

Explanatory note for arrangement of electrical network

This project is developed on the basis of floor plan drawings, and in accordance with client requirements, codes and regulations of designing - Construction Codes and Regulations SNiP 23-0595, SNiP 31-110-2003, Regulations for Arrangement of Eectrical Installations PUE &6.1, Instruction for Electrical Supply of Industrial Facilities CN 357-77, Codes of Natural and Artificial Illumination SNiP 3.05.06-85, and other regulatory documents;

The presented project envisages arrangement of electrical network of the kindergarten for 75 children of various municipalities;

In terms of the reliability of power supply, the facility belongs to Category II.

Network voltage is 400 / 230 V, frequency - 50 Hz.

According to the calculation, the total requested capacity of the facility is 30.11 kW.

- Electrical power supply, parameters of feeding cable, route and wiring method, and arrangement of measure unit is performed in accordance with the technical specifications issued by a power supplier company.

Calculation of loads and power distribution for the facility are presented in the project. The lighting specs sheet is composed according to the "Code of Designing an Electrical Lighting" (chapter 1, table 5-38).

For the indoor power supply of the facility, the following is envisaged:

- A main incoming and distribution board is to be installed in the stairwell, mounted on the wall, installation height - 1.0 m, with incoming three-phase 3P 50 A automatic circuit breaker; the main distribution board is to be equipped with three-phase and single-phase automatic breakers and differential breakers according to the switch wiring diagram;

- An incoming 3P 63 A three-phase automatic circuit breaker is to be installed in the main distribution board, from which the DB-1 unit is fed by means of copper conductor cable N2XH-5x16 mm2, which is to be installed at the existing main distribution board; in the main distribution board (MDB), in all three outgoing lines, which feed floor distribution boards, 3 units of 3P 100 A three-phase protective differential breaker must be added (protective cutout device), which will ensure protection of electrical network and human safety, by isolation of contacts with differential breaker switch-off during a short circuit or current leakage;

In addition, a voltage release device PH47/230 V is to be added in the diagram, which is activated by the contact from the fire alarm board and mechanically switches off the breaker in the case of fire;

This device disconnects the electrical network in the case of fire, except the distribution boards of pumping station and weak currents;

- Three-phase 3P 16 A automatic circuit breaker is envisaged in the MDB for elevator; feeding of elevator's electrical board is to be made with N2XH 5x6 mm2 section cable; the DB for elevator is located on the technical floor and is included in the complete equipment of the elevator;

- According to the plan, an incoming distribution board is to be installed in the building's corridor at the first (ground) floor, with installation height of 1.80 m from the floor. Electrical feed of this incoming DB is to be made by means of N2XH-5x6 and N2XH-5x4 mm2 section copper conductor cables; according to the electrical feeding network diagram, main cables are to be passed through 50 mm diameter PVC smooth duct;

- Electrical network is to be made with 5-conductor, 3-conductor cables, TN-S system, isolated neutral (N) and protective earth (PE) cables;

- For protection and distribution of the designed network, the incoming distribution board is to be equipped with incoming three-phase 3P 50 A and automatic breakers and differential breakers in accordance with switch wiring diagrams;

Copper conductor N2XH-3x2.5 mm2 and N2XH-3x1.5 mm2 cables are to be installed into the suspended ceiling in the corridor to be passed from the incoming DB to the junction boxes installed in a hidden way, under the plaster;

- Lighting fixtures complying with the lighting requirements of the international standard IEC 60598-2011 (CП 52.13330.2011) and climatic conditions (moderate and cold climate) must be chosen for lighting, with protection class no less than IP20; luminescent light fixtures are envisaged for lighting; illumination intensity in the administration and office rooms must be 200 lux, buffet - 300 lux, auxiliary premises, corridor and toilets - 150 lux;

- LED light fixtures with 24 W must be chosen for lighting of rooms and offices, and assembly hall, and for the corridor, stairwell, auxiliary premises and toilets - LED light fixtures with 15 W; switching of light fixtures is to be carried out by means of local light switches; electrical feeding from the installed distribution board;

In the toilet, an exhaust ventilator is to be installed along with a light fixture, switched by means of local light switch; wall light fixtures must be installed at height of 250 cm from the floor;

Ventilation is switched on-off in the kitchen and washing/ironing rooms by means of local light switch, capacity - 60 W;

Inside the building, copper conductor cables are chosen according to GOST 31565-2012 standard;

Lighting network is to be made from copper conductor cables with 3x1.5 mm2 section, in a hidden way, under plaster.

