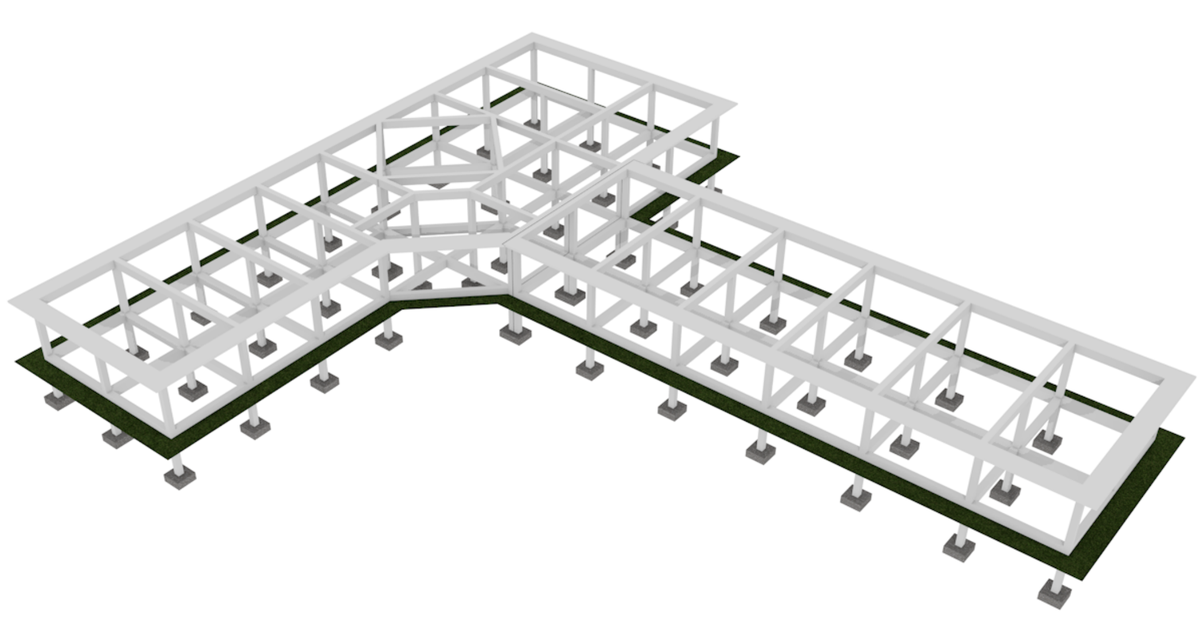
DANISH REFUGEE COUNCIL

Community
Education Center
in Khoni

Structural, Electrical,
Sanitary-Engineering
Parts of the Project



2019

Content

References:

პროექტირების დროს გამოყენებული ლიტერატურა:
- *СНиП. **2.03.01-84*** - *"ბეტონის და რკინაბეტონის კონსტრუქციები"*
- *СНиП. **II-7-81*** - *"მშენებლობა სეისმურ რაიონებში"*
- *СНиП. **2.01.07-85*** - *"დატვირთვები და ზემოქმედება"*
- *СНиП **2.02.01-83*** - *"შენობების და ნაგებობების ფუძე-საძირკვლები"*
- *ГОСТ **14098-91*** - *"არმატურის და ლითონის ჩასატანებელი ელემენტების შედუღება რკინაბეტონის კონსტრუქციებში"*

*უსაფრთხოება: მშენებლობის პროცესში საჭიროა ვიხელმძღვანელოთ სამშენებლო ნორმების: СНиП. **III-4-80*** -ის მოთხოვნების შესაბამისად და მკაცრად დავიცვათ უსაფრთხოების წესები.*

Explanation Letter

The design of the structural part is elaborated according to the architectural part of the design documentation. Construction Site (Cadastral Land Code 37.07.38.610) is located in Khoni,
According to the norms "Construction Climatology" the climatic characteristics of the construction site are:

- Average annual temperature + 14.3 ° C
- Absolute maximum temperature + 41 ° C
- Absolute minimum temperature - 18 ° C
- Annual precipitation- 1793 mm
- Snow cover weight - 0.5 kPa
- The standard depth of frost penetration - 0 m
- Wind reporting pressure - 0.6 kPa
- The direction of the prevailing wind is - East
- According to the seismic map, Khoni belongs to the seismic magnitude of 8 .
- On the basis of the geological survey, one engineering and geological element separated from the study site has been obtained as a basis for geological studies (layer # 4) - stone chips and gravel with clay filler (A QIIV); With the following indicators:

Average Engineeing-Geological Parameters of the Ground

გრუნტის საშუალო საინჟინრო-გეოლოგიური პარამეტრები									
სიმკვრივე Density	ფორიანობის კოეფიციენტი Porines coeficient	ფილტრაციის კოეფიციენტი Filtration coeficient	შინაგანი ხახუნის კუთხე Angle of internal friction	შეჭიდულობა Countertraction (friction)	საანგარიშო წინაღობა კუმშვაზე Design resistance on compression	დეფორმაციის მოდული Module of deformation	ღრეკადობის მოდული Bending module	ქანობის ფერდის ქანობი	გრუნტების დამუშავების კატეგორია Category of processing of the ground
ρ გ/სმ³	e %	K ფ	φ	C კგ/სმ²	R_o კგ/სმ²	E_o კგ/სმ²	E კგ/სმ²		
1.75	0.47	40	31⁰	0.02	3.5	400	2400	1:1.5	II

The report of the building structural design is performed in the program "LIRA".
The building represented in the project is a single-storey stone building with an average floor level of 0.45 meters above the ground level.
First floor level 0.00 corresponds to absolute level 119.95.
The floor height of the building is 2.9 meters from floor to ceiling.
A natural sand-gravel mixture (fration 0.5-70mm) should be used for backfilling and embankemnt. During the construction of a ballast filling on the construction site, it is necessary to compact it in layers with a vibro ramming machine at every 20 centimeters.
During the construction of a ballast filling on the construction site, it is necessary to compact it in layers with a vibro ramming machine at every 20 centimeters.
The framed walls and partition masonry is built with a 12 cm thick outer layer of ceramic brick (for the outer contour of walls) and lightweight small blocks with a thickness of 30 and 15 cm. The ceramic brick quality is not less than M170 and the small block quality is not less than M70 (volume weight 800 kg / m3), therefore the mortar quality used should be not less than M70.
The bearing structure of the building is the framed structure of monolith reinforced concrete cornices, girds with reinforced concrete inserts (cores, girds) which incorporates the external and internal reinforced bearing walls.
The reinforced cores are concreted in parallel to the construction of reinforced bearing walls. The partitions are made of reinforced small pumice blocks. Floors in the bathrooms are tiled and there is laminate flooring in the rooms. Floor warming is made of XPS tiles, and ceiling warming with glass-wool. On the ceiling the so-called rough timber flooring is arranged at the attic level.
The suspended ceiling of the bathroom is made of plastic boards, and it is made of gypsum boards in the rooms. The bearing structure of the roof is wooden, and the roofing is made of painted metal tiles. The windows are made of double-glazed metal profiles.
The entrance doors are made of steel and iso-aluminum, PVC in the bathroom, and wood (so-called MDF) in the rooms.
The external staircases and staircase landings will be finished with granite slabs. A concrete walkway iwill be arranged around the building. Concrete of B25 grade will used in monolithic structures.
Before the backfill of the ground the external surfaces of the walls, columns and foundation slabs must be treated with bitumen mastic up to 0.00 level and the Linocrome damp-proofing of two layers should be arranged.
The dimensions of the drawings are given in millimeters, levels in meters. All sheets of the structural part shall be considered as one whole and the consideration of each sheet shall include the information from the other sheets as well as the architectural drawings.
Bending of structural reinforcement elements shall be done by cold mechanical method.
After the excavation the condition of the ground should be additionally assessed, so that the foundation structure can be adjusted.
All changes made to the project during construction must be agreed with the project authors.

DANISH REFUGEE COUNCIL
Danish Refugee Council

Community Education Center in Khoni

Project address:
Georgia, Khoni

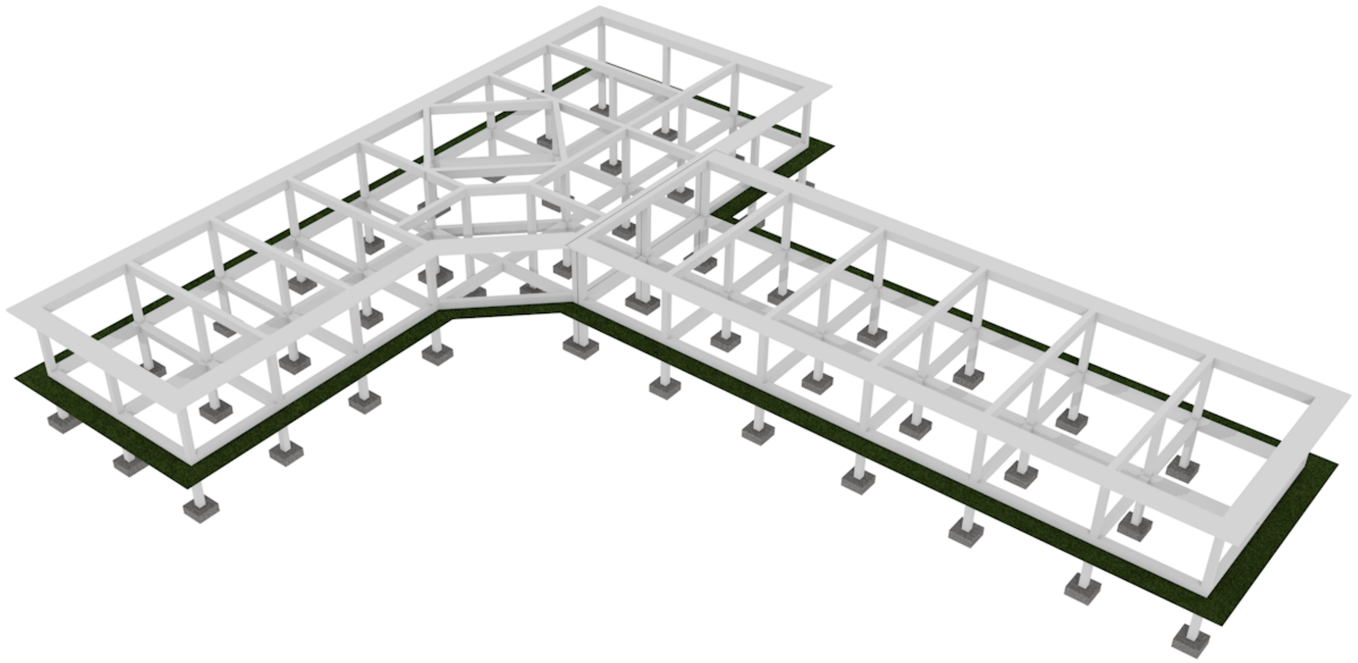
Stage:
Architectural project

სარჩევი, განმარტებითი ბარათი
Explanatory note

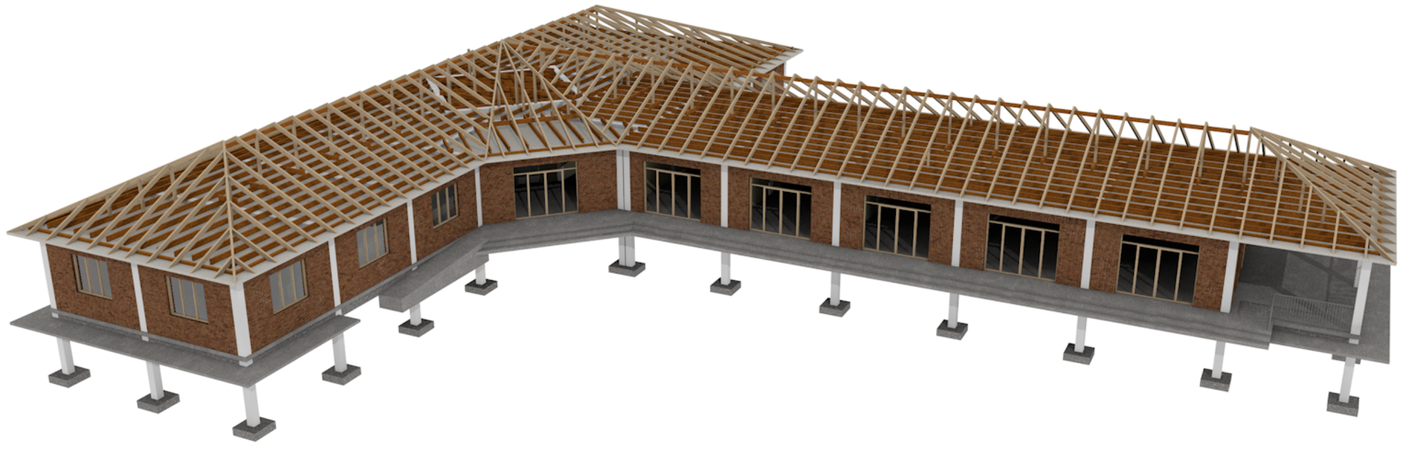
ფორმატი Format A - 2

ფურცელი Page	ფურცლები Pages
2	30

Bulk Concrete Render



Bulk Concrete Render with Walls



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Project address:

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Khoni

Stage:
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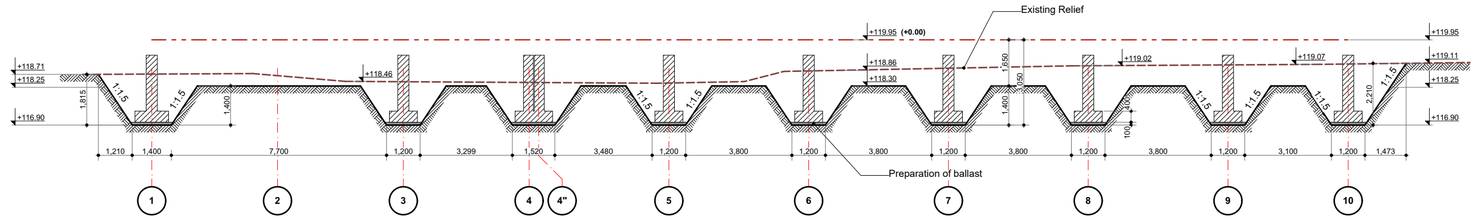
Rendering

Format A - 2

Page	Pages
3	30

Section A-A



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Community Education Center in Khoni

Project address:

Georgia,
Khoni

Stage:
Architectural project

ფორმატი Format	A - 2

ფურცელი Page	ფურცლები Pages
4	30

საძირკვლის გეგმა სვეტების მარკირებით

ელემენტი	№	არმატურის პროფილი	სიგრძე მმ	რაოდენობა	საერთო სიგრძე მ	
წერტილოვანი საძირკველი						
წხ-1 (30 ცალი)	1	12 A500c	1560	360	561.60	
	2	12 A500c	960	360	345.60	
	3	10 A500c	500	480	240.00	
წხ-2 (14 ცალი)	1	12 A500c	1560	168	262.08	
	2	12 A500c	960	168	161.28	
	3	10 A500c	500	224	112.00	
წხ-3 (3 ცალი)	1	12 A500c	1875	18	33.75	
	2	12 A500c	1560	24	37.44	
	3	12 A500c	1275	18	22.95	
	4	12 A500c	960	24	23.04	
	5	10 A500c	500	72	36.00	
წხ-4 (3 ცალი)	1	12 A500c	1760	42	73.92	
	2	12 A500c	1160	42	48.72	
	3	10 A500c	500	75	37.50	
	ბეტონი B25 m3					20.91

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Project address:
Georgia, Khoni

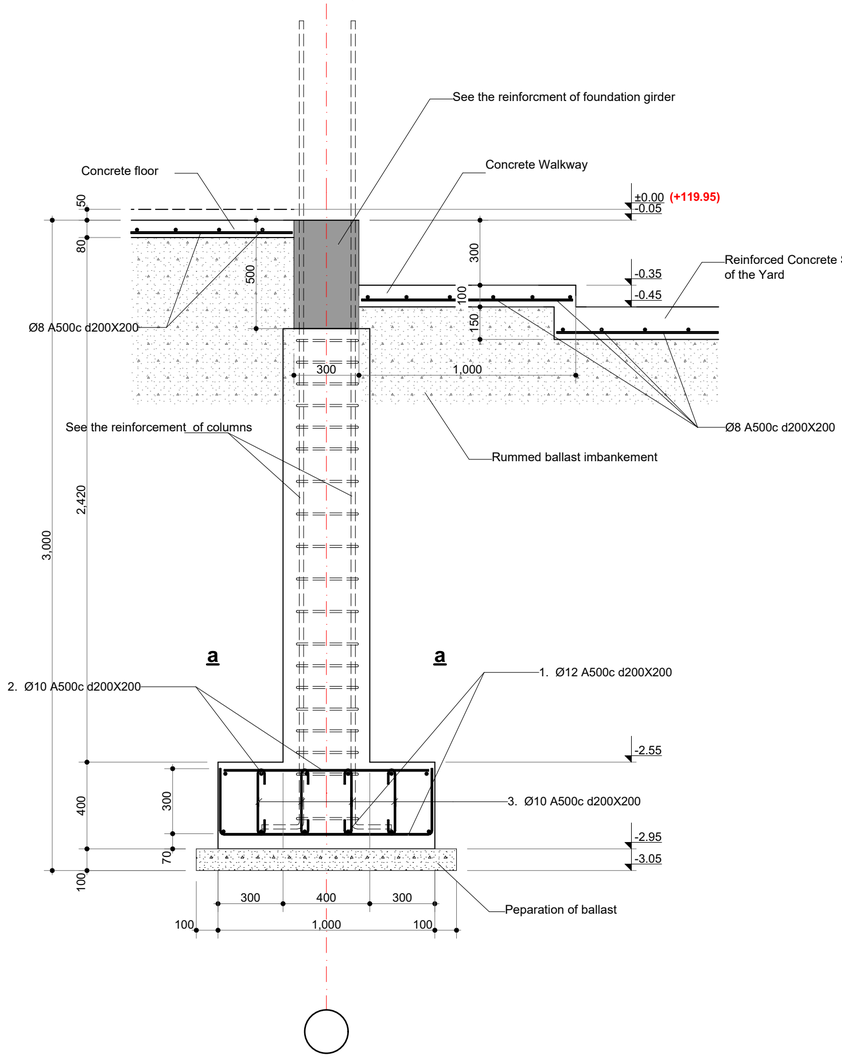
Stage:
Architectural project

Faoundation Plan

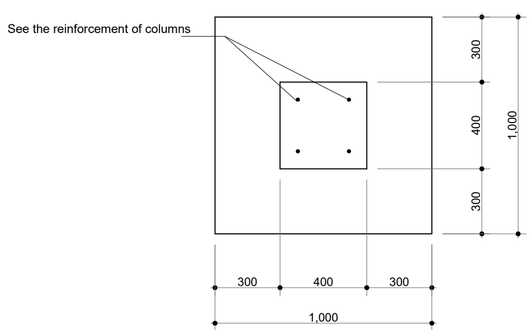
Format A - 2

Page	Pages
5	30

Pad Foundation (ნ-1)



a-a



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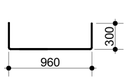
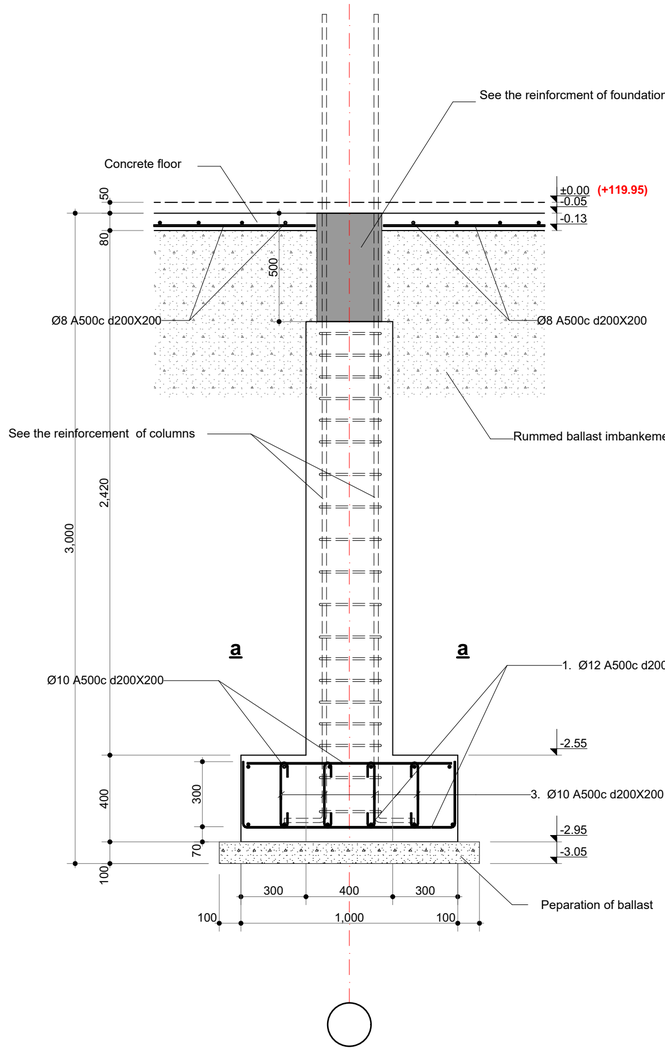
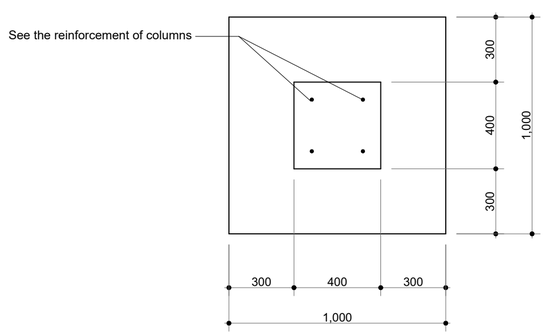


