

Palestine Polytechnic University  
College of Engineering  
Civil Engineering Department  
Building Engineering

# Graduation Project

## "Structural Design of a Tourist Spa Center"

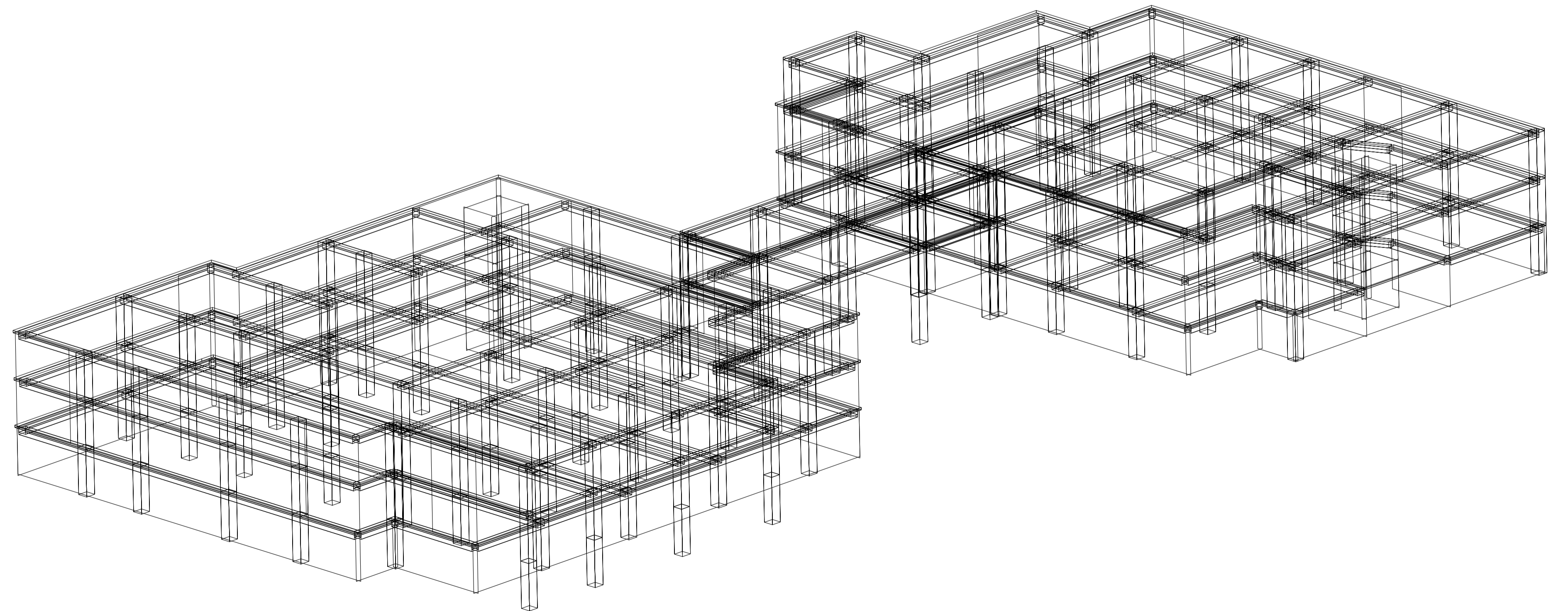
Project Team:

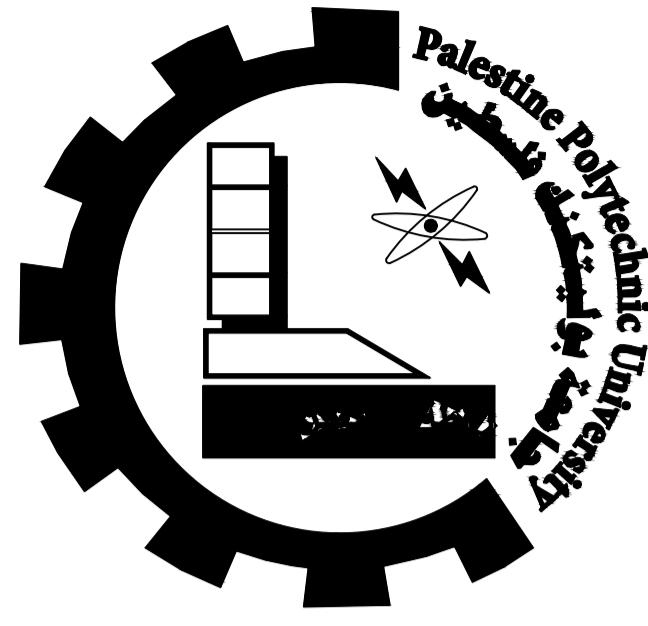
Raneen Emad Saafin  
&  
Rahma Yousef Qawasmi

Supervisor:

Dr. Nafeth Nasereddin

May 2022





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Project Team:

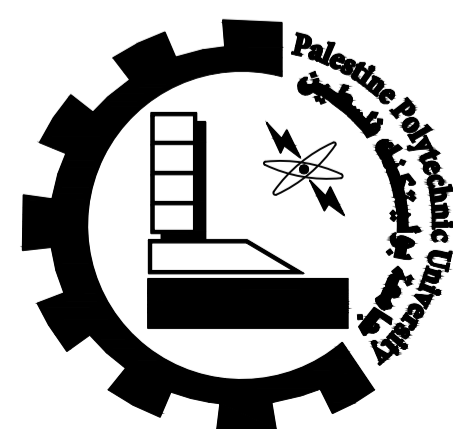
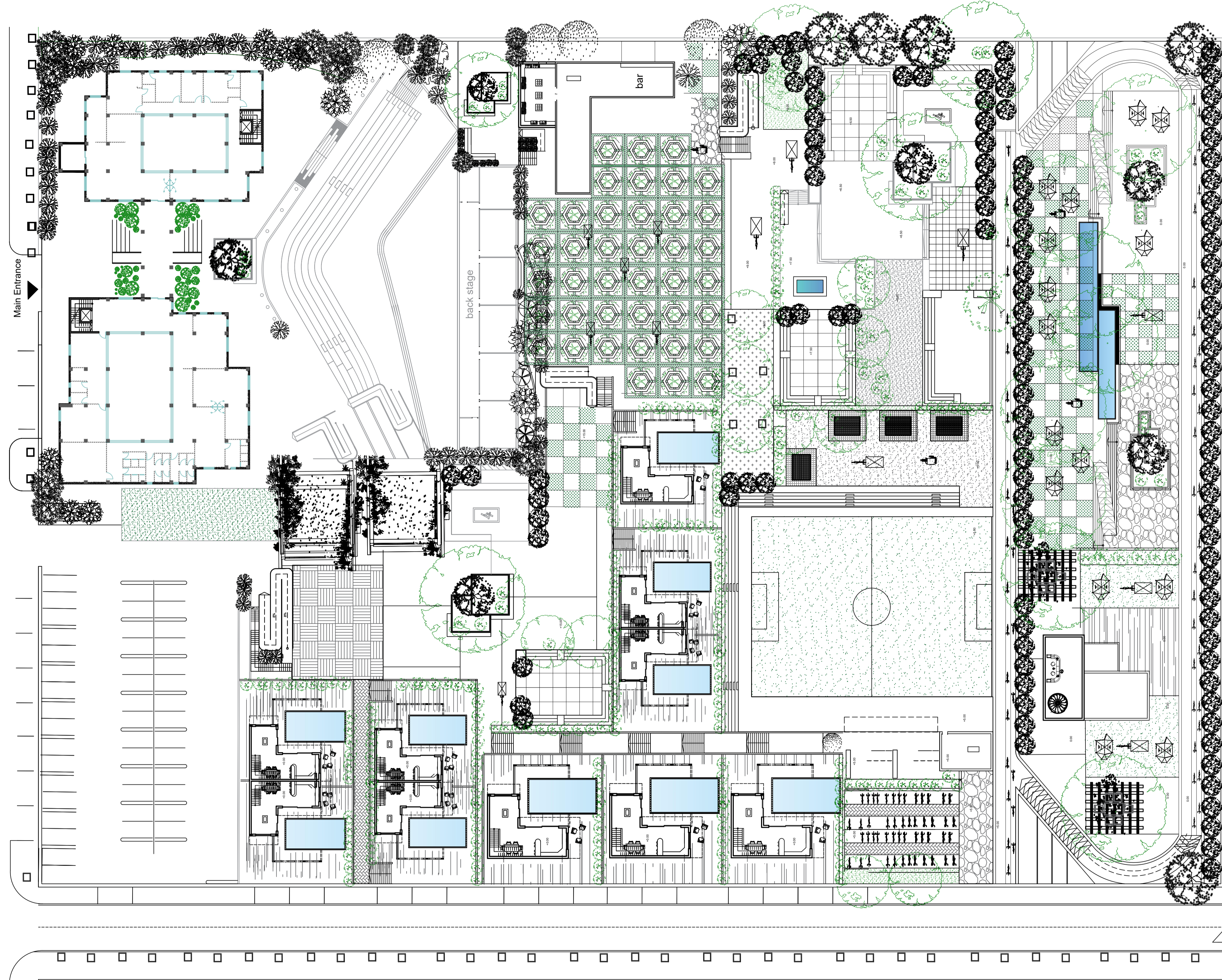
Raneen Emad Saafin  
&  
Rahma Yousef Qawasmi

Supervisor:

Dr. Nafeth Nasereddin

May 2022

Architectural Drawings		Structural Drawings	
Drawing No.	Drawing Title	Drawing No.	Drawing Title
A00	Site Plan	S00	General Notes
A01	Basement Floor Dimensions Plan	S01	Column Layout
A02	Basement Floor Furniture Plan	S02	Footing Layout
A03	Ground Floor Dimensions Plan	S03-S06	Isolated Footing Details
A04	Ground Floor Furniture Plan	S07-S08	Mat Footing Details
A05	First Floor Dimensions Plan	S09-S10	Neighbor Footing Details
A06	First Floor Furniture Plan	S11	Columns Details
A07	Northern Elevation	S12	Strip Footing Details
A08	Southern Elevation	S13-S15	Basement & Pool Walls Details
A09	Eastern Elevation	S16-S23	Shear Walls Details
A10	Western Elevation	S24-S29	Slabs Details
A11	Section A-A	S30-S42	Beams Details
A12	Section B-B	S043	Stairs Details



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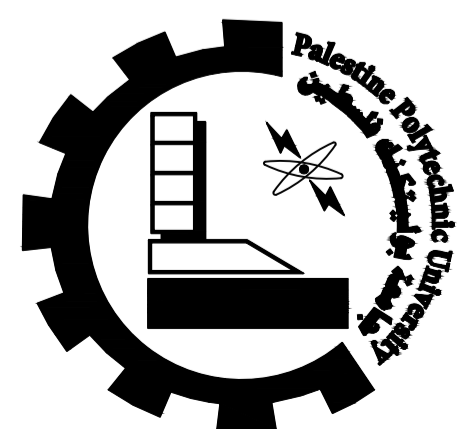
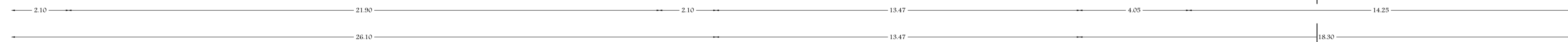
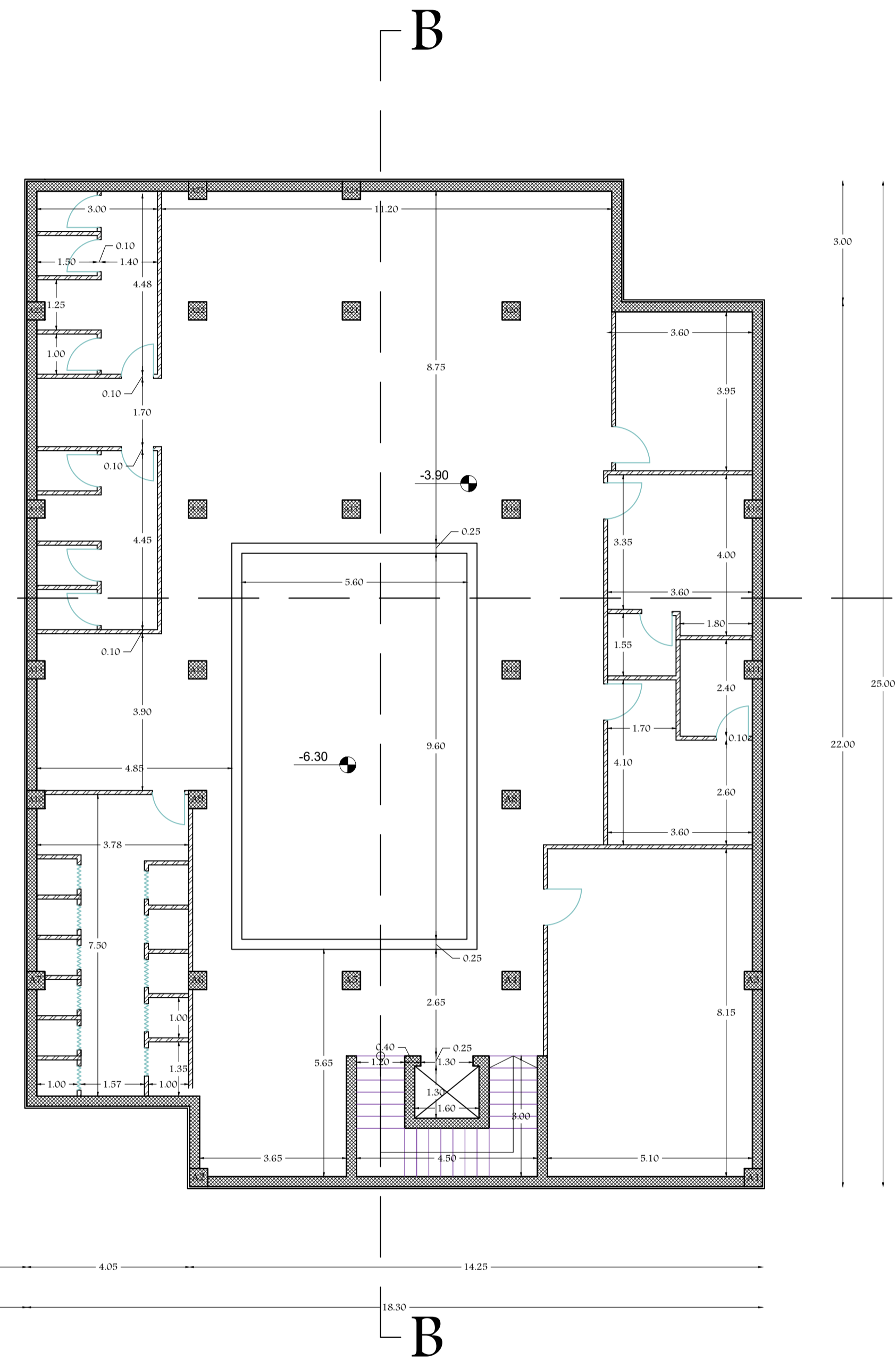
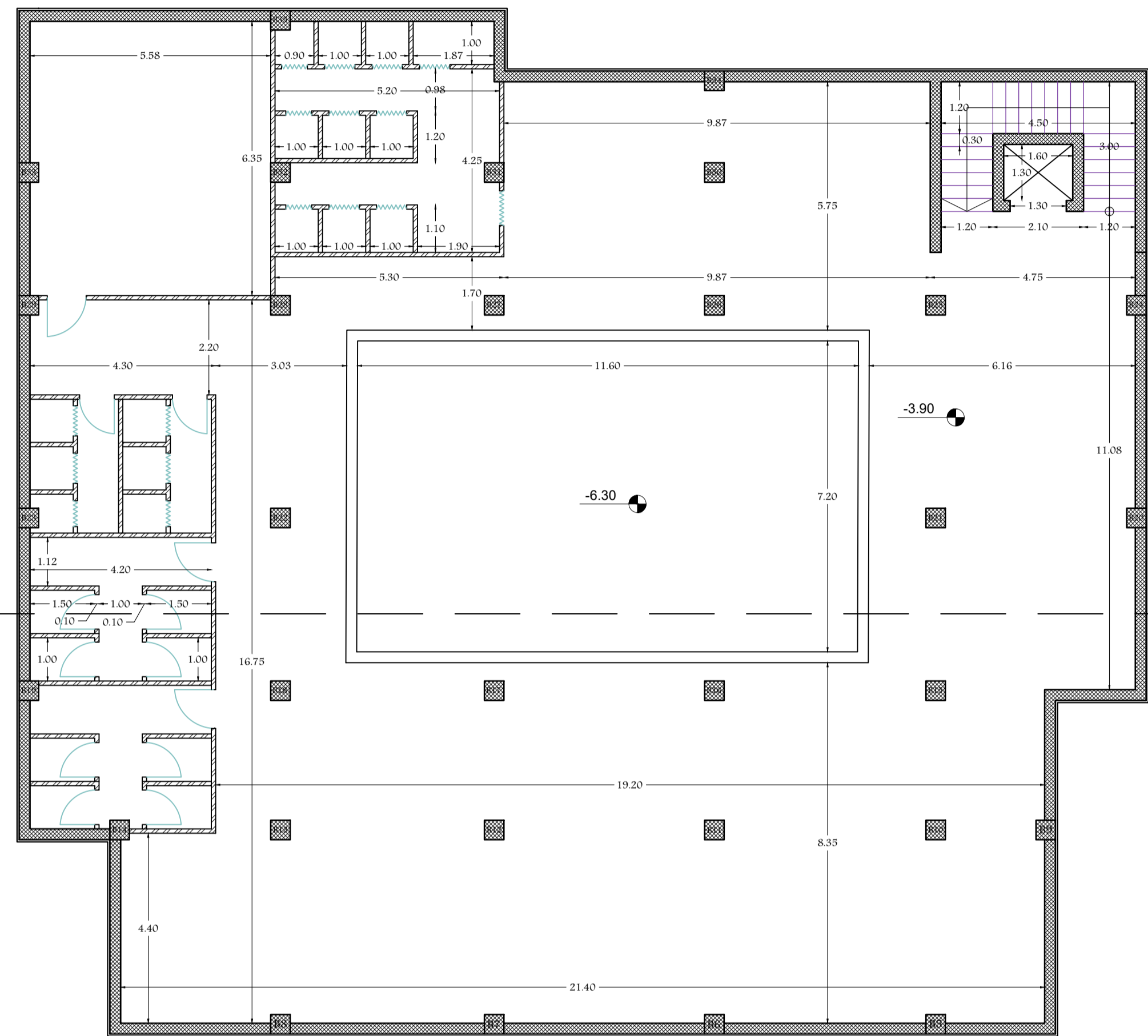
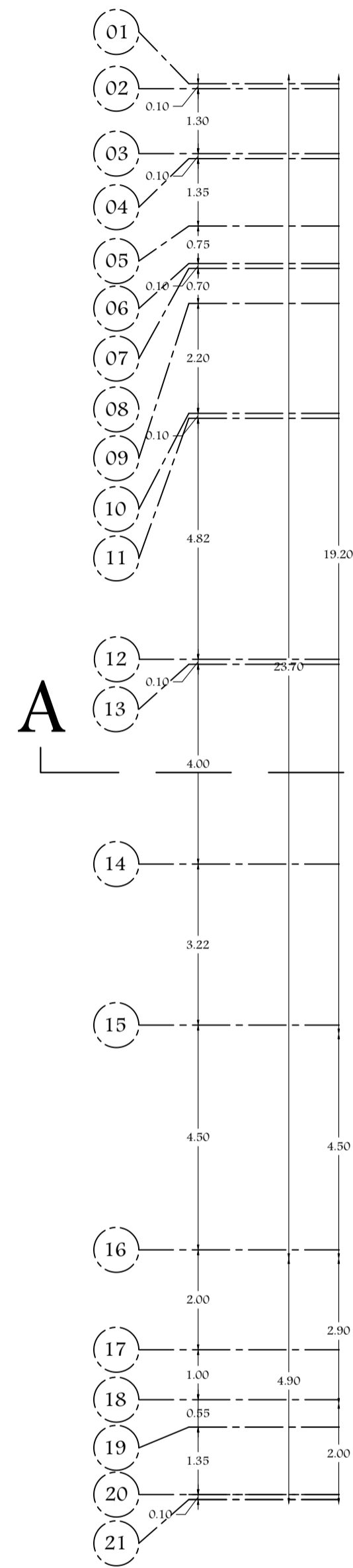
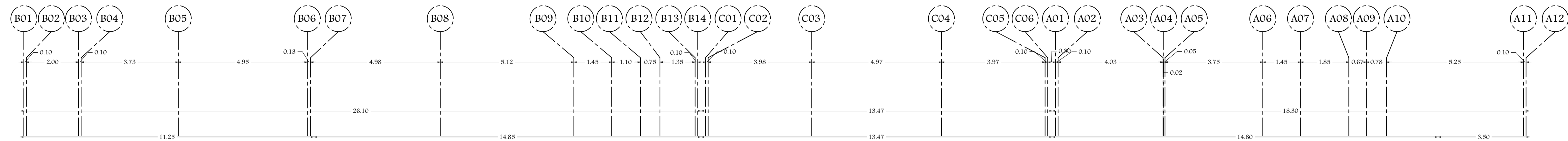
Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

Drawing Title:  
 Site Plan

Scale: 1:100  
 Drawing No. Aoo

Hatching Key	
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

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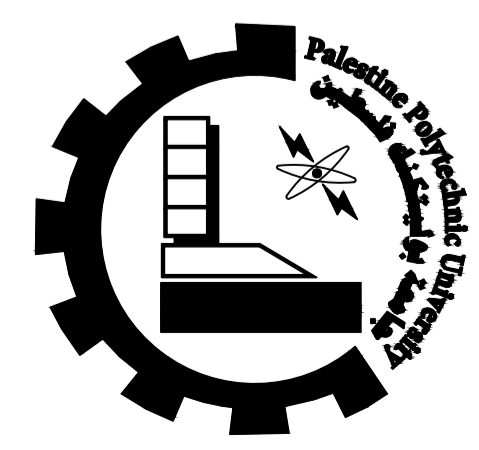
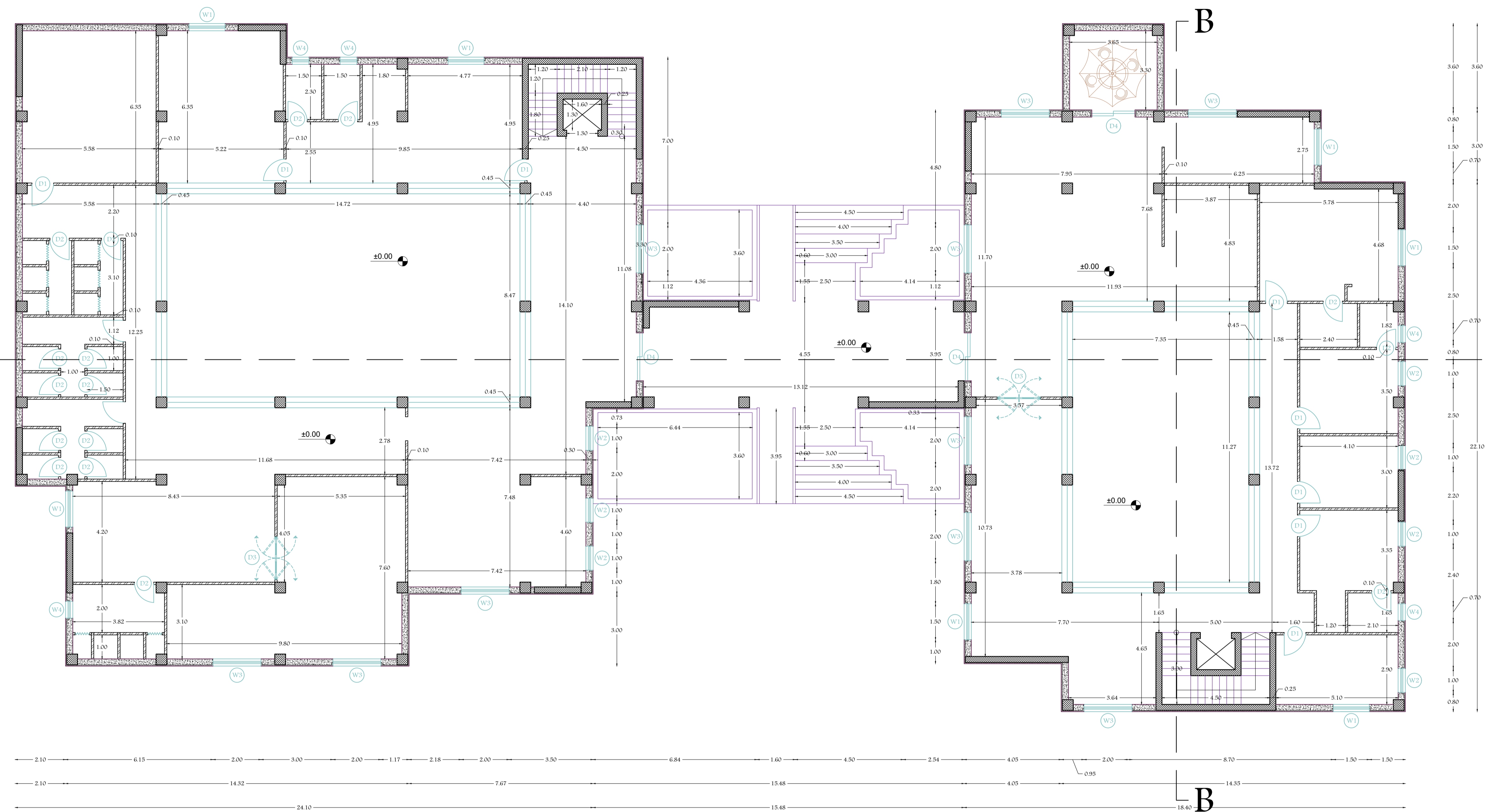
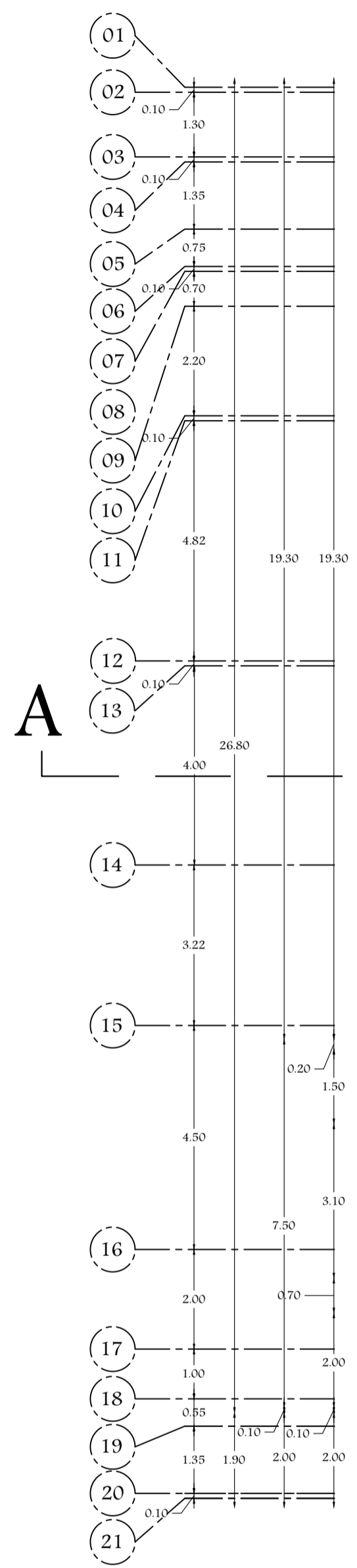
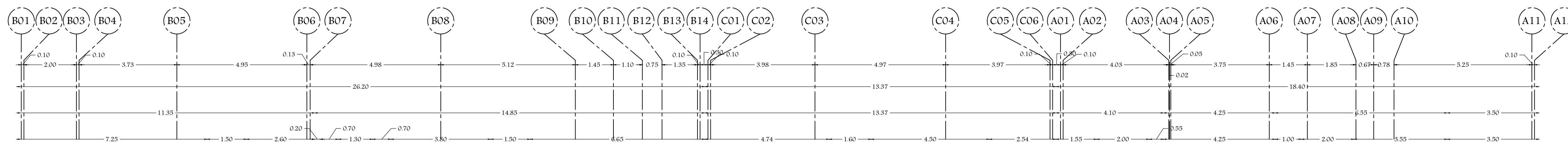
Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

Drawing Title:  
 Basement Floor Dimension  
 Scale: 1:100  
 Drawing No. A01

Hatching Key

- Concrete
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- Cement Brick
- Stone

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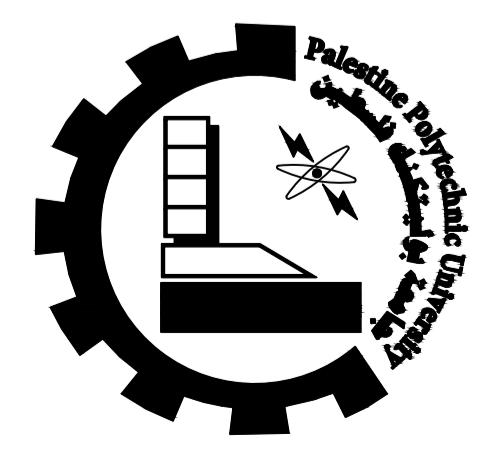
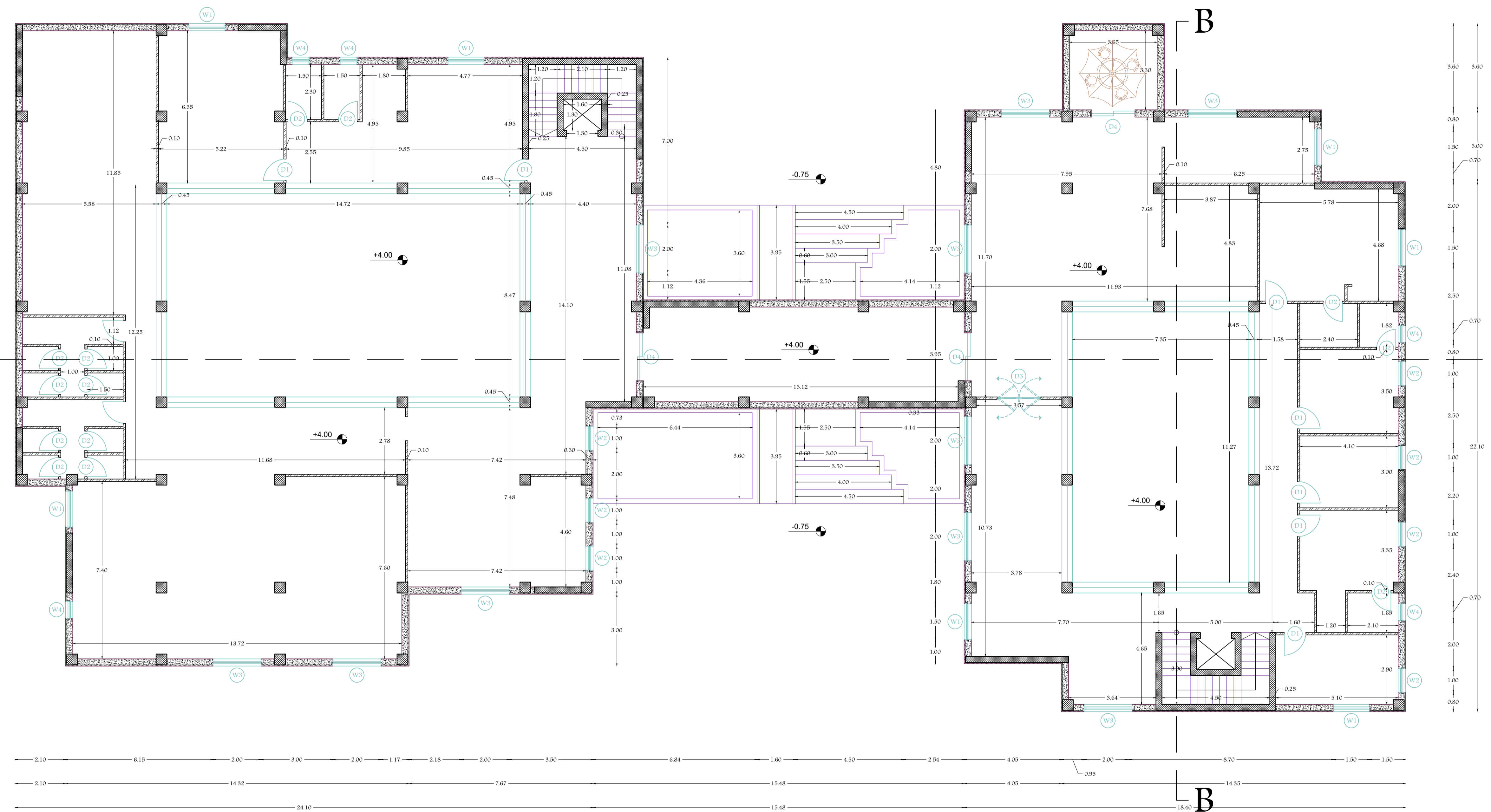
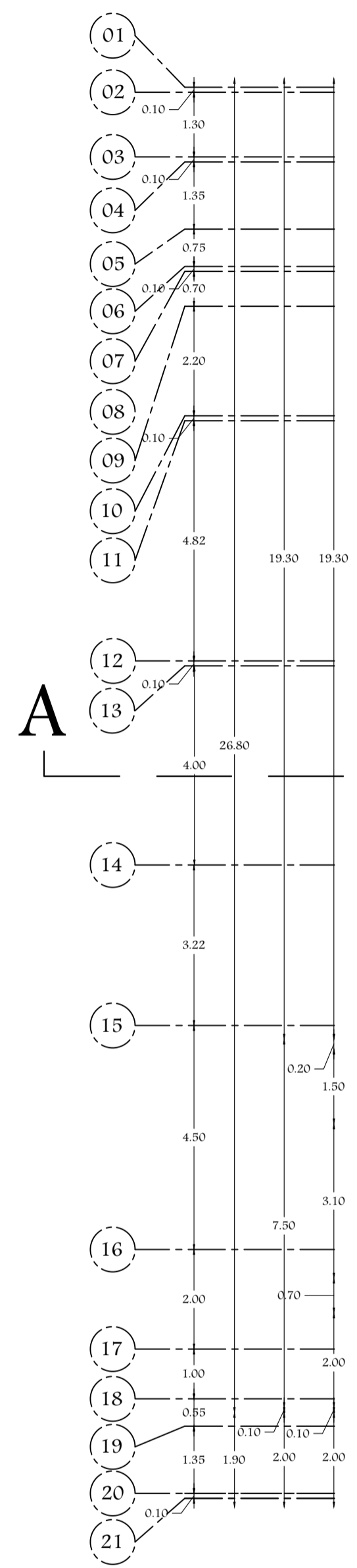
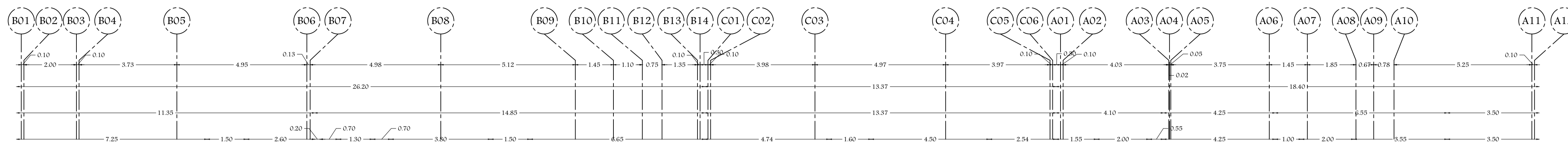
Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

Drawing Title:  
 Ground Floor Dimension  
 Scale: 1:100  
 Drawing No. A02

Hatching Key

	Concrete
	Reinforced Concrete
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	Stone

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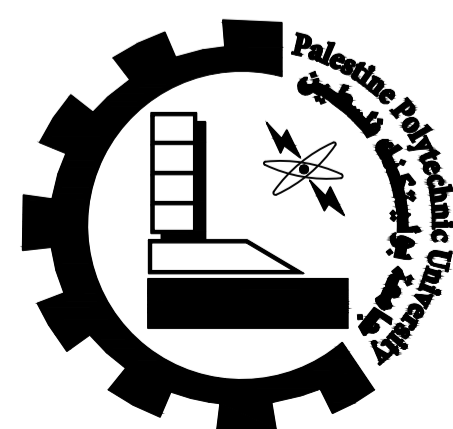
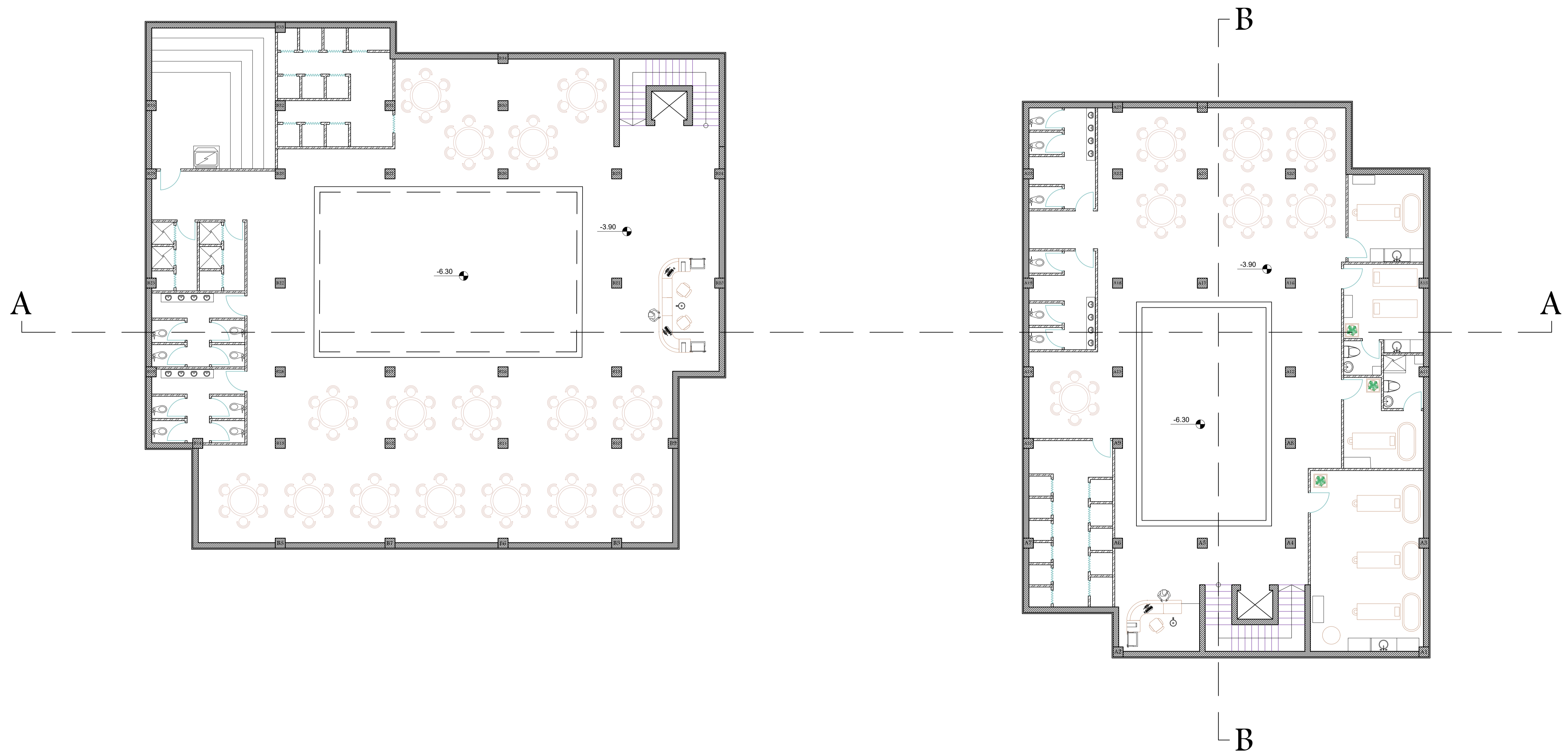
Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

Drawing Title:  
 First Floor Dimension  
 Scale: 1:100  
 Drawing No. A03

Hatching Key

	Concrete
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	Cement Brick
	Stone

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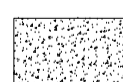



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Project Team:  
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 Rahma Yousef Qawasmi

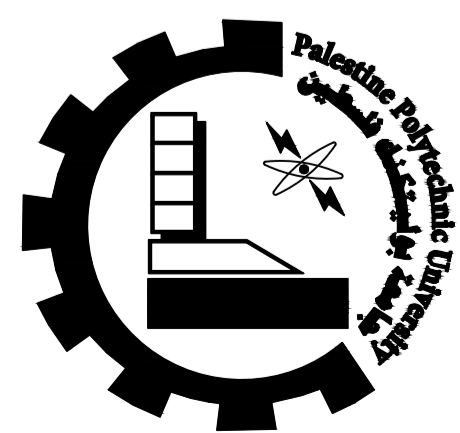
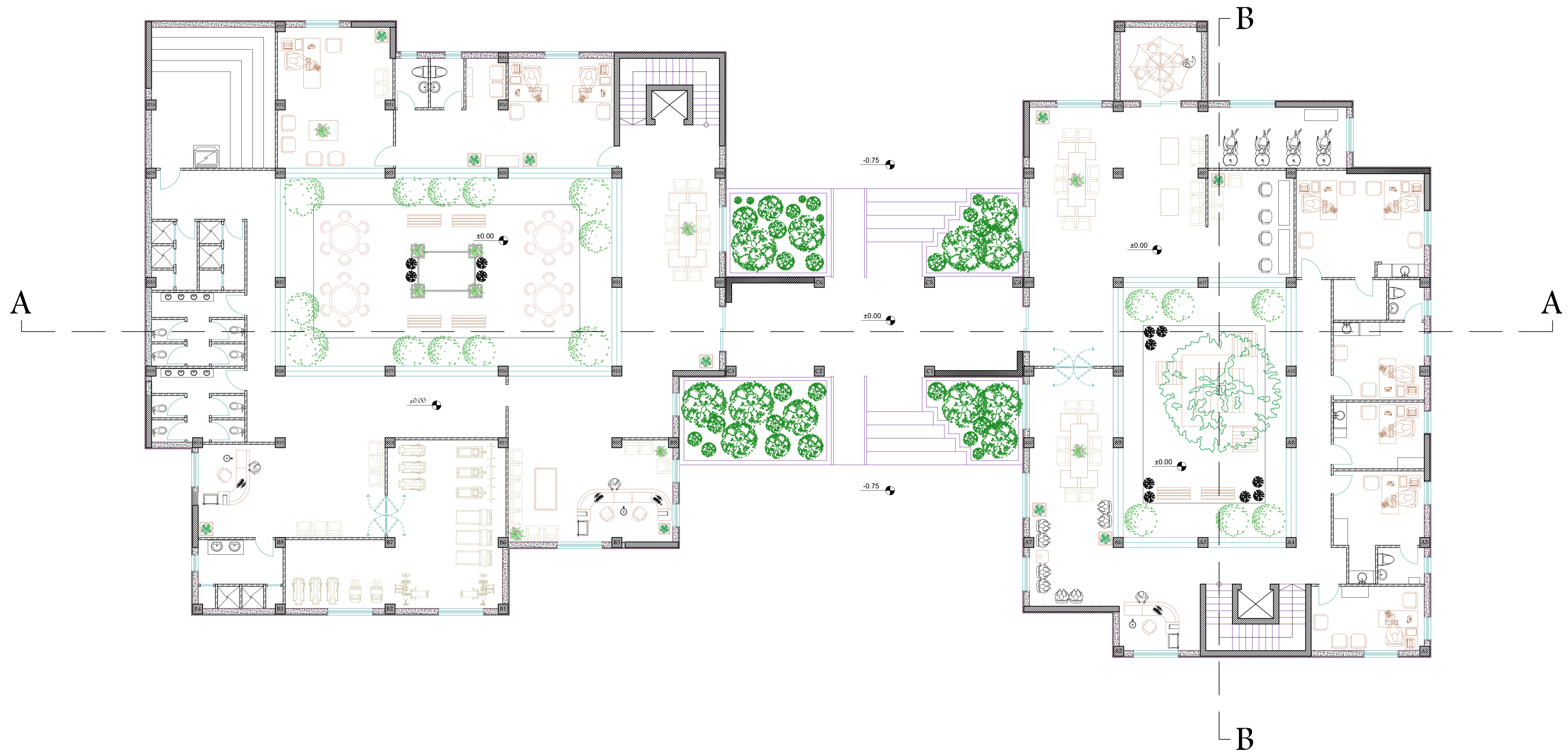
Drawing Title:  
 Basement Floor Furniture

Scale: 1:100  
 Drawing No. Ao4

Hatching Key

-  Concrete
-  Reinforced Concrete
-  Cement Brick
-  Stone

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Drawing Title:  
 Ground Floor Furniture

Scale: 1:100

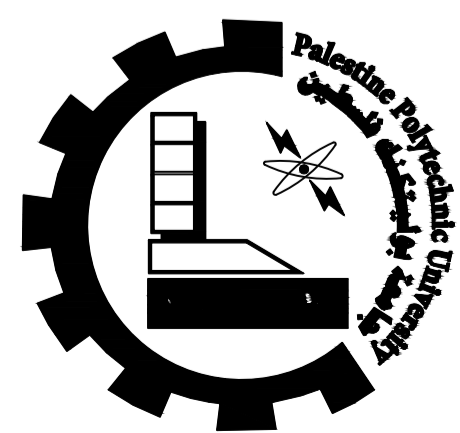
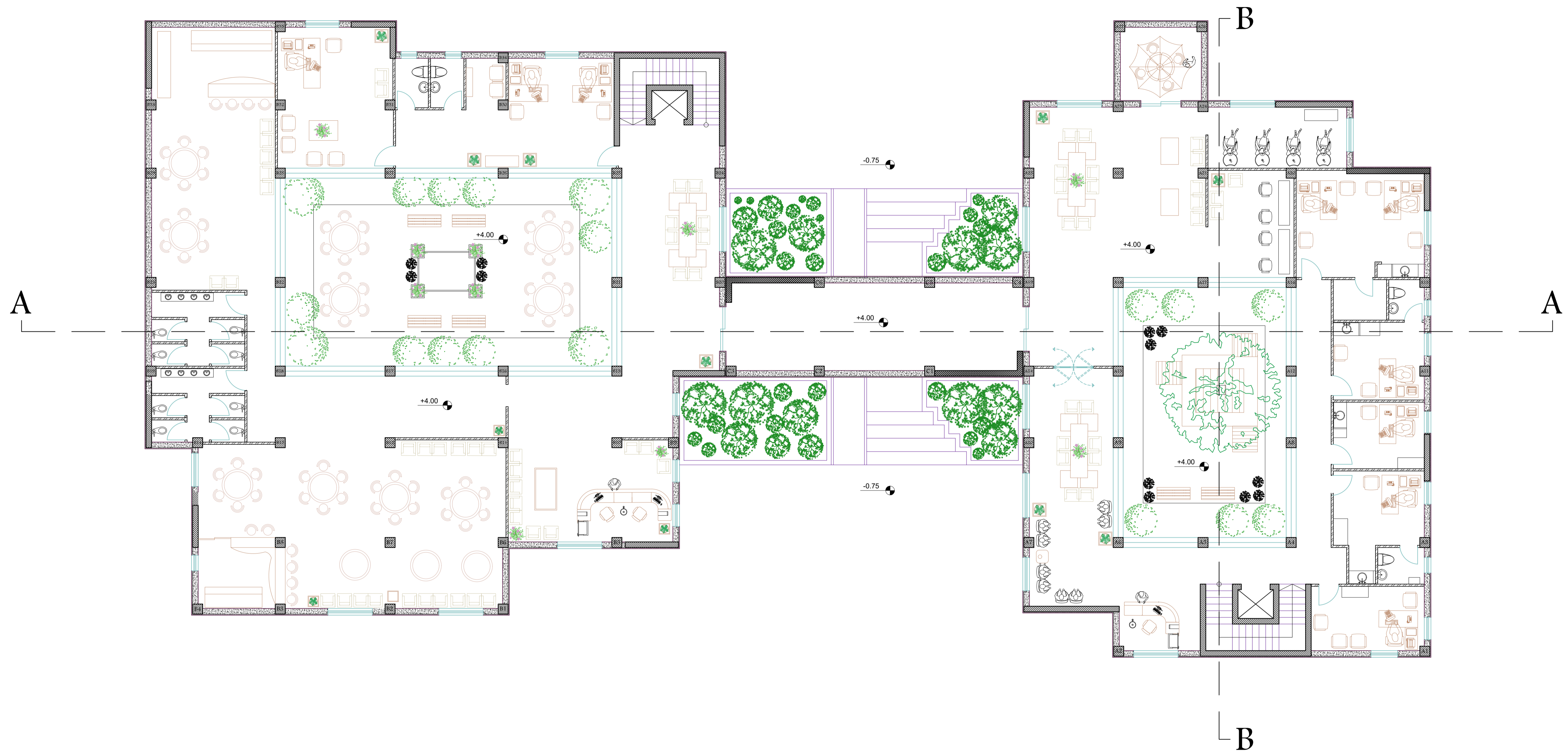
Drawing No. A05

Hatching Key

- Concrete
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- Stone

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Project Team:  
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 Rahma Yousef Qawasmi

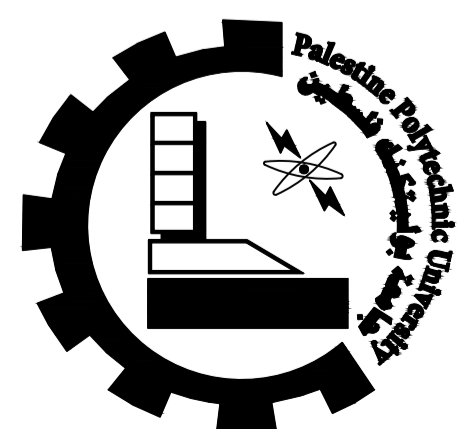
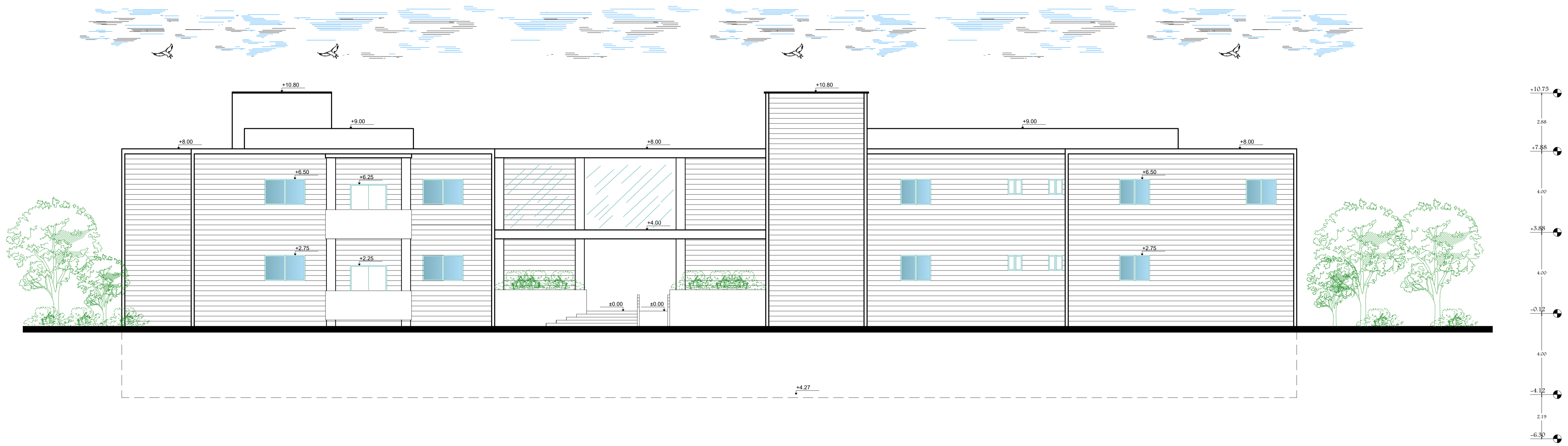
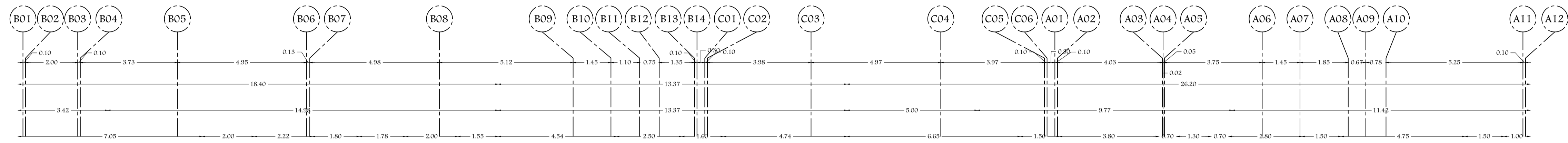
Drawing Title:  
 First Floor Furniture

Scale: 1:100  
 Drawing No. Ao6

Hatching Key

- Concrete
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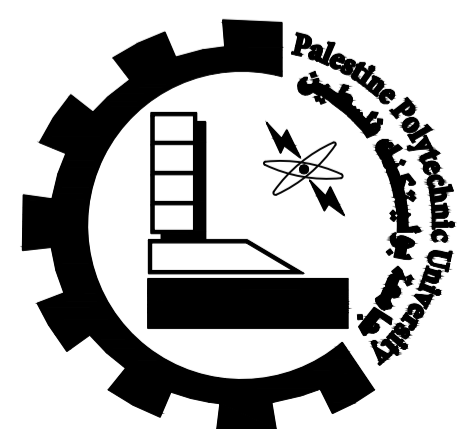
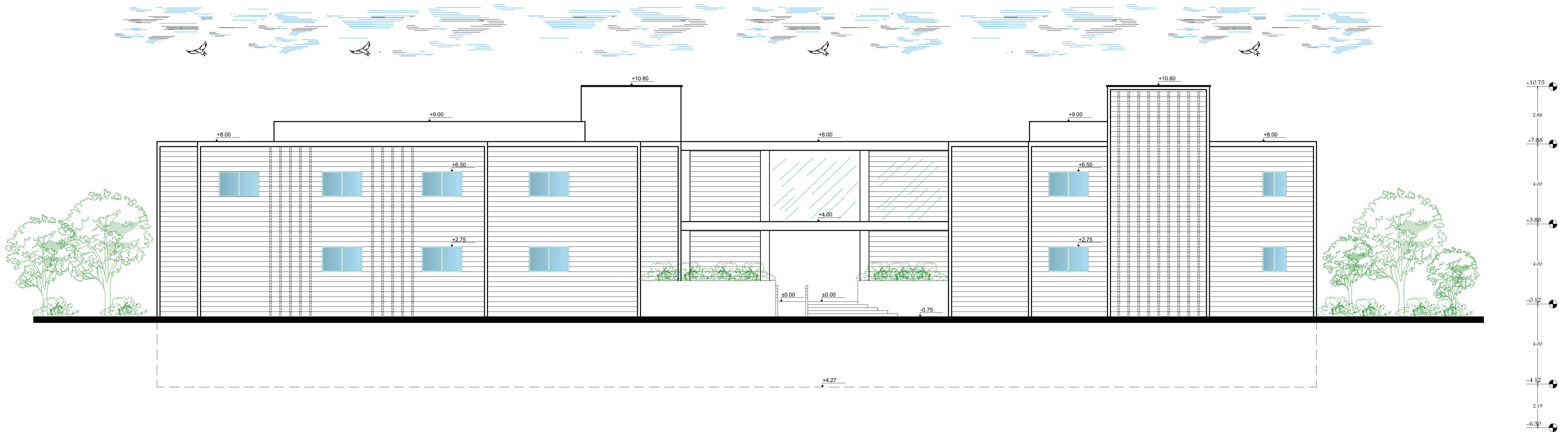
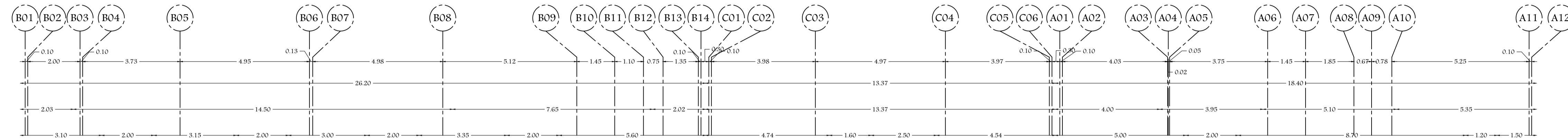
Drawing Title:  
 Northern Elevation

Scale: 1:100  
 Drawing No. A07

Hatching Key

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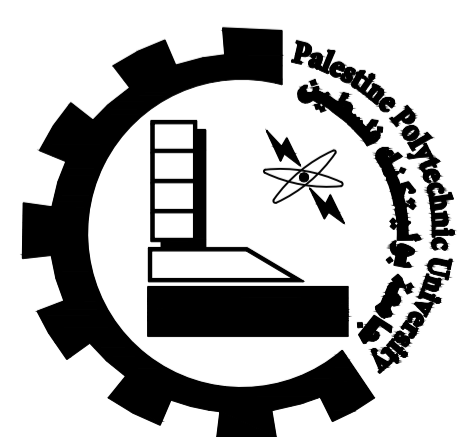
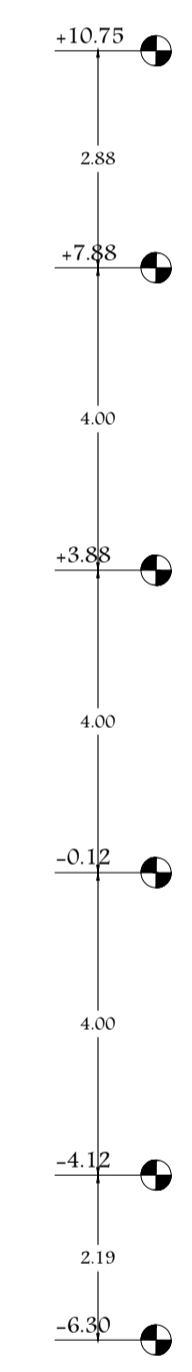
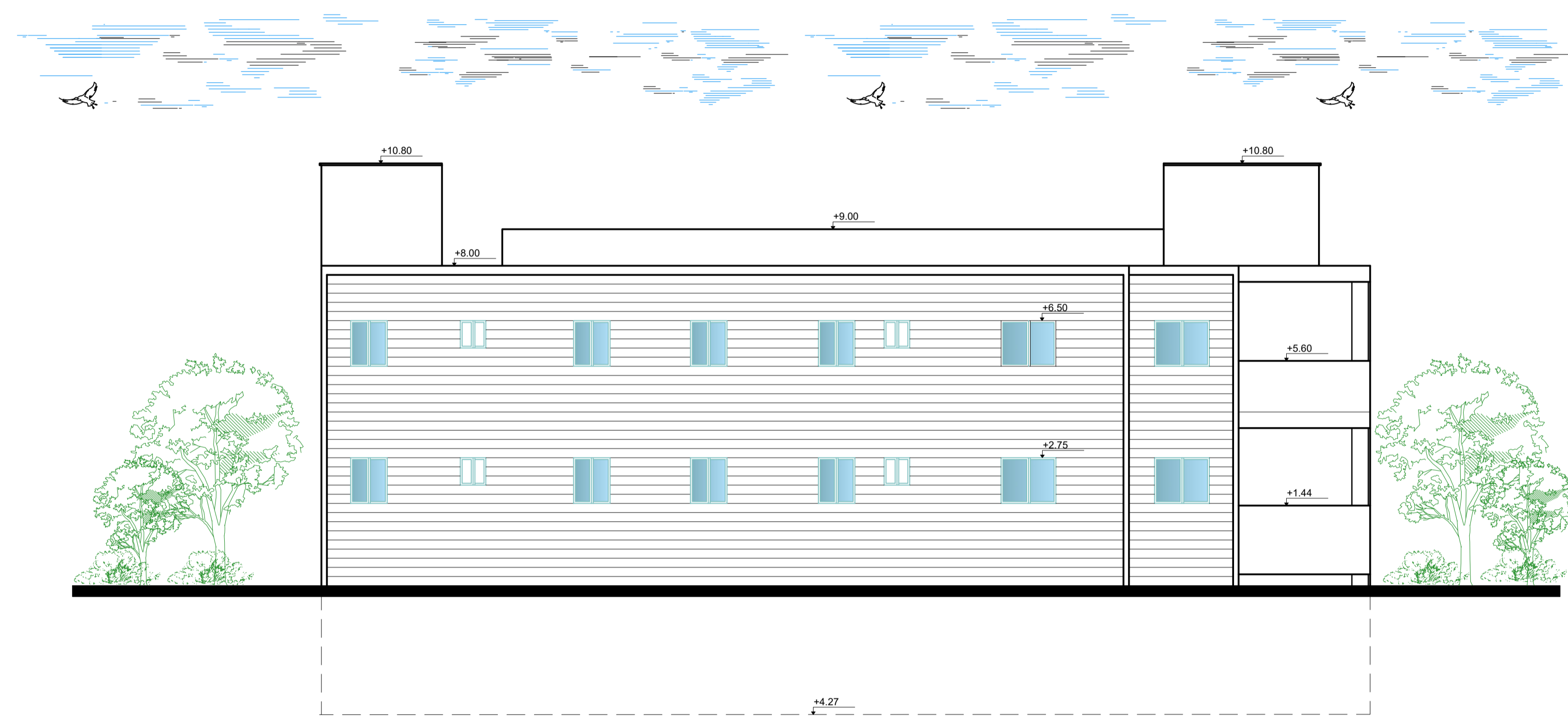
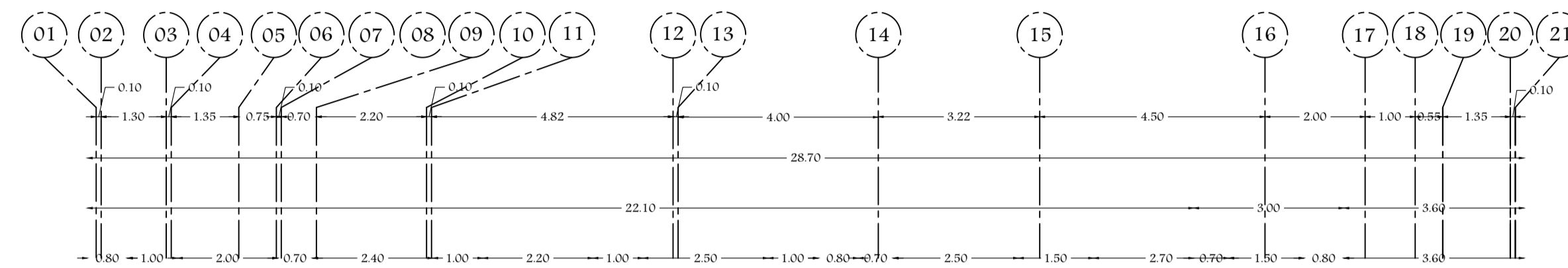
Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

Drawing Title:  
 Southern Elevation  
 Scale: 1:100  
 Drawing No. Ao8

Hatching Key

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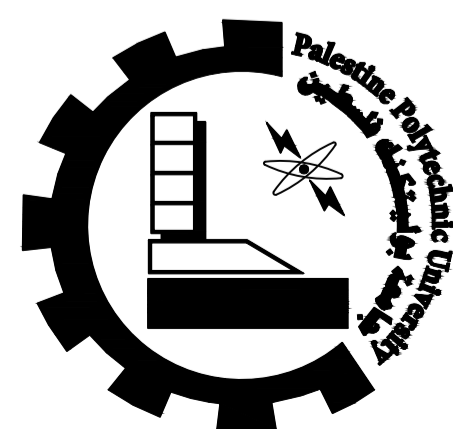
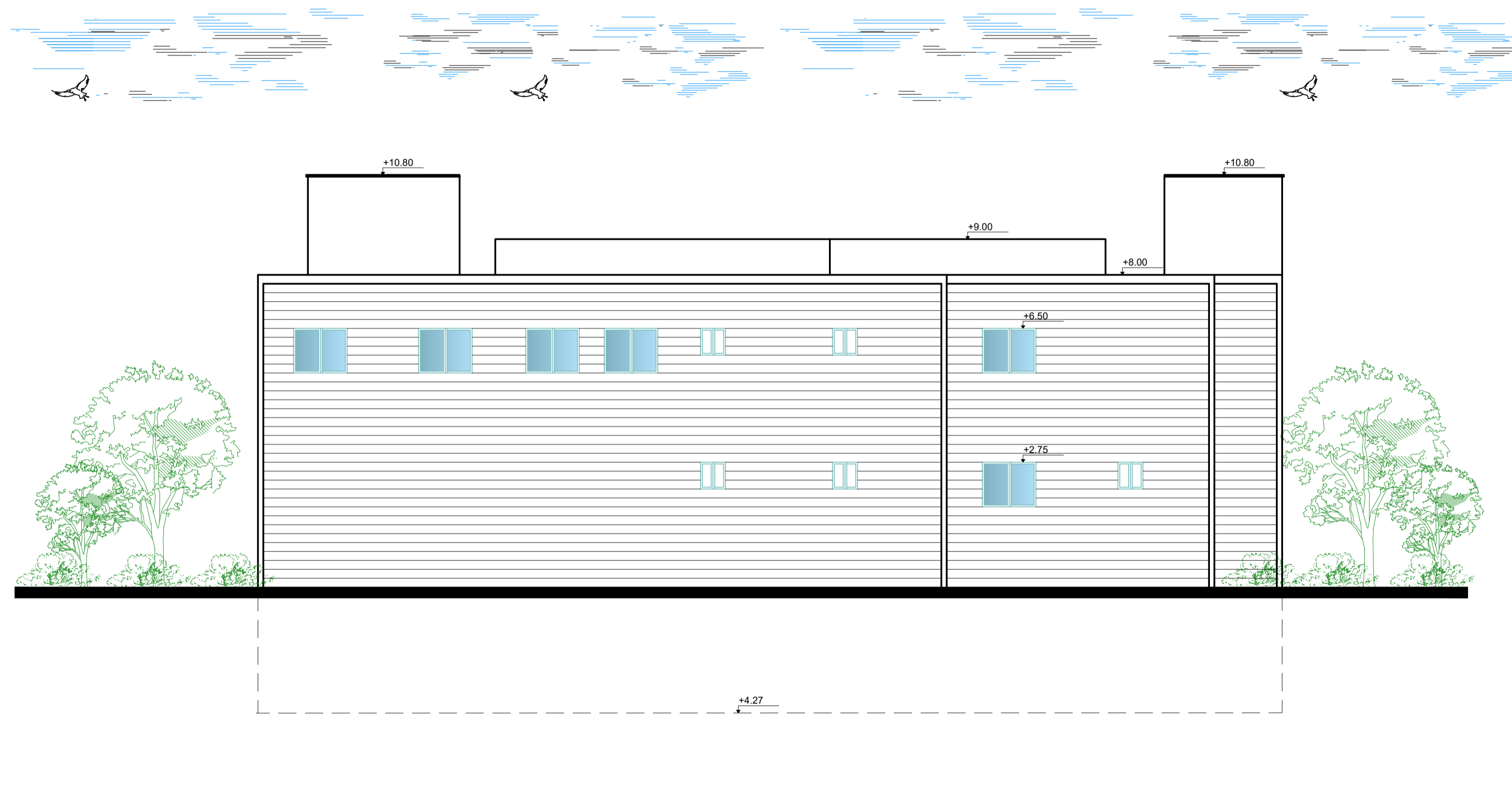
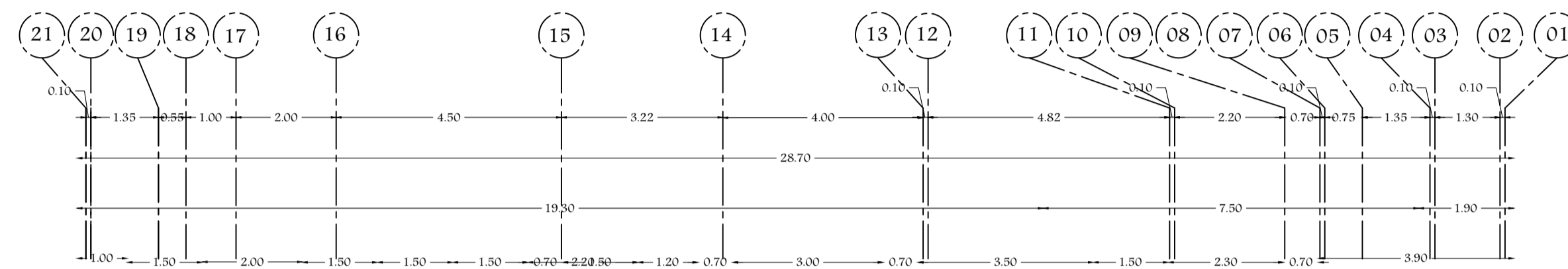
Drawing Title:  
 Eastern Elevation

Scale: 1:100  
 Drawing No. A09

Hatching Key

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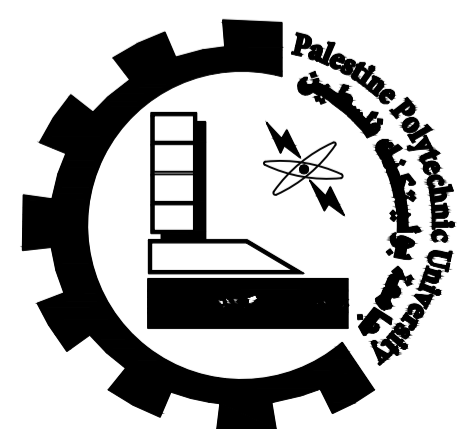
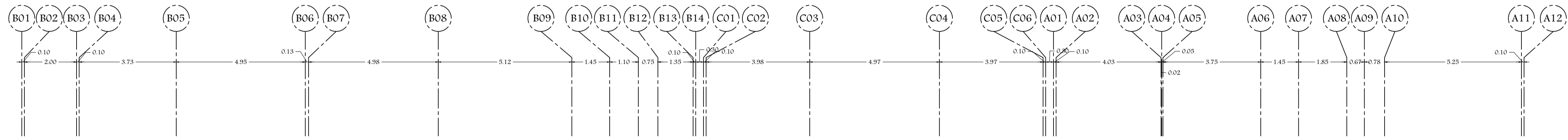
Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

Drawing Title:  
 Western Elevation  
 Scale: 1:100  
 Drawing No. A10

Hatching Key

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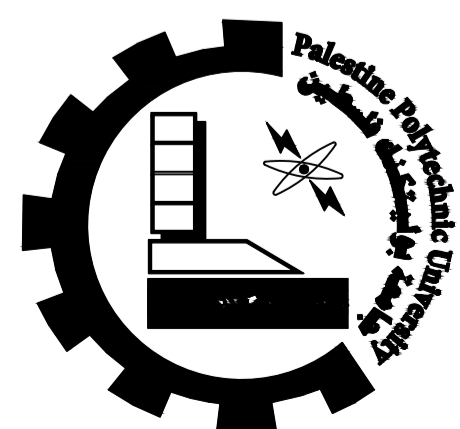
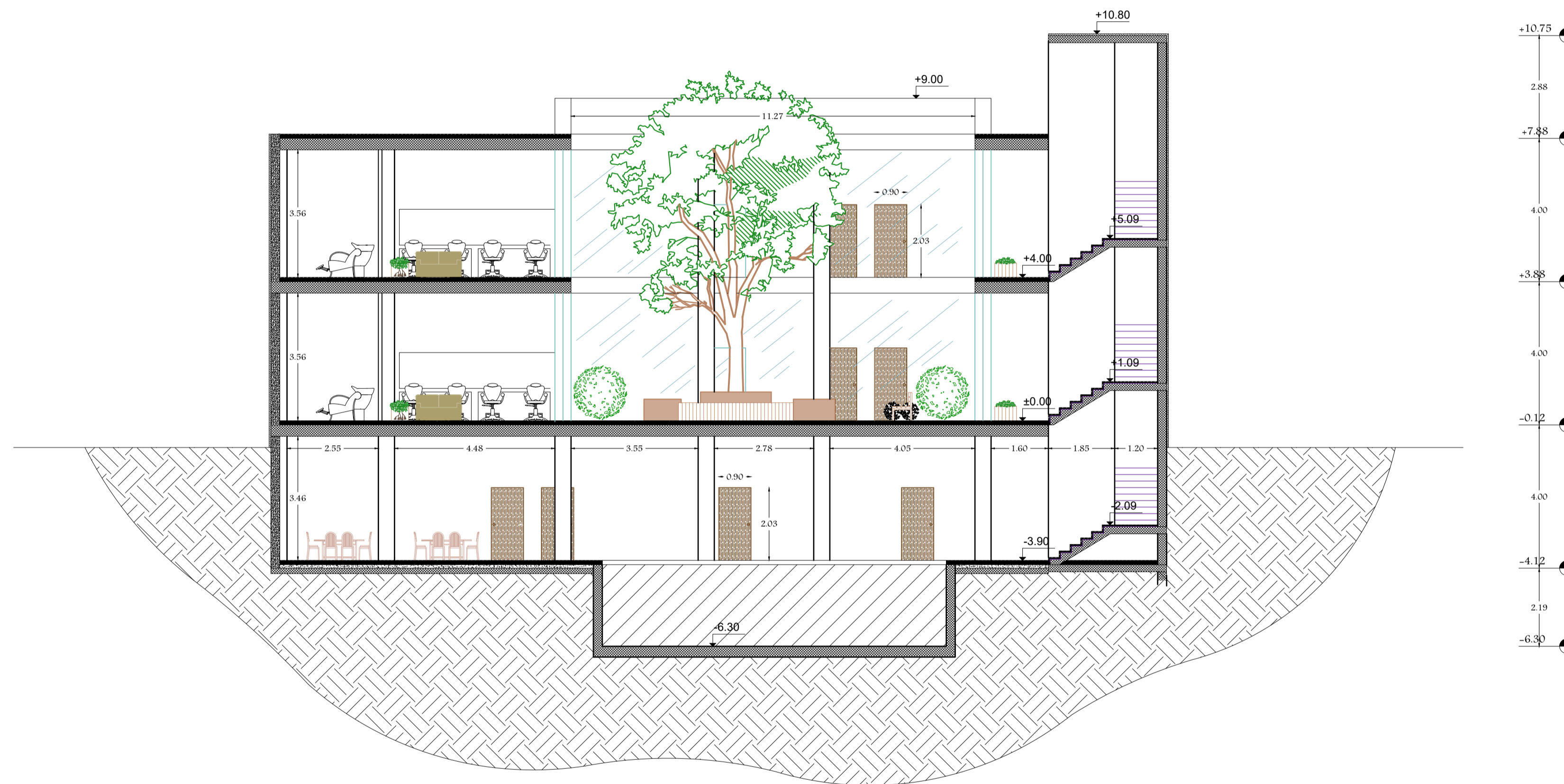
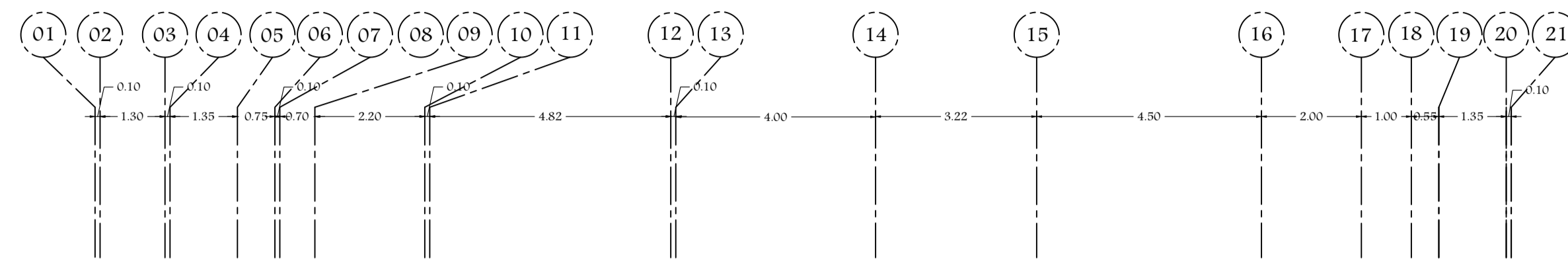
Drawing Title:  
 Section A-A

Scale: 1:100  
 Drawing No. A11

Hatching Key

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Drawing Title:  
 Section B-B

Scale: 1:100  
 Drawing No. A12

Hatching Key

- Concrete
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# STRUCTURAL DESIGN CRITERIA AND CONSTRUCTION REQUIREMENTS

## 1. GENERAL:

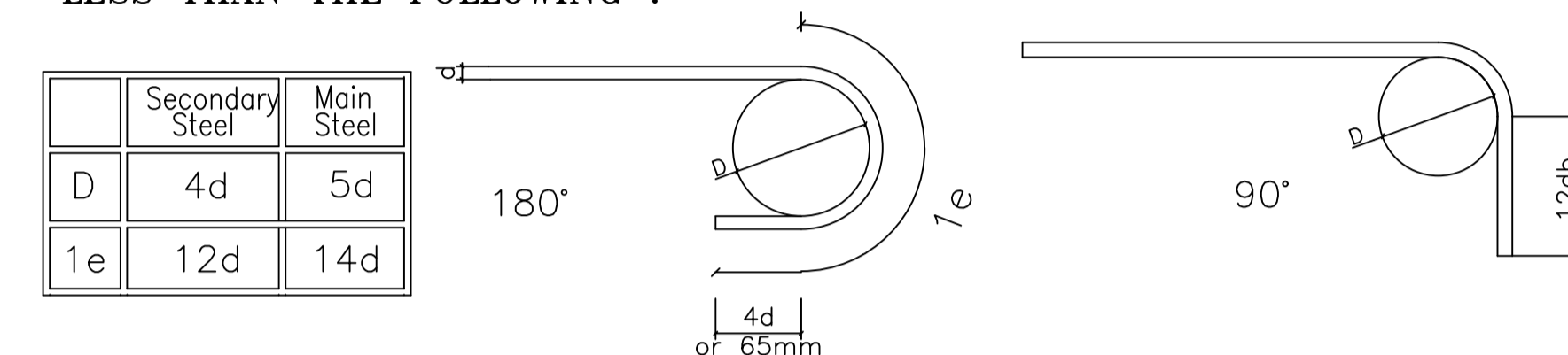
- 1.1 ALL DIMENSIONS ARE METRIC EXCEPT THE DRAWING MARKED WITH A NOTE .
- 1.2 ALL STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE RELEVANT ARCHITECTURAL DRAWINGS.
- 1.3 THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCEMENT OF WORKS AND ANY DISCREPANCIES SHALL BE REPORTED TO TO THE ENGINEER BEFORE EXECUTION.
- 1.4 ALL OPENINGS FOR PIPING AND CONVEYANCE SHALL BE FORMED IN POSITION BEFORE THE CASTING OF CONCRETE.
- 1.5 NO HOLES OR CHASES ARE PERMITTED IN THE CONCRETE MEMBERS UNLESS OTHER THAN AS DETAILED OR UNLES APPROVED BY THE ENGINEER.
- 1.6 ELECTRICAL CONDUITS SHOULD NOT BE PROVIDED WITH IN THE COVER TO THE REINFORCEMENT OF STRUCTURAL ELEMENTS.

## 2. DESIGN:

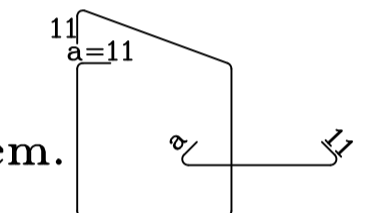
- 2.1 CODES OF PRACTICE AND STANDARDS USED:
  - a. DESIGN AND DETAILING ARE IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-14) .
  - b. GRAVITY LOADS ESTIMATION ARE IN ACCORDANCE OF JORDANIAN CODE .
  - c. FOR THE DEFINITION OF LATERAL SEISMIC LOADING (ASCE7-16) IS USED.
- 2.2 ASSUME THE DESIGN ALLOWABLE BEARING CAPACITY OF THE SUPPORTING SOIL UNDER THE FOUNDATION 400 kN/m<sup>2</sup>
- 2.3 LIVE LOAD ACCORDING TO THE JORDANIAN NATIONAL BUILDING CODE IS 4kN/m<sup>2</sup>
- 2.4 ALL STRUCTURAL MEMBERS ARE DESIGNED TO WITHSTAND TOTAL NUMBER OF THREE STORIES.
- 2.5 ASSUME THE LAYER DIRECTLY BELOW ZERO LEVEL IS IA A VALID FOUNDATION LAYER.

## 3. CONCRETE & REINFORCEMENT:

- 3.1 CONCRETE GRADE ARE B350 FOR ALL MEMBERS EXCEPT FOUNDATIONS WITH GRADE B300.
- 3.2 DEFORMED REINFORCING BARS SHALL CONFORM TO THE ASTM SPECIFICATIONS.
- 3.3 ALL STEEL REINFORCEMENT BARS SHALL BE FROM HIGH TENSILE DEFORMED BARS OF YIELD STRENGTH = 420 MPa
- 3.4 LAP SPLICE LENGTHS OF REINFORCEMENT BARS SHALL BE AS SHOWN ON THE DRAWINGS BUT NOT LESS THAN 50 BARS DIAMETER (50 $\phi$ ).
- 3.5 ALL REINFORCING BARS ANCHORING TWO DIFFERENT STRUCTURAL ELEMENTS SHALL BE ENDED WITH 90 OR 180 HOOK AS SHOWN ON DRAWINGS BUT NOT LESS THAN THE FOLLOWING :

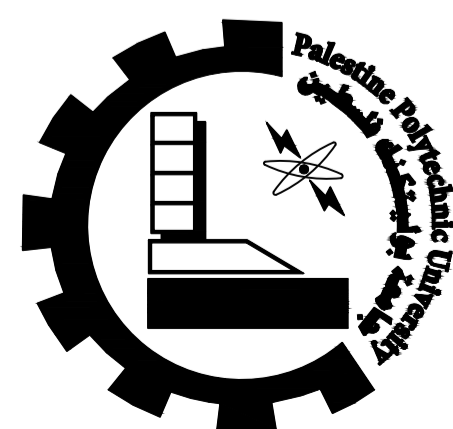


- 3.6 MINIMUM CLEAR CONCRETE COVER TO STEEL REINFORCEMENT SHALL BE AS FOLLOWS :
  - 75mm. FOR FOUNDATIONS .
  - 40mm. FOR BEAMS & COLUMNS.
  - 20mm. FOR SLABS.
- 3.7 IN ALL STIRRUPS IN BEAMS & COLUMNS THE LENGTH OF a = 11 cm.



