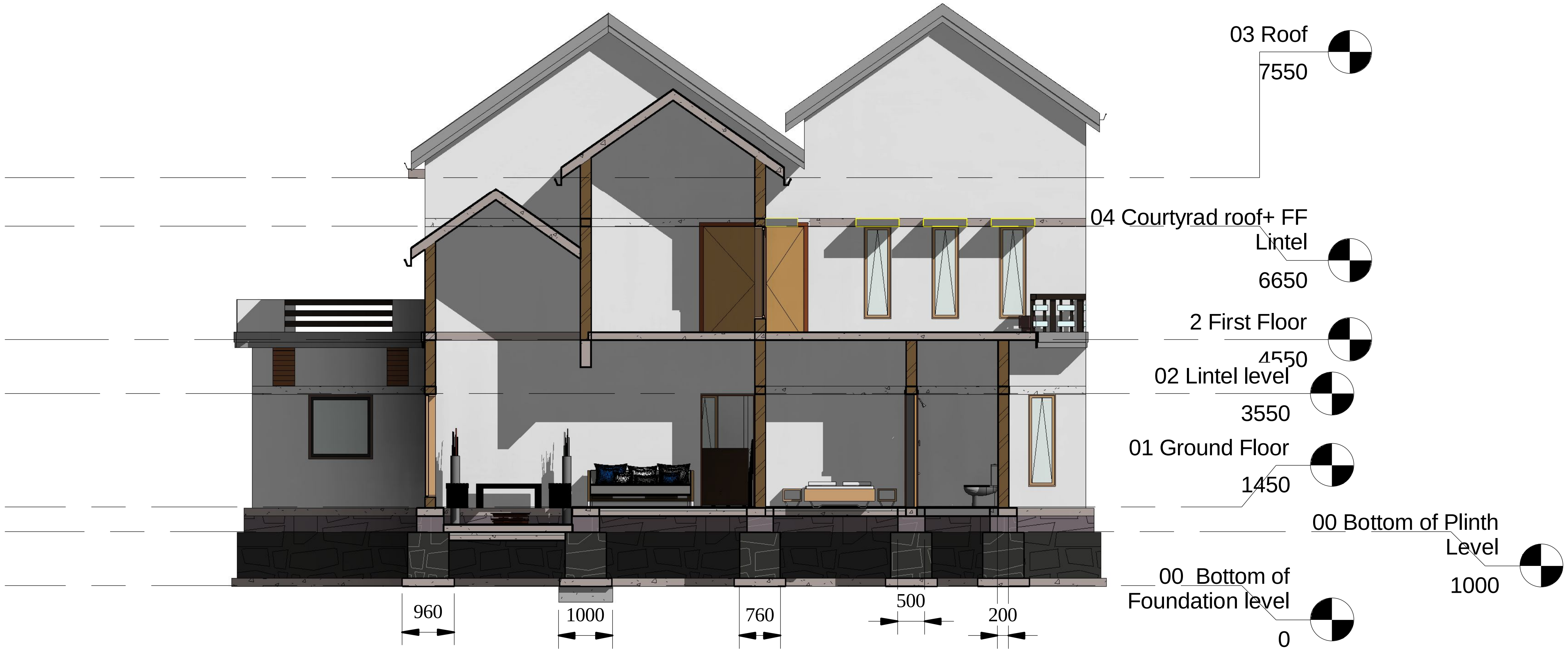
PROJECT:

PROPOSED RESIDENTAIL PROJECT AT MANDALAM KUNNU

TITLE: **Longitudinal Section**

DRAWN	CHECKED	SCALE	JOB. NO	DATE
SHAFEEKH		1 : 100	1	8/10/2015 9:52:18 PM
COMPANY	TYP	SHEET . NO	REV. NO	DRG STATUS
	ST	A8		FA





2

Lateral Section

1 : 100

KEY PLAN

ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METERS ONLY; UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE THE DRAWING FOLLOW THE FIGURED DIMENSIONS ONLY.

PROVIDE A LAP SPLICE OF 40 TIMES DIA OF SMALLER BAR WHEREVER LAPPING IS NEEDED.

READ THIS DRG. ALONG WITH ARCHITECTURAL DRG.IN CASE OF ANY DISCREPANCY BEING NOTiCED IT SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF THE CONSULTANT BEFORE COMMENCING THE WORK.

THE CLEAR COVER SHOWN IN TABLE BELOW SHALL BE FROM THE OUTER FACE OF THE STRUCUTRAL ELEMENT TO THE STIRRUPS FOR PEDASTAL, COLUMNS,BEAMS & TO THE MAIN REINFORCEMENT IN CASE OF FOOTING AND SLABS.

ITEM	GRADE OF CONCRETE	GRADE OF STEEL	COVER
FOOTINGS	M20	Fe415	50mm
PEDESTAL	M20	Fe415	40mm
COLUMN	M20	Fe415	40mm
TIE BEAM	M20	Fe415	40mm
ROOF BEAM	M20	Fe415	25mm
FLOOR SLAB	M20	Fe415	15mm
ROOF SLAB	M20	Fe415	15mm
PCC	M15		
PLASTERING	1:6		

PURPOSE:

ISSUED FOR APPROVAL

CLIENT:

Mr. Abdul Latheef

PROJECT:

PROPOSED RESIDENTAIL PROJECT AT MANDALAM KUNNU

TITLE: **Lateral Section**

DRAWN	CHECKED	SCALE	JOB. NO	DATE
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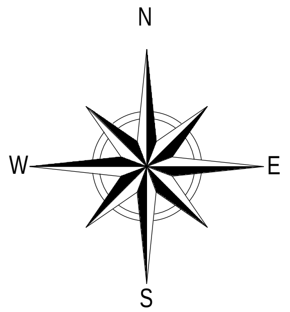
COMPANY	TYP	SHEET . NO	REV. NO	DRG STATUS
	ST	A9		FA



2 First Floor

1 : 100

KEY PLAN

ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METERS ONLY; UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE THE DRAWING FOLLOW THE FIGURED DIMENSIONS ONLY.

PROVIDE A LAP SPLICE OF 40 TIMES DIA OF SMALLER BAR WHEREVER LAPPING IS NEEDED.

READ THIS DRG. ALONG WITH ARCHITECTURAL DRG.IN CASE OF ANY DISCREPANCY BEING NOTiCED IT SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF THE CONSULTANT BEFORE COMMENCING THE WORK.

THE CLEAR COVER SHOWN IN TABLE BELOW SHALL BE FROM THE OUTER FACE OF THE STRUCUTRAL ELEMENT TO THE STIRRUPS FOR PEDASTAL, COLUMNS,BEAMS & TO THE MAIN REINFORCEMENT IN CASE OF FOOTING AND SLABS.

ITEM	GRADE OF CONCRETE	GRADE OF STEEL	COVER
FOOTINGS	M20	Fe415	50mm
PEDESTAL	M20	Fe415	40mm
COLUMN	M20	Fe415	40mm
TIE BEAM	M20	Fe415	40mm
ROOF BEAM	M20	Fe415	25mm
FLOOR SLAB	M20	Fe415	15mm
ROOF SLAB	M20	Fe415	15mm
PCC	M15		
PLASTERING	1:6		

PURPOSE:

ISSUED FOR APPROVAL

CLIENT:

Mr. Abdul Latheef

PROJECT:

PROPOSED RESIDENTAIL PROJECT AT MANDALAM KUNNU

TITLE: **First Floor Plan**

DRAWN	CHECKED	SCALE	JOB. NO	DATE
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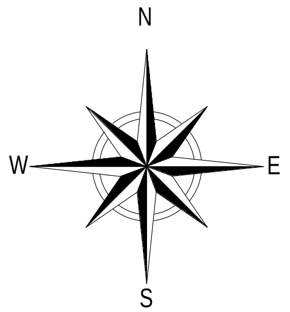
COMPANY	TYP	SHEET . NO	REV. NO	DRG STATUS
	ST	A7		FA



1 East
1 : 100

KEY PLAN

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ROOF BEAM	M20	Fe415	25mm
FLOOR SLAB	M20	Fe415	15mm
ROOF SLAB	M20	Fe415	15mm
PCC	M15		
PLASTERING	1:6		

PURPOSE:

ISSUED FOR APPROVAL

CLIENT:

Mr. Abdul Latheef

PROJECT:

PROPOSED RESIDENTAIL PROJECT AT MANDALAM KUNNU

TITLE: **East Elivation**

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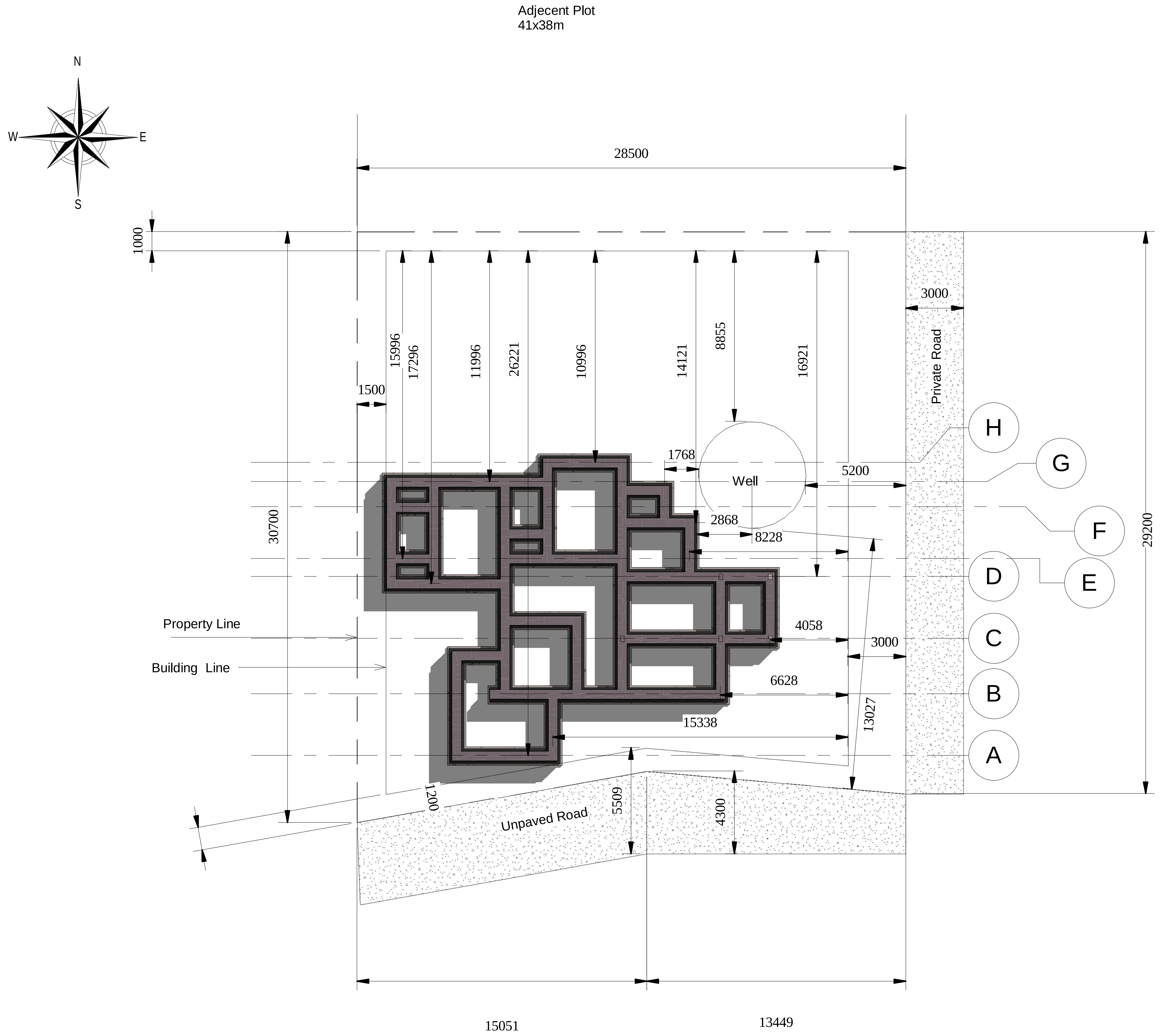

KEY PLAN

ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METERS ONLY; UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE THE DRAWING FOLLOW THE FIGURED DIMENSIONS ONLY.

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ROOF BEAM	M20	Fe415	25mm
FLOOR SLAB	M20	Fe415	15mm
ROOF SLAB	M20	Fe415	15mm
PCC	M15		
PLASTERING	1:6		

PURPOSE:

ISSUED FOR APPROVAL

1 A10

CLIENT:

Mr. Abdul Latheef

PROJECT:

PROPOSED RESIDENTAIL PROJECT AT MANDALAM KUNNU

TITLE: **Site Plan**

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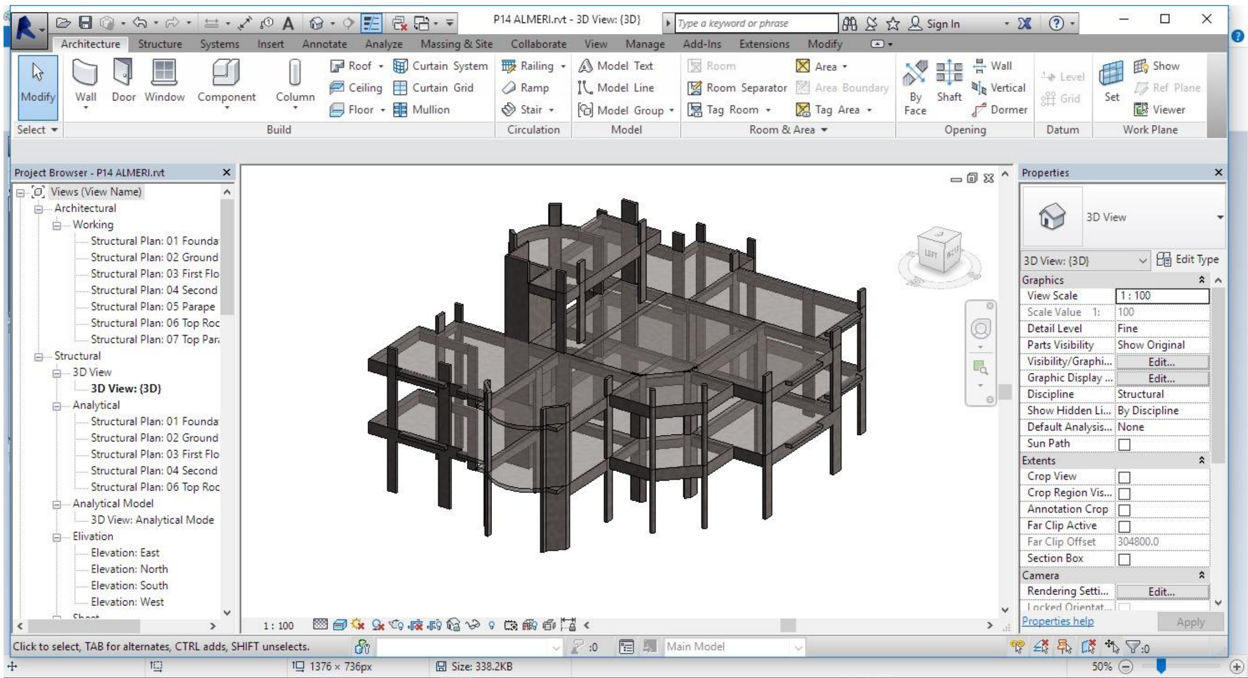
	ST	A11		FA

REVIT STRUCTURE

ANALYTICAL MODEL IN REVIT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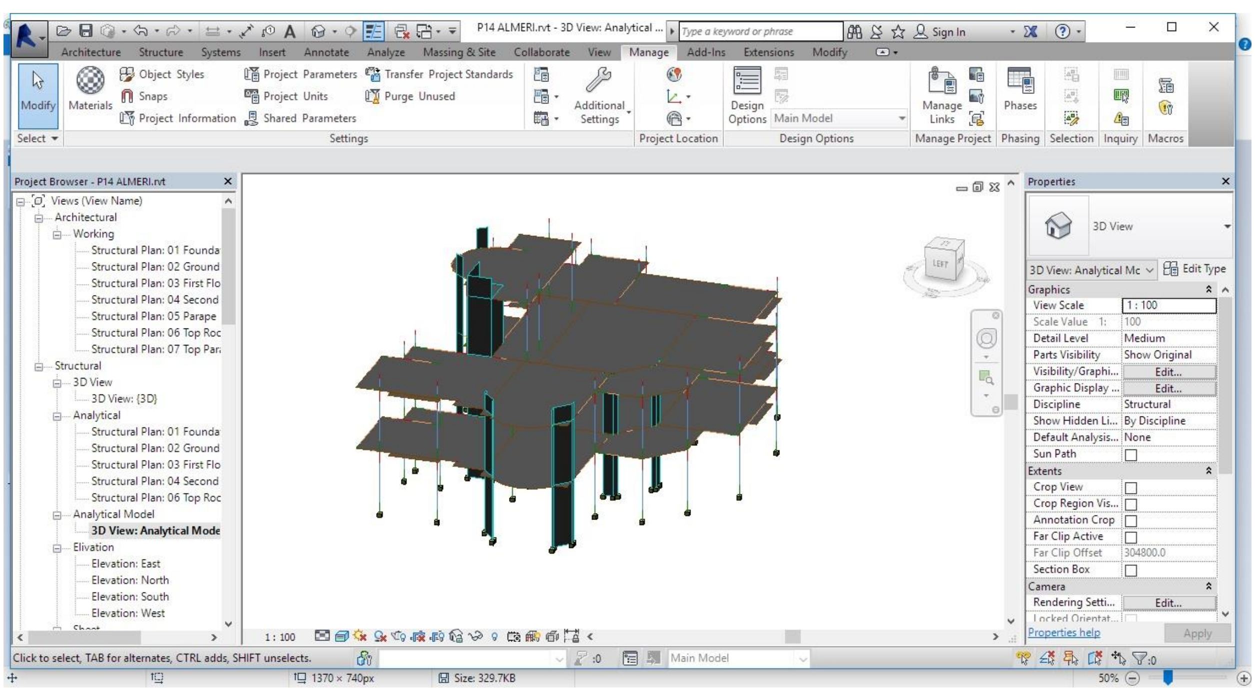
Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins Extensions Modify
Project Browser - P14 ALMERI.rvt
Properties
3D View
Click to select, TAB for alternates, CTRL adds, SHIFT unselects.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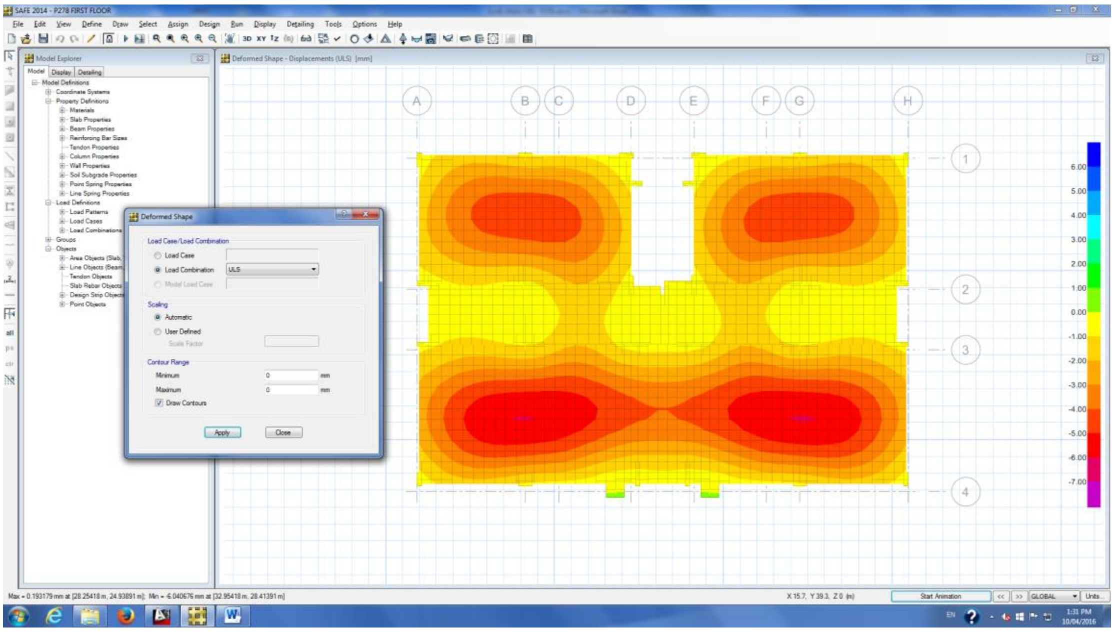
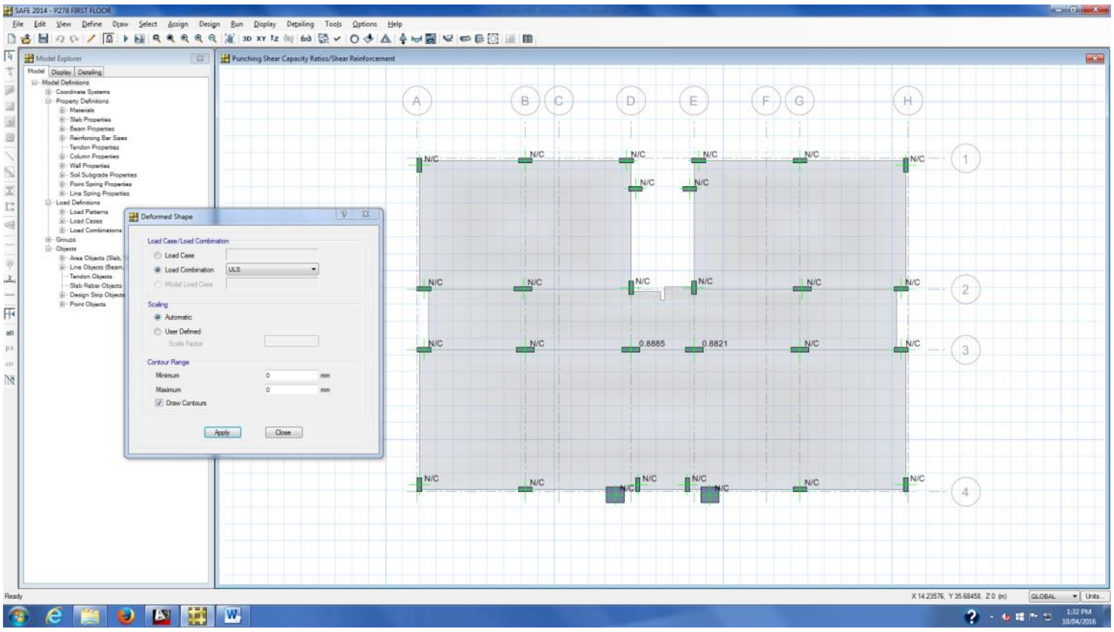
Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins Extensions Modify
Project Browser - P14 ALMERI.rvt
Properties
3D View
Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

