

Klaipėda State Seaport South Gate Complex, Kairiai st. 17, Klaipėda, construction project

NAME OF PROJECT (ACCORDING TO THE AGREEMENT)

DESIGN TITLE	Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai st. 17, Klaipėda, construction project
DESIGN NUMBER	8858
CLIENT (BUILDER)	AB Klaipėda State Seaport Authority J. Janonio g. 24, 92251 Klaipėda
TYPE OF CONSTRUCTION	New construction
PURPOSE OF THE STRUCTURE	Transport communications: structures of water ports
BUILDING CATEGORY	Exceptional structures
DESIGN STAGE	Technical project
DESIGN PART	Electrical Engineering Part. Lighting (I phase of constructions) 01 - southern dam; 02 - northern dam (I phase)
FILE MARK	8858-01,02-TP-E-06.01
REVISION	0
FILE RELEASE DATE	2024-03

COMPANYS	QUALIF. DOC. NO.	DUTIES	NAME SURNAME	SIGNATURE
UAB „Kelprojektas“	39928	Project manager	Rimantas Valančius	
UAB „ST projektai“				

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PART OF THE PROJECT

Row No.	File (binder) identifier	Revision	Name	Notes
14.	8858-01,02-TP-E2-06.01	0	The Electrical part. Lighting <i>(Construction phase I)</i> (01 – Southern dam) (02 – Northern dam)	

A COMPOSITION SHEET FOR THE TEXTUAL DOCUMENTATION OF THE PART OF THE PROJECT

Row No.	Document identifier	Sheet number	Revision	Name
1.	8858-01,02-TP-E2-06.01-BSŽ	2	0	File document composition chart
2.	8858-01,02-TP-E2-06.01-AR	5	0	Explanatory note
3.	8858-01,02-TP-E2-06.01-MTS	16	0	Technical specifications for materials
4.	8858-01,02-TP-E2-06.01-DTS	7	0	Technical specifications for the works
5.	8858-01,02-TP-E2-06.01-SŽ	3	0	Bill of Quantities

THE DRAWING COMPOSITION SHEET FOR THE DESIGN PART OF THE PROJECT

Row No.	Document identifier	Sheet number	Revision	Name
1.	8858-01,02-TP-E2-06.01-B.00	1	0	Project parts layout tab
2.	8858-01,02-TP-E2-06.01-B.01	3	0	Layout plan of utilities and installations M1:500
3.	8858-01,02-TP-E2-06.01-B.02	1	0	AVS structural diagram
4.	8858-01,02-TP-E2-06.01-B.03	1	0	Lighting connection structural diagram

Row No.	Document identifier	Number of sheets	Name
1.	2023-02-13, TER23-11465	3	Access Conditions (ESO)
2.	-	16	DIALux report
3.	-	1	Voltage loss and short circuit table
4.	-	1	PDV qualification certificate

1. EXPLANATORY NOTE

1.1. MAIN TECHNICAL INDICATORS OF THE PROJECT PART

Row No.	Name	unit	Quantity	Notes
1.	Lighting support. LED luminaire 30W. H=4m	compl.	72	TS 2.1
2.	Polyurethane Flexible LED Floodlight 220W.	compl.	2	TS 2.2
3.	Cable length	m	5170	Al 4x35mm ²
			355	Cu 3x1,5mm ² (abutments)
			35	Cu 3x2,5mm ²
			670	
4.	Distance of illuminated section	m	1900	
5.	Installed power of the lighting section	kW	2,280	
6.	Annual electricity consumption for lighting	kWh	9120	4000h/year

1.2. LIST OF NORMATIVE DOCUMENTS APPLIED IN THE PROJECT

Row No.	Name	Abbreviation	Year of approval
1.	Rules for the protection of electricity networks	ETAT	2010
2.	Rules for the installation of electrical lines and wiring	ELI T	2012
3.	General rules for the installation of electrical installations	E BT	2012
4.	Construction Law of the Republic of Lithuania		1996
5.	Law on Special Conditions of Land Use of the Republic of Lithuania		2019
6.	Safety rules for the operation of electrical installations	SEE T	2010
7.	Rules for the operation of power stations and electricity networks	EETET	2012
8.	Rules for the installation of relay protection and automation for electrical installations	E RAA T	2011
9.	Special conditions for the use of land and forest		2019
10.	Lightning protection for buildings. External lightning protection of structures.	STR 2.01.06:2009	2009
11.	Streets and local roads. General requirements.	STR 2.06.04:2011	2011
12.	Description of the procedure for performing geodetic measurements of topographic objects and drawing up topographic plans	GKTR 1.01:2023	2023
13.	Normative construction technical documents	STR 1.01.02:2016	2016
14.	Construction work. Building construction supervision	STR 1.06.01:2016	2016
15.	Building design, project expertise	STR 1.04.04:2016	2016
16.	Building permits. Completion of construction. Suspension of construction. Removal of the consequences of unauthorised construction. Remedying the consequences of construction under an illegally issued building permit	STR 1.05.01:2016	2016
17.	Rules for the installation of electrical lighting installations	AE T	2011
18.	Road lighting. Part 1. Guide to the selection of lighting classes	CEN/TR 13201-1:2014	2014
19.	Road lighting. Part 2. Performance requirements	LST EN 13201-2:2016	2016
20.	Natural and artificial lighting in workplaces. Minimum illuminance limits values and general measurement requirements.	HN 98:2014	2014
21.	Light and lighting. Workplace lighting. Part 2. Workplaces on the outside of buildings.	LST EN 12464-2:2014	2014
22.	Pipe systems for cable management. Part 24. Particular requirements. Underground pipe systems	LST EN 61386-24:2011	2011
23.	Building design. General requirements for formalisation	LST 1516:2015	2015

1.3. DESIGN SOLUTIONS

The construction project of communication-purpose structures (southern dam, northern dam, docks, and waterfront) at Kairių St. 17, Klaipėda, was prepared in accordance with the conditions of the competition, applicable norms, and regulations. The power supply for the lighting is planned to come from the newly designed lighting control panel AVS, which is powered by ESO KAS (coordinates 6170975.67, 320938.64) according to the connection conditions TER23-11465. The arrangement and equipment of the panel's devices will be specified during the detailed design phase.

From the AVS panel, the power supply for the beacon navigation lights is planned (the navigation light is specified in another part of the project and supplied with the beacon). In this part of the project, only the power supply for the navigation light is planned.

Separate cables to the beacons are designed to be laid underground in the same trench as the lighting cables. In the northern dam, protective pipes and grounding strip are designed in this part. In one pipe, the power supply cable for the beacon lights is laid, while the other is left as a reserve. During the 4th construction stage, the lighting cable will be laid in this reserve pipe. A temporary lighting control panel is planned for the control of the LED lamp of beacon No.1, installed under the beacon (until the 4th construction stage when the illumination will be switched from the nearest lamp). The panel is connected to the power supply cable of the beacon light. The lighting is installed with energy-efficient LED lamps. Lamps are connected from the common lighting line for the illumination of the lower part of the beacons. The foundations for the lamps are specified in the construction part of the project. The table specifies the height and angle of the lamp installation, as well as the dimensions of supports and piles:

Marking of the luminaire on the plan	Overall height, m	Supports height, m	Guardrail height, m	Guardrail length, m	Angle of the luminaire with the ground the surface	Foundation	Refreshments
P-	4	4	0	0	-	Provided in Section SK (VGAP type)	Yes
S-	4	4	0	0	-	Provided in Section SK (VGAP type)	Yes
Lighthouse Illuminator	3	-	-	-	-	-	No

The cables are selected considering load currents, voltage losses, and short-circuit currents at the line ends. The cable is laid in a PE d75 pipe. Lighting cables are connected to lighting poles using branching bolts. At the ends of the cables, rear clamps are installed. Automatic switches are mounted for the protection of lamps on the poles. For grounding in the southern and northern dams, a galvanized grounding strip is laid beside the pipe being laid. This strip is connected to a newly installed ground rod on the shore. From the strip, grounding branches are made beside the lighting poles. The branches are connected to the strip by welding and waterproofing. All lighting poles are grounded with a grounding resistance not exceeding 30 ohms. The equivalent resistance is not greater than 10 ohms. Construction, installation, and grounding works are carried out in accordance with occupational safety regulations, AET, and EBT requirements. Additionally, compliance with the technical specifications provided in this project and the installation requirements of equipment manufacturers is required. During the intersection of the designed cable lines with underground utilities, manual excavation works are performed. Before the start of work, representatives of intersecting underground utilities should be called for consultation.

1.4. SELECTION OF LIGHTING STANDARDS

The lighting of the communication structures has been designed in accordance with EN 12464-2:2014, which requires that the embankment passages are pedestrian-only and that the average illuminance of the waiting area must be at least EAV 10lx.

The average illuminance values $E_{(vid)}$ obtained from the illuminance calculations using the DIALUX software (report in Annex 1) satisfy the minimum average illuminance levels.

1.5. CABLE HEATING CALCULATIONS (INTERSECTION WITH NORDBALT CABLE LINES)

Newly designed lighting cable lines intersect with existing NORDBALT northern and southern lines (at distances of 5.35m and 1.65m). Lighting lines are laid above existing networks.

To ensure that the heating of the newly designed lighting cables does not affect existing NORDBALT lines, we provide cable line heating calculations: 1. Calculation of electrical cable line current:

Calculate the electrical current flowing through each line using the given load and network voltage.

Current (I) = Power (P) / Voltage (U).

Line No. 1 kW Load:

Current (I1) = 1000 W / 400 V = 2,5 A

Line No.2 2,28 kW Load:

Current (I2) = 2280 W / 400 V = 5,7 A

Calculation of heating of electric cable lines:

Cable resistance (R) = 0,868 Ω/km (Al 4x35mm)²

Thermal resistance of conductor (ρ) = 0,026 Ω·mm²/m (for the aluminum cable)

C = 240 J/(kg·K)

S = 0,0035 m²

L = 2000 m

ρ = 2,7 g/cm³ (arba 2700 kg/m³)

c = 900 J/(kg·K)

V = S * L = 0,0035 m² * 2000 m = 7 m³

m = ρ * V = 2700 kg/m³ * 7 m³ = 18900 kg

Calculate thermal adhesion:

Q = C * m * ΔT

Q = 240 J/(kg·K) * 18900 kg * ΔT

Calculate temperature rise:

ΔT = Q / (m * c)

ΔT = (240 J/(kg·K) * 18900 kg * ΔT) / (18900 kg * 900 J/(kg·K))

0.7333 * ΔT = 0

Conclusion.

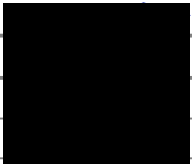

The temperature increase ΔT is equal to 0. This means that the cable temperature remains constant and does not affect the environment.

When calculating the allowable maximum cable power (taking into account network capacity, considering that the cable is loaded to the maximum), the temperature increase is less than 1 degree, so it will not have an impact on the network (even when loaded to the maximum).

1.6. A LIST OF THE SOFTWARE USED

Programinės įrangos tiekėjas	Name of the software	Licence
1	2	3
<i>Electrical part (E)</i>		

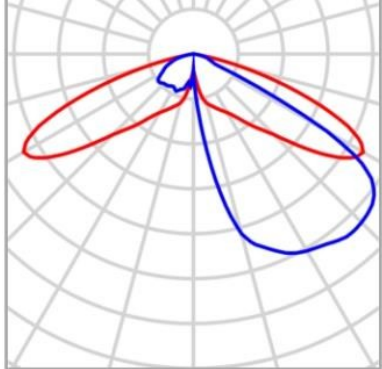
Microsoft	Office Basic 2007	VM011330082
Microsoft	Win HmPrem 7	VM032070993
Autodesk	AutoCAD LT 2017	S/N 556-67010790
BullzipPDF	BullzipPDF	Nemokama
DIAL GmbH	DIALux EVO 8.2	Nemokama

0	2023-11	BUILDING PERMIT, COMPETITION		
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)		
Designer	Proof of qualification document no.	Duties	Name, surname	Signature
UAB Kelprojektas	39928	PM	Rimantas Valančius	
UAB „ST projektai“				

2. TECHNICAL SPECIFICATIONS FOR MATERIALS

2.1. LUMINAIRES

S-; P-;

LIGHT DIAGRAM	
LAMPS AND ELECTRIC PART I:	<p>Correlation temperature not more than 3000K; Luminaire total luminous flux not less than 60W; luminous flux not less than 3592lm; colour rendering factor Ra > 70; Lifetime not less than 100 000 hours at L90B10; LED current not exceeding 500mA; ENEC and ENEC+ certificates;</p>
PROTECTION FACTOR AND VOLTAGE:	<p>IP66, IK10; Supply voltage 220-240V 50/60Hz; Surge and lightning protection of at least 10kV inside the luminaire; Class II electrical safety; Ambient temperature from -40°C to +45°C</p>
ADDITIONAL REQUIREMENTS:	<p>Minimum 24 months warranty, Colour - Anthracite</p>
CORPUS:	<p>The non-metallic materials and components in the product are chemically fully compatible with LEDs. They do not emit VOCs (Volatile Organic Compounds), which can affect the performance, stability and colour temperature of the luminaire during operation.</p>

Support

OBJECT (TYPE):	Conical lighting support
MATMENYS H=5,0m:	<p>H1=5000mm, h=500mm, D≥125mm, d=60mm (the diameter of the support is to be specified in the detailed design, according to foundations selected in the SK section)</p>
INSTALLATION:	Installed in a reinforced concrete foundation of the VGAP type.
CORPUS:	<p>Hot-dip galvanised (inside and outside) steel. Grounding of the support on the inside of the housing. With sealed service door recessed into the housing. Suitable for marine use climate and wind load.</p>
COLOR:	Antracito

2.2. LUMINAIRES

Polyurethane Flexible Floodlight;

LIGHTING DIAGRAM	
LAMPS AND ELECTRICAL COMPONENTS:	<p>Flexible polyurethane (PU) strip in bright white color with LED light source. UV resistant. Narrow optics. Power not exceeding 22W/m, luminous flux of the luminaire not less than 1900 lm/m. Correlated color temperature 4000 K. Color rendering index CRI\geq85. Standard color matching deviation - three steps according to MacAdam. IP67 protection class. Impact resistance IK08. Electrical safety class III. Product weight 2.015 kg/m. Luminaire dimensions 14 × 14 × L mm. LED service life not less than 72,000 hours / L70B20. Operating ambient temperature -20 / +50 °C. With a remote 24V power supply that has DALI 2 protocol.</p>
THE SET IS COMPOSED OF	<p>Floodlight L-10m, power supply designed for outdoor installation (IP67).</p>
ADDITIONAL REQUIREMENTS	<p>Supplied with mounting brackets</p>

2.3. CABLE WITH ALUMINIUM STRANDS.

Row No.	Technical parameters and requirements	Size, condition
1.	Standart	LST 1702 (HD 603) arba IEC 60502-1;
2.	Rated voltage U0/U	$\geq 0,6/1$ kV
3.	Maximum voltage	1,2 kV
4.	Normal frequency	50 Hz
5.	Operating conditions	on the ground, in the open air
6.	Ambient temperature	-35 ... +35 °C
7.	Number of conductors	4
8.	Conductor	Annealed aluminium
9.	Conductor insulation	XLPE
10.	Color coding of cable cores	In accordance with LST 1555 (LST HD 308) or IEC 60757.
11.	Outer shell	Black UV-resistant PVC or UV-resistant non-flammable PE
12.	Maximum cable temperature at short circuit for connection (5 s)	+ 90 °C
13.	Maximum cable temperature at short circuit for connection (5 s)	+ 250 °C
14.	Lowest laying temperature	-10 °C for cables with aluminium conductors
15.	Minimum bending radius	$\leq 12xD$ D - outer diameter of the cable
16.	Lifetime	> 40 years
17.	Warranty period	≥ 24 months

Up to 1 kV cables with plastic insulation technical parameters

Conductor cross-section area, mm ²	Conductor design*	The maximum active resistance at 20 °C, Ω/km	Long-lasting (+70°C) operating current Grunt, A	Long-term operating current in air (+70°C), A
<u>Aluminium conductors</u>				
4x35	SM	0,868	125	125

* RE - round monolithic; RM - round multi-wall; SM - sectoral multi-wall.

2.4. END OF CABLE.

Aluminium crimp-on lugs for connecting the ends of 0.4kV cable cores to equipment.

2.5. CABLE WITH COPPER STRANDS.

	Technical parameters and requirements	Size, condition
1.	Standard	LST 2010 or LST 2011
2.	Rated voltage U0/U	≥ 450/750 V
3.	Nominal frequency	50 Hz
4.	Test voltage	≥ 2500 V, 50 Hz, 5 min.
5.	Operating conditions	In the field
6.	Ambient temperature	-35 °C ... +35 °C
7.	Conductor	Annealed round multi-wire twisted copper, Grade 5 according to LST EN 60228
8.	Conductor insulation	PVC or XLPE
9.	Maximum long-term conductor temperature	≥ +70 °C
10.	Maximum conductor temperature at short circuit for connection (5s)	≥ +160 °C
11.	Colour coding of cable cores	According to LST 1555 (LST HD 308) or IEC 60757
12.	Outer shell	Black, UV-resistant for outdoor use; PVC or non-flammable halogen-free mixture;
13.	Lowest installation temperature	-5 °C
14.	Minimum bending radius during installation	- When installing 10xD; - Folded once 8xD. D - outer diameter of the cable
15.	Lifetime	≥ 40 years
16.	Warranty period	≥ 24 months

2.6. THERMOSHRINKABLE CABLE END.

Construction: the root of the cable is sealed by a thermoshrink glove with a thermoplastic adhesive on the inner surface. This glove shall be placed over the cores and the end of the outer sheath of the cable. The gap

between the cable tip and the insulation of the strand is also sealed by a heat-shrink tube with an inner surface coated with a thermosetting adhesive. All materials are UV-resistant and resistant to sunlight and atmospheric agents.

