

“Klaipėda State Seaport South Gate Complex, Kairiai str. 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 st. 24, 92251 Klaipėda
TYPE OF CONSTRUCTION	New construction
PURPOSE OF THE STRUCTURE	Transport communications: structures of water ports
BUILDING CATEGORY	Non-Exceptional structures
DESIGN STAGE	Technical project
DESIGN PART	Water Supply And Sewerage Part (<i>I Building Phase</i>): <i>Southern (01) and Northern (02) Dams</i>
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COMPANY	QUALIF. DOC. NO.	DUTIES	NAME SURNAME	SIGNATURE
UAB „Kelprojektas“				
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1. GENERAL INFORMATION

"The construction project titled 'Project for the Structures of Transport and Communication Purpose (southern dam, northern dam, quays, and waterfront) at Kairiai St. 17, Klaipėda' (hereinafter referred to as the Project) was prepared in accordance with the service contract concluded between UAB "Kelprojektas" and the State Seaport Authority of Klaipėda.

The structural solutions of the Project were developed in compliance with the construction norms and regulations applicable in the Republic of Lithuania. State standards and European EN standards, whose use is legalized by the relevant publications in the Republic of Lithuania, apply to construction materials and products used in the construction.

Building – Southern Dam, Northern Dam (I Part);

Building purpose – Transport communications -water port structures (8.5) (dams);

Site of building (address) – Kairiai str. 17;

Type of construction – New construction;

Building category – Non-exceptional structure.

The project complies with the provisions of laws, other legal acts, project preparation documents, normative construction technical documents, normative documents on the safety and purpose of construction.

Pursuant to Article 6(4) of the Law on Construction of the Republic of Lithuania and the requirements of Annex 1 to the Building Regulation STR 1.04.04:2017 "Design of Building, Project Expertise", we hereby confirm that the design solutions:

- comply with the essential requirements for buildings set out in (EU) Regulation No 305/2011, the requirements of laws, other legal acts, mandatory design documents, normative construction technical documents, normative documents on safety and purpose of the building;

- does not prejudice the interests of the State, the society for the integration of people with disabilities and third parties.

The normative and other documents and data on which this part of the project has been prepared and the computer programs on which this part of the project has been prepared are listed in Chapter 14 of this explanatory memorandum.

The single altitudes given in the project are given in the Baltic Altitude System BAS77. The double altitudes indicated are in the Lithuanian altitude system LAS07 (in brackets in the Baltic altitude system BAS77). An altitude of 0,00 in the Baltic Altitude System corresponds to an altitude of +0,13 m in the Lithuanian Altitude System (LAS07).

Note. During the technical project preparation stage, cost quantity lists are prepared based on standardized cost indicators. During the work project preparation stage, these indicators are refined (according to STR 1.04.04:2017 "Structure Design, Project Expertise," approved by the order of the Minister of Environment of the Republic of Lithuania on November 7, 2016, No. D1-738 "On the Approval of the Construction Technical Regulation STR 1.04.04:2017 "Structure Design, Project Expertise," point 6.11).

2. BUILDER (CLIENT)

Klaipėda State Seaport Authority, code 240329870, J. Janonio str. 24, LT-92251 Klaipėda, tel. +37046499799, fax [REDACTED] (hereinafter - KVJUD).

3. DESIGNER

"KELPROJEKTAS", Jonavos str. 7, D building, LT-44192 Kaunas, Lithuania, info@kelprojektas.lt, www.kelprojektas.lt, Company code 234004210.

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Project part manager – [REDACTED]

4. GENERAL INFORMATION ABOUT STRUCTURES

4.1. Functional purpose

SOUTHERN DAM- COMMUNICATIONS - WATER PORT STRUCTURES (8.5) (DAMS);
NORTHERN DAM- COMMUNICATIONS - WATER PORT STRUCTURES (8.5) (DAMS);
WHARF- COMMUNICATIONS - WATER PORT STRUCTURES (8.5) (WHARVES);
QUAY- COMMUNICATIONS - WATER PORT BUILDINGS (8.5) (QUAYS);

4.2. Specialty category

SOUTHERN DAM- NON EXCEPTIONAL;
NORTHERN DAM- NON EXCEPTIONAL;
WHARF- NON EXCEPTIONAL;
QUAY- NON EXCEPTIONAL;

4.3. Geodetic control of construction

Plans of engineering networks (geodetic photographs) are ordered and carried out according to:
- regulation of technical requirements of geodesy and cartography GKTR 2.01.01:1999
"Procedure for making geodetic photographs of underground networks and communications constructed in the territory of the Republic of Lithuania";
- Rules for issuing, suspending, and revoking validity of surveyor's qualification certificates, approved by the Government of the Republic of Lithuania in 2010. December 22 by resolution no. 1853 "Regarding the approval of the rules for issuing, suspending, and revoking validity of surveyor's qualification certificates" (*summary version valid from 08/06/2021*), established procedure;
- Law of the Republic of Lithuania on Geodesy and Cartography, 2001 June 28 No. IX-415;
- Construction technical regulation STR 1.06.01:2016 "Construction works. Supervising the construction of the structure".

4.3.1. Periodicity

Plans of engineering networks (geodetic photographs) are ordered and carried out in accordance with the procedure established in Chapter IV of STR 1.06.01:2016, GKTR 2.01.01:1999 and the rules for issuing, suspending, and revoking the qualification certificates of a surveyor.

According to STR 1.06.01:2016 "Construction works. Construction supervision of the building" Contractors must carry out geodetic control of the works and ensure that the layout of the building in the plan and the vertical profile meet the requirements of the building design (according to GKTR 2.01.01:1999).

It is forbidden to fill the constructed engineering networks and other constructed engineering structures with soil without carrying out geodetic measurements and engineering network plans (geodetic photos) and without signing acts of hidden construction works.

After additional filling or excavating of soil from the existing engineering networks, the plans (geodetic photos) of the engineering networks must be adjusted, and the data must be submitted by the construction manager of the structure to the owner (user) of these networks.

Geodetic photographs of all underground networks and communications under construction, as well as underground and above-ground structures related to their operation (underpasses, reservoirs, pumping stations, pipelines, etc.) are carried out - hereinafter referred to as underground communications.

Periodicity is determined by the Builder in the contract of works.

4.3.2. Order

According to GKTR 2.01.01:1999 - geodetic photographs of underground communications are ordered by the builder (customer). The order specifies the type of communications, their approximate length and the construction completion time.

The procedure for taking geodetic photos is provided for in the regulation GKTR 2.01.01:1999 (see Chapter 2, Clauses 2.1-2.13).

According to STR 1.06.01:2016 "Construction works. Supervising the construction of the structure", IV ch. clauses 36.4.1 and 36.18 of the ninth section provide for the obligations of the Structural Construction Manager regarding geodetic measurements and geodetic photographs.

The procedure is specified by the Builder in the contract of works.

4.3.3. Reports

In accordance with the Law on Geodesy and Cartography of the Republic of Lithuania (28 June 2001, No. IX-415, in force since 2021-07-03), Article 13. The rights and duties of a surveyor shall be to prepare reports on surveying and cartographic works in accordance with the procedure established by the institution authorised by the Government and to submit them to the client of surveying and cartographic works.

STR 1.06.01:2016 "Construction works. Construction supervision", Annex 4 contains a description of the procedure for completing the Construction Works Log1, which:

- Clause 19 states that <Section III of the Log contains a recommended list of basic geodetic control photographs of the structure, its parts and structures, engineering networks.
- All geodetic control photographs of the structure shall be recorded on Form F-15, and forms for geodetic control photographs are provided on Form F-16. The geodetic control photographs shall be recorded by the surveyor together with the construction manager of the structure (the construction manager of the general or special construction works of the structure - when general or special construction works are carried out). The registration shall include the names of the diagrams, photographs, the date of execution, the conformity with the design of the structure and the deviations found;
- Paragraph 21 states that inspection reports on concealed works shall be drawn up as soon as they have been inspected, without any further construction work being undertaken. Where necessary, geodetic control photographs shall be taken;
- Paragraph 35 states that the Contractor (subcontractor) shall hand over the main Logbook and the additional Logbooks, together with the other documents, to the Developer (Employer) after the Building has been declared fit for use.

Annex 4, Section III, Geodetic Control Documentation, contains a list of recommended basic geodetic control photographs of the Building, its parts and structures and engineering networks.

The reports shall be specified by the Developer in the Contract for the Contract Works2.

5. GEOGRAPHICAL LOCATION

In the area of the Klaipėda State Seaport, where various economic activities are already taking place, in the southern part of water area, there are currently no hydrotechnical structures in the southern part of the water area. The area is used by recreational fishermen in an uncontrolled manner (for launching boats, abandoning vehicles during fishing, etc.). The site is accessible from Kairių Street and is crossed by several dirt roads. The total area of the construction site is approximately 45 ha (~5 ha of planned storage area and ~40 ha of dredged area with structures under construction).

The construction of the southern and northern dykes, the pier and the quay is planned on the land plot of Klaipėda State Seaport, Kairiai str. 17, Klaipėda city.

Changed 2018 of the Minister of the Environment of the Republic of Lithuania May 10 by order no. D1-382 "Regarding the Minister of the Environment of the Republic of Lithuania of 2016 December 2 by order no. D1-848 Regarding the construction technical regulation STR 1.06.01:2016 "Construction works. Structural construction supervision" approval" change".

According to 2018 of the Minister of the Environment of the Republic of Lithuania May 10 order no. D1-382 "Regarding the Minister of the Environment of the Republic of Lithuania in 2016 December 2 by order no. D1-848 Regarding the construction technical regulation STR 1.06.01:2016 "Construction works. Clause 1.4 of the amendment to the "approval" of construction maintenance (<1.4. I change the description of the procedure for filling out the Construction Work Journal in Appendix 4:>) A paper or electronic Journal is filled out at the choice of the builder (client).

6. NATURES CONDITIONS OF THE AREA

The plot is located in the southern part of the city of Klaipėda, at Kairiai str. 17, in the foreshore and coastal zone of the Curonian Lagoon. In the coastal and coastal areas of the plot, the absolute heights of the terrain reach 0.0 - 0.3 m.

Bathymetric conditions: the depth of the KVJU water area ranges from 0.5 m (in the southern part behind Kiaulė Nugara Island) to 15.5 m (at the sea gate of the port). The depth of the internal shipping channel of the port reaches 14.5-15 m, the inlet channel - 15.5 m. The width of the Klaipėda Strait within the port limits varies from 0.4 to 1.1 km.

Currently, the nature of the bottom relief of the Klaipėda Strait is very closely related to the hydrodynamic conditions, and at the same time to the sedimentation processes of the current sediments.

6.1. Meteorological conditions

6.1.1. Air temperature

Air temperature is one of the main meteorological elements. Average multi-year data Klaipėda is presented in table 1.

Table 1. Average multi-year air temperature data in Klaipėda.

Air temp. °C	Months												Year
	01	02	03	04	05	06	07	08	09	10	11	12	
	-2,0	-2,7	1,0	6,2	11	14,9	18,1	17,7	13,9	8,7	4,5	-0,2	7,6
Max	8,7	15,4	18,6	27	30,4	34	34	34	30,4	22,2	15,4	10,3	34
Min.	-33	-33,4	-20,8	-12,8	-4	-0,7	4,9	2,9	-4,9	-9,1	-14,4	-24,2	-33,4

6.1.2. Precipitation, fog

Table 2. Average multi-year precipitation data in Klaipėda.

Precipitation quantity, mm	Months												Year
	01	02	03	04	05	06	07	08	09	10	11	12	
Norm	50	31	39	36	39	56	74	83	89	80	90	68	735
2008 - 2012													
Average	64,4	43	40,4	29	38,8	54,8	89,2	130,8	87,6	105,8	86,2	100,4	870,4

A hazardous meteorological phenomenon is a significant reduction in visibility during smoke. Due to active water vapor condensation during smoke, the visibility distance during smoke is less than 1 km. The Klaipėda coastal region is characterized by advection-origin smoke during the cold season and specific coastal (frontal) smoke formations occurring at the end of summer, autumn, and winter (see Table 3).

Table 3. Fog duration characteristic.

Duration, hour.	Months												Year
	01	02	03	04	05	06	07	08	09	10	11	12	
Avg.	18,13	20,3	40,56	41,39	21,13	12,19	4,35	3,27	7,17	12,48	16,53	23,1	223
Max	126	120	194	115	112	74	52	42	26	74	102	102	682

6.1.3. Wind

Wind is one of the most constant meteorological elements and is more influenced by the seasonal cycles of cyclones (cyclonic circulation is observed in the climate of the Klaipėda region for about 200 days per year) and anticyclones' activity. Therefore, along the coast, there is a very distinct annual variation in prevailing wind directions. According to the data from the Klaipėda marine meteorological station (supplemented by handbooks and additional information from the monitoring data of the Lithuanian Hydrometeorological Service until 2013), the maximum speeds and directions of prevailing winds are provided in Table 4.

Table 4. Maximum wind speed and direction.

Wind	Months												Year
	01	02	03	04	05	06	07	08	09	10	11	12	
10 m in height (till 2013)													
Prevailing direction	SE	SE	SE	NW	NW	NW	W	S	W	SE	SE	SE	SE
Max, m/s	34	30	28	26	24	25	34	32	30	40	36	38	40
24 m in height (2008-2012)													
Prevailing direction	SW	W	WN W	NW	W	SSW	S	SSE	WS W	WS W	W	SW	SSE
Max, m/s	27	31	27	21	20	22	31	39	23	31	33	26	39

Strong winds are characterized by a distinct seasonality - they are mostly observed in the autumn and winter months. According to the prevailing directions, storm winds differ from average ones.

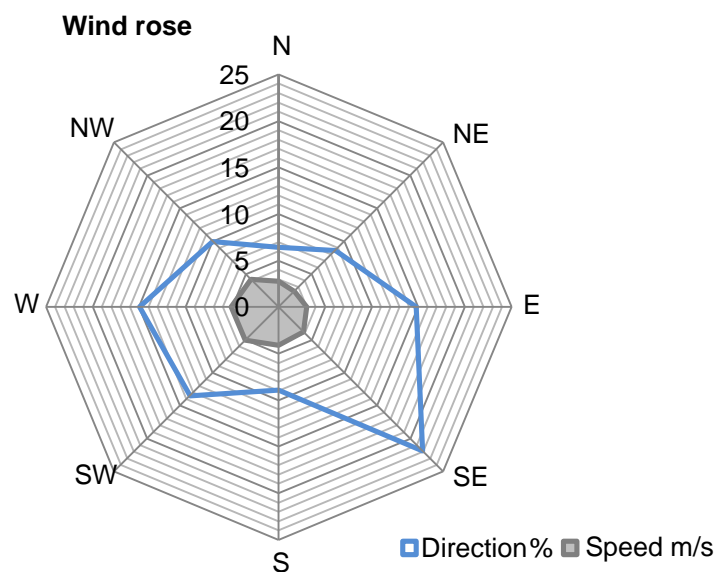


Fig. 1 Average wind rose according to observational data until 2013 (at 10 m height).

6.2. Hydrological conditions

6.2.1. Water levels

The port of Klaipėda is located in the Curonian Lagoon, flowing into the Baltic Sea. The water level in the Curonian Lagoon and the port fluctuates due to different water inflows from the inland area and varying water levels in the Baltic Sea. The average water level is ± 0.00 m (± 0.13 m).

A characteristic feature of water level changes in the Klaipėda strait is the pronounced fluctuations in water level throughout the day. Sudden level changes caused by storm surges are most commonly observed in autumn and winter.

In the Klaipėda strait, the instantaneous water level usually (in 95% of cases) fluctuates in the range from +50 to -50 cm. Over the last 50 years, the highest water levels in the Klaipėda state seaport waters were measured on October 18, 1967, at +186 cm above the Baltic System (BS) "zero," on December 4, 1999, at +165 cm, and on January 8, 2005, at +154 cm. The lowest levels during the mentioned period were measured on November 23, 1984, at -90 cm, and on January 8, 1972, at -80 cm BS (data provided by the Lithuanian Hydrometeorological Service).

Water levels for the reconstructed quay are accepted based on the data provided in Table 2 of the annex "Design of Sea Ports and Navigation Structures."

Table 5. Maximum and minimum instantaneous water

Recurrent T	1	2	5	10	20	50	100
Probability $P_{max\ VL, \%}$	99	50	20	10	5	2	1
Maximum level, m	0,58 (0,45)	0,98 (0,85)	1,23 (1,10)	1,37 (1,24)	1,56 (1,43)	1,75 (1,62)	1,93 (1,80)
Probability $P_{min\ VL, \%}$	1	50	80	90	95	98	99
Minimum level, m	-0,37 (-0,50)	-0,55 (-0,68)	-0,64 (-0,77)	-0,70 (-0,83)	-0,76 (-0,89)	-0,84 (-0,97)	-0,90 (-1,03)

Notes:

1. Heights in parentheses are given in the Baltic height system (BAS77);
2. Intermediate values are determined by interpolation;
3. Consequences of CC2 for class structures:
 - ✓ probability of highest water levels - 10% (1 time in 10 years);
 - ✓ probability of the lowest water levels - 97% (3 times in 100 years);

6.2.2. Undulation

In the Klaipėda Strait, the wave pattern is directly influenced by the wind regime and differs slightly from the wave action in the Baltic Sea. The Curonian Spit peninsula, acting as a barrier, has an impact by protecting against direct sea wave influence. Sea waves affect only the northern part of the port area through the port gates, gradually weakening as they move away from the sea gates.

The largest waves at the entrance channel of the Klaipėda port form during severe storms when strong winds blow from the W-NW-SW directions. Waves from the W and SW directions spread furthest into the port area. In addition to the usual wind-induced wave action, the Klaipėda Strait is characterized by special low-frequency long-period waves caused by traction and wave diffraction – chaotic wave movement where smaller waves climb onto larger waves, and even smaller waves onto these.

6.2.3. Ice phenomena

In the southern part of the Klaipėda port and in the Curonian Lagoon, a continuous ice cover forms annually. In the northern part of the port, due to the flow of the Dane River and continuous navigation of ships in the waters, a continuous ice cover forms infrequently. The frequency of ice formation in the Klaipėda port is presented in the table.

Table 6. Frequency of ice formation in the port of Klaipėda

	December	January	February	March	April
Average	on the 3rd.	on the 5th.	on the 5th.	on the 4th.	on the 2nd.
Minimal				-	
Maximum	on the 7th.	on the 10th.	on the 17th.	on the 17th.	on the 3rd.

7. GEOLOGICAL AND HYDROLOGICAL CONDITIONS OF THE CONSTRUCTION SITE

The files of topogeodetic and geological survey data are integral parts of this project. The design work is carried out in accordance with the topogeodetic survey prepared and coordinated by UAB "GEOSMART" and the geological survey report prepared by UAB "Garant diving." Other data required for the preparation of the project are specified in the General Section, file BD-01.01. The complete geological report is provided in the appendices of the project's General Section.

7.1. Geological conditions of the construction site

The geological structure of the investigation site up to a depth of 7.0 – 18.0m (-7.0 - -17.7m abs. a.) consists of the following formations: technogenic formations (tIV), Holocene marine sediments (mIV), Holocene peat (bog) deposits (bIV), Holocene Postlittoral sea sediments (mIVPL), Holocene Littoral sea sediments (mIVL), upper Pleistocene Baltic interlobate limnoglacial deposits (lgIIIbl), and upper Pleistocene Baltic interlobate glacial deposits (gIIIbl).

Technogenic formations (tIV) consist of artificial soil (Mg): dumped sand, yellowish-brown, moist – watery. Fill soil is identified at investigation points No. 27 – 29. Its thickness reaches 0.6 – 1.0m.

Holocene marine sediments (mIV) consist of silty sand (siSa), light grayish and gray, with a small admixture of organic matter and gravel, moist – watery. The complex is distinguished at investigation points No. 21 and 23 – 29. At point No. 26, it lies in two layers, with peat (bog) deposits interlayered between them. The thickness of the complex varies from 0.3m to 1.5m.

Holocene peat (bog) deposits (bIV) consist of silt (Dy): sandy low-plasticity silt with a small admixture of organic material (saSiOL), dark gray and brown, locally with a greenish hue, with detritus admixture, watery. The complex is distinguished at investigation points No. 1 – 22 and 24 - 29. Its thickness varies from 0.2m to 2.4m.

Holocene Postlittoral sea sediments (mIVPL) consist of uniformly sorted low silt - clayey sand (SaFU), brown, gray, dark gray, and greenish-gray, with a small admixture of organic matter and detritus, watery.

The complex is distinguished at investigation points No. 1 – 25 and 27 - 29. Its thickness varies from 0.3m to 4.9m.

Holocene Littoral sea sediments (mIVL) consist of:

- poorly sorted sand (SaP), gray, watery, with a small detritus admixture;
- poorly sorted gravelly sand (grSaP), gray, watery;
- sandy low-plasticity silt with a small admixture of organic material (saSiOL), gray, saturated with water, locally with sand lenses;
- sandy low-plasticity clay and silt (saCIL-SiL), dark gray, saturated with water, with a small admixture of organic matter;
- uniformly sorted sand (SaU), light gray and yellowish-gray, locally with gravel and pebble admixture, watery.

The complex is distinguished at all investigation points. Its base was not reached at investigation points No. 1 – 26. The investigated thickness of the complex varies from 2.2m to 10.9m.

Upper Pleistocene Baltic interlobate limnoglacial deposits (lgIIIbl) consist of low-plasticity clay and silt (CIL-SiL), gray and brownish-gray. The complex is distinguished at investigation points No. 27 – 29. Its base was not reached at investigation point No. 27. The investigated thickness of the complex varies from 0.5m to 1.5m.

Upper Pleistocene Baltic interlobate glacial deposits (gIIIbl) consist of sandy low-plasticity moraine clay (saCIL), brownish-gray, with up to 5% gravel and pebble. The complex is distinguished at investigation points No. 28 and 29. Its base was not reached. The investigated thickness of the complex varies from 1.8m to 2.0m. Summarizing the research results, it can be stated that the substrate layer consists of bog and marine deposits. Substrate soil (below the clay layer) is variously graded sand with interlayers of fine-grained soil (various granulometric composition dust) occurring. Beneath marine sands lies a limnoglacial clay-dust layer, and beneath that are determined morainic sandy clay deposits. Four lithological types of soil were identified in the study area. Conditionally weak layers (organic soil (IGS 2), loose sands (IGS 3 and 4), and weak clay – dust deposits (IGS 11)) predominate in the upper and middle parts of the engineering geological profiles up to a depth of 8.2m from the ground surface. Horizontal and sub-horizontal soil layers and lenses are widespread in the profile. Forms of buried paleorelief and pre-Quaternary rocks were not identified on the study

7.2. Hydrogeological site conditions

The investigations took place in the coastal and nearshore area of the Curonian Lagoon, resulting in groundwater levels that are largely The water is contained in organic soils and marine sand layers of varying granulometric composition and sorting. Due to spring floods and summer droughts, the water table can vary by up to 0,5-1,0 m from the measured level during fieldwork. The distribution of the aquifer is uniform and continuous. The groundwater is drained by the Curonian Lagoon and the Baltic Sea. The filtration coefficients (k) of the sands isolated in the study area vary from $3.52 \cdot 10^{-6}$ m/s (siSa) to $9.90 \cdot 10^{-5}$ m/s (SaU). Groundwater will accumulate in excavations or boreholes during construction. During the investigations, groundwater samples were taken from investigation sites 1 and 29. According to the results obtained chemical analysis results (Textual Appendices 8.86; 8.87; 8.88 and 8.89), the aggressiveness of the groundwater for concrete was assessed in accordance with the methodology given in STR 2.05.05:2005 [8].

Table 7. Evaluation of the aggressiveness of chemical water to concrete at the research site.

Chemical characteristic	Set value	Ground water aggressiveness limit for concrete value, mg/l	Ground water aggressiveness class for concrete
SO_4^{2-} , mg/l	111,9	≥ 200	-
pH	6,51	$\leq 6,5$	-
Aggressive CO_2 , mgO ₂ /l	< 5	≥ 15	-
NH_4^+ , mg/l	< 0,02	≥ 15	-
Mg^{2+} , mg/l	65,78	≥ 300	-

Table 8 Evaluation of the aggressiveness of chemical water to concrete at the research site.

Chemical characteristic	Set value	Ground water aggressiveness limit for concrete value, mg/l	Ground water aggressiveness class for concrete
SO_4^{2-} , mg/l	154,8	≥ 200	-
pH	6,95	$\leq 6,5$	-
Aggressive CO_2 , mgO ₂ /l	6,38	≥ 15	-
NH_4^+ , mg/l	< 0,02	≥ 15	-
Mg^{2+} , mg/l	34,8	≥ 300	-

Laboratory tests have shown that the acidity (pH) of the groundwater at test site 1 is very close to the limit value. This must be taken into account in the design of concrete structures and in the selection of the concrete class. The other groundwater chemical characteristics do not exceed the limit values for groundwater chemical aggressiveness.

The analysis of both water samples shows that the Curonian Lagoon's coastal and nearshore water is dominated by high concentrations of sodium cations (Na⁺) and chlorine anions (Cl⁻). Total water mineralisation is also high (Gr. 1 found to be 1899 mg/l, Gr. 29 found to be 1472 mg/l). This suggests that mixing processes between freshwater and seawater are occurring in this area of the lagoon.

7.2.1. Unstable soil layer

The engineering geological surveys (IGT) have shown that in the area of the proposed structures on the seabed a layer of sludge (hereinafter referred to as 'unstable soil') has formed on the project area. The thickness of this layer according to the IGT varies from 0,3 m. The average thickness of the unstable soil layer calculated from the IGT data is about 1 m. The IGTs were carried out at or near the axes of the projected structures, but it can be assumed that the unstable soil layer is distributed throughout the water area. As the unstable soil layer is an unsuitable base for the structures and dredging is envisaged. In the construction part of the project, the removal of the unstable soil layer is assessed. The design includes indicative coordinates for the boundaries of the unstable soil area to be removed and the IGT adopted elevations for the bottom of the unstable soil. Prior to the removal of unstable soil at the dam site, it is necessary to renew the bathymetric measurements. During Phase I of construction, unstable soil in the construction area shall be removed and transported to the offshore disposal site.

7.3. Soil composition and engineering geological layers

The analysis of the field and laboratory survey material has led to the identification of 18 engineering geological (IGS), the descriptions of which are given in the table below.

Table 9. IGS geological description.

IGS No.	Geological description and name of the layer according to [3] and [6] and [7]
IGS 1	Artificial soil (Mg): poured sand, yellow-brown, wet - watery. The layer was isolated at research sites no. 27 – 29. Its thickness reaches 0.6 – 1.0 m.
IGS 2	Silt (Dy): sandy low plasticity silt with low organic matter content (siltLoam), dark gray and brown, sometimes with a greenish hue, with detritus impurities, waterlogged. The layer is identified at test points No. 1 – 22 and 24 - 29. Its thickness varies from 0.2m to 2.4m.
IGS 3	Loamy sand (siSa), light bluish-gray, with a small amount of organic matter and gravel admixture, moist – waterlogged, loose. The layer is distinguished at the research points No. 21 and 23–29. At the research point No. 26, it is stratified into two layers, between which peat (silt) intercalations are present. The thickness of the layer varies from 0.3m to 1.5m.
IGS 4	Evenly sorted, slightly silty-clayey - loamy sand (SaFU), brown, gray, and greenish-gray, with a small admixture of organic matter and detritus, waterlogged, loose. The layer is identified at test points No. 1–25 and 27–29 at various depths. Its thickness varies from 0.3m to 4.1m.
IGS 5	Evenly sorted, slightly silty to clayey sand (SaFU), brown, gray, dark gray, and greenish-gray, with a low content of organic matter and detritus, watery, of medium density. The layer is identified at investigation points No. 1, 4, 5, 9, 11 – 14, 16, 17, 19, and 20, at various depths. Its thickness varies from 0.3m to 3.3m.
IGS 6	Evenly graded, slightly silty-clayey sand (SaFU), brownish-gray, and greenish-gray, with a small amount of organic and detrital impurities, waterlogged, dense. The layer is identified at test points No. 10, 14, and 17. Its thickness varies from 0.3m to 0.9m.
IGS 7	Poorly sorted sand (SaP), gray, watery, with a small detritus admixture, very dense. The layer is distinguished in research locations No. 9 and 21. Its thickness varies from 0.9m to 1.2m.
IGS 8	Poorly sorted gravelly sand (grSaP), gray, watery, very dense. The layer is distinguished at the research site No. 12 at various depths. Its thickness varies from 0.4m to 0.9m.
IGS 9	Poorly sorted gravelly sand (grSaP), gray, watery, especially dense. The layer is identified at the investigation site No. 12. Its thickness is approximately 1.0m.
IGS 10	Sandy low-plasticity dust with low organic material content (saSiOL), gray, saturated with water, locally containing sand lenses, very strong. The layer is identified at test points No. 8-10, 12, 20, 23, 24, and 26-28. Its thickness varies from 0.1m to 0.4m.
IGS 11	Sandy, low plasticity silt and clay (saCIL-SiL), dark gray, saturated with water, with a small organic impurity, weak. The layer is identified at survey points No. 18, 20, and 21. Its thickness varies from 0.3m to 0.5m.
IGS 12	Sandy low plasticity clay and silt (saCIL-SiL), dark gray, water-saturated, with a small amount of organic impurities, of medium strength. The layer is identified at survey points No. 6, 11, 12, 17, and 25. Its thickness varies from 0.3m to 0.8m.
IGS 13	Uniformly sorted sand (SaU), light gray, watery, of medium density. The layer is identified at the investigation sites No. 2, 3, 8, 15, 22, 23, and 25–28 at various depths. Its thickness varies from 0.3m to 1.2m.
IGS 14	Evenly graded sand (SaU), light gray, watery, dense. The layer is distinguished at test locations No. 2–4, 6–8, 10, 11, 15, 16, and 20–29, at various depths. Its thickness varies from 0.3m to 2.5m.
IGS 15	Evenly graded sand (SaU), light gray, watery, with occasional gravel and silt impurities, very dense. The layer is distinguished at the investigation sites No. 1–8, 9–18, and 20–29 at various depths. The base was not reached at the investigation site No. 21. The thickness of the investigated layer varies from 0.3m to 2.2m.
IGS 16	Evenly graded sand (SaU), light gray and yellowish-gray, wet, with occasional gravel and silt admixture, particularly dense. The layer is identified at test locations No. 1-29 at various depths. Its bottom was not reached at test locations No. 1–20 and 22–26. The thickness of the investigated layer varies from 0.5m to 7.9m.
IGS 17	Low plasticity clay and silt (CIL-SiL), gray and brownish-gray, very strong. The layer is identified at test points No. 27–29. Its bottom was not reached at test point No. 27. The thickness of the layer varies from 0.5m to 1.5m.
IGS 18	Sandy low plasticity moraine clay (saCIL), grayish-brown, with mica and gravel up to 5%, of medium strength. The layer is identified at test points No. 28 and 29. Its bottom has not been reached. The investigated layer thickness varies from 1.8m to 2.0m.

8. DISTANCES TO ADJACENT BUILDINGS AND ENGINEERING NETWORKS

There are no properties registered in the Real Estate Cadastre and Register in the planned works area buildings are not registered in the Cadastre and Registry of Registers and therefore no demolition works are foreseen. There are buildings registered in the Real Estate Cadastre and Register in the planned works area engineering networks. 300 kV NS power cable lines, NordBalt. The networks are operated by AB Litgrid. Broadband internet cable line RAIN, operated by Public Enterprise "Plačiajuostis internetas". Existing utilities under the south dam and wharf.

8.1. Requirements for works in the vicinity of NordBalt 300 kV NS power cable lines

Prior to the commencement of the works, the Contractor must agree the technology card with AB Litgrid representatives. Upon completion of the excavation above the cable, information on the actual excavation depths shall be provided to AB Litgrid and an assessment of their compliance with the design. This shall be done before the trenches are backfilled. The use of vibratory plates and other vibratory equipment is prohibited within 10 metres on either side of the cable machines. Anchoring is prohibited within 100 metres of the cable protection zone. A prohibitive sign is to be installed at the boundary of the buffer zone and anchoring with the sign is prohibited.

9. CONDITION OF EXISTING STRUCTURES AND ENGINEERING NETWORKS

9.1. NordBalt 300 kV NS power cable line

The construction work zone of the southern dam includes NordBalt, AB Litgrid, 300 kV NS electricity cables lines. The utilities (330 kV NS power cable lines) were installed in 2016.

9.1.1. Cable depth setting

Before the start of the works in the area of the southern dyke, where the southern dam is being built over the NordBalt power cable, the contractor must carry out surveys to determine (adjust) the planned position and depth of the cable. In accordance with the conditions of AB Litgrid representatives, the results of the surveys of the planned position and depth of the cable shall be submitted. The data of the cable positioning (adjustment) surveys shall be presented to the representatives of AB Litgrid. Upon completion of the excavation work above the cable, information on the actual. The actual excavation depths and their conformity with the design shall be assessed. This shall be done before the trenches are backfilled.

9.1.2. Influence of the dam structure on the protective pipe of the existing NORDBALT cable

The main part of the ground settlement (14 mm) will occur above the cable. The cable will not be affected by the deposition of soil layers above the cable. The theoretical calculated settlement below the cable of 3.7 mm is within acceptable limits and will therefore not have a negative impact. The theoretical deformation of the pipe due to applied pressures is also within the permissible limits. For the plan positions of the existing "NordBalt" cables, see the project drawings.

9.2. RAIN broadband internet cable line

The construction work zone of the southern dam includes the broadband internet cable line RAIN, "Plačiajuostis internetas". Installed in 2011.

10. THE MAIN CONSIDERATIONS JUSTIFYING THE DESIGN PROPOSALS DECISIONS

Klaipėda State Seaport Authority plans to build the Klaipėda State Seaport southern gateway complex. The Southern Harbour Gate is a multifunctional hydrotechnical structure, the main purpose of which is preventive environmental protection, designed to minimise changes in water permeability and, at the same time, salt water dispersion into the Curonian Lagoon by improving (dredging, widening, reversing) the port's shipping channel and water areas.

In assessing the II-A-2 variant of the project proposals for the 'Southern Gate Complex of the Klaipėda State Seaport, Kairiai str. 17, Klaipėda' prepared by UAB 'Sweco Lietuva,' and following the solutions of the General Plan for the Klaipėda State Seaport (land, internal waters, outer roads, and related infrastructure) and the decision of the Environmental Protection Agency on the improvement (deepening and widening) of the external and internal navigation channel of the Klaipėda State Seaport, reconstruction of the southern and northern breakwaters, and securing part of the Curonian Spit slope and the possibilities of constructing southern port gates on March 4, 2019, in the letter No. (30.1)-A4-1585, the technical project for the construction of the 'Southern Gate Complex of the Klaipėda State Seaport, Kairiai Str. 17, Klaipėda' is being prepared. The geometric, spatial, and environmental impact of the southern gates has been evaluated based on the technical concept report TK-K-1 *"Technical Concept of the Southern Gate of the Klaipėda State Seaport, Assessing the Development of Small and Recreational Ship Port (Marina) Infrastructure in the Southern Part of Klaipėda"* in 2015 and the environmental impact assessment report 16141-PAV.AT-1 *"Assessment of the Environmental Impact of the Construction (Building) of the Improvement of the External and Internal Navigation Channel of the Klaipėda State Seaport, Reconstruction of Southern and Northern Breakwaters, and Securing Part of the Curonian Spit Slope and the Construction of Southern Port Gates"* in 2015.

The conclusions in the reports include:

- The solution for the development of the southern gates of the Klaipėda State Seaport and its implementation scenarios are based on mathematical modeling of narrow strait flow. Alternative options for the southern port gates were analyzed hydrologically, and changes in the permeability, flow rates, and sediment flow of the Klaipėda Strait were calculated.
- When installing berths for small and recreational ships, the static position is chosen similarly to the concept so that the dam structure and parameters compensate for the increased permeability of the Klaipėda Strait due to port deepening.
- Application of nature protection measures limiting permeability for stages of port development is justified. The proposed solution for the southern port gates is environmentally friendly and meets the long-term development goals of the seaport.

In 2015, UAB "Sweco Lietuva" conducted a selection regarding the environmental impact assessment of "Storage of Extracted Sandy Soil in the Aquatorium of the Klaipėda State Seaport." According to the information document of the selection, the storage area was planned in a land plot controlled by the Directorate, approximately 6.6 hectares in size (after starting the technical project and slightly changing decisions, the area decreased to approximately 5 hectares). On January 8, 2015, the Environmental Protection Agency (hereinafter referred to as AAA) issued a conclusion that environmental impact assessment is mandatory. Later, it was clarified that only clean soil of pollution classes I and II will be stored in the area, following the rules for excavation of soil in seas and sea areas and the handling of excavated soil (LAND 46A-2002). Based on these reasons, AAA evaluated and, on April 7, 2015, provided the final conclusion that environmental impact assessment is not mandatory. In the 2019 PAV report, it was stated that the water area of the southern gates is planned to be deepened to a depth of 3 meters. The decisions changed slightly when preparing the technical project. It was decided to deepen the water area of the southern gates to 4.6 meters (in the ferry zone) and 3.5 meters (in the zone of small and recreational ships). Considering this, a decision was made to conduct a selection for the clarification of the environmental impact assessment for the project 'Improvement of the External and Internal Navigation Channel of the Klaipėda State Seaport (Deepening and Widening), Reconstruction of Southern and Northern Breakwaters, and Securing Part of the Curonian Spit Slope, and the Construction of Southern Port Gates.' On March 4, 2019, the decision No. (30.1)-A4-1585 'On the Possibility of the Construction of the Improvement of the External and Internal Navigation Channel of the Klaipėda State Seaport (Deepening and Widening), Reconstruction of Southern and Northern Breakwaters, and Securing Part of the Curonian Spit Slope, and the Construction of Southern Port Gates' (hereinafter referred to as PAV decision) was received, stating that the planned economic activity – the construction of the improvement of the external and internal navigation channel of the Klaipėda State Seaport (deepening and widening), reconstruction of southern and northern breakwaters, and securing part of the Curonian Spit slope, and the construction of southern port gates – is permissible according to the alternative presented in the PAV report. The structures of the southern gate complex of the Klaipėda State Seaport are not intended for direct needs of the Klaipėda State Seaport (navigation or cargo) but have an environmental function aimed at minimizing and avoiding the potential impact of planned solutions for the Klaipėda State Seaport (changes in water permeability, flow rates, and sediment flow of saline water). When planning projects for the development of the Klaipėda State Seaport, which involve solutions for dredging and widening the external and internal waters, the Klaipėda State Seaport Directorate (hereinafter referred to as KVJUD or the Directorate) examines the possibilities of targeted use of extracted uncontaminated sandy soil (Classes I, II, III according to LAND 46A-2002). This soil could be used for replenishing beaches (Class I) or for port purposes in construction works, forming new territories, and constructing and installing hydrotechnical structures, as well as for other construction and civil engineering works in the restoration of existing beaches in port approaches.

The structures within the southern gate complex of the Klaipėda State Seaport serve an environmental purpose rather than directly meeting the operational needs of the seaport, such as navigation or cargo handling. Their primary objective is to minimize and mitigate the potential impacts of planned developments in the Klaipėda State Seaport, specifically addressing changes in water permeability, flow rates, and sediment flow of saline water.

During the planning of projects for the expansion and enhancement of the Klaipėda State Seaport, which includes measures like dredging and widening both the external and internal water areas, the Klaipėda State Seaport Directorate (referred to as KVJUD or the Directorate) explores options for the targeted use of excavated uncontaminated sandy soil. This soil, categorized into Classes I, II, III according to LAND 46A-2002, holds potential applications such as beach replenishment (Class I) or for various port-related purposes, including construction projects, the creation of new areas, installation of hydrotechnical structures, and other civil engineering works involved in the restoration of existing beaches within port approaches.

The information for the selection regarding the mandatory environmental impact assessment of the planned economic activity has been prepared in accordance with the Republic of Lithuania Law on Environmental Impact Assessment of Planned Economic Activities, methodological guidelines for the selection of planned economic activities, technical task requirements of the Klaipėda State Seaport Directorate (KVJUD), and the information provided in the project proposals for the Southern Gate Complex of the Klaipėda State Seaport, located at Kairiai Str. 17, Klaipėda.