Hidden sockets with ground contact are envisaged in the project; socket network is to be made from copper conductor cables 3x2.5 mm2 section, in a hidden way, under plaster.

Installation height for sockets is 1.80 m from the floor. In the kitchen, the installation height is 1.20 m from the floor;

Installation height for sockets in the rooms of director, nurse and administration management is 0.90 m from the floor (according to PUE 6.6.30, 6.6.31).

The project envisages arrangement of emergency lighting, in accordance with GOST 55842-2013; ceiling LED light fixtures must be installed, 3W, with integrated battery for 5 hours of working mode (SNiP 23-05-95*), illumination intensity is 5 lux; electrical feeding of light fixtures is to be made from 1P 6 A automatic breaker, installed in the MDB, by means of N2XH-FE-3x1.5 mm2 section copper conductor cable;

For the emergency shutdown, 3 W lighting fixtures must be installed in the exit passages, with integrated battery for 5 hours of working, with the caption "EXIT".

Electrical feeding of the light fixtures is to be carried out from 1P 6 A automatic circuit breaker installed in the MDB, by means of N2XH-FE-3x1.5 mm2 section copper conductor cable;

Earthing of the main incoming and distribution board (MDB) is to be made by means of TN-S system.

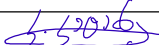
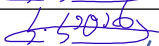
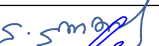
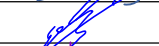
- An earthing network is to be arranged in the yard of the facility (according to GOST 121.030-81, GOST 30331.1-2013);

- Earthing network is to be made by placing vertical earth rods in the ground, at depth of 3 m. Vertical earth electrodes must head a diameter of 18 mm, their number is 4 pieces. The distance between the earth electrodes is 2 m. Horizontal earthing is to be made by means of 4x40 metal flat at depth of 0.7 m.

The allowed value of earthing contour resistance is 4 ohm. The resistance is to be measured in a laboratory way and earth electrodes must be added, if needed.

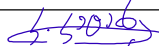
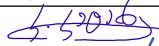
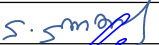
M6 screws are fixed on the earth flat, to which the earthing 16 mm2 copper conductor cable is to be connected, with a cable cap; the second end of the earthing cable with cable cap and M6 screw will be connected and fixed to the PE earthing bus by means of screw-nut connection; the connection must be protected from mechanical damage and corrosion, for which the place of connection must be treated with anti-corrosive compound bitumen; the connection belongs to II class (PUE T.1.7.139, GOST 10434). The explanatory note for lighting of the territory and its specifications are presented separately; 1P 6 A automatic circuit breaker is to be installed in the main distribution board for electrical feeding of lighting fixtures installed on the territory; electrical feeding is to be made by means of main aluminum conductor cable NAVY 3x4 mm2.The explanatory note for arranging an electrical network of the boiler room and its specifications are presented separately;The route with N2XH 5x4 mm2 grade and section cable is to be made from the MDB of the facility to the incoming DB of the boiler room; The cable must be passed through PVC tray with a diameter of 50 mm; Cable grade and section is chosen according to requested power, taking into consideration a long-term allowable amperage and voltage losses; voltage loss <5%, which is within the norm. The depth of cable laying is 700 mm in natural conditions. Sand (or sifted earth) cushion - 100 mm and sand (or sifted earth) cushion above - 100 mm; For protection from mechanical damage, along the route, a route indicating sign must be laid above the sand cushion; cable ends must be isolated with cable caps.

During the installation works, the Regulations for Arrangement of electrical installations and Safety Regulations must be followed.

PROJECT NAME:	CLIENT:	PLANNER:	POSITION	NAME	SIGNATURE	DRAWING NAME	STAGE	FORMAT	SHEET #
DESIGN AND ESTIMATE DOCUMENTATION FOR CONSTRUCTION OF THE KINDERGARTEN FOR 75 CHILDREN	MUNICIPAL DEVELOPMENT FUND OF GEORGIA	INDIVIDUAL ENTREPRENEUR K. KATSADZE	DIRECTOR	K. KATSADZE		EXPLANATORY NOTE ON ARRANGEMENT OF ELECTRICAL NETWORK	WORKING PROJECT	A - 3	პლ-1
			ARCHITECT	K. KATSADZE			ELECTRO TECHNICAL PART		
			ARCHITECT	L. GOMIDZE					
ADDRESS: VARIOUS MUNICIPALITIES IN GEORGIA	ADDRESS: TBILISI, 150, AGMASHENEBELI ST.	ADDRESS: BATUMI, 60, GORGASALI ST.	CONSTRUCTOR	B. KAKHIDZE		SCALE 1:100			
			PERFORMED BY:	R. GOGIASHVILI					