## 4. SYMBOLS & ABBREVIATIONS:

- R.S RIBBED SLAB
- F FOOTING
- S.F. STRIP FOOTING
- C.F. COMBINED FOOTING
- C COLUMN
- B BEAM
- SW SHEAR WALL
- BW BASEMENT WALL
- T.B TOP REINFORCEMENT
- B.B BOTTOM REINFORCEMENT
- T.O.F Top of Footing
- L.C Leveling Course
- $\phi$  REINFORCEMENT BAR DIAMETER (mm)
- @,/ REINFORCEMENT SPACING



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Supervisor:  
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Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
General Notes

Drawing No. Soo

### Hatching Key

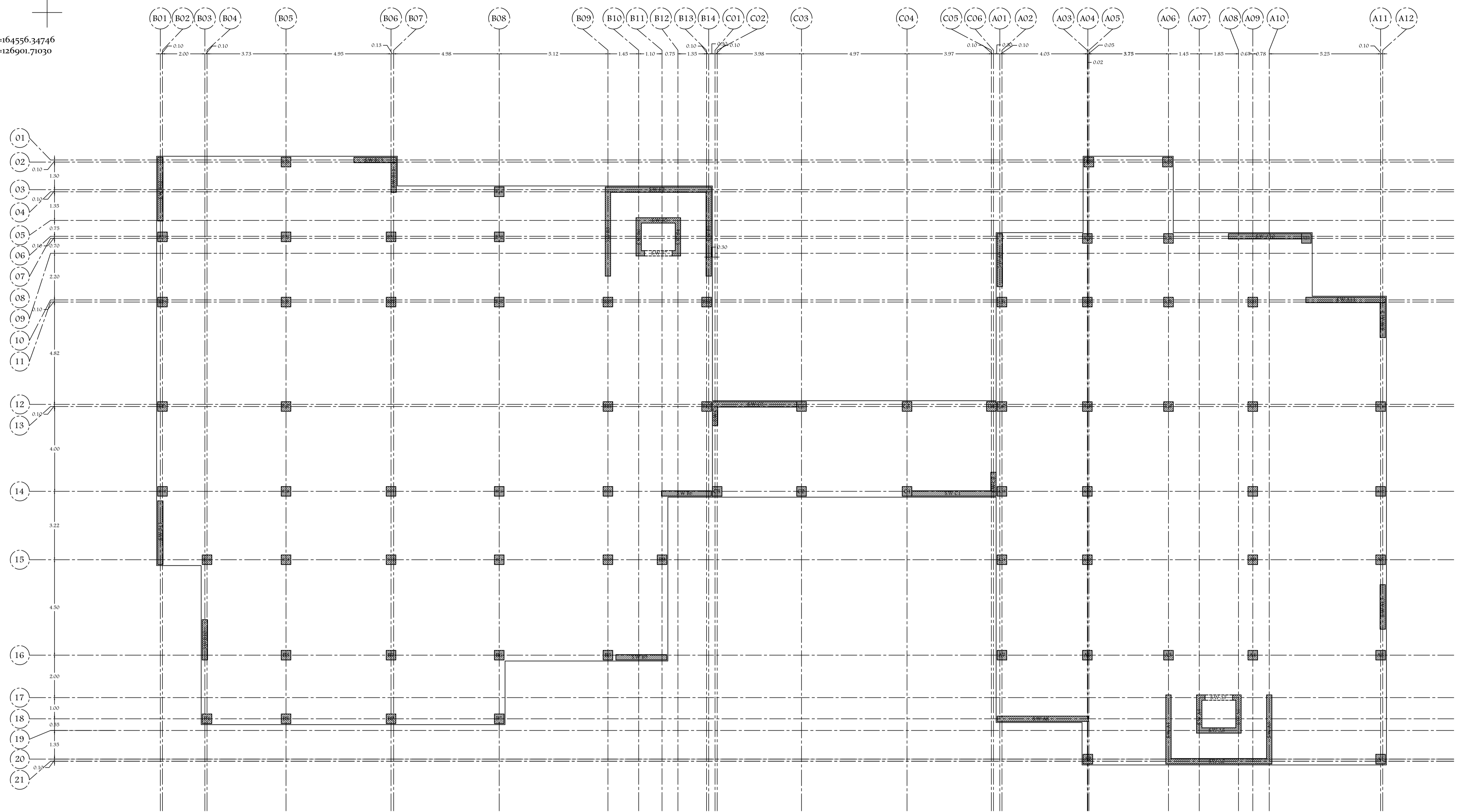
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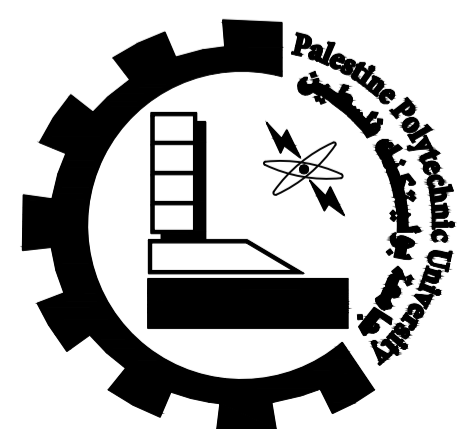
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x=164712.98111  
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Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

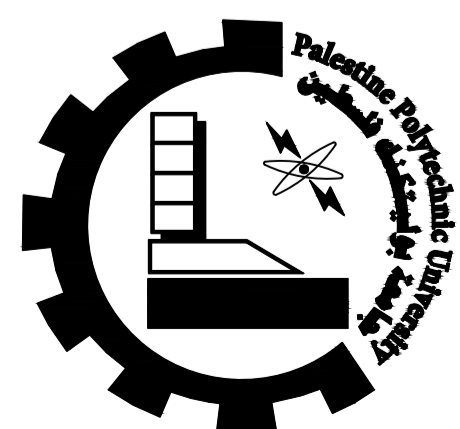
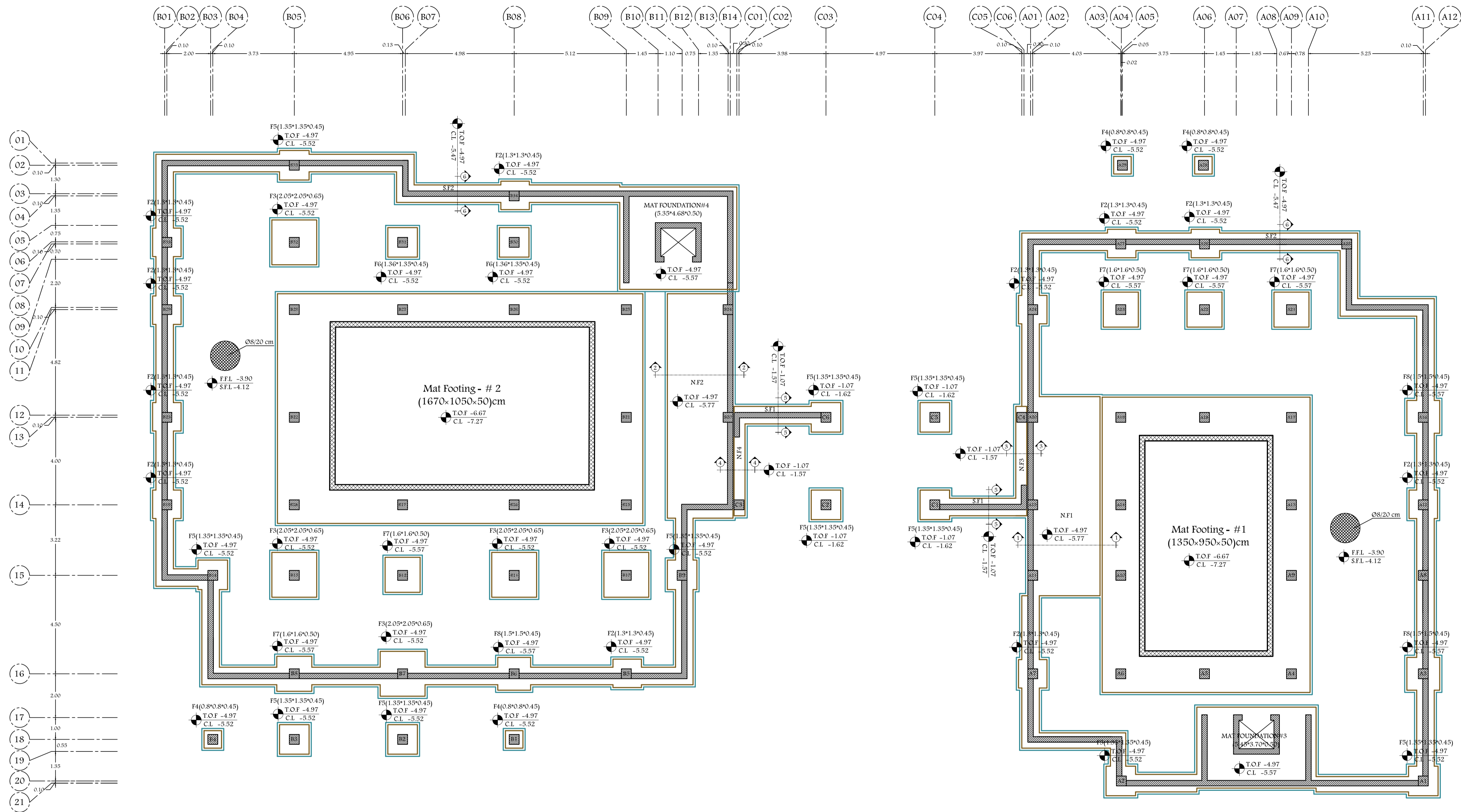
Drawing Title:  
Column Layout

Scale: 1:100  
Drawing No. S01

Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022



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 Civil Engineering Department  
 Building Engineering



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Graduation Project  
 Structural design of a tourist  
 spa resort  
 Supervisor:  
 Dr. Nafeth Nasereddin

Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

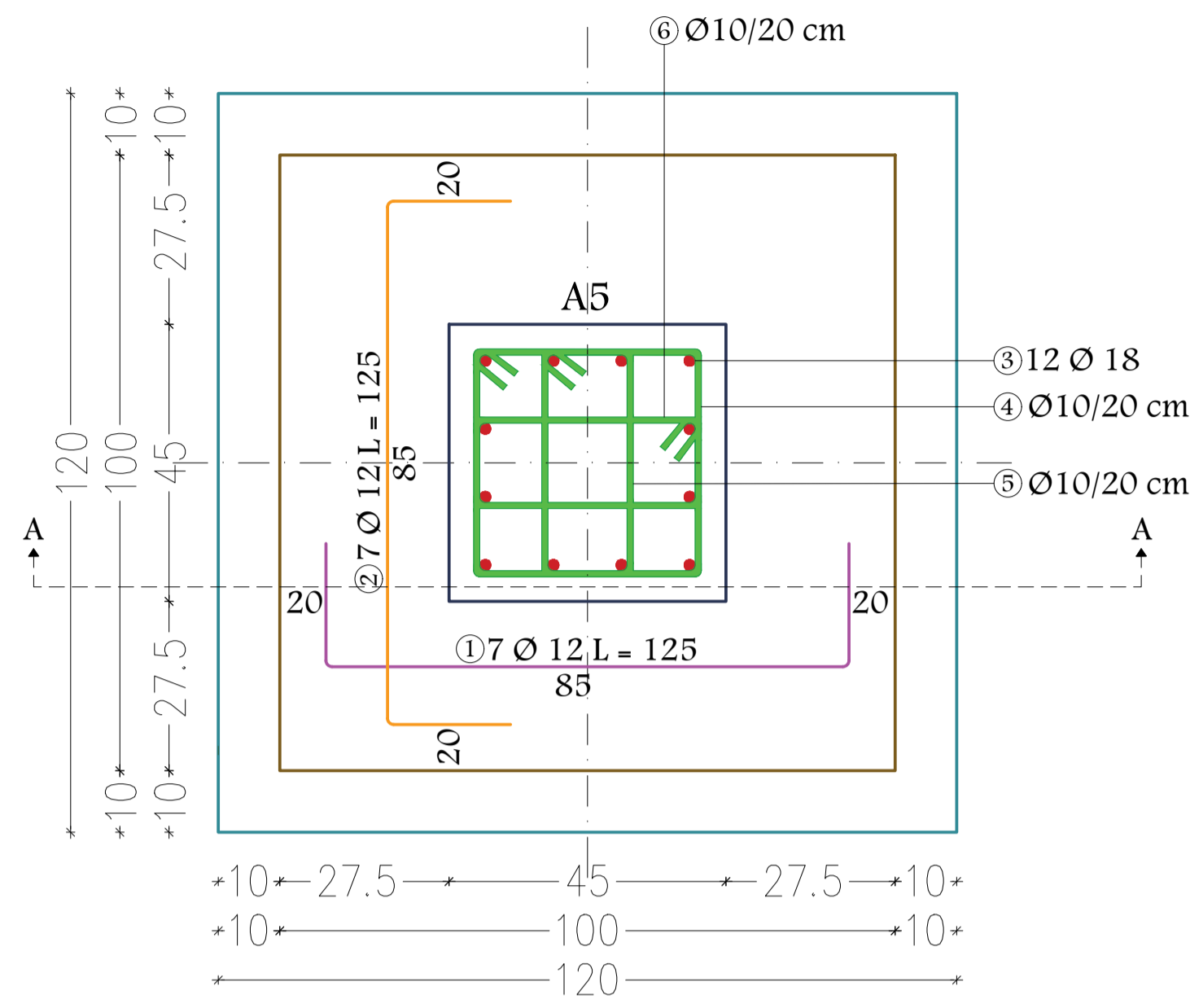
Drawing Title:  
 Footing Layout Plan  
 Scale: 1:100  
 Drawing No. S02

Hatching Key

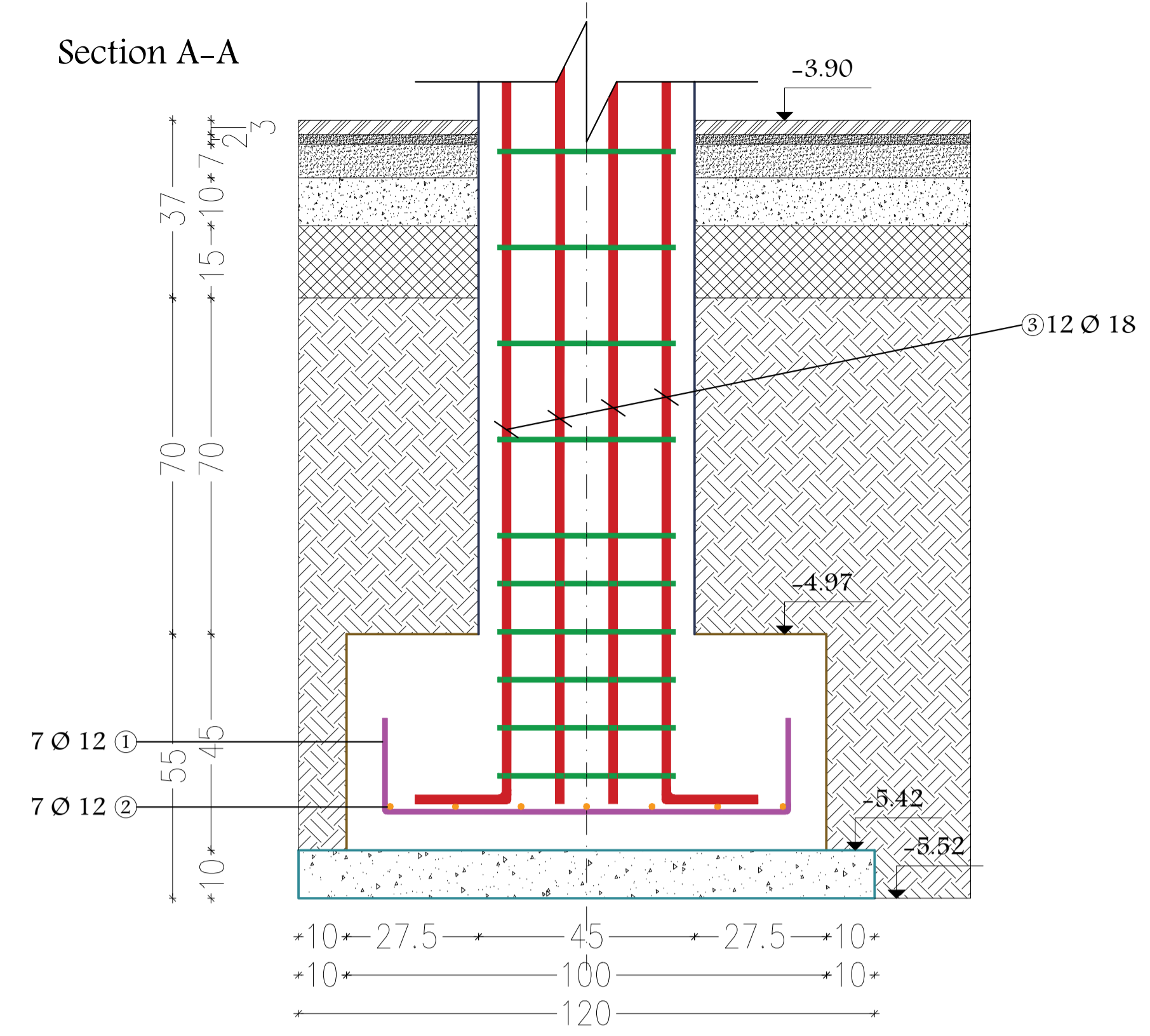
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

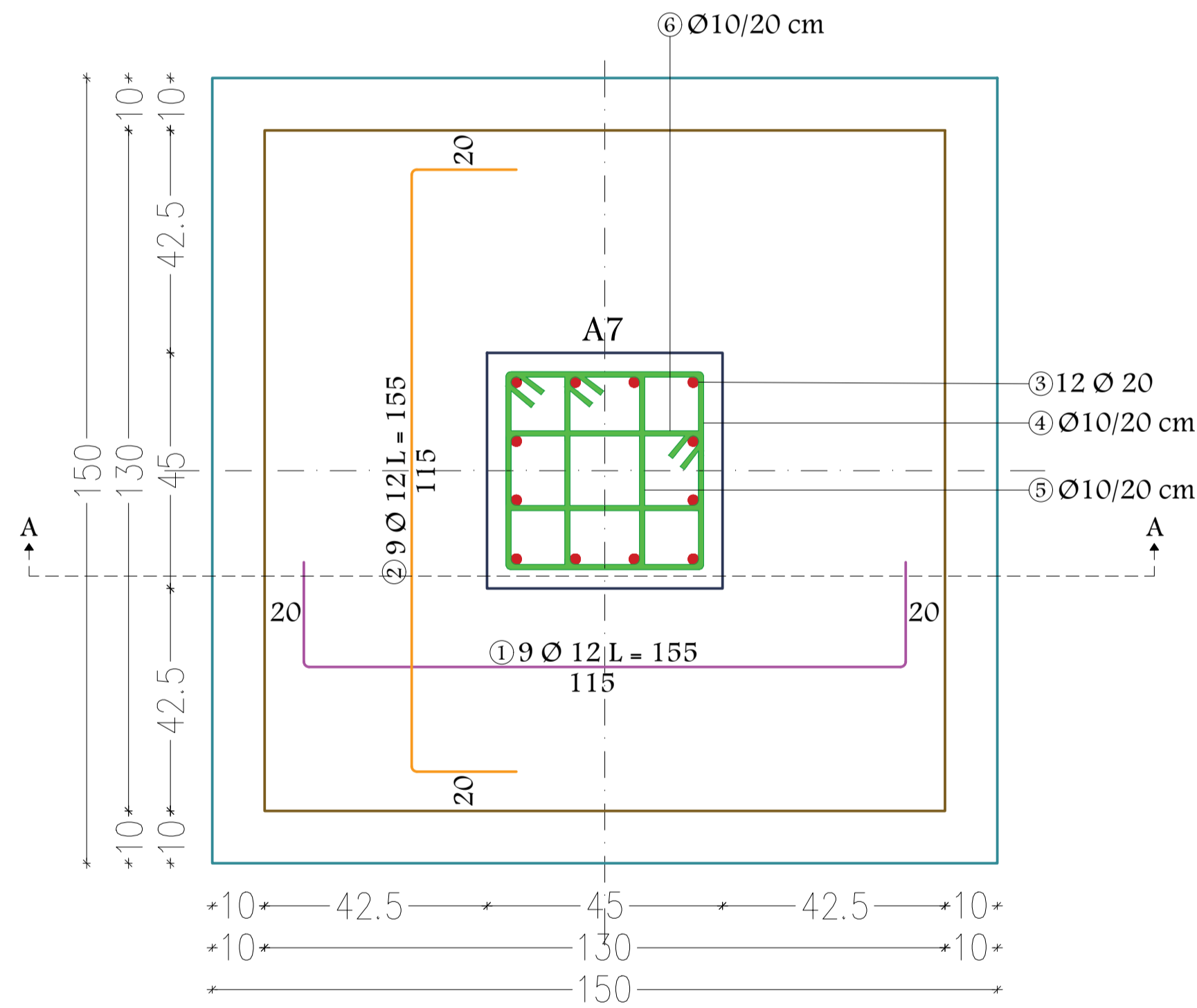
Isolated Footing - F 1 (100×100)cm



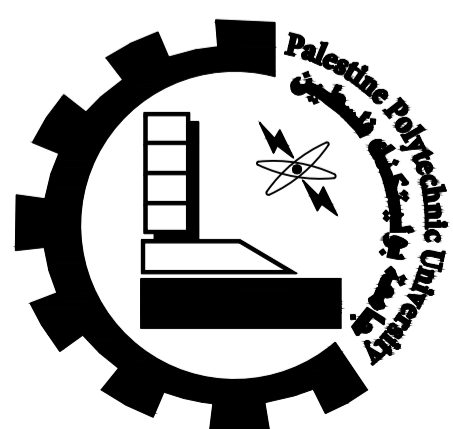
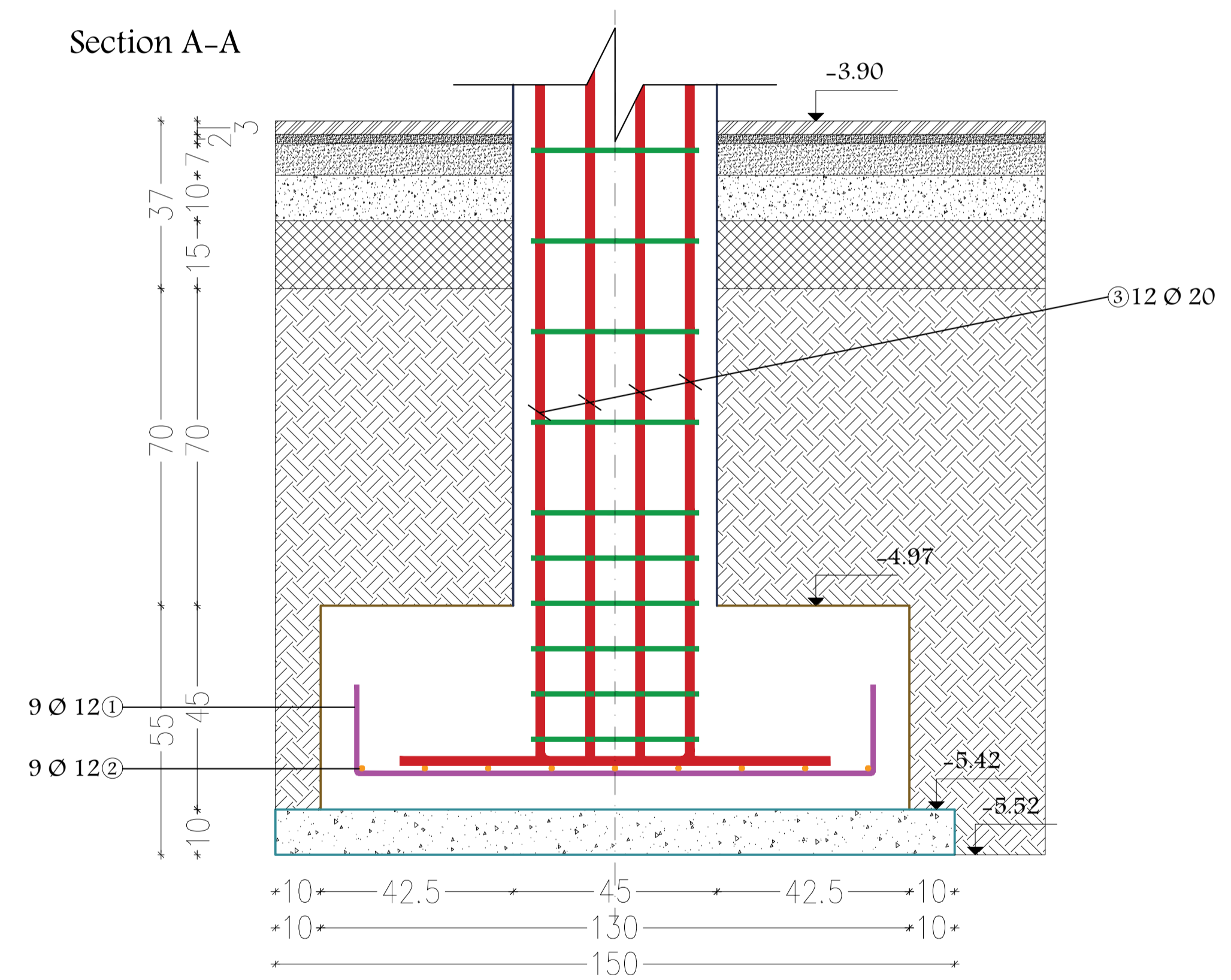
Section A-A



Isolated Footing - F 2 (130×130)cm



Section A-A



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Graduation Project  
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Supervisor:  
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Rahma Yousef Qawasmi

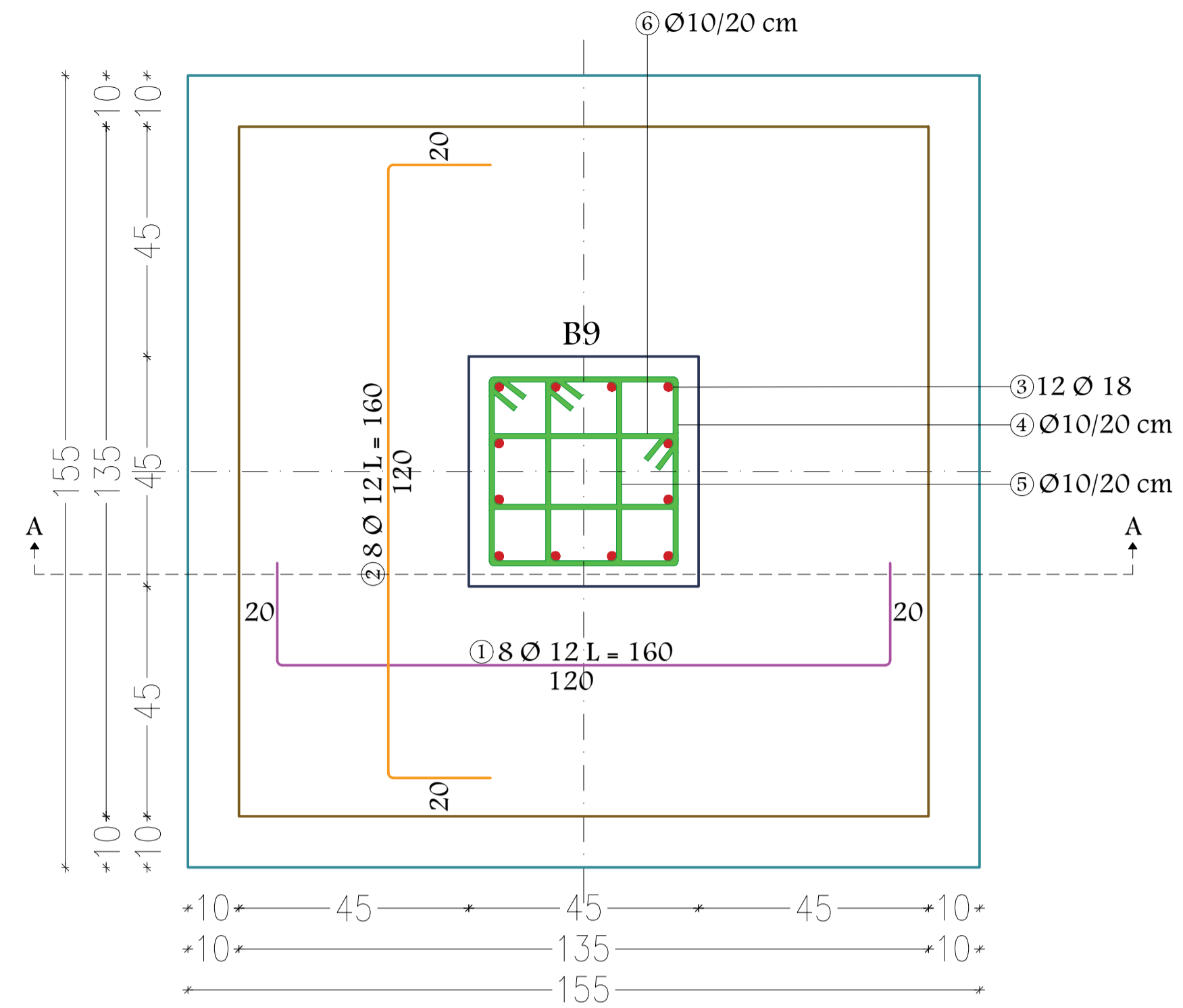
Drawing Title:  
Isolated Footings Details  
Scale: 1:150  
Drawing No. S03

Hatching Key

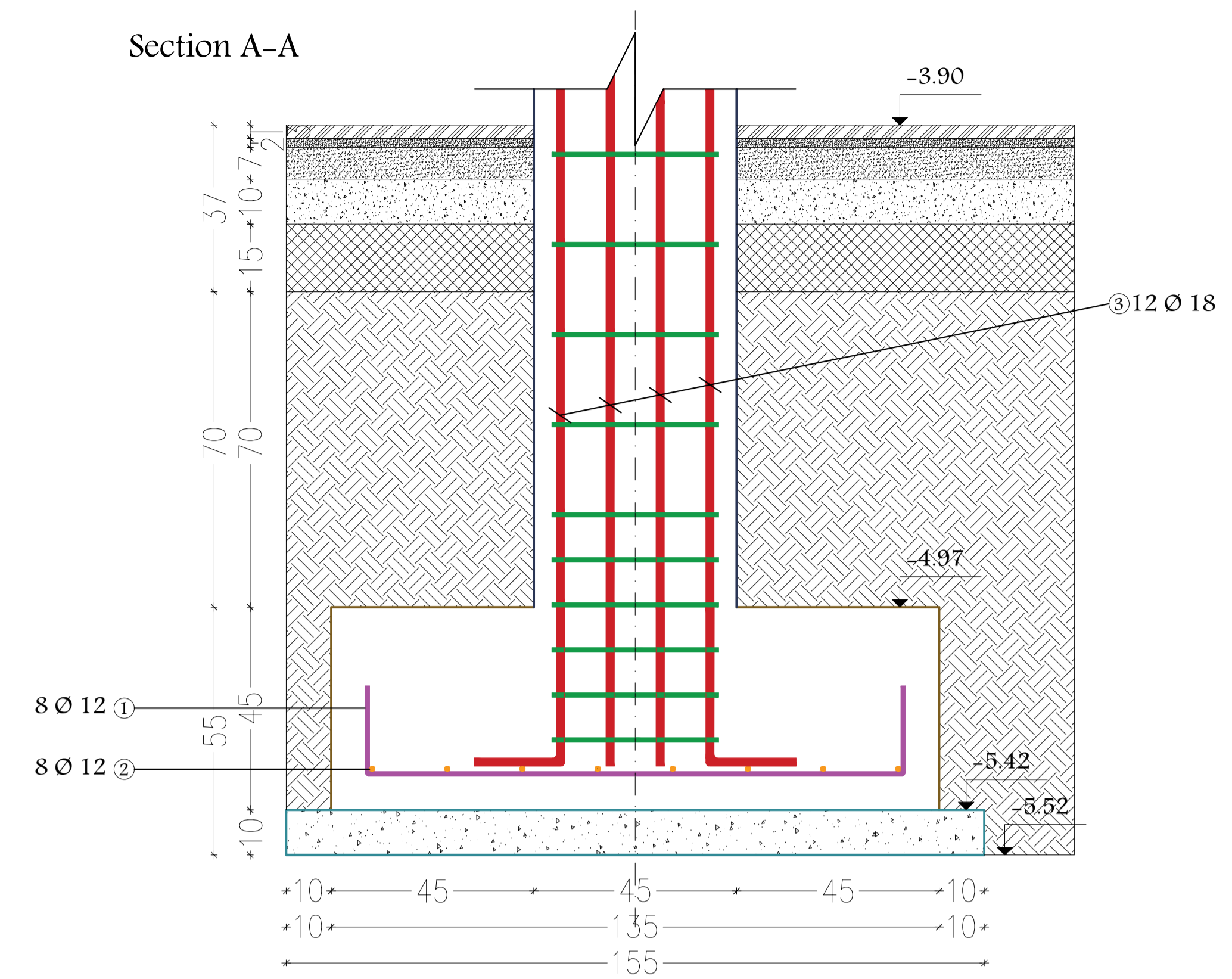
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

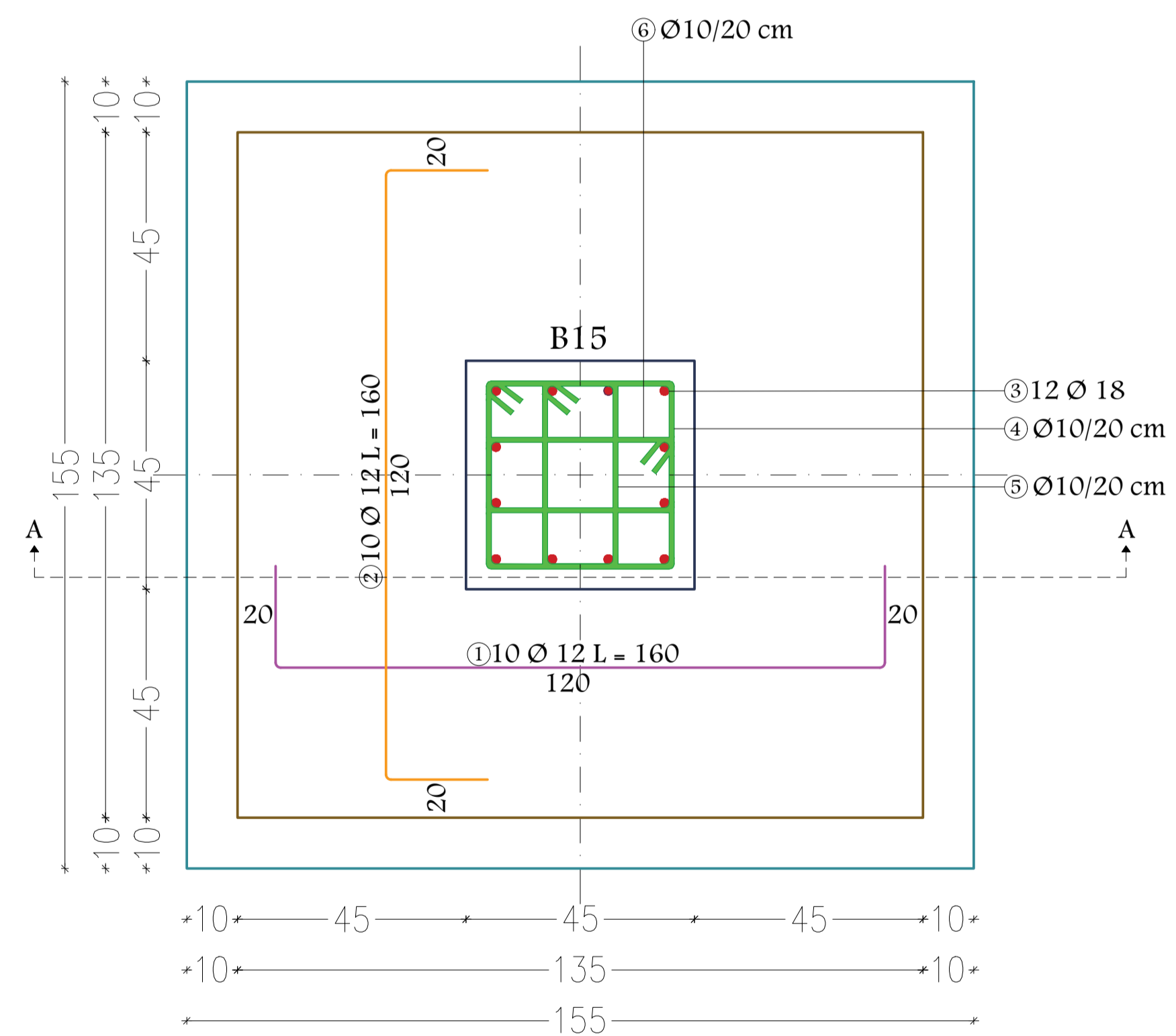
Isolated Footing - F 3 (135x135)cm



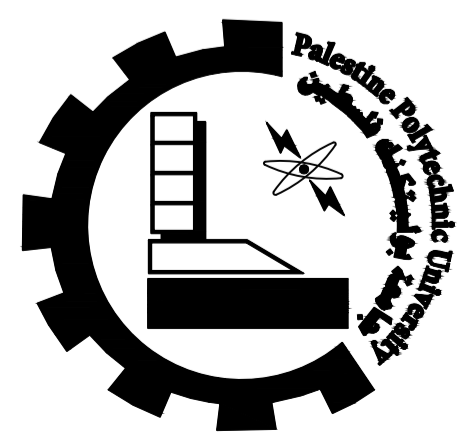
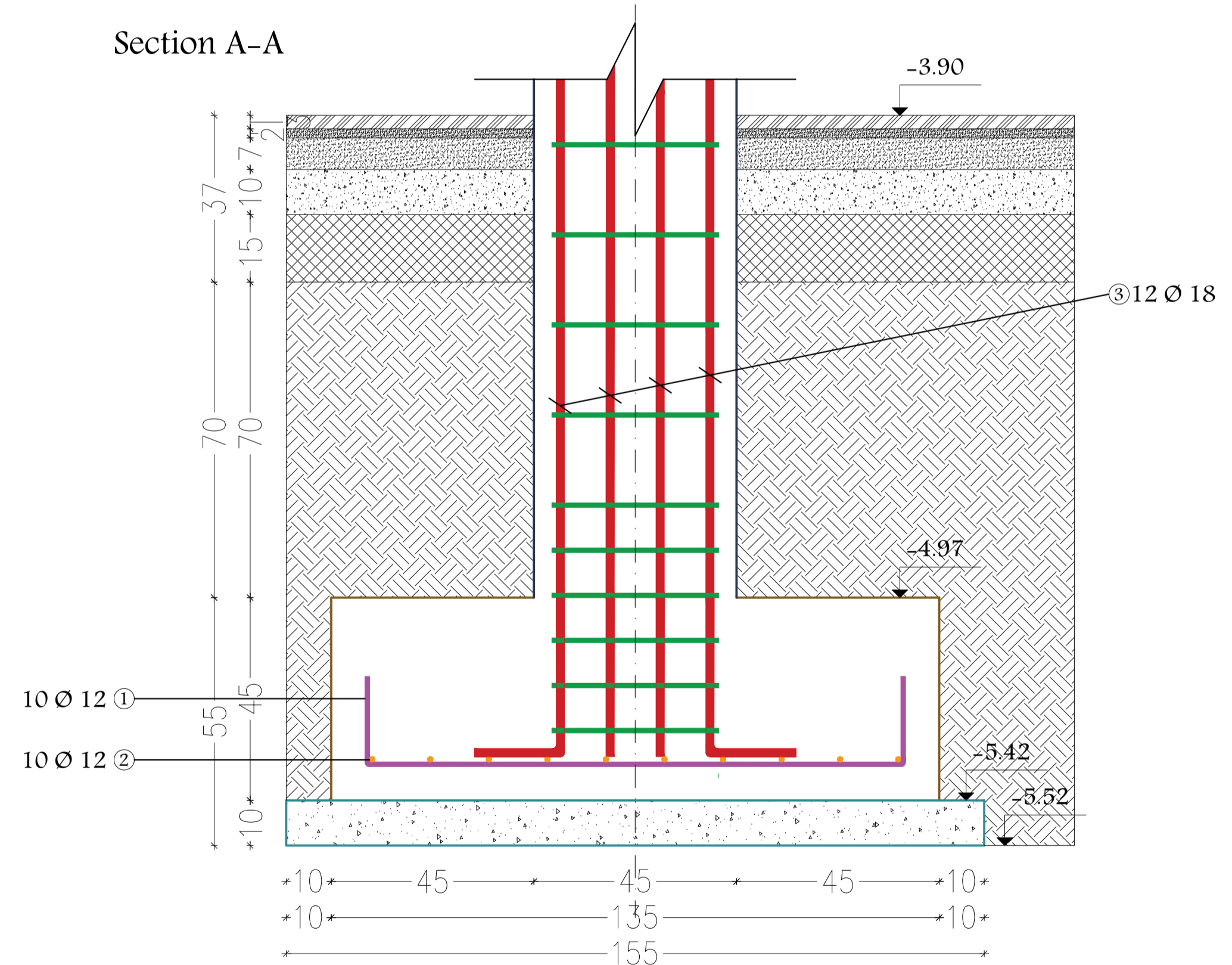
Section A-A



Isolated Footing - F 4 (135x135)cm



Section A-A



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Graduation Project  
Structural design of a tourist spa resort

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Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

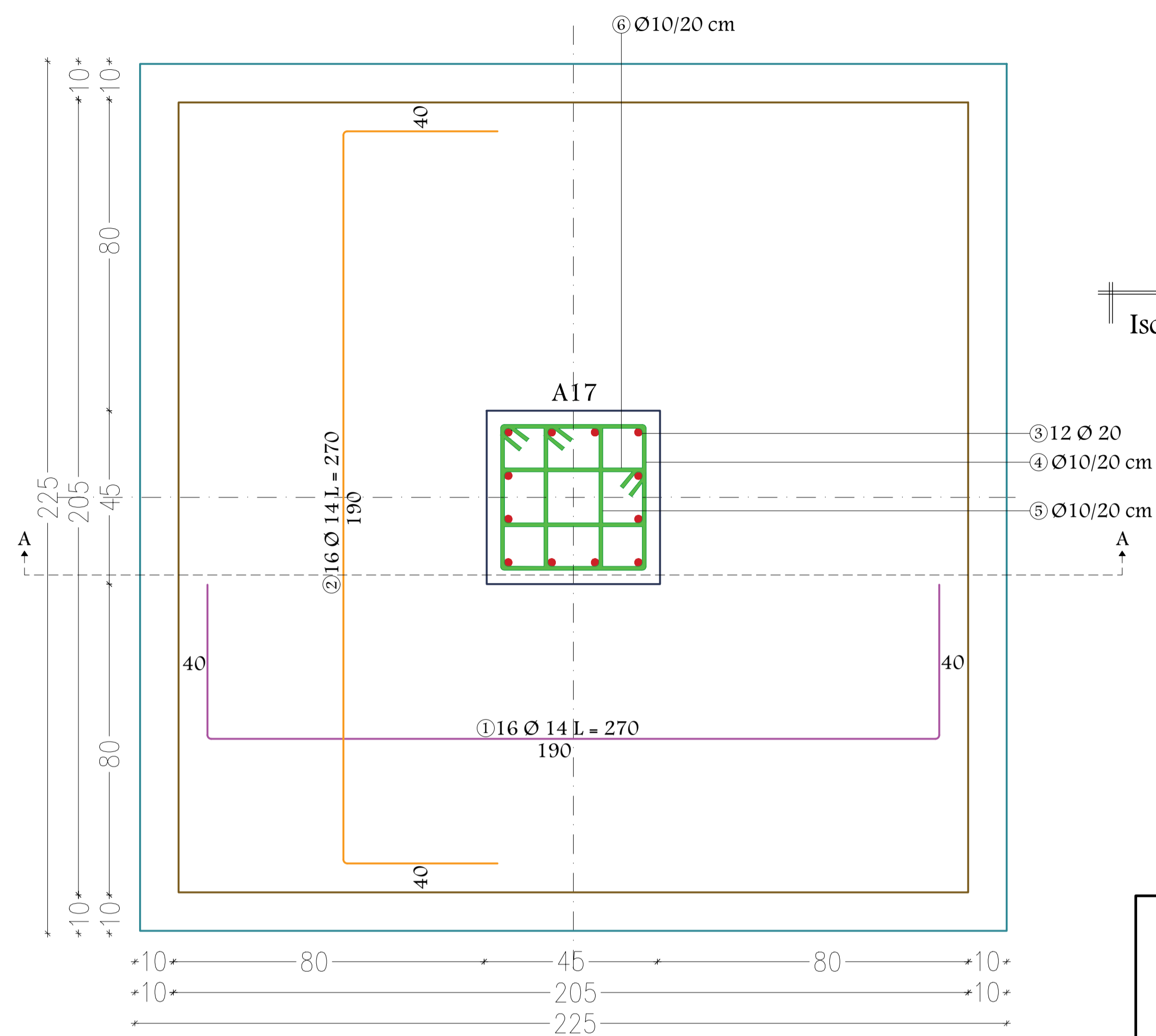
Drawing Title:  
Isolated Footings Details

Scale: 1:150  
Drawing No. So4

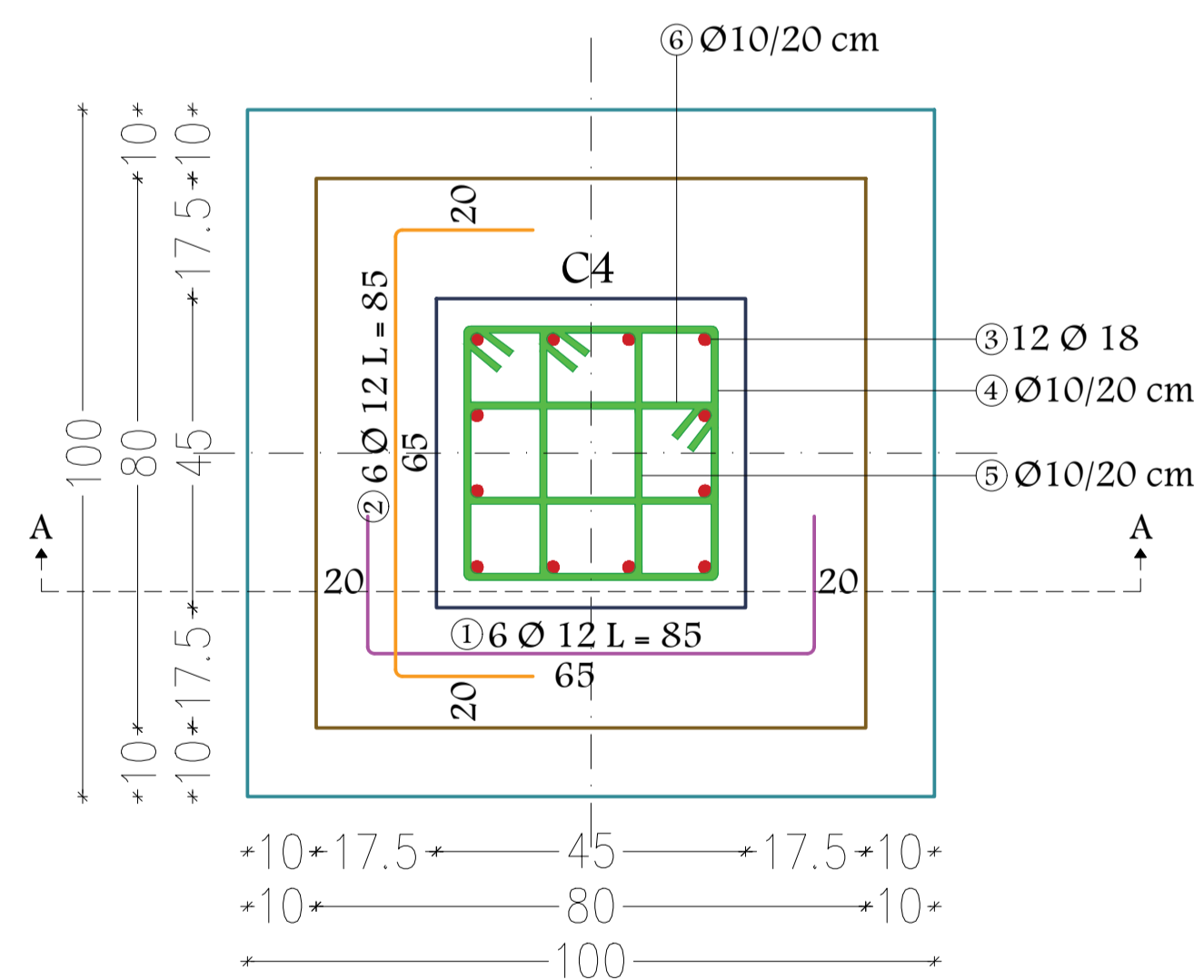
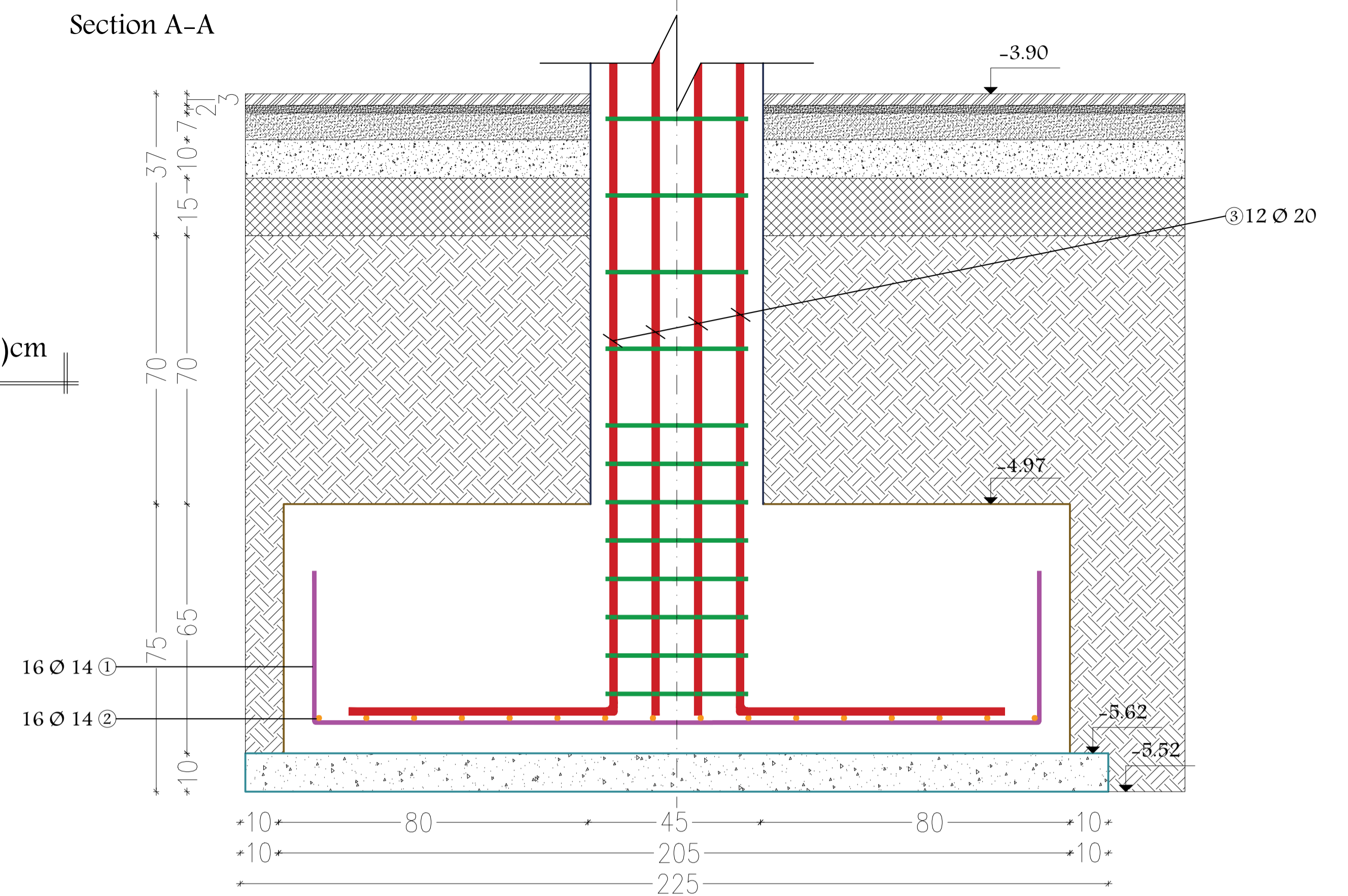
Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

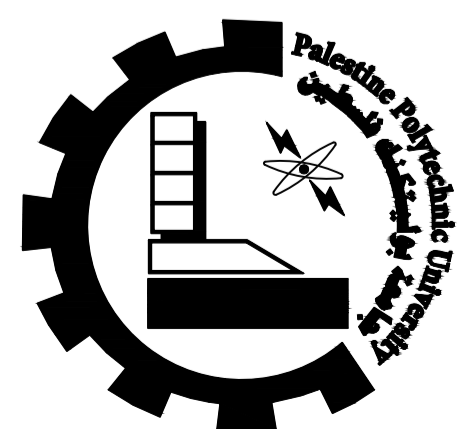
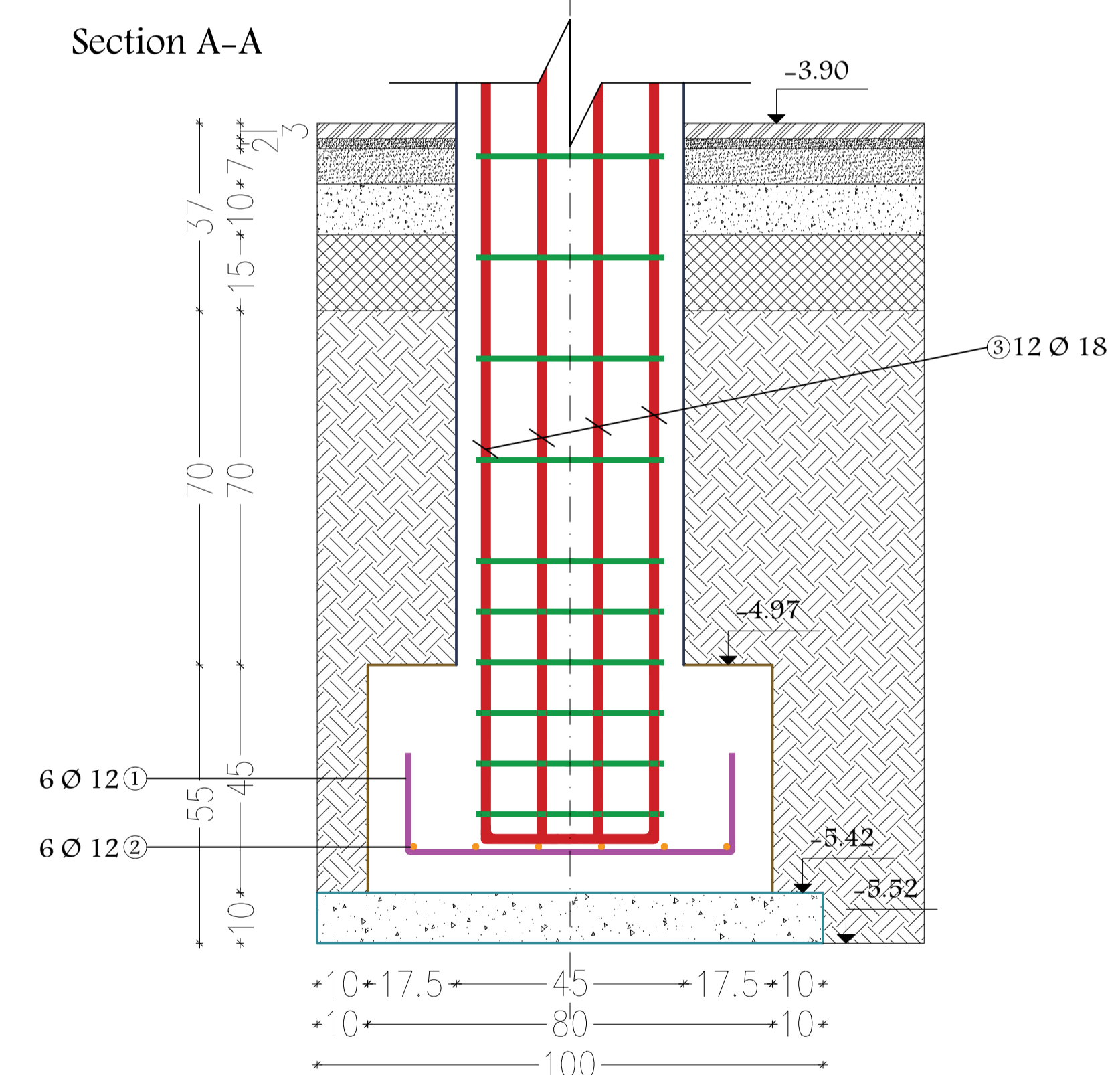
May 2022



Section A-A



Section A-A



Palestine Polytechnic University  
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Civil Engineering Department  
Building Engineering



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Graduation Project  
Structural design of a tourist spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

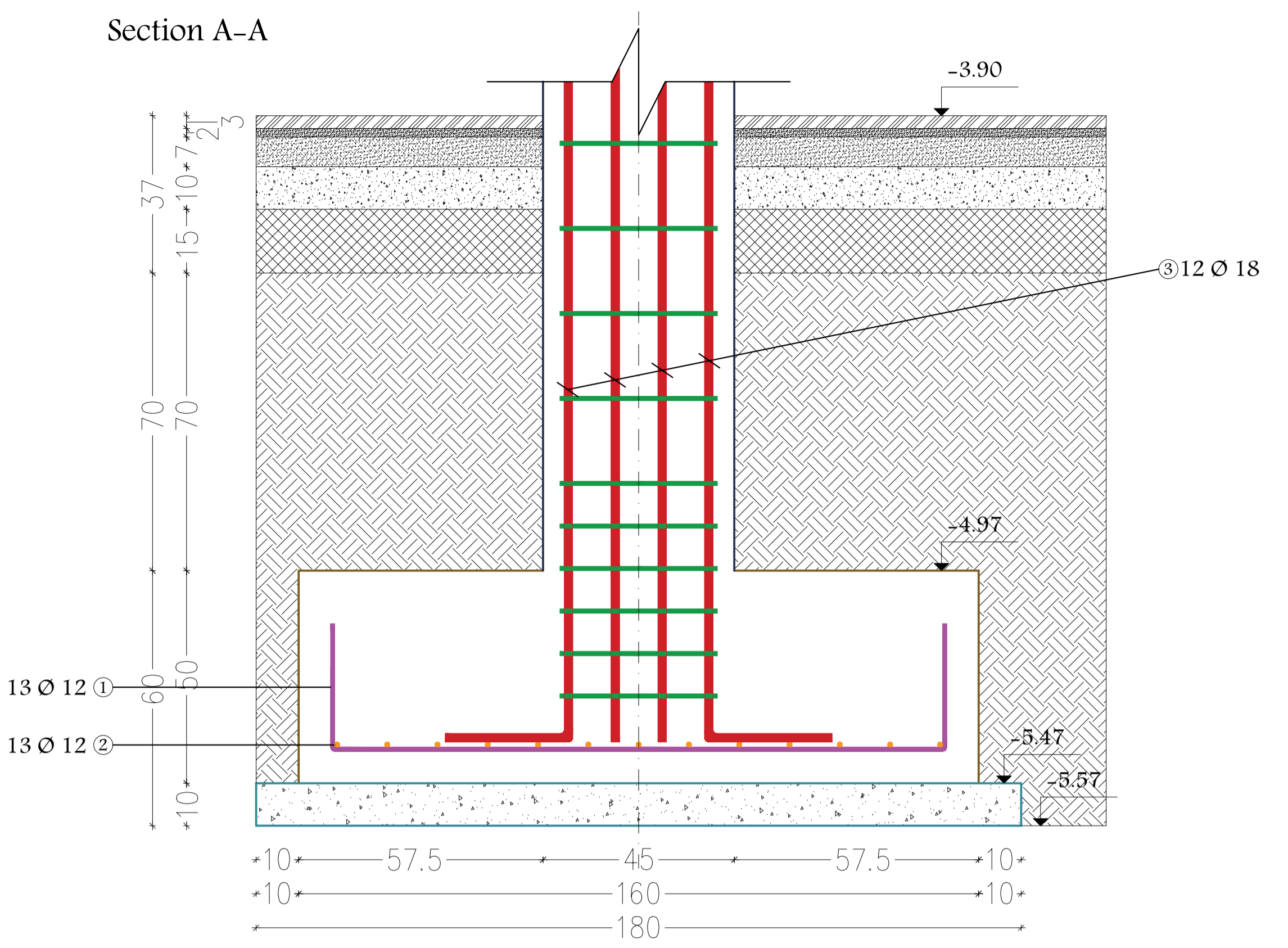
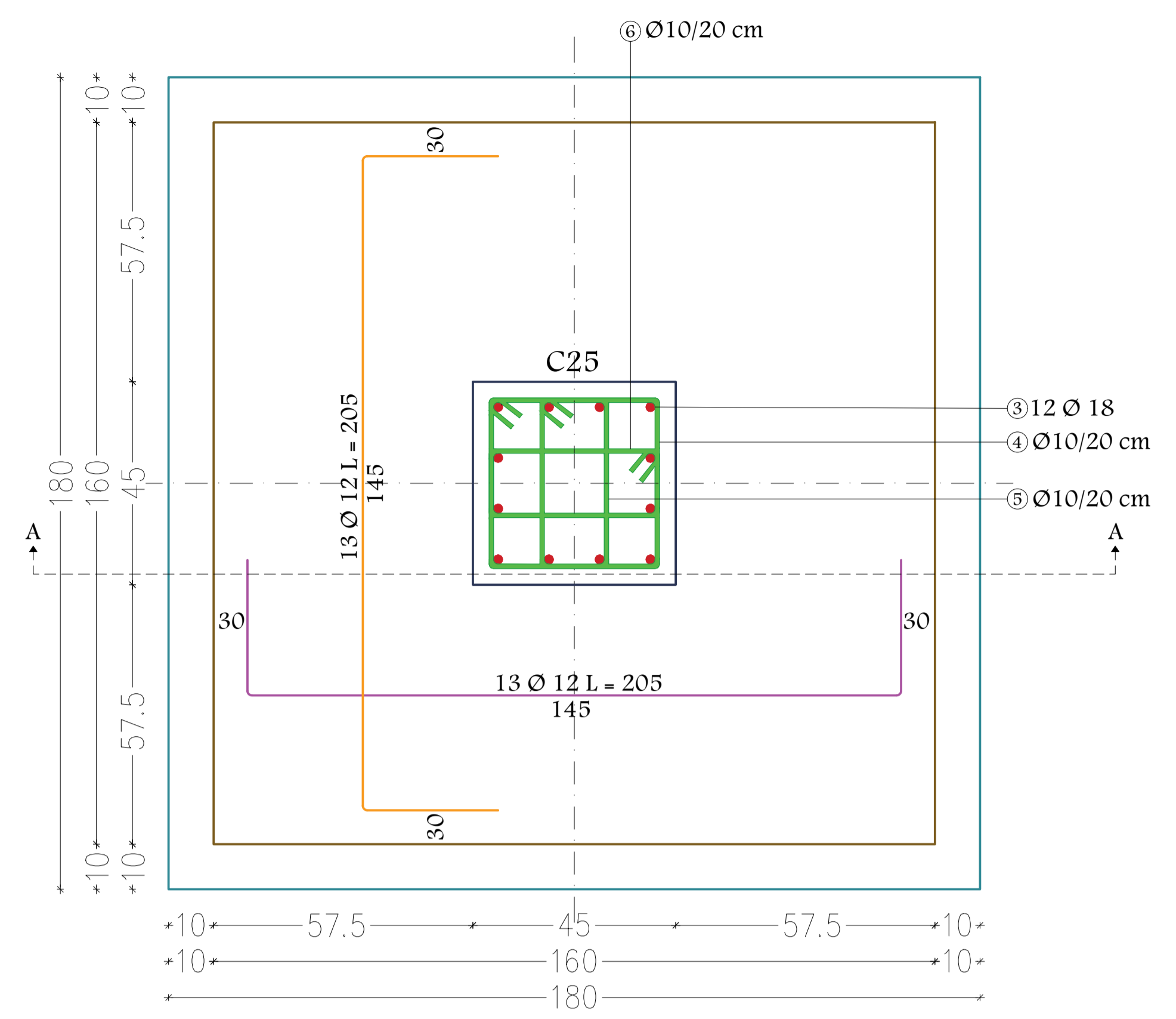
Drawing Title:  
Isolated Footings Details  
Scale: 1:150  
Drawing No. S05

Hatching Key

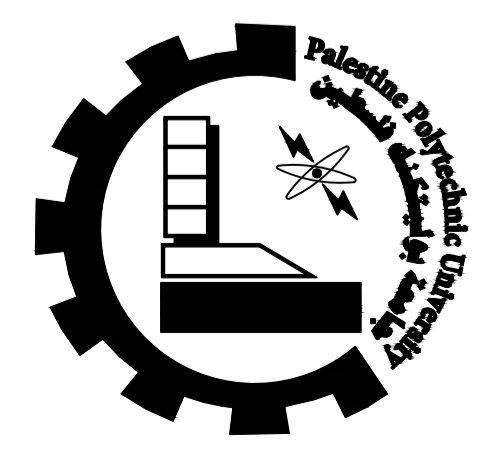
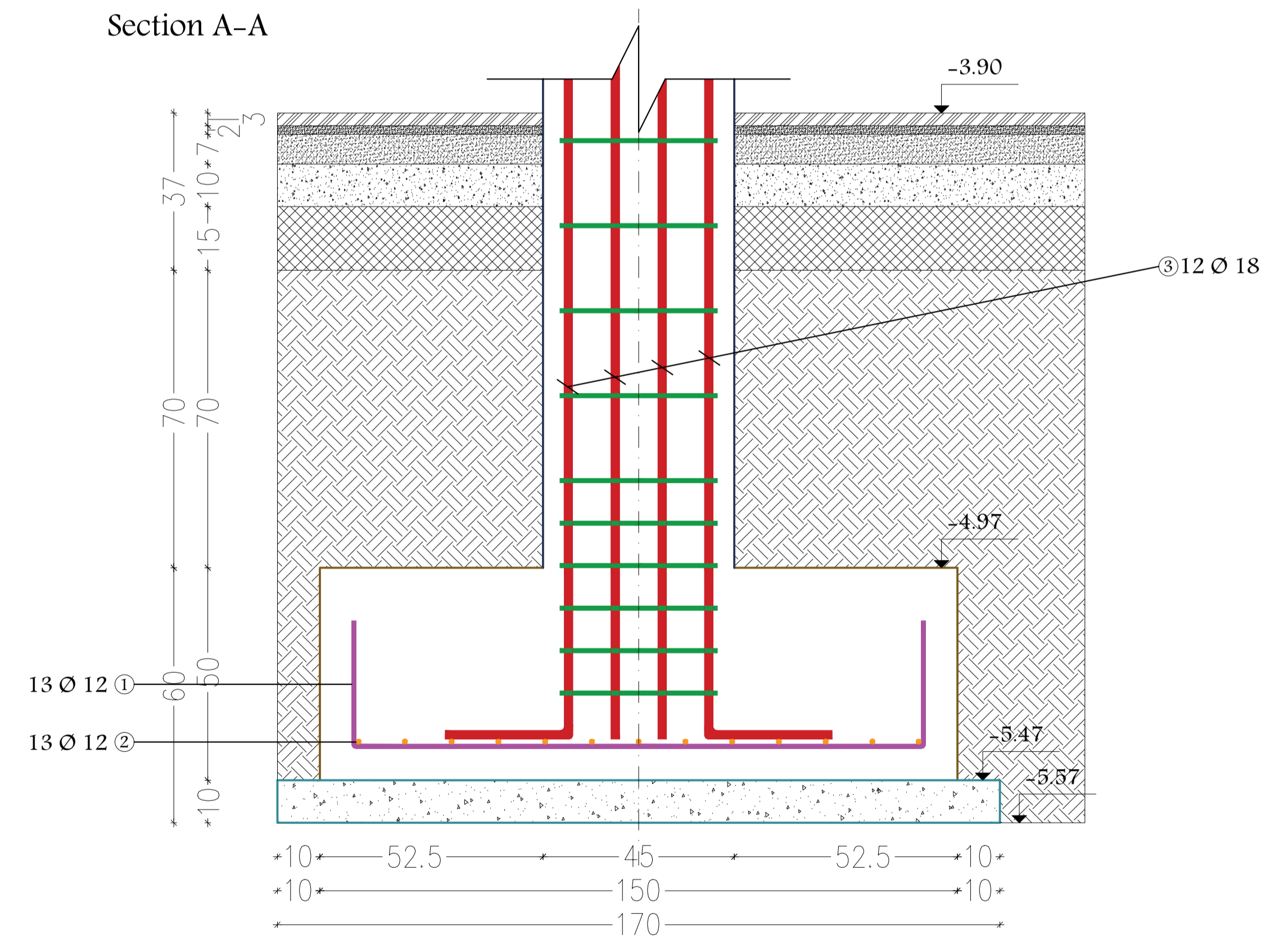
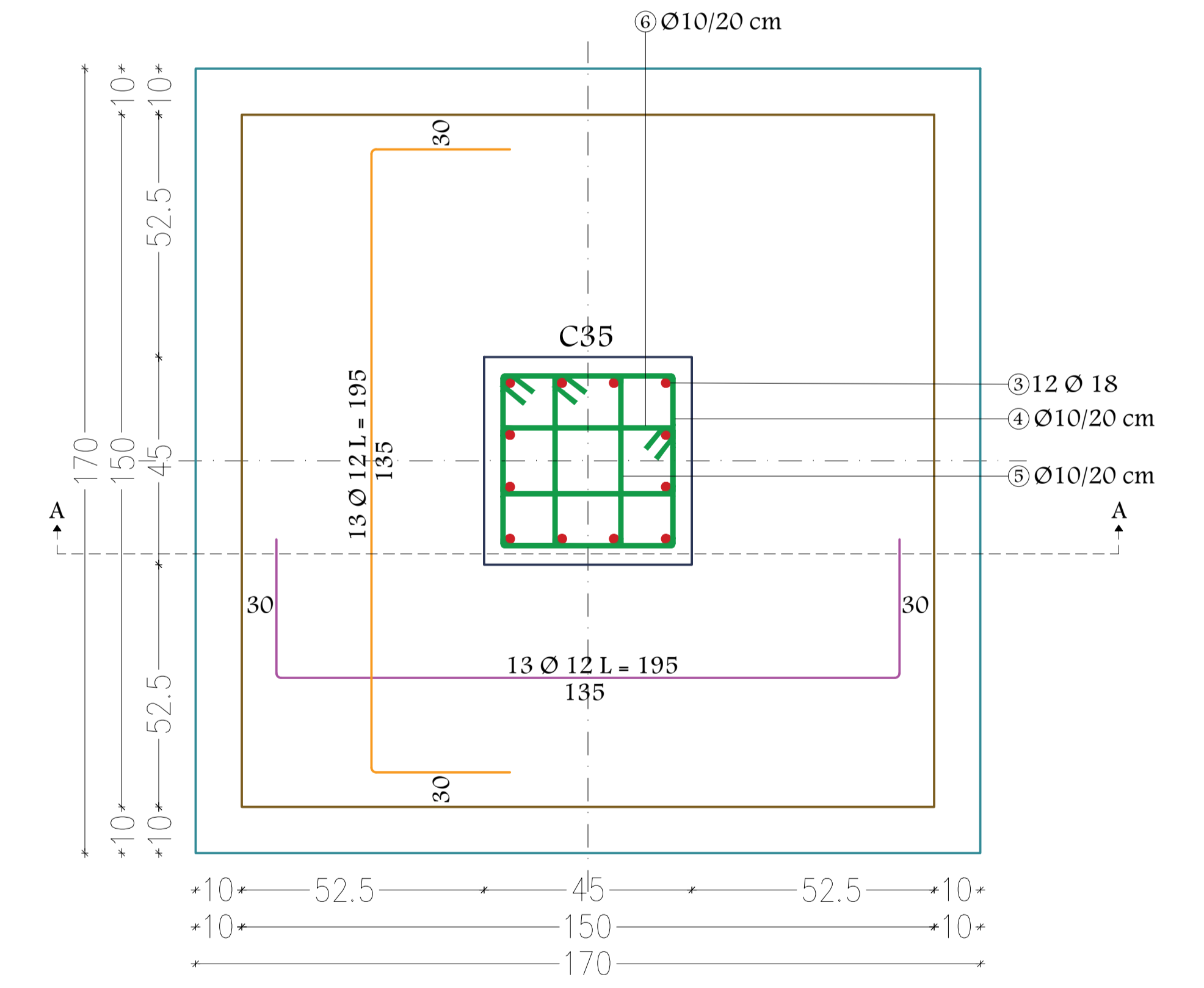
- Concrete
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May 2022

Isolated Footing - F 7 (160×160)cm



Isolated Footing - F 8 (150×150)cm



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Graduation Project  
Structural design of a tourist spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

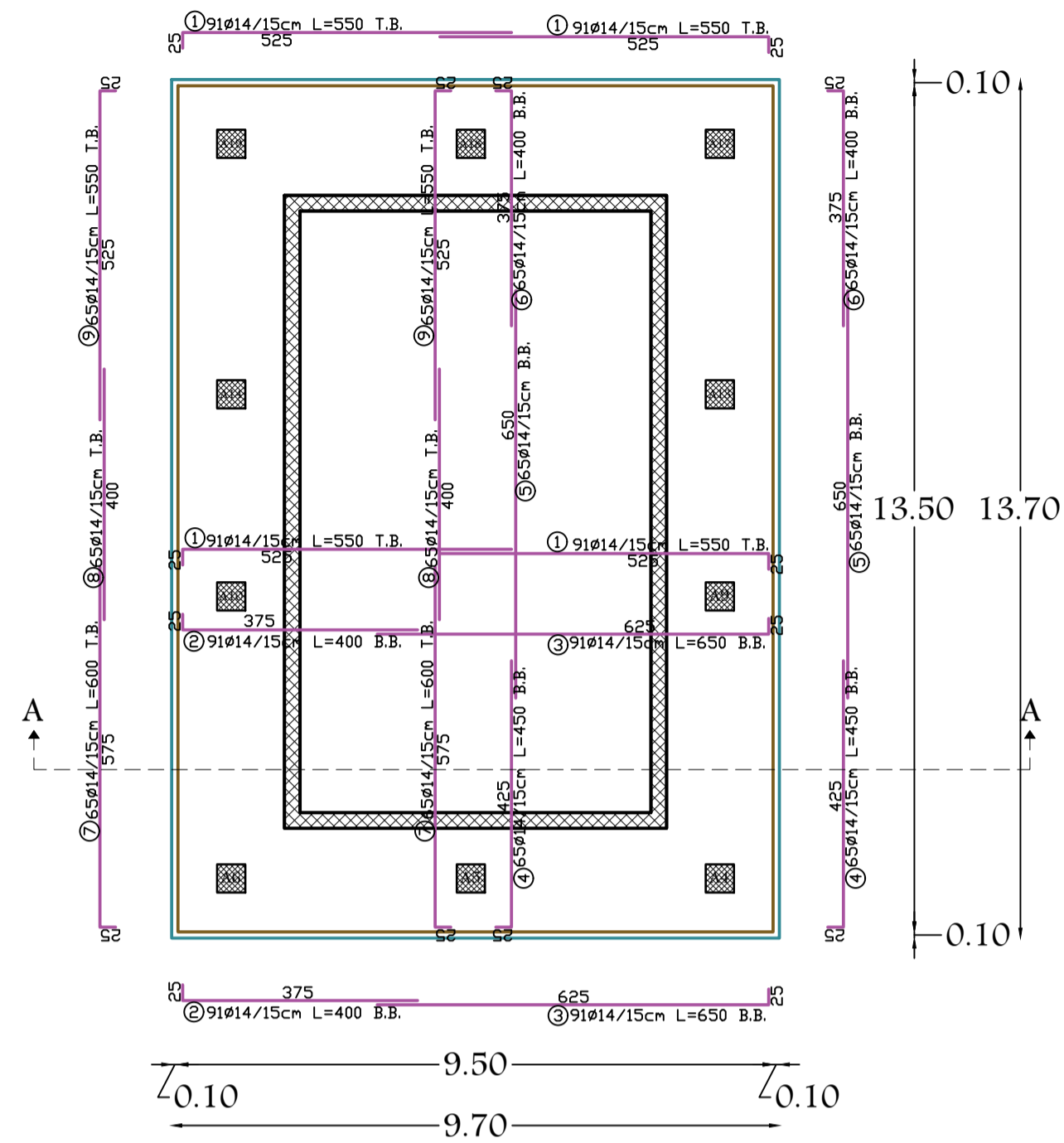
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Isolated Footings Details  
Scale: 1:150  
Drawing No. So6

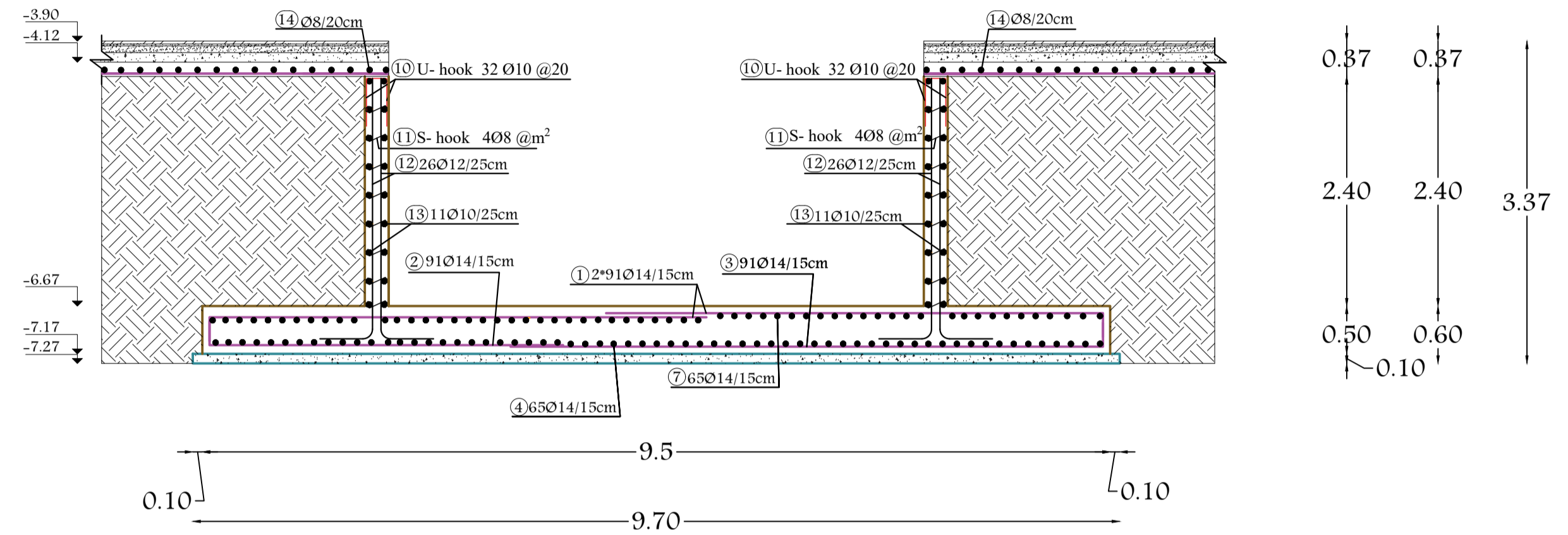
Hatching Key	
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

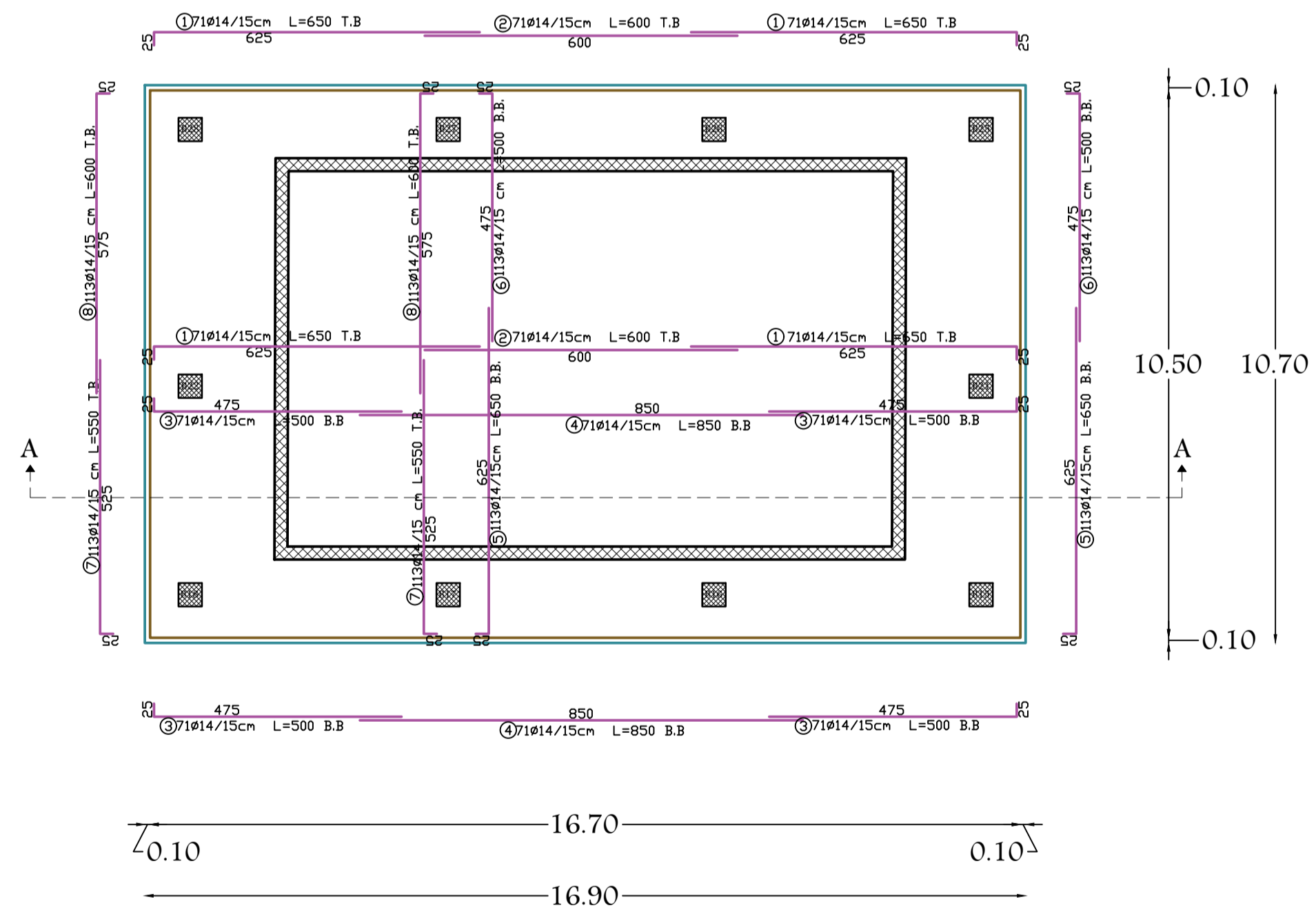
Mat Footing - #1 (1350×950×50)cm



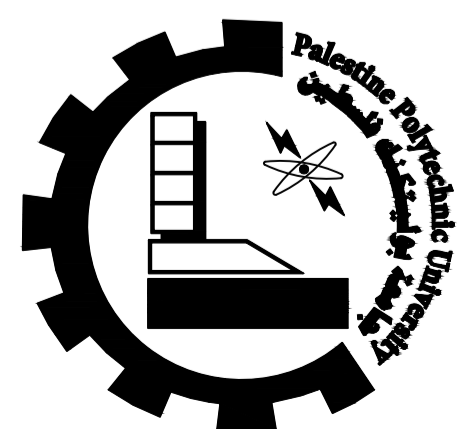
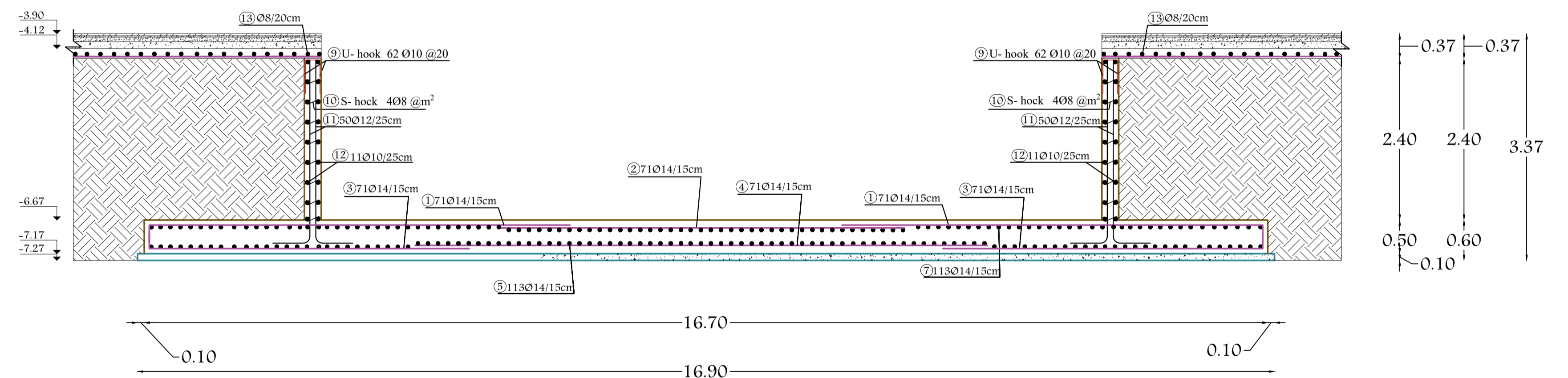
Section A-A SCALE 1:50



Mat Footing - #2 (1670×1050×50)cm



Section A-A SCALE 1:50



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Graduation Project  
Structural design of a tourist  
spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

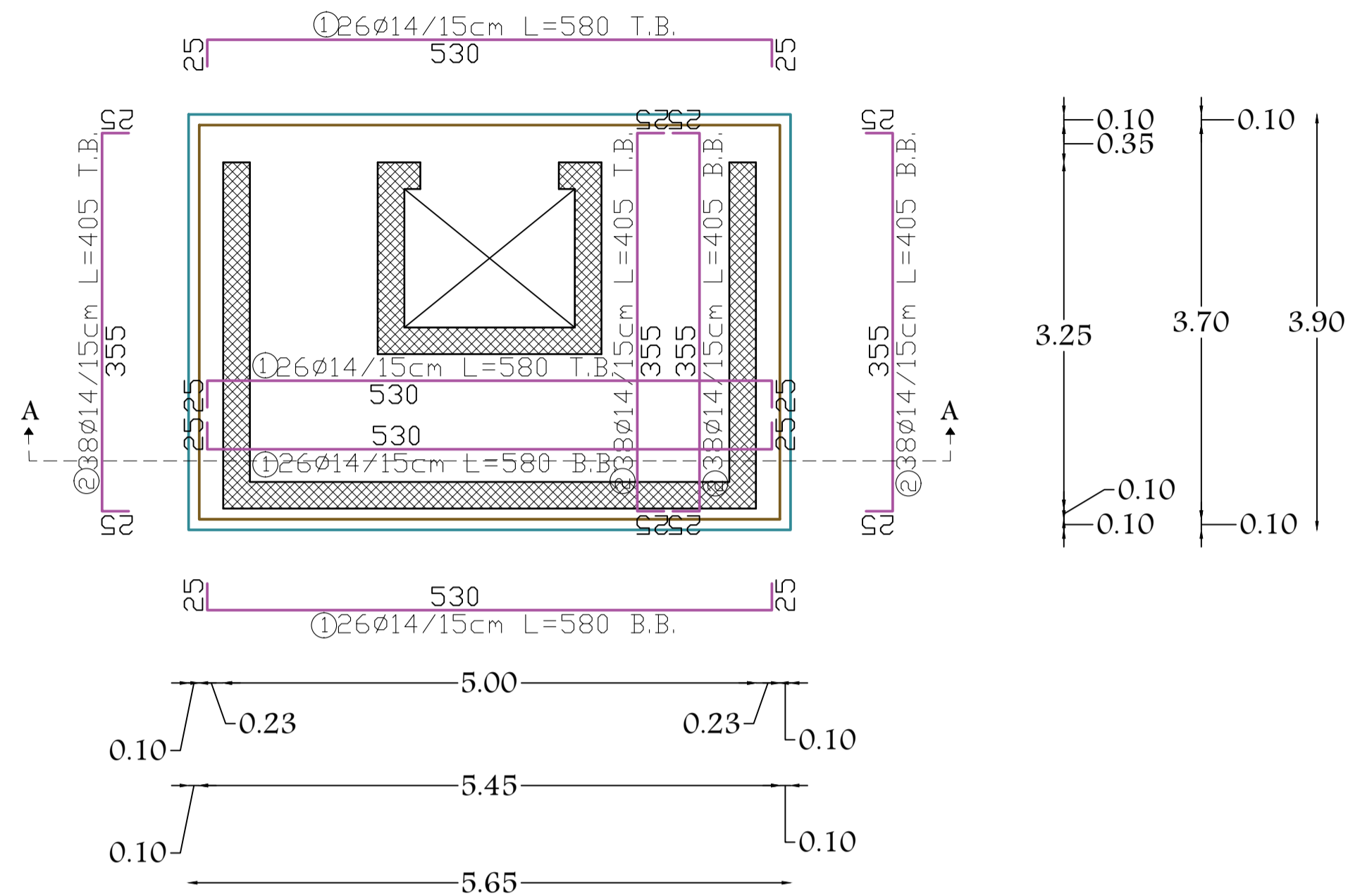
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Mat Foundation Design  
Scale: 1:100  
Drawing No. So7

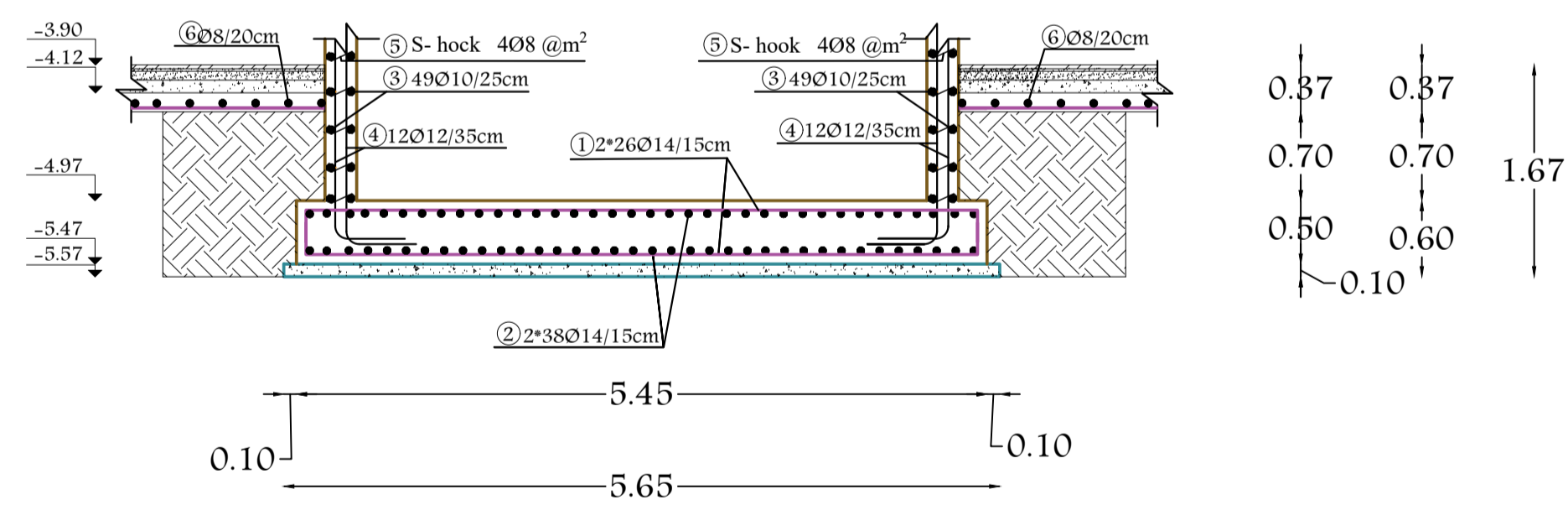
Hatching Key	
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

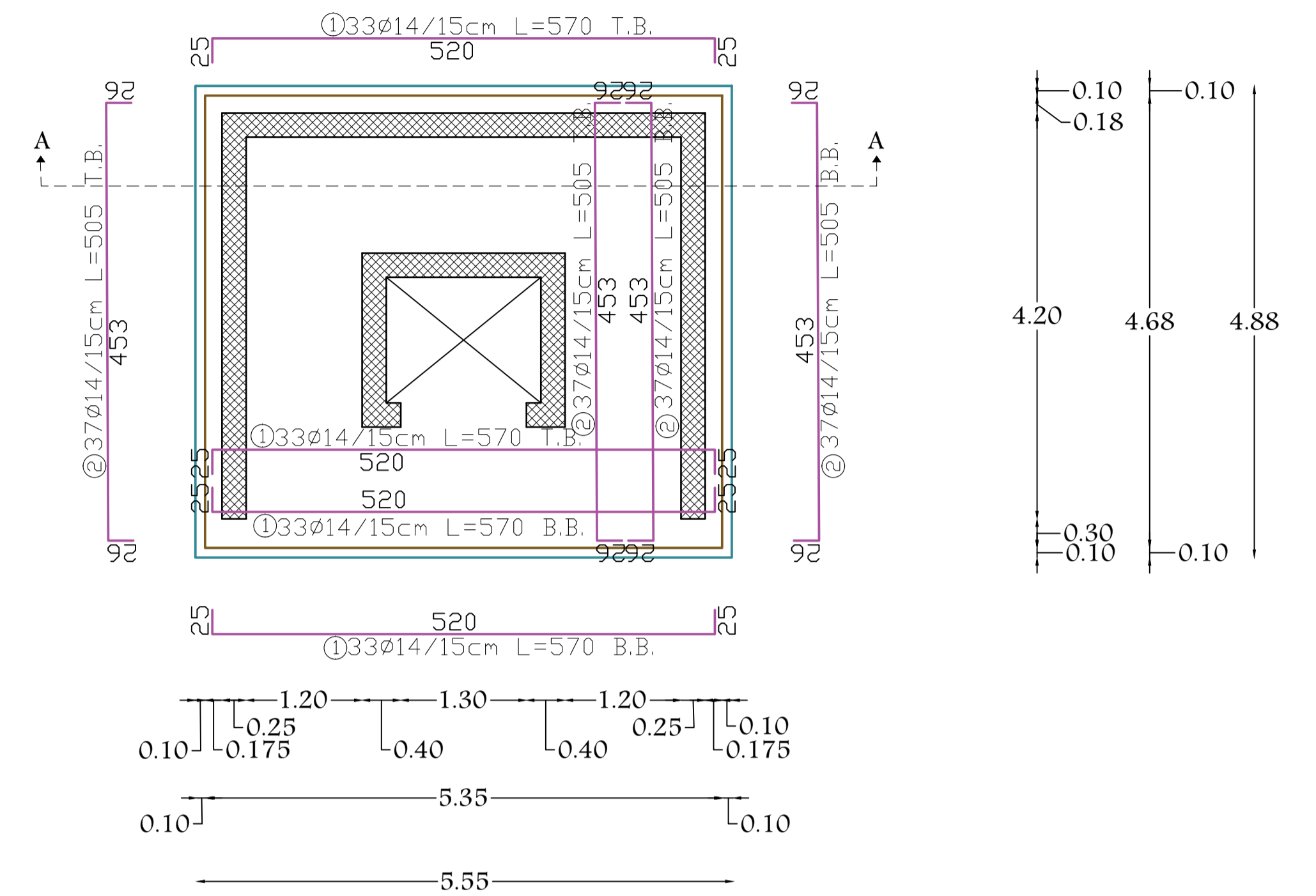
Mat Footing - #3 (545x700x50)cm



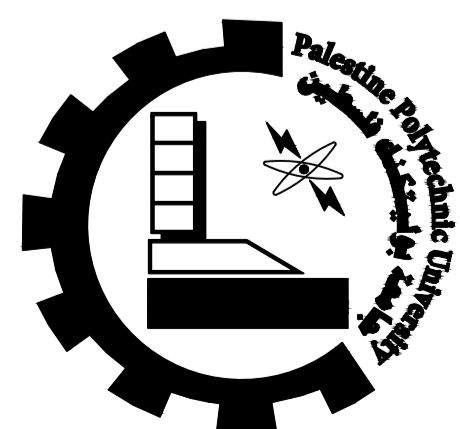
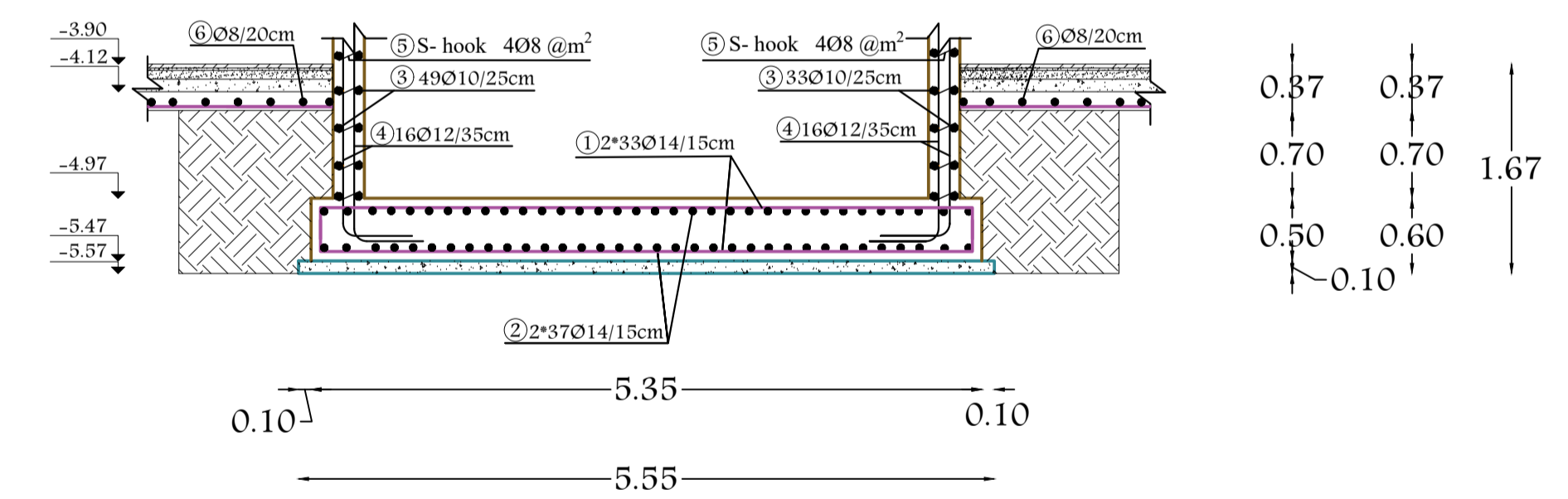
Section A-A  
SCALE 1:50



Mat Footing - #3 (535x470x50)cm



Section A-A  
SCALE 1:50



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Graduation Project  
Structural design of a tourist  
spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Mat Foundation Design  
Scale: 1:50  
Drawing No. So8

Hatching Key

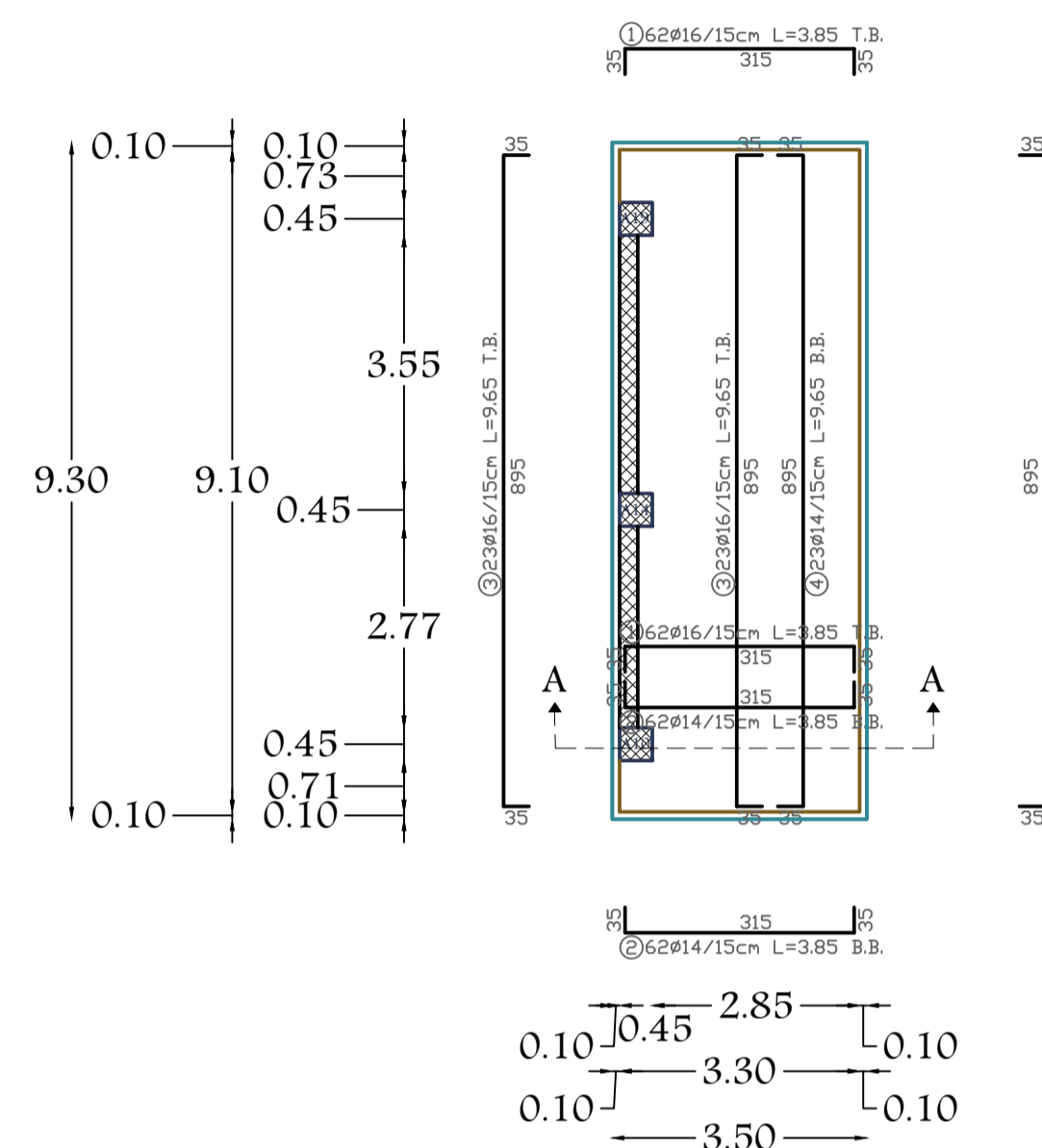
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022



