

Structural Design Criteria & Specifications & Construction Requirements

GENERAL NOTES

1. CODE OF PRACTICE

Detailing and workmanship shall be according to ACI 318-19, and the technical specifications provided. Approved equivalent international codes shall be accepted. Design for concrete done according to ACI 318-19 Uniform Building Code UBC97 For the definition of lateral Seismic Loading.

2. DIMENSIONS

- a) Gravity Loads Estimation are in Accordance of Jordan Code.
- b) Distances and Dimensions in (cm) Reinforcement Bar Sizes in (mm) Unless Otherwise Indicated on Drawings Elevations are in Meters.

3. DRAWINGS

1- Structural Drawings shall be read in Conjunction with Architectural.

For required Openings refer to Architectural, Mechanical and Electrical Drawings.

- 2- Contractor shall prepare Working Drawings and Bar Bending Schedules for Reinforcement in a Format agreed with the Engineer.
- 3- Contractor shall supply Detailed Drawings and Calculations for all support and temporary works and propping systems as applicable and all other relevant information subject to the Engineer's approval prior to commencement of construction.

4. REINFORCEMENT

- 1- Reinforcement shall be deformed high strength steel bars of characteristic strength of 420 Mpa complying with ASTM standards or equivalent for diameters 10mm & above.
- 2- Reinforcement shall be deformed steel bars of characteristic strength of 420 MPa complying with ASTM standards or equivalent for diameters 10mm & below.
- 3- Contractor to provide bar bending schedule.
- 4- Where bar length is not specified, longest practicable bar length shall be employed with staggered lap splices. Lap length shall be 30 times bar diameter.

5. REINFORCED CONCRETE

The following two types of reinforced concrete shall be employed:
 B300 - Grade 300 for all reinforced concrete members except architectural fair faced concrete facades. Characteristic Strength as defined by a 150 mm cube at age of 28 days shall be:
 B350 - $30 \times 0.8 = 24$ MPa (Because it is Cube Specimen)

6. PLAIN CONCRETE

The following type of plain concrete shall be employed:
 B200 - Grade 200 concrete of characteristic cube strength equal to 20 MPa, minimum cement content of 200 kilograms per cubic meter, and a maximum water cement ratio of 0.70 to be used for Blinding Concrete under foundations.

7. AGGREGATES

Maximum Aggregate Size shall be 25 mm.

8. FOUNDATIONS

- Contractor shall adhere strictly to the Geotechnical Report for this project. He shall be responsible to determine Strata Characteristics at the Appropriate Levels.
- Allowable Bearing capacity = 450 KN/m².

9. BACK Fill

All Back Fill Material shall conform to Specifications and shall be properly tested. No Back Filling is permitted around

10. DESIGN LOADING

Basement Walls prior to pouring of Framing Slabs.
 Design Live Loads are as follows:
 Live Load = 2.0 KN/m²

GENERAL NOTES

1. NOTATION

- T.B=TOP BARS
 B.B=BOTTOM BARS
 S= SPACING.
 ϕ = DIAMETER FOR STEEL BARS.
 @ OR / = INDICATES THAT THE FOLLOWING NUMBER IS THE SPACING BETWEEN BARS.

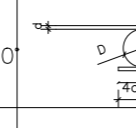
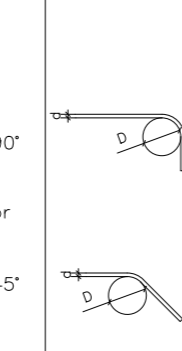
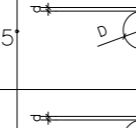
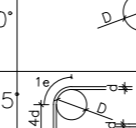

2. COVER

Clear Concrete cover to Reinforcement shall be :
 75mm for Concrete Below Grade for Non-salty Soils
 20mm for Ribs 40mm for Beams 40mm for Columns
 40mm for Walls 20mm for Slabs and Ribs
 Reinforcing Bars of Girder shall be anchored over the center line of Column,
 And Reinforcing Bars of Sub-beam shall be anchored over the Center line of Girder.

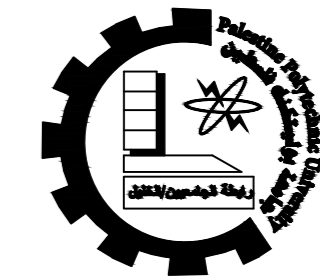
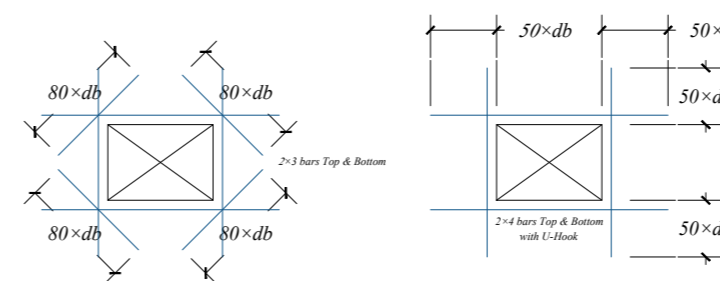
3. Min. Bar Spacing

- Unless otherwise shown below, Sub-beam and Cantilever Beam shall be conformed
 Bar spacing "a" shall be not less than the greatest in the following three cases:
 1) 25 mm 2) 1.5 d
 3) 1.25 times the max size of coarse aggregate.

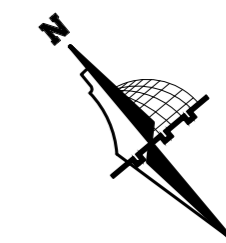
Standard Hook Details and Bar Bends

End position				Intermediate position			
Hook details	Secondary Steel	Main Steel	Application	Hook details	Secondary Steel	Main Steel	Application
180° 	D	4d	5d	90° or 45° 	D	3d and over	Hoop and stirrup
135° 	1e	12d	14d		D	4d and over	16mm dia. bar and smaller
90° 	D	4d	--	D	5d and over	6d	Main bars less than 30mm in column and girder
135° 90° 	D	4d	--	D	8d	8d	30mm dia bar and over in column and girder
	1e	8d	--				
	1'e	10d	--				Spacer bar

Typical Reinforcement Detail Around Openings In Slabs



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

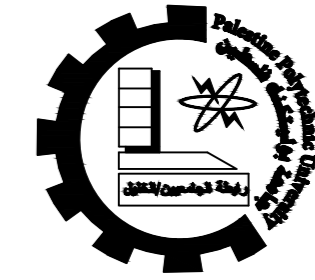
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 General notes

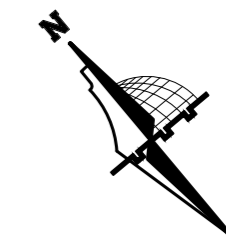
SCALE 1/100

DRAW. NO. S00

2024



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design of a Residential complex"

Supervisor
Dr. Belal Almasre

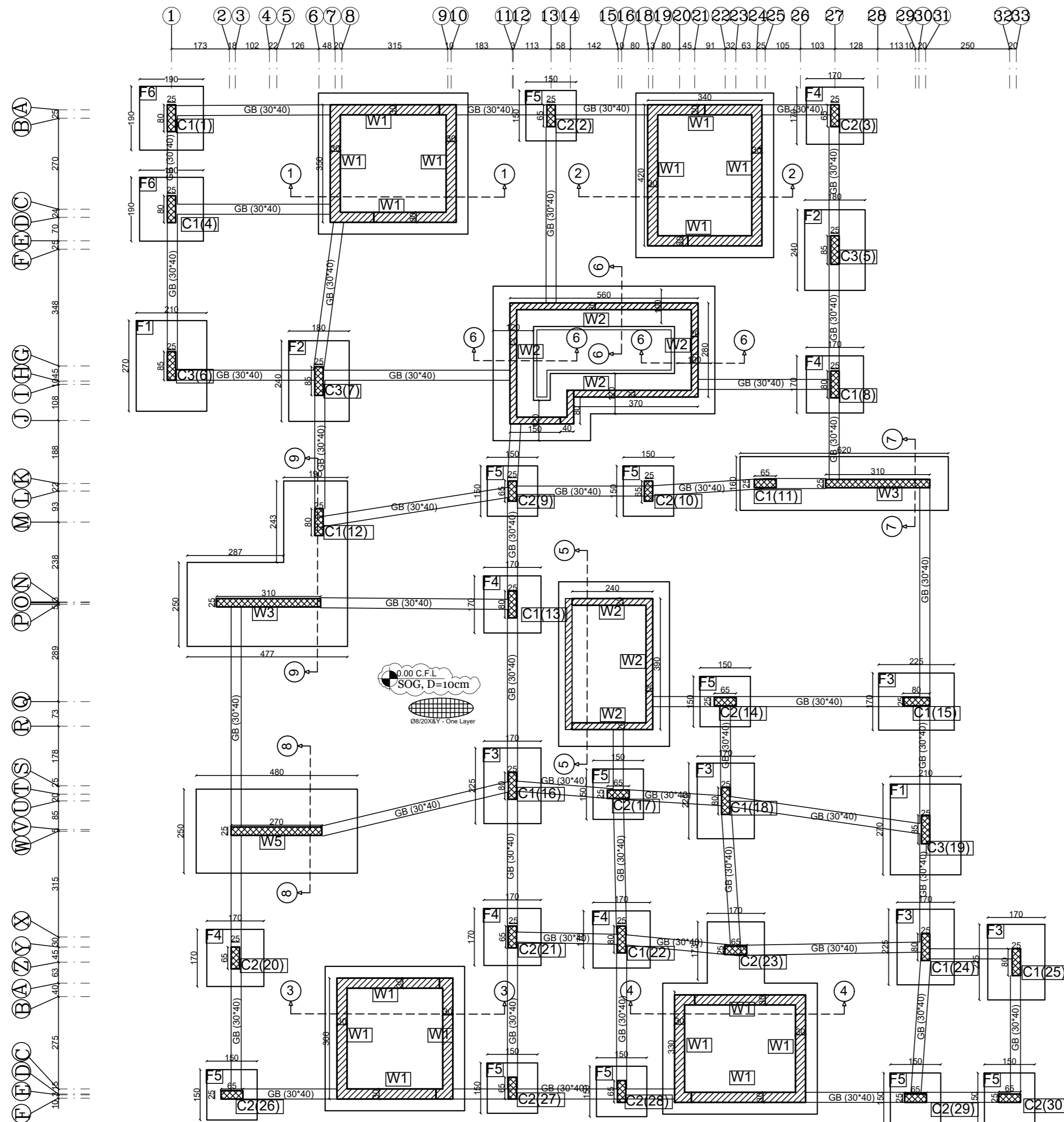
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

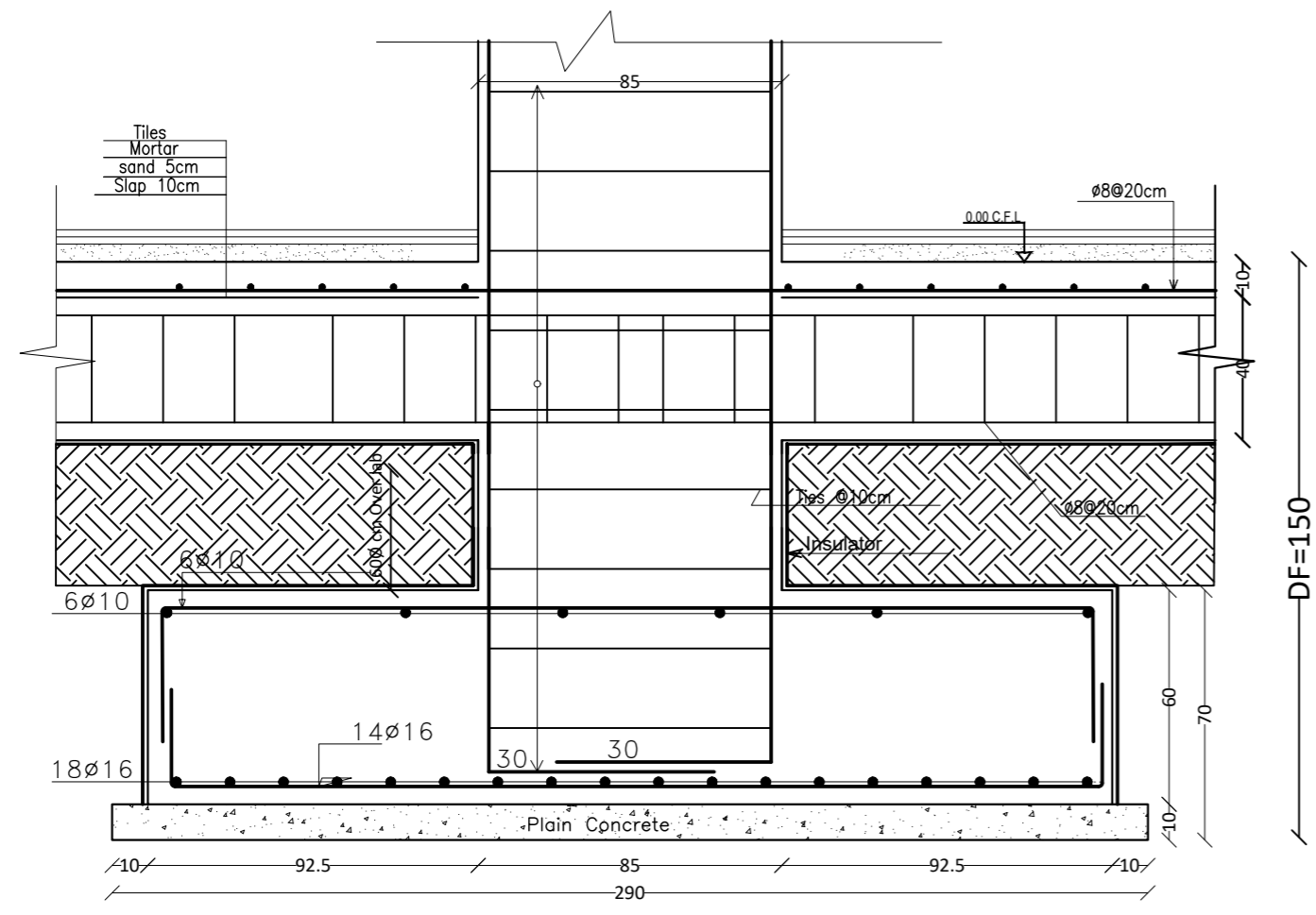
Drawing Title
Columns & Walls Layout

SCALE 1/100

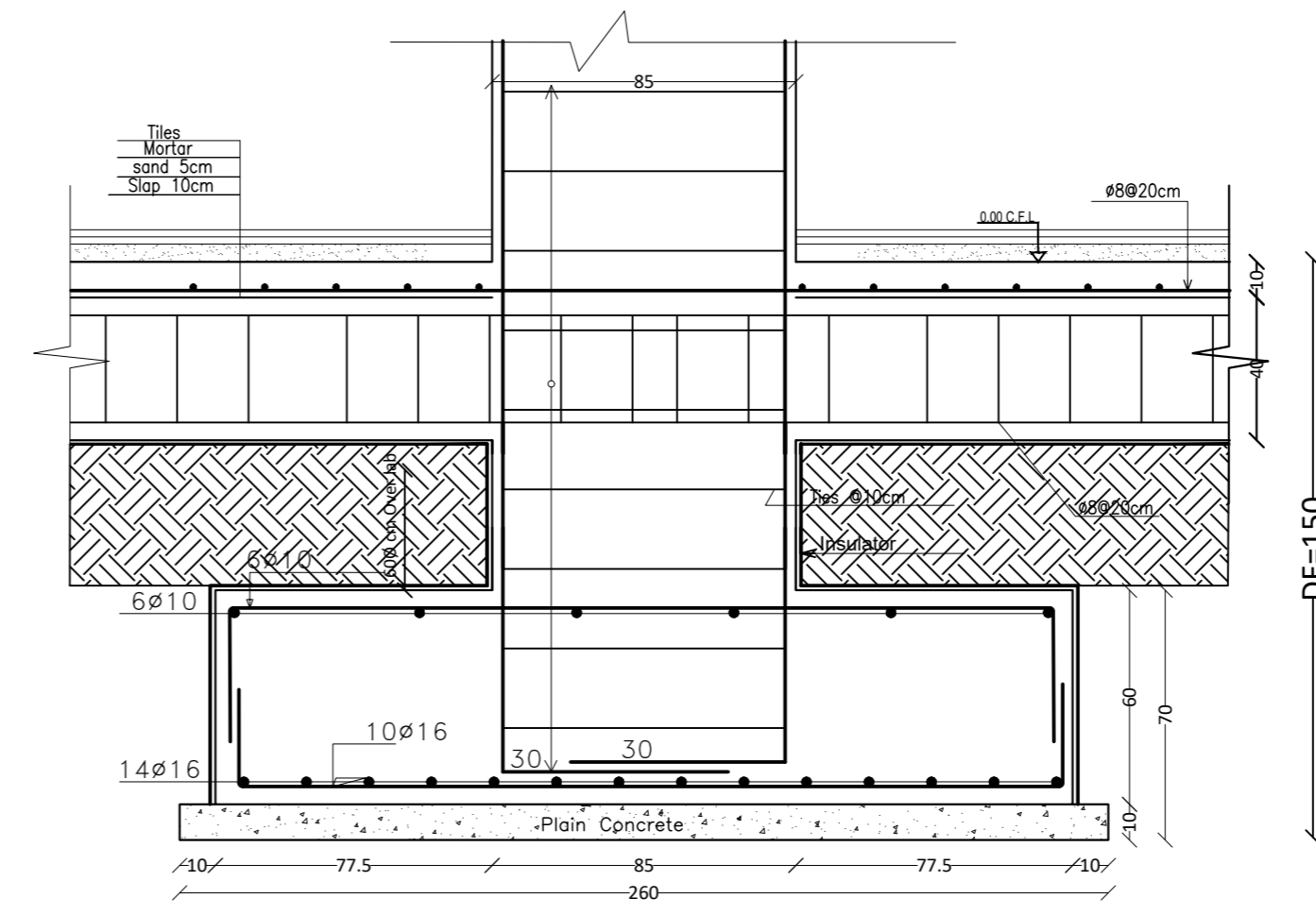
DRAW. NO. S01

2024

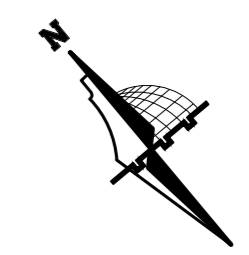
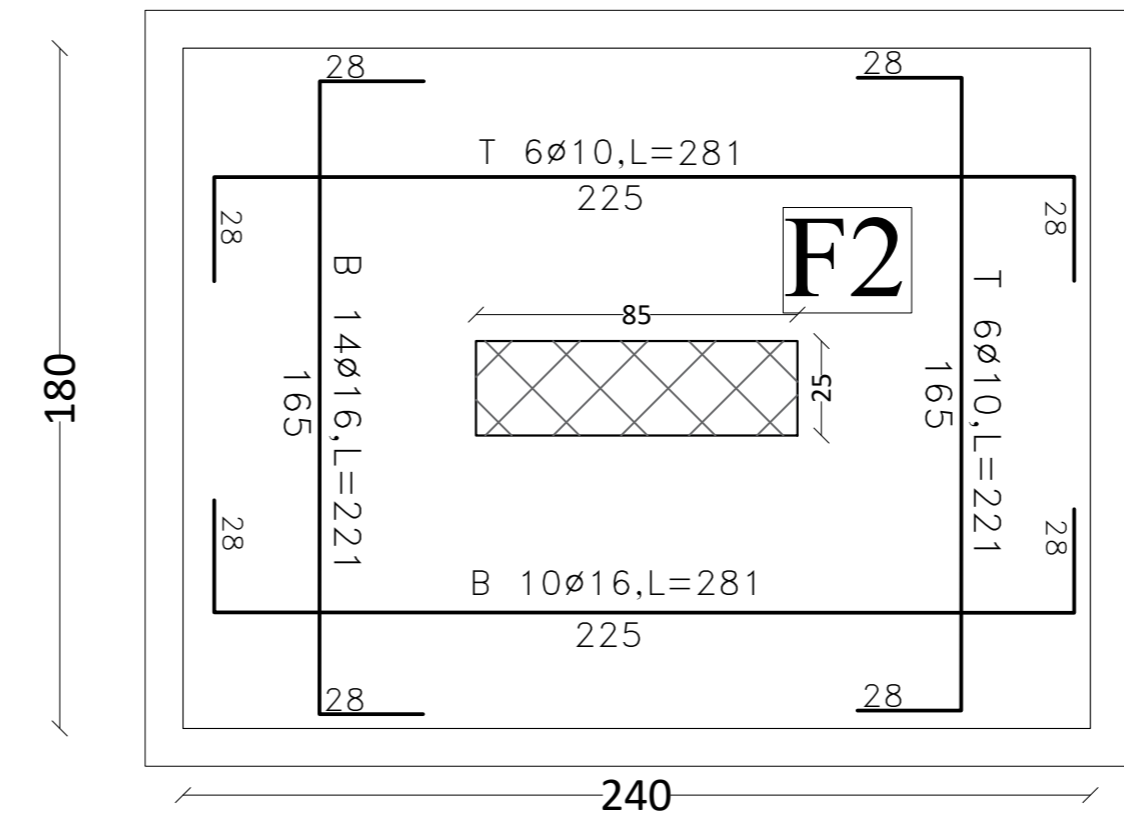
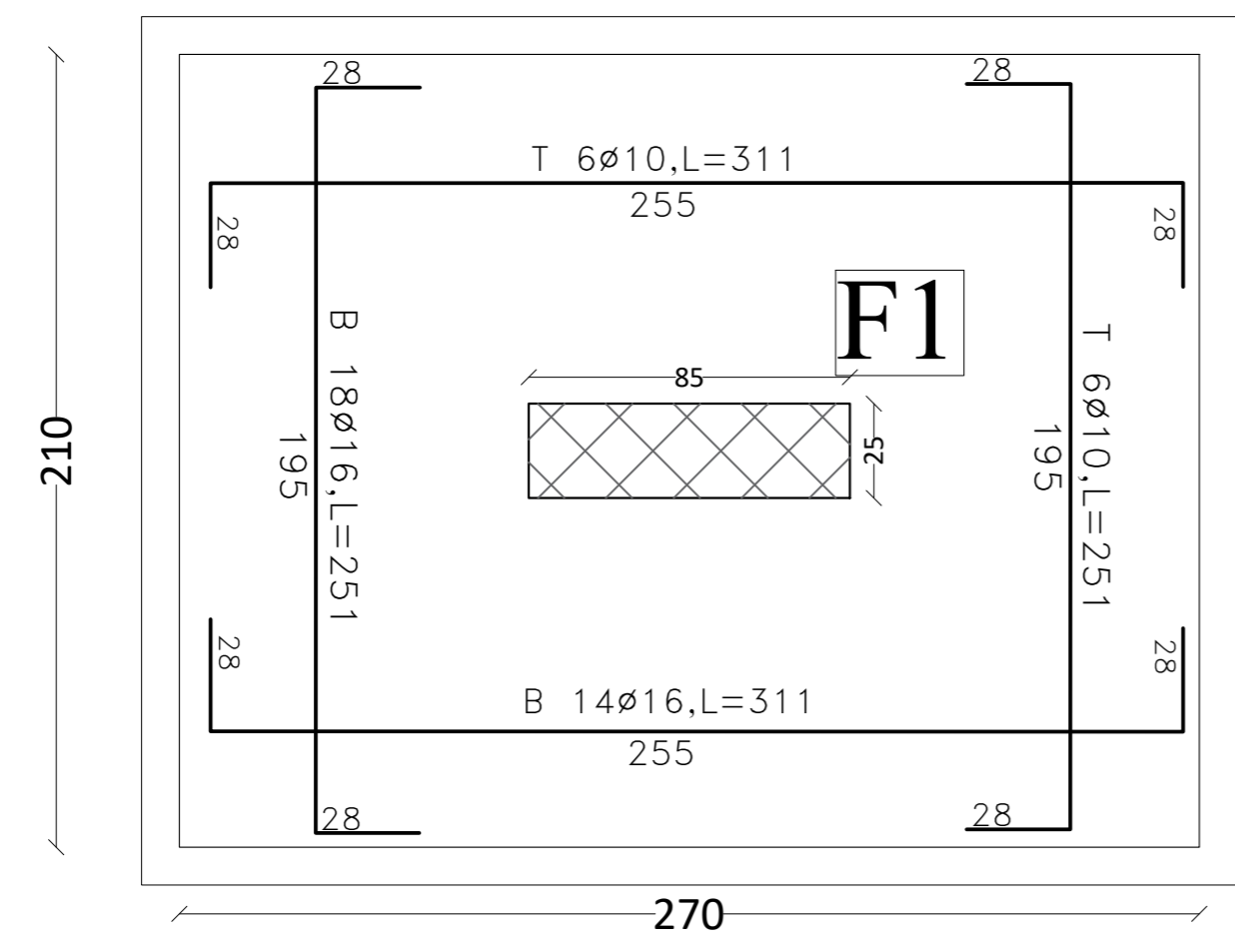




2xF1 Sec.
1:20



2xF2 Sec.
1:20



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

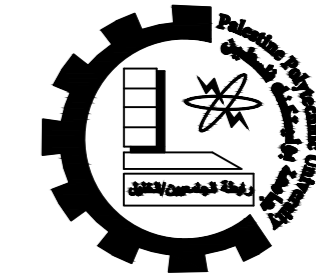
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 Foundation Details

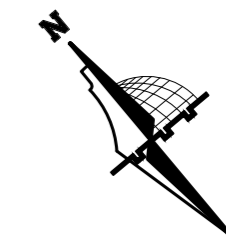
SCALE 1/100

DRAW. NO. S02

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

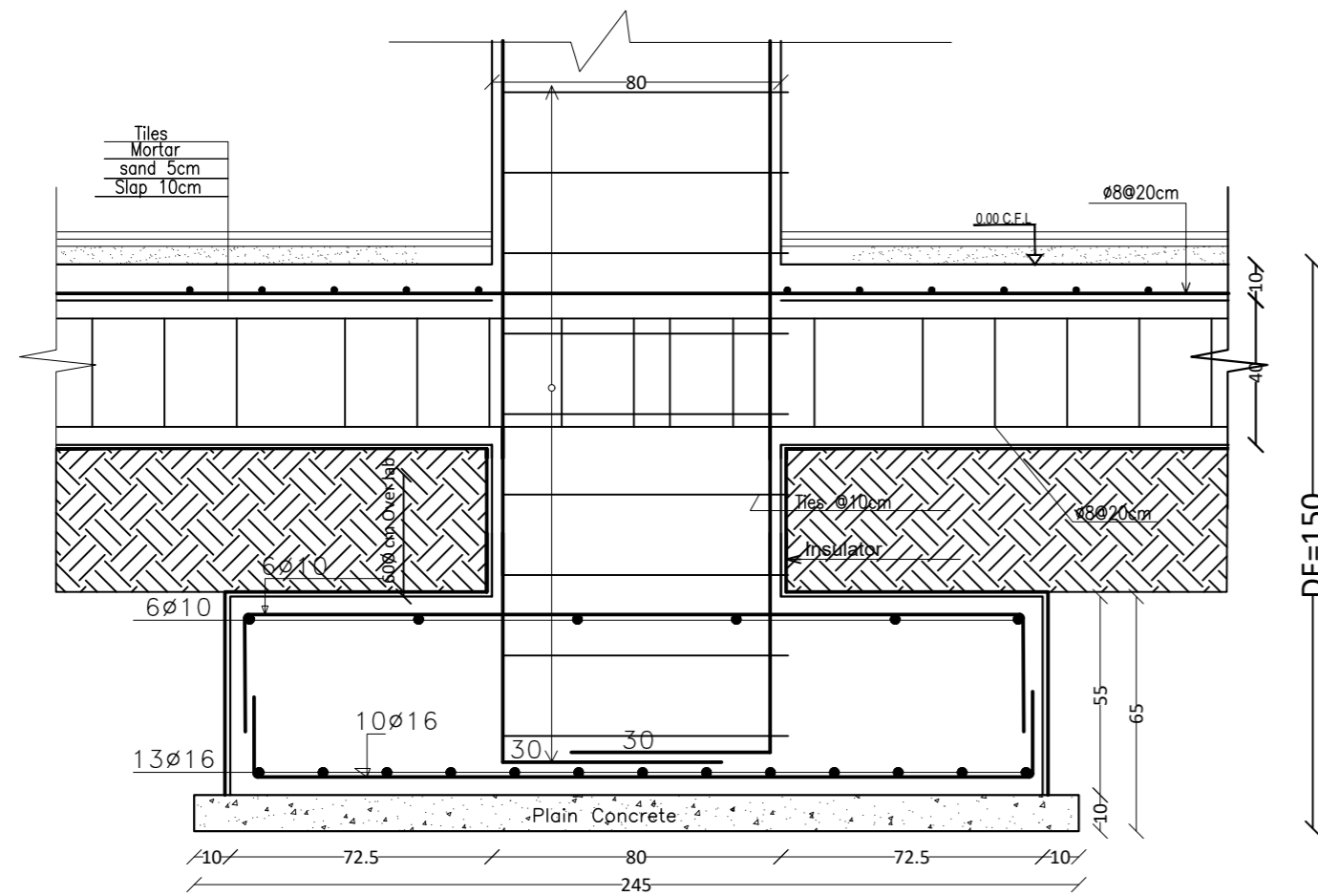
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 Foundation Details

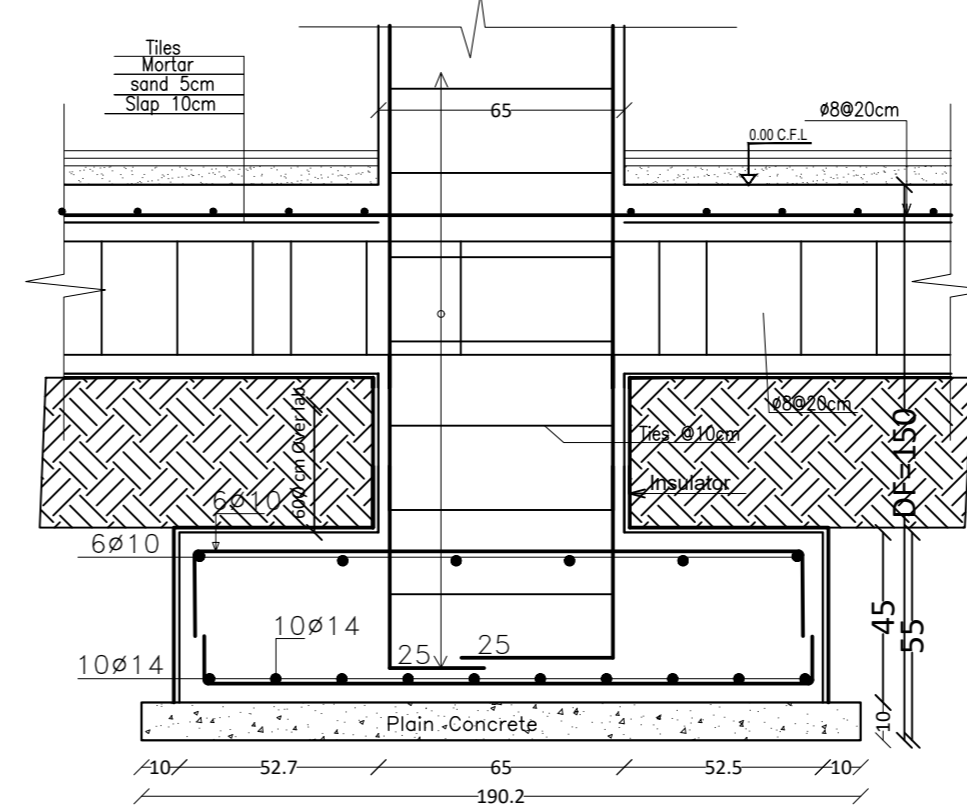
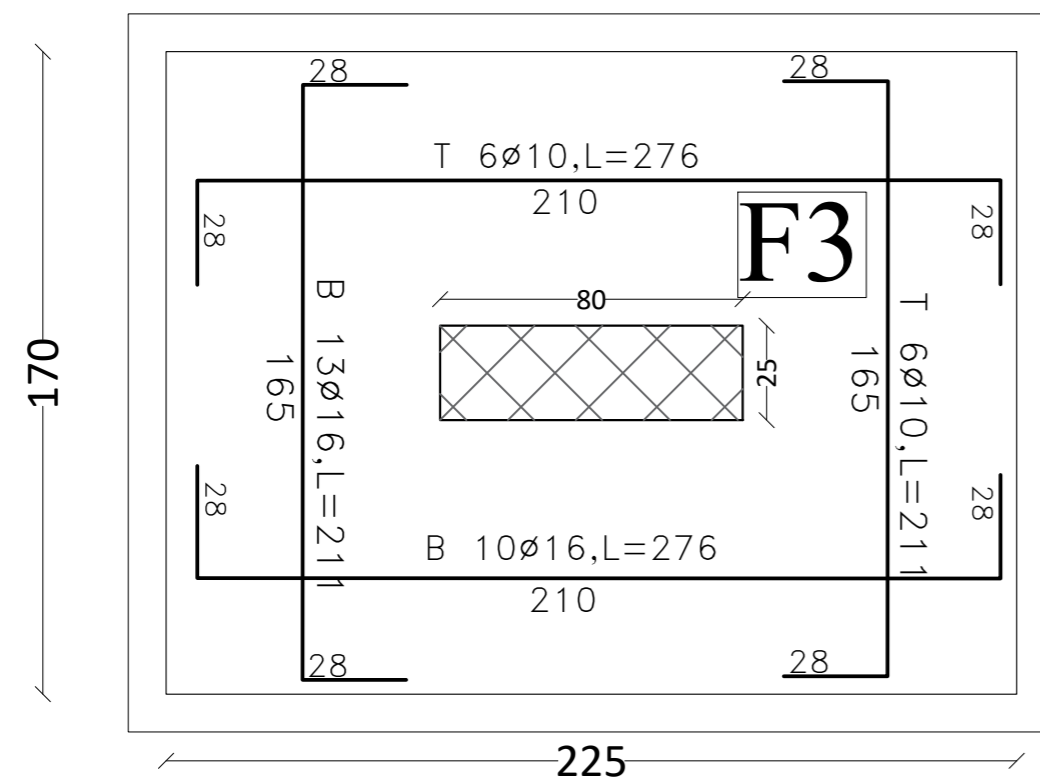
SCALE 1/100

DRAW. NO. S03

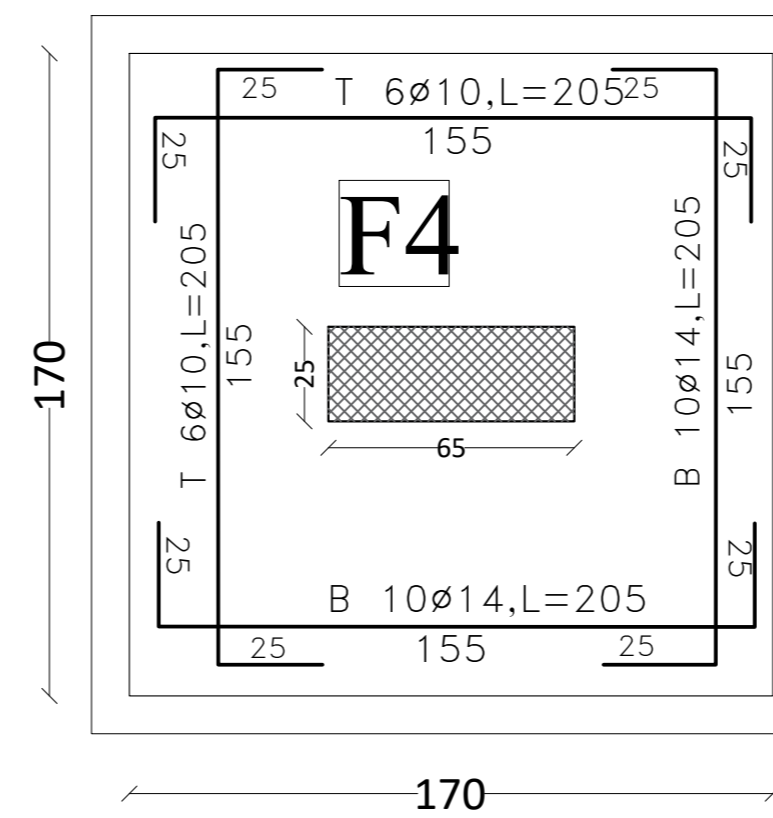
2024

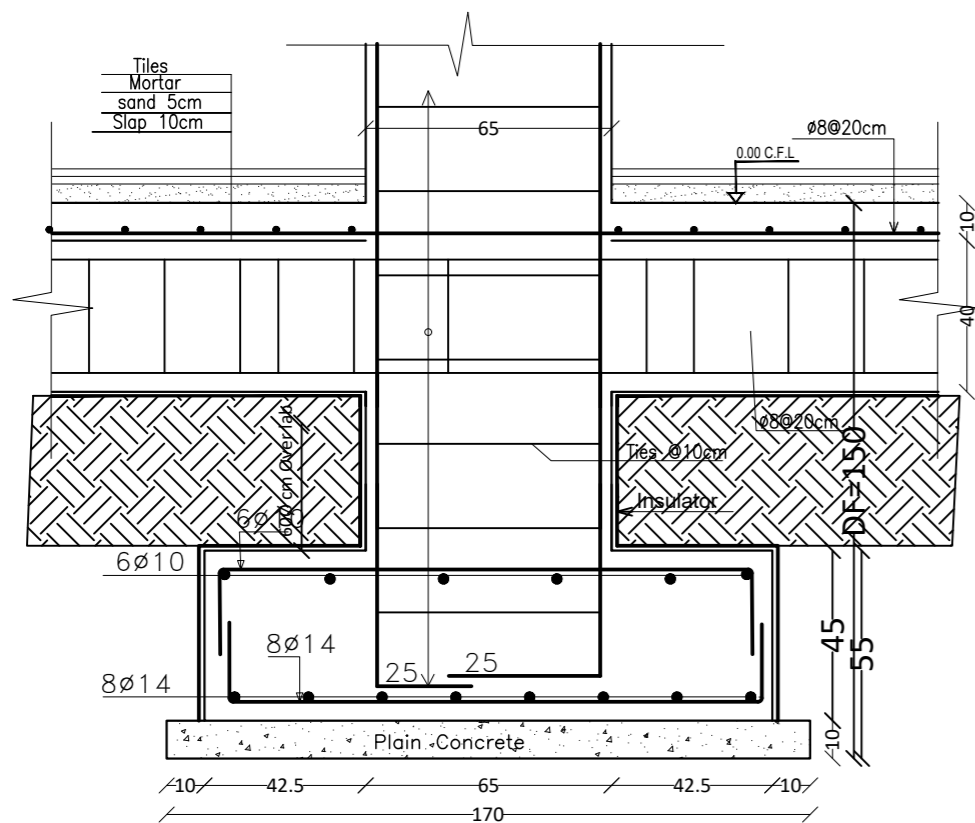


6xF3 Sec.
 1:20

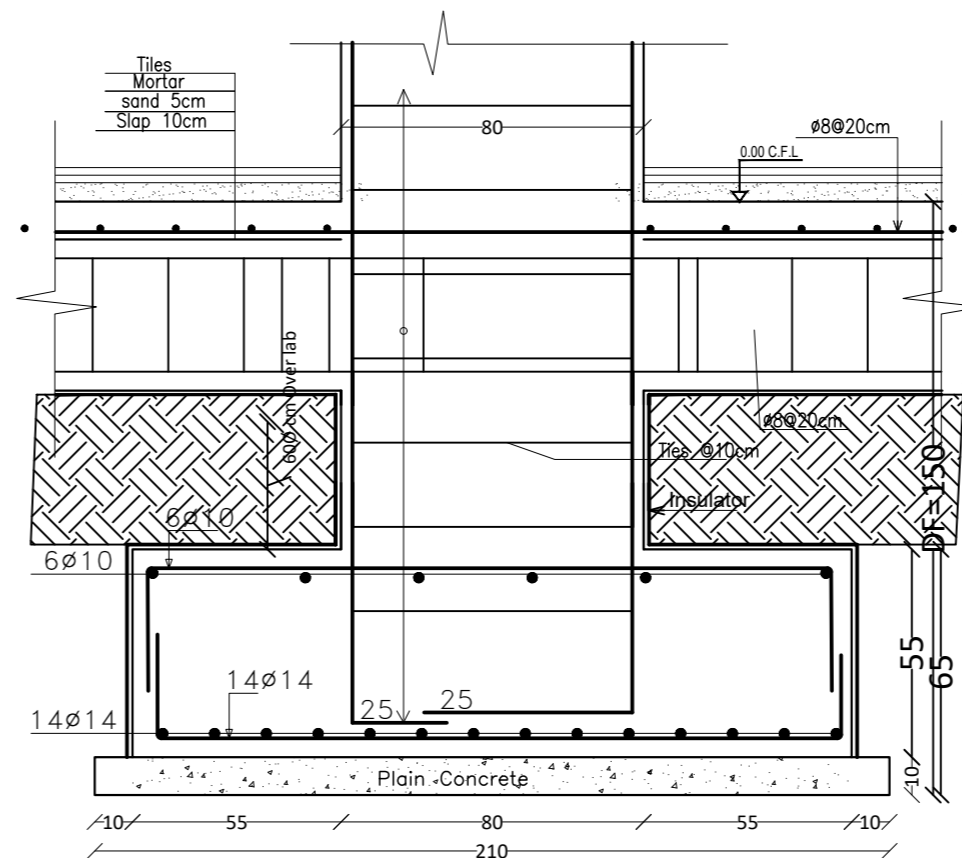
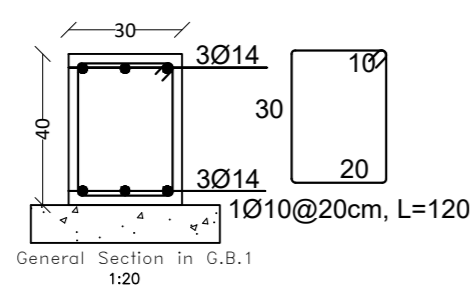
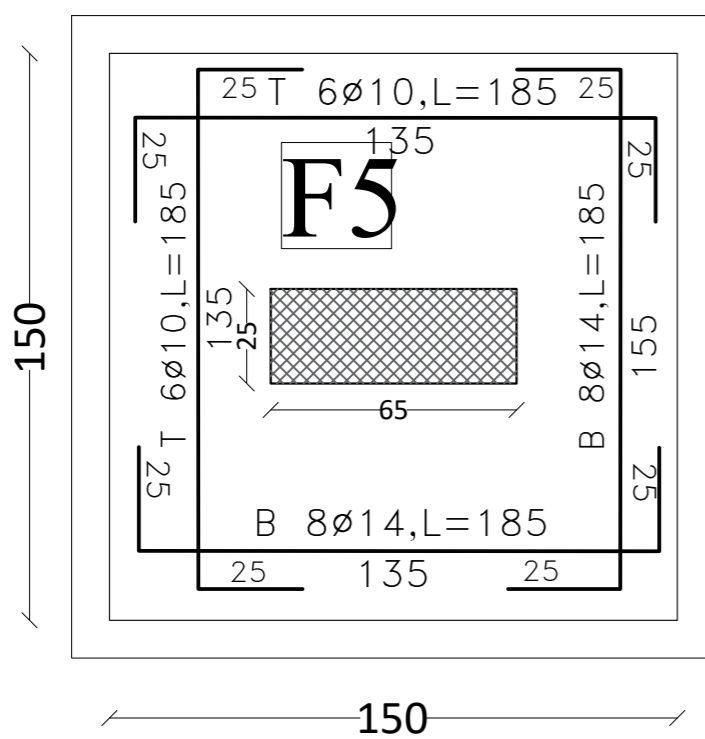


7xF4 Sec.
 1:20

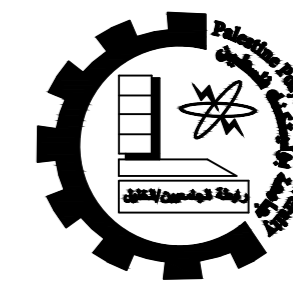
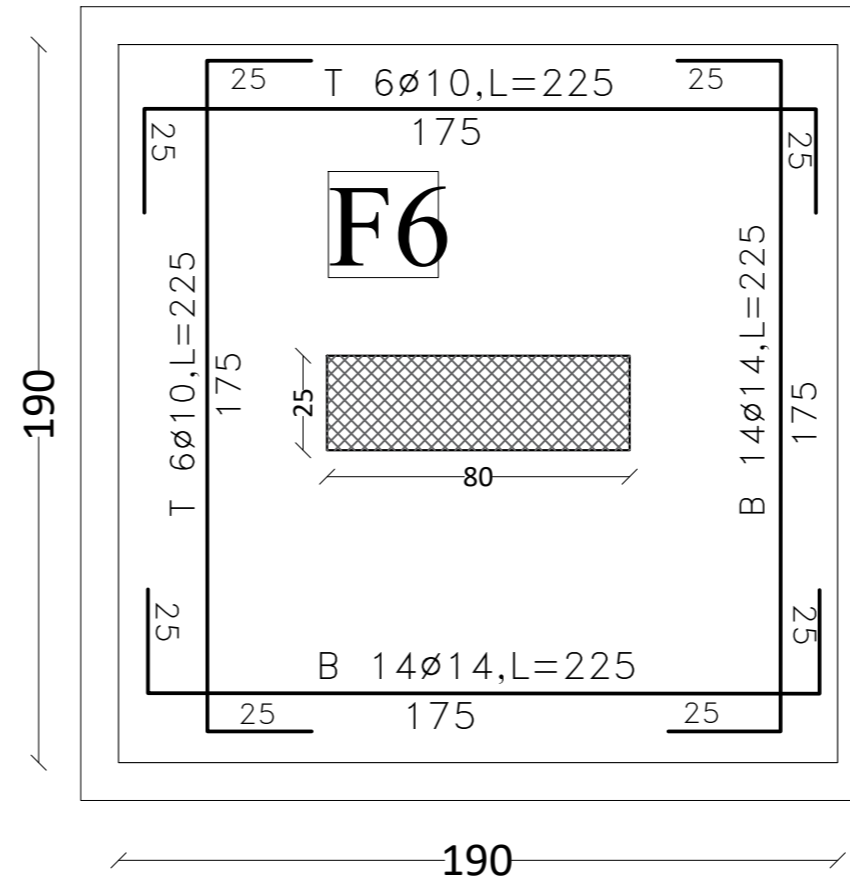




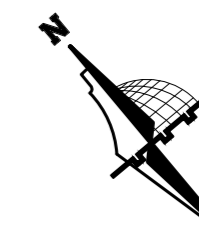
11x5 Sec.
1:20



2x6 Sec.
1:20



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

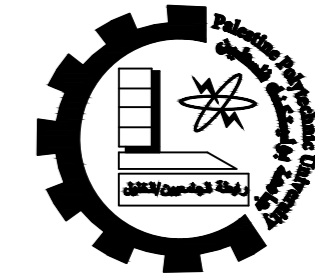
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
Foundation Details

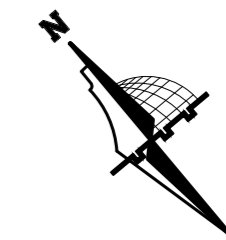
SCALE 1/100

DRAW. NO. S04

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

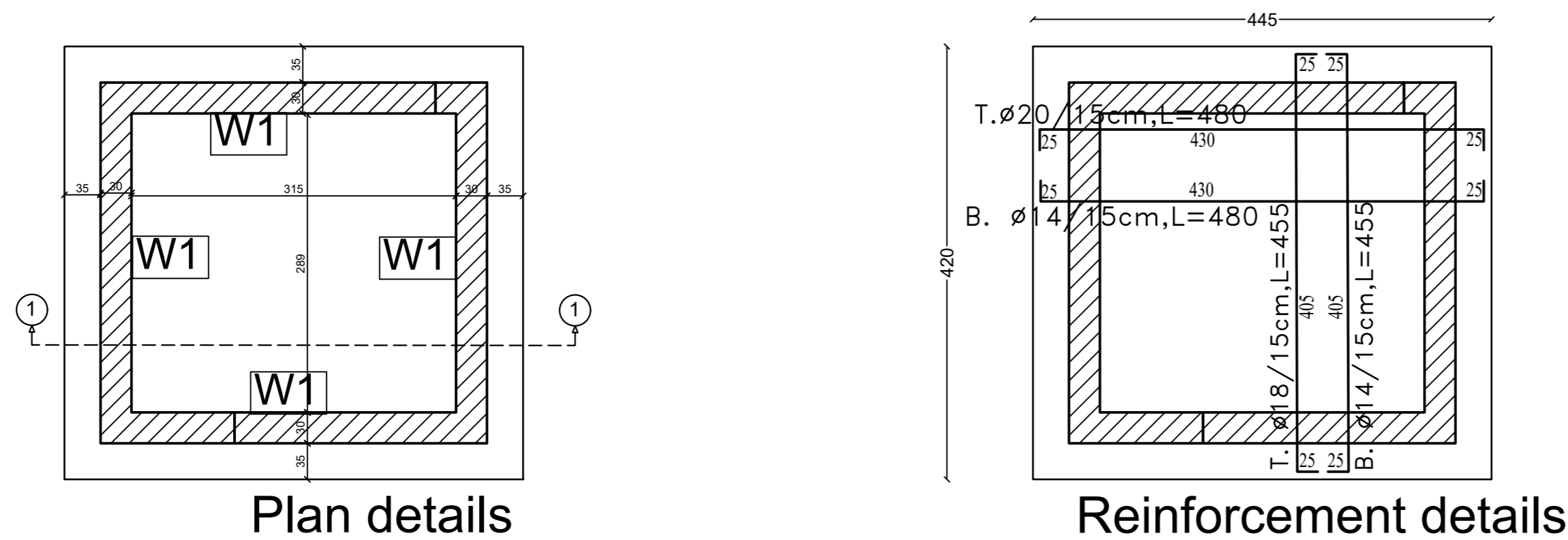
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 Foundation Details

SCALE 1/100

DRAW. NO. S05

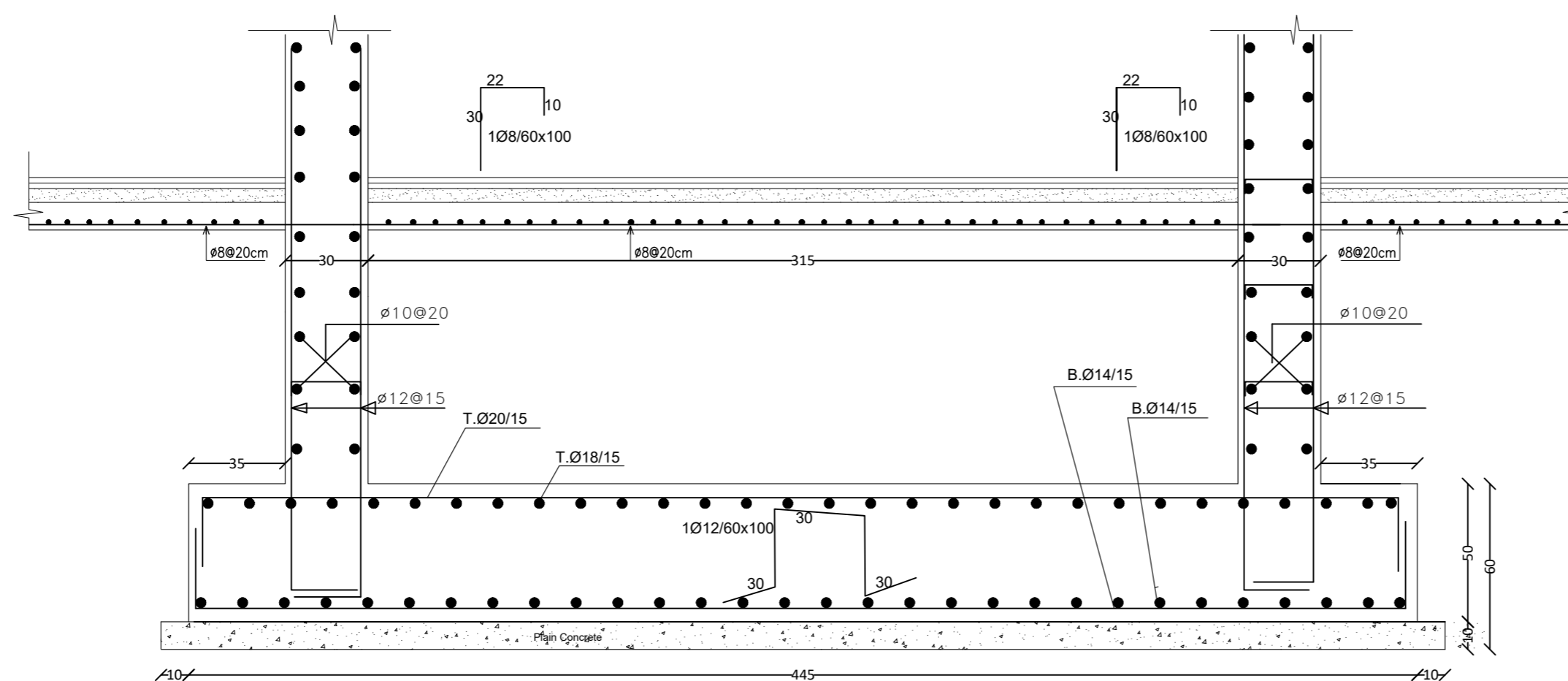
2024



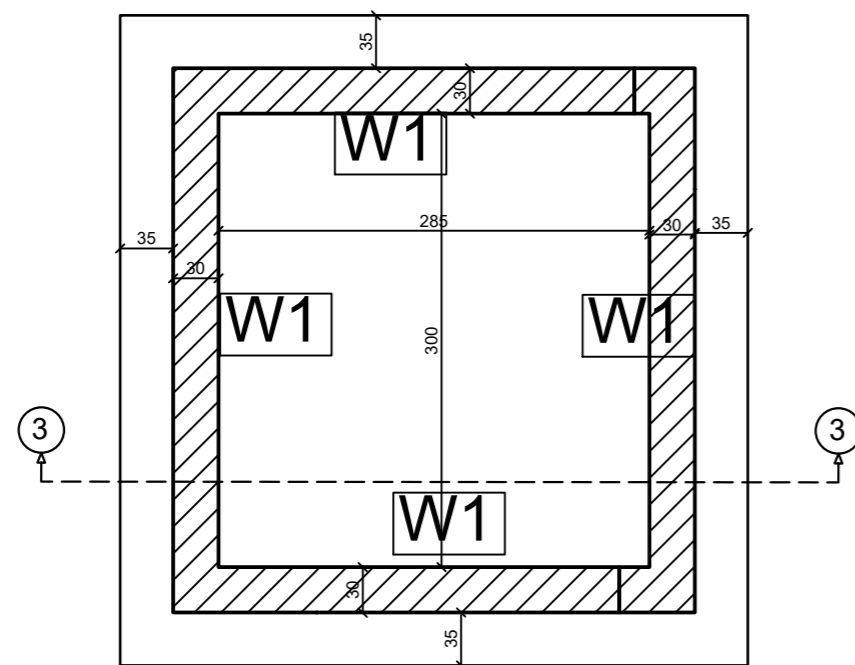
Plan details

Reinforcement details

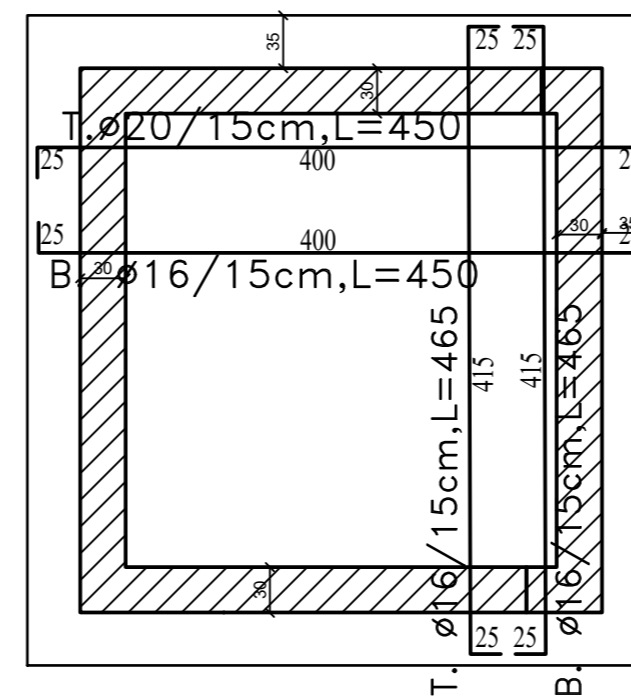
Mat Foundation details
 Scale 1:50



Sec. 1-1
 Scale 1:20

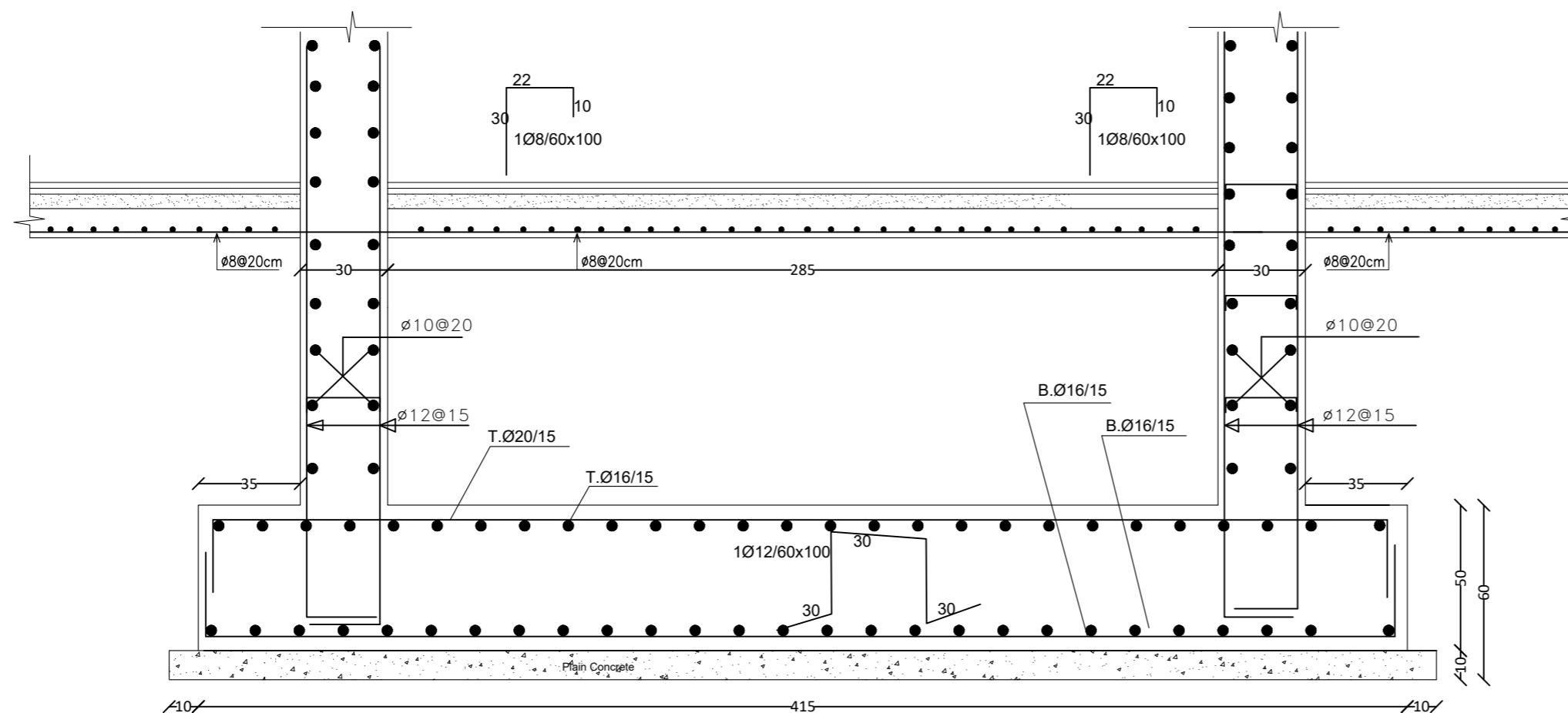


Plan details

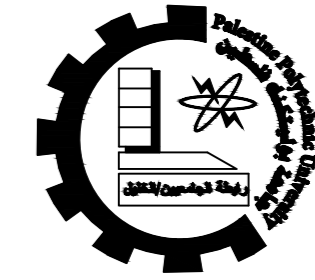


Reinforcement details

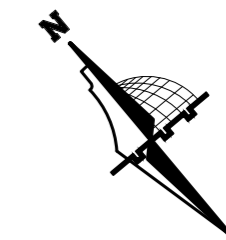
Mat Foundation details
Scale 1:50



Sec. 3-3
Scale 1:20



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

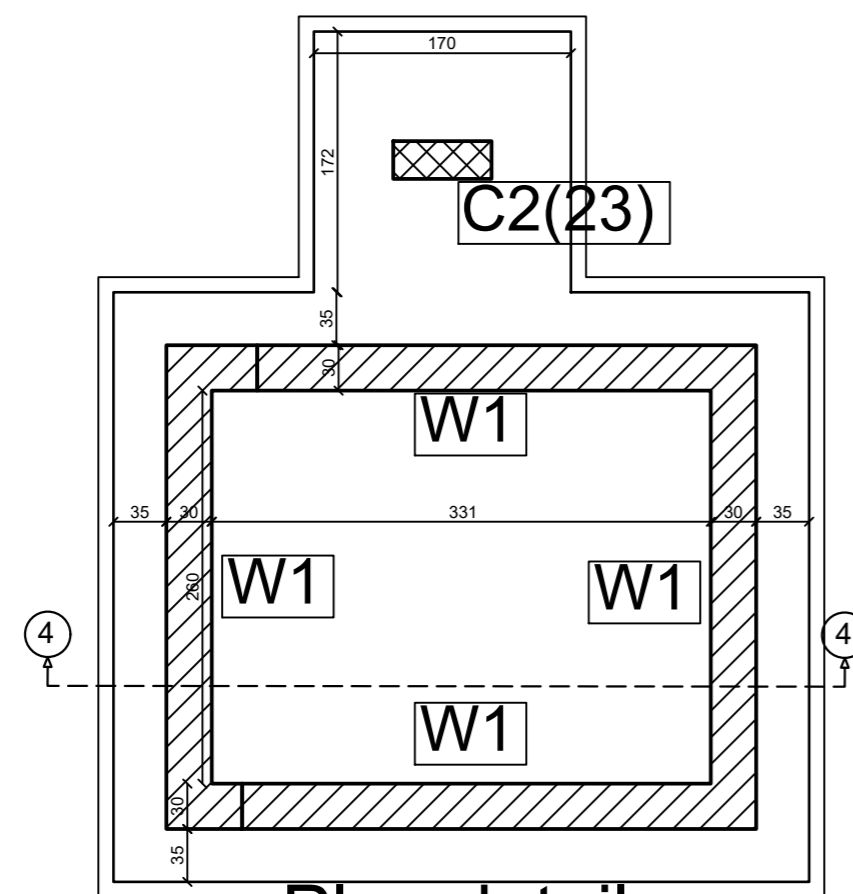
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
Foundation Details

