
Right Side Mosul Low Cost House Units

2019-06-16

Architectural Documents for Type B

ARCHITECTURAL LIST OF DRAWING

NUM.	TITLE	SCALE	PAPER	REVISION
AR-LD-00	List of Drawings	N/A	A3	REV - 06
AR-PL-01	Site Plan	1:1000	A3	REV - 06
AR-PL-02	Typical Apartment Plans	1:100	A3	REV - 06
AR-PL-03	Typical Handicap Apartment Plans	1:100	A3	REV - 06
AR-PL-04	Ground Floor Plan - Type B	1:200	A3	REV - 06
AR-PL-05	Typical Floor Plan - Type B	1:200	A3	REV - 06
AR-PL-06	Roof Floor Plan - Type B	1:200	A3	REV - 06
AR-Ele-01	Elevation A&B - Type B	1:200	A3	REV - 06
AR-DR-01	Door Schedule and Drawings	N/A	A3	REV - 06
AR-WN-01	Window Schedule and Drawings	N/A	A3	REV - 06
AR-DTP-01	Floor Ceramic Details Above Reinforced Slab	N/A	A3	REV - 06

Notes:
All dimensions are in centimeters unless is noted
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This drawing is to be read in conjunction with all other relevant drawings.

Legend:

Project:

Right Side Mosul Buildings

Drawing :
List of Drawings -
Architectural Works

Location:

Mosul

Scale:
N/A

SN:
AR-LD-00

Format:
A3

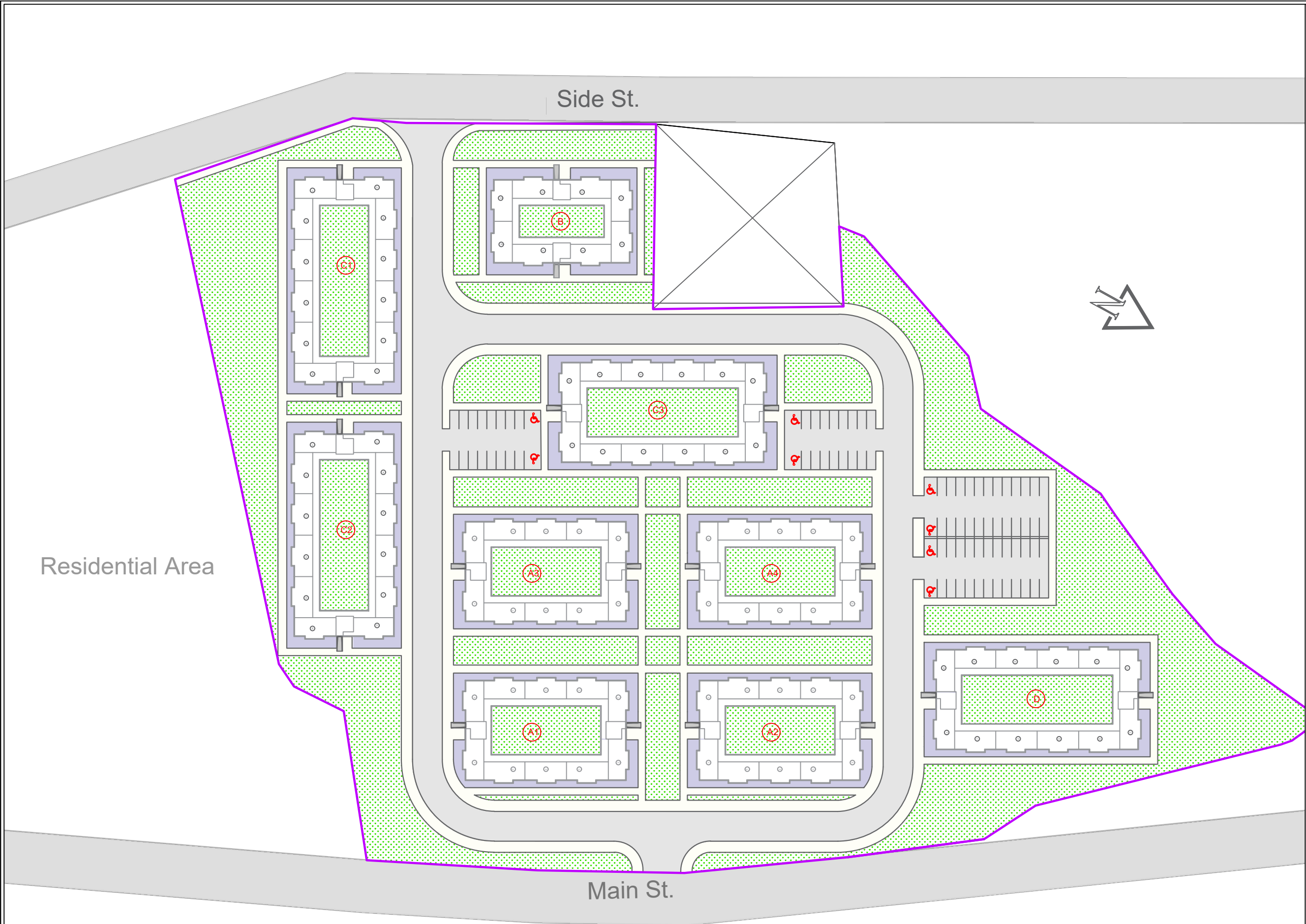
rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
UN-HABITAT

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Notes:
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Legend:			
Type	Apt./Floor	Floor No.	Total Apt.
A	10	03	30
B	08	03	24
C	12	04	48
D	12	03	36

Project:
Right Side Mosul Buildings

Drawing :
Site Plan

Location:
Mosul

Scale:
1/1000

Format:
A3

rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
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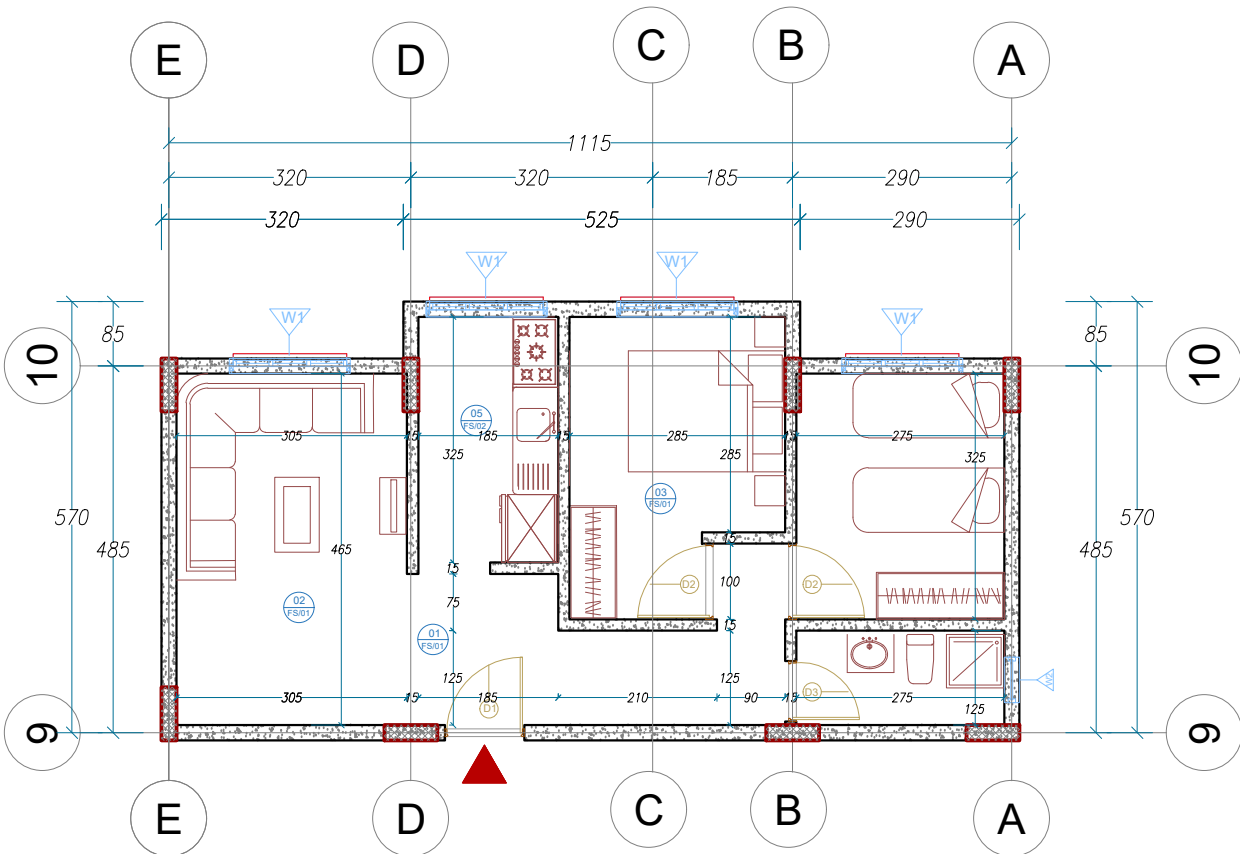
Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
UN-HABITAT

Type	Location
01	Apartment entrance
02	Main hall
03	Master bedroom
04	Bedrooms
05	Kitchen
06	Bath rooms
07	Main Corridor
08	Main Stairs

Gross Area : 61.3m2
Total Area B : 78.8m2
Total Area C : 80.4m2



Notes:
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Legend:

Project:

Right Side Mosul Buildings

Drawing :

Typical Apartment Plans

Location:

Mosul

Scale: 1/100
SN: AR-PL-02

Format: A3

rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

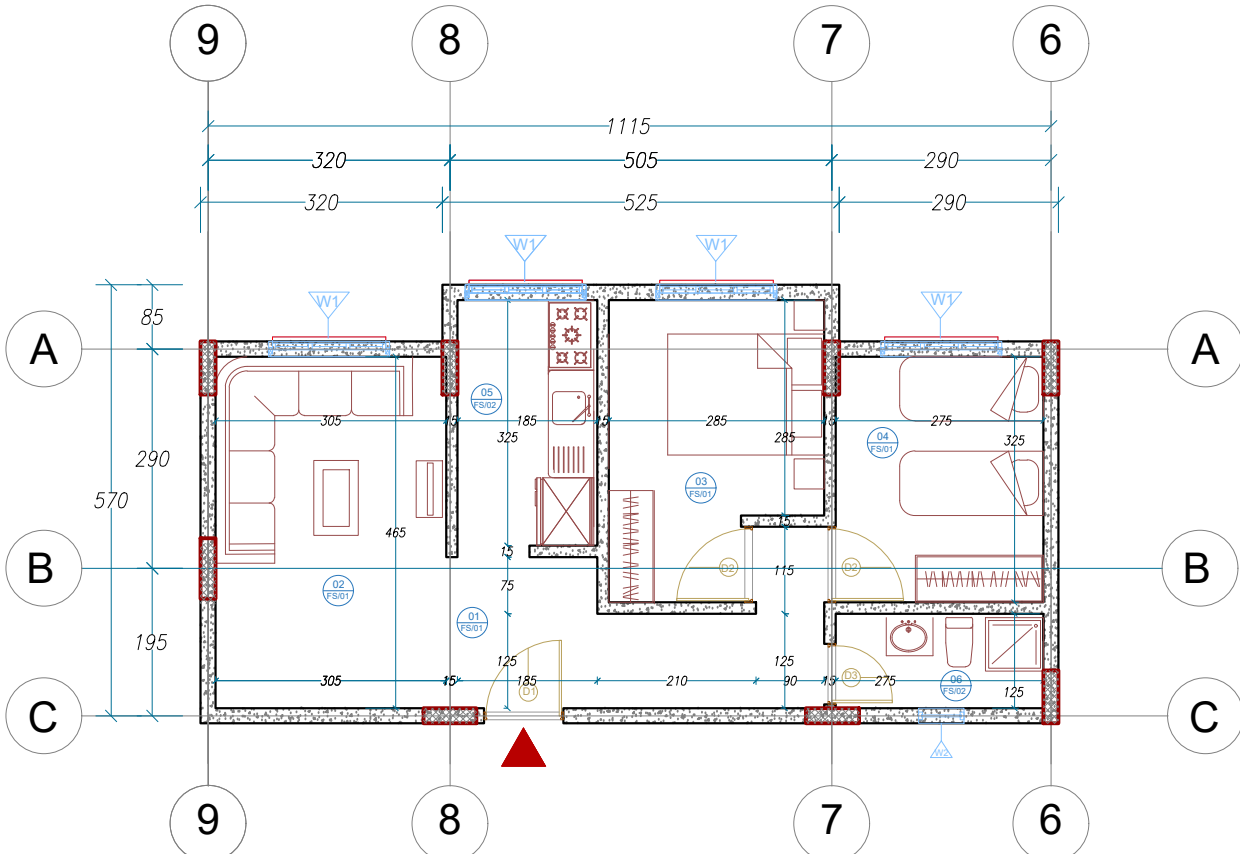
Approved by:
R.Almasri

Client:
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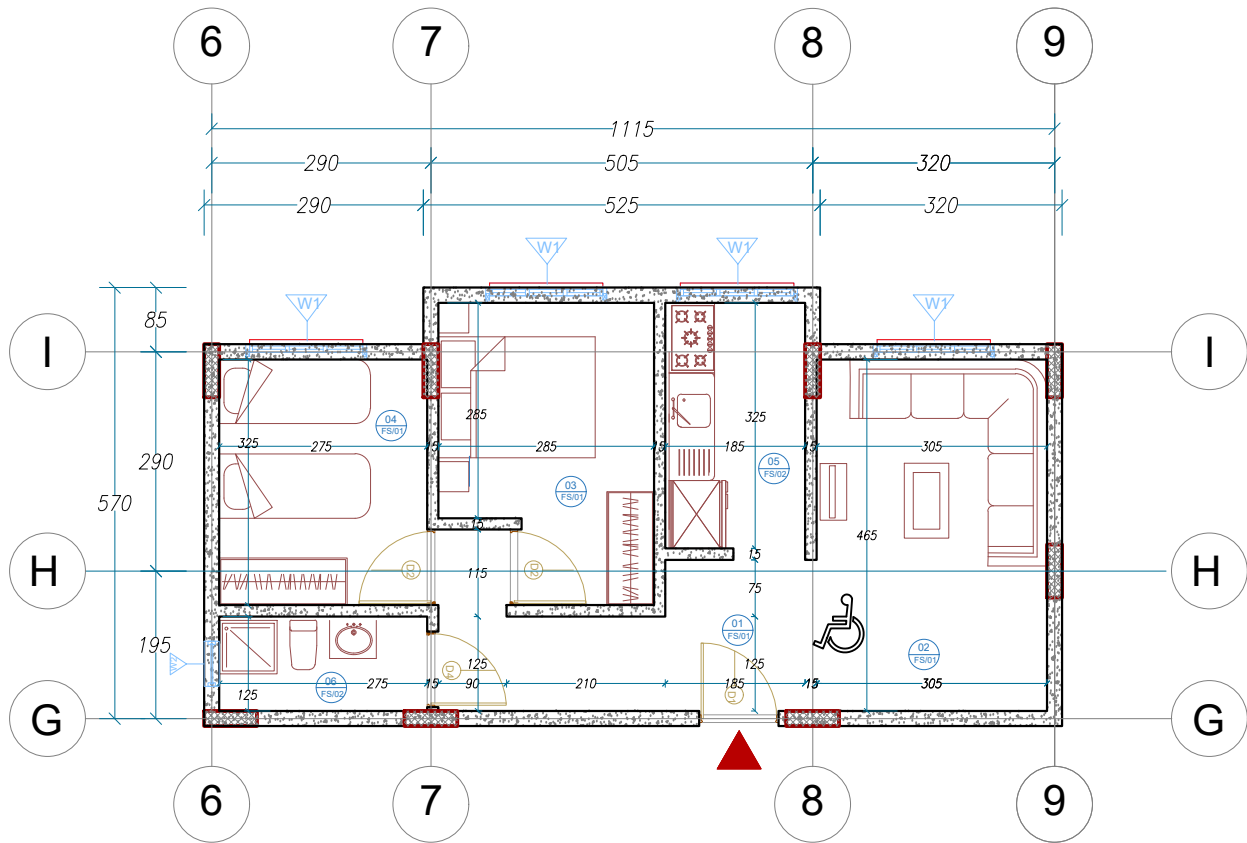
Type	Location
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08	Main Stairs

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Legend:

Project:

Right Side Mosul Buildings

Drawing :

Typical Handicap Apartment Plans

Location:

Mosul

Scale:
1/100

SN:
AR-PL-03

Format:
A3

rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

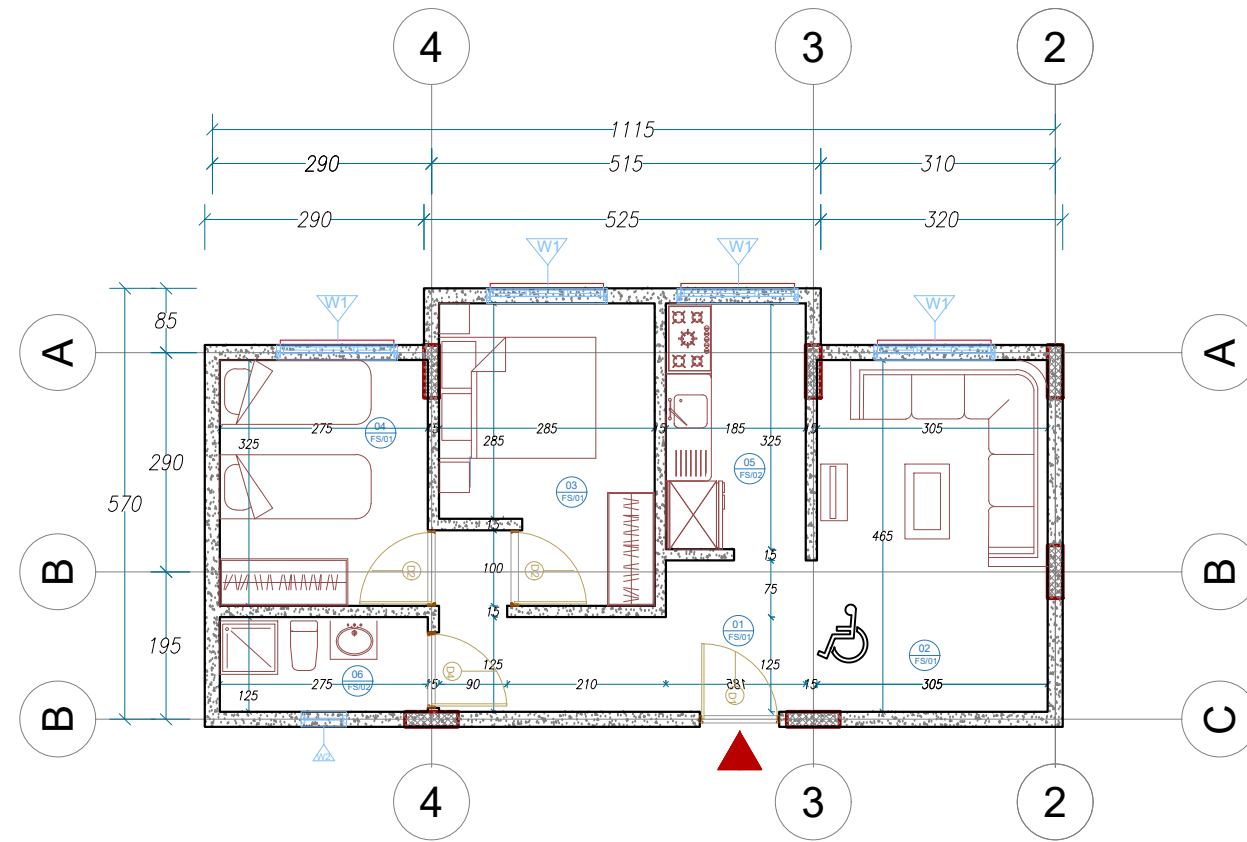
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R.Almasri

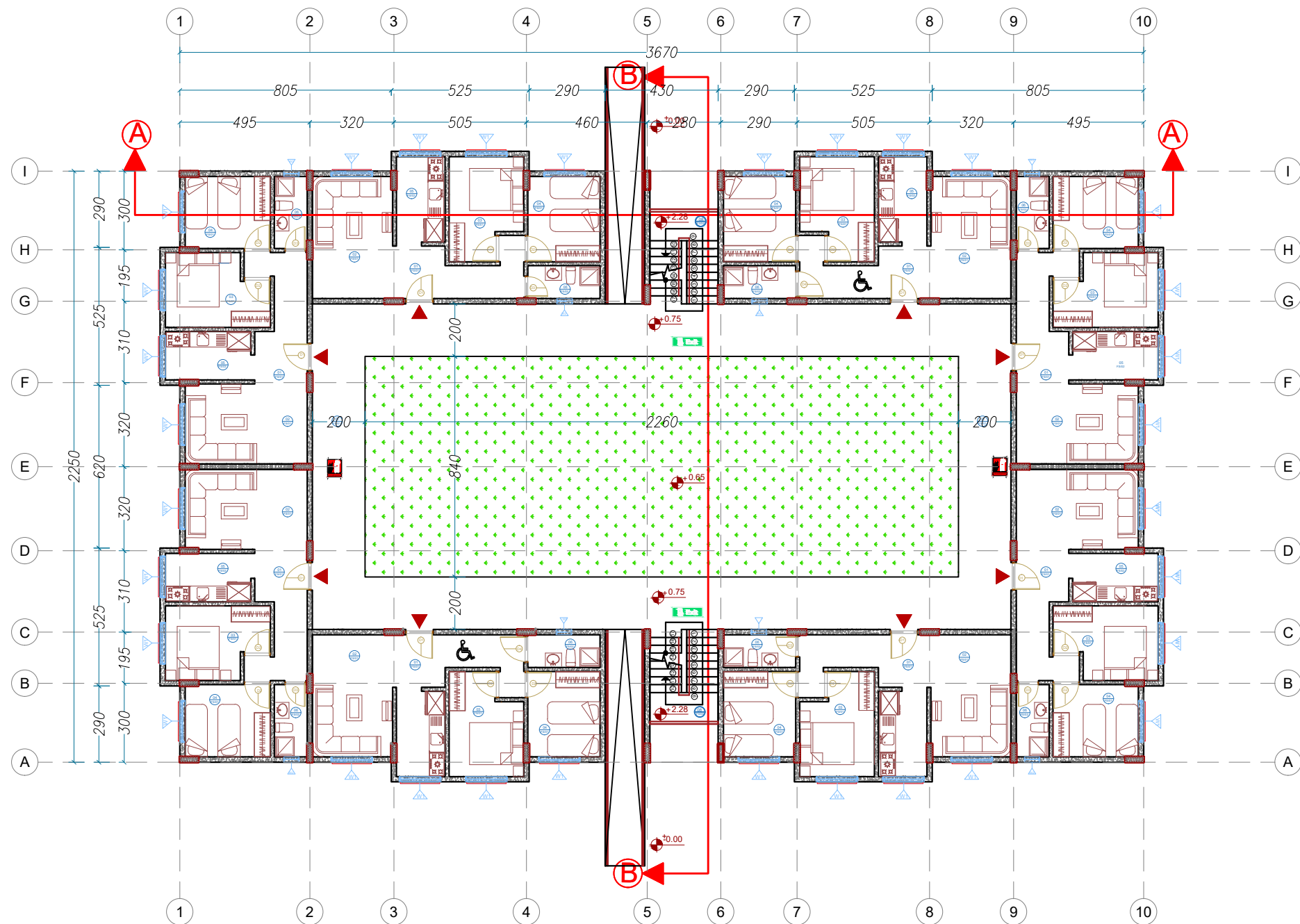
Client:
UN-HABITAT

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Type	Location
01	Apartment entrance
02	Main hall
03	Master bedroom
04	Bedrooms
05	Kitchen
06	Bath rooms
07	Main Corridor
08	Main Stairs

Gross Area : 61.3m2
Total Area B : 78.8m2
Total Area C : 80.4m2





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Legend:

Symbol	Description
	Exit Signage
	Fire Extinguisher

Project:

Right Side Mosul Buildings

Drawing :

Ground Floor Plan
(Type B)

Location:

Mosul

Scale:
1/200

SN:
AR-PL-04

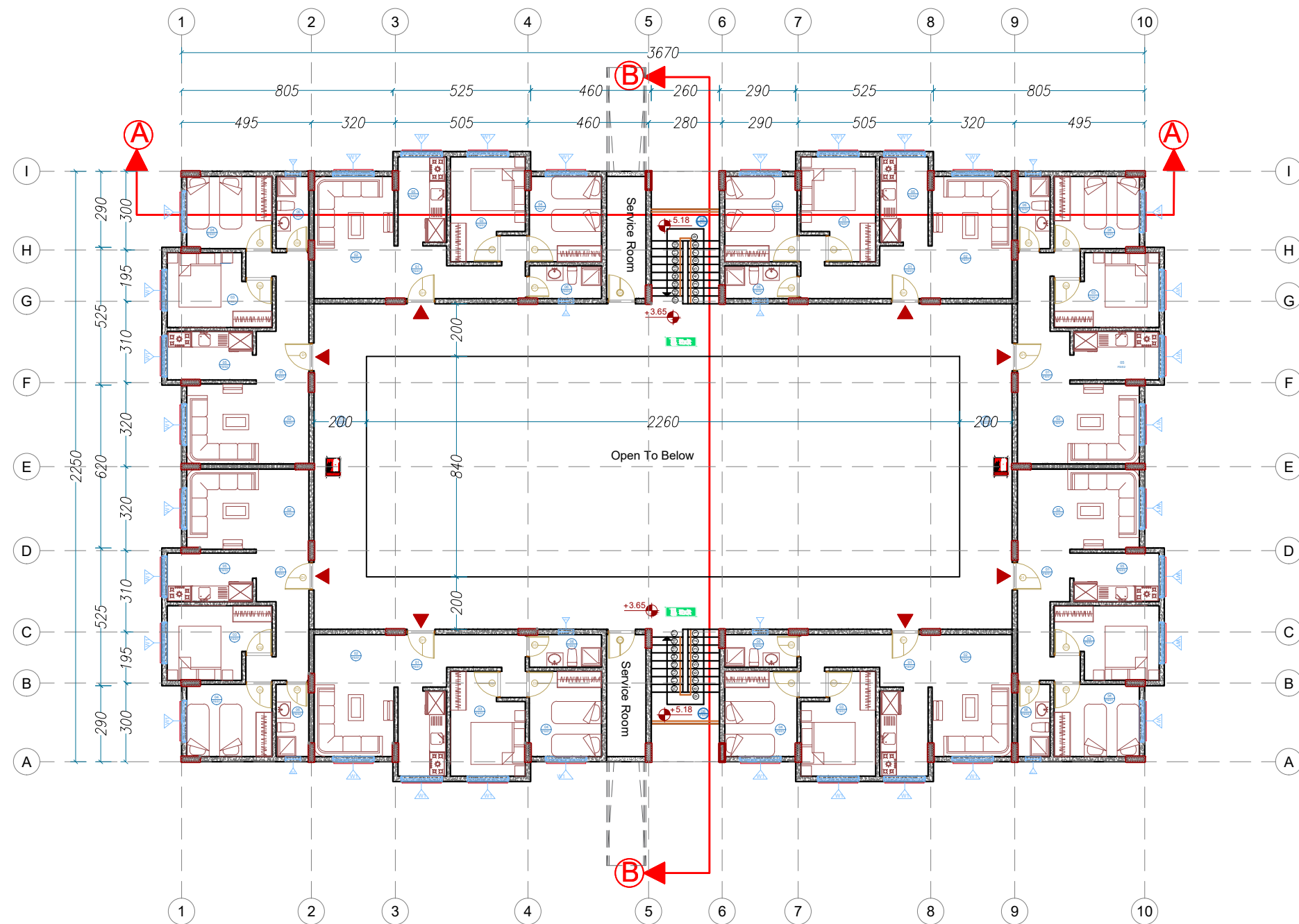
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rev.	Description	Date
F	Tendering	16-06-2019
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C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
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Legend:

Symbol	Description
	Exit Signage
	Fire Extinguisher

Project:

Right Side Mosul Buildings

Drawing :

Typical Floor Plan (Type B)

Location:

Mosul

Scale:

1/200

Format:

A3

SN:	AR-PL-05
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rev.	Description	Date
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E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

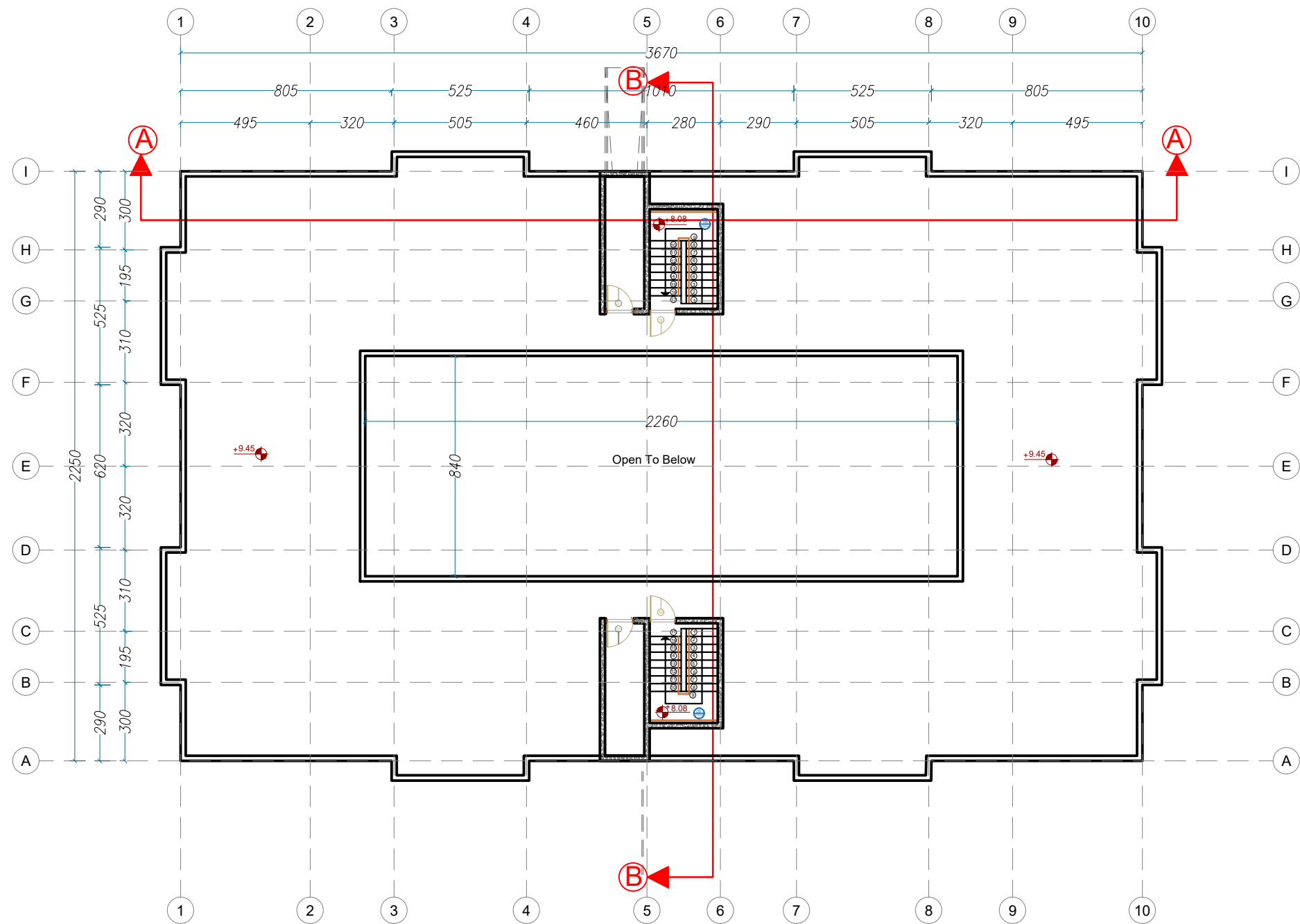
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Approved by:

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Client:

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Legend:

Symbol	Description
	Exit Signage
	Fire Extinguisher

Project:

Right Side Mosul Buildings

Drawing :

Roof Floor Plan
(Type B)

Location:

Mosul

Scale:
1/200

SN:
AR-PL-06

Format:
A3

rev.	Description	Date
F	Tendering	16-06-2019
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D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
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Arch: Shahyan Luttfi

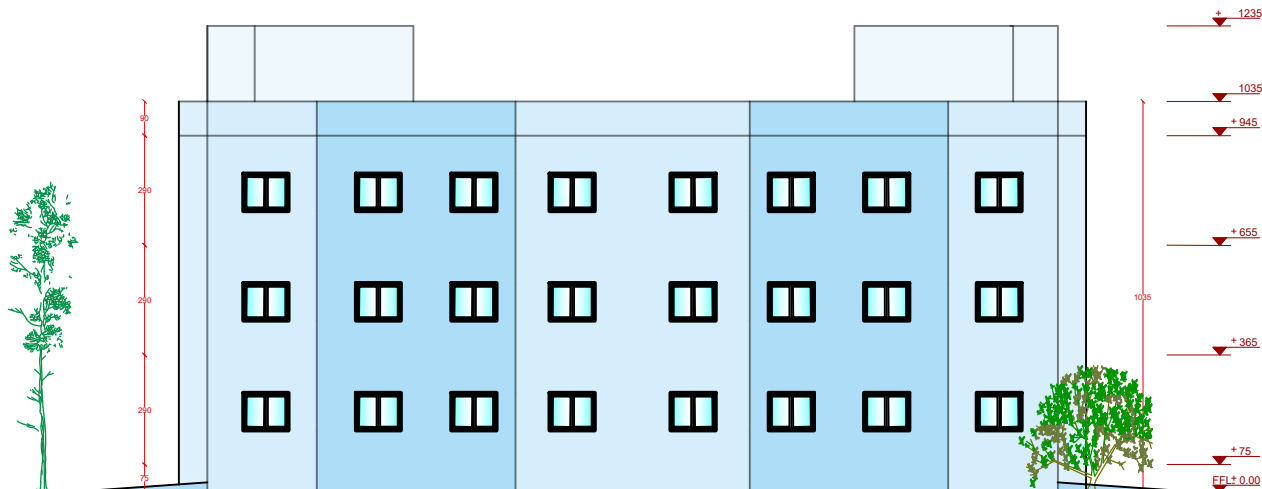
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R.Almasri

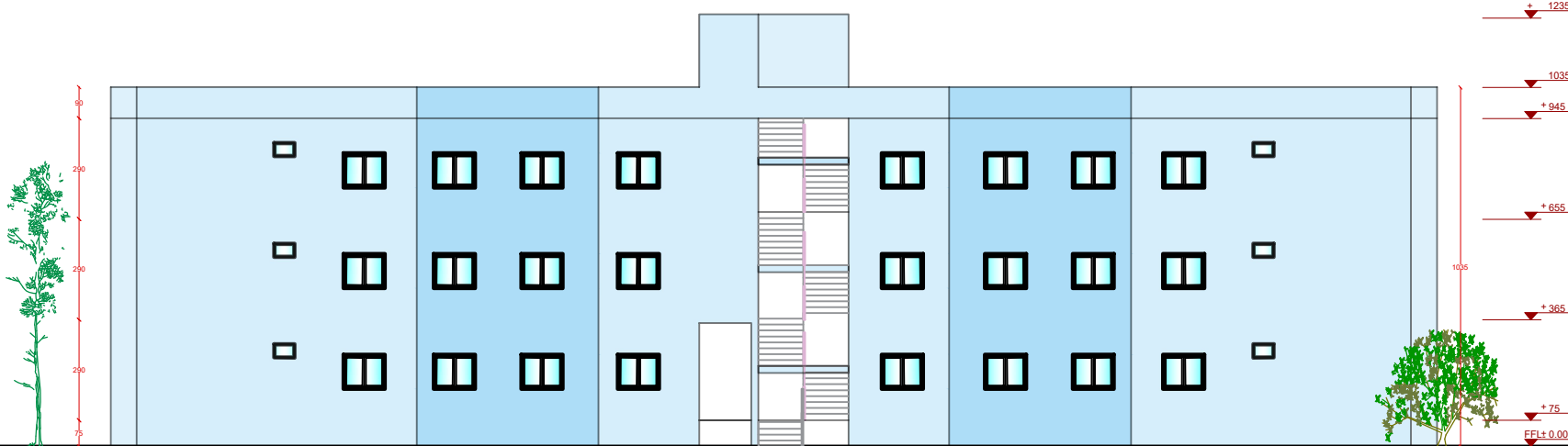
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Elevation A



Elevation B

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Legend:

Project:
Right Side Mosul Buldings

Drawing :
Elevation A&B
(Type B)

Location:
Mosul

Scale:
1/200

SN:
AR-Ele-01

Format:
A3

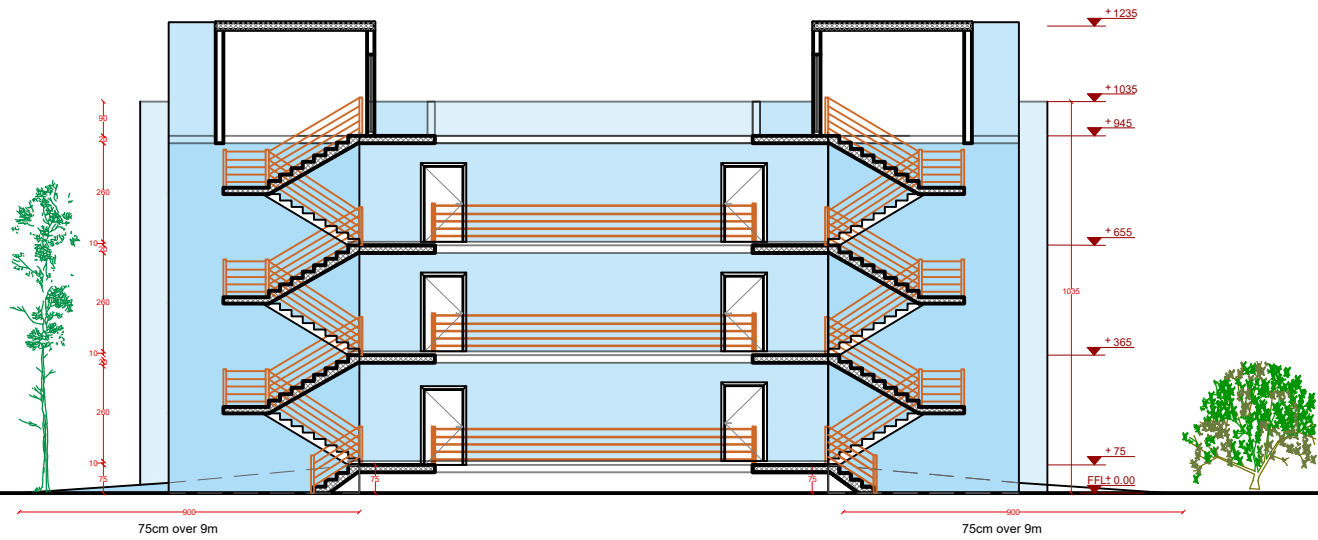
rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
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Arch: Shahyan Luttfi

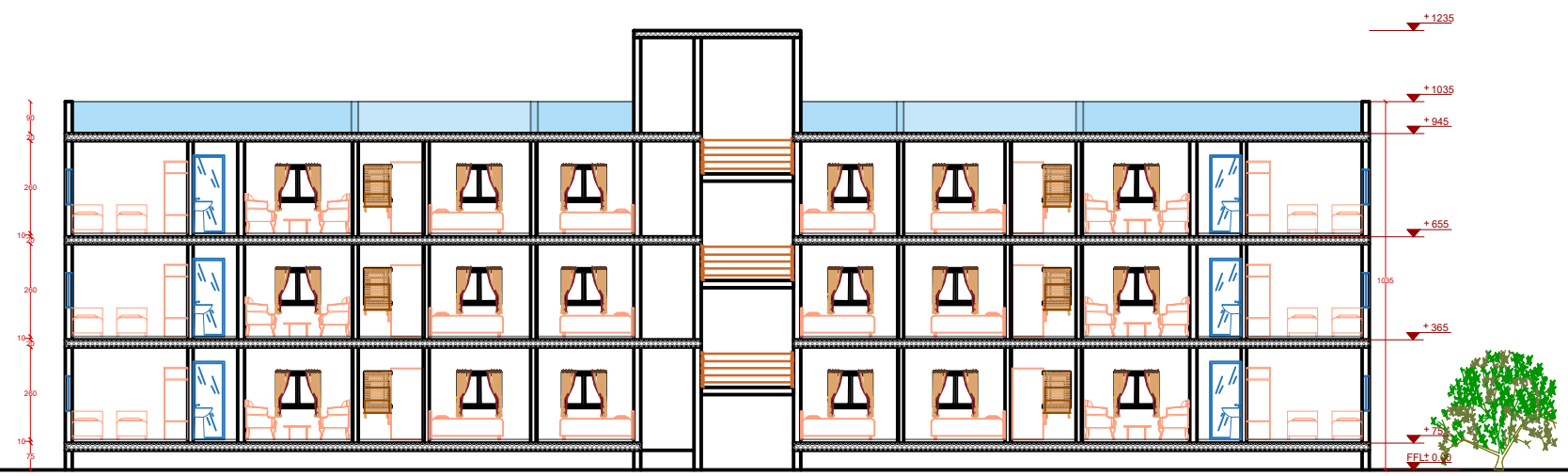
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Section B-B



Section A-A

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Legend:

Project:
 Right Side Mosul Buldings

Drawing :
 Sections AA & BB
 (Type B)

Location:
 Mosul

Scale: 1/200	SN: AR-Sec-01
Format: A3	

rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
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Client:
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Legend:

Project:

Right Side Mosul Buildings

Drawing :

Door Schedule and Drawings

Location:

Mosul

Scale:
N/V

SN:
AR-DR-01

Format:
A3

rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
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Arch: Shahyan Luttfi