Pos.3

Pad Foundation ნ-2



a-a



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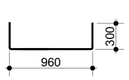

Pos.3

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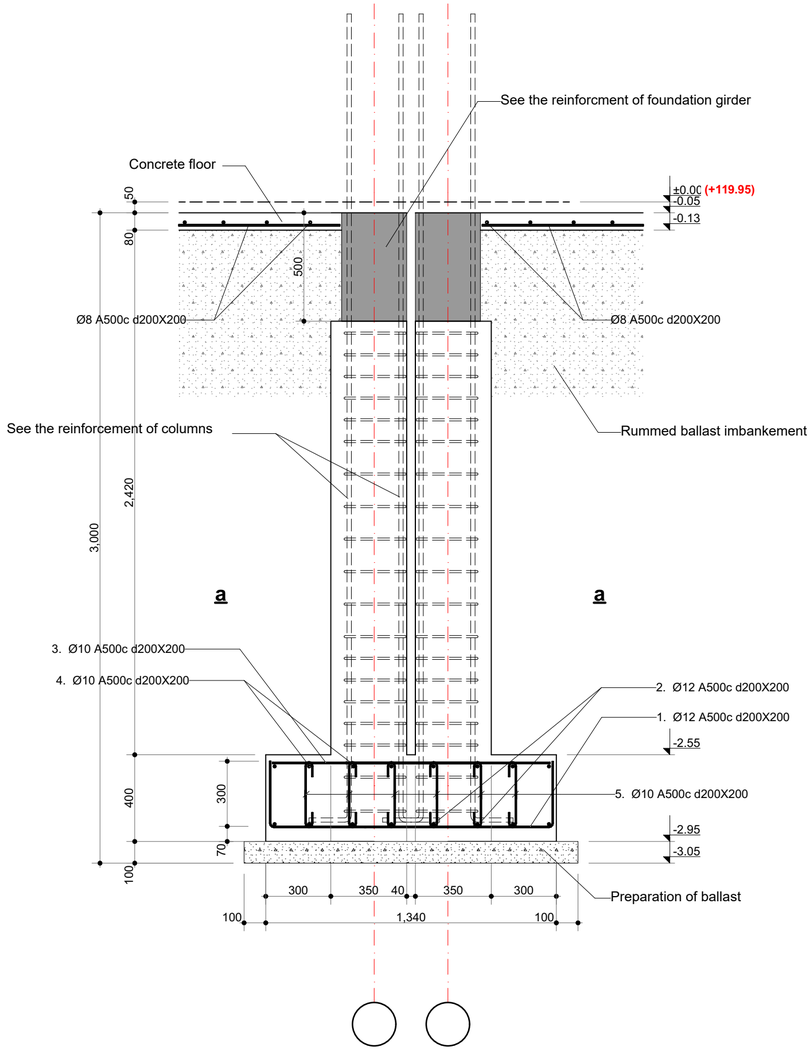
Foundation ნს-1

Foundation ნს-2

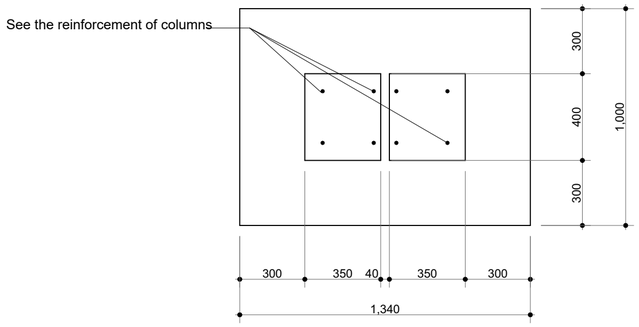
Format A - 2

Page	Pages
6	30

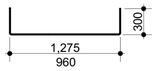
Pad Foundation (б-3)



a-a

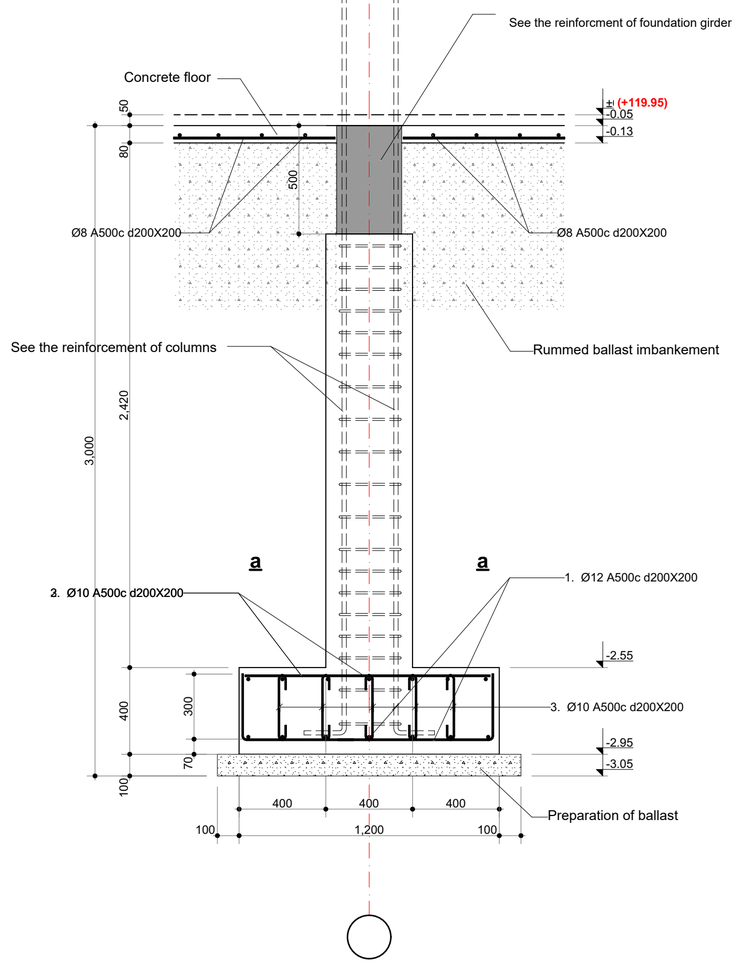


Pos.1 (Pos.2)

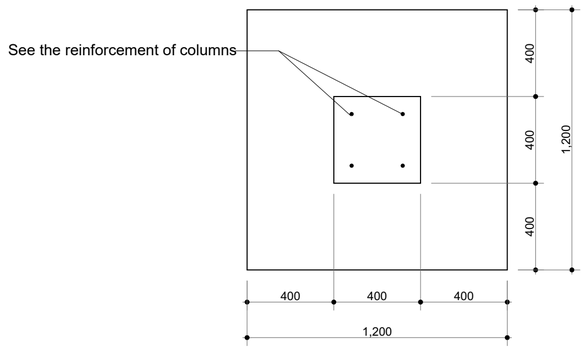


Pos.4

Pad Foundation б-4



a-a



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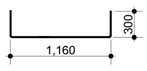


Pos.3

Danish Refugee Council

Community Education Center in Khoni

Project address:

Georgia, Khoni

-

Stage:
Architectural project

Foundation б-3

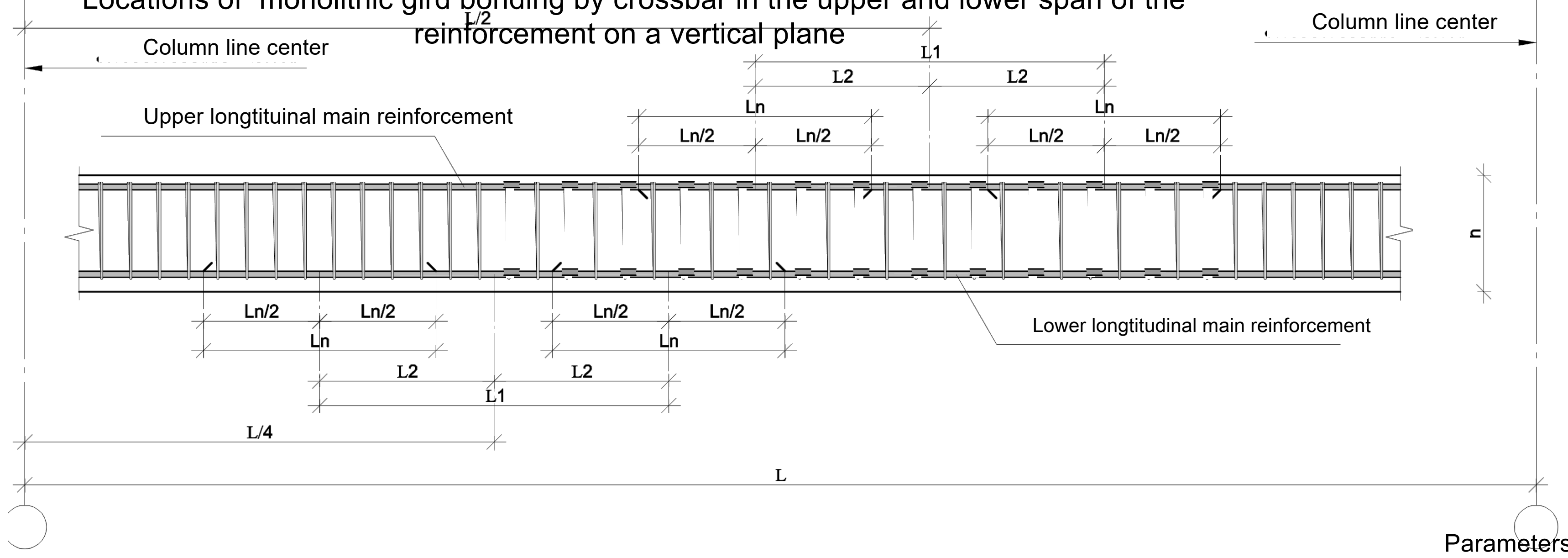
Foundation б-4

Format A - 2

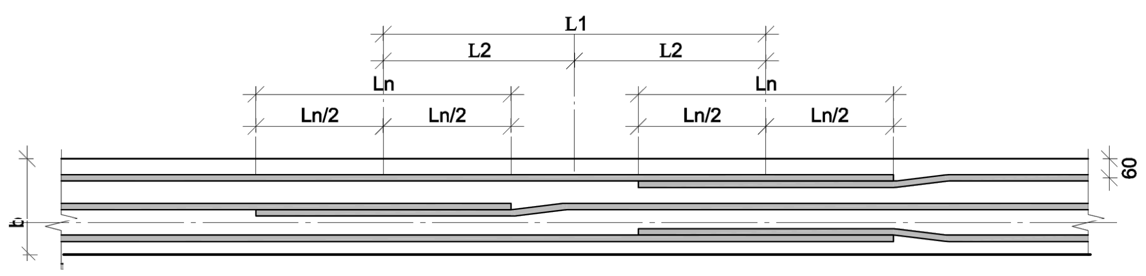
Page	Pages
7	30

მონოლითური რიგელის ზედა და ქვედა არმატურის მალში გადადებით გადაბმის ლოკაციები ვერტიკალურ სიბრტყეში

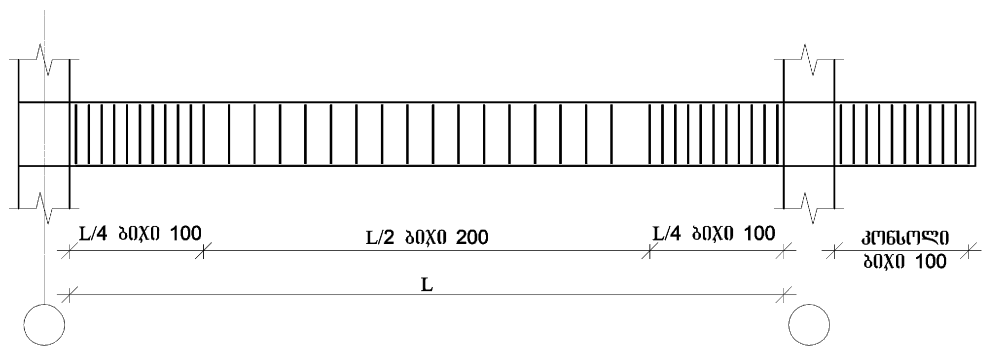
Locations of monolithic gird bonding by crossbar in the upper and lower span of the reinforcement on a vertical plane



Plan of monolithic gird bonding of crossbar in the upper and lower span of the reinforcement



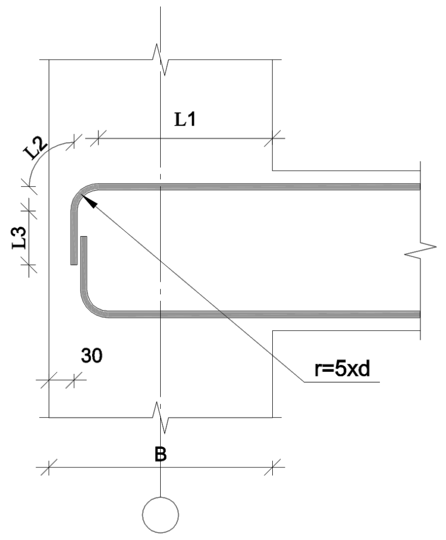
Allocation plan of gird hanger



Parameters of gird bond crossbar in the upper and lower reinforcement

Diameter of reinforcement არმატურის დიამეტრი Ø (მმ)	Reinforcement crossbar (mm) არმატურის გადადება (მმ) $L_n=40*D$	Distance between the crossbar centres (mm) გადადებების ცენტრებს შორის მანძილი (მმ) $L_1 \geq 1.5*L_{გად}$	Distance from the marking point 'X' to reinforcement crossbar center (mm) მონიშვნის "X" წერტილიდან არმატურის გადადების ცენტრამდე მანძილი (მმ) $L_2 \geq L_1/2$	Zone of Hanger, Spacing - 100 mm საკიდის ზონა ბიჯი-100 (მმ) $L_3=L_1+L_{გად}$
Ø16 A500C	640	960	480	1600
Ø18 A500C	720	1080	540	1800
Ø20 A500C	800	1200	600	2000
Ø22 A500C	880	1320	660	2200
Ø25 A500C	1000	1500	750	2500

Fixing (bending) Node of Grid in the upper and lower reinforcement column

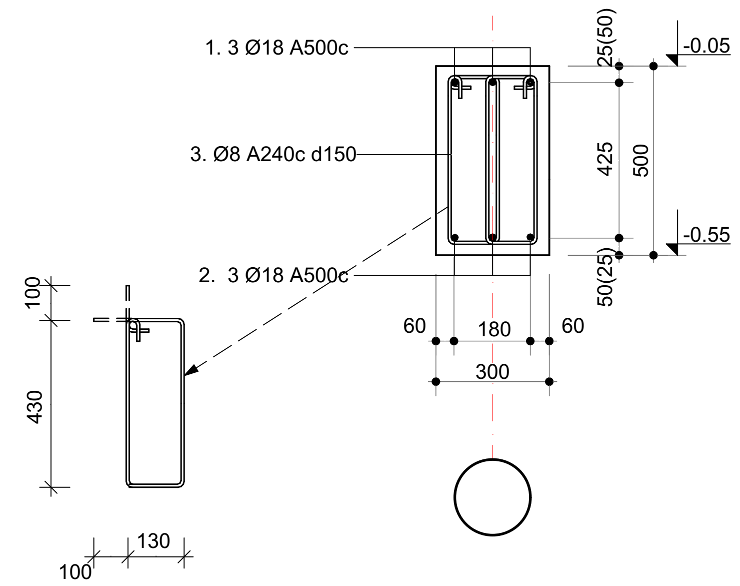


Parameters of fixing node of grid in the upper and lower reinforcement column

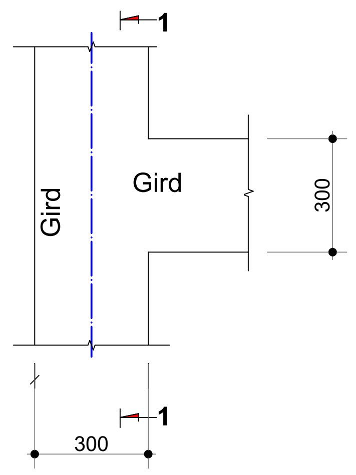
როცა (B=400)

$L_{საანკერო}=40d=L_1+L_2+L_3=2xL_1$ (მმ)					
არმატურის დიამეტრი Ø Diameter of reinforcement	$L_{საანკერო}=40Ø$	r=5d მმ.	$L_1=L(საანკ.)x0.5$ (მმ)	$L_2=\frac{(5dx2)XП}{4}$ (მმ)	$L_3=L(საანკ.)-(L_1+L_2)$ (მმ)
Ø16 A500C	640	80	320	126	194
Ø18 A500C	720	90	360	141	219
Ø20 A500C	800	100	400	157	243

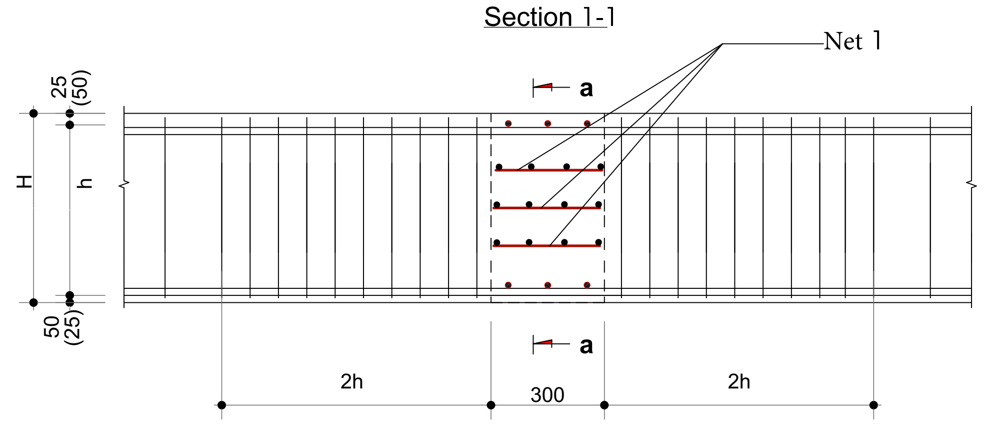
Section on Gird რ-1 (End girder)



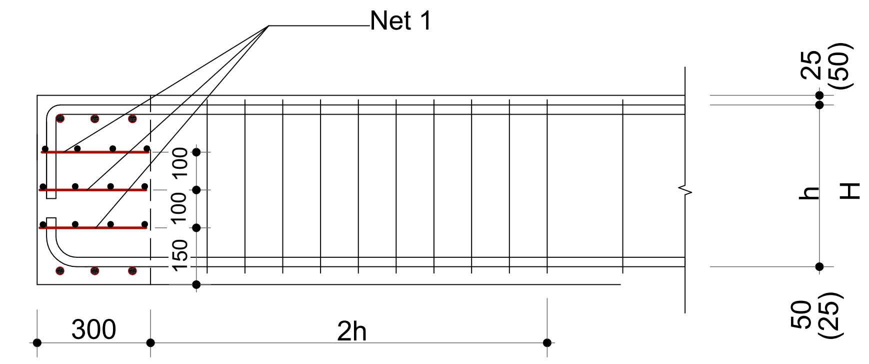
Strengthening of the Gird to Gird Connection Node