2.7. PROTECTION CONDUITS FOR CABLES LAID IN THE OPEN GROUND, UP TO 125MM OUTER DIAMETER

Row No.	Technical parameters and requirements	Size, condition
1.	Standards	LST EN 61386-24
2.	Product certification must be carried out by an independent organisation in Europe that is accredited for products in certification.	Submit certificate
3.	Material	PP, PE
4.	Outer wall of the pipe	Corrugated
5.	Pipe inner wall	Even
6.	Colour of the outer wall of the pipe	Red
7.	Pipe outer diameters	Refer to the bill of quantities
8.1.	Resistance to compression according to LST EN 61386-24.	≥ 750 N;
8.2.	Resistance to impact according to LST EN Standard 61386-24.	N - normal
8.3.	Bending of the cable protection tube in bends	Use special elbows or a flexible (≥ 450 N compressive strength) pipe when turning and starting on electrical objects.
8.4.	The outer wall of the pipe shall bear	Marking: <ul style="list-style-type: none"> • Manufacturer; • Standard; • Compressive strength (750 N); • Impact resistance; • Nominal diameter of the pipe; • Raw material of the cable protective pipe.
9.	Operating temperature	-20 + 60 oC
10.	Service life	≥ 40 years
11.	Warranty period	≥ 5 years

2.8. GROUNDING CLAMPS.

Application: for connecting cables inside a lighting support. The quantity and cross-section of the incoming and outgoing conductors shall be based on the bill of quantities. The insulating part of the enclosure shall be made of impact-resistant and non-combustible material. All metal parts shall be protected against corrosion. Terminal screws shall be non-penetrating. Degree of protection IP20. Supplied with earthing cable and nozzle. Mounted on DIN rail or other manufacturer's in the manner specified.

2.9. EARTHING KIT.

Row No.	Technical parameters and requirements	Size, condition
1.	Standards	ISO 9001:2000; ISO 14001:2004
2.	Rod material	Steel
3.	Rod coating	≥ 0,07 mm. Zinc coating (for steel bar)
4.	Rod diameter	≥ 14 mm.

5.	Rod coupling brass or copper	threaded or pressurised
6.	Earthing system connection elements	Steel; galvanised steel
7.	Earthing system performance period	≥ 15 years

2.10. GALVANISED WIRE/TAPE.

Wire: d8mm, hot-dip galvanised, zinc thickness not less than 350 g/m² (approx. 50 µm on average), for ground use.

Tape: 30mmx4mm. Conforms to VDE 0185-305 (IEC 62305). Zinc layer of at least 500 g/m² (approx. 70 µm on average), for ground use.

2.11. CABLE SIGNAL STRIPS.


Row No.	Technical parameters and requirements	Size, condition
8.	Made of polyethylene	PE
9.	Colour	Yellow
10.	For use in	On Earth
11.	Ambient temperature	-35 ... +35 oC
12.	Packing quantity	≥ 50 m
13.	Tape thickness	≥ 0,5 mm
14.	Strip width	Determined when ordering 100÷310 mm
15.	The tape must have black lettering:	"Attention! Cable"
16.	Lifetime	≥ 40 years
17.	Warranty period	≥ 5 years

2.12. 6-63 A AUTOMATIC TRANSFER SWITCHES

Row No.	Technical parameters and requirements	Size, condition
1.	For use in	Indoors in an unheated room
2.	Ambient temperature	-25 °C ... +55 °C
3.	Relative humidity	≤ 95 %
4.	Elevation above sea level	≤ 1000 m
5.	Rated voltage	230 V/400 V AC
6.	Maximum voltage	≥ 440 V
7.	Nominal frequency	50 Hz
8.	Insulation voltage	≥ 440 V
9.	Impulse voltage	≥ 4 kV
10.	Disconnection capacity at rated voltage	- I _{cu} ≥ 10 kA; - I _{cs} ≥ 75 % I _{cu} (≥7.5 kA).
11.	Electrical wear resistance (number of duty cycles):	I _n ≤ 63 A; (≥10000);
12.	Degree of protection IP2X	IP2X
13.	Bolted clamps (bolted clamps)	Suitable for single and multi-core wires
14.	Effect of the decoupler	- From thermal-electromagnetic

15.	Method of fixing	On a DIN rail mounting bracket (clamp), according to the LST EN 60715 standard.
16.	High temperature and flame resistance of the automatic switch	According to LST EN 60947-1, sections 7.1.2.2 or 7.1.2.3.
17.	Circuit isolation	It must comply with the construction requirements for the insulation of the circuit according to section 7.1.7 of the LST EN 60947-1 standard.

2.13. ELECTRICAL DEVICE SYMBOLS.

Row No.	Technical parameters and requirements	Size, condition
1.	External view	
2.	Purpose of electrical device labels:	On the service door of the lighting
3.	Material of the plate and text on the plate	Temperature: -35 ... +35 °C; Relative humidity: ≥ 95%; Resistant to ultraviolet radiation, atmospheric, and mechanical impact.
4.	Plate material and color	plastic
5.	Plates attached to the enclosures of electrical devices, doors, covers, or similar components.	Glued.
6.	Dimensions	50x50mm

2.14. LIGHTING SUPPLY POINT DISTRIBUTION BOARDS

Row No.	Technical parameters and requirements	Size, condition
1.	Operating Conditions	Outside or inside
2.	Ambient temperature	-35... +35°C
3.	Nominal voltage	400/230 V
4.	Insulation voltage	6/2,5 kV (LI/AC)
5.	Nominal frequency	50 Hz
6.	Impact resistance, degree of protection	≥IK10, ≥IP54
7.	Flammability class	FV0 by LST EN 60695-11-10 (or V0 by UL94)
8.	Fire resistance	960°C, VDE 0471
9.	Temperature resistance of insulating materials of the body index	E, 120°C
10.	Electrical protection (isolation) class	II
11.	Casing insulation resistance	240 kV/cm



12.	Corpus material	Weatherproof, sealed against atmospheric precipitation, made of glass-fibre reinforced polyester (or other corrosion-resistant material). Not less than 25% glass fibre. Thickness of the walls of the casing not less than 3,5 mm \pm 1 mm
13.	Corpus color	Grey (RAL 7035)
14.	Ventilation	With ventilation openings IP-55
15.	Lifetime	\geq 25 years
16.	Warranty period	\geq 5 year

1. Lighting power point (LP) panels shall be made of glass-fibre reinforced polyester, with a protection class not less than IP54, complete with foundation, power, control and supply components. Fully waterproof and dustproof, suitable for outdoor use, anti-graffiti coated and with a pitched canopy.

2. The panels shall be flame retardant, resistant to low and high temperatures, rusting and UV light, as well as resistant to corrosion, chemicals and atmospheric agents.

3. The design of the panel shall allow some parts of the foundation to be removed without the use of tools, allowing for easy cabling and installation. The entry part of the cable terminals shall be mounted on a rail at least 20 cm below the bottom of the cabinet.

4. MPs must have a distinctive logo on the door: **MP XXXX**. The MP number and the dimensions of the logo shall be provided to the Supplier at the time of order. The door shall also bear the following sign: 'Caution, risk of electric shock'.

5. A diagram of the MP shall be placed on the inside of the door of the panel, a second copy of which shall be submitted to the contracting entity together with the other documents, when presented to the MP.

6. Additional internal equipment needs to be installed quickly and easily thanks to the efficient modular design.

7. **Each panel must have a 20% space reserve for future expansion.**

8. The panel door shall be locked with a metal key and shall be capable of being fitted with a padlock.

TECHNICAL SPECIFICATION FOR LIGHTING CONTROL SYSTEM

1. General requirements

1.1. A lighting control system for buildings used for communication purposes is an automated, remotely monitored and controlled complex of lighting devices and equipment designed to control and manage the lighting power point, lighting lines and individual luminaires, to save electricity and reduce maintenance costs;

1.2. The lighting control system must be designed in such a way that it does not require major changes to the existing lighting infrastructure;

1.3. The system components are installed in the lighting control cabinet and in the luminaires or lighting supports.

2. Management system software and functionality requirements

2.1. The lighting control system software must:

2.1.1. have a web application adapted for the Android platform (or a smart app) and be accessible from any computer via various types of browsers, including Microsoft Internet Explorer, Edge, Safari, Firefox and Chrome;

2.1.2. be able to be installed on the manufacturer's, supplier's or customer's server/cloud;



- 2.1.3. have 2-step verification access, and support HTTPS for additional security;
- 2.1.4. be developed using open and standardised languages, including Java, XML configuration files and SQL database. It shall be possible to develop additional functionality without the need to purchase an additional software licence for development;
- 2.1.5. write all data to a centralised SQL database and be compatible with MYSQL or PostgreSQL to avoid having to commit to a software licence for the database engine;
- 2.1.6. allow the administrator to create, modify and delete users, passwords and groups;
- 2.1.7. support a wide range of widely used PLC and RF control systems from a variety of competing equipment suppliers;
- 2.1.8. be able to ensure the interconnection and interoperability of solutions from different equipment manufacturers, guaranteeing the independence of the control software and field tool layers;
- 2.1.9. support the configuration, programming, control and monitoring of luminaire controllers for different models from at least three competing suppliers;
- 2.1.10. support multiple languages, including Lithuanian and English, and dictionaries must be exportable and modifiable by administrator;
- 2.1.11. support light points, segment controllers, sensors, electric vehicle charging stations, meteorological stations, energy metering devices and other objects to develop smart city applications;
- 2.1.12. support Application Programming Interface (API) for interacting with third-party software;
- 2.1.13. an interactive geographic map of cabinets, light fittings and other objects, with the ability to create new objects, move, delete, group and duplicate objects, as well as filter them by status, profile, model, group;
- 2.1.14. be compatible with multiple map sources (e.g. Microsoft Bing, Google, etc.);
- 2.1.15. be customised for use by several or more users, with different user rights (including administrative rights), control cabinet groups, interface language and alarm settings;
- 2.1.16. control and monitor lighting control cabinets (and/or luminaires) using GPRS, 2G, 3G, 4G LTE mobile technologies;
- 2.1.17. control the switching on/off of the lighting by means of a photosensor to be active half an hour before sunrise/sunset, with the possibility of changing and sliding the interval of activity for an individual control cabinet or a group of them;
- 2.1.18. in the event of a photo sensor failure, continue working according to an astronomical clock based on the geographical coordinates of the cabinet and the time of year;
- 2.1.19. be able to set dimming profiles for luminaires using interactive sliders - at least 10 dimming levels per luminaire or group of luminaires;
- 2.1.20. be able to remotely set and change the illuminance level (lx) for switching the lighting on/off, and assign one photosensor to multiple control cabinets;
- 2.1.21. detect faults in phases, fuses, contactors and photosensors and send alarm messages or simply display them in the system, depending on the user's settings;
- 2.1.22. checking and storing, at least every 5 minutes, the voltage, current, $\cos\phi$ and output line current values of the supply phases and the illuminance level values. Display these parameters together with the door sensor status change signals on interactive graphs for a selected period of time;
- 2.1.23. be able to set thresholds on interactive current consumption graphs using sliders and display alarm messages in the system when current consumption values deviate from the set thresholds (thresholds set by the supplier);



- 2.1.24. be able to store and graphically display luminaire parameters such as current, voltage, temperature, dimming level or others, depending on the luminaire controller;
- 2.1.25. report power supply voltage spikes or dips when they exceed the $\pm 10\%$ limit;
- 2.1.26. track and display the magnitude of the leakage current, be able to set a limit value and report when the limit is exceeded;
- 2.1.27. Generate reports in HTML and XLSX format for all chart parameters, sorting and filtering by time, type, status, time period, etc;
- 2.1.28. storing all alarm messages in the system memory and reporting them in HTML and XLSX format, sorting and filtering them by type, object, time period, etc;
- 2.1.29. provide detailed reports on users' activities in the system in HTML and XLSX format;
- 2.1.30. record the operating hours of the luminaires and notify when the specified number of operating hours is exceeded (the limits are set by the supplier, taking into account the lifetime of the luminaires concerned);
- 2.1.31. colour display of the status of control cabinets, output lines and luminaires, depending on the real-time status (supply voltage on/off, load on/off, luminaire on/off, faults, communication errors, etc.);
- 2.1.32. display identification information for each cabinet/light, selected from a list or interactive map (information entered by the supplier);
- 2.2. In the event of current or voltage increases/decreases, carry out a status check after 15 minutes, and only if there is no current for a fault - to display an alarm message;
- 2.3. All user interactions with the platform shall be secured using at least 128-bit SSL encryption;
- 2.4. **System critical alarm messages:**
 - 2.4.1. Unauthorised opening of control cabinet doors (any);
 - 2.4.2. Unauthorised switching on of lights during daylight hours;
 - 2.4.3. The lights did not come on during the dark hours;
 - 2.4.4. Voltage loss at the input (from ESO);
 - 2.4.5. Controller power failure;
 - 2.4.6. Fuse failure on the output line;
 - 2.4.7. Exceeding the limiting leakage current on output lines.These messages must have the highest priority and be sent to the control centre and displayed in the system immediately (SMS, email, audio and visual alerts on the computer screen).

3. Requirements for outdoor equipment

3.1. The segment (cabinet) controller must:

- 3.1.1. communicate with the control system software using secure TCP/IP over any Ethernet medium including GPRS, 3G, 4G, WiFi. Proprietary protocols are not acceptable;
- 3.1.2. have an internal RAM of ≥ 16 MB for storing system working events;
- 3.1.3. in the event of a loss of connection to the server, to continue working autonomously for at least one month, according to the controller's stored an astronomical clock and a photosensor;
- 3.1.4. in the event of a photocell failure, to continue working according to an astronomical clock based on the geographical coordinates of the cabinet and time;
- 3.1.5. be configurable and updatable remotely via a web application;



- 3.1.6. autonomously execute user-assigned control programs. In case of communication failures, data must be stored in the module for ≥ 48 hours before synchronization with the server;
- 3.1.7. support controllers from multiple manufacturers;
- 3.1.8. communicate with the control system software using standard methods such as XML and HTTP messages. No patented protocols should be used to ensure compatibility and interaction with competing supplier software.
- 3.1.9. exchange control and monitoring data with luminaire controllers via Power Line Communication (PLC) or Long Range Radio Frequency (LoRa) technologies. Transition from PLC to RF or vice versa should not require replacing the entire controller;
- 3.1.10. have an integrated GPRS and/or 2G and 3G modem;
- 3.1.11. control no fewer than 350 individual luminaires;
- 3.1.12. support Modbus extensions for additional digital/analog inputs;
- 3.1.13. support one or more standardized protocols for communicating, controlling, and monitoring any luminaire controller that uses the same protocol;
- 3.1.14. have the capability to connect and automatically read and store electricity consumption data (if supplied with an electricity meter). Without the meter, the controller must independently calculate the amount of consumed electricity (data collected by the controller does not necessarily have to be accepted by AB ESO);
- 3.1.15. have the ability to include additional programs in the segment controller, support new "smart city" programs, create other specific functions, or support new protocols;
- 3.1.16. mountable on a DIN 35 mm rail;
- 3.1.17. have a battery >700 mAh. In case of power supply interruption, the battery must ensure the operation of the controller module necessary for data storage, sending an alarm message about the voltage loss, and safe shutdown of the controller module;
- 3.1.18. communicate with luminaires using RF or PLC communication, using secure AES 128 encryption;
- 3.1.19. have a real-time clock with a backup battery and support for an astronomical calendar. The clock must be synchronized with the server at least once every 24 hours;
- 3.1.20. support operating environment temperature: from -35°C to $+65^{\circ}\text{C}$, with a relative humidity of up to 95%;
- 3.1.21. be powered by 230 VAC $-15\% \div +10\%$, have a 4000 V voltage surge protection, integrated fuse, and power consumption not exceeding 3W;
- 3.1.22. have no fewer than three voltage measurement inputs with an accuracy of $\pm 1\%$;
- 3.1.23. have no fewer than 18 current transformer inputs;
- 3.1.24. have no fewer than three relay outputs;
- 3.1.25. have one analog 4-20 mA input;
- 3.1.26. have three digital inputs;
- 3.1.27. have one digital output;
- 3.1.28. have one USB or Ethernet (RJ-45) port;
- 3.1.29. have one RS-485 port.