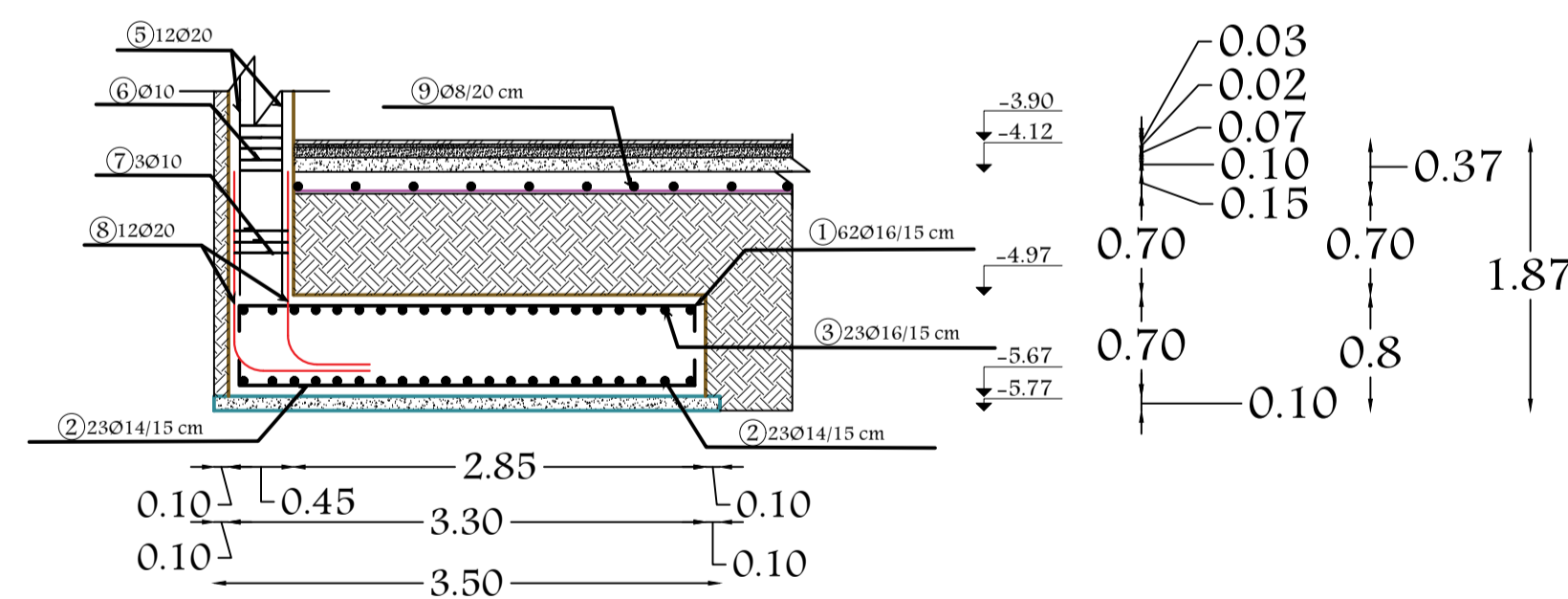
Neighbor Footing - #2 (300\*1020\*70)cm

SCALE 1:100



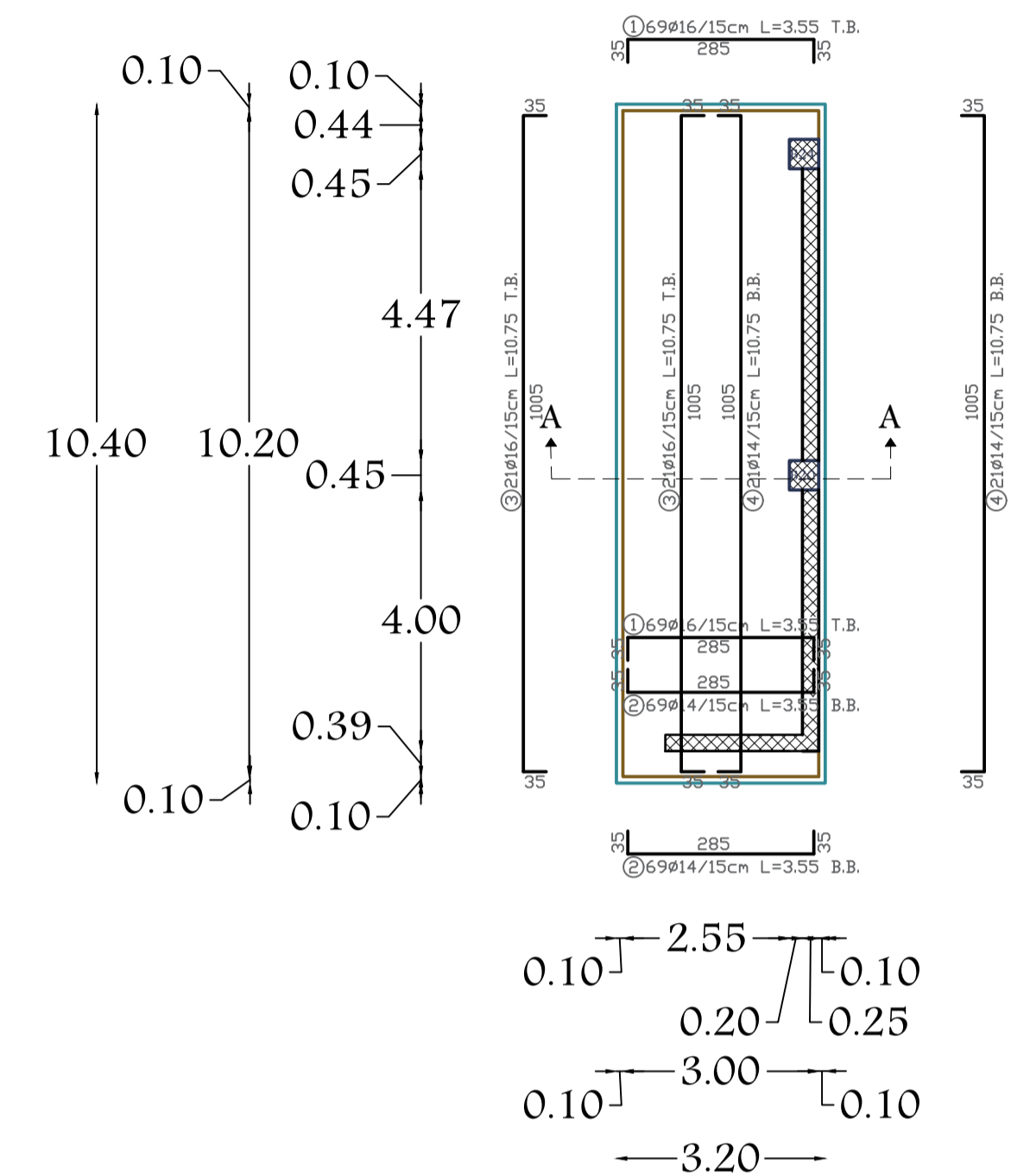
Section A-A

SCALE 1:50



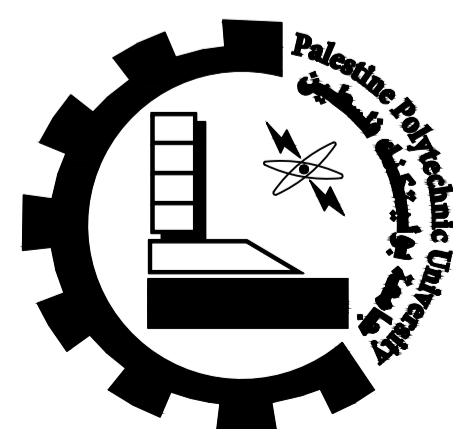
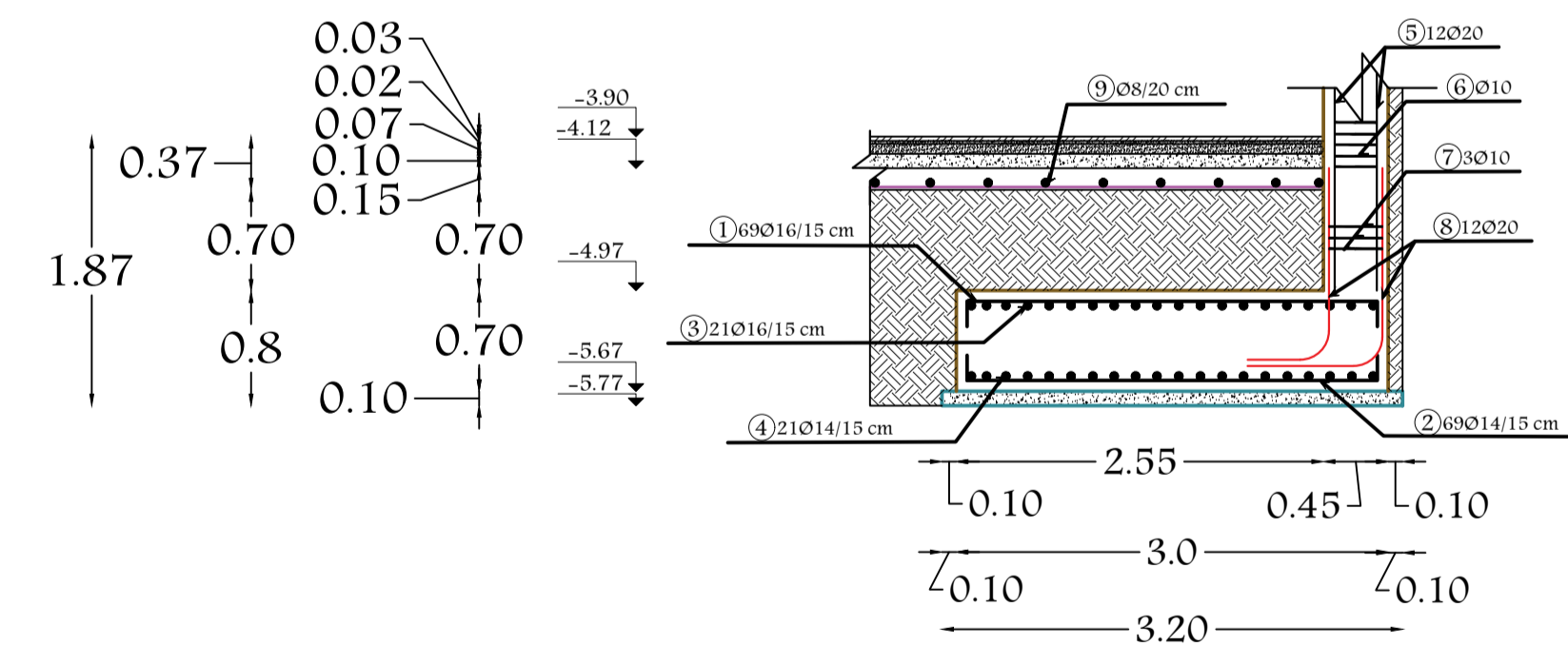
Neighbor Footing - #2 (300\*1020\*70)cm

SCALE 1:100



Section A-A

SCALE 1:50



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Graduation Project  
Structural design of a tourist  
spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Neighbor Foundation  
Design  
Scale: 1:100  
Drawing No. S09

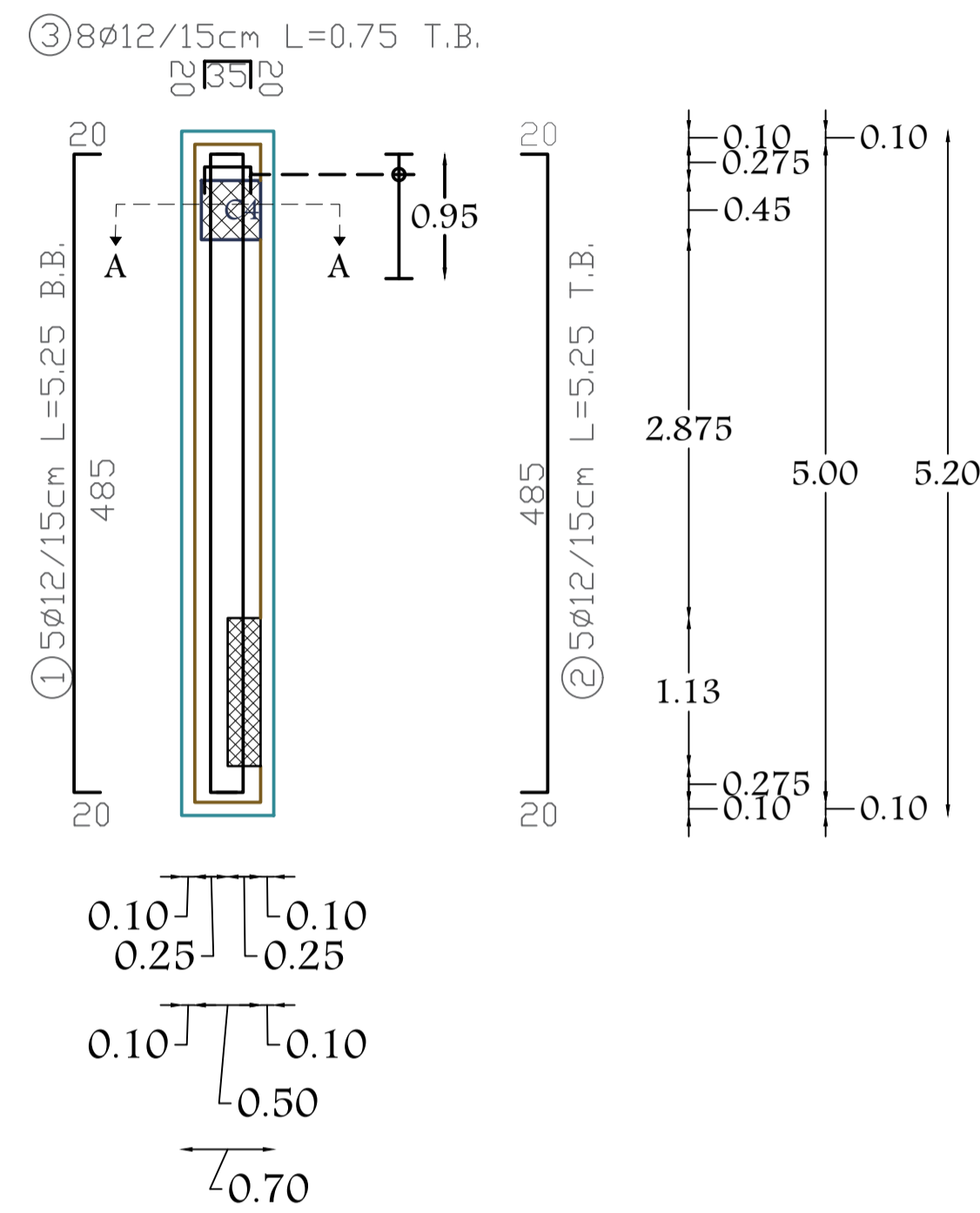
Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

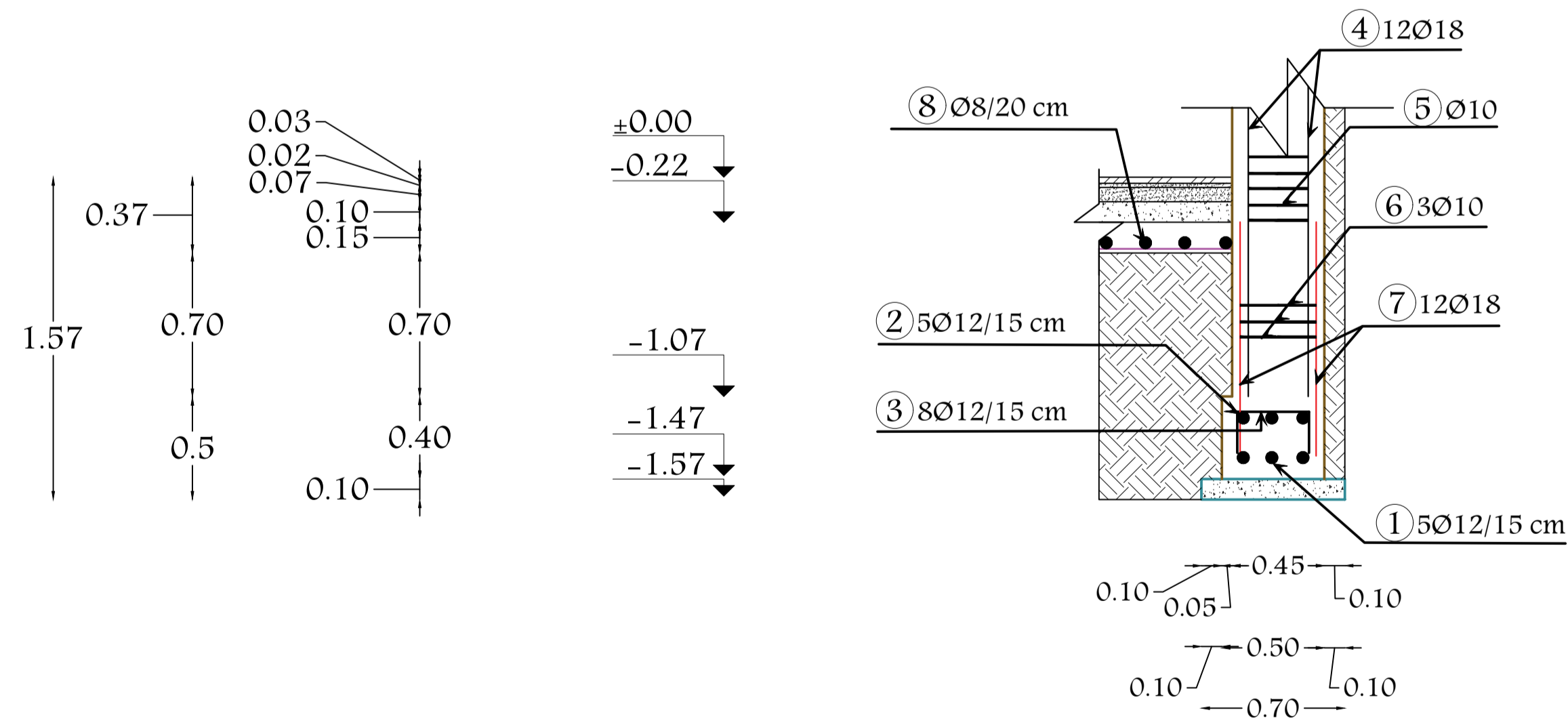
### Neighbor Footing - #3 (50\*500\*40)cm

SCALE 1:100



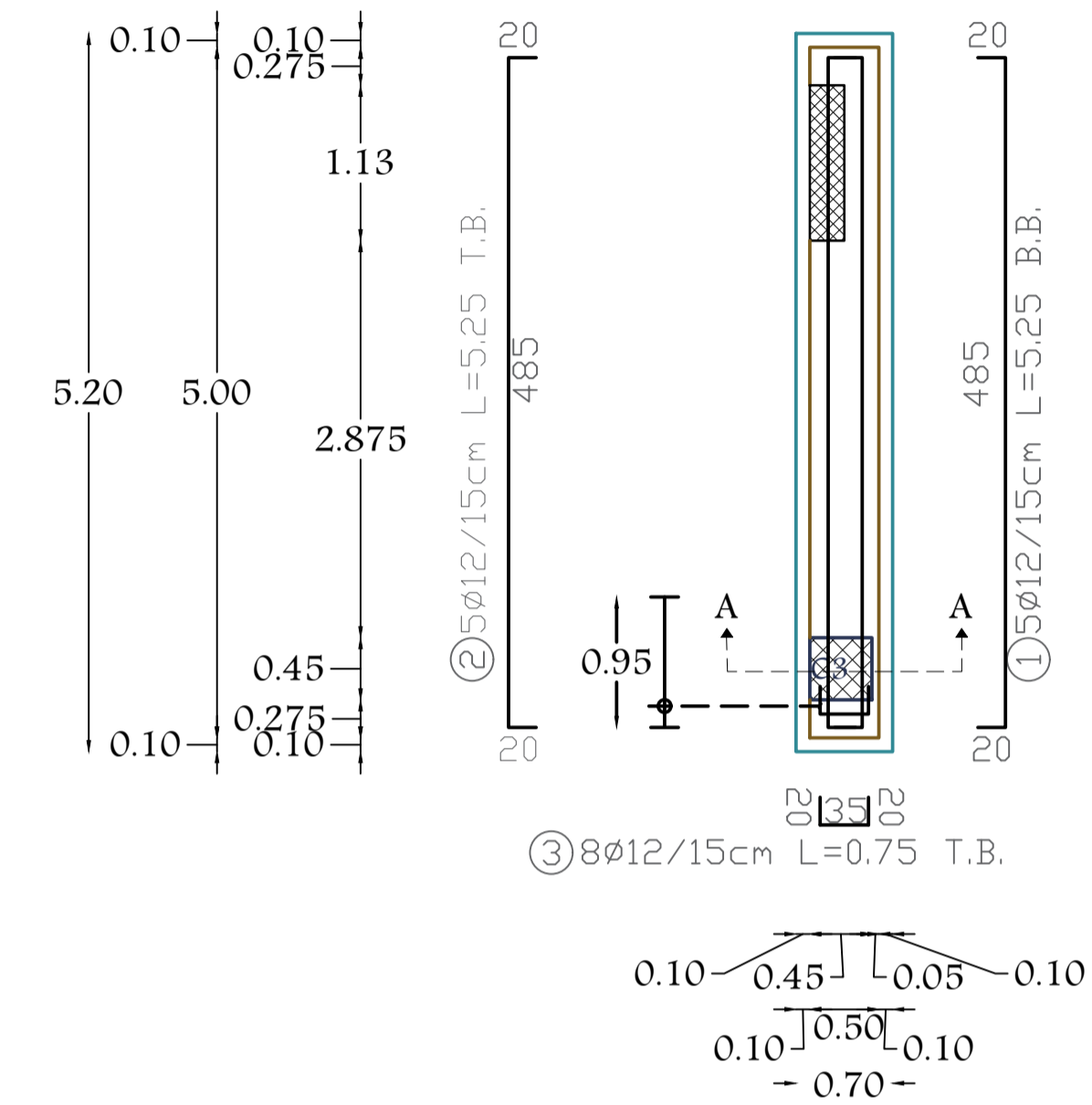
### Section A-A

SCALE 1:50



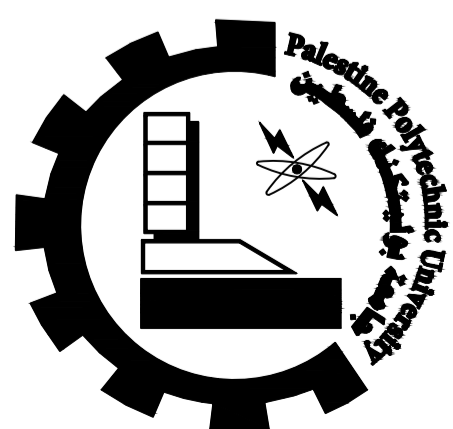
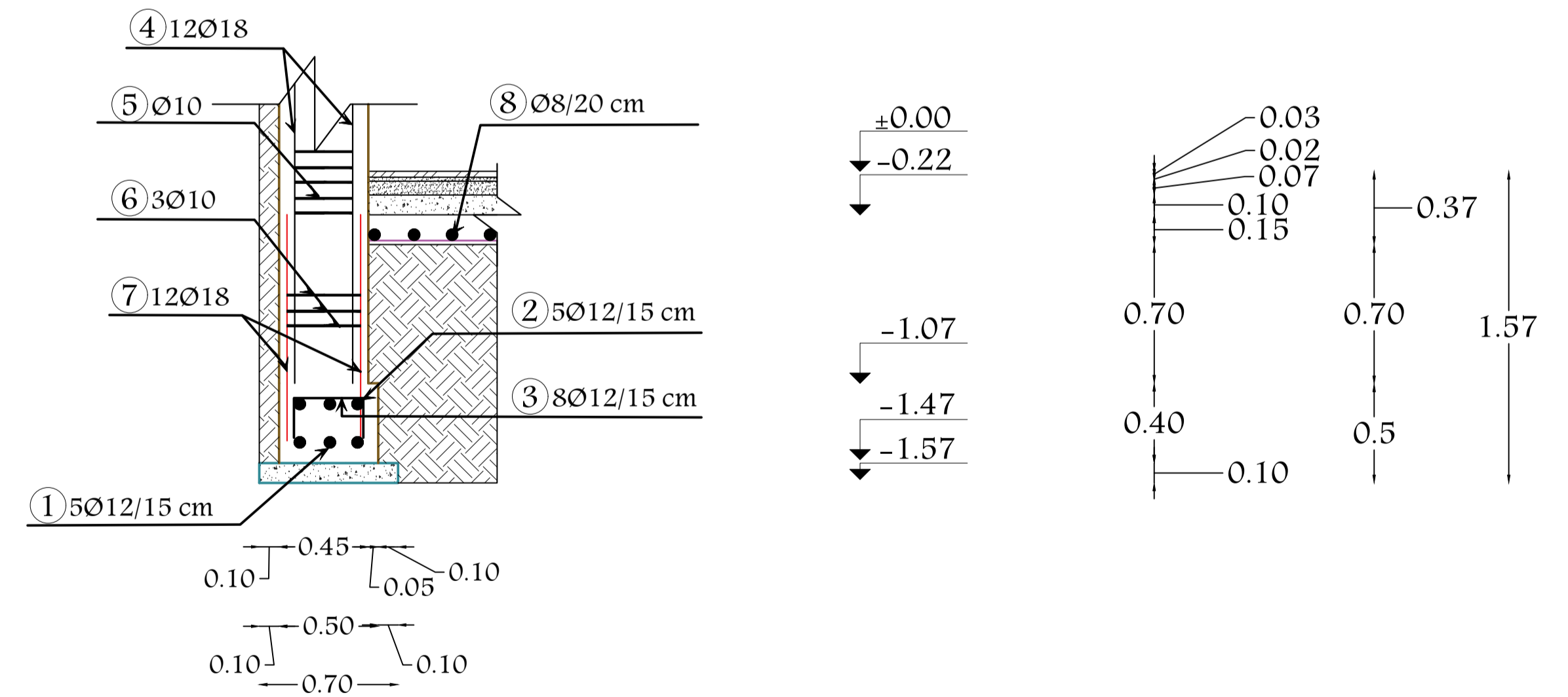
### Neighbor Footing - #4 (50\*500\*40)cm

SCALE 1:100



### Section A-A

SCALE 1:50



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Graduation Project  
Structural design of a tourist  
spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Neighbor Foundation  
Design  
Scale: 1:100  
Drawing No. S10

### Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

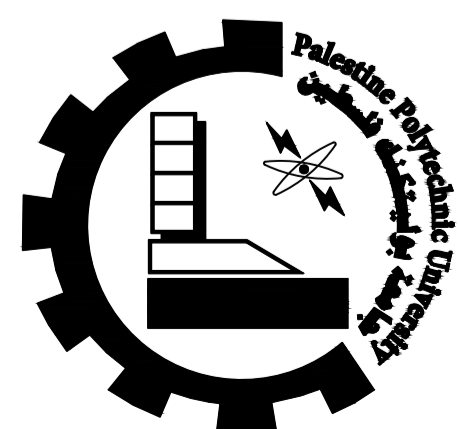
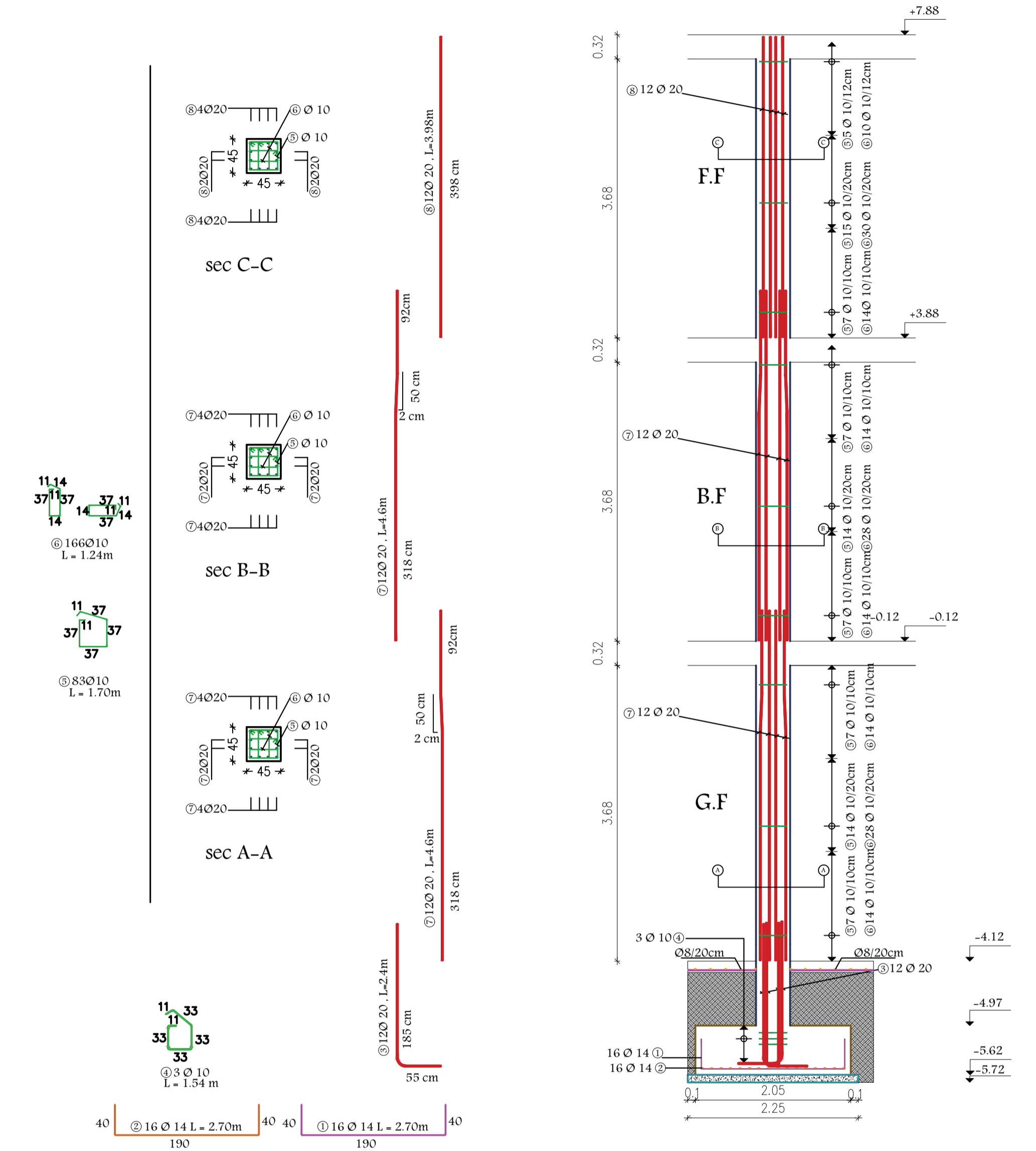
## DETAILING OF COLUMNS

SCALE 1:10

Group No.	Column No.	Column Section	Stirrups Deatailing
"C1"	BF&GF&FF A28, A29 B1, B4 C2, C3, C6		
"C2"	BF&GF&FF A1, A2, A5, A15, A18 B2, B3, B9, B14 C1, C4, C5		
"C3"	BF&GF&FF A5, A7, A8, A11, A12, A14, A15, A20, A24, A26, A27 B5, B15, B19, B20, B23, B24, B29, B30, B31, B33, B34		
"C4"	BF&GF&FF A3, A10, A13, A16, A21, A22, A23 B6, B8, B12, B16, B17, B18, B21, B22, B25, B27		
"C5"	BF&GF&FF A4, A6, A9, A17, A19 B7, B10, B11, B13, B26, B28, B32		

## SECTION OF COLUMN #A16

SCALE 1:50



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Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Columns Details

Scale: 1:50  
Drawing No. S11

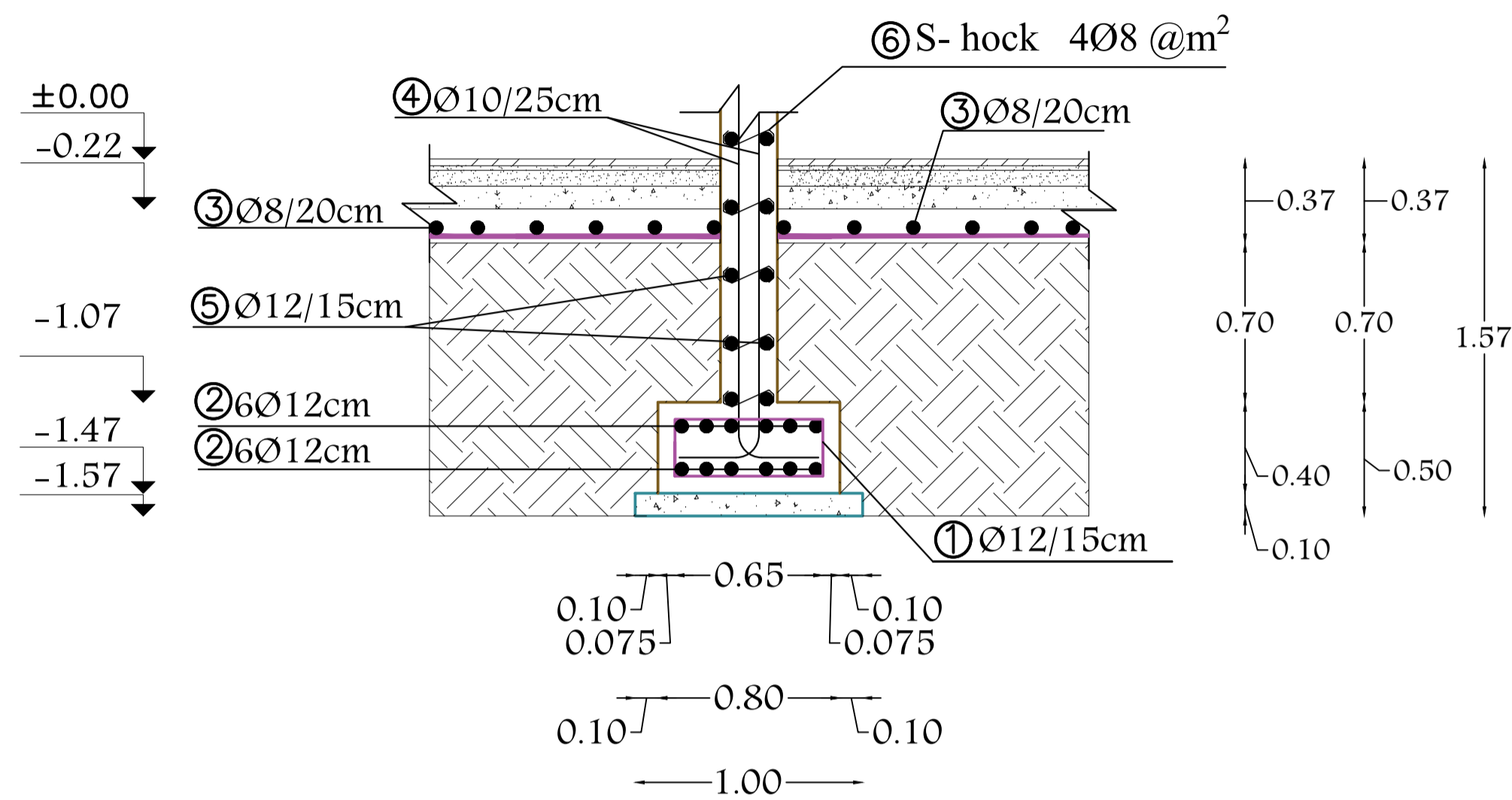
Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

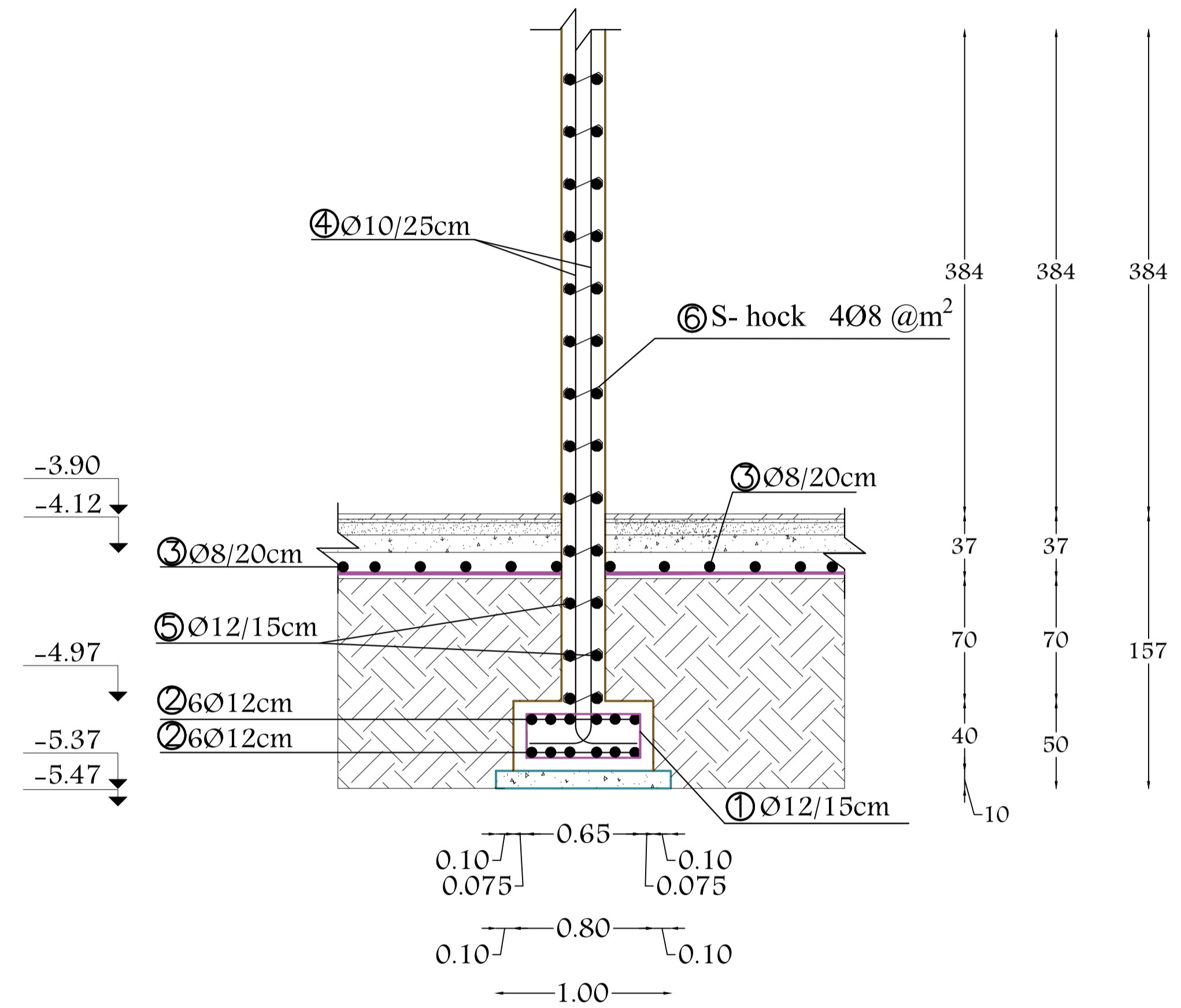
Strip Footing - #1 Section 5-5

SCALE 1:25



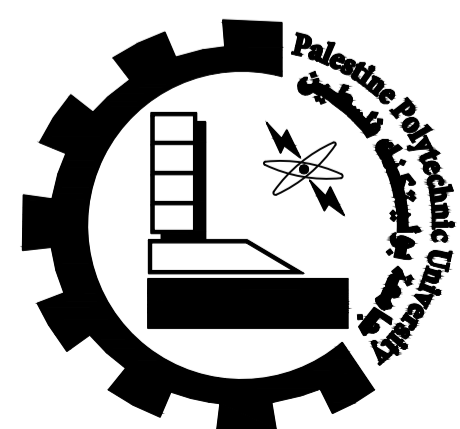
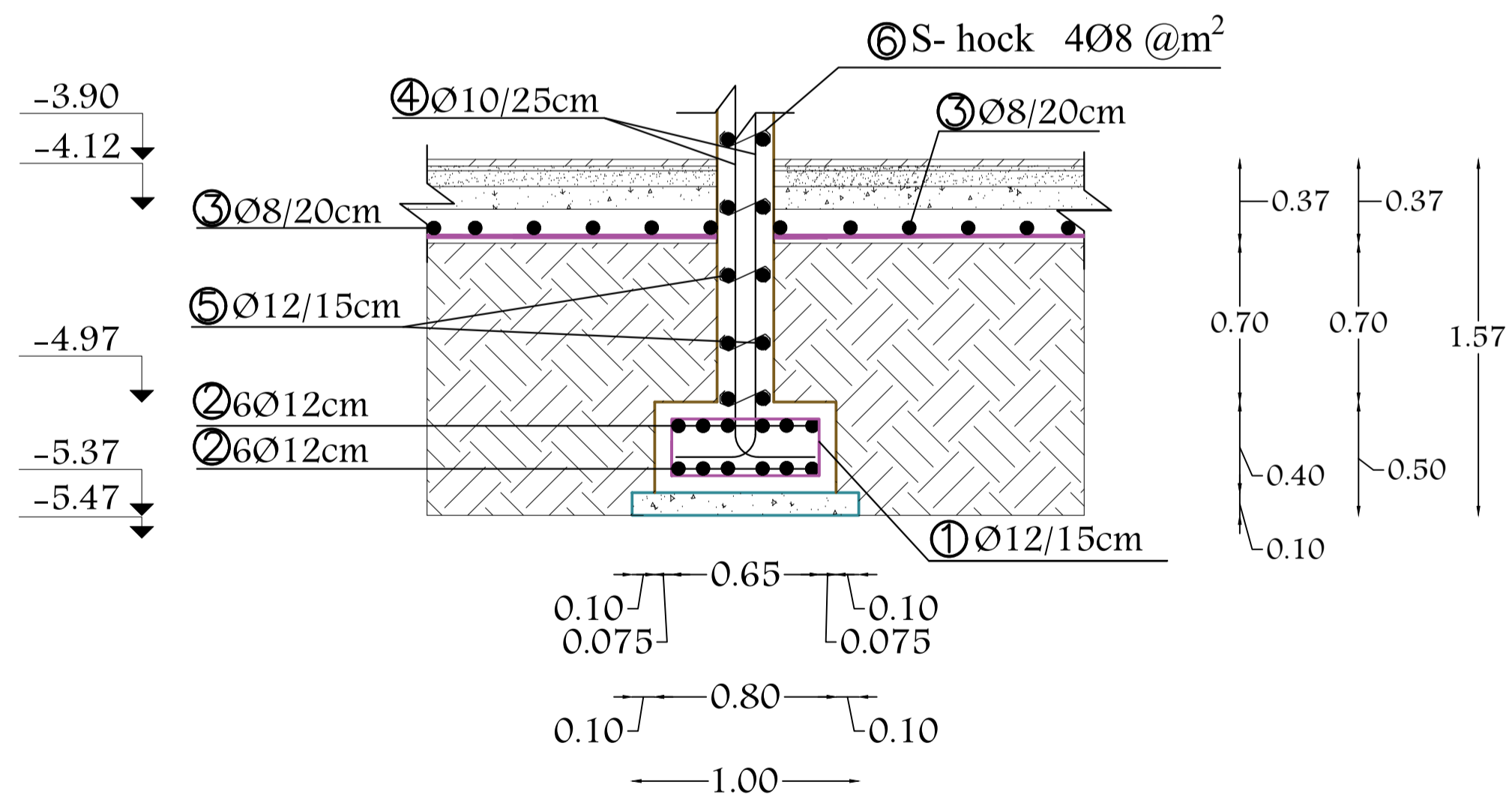
Basement Wall-Footing Section

SCALE 1:25



Strip Footing - #1 Section 5-5

SCALE 1:25



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Structural design of a tourist  
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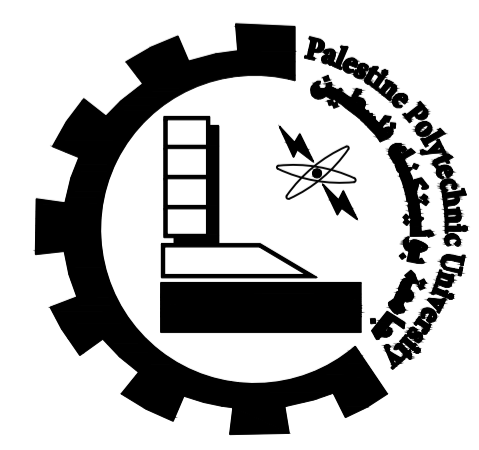
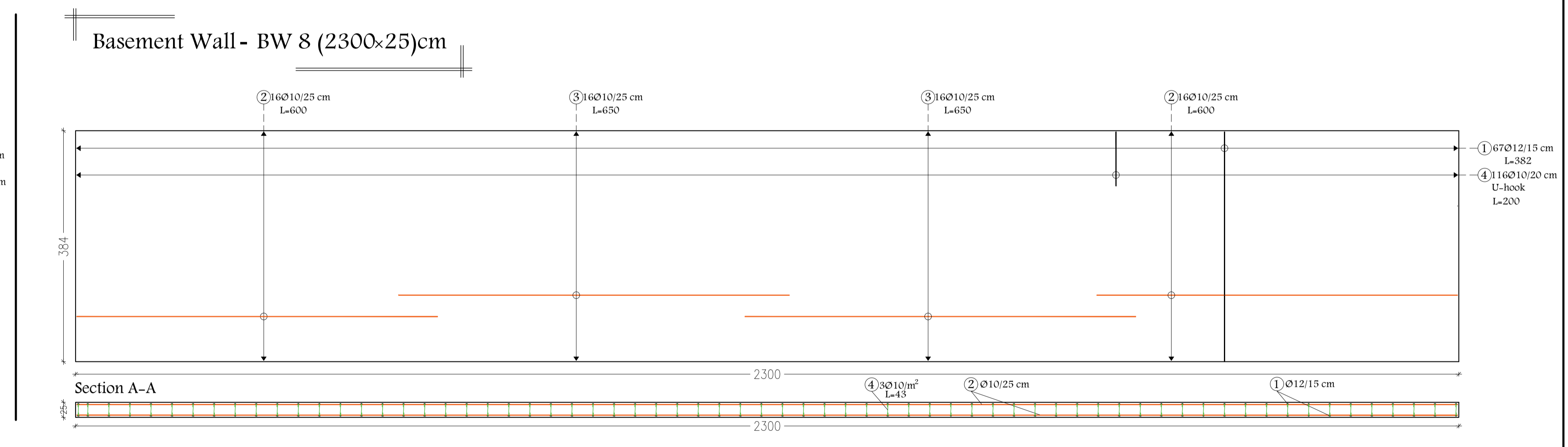
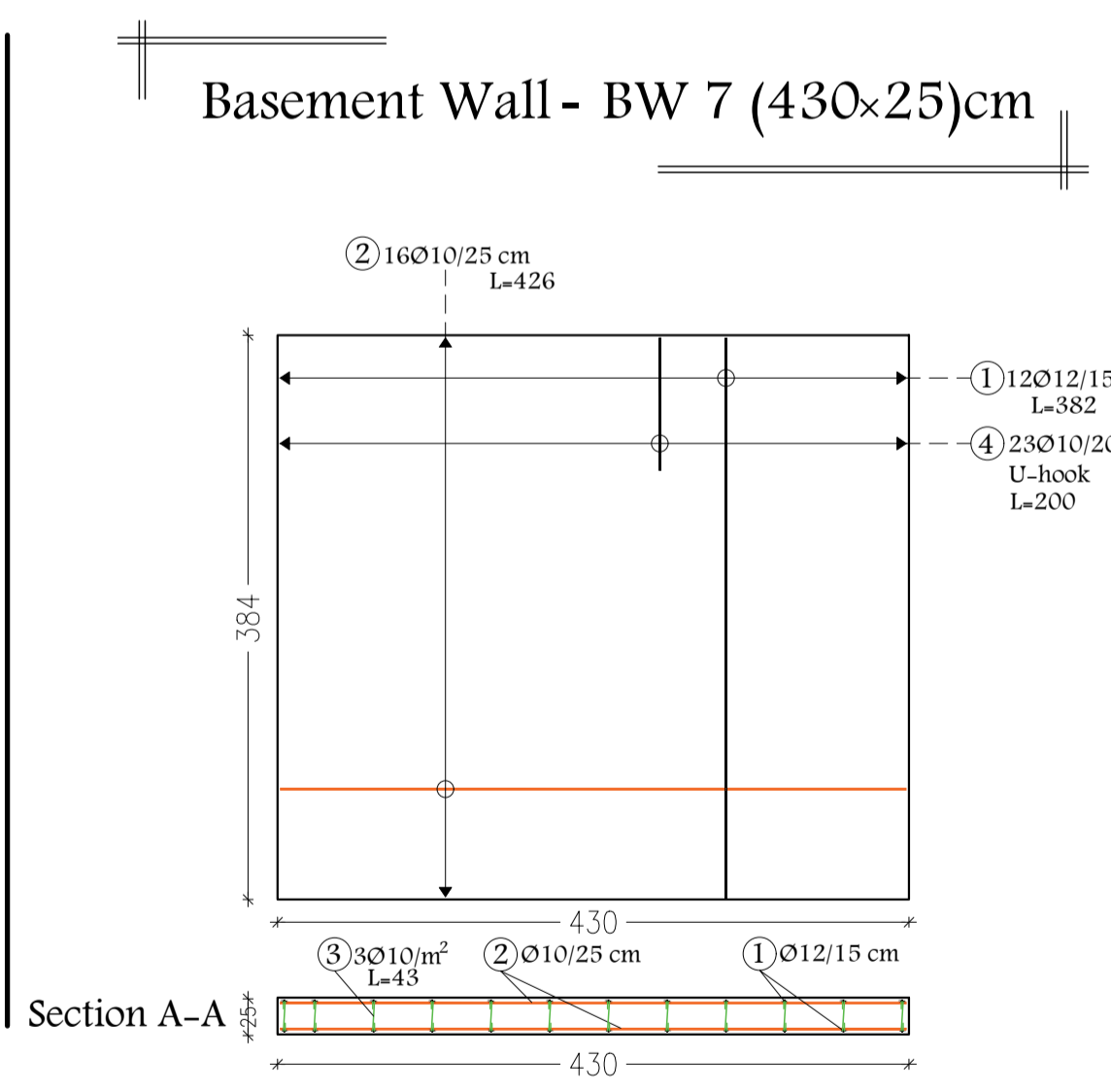
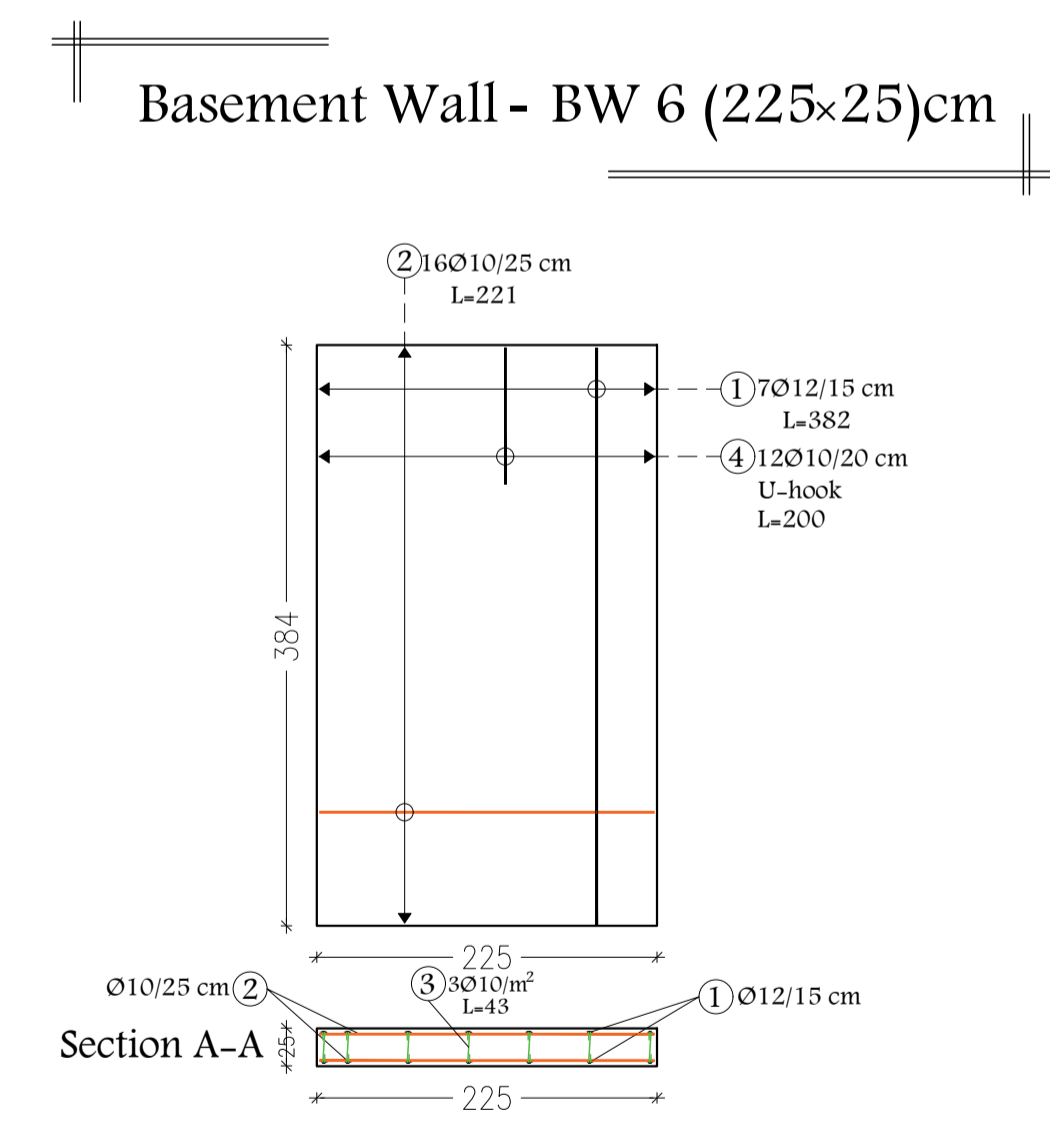
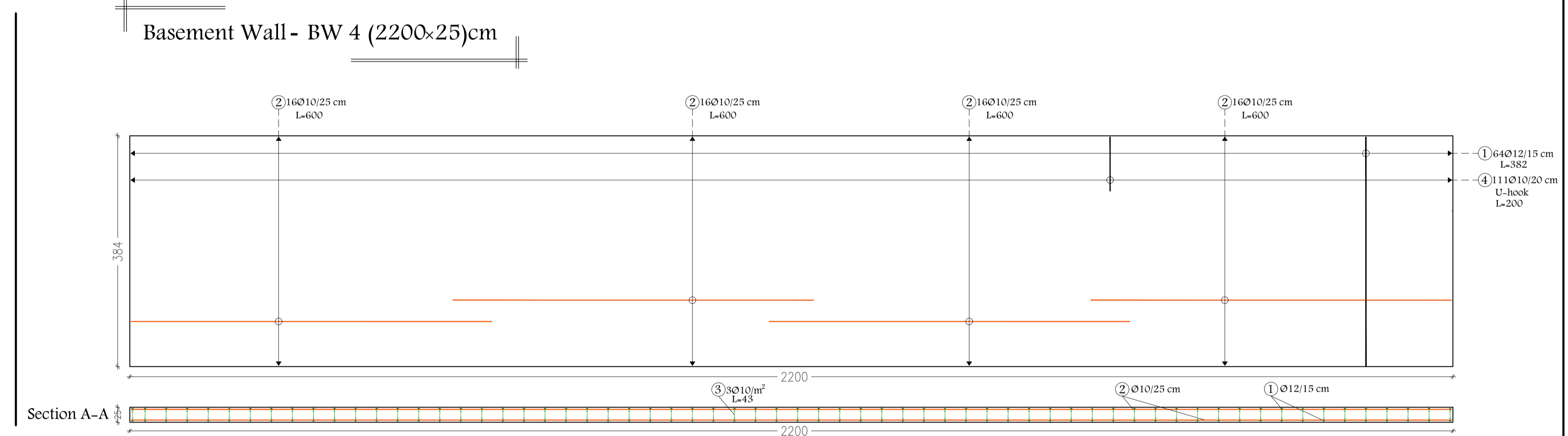
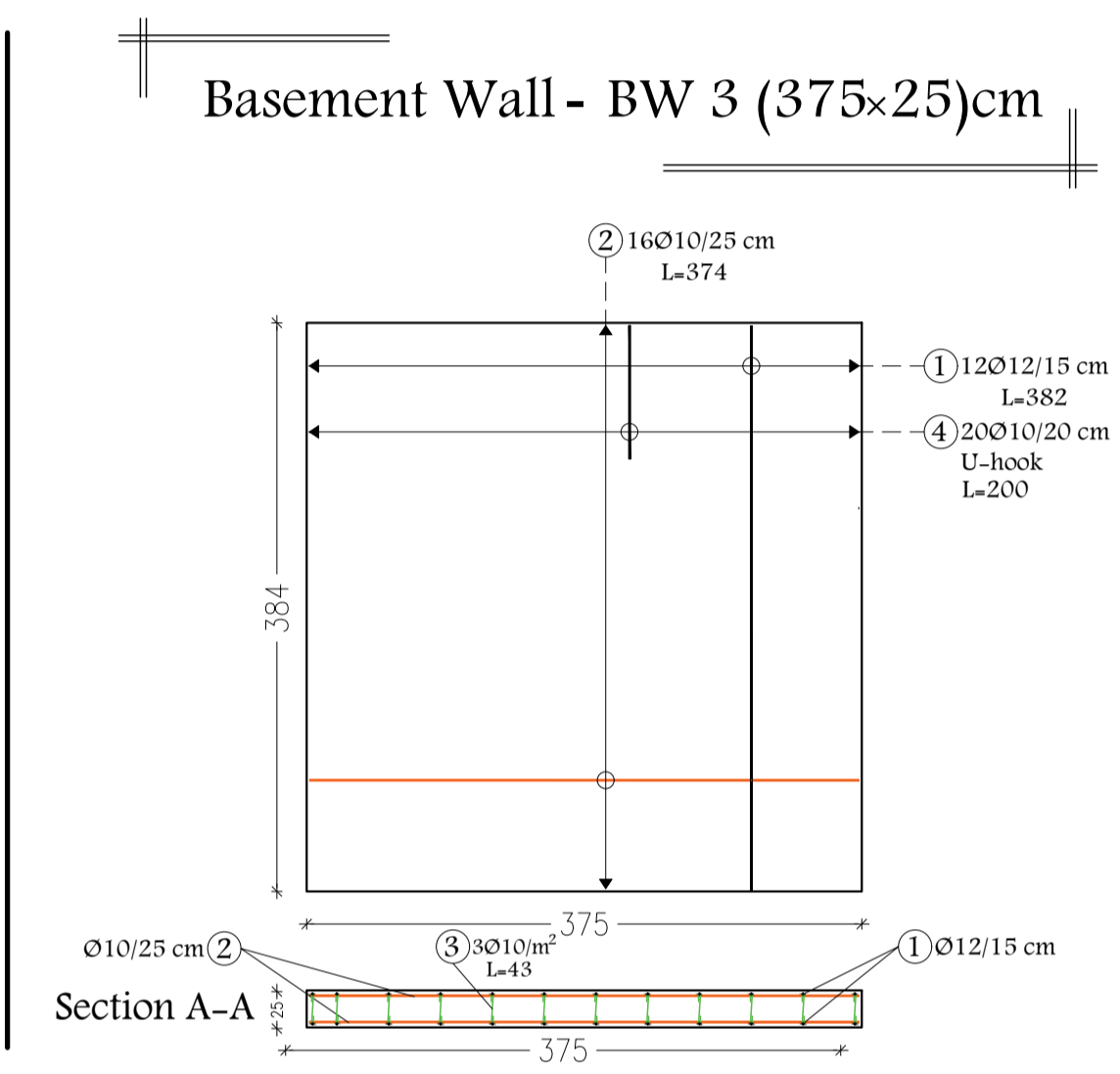
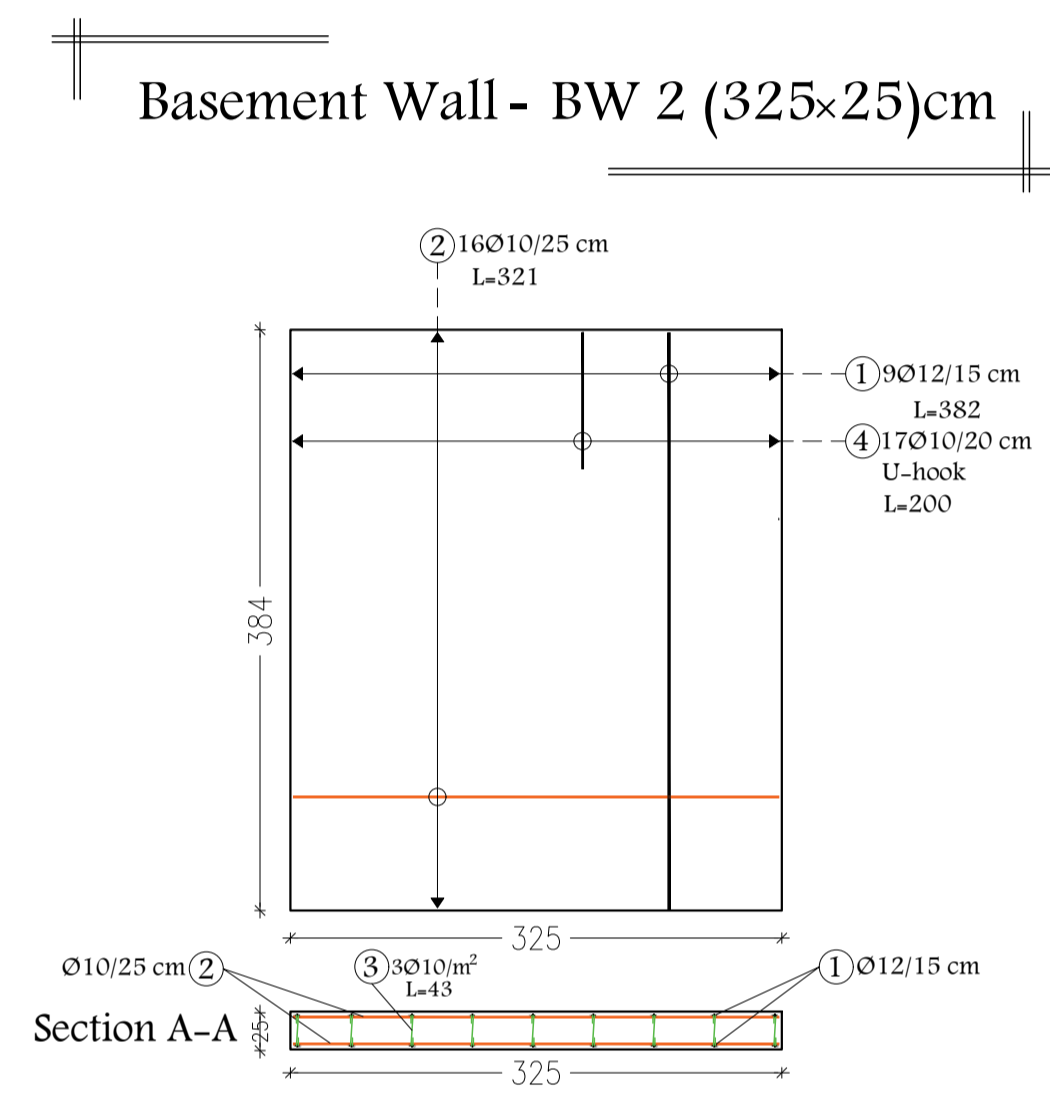
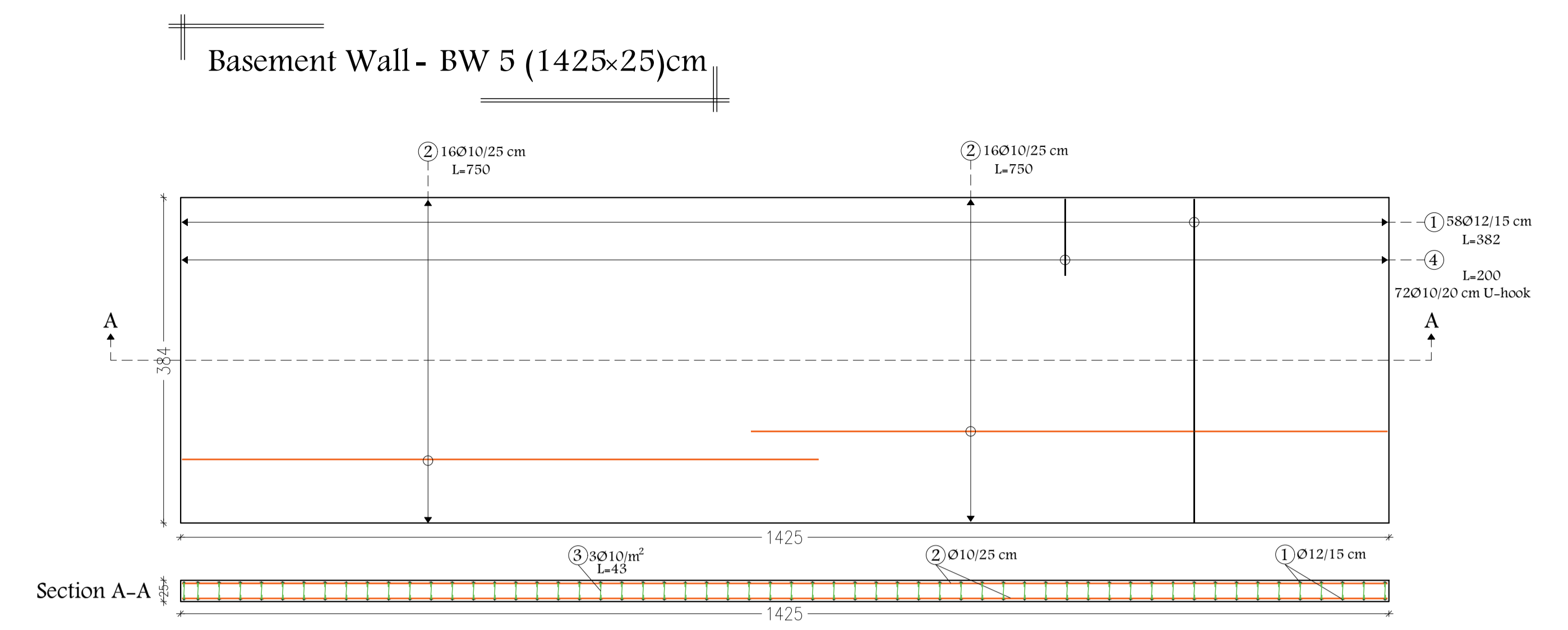
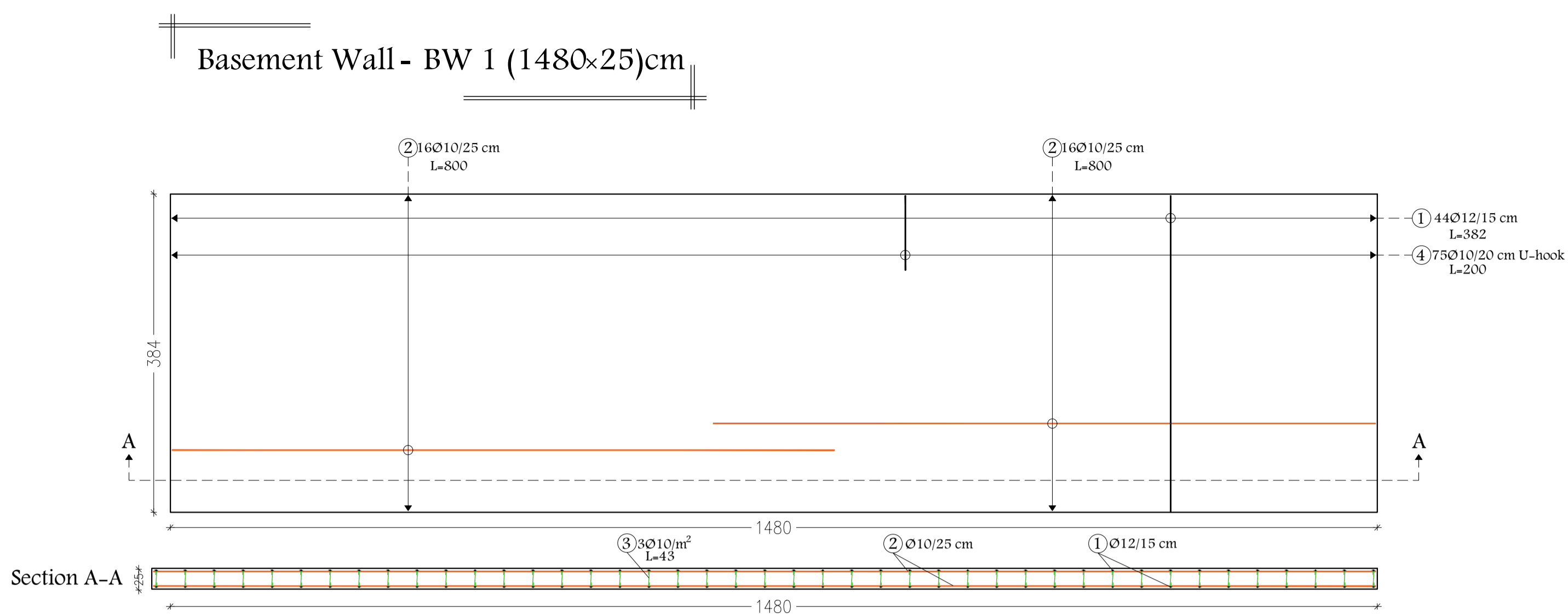
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Strip Foundation  
Details  
  
Scale: 1:100  
Drawing No. S12

Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022



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Graduation Project  
Structural design of a tourist spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

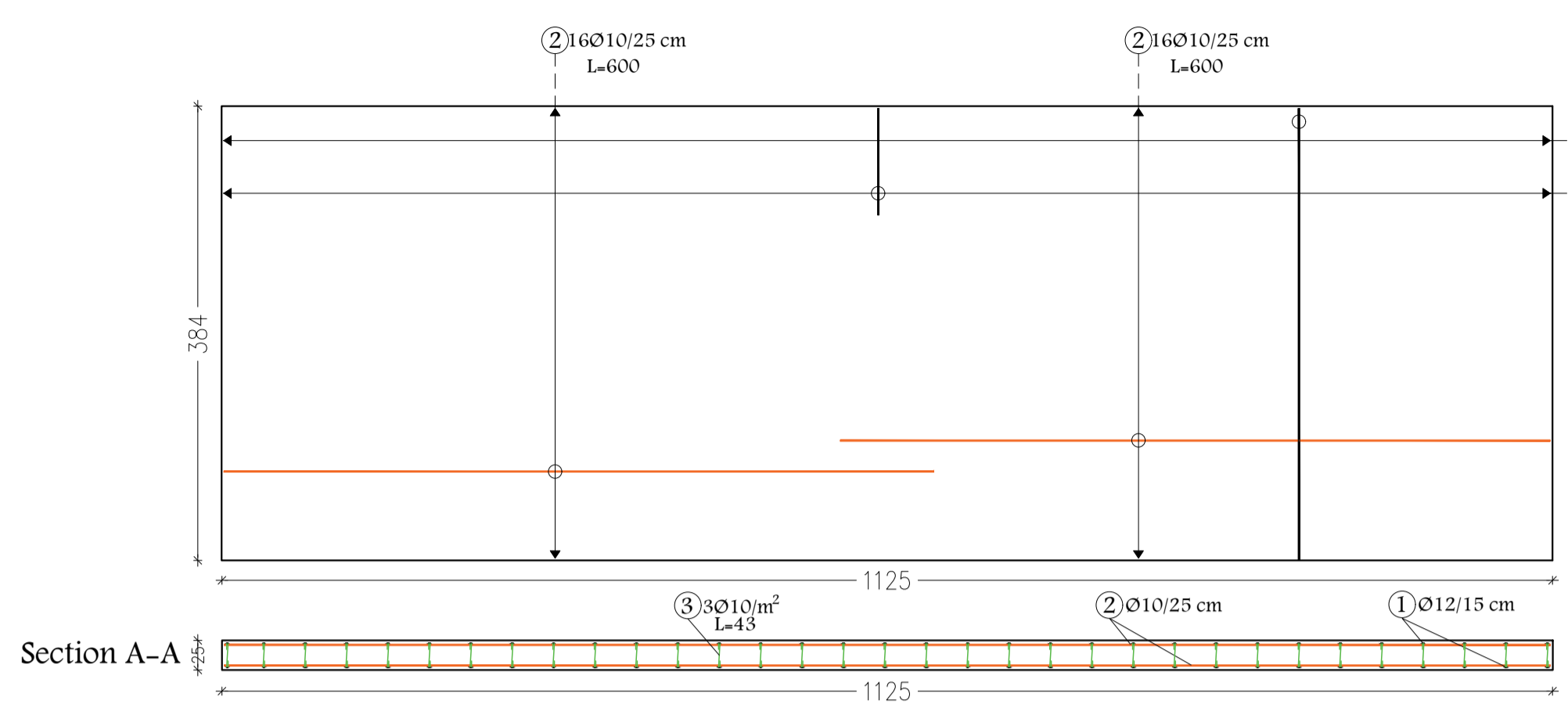
Drawing Title:  
Basement Walls Details  
Scale: 1:50  
Drawing No. S13

Hatching Key

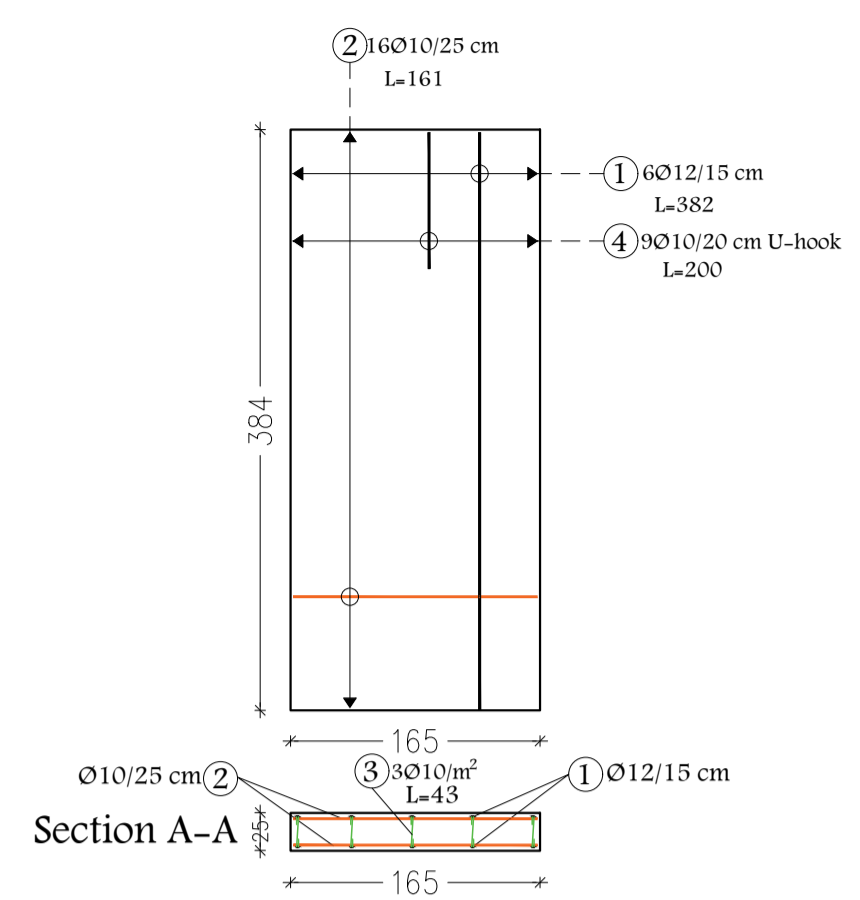
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

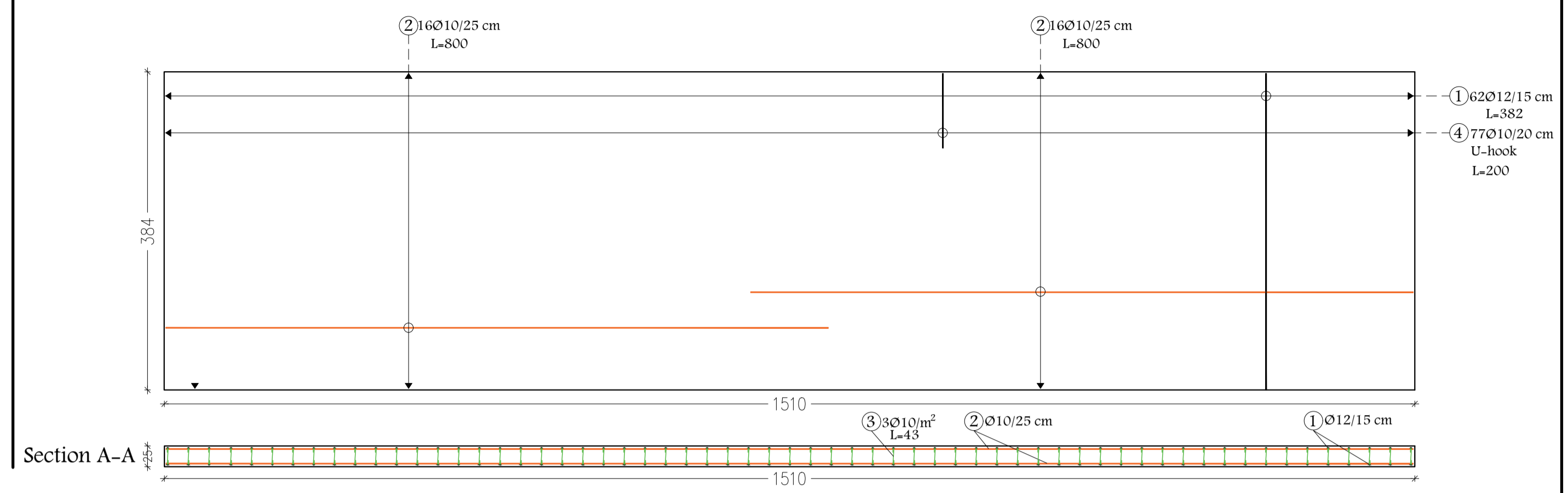
Basement Wall - BW 9 (1125×25)cm



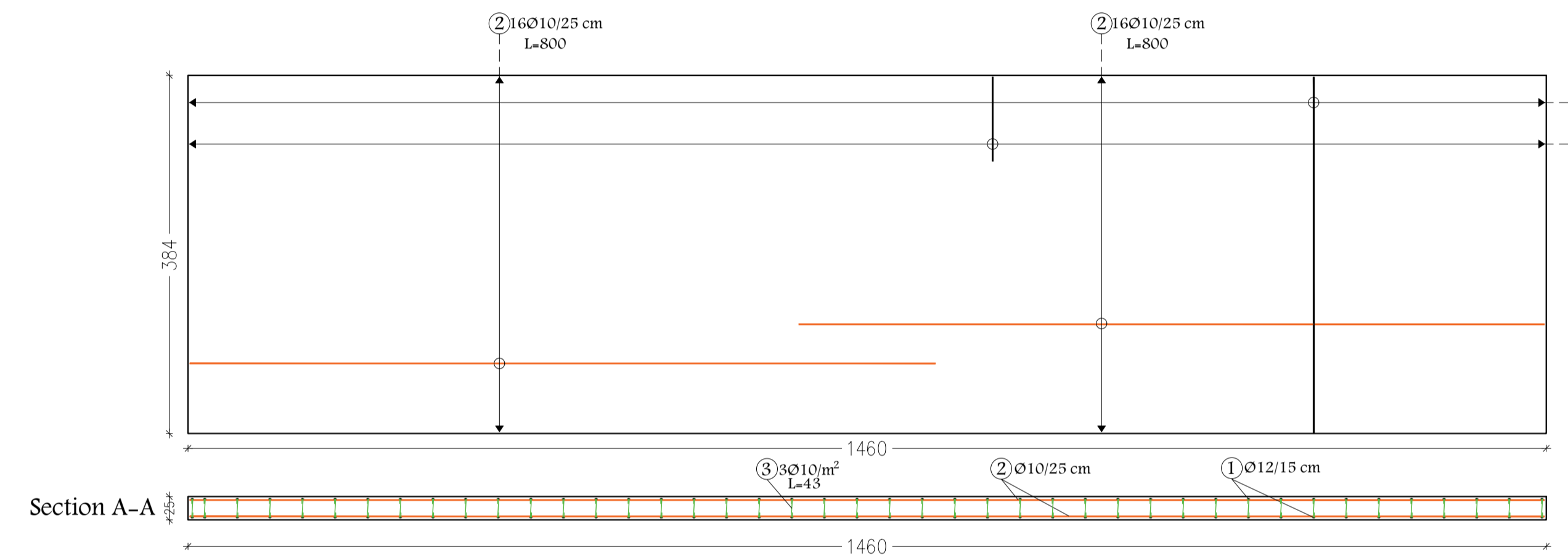
Basement Wall - BW 10 (165×25)cm



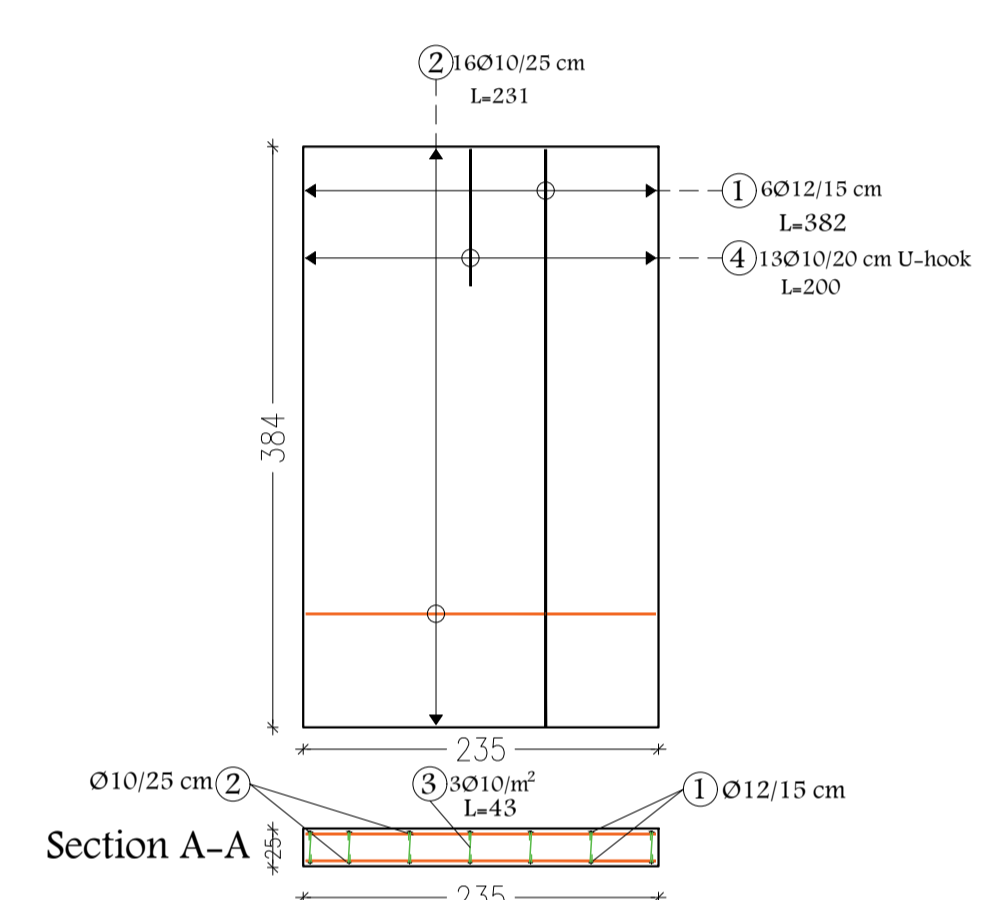
Basement Wall - BW 11 (1510×25)cm



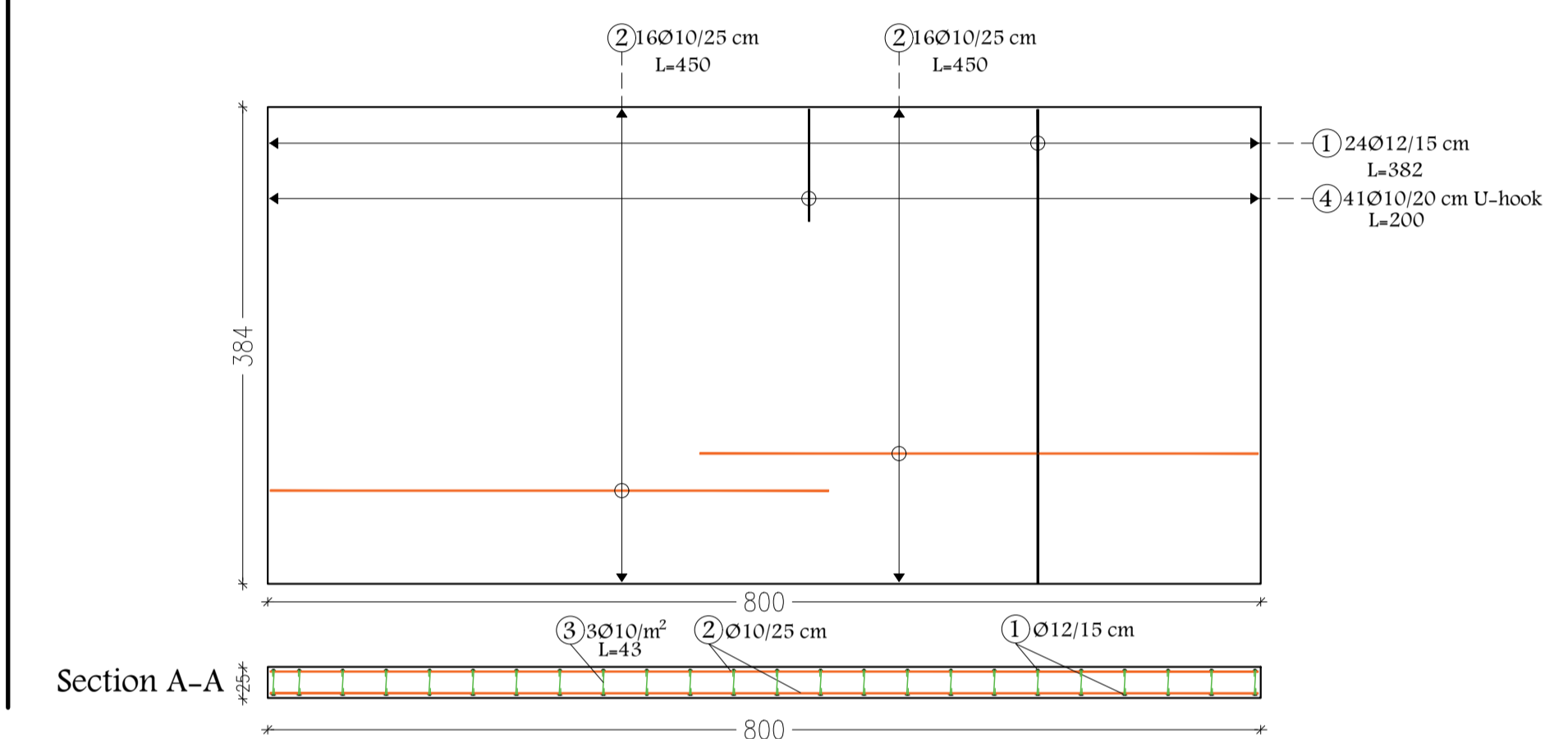
Basement Wall - BW 12 (1460×25)cm



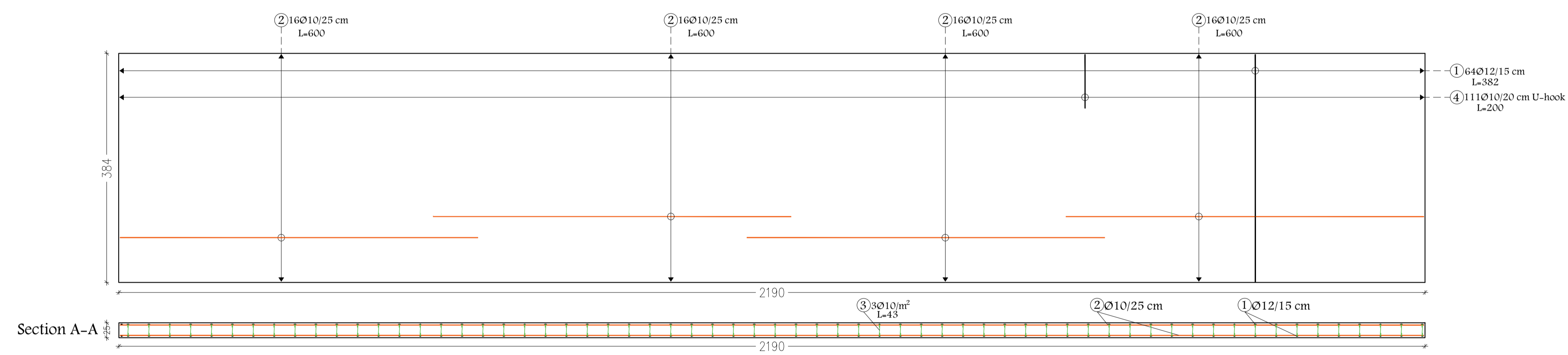
Basement Wall - BW 13 (235×25)cm



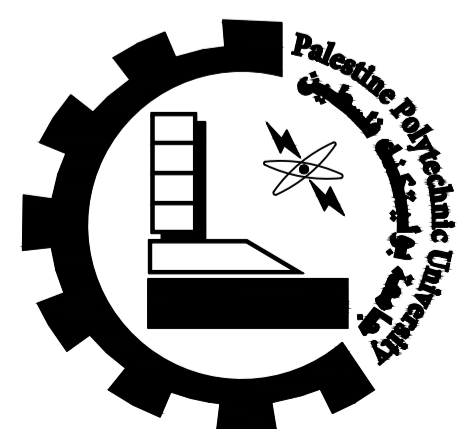
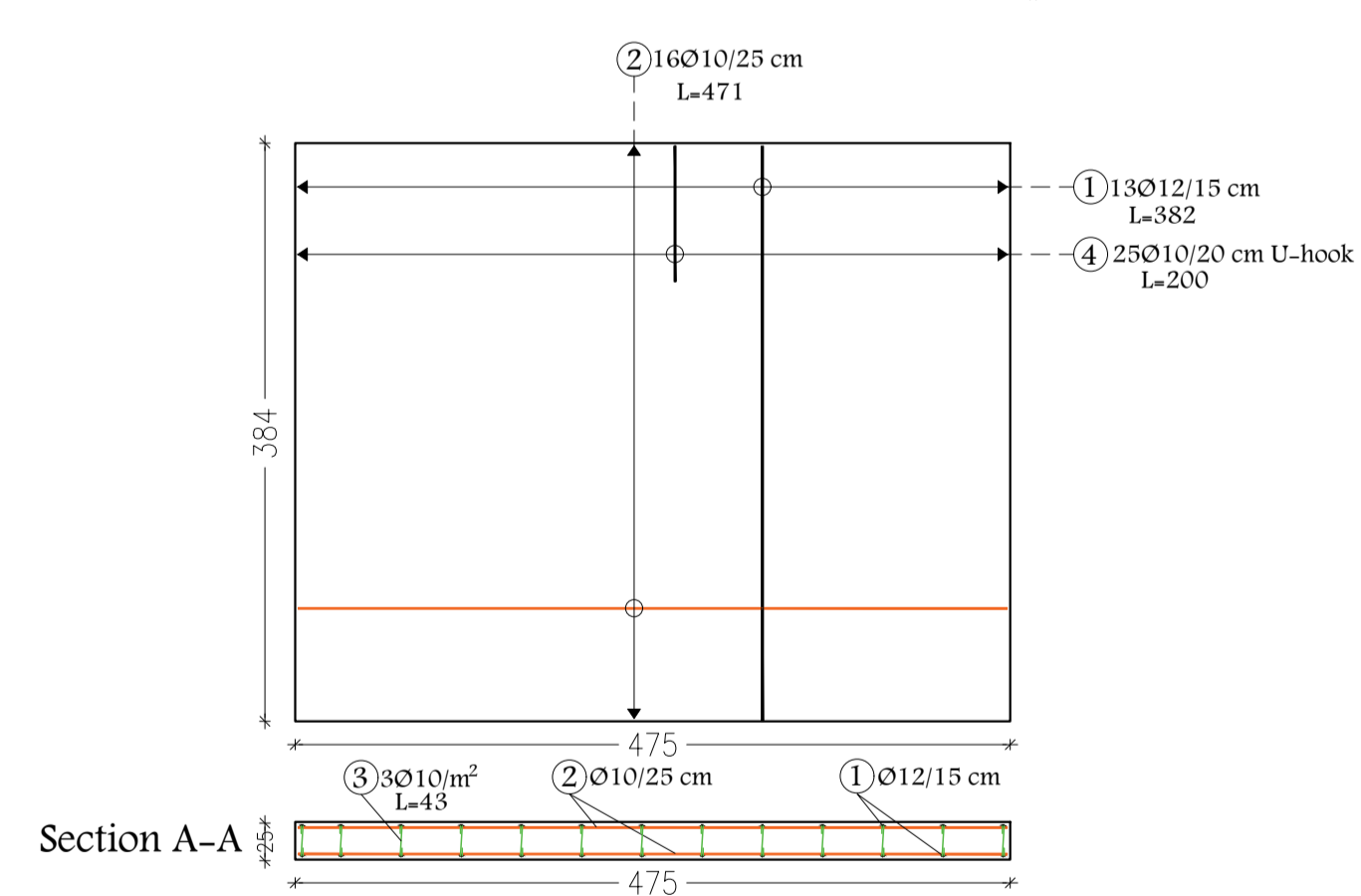
Basement Wall - BW 14 (800×25)cm



Basement Wall - BW 15 (2190×25)cm



Basement Wall - BW 16 (475×25)cm



Palestine Polytechnic University  
College of Engineering  
Civil Engineering Department  
Building Engineering



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Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