The main justifications for the presented project solutions are:

- The task of design work.
- Topographical measurements conducted in 2021 (by UAB "GEOSMART").
- Engineering investigations carried out in 2022 (by UAB "Garant diving").
- Previous experience in designing projects of this type.

11. INFORMATION AND SOLUTION DATA

The most important task is to ensure the proper hydrodynamic regime in the Klaipėda Strait upon completion of the southern and northern breakwater construction and dredging works in the Klaipėda Port waters. Considering the scope of construction works and possible indicative construction timeframes, the construction and dredging activities have been divided into stages.

Construction works are divided into four stages of construction works:

- **Phase I of construction - construction of part I of the southern and northern dams;**
- Phase II of construction – construction of the wharf;
- Phase III of construction - construction of the embankment.
- Phase IV of construction - construction of part II of the northern dam.

Water area dredging works are divided into two stages of harbor water area dredging works:

- Phase I – dredging of the water area up to -3.5 m (-1.5 m in the southern part);
- Phase II - dredging of a part of the water area (in the ferry area) up to -4.6 m (assuming a turning circle ferry solution).

Small boat harbor activities can be implemented during the first and second construction phases and the first dredging phase. The operations of passenger ships requiring a quay can be realized during the third construction phase and the second dredging phase. Dredging of the port navigation channel to a depth of -17.0 m is possible during the fourth construction phase.

The indicative construction period for the first construction phase is 2 years. The indicative duration for the second and third construction phases is approximately 2.5 years each. The indicative duration for the fourth construction phase is 1 year.

Simultaneously with the first construction phase, the execution of the first dredging phase is possible. This is done to utilize excess excavated soil during dredging in the construction of breakwaters, thereby minimizing additional transportation and storage tasks.

The timelines of construction work directly depend on the capabilities of the contractor, as the complex involves several structures that can be built sequentially or concurrently.

12. LOADS AND THEIR COMBINATIONS

12.1. Constant loads

12.1.1. Vertical

Self-weights – the specific weight γ (gamma) of materials, such as steel, reinforced concrete structures, soil, and other substances, is used to calculate their self-weights

12.1.2. Horizontal

Active soil pressure load σ_a , depending on depth z :

$$\sigma_a = K_a \sigma'_{vz} - 2c' \sqrt{K_a}$$

here K_a – active soil pressure coefficient;
 σ'_{vz} – effective vertical soil pressure at depth;
 c' – soil cohesion

12.2. Variable Load

12.2.1. Vertical

12.2.1.1 Usage load

Distributed usage (operating) load form possible high concentration of people, buses, trucks and similiar equipment $q_k = 19,6 \text{ kN m}^2$

12.2.1.2 Transport (local) load

To design the pavements, local loading is induced by heavy-duty transport.

The load is accepted according to the standard type of local traffic truck presented in LST EN 1991-2:2003 Table 4.7. The accepted equivalent axis load $Q_k = 130 \text{ kN}$.

Wheel type B, footprint width $B = 270 \text{ mm}$, length $L = 330 \text{ mm}$.

The equivalent distributed load is calculated based on the wheel footprint area:

$$q_k = \frac{Q_k}{2 \cdot B \cdot L} = \frac{130 \text{ kN}}{2 \cdot 0,27 \text{ m} \cdot 0,33 \text{ m}} = 730 \text{ kN m}^2$$

Distance between axes - 4.5 m. Distance on the axle between wheel centers - 2.0 m.

The accepted equivalent axis load complies with the load requirements according to STR 2.05.04:2003 category G ($Q_k = 90 \text{ kN}$) and the maximum 11.5 tons axis load set for trucks according to the European Council Directive 96/53/EB.

12.2.1.3 Snow load

The snow load on the structure is not significant and together with the maximum load of use at the same time in the combination won't work, so not rated.

12.2.2. Horizontal

12.2.2.1 Undulation

The wave height calculated for the design case (wave height for a 2% probability wind speed) and the operational case (when the wind speed is 15 and 20 m/s) is presented in Table 10.

Table 10. Calculated wave heights

Wind direction	Wind speed u , m/s	Wind acceleration road l , m	Average depth d , m	Wave height h_s , m
North	15	2000	7,0	0,51
	20	2000	7,0	0,70
	26	2000	7,0	0,93
South	15	52000	3,0	0,80
	20	52000	3,0	0,94
	23	52000	3,0	1,01
Western	15	1000	7,0	0,39
	20	1000	7,0	0,54
	34	1000	7,0	0,96

The calculated wave height $h_s = 1.0$ was adopted for the calculations.

12.2.2.2 Ice load

In the southern and middle parts of the Curonian Lagoon, where weak currents prevail, the ice cover is formed by fresh water. In the past, a stable ice cover of up to 78 cm thickness was observed (Baušys, 1978). However, in the northern part of the Curonian Lagoon, strong outflowing currents of fresh or mixed fresh and brackish water dominate. Inflowing currents of brackish sea water are also observed, preventing the formation of a permanent ice cover. Previously, near Kiaulės nugaras, a maximum ice thickness of 30 cm was recorded, with thermal cracks ranging from a few centimeters to 2 m in width due to frequent changes in temperature and wind direction. Almost every winter, frost heaving is observed in the northern part. During mild and moderate winters, a northward flow forms along the Curonian Spit.

For calculations, an assumed design ice thickness $h_d = 0.3$ m; 0.5 m (depending on the consequences of the structure's limit state).

12.3. Safety limit states

EQU - the safety limit state where, under this condition, the structure or its part is considered rigid, loses static equilibrium when small changes in the effects of one source in the spatial distribution are significant, and the strength of construction materials and soil is insignificant.

STR - the safety limit state where structural elements fail when the strength of materials is insufficient or excessive deformations occur.

GEO - the safety limit state where foundation settlement or excessive deformations begin, and the strength of the foundation is significant for ensuring resistance.

GEO-3 - a separate case of safety limit state GEO used in assessing overall stability.

UPL - loss of structural or foundation equilibrium due to uplifting under the action of water pressure or other vertical effects.

HYD - safety limit state where the foundation loses stability due to hydrodynamic pressure and insufficient soil filtration strength.

Two main design cases DA2 and DA3 are applicable to the safety limit state.

1. Design case DA2:

– Combination A1 "+" M1 "+" R2;

2. Design case DA3:

– Combination (A1* and A2**) "+" M2 "+" R3;

Group A is applied to actions and their effects, Group M to soil indicators, and Group R to force values. A1* - only for structural actions; A2** - only for geotechnical actions.

12.3.1. Partial reliability coefficients

The calculated values of actions are obtained by multiplying characteristic values by partial safety factors, forming combinations of actions - multiplied by the corresponding combination factors of actions. These partial factors are presented in the tables below. For the ultimate limit state, all partial safety factors are set equal to 1.0.

12.3.2. Stability (EQU) safety limit state

Table 11. Partial coefficients for the effects of γF when checking the static equilibrium limit state būAB (EQU)

Effect		Marking	Worth	Notes
Permanent	Unfavorable	$\gamma_{G:dst}$	1,1	to permanent destabilizing effects
	Favorable	$\gamma_{G:stb}$	0,9	to permanent stabilizing effects
Variable	Unfavorable	$\gamma_{Q:dst}$	1,5	destabilizing effects causing hydraulic fracturing
	Favorable	$\gamma_{Q:stb}$	0	for stabilizing effects to prevent hydraulic breakdown

Table 12. Partial coefficients γM for soil properties when checking static equilibrium limit state būAB (EQU)

Soil indicator	Mark	Worth
The tangent of the angle of internal friction	$\gamma_{\varphi'}$	1,25
Effective clutch	$\gamma_{c'}$	1,25
Undrained shear strength	γ_{cu}	1,4
Unrestrained compressive strength	γ_{qu}	1,4
Specific gravity	γ_{γ}	1,0
$\gamma_{\varphi'}$ - partial coefficient applied to the tangent of the internal friction angle ($\tan \varphi k$)		

12.3.3. Structural (STR) and geotechnical (GEO) safety and serviceability limit states

Table 13. Partial coefficients for the effects of factors/actions

Factor	Marking	Meaning	
		A1	A2
Constant	Unfavorable	γ_G	1,35
	Favorable		1,00
Variable	Unfavorable	γ_Q	1,30
	Favorable		0,00

Table 14. Partial soil coefficients

Soil parameters	Marking	Meaning	
		M1	M2
Shear resistance (tangent of internal friction angle)	$\gamma_{\varphi'}$	1,00	1,25
Effective clutch	$\gamma_{c'}$	1,00	1,25
Undrained shear strength	γ_{cu}	1,00	1,40
Unrestrained compressive strength	γ_{qu}	1,00	1,40

Soil parameters	Marking	Meaning	
		M1	M2
Weight density	γ_γ	1,00	1,00
$\gamma_{\varphi'}$ - partial coefficient applied to the tangent of the internal friction angle ($\tan \varphi'k$)			

Table 15. Partial coefficients of base resistance of supporting structures

Soil parameters	Marking	Meaning	
		R2	R3
Resistance to crushing	$\gamma_{R:v}$	1,4	-
Slip resistance	$\gamma_{R:h}$	1,1	-
Resistance of the base	$\gamma_{R:e}$	1,4	-

12.3.4. Values of effect adjustment coefficients ψ

The coefficient ψ , which evaluates the reductions in the calculated values of variable effects, for others together is applied as ψ_0 , ψ_1 or ψ_2 for the acting variable effects.

Table 16. Values of effect adjustment coefficients ψ

The effect	ψ_0	ψ_1	ψ_2
Gathering areas	0,7	0,7	0,6
Storage areas	0,8	0,9	0,8
Traffic areas	0,7	0,5	0,3
Snow loads	0,7	0,5	0,2
Wind loads	0,6	0,2	0
Temperature (non-fire)	0,6	0,5	0

12.4. Load combinations

Combinations of permanent and short-term calculable situations (main combinations) are defined by the formula

$$E_d = \sum \gamma_{G,j} G_{k,j} + \sum_{i \geq 1} \gamma_{Q,i} Q_{k,i}$$

Table 17. Combinations of effects

Combination	Permanent effects		Variable effects	
	unfavorable	favorable	the prevailing	others
Countable	$\gamma_{Gj,sup} G_{kj,sup}$	$\gamma_{Gj,inf} G_{kj,inf}$	$\gamma_{Q,1} Q_{k,1}$	$\gamma_{Q,i} \psi_{0,i} Q_{k,i}$
Characteristic	$G_{kj,sup}$	$G_{kj,inf}$	$Q_{k,1}$	$\psi_{0,i} Q_{k,i}$
Frequency	$G_{kj,sup}$	$G_{kj,inf}$	$\psi_{1,1} Q_{k,1}$	$\psi_{2,i} Q_{k,i}$
Supposedly permanent	$G_{kj,sup}$	$G_{kj,inf}$	$\psi_{2,1} Q_{k,1}$	$\psi_{2,i} Q_{k,i}$

Combinations (situations) are made using individual load combinations and presented in the table below.

Table 18. Calculated load combinations (situations) for wharfs

Combinations	Own weights (L-1)	Use load (L-2)	Transport load (L-3)	Undulation (L-4)	Ice load (L-5)
1	2	3	4	5	
LC-1	+	+			
LC-2	+		+		
LC-3	+			+	
LC-4	+				+

Table 19. Calculated load combinations (situations) for coverings/plates

Combinations	Own weights (L-1)	Wind load (L-6)			
1	2	3			
LC-1	+	+			

Table 20. Calculated combinations of loads (situations) for the closing seam of the ship's slip during construction

Combinations	Own weights (L-1)	Transport load (L-3)	Transportation load (L-7)		
1	2	3			
LC-1	+	+			
LC-2	+		+		

13. DESIGN SOLUTIONS

13.1. Construction of the southern and northern dams

The southern part of the water area is planned to be closed by installing the southern dam, while the northern part of the water area is intended to be closed by installing the northern dam. Unstable bottom sediment, such as silt, is removed, and trenches are formed to the elevations indicated in the project drawings. The foundation of the dams is formed, and geotextile is installed. On the installed geotextile, the core structure of the dams is constructed using mineral materials. The sloping surface of the dam core is covered with geotextile (the exact requirement is specified during the detailed design phase). A protective (cover) layer is installed on the geotextile made of mineral materials, which is then followed by a filtration layer. An additional protective (cover) layer made of mineral materials is formed on top of the constructed dam core to protect it from potential natural effects during the operational period.

The constructions of the southern and northern dams made of mineral materials are divided into three zones:

Zone No.1 - dam construction (core, filtration, and protective (cover) layers) formed from the bottom to the elevation of -0.87 m (-1.00 m). Mineral materials are permanently submerged underwater.

Zone No.2 - dam core construction formed from an elevation of -0.87 m (-1.00 m) to +0.63 m (+0.50 m). The filtration and protective (cover) layers of the dam are formed from an elevation of -0.87 m (-1.00 m) to the top of the dam's protective (cover) layer. Mineral materials are partially submerged underwater (enter the water level fluctuation zone, affected by precipitation, heated by the sun, subjected to freezing-thawing cycles).

– Zone No.3 - a separating geotextile is installed above the dam core (if the fraction of materials in Zone No.3 is smaller than in Zone No.2), and from an elevation of +0.63 m (+0.50 m), a base for the covering structure is formed using mineral materials on which concrete structures and covering structures are installed.

13.1.1. Geotextile

A separation layer made of geotextile is installed on the base of the bottom, which consists of loose sand. The reverse filter of the dam, wharf structure is installed from geotextile. Below are the data for selecting a geotextile reverse filter.

Table 21. Multipliers for calculating geotextile reverse filters

Loose soils		Cohesive soils	
One direction flow		Alternating flow	Any flow
$C_u < 5$	$C_u \geq 5^*$	-	-
$0_{90} < 2,5d_{50}$	$0_{90} < 10d_{50}$	$0_{90} < d_{50}$	$0_{90} < 10d_{50}$
$0_{90} \leq d_{90}$	$0_{90} \leq d_{90}$		$0_{90} \leq d_{90}$
-	-	-	$0_{90} \leq 0,1 \text{ mm}$

Notes: * When the grain size distribution curve is close to a straight line, $0_{90} \leq d_{90}$ is valid up to $C_u < 27$.

1) Here, 0_{90} represents the generalized size (diameter) of geotextile pores (voids), which corresponds to 90% through the geotextile in the soil grain size distribution curve.

2) For non-woven geotextile with a thickness greater than 1.5 mm, increase the coefficients by 20% when d_{50} and d_{90} are present.

3) Conditions for laying geotextile: when laying on coarse gravel, reduce the coefficients by 1.5 times or more for d_{50} and d_{90} (to be refined through laboratory tests).

13.1.2. Dam core

The dam construction core (embankment) is formed using local excavated mineral soil and/or imported mineral materials. When fine-grained mineral soils are used, various geotextile products must be additionally employed to reduce and/or prevent the washing out of fine-grained mineral fill, ensuring the stability of the constructed slopes both underwater and above water.

If the mineral material used allows the formation of stable required slopes and is not washed out during construction, there is no need for additional geotextile products for core formation.

During construction, in order to shape the underwater and above-water slope core structures, the Contractor selects the materials and details the core construction solutions in the construction project based on the

Contractor's chosen and assessed construction technology, the used mineral materials, the fraction of mineral materials, and other necessary additional measures.

13.1.2.1 Water flow velocities and mineral soil particle size

According to the conducted technical conception of the southern gates of the Klaipėda State Seaport and the modeling of water flow structure, with a maximum discharge of 4200 m³/s from the Curonian Lagoon to the Baltic Sea, a water flow will form near the designed structure, with a velocity ranging from 1.2 to 1.4 m/s. Below is a summary table of the modeling results.

Table 22. Dependency of water flow velocity at the dam head on the water discharge in the estuary.

Water flow from the Curonian Lagoon to the Baltic Sea	Water current flow speed, m/s
1600	0,5-0,55
2700	0,8-0,9
4200	1,2-1,4

According to JUTR (6, 7) and EAU 2012 (12.4.3), annual parameters of stones for erosion protection depend on the water flow velocity. Erosion typically occurs when the flow velocity exceeds permissible rates.

Table 23. Average value of stones when assessing water flow velocity.

Water currents speed, m/s	Mass mean value (median) W_{n50} kg		Meanvalue of diameter (median) D_{n50} , cm	
	JUTR	EAU 2012	JUTR	EAU 2012
0,5	0,0018	0,001	1,1	0,99
0,55	0,0032	0,002	1,3	1,20
0,8	0,03	0,022	2,8	2,53
0,9	0,06	0,046	3,5	3,20
1,4	0,86	0,645	8,5	7,75
2,0	7,29	5,486	17,4	15,82

The materials used are selected based on the speed of the water flow. Water current speed The effect of 0.55 m/s The materials used are selected based on the speed of the water flow. Water current speed is relevant during the construction of the dam for the structural material of the core, the filter layer stone anniversary. The water current speed of 1.4 m/s is relevant during the operation of the stones of the protective layer for the year.

13.1.2.2 Slope stability calculations

Concrete foundations are constructed to anchor pontoon ramps. The foundations are placed near the edge of the slope, and the slope gradient is 1:1.5. The stability of the slope is checked in construction and operational cases. Calculations are performed using the Bishop method.

Table 24. Slope stability calculations results

Situation No.	Description of the situation	Slope stability coefficient
1	The core is installed, without protective and filtration layers of stones, before pouring the foundation concrete.	1,636
2	Installed core, without protective and filter layers of stones, when concreting the foundation	1,452
3	Installed core, with protective and filter layers of stones, before concreting the foundation	2,032
4	Installed core, with a protective and filtering layer of stones, while concreting the foundation	1,872
5	Fully equipped wharf during operation	1,562

The slope stability coefficient is considered sufficient when the value is greater than or equal to 1.5. Conclusion: The slope stability is ensured. Before installing reinforced concrete structures at the top of the slope near the edge (i.e., when concreting the foundation of the pontoon ladder support), it is necessary to install filtration and protective (cushion) layers (up to the formed foundation base).

13.1.3. Filtration layer

The filtration layer is installed to protect the core of the dam from the washout of fine particles through the cushion layer, as well as to protect the geotextile from damage when installing fractured cushion stones.

The annual values of the filtration layer are calculated based on the conditions:

According to the average mass of stones used in the cushion layer:

$$\frac{M_{50u}}{M_{50a}} = \frac{1}{15} \div \frac{1}{10}$$

$$M_{50u,min} = M_{50a} \cdot \frac{1}{15} = 12,8 \text{ kg}$$

$$M_{50u,max} = M_{50a} \cdot \frac{1}{10} = 19,3 \text{ kg}$$

M_{50u} – average mass of filter layer stones;

ia M_{50a} - the average mass of stones of the paving layer..

According to the average diameter of the stones used in the paving layer

$$\frac{D_{n50a}}{D_{n50u}} = 2,2 \div 2,5$$

$$D_{n50u,min} = \frac{D_{n50a}}{2,5} = 15,6 \text{ cm}$$

$$D_{n50u,max} = \frac{D_{n50a}}{2,2} = 17,7 \text{ cm}$$

D_{n50u} – average diameter of filter layer stones;

ia D_{n50a} - the average diameter of the stones of the paving layer.

The standard fraction 90/250 mm is accepted. More detailed calculations are presented in the appendices.

The adopted fraction is specified in STR EN 13383-1 "Appraisal stone. Part 1. Technical requirements" and corresponds to the CP90/250 mm particle diameter 17 cm, stones of this fraction

resistant to a water flow speed of 2.0 m/s.

Table 25. Thickness of stone layer according to standard categories of facing stone

Category	CP _{90/250}
Fraction, mm	90 iki 250
Average calculated mass M₅₀, kg	13
Average nominal diameter D_{n50}, cm	17
Layer thickness t_d, m	0,34

13.1.4. Protective (apparatus) layer

The protective (cushion) layer of slope reinforcement is a protective layer of stones on the exterior of the construction, designed to ensure resistance to the impact of waves, ice, water level fluctuations, temperature variations, atmospheric precipitation, and wind.

Slope reinforcement is divided into two parts – main and eased. Main slope reinforcement is carried out in the zone of the most intense impact of waves and ice. It is assumed to be from the lowest water level with a 97% probability, and it is considered equal to the altitude of -0.87 m LAS07 (-1.00 m BAS77) up to the top of the construction (Zone No. 2). Higher cold resistance requirements are imposed on the main slope reinforcement.

Eased slope reinforcement is carried out below the main slope reinforcement, from the bottom to the altitude of -0.87 m LAS07 (-1.00 m BAS77) (Zone No. 1).

13.1.5. Water culverts

In the southern protective dam, water-permeable structures are installed to ensure water exchange in the water area. The water exchange in the water area is assessed using a hydrodynamic model. The results of hydrodynamic modeling with conclusions are presented in the report "Evaluation of Water Exchange in the Water Area of the Southern Gates of Klaipėda Port, Applying Hydrodynamic and Sediment Transport Numerical Modeling Methods." The hydrodynamic modeling report is included in the annexes of the project's General Part. Based on the modeling results, the diameter, quantity, and installation locations of the water permeable structures are selected. The quantity and spatial arrangement of the water permeable structures can be found in the project drawings.

13.1.5.1 Effects of water ripples

According to [Rock Manual], the average diameter of the armor stone is calculated for resistance to wave action. Detailed calculations are provided in the annexes, and the results of the calculations are presented in the table.

Table 26. Mass of stones with a variable slope factor and under the influence of a wave of different heights

Wave height h _b (m)	The slope of the slope	Average rock	
		Weight W ₅₀ (kg)	Diameter D ₅₀ (cm)
0,75	1:1,5	191,6	41,7
1,00	1:3,0	227,0	44,1

The outer perimeter of the dams, having the maximum possible environmental impact, is accepted with a slope ratio of 1:3. The inner perimeter of the dams is accepted with a slope ratio of 1:1.5.

13.1.5.2 Effect of Ice

According to the [Rock Manual], it is recommended to accept a slope of less than 30° due to ice exposure. Accepted slope 1:3 is 18.4°. It is recommended that the average stone diameter is greater than the maximum ice diameter thickness. Ice thicker than the accepted average stone diameter (39 cm) is unlikely. It is checked whether the horizontal component of the force of the impact of ice will not exceed the force of resistance to the movement of stones. The resistance of the accepted stone diameter is sufficient. The calculations are presented in the engineering calculations file.

13.1.5.3 Setting stone fraction

According to the calculations performed, the standard fraction of 60-300 kg is accepted. This fraction is specified in LST EN 13383-1 "Armor Stone - Part 1: Technical Specifications" and corresponds to the LMA_{60/300} category indicated in Table 2 of Section 4.2 of the standard.

Table 27. Thickness of stone layer according to standard categories of facing stone

Category	LMA _{60/300}
Fraction, <i>kg</i>	60 iki 300
Average mass <i>M_{em}, kg</i>	120 iki 190 (avg. 155)
Average calculated mass <i>M₅₀, kg</i>	149 iki 236 (mean. 192,5)
Average nominal diameter <i>D_{n50}, cm</i>	39
Layer thickness <i>t_d, m</i>	0,78

13.1.6. Connection of the northern dam structure with the quay structure.

The construction of the northern dam is carried out in the first stage of construction works, while the construction of the quay at the base of the northern dam is planned to be carried out in the third stage of construction works. In order to avoid interference with the newly constructed dam structures by connecting different structures at different construction stages, it has been decided to install a section of the quay's pile foundation - a sheet pile wall in the first stage of construction works. The length of the quay's pile foundation section is planned to be sufficient so that, when starting the third stage of construction works (quay construction), it will be possible to smoothly connect the already installed dam structure with the quay structure being constructed in the third stage.

The length and plan position of the quay's construction section are indicated in the project drawings. The length of the section is subject to adjustment during the detailed design phase.

13.1.7. Concrete protection against ice impact.

Concrete superstructure designed for protection against ice impact.

Table 28. Summary of calculations results for concrete ice protection studs.

Title	Unit	Bending moment.
On the inner side of the wall., h=550 mm	-	-
Acting characteristic bending moment.	kNm/m	162,0
Acting calculated bending moment.	kNm/m	210,6
Acting calculated lateral force.	kN/m	78,0

The length and horizontal position of the reinforced concrete counterfort are to be viewed in the project drawings.

13.1.8. Foundations for fixing pontoon lindens

This project provides for the approval of the pontoon boats planned in the future reinforced concrete foundations. The dimensions of the foundations are 5 m long, 1.5 m wide, 1.2 m high. Due to the loads caused to the pier structure at the top of the slope during the installation of foundations, foundations are installed only after installing the outer layers of wharf stones up to an altitude of +0.63 m (+0.5 m).

13.1.9. Technology canal

The technological canal is installed along the southern dam. The technological canal consists of reinforced concrete manholes (communication cable manholes) installed at an average interval of 100 m and 2 units of d110 plastic pipes installed between the manholes.

13.1.10. Navigation marks and their foundation

On the southern and northern dam, navigation marks are installed.

At the head of the southern dam, a green navigation mark, approximately 4 meters in height, with a light at the top is planned.

At the head of the northern dam and at the turn of the dam, a red navigation mark, approximately 4 meters in height, with a light at the top is planned.

For detailed solutions of navigation marks, refer to the project drawings.

Navigation marks are mounted on the installed reinforced concrete shallow foundations. The weight of the navigation mark is assumed to be about 2 tons. The foundation has a height of 4.6 meters and a width of 1.3 meters.

The possibility of installing a 2 x 2 m stand on top of the navigation mark is considered for future use.

13.1.11. Railings, gates

In the southern dam, on one side, a barrier made of reinforced concrete is formed as protection against ice. On the remaining perimeter, on the other side, railings made of stainless steel are installed.

In the northern dam, pedestrian traffic is restricted by gates at the beginning of the northern dam on the shore and a sign prohibiting traffic. Parameters and the layout of gates restricting pedestrian traffic, as well as their foundations, are provided in the drawings. Parameters of railings, signs, gates, and their foundations should be refined and detailed in the detailed project.

13.2. Preparatory works

Organization of temporary access roads and other construction works are described in the preparation for construction and organization of construction works part of this project 8858-00-TP-SO-08.01. Wharf construction works are being carried out on the coast of the Curonian Lagoon. It is planned to carry out the work by a combination of floating means and land. Due to the nature of the construction works, the discharge of water from the construction site is not foreseen.

13.2.1. Removal of soil, vegetation, unstable soil, and waste

For the designed structures, the removal of obstructing trees is planned. The extracted trees, branches, and shrubs will undergo shredding and be transported to a waste management center for composting of green waste. The vegetation removal process is detailed in section 8858-00-TP-SO-08.01, titled 'Estimated Amount (by weight) of Various Types of Construction Waste.'

Excavated mineral soil, specifically sand, will be reclaimed for reuse in the construction of quay structures. Unstable soil, identified as clayey soil, will either be removed at sea or handled in accordance with waste management regulations. The remaining unused mineral soil, particularly sand, will be utilized to supplement the construction of the northern dam Part I.

Materials not explicitly mentioned in this list that could be potentially reused will be transported to storage locations only after coordination with the Construction Works Execution Management KVJUD.

13.3. The axis (alignment) plan of the dam.

The plan position of the dam's horizontal axis (alignment) is to be viewed in the project's plan drawings.

13.4. The longitudinal profile of the dam.

The longitudinal profiles, slopes, and related solutions for the dam are presented in the project's longitudinal and cross-section drawings.

13.5. Land slope

A fill embankment (zone No.3) is formed for the foundation of the deck structure. The fill embankment is constructed on frost-resistant mineral soil, which is used to build the dam core structure (zone No.2). The Contractor, when selecting the parameters of the mineral soil and the construction method, must ensure the stability of the constructed fill embankment (compaction indicators, deformation modulus) according to the Rules for the Performance of Road Earthworks and the Installation of Fill Embankments IT ŽS 17, point 175, which states: "When starting compaction works, the Contractor proves in the test section that, using the selected construction method, the requirements for compaction specified in the work description or in Section VIII, the second subsection, are met (see also points 578–586). If these requirements are not met, the Contractor must change the construction method."

Notes:

1. During construction works, it is necessary to check the deformation modulus E_{V2} of the fill embankment. The Contractor must compact the embankment until the deformation modulus $E_{V2} \geq 45$ MPa, or as specified in the technical specifications.
2. It is recommended to carry out compaction works at lower water levels; therefore, when preparing the construction schedule, the Contractor must assess the fluctuations in water levels and carry out compaction works during dry periods of the year.

13.6. Rainwater collection, purification, and drainage.

A dam structure is being constructed in the waters of the Curonian Lagoon. The southern dam is equipped with decks on the dam crest intended for pedestrians and occasional authorized transport. Long-term parking on the decks for vehicles with internal combustion engines is not allowed. On the northern dam, gates restricting access are installed - entry onto the northern dam is permitted only for the Builder's individual servicing vehicles.

As the decks will be used by pedestrians and vehicle parking is not allowed, rainwater collection, cleaning, and drainage are not anticipated (not mandatory).

13.7. Top dam cover structure

Plans/sections of the covering structure installation solutions are provided within this section. The covering structure of the southern dam is being designed:

- Fiberconcrete covering 0,20 m;
- Crushed stone base layer ($E_{V2} \geq 120$ MPa) 0,40 m;
- Top of the formed core compaction ($E_{V2} \geq 45$ MPa)

Northern dam designed covering construction:

- Mineral soil – crushed stone 0/45 covering ($E_{V2} \geq 150$ MPa) 0,60 m;
- Top of the compacted core ($E_{V2} \geq 45$ MPa)

13.7.1. Fiber concrete surface

For the southern dam, a fibrous concrete covering reinforced with polypropylene fibers (macro fibers) is designed. The concrete strength class and environmental exposure class comply with the requirements specified in the technical specification. The recommended durability class is S4.

The thickness of the concrete layer is 200mm. The design of the fibrous concrete covering follows the specified loads in the project, adhering to the TR-34 guidelines (3rd and 4th editions), Model Code 2010, EC2 regulations, and the technical parameters of the product.

Expansion joints for deformation and shrinkage control are planned at an average spacing of 3.5 m x 3.5 m. Temperature-induced expansion joints are planned at an average spacing of 14 m. The arrangement of expansion joints must be detailed in the construction project.

The surface of the concrete covering should be textured, as specified in the project's technical specifications. During the installation of the concrete covering, it is recommended to reduce the water evaporation rate from the concrete by using additional measures and covering the poured concrete layer with a membrane to prevent uncontrolled cracking of the concrete.

14. TECHNICAL INDICATORS OF PROJECT SOLUTIONS

Technical indicators of the southern dam:

- Dam crest length* – 1302 m.
- Dam crest width* – 10,0÷20,0 m.
- Dam crest top elevation* – +2,13 (+2,00)** m.
- Port water depth (bottom elevation) – -3,37 (-3,50)** m.
- Consequence class – CC2.

Northern dam technical parameters:

- Total length of the dam crest* - 995,5 m
 - o Dam crest length* during I construction phase*** – 575,0 m.
 - o Dam crest length* during IV construction phase*** – 420,5 m.
- Dam crest width* - 11,0÷21,0 m.
 - o Dam Crest Width* Phase I – 11,0 m.
 - o Dam Crest Width* Phase IV – 11,0÷21,0 m.
- Dam Crest Top Altitude* – +2,13 (+2,00)** m.
- Port Waters Depth (Bottom Altitude) – -4,47 m (-4,60 m)** m.
- Consequence Class – CC2.

* The indicators are calculated in accordance with the Rules for Cadastral Measurements of Real Estate and Data Collection, approved by the Minister of Agriculture of the Republic of Lithuania. Upon completion of construction and conducting cadastral measurements, these indicators may have insignificant deviations.

** The specified double altitudes are in the Lithuanian height system LAS07 (in parentheses - Baltic height system BAS77).

*** Upon completion of the I phase of construction of the northern dam, 58% of the structure completion is registered; upon completion of the IV phase construction works, 100% of the structure completion is registered.

15. PROJECT PREPARATION AND MAIN REGULATORY CONSTRUCTION TECHNICAL DOCUMENTS, AND COMPUTER PROGRAMS

15.1. Project preparation documents:

Document index	Title	Notes
	Design Task (AB Klaipėda State Seaport Authority)	
	Additional Design Task No. 1 (AB Klaipėda State Seaport Authority)	
	Construction Project Proposals for the Southern Gate Complex of Klaipėda State Seaport, Kairiai Str. 17, Klaipėda, UAB "Sweco Lietuva," 2022	
	Engineering Geological (Geotechnical) Survey Report, UAB "Garant Diving"	
	Topogeodetic photograph, UAB "GEOSMART"	
S/33-2104.23.23-G-V:01 2023 m.,	Assessment of water exchange in the southern gate waters of Klaipėda Port using hydrodynamic and numerical modeling methods for sediment transport. Report by the Lithuanian Energy Institute.	
	Information for the environmental impact assessment selection, UAB "Kelprojektas."	
NT Register 44/520032	Extracts from the Real Estate Register database.	
NT Register 44/1441189	Extracts from the Real Estate Register database.	
	Depth plan	
	The technical concept of the southern gates of the Klaipėda State Seaport, developed by UAB 'Sweco Lietuva' and the Lithuanian Energy Institute, evaluating the development of infrastructure for small and recreational vessels (marinas) in the southern part of the city of Klaipėda (2015).	
8858-00-TP-SP-02.01.PR-01	Position of the fiber optic cable (RAIN) near the designed structure QUAY - 03	
	The decision on the environmental impact assessment, 2019.	

15.2. Computer programs used in the preparation of this part of the project:



Row No.	Manufacturer	Program title
1.	Microsoft 365 (Office)	Formalization
2.	Autodesk AutoCAD 2023	Construction modeling, drawing
3.	Autodesk Civil 3D 2023	Modeling of surfaces, calculation of cost quantities.
4.	Autodesk RSA 2023	Analysis and calculation of constructions

15.3. Normative construction technical documents:

STR 1.01.03:2017	Classification of Structures;
STR 1.01.08:2002	Types of Building Construction;
STR 1.04.02:2011	Geological and Geotechnical Engineering Surveys;
STR 1.04.04:2017	Structural Design, Project Expertise;
STR 1.06.01:2016	Construction Works. Building Maintenance;
STR 2.01.01(1):2005	Essential Building Requirements. Mechanical Resistance and Stability;
STR 2.01.01(3):1999	Essential Building Requirements. Hygiene, Health, Environmental Protection;
STR 2.01.01(4):2008	Essential Building Requirements for "Safe Use";

STR 2.05.19:2005	Engineering Hydrology. Basic Calculation Requirements;
STR 2.05.03:2003	Fundamentals of Structural Engineering Design
STR 2.05.04:2003	Effects and Loads
STR 2.05.05:2005	Design of Concrete and Reinforced Concrete Structures
STR 2.05.08:2005	Design of Steel Structures. Basic Principles
STR 2.02.06:2004	Hydrotechnical Structures. Basic Principles
STR 2.05.14:2005	Design of Foundations and Bases for Hydrotechnical Structures
STR 2.05.15:2004	Hydrotechnical Structures: Effects and Loads
STR 2.05.21:2016	Geotechnical design. General requirements.
STR 2.06.04:2014	Geotechnical Design: General Requirements
STR 2.07.01:2003	Water Supply and Sewerage. Building Engineering Systems. Outdoor Engineering Networks;
LST EN 206	Concrete. Specification, operational characteristics, production, and compliance
LST EN 1997-1	Eurocode 7. Geotechnical Design Part 1. Basic rules
LST EN 12063	Special Geotechnical Works. Retaining Wall Structures
LST EN 13101	Manhole Ladders. Requirements, Marking, Testing, and Compliance Assessment
LST EN 13383-1	Riprap Stone. Part 1. Technical Requirements
LST EN 13383-2	Hydrotechnical stone filling. Part 2.
LST EN 13253	Geotextile and related products. Essential characteristics for use in erosion protection structures (shore protection and slope stabilization).
EAU 2012	Krantinių, uostų ir vandens kelių komiteto
PIANC	International Navigation Association Standards for Fender Systems
A1-425	Safety Rules for Lifting Cranes Usage
LAND 46A-2002	Rules for Excavation of Soils in Maritime and Seaport Waters and Handling of Excavated Soils
2020 m. balandžio 6 d. įsakymu Nr. 3-181	Technical Regulations for Maritime Ports and Shipping Infrastructure Design
GKTR 2.08.01:2000	Geodetic investigations for construction engineering;
KPT SDK 19	Rules for the Design of Standardized Pavement Structures of Roads;
ĮT ŽS 17	Rules for the Performance of Earthworks and the Installation of Earth Embankments on Roads;
ĮT SBR 19	Rules for the Installation of Layers of Road Pavement Structures without Binders;
TRA UŽPILDAI 19	Technical Description of Requirements for Road Fillings;
TRA SBR 19	Technical Description of Requirements for Non-Bound Mixtures and Soils Used for Layers without Binders on Roads;
APR-BĮA 10	Recommendations for the Design, Implementation, and Maintenance of Environmental Protection Measures APR-BĮA 10;
APR-VTA 10	Recommendations for the Design, Implementation, and Maintenance of Environmental Protection Measures. Protection of Water Bodies APR-VTA 10
	The Rock Manual – The use of rock in hydraulic engineering (2nd edition), CIRIA/CUR C683 2012.
	Construction Waste Management Regulations;
	Klaipėda State Seaport Usage Rules.
	Klaipėda State Seaport Navigation Rules
	Klaipėda State Seaport Aquatory Technical Supervision Rules.

	Order No. 67 of April 17, 1997, by the Ministry of Environmental Protection of the Republic of Lithuania, "On the Assessment of the Impact of Dredging Works in the Klaipėda Port on Fisheries," with amendments until 2015.
	Report on the Determination of Navigation Zones in the Klaipėda State Seaport in 2015.

0	2023-11	For construction permit, competition		
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)		
Designer	Qualification document no.	Duties	Name surname	Signature
UAB „Kelprojektas“	39928	BPM	Rimantas Valančius	
				

1. GENERAL REQUIREMENTS

Before starting construction works, it is necessary to prepare and submit the following construction documents and projects for coordination with the designer, customer, and technical supervisor:

- a) Work project (mandatory).
- b) Technological project (mandatory for the contractor in all cases). The construction technology execution project must include solutions to ensure the safety and health of workers.

- Technical specifications encompass technical requirements for individual construction works, products, and equipment, as well as instructions for work control and facility operation. Technical specifications for construction products are standards and certificates.
- The composition of prepared data, the quantity of solutions, and their detailing (text, calculations, drawings) are generally sufficient for the understanding and evaluation of the builder's intention, determining the construction cost, coordinating and conducting expertise, and obtaining a construction permit, and preparing the work project.
- Before the start of earthworks, it is necessary to refine the plan (geodetic photograph) if construction permits or written approvals from authorized municipal and state officials were obtained more than 1 year ago.
- If, when excavating soil, engineering structures, archaeological heritage, or valuable features of cultural heritage objects are not indicated in the drawings or plan (topographic geodetic photograph), work is temporarily suspended. The builder (customer) identifies the owners of engineering structures, requires users to document them in drawings, coordinates further supervision of earthworks, and allows work to continue. If archaeological heritage or valuable features of a cultural heritage object are discovered during earthworks, the builder (customer) must inform the municipality's heritage protection division, which then informs the Department of Cultural Heritage. In this case, earthworks can be continued in accordance with the procedure established by the Republic of Lithuania Law on the Protection of Immovable Cultural Heritage.
The contractor or builder (customer) is responsible for damage to engineering networks, other engineering structures, or archaeological heritage during earthworks in accordance with the procedure established by laws and other legal acts if they do not provide otherwise.
- The entire complex of construction works carried out on the object must comply with the requirements of these construction normative documents:
 - o Republic of Lithuania construction technical regulations (STR), standards (LST), construction norms (RSN);
 - o European standards (EN) and international standards (ISO) valid in the Republic of Lithuania;
 - o Republic of Lithuania Law on Occupational Safety and Health.
- All standards, technical certificates, general technical specifications, materials, or products specified in the project can be changed to equivalent standards, technical certificates, general technical specifications, materials, or products. Each reference to a standard, technical certificate, general technical specifications, materials, or products is applied with the words "or equivalent," even if not explicitly stated.