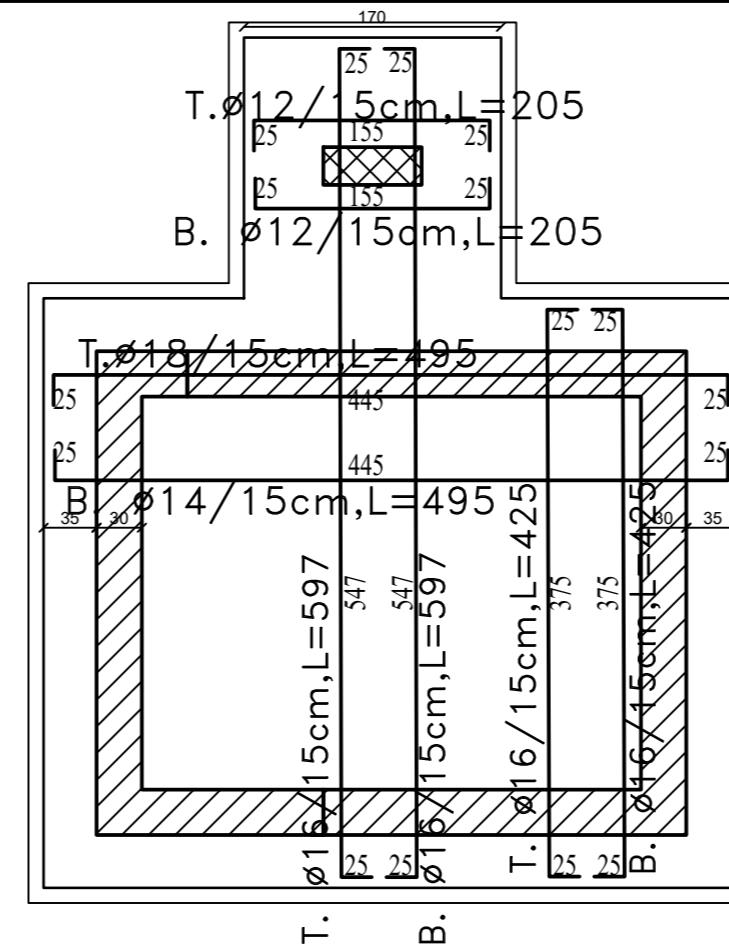
SCALE 1/100

DRAW. NO. S07

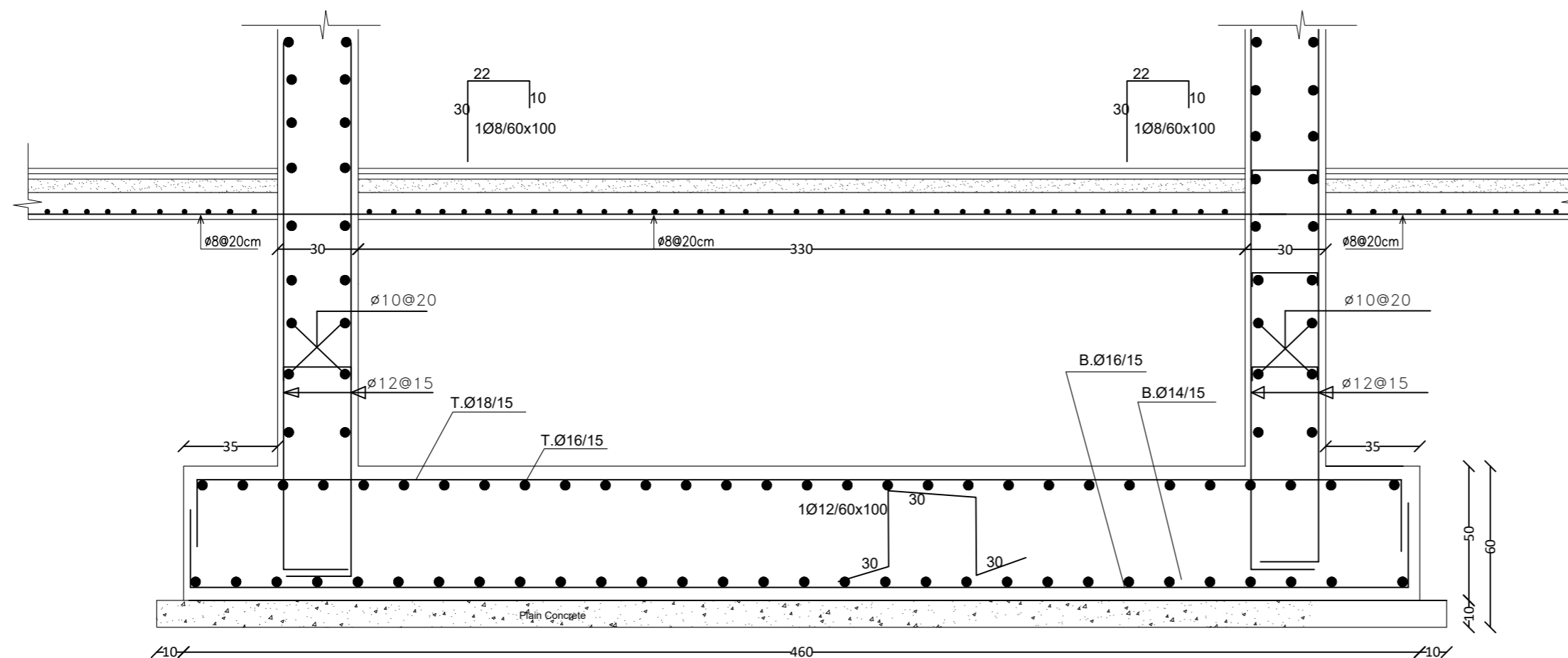
2024



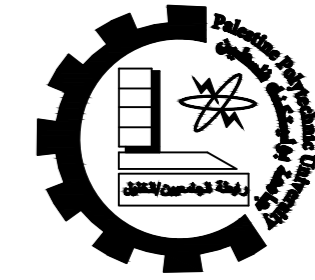
Plan details



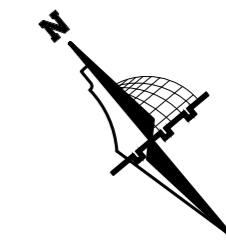
Mat Foundation details Reinforcement details
Scale 1:50



Sec. 4-4
Scale 1:20



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

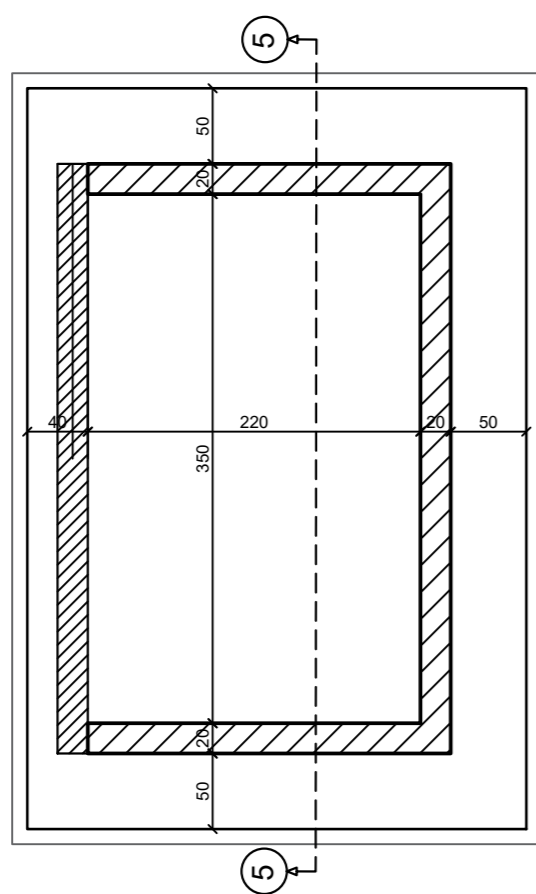
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
Foundation Details

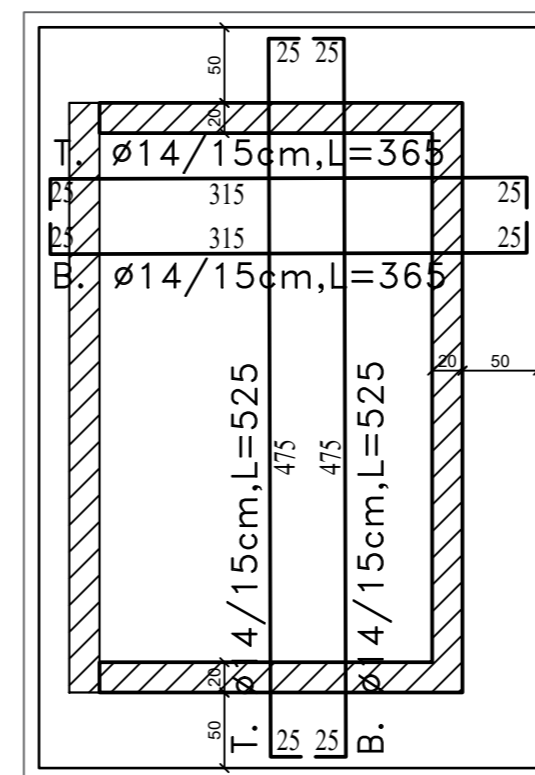
SCALE 1/100

DRAW. NO. S08

2024

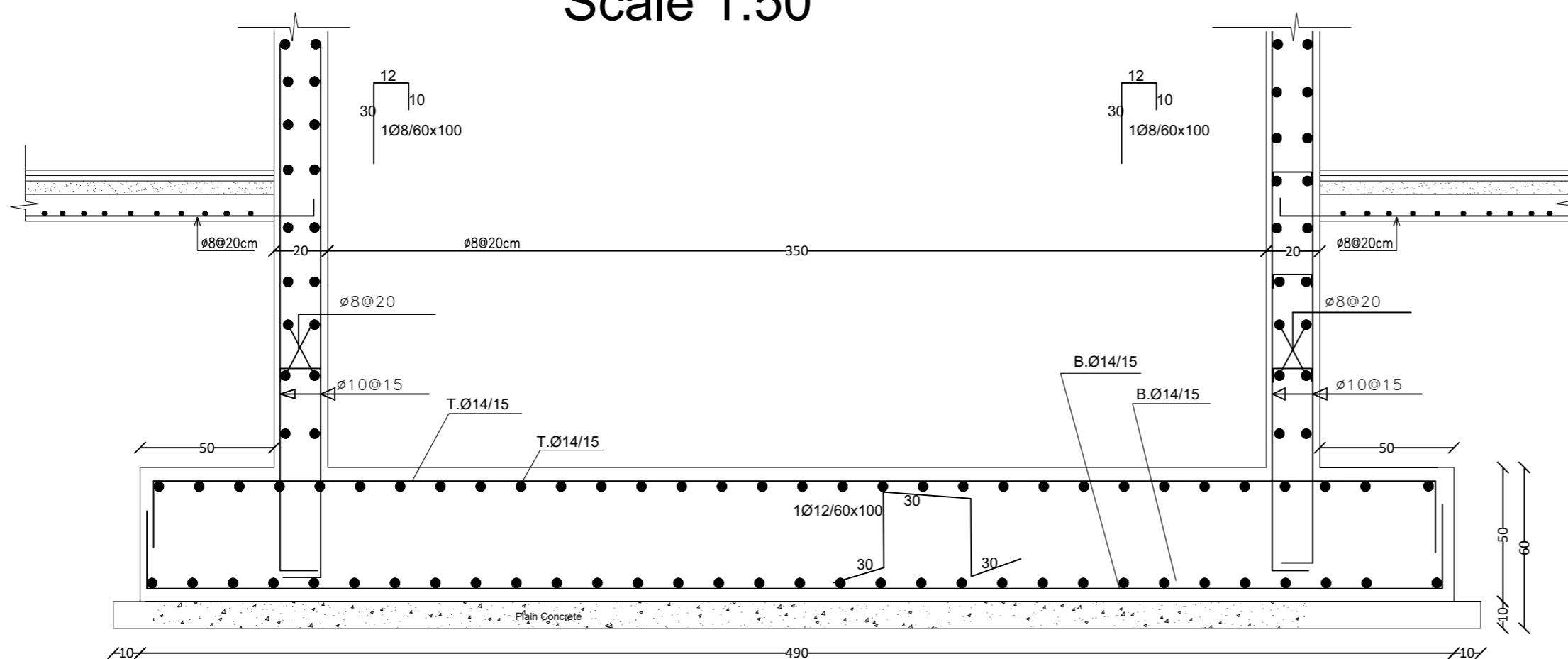


Plan details

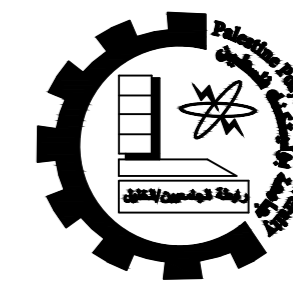


Reinforcement details

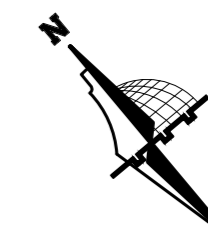
Mat Foundation details
Scale 1:50



Sec. 5-5
Scale 1:20



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

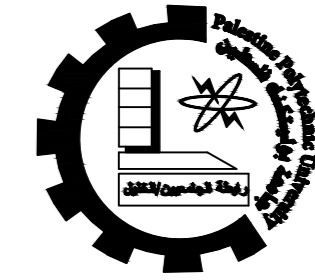
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
Foundation Details

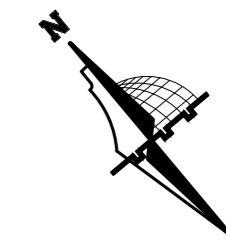
SCALE 1/100

DRAW. NO. S09

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

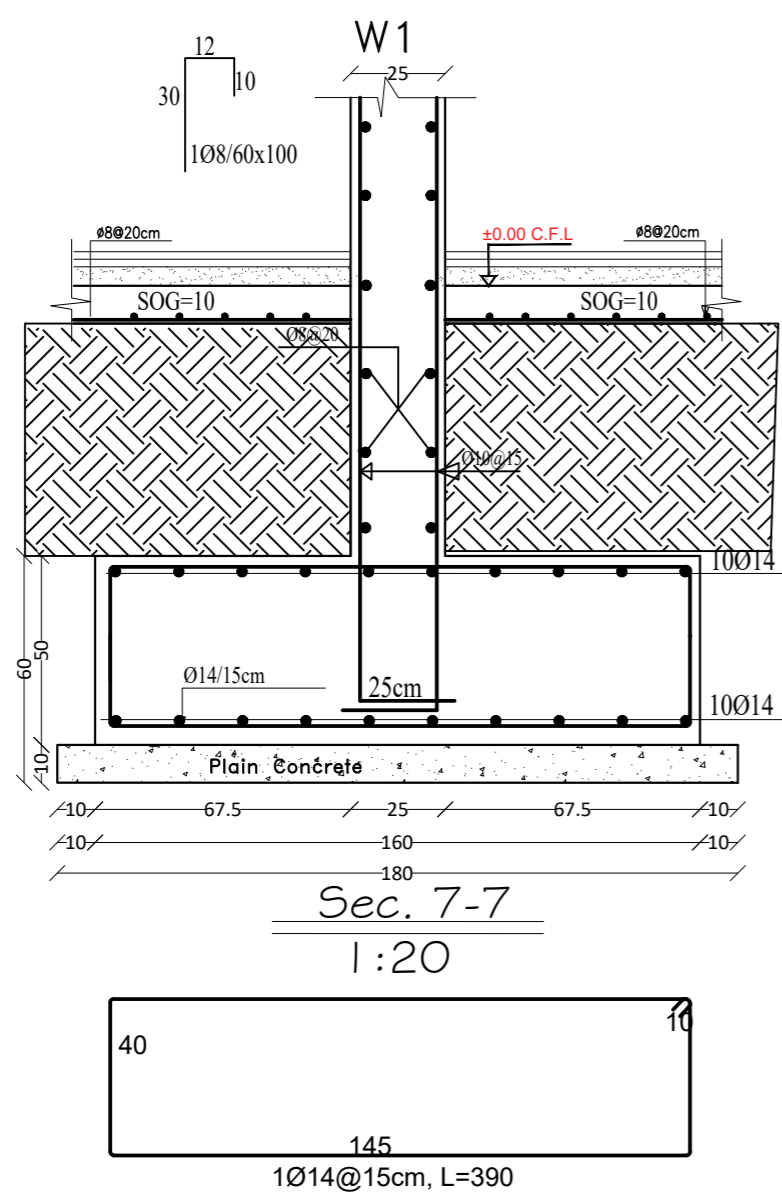
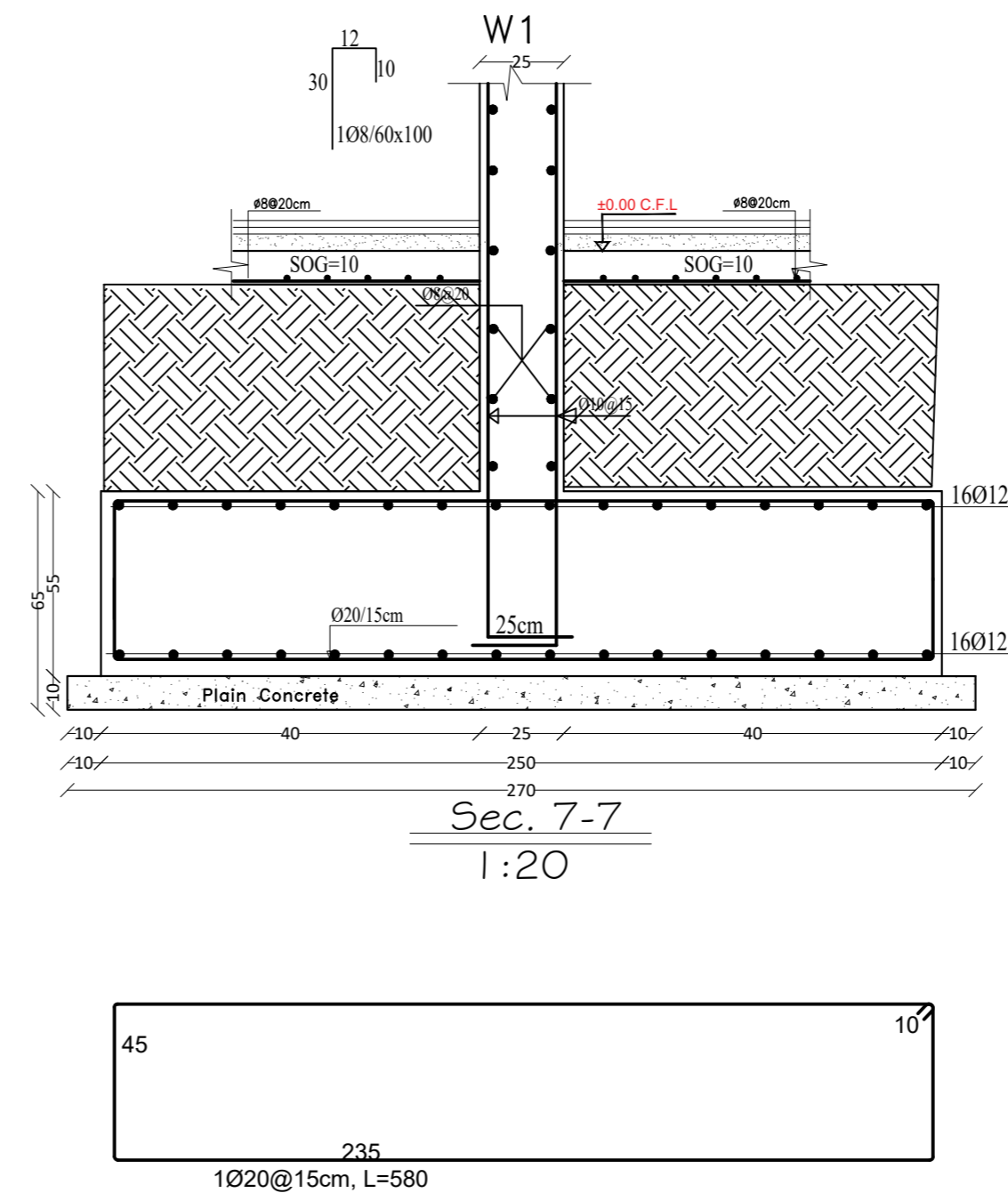
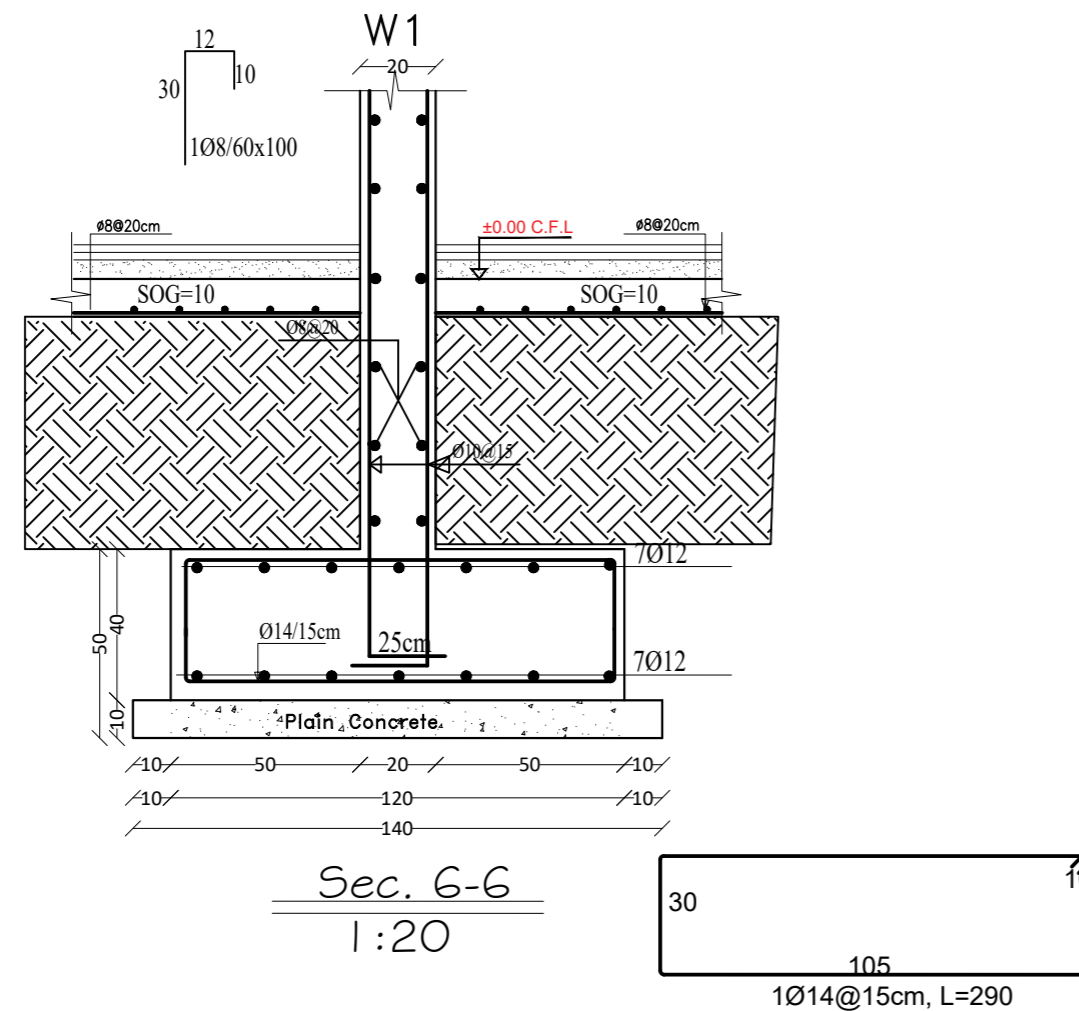
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

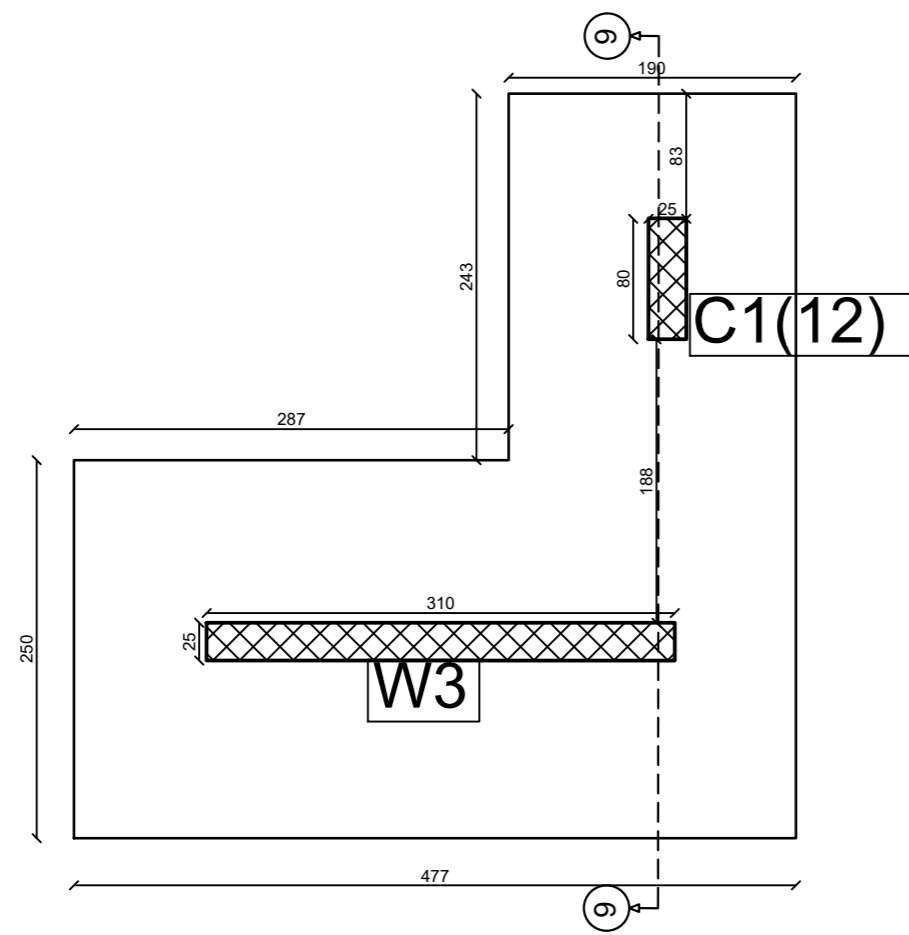
Drawing Title
 Foundation Details

SCALE 1/100

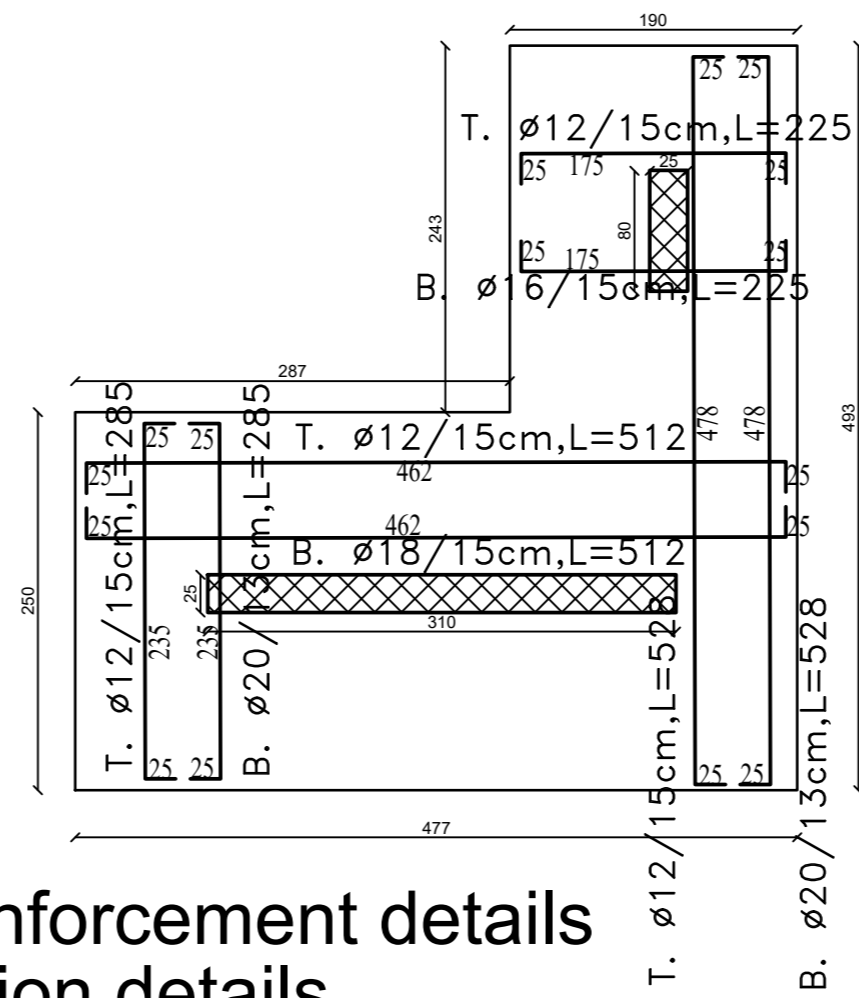
DRAW. NO. S10

2024



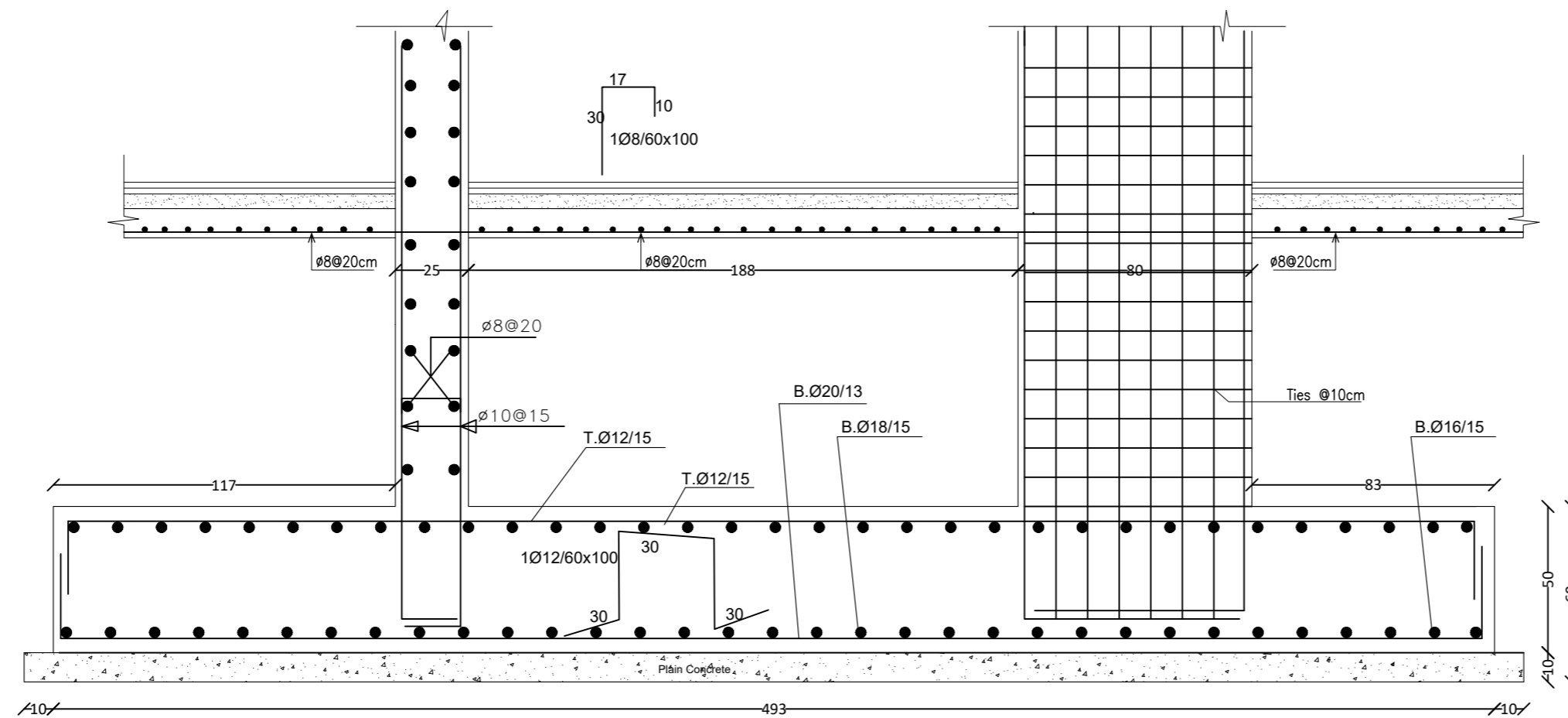


Plan details

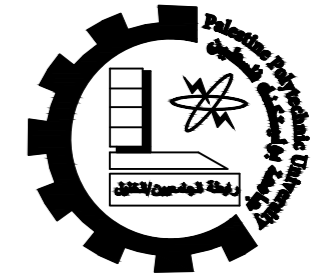


Reinforcement details

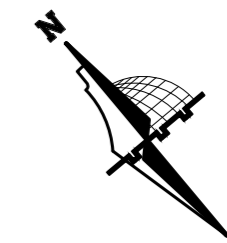
Combined Foundation details
Scale 1:50



Sec. 9-9
Scale 1:20



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

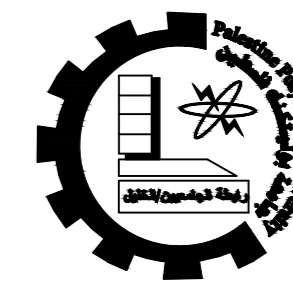
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
Foundation Details

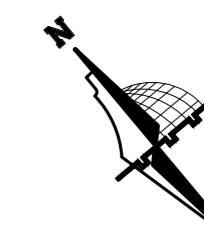
SCALE 1/100

DRAW. NO. S11

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

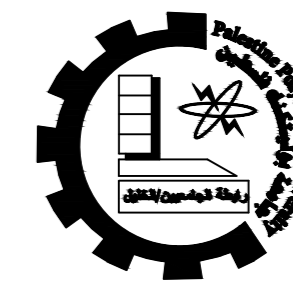
Drawing Title
 Column Details

SCALE 1/100

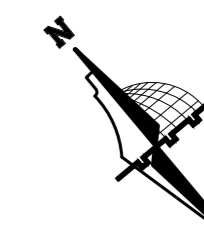
DRAW. NO. S12

2024

Column&wall group	Ground&First Floor	Second&Third Floor	above floor
C1			
C2			
C3			



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

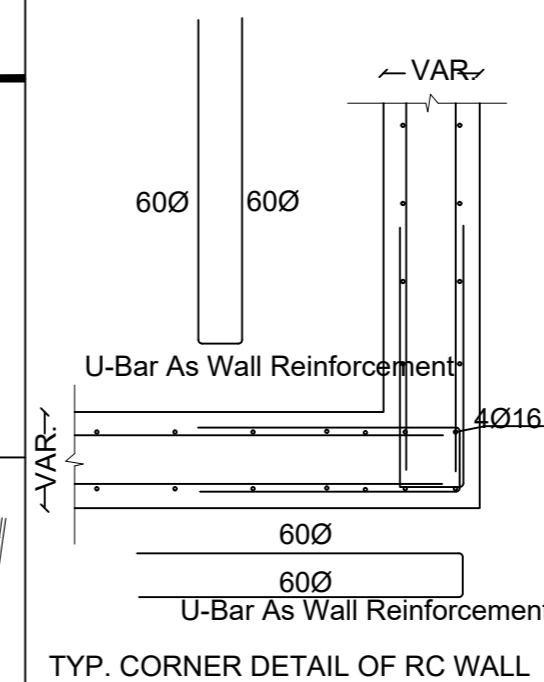
Drawing Title
 Wall Details

SCALE 1/100

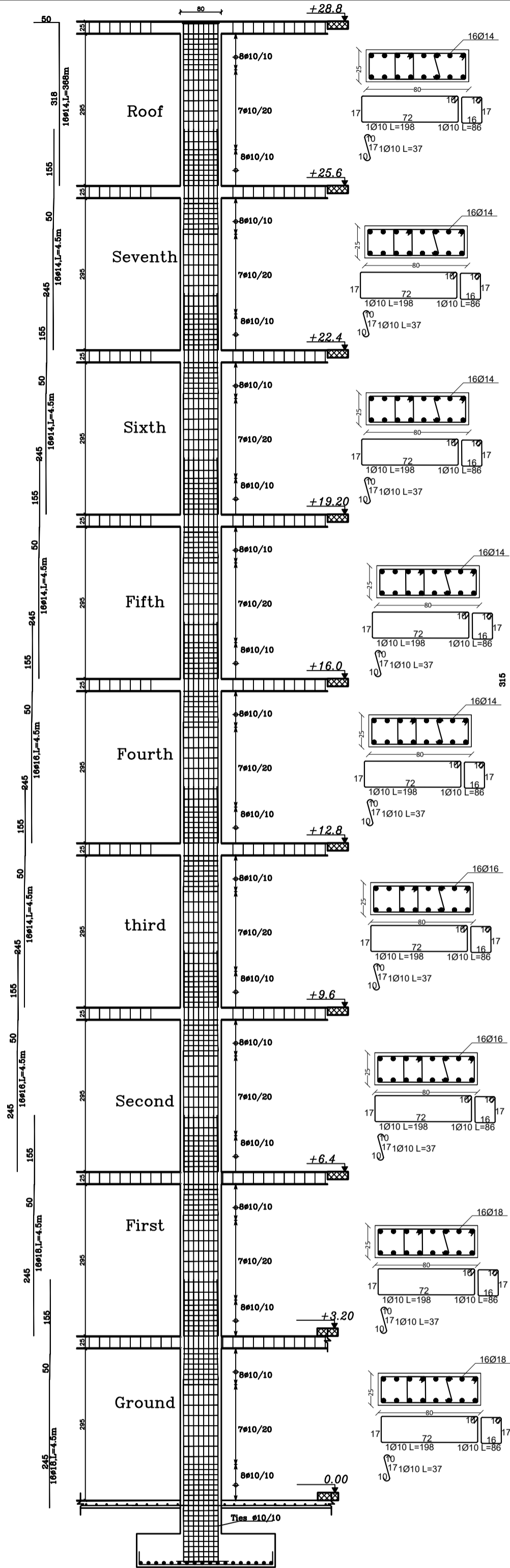
DRAW. NO. S13

2024

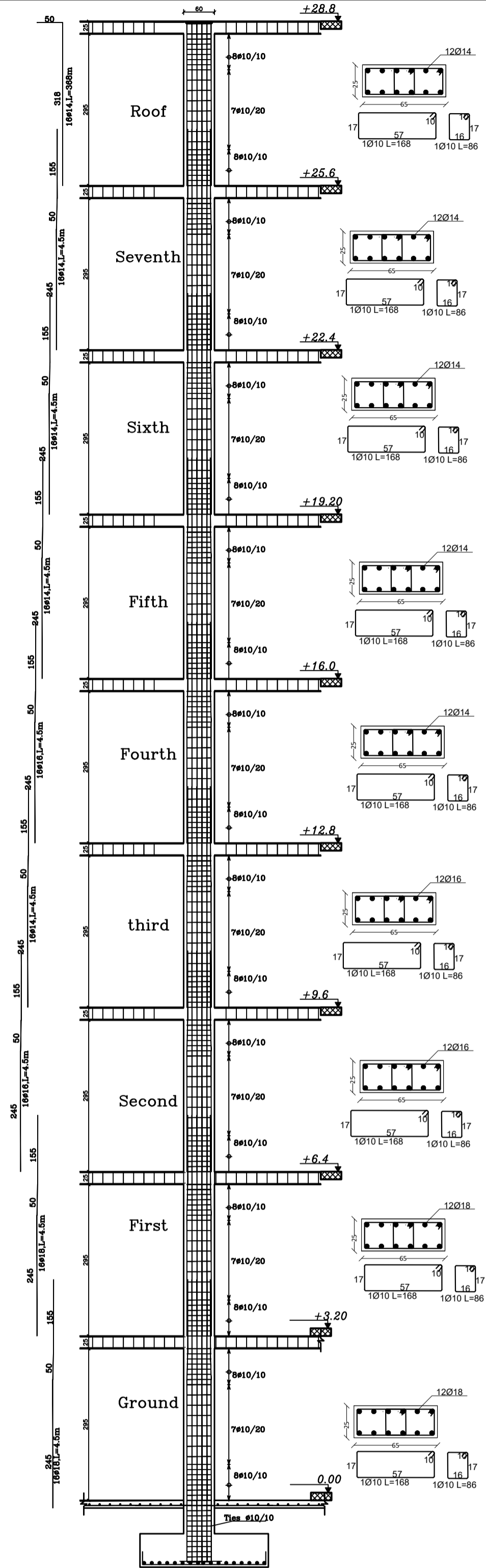
Column&wall group	Ground&First Floor	Second&Third Floor	above floor
W1			
W2			
W3			
W4			



C1



C2



Drawing Title

Column Details

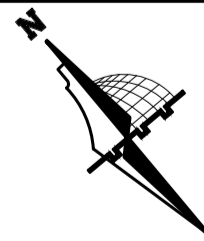
SCALE 1/100

DRAW. NO. S14

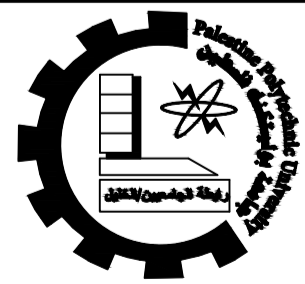
2024

Supervisor
Dr. Belal Almasre

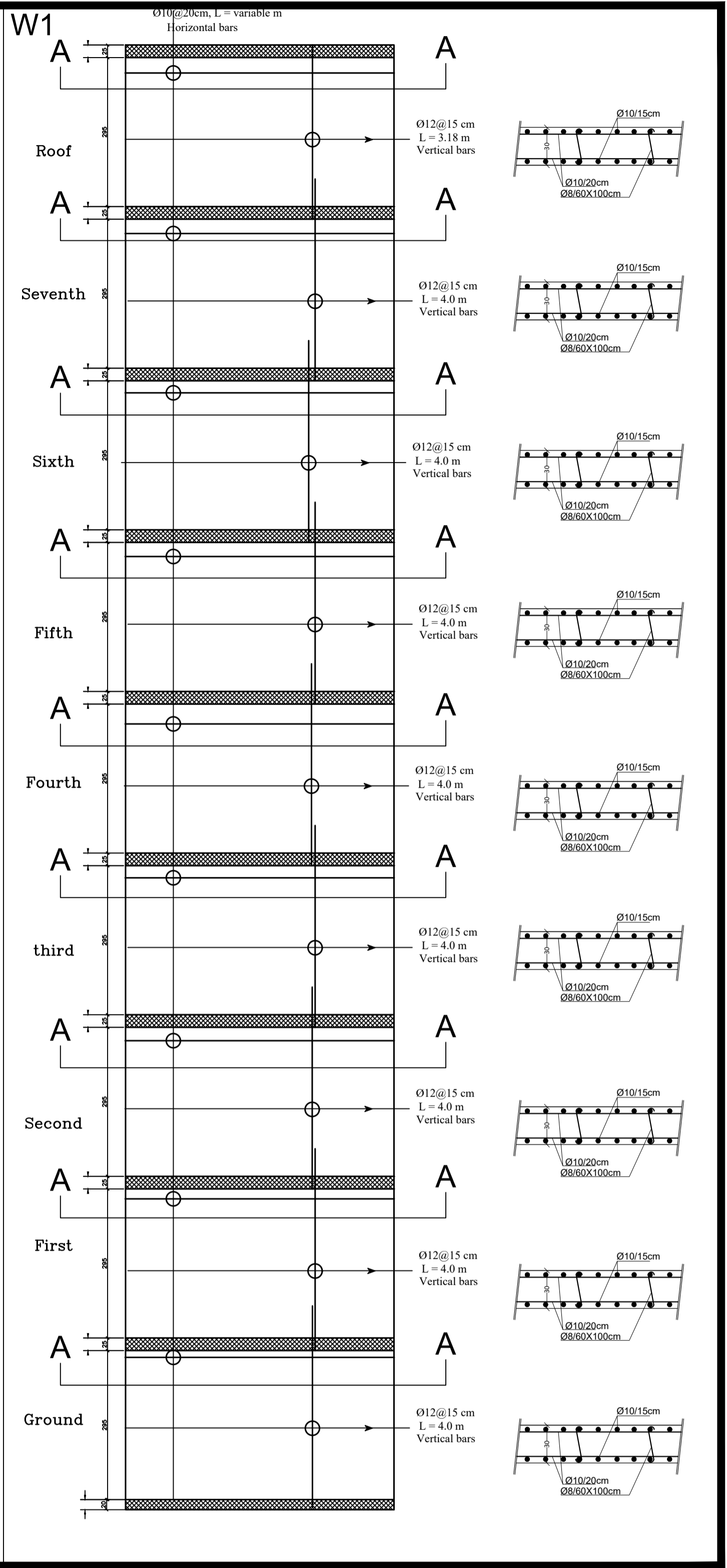
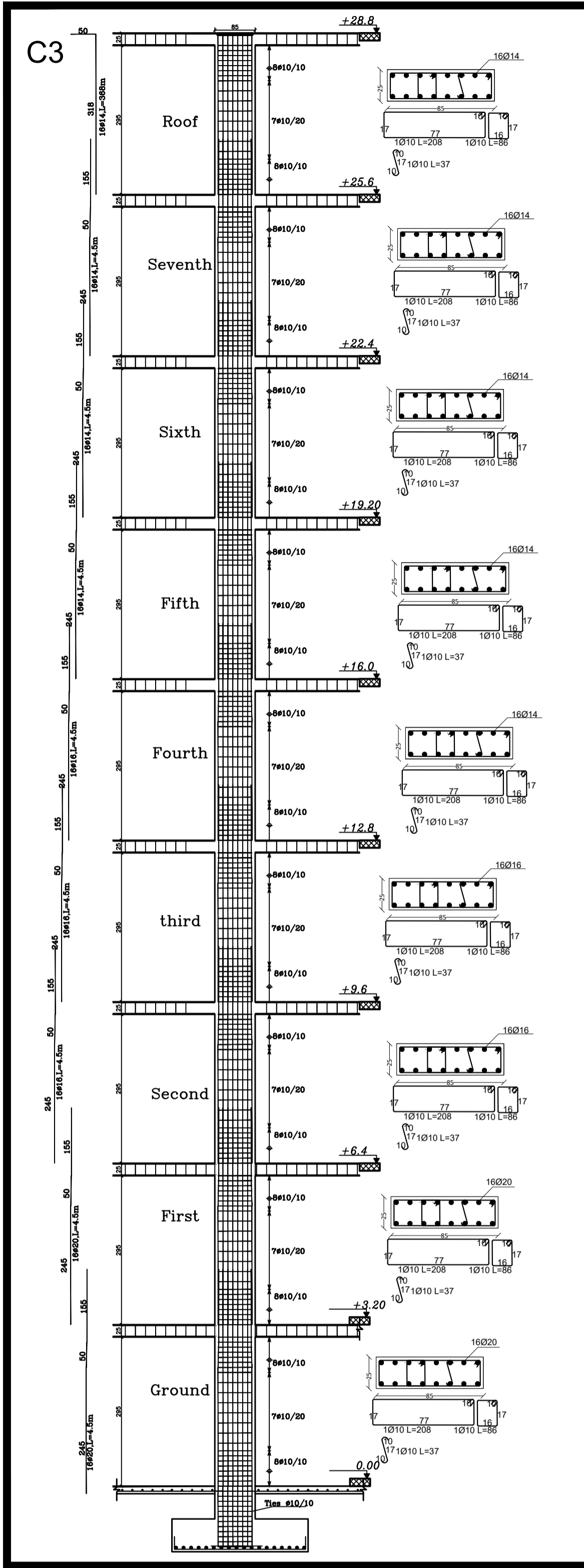
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout



Graduation Project
"Structural Design
of a Residential complex"



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Drawing Title

Column Details

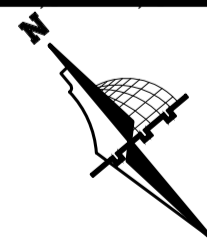
SCALE 1/100

DRAW. NO. S15

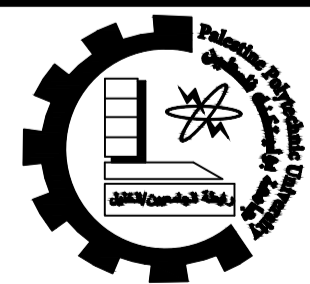
2024

Supervisor
Dr. Belal Almasre

Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

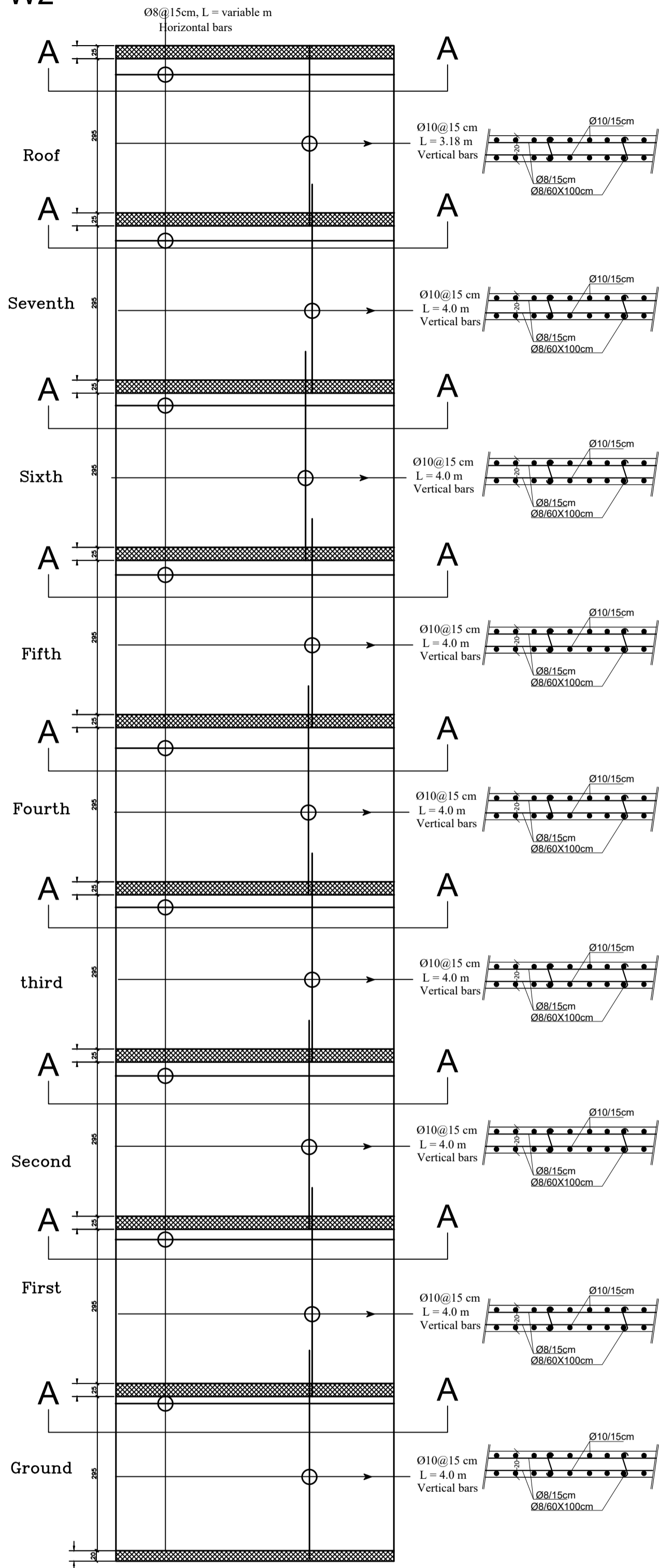


Graduation Project
"Structural Design
of a Residential complex"

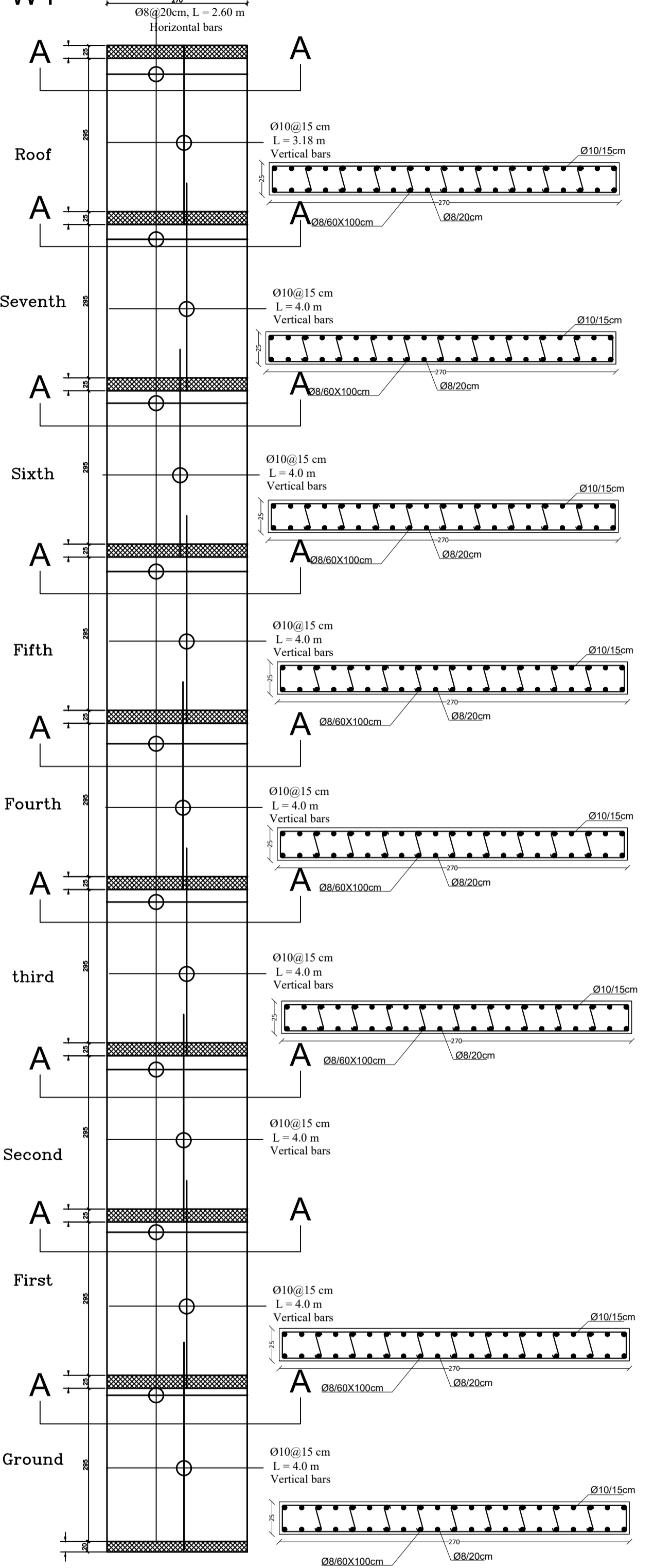


Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering

W2



W4



S:W7,SW14,SW24, SW32
 Drawing Title
 Wall Details

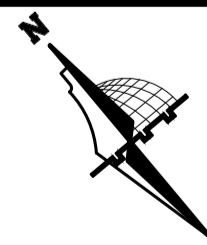
SCALE 1/100

DRAW. NO. S16

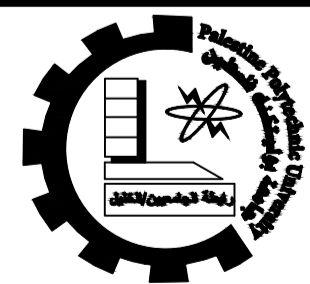
2024

Supervisor
 Dr.Belal Almasre

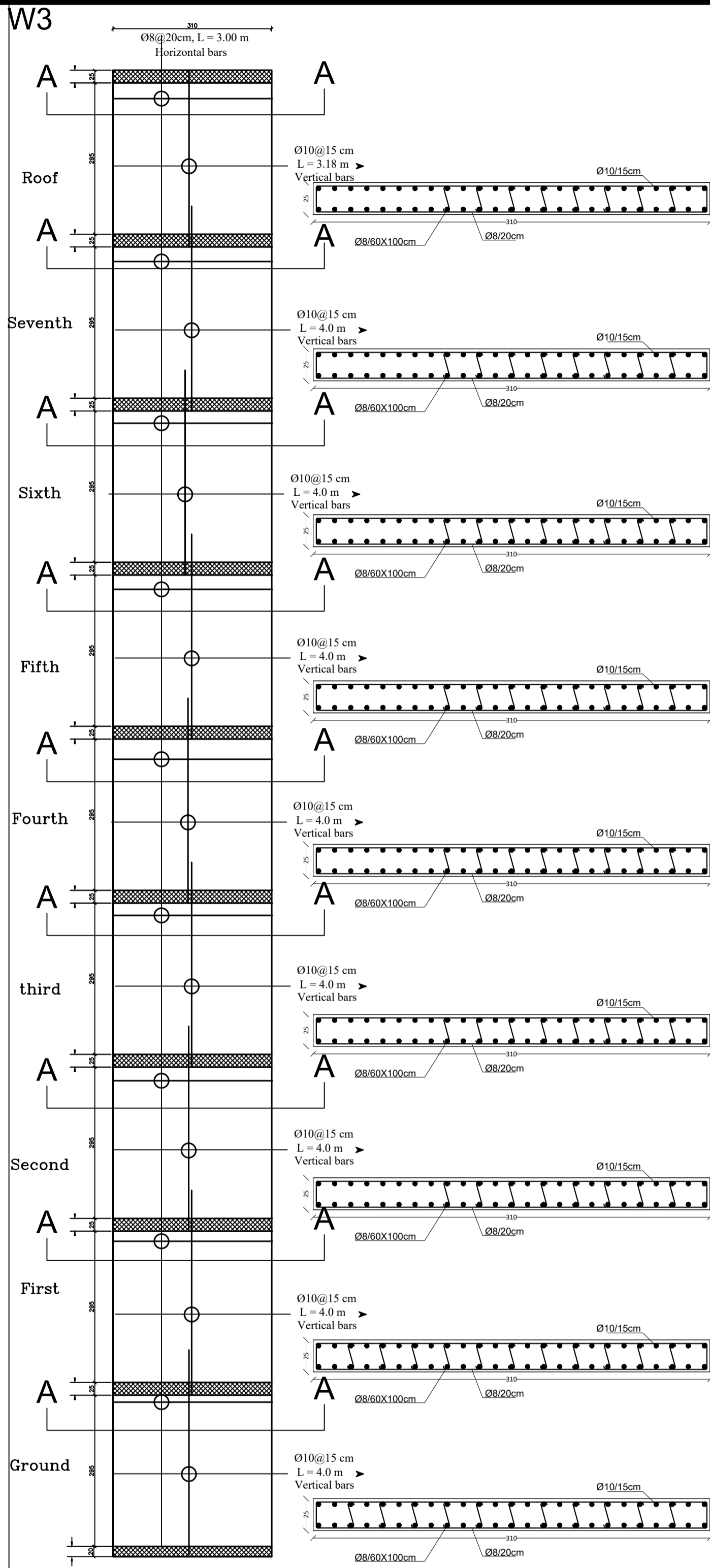
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout



Graduation Project
 "Structural Design
 of a Residential complex"



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Drawing Title

Wall Details

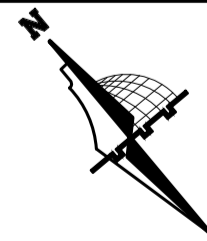
SCALE 1/100

DRAW. NO. S17

2024

Supervisor
Dr. Belal Almasre

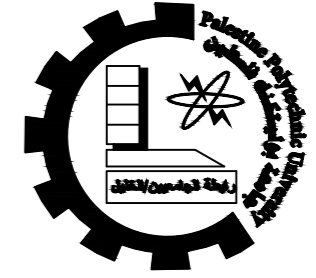
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout



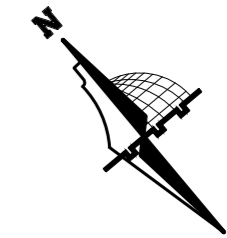
Graduation Project
"Structural Design
of a Residential complex"



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

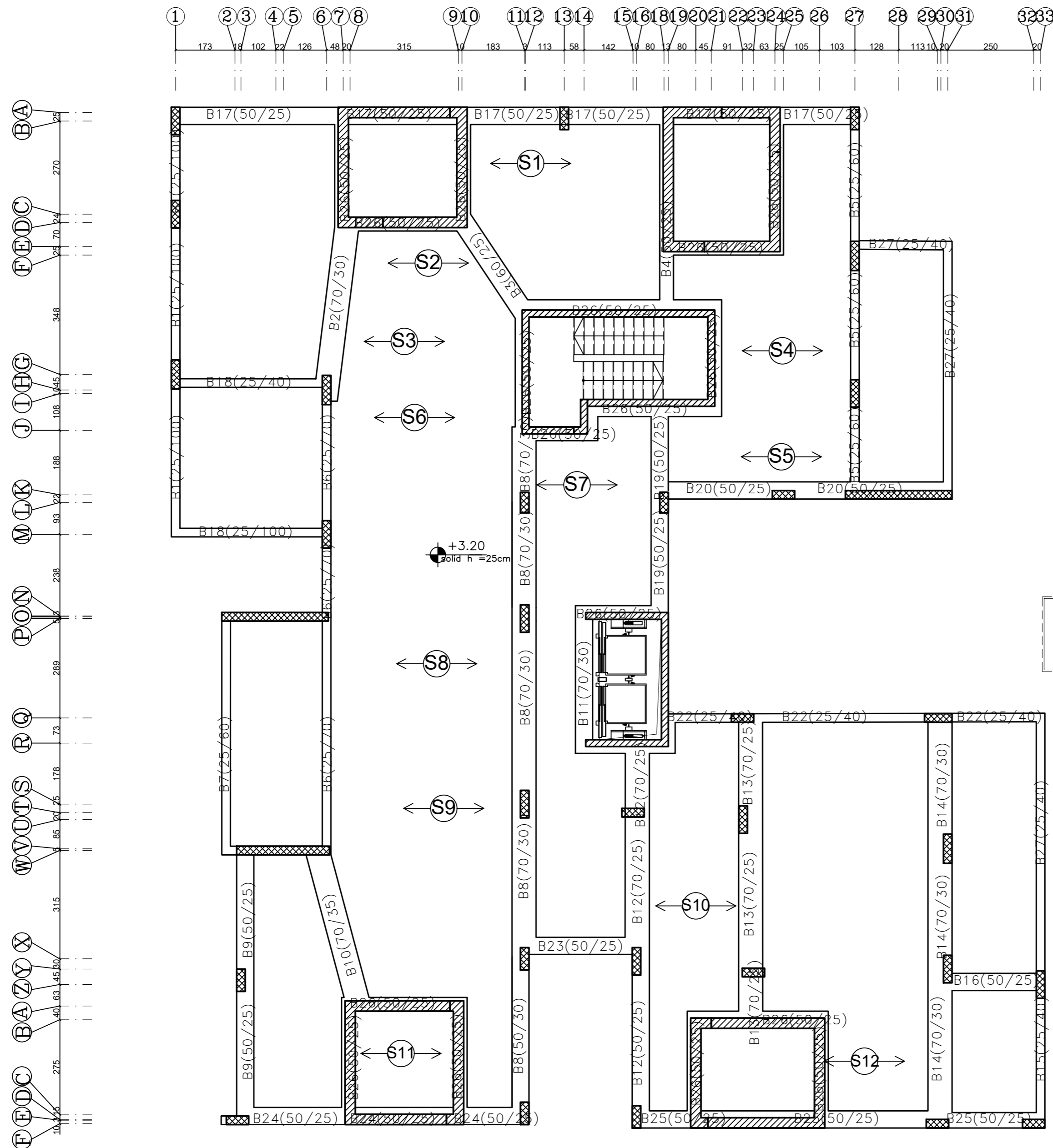
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

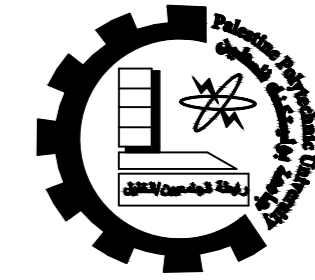
Drawing Title
 GROUND FLOOR
 slab layout