SAFE

ANALYSIS AND DESIGN OF SLAB

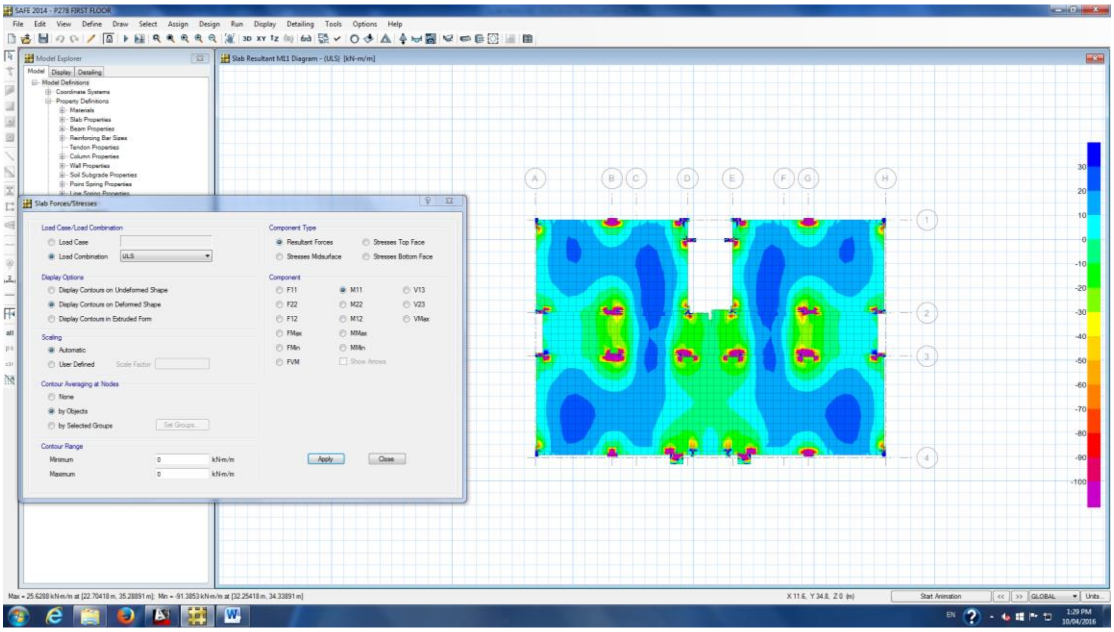


First Floor Downward Displacement-ULS

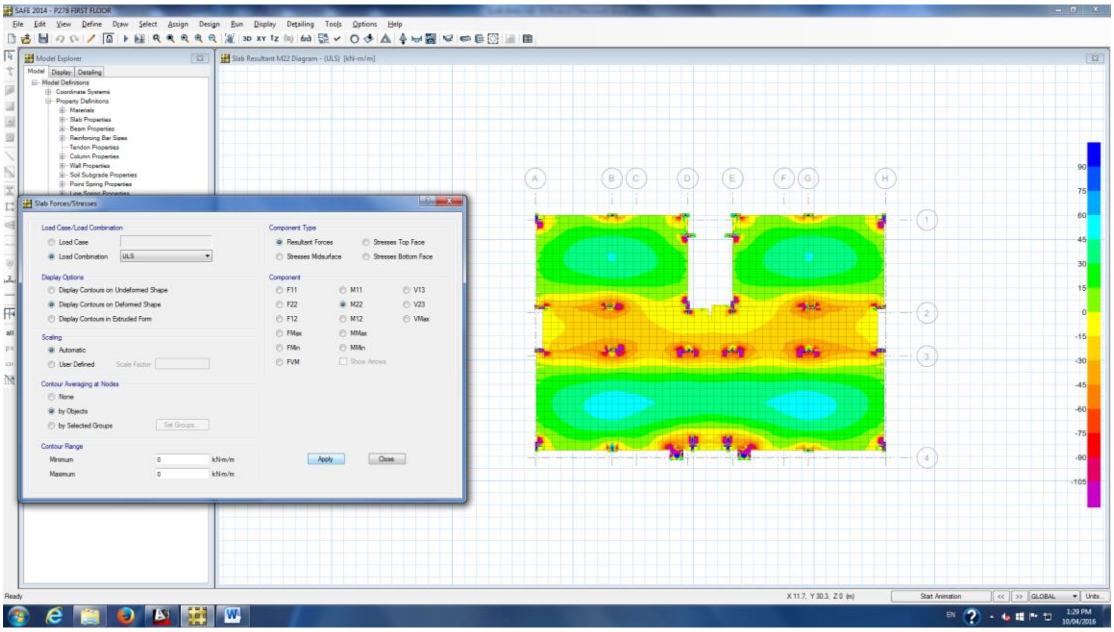


First Floor Slab Punching Check- No Punching

FIRST FLOOR SLAB ANALYSIS

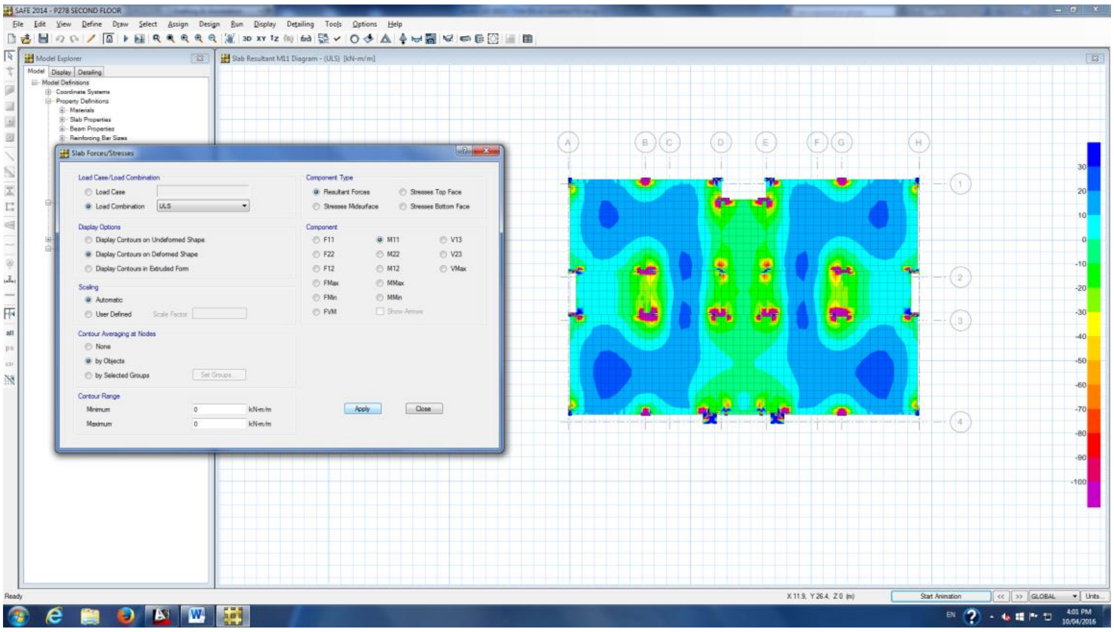


First Floor Slab Moment M11- Load Case- ULS

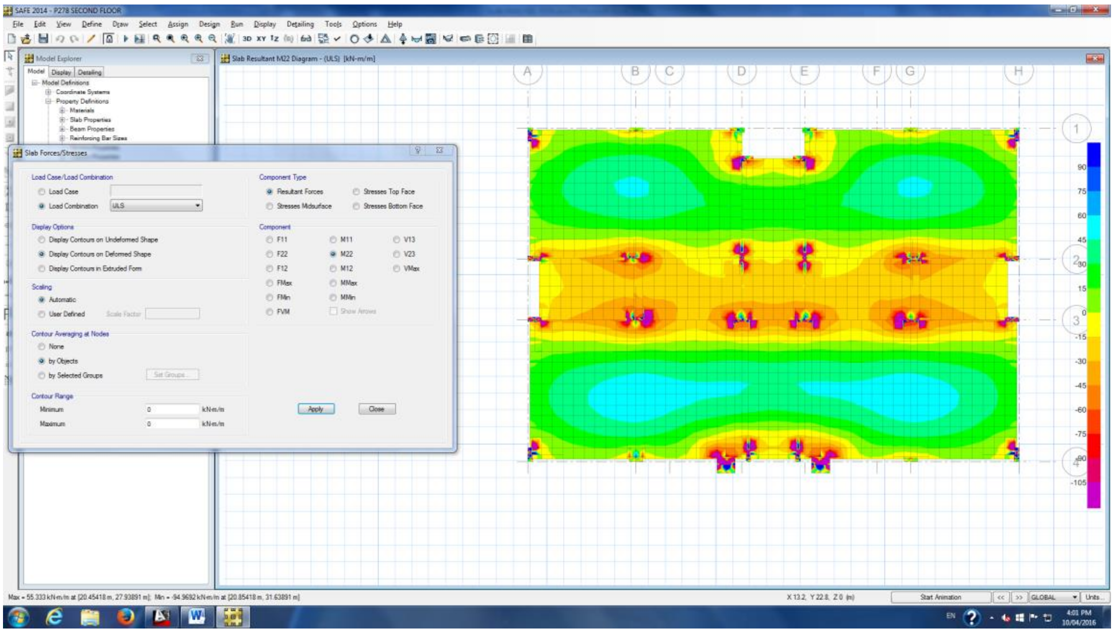


First Floor Slab Moment M22- Load Case- ULS

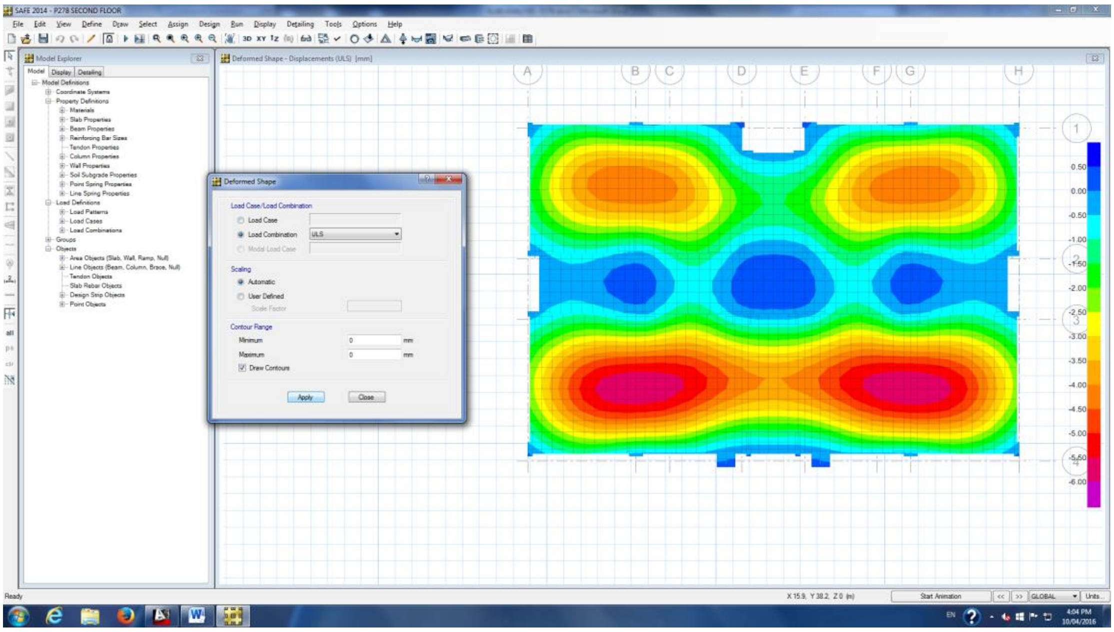
TOP ROOF SLAB ANALYSIS



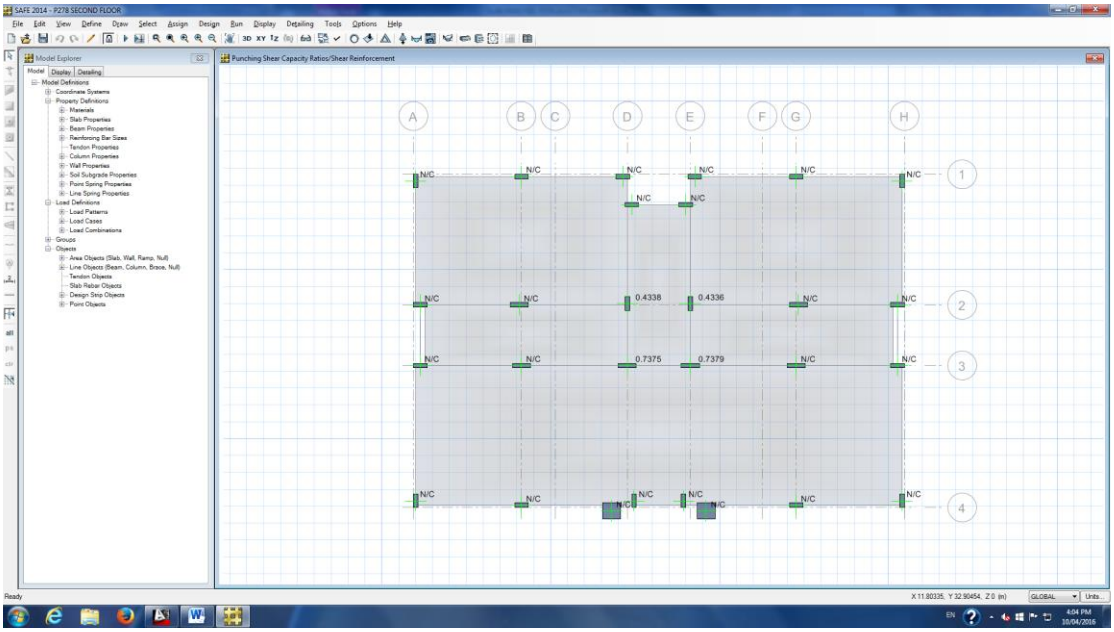
Top Roof Slab Moment M11-ULS



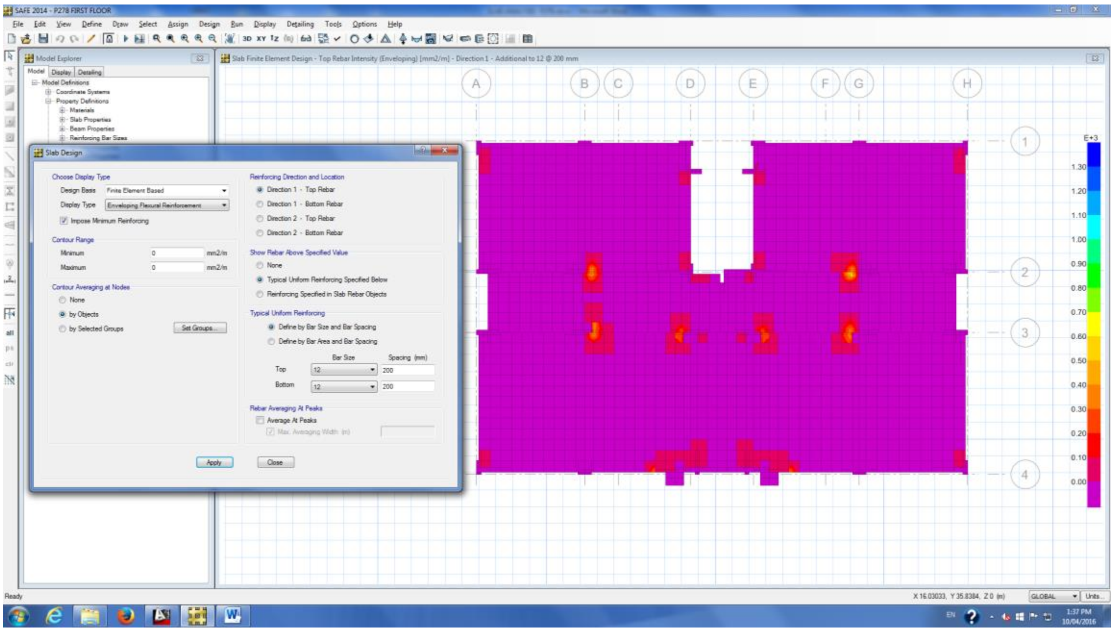
Top Roof Slab Moment M22-ULS



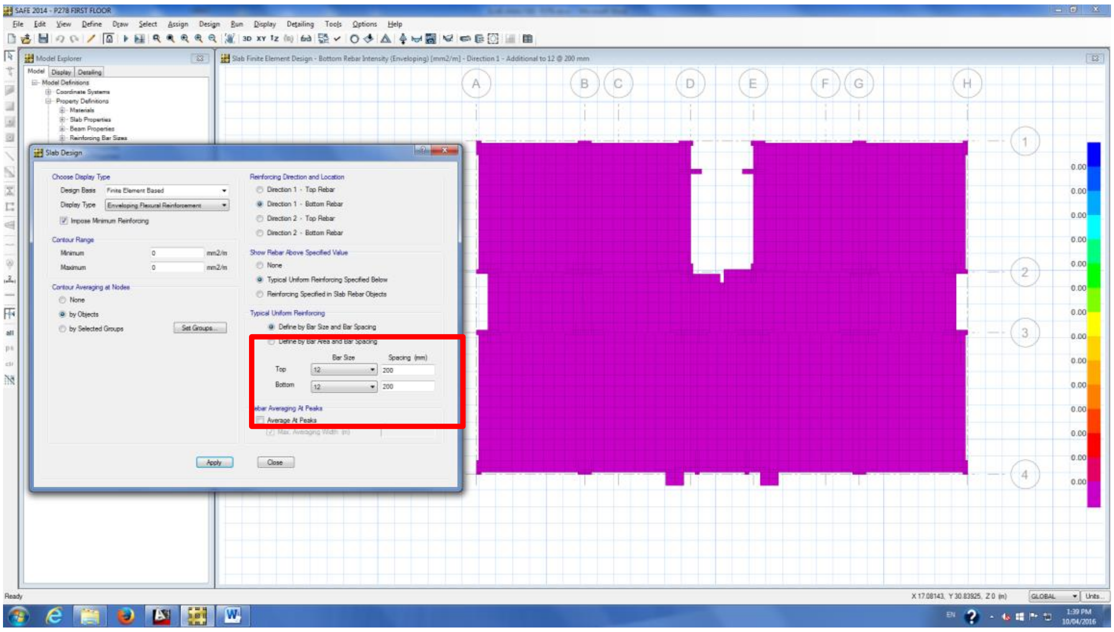
First Floor Downward Displacement-ULS



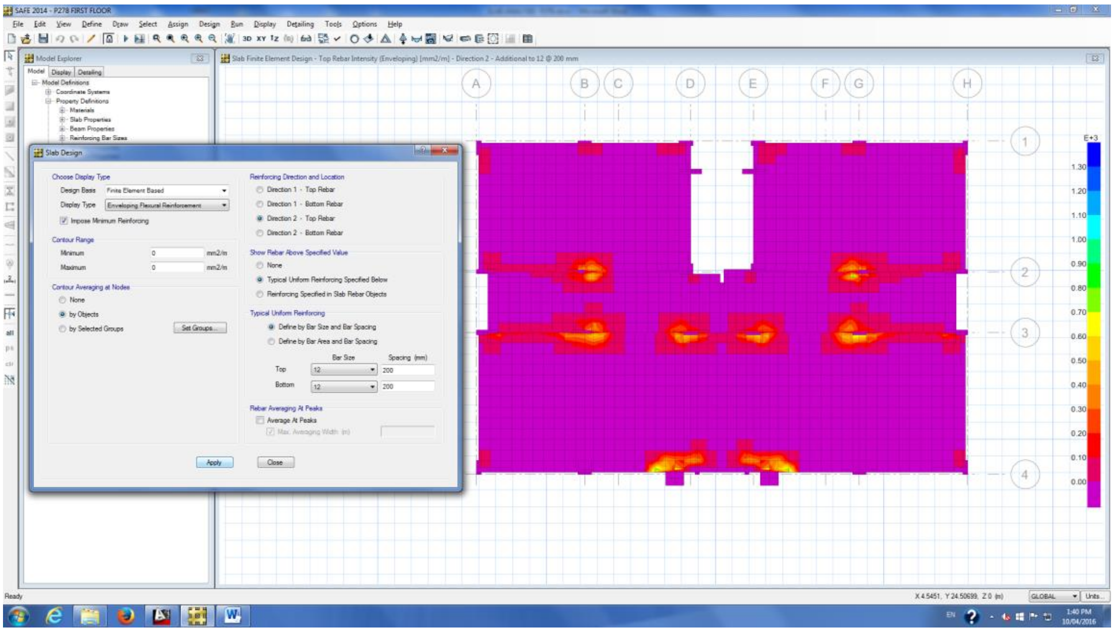
Roof Floor Slab Punching Check- No Punching



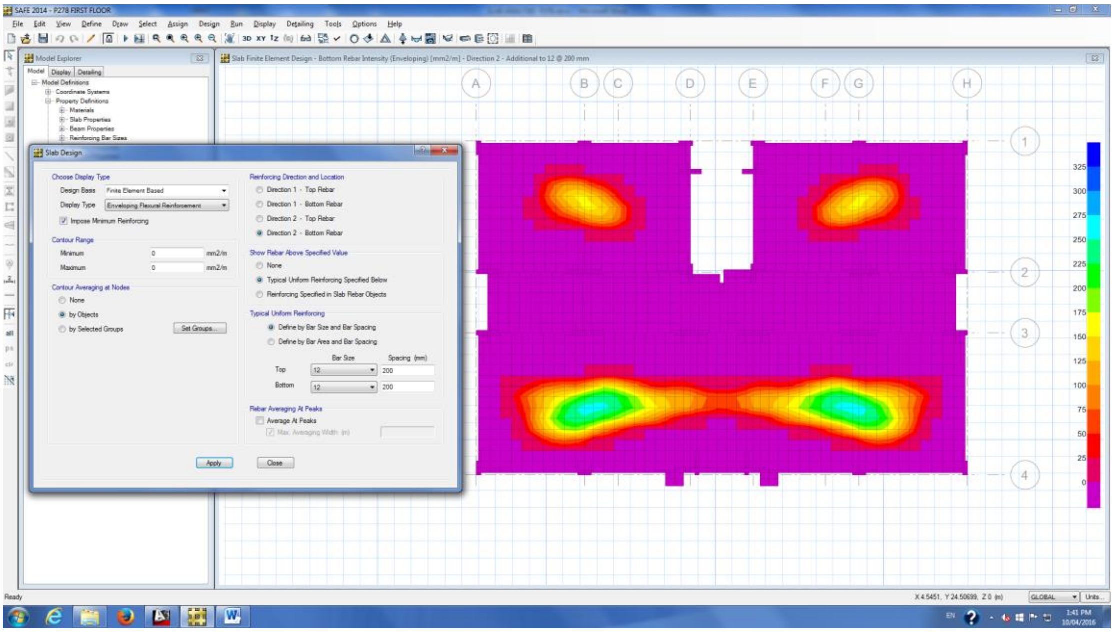
First Floor Slab Rebar Required Area – Direction 1 Top Rebar



First Floor Slab Rebar Required Area – Direction 1 Bottom Rebar



First Floor Slab Rebar Required Area – Direction 2 Top Rebar



First Floor Slab Rebar Required Area – Direction 2 Bottom Rebar

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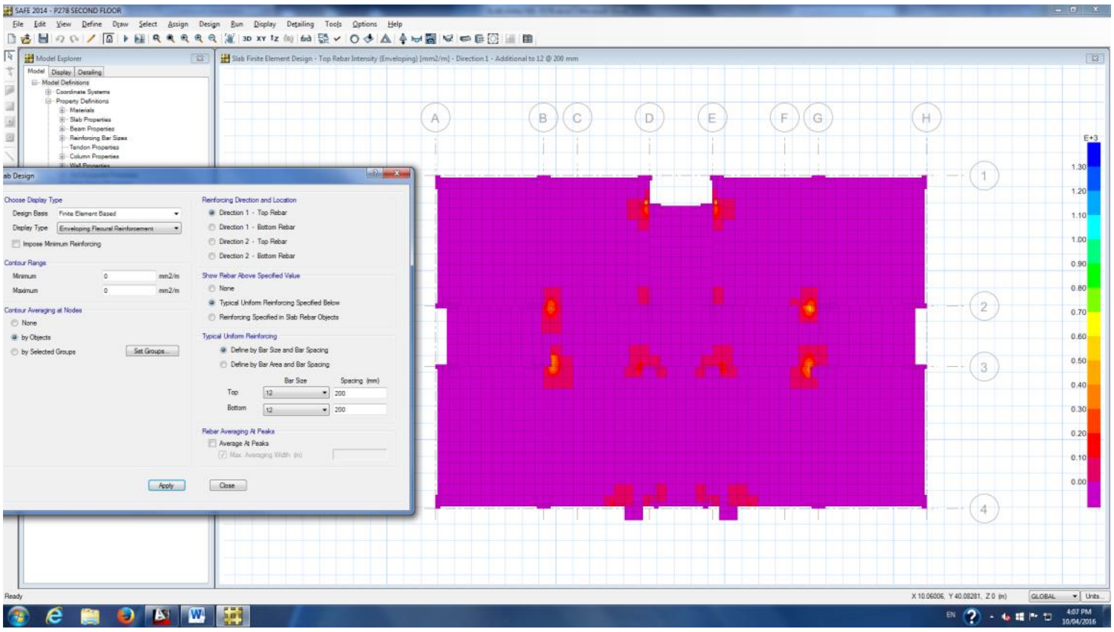
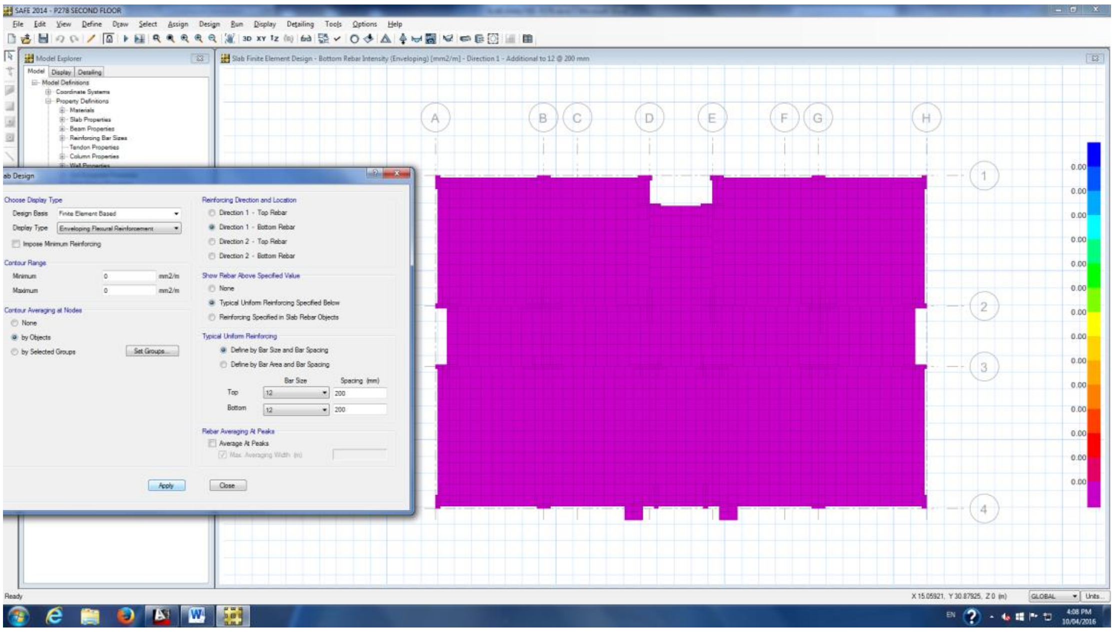
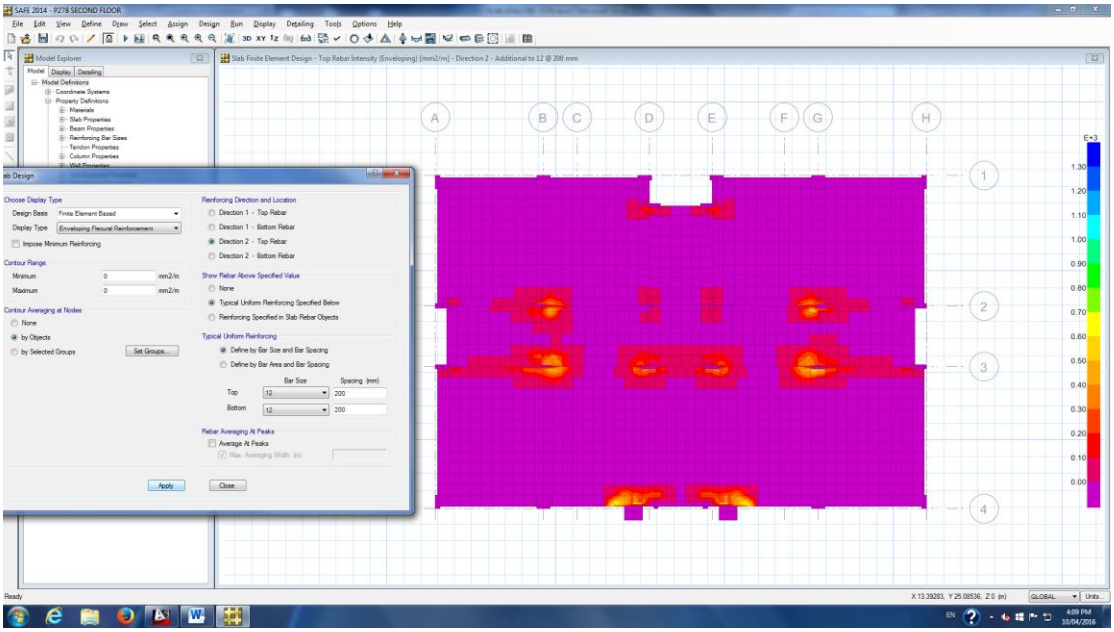


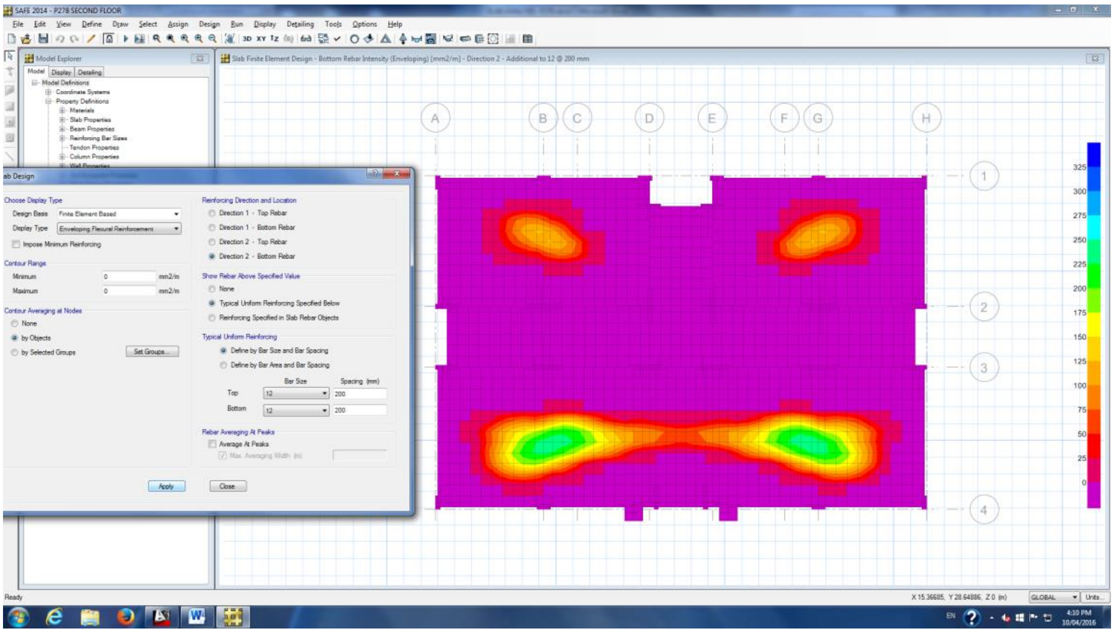
Top Roof Slab Rebar Required Area – Direction 1 Top Rebar



Top Roof Slab Rebar Required Area – Direction 1 Bottom Rebar

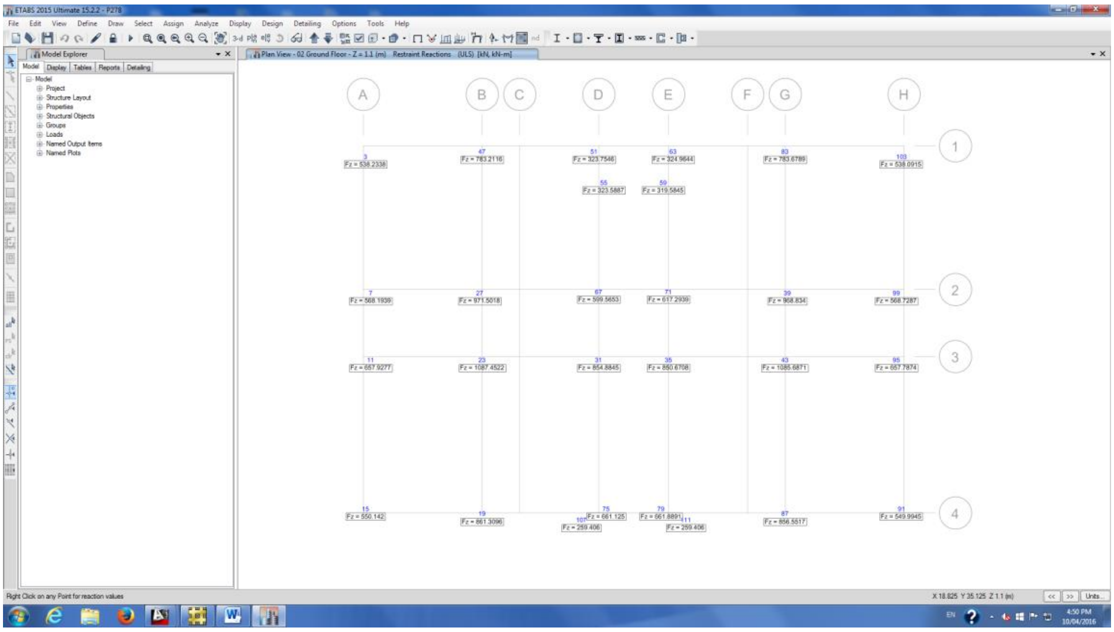


Top Roof Slab Rebar Required Area – Direction 2 Top Rebar



Top Roof Slab Rebar Required Area – Direction 2 Bottom Rebar

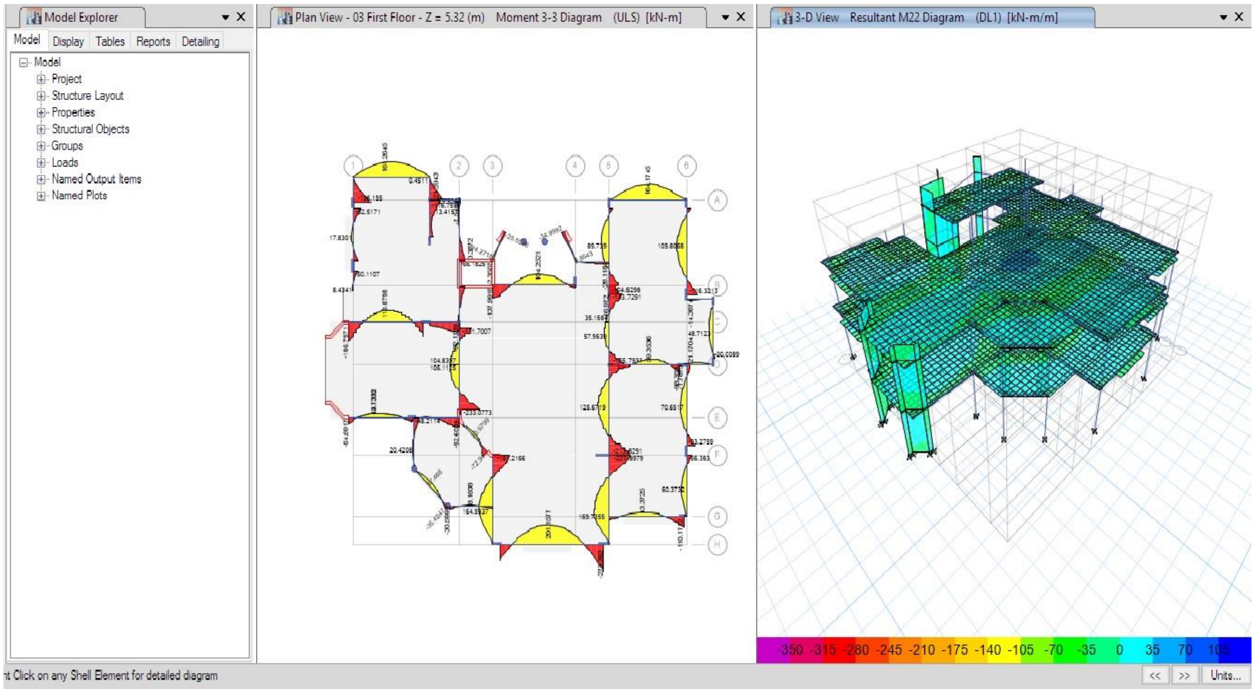
GLOBAL REACTION – LOAD CASE ULS



Force Unit- kN

ETABS

ANALYSIS AND DESIGN OF RESIDENTIAL VILLA


Model Explorer
Model
Display
Tables
Reports
Detailing
Model
Project
Structure Layout
Properties
Structural Objects
Groups
Loads
Named Output Items
Named Plots
Plan View - 03 First Floor - Z = 5.32 (m)   Moment 3-3 Diagram   (ULS) [kN-m]
3-D View   Resultant M22 Diagram   (DL1) [kN-m/m]
-350 -315 -280 -245 -210 -175 -140 -105 -70 -35 0 35 70 105
Click on any Shell Element for detailed diagram
Units...