All planned works in the complex must be carried out according to the construction work execution technology project (SDTP) prepared by the contractor.

1.1. General instructions to perform necessary surveys before preparing the work project for the part of the project.

Additional surveys are not foreseen when performing the work project for this part of the project.

In accordance with the technical regulation for construction STR 1.04.04:2017 "Structural Design, Structural Expertise" requirements, the drawings (plans) of the structural project are prepared on a topographic plan not older than 3 years (from the beginning of structural design), which is updated (if necessary) during the project preparation.

1.2. Tests and hidden works

1.2.1. Tests

Tests and methods of sample confirmation must be coordinated with the Client. The results must be kept at the construction site and later provided to interested parties for review.

In the structural part of the project, tests are planned for the following structural elements of pavement construction:

Soil embankments (for subbase and subbase layers) in accordance with the requirements of Chapter XVIII of the Road Works and Embankment Installation Regulations ĮT ŽS 17;

Subbase layers - tests of non-bound material subbase layers according to the rules for laying pavement construction layers without binders ĮT SBR 19 and the technical requirements for road fillings TRA UŽPILDAI 19.

1.2.2. Hidden work

The passage describes the process of supervising and inspecting concealed elements during the construction of a structure. It emphasizes that the construction supervisor, employed by the contractor, is responsible for examining and delivering hidden components and works to the technical inspector. This inspection involves verifying load-bearing structures, concealed elements, and tasks, with the involvement of specific work supervisors and technical inspectors. The construction supervisor is required to sign handover and acceptance documents only after a thorough inspection.

Once the concealed work inspection is complete and the relevant documents are signed, the contractor can proceed with the planned construction work.

In the structural part of the project, the following concealed works are planned:

- Dam core installation (underwater installation);
- Filter layer installation (underwater installation);
- Protection (cover) layer installation (underwater installation);
- Drain installation (underwater installation);
- Other underwater works;
- Earth embankment construction;
- Foundation layer construction;
- Monolithic reinforced concrete structures construction;
- Anti-corrosion protection of metal structures;
- Expansion joint installation;

1.3. Specific normative and other documents that must be followed in carrying out construction works

When performing construction works:

- Earthworks must be carried out following STR 1.06.01:2016 'Construction Works. Building Construction Supervision' and the Road Earthworks Execution and Subgrade Installation Rules ĮT ŽS

– When preparing the layers of the construction base, follow the rules for the installation of unbound layers of road construction specified in IT SBR 19, the technical requirements for mineral material mixtures used for unbound layers in road construction described in TRA SBR 19, and the technical requirements for road fills outlined in TRA UŽPILDAI 19.

1.4. Other General Requirements

Throughout the entire period of work until the handover of the dam to the Contractor for use, the Contractor is responsible for the supervision of the dam. They are liable for any damage caused to third parties.

During the construction work, the proper functioning of all engineering networks must be ensured. The Contractor must summon representatives of the cable maintenance services to mark the cables during the work. The costs for these tasks are anticipated and should be covered by the Contractor.

The Contractor may encounter non-essential discrepancies in solutions and/or quantities. Upon noticing any discrepancies, the Contractor must promptly contact the technical supervision manager (Engineer), providing a detailed explanation of the situation. Based on the Engineer's instructions, the Designer evaluates the received information and provides a motivated response to the Engineer or Contractor, indicating whether the identified discrepancies are possible. Changes, additions, and corrections to the project are only made with the consent of both the Designer and the Contractor, following the requirements of STR 1.04.04:2017 "Structural Design, Structural Expertise."

1.5. Testing Procedure for Supporting Structures and Engineering Systems

Before testing supporting structures, the parties must agree on the testing time, location, and method. During the testing of supporting structures, access to all test locations must be ensured, and all necessary documents, tools, and equipment must be prepared. The methods of testing and approval of samples must be coordinated with the Client.

All tests specified in conditions, standards, and Lithuanian Republic standards are carried out. The results are presented for the consideration of interested parties. In such a case, if the test results are worse than specified in the requirements, the Contractor must promptly inform all interested parties. If the results are unsatisfactory in terms of the safety factors of structures or any other material assets that are essential for job results, the Contractor must promptly inform interested parties and organize a meeting to make decisions about organizing future work. If necessary, safety measures must be taken to prevent any damage and danger.

1.6. Construction materials used in construction.

The construction materials used in construction must meet the minimum environmental protection criteria, as established by the order No. D1-508 of the Minister of Environment of the Republic of Lithuania dated June 28, 2011, 'On the list of products subject to environmental criteria for public procurement and procurement, the description of the application procedure for environmental criteria and environmental criteria that contracting authorities and contracting entities must apply when purchasing goods, services, or works' (follow the current version – the valid consolidated version from December 24, 2021).

2. PREPARATORY WORKS

2.1. Introduction

In this section of the Technical Specification, requirements for the preparatory work performed at the beginning of the construction of a new pier are outlined, including execution, control, and acceptance.

During the preparation of the pier construction site (construction site), the Contractor must:

- Ensure the drainage of the construction site surface and the discharge of rainwater;
- Protect the construction site from the harmful effects of groundwater, spring thaw, etc.;
- Avoid deterioration of the physical and mechanical properties of the soil;
- Remove the topsoil and other unsuitable or hazardous materials;
- Clear shrubs, trees, and remove stumps;
- Organize work properly to protect the environment and reduce noise;
- Perform all other preparatory work according to the characteristics of the construction site and the nature of the construction work

2.2. Performance of works

2.2.1. Requirements for Geodetic Marking Works

Requirements for geodetic marking works according to ĮT ŽS 17 – Rules for the Execution of Earthworks and the Arrangement of Earth Foundations for Road Construction ĮT ŽS 17, approved by the Director of the Lithuanian Road Administration under the Ministry of Transport and Communications on April 3, 2017, Order No. V-111 'On the Approval of the Rules for the Execution of Earthworks and the Arrangement of Earth Foundations for Road Construction ĮT ŽS 17' (hereinafter referred to as ĮT ŽS 17), Appendix 1.

2.2.2. Conditions for Preservation and Utilization of Trees and Vegetation

The Contractor must remove trees that hinder the project implementation. Trees and shrubs within the construction area of the newly constructed pier must be removed. The specified trees in the project are cut manually or mechanically. Tall trees that pose a risk to the engineering networks in the construction area, when cut in the usual way, must be cut using elevated platforms or climbing equipment. In such cases, tree branches are removed first, and later the trunk is cut. Thin tree trunks are extracted with roots. Thick tree stumps must be removed using shovels, excavators, or other methods. To prevent water infiltration into the soil, holes created after stump removal must be immediately filled with soil up to ground level, and the soil must be compacted according to requirements.

It is recommended to transport cutting and pruning waste, as well as tree stumps, to the regional waste management center's green waste composting site or, if shredded, spread them together with the soil. If the Contractor chooses to spread shredded vegetation together with the soil, it is recommended to do so on erosion-resistant areas, as a large amount of biodegradable waste can inhibit the vegetation of grassy plants (acting as mulch that can alter the soil's chemical composition). When managing areas with plant waste (e.g., cutting, pruning waste, stumps), burning or burying them in the ground is not recommended. They should be disposed of in the manner specified above or by other suitable means.

The volumes for the removal of wood and wood waste are specified in the project documents. If the project does not specifically indicate where the vegetation must be removed or does not specify the protected vegetation, then all vegetation hindering project implementation must be removed.

2.2.2.1. Criteria for Protected Trees and Shrubs

The Contractor, when carrying out the removal of trees and shrubs, must adhere to the requirements of the Government of the Republic of Lithuania's resolution No. 206 of March 12, 2008 (amended by the Government of the Republic of Lithuania's resolution No. 521 of May 30, 2018) "CRITERIA FOR CLASSIFYING TREES AND SHRUBS GROWING ON NON-FORESTRY LAND AS PROTECTED.

In the coastal protection zone, the diameter (at a height of 1.3 m) and height parameters of protected tree species and/or genera, shrubs, are classified as:

- ✓ oaks, elms, maples, limes, poplars, willows, beeches, bird cherries, hornbeams – 12 cm or larger diameter;
- ✓ pines, spruces, Scots pines, larches, firs, black alders, alders, hazels, chestnuts, wild apple trees, wild pear trees – 20 cm or larger diameter;
- ✓ birches, aspens – 30 cm or larger diameter;
- ✓ common junipers – taller than 3 m;

The trees and shrubs growing in the coastal protection zone do not meet these criteria if they are:

- ✓ withered, overturned, broken, burned, damaged during natural disasters, extreme events, fires, or accidents (except for those damaged due to the illegal actions of individuals or legal entities);
- ✓ invasive species of trees and shrubs.

The removal of unprotected trees and shrubs in regulated riverbanks and coastal protection zones can be carried out without environmental restrictions.

2.2.2.2. Removal of Soil and Vegetation Waste

The volumes of soil and vegetation waste removal are specified in the project documents. If the project does not specifically indicate where the vegetation must be removed or does not specify the type of vegetation to be preserved, then all interfering vegetation is removed to facilitate the implementation of the project works.

Note: The Contractor must assess that the quantities of vegetation may deviate from those specified in the project due to natural growth or the impact of coastal maintenance works.

3. EARTHWORKS

The scope of earthworks includes:

- Excavation of soil up to the specified altitudes in the project;
- Filling of soil up to the specified altitudes in the project;
- Transportation of soil to the construction site (if necessary, and from it if needed);
- Land planning and management.

When performing earthworks, it is necessary to follow:

- STR 1.06.01:2016 "Construction Works. Building Structure Supervision," Section V, "Earthworks."
- Environmental requirements for cleaning and dredging the bottom of surface water bodies for internal waterways, ports, and harbors.
- "Description of Surface Water Body Management Requirements" D1-1038 (follow the current edition – valid summary from 2021-05-01).

Excavation construction and installation works should be as shallow as possible, digging only to the depth that does not disturb the foundation.

The Contractor must take measures to prevent slopes from sliding or walls from collapsing. If soil enters the excavation despite this, it must be removed. If irregularities or deeper areas arise due to this, they must be filled.

If the excavation is larger than specified in the project, it will not be paid for. Any excavations larger than in the project must be filled according to the Contractor's invoice. The filling of excavations is done with material meeting the requirements specified in the project.

If the Contractor encounters soil that, in their opinion, is weak, they must immediately inform the project manager, who decides whether this soil is indeed weak and proposes an alternative design solution in this location (removing weak soil, replacing it with good soil, etc.). During earthworks, it is forbidden to cover green areas with soil or construction products and their waste. When carrying out earthmoving works (removing topsoil, preparing the ground), it is necessary to preserve the fertile soil layer. The removed fertile soil layer in the construction work zone is stored in open areas of the construction site and later used for site revegetation. Unused soil after construction is used following the requirements of description D1-1038 or for improving less productive agricultural lands. When carrying out dredging works in the water area, the excavated existing sandy and/or gravel soils can be reused in the construction of pier foundations (core) structures. Construction works will be carried out underwater or on land (in the coastal zone), so there will be no need for groundwater lowering, except during the construction of ship slips. For the base construction of self-compacting fraction aggregates, smaller fraction mineral materials are used. Self-compacting gravel is a mineral material of the corresponding fraction (screened gravel fr. 4/16 or equivalent) that compacts in water during installation. It can be replaced by gravel with a fraction of 0 – 32 mm, compacted to at least 98% according to Proctor, every 30 cm of soil layer. The Contractor must ensure that the construction of the wharf is carried out using technically proper methods to avoid environmental pollution with oil products. When installing the foundation, filtration, and protective (revetment) layers of the pier structure, as well as during dredging works in the Curonian Lagoon, there will be a temporary increase in the washout of fine soil particles and an increase in water turbidity. The amount of washed-out particles during construction will not be significant. The amount of washed-out fine sand particles will directly depend on water flow rates, water levels, and planned construction work efficiency. Increased turbidity will not affect biodiversity. The Contractor must restore the access roads used during construction works, reinstating them to their original state according to the property owner or Builder's requirements.

3.1. Conditions for Excavation Formation and Handling of Excavated Soil

The upper layer, approximately 1.0 m thick, of excavated soil, based on the granulometric composition, consists of clay (unstable soil), and deeper soil consists of sand (stable soil).

The specified trenches are formed in such a way that the installed structures in the trenches meet the requirements and tolerances specified in the project.

The slopes of the trenches may be steeper than indicated in the project, provided their stability is ensured. In the case of unstable formed slopes, in the event of slope failures before installing the structures and if the failures hinder the installation of structures, the formation of slopes

must be repeated.

According to LAND 46A-2002 "Rules for Excavation of Soil in Seas and Sea Port Areas and Removal of Excavated Soil," excavation is considered targeted soil excavation when it is suitable for the construction of port infrastructure objects or for the management of shore areas.

Excavated sandy soil can be used for the construction of Part I of the northern dam. If the excavated sand meets the requirements of Class I pollution and sanitary and hygienic requirements as set out in LAND 46A-2002, such sand can be used to replenish or restore beaches.

Upon a decision being made, the excavated soil can be disposed of at sea.

Targeted soil excavation, beach replenishment and/or disposal at sea works can only be started after obtaining a permit from the Klaipėda Regional Environmental Protection Agency. All soil excavation works must be carried out in accordance with the provisions of LAND 46A-2002.

4. DAM CONSTRUCTION MATERIALS

During construction, the products, materials, and equipment used must meet the requirements specified in the technical specifications. The names of materials (manufacturers) specified in the technical project indicate the minimum quality requirements for that type of material. The contractor may replace them with materials having the same or better technical characteristics.

Imported materials used for dam constructions must satisfy the applicable Lithuanian standards (LST) and technical requirements:

- Cover stone. Part 1. Technical requirements (LST EN 13383-1) or equivalent.
- Hydrotechnical fill of stones. Part 2. Test methods (LST EN 13383-2) or equivalent.
- Technical requirements for non-bound mixtures and soils used for layers without binders on roadways - TRA SBR 19.
- Technical requirements for road fills - TRA UŽPILDAI 19.
- LST EN 13253 "Geotextiles and geotextile-related products. Characteristics required for use in construction works for erosion control (shore protection and slope reinforcement)" or equivalent.

4.1. Protective (cover) and filtration layer mineral materials and their mixtures

The external protective (cover) layer formed from mineral materials with a filtration layer protects the formed dam core structure from potential natural influences during the operational period.

4.1.1. Geometric requirements

In dam construction, the mineral materials used must comply with the following:

- ✓ For the installation of the filtration layer, it must meet the granulometric category CP_{90/250} of standard coarse grading according to LST EN 13383-1:2002, Section 4.2.
- ✓ For the installation of the blanket layer, it must comply with LST EN 13383-1:2002, Section 4.2:
 - a) Requirements for average mass (excluding fragments) and the mass category LMA_{60/300} of standard A-type lightweight aggregates;
 - b) Requirements for the mass category LMB_{15/300} of standard B-type lightweight aggregates.
- ✓ The dam core construction must comply with the *requirements of Section 4.2.*

- The specified coarse grading granulometric categories $CP_{90/250}$ and aggregate mass categories $LMA_{60/300}$ are applicable.
- The $LMA_{60/300}$ category is applied when the slope ratio change falls within the range from 1:1.5 to 1:3.0.

Note: When constructing shallower slope structures and if necessary, it is permissible to adjust-change the specified aggregate mass categories based on the results of calculations.

In dam construction, there are no essential requirements for the particle shape, i.e., the length-to-thickness ratio of particles, in the filtration and blanket layers of mineral materials that meet the granulometric composition. The sorting of lightweight aggregates and the proportion of crushed or fragmented surfaces are not specified. The material used must comply with the form category LTNR and the crushed or fragmented surface category RO_{NR} according to LST EN 13383-1:2002.

4.1.2. Physical requirements

- The dry particle density of mineral materials used in the construction of dam filtration and protective (cover) stone layers should be ≥ 2.60 mg/m³.
- The integrity of dry particle blocks of mineral materials used in the construction of layers is also crucial. Protective (cover) stone units should be uniform, i.e., free of cracks, vesicles, stylolitic layers, fissure layers, layering, splitting, contact with other units, or similar defects that could cause the specimens of stones to break during laying, loading, or weighing. The fracture resistance of dry particle blocks of mineral materials should meet the requirements of the CS60 category. Higher categories of mineral materials may also be used.
- The wear resistance of mineral materials used in the construction of dam filtration and protective (cover) stone layers should meet the requirements of the MDE30 category. Higher categories MDE20 and MDE10 compliant mineral materials may also be used.

Wear resistance requirements for mineral materials apply to the surface layers of protective stone, which are subject to abrasion due to sediment. The environment of use of mineral materials, with impacts according to wear resistance:

- MDE10 category: highly abrasive environment, e.g., very stormy seas with rugged coastlines, river currents, dynamic reinforced construction concept.
- MDE20 category: exceptionally abrasive environment, e.g., quite stormy seas with rugged or sandy coastlines.
- MDE30 category: moderately abrasive environment, e.g., occasional strong wave action or solid current flow.

There are no requirements for the color characteristics of mineral materials, stones. The variation in color of natural mineral materials supplied from a stone quarry (or a separate quarry area) based on an established supply model is not a reason to reject them as unsuitable.

4.1.3. Requirements for chemical properties

There cannot be any foreign materials in the dam core, filtration layer, and protective (cover) stones that could harm the construction or the environment in which they are used.

4.1.4. Durability requirements

In cold climate conditions, mineral materials, subjected to cyclical compression due to freezing and thawing, can become easily susceptible to weathering. In warm climate conditions, mineral materials can become easily susceptible to weathering due to periodic salt crystallization pressure, resulting from the formation of salty precipitation from evaporating salty water. The susceptibility of rocks to deterioration due to these and other cyclical compression mechanisms primarily depends on

the climate, final use, petrographic type, source of rock geological weathering degree, presence of unstable minerals, extraction method, granulometric distribution, and defects through which water can penetrate into the stone.

4.1.4.1. Water absorption

If the water absorption is not greater than the average absorption <0.5 mass percent (water absorption category WA0.5 value), mineral materials can be considered resistant to freezing and thawing as well as salt crystallization, and further studies are not required (TRA UŽPILDAI 19, LST EN 13383-1:2002). However, many satisfactory quality protective (armoring) stones have higher water absorption values. For example, marine limestones and sands often have absorption values greater than 4 percent, while Permian limestones, dolomites, and argillaceous sands often have absorption values greater than 2 percent. Nevertheless, these materials can maintain suitable resistance to freezing-thawing cycles or salt crystallization processes. For protective (armoring) stones with water absorption values greater than 0.5 percent, freeze-thaw tests should generally be performed according to the information in section 9 of the LST EN 13383-2:2002 standard or magnesium sulfate values should be determined according to the LST EN 1367-2 standard.

4.1.4.2. Resistance to freezing and thawing

The resistance of mineral materials to freezing and thawing is determined following the information in section 9 of the LST EN 13383-2:2002 standard. The resistance to freezing and thawing must meet the requirements of the FT_A category.

Resistance testing is not **required** for mineral materials used in forming the dam construction from the bottom to an altitude of -0.87 m (-1.00 m) (Zone No.1). Mineral materials in Zone No.1 are permanently submerged.

Resistance testing is **required** for mineral materials used in forming the dam construction from an altitude of -0.87 m (-1.00 m) (Zone No.2 and Zone No.3). Mineral materials used in forming the dam construction (Zone No.2 and Zone No.3) enter the water fluctuation zone, with the possibility of freezing and thawing.

4.1.4.3. Resistance to salt crystallization

The resistance of mineral materials (excluding fragments) to salt crystallization is determined following the information in section 8 of the LST EN 1367-2:1998 standard. The resistance to salt crystallization must meet the requirements of the MS25 category. The percentage value of mass loss due to magnesium sulfate should be < 25. If there is no suitable sample of mineral material fill, the test portion is obtained by crushing at least six different units of protective stone with a laboratory crusher, whose masses do not differ by more than 25 percent.

4.2. Dam core minerals and formation

When constructing the core (fill) of the dam, local excavated sandy and/or gravelly soil can be used, obtained through soil excavation and trench formation, port water area dredging works, and/or excavated from the future inner part of the water area after removing the unstable soil layer on top and/or imported mineral materials (sandy and/or gravelly soil and/or crushed stone). When installing the dam core and selecting the materials to be used, it is mandatory to consider that:

The goal is to form the slope ratios of the dam embankment under water at 1:1.5 and 1:3;

The flow velocity near the bottom exceeds the permissible flow rates for fine sand particles, and fine particles may be washed away. To reduce and/or stop the washing out of sandy/gravelly fill, various solutions involving the use of geotextile are necessary.

Geotextile and geotextile products are intended for shaping the dam core construction, aiming to reduce the washout of fine soil and turbidity of the Curonian Lagoon water during construction.

4.3. Alternative solutions for dam core

For the formation of dam cores, non-bound mixtures and imported coarse-grained soils can be used, whose classification must meet the requirements of TRA SBR 19. When installing the dam core construction, follow the technical requirements of TRA SBR 19 Section V "Basic Guidelines" (First Section "Non-bound Mixtures"), point 10., which states:

- ✓ Non-bound mixtures can be made from:
 - Natural fillers;
 - Artificial fillers;
 - Recycled fillers;
 - Natural and artificial fillers;
 - Recycled and natural fillers;
 - Recycled and artificial fillers;
 - Recycled, natural, and artificial fillers;

The technical requirements described in the technical specifications document TRA UŽPILDAI 19 [5.3] apply to non-bound mixture materials. When forming the dam core from a larger fraction of non-bound mineral mixtures and/or ensuring that there will be no washing out of fine fraction soil particles, during the detailed design phase, geotextile may not be installed on the dam core.

4.4. Geotextile

4.4.1. General provisions

Geotextile, as a separation and filtration element, must comply with the requirements of LST EN 13253:2017 or an equivalent standard. It must also meet the requirements for protective use according to LST EN 13255:2017 or an equivalent standard. The declared properties, with declared permissible deviations, must meet the requirements specified in Table 1. The products must be suitable for use according to the specified purpose

4.4.2. Functions

- To protect the base of the dam from erosion;
- To separate layers of soil with different fractions to prevent mixing;
- To perform the filtering function, preventing the washout of fine particles from the dam construction
- To allow water to quickly drain from the dam construction, preventing the buildup of hydrostatic pressure.

Table 1. Requirements for Geotextile

Properties	Standard or equivalent	Values (min/max considering errors)
Areal density	LST EN ISO 9864	$\geq 450 \text{ g/m}^2$
Tensile strength along across	LST EN ISO 10319	$\geq 32 \text{ kN/m}$ $\geq 32 \text{ kN/m}$
Elongation at maximum load along across	LST EN ISO 10319	$\geq 50 \%$ $\geq 55 \%$
Static puncture resistance	LST EN ISO 12236	$\geq 5,8 \text{ kN}$
Resistance to dynamic penetration	LST EN ISO 13433	$\leq 5 \text{ mm}$
Protection efficiency	LST EN 13719	$\leq 2,3 \%$
Material raw material	---	Polypropylene (PP)
Characteristic hole dimension	LST EN ISO 12596	$0,06 \text{ mm} \leq O90 \leq 0,12\text{mm}$
Permeability to water perpendicular to the plane direction	LST EN ISO 11058	$\geq 28 \text{ l/m}^2/\text{s}$
Longevity	LST EN 13249 B annex	Resistant for a minimum of 100 years in natural soils with a pH value between 4 and 9 and soil temperature $<25^\circ\text{C}$.

When forming the dam core, the contractor can choose the installation technology based on the equipment and construction techniques used by the contractor. Therefore, the use of other geotextile and/or geosynthetic products for the construction of the dam core is allowed. Additional materials allowed for forming the dam core include:

- ✓ Geotextile containers and/or geosynthetic containers (tubes);
- ✓ Hydraulic non-woven geotextile;
- ✓ Sand containers (big bags);
- ✓ Other geotextile and/or geosynthetic products.

Table 2. Product characteristics crucial for selection and proposal submission.

Functions Characteristics	Erosion Protection
Surface density	*
Thickness	*
Resistance to static puncture	*
Tensile strength	*
Elongation under maximum load	—
Flexibility	—
Friction	*
Damage during installation	2)
Characteristic opening dimension	—
Water permeability	—
Chemical aging resistance	Service life up to 5 years in natural soils when the surrounding environment ($4 \leq \text{pH} \leq 9$)
Resistance to atmospheric influence	—
* there is an effect, but it is not determined – not considered; 2) installation method is adapted to the product.	

Due to the contractor's chosen installation technology based on the equipment and construction techniques used by the contractor, as well as the selected mineral material, the use of materials/products with different characteristics and parameters (geotextile and/or geosynthetic) is allowed in the construction of dam slope structures. However, the final decision on the suitability and use of materials chosen by the contractor in construction is made by the supervisor of the structural project when preparing the work project.

4.5. Conditions for preservation and use of excavated soil

The majority of the work will be carried out in the water and in a narrow coastal zone where there is no formed vegetative layer. Part of the excavated soil, suitable for the construction of dam structures, may be used for forming the dam structure (core). A portion of the excavated mineral soil, which will be reused in construction, may be temporarily stored in a dry place after removing the vegetative layer.

Unstable soil—clayey soil—is transported to a location for soil disposal and compacted. The remaining unused mineral soil—sand fraction—is used for the construction of the northern part of the dam, Section I.

During earthworks, compliance with the "Regulations for the Management of Surface Water Bodies" D1-1038 (following the current version, effective from 2021-05-01) and Article 20 of the Law of the Republic of Lithuania on Protected Areas is required. The requirements for the protection zones of surface water bodies, coastal protection belts, and activities in these areas allow the construction of hydrotechnical structures and earthmoving works in preparing the necessary foundation for hydrotechnical structure construction.

During the execution of the works, water turbidity may occur solely due to ongoing construction activities. Suspended soil particles are carried by water currents and settle in the Curonian Lagoon as flow velocities decrease. In the Curonian Lagoon areas where water flow velocities are low, suspended and transported soil particles will accumulate.

If historical, cultural, or archaeological values are discovered during soil excavation, work must be halted, and the findings reported to the Cultural Heritage Division.

4.6. Control of the construction of dams, tolerances for the installation of layers

During the execution of the works, control measurements of the dam structure and its layers must be carried out. Since the planned construction will take place in the Curonian Lagoon, variations in natural processes, water flow velocities, water level fluctuations, and the intensity of suspended particles (silt) could result in changes in the depths of the Curonian Lagoon bed over time.

Upon completing the formation works of the trench of the section approved by the Contractor, before the construction begins, inspections, and measurements of the trenches are performed.

4.7. Control bathymetric and shore (control point) measurements

To refine and determine the actual quantity of materials used for the dam constructions, it is necessary to conduct baseline - actual bathymetric and shoreline (control points) measurements at the planned dam locations. These measurements are performed only before the start of physical work due to possible changes in the contour surface of the bottom and shoreline. The suitability interval (timeframe) for measurements is assessed by the Client and the Contractor in agreement before the start of construction works. To avoid potential disputes regarding the quality of measurements or the accuracy of the provided information, it is recommended for both the Client and the Contractor to conduct bathymetric measurements and agree on the suitability of the obtained data (reference surfaces) for refining the actual quantities of costs.

4.8. Planned position of the dam structure

Due to the complex nature of construction works, natural influences, changes in water levels, and the impact of currents on the southern and northern dam allowable axial plan positions have a margin of error:

- ±1.0 m: marking of the axial positions in the plan for both southern and northern dams.
- ±1.0 m: change in the dam axis (head) point (lengthening/shortening).

The Contractor is responsible for marking the planned axial positions of the dams and providing the marked axial positions to the project manager. The final decision on the correctly marked axial positions of the dams is made by the project manager. After receiving approval, construction works on dam structures can proceed.

4.8.1. Tolerances for stone annuals

Due to complex construction works and ongoing natural influences, as well as water level and current changes, the tolerances for the slope ratio and layer thickness of the slope structures of the southern and northern dams are:

Table 3. Practical allowable deviations achievable using aboveground equipment.

<i>depth of rotation</i>	$M_{em} < 300 \text{ kg}$
<i>LW aspect</i>	$M_{em} < 300 \text{ kg}$
higher LW = dry	+0,2 m up to – 0,2 m
0 up to – 5 m	+0,5 m up to – 0,3 m

Notes:

1. M_{em} = effective average mass.
2. Tolerances apply even if non-standard ratings are provided.
3. All tolerances apply to design profile and actual average profile unless specified otherwise.
4. The deviation of two consecutive mean actual profiles should be positive.
5. Despite the accumulation of any positive tolerances of the lower layers, the thickness of the layer shall not be less than 80 per deflection of the nominal thickness, calculated using average actual profiles. When an accumulation of positive tolerances occurs and is acceptable to the engineer, the position of the design profiles will need to be adjusted to accommodate.

5. GUTTERS (STEEL SPIRAL CORRUGATED PIPES)

Due to water circulation in the South Gate Harbor waters, steel spiral corrugated pipes are installed in the construction of the southern dam. Spiral corrugated pipes are assembled underwater. The use of steel spiral corrugated pipes must meet the minimum technical requirements specified in the table or equivalent to them.

Table 4. Minimum Requirements for Steel Spiral Corrugated Pipes.

Title	
Steel spirally corrugated pipe HCPA-47	
DESCRIPTION	
According to the geometric parameters of the bed, determine the thickness and length of the permeable sheet, which are presented in the table. Mineral materials of finer fraction are used for backfilling of culverts. The materials used must not damage the outer surface of the culverts. Use self-compacting mineral materials of the appropriate fraction (gravel chip fr. 4/16 or equivalent) or gravel, fraction 0 - 32 mm, compacted to at least 98% according to Proctor, parallel to both sides of the structure, evenly poured and compacted in layers of soil every 30 cm.	
CERTIFICATE	
Construction type	HCPA-47 TCx2
Construction corrugation, mm	≥ 125 x 26
Construction wall thickness, mm	≥ 3,50
Construction width (internal), m	3,49
Construction height (internal), m	2,27
Steel grade	S250GD / DX51D
Connecting construction segments	With clamps
Anti-corrosion coating	Zinc coating (coating thickness corresponds to LST EN 10346 or equivalent standard coating requirements for Z600 coating) and additionally 100% of the perimeter is covered with a polymer coating from the inside and outside (average coating thickness ≥ 250 μm, meets the requirements of LST EN 10169 or an equivalent standard).
Manufacturing and quality control	The structure must have a production quality control compliance certificate issued by a notified body in accordance with the requirements of LST EN 1090-1 or an equivalent standard, must have a product performance declaration confirming this and must be marked with the CE mark in accordance with Regulation (EU) No. 305/2011 requirements. The structure must be manufactured according to the requirements of LST EN 1090-2 or an equivalent standard. The production quality must meet the EXC2 class.

Notes:

- 1. The parameters and quantities specified in the table are accepted to determine the calculated cost of construction and can be refined during the preparation of the work project by assessing equivalent products with no worse parameters.*
- 2. When any parameters of the design change, it is necessary to refine the geometric parameters and sheet cross-sectional properties of the structure.*
- 3. The contractor installs spiral corrugated pipes (culverts) according to the prepared Technical Design and Construction Project (STDP), taking into account and evaluating the requirements of manufacturers of steel spiral corrugated pipes or equivalent products for transportation, storage, installation, and assembly.*

6. CONCRETE STRUCTURES

6.1. Concrete

6.1.1. General guidelines

The concrete used for concrete and reinforced concrete products must comply with the requirements of LST EN 206 and LST EN 1974. Concrete works must be carried out according to the construction works execution technology project (SDTP) prepared by the contractor. When preparing the concrete mix, laying it, and curing it, the control of production processes and concrete properties must be carried out according to the procedure specified in LST EN 206, and those requirements for concrete, its production, supply, control, and conformity assessment.

Table 5. The concrete used for constructions must meet the following minimum requirements:

Row No.	Element title	Standard or equivalent	Concrete class	Environmental exposure classes*
1	Leveling concrete layer	LST EN 206	C8/10	-
2	Leveling concrete layer Reinforced concrete protection against ice		C35/45	XC4; XS3; XD3; XF4; XA2
3	Reinforced concrete pavements Foundation of navigation sign Foundation of security gate		C35/45	XC4; XS1; XD3; XF4
4	Other reinforced concrete monolithic structures		C30/37	XC4; XS3;
* The table shows the minimum class requirements. Classes can be changed to higher classes than indicated				

If the resistance to freezing for environmental classes is conditionally not indicated, the minimum frost resistance must be ensured according to LST 1428.17, XF1 – F100; XF2 – F150; XF3 – F200; XF4 – F300.

The contractor selects the consistency class (slump) of leveling layer concrete and monolithic construction concrete according to the adopted construction technology and recommendations of the concrete manufacturer/supplier.

When concreting in a hot environment, the curing of the concrete structure forming process should start immediately after concreting and continue until the concrete reaches 70% of the design strength. The curing of curing concrete should be done by moistening the surface with water mist or covering it with wet blankets to prevent beams, slabs, and formwork concrete from drying out and causing additional shrinkage due to moisture evaporation, leading to additional tensile stresses in the concrete. The duration of curing for curing concrete is determined based on the rate of cement hydration, concrete properties, environmental temperature, and relative humidity. Considering these factors, the curing duration for curing concrete ranges from 2 to 10 days.

6.1.2. Concrete quality assurance

The minimum number of specimens required to assess the conformity of concrete strength must be no less than 4. Three specimens should be kept under standard humidity and temperature conditions. The fourth specimen should be kept under outdoor conditions for 28 days, just like the main concrete mass, unless construction technical supervision specifies otherwise.

Instead of producing a concrete structure using a test cube, it is also possible to take a suitable test core (d=15 cm) for testing. One of the specimens, kept under standard humidity conditions, is tested after 7 days, and the other two after 28 days of curing. The fourth specimen, which was kept under outdoor conditions, must be marked and tested only with the approval of construction technical supervision. Instead of testing the properties of a reinforced concrete structure using a test cube, it is also possible to extract a core sample of suitable size for testing (d=15 cm). Documents confirming the compliance of materials intended for concrete production must be submitted to the construction technical supervisor.

Strength conformity tests may not be carried out if:

- The concrete plant control complies with standards LST EN 206;
- Preliminary tests yielded positive results;
- The assigned concrete class is not greater than C20/25;
- The volume of this concrete mix is less than 150 m³;
- The construction made with this concrete is not significant for the overall reliability of the structure.

If the concrete is required to meet frost resistance class F and/or water impermeability class W, an additional specimen for each of these classes should be taken in the batch to determine the specified classes.

The following list provides data that must be included in the concrete strength test report (additional information may be included):

- Location of concrete work;
- Number and design compressive strength of the mortar;
- Quantity of laid concrete;
- Proportions (composition) of the concrete mix;
- Water-cement ratio;
- Maximum particle size of aggregate;
- Consistency measurements;
- Time (hours) of sample collection and ambient temperature at that moment;
- Concrete pouring date;
- Required and actual curing time of specimens during testing;
- Names of individuals who took the specimens and conducted the tests

6.1.3. Macro fiber (fibers)

Fiber concrete is used for coverings/structures - concrete reinforced with polypropylene macro fibers (by fibers). Polypropylene fibers must meet the requirements of LST EN 14889-2 or an equivalent standard. The yield of fibers (kg/m³) is selected after evaluating the loads acting on the coating/structure, additionally used reinforcement, thickness of the structure and soil layers. The yield of fibers is specified in the work project.

Table 6. Indicative yield of fibers for fiber concrete

Row No.	Elements	Indicative amount, kg/m ³
1.	Concrete pavements	3
NOTE: the quantities indicated in the table are accepted for determining the estimated cost of construction and are revised during the preparation of the work project.		

Table 7. Minimum technical requirements for polypropylene microfibers (fibromas)

Physical/mechanical properties	Standard or equivalent	Operational properties
Density	-	$\geq 0,9 \text{ kg/dm}^3$
Melting point	-	$\geq 160 \text{ }^\circ\text{C}$
Equivalent diameter	LST EN 14889-2:2007	$\geq 0,7 \text{ mm}$
Length	LST EN 14889-2:2007	$\geq 40 \text{ mm}$
Tensile strength	LST EN 14889-2:2007	$\geq 450 \text{ MPa}$

After coordinating the decision with the supervisor of the execution of the construction project, polypropylene fiber is possible replace with steel fibers. In order to coordinate the decision, the contractor must submit the calculations of steel fiber reinforced structures to the supervisor of the project implementation. The steel fibers used must meet the requirements of LST EN 14889-1 or an equivalent standard.

Fiber concrete structures are installed in such a way that visible fibers do not form on the surface of the concrete. Visible fibers formed and present on the surface of the concrete must be removed.

6.1.4. Microfiber (fiber)

For facilitating the installation of flat concrete monolithic elements and for plastic shrinkage cracking to reduce, it is recommended to use a polypropylene microfiber/fiber additive for concrete.

Table 8. Technical requirements for polypropylene microfiber (fiber)

Physical/mechanical properties	Standard or equivalent	Operational properties
Density	-	$\geq 0,9 \text{ kg/dm}^3$
Melting point	-	$\geq 160 \text{ }^\circ\text{C}$
Equivalent diameter	LST EN 14889-2:2007	$\geq 20 \text{ }\mu\text{m}$
Length	LST EN 14889-2:2007	$\geq 12 \text{ mm}$
Tensile strength	LST EN 14889-2:2007	$\geq 360 \text{ MPa}$

The yield of polypropylene microfibers in concrete is 0.9 kg/m^3 or according to the manufacturer's/supplier's recommendations. The use of alternative products or means of other materials is allowed. The microfiber used must meet the requirements of LST EN 14889-2 or an equivalent standard. Work should be carried out in accordance with the instructions and recommendations of the manufacturer/supplier.

6.2. Armature

Reinforcement of reinforced concrete structures designed in this project must accept compression and bending and torsional loads. Its protective concrete layers and construction principles must meet the requirements of STR 2.05.05:2005 Chapter XVII.

Reinforcing steel for the reinforcement of structures must be as specified in the design. Characteristic strength according to the yield point: smooth reinforcement $f_{yk} = 240 \text{ MPa}$, rhombic reinforcement $f_{yk} = 500 \text{ MPa}$ (characteristic deformation under the maximum force $\epsilon_{uk} \geq 5.0\%$, unless otherwise specified).

The armature must meet the requirements of LST EN ISO 15630 or LST EN 10080. The fittings used must have manufacturer's certificates issued according to international standards. All the installed fittings must be checked and approved by the act before concreting the products.

Table 9. Permissible deviations in the dimensions of the armature installation

Parameter	Allowable deviation, mm
Distances between centers of reinforcing bars	±10
Deviations of the thickness of the protective concrete layer from the design: - when the thickness of the protective layer exceeds 20 mm and the cross-sectional dimension in mm:	
up to 100	+4, -5
from 101 up to 200	+8, -5
from 201 up to 300	+10, -5
more than 300	+15, -5

When installing the reinforcement in the formwork, the distances between the rows and the thickness of the concrete protective layer are controlled. The protective layer of the working reinforcement must ensure the joint operation of the reinforcement and concrete at all stages of construction work, as well as protect the reinforcement from the atmosphere, aggressive environment, high temperature and similar effects.

Table 10. Reinforcement protective layer thickness requirements

The thickness of the protective layer of the working (longitudinal) reinforcement, in mm, must be at least: (if unless otherwise specified in the drawings)	
the diameter of the armature (if it does not exceed 40 mm)	-
maximum dimension of aggregate grain (if less than 32 mm)	-
maximum dimension of filler grain plus 5 mm (if greater than 32 mm)	-
in prefabricated foundations	30
in monolithic foundations with a preparatory concrete layer	35
in monolithic foundations without a preparatory concrete layer	70
unstressed reinforcement and service condition classes XD1, XD2, XD3, XF1, XF2, XF3, XF4	40
clutches and cross bars	15

6.2.1. Anchoring and lowering of reinforcement

Diamond and smooth reinforcing bars are used without hooks in welded bars and nets. Tensile smooth bars in tie nets and bars must have loops, hooks or a welded cross bar. The anchoring of the tension and compression work reinforcement and the joint insertion must be installed ensuring that the length l_0 is at least $50 \cdot \varnothing$, where \varnothing is the diameter of the bar, unless otherwise specified. Tensile and compression work reinforcement joints can be made by tapping or welding way. When making a joint with a recess flush with the reinforcement, a hook must be additionally installed, as indicated in Fig. 3.