SPECIFICATIONS				
NºNº	LEGEND	NAME	MEAS. UNIT	Q-TY
1		JUNCTION BOX ШБРА 380/25-1C ГОСТ Р 50571 (IEC-1312-1 (1995-02) IEC-1643-1) PROTECTION CLASS IP40, SIZE 630x530x215 mm FRAME FOR WALL MOUNTING - 1 pc. FIRED PIN, 4 pcs.	SET	1
		VOLTAGE RELEASE DEVICE PH47/230V		1
		THREE-PHASE AUTOMATIC BREAKER 3P 63 A, C, 6kA ГОСТ Р МЭК 60898-2-2006	pc	1
		THREE-PHASE AUTOMATIC BREAKER 3P 50 A, C, 6kA ГОСТ Р МЭК 60898-2-2006	pc	1
		THREE-PHASE AUTOMATIC BREAKER 3P 6 A, C, 6kA ГОСТ Р МЭК 60898-2-2006	pc	1
		THREE-PHASE DIFFERENTIAL AUTOMATIC BREAKER 3P 16A , 30kA ГОСТ Р МЭК 60898-2-2006	pc	1
		SINGLE-PHASE AUTOMATIC BREAKER 1P 6A , C, 6kA ГОСТ Р МЭК 60898-2-2006	pc	3
2		INCOMING DISTRIBUTION BOARD 24 MODULE IN-BUILT , ШПБ-П-12, PROTECTION CLASS IP40, SIZE 327x237x102 mm N, PE BUSES AND TERMINAL BLOCKS - 1 pc MARKING TAPE - 1pc GALVANIZED DIN-RAIL , 35x7,5mm 2 m ГОСТ Р МЭК 60715-2003 - 1pc HOLDERS - SCREW M08, ГОСТ 1759.0-87/933 - 8pc	SET	1
		THREE-PHASE AUTOMATIC BREAKER 3P 50 A, C, 6kA ГОСТ Р МЭК 60898-2-2006	pc	1
		SINGLE-PHASE DIFFERENTIAL AUTOMATIC BREAKER 1P 16A , 30 MA ГОСТ Р МЭК 60898-2-2006	pc	4
		SINGLE-PHASE DIFFERENTIAL AUTOMATIC BREAKER 1P 10A , 30 MA ГОСТ Р МЭК 60898-2-2006	pc	7
		SINGLE-PHASE AUTOMATIC BREAKER 1P 6A , C, 6kA ГОСТ Р МЭК 60898-2-2006	pc	9
3		JUNCTION BOX, BURIED INSTALLATION 80x80	pc	48
4		LIGHT SWITCH SINGLE-KEY, BURIED INSTALLATION	pc	51
5		LIGHT SWITCH DOUBLE-KEY, BURIED INSTALLATION	pc	7
6		SOCKET, BURIED INSTALLATION WITH EARTHING CONTACT ГОСТ IEC 60884-1-2013	pc	183
7		LDPO LIGHT FIXTURE LED -24w , 230 V , 50 H , 2400 Lm IP20 ART. NO. LDPO0-4003-15-4000-K01: DIMENSIONS ø300 x 85mm ГОСТ IEC 60598-2-1	pc	35
8		LDPO LIGHT FIXTURE LED -15w , 230 V , 50 H , 1000 Lm IP20 ART. NO. LDPO0-4003-15-4000-K01: DIMENSIONS 195x195x45 ГОСТ IEC 60598-2-1	pc	109
9		LTM LIGHT FIXTURE LED -6 w , 230 V , 50 H , 700 Lm, IP44 ART. NO. Lightstar Acric Led 212010 : DIMENSIONS 80(75)x10x40 ГОСТ IEC 60598-2-1	pc	38
10		CEILING LIGHT FIXTURE FOR EMERGENCY LIGHTING WITH INTEGRATED BATTERY, LED 3 W, 68 Lm, LED EMERGENCY LUMINAIRE (414,66x26,2,29 mm) IP30	pc	75
10-1		CEILING LIGHT FIXTURE FOR BALCONY INSTALLATION 6 W, 230 V, 112 IP44	pc	8

