DANISH REFUGEE COUNCIL

Architectural Project

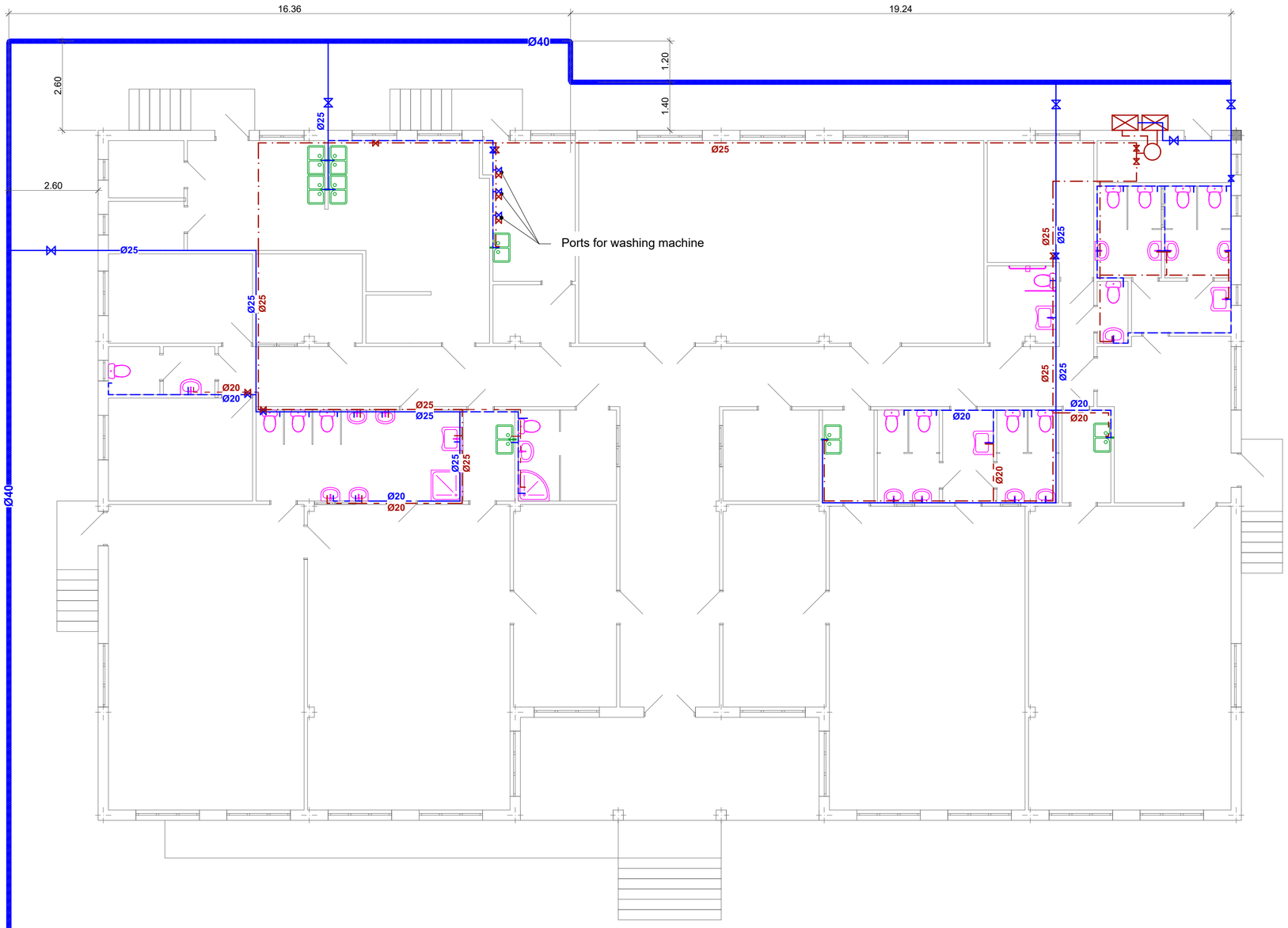
Typical Kindergarten

Plumbing, Electrical Engineering, Heating, and

Fire Alarm Systems of the Project

2020

Plan of Water Suppy System



Cold water pipe of 40 mm D
Cold water pipe of 25 mm D
Cold water pipe of 20 mm D

Hot water pipe of 25 mm D
Hot water pipe of 20 mm D
Double contour heating boiler
Valve
Hot water receiver

Note:
A separate valve (20 mm) will be installed on all toilet bowls.

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 consumption of the three groups of the garden, the kitchen and the staff at different points in the garden is 3.4 m3/h.
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 service hot water supply of the building is provided by twocircuit heating boilers, creating a stable supply in the receiver.

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 manholes can be replaced by assembled structures.

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Plan of Water Supply System

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ა. გერგედავა
A. Gergedava

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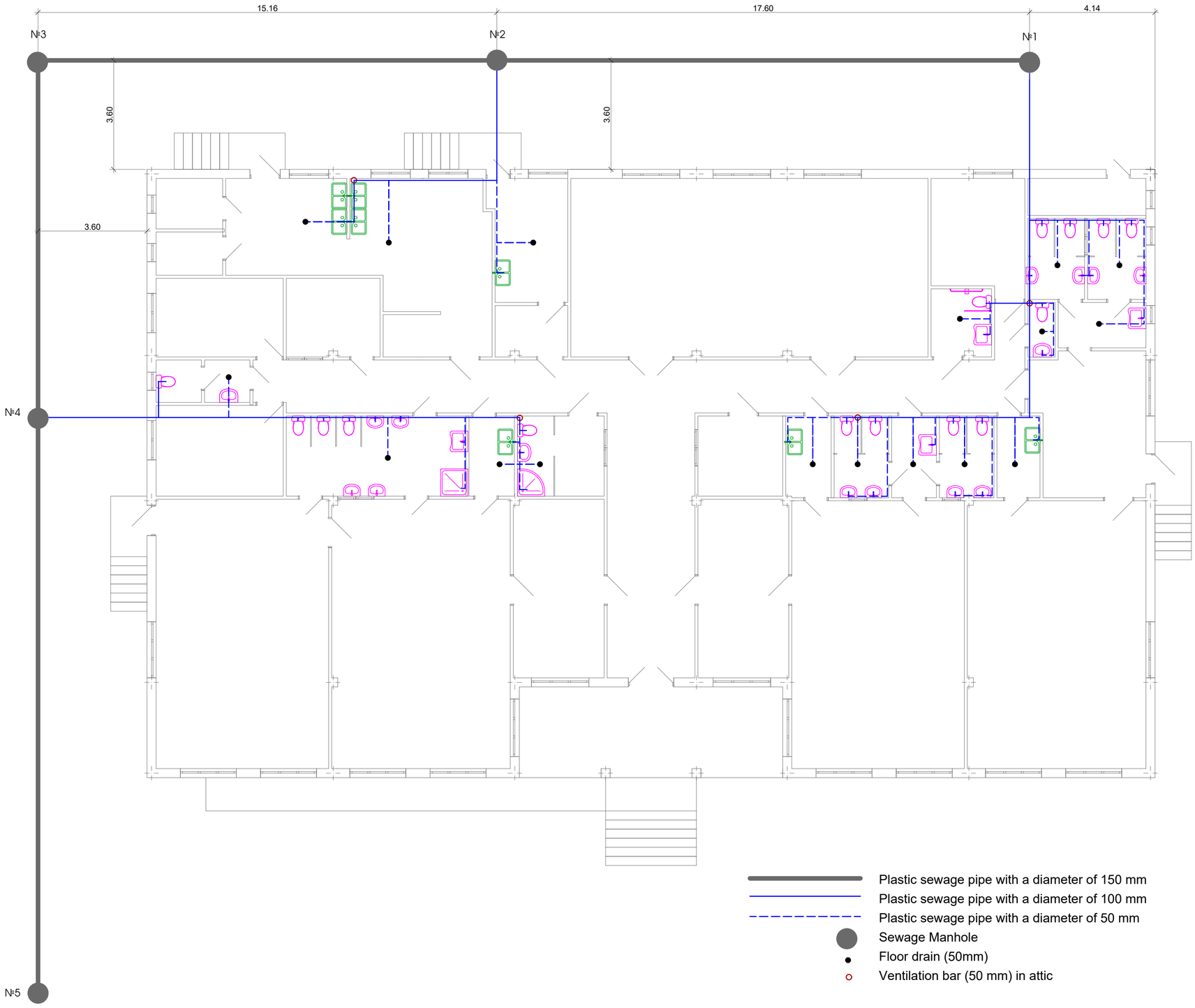
Sewage System Plan