3.2. Luminaire controller (PLC) (if applicable) must:

- 3.2.1. be mounted at the bottom or inside the luminaire (PLC), or outside the luminaire (RF);
- 3.2.2. support 1-10 volt, DALI, or PWM control interfaces to match the majority of LED drivers and electronic ballasts on the market;
- 3.2.3. use a standardized protocol so that luminaire controllers can be replaced with controllers from at least three different manufacturers;
- 3.2.4. have the ability to directly transfer data from linked sensors to other luminaire controllers without using the segment controller;

- 3.2.5. dim the luminaire in the range from 10 to 100% with a $\leq 10\%$ step;
- 3.2.6. read data from the LED luminaire driver via the DALI/DALI 2 interface, such as current, voltage, power consumption, operating time, temperature;
- 3.2.7. have an input for receiving data from an external motion sensor (PIR, Radar, etc.);
- 3.2.8. operate in the temperature range from -40°C to $+75^{\circ}\text{C}$, with a relative humidity of up to 95%;
- 3.2.9. be powered by 230 VAC $-15\% \div +10\%$, have 3000 V voltage surge protection, an integrated fuse, and power consumption not exceeding 2W.
- 3.2.10. have one digital input;
- 3.2.11. use the CENELEC standard for communication with the segment controller (PLC);
- 3.2.12. use open frequencies for communication with the segment controller (RF);
- 3.2.13. maintain communication with the server via open IoT networks (LoRaWAN, NBIoT, Sigfox, etc.) (RF);
- 3.2.14. have a real-time clock with an astronomical calendar and memory to ensure autonomous operation without communication for at least 365 days (RF);
- 3.2.15. have a protection class of at least IP65 (RF);
- 3.2.16. have an automatic location detection function using a built-in GPS receiver (RF);
- 3.2.17. have a luminaire inclination sensor and generate an alarm message about a fallen support (RF);
- 3.3. The provided control hardware must have CE marking;
- 3.4. Compliance with mandatory safety and electromagnetic compatibility standards;
- 3.5. The protection class of outdoor equipment components is not less than IP65 or not less than IP20 if placed in a separate IP65 class environment.
- 3.6. The control system must meet the essential requirements of the following directives:
 - 3.6.1. Council Directive 2014/35/EU

Link	Name of the standard
LST EN 60950-1:2006 As amended	Information technology equipment. Safety. Part 1. General requirements (IEC 60950-1:2005, modified)
LST EN 62368-1:2015 As amended	Audio-visual, information and communication technology equipment. Part 1. Safety Requirements (IEC 62368-1:2014, modified)

3.6.2. Council Directive 2014/30/EU


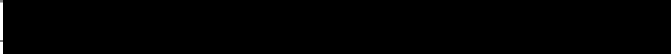
Link	Name of the standard
LST EN 55015:2013 As amended	Limits and methods of measurement for the radio disturbance characteristics of electrical lighting and similar equipment (CISPR 15:2013 + IS1:2013 + IS2:2013)

LST EN 61547:2009 As amended	General purpose lighting equipment. EMC immunity requirements (IEC 61547:2009)
LST EN 50065-1:2011 As amended	Signal transmission on low-voltage electrical networks from 3 kHz to 148,5 kHz Frequency domain - Part 1. General requirements, frequency bands and electromagnetic disturbances
LST EN 301 489-1 V1.9.2:2011 As amended and extended	Electromagnetic compatibility and radio spectrum issues. Electromagnetic compatibility (EMC) standard for radio equipment and services. Part 1: EMC standards. General technical requirements

4. Other requirements

- 4.1. The user shall have free access to software for the configuration and management of the system for at least 10 (ten) years;
- 4.2. The Supplier shall ensure that the Management System software is operational, free of charge, and that any errors detected are corrected for at least ten (10) years from the date of delivery to the User;
- 4.3. Software must be kept up-to-date for at least 10 (ten) years after the transfer of the system to the buyer. In the event of a newer version, an upgrade shall be provided no later than 1 (one) month after the date of distribution of that version;
- 4.4. The management system data is stored on the supplier's server (hosting) for at least 10 (ten) years. The server shall be operated and maintained by the supplier;
- 4.5. On completion of the configuration of the equipment (after installation on site), the customer shall be provided with a service and instructions for working with the control system in Lithuanian;

The Supplier shall provide training to the Customer's personnel and answer any questions that may arise during the warranty period.

0	2023-11	BUILDING PERMIT, COMPETITION		
REVISION	DATE	RELEASE STATUS. REASON FOR THE CHANGE (IF APPLICABLE)		
Designer	No. of the qualification document.	Responsibilities	Name, surname	Signature
UAB Kelprojektas	39928	PM	Rimantas Valančius	
UAB "ST projektai"				

3. TECHNICAL SPECIFICATIONS FOR THE WORKS

The Contractor shall have sufficient qualified personnel and equipment to carry out all the work envisaged. All installation shall be carried out in accordance with the design drawings, as well as the manufacturer's drawings and recommendations, the instructions and tolerances specified. Where the Contractor's company rules specify less stringent tolerances, they must not be followed.

All tests shall be documented by a hidden works report. The Contractor shall keep a proper construction progress log.

3.1. GENERAL REQUIREMENTS FOR EARTHWORKS

The contractor or farm builder/developer must obtain a permit to excavate from the town council. The builder or earthmoving manager must:

- 1) Obtain written consent from LITGRID, the operator of the NORDBALT network, prior to commencement of works;
- 2) Obtain written consent from the company operating the communications network, VšĮ Plačiajuostis internetas, before starting work and TELIA LIETUVA, AB;
- 3) Work in the protection zone of existing networks is carried out by calling a representative of the operating organisation.
- 4) Only start excavation work after obtaining an excavation permit, an agreed project, a construction work log and a building demarcation certificate with a diagram;
- 5) Mark the locations of existing underground engineering networks and facilities, the boundaries of immovable cultural property and their protection zones, and take measures to protect the structures, soil to be protected, and vegetation from potential damage;
- 6) Do not commence excavation work in town squares, streets, driveways and roads until the detours and technical traffic control measures specified in the excavation permit have been installed;
- 7) Excavation in the railway protection zone must be carried out only in the presence of an authorised representative of the railway authority, who must, if necessary, summon representatives of the railway departments concerned.
- 8) Before excavation, in the protection zones of existing engineering networks and facilities, to agree safety measures with the companies using them, to excavate the ground only in the presence of the supervisor of the works and to follow the instructions of the representative of the electricity, heat networks, oil and gas pipeline company (STR 1.06.01:2016 "CONSTRUCTION WORKS - CONSTRUCTION CONSTRUCTION MAINTENANCE"), or with their supervision.

The excavated utilities and installations are backfilled with earth in the presence of representatives of the companies using them. Excavations in the carriageway of roads shall be backfilled with earth under the supervision of a representative of the company using the road. The backfill shall be compacted. The company shall be notified at least one day in advance of the start of the backfilling operations.

In all cases, after the completion of the earthworks, the ground level must be the same as before the works started or changed in accordance with the design of the structure, and geodetic photographs must be taken of the underground communications to be constructed.

3.2. TRENCHING, CABLE LAYING

1. Geodetic alignment

- 1) Marking is carried out with wooden markers at bends and on a linear track every 50m, marking the beginning and the end of the track, axis, location of wells;
- 2) marking the intersections of underground communications by erecting special signs;
- 3) without knowing the exact locations of the existing communications, trenching shall be carried out every 20 m (0.35 m wide transverse trenches across the full width and depth of the trench); the location of the cables shall be determined by finder;
- 4) a geodetic alignment record shall be drawn up, accompanied by an alignment diagram, in the presence of the contractor and the client's maintenance engineer.



2. Trenching

- 1) on city streets by hand, and in undeveloped areas by single- or multi-shovel excavators, or by non-routing cable-laying machines;
- 2) the excavated soil is poured onto the slope of the trench at a distance of at least 0.5 m from the edge of the trench;
- 3) the excavated trench is cleared of stones and debris; a base of loose soil 10 cm thick is laid, and a base of sand is laid in clay or loam;
- 4) Trenching with vertical walls without anchoring is allowed:
 - in poured soils up to a depth of 1.0 m;
 - in sandy loams up to 1.25 m deep;
 - in loams and clays up to 1.5 m deep.
- 5) Mechanised trenching is allowed in the cable protection area:
 - single axle excavators up to 50 to the depth of the existing cable and within 1,0 m of the axis of the existing cable;
 - using multi-bus excavators 1.0-1.5 m from the existing cable;
 - with cable layers (non-routing) - 1.5 m from the existing cable.
- 6) unbundling of electrical cables is carried out manually, without impact;
- 7) tolerances from the design bottom elevation:
 - + 15 cm when digging with single-point excavators;
 - + 10 cm when digging with trenchers. Winter excavation:
 - Pneumatic and compressor-based loosening;
 - Thawing the soil by covering the excavation area with hoods and letting the heat from the stoves escape;
 - Electric ground thawing by fencing off the heated area at a distance of at least 3.0 m and posting warning signs;
 - no open flames above existing cables;
 - can be excavated without scraping to freezing depth, except for sand.
 - low-voltage cables at depths of 0.35-0.70 m and in areas of frequent excavation are protected by enclosures or laid in conduits.

3. Backfilling of trenches

Backfilling of trenches shall be carried out in three phases:

- a levelling layer that is poured under the pipe;
- the initial backfill layer;
- final topping up.

The cable shall be partially backfilled with a layer of at least 10 cm thick:

- sand in loams;
- sand, sandy loam - soil excavated from trenches, free of stones and construction debris. Cables shall be protected against mechanical damage:
 - low-voltage cables at depths of 0.35-0.70 m and in areas of frequent excavation are protected by enclosures or laid in conduits.

The width of the signal strip per cable is 10 cm, thickness 0,5 mm. The signal strip shall be levelled when the trench is backfilled.

Once the cable protection has been installed, representatives of the electrical installation company and the construction organisation, together with the customer's supervising engineer, inspect the route and draw up a covered works report. Geodetic photographs of the communications shall be taken.

The soil is compacted in layers of 20-30 cm by means of small machinery, with a compaction ratio of 0.98. When laying cables across fields, the backfilled trench shall not be compacted. In road and street crossings, the trench is filled with sand. If necessary, only horizontal drilling is possible, on both sides by excavating sinkholes on either side.



4. Levelling layer

The minimum thickness of the levelling layer to be formed on top of the soil or the chosen substructure is 100 mm. In the absence of specific instructions in the design, sand, gravel or crushed stone shall be used for the levelling layer.

The maximum particle size of the sand, gravel or crushed stone components used for the levelling layer shall not exceed 10 % of the diameter of the pipe (in any case not more than 20 mm). If the soil meets these requirements, no levelling layer is required.

5. Cable laying

Cable laying depths:

- 6-10 kV, control, low-voltage and communication cables - 0,7 m;
- cables under roads and streets - 1.0 m

Minimum distances between parallel cables:

- 0,10 m between power and control cables;
- between the control cables - not to be fixed;
- 0.5 m between the cable to be laid and an existing cable belonging to another organisation.

The cable shall be laid in a dry trench. In case of high groundwater, it shall be laid in the open pumps or needle filters, discharging into existing ditches or storm sewers.

The trench is cleared of stones and debris, and a base of loose soil 10 cm thick is prepared, with a base of sand in clay or loamy loams.

Before laying the cable, the maintenance engineer (customer) shall be called and together with the contractor shall check:

- trench depth, bend angles;
- cable certificates;
- cable drum inspection certificates; winter cable laying is allowed:
- cables with impregnated paper insulation - not below 0 °C;
- plastic-insulated cables from -7 °C to -20 °C.

At lower temperatures, the cable shall be warmed up with indoor heating appliances before laying:

- at temperatures between +5 and +10 °C - 72 h
- at temperatures between +10 and +25 °C for 24 hours;
- at temperatures between +25 and +40 °C - 18 h

The width of the signal strip per cable is 10 cm, thickness 0,5 mm. The signal strip shall be levelled when the trench is backfilled. After the cable protection has been installed, representatives of the electrical installation company and the construction organisation, together with the customer's supervising engineer, shall inspect the route and draw up a certificate of covered work. Geodetic photographs of the communications shall be taken. The soil is compacted in layers of 20-30 cm by means of small machinery, with a compaction ratio of 0,98. When laying cables across fields, the backfilled trench shall not be compacted. In road and street crossings, the trench shall be backfilled with sand.

6. Primary backfill layer

Primary backfill refers to the materials poured around the pipe on top of the levelling layer. Priming is sometimes referred to as protective or lateral backfilling.

The thickness of the primary backfill above the pipe, unless specified in the design, may be up to 300 mm but not less than 150 mm.

The primary backfill materials shall be of the same quality as the levelling layer.

The primary backfill layer shall be formed when the pipe is laid. This protects the pipe from stones falling from the sides of the trench, etc. The quality and density of the backfill material directly determines the resistance and deformation of the pipe. The backfill layer extending to the side of the pipe must be shaped with particular care. Properly compacted backfill shall support the pipe uniformly and protect it from lateral, longitudinal and overhead loads.

7. Final pouring

In the surrounding area, lightly compactable materials shall be used for the final backfill according to the specific conditions. In uninhabited areas, trenched soil may be used.

Grain size standards shall be applied to the final backfill materials:

- the 1,0 m thick layer (measured from the top of the pipe) must be free of stone or rubble fragments larger than 300 mm in diameter; - the aggregate material must be of different grain sizes to avoid voids that increase the possibility of uneven freezing.

3.3. CABLE END PREPARATION

Preparation of cable ends up to 10kV, carried out by cutting the cable, removing the insulation and unbundling the cores.

Preparation of the ends of the cable cores, including procurement of all materials. Cable insulation - plastic.

3.4. INSTALLATION OF EARTHING

The earthing switch shall be equipped with steel lugs, steel resistive rods and couplings to connect them together. The rods shall be hammered into the ground and connected to each other. The forging shall be carried out until the instrumentation indicates that the earth resistance of the earth electrode is less than 30Ω for the re-grounding and 10Ω for the earthing of the enclosures in the IAS and AVS. This type of earthing switch is usually installed in soils with low resistivity. These include clay, loam, black soil and mixed soils of the above components.

3.6. INSTALLATION OF PIER FOUNDATIONS

The foundations of the piers are designed in the structural part of the project.

3.7. INSTALLATION OF A HEAT-SHRINK GLOVE

The root of the cable is sealed by a thermoshrink glove with a thermoplastic adhesive on the inner surface. This glove shall be placed over the cores and the end of the outer sheath of the cable. The gap between the cable tip and the insulation of the strand is also sealed by a heat-shrink tube with an inner surface coated with a thermosetting adhesive. All materials are UV-resistant and resistant to sunlight and atmospheric agents. The set of end sleeves for armoured cables shall include a non-solderable earthing fitting consisting of a spring and an earthing conductor. If it is necessary to protect the insulation of the cores against UV radiation, insulating CGPT tubes can be ordered separately.

3.8. INSTALLATION OF THE SUPPORT

Installation of lighting supports is carried out by crane. The lighting supports shall be installed on a reinforced concrete VGAP-type foundation. The installation shall be carried out in accordance with the technical requirements of the support manufacturer.

3.9. INSTALLATION OF TERMINALS

The terminals are mounted inside the support on the busbar. The fuse box with fuses is also mounted on the same busbar on the right side.

3.10. OPENING THE CABLE IN THE LIGHTING SUPPORT

After installation of the support, the cable in the lighting support shall be opened from top to bottom without damaging the cable insulation. Only double insulated cables shall be used.

3.11. FIXING AND CONNECTING THE LUMINAIRES ON THE BRACKET

The luminaires are mounted from a car turret. The luminaire shall be fixed to the bracket by means of a screw. Servicing, opening and replacing the lamp shall be carried out without tools or with a minimum of tools. Servicing shall be carried out by opening the top cover from above.

4. ADDITIONAL INSTRUCTIONS

4.1. TESTING, QUALITY CONTROL OF WORKS

Individual stages of the works may be inspected by services appointed by the builder. An inspection report shall be drawn up for each inspection.

Any deficiencies found must be rectified at the expense of the company that carried out the work, within a time limit set by the builder.

4.2. SAFETY OF WORK

Work shall be carried out in accordance with the Safety Regulations for the Operation of Electrical Installations, the Safety and Health Regulations for Construction (for work not covered by the Safety Regulations for the Operation of Electrical Installations), the company's (branch) safety and health instructions and other normative documents on occupational safety and health.

The work may be carried out by theoretically and practically trained electrical personnel (certified in accordance with the prescribed procedures and holding documents conferring the relevant rights as electrical personnel).

Work on operating electrical installations shall only be carried out by non-electrical personnel under the supervision of the person(s) responsible for the electrical installation. In this case, the instructions of the supervisor to the workers to ensure electrical protection shall be mandatory.

Electrical workers are responsible for compliance with and breaches of workplace safety rules in accordance with their qualifications, competence and rights, which are defined by employment contracts or other mutually agreed obligations.

Only electrical personnel with competence as defined in the EVS shall be authorised to give instructions for work on electrical installations.

Construction and installation work must only be carried out by companies certified for this type of work.

This construction project does not include complex structures with unmastered technology, therefore the construction and installation works should be guided by the regulation STR 1.06.01:2016 "Construction works. Construction supervision" and other documents regulating the construction process.

Follow the "*Rules for the safe operation of electrical equipment*" when working on operating electrical equipment. The requirements of these rules must be complied with by those carrying out operation and installation work. Work by non-electrical workers may only be carried out under the supervision of an electrical engineer. In this case, the instructions of the supervisor to the workers to ensure electrical protection are mandatory.

To ensure the safety and health of workers working on overhead lines, it is necessary to disconnect (de-energise) and earth the OL at the points of disconnection from which voltage may be applied (including the possibility of voltage application due to reverse transformation), or to earth between the point of disconnection (de-energisation) and the workplace. The movable earthing switches at the point of disconnection (tripping) shall be connected to an earthing device.



When climbing onto a support with fitter's claws or climbing irons is dangerous (due to insufficient support, obstruction of structures mounted on the support, etc.), the support must be reinforced or a people lifting mechanism must be used.

The methods of support demolition and construction, the necessity of their fastening, and the ways of fastening are determined by the work supervisor, following technological cards, project documentation, DSSI, and other regulatory acts.

Legal and physical entities carrying out work in active electrical installations, which they do not own by ownership or trust rights, must submit a certificate from the State Energy Inspectorate and/or the Ministry of Environment, granting the right to perform such work, and a list of electrical workers specifying their qualification category and rights. Failure to submit such a document and list prohibits allowing employees of another company or individual to work.