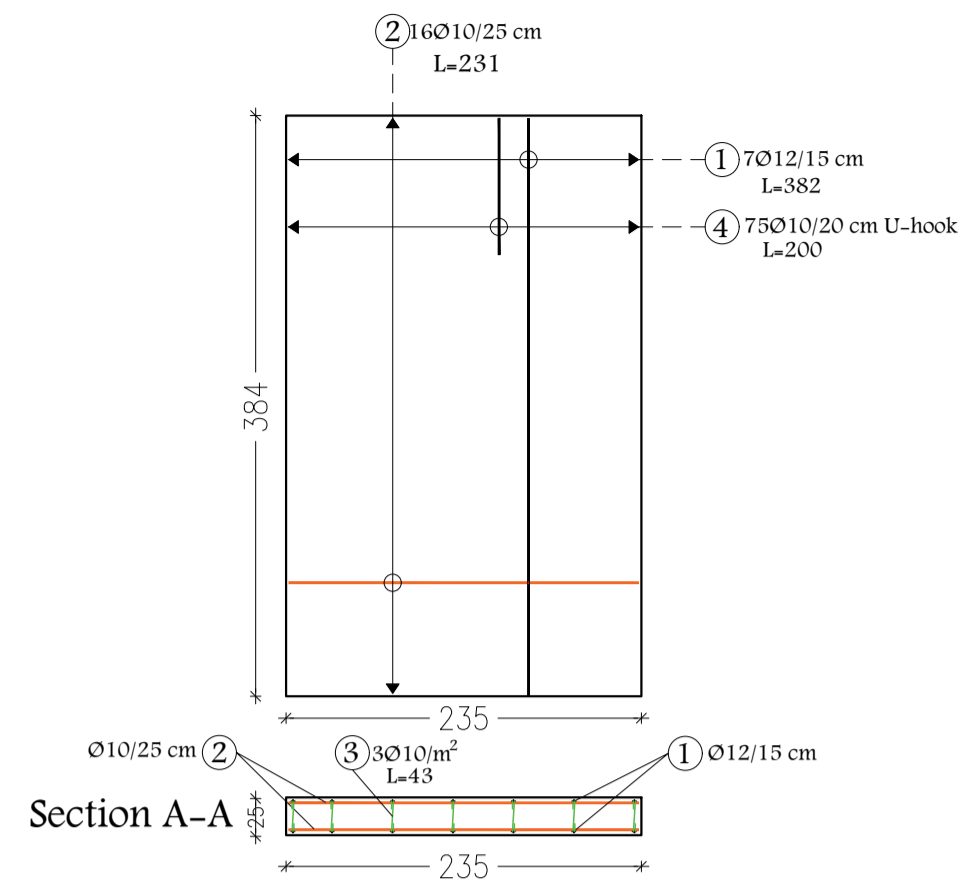
Drawing Title:  
Basement Walls Details  
Scale: 1:50  
Drawing No. S14

Hatching Key

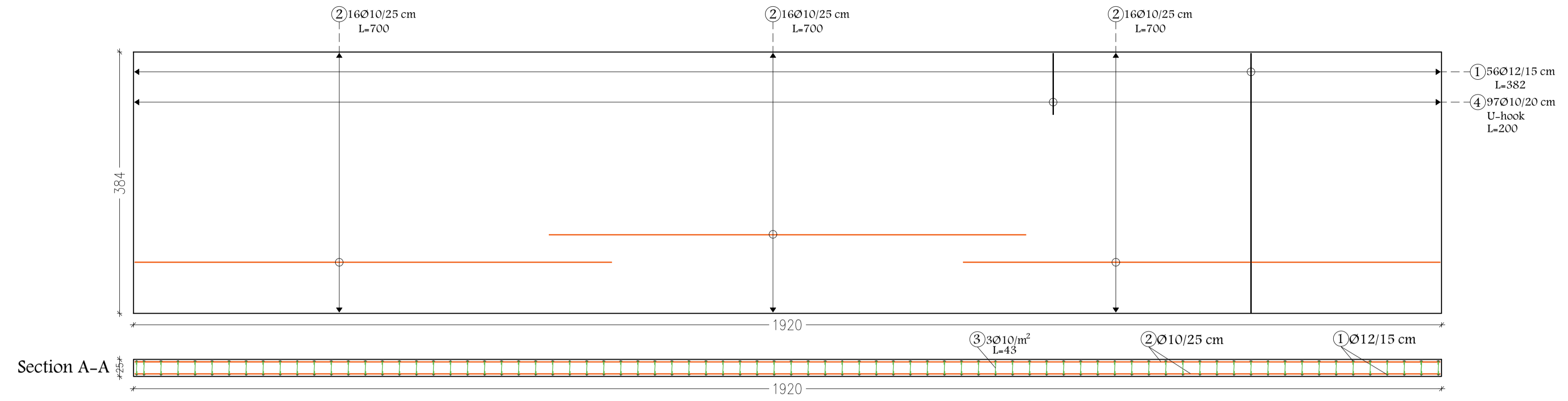
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

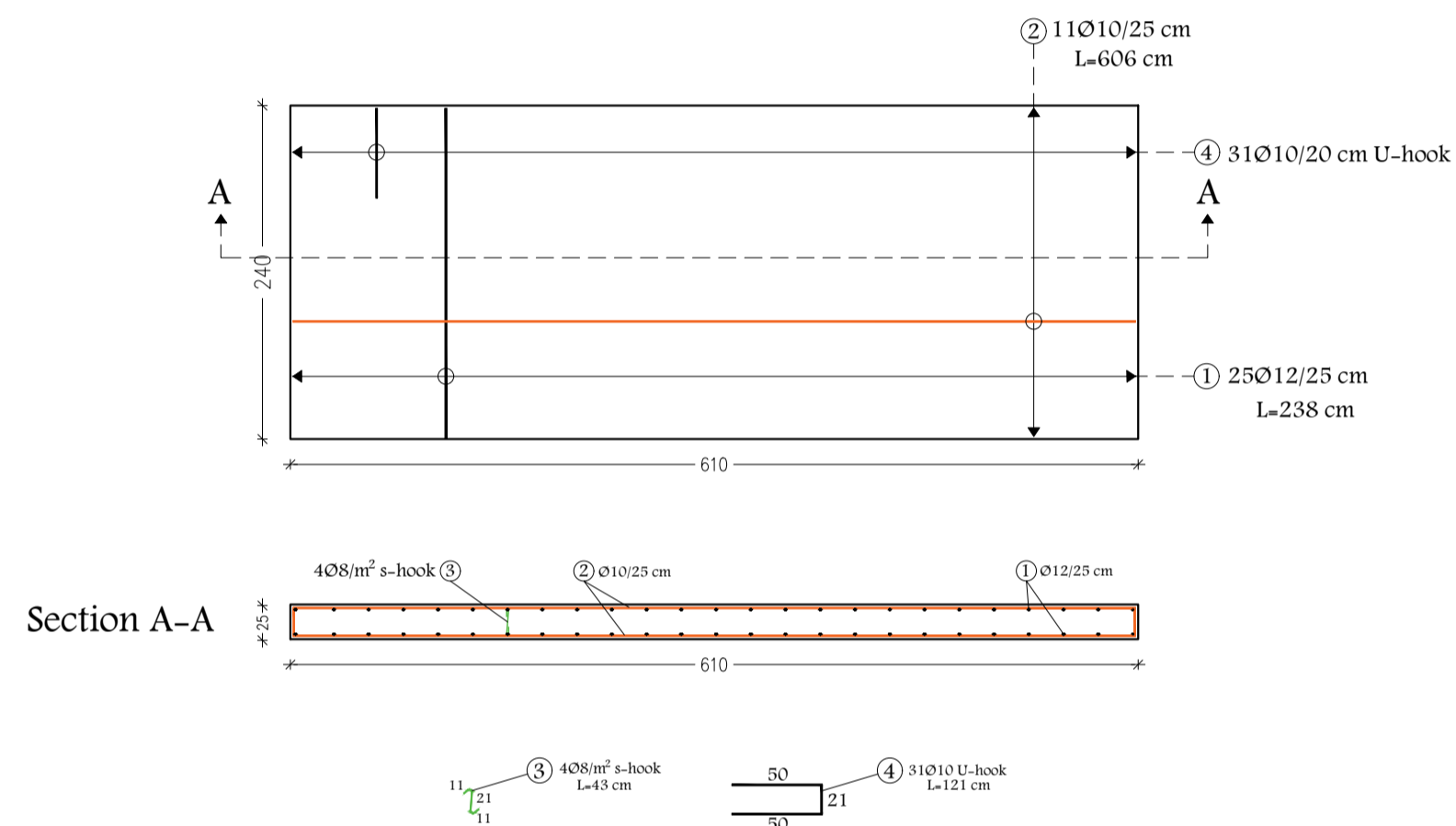
Basement Wall - BW 17 (235x25)cm



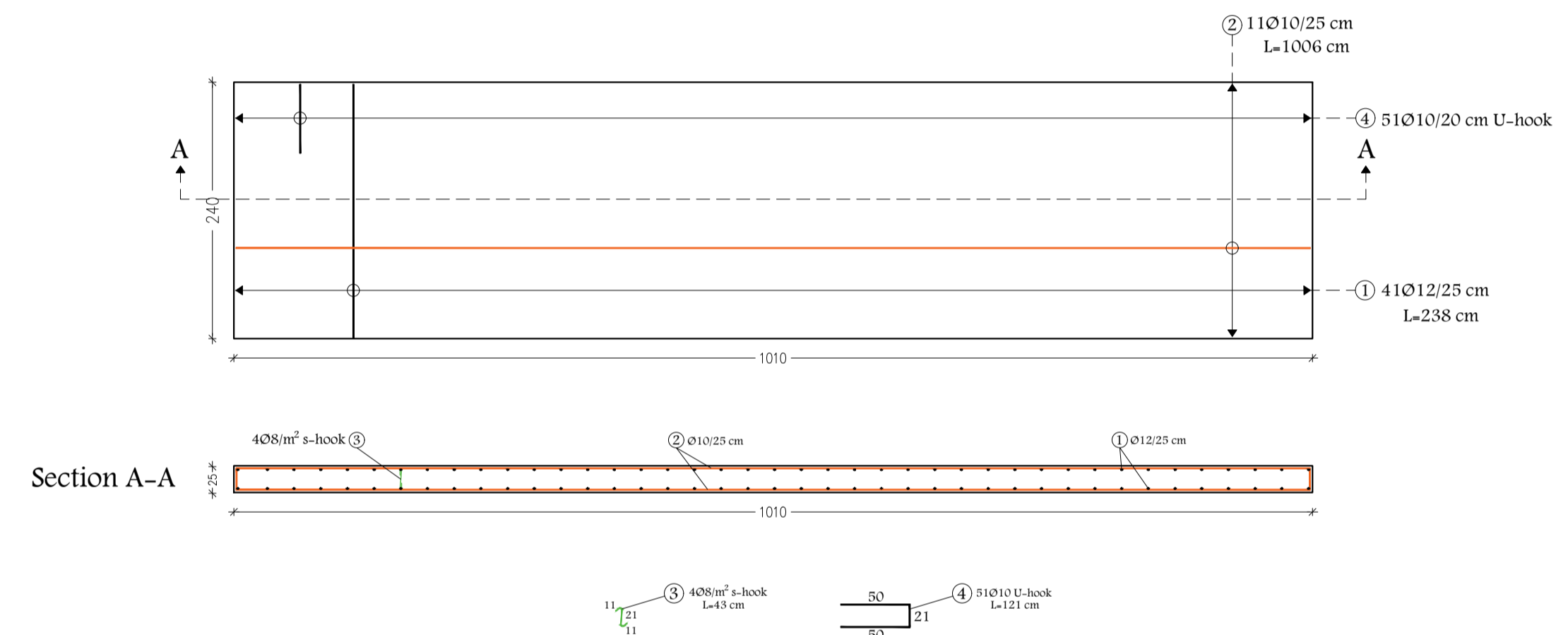
Basement Wall - BW 18 (1920x25)cm



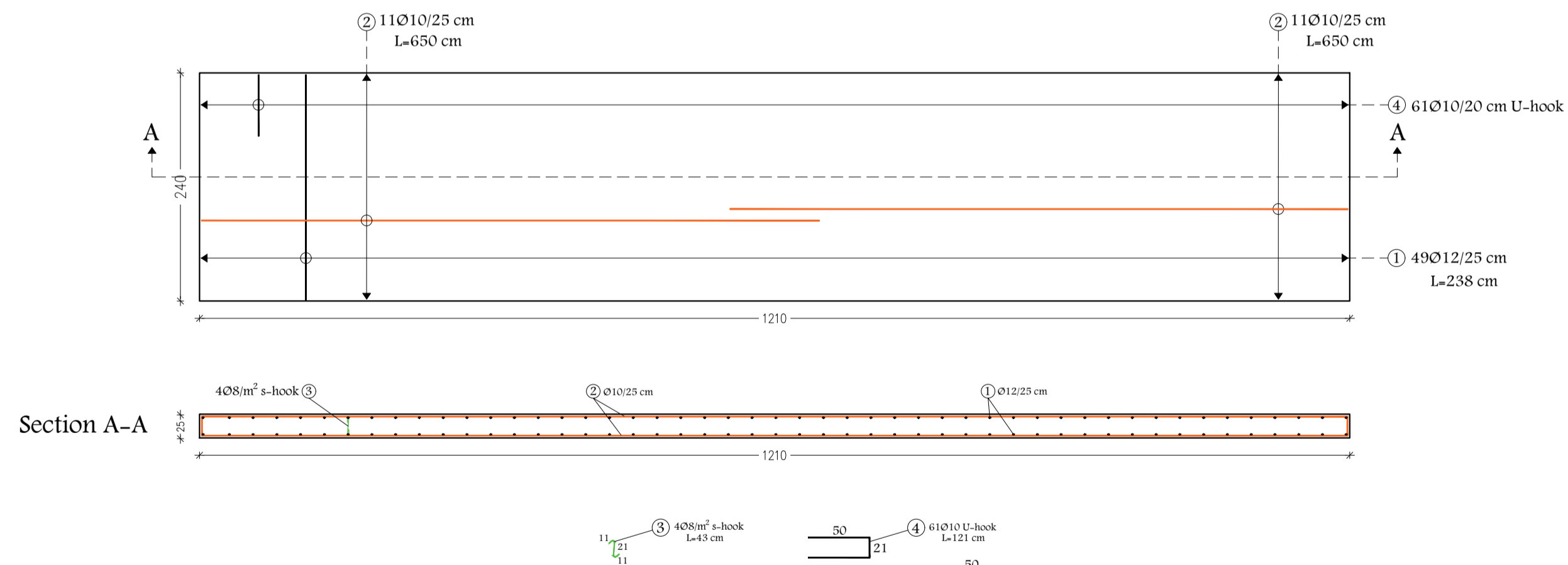
Pool Wall - PW 1 (610x25)cm



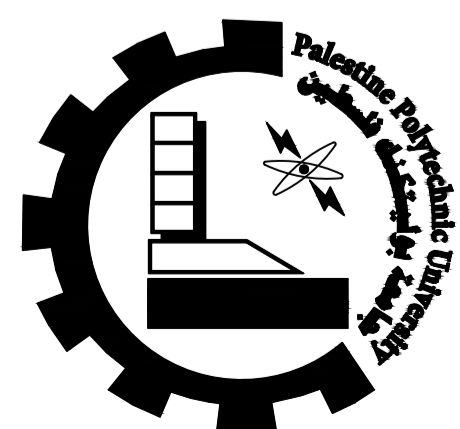
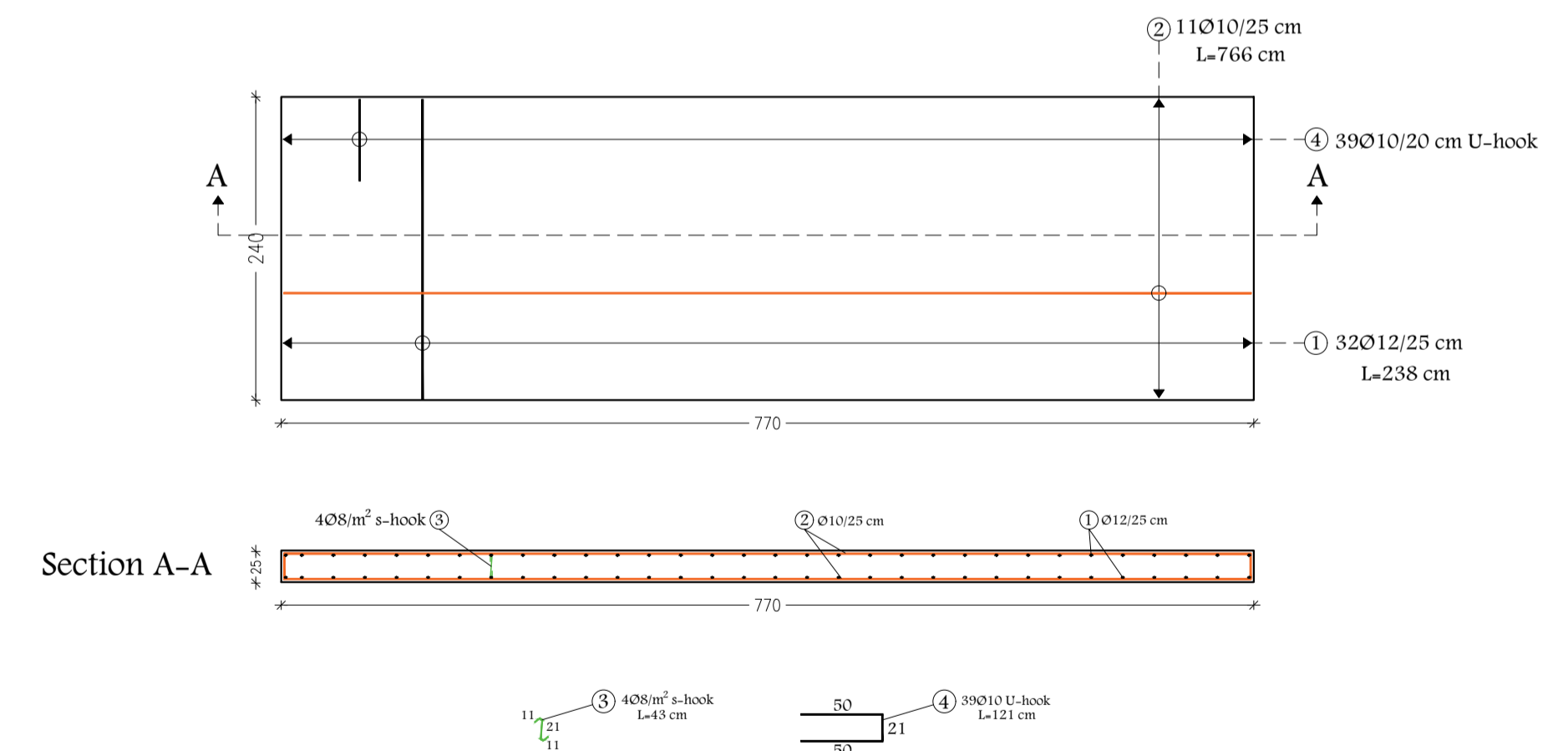
Pool Wall - PW 2 (1010x25)cm



Pool Wall - PW 3 (1210x25)cm



Pool Wall - PW 4 (770x25)cm



Palestine Polytechnic University  
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Civil Engineering Department  
Building Engineering



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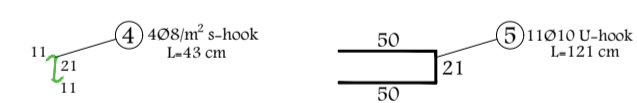
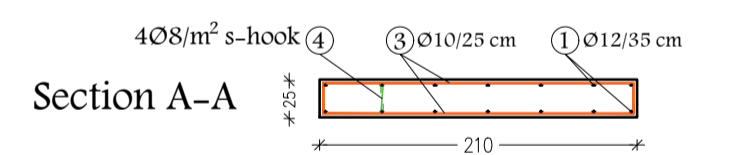
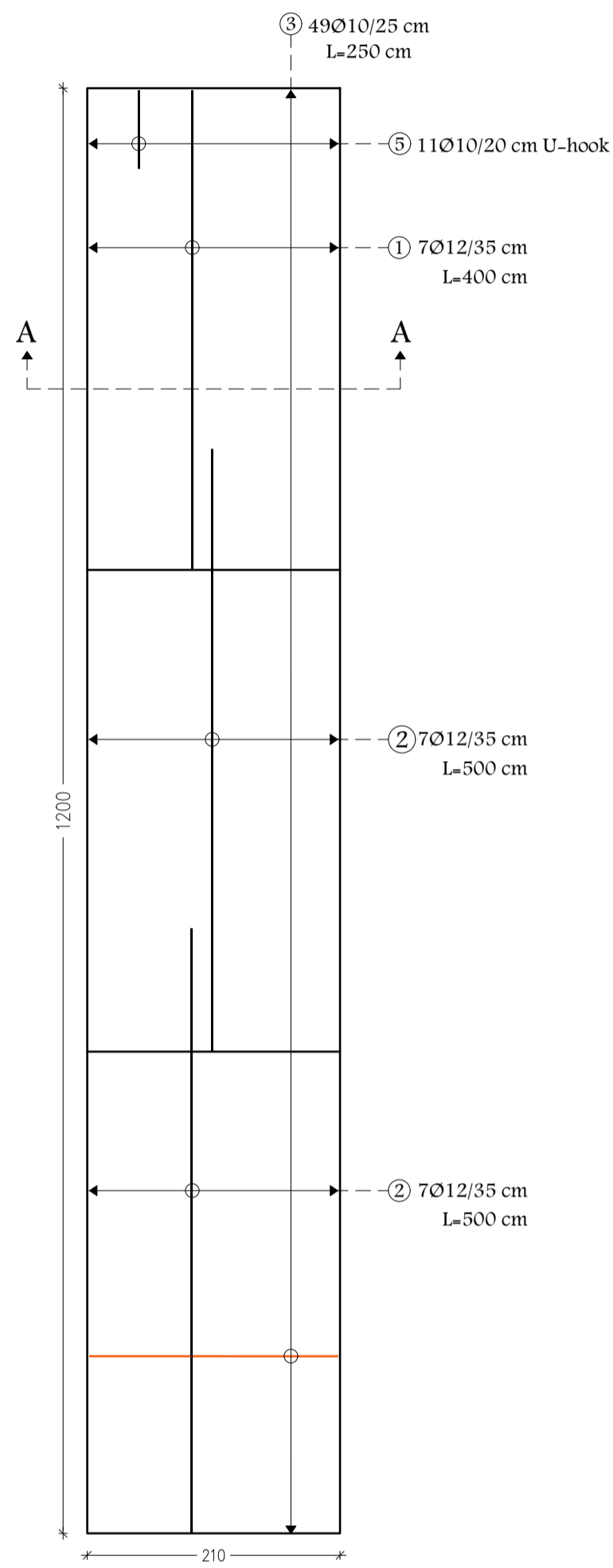
Drawing Title:  
Basement Walls Details & Pool Walls Details  
Scale: 1:50  
Drawing No. S15

Hatching Key

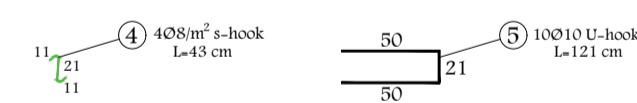
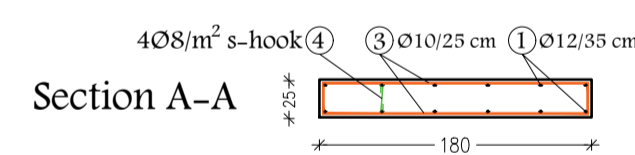
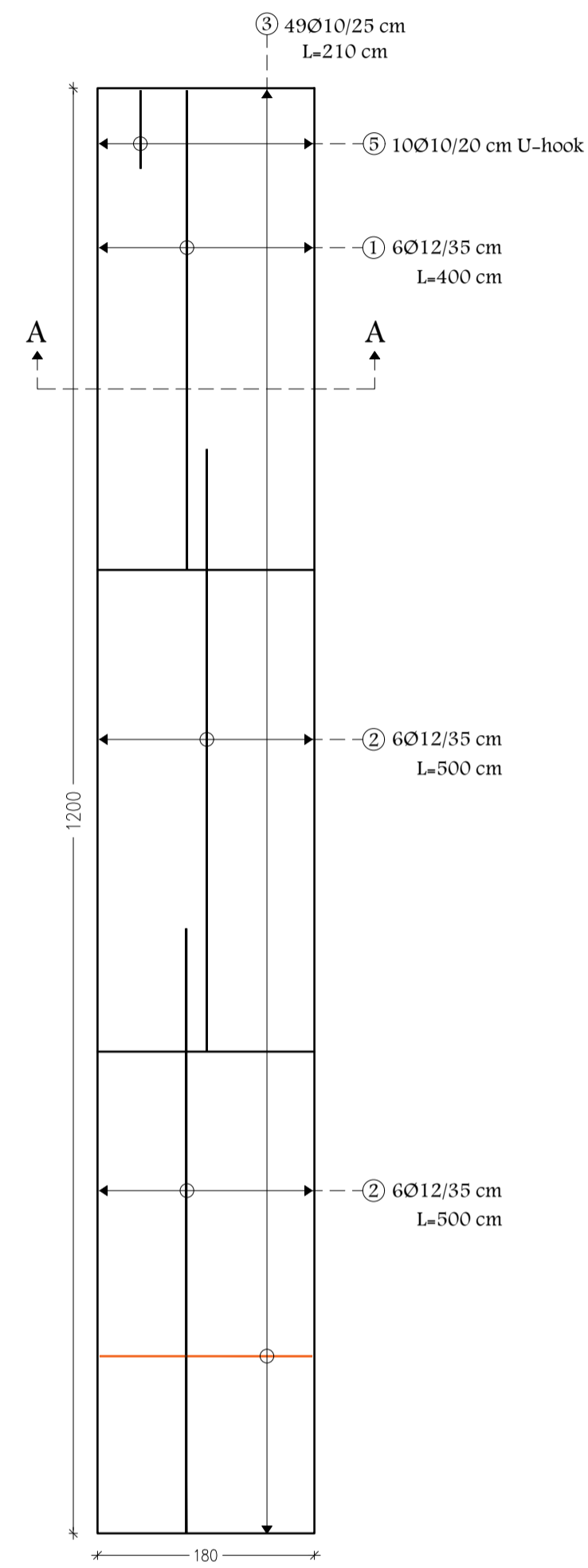
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

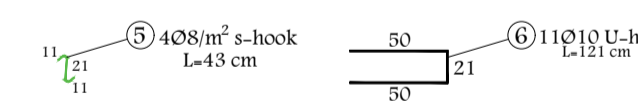
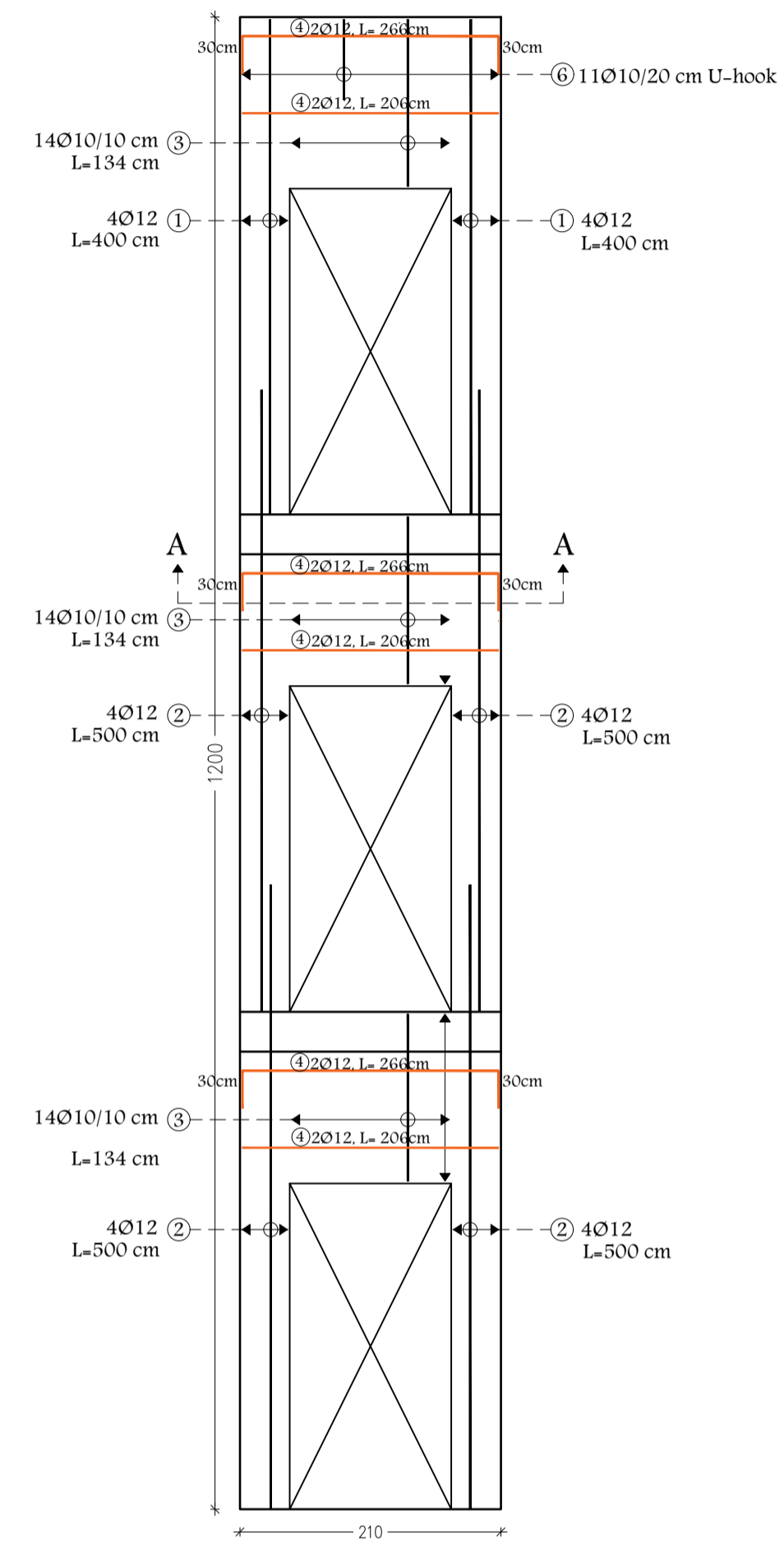
### Shear Wall - SW A5 (210x25)cm



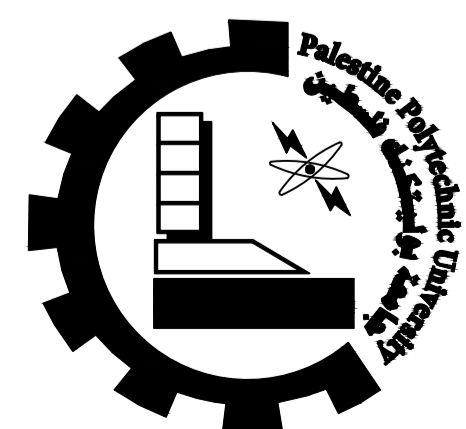
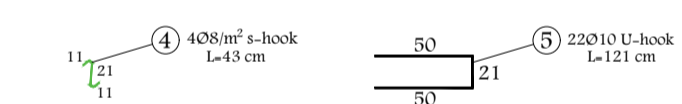
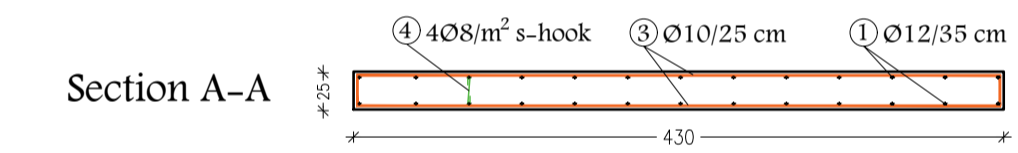
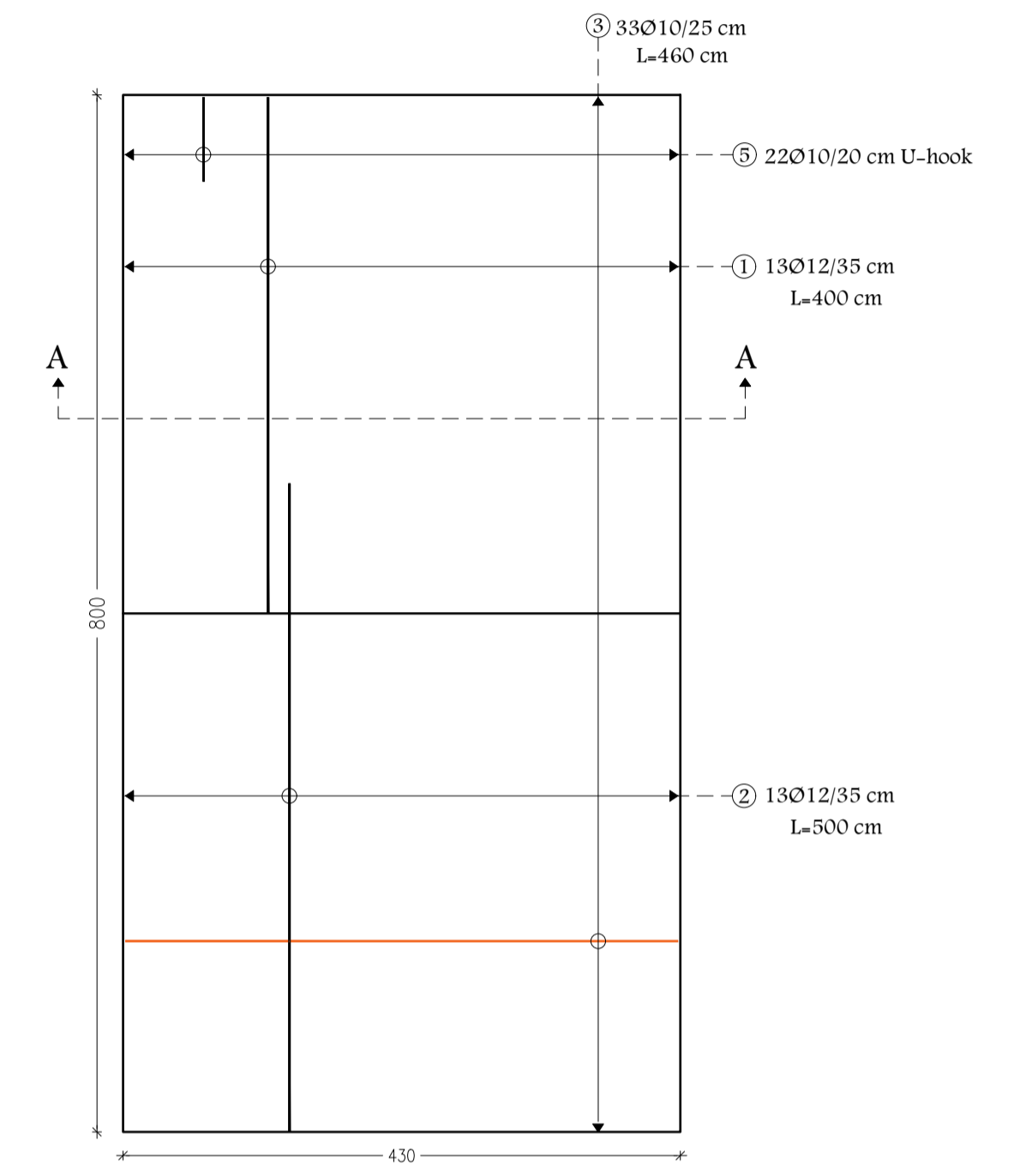
### Shear Wall - SW A6 (180x25)cm



### Shear Wall - SW A7 (210x25)cm



### Shear Wall - SW A8 (430x25)cm



Palestine Polytechnic University  
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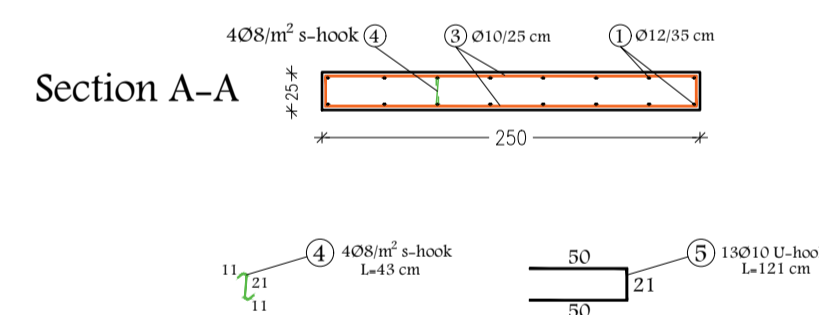
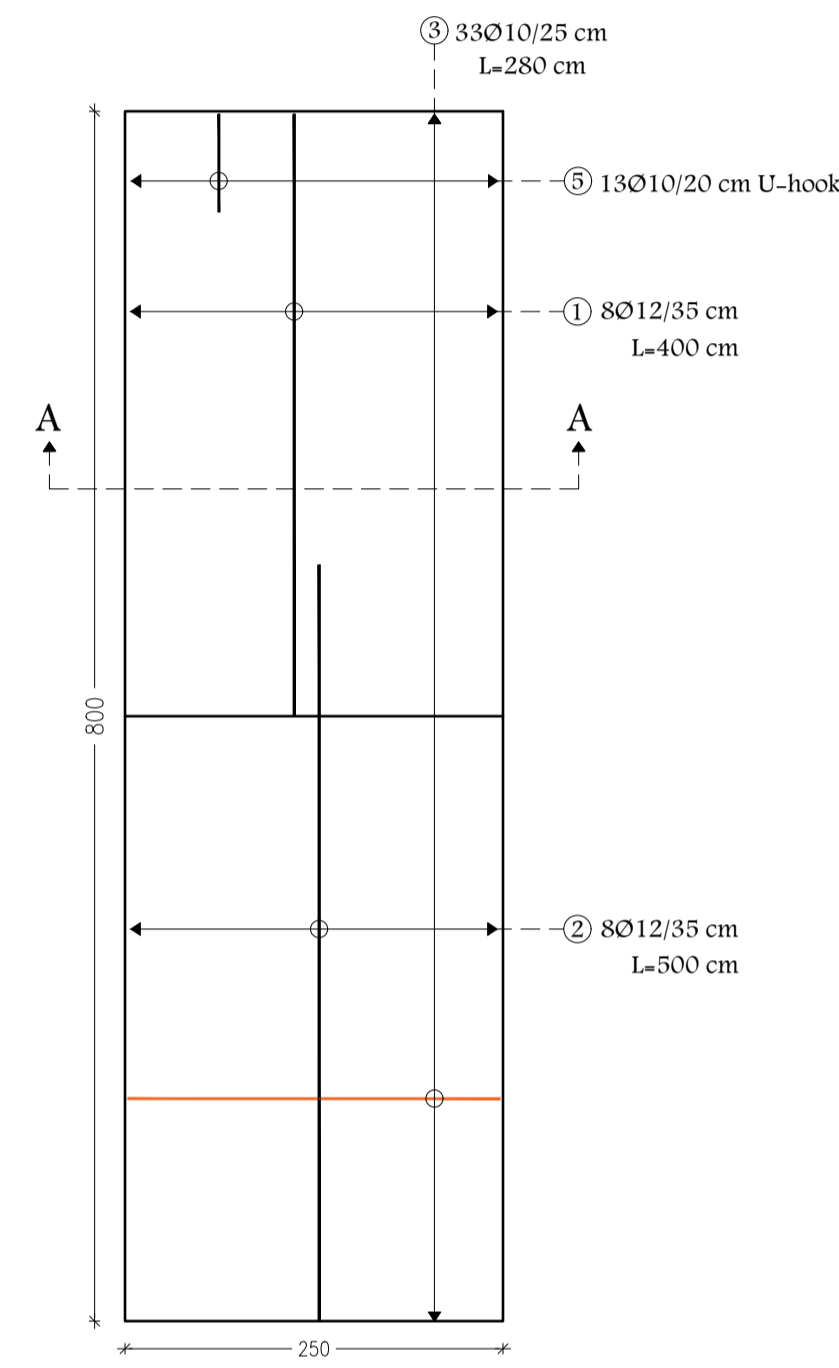
Drawing Title  
Shear Wall Reinforcement  
Scale: 1:50  
Drawing No. S17

Hatching Key	
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

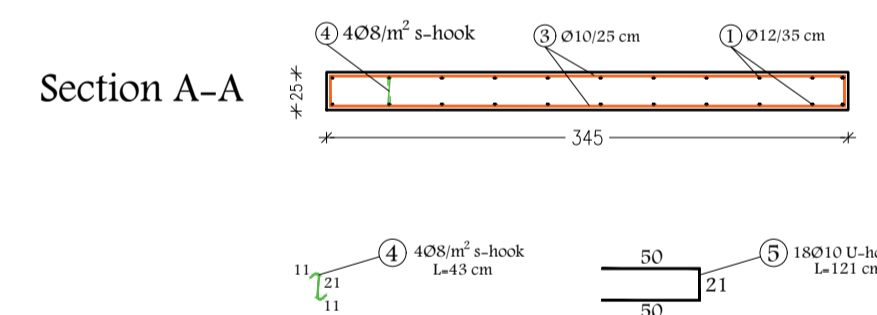
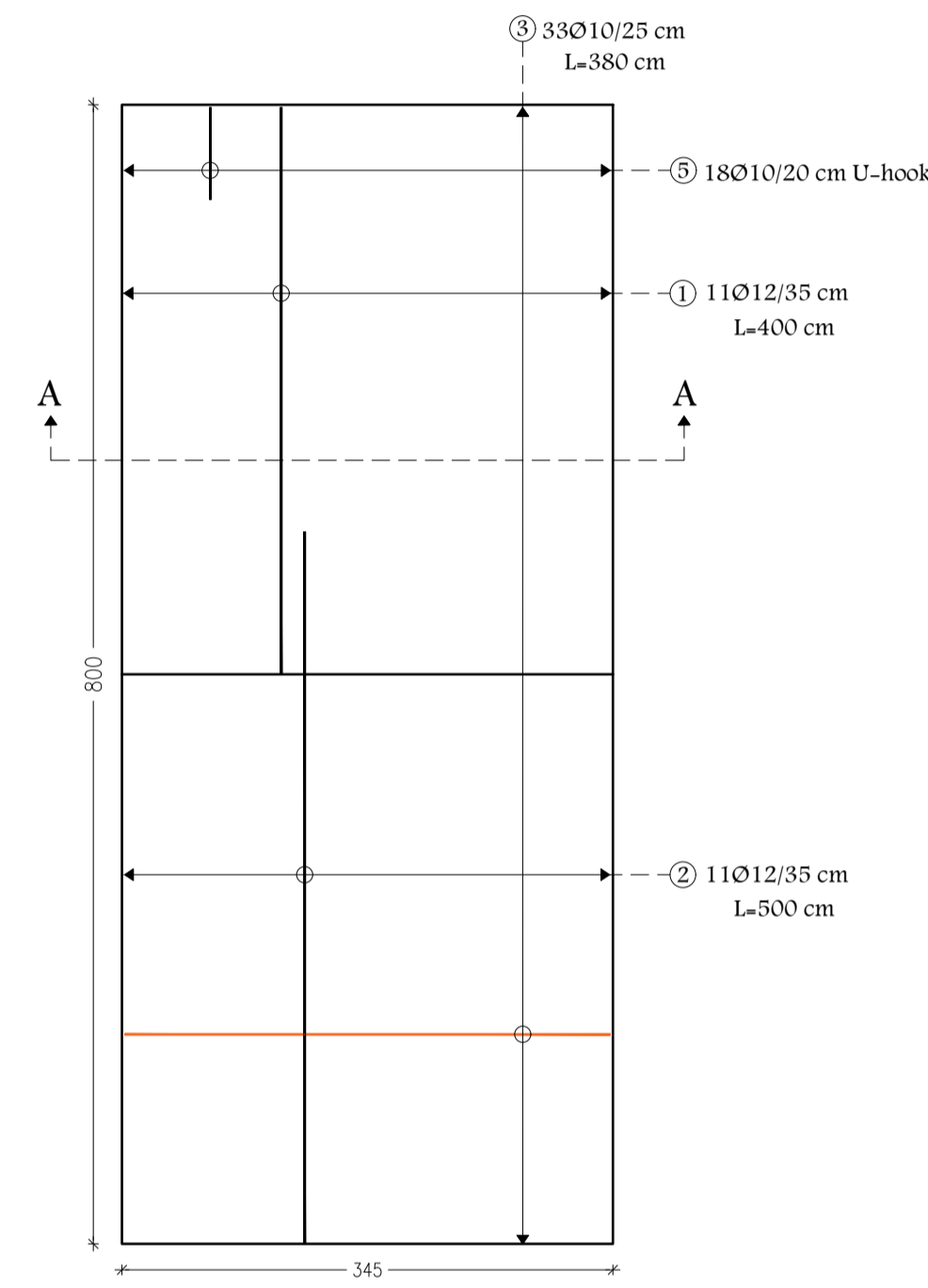
May 2022



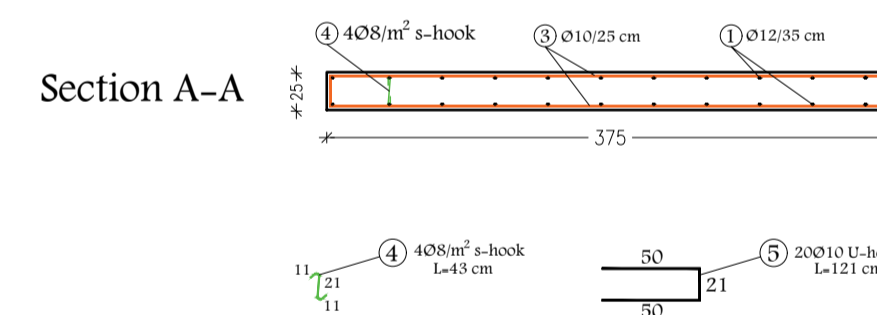
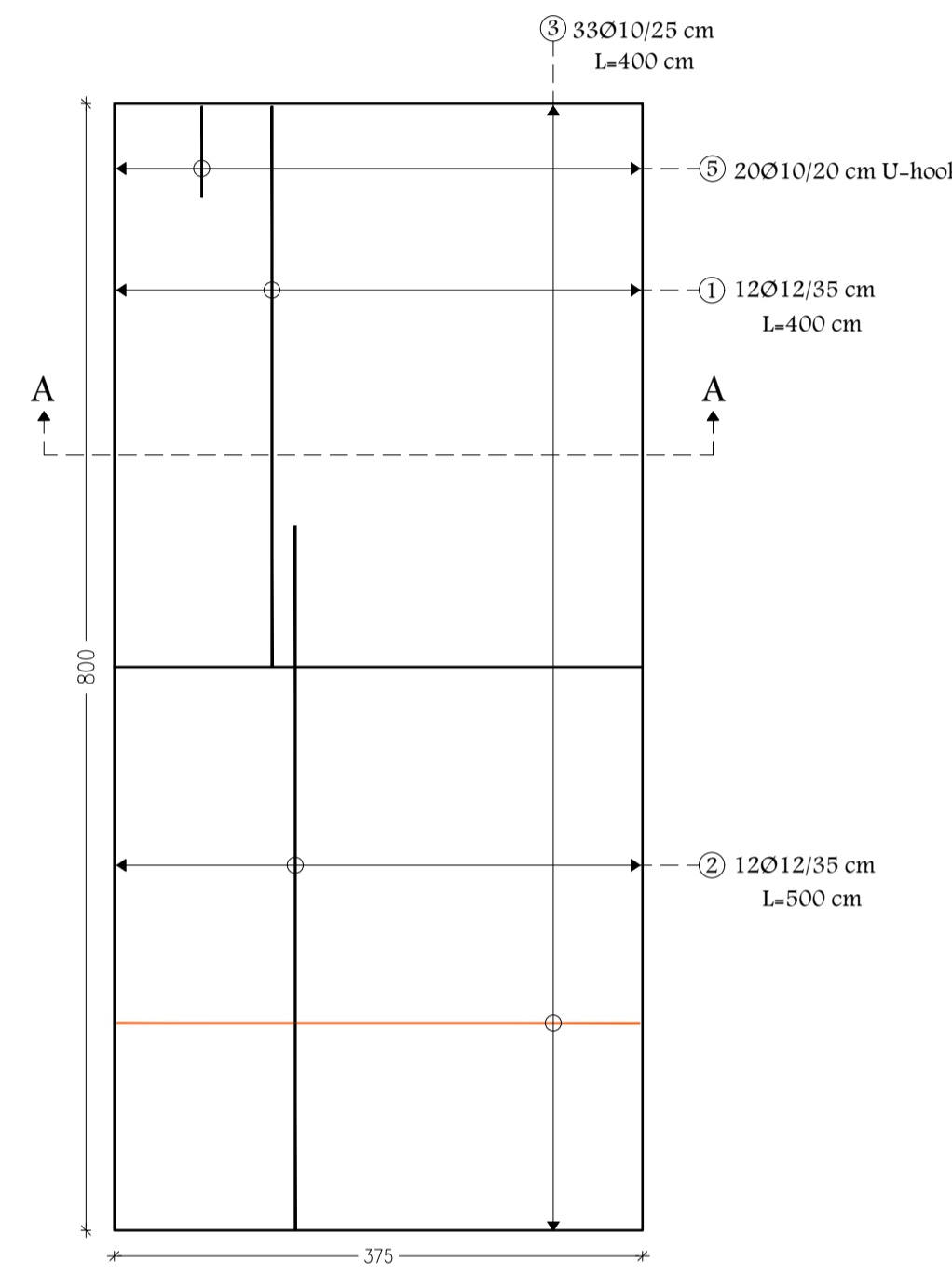
Shear Wall - SW A9 (250×25)cm



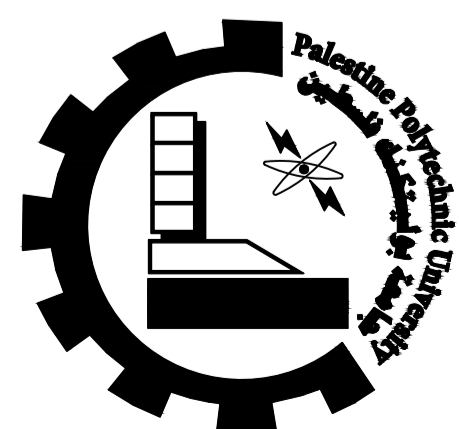
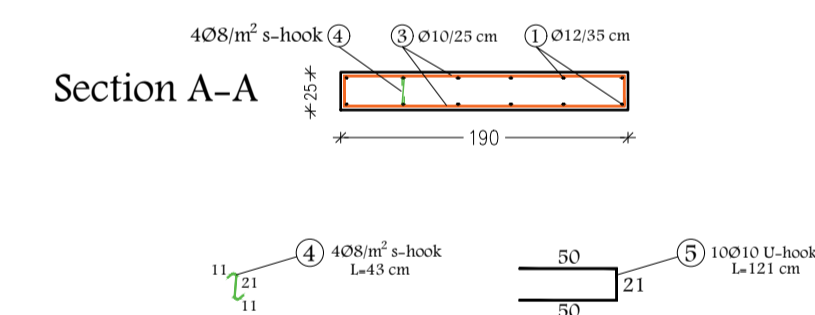
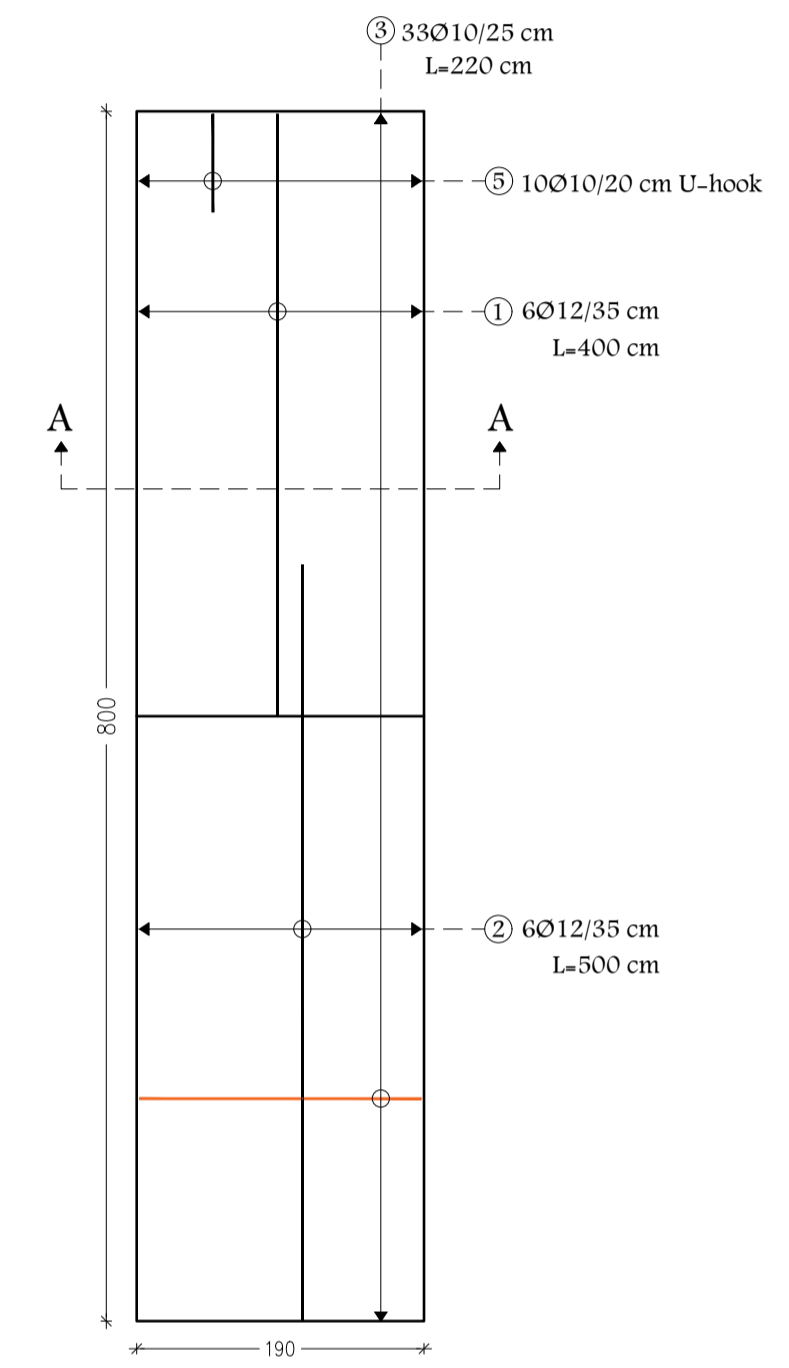
Shear Wall - SW A10 (345×25)cm



Shear Wall - SW A11 (375×25)cm



Shear Wall - SW A12 (190×25)cm



Palestine Polytechnic University  
College of Engineering  
Civil Engineering Department  
Building Engineering



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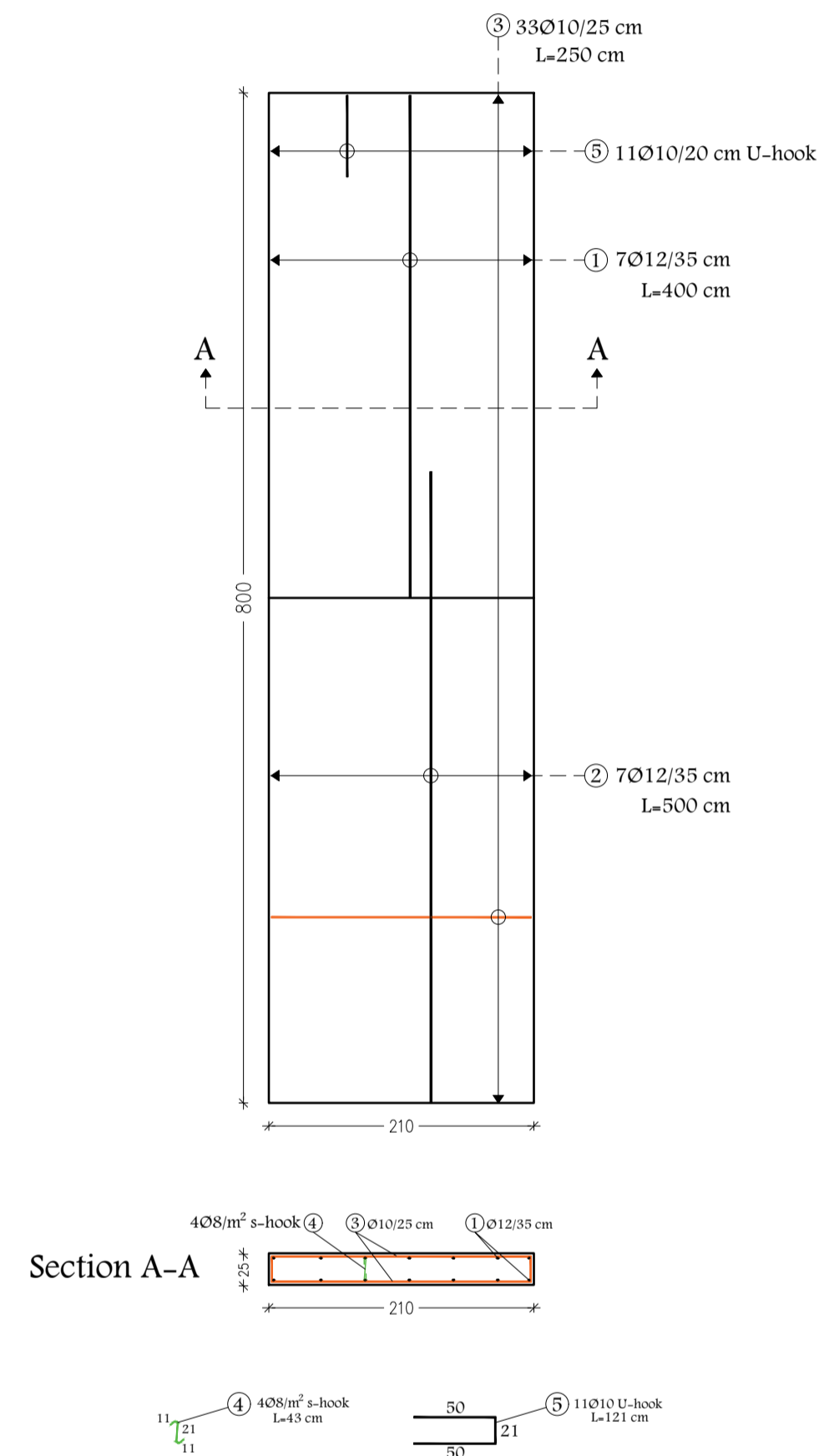
Drawing Title  
Shear Wall Reinforcement  
Scale: 1:50  
Drawing No. S18

Hatching Key

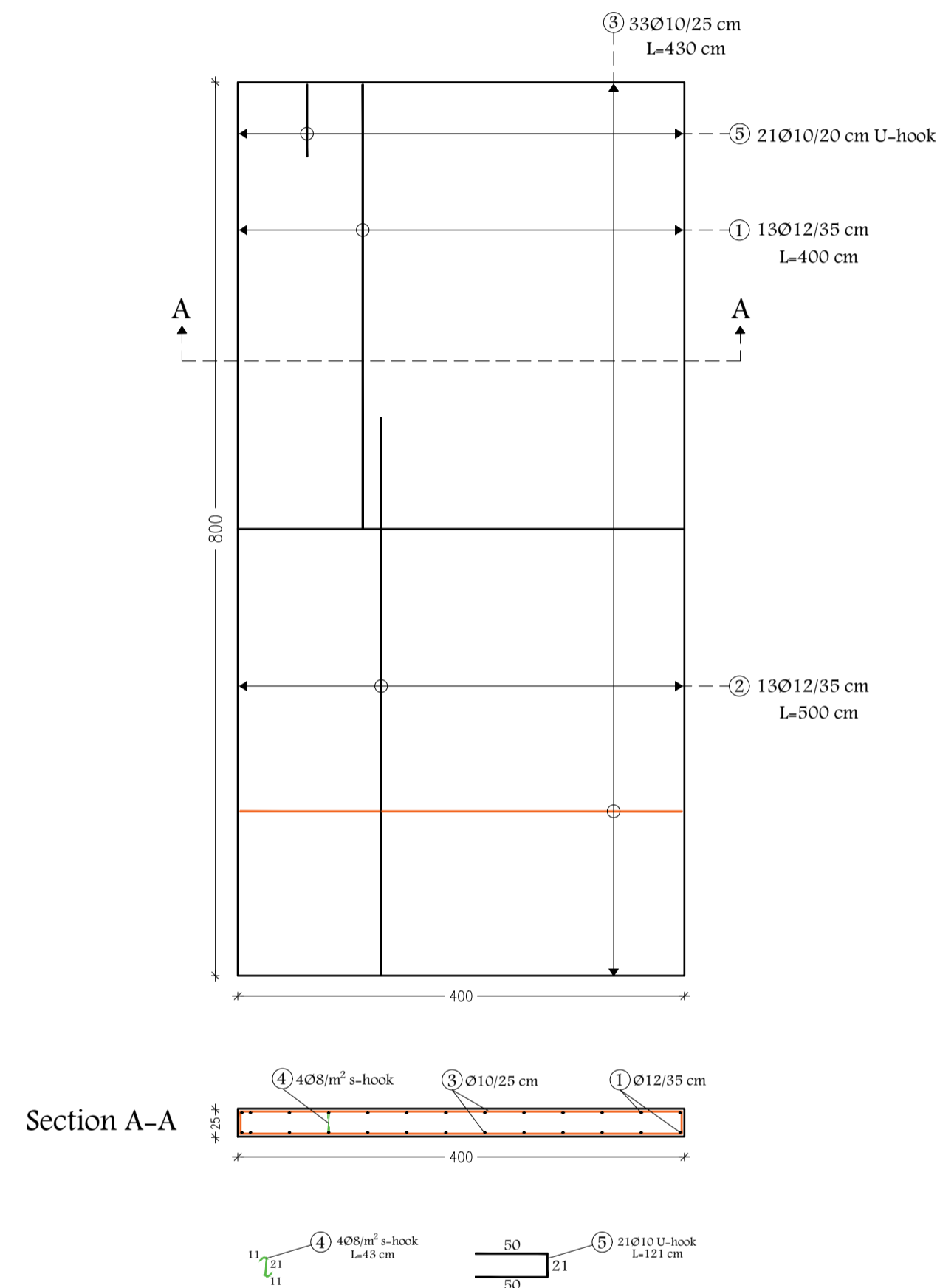
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

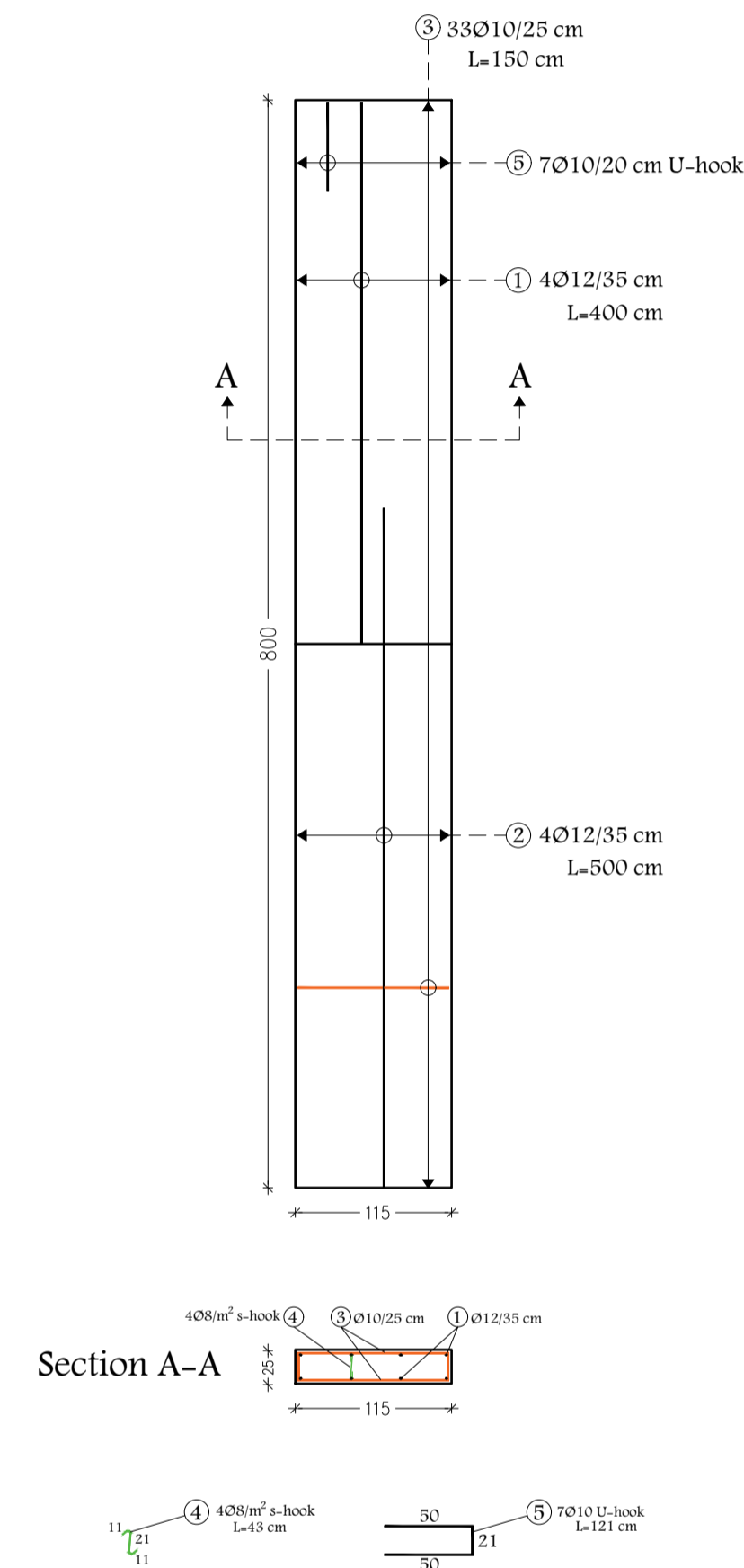
Shear Wall - SW A13 (210x25)cm



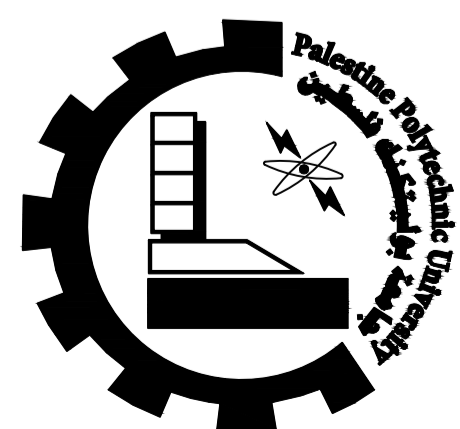
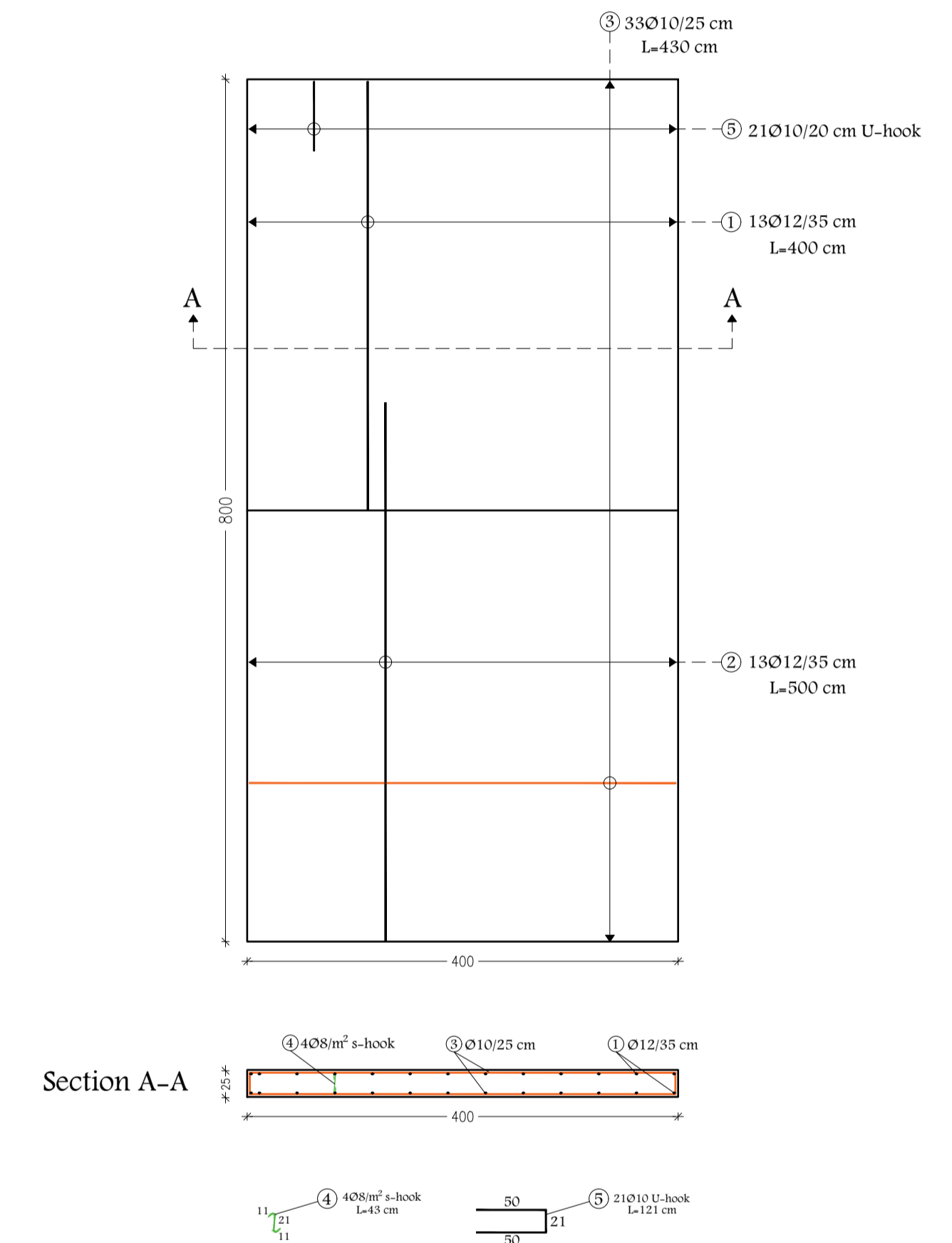
Shear Wall - SW C1 (400x25)cm



Shear Wall - SW C2 (115x25)cm



Shear Wall - SW C3 (400x25)cm



Palestine Polytechnic University  
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Building Engineering



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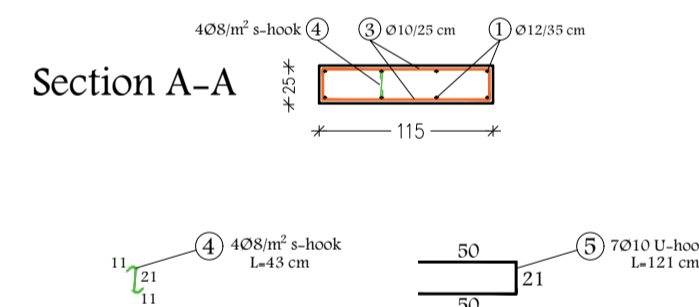
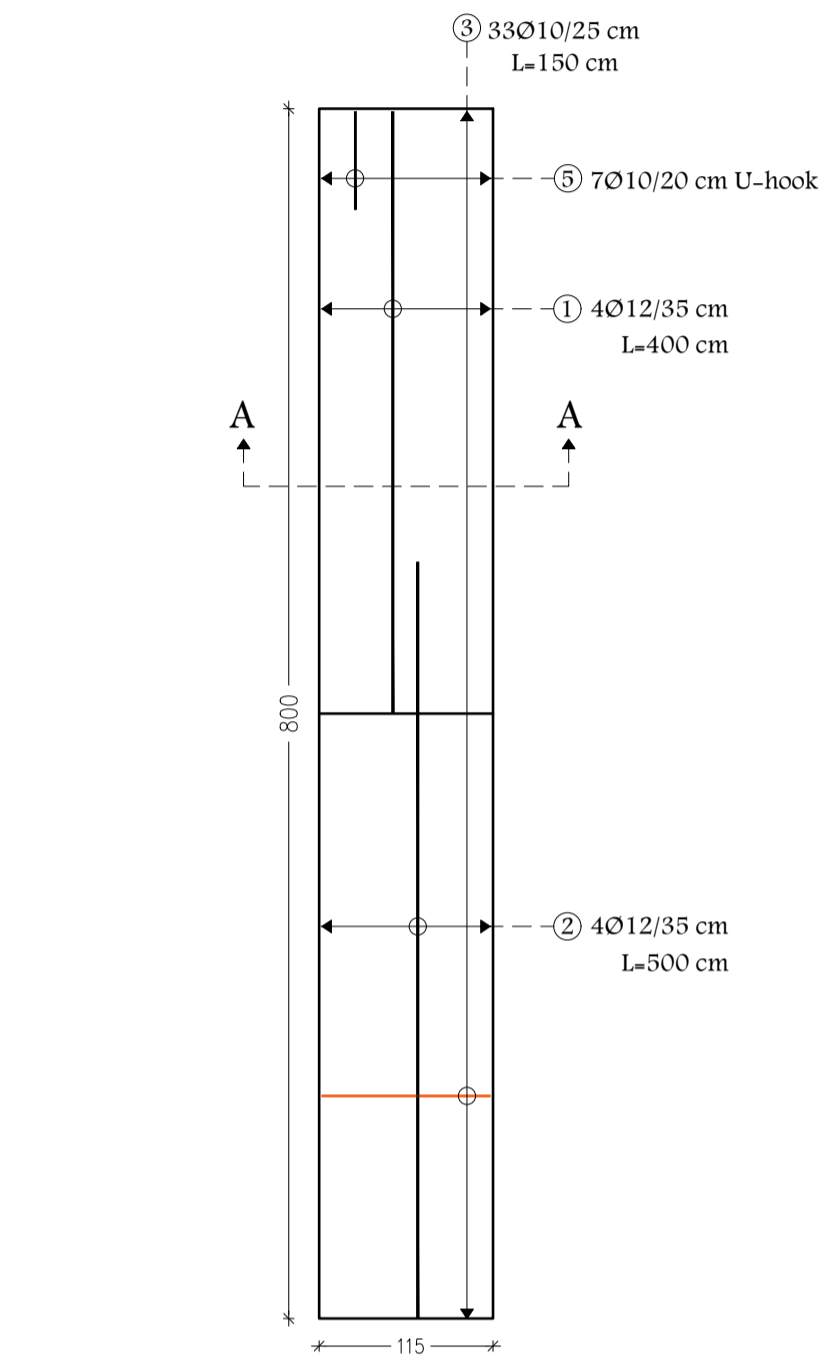
Drawing Title  
Shear Wall Reinforcement  
Scale: 1:50  
Drawing No. S19

Hatching Key

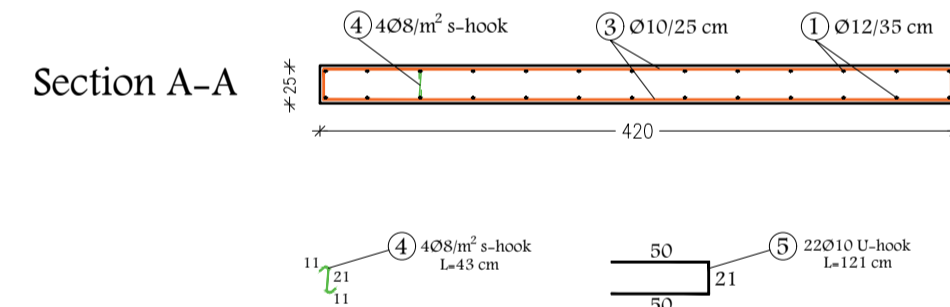
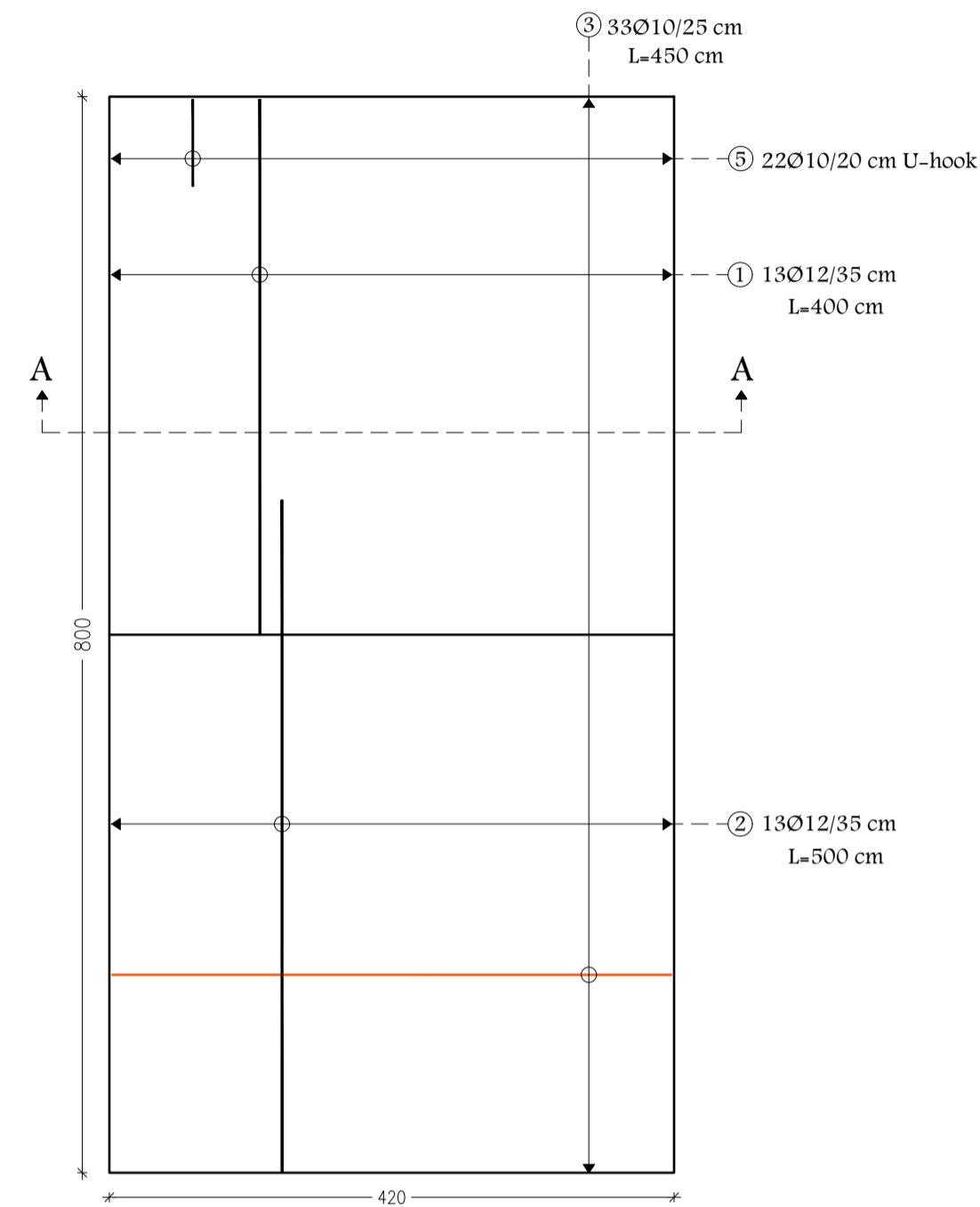
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

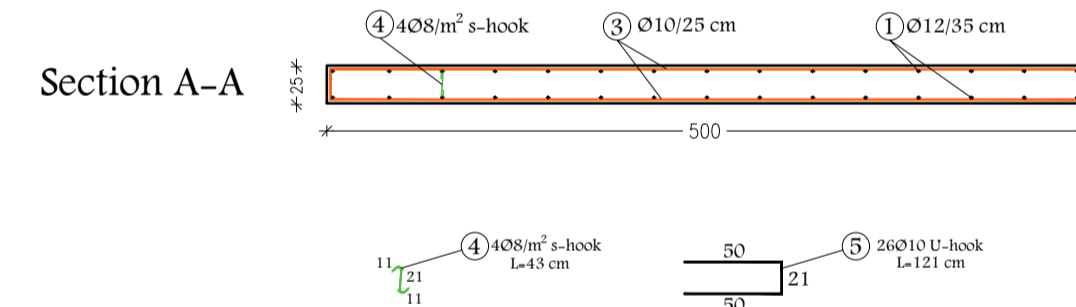
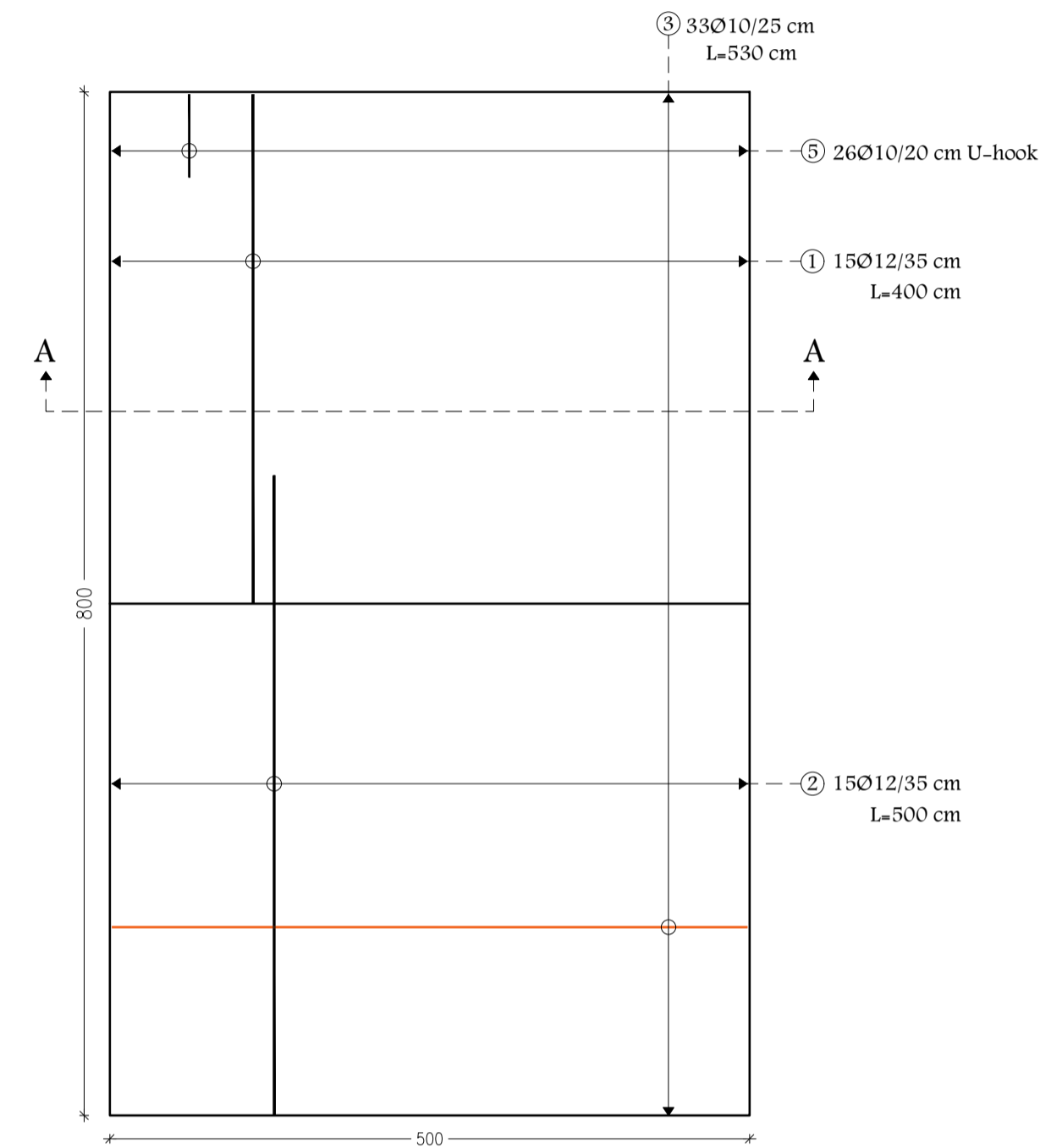
Shear Wall - SW C4 (115×25)cm



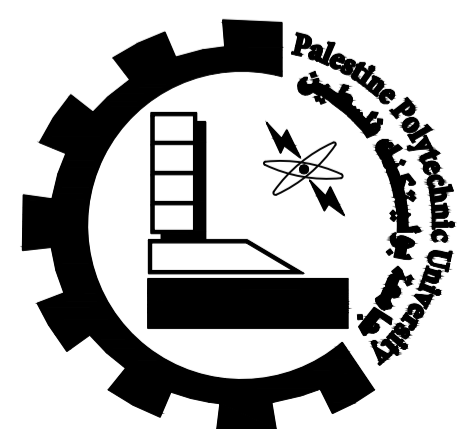
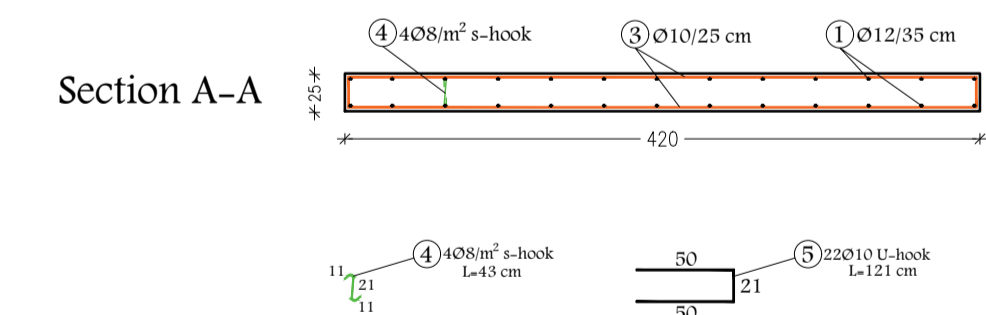
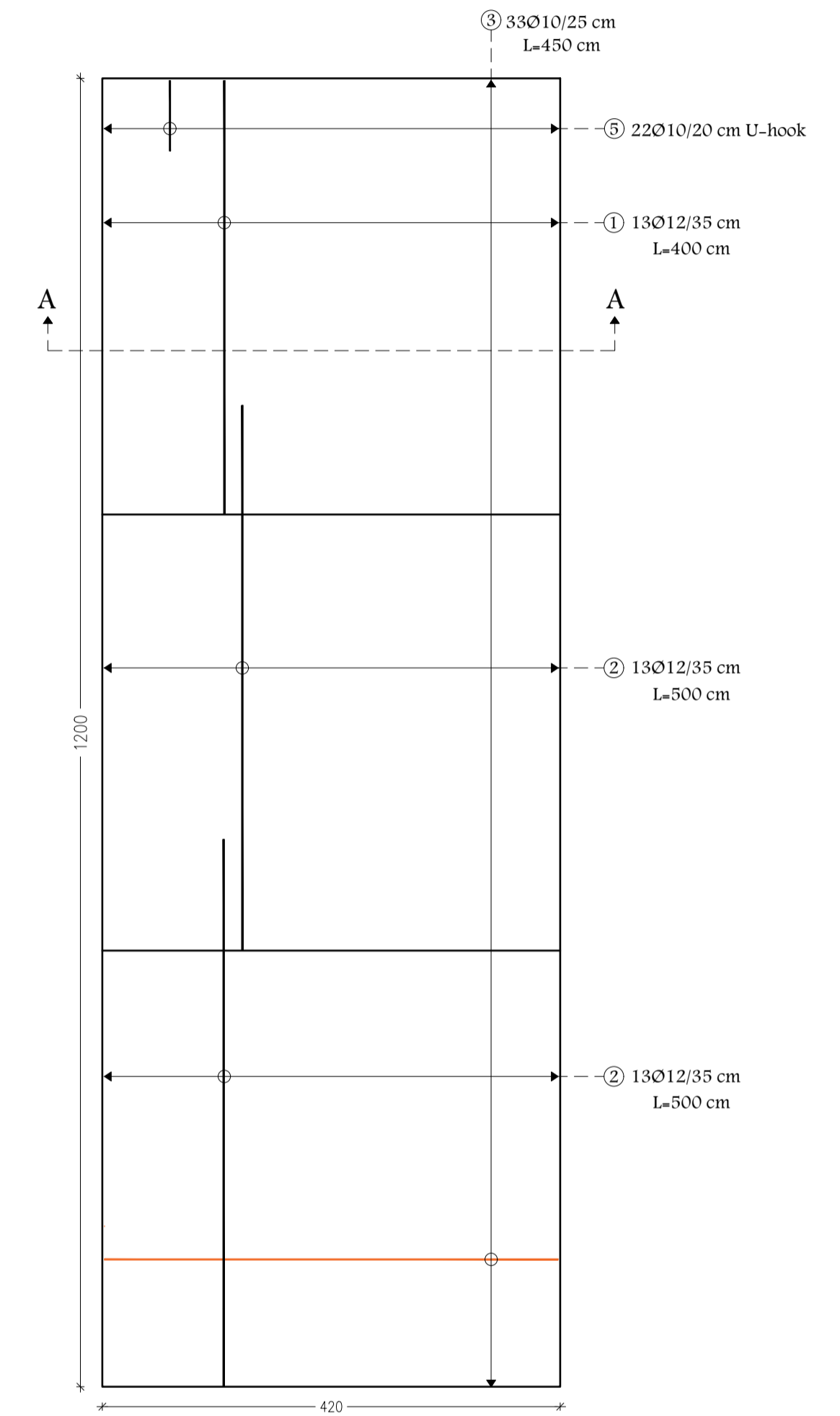
Shear Wall - SW B1 (420×25)cm



Shear Wall - SW B2 (500×25)cm



Shear Wall - SW B3 (420×25)cm



Palestine Polytechnic University  
College of Engineering  
Civil Engineering Department  
Building Engineering



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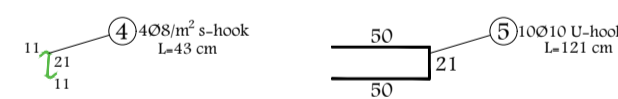
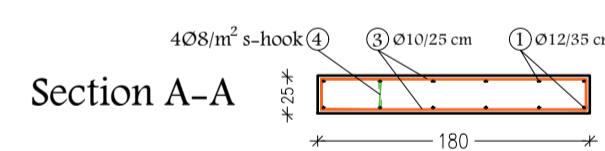
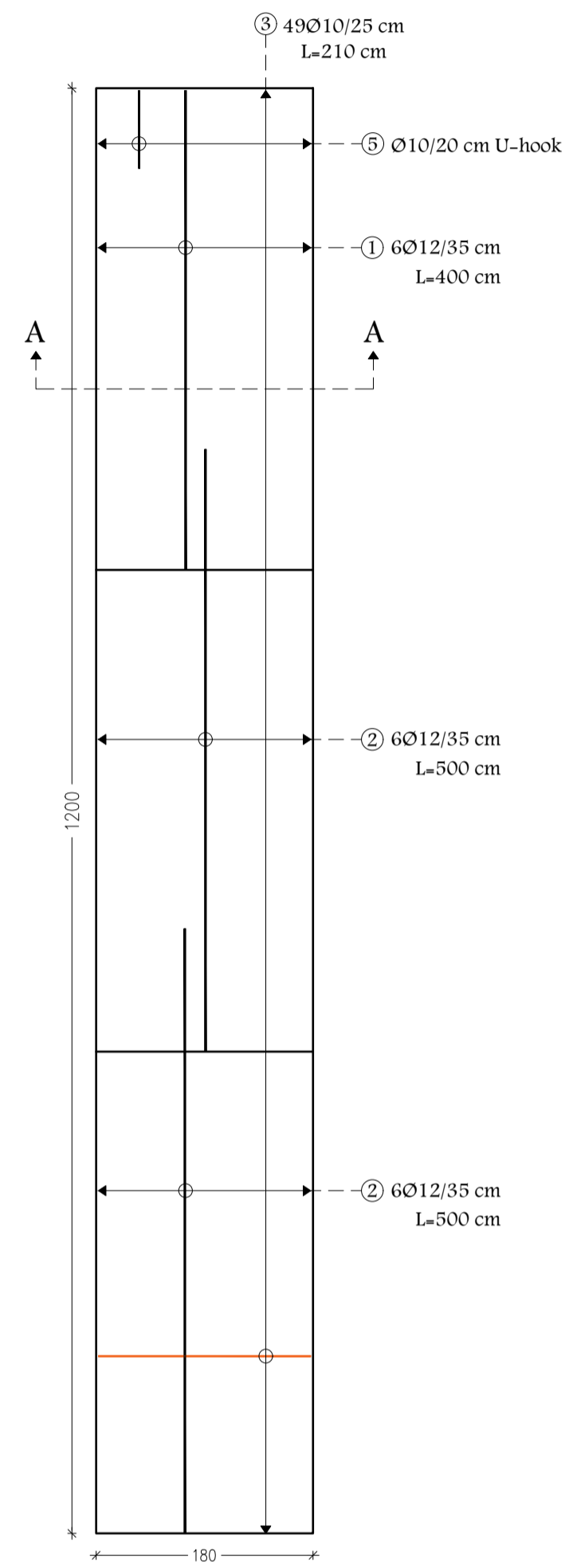
Drawing Title  
Shear Wall Reinforcement  
Scale: 1:50  
Drawing No. S20