SCALE 1/100

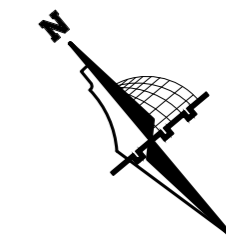
DRAW. NO. S18

2024





Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

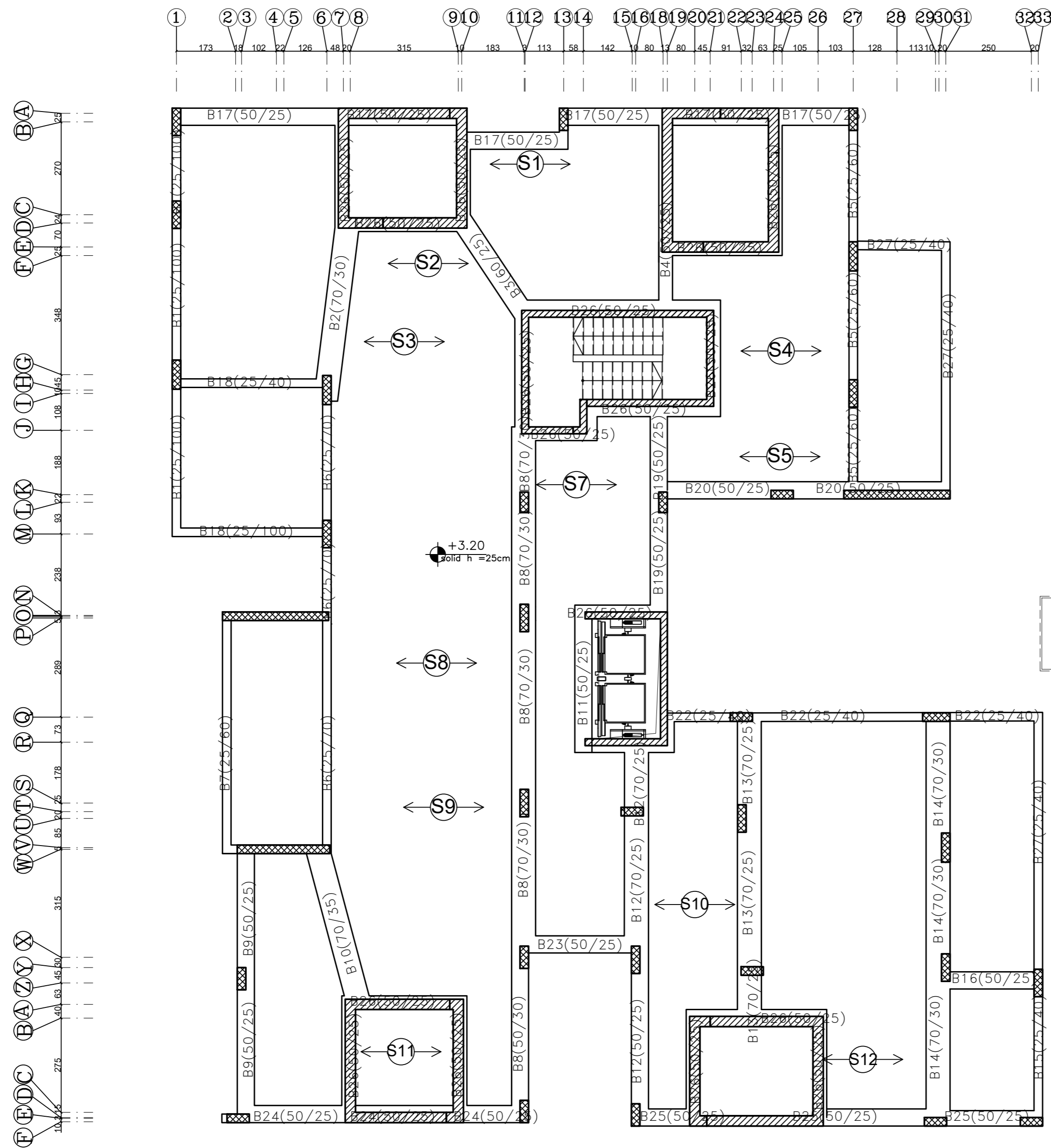
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

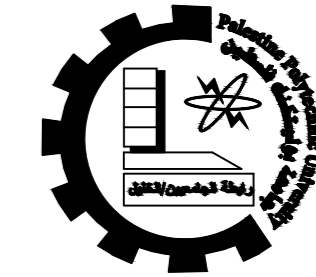
Drawing Title
Typical FLOOR
slab layout

SCALE 1/100

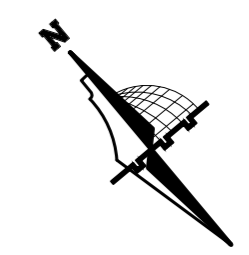
DRAW. NO. S19

2024





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

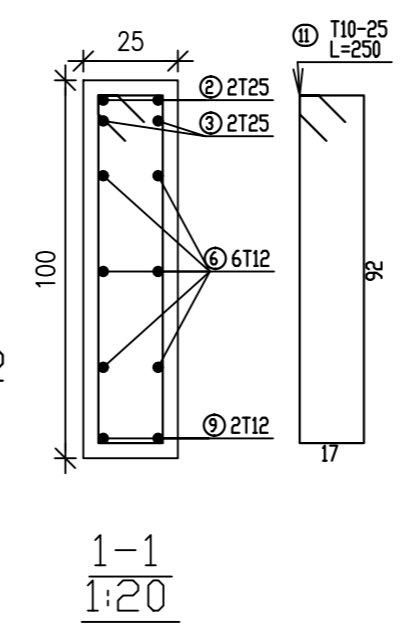
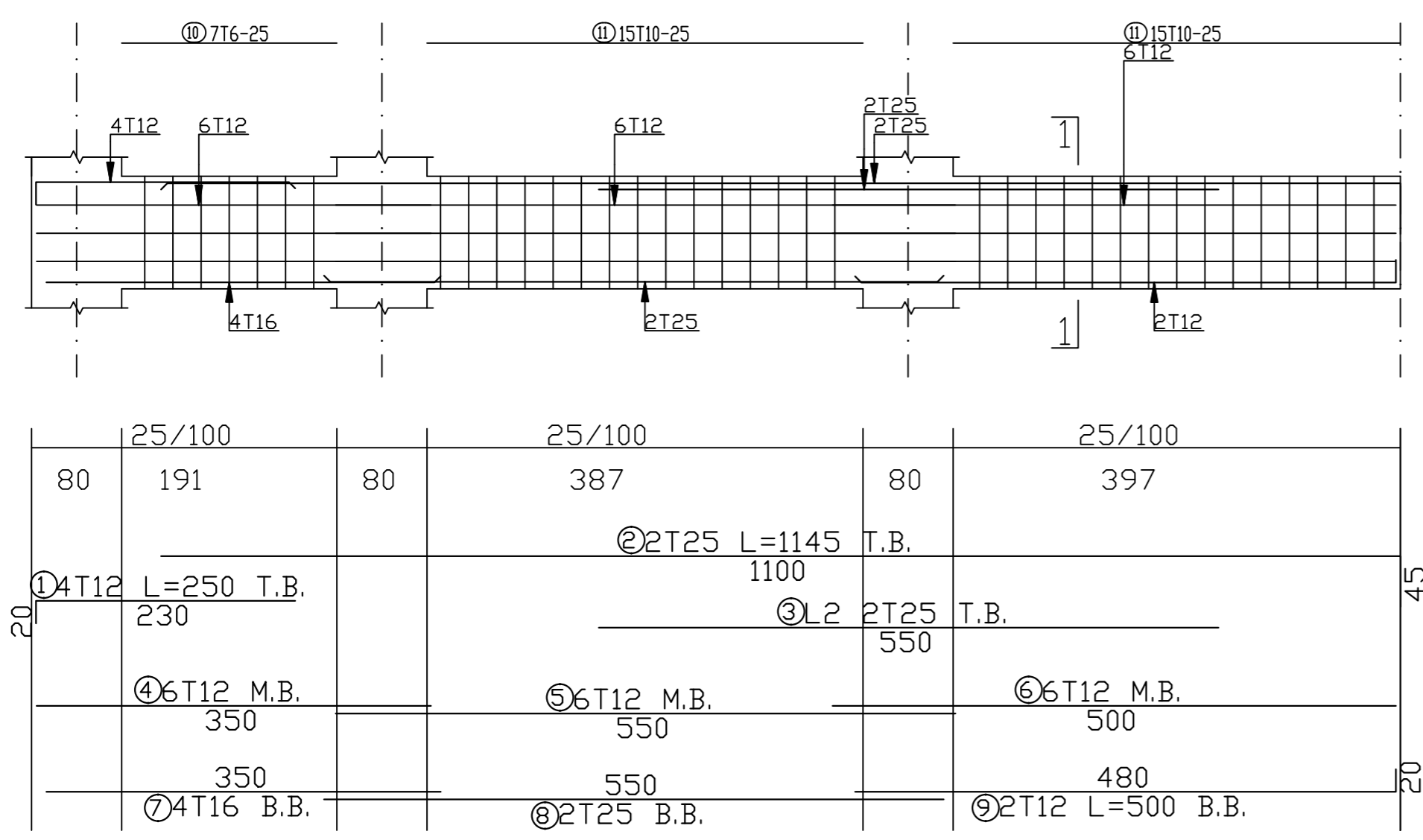
Drawing Title
 Beams ground & typical details

SCALE 1/100

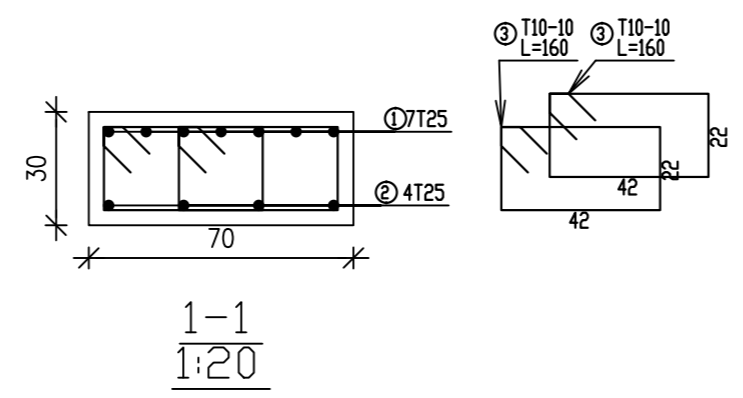
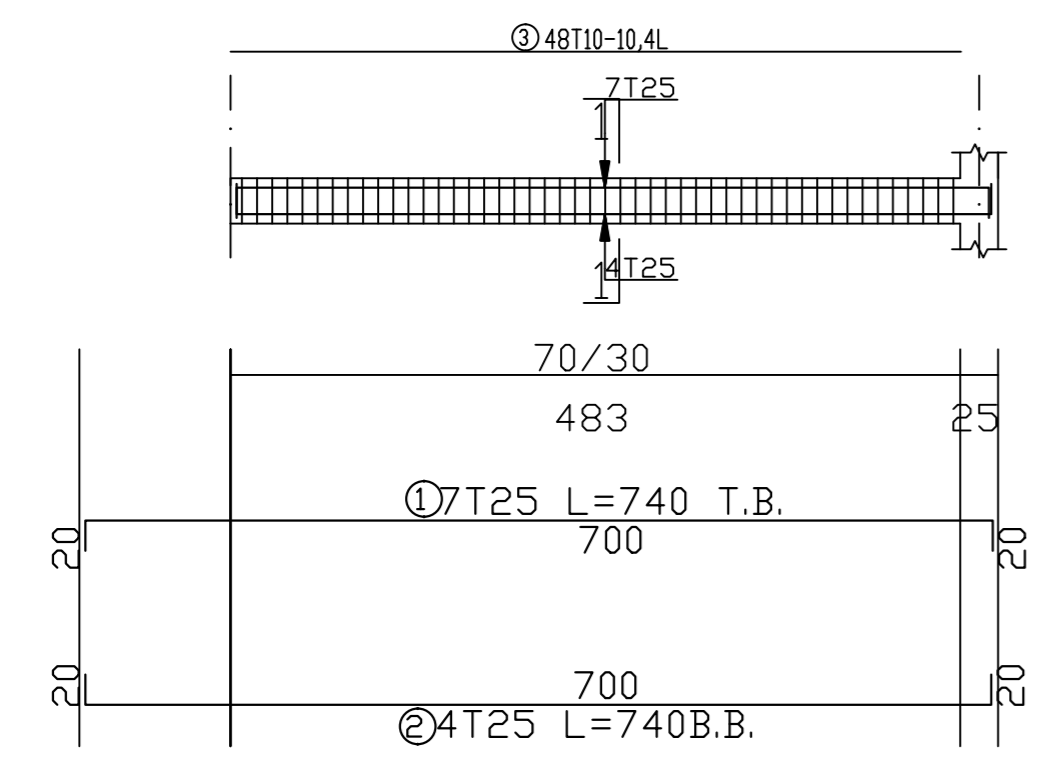
DRAW. NO. S21

2024

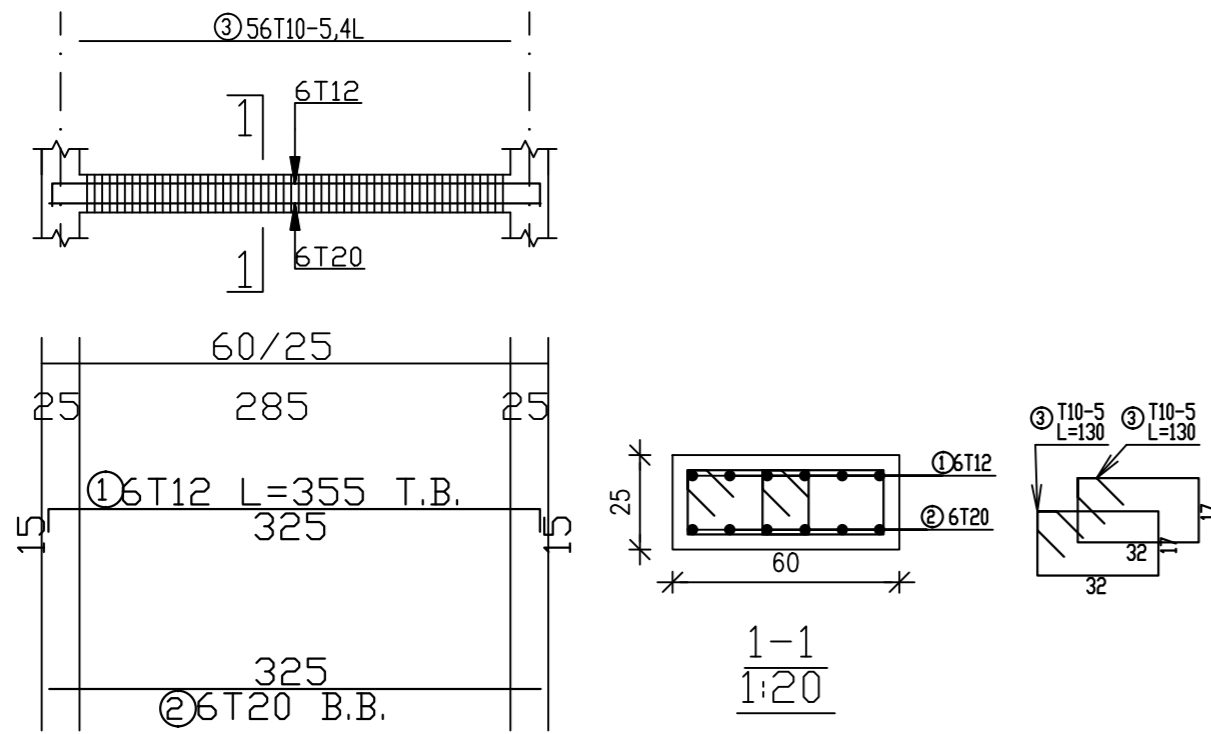
BEAM - B1 (25/100)



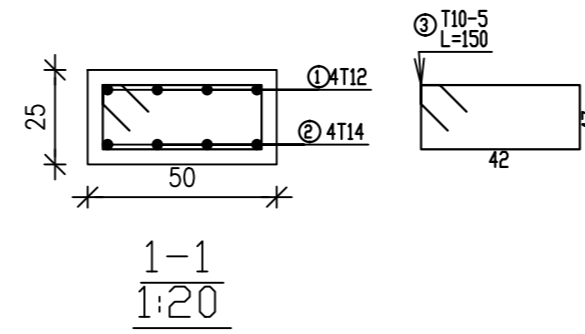
BEAM - B2 (70/30)



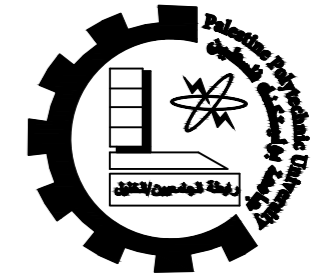
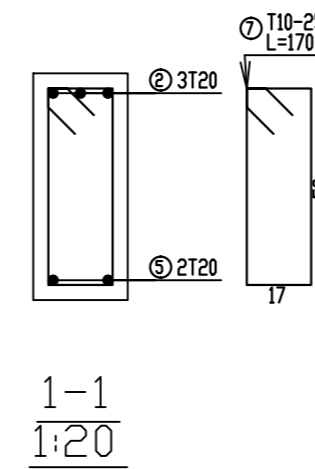
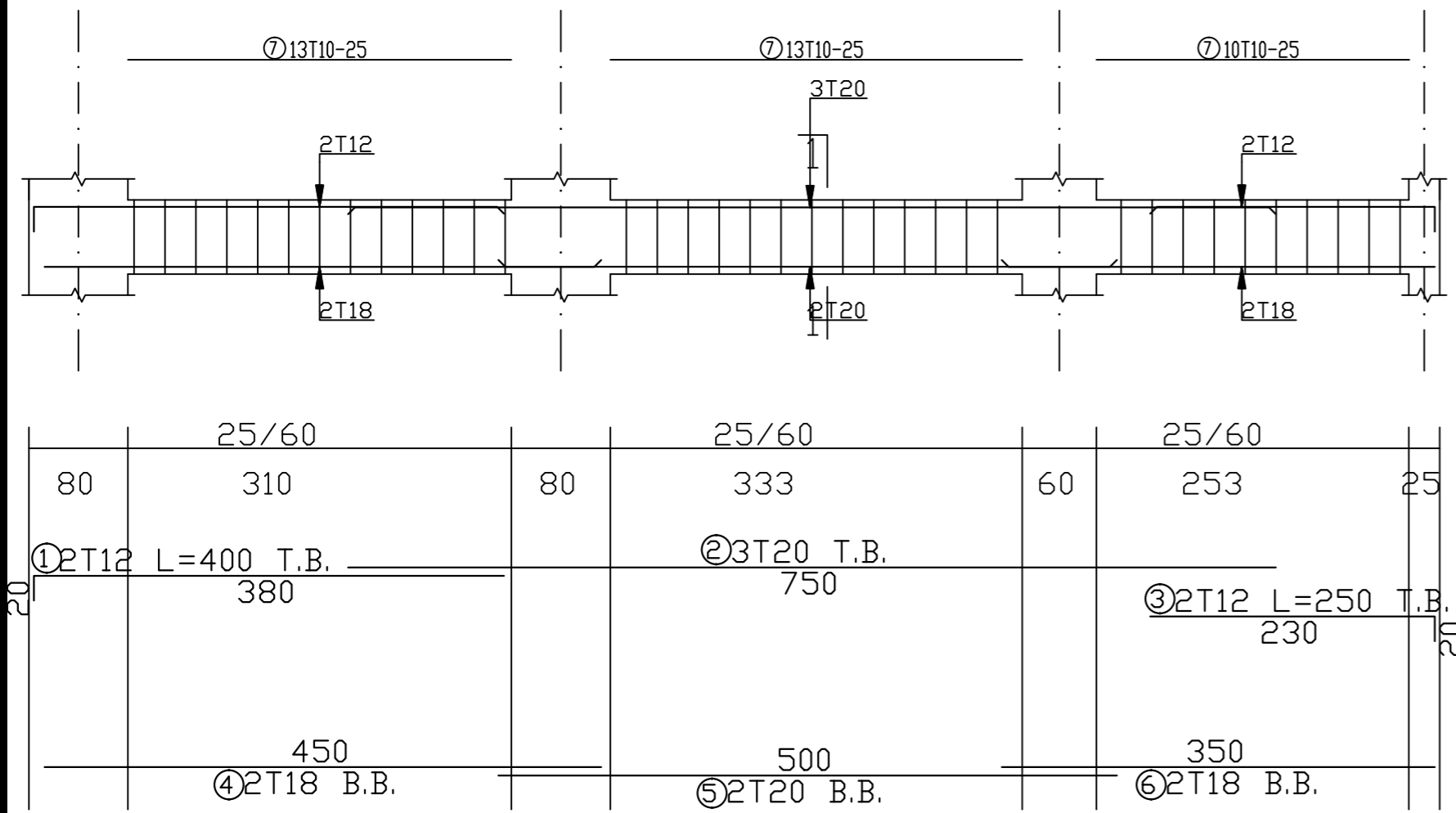
BEAM - B3 (60/25)



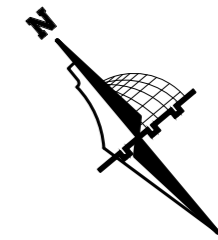
BEAM - B4 (50/25)



BEAM - B5 (25/60)



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

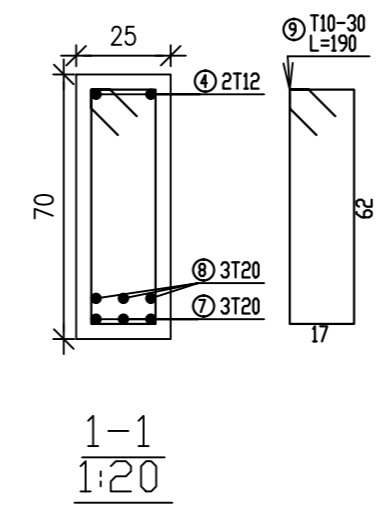
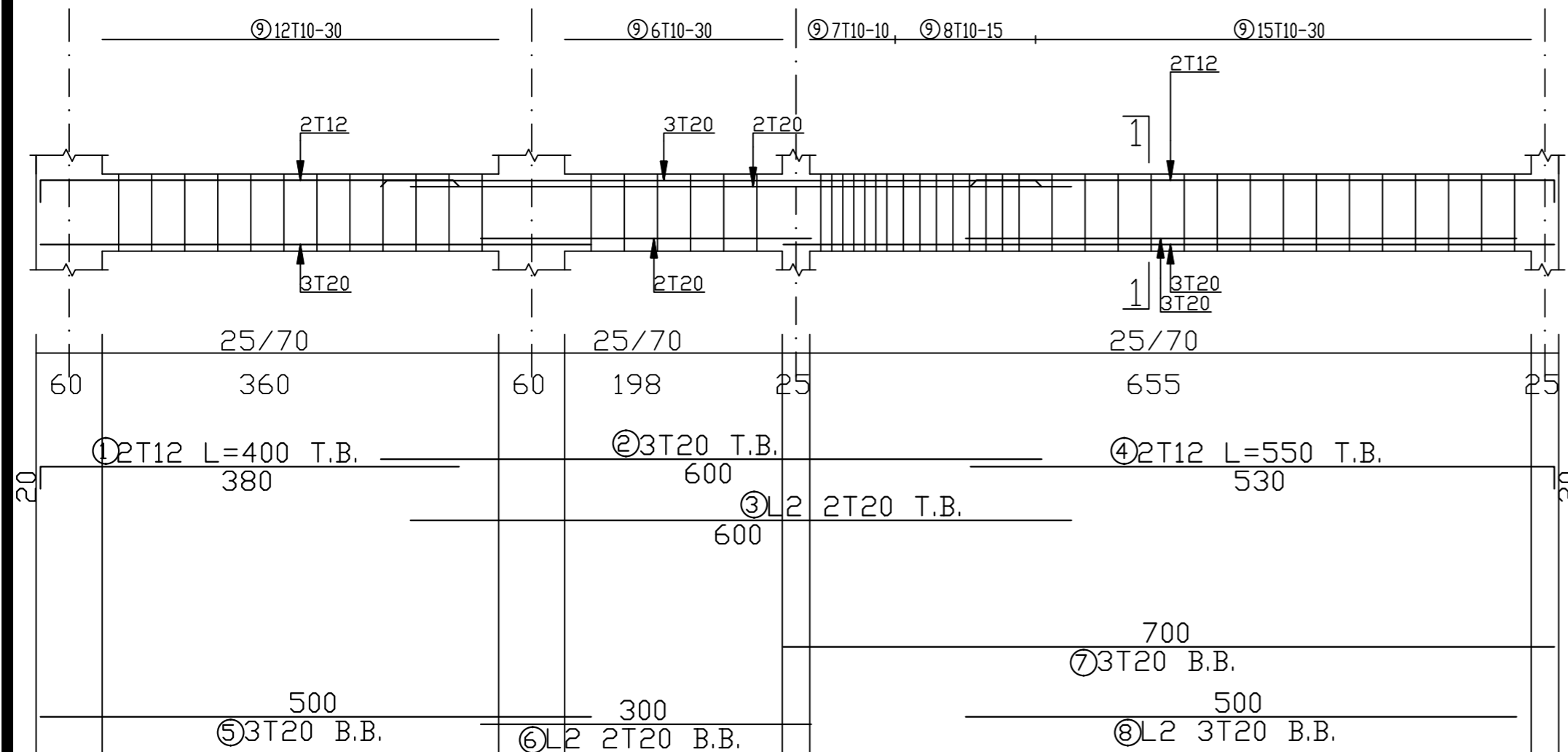
Drawing Title
Beams ground & typical details

SCALE 1/100

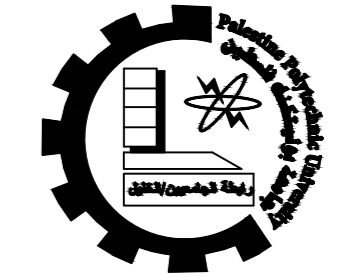
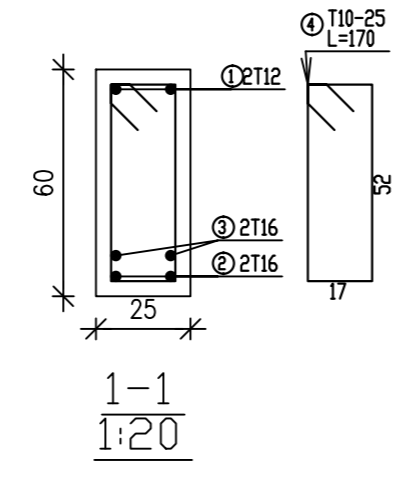
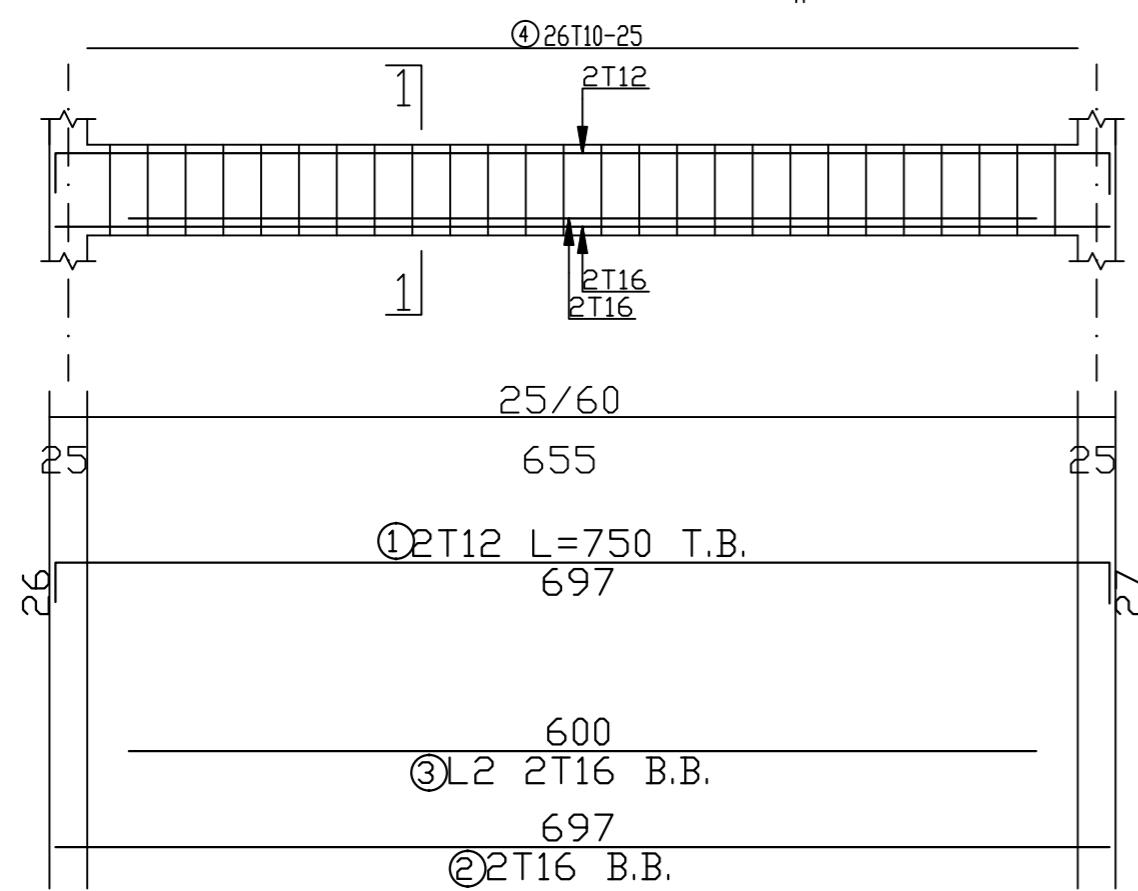
DRAW. NO. S23

2024

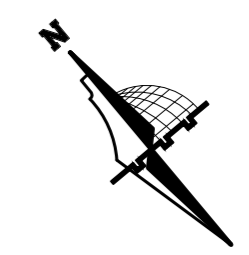
BEAM - B6 (25/70)



BEAM - B7 (25/60)



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

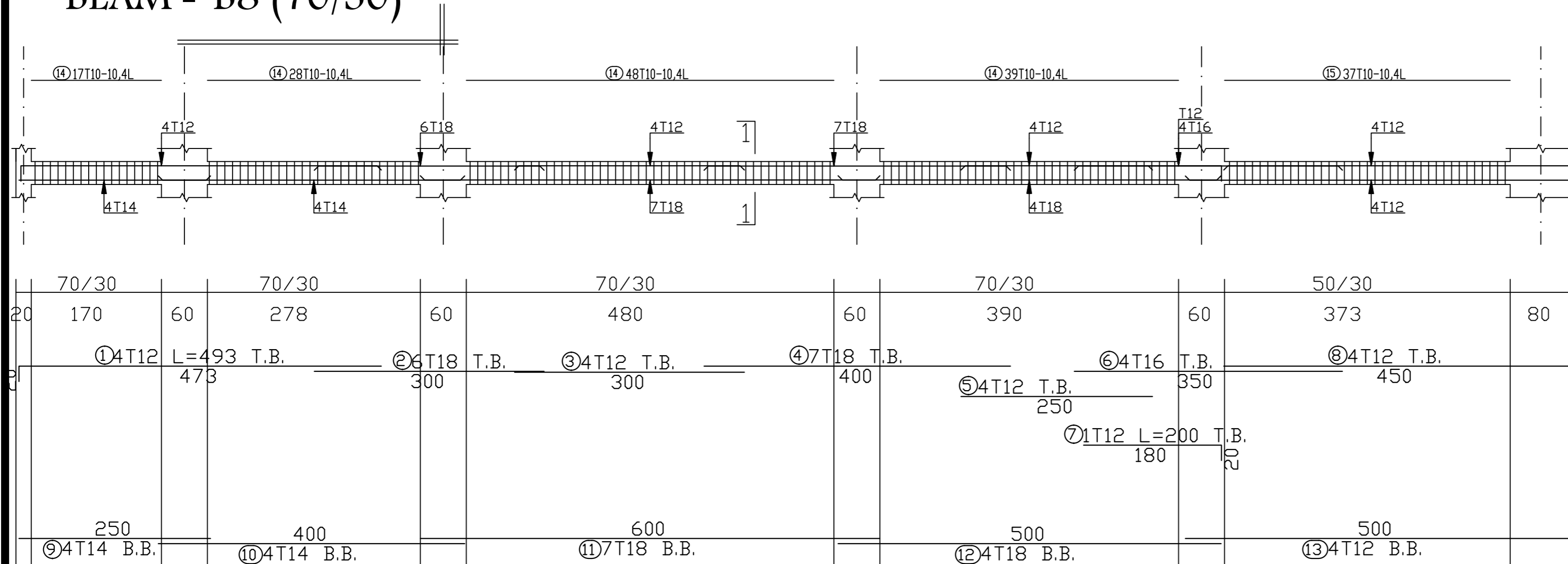
Drawing Title
 Beams ground & typical details

SCALE 1/100

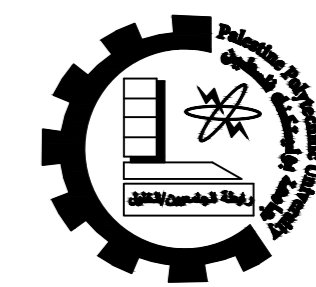
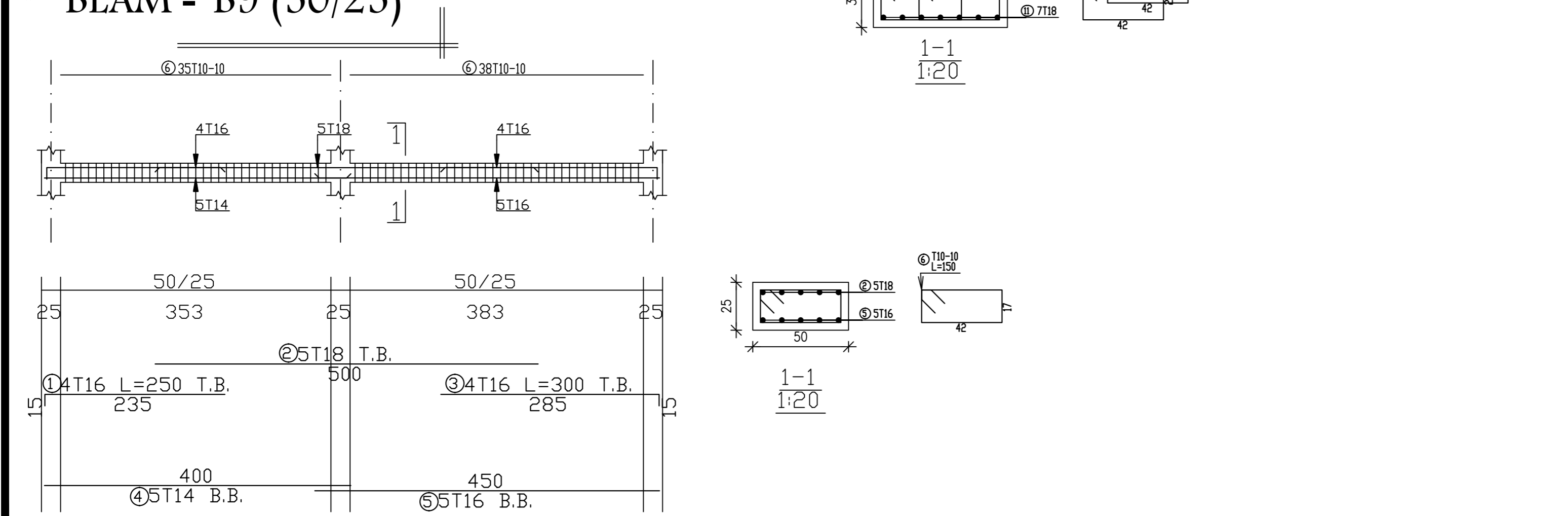
DRAW. NO. S24

2024

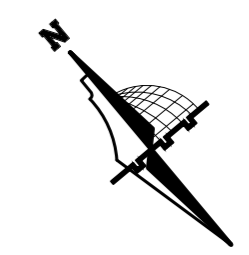
BEAM - B8 (70/30)



BEAM - B9 (50/25)



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

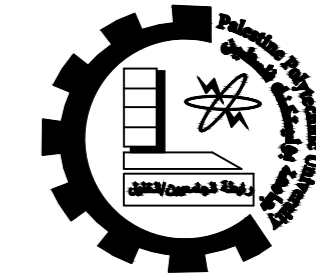
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 Beams ground & typical details

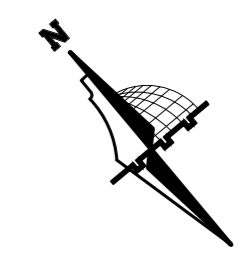
SCALE 1/100

DRAW. NO. S25

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

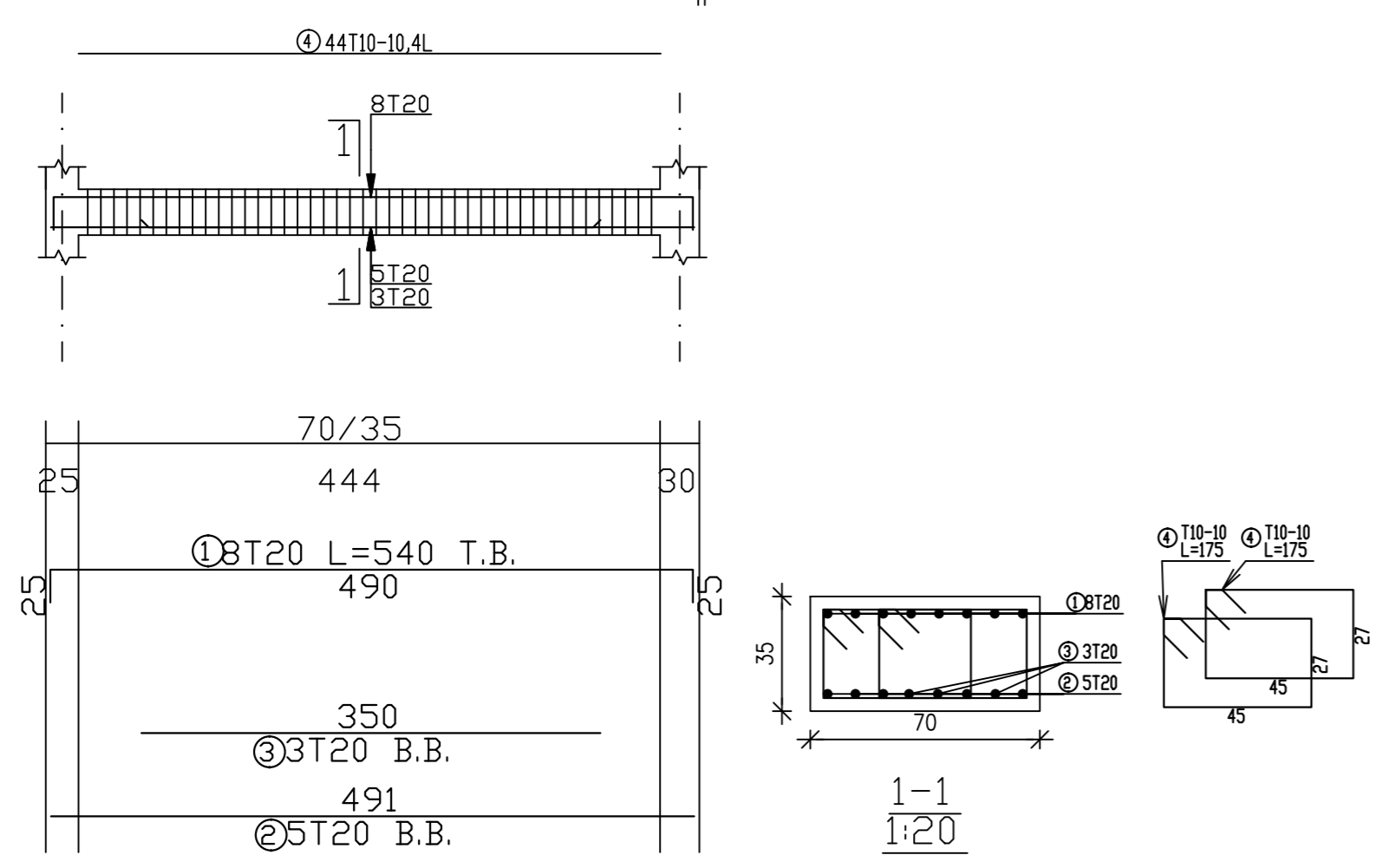
Drawing Title
 Beams ground & typical details

SCALE 1/100

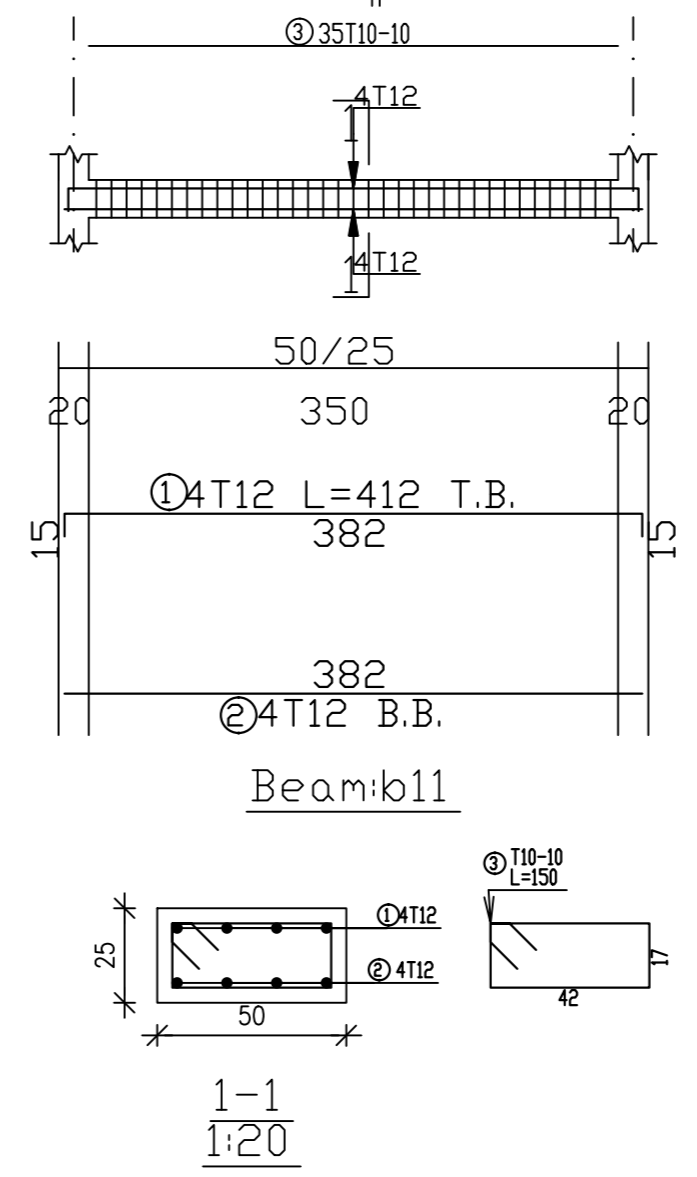
DRAW. NO. S26

2024

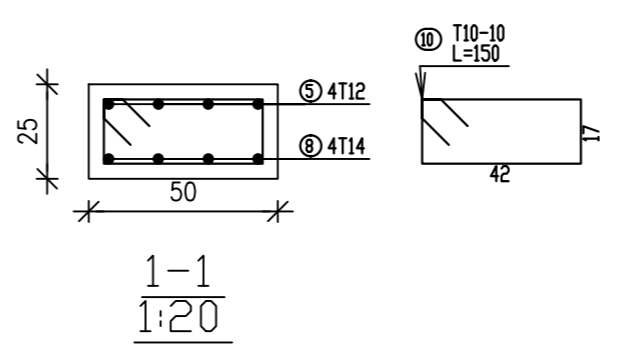
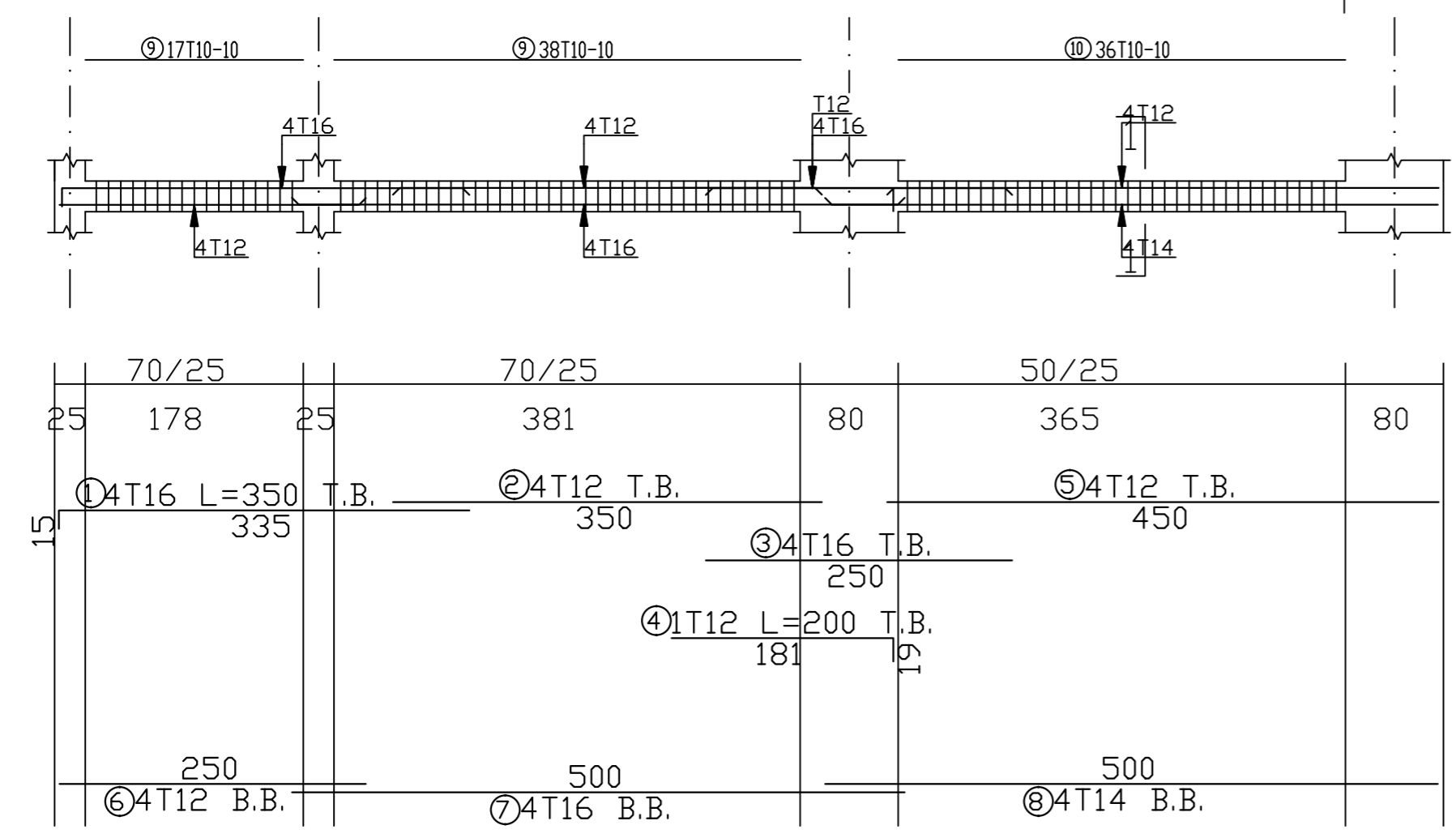
BEAM - B10 (70/35)

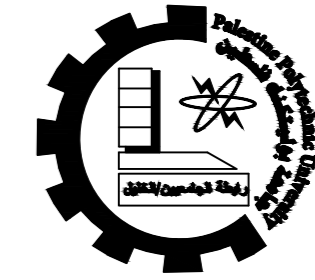


BEAM - B11 (50/25)

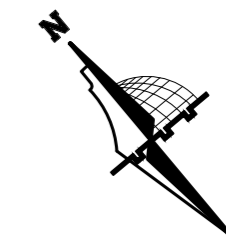


BEAM - B12 (70/25)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

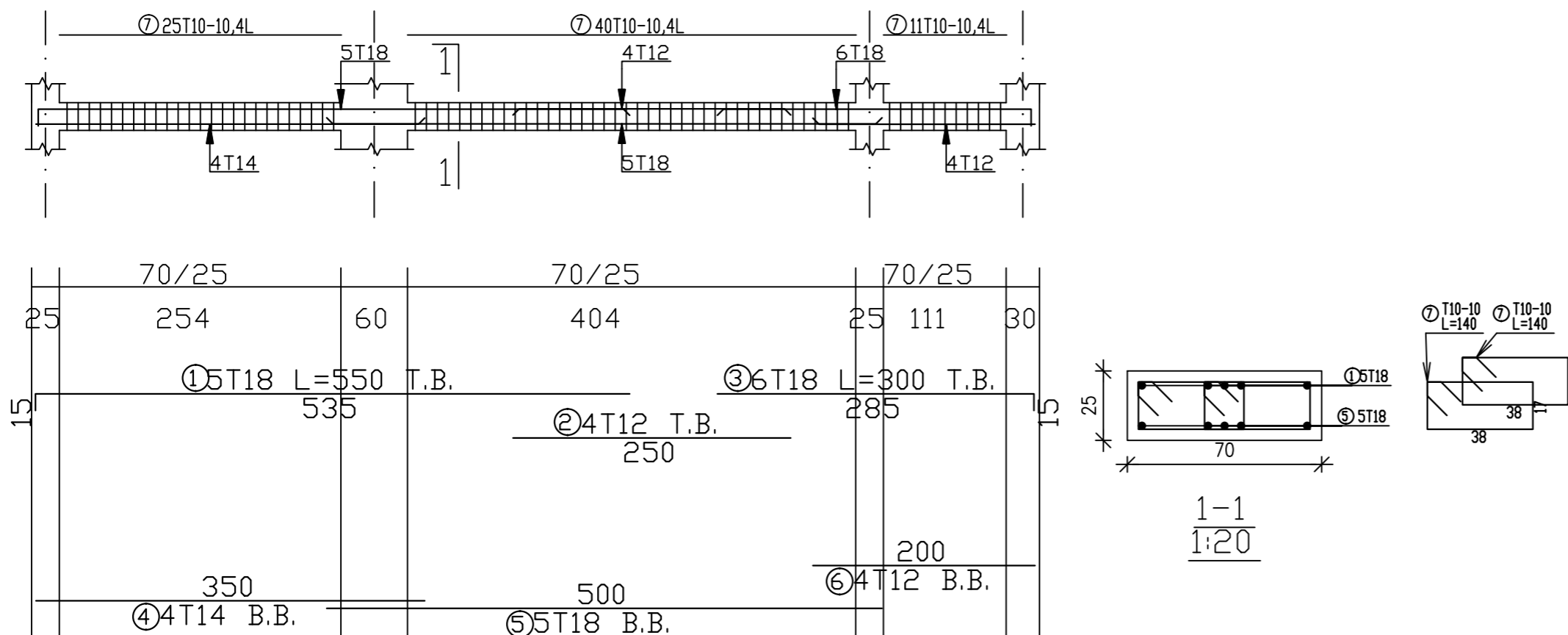
Drawing Title
 Beams ground & typical details

SCALE 1/100

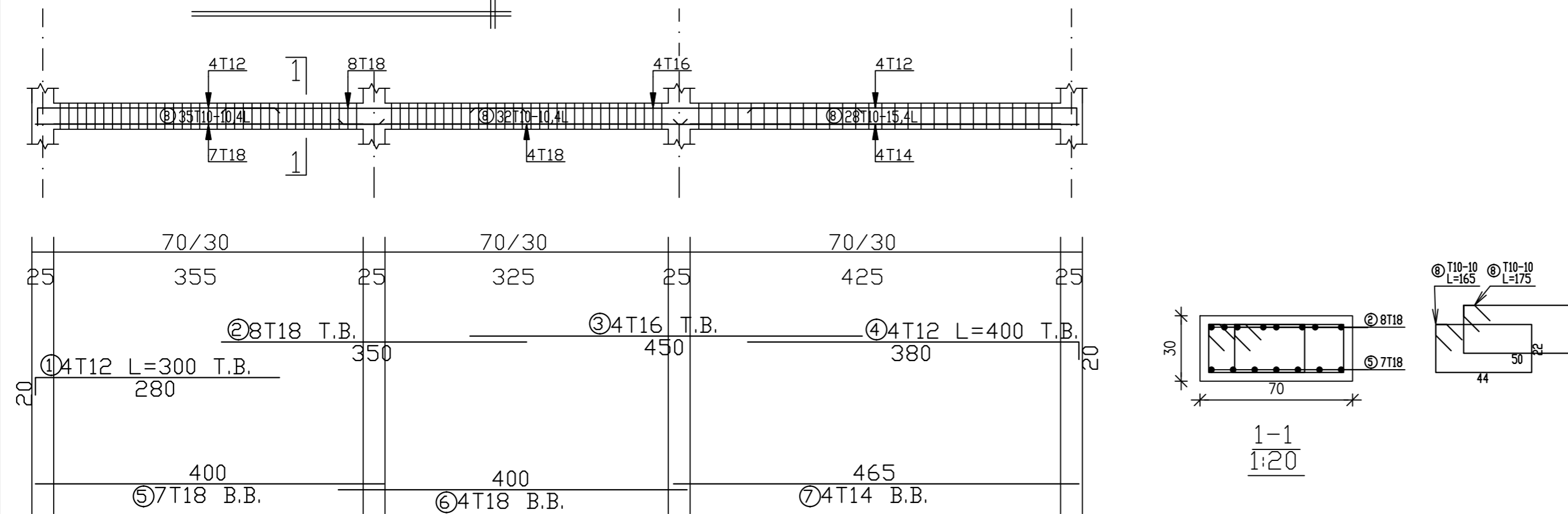
DRAW. NO. S27

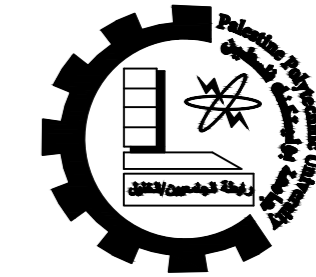
2024

BEAM - B13 (70/25)

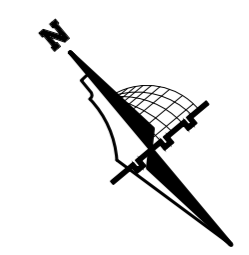


BEAM - B14 (70/30)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

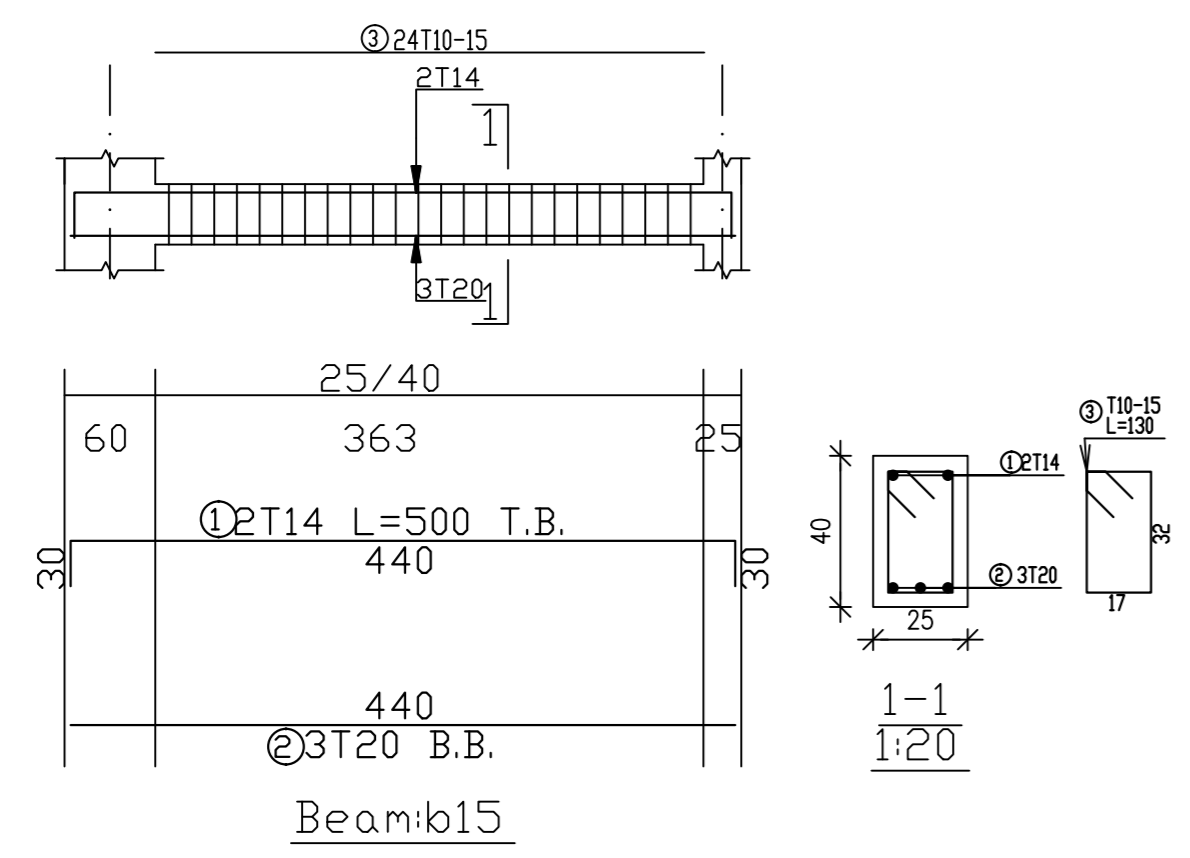
Drawing Title
 Beams ground & typical details

SCALE 1/100

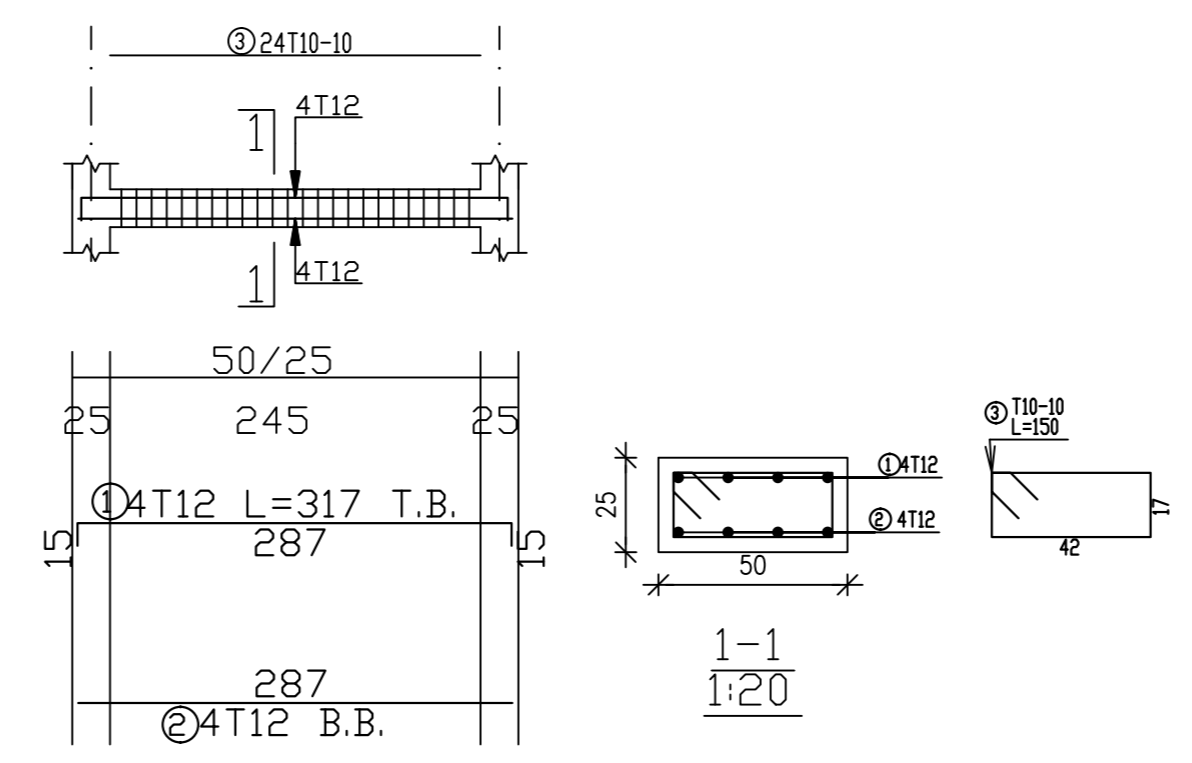
DRAW. NO. S28

2024

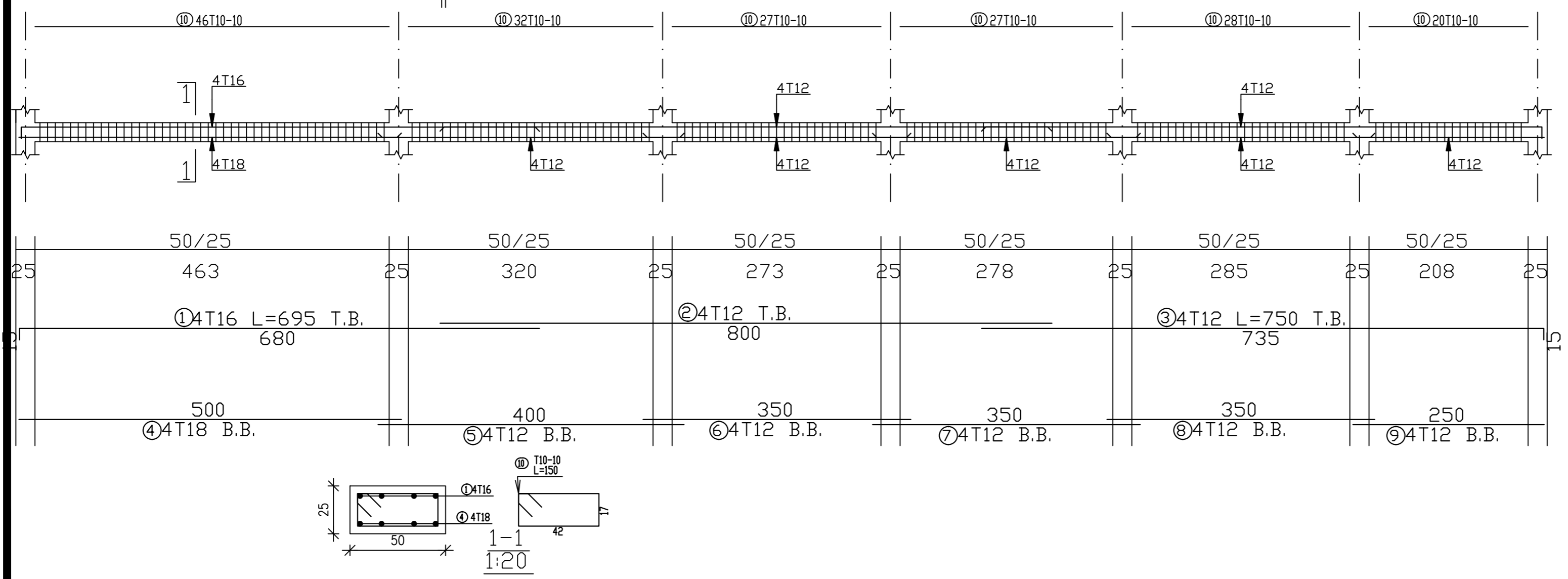
BEAM - B15 (25/40)

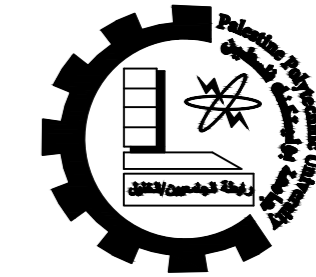


BEAM - B16 (50/25)

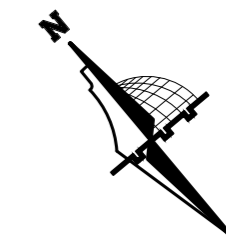


BEAM - B17 (50/25)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

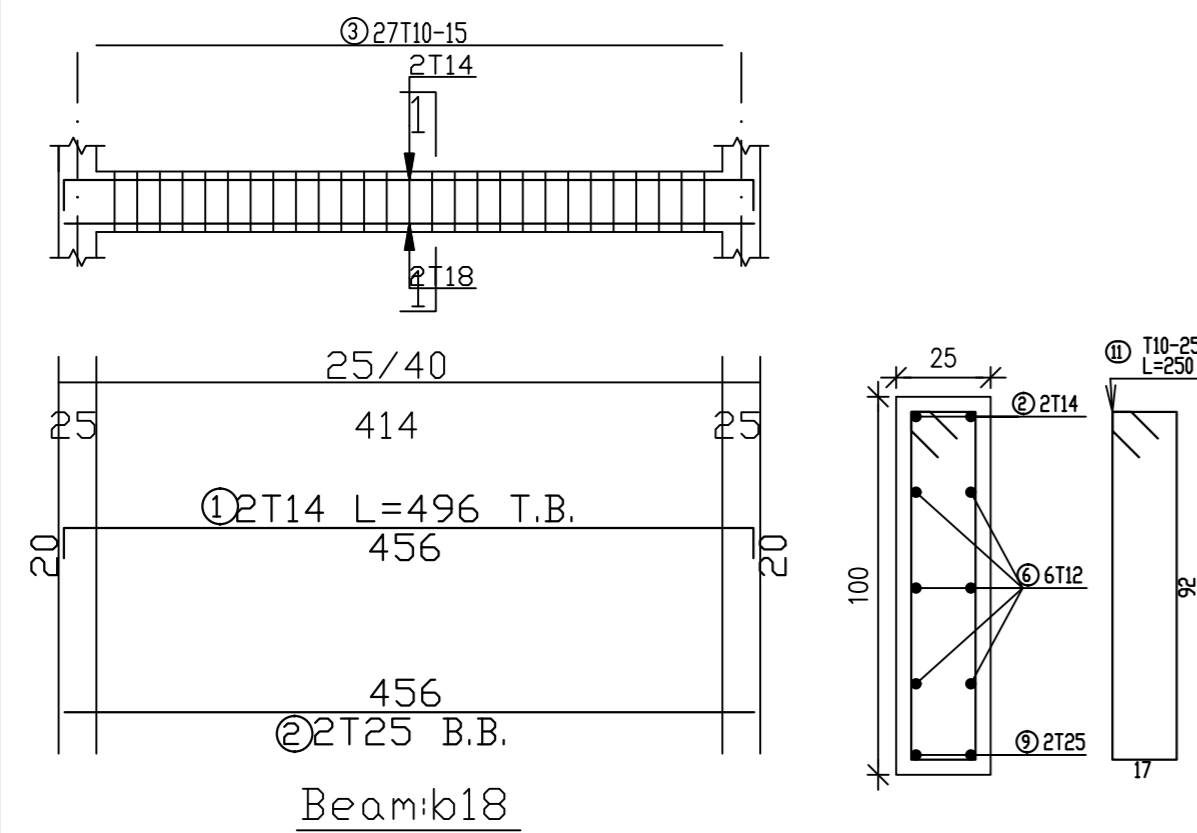
Drawing Title
 Beams ground & typical details