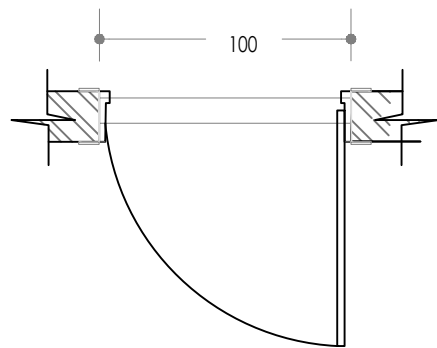
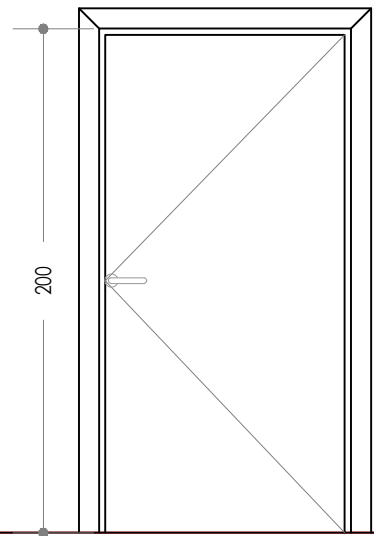
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R.Almasri

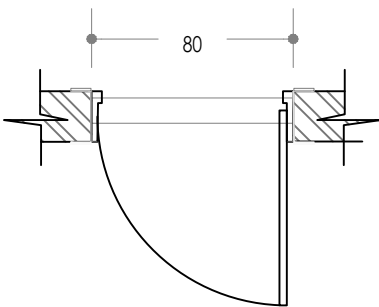
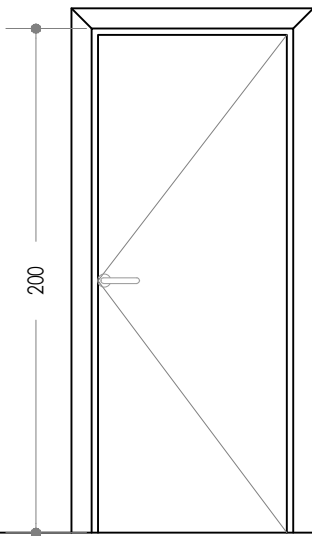
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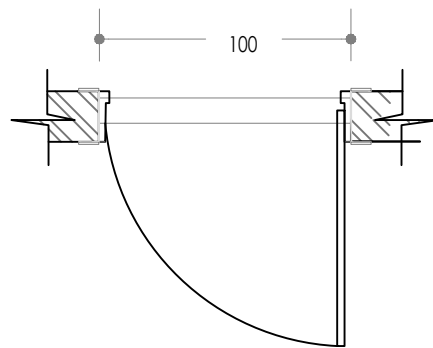
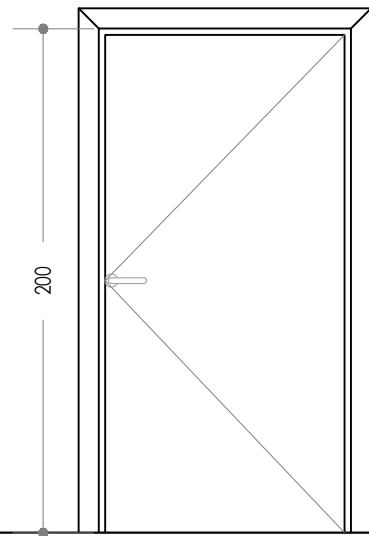
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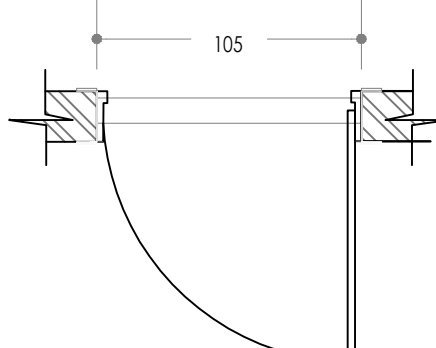
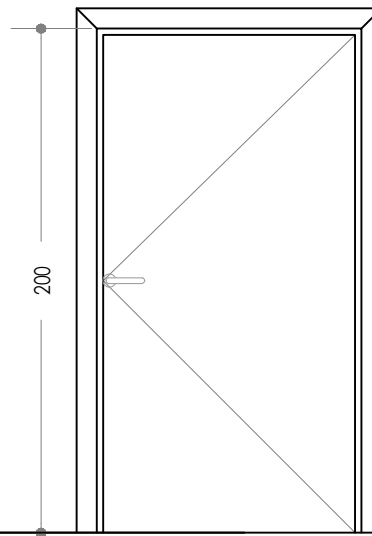
Name	D4
Location	Handicap Bath rooms
Dimention	100*200
Material	PVC door
Quantity	One in each Handicap apartment
Movement	One flap door



Name	D3
Location	Bath rooms
Dimention	80*200
Material	PVC door
Quantity	One in each Typical apartment
Movement	One flap door

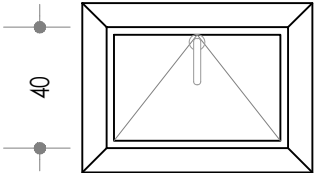


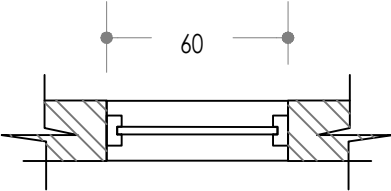
Name	D2
Location	Bedrooms
Dimention	100*200
Material	Metal door
Quantity	Two in each Typical apartment
Movement	One flap door



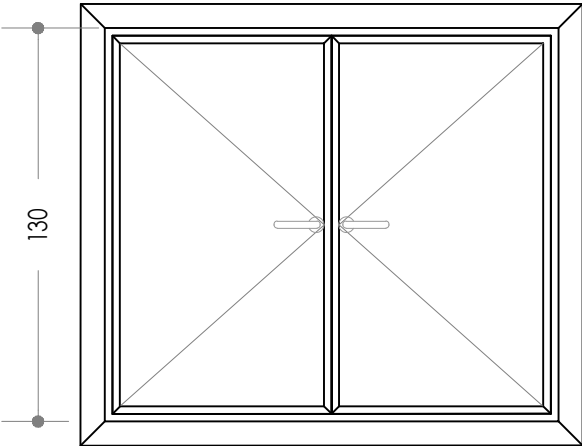
Name	D1
Location	Apartment entrance Service Rooms Staircase rooms
Dimensions	105*200
Material	Metal door
Quantity	One in each apartment
Movement	One flap door

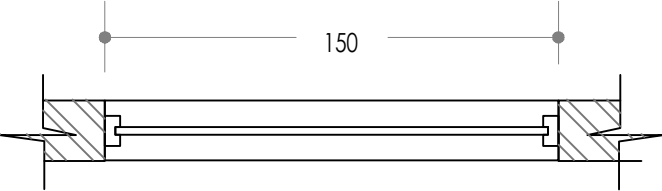
Type	Quantity in one apartment	QTY in typical floor (Type B)	QTY One Building (Type B)
D1	1	10	30
D2	2	16	50
D3	1	8	22
D4	1 (Handicap apartments)	2 (Handicap apartments)	2 (Handicap apartments)





Name	W2
Location	Bath rooms
Dimention	40*60
Material	PVC window (blurred glass)
Quantity	One in each apartment
Movement	One flap window





Name	W1
Location	Main hall ,Kitchen,Master bedroom,Bedroom
Dimention	120*100
Material	PVC window
Quantity	Four in each apartment
Movement	Two flap window

Type	Quantity in one apartment	QTY in typical floor (Type B)	QTY One Building (Type B)
W1	4	32	96
W2	1	8	24

Notes:
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Legend:

Project:
Right Side Mosul Buldings

Drawing :
Window Schedule and Drawings

Location:
Mosul

Scale: N/V	SN: AR-WN-01
Format: A3	

rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

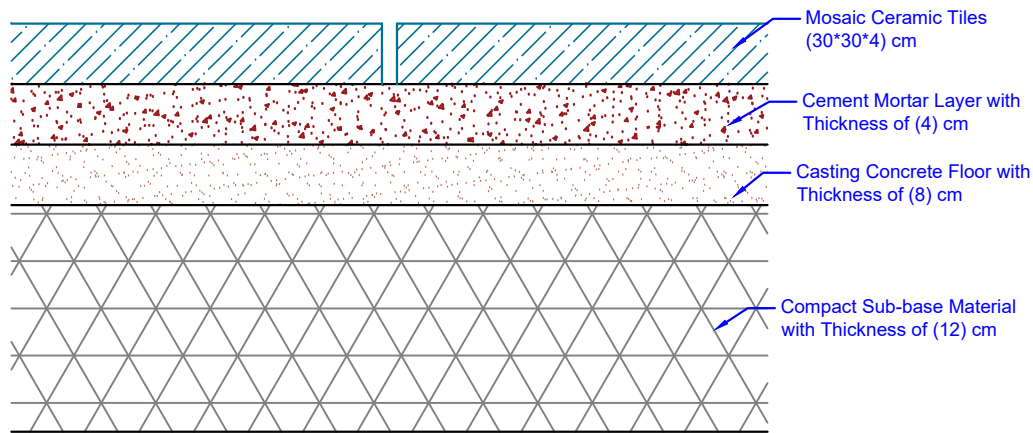
Arch: Shahyan Luttfi

Approved by:
R.Almasri

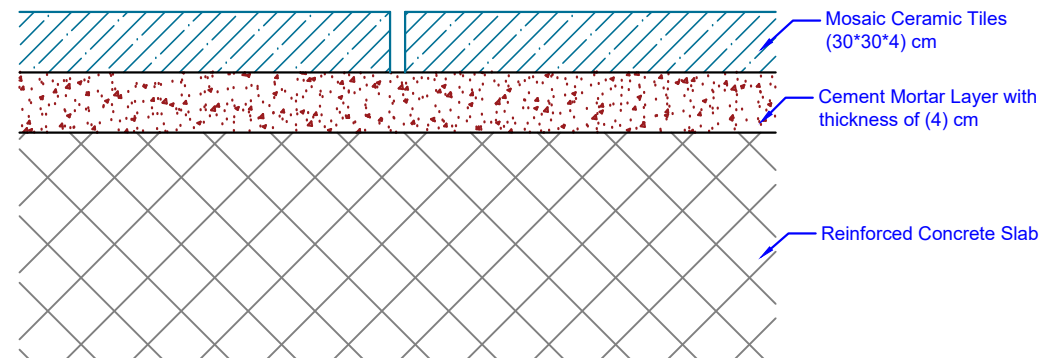
Client:
UN-HABITAT



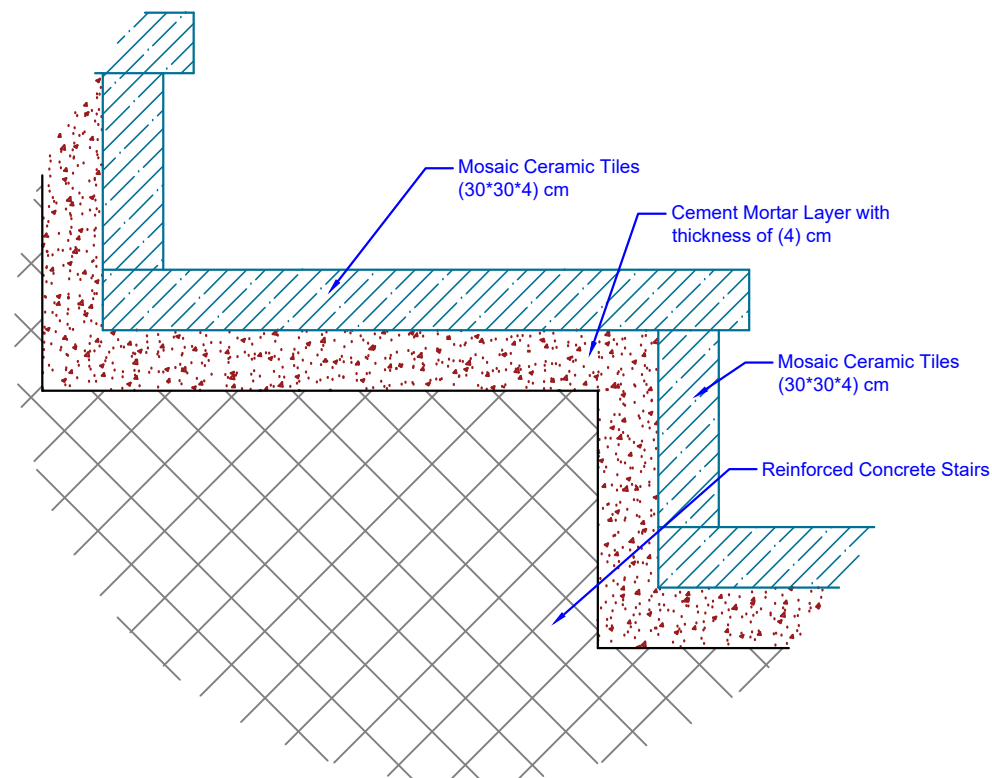
FOR A BETTER URBAN FUTURE



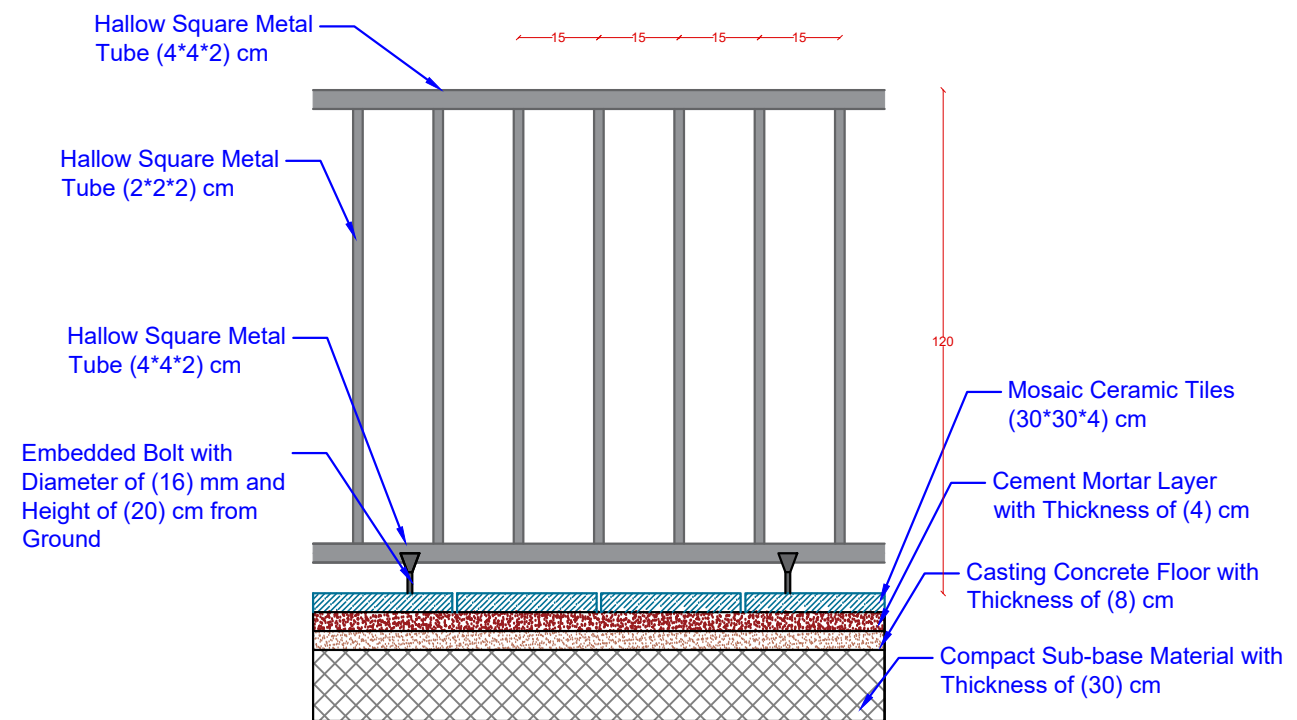
Detail No.01: Floor Ceramic Details for Ground Floor



Detail No.02: Floor Ceramic Details above Reinforced Slab



Detail No.03: Floor Ceramic Details for Stairs



Detail No.04: Metal Handrail Details

Notes:
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Project:
Right Side Mosul Buildings

Drawing :
Floor Ceramic Details above Reinforced Slab

Location:
Mosul

Scale: N/V
Format: A3
SN: AR-DTP-01

rev.	Description	Date
F	Tendering	16-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Juwan Agha

Approved by:
R.Almasri

Client:
UN-HABITAT

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Right Side Mosul Low Cost House Units

2019-06-16

Sanitation Documents for Type B

Sanitation

LIST OF DRAWING

NUM.	TITLE	SCALE	PAPER	REVISION
SA-LD-00	List of Drawings	N/A	A3	REV - 06
SE-PL-01	Ground Floor Sewage Plan - Type B	1:200	A3	REV - 06
SE-PL-02	Typical Floor Sewage Plan - Type B	1:200	A3	REV - 06
SE-PL-03	Roof Floor Sewage Plan - Type B	1:200	A3	REV - 06
WS-DPL-01	Ground Floor Water Supply Plan -Type B	1:200	A3	REV - 06
WS-DPL-02	Typical Floor Water Supply Plan -Type B	1:200	A3	REV - 06
WS-PL-03	Roof Floor Water Supply Plan -Type B	1:200	A3	REV - 06
WS-PL-04	General Details 01	N/A	A3	REV - 06
WS-PL-05	General Details 02	N/A	A3	REV - 06
WS-PL-06	General Details 03	N/A	A3	REV - 06
WS-DPL-01	Ground Floor & Typical Floor Water Supply Details-Type C & D	N/A	A3	REV - 06
WS-DPL-02	Water Supply Schematic for Type B,C & D	N/A	A3	REV - 06

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Legend:

Project:

Right Side Mosul Buildings

Drawing :
List of Drawings -
Architectural Works

Location:

Mosul

Scale:
N/A

SN:
AR-LD-00

Format:
A3

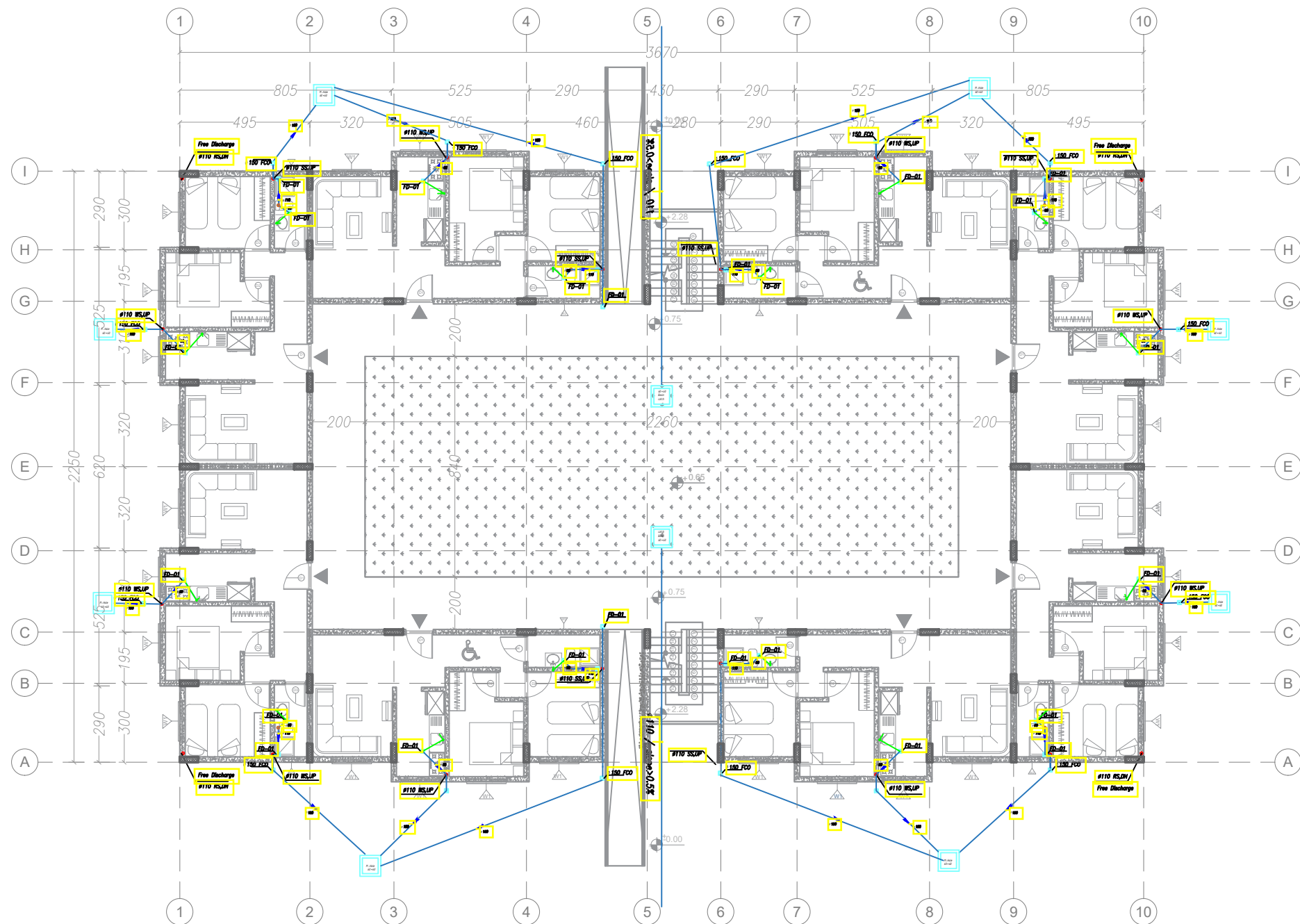
rev.	Description	Date
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Arch: Shahyan Luttfi

Approved by:
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Legend:

Project:

Right Side Mosul Buildings

Drawing :

Ground Floor Sewage Plan-Type B

Location:

Mosul

Scale:
1/200

SN:
SE-PL-01

Format:
A3

rev.	Description	Date
F	Tendering	19-06-2019
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Legend:

Project:

Right Side Mosul Buildings

Drawing :

Typical Floor Sewage Plan-Type B

Location:

Mosul

Scale:
1/200

SN:
SE-PL-02

Format:
A3

rev.	Description	Date
F	Tendering	19-06-2019
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Arch: Shahyan Luttfi

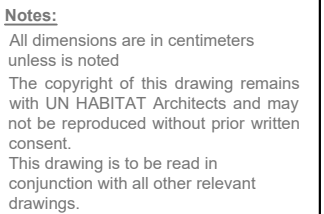
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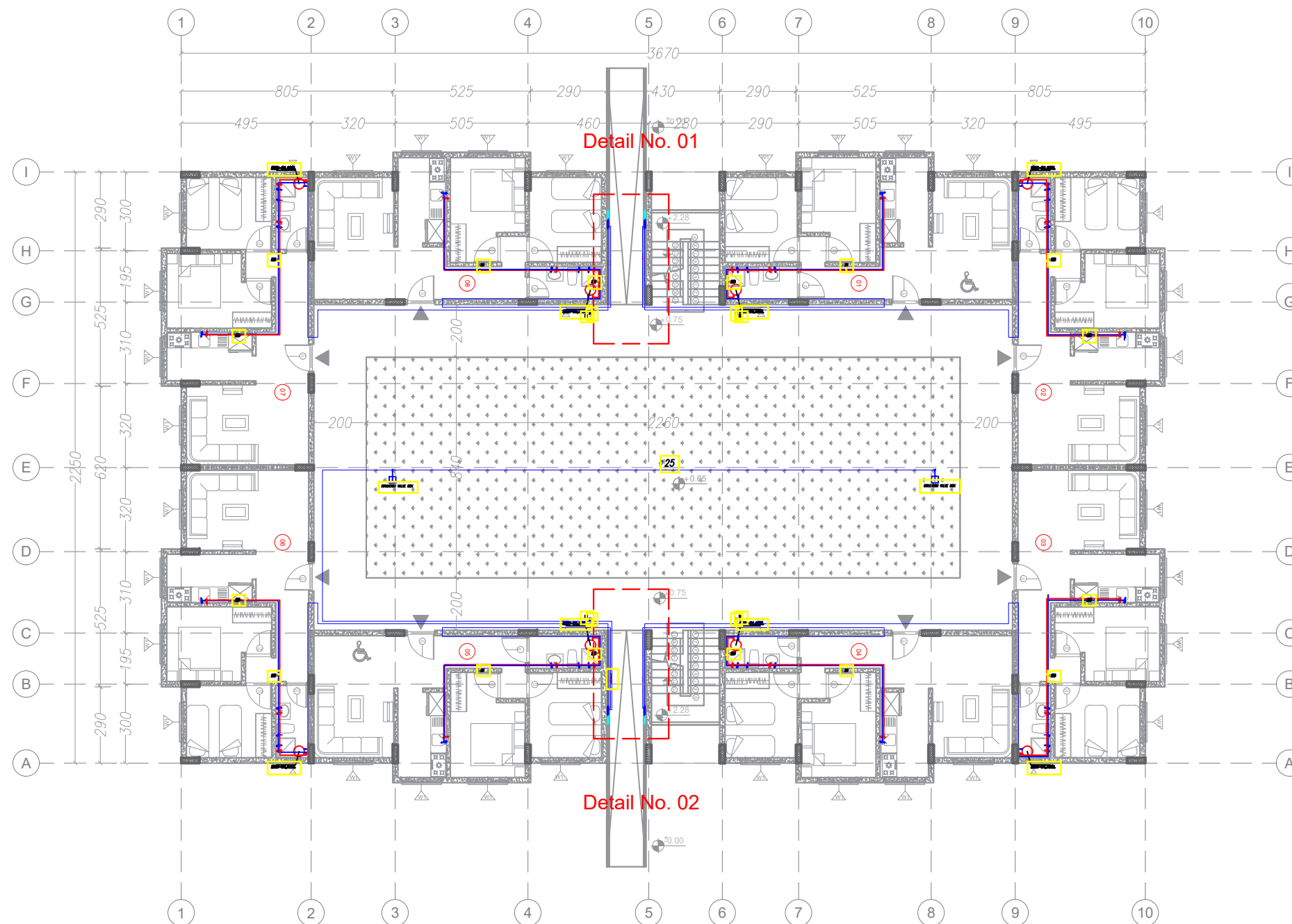
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Legend:

Project:

Right Side Mosul Buildings

Drawing :
 Type B -Ground Floor-
 Water supply plan

Location:

Mosul

Scale:
 1/200

SN:
 WS-DPL-01

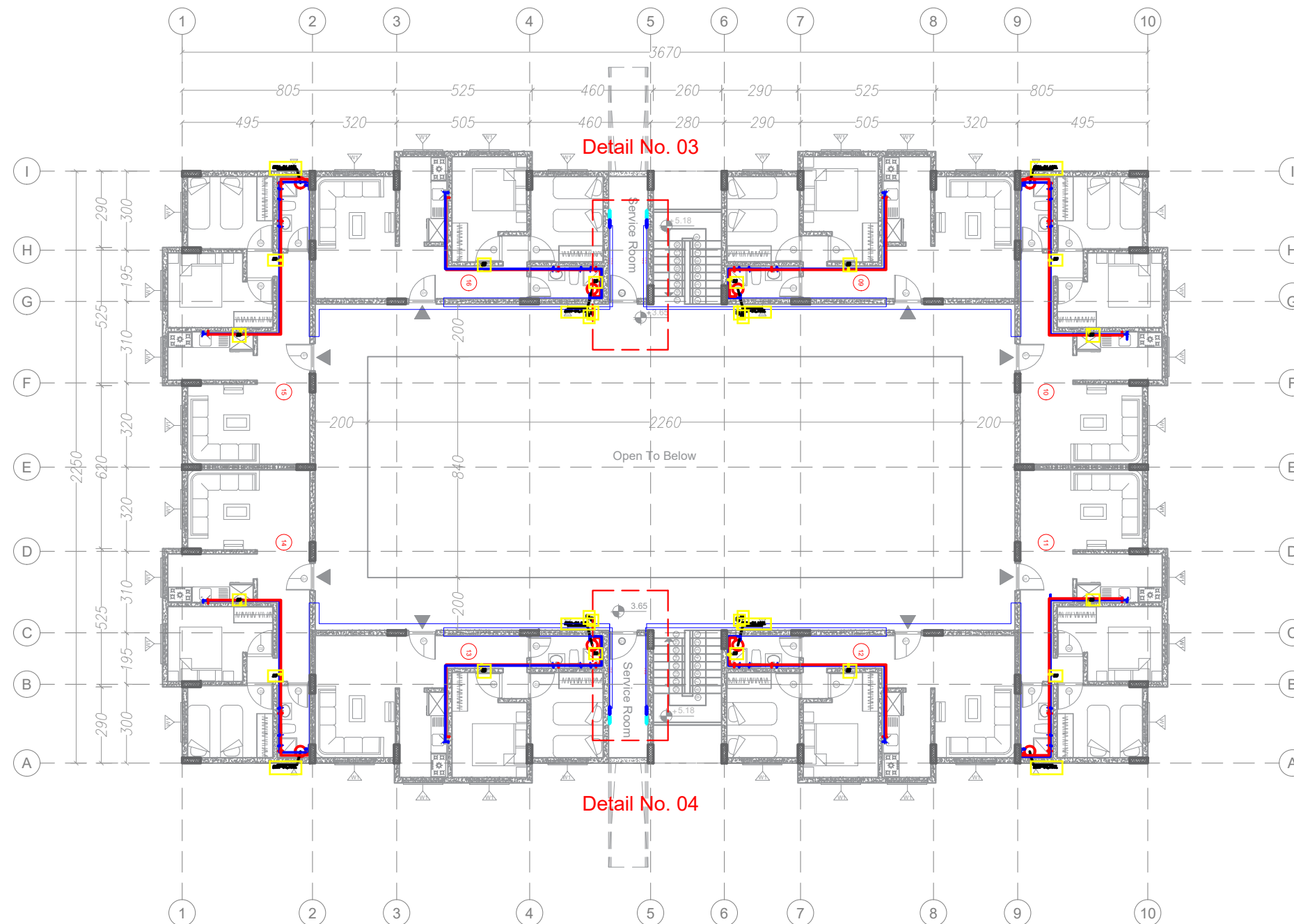
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rev.	Description	Date
F	Tendering	19-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
 R.Almasri

Client:
 UN-HABITAT



Notes:
All dimensions are in centimeters unless is noted
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This drawing is to be read in conjunction with all other relevant drawings.

Legend:

Project:

Right Side Mosul Buildings

Drawing :
Type B -Typical Floor-
Water supply plan

Location:

Mosul

Scale:
1/200

SN:
WS-DPL-02

Format:
A3

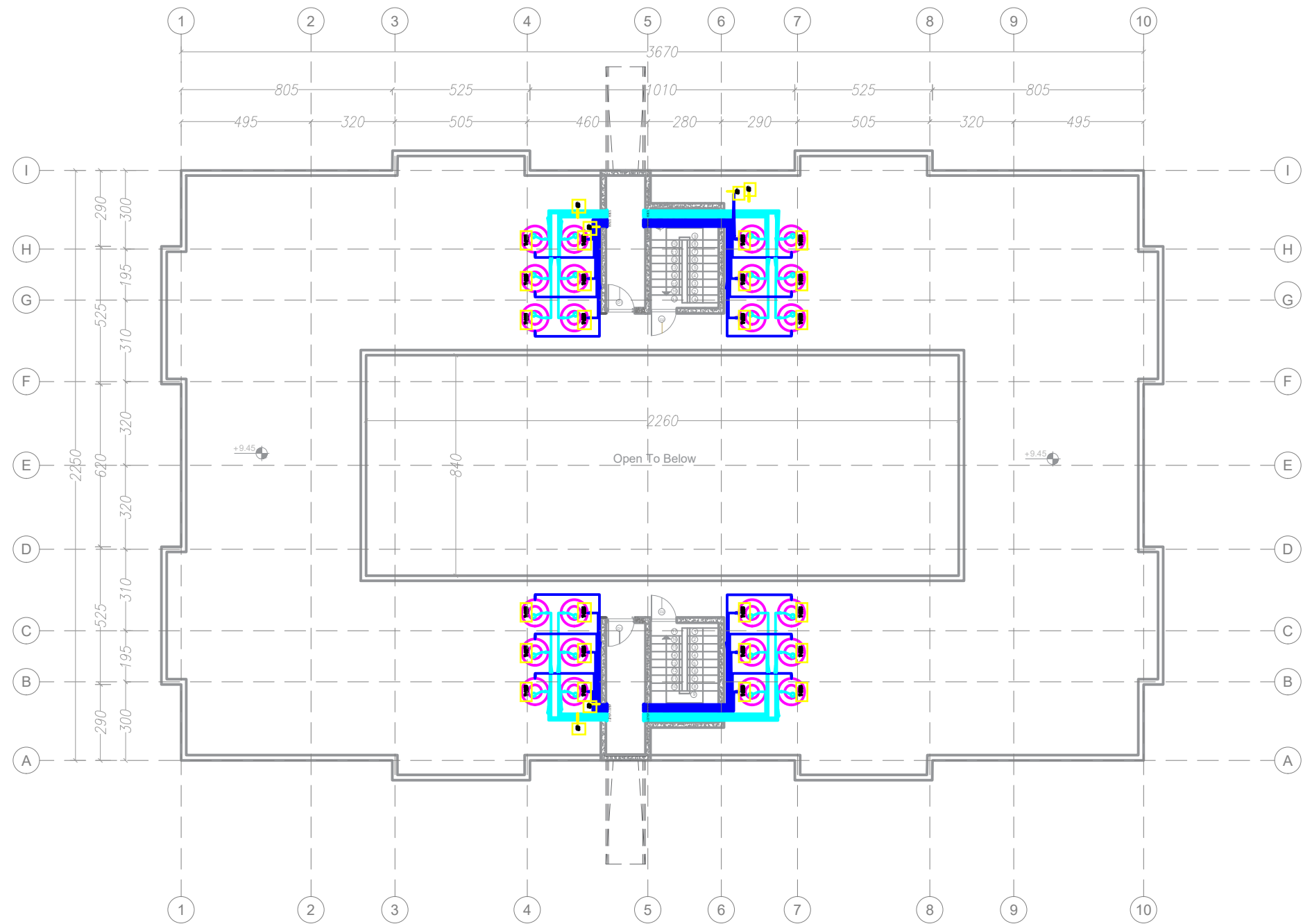
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F	Tendering	19-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
UN-HABITAT

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FOR A BETTER URBAN FUTURE



Notes:
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This drawing is to be read in conjunction with all other relevant drawings.

Legend:

Project:
Right Side Mosul Buildings

Drawing :
Type B-Roof Plan -Water Supply Plan

Location:
Mosul

Scale:
1/200

Format:
A3

SN:
WS-PL-03

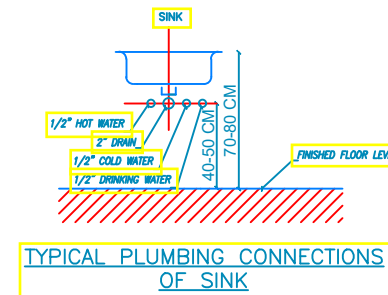
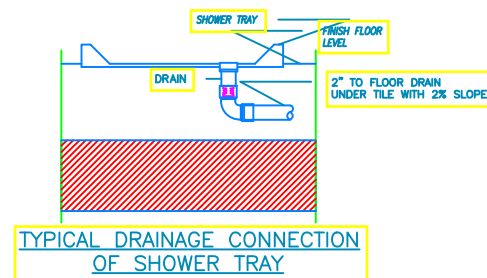
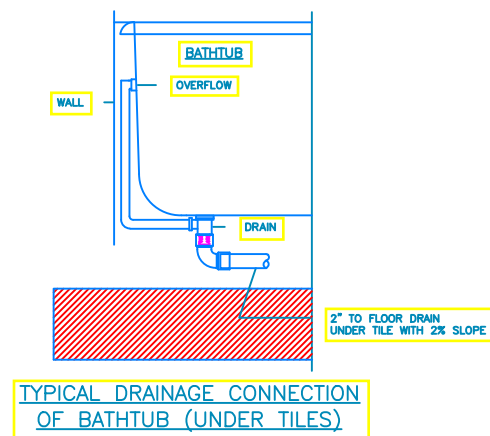
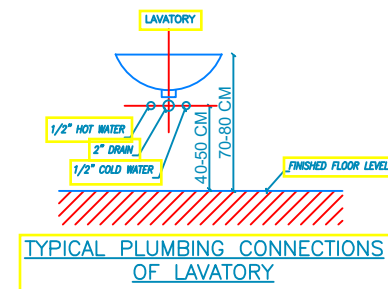
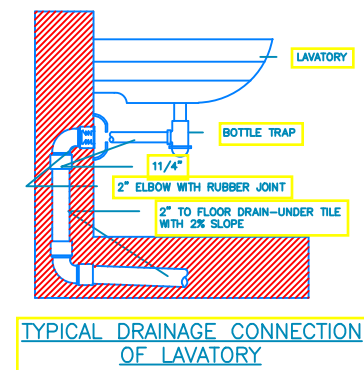
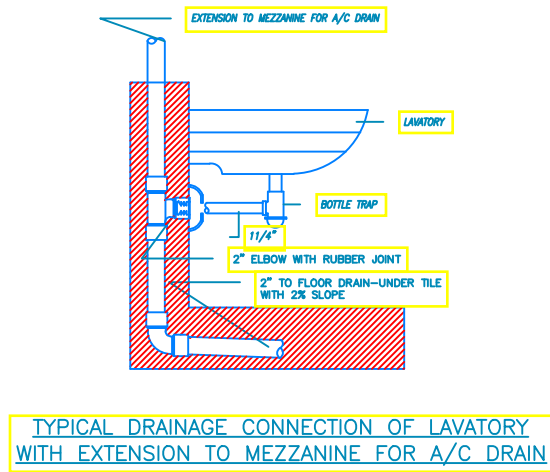
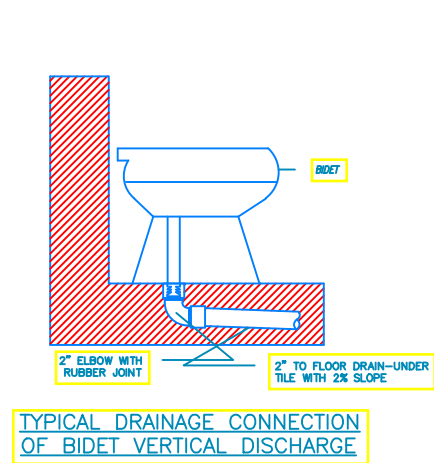
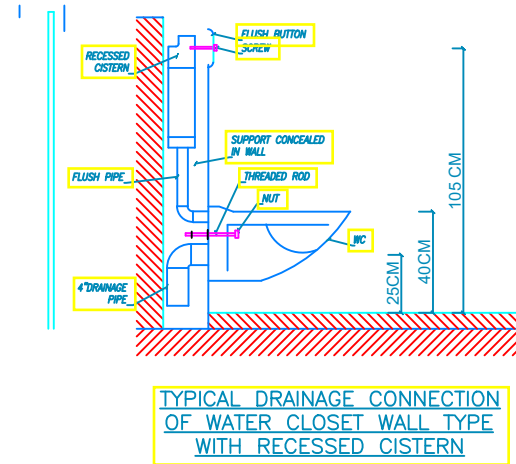
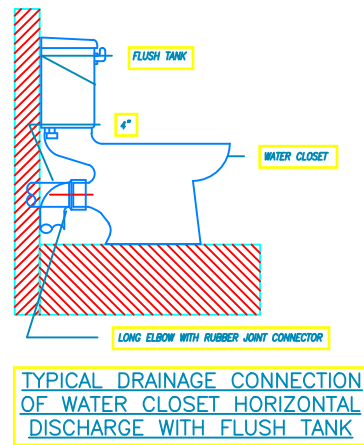
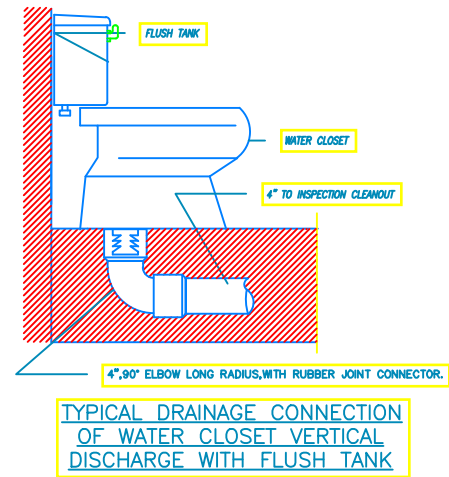
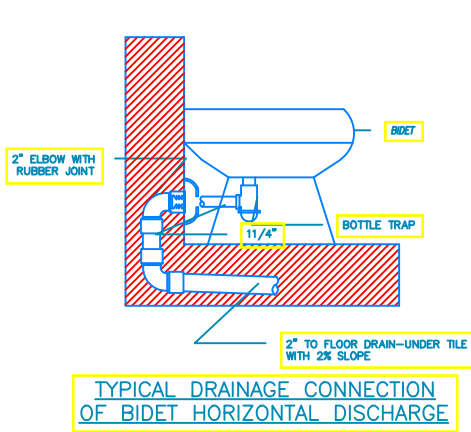
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D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
UN-HABITAT

UN HABITAT
FOR A BETTER URBAN FUTURE



Notes:
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Legend:

Project:

Right Side Mosul Buildings

Drawing :
General Details 02

Location:
Mosul

Scale:
N/V

SN:
WS-PL-05

Format:
A3

rev.	Description	Date
F	Tendering	19-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
UN-HABITAT

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WS EQUIPMENTS

NAME OF EQUIPMENT	BLOCK
GATE VALVE	
BALL VALVE	
FOAT VALVE	
SOLINOIDE VALVE	
TWO-WAY VALVE	SLV 
THREE-WAY VALVE	
CHECK ALARM VALVE	
GLOBE VALVE	
PRESSURE REDUCING VALVE	
CHROME PLATED VALVE	
BUTTERFLY VALVE	
PRESSURE GAUGE	
SAFETY VALVE	SV 
STRAINER	ST 
FLANGE OR UNION	
VALVE BOX	
EXPANSION JOINT	
WATER METER	
AUTOMATIC AIR VENT	VV 
U. V. TRETILISER	
PUMP IN LINE CIRCULATOR	
PUMP	
ELECTRIC WATER HEATER	
TANK (VERTICAL)	
FUEL BOILER	
BOILER ELECTRIC	
BOOSTER	BP 

WATER SUPPLY PIPES

AWJEVIATION	DESIGNATION
CW — — —	COLD WATER PIPES
HW — — —	HOT WATER PIPES
HWR — — —	HOT WATER RETURN PIPES
PCW — — —	PUMPED COLD WATER
DW — — —	POTABLE COLD WATER
W — W —	WATER FROM WELL
IR — IR —	HOT SOFT WATER RETURN PIPES
WT	WATER TANK
	WELL
	HOSE PIP
	CUT OFF VALVES OF BATHROOM
	HWST
	E.T
	T.W.T
	CP
	SCP
	T.W.P
	T.W.U
	BP
	I.R.P

DRAINAGE PIPES &EQUIPMENT

AWJEVIATION	DESIGNATION
RW	STORM STACK
WW	WASTE STACK
VP	VENT PIPE
RD	RAIN WATER DRAIN
FD	FLOOR DRAIN
FDS	FLOOR DRAIN WITH SIPHONE
C.O	CLEAN OUT
C.O.S	CLEAN OUT WITH SIPHONE
	SP
	SSP

FIRE FIGHTING PIPES

AWJEVIATION	DESIGNATION
FW — F —	FIRE FIGHTING PIPES
FH 	HOSE CABINET
FWR	FIRE WATER RISER
FP 	FIRE WATER PUMP
EX. CO2 	FIRE EXTINGUASHER WITH CO2
EX. FOAM 	FIRE EXTINGUASHER WITH FOAM
S 	FM-200 NOZZLE

EQUIVALENT PIPES DIAMETERS

Galvanized Steel Pip		Multi layer Pipe (Pex-Al-PEX)		Polypropylene Pipe (PPR - PN10)		Polypropylene Pipe (PPR - PN20)		Polypropylene Pipe (PPR - PN25)		PVC - C Pipe (CPVC - PN10)		PVC - C Pipe (CPVC - PN20)		PVC - C Pipe (CPVC - PN25)		Copper Pipes	
Nominal Diameter	Inside Diameter	Outside Diameter	Inside Diameter	Outside Diameter	Inside Diameter	Outside Diameter	Inside Diameter	Outside Diameter	Inside Diameter	Outside Diameter	Inside Diameter	Outside Diameter	Inside Diameter	Outside Diameter	Inside Diameter	Outside Diameter	Inside Diameter
(Inch)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1/2"	12.7	16	12	20	16.2	25	16.6	25	15.0	20	17.0	20	16.2	-	-	15	13.43
3/4"	19.05	25	20	25	20.4	32	21.2	32	19.2	25	21.2	25	20.4	25	19.4	22	20.00
1"	25.4	32	26	32	26.0	40	26.6	40	24.0	32	27.2	32	26.0	32	24.8	28	26.00
1 1/4"	31.75	40	32	40	32.6	50	33.2	50	30.0	40	34.0	40	32.6	40	31.0	35	32.35
1 1/2"	38.1	50	41	50	40.8	63	42.0	63	37.8	50	42.6	50	40.8	50	38.8	42	39.35
2"	50.8	63	51	63	51.4	75	50.0	75	45.0	63	53.6	63	51.4	63	49.0	54	51.35
2 1/2"	63.5	75	60	75	61.2	90	60.0	-	-	75	63.8	75	61.2	75	58.2	67	64.11
3"	76.2	90	73	90	73.6	110	73.2	-	-	90	76.6	90	73.6	90	70.0	76	72.85
4"	101.6	110	90	110	90.0	-	-	-	-	110	93.6	110	90.0	110	85.4	108	104.70

Notes:
All dimensions are in centimeters unless is noted
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This drawing is to be read in conjunction with all other relevant drawings.