Hatching Key

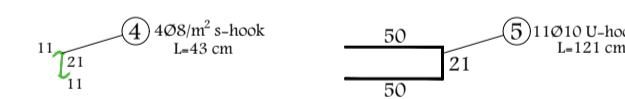
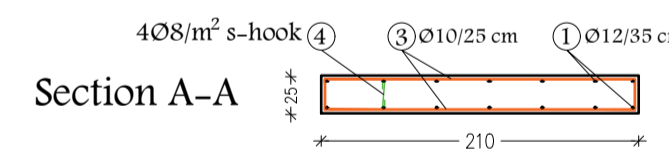
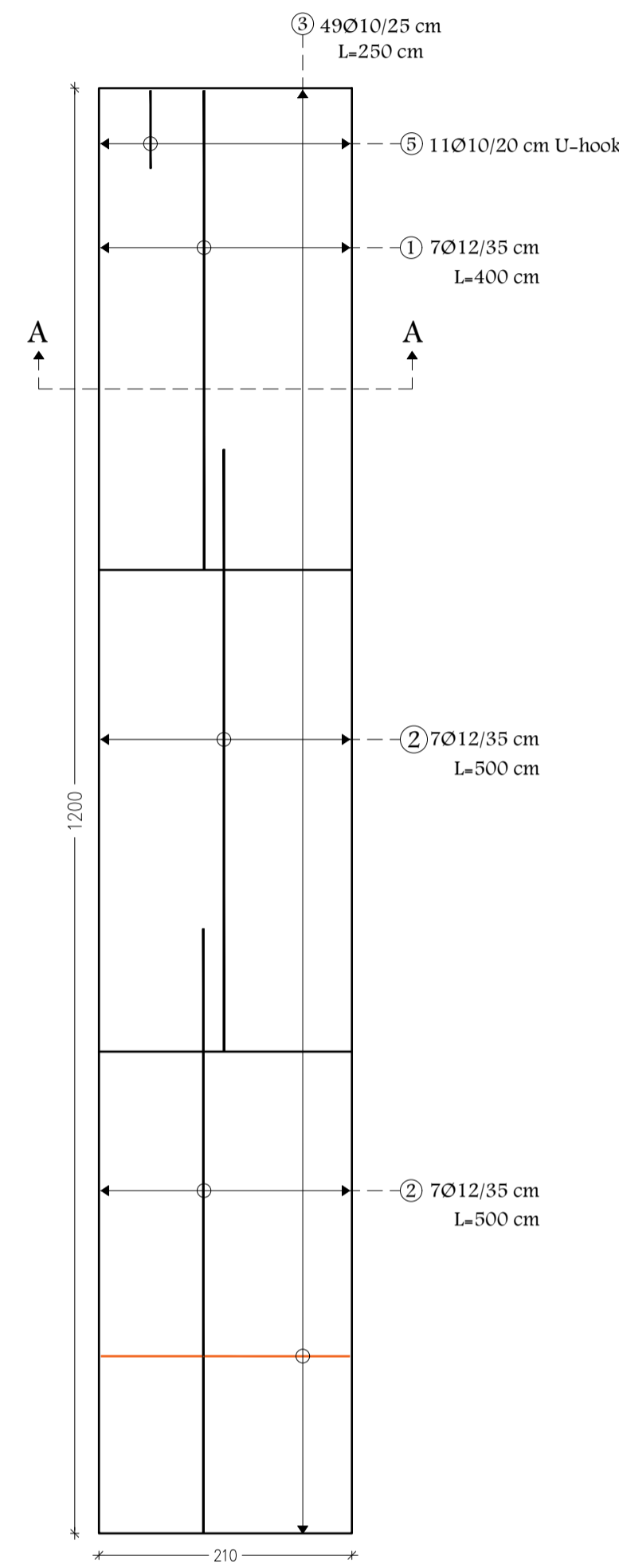
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

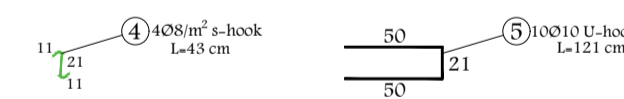
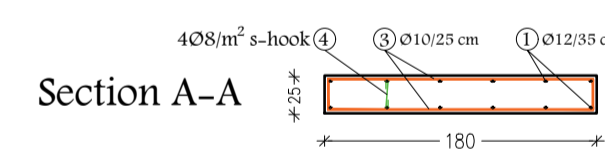
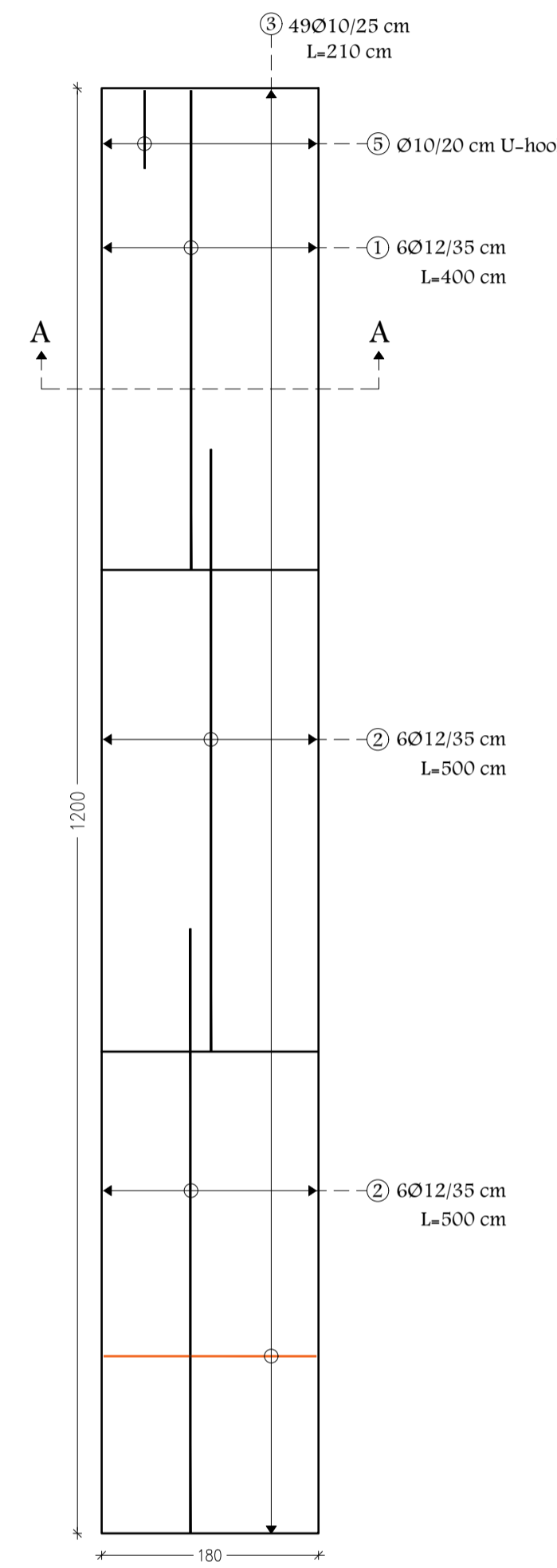
Shear Wall - SW B4 (180x25)cm



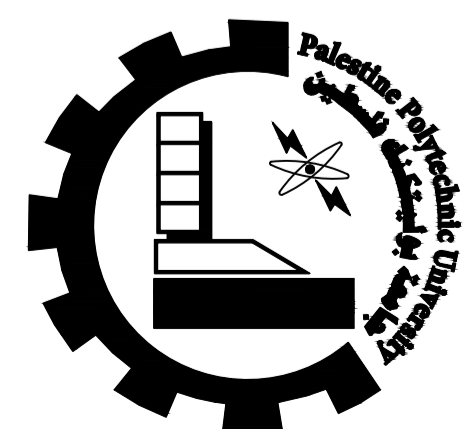
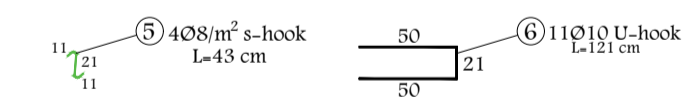
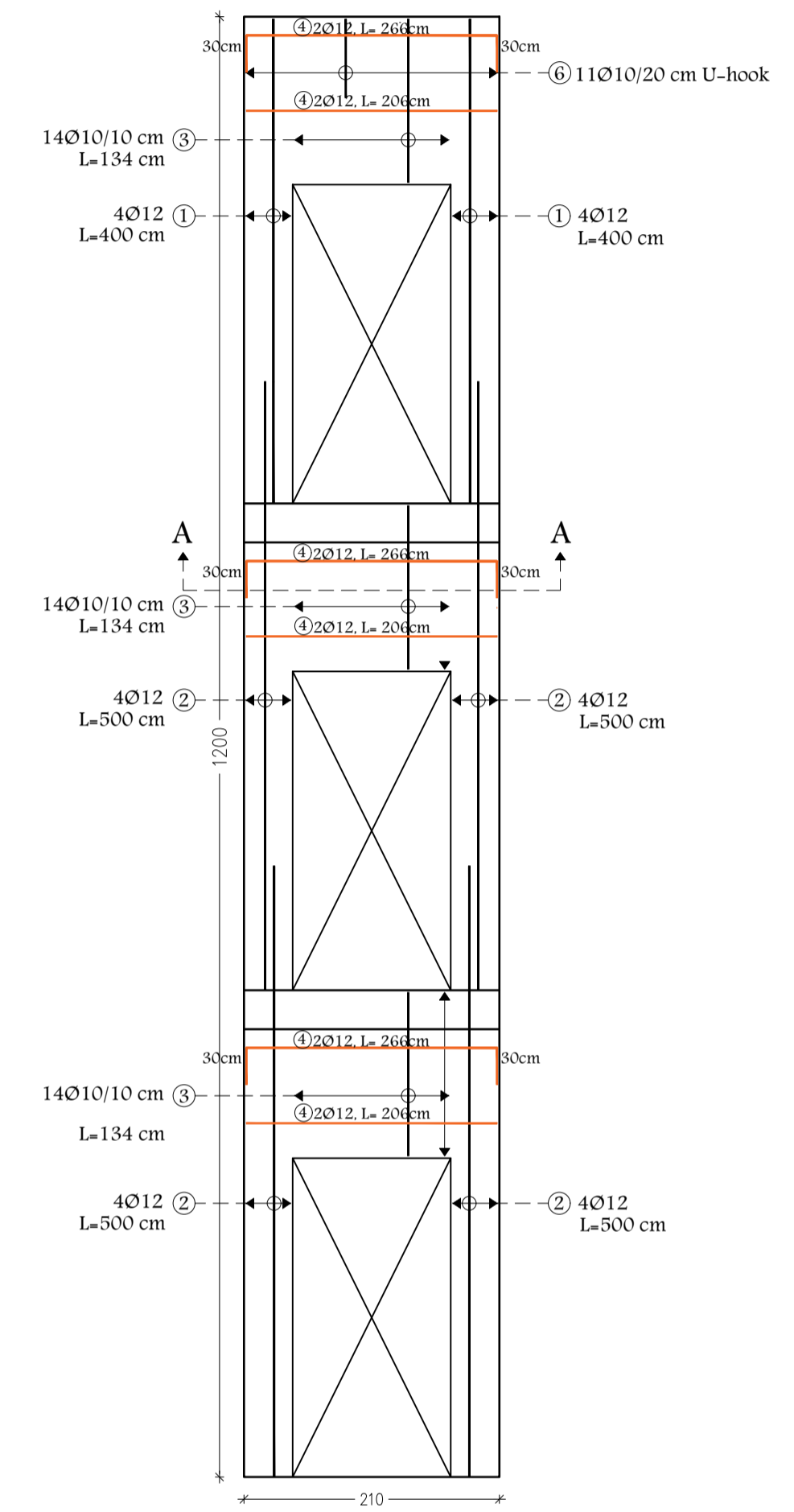
Shear Wall - SW B5 (210x25)cm



Shear Wall - SW B6 (180x25)cm



Shear Wall - SW B7 (210x25)cm



Palestine Polytechnic University  
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Building Engineering



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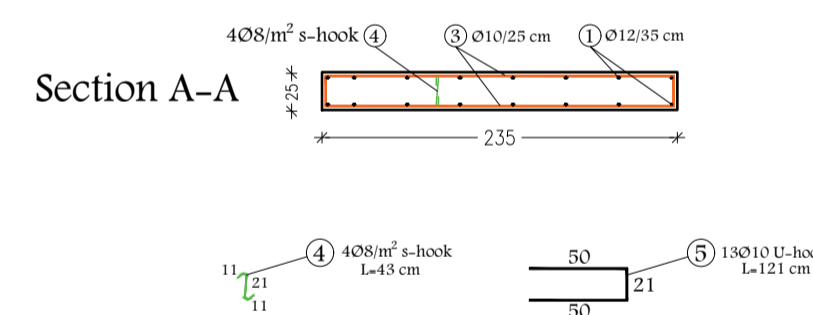
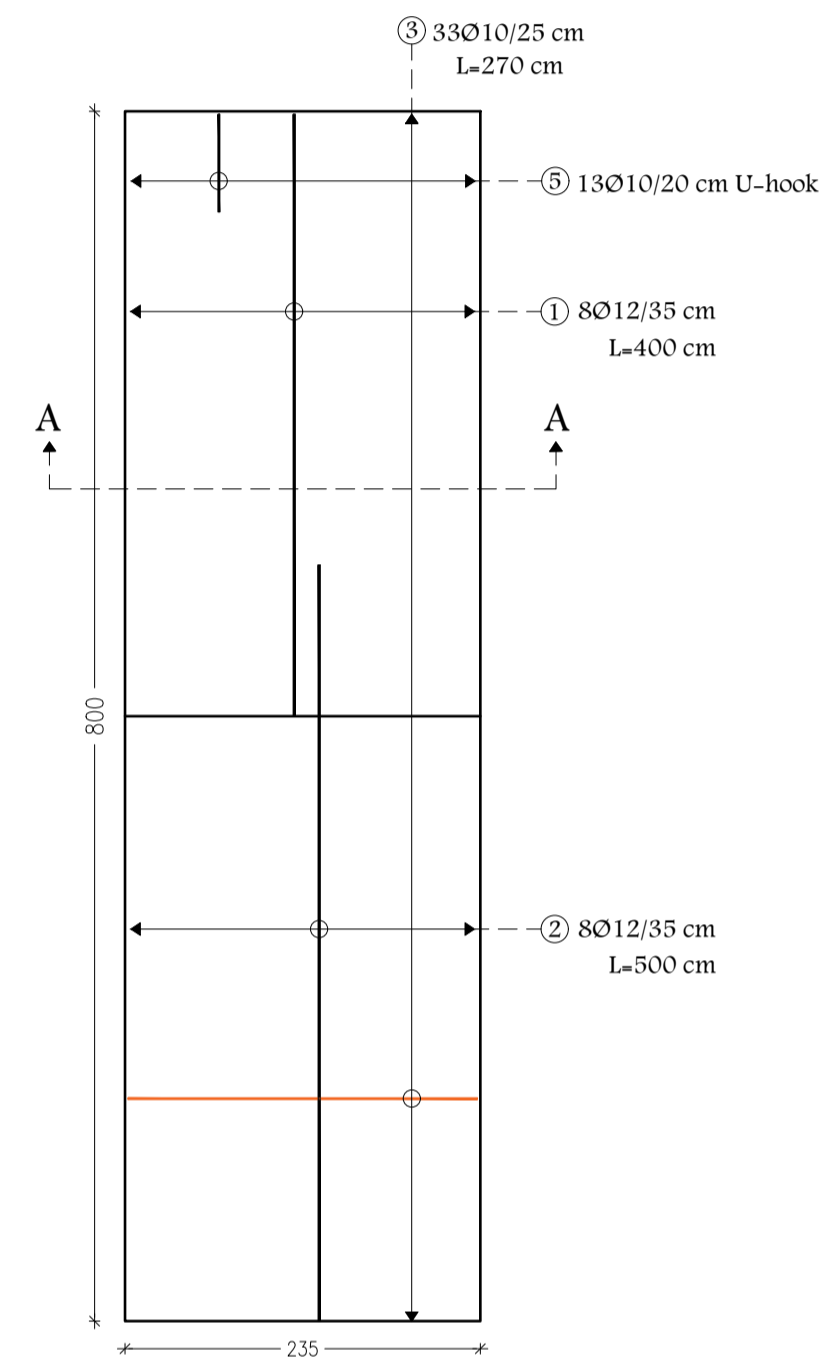
Drawing Title  
Shear Wall Reinforcement  
Scale: 1:50  
Drawing No. S21

Hatching Key

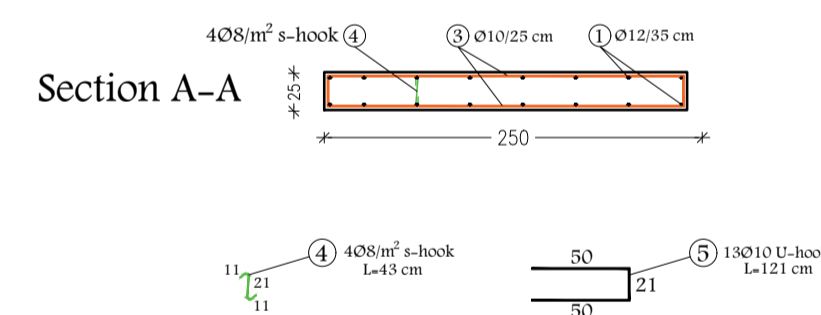
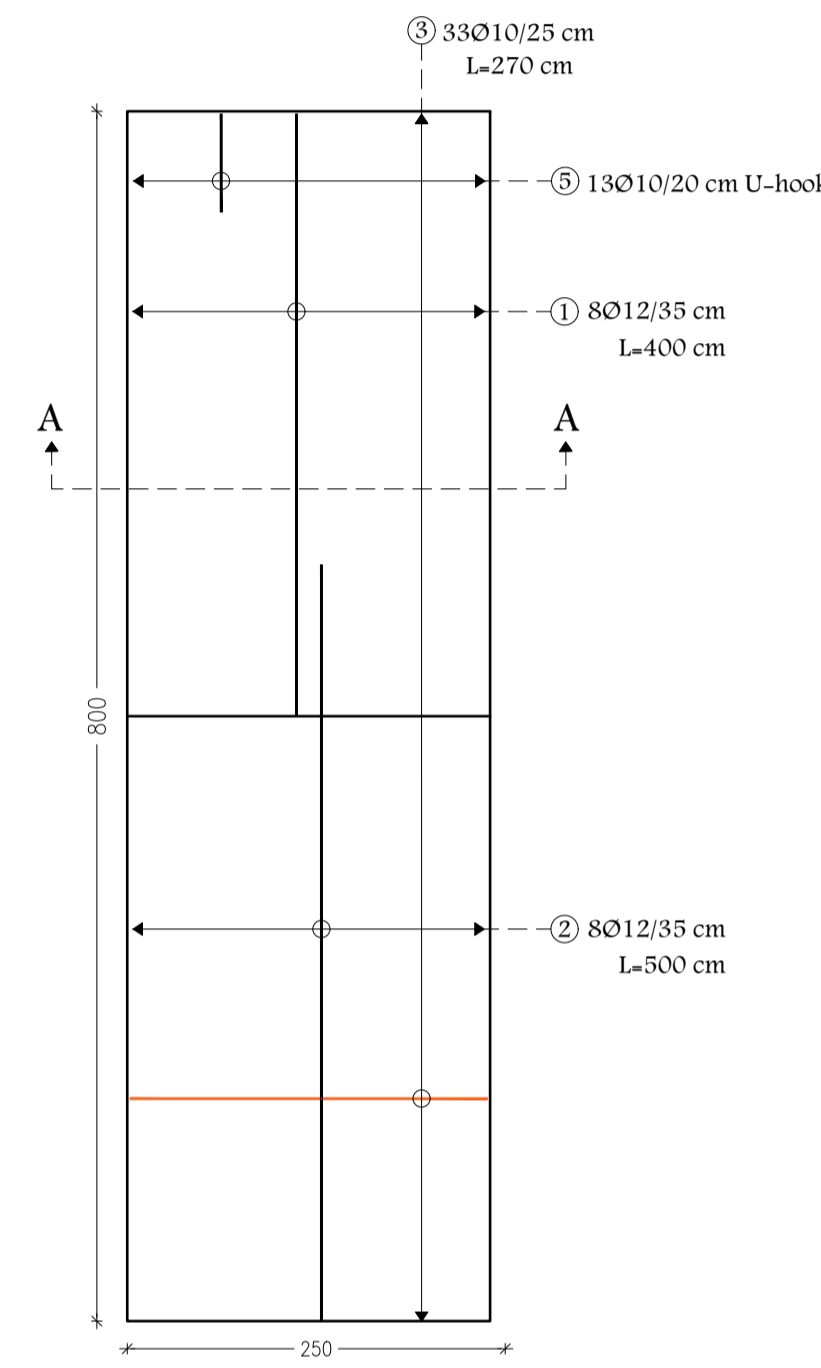
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

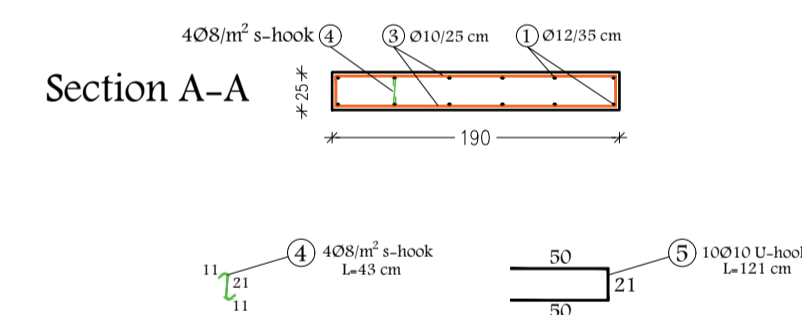
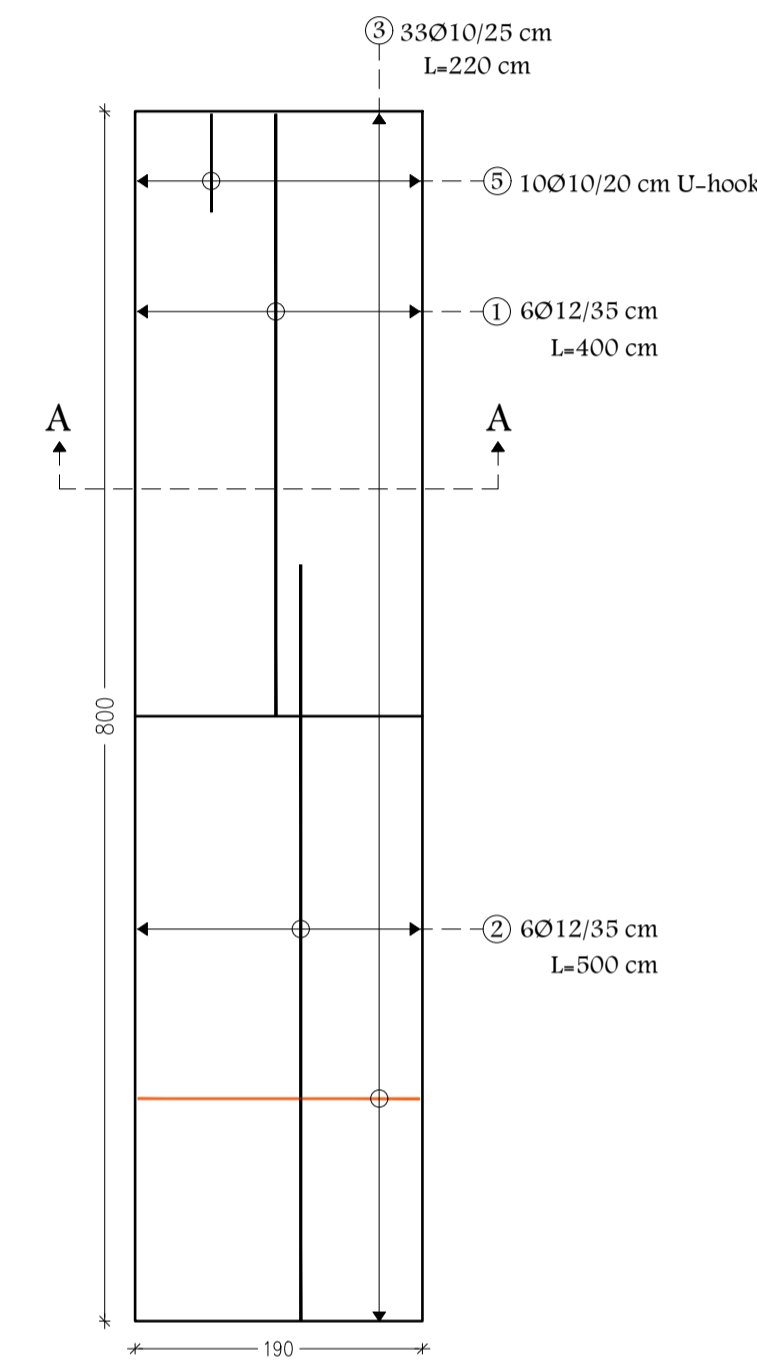
Shear Wall - SW B8 (235×25)cm



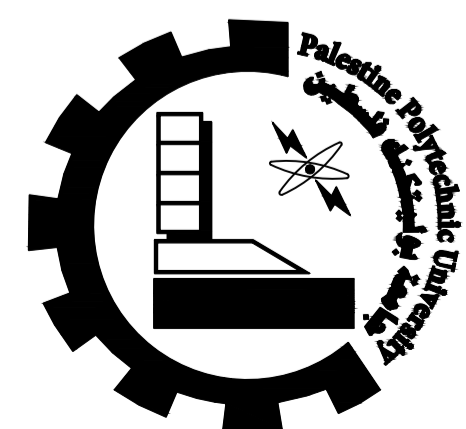
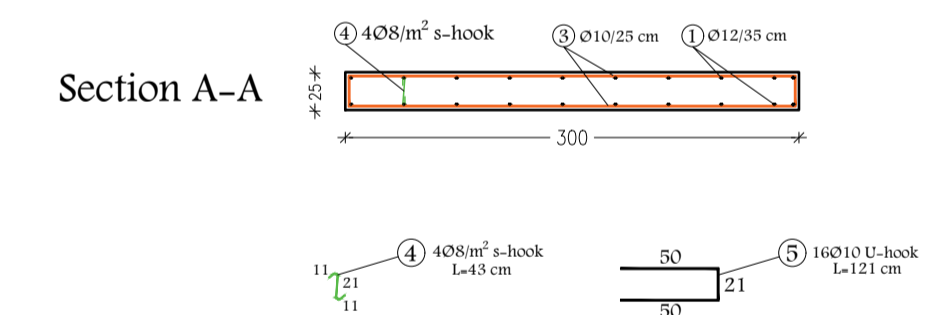
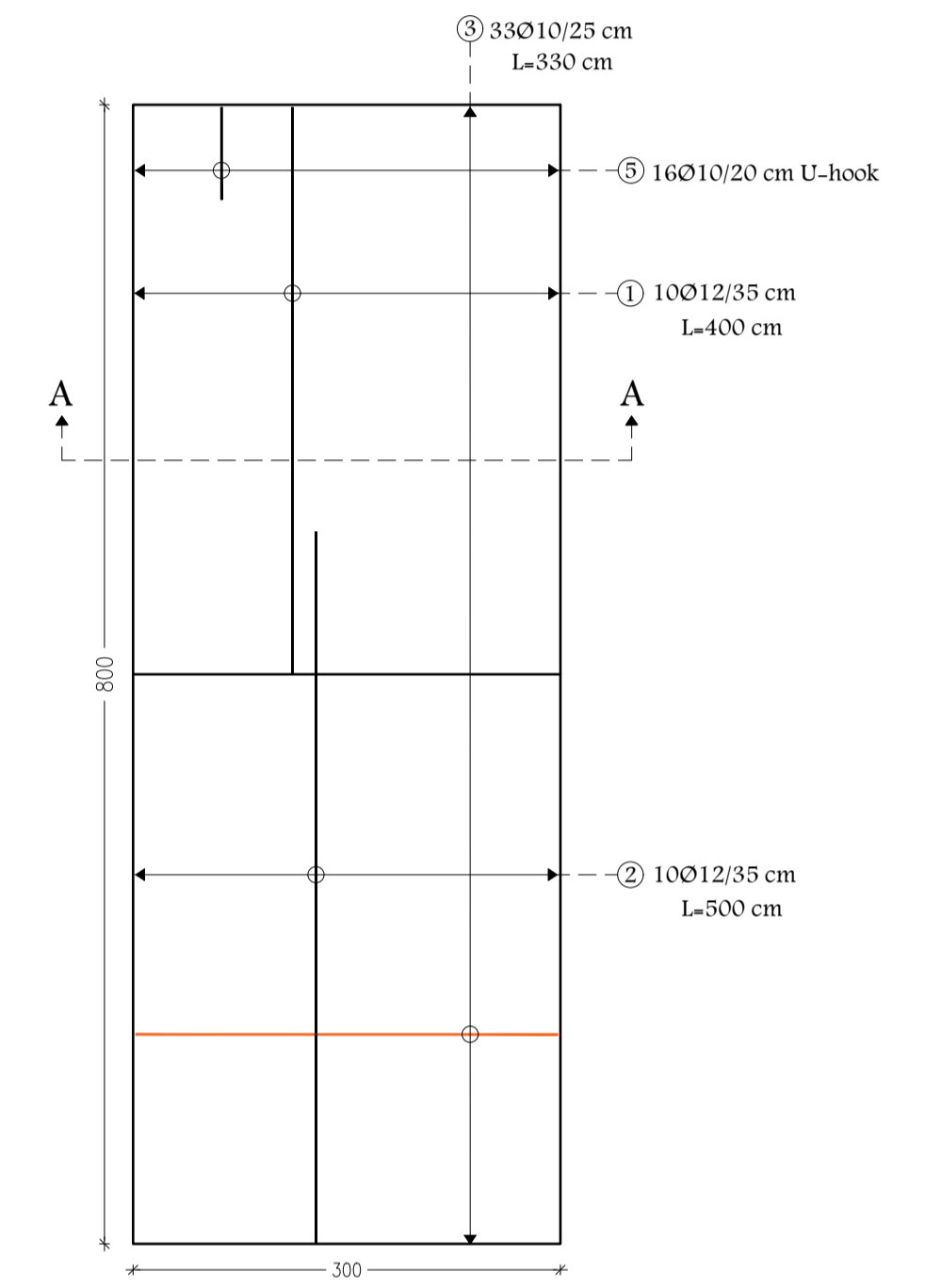
Shear Wall - SW B9 (240×25)cm



Shear Wall - SW B10 (190×25)cm



Shear Wall - SW B11 (300×25)cm



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Building Engineering



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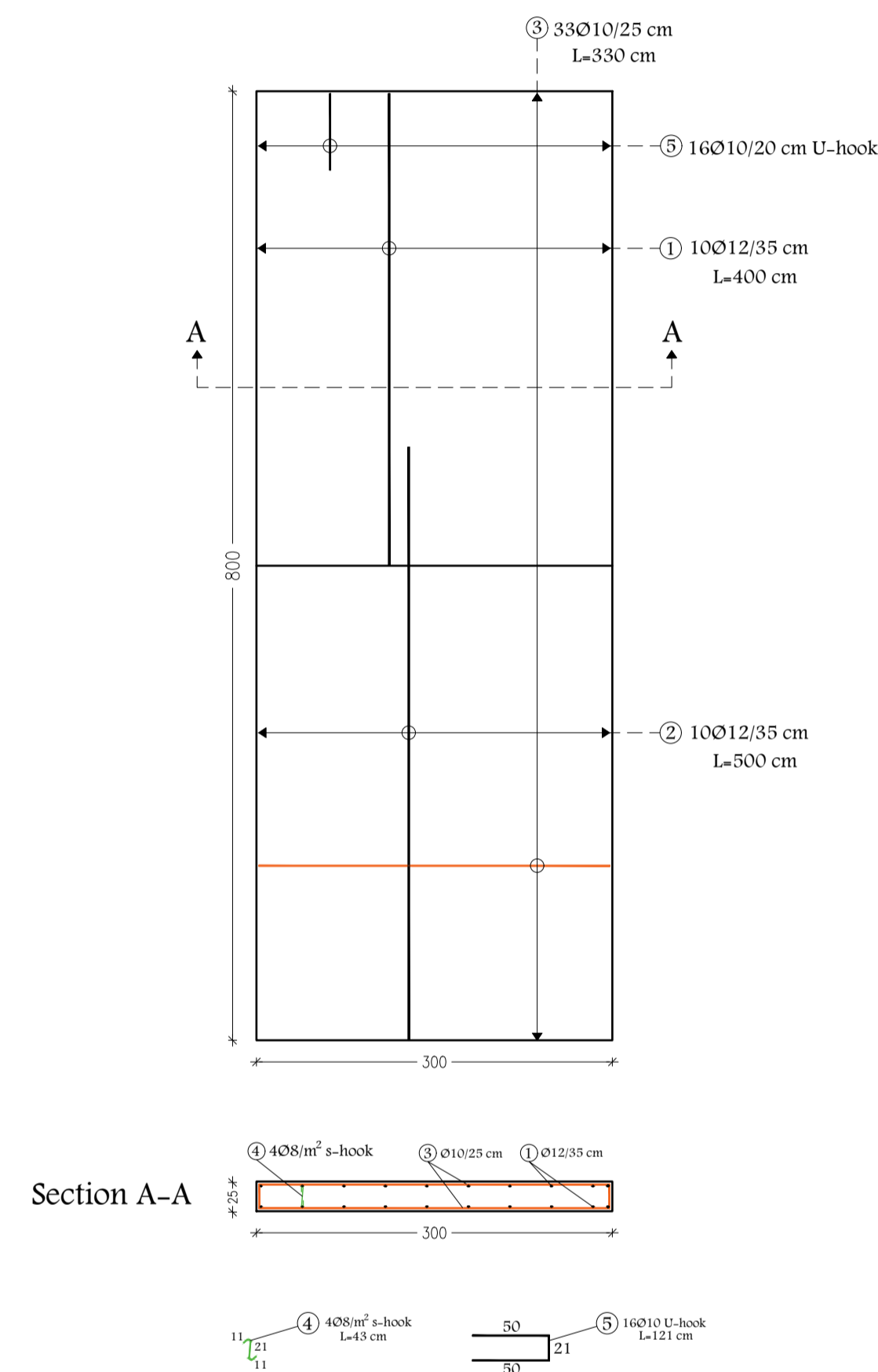
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title  
Shear Wall Reinforcement  
Scale: 1:50  
Drawing No. S22

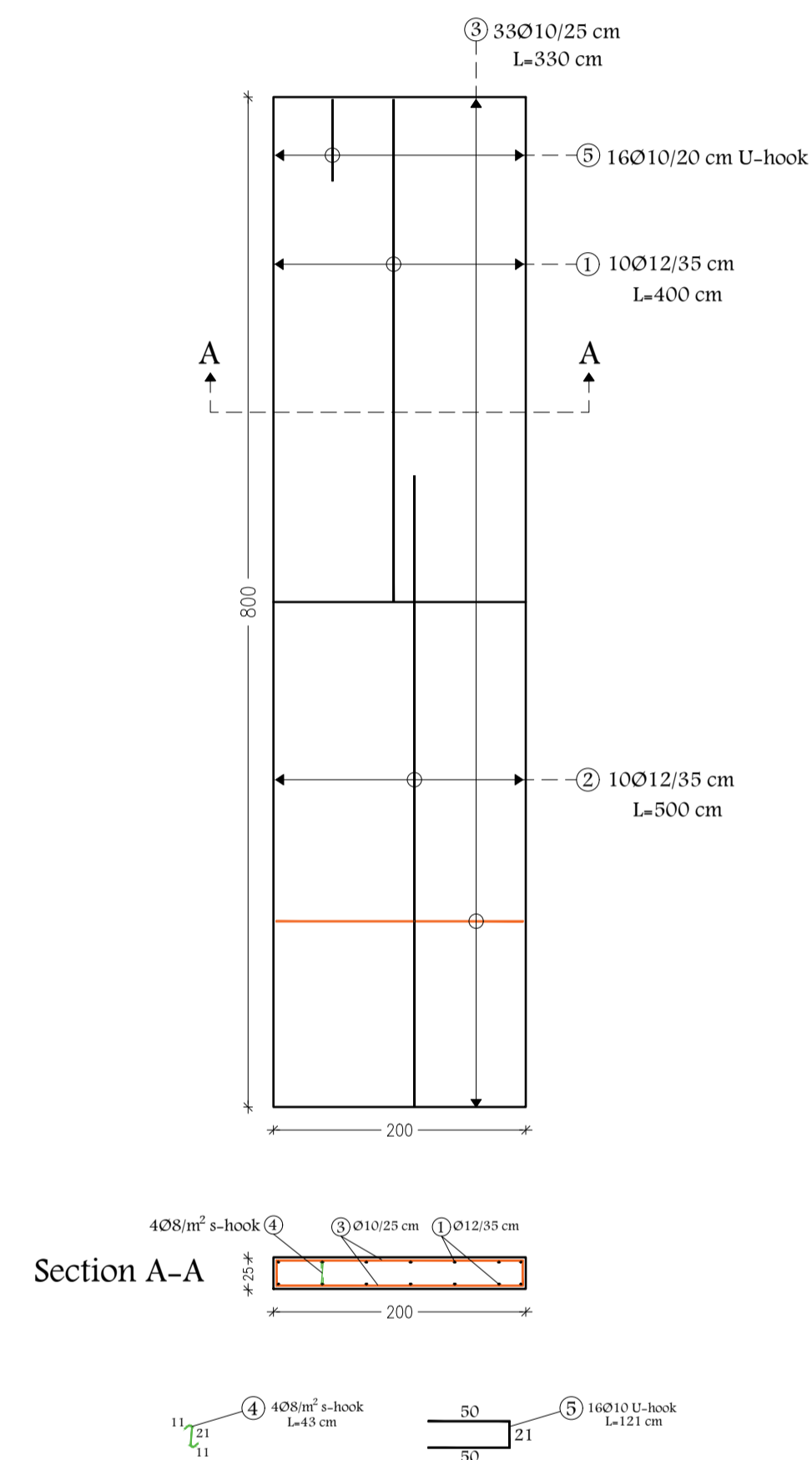
Hatching Key	
	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022

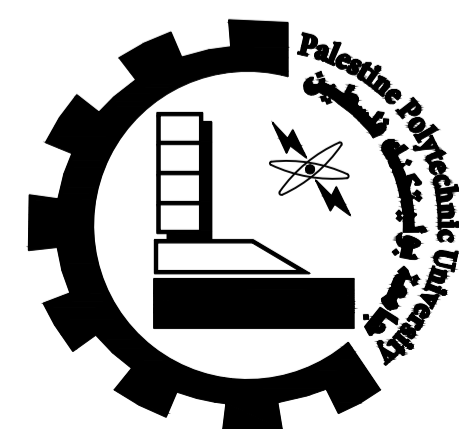
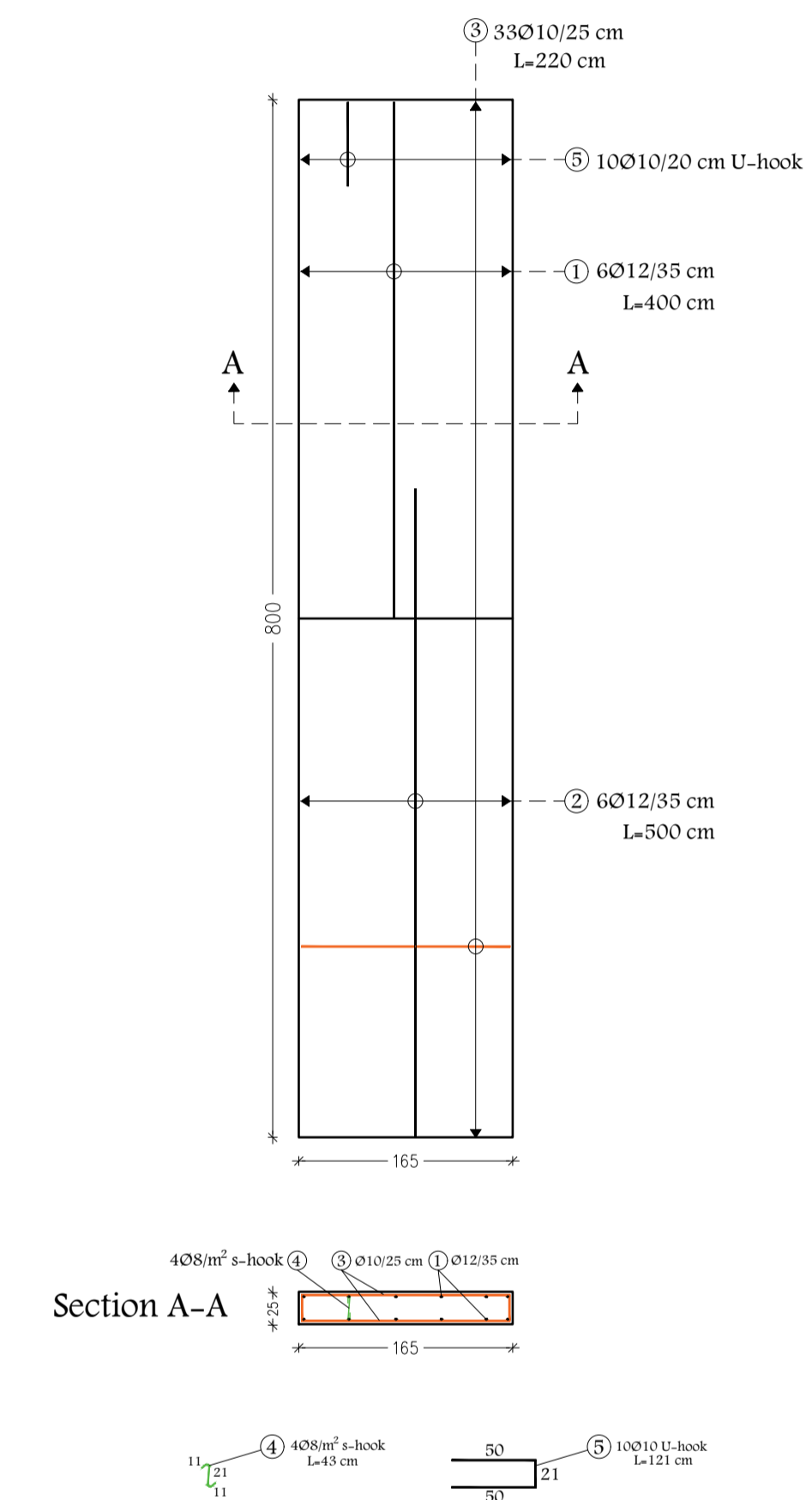
Shear Wall - SW B12 (300x25)cm



Shear Wall - SW B13 (200x25)cm



Shear Wall - SW B14 (190x25)cm



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College of Engineering  
Civil Engineering Department  
Building Engineering



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Graduation Project  
Structural design of a tourist spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

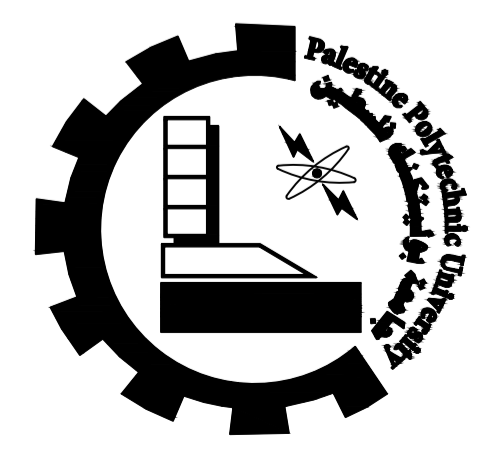
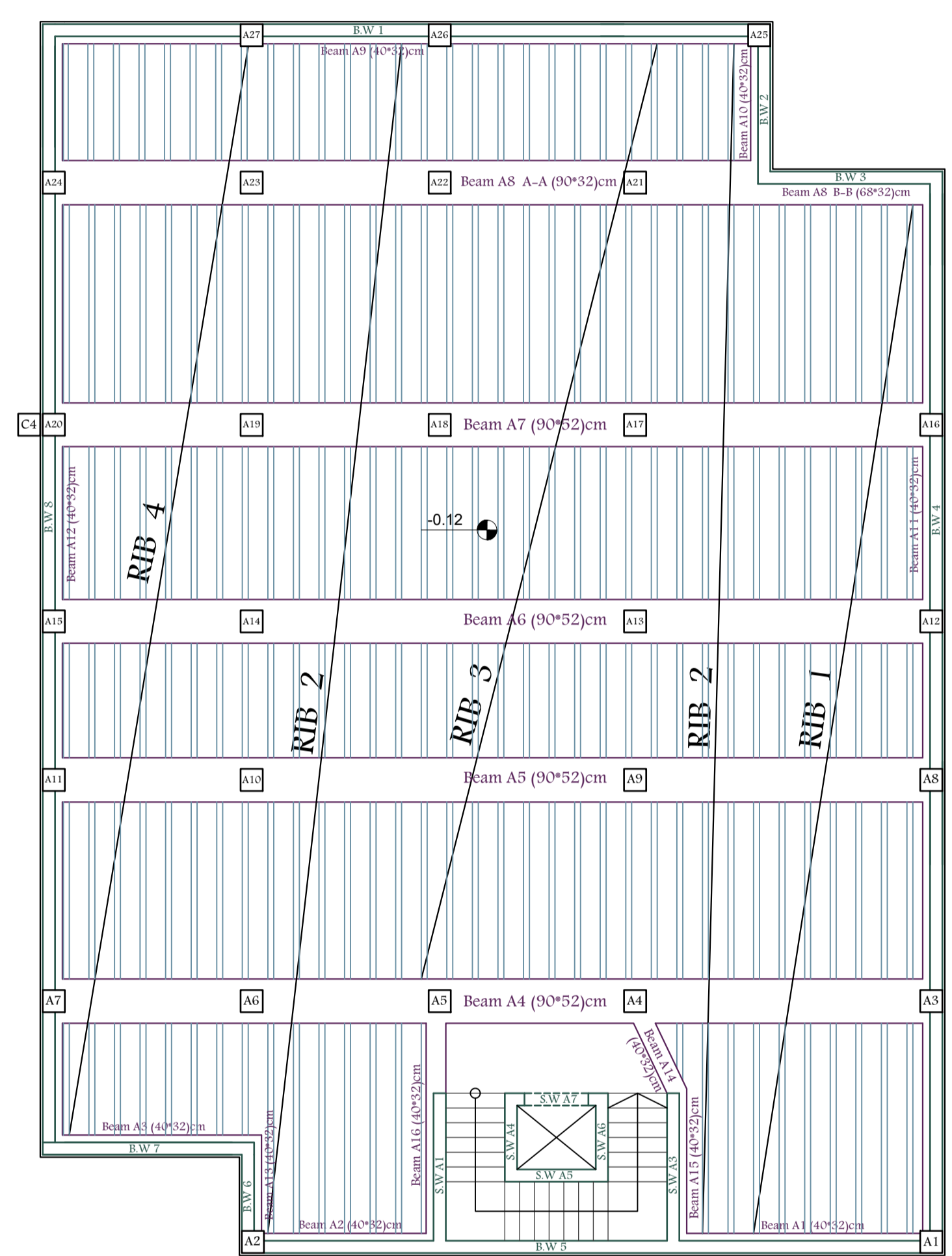
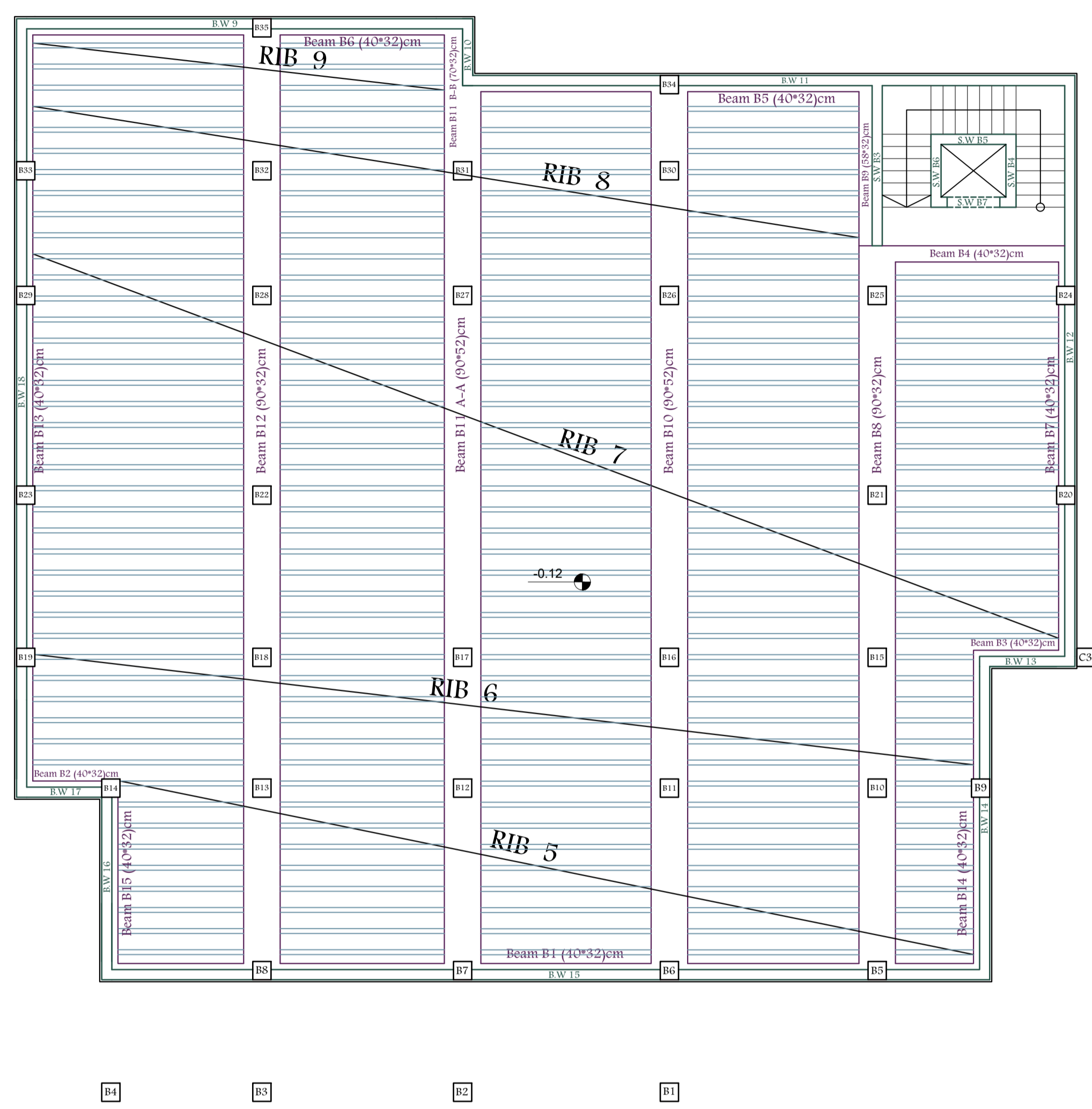
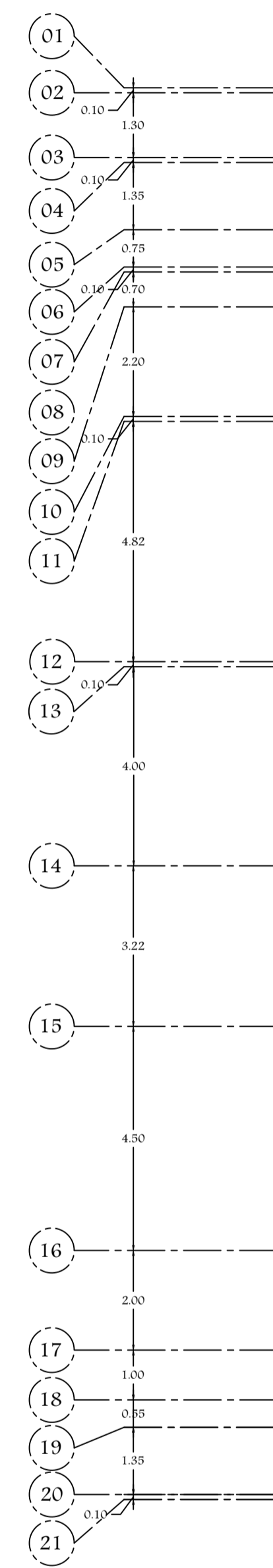
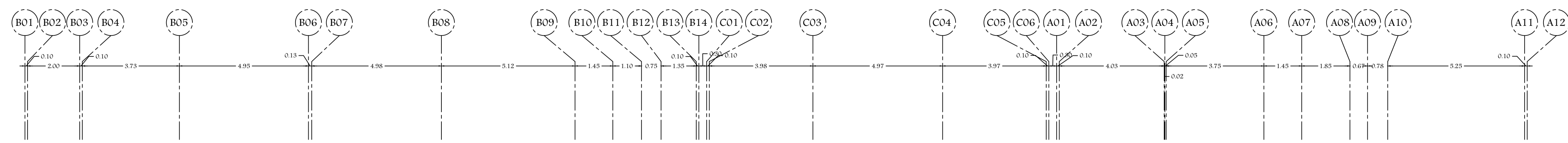
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title  
Shear Wall Reinforcement  
Scale: 1:50  
Drawing No. S23

Hatching Key

	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022



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 Civil Engineering Department  
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Graduation Project  
 Structural design of a tourist spa resort  
 Supervisor:  
 Dr. Nafeth Nasereddin

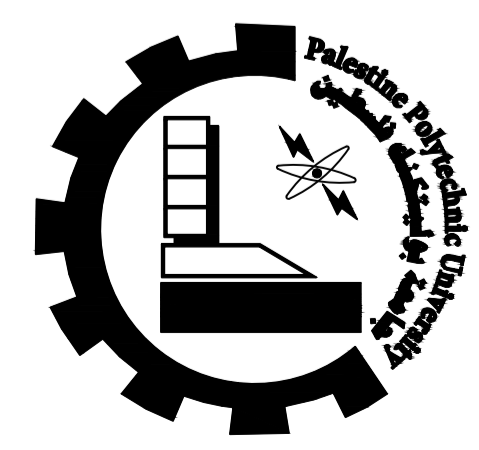
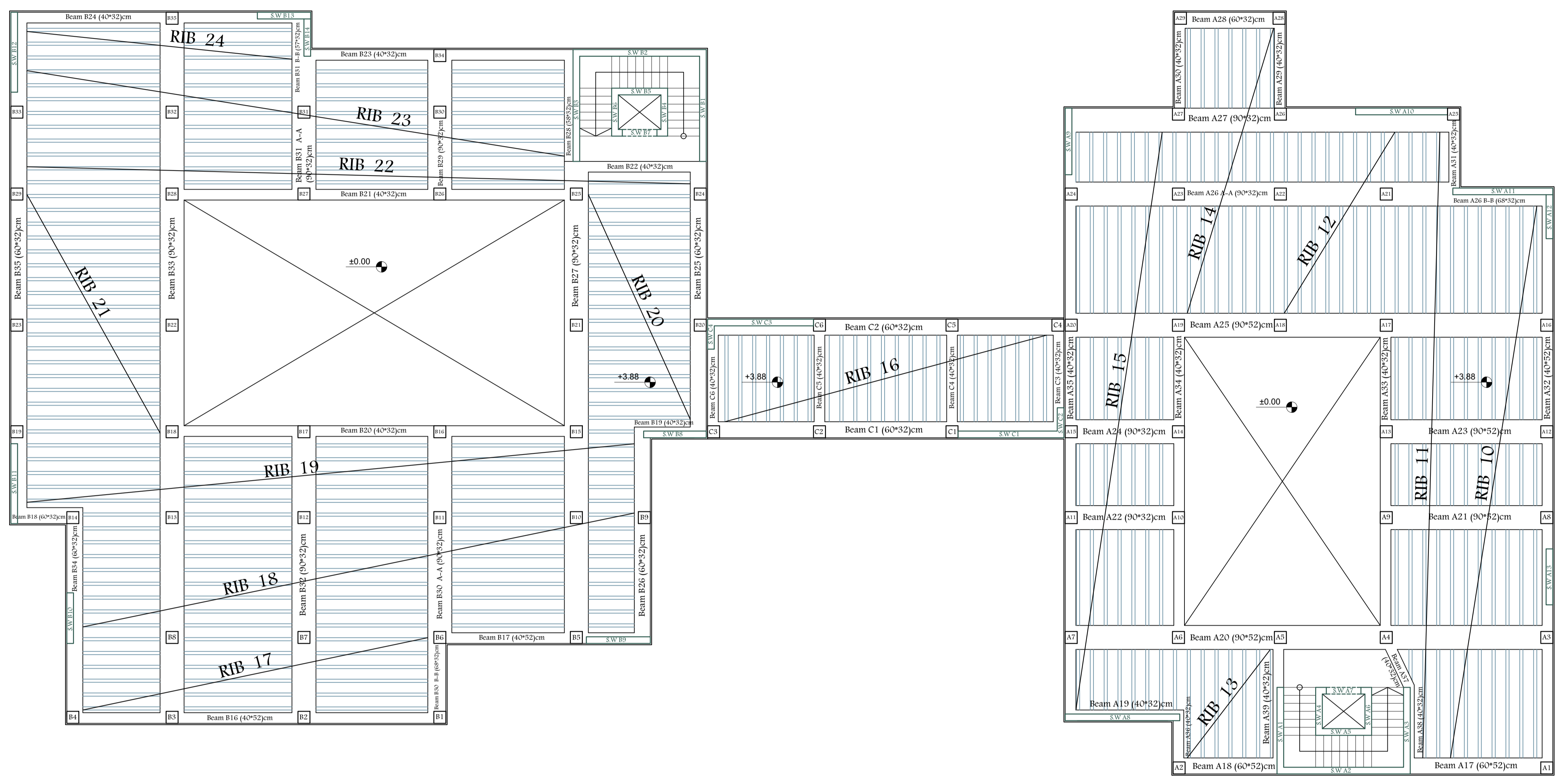
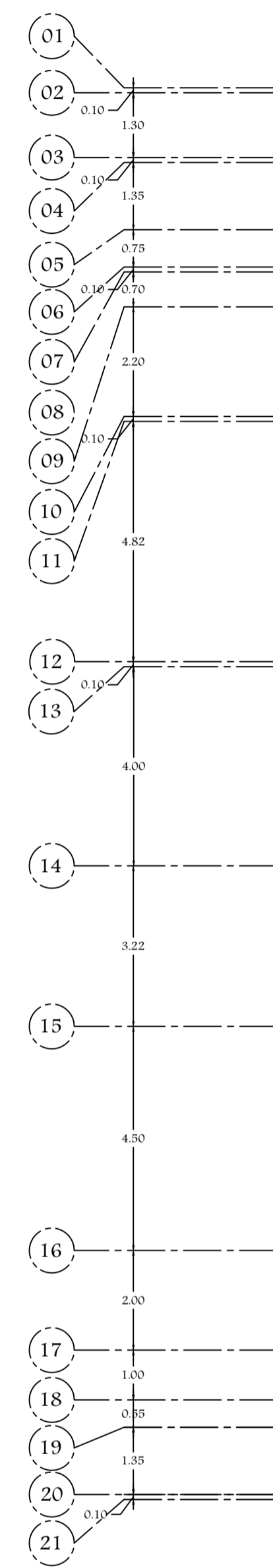
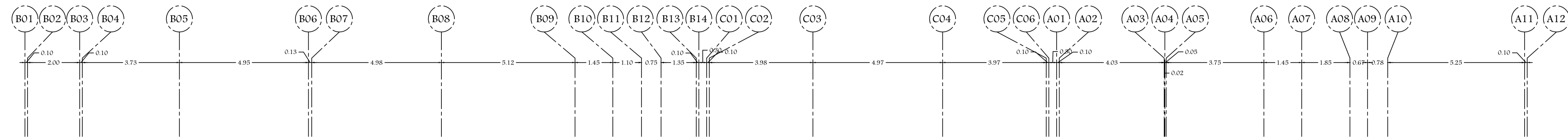
Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

Drawing Title:  
 Basement Floor Slab  
 Scale: 1:100  
 Drawing No. S24

Hatching Key

	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

May 2022



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 Building Engineering



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 Structural design of a tourist spa resort  
 Supervisor:  
 Dr. Nafeth Nasereddin

Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

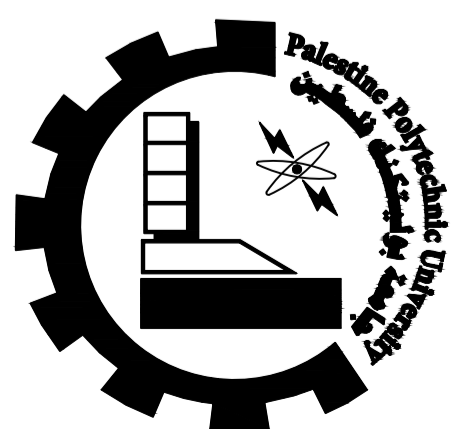
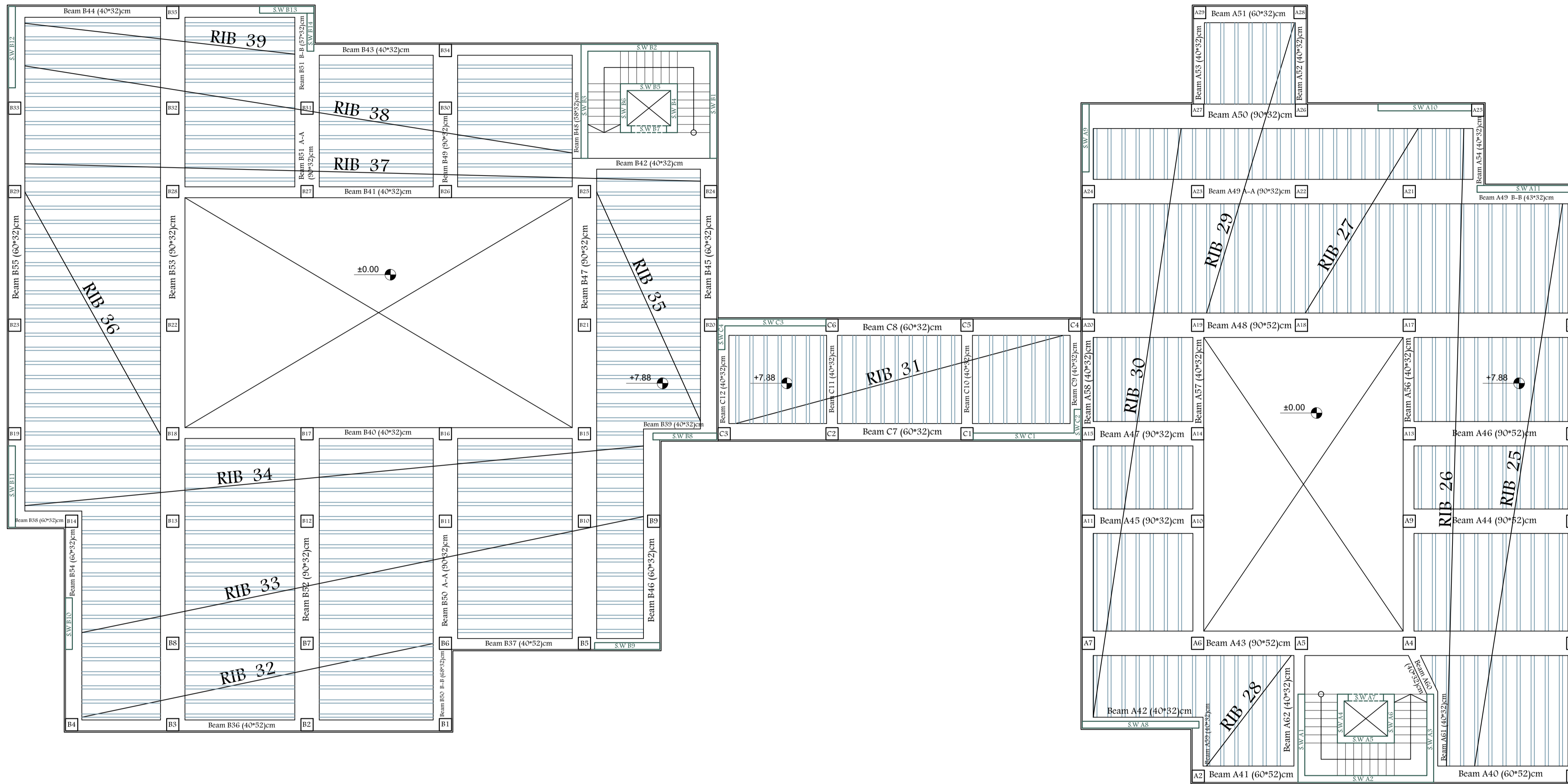
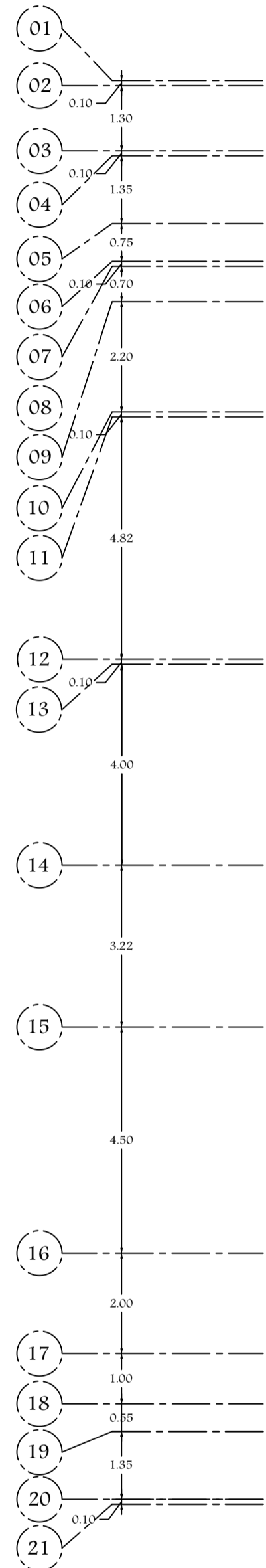
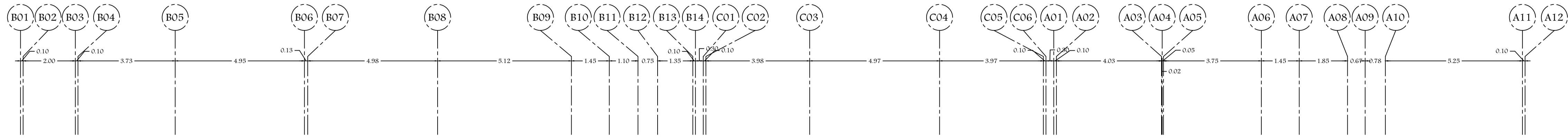
Drawing Title:  
 Ground Floor Slab  
 Scale: 1:100  
 Drawing No. S25

Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022





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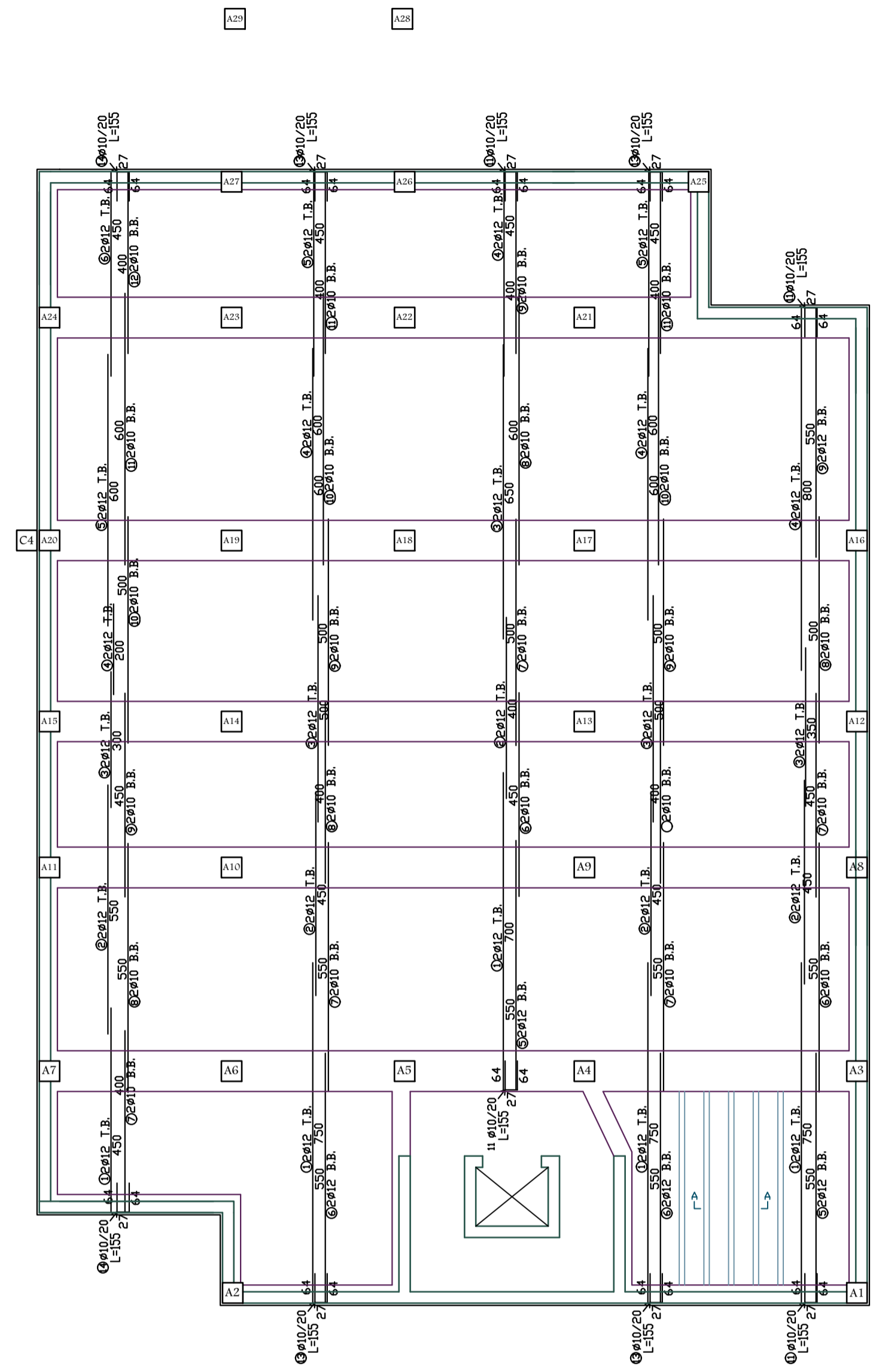
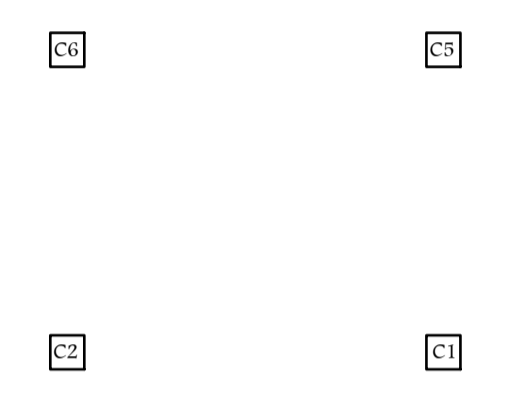
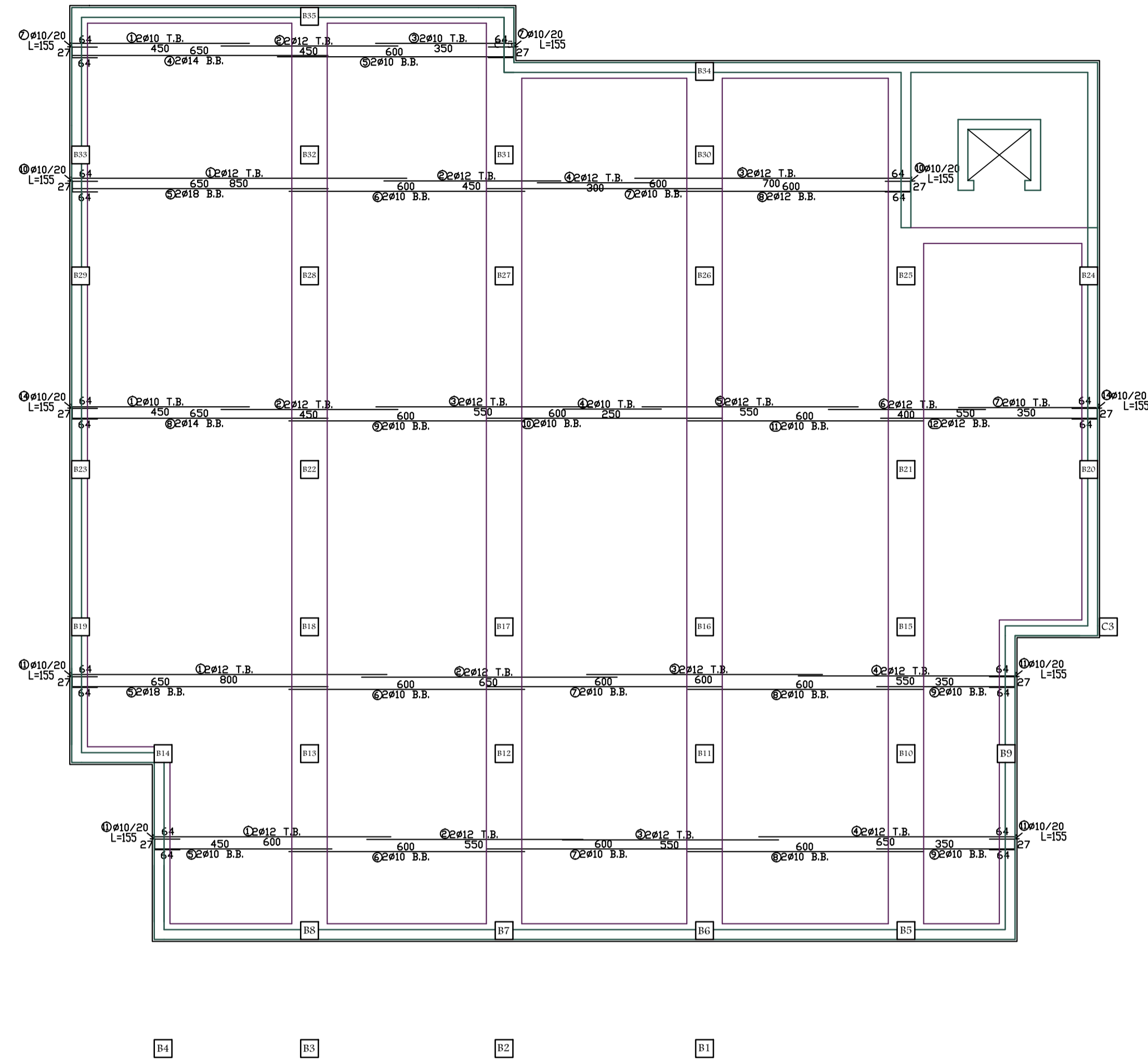
Project Team:  
 Raneen Emad Saafin  
 Rahma Yousef Qawasmi

Drawing Title:  
 First Floor Slab  
 Scale: 1:100  
 Drawing No. S26

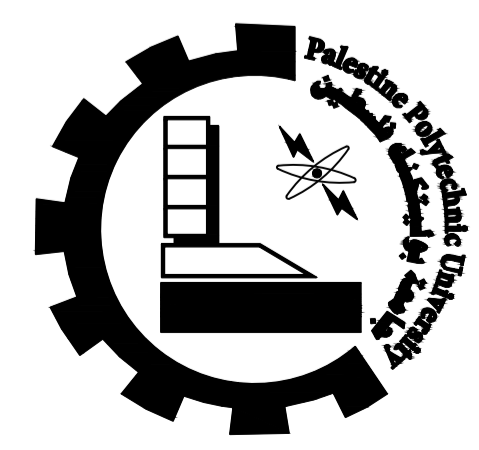
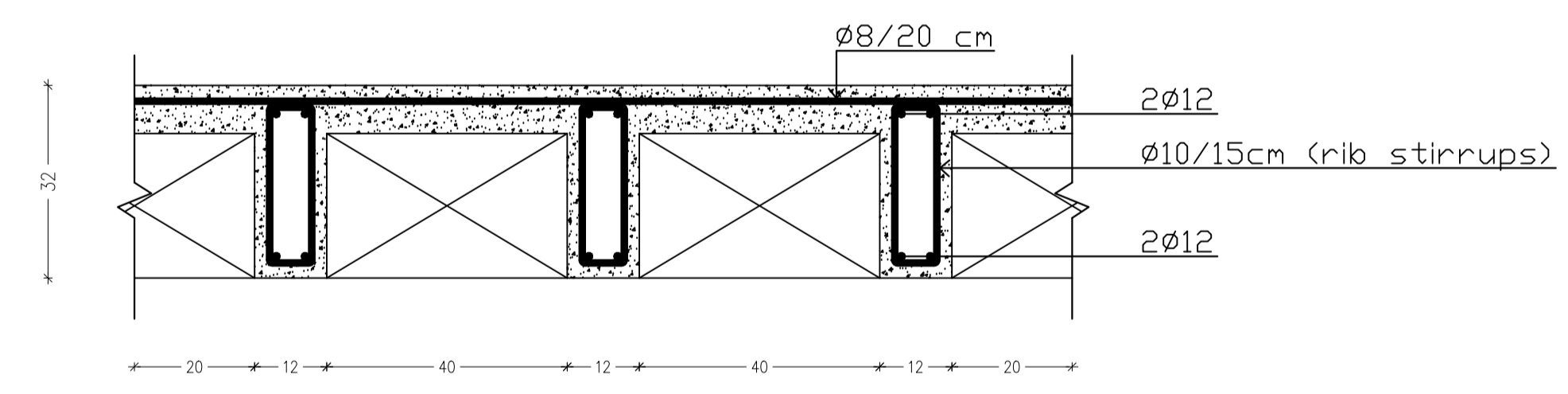
Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022



Section A-A  
SCALE 1:10



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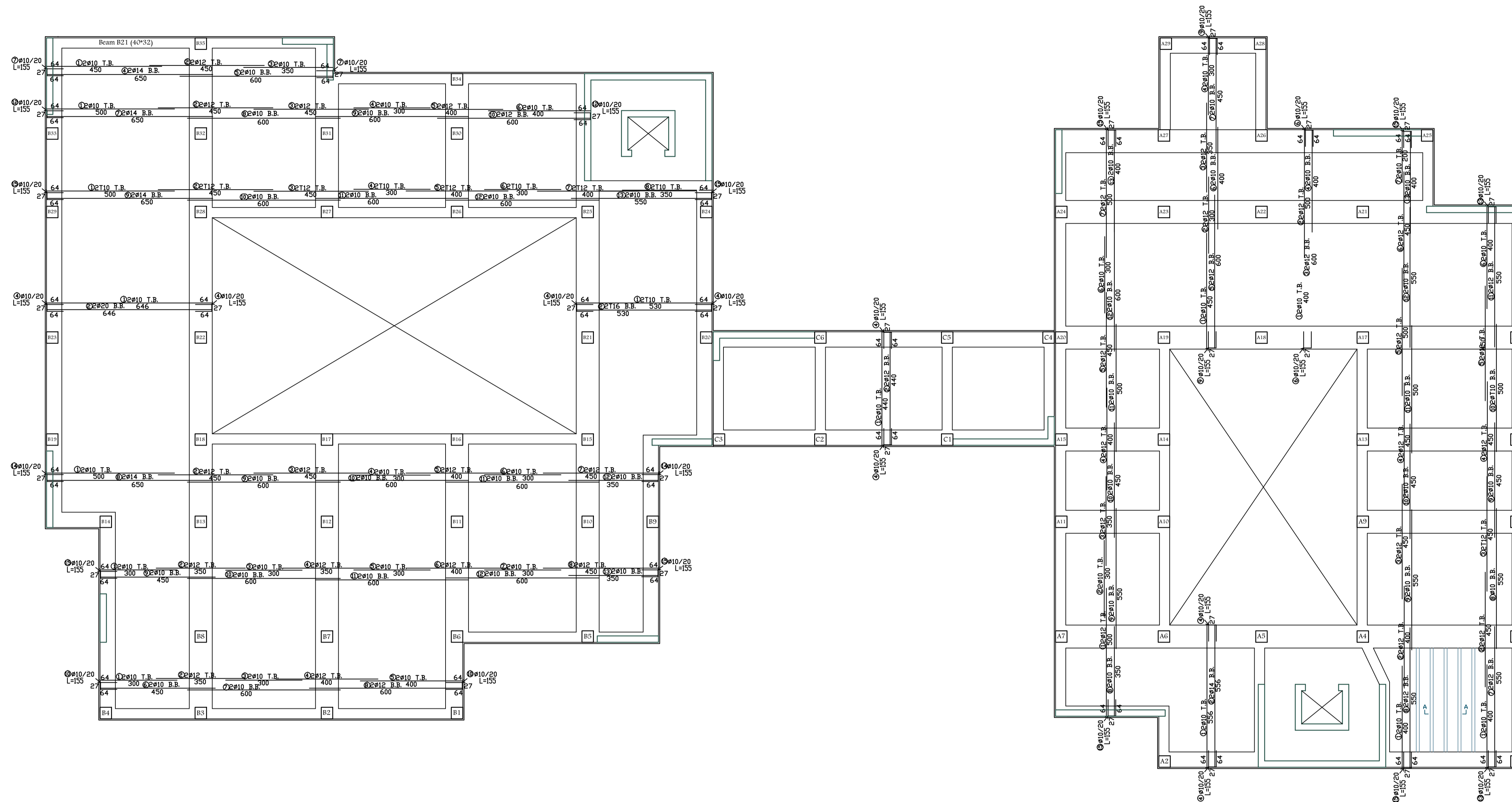
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Basement Floor Slab Reinforcement  
Scale: 1:100  
Drawing No. S27

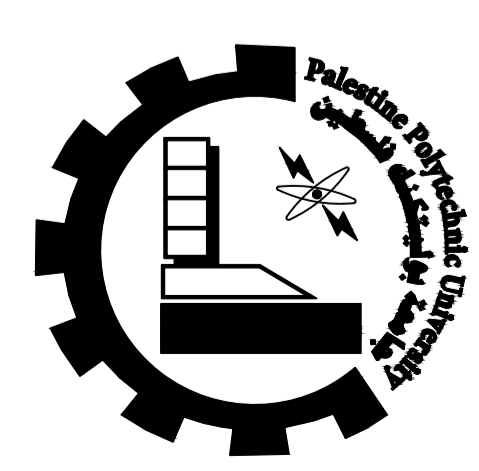
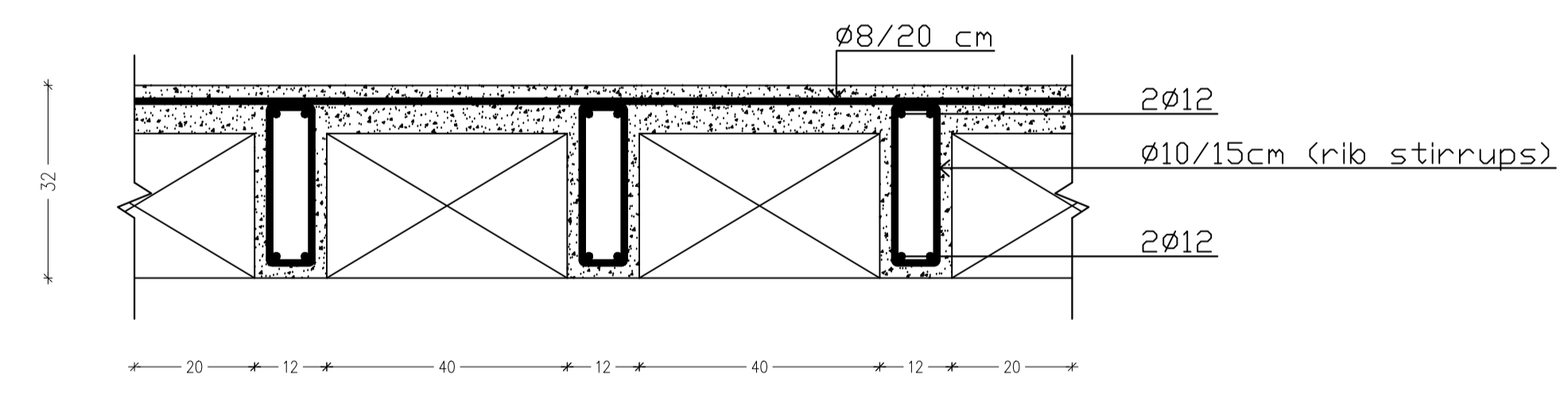
Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022



Section A-A  
SCALE 1:10



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Civil Engineering Department  
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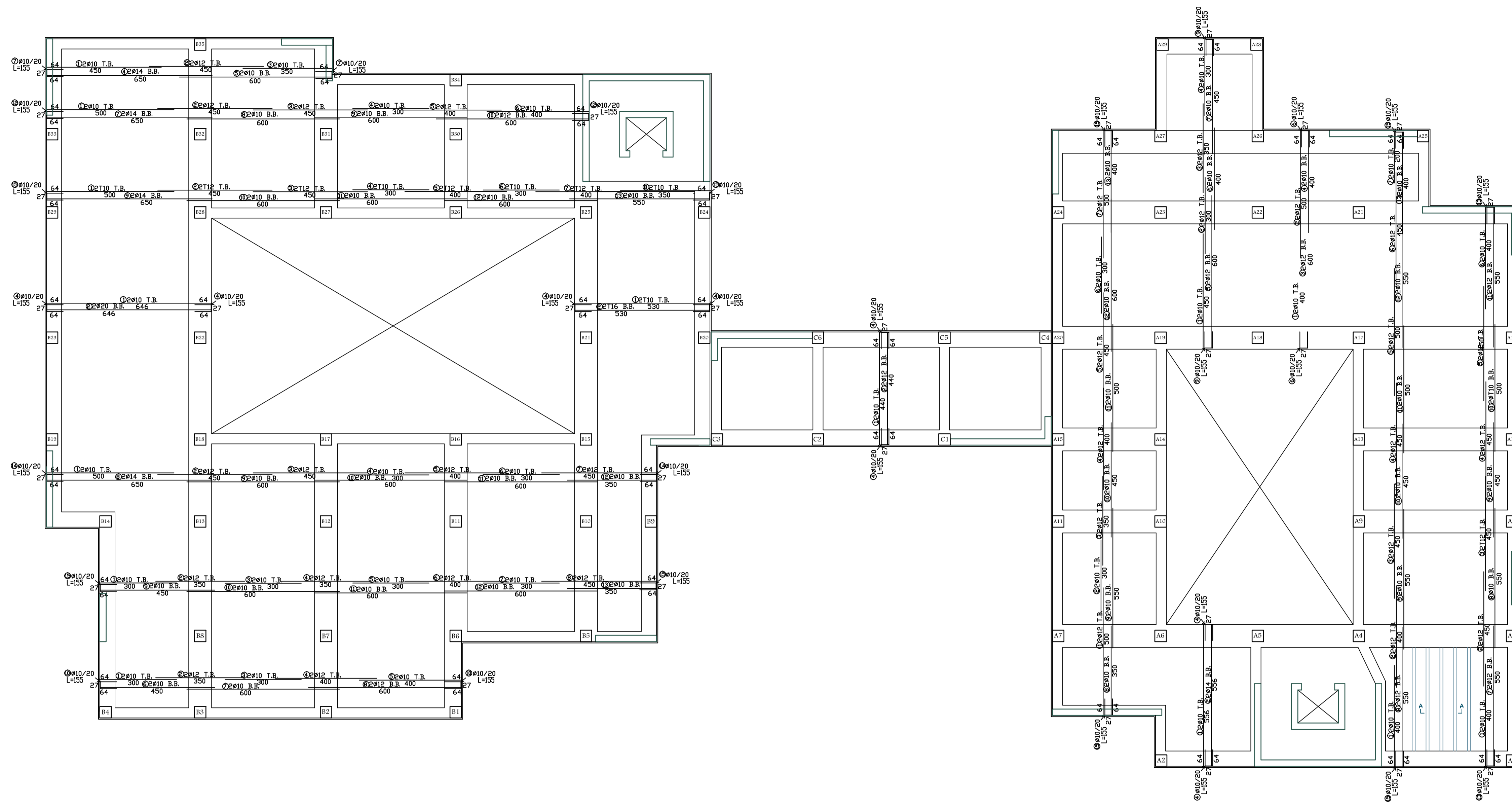
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Ground Floor Slab Reinforcement  
Scale: 1:100  
Drawing No. S28

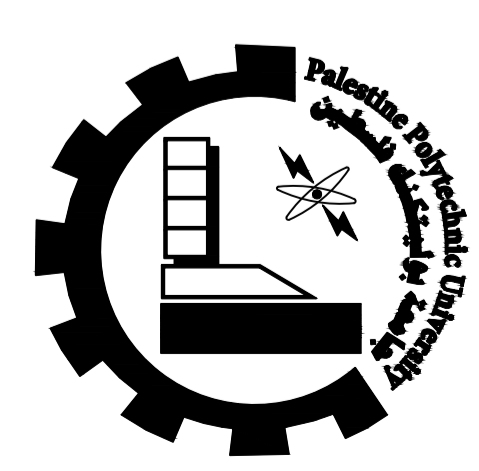
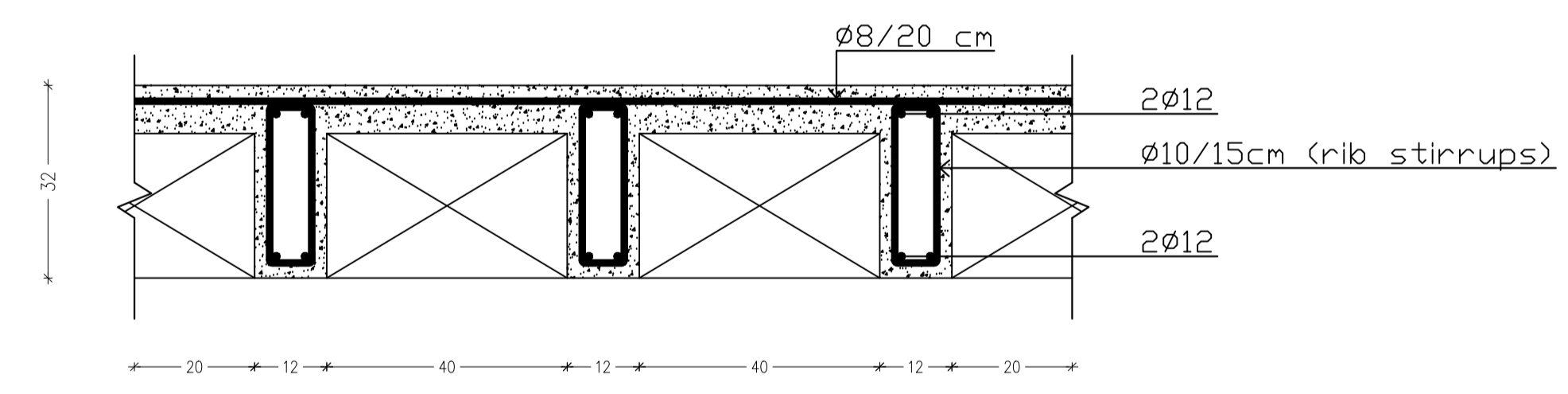
Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022



Section A-A  
SCALE 1:10



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Rahma Yousef Qawasmi

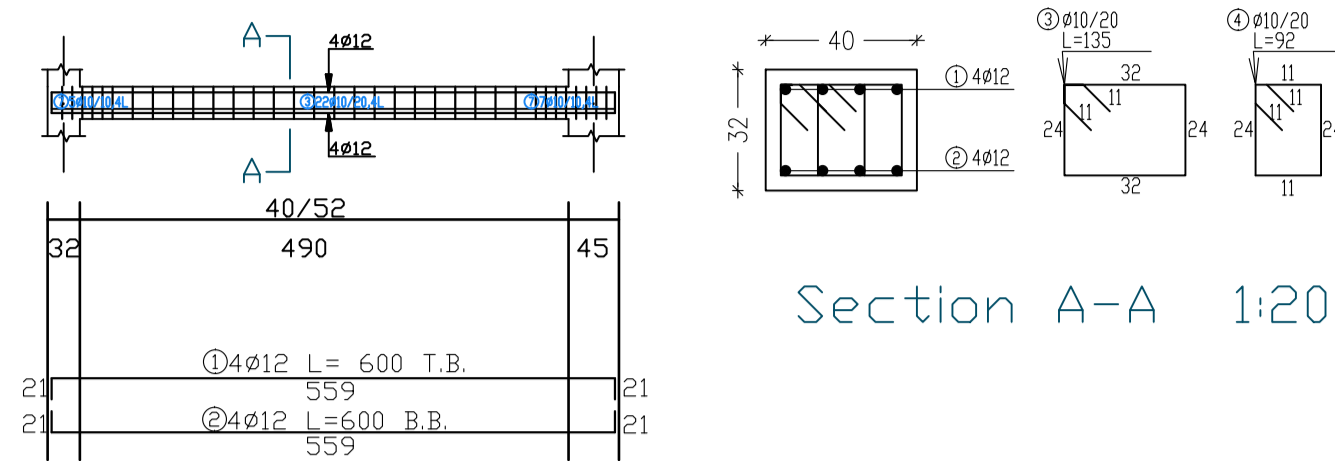
Drawing Title:  
First Floor Slab Reinforcement  
Scale: 1:100  
Drawing No. S29