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Plan of Sewage Sysytem

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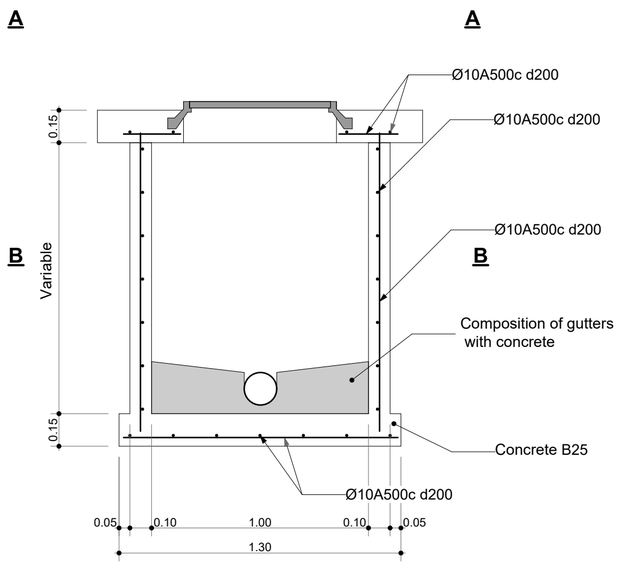
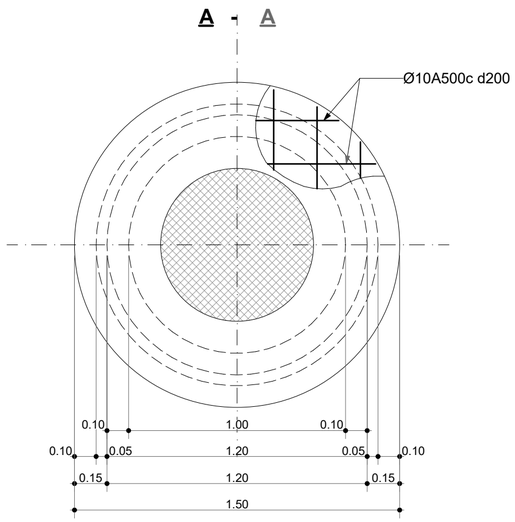
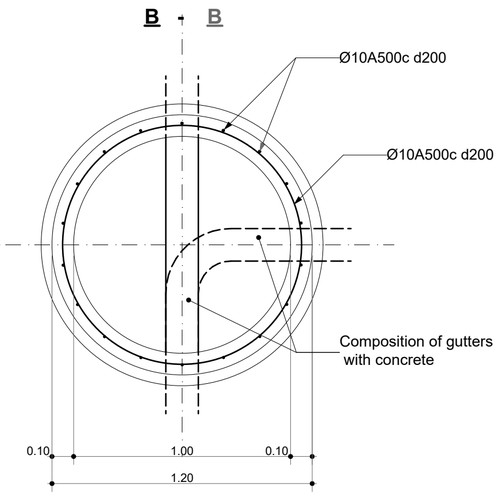
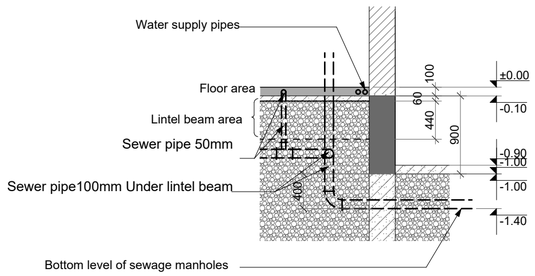
Sewage Manhole







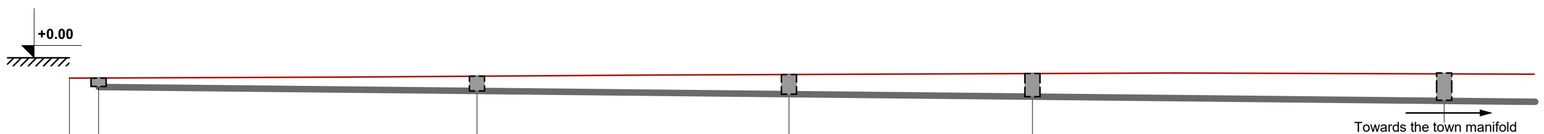
Location of pipes in floor cross section



Specificaton

Water Supply List	UoM	Q-ty
Wash stand	Set	7
Children's wash stand	Set	12
Wash stand with accessories for disabled	Set	1
Kitchen double-sink	Set	8
Wash stand mixer	Set	19
Mixer of Wash stand for disabled	Set	1
Mixer of Kitchen double-sink	Set	8
Children's Toilet bowl	Set	11
Toilet bowl	Set	3
Toilet bowl with accessories for disabled	Set	1
Shower tray 90x90	Set	2
Shower mixer	Set	2
Plastic hot water pipe with fiberglass 25 mm	Meter	105
Plastic hot water pipe with fiberglass 20 mm	Meter	40
Plastic cold water pipe 25 mm	Meter	134
Plastic cold water pipe 20mm	Meter	84
Plastic cold water pipe 40mm	Meter	120
Valve 40	pcs	1
Valve 25	pcs	8
Valve 20	pcs	30
Fittings, 60% of pipe cost		
Sewage		
50mm thick plastic sewer pipe	Meter	104
100mm thick plastic sewer pipe	Meter	95
150m thick plastic sewer pipe	Meter	110
Stainless steel floor drainage 50 mm	pcs	17
Sewage manhole	set	5
Fittings, 60% of pipe cost		

Longitudinal Profile of Sewage Collector



Bottom mark of pipe	21.60 (-1.70)	21.40 (-1.90)	21.25 (-2.05)	21.10 (-2.20)	20.90 (-2.40)
Centre-line ground elevation	21.95	21.75	21.80	21.90	22.05
Design elevation of the manhole cover	22.20	22.15	22.10	22.20	22.25
Manhole depth in cm	60	75	85	110	130
Diameter of pipe in mm	150	150	150	150	
slope	i=0.01	40.5	i=0.01		
distance	18.4	15.1	11.8	20.0	
Marking point	manhole #1	manhole #2	Manhole #3	Manhole #4	Manhole #5