ROBOT STRUCTURAL ANALYSIS

ANALYSIS AND DESIGN OF RESIDENTIALVILLA

This report shows the structural design of the Floors and Global Reaction forces of Columns under load case ULS. The 3D Analytical Model is created and analysed in CSI SAFE 2014 V14.1.1 software. All analysis and design are based on the BS 8110-1997 code. All design parameters are shown through Table 1 to 5.

Concrete	Value	Unit
Characteristic Compressive Strength, f_{ck}	C40	N/mm^2
Young Modulus, E:	28000	N/mm^2
Poisson Ratio	0.2	—
Shear Modulus, G	11666.66	N/mm^2
Density	25	KN/m^3
Damping Ratio	0.15	—
Thermal Expansion Coefficient	0.000012	$(1/^{\circ}C)$

Table 1

Steel	Value	Unit
Yield Strength of Steel, f_y:	460	N/mm^2
Poisson Ratio	0.3	—
Shear Modulus, G	80000	N/mm^2
Density	77.01	KN/m^3
Damping Ratio	0.06	—
Thermal Expansion Coefficient	0.000012	$(1/^{\circ}C)$
Reduction Factor For Shear	1.54	
Limit Strength for Tension	640	N/mm^2

Table 2

Load	Value	Unit
Super Imposed Dead (Floor Finishes + Partition Wall Load)	6	KN/m^2
Live Load	2.5	KN/m^2

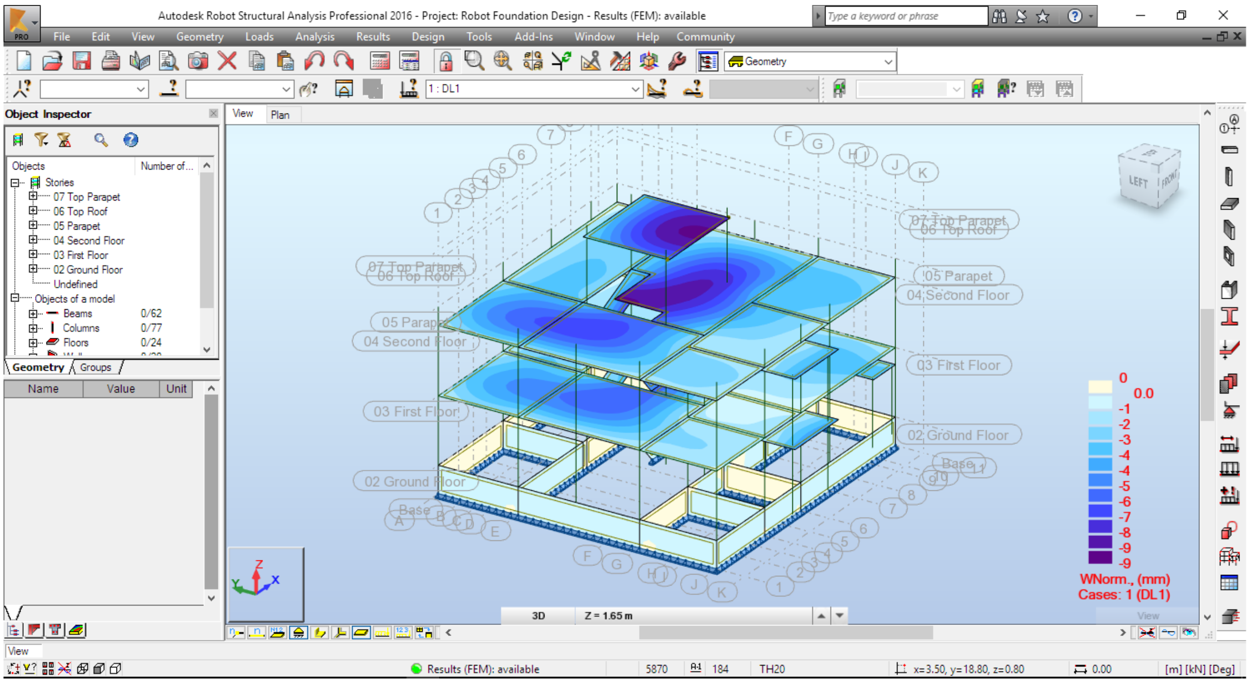
Table 3

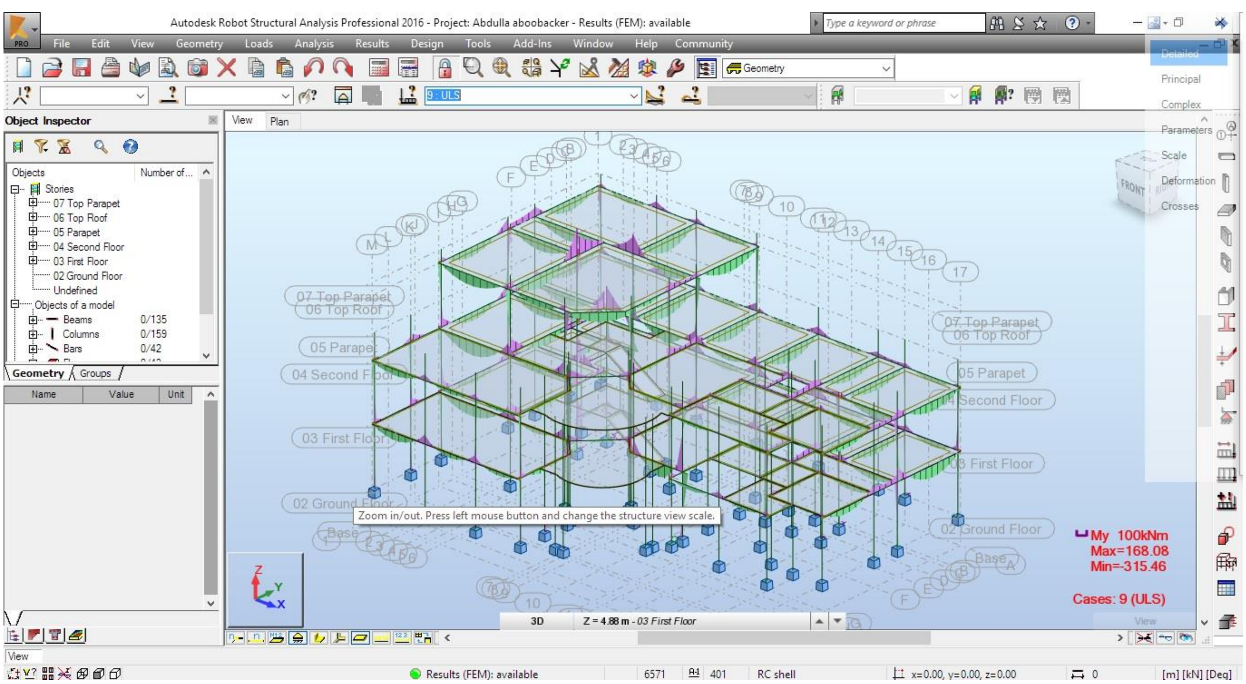
Load Factor	Value	Unit
Live Load	1.6	—
Dead Load	1.4	—

Table 4

Load Combinations	Value
ULS	1.4DL+1.6LL
SLS	1DL+1LL

Table 5


Autodesk Robot Structural Analysis Professional 2016 - Project: Robot Foundation Design - Results (FEM): available
File Edit View Geometry Loads Analysis Results Design Tools Add-Ins Window Help Community
Object Inspector
Stories
07 Top Parapet
06 Top Roof
05 Parapet
04 Second Floor
03 First Floor
02 Ground Floor
Undefined
Objects of a model
Beams 0/62
Columns 0/77
Floors 0/24
Geometry Groups
Name Value Unit
WNorm., (mm)
Cases: 1 (DL1)
3D Z = 1.65 m
Results (FEM): available
x=3.50, y=18.80, z=0.80
[m] [kN] [Deg]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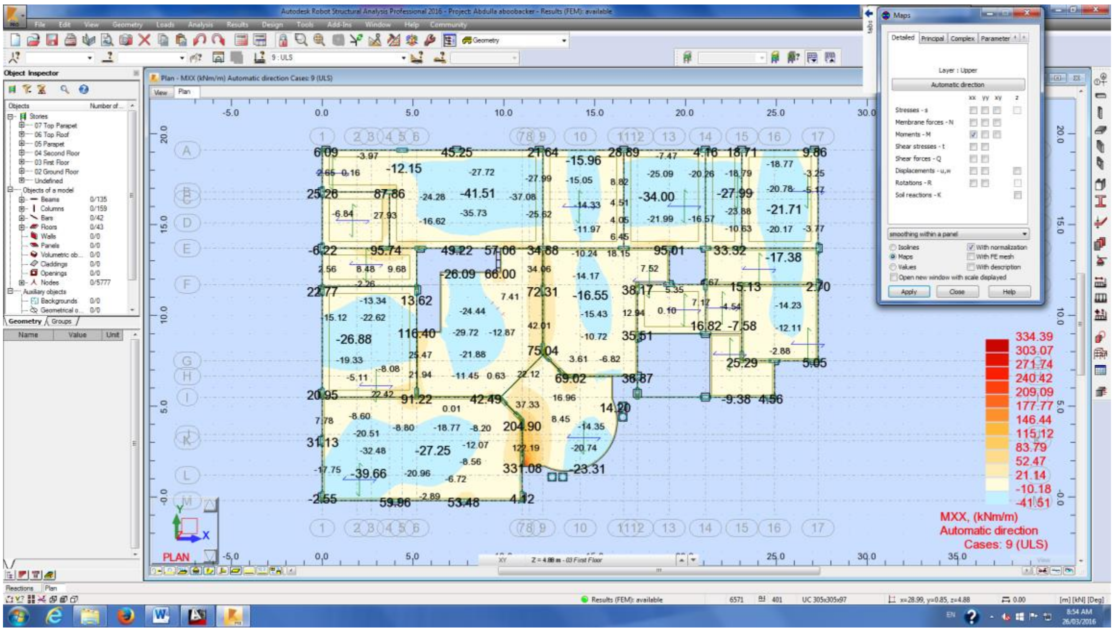
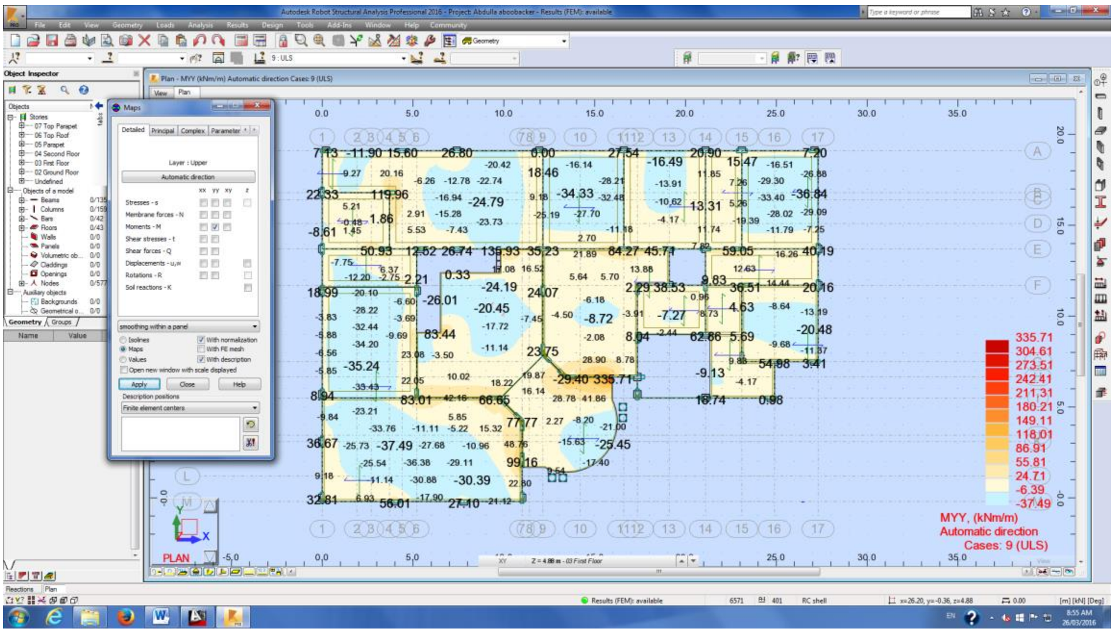
File Edit View Geometry Loads Analysis Results Design Tools Add-Ins Window Help Community
Object Inspector
Stories
07 Top Parapet
06 Top Roof
05 Parapet
04 Second Floor
03 First Floor
02 Ground Floor
Undefined
Objects of a model
Beams 0/135
Columns 0/159
Bars 0/42
Geometry Groups
Name Value Unit
Zoom in/out. Press left mouse button and change the structure view scale.
My 100kNm
Max=168.08
Min=-315.46
Cases: 9 (ULS)
3D Z = 4.88 m - 03 First Floor
Results (FEM): available
RC shell
x=0.00, y=0.00, z=0.00
[m] [kN] [Deg]

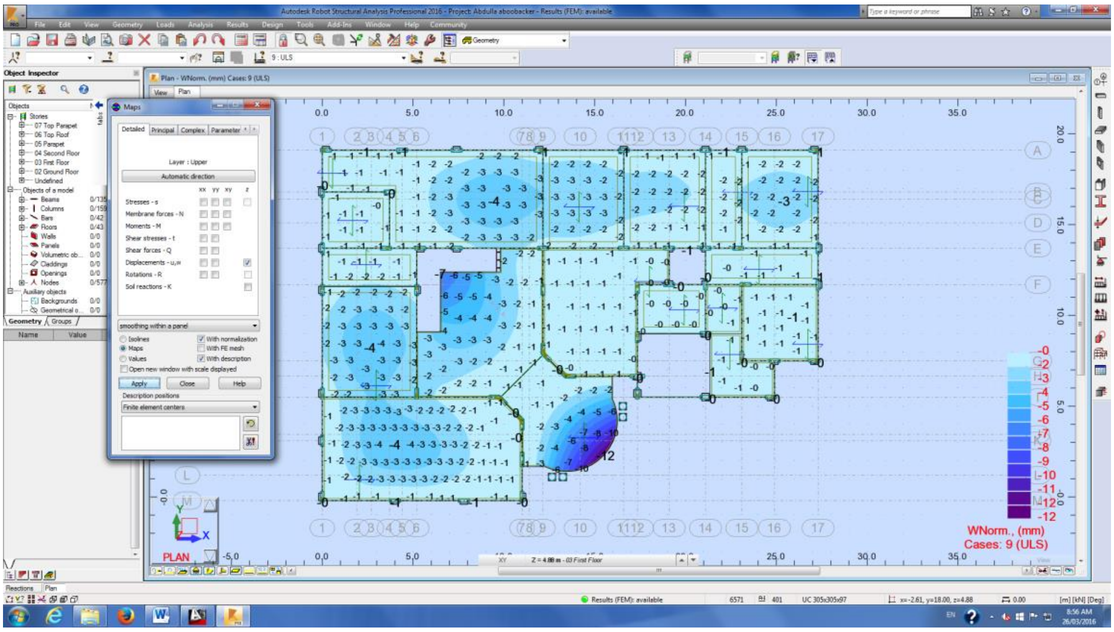
FIRST FLOOR SLAB ANALYSIS



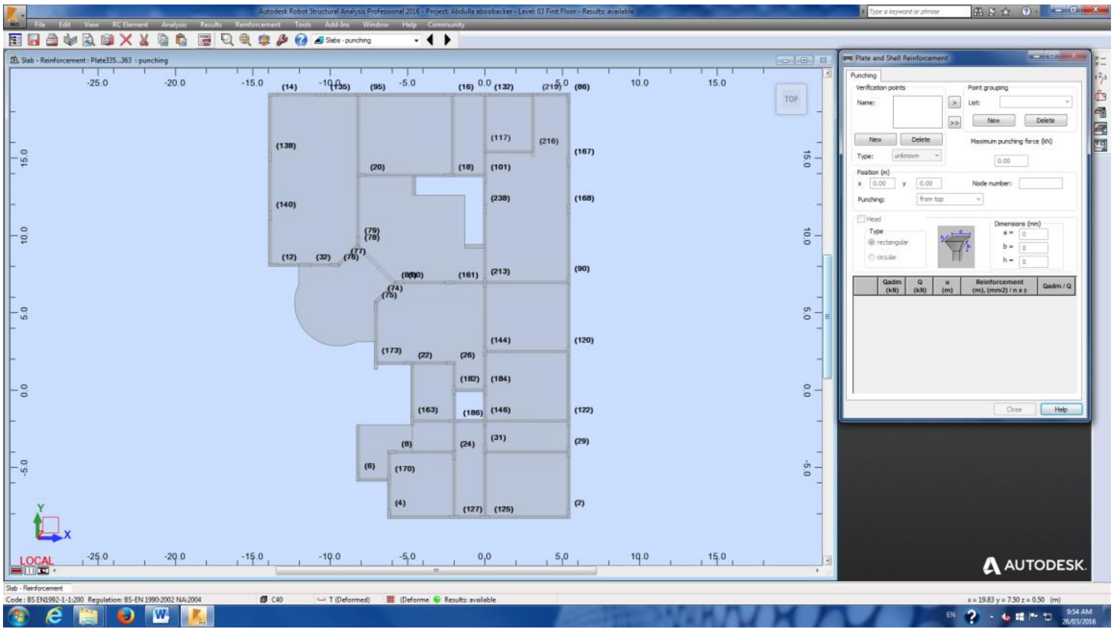
First Floor Slab Moment M11- Load Case- ULS



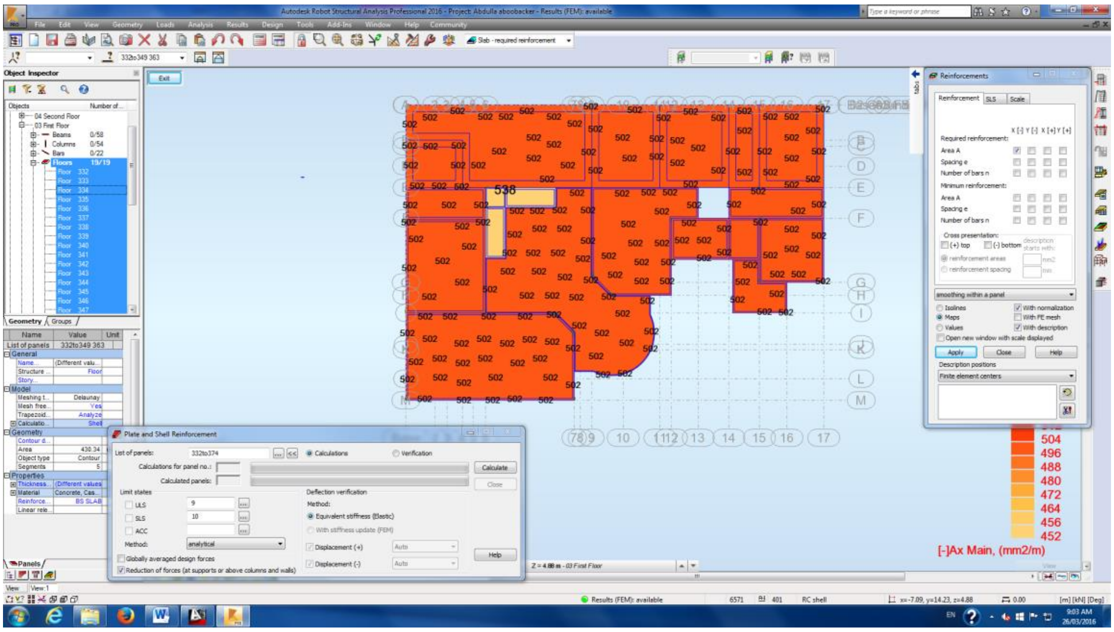
First Floor Slab Moment M22- Load Case- ULS



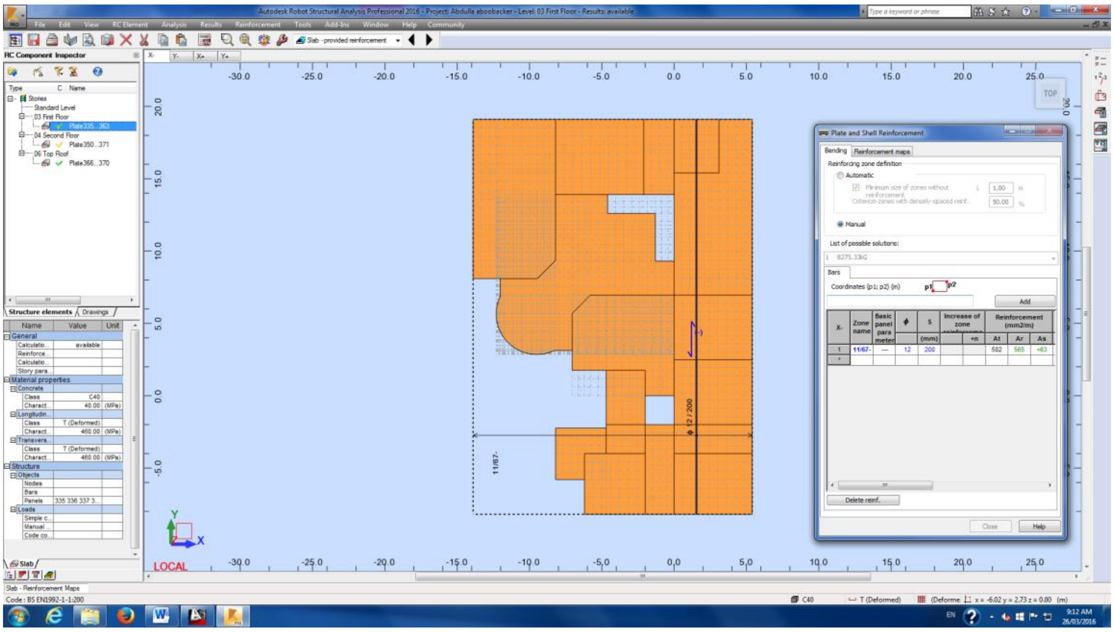
First Floor Downward Displacement-ULS



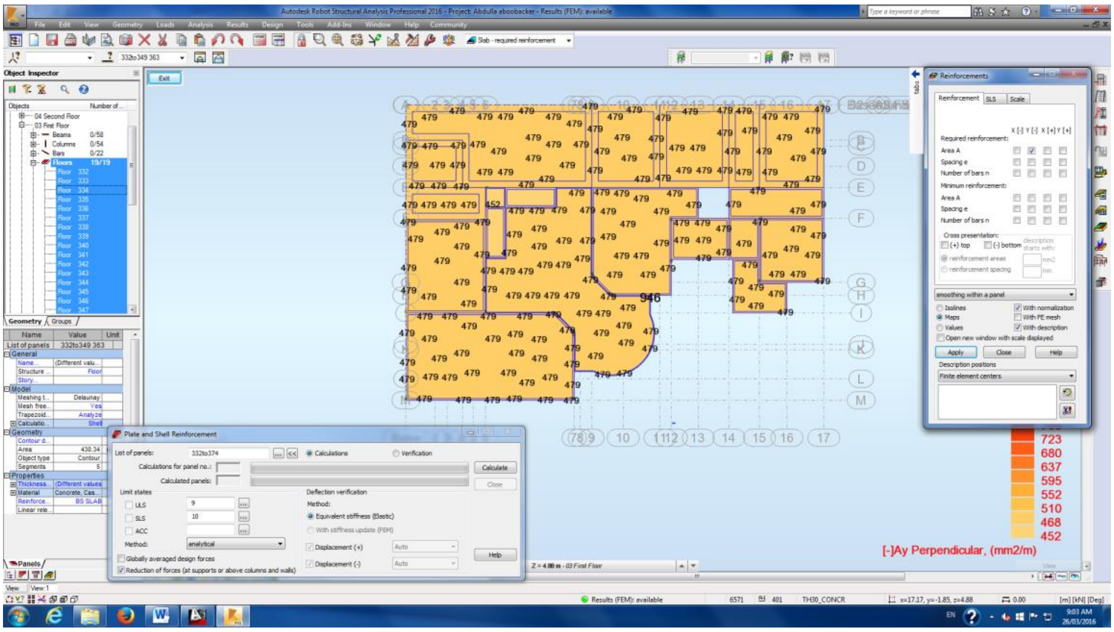
First Floor Slab Punching Check- No Punching