In the absence of the possibility to implement the requirements for the joint of tensile reinforcement of the adjacent plate, the length of the recess should be taken to be 1.5 times greater. Welded joints of non-stressed work fittings should be made with a seam that is $10 \cdot \emptyset$ long, $0.5 \cdot \emptyset$ wide (but ≥ 8 mm) and $0.3 \cdot \emptyset$ seam static height (but ≥ 4 mm), as indicated in Fig. 3.

The joint allowance of individual bars, welded or bonded nets and tension bars of bars must always be placed by pushing. The cross-sectional area of the connecting reinforcing bars in one section or length l_0 must not exceed 50% of the total cross-sectional area of the reinforcement for ribbed reinforcement and no more than 25% for smooth reinforcing bars

Working reinforcement bars are not connected by allowance in the tensile zone of bending and eccentrically compressive elements, in the place of maximum notches and maximum utilization. In the event of slackening of the joints of tensile work reinforcement, made without complying with the specified length requirement, additional fixing of the joints by welding is carried out, the decision being coordinated with the Designer.

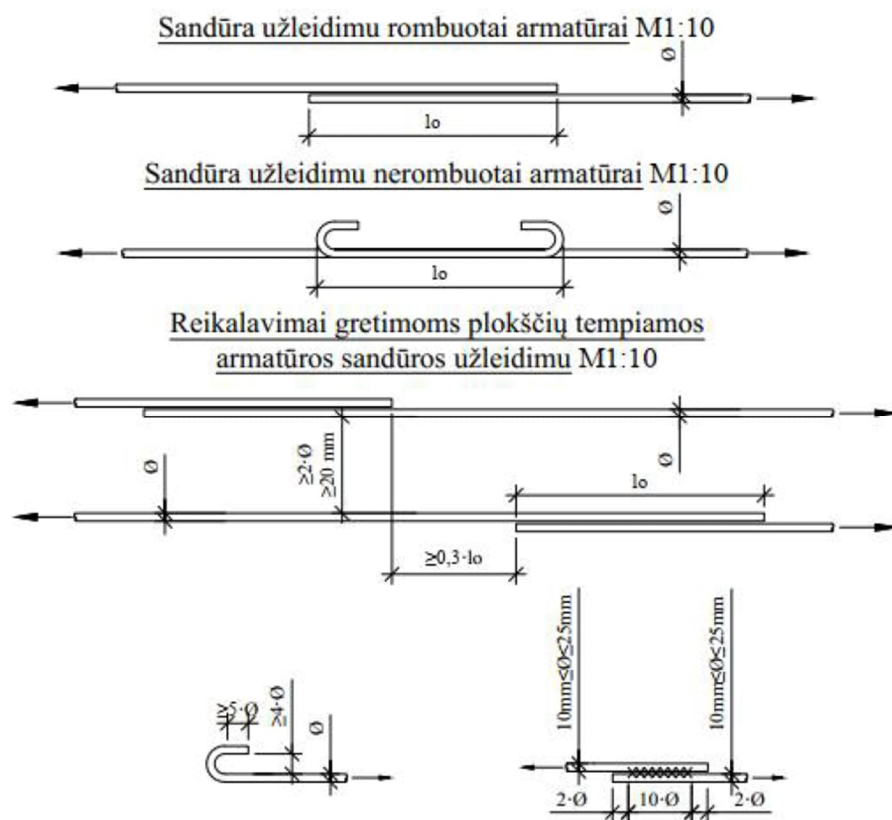


Figure. 1 Embedding and protrusion of reinforcement

6.3. Concrete construction

The concrete mix is applied in horizontal layers across the entire area of the concrete structure. To ensure uniformity of the entire concrete structure, the freshly prepared concrete mix should be applied to a previously compacted layer where the cement has not yet begun to set.

The thickness of the concrete mix layer should not exceed 1.25 times the length of the working part of the vibrating poker. When compacting with surface vibrators, the thickness of the concrete layer for unreinforced structures should not be more than 250 mm, and for structures with double reinforcement – 120 mm. After a longer work break, construction can be continued when the previously laid concrete has attained a compressive strength of not less than 1.5 MPa. Concrete mix can be compacted by pouring and vibrating.

The surface of hardened concrete onto (near) which new concrete will be poured is roughened in a specified manner. It is roughened like a sand stream and/or by jetting to expose the aggregate and remove all cement paste, loose particles, fractures, and any parts that may adversely affect the bond between existing and new concrete. The surface is cleaned from debris and dust. The surface of previously hardened concrete, to which no binding additives have been added, is moistened with water or kerosene emulsion before pouring new concrete on it, unless otherwise specified in the project. Concrete cannot be poured until all related works that may affect the setting and curing of concrete are completed. Concrete is poured in such a way that no segregation of materials occurs in it. Chutes or other equipment that allow

the concrete mix to fall freely should be used, allowing the concrete mix to fall no more than 1.0 m. Once concrete pouring has begun, it must continue until the entire block, slab, foundation, or other structure is completely poured. Pouring is not considered continuous if there are breaks between concrete pours on the same surface lasting longer than 15 minutes or according to the time determined in the laboratory, taking into account the concrete setting, air temperature, etc. The layout of construction joints in the element must be coordinated with technical supervision.

When compacting the concrete mix, it is not allowed to support the compaction vibrator on reinforcing bars, embedded parts, formwork, and their fastening elements. The deep vibrator must be immersed in the already compacted lower layer of concrete from 5 to 10 cm deep.

Table 11. Permissible tolerances for reinforced concrete monolithic structures.

Deviation name	Permissible deviations ,
deviations of the vertical planes of the foundations and their intersection lines from the vertical per the entire height of the structure	±20
walls concreted in stationary formwork and columns supporting monolithic overlay	±15
walls and columns supporting prefabricated beam structures	±10
deviation of horizontal planes from the horizontal throughout the inspected section plane	±20
local irregularities of the concrete surface in the two-meter-long section of the added ruler (excluding supporting surfaces)	±5
element length and span	±20
element cross-sectional dimensions	-3 to +6
of monolithic or prefabricated reinforced concrete columns and other prefabricated elements support surface altitudes;	±5
Positions of anchor bolts	
in plan when the supports are inside the contour	±5
in the plan when the supports are outside the contour	±10
by height	±20
Altitude difference at the junction of two surfaces by height	±3

6.3.1. Requirements for formwork

The slabs of monolithic concrete and reinforced concrete structures and the supporting structures must:

- be stable, durable, and strong;
- withstand the mass of the poured concrete mixture and additional loads that arise during concreting;
- ensure the form and accurate dimensions of the concreting structures.

Table 12. Tolerances for Pavement Layers

Name of the deviation	Permissible Deviations, mm
deviation from the vertical or bedding plane from the design slope	
in one meter length - 5 mm	±5
20 mm throughout the foundation height,	±20
throughout the walls at a height of up to 5 m	±20
beam	±5
displacement of formwork axes from the design position	
foundations	±15
walls and columns	±8
beams and lengths	±10
foundations under steel columns	1, 1L (L – opening width or column pitch)
the displacement of the axes of the prefabricated formwork in relation to the axes of the structure	10
deviations of dimensions of beams and columns from the design ones	-3 to +6
formwork irregularities, measured with a 2 m long ruler	±3

6.3.2. Execution of concrete works when the air temperature is above +25°C.

During concrete works, when the ambient temperature is higher than +25 °C, or the relative humidity is below 50%, or the wind speed exceeds 5 m/s, the quality of concrete work and prevention of concrete cracking must be ensured by using additional measures during the concrete placement. Microfibers, chemical additives, or other suitable methods may be used.

When pouring concrete in a hot environment, the supervision of the concrete structure forming process should commence immediately after concrete placement and continue until the concrete reaches 70% of the design strength. Due to plastic settlement cracks appearing on the concrete surface, permissible re-vibration of concrete should be carried out no later than 0.5-1 hour after the completion of placing. When the concrete strength is 0.5 MPa, further maintenance should be performed by ensuring the moisture of the concrete surface, periodically spraying water. Curing concrete during hardening should be protected from direct sunlight by covering it with insulating materials.

When monitoring the work in hot weather, it is necessary to check:

- The consistency and setting time of the concrete mix (after production and before laying);
- The temperature of water, concrete mix, and air;
- The strength of concrete, water impermeability, and frost resistance.

6.3.3. Carrying out concrete work when the air temperature is below +5° C

The following requirements must be implemented when the average daily temperature is below +5°C and the minimum daily temperature is below 0°C. Works can be carried out by coordinating with the technical supervisor. When conducting concrete work in winter until the concrete reaches 80% of the design strength, the structures must be covered with insulated panels and blankets to prevent the concrete from freezing. When the air temperature is not lower than -15°C, the temperature of poured concrete must not be lower than +10°C. When the air temperature is lower than -15°C, the concrete temperature must not be lower than +15°C (cold concrete can only be used for non-reinforced structures). The base on which the concrete mix will be poured must be protected from freezing. Snow and ice must be cleared at the joints where the concrete connects with precast structures. To accelerate the setting of concrete, chemical additives approved by the Technical Supervisor may be used in concrete production. They should not reduce the strength of the concrete. Thermal processing (heating) of the cured concrete may also be used. The following normative parameters of concrete must be checked: compressive strength, frost resistance, water impermeability. Concrete testing must be carried out as specified in the section "Concrete and Its Control." Before testing, it must be kept for 2-4 hours at -20°C. The quality of the materials and products used, the temperature of heated water and aggregates, the correctness of joint installation, the arrangement of openings, and protective layers must be constantly monitored.

6.3.4. Concrete surfaces

6.3.4.1. General instructions

These requirements apply to all monolithic and precast concrete, and reinforced concrete structures, and products made from all types of concrete. The surface of the forms and pallets must be of such quality as to ensure the necessary requirements for the concrete surface of the structure, protection of the reinforcement from corrosion, as well as a uniform concrete color.

Table 13. The concrete surfaces of structures must meet the following requirements

Row No.	Surface of elements	Product surface category (LST 2015:2020)
1	Reinforced concrete anti-ice protection surfaces are visible near the path and the top	B
2	The surfaces near the walkway and the top of the pontoon limed anchoring foundations are visible	B

Table 14. Allowable deviations of concrete surfaces (according to LST 2015:2020)

Product surface category	The number of formed nodes 1 m ²			Number of excavations 1 m ² , when the diameter of the excavation is (5-10) mm, depth up to 5 mm	Maximum differential settlement, mm	Maximum hub height, mm	Maximum groove depth, mm
	Height, 1 mm	Height, 2 mm	Height, 3 mm				
A*	0	0	0	10	0	0	0
B	10	0	0	20	2	0	2
C	20	5	3	50	5	5	5

Explanation:

- 1) Class A surfaces are achieved when in contact with a horizontal mold surface.
- 2) The number of depressions up to 5 mm in diameter, with a depth not exceeding 5 mm, is not regulated.
- 3) For a visible surface where the drawing or the agreement between the customer and the manufacturer does not specify the surface class, the permissible deviations of Class C surface apply. For an invisible surface, there are no restrictions on deviations, but a protective layer of concrete within the permissible deviation limits must be ensured.

Cracks in the used products are not allowed, except for transverse cracks from the prestressed reinforcement in prestressed concrete products. The width of such cracks must not exceed the permissible values set by standards for a specific product. Additionally, cracks due to concrete shrinkage and other technological cracks must not be larger than 0.1 mm for products made of heavy concrete exposed to cyclic freezing and thawing in a moist environment or in a fluctuating water level zone.

6.3.4.2. The roughening of concrete surfaces.

The horizontal surface of concrete ceilings, squares, pavements, and stair steps must have sufficient roughness to meet the essential requirements of the construction specified in STR 2.01.01(4):2008 "Occupational Safety." To achieve the necessary roughness, horizontal concrete surfaces where human and vehicular traffic is expected are prepared by finishing with a vibrating screed, troweling, and then brushing with a broom.

Brushed Surface:

A brushed surface is obtained by finishing the horizontal surface of the structure with a broom (after consolidating the concrete, leveling with a vibrating screed, and troweling). This method imparts a specific texture to the surface, depending on the length and stiffness of the broom bristles. The direction of brushing is coordinated with the project supervisor.



Image 2: Concrete Surface Brushed with a Broom

Alternative Solutions

The method and materials for surface roughening can be changed to equivalent ones after coordinating the solutions with the construction project supervisor, construction technical supervisor, and contractors.

6.3.4.3. Maintenance of Concrete Structures

In the initial curing stage of freshly poured concrete, a specific temperature and humidity regime must be maintained. Concrete needs to be periodically moistened to keep it damp, protected from direct sunlight in the summer, and shielded from cold temperatures in the winter. Open concrete surfaces should not be watered. In the summer, concrete made with ordinary Portland cement is watered for the first seven days. When the air temperature is higher than 15°C, the concrete is watered every 3 hours for the first three days and once during the night, later not less than three times per day. Watering can commence 5-10 hours after the concrete has been placed. If the average daily air temperature is 3°C or lower, concrete should not be watered.

The removal time for forms depends on the rate of concrete curing and the intended purpose of the structure. The deflections of cast-in-place reinforced concrete and concrete structures should not exceed allowable limits.

6.4. Waterproofing

All surfaces of reinforced concrete structures, in direct contact with the ground zone, are coated/sprayed with bituminous waterproofing, twice. Bituminous waterproofing can be replaced with cementitious waterproofing or any other equivalent material ensuring waterproofing of the concrete surface and resistance to water absorption.

6.5. Expansion Joints

Expansion joints are divided into technological joints (for different stages of concreting), contraction (control) joints, temperature joints, and settlement joints. For sealing the external exposed gaps of all types of joints, use elastic sealant, gray in color, resistant to atmospheric factors, salts, UV rays, and ozone exposure. Joints must be properly sealed and protected.

6.5.1. Temperature joints

Temperature joints are installed in long continuous structures to restrict movement in all directions except longitudinally. The locations for the installation of joints are indicated in the drawings, with the specific details provided in the working project. In the connections of temperature joints, reinforcement bars must be interrupted. Depending on the purpose of the structure and the forces acting on them, standard and non-standard solutions for the installation of temperature expansion joints are possible. For deformation-temperature joints, the project specifies the use of an expansion joint strip (extruded polystyrene) ≥ 20 mm, with the top filled with sealant

6.5.2. Seat seams

Settlement joints are installed in the gap between different reinforced concrete structures, similar to temperature joints, except that the structures are completely separated. Reinforcement bars are interrupted, and connecting details are not installed. The locations for the installation of settling joints are indicated in the drawings, with their precise placement detailed in the working project.

6.5.3. Shrinkage (control) seams

The purpose of contraction (control) joints is to divide large-area structures (e.g., slabs) into smaller sections, thereby controlling and predicting the locations of cracks and reducing stresses in the concrete. Reinforced concrete flat structures are divided into average 3.5 x 3.5 meter sections, but not larger than 4 x 4 meters, unless otherwise specified in the drawings. Joints are installed by cutting the top surface of the concrete. The depth of the joints is $\geq 1/4 \times h$, where h is the height of the reinforced concrete slab. The width of the joints is ≥ 10 mm. Joints are cleaned, an elastic sealing strip is placed in them, and then sealed with a sealant. Instead of cut and sealed joints, the contractor is allowed to use specialized profiles.

6.6. Technological seams and sealing

Construction joints are installed between different concrete placement stages. Reinforcement bars and meshes must be continuous across all construction joints. When concreting is halted in a vertical or sloping plane, appropriate concrete retention meshes, supporting planks, and measures allowing continuous continuity of the reinforcement through the junction must be installed. Any concrete mixture that spills through the joint must be immediately removed after it has set.

Joints can be installed as indicated in the drawings or as specified in the contractor's construction work technology project, after informing the construction project supervisor and the construction technical supervisor. Where construction joints are not specified in the drawings, the contractor may propose their layout before the start of concreting. If dowels (inserts) are placed in construction joints, they must be securely anchored in the slab.

Expansion waterproofing bentonite strips may be used as needed for sealing construction joints and sealing openings for installed engineering networks. Such joints are specified and detailed in the drawings of the work project. The sealing strip for construction joints is laid (attached) on the cast and set concrete element before starting the next concreting stage. For sealing engineering networks and pipes, the strip is installed around the entire perimeter of the pipe.

7. PRODUCTION AND INSTALLATION OF METAL STRUCTURES

7.1. General instructions

This section presents the main requirements for the design, manufacturing, and construction of steel structures.

Detailed drawings of non-typical steel structures must be provided in the work project. Products manufactured according to typical construction drawings must meet the requirements listed in this section. If necessary, equivalent standards for the steel grade/class and other relevant criteria specified in this project may be used in the project documentation. These documents must be reviewed by the construction technical supervision before the commencement of work, and the appropriate decision must be approved

7.2. Materials

If there are no other instructions in the material quantities log, in the following sections, steel must meet the minimum requirements specified in Table 4.2.1. The class of structural steel is indicated in the working project drawings. When assessing the conditions of use for products and structures, the grade of steel is selected for them according to Table 6.1 in Section VI of STR 2.05.08. Connection means are selected following the instructions in Section II of Section VI of STR 2.05.08.

Table 15. The steel used for structures must meet the following minimum requirements:

Row No.	Product or material common name	Standard or equivalent	Steel brand/class*	Characteristics*
1.	Steel gusset/clamp wall Provided by the builder	LST EN 10248	$\geq S 270 GP$	$f_y \geq 270 N/mm^2$,
2.	Steel mortise/clamp lock connections	LST EN 10248	$\geq S 270 GP$	$f_y \geq 270 N/mm^2$,
3.	Steel profiles	LST EN 10025	$\geq S 355$	$f_y \geq 355 N/mm^2$,
4.	Structural steel	LST EN 10025	$\geq S 355$	$f_y \geq 355 N/mm^2$,
5.	Assembly steel (inserts, sheet steel)	LST EN 10025	$\geq S 235$	$f_y \geq 235 N/mm^2$,
6.	Stainless steel handrails	-	AISI316; AISI316L	$f_y \geq 190 N/mm^2$,

* The table shows the minimum requirements. Steel grades/grades can be changed to higher grades/grades than specified.

where: f_y is the characteristic strength of the steel at the yield point.

- Note: 1. Construction profiles: all profiles accepted in the project must be new, with a smooth surface, clean, without rust. The dimensions of the profiles must be exactly the same. Profiles must be factory tested and must have certificates of conformity.
2. By way of exception, the requirements of this point may not be applied only to those owned by the Builder and the Contractor for transferred products, materials. The Builder agrees in writing with the Contractor on the possible materials assess the risks of use in construction works and the distribution of responsibilities.

Welding Materials

For welding steel structures, use: covered electrodes for manual arc welding of unalloyed steels – according to LST EN ISO 2560, LST EN ISO 18275, electrode wires according to LST EN ISO 14341, LST EN ISO 14171, LST EN ISO 17632, fluxes according to LST EN ISO 14174, protective gases according to LST EN ISO 14175.

Welding materials and welding technology must ensure a minimum weld resistance not less than the resistance of the welded steel cross-section in the ultimate state with its cross-sectional strength according to the strength limit f_u , as well as not less than the weld metal strength, impact toughness, and relative elongation. The characteristic weld metal strengths of transverse fillet welds welded with covered electrodes are specified in Table 6.12 of STR 2.05.08, and those welded with flux-cored wires in protective gases are specified in Table 6.13 of STR 2.05.08.

7.3. Welding joints

Junctions of constructions must be designed to allow easy execution of welding works. Mechanized and automated welding methods are applied to products prepared in factories. Welding of constructions on the construction site is only possible by welding joints after coordinating each case with the technical supervision engineer.

All welding works must be carried out in a way that avoids any deformation of connecting details. Before welding, each weldable detail must be thoroughly cleaned, removing all impurities, slag, rust, lubricants, paints, and other extraneous materials.

Surfaces of welded constructions and the welder's workplace must be protected from rain, snow, and wind. When the ambient temperature is below $+5^{\circ}\text{C}$, the joint metal must be preheated to $+50^{\circ}\text{C}$ or the ambient temperature must be raised to $+5^{\circ}\text{C}$ using special tents.

The contractor must assign an engineer for welding works who has sufficient knowledge and experience in steel constructions and welding.

The contractor must provide a welding work technology using procedures and work sequences to obtain minimal temporary stresses.

Welding materials must comply with steel grades/classes for connecting details according to LST EN ISO 2560. Mandatory inspection of all pole welds. Tests and inspections of structural steel poles and pole details must be carried out according to the requirements of LST EN 12699.

The technical supervisor may require the contractor to prepare and test examples of each type of welding. Welding protocols must mention the construction, welder, and welding date. Welding protocols must be promptly submitted to the technical supervisor.

The characteristic of the deposited metal must meet the quality of the welded steel. All welded seams must be carried out according to the drawings. If not specified otherwise, the minimum static lengths of seams are accepted according to table 7.29 of STR 2.05.08. For constructions without anti-corrosion coating, the minimum seam thickness is increased by 1.0 mm. In the water level fluctuation zone, the minimum seam thickness is increased by 2.0 mm. However, the accepted static lengths of seams must not exceed $1.2t$, where t is the thickness of the thinnest connecting element. The drawings indicate the static length z or the thickness a of the seam. The dependence of the seam thickness and static length is determined by the formula: $z = 1.414 \times a$.

After producing a steel product, the technical supervisor may require testing any welding location by a non-destructive method.

Welding of concrete reinforcement is allowed only if specified in the drawings. Necessary welds must be shown to the technical supervisor before work. Relevant welding certificates must be submitted before work.

Inspection locations of welding seams are selected by the technical supervisor, and their inspection must be carried out with his participation.

7.4. Screws

Strong bolts are used for connecting metal structures. Their diameter and quantity are determined when preparing the design and constructing nodes.

Permissible deviations of bolts, screws, and nuts must meet the specified requirements of LST EN ISO 4759-1. Deviations of nuts must not exceed those specified in LST EN ISO 4759-3.

All bolts and nuts must have factory markings. Using bolts without factory markings is prohibited. For tensioned structural connections, bolts of quality classes 8.8 or 10.9 are used, whose mechanical properties meet the requirements of LST EN ISO 898-1.

For bolted joints, other bolts, nuts, and washers with mechanical properties that meet the following requirements can also be used: bolts - LST EN ISO 898-1, nuts - LST EN ISO 898-2, and washers - LST EN ISO 887.

Substituting bolts, nuts, and washers with different ones than specified must be coordinated with the project leader. Persons making changes without notifying about such substitutions bear responsibility. Nuts must easily screw onto bolts. This must be checked before assembly. Factory nuts must be screwed in such a way that the quality class marking is visible. Nuts cannot be welded unless specified in the project.

For connections using non-tensioned bolts, sets of bolts are selected according to combinations provided in table 6.2 of STR 2.05.08. The non-tensioned bolt's threaded part, subjected to shear stress, must not be deeper than half the thickness of the element adjacent to the nut or deeper than 5 mm.

For bolted joints, other bolts, nuts, and washers (DIN 6914-6916) whose mechanical properties meet the following requirements can also be used: bolts - LST EN ISO 898-1, nuts - LST EN ISO 898-2, and washers - LST EN ISO 887.

7.5. Painting of steel structures

When painting metal structures, one should follow the guidelines of LST EN ISO 12944 "Paints and Varnishes. Corrosion Protection of Steel Structures with Protective Paint Systems," DIN 18364, LST EN ISO 1461, or equivalent standards and manufacturer requirements.

Surface preparation for painting includes the following steps:

Clean the metal surface from any impurities (grease, rust, oils, dirt, old paint, etc.) and perform a de-rusting procedure.

Prepare the surfaces using abrasive materials (sandblasting, high-pressure water jetting, or other methods) or mechanically clean them using abrasive disks, belts, etc.

Clean the surfaces to Sa 2½ degree according to ISO 8501-1 standards.

During work and in the presence of completed structures, attention must be paid to protection against the entry of harmful substances into the environment.

Painting of sprayed-on/injected elements with poles is not provided – select profiles considering their sufficient resistance to rusting over 50 years of operation.

Paint the swiveling columns in black RAL color (9005 or 9011) and bright yellow RAL color (1016 or 1021). Number the columns accordingly. Paint the wheel guards in black RAL color (9005 or 9011) and bright yellow RAL color (1016 or 1021). Paint ladders/climbing aids in black RAL color (9005 or 9011).

Elements covered with an anti-corrosion coating, which have transportation and assembly damage, must be completely repaired by restoring the layer. The surface preparation cleanliness class in this case is P Ma. Repaired surfaces are restricted to covering in straight lines.

Elements covered with an anti-corrosion coating are sprayed only. Corners, bolts, joints, and edges are painted with a brush before spraying.

It is specified in the project to paint exposed steel structures to reduce the impact of corrosion. The indicated steel elements/constructions are protected from corrosion by painting.

Paint steel structures according to specified corrosion classes (following LST EN 12944-5 requirements):

Corrosion Class C5 – for elements above water;

Corrosion Class Im2 - for partially submerged/immersed elements.

The contractor must ensure access to painted elements. When accepting anti-corrosion coating works on the construction site, the contractor must constantly have a magnetic thickness measurement device for the coating.

Painting works must be carried out in accordance with the painting requirements specified in the paint manufacturer's instructions and recommendations.

7.6. Gate filler

A cross-tensioned net is used to fill the gate.

The net is made of stainless steel.

The sheets are cut and stretched, diamond-shaped eyelets are formed.

The net is rolled.

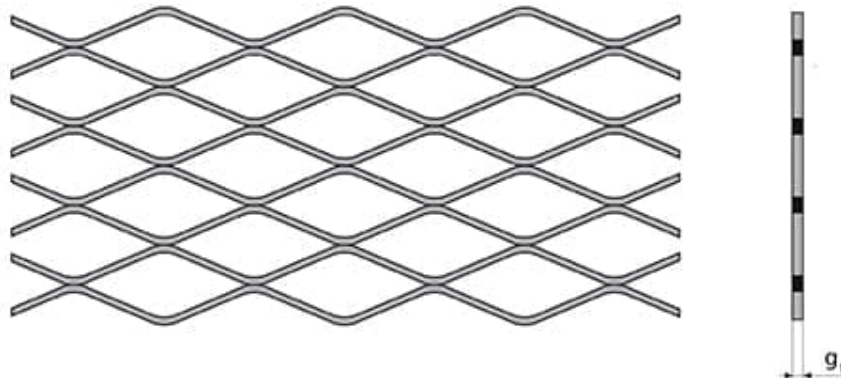


Fig. 3 Cross-tensioned net - rolled

Raw steel sheet thickness ≥ 2 mm.

Eyelet dimensions $15 \text{ mm} \leq a \leq 30 \text{ mm}$, $30 \text{ mm} \leq b \leq 45 \text{ mm}$.

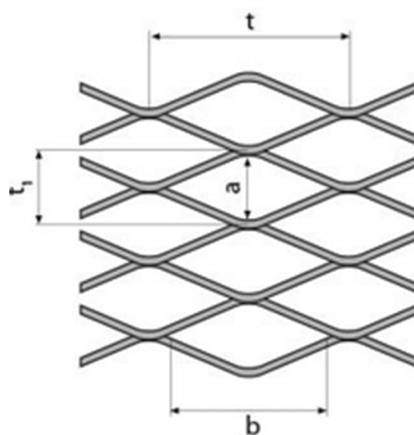


Fig. 1 Dimensions of cross-tension net eyelet

8. POLES

8.1. Steel snap poles

The material and production of steel poles must comply with LST EN 1993-5 "Eurocode 3. Design of steel structures. Part 5." The type, size, permissible deviations, quality, and steel grade of the poles must meet the specified requirements, and they should not be damaged or corroded.

To prevent damage to the upper part of a steel tapered pole, its head must be reinforced or protected by a well-fitted steel cap.

Shims should be used for the elongation of anchor bolts and tubular poles.

The material and production of steel poles, including collisions and reinforcements, must meet the requirements of LST EN 12063.

8.2. Recommendations for the installation of click piles

It is suggested to undertake the following before starting the steel inserts/clamping work measures to reduce soil friction in the locks and thus facilitate the installation of inserts/clamps:

- the free lock of the steel insert must be inclined at the top;
- when forging steel inserts, the free lock must be protected from soil entering it (that is can be made by blindly sealing the bottom of the mortise lock with a screw, rod, steel sheet, etc.);
- the cavities of the locks can be filled with a sealing system (to increase slippage and for sealing).

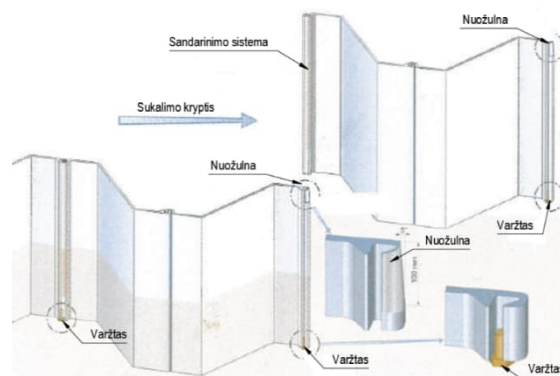


Fig. 2 Recommendations for the installation of the spigot/groove (direction of driving, clearance, etc.)

The arrangement and forging direction of steel anchors must be determined before ordering steel anchors (double anchor form, slope of the tops, etc.).

The sealing system must be environmentally friendly.

8.2.1. Additional measures

Due to the challenging geological conditions at the construction site, it is recommended to consider one of the following additional measures for the installation of driven steel piles/inserts:

- Strengthening the tops of the anchors by attaching sheet steel overlays;
- Reduction of side friction by attaching sheet steel overlays at the bottom of the anchors;
- Drilling holes at the anchor installation site (ground loosening);
- High-pressure jetting (rinsing) assistance.

The contractor also has the right to use other additional measures not mentioned in the project. In each case, a Construction Work Execution Technology Project (CWETP) card must be prepared and coordinated in the established procedure.

8.2.1.1. With the help of a high-pressure jet (rinsing)

The equipment consists of pipes attached to the steel anchor, through which, with the help of pumps, controlled water supply is carried out using high-pressure flow from nearby reservoirs.



Fig. 3 Attachment of pipes to the anchor.

Continuous supervision must be carried out during the work to promptly detect whether the installation of the anchor poses a danger to the adjacent area.

During installation, due to the high-pressure water flow, soil flushing may occur near the anchor, and the internal friction angle of the soil may decrease due to flushing, reducing the friction on the anchor, which may cause the anchors to drift.

When installing a group of anchors, the last few meters should be installed without flushing to preserve the existing soil structure, avoid creating voids, and prevent a reduction in the strength of the foundation. Solutions must be coordinated with the project manager, and a separate Construction Work Execution Technology Project (CWETP) card should be prepared.

8.2.1.2. Reinforcement of the lower part of the steel snap pile/inlay with steel sheets

Due to complex geological conditions at the construction site, the upper and lower parts of the steel anchor/rod may be reinforced with cover plates made of steel sheets.

Reinforcements of anchors/pipes must be carried out following the requirements of Section 8.5 of LST EN 12063. However, the Contractor may adjust the dimensions of the steel sheets, their attachment, and the steel grade of the reinforcements at their discretion. The accepted and adjusted parameters of the reinforcements must be coordinated with the Project Manager.

Reinforcements of anchors and pipes are assembly elements, so changes to reinforcements during construction are considered non-essential structural changes.

8.2.1.3. Drilling holes at the place of installation of the inserts

For drilling holes, screws with a diameter of 200 – 300 mm can be used. Holes must be drilled along the axes of the anchors. After drilling, the disturbed soil should be left in the holes, and if that is not possible, any voids should be filled with clean soil.

It is not allowed to drill holes in the passive zone of the soil, close to the elevation of the bottom of the anchor, and in places where artesian water may be encountered.

When installing a group of anchors, the last few meters below the design level should be installed without drilling to avoid disrupting the existing soil structure, preventing the formation of voids, and maintaining the strength of the foundation.

Decisions such as the parameters of the selected drill, the drilling locations, depth, etc., must be coordinated with the project manager, and a separate card for the construction work execution technology project (SDTP) must be prepared.

8.3. Installation of clamp poles

8.3.1. General requirements

When carrying out the installation works of poles, it is necessary to take all necessary measures to ensure safety on the construction site and in its vicinity, reduce noise and vibration impact on people, and minimize potential effects on nearby property.

The procedure for installing anchors and poles must be precisely planned, and attention should be paid to:

✓ The group of installed horizontal or vertical poles must not exceed the permissible values:

– Retaining wall:

◆ The top position of retaining wall poles in the plane:

∇ $e \leq 100$ mm (underwater).

◆ Vertical inclination of retaining wall poles in all directions:

∇ $i \leq i_{maks} = 0,02$ m/m.

– The soil around the pole must not be compacted to the extent that it is no longer possible to install other poles;

– Vibration occurring during the piling of a pole should not affect adjacent freshly installed poles.

In exceptional cases (obstacles encountered at the construction site, unspecified elements or bodies in the project, etc.), it may happen that structures cannot be installed without exceeding the specified limit deviations. In such a situation, the construction work supervisor appointed by the Contractor must contact the Project Manager, who, after evaluating the future deviations, makes a decision whether to allow the installation of structures that exceed the permissible deviations. The decision made must be recorded in the construction work journal - essential or non-essential changes to the technical project.

✓ The as-built documentation of installed structures is submitted to the Project Manager, who, based on the as-built documentation, adjusts the working project drawings, if necessary, and the technical project drawings.

✓ Before starting the work, the Contractor must have an approved piling plan, which describes the equipment, the method of installation, specifies the location of the first pile, and the sequence of installing all piles, including axis coordinates.

✓ When preparing the SDTP, the Contractor must assess and appropriately select the equipment for pile driving, taking into account the cross-section of the piles and geological conditions."

8.3.2. Profiled steel (steel poles)

Profiles must be tested in the factory and have to have conformity certificates. If necessary, they can be tested during construction. Profile testing can only be performed by a laboratory with a certificate. The construction technical supervisor has the right to demand that profiles be tested for elongation, rotation by 180°, and bending at the welding points. If the test results are negative, the contractor (supplier) must cover the expenses for any additional tests.

8.3.3. Maintenance, monitoring of the installation of culverts.

8.3.3.1. Input installation maintenance

A qualified and experienced person must oversee maintenance work. The person overseeing the work is responsible for:

- ✓ Ensuring that the work is carried out in accordance with LST EN 12063 "Special Geotechnical Works. Diaphragm Walling" or other additional requirements, and that the work execution procedure is coordinated;
- ✓ Monitoring the construction of diaphragm walls and maintaining all necessary recorded data;
- ✓ Informing the client's representative and/or the designer about any changes in circumstances or conditions on the construction site or in any unforeseen situations.

8.3.3.2. Monitoring of input installation

Observation at all stages of the diaphragm wall installation must be carried out in accordance with the diaphragm wall installation program and the requirements of LST EN 1997-1. The monitoring of the diaphragm wall construction process should also include earlier walls, and all necessary information should be accumulated based on LST EN 12699 "Special Geotechnical Works. Diaphragm Walls" sections 10.3 and, if necessary, 10.4.

Deviations during the installation must not exceed what is specified in detailed construction drawings and technical specifications. In exceptional cases (such as obstacles at the construction site, unspecified elements or bodies in the project, very complex geological conditions, etc.), it may happen that individual elements of the constructed structures (diaphragm walls/piles) do not reach the design altitude. In such cases, incomplete documentation for the constructed structures must be submitted to the Designer. After reviewing the as-built documentation, the Designer assesses the resistance and stability sufficiency of the constructed structures. The Project Manager makes a decision regarding the structures not installed up to the design altitude and provides a response – a solution, whether additional solutions need to be considered, and whether these are essential or non-essential changes to the structure.

In case of any bulging or deformation of the diaphragm wall/pile, the ground must be excavated down to the design altitude, and the quality of the diaphragm wall/pile should be checked (with the help of rods). If cracks are observed in the diaphragm wall/pile, the Contractor should, at their own expense, repair them.

9. ENGINEERING NETWORKS

9.1. Monolithic/prefabricated communication sewer wells (inserts, cast iron hatch)

The well is made of: reinforced concrete, class \geq C30/37;

- Complete set: cast iron hatch, load class – D400;
- Screws for fixing the intended hatch;
- Anchor bolt;
- Cable holder;
- Dimensions 1050x85x700;

The communication well must be watertight. When installing the device, the manufacturer's and supplier's rules, regulations and construction regulations must always be followed.

9.1.1. Preparation of the base of the communications well

A foundation must be installed under the well that meets the requirements of the project. The base of the well has be installed on unmoved ground. If, during the digging of the trench, it was over-excavated — soil is poured in those places and the bottom of the trench is compacted, the bottom of the trench must be compacted to $EV2 \geq 45$ MPa. The wells are installed on a 7 cm thick pre-cast concrete C12/15 sublayer. A sand/gravel base with a thickness of at least 30 cm is installed under the preparatory concrete layer, which must be compacted to 95% according to Proctor (or the corresponding deformation modulus — $EV2 \geq 60$ MPa). When compacting the soil, there must be no water in the excavation, and the compacted soil must be dry.

The well cannot be supported on a base of filled soil containing organic impurities. If after excavating the pit for the installation of the well, fill soil with organic impurities is found, it should be dug up to the clay or sand layer and the pit should be filled with a compacted sand/gravel mixture up to the design altitude.

9.2. Openings and niches

Installation of openings or niches not provided for in structural drawings in supporting structures without Engineer's consent in writing is not permitted. If punching, cutting or similar operations are to be carried out, the work shall be carried out in such a way that so that the structures remain intact after their completion. The work environment must be arranged to meet environmental requirements.

9.2.1. Use of sealing material

Rubbish and dust must be cleaned from the sealing base. It must be dry, clean, whatever cracks and irregularities exceeding the permissible limits must be filled and smoothed. The priming of surfaces, where necessary, must be continuous. The primer must bond well with the base. The application method, the number of layers and other requirements must comply with the technical instructions of the selected sealing system and supplier.

9.3. Protective conduits for cables laid in the open ground

Table 16. Requirements for conduit pipes for engineering networks.

Row No.	Technical parameters and requirements	Size, condition
1.	Product certification	Certified for cable drainage
2.	Pipe made of plastic	PE
3.	Overall dimensions of pipes	110
4.	The outer wall of the pipe	Corrugated
5.	The inner wall of the pipe	Even
6.	Characteristics of plastic pipes:	
6.1.	Density	800-960 kg/m ³
6.2.	Modulus of elasticity	≥750 MPa
6.3.	Mechanical resistance	≥750 N
6.4.	Melting index	0,15÷0,5 g/10 min
6.5.	Operating temperature	-20 ÷ +75 °C
6.6.	Resistance to aggressive environment	Resistant to most acids and bases

Appropriate segmented pipes shall be used for the passage of pipes through the manhole wall seals. The gap between the manhole wall and the pipeline shall be sized according to the dimensions of the selected seal.

9.4. Hatches and covers (in the marina area)

Requirements for hatches:

- The manhole cover and frame are made of malleable cast iron;
- Load class D400;
- The frame is hinged to the manhole;
- The hinge design shall provide for locking of the cover in the open position, to prevent accidental closing;
- The frame shall be fitted with a shock-absorbing liner, resistant to transport loads, ensuring stability
- A mechanical lock shall be provided;
- Covers shall be labelled to distinguish between water supply networks;
- The hatches shall be of the "floating", heavy duty type with a load capacity of 40 tonnes;
- Manufactured in accordance with EN124 and certified by an authorised by an authorised certification body.

The hatches shall be designed for the operation of the pier and shall be able to withstand an equivalent axle load of $Qk = 130 \text{ kN}$, and comply with the climatic conditions of Lithuania.

Tolerances for casting dimensions shall be in accordance with accuracy class 9 and for masses in accordance with accuracy class 12. Hatch diameter 700 mm. The hatch covers shall fit snugly against the annular surface of the body. The cover shall fit loosely into the housing. A misalignment of the edge of the cover with the edge of the housing of $\pm 2.5 \text{ mm}$. The surface of the hatches shall be free from adhesions and spillages. The surface of the hatches shall be free of voids of more than 10 mm in diameter and 3 mm deep, covering more than 5% of the surface of the hatch. Cracks in the hatches are not permitted.