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Longitudinal Profile of Sewage Collector., Axonometry plans, specification

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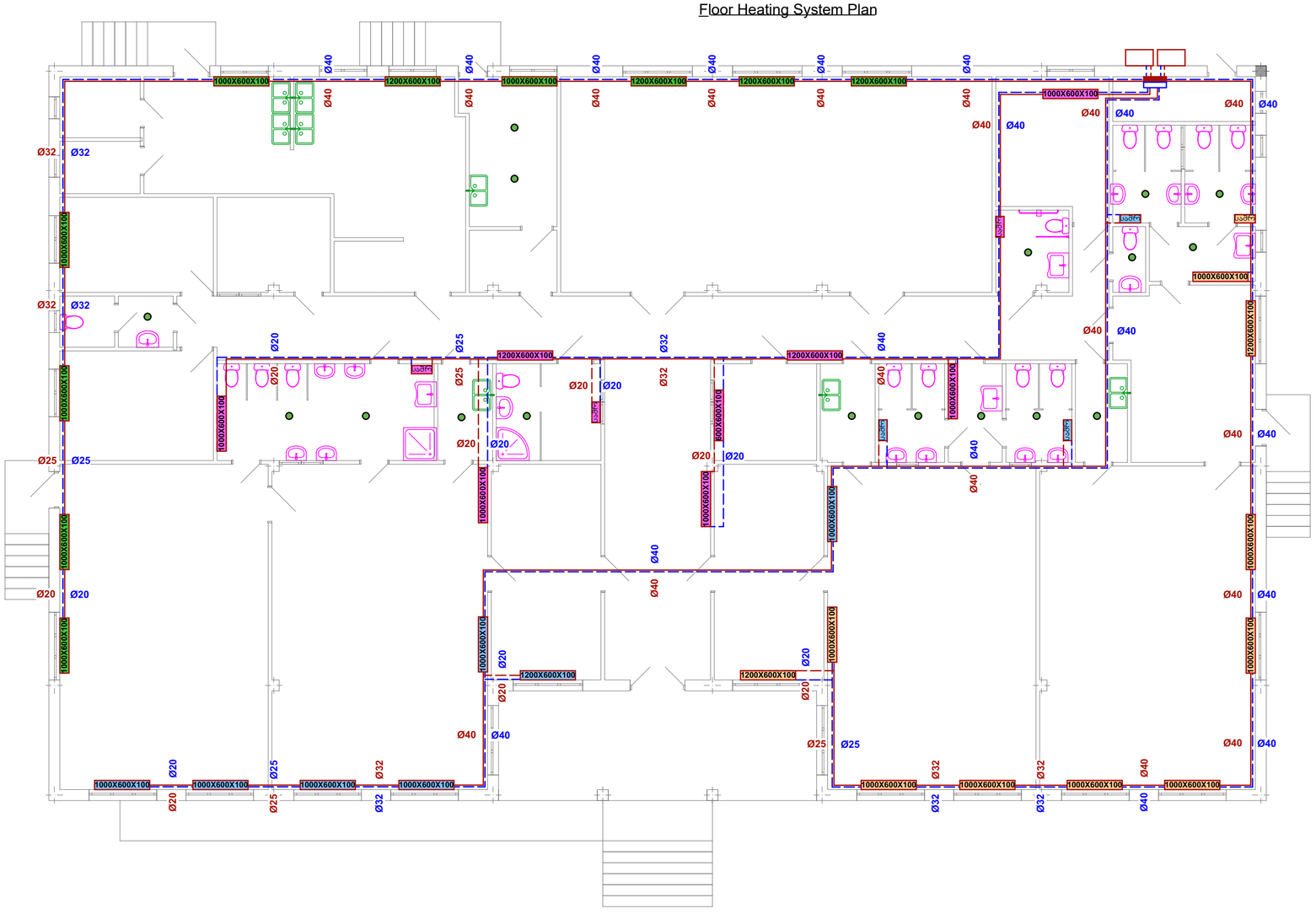
Floor Heating System Plan



Heating System

Explanatory Letter

-The designed heating system is double-pipe, horizontal. -The heat conductor is water. With a temperature of 65-50C. - Metal panel radiators are used as heating device, 600 mm height

- Pipes will be installed while floor preparation with insulation.
- External heat reporting temperature accepted - 80.
- Heating boilers, 40 kW -1 and 10 kW 5, are selected for heating. Double-contour with coaxial smoke pipe and automation.
- Hydro models and manifolds are installed with boilers.

Legends:

- 1000X600X100 — Steel panel radiator
- სამრ — Steel drier
- Plastic inlet pipe
- Plastic return pipe
- Double contour heating boiler
- Manifolds
- Fan (for 100 mm pipe)

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Plan of Heating System of the Floor

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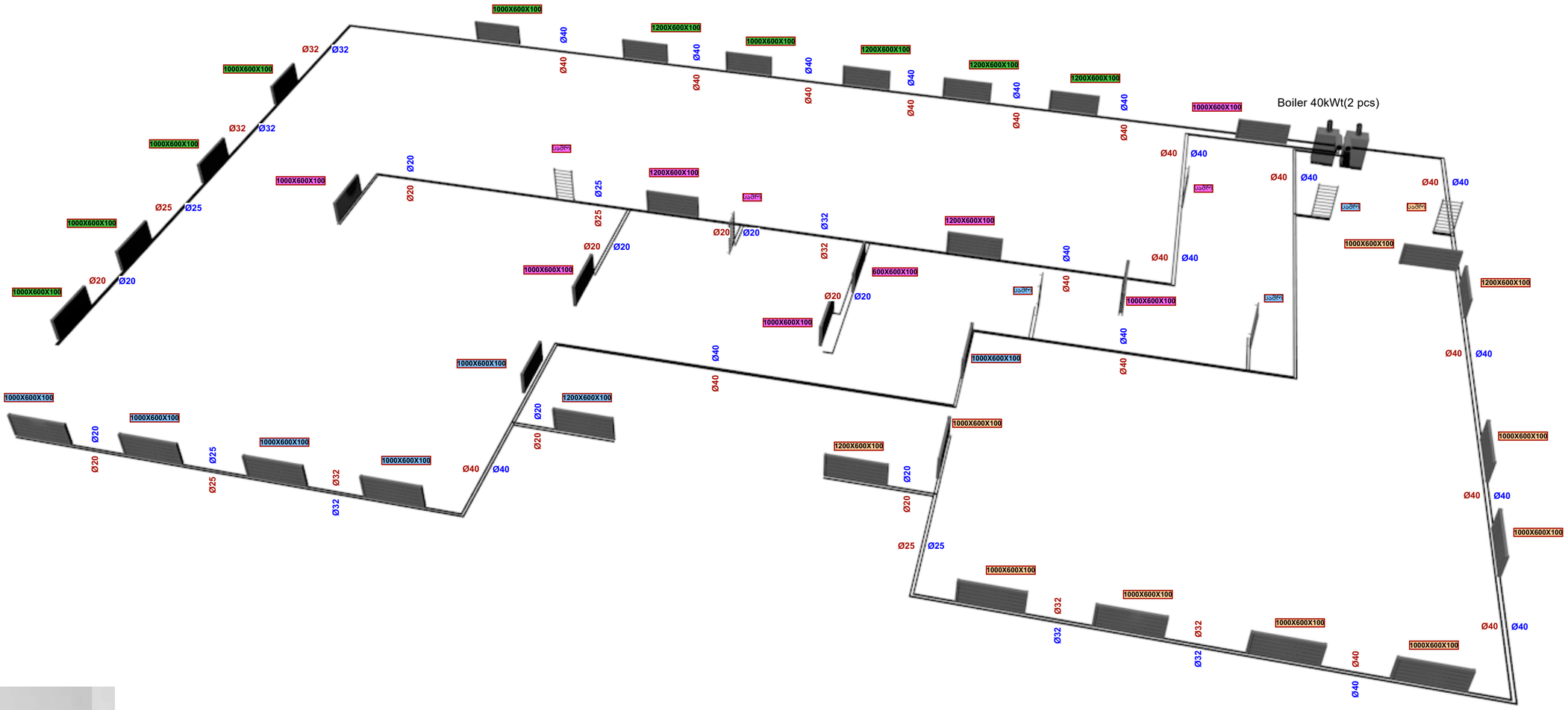
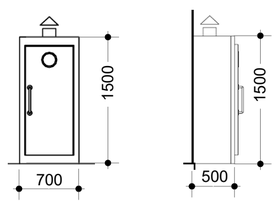
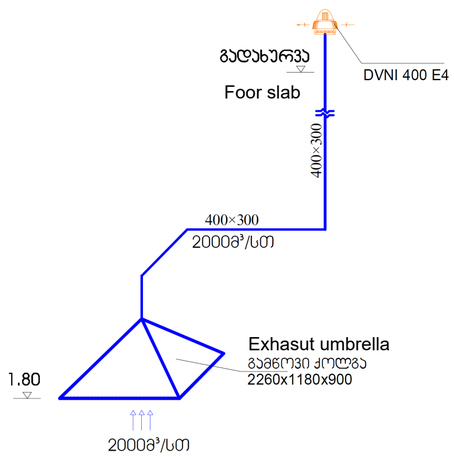
Axonometric diagram of the heating system