Section 1-1

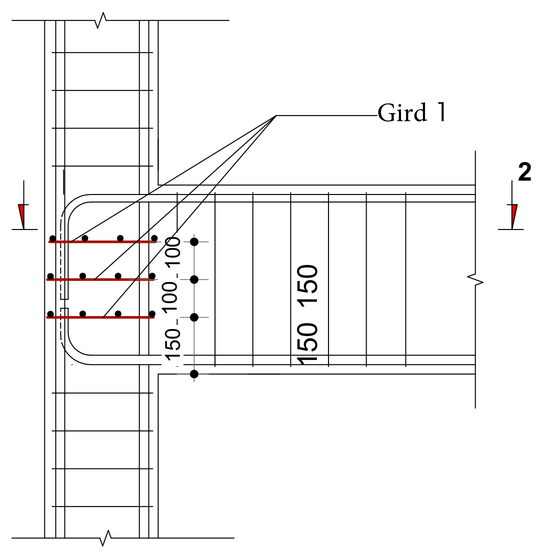


Section a-a

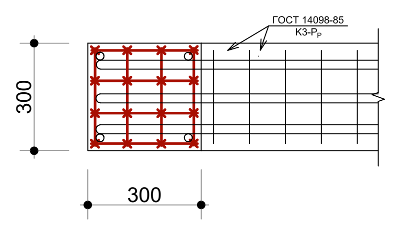


Strengthening of the intersection of grid and columns

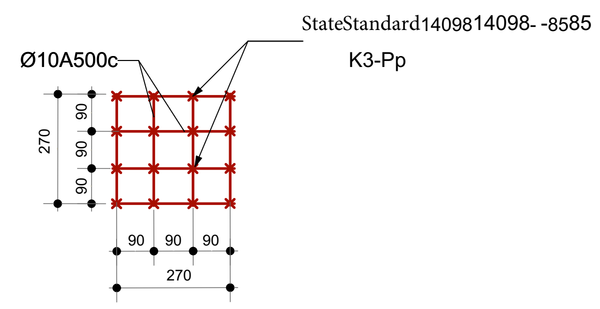
Columns



Section 2-2



Net 1



ელემენტი Component	№	არმატურის პროფილი Reinforcement	სიგრძე მმ Length mm	რაოდენობა Quantity	საერთო სიგრძე მ Total length m	
რკინაბეტონის რიგელები (რანდკოჭები) Reinforced Concrete Girds						
	1	18 A500c	443000	3	1329	
	2	18 A500c	412000	3	1236	
	3	8 A240c	1320	5960	7867.2	
	ბეტონი B25 m3		Concrete			57.4
იატაკის რკინაბეტონის ფილა Reinforced concrete foor slabs		8 A500c			6170.00	
	ბეტონი B15 m3		Concrete			52.8

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DANISH REFUGEE COUNCIL

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Project address:
Georgia, Khoni

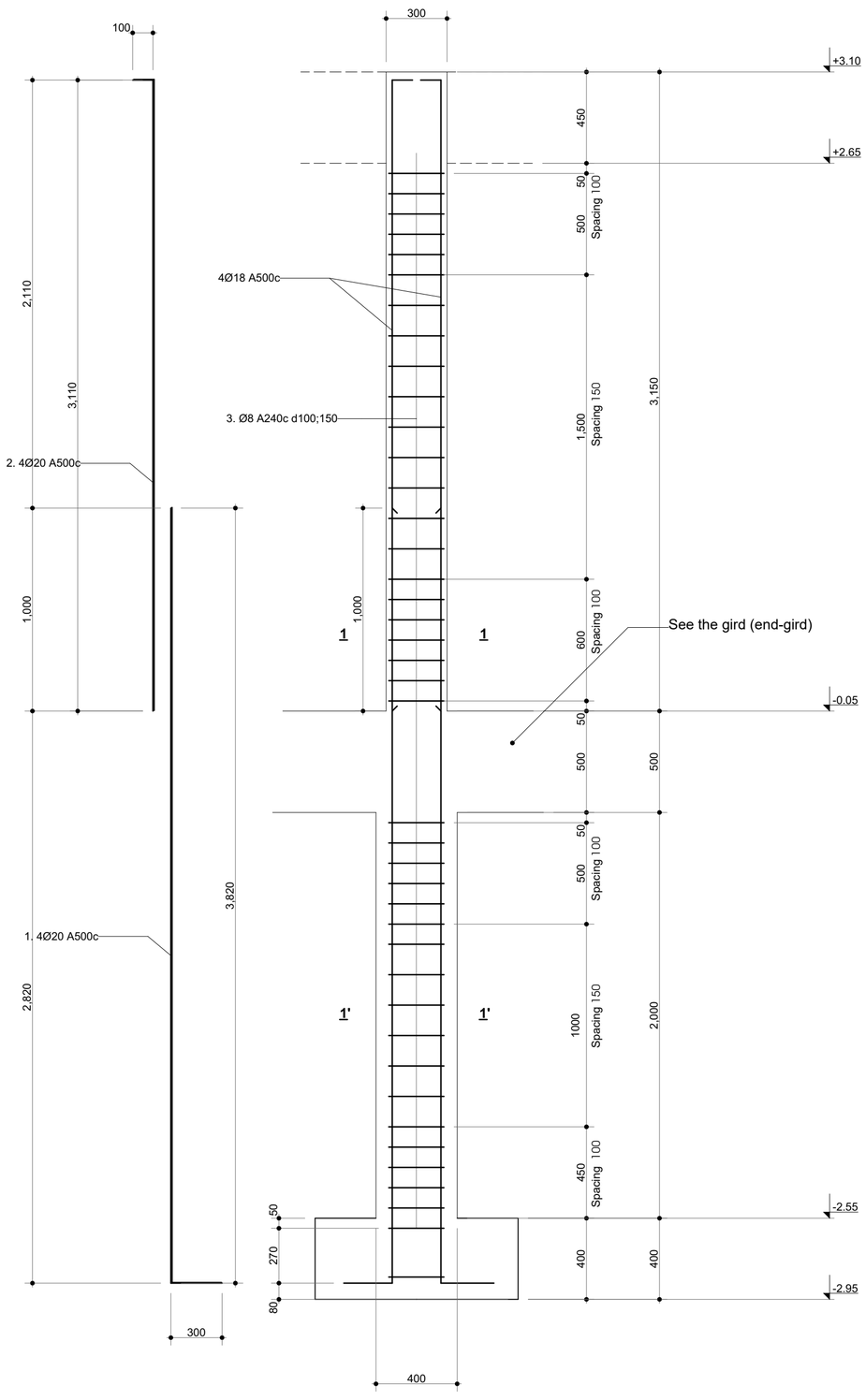
Stage:
Architectural project

Monolith gird

Strengthennh of nodes

Format	A - 2
Page	Pages
8	30

Column Ս-1



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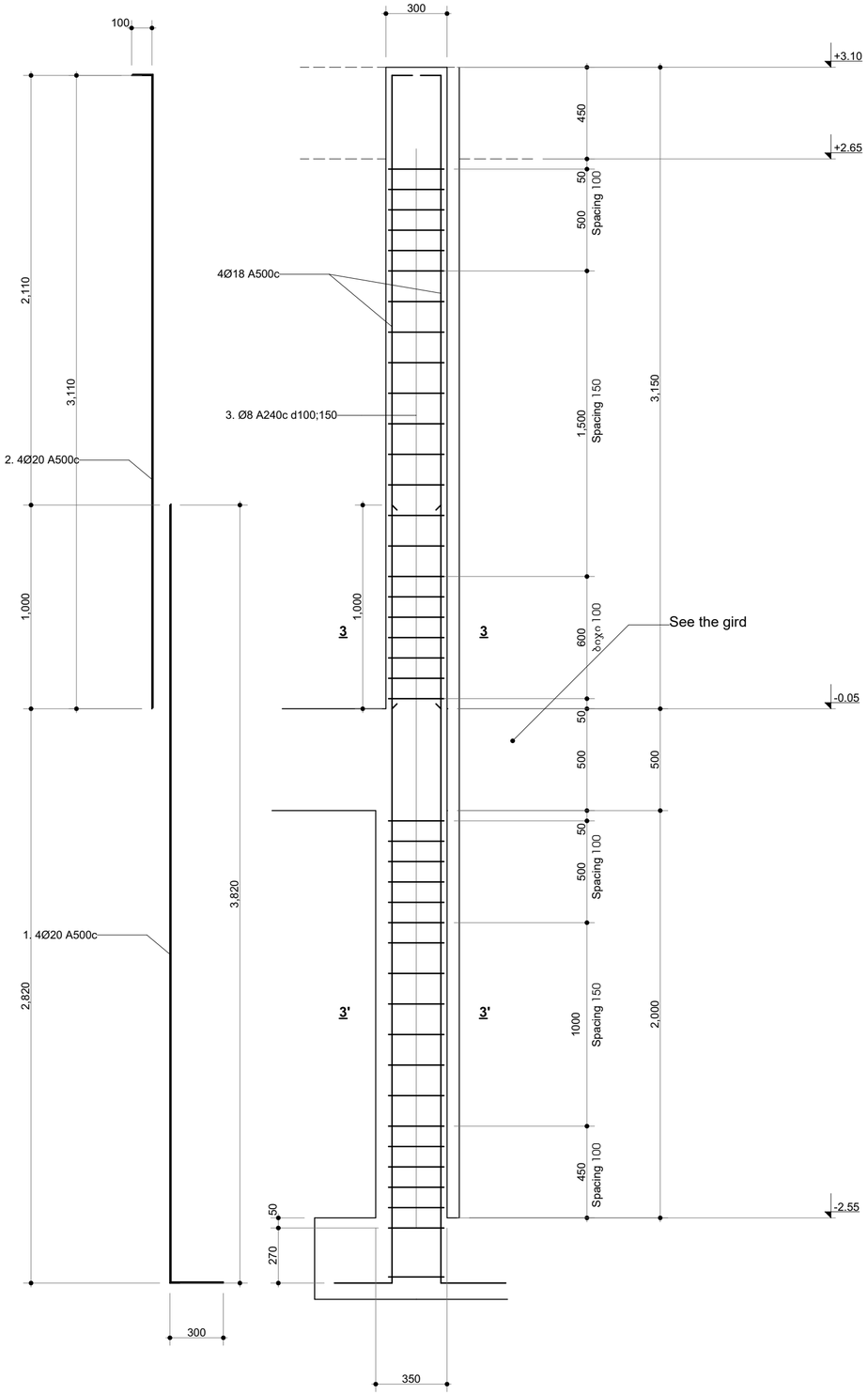
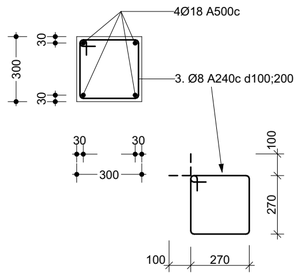
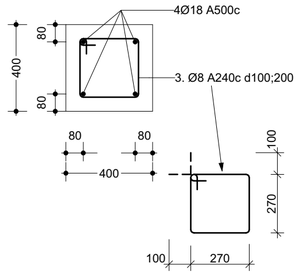


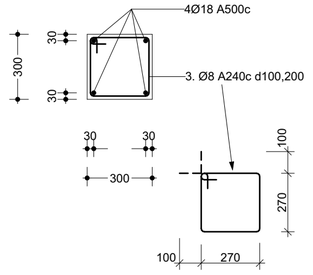
Section 1-1



Section 1'-1'



Section 3-3



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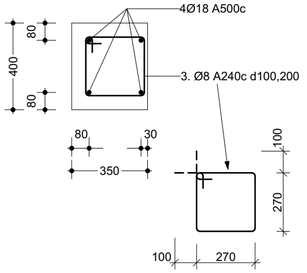

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Column Ս-1

Column Ս-1'

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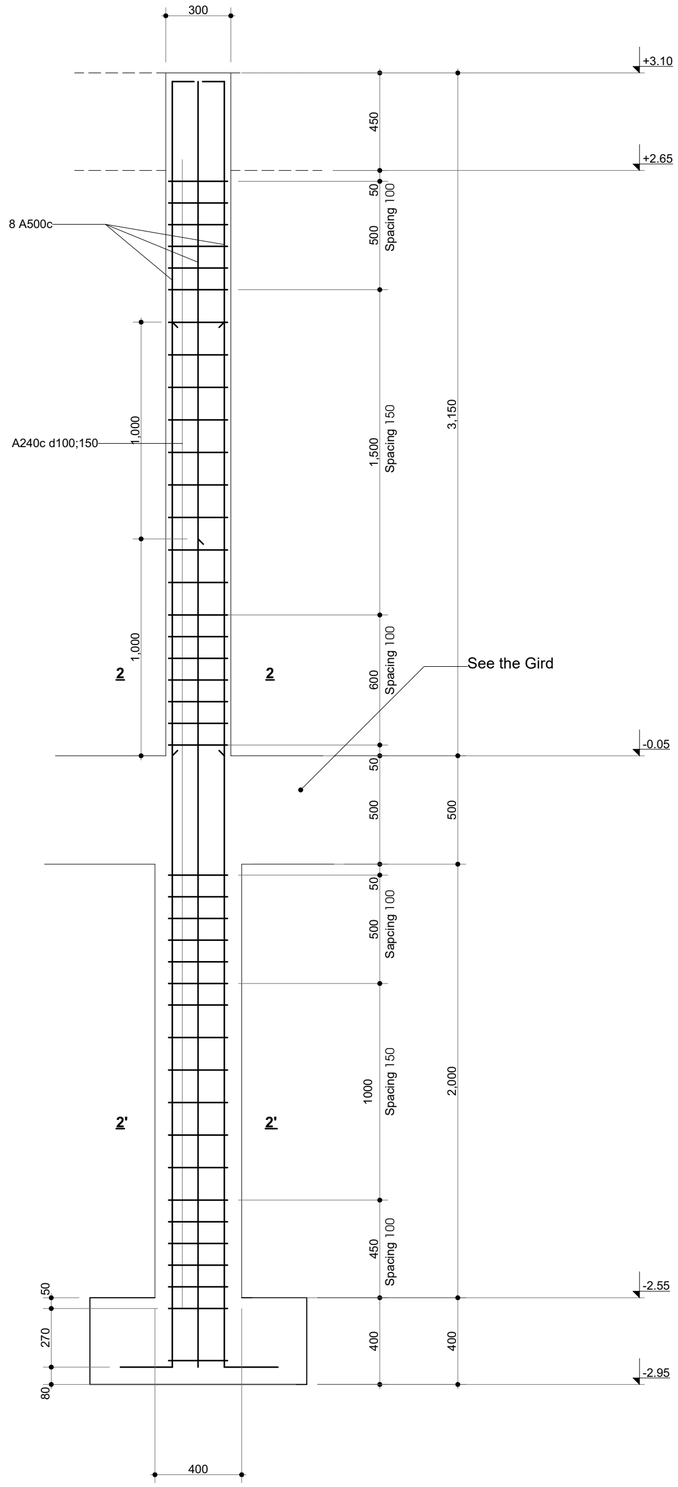
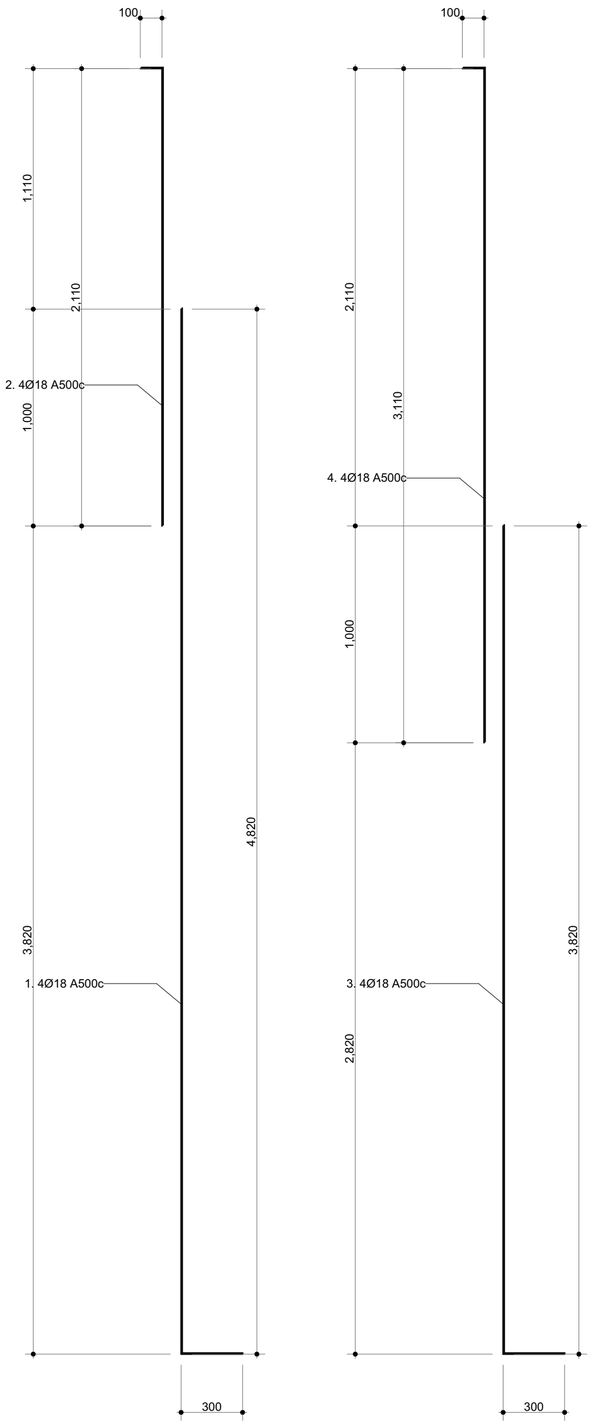
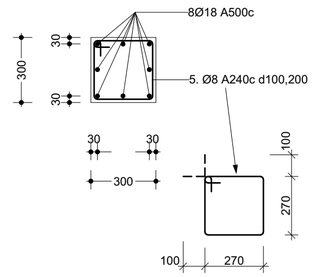
Column ს-2





Section 2-2



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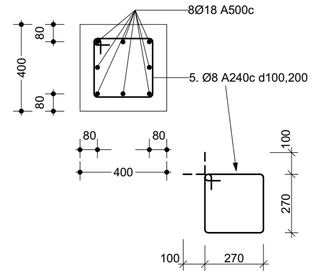

ელემენტი Component	№	არმატურის პროფილი Reinforcement	სიგრძე მმ Length mm	რაოდენობა Quantity	საერთო სიგრძე მ Total length m	
რკინაბეტონის სვეტები Reinforced Concrete Columns						
სვეტი ს-1 (36 ცალი) Columns ს-1 (36 pcs)	1	18 A500c	4120	144	593.28	
	2	18 A500c	3210	144	462.24	
	3	8 A240c	1280	1476	1889.28	
სვეტი ს-1' (3 ცალი) Columns ს-1' (3 pcs)	1	18 A500c	4120	12	49.44	
	2	18 A500c	3210	12	38.52	
	3	8 A240c	1280	123	157.44	
სვეტი ს-2 (14 ცალი) Columns ს-2 (14 pcs)	1	18 A500c	5120	56	286.72	
	2	18 A500c	2210	56	123.76	
	3	18 A500c	4120	56	230.72	
	4	18 A500c	3210	56	179.76	
	5	8 A240c	1280	574	734.72	
კვანძების გაძლიერება Strengthening of nodes		10 A500c			860	
	ბეტონი B25 Concrete					35.32

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Column ს-2

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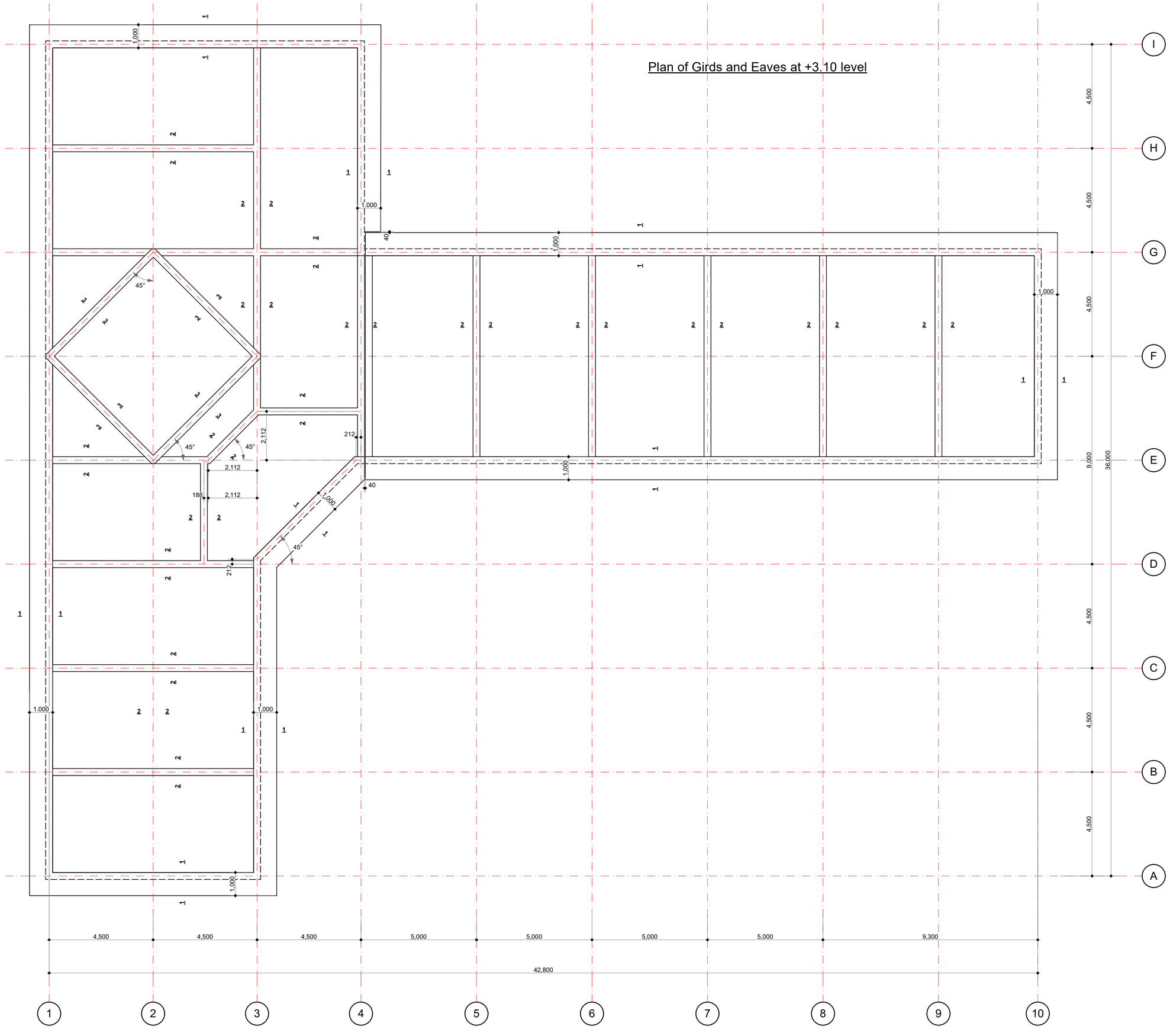
10	30