Hatches shall be supplied complete. The kit shall include:

- lid - 1 piece;
 - housing - 1 piece.
- The marking and external appearance of the hatches shall be checked visually.
Hatch markings and external appearance are checked visually.

10. PROTECTIVE MEASURES

10.1. Railings and/or barriers

In the upper part of the dam, stainless steel railings (for the post and handrails) are installed, which must ensure the resistance of the characteristic horizontal load ≥ 1 kN/m. Detailed structural solutions for stainless steel railings must be detailed in the work project during preparation.

11. EXCAVATION AND INSTALLATION OF EARTHWORKS AND EMBANKMENTS

11.1. Introduction

This section of the TS contains requirements for the installation of the earthen embankment (base of the pavement structure) and the execution of earthworks. In addition to the requirements in this chapter, other requirements specified in the Carriageway Excavation and Embankment Installation Regulations TS ŽS 17 shall also apply.

11.2. General requirements

11.2.1. Preparatory and accompanying work

The Customer shall assess and determine the location and condition of the sub-base of the pavement structure. It is recommended that suppliers also inspect the location of the pavement substructure.

If it is necessary to assess the conditions of the pavement substructure installation/construction site when submitting an alternative proposal, this is the responsibility of the supplier.

It is the Contractor's responsibility to familiarise themselves with the site conditions.

On-site and off-site slurries may only be removed in agreement with the client.

The shafts under and within the structure shall be backfilled and compacted in such a way as to meet the requirements of the ES 17 VIII the requirements of Chapter 2, Section 2. Areas used for construction work shall be kept in a state of repair at all times. To be ensure that adjacent areas and structures, including plantations, are not damaged.

11.2.2. Building materials

The following is used to construct the earthen embankment:

- soil and rock;
- construction materials;
- RC mixtures;
- by-products of industrial production;
- geosynthetics;
- lightweight materials (e.g. pumice, foam);
- Drainage, filtration, waterproofing and other materials required for certain works.

11.2.3. Base layers for non-bonded materials

The materials of the base layers of non-bonded materials shall comply with: Unbonded highway Technical Requirements for Binding Agent-Free Mixes and Soils for Road Surfacing Layers TRA SBR 19, Technical Requirements for Road Aggregates TRA UŽPILDAI 19 and Rules for the Installation of Binding Agent-Free Pavement Construction Layers IT SBR 19.

Table 17. Materials used for the base layers are indicated.

Layer name	Unbound mineral mixtures and soils according to TRA SBR 19
AŠAS lower part	0/5, 0/8, 0/11, 0/16, 0/22, 0/32, 0/45, 0/56 and 0/63 unbound mixtures, and soils of the group ŽG, ŽP, ŽB, SG, SP and SB, by standard LST 1331 or equivalent.
AŠAS higher part 0,45 m thickness	0/16, 0/22, 0/32, 0/45, 0/56 and 0/63 unbound mixtures, and soils of the groups ŽG and ŽP, by standard LST 1331 or equivalent.
Crushed stone base layer	0/45 loose mix;

Note. The sizes of the crushed stone fractions used are selected according to the granulometric composition of the mixture.

11.2.4. Work performance

Earthworks, drainage and water draining works shall be carried out in accordance with all safety requirements. For earthworks in special areas, such as protected waters or cultural heritage protection areas, the provisions of the relevant technical regulations specified in the project shall be complied with.

11.2.5. Tests

In accordance with the IT ŽS 17, Chapter V, Section 4.

11.2.6. Acceptance of works

In accordance with the IT ŽS 17, Chapter V, Section 5.

11.2.7. Defect management

In accordance with the IT ŽS 17, Chapter V, Section 6.

11.2.8. Warranty periods

In accordance with the IT ŽS 17, Chapter V, Section 7.

11.2.9. Payment for work carried out

In accordance with the IT ŽS 17, Chapter V, Section 8.

11.3. Soils, rocks and other construction materials

11.3.1. Soils, rocks, building materials and lightweight building materials

In accordance with Chapter VII, Sections 1, 2 and 4 of the IT ŽS.

11.4. Excavations and embankments

11.4.1. Excavation and loading

11.4.1.1. General provisions

The soil and rock is separated, loaded, transported and stored at the installation site or intermediate site in the following manner discharged at the installation site and at the intermediate storage site in such a way as not to impair their structural properties. If soils, rocks or other materials of different suitability are encountered during excavation and if their use is to be different, they shall be separated and further used separately.

If the contractor encounters weak-unstable soil in the area under the structure, the contractor shall remove the weak soil by replacing it with good soil. Soils containing more than 10% organic impurities or cohesive (dust/clay) soils shall not be used for foundations and base backfills. Such soils shall be removed and replaced by gravelly sand.

11.4.1.2. Transportation

Methods of transporting soil, the sequence of technological processes, and the selection of machinery by the contractors in accordance with their own competence, as defined by their applicable building regulations. The construction rules applied by the contractors shall not contradict the prescriptions of Regulation IT ŽS 17.

In the case of hydraulic placement, the excavation, transport and spreading of the soil are part of the same work process.

For the preparation of the excavation, the means of transport shall be selected by the contractors in accordance with the recommended transport routes specified in the technical design. The excavated soil shall be used for environmental clean-up after the construction works, and the remaining unused soil shall be transported by the contractor for disposal/clean-up, or disposed of at sea together with unstable soil.

11.4.2. Installation and compaction

In accordance with the IT ŽS 17, Chapter VIII, Section 2.

Excavations shall be backfilled and embankments shall be poured in horizontal layers of up to 30 cm thick with a slope of no more than 2 %, compacted. The soils and foundations shall be compacted as specified in the design. If the design does not specify a compaction ratio, the subgrade shall be considered to be compacted to $E_{v2} \geq 45$ MPa. The compacted soil shall be compacted to $q_c \geq 8$ MPa throughout the depth of the layer. The contractor shall check the specified degree of compaction during compaction. If it is found to be insufficient, the compaction shall be repeated. In the event of failure to compact to the specified value ($E_{v2} \geq 45$ MPa), the foundations may be accepted when the compaction of the subgrade soil is $D_{pr} \geq 100\%$. This must be agreed with the Project Manager.

11.4.3. The top of the soil bank

In accordance with the IT ŽS 17, Chapter VIII, Section 3.

11.4.4. Deformation modulus

If the construction contract includes both earthworks and pavement construction, the requirements of Chapter VIII, Section 4, Chapter 17 of the IR IR shall be fulfilled immediately prior to the installation of the pavement structure layers.

11.4.5. Carrying out work during the cold season

In accordance with the IT ŽS 17, Chapter VIII, Section 7.

11.5. Soil works

General guidance is provided in Chapter IX, section 17 of the IT ŽS.
Specific solutions are specified in the project documents.

12. FOUNDATIONS OF LIGHTING SUPPORTS

Typical prefabricated reinforced concrete foundations for lighting supports are used. Base for support with vertical adjustment screws made of stainless steel and with protective rubber. The height is selected to ensure load resistance for the chosen height of the luminaire support. Resistance to wind load: at least 36 m/s (standard EN40-3).

If it is not possible to install a typical foundation that ensures resistance to the specified loads, install a non-standard foundation with increased dimensions.

13. NAVIGATION MARK

Poles are painted in accordance with international shipping regulations.

The steel structures of the navigation sign of the southern dam are painted green (RAL 6037). The steel structures of the navigation sign of the northern dam are painted red (RAL 3028). Intermediate strips with white (RAL 9016) paint. Colors must be coordinated with the Builder.

Ensure the corrosion resistance of the elements in accordance with the section "Protection against corrosion".

13.1.1. Navigation light

A light-emitting element - a navigation lamp - is installed above the navigation sign. A lantern with single flashing lights. Flashing light - 0.5 s light, 1.5 s dark. The light on the south dam is green. The light on the north dam is red.

A battery is installed to ensure a temporary power supply in case of loss of the main power source. The size of the battery capacity must ensure constant, uninterrupted operation of the lamp during the entire dark period of the day.

Lamps and all their parts must be resistant to atmospheric effects, moisture, adapted for use in a marine environment.

The requirements for the lights are revised during the preparation of the Builder's work project.

14. OCCUPATIONAL SAFETY

When carrying out work, the Contractor must follow A1 - 394 "Rules for the use of lifting cranes" and other valid work safety documents.

15. CONSTRUCTION WASTE



Most of the Curonian Lagoon's bottom and shoreline is composed of sand of varying grain size.

No production will take place on the project site and therefore no industrial waste will be generated. Environmentally friendly materials such as sand, gravel, crushed stone, stones, metal, geotextiles and recycled inert (RC) materials will be used during construction.

The management of the waste generated shall be carried out in accordance with the requirements laid down in the Construction Waste Management Regulations approved by Order No D1-637 of the Minister of the Environment of the Republic of Lithuania of 29 December 2006.

On the construction site, recyclable waste and reusable structures/materials shall be sorted, and other wastes shall be sorted, such as secondary raw materials and hazardous waste. Non-hazardous construction waste may be stored on the site for a maximum period of one year from the date of its generation, but no longer than until the end of the construction works. When storing contaminated waste, the site shall be arranged in such a way as to prevent contaminated waste from entering the soil and groundwater. Waste must be disposed of in such a way that it does not endanger the health of site workers. Construction waste shall be transported, with the approval of the client, to undertakings authorised to recycle or store construction waste or to a landfill.

Construction debris will be stored in sealed containers or neat piles (provided that the debris does not pollute the environment with harmful substances) on the fenced construction site until its removal or use. It is up to the holder of the construction waste to decide how and to which waste management site the construction waste will be transported and to be responsible for the orderly loading and delivery of the construction waste. The builder shall provide the Commission for the Recognition of Fitness for Use with documentation on the delivery of waste not suitable for recycling or use for disposal after completion of the construction. The soil excavated during construction shall be used on site, provided that it is of good quality and meets the requirements of the design. If sandy soil is generated after the completion of the construction works, it shall be transported to the soil storage site provided for in the project. In the case of soil-soil-plant soil, it shall be spread and leveled in the shore area.

0	2024-03	For construction permit, competition		
REVISION	DATE	RELEASE STATUS. REASON FOR THE CHANGE (IF APPLICABLE)		
Designer	No. of the qualification document.	Duties	Name, surname	Signature
UAB „Kelprojektas“	39928	BPM	Rimantas Valančius	
				



Row No.	Name technical characteristics	Marking	Unit	Quantity	Notes
	1. PREPARATORY WORKS	-	-	-	
1.1.	Removal of vegetation, trees, plant layer in the quay construction area on the shore and disposal	2; 3; 11	m ²	6400	
1.2.	Removal of unstable soil in quay pavements in the installation area, transporting the soil to an offshore dredging site up to 33 km away and dredging at sea	4.5	m ³	87200	
1.3.	Excavation/pumping and underwater trenching, including removal of boulders and inspection of underwater works, including use of excavated soil in the construction of North Dam Part I	4.5	m ³	20300	
	2. DAM INSTALLATION WORKS	-	-	-	
2.1.	Installation of Geotextile Layer on the Bottom Underwater	4.4	m ²	61500	
2.2.	Formation and installation of Dam Core (Zone No. 1) from the bottom to an altitude of -0.87 m (-1.00 m)	4	m ³	91700	
2.3.	Formation and installation of Dam Core (Zone No. 2) from -0.87 m (-1.00 m) to +0.63 m (+0.50 m) altitude	4	m ³	31900	
2.4.	Installation of a filter geotextile layer to protect the upper part of the dam core (Zone No. 3) from leaching of the dam core (Zone No. 2)	4.4	m ²	8900	
2.5.	Installation of a filter geotextile layer on the dam core	4.4	m ²	51200	
2.6.	Formation and installation of the dike core (Zone No. 3) above the dike core zone no. 2 to the bottom of the pavement structure including compaction in layers	4	m ³	13000	
2.7.	Installation of Stone Pitching Filtration Layer (Zone No. 1) from the bottom to -0.87 m (-1.00 m) altitude	4	m ³	10500	
2.8.	Installation of Stone Pitching Filtration Layer (Zone No. 2) from -0.87 m (-1.00 m) to the top	4	m ³	6900	
2.9.	Annual installation of stones of the protective layer (zone No. 1) from the bottom to an altitude of -0.87 m (-1.00 m)	4	m ³	19000	
2.10.	Annual installation of protective layer (Zone No. 2) stones from -0.87 m (-1.00 m) to the top	4	m ³	16800	

Row No.	Name technical characteristics	Marking	Unit	Quantity	Notes
	3. CULVERT INSTALLATION WORKS	-	-	-	-
3.1.	Installation of a metal corrugated pipe culvert including pipe joint clamps	5	pcs.	12	
3.2.	Backfilling of the culvert with self-compacting crushed rock	5	m ³	8480	
3.3.	Installation of a geotextile layer around the perimeter	4.4	m ²	9000	
	4. REINFORCED CONCRETE PROTECTION AGAINST ICE-SHEET INSTALLATION WORKS	-	-	-	
4.1.	Compaction of the installed base to $E_{v2} \geq 45$ MPa	11.4	m ²	6300	
4.2.	Installation of a crushed stone base course, hvid = 30 cm and compaction to $E_{v2} \geq 100$ MPa	11	m ²	5900	
4.3.	Installation of the leveling concrete layer, hvid=5 cm	6.1	m ²	4970	
4.4.	Installation of reinforced concrete structure, including concrete and reinforcement and installation of expansion joints	6	-	-	
4.4.1	Concrete C35/45	6.1	m ³	5200	
4.4.2	Armature $f_{yk} = 500$ MPa	6.2	t	420	
	5. FIXING PONTOON GANGWAYS FOUNDATION INSTALLATION WORKS	-	-	-	
5.1.	Compaction of the installed base to $E_{v2} \geq 45$ MPa	11.4	m ²	100	
5.1.1	Installation of a crushed stone base course, hvid = 30 cm and compaction to $E_{v2} \geq 100$ MPa	11	m ²	100	
5.1.2	Concrete levelling layer, hvid = 5 cm, Installation	6.1	m ²	55	
5.2.	Installation of reinforced concrete structure, including concrete and reinforcement	6	-	-	
5.2.1	Concrete C35/45	6.1	m ³	54	
5.2.2	Armature $f_{yk} = 500$ MPa	6.2	t	5	
	6. INSTALLATION OF THE PROCESS DUCT WORK	-	-	-	
6.1.	Installation of a process channel along the dyke from the beginning to the navigation mark in plastic pipes 2 pcs, d110 including compaction	9	m	1300	2600 m of pipe
6.2.	Installation of a communications cable duct including cast iron manhole and additional fittings, compaction of the substrate, installation of a crushed rock base and concrete levelling layer	9	compl.	14	

Row No.	Name technical characteristics	Marking	Unit	Quantity	Notes
	7. PAVEMENT INSTALLATION WORKS	-	-	-	
7.1.	Compaction of the installed base to $E_{v2} \geq 45$ MPa	11.4	m ²	10340	
7.2.	Installation of a crushed stone base course, $h_{vid} = 40$ cm and compaction to $E_{v2} \geq 120$ MPa	11	m ²	10340	
7.3.	Installation of fibre-reinforced concrete pavement, $h_{vid} = 20$ cm, including concrete, polypropylene fibres, concrete release liner, installation of expansion joints, surface roughening	6	m ²	9230	
	8. FINISHING WORKS	-	-	-	
8.1.	Installation of a lighting support foundation including installation of the base, fixing screws	3; 6; 12	compl.	71	
8.2.	Installation of a reinforced concrete foundation for a navigation sign, including concrete and reinforcement, compaction of the base, installation of a crushed stone base and a levelling layer of concrete	3; 6	compl.	1	
8.3.	Installation of a navigation sign including fabrication, painting, navigation light and installation	6; 7; 12	compl.	1	
8.4.	Installation of stainless steel handrails including fabrication and installation	7; 10	m	1250	
8.5.	Backfilling of the dam's connection to the shore using excavated soil and restoring the former surface level including planning	2; 11	m ³	1800	

Notes.

- Altitudes are in the Lithuanian altitude system LAS07 (in brackets in the Baltic altitude system BAS77). The elevation of the mean perennial water level is +0.13 m in LAS07 (0.00 m in BAS77).
- The specified quantities for dismantling and dam construction are approximate and may differ from actual quantities, as these quantities depend directly on the required removal thickness of the existing sediment layer.
- During the technical design phase, cost quantity sheets are prepared on the basis of the aggregated cost indicators. During the stage of preparation of the detailed design, these indicators are adjusted (*in accordance with STR 1.04.04:2017 "Building Design, Project Expertise", approved by Order of the Minister of the Environment of the Republic of Lithuania No DI-738 of 7 November 2016 "On the Approval of the Building Technical Regulation STR 1.04.04:2017 "Building Design, Project Expertise"*).

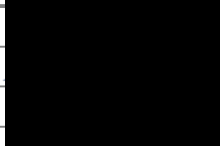

0	2023-11	BUILDING PERMIT, COMPETITION			
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)			
Designer	No. of the qualification document.	Duties	Name, surname	Signature	
UAB „Kelprojektas“	39928	BPM	Rimantas Valančius		
					

Row No.	Title and technical characteristics	Mark	Unit	Quantity	Notes
	1. PREPARATORY WORKS	-	-	-	
1.1.	Removal of vegetation, trees, and the vegetative layer in the dam construction zone on the shore and disposal	2; 3; 11	m ²	2500	
1.2.	Removal of unstable soil in the dam construction area, including removal of boulders and inspection of underwater works, transport of soil to a disposal site up to 33 km offshore and disposal at sea	4.5	m ³	76200	
1.3.	Excavation/excavation and underwater trenching, including removal of boulders and inspection of underwater works, including the use of excavated soil in the construction of the northern part I of the dam	4.5	m ³	30330	
	2. DAM INSTALLATION WORKS	-	-	-	-
2.1.	Technological separation of the geotextile layer installation on the sub-bottom under water	4.4	m ²	18600	
2.2.	Formation and installation of the core of the dam (Zone 1) from the bottom to an elevation of -0.87 m (-1.00 m)	4	m ³	24740	
2.3.	Formation and installation of a dam core (zone 2) from an elevation of -0.87 m (-1.00 m) to +0.63 m (+0.50 m)	4	m ³	6380	
2.4.	Installation of a geotextile filter layer at the top of the dam core (Zone 2) to protect the upper part of the dam core (Zone 3) against scour	4.4	m ²	2480	
2.5.	Installation of a geotextile filter layer on the dam core	4.4	m ²	12060	
2.6.	Formation and installation of a dam core (zone 3) above dam core zone 2 up to the bottom of the pavement structure including compaction in layers	4	m ³	7120	
2.7.	Installation of a stone bed from the bottom to an elevation of - 0.87 m (-1.00 m) in the filtration layer (Zone 1)	4	m ³	3300	
2.8.	Installation of a stone annual from -0.87 m (-1.00 m) to the top of the filtration layer (Zone 2)	4	m ³	1180	
2.9.	Installation of a protective layer (Zone 1) of stone from the bottom to an elevation of - 0.87 m (-1.00 m)	4	m ³	5620	
2.10.	Installation of a stone annual of the protective layer (zone 2) from -0.87 m (-1.00 m) to the top	4	m ³	2920	

Row No.	Title and technical characteristics	Mark	Unit	Quantity	Notes
2.11.	Installation of a crash wall from steel girder supplied by the Developer at the root of the northern embankment, for the connection to the embankment face wall to be installed in the next phase, including transportation of the girder from the girder storage area, cutting of the girder, welding of the girder, welding of the girder, and the provision of additional sheet-steel inserts	7; 8	m	17,5	
	3. PAVEMENT INSTALLATION WORKS	-	-	-	-
3.1.	Compaction of the installed base to $Ev2 \geq 45$ MPa	11.4	m ²	4540	
3.2.	Installation of a crushed stone base course, hvid = 60 cm and compaction to $Ev2 \geq 150$ MPa	11	m ²	4540	
	4. FINISHING WORKS	-	-	-	-
4.1.	Installation of a reinforced concrete foundation for a navigation sign including concrete and reinforcement, and installation of footings	3; 6	compl.	1	
4.2.	Installation of a navigation sign including fabrication, painting, navigation light and installation	6; 7; 12	compl.	1	
4.3.	Installation of security gates to restrict access on the northern dam, including painting and foundations with footings	3; 6; 7	compl.	1	
4.4.	Filling of the dam shore connection to restore the former surface level including planning	2; 10	m ³	1800	
4.5.	Transportation of the stones provided by the Developer up to a distance of 1 km from the Developer's onshore storage site and installation of the core of the northern dam at the bottom of the slope on the harbour side of the basin	-	m ³	250	

Notes.

- Altitudes are in the Lithuanian altitude system LAS07 (in brackets in the Baltic altitude system BAS77). The elevation of the mean perennial water level is +0.13 m in LAS07 (0.00 m in BAS77).
- The dismantling and damming quantities quoted are indicative and may differ from the actual quantities, as these
The actual quantities directly depend on the thickness of the existing sludge layer to be removed.
- During the technical design phase, cost quantity sheets are prepared on the basis of the aggregated cost indicators. During the stage of preparation of the detailed design, these indicators are adjusted (in accordance with STR 1.04.04:2017 "Building Design, Project Expertise", approved by Order of the Minister of the Environment of the Republic of Lithuania No D1-738 of 7 November 2016 "On the Approval of the Building Technical Regulation STR 1.04.04:2017 "Building Design, Project Expertise").

0	2024-03	BUILDING PERMIT, COMPETITION		
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)		
Designer	No. of the qualification document.	Duties	Name, surname	Signature
UAB „Kelprojektas“	39928	BPM	Rimantas Valančius	
				

1

2

3

4

EXPLOITATION

A

A

NO.	NAME OF STRUCTURE	PURPOSE OF STRUCTURE	CATEGORY OF STRUCTURE	CONSTRUCTION TYPE	CONSTRUCTION STAGE
01	SOUTHERN DAM	COMMUNICATIONS - WATER PORT STRUCTURES (8.5) (DAMS)	NON EXCEPTIONAL	CONSTRUCTION OF A NEW STRUCTURE	FIRST
02	NORTHERN DAM	COMMUNICATIONS - WATER PORT STRUCTURES (8.5) (DAMS)	NON EXCEPTIONAL	CONSTRUCTION OF A NEW STRUCTURE	FIRST FOURTH
03	WHARF	COMMUNICATIONS - WATER PORT STRUCTURES (8.5) (PIERS)	NON EXCEPTIONAL	CONSTRUCTION OF A NEW STRUCTURE	SECOND
04	QUAY	COMMUNICATIONS - WATER PORT BUILDINGS (8.5) (WHARES)	NON EXCEPTIONAL	CONSTRUCTION OF A NEW STRUCTURE	THIRD

B

B

C

C

D

D


E

E

F

F



0	2024-03	BUILDING PERMIT, COMPETITION		
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)		
QUAL. DOC. NO.			NAME OF PROJECT	
			Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project	
39928	BPM	R.Valančius	DESIGN NUMBER AND TITLE	
[REDACTED]			All buildings - No. XX	
[REDACTED]			DOCUMENT TITLE	
[REDACTED]			Situation diagram	
[REDACTED]			REVISION	0
EN	BUILDER AND/OR CLIENT		DOCUMENT MARK	
	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		8858-XX-TP-SK-04.01-B-01	
			SHEET	SHEETS
			1	1

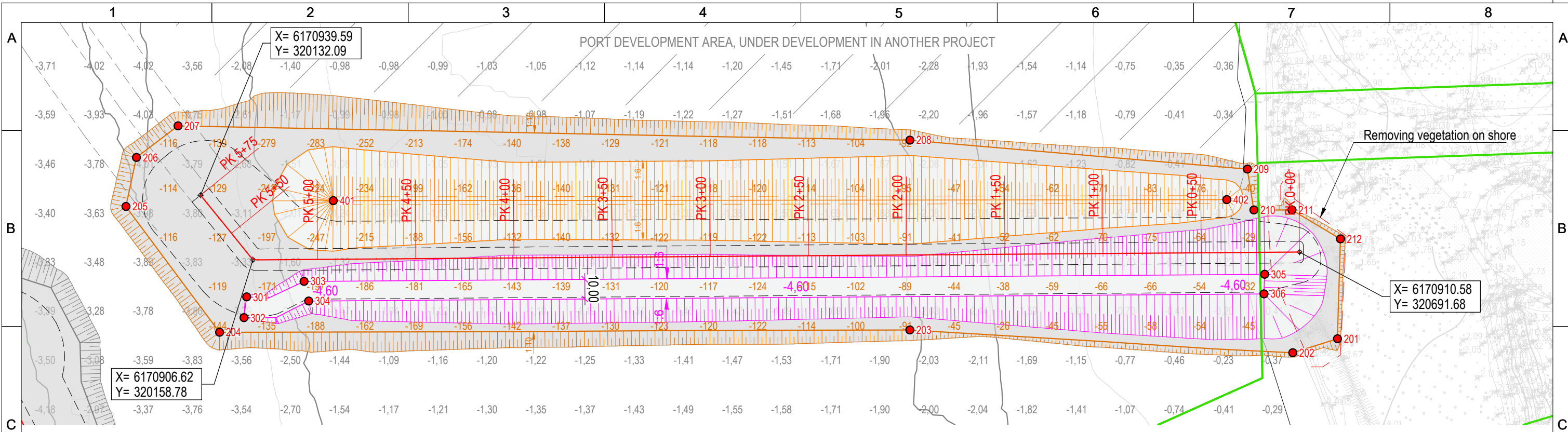


Table of coordinates for the limits of silt removal

Point No.	Silt bottom alt.	X	Y
201	0.59	6170873.87	320706.91
202	-0.98	6170859.34	320688.24
203	-2.87	6170870.89	320493.31
204	-5.22	6170869.72	320141.72
205	-5.13	6170933.76	320094.06
206	-5.22	6170958.77	320099.44
207	-5.06	6170974.84	320120.62
208	-2.95	6170967.59	320493.31
209	-0.83	6170952.86	320665.11
210	-0.39	6170931.98	320668.48
211	0.85	6170932.05	320687.84
212	0.48	6170919.00	320709.64

Trench boundary coordinate table

Point No.	X	Y
301	6170887.72	320155.56
302	6170877.15	320154.19
303	6170895.65	320184.80
304	6170885.67	320187.12
305	6170899.29	320673.95
306	6170889.29	320673.64

Levee axis coordinate table

Point No.	X	Y
401	6170936.72	320199.65
402	6170937.30	320654.65

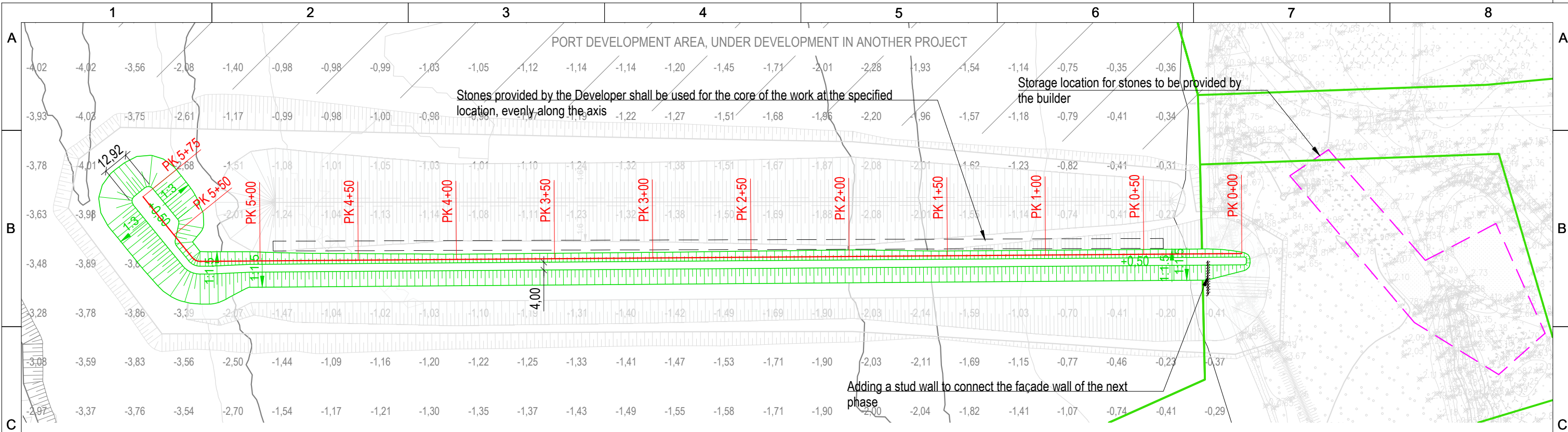
LEGEND:

- Unstable soil disposal area
- Slopes are formed during the removal of unstable soils
- Trench area
- Slopes to be formed for trenches
- Sand dredged during the construction of the northern part I of the dam is used in the construction of the dam
- Outline of the top and bottom of the structure of Part I of the northern dam
- Outline of the top and bottom of the structure of Part II of the northern dam
- Centreline of Part I of the northern dam
- Bathymetric depth, metres
- Indicative thickness of unstable soil layer, in centimetres
- Plot boundaries

Notes:

1. Dimensions in metres, altitudes in metres in the Baltic Altitude System (BAS77).
2. Coordinates are in the Lithuanian coordinate system (LKS-94). Coordinates to be adjusted during the preparation of the work project.

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT
			Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME
			Northern Dam - No. 02
			DOCUMENT NAME
			Unstable Soil Removal and Trenching Plan for the Northern Dam (Part I) scale 1:2000
			REVISION
			0
			DOCUMENT MARK
			8858-02-TP-SK-04.01.B-02
			SHEET
			1
			SHEETS
			1

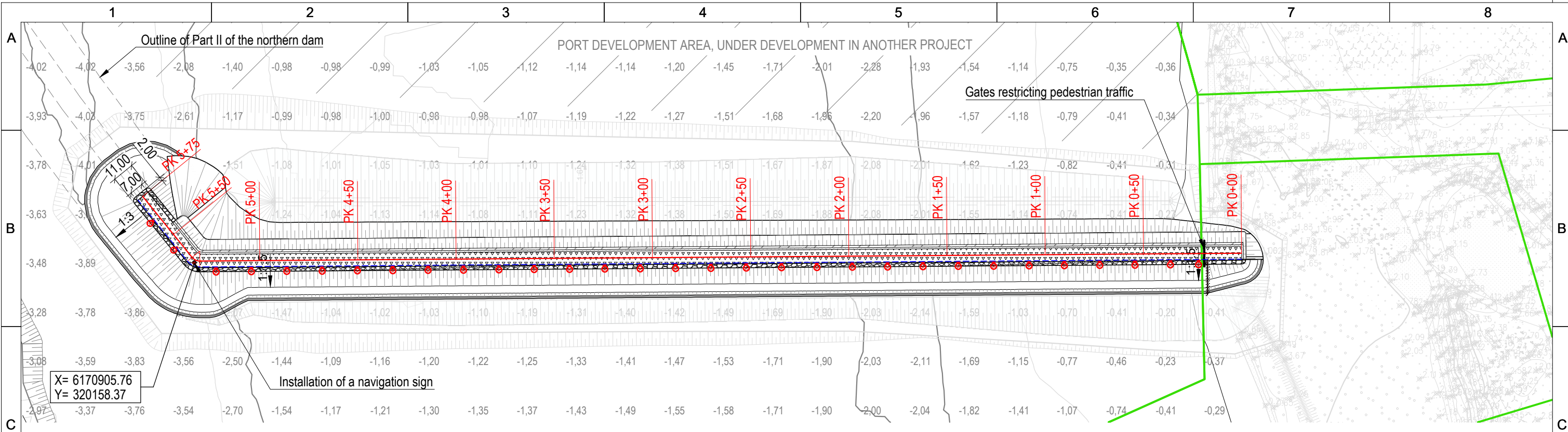


LEGEND:

- Core of the northern dam (Part I) (Zones 1 and 2)
- Formed slopes
- Dam's centreline
- Bathymetric depth, metres
- Plot boundaries

- Notes:**
1. Dimensions in metres, altitudes in metres in the Baltic Altitude System (BAS77).
 2. Coordinates are in the Lithuanian coordinate system (LKS-94). Coordinates to be adjusted during the preparation of the work project.

0	2024-03	BUILDING PERMIT, COMPETITION		
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)		
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project	
39928	BPM	R. Valančius	BUILDING NUMBER AND NAME Northern Dam - No. 02	
[REDACTED]	[REDACTED]		DOCUMENT NAME	REVISION
			Installation plan for the core of the Northern dam (Part I) (Zone 2; 3), scale 1:2000	0
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		DOCUMENT MARK	SHEET SHEETS
			8858-02-TP-SK-04.01.B-03	1 1



LEGEND:

- Construction of the northern dam (Part I)
- Coating of the dam with mineral soil
- Formed slopes
- Outline of the top and bottom of the structure of Part II of the northern dam
- Damba centreline
- Bathymetric depth, metres
- Plot boundaries
- Locations of luminaire supports (supports and foundations to be installed in accordance with Part II of the northern dam)
- Installation of protective conduit(s) for the electricity cable (see Part -E of the project)

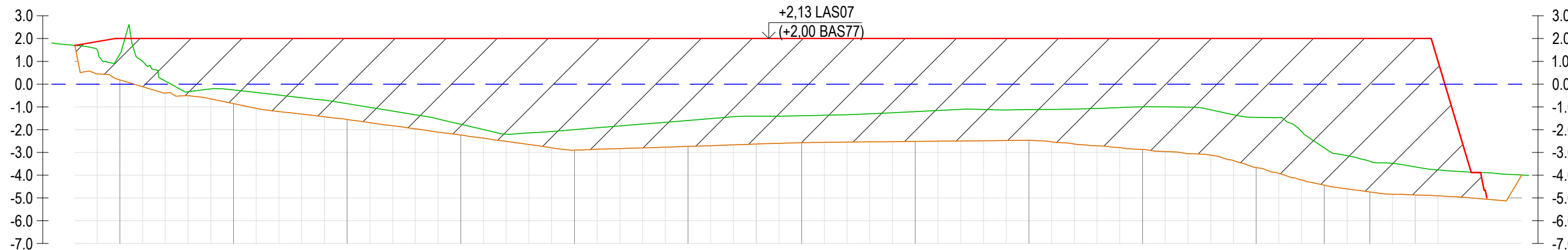
Notes:

1. Dimensions in metres, altitudes in metres in the Baltic Altitude System (BAS77).
2. Coordinates are in the Lithuanian coordinate system (LKS-94). Coordinates to be adjusted during the preparation of the work project.

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT
			Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R. Valančius	BUILDING NUMBER AND NAME
			Northern Dam - No. 02
			DOCUMENT NAME
			Installation plan of the northern dam (Part I)
			scale 1:2000
			REVISION
			0
EN	BUILDER AND/OR CLIENT		DOCUMENT MARK
	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		8858-02-TP-SK-04.01.B-04
			SHEET
			1
			SHEETS
			1

LONGITUDINAL PROFILE OF THE NORTHERN DAM (PART I)


Mh 1:2000
Mv 1:200

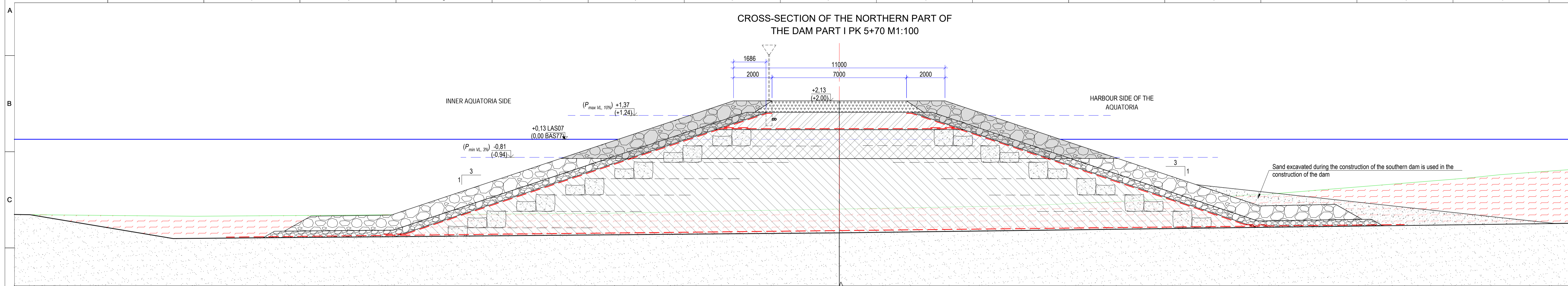


THE ELEVATION OF THE EXISTING SEABED	DESIGN BOTTOM ELEVATIONS	LABELS OF WORK, m	PICKETS
1.81			-0+30
1.33	0.19	-1.14	0+00
-0.26	-0.86	-0.60	0+50
-0.86	-1.55	-0.69	1+00
-1.76	-2.24	-0.47	1+50
-2.00	-2.90	-0.90	2+00
-1.60	-2.73	-1.13	2+50
-1.39	-2.57	-1.18	3+00
-1.21	-2.52	-1.31	3+50
-1.12	-2.46	-1.34	4+00
-0.99	-2.87	-1.88	4+50
-1.46	-3.66	-2.20	5+00
-2.84	-4.45	-1.61	5+50
-3.39	-4.73	-1.34	5+50
-3.72	-4.88	-1.16	5+75
-3.88	-5.04	-1.16	6+00
-4.01			6+20

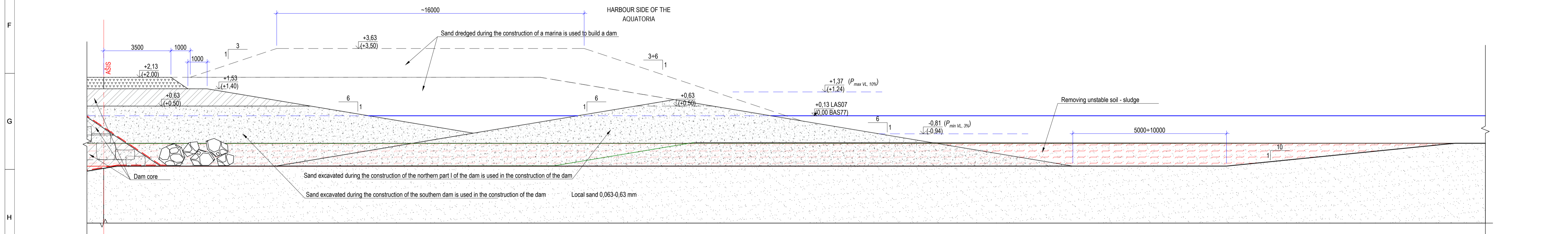
Notes:

1. Dimensions in metres, altitudes in metres in the Baltic Altitude System (BAS77).

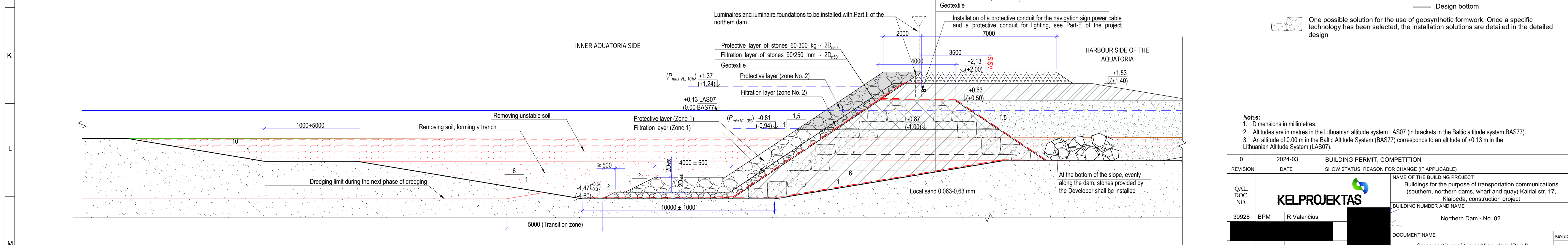
0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT
			Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME
			Northern Dam - No. 02
			DOCUMENT NAME
			Longitudinal profile of the northern dam (Part I)
			REVISION
			0
EN	BUILDER AND/OR CLIENT		DOCUMENT MARK
	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		8858-02-TP-SK-04.01.B-05
			SHEET
			1
			SHEETS
			1



CROSS-SECTION OF THE NORTHERN PART OF THE DAM PART I PK 2+80 SCALE 1:100



CROSS-SECTION OF THE NORTHERN PART OF THE DAM PART I PK 2+80 SCALE 1:100



LEGEND:

	Removing unstable soil		Protective layer (Zone 1)
	Removing sandy soil		Filtration layer (Zone 1)
	Existing sandy soil		Protective layer (Zone 2)
	The core of the dam (zone No. 3)		Filtration layer (Zone 2)
	The core of the dam (zone No. 2)		Average water level
	The core of the dam (zone No. 1)		Geotextile
	Mineral soil coating		Existing bottom
	One possible solution for the use of geosynthetic formwork. Once a specific technology has been selected, the installation solutions are detailed in the detailed design		Design bottom

Notes:
 1. Dimensions in millimetres.
 2. Altitudes are in metres in the Lithuanian altitude system LAS07 (in brackets in the Baltic altitude system BAS77).
 3. An altitude of 0.00 m in the Baltic Altitude System (BAS77) corresponds to an altitude of +0.13 m in the Lithuanian Altitude System (LAS07).