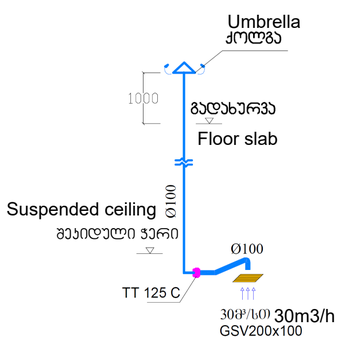
Steel Wall Box fo Heating Boiler



Kitchen ventilation scheme



Sanitary Units Ventilation Scheme



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Typical Kindergarten

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Axonometric Plan of Heating System

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A. Gergedava

ა. ქანთარ

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Page	Pages
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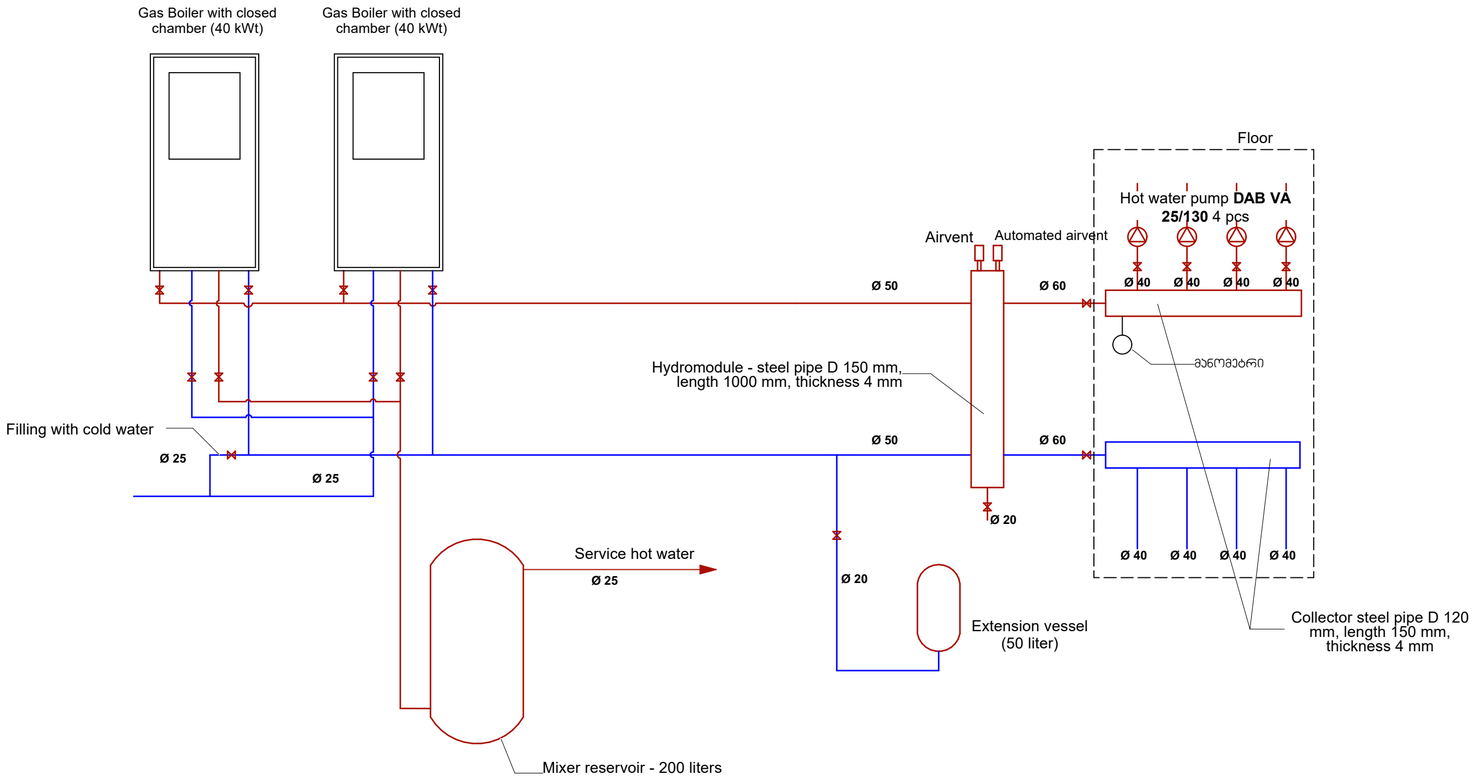
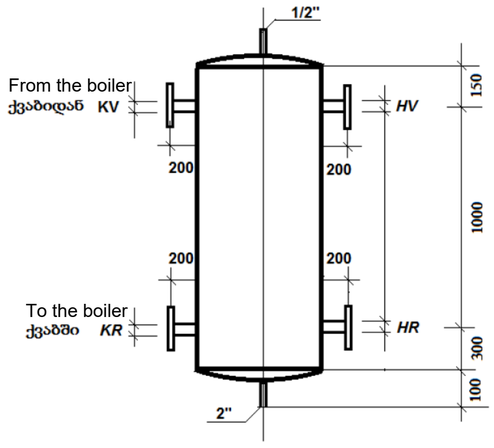
Principal PLan of the Heating System