Legal entities entering into a contract must, before starting work on the client's electrical installations, draw up acts of mutual responsibility for occupational safety and health (contract agreements). These agreements must establish the procedure for organizing and performing work, responsibility, relationships between the contractor's and client's employees, and the procedure for instructing dispatched workers.

Special minimum requirements for the arrangement of workplaces in construction sites:

Stability and firmness:

- Movable or stationary workplaces, regardless of their height or depth, must be stable and firm. When installing them, it is necessary to take into account the number of workers, the possible maximum load, its distribution, and possible external influences. If supporting and other parts of these workplaces are unstable, their stability must be ensured by reliable and safe fastening devices to prevent accidental or spontaneous sliding of the entire workplace or its part.
- The stability and firmness of the workplace must be properly checked, especially after changing its height or depth.

Electrical equipment and installation:

- Electrical equipment and installation at the construction site, especially if they are affected by environmental factors, must be regularly supervised and inspected.
- It is mandatory to specify, check, and clearly mark the devices that were in the construction site before installing it.

Atmospheric impact:

- Workers must be protected from atmospheric factors that are harmful to their safety and health.

Falling objects:

- Workers must be protected from falling objects by collective safety measures, and necessary personal protective equipment must be issued to workers.
- Materials and equipment must be arranged or stacked in piles so that they cannot slip or overturn. If necessary, passages must be covered or ensured that it is impossible to enter dangerous areas.

Poles and ladders:

- All poles must be properly designed, installed, checked, and maintained to prevent tipping or sudden movement.
- Work platforms, galleries, and pole ladders must be designed and installed to reliably protect workers from falling or falling objects.
- Poles must be regularly checked.

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- Before starting to use;
- During regular periods of use;
- After relocation, interruptions in use, adverse weather conditions, or weak underground impacts, natural disasters, or other circumstances that could affect the stability or firmness of the poles;
- Ladders must be sufficiently strong and properly maintained. They must be used in appropriate locations and for their intended purpose;
- It must be ensured that mobile (movable) poles do not move on their own.

Lifting mechanisms:

- All lifting mechanisms and lifting tools, including essential components, fasteners, supports, must be: properly designed and constructed and sufficiently strong to be used for their intended purpose; correctly assembled and used; kept in good condition; inspected and regularly tested and controlled, following the laws of the Republic of Lithuania on the supervision of potentially hazardous equipment and other normative legal acts; serviced by qualified (appropriately trained, certified) personnel.

The employer must ensure that first aid can be provided at any time. Employees must be trained to provide first aid to the injured. An employee who has been injured or suddenly falls ill due to an accident must be promptly taken to a medical institution.

4.3. SAFETY REQUIREMENTS AND GENERAL SITE PROCEDURES

The contractor is responsible for all safety equipment on the construction site and must comply with all safety requirements specified in the normative acts and laws of the Republic of Lithuania. All contractor's employees must be properly trained to perform their assigned construction tasks, adhering to all safety requirements and not posing a danger to their own, others', and other workers' health. The contractor designates a person for each work zone who, in addition to supervising the progress of the work, is responsible for safety in that zone.

The contractor must fill out a safety briefing journal, and all individuals working on the site or construction site must sign in this journal, confirming that they have attended the safety briefing. Only individuals with specified permits are allowed to work with lifting mechanisms.

4.4. CLEANING

Construction waste that arises on the construction site must be removed to the landfill.

All waste, debris, and construction waste collected during cleaning are the property of the Contractor and must be removed from the construction site without obstructing traffic on the streets or disturbing neighboring property owners.

Upon completion of the work, it is the responsibility of the Contractor to remove all debris and unnecessary materials from the construction site and the surrounding area, including temporary structures, construction signs, tools, poles, materials, construction equipment, and devices used by them or their subcontractors in performing the work. The Contractor must clean the work area and leave the work zone in an orderly manner (submitting it to the relevant local government department according to the established procedure).

4.5. WARRANTIES

The Contractor must provide warranties for the work performed in accordance with the laws applicable in Lithuania.

0	2023-11	BUILDING PERMIT, COMPETITION		
REVISION	DATE	RELEASE STATUS. REASON FOR THE CHANGE (IF APPLICABLE)		
Designer	No. of the qualification document.	Responsibilities	Name, surname	Signature
UAB Kelprojektas	39928	PM	Rimantas Valančius	
UAB "ST projektai"				



5. BILL OF QUANTITIES
5.1. BILL OF MATERIALS

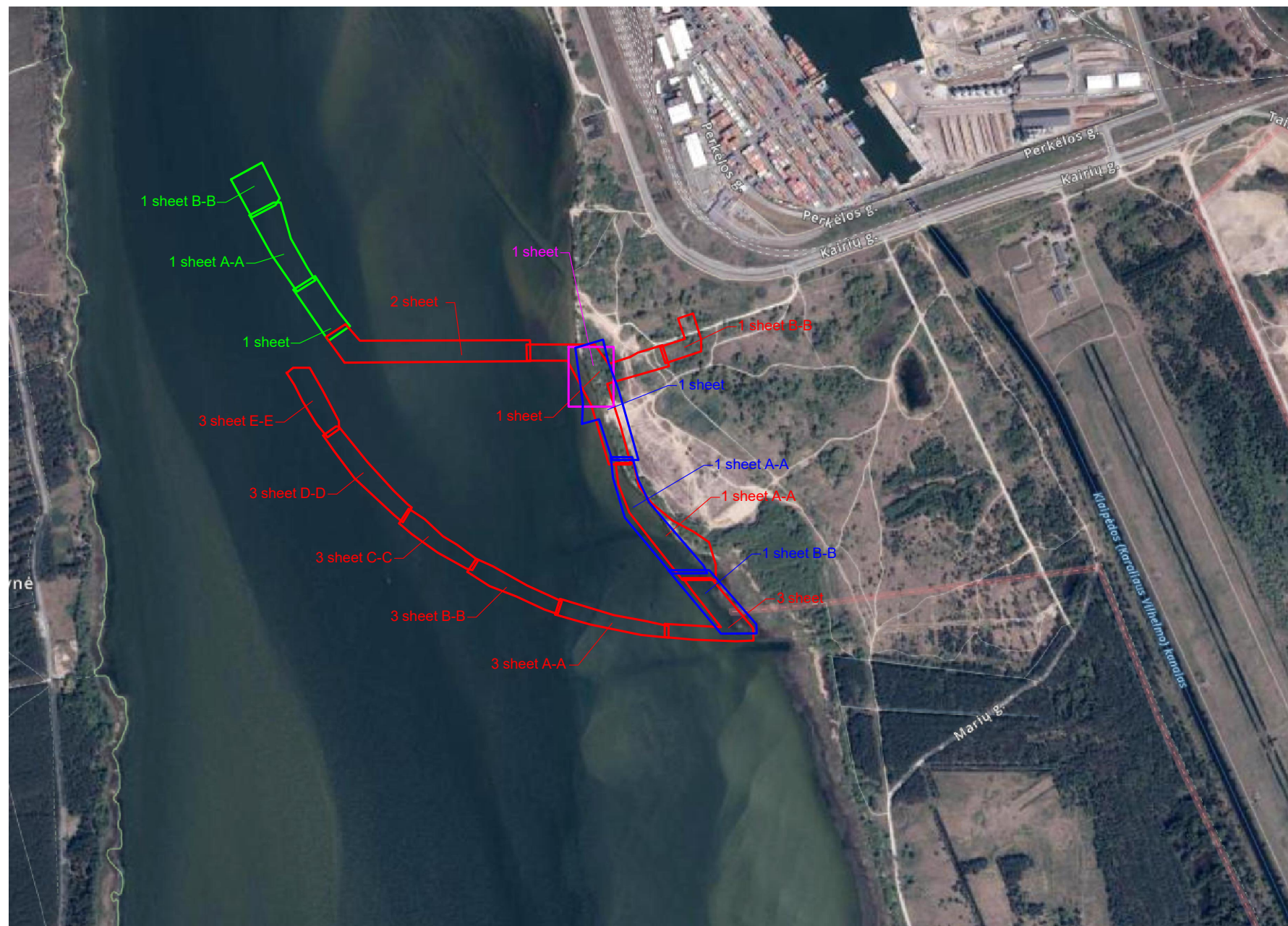
Row No.	Name	Tech. specif. tag	Units	Quantity
1.	LED luminaire 30W	2.1	compl.	71
2.	Polyurethane flexible spotlight LED 220W (mounting elements included)	2.2	compl.	2
3.	Illumination control panel (includes an astronomical clock with a photo sensor and one control group).	-	compl.	1
4.	Support for luminaires. H=4m (above ground)	2.1	compl.	71
5.	Aluminium stranded cable 4x35mm ²	2.3	m	5170
6.	Copper stranded cable 3x2,5 mm ² with double PVC insulation	2.5	m	35
7.	Cable with copper conductors 3x1.5 mm ² with double PVC insulation	2.5	m	355
8.	Cable with copper strands 3x6mm ²	2.3	m	670
9.	1kV rear coupling with 4x35mm ² heat pipes	2.4 2.6	compl.	146
10.	1kV rear bushing with terminal tubes 3x6mm ²	2.4 2.6	compl.	2
11.	PE pipe Ø75mm	2.8	m	5216
12.	Cable signal strip	2.13	m	5216
13.	Release clamp	2.9	compl.	71
14.	Automatic switch 1P C6A (mounted in the support)	2.14	compl.	72
15.	Markings for electrical installations	2.18	compl.	71
16.	Lighting power point with equipment and foundation	2.19 B.02	compl.	1
17.	Earthing kit R≤10Ω:	2.11. 2.12	compl.	3
18.	Galvanised strip 30x4	2.10	m	1890
19.	Galvanised wire d8	2.10	m	216

5.2. INSTALLATION WORKSHEET

Row No.	Name	Tech. specif. tag	Units	Quantity
1.	Manual trenching, backfilling and compaction	3.2	m	200
2.	Mechanised trenching, backfilling and compaction	3.2	m	5016
3.	Laying the cable signal strip	3.2	m	5216

4.	Laying PE pipes d75 in the trench	3.2	m	5216
5.	Laying galvanised tape in the trench	3.2	m	1890
6.	Insertion of the cable into PE/PP pipe/laying in the channel/construction	3.2	m	5875
7.	Placing supports on the foundation	3.8	compl.	71
8.	Installation and connection of luminaires	3.11	compl.	75
9.	Installation of a rear coupling with heat pipes	3.7	compl.	148
10.	Installing the disconnecting clamps inside the support	3.9	pcs.	71
11.	Installation of an automatic switch in the support	3.9	compl.	72
12.	Opening the cable in the lighting support	3.10	m	355
13.	Marking of electrical installations	-	pcs.	71
14.	Installation and commissioning of a lighting power point with equipment and foundation	-	compl.	1
15.	Mounting of the lighting control panel in the control room	-	compl.	1
16.	Installation of the earthing circuit $R \leq 10\Omega$:	3.4	compl.	3
17.	Connection of the lighting power point to the grounding circuit	3.4	compl.	1
18.	Connection of lighting supports and other devices to the grounding circuit	3.4	m	216
19.	Measurement of grounding circuit resistance	3.4	compl.	3
20.	Measurement of transitional resistance in grounding device contact connections	-	compl.	3
21.	Measuring the insulation resistance of a cable	-	compl.	75
22.	Measurement of impedance in phase and neutral conductor circuits	-	compl.	75
23.	System commissioning and debugging	-	compl.	1
24.	Filler photo	-	compl.	1

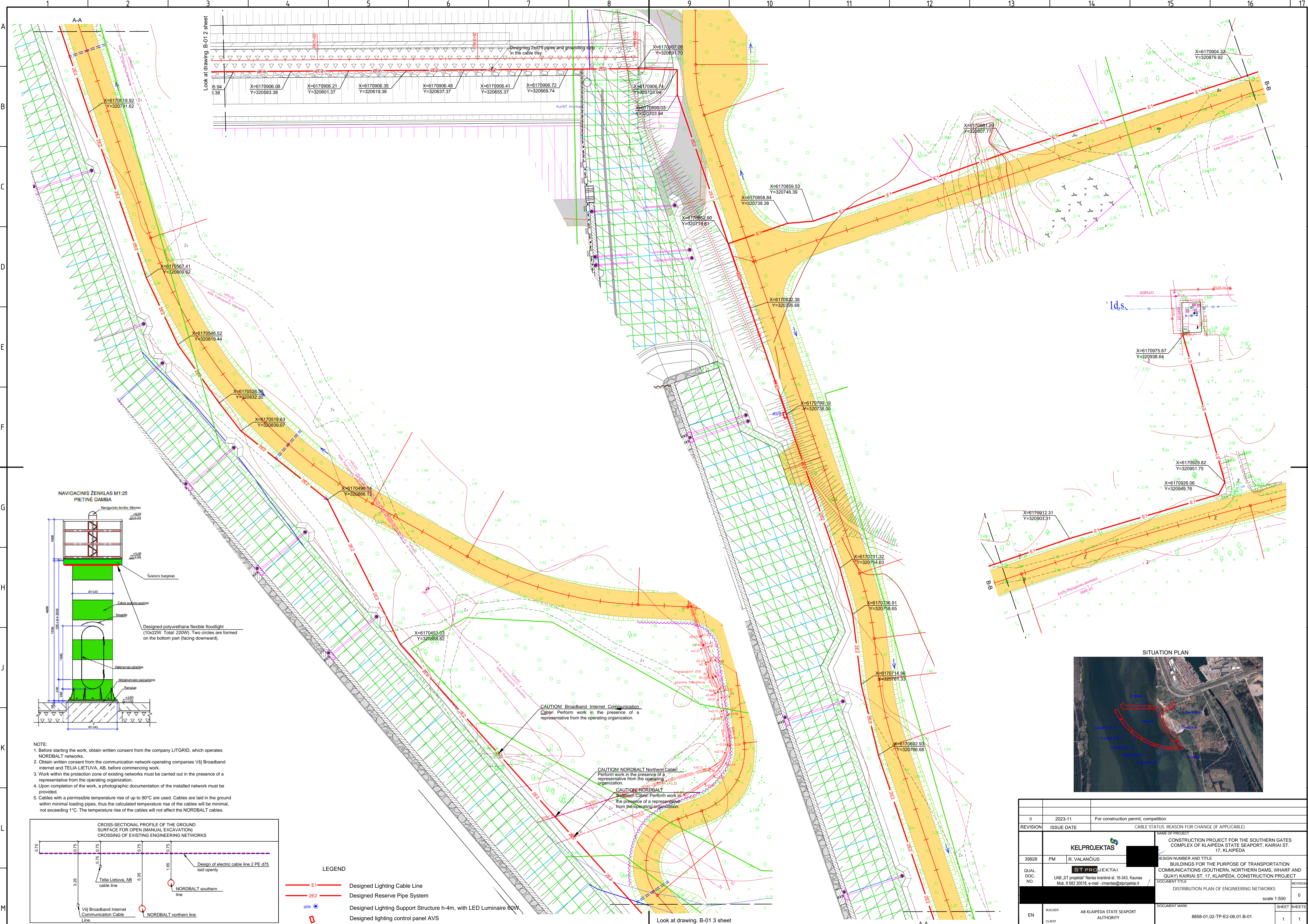
0	2023-11	BUILDING PERMIT, COMPETITION		
REVISION	DATE	RELEASE STATUS. REASON FOR THE CHANGE (IF APPLICABLE)		
Designer	No. of the qualification	Responsibilities	Name, surname	Signature
UAB Kelprojektas	39928	PM	Rimantas Valančius	
UAB „ST projektai“				



NOTES.