Plan of Girds and Eaves at +3.10 level



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Plan of Girds and Eaves at +3.10 level

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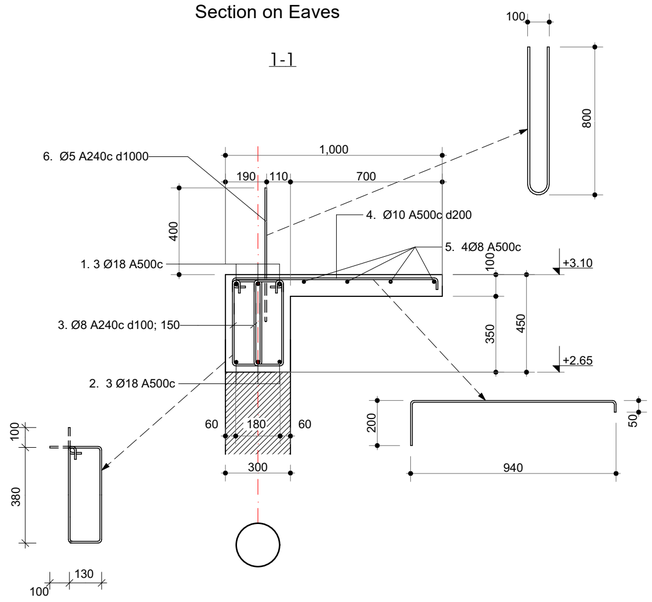
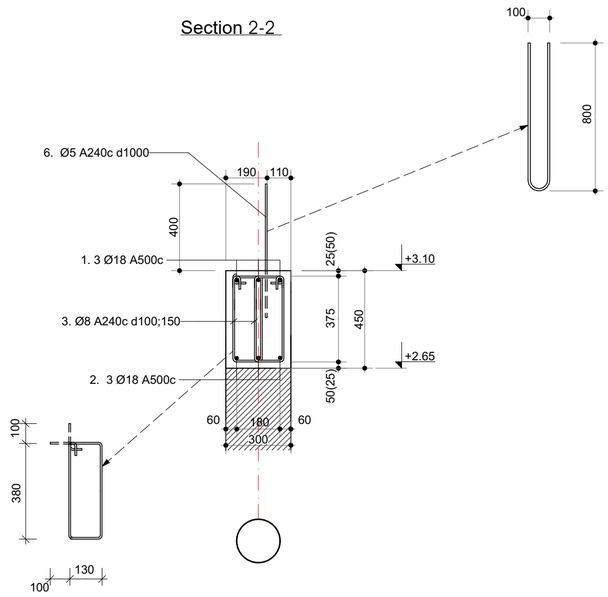
Section on Eaves

1-1



Section 2-2



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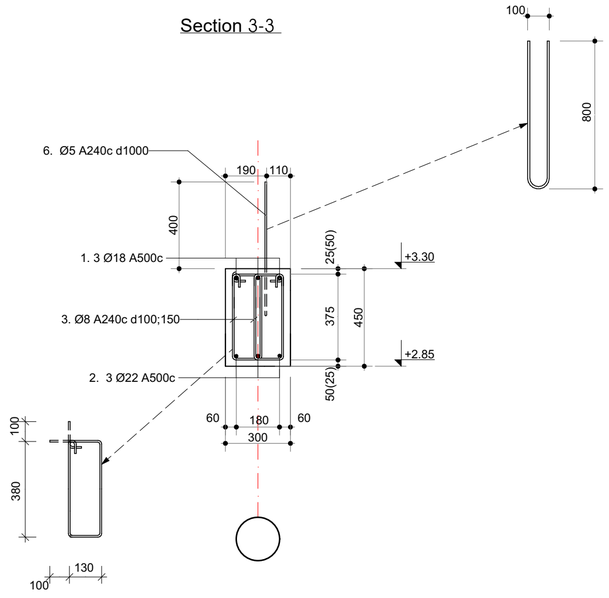

ელემენტი Component	№	არმატურის აღნიშვნა Reinforcement	სიგრძე მმ Length mm	რაოდენობა Quantity	საერთო სიგრძე m Total length m	
რიგელები და ლავგარდანი Girds and Eave						
რიგელი Gird	1	18 A500c	382000	3	1146	
	2	18 A500c	378000	3	1134	
	3	8 A240c	1220	5090	6209.8	
	6	5 A240c	1730	330	570.9	
ლავგარდნის ფილა Eaves slab	4	10 A500c	1190	810	963.9	
	5	8 A500c	172000	4	688	
	ბეტონი B25 m3 Concrete					54.6

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Section on Girds

1-1;
2-2;
3-3

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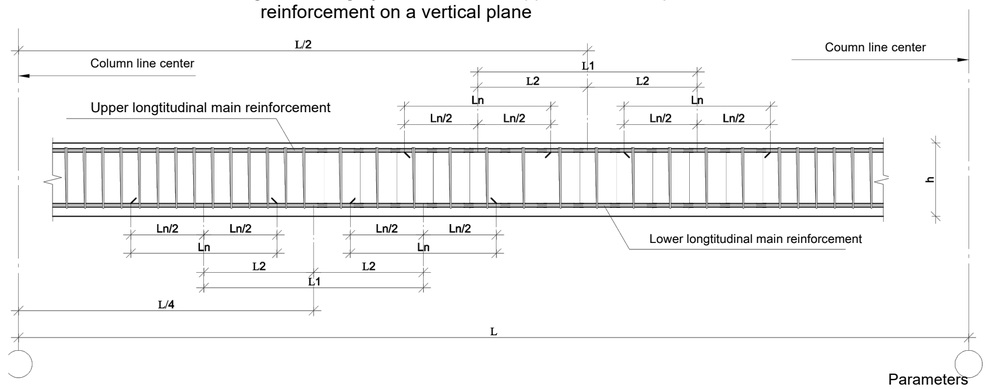
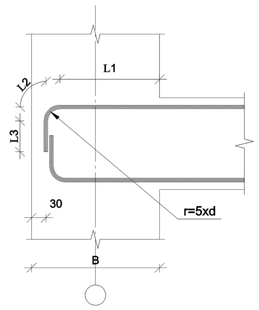
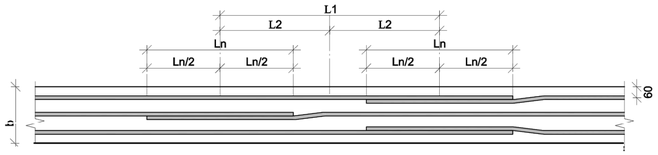
Locations of monolithic gird bonding by crossbar in the upper and lower span of the reinforcement on a vertical plane



Fixing (bending) Node of Grid in the upper and lower reinforcement column



Plan of monolithic gird bonding of crossbar in the upper and lower span of the reinforcement



Parameters of gird bond crossbar in the upper and lower reinforcement

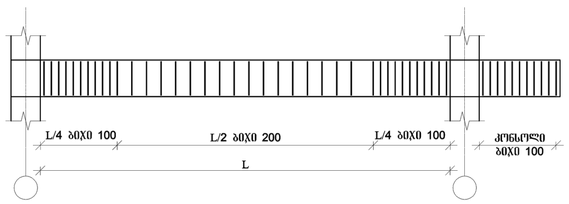
Diameter of renforcement	Reinforcement crossbar (mm)	Distance between the crossbar centres (mm)	Distance from the marking point 'X' to reinforcement crossbar center (mm)	
არმატურის დიამეტრი Ø (მმ)	არმატურის ბადეების სიგრძე L_n=40*D	ბადეების ცენტრებს შორის მანძილი $L_2 \geq 1.5*L_{ბად}$	მარკირების წერტილიდან "X" წანაცვლება არმატურის ბადეების ცენტრამდე მანძილი $L_2 \geq L_1/2$	საბოლოო ბადემდე მანძილი $L_3=L_1+L_{ბად}$
Ø16 A500C	640	960	480	1600
Ø18 A500C	720	1080	540	1800
Ø20 A500C	800	1200	600	2000
Ø22 A500C	880	1320	660	2200
Ø25 A500C	1000	1500	750	2500

Parameters of fixing node of grid in the upper and lower reinforcement column

რიგის (B=400)

არმატურის დიამეტრი Ø	$L_{ბად}=40d=L_1+L_2+L_3=2xL_1$ (მმ)				
	$L_{ბად}=40Ø$	r=5d მმ.	$L_1=L_{ბად}/2+0.5$ (მმ)	$L_2=(5d+2)XП$ (მმ) 4	$L_3=L_{ბად}-(L_1+L_2)$ (მმ)
Ø16 A500C	640	80	320	126	194
Ø18 A500C	720	90	360	141	219
Ø20 A500C	800	100	400	157	243

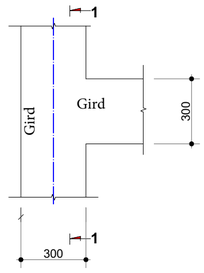
Plan of Allocaton of Gird Hangers

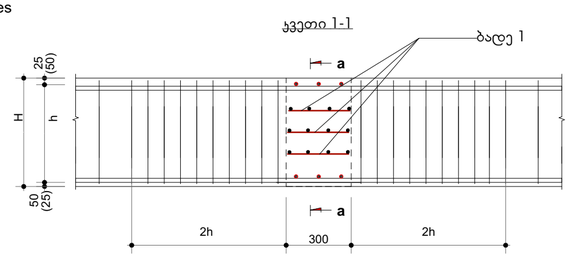


Specification of Reinforcement

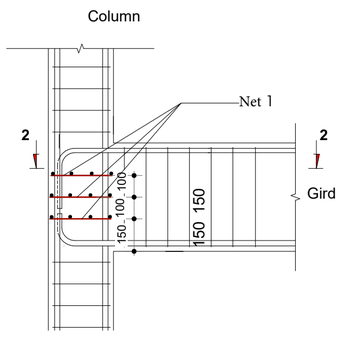
Cross-Section		Total Length m	Total Weight (K) g	Weight of R/M	Total Weight , ton	Total Weight (acc. to grades)
A240c	5 A240c	571.0	571.0	0.190	0.11	7.3
	8 A240c	17344.0	18211.2	0.394	7.18	
A500c	6 A500c	1960.0	1960.0	0.222	0.44	31.4
	8 A500c	27858.0	29250.9	0.394	11.54	
	10 A500c	5120.0	5376.0	0.616	3.31	
	12 A500c	1996.0	2095.8	0.887	1.86	
	14 A500c		0.0	1.208	0.00	
	16 A500c		0.0	1.578	0.00	
	18 A500c	6810.0	7150.5	1.997	14.28	
	20 A500c		0.0	2.465	0.00	
	22 A500c		0.0	2.983	0.00	
	25 A500c		0.0	3.851	0.00	
ჯამი					38.71	

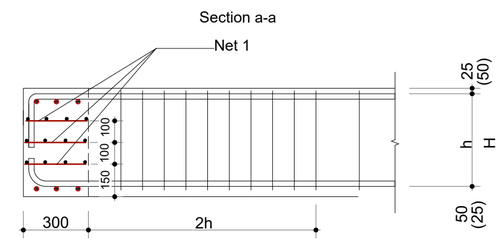
Strengthening of Gird to Gird Connection Nodes

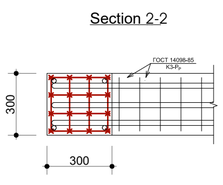


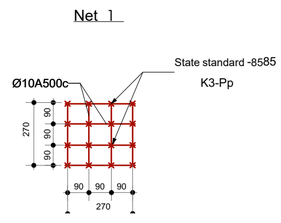


Strengthening of node of girds and columns intersection









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Monolith Gird

Strengthening of Nodes

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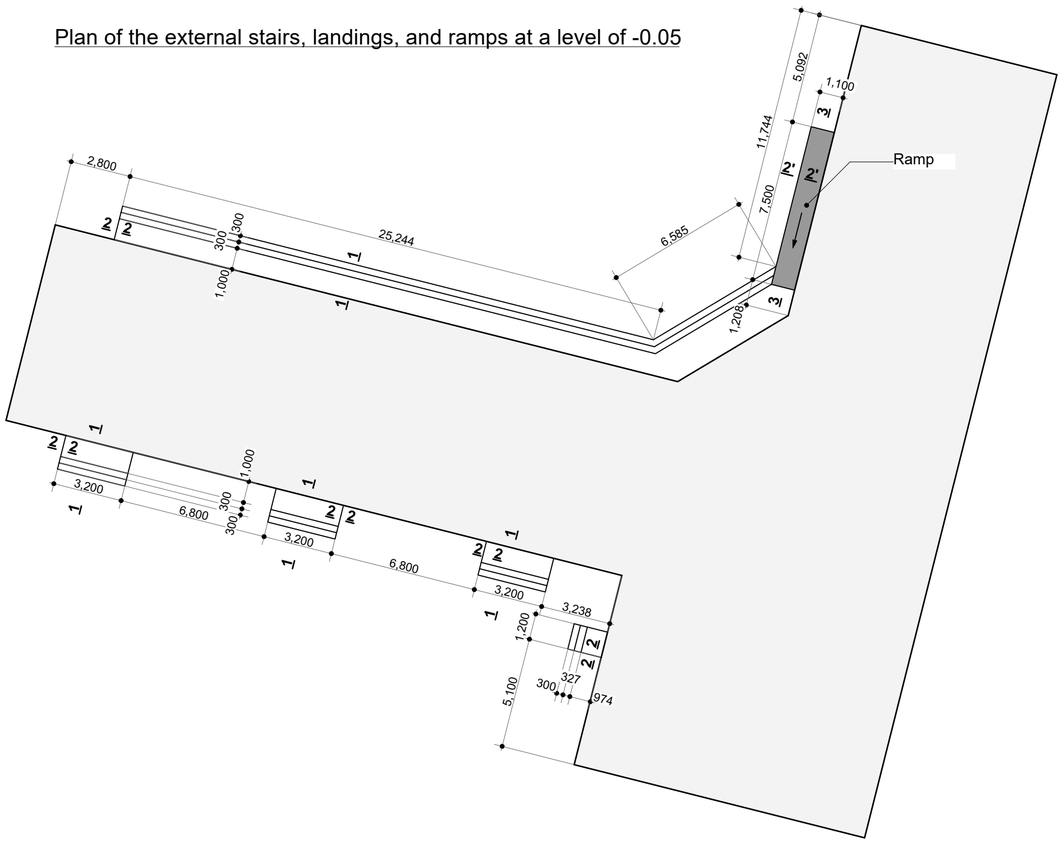
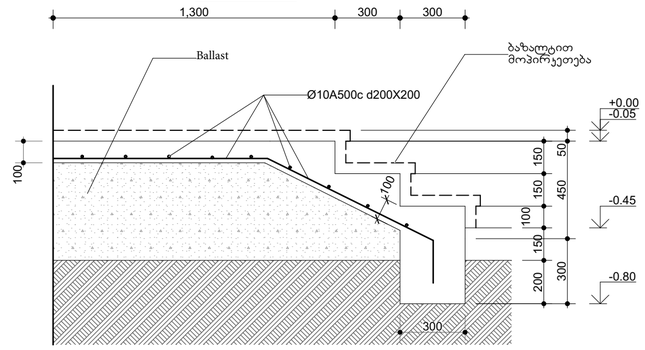
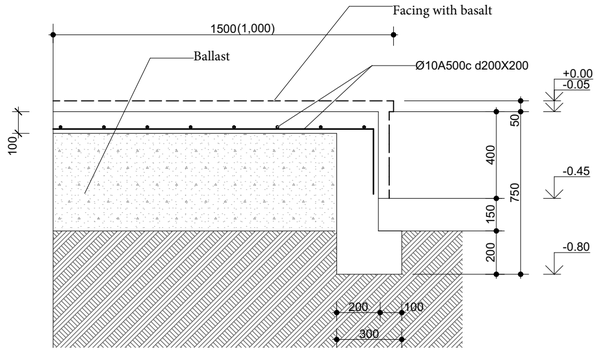
Plan of the external stairs, landings, and ramps at a level of -0.05



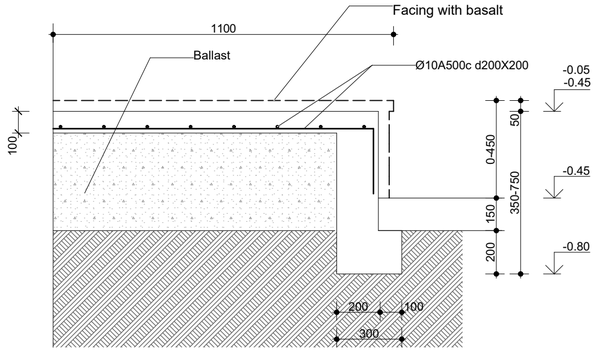
Section 1-1



ჭრილი 2-2



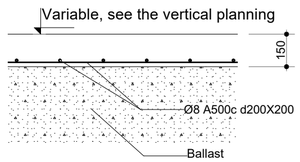
Section 2'-2'



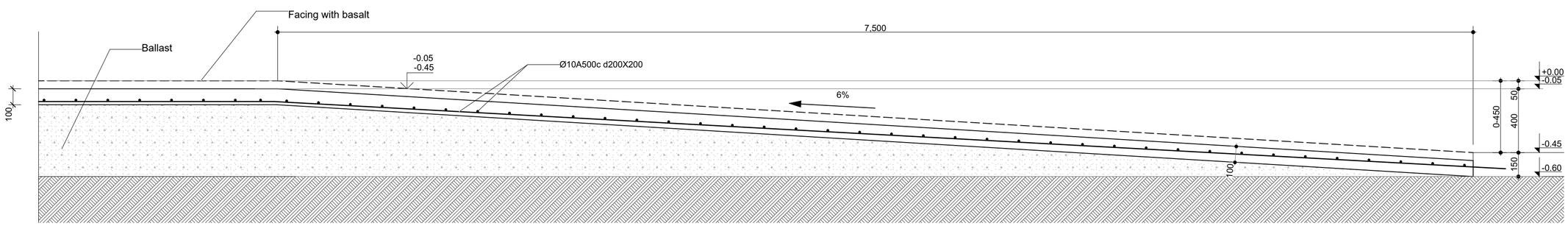
Staircases, landing, walkway and ramp

ელემენტი Component	№	არმატურის პროფილი Reinforcement	სიგრძე მმ Length mm	რაოდენობა Quantity	საერთო სიგრძე მ Total length m	
კიბეები, მოედანი, სარინელი და პანდუსი						
კიბეები და პანდუსი Staircases and ramp	1	10 A500c			2350	
						36.4
მოედნის ფილა და სარინელი	2	8 A500c			21000	
Slab of staircase landing, and walkway	ბეტონი B25 m3 Concrete					339
						264