SCALE 1/100

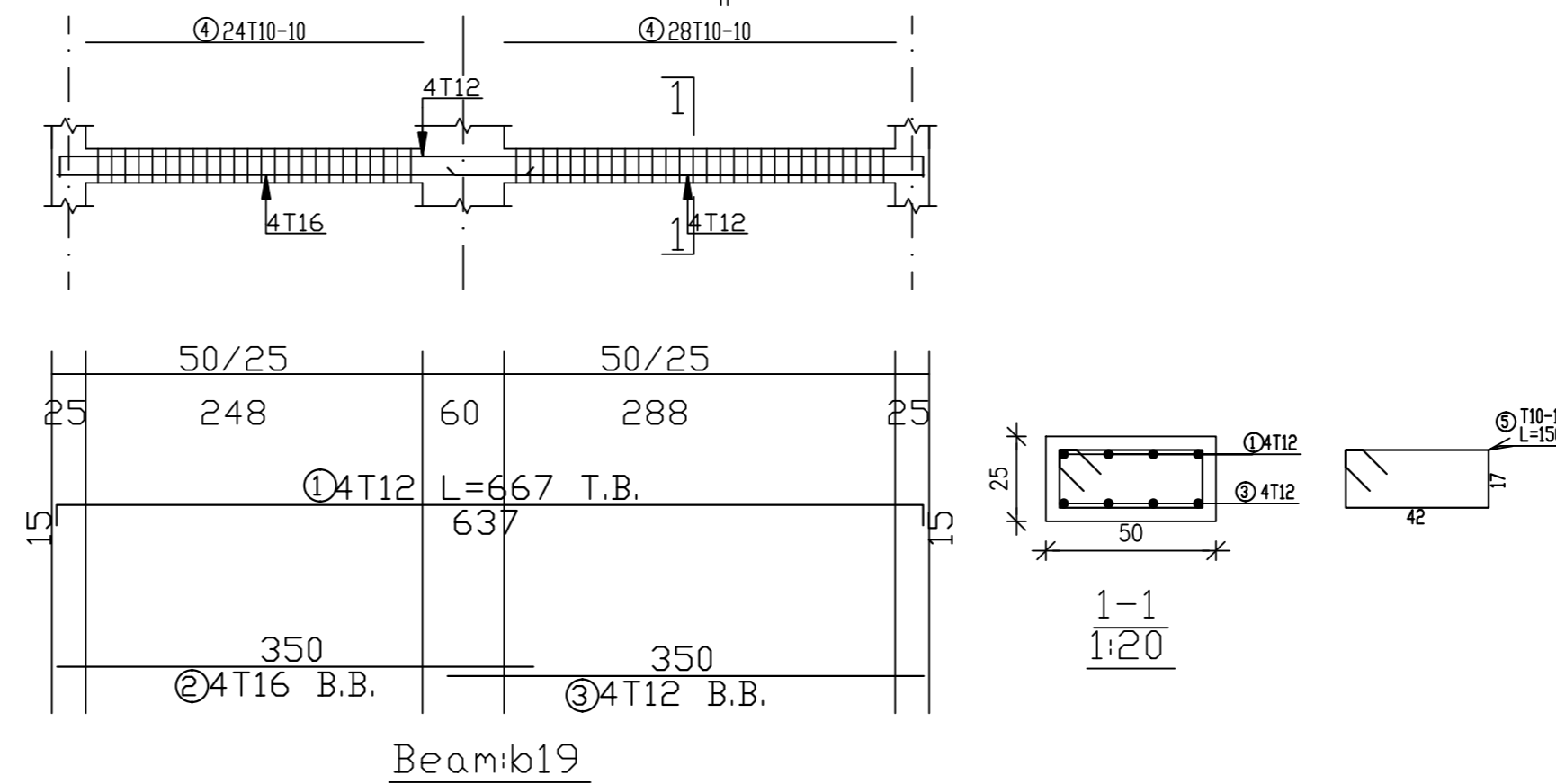
DRAW. NO. S29

2024

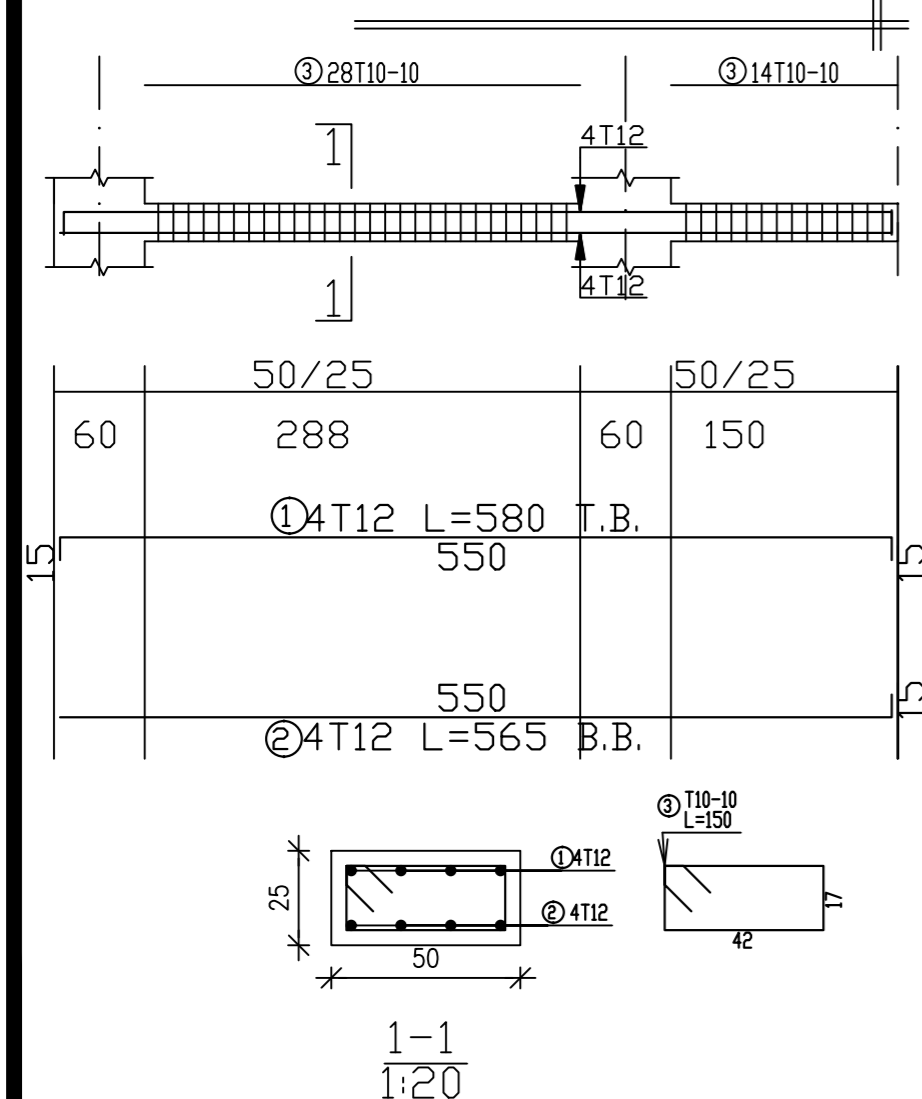
BEAM - B18 (25/40)

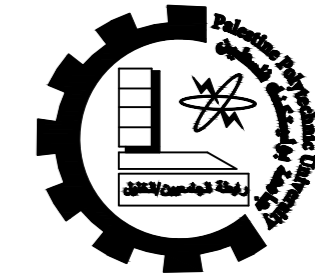


BEAM - B19 (50/25)

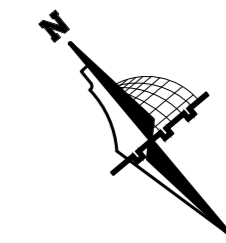


BEAM - B20 (50/25)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

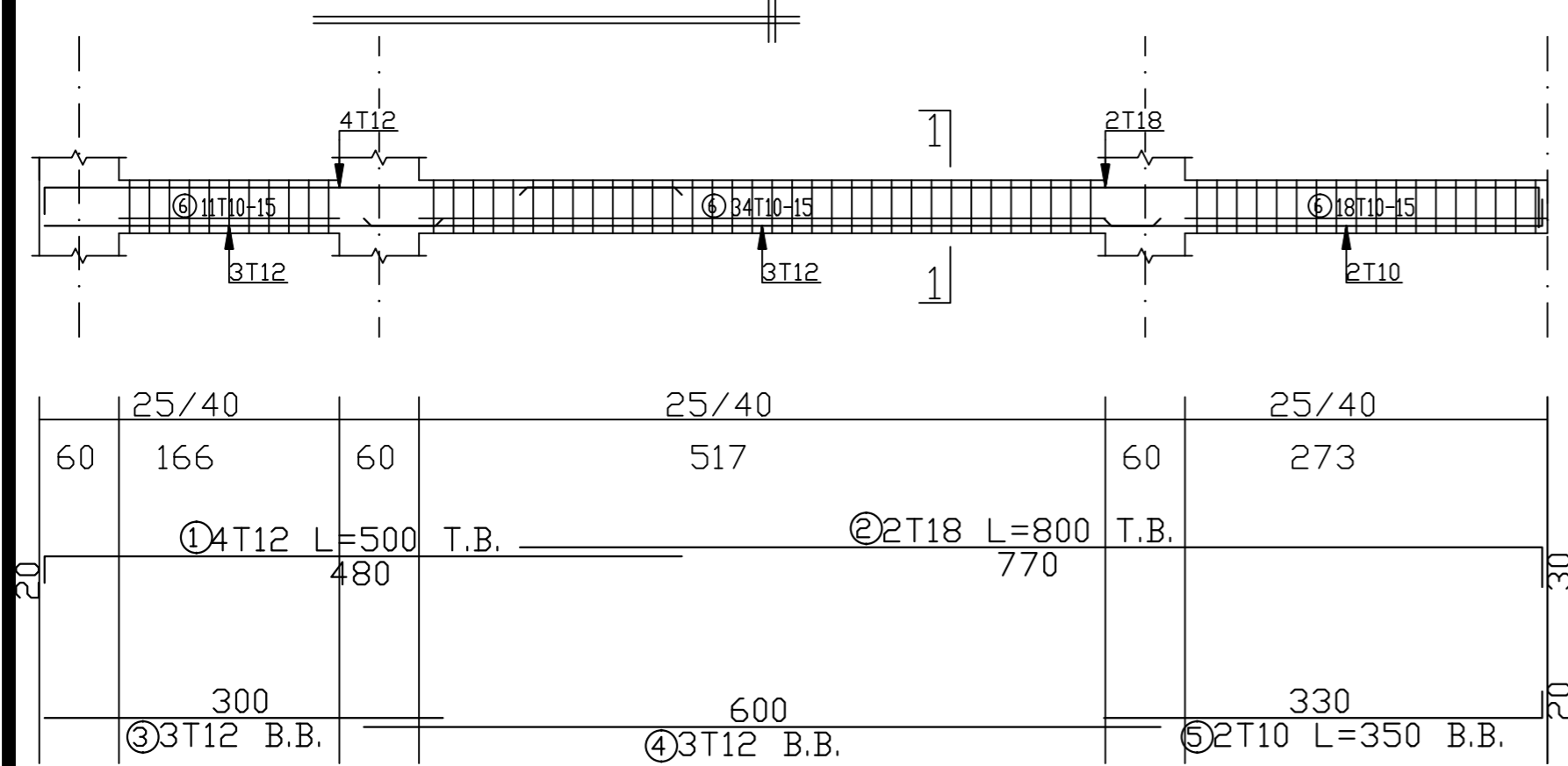
Drawing Title
 Beams ground & typical details

SCALE 1/100

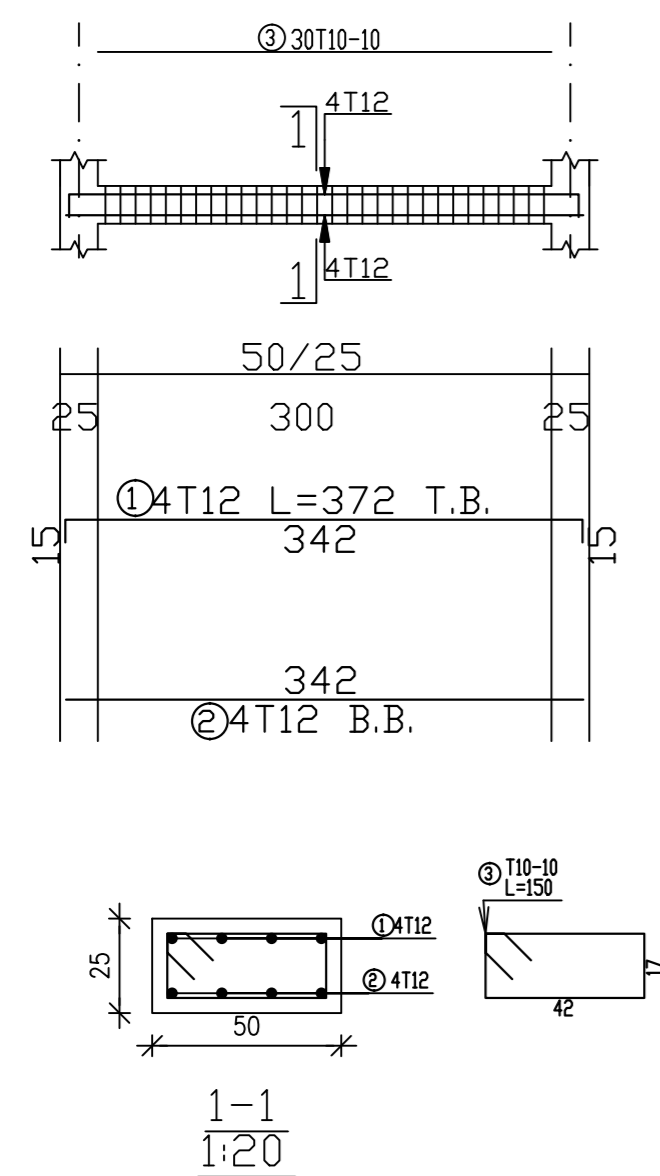
DRAW. NO. S30

2024

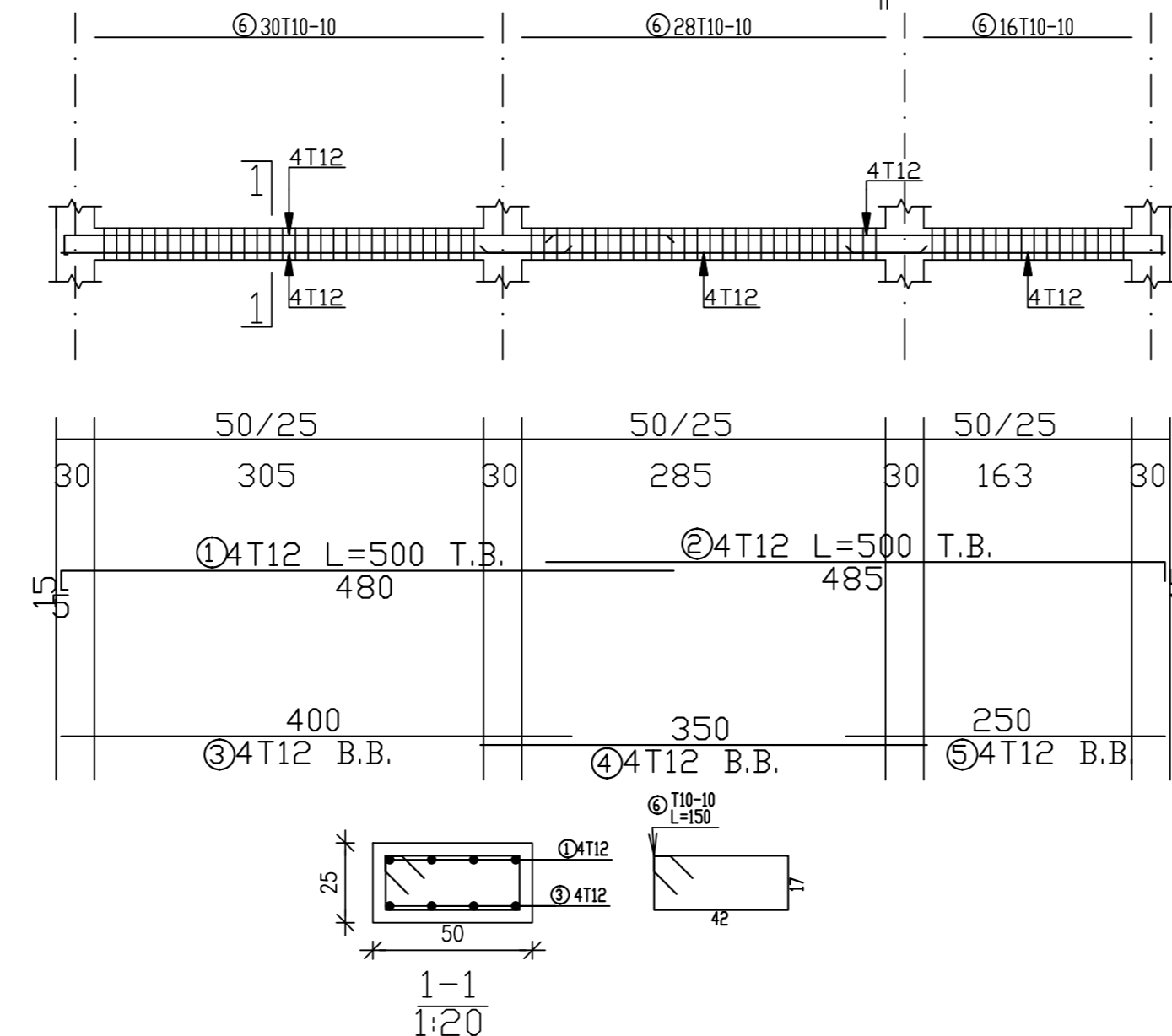
BEAM - B22 (25/40)

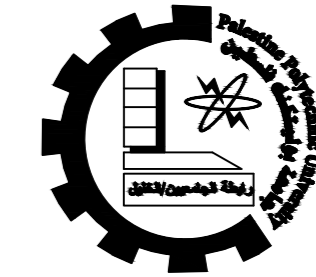


BEAM - B23 (50/25)

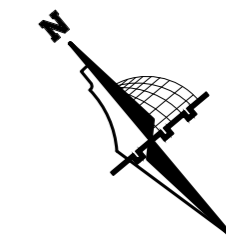


BEAM - B24 (50/25)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

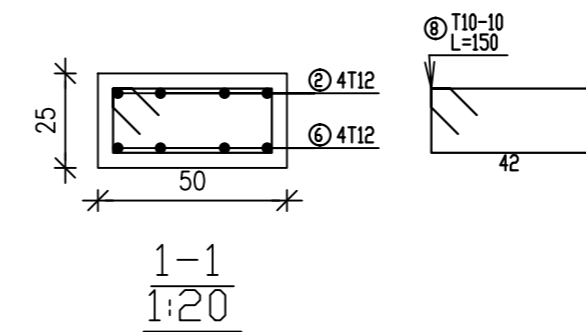
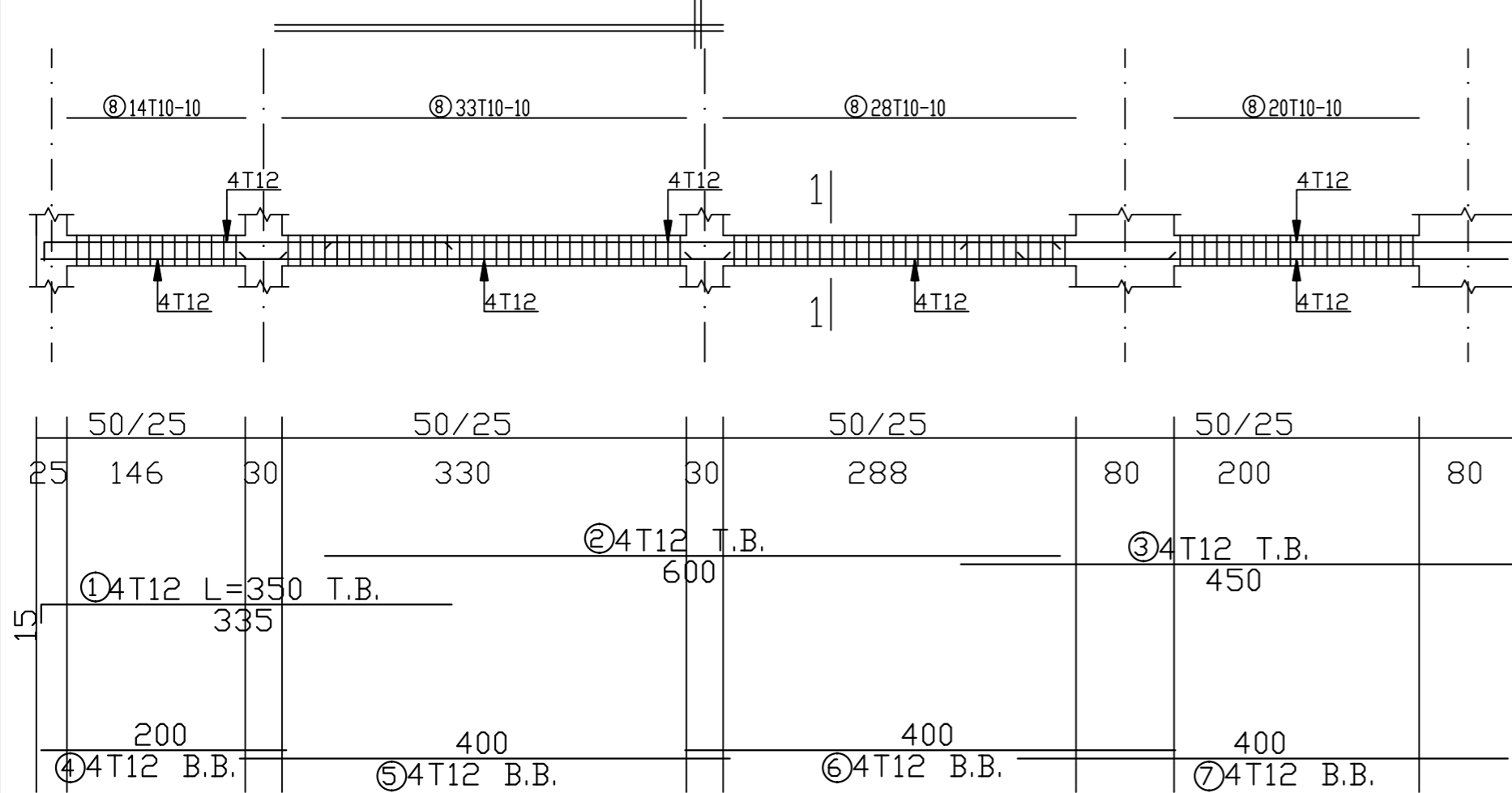
Drawing Title
 Beams ground & typical details

SCALE 1/100

DRAW. NO. S31

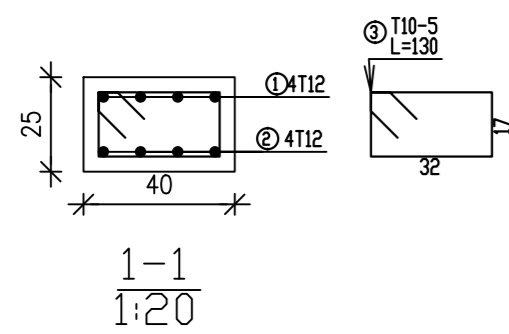
2024

BEAM - B25 (50/25)

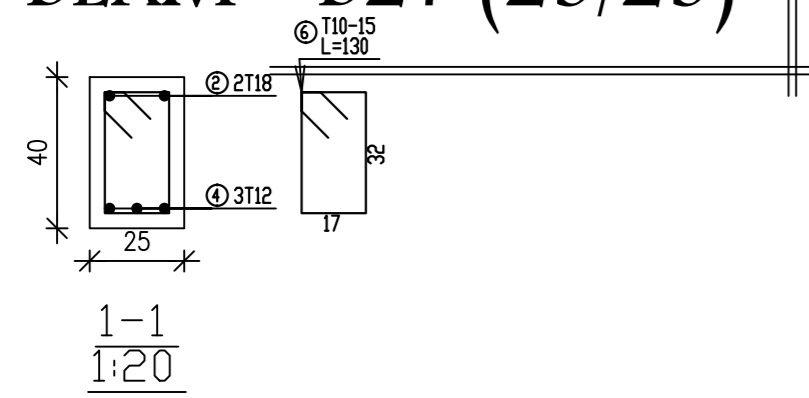


BEAM - B26 (50/25)

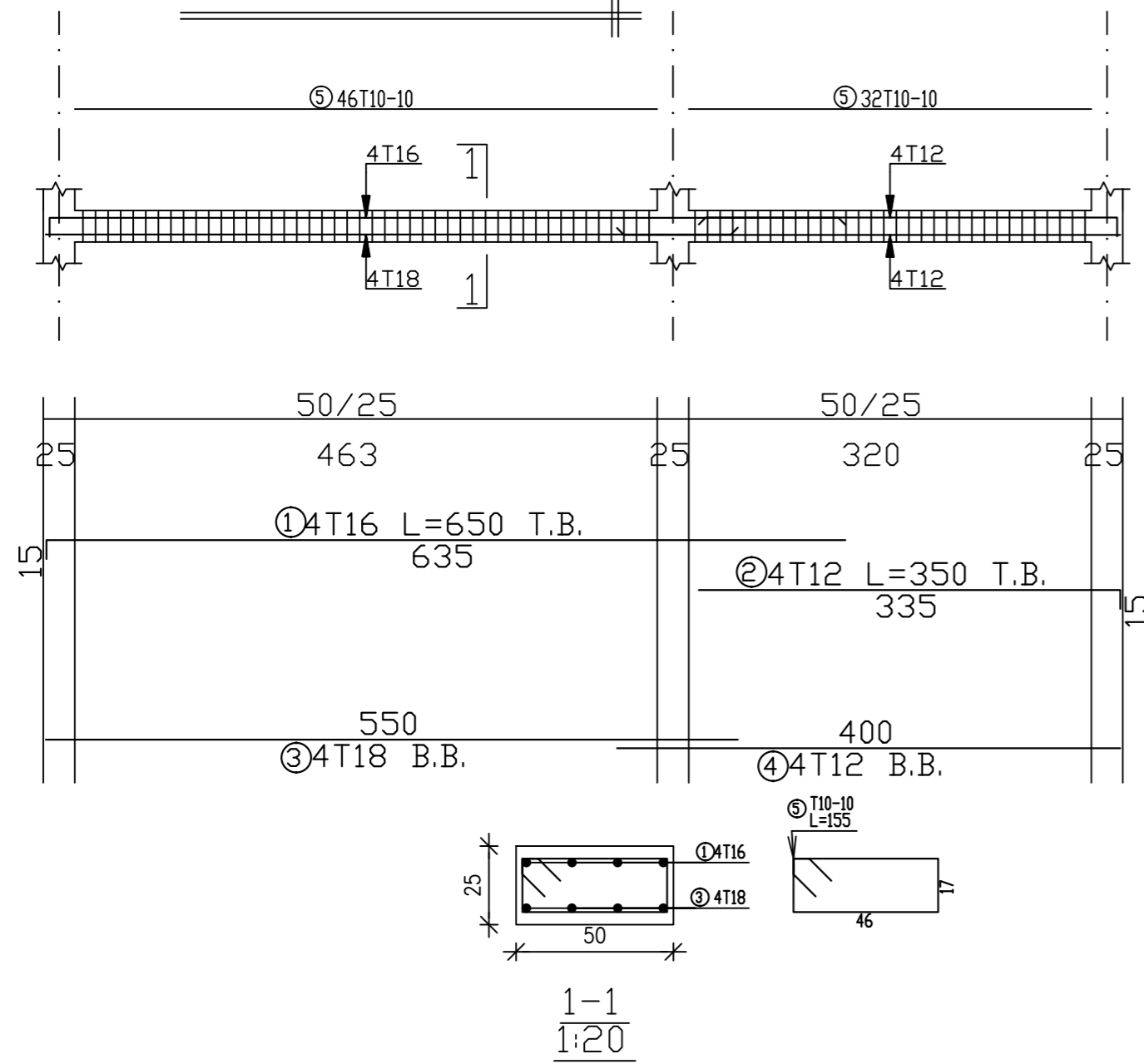
Beam: b26



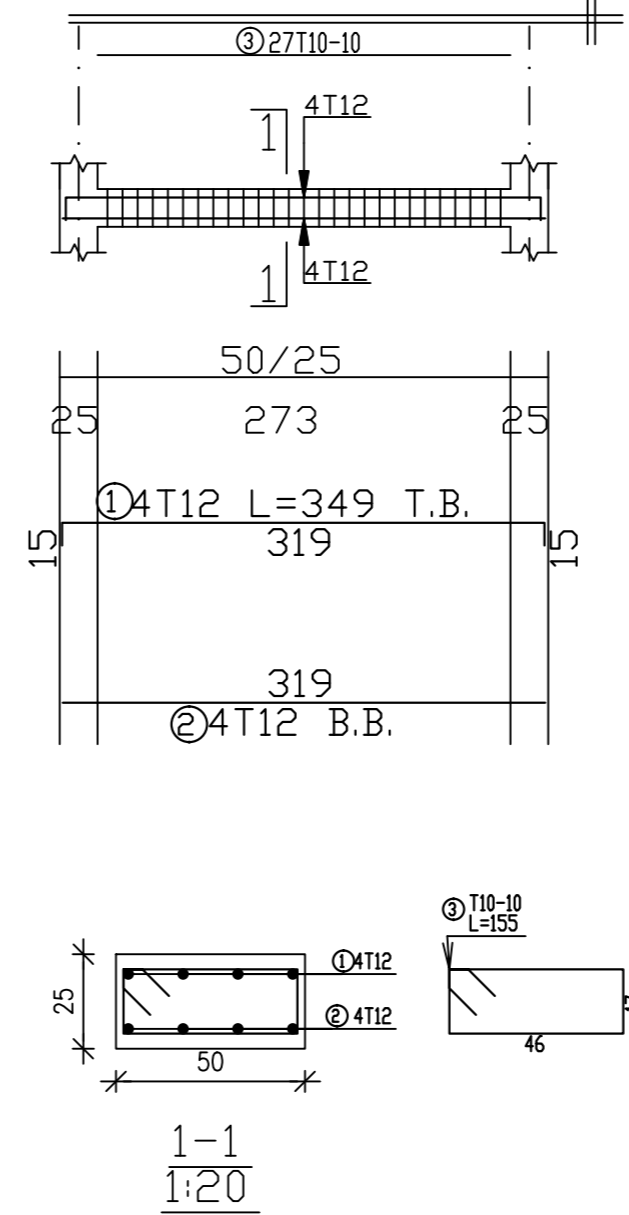
BEAM - B27 (25/25)



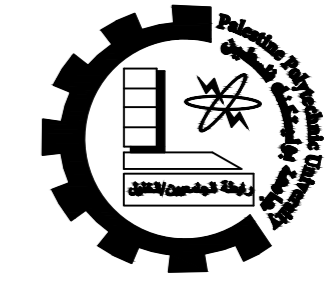
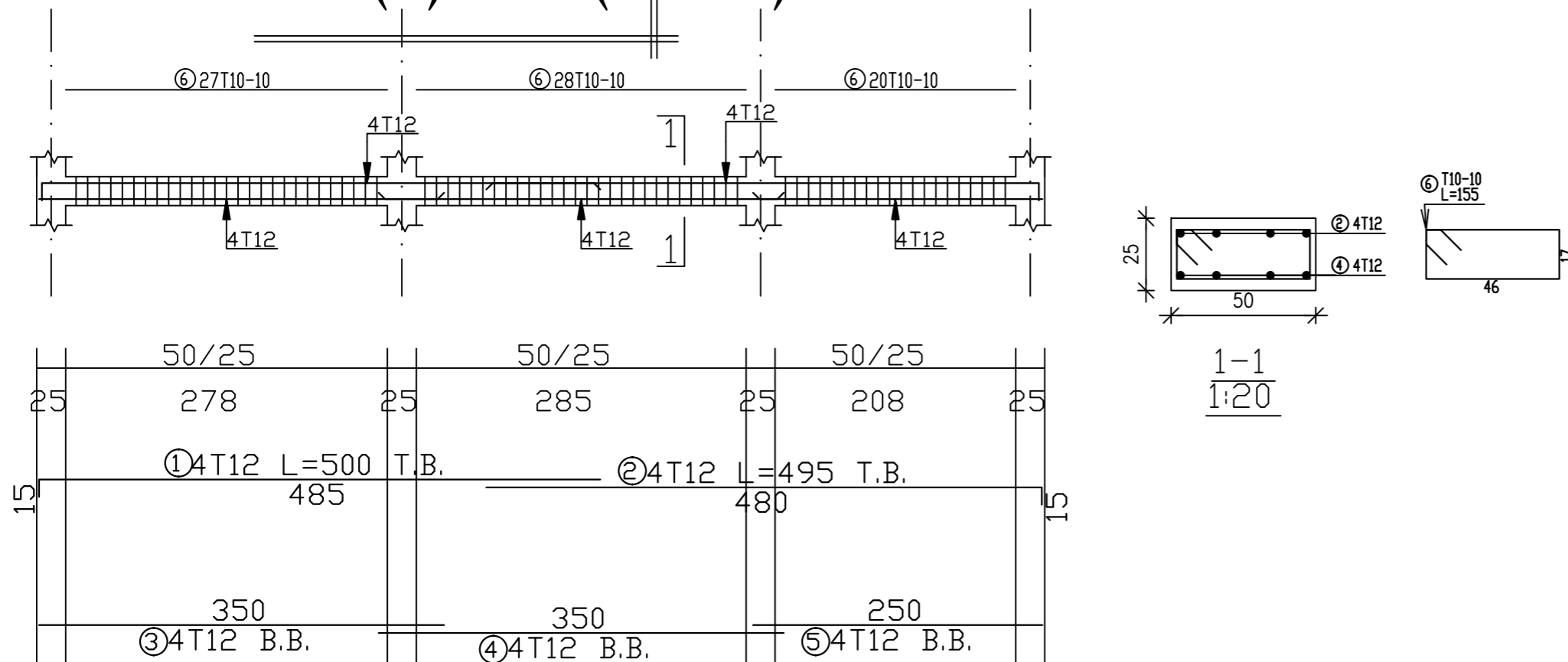
BEAM - B17(1) First (50/25)



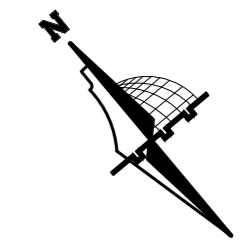
BEAM - B17(2) First (50/25)



BEAM - B17(3) First (50/25)



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

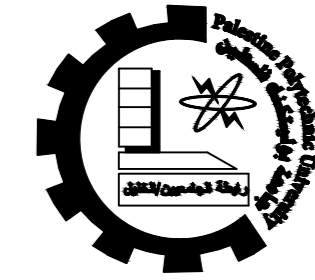
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
Beams ground & typical details

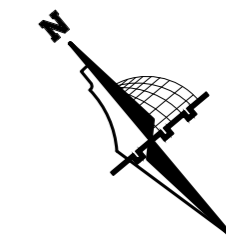
SCALE 1/100

DRAW. NO. S32

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

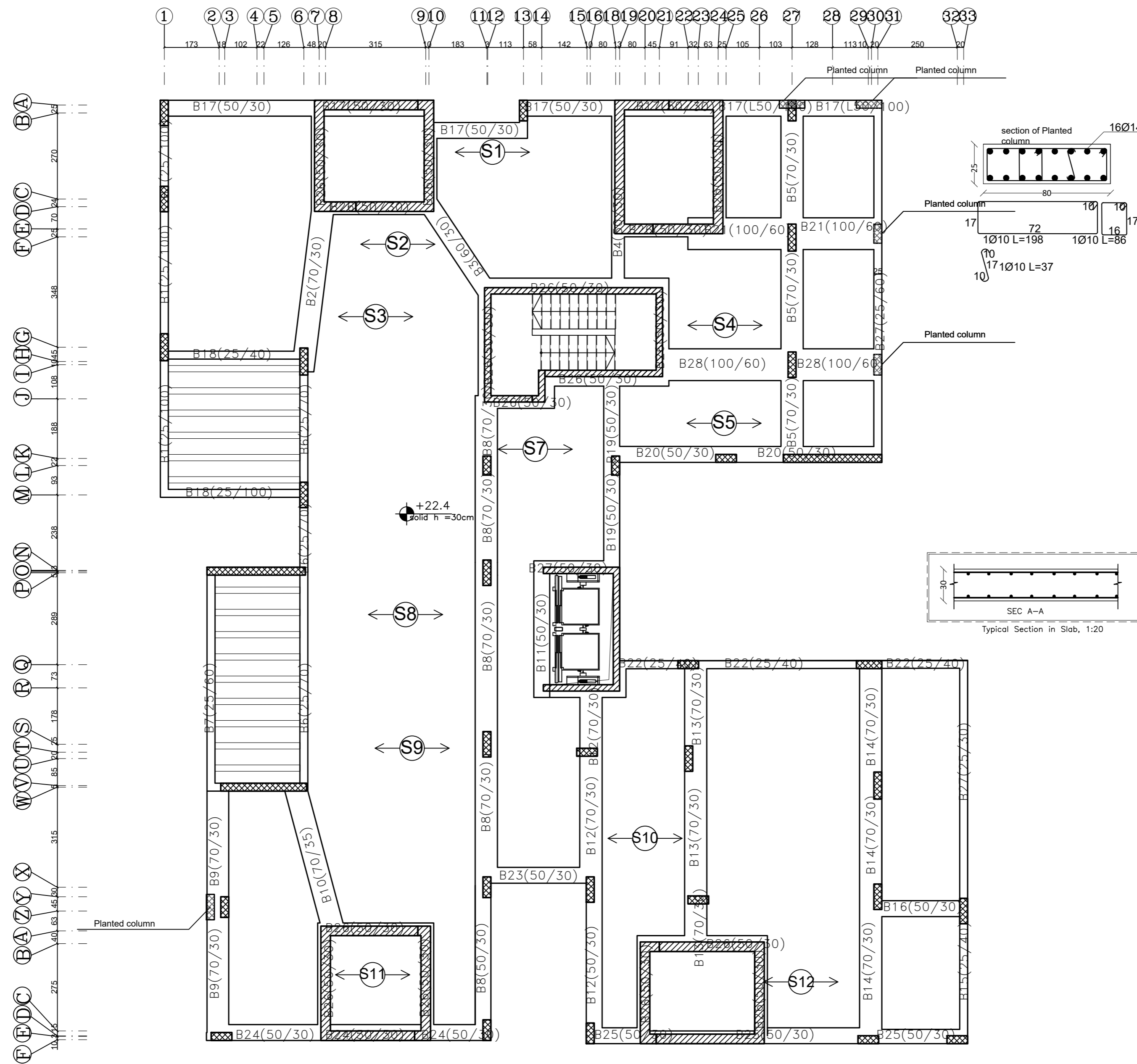
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

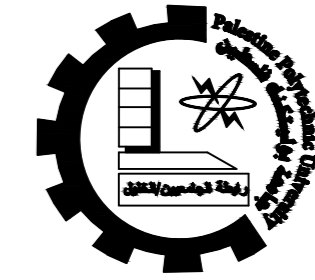
Drawing Title
 Sixth FLOOR
 slab layout

SCALE 1/100

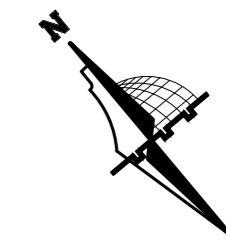
DRAW. NO. S34

2024





Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design of a Residential complex"

Supervisor
Dr. Belal Almasre

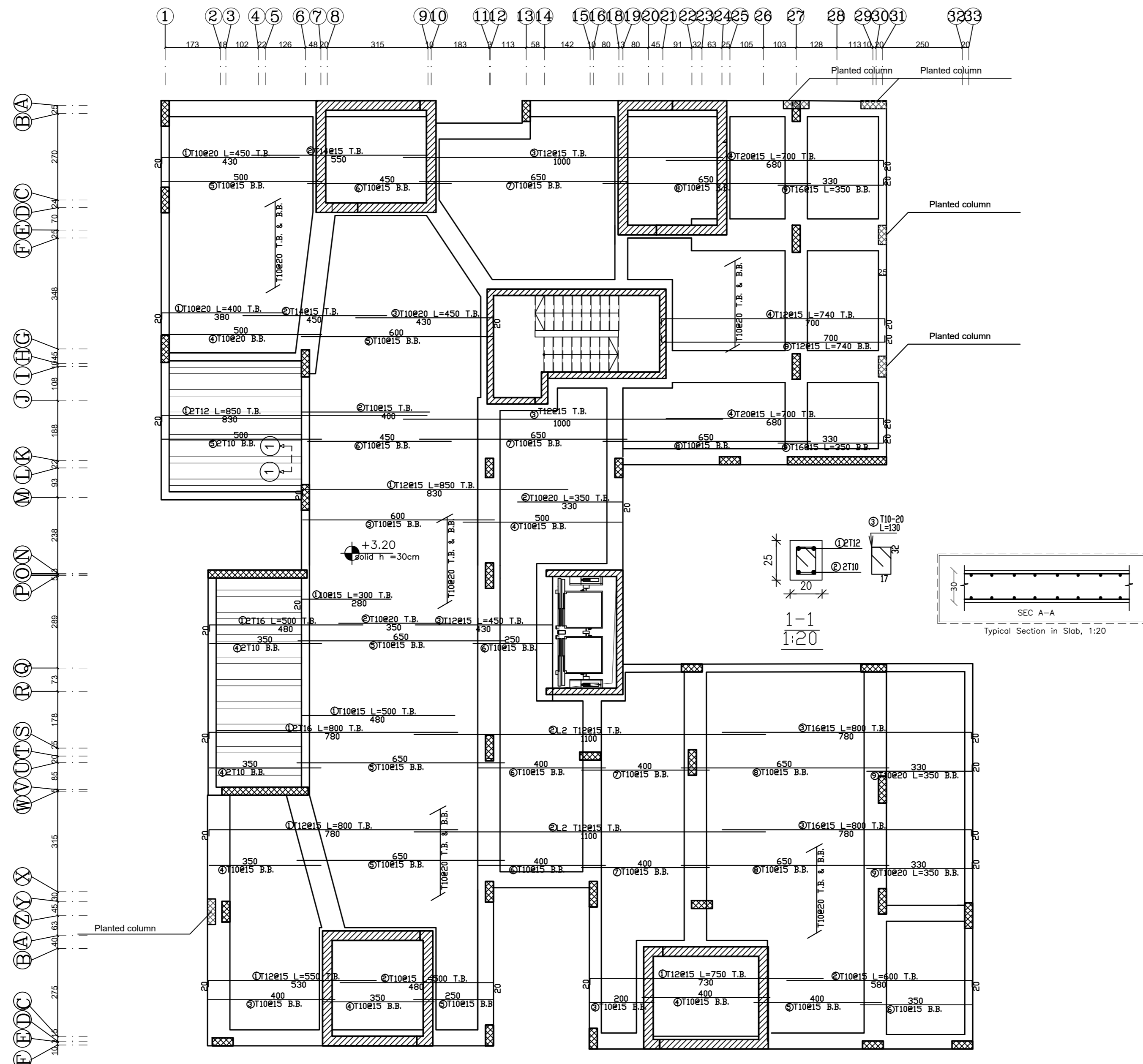
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

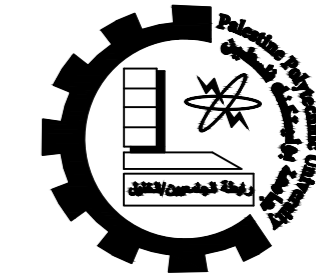
Drawing Title
Sixth FLOOR
slab details

SCALE 1/100

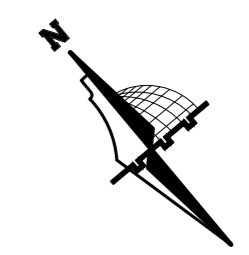
DRAW. NO. S35

2024





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

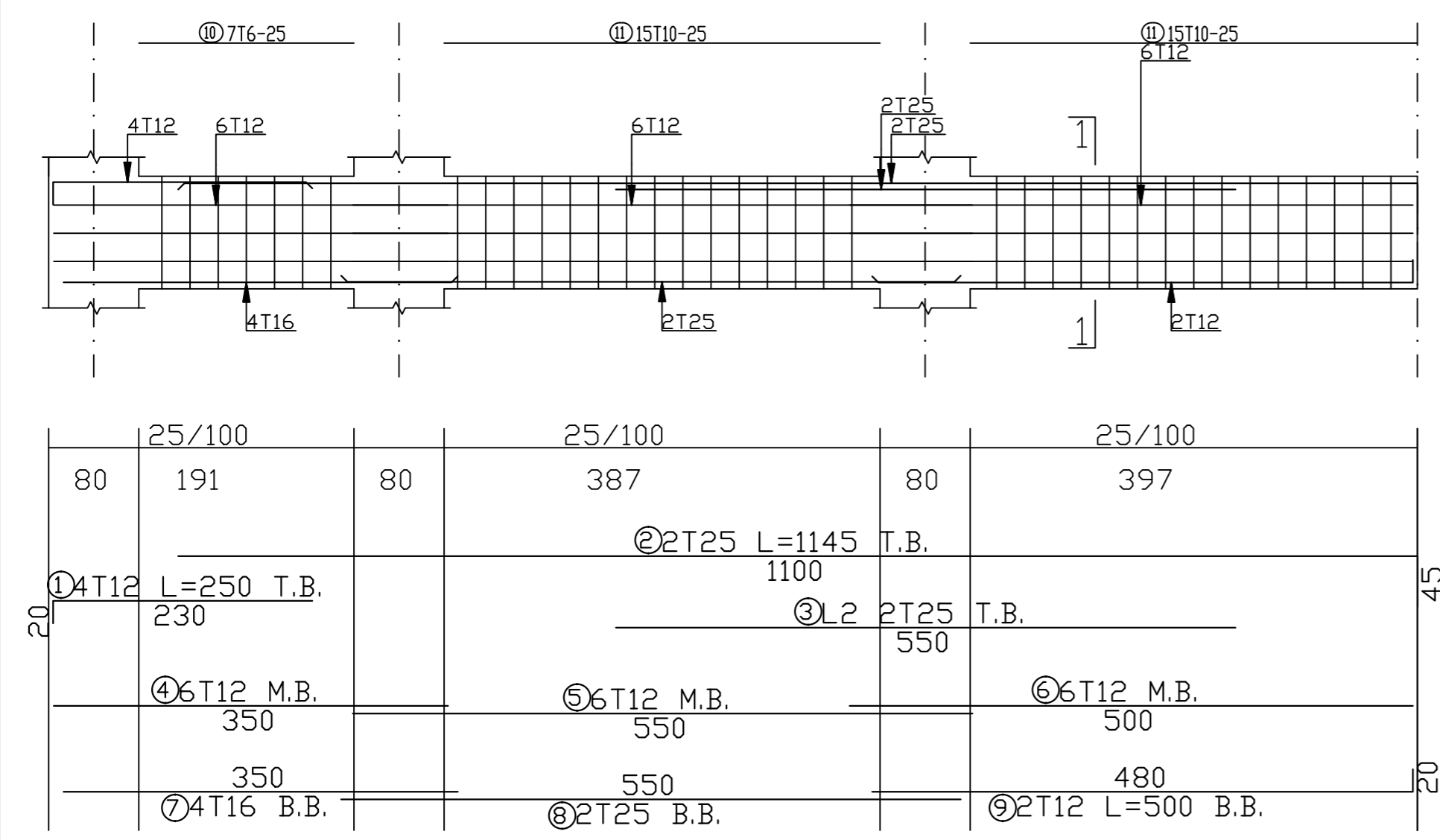
Drawing Title
 sixth Beams details

SCALE 1/100

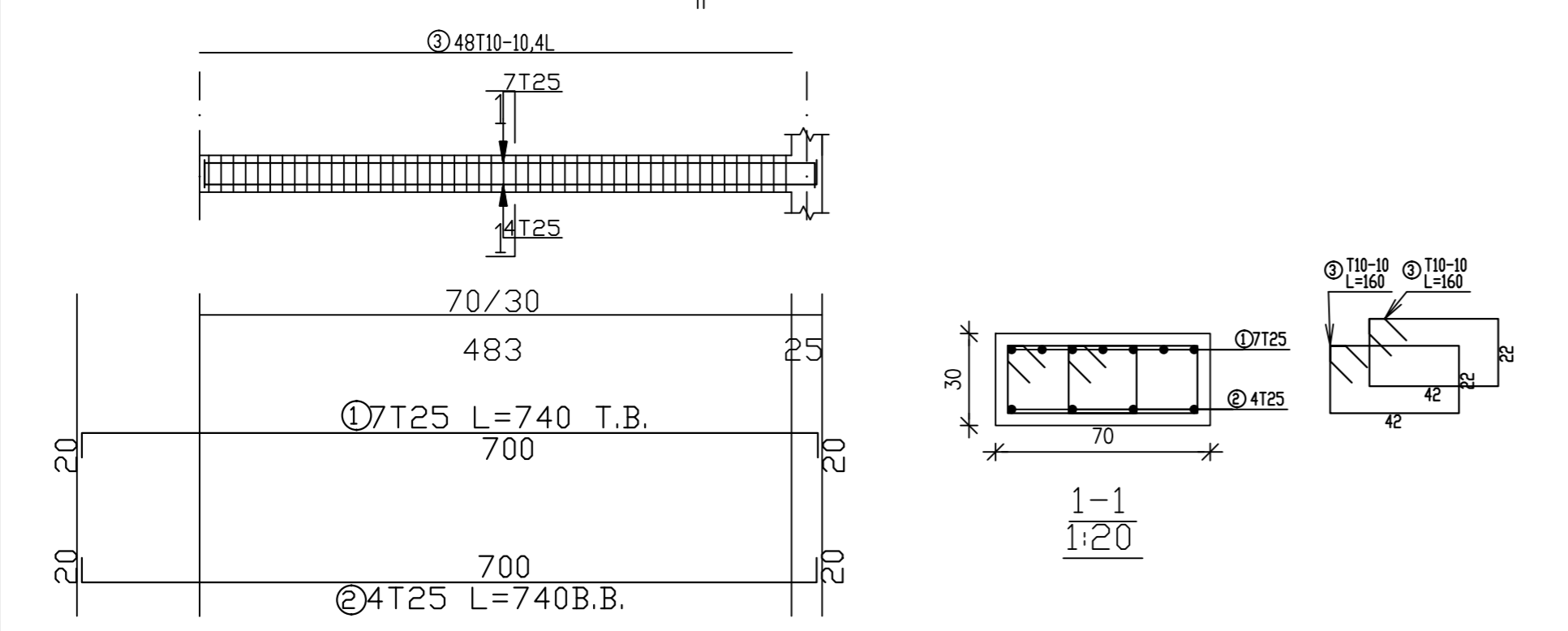
DRAW. NO. S36

2024

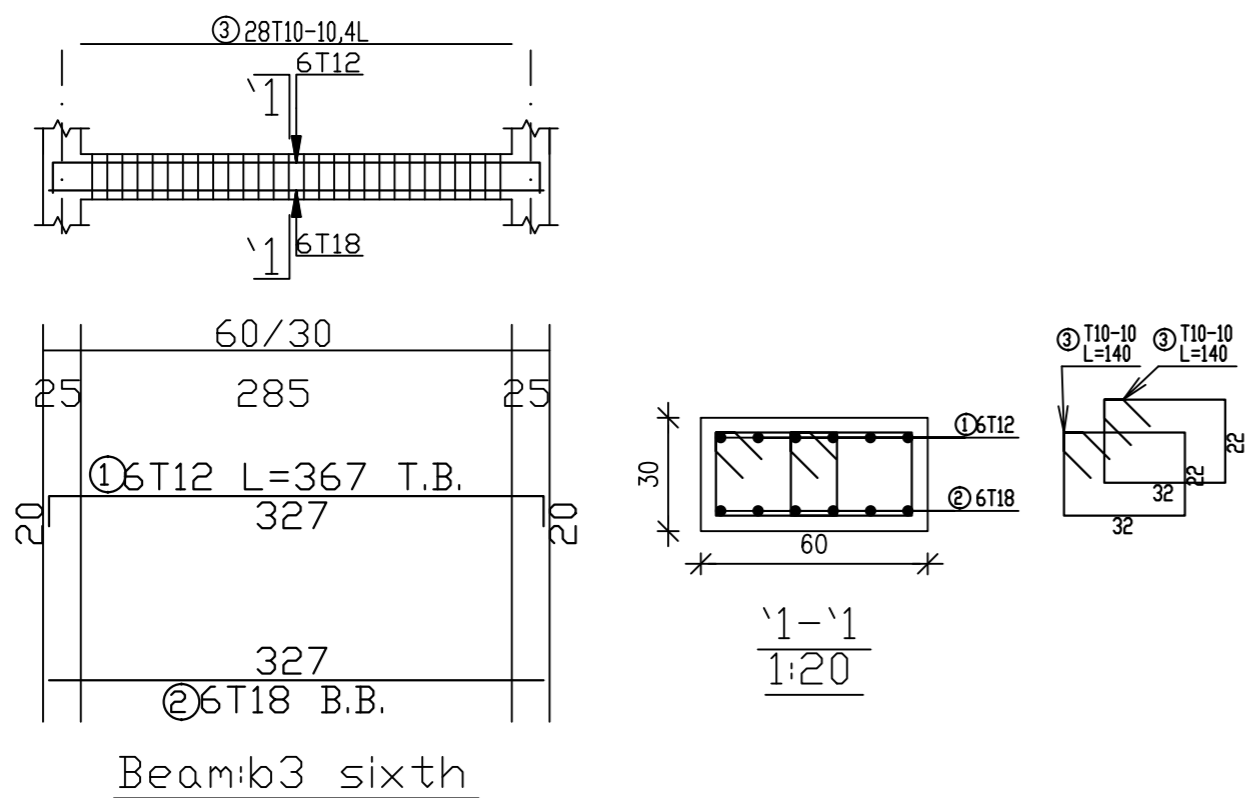
BEAM - B1 (25/100)



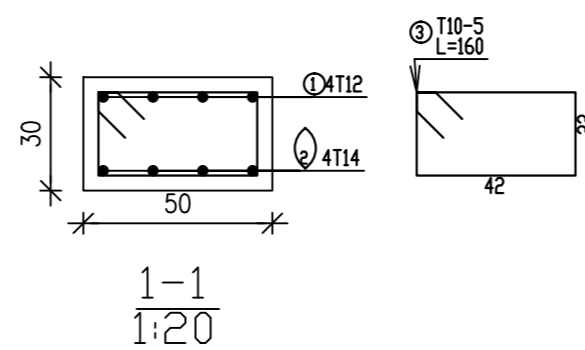
BEAM - B2 (70/30)



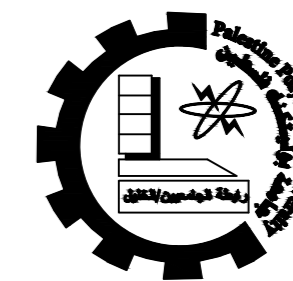
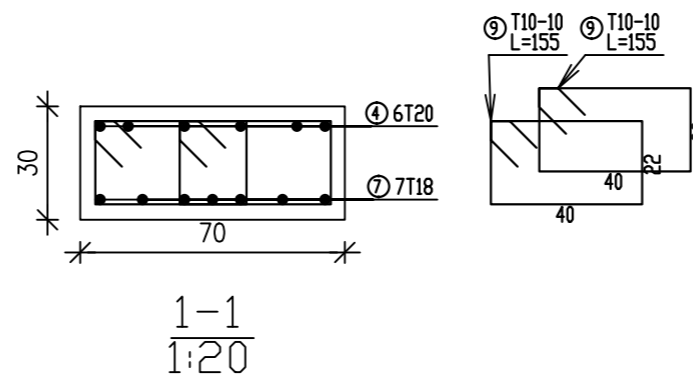
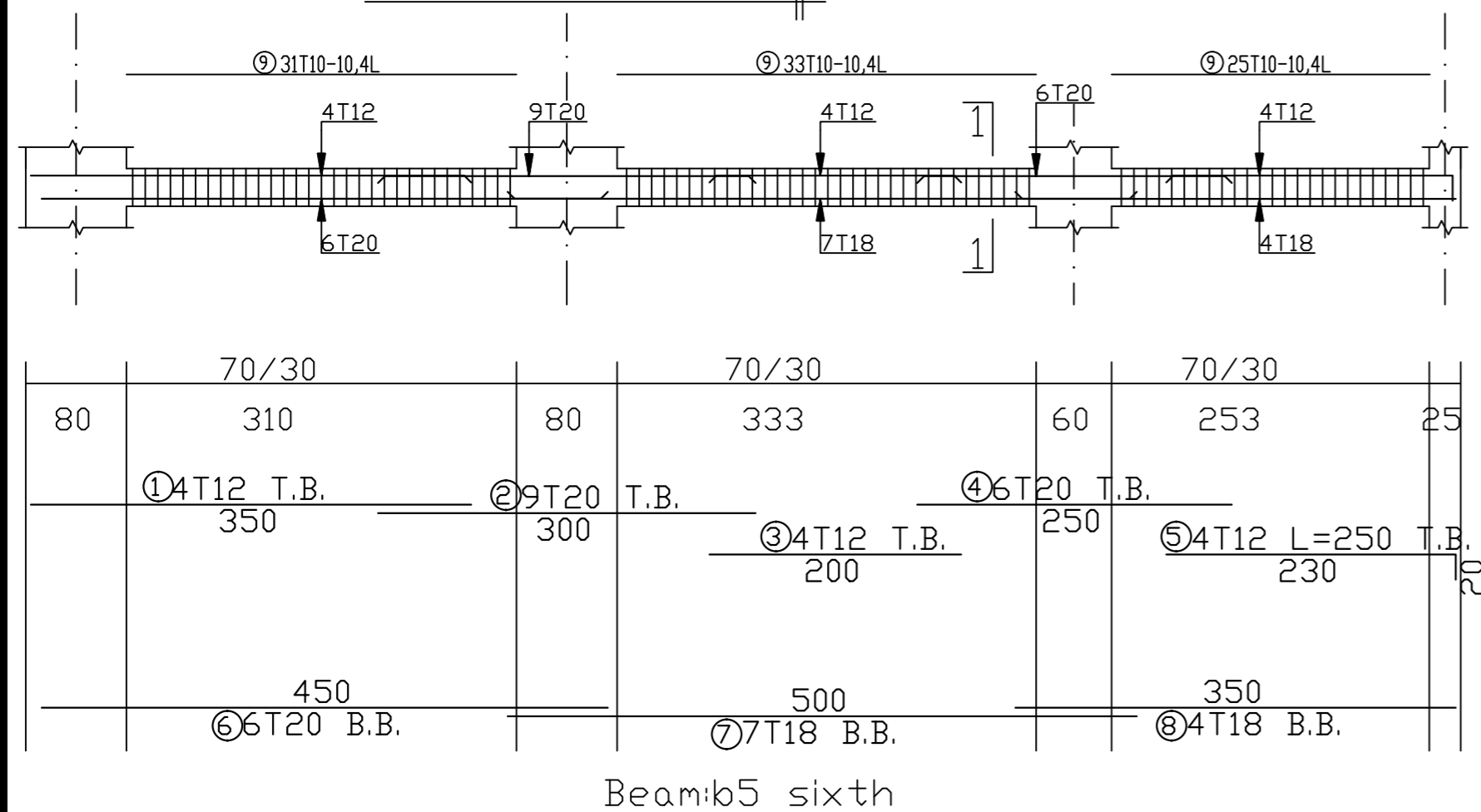
BEAM - B3 (60/30)



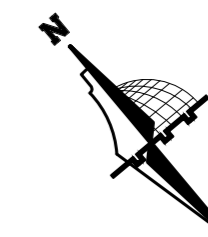
BEAM - B4 (50/25)



BEAM - B5 (70/30)



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr.Belal Almasre

Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

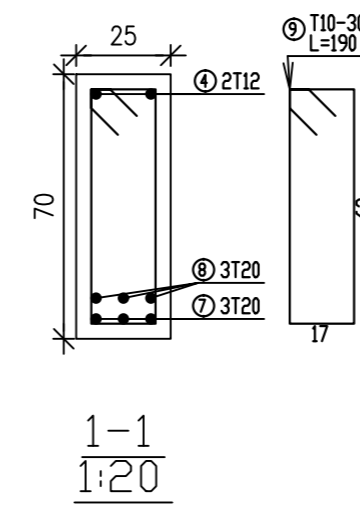
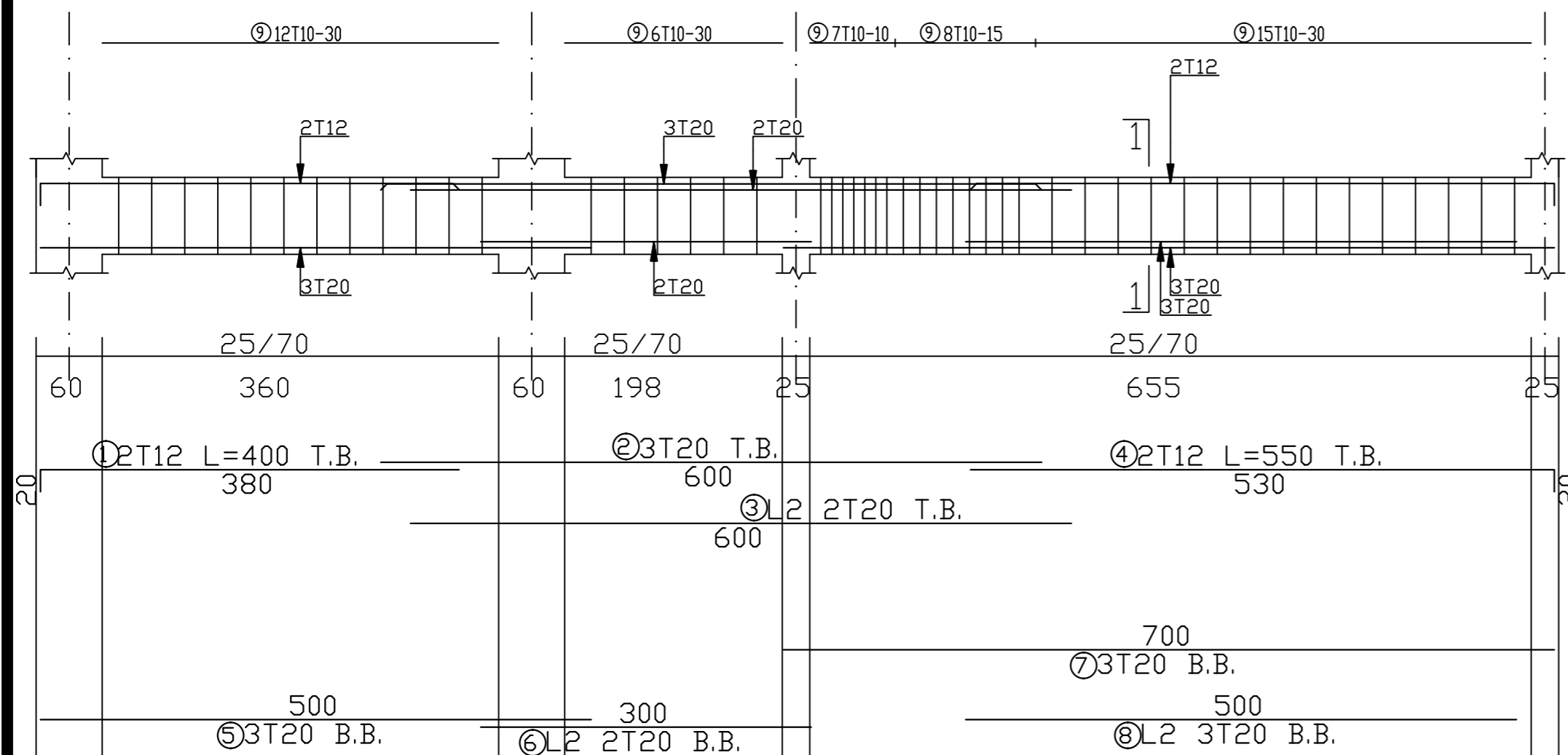
Drawing Title
sixth Beams details