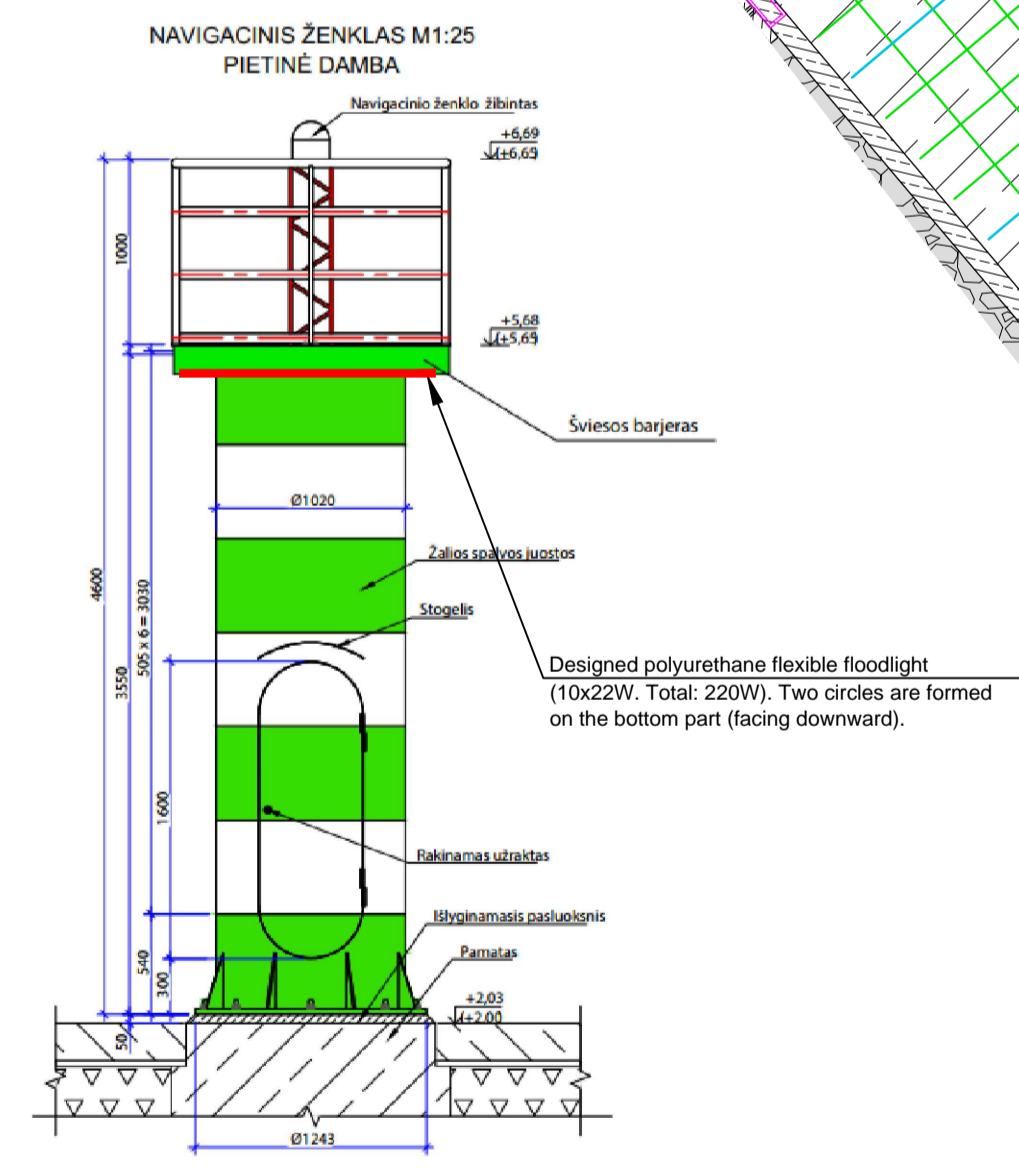
1. Zones marked in red color - part of the project 8858-01,02-TP-E-06.01
2. Zones marked in green color - part of the project 8858-02-TP-E-06.04
3. Zones marked in blue color - part of the project 8858-03-TP-E-06.02
4. Zones marked in purple color - part of the project 8858-04-TP-E-06.03

0	2023-11	For construction permit, competition			
REVISION	ISSUE DATE	CABLE STATUS. REASON FOR CHANGE (IF APPLICABLE)			
			NAME OF PROJECT CONSTRUCTION PROJECT FOR THE SOUTHERN GATES COMPLEX OF KLAIPĖDA STATE SEAPORT, KAIRIAI ST. 17, KLAIPĖDA		
39928	PM	R. VALANČIUS	DESIGN NUMBER AND TITLE BUILDINGS FOR THE PURPOSE OF TRANSPORTATION COMMUNICATIONS (SOUTHERN, NORTHERN DAMS, WHARF AND QUAY) KAIRIAI ST. 17, KLAIPĖDA, CONSTRUCTION PROJECT		
QUAL. DOC. NO.	UAB „ST projektai“ Neries krantinė st. 16-343, Kaunas Mob. 8 683 30018, e-mail - irmantas@stprojektai.lt		DOCUMENT TITLE PROJECT PARTS LAYOUT PLAN		REVISION 0
EN	BUILDER	AB KLAIPĖDA STATE SEAPORT AUTHORITY		DOCUMENT MARK 8858-01,02-TP-E2-06.01.B-02	SHEET SHEETS 1 1



Look at drawing: B-01 2 sheet

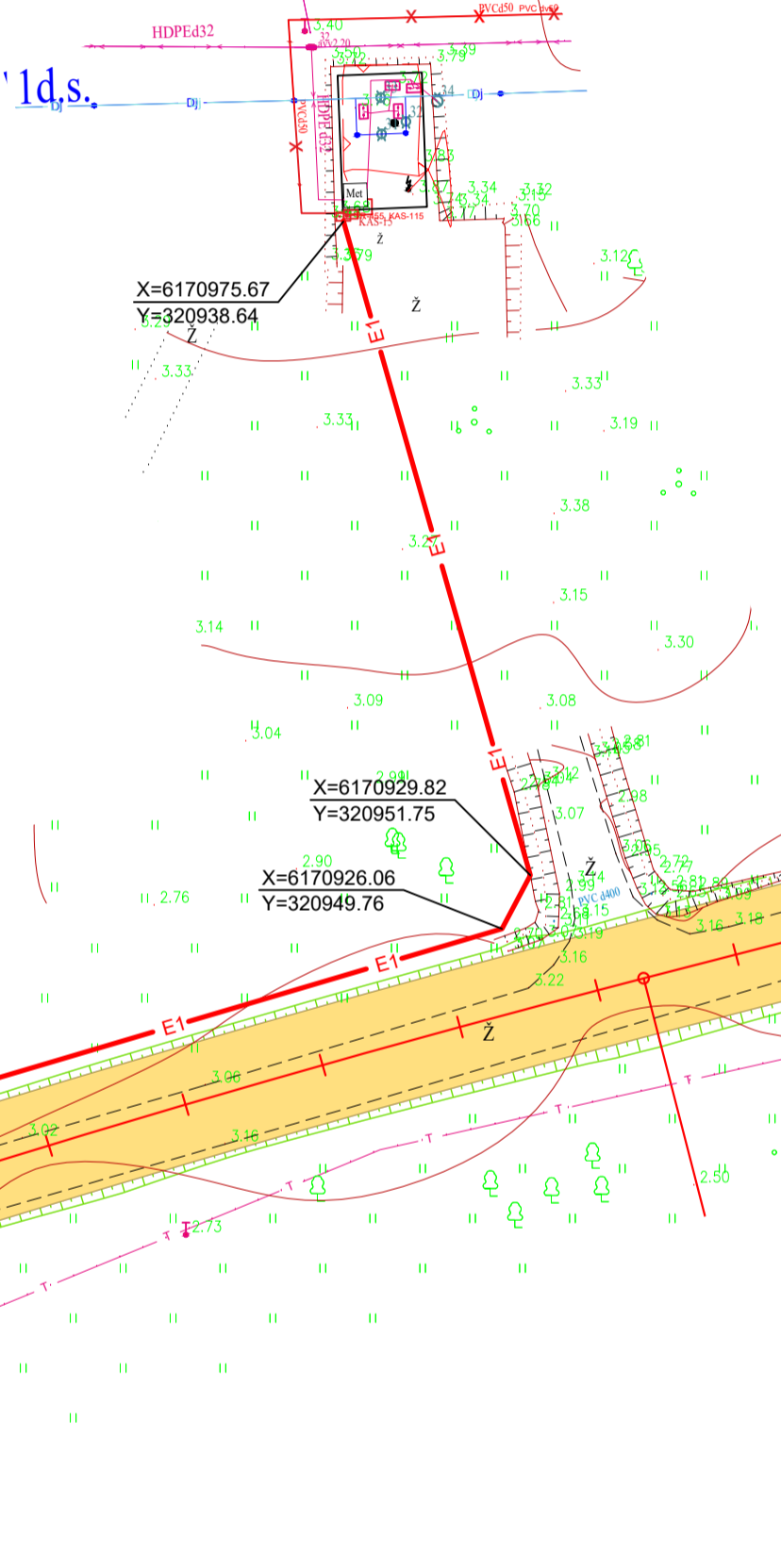
Look at drawing: B-01 3 sheet



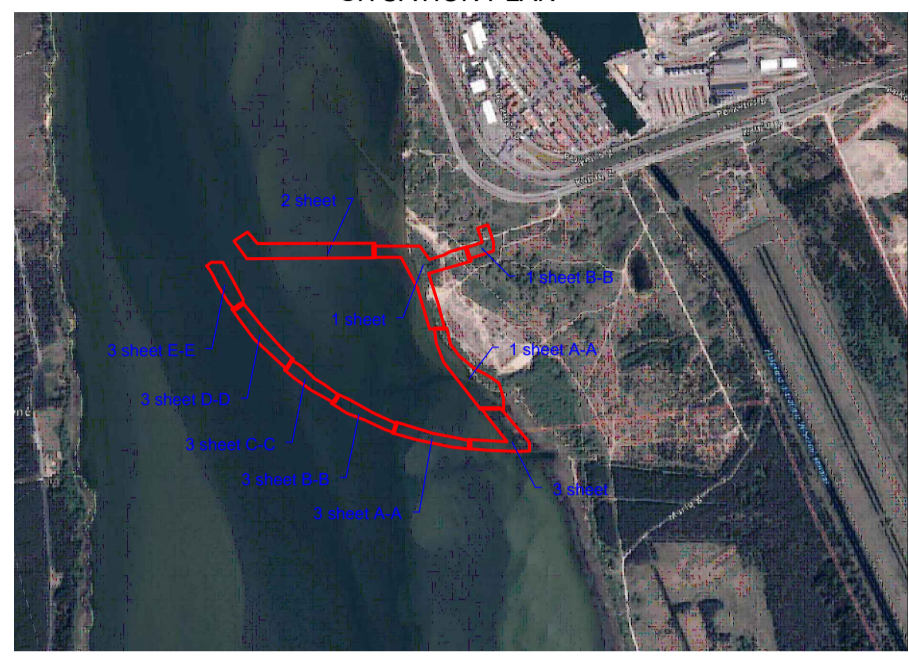
- NOTE:
- Before starting the work, obtain written consent from the company LITGRID, which operates NORDBALT networks.
 - Obtain written consent from the communication network-operating companies VŠĮ Broadband internet and TELIA LIETUVA, AB, before commencing work.
 - Work within the protection zone of existing networks must be carried out in the presence of a representative from the operating organization.
 - Upon completion of the work, a photographic documentation of the installed network must be provided.
 - Cables with a permissible temperature rise of up to 90°C are used. Cables are laid in the ground within minimal loading pipes, thus the calculated temperature rise of the cables will be minimal, not exceeding 1°C. The temperature rise of the cables will not affect the NORDBALT cables.

- LEGEND
- E1 — Designed Lighting Cable Line
 - E2 — Designed Reserve Pipe System
 - 30W — Designed Lighting Support Structure h-4m, with LED Luminaire 80W
 - AVS — Designed lighting control panel AVS

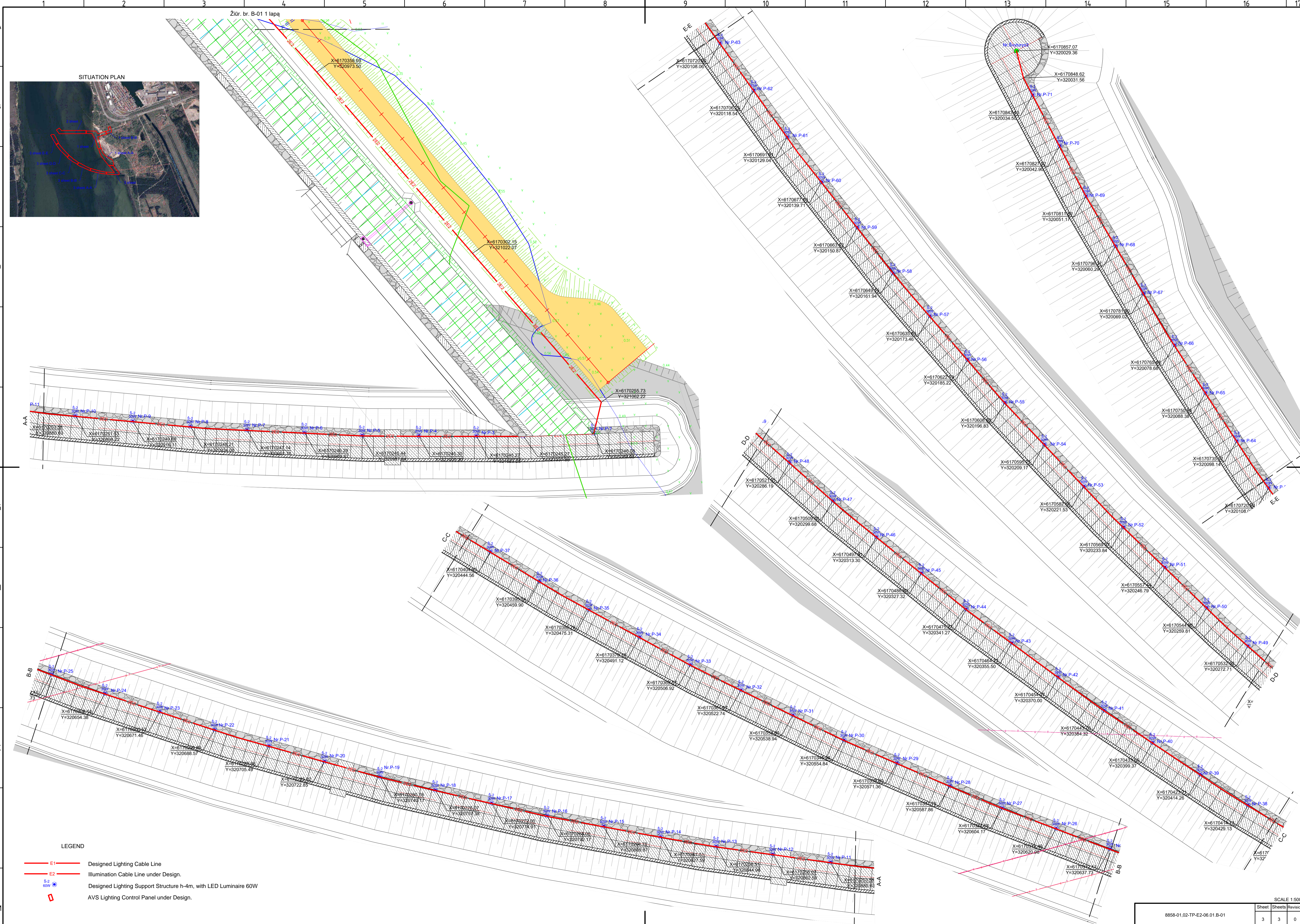
l.d.s.



0	2023-11	For construction permit, competition
REVISION	ISSUE DATE	CABLE STATUS, REASON FOR CHANGE (IF APPLICABLE)
39928	PM R. VALANČIUS	CONSTRUCTION PROJECT FOR THE SOUTHERN GATES COMPLEX OF KLAIPĖDA STATE SEAPORT, KAIRIAI ST. 17, KLAIPĖDA
QUAL. DOC. NO.	UAB „ST projektai“ Neries krantinės st. 16-343, Kaunas Mob. 8 683 30018, e-mail - rmanantas@stprojektai.lt	DESIGN NUMBER AND TITLE BUILDINGS FOR THE PURPOSE OF TRANSPORTATION COMMUNICATIONS (SOUTHERN, NORTHERN DAMS, WHARF AND QUAY) KAIRIAI ST. 17, KLAIPĖDA, CONSTRUCTION PROJECT
EN	BUILDER CLIENT	AB KLAIPĖDA STATE SEAPORT AUTHORITY
	DOCUMENT MARK	8858-01.02-TP-E2-06.01-B-01
	scale	1:500
	SHEET	1
	SHEETS	1