Reinforcing of yard reinforced concrete ground slab



Section 3-3



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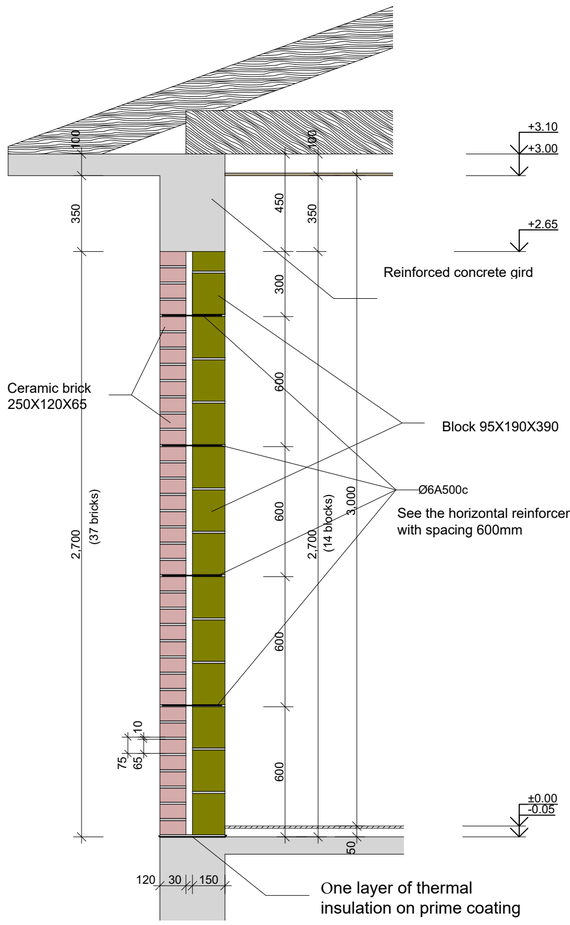
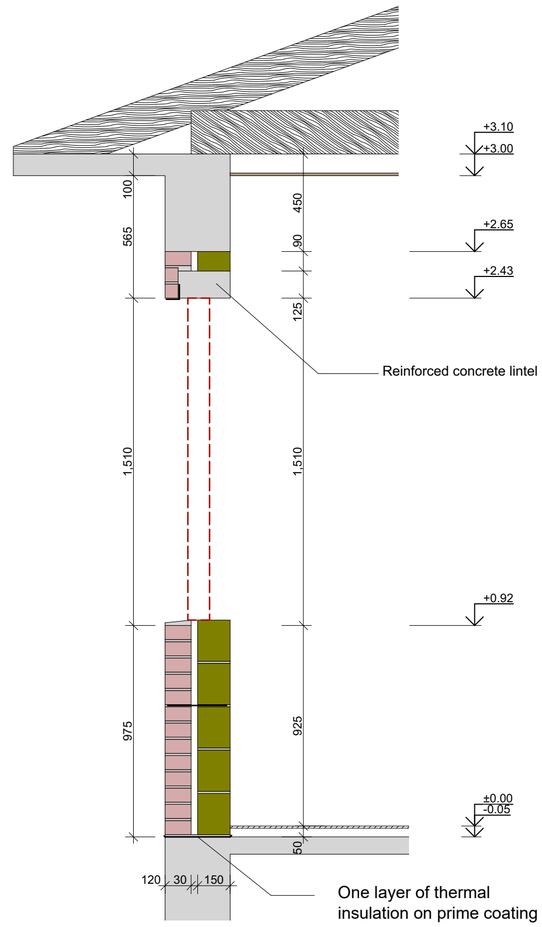
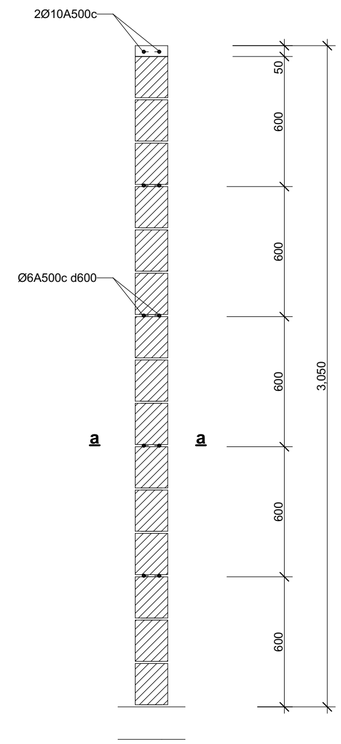
Section on External Wall



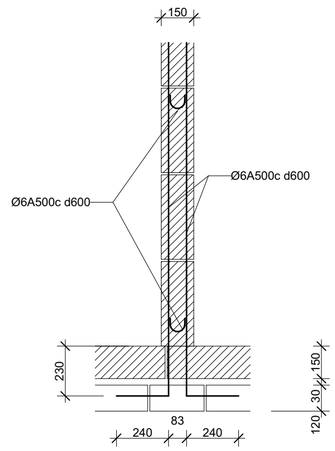
Section on the wall at the window aperture



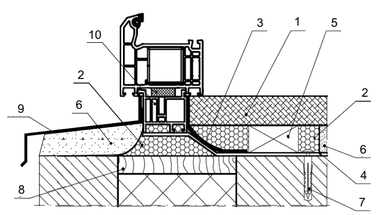
Partition Reinforcement



a - a



Window external details



1. Window ledge
2. Installation foam
3. Vapour sealing tape
4. Flexible anchor
5. Supporting fixing lug
6. Plaster
7. Expansion pin anchor
8. Mortar layer
9. Rainwater pipe
10. Additional profile

Filling of the bricks with mortar in the horizontal and vertical plane

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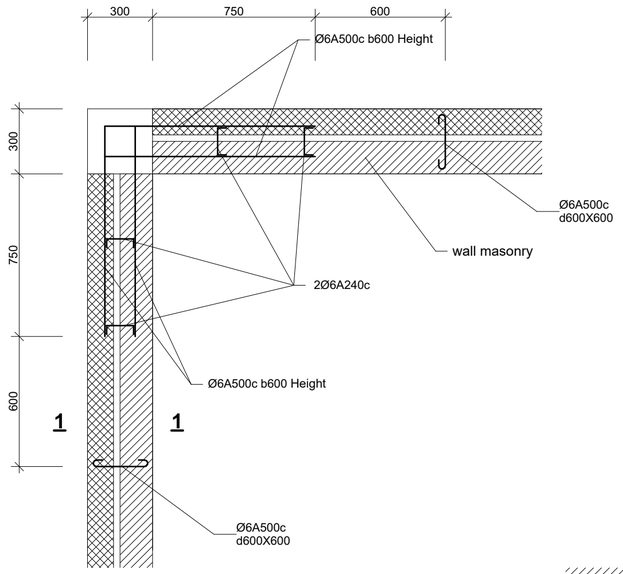
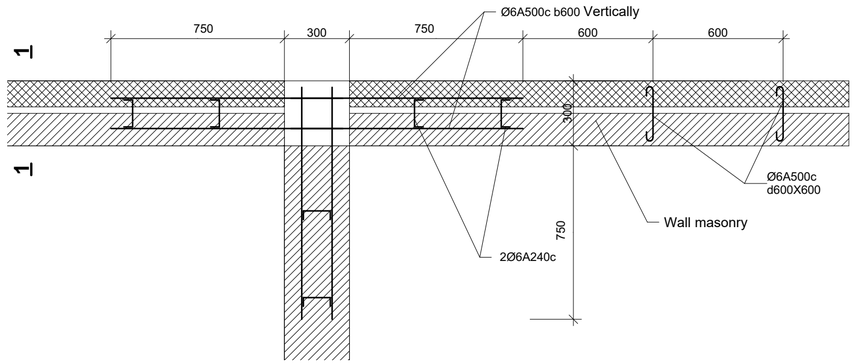
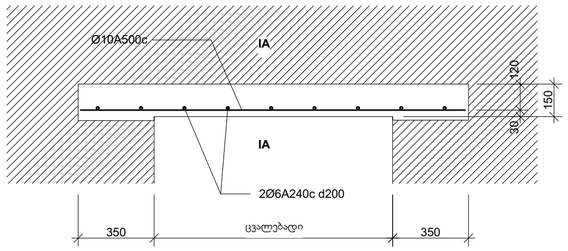
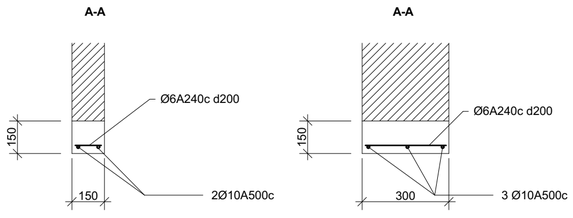
Connection of Coumns with walls





Monolith lintel on internal wall



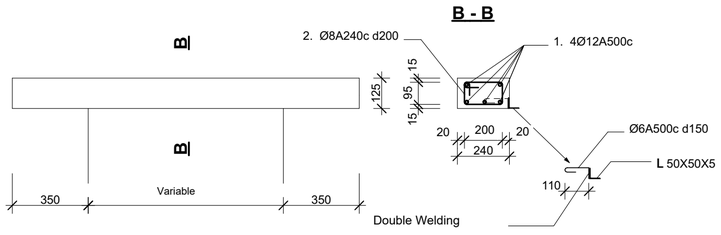


1 - 1

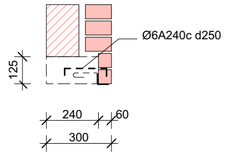
The filling of the wall stone masonry should be connected to the columns of the frame by reinforcement balustrades of 750 mm long, with spacing of 600 height. If the wall (filling) length exceeds 3 meters, it should be connected to the reinforced concrete ceiling construction with reinforcement rods.

The nodes shown in the drawing can be constructed while masonry of the structure and bearing walls simultaneously, as well as after concreting. This requires perforation of the frame structure at 20 cm depth and inserting in the reinforcement rods into it with a polymer solution. The stone partitions need to be reinforced with 2Ø6AI reinforcement throughout the whole length, at 600mm in height and should be fitted with a reinforced concrete frame or wall masonry.

Lintel on External Wall



Lintel to be concreted on the angle after the brick masonry.



ელემენტი Component	№	არმატურის პროფილი Reinforcement	სიგრძე მმ Length mm	რაოდენობა Q-ty	საერთო სიგრძე მ Total length m	
Reinforcement of Walls and Partitions კედლების და ტიხრების არმირება						
	1	10 A500c			200	
	2	6 A500c			1960	
ზლუდარები Lintels						
ზლუდარი გარე კედელზე Lintel on External Wall	1	12 A500c			425	
	2	8 A240c			380	
		∟50X50X5			96	
ზლუდარი შიგა კედლებზე Lintel on Internal Wall	1	10 A500c			320	
	2	8 A240c			105	
	ბეტონი B25 m3 Concrete					5.8

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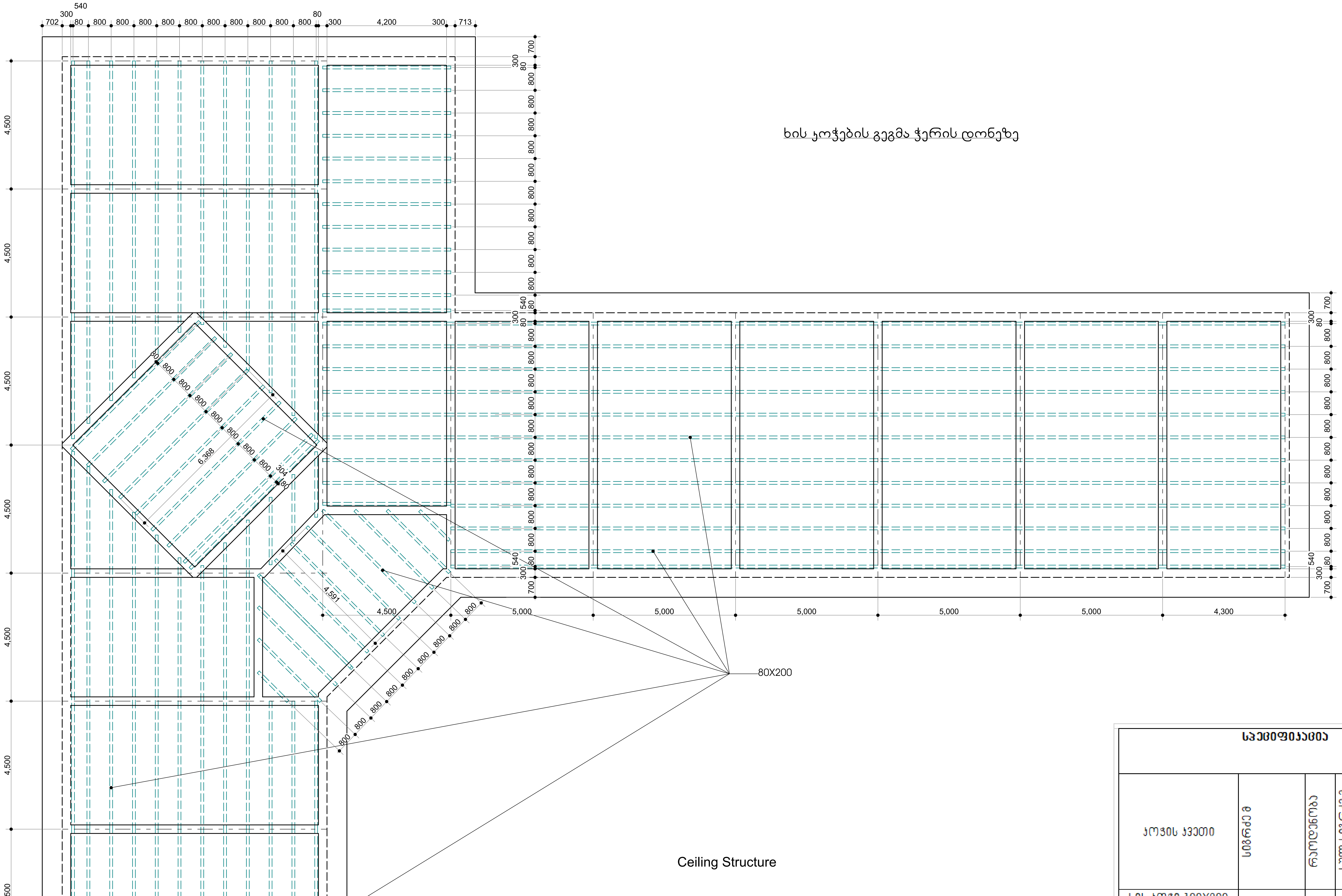
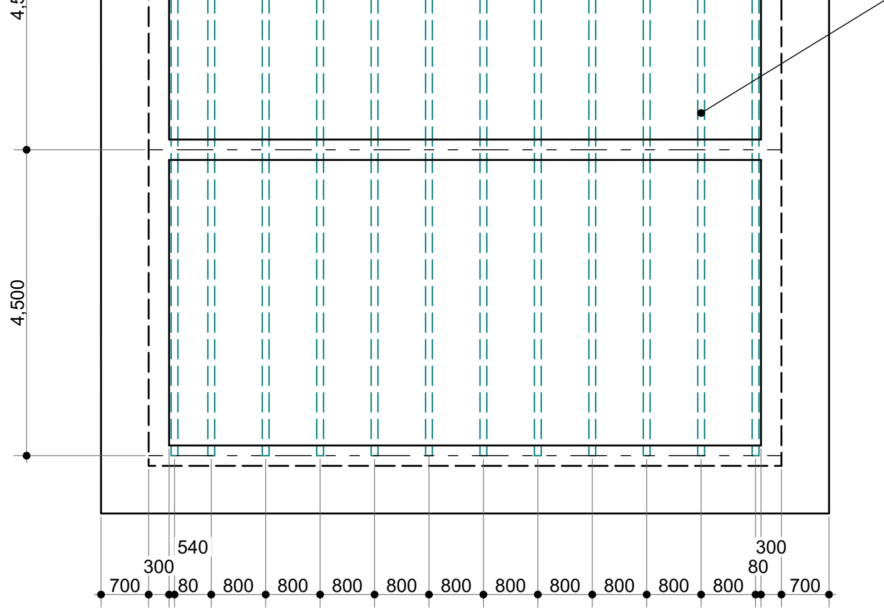
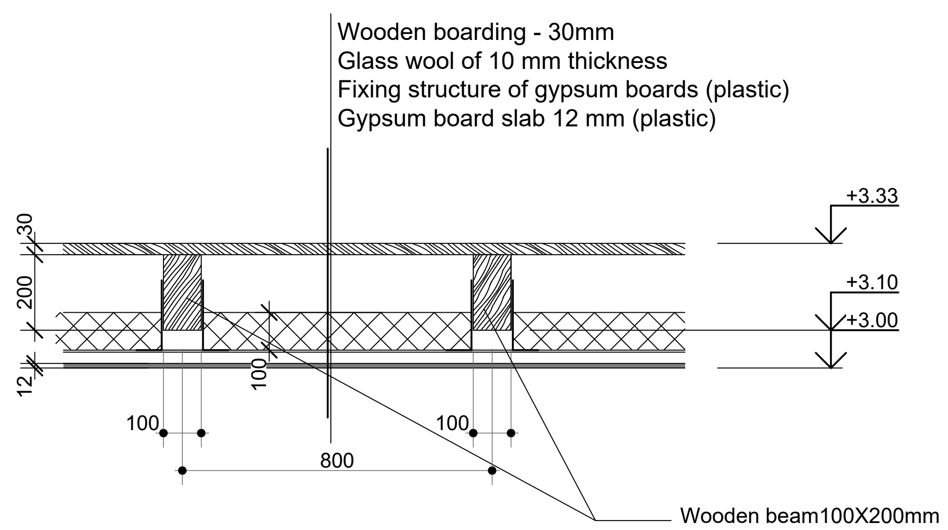
ხის კოჭების გეგმა ჭერის დონეზე





Ceiling Structure



სპეციფიკაცია				
კოჭის კვეთი	სიგრძე მ	რაოდენობა	სულ სიგრძე მ	მოცულობა
ხის კოჭი 100X200	4.8	91	436.8	9.6
ხის კოჭი 100X200	5.3	72	381.6	8.4
ხის კოჭი 100X200	6.4	9	57.6	1.3
ხის კოჭი 100X200	2.4	5	12	0.3
ხის კოჭი 100X200	3	24	72	1.6
			Σ	21.1

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Format A-2

Page	Pages
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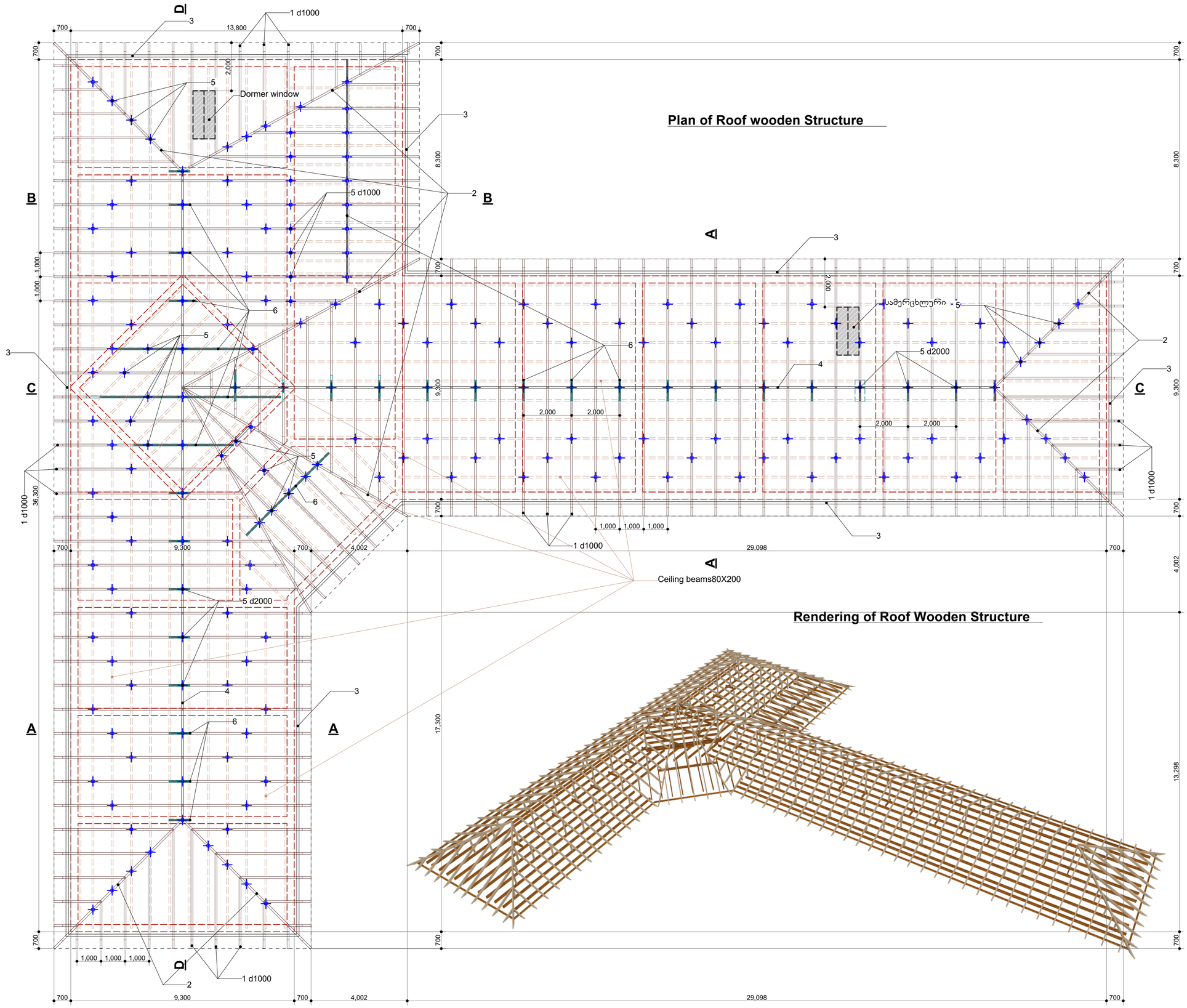
Plan of Roof wooden Structure