SCALE 1/100

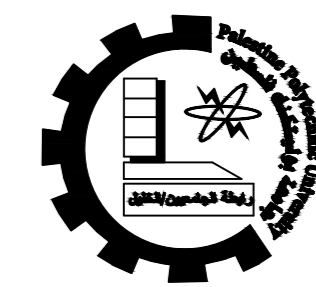
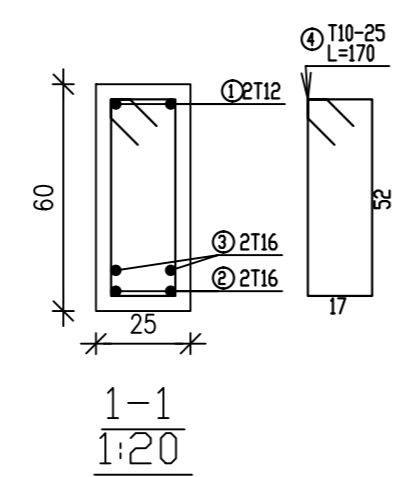
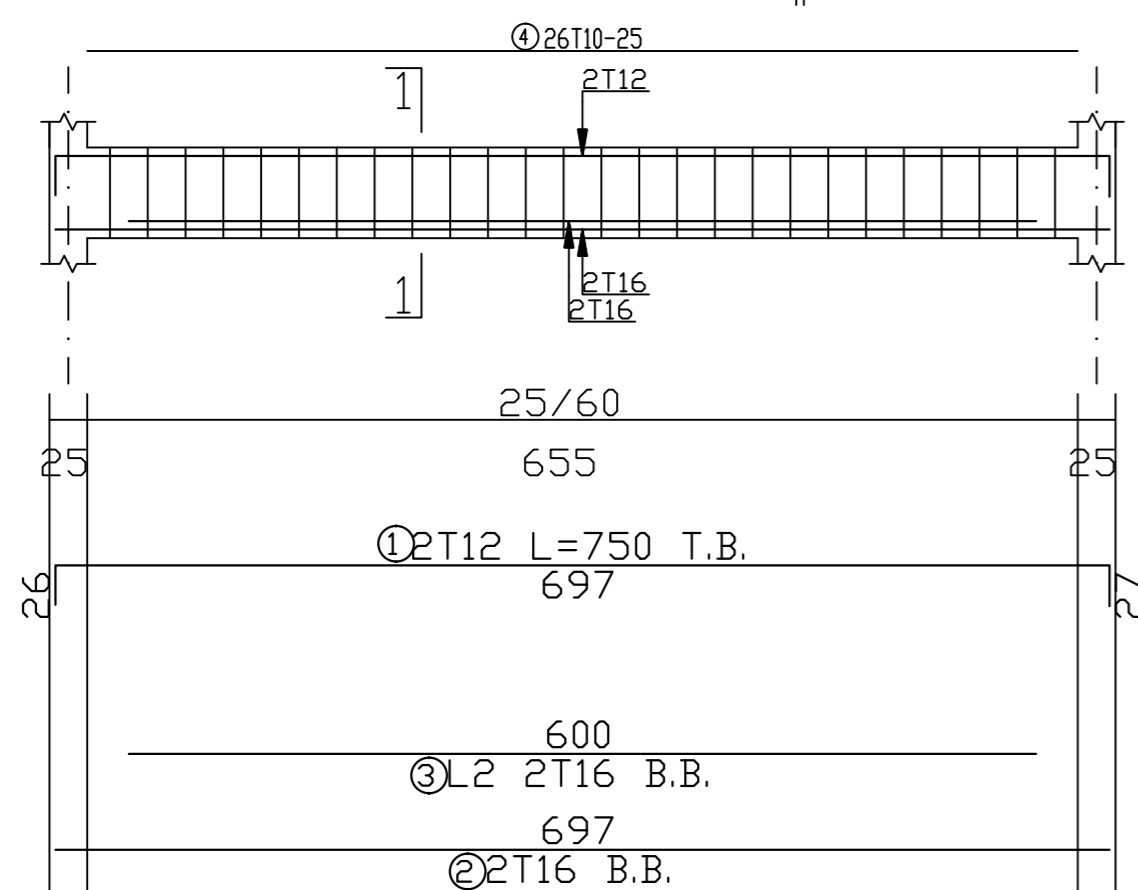
DRAW. NO. S38

2024

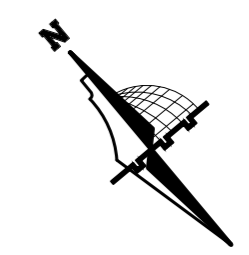
BEAM - B6 (25/70)



BEAM - B7 (25/60)



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

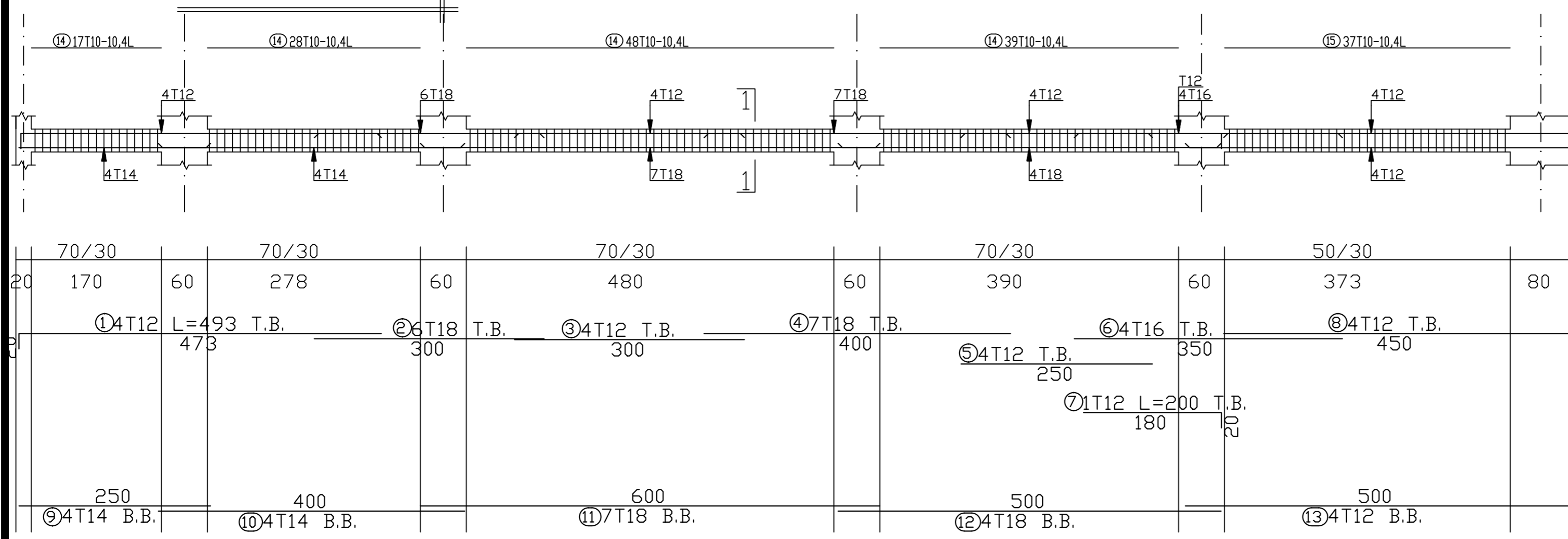
Drawing Title
 sixth Beams details

SCALE 1/100

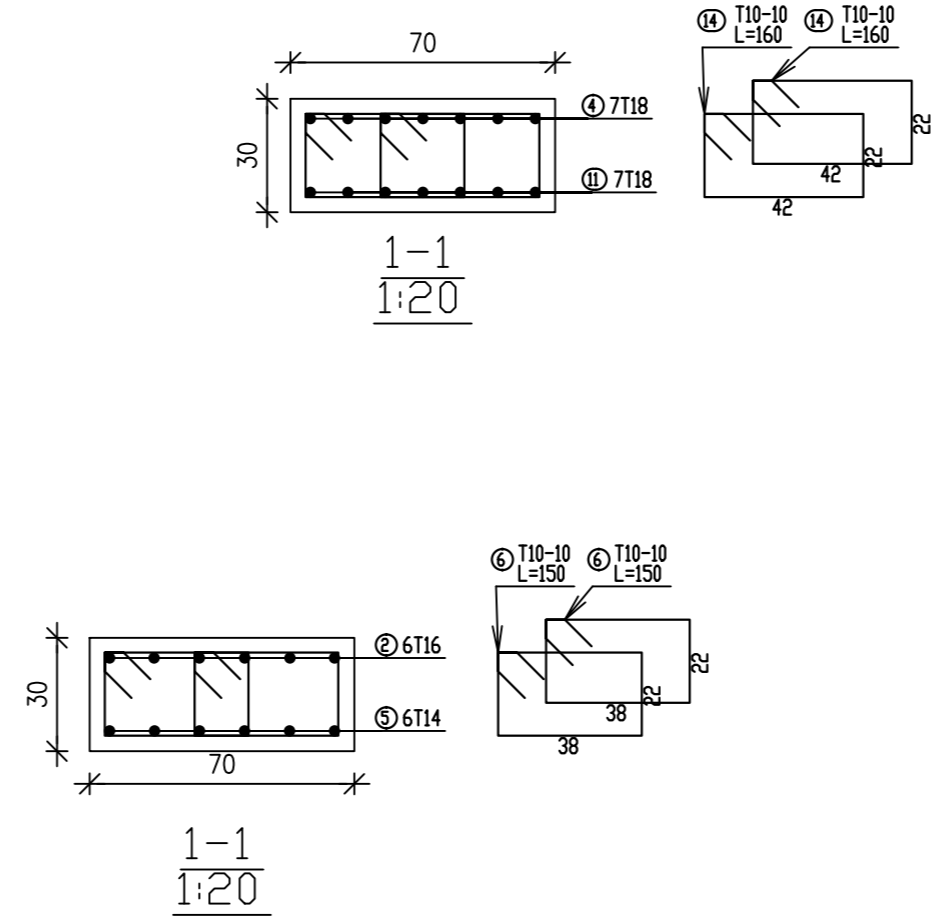
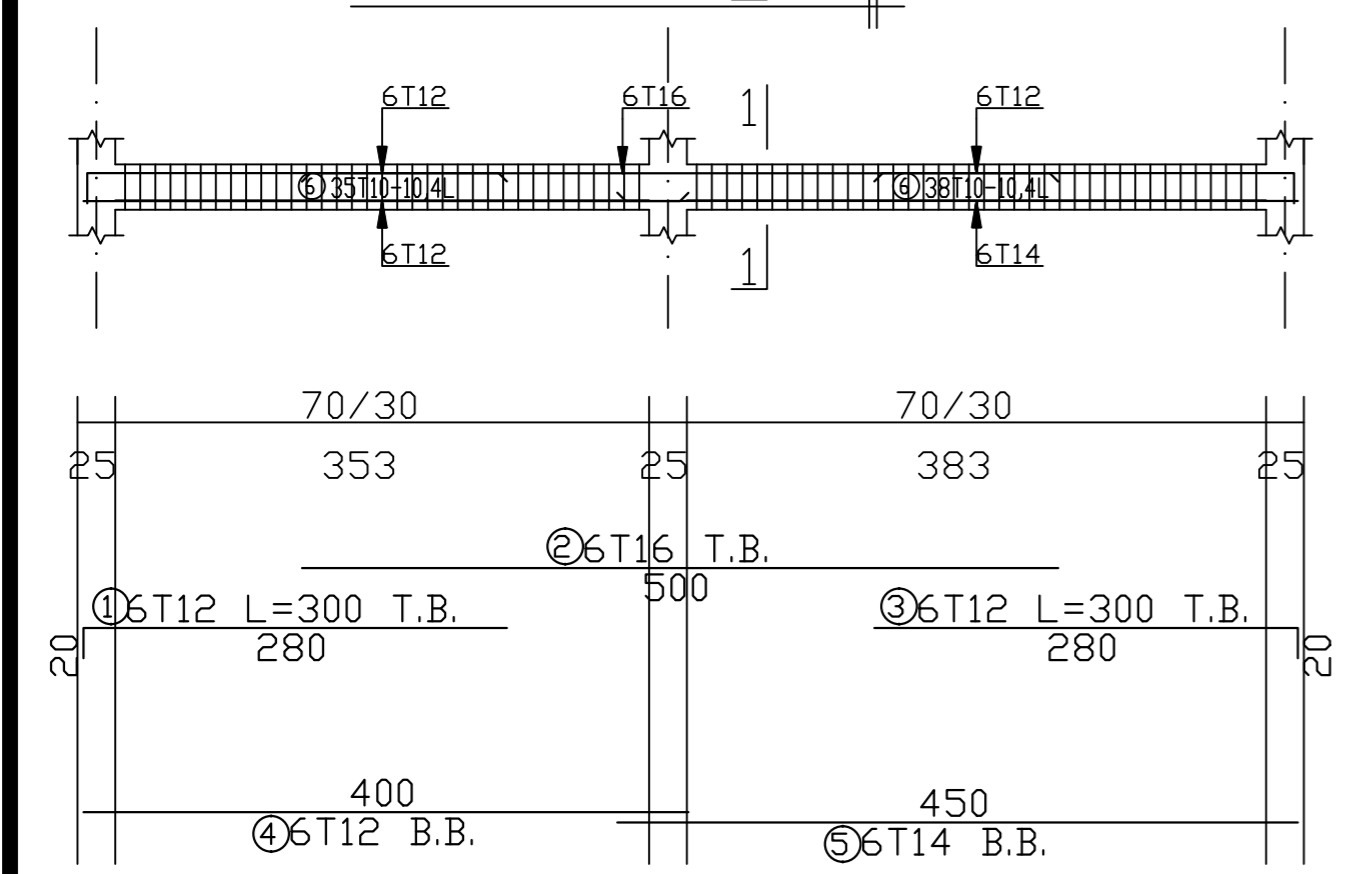
DRAW. NO. S39

2024

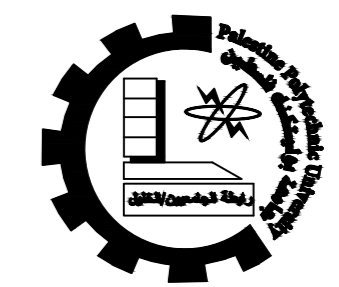
BEAM - B8 (70/30)



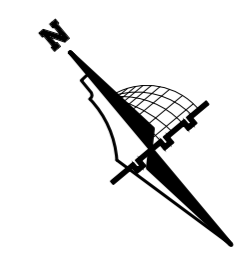
BEAM - B9 (70/30)



Beam:b9 SIXTH



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr.Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

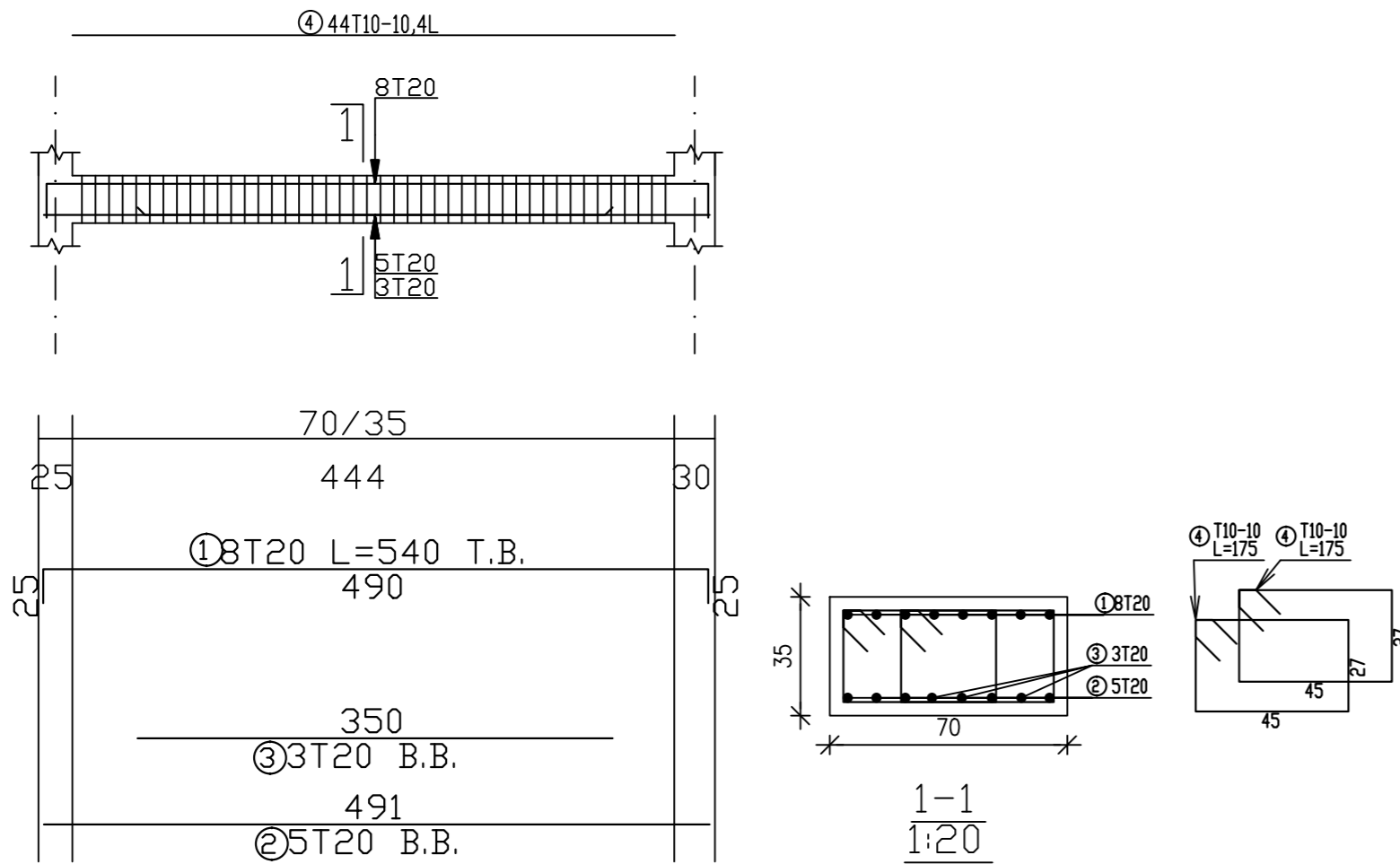
Drawing Title
 sixth Beams details

SCALE 1/100

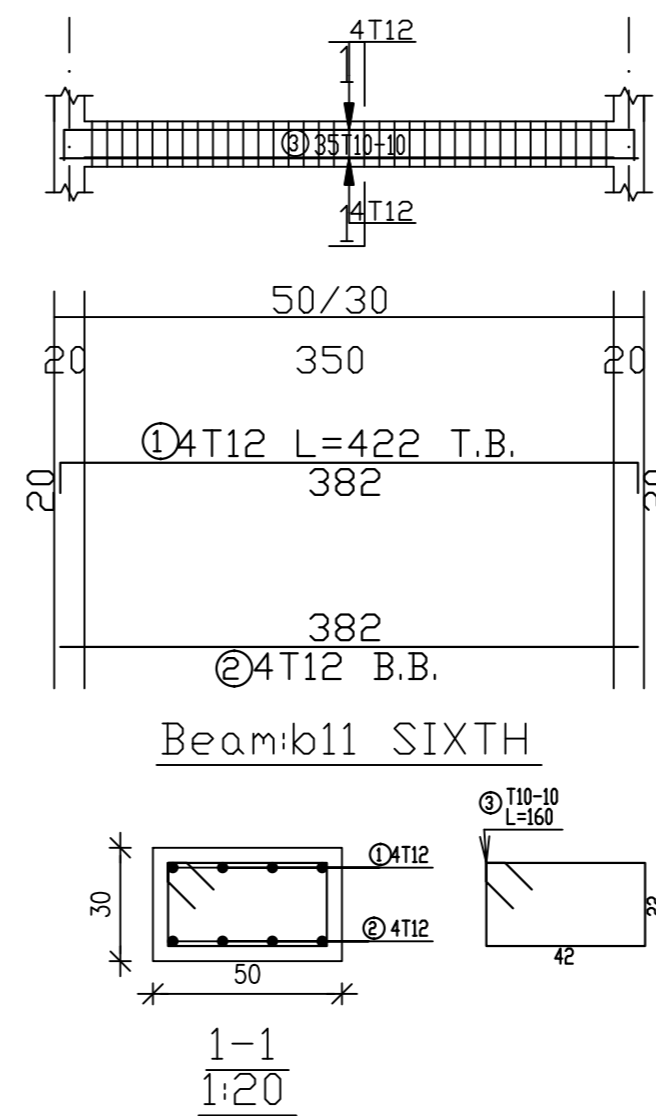
DRAW. NO. S40

2024

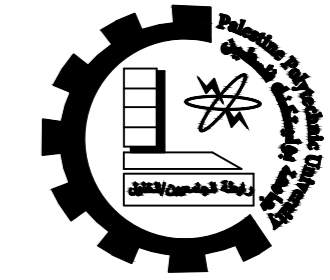
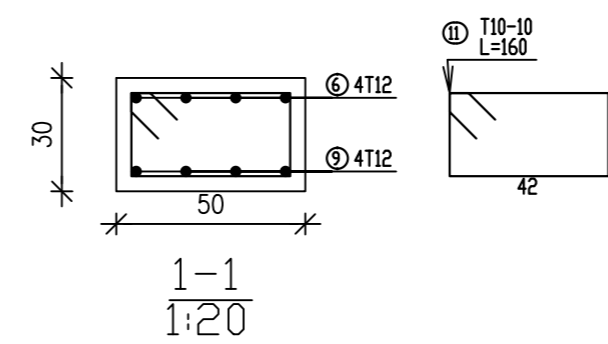
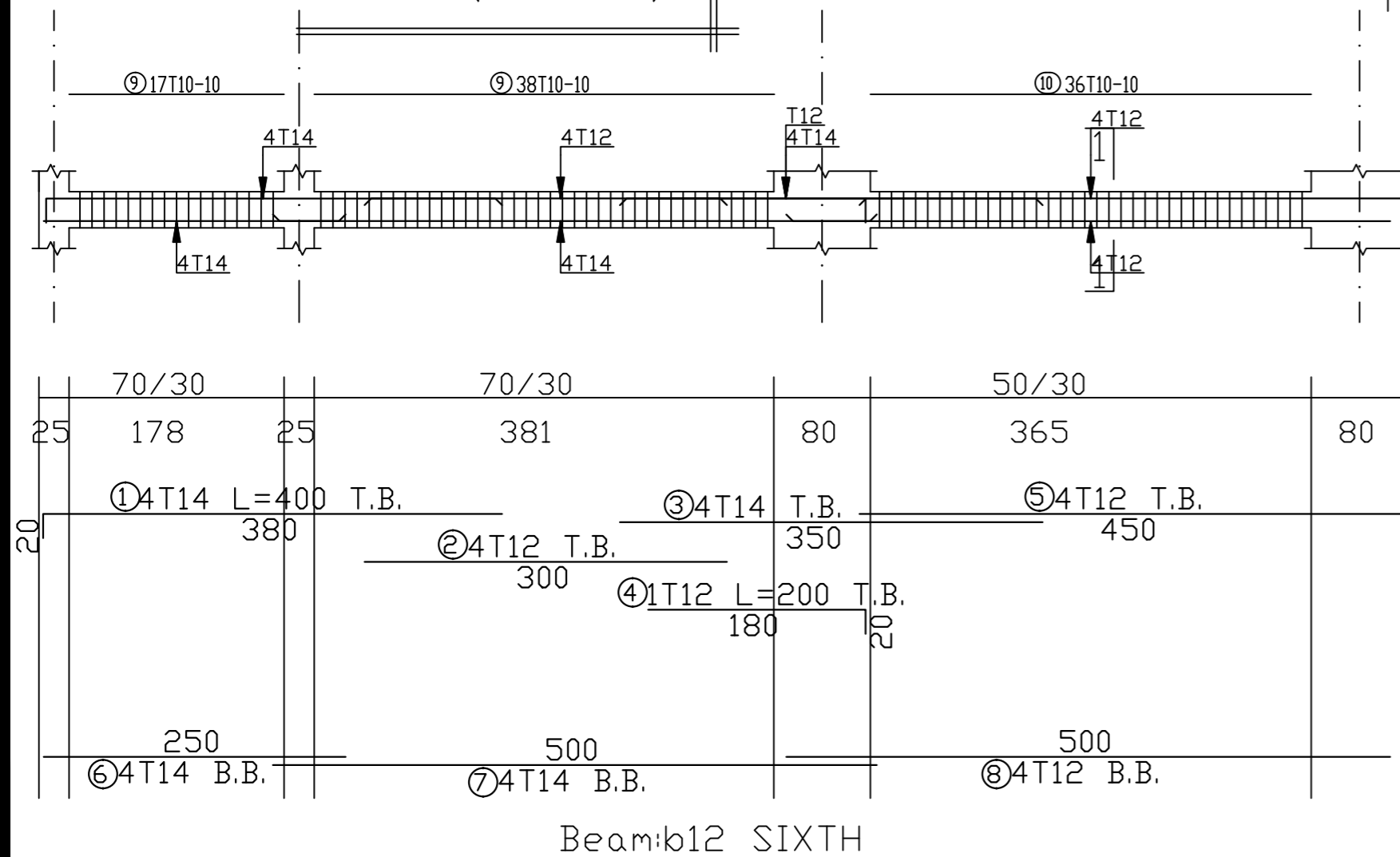
BEAM - B10 (70/35)



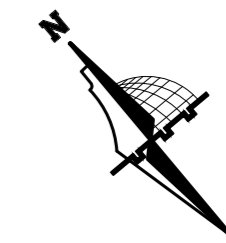
BEAM - B11 (50/30)



BEAM - B12 (70/30)



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

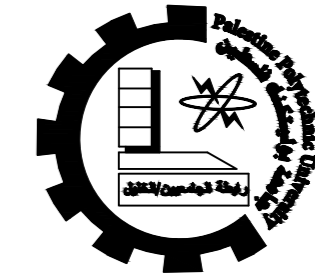
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
sixth Beams details

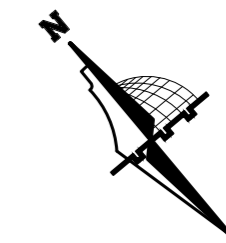
SCALE 1/100

DRAW. NO. S41

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

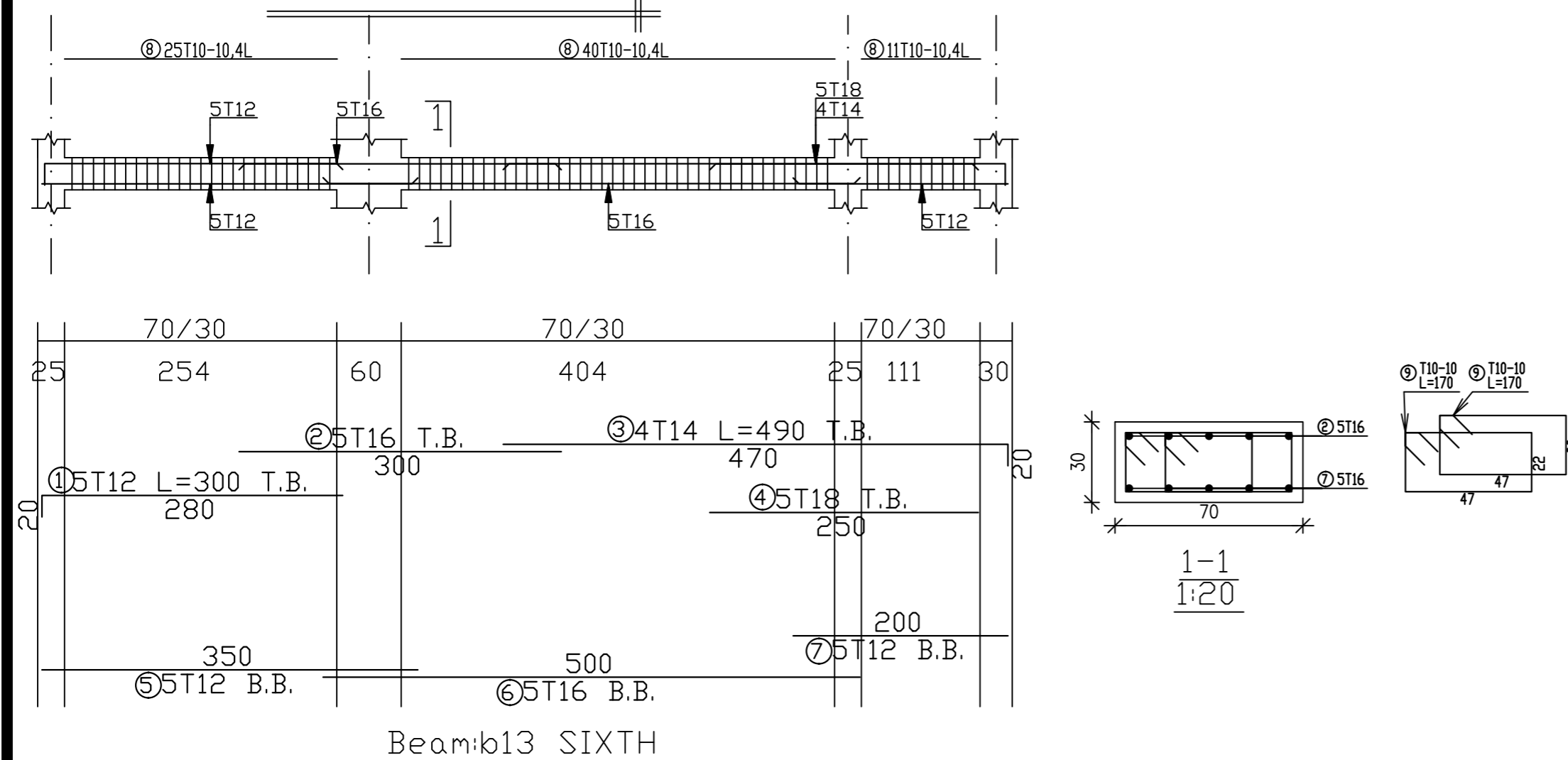
Drawing Title
 sixth Beams details

SCALE 1/100

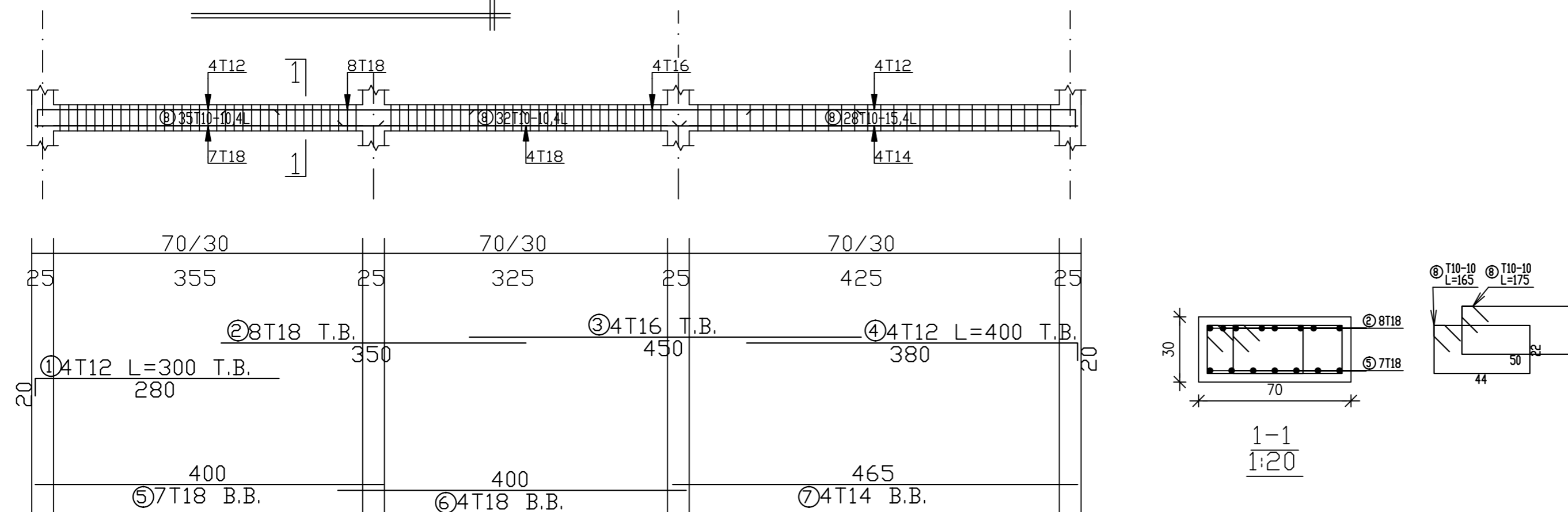
DRAW. NO. S42

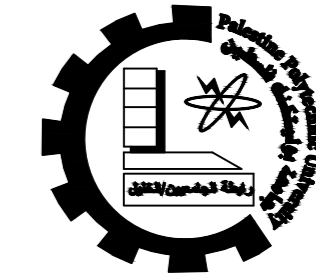
2024

BEAM - B13 (70/30)

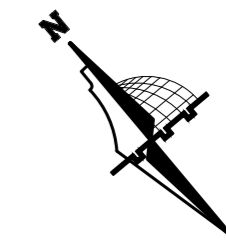


BEAM - B14 (70/30)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

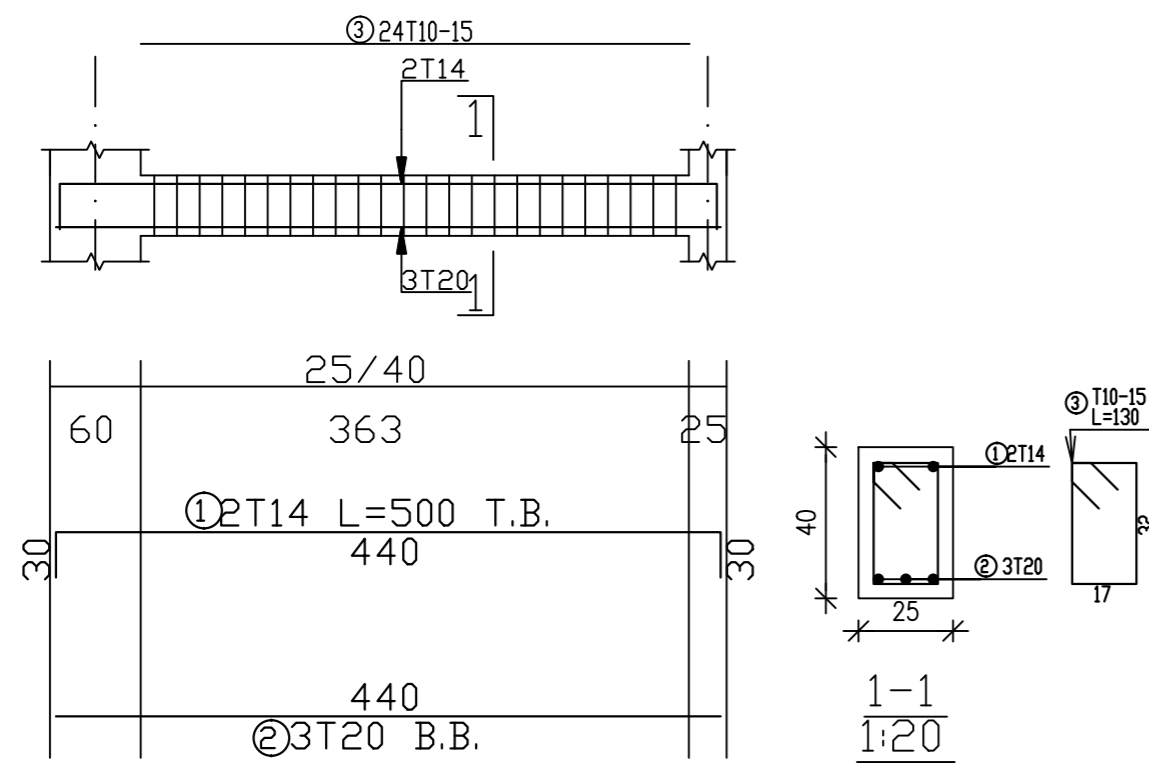
Drawing Title
 sixth Beams details

SCALE 1/100

DRAW. NO. S43

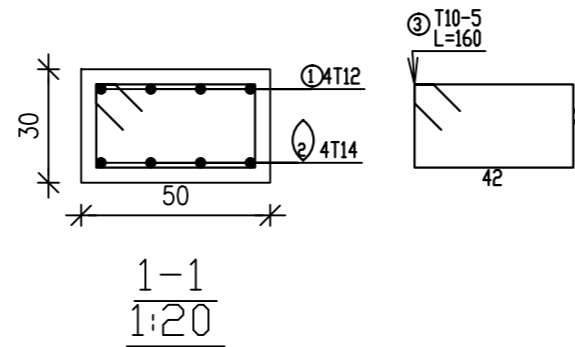
2024

BEAM - B15 (25/40)

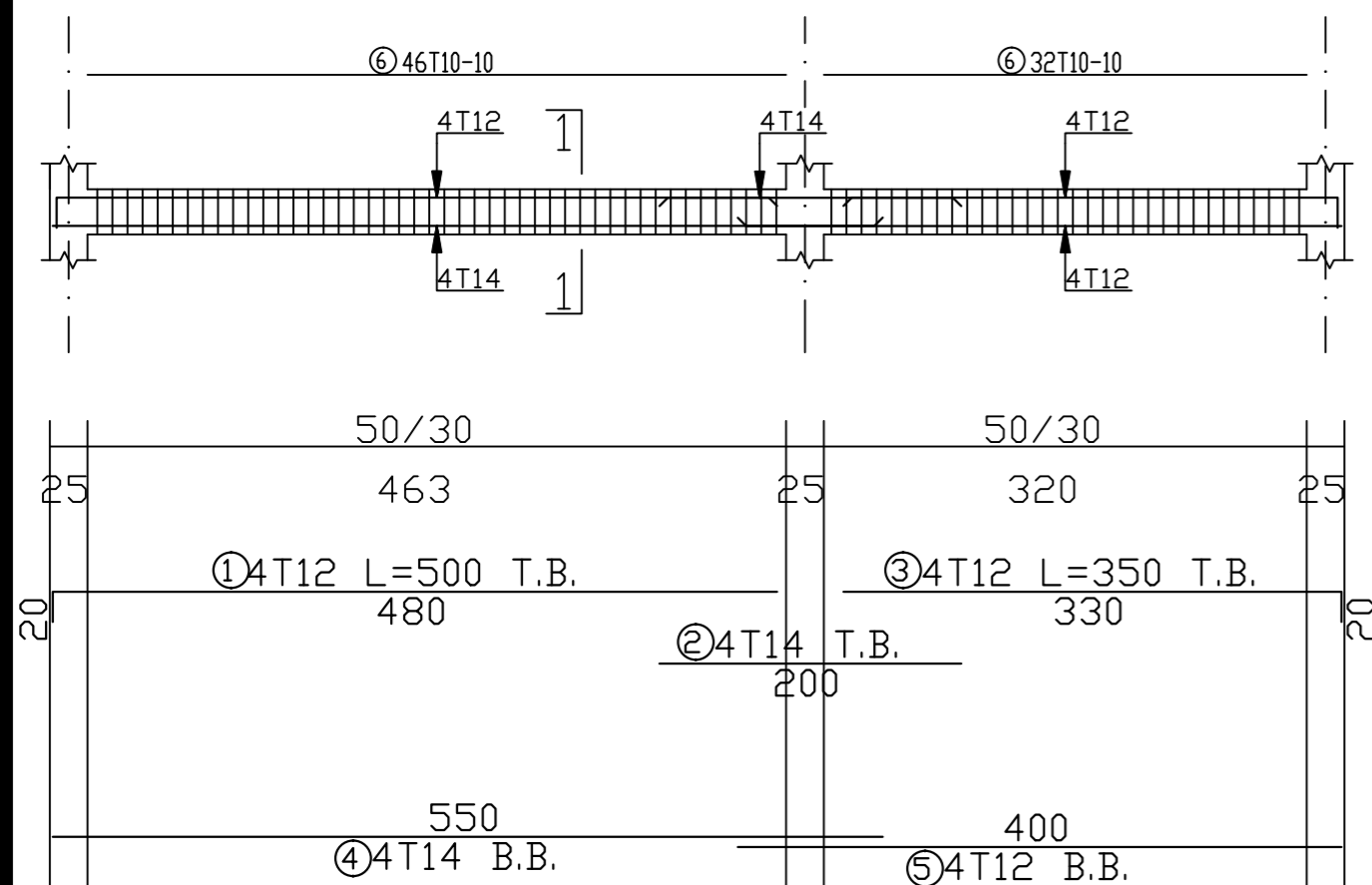


Beam:b15

BEAM - B16 (50/30)

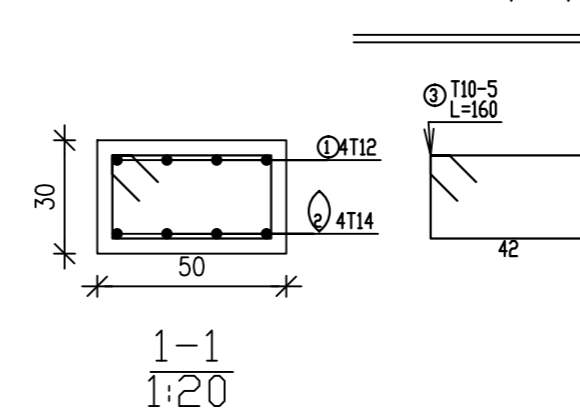


BEAM - B17(1) (50/30)

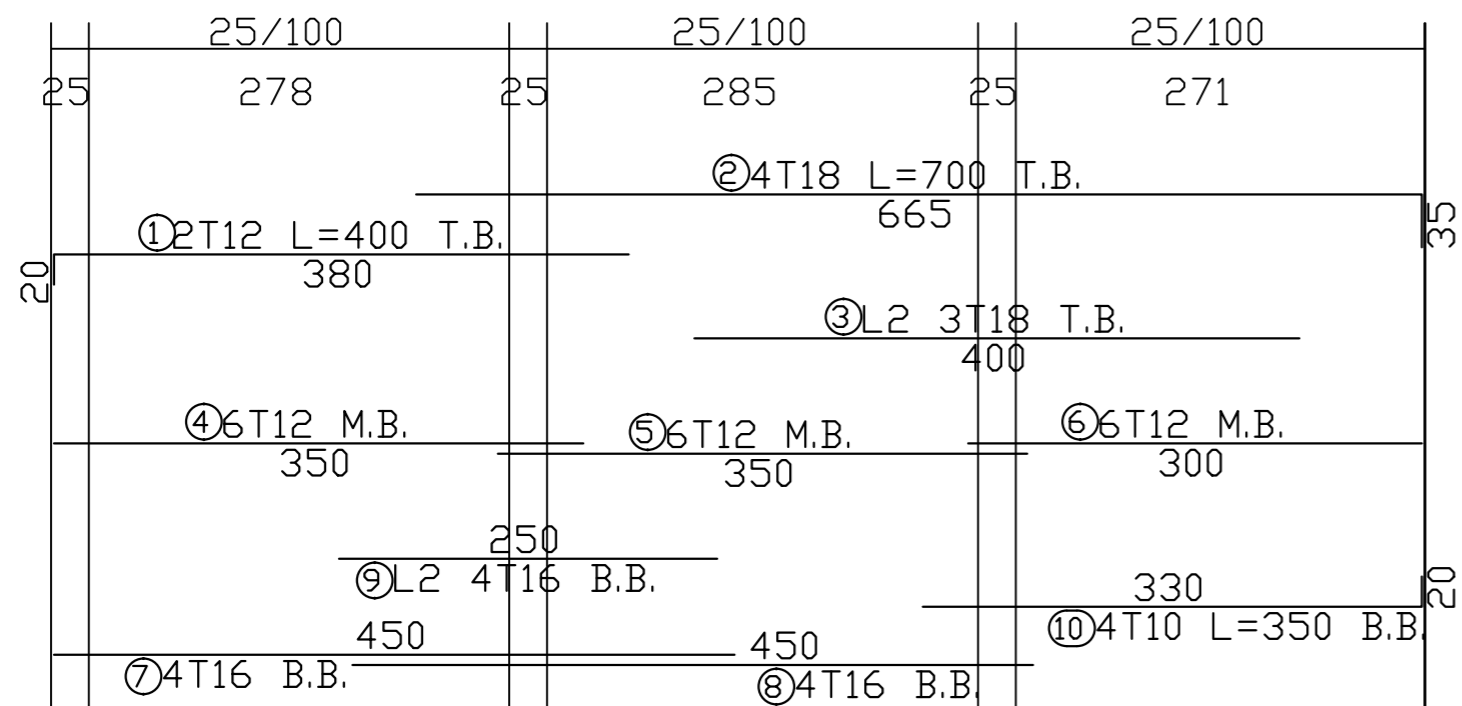
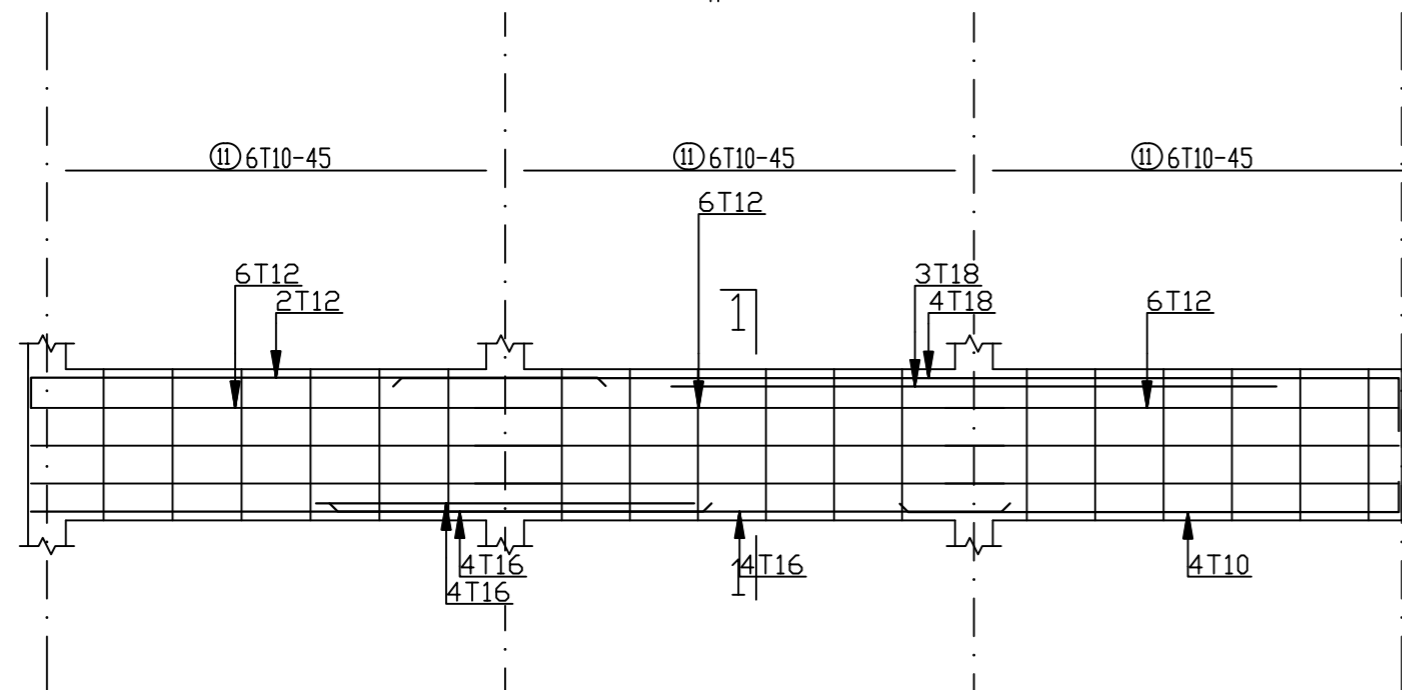


Beam:b17SIXTH

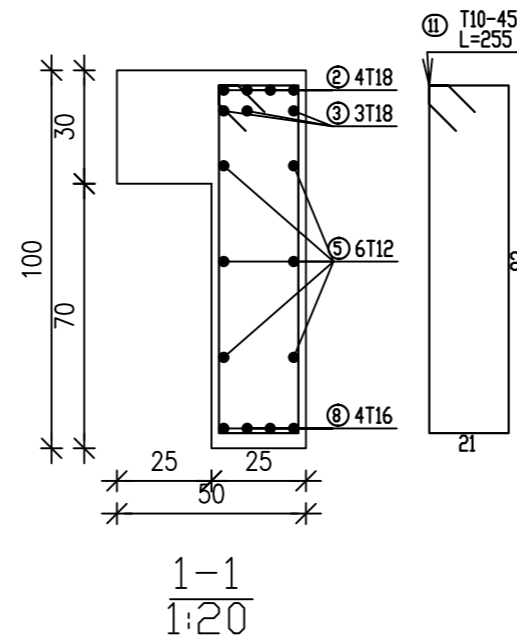
BEAM - B17(2) (50/30)



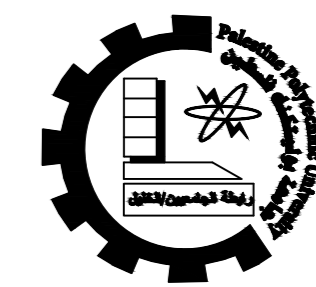
BEAM - B17(3) (25/100)



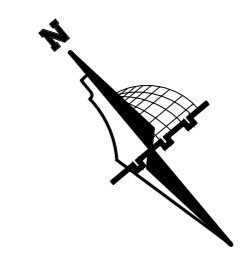
Beam:b17 3 SIXTH



1-1
1:20



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr.Belal Almasre

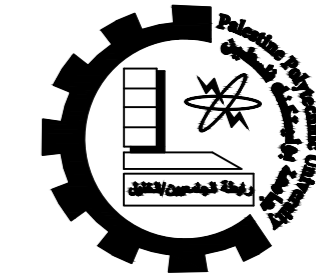
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 sixth Beams details

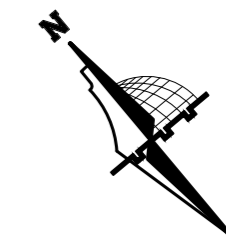
SCALE 1/100

DRAW. NO. S43

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

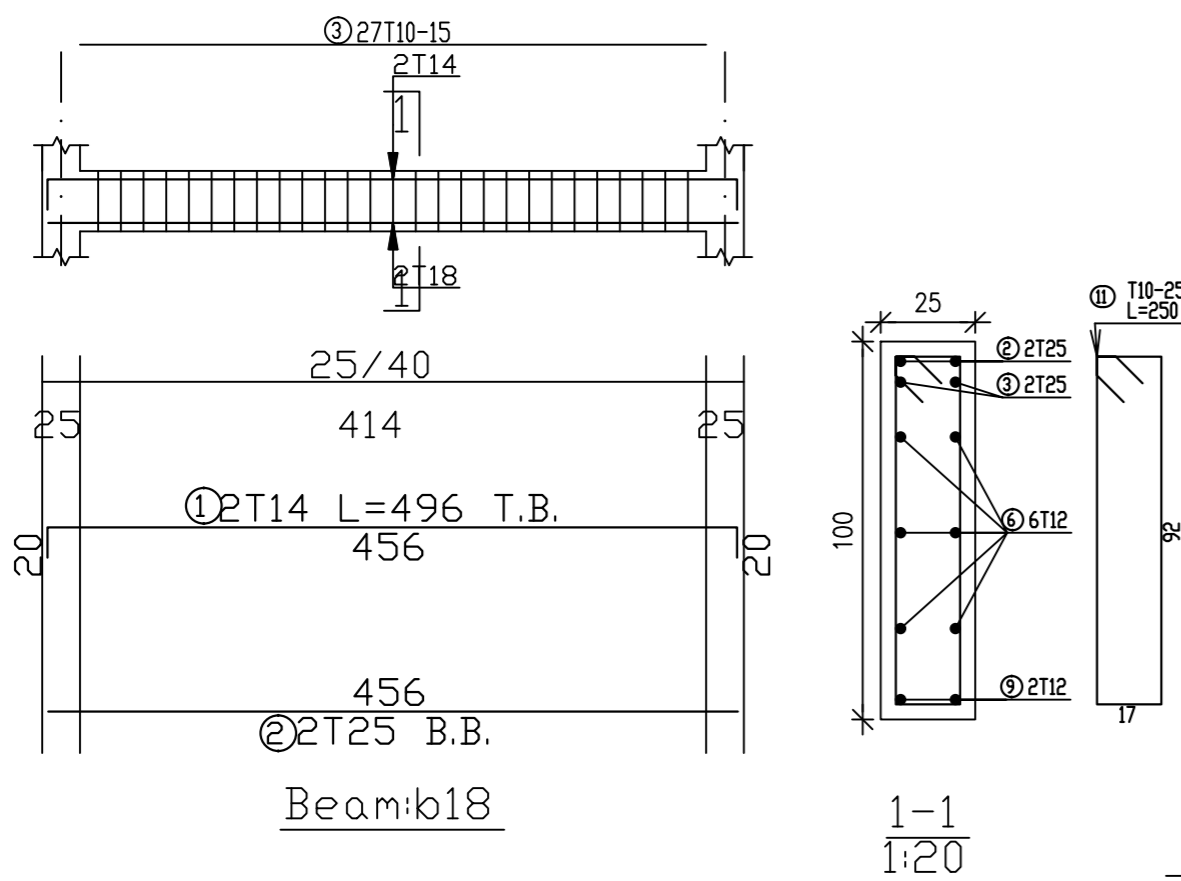
Drawing Title
 sixth Beams details

SCALE 1/100

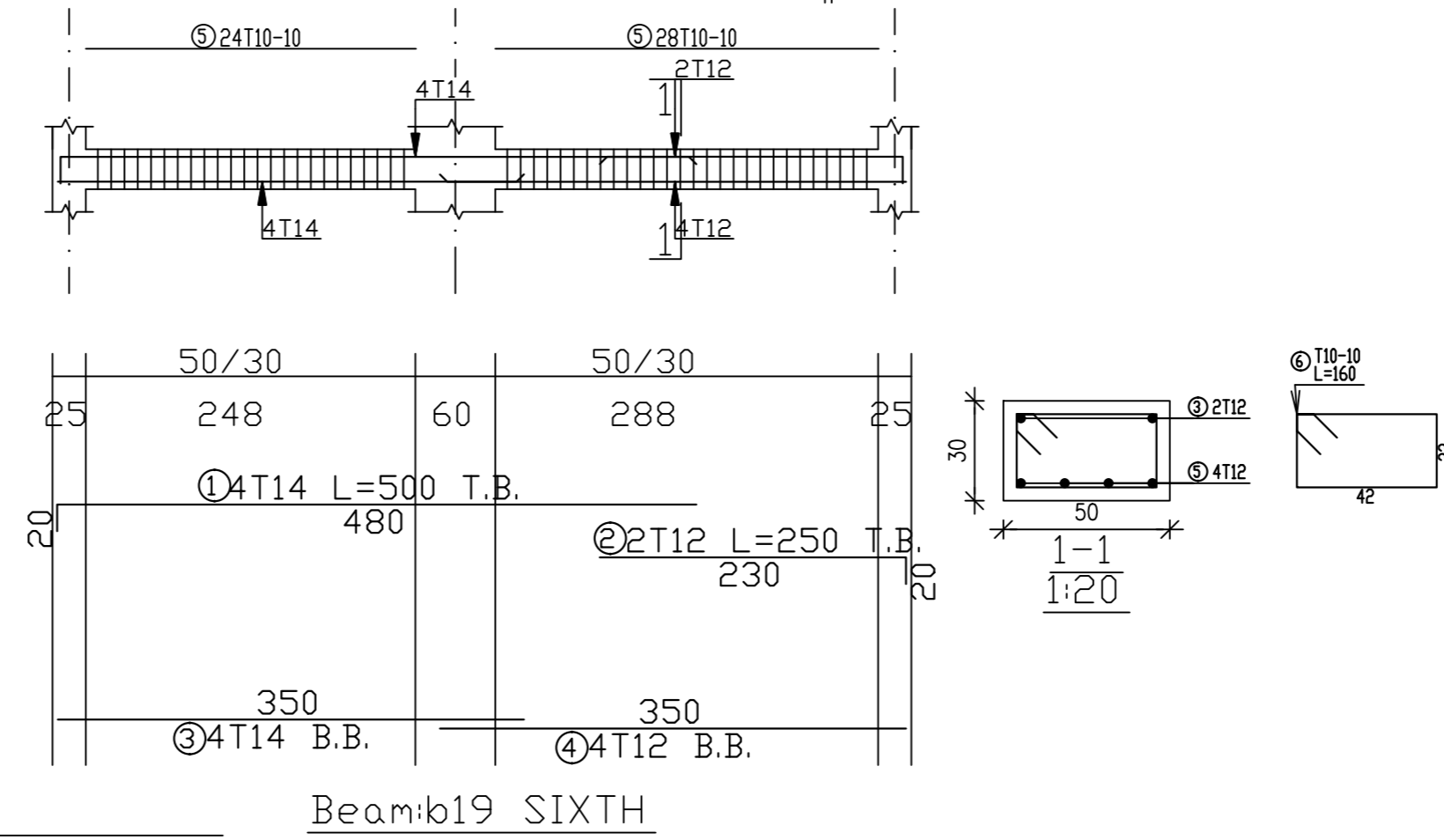
DRAW. NO. S44

2024

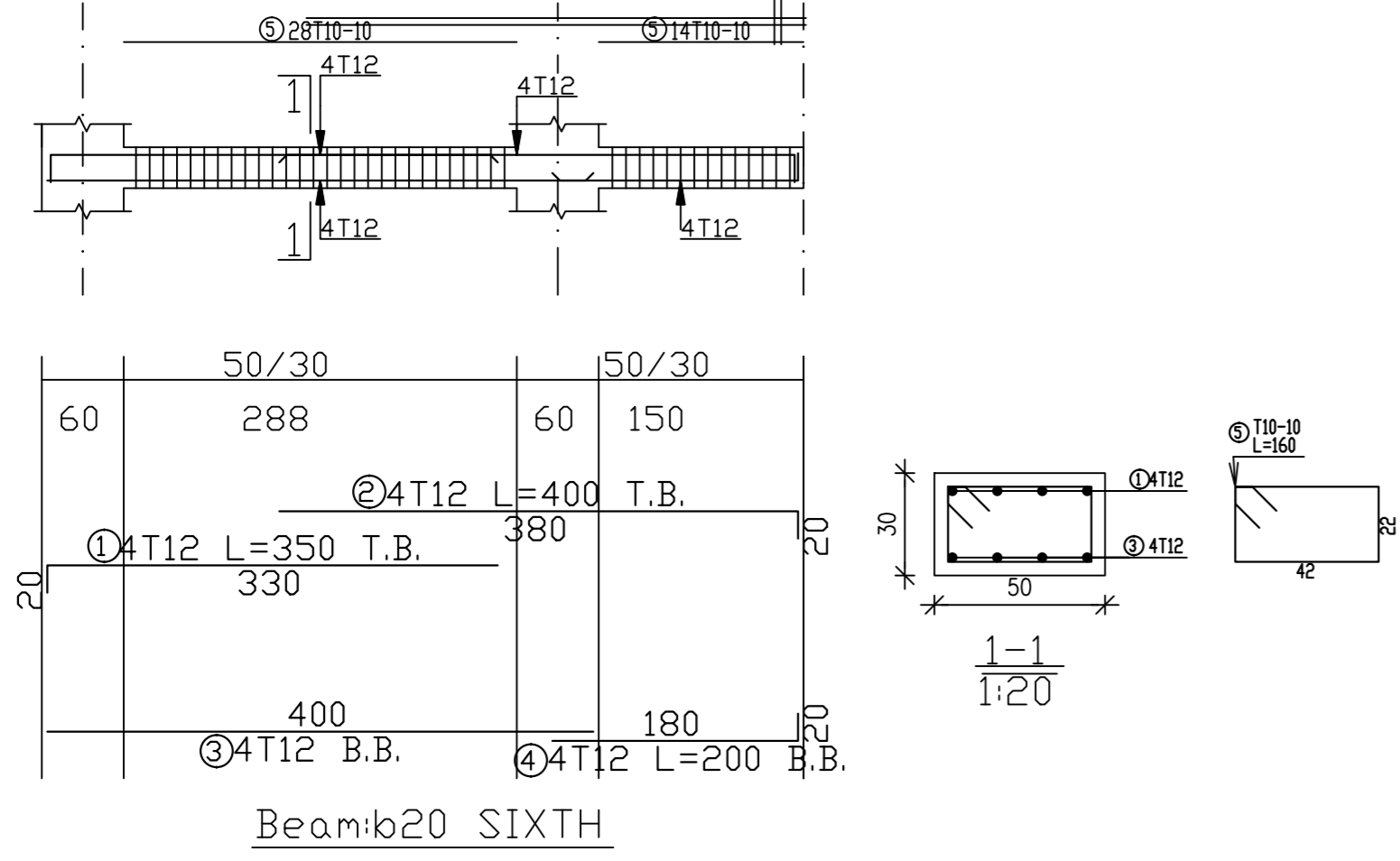
BEAM - B18 (25/40)



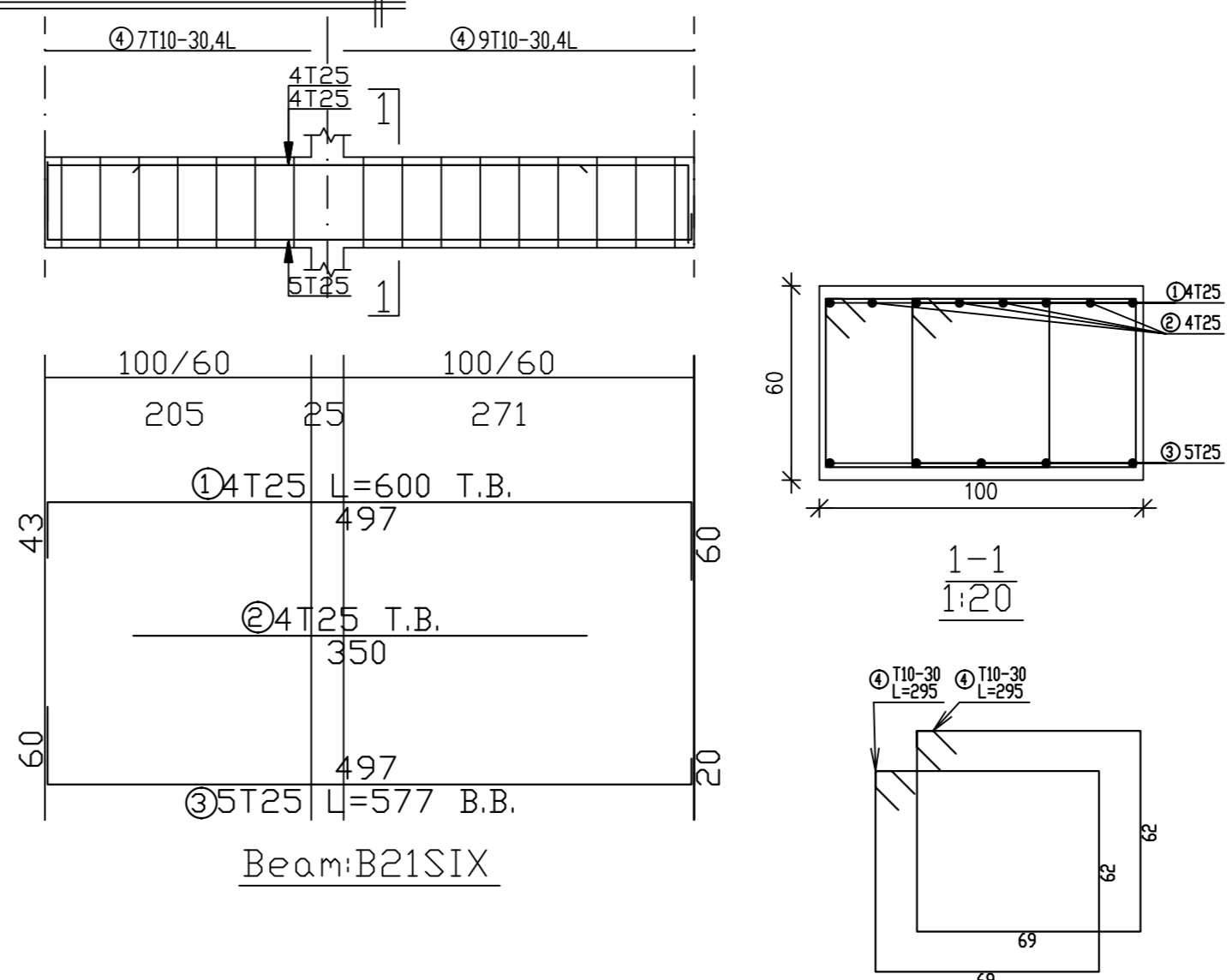
BEAM - B19 (50/30)