Panel radiator connection diagram

Hydromodule
ჰიდრომოდული



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

Specification

List	UoM	Q-ty
Gas boiler (40 kW) double circuit with coaxial pipe	Set	2
Extension vessel (50 liter)	Set	1
Locking valve 40mm	Pcs	8
Safety valve 3.0 atm	Pcs	2
Metal pipe 150mm for collectors	meter	2
Hydromodule 1	Pcs	1
Heating circulation pump DAB VA 25/130	Pcs	4
Automated air vent	Pcs	2
Plastic pipe insulated with fiberglass 40mm	meter	205
Plastic pipe insulated with fiberglass 32mm	meter	138
Plastic pipe insulated with fiberglass 25mm	meter	115
Plastic pipe insulated with fiberglass 20mm	meter	52
fittings 60% of pipe cost		
Steel panel radiators 600X600X100	Pcs	1
Steel panel radiators 1000X600X100	Pcs	23
Steel panel radiators1200X600X100	Pcs	9
Bathroom drier 1200 mm	Pcs	7
Radiator valve on supplying (inlet) pipe	Pcs	42
Radiator ale on return pipe	Pcs	42
Mixer reservoir 200 liter	Pcs	1

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Principal Plan of Heating System

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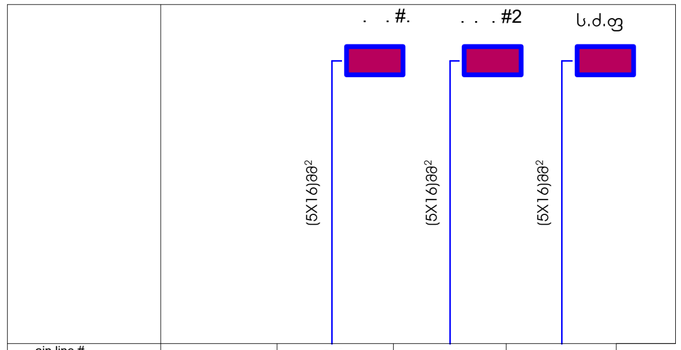
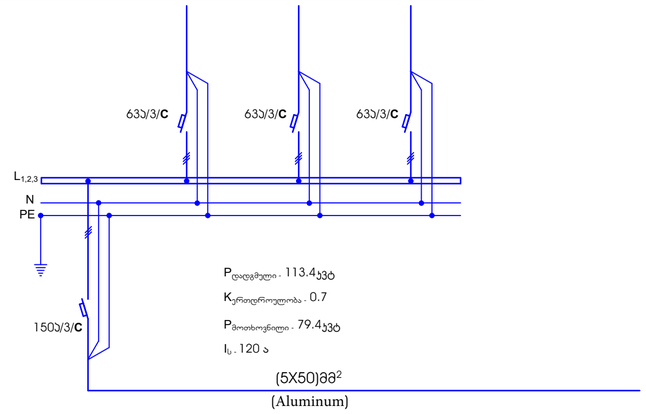
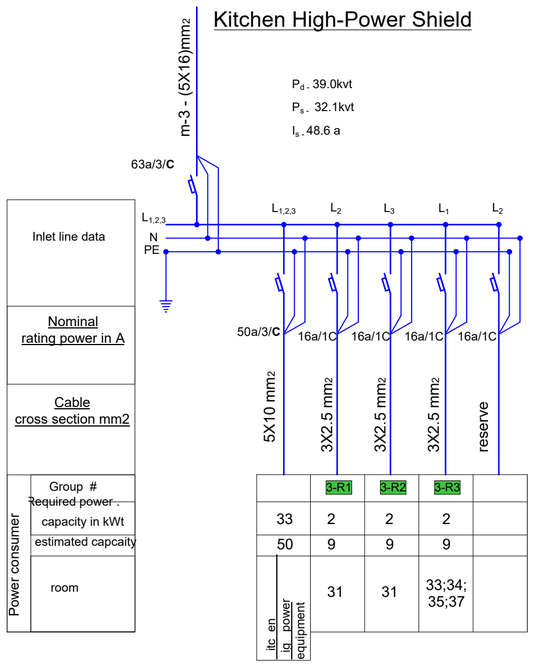
Inlet distribution shield



ain line #		L-1	L-2	L-3
otal capacity in kWt		39.0	35.4	39.0
Calculated capacity in kWt		32.5	29.7	32.1
Calculated oltage in A		49.2	45	48.6
engt in m		12	18	24



Kitchen High-Power Shield



Inlet line data					
Nominal rating power in A					
Cable cross section mm2					
Power consumer	Group #	3-R1	3-R2	3-R3	
	Required power . capacity in kWt	33	2	2	2	
	estimated capcaity	50	9	9	9	
	room	light power equipment	31	31	33;34; 35;37	

Electric-Engineering Part

Explanatory Letter

The electrical and technical part of the project of this building is based on the architectural, structural, water supply and sewage parts of the same project. -In terms of reliability of energy supply, the object belongs to category III.

- Voltage parameters: voltage 400/230 V - Frequency 50 H - Maximum permissible voltage drop 5% (2.5% on incoming cable, 2.5% on the project site) Grid (L1, L2, L3, N, PE) The electricity of the building is supplied from the existing network. In order to receive and distribute electricity, there is a distribution shield in the corridor of the building, from where the electricity is supplied to the distribution shields and accordingly to all the units of the building, a separate shield is designed for the supply of kitchen power network.

-Electricity metering is done by a three-phase active power meter, the location of which is determined in agreement with the local electricity service.

- LED bulbs are used for lighting. The height of the installation of plugs for children is 1.8m above the floor.

The entire electricity network is made of a non-halogen copper cable, with double insulation that will be installed on the ceiling and under the plaster of the walls. Under the ceiling and on the ceiling, the cables and wires shall each be inserted separately into plastic pipes, where, in case of need, the appropriate channels will be cut in the walls.

-In the absence of a TN-S network, the system must be adjusted to TN-C-S- It is planned to ground the main distribution shield. Grounding resistance should not exceed 4 warps at any time of the year. - Installation works must be carried out in full compliance with the rules of arrangement of electrical installations.

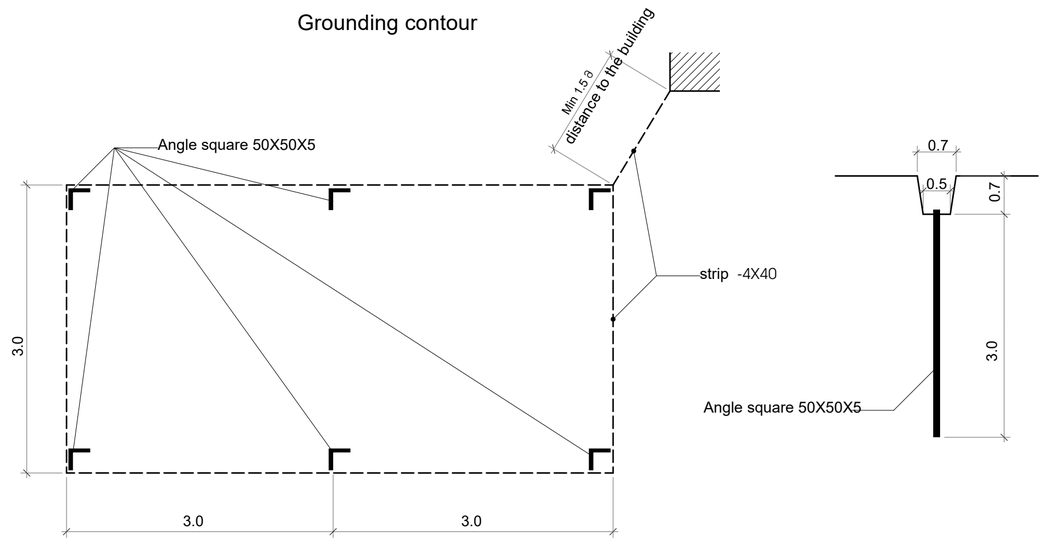
- The calculation of the illumination network envisages the possibility of replacing the incandescent bulbs in the network.