Legend:

Project:

Right Side Mosul Buldings

Drawing :
General Details 03

Location:

Mosul

Scale:
N/V

SN:
WS-PL-06

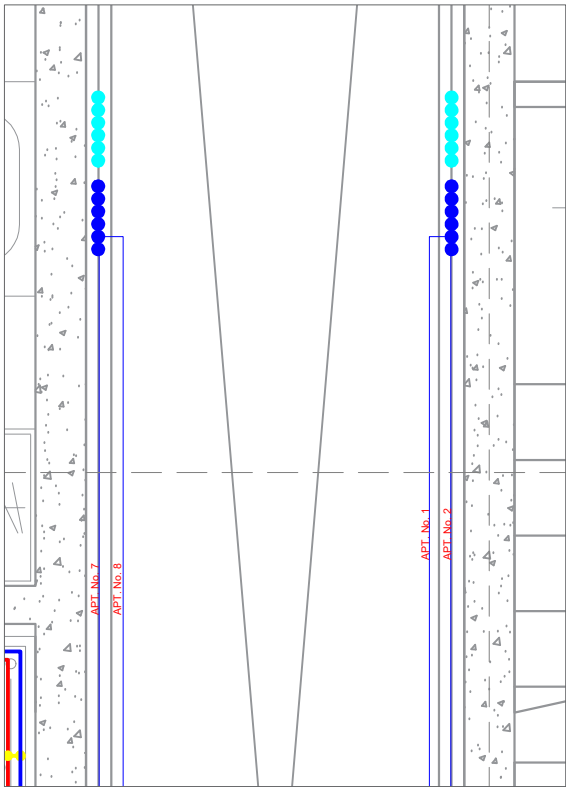
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rev.	Description	Date
F	Tendering	19-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

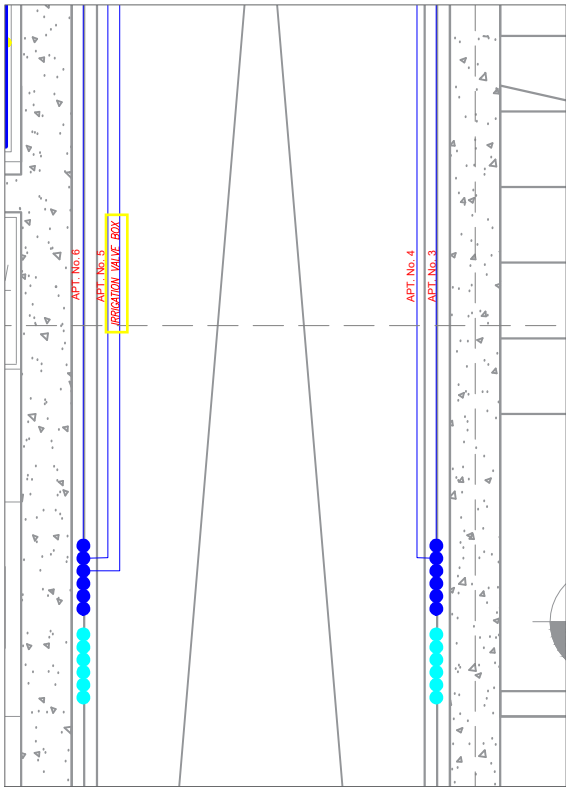
Arch: Shahyan Luttfi

Approved by:
R.Almasri

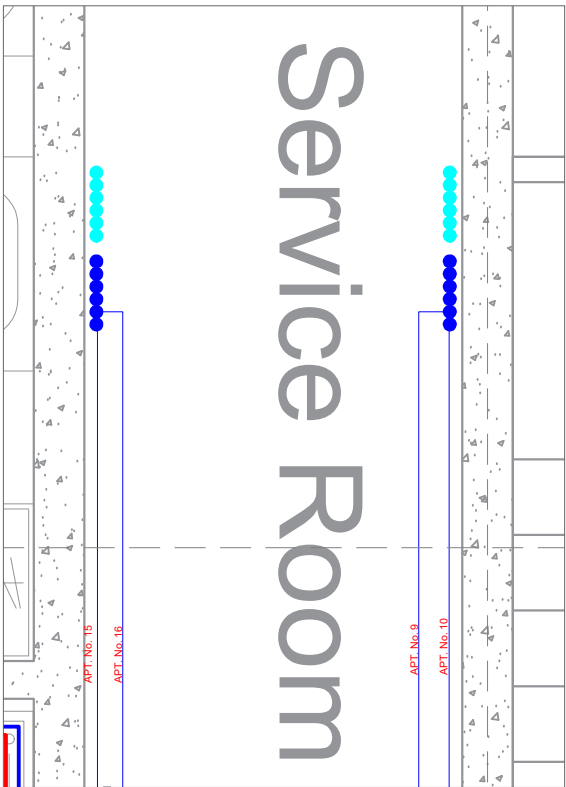
Client:
UN-HABITAT



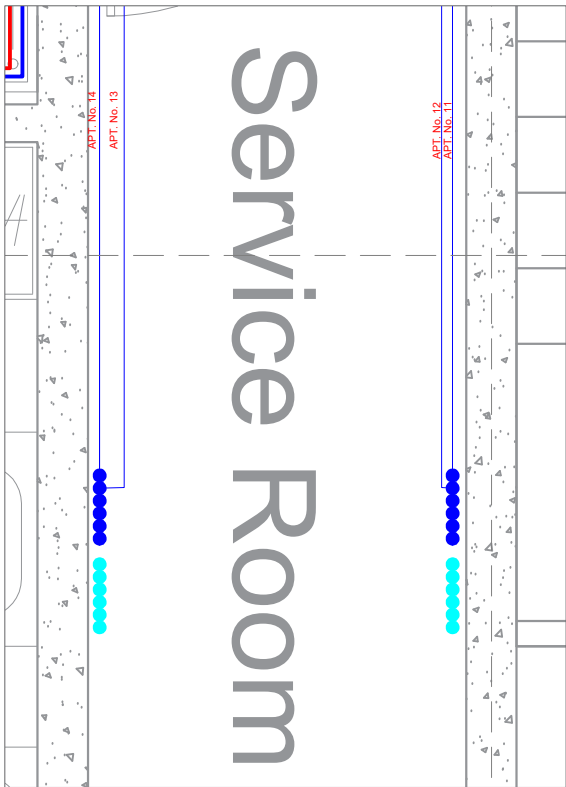
Detail No. 01



Detail No. 02



Detail No. 03



Detail No. 04

Notes:
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This drawing is to be read in conjunction with all other relevant drawings.

Legend:

Project:

Right Side Mosul Buldings

Drawing :
Ground Floor & Typical Floor
-Water Supply Details-Type B

Location:
Mosul

Scale:
N/V

SN:
WS-DPL-01

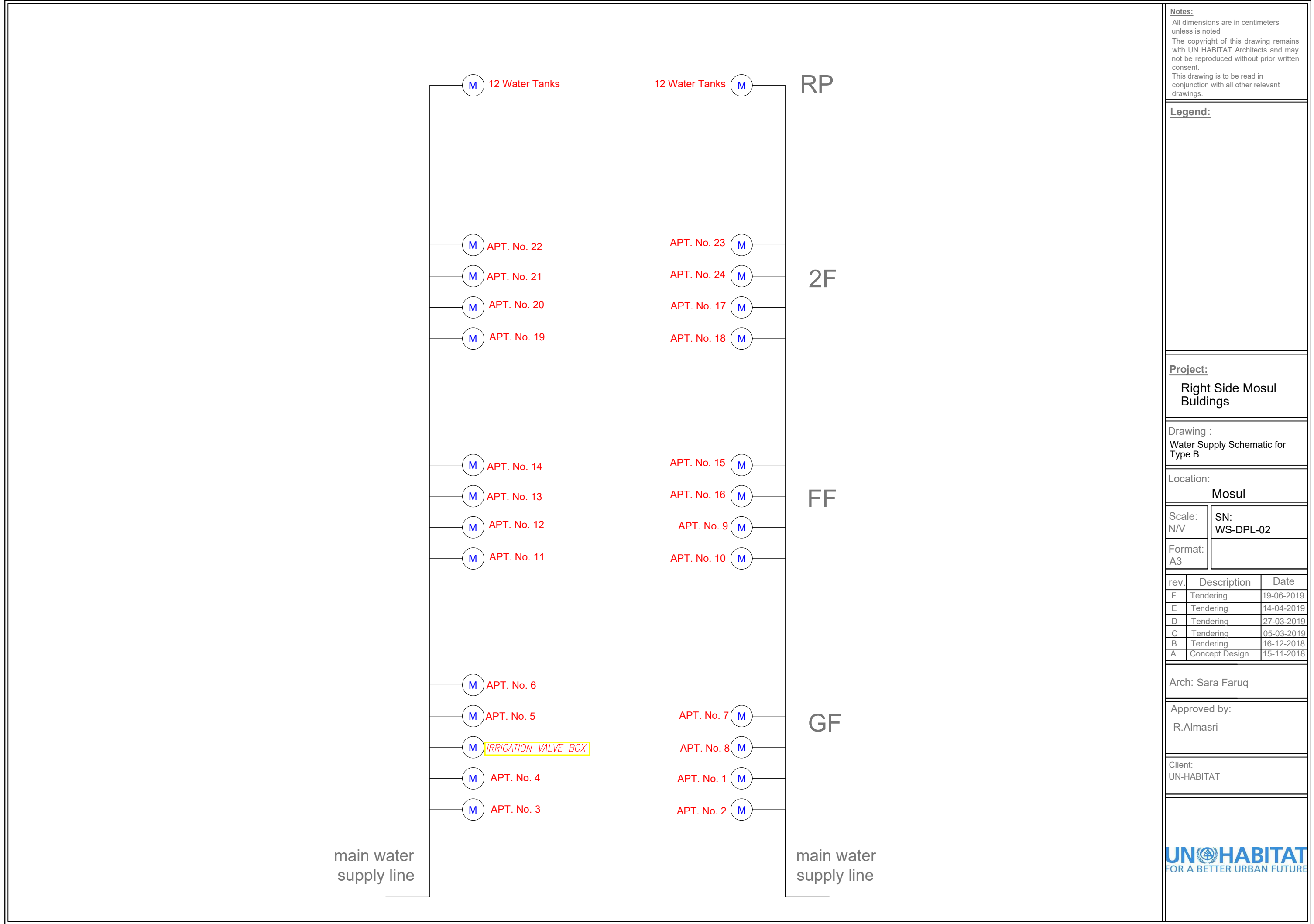
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rev.	Description	Date
F	Tendering	19-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Sara Faruq

Approved by:
R.Almasri

Client:
UN-HABITAT



Right Side Mosul Low Cost House Units

2019-06-16

Electrical Documents for Type B

Electrical

LIST OF DRAWING

NUM.	TITLE	SCALE	PAPER	REVISION
ELE-LD-00	List of Drawings	N/A	A3	REV - 06
ELE-PL-01	Type B - Ground Floor Sockets and Lighting	1:200	A3	REV - 06
ELE-PL-02	Type B - Typical Floor Sockets and Lighting	1:200	A3	REV - 06
ELE-PL-03	SDB Panel	N/A	A3	REV - 06
ELE-PL-04	DB5-1 to DB5-2	N/A	A3	REV - 06

Notes:
All dimensions are in centimeters unless is noted
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This drawing is to be read in conjunction with all other relevant drawings.

Legend:

Project:

Right Side Mosul Buildings

Drawing :
List of Drawings -
Electrical Works

Location:

Mosul

Scale:
N/A

SN:
AR-LD-00

Format:
A3

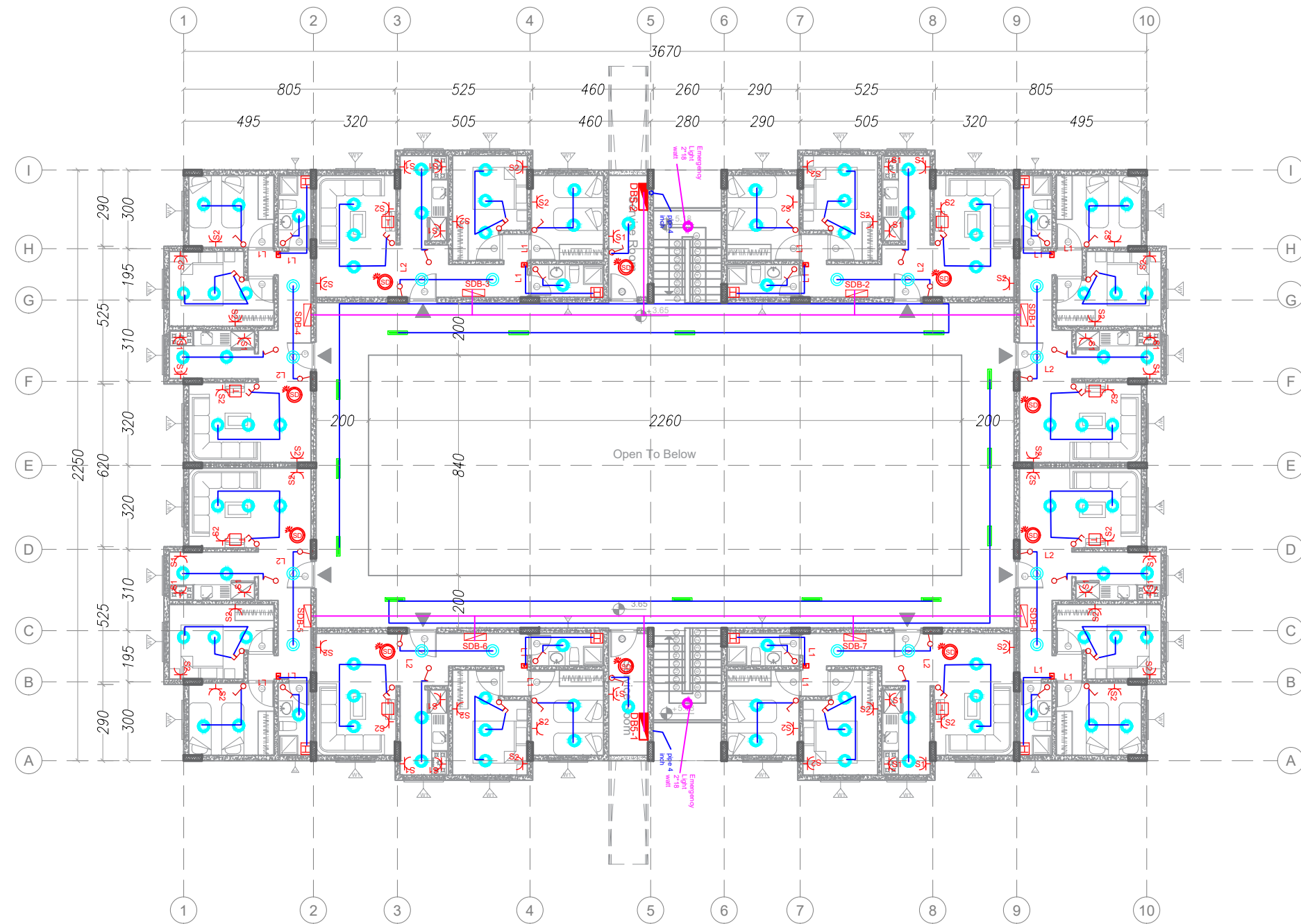
rev.	Description	Date
F	Tendering	19-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
UN-HABITAT

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Notes:
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Legend:

Shape	Description
	LED Lamp 18W/220V - IP 65
	LED Lamp 8W/220V
	LED Tube Lamp , 18W/220V
	one-way switch / 10A
	Two-way switch / 10A
	SDB - Distribution Board
	Electrical Outlet / 220V / 10A & TV Socket
	Electrical Outlet / 220V / 16A
	Electrical Outlet / 220V / 16A For Heater Water
	Stand alone Smoke Detectors

Project:

Right Side Mosul Buildings

Drawing :

Type B-Typical Floor-Sockets and Lighting

Location:

Mosul

Scale:
1/200

SN:
ELE-PL-02

Format:
A3

rev.	Description	Date
F	Tendering	19-06-2019
E	Tendering	14-04-2019
D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Eng: Rawand

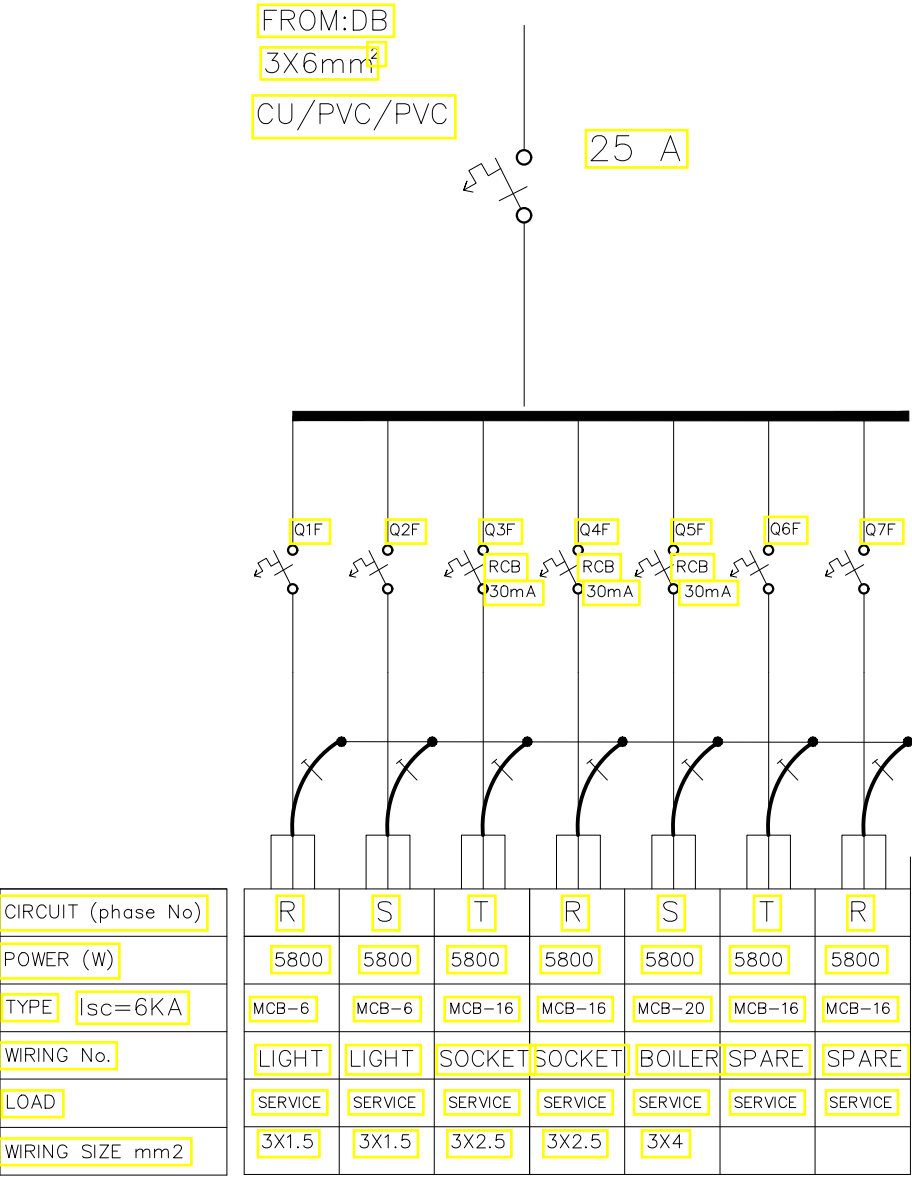
Approved by:

R.Almasri

Client:

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CONNECTED LOAD: 5.85 KW
DEMAND LOAD: 2.5 KW

SDB PANEL (Typical)

Notes:
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Legend:

Project:
Right Side Mosul Buildings

Drawing :
SDB Panel

Location:
Mosul

Scale:
N/A

SN:
ELE-PL-03

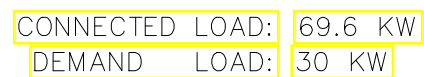
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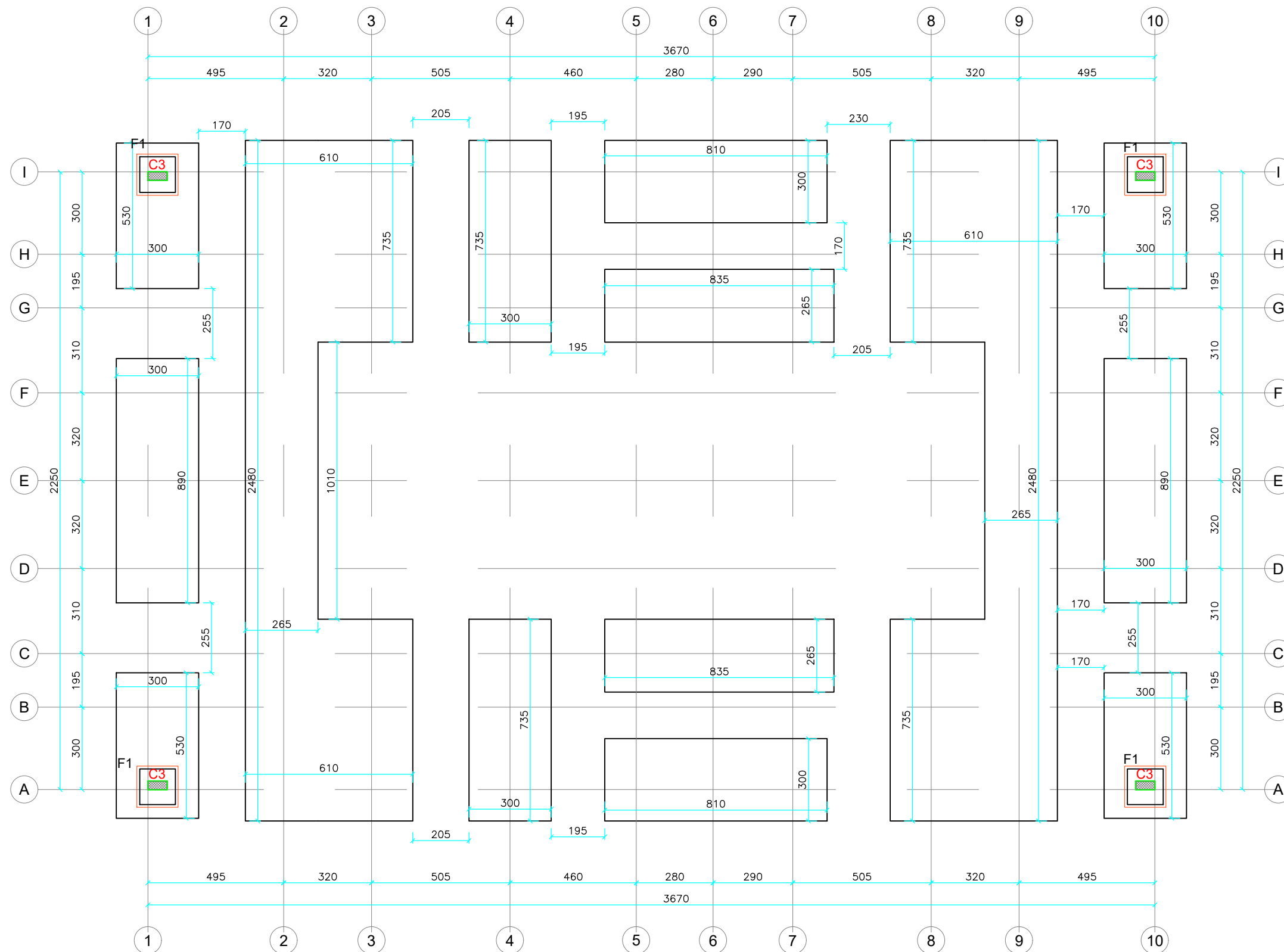
rev.	Description	Date
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D	Tendering	27-03-2019
C	Tendering	05-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Eng: Rawand

Approved by:
R.Almasri

Client:
UN-HABITAT





EXCAVATION PLAN B

Notes:
All dimensions are in centimeters unless is noted
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This drawing is to be read in conjunction with all other relevant drawings.

Legend:
REFERENCE:
REFER TO THE GENERAL STRUCTURAL NOTES ON DRAWING NO. : ST-001

REFER TO THE GENERAL STRUCTURAL DETAILS ON DRAWING NO. : ST-002

CONCRETE C30 FOR VERTICAL ELEMENTS & C25 FOR OTHERS

REINFORCEMENT FY400
THE FOUNDATIONS DESIGN IS BASED ON THE ALLOWABLE BEARING PRESSURE OF (4 Kg/CM²)

Project:
Right Side Mosul Buildings

Drawing :
Foundation Plan -(ST-01)
-(Type B)

Location:
Mosul

Scale:
1/100

SN:
ST-SP-01

Format:
A3

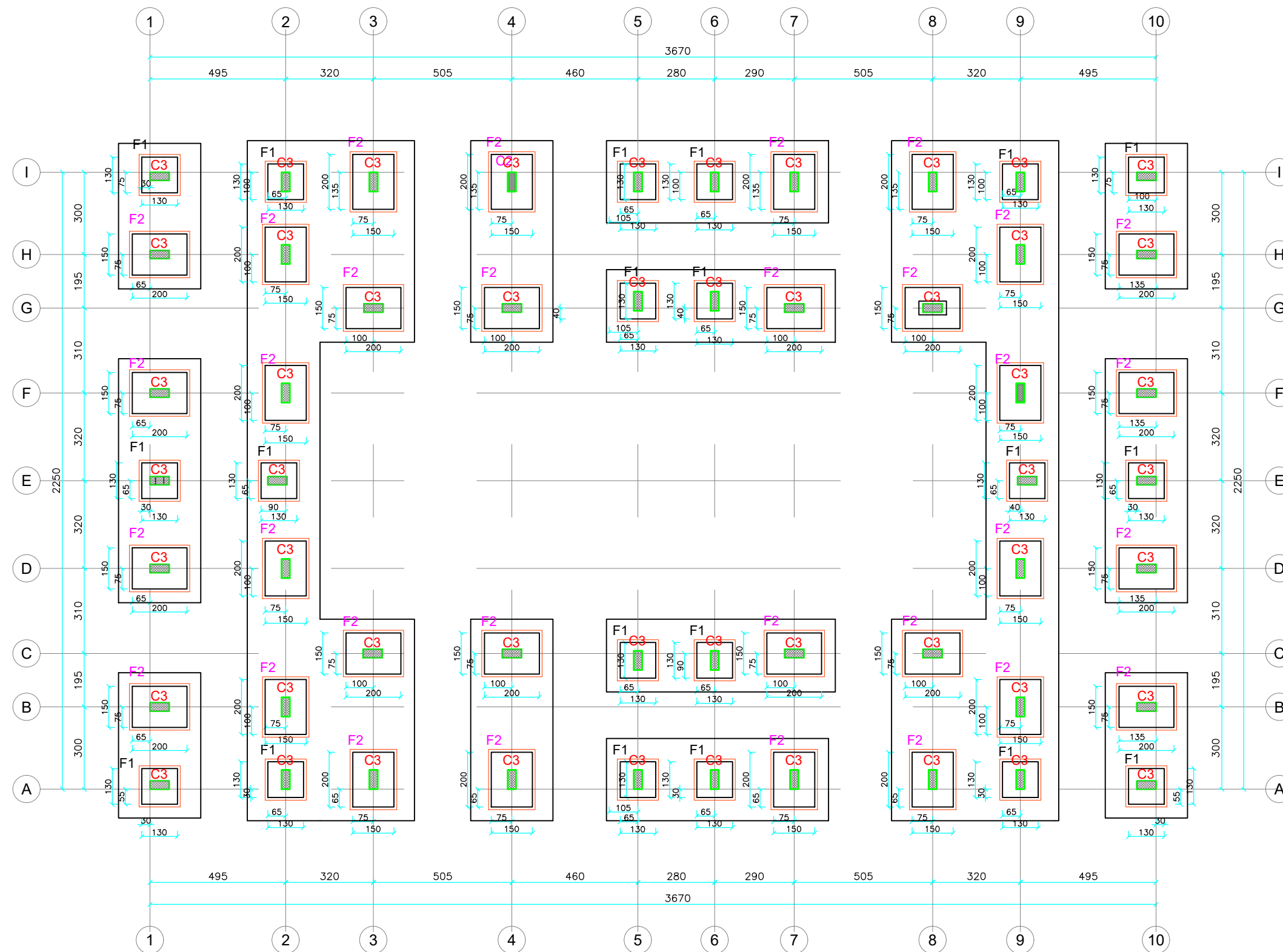
rev.	Description	Date
D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
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EXCAVATION PLAN B

Notes:
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Legend:

REFERENCE:
REFER TO THE GENERAL
STRUCTURAL NOTES ON
DRAWING
NO. : ST-001

REFER TO THE GENERAL
STRUCTURAL DETAILS ON
DRAWING NO. : ST-002

CONCRETE C30 FOR VERTICAL
ELEMENTS & C25 FOR OTHERS

REINFORCEMENT FY400

THE FOUNDATIONS DESIGN IS
BASED ON THE ALLOWABLE
BEARING
PRESSURE OF (4 Kg/CM²)

Project:

Right Side Mosul
Buildings

Drawing :
Foundation Plan -(ST-01)
-(Type B)

Location:
Mosul

Scale:
1/100

SN:
ST-SP-01

Format:
A3

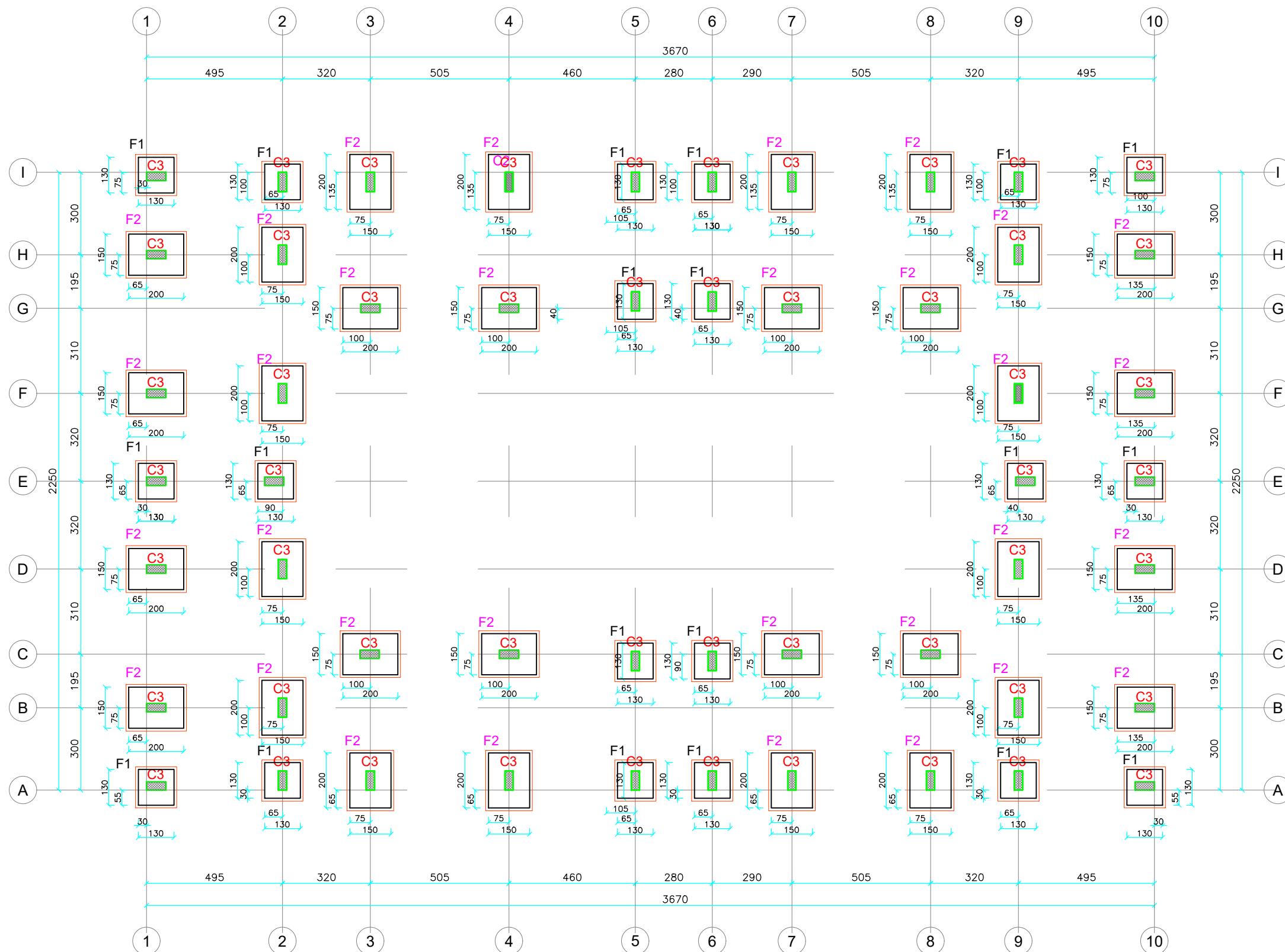
rev.	Description	Date
D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
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Foundations Plan B
SCALE 1/100

Notes:
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Legend:

REFERENCE:
REFER TO THE GENERAL
STRUCTURAL NOTES ON
DRAWING
NO. : ST-001

REFER TO THE GENERAL
STRUCTURAL DETAILS ON
DRAWING NO. : ST-002

CONCRETE C30 FOR VERTICAL
ELEMENTS & C25 FOR OTHERS

REINFORCEMENT FY400

THE FOUNDATIONS DESIGN IS
BASED ON THE ALLOWABLE
BEARING
PRESSURE OF (4 Kg/CM²)

Project:

Right Side Mosul
Buildings

Drawing :
Foundation Details-(ST-01)
-(Type B)

Location:
Mosul

Scale:
1/100

SN:
ST-SP-01-A

Format:
A3

rev.	Description	Date
D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
UN-HABITAT

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Right Side Mosul Low Cost House Units

17/09/2019

UPDATE STRUCTURAL PACKAGES

TYPE B

STRUCTURAL
LIST OF DRAWING

NUM.	TITLE	SCALE	PAPER	REVISION
ST-000	List Of Drawing		A1	REV - 01
ST-001	General Notes		A1	REV - 01
ST-002	General Details		A1	REV - 01
ST-01	Foundations Plan		A1	REV - 01
ST-02	Foundations Details		A1	REV - 01
ST-03	Axis Of Columns □ Details		A1	REV - 01
ST-04	Ground Beams □ Slab On Grade □ Details		A1	REV - 01
ST-05	Ground □ First Beams Details (1)		A1	REV - 01
ST-06	Ground □ First Beams Details (2)		A1	REV - 01
ST-07	Second Beams Details (1)		A1	REV - 01
ST-08	Second Beams Details (2)		A1	REV - 01
ST-9	Ground □ First □ Second Framing Plan		A1	REV - 01
ST-10	Ground □ First □ Second Floor Reinf. Plan (□ Dir.)		A1	REV - 01
ST-11	Ground □ First □ Second Floor Reinf. Plan (Y Dir.)		A1	REV - 01
ST-12	Stair Details		A1	REV - 01

Notes:
All dimensions are in centimeters unless is noted
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This drawing is to be read in conjunction with all other relevant drawings.

Legend:

Project:

Right Side Mosul Buildings

Drawing :
List of Drawings-(Type B)

Location:

Mosul

Scale:
1/100

SN:
ST-LD-00

Format:
A3

rev.	Description	Date
E	Tendering	17-09-2019
D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
UN-HABITAT

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A- GENERAL NOTES :

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION AND THE CONSULTANT SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.
2. ALL DIMENSIONS TO TAKE PRECEDENCE OVER SCALE SHOWN ON PLANS , SECTIONS AND DETAILS.
3. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
4. UNLESS OTHERWISE SHOWN , ALL DIMENSIONS AND ALL LEVELS ARE IN CENTIMETERS .
5. SEE ARCHITECTURAL DRAWINGS FOR THE FOLLOWING :
 - a. SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS.
 - b. DIMENSIONS NOT SHOWN ON STRUCTURAL DRAWINGS.
6. SEE MECHANICAL PLUMBING AND ELECTRICAL DRAWINGS FOR THE FOLLOWING INFORMATION.
 - a. PIPE RUNS, SIFFES, HANGERS, TRENCHES, WALL AND SLAB OPENINGS ETC.
 - b. ELECTRICAL CONDUIT RUNS, BOXES, OUTLETS IN WALL AND SLABS .
 - c. CONCRETE INSERTS FOR ELECTRICAL, MECHANICAL OR PLUMBING FIXTURES.
7. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE UNLESS OTHERWISE INDICATED . THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION . SUCH MEASURES SHALL INCLUDE BUT NOT BE LIMITED TO BRACING,SHORING OF LOADS DUE TO CONSTRUCTION EQUIPEMENT ETC. SUPERVISION TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.
8. OPENINGS ,POCKETS ETC.SHALL NOT BE PLACED IN SLABS , DECKS, BEAMS, JOISTS, COLUMNS, WALLS, ETC. UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS . NOTIFY THE STRUCTURAL ENGINEER WHEN DRAWINGS BY OTHERS SHOW OPENINGS , POCKETS, ETC . BUT NOT LIKEWISE SHOWN ON THE STRUCTURAL RAWINGS.
9. ALL HEAVY EQUIPEMENT PIECES WITH A UNIT LOAD HIGHER THAN THE DESIGN LOAD SHALL NOT BE PLACED ON ANY FLOOR WITHOUT THE APPROVAL OF STURCTURAL ENGINEER.
10. CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED FLOORS OR ROOF LOAD SHALL NOT EXCEED DESIGN LIVE LOAD FOR EACH PARTICULAR LEVEL.
11. OVER-EXCAVATION UNDER FOOTINGS SHALL BE BACKFILLED WITH MASS CONCRETE.
12. ABBREVIATIONS AND SYMBOLS :

* =	- AND	MIN	- MINIMUM
(L±...), (...)	- LENGTH	NIS	- NOT TO SCALE
⊙ , / - AI		No.	- NUMBER
DET.	- DETAIL	RC	- REINFORCED CONCRETE
EL.	- ELEVATION	ST	- STRUCTURAL
FL	- FINISHED LEVEL	⊕	- STRUCTURAL FLOOR LEVEL
MAX	- MAXIMUM	T=	- THICKNESS OF SLAB
VAR.	- VARIABLE	TYP.	- TYPICAL

B- MATERIALS :

1. GENERAL :

ALL MATERIALS TO BE USED IN THE CONJUNCTION SHALL COMPLY WITH THE REQUIREMENTS OF CURRENT RELEVANT BRITISH STANDARDS UNLESS NOTED BELOW
2. CONCRETE :

UNLESS OTHERWISE NOTED CONCRETE SHALL BE :

 - 2.1. BLINDING CONCRETE :

GRADE IS, PARTLAND CONTENT 200kg./m.cu. MINIMUM. MAXIMUM AGGRETE SIZE 20mm.
 - 2.2. FOUNDATION & SUPER STRUCTURE :

GRADE 30, 28 DAYS , STRENGTH 30 N/mm.sq
MAXIMUM AIGRETTE SIZE 20mm. FOR SUB-STRUCTURE USE MSRPC.
 - 2.3. ALL REINFORCED CONCRETE IS TO MADE FROM CEMENT, FINE AGGREGATES (SAND & CRUSHER FINES)
COARSE AGGREGATES (10mm & 20mm) AND WATER.
 - 2.4. THE CONTRACTOR IS TO SUBMIT PROPOSED MIX DESIGNS TOGETHER WITH NOT LESS THAN 4 nos. 7 DAYS
AND 4 nos. 28 DAYS CUBE TEST RESULTS FOR APPROVAL WELL BEFORE COMMENCEMENT OF CONCRETE WORKS.
 - 2.5. THE FOLLOWING TEST RESULTS ARE TO BE SUBMITTED ALONG WITH THE PROPOSED MIX DESIGNS.