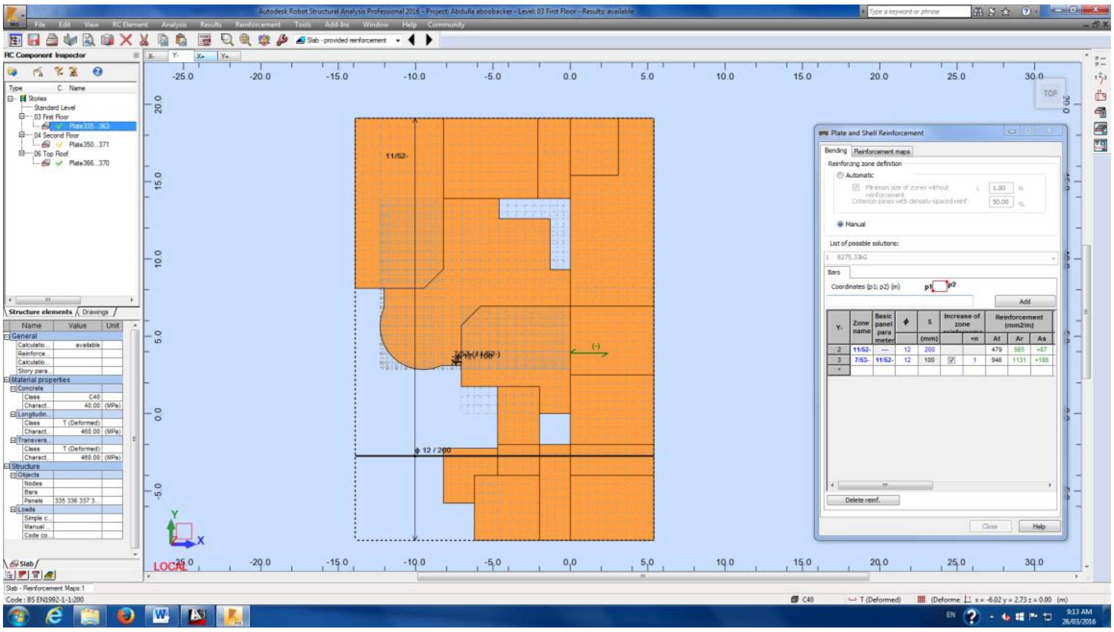
First Floor Slab Rebar Required Area Bottom X direction



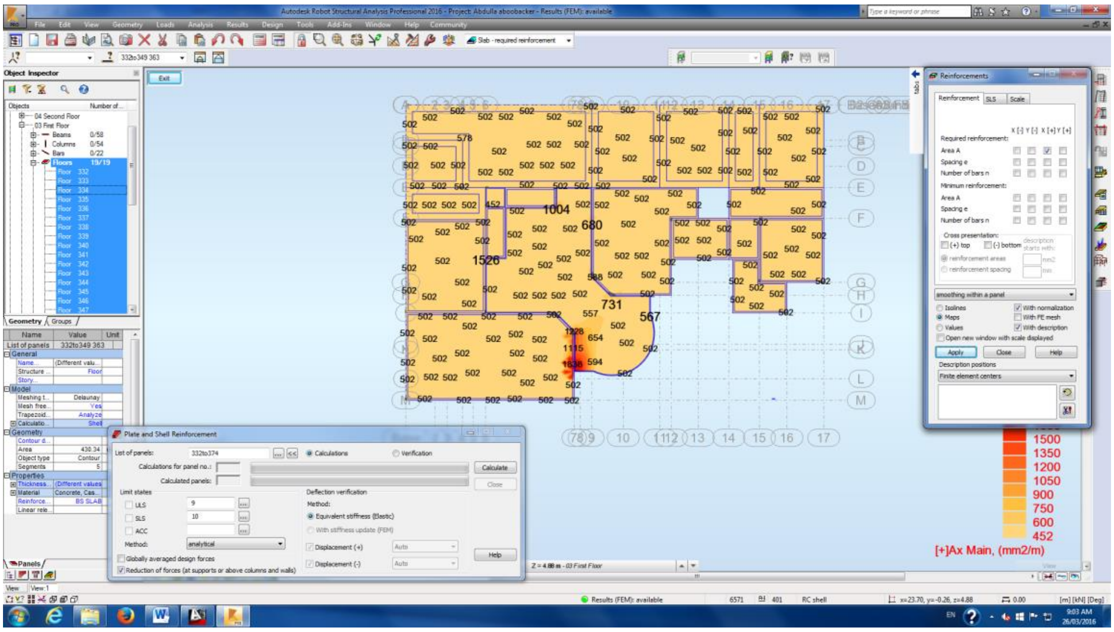
First Floor Slab Rebar Provided Area Bottom X direction



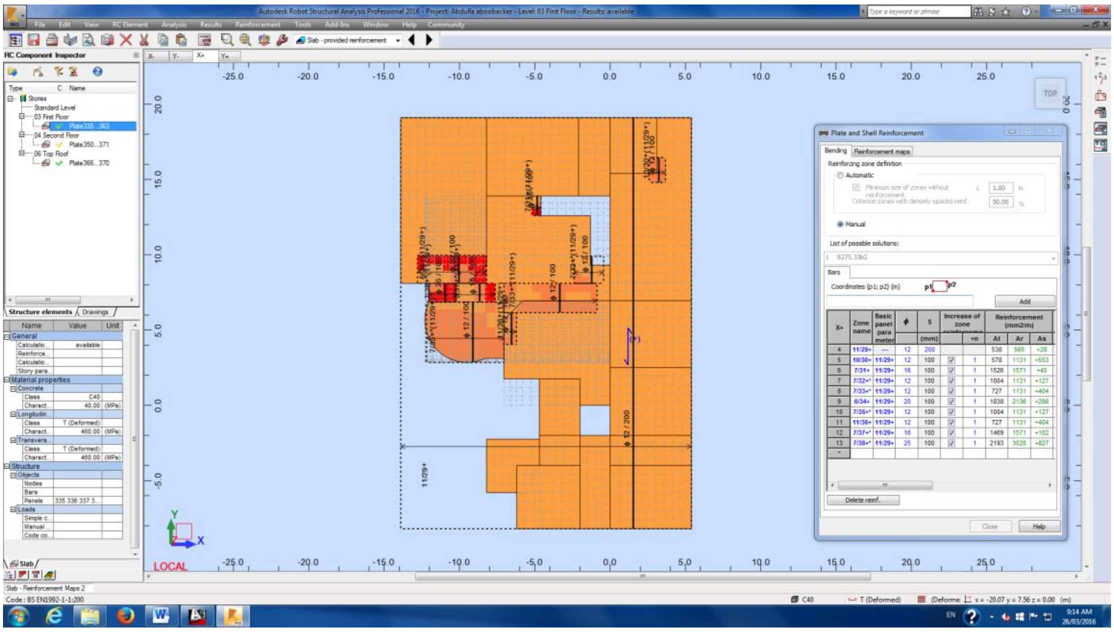
First Floor Slab Rebar Required Area Bottom Y direction



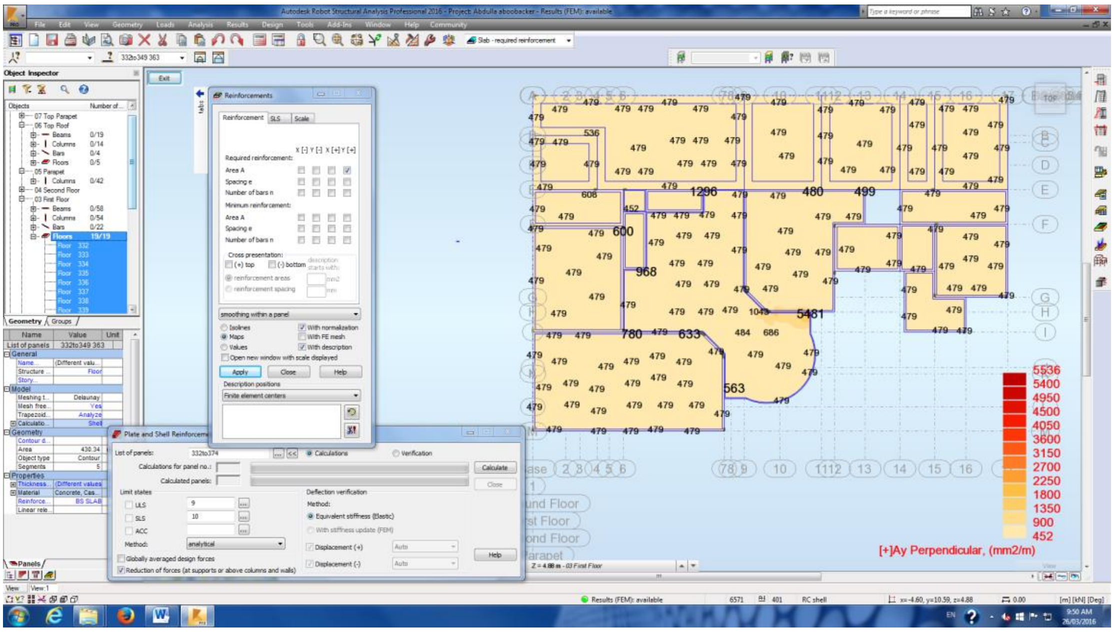
First Floor Slab Rebar Provided Area Bottom Y direction



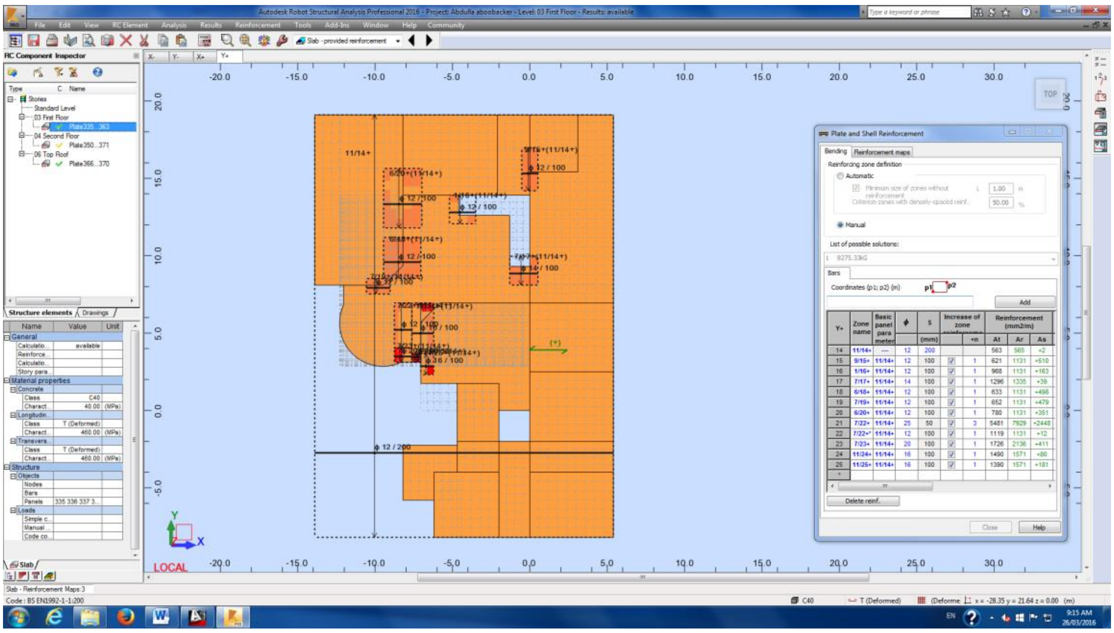
First Floor Slab Rebar Required Area Top X direction



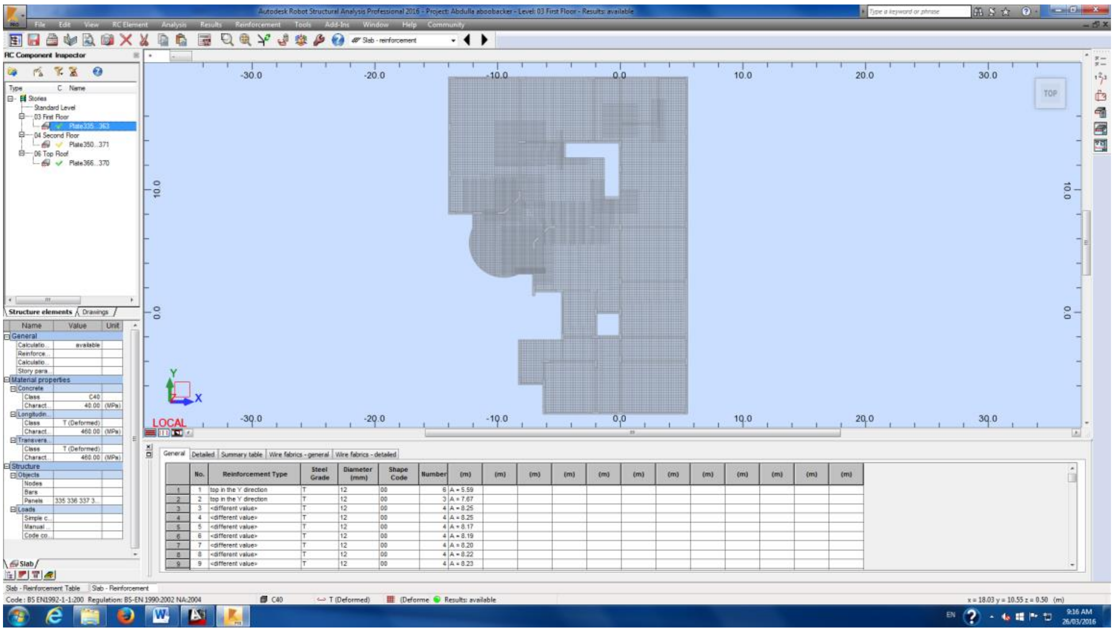
First Floor Slab Rebar Provided Area Top X direction



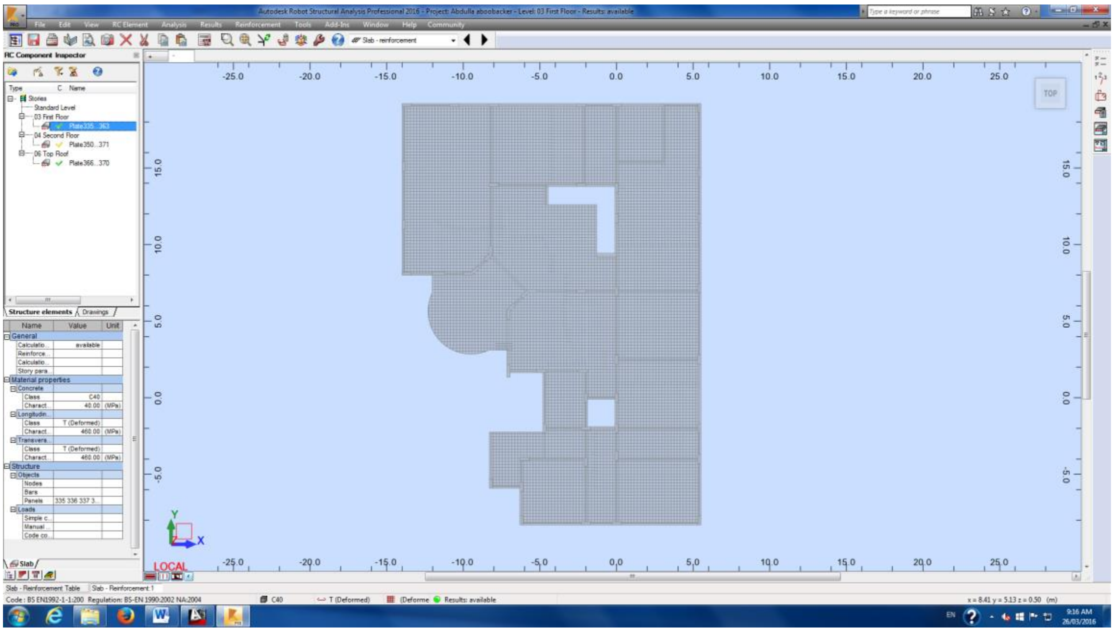
First Floor Slab Rebar Required Area Top Y direction



First Floor Slab Rebar Provided Area Top Y direction

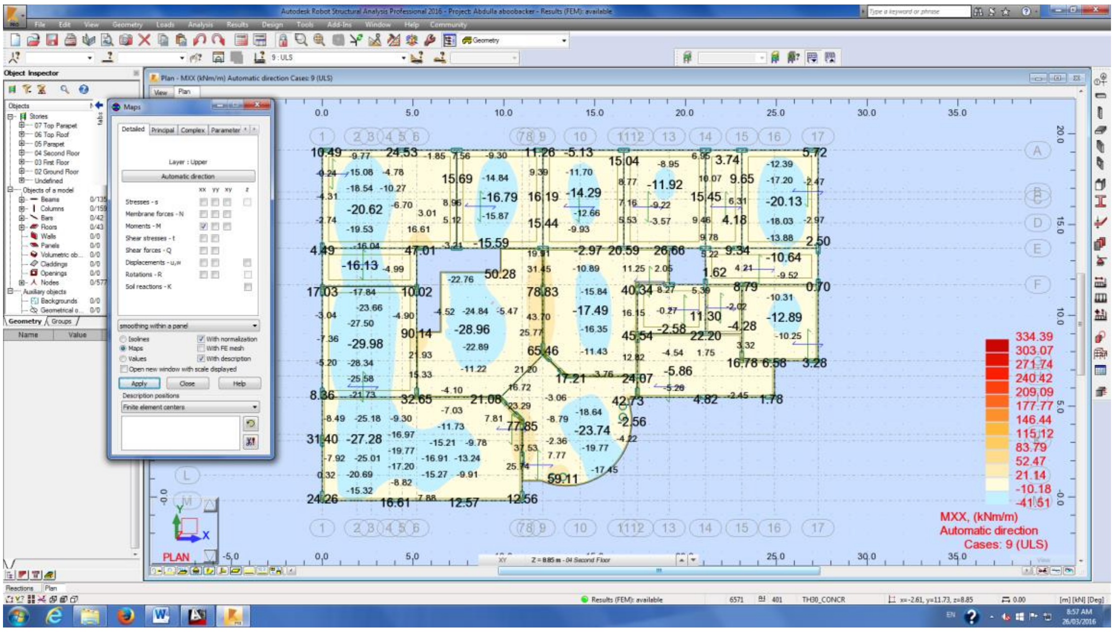


First Floor Slab Rebar Provided Area Top View

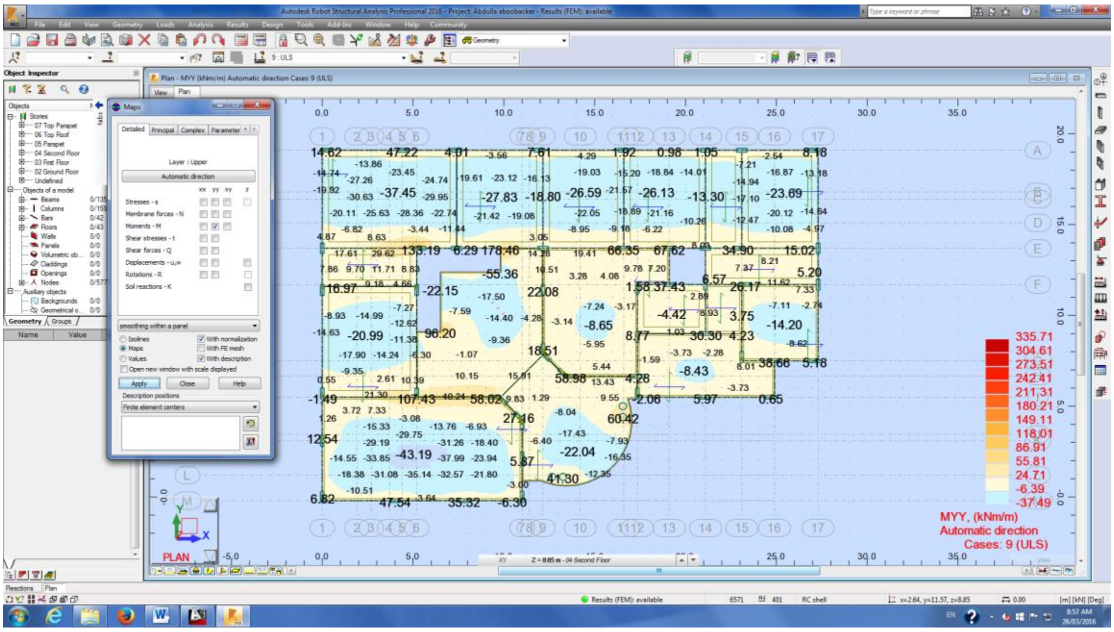


First Floor Slab Rebar Provided Area Bottom View

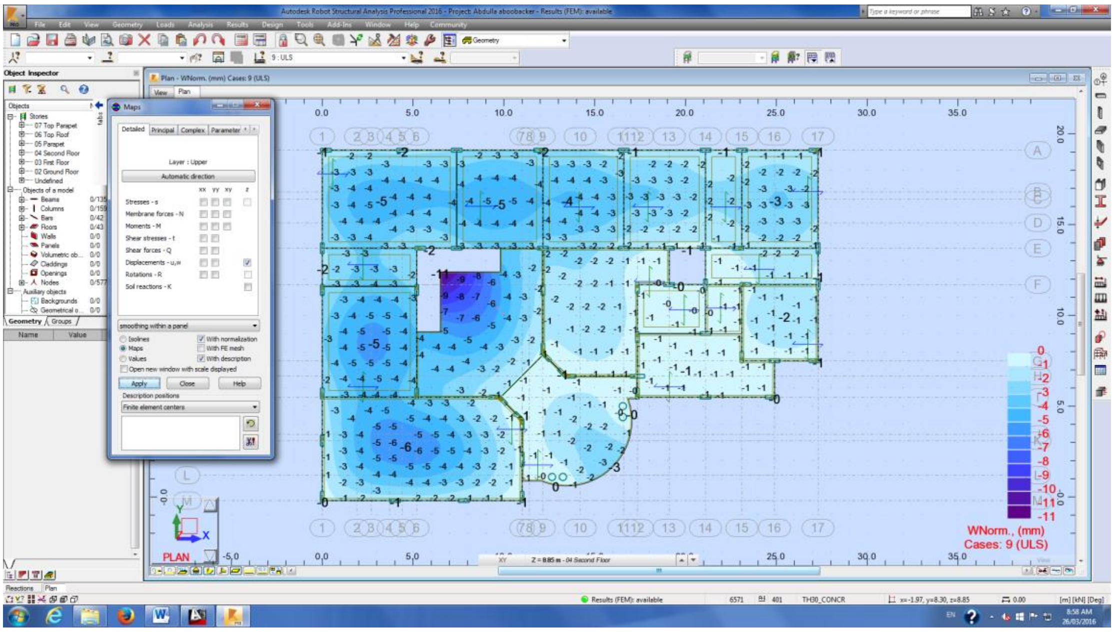
ROOF FLOOR SLAB ANALYSIS



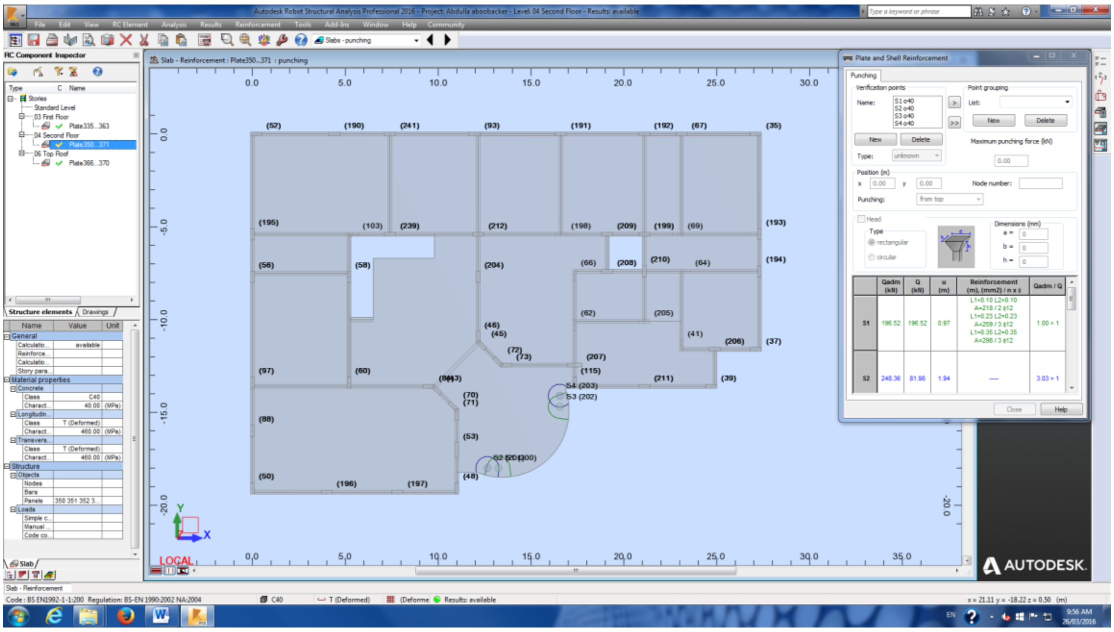
Roof Floor Slab Moment M11-ULS



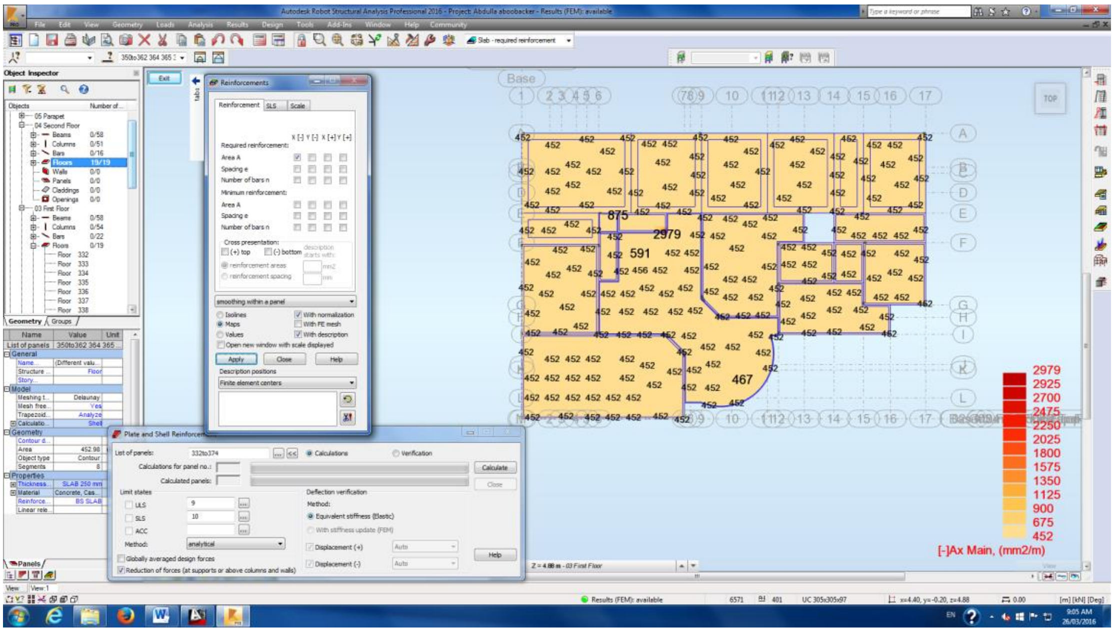
Roof Floor Slab Moment M22-ULS



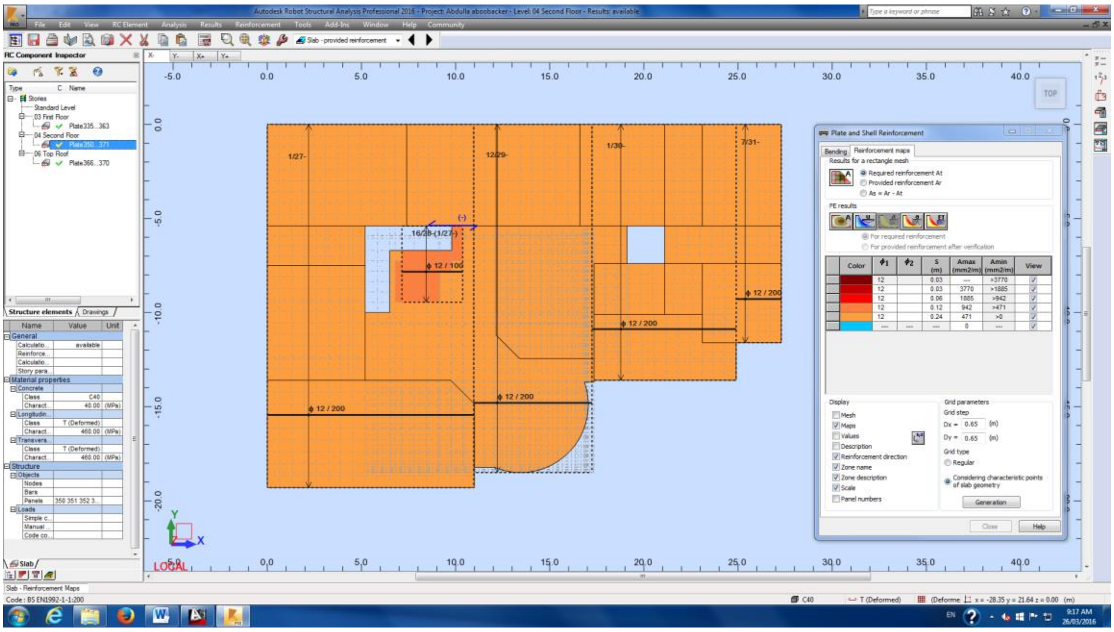
Roof Floor Downward Displacement-ULS



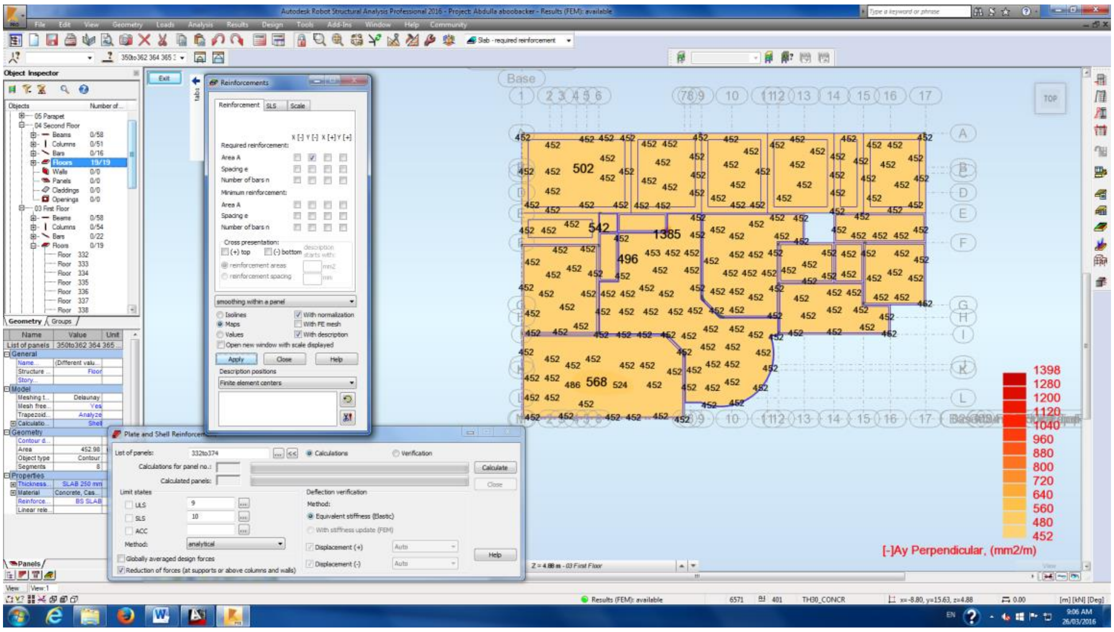
Roof Floor Slab Punching Check- Punching Correction Reinforcement Required at Indicated Green Area