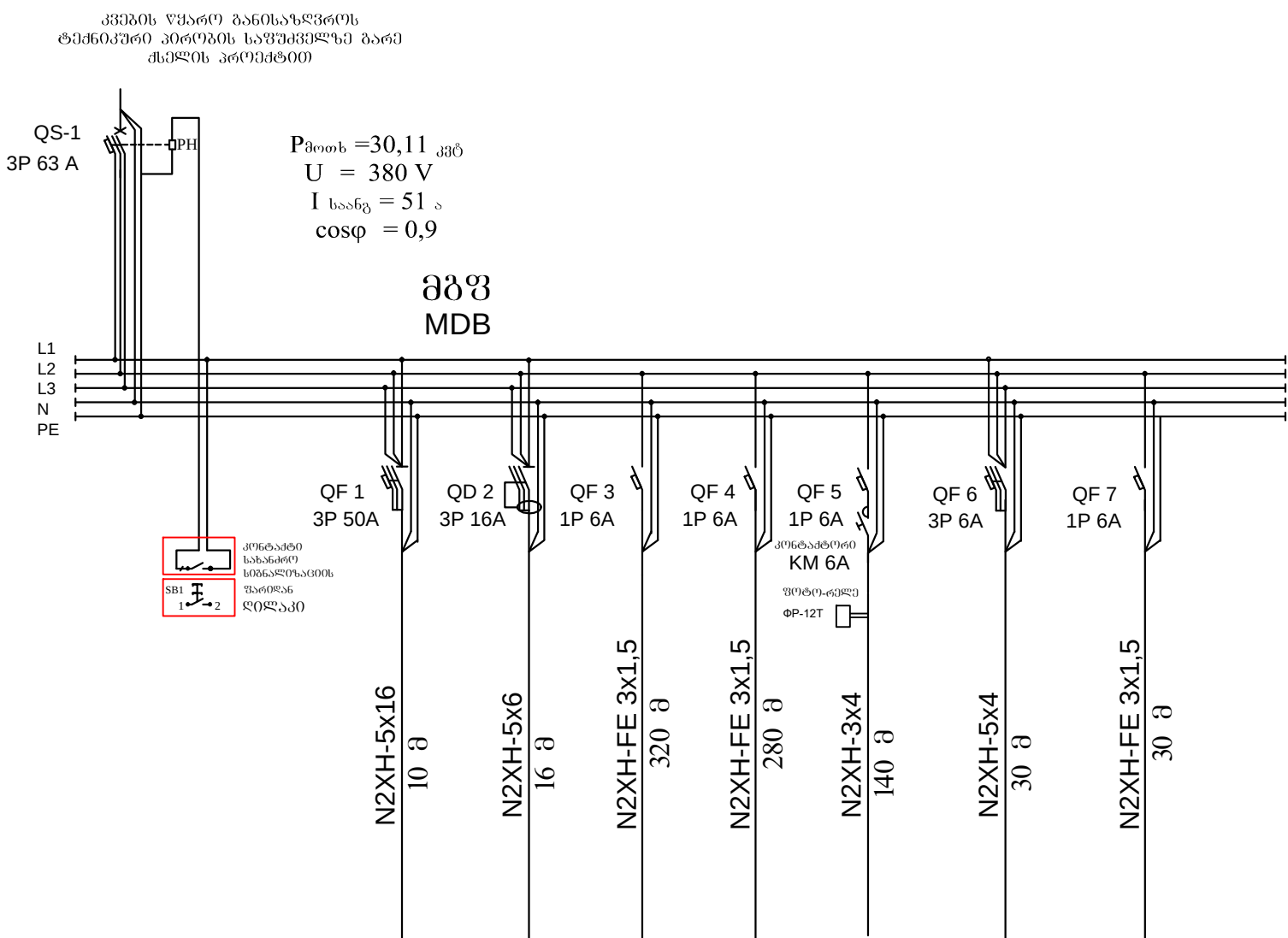
SPECIFICATIONS				
NºNº	LEGEND	NAME	MEAS. UNIT	Q-TY
11		WIRE WITH COPPER CONDUCTOR N2XH, SECTION 3X1,5 SQ. MM	m	1100
12		WIRE WITH COPPER CONDUCTOR N2XH, SECTION 3X2,5 SQ. MM	m	1400
13		WIRE WITH COPPER CONDUCTOR N2XH, SECTION 3X4 SQ. MM	m	360
14		CABLE WITH COPPER CONDUCTOR N2XH 5x6 SQ. MM	m	16
15		WIRE WITH COPPER CONDUCTOR N2XH 5x16 SQ. MM	m	10
16		CABLE CAP 16 SQ. MM	pc	10
17		HORIZONTAL EARTHING STEEL FLAT, 40X4 mm	m	30
18		VERTICAL EARTHING ROD, 18 mm	pc	6
19		CORRUGATED FIRE-PROOF DUCT, D-32 mm	m	23
20		CABLE DUCT INCOMBUSTIBLE, CORRUGATED METAL 50X50X0,7 L=2m	m pc	70 35
21		EARTHING WIRE, COPPER CONDUCTOR CABLE NYM-1x16 88²	m	15
22		CABLE CAP 16 SQ. MM	pc	2
23		BOLT AND NUT M6	SET	4
24		CEILING BRACKET FOR HOLDING A CABLE TRAY MS100-300P	pc	8
25		PIN	pc	16
26		CCA1001 ART.NO LSSA0-1001-003-K03 3w , 230 V , 50 H , 40 Lm LED LIGHT FIXTURE WITH A BATTERY FOR EMERGENCY LIGHTING WITH CAPTION "EXIT" 365x180x25 ГОСТ IEC 60598-2-22	pc	41
27		WIRE WITH COPPER CONDUCTOR N2XH FE 3x1,5 mm²	m	600
28		UNINTERRUPTED POWER SUPPLY (UPS LP 30-33 CE-21Ah) 1 kW / 220 V	pc	1