CEMENT	- TESTS SHOW COMPLIANCE WITH BS 12 (OPC) OR BS 4027 (SRC).
FINE AGGREGATES	- SENE ANALYSIS, CHEMICAL ANALYSIS (CHLORIDES AND SULPHATES), ABSORPTION TESTS, SOUNDNESS, POTENTIAL ALKALI REACTIVITY.
COARSE AGGREGATES	- SENE ANALYSIS, CHEMICAL ANALYSIS (CHLORIDES AND SULPHATES), FLONGATION INDEX, FLAKINESS INDEX, ABSORPTION TEST, SOUNDNESS, POTENTIAL ALKALI REACTIVITY.
WATER	- DISSOLVED SOLID.
3. REINFORCEMENT :

DETAILS OF ADMIXTURE AND ADDITIVES ARE TO BE SUBMITTED ALONG WITH THE PROPOSED MIX DESIGNS.

 - 3.1. ' T ' DENOTES HOT ROLLED DEFORMED HIGH YIELD BOND STEEL REINFORCEMENT, CHARACTERISTIC STRENGTH 420 N/mm. sq.
 - 3.2. THE FOLLOWING TEST RESULTS FOR EACH BAR DIAMETER AND EACH SOURCE OF SUPPLY, ARE TO BE SUBMITTED FOR APPROVAL.

- TENSION TESTS (YIELD AND ULTIMATE)
- ELONGATION.
- CROSS - SECTIONAL AREA.
- CHEMICAL ANALYSIS.
- BEND AND REBEND TESTS.
 - 3.3. CONCRETE COVER TO REINFORCEMENTIS TO BE :

SUB STRUCTURE	SUPER STRUCTURE
FOUNDATION - 50mm ALL FACES	COLUMNS - 25mm
TIE BEAMS - 40mm ALL FACES	BEAMS - 25mm TOP & BOTTOM
COLUMNS - 50mm	SLAB - 25mm TOP & BOTTOM
 - 3.4. REINFORCEMENT LAP LENGTHS ARE TO BE :

TENSION	- 50 TIMES DIAMETER OF SMALLER LAPPED BAR REINFORCEMENT.
COMPRESSION	- 40 TIMES DIAMETER OF SMALLER LAPPED BAR REINFORCEMENT.
	- 300 mm FOR MESH REINFORCEMENT.

OR AS SHOWN ON REINFORCEMENT DRAWINGS.

C- GROUND BEARING SLABS :

1. BACKFILL IS TO COMPRISED GRANULAR MATERIALS PLACED IN LAYERS 250mm THICK AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY.
2. UNLESS SHOWN TO THE CONTRARY ON THE DRAWINGS, THE GROUND BEARING SLABS SHALL BE CAST MONOLITHICLY WITH THE TIE BEAMS AND COLUMN WITH CONTINUITY OF REINFORCEMENT IN THE GROUND FLOOR SLAB.

D- CONSTRUCTION JOINTS AND SHRINKAGE STRIPS :

1. BACKFILL IS TO COMPRISED GRANULAR MATERIALS PLACED IN LAYERS 250mm THICK AND COMPACTED TO A MINIMUM CONSTRUCTION AND SHRINKAGE STRIPS
2. SURFACE OF CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND LAITANCE REMOVED.
3. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.
4. CONSTRUCTION JOINTS IN FLOOR SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF SPANS OF SLABS. BEAMS AND GIRDERS. JOINTS IN GIRDERS SHALL BE OFFSET A MINIMUM DISTANCE OF TWO TIMES THE WIDTH OF INTERSECTING BEAMS.
5. BEAMS, GIRDERS AND HAUNCHES SHALL BE PLACED MONOLITHICALLY AS PART OF A SLAB SYSTEM, UNLESS OTHERWISE SHOWN IN DESIGN DRAWINGS OR SPECIFICATIONS.
6. BEAMS, GIRDERS OR SLABS SUPPORTED BY COLUMNS OR WALLS SHALL NOT BE CAST OR ERECTED UNTIL CONCRETE IN VERTICAL SUPPORT MEMBERS IS NO LONGER PLASTIC.

E- FOUNDATIONS

1. AFTER REACHING THE SUGGESTED FOUNDATION LEVEL, EXPERIENCED GEOTECHNICAL ENGINEER SHOULD BE CONSULTED TO INSURE THE SIMILARITY BETWEEN THE RECOMMENDATIONS IN HIS REPORT WITH THE SITE CONDITIONS.
2. ALL FOOTING EXCAVATIONS SHALL BE CLEANED OF LOOSE MATERIAL AND WATER.
3. ALL FOUNDATION MATERIAL SHALL BE INSPECTED BY THE ENGINEER BEFORE ANY CONCRETE IS PLACED.
4. WHERE VERIFIED FOUNDATION MATERIAL IS FOUND LOWER THAN THE UNDERSIDE OF FOUNDATIONS AS DETAILED, BACK FILL THE SPACE BETWEEN FOUNDING MATERIAL AND FOOTING SOFFIT WITH LEAN CONCRETE (f'c = 12 MPA).
5. EXCAVATION , BACK FILLING & FOUNDATION :

FOUNDATION SHOULD BE BASED ON UNDISTURBED SOIL STRATA . THE FOUNDATIONS DESIGN IS BASED ON THE ALLOWABLE BEARING PRESSURE OF (4 Kg/CM²) THE CONTRACTOR IS RESPONSIBLE TO VERIFY OF THE SOIL BEARING PRESSURE CAPACITY BY SPECIALIZED CONSULTANT. THE CONTRACTOR IS RESPONSIBLE TO CLEAR THE CONSTRUCTION SITE AND TO REMOVE ALL EXISTING MISCELLANEOUS FILL. BOTTOM OF EXCAVATIONS SHOULD BE SMOOTH AND FREE FROM LOOSE EARTH OR CLAY AND SOFT AREAS SHOULD BE COMPACTED TO THE REQUIRED DENSITY.
6. ALL WALLS AND COLUMNS SHALL BE CONCENTRIC WITH SUPPORTING FOUNDATIONS UNLESS OTHERWISE NOTED ON THE DRAWINGS.

F- CAMBER NOTES:

UNLESS OTHERWISE INDICATED, PROVIDE MINIMUM CAMBER FOR BEAMS WITH SPAN IN EXCESS OF 8.0 m AS FOLLOWS:
CONTINUOUS BEAM - 1.5 mm PER m OF SPAN (i.e. A 10m SPAN BEAM WILL HAVE 15 mm CAMBER AT MIDSPAN).
SIMPLE BEAM - 2.0 mm PER m OF SPAN AT MIDSPAN.

G- GENERAL REQUIREMENT OF CONCRETE :

NO	TESTS	TEST METHOD	SPECIFICATION LIMIT
1	TEMPERATURE (AT PLACEMENT)	ASTM 1064	30° C MAX.
2	SLUMP mm (AT PLACEMENT)	BS 1881; PART 102	FOR ALL GRADES : 150 ± 25 mm
3	WATER PERMEABILITY	DIN 1048	10mm MAX.
4	RAPID CHLORIDE PENETRATION (RCP)	ASTM C1202	1000 coul. MAX.
5	WATER ABSORPTION	BS 1881; PART 122	1.5% coul. MAX.
6	CHLORIDES BY WEIGHT OF CEMENTATIONS MATERIAL	BS 1881; PART 124	15% coul. MAX.
7	SULPHATES (503) BY WEIGHT OF CEMENTATIONS MATERIAL	BS 1881; PART 124	4.0% coul. MAX.

H- CONCRETE :

1. CONCRETE STRENGTH AND QUALITY :

CONCRETE STRENGTH CYLINDER 150X300MM (Kg/cm²)	CONCRETE CLASSIFICATION ACCORDING TO ACI-318 CODE FOR REINFORCED CONCRETE	TYPE OF STRUCTURE ELEMENT
300	C30	COLUMNS
250	C25	REINFORCED CONCRETE STAIRS
250	C25	REINFORCED CONCRETE SLABS AND BEAMS
250	C25	FOUNDATION
120	C12	PLAIN CONCRETE

2. CONCRETE SHOULD BE CONSOLIDATED BY VIBRATION. CURE ALL CONCRETE SURFACES AS DIRECTED BY THE SPECIFICATION.
3. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
4. BEAM DEPTHS INCLUDE SLAB THICKNESS WHERE SLAB IS PLACED INTEGRALLY WITH THE BEAM.

I- REINFORCEMENT

1. STEEL SHALL BE DEFORMED BARS (FY=400 Mpa.),

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Legend:

Project:

Right Side Mosul Buildings

Drawing :
List of Drawings-(Type B)

Location:
Mosul

Scale:
1/100

SN:
ST-LD-01

Format:
A3

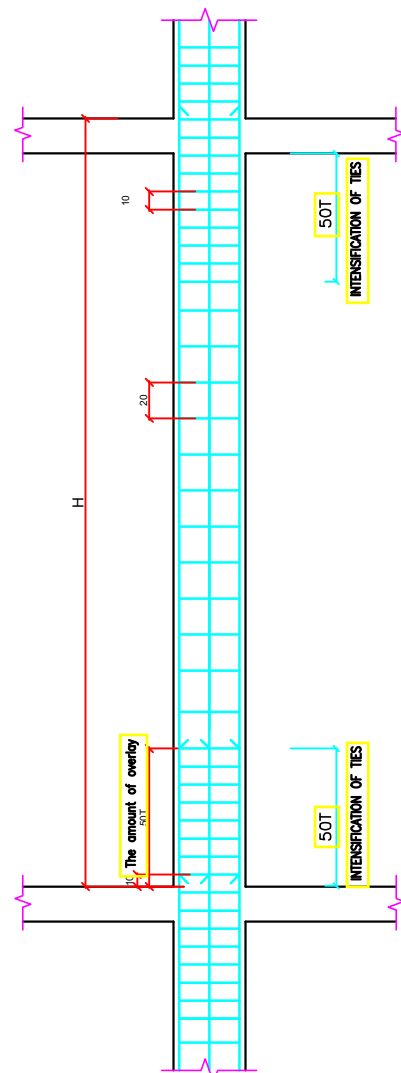
rev.	Description	Date
E	Tendering	17-09-2019
D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

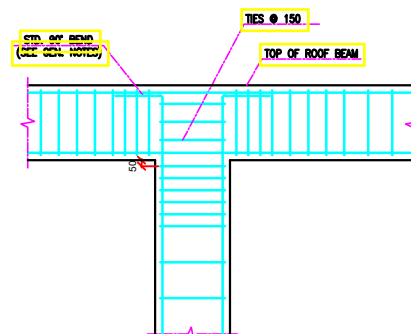
Approved by:
R.Almasri

Client:
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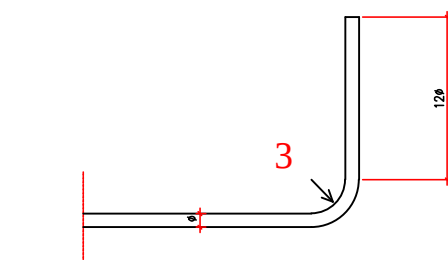
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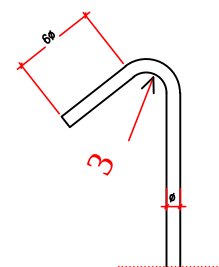
COLUMN LONGITUDINAL SECTION



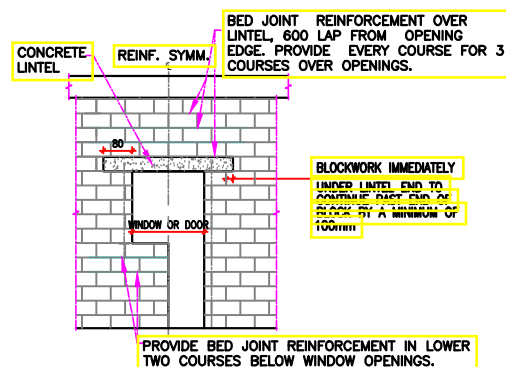
TYPICAL BEAM COLUMN JOINT DETAIL



STANDARD 90° HOOK FOR MAIN BARS

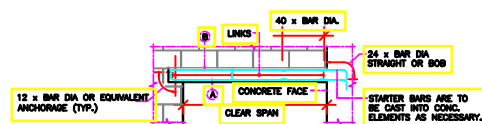
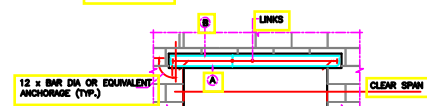


STANDARD 135° HOOK FOR STIRRUPS
AND COLUMN TIES



TYPICAL BLOCKWORK DETAIL
AT WINDOW OR DOOR OPENING

SCALE 1:50



TYPICAL STANDARD LINTELS
(NON LOAD BEARING BLOCK WALLS)

SCALE 1:25

SCHEDULE OF INSITU LINTELS UNO.

SIZE BXD	MAX SPAN	REINFORCEMENT		LINKS	DETAILS
		A (BOT.)	B (TOP)		
100X200	1500	1Ø14	1Ø14	Ø8/150	
100X300	3000	1Ø18	1Ø18	Ø8/150	
150X200	1500	1Ø16	1Ø16	Ø8/150	
150X300	3000	1Ø20	1Ø20	Ø8/150	
200X200	2000	2Ø12	2Ø12	Ø8/150	
200X300	3000	2Ø18	2Ø18	Ø8/150	
300X300	3000	3Ø16	3Ø16	Ø8/150	

NOTES:

1. BEARING ON BLOCK WALL ON EITHER SIDE OF OPENING SHALL BE AT LEAST EQUAL TO THE OVERALL DEPTH OF THE LINTEL.
2. OVERALL LINTEL DEPTHS COULD BE INCREASED TO SUIT BLOCKWORK COURSING

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Project:

Right Side Mosul Buildings

Drawing :
List of Drawings-(Type B)

Location:

Mosul

Scale:
1/200

SN:
ST-LD-02

Format:
A3

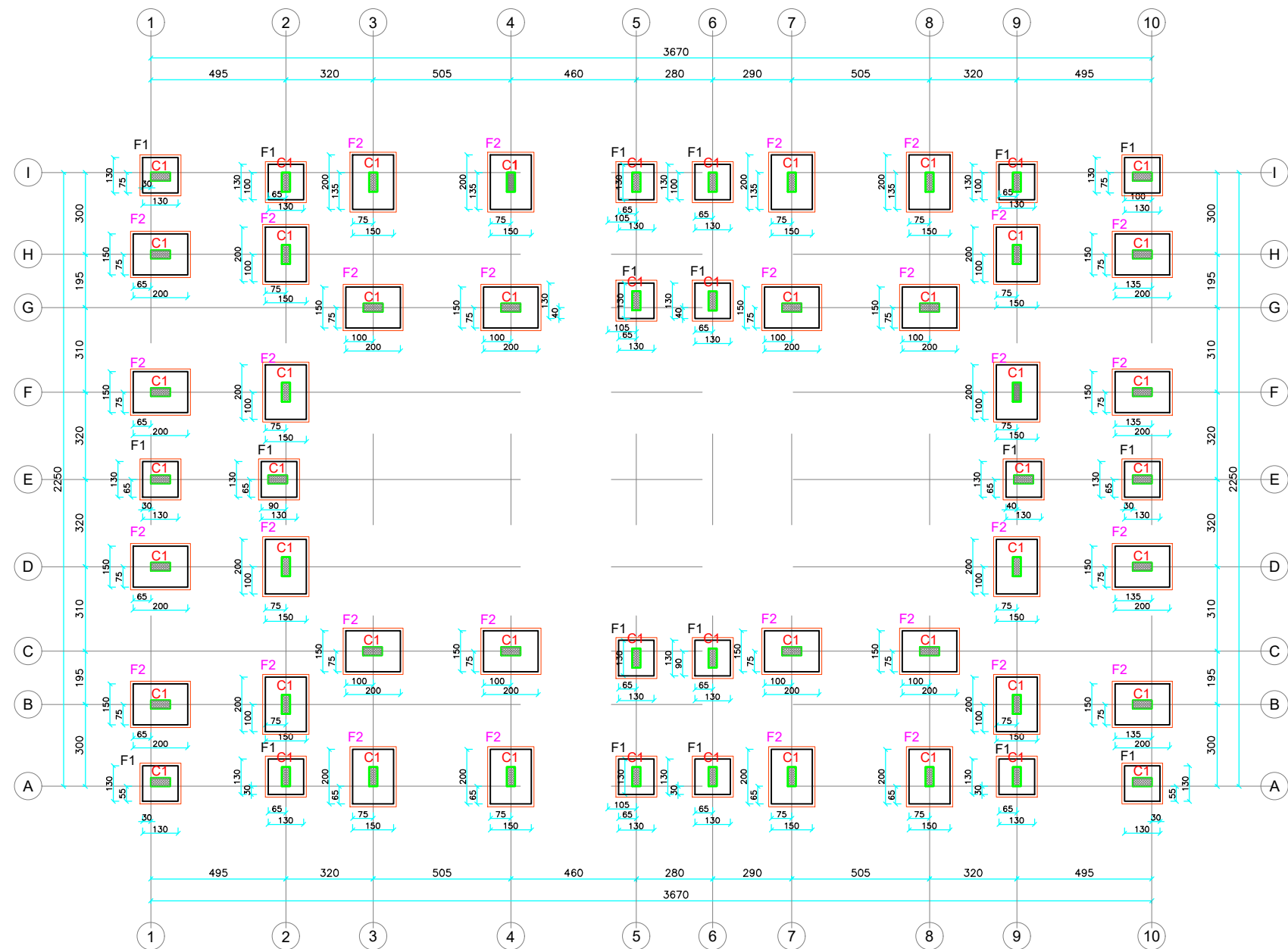
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D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

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Approved by:
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Foundations Plan
SCALE 1/100
TYPE B

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Legend:

REFERENCE:
REFER TO THE GENERAL
STRUCTURAL NOTES ON
DRAWING
NO. : ST-001

REFER TO THE GENERAL
STRUCTURAL DETAILS ON
DRAWING NO. : ST- 002

CONCRETE C30 FOR VERTICAL
ELEMENTS & C25 FOR OTHERS

REINFORCEMENT FY400

THE FOUNDATIONS DESIGN IS
BASED ON THE ALLOWABLE
BEARING
PRESSURE OF (4 Kg/CM²)

Project:

Right Side Mosul
Buildings

Drawing :
Foundation Plan -(ST-01)
-(Type B)

Location:
Mosul

Scale:
1/100

SN:
ST-01

Format:
A3

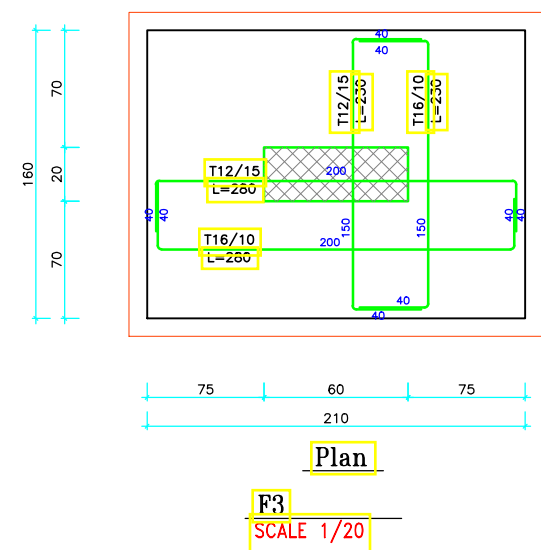
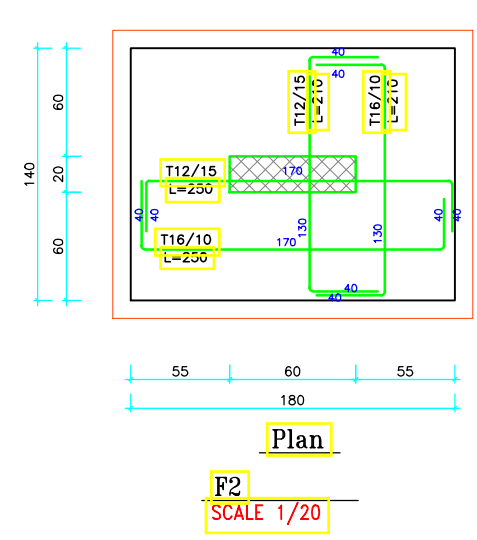
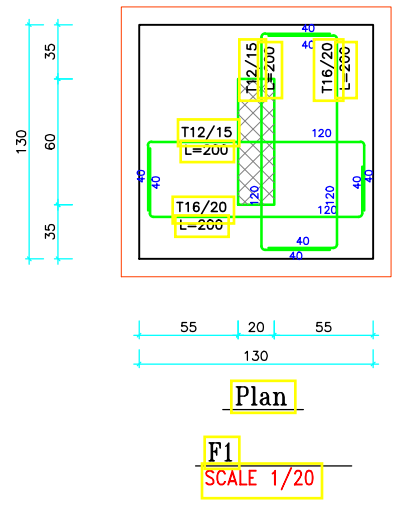
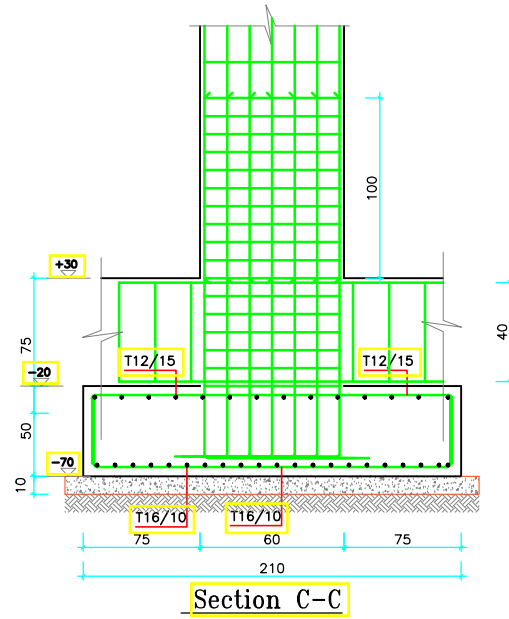
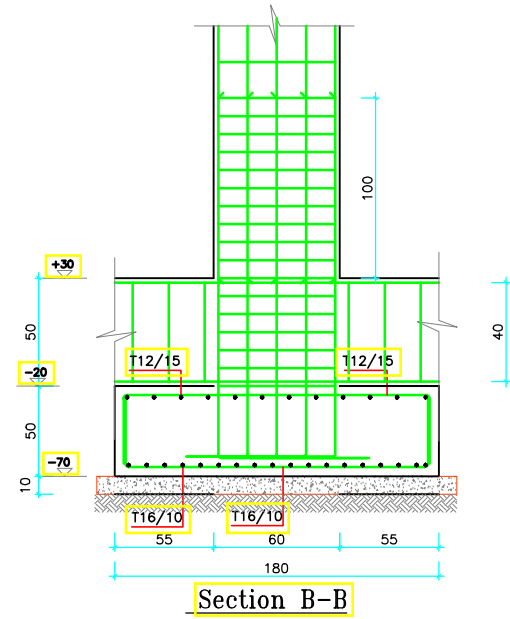
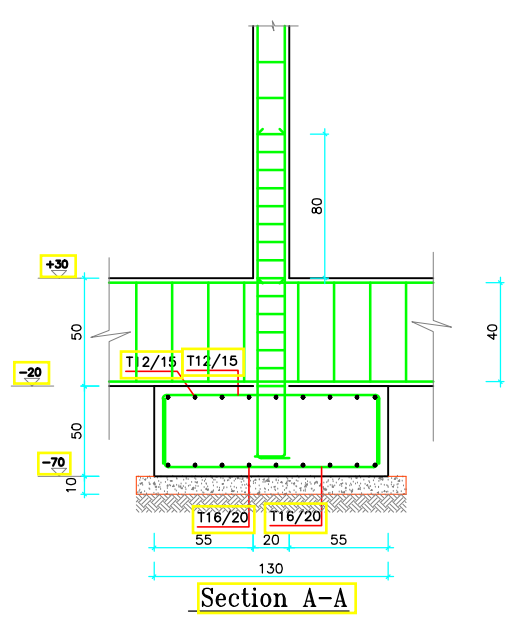
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D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
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Legend:
REFERENCE:
REFER TO THE GENERAL STRUCTURAL NOTES ON DRAWING NO. : ST-001
REFER TO THE GENERAL STRUCTURAL DETAILS ON DRAWING NO. : ST-002
CONCRETE C30 FOR VERTICAL ELEMENTS & C25 FOR OTHERS
REINFORCEMENT FY400
THE FOUNDATIONS DESIGN IS BASED ON THE ALLOWABLE BEARING PRESSURE OF (4 Kg/CM²)

Project:
Right Side Mosul Buildings

Drawing :
Foundation Details-(ST-01)
-(Type B)

Location:
Mosul

Scale: 1/100	SN: ST-DT-02
Format: A3	

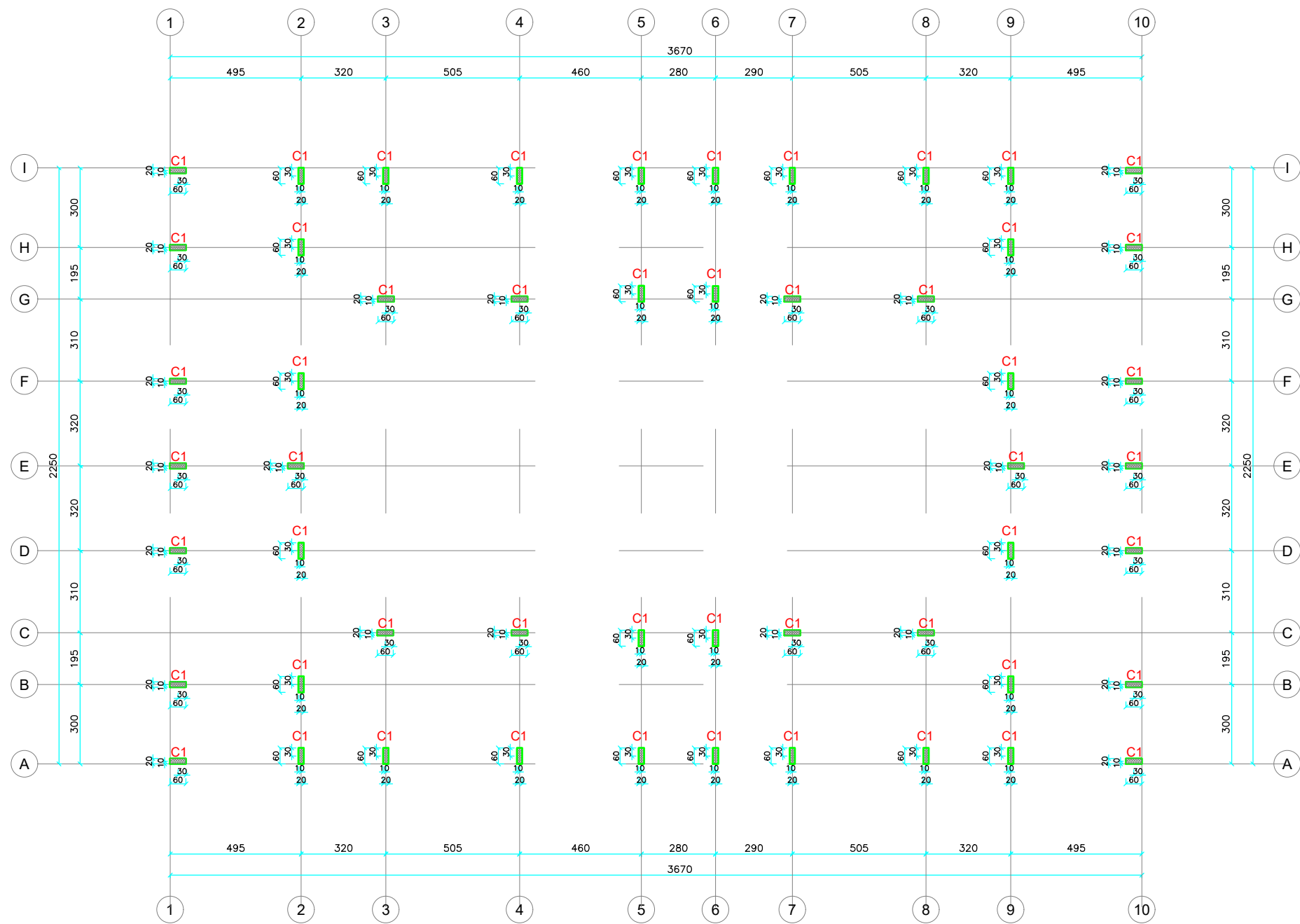
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D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

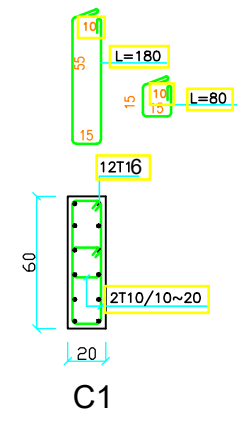
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Axis Of Columns
SCALE 1/100

TYPE B



Columns Details
Sc. 1/20

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Legend:
REFERENCE:
REFER TO THE GENERAL STRUCTURAL NOTES ON DRAWING NO. : ST-001
REFER TO THE GENERAL STRUCTURAL DETAILS ON DRAWING NO. : ST-002
CONCRETE C30 FOR VERTICAL ELEMENTS & C25 FOR OTHERS
REINFORCEMENT FY400

Project:
Right Side Mosul Buildings

Drawing :
Axis of Columns □ Details- (ST-03)-(Type B)

Location:
Mosul

Scale:
1/100

SN:
ST-03

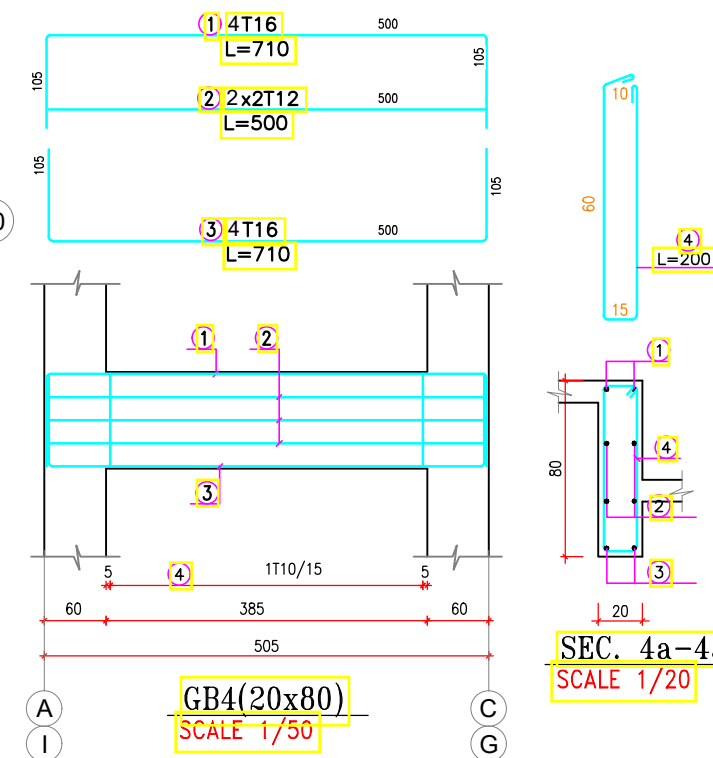
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rev.	Description	Date
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D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
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Ground Beams Sections

Sc. 1/20

Notes:
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Legend:

REFERENCE:
REFER TO THE GENERAL
STRUCTURAL NOTES ON
DRAWING
NO. : ST-001

REFER TO THE GENERAL
STRUCTURAL DETAILS ON
DRAWING NO. : ST-002

CONCRETE C30 FOR VERTICAL
ELEMENTS & C25 FOR OTHERS
REINFORCEMENT FY400

Project:

Right Side Mosul
Buildings

Drawing :
Ground First ☐ Second Framing
Plan (ST-05)-(Type B)

Location:

Mosul

Scale:
1/100

SN:
ST-05

Format:
A3

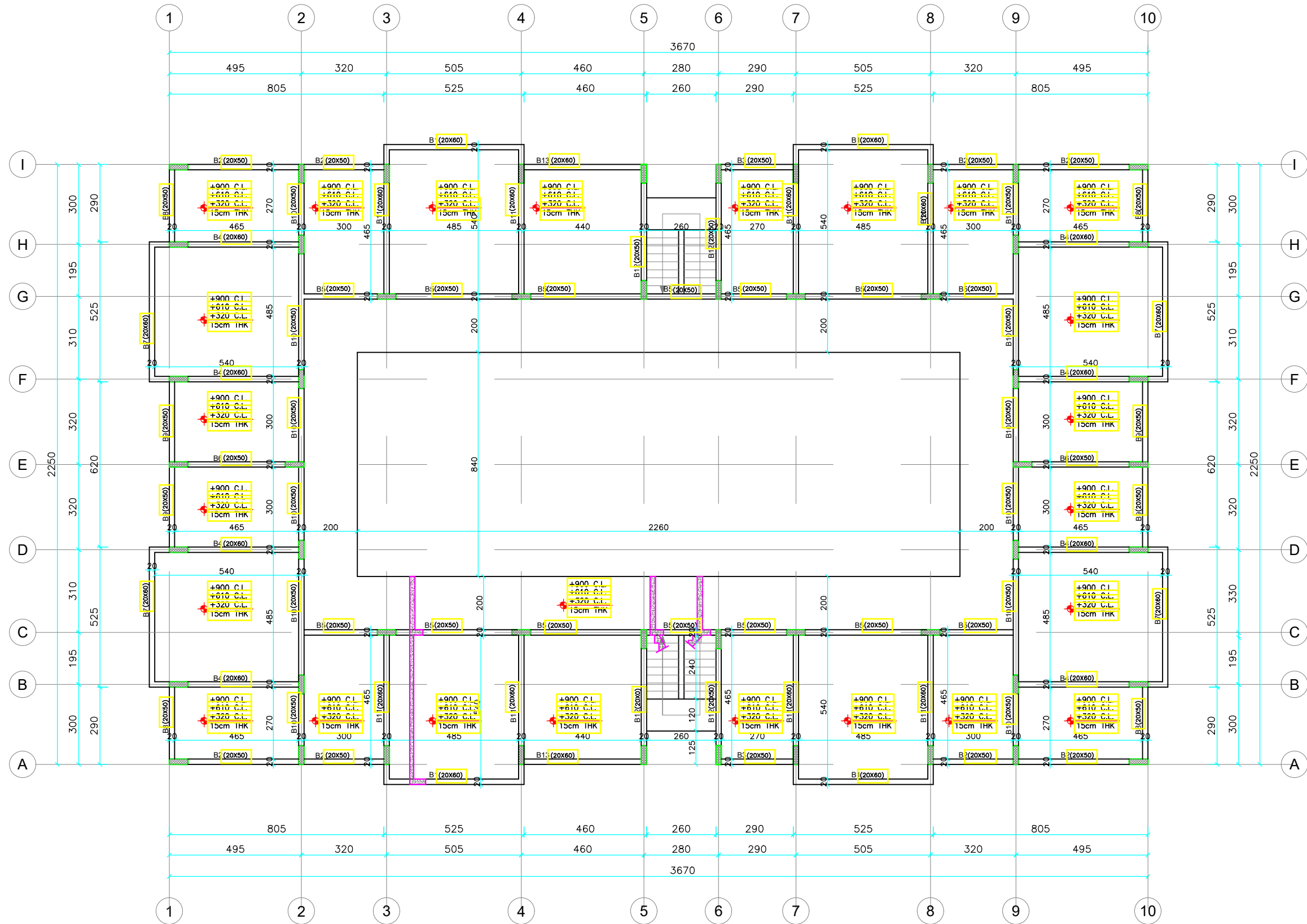
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D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
A	Concept Design	15-11-2018

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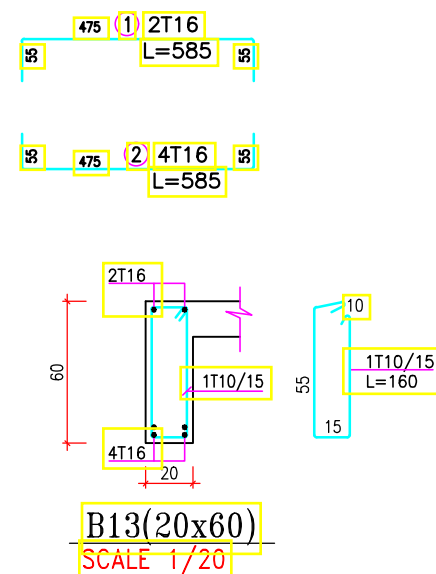
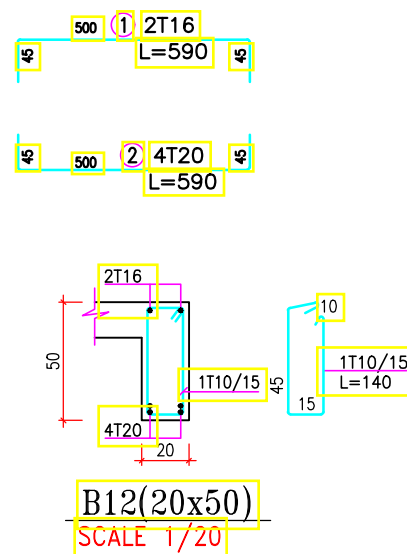
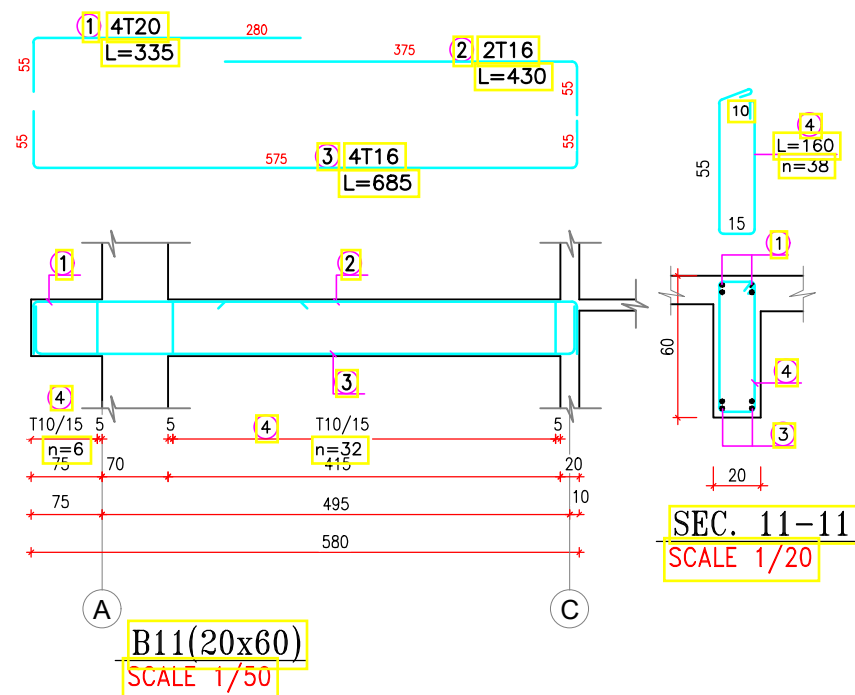
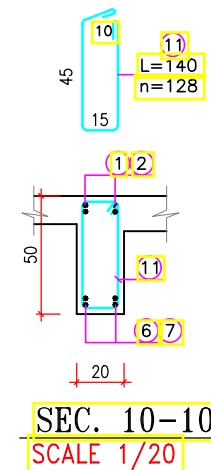
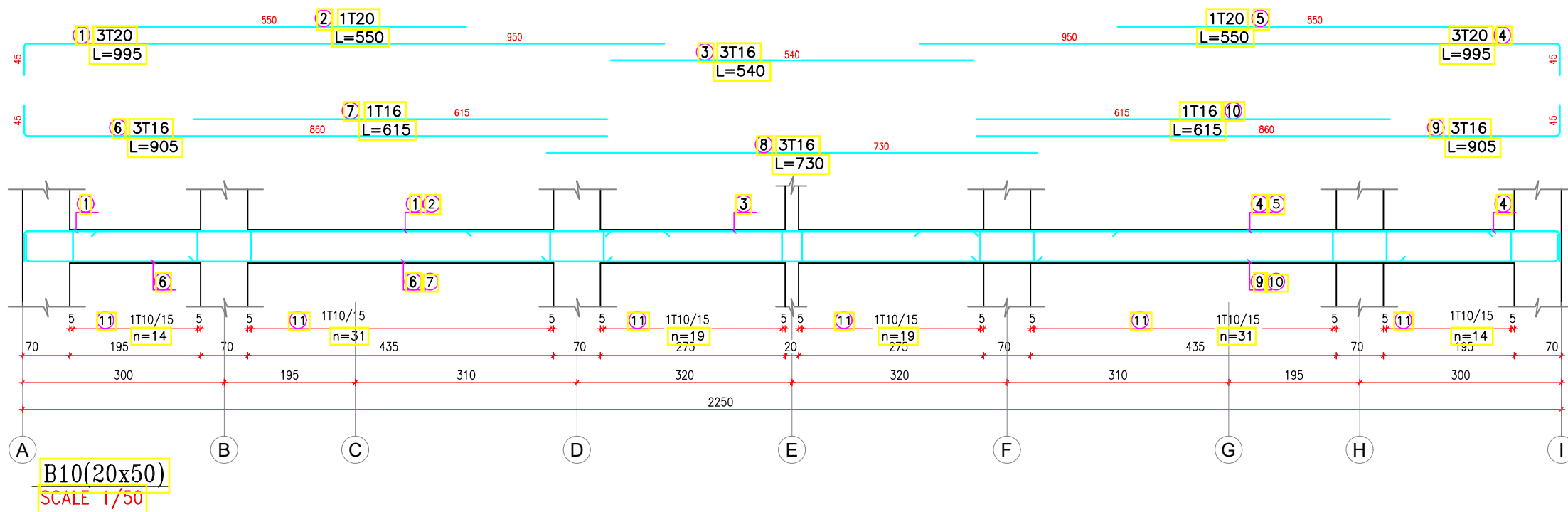


Ground , First & Second Framing Plan

SCALE 1/100

TYPE B





TYPE B

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Legend:
REFERENCE:
REFER TO THE GENERAL STRUCTURAL NOTES ON DRAWING NO. : ST-001
REFER TO THE GENERAL STRUCTURAL DETAILS ON DRAWING NO. : ST- 002
CONCRETE C30 FOR VERTICAL ELEMENTS & C25 FOR OTHERS
REINFORCEMENT FY400