Rendering of Roof Wooden Structure

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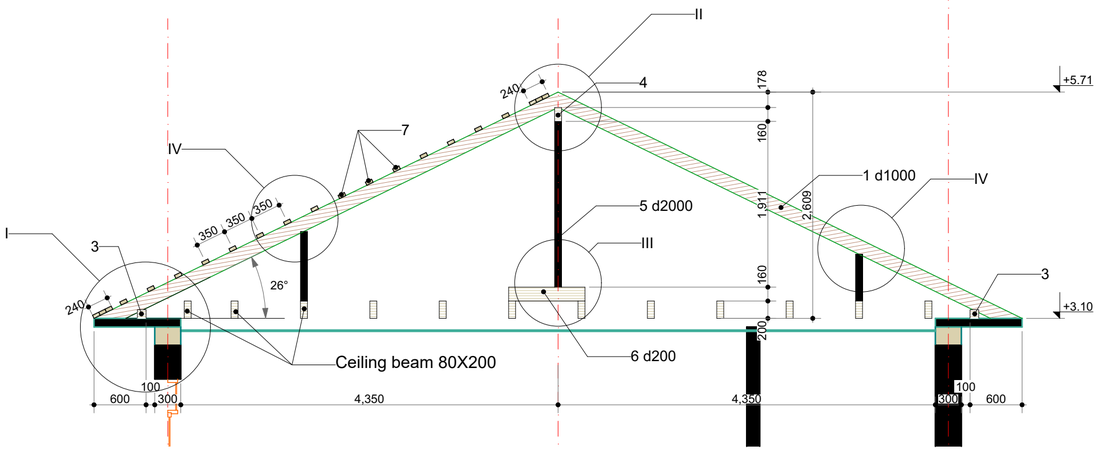
სახურავის ხის სტრუქტურის გეგმა და რენდერი

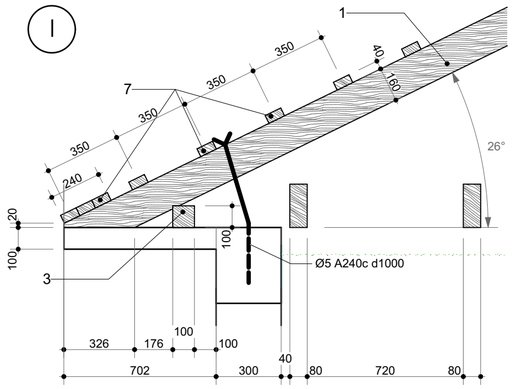
ფორმატი Format A - 2

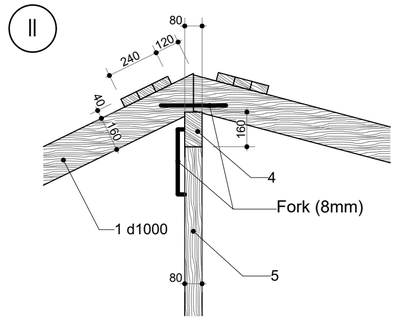
ფურცელი Page	ფურცლები Pages
18	30

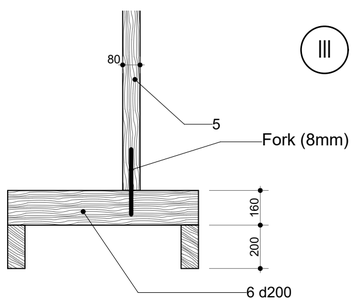
A - A

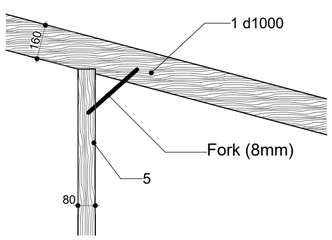


B - B









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Project address:

Georgia, Khoni

ეტაპი:

მუშა პროექტი

Stage:

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ჭრილი **A-A; B-B**

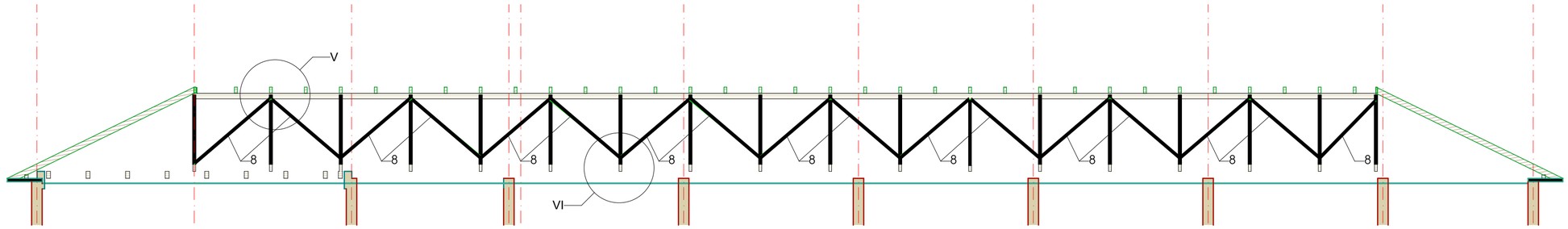
კვანძები

ფორმატი Format	A - 2

ფურცელი Page	ფურცლები Pages
19	30

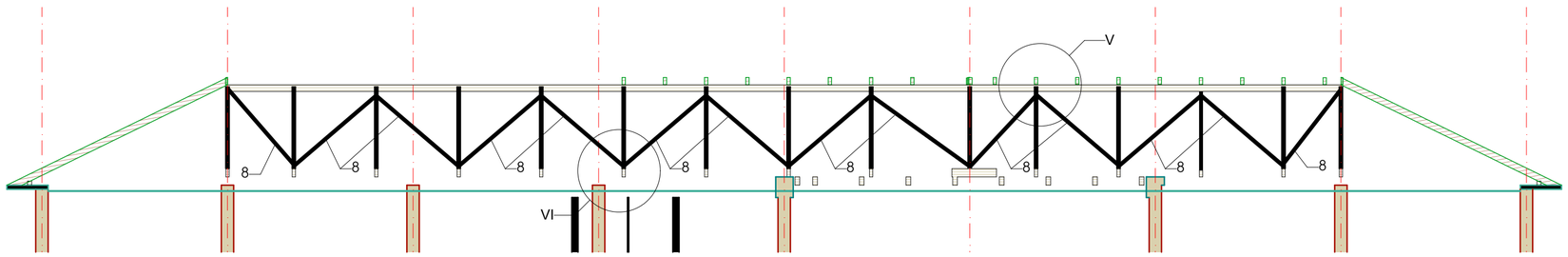
Connections on a Central Axis

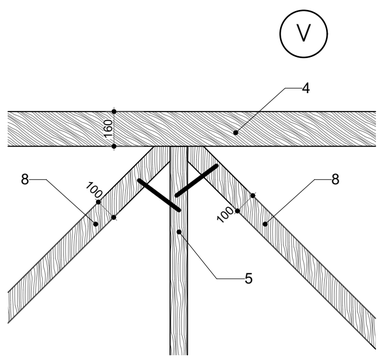
C - C

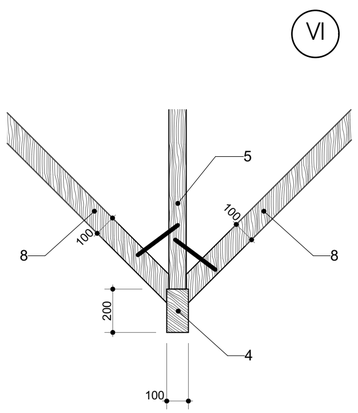


Connections on a Central Axis

D - D







ხის ელემენტების სპეციფიკაცია
Specification of Wooden Components

№	ჯოხის კვეთი **Beam Section**	სიგანე მმ **Width mm**	სიმაღლე მმ **Height MM**	საერთო სიგრძე მ **Total length m**	მოცულობა მ3 **Volume m 3**
1	ნიფხვი **Rafter**	80	160	1010	12.93
2	დიაგონალური ნიფხვი **Diagonal Rafter**	80	160	86	1.10
3	მაუერლატი **Wall-plate**	100	100	163	1.63
4	კეხის ჯოხი **Ridge beam**	80	160	61	0.78
5	დგარი **Pillar**	80	80	360	2.30
6	გამანაწილებელი ჯოხი **Spreading beam**	80	160	142	1.82
7	ლარტყის ძელაკი **Squared timber bar**	40	80		10.30
8	ირიბანა კავშირებისთვის **For diagonal connections**	100	100	88.00	0.88
				∑	31.74

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Community Education Center in Khoni

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Project address:

Georgia, Khoni

ეტაპი: მუშა პროექტი

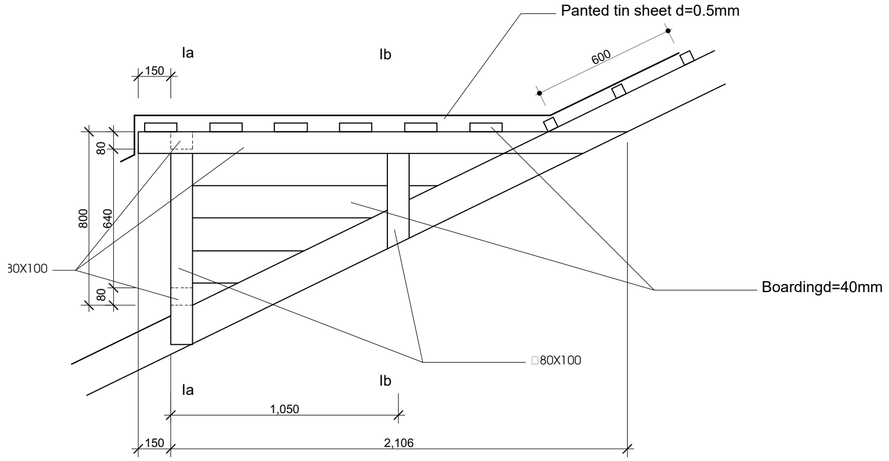
Stage: Architectural project

ჭრილი **C-C; D-D** კვანძები

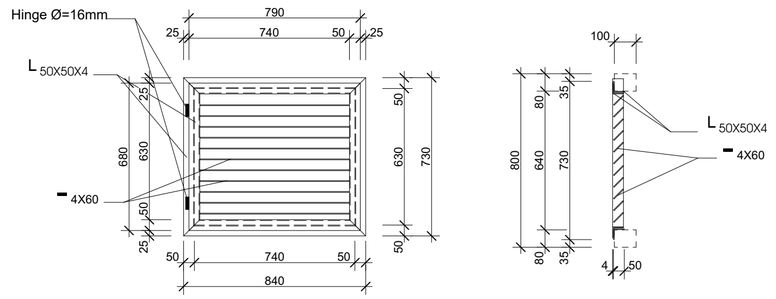
ფორმატი Format A - 2

ფურცელი Page	ფურცლები Pages
20	30

Dormer Window



Steel Window



ფოლადის სპეციფიკაცია Specification of Steel

ჯვეთი Section	სიგრძე g Length m	რაოდენობა Q-ty	სულ სიგრძე g Total length m	წონა კგ Weight kg
L50X50X4	0.73	2	1.46	4.23
L50X50X4	0.84	2	1.68	4.87
L50X50X4	0.68	2	1.36	3.94
L50X50X4	0.79	2	1.58	4.58
_60X4	0.69	11	7.59	14.27
			∑	31.90

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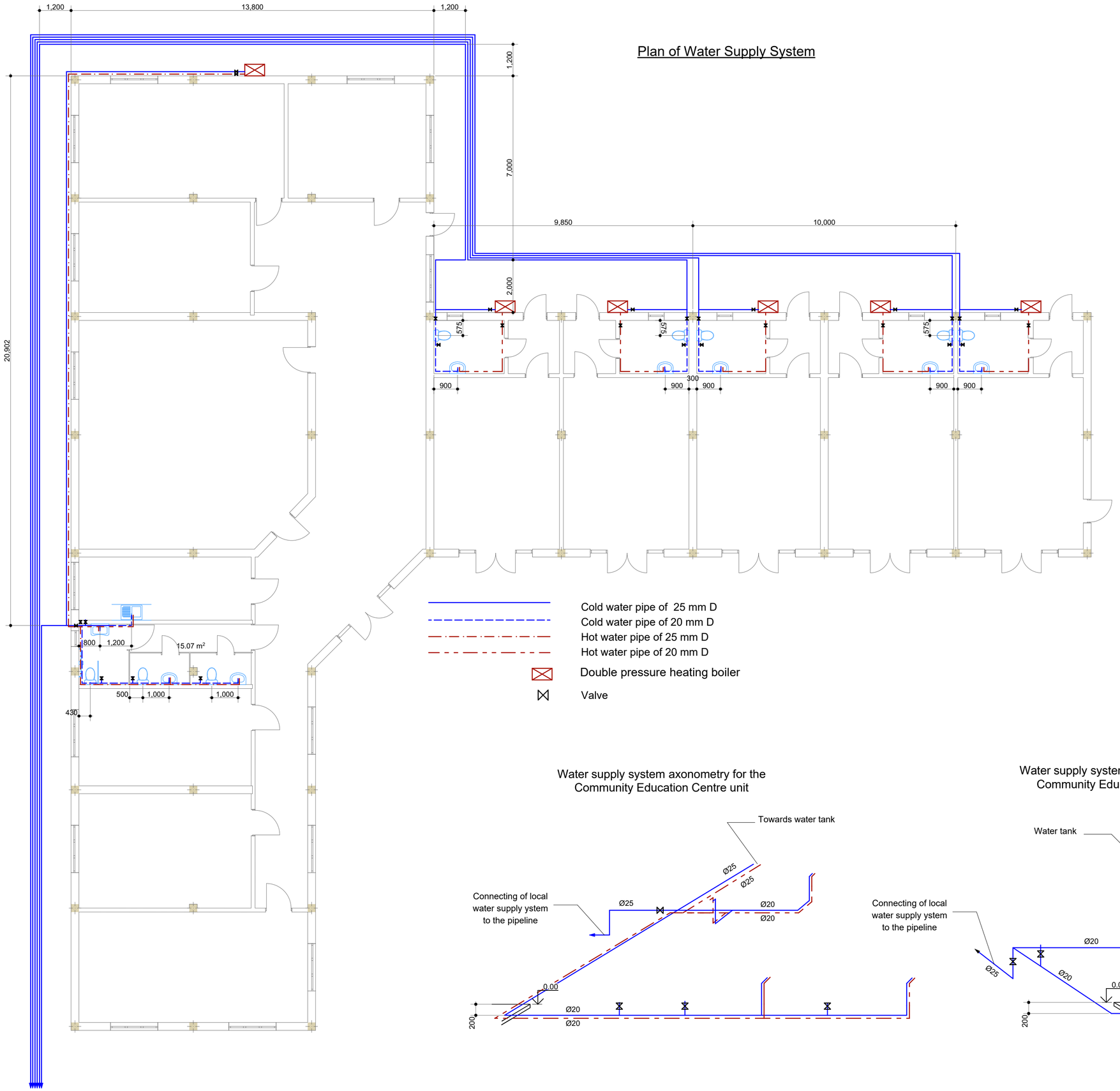
სამრეცხლური

ფორმატი Format A - 2

ფურცელი Page	ფურცლები Pages
21	30

Plan of Water Supply System



Water Supply System

The water supply of the building is provided by the urban water supply system. Water is supplied by the inlet under the first-floor slab.

The water supply is provided separately for the six dwelling units of the building (educational center and five commercial objects) from the urban network. The design cold water discharge for the educational center unit is 1.55 m3 / hr and for one commercial unit is 0.72 m3 / hr.

The water supply pipes of the building is made of polypropylene pipes and fittings. Cold and hot water pipes should be provided with heat insulation. First, the 2-meter pipe should be coated with thermal insulation, then it should be covered with the mineral wool of 5 cm thickness.

The hot water supply of the building is provided through the local water heater only for the educational center unit.

Sewage System

The internal sewer network of the building is represented by the main manifold of the yard and local area networks of six dwelling units. The yard manifold is connected to the urban sewer manifold provided on the street, and the bottom level of will have to be further specified at the construction phase.

The local sewage pipes of the dwelling units are provided under the concrete slab of the floor, the horizontal part of the pipe should be packed with heat insulation (10 cm thick). The sewage network is made of 150, 100 and 50 mm polypropylene pipes and fittings. For ventilation of the network 50 mm pillars are located at 0.2 mm from the ceiling and are ended in the ventilated attic. The horizontal sections of the sewage network are arranged with the following minimum slope: for 150 and 100 D pipes - 0,015; for 50 D pipes - 0.03.

Monolithic reinforced concrete sewage msnholes can be replaced by assembled structures.

Water supply system axonometry for the Community Education Centre unit

Water supply system axonometry for the Community Education Centre unit

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წყალმომარაგების სისტემის გეგმა

ფორმატი Format A - 2

ფურცელი Page	ფურცლები Pages
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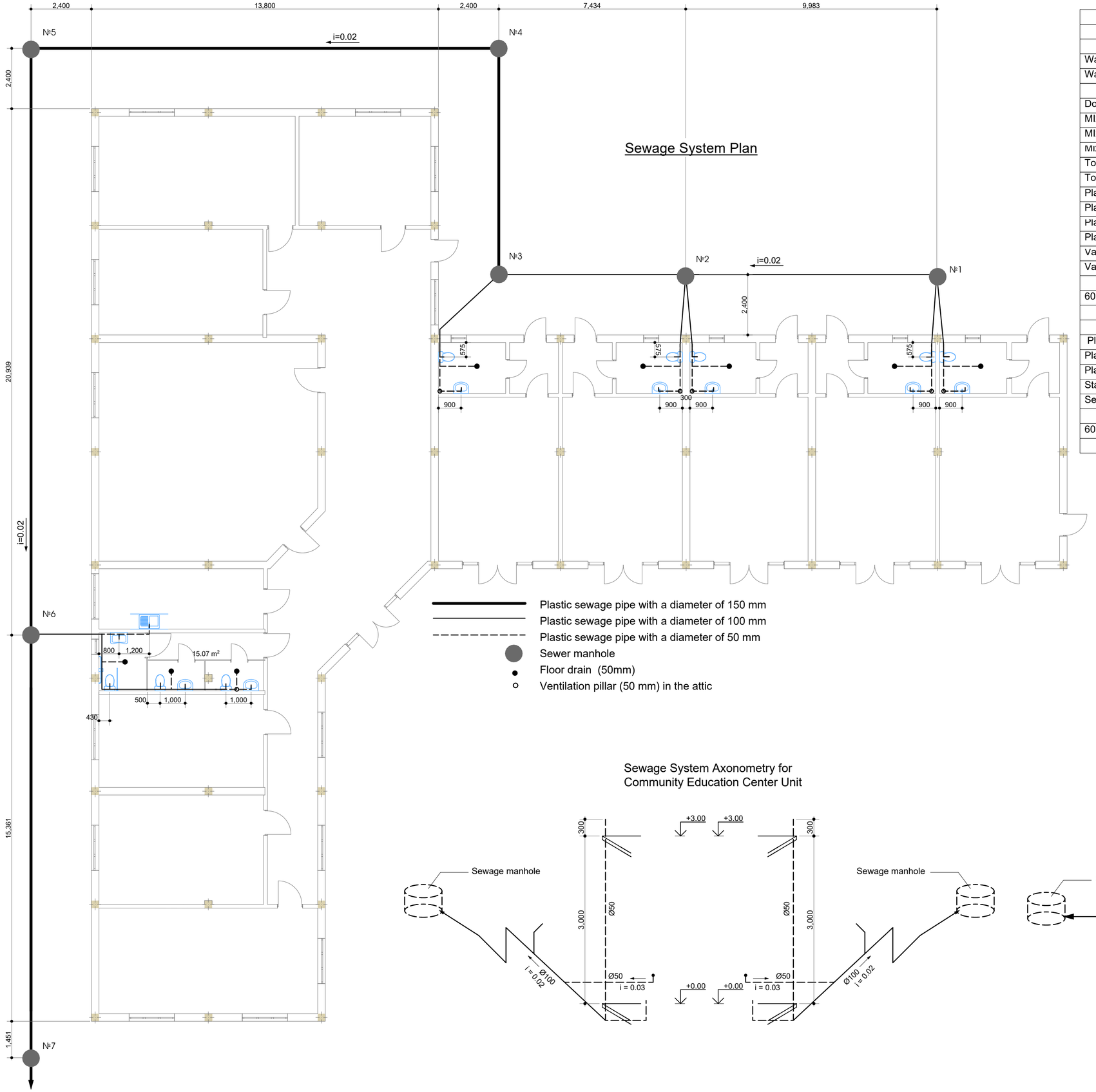
Sewage System Plan



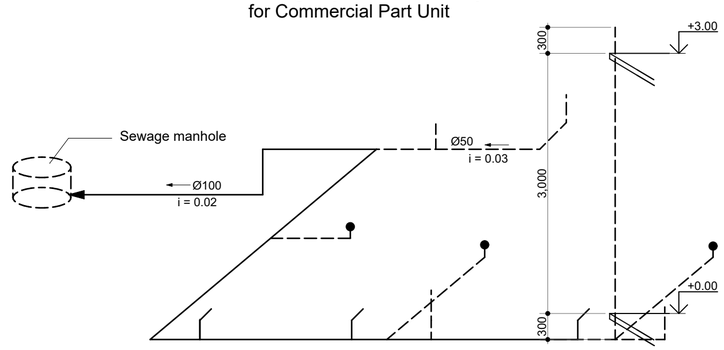
Plastic sewage pipe with a diameter of 150 mm
Plastic sewage pipe with a diameter of 100 mm
Plastic sewage pipe with a diameter of 50 mm
Sewer manhole
Floor drain (50mm)
Ventilation pillar (50 mm) in the attic