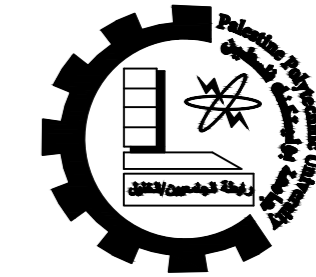


BEAM - B20 (50/30)

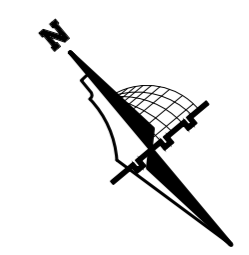


BEAM - B21 (100/70)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

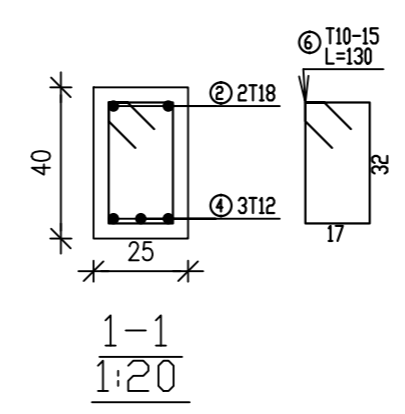
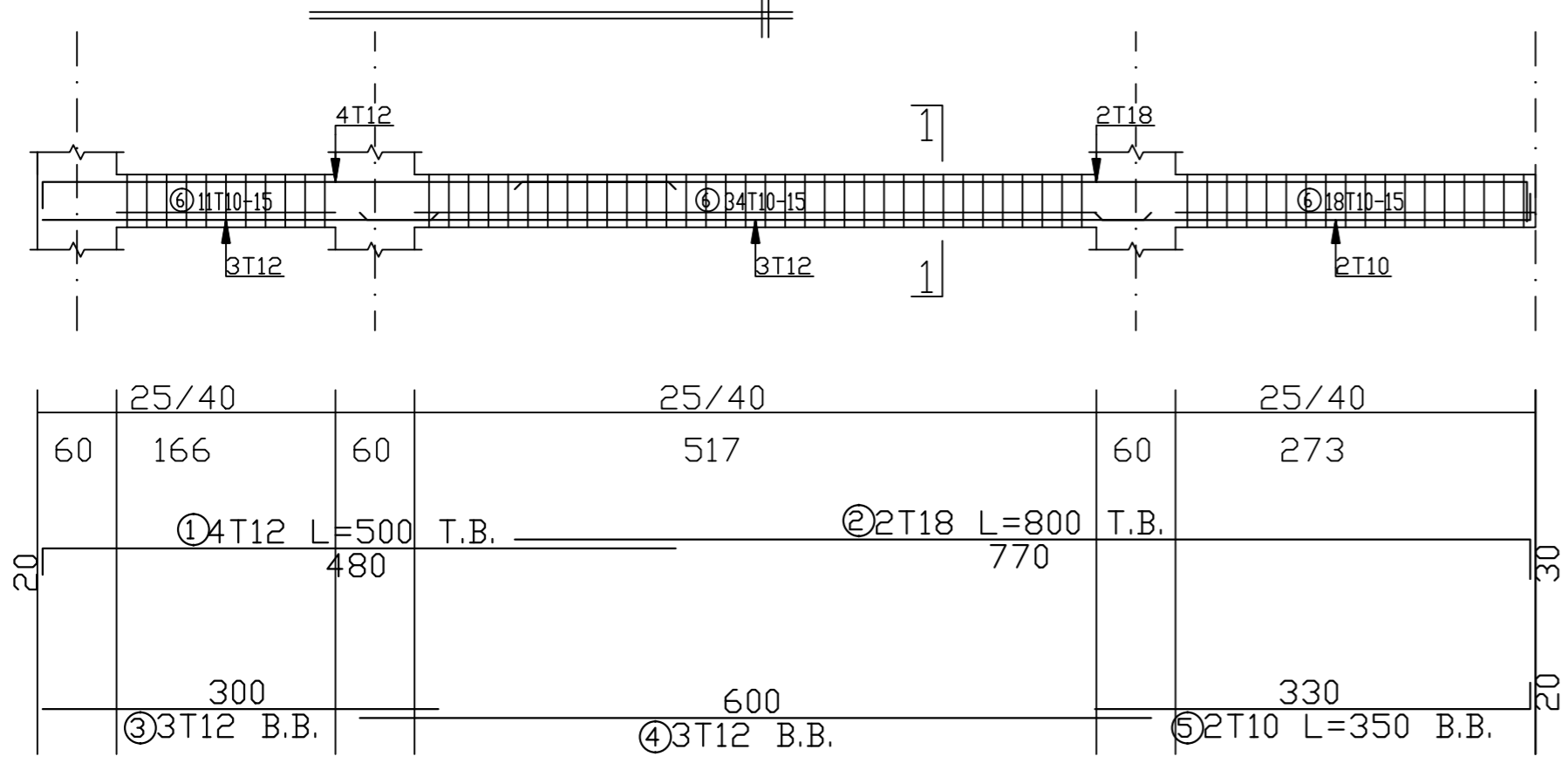
Drawing Title
 sixth Beams details

SCALE 1/100

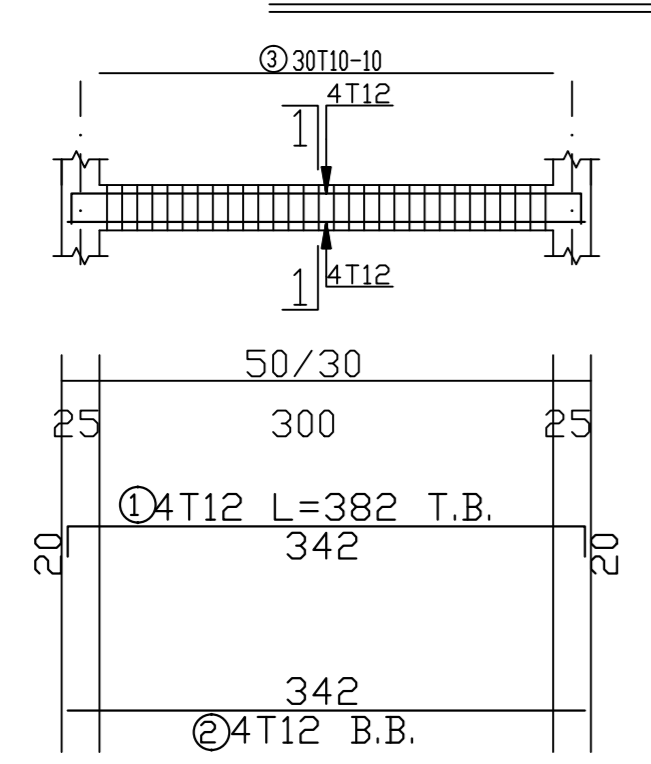
DRAW. NO. S45

2024

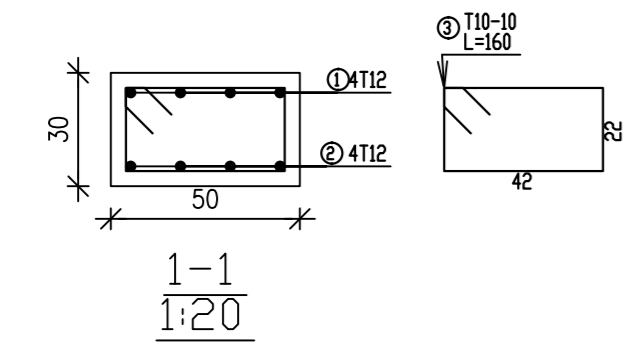
BEAM - B22 (25/40)



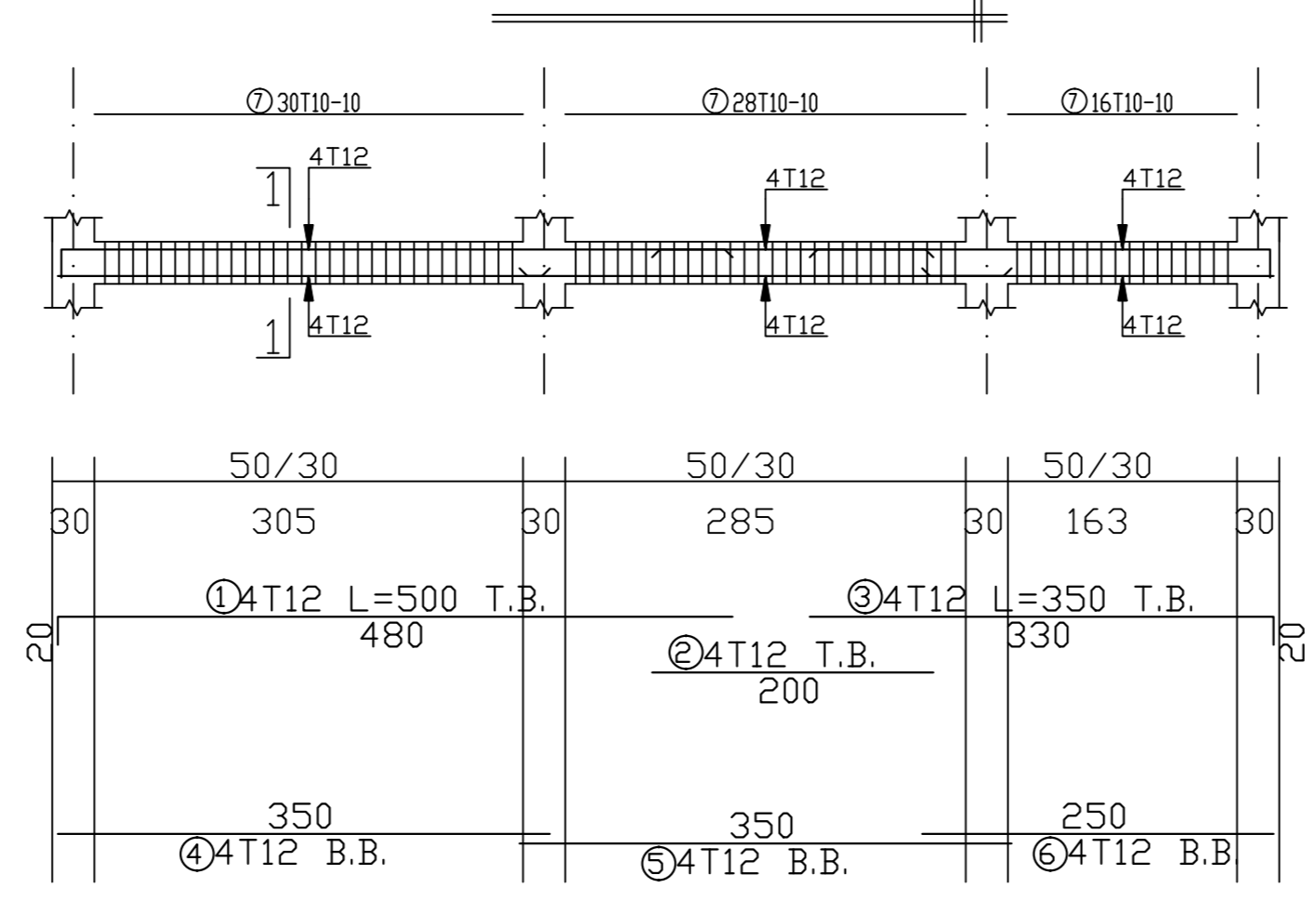
BEAM - B23 (50/30)



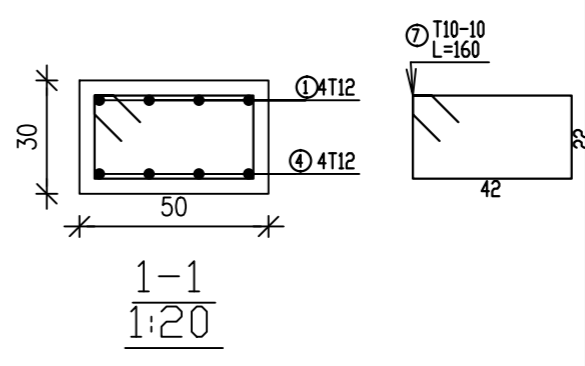
Beam:b23 SIX



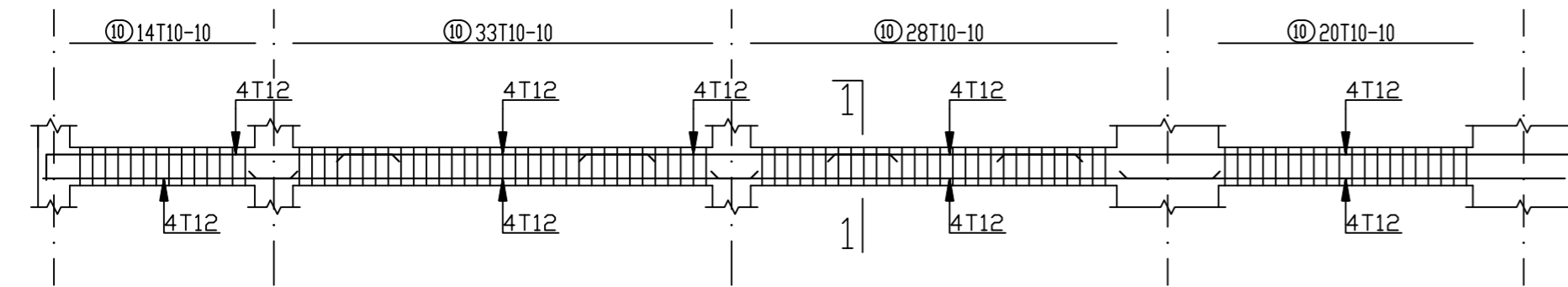
BEAM - B24 (50/30)



Beam:b24 SIX

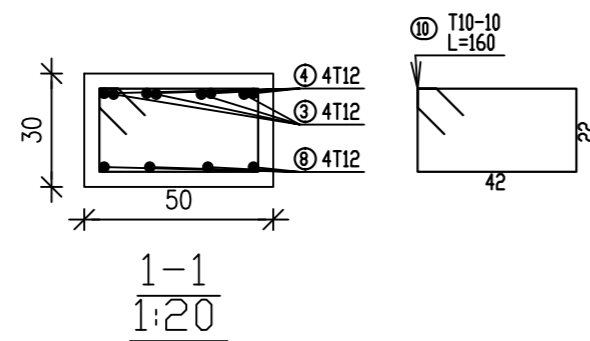


BEAM - B25 (50/30)



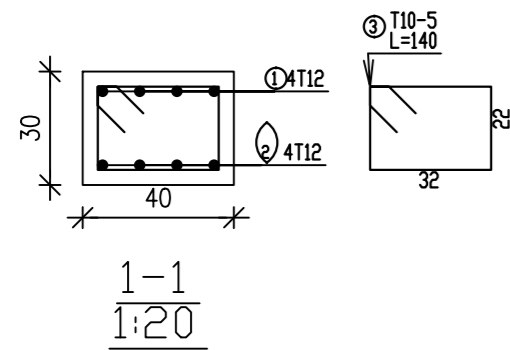
50/30	50/30	50/30	50/30	
25	146	30	330	30
			288	80
				200
				80
①4T12 L=300 T.B.	②4T12 T.B.	③4T12 T.B.	④4T12 T.B.	⑤4T12 T.B.
280	250	250	200	450
200	400	400	350	
⑥4T12 B.B.	⑦4T12 B.B.	⑧4T12 B.B.	⑨4T12 B.B.	

Beam:b25 SIX

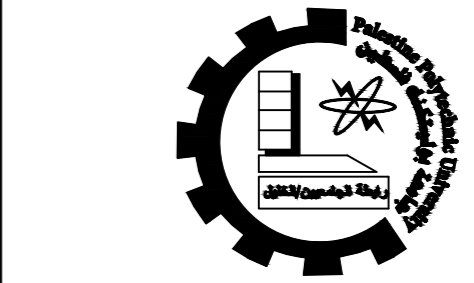
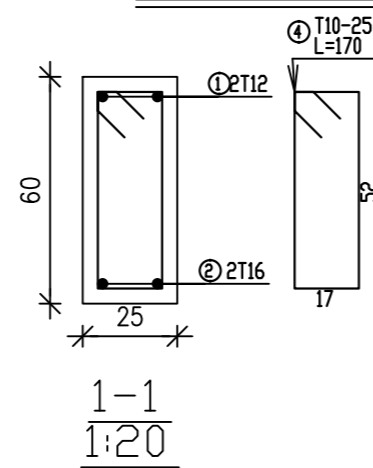


BEAM - B26 (50/30)

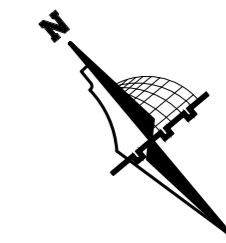
Beam:b26



BEAM - B27 (25/60)



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr.Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

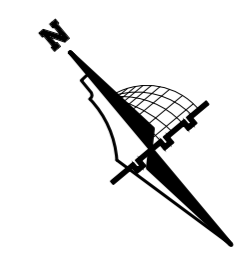
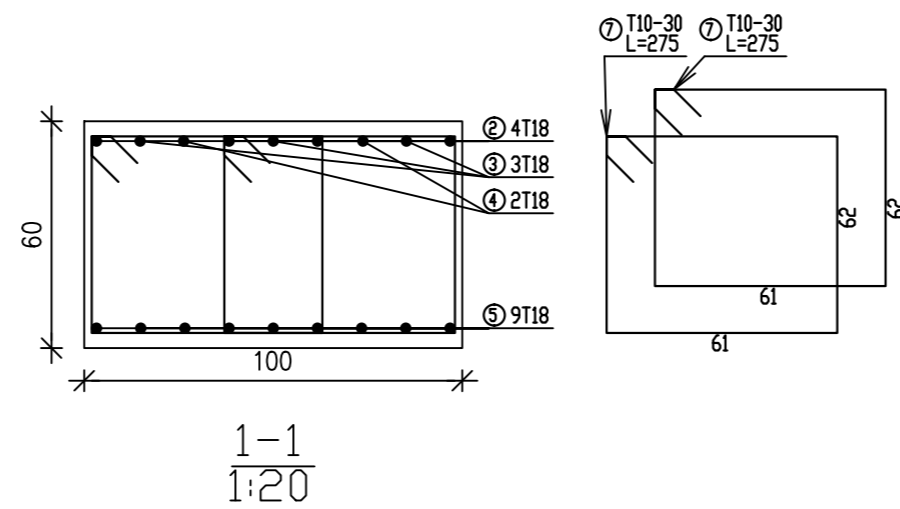
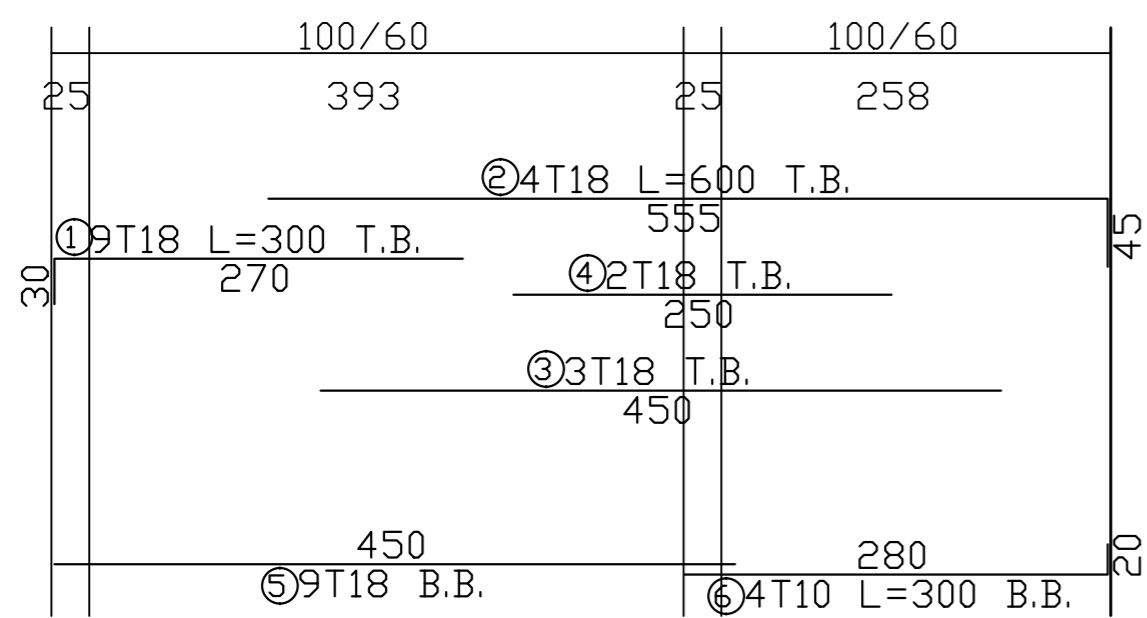
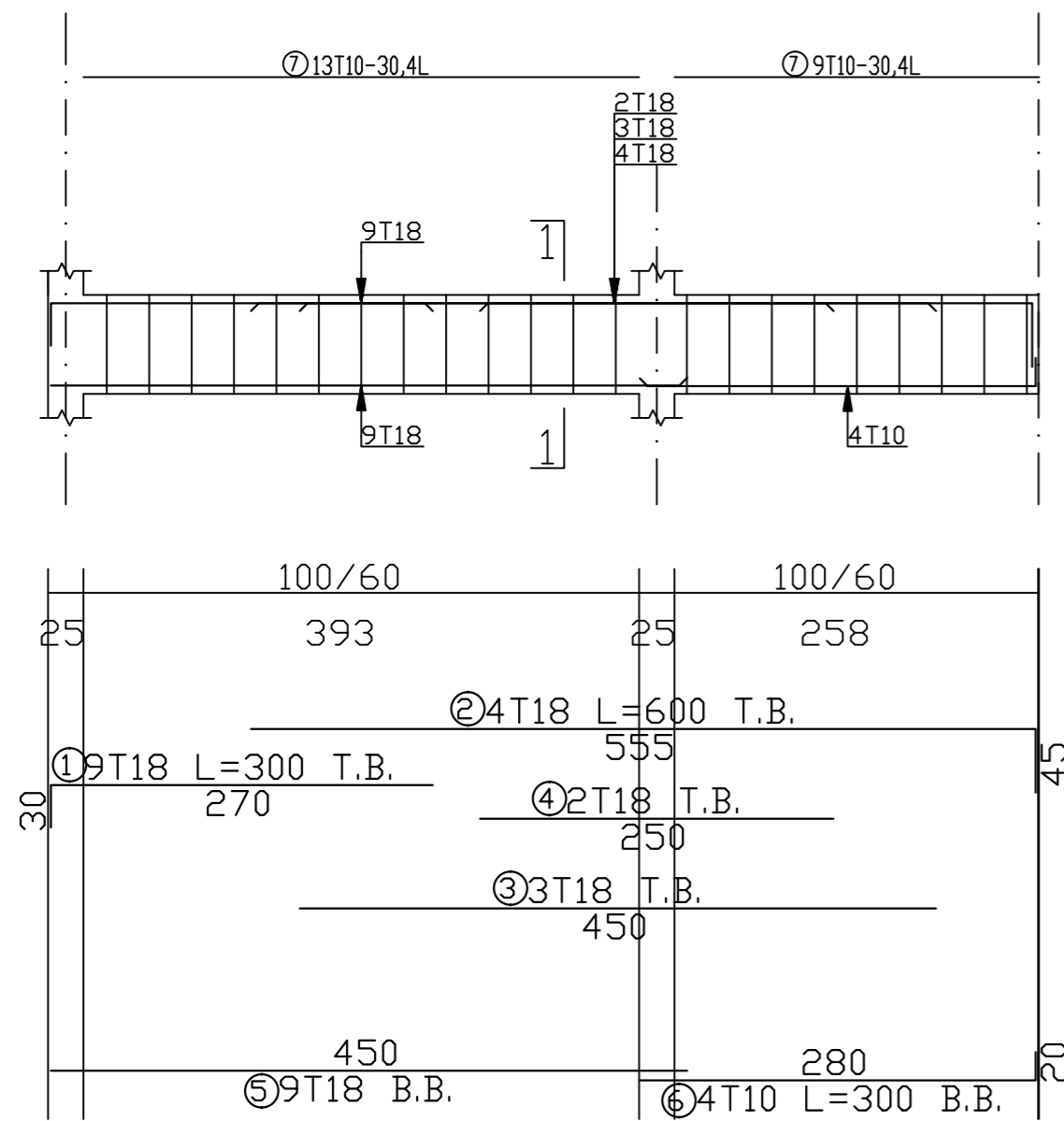
Drawing Title
 sixth Beams details

SCALE 1/100

DRAW. NO. S46

2024

BEAM - B28 (100/70)



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

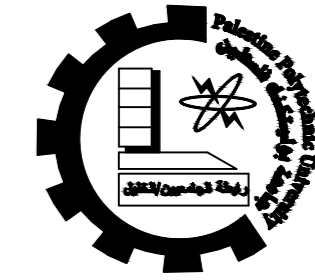
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 sixth Beams details

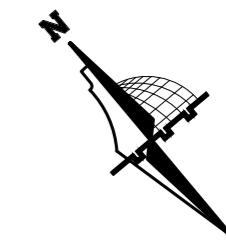
SCALE 1/100

DRAW. NO. S47

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

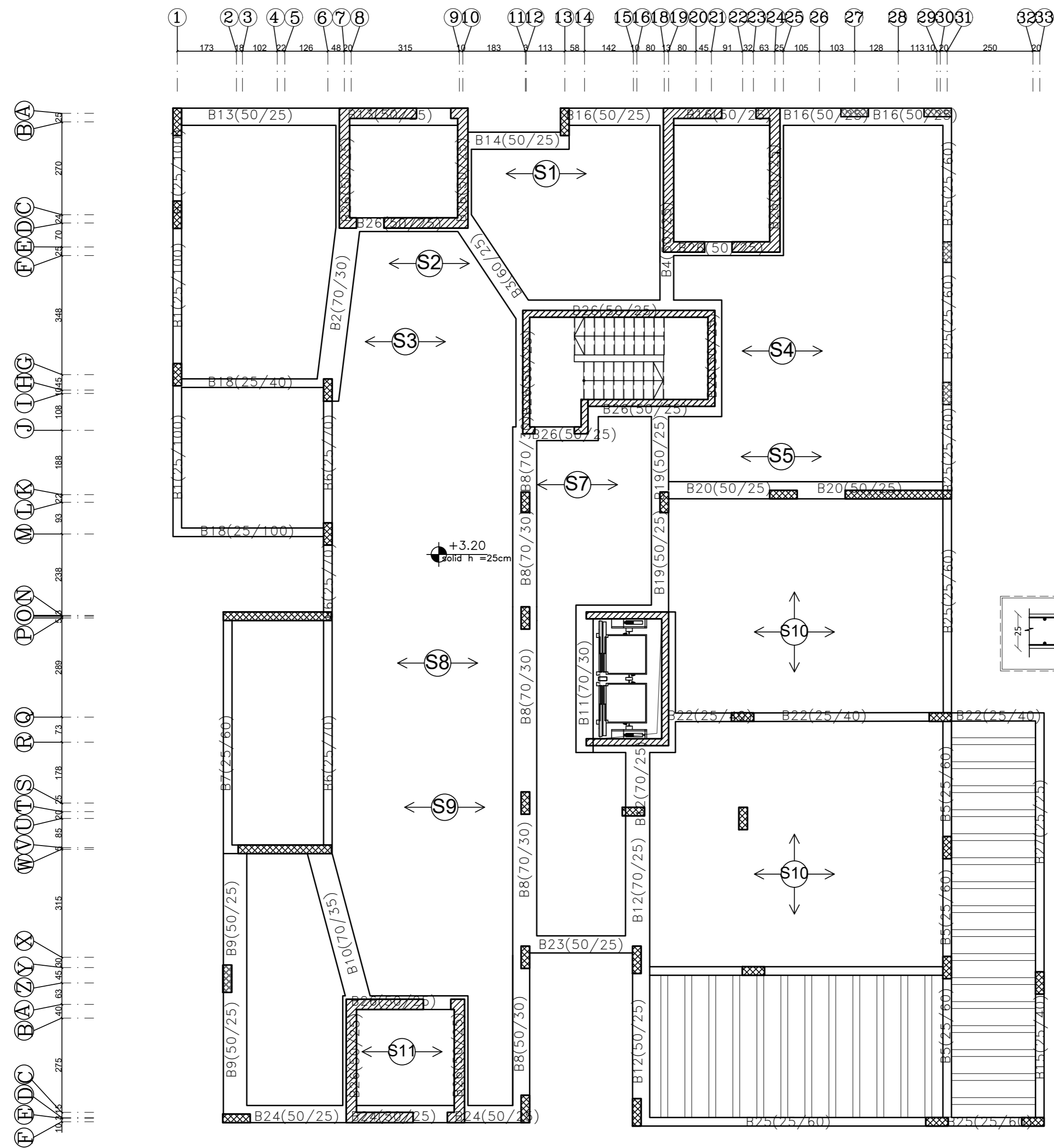
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

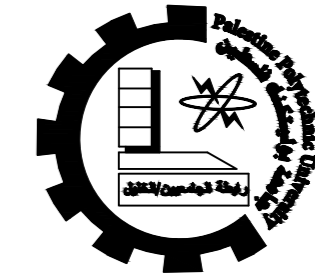
Drawing Title
 Seventh FLOOR
 slab layout

SCALE 1/100

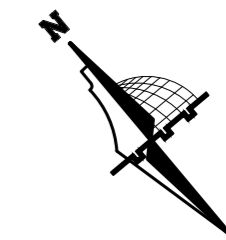
DRAW. NO. S48

2024





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

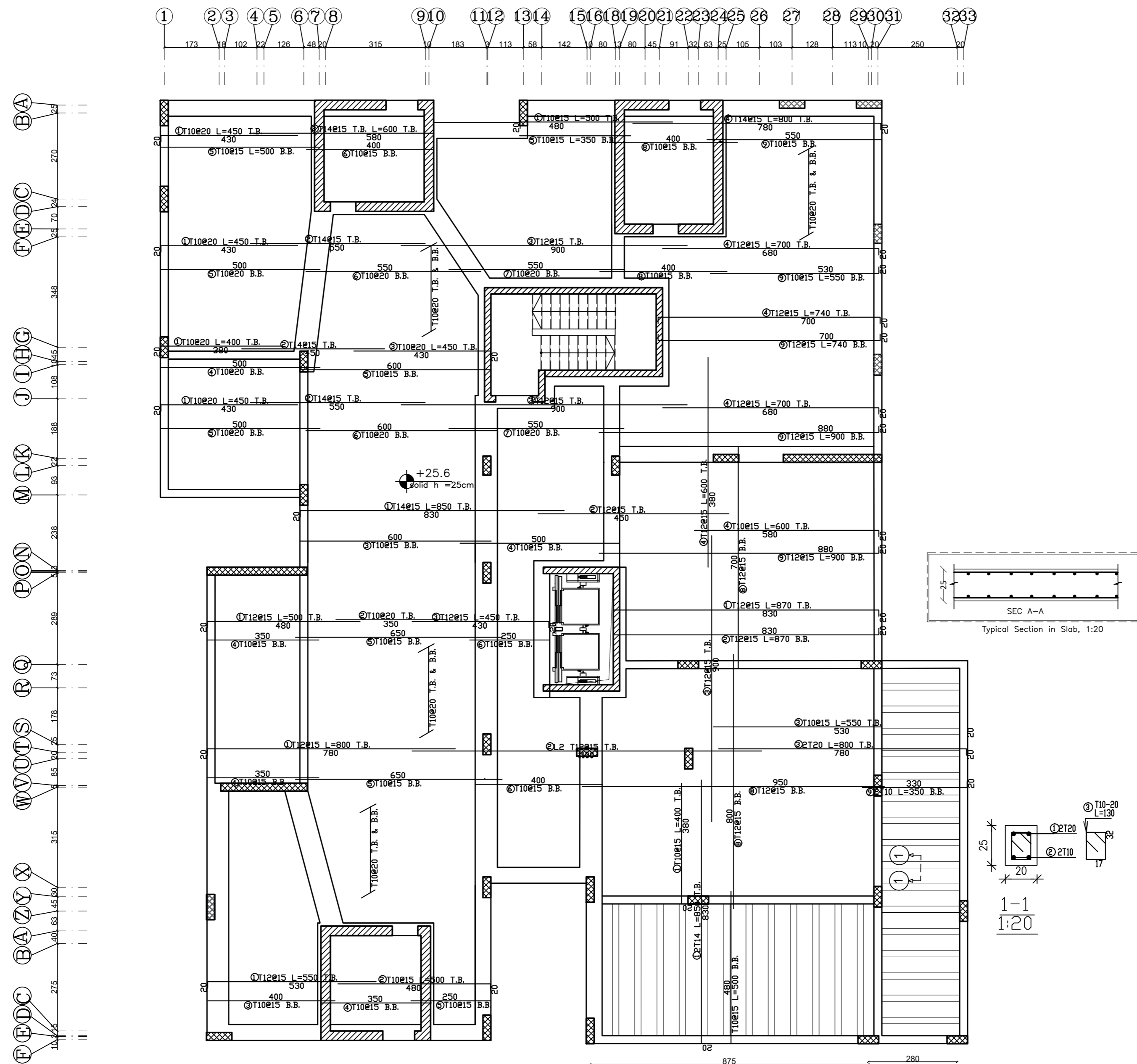
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

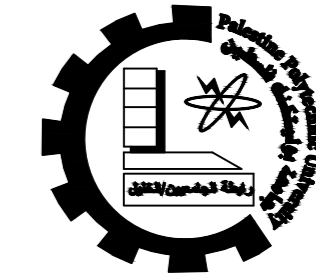
Drawing Title
 Sixth FLOOR
 slab layout

SCALE 1/100

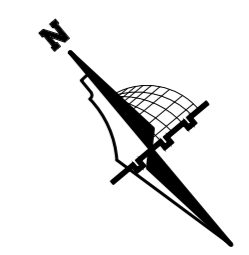
DRAW. NO. S48

2024





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

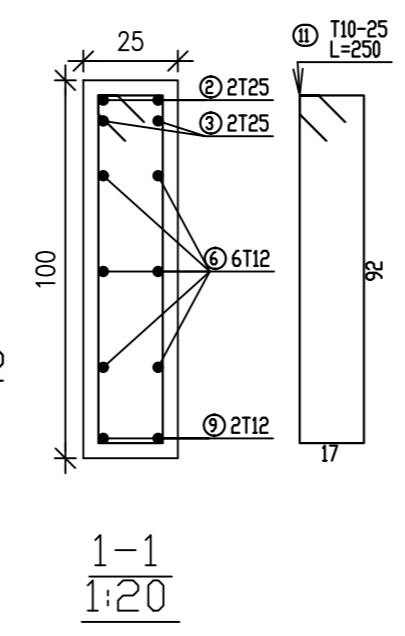
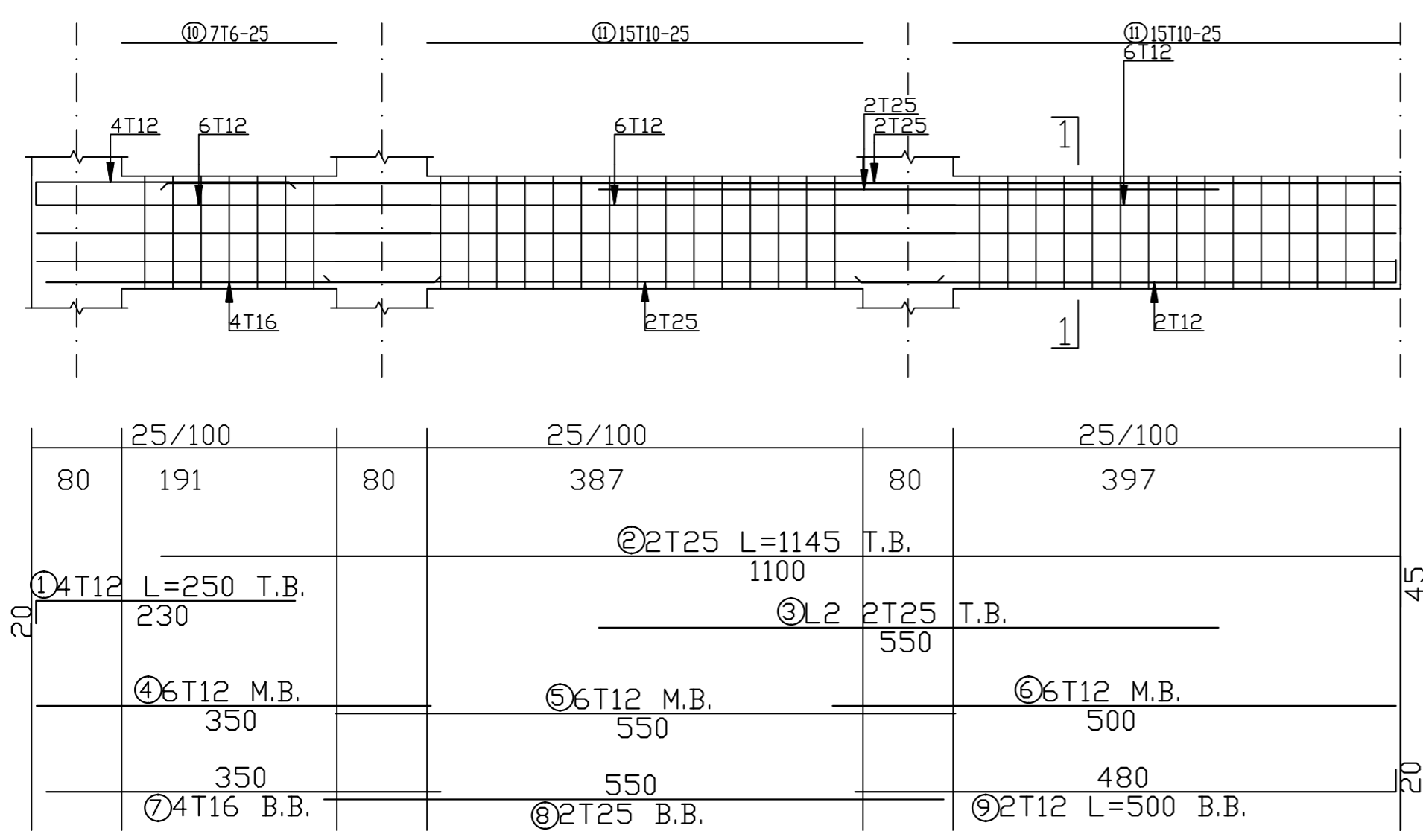
Drawing Title
 seventh Beams details

SCALE 1/100

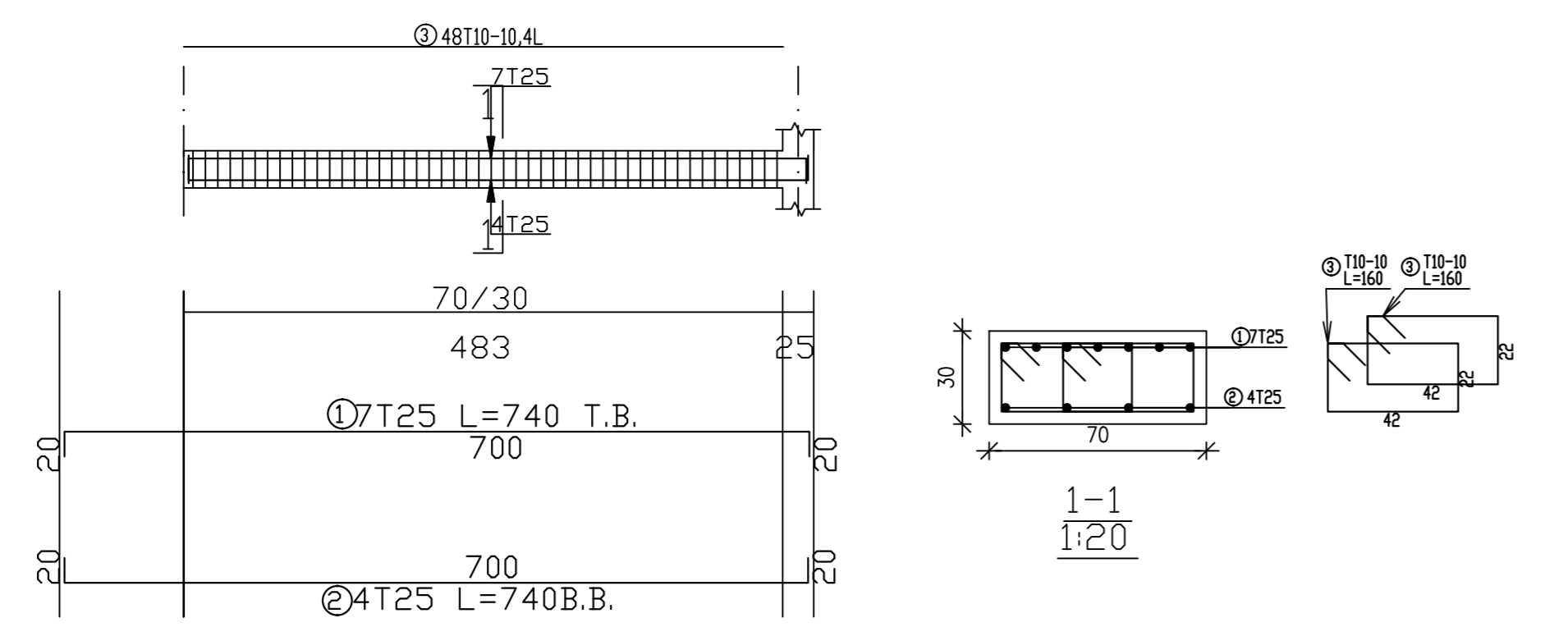
DRAW. NO. S49

2024

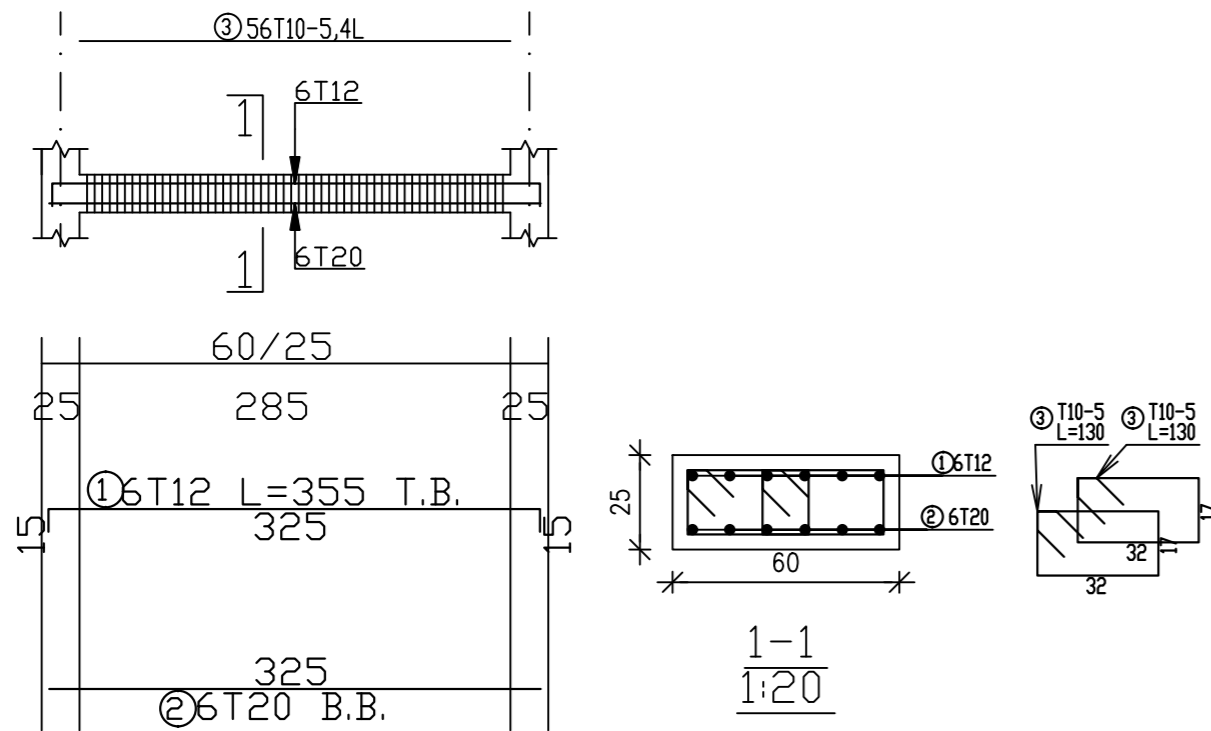
BEAM - B1 (25/100)



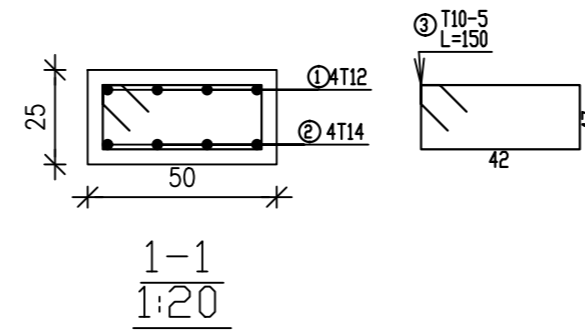
BEAM - B2 (25/100)



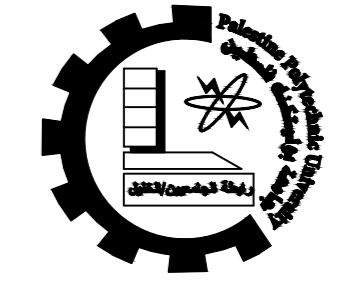
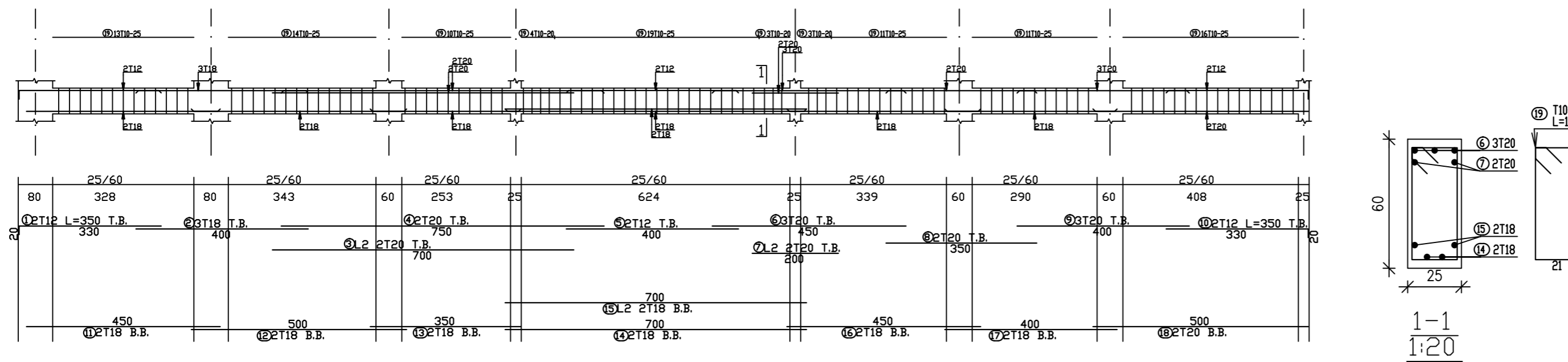
BEAM - B3 (60/25)



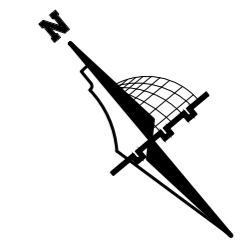
BEAM - B4 (60/25)



BEAM - B5 (25/60)



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr.Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

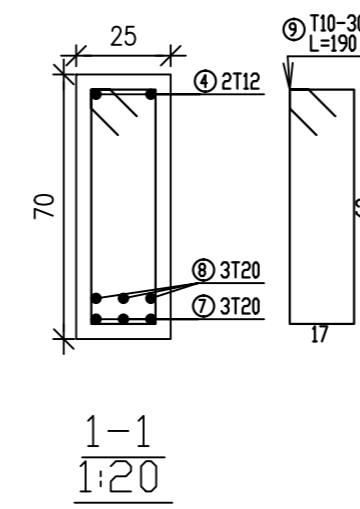
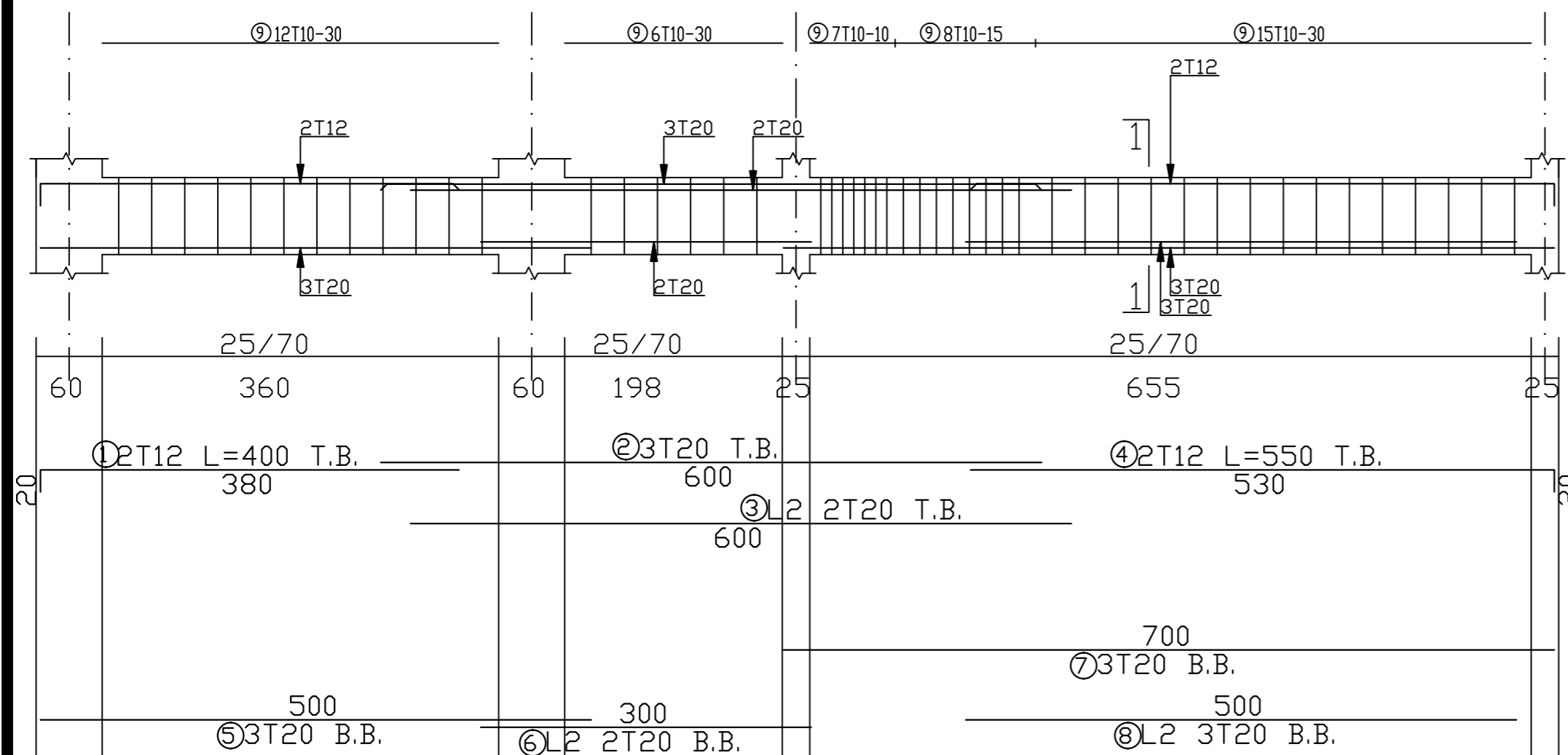
Drawing Title
 seventh Beams details

SCALE 1/100

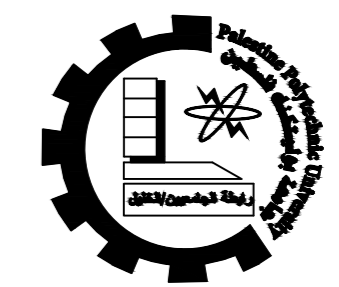
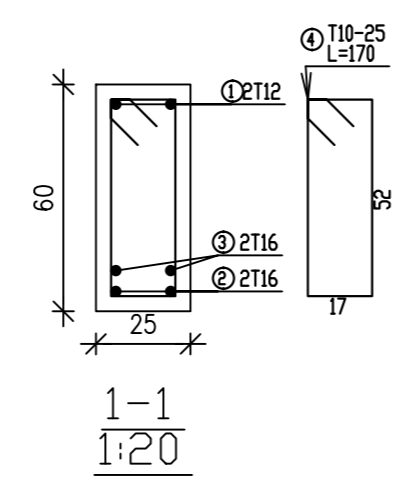
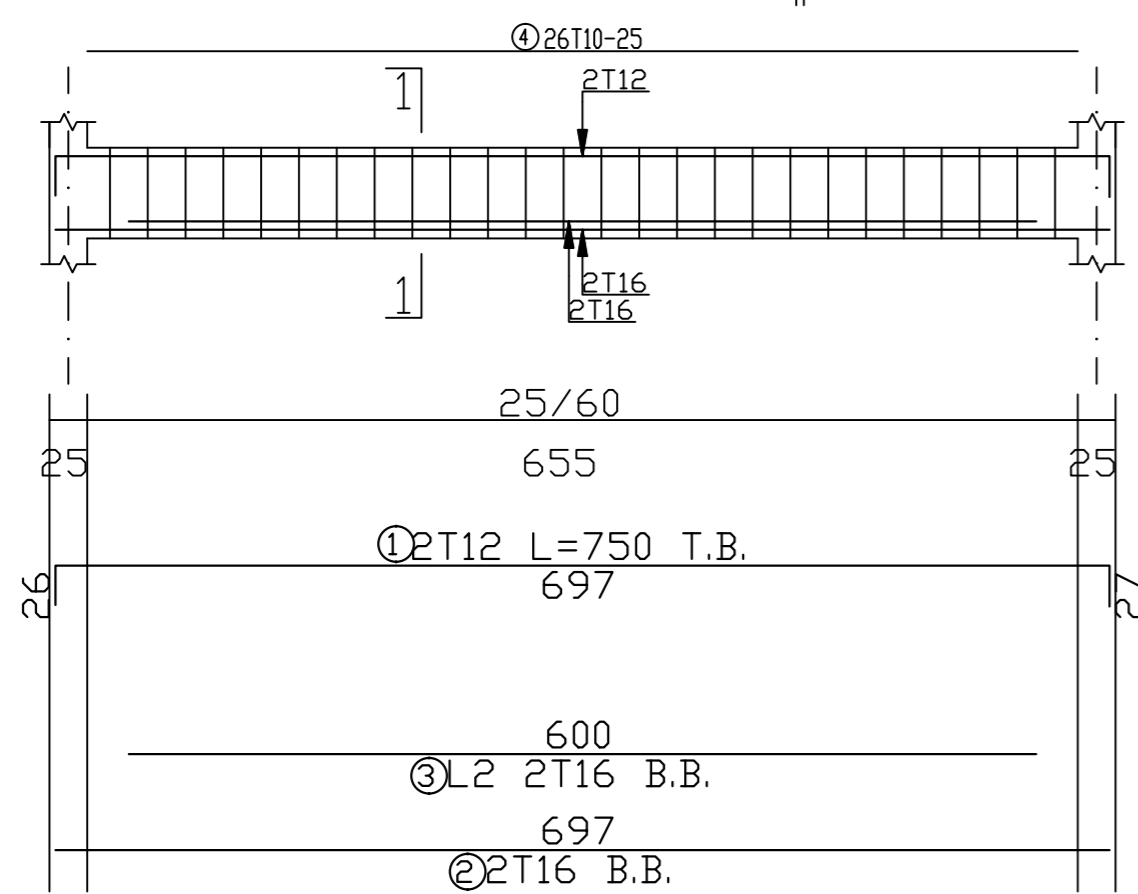
DRAW. NO. S50

2024

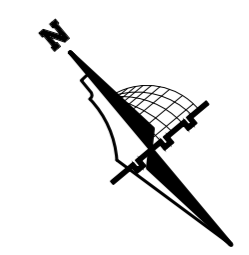
BEAM - B6 (25/70)



BEAM - B7 (25/60)



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

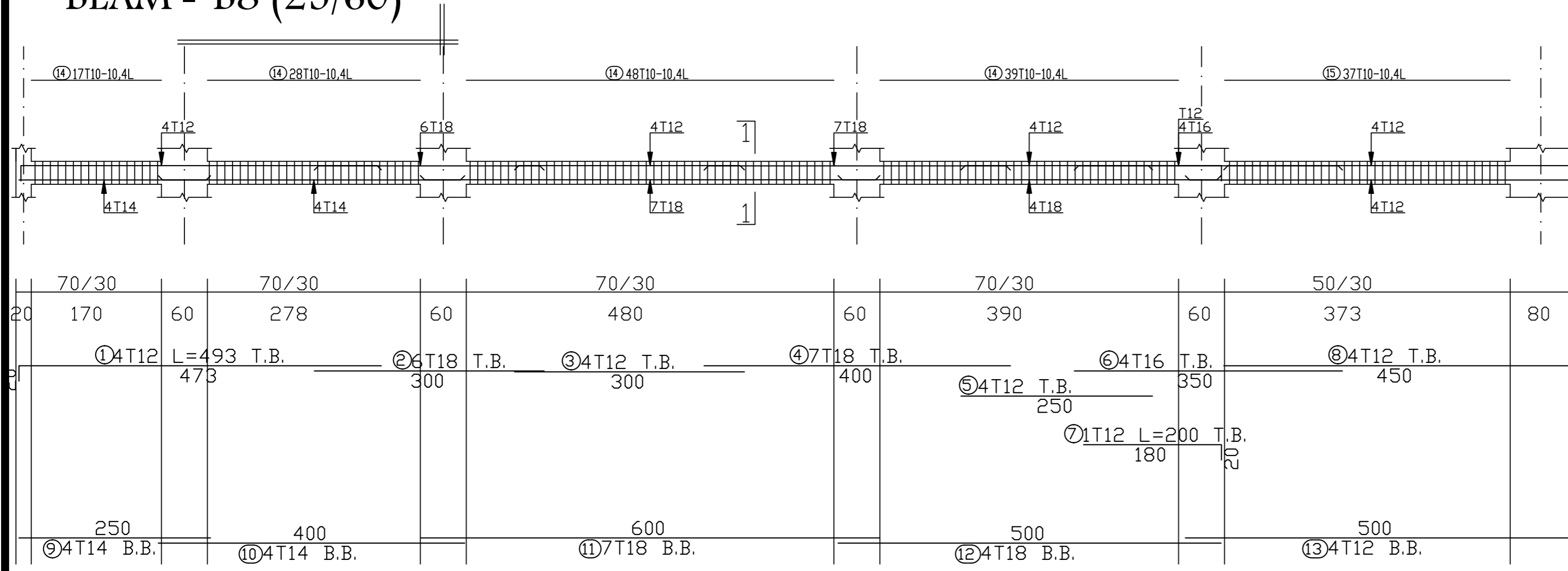
Drawing Title
seventh Beams details

SCALE 1/100

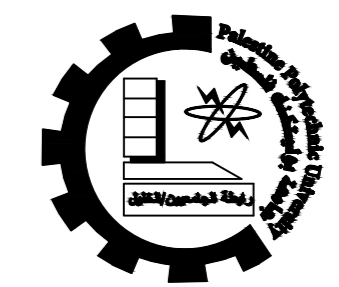
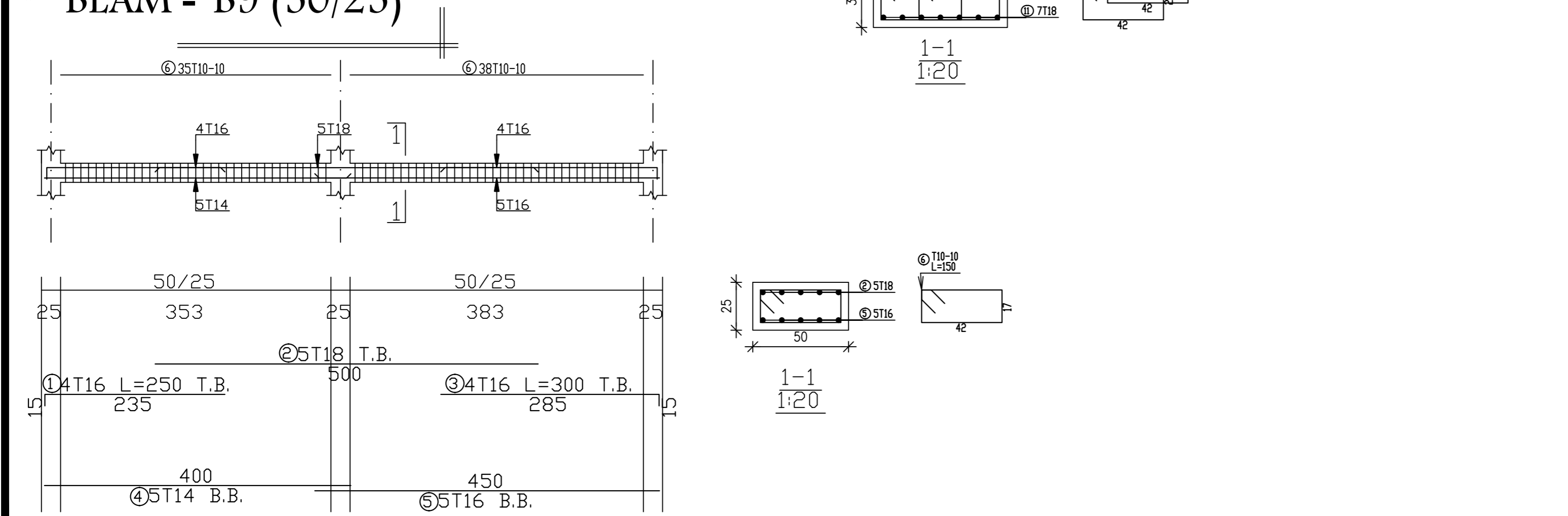
DRAW. NO. S51

2024

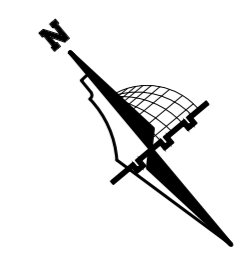
BEAM - B8 (25/60)



BEAM - B9 (50/25)



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

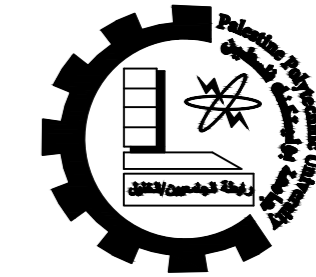
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 seventh Beams details