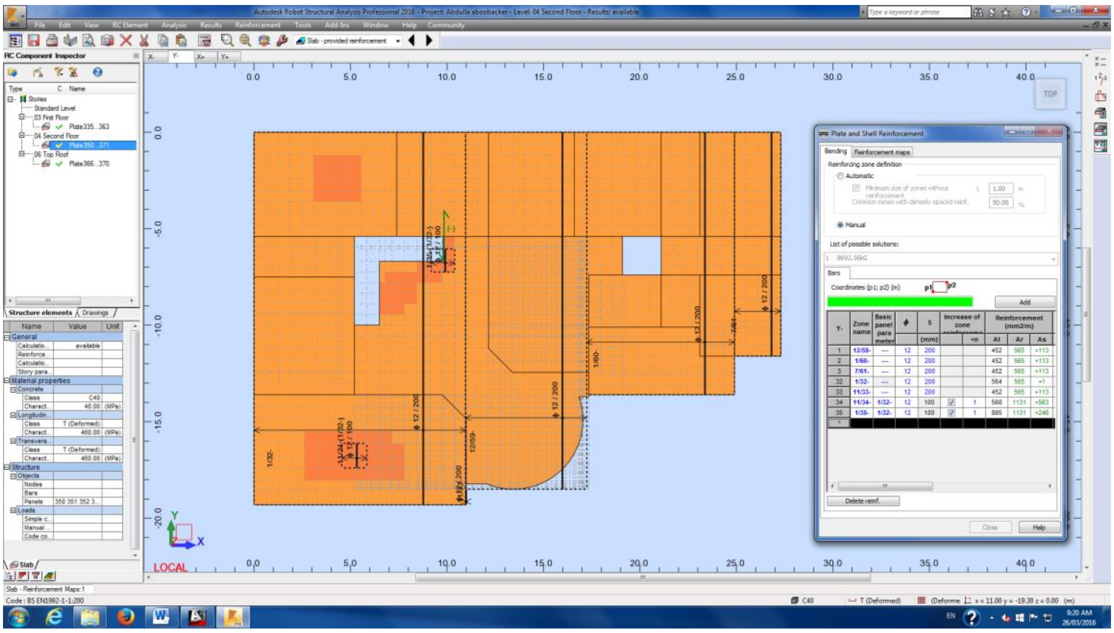
Roof Floor Slab Rebar Required Area Bottom X direction



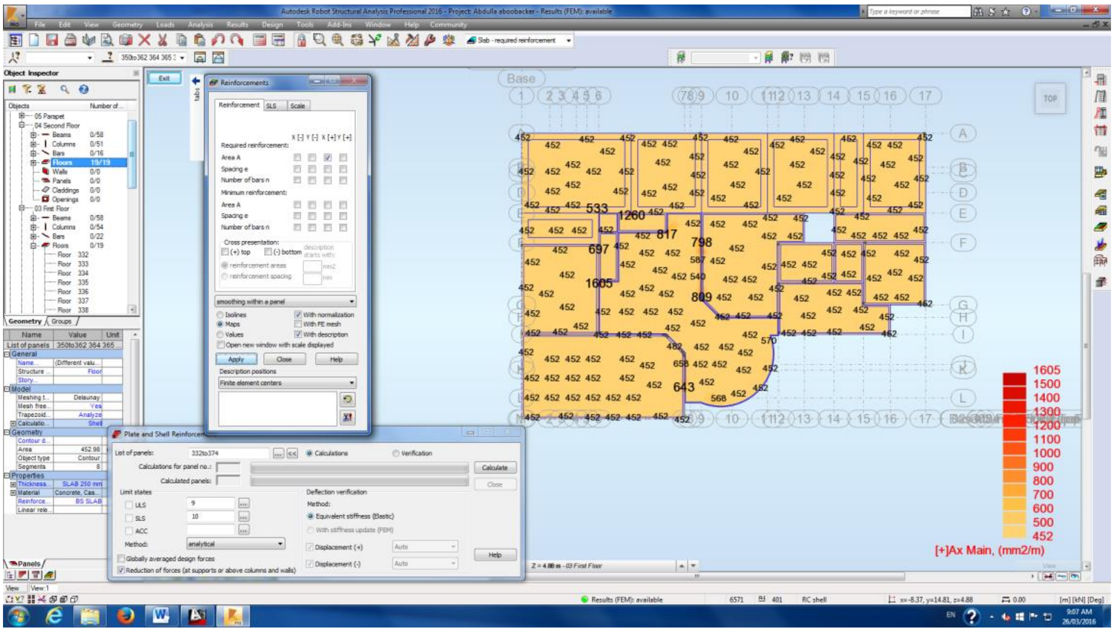
Roof Floor Slab Rebar Provided Area Bottom X direction



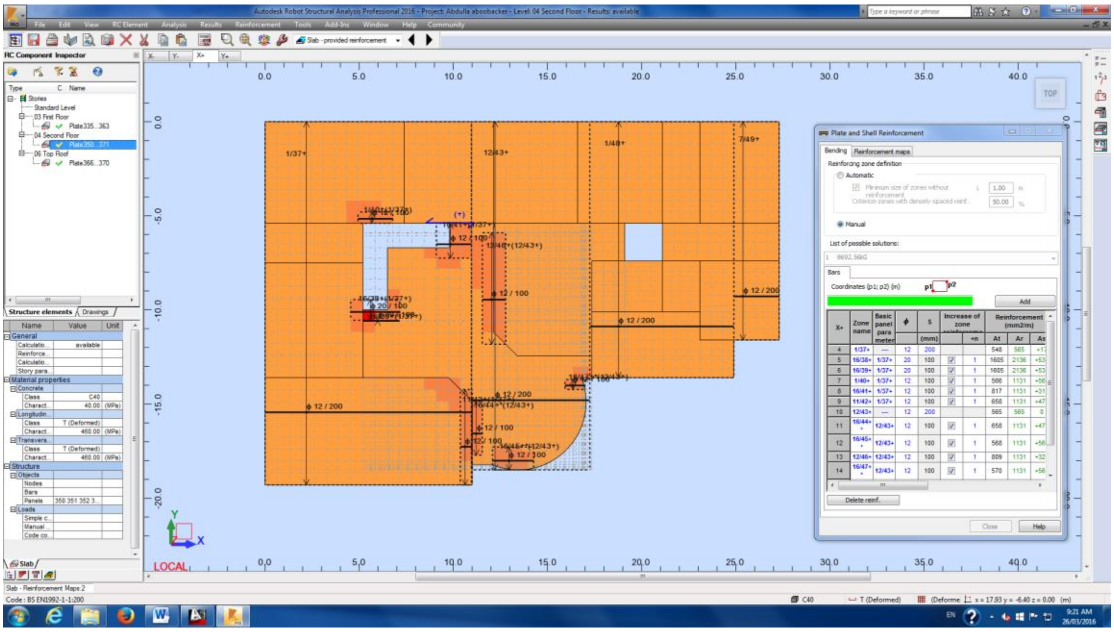
Roof Floor Slab Rebar Required Area Bottom Y direction



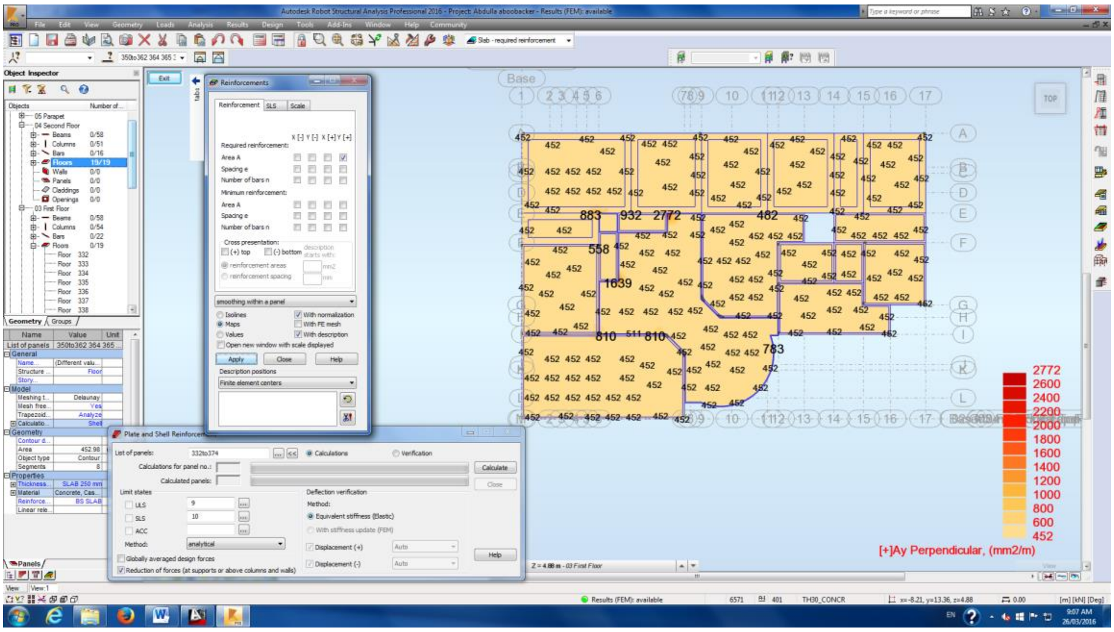
Roof Floor Slab Rebar Provided Area Bottom Y direction



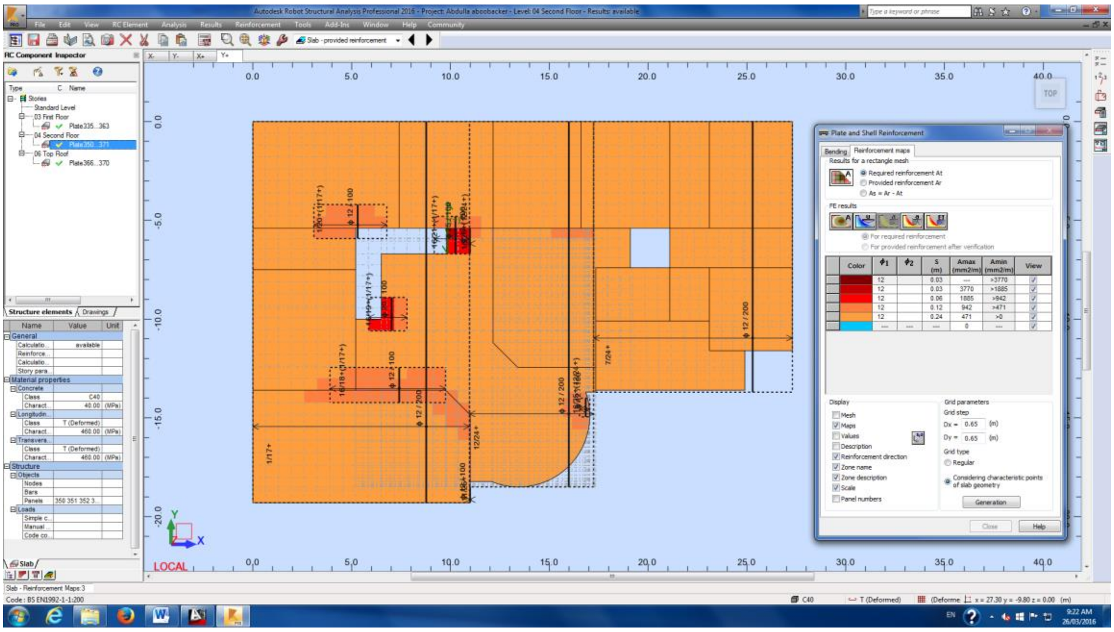
Roof Floor Slab Rebar Required Area Top X direction



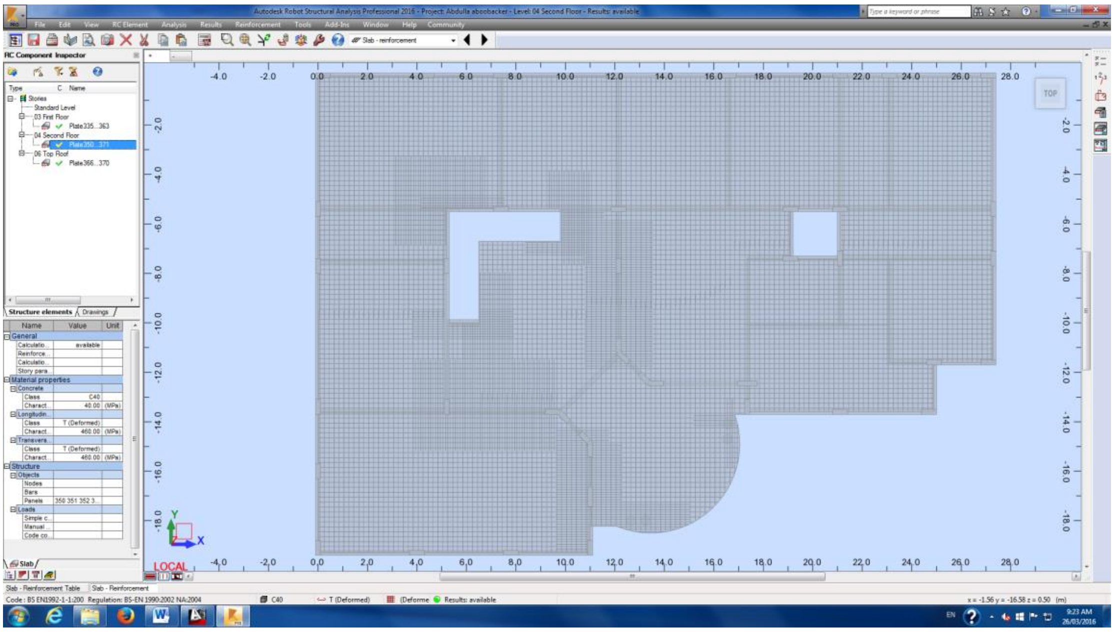
Roof Floor Slab Rebar Provided Area Top X direction



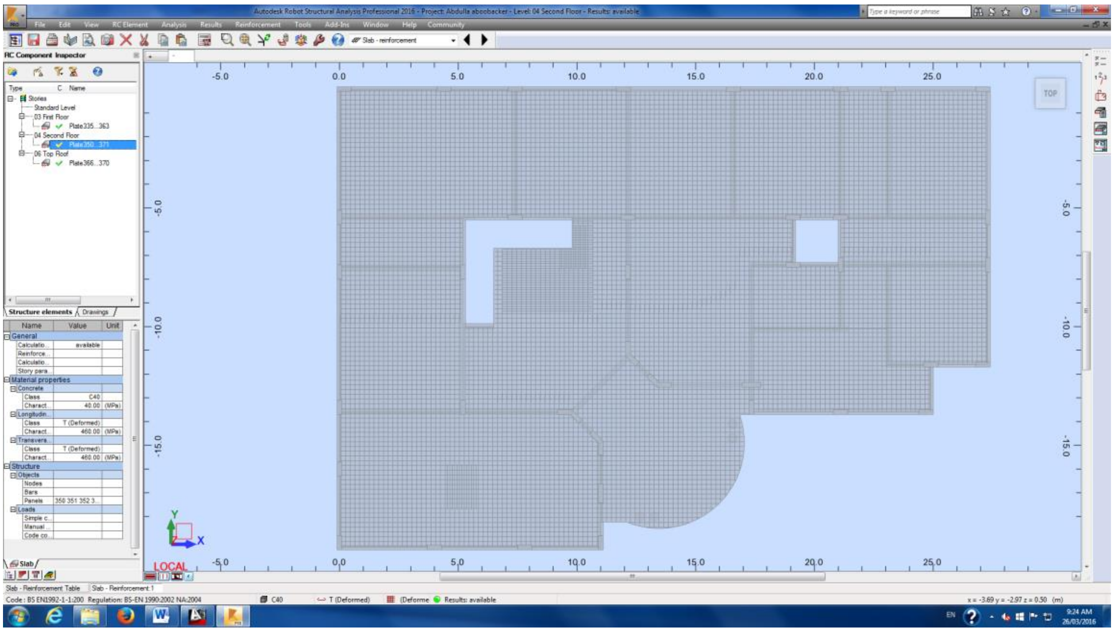
Roof Floor Slab Rebar Required Area Top Y direction



Roof Floor Slab Rebar Provided Area Top Y direction



Roof Floor Slab Rebar Provided Area Top View



Roof Floor Slab Rebar Provided Area Bottom View

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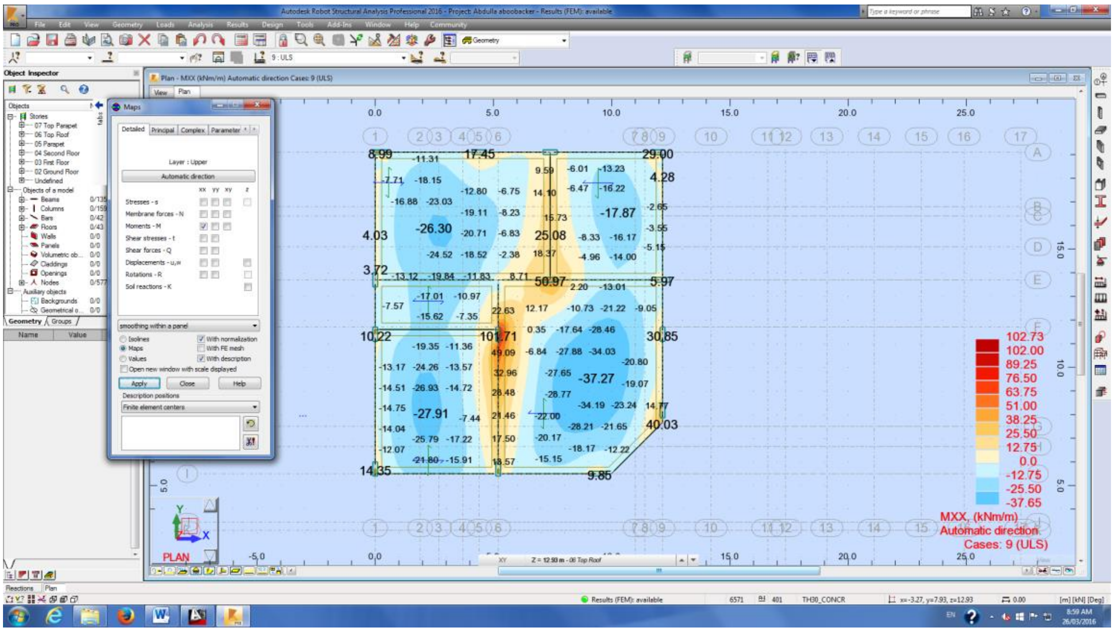
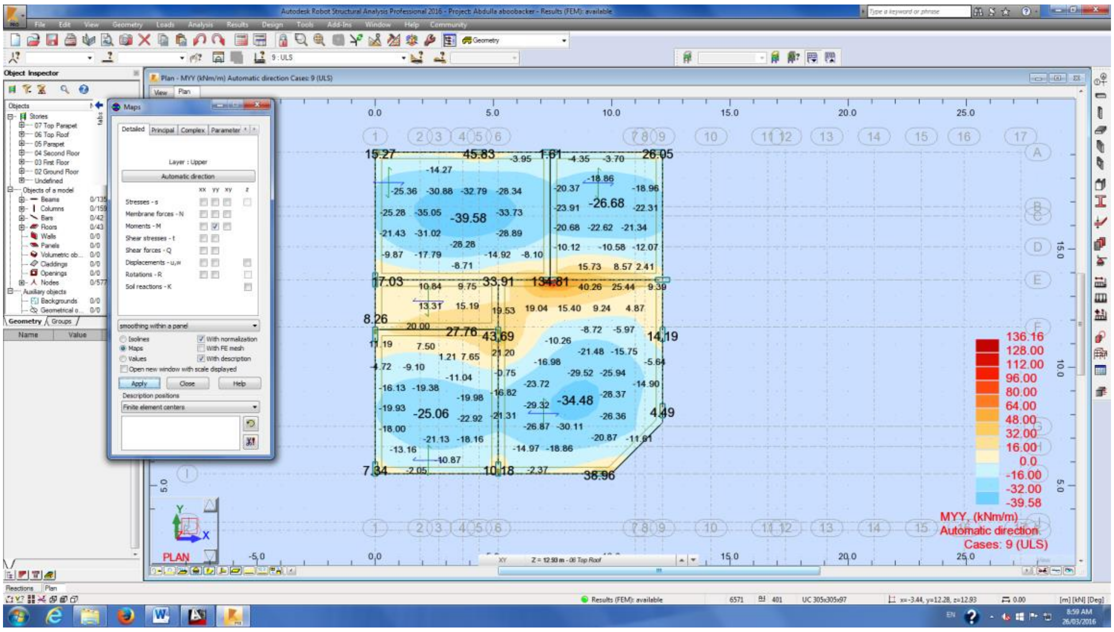
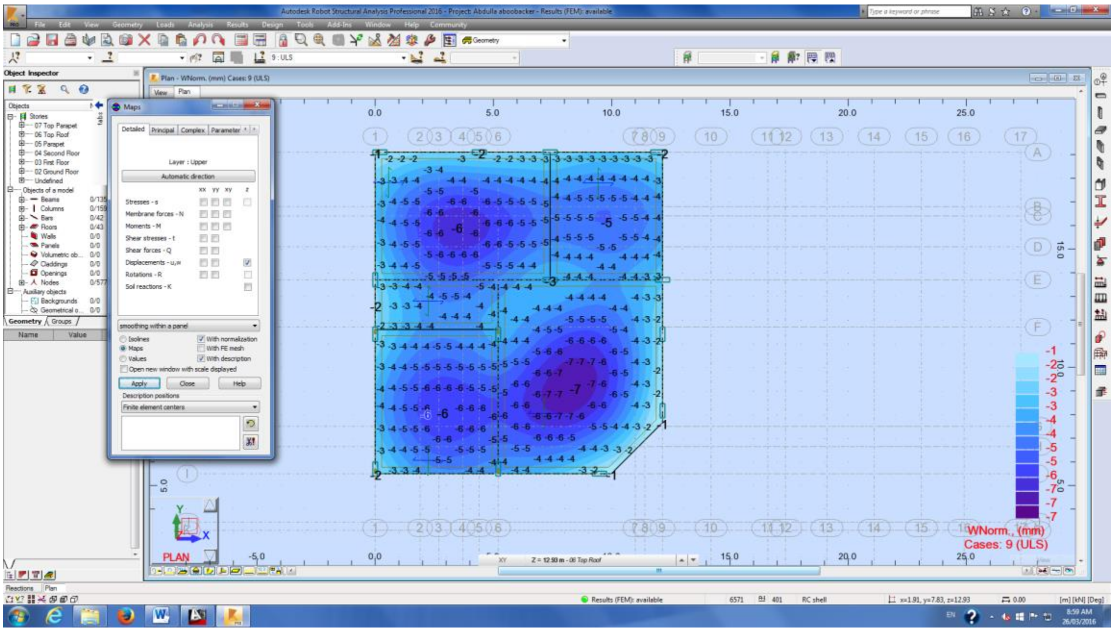
TOP ROOF SLAB ANALYSIS