Specification

	UoM	Q-ty
Water Supply		
Wash basin	Set	7
Washbasin with accessories for disabled people	Set	1
Double bowl kitchen sink	Set	1
MIxer-tap	Set	7
MIxer tap with accessories for disabled people	Set	1
Mixer tap for kitchen sinkreulos niJaris	Set	1
Toilet bowl	Set	7
Toilet bowl with accessories for disabled people	Set	1
Plastic hot water pipe with fiberglass 25 mm	m	36
Plastic hot water pipe with fiberglass 20 mm	m	56
Plastic cold water pipe 25 mm	m	538
Plastic cold water pipe 20 mm	m	54
Valve 25	pcs	12
Valve 20	pcs	18
60% of the cost of pipe fittings		
Sewage		
Plastic sewer pipe of 50mm thickness	m	54
Plastic sewer pipe of 100mm thickness	m	78
Plastic sewer corrugated pipe 150 mm	m	98
Stainless steel floor drain 50 mm	pcs	8
Sewage manhole	set	7
60% of the cost of pipe fittings		

Sewage System Axonometry for Community Education Center Unit

Sewage System Axonometry for Commercial Part Unit



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კანალიზაციის სისტემის გეგმა

ფორმატი Format A - 2

ფურცელი Page	ფურცლები Pages
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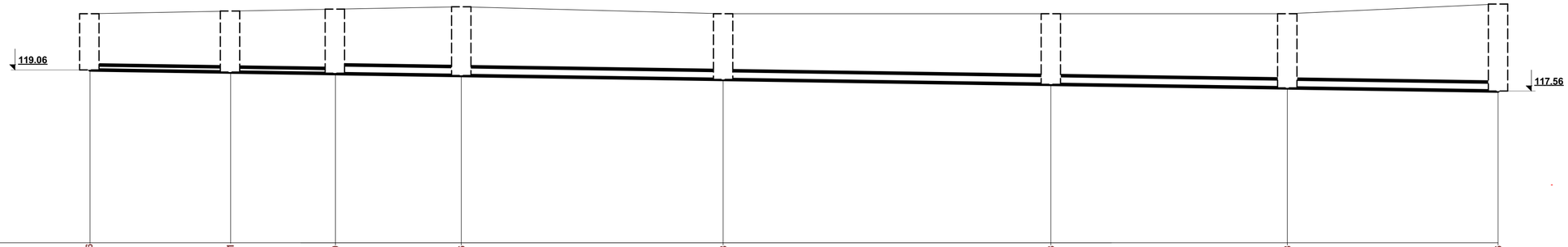
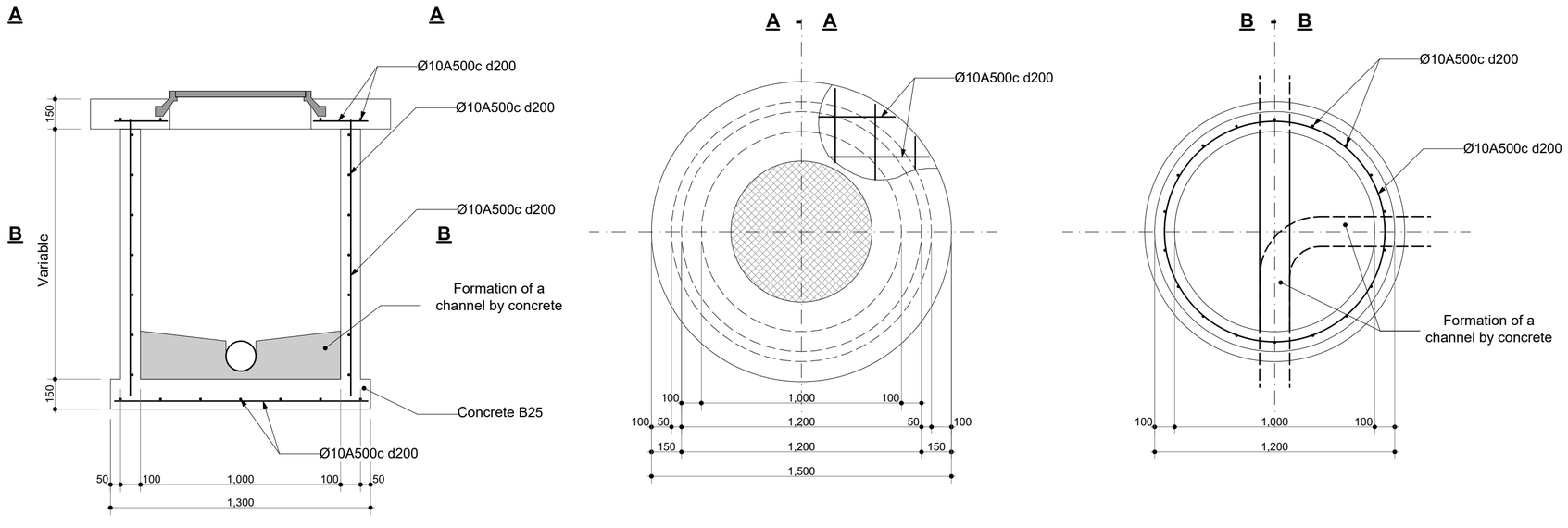
Longtitudinal Profile of Sewage Collector



Pipe invert elevation	119.06	118.91	118.80	118.66	118.38	118.03	117.78	117.56
Centre-line ground elevation	119.36	118.50	119.27	119.27	119.20	118.80	119.00	119.60
Design elevation of manhole cover	119.46	119.48	119.49	119.50	119.45	119.45	119.45	119.60
Depth of manhole in cm	40	57	69	84	107	142	167	204
Pipe diameter in mm	100	100	150	150	150	150	150	
slope	i=0.015	i=0.015	i=0.015	i=0.015	i=0.015	i=0.015	i=0.015	
Distance	10.0	7,5	9.0	18,6	23,3	16,9	15,0	
Distinguished point	Manhole #1	Manhole #2	Manhole #3	Manhole #4	ჭა №5	ჭა №6	ჭა №7	საქალაქო კოლექტორის ჭა

Sewage Manhole



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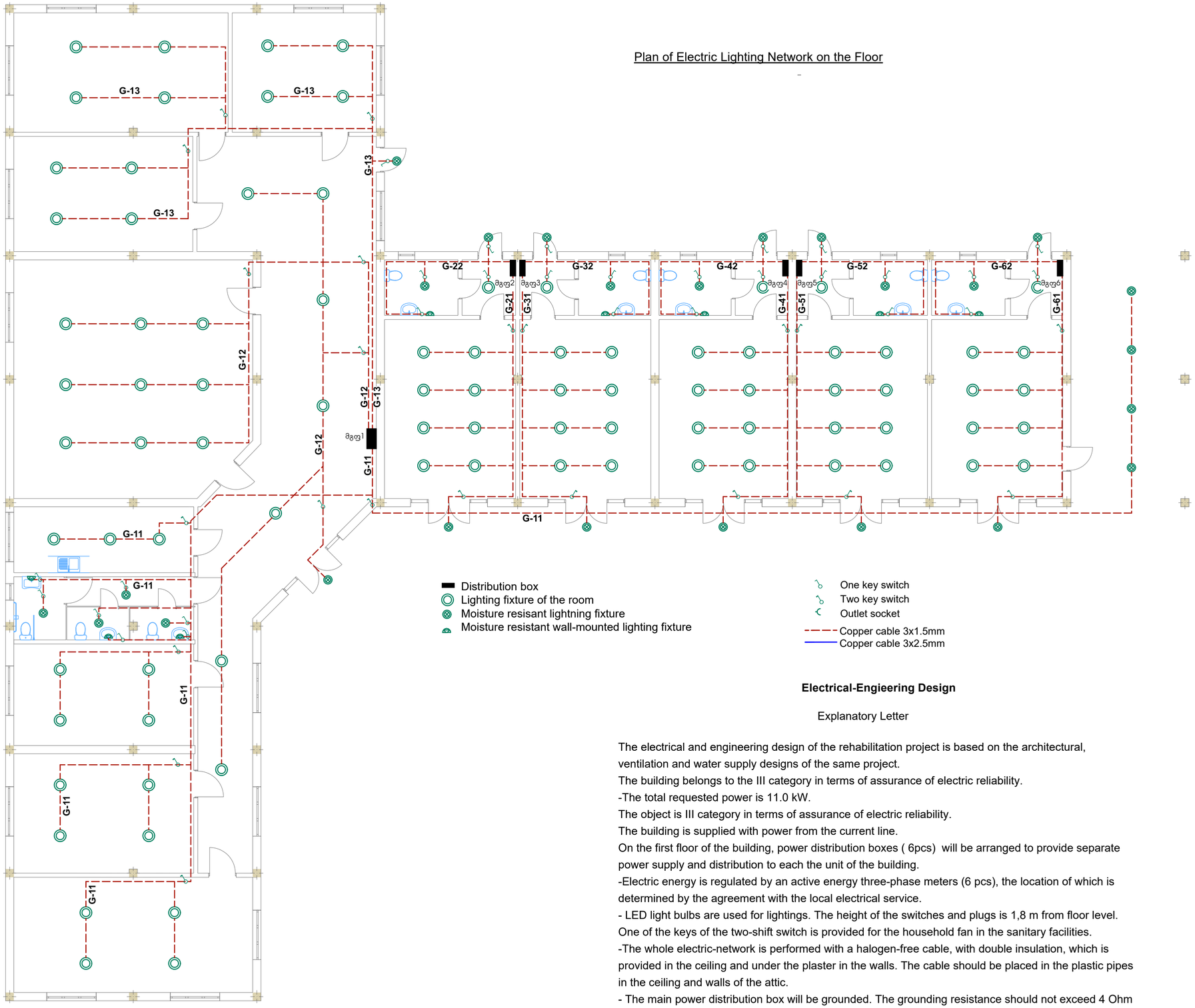
კანალიზაციის კოლექტორის გრძივი პროფილი. აქსონომეტრიული სქემები სპეციფიკაცია

ფორმატი Format A - 2

ფურცელი Page	ფურცლები Pages
24	30



Plan of Electric Lighting Network on the Floor

Distribution box
Lighting fixture of the room
Moisture resisant lightning fixture
Moisture resistant wall-mounted lighting fixture

One key switch
Two key switch
Outlet socket
Copper cable 3x1.5mm
Copper cable 3x2.5mm

Electrical-Engieering Design

Explanatory Letter

The electrical and engineering design of the rehabilitation project is based on the architectural, ventilation and water supply designs of the same project.
The building belongs to the III category in terms of assurance of electric reliability.
-The total requested power is 11.0 kW.
The object is III category in terms of assurance of electric reliability.
The building is supplied with power from the current line.
On the first floor of the building, power distribution boxes (6pcs) will be arranged to provide separate power supply and distribution to each the unit of the building.
-Electric energy is regulated by an active energy three-phase meters (6 pcs), the location of which is determined by the agreement with the local electrical service.
- LED light bulbs are used for lightings. The height of the switches and plugs is 1,8 m from floor level. One of the keys of the two-shift switch is provided for the household fan in the sanitary facilities.
-The whole electric-network is performed with a halogen-free cable, with double insulation, which is provided in the ceiling and under the plaster in the walls. The cable should be placed in the plastic pipes in the ceiling and walls of the attic.
- The main power distribution box will be grounded. The grounding resistance should not exceed 4 Ohm at any time of the year.

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Community Education Center in Khoni

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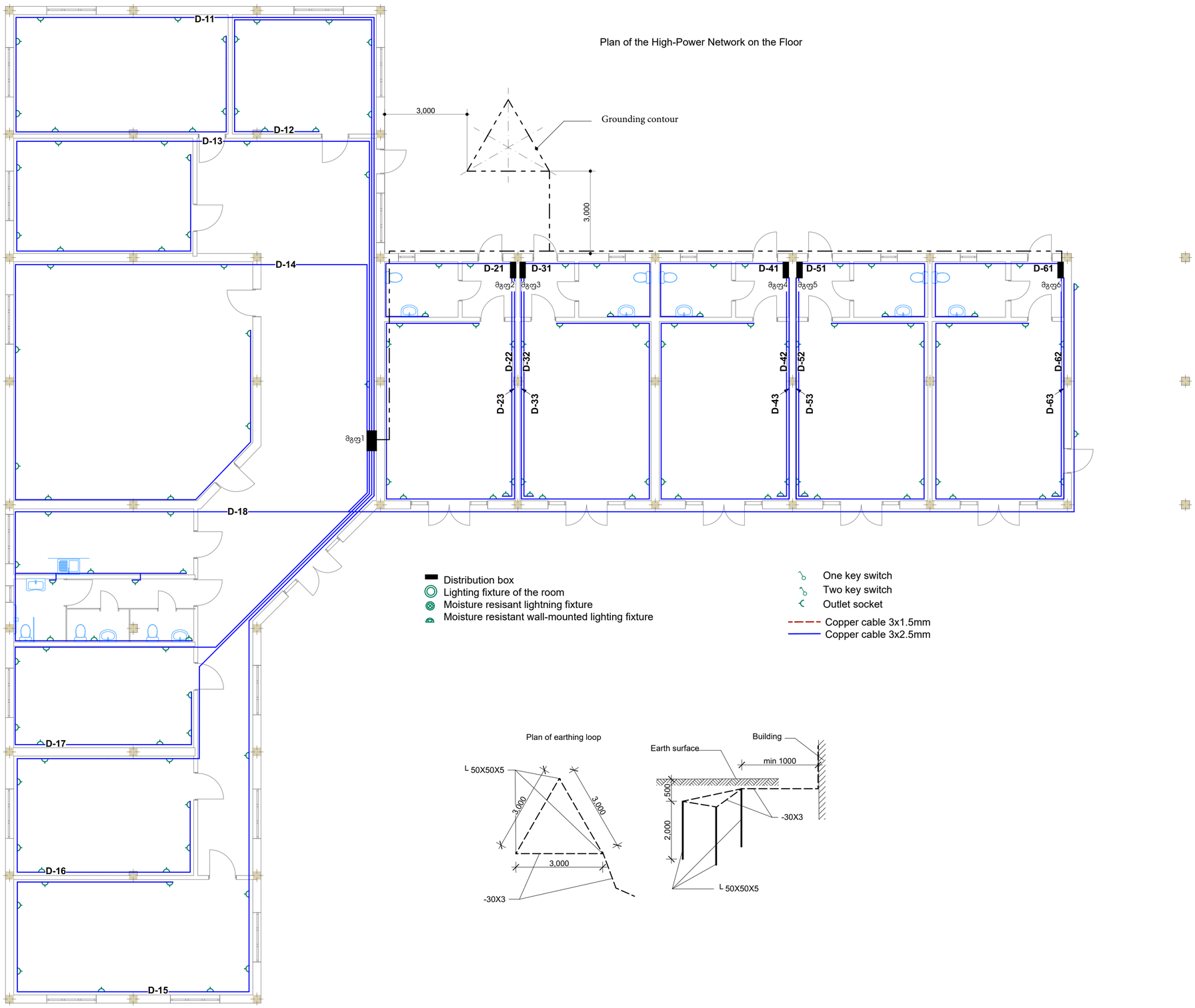
Stage:
Architectural project

სართულის ელგანათების ქსელის გეგმა

ფორმატი Format A - 2

ფურცელი Page	ფურცლები Pages
25	30

Plan of the High-Power Network on the Floor



- Distribution box
- Lighting fixture of the room
- Moisture resisant lightning fixture
- Moisture resistant wall-mounted lighting fixture

- One key switch
- Two key switch
- Outlet socket
- Copper cable 3x1.5mm
- Copper cable 3x2.5mm

Plan of earthing loop

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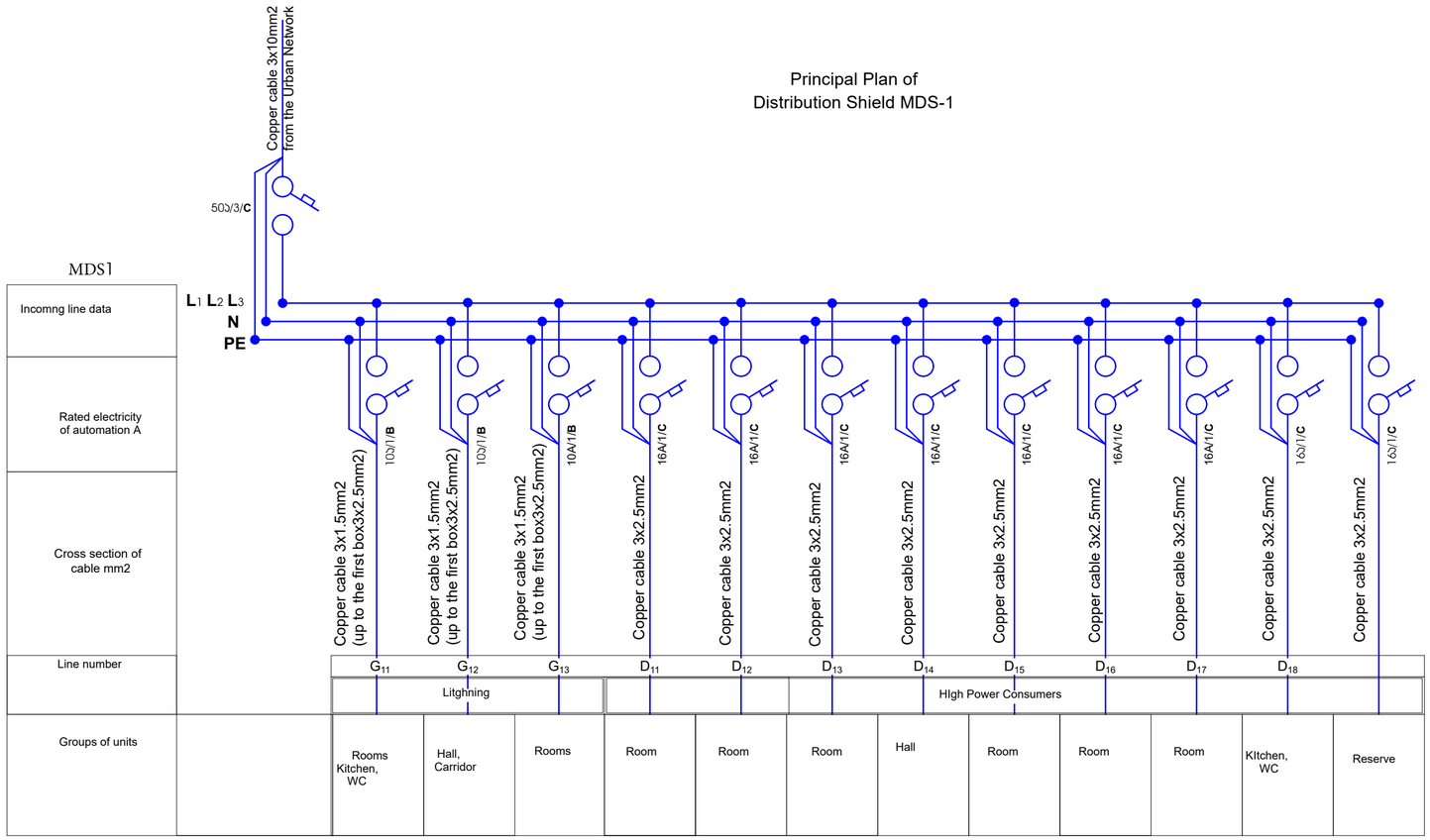
ძალოვანი ელექტროქსელის გეგმა სართულზე