Project:
Right Side Mosul Buildings

Drawing :
Ground First Beam Details-(ST-09)-(Type B)

Location:
Mosul

Scale:
1/100
Format:
A3
SN:
ST-07

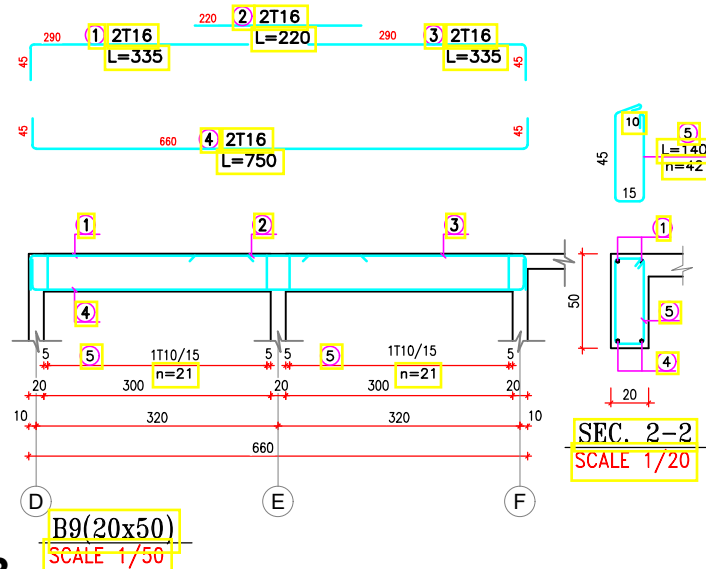
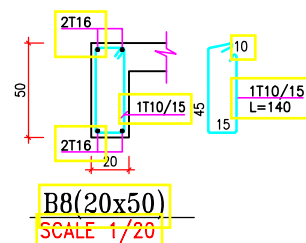
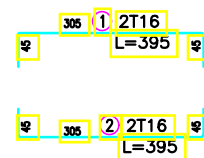
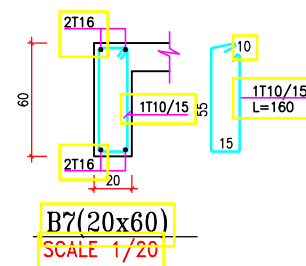
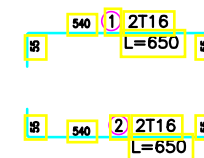
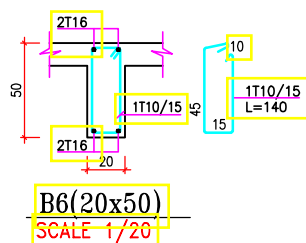
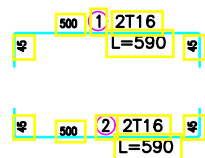
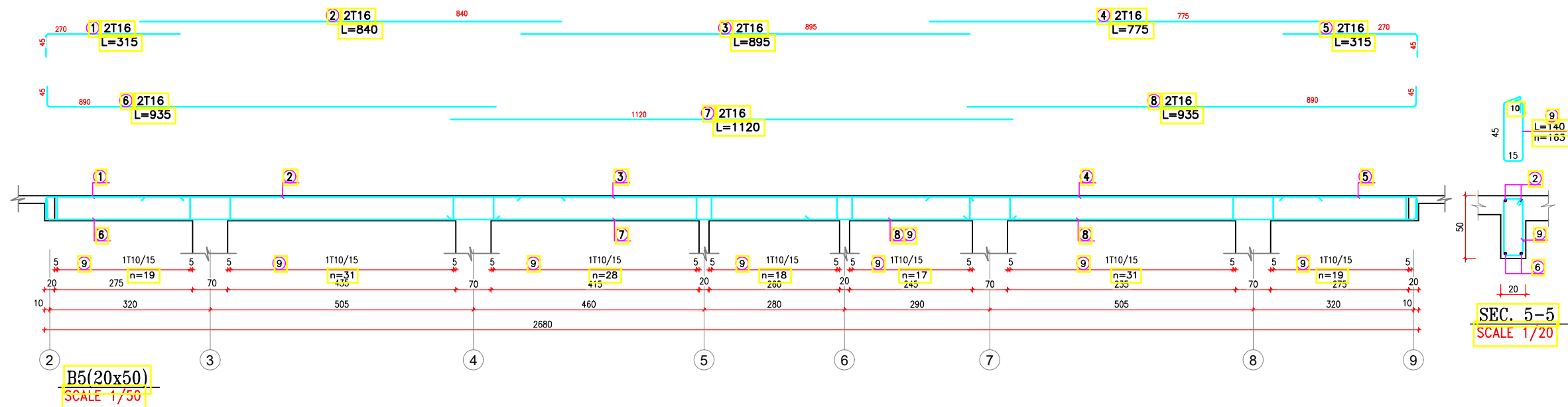
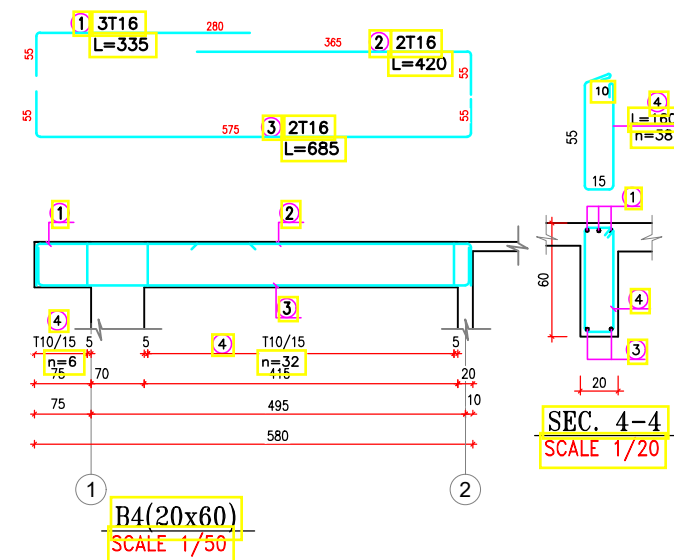
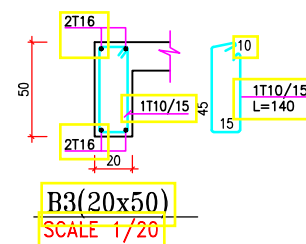
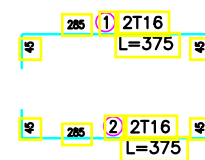
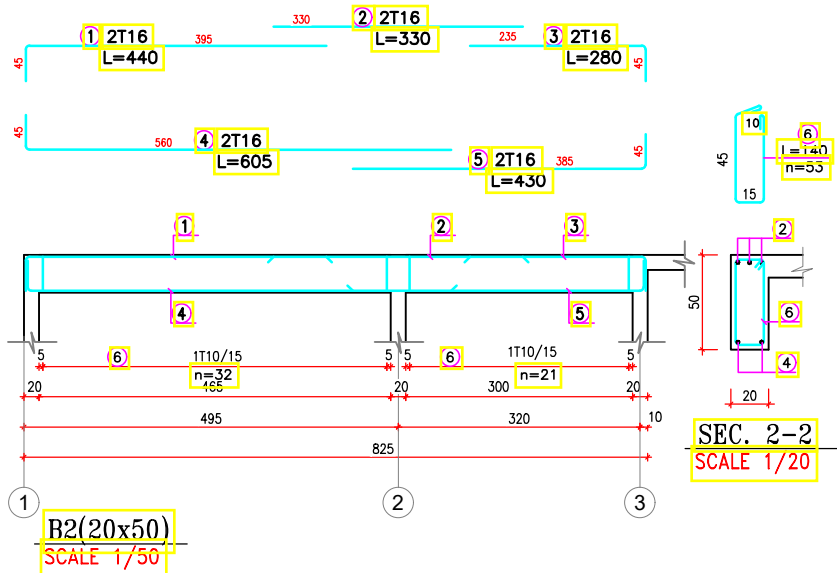
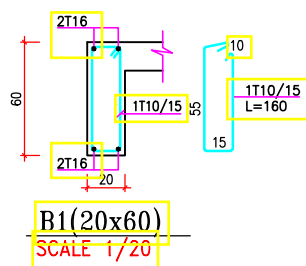
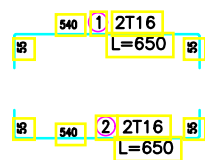
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B	Tendering	16-12-2018
A	Concept Design	15-11-2018

Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
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CONCRETE C30 FOR VERTICAL ELEMENTS & C25 FOR OTHERS
REINFORCEMENT FY400

Project:

Right Side Mosul Buildings

Drawing :
Second Beam Details.
(ST-10)-(Type B)

Location:

Mosul

Scale:
1/200

SN:
ST-08

Format:
A3

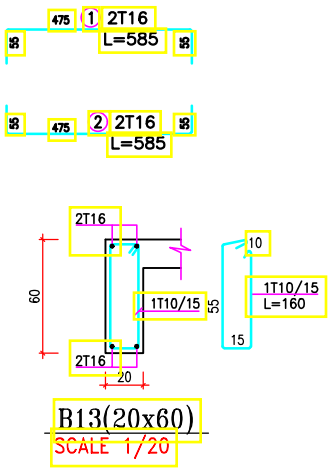
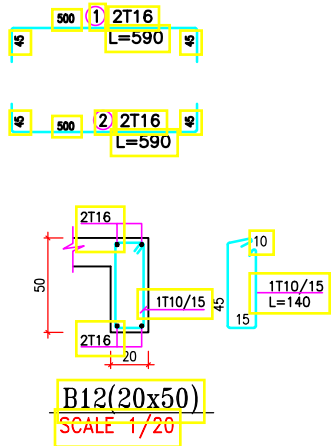
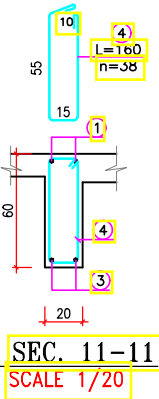
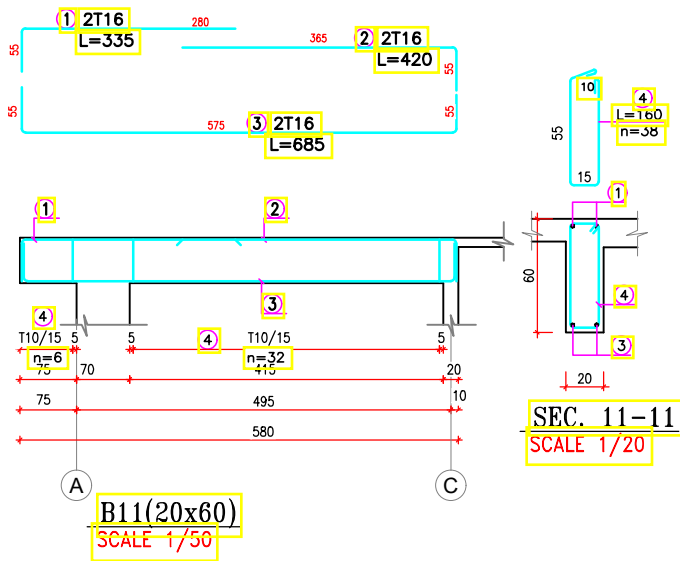
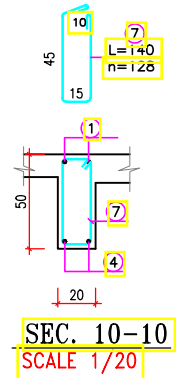
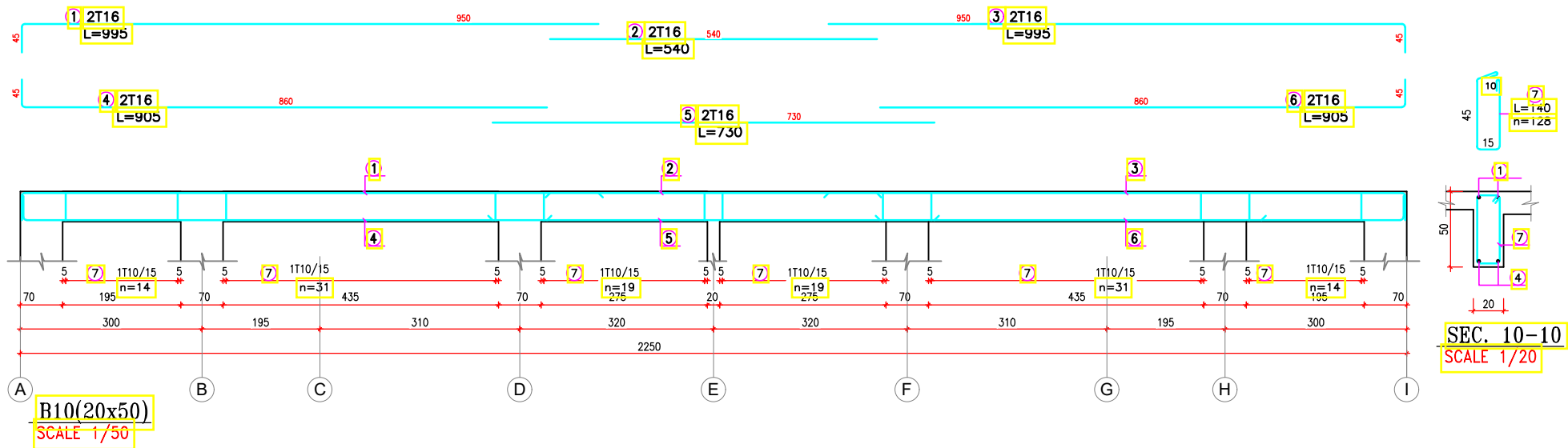
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CONCRETE C30 FOR VERTICAL ELEMENTS & C25 FOR OTHERS
REINFORCEMENT FY400

Project:
Right Side Mosul Buildings

Drawing :
Second Beam Details.
(ST-11)-(Type B)

Location:
Mosul

Scale:
1/200
Format:
A3
SN:
ST-09

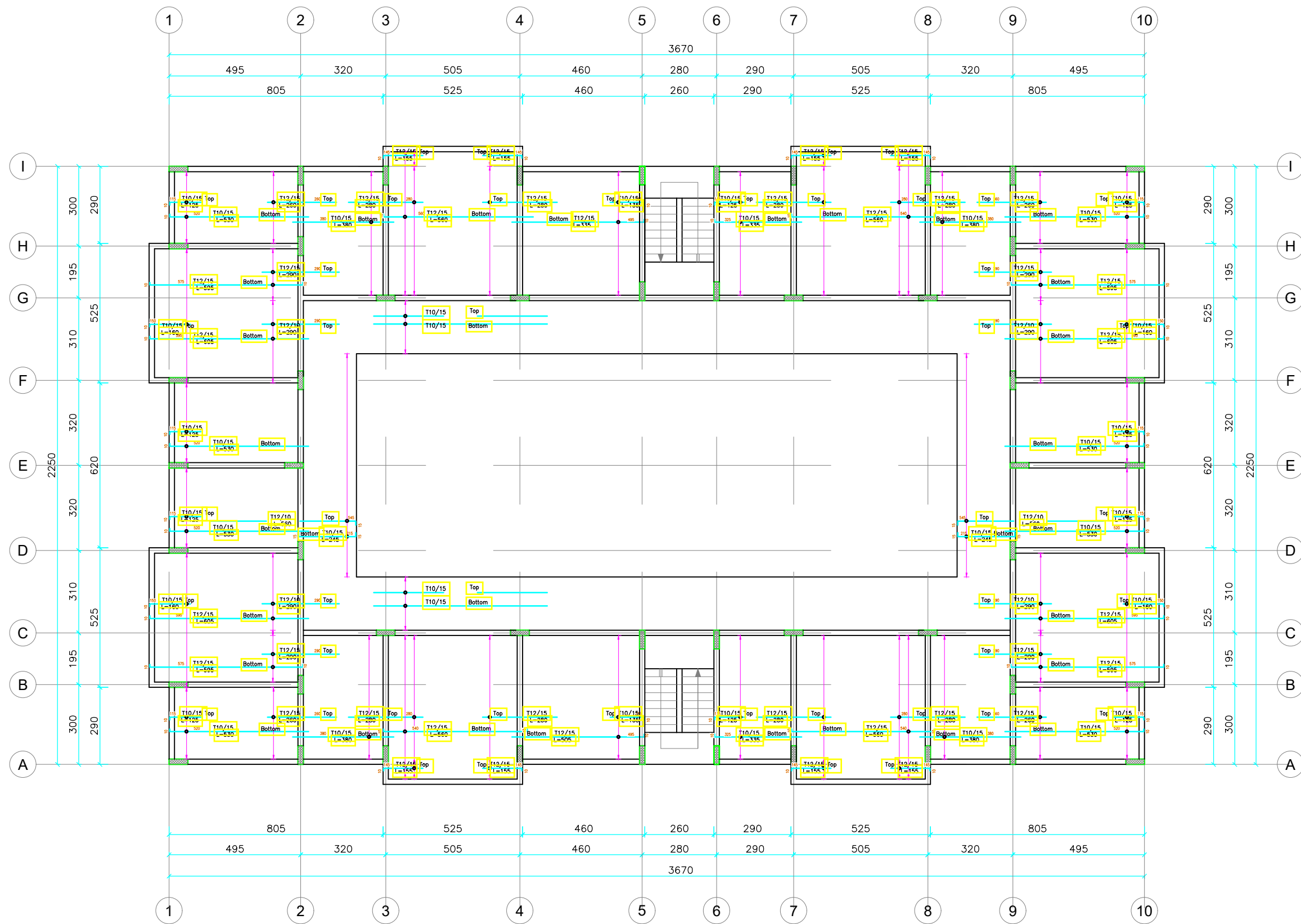
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Arch: Shahyan Luttfi

Approved by:
R.Almasri

Client:
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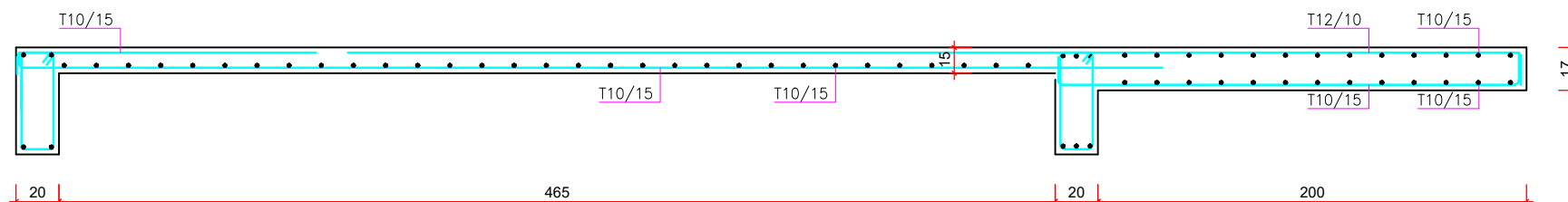
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Ground , First & Second Floor Reinf. Plan (X Dir.)

SCALE 1/100

TYPE B



Section A-A

SCALE 1/20

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CONCRETE C30 FOR VERTICAL
ELEMENTS & C25 FOR OTHERS

REINFORCEMENT FY400

TOP REINFORCEMENT
BOTTOM REINFORCEMENT

Project:

Right Side Mosul
Buildings

Drawing :
Ground First Second Reinf.
Plan- Direc.(ST-06)-(Type B)

Location:

Mosul

Scale:
1/100

SN:
ST-10

Format:
A3

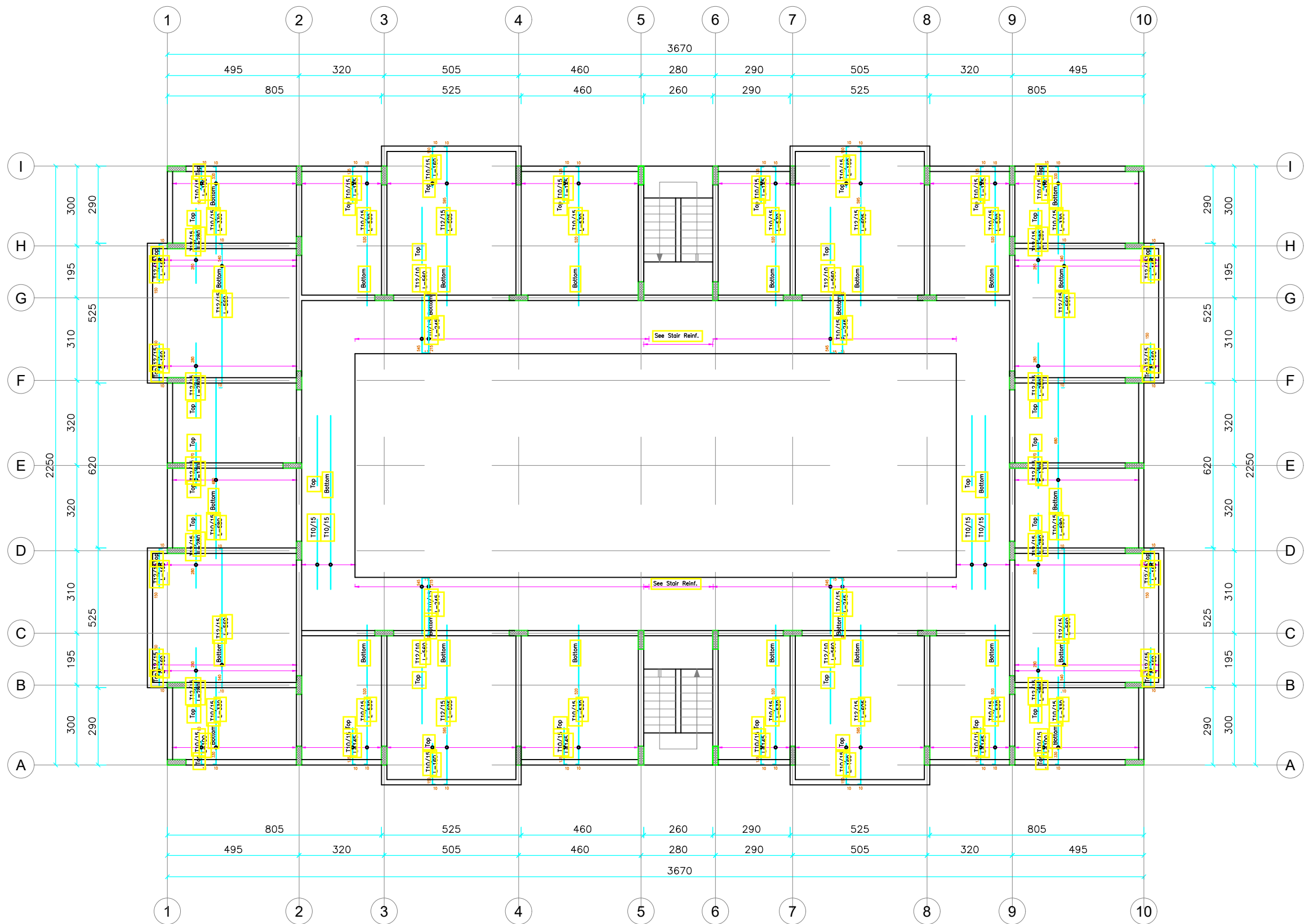
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Arch: Shahyan Luttfi

Approved by:
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Ground , First & Second Floor Reinf. Plan (Y Dir.)
SCALE 1/100

TYPE B

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CONCRETE C30 FOR VERTICAL ELEMENTS & C25 FOR OTHERS
REINFORCEMENT FY400
TOP REINFORCEMENT
BOTTOM REINFORCEMENT

Project:
Right Side Mosul Buildings

Drawing :
Ground First Second Reinf.
Plan-Y Direc.(ST-07)-(Type B)

Location:
Mosul

Scale:
1/100
Format:
A3
SN:
ST-11

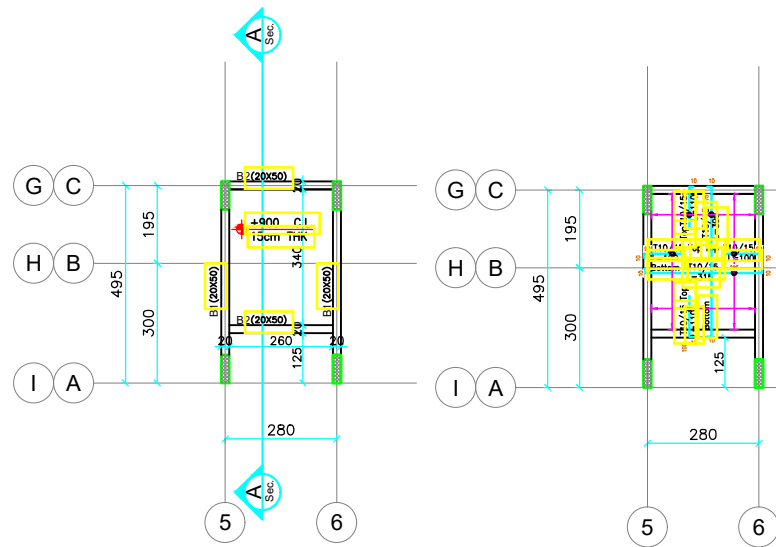
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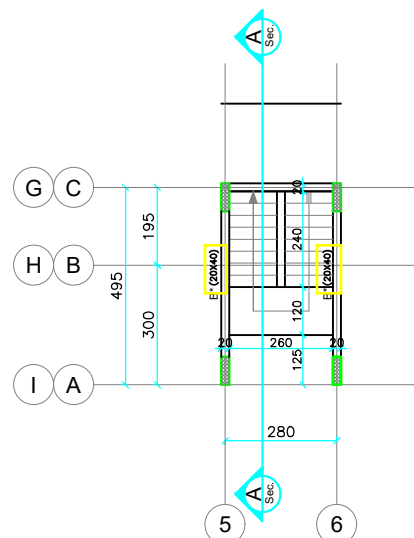
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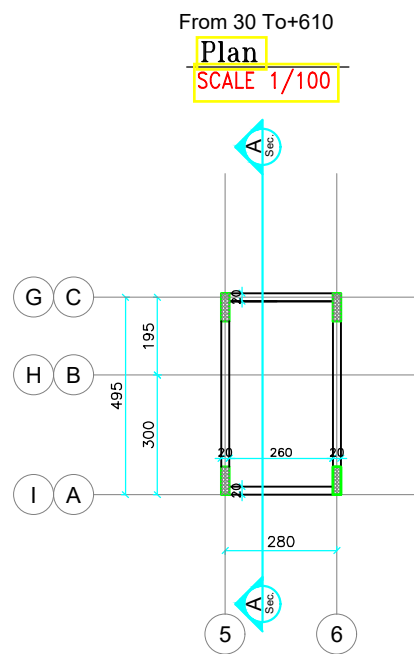




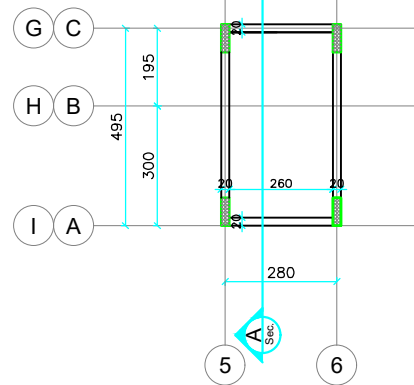
level +900
Plan
SCALE 1/100



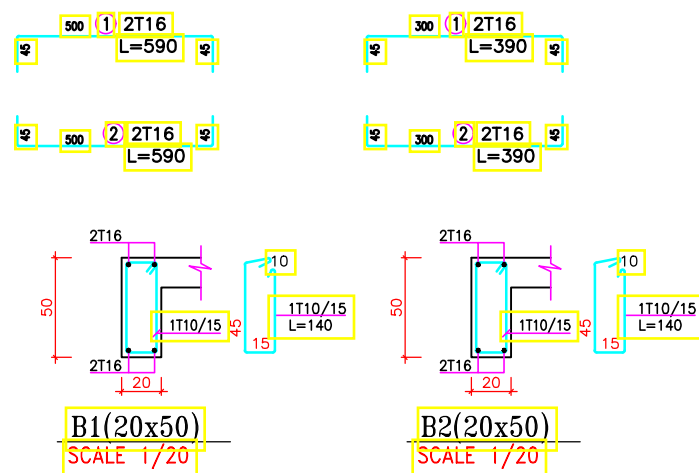
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Reinf.
SCALE 1/100



From 30 To+610
Plan
SCALE 1/100

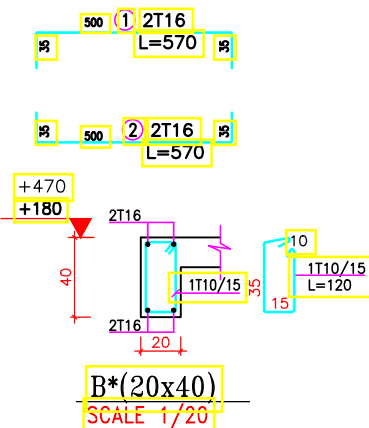


From +32 To 30
Plan
SCALE 1/100

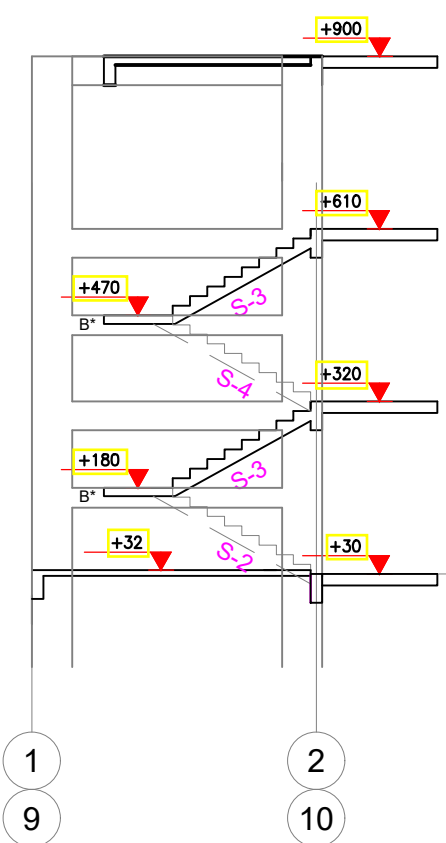


B1(20x50)
SCALE 1/20

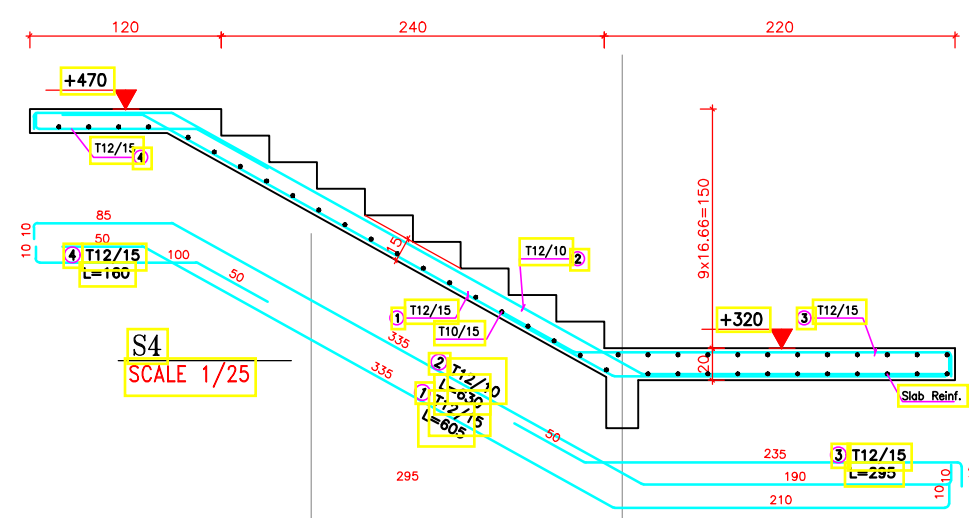
B2(20x50)
SCALE 1/20



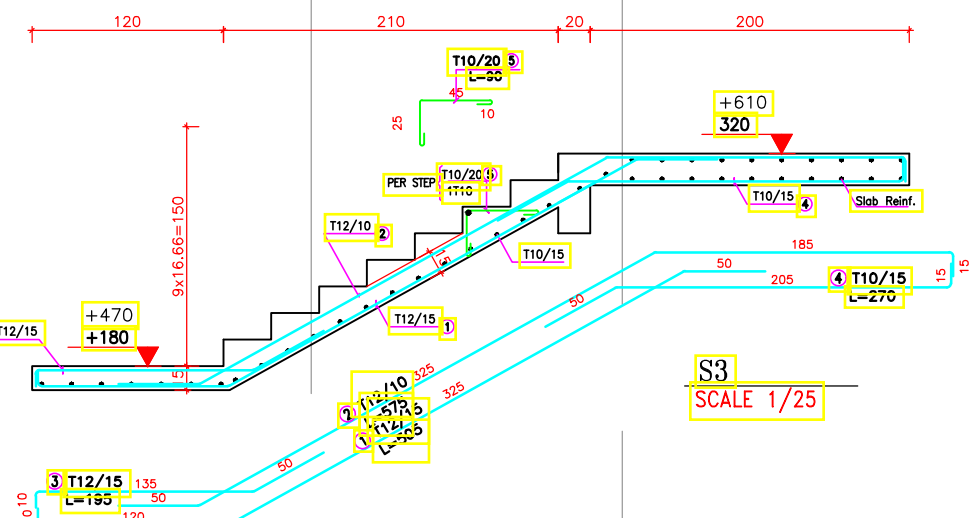
B*(20x40)
SCALE 1/20



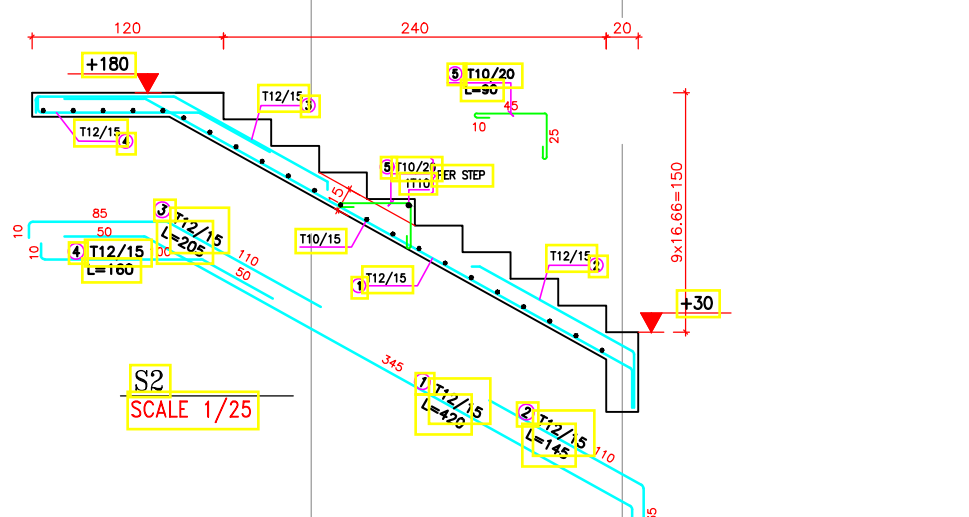
NORTH ENTRANCE TYPE B
SCALE 1/100



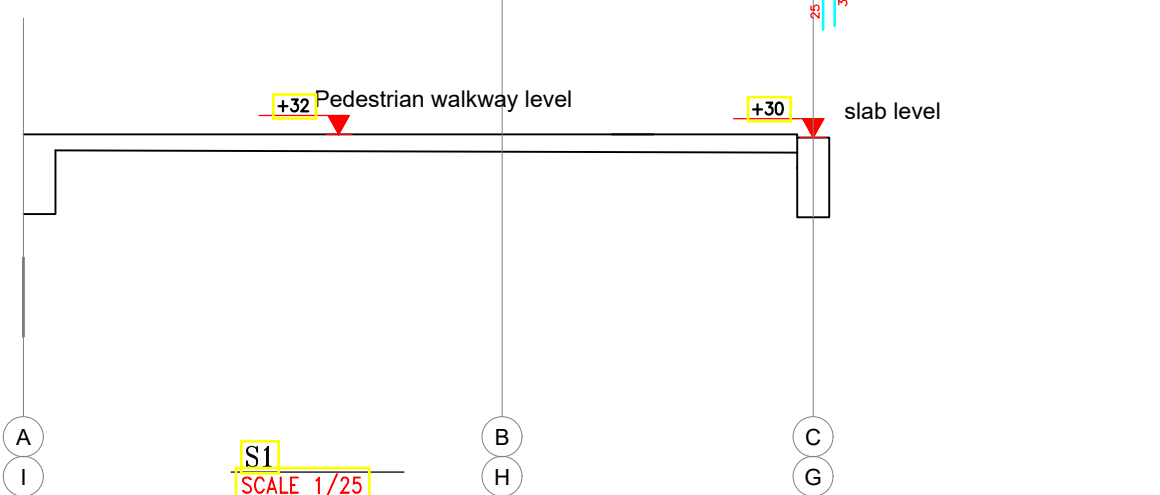
S4
SCALE 1/25



S3
SCALE 1/25



S2
SCALE 1/25



S1
SCALE 1/25

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CONCRETE C30 FOR VERTICAL ELEMENTS & C25 FOR OTHERS
REINFORCEMENT FY400

Project:
Right Side Mosul Buildings

Drawing :
Stair Details. (ST-12)-(Type B)

Location:
Mosul

Scale:
1/100

SN:
ST-DT-12

Format:
A3

rev.	Description	Date
E	Tendering	17-09-2019
D	Tendering	23-06-2019
C	Tendering	04-03-2019
B	Tendering	16-12-2018
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Calculation Sheet of

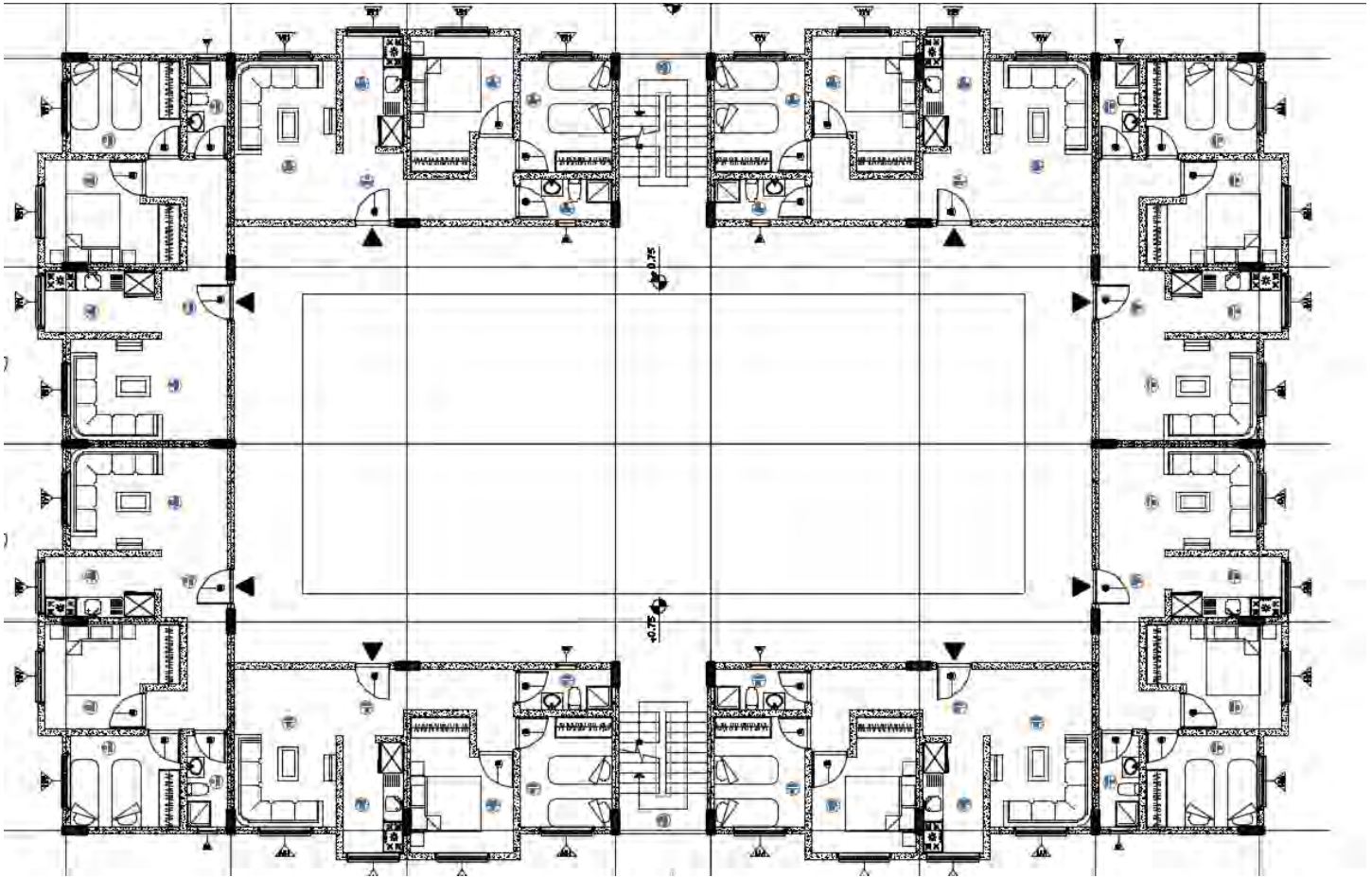
Residential building (8)

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1 Introduction:

The project consists of three residential stories and as shown below.