Hatching Key

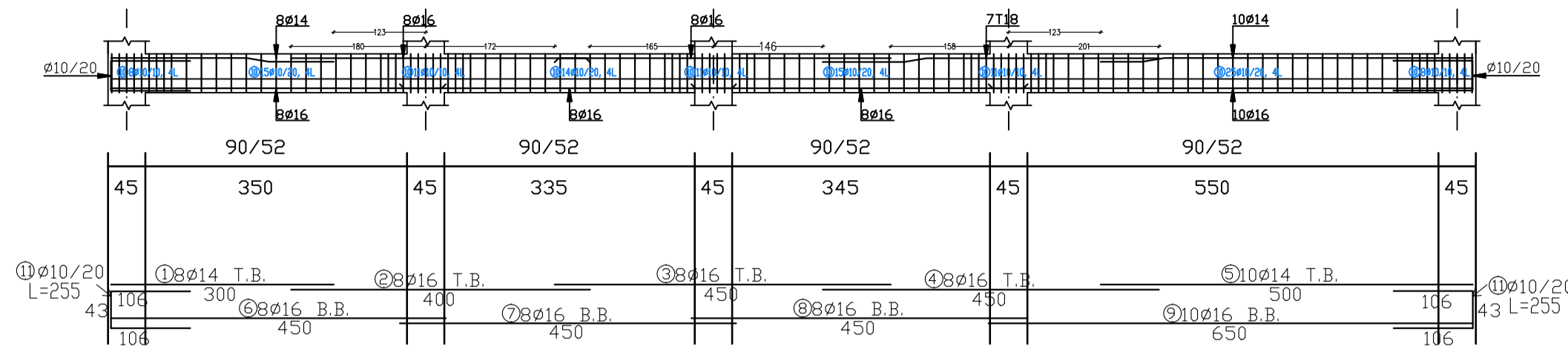
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

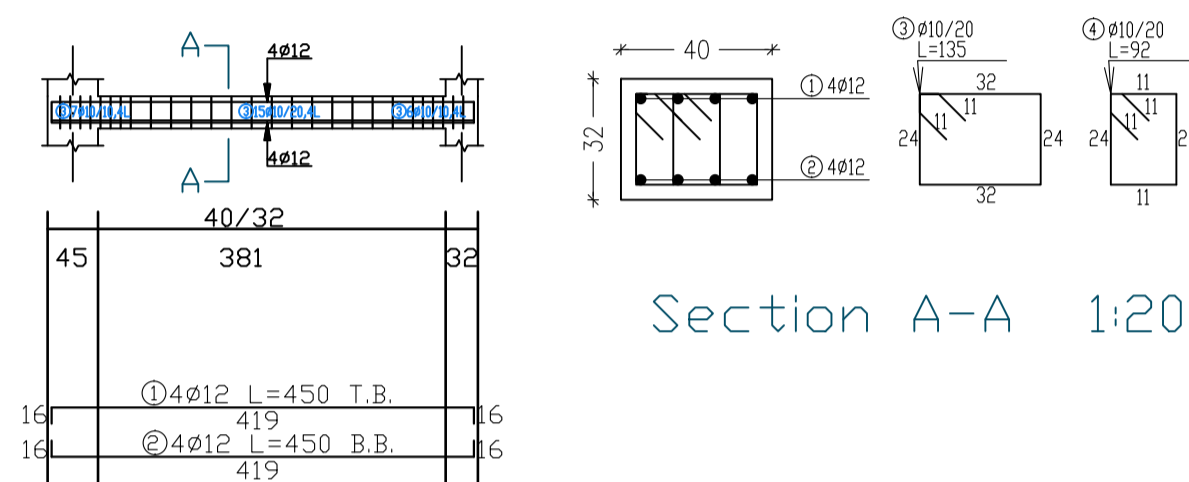
Beam A1 (40x32)cm



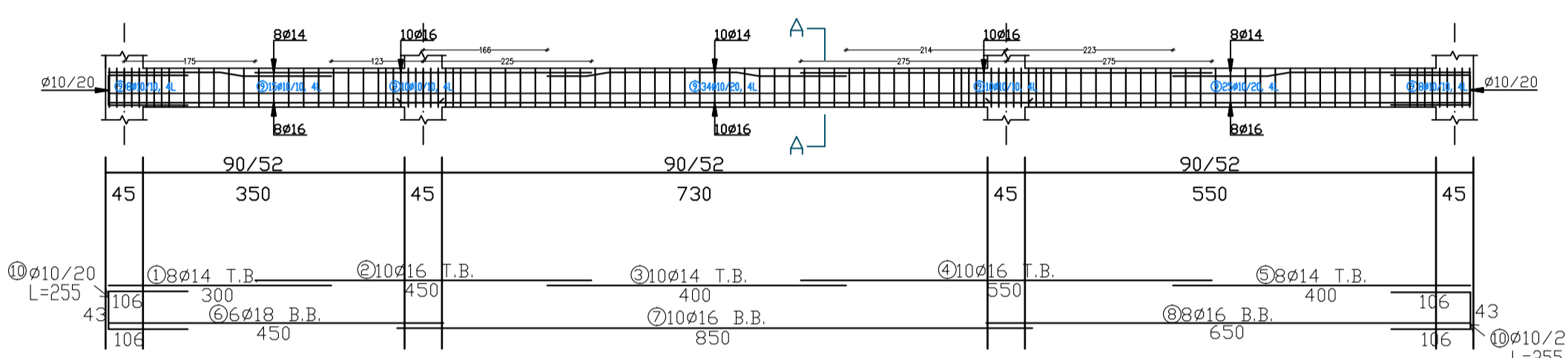
Beam A4 (90x52)cm



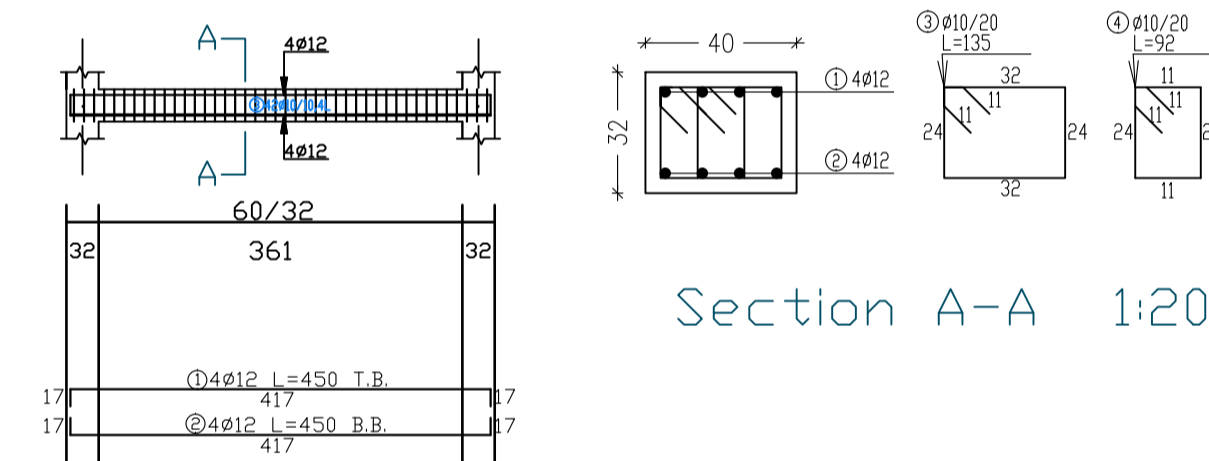
Beam A2 (40x32)cm



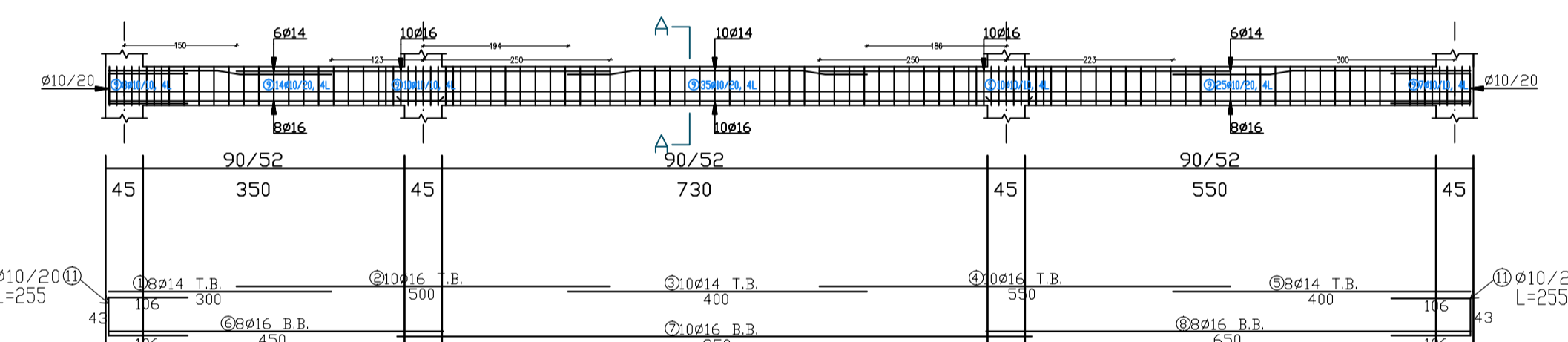
Beam A5 (90x52)cm



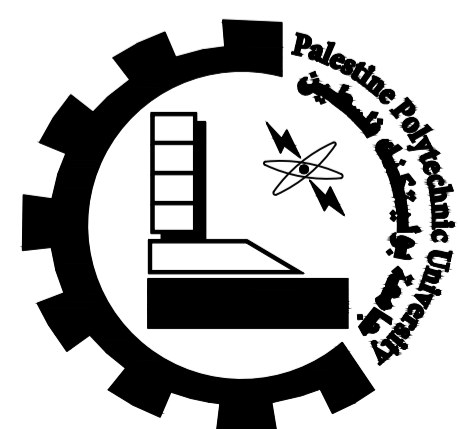
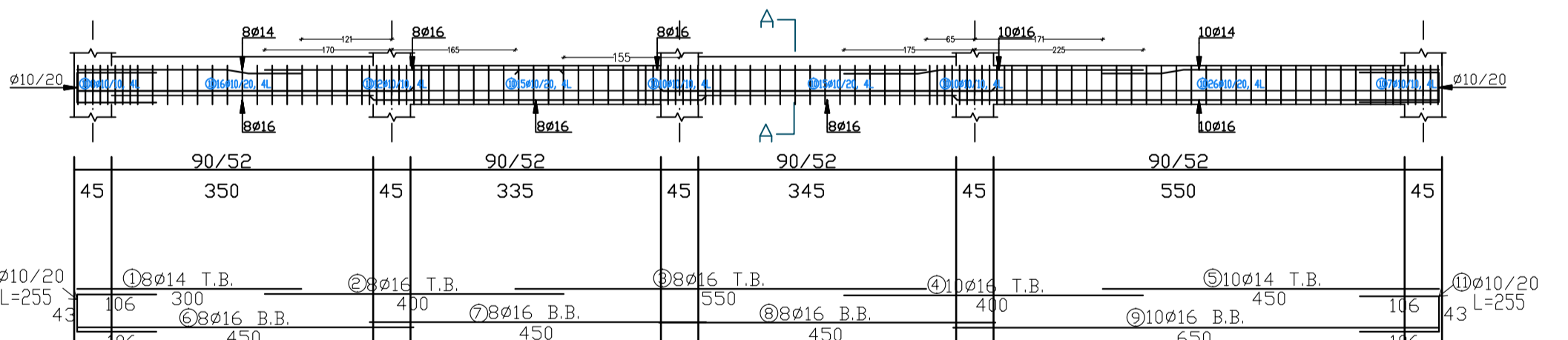
Beam A3 (40x32)cm



Beam A6 (90x52)cm



Beam A7 (90x52)cm



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 Civil Engineering Department  
 Building Engineering



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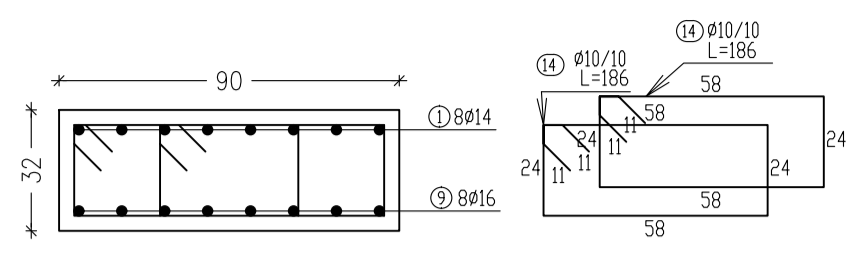
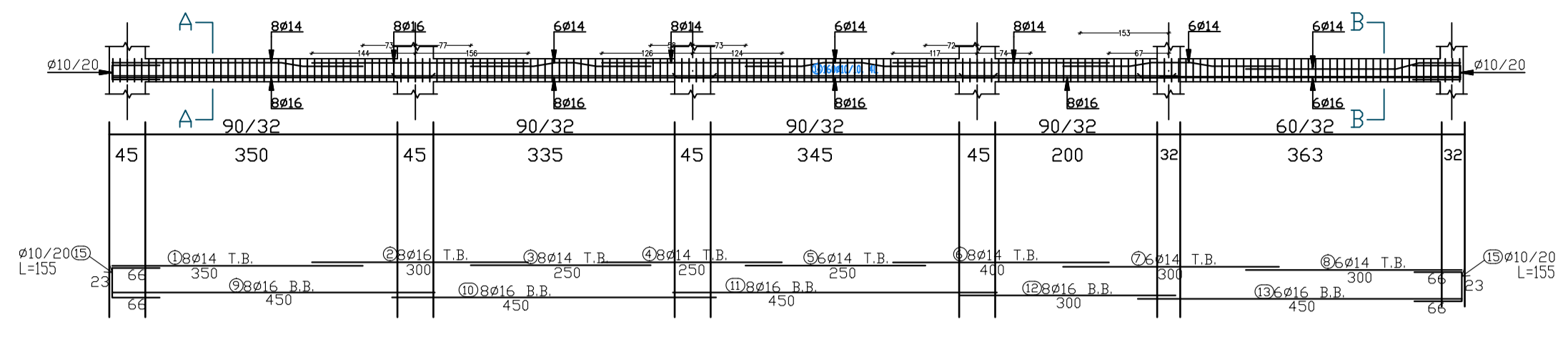
Drawing Title:  
 BEAMS Reinforcement  
 Basement A  
 Scale: 1:75  
 Drawing No. S30

Hatching Key

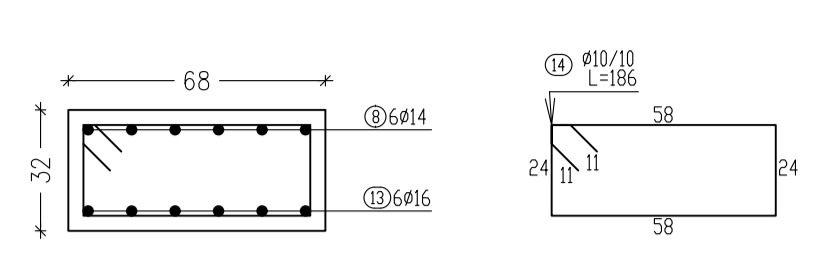
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

Beam A8 : A-A (90/32) & B-B (68 /32)

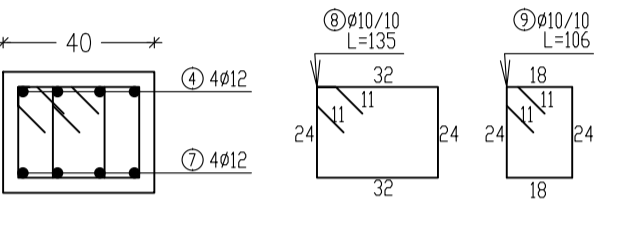
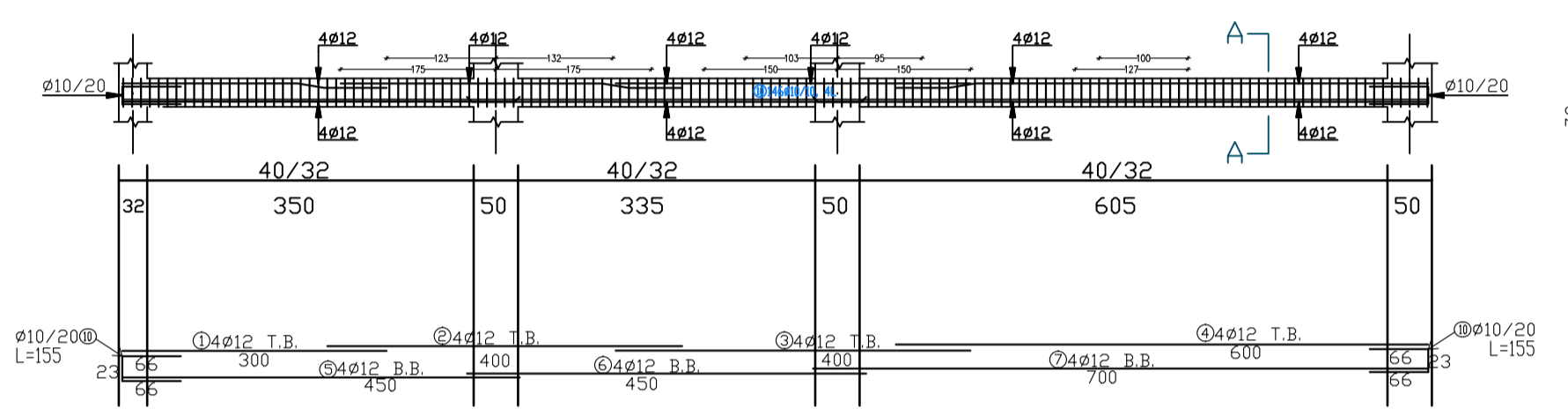


Section A-A 1:20



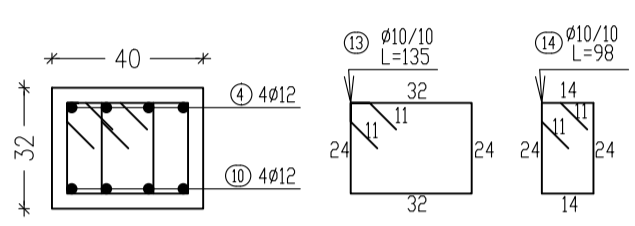
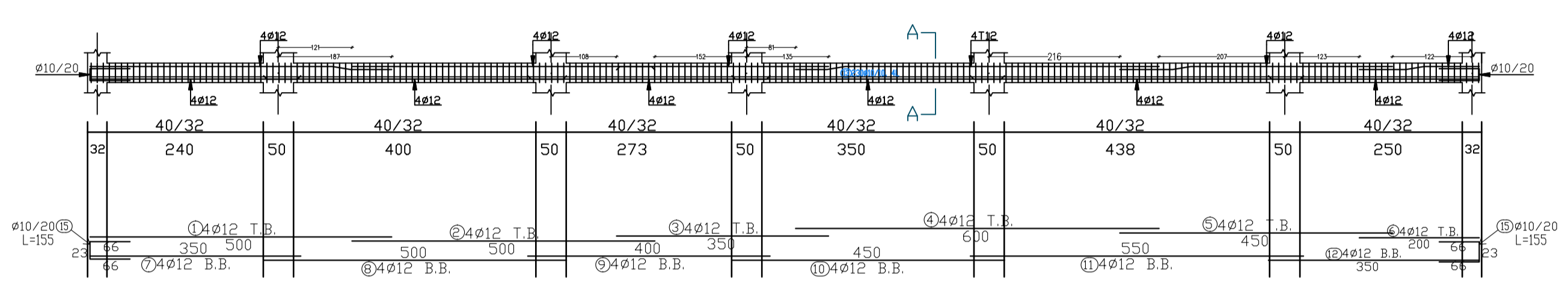
Section B-B 1:20

Beam A9 (40x32)cm



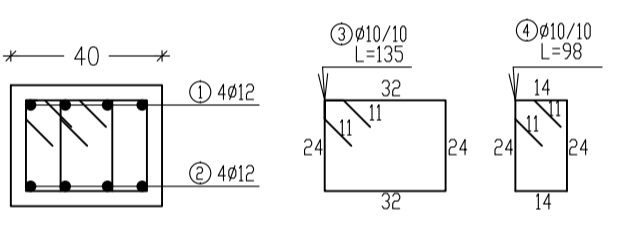
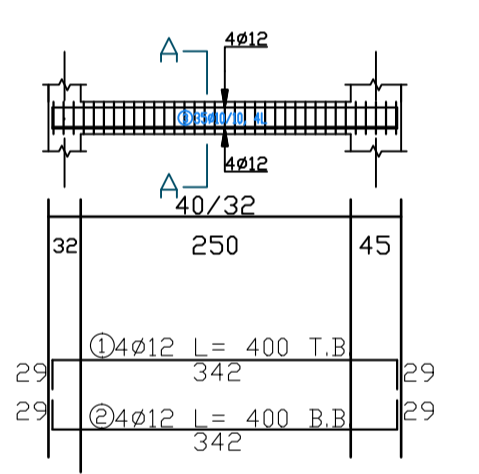
Section A-A 1:20

Beam A12 (40x32)cm



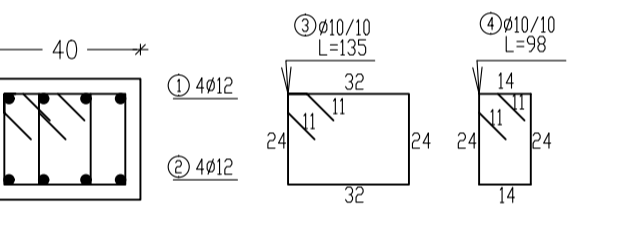
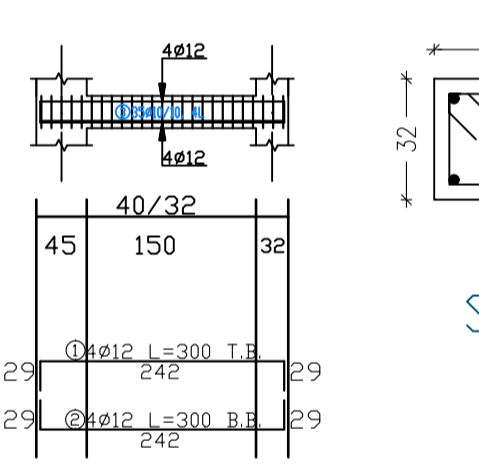
Section A-A 1:20

Beam A10 (40x32)cm



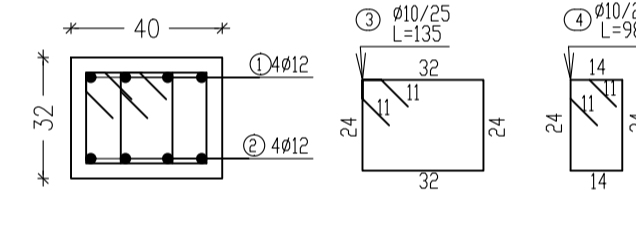
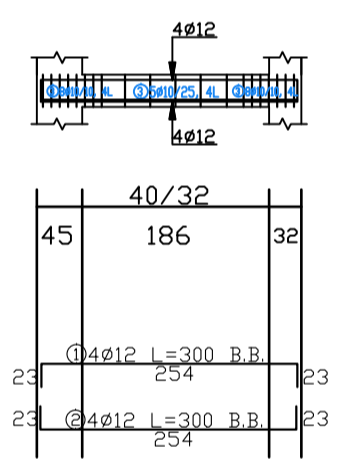
Section A-A 1:20

Beam A13 (40x32)cm



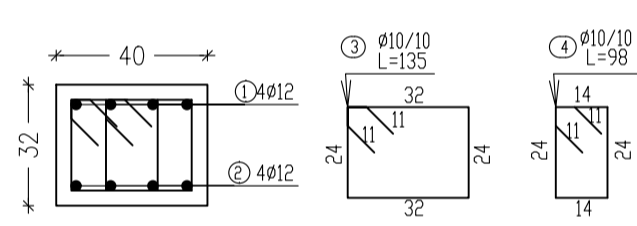
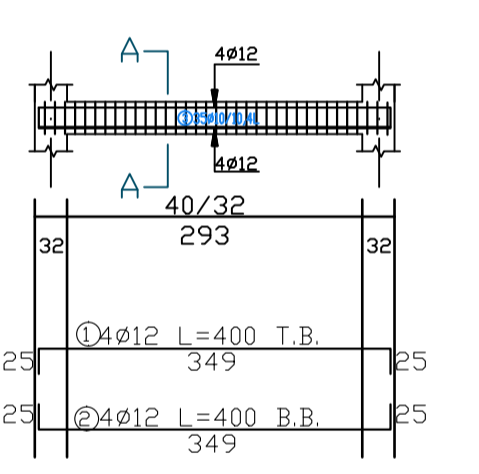
Section A-A 1:20

Beam A14 (40x32)cm



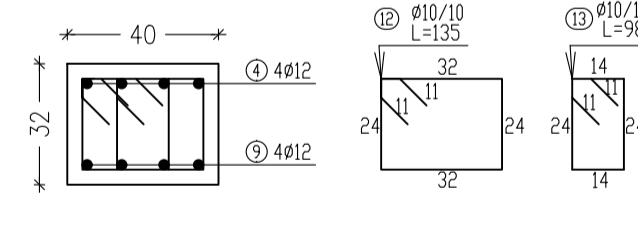
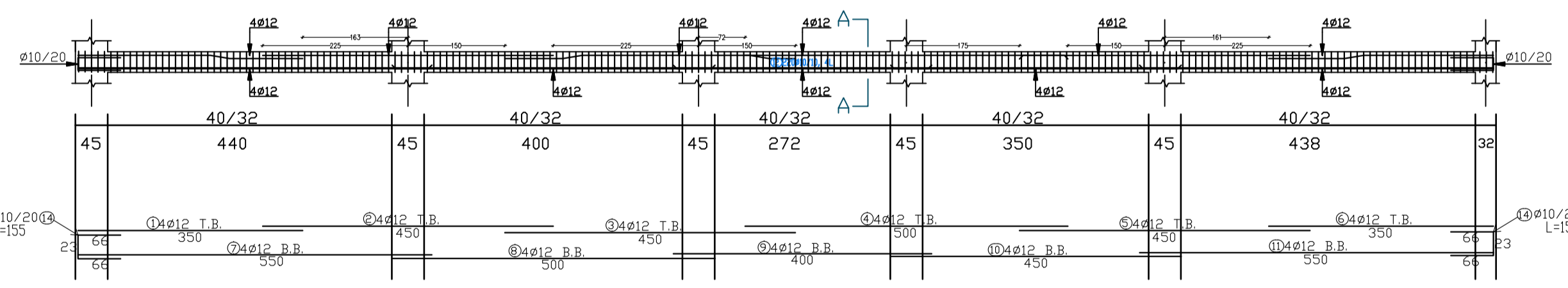
Section A-A 1:20

Beam A15 (40x32)cm



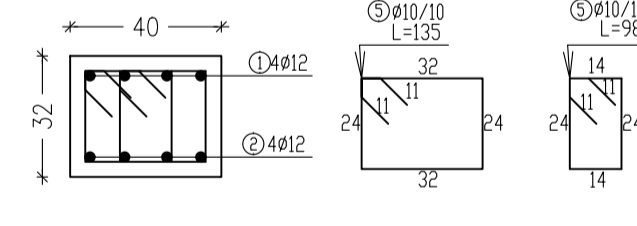
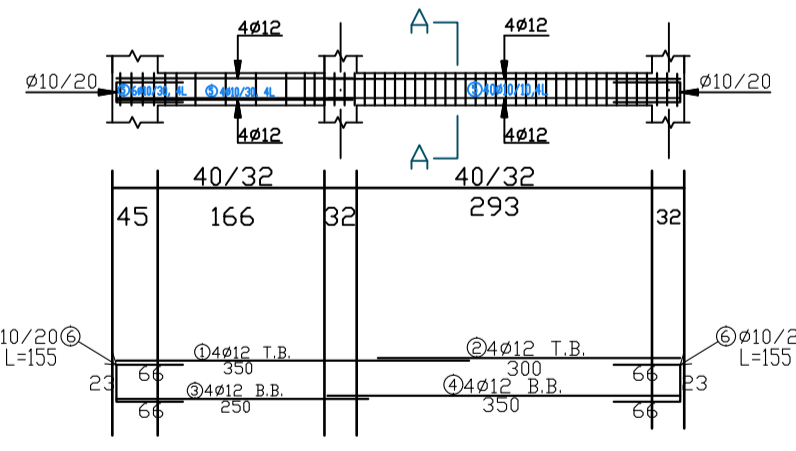
Section A-A 1:20

Beam A11 (40x32)cm

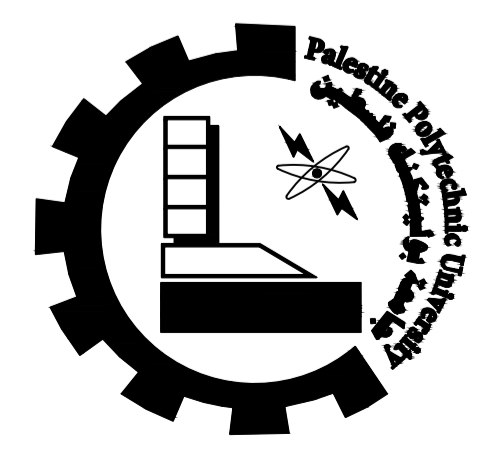


Section A-A 1:20

Beam A16 (40x32)cm



Section A-A 1:20



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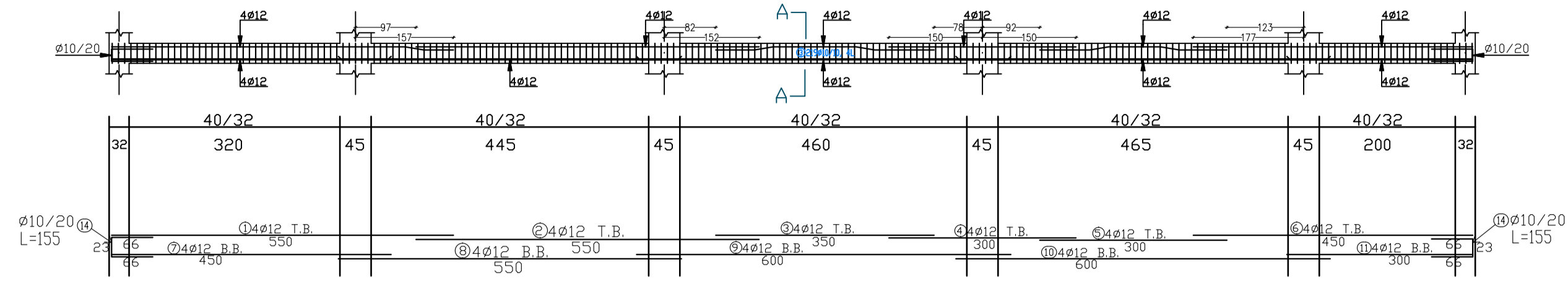
Drawing Title:  
BEAMS Reinforcement  
Basement A  
Scale: 1:75  
Drawing No. S31

Hatching Key

	Concrete
	Reinforced Concrete
	Cement Brick
	Stone

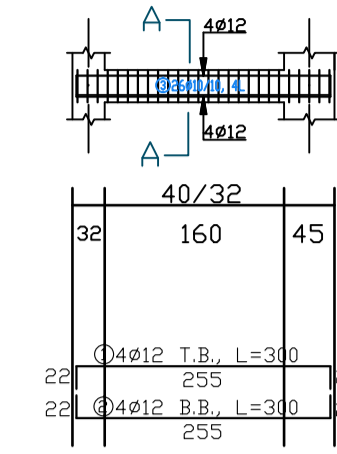
May 2022

### Beam B1 (40x32)cm



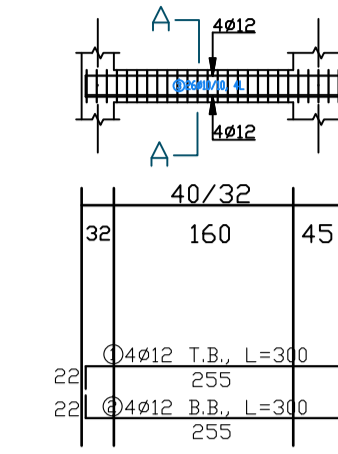
Section A-A 1:20

### Beam B2 (40x32)cm



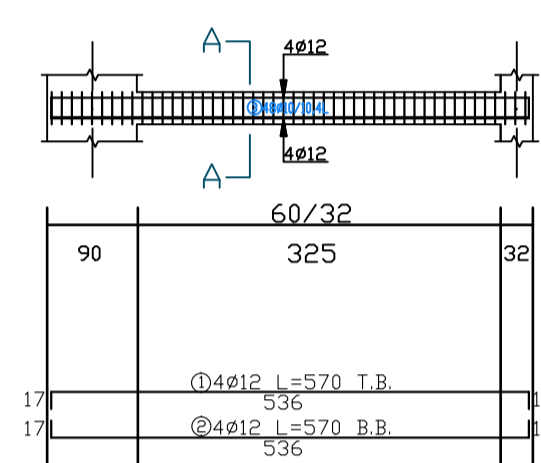
Section A-A 1:20

### Beam B3 (40x32)cm



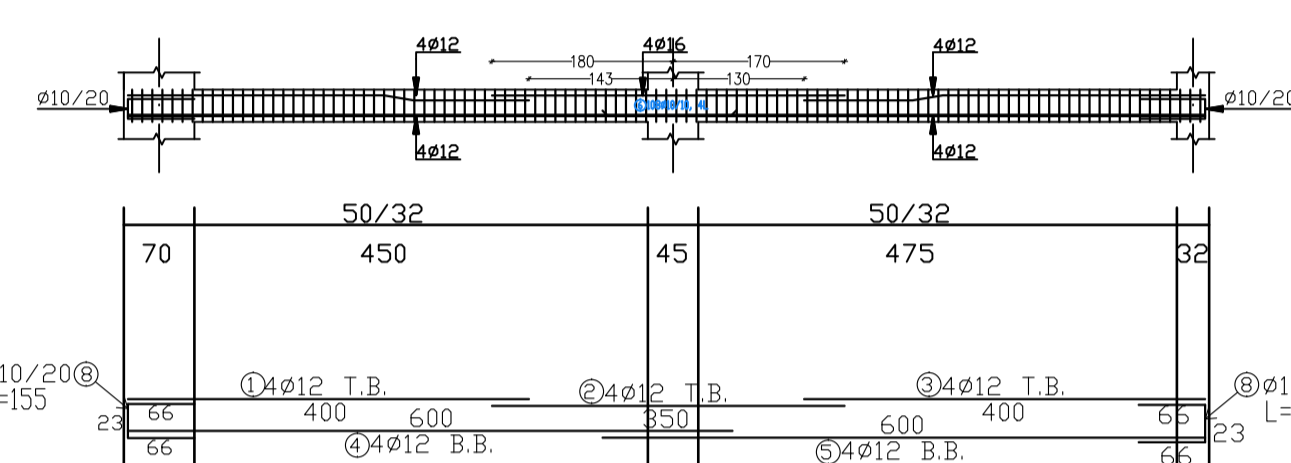
Section A-A 1:20

### Beam B4 (40x32)cm



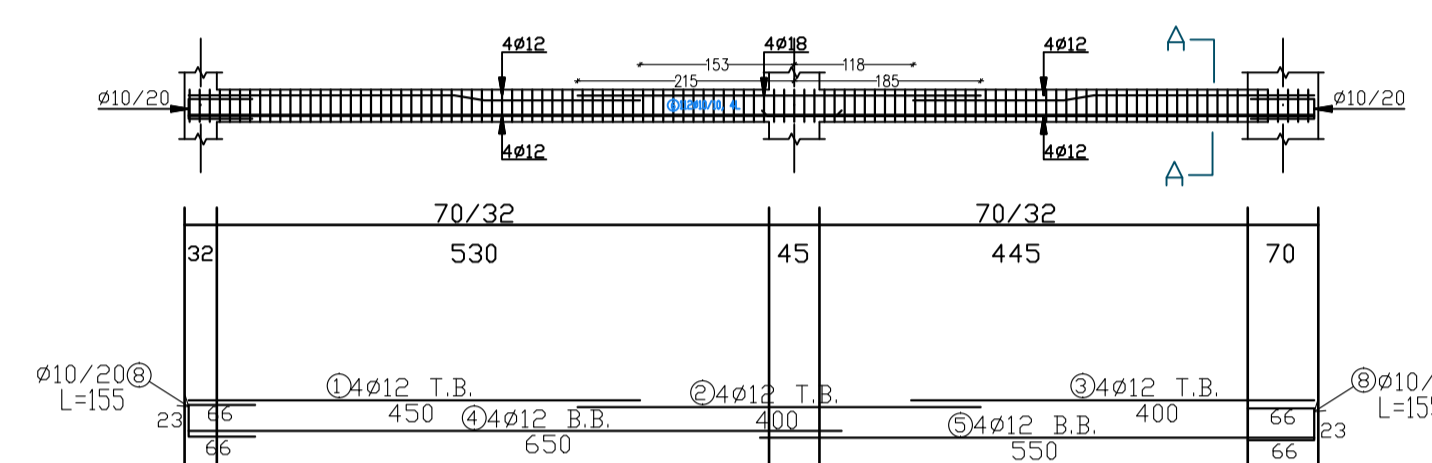
Section A-A 1:20

### Beam B5 (40x32)cm



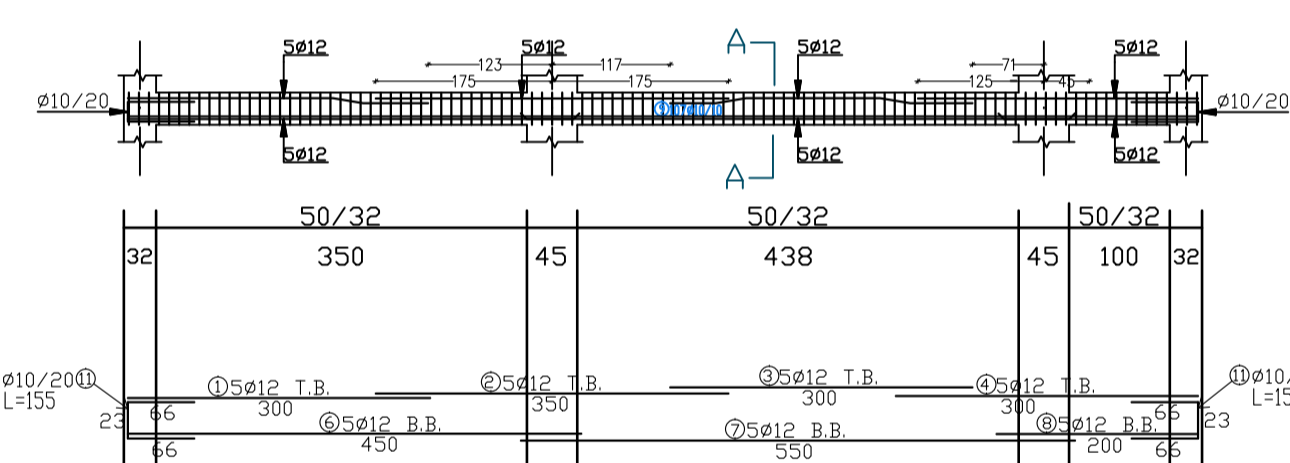
Section A-A 1:20

### Beam B6 (40x32)cm



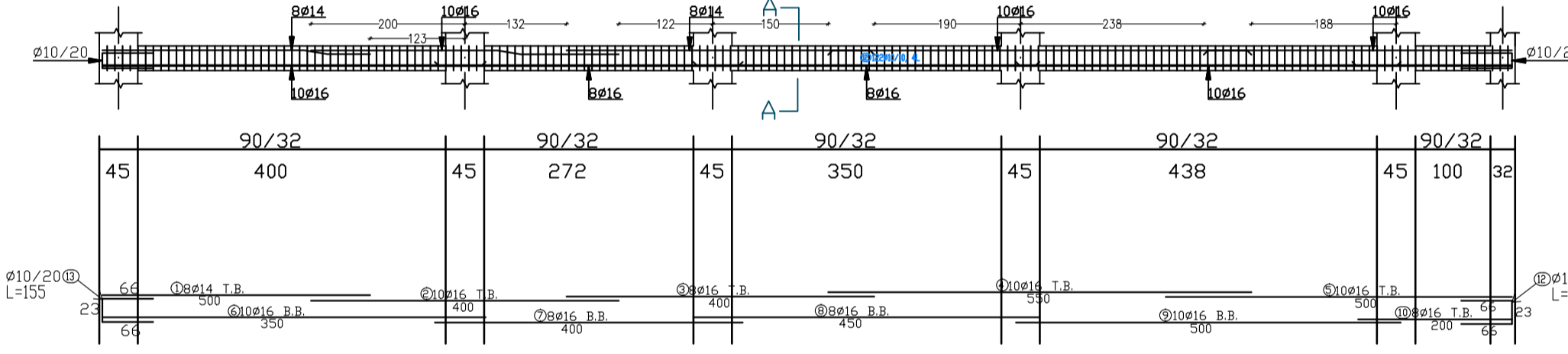
Section A-A 1:20

### Beam B7 (40x32)cm



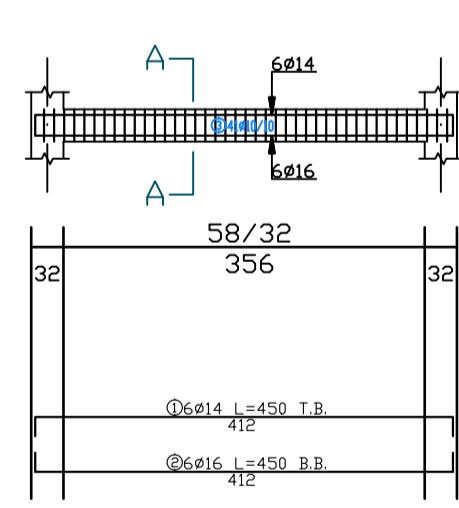
Section A-A 1:20

### Beam B8 (90/32)cm



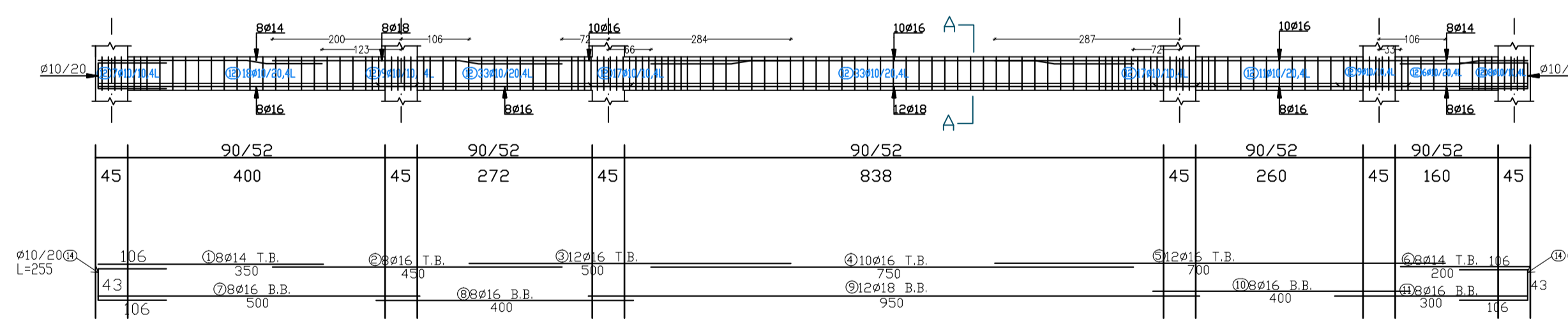
Section A-A 1:20

### Beam B9 (58x52)cm

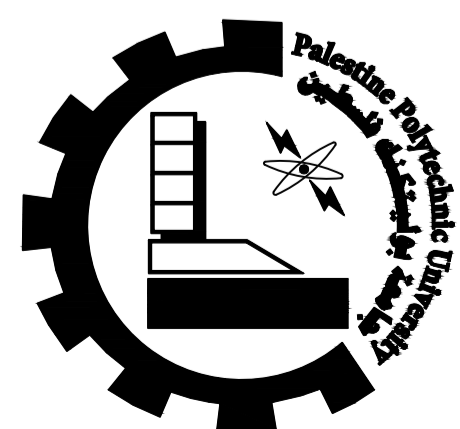


Section A-A 1:20

### Beam B10 (90x52)cm



Section A-A 1:20



Palestine Polytechnic University  
College of Engineering  
Civil Engineering Department  
Building Engineering



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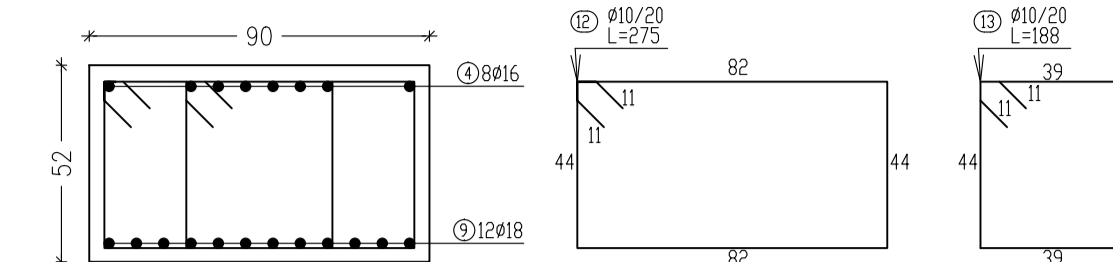
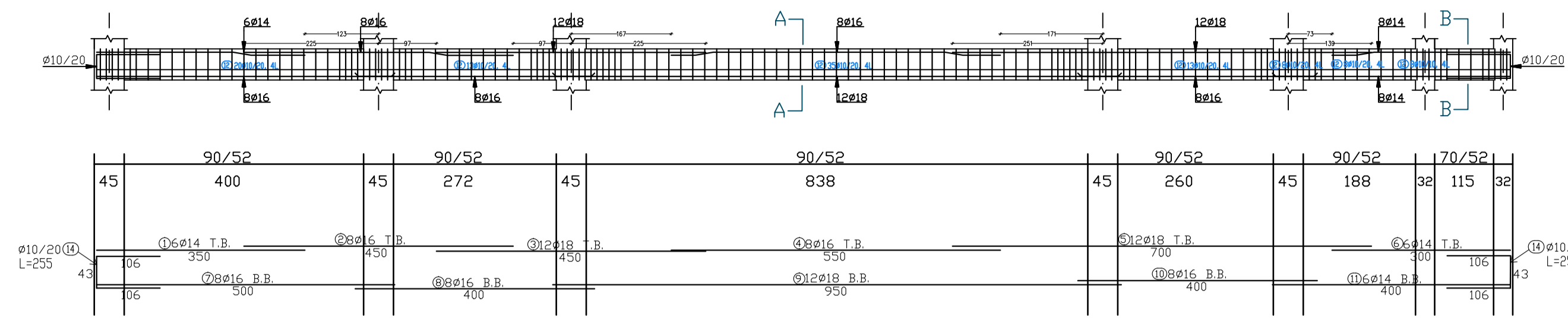
Drawing Title:  
BEAMS Reinforcement  
Basement B  
Scale: 1:75  
Drawing No. S32

#### Hatching Key

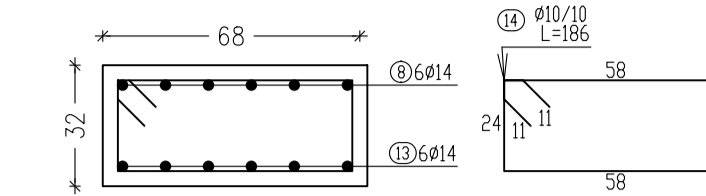
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

### Beam B11 (90×52)cm

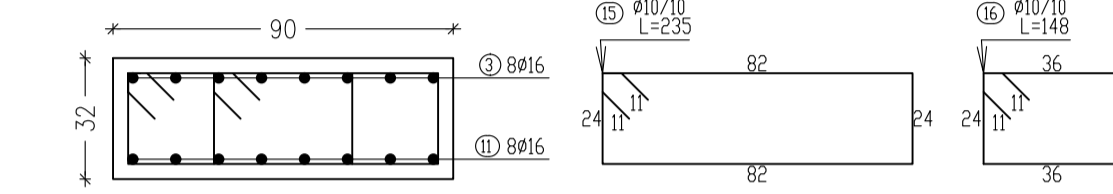
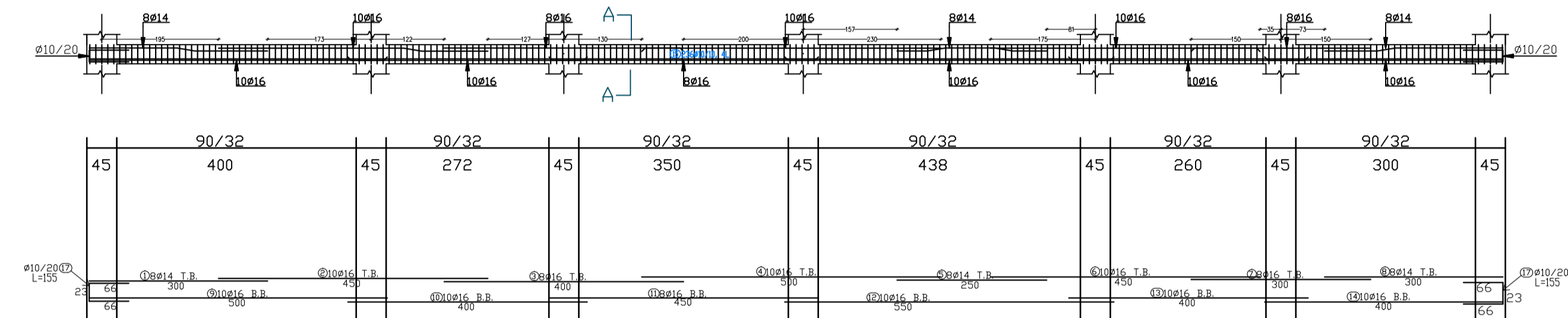


Section A-A 1:20



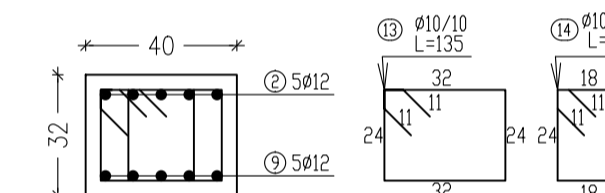
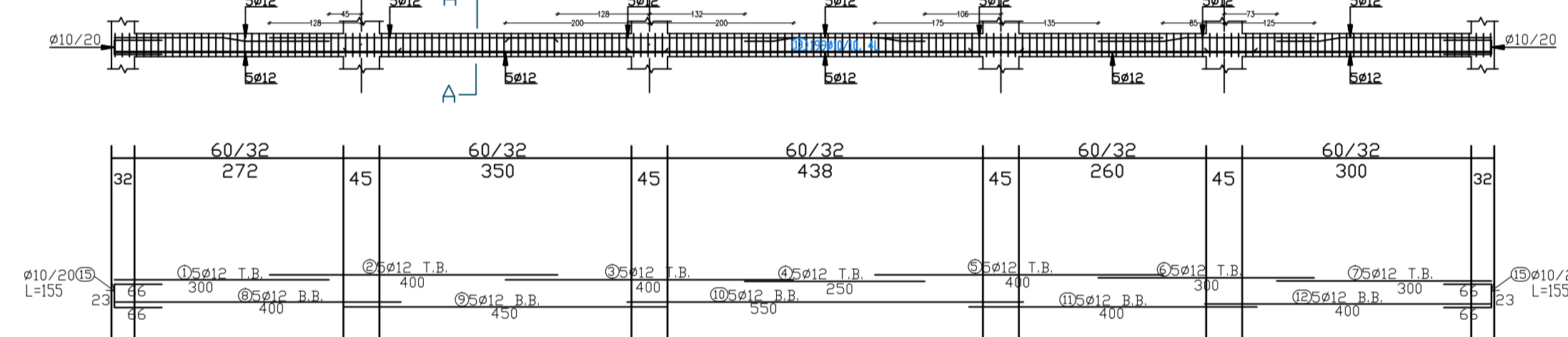
Section B-B 1:20

### Beam B12 (90×32)cm



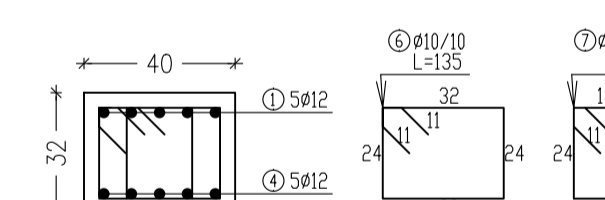
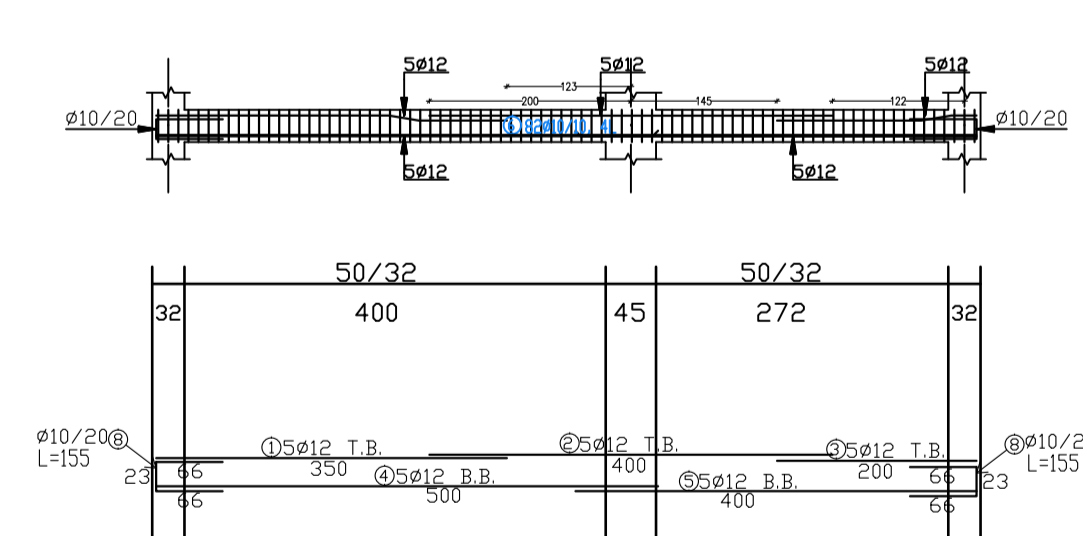
Section A-A 1:20

### Beam B13 (40×32)cm



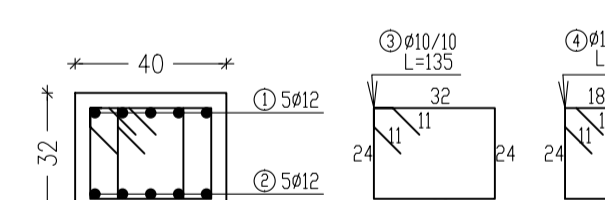
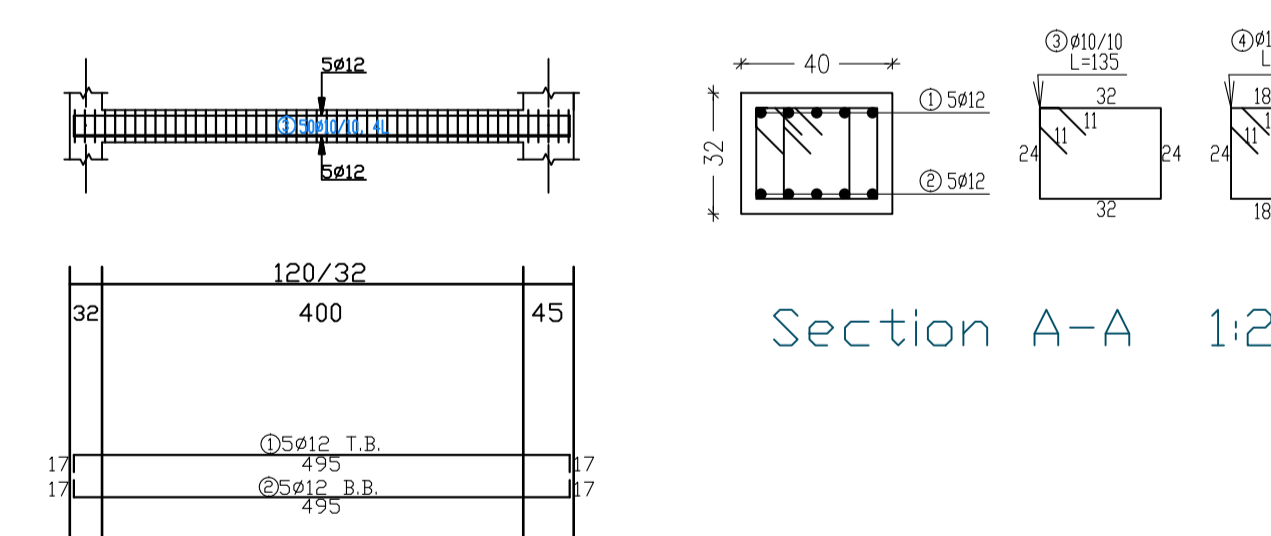
Section A-A 1:20

### Beam B14 (40×32)cm

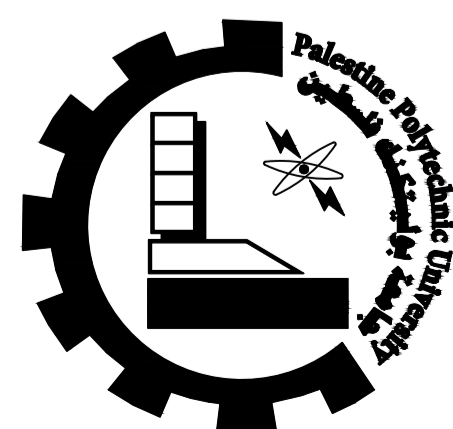


Section A-A 1:20

### Beam B15 (40×32)cm



Section A-A 1:20



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College of Engineering  
Civil Engineering Department  
Building Engineering



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Graduation Project  
Structural design of a tourist spa resort  
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi  
Supervisor:  
Dr. Nafeth Nasereddin

Drawing Title:  
BEAMS Reinforcement  
Basement B

Scale: 1:75  
Drawing No. S33

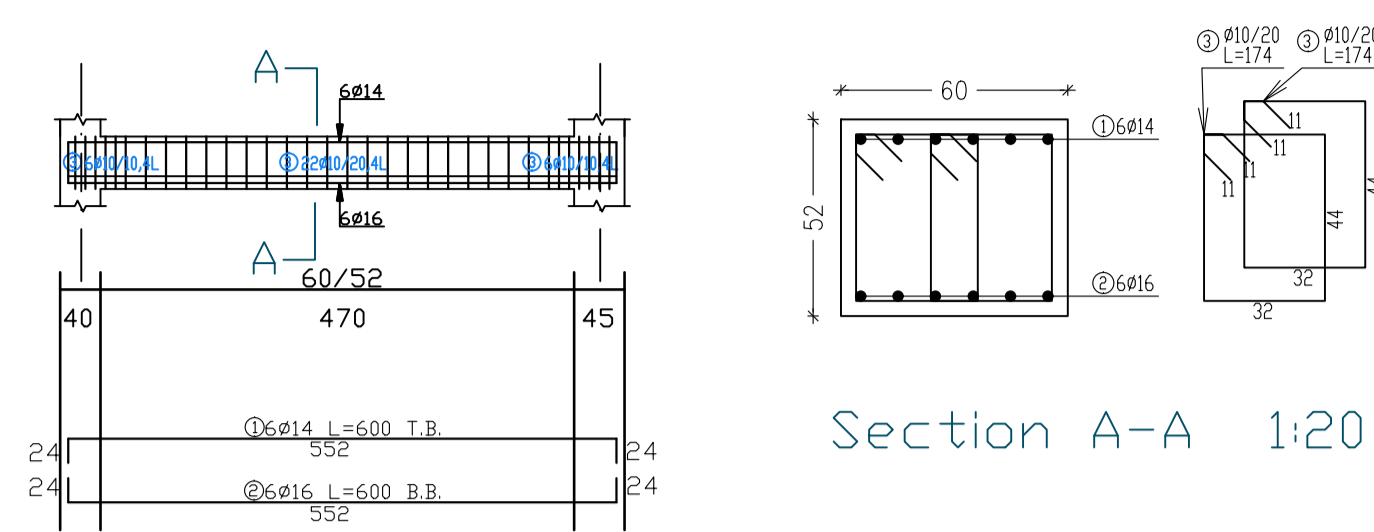
#### Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

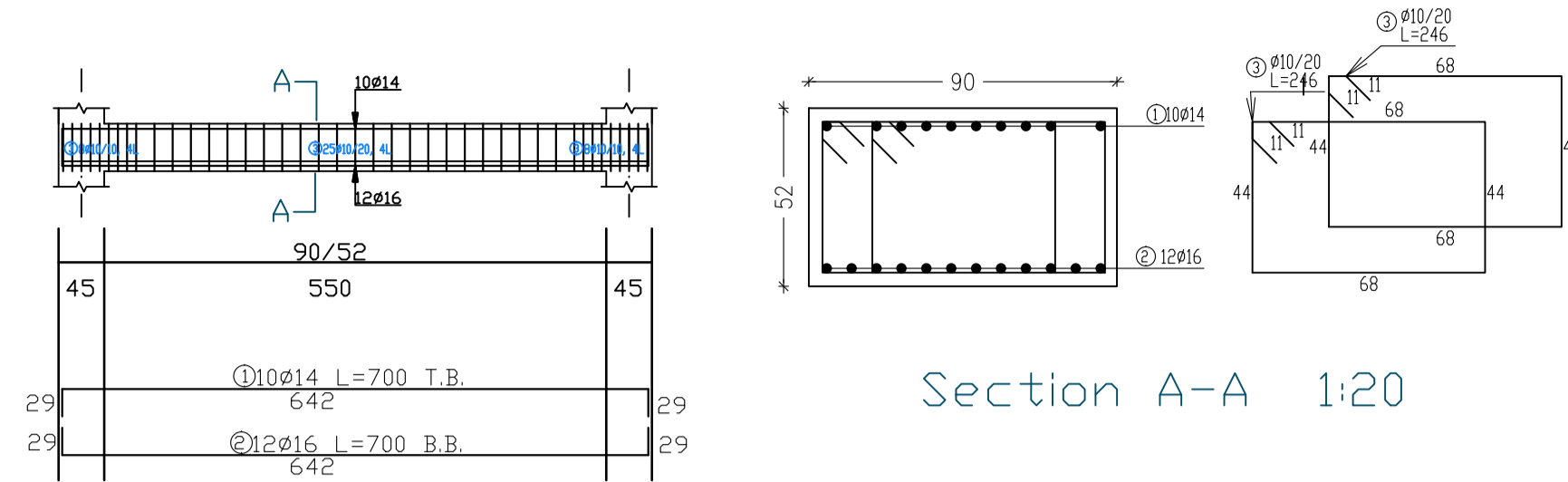
May 2022



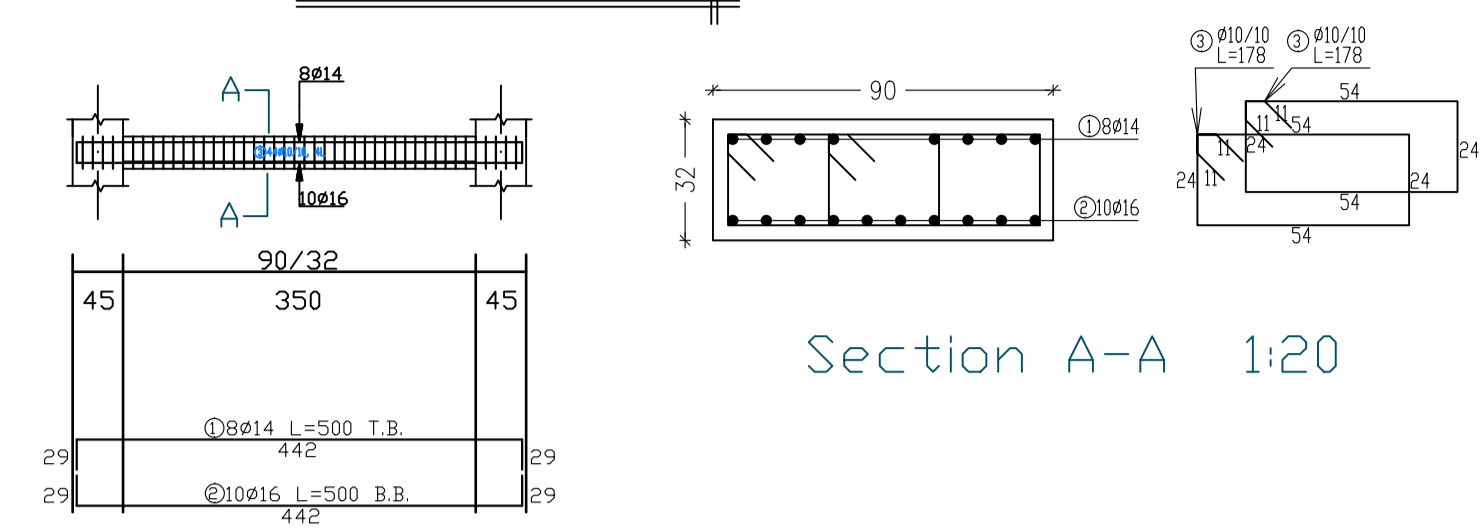
Beam A17 (60x52)cm



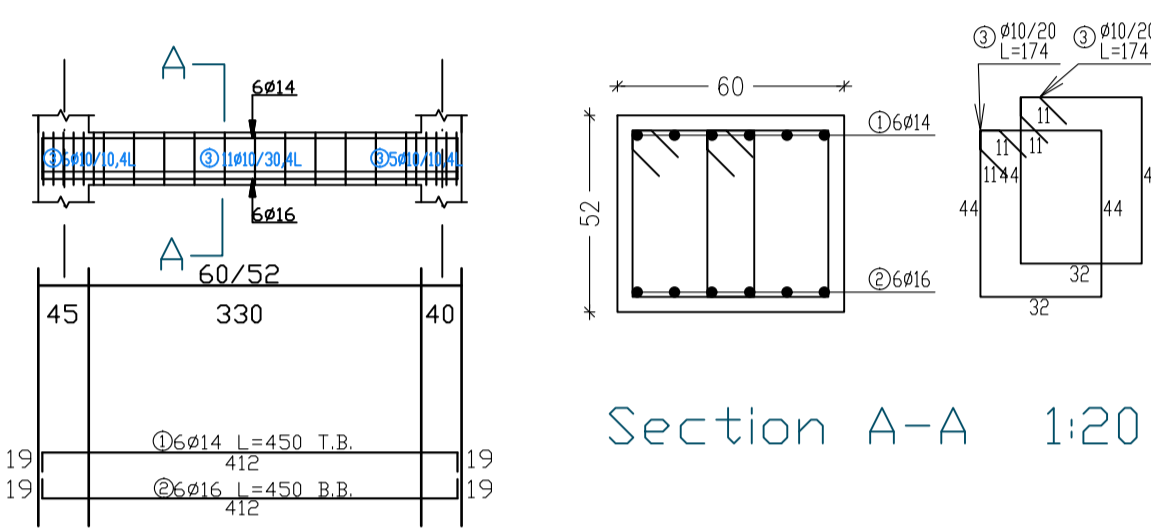
Beam A21 (90x52)cm



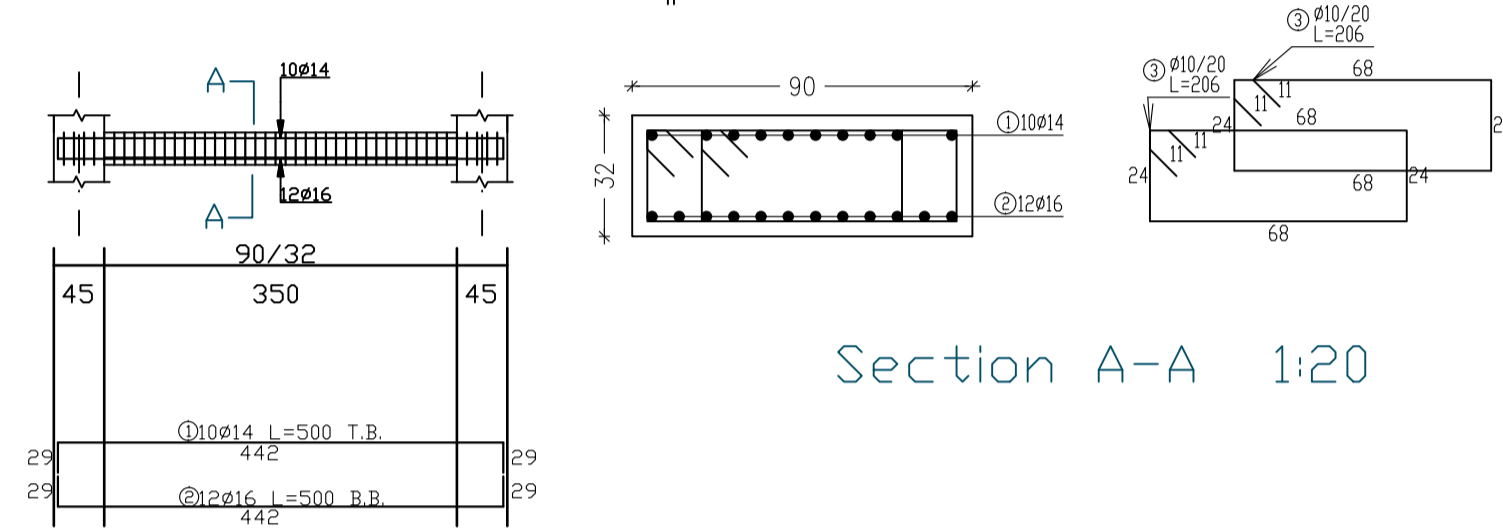
Beam A24 (90x32)cm



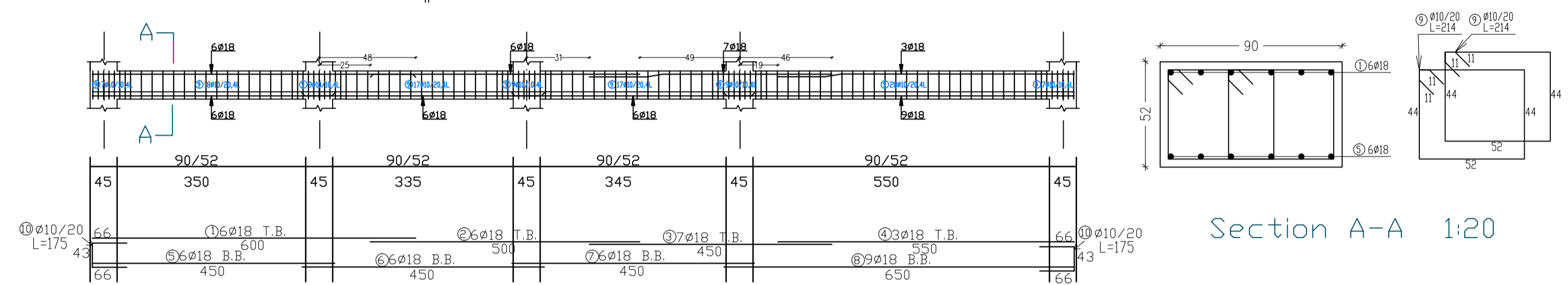
Beam A18 (60x52)cm



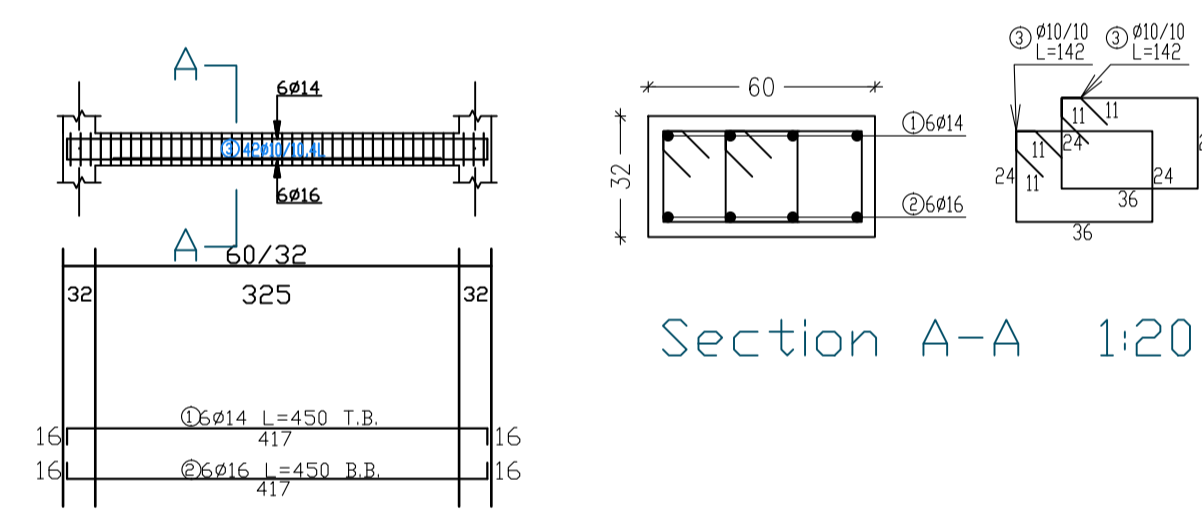
Beam A22 (90x32)cm



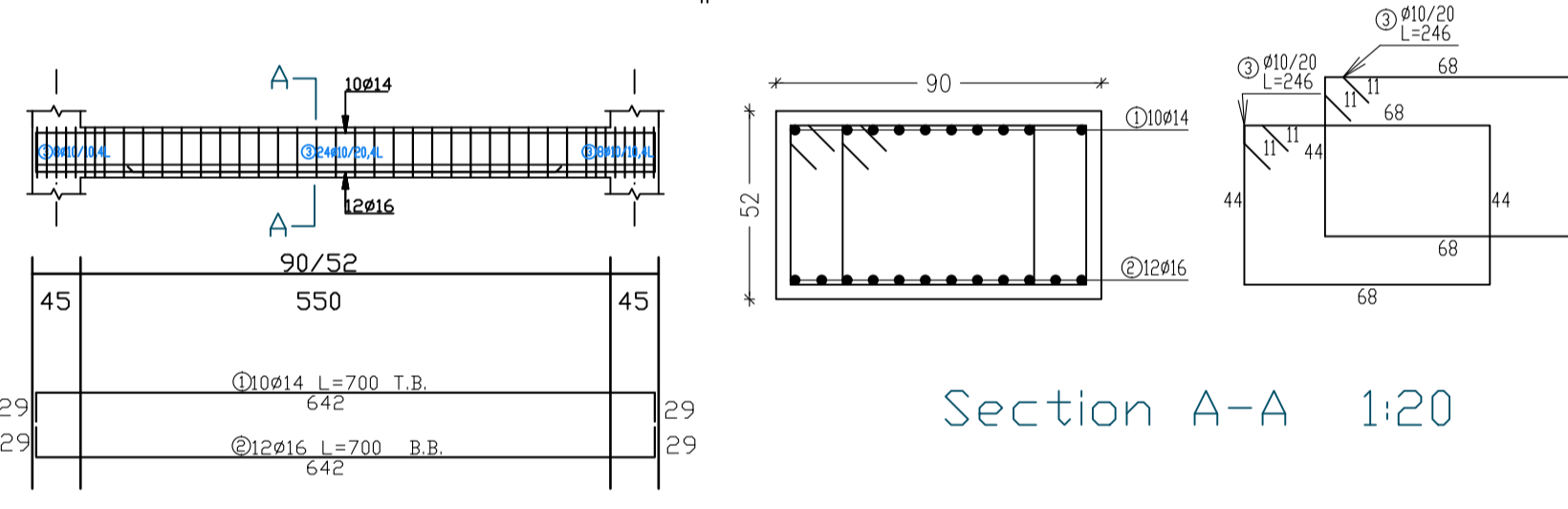
Beam A25 (90x52)cm



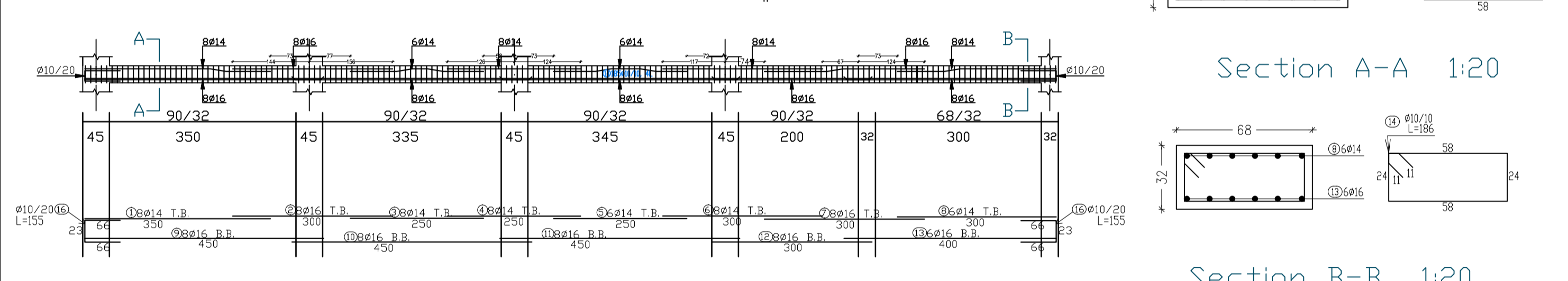
Beam A19 (60x32)cm



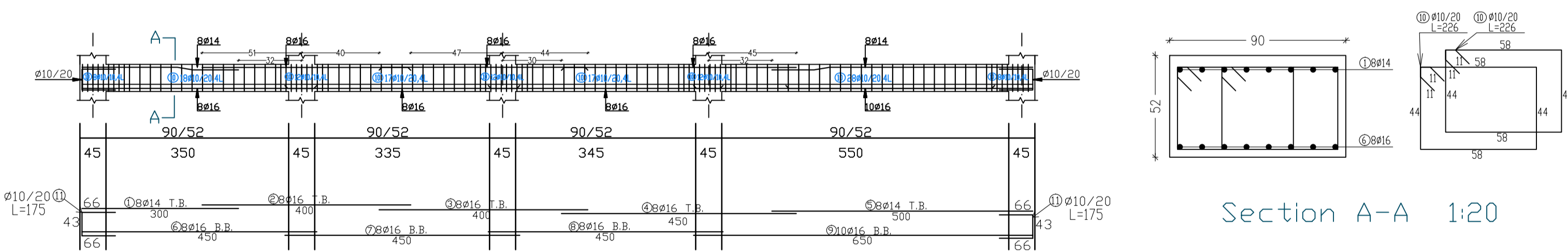
Beam A23 (90x52)cm



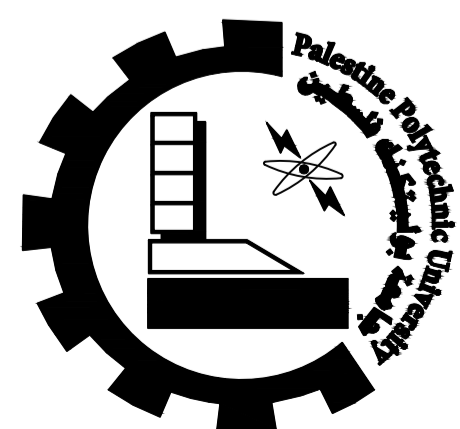
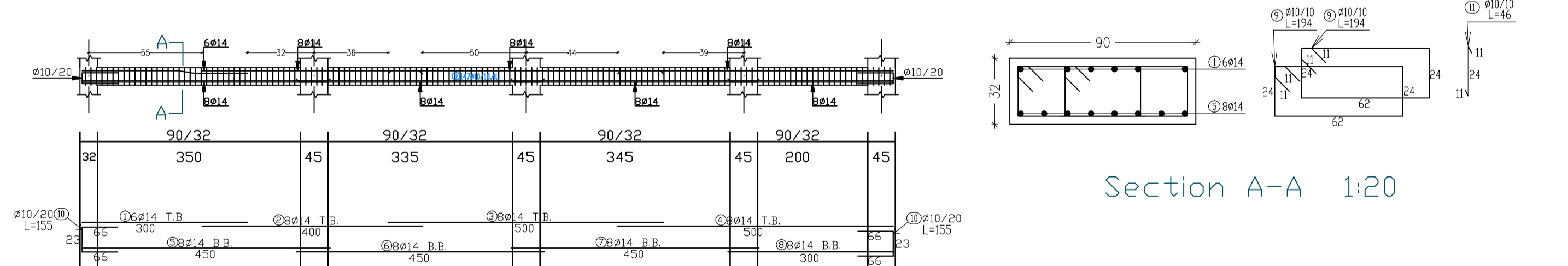
Beam A26 : A-A (90/32)cm & B-B (43x32)cm



Beam A20 (90x52)cm



Beam A27 (90x32)cm



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Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
BEAMS Reinforcement  
Ground A

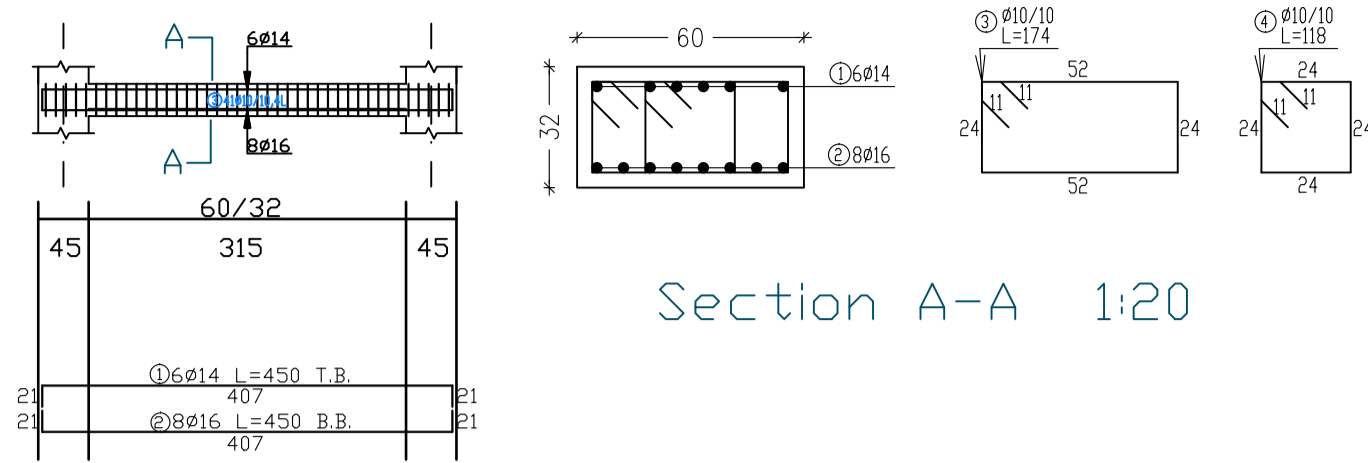
Scale: 1:75  
Drawing No. S34

Hatching Key

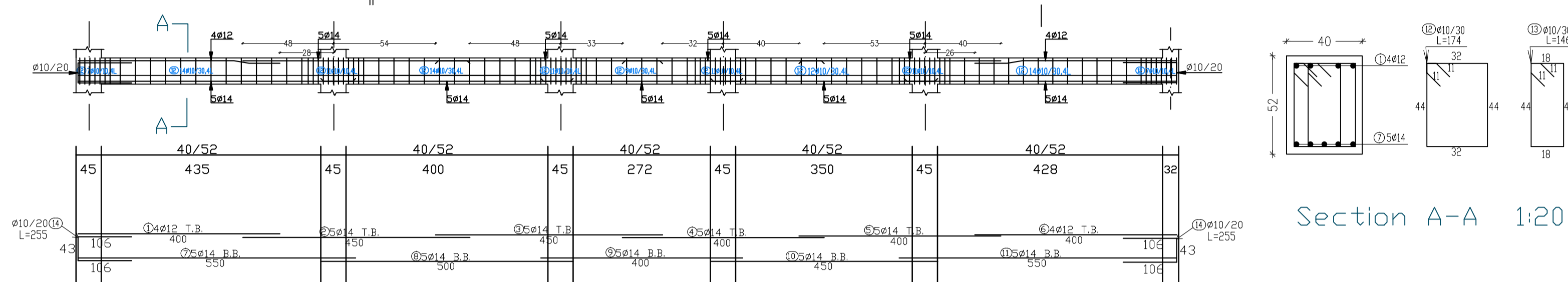
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