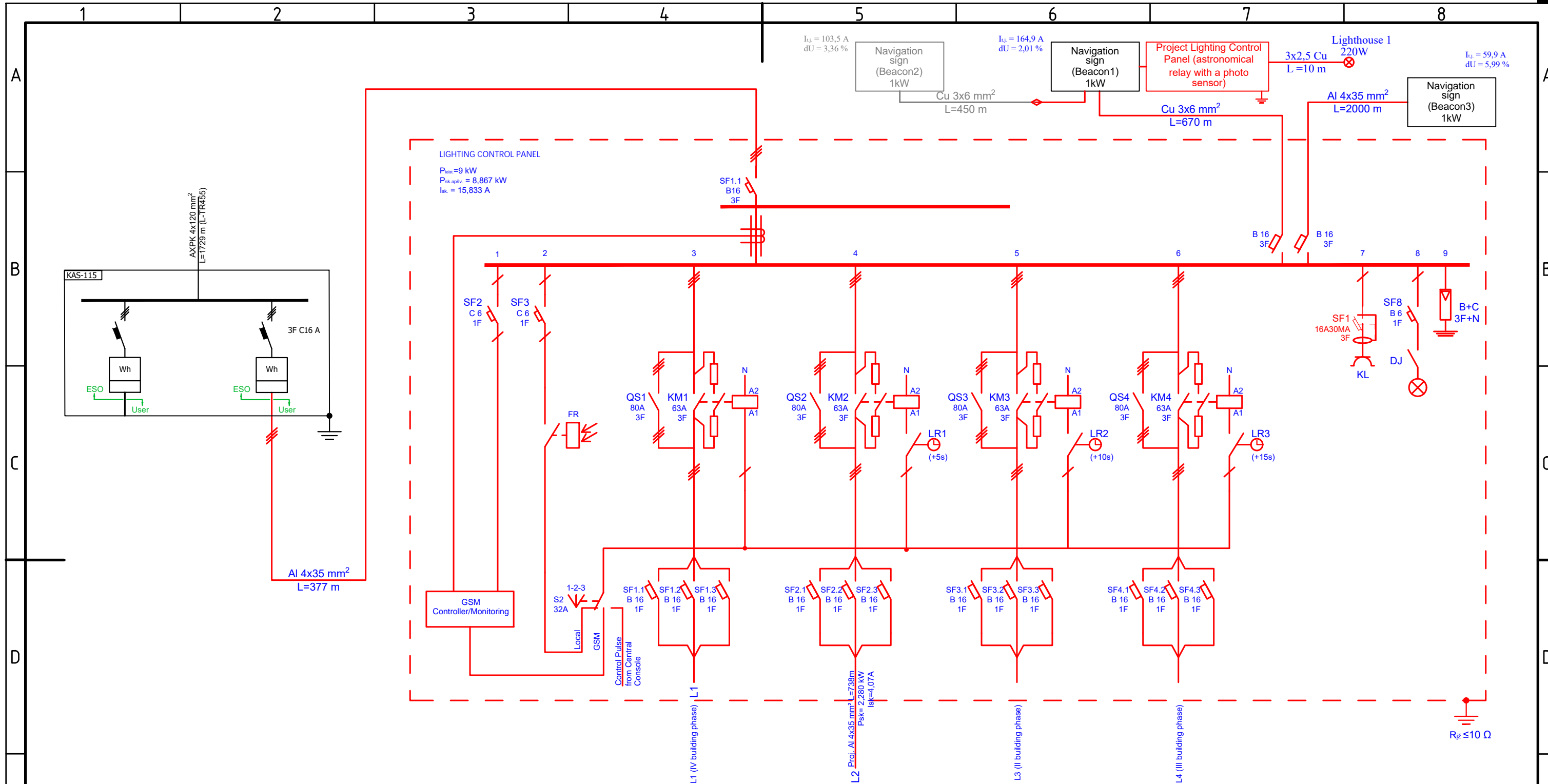
SITUATION PLAN



Žiūr. br. B-01 1 lapa

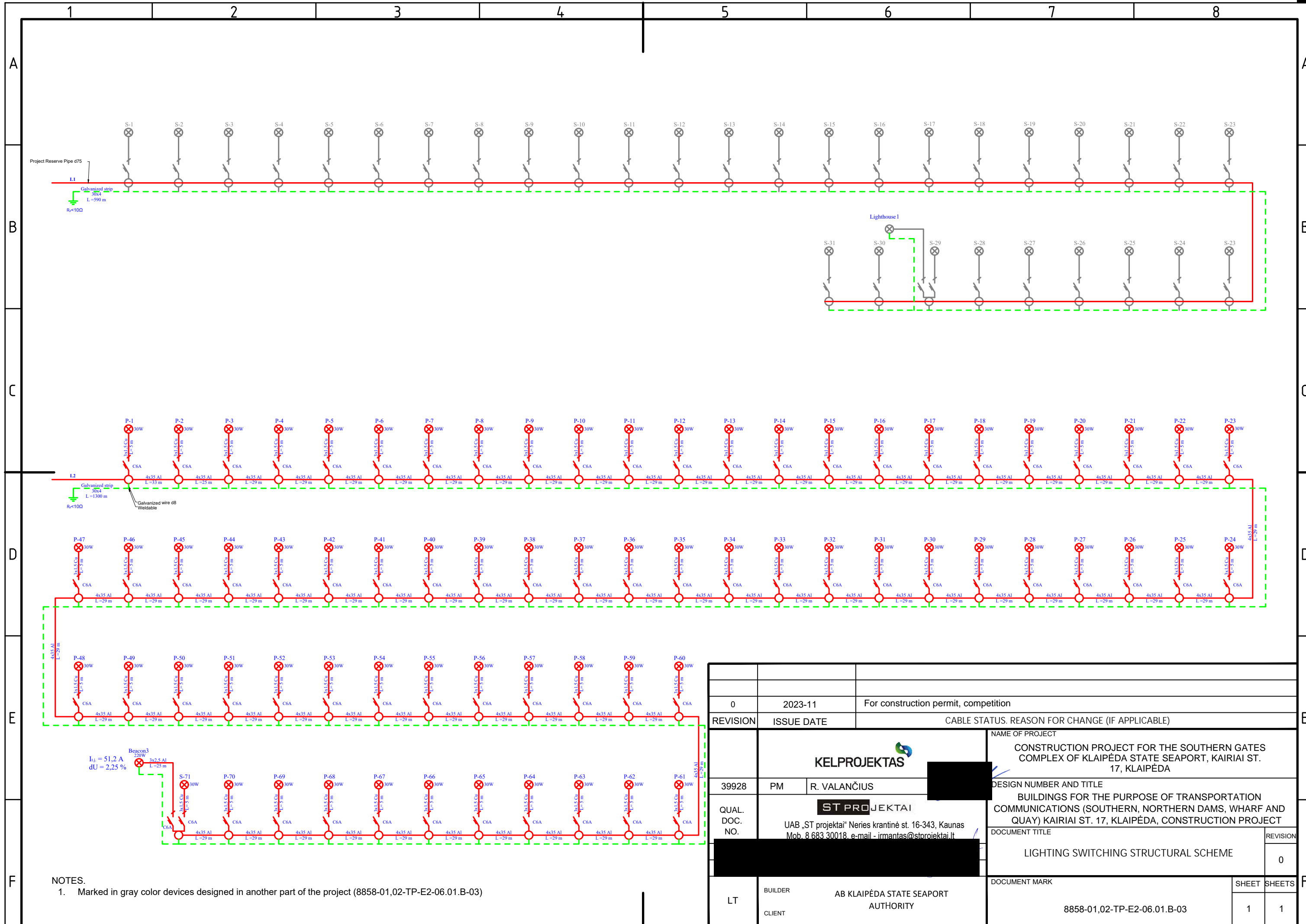
- LEGEND**
- E1 — Designed Lighting Cable Line
 - E2 — Illumination Cable Line under Design.
 - ⊙ 60W — Designed Lighting Support Structure 4-m, with LED Luminaire 60W
 - — AVS Lighting Control Panel under Design.

8558-01_02-TP-E2-06.01.B-01		SCALE 1:500	
Sheet	3	Sheets	3
Revision	0		



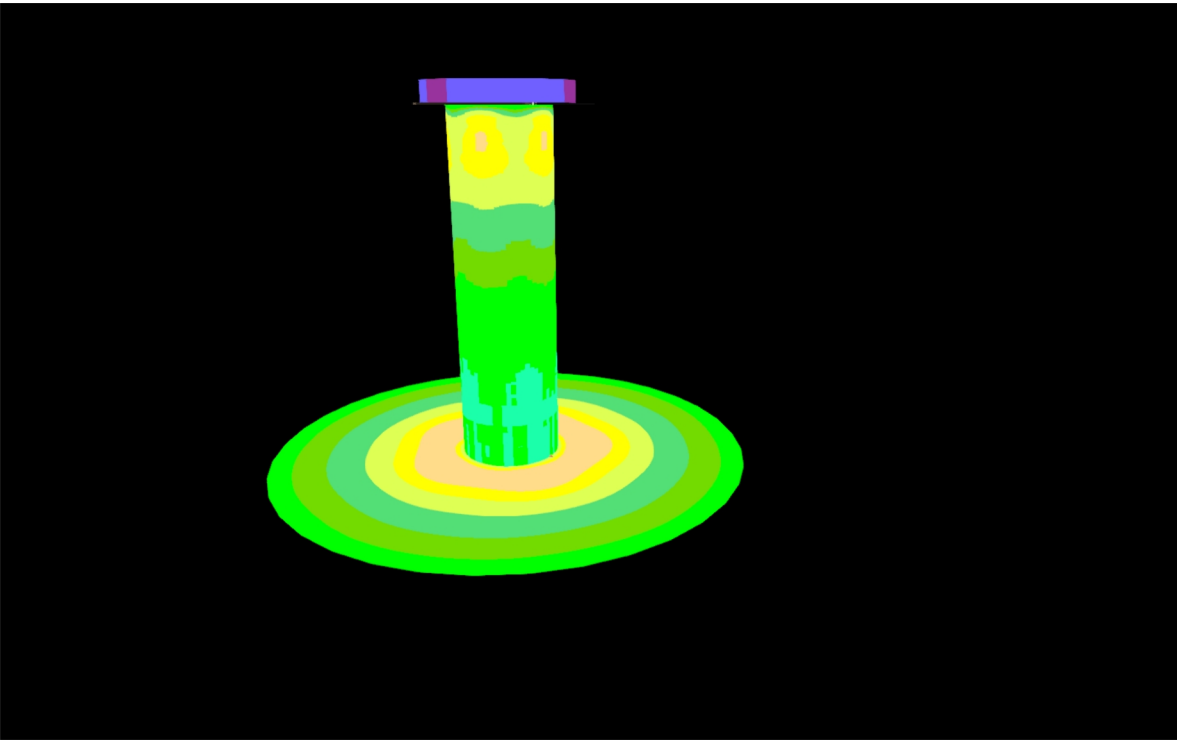
- Notes:
1. The connection of the designed lighting supports is planned from the designed lighting control panel AVS
 2. The layout and assembly of the equipment in the panel are adjusted during the detailed design phase
 3. For Lighthouse No.1, the connection of LED strips beneath the lighthouse is planned with a temporary lighting control panel with an astronomical clock and a photo sensor until the completion of Construction Phase IV. The panel is mounted inside the lighthouse.

0	2023-11	For construction permit, competition
REVISION	ISSUE DATE	CABLE STATUS. REASON FOR CHANGE (IF APPLICABLE)
		NAME OF PROJECT
		CONSTRUCTION PROJECT FOR THE SOUTHERN GATES COMPLEX OF KLAIPĖDA STATE SEAPORT, KAIRIAI ST. 17, KLAIPĖDA
39928	PM	R. VALANČIUS
QUAL. DOC. NO.	UAB „ST projektai“ Neris krantinė st. 16-343, Kaunas Mob. 8 683 30018, e-mail - irmantas@stprojektai.lt	
AVS STRUCTURAL DIAGRAM		REVISION
AVS STRUCTURAL DIAGRAM		0
EN	BUILDER	AB KLAIPĖDA STATE SEAPORT AUTHORITY
	CLIENT	8858-01,02-TP-E2-06.01.B-02
		SHEET SHEETS
		1 1

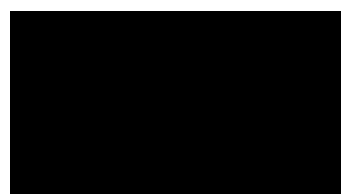


0	2023-11	For construction permit, competition
REVISION	ISSUE DATE	CABLE STATUS. REASON FOR CHANGE (IF APPLICABLE)
39928	PM	R. VALANČIUS
QUAL. DOC. NO.	 ST PROJEKTAI UAB „ST projektai“ Neris krantinė st. 16-343, Kaunas Mob. 8.683.30018, e-mail - irmantas@stprojektai.lt	
LT	BUILDER	AB KLAIPĖDA STATE SEAPORT AUTHORITY
	CLIENT	AB KLAIPĖDA STATE SEAPORT AUTHORITY
NAME OF PROJECT		CONSTRUCTION PROJECT FOR THE SOUTHERN GATES COMPLEX OF KLAIPĖDA STATE SEAPORT, KAIRIAI ST. 17, KLAIPĖDA
DESIGN NUMBER AND TITLE		BUILDINGS FOR THE PURPOSE OF TRANSPORTATION COMMUNICATIONS (SOUTHERN, NORTHERN DAMS, WHARF AND QUAY) KAIRIAI ST. 17, KLAIPĖDA, CONSTRUCTION PROJECT
DOCUMENT TITLE		LIGHTING SWITCHING STRUCTURAL SCHEME
DOCUMENT MARK		8858-01,02-TP-E2-06.01.B-03
	REVISION	0
	SHEET	1
	SHEETS	1

NOTES.
 1. Marked in gray color devices designed in another part of the project (8858-01,02-TP-E2-06.01.B-03)



nav sign

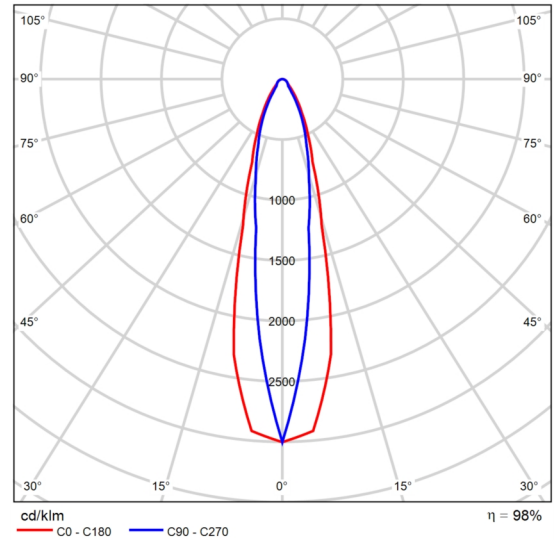


Product data sheet

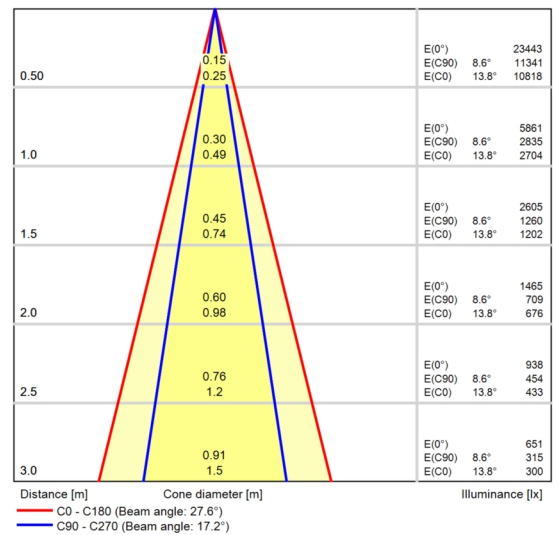
Linea Light Group - Rubber_Ottiche- Strip, White, IP67 - Mono-emission LED 19 W



Article No.	82216N20
P	22.0 W
Φ_{Lamp}	1952 lm
$\Phi_{Luminaire}$	1919 lm
η	98.31 %
Luminous efficacy	87.2 lm/W
CCT	4000 K
CRI	85