2 Materials:

Introduction:

The design was prepared considering the following Materials like reinforcement steel and Concrete

Material characteristics:

The modulus of elasticity is based on the cylinder strength of the concrete based on the formula from the ACI 318-08

$$E_c = 4700 \cdot \sqrt{f_c}$$

TABLE: Material Properties - Summary					
Name	Type	E	v	Unit Weight	Design Strengths
		kN/m ²		kN/m ³	
FY400	Rebar	200000000	0.3	76.9729	F _y =400000 kN/m ²
F' _c =25MPa	Concrete	23500000	0.2	25	F _c =25000 kN/m ²
F' _c =30Mpa	Concrete	25743000	0.2	25	F _c =30000 kN/m ²

TABLE: Material List by Element Type	
Element Type	Material
Foundation	F' _c =25MPa
Column	F' _c =30Mpa
Beam	F' _c =25MPa
Floor	F' _c =25MPa

3 Loads:

Introduction:

For the structural design of this building Dead , super dead loads
(walls+ finishes), Live loads and their combinations have been used

3.1 Static load cases:

TABLE: Load Patterns		
Name	Type	Self Weight Multiplier
DL	Dead	1
LL	Live	0

3.2 Load Combination:

TABLE: designing Load Combinations		
Name	LOAD	Type
MAIN	1.4DL+1.7LL	Linear Add
CLASSIC	DL+ LL	Linear Add
EX1P	1.4 DL +1.1EX1+0.55LL	Linear Add
EX1N	1.4 DL -1.1EX1+0.55LL	Linear Add
EX2P	1.4 DL +1.1EX2+0.55LL	Linear Add
EX2N	1.4 DL -1.1EX2+0.55LL	Linear Add
EY1P	1.4 DL +1.1EY1+0.55LL	Linear Add
EY1N	1.4 DL -1.1EY1+0.55LL	Linear Add
EY2P	1.4 DL +1.1EY2+0.55LL	Linear Add
EY2N	1.4 DL -1.1EY2+0.55LL	Linear Add
EXX1P	0.89 DL +1.1EX1	Linear Add
EXX1N	0.89 DL -1.1EX1	Linear Add
EXX2P	0.89 DL +1.1EX2	Linear Add
EXX2N	0.89 DL -1.1EX2	Linear Add
EYY1P	0.89 DL +1.1EY1	Linear Add
EYY1N	0.89 DL -1.1EY1	Linear Add
EYY2P	0.89 DL +1.1EY2	Linear Add
EYY2N	0.89 DL -1.1EY2	Linear Add

3.3 Loads on various areas

Area	Value (KN/m ²)	Area	Value (KN/m ²)
Terrace	LL=3 & SDL=3	Bed room	LL=2 & SDL=2
Stair case	LL=3 & SDL=4	Dressing room	LL=2 & SDL=2

4 Model Description:

Introduction

For the detailed analysis of the building a structural model has been made of the Chalet. The model is used to retrieve results for all the structural elements of the building.

4.1 Procedure:

The following procedure has been followed for all the elements analysis in Etabs:

1. Build 3D model
2. Define all slabs, beams and walls
3. Reduce element stiffness appropriately.
4. Define element releases, support conditions etc.
5. Define loads (Section 3.1)
 - a. Self-weight (SW)
 - b. Dead Load (DL)
 - c. Live Load
6. Design elements (floors, beams and columns)

4.2 Model:

The finite element models are built using Etabs 2016 ver16.0.0 (Fig 1). The model was built as a 3D model

The following model files are used:

BUILDING(8).EDB

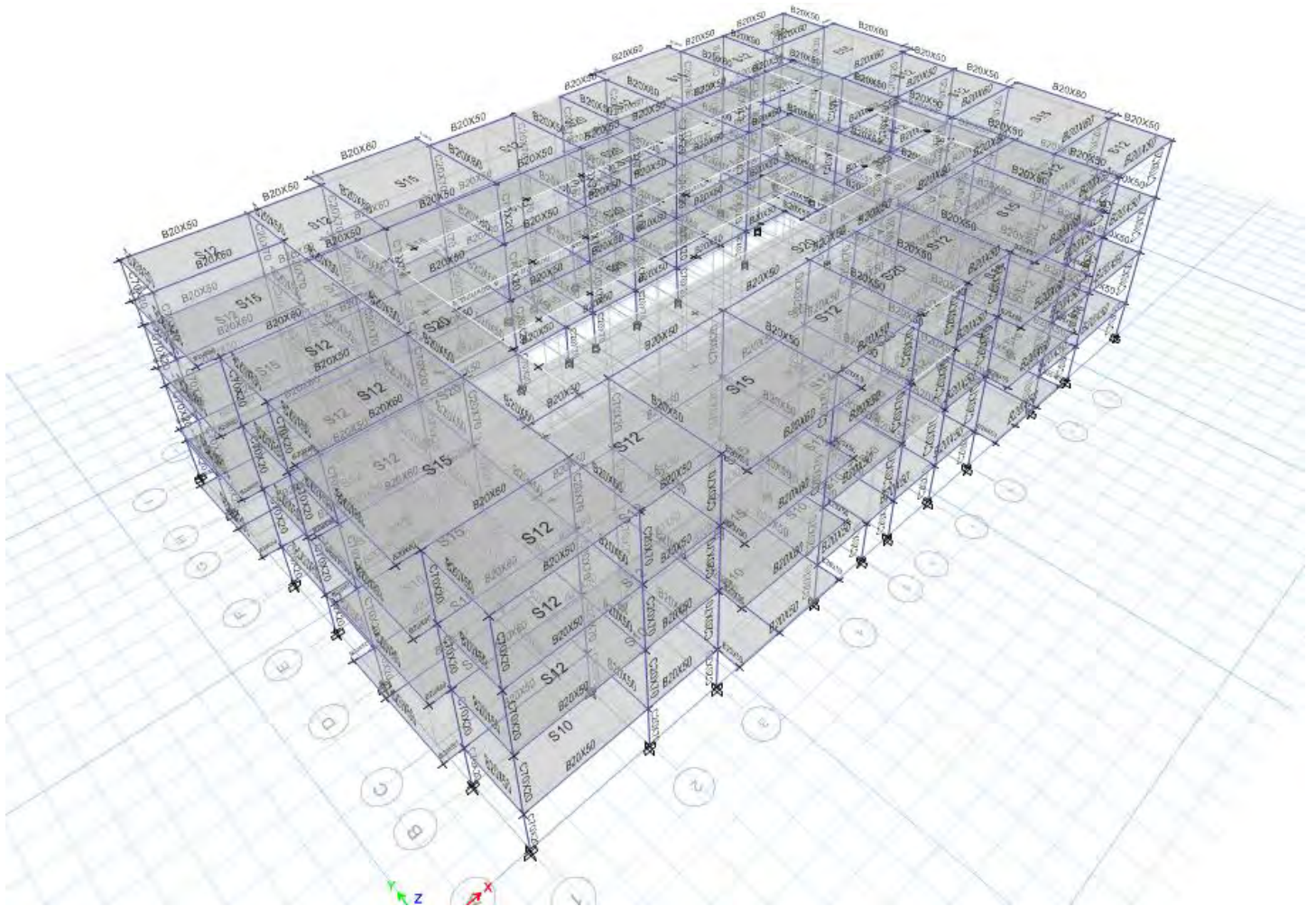


Fig (1): 3D Model

Frame elements are used for all beams & columns, and shell elements are used for slabs. The shell elements have a constant thicknesses throughout which are defined in the next table.

TABLE: Shell Sections - Slab					
Name	Material	Slab Type	Element Type	Slab Thickness	One-Way Load Distribution?
				cm	
S10	F'c=25MPa	Uniform	Shell-Thin	10	
S12	F'c=25MPa	Uniform	Shell-Thin	15	
S20	F'c=25MPa	Uniform	Shell-Thin	20	

Beam Elements sections are defined as next depending on framing plans in Etabs as figures (2 to 4)

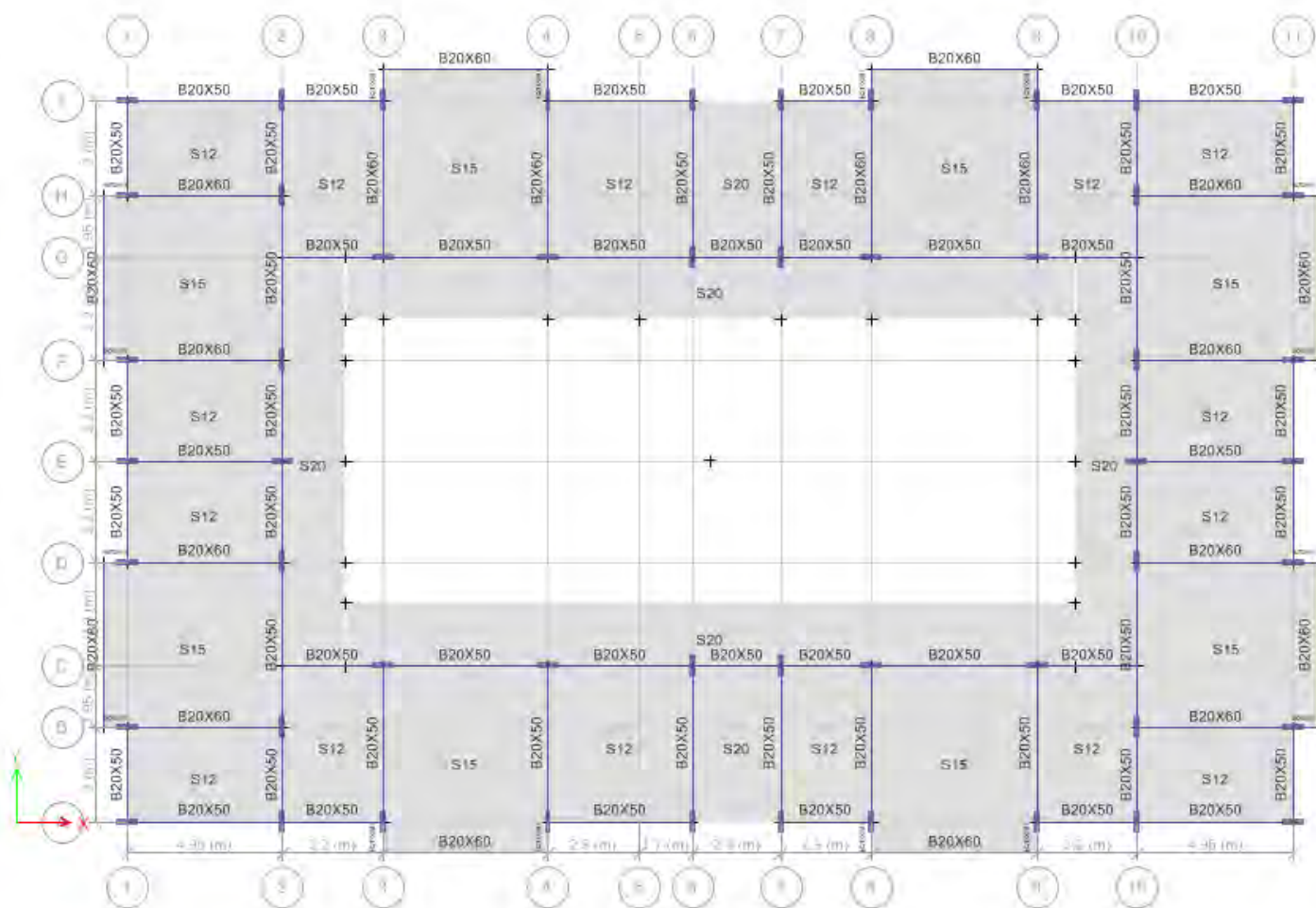


Fig (2): Ground Floor Framing Plan

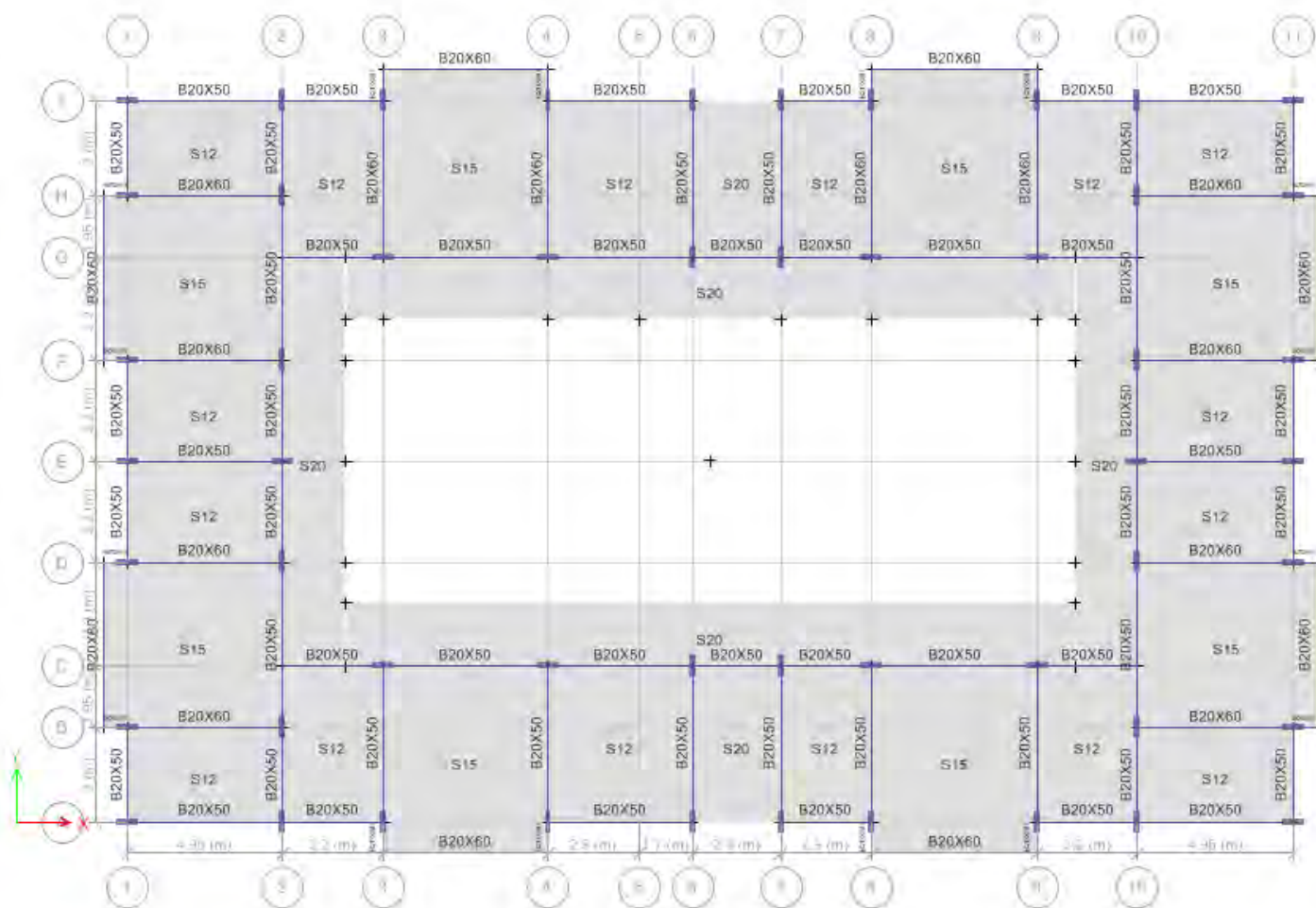


Fig (3): first Floor Framing Plan

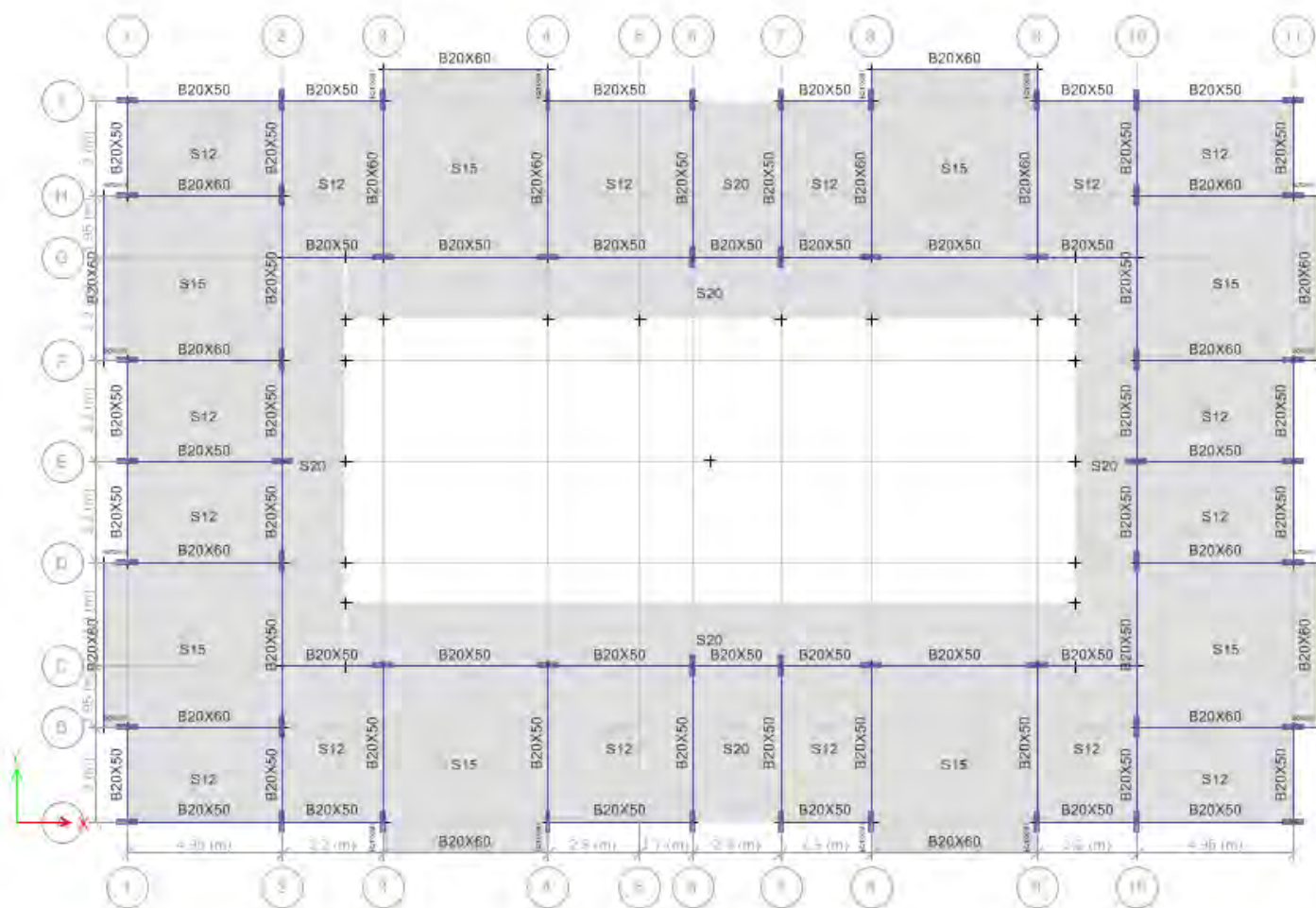


Fig (4): second Floor Framing Plan

5 Sections Analysis:

Introduction

After retrieving all element results from the structural model, every element in the building can be checked against the relevant combinations of loads. For the different elements the capacity is calculated and compared to the actual combination of section forces as found in the model

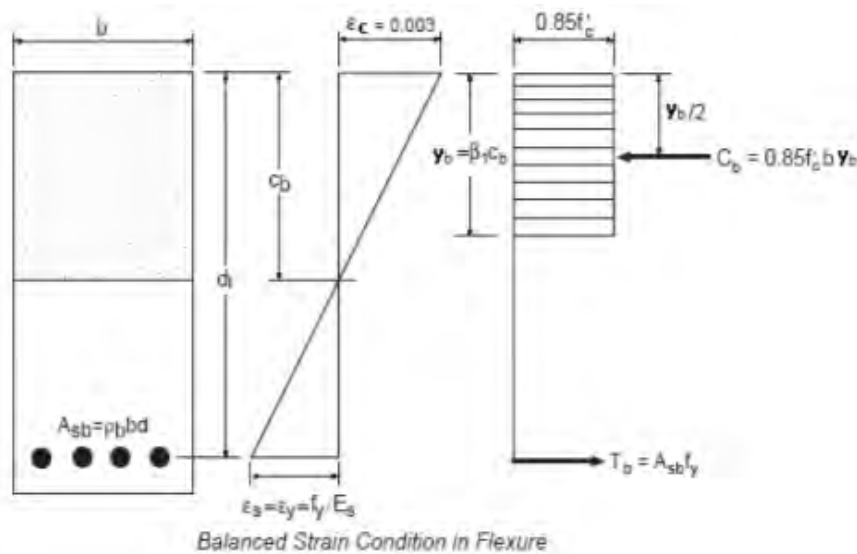
5.1 General methodology for slabs, beams and walls

As a tool to check the floor slabs, walls and beams in the building, they have to be compared with maximum capacity of the section which calculated as following depending on ACI 318-08:

5.1.1 Design of Flexure:

. phi = 0.90 Flexure strength reduction factor (Tension-controlled section)

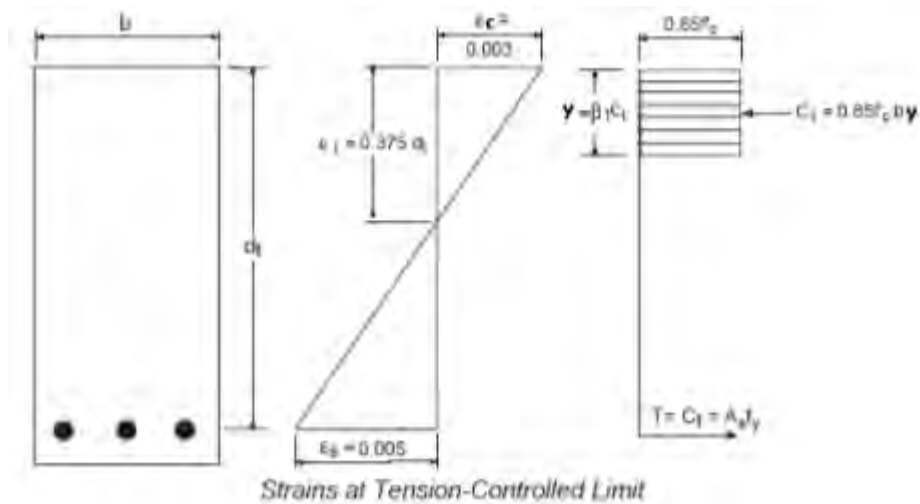
Section at Balance case:



```
. ec = 0.003
. es = ey = fy / Es
. dt = H - dc
. Cb = [ec/(ec+ey)]*dt
. 0.85 >= {beta = 0.85-0.05[(f'c-28)/7]} >= 0.65
. Yb = beta * Cb
. Asb = {[0.85*f'c*B*Yb]/fy}
. Mub = phi*{0.85*f'c*B*Yb*[dt-(Yb/2)]}
```

Concrete ultimate compressive strain
Reinf. tensile strain
Effective depth
Neutral axis depth
Equivalent depth factor
Equivalent compressive block depth
Balanced area of steel
Balanced resistance moment, where phi = 0.65

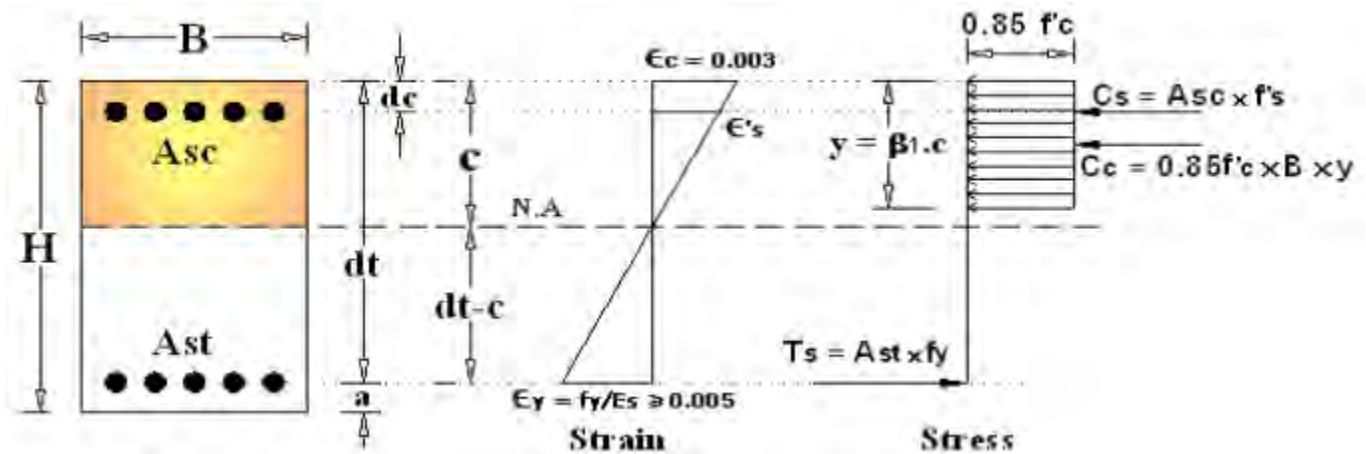
Singly Reinforced Section (Tension-Controlled Section)



$\epsilon_c = 0.003$
 $\epsilon_s = 0.005$
 $dt = H - dc$
 $C_t = [\epsilon_c / (\epsilon_c + \epsilon_s)] * dt$
 $0.85 \geq \{\beta_1 = 0.85 - 0.05[(f'_c - 28)/7]\} \geq 0.65$
 $Y = \beta_1 * C_t$
 $A_s = \{[0.85 * f'_c * B * Y] / f_y\}$
 $M_u = \phi * \{0.85 * f'_c * B * Y * [dt - (Y/2)]\}$

Concrete compressive strain
 Reinf. tensile strain
 Effective depth
 Neutral axis depth
 Equivalent depth factor
 Equivalent compressive block depth
 Maximum area of steel for singly reinforced section
 Maximum resistance moment for singly reinforced section

Doubly Reinforced Section (Tension –Controlled Section)



. $C = 0.375 \cdot dt$	Neutral axis depth
. $0.85 \geq \{\beta = 0.85 - 0.05[(f'_c - 28)/7]\} \geq 0.65$	Equivalent depth factor
. $Y = \beta \cdot C$	Equivalent compressive block depth
. $\epsilon'_s = \{[(C - dc)/C] \cdot \epsilon_c\}$	Strain of compression reinforcement
. $f'_s = \{\epsilon'_s \cdot E_s\} \leq f_y$	Yield strength of compression reinforcement
. $A_{st} = 0.04 \cdot B \cdot dt$	Maximum area of tension steel for doubly reinforced section
. $A_{sc} = \{[A_{st} \cdot f_y - 0.85 \cdot f'_c \cdot B \cdot Y] / [f'_s - 0.85 \cdot f'_c]\}$	Maximum area of compression steel for doubly reinforced section
. Maximum resistance moment for doubly reinforced section:	
. $M_u = \phi \cdot \{0.85 \cdot f'_c \cdot B \cdot Y \cdot [dt - (Y/2)] + A_{sc} \cdot (f'_s - 0.85 \cdot f'_c) \cdot (dt - dc)\}$	

5.1.2 Design of Shear:

. $\phi = 0.75$ Shear strength reduction factor

Concrete shear strength

$$. V_{cn} = \{\phi \cdot 0.17 \cdot \sqrt{f'_c} \cdot B \cdot d\}$$

Check sufficient of section

$$. V_{sn(max)} = \phi \cdot 0.66 \cdot \sqrt{f'_c} \cdot B \cdot d$$

Maximum shear force can be carried by shear reinforcement

$$. V_n(max) = V_{cn} + V_{sn(max)}$$

Maximum shear force can be carried by section

5.1.3 Design of Torsion:

. $\phi = 0.75$ Strength reduction factor

Threshold torsion

$$. T_s = T_{cr}/4 = \phi \cdot 0.083 \cdot \sqrt{f'_c} \cdot (A_{cp}^2 / P_{cp})$$

Threshold torque = one-quarter of cracking torque

Check sufficient of section size

. Size of section should be sufficient to reduce unsightly cracking and prevent crushing of concrete compression struts

$$. v_{u_max} = \phi \cdot 0.83 \cdot \sqrt{f'_c}$$

Maximum allowable stresses due to combined shear and torsion

$$. v_u = \sqrt{(V_u / (B \cdot d))^2 + ((T_u \cdot \phi) / (1.7 \cdot A_{oh}^2))^2}$$

applied stresses due to combined shear and torsion

$$. A_{oh} = X_o \cdot Y_o$$

Area enclosed by centerline of outermost closed transverse torsional reinforcement

5.1.4 Deflection:

*Maximum Allowable Deflection

Immediate deflection due to live load

. Floors not supporting or attached to nonstructural elements likely to be damaged by large deflection ($L/360$)

Total deflection due to sustained loads and additional live load

. Roof or floor construction supporting or attached to nonstructural elements not likely to be damaged by large deflections ($L/240$)

5.2 Floor Slabs:

There are two types of slabs, which are one way solid slab and two way solid slab.

All slabs have been checked according to the steps described in Paragraph 5.1,

Slabs elastic deflections is under service loads and Moment diagrams under factored loads are clarified on figures (5 to 13) depending on ETABS 2016 Results as next

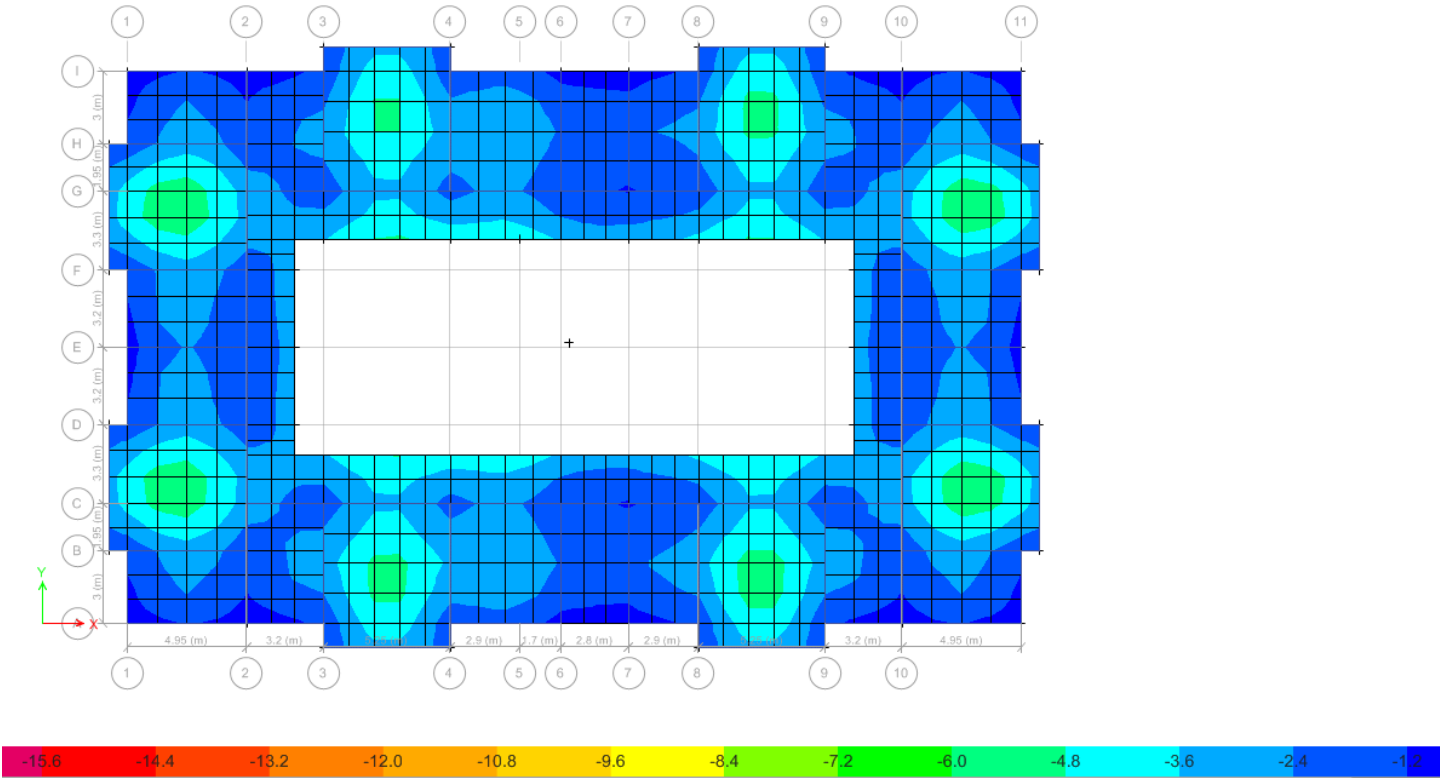


Fig (5): Ground Floor Deflection Contour (mm)

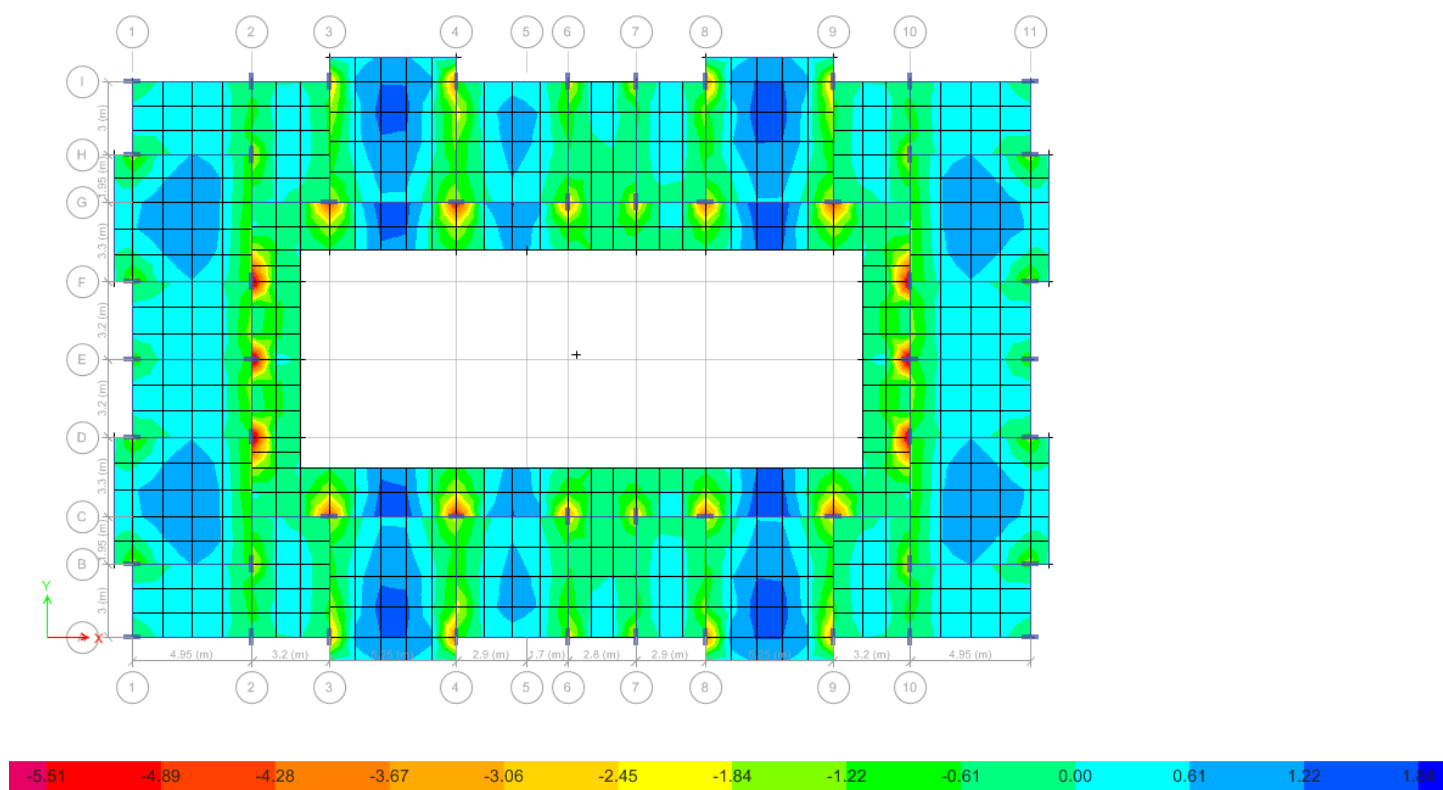


Fig (6): Ground Floor Moment Diagram-M11 (t.m/m)

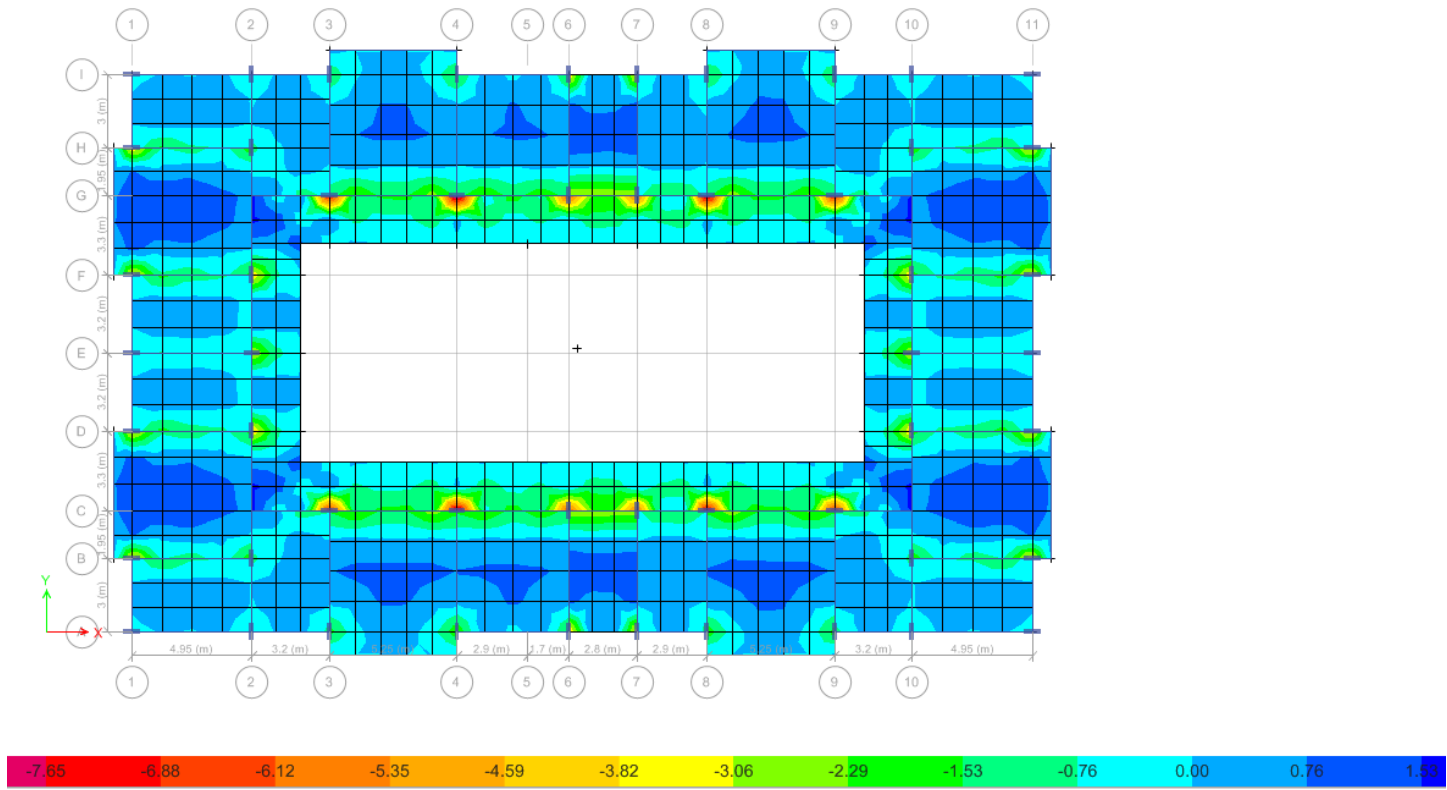


Fig (7): Ground Floor Moment Diagram-M22 (t.m/m)

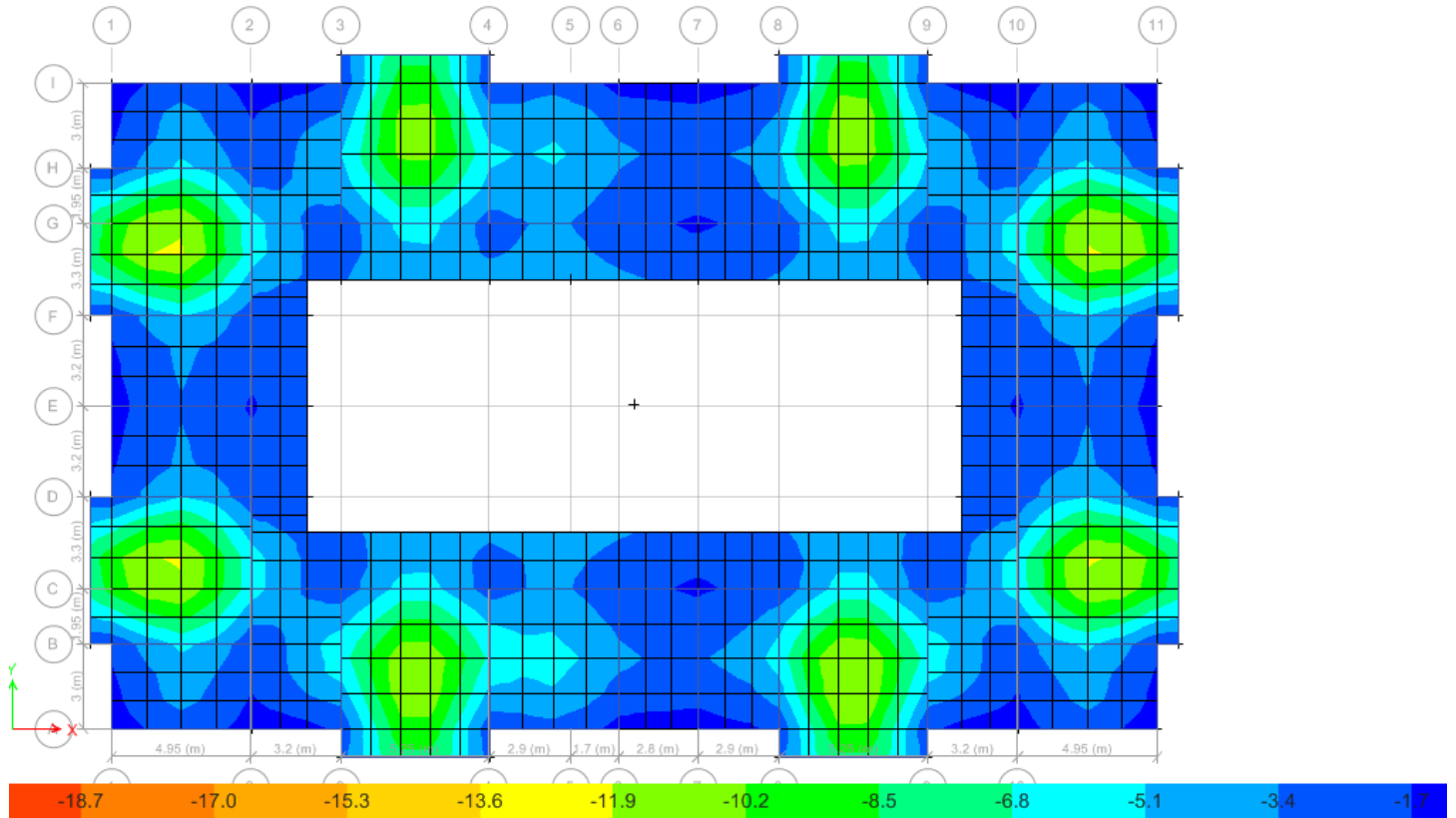


Fig (8): First Floor deflection contour - (mm)