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DESIGN AND ESTIMATE DOCUMENTATION FOR CONSTRUCTION OF THE KINDERGARTEN FOR 75 CHILDREN	MUNICIPAL DEVELOPMENT FUND OF GEORGIA	INDIVIDUAL ENTREPRENEUR K. KATSADZE	DIRECTOR	K. KATSADZE		SPESIFICAIONS OF MATERIALS AND EQUIPMENT	WORKING PROJECT	A - 3	ქვ-2		
			ARCHITECT	K. KATSADZE			ELECTRO TECHNICAL PART				
			ARCHITECT	L. GOMIDZE							
ADDRESS: VARIOUS MUNICIPALITIES IN GEORGIA	ADDRESS: TBILISI, 150, AGMASHENEBELI ST.	ADDRESS: BATUMI, 60, GORGASALI ST.	CONSTRUCTOR	B. KAKHIDZE		SCALE 1:100					
			PERFORMED BY:	R. GOGIASHVILI							

კვების წყარო
შემყვანი ავტომატური ამომრთველი ნომერი, ტიპი, ნომინალური ღირსი (ა)
დაცვაში ამომრთველი ნომერი, ტიპი, ნომინალური ღირსი (ა)
გამავალი ხაზის ავტომატური ამომრთველი ნომერი, ტიპი, ნომინალური ღირსი (ა)
საღმნის მარკა კვეთი, სიგრძე (მ)
მომხმარებლის დასახელება
დაღმებული სიმძლავრე (კვტ)
საანგარიშო / გაფშვები ღირსი (ა)

მარკირება - საანგარიშო
დატვირთვა, ვტ
სიმძლავრის კოეფიციენტი, -
საანგარიშო ღირსი კალა (ა) -
მონაკვეთის სიგრძე (მ)