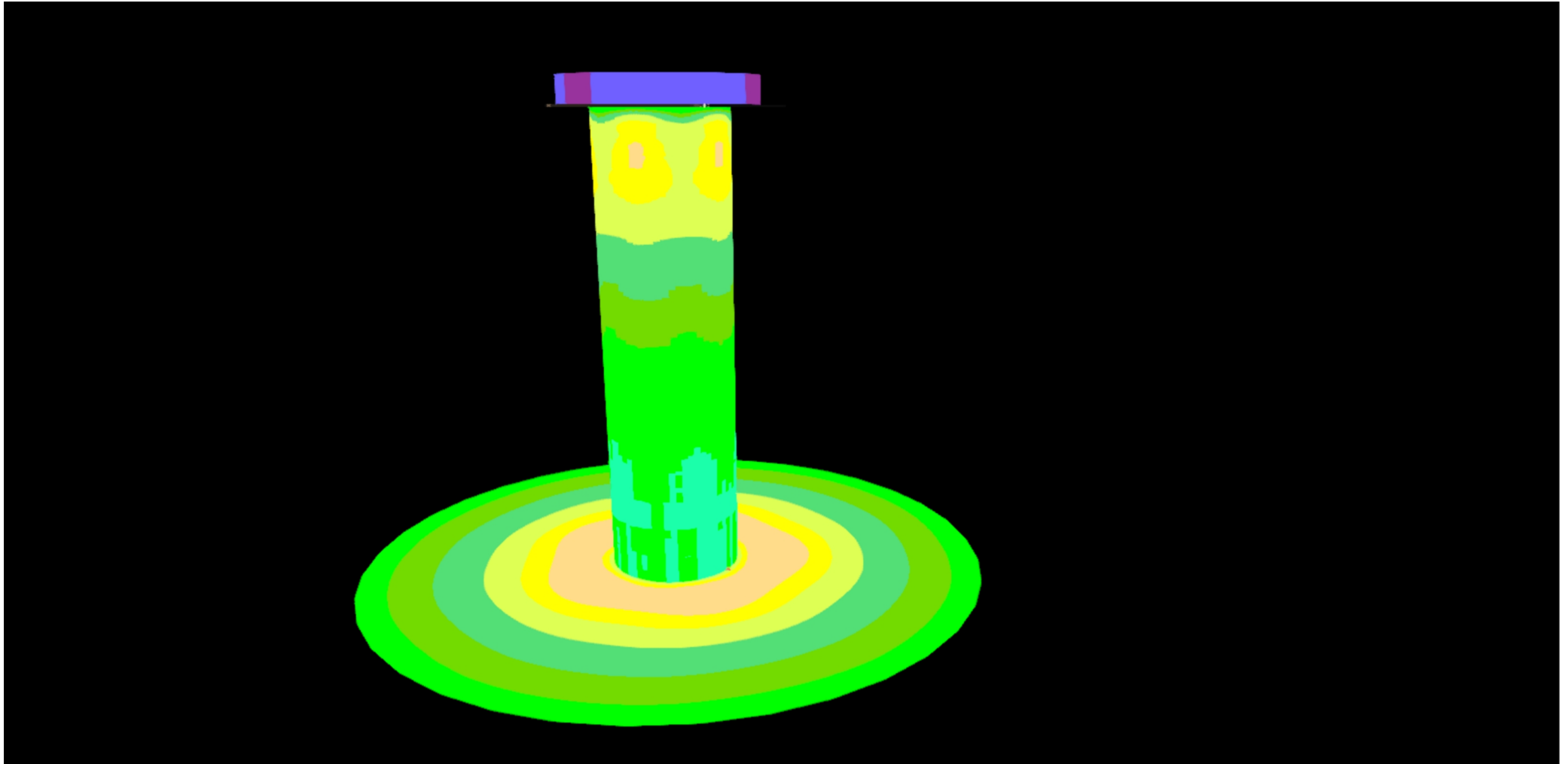
Polar LDC



Cone diagram

nav sign

Images



Site 1

Luminaire list

 Φ_{total}

19190 lm

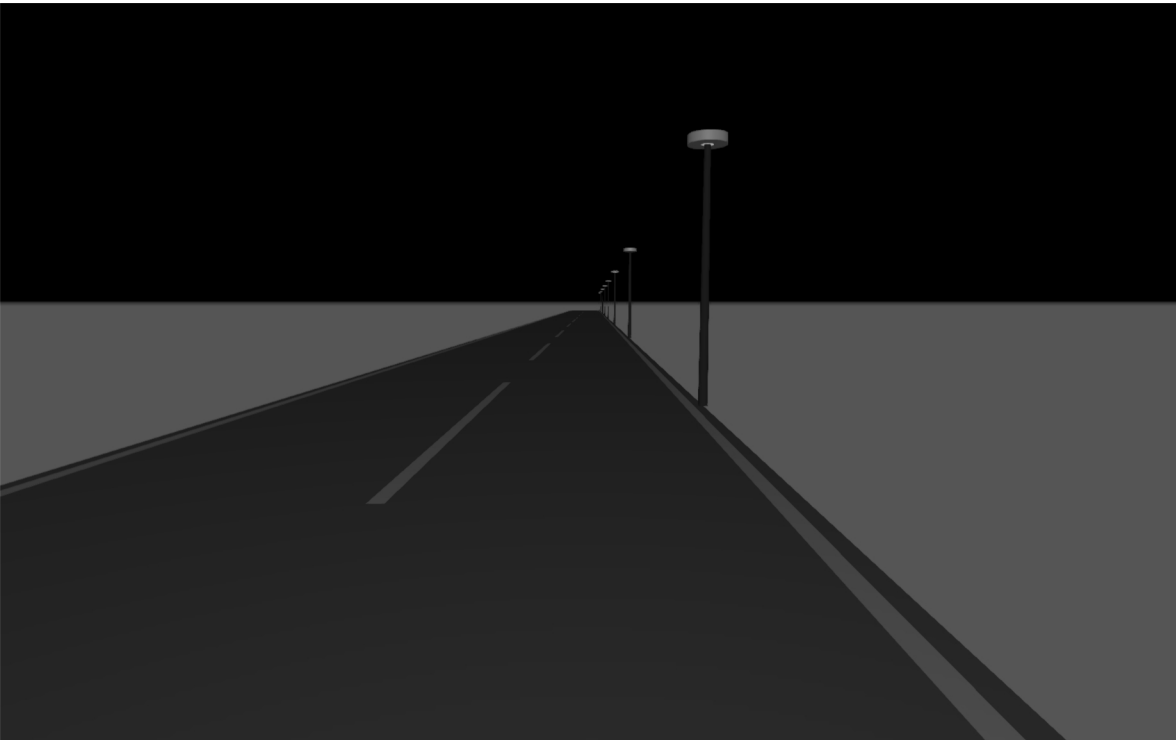
 P_{total}

220.0 W

Luminous efficacy

87.2 lm/W

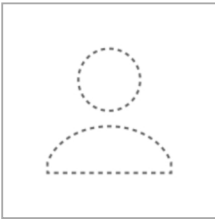
pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
10	Linea Light Group	82216N20	Rubber_Ottiche- Strip, White, IP67 - Mono-emission LED 19 W	22.0 W	1919 lm	87.2 lm/W



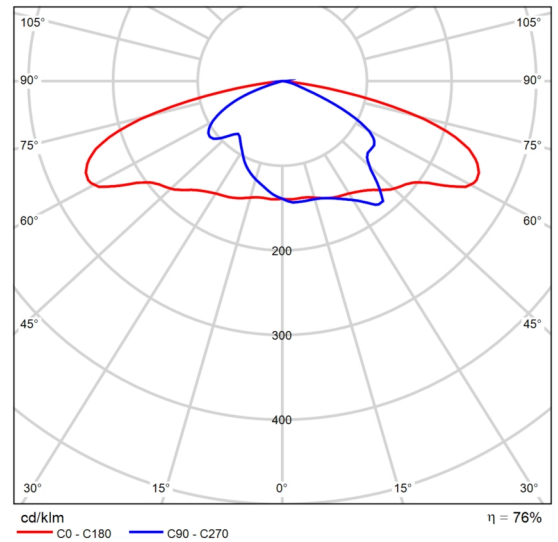
port_quay

Product data sheet

Not yet a DIALux member - NETTUNO-S-180W-3070-A10



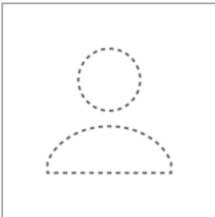
Article No.	NETTUNO-S-180W-3070-A10
P	178.4 W
Φ_{Lamp}	29100 lm
$\Phi_{Luminaire}$	21985 lm
η	75.55 %
Luminous efficacy	123.2 lm/W
CCT	3000 K
CRI	70



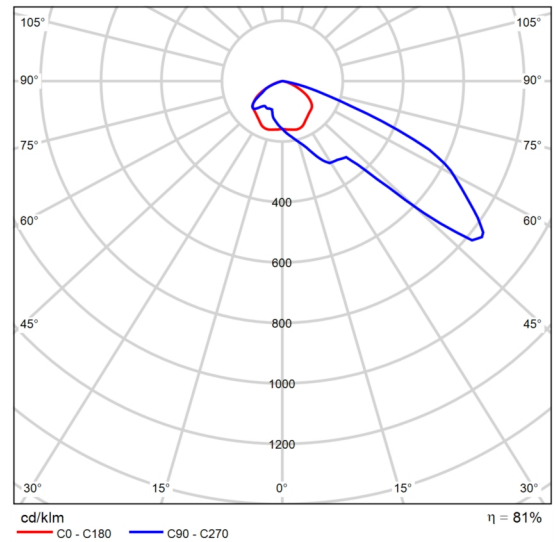
Polar LDC

Product data sheet

Not yet a DIALux member - NETTUNO-S-180W-3070-A13



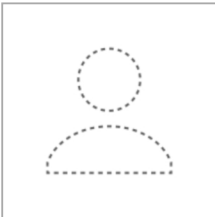
Article No.	NETTUNO-S-180W-3070-A13
P	178.4 W
Φ_{Lamp}	29100 lm
$\Phi_{\text{Luminaire}}$	23437 lm
η	80,54 %
Luminous efficacy	131.4 lm/W
CCT	3000 K
CRI	70



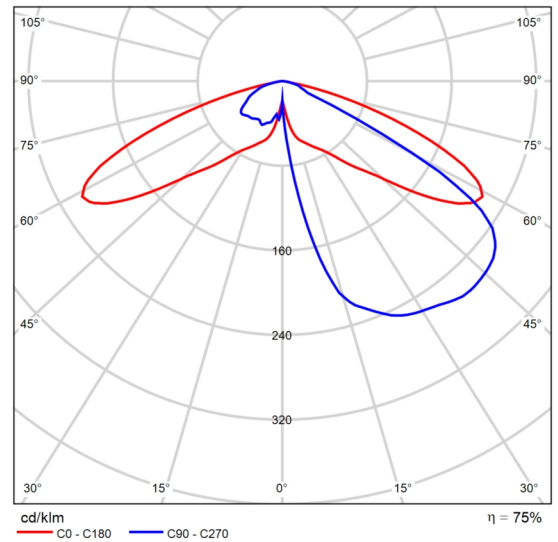
Polar LDC

Product data sheet

Not yet a DIALux member - OLIMPIA-P-30W-3070-AB4



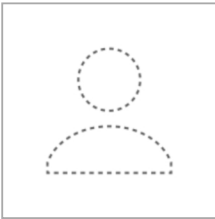
Article No.	OLIMPIA-P-30W-3070-AB4
P	30.0 W
Φ_{Lamp}	4820 lm
$\Phi_{\text{Luminaire}}$	3592 lm
η	74.51 %
Luminous efficacy	119.7 lm/W
CCT	3000 K
CRI	70



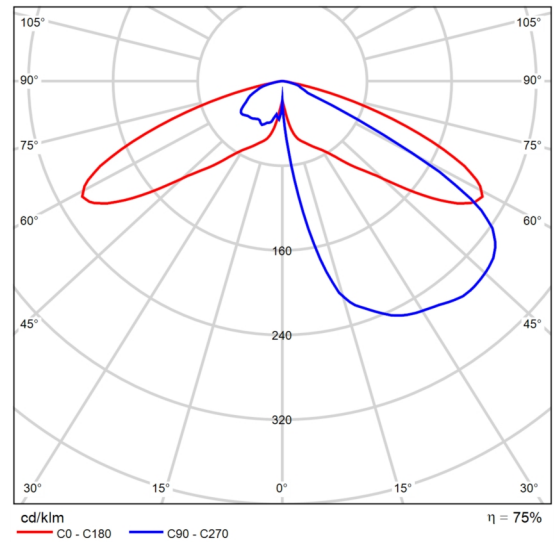
Polar LDC

Product data sheet

Not yet a DIALux member - OLIMPIA-P-60W-3070-AB4



Article No.	OLIMPIA-P-60W-3070-AB4
P	60.0 W
Φ_{Lamp}	9997 lm
$\Phi_{\text{Luminaire}}$	7449 lm
η	74.51 %
Luminous efficacy	124.2 lm/W
CCT	3000 K
CRI	70



Polar LDC

Site 1

Luminaire list

 Φ_{total}

792117 lm

 P_{total}

6506.8 W

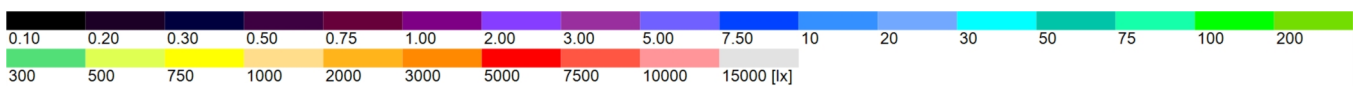
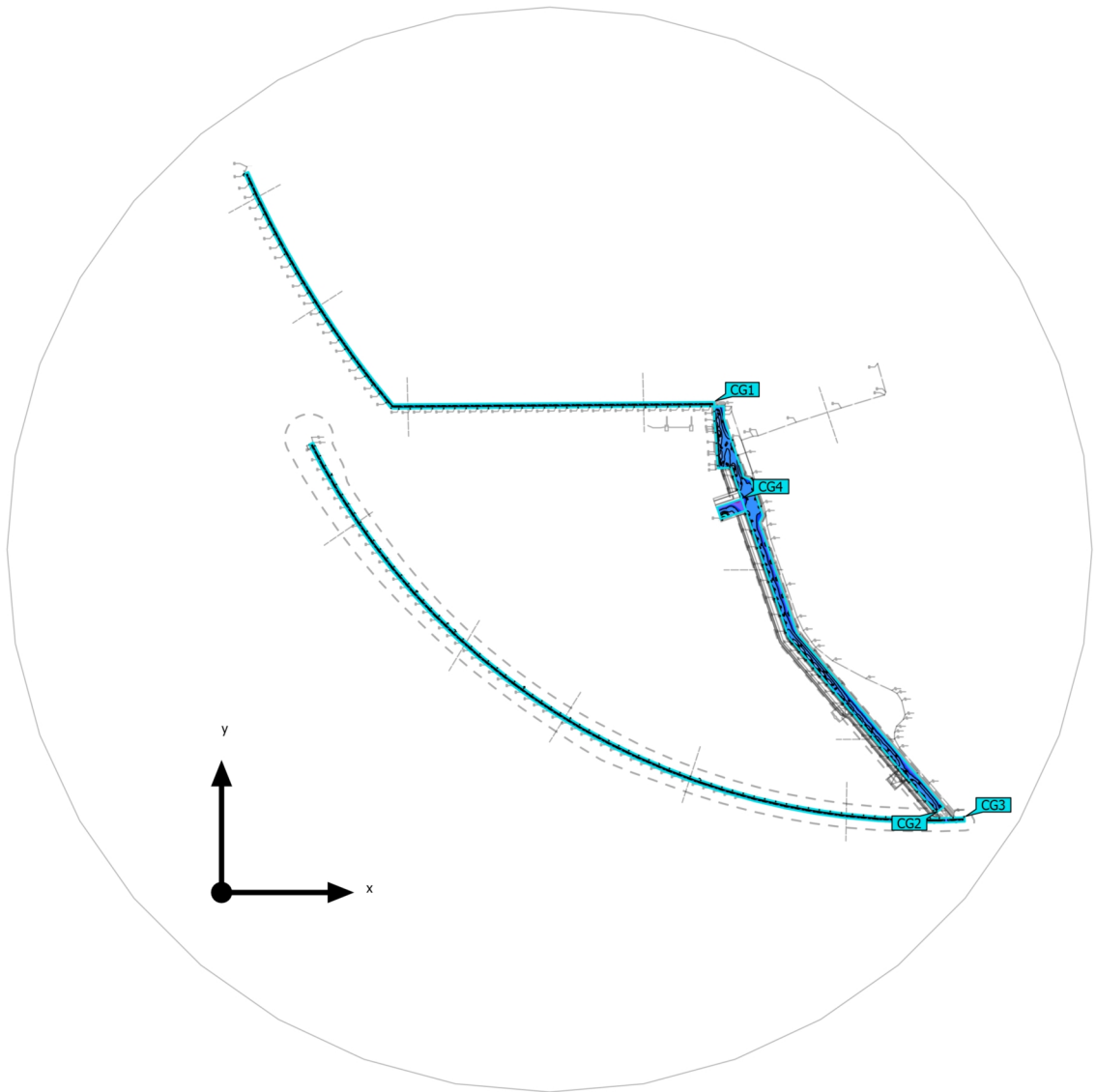
Luminous efficacy

121.7 lm/W

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
1	Not yet a DIALux member	NETTUNO-S-180W-3070-A10	NETTUNO-S-180W-3070-A10	178.4 W	21985 lm	123.2 lm/W
1	Not yet a DIALux member	NETTUNO-S-180W-3070-A13	NETTUNO-S-180W-3070-A13	178.4 W	23437 lm	131.4 lm/W
127	Not yet a DIALux member	OLIMPIA-P-30W-3070-AB4	OLIMPIA-P-30W-3070-AB4	30.0 W	3592 lm	119.7 lm/W
39	Not yet a DIALux member	OLIMPIA-P-60W-3070-AB4	OLIMPIA-P-60W-3070-AB4	60.0 W	7449 lm	124.2 lm/W

Site 1 (Light scene 1)

Calculation objects



Site 1 (Light scene 1)

Calculation objects

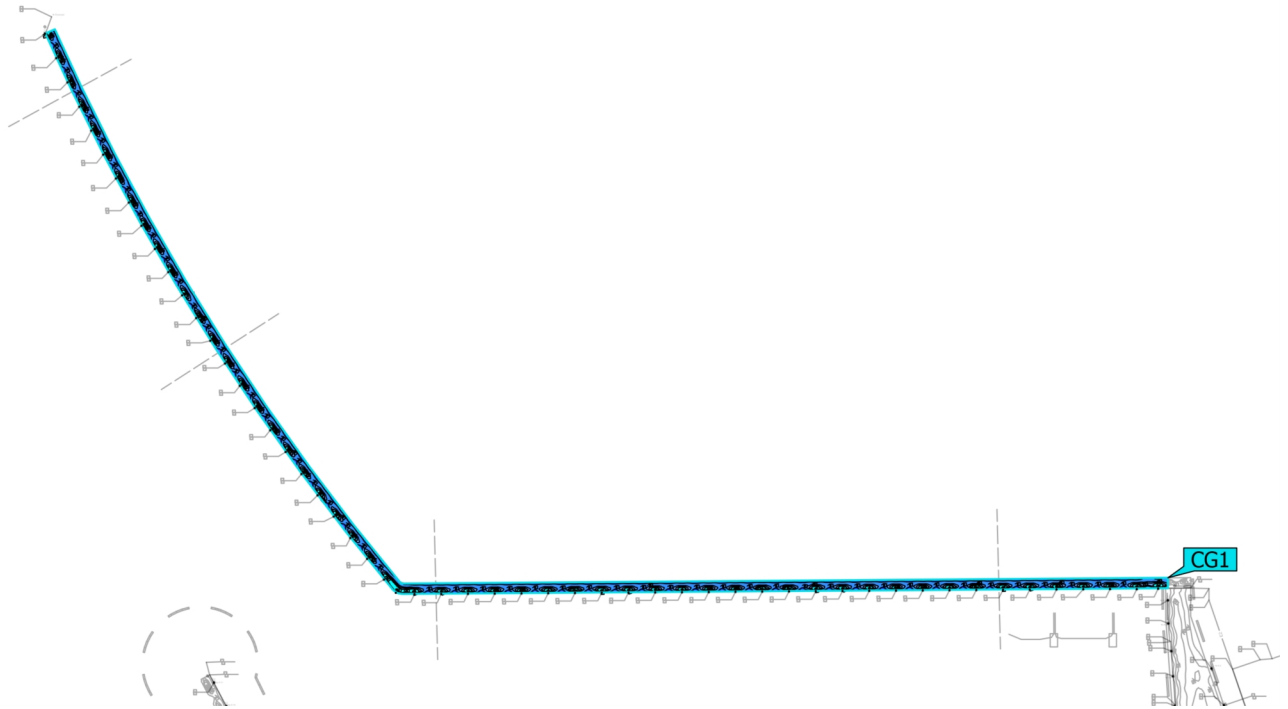
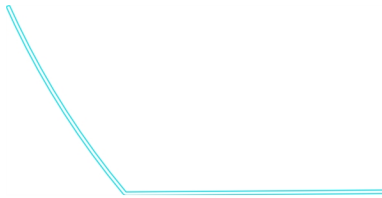
Calculation surfaces