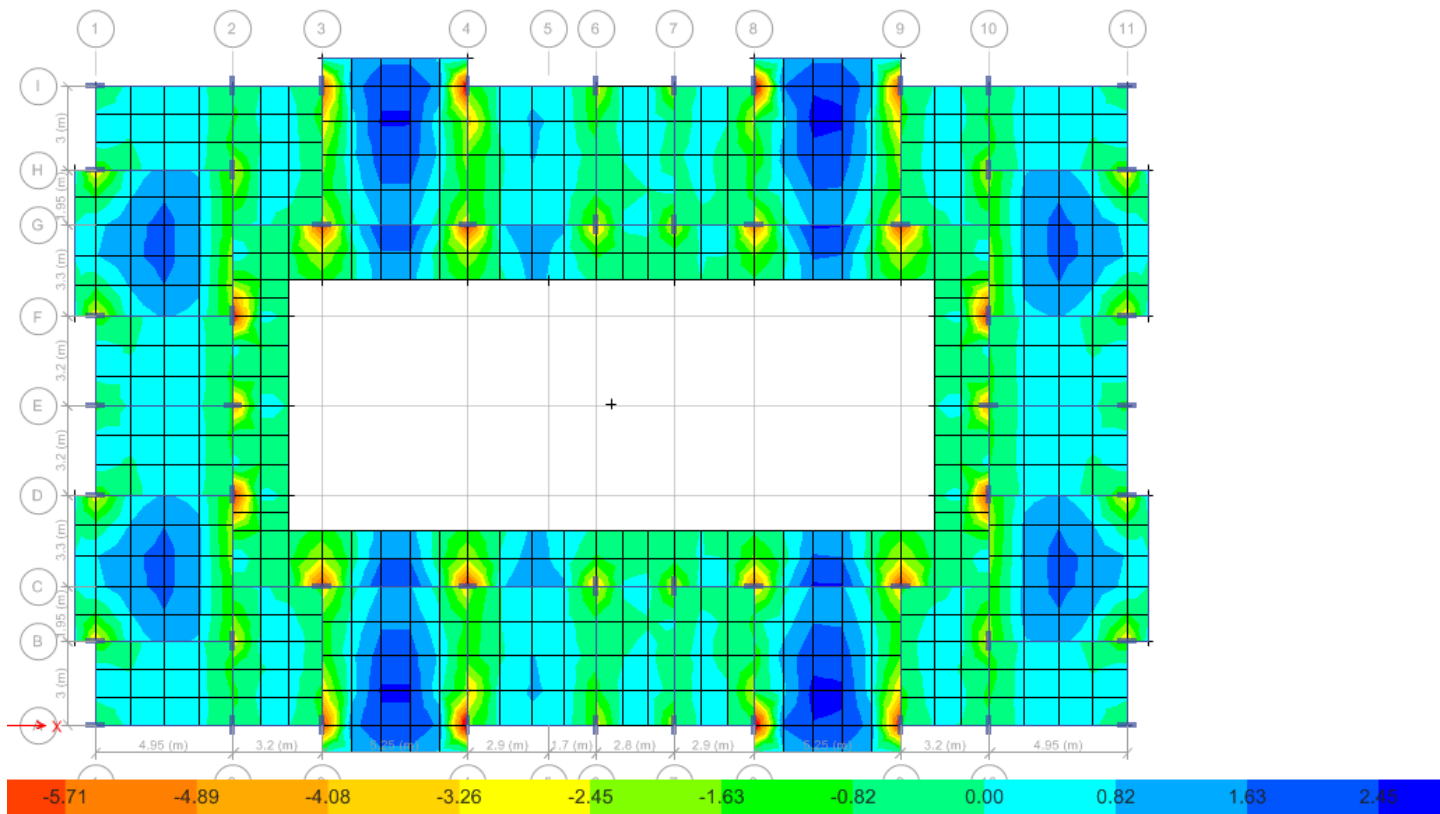


Fig (9): First Floor Moment Diagram-M11 (t.m/m)

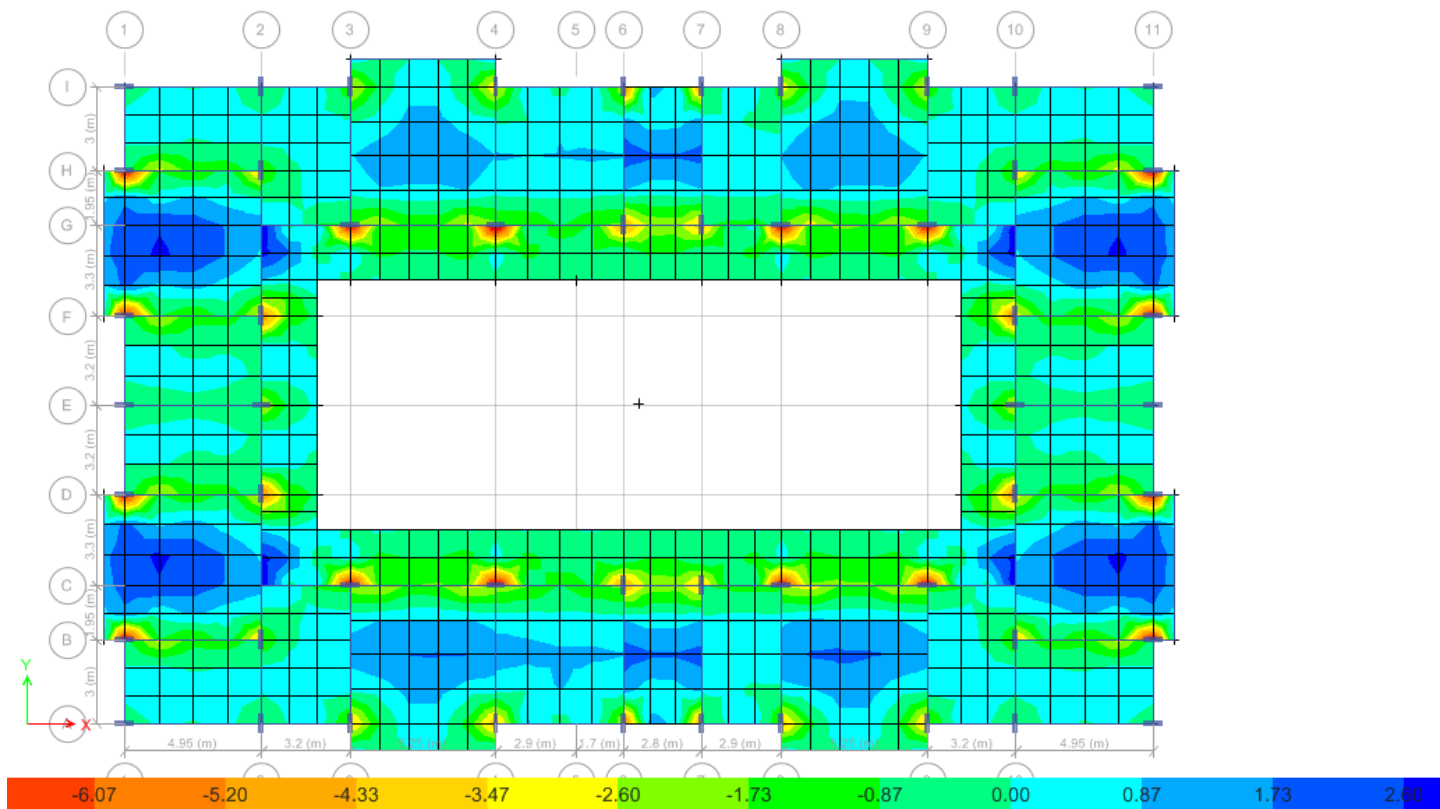


Fig (10): First Floor Moment Diagram-M22 (t.m/m)

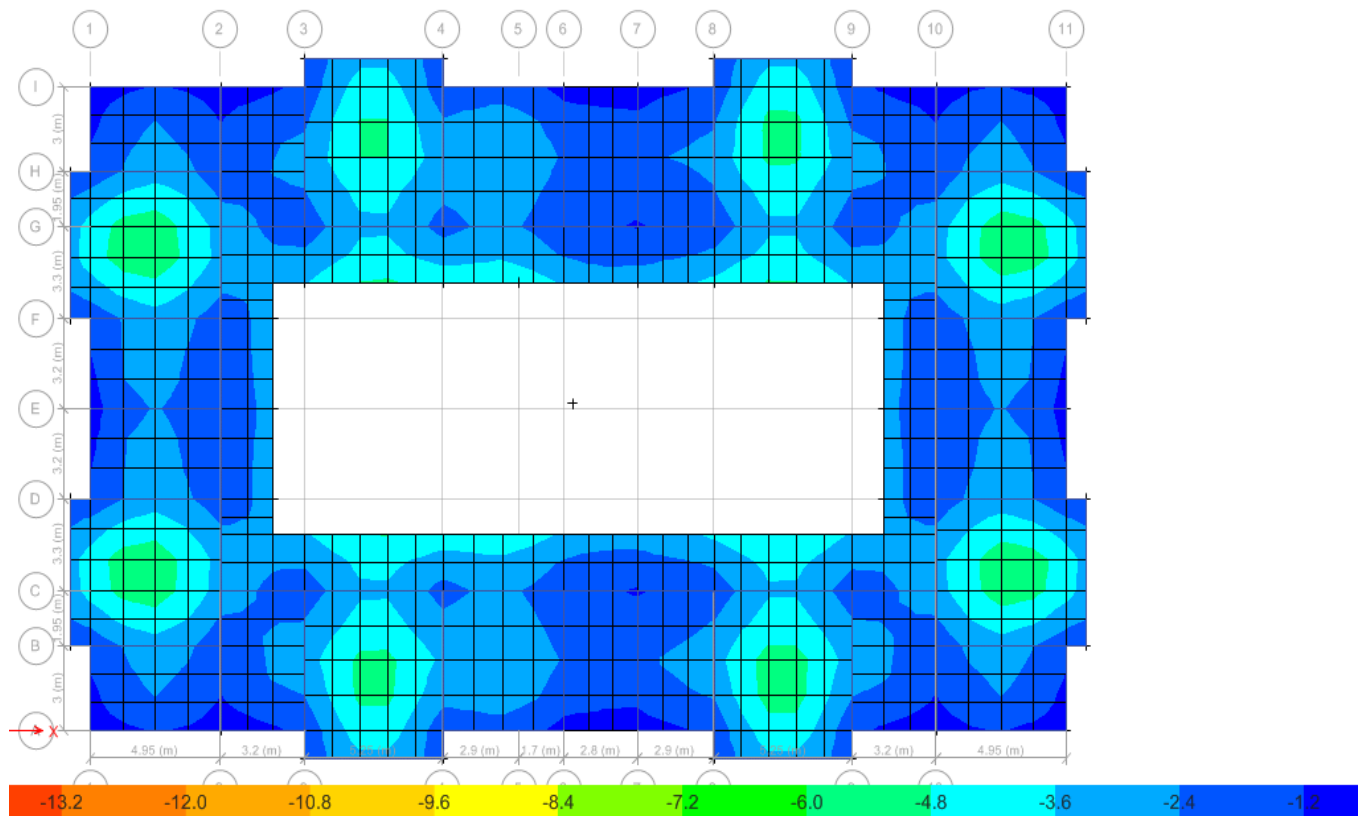


Fig (11): Second Floor Deflection contour (mm)

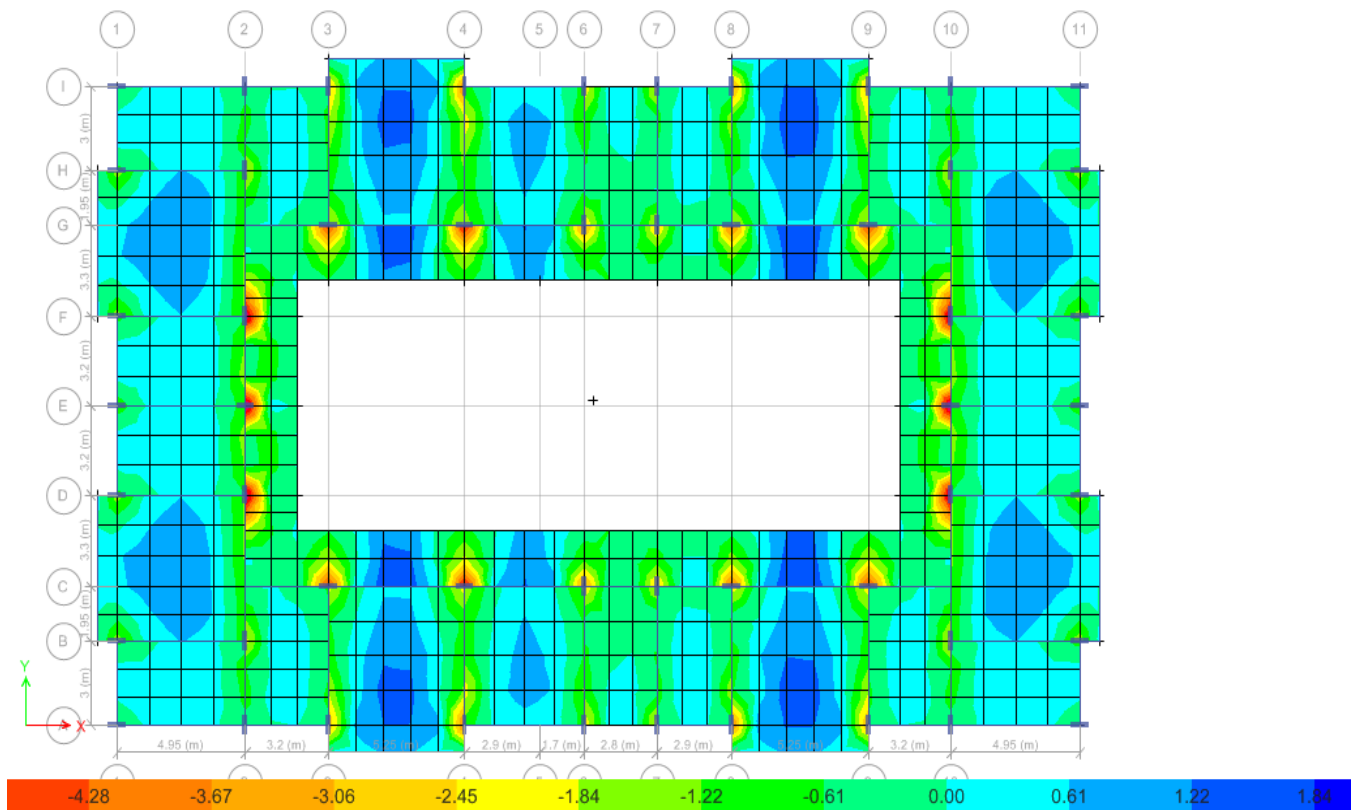


Fig (12): Second Floor Moment Diagram-M11 (t.m/m)

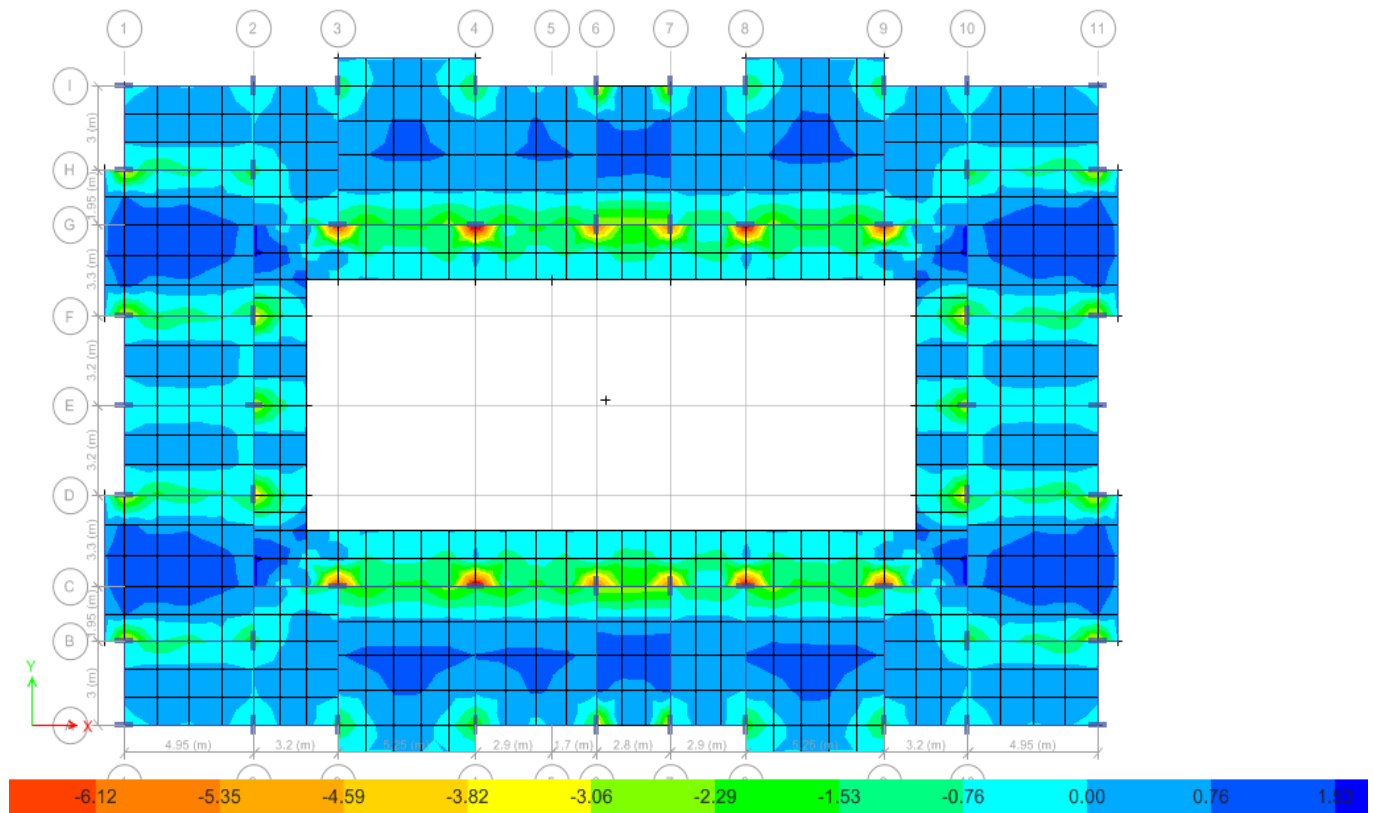


Fig (13): Second Floor Moment Diagram-M22 (t.m/m)

5.3 Beams:

All beams are designed and checked according to the same procedures, which are very similar to the procedures followed for the floor slabs as per Paragraph 5.1.

Beams Moment and shear diagrams are clarified on figures (14 to 19) depending on Etabs Results as next

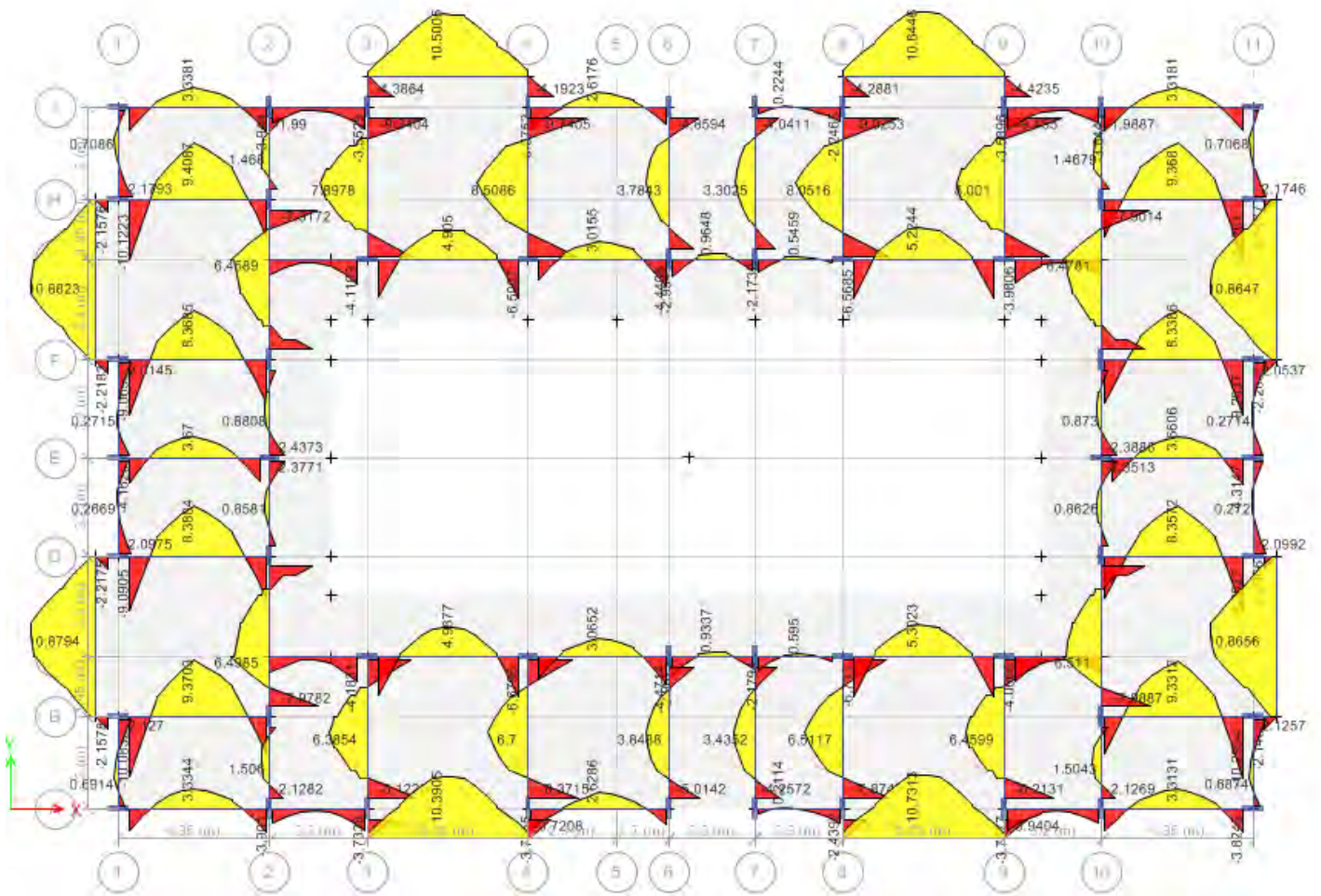


Fig (14): Ground Floor Beam Moment diagram (M3-t.m)

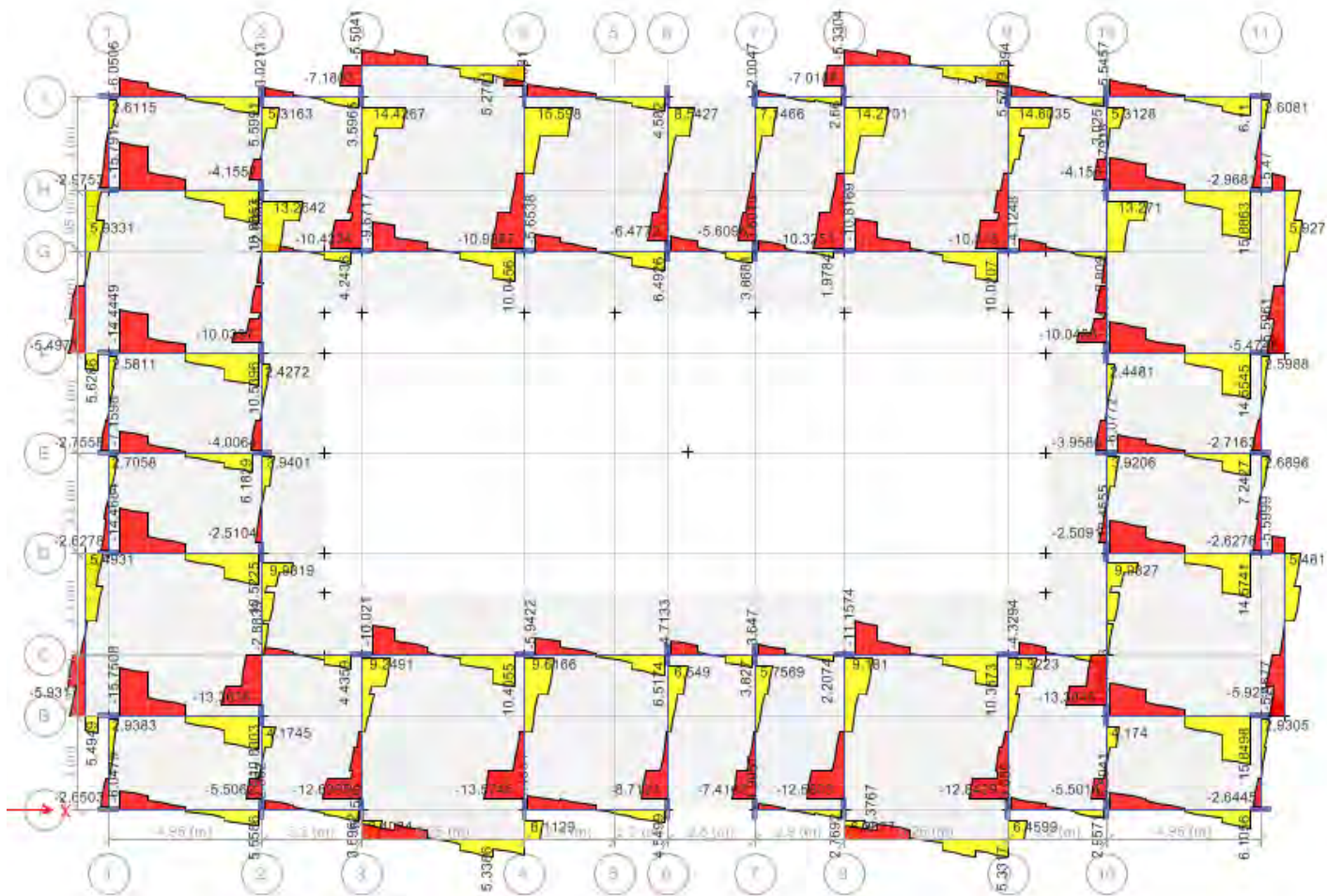


Fig (15): Ground Floor Shear diagram (Shear2-2-t)

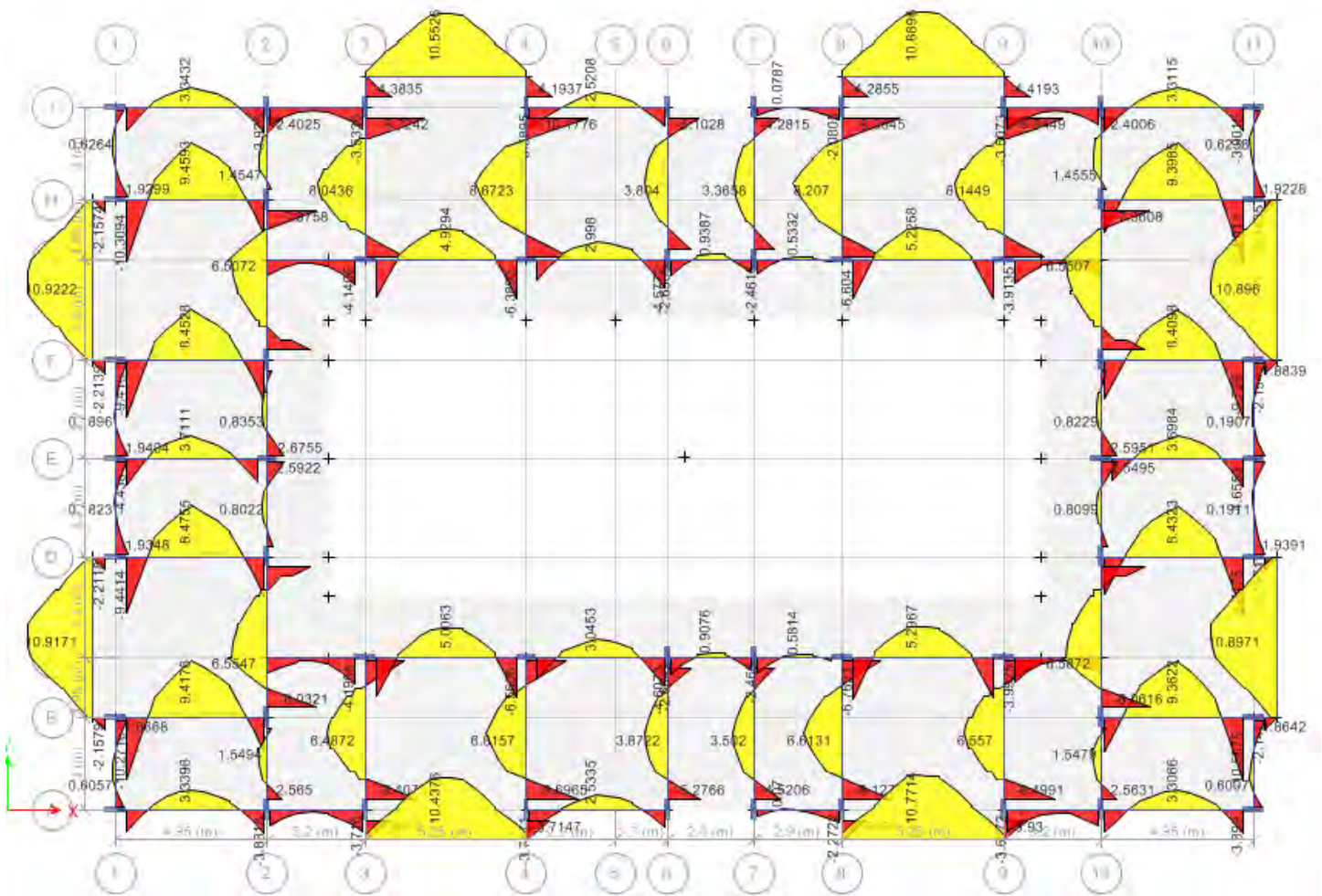


Fig (16): 1st Floor Beam Moment diagram (M3-t.m)

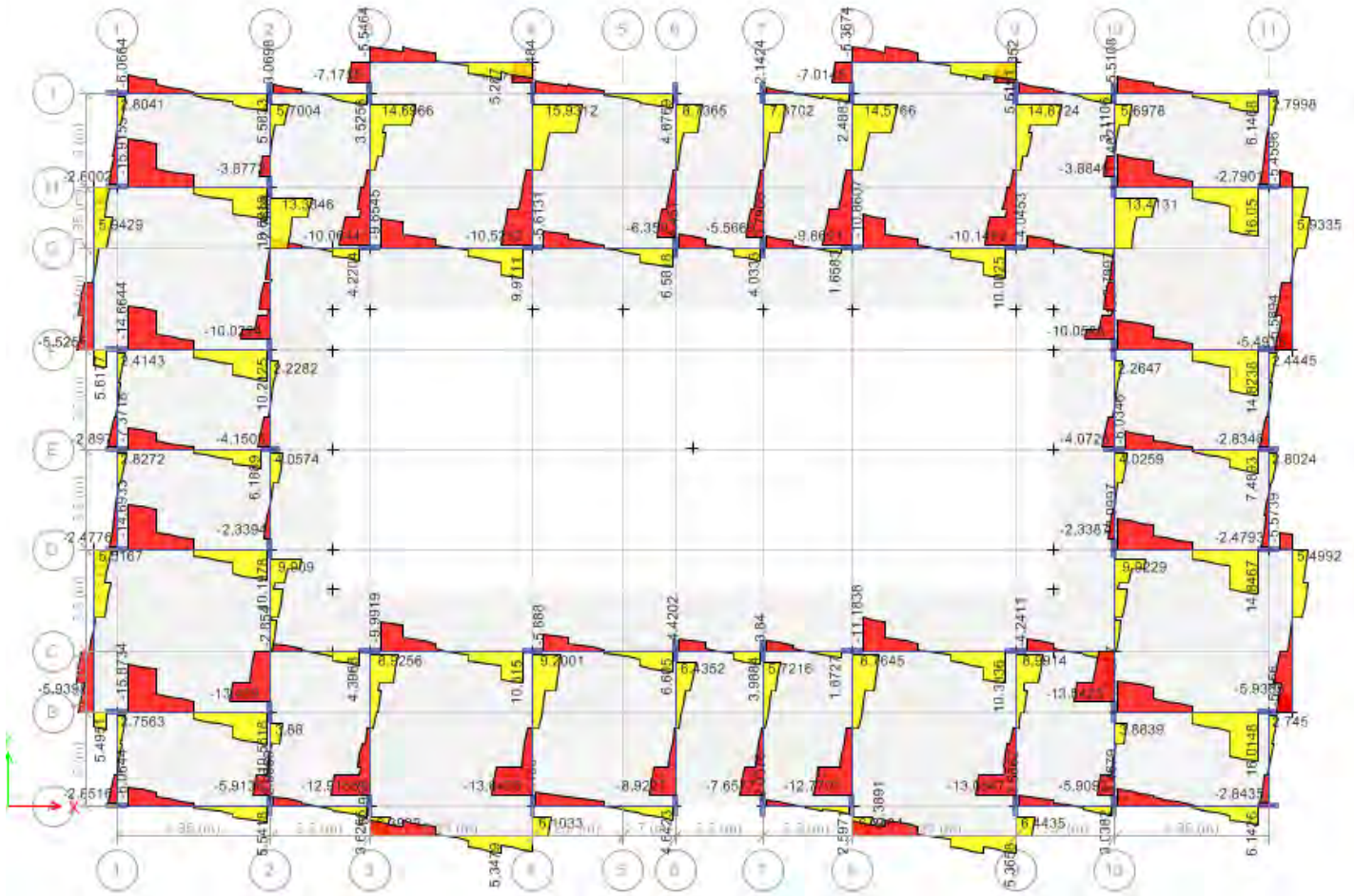


Fig (17): 1st Floor Shear diagram (Shear2-2-t)

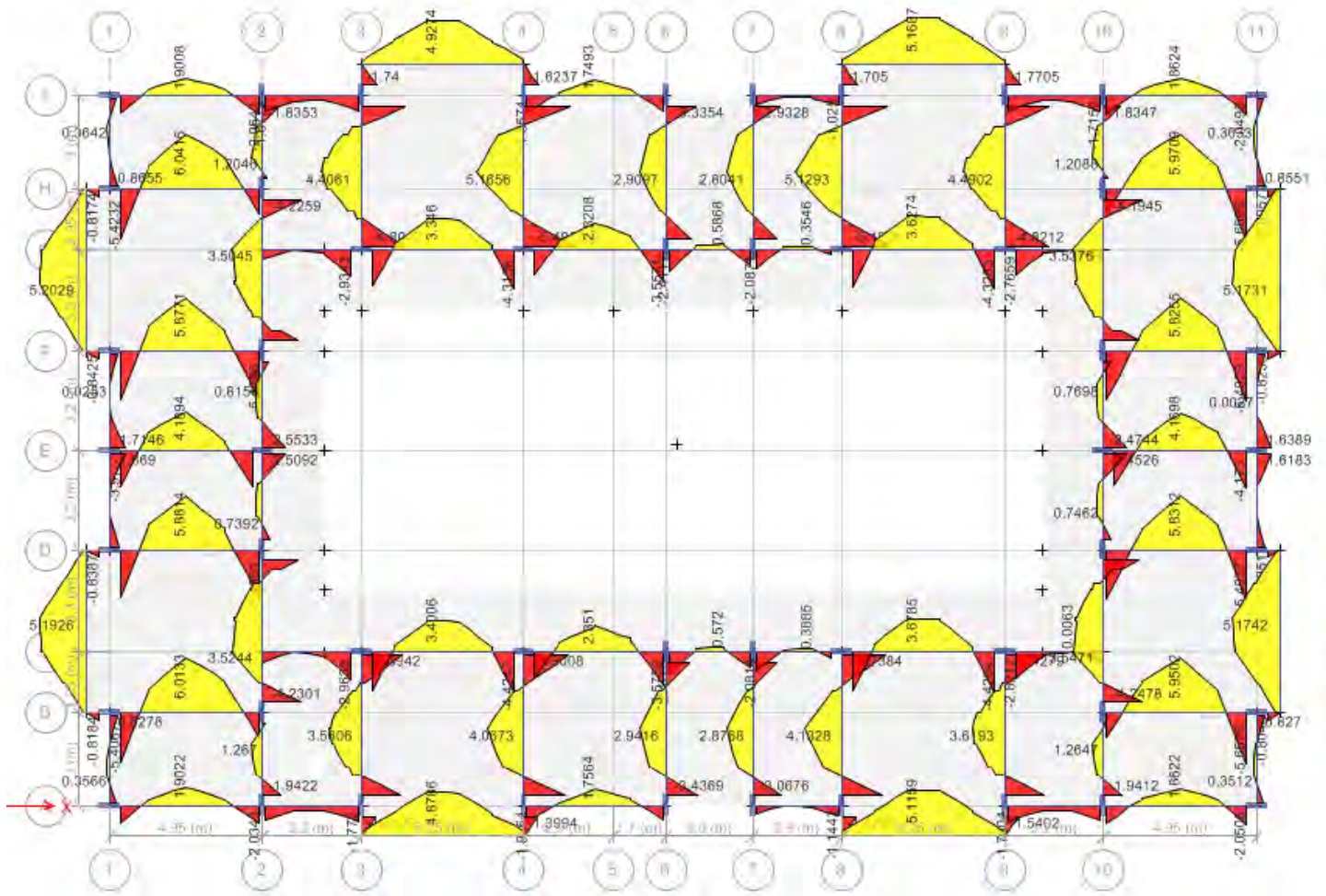


Fig (18): 2nd Floor Beam Moment diagram (M3-t.m)

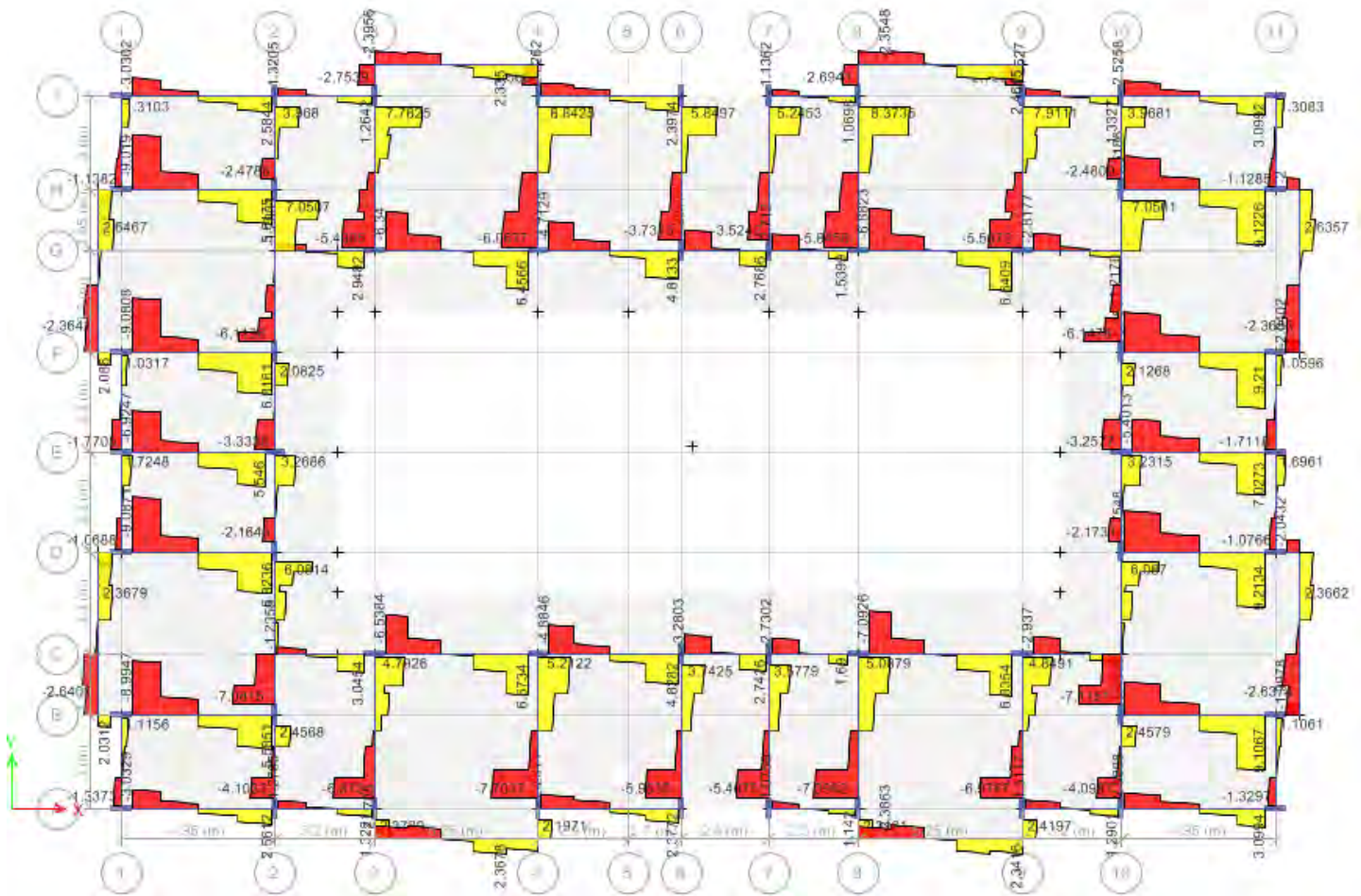


Fig (19): 2nd Floor Shear diagram (Shear2-2-t)

5.4 Columns

The columns & walls sections are designed in Etabs Model, and The following column & Walls sizes in figures (20 to 30), reinforcement are used throughout in the building. Please refer to the structural plans and sections for locations.