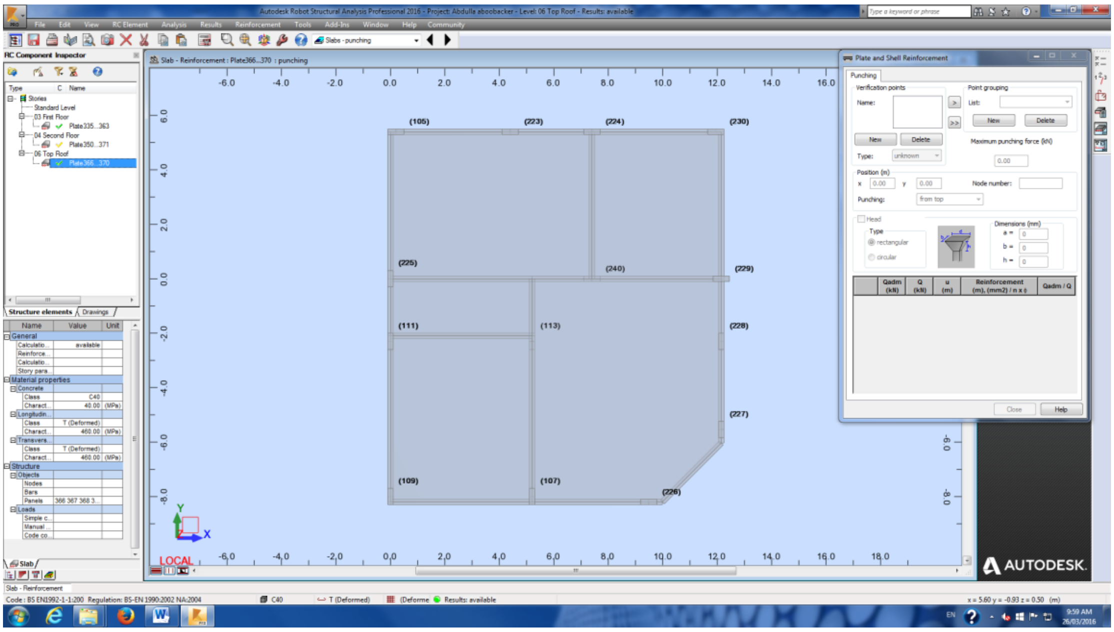
Top Roof Slab Moment M11-ULS



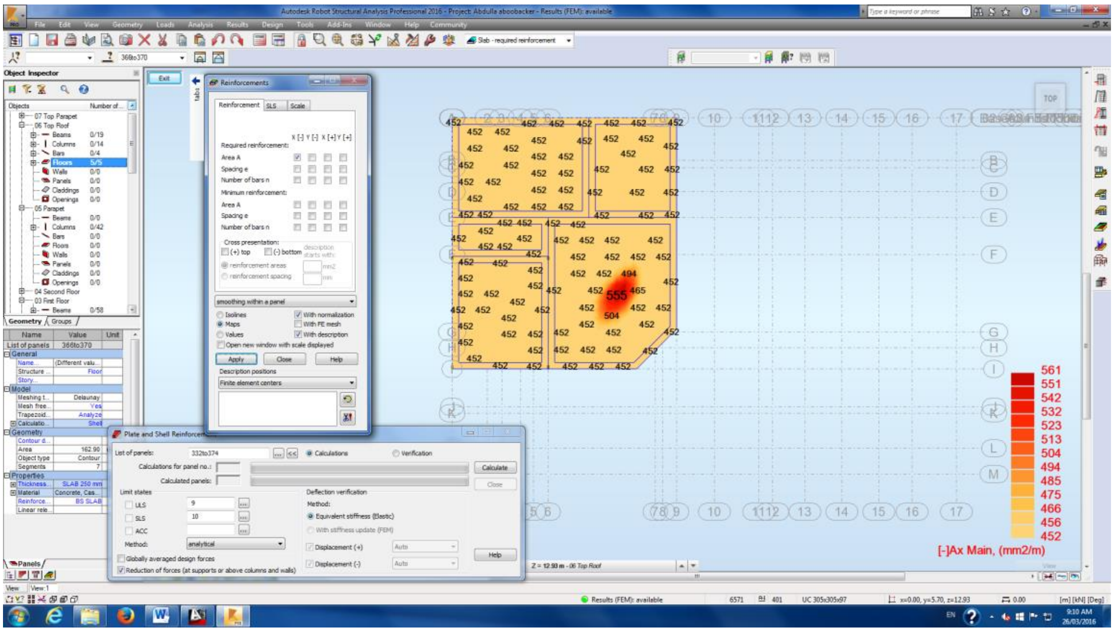
Top Roof Slab Moment M22-ULS



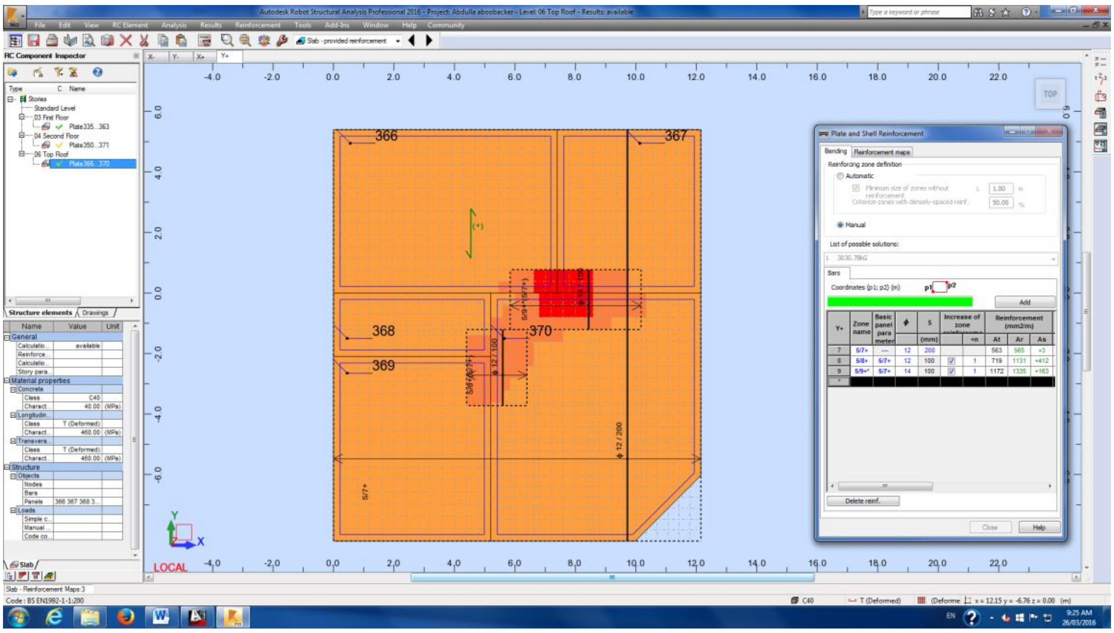
First Floor Downward Displacement-ULS



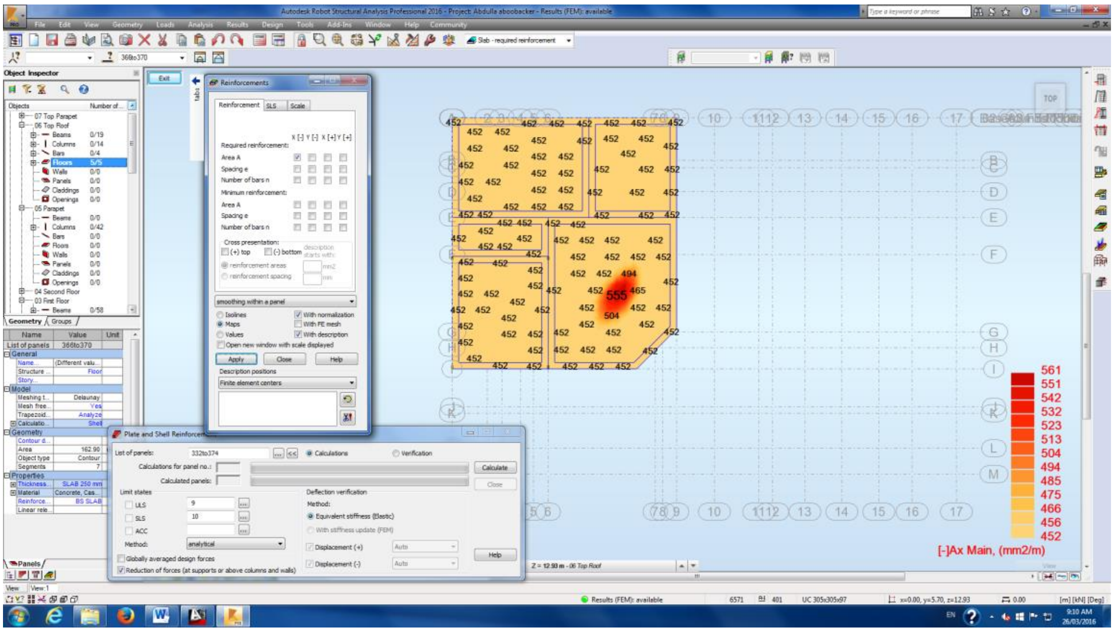
Roof Floor Slab Punching Check- No Punching



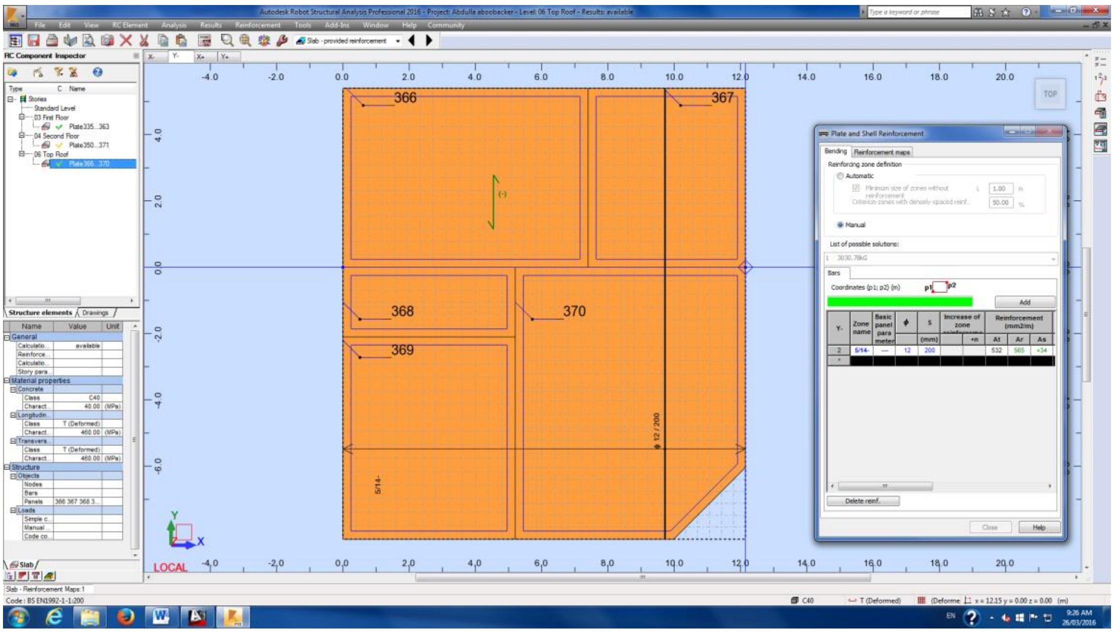
Top Roof Slab Rebar Required Area Bottom X direction



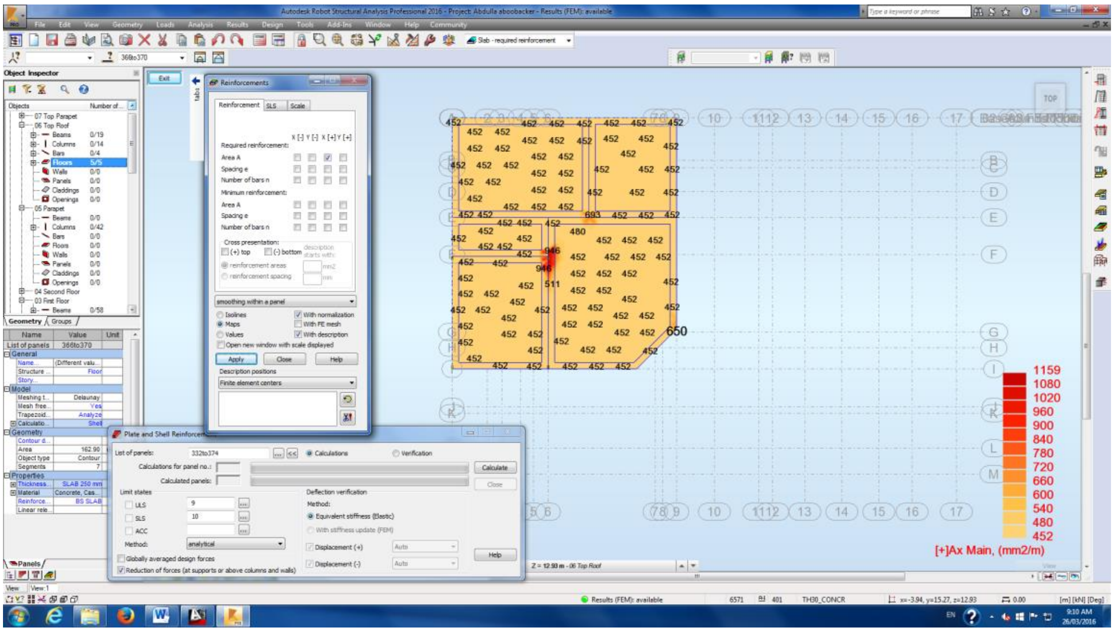
Top Roof Slab Rebar Provided Area Bottom X direction



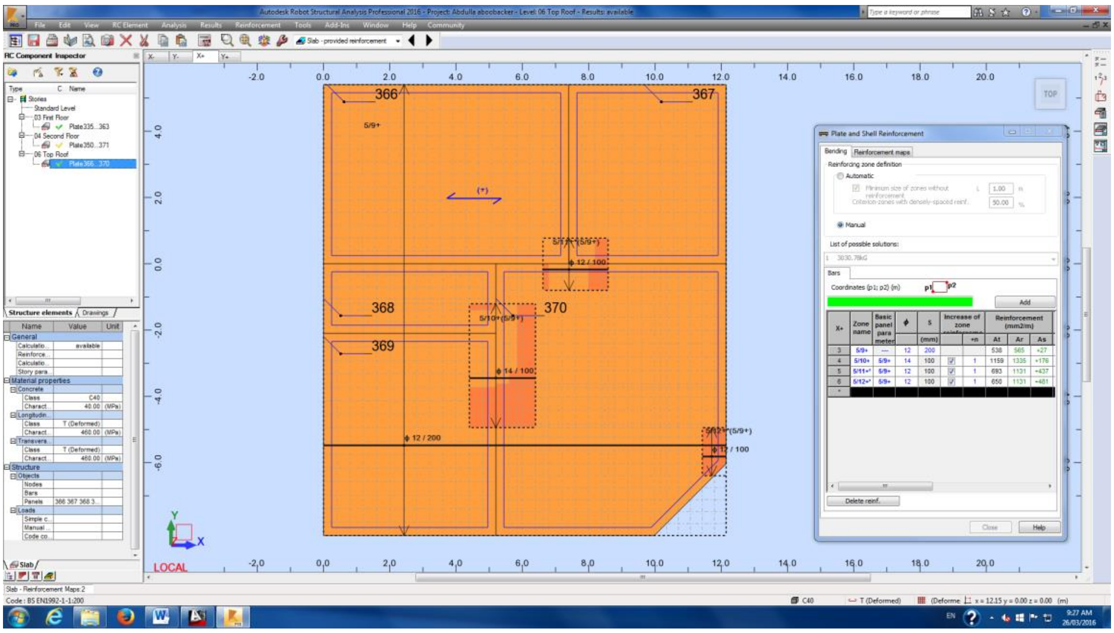
Top Roof Slab Rebar Required Area Bottom Y direction



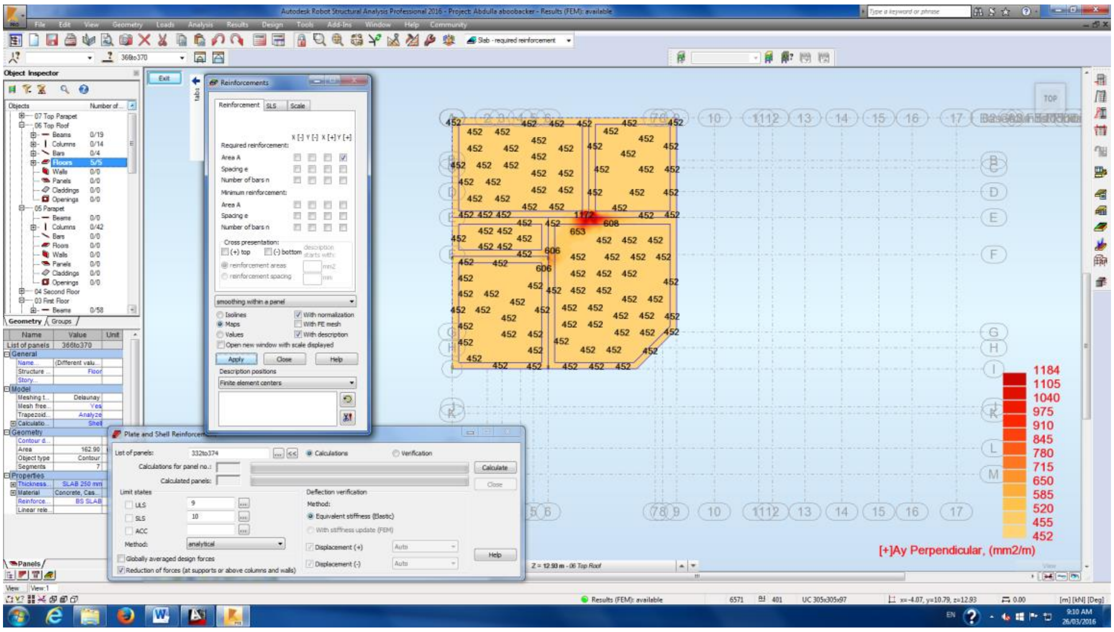
Top Roof Slab Rebar Provided Area Bottom Y direction



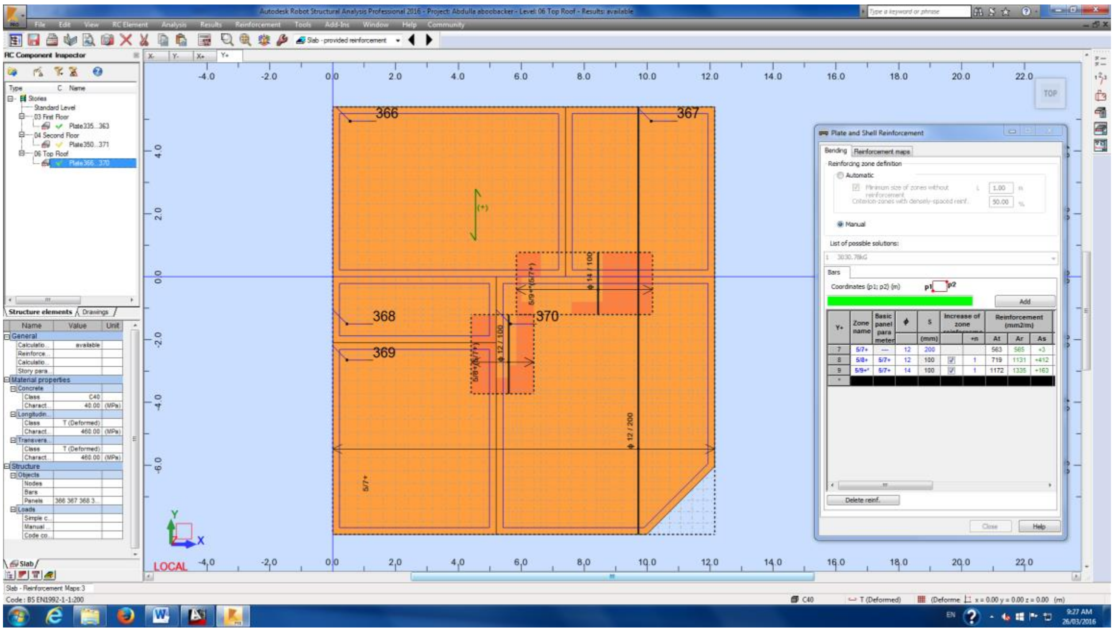
Top Roof Slab Rebar Required Area Top X direction



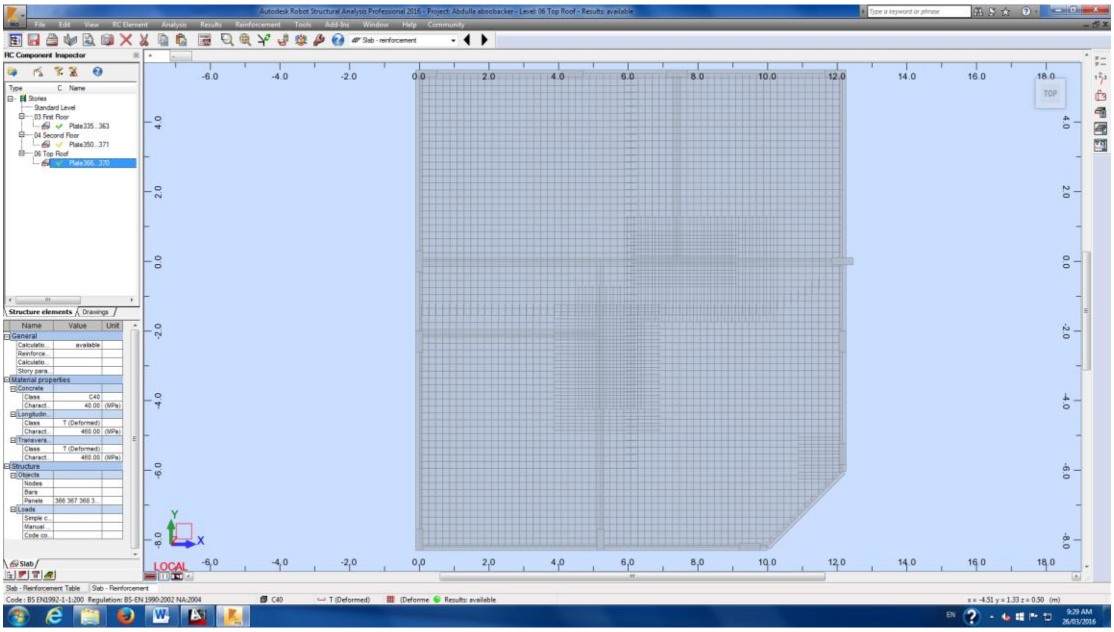
Top Roof Slab Rebar Provided Area Top X direction



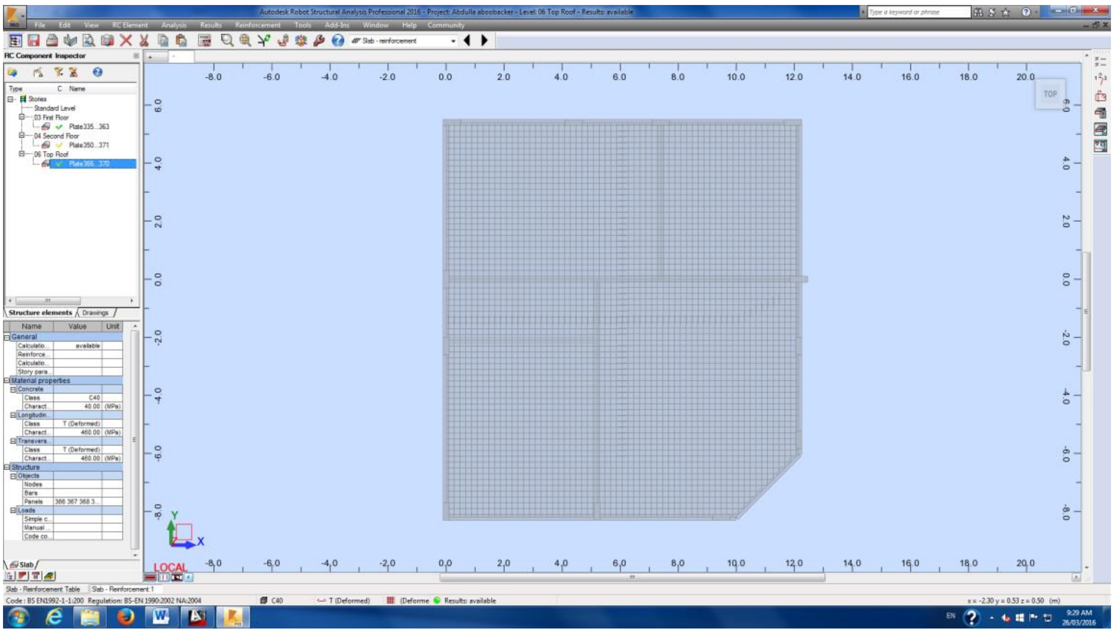
Top Roof Slab Rebar Required Area Top Y direction



Top Roof Slab Rebar Provided Area Top Y direction



Roof Floor Slab Rebar Provided Area Top View



Roof Floor Slab Rebar Provided Area Bottom View

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TEKLA TEDDS

MANUAL CALCULATION

SHAFEEKH MELANGADI	Project: Sample Calculation				Job Ref.	
	Section: DB1				Sheet no./rev. 1	
	Calc. by: Shafeekh	Date: 6/2/2016	Chk'd by	Date	App'd by	Date

RC MEMBER DESIGN

In accordance with EN1992-1-1:2004 incorporating Corrigenda January 2008 and the UK national annex

Tedds calculation version 3.0.03

Concrete details - Table 3.1. Strength and deformation characteristics for concrete

Concrete strength class	C35/45
Aggregate type	Quartzite
Aggregate adjustment factor - cl.3.1.3(2)	AAF = **1.0**
Characteristic compressive cylinder strength	f_{ck} = **35** N/mm^2
Characteristic compressive cube strength	$f_{ck,cube}$ = **45** N/mm^2
Mean value of compressive cylinder strength	$f_{cm} = f_{ck} + 8$ N/mm^2 = **43** N/mm^2
Mean value of axial tensile strength	$f_{ctm} = 0.3$ N/mm^2 $\times (f_{ck}/ 1$ N/mm$^2)^{2/3}$ = **3.2** N/mm^2
Secant modulus of elasticity of concrete	$E_{cm} = 22$ kN/mm$^2 \times [f_{cm}/10$ N/mm$^2]^{0.3} \times$ AAF = **34077** N/mm^2
Ultimate strain - Table 3.1	ε_{cu2} = **0.0035**
Shortening strain - Table 3.1	ε_{cu3} = **0.0035**
Effective compression zone height factor	λ = **0.80**
Effective strength factor	η = **1.00**
Coefficient k_1	k_1 = **0.40**
Coefficient k_2	$k_2 = 1.0 \times (0.6 + 0.0014 / \varepsilon_{cu2})$ = **1.00**
Coefficient k_3	k_3 = **0.40**
Coefficient k_4	$k_4 = 1.0 \times (0.6 + 0.0014 / \varepsilon_{cu2})$ = **1.00**
Partial factor for concrete -Table 2.1N	γ_C = **1.50**
Compressive strength coefficient - cl.3.1.6(1)	α_{cc} = **0.85**
Design compressive concrete strength - exp.3.15	$f_{cd} = \alpha_{cc} \times f_{ck} / \gamma_C$ = **19.8** N/mm^2
Compressive strength coefficient - cl.3.1.6(1)	α_{ccw} = **1.00**
Design compressive concrete strength - exp.3.15	$f_{cwd} = \alpha_{ccw} \times f_{ck} / \gamma_C$ = **23.3** N/mm^2
Maximum aggregate size	h_{agg} = **20** mm
Monolithic simple support moment factor	β_1 = **0.25**

Reinforcement details

Characteristic yield strength of reinforcement	f_{yk} = **500** N/mm^2
Partial factor for reinforcing steel - Table 2.1N	γ_S = **1.15**
Design yield strength of reinforcement	$f_{yd} = f_{yk} / \gamma_S$ = **435** N/mm^2

Nominal cover to reinforcement

Nominal cover to top reinforcement	c_{nom_t} = **35** mm
Nominal cover to bottom reinforcement	c_{nom_b} = **35** mm
Nominal cover to side reinforcement	c_{nom_s} = **35** mm

Fire resistance

Standard fire resistance period	R = **60** min
Number of sides exposed to fire	3
Minimum width of beam - EN1992-1-2 Table 5.5	b_{min} = **120** mm

SHAFEEKH MELANGADI	Project Sample Calculation				Job Ref.	
	Section DB1				Sheet no./rev. 2	
	Calc. by Shafeekh	Date 6/2/2016	Chk'd by	Date	App'd by	Date

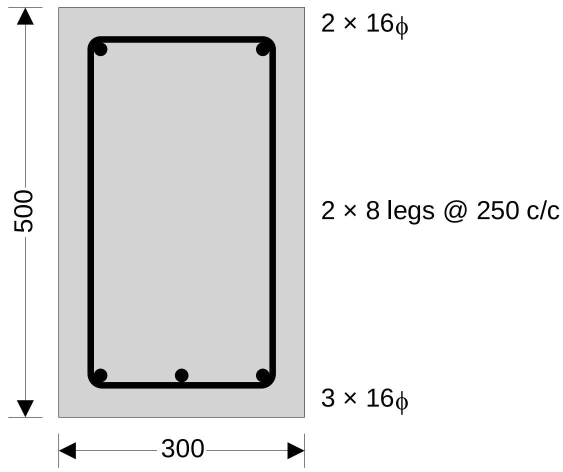
Section 1 - Design DB 1

Rectangular section details

Section width $b = \mathbf{300}$ mm

Section depth $h = \mathbf{500}$ mm

PASS - Minimum dimensions for fire resistance met



Positive moment - section 6.1

Design bending moment $M = M_{pos\_s1} = \mathbf{100.0}$ kNm

Effective depth of tension reinforcement $d = \mathbf{449}$ mm

Redistribution ratio $\delta = \min(\delta_{pos\_s1}, 1) = \mathbf{1.000}$

$K = M / (b \times d^2 \times f_{ck}) = \mathbf{0.047}$

$K' = (2 \times \eta \times \alpha_{cc} / \gamma_C) \times (1 - \lambda \times (\delta - k_1) / (2 \times k_2)) \times (\lambda \times (\delta - k_1) / (2 \times k_2)) =$ $\mathbf{0.207}$

K' > K - No compression reinforcement is required

Lever arm $z = \min(0.5 \times d \times [1 + (1 - 2 \times K / (\eta \times \alpha_{cc} / \gamma_C))^{0.5}], 0.95 \times d) = \mathbf{427}$ mm