- The calculation of the lighting network envisages the possibility of replacing the incandescent bulbs in the network.

Specification

#	List	UoM	Q-ty
1	Inlet-Distribution box,IP rating 43 automatic opening circuit breaker: inlet 150A/3-1 pcs outlet groups - 63 A/3- pcs	set	1
2	Electric distribution box (for lighting) IP rating 30, automatic circuit breaker: inlet 63 A/1- pcs outlet groups - 16A/1-12 pcs, 10A/1-12 pcs	set	2
3	Kitchen high-power shield, IP rating 30 automatic opening circuit breaker : inlet 63A/3-1 pcs, outlet groups 50A/3-1 pcs? 16 A/3-4 pcs	set	1
4	Two-pole outlet socket with the third grounding circuit 10Amp	pcs	38
5	One-pole outlet socket with the third grounding circuit 10Amp	pcs	26
6	One-pole outlet socket air-tight with the third grounding circuit 10Amp	pcs	16
7	One-pole outlet socket for AC , with the third grounding circuit 16Amp	pcs	9
8	Distribution box	pcs	84
9	One-key switch	pcs	10
10	One-key switch, air-tight	pcs	10
11	Two-key switch	pcs	12
12	Two-key switch, air-tight	pcs	17
13	Lighting fixture for room LED 18 W	pcs	94
14	Spot Lighting fixture for room LED 18 W	pcs	34
15	Spot Lighting fixture for room LED 18 W	pcs	29
16	Copper cable with double insulation , cross section 3X1.5 m2	meter	1410
17	Copper cable with double insulation , cross section 3X2.5 m2	meter	1510
18	Inlet copper cable with double insulation, cross section 5X35 m2	meter	60
19	Inlet copper cable with double insulation, cross section 5X16 m2	meter	49

Grounding contour



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Typical Kindergarten

Project address:

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Principal Plans of Shields

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ა . ფხაკაძე

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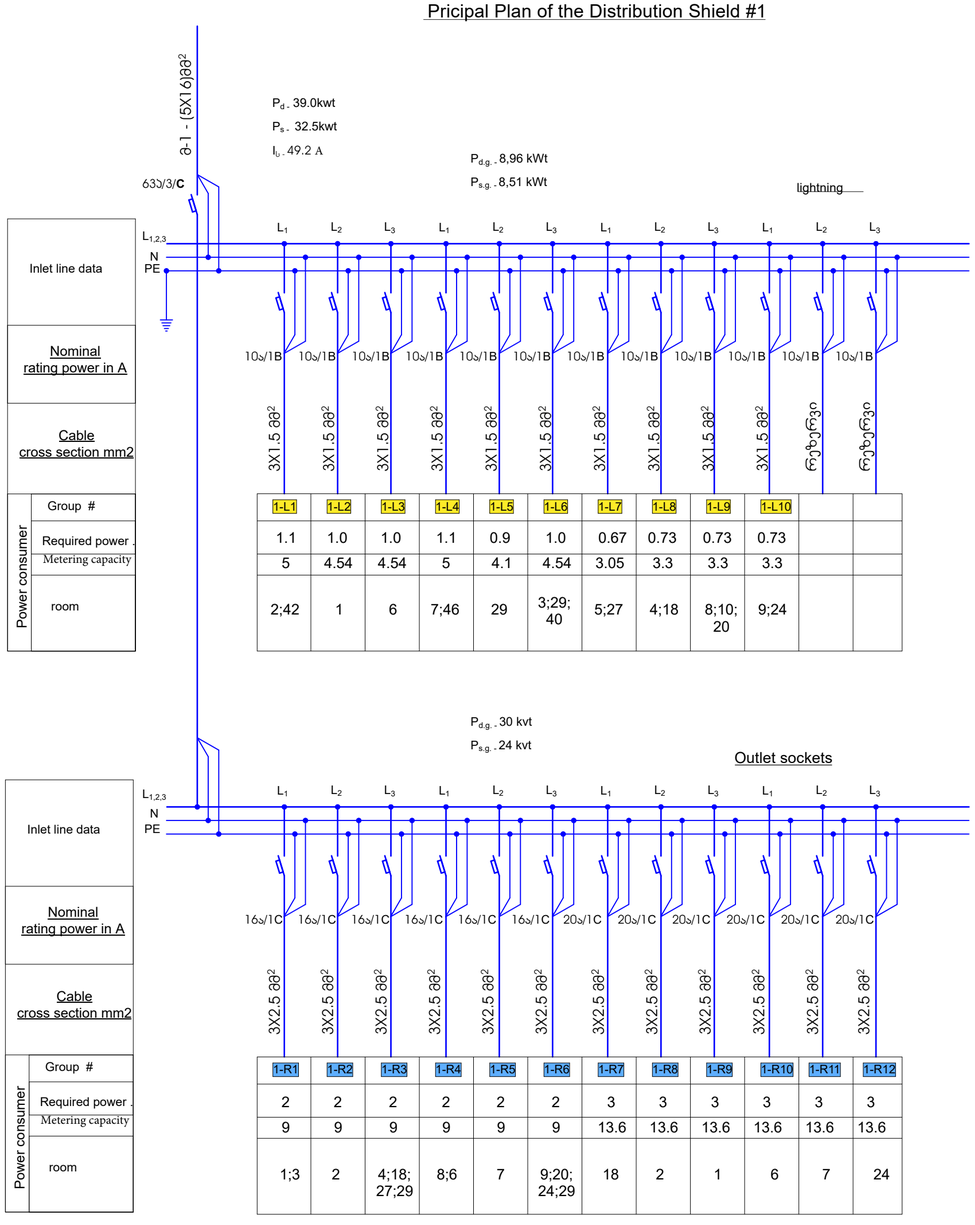
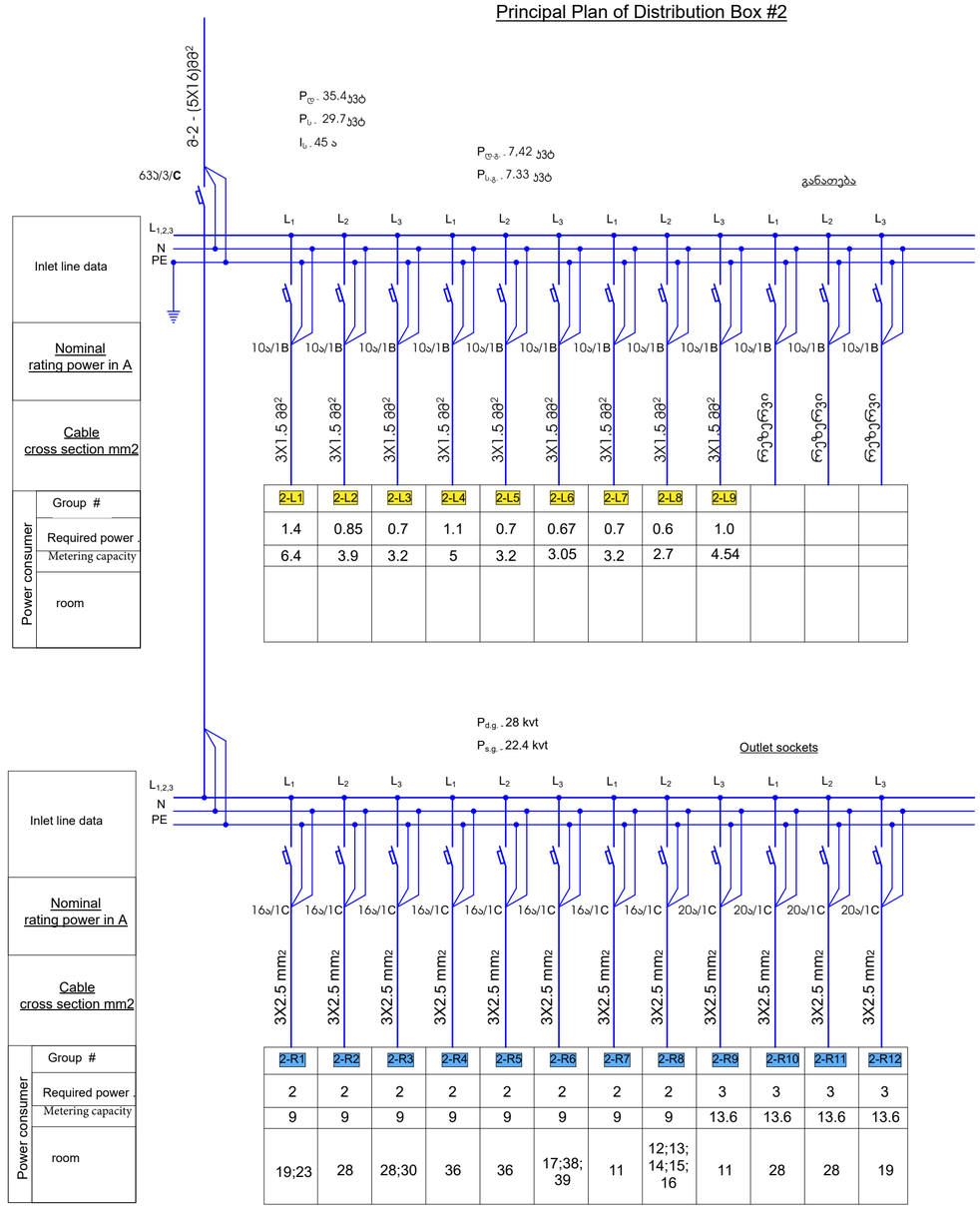
Pricipal Plan of the Distribution Shield #1