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS, REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.	KELPROJEKTAS		NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kaivali str. 17, Klaipėda, construction project
39928	BPM	R. Valančius	BUILDING NUMBER AND NAME Northern Dam - No. 02
			DOCUMENT NAME Cross-sections of the northern dam (Part I)
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Jarošio st. 24, LT-92251 Klaipėda	DOCUMENT MARK 8858-02-TP-SK-04.01-B-06	REVISION 0 SHEET 1 SHEETS 1

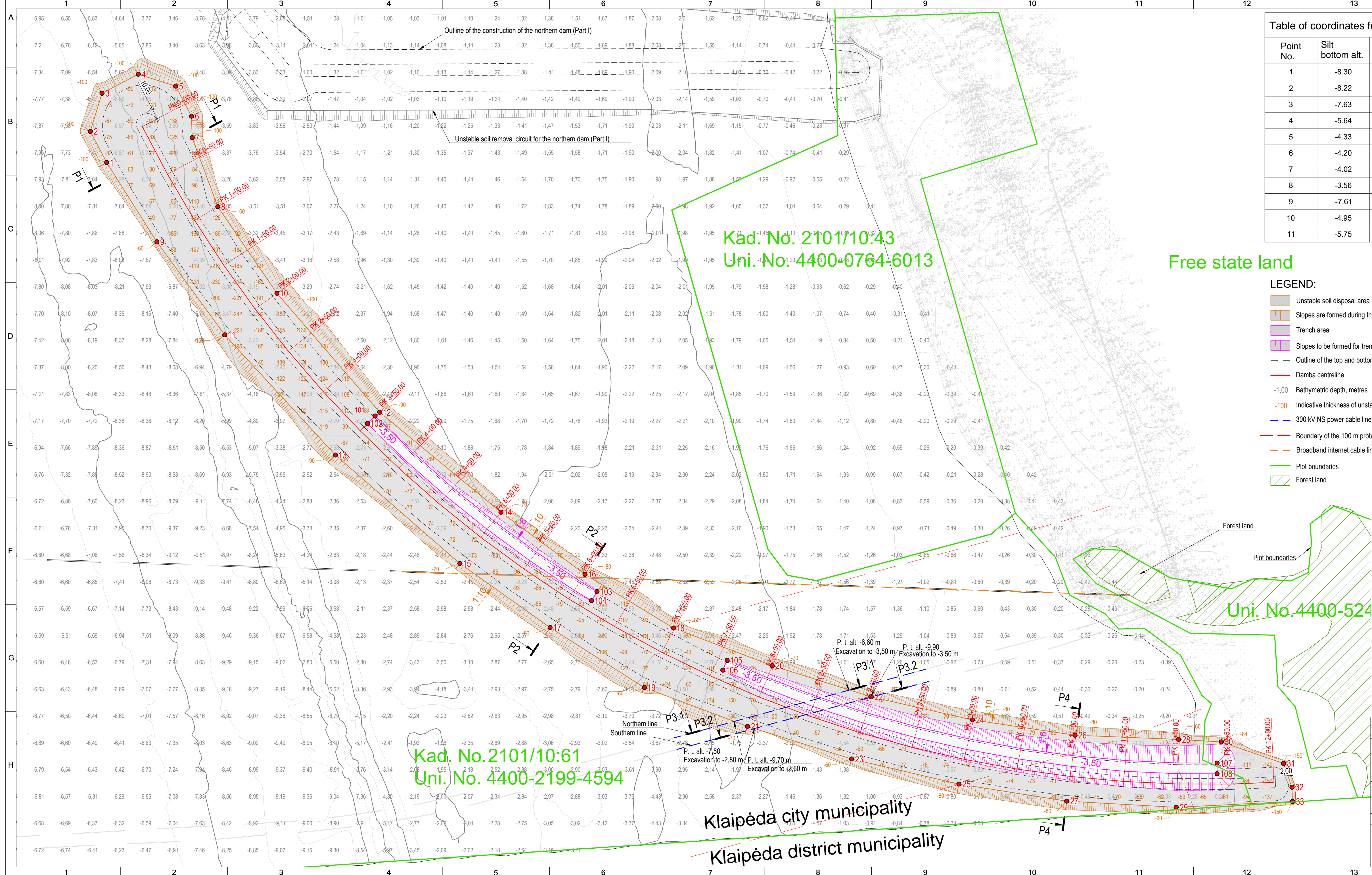


Table of coordinates for the limits of silt removal

Point No.	Silt bottom alt.	X	Y
1	-8.30	6170821.31	319991.71
2	-8.22	6170850.30	319976.39
3	-7.63	6170885.76	319987.35
4	-5.64	6170903.58	320021.08
5	-4.33	6170892.48	320055.90
6	-4.20	6170864.39	320070.74
7	-4.02	6170844.45	320071.28
8	-3.56	6170780.08	320095.19
9	-7.61	6170747.31	320038.47
10	-4.95	6170699.39	320150.31
11	-5.75	6170660.61	320101.67

Table of coordinates for the limits of silt removal

Point No.	Silt bottom alt.	X	Y
12	-3.49	6170588.48	320246.05
13	-3.56	6170548.65	320204.86
14	-2.63	6170495.39	320359.02
15	-3.10	6170447.67	320320.75
16	-3.17	6170437.55	320437.34
17	-3.37	6170387.91	320404.81
18	-4.25	6170387.41	320519.73
19	-5.07	6170331.98	320492.63
20	-2.90	6170352.40	320611.70
21	-2.46	6170295.84	320588.79
22	-2.07	6170323.32	320704.01

Table of coordinates for the limits of silt removal

Point No.	Silt bottom alt.	X	Y
23	-2.06	6170265.46	320685.73
24	-1.59	6170301.85	320798.34
25	-1.68	6170242.03	320785.66
26	-1.31	6170287.64	320893.83
27	-1.32	6170226.13	320886.09
28	-0.83	6170283.60	320990.39
29	-0.91	6170220.41	320988.14
30	-0.53	6170281.35	321030.21
31	-1.04	6170261.30	321088.13
32	-1.04	6170239.07	321095.98
33	-1.04	6170225.76	321096.52

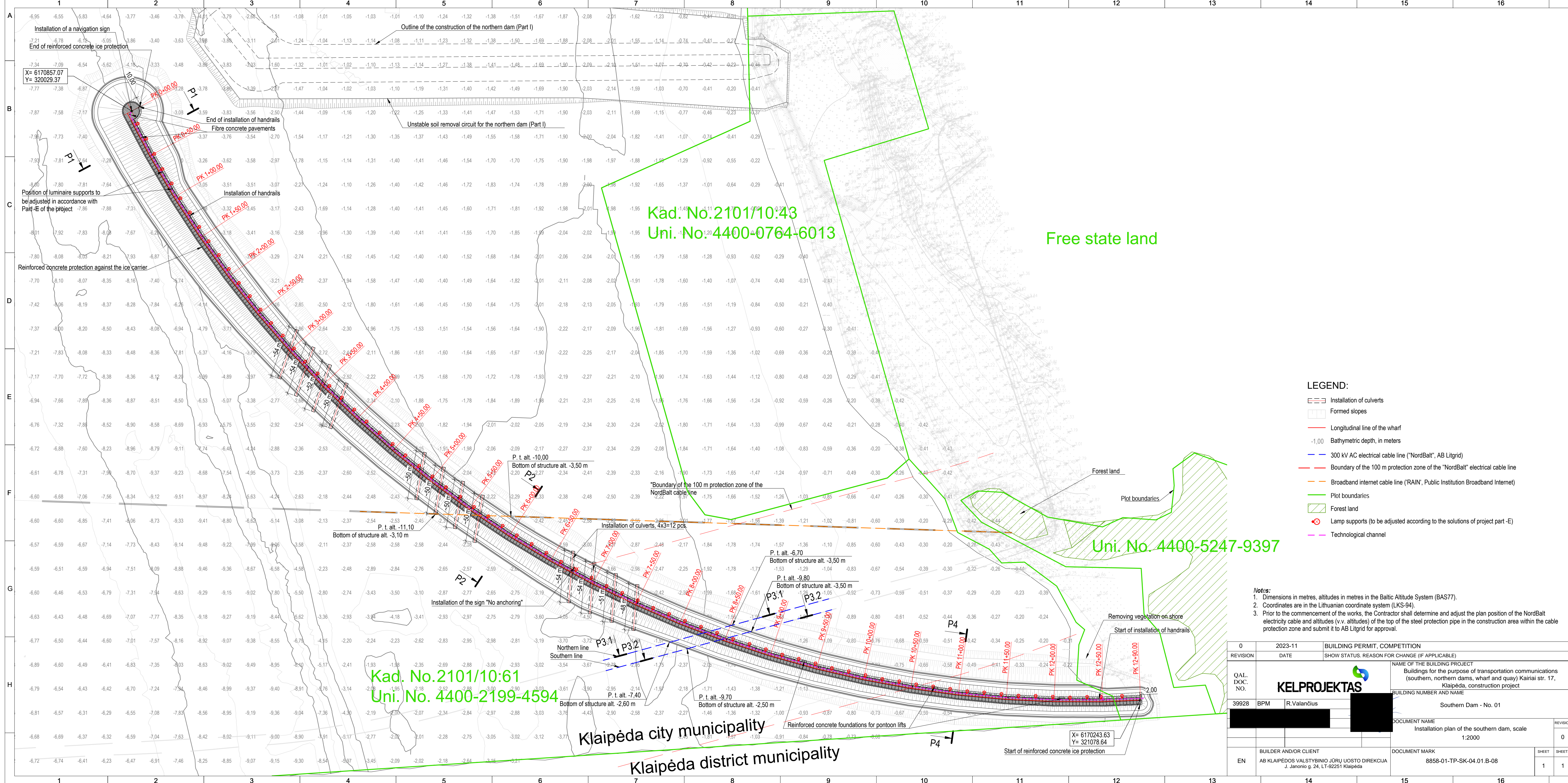
- LEGEND:
- Unstable soil disposal area
 - Slopes are formed during the removal of unstable soils
 - Trench area
 - Slopes to be formed for trenches
 - Outline of the top and bottom of the dam structure
 - Damba centreline
 - Bathymetric depth, metres
 - 100 Indicative thickness of unstable soil layer, in centimetres
 - 300 kV NS power cable line (NordBalt, AB Litgrid)
 - Boundary of the 100 m protection zone of the "NordBalt" electrical cable line
 - Broadband internet cable line ("RAIN", Public Enterprise Broadband internet)
 - Plot boundaries
 - Forest land

Trench boundary coordinate table

Point No.	X	Y
101	6170585.06	320241.72
102	6170578.03	320234.60
103	6170421.49	320448.50
104	6170412.93	320443.33
105	6170357.39	320569.69
106	6170348.21	320565.72
107	6170261.61	321026.22
108	6170251.60	321026.21

- Notes:
- Dimensions in metres, altitudes in metres in the Baltic Altitude System (BAS77).
 - Coordinates are in the Lithuanian coordinate system (LKS-94).
 - Prior to the commencement of the works, the Contractor shall determine and adjust the plan position of the NordBalt electricity cable and altitudes (v.v. altitudes) of the top of the steel protection pipe in the construction area within the cable protection zone and submit it to AB Litgrid for approval.

0	2024-03	BUILDING PERMIT, COMPETITION
REVISION	DATE	SHOW STATUS, REASON FOR CHANGE (IF APPLICABLE)
QAL. DOC. NO.	KELPROJEKTAS	
39928	BPM	R. Valančius
NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project		
BUILDING NUMBER AND NAME Southern Dam - No. 01		
DOCUMENT NAME Unstable Soil Removal and Trenching Plan for the Northern Dam (Part I) scale 1:2000		
DOCUMENT MARK 8858-01-TP-SK-04.01.B-07		
BUILDER AND/OR CLIENT EN	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda	REVISION 0
SHEET		SHEETS
1		1



LEGEND:

- Installation of culverts
- Formed slopes
- Longitudinal line of the wharf
- 1,00 Bathymetric depth, in meters
- 300 kV AC electrical cable line ("NordBalt", AB Litgrid)
- Boundary of the 100 m protection zone of the "NordBalt" electrical cable line
- Broadband internet cable line ("RAIN", Public Institution Broadband Internet)
- Plot boundaries
- Forest land
- Lamp supports (to be adjusted according to the solutions of project part -E)
- Technological channel

- Notes:**
- Dimensions in metres, altitudes in metres in the Baltic Altitude System (BAS77).
 - Coordinates are in the Lithuanian coordinate system (LKS-94).
 - Prior to the commencement of the works, the Contractor shall determine and adjust the plan position of the NordBalt electricity cable and altitudes (v.v. altitudes) of the top of the steel protection pipe in the construction area within the cable protection zone and submit it to AB Litgrid for approval.

0	2023-11	BUILDING PERMIT, COMPETITION
REVISION	DATE	SHOW STATUS, REASON FOR CHANGE (IF APPLICABLE)
QAL. DOC. NO.		
39928	BPM	R.Valančius
NAME OF THE BUILDING PROJECT		Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kaivaliai str. 17, Klaipėda, construction project
BUILDING NUMBER AND NAME		Southern Dam - No. 01
DOCUMENT NAME		Installation plan of the southern dam, scale 1:2000
EN	BUILDER AND/OR CLIENT	AB KLAIPĖDOS VALSTYBINIO JŪRŲ UOSTO DIREKCIJA J. Janonio g. 24, LT-92251 Klaipėda
EN	DOCUMENT MARK	8858-01-TP-SK-04.01.B-08
	SHEET	1
	SHEETS	1

Klaipėda city municipality
Klaipėda district municipality

Uni. No. 4400-5247-9397

Kad. No.2101/10:43
Uni. No.4400-0764-6013

Kad. No.2101/10:61
Uni. No.4400-2199-4594

Forest land

Plot boundaries

"Boundary of the 100 m protection zone of the NordBalt cable line"

P. t. alt. -10,00
Bottom of structure alt. -3,50 m

P. t. alt. -11,10
Bottom of structure alt. -3,10 m

P. t. alt. -6,70
Bottom of structure alt. -3,50 m

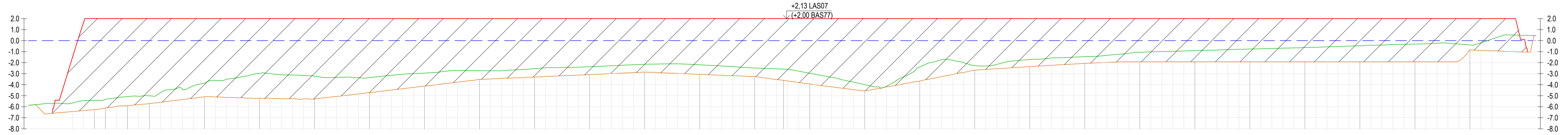
P. t. alt. -9,80
Bottom of structure alt. -3,50 m

P. t. alt. -7,40
Bottom of structure alt. -2,60 m

P. t. alt. -9,70
Bottom of structure alt. -2,50 m

X= 6170243.63
Y= 321078.64

LONGITUDINAL PROFILE OF THE SOUTHERN DAM



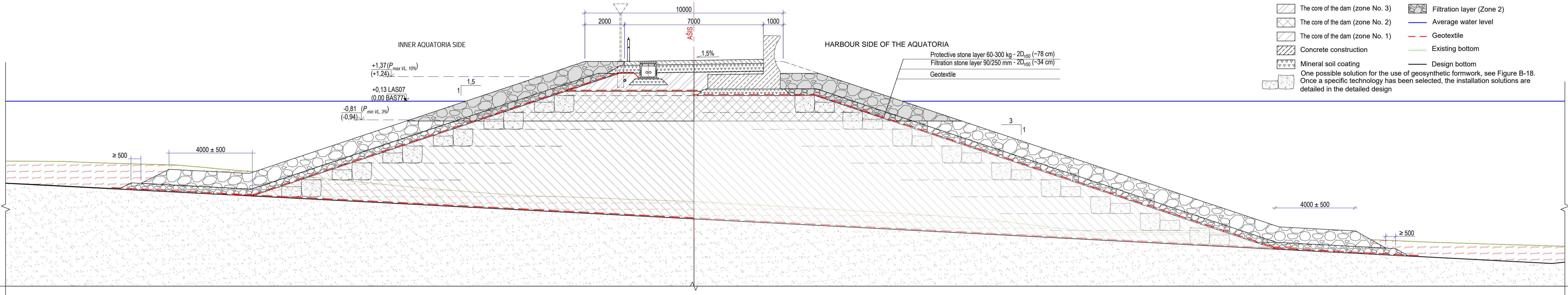
Mh 1:2000
Mv 1:200

EXISTING HEIGHTS	-5.78	-5.43	-5.01	-3.85	-3.00	-3.22	-3.36	-2.95	-2.73	-2.54	-2.37	-2.14	-2.20	-2.49	-2.96	-3.99	-2.39	-2.27	-1.72	-1.45	-1.06	-0.91	-0.77	-0.63	-0.47	-0.32	-0.39	0.48		
DESIGN BOTTOM ELEVATIONS	-6.16	-6.26	-5.71	-5.10	-5.23	-5.30	-4.72	-4.13	-3.51	-3.31	-3.08	-2.86	-3.06	-3.26	-3.93	-4.55	-3.67	-2.68	-2.36	-2.06	-1.92	-1.92	-1.92	-1.92	-1.92	-1.60	-0.85	-1.04		
LABELS OF WORK, m	0.00	-0.38	-0.83	-0.71	-1.25	-2.23	-2.08	-1.37	-1.18	-0.79	-0.76	-0.72	-0.71	-0.86	-0.77	-0.96	-0.56	-1.28	-0.41	-0.65	-0.61	-0.86	-1.01	-1.15	-1.29	-1.45	-1.60	-0.45	-1.51	0.00
PICKETS	0+50	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	4+50	5+00	5+50	6+00	6+50	7+00	7+50	8+00	8+50	9+00	9+50	10+00	10+50	11+00	11+50	12+00	12+50	13+00		

Notes:
1. Dimensions in metres, altitudes in metres in the Baltic Altitude System (BAS77).

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS, REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.	 KELPROJEKTAS		NAME OF THE BUILDING PROJECT
			Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME
			Southern Dam - No. 01
			DOCUMENT NAME
			Longitudinal profile of the southern dam
			REVISION
			0
EN	BUILDER AND/OR CLIENT		DOCUMENT MARK
	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		8858-01-TP-SK-04.01.B-09
			SHEET
			1
			SHEETS
			1

CROSS-SECTION P1-P1 SCALE 1:100 OF THE SOUTHERN DAM

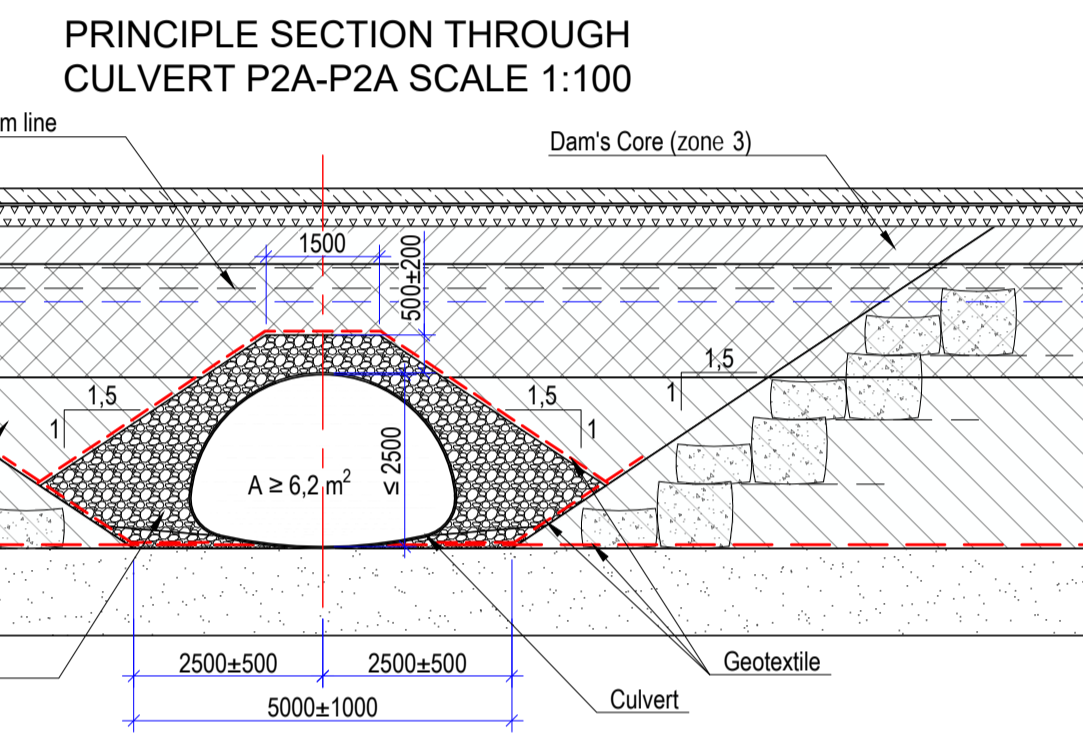
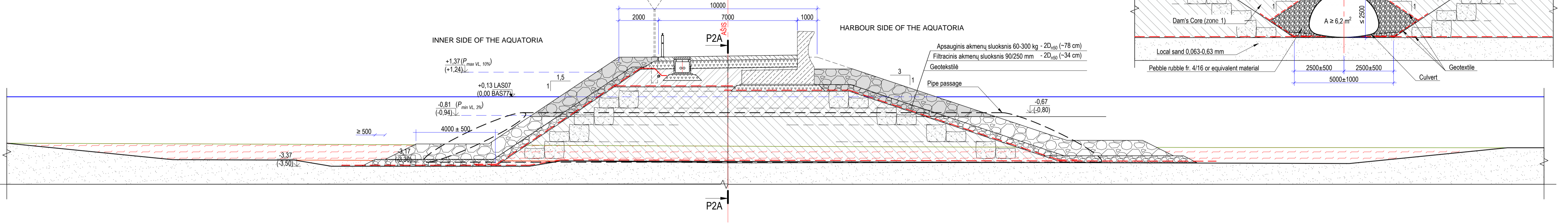


LEGEND:

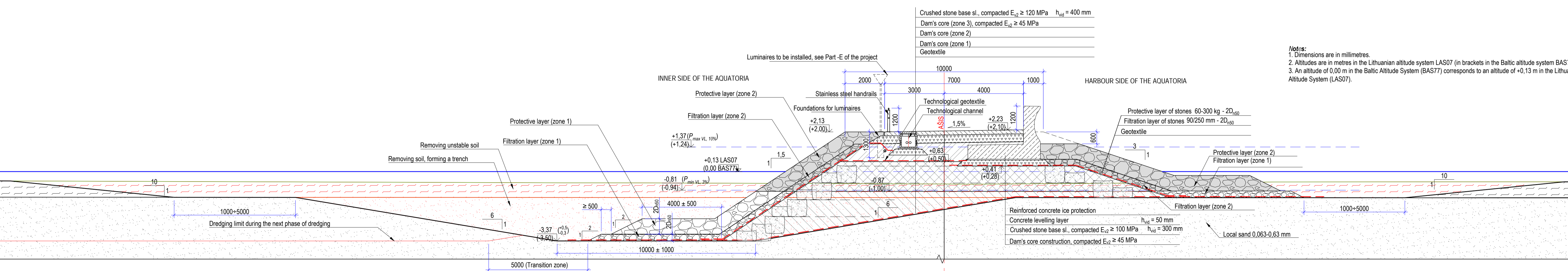
	Removing unstable soil		Protective layer (Zone 1)
	Removing sandy soil		Filtration layer (Zone 1)
	Existing sandy soil		Protective layer (Zone 2)
	The core of the dam (zone No. 3)		Filtration layer (Zone 2)
	The core of the dam (zone No. 2)		Average water level
	The core of the dam (zone No. 1)		Geotextile
	Concrete construction		Existing bottom
	Mineral soil coating		Design bottom

One possible solution for the use of geosynthetic formwork, see Figure B-18. Once a specific technology has been selected, the installation solutions are detailed in the detailed design

CROSS-SECTION P2-P2 SCALE 1:100 OF THE SOUTHERN DAM



CROSS-SECTION P4-P4 SCALE 1:100 OF THE SOUTHERN DAM

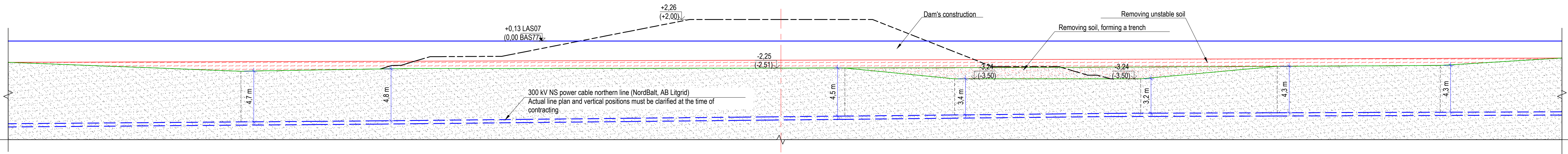


- Crushed stone base sl., compacted $E_{v2} \geq 120$ MPa $h_{v2} = 400$ mm
- Dam's core (zone 3), compacted $E_{v2} \geq 45$ MPa
- Dam's core (zone 2)
- Dam's core (zone 1)
- Geotextile

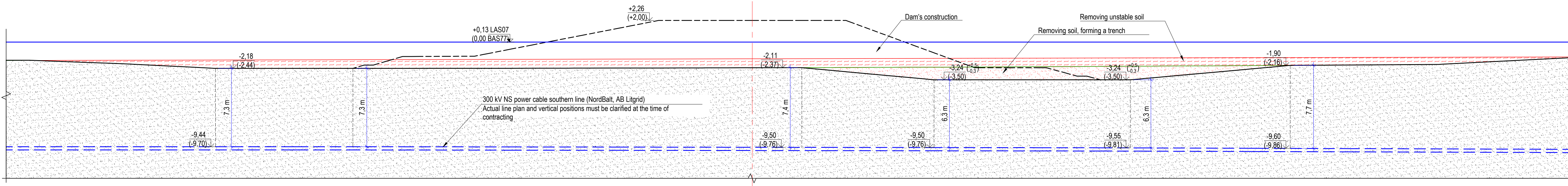
Notes:
 1. Dimensions are in millimetres.
 2. Altitudes are in metres in the Lithuanian altitude system LAS07 (in brackets in the Baltic altitude system BAS77).
 3. An altitude of 0.00 m in the Baltic Altitude System (BAS77) corresponds to an altitude of +0.13 m in the Lithuanian Altitude System (LAS07).

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS, REASON FOR CHANGE (IF APPLICABLE)	
QAL, DOKC. NO.	KELPROJEKTAS	NAME OF THE BUILDING PROJECT	Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R. Valančius	BUILDING NUMBER AND NAME
			Southern Dam - No. 01
			DOCUMENT NAME
			Cross-sections of the southern dam
EN	BUILDER AND/OR CLIENT	DOCUMENT MARK	REVISION
	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda	8858-01-TP-SK-04.01-B-10	0
			SHEET SHEETS
			1 2

CROSS-SECTION P3.1-P3.1 SCALE 1:200 OF THE SOUTHERN DAM



CROSS-SECTION P3.2-P3.2 SCALE 1:200 OF THE SOUTHERN DAM



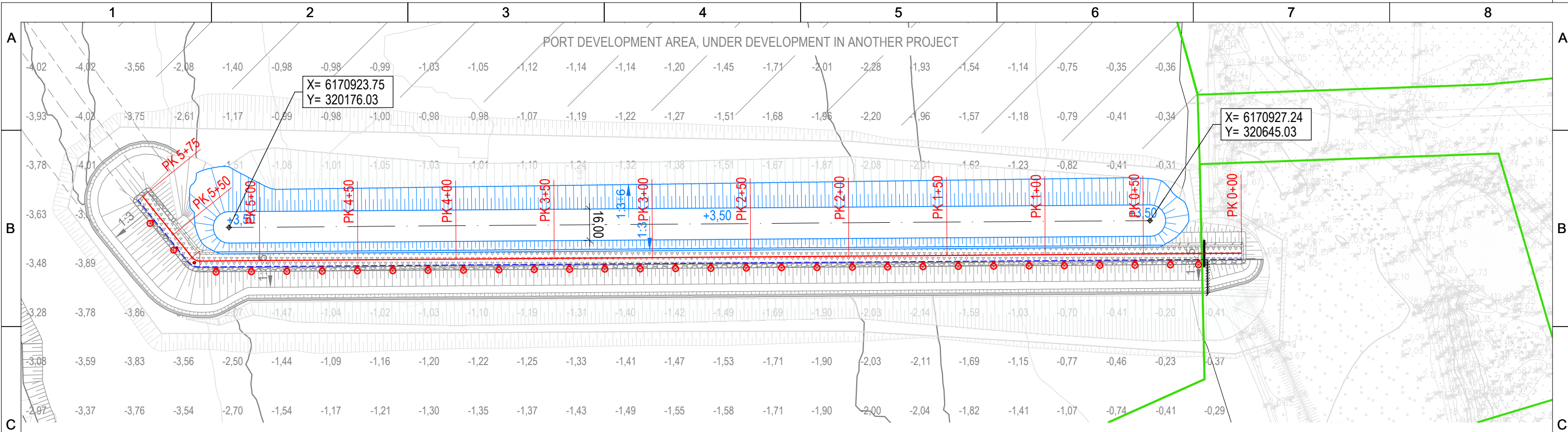
LEGEND:

- Removing unstable soil
- Removing sandy soil
- Existing sandy soil
- Existing bottom
- Design bottom








Notes:

1. Dimensions are in millimetres.
2. Altitudes are in metres in the Lithuanian altitude system LAS07 (in brackets in the Baltic altitude system BAS77).
3. An altitude of 0,00 m in the Baltic Altitude System (BAS77) corresponds to an altitude of +0,13 m in the Lithuanian Altitude System (LAS07).
4. Prior to the commencement of the works, the Contractor shall determine and clarify the plan position of the NordBalt power cable and the steel protective altitudes (v.v. altitudes) of the top of the steel conduit in the construction area within the cable protection zone and submit it to AB Litgrid for approval.

0	2024-03	BUILDING PERMIT, COMPETITION
REVISION	DATE	SHOW STATUS, REASON FOR CHANGE (IF APPLICABLE)
QAL. DOC. NO.		
39928	BPM	R.Valančius
NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project		BUILDING NUMBER AND NAME Southern Dam - No. 01
DOCUMENT NAME Cross-sections of the southern dam		REVISION 0
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda	DOCUMENT MARK 8858-01-TP-SK-04.01-B-10
		SHEET 2
		SHEETS 2




LEGEND:

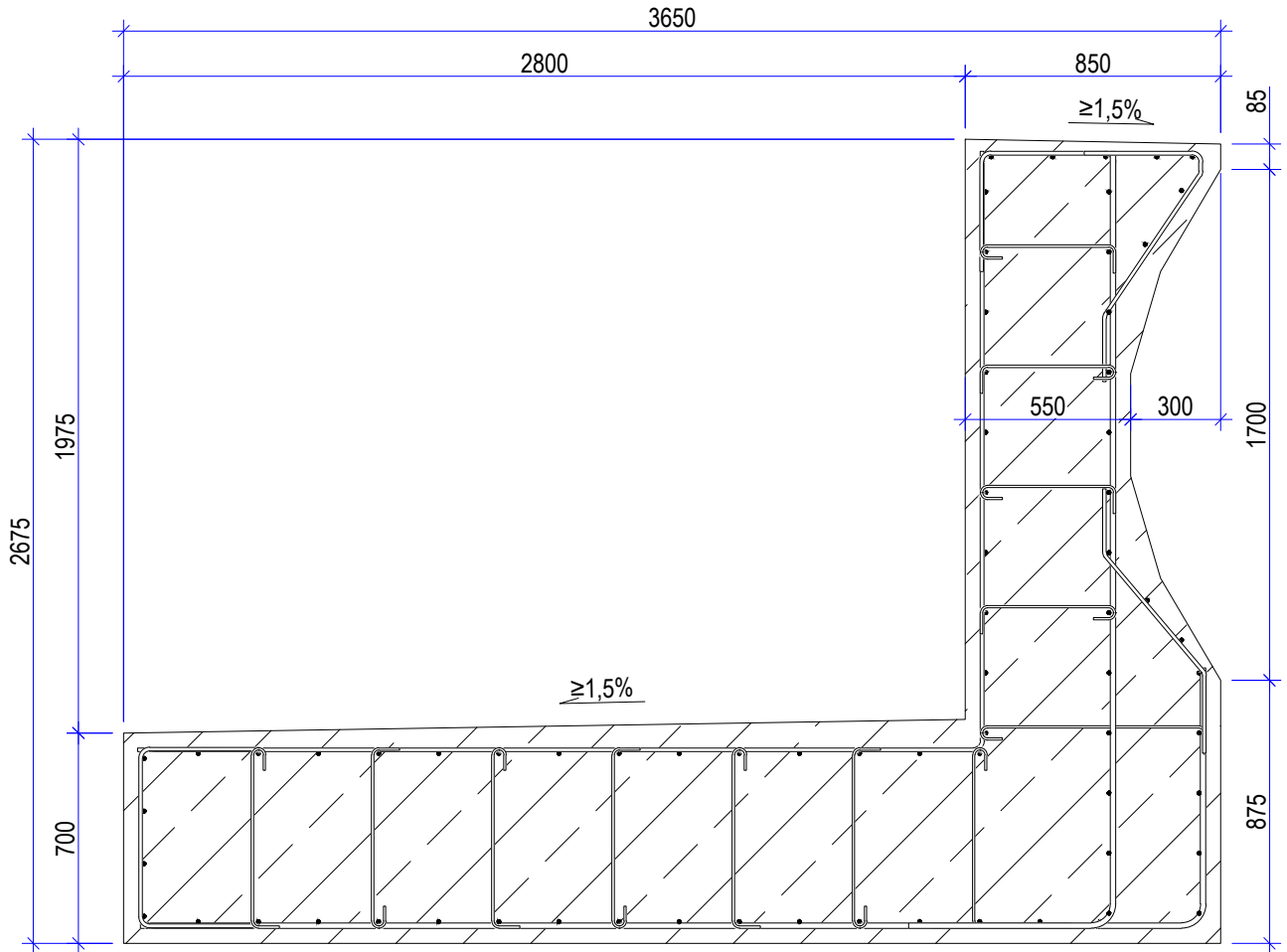
-  Sand used in the northern dam
-  Construction of the northern dam (Part I)
-  Formed slopes
-  Outline of the top and bottom of the structure of Part II of the northern dam
-  The centre line of the dam
-  -1,00 Bathymetric depth, metres
-  Plot boundaries

Notes:

1. Dimensions in metres, altitudes in metres in the Baltic Altitude System (BAS77).
2. Coordinates are in the Lithuanian coordinate system (LKS-94). Coordinates to be adjusted during the preparation of the work project.


0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT
			Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME
			All buildings - No. XX
			DOCUMENT NAME
			Diagram of the use of excavated soil from the construction of the marina in the northern barrage
			REVISION
			0
			DOCUMENT MARK
EN	BUILDER AND/OR CLIENT		8858-XX-TP-SK-04.01.B-11
	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		SHEET SHEETS
			1 1

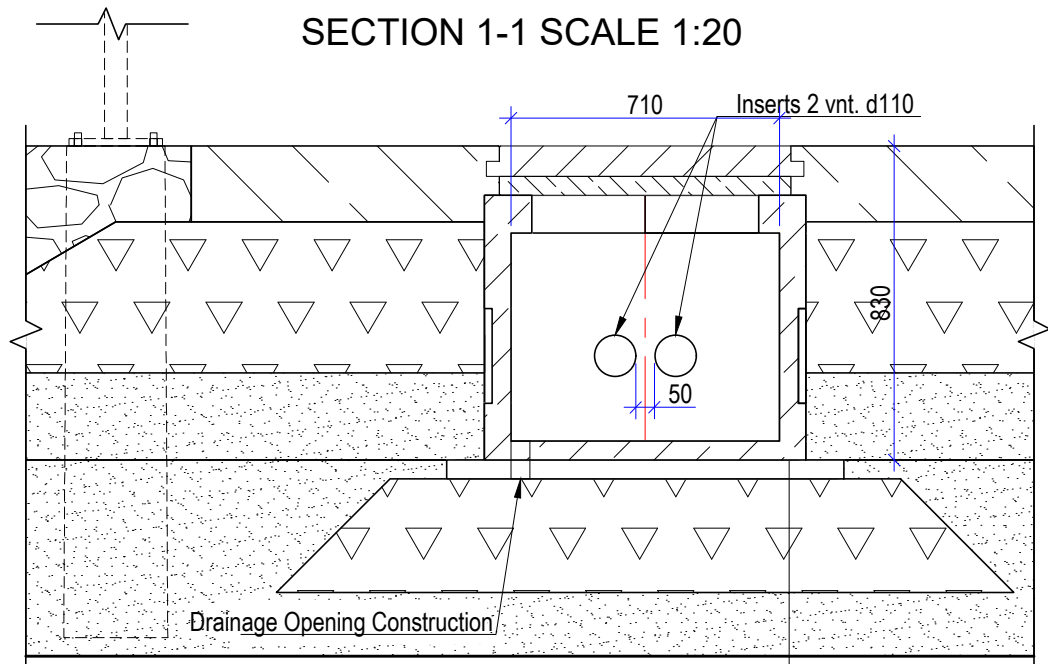
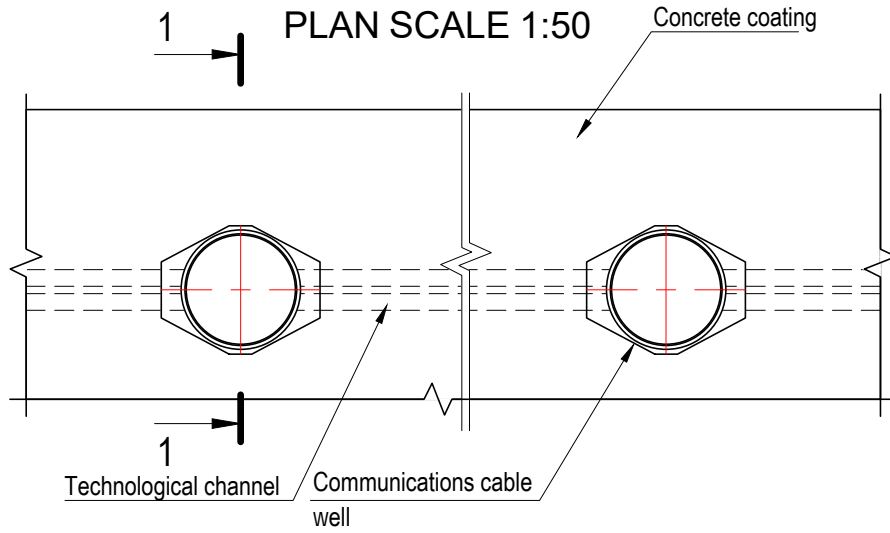
**REINFORCED CONCRETE ICE SHELTERS
PRINCIPLE DIAGRAM SCALE 1:25**



Notes:


1. Dimensions are in millimetres.
2. Dimensions and reinforcement to be adjusted during the preparation of the detailed design.
3. The structure shall be concreted on site using monolithic reinforced concrete or installed using precast elements. The solutions shall be detailed in the detailed design.