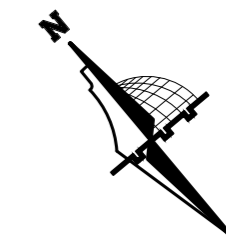
SCALE 1/100

DRAW. NO. S52

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

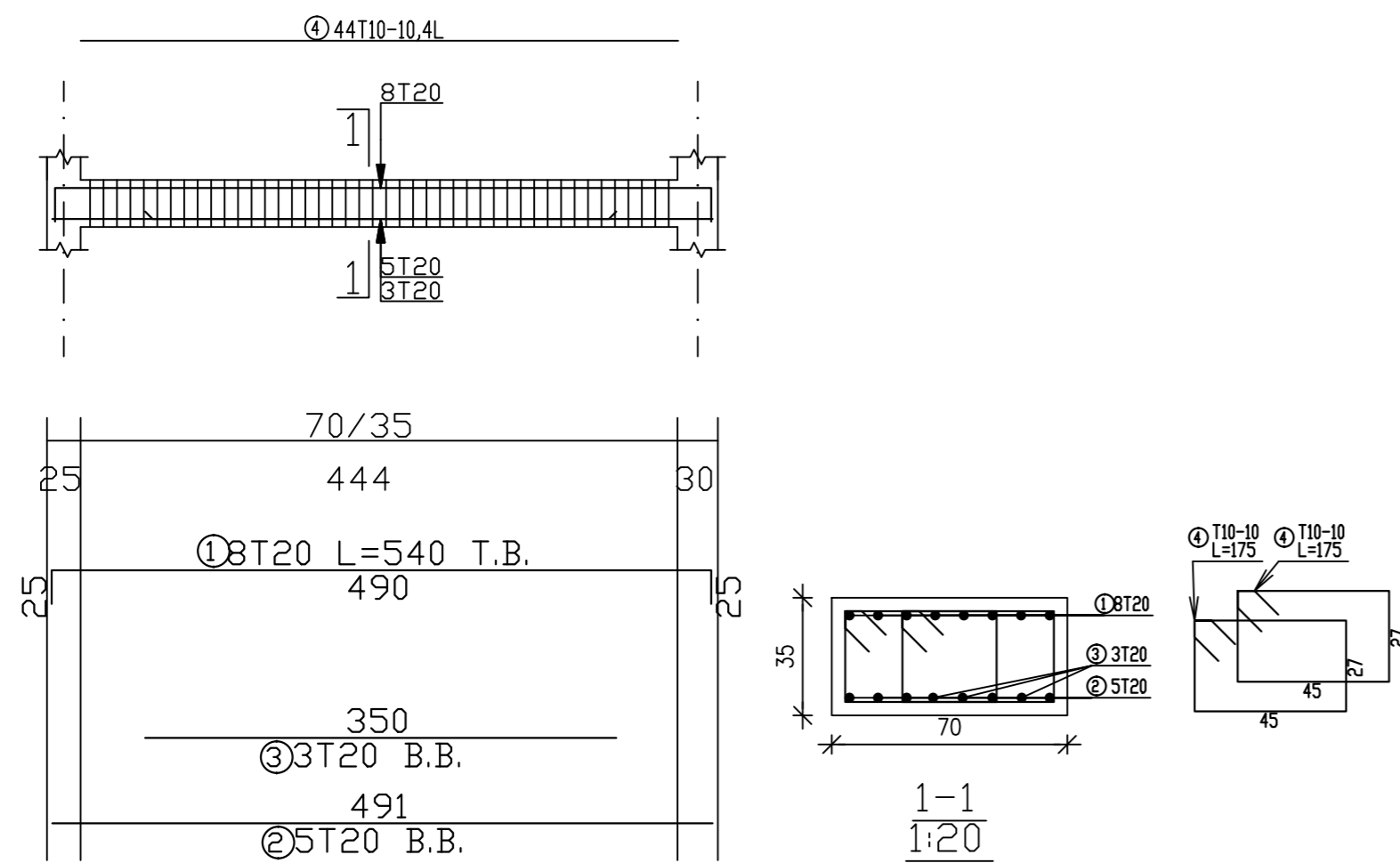
Drawing Title
 seventh Beams details

SCALE 1/100

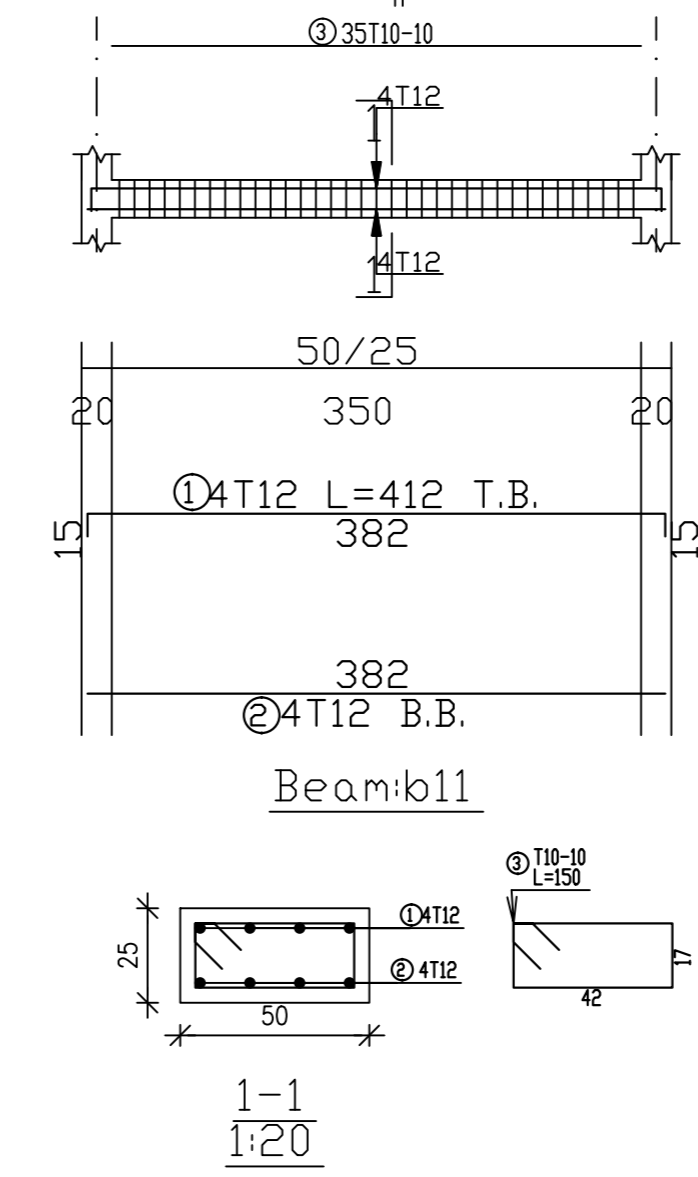
DRAW. NO. S53

2024

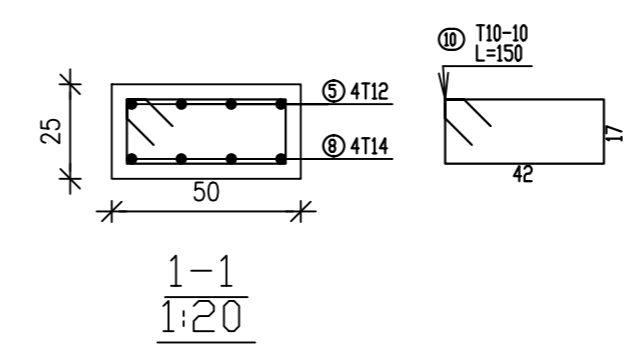
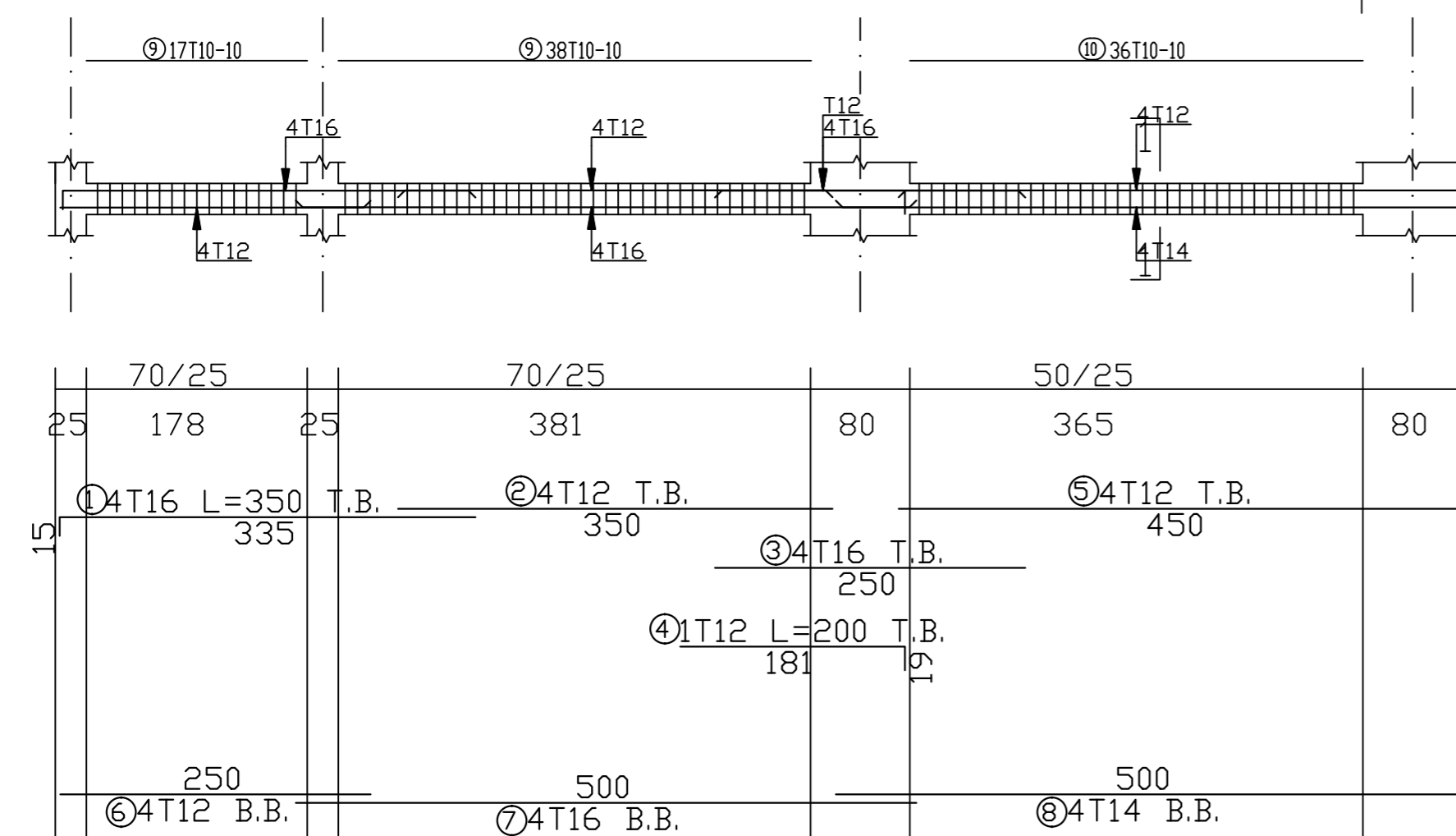
BEAM - B10 (70/35)



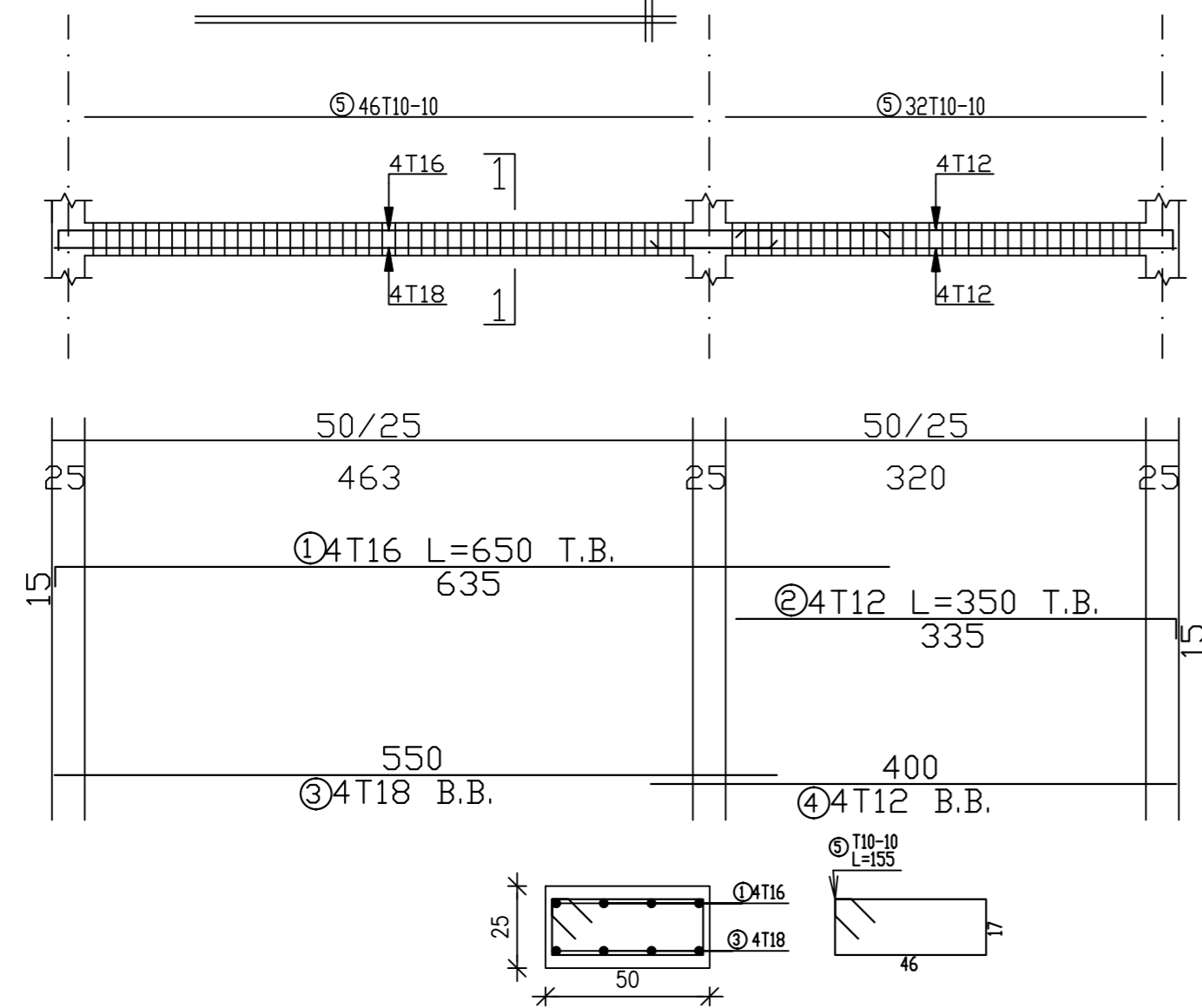
BEAM - B11 (50/25)



BEAM - B12 (70/25)

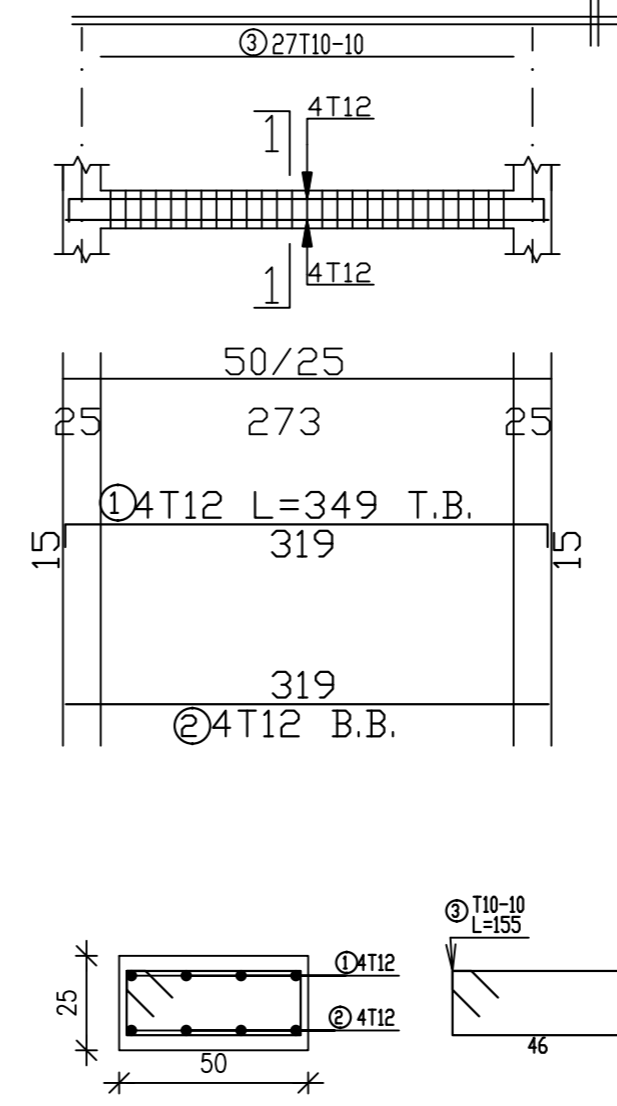


BEAM - B13 (50/25)



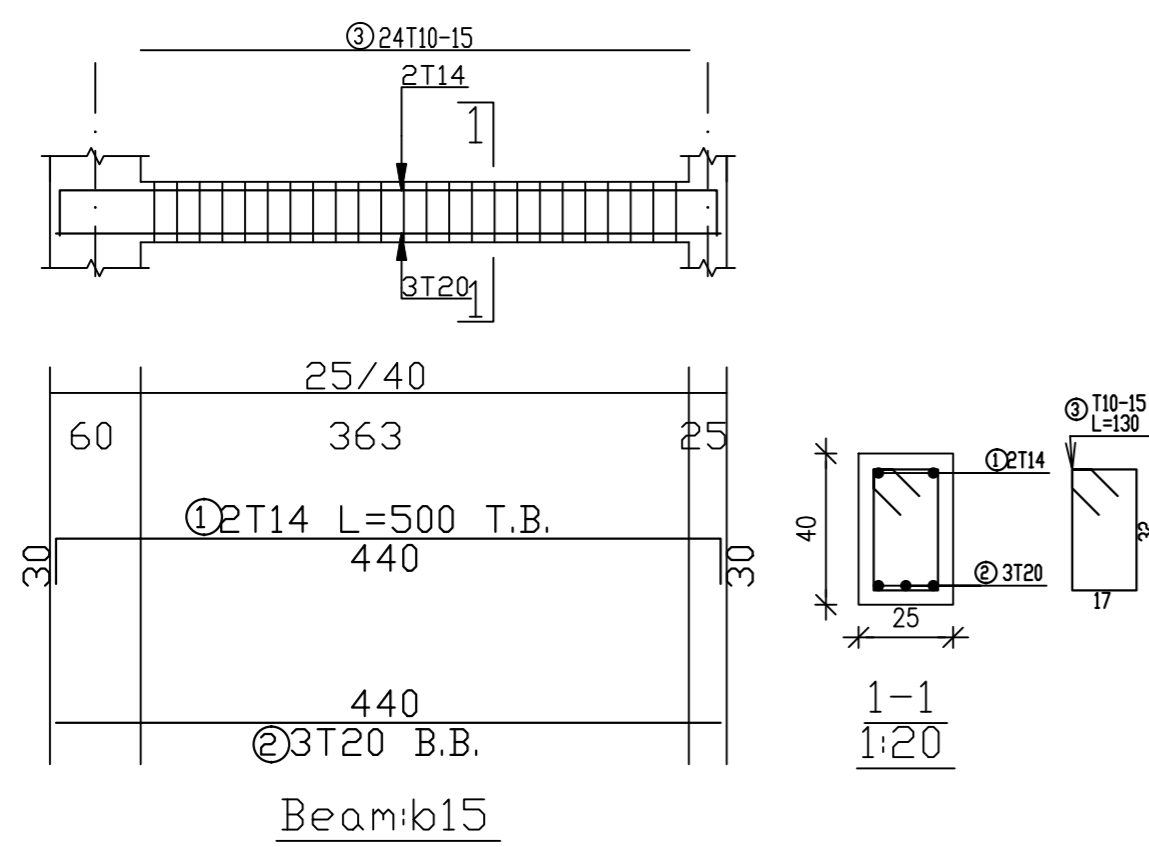
1-1
1:20

BEAM - B14(50/25)



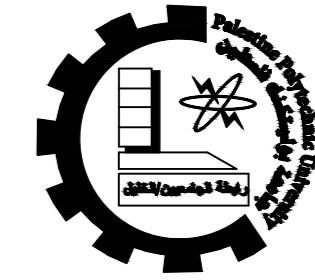
1-1
1:20

BEAM - B15 (25/40)

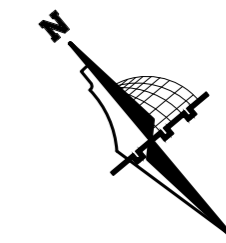


1-1
1:20

Beam:b15



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr.Belal Almasre

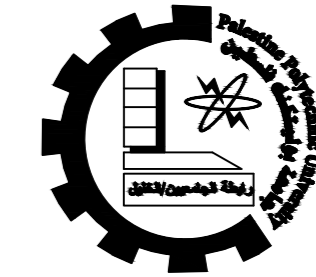
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
seventh Beams details

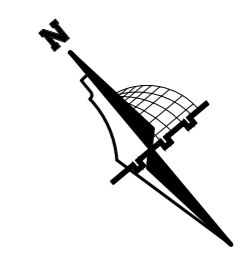
SCALE 1/100

DRAW. NO. S54

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

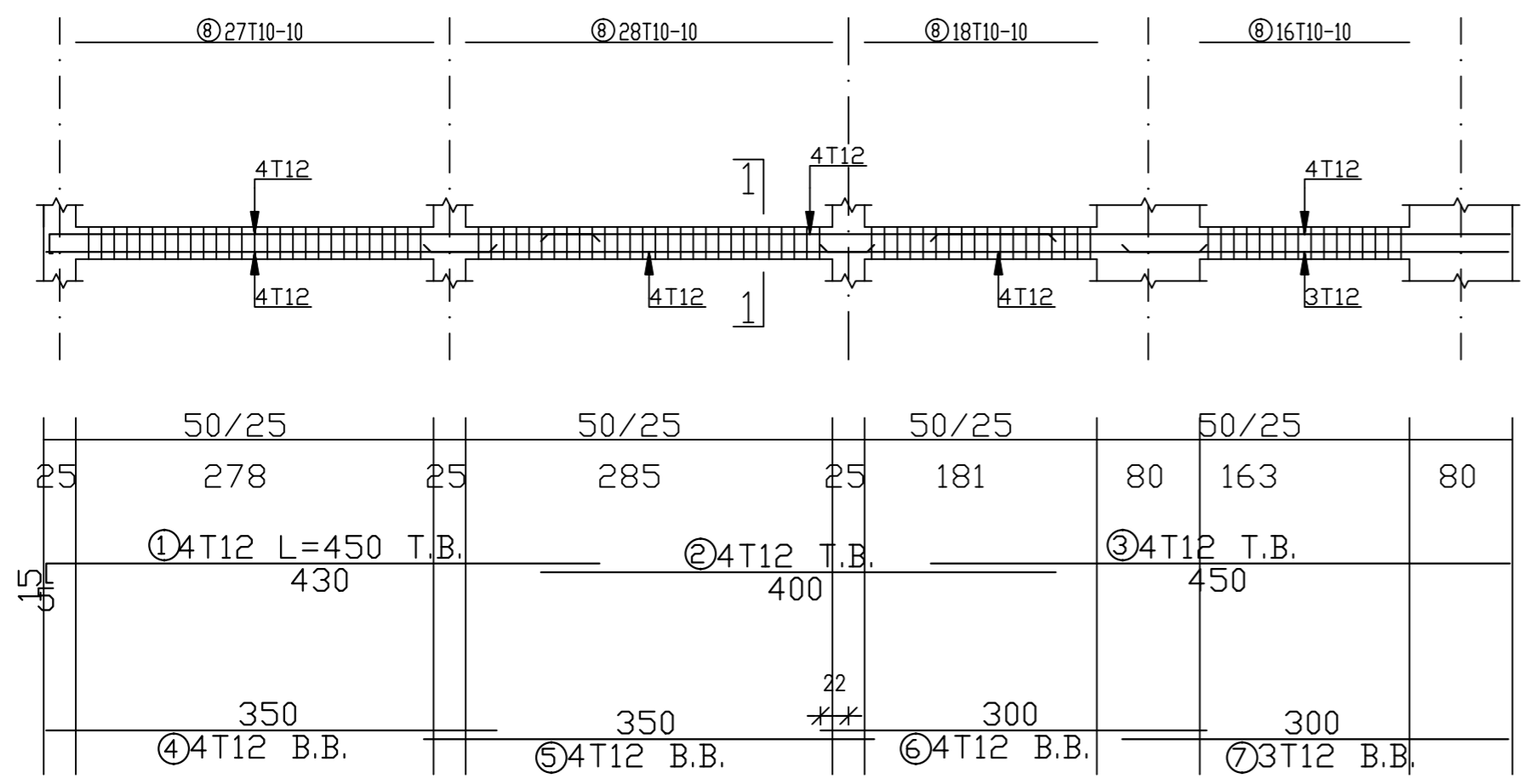
Drawing Title
 seventh Beams details

SCALE 1/100

DRAW. NO. S55

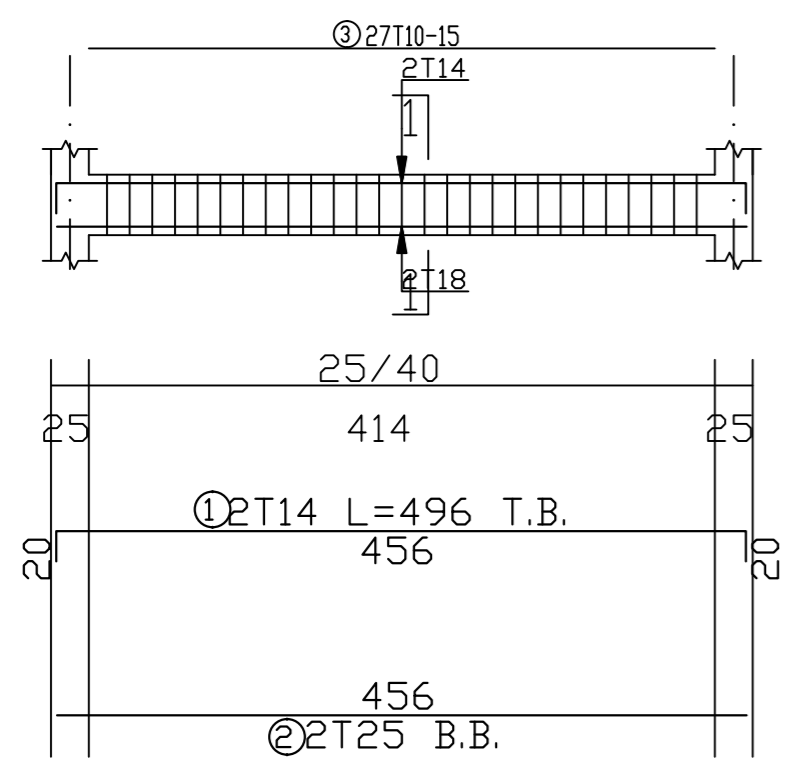
2024

BEAM - B16 (50/25)



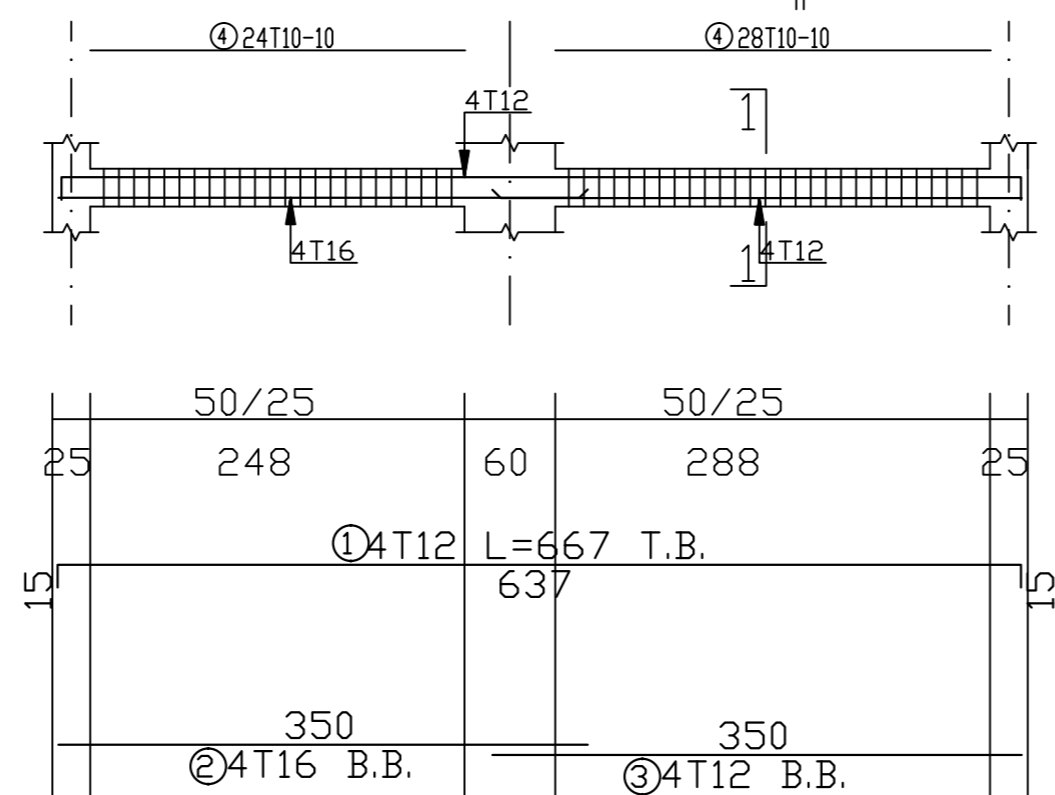
Beam:b16 seventh

BEAM - B18 (25/40)

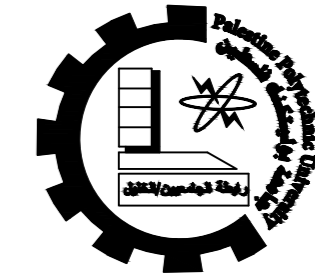


Beam:b18

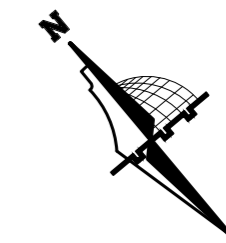
BEAM - B19 (50/25)



Beam:b19



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

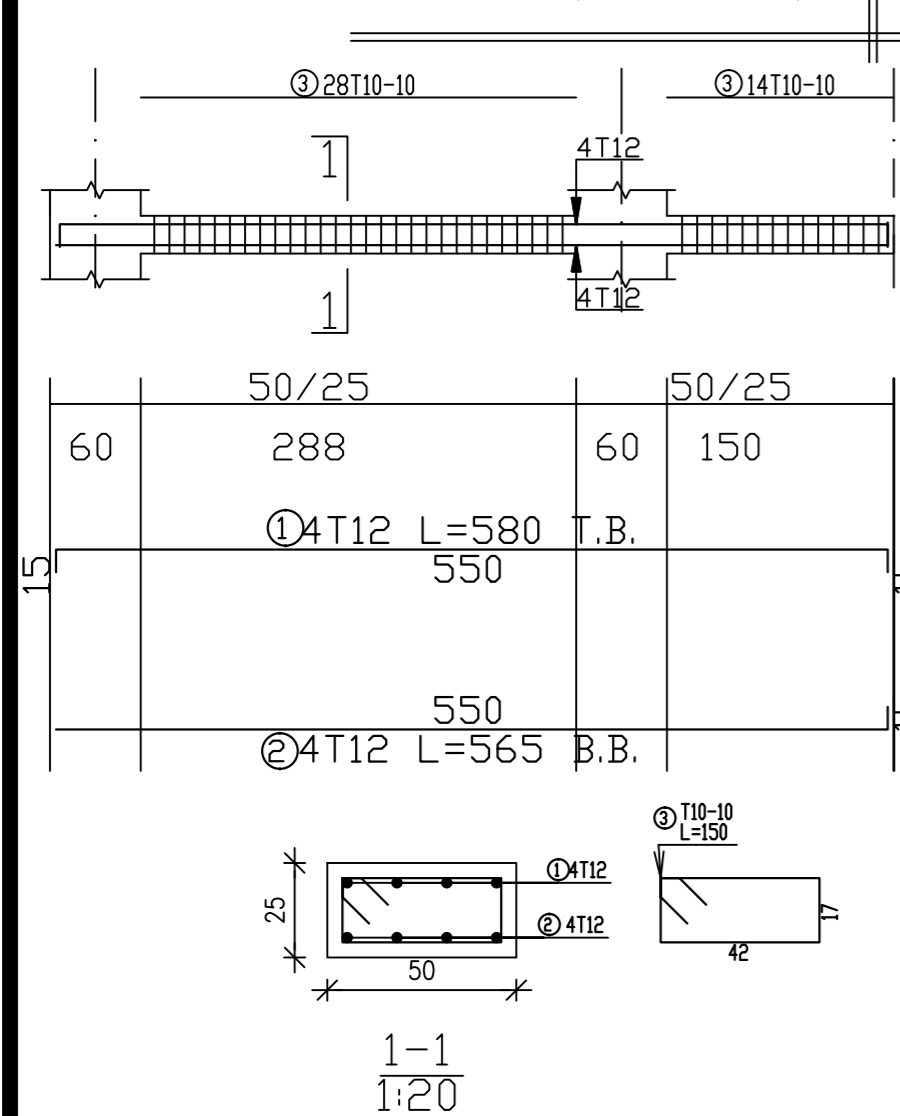
Drawing Title
 seventh Beams details

SCALE 1/100

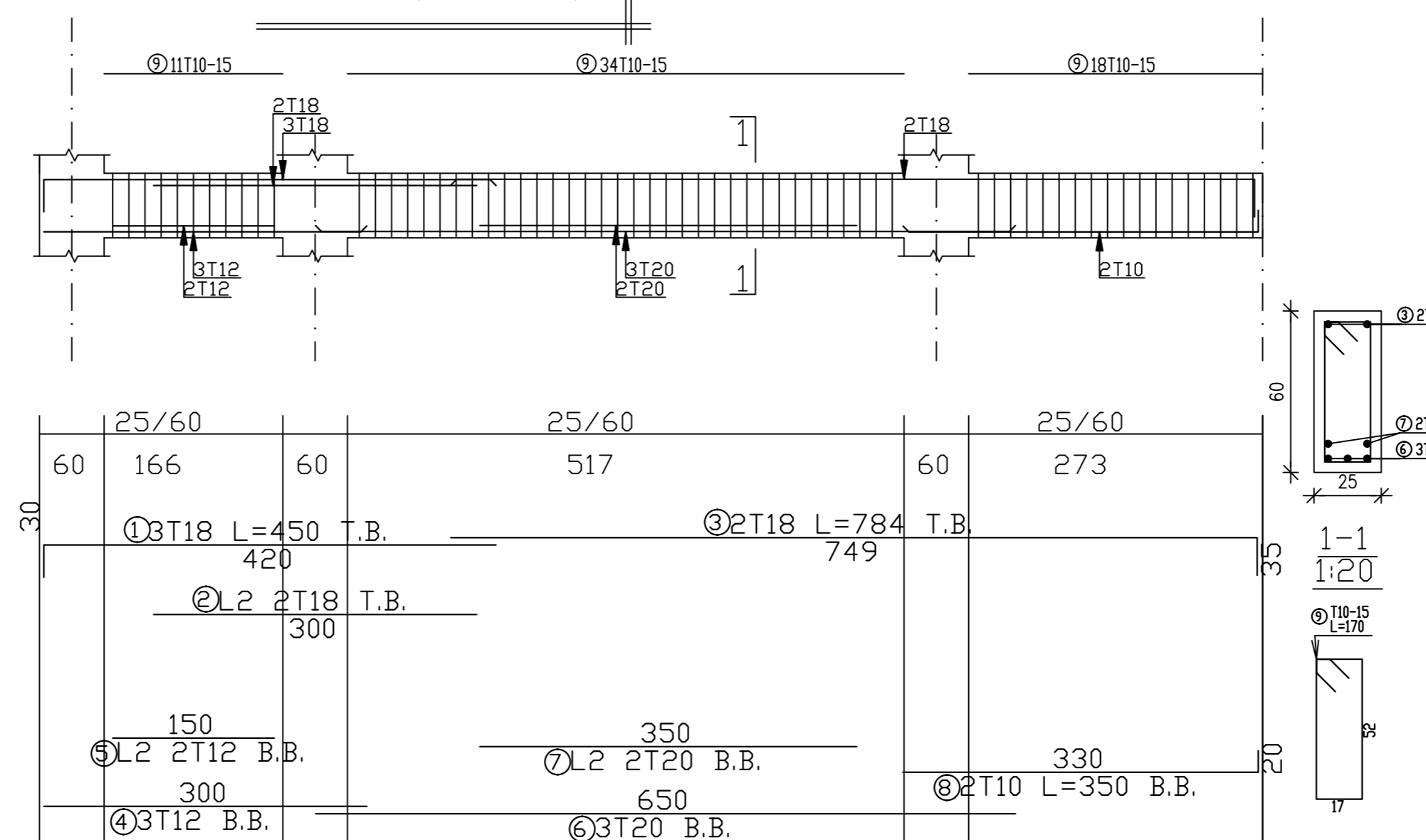
DRAW. NO. S56

2024

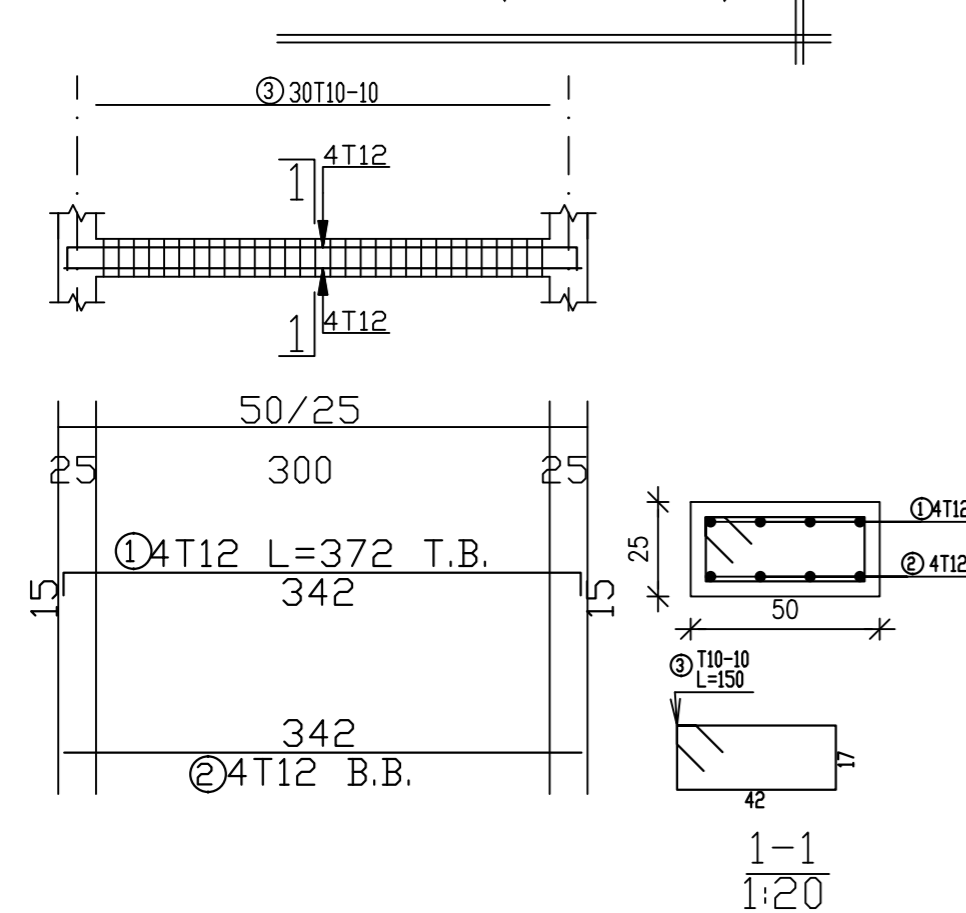
BEAM - B20 (50/25)



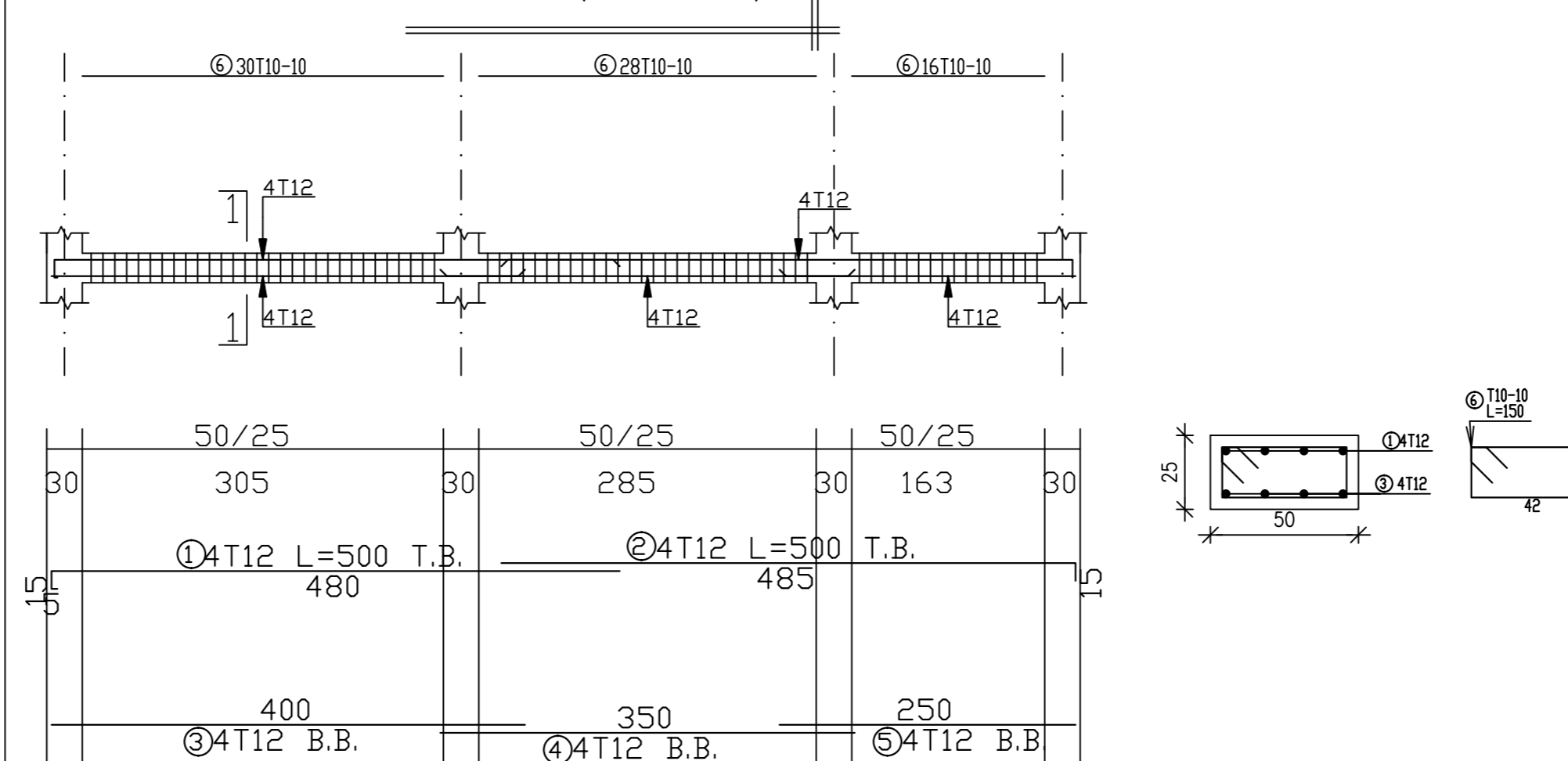
BEAM - B22 (25/60)

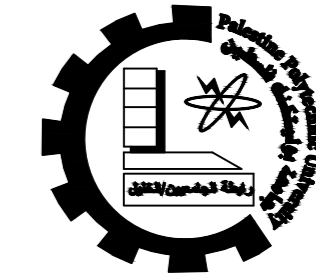


BEAM - B23 (50/25)

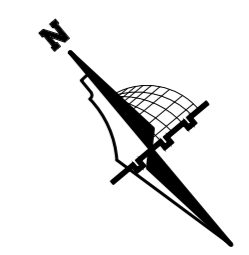


BEAM - B24 (50/25)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

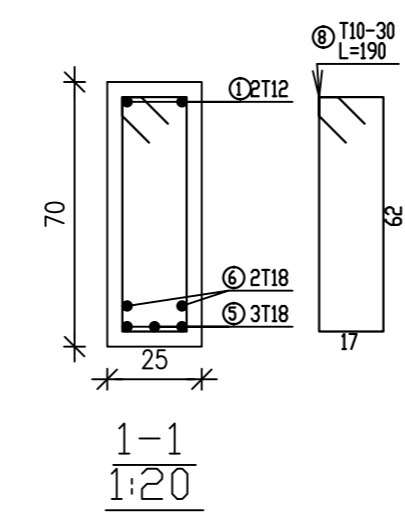
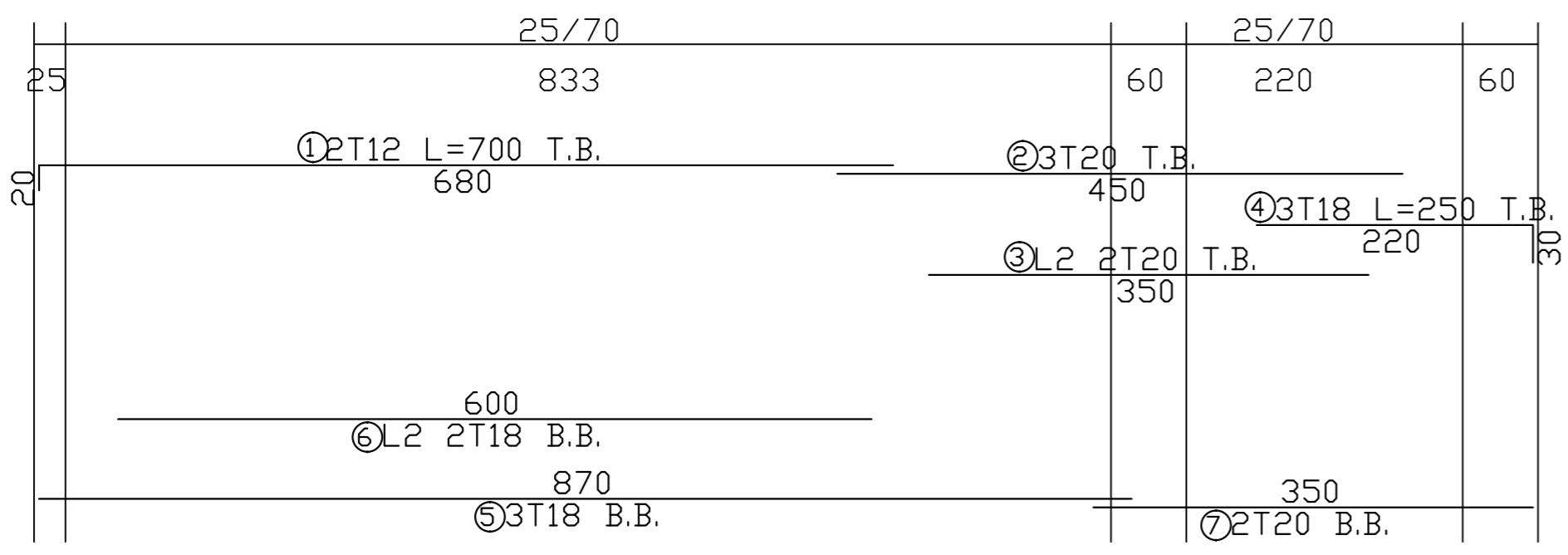
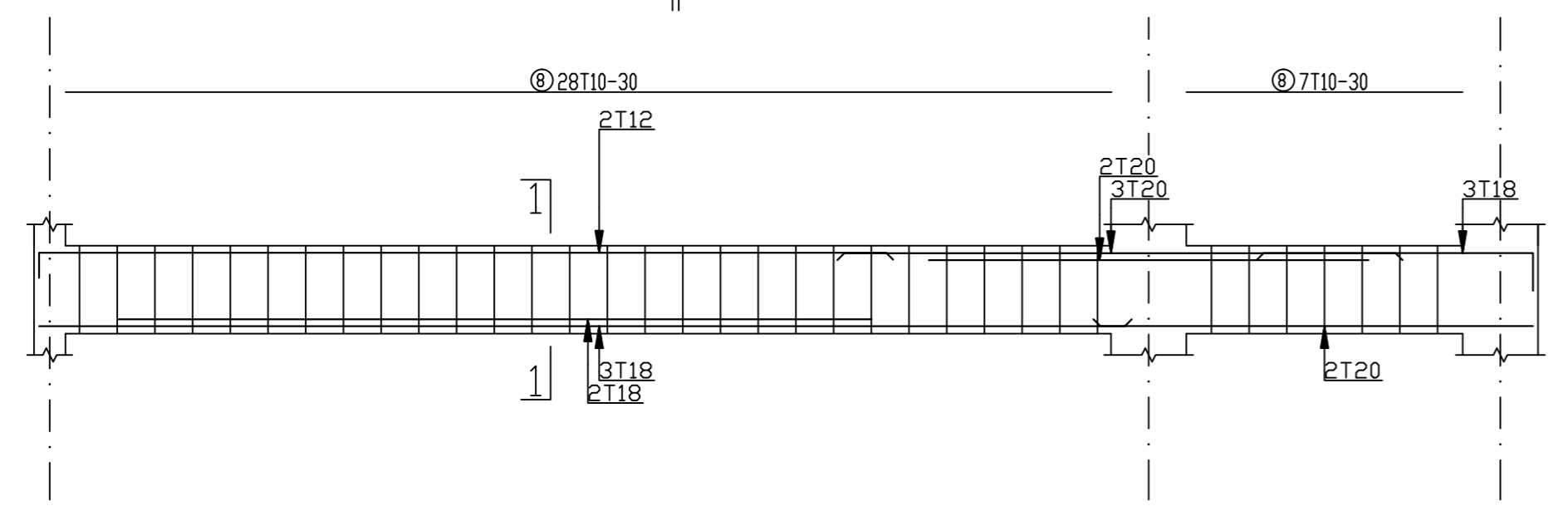
Drawing Title
 seventh Beams details

SCALE 1/100

DRAW. NO. S57

2024

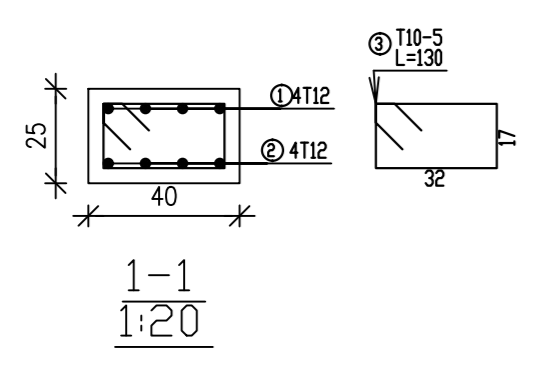
BEAM - B25 (25/60)



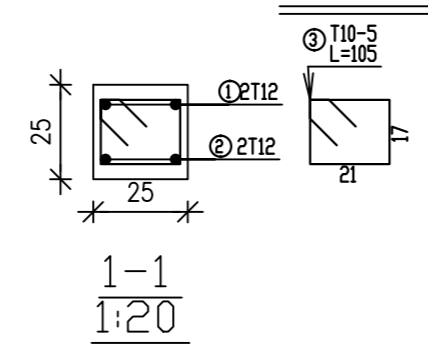
Beam:b25 seventh

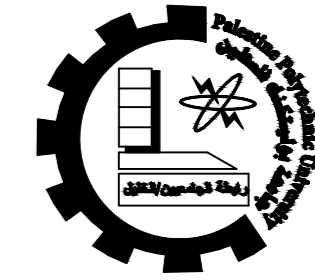
BEAM - B26 (50/25)

Beam:b26

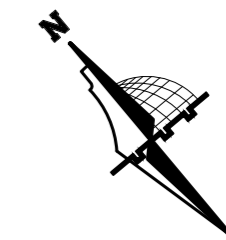


BEAM - B27 (25/25)





Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

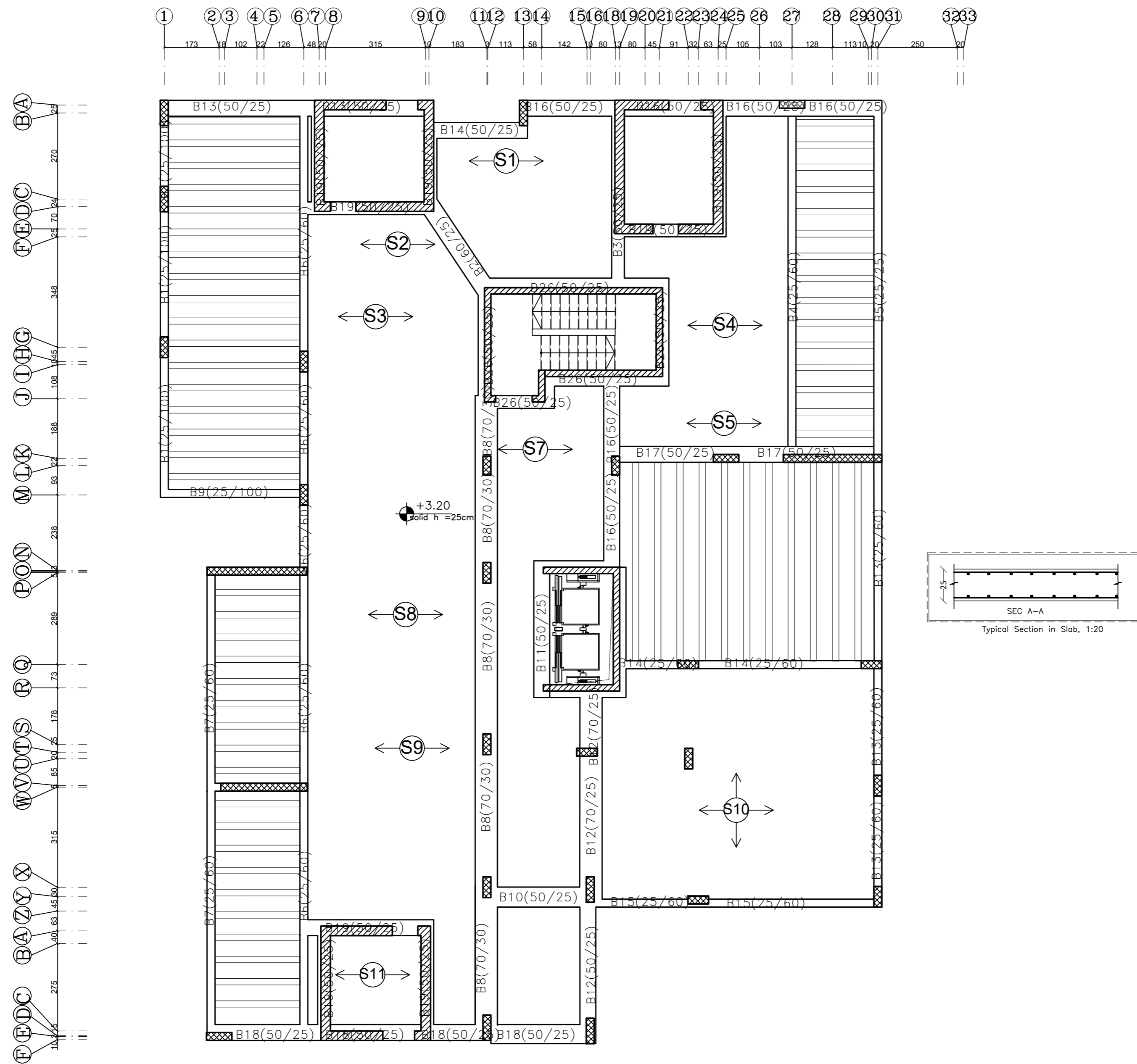
Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

Drawing Title
Roof FLOOR
slab layout

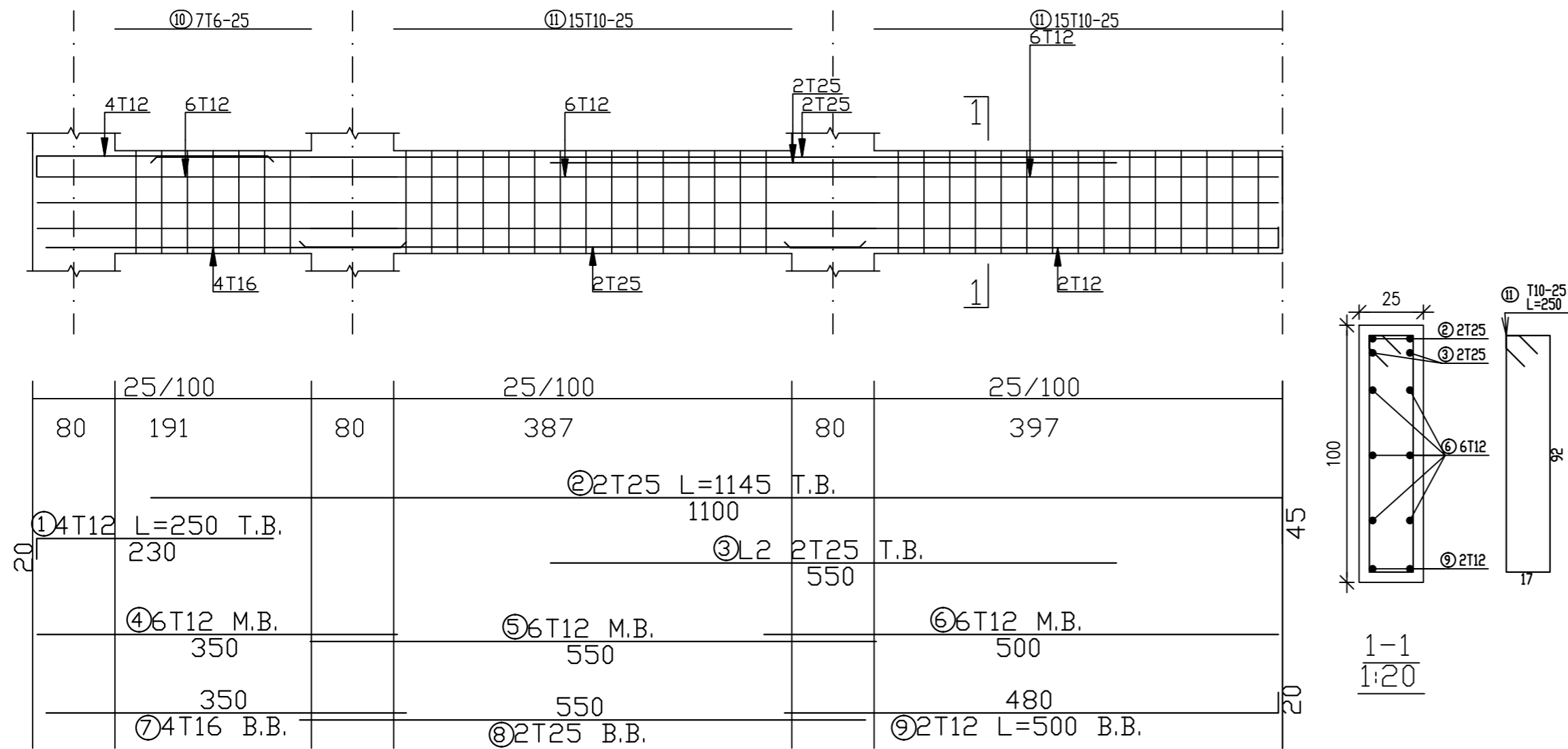
SCALE 1/100

DRAW. NO. S58

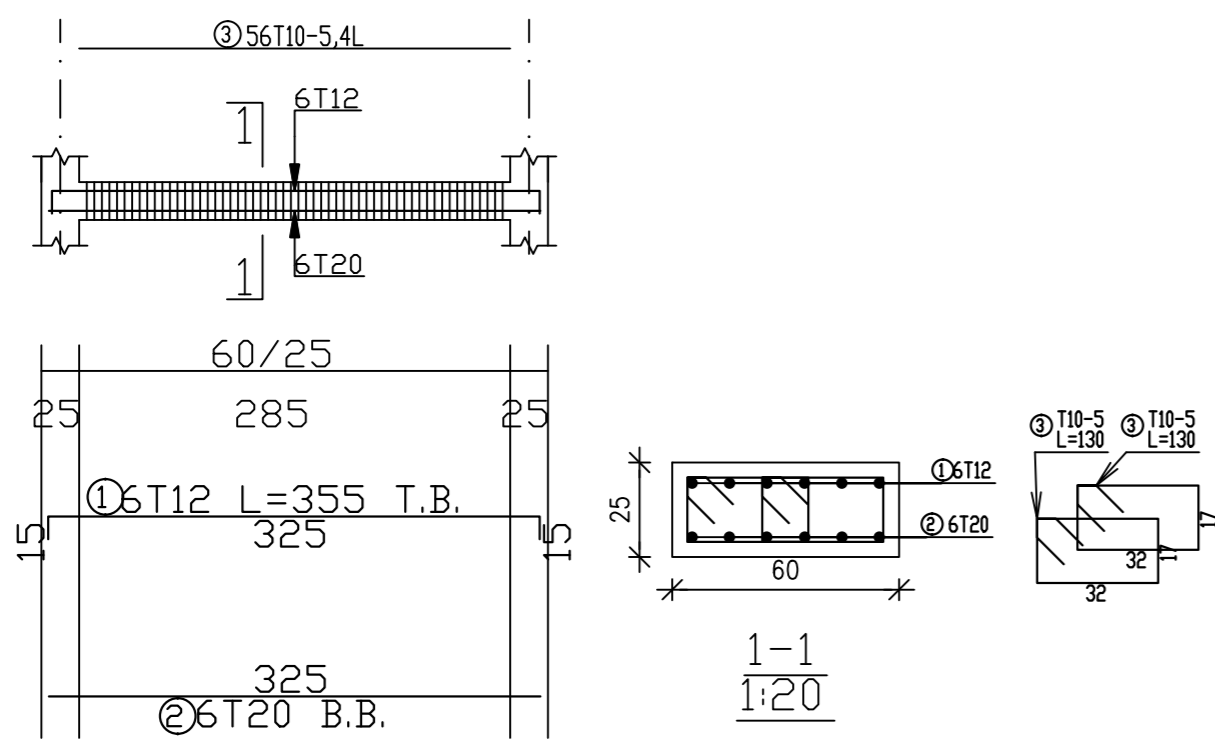
2024



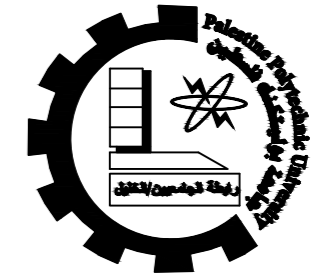
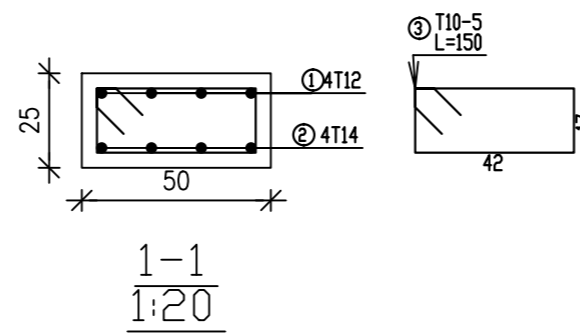
BEAM - B1 (25/100)



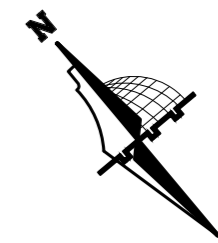
BEAM - B2 (60/25)



BEAM - B3 (50/25)