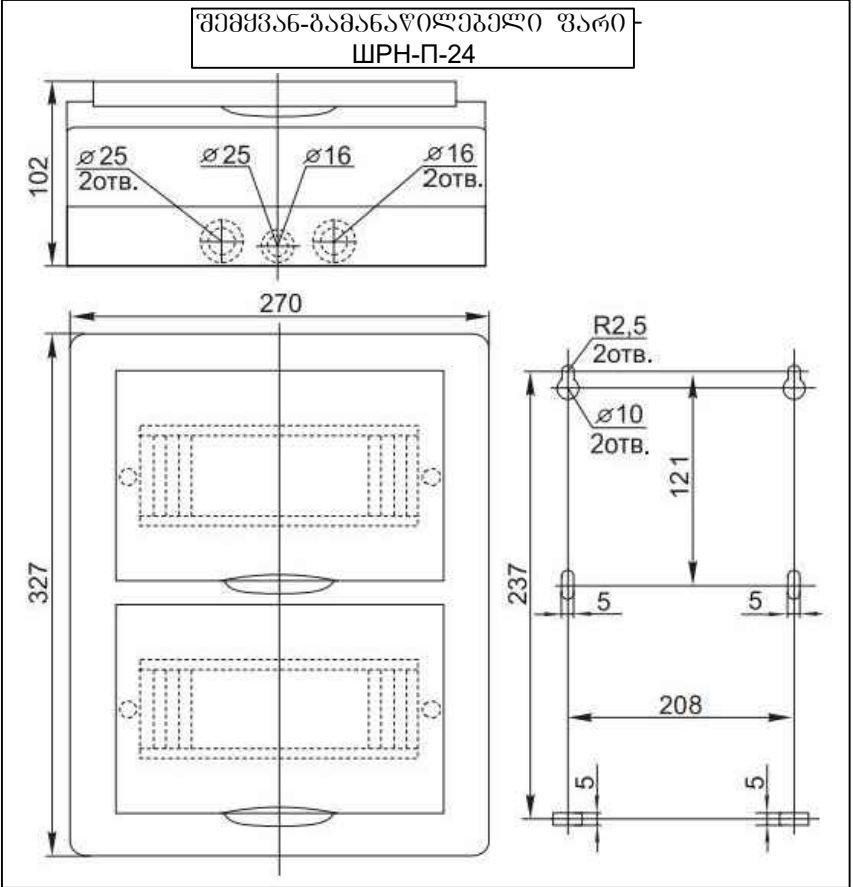
დატვირთვის მომენტი, ვტ.მ
კაბკის დანაკარგები (%),
საღმნის მარკა კვეთი,
მოცემულია ცხრილში



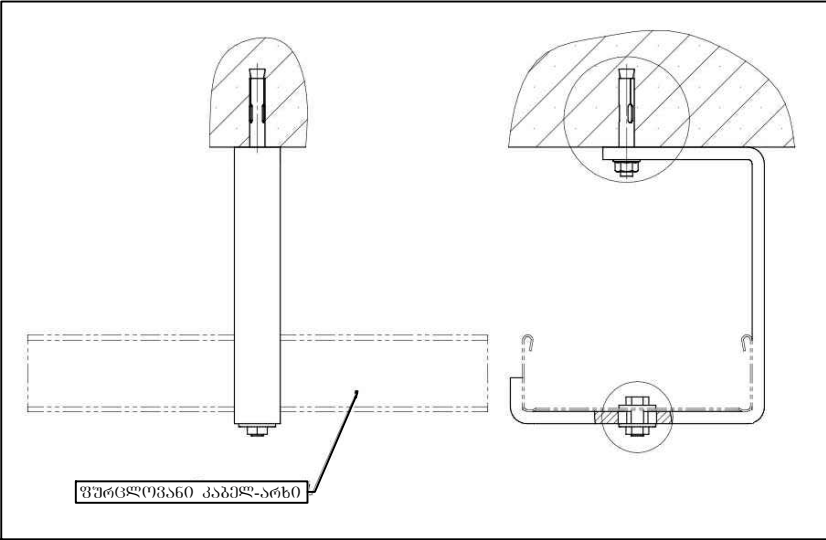
შგვ-1 DB-1	ლიფტის ფარში ტექნ. სართული	ავარიული განათება	ავარიული გასასვლ. აბრები	გარე განათე- ბა	შგვ- საშვავი	სახანძრო სიმანქანაში პანელი
20,4 kW / 380 V	6 kW / 380 V	0,222 kW / 220 V	0,123 kW / 220 V	0,280 kW / 220 V	2,8 kW / 380 V	0,300 kW / 220 V
32,6	10,1	1,1	0,6	1,3	4,7	1,4