0	2024-03	BUILDING PERMIT, COMPETITION		
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)		
QAL. DOC. NO.				NAME OF THE BUILDING PROJECT
				Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME	
[REDACTED]			Southern Dam - No. 01	
DOCUMENT NAME				REVISION
Principal solutions for reinforced concrete ice protection				0
EN	BUILDER AND/OR CLIENT			DOCUMENT MARK
	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda			8858-01-TP-SK-04.01-B-12
				SHEET
				1
				SHEETS
				1



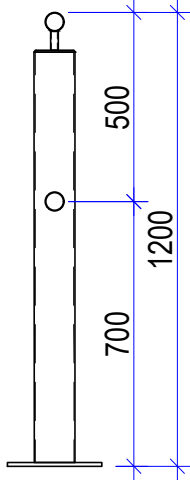
Communication cable well RKŠ1-3 (inserts, cast iron manhole)	
Concrete levelling layer	$h_{vid} = 50 \text{ mm}$
Aggregate base course, compacted $E_{v2} \geq 100 \text{ MPa}$	$h_{vid} = 300 \text{ mm}$
Dam core structure, compacted $E_{v2} \geq 45 \text{ MPa}$	

Notes:
 1. A drainage opening is being installed, dimensions specified in millimeters.

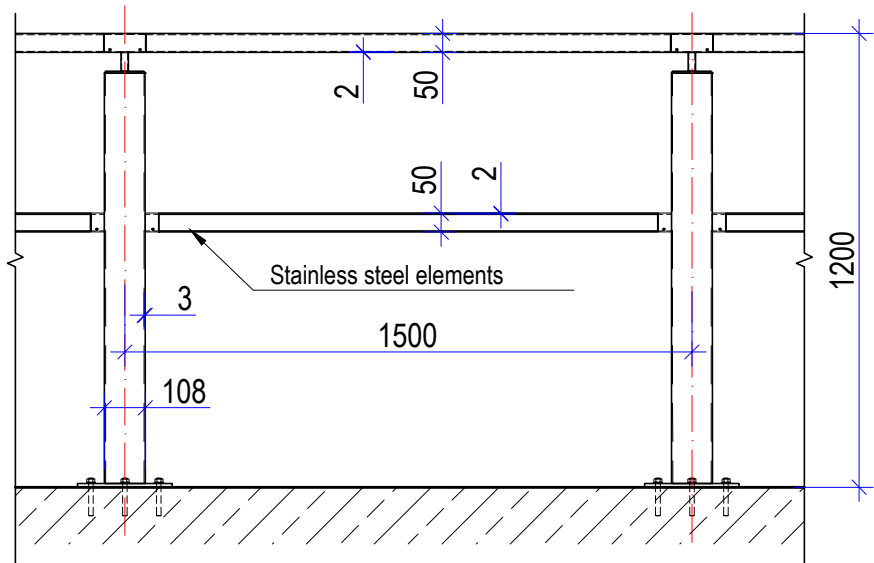
0	2024-03	BUILDING PERMIT, COMPETITION			
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)			
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT		
			Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project		
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME		
			Southern Dam - No. 01 Northern Dam - No. 02		
			DOCUMENT NAME	REVISION	
			Technological Channel Fundamental Solutions	0	
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		DOCUMENT MARK	SHEET	SHEETS
			8858-01,02-TP-SK-04.01-B-13	1	1

A4 (210 x 297 mm)

CROSS SECTION
SCALE 1:10




PRINCIPLE DIAGRAM OF HANDRAIL SCALE 1:10

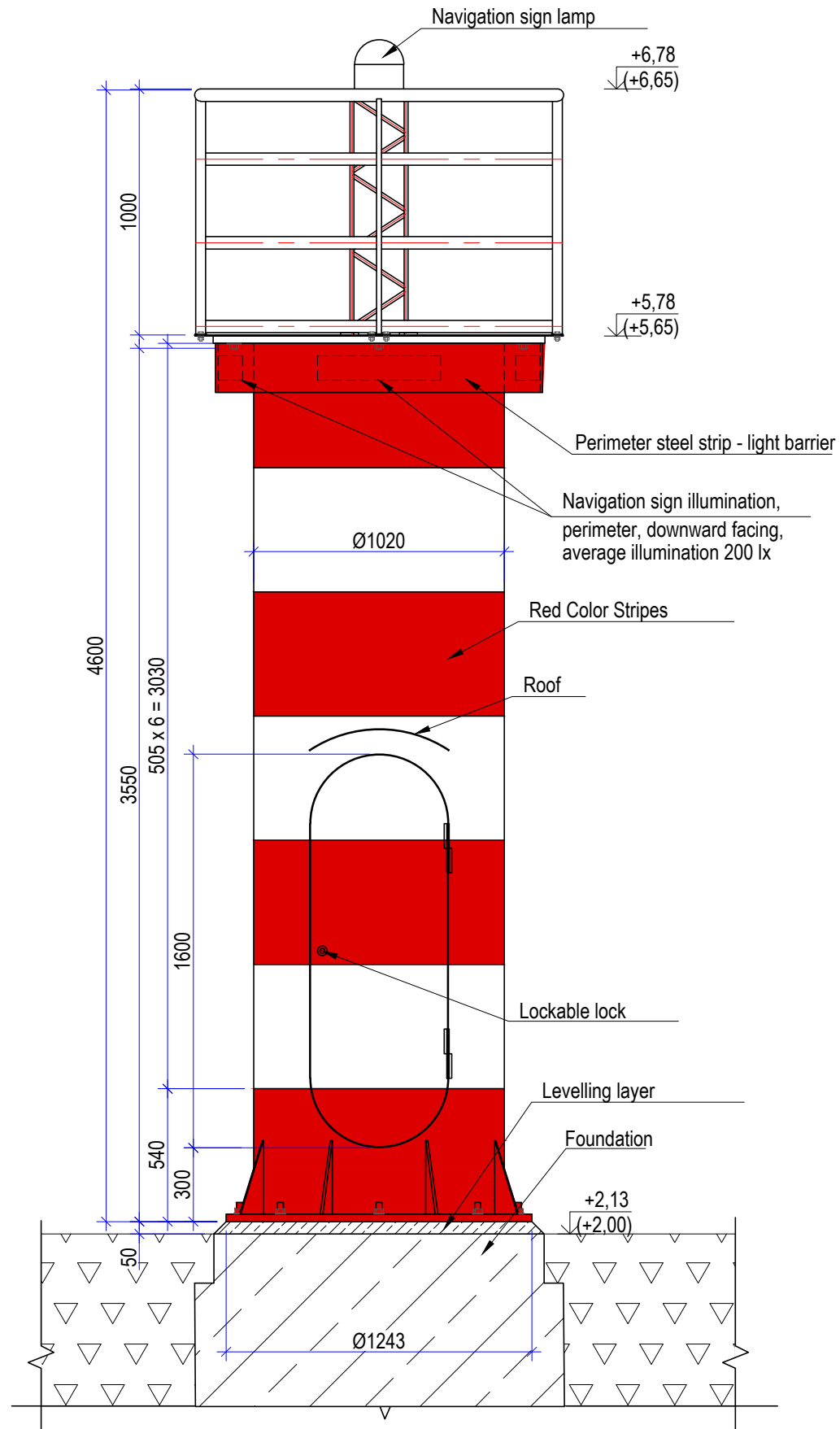


Notes:

1. Dimensions are in millimetres.
2. Dimensions to be adjusted during the preparation of the working draft.
3. Material requirements are given in the technical specifications.

0	2024-03	BUILDING PERMIT, COMPETITION		
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)		
QAL. DOC. NO.				NAME OF THE BUILDING PROJECT
				Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME	
[REDACTED]			Southern Dam - No. 01	
DOCUMENT NAME				REVISION
Principal solutions for handrails				0
EN	BUILDER AND/OR CLIENT			DOCUMENT MARK
	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda			8858-01-TP-SK-04.01-B-14
				SHEET
				1
				SHEETS
				1

NAVIGATION MARKER SCALE 1:25 NORTHERN DAM




NAVIGATION MARKER TABLE

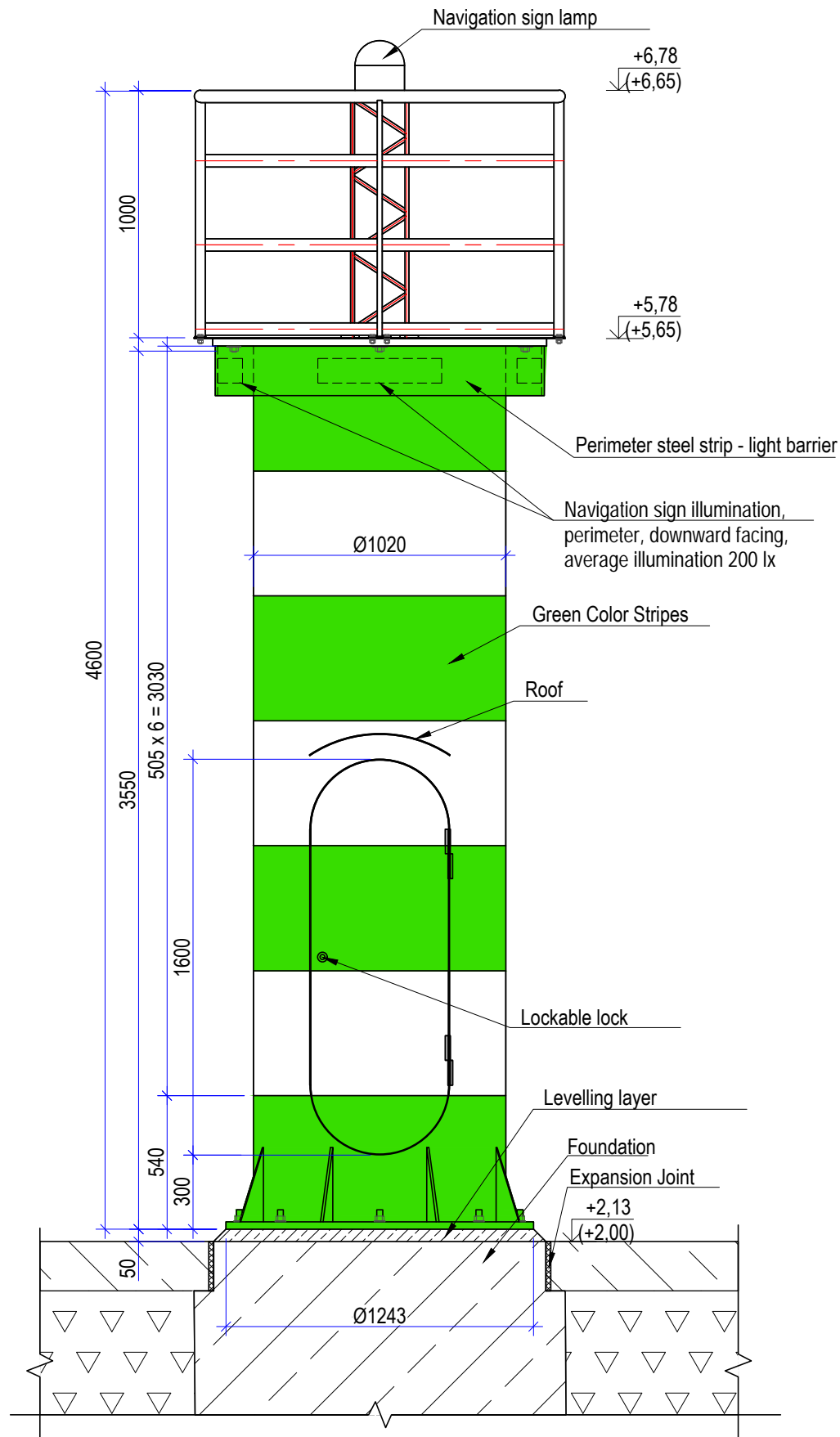
1	2	3	4	5	6	7	8
	The start of the northern dam of the south gate. The South Gate complex. The northern dam. Beginning.	55-38.58N 21-08.35E	BI R 2s	6,6	3	Metal column with white and red horizontal stripes and viewing platform. 4,6m.	0,5+(1,5)
	Breach of the northern dam of the south gate at the entrance. South Gate complex. The northern dam. Inlet.	55-38.38N 21-08.59E	BI R 2s	6,6	3	Metal column with white and red horizontal stripes and viewing platform. 4,6m.	0,5+(1,5)

Notes:

- Dimensions are in millimetres.
- Altitudes are in metres in the Lithuanian altitude system LAS07 (in brackets in the Baltic altitude system BAS77).
- For the grounding and lighting of the navigation sign, see Part -E of the project.

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME Northern Dam - No. 02
			DOCUMENT NAME Navigation marker for the northern dam
			REVISION 0
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		DOCUMENT MARK 8858-02-TP-SK-04.01.B-15
			SHEET 1
			SHEETS 1

NAVIGATION MARKER SCALE 1:25 SOUTHERN DAM




NAVIGATION SIGN BOARD

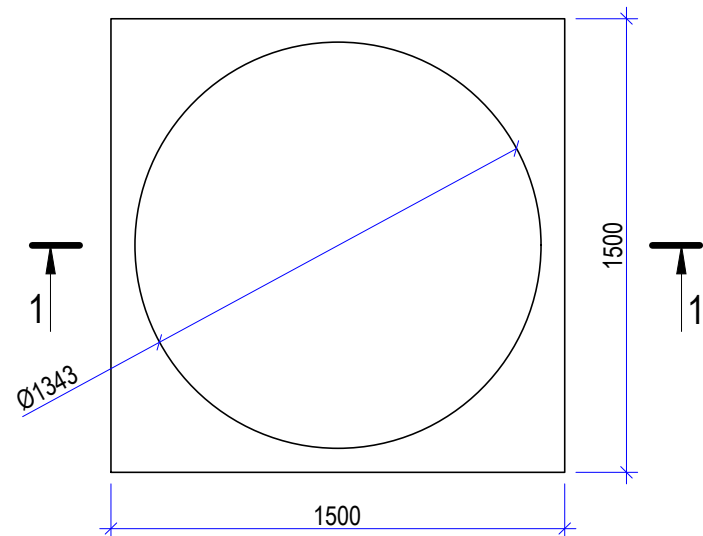
1	2	3	4	5	6	7	8
	The southern dam of the southern gate. The South Gate complex. The South Dam. Beginning. Entrance.	55-38.35N 21-08.47E	Bl Ž 2s	6,6	3	Metal column with white and green horizontal stripes and viewing platform. 4,6m.	0,5*(1,5)

Notes:

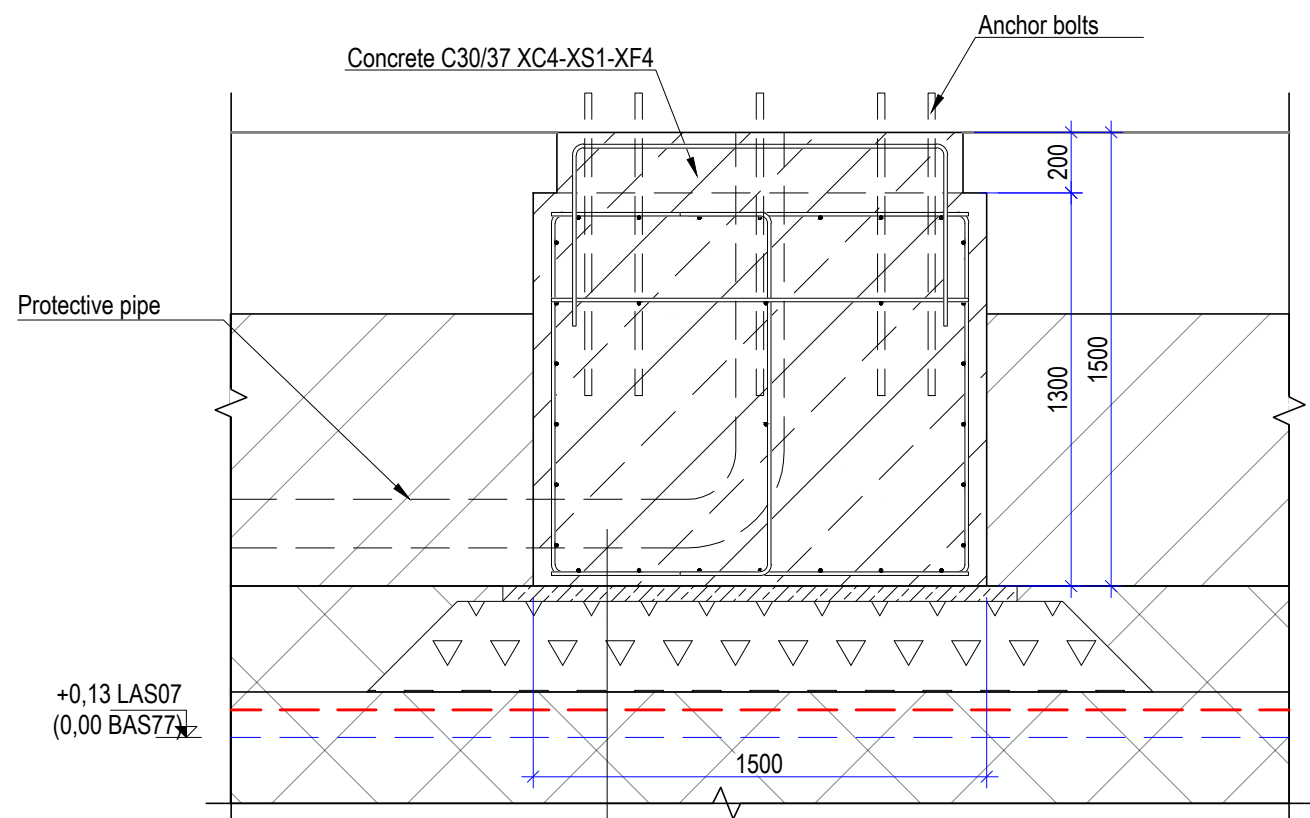
1. Dimensions are in millimetres.
2. Altitudes are in metres in the Lithuanian altitude system LAS07 (in brackets in the Baltic altitude system BAS77).
3. For the grounding and lighting of the navigation sign, see Part -E of the project.

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project
			BUILDING NUMBER AND NAME Southern Dam - No. 01
39928	BPM	R.Valančius	DOCUMENT NAME Southern Dam navigation marker
			REVISION 0
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		DOCUMENT MARK 8858-01-TP-SK-04.01.B-16
			SHEET 1
			SHEETS 1

PLAN SCALE 1:25



SECTION 1-1 SCALE 1:25



Reinforced concrete foundation for a navigation sign	
Concrete levelling layer	- 50 mm
Aggregate base course, compacted	$E_{v2} \geq 100$ MPa - 300 mm
Geotextile	
Dam's core, base compacted	$E_{v2} \geq 45$ MPa

Notes:

1. Dimensions are in millimetres.
2. Dimensions and reinforcement to be adjusted during the preparation of the detailed design.
3. The structure shall be concreted on site using monolithic reinforced concrete or installed using precast elements. The solutions shall be detailed in the detailed design.

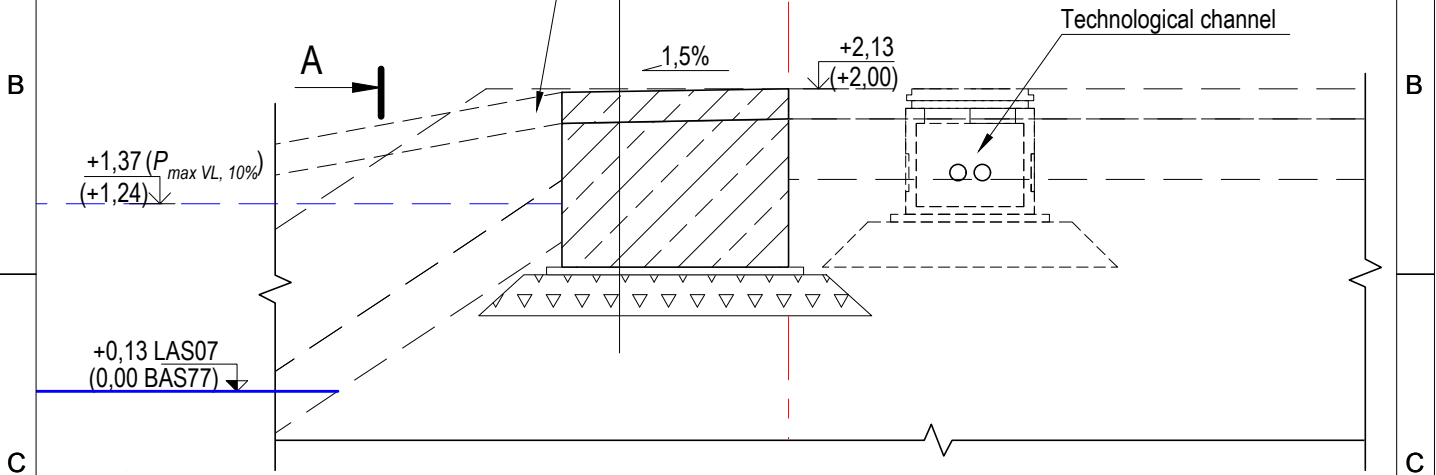
0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.	39928	BPM	R.Valančius
NAME OF THE BUILDING PROJECT			
Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project			
BUILDING NUMBER AND NAME			
Southern Dam - No. 01 Northern Dam - No. 02			
DOCUMENT NAME			REVISION
Principal solutions for the foundation of a navigational sign			0
BUILDER AND/OR CLIENT	DOCUMENT MARK		SHEET SHEETS
EN	AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		8858-01,02-TP-SK-04.01.B-17 1 1

SECTION 1-1 SCALE 1:50

Foundation for Attaching a Pontoon Bridge

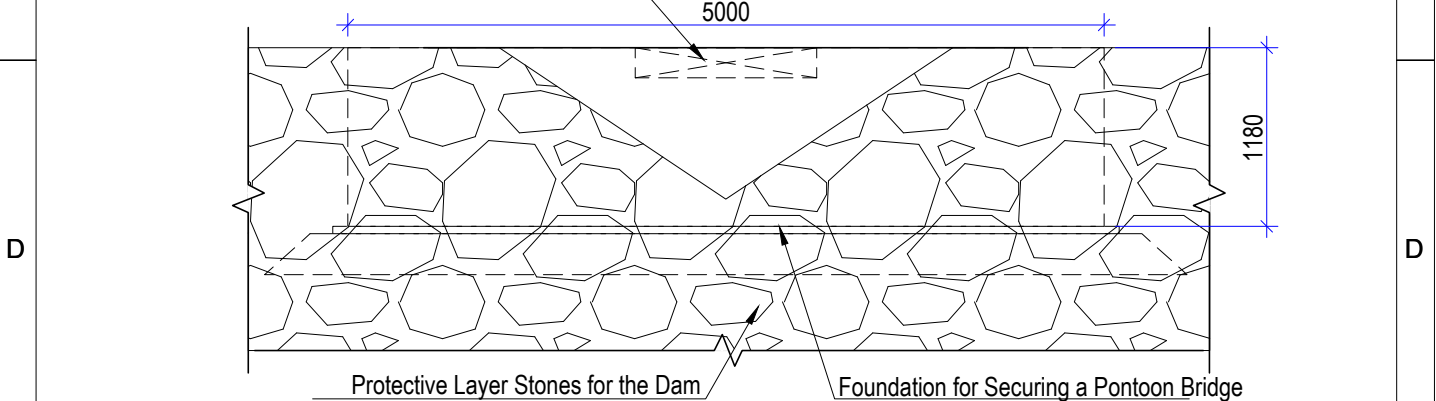
Concrete levelling layer	$h_{vid}=50\text{ mm}$
Aggregate base layer, compacted $E_{v2} \geq 100\text{ MPa}$	$h_{vid}=300\text{ mm}$
Pillar base, compacted $E_{v2} \geq 45\text{ MPa}$	

Pontoon Bridge Installed Under Another Project




VIEW A SCALE 1:50

Pontoon Bridge Installed Under Another Project

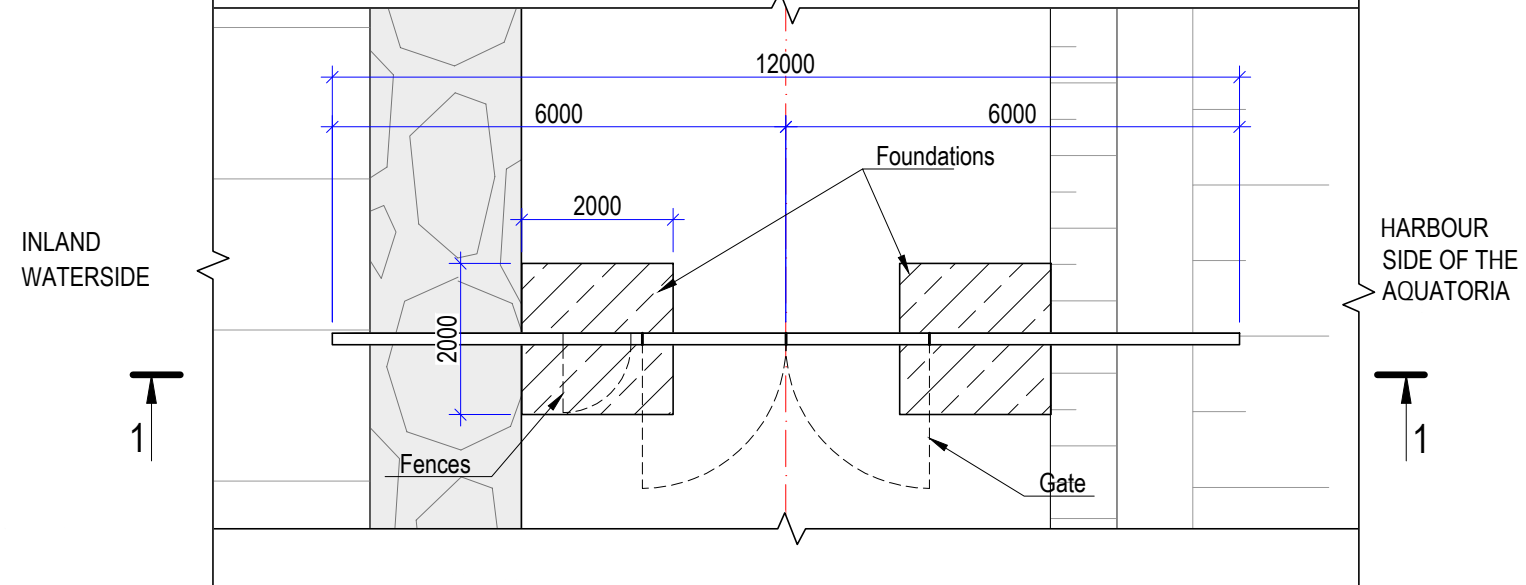


Notes:

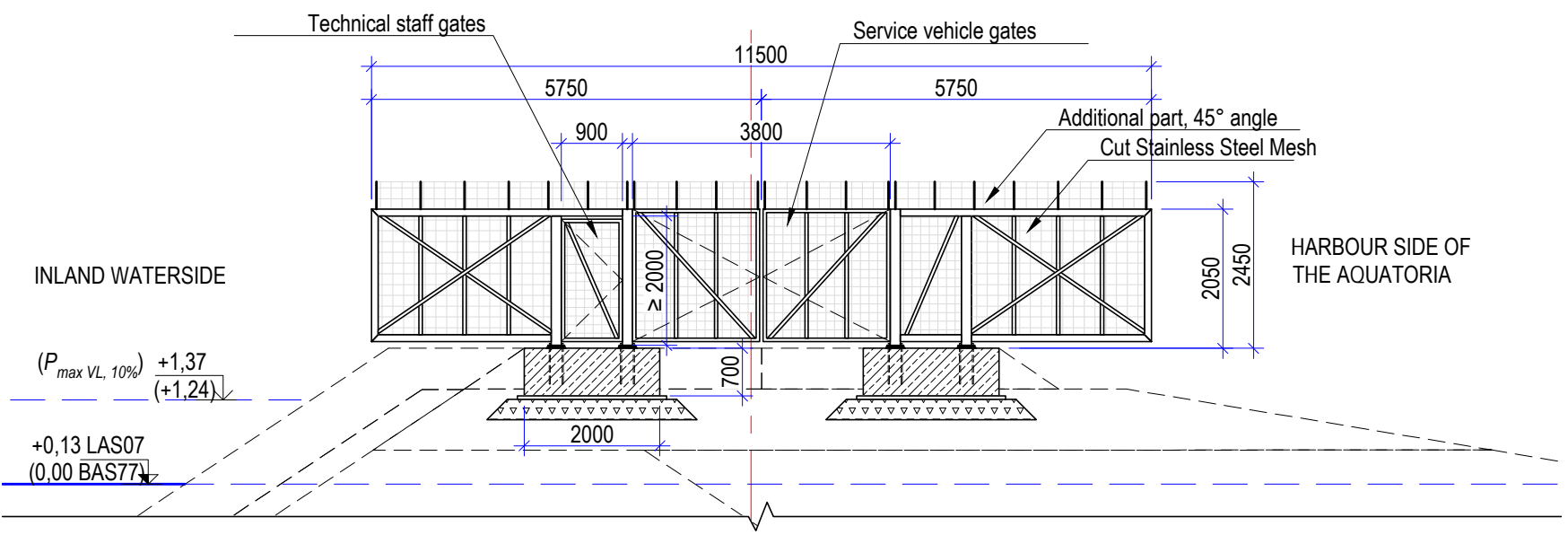
1. Dimensions are in millimetres.
2. Dimensions and reinforcement to be adjusted during the preparation of the detailed design.
3. The structure shall be concreted on site using monolithic reinforced concrete or installed using precast elements. The solutions shall be detailed in the detailed design.

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.			
	NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project		
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME Southern Dam - No. 01
			DOCUMENT NAME Principal solutions for the pontoon tower foundation
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		DOCUMENT MARK 8858-01-TP-SK-04.01-B-18
			SHEET 1
			SHEETS 1

PLAN SCALE 1:100




SECTION 1-1 SCALE 1:100

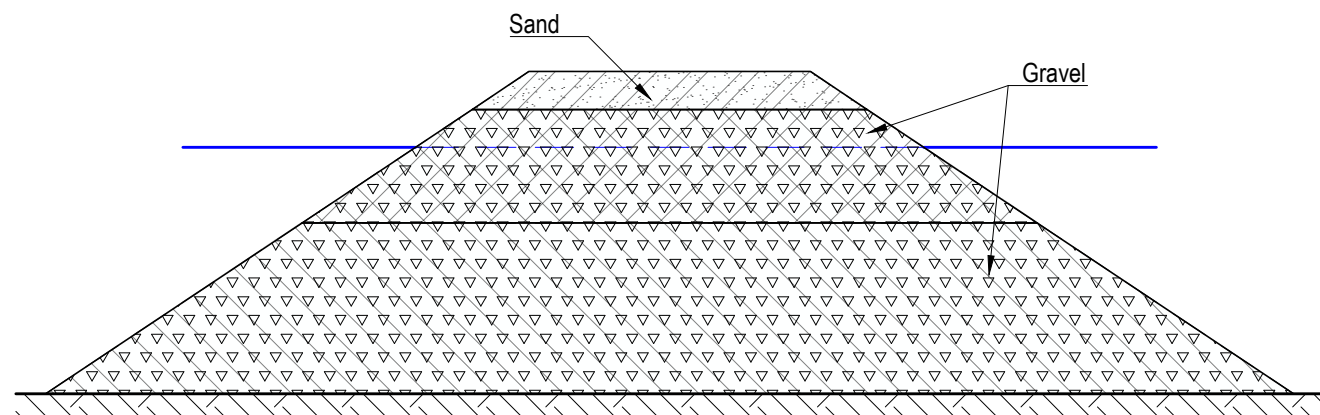
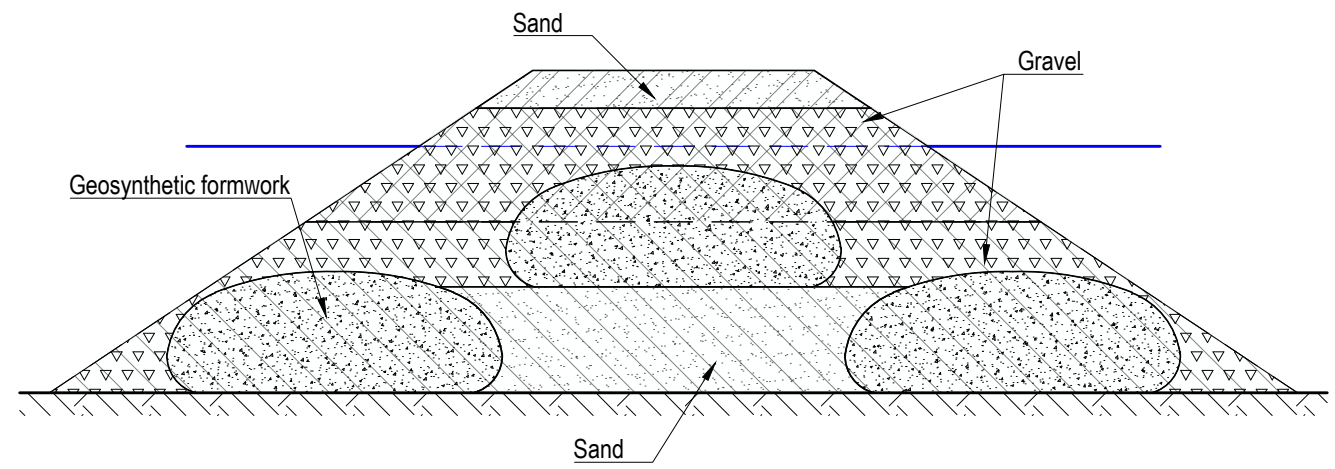
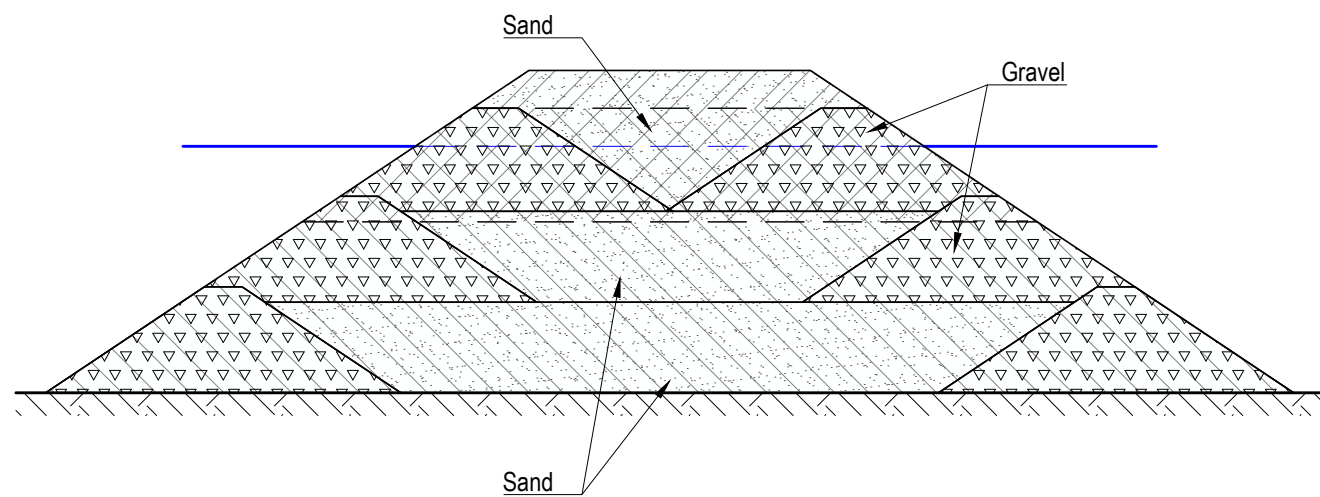
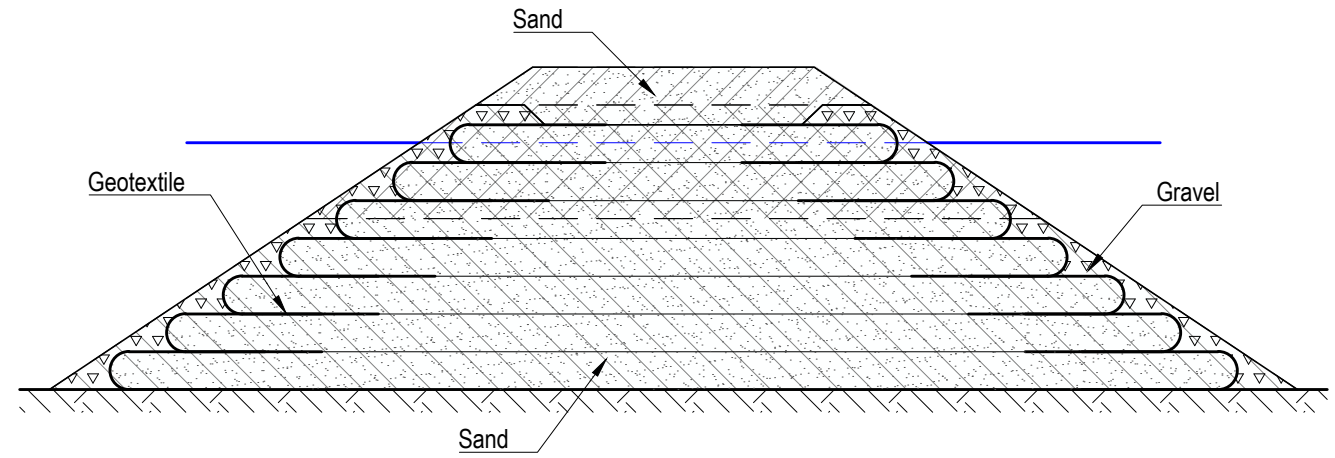
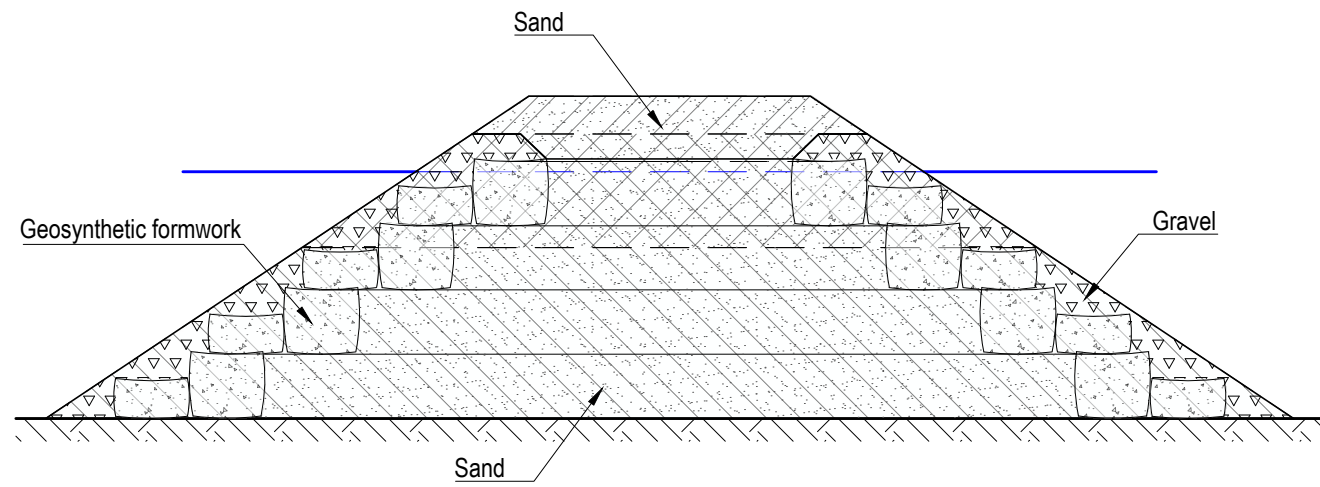


Notes:

1. Dimensions specified in millimeters.
2. Fence height should be 2,450 mm (main vertical part – 2,050 mm, additional part enhancing protective function, installed at a 45-degree angle – 400 mm).
3. Dimensions and solutions of structures to be refined during the preparation of the working project.