Principal Plan of Distribution Box #2



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Principal Plans of Distribution Shields

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DANISH REFUGEE COUNCIL

Plan of Electric lighting System

Legend:

- Inlet distribution shield
- Distribution shield
- Two-pole socket
- One-pole socket
- Air-tight plug socket
- Fan (for 100 mm pipe)
- Cooper cable 3X1.5mm^2
- 1-L1 — Separate group of lighting network
- Two-pole circuit breaker
- Two-pole circuit breaker air-tight
- One-pole circuit breaker
- One-pole circuit breaker air-tight
- LED lighting fixture for ceiling
- Spot lighting fixture for ceiling
- LED lighting fixture air-tight
- Exit sign

Typical Kindergarten

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Plan of electric lighting network of the floor

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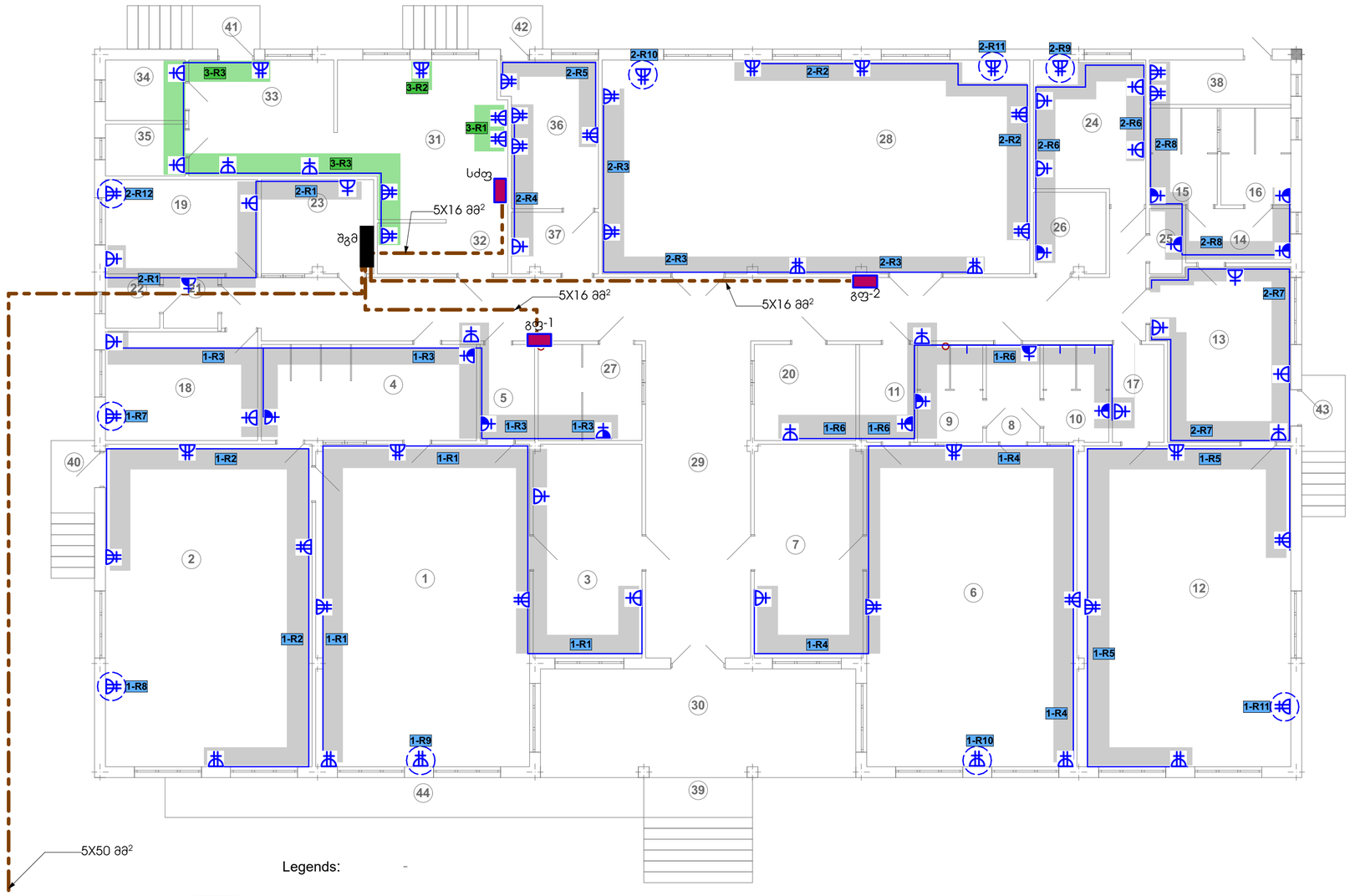
Power Supply Plan of High-Power System