Depth of neutral axis $x = 2 \times (d - z) / \lambda = \mathbf{56}$ mm

Area of tension reinforcement required $A_{s,req} = M / (f_{yd} \times z) = \mathbf{539}$ mm^2

Tension reinforcement provided $3 \times 16\phi$

Area of tension reinforcement provided $A_{s,prov} = \mathbf{603}$ mm^2

Minimum area of reinforcement - exp.9.1N $A_{s,min} = \max(0.26 \times f_{ctm} / f_{yk}, 0.0013) \times b \times d = \mathbf{225}$ mm^2

Maximum area of reinforcement - cl.9.2.1.1(3) $A_{s,max} = 0.04 \times b \times h = \mathbf{6000}$ mm^2

PASS - Area of reinforcement provided is greater than area of reinforcement required

Crack control - Section 7.3

Maximum crack width $w_k = \mathbf{0.3}$ mm

Design value modulus of elasticity reinf – 3.2.7(4) $E_s = \mathbf{200000}$ N/mm^2

Mean value of concrete tensile strength $f_{ct,eff} = f_{ctm} = \mathbf{3.2}$ N/mm^2

Stress distribution coefficient $k_c = \mathbf{0.4}$

Non-uniform self-equilibrating stress coefficient $k = \min(\max(1 + (300 \text{ mm} - \min(h, b)) \times 0.35 / 500 \text{ mm}, 0.65), 1) = \mathbf{1.00}$

Actual tension bar spacing $s_{bar} = (b - (2 \times (c_{nom\_s} + \phi_{s1\_v}) + \phi_{s1\_b\_L1} \times N_{s1\_b\_L1})) / (N_{s1\_b\_L1} - 1) + \phi_{s1\_b\_L1} =$ $\mathbf{99}$ mm

Maximum stress permitted - Table 7.3N — σ_s = **321** N/mm^2

Steel to concrete modulus of elast. ratio — $\alpha_{cr} = E_s / E_{cm}$ = **5.87**

Distance of the Elastic NA from bottom of beam — $y = (b \times h^2 / 2 + A_{s,prov} \times (\alpha_{cr} - 1) \times (h - d)) / (b \times h + A_{s,prov} \times (\alpha_{cr} - 1))$ = **246** mm

Area of concrete in the tensile zone — $A_{ct} = b \times y$ = **73854** mm^2

Minimum area of reinforcement required - exp.7.1 — $A_{sc,min} = k_c \times k \times f_{ct,eff} \times A_{ct} / \sigma_s$ = **296** mm^2

PASS - Area of tension reinforcement provided exceeds minimum required for crack control

Quasi-permanent moment — $M_{QP} = M_{pos\_QP\_s1}$ = **65.0**kNm

Permanent load ratio — $R_{PL} = M_{QP} / M$ = **0.65**

Service stress in reinforcement — $\sigma_{sr} = f_{yd} \times A_{s,req} / A_{s,prov} \times R_{PL}$ = **253** N/mm^2

Maximum bar spacing - Tables 7.3N — $s_{bar,max}$ = **184.2** mm

PASS - Maximum bar spacing exceeds actual bar spacing for crack control

Negative moment - section 6.1

Design bending moment — $M = M_{neg\_s1}$ = **35.0** kNm

Effective depth of tension reinforcement — d = **449** mm

Redistribution ratio — $\delta = \min(\delta_{neg\_s1}, 1)$ = **1.000**

$K = M / (b \times d^2 \times f_{ck})$ = **0.017**

$K' = (2 \times \eta \times \alpha_{cc} / \gamma_C) \times (1 - \lambda \times (\delta - k_1) / (2 \times k_2)) \times (\lambda \times (\delta - k_1) / (2 \times k_2))$ = **0.207**

K' > K - No compression reinforcement is required

Lever arm — $z = \min(0.5 \times d \times [1 + (1 - 2 \times K / (\eta \times \alpha_{cc} / \gamma_C))^{0.5}], 0.95 \times d)$ = **427** mm

Depth of neutral axis — $x = 2 \times (d - z) / \lambda$ = **56** mm

Area of tension reinforcement required — $A_{s,req} = M / (f_{yd} \times z)$ = **189** mm^2

Tension reinforcement provided — $2 \times 16\phi$

Area of tension reinforcement provided — $A_{s,prov}$ = **402** mm^2

Minimum area of reinforcement - exp.9.1N — $A_{s,min} = \max(0.26 \times f_{ctm} / f_{yk}, 0.0013) \times b \times d$ = **225** mm^2

Maximum area of reinforcement - cl.9.2.1.1(3) — $A_{s,max} = 0.04 \times b \times h$ = **6000** mm^2

PASS - Area of reinforcement provided is greater than area of reinforcement required

Crack control - Section 7.3

Maximum crack width — w_k = **0.3** mm

Design value modulus of elasticity reinf – 3.2.7(4) — E_s = **200000** N/mm^2

Mean value of concrete tensile strength — $f_{ct,eff} = f_{ctm}$ = **3.2** N/mm^2

Stress distribution coefficient — k_c = **0.4**

Non-uniform self-equilibrating stress coefficient — $k = \min(\max(1 + (300 \text{ mm} - \min(h, b)) \times 0.35 / 500 \text{ mm}, 0.65), 1)$ = **1.00**

Actual tension bar spacing — $s_{bar} = (b - (2 \times (c_{nom\_s} + \phi_{s1\_v}) + \phi_{s1\_t\_L1} \times N_{s1\_t\_L1})) / (N_{s1\_t\_L1} - 1) + \phi_{s1\_t\_L1}$ = **198** mm

Maximum stress permitted - Table 7.3N — σ_s = **242** N/mm^2

Steel to concrete modulus of elast. ratio — $\alpha_{cr} = E_s / E_{cm}$ = **5.87**

Distance of the Elastic NA from bottom of beam — $y = (b \times h^2 / 2 + A_{s,prov} \times (\alpha_{cr} - 1) \times (h - d)) / (b \times h + A_{s,prov} \times (\alpha_{cr} - 1))$ = **247** mm

Area of concrete in the tensile zone — $A_{ct} = b \times y$ = **74231** mm^2

Minimum area of reinforcement required - exp.7.1 — $A_{sc,min} = k_c \times k \times f_{ct,eff} \times A_{ct} / \sigma_s$ = **394** mm^2

PASS - Area of tension reinforcement provided exceeds minimum required for crack control

Quasi-permanent moment — $M_{QP} = M_{neg_QP_s1} = $ **35.0**kNm

Permanent load ratio — $R_{PL} = M_{QP} / M = $ **1.00**

Service stress in reinforcement — $\sigma_{sr} = f_{yd} \times A_{s,req} / A_{s,prov} \times R_{PL} = $ **204** N/mm^2

Maximum bar spacing - Tables 7.3N — $s_{bar,max} = $ **244.9** mm

PASS - Maximum bar spacing exceeds actual bar spacing for crack control

Minimum bar spacing (Section 8.2)

Top bar spacing — $s_{top} = (b - (2 \times (c_{nom_s} + \phi_{s1_v}) + \phi_{s1_t_L1} \times N_{s1_t_L1})) / (N_{s1_t_L1} - 1) = $ **182.0** mm

Minimum allowable top bar spacing — $s_{top,min} = \max(\phi_{s1_t_L1} \times k_{s1}, h_{agg} + k_{s2}, 20mm) = $ **25.0** mm

PASS - Actual bar spacing exceeds minimum allowable

Bottom bar spacing — $s_{bot} = (b - (2 \times (c_{nom_s} + \phi_{s1_v}) + \phi_{s1_b_L1} \times N_{s1_b_L1})) / (N_{s1_b_L1} - 1) = $ **83.0** mm

Minimum allowable bottom bar spacing — $s_{bot,min} = \max(\phi_{s1_b_L1} \times k_{s1}, h_{agg} + k_{s2}, 20mm) = $ **25.0** mm

PASS - Actual bar spacing exceeds minimum allowable

Section in shear (section 6.2)

Angle of comp. shear strut for maximum shear — $\theta_{max} = 45$ deg

Strength reduction factor - cl.6.2.3(3) — $v_1 = 0.6 \times (1 - f_{ck} / 250 \text{ N/mm}^2) = $ **0.516**

Compression chord coefficient - cl.6.2.3(3) — $\alpha_{cw} = $ **1.00**

Minimum area of shear reinforcement - exp.9.5N — $A_{sv,min} = 0.08 \text{ N/mm}^2 \times b \times (f_{ck} / 1 \text{ N/mm}^2)^{0.5} / f_{yk} = $ **284** mm^2/m

Design shear force at support — $V_{Ed,max} = V_{Ed,max_s1} = $ **50** kN

Min lever arm in shear zone — $z = $ **427** mm

Maximum design shear resistance - exp.6.9 — $V_{Rd,max} = \alpha_{cw} \times b \times z \times v_1 \times f_{cwd} / (\cot(\theta_{max}) + \tan(\theta_{max})) = $ **770** kN

PASS - Design shear force at support is less than maximum design shear resistance

Design shear force — $V_{Ed} = $ **50** kN

Design shear stress — $v_{Ed} = V_{Ed} / (b \times z) = $ **0.391** N/mm^2

Angle of concrete compression strut - cl.6.2.3 — $\theta = \min(\max(0.5 \times \text{Asin}[\min(2 \times v_{Ed} / (\alpha_{cw} \times f_{cd} \times v_1),1)], 21.8 \text{ deg}), 45\text{deg})$

$= $ **21.8** deg

Area of shear reinforcement required - exp.6.8 — $A_{sv,des} = v_{Ed} \times b / (f_{yd} \times \cot(\theta)) = $ **108** mm^2/m

Area of shear reinforcement required — $A_{sv,req} = \max(A_{sv,min}, A_{sv,des}) = $ **284** mm^2/m

Shear reinforcement provided — 2 × 8 legs @ 250 c/c

Area of shear reinforcement provided — $A_{sv,prov} = $ **402** mm^2/m

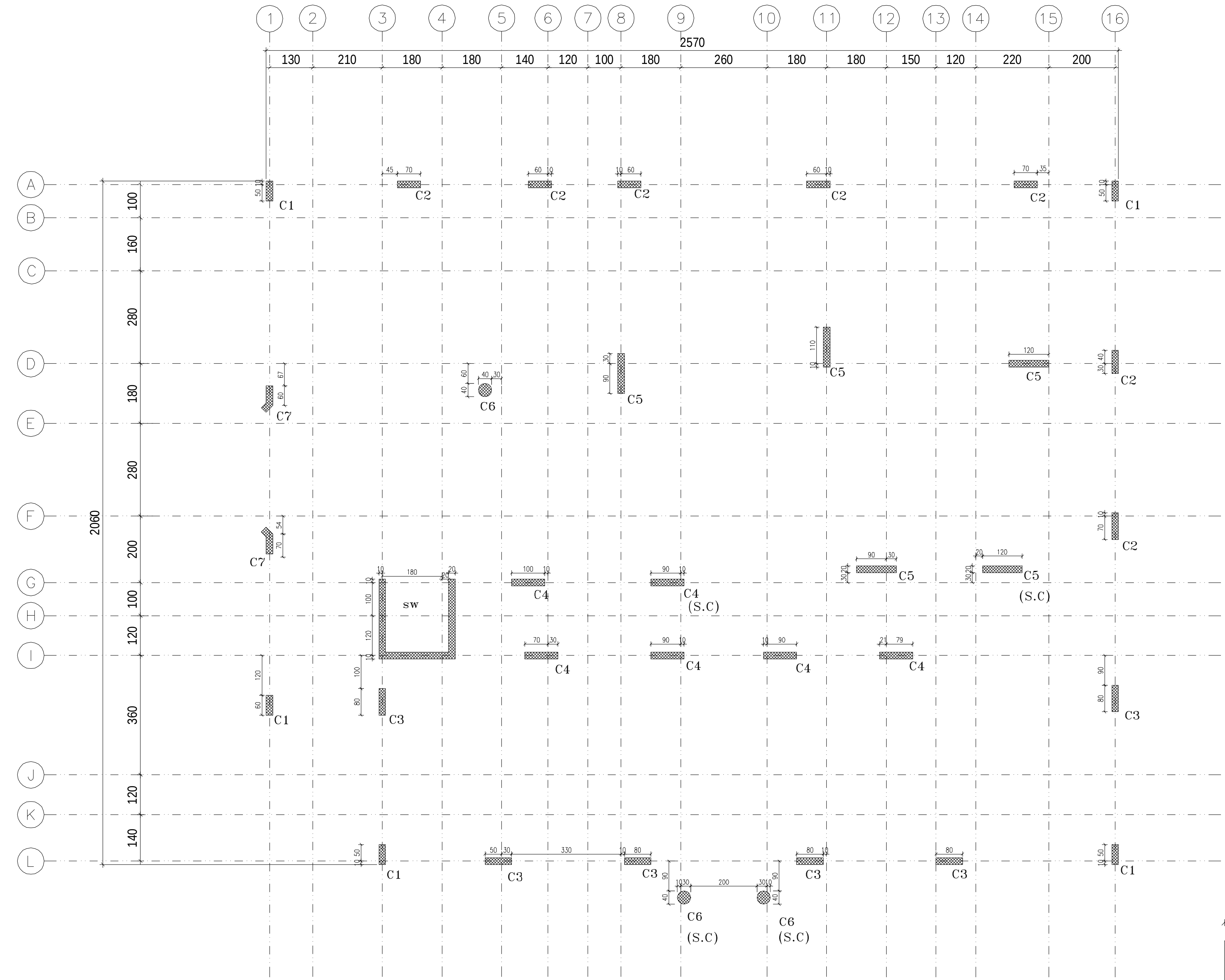
PASS - Area of shear reinforcement provided exceeds minimum required

Maximum longitudinal spacing - exp.9.6N — $s_{vl,max} = 0.75 \times d = $ **337** mm

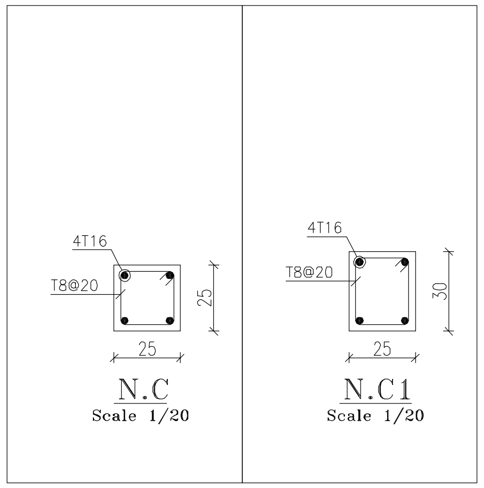
PASS - Longitudinal spacing of shear reinforcement provided is less than maximum

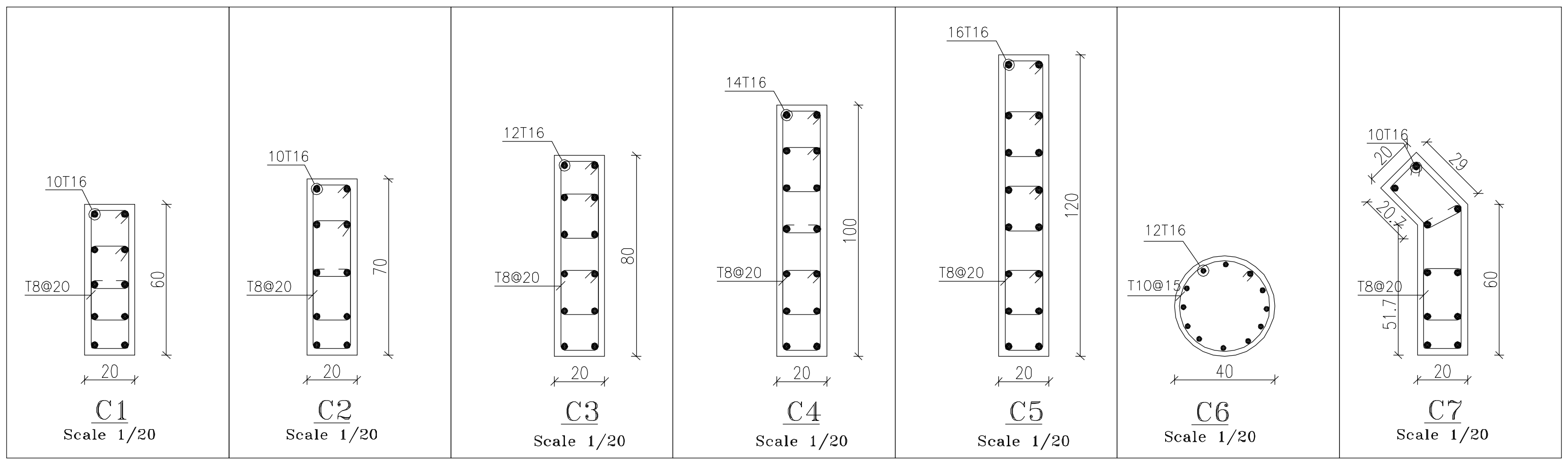
STRUCTURAL DETAILING

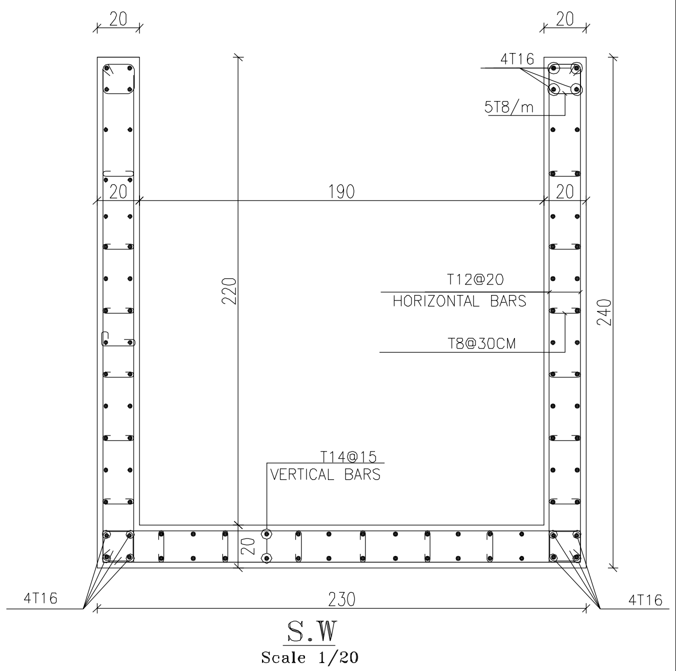
FOR APPROVAL FROM MUNCIPALITY



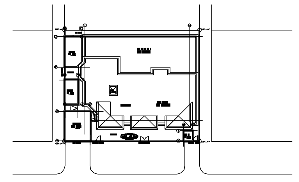
(S.C):STOPPED COLUMNS
(P.C): PLANTED COLUMNS







Key Plan:



General Notes:

Rev. No.	Description	Date

Master Developer/Developer:
(Name and Address)

Owner / Tenant
(Name and Address)

محمد علي سالم الجوهي

MOHAMED ALI SALEM ALJOUHI

Consultant-of-Record
(Name and Address)

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Project Name:

فيلا سكنية
طابق أرضي + أول + روف

Zone:
BANIYAS EAST — بني ياس شرق 4_1

Sector No:	Plot No:
EB1_04	PLOT NO : 112

Project Description:

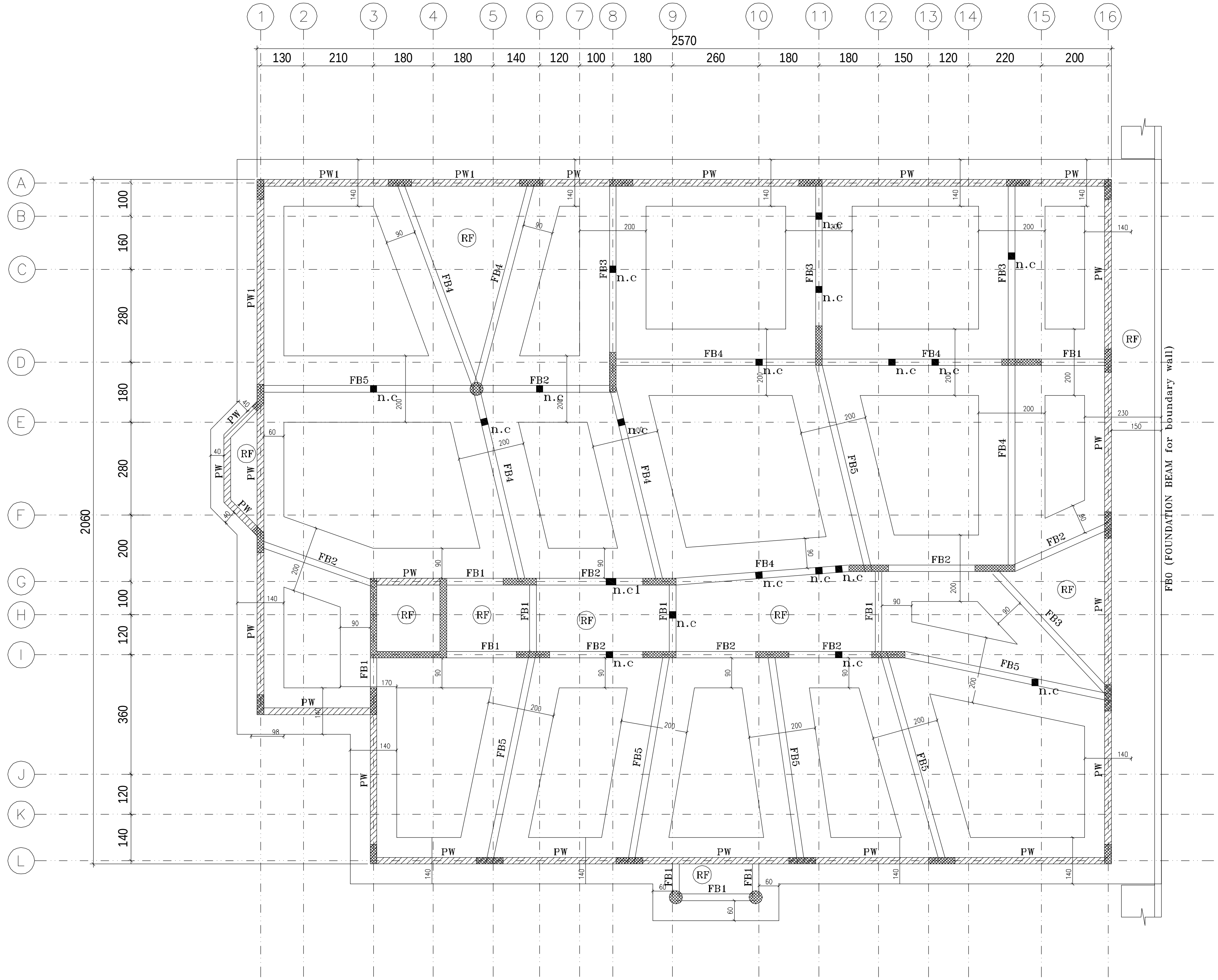
عبارة عن بناء فيلا سكنية جديدة مكونة من طابقين و روف وغرفة سائق و غرفة حارس و باركنغ للسيارات و غرفة كهرباء و سور خارجي

Drawing Title:

GROUND COLUMN'S LAYOUT

Drawing No:	Revision No:
S100	-03.-
Submission Date:	**Scale:**
22-05-2016	1/100
Project ID:	**Plan ID:**
2013-56759	1361043

Official Use Only:



NOTE:-

1:- THE FOUNDATION HAS BEEN DESIGNED TO CARRY LOADS OF (3) FLOOR

2:- THE FOUNDATION HAS BEEN DESIGNED BY TAKING BEARING CAPACITY OF 1.0 Kg/cm2 (B.C AS PER SOIL REPORT= 1.48kg/cm2)

3:- (RF) RAFT FOUNDATION THICKNESS=30CM WITH 7T12/M TOP&BOTTOM STEEL.

4:- PW WEDTH=25CM&TOP LEVEL=+0.65M
PW1 WEDTH=25CM&TOP LEVEL=+0.80M

5:- Fcu=40 Mpa.

6:- Fy=460 Mpa

LABORATOY INFORMATION:

-MATRIX LAB.
-REF : XSA/16-139
-DATE: 7/03/2016
-REC : BC=1.48kg/cm2@-1.0m

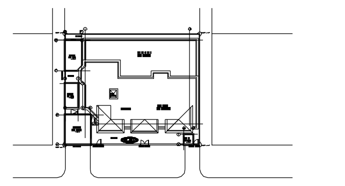
SCHEDULE OF FOUNDTION BEAMS

BEAM MARK	BEAM SIZES BxH	REINFORCEMENT								TOP LEVEL (m)	REMARK
		TOP STEEL		BOTTOM STEEL		STIRRUPS			SIDE BARS		
		FULL BAR	EXTRA CUT BAR AT MID SPAN	FULL BAR	EXTRA CUT BAR UNDER SUPPORT	UPTO L/3 FROM SUPPORT	MIDDLE SPAN L/3	NO.OF LEGS			
FB1	25X110	2T20	2T20	2T20	2T20	T10@15	T10@20	2	2T12@20	+0.10	
FB2	25X110	3T20	2T20	2T20	3T20	T10@15	T10@20	2	2T12@20	+0.10	
FB3	25X110	3T20	3T20	3T20	5T20	T10@15	T10@20	2	2T12@20	+0.10	
FB4	25X110	5T20	3T20	3T20	5T20	T10@15	T10@20	2	2T12@20	+0.10	
FB5	25X110	4T20	4T20	4T20	4T20	T12@15	T12@20	2	2T12@20	+0.10	
PW	25X165	3T20	---	3T20	---	T12@20	T12@20	2	2T12@20	+0.65	
PW1	25X180	3T20	---	3T20	---	T12@20	T12@20	2	2T12@20	+0.80	

DON'T USE EXTRA CUT BAR AT SUPPORT FOR SIMPLY SUPPOTRED BEAMS

- **Excavate and level the existing soil at the proposed Excavation level of 1.25m below existing ground surface.**
- **Compact using heavy rollers the existing soil at the bottom of excavation at 1.25m below existing ground surface to a minimum of 95% of its maximum dry density at its optimum moisture content obtained from the Modified Proctor Compaction Test.**
- **Construct one layer of Engineering fill 25cm thickness, compacted to 95% of its maximum dry density at its optimum moisture content obtained from modified Proctor test.**
- **Lay the Shallow Foundations at the level of 1.0m below the existing ground surface immediately after the compaction of the engineering fill is over.**

Key Plan:



General Notes:

Rev. No.	Description	Date

Master Developer/Developer:
(Name and Address)

Owner / Tenant
(Name and Address)

محمد علي سالم الجوهي

MOHAMED ALI SALEM ALJOUHI

Consultant-of-Record
(Name and Address)

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للاستشارات الهندسية
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TEL.:+971 2 5821405, MOB:+971 554040534, FAX.:+971 2 5821406

Project Name:

فيلا سكنية
طابق أرضي + أول + روف

Zone:

BANIYAS EAST — بني ياس شرق 4_1

Sector No:	Plot No:
EB1_04	PLOT NO : 112

Project Description:

عبارة عن بناء فيلا سكنية جديدة مكونة من طابقين و روف وغرفة سائق و غرفة حارس و باركنغ للسيارات و غرفة كهرباء و سور خارجي

Drawing Title:

FOUNDATION LAYOUT

Drawing No:	Revision No:
S200	-03.-
Submission Date:	**Scale:**
22-05-2016	1/100
Project ID:	**Plan ID:**
2013-56759	1361043

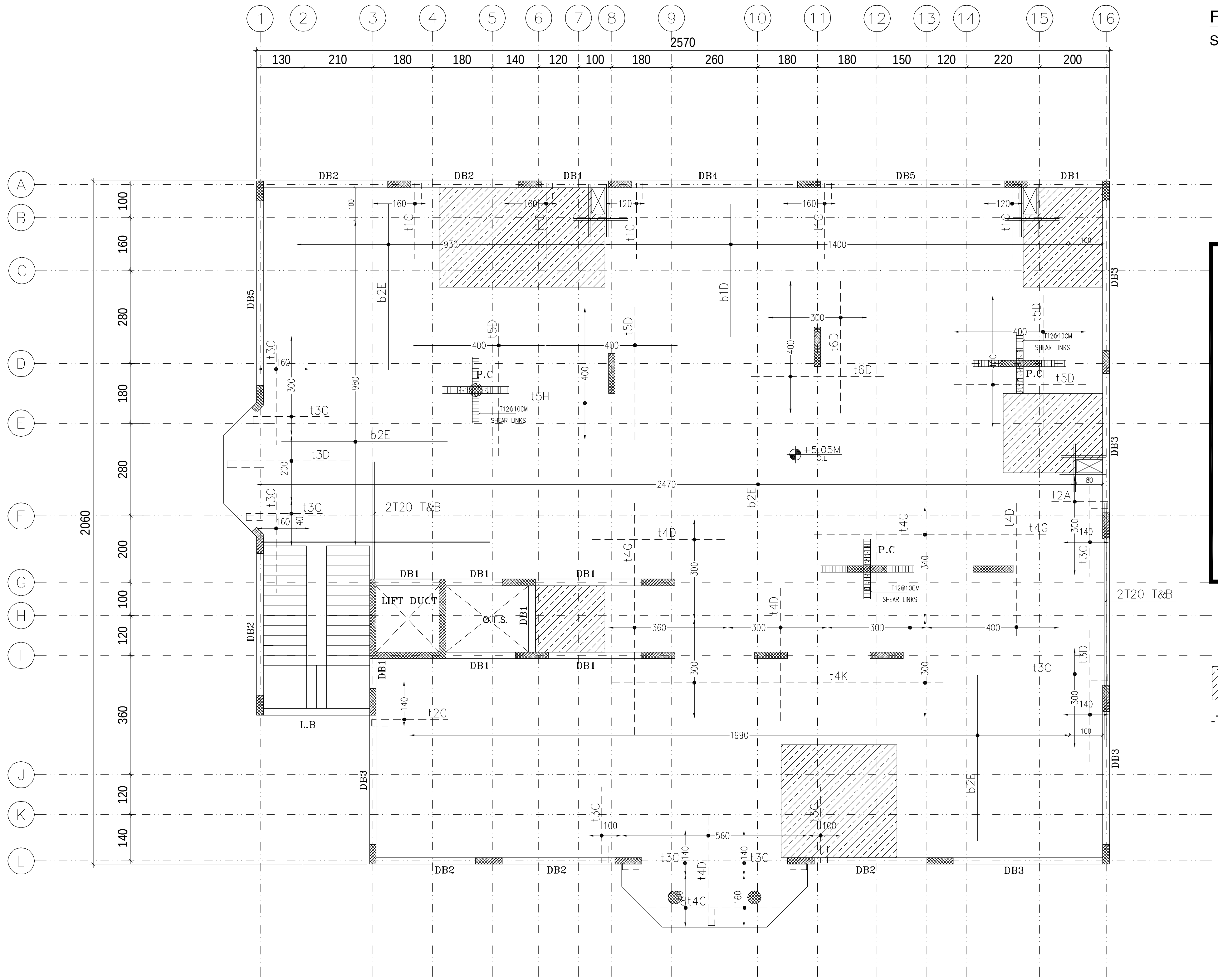
Official Use Only:

FIRST SLAB LAYOUT

SCALE 1:100

Thickness of Slab 28 cm
Provide 5T12mm/m Bottom Mesh
Provide 5T14mm/m Top Mesh
ONLY EXTRA BARS ARE SHOWN ON PLAN.