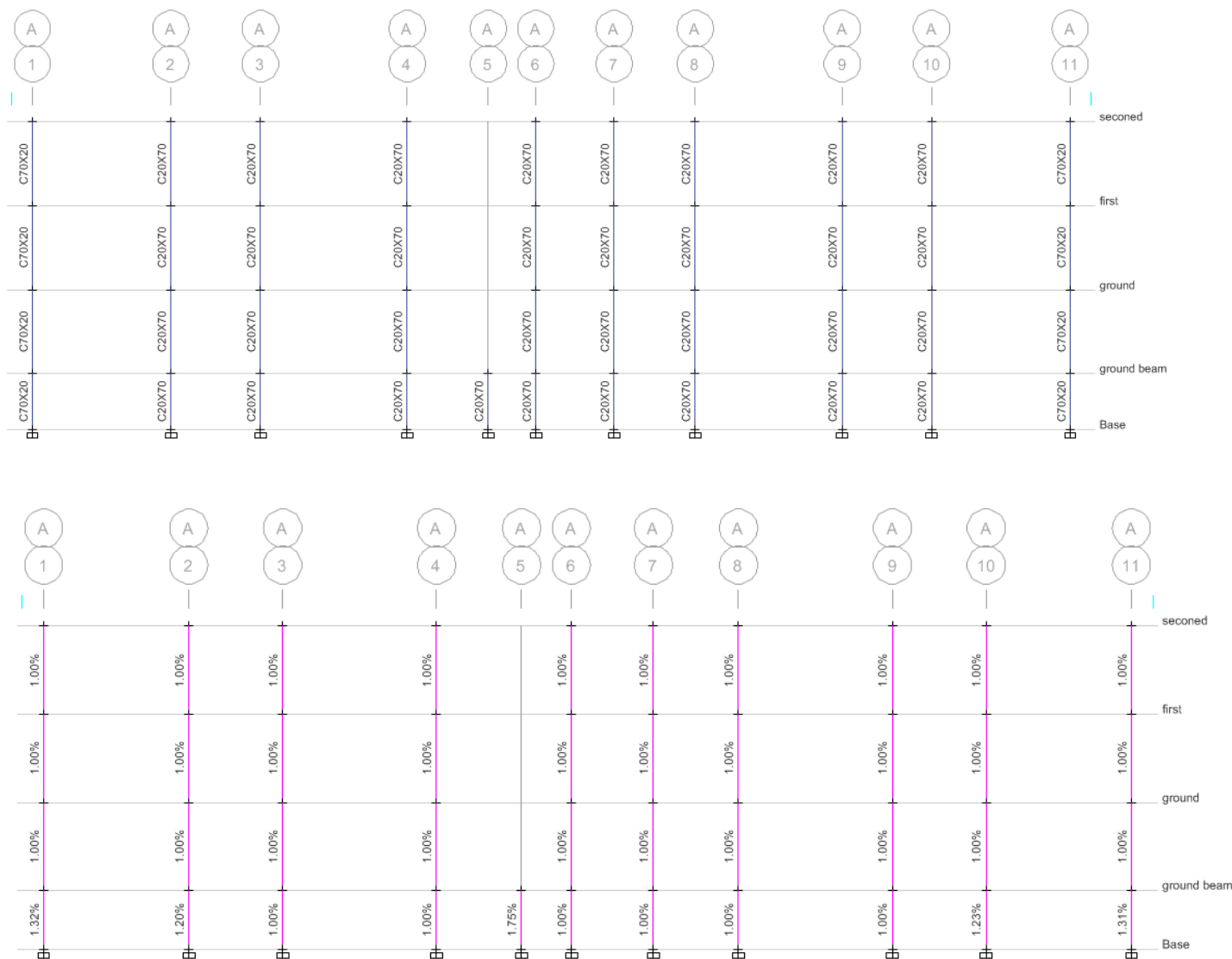


Fig (20): Columns on grid A dimensions (cmXcm)& Column P-M-M interaction Ratio



Fig (21): Columns on grid B dimensions (cmXcm)& Column P-M-M interaction Ratio

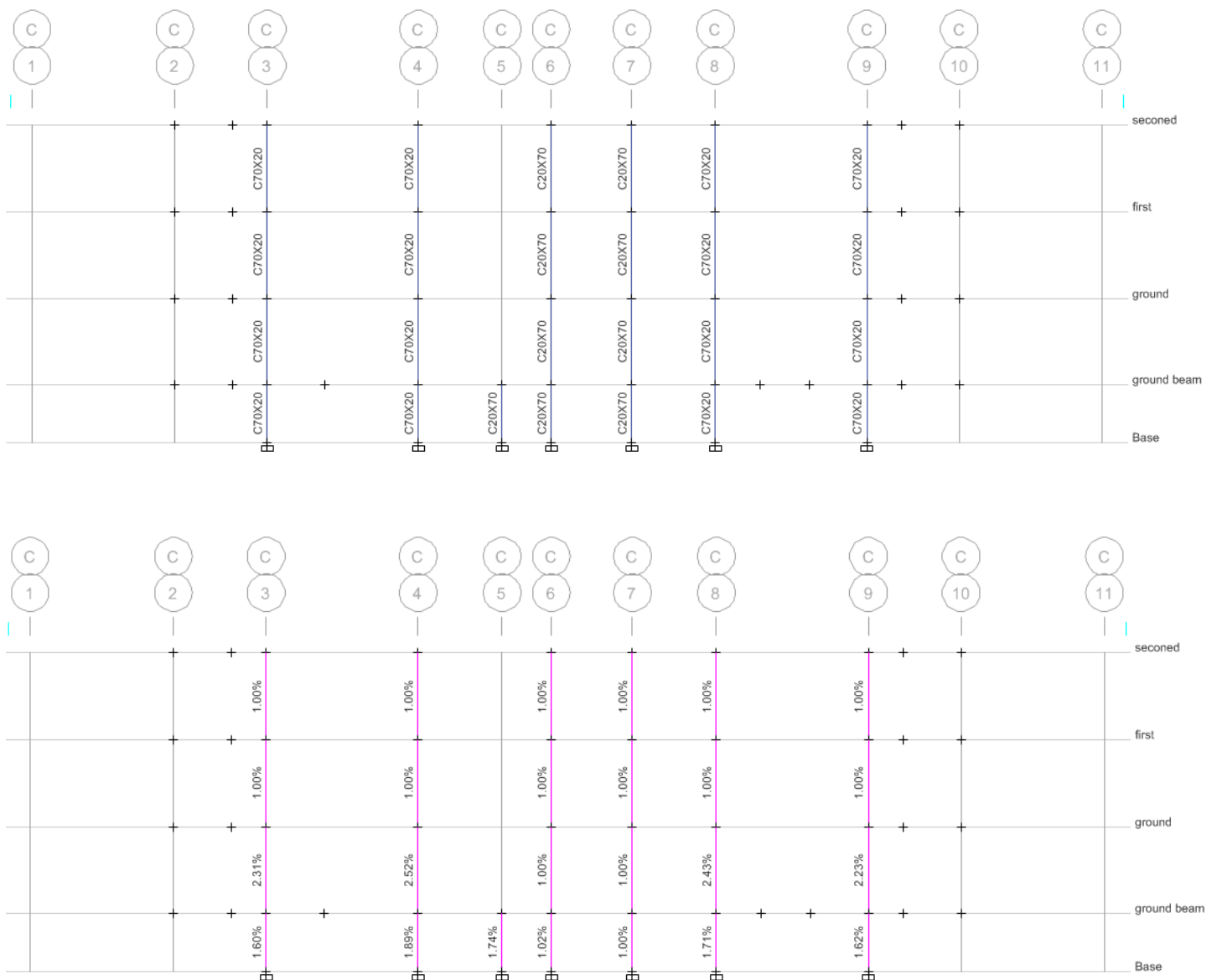


Fig (22): Columns on grid C dimensions (cmXcm)& Column P-M-M interaction Ratio

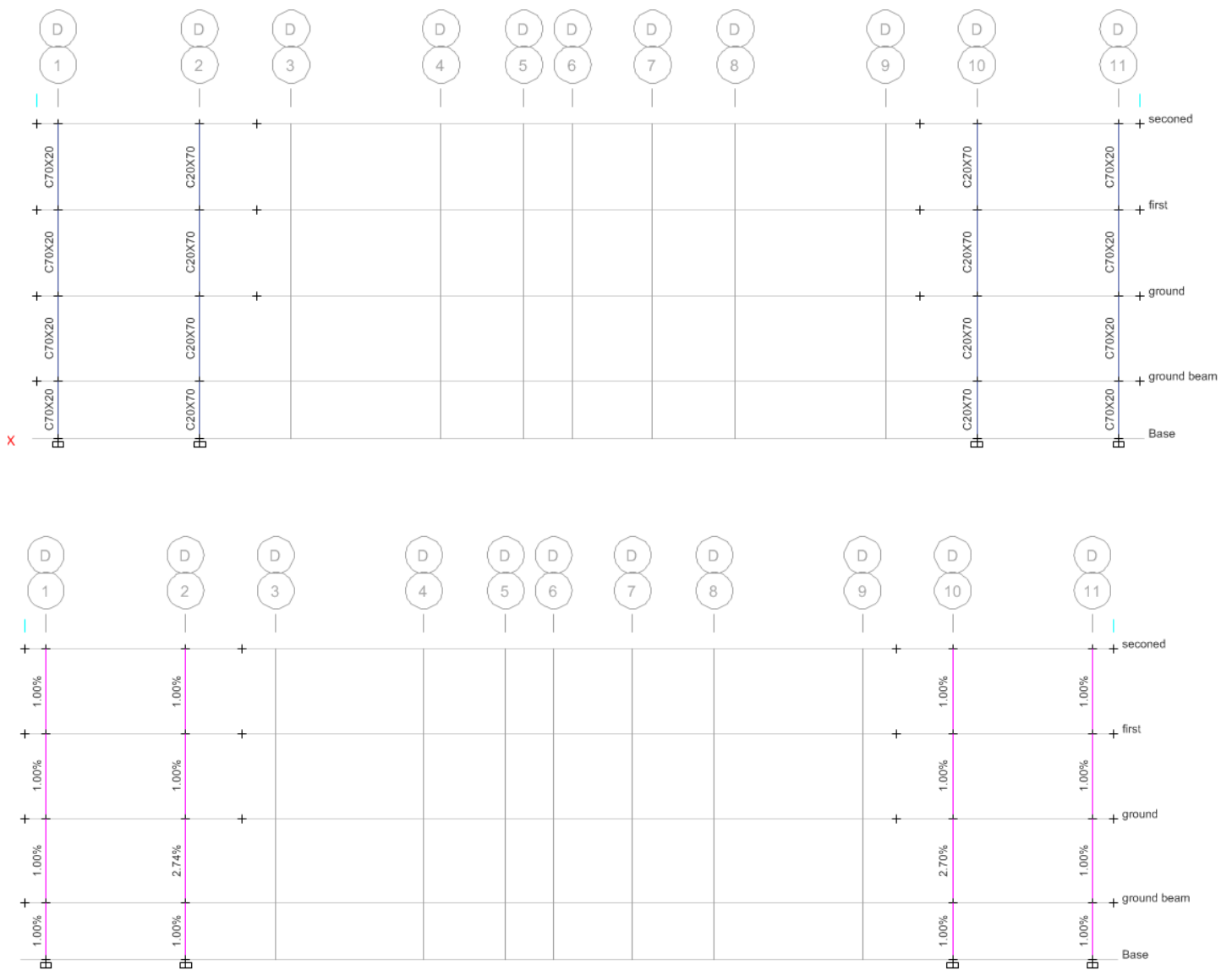


Fig (23): Columns on grid D dimensions (cmXcm)& Column P-M-M interaction Ratio

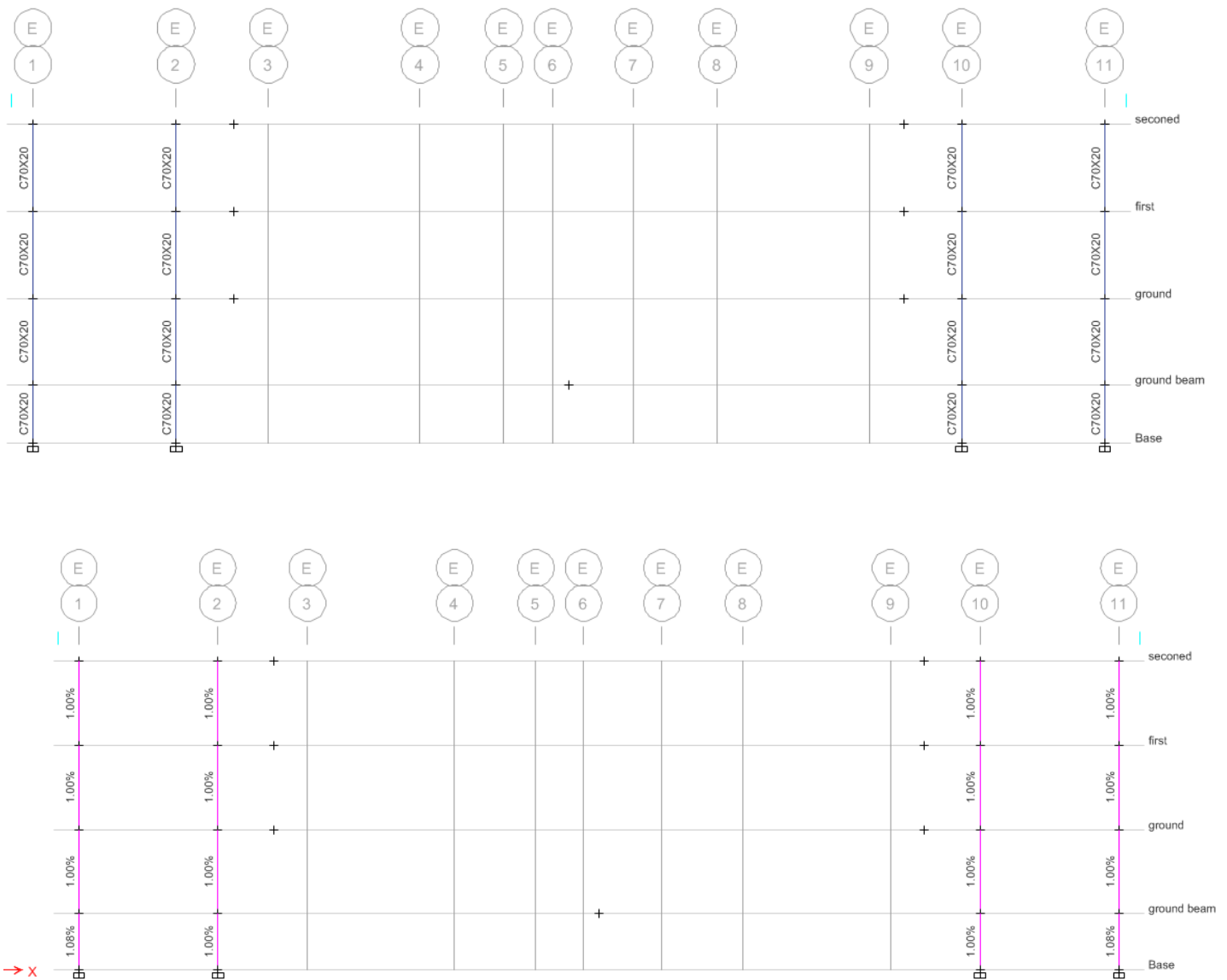


Fig (24): Columns on grid E dimensions (cmXcm)& Column P-M-M interaction Ratio



Fig (25): Columns on grid F dimensions (cmXcm)& Column P-M-M interaction Ratio

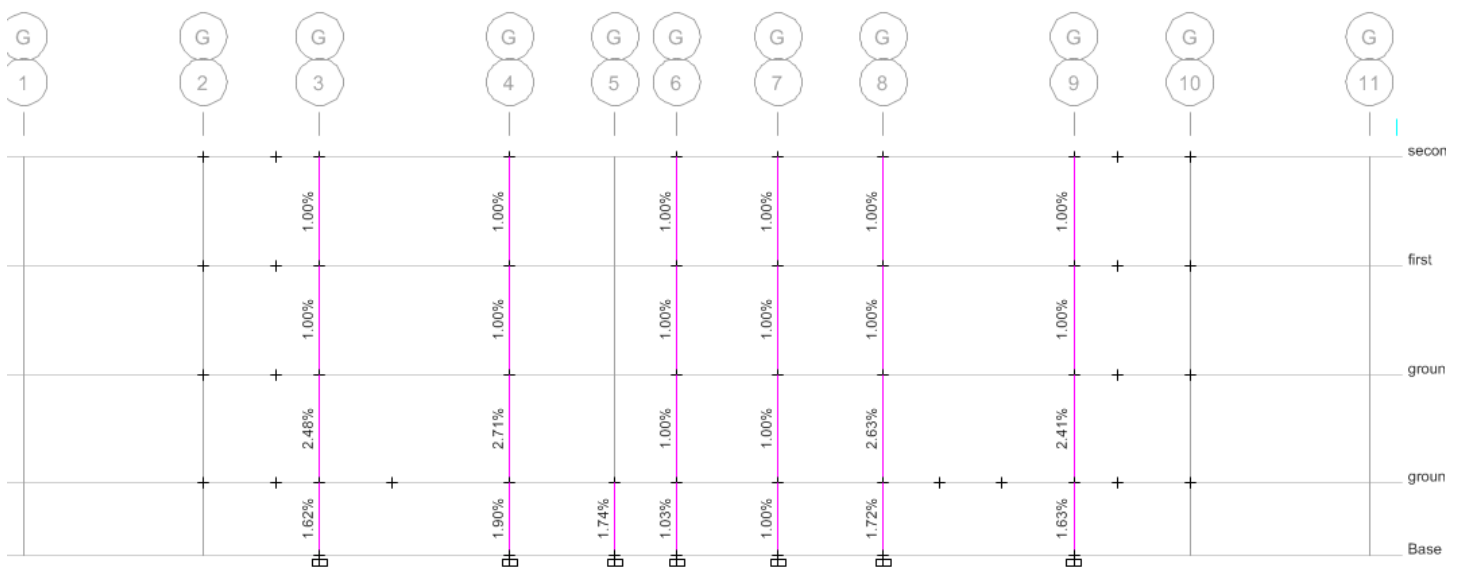
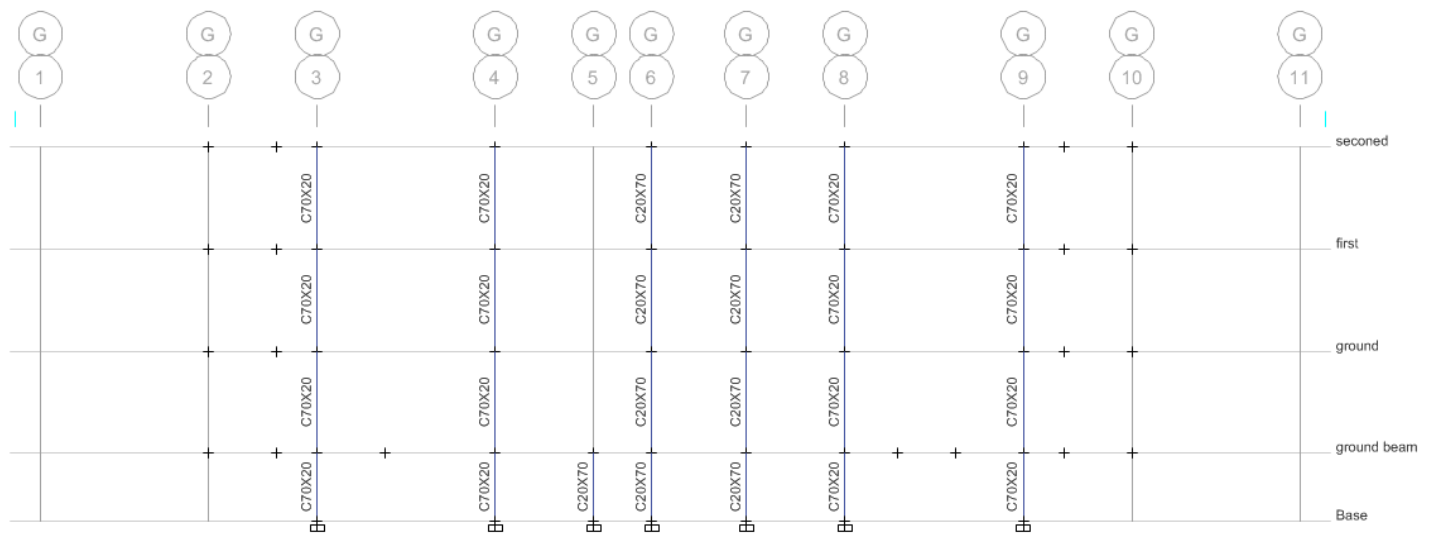


Fig (26): Columns on grid G dimensions (cmXcm)& Column P-M-M interaction Ratio

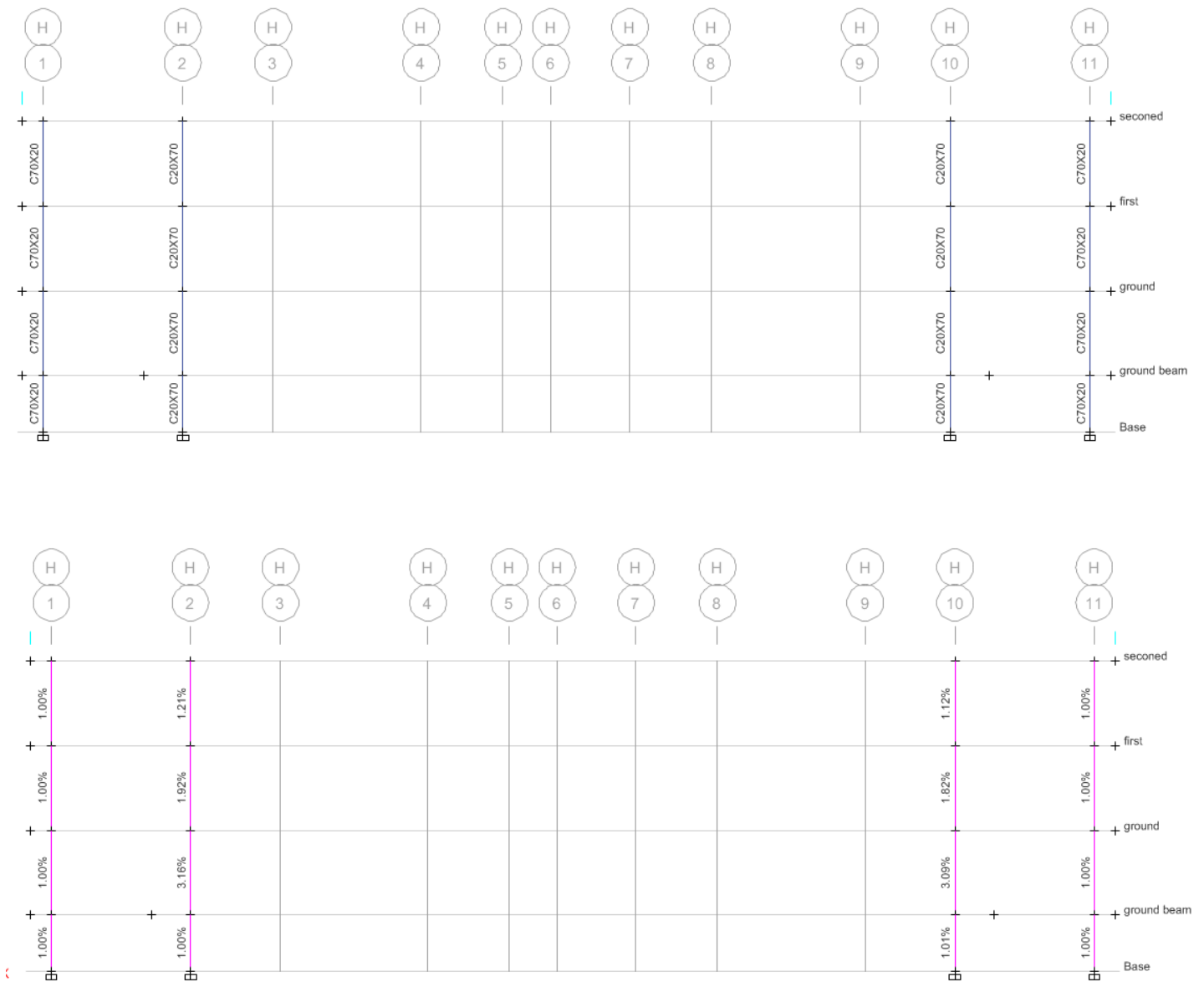


Fig (27): Columns on grid H dimensions (cmXcm)& Column P-M-M interaction Ratio

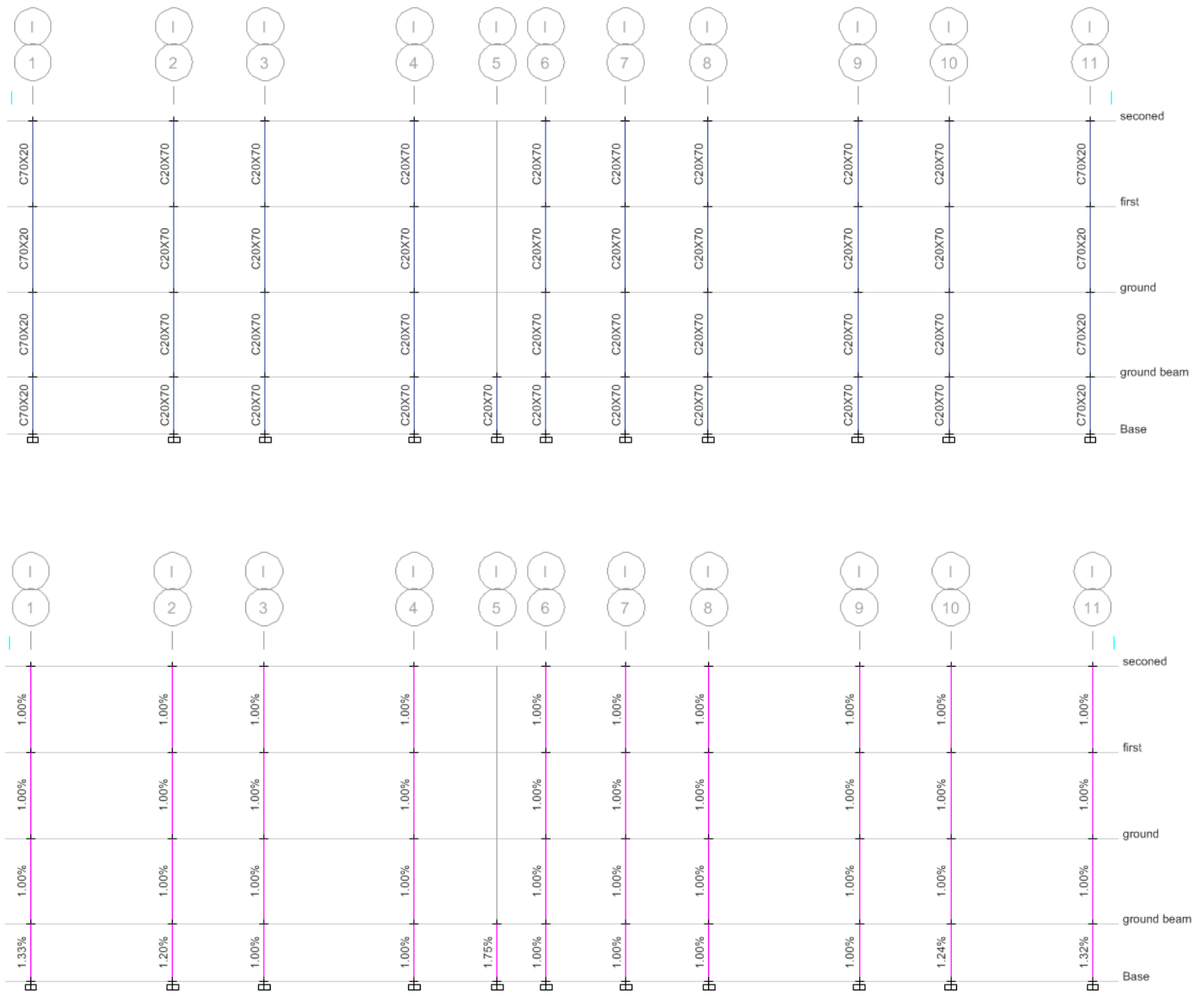


Fig (28): Columns on grid I dimensions (cmXcm)& Column P-M-M interaction Ratio

6 Ground Works:

Introduction

For ground works the results from the Safe ver 16.0.0 model have been used to check the foundation according to provided soil investigation report (Bearing Capacity 40 t/m²), The capacity of the foundation elements is compared to the resulting loads and the foundation is designed accordingly.

6.1 foundation

Foundations are isolated with thickness = 50cm

(Fig 31), Please refer to the structural plans and sections for locations.

Design for flexure under combination of factored loads, where figures (33 & 34) are clarifying bending moments in the foundations.

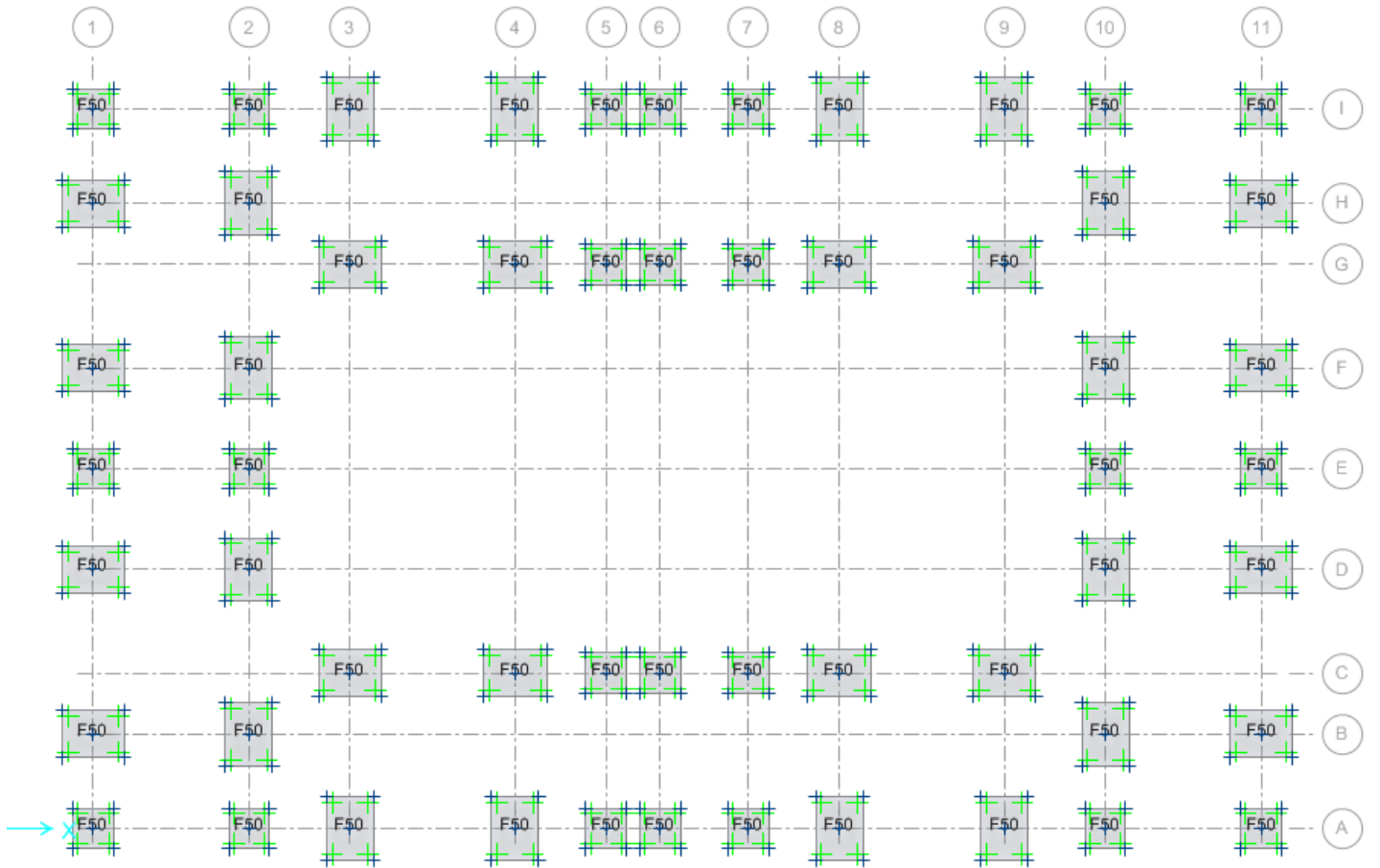


Fig (31): Foundations Thicknesses (cm)

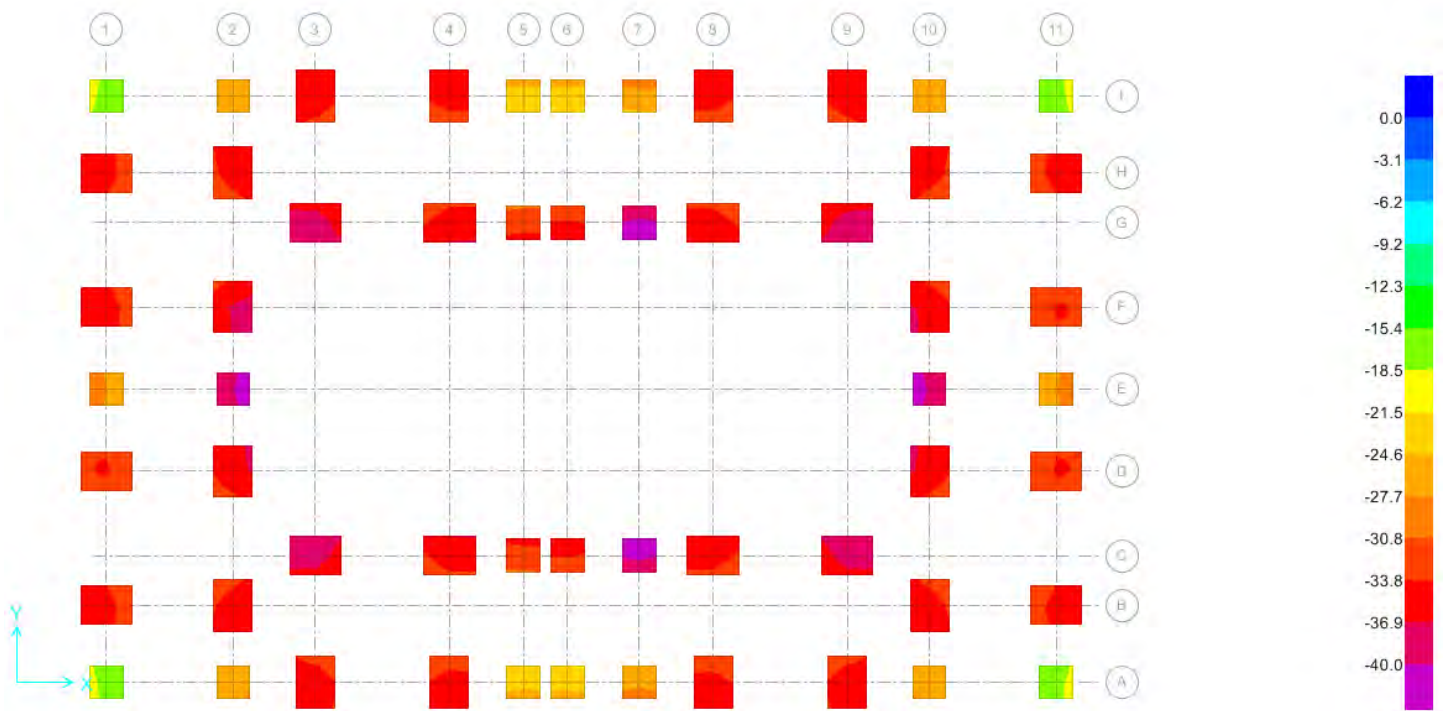


Fig (32): FOUNDATION Soil Pressure (t/m^2)

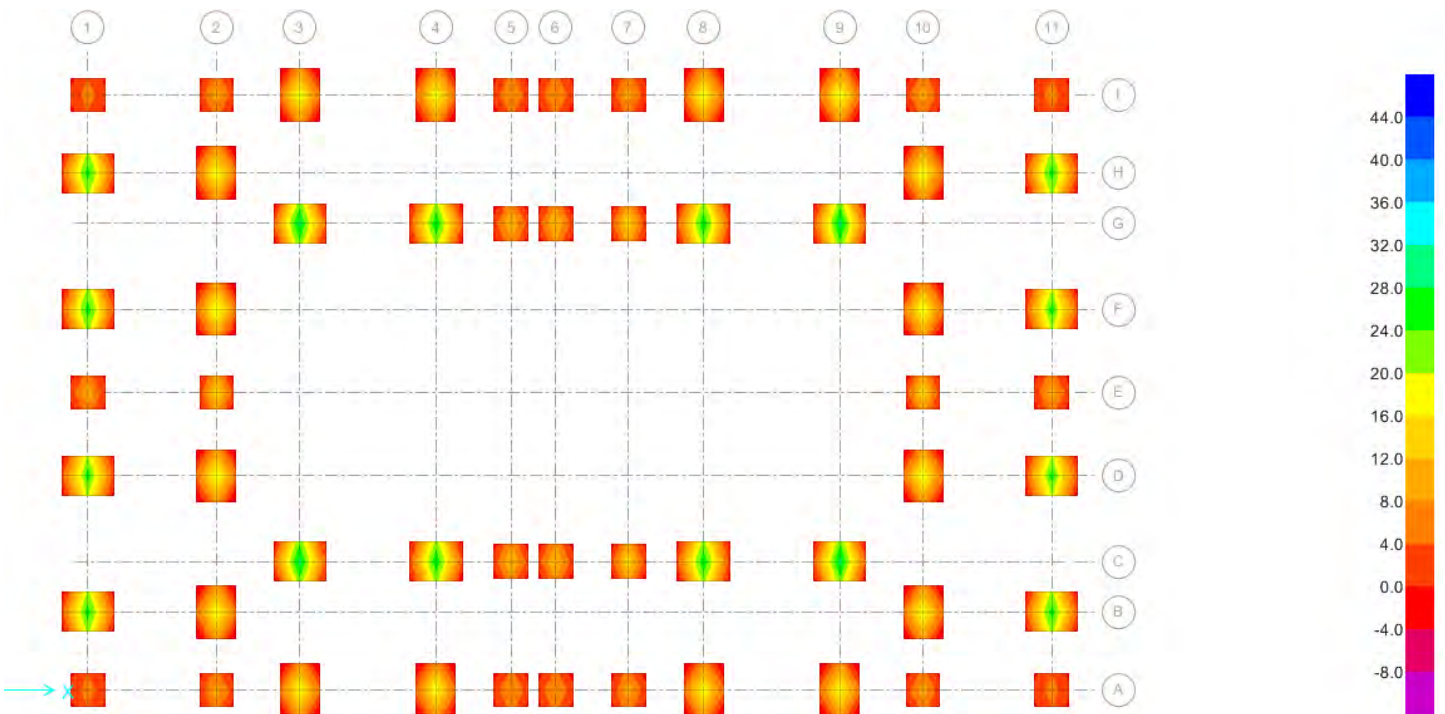


Fig (33): FOUNDATION Moment M_{11} (t.m/m):

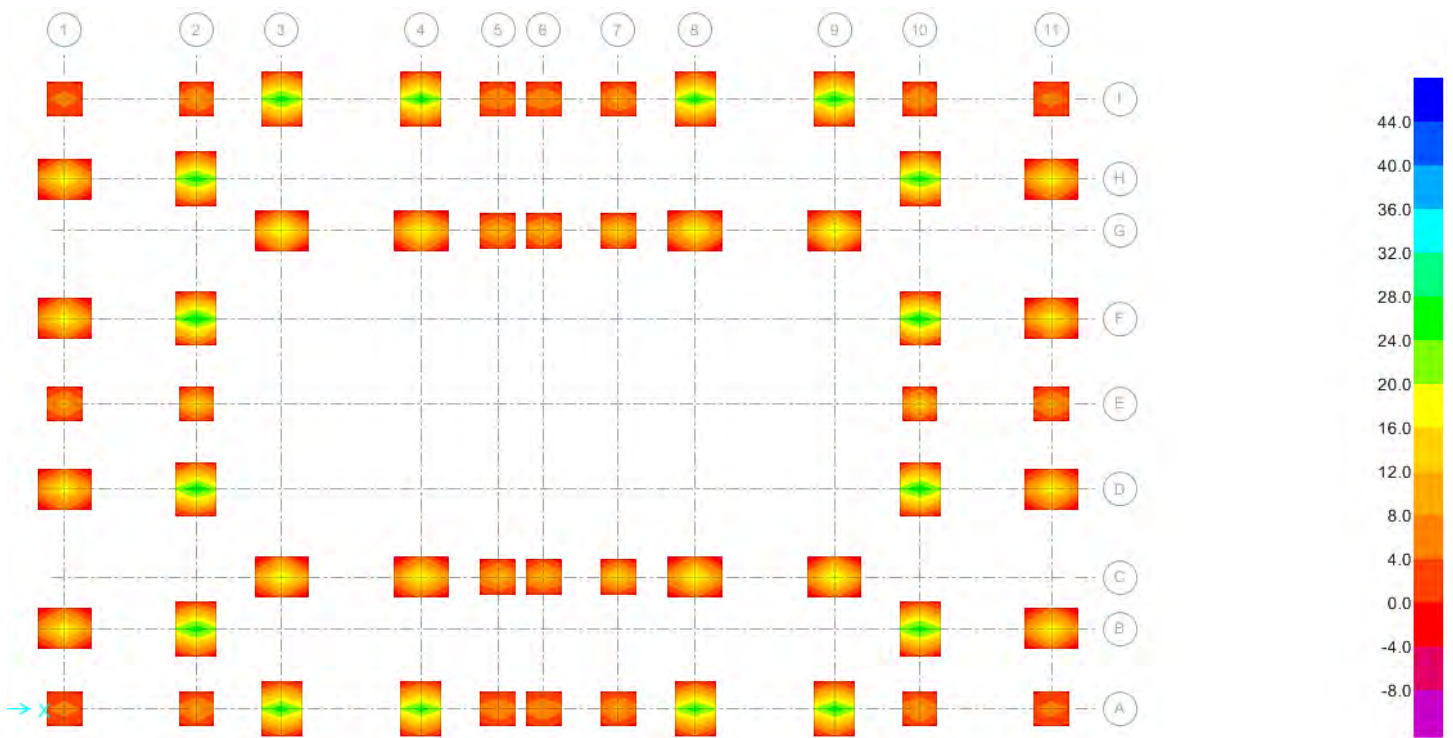


Fig (34): FOUNDATION Moment M22 (t.m/m):