საკომუტაც იო აპარატის ნომერი	შგვ	საანგარიშო სიმძლავრე	ძაბვის საფუხური	ნომინ.დენი	სიმძლავრის კოეფიცი.	ავტომ. ამომრთვ.	სიგრძე (მ)	კაბელის მარკა	კაბელის კვეთი	დატვირთვის მომენტი	ძაბვის კარგვა	ძაბვის კარგვა $\Delta U, \% = \Delta U \cdot 100 / U_{nom}$	ფაზების დატვირთვა		
		P (W)	U (V)	I (A)	$\cos\varphi$					M (ვტ.მ)	ΔU (ვ)	ΔU (%)	L1	L2	L3
QF1	DB-1	20385,0	380	32,6	0,95	3P 50 A	10	N2XH	5x16	203850	0,00	0,00	6630,0	6375,0	6680,0
QF2	DB-ლიფტი	6000,0	380	10,1	0,9	3P 16 A	16	N2XH	5x6	96000	0,75	0,20	2000,0	2000,0	2000,0
QF3	DB-აფარ.განათ.	222,0	220	1,1	0,95	1P 6 A	320	N2XH	3x1,5	71040	6,19	2,82		222,0	
QF4	DB-აფარ.გასასვ.	123,0	220	0,6	0,95	1P 6 A	280	N2XH	3x1,5	34440	3,00	1,36		123,0	
QF5	DB-გარე განათ.	280,0	220	1,3	0,95	1P 6 A	140	N2XH	3x4	39200	1,30	0,59		280,0	
QF6	DB-საქვებე	2800,0	380	4,7	0,9	3P 6 A	30	N2XH	5x4	84000	0,98	0,26	8630,0	9000,0	8680,0
QF7	DB-აფარ.გასასვ.	300,0	220	1,4	0,95	1P 6 A	30	N2XH	3x1,5	9000	0,78	0,36		300,0	
	MDB-1	30110,0	380	50,9	0,9	3P 63 A									

პროექტის დასახელება :	დამკვეთი :	დამგეგმარებული :	თანამდებობა	გვარი	ხელმოწერა	ნახაზის დასახელება	მტაპი	ფორმატი	ფურცლის №
75 გავშვზე გათვლილი საბაჟვყო გალის გეგმეგლოგის საპროექტო-სახარჯთაღრიცხვო ლოკუშინტაცია	საძარმეშლოს მუნციკალური განვითარების ფონდი	ო.მ. "კოლა კაცაძე"	დირექტორი	კაკაცაძე		მთავარი შემყვან-გამანაწილებელი ფარის მკვებაში ქსელის და საკომუტაციო სქემა	მუშა პროექტი	A - 3	ელექტრო- ტექნიკური ნაწილი
			არქიტექტორი	კაკაცაძე					
			არქიტექტორი	ლ.ლომძე					
მისამართი: საძარმეშლოს სხადასა მუნციკალიტეტი	მისამართი: ქ. თბილისი, დ. ალგაშინგლის გამგირი №150	მისამართი: გათუში, გორბასლის ქუნა № 60	კონსტრუქტორი	გ. კახიძე					
			შეანსულა	რ.გობიანშვილი					



საკაბელო არხის ჭერში სამონტაჟო სქემა



ღამიწების მოწყობის სურათი



მთავარი შემყვან-ბამანაწილებელი ფარის ღამიწების მოწყობის სურათი



ღამიწების კონტურთან სპილენძისპარღვიანო კაბელის მონტაჟი



პროექტის დასახელება :	დამკვეთი :	დამგებმარეგული :	თანამდებობა	გვარი	ხელმოწერა	ნახაზის დასახელება	მტაპი	ფორმატი	ფურცლის №
75 ბაგვშეუ ბათვილილი საბაგვშეუ ბათის გვმნეგლოგის საბრეშტო-სახარგოტარეგნეგო ლოკუშენეგნეგია	საბარეშეულო გუნეგეგალოგის ბანეგეგარეგის ვონეგ	ო.გ. "კოგა კაცაცე"	დირეშტორი	კაცაცე	5.5.2025	შემყვან-ბამანაწილებელი ფარი ШРН-П-24 ღამიწების მოწყობის ღებალეგ	გუნეგ პროექტი	A - 3	ელ-5
			არქიტეშტორი	კაცაცე	5.5.2025				
			არქიტეშტორი	ლ.ლოგეგ	5.5.2025				
			კონსტრუქტორი	ბ. კაცეგ	5.5.2025				
მისამართი: საბარეშეულო სხვალეგ გუნეგეგალოგეგ	მისამართი: მ. თეგეგისი, დ. ალგეგეგეგის ბამეგორი №150	მისამართი: ბათეგეგ, გორგასეგის ქუნეგ № 60	შეისრულეგ	გ.გეგეგეგეგეგ	5.5.2025				