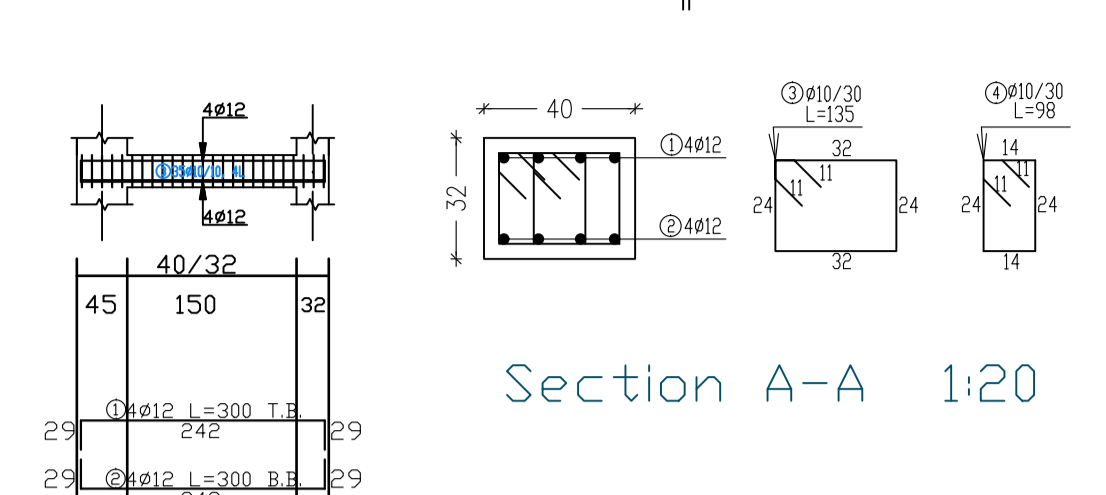
Beam A28 (60x52)cm



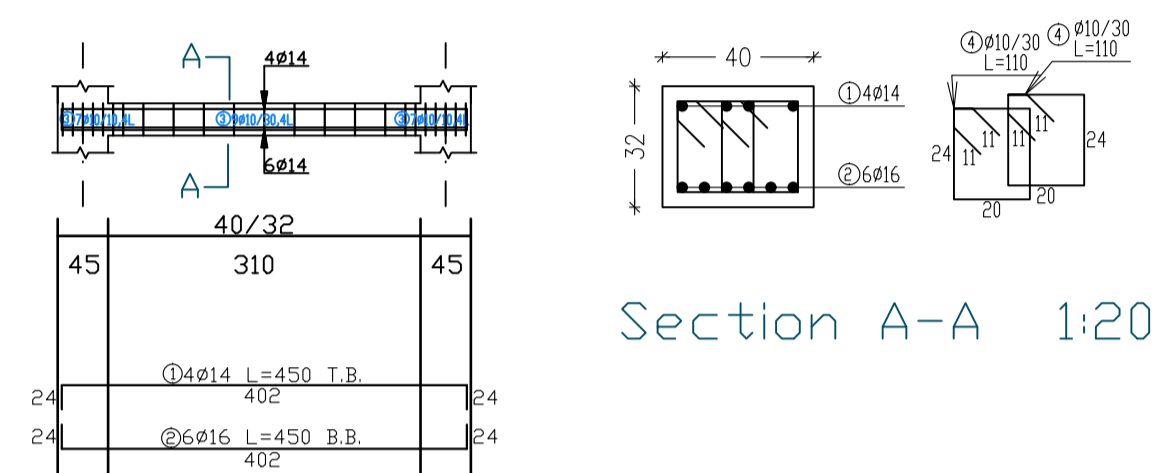
Beam A32 (40x52)cm



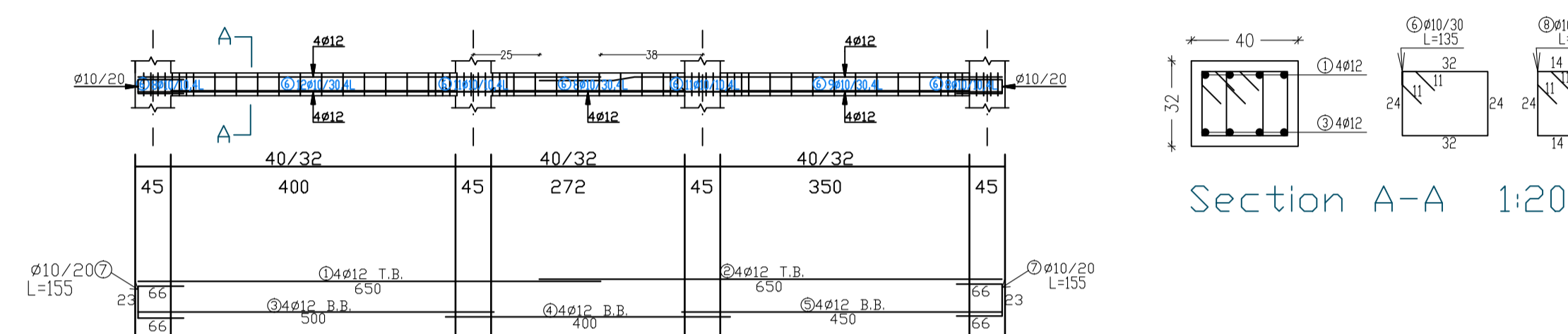
Beam A36 (40x32)cm



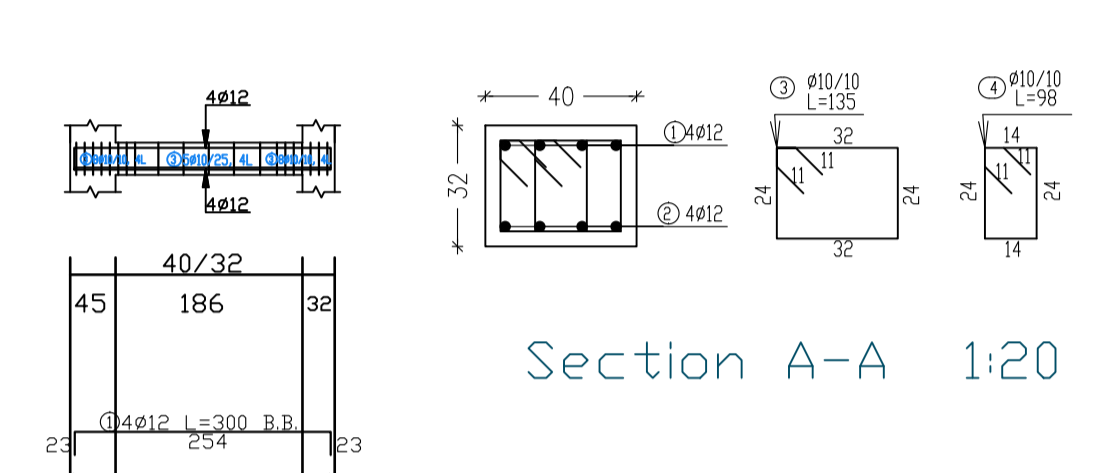
Beam A29 (40x32)cm



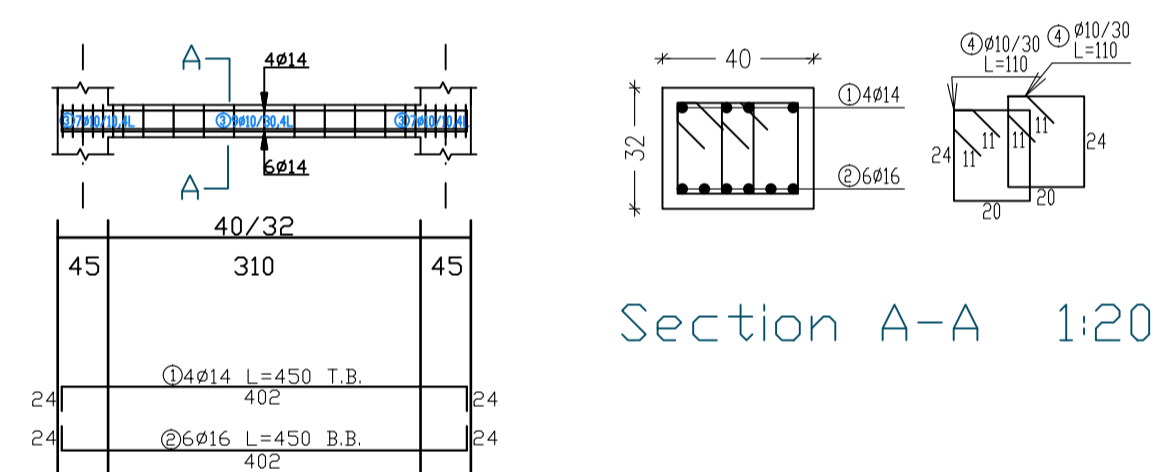
Beam A33 (40x32)cm



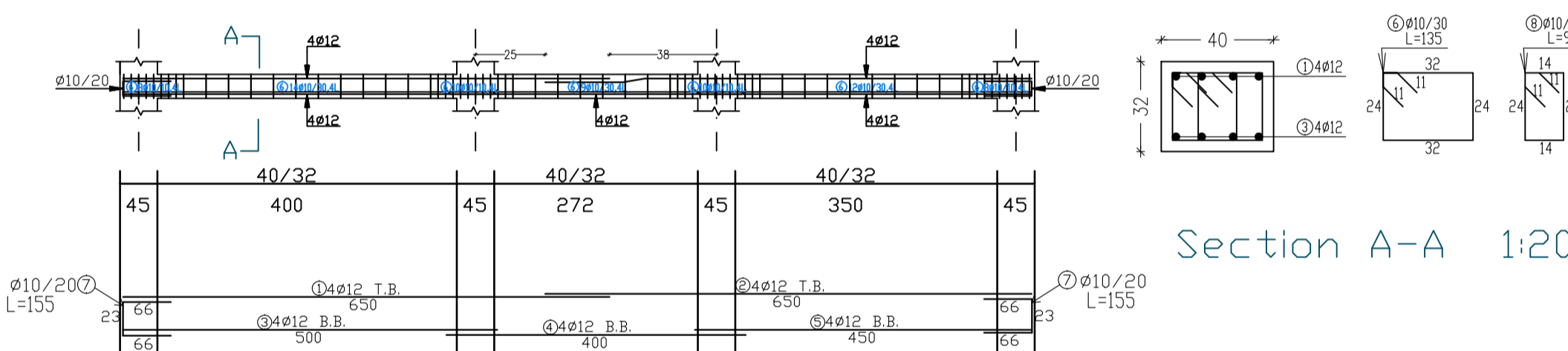
Beam A37 (40x32)cm



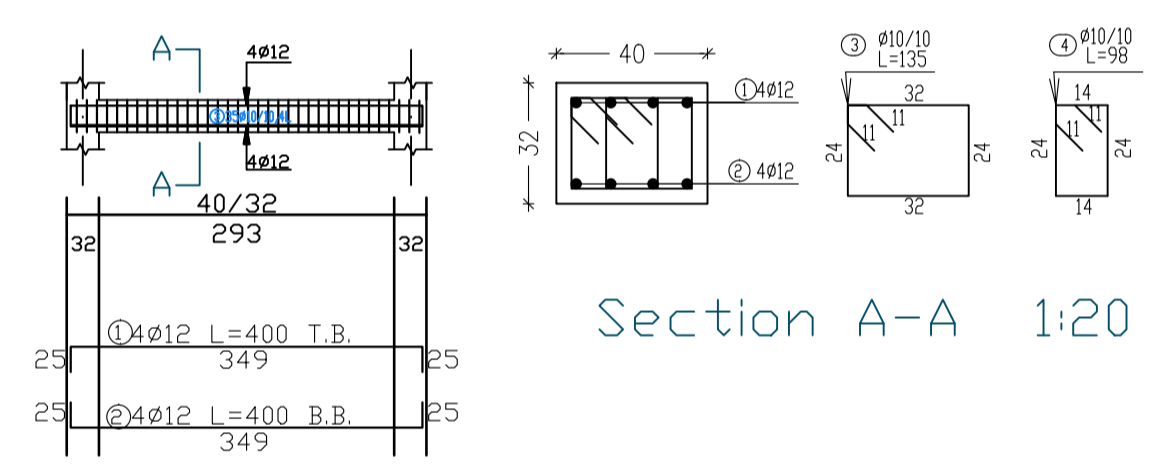
Beam A30 (40x32)cm



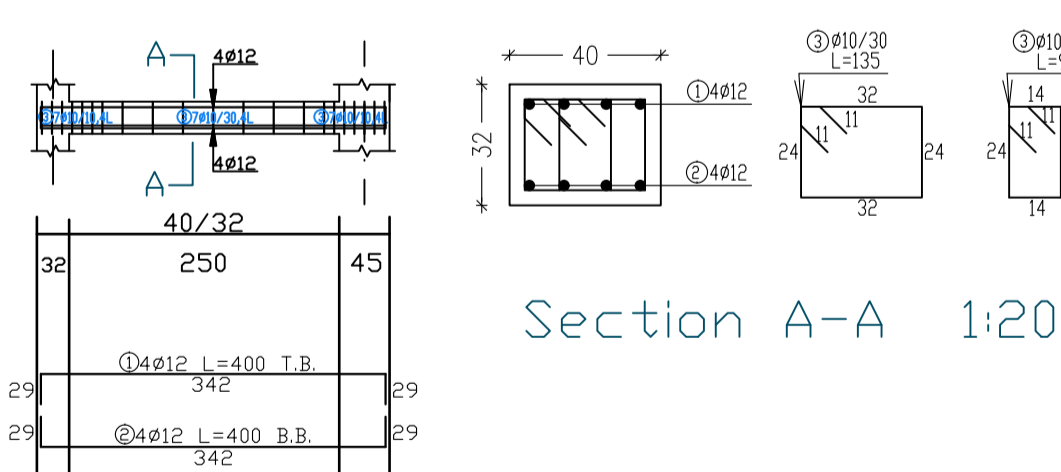
Beam A34 (40x32)cm



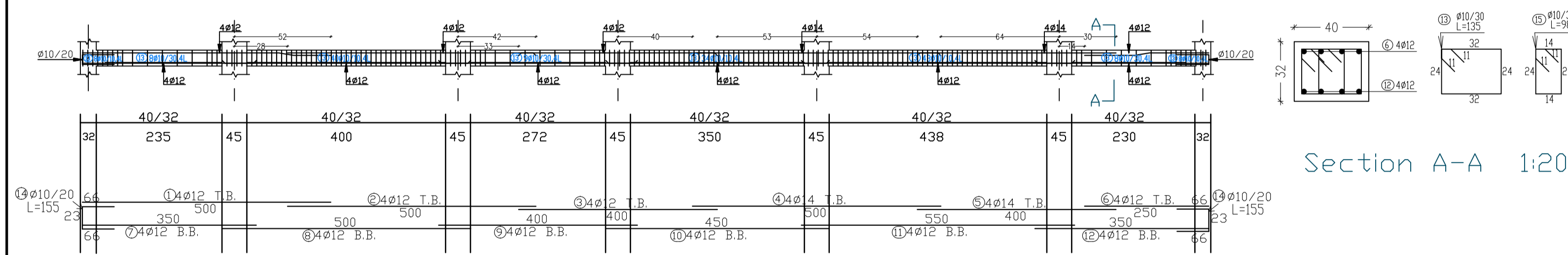
Beam A38 (40x32)cm



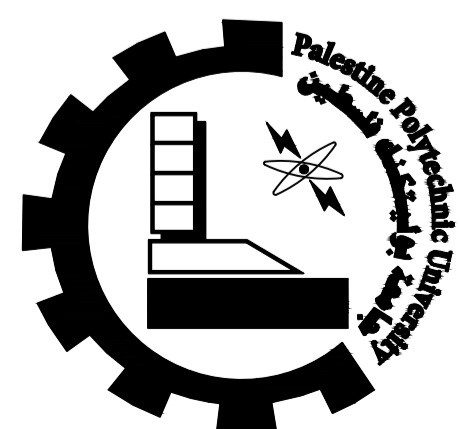
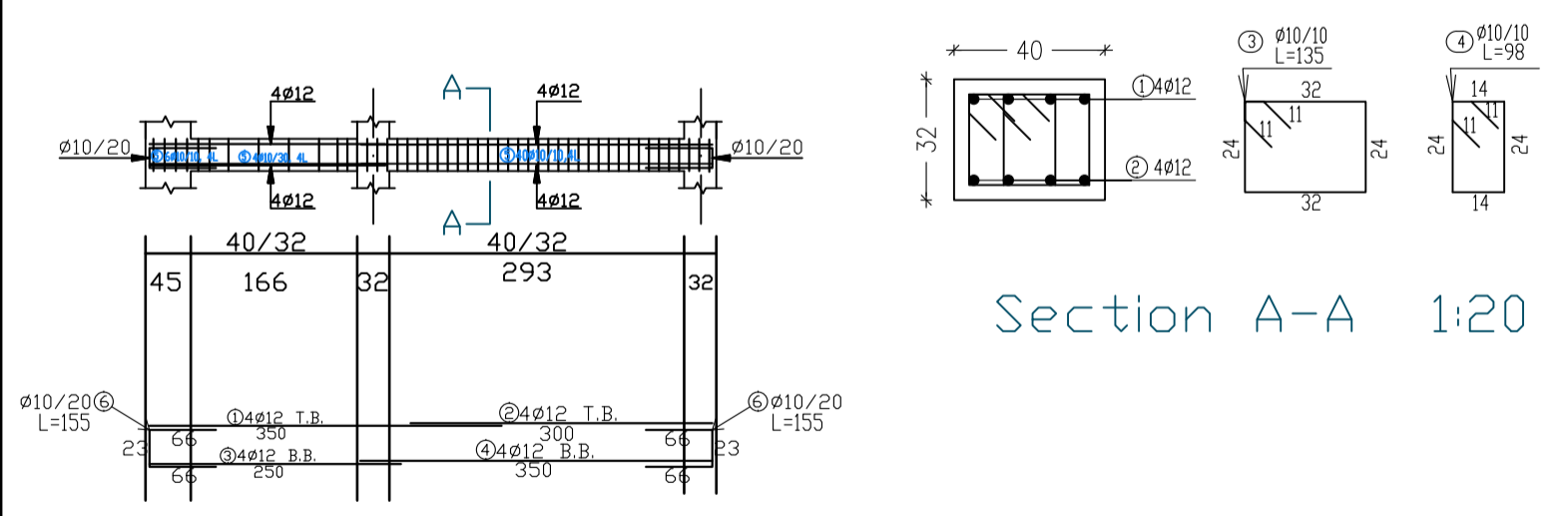
Beam A31 (40x32)cm



Beam A35 (40x32)cm



Beam A39 (40x32)cm



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Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
BEAMS Reinforcement  
Ground A

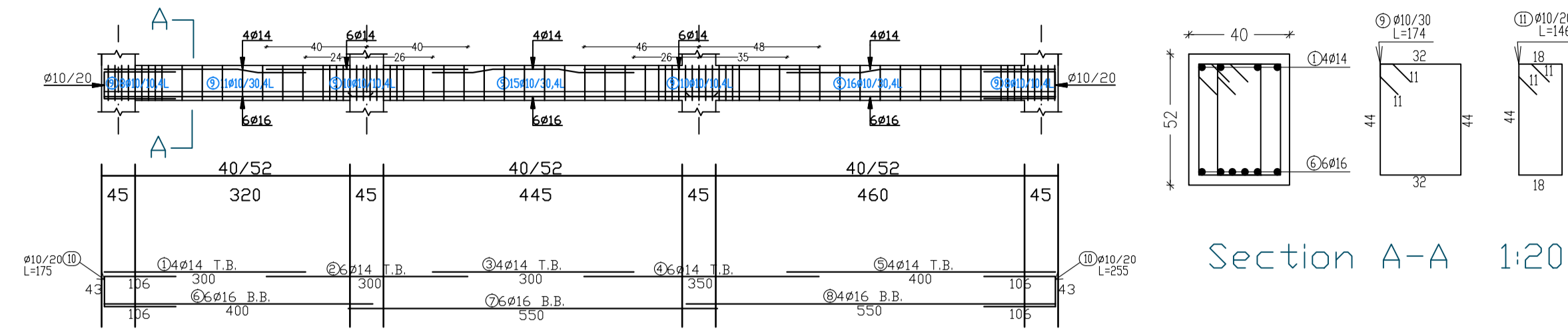
Scale: 1:75  
Drawing No. S35

Hatching Key

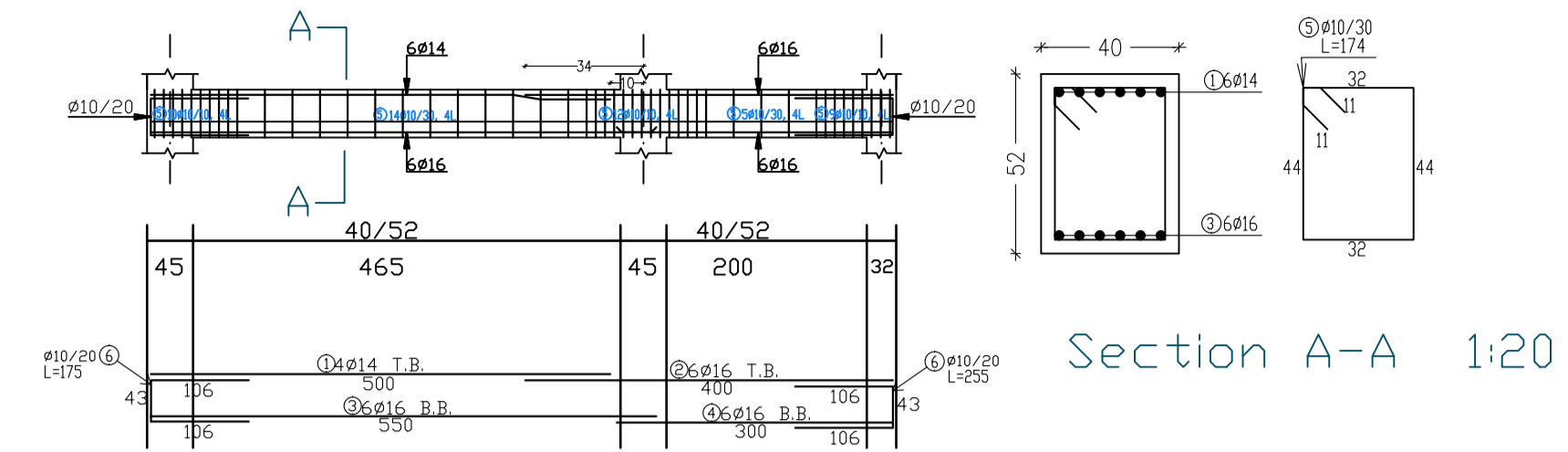
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

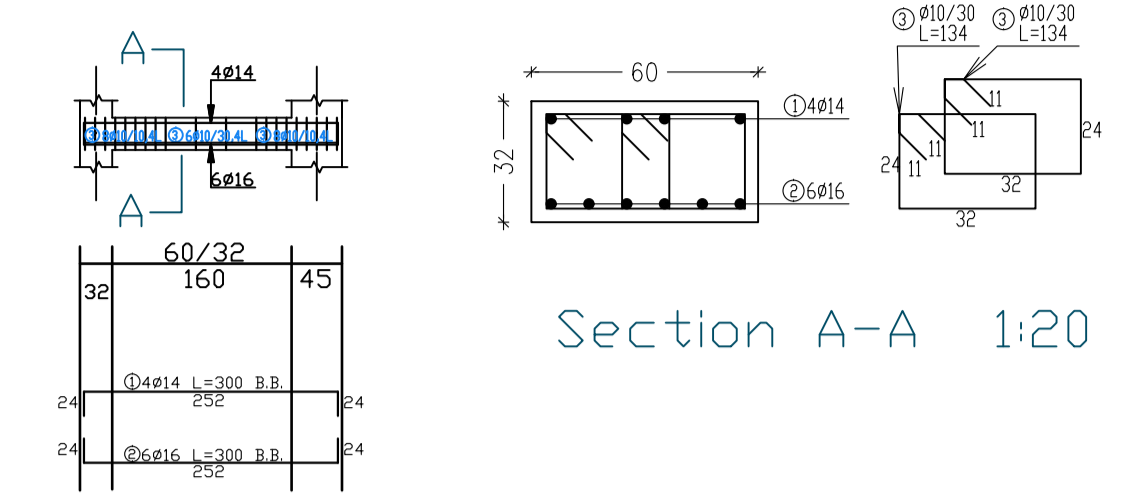
Beam B16 (40x52)cm



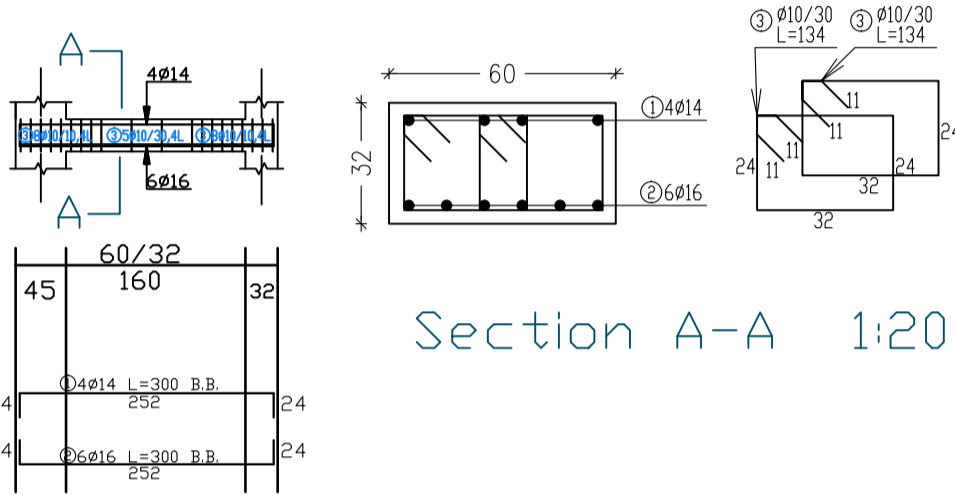
Beam B17 (40x52)cm



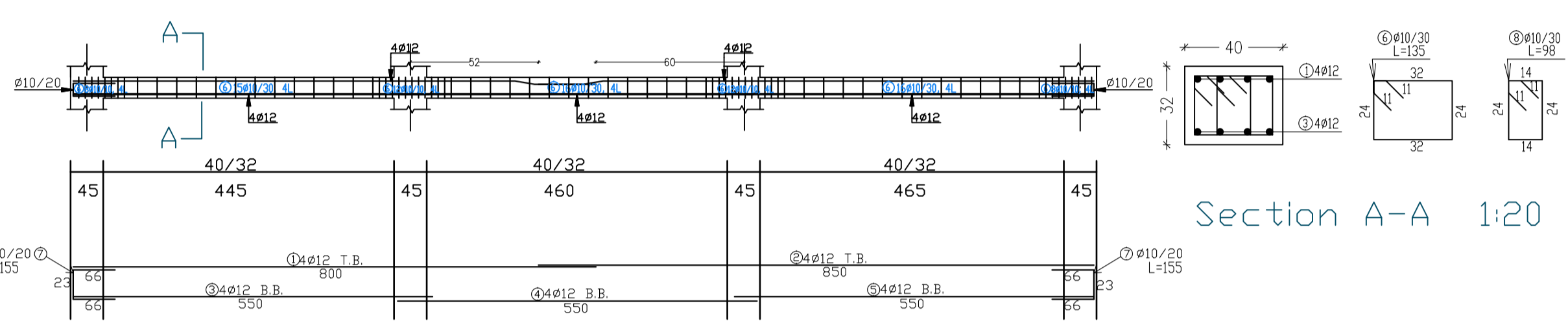
Beam B18 (60x32)cm



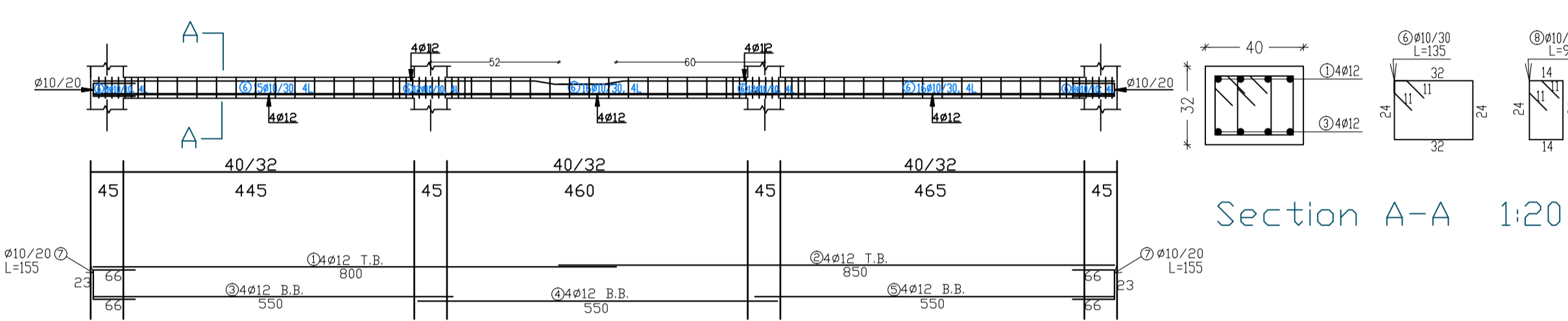
Beam B19 (60x32)cm



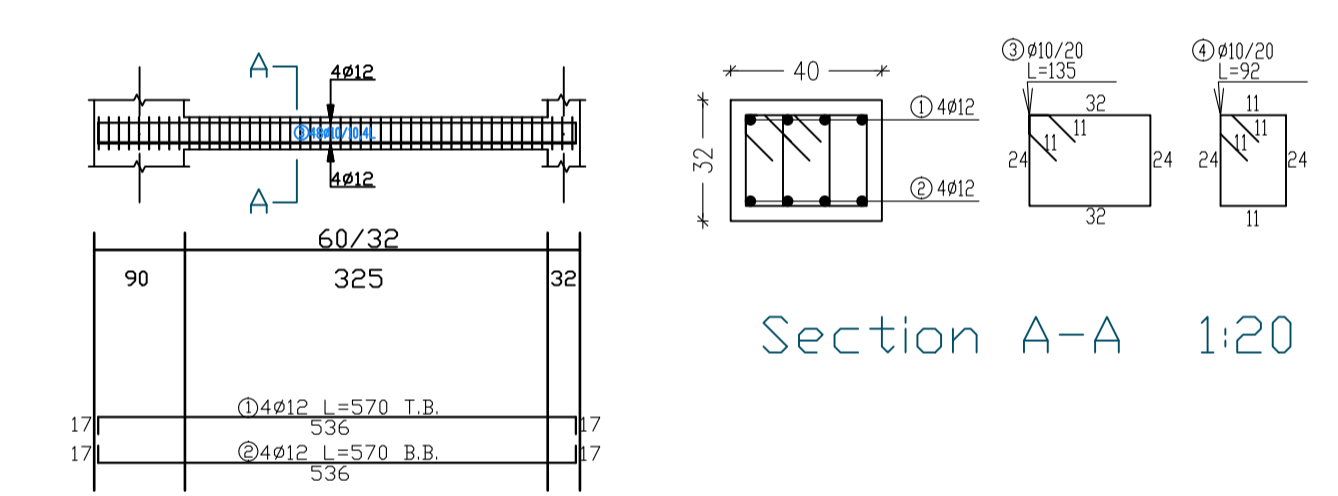
Beam B20 (40x32)cm



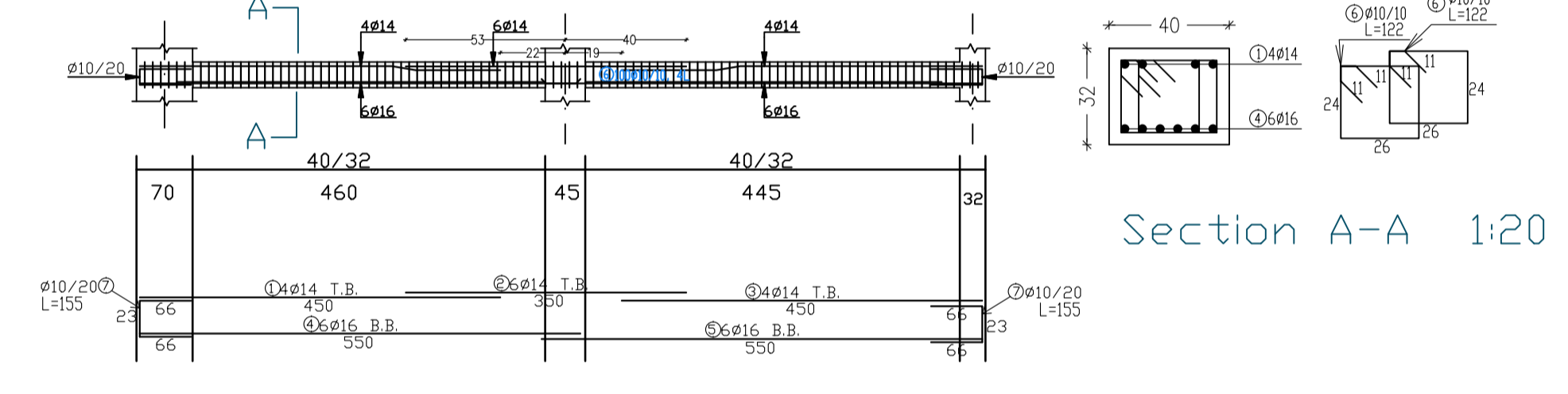
Beam B21 (40x32)cm



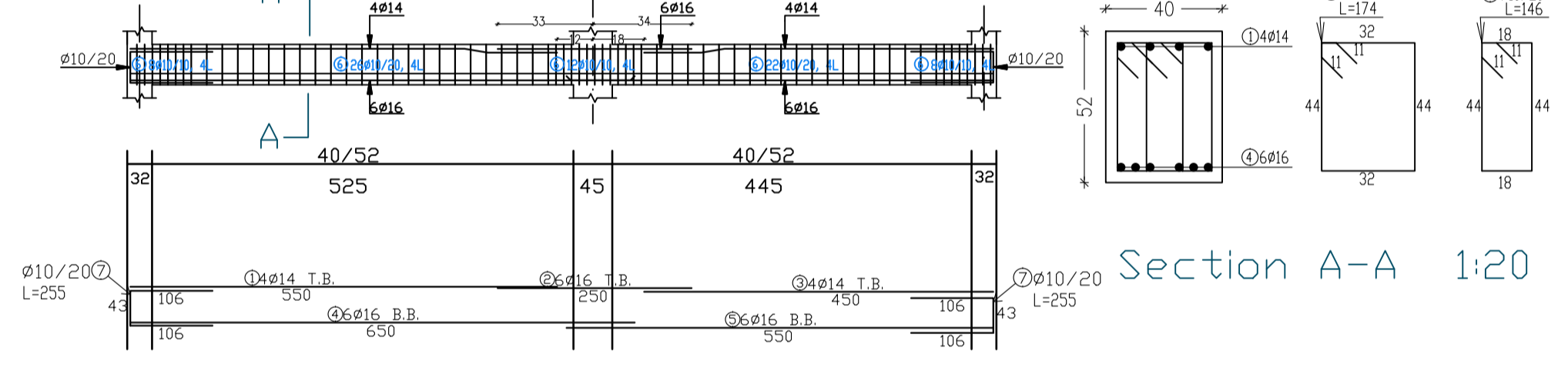
Beam B22 (40x32)cm



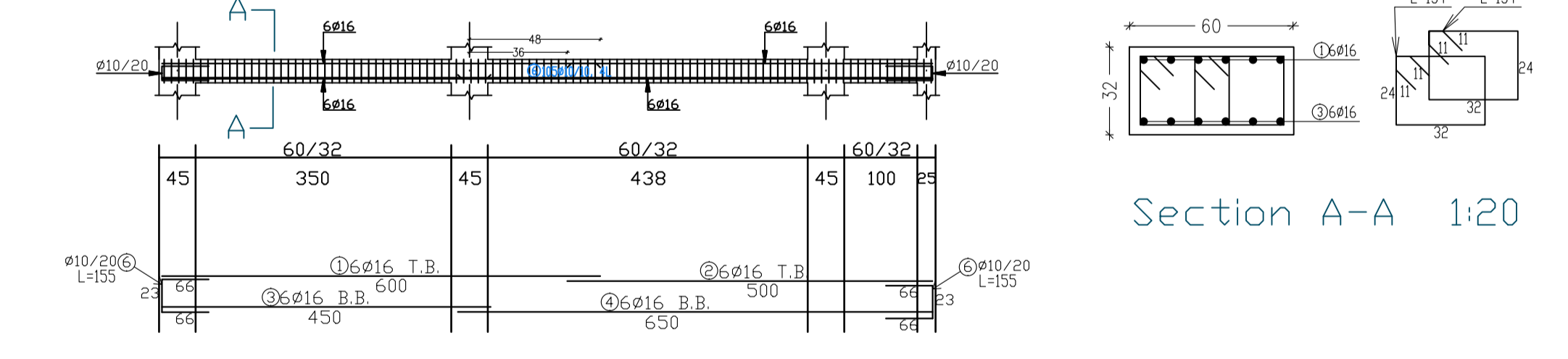
Beam B23 (40x32)cm



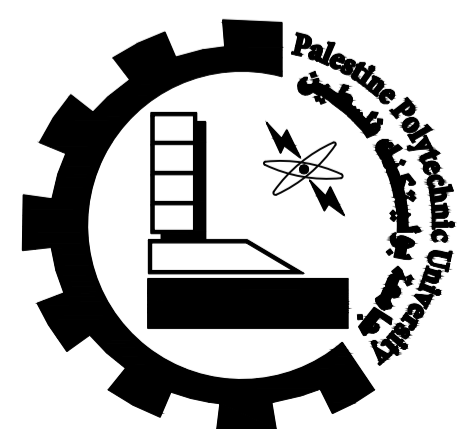
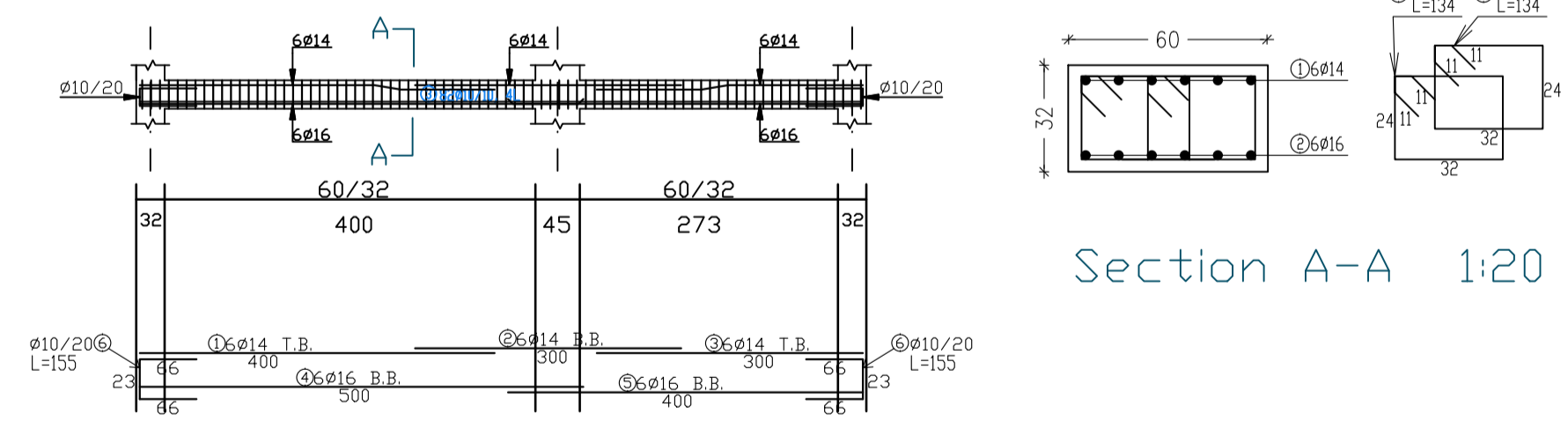
Beam B24 (40x52)cm



Beam B25 (60x32)cm



Beam B26 (60x32)cm



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Graduation Project  
Structural design of a tourist spa resort  
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi  
Supervisor:  
Dr. Nafeth Nasereddin

Drawing Title:  
BEAMS Reinforcement  
Ground B

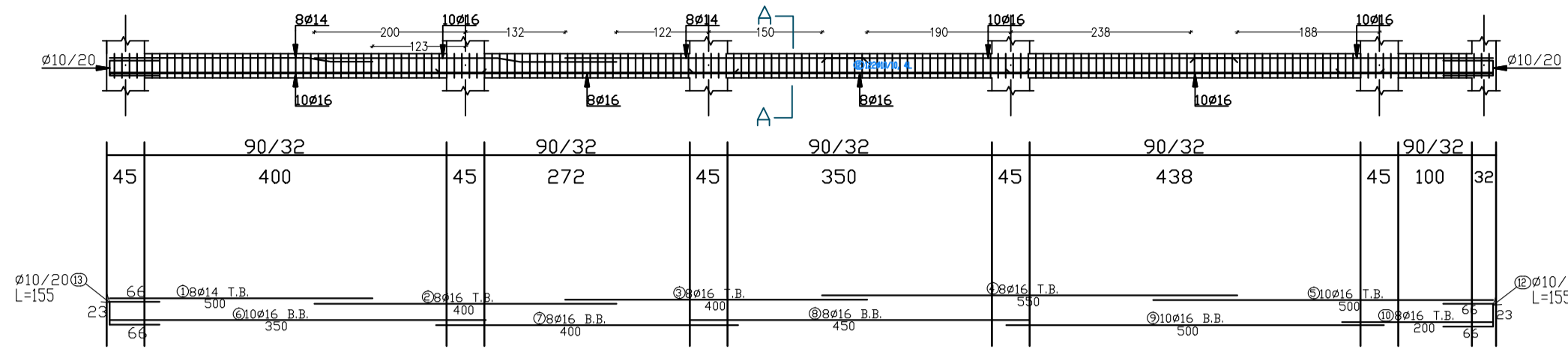
Scale: 1:75  
Drawing No. S36

Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

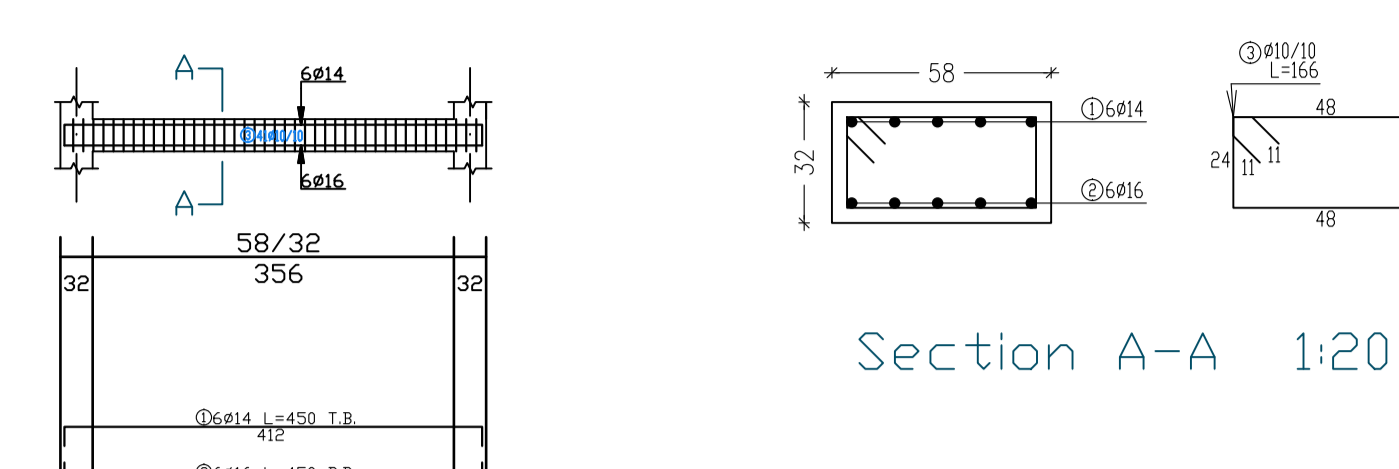
May 2022

### Beam B27 (90/32)cm



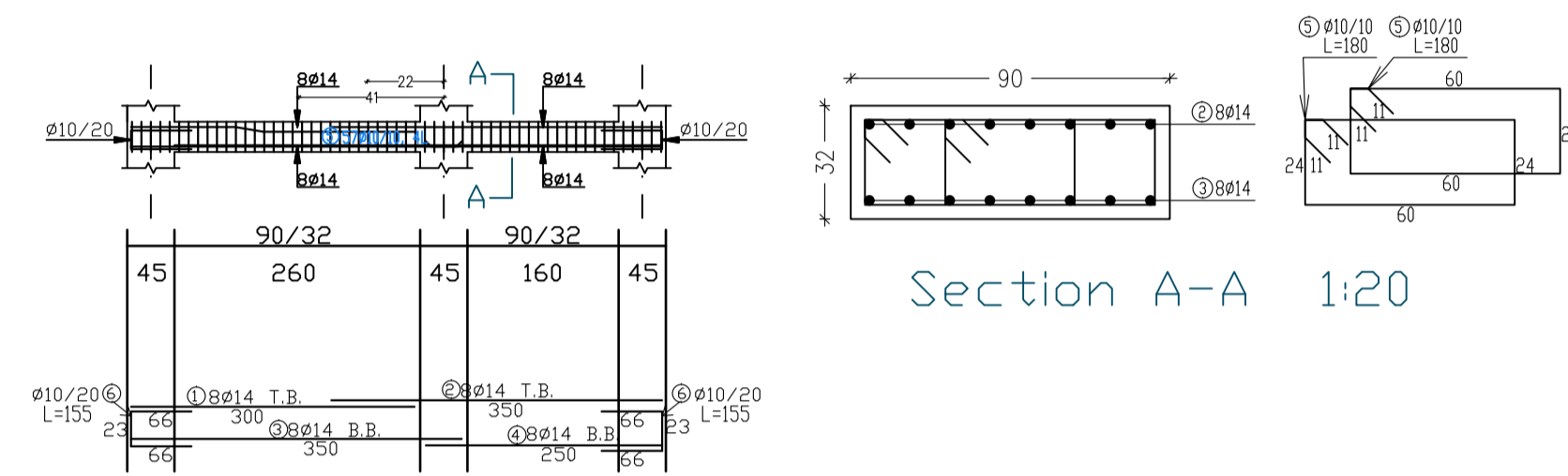
Section A-A 1:20

### Beam B28 (58x52)cm



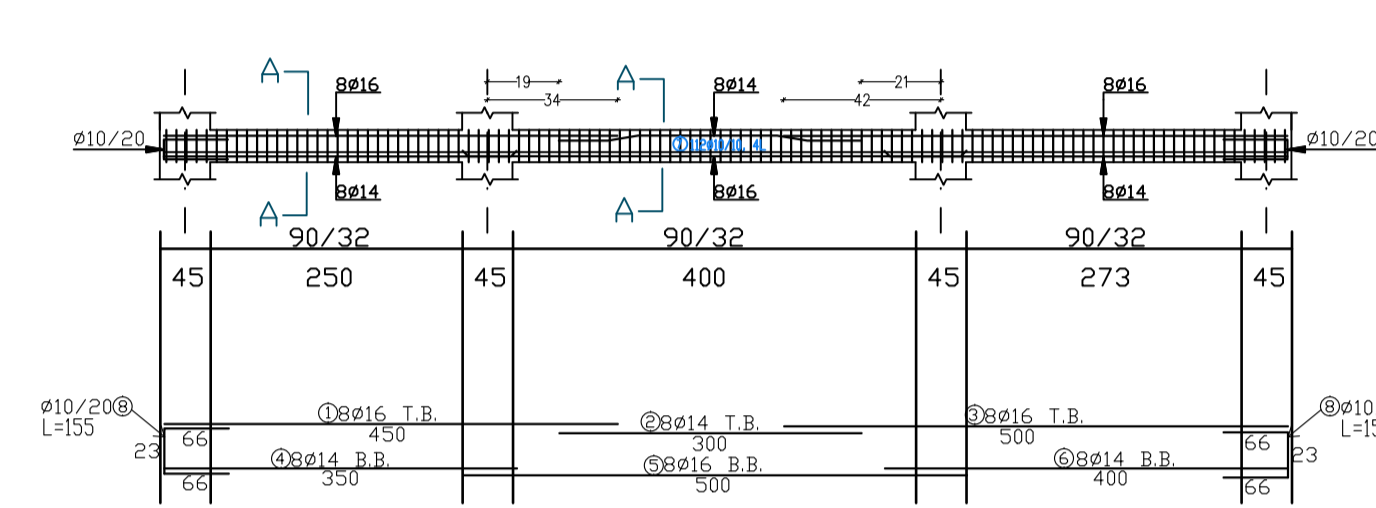
Section A-A 1:20

### Beam B29 (90x32)cm



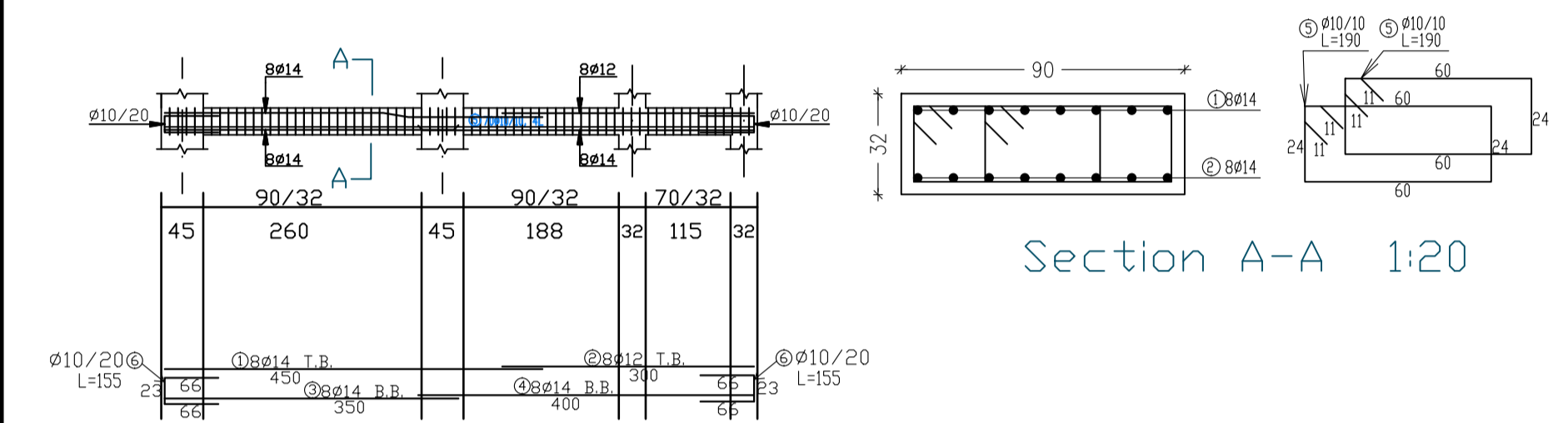
Section A-A 1:20

### Beam B30 (90x32)cm



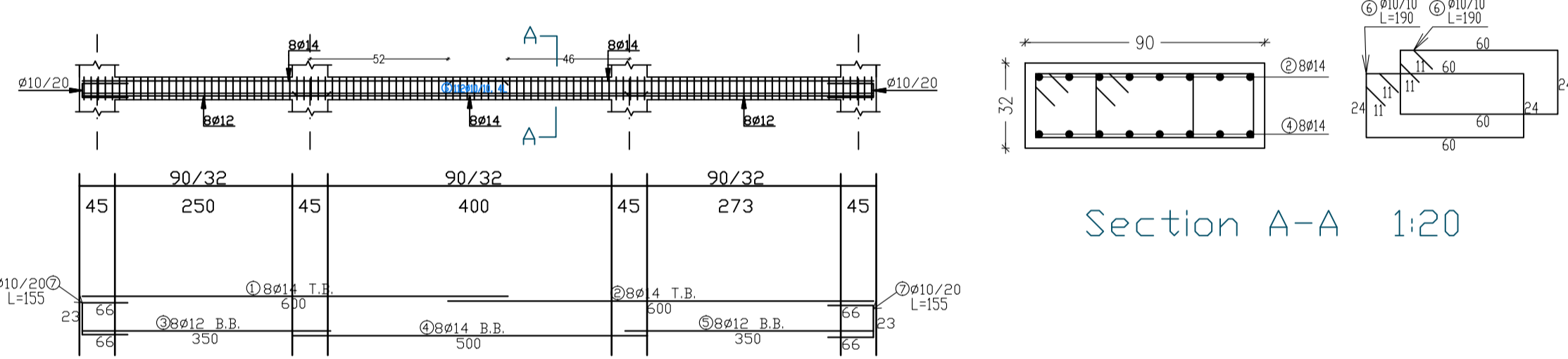
Section A-A 1:20

### Beam B31 (90x32)cm



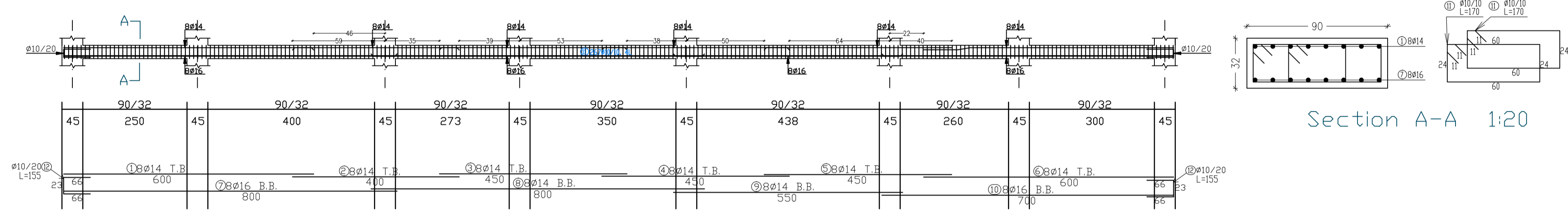
Section A-A 1:20

### Beam B32 (90x32)cm



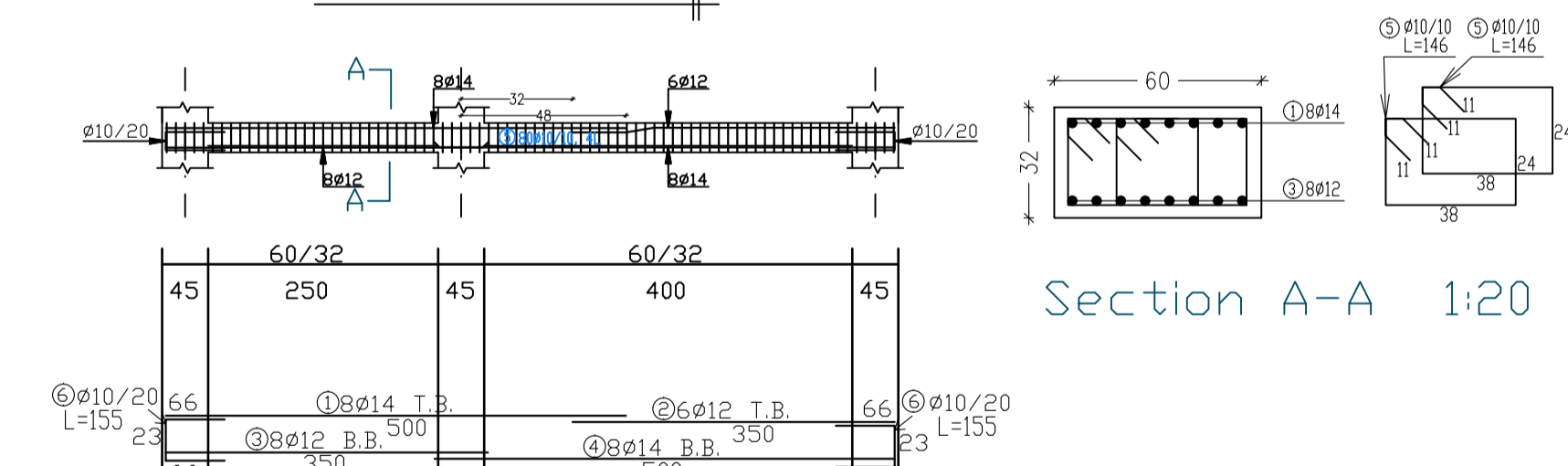
Section A-A 1:20

### Beam B33 (90x32)cm



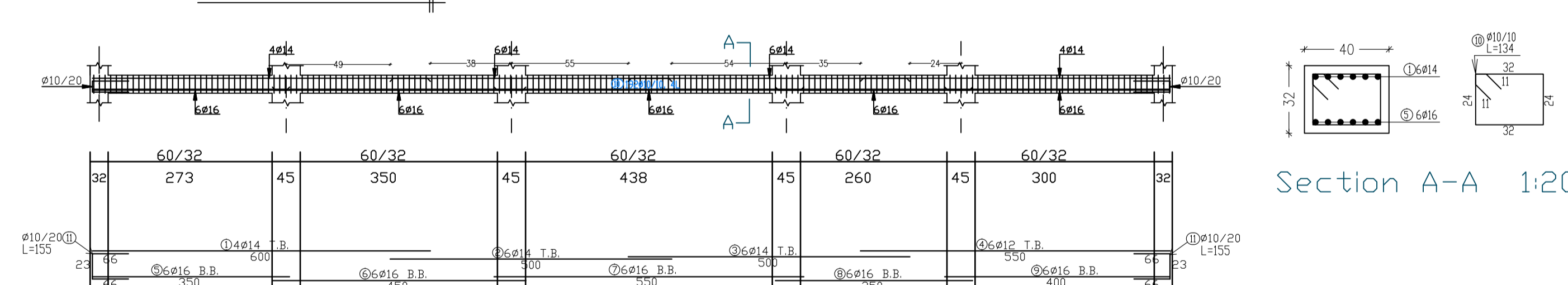
Section A-A 1:20

### Beam B34 (60x32)cm

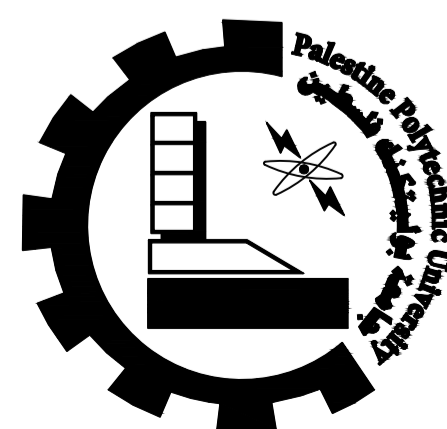


Section A-A 1:20

### Beam B35 (40x32)cm



Section A-A 1:20



Palestine Polytechnic University  
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Civil Engineering Department  
Building Engineering



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Graduation Project  
Structural design of a tourist spa resort  
Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi  
Supervisor:  
Dr. Nafeth Nasereddin

Drawing Title:  
BEAMS Reinforcement  
Ground B

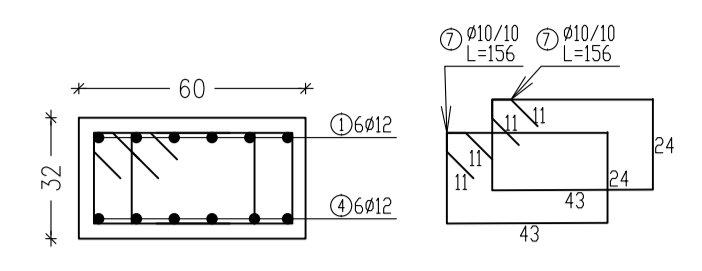
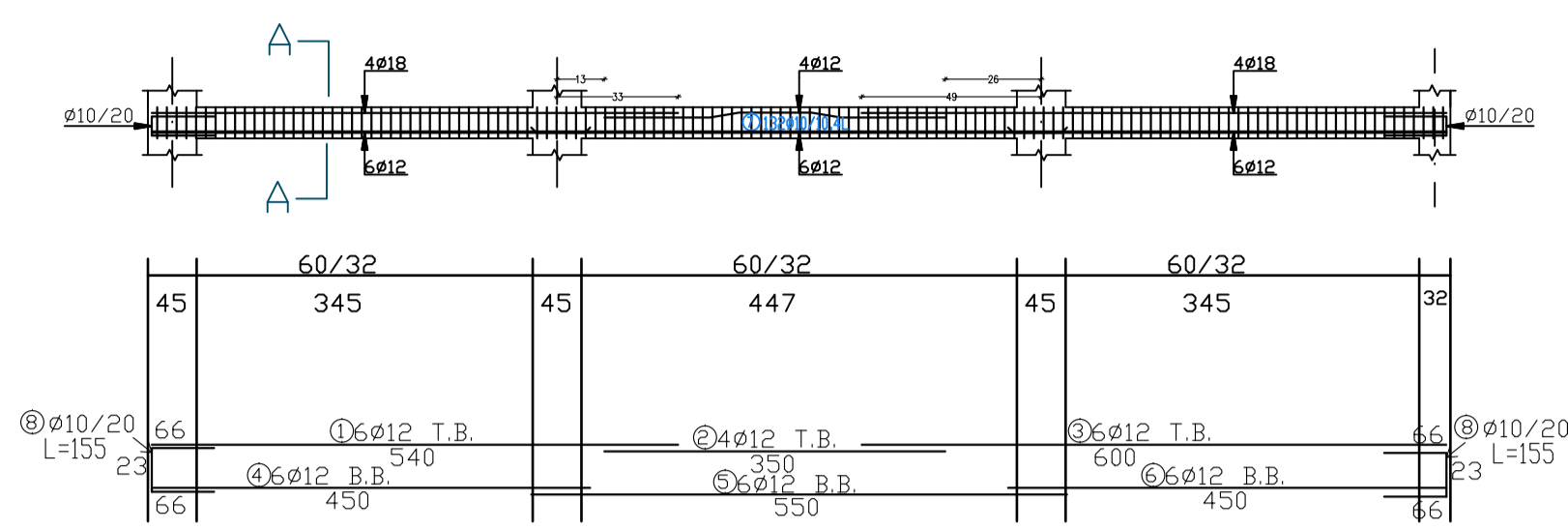
Scale: 1:75  
Drawing No. S37

#### Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

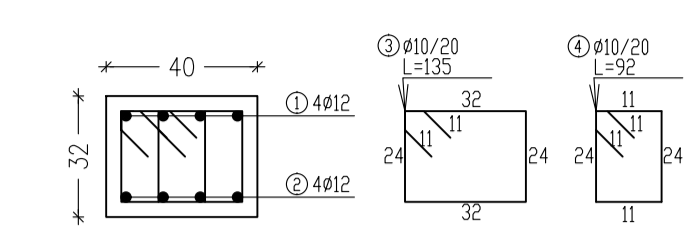
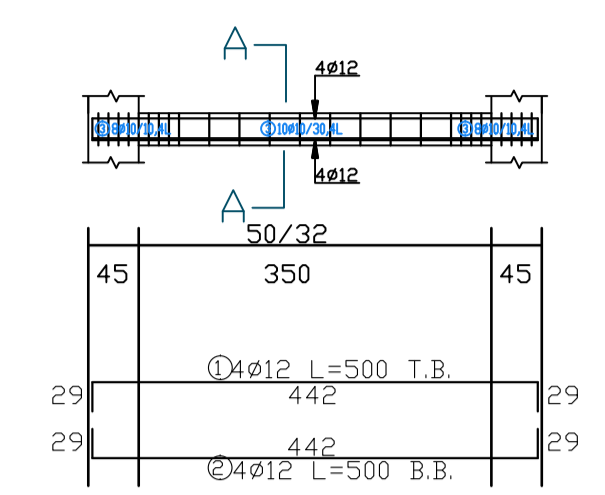
May 2022

Beam C1 (60×32)cm



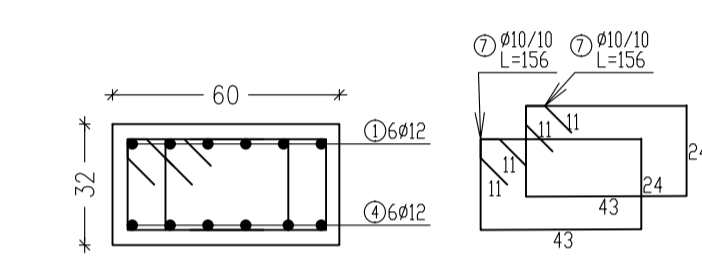
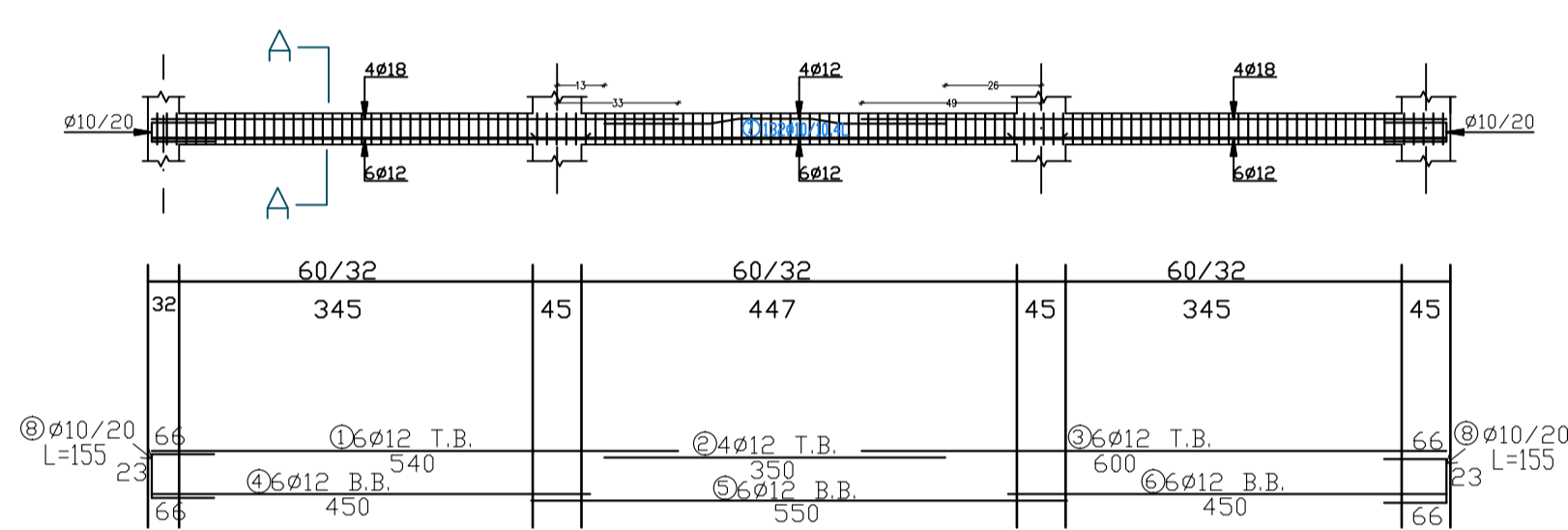
Section A-A 1:20

Beam C4 (40×32)cm



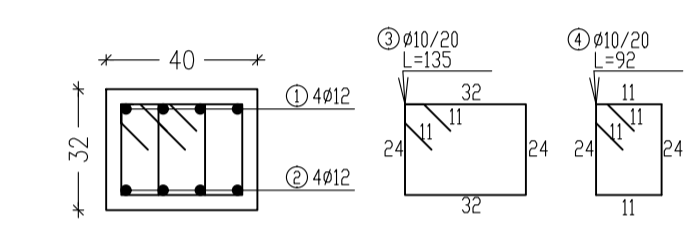
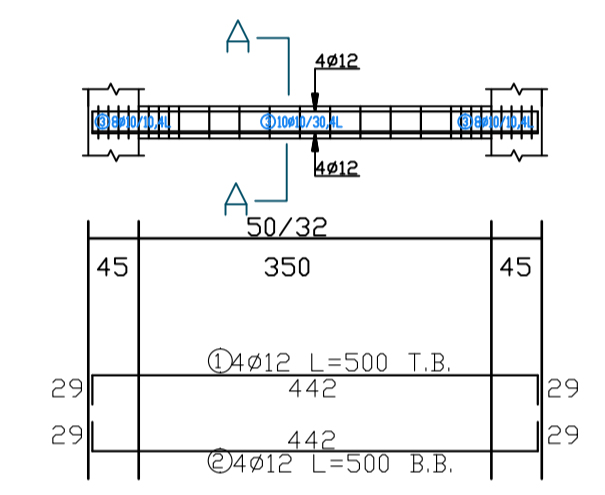
Section A-A 1:20

Beam C2 (60×32)cm



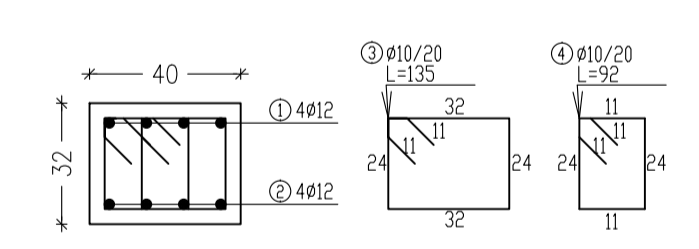
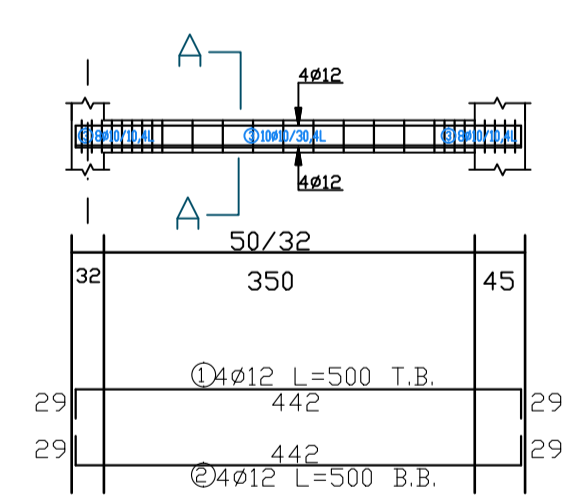
Section A-A 1:20

Beam C5 (40×32)cm



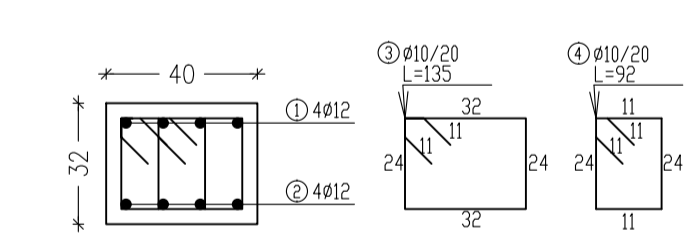
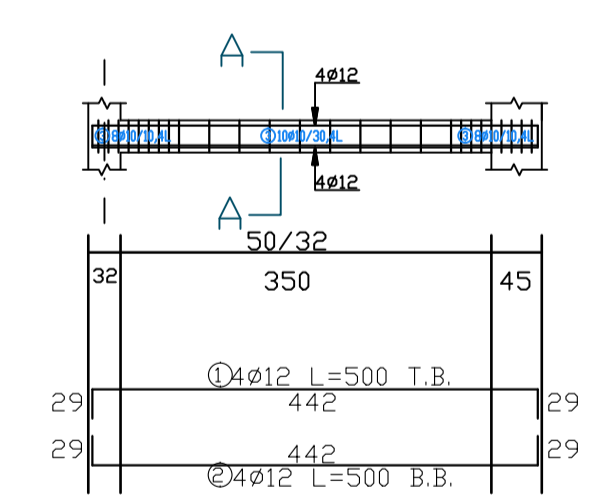
Section A-A 1:20

Beam C3 (40×32)cm

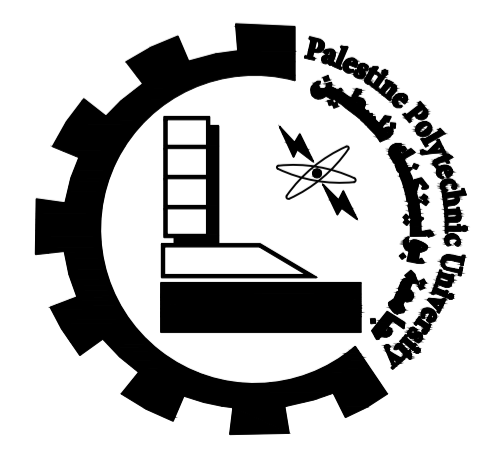


Section A-A 1:20

Beam C6 (40×32)cm



Section A-A 1:20



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Rahma Yousef Qawasmi

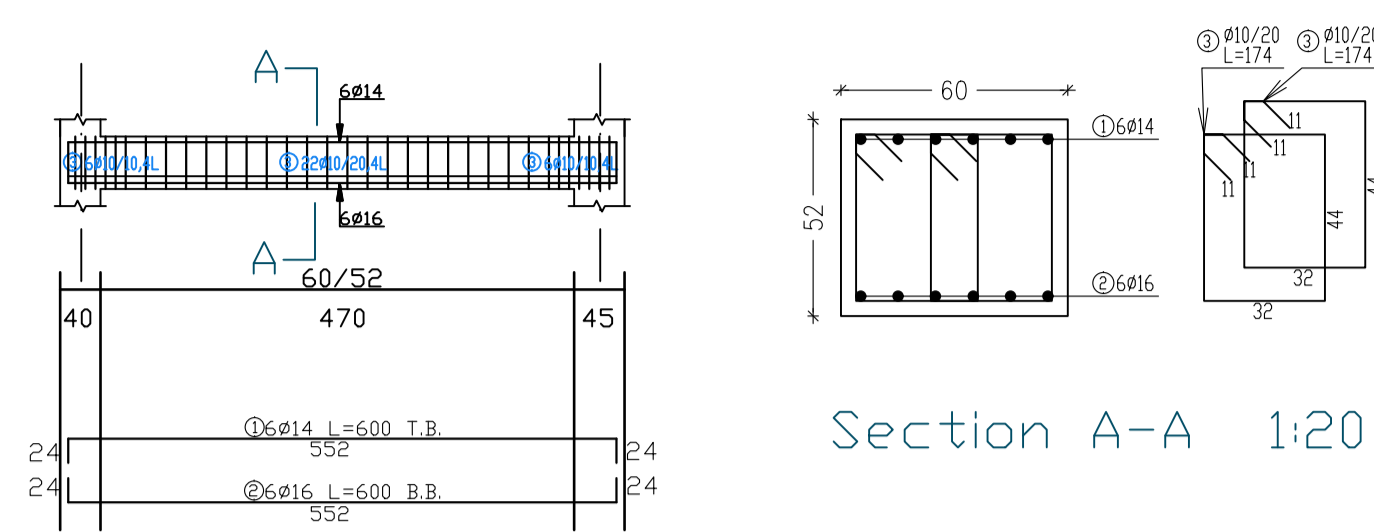
Drawing Title:  
BEAMS Reinforcement  
Bridge A  
Scale: 1:75  
Drawing No.38

Hatching Key

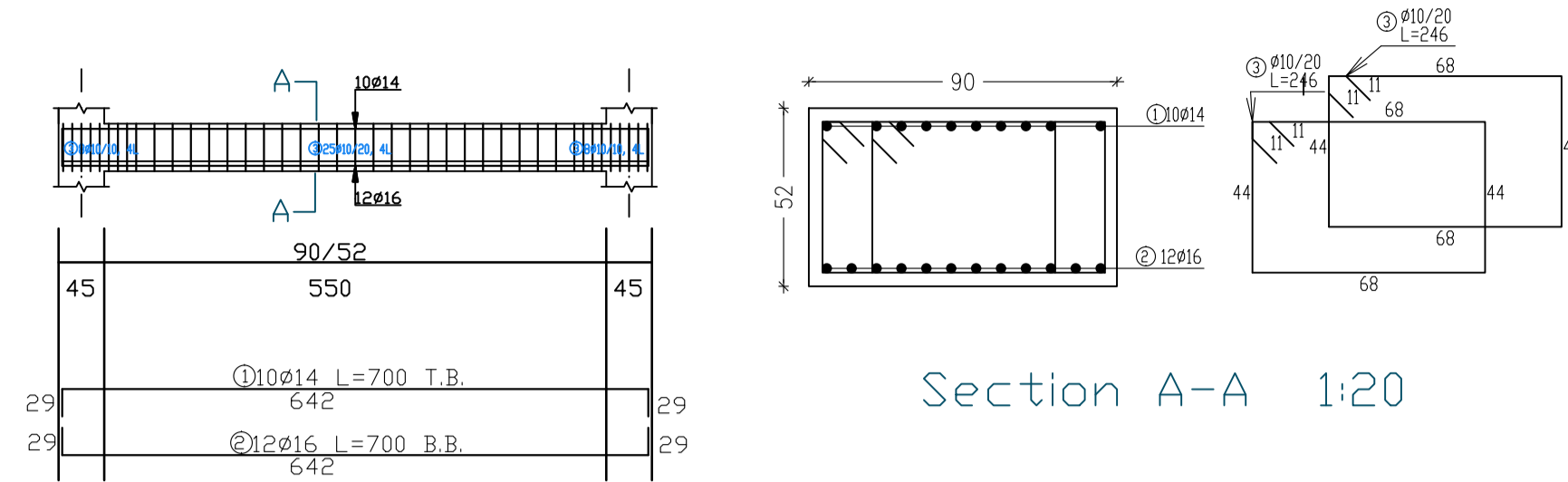
- Concrete
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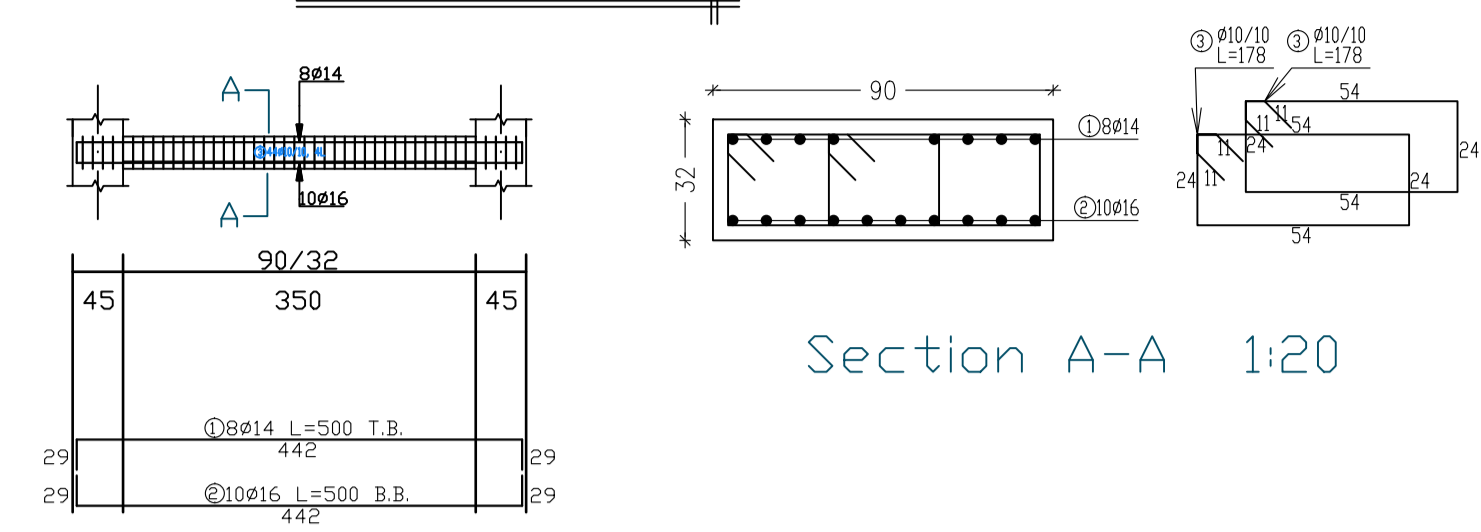
Beam A40 (60x52)cm



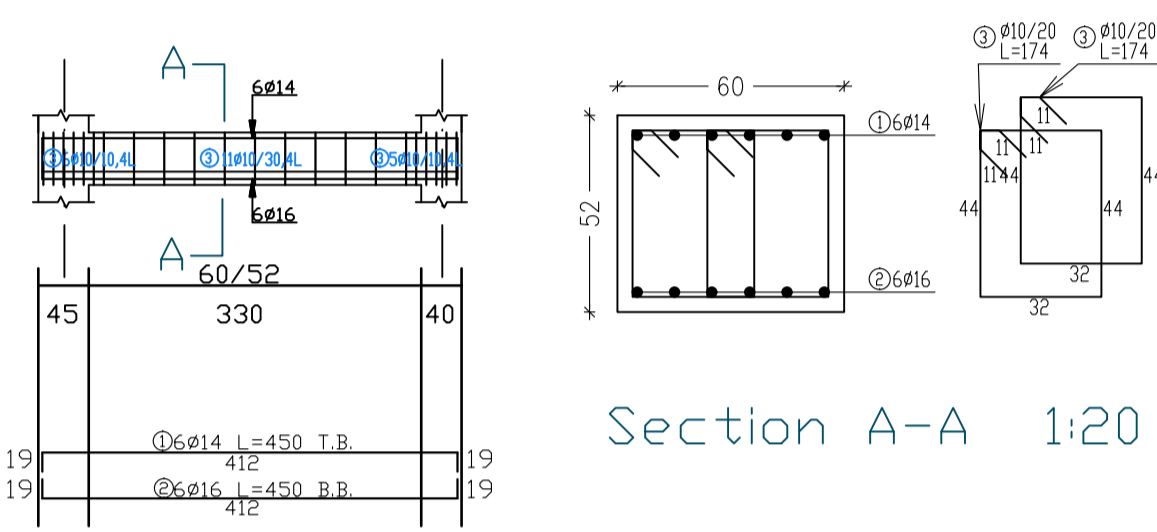
Beam A44 (90x52)cm



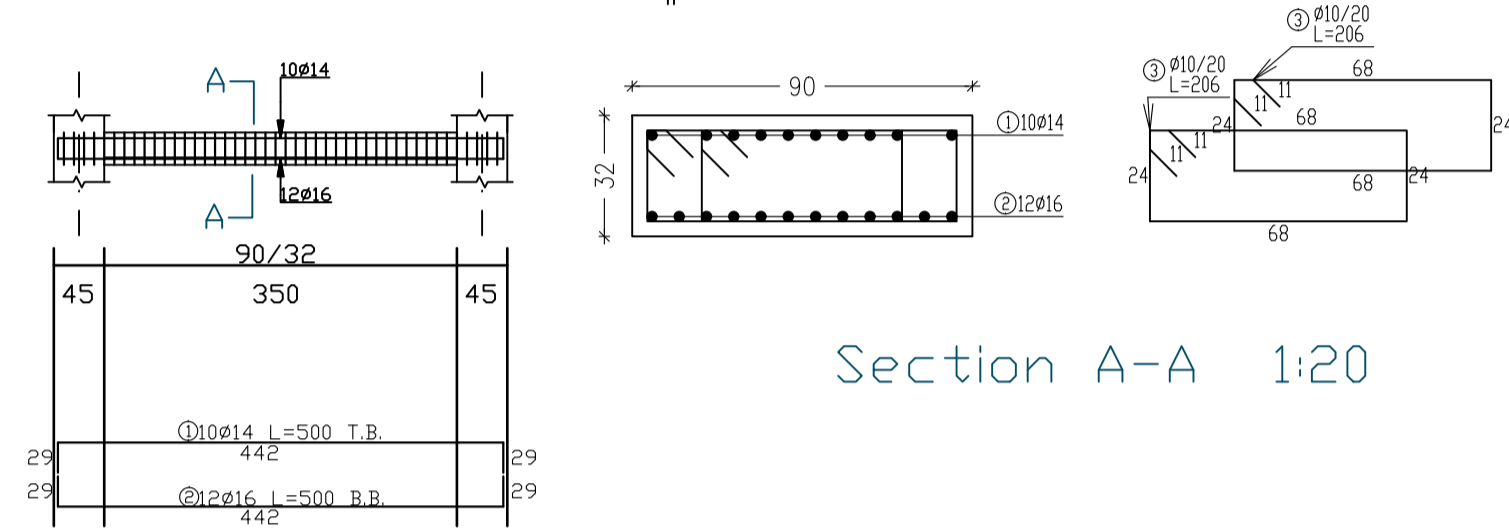
Beam A47 (90x32)cm



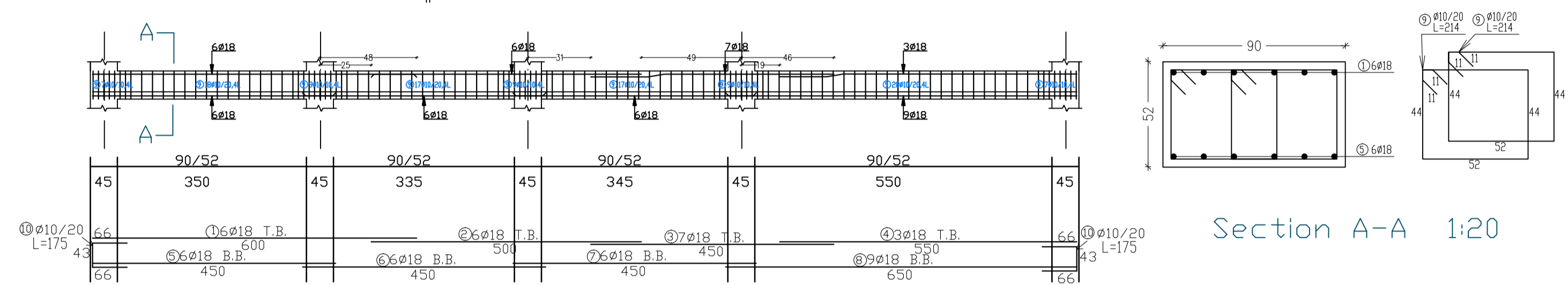
Beam A41 (60x52)cm



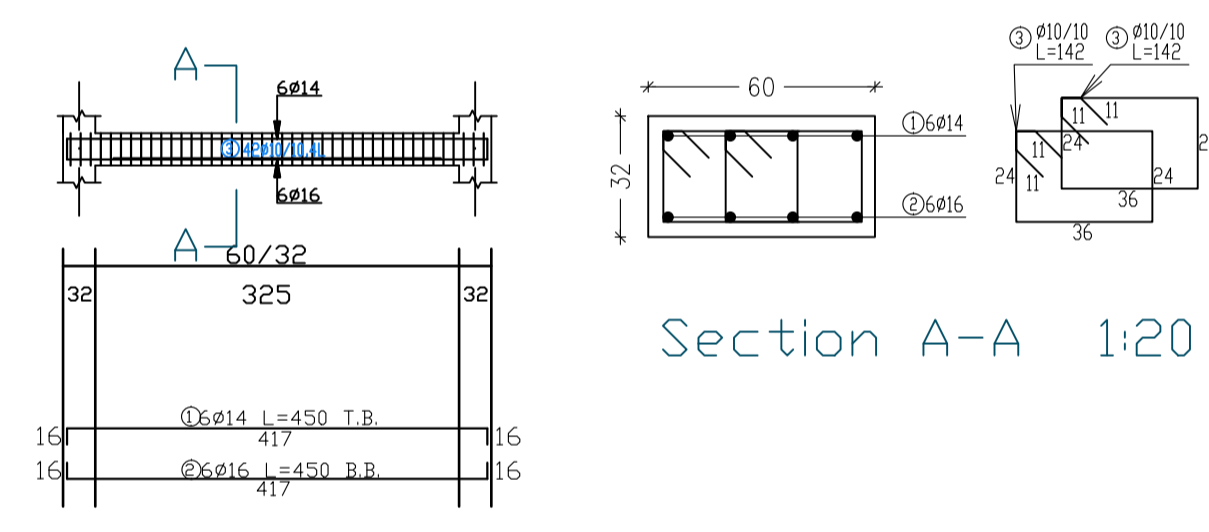
Beam A45 (90x32)cm



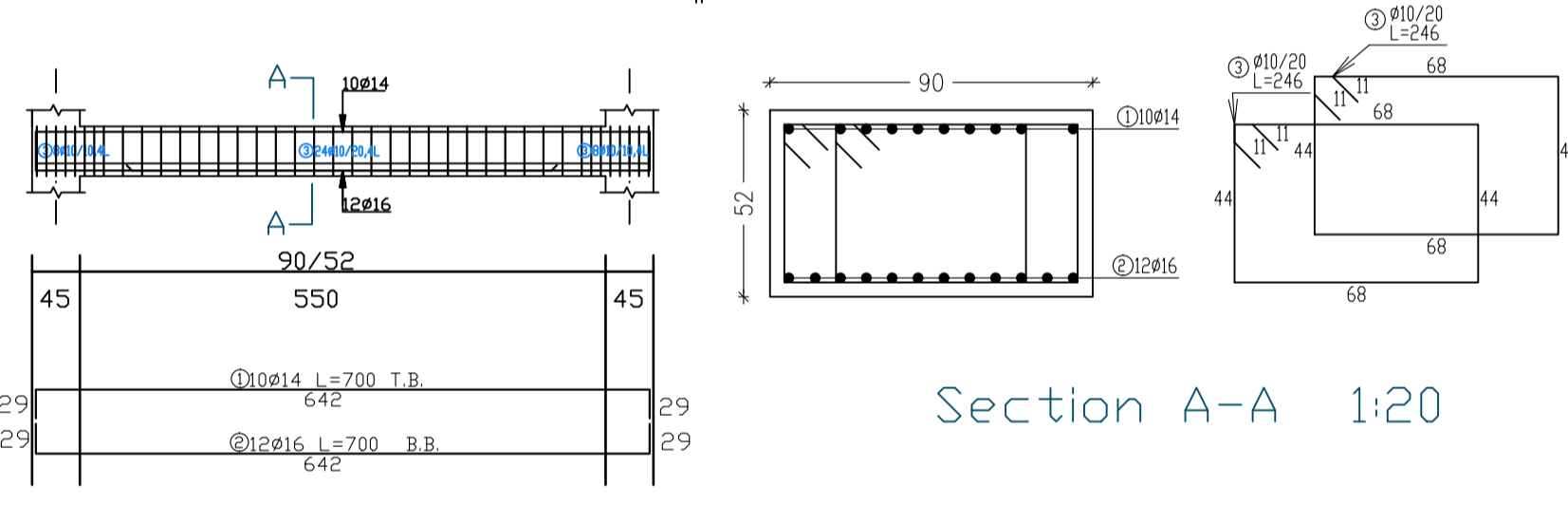
Beam A48 (90x52)cm



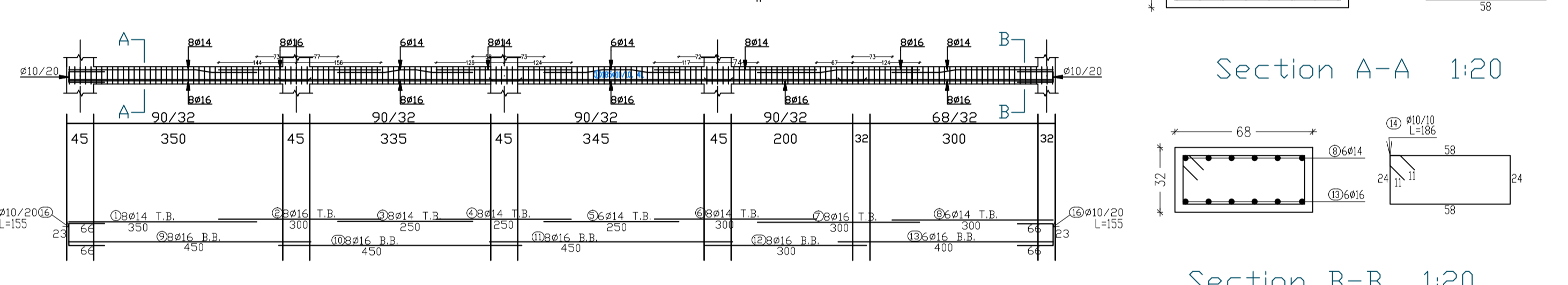
Beam A42 (60x32)cm



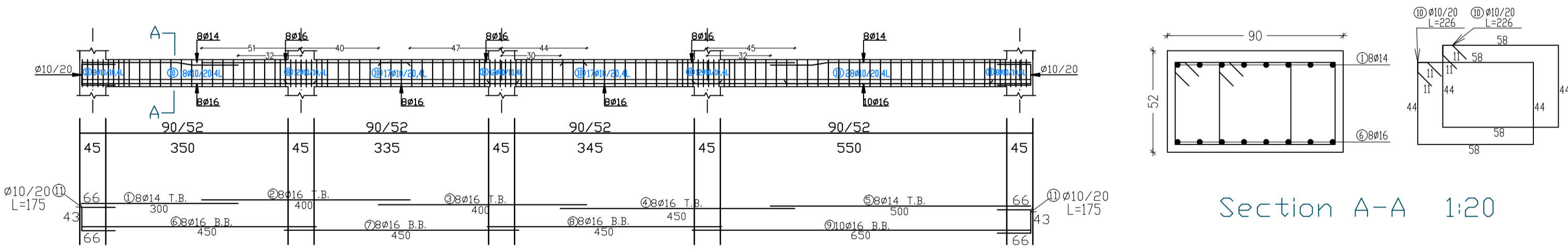
Beam A46 (90x52)cm



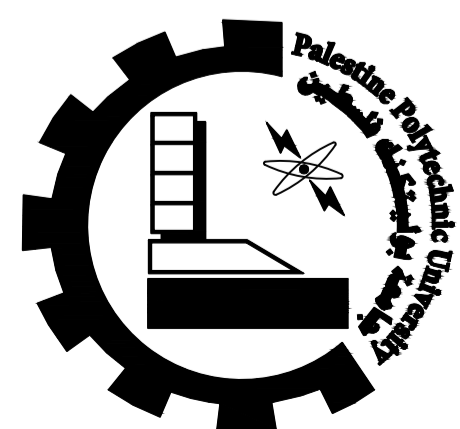
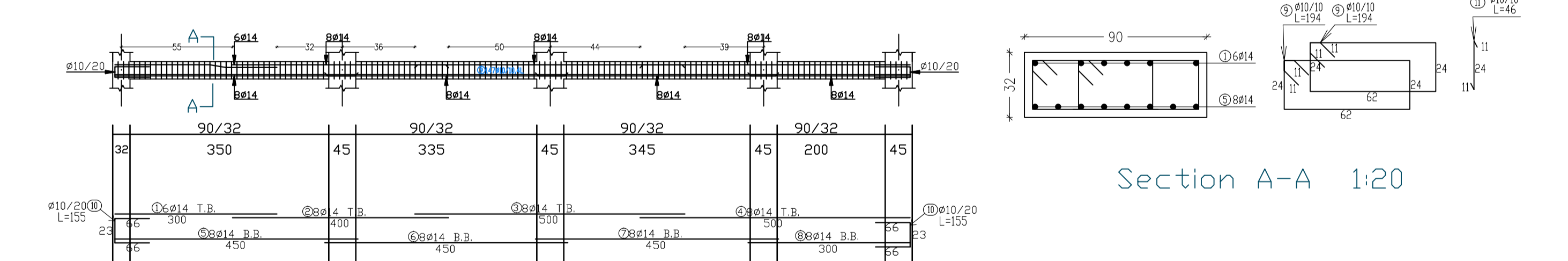
Beam A49 : A-A (90/32)cm & B-B (43x32)cm



Beam A43 (90x52)cm



Beam A50 (90x32)cm



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Graduation Project  
Structural design of a tourist spa resort  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
BEAMS Reinforcement  
First A

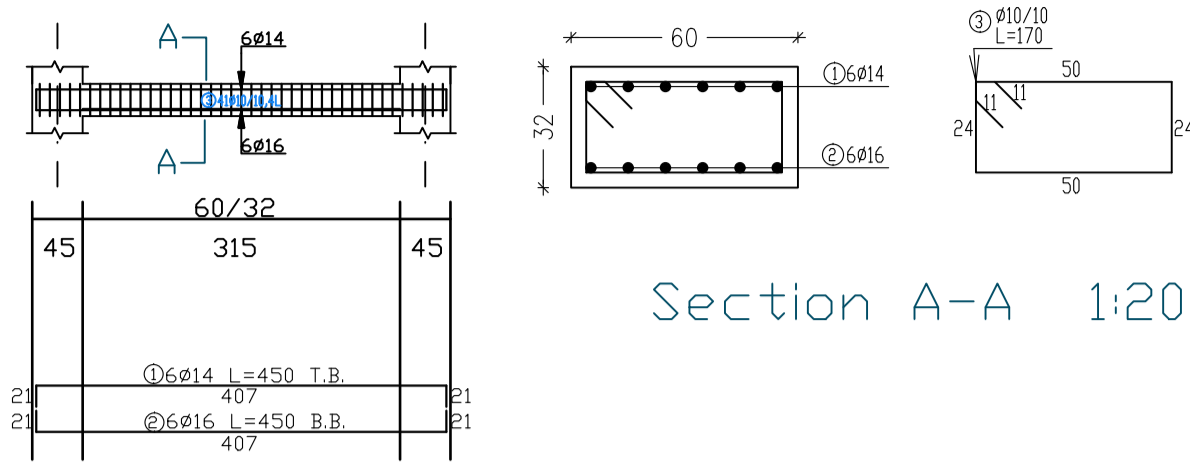
Scale: 1:75  
Drawing No. S39

Hatching Key

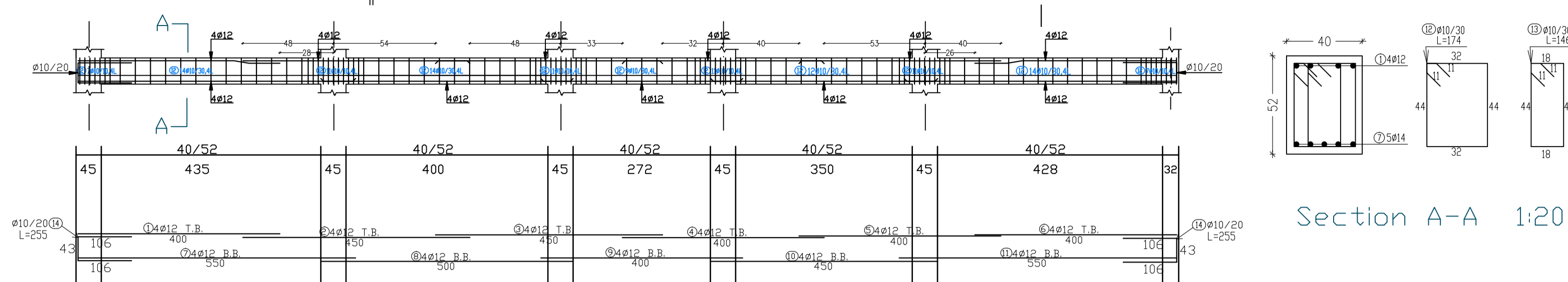
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