Properties	\bar{E}	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 1 Perpendicular illuminance Height: 0.000 m	16.9 lx	4.28 lx	46.7 lx	0.25	0.092	CG1
Calculation surface 3 Perpendicular illuminance Height: 0.000 m	12.7 lx	3.83 lx	24.5 lx	0.30	0.16	CG2
Calculation surface 2 Perpendicular illuminance Height: 0.000 m	16.7 lx	4.45 lx	46.4 lx	0.27	0.096	CG3
Calculation surface 4 Perpendicular illuminance Height: 0.000 m	13.4 lx	3.94 lx	44.2 lx	0.29	0.089	CG4

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Calculation surface 1



Properties	\bar{E}	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 1 Perpendicular illuminance Height: 0.000 m	16.9 lx	4.28 lx	46.7 lx	0.25	0.092	CG1

Utilisation profile: DIALux presetting (5.1.4-Standard (outdoor transportation area))

Site 1 (Light scene 1)

Calculation surface 3

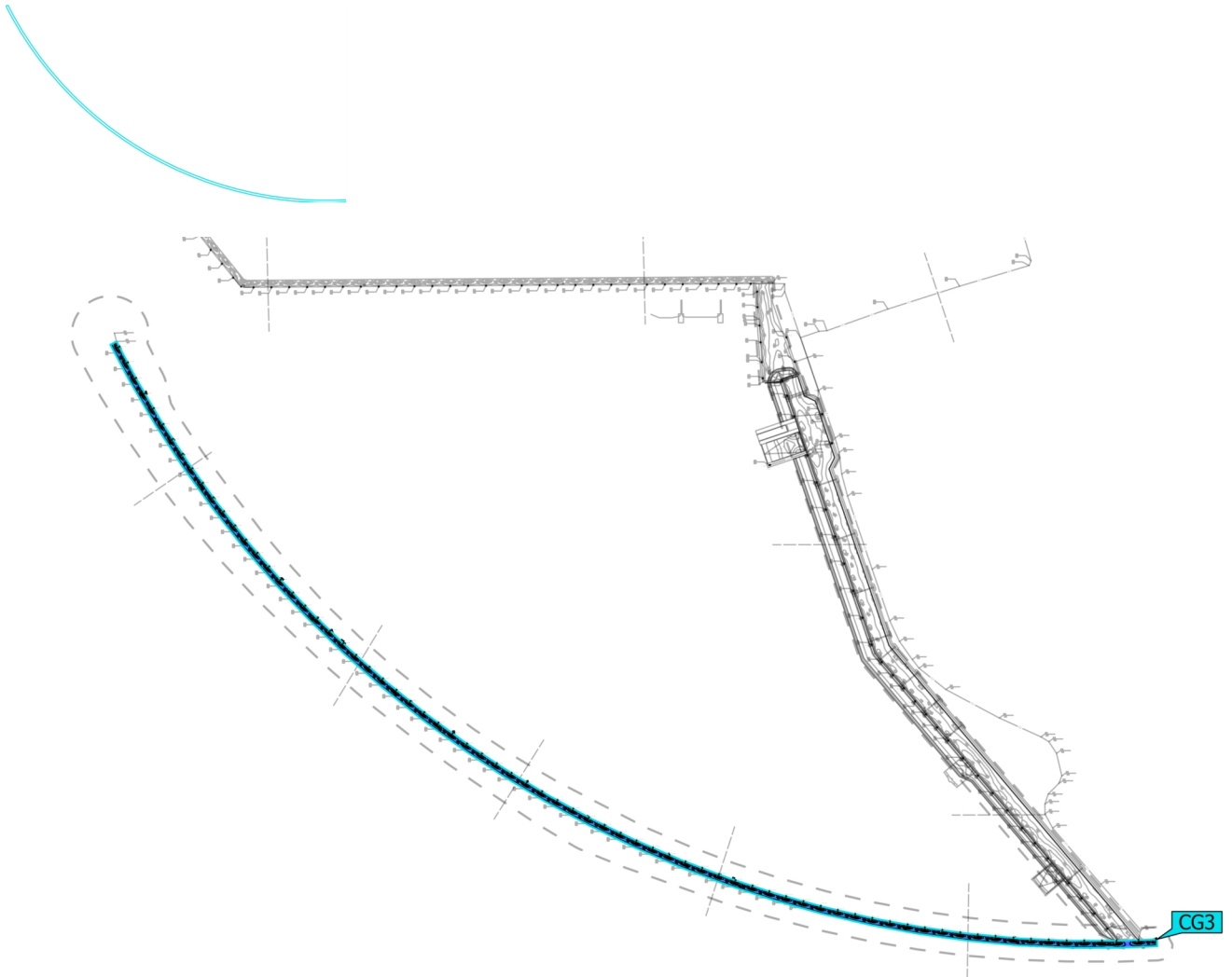


Properties	\bar{E}	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 3 Perpendicular illuminance Height: 0.000 m	12.7 lx	3.83 lx	24.5 lx	0.30	0.16	CG2

Utilisation profile: DIALux presetting (5.1.4-Standard (outdoor transportation area))

Site 1 (Light scene 1)

Calculation surface 2

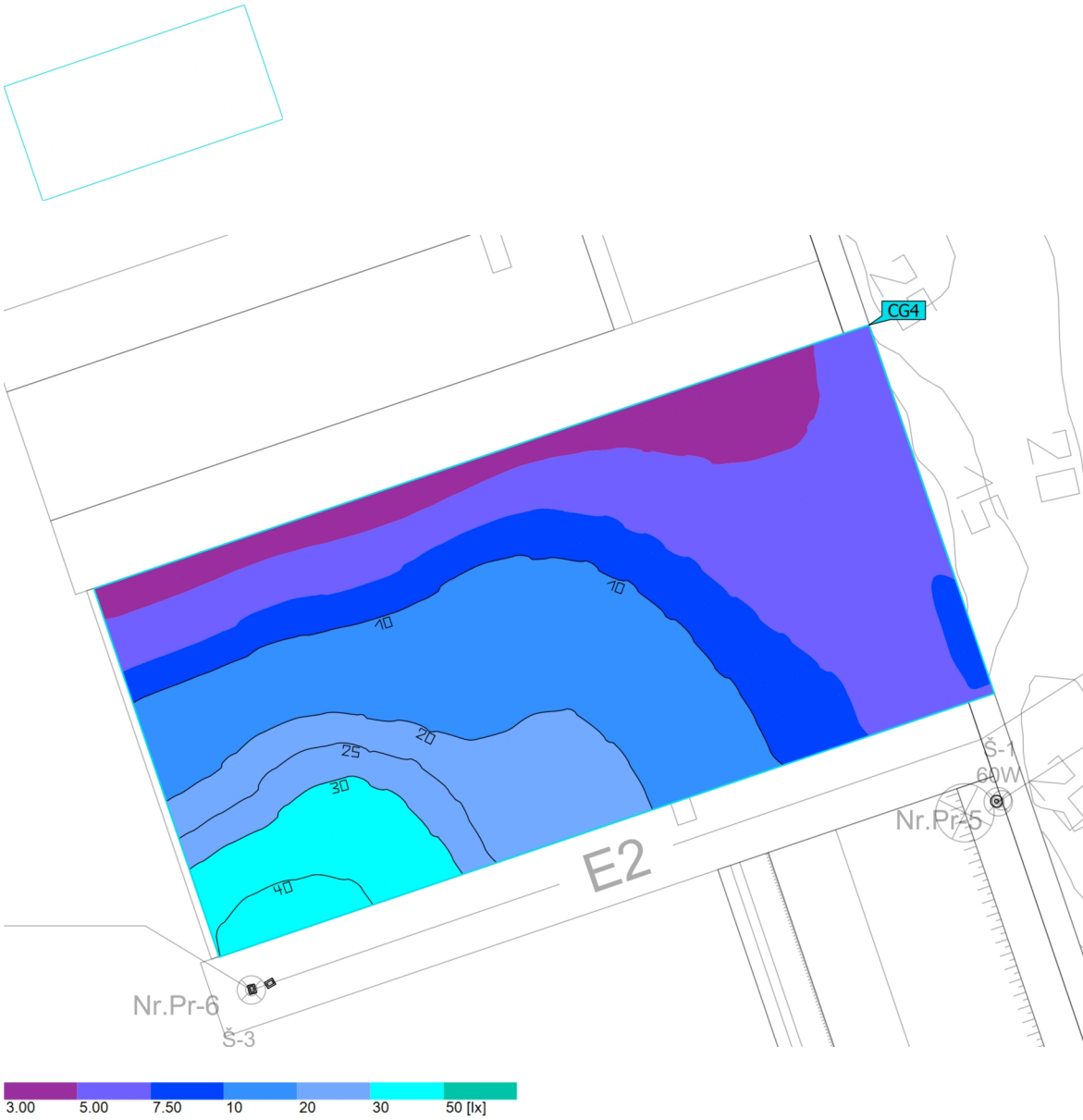


Properties	\bar{E}	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 2 Perpendicular illuminance Height: 0.000 m	16.7 lx	4.45 lx	46.4 lx	0.27	0.096	CG3

Utilisation profile: DIALux presetting (5.1.4-Standard (outdoor transportation area))

Site 1 (Light scene 1)

Calculation surface 4



Properties	\bar{E}	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 4 Perpendicular illuminance Height: 0.000 m	13.4 lx	3.94 lx	44.2 lx	0.29	0.089	CG4

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

**PRIJUNGIMO SĄLYGOS TERMINUOTAM ELEKTROS
ĮRENGINIŲ PRIJUNGIMUI NR. TER23-11465**Parengta: 2023-02-13,
Galioja iki: 2024-02-13**Klientas:** AB Klaipėdos valstybinio jūrų uosto direkcija**Kliento kontaktiniai duomenys:** Minijos g. 19, Klaipėda, Klaipėdos m. sav., +37061423308,
rimantas.valancius@kelprojektas.lt**Objekto pavadinimas:** Apšvietimas**Objekto adresas:** Kairių g. 17, Klaipėda, Klaipėdos m. sav.**Investicinio projekto Nr.:** E1N3311465

Kliento paraiškos Nr. 23-11465 duomenys	Elektros energijos tiekimo patikimumo kategorija			Atvado tipas (vienfazis, trifazis)
	I	II	III	
Esama leistinoji naudoti galia (kW):	-	-	-	
Nauja leistinoji naudoti galia (kW):	-	-	9	Trifazis
Iš viso leistinoji naudoti galia (kW):	-	-	9	Trifazis
Komercinės apskaitos spintos spalva:				
Išmanioji apskaita:	Neužsakyta			

1. Šios prijungimo sąlygos terminuotam elektros įrenginių prijungimui išduodamos Kliento objekto, esančio Kairių g. 17, Klaipėda, Klaipėdos m. sav., prijungimui prie AB "Energijos skirstymo operatoriaus" skirstomųjų tinklų. Objekto terminuotam prijungimui parinktas optimalus taškas atsižvelgiant į techninius ir ekonominius rodiklius.

2. Nuosavybės ir turto eksploatavimo riba nustatoma Elektros tinklų nuosavybės riba nustatyta: ant kabelio (atvado), pakloto iš komercinės apskaitos spintos (KAS) į savininko objekto vidaus elektros tinklą, prijungimo gnybtų.

3. Kliento veiksmai įgyvendinant prijungimo sąlygas terminuotam elektros įrenginių prijungimui:

3.1. Susipažinkite su terminuotų (laikinių) elektros įrenginių prijungimo prie Bendrovės tinklų paslaugos sutartimi ir sumokėkite įmoką. Atlikti apmokėjimą galite prisijungę Bendrovės savitarroje www.eso.lt/savitarna, skiltyje „Paraiškos“.

3.2. Pasirinkite ir užsisakykite reikiamą kvalifikaciją turinčią įmonę/elektriką (kvalifikaciją turinčią įmonę/elektriką galite pasirinkti savarankiškai arba iš Bendrovės pateikiamo partnerių portalo sąrašo www.eso.lt/lt/namams/elektra/paslaugos_1723/varzu-matavimas), kuri (-s) atliks Jūsų vidaus elektros instaliacijos (toliau - įvado) iki nuosavybės ribos su Bendrove įrengimą/patikrinimą, kaip turi būti paruoštas elektros įvadas rasite www.eso.lt/lt/eso-partneriams/elektros-partneriams/sutarciu-valdyma/techniniai-reikalavimai/projektu-techniniai-reikalavimai, pavadinimu „1. 3 Elektros apskaitų įrenginių įrengimo atmintinė (ESO ir kliento rangovams)“. Prijungimo sąlygų dokumento kopiją prašome pateikti Jūsų pasirinktai kvalifikaciją turinčiai įmonei/elektrikui, kuri (-s) atlikus (-ęš) darbus turės pateikti

Klientų aptarnavimasKlientų aptarnavimo tel. 1852 arba 8 697 61 852*
Nemokama elektros sutrikimų linija 1852
Nemokama dujų sutrikimo linija 1804
Svetainė www.eso.lt*Ilgasis numeris apmokestinamas pagal kliento ryšio operatoriaus plano
įkainius**Įmonės rekvizitai**AB „Energijos skirstymo operatorius“
Laisvės pr. 10, LT-04215 Vilnius, Lietuva
El. p. info@eso.lt
Juridinio asmens kodas 304151376
PVM kodas: LT100009860612
Registro tvarkytojas VĮ Registrų centras
E. pristatymas 304151376Bendrovė tvarko Jūsų asmens duomenis tik teisės aktuose apibrėžtais teisėtais pagrindais. detalesnė informacija apie Jūsų asmens duomenų tvarkymo sąlygas ir susijusias teises viešai skelbiama Bendrovės interneto svetainėje www.eso.lt

Elektros energetikos įrenginių techninės būklės patikrinimo aktą (toliau - Rangovo aktas) patvirtinančio Jūsų objekto vidaus elektros tinklo įrengimo kokybę. Rangovo aktą Jūsų pasirinkta įmonė pateiks per www.eso.lt/paraiskos/rangovu-aktu-pateikimas/1.

3.3. Apskaitos prietaisą įrengsime po to, kai pasirašysite sutartį su pasirinktu elektros energijos tiekėju.

3.4. Svarbi informacija:

3.4.1. Terminuotas (laikinas) elektros įrenginių prijungimas galioja **dvylika** metų nuo prijungimo paslaugos sutarties apmokėjimo dienos.

3.4.2. Kliento terminuotų (laikinių) elektros įrenginių prijungimo darbus, pagal 4 (AB „Energijos skirstymo operatorius“ veiksmai įgyvendinant objekto prijungimą) prijungimo sąlygų punktą iki nuosavybės ir turto eksploataavimo ribos atliks Bendrovė.

3.4.3. Pasibaigus objekto elektros energijos pirkimo-pardavimo (persiuntimo) paslaugos sutarčiai Bendrovė atlieka terminuotų (laikinių) kliento elektros įrenginių atjungimo paslaugą. Klientui nuosavybės teise, priklausančius terminuotus (laikinius) elektros įrenginius ir tinklus turi išmontuoti asmeninėmis lėšomis.

3.4.4. Pasikeitus poreikiui, Bendrovės savitarnoje www.eso.lt/savitarna pateikite naują paraišką. Bendrovė gavusi naują paraišką parengs ir išduos naujas prijungimo sąlygas.

3.4.5. Norėdami savo objekte atlikti vidaus elektros instaliacijos pertvarkymo darbus ir pamačius, kad darbų atlikimui reikės nuimti ir uždėti apskaitos prietaiso plombą, prieš fizinių darbų pradžią susijusią su plombų nuėmimu, turite informuoti Bendrovę tel. +370 697 61852, kad nuimate plombą. Užbaigus visus vidaus elektros instaliacijos pertvarkymo darbus, turite pakartotinai informuoti tel. +370 697 61852, kad Bendrovės darbuotojai apskaitos prietaisą užplombuotų. Daugiau informacijos skaitykite www.eso.lt/lt/namams/elektra/skaitikliai-ju-prieziura-ir-tikrinimas/skaitikliu-prieziura/kaip-nuimti-ir-uzdėti-plomba.

4. AB „Energijos skirstymo operatorius“ veiksmai įgyvendinant Objekto prijungimą:

4.1. Esamoje komercinės apskaitos spintoje KAS-115 (iš transformatorinės TR-455) laisvoje vietoje įrengti trifazį „C“ charakteristikos 16 A automatinį jungiklį.

5. Kita informacija

5.1. Elektros energijos prijungimo procesą galite stebėti AB „Energijos skirstymo operatorius“ savitarnos svetainėje, kurią rasite www.eso.lt, skiltyje.

Daugiau aktualios informacijos dėl elektros įrenginių prijungimo tolimesnių žingsnių bei kitų AB „Energijos skirstymo operatorius“ teikiamų paslaugų galite rasti www.eso.lt arba kilus papildomiems klausimams Jums gali padėti Jūsų asmeninis vadybininkas, kurio kontaktus rasite prisijungę prie savo paskyros savitarnos svetainėje, kurią rasite www.eso.lt.

Skambučiai apmokestinami pagal Jūsų pasirinkto ryšio operatoriaus taikomą tarifą ar mokėjimo planą.

Klientų aptarnavimas

Klientų aptarnavimo tel. 1852 arba 8 697 61 852*

Nemokama elektros sutrikimų linija 1852

Nemokama dujų sutrikimų linija 1804

Svetainė www.eso.lt

*Ilgasis numeris apmokestinamas pagal kliento ryšio operatoriaus plano įkainius

Įmonės rekvizitai

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