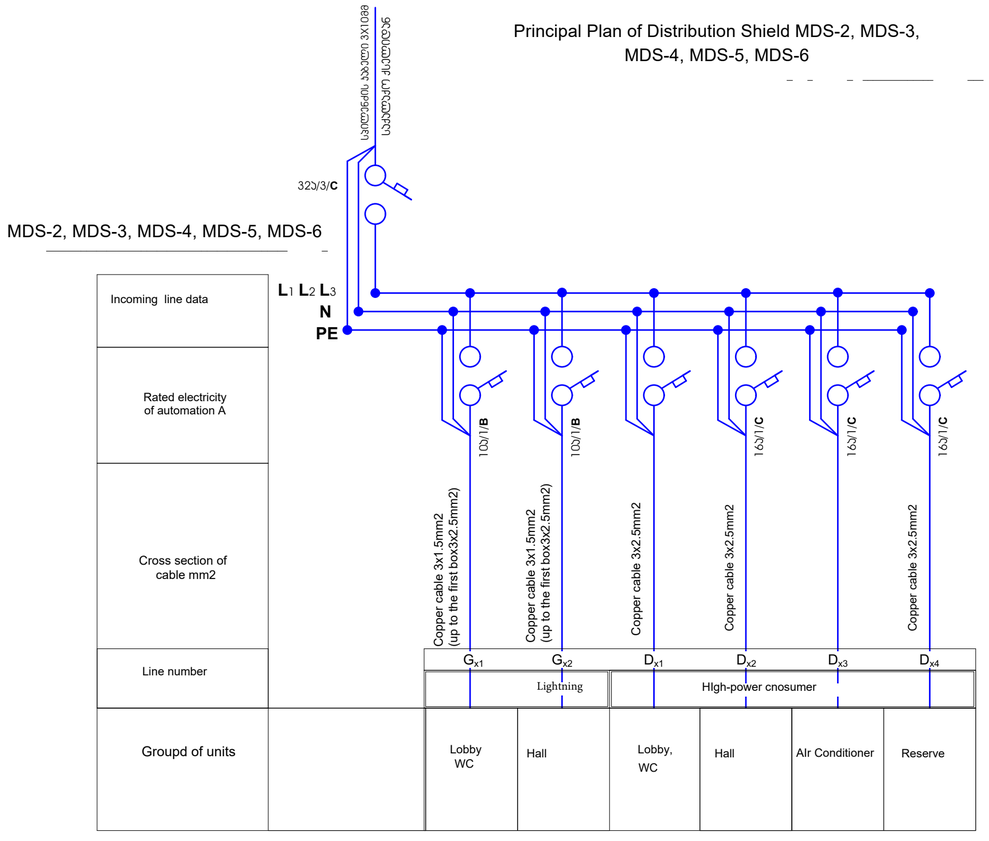
ფორმატი Format A - 2

ფურცელი Page	ფურცლები Pages
26	30

Principal Plan of Distribution Shield MDS-1



Principal Plan of Distribution Shield MDS-2, MDS-3, MDS-4, MDS-5, MDS-6



№	დასახელება List of items	განზომილების ერთეული UoM	რაოდენობა Q-ty
1	განაწილებელი ფარი, ჩაფლული, შემყვანზე ორპოლუსა ავტომატური ამომრთველით . სახახო ავტომატური ამომრთველებით Distribution shield with two-pole circuit-breaker, automatic opening circuit breaker	ცალი Pcs	6
2	საშტეფსელო როზეტი ორპოლუსა მესამე დამამიწებელი კონტაქტით 10ამპ Two-pole sock with the third grounding contact	ცალი Pcs	134
3	ამომრთველი ერთკლავიშიანი One key switch	ცალი Pcs	32
4	ამომრთველი ორკლავიშიანი Two key switch	ცალი Pcs	26
5	ოთახის სანათი მოწყობილობა (ლედ 18ვტ) Lighting fixture of the room (LED 1 Wt)	ცალი Pcs	92
6	ტენგამძლე კედლის ბრა (ლედ 18ვტ) Moisture resisant lightning fixture (LED 1 Wt)	ცალი Pcs	9
7	ტენგამძლე სანათი მოწყობილობა (ლედ 18ვტ) Moisture resistant wall-mounted lighting fixture (LED 1 Wt)	ცალი Pcs	27
8	კაბელი სპილენძის ორმაგი Copper cable double insulated იზოლაციითკვეთი3X1,5კვ.მმ Crossection 3x1,5 mm2	მეტრი m	780
9	კაბელი სპილენძის ორმაგი Copper cable double insulated იზოლაციითკვეთი3X2,5კვ.მმ Crossection 3x1,5 mm2	მეტრი m	980
10	შემომყვანი კაბელისპილენძის ორმაგი იზოლაციით კვეთი 3X6კვ.მმ Incoming copper cable double insulated, crossection 3X6mm2	მეტრი m	300
11	განაწილებელიკოლოფი Distributor box	ცალი Pcs	180

სპეციფიკაცია
Specification

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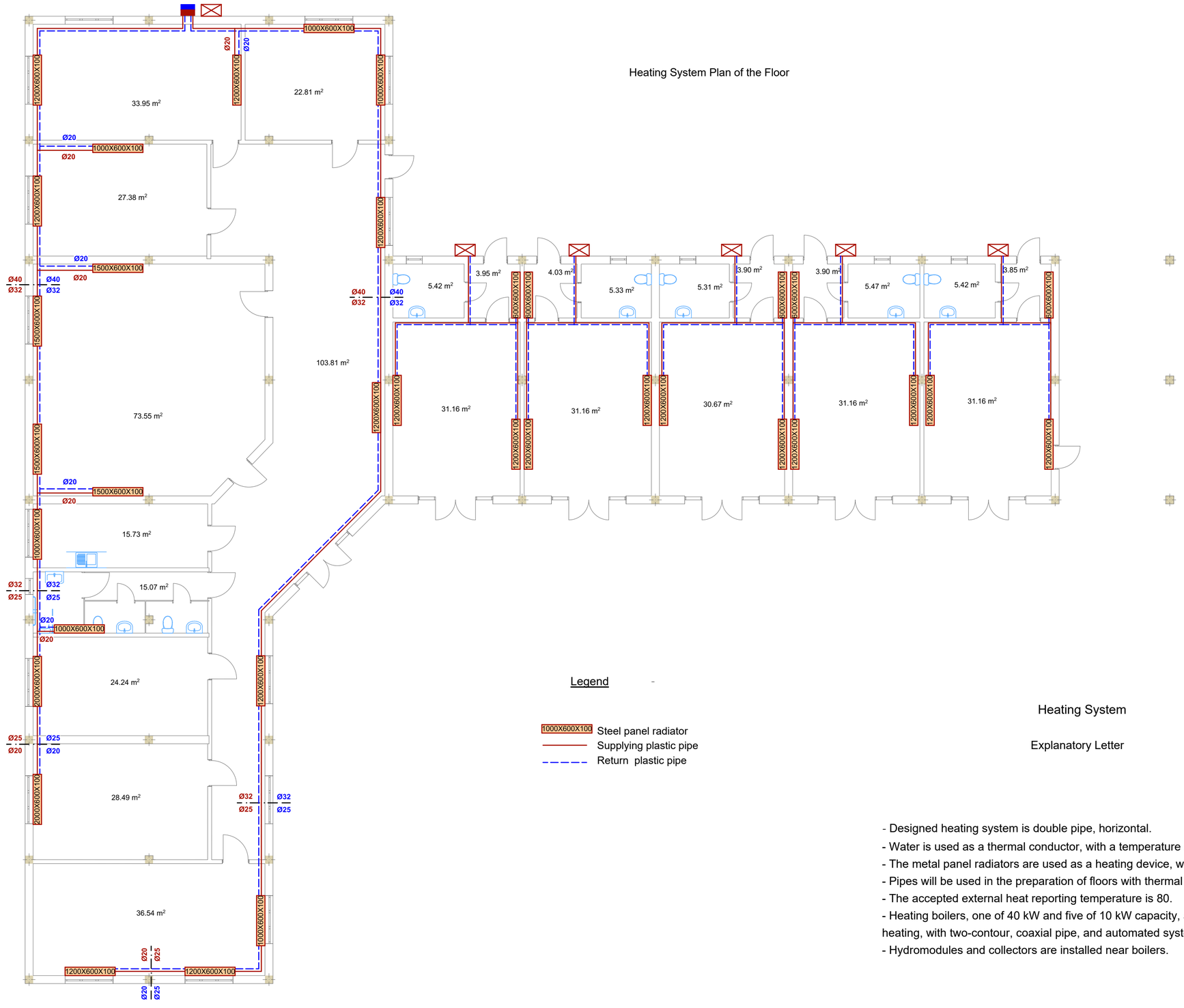
მთავარი განაწილებელი ფარების პრინციპიალური სქემები

Format A - 2



Heating System Plan of the Floor

Legend

1000X600X100 Steel panel radiator
Supplying plastic pipe
Return plastic pipe

Heating System

Explanatory Letter

- Designed heating system is double pipe, horizontal.
- Water is used as a thermal conductor, with a temperature of 65-500 C.
- The metal panel radiators are used as a heating device, with height 600 mm
- Pipes will be used in the preparation of floors with thermal insulation coating.
- The accepted external heat reporting temperature is 80.
- Heating boilers, one of 40 kW and five of 10 kW capacity, are selected for heating, with two-contour, coaxial pipe, and automated system.
- Hydromodules and collectors are installed near boilers.

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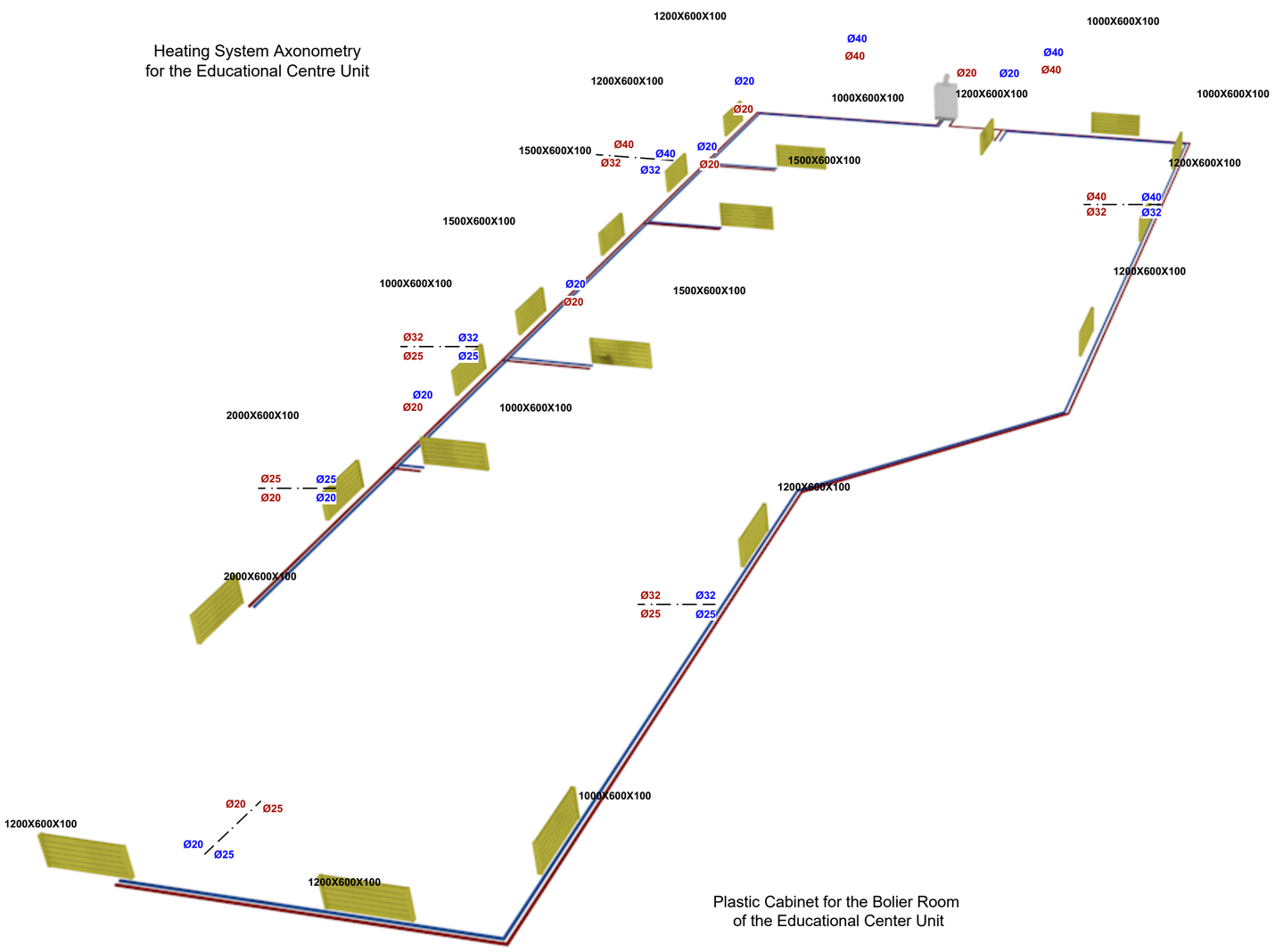
სათაური:

Format A - 2

Page	Pages
28	30

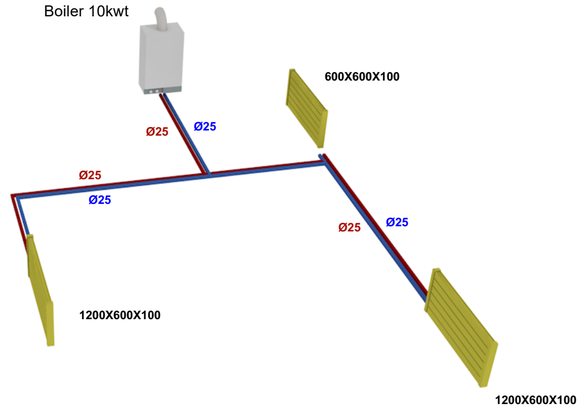
Heating System Axonometry for the Educational Centre Unit

Boiler 40kWt

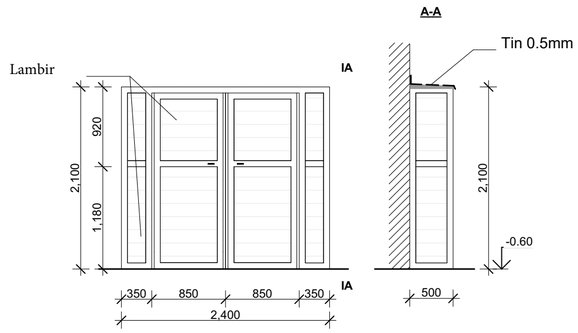


Heating System Axonometry for the Educational Centre Unit

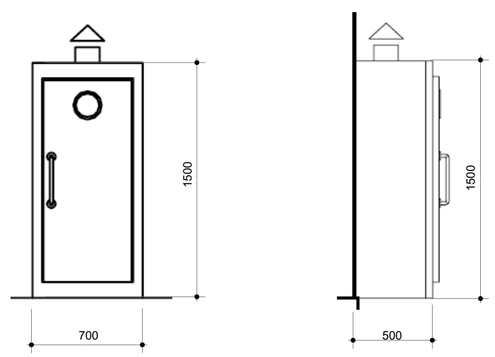
Boiler 10kwt



Plastic Cabinet for the Bolier Room of the Educational Center Unit



Metal Cabinet for the Bolier Room of the Educational Center Unit



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გათბობის სისტემის აქსონომეტრიული სქემა

ფორმატი Format A - 2

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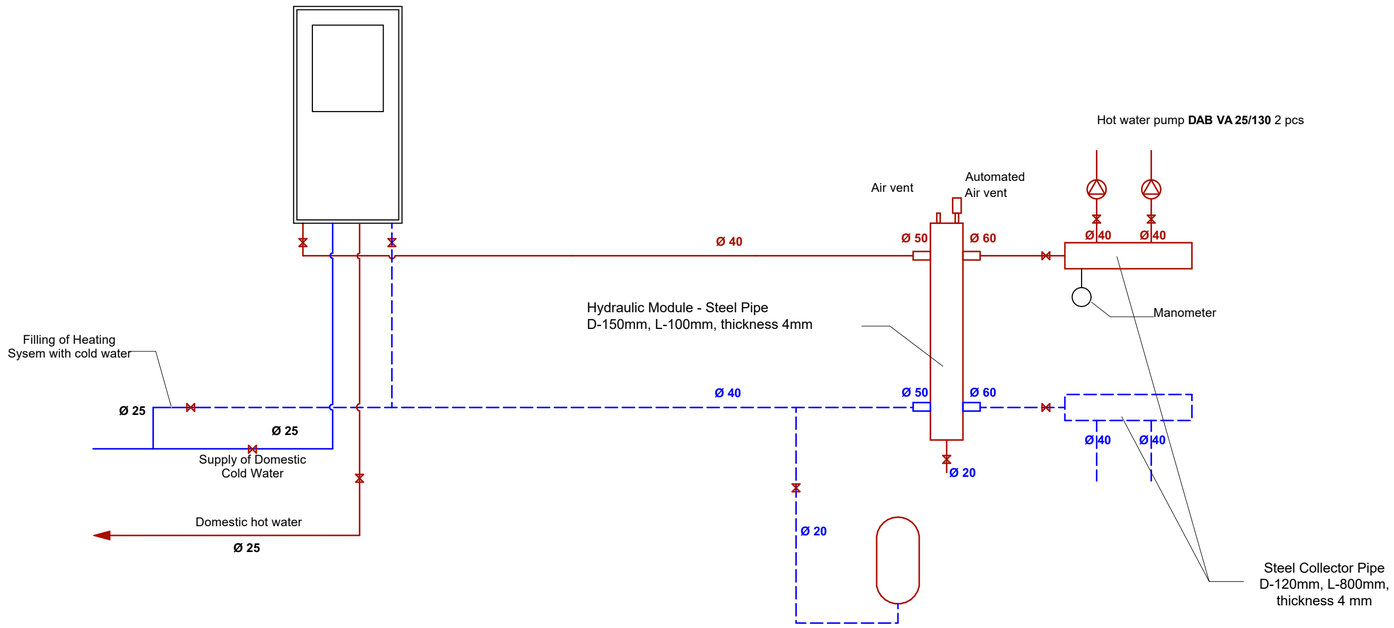
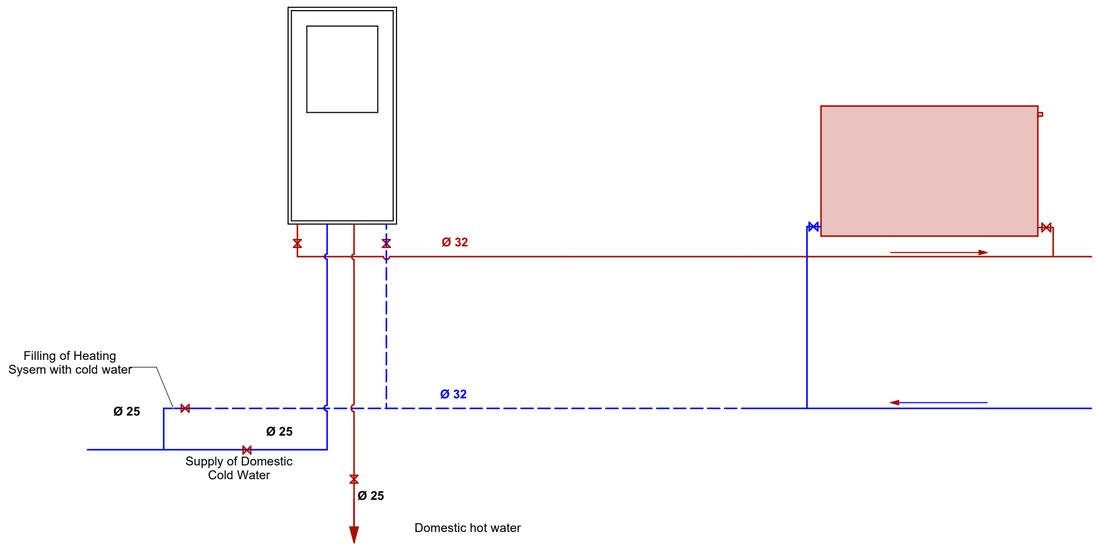
Gas boiler with closed chamber (40 kW) double circuit

Principal Plan of Heating System for Educational Centre Unit

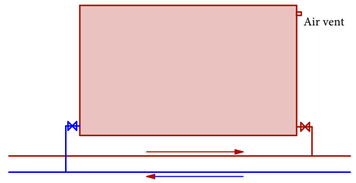


Gas boiler with closed chamber (10 kW) double circuit

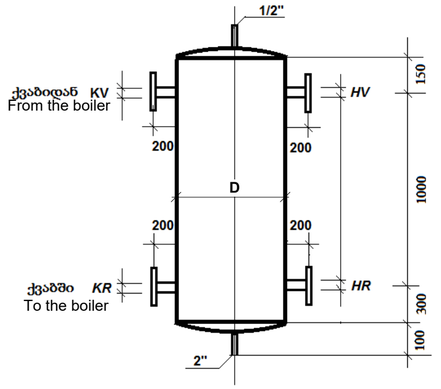
Principal Plan of the Heating System for the Commercial Units



Plan of Connecting of Panel Radiator



Hydromodule



kg/h	D	KV	KR	HV	HR
8000	150	50	50	65	65

Specification

List of Item	UoM	Q-ty
Gas boiler (40 kW) double circuit with coaxial pipe	set	1
Gas boiler (10 kW) double circuit with coaxial pipe	set	5
Extending Water Tank (50 Lt)	set	1
Locking valve 40mm	pcs	8
Safety valve 3.0 atm	pcs	6
Metal pipe 150mm for collectors	meter	2
Hydromodule	pcs	1
Hating circulation pump DAB VA 25/130	pcs	2
Automated air vent	pcs	6
Plastic pipe insulated with fiberglass 40mm	meter	120
Plastic pipe insulated with fiberglass 32mm	meter	110
Plastic pipe insulated with fiberglass 25mm	meter	95
Plastic pipe insulated with fiberglass 20mm	meter	65
fittings 60% of pipe costmilebis Rirebulebis 60%		
Steel panel radiators 600X600X100	pcs	5
Steel panel radiators 1000X600X100	pcs	6
Steel panel radiators1200X600X100	pcs	18
Steel panel radiators 1500X600X100	pcs	4
Steel panel radiators 2000X600X100	pcs	2
Radiator valve on supplying pipe	pcs	35
Radiator valve on return pipe	pcs	35

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ფორმატი Format	A - 2

ფურცელი Page	ფურცლები Pages
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