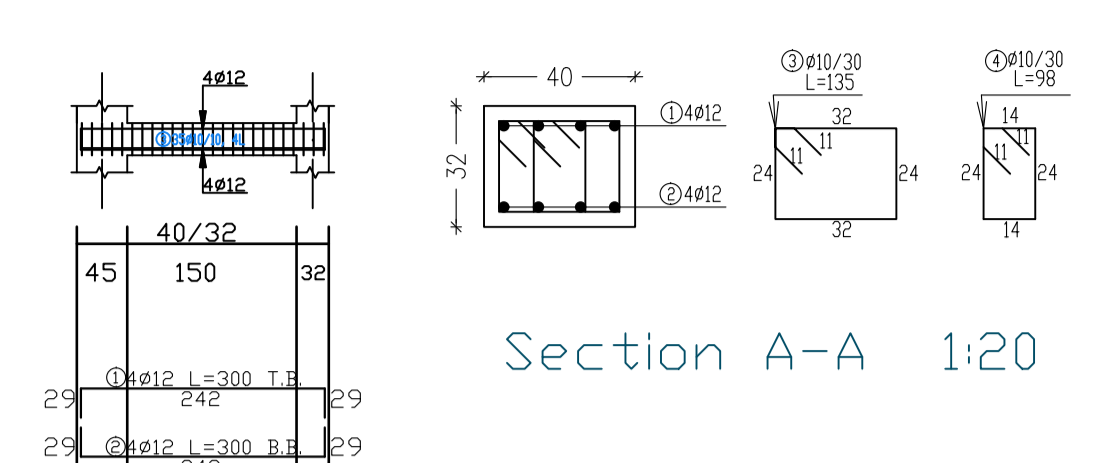
Beam A51 (60x52)cm



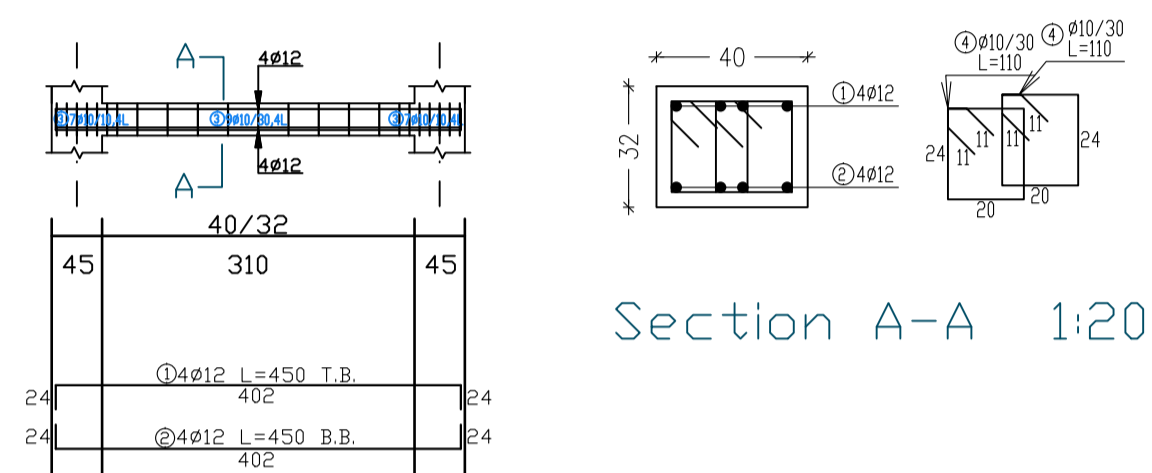
Beam A55 (40x52)cm



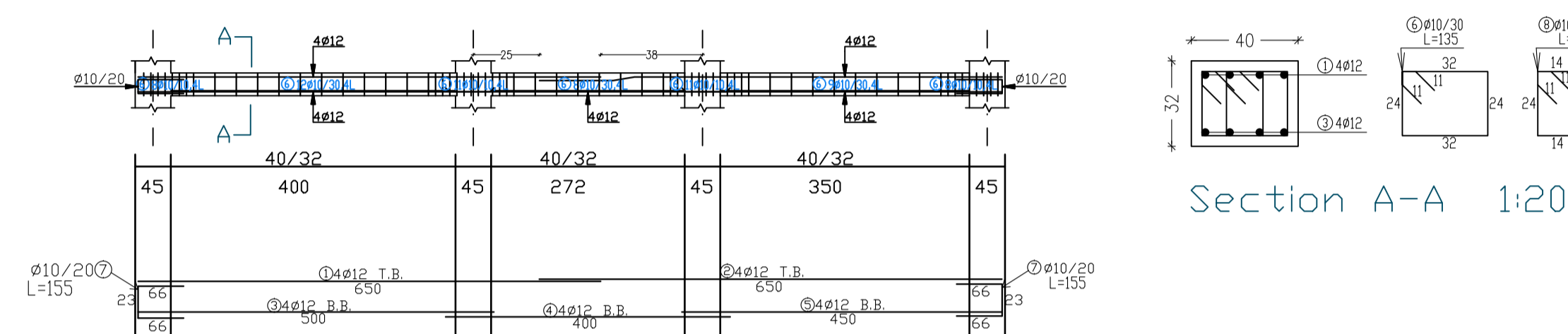
Beam A59 (40x32)cm



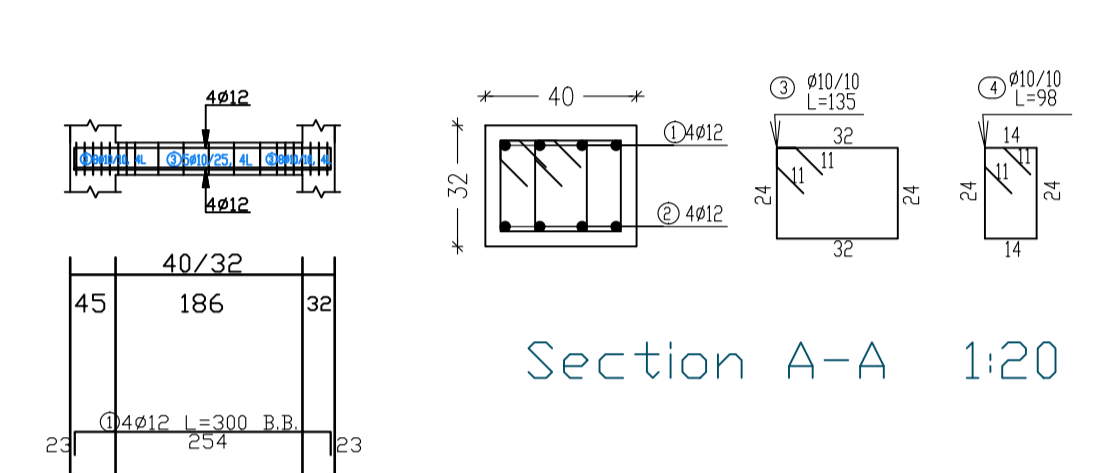
Beam A52 (40x32)cm



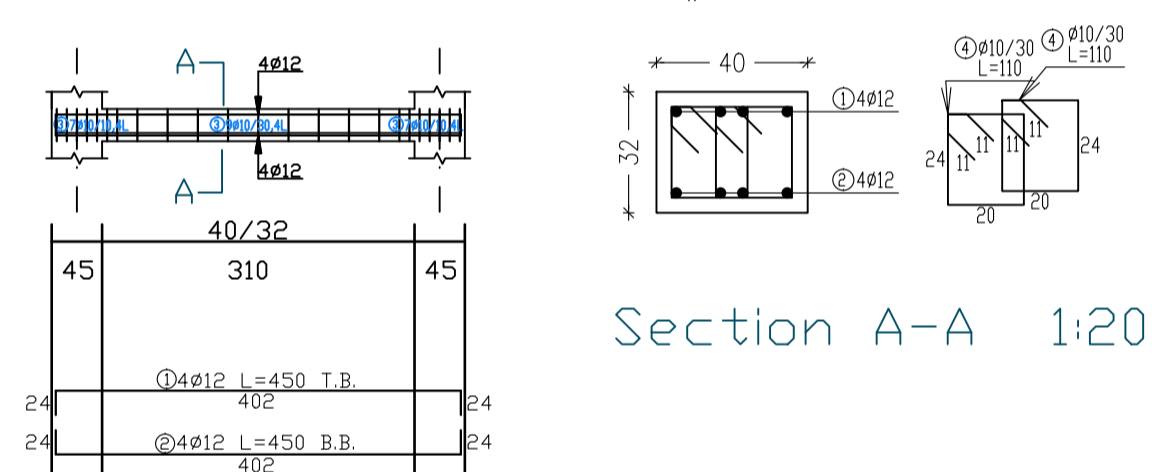
Beam A56 (40x32)cm



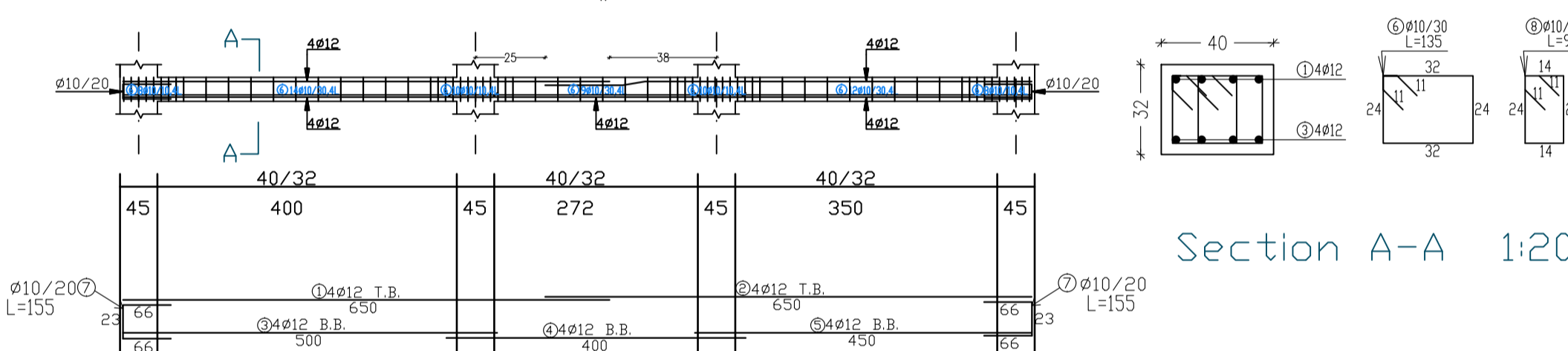
Beam A60 (40x32)cm



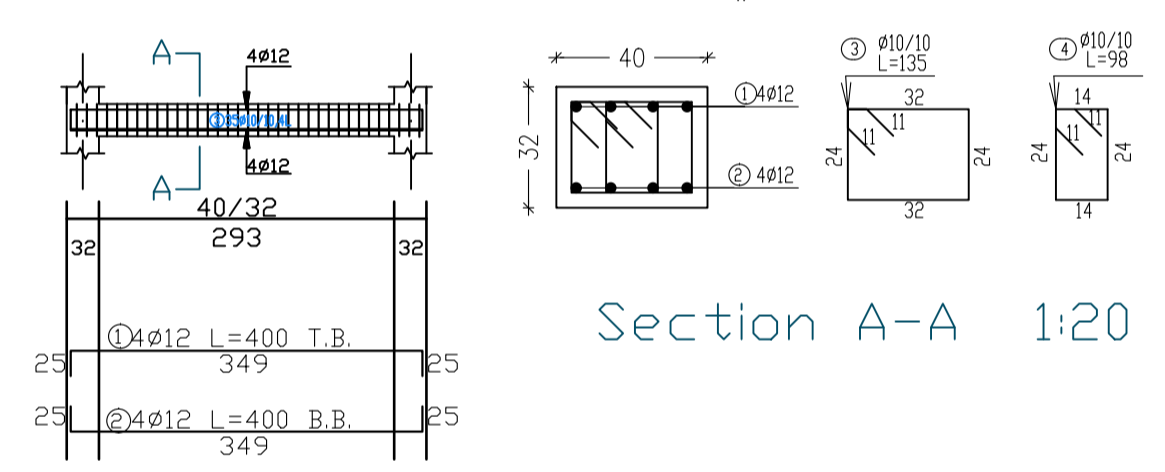
Beam A53 (40x32)cm



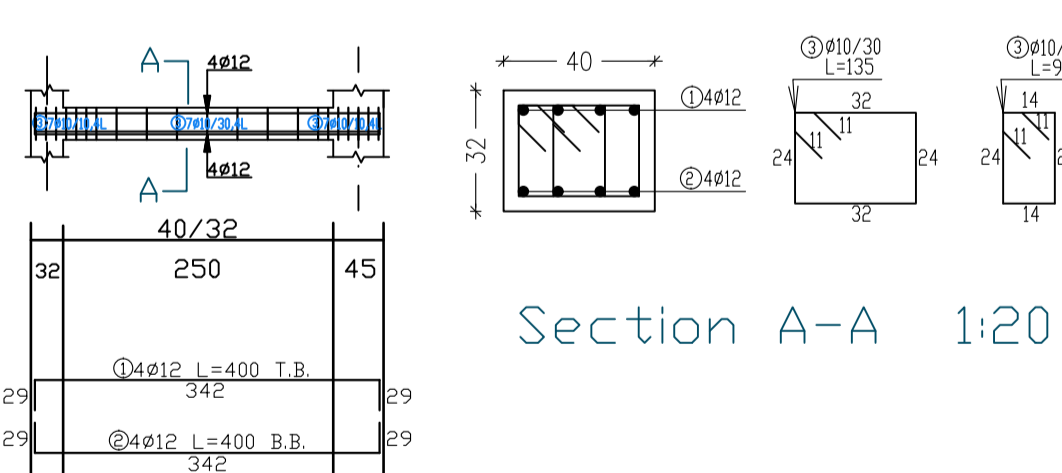
Beam A57 (40x32)cm



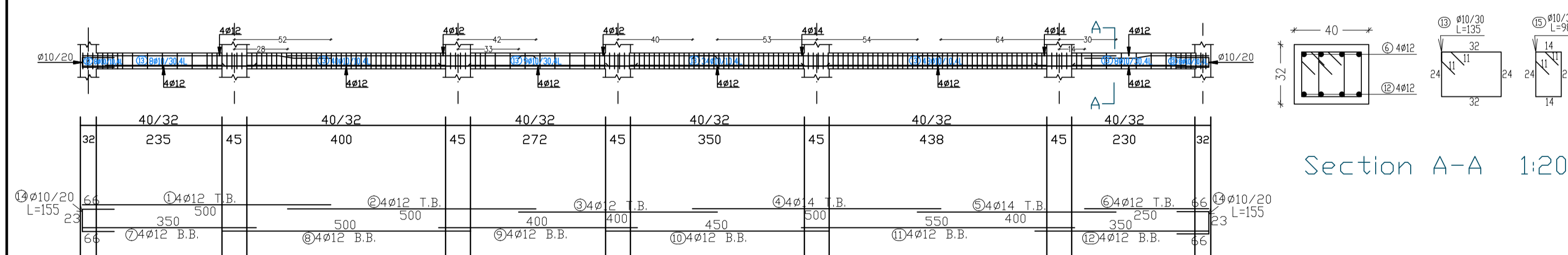
Beam A61 (40x32)cm



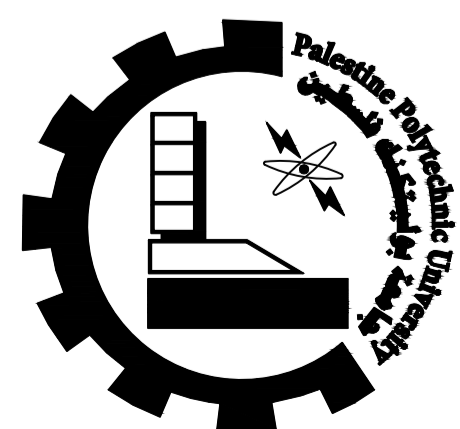
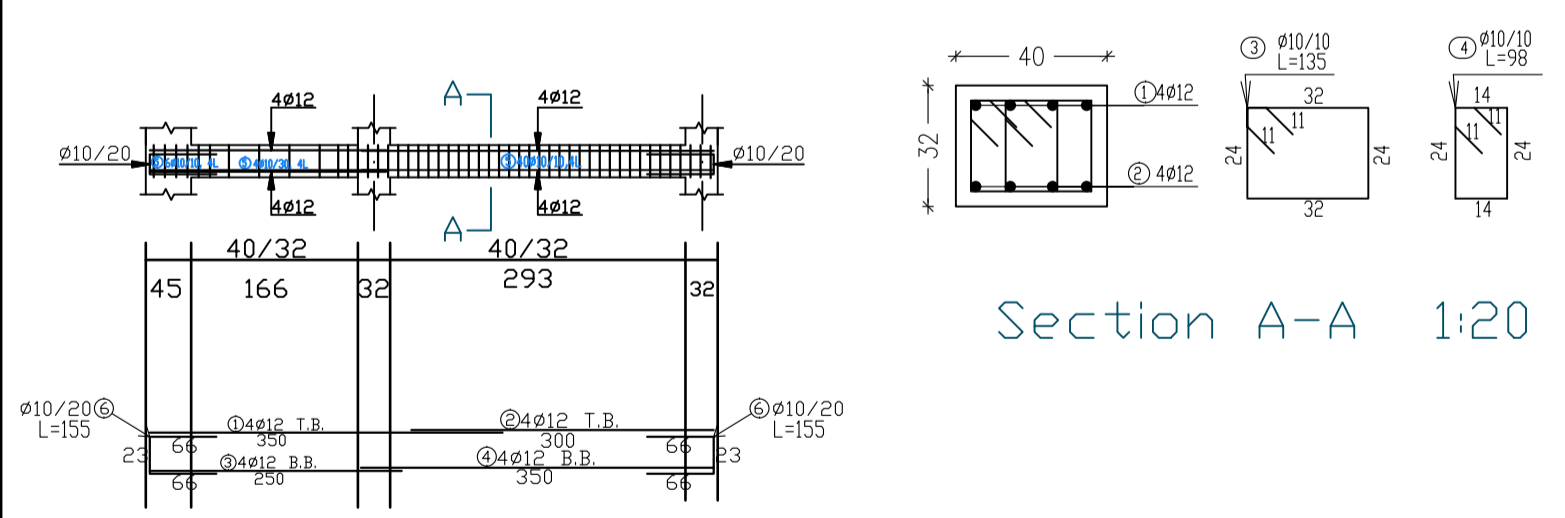
Beam A54 (40x32)cm



Beam A58 (40x32)cm



Beam A62 (40x32)cm



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Graduation Project  
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Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
BEAMS Reinforcement  
First A

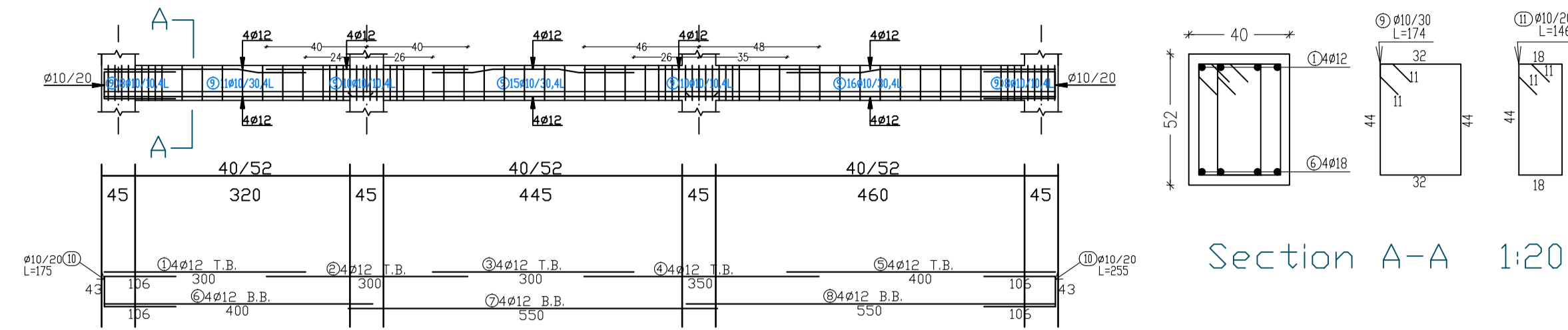
Scale: 1:75  
Drawing No. S40

Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

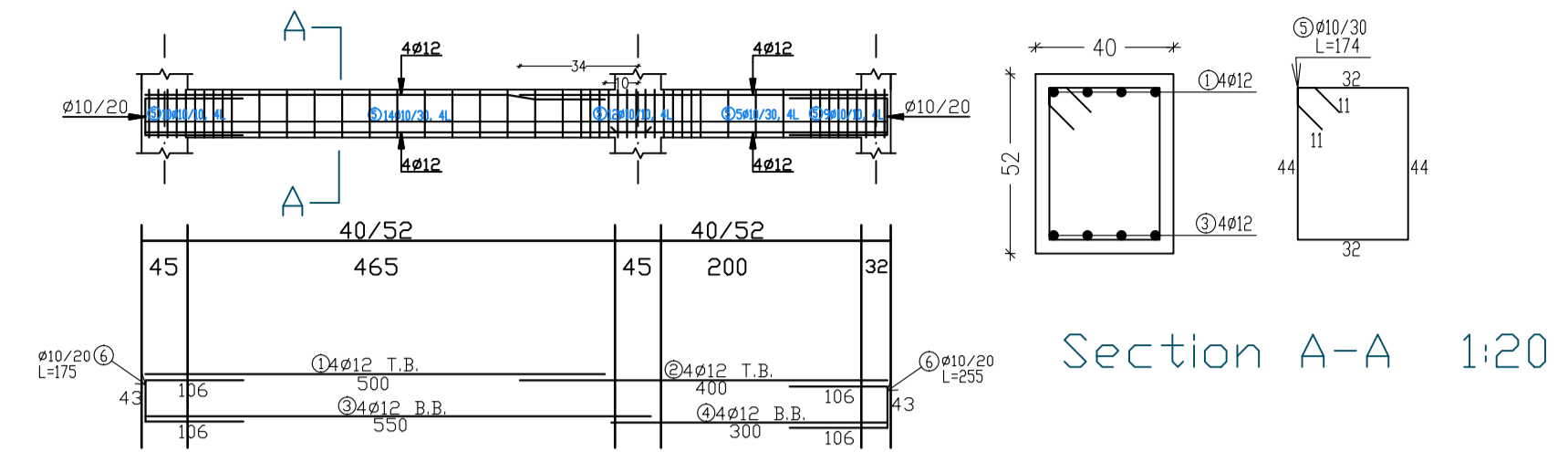
May 2022

Beam B36 (40x52)cm



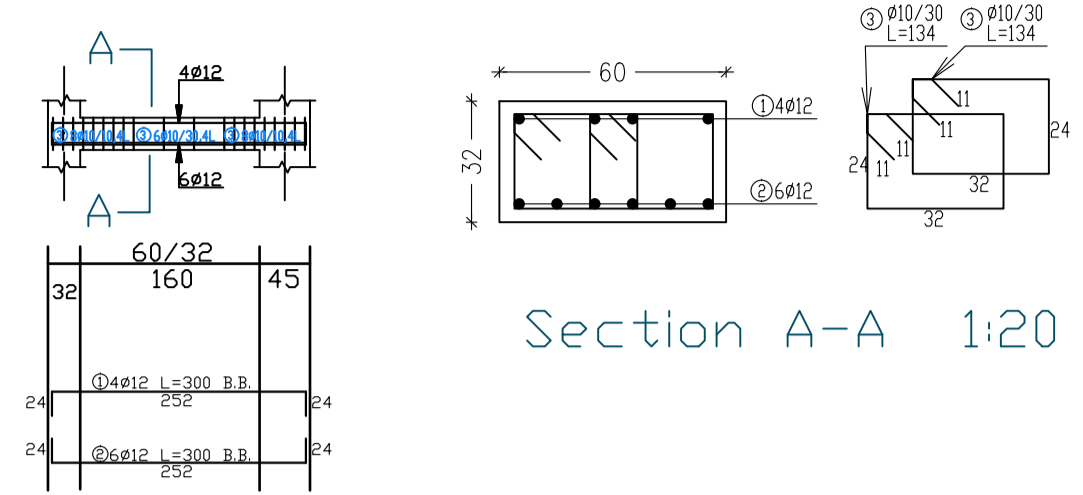
Section A-A 1:20

Beam B37 (40x52)cm



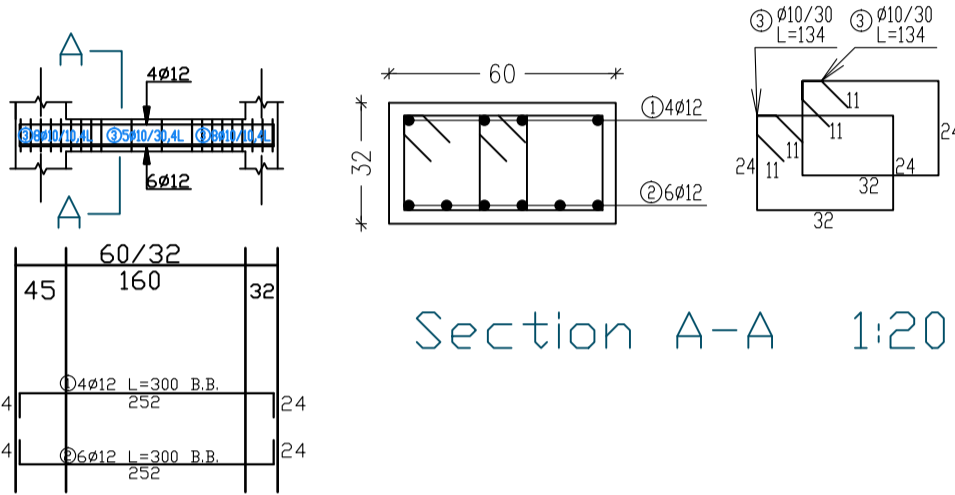
Section A-A 1:20

Beam B38 (60x32)cm



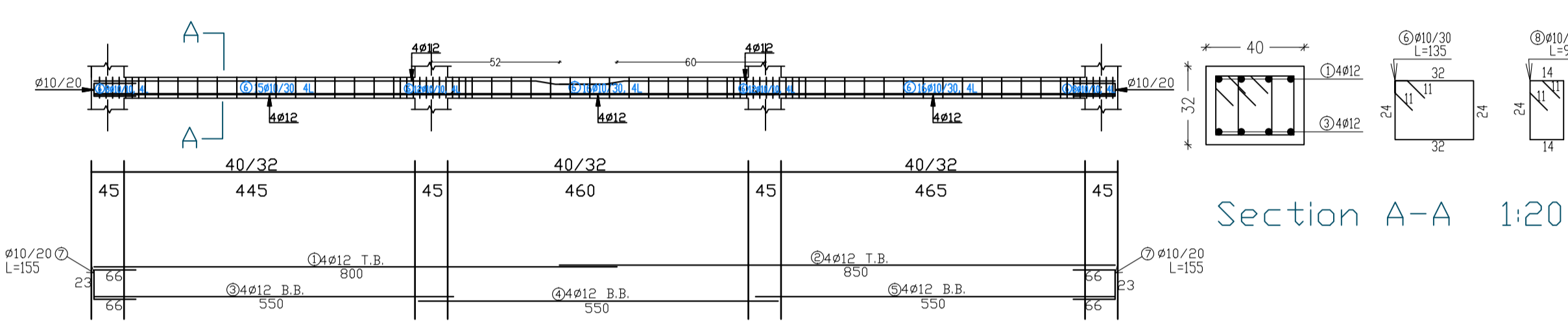
Section A-A 1:20

Beam B39 (60x32)cm



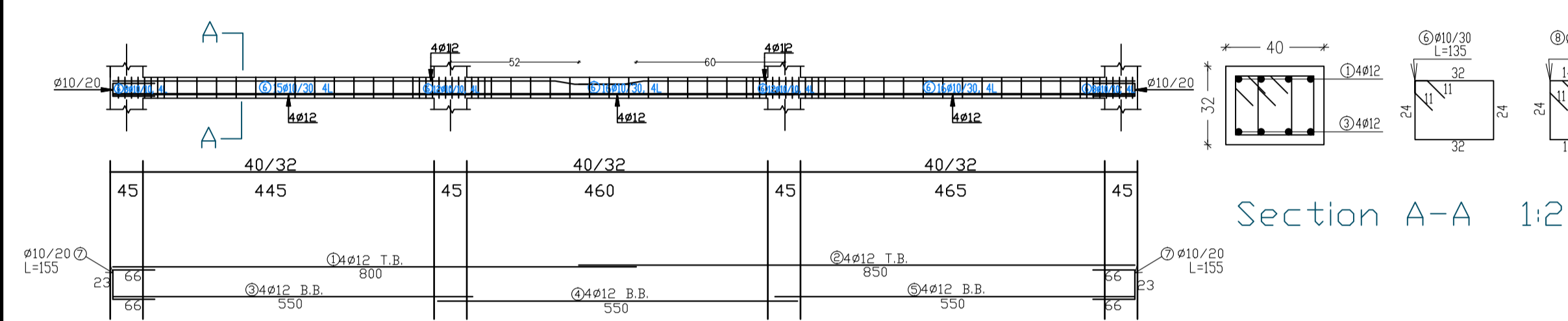
Section A-A 1:20

Beam B40 (40x32)cm



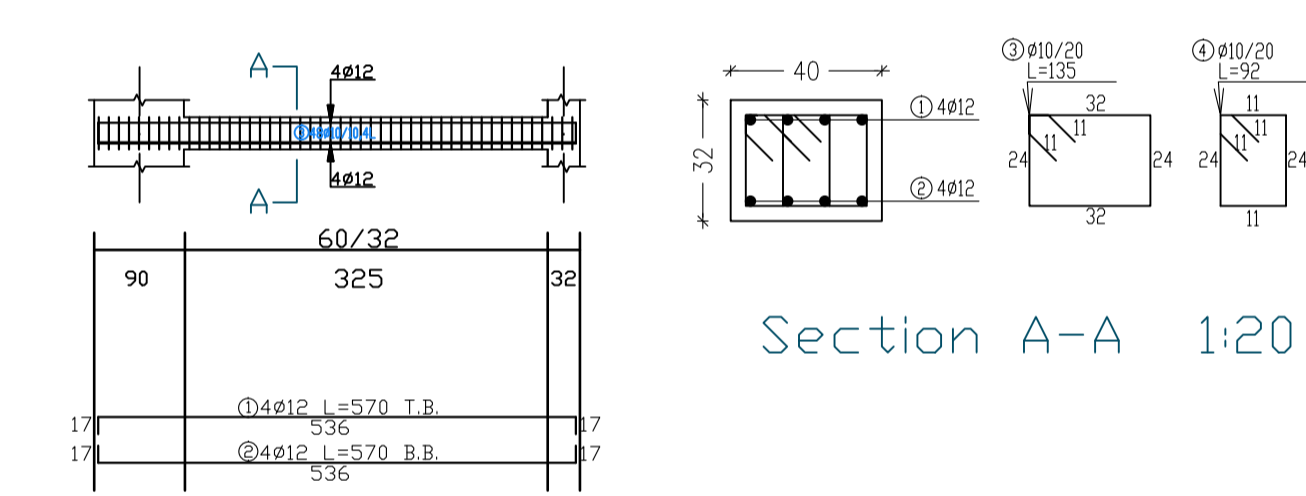
Section A-A 1:20

Beam B41 (40x32)cm



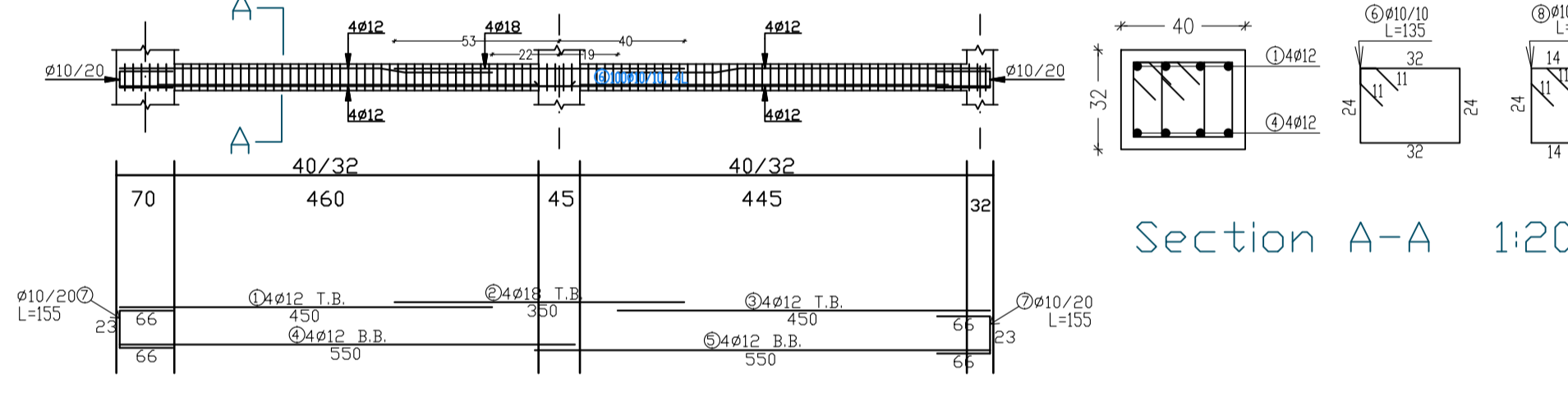
Section A-A 1:20

Beam B42 (40x32)cm



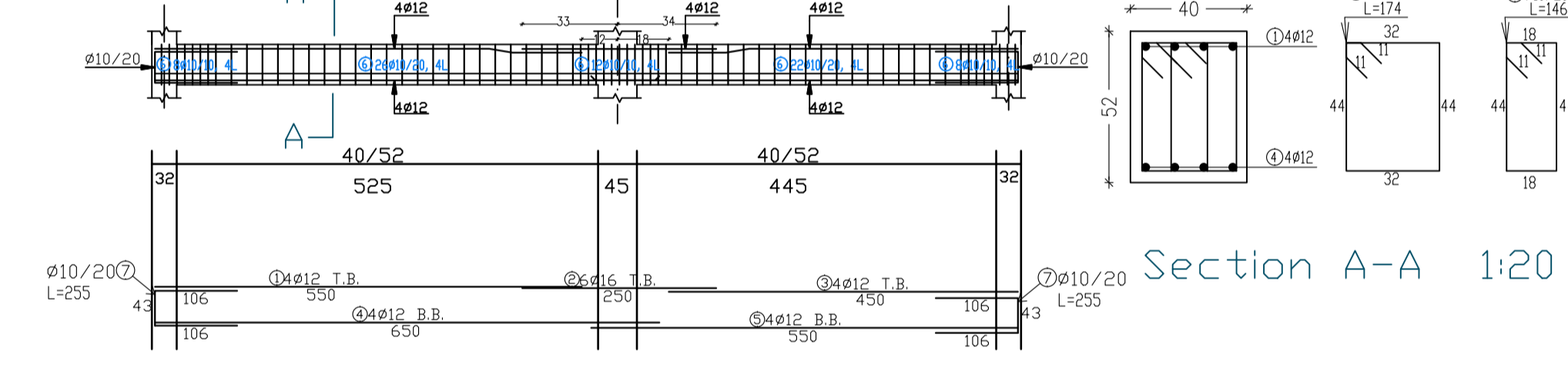
Section A-A 1:20

Beam B43 (40x32)cm



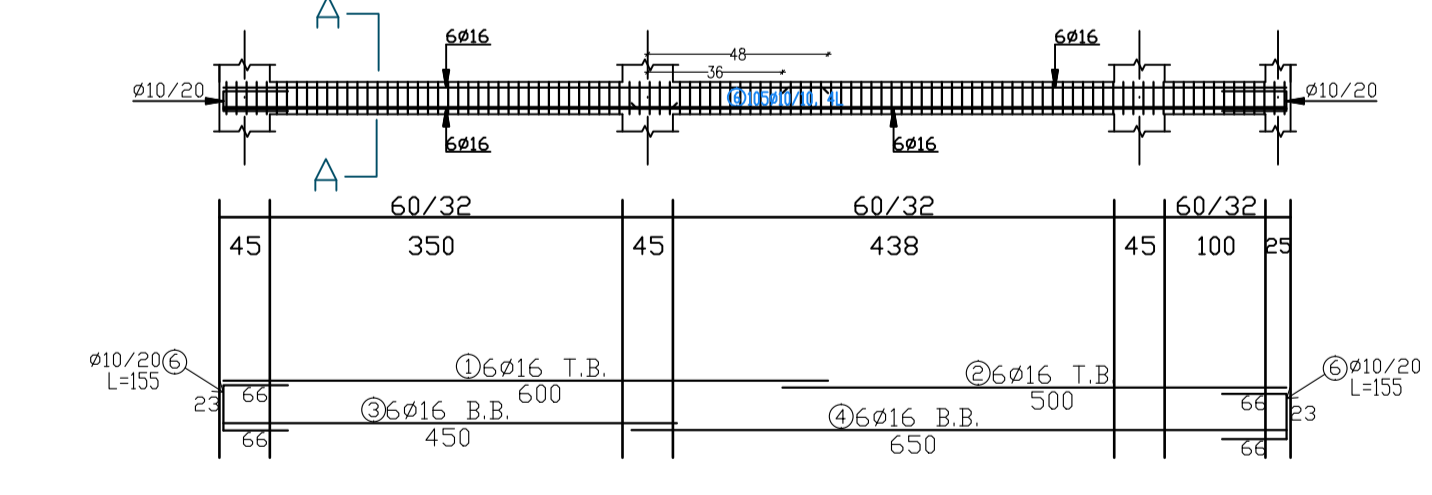
Section A-A 1:20

Beam B44 (40x52)cm



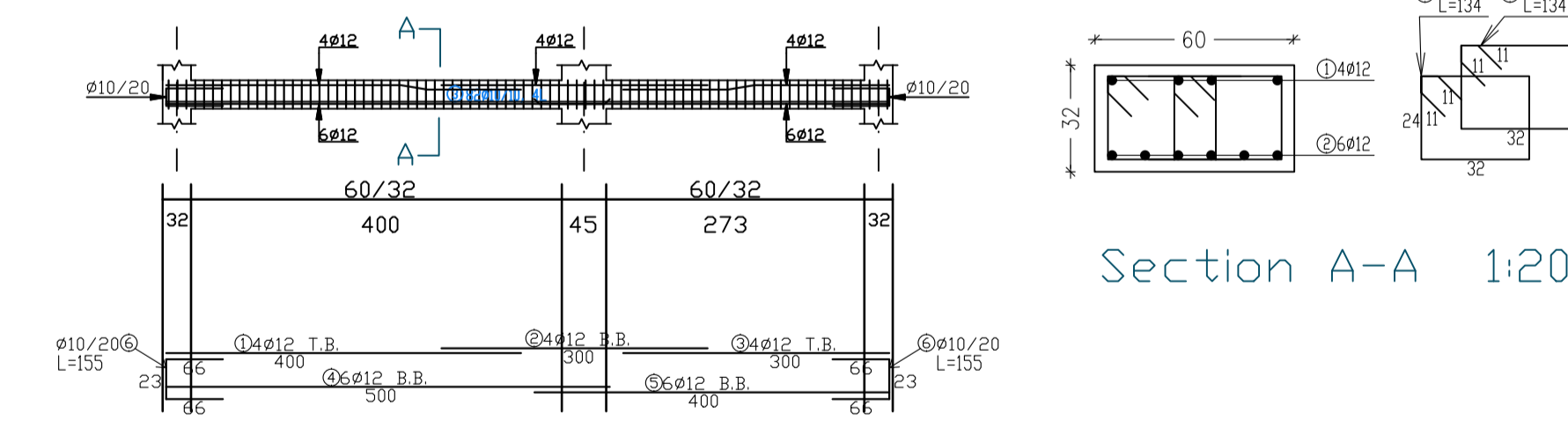
Section A-A 1:20

Beam B45 (60x32)cm

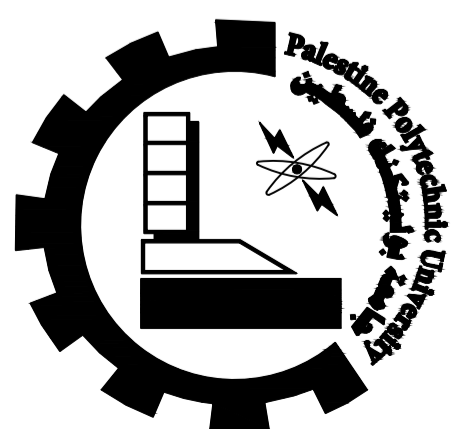


Section A-A 1:20

Beam B46 (60x32)cm



Section A-A 1:20



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College of Engineering  
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Graduation Project  
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Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
BEAMS Reinforcement  
First B

Scale: 1:75  
Drawing No. S41

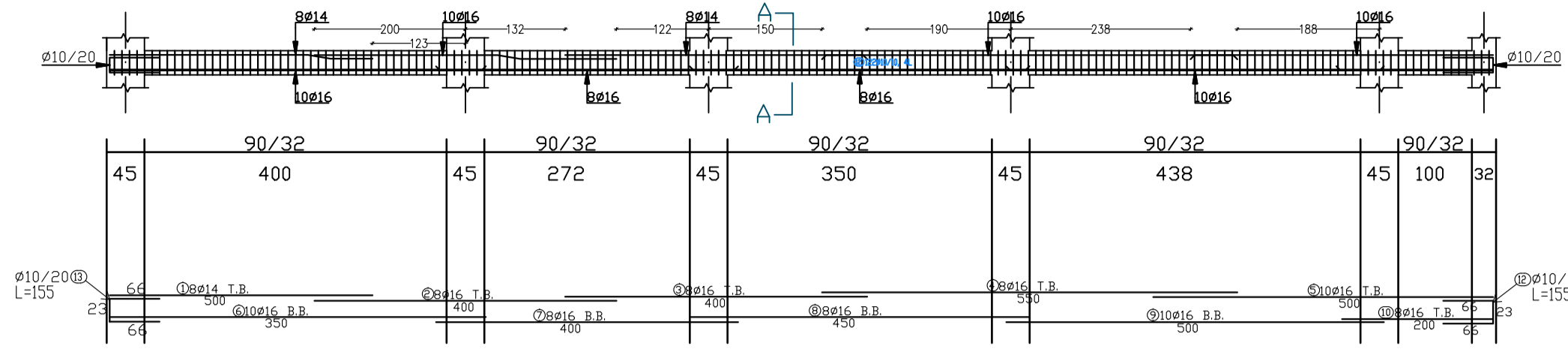
Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

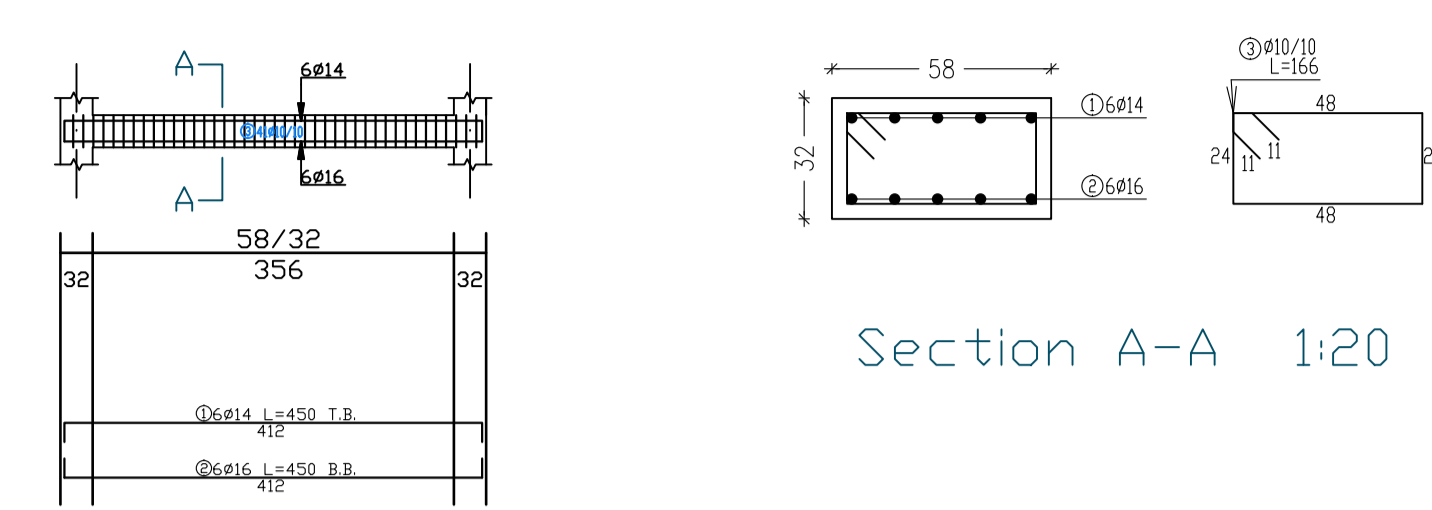


### Beam B47 (90/32)cm



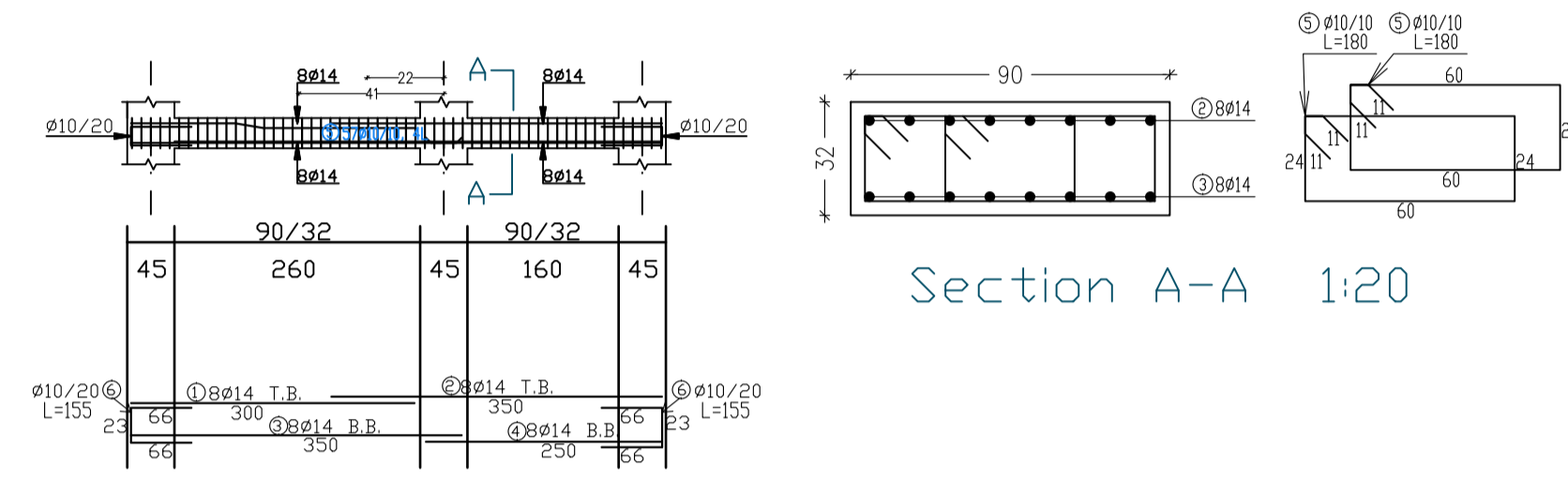
Section A-A 1:20

### Beam B48 (58x52)cm



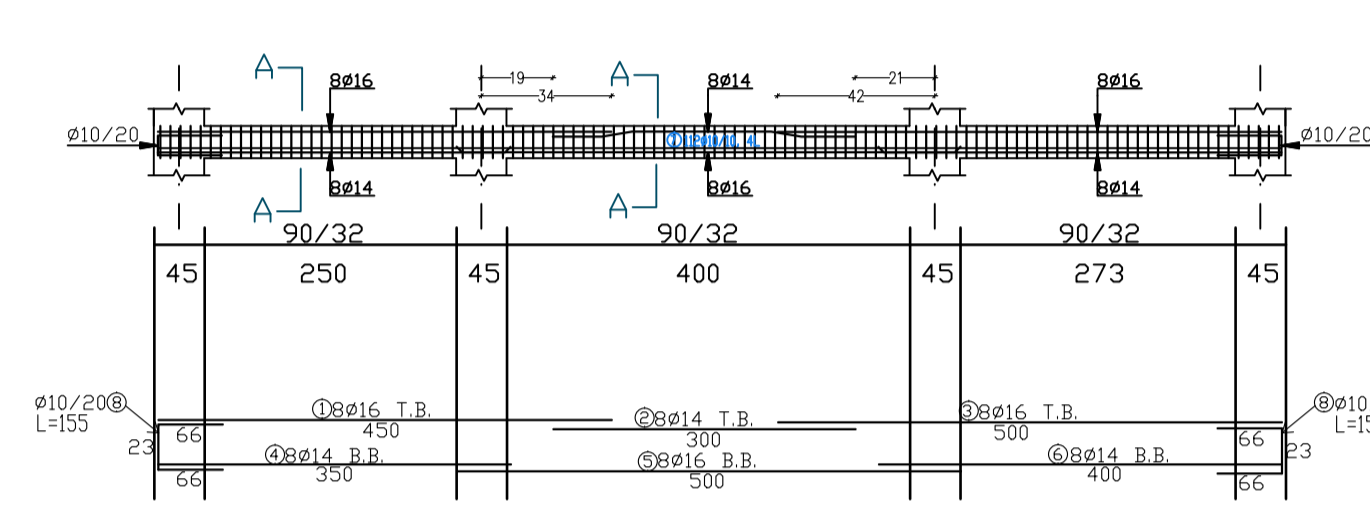
Section A-A 1:20

### Beam B49 (90x32)cm



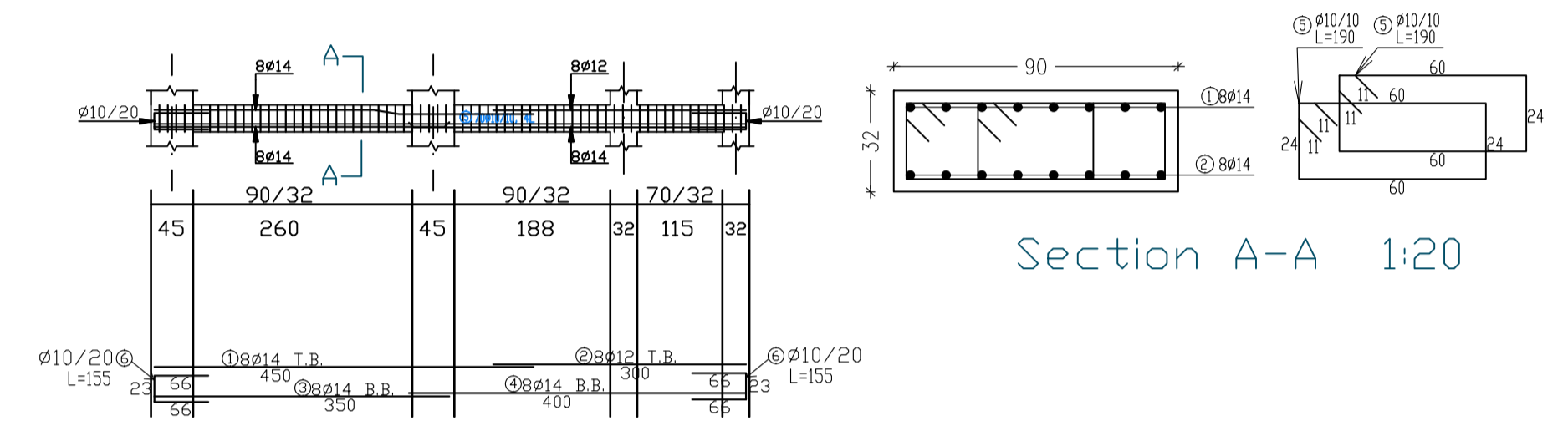
Section A-A 1:20

### Beam B50 (90x32)cm



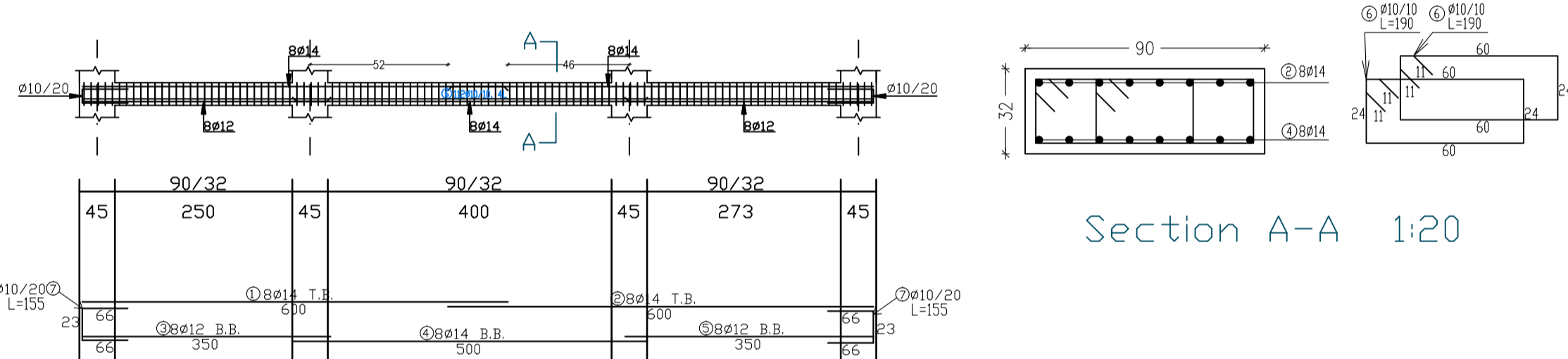
Section A-A 1:20

### Beam B51 (90x32)cm



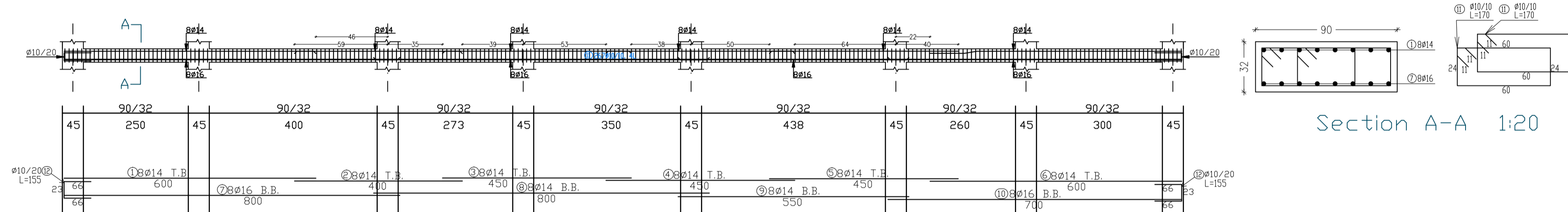
Section A-A 1:20

### Beam B52 (90x32)cm



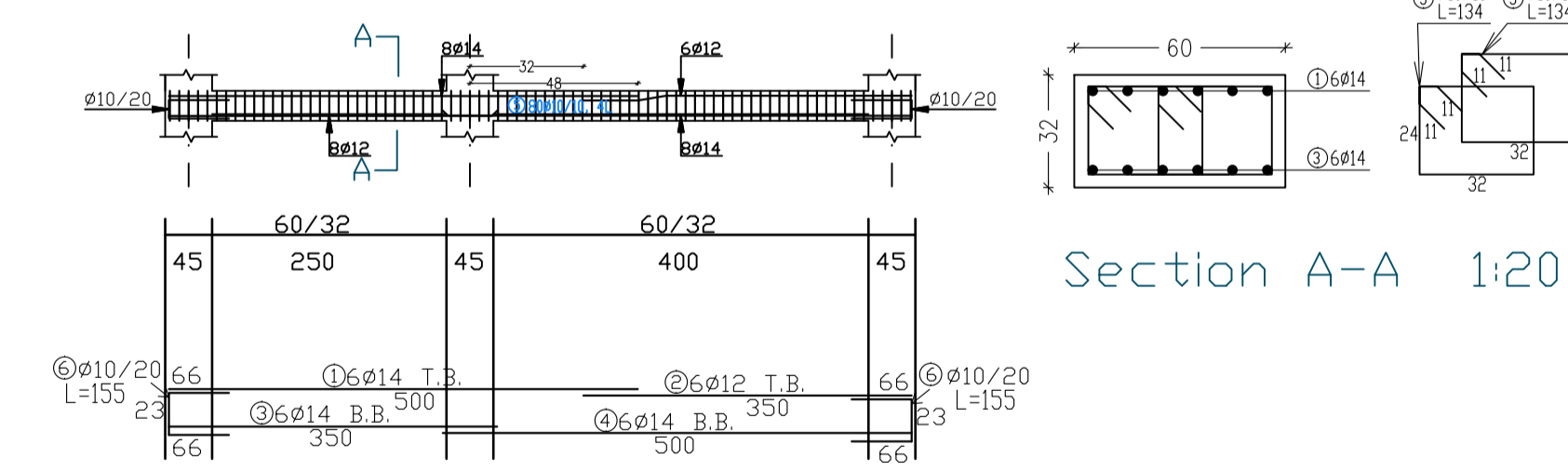
Section A-A 1:20

### Beam B53 (90x32)cm



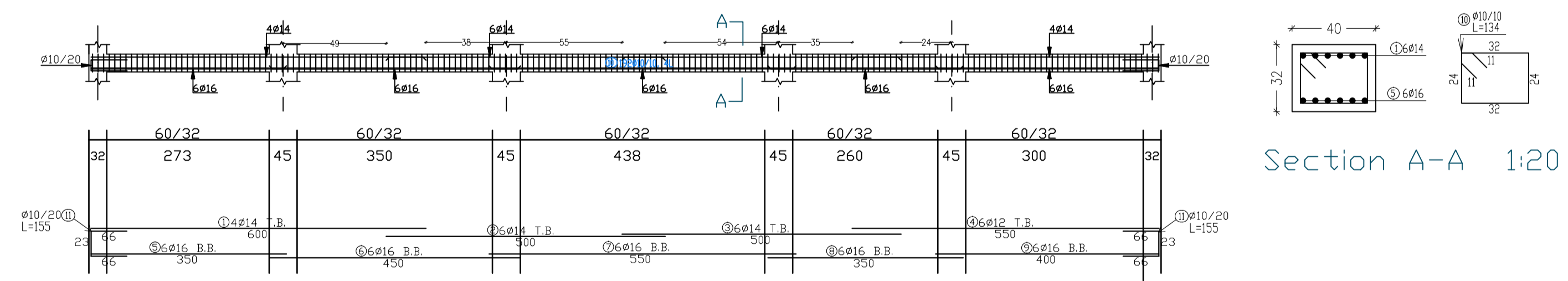
Section A-A 1:20

### Beam B54 (60x32)cm

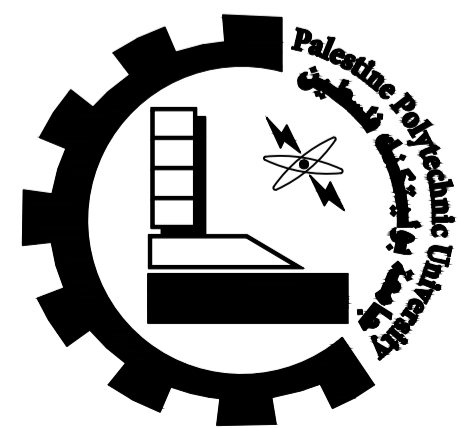


Section A-A 1:20

### Beam B55 (40x32)cm



Section A-A 1:20



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Civil Engineering Department  
Building Engineering



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Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi  
Supervisor:  
Dr. Nafeth Nasereddin

Drawing Title:  
BEAMS Reinforcement  
First B

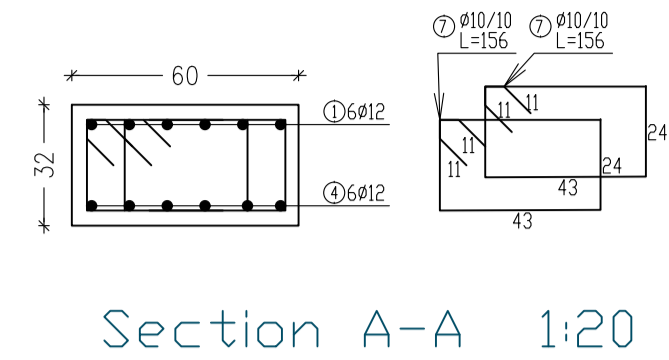
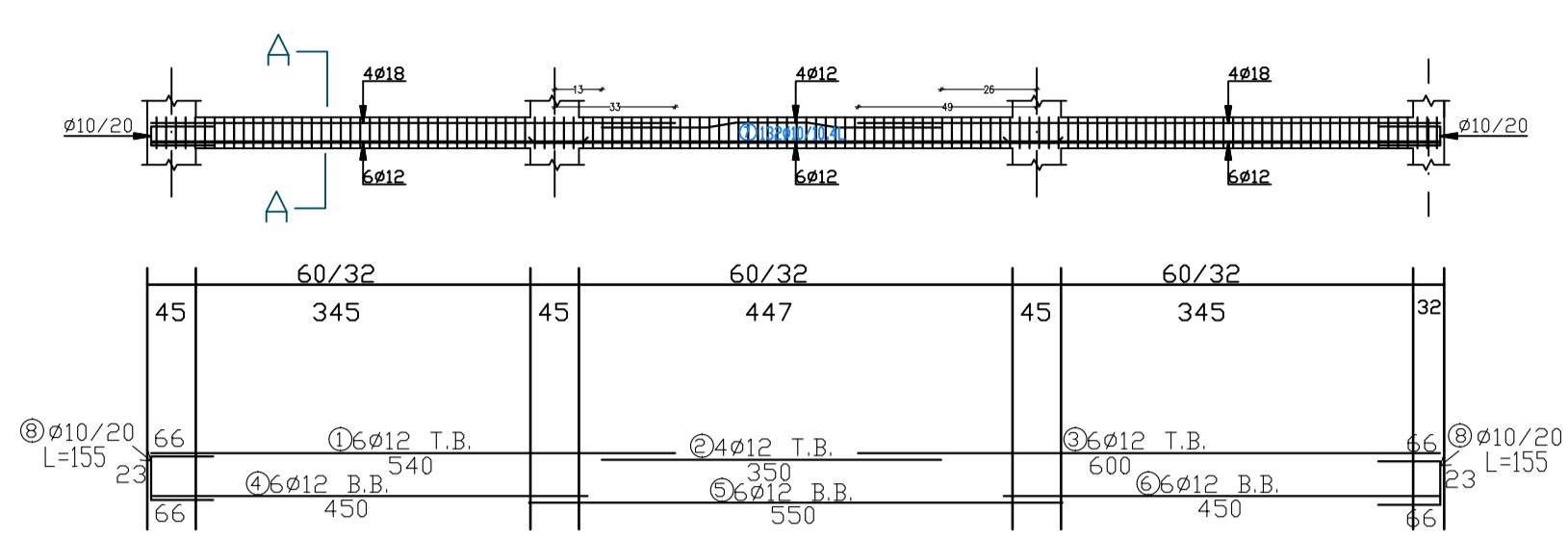
Scale: 1:75  
Drawing No. S42

#### Hatching Key

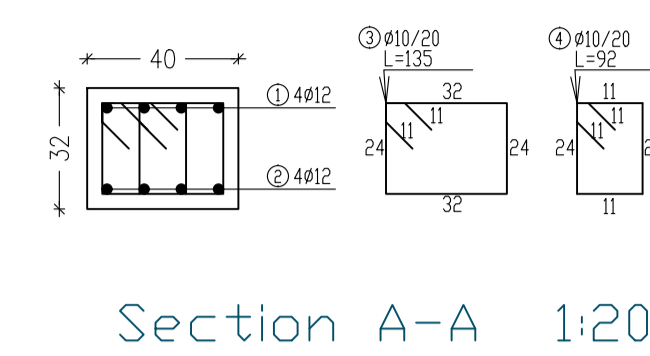
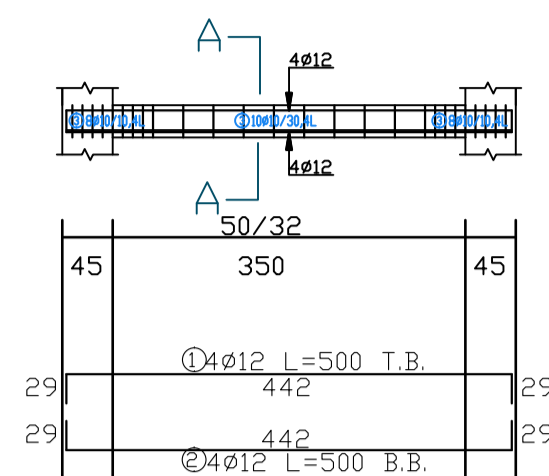
- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

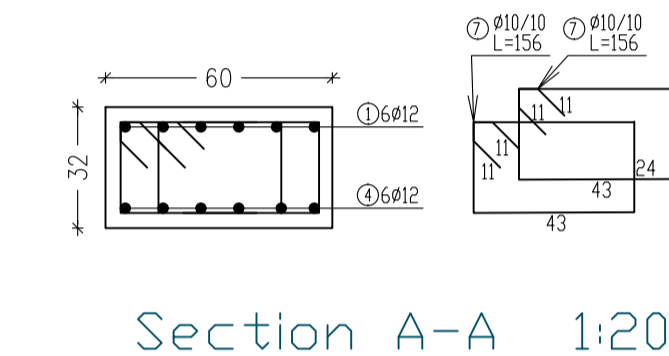
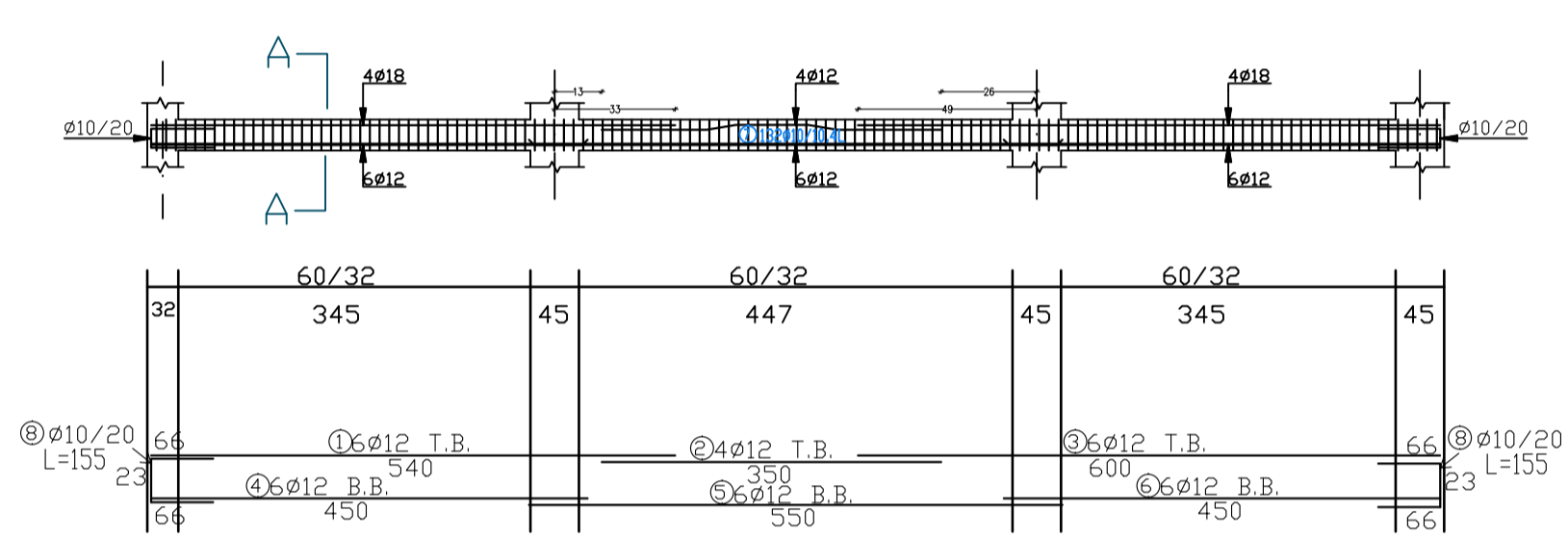
Beam C7 (60×32)cm



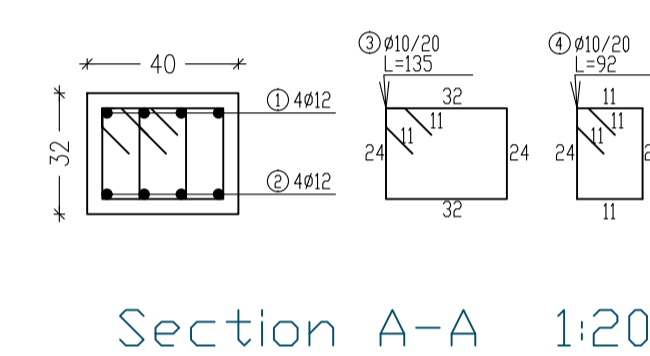
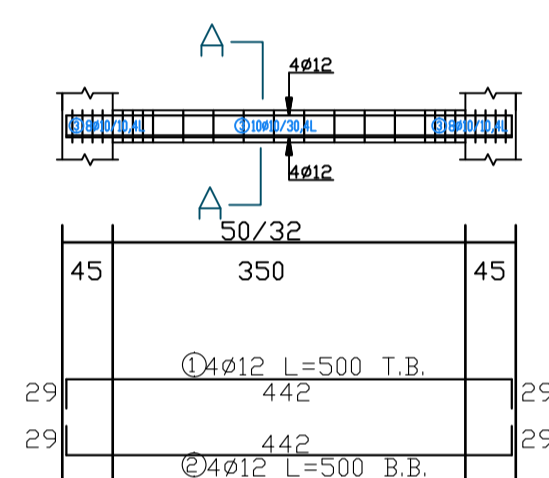
Beam C10 (40×32)cm



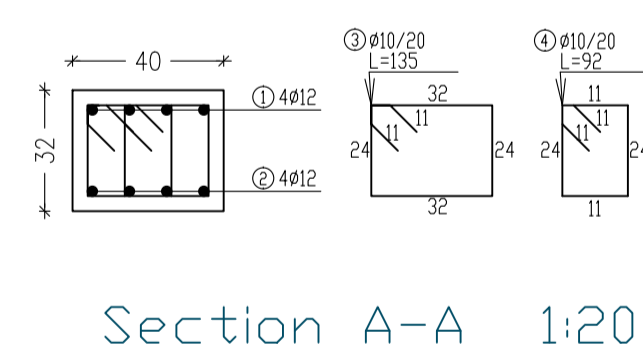
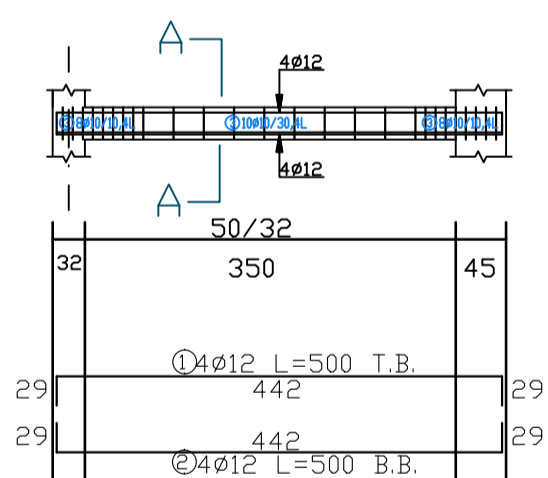
Beam C8 (60×32)cm



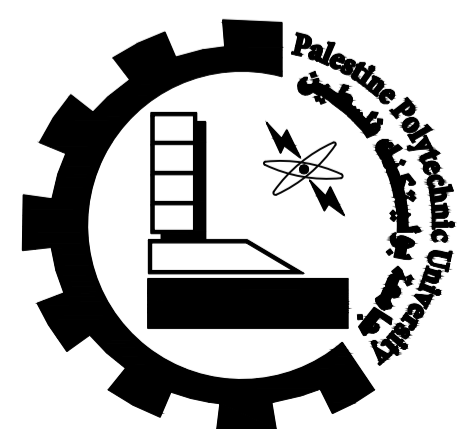
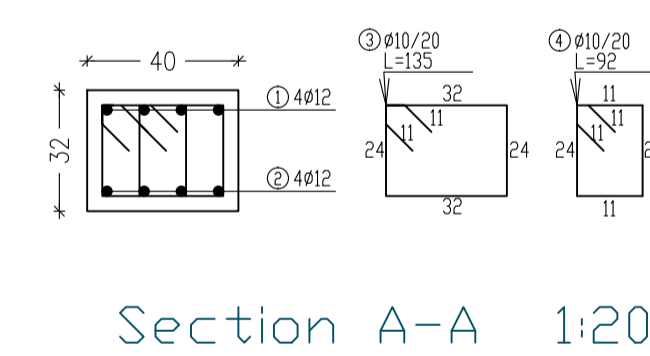
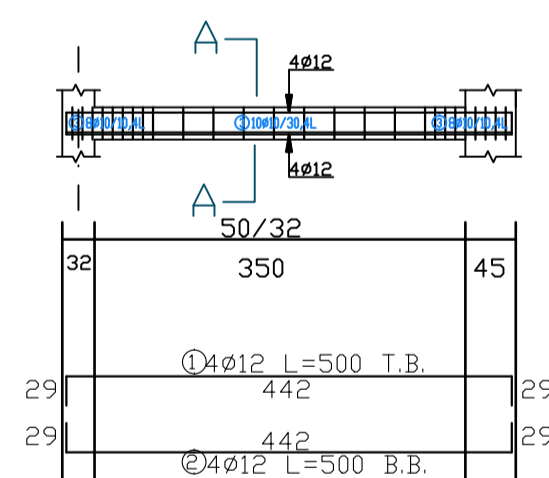
Beam C11 (40×32)cm



Beam C9 (40×32)cm



Beam C12 (40×32)cm



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Project Team:  
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Rahma Yousef Qawasmi  
Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
BEAMS Reinforcement  
Bridge B

Scale: 1:75  
Drawing No. S43

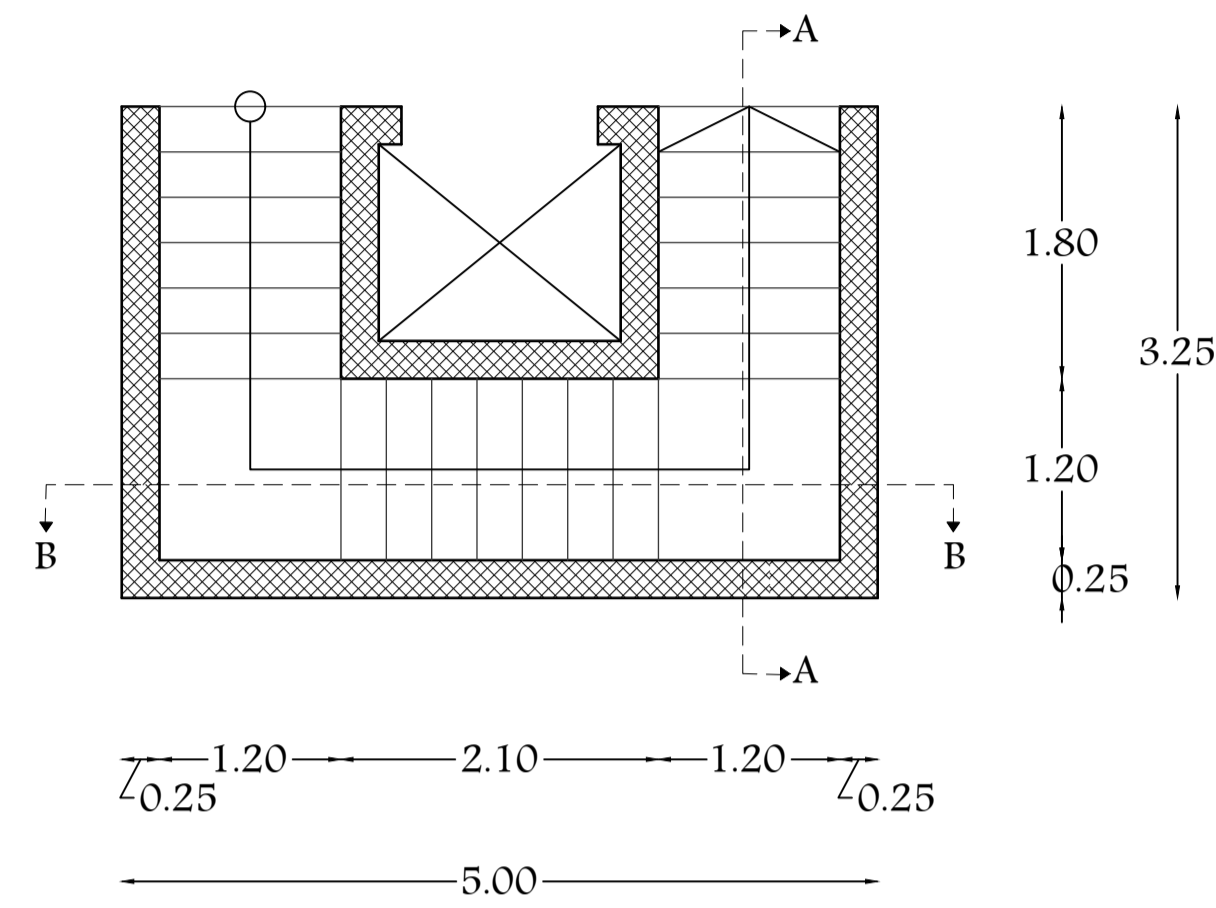
Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022

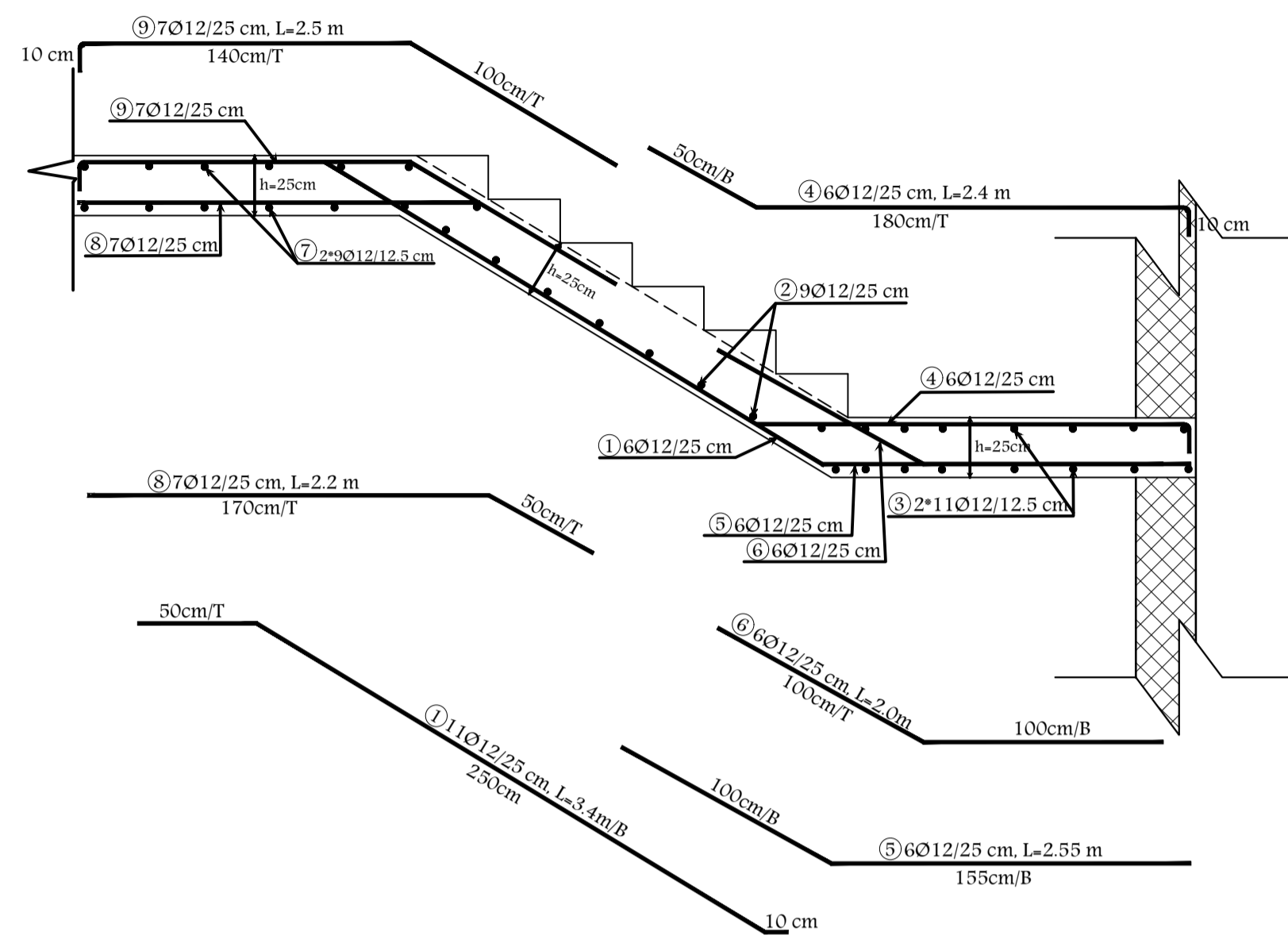
Stair #1

SCALE 1:50



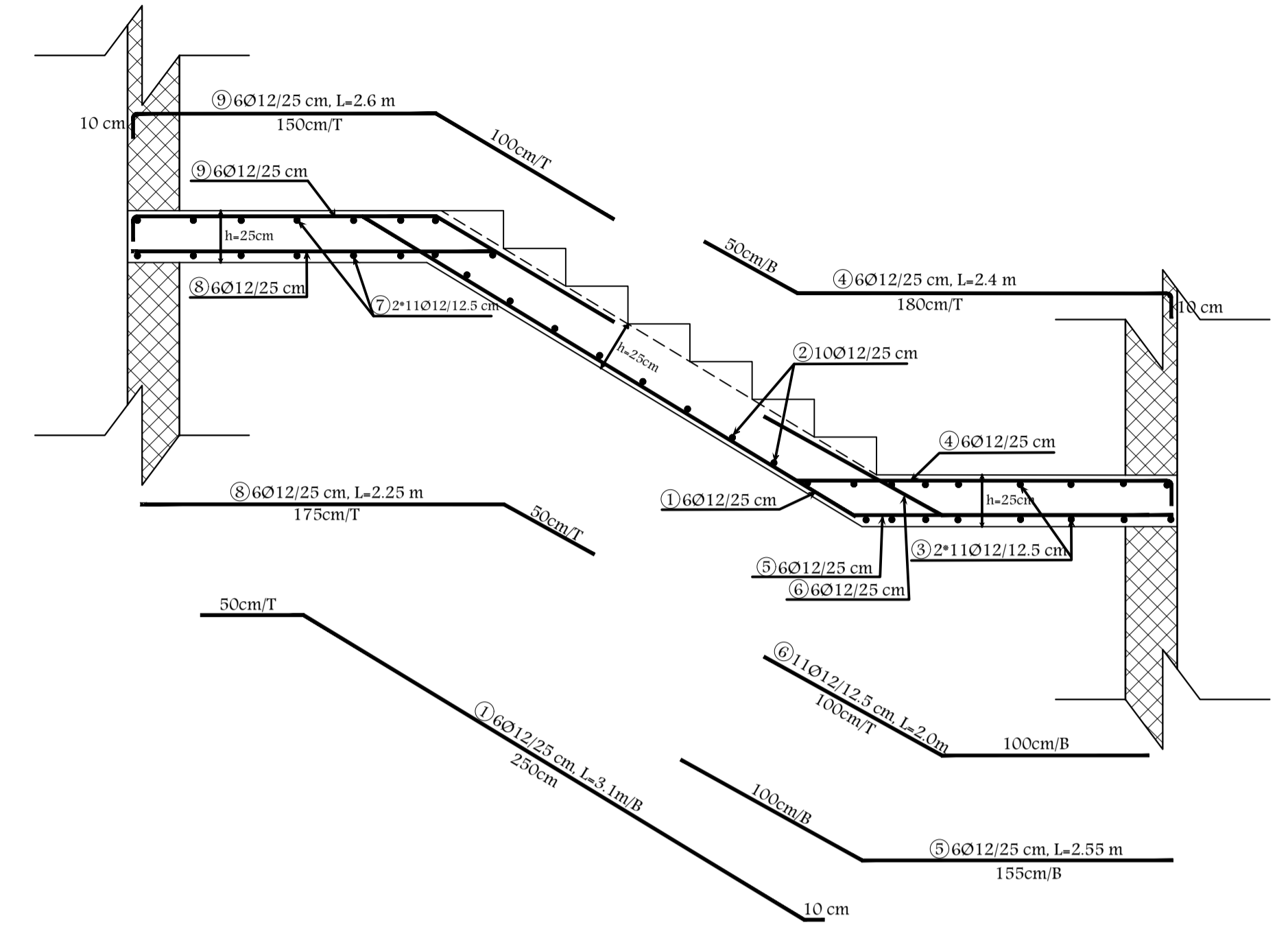
Section A-A

SCALE 1:25



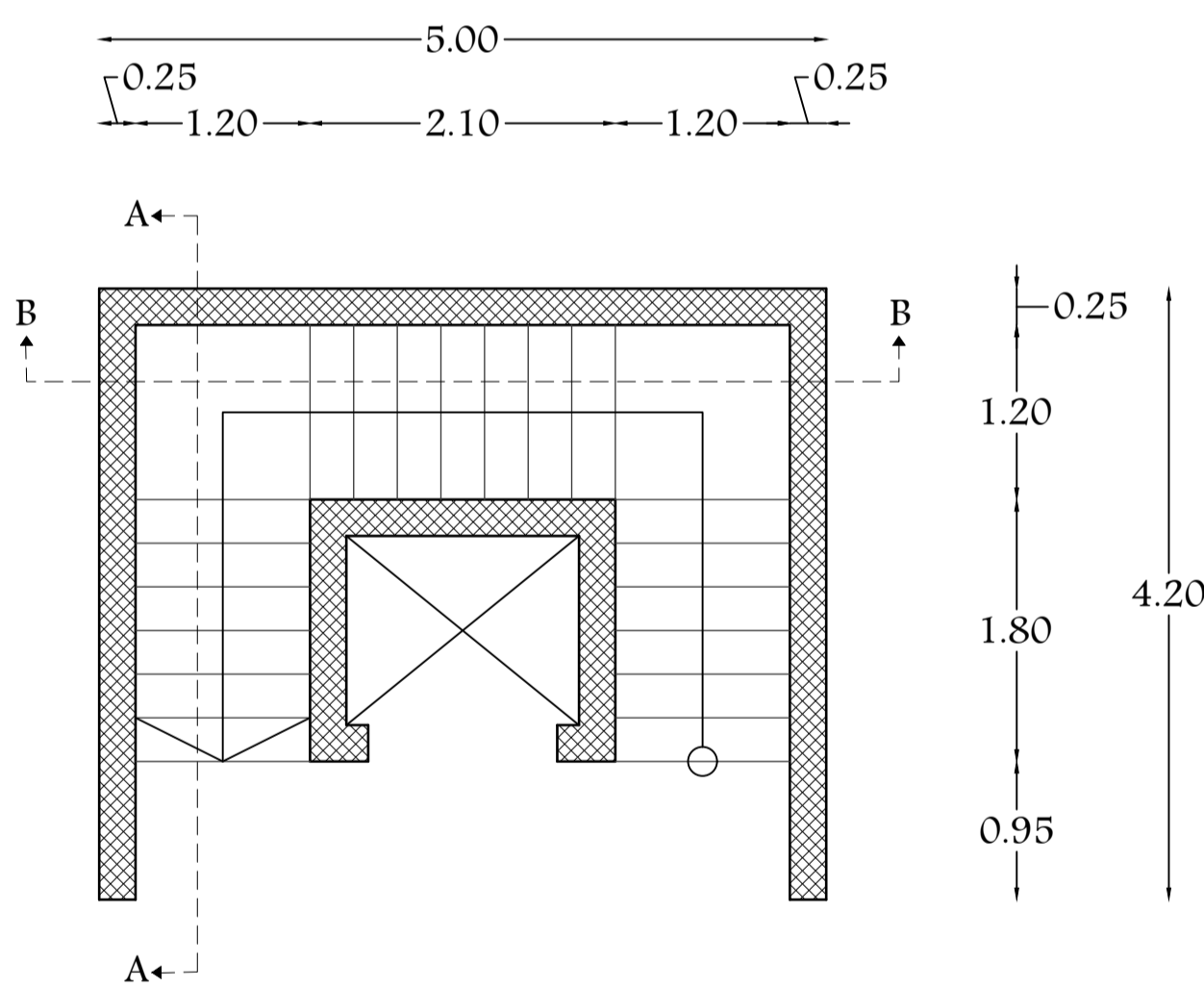
Section B-B

SCALE 1:25



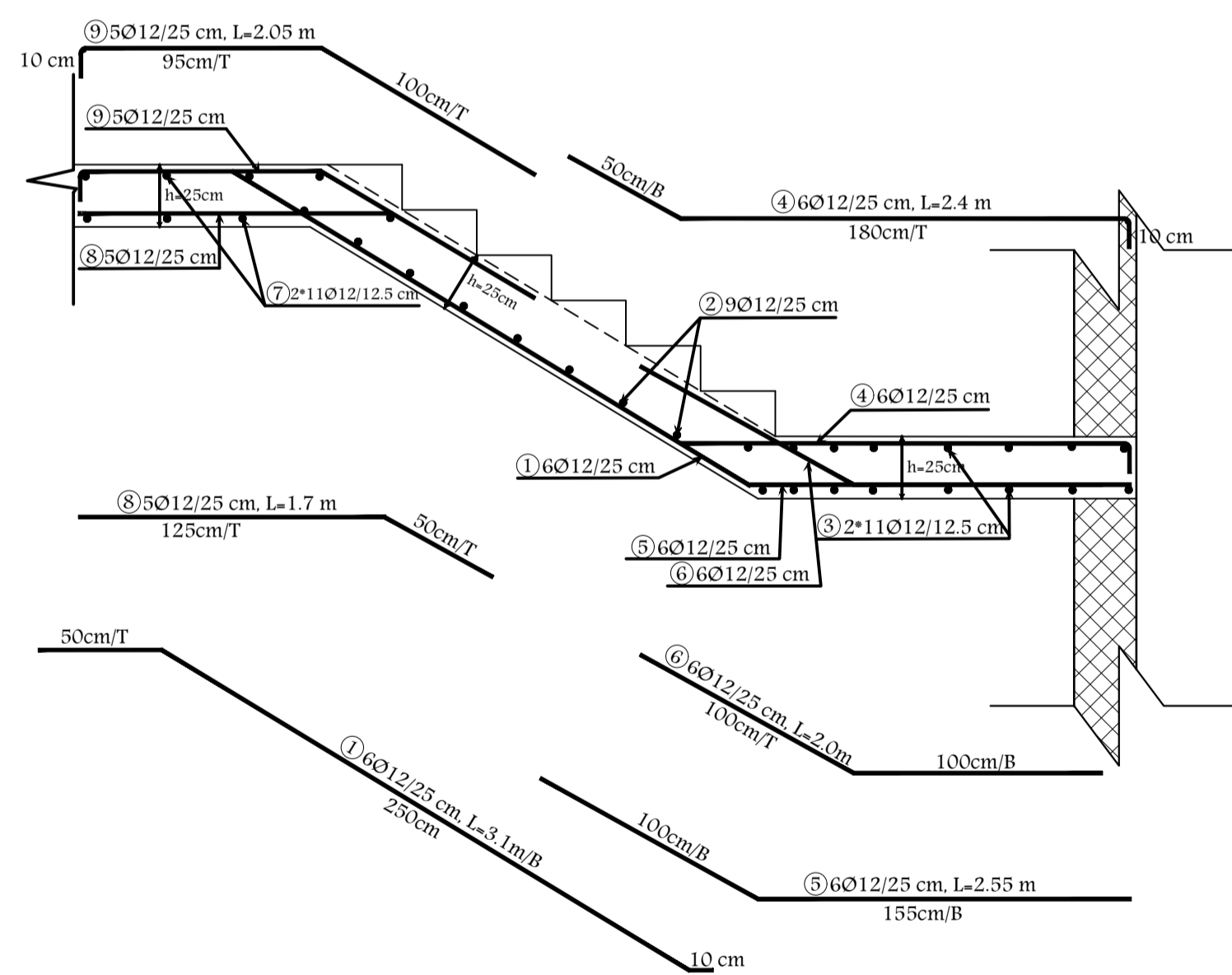
Stair #2

SCALE 1:50



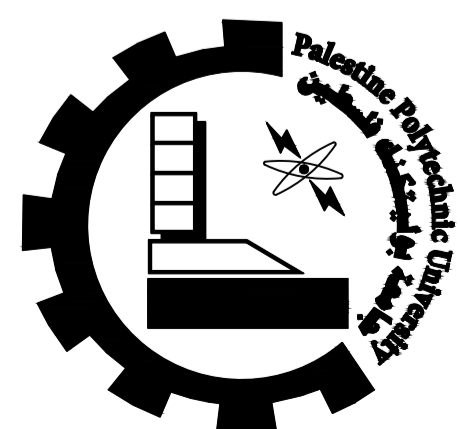
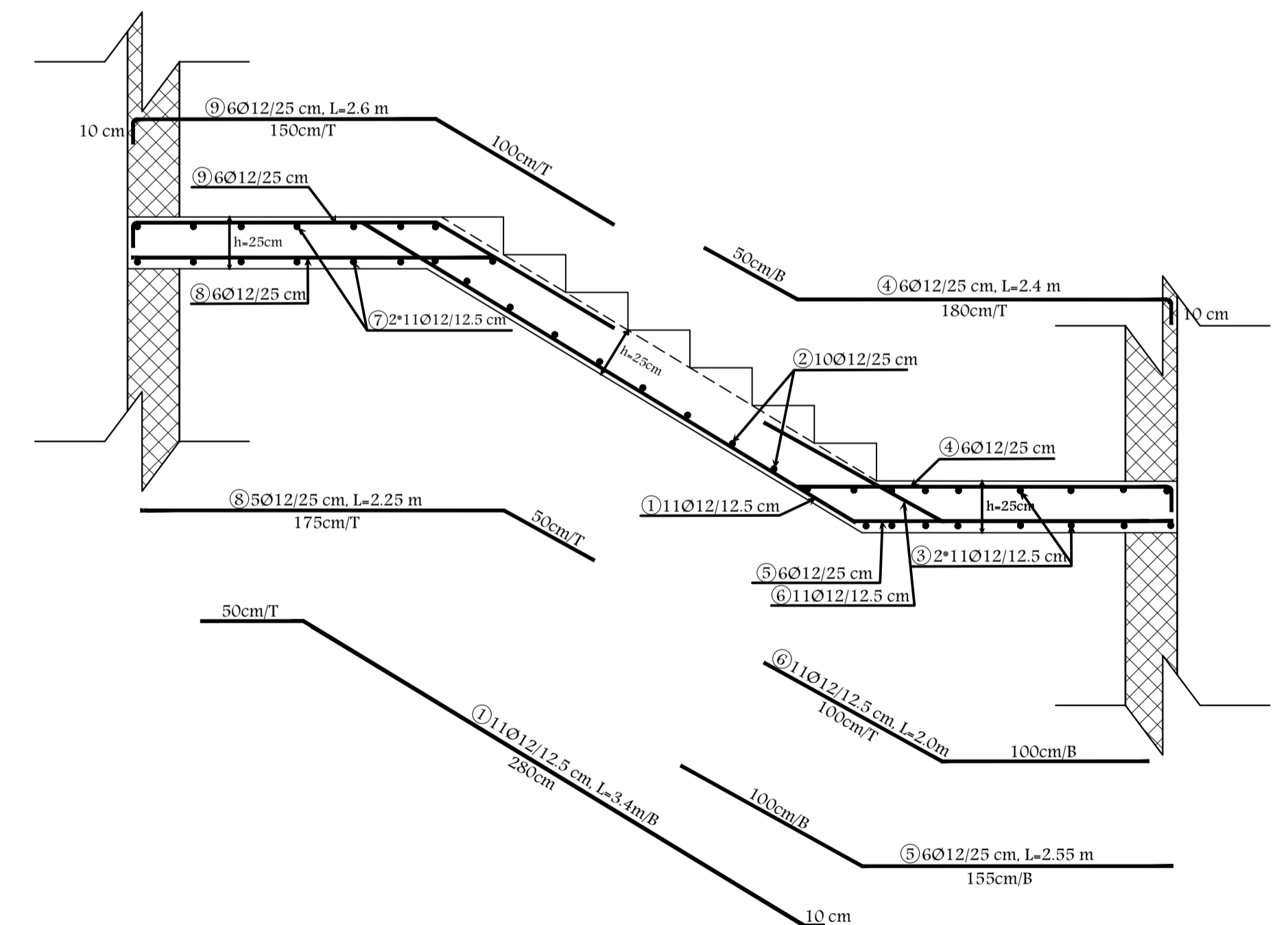
Section A-A

SCALE 1:25



Section B-B

SCALE 1:25



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Graduation Project  
Structural design of a tourist  
spa resort

Supervisor:  
Dr. Nafeth Nasereddin

Project Team:  
Raneen Emad Saafin  
Rahma Yousef Qawasmi

Drawing Title:  
Stairs Design

Scale: 1:100  
Drawing No. S44

Hatching Key

- Concrete
- Reinforced Concrete
- Cement Brick
- Stone

May 2022