Legends:

- Inlet distribution shield
- Distribution shield
- Two-pole outlet socket
- Two-pole outlet socket for AC
- One-pole outlet socket
- Air-tight plug outlet socket
- Fan (for 100 mm pipe)
- Copper cable 3X1.5mm²
- 1-R1 — Separate groups of high-power network

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Power Supply Plan of High Power System

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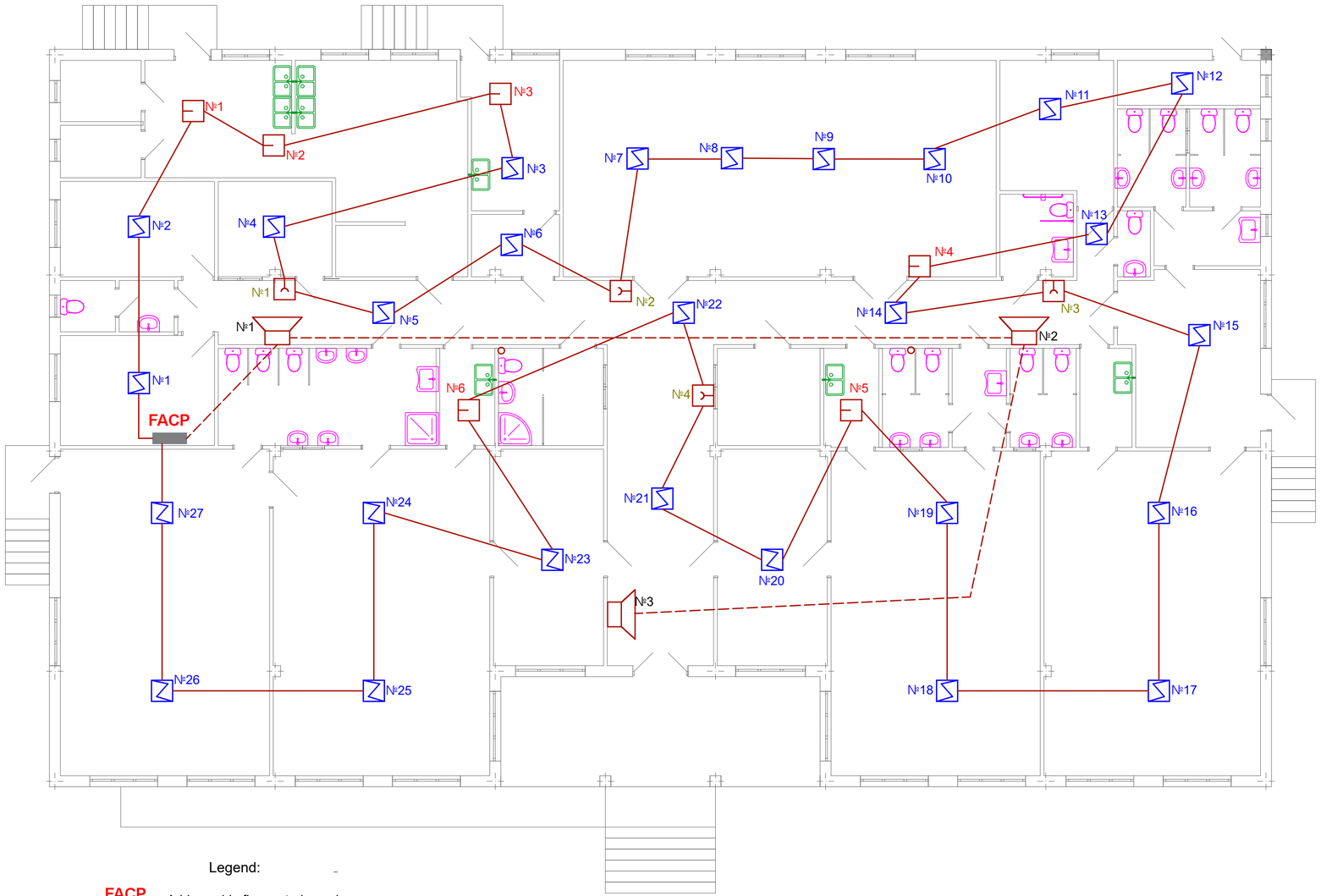
Fire Alarm System Plan



Legend:

FACP	Addressable fire contorl panel
	Addressable optic moke detector
	Addressable thermal detector
	Addresable alarm button
	Addressable alarm

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Paln of Fire Alarm System

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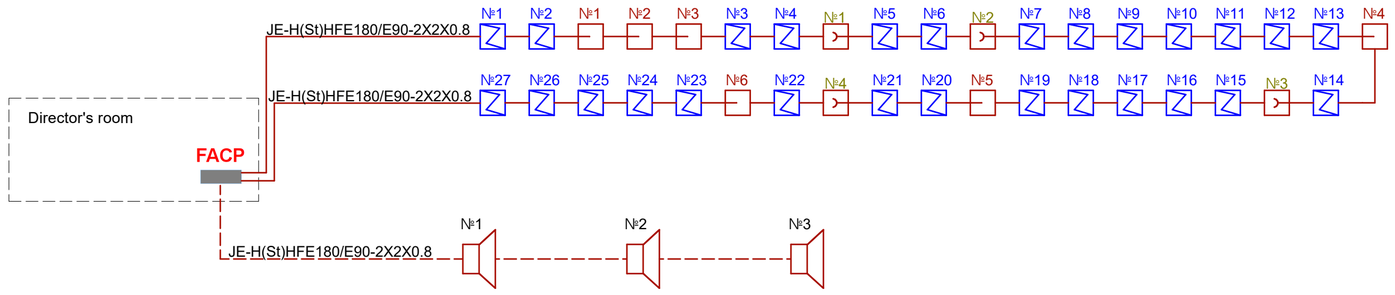
Fire Alarm System

The fire alarm control panel must be installed on the ground floor level in the director's room. The project provides an addressable fire alarm system, the network of which is organized by a circular topology.
The fire extinguisher cable is built with a 2x2x0.8 mm 2 type fire proof cable and must be connected directly to the fire alarm panel. Fire alarm, smoke, or combined fire detectors must be of the addressable type. Heat, smoke, or combined transmitters are be installed on the ceiling's geometric center (in the case of one broadcaster) or on a ceiling of an equally distributed control area.
Appropriate installation and schematic drawings are attached to the project. Alarm buttons are installed at all exits, at 1.8 m height from the floor. A fire alarm shall be mounted 0.3 m from the ceiling and shall give an alarm of not less than 100 dB / m 2. Schematic drawing and design drawings of fire detectors, hand fire detectors and alarms are attached to the project.

Structural Diagram of the Fire Alarm System



Fire Alarm System			
1	Fire proof cable JE-(St) H FE 180/E90 - 2X1X0.8	m	320
2	Addressble one loup fire control panel	set	1
3	Addressable smoke optic detector	pcs	27
4	Addressable thermal detector	pcs	6
5	Universal addressable base	pcs	33
6	Addressable alarm button	pcs	4
7	Addressable alarm	pcs	3
8	Power supply unit	pcs	1

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Structural Plan of Fire Alarm System

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