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

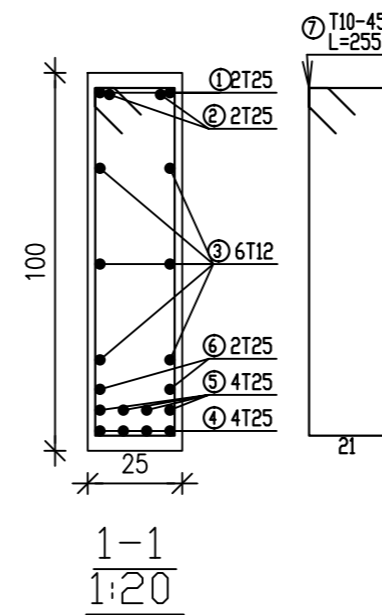
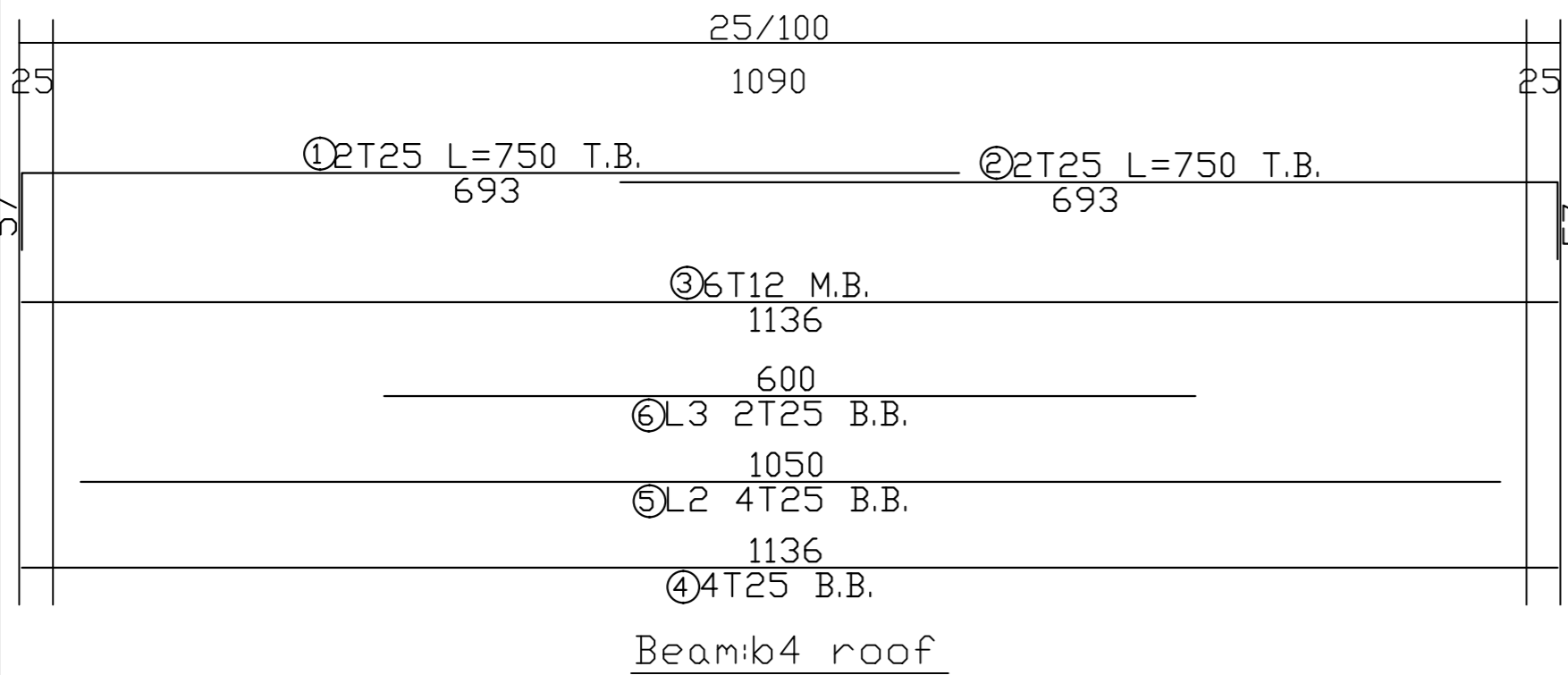
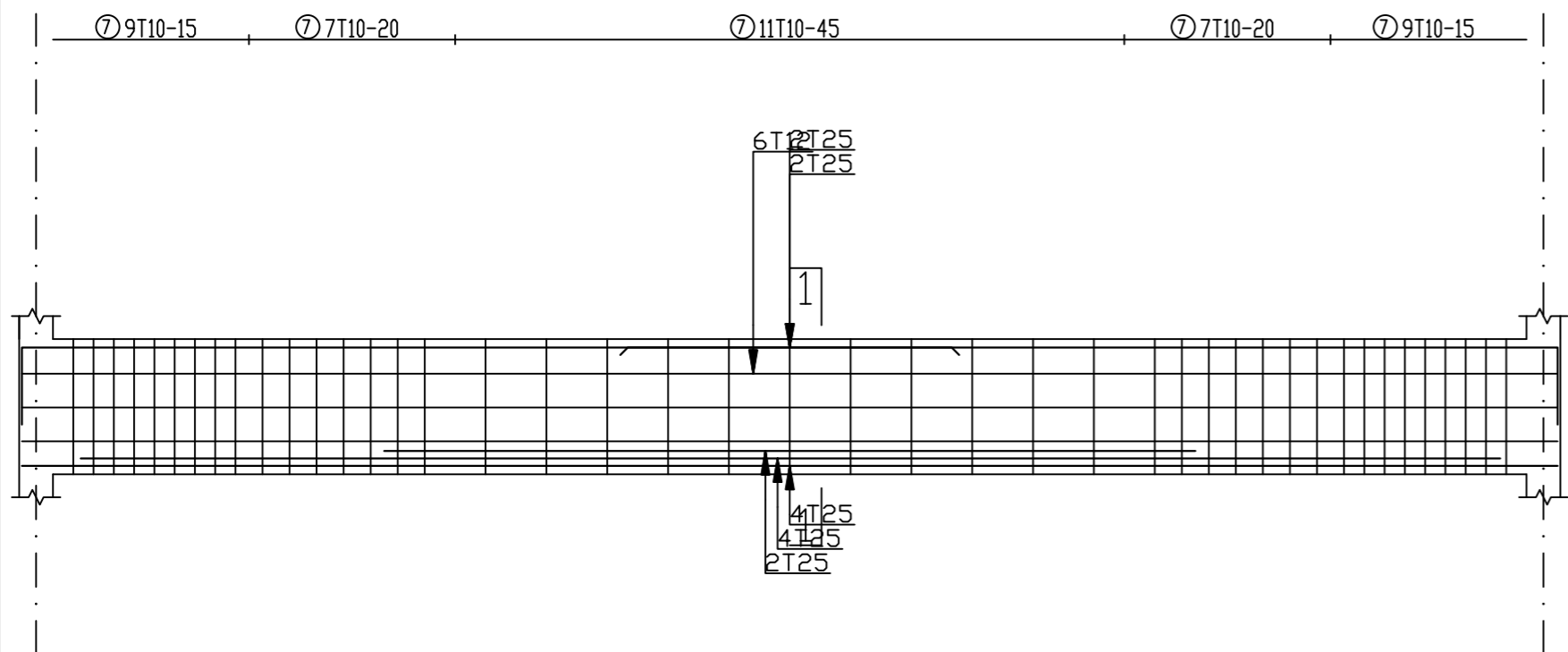
Drawing Title
 Roof beams
 details

SCALE 1/100

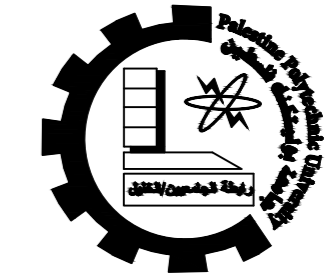
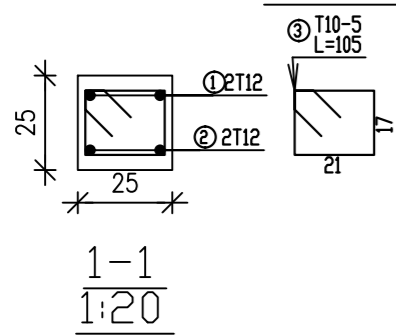
DRAW. NO. S60

2024

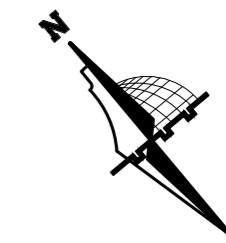
BEAM - B4 (25/100)



BEAM - B25 (25/25)



Palestine Polytechnic University
College of Engineering
Civil & Arch. Eng Department
Building Engineering



Graduation Project
"Structural Design
of a Residential complex"

Supervisor
Dr. Belal Almasre

Project Team
Fadi Sabbagh
Sharbel Farhat
Amir Gadban
Amir Zatout

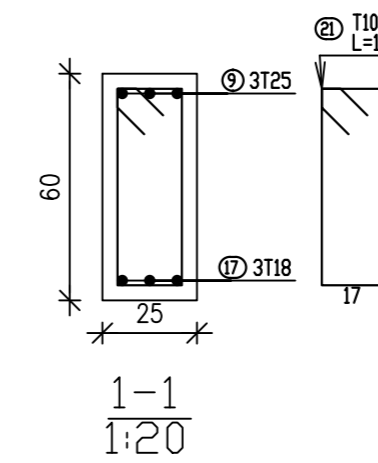
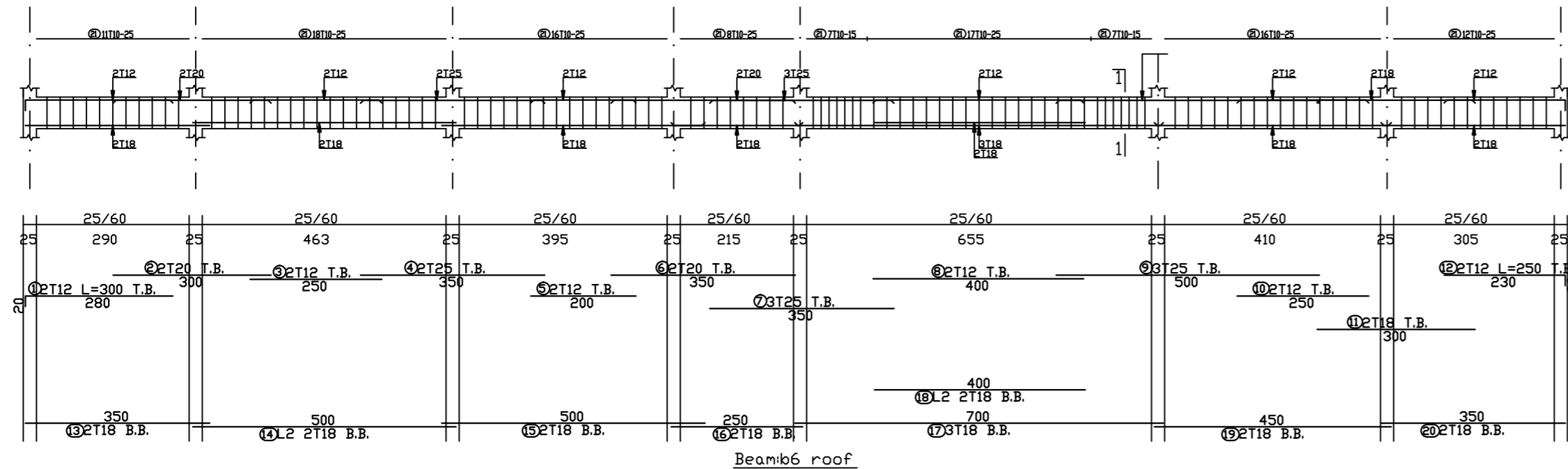
Drawing Title
Roof beams
details

SCALE 1/100

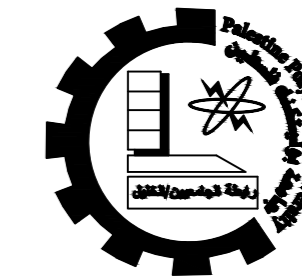
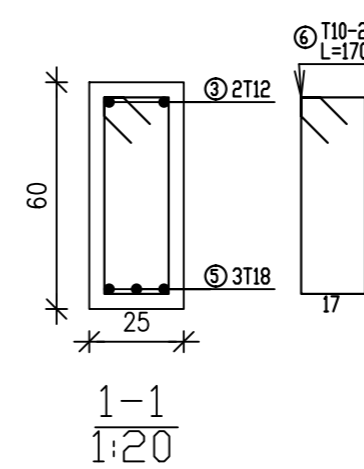
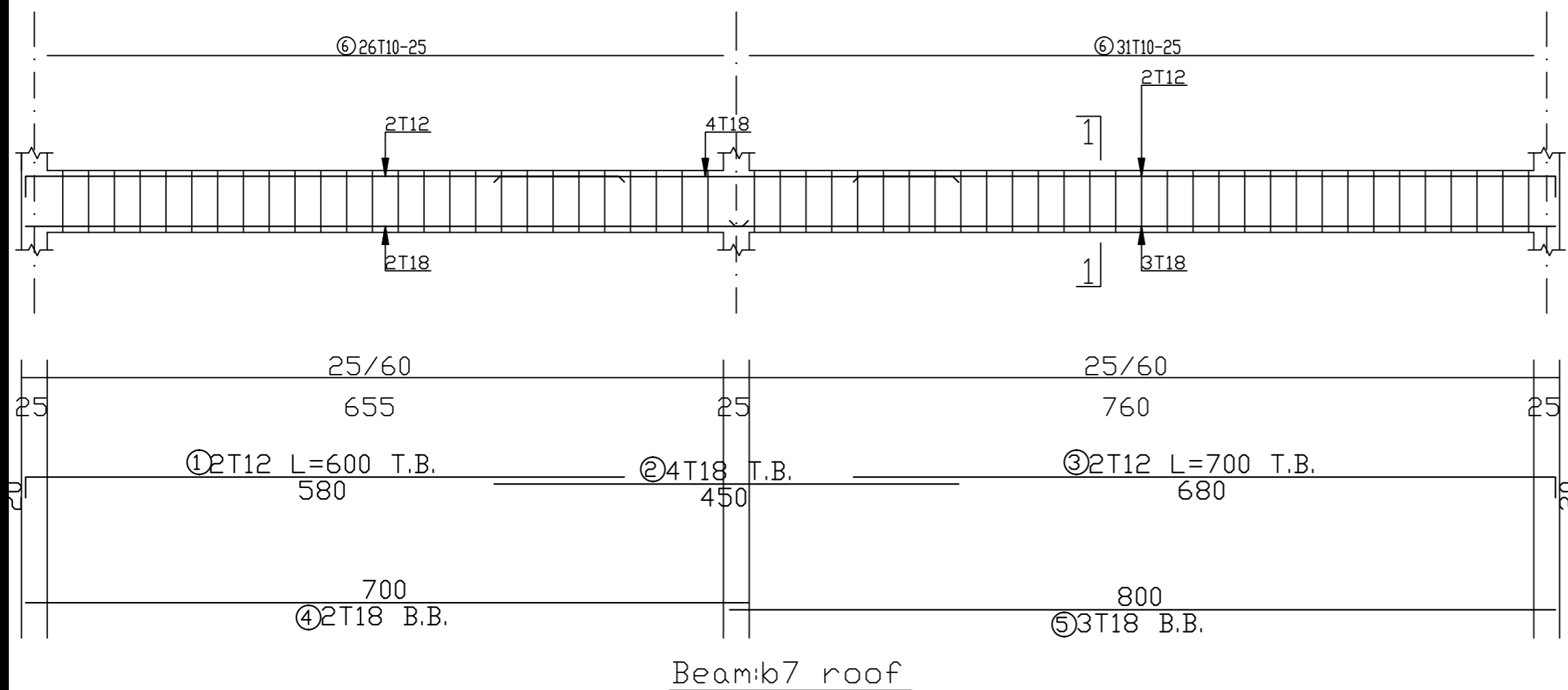
DRAW. NO. S61

2024

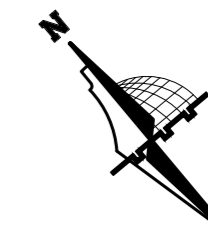
BEAM - B6 (25/60)



BEAM - B7 (25/60)



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr.Belal Almasre

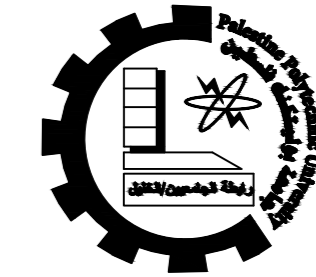
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 Roof beams
 details

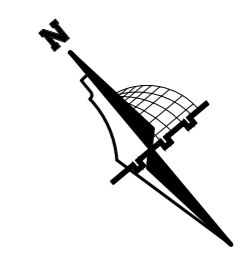
SCALE 1/100

DRAW. NO. S62

2024



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

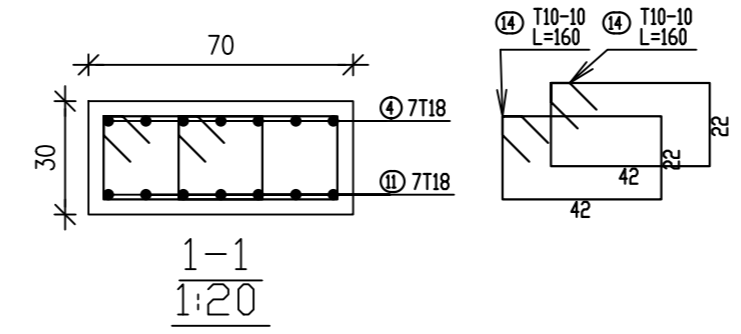
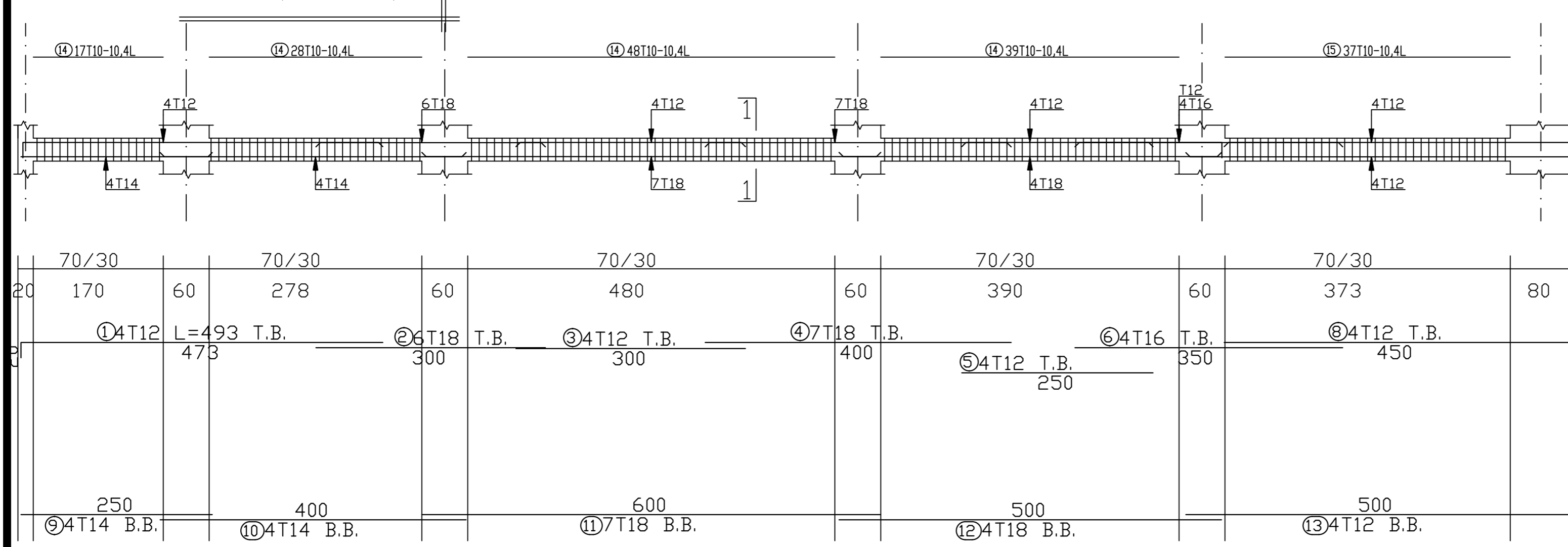
Drawing Title
 Roof beams
 details

SCALE 1/100

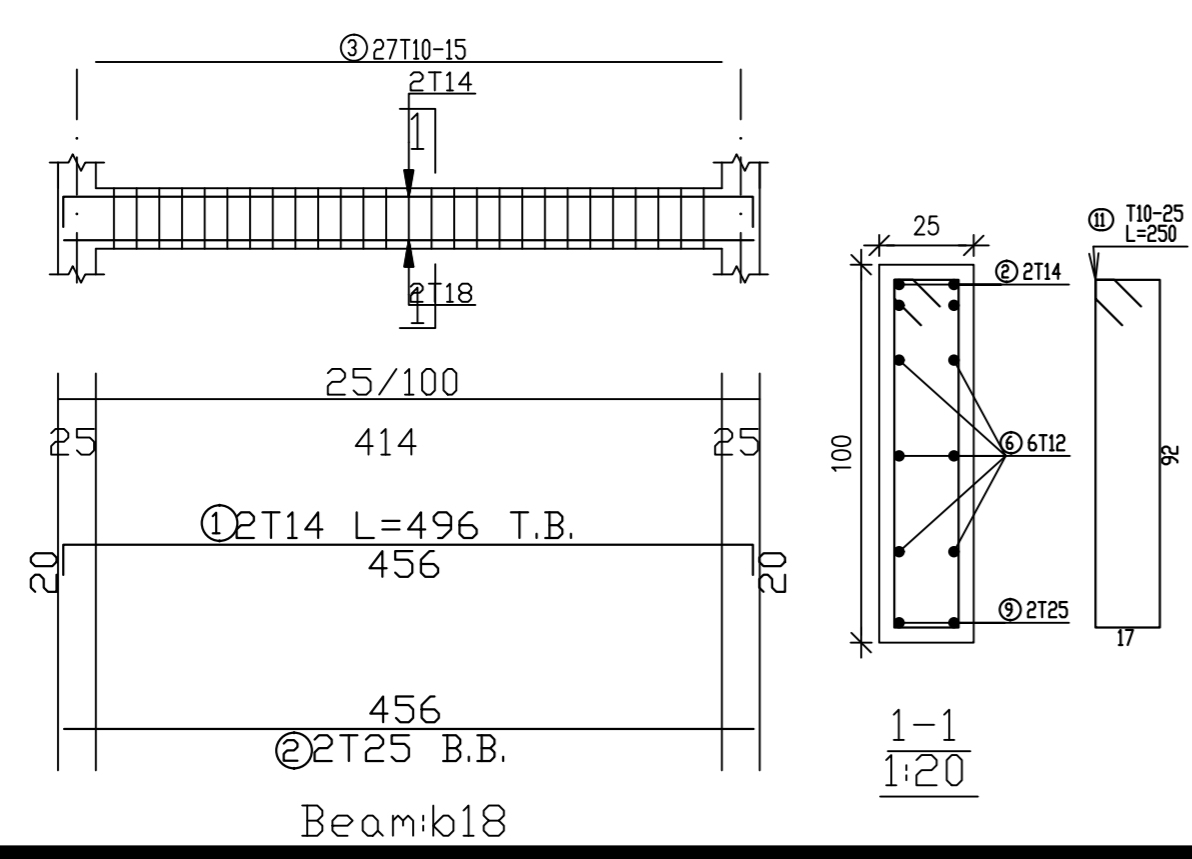
DRAW. NO. S63

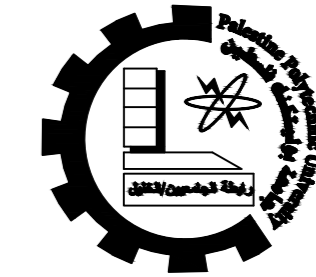
2024

BEAM - B8 (70/30)

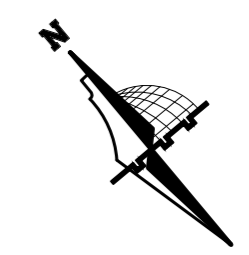


BEAM - B9 (25/100)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

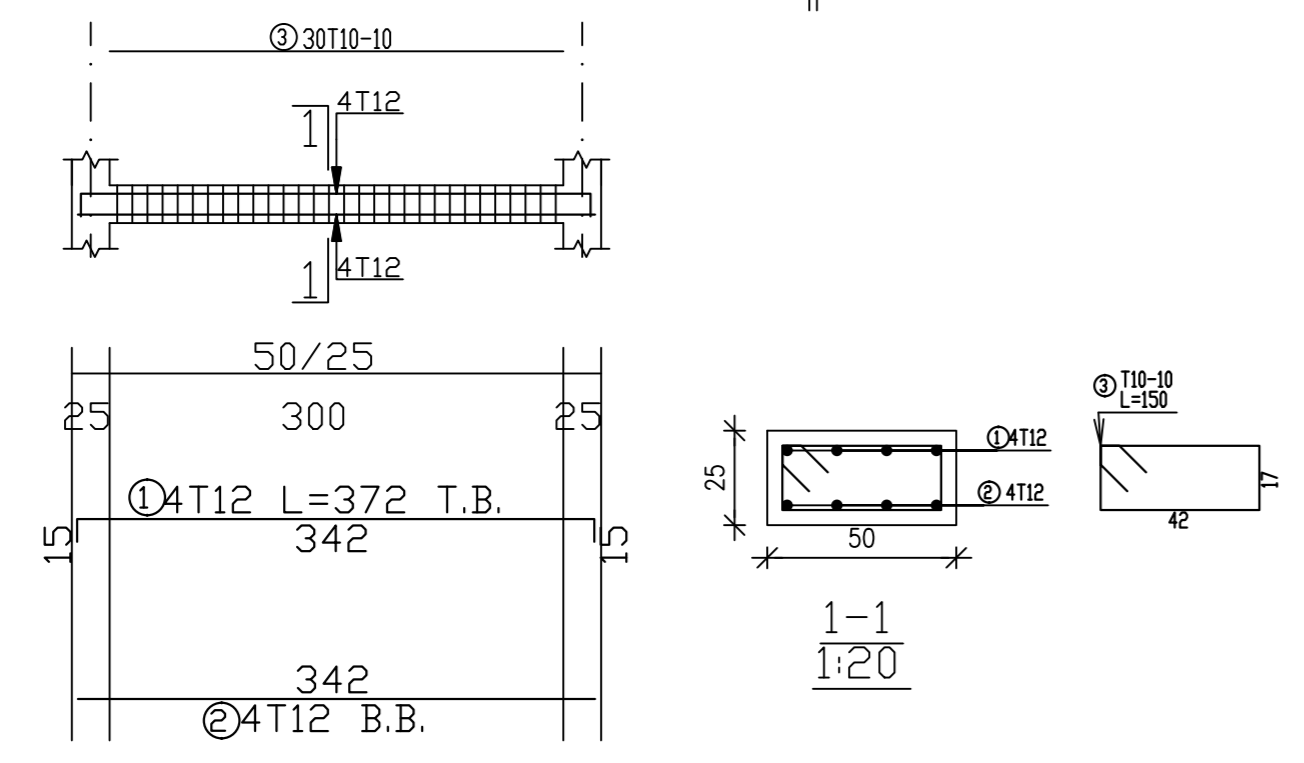
Drawing Title
 Roof beams
 details

SCALE 1/100

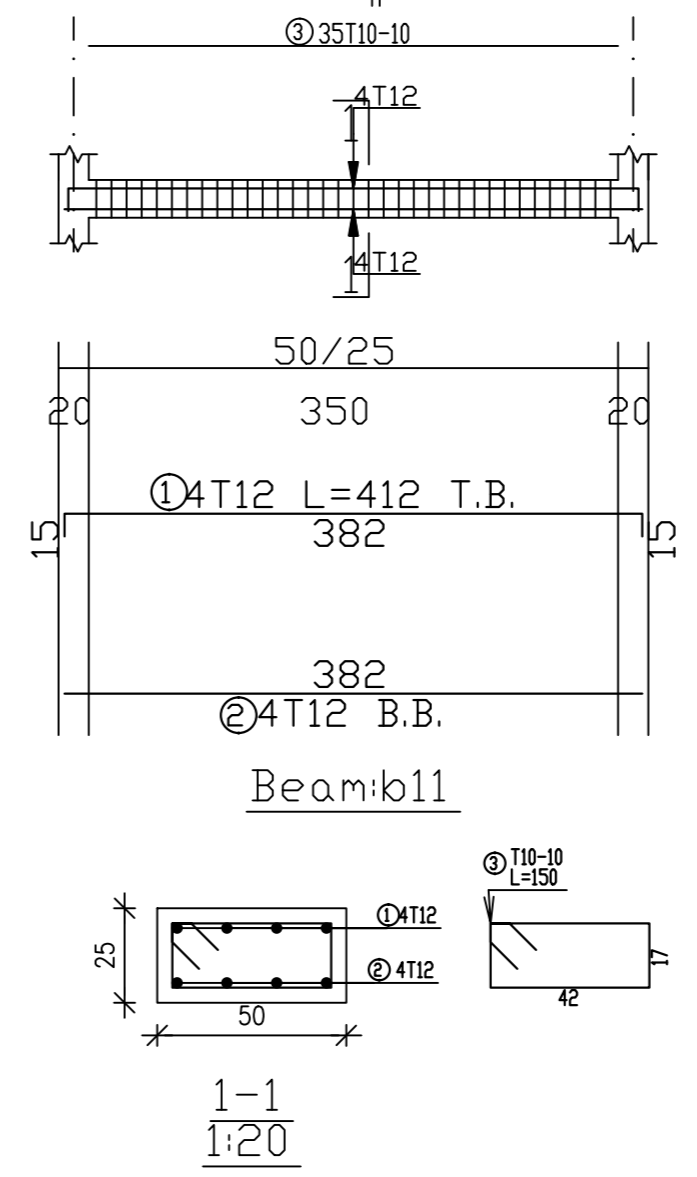
DRAW. NO. S64

2024

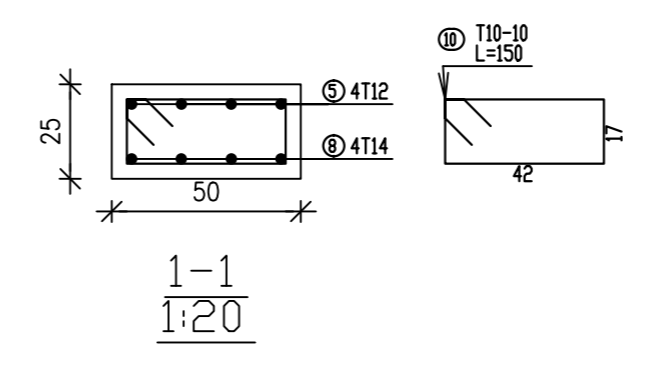
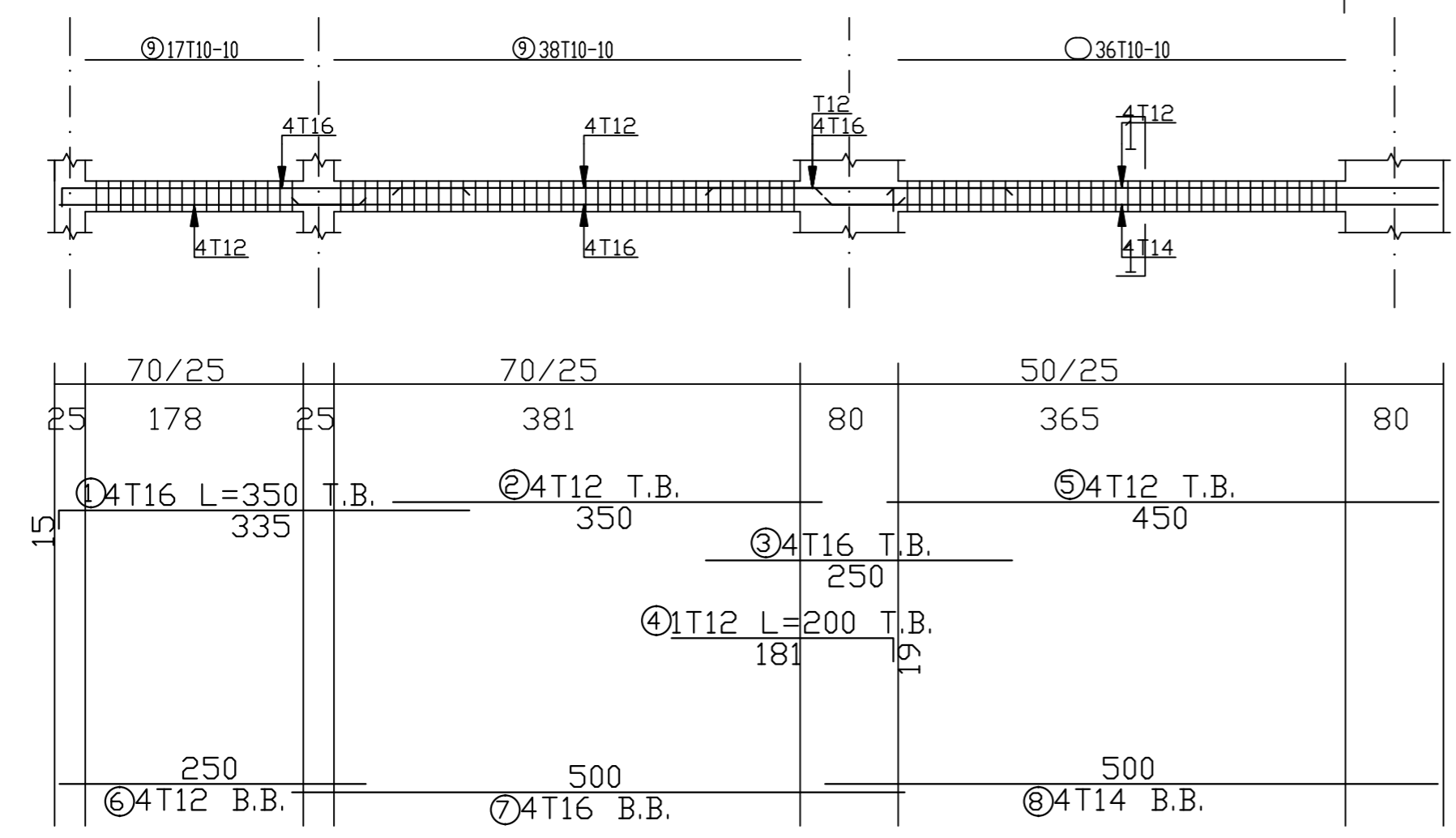
BEAM - B10 (50/25)

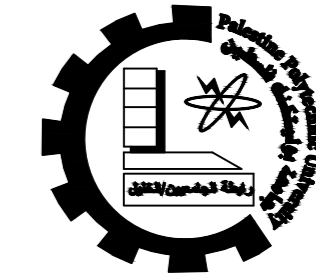


BEAM - B11 (50/25)

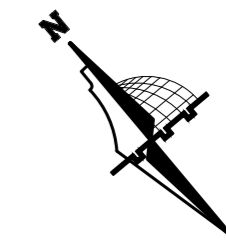


BEAM - B12 (70/25)





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

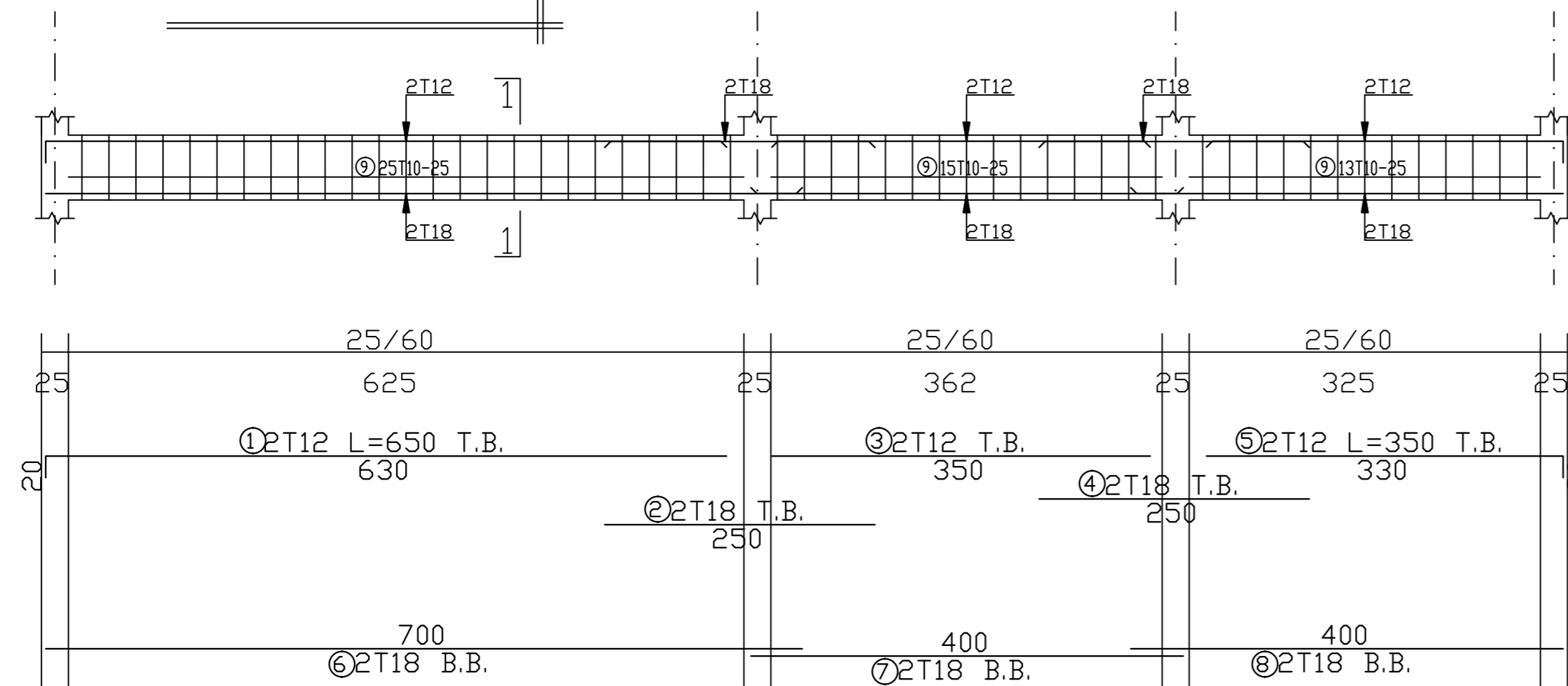
Drawing Title
 Roof beams
 details

SCALE 1/100

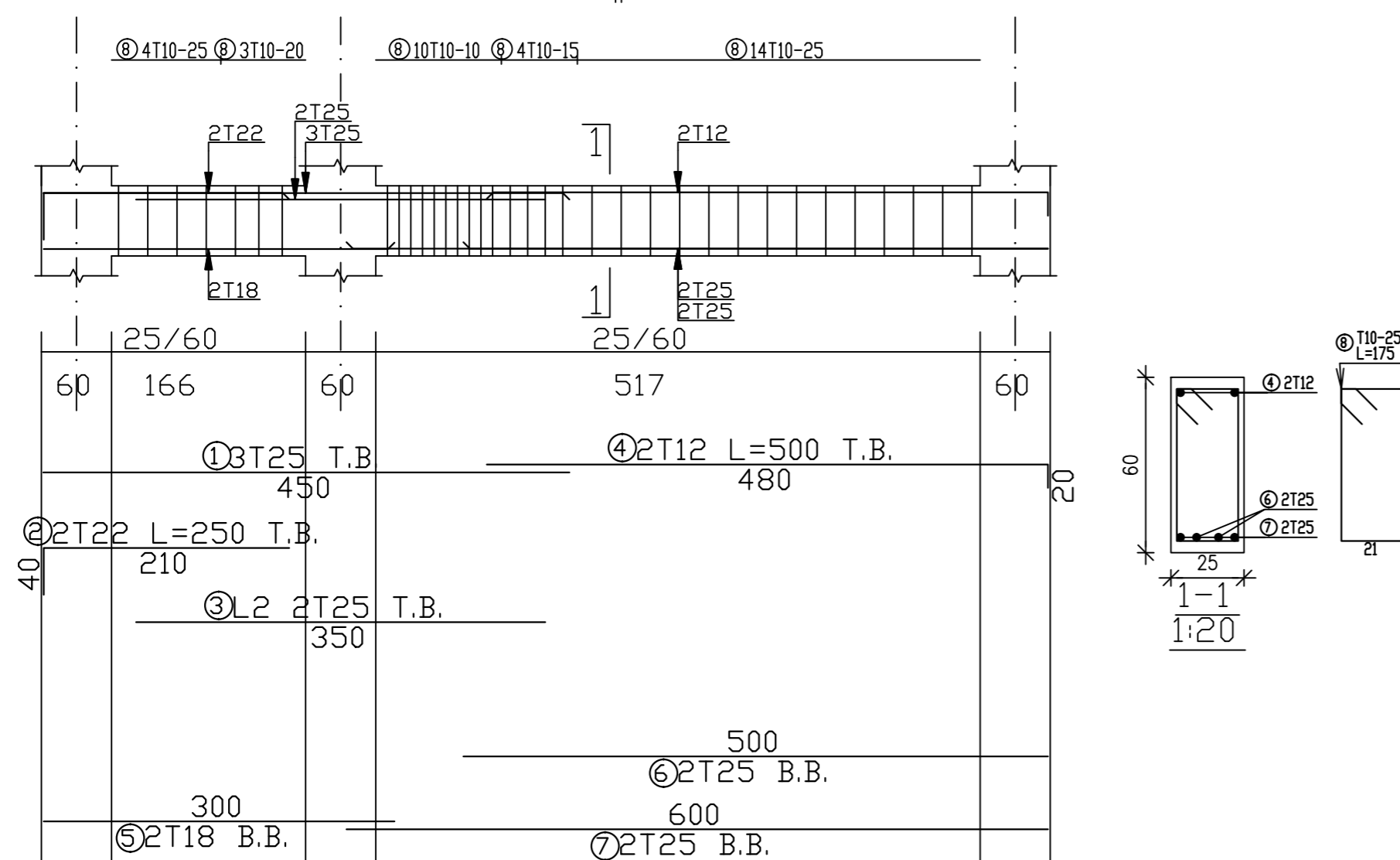
DRAW. NO. S65

2024

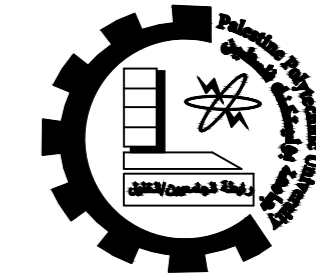
BEAM - B13 (25/60)



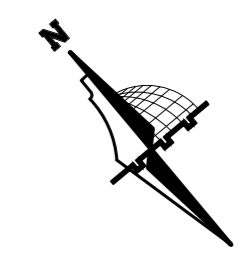
BEAM - B14 (25/60)



Beam:b22 roof



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

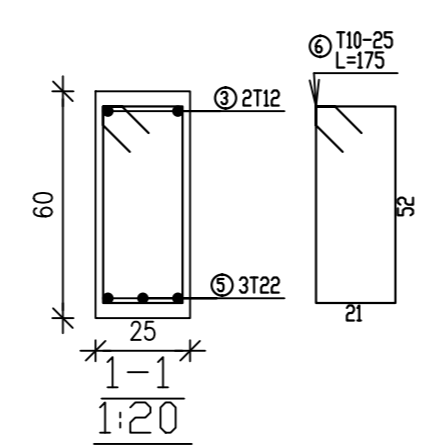
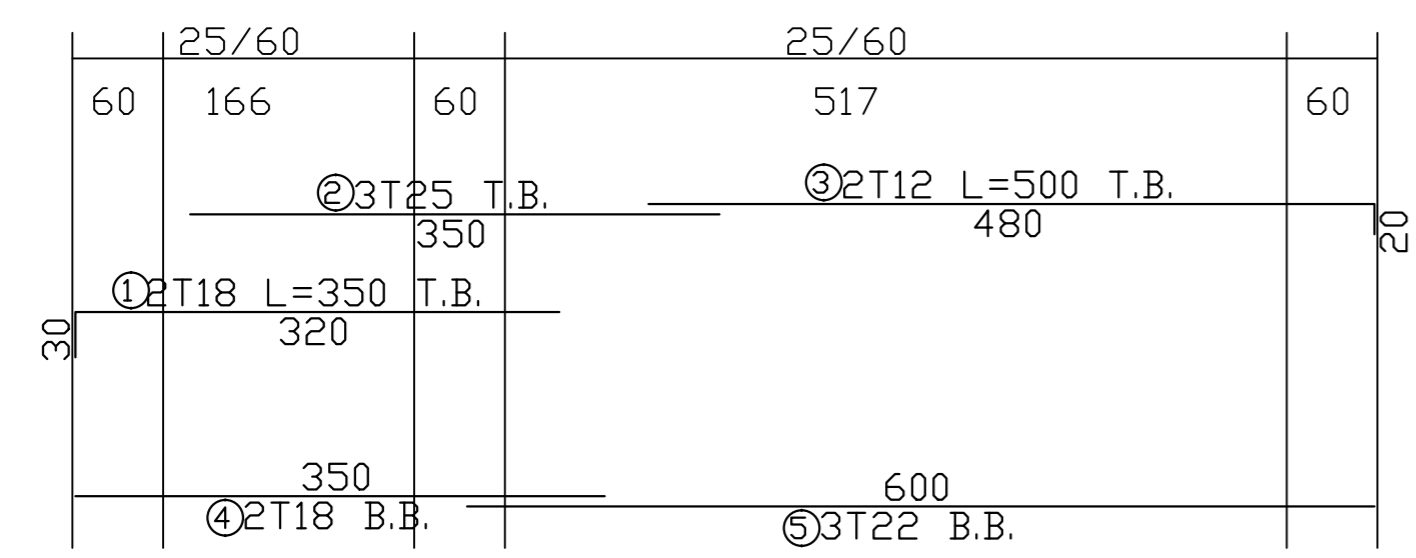
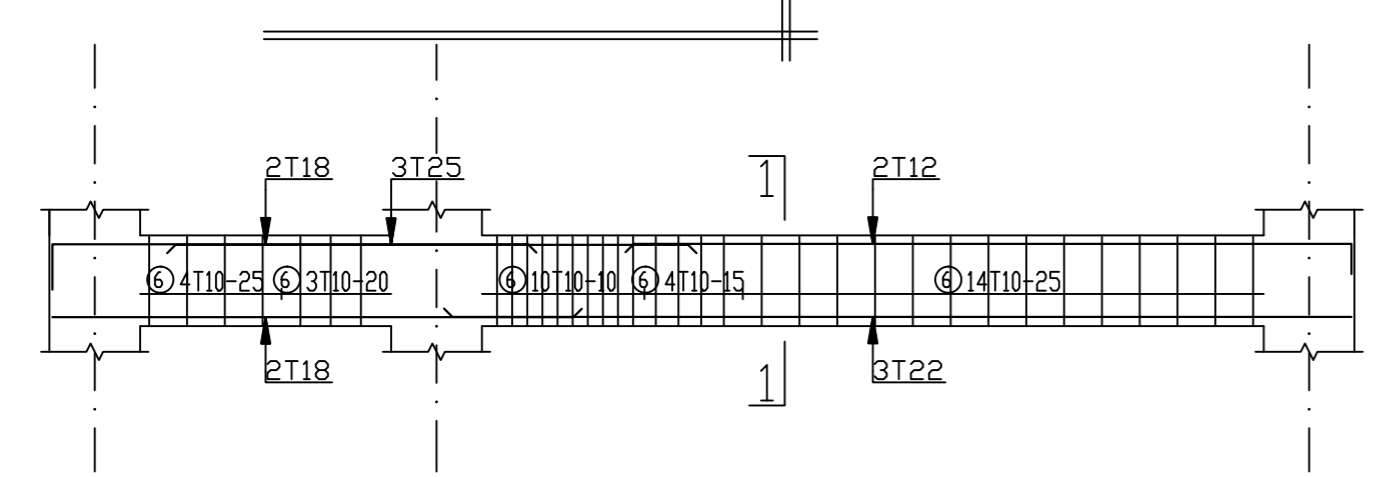
Drawing Title
 Roof beams
 details

SCALE 1/100

DRAW. NO. S66

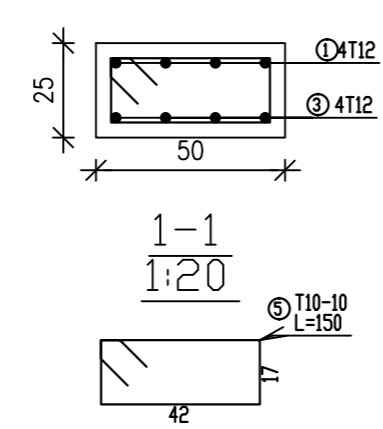
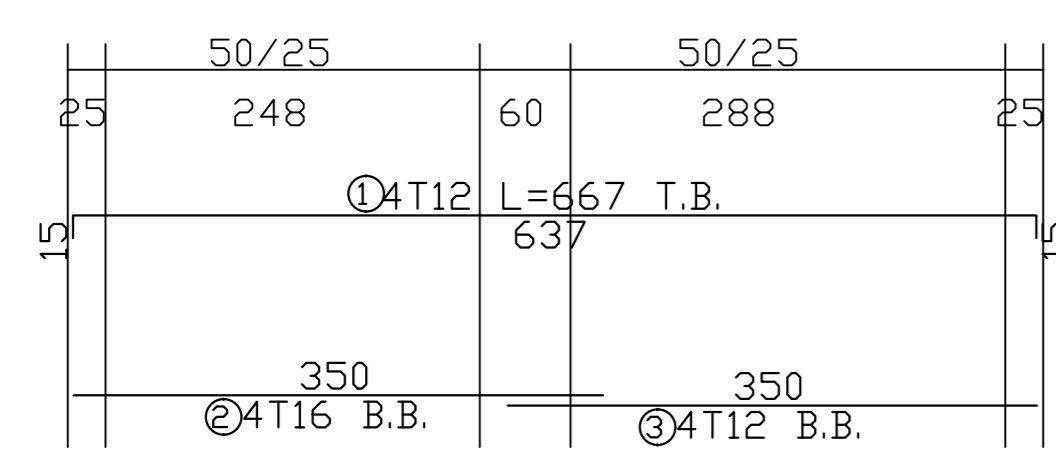
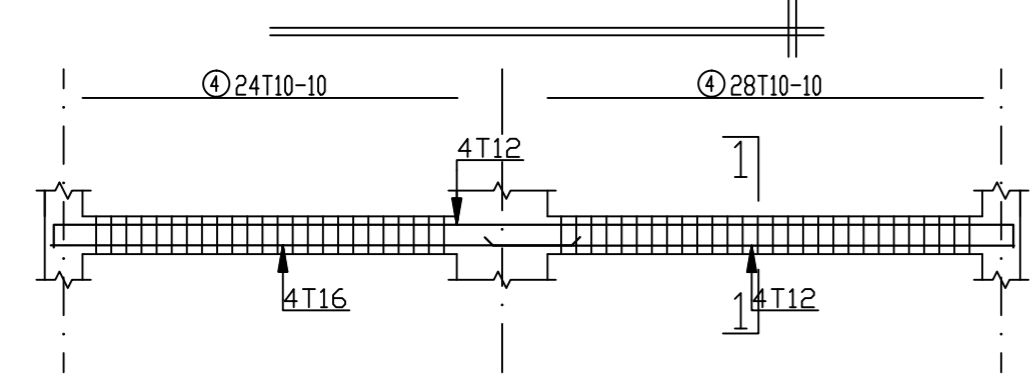
2024

BEAM - B15 (25/60)



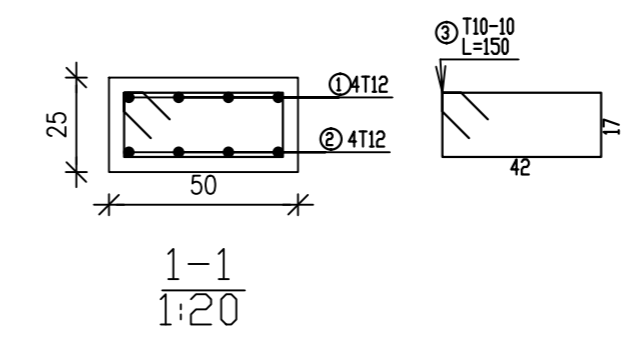
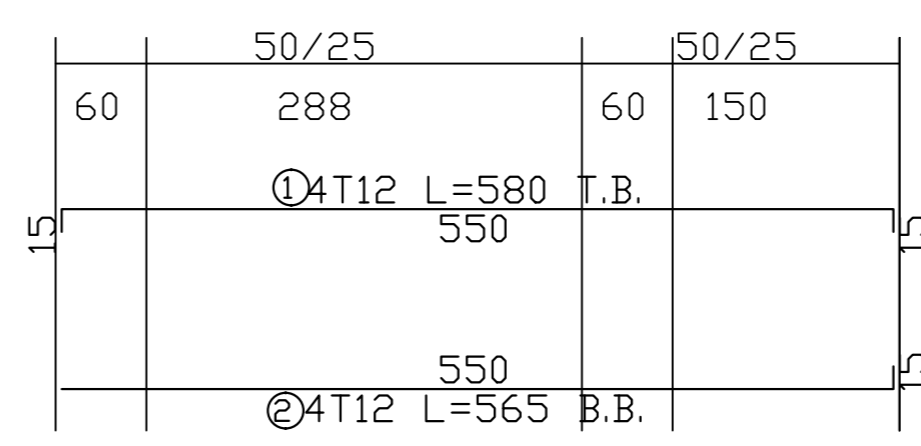
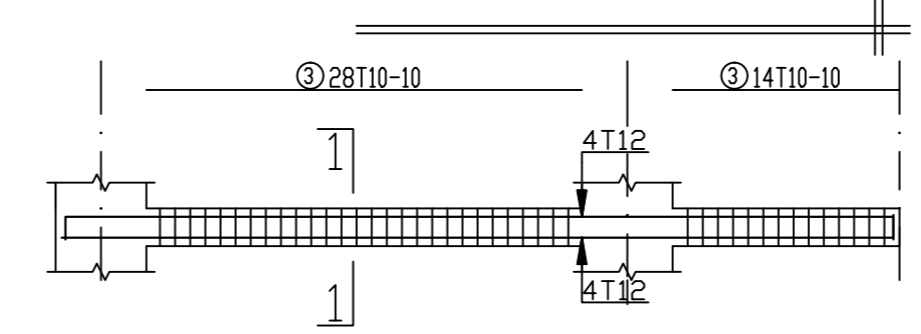
Beam:b15 roof

BEAM - B16 (50/25)

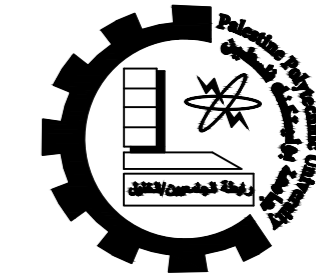


Beam:b19

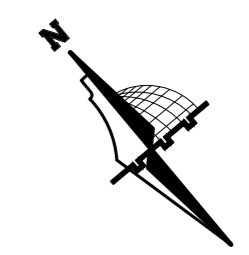
BEAM - B17 (50/25)



1-1
1:20



Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

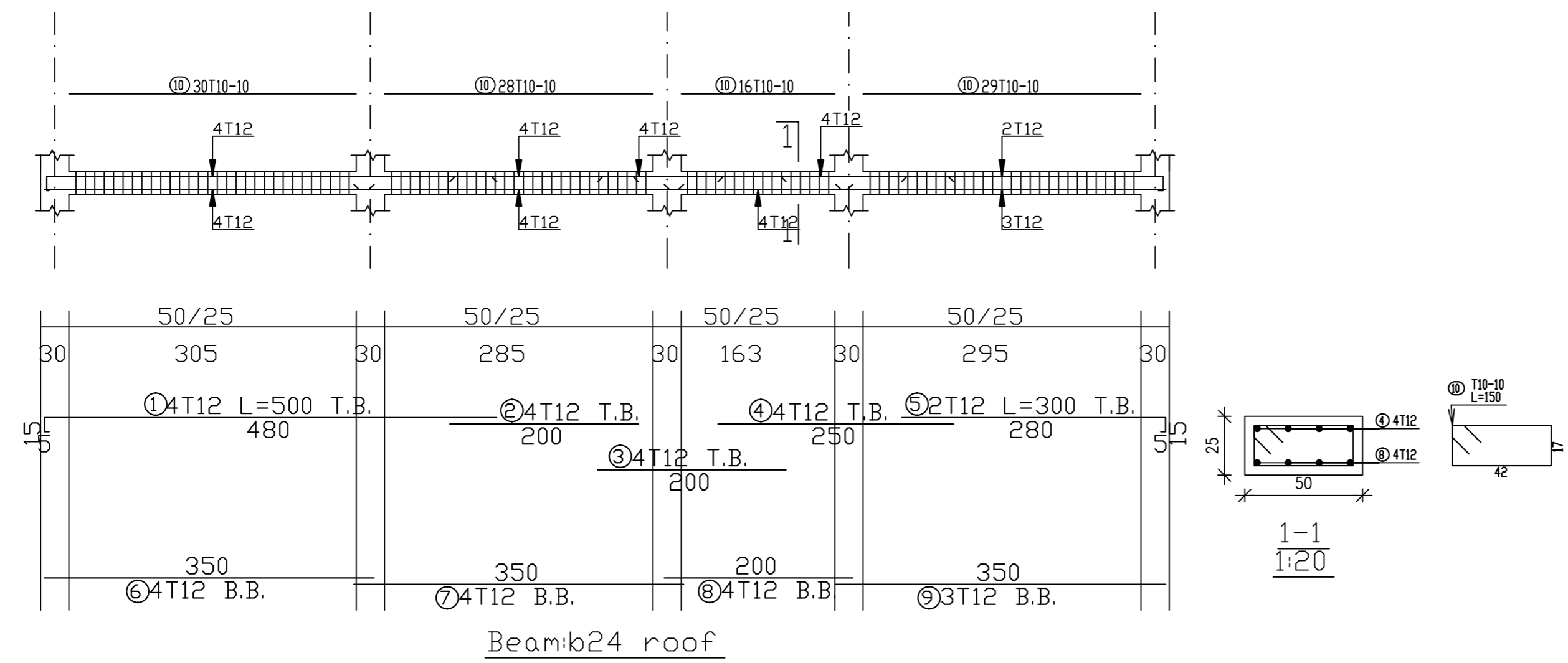
Drawing Title
 Roof beams
 details

SCALE 1/100

DRAW. NO. S67

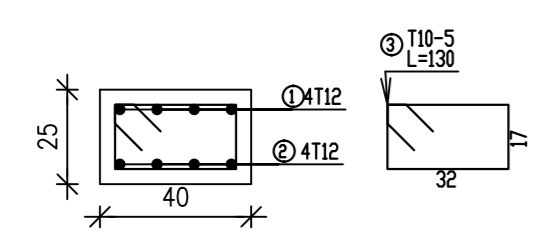
2024

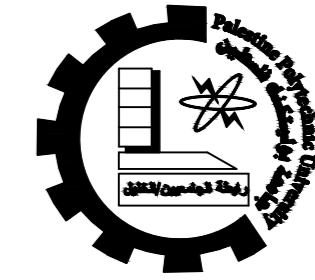
BEAM - B18 (50/25)



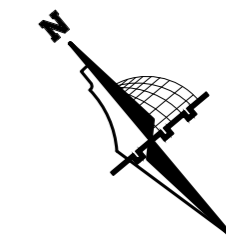
BEAM - B19 (50/25)

Beam: b26





Palestine Polytechnic University
 College of Engineering
 Civil & Arch. Eng Department
 Building Engineering



Graduation Project
 "Structural Design
 of a Residential complex"

Supervisor
 Dr. Belal Almasre

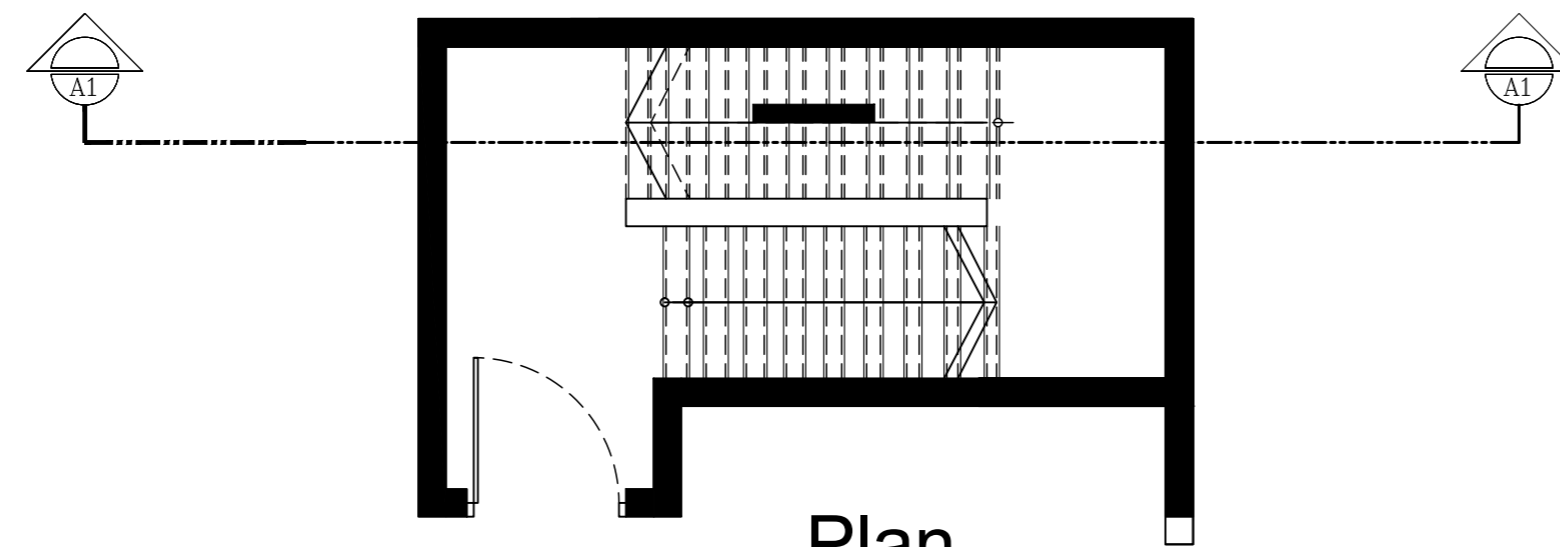
Project Team
 Fadi Sabbagh
 Sharbel Farhat
 Amir Gadban
 Amir Zatout

Drawing Title
 Stair details

SCALE 1/100

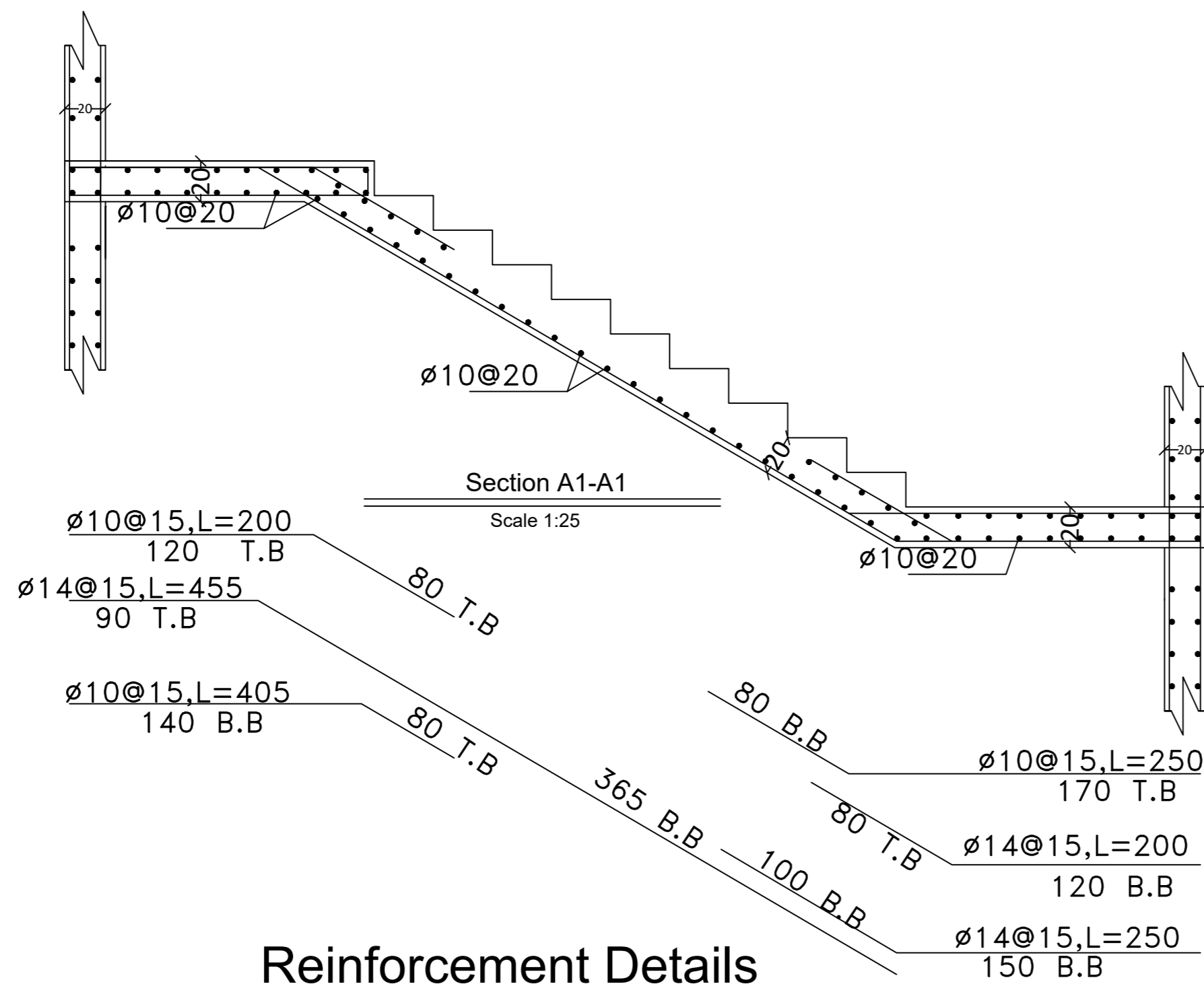
DRAW. NO. S68

2024



Plan

Scale 1:50



Section A1-A1

Scale 1:25

Reinforcement Details

Scale 1:25

$\phi 10@15, L=0.96(U\text{-hook})$