0	2024-03	BUILDING PERMIT, COMPETITION	
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)	
QAL. DOC. NO.			
	NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project		
39928	BPM	R. Valančius	BUILDING NUMBER AND NAME Northern Dam - No. 02
			DOCUMENT NAME Principal solutions for security fences
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		DOCUMENT MARK 8858-02-TP-SK-04.01-B-19
			REVISION 0
			SHEET 1
			SHEETS 1

SCHEMES FOR POSSIBLE SOLUTIONS FOR FORMING THE CORE OF THE DAM USING GEOSYNTHETICS, SAND AND/OR CRUSHED ROCK



LEGEND:

- The core of the dam (zone No. 3)
- The core of the dam (zone No. 2)
- The core of the dam (zone No. 1)
- Average water level

Notes:

1. Materials are selected according to dam core zones No. 1, 2, and 3, and their requirements are specified in technical specifications.
2. Only a few of the possible dam core shaping solutions are shown in the diagrams. Other alternative solutions that meet project requirements are permissible. Once a specific installation solution and construction technology are chosen, the installation solutions are detailed in the working project.
3. Geotextile is installed on the base, and in the dam core diagrams, it is conditionally not shown; see structural cross-sections.

0	2024-03	BUILDING PERMIT, COMPETITION		
REVISION	DATE	SHOW STATUS. REASON FOR CHANGE (IF APPLICABLE)		
QAL. DOC. NO.			NAME OF THE BUILDING PROJECT Buildings for the purpose of transportation communications (southern, northern dams, wharf and quay) Kairiai str. 17, Klaipėda, construction project	
39928	BPM	R.Valančius	BUILDING NUMBER AND NAME Southern Dam - No. 01 Northern Dam - No. 02	
			DOCUMENT NAME	REVISION
			Diagrams of possible options for the design of the dike core	0
EN	BUILDER AND/OR CLIENT AB Klaipėda State Seaport Authority J. Janonio st. 24, LT-92251 Klaipėda		DOCUMENT MARK	SHEET
			8858-01,02-TP-SK-04.01-B-20	1
			SHEETS	1

STATE ENTERPRISE KLAIPEDA STATE SEAPORT AUTHORITY

I APPROVE

Director of Infrastructure

____ th, 2022

TECHNICAL TASK

2022 - - No.T-

1. Project title:	Construction Project of the Southern Gate Complex of the Klaipeda State Seaport, Kairiu st. 17, Klaipeda	
2. Client	Klaipeda State Seaport Authority (hereinafter referred to as the Port Authority)	
3. Construction location	<p>3.1. Land plots of the Klaipeda State Seaport, which are managed by the Port Authority on the basis of a trust of state land:</p> <p>3.1.1. Unique number 4400-0764-6013, cadastral number 44/520032, Kairiu st. 17, Klaipeda;</p> <p>3.1.2. Unique number 4400-2199-4594, cadastral number 44/1441189, Klaipeda;</p> <p>3.1.3. Unique number 4400-0778-5884, cadastral number 44/529726, Kairiu st. 19, Klaipeda.</p> <p>3.2. Vacant state land, Klaipeda.</p>	
4. Category of buildings:	<p>4.1. Southern dam - non-exceptional structure</p> <p>4.2. Northern dam - non-exceptional structure</p> <p>4.3. Wharf - non-exceptional structure</p> <p>4.4. Quay - non-exceptional structure</p>	
5. Design stage:	5.1. Technical project	
6. Type of construction:	6.1. New construction	
7. Purpose of the structure:	<p>7.1. Southern dam – 8.5 Transport communications, structures of water ports (dams)</p> <p>7.2. Northern dam – 8.5 Transport communications, structures of water ports (dams)</p> <p>7.3. Wharf – 8.5 Transport communications, structures of water ports (wharves)</p> <p>7.4. Quay – 8.5 Transport communications, structures of water ports (quays)</p>	
8. Key data about structures:	8.1. Southern dam: Length*: 1020 m Design depth**: 3.5 + 4.6 m, transitioning to natural depths at the end of the dam	8.2. Northern dam: Length*: 1300 m Design depth**: 4.6 m, transitioning to natural depths at the end of the dam

	8.3. Wharf: Length*: 80 m Top elevation: 2 m Design depth: 4,6 m	8.4. Quay: Length*: 724 m Top elevation: 2 m Design depth: 4,6 m
	*The lengths and widths of structures are specified during the design stage. **Depths and heights are based on the Baltic Height System BAS77.	
9. Calculated ship dimensions:	9.1. Wharf: maximum ferry length - 62.20 m, maximum ferry width - 14 m, maximum ferry displacement - 724 t 9.2. Quay: maximum pleasure craft length - 15 m, maximum pleasure craft width - 5 m	
10. Project Development Basis:	10.1. General Plan solutions for the Klaipeda State Seaport (land, internal water area, external raid, and related infrastructure). 10.2. Decision of the Environmental Protection Agency on the possibilities of improving (deepening and widening) the external and internal navigation channel of the Klaipeda State Seaport, reconstruction (construction) of the southern and northern breakwaters, strengthening of a part of the Curonian Spit slope and construction of the southern port gates (letter No. (30.1)-A4-1585 of 2019-03-04).	
11. Scope of Design Services:	11.1. Taking into account Variant II-A-2 of the "Design Proposals for the Klaipeda State Seaport Southern Gate Complex, Kairiu st. 17, Klaipeda" project prepared by UAB "Sweco Lietuva" (hereinafter referred to as the Design Proposals), and guided by the documents specified in Section 10, prepare the technical design for the "Klaipeda State Seaport Southern Gate Complex, Kairiu st. 17, Klaipeda, Construction Project": 11.1.1. If, after evaluating the Design Proposals prepared by UAB "Sweco Lietuva", the designer can propose a more rational solution, he/she shall propose such a solution to the client; 11.1.2. Divide the designed complex and water area into zones according to the intended use (ferry zone, young sailors' training zone, small and pleasure craft marina zone, etc.); 11.1.3. Perform structural calculations to substantiate the planned solutions for the southern and northern embankments, quays and piers; 11.1.4. Design draft of -4.6 m in the ferry zone and -3.5 m in the rest of the water area; 11.1.5. Design depth of the entrance channel to the southern gate water area - 4.6 m, width - not less than 60.0 m;	

	<p>11.1.6. Wharfside operating loads shall be selected and justified so that they are suitable for berthing ferries;</p> <p>11.1.7. Provide a slip solution in the young sailors' training zone;</p> <p>11.1.8. In order to ensure water circulation in the southern gate water area, provide the necessary number of drainage pipes, their installation locations and structural solution in the southern dam, the effectiveness of which would be substantiated by the designer's chosen methods and structural calculations;</p> <p>11.1.9. If necessary and taking into account the available data, provide a solution for the control of sediment flow (from sedimentation) at the entrance to the southern gate;</p> <p>11.1.10. Design a pedestrian walkway on the southern embankment, taking into account all safety requirements;</p> <p>11.1.11. Select pavements for embankments, quays and piers, taking into account the nature of use and safety of the structures;</p> <p>11.1.12. Ensure smooth functional connection with the adjacent land area (provide a solution for access to the quay/pier);</p> <p>11.1.13. Navigation marks on embankments and water navigation marks in the southern gate water area, marking the depths of the water area;</p> <p>11.1.14. All necessary channels for engineering networks (water and sewage, outdoor fire water supply, electricity, communications) on the quay and pier;</p> <p>11.1.15. Provide locations for the installation of power supply columns on the pier;</p> <p>11.1.16. Provide locations for the installation of water supply columns on the pier.</p> <p>11.1.17. Design lighting for the southern and northern embankments, quay and pier area. Provide a separate meter for electricity metering; obtain technical specifications if necessary;</p> <p>11.1.18. Design stormwater networks in accordance with the requirements of Lithuanian legislation. Design stormwater collection from buildings only in the zone of planned solutions. Provide longitudinal profiles of the designed networks;</p> <p>11.1.19. Design ladders for exiting the water;</p> <p>11.1.20. Design the necessary mooring facilities (bumpers, mooring bollards); provide for the painting of the mooring bollard bodies and the marking of the mooring bollards according to the port's numbering system;</p>
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	<p>11.1.21. Provide a solution for temporary access that will ensure access to the construction site;</p> <p>11.1.22. Submit dredging solutions in a separate part (including, but not limited to):</p> <p>11.1.22.1. Provide for two stages of dredging works:</p> <p>11.1.22.1.1. Stage I - dredging works in the water area up to 3.5 m;</p> <p>11.1.22.1.2. Stage II - dredging works in part of the water area (ferry zone) up to 4.6 m (providing a turning circle solution for ferries);</p> <p>11.1.22.2. Before preparing the dredging project, coordinate the scope and boundaries of dredging works with the client;</p> <p>11.1.22.3. Prepare a coordinated dredging scheme, indicating the slopes;</p> <p>11.1.22.4. Prepare dredging project solutions that will not affect the mechanical strength and stability of surrounding hydraulic structures;</p> <p>11.1.22.5. Specify the dredging conditions;</p> <p>11.1.22.6. Specify the dredging procedure;</p> <p>11.1.22.7. For dredging works in zones where the design depth is to be reached, specify the permissible over-dredging, and in the slopes, specify the formation tolerance from the slope formation line;</p> <p>11.1.22.8. Specify the volume of excavated soil to be excavated and disposed of in accordance with the provisions of LAND 46A-2002;</p> <p>11.1.22.9. Calculate and specify the volume of the planned excavated soil, which is defined in accordance with Section 22 of LAND 46A-2002 as geological layers of undisturbed structure and overlaid by current sedimentation processes.</p> <p>11.2. Provide a solution for the storage of soil suitable for land formation that will not be used for the construction of the southern port gates on the land plot of the Klaipeda State Seaport, unique number 4400-0778-5884, cadastral number 44/529726, Kairiu st. 19, Klaipeda.</p> <p>11.3. Present the design depths and heights in BAS77 and LAS07 systems.</p> <p>11.4. Provide for construction stages: Stage I - construction of the southern and northern embankments and dredging works in the water area; Stage II - construction of the pier; Stage III - construction of the quay.</p> <p>11.5. The solutions for each construction stage shall be such that completion procedures can be carried out for each construction stage. The project documentation (files) for each construction stage shall be formed separately.</p>
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	<p>11.6. Coordinate the project solutions with the solutions of the implemented or implemented projects of the adjacent port facilities.</p> <p>11.7. Recommendations on the sequence of construction of complex structures, the construction period, the organization of construction works, a traffic organization scheme, plans for material storage places, which would be coordinated with the Port Authority, and specify the duration of construction works.</p> <p>11.8. If necessary, the designer may refine the name of the technical project in agreement with the client.</p> <p>11.9. Determine the estimated construction cost of the technical project by preparing a part of the project for determining the estimated construction cost. When preparing the part of the project for determining the estimated construction cost, the prices set in the estimated cost of materials and products, the value of which is more than 10% of the total cost of the object, must be based on commercial offers from three manufacturers (suppliers), which are obtained by the project developer and submitted as part of the project for determining the estimated construction cost of the technical project.</p> <p>11.10. Prepare bills of quantities of work and determine the estimated construction cost for each construction stage separately, for each structure separately.</p> <p>11.11. Based on the estimated construction cost prepared by the designer, prepare bills of quantities of work for the competition for works that will be performed by order of the Port Authority, where each work item would be clearly distinguished with an individual serial number;</p> <p>11.12. Fill in the prepared bills of quantities of work for the competition (1 copy), based on the estimated construction cost prepared by the designer.</p>
12. Other additional conditions:	<p>12.1. All initial data required for the preparation and implementation of this project must be prepared by the designer. The designer must verify all initial data provided by the client when preparing the project; the designer is responsible for the quality of the project and for the adopted design solutions.</p> <p>12.2. The engineering geological and geotechnical research report will be prepared separately under a separate order from the Port Authority. The preparation of the engineering</p>

	<p>geological and geotechnical research report and the receipt of the assessment conclusions from the Lithuanian Geological Survey under the Ministry of Environment may take up to 6 months from the date of signing the contract with the provider of engineering geological and geotechnical research services.</p> <p>12.3. If necessary, the provided topographic survey must be verified by the designer (the topographic survey must indicate the engineering geodetic marks according to which the topographic survey was prepared).</p> <p>12.4. Carry out a screening for environmental impact assessment (due to dredging of the water area and storage of excavated soil on the land plot of the Klaipeda State Seaport, unique number 4400-0778-5884, cadastral number 44/529726, Kairiu st. 19, Klaipeda):</p> <p>12.4.1. prepare all documentation necessary for the screening for environmental impact assessment of the planned economic activity;</p> <p>12.4.2. submit to the Port Authority the screening conclusion for environmental impact assessment;</p> <p>12.4.3. if the screening conclusion for environmental impact assessment states that an environmental impact assessment is mandatory for the planned economic activity, 12.4.4. the Port Authority will select the drafter of this document by separate public procurement procedure;</p> <p>12.4.5. if the screening conclusion for environmental impact assessment states that an environmental impact assessment is mandatory for the planned economic activity, the designer will have to adjust and re-coordinate the service provision schedule, taking into account the period of preparation of the environmental impact assessment report and receipt of the conclusion.</p> <p>12.5. The designer, authorized by the Port Authority, shall apply to the relevant institutions for the necessary technical conditions (or other conditions, special requirements) for the preparation of this project and shall prepare the project in accordance with these conditions.</p> <p>12.6. The prepared and preliminarily agreed with the organizations (companies) setting the technical conditions technical project shall be presented, with the participation of the project manager who headed the project preparation, to the Port Authority's technical council (before the</p>
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	<p>technical project expertise is carried out) and obtain its approval.</p> <p>12.7. If it becomes clear that it is necessary to clarify or obtain new conditions or special requirements, the designer must apply to the relevant institution to clarify or obtain these conditions or special requirements.</p> <p>12.8. During the preparation of the technical project, the designer shall submit reports on the implementation of the contract (volume, quality, schedule implementation) at least once a month, indicating specific planned actions, with specific responsible persons and deadlines for each.</p> <p>12.9. The designer must take into account the comments and remarks made during the meetings of the Port Authority's technical council.</p> <p>12.10. The technical project solutions shall be submitted to the Port Authority's technical council for coordination at least 10 days before the planned date of the Technical Council meeting.</p> <p>12.11. Upon receipt of the project expertise with a positive conclusion "The technical project can be approved", the designer (authorized by the Port Authority) receives a construction permit.</p> <p>12.12. The first technical project expertise is carried out by order of the Port Authority. If the technical project has shortcomings, the designer pays for all subsequent expertises.</p> <p>12.13. The project manager and project part managers shall coordinate project solutions with the relevant institutions (including the Fire Safety and Rescue Department under the Ministry of Internal Affairs) when preparing the project and obtaining a construction permit in accordance with applicable legislation.</p> <p>12.14. In preparing the project, be guided by the existing territorial planning documents.</p> <p>12.15. The designer shall submit written answers to questions received during the public competition for the selection of the contractor for the project of this object within one working day.</p> <p>12.16. Carry out supervision of the implementation of the construction project:</p> <p>12.16.1. carry out supervision of the implementation of the construction project, as provided for by the legislation of the Republic of Lithuania, the Law on Construction of the Republic of Lithuania, construction technical regulations, etc.;</p>
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	<p>12.16.2. If additional (unforeseen) work is found during construction, the designer must make a change to the design solution and prepare a construction cost estimate for these works;</p> <p>12.16.3. before the object completion procedures, the designer must prepare a free-form certificate on the changes made to the design solutions.</p> <p>12.17. All risk for improperly planned and evaluated works shall be borne by the designer. No additional payments for works and services that the designer did not foresee when submitting the proposal shall be made if their execution falls within the requirements of the technical specification.</p>
13. Project Composition	<p>13.1. Parts of the technical project according to STR 1.04.04:2017 "Design of buildings, project expertise", including the part for determining the estimated construction cost.</p> <p>13.2. Submit the file of structural calculations separately.</p> <p>13.3. Submit the file of dredging works separately.</p>
14. Mandatory Project Preparation Documents	<p>14.1. General Plan of the Klaipeda State Seaport (land, internal water area, external raid and related infrastructure), approved by the Resolution No. 1278 of the Government of the Republic of Lithuania on December 11, 2019.</p> <p>14.2. Decision of the Environmental Protection Agency on the possibilities of improvement (dredging and widening) of the external and internal navigation channel of the Klaipeda State Seaport, reconstruction (construction) of the southern and northern breakwaters and strengthening of a part of the Curonian Spit slope and construction of the southern port gates (letter No. (30.1)-A4-1585 dated 2019-03-04).</p> <p>14.3. Rules for the design, dredging, bottom cleaning and technical maintenance of the water areas of the Klaipeda State Seaport and the Sventoji State Seaport.</p> <p>14.4. Rules for the excavation of soil in the water areas of the sea and seaports and the removal of excavated soil (LAND 46A - 2002 with subsequent amendments).</p> <p>14.5. The technical project is prepared in accordance with the Law on Construction of the Republic of Lithuania and other normative acts regulating the design, construction and operation of such structures.</p> <p>14.6. EAU 2012 "Recommendations of the Committee on Hydrotechnical Structures, Ports</p>

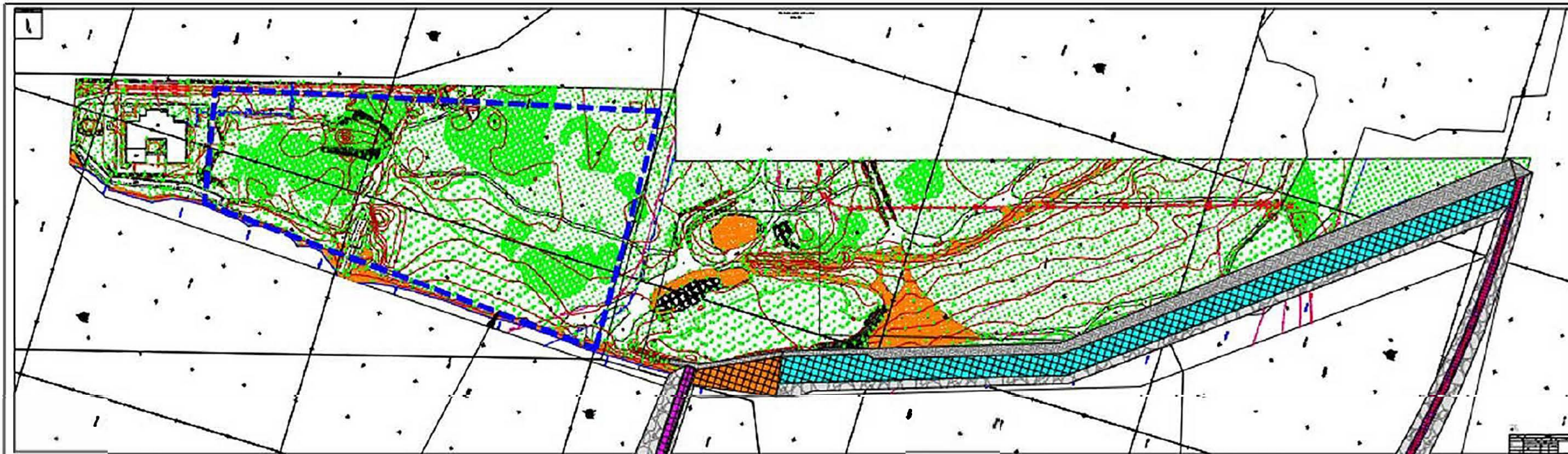
	<p>and Waterways" 9th edition (recommended literature, if there are uncertainties in STR and Eurocodes);</p> <p>Note. When applying Eurocodes, coefficients should be taken according to national annexes for Lithuania.</p>
15. Number of Project Documentation	<p>15.1. Prepare 5 copies of the technical project (with separate bills of quantities for each structure) in paper form in Lithuanian and English;</p> <p>15.2. 2 copies on a digital medium (in Lithuanian and English), which contains all files used in the project in a neat order (by sequence or combined into one common file), converted to PDF format, signed with an electronic signature (or a vector or high-quality scanned signature can be uploaded) and additionally attached drawings in DWG format. Additionally, provide all personalized project parts (in Lithuanian and English) in such a way that the protection of personal data is ensured in accordance with the requirements of the law;</p> <p>15.3. Submit the file of structural calculations separately in 1 copy in paper form and 1 copy in digital form in PDF format (in Lithuanian).</p> <p>15.4. Provide the clarified topographic survey in 2 copies in paper form and 1 copy in digital form in PDF and DWG formats.</p> <p>15.5. Submit 2 copies in paper form and 1 copy in digital form of the environmental impact assessment document for the planned economic activity. The conclusion of the environmental impact assessment of the planned economic activity shall be provided in Lithuanian and English.</p> <p>15.6. Competitive bills of quantities (in Lithuanian and English) shall be submitted in digital form (1 copy).</p> <p>15.7. Documents for consideration by the Technical Council shall be submitted in 1 copy in PDF format.</p>
16. Initial Data	<p>16.1. Design proposals for the construction of the Klaipeda State Seaport Southern Gates Complex, Kairiu st. 17, Klaipeda, UAB „Sweco Lietuva“, 2022 m.</p> <p>16.2. Copy of the extract from the Central Register of Real Property.</p> <p>16.3. Plan of the plot with unique number 4400-0764-6013, cadastral number 44/520032, Kairiu st. 17, Klaipeda.</p>

	<p>16.4. Plan of the plot with unique number 4400-2199-4594, cadastral number 44/1441189, Klaipeda.</p> <p>16.5. Plan of the plot with unique number 4400-0778-5884, cadastral number 44/529726, Kairiu st. 19, Klaipeda.</p> <p>16.6. Topographic survey.</p> <p>16.7. Report on engineering geological investigations of the boat pier on the Smiltynė Peninsula, UAB „Geoprojektas“ ir Ko., 2008 m.</p> <p>16.8. Technical specification for engineering geological and geotechnical investigations of the Klaipeda State Seaport Southern Gates Complex.</p> <p>16.9. Depth plan (upon conclusion of the contract, the Contractor shall provide bathymetric depth data of the port water area according to the boundaries prepared by the Designer and agreed with the Contractor).</p> <p>16.10. Environmental impact assessment report for the improvement (dredging and widening) of the external and internal navigation channel of the Klaipeda State Seaport, reconstruction (construction) of the southern and northern breakwaters and strengthening of a part of the Curonian Spit slope and construction of the southern port gates. The Designer will be provided upon conclusion of the contract.</p> <p>16.11. Technical concept of the Klaipeda State Seaport Southern Gates prepared by UAB „Sweco Lietuva“ and the Lithuanian Energy Institute, taking into account the development of the infrastructure of the port (marina) for small and pleasure craft in the southern part of Klaipeda (2015). The Designer will be provided upon conclusion of the contract.</p>
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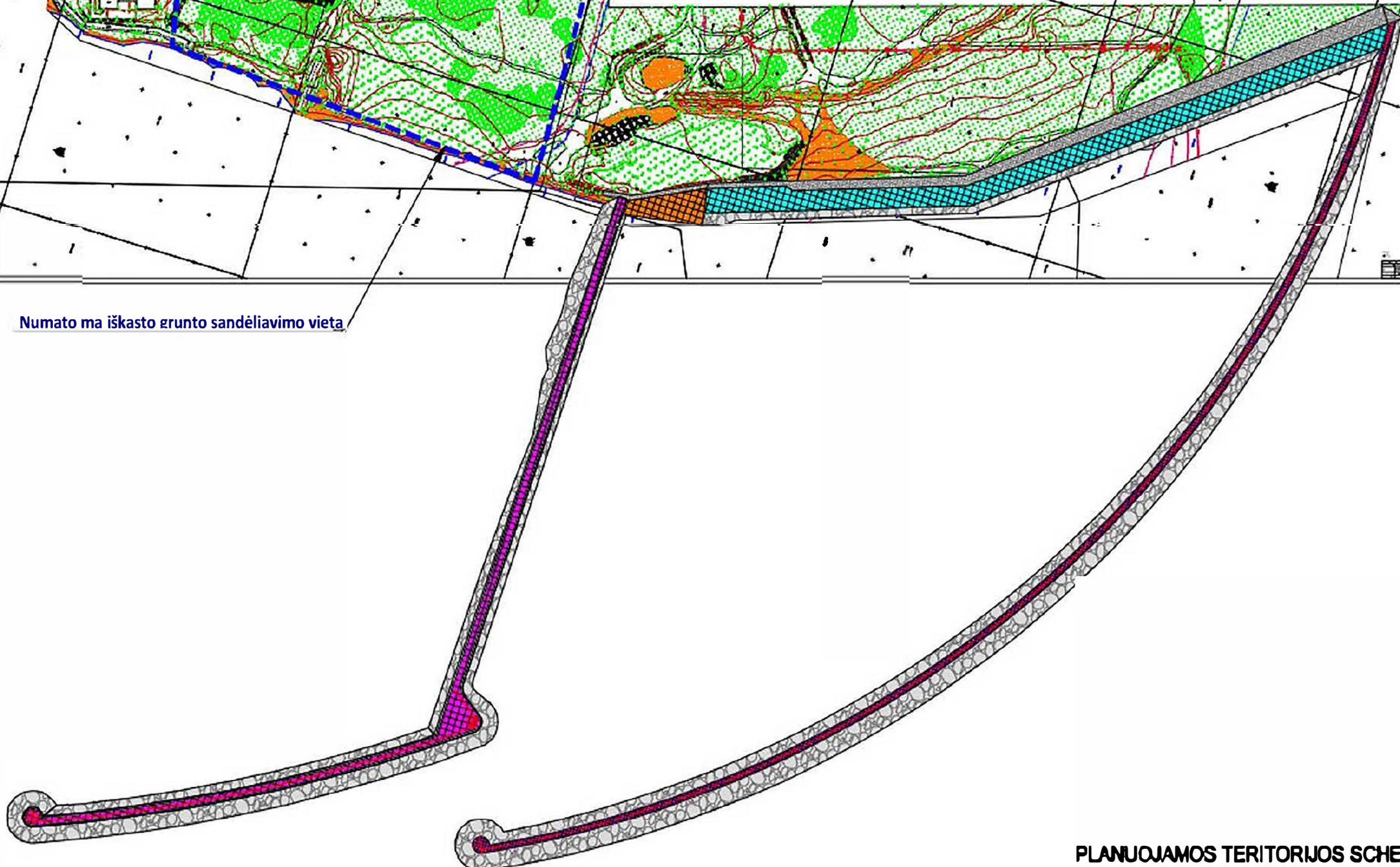
ATTACHED: Site Scheme of the Planned Territory, 1 sheet.

Harbor Master

Head of Construction and Operation Department



Numato ma iškasto grunto sandėliavimo vieta



PLANUOJAMOS TERITORIJOS SCHEMA


DETALŪS METADUOMENYS

Dokumento sudarytojas (-ai)	KVJUD 240329870, J. Janonio g. 24, LT-92251 Klaipėda
Dokumento pavadinimas (antraštė)	PROJEKTAVIMO UŽDUOTIS Klaipėdos valstybinio jūrų uosto pietinių vartų komplekso, Kairių g. 17, Klaipėdoje, statybos projektas
Dokumento registracijos data ir numeris	2022-03-21 Nr. T-32
Dokumento gavimo data ir dokumento gavimo registracijos numeris	–
Dokumento specifikacijos identifikavimo žymuo	ADOC-V1.0
Parašo paskirtis	Suderinimas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	█ Uosto kapitonas, Uosto kapitonas
Sertifikatas išduotas	█
Parašo sukūrimo data ir laikas	2022-03-16 07:55:40 (GMT+02:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2021-06-01 10:39:07 – 2026-05-31 23:59:59
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	█ Infrastruktūros direktorius, Infrastruktūros direktorius
Sertifikatas išduotas	█
Parašo sukūrimo data ir laikas	2022-03-21 13:00:51 (GMT+02:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2018-06-21 10:05:46 – 2023-06-20 23:59:59
Informacija apie būdus, naudotus metaduomenų vientisumui užtikrinti	"Registravimas" paskirties metaduomenų vientisumas užtikrintas naudojant "RCSC IssuingCA, VI Registru centras - i.k. 124110246 LT" išduotą sertifikatą "Dokumentų valdymo sistema Avilys, Klaipėdos valstybinio jūrų uosto direkcija, VĮ, į.k. 240329870 LT", sertifikatas galioja nuo 2021-12-20 12:39:15 iki 2024-12-19 12:39:15
Pagrindinio dokumento priedų skaičius	1
Pagrindinio dokumento pridedamų dokumentų skaičius	–
Priedamo dokumento sudarytojas (-ai)	–
Priedamo dokumento pavadinimas (antraštė)	–
Priedamo dokumento registracijos data ir numeris	–
Programinės įrangos, kuria naudojantis sudarytas elektroninis dokumentas, pavadinimas	Dokumentų valdymo sistema Avilys, versija 3.5.58
Informacija apie elektroninio dokumento ir elektroninio (-ių) parašo (-ų) tikrinimą (tikrinimo data)	Atitinka specifikacijos keliamus reikalavimus. Visi dokumente esantys elektroniniai parašai galioja (2022-03-21 13:05:45)
Paieškos nuoroda	–
Papildomi metaduomenys	Nuorašą suformavo 2022-03-21 13:05:45 Dokumentų valdymo sistema Avilys

STATE ENTERPRISE KLAIPEDA STATE SEAPORT AUTHORITY

I APPROVE

Director of Infrastructure


 _____th, 2023

 ADDITIONAL DESIGN ASSIGNMENT No. 1
 to Design Assignment No. T-32 dated 2022-03-21
 2023 - No.

1. Project title:	Construction Project of the Southern Gate Complex of the Klaipeda State Seaport, Kairiu st. 17, Klaipeda	
2. Client	Klaipeda State Seaport Authority (hereinafter referred to as the Port Authority)	
3. Construction location	3.1. Land plots of the Klaipeda State Seaport, which are managed by the Port Authority on the basis of a trust of state land: 3.1.1. Unique number 4400-0764-6013, cadastral number 44/520032, Kairiu st. 17, Klaipeda; 3.1.2. Unique number 4400-2199-4594, cadastral number 44/1441189, Klaipeda; 3.1.3. Unique number 4400-0778-5884, cadastral number 44/529726, Kairiu st. 19, Klaipeda. 3.2. Vacant state land, Klaipeda.	
4. Category of buildings:	4.1. Southern dam - non-exceptional structure 4.2. Northern dam - non-exceptional structure 4.3. Wharf - non-exceptional structure 4.4. Quay - non-exceptional structure	
5. Design stage:	5.1. Technical project	
6. Type of construction:	6.1. New construction	
7. Purpose of the structure:	7.1. Southern dam – 8.5 Transport communications, structures of water ports (dams) 7.2. Northern dam – 8.5 Transport communications, structures of water ports (dams) 7.3. Wharf – 8.5 Transport communications, structures of water ports (wharves) 7.4. Quay – 8.5 Transport communications, structures of water ports (quays)	
8. Key data about structures:	8.1. Southern dam: Length*: 1020 m Design depth**: 3.5 + 4.6 m, transitioning to natural depths at the end of the dam	8.2. Northern dam: Length*: 1300 m Design depth**: 4.6 m, transitioning to natural depths at the end of the dam

	8.3. Wharf: Length*: 80 m Top elevation: 2 m Design depth: 4,6 m	8.4. Quay: Length*: 724 m Top elevation: 2 m Design depth: 4,6 m
	*The lengths and widths of structures are specified during the design stage. **Depths and heights are based on the Baltic Height System BAS77.	
9. Calculated ship dimensions:	9.1. Wharf: maximum ferry length - 62.20 m, maximum ferry width - 14 m, maximum ferry displacement - 724 t 9.2. Quay: maximum pleasure craft length - 15 m, maximum pleasure craft width - 5 m	
10. Project Development Basis:	10.1. General Plan solutions for the Klaipeda State Seaport (land, internal water area, external raid, and related infrastructure). 10.2. Decision of the Environmental Protection Agency on the possibilities of improving (deepening and widening) the external and internal navigation channel of the Klaipeda State Seaport, reconstruction (construction) of the southern and northern breakwaters, strengthening of a part of the Curonian Spit slope and construction of the southern port gates (letter No. (30.1)-A4-1585 of 2019-03-04). 10.3. Conclusion of the Environmental Protection Agency on the assessment of the impact on the environment of dredging the water area and storing the excavated soil on a land plot of the Klaipeda State Seaport at Kairių g. 19, Klaipeda city (letter No. (30-2)-A4E-7719 dated 2023-07-26).	
11. Scope of Design Services:	11.1. Prepare the structural design of the northern dam and perform structural calculations to support it. 11.2. Divide the construction of the dam into two parts (Part I - from the shore to the turn, forming gates, Part II - the remaining part). 11.3. Solutions for the first part (from the shore to the turn) of the northern dam: 11.3.1. Assess the possibility of using part of the mineral soil excavated in the project area to form the northern slope and assess the removal of silt in the dam zone to the extent necessary to implement the dam's structural design; 11.3.2. Assess the possibility of constructing the dam cover from mineral soil and prepare a solution; 11.3.3. Design a navigational mark; 11.3.4. Provide for lighting points and a casing;	

	<p>11.3.5. Assess whether the boulders available to the Contractor are suitable for the construction of the core of the northern dam and prepare a solution for their use;</p> <p>11.3.6. Design gates to restrict access to the northern dam.</p> <p>11.4. Prepare solutions for the second part of the northern dam that are linked to the solutions for the first part:</p> <p>11.4.1. Assess the possibility of constructing the dam cover from mineral soil and prepare a solution;</p> <p>11.4.2. Design a navigational mark;</p> <p>11.4.3. Design the lighting of the northern dam.</p> <p>11.5. Provide in the project solutions that sand that will not be used in the construction of the complex structures and that meets the requirements for replenishing beaches can be used to replenish beaches.</p> <p>11.6. Refine the construction stages, and plan the construction of the second part of the northern dam separately from the other construction stages.</p> <p>11.7. Prepare the dredging of the water area to a depth of 3.5 m (i.e. the first stage of dredging works) in such a way that the dredging works can be carried out without constructing a quay. Plan the implementation of solutions for dredging the water area to a depth of 4.6 m (i.e. the second stage of dredging works) after the construction of the quay.</p>
12. Other additional conditions:	12.1. All other requirements set out in the Design Assignment No. T-32 dated 2022-03-21 shall apply to the project.

ATTACHED: Site Scheme of the Planned Territory, 1 sheet.

Harbor Master

Head of Construction and Operation Department

(parašas)
[redacted]

(data)
Plėtros ir aplinkosaugos skyriaus vadovas

(parašas)
[redacted]

(data)
Statybos ir eksploatacijos departamento
direktorius

(parašas)
[redacted]

(data)
Akvatorijos gilinimo skyriaus vadovė

(parašas)
[redacted]

(data)

(parašas)
[redacted]

(data)
Plėtros ir aplinkosaugos skyriaus vadovo pavaduotojas

(parašas)
[redacted]

(data)
Konstruktorius-konsultantas

(parašas)
[redacted]

(data)
Vyriausiasis energetikas

(parašas)
[redacted]

(data)

Plėtros ir aplinkosaugos skyriaus projektų vadovė _____ [redacted]

DETALŪS METADUOMENYS

Dokumento sudarytojas (-ai)	KVJUD 240329870, J. Janonio g. 24, LT-92251 Klaipėda
Dokumento pavadinimas (antraštė)	PAPILDOMA PROJEKTAVIMO UŽDUOTIS Nr. 1 prie 2022-03-21 projektavimo užduoties Nr. T-32
Dokumento registracijos data ir numeris	2023-10-05 Nr. T-148
Dokumento gavimo data ir dokumento gavimo registracijos numeris	–
Dokumento specifikacijos identifikavimo žymuo	ADOC-V1.0
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	█ Pavaduojantis atostogų metu, Plėtros ir aplinkosaugos skyrius
Sertifikatas išduotas	█
Parašo sukūrimo data ir laikas	2023-10-04 09:49:28 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2021-02-05 13:34:14 – 2026-02-04 23:59:59
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	█ Skyriaus vadovo pavaduotojas, Plėtros ir aplinkosaugos skyrius
Sertifikatas išduotas	█
Parašo sukūrimo data ir laikas	2023-10-04 09:50:12 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2021-02-05 13:34:14 – 2026-02-04 23:59:59
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	█ Akvatorijos gilinimo skyriaus vadovė, Akvatorijos gilinimo skyrius
Sertifikatas išduotas	█
Parašo sukūrimo data ir laikas	2023-10-04 10:40:07 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2023-06-14 18:43:49 – 2028-06-12 23:59:59
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	█ konstruktorius-konsultantas, Statybos ir eksploatacijos departamentas
Sertifikatas išduotas	█
Parašo sukūrimo data ir laikas	2023-10-04 10:55:22 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2019-07-30 20:56:51 – 2024-07-28 23:59:59
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	█ Statybos ir eksploatacijos skyriaus vadovas, Statybos ir eksploatacijos skyrius
Sertifikatas išduotas	█
Parašo sukūrimo data ir laikas	2023-10-04 10:59:04 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE

DETALŪS METADUOMENYS

Sertifikato galiojimo laikas	2023-05-04 15:20:55 – 2028-05-02 23:59:59
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	[redacted] Uosto kapitonas, Uosto kapitonas
Sertifikatas išduotas	[redacted]
Parašo sukūrimo data ir laikas	2023-10-04 11:45:06 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2021-06-01 10:39:07 – 2026-05-31 23:59:59
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	[redacted] Direktorius, Statybos ir eksploatacijos departamentas
Sertifikatas išduotas	[redacted]
Parašo sukūrimo data ir laikas	2023-10-04 16:15:06 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2019-01-24 11:18:38 – 2024-01-23 23:59:59
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	[redacted] Inžinierius energetikas, Bendrasis skyrius
Sertifikatas išduotas	[redacted]
Parašo sukūrimo data ir laikas	2023-10-05 13:14:29 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2022-09-30 14:25:40 – 2027-09-29 23:59:59
Parašo paskirtis	Tvirtinimas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	[redacted] Infrastruktūros direktorius, Infrastruktūros direktorius
Sertifikatas išduotas	[redacted]
Parašo sukūrimo data ir laikas	2023-10-05 13:18:04 (GMT+03:00)
Parašo formatas	XAdES-EPES
Laiko žymoje nurodytas laikas	–
Informacija apie sertifikavimo paslaugų teikėją	EID-SK 2016, AS Sertifitseerimiskeskus EE
Sertifikato galiojimo laikas	2023-05-27 11:36:29 – 2028-05-25 23:59:59
Informacija apie būdus, naudotus metaduomenų vientisumui užtikrinti	"Registravimas" paskirties metaduomenų vientisumas užtikrintas naudojant "RCSC IssuingCA, VI Registru centras - i.k. 124110246 LT" išduotą sertifikatą "Dokumentų valdymo sistema Avily, Klaipėdos valstybinio jūrų uosto direkcija, VĮ, i.k. 240329870 LT", sertifikatas galioja nuo 2021-12-20 12:39:15 iki 2024-12-19 12:39:15
Pagrindinio dokumento priedų skaičius	–
Pagrindinio dokumento pridedamų dokumentų skaičius	–
Pridedamo dokumento sudarytojas (-ai)	–
Pridedamo dokumento pavadinimas (antraštė)	–
Pridedamo dokumento registracijos data ir numeris	–
Programinės įrangos, kuria naudojantis sudarytas elektroninis dokumentas, pavadinimas	Dokumentų valdymo sistema Avily, versija 3.5.71.1
Informacija apie elektroninio dokumento ir elektroninio (-ių) parašo (-ų) tikrinimą (tikrinimo data)	Atitinka specifikacijos keliamus reikalavimus. Visi dokumente esantys elektroniniai parašai galioja (2023-10-05 13:31:30)
Paieškos nuoroda	–

DETALŪS METADUOMENYS	
Papildomi metaduomenys	Nuorašą suformavo 2023-10-05 13:31:30 Dokumentų valdymo sistema Avilys