Provide 2T20 Top and Bottom Around Openings



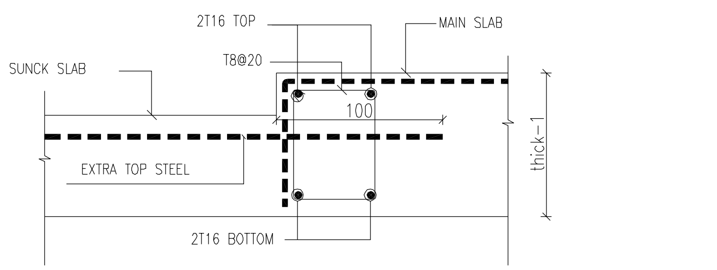
EXTRA TOP BARS	BAR LENGTH	EXTRA BOTT. BARS
T1 = T12@200	A = 2.4m	B1 = T12@200
T2 = T14@200	C = 3.0m	B2 = T14@200
T3 = T16@200	D = 4.0m	B3 = T16@200
T4 = T20@200	E = 5.0m	B4 = T20@200
T5 = T25@200	F = 6.0m	B5 = T25@200
T6 = T20@100	G = 7.0m	
T7 = T25@100	H = 8.0m	
0 = 2 Y 20 T&B	K = 10.0m	

TYPICAL EXTRA BAR ILLUSTRATION

TOP — T 1 C — TYPE OF EXTRA BARS / LENGTH OF BARS

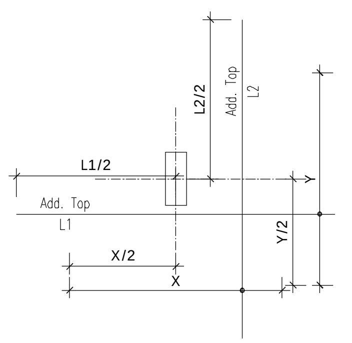
BOTTOM — B 2 D — TYPE OF EXTRA BARS / LENGTH OF BARS

SUNK SLAB 20CM.
TOP MESH T12 @20 CM BOTHWAY.
-T14 @20 BOTTOM MESH BOTHWAY(SLAB MESH).



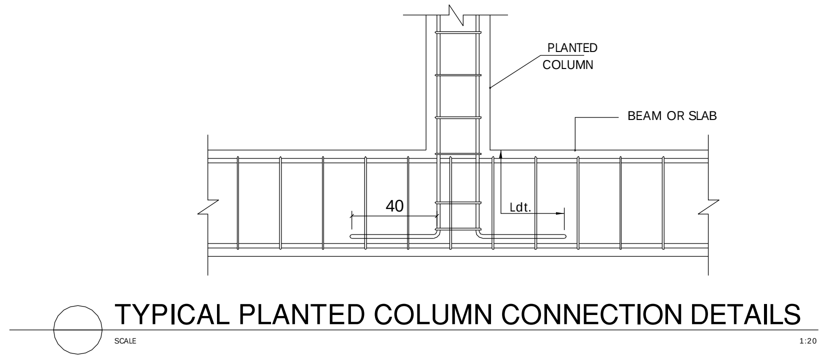
TYPICAL EXTRA TOP STEEL AT SUNK SLAB

Scale 1/10



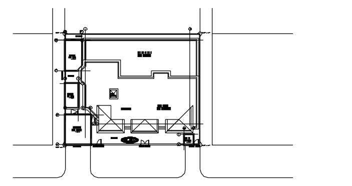
Typical Detail For Placement of Additional Reinforcement above columns

Scale 1:50



TYPICAL PLANTED COLUMN CONNECTION DETAILS

Key Plan:



General Notes:

Rev. No.	Description	Date

Master Developer/Developer:
(Name and Address)

Owner / Tenant
(Name and Address)

محمد علي سالم الجوهي

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Consultant-of-Record
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السيف للاستشارات الهندسية

AL SAIF ENGINEERING CONSULTANTS

DESIGN,SUPERVISION,CONSULT

P.O.BOX: 149060 ABU DHABI

Project Name:

فيلا سكنية

طابق أرضي + أول + روف

Zone: BANIYAS EAST — بني ياس شرق 4_1

Sector No:	Plot No:
EB1_04	PLOT NO : 112

Project Description:

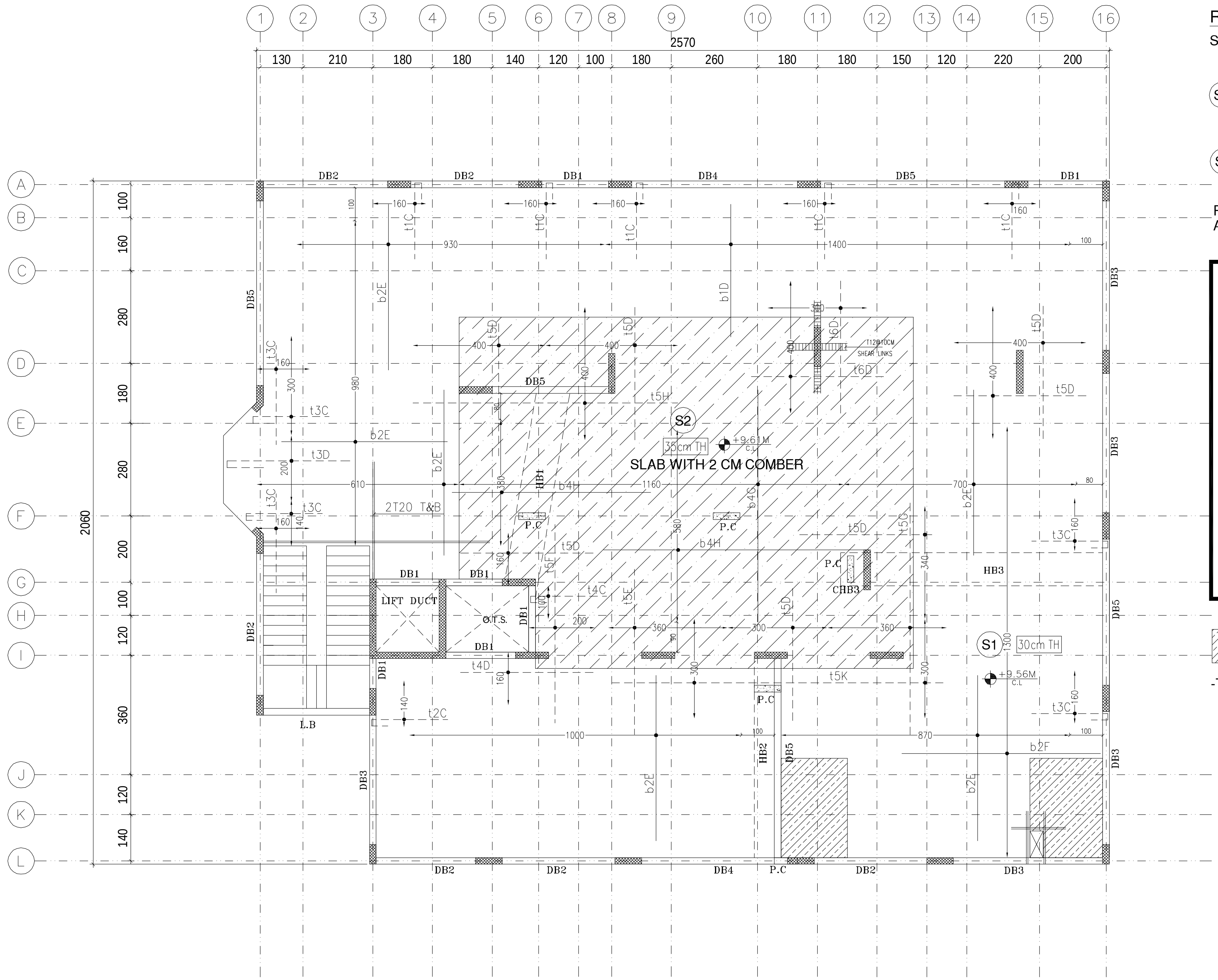
عبارة عن بناء فيلا سكنية جديدة مكونة من طابقين و روف وغرفة سائق و غرفة حارس و باركنغ للسيارات و غرفة كهرباء و سور خارجي

Drawing Title:

FIRST SLAB LAYOUT

Drawing No:	Revision No:
S301	-03.-
Submission Date:	**Scale:**
22-05-2016	1/100
Project ID:	**Plan ID:**
2013-56759	1361043

Official Use Only:



ROOF SLAB LAYOUT

SCALE 1:100

S1 – Thickness of Slab 30 cm
- Provide 5T14mm/m Bottom Mesh
- Provide 5T12mm/m Top Mesh

S2 – Thickness of Slab 35 cm
- Provide 5T14mm/m Bottom Mesh
- Provide 5T12mm/m Top Mesh

Provide 2T20 Top and Bottom Around Openings

EXTRA TOP BARS
T1 = T12@200
T2 = T14@200
T3 = T16@200
T4 = T20@200
T5 = T25@200
T6 = T20@100
T7 = T25@100
0 = 2 Y 20 T&B

BAR LENGTH
A = 2.4m
C = 3.0m
D = 4.0m
E = 5.0m
F = 6.0m
G = 7.0m
H = 8.0m
K = 10.0m

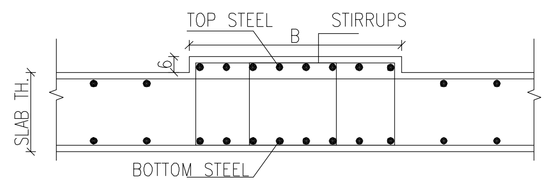
EXTRA BOTT. BARS
B1 = T12@200
B2 = T14@200
B3 = T16@200
B4 = T20@200
B5 = T25@200

TYPICAL EXTRA BAR ILLUSTRATION

TOP — T 1 C — TYPE OF EXTRA BARS / LENGTH OF BARS

BOTTOM — B 2 D — TYPE OF EXTRA BARS / LENGTH OF BARS

SUNK SLAB 22CM.
TOP MESH T12 @20 CM BOTHWAY.
-T14 @20 BOTTOM MESH BOTHWAY(SLAB MESH).



TYPICAL (H.B) DETAILS

SCALE 1/20

Key Plan:

General Notes:

Rev. No.	Description	Date

Master Developer/Developer: (Name and Address)

Owner / Tenant (Name and Address)

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P.O.BOX: 149060 ABU DHABI

Project Name:

فيلا سكنية

طابق أرضي + أول + روف

Zone: BANIYAS EAST — بني ياس شرق 4_1

Sector No:	Plot No:
EB1_04	PLOT NO : 112

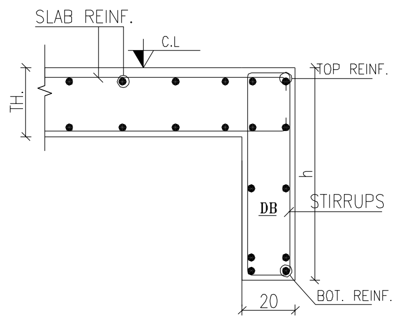
Project Description:

عبارة عن بناء فيلا سكنية جديدة مكونة من طابقين و روف وغرفة سائق و غرفة حارس و باركنغ للسيارات و غرفة كهرباء و سور خارجي

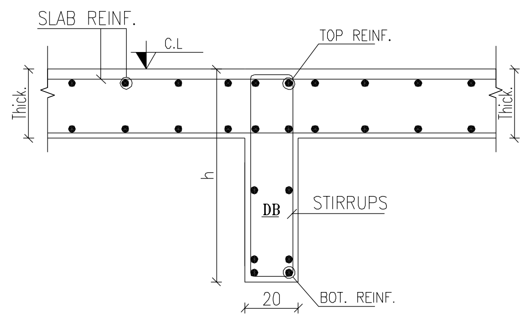
Drawing Title: ROOF SLAB LAYOUT

Drawing No:	Revision No:
S302	-03.-
Submission Date: 22-05-2016	Scale: 1/100
Project ID: 2013-56759	Plan ID: 1361043

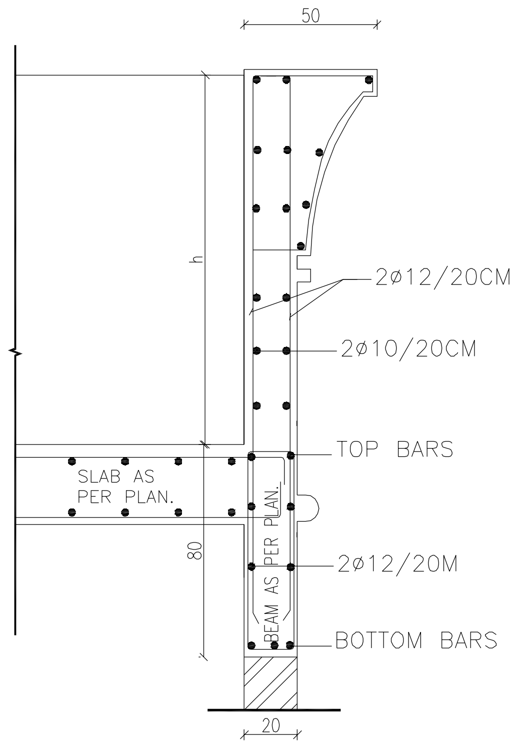
Official Use Only:



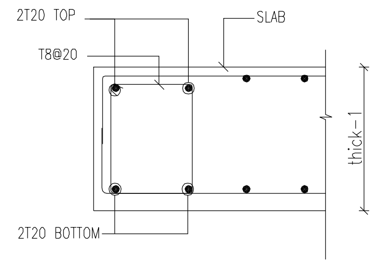
TYPICAL EXTERNAL DROP BEAM
Scale 1/20



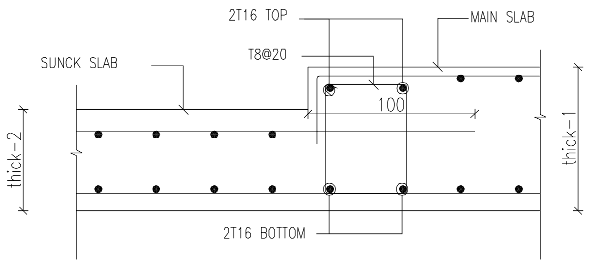
TYPICAL INTERNAL DROP BEAM
Scale 1/20



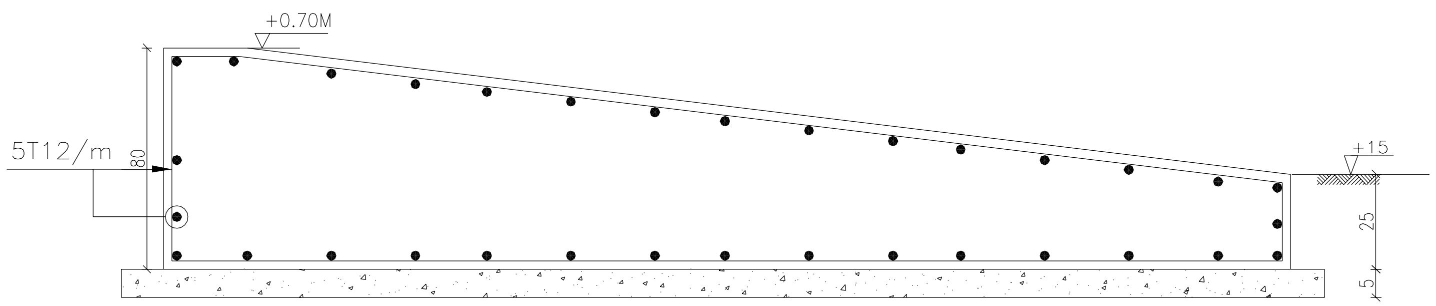
TYPICAL PARAPET
SCALE :1/20



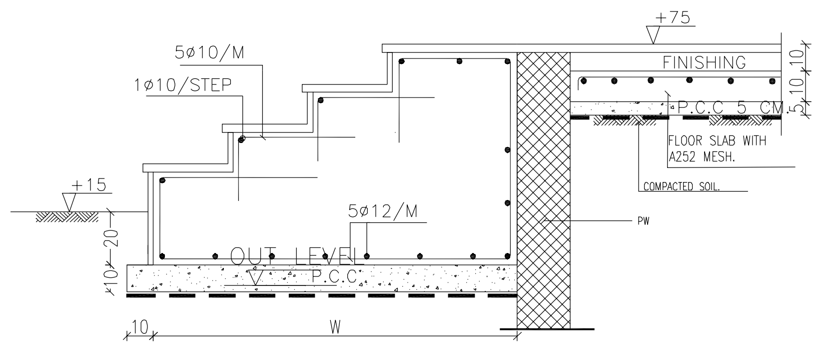
TYPICAL DETAILS AT FREE EDGE SLAB
Scale 1/10



CONNECTION DETAIL BETWEEN SUNCK SLAB & MAIN SLAB
Scale 1/10

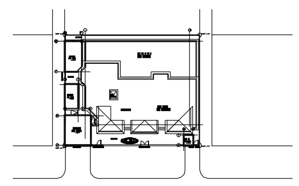


TYPICAL RAMP SECTION



TYPICAL GROUND STEP
scl:1/25

Key Plan:



General Notes:

Rev. No.	Description	Date

Master Developer/Developer:
(Name and Address)

Owner / Tenant
(Name and Address)
محمد علي سالم الجوهي
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Project Name:
فيلا سكنية
طابق أرضي + أول + روف

Zone:
BANIYAS EAST
بني ياس شرق 4_1

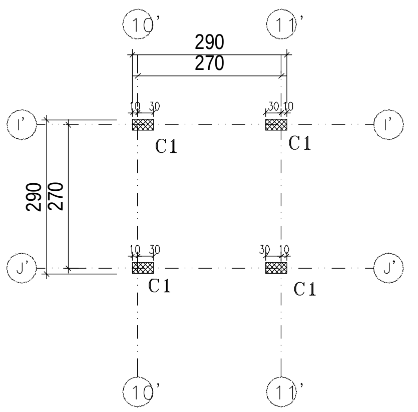
Sector No:	Plot No:
EB1_04	PLOT NO : 112

Project Description:
عبارة عن بناء فيلا سكنية جديدة مكونة من طابقين و روف وغرفة سائق و غرفة حارس و باركنغ للسيارات و غرفة كهرباء و سور خارجي

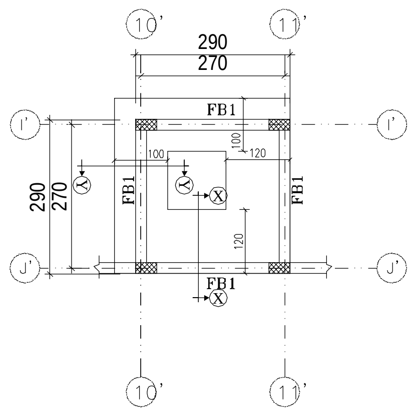
Drawing Title:
TYPICAL DETAILS-1

Drawing No:	Revision No:
S401	-03.-
Submission Date: 22-05-2016	Scale: 1/100
Project ID: 2013-56759	Plan ID: 1361043

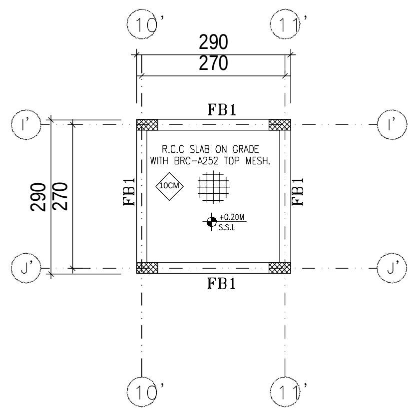
Official Use Only:



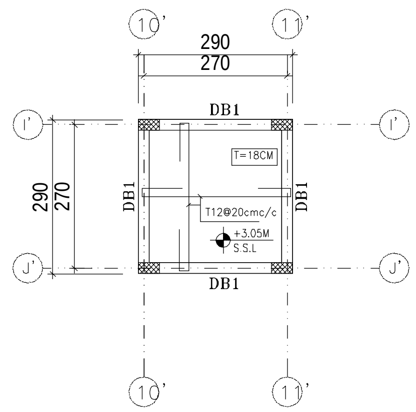
ELE. ROOM
COLUMN LAYOUT



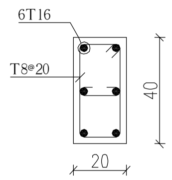
ELE. ROOM
FOUNDATION LAYOUT



ELE. ROOM
GROUND SLAB LAYOUT



ELE. ROOM
ROOF SLAB LAYOUT



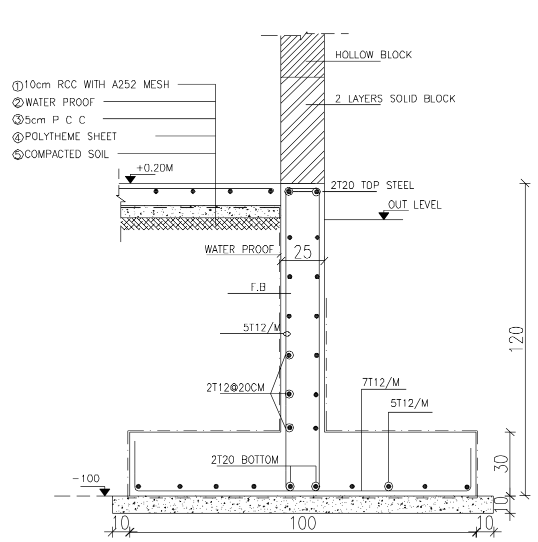
C1
Scale 1/20

SCHEDULE OF FOUNDTION BEAMS

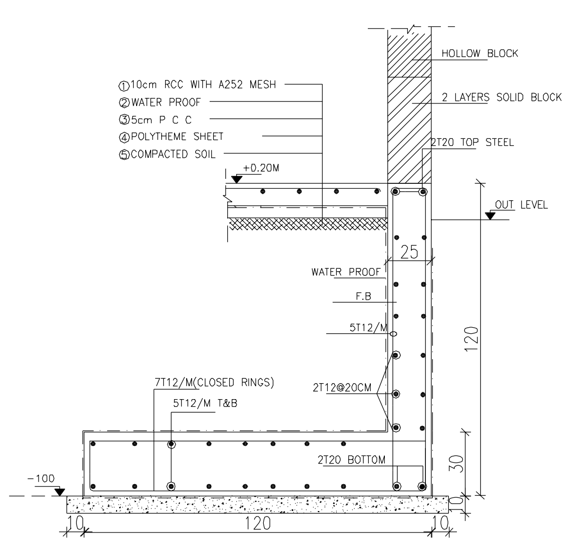
BEAM MARK	BEAM SIZES BxH	REINFORCEMENT: TOP STEEL FULL BAR	TOP STEEL EXTRA CUT BAR AT MID SPAN	BOTTOM STEEL FULL BAR	BOTTOM STEEL EXTRA CUT BAR UNDER SUPPORT	STIRRUPS UPTO L/3 FROM SUPPORT	STIRRUPS MIDDLE SPAN L/3	STIRRUPS NO.OF LEGS	SIDE BARS	TOP LEVEL (m)	REMARK
FB1	25X120	2T20	–	2T20	–	T12@20	T12@20	2	2T12@20	+0.20	

SCHEDULE OF BEAMS

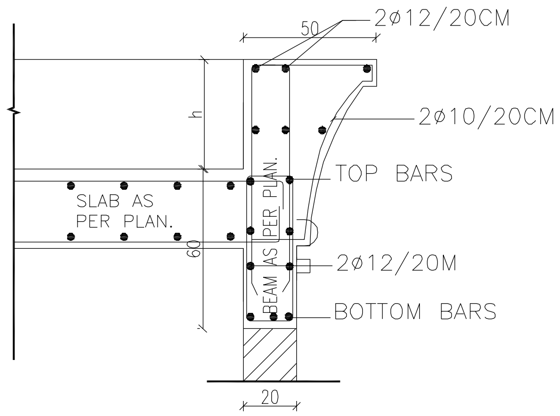
BEAM MARK	BEAM SIZES BxH	REINFORCEMENT: BOTTOM STEEL FULL BAR	BOTTOM STEEL EXTRA CUT BAR AT MID SPAN	TOP STEEL FULL BAR	TOP STEEL EXTRA CUT BAR AT INTIRIOR SUPPORT	STIRRUPS UPTO L/3 FROM SUPPORT	STIRRUPS MIDDLE SPAN L/3	STIRRUPS NO.OF LEGS	SIDE BARS	REMARKS
DB1	20X60	2T16	–	2T16	–	T8@20	T8@20	2	2T12@20	



SEC:Y-Y
SCALE 1:20

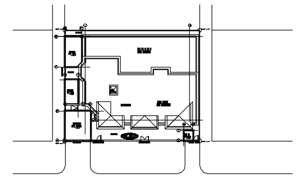


SEC:X-X
SCALE 1:20



TYPICAL PARAPET
SCALE :1/20

Key Plan:



General Notes:

Rev. No.	Description	Date

Master Developer/Developer:
(Name and Address)

Owner / Tenant
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Project Name:
فيلا سكنية
طابق أرضي + أول + روف

Zone:
BANIYAS EAST — بني ياس شرق 4_1

Sector No: EB1_04
Plot No: PLOT NO : 112

Project Description:
عبارة عن بناء فيلا سكنية جديدة مكونة من طابقين و روف وغرفة سائق و غرفة حارس و باركنج للسيارات و غرفة كهرباء و سور خارجي

Drawing Title: ELE. ROOM
Structure Drawing

Drawing No: S504
Revision No: -03.-

Submission Date: 22-05-2016
Scale: 1/100

Project ID: 2013-56759
Plan ID: 1361043

Official Use Only: