New building of the UL Faculty of Mechanical Engineering – Phase 1

SPECIAL TECHNICAL CONDITIONS

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1. INTRODUCTION

The subject of the public procurement order is the execution of Phase 1 of the new University of Ljubljana Faculty of Mechanical Engineering building (hereinafter also referred to as: UL FS) which, as part of the operation “Construction and establishment of the research infrastructure of the Faculty of Mechanical Engineering, University of Ljubljana (RI FS UL)”, covers the execution of preparatory and earth works, a construction pit, deep foundation works with piles, and geoprobe operations. The works will be carried out on the basis of the project for the new construction of the “Faculty of Mechanical Engineering” building, detailed design documents (PZI) project No. 362-19, September 2025, designed by IBE d.d. and SADAR + VUGA d.o.o.

The investment project for the new building of the UL Faculty of Mechanical Engineering is being planned and implemented in parallel with the project for the new building of the Faculty of Pharmacy, University of Ljubljana (hereinafter UL FFA), the project Shared access and landscaping of the FS and FFA areas, the detailed design documents for the relocation of the S 1000 gas pipeline in the OPPN65 - Biotechnical Centre area, the detailed design documents for the expansion of the public section of the DN150 water supply system to serve the Faculty of Mechanical Engineering and the Faculty of Pharmacy, and the detailed design documents for the redesign of the 20 kV MV cable loop RTP13 Vič 110/20 kV (J17) - (J09) in the area of the Faculty of Mechanical Engineering and the Faculty of Pharmacy.

These are the largest investment projects in the last few decades planned by the University of Ljubljana (hereinafter UL) in a coordinated manner.

The new building of the UL Faculty of Mechanical Engineering will provide benchmark educational and scientific-research (also high-tech) laboratory premises and equipment comparable to those of similar institutions in the developed world, thereby considerably improving the research and development capacities of the UL Faculty of Mechanical Engineering and enabling the introduction of new research programmes and directions that are key to its role as a leader of green and digital transformation.

The building will have high energy efficiency and will meet the highest standards of functionality, sustainable construction, all aspects of technical, biological and chemical safety, cost-effective construction, operation and maintenance, and will also be an architectural achievement. It will comply with the DNSH (“do no significant harm”) principles.

The new building project for the Faculty of Mechanical Engineering, University of Ljubljana has received the DGNB Gold Pre-Certificate – one of the most complex internationally recognised certifications in the area of sustainable construction. The awarding of the pre-certificate confirms the high standards of sustainable planning, energy efficiency and responsible resource management incorporated into the development of the new UL FS building.

The investor in the construction of the Faculty of Mechanical Engineering (project no.: 362-19) has opted for phased construction. The present public contract concerns Phase 1, with one or more subsequent phases to follow.

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This tender documentation (DZR) covers the construction of

- the Faculty of Mechanical Engineering / PHASE 1,

which includes:

- **the excavation of a construction pit for the faculty building,**
- **deep foundation works for the faculty building and shelter facility,**
- **geoprobing operations,**

and all preparatory, finishing and other works as described in the technical conditions of the designers' works schedule and all other documents in the tender documentation.

NOTE:

All data and information in relation to works and equipment that do not form part of this invitation to tender for Phase 1 of the new UL Faculty of Mechanical Engineering building or that form part of future phases of construction are mentioned solely for information purposes, or must be considered as appropriate/necessary in the course of Phase 1 construction.

The selected contractor must coordinate the timing and technical aspects of its activities during the execution of Phase 1 covered by this invitation to tender with the contractor of works for subsequent phases of construction, as well as with the contractors responsible for all other projects taking place in the wider construction area.

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PREPARATION OF SPATIAL PLANNING DOCUMENTATION

A Detailed Municipal Spatial Plan – "OPPN 65 Faculties near the Biotechnical Centre" (OPPN developer: ŠABEC KALAN ŠABEC – ARHITEKTI, Mojca Kalan Šabec, s.p., January 2023) was developed for the area in question between 2020 and 2023, for which the solution was obtained through an urban planning competition.

An Environmental Report for the OPPN was prepared in 2022 based on the environmental impact assessment conducted (produced by: GIGA-R, okoljsko svetovanje in rešitve, Margita Žaberl s.p., January 2022).

Technical documentation, an economic study and guidelines were prepared for the new spatial planning document and initial opinions were obtained.

Following a public display held on 20 March 2023, the City Council of the City of Ljubljana adopted a decree enacting this spatial planning document.

DEVELOPMENT PROGRAM AND ASSESSMENT OF COMMUNITY INFRASTRUCTURE CONTRIBUTION

A detailed plan for the development of building land was prepared for the area covered by the detailed municipal spatial plan 65 of the Faculties near the Biotechnical Centre (produced by: ŠABEC

KALAN ŠABEC – ARHITEKTI, Mojca Kalan Šabec, s.p., April 2024), on the basis of which the City Council of the City of Ljubljana adopted, at its 15th session on 1 July 2024, a decree on the Programme for the Development of Building Land in OPPN 65 of the Faculties near the Biotechnical Centre.

By Decision No. 3541-216/2024-4 dated 8 July 2024 the City of Ljubljana assessed a community infrastructure contribution for the planned new construction, which the University of Ljubljana paid on 9 July 2024.

DRAFTING OF PROJECT DOCUMENTATION

Based on the public tenders conducted, the drafters of the project documentation and the engineering services contractor were selected, namely the architectural firm Sadar + Vuga, the design company IBE d.d. and the engineering company LUZ d.d.

In 2020, the conceptual design (IDZ) was prepared, on the basis of which the design conditions were obtained.

Project documentation to obtain the opinions and a building permit – DGD was prepared in 2022 as well as an environmental impact assessment. All required opinions from the competent authorities and organisations were obtained on the basis of the compiled project documentation.

Based on the terms of reference, the obtained opinions and the issued comprehensive building permit, the detailed design documents (PZI) were prepared and submitted in 2025.

Upon the completion of construction, the designer will prepare the as-built design (PID) prior to submitting the application for a technical inspection.

INTEGRAL BUILDING PERMIT

On 16 July 2024, pursuant to the project documentation to obtain the opinions and a building permit (DGD, Supplement 2: Fair copy April 2024 – Faculty of Pharmacy: Project no. 176/2021, ARHEMA d.o.o., ATELIERARHITEKTI d.o.o.; Faculty of Mechanical Engineering: Project no. 362-19, IBE d.d. / SADAR + VUGA d.o.o.; Shared access and landscaping of the FS and FFA area: Project no. 380-20, IBE d.d. / SADAR + VUGA d.o.o.), the environmental impact report (produced by: GIGA-R, okoljsko svetovanje in rešitve, Margita Žaberl s.p. and E-net okolje d.o.o., May 2023), opinions obtained from competent authorities and organisations, the building permit application and the confirmation of payment of the community infrastructure contribution, the Ministry of Natural Resources and Spatial Planning issued an integral building permit for both projects (Decision no. 35105-53/2023-2550-71), which became final on 20 September 2024.

CONSTRUCTION SITE

The new building of the Faculty of Mechanical Engineering, University of Ljubljana, has a modern design and is situated within the Brdo Biotechnical Centre, which promotes interdisciplinary networking and collaboration among various members of the University of Ljubljana.

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The new building of the Faculty of Mechanical Engineering (FS) forms a coherent unit together with the existing and planned buildings of the Faculty of Pharmacy (FFA). The FS building functions as a separate entity and is not connected to other buildings.

The area concerned is located at the southern foot of Rožnik, on flat, undeveloped land between the Glinščica River to the north, agricultural land to the south, the Path of Remembrance and Comradeship (POT) to the west, and the area of existing faculties to the east. The area covers the western part of the new Brdo University Centre, where the Biotechnical Faculty (BF), the Faculty of Chemistry and Chemical Technology (FKKT), and the Faculty of Computer and Information Science (FRI) are located.

In terms of urban planning, the new FS building is designed as a compact volume with four light-filled atriums descending in terraces toward the south. This creates an urban character for the building facing the campus and a soft, green, lower volume facing the Path of Remembrance and Comradeship (POT). The building's horizontal planes are offset, enabling the FS to respond and adapt to the existing and planned site theme. The placement and appearance of the new FS building thus establish a relationship with the spatial qualities: with POT and its tree-lined avenue on the southwest side, with the existing faculties to the north and east and the broader area with Rožnik in the background.

The main traffic access to the area concerned is planned from the north, via Večna pot. The access to the newly planned faculties (Faculty of Mechanical Engineering and Faculty of Pharmacy) is shared with the Faculty of Computer and Information Science and the Faculty of Chemistry and Chemical Technology. From the traffic and technical point of view, the existing access is arranged within the framework of the broader traffic regulation and mobility plan for the entire Brdo Higher Education Centre area.

The new building of the Faculty of Mechanical Engineering is accessible on foot, by bicycle, two-wheeled vehicles, or by car. Pedestrian access is provided from the south and west via connections to POT and from the north via Večna pot (from the nearest LPP bus stop).

The landscaping between the two new faculties (which is the subject of a separate project) includes a traffic connection to the building (a ramp with an underground access) from the north side along the western facade of the existing FKKT, as well as a limited-traffic loop road around the building for delivery and emergency access.

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Figure 1 1: Positioning of the buildings in space

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In addition to the project for the new Faculty of Mechanical Engineering, several separate projects are also planned, since they are a prerequisite for the construction of the Faculty of Mechanical Engineering and obtaining of an operating permit:

1. Shared exterior and utility infrastructure for the area, including the access to the underground garage for the FS and the FFA

- Project No.: 380-20
- Construction title: Shared access and landscaping of the Faculty of Mechanical Engineering and the Faculty of Pharmacy areas
- Designer: IBE d.d. and SADAR+VUGA d.o.o.
- Investor: University of Ljubljana

2. Relocation of the S1000 gas pipeline

- Project No.: S 1000/22428
- Construction title: Relocation of the S1000 gas pipeline in the OPPN65 area – Biotechnical Centre
- Designer: ENERGETIKA LJUBLJANA d.o.o.
- Investor: ENERGETIKA LJUBLJANA d.o.o.

3. Expansion of the secondary water supply system

- Project No.: KFSFFA-D549/095
- Construction title: Expansion of the public section of the DN150 water supply system for the connection of the Faculty of Mechanical Engineering and the Faculty of Pharmacy
- Designer: d.d.
- Investor: CITY OF LJUBLJANA

4. Relocations and new routes of MV lines

- Project No.: DFSFFA-D549/095
- Construction title: Reconstruction of the 20 kV MV cable loop RTP13 Vič 110/20 kV (J17) - (J09) in the area of the Faculty of Mechanical Engineering and the Faculty of Pharmacy
- Designer: IBE d.d.
- Investor: ELEKTRO LJUBLJANA d.d.

The scope of work by the investor ELEKTRO LJUBLJANA d.d. also includes the connection of the Faculty of Mechanical Engineering building to the upgraded MV network.

In addition to the above, a separate construction project for the Faculty of Pharmacy is underway at the site, project no.: 176/2021.

For the entire duration of the construction, the constructor for the Faculty of Mechanical Engineering must coordinate its activities with the constructors of the abovementioned separate projects in terms of timing and technical aspects.

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2. ARCHITECTURAL DESIGN OF THE BUILDING

2.1 FACULTY BUILDING

The new UL FS building is designed as a modern structure of superimposed horizontal planes of various sizes and shapes. The planes are stacked crosswise from southwest to northeast, allowing for a continuous transition of green space along POT through atria and green terraces toward the existing buildings of the FKKT and FRI faculties. The positioning of the horizontal planes ensures optimal lighting of the workspaces throughout the entire depth of the building and they are adjusted to the entrance points, the shape of the plot, natural lighting and views of the surroundings from the building.

The interior passageway, which serves as the faculty's central semi-public space, connects the entrance plazas that are part of the landscaping (subject of a separate project). The passageway continues into a vertical hall extending the full height of the building. Elevators and staircases of the hall connect all floors of the building. The space of the passageway and the vertical hall is naturally lit through two atriums.

The passageway and the vertical hall serve as connecting areas, a place for student work and socialising, as well as a venue for special events on the terrace level. They are the most attractive locations in the building and used as the hub of social interaction and activity within the building.

The building has four large, green atriums. They provide natural lighting for the connecting areas and laboratories. Their positioning specifies the logic of circulation across individual floors and allows views of the surroundings.

2.1.1 Floor plan dimensions and capacity

The Faculty of Mechanical Engineering building is rectangular in plan, with built dimensions (L x W) of 137.8 m x 91.6 m. Including overhangs, the maximum floor dimensions are 141.3 m x 93.6 m and the underground part 139.7 m x 96.4 m (L x W).

The parapet of the terrace floor is at elevation +19.95 m. Machinery and electrical equipment are installed on the roof of the building, which is at elevation +19.40 m, owing to which access to the roof is also envisaged via the staircase at axis A/9-10.

2.2 SHELTER FACILITY

When designing the UL Faculty of Mechanical Engineering building in Ljubljana, which is a building dedicated to regular educational activities, due regard was paid to the requirement of the Decree on the construction and maintenance of shelters (Official Gazette of the Republic of Slovenia, Nos. 57/96 and 54/15), which requires developers of buildings dedicated to regular educational activities for more than 100 participants of an educational programme in urban areas with more than 10,000 inhabitants to integrate a shelter providing basic protection into the building.

The shelter is envisaged as being partly below ground level and partly covered with earth, with two dual-purpose shelters offering basic protection.

A fenced area for recreational sports activities will be situated on the roof of the building. Access to the recreational area will be via stands on the northern side of the building and via a lifting platform in the NW corner of the building.

The western façade and part of the southern façade will be dressed in composite aluminium façade panels over a standard substructure. The eastern section and part of the southern section will be covered with earth and greened.

Driveways, access routes, and handling, parking, emergency and green areas will be laid out as the new building is constructed, and the building connected up to the necessary utilities infrastructure.

3. CONSTRUCTION

3.1 PROTECTION OF THE CONSTRUCTION PIT

Because of the geomechanical properties of the soil as established, as well as the envisaged depth of the work and the fact that construction is to take place in the vicinity of municipal infrastructure, the entire perimeter of the excavation/construction pit will have to be protected by an adequate temporary protective structure that will remain in place for the duration of excavation of the construction pit or the construction of the basement part of the building (a maximum of two years).

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Protection of the construction pit is designed as protection of the excavation using a vertical protective structure: a steel sheet pile of the Larssen VL604 type, with a length of up to 16 m. In order to support the retaining structure of the deep excavation of the construction pit, temporary geotechnical anchors will have to be installed at two levels. These will comprise steel cables of strength f_y/f_u = 1,660/1,860 N/mm² and with a minimum cross-sectional area of 1.5 cm² (0.6") per steel strand. All anchors, with the exception of those used for testing, will be four-cable (4 x 0.6").

NOTE

Only when the contractor for Phase 2 of the new UL FS building has completed work on the reinforced structure to an elevation of 0.00 will it be possible to remove the sheet piles and geotechnical anchors and execute the backfilling.

3.2 GEOMECHANICAL SURVEY AND FOUNDATION WORK

The Faculty of Mechanical Engineering (Slovenian abbreviation FS for Fakulteta za strojništvo) is located alongside the Glinščica watercourse, on marshy soil with relatively poor load-bearing capacity and groundwater approximately 0.50 to 1.5 m below the ground. The composition of the soil is summarised in the Geological/geotechnical study produced by the IRGO Consulting d.o.o. company from Ljubljana. The study has a reference number of 3009776 and is dated January 2021.

The ground at the location of the FS building is generally level and located at a height above sea level of approximately 297.5 m. In view of the established composition of the soil at the construction location, where there is a fairly compactible layer, with poor load-bearing capacity, of thick clay and silty sand of variable thickness across the site, and the design of the building itself, the foundation must be executed as deep foundations on sunk reinforced concrete piles.

A suitable layer for the foundation piling appears at the site at a depth of 18 m or more below the current ground level or at a height above sea level below approximately 279.5 m.

The locations of the piles are mainly centrally below the building's columns. To absorb the force in the columns bearing the greatest load, the loads will be distributed via reinforcements in the floor slab to two piles. The thickness of the reinforcement with the slab will be 140 cm, as will the thickness of the slab at the deepenings resulting from the shafts.

The installation of piles at the bottom of the construction pit of the faculty building and the shelter is envisaged.

The following piles are envisaged for the foundation work:

- FS building 452 piles with a diameter of 100 cm and 120 cm and a length of 25 (28) m.
- shelter 78 piles with a diameter of 80 cm and a net length of 16 m.

3.3 LANDSCAPING

As an element of landscaping, the plan includes the development of access, delivery, and emergency routes along the southern perimeter of the building. This is part of the shared landscaping, which is functionally oriented somewhat more toward the UL FS building with the shelter facility and includes a southern delivery and emergency route that connects the western and eastern plazas along the southern side of the UL FS building providing access from the south. The

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landscaping also comprises the contact between the shared landscaping and the building. The area of the FS landscaping is shown in the graphic section of the project (marked as the FS area).

The landscaping of the UL FS building shall follow the same layout and design as the shared landscaping, which is explained in more detail in the project "Shared access and landscaping of the Faculty of Mechanical Engineering and the Faculty of Pharmacy areas," project no.: 380 -20. The landscaping is supplemented by the traffic engineering plan and the landscape architecture plan.

4. MECHANICAL ENGINEERING

4.1 HEATING AND COOLING

The building will be heated and cooled by a heat pump and cooling unit capable of producing heating and cooling water at the same time. During the winter, when the building needs to be heated but the research process cooled, heat will be transmitted efficiently via these installations. In summer, when both the building and the research process need to be cooled, the heat will be used to heat sanitary hot water. Heating or cooling surpluses are offset indirectly using shallow geothermal energy from the geoprobes below the building.

The shallow geothermal energy extraction study was produced by Irgo Consulting d.o.o., Study No. 3015896, January 2023. Key points from the study:

- the study addresses both UL faculties at the site: the Faculty of Mechanical Engineering (FS) and the Faculty of Pharmacy (FFA)
- the well water is not suitable as a source of heating or cooling because the flows are insufficient
- for long-term use of the geoprobes, it is important to balance the system from this source between heating and cooling

The geoprobes below the FS building are distributed at a distance of 6–8 m in a grid between the piles: 230 geoprobes are envisaged at a depth of up to 140 m. The geoprobes are expected to extend, depending on the height of the building, from -9.2 m to -139.2 m.

5. CONNECTIONS TO UTILITIES INFRASTRUCTURE

FS water supply system connection is foreseen at the southeast corner of the building.

Connection to the gas pipeline network

The building of the Faculty of Mechanical Engineering will be connected to the natural gas infrastructure pipeline via a new connection line running between the FS building and the shelter facility.

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Connection of the FS substation to the MV distribution network

The new FS substation is located on the ground floor on the south side of the FS building and will be integrated into the public MV distribution network operated by Elektro Ljubljana. The connection of the FS substation to the MV network is foreseen in electrical cable duct KJ3a. Two cable conduits will be placed in the cable duct to the MV switchgear in the FS substation. The first is connected to the +SN_P1_TP_J2 busbar, the second to the +SN_P1_TP_J1 busbar. In the KJ3a cable duct, these two cable conduits are spliced with cable conduit KBV2 using appropriate cable connectors.

Connection to the optical telecommunications network

The building will be connected to the optical telecommunications network on the south side via the new TK FS shaft on the new TK cable duct, which is planned in a separate project south of the FS building: Shared access and landscaping of the Faculty of Mechanical Engineering and Faculty of Pharmacy areas, Project No.: 380 -20.

Connection to the municipal wastewater sewerage network

The new internal municipal wastewater sewerage line from the FS building runs along the northern facade of the building to the connection point with the existing reconstructed internal municipal wastewater sewerage at the southwest corner of the FKKT building. The reconstruction or new internal municipal wastewater collection system from the faculty area is comprehensively addressed in the framework of a separate project, Shared access and landscaping of the Faculty of Mechanical Engineering and the Faculty of Pharmacy areas, project no.: 380 -20. The connection to the existing public municipal wastewater sewer on the left bank of the Glinščica River is also part of the abovementioned separate project.

Connection to the internal rainwater drainage network

Rainwater from the roofs of the FS building will be partly directed via an internal gravity system on the building's floors into a negative pressure rainwater drainage system, which will run beneath the garage ceiling on the basement level. The roofs of the building are partially drained by gravity via downspouts in the facade. The interior atriums are also drained by gravity beneath the garage ceiling in the basement level. To prevent water backflow (and animals entering the pipes), the outlets from the atriums are equipped with check valves on the pipes before the connection to the common internal rainwater drainage system.

Clean rainwater from the roofs of the building will be directed via a vacuum system directly into a new clean rainwater tank on the north side of the FS building (part of the project "Shared access and landscaping of the FS and FFA areas," Project No. 380 -20). The gravity section of the clean rainwater drainage system is connected to the common internal rainwater drainage system, which is part of the project "Shared access and landscaping of the FS and FFA areas," Project No. 380-20.

The roofs of the FS building are partially designed as paved terraces, gravel-filled areas and green roofs, which help reduce peak runoff. All clean rainwater gravity drains from the roof of the building are routed into the internal rainwater sewer system via sand traps.

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All new paved traffic areas of the landscaping to be used for delivery and emergency purposes will be constructed as impermeable surfaces. Rainwater from the paved traffic areas will be drained towards the linear drains via longitudinal and transversal slopes and via an oil separator into the internal shared rainwater sewer system.

Rainwater from the recreational area on the roof of the FS shelter facility will be drained by gravity via linear channels to sand traps along the shelter facility and into the new shared internal rainwater drainage system.

Due to high groundwater levels at the site (1.0–2.0 m below ground level), infiltration of large volumes of clean rainwater is not possible; a gravity discharge of clean rainwater via existing and new retention basins into the Glinščica stream is therefore planned. The construction of retention basins and the discharge of clean rainwater into the Glinščica stream is the subject of a separate project: Shared access and landscaping of the Faculty of Mechanical Engineering and the Faculty of Pharmacy areas, Project No.: 380-20. Full concrete encasement of all pipes is planned due to high groundwater levels.

Hydrant network

To ensure adequate fire safety for the new faculty buildings and their connection to the water supply system, a new public secondary water supply system (water supply and hydrant), which runs along the south side of both new buildings and is not part of this project (part of a separate project: Expansion of the public section of the DN150 water supply system for the connection of the Faculty of Mechanical Engineering and the Faculty of Pharmacy, Project No. KFSFFA-D549/095) is foreseen.

Waste management

The municipal waste area – a collection point measuring approx. 82 m² – is located in the northwest corner of the building's basement, next to the access ramp to the underground garage. It will have drainage and ventilation as part of the garage.

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6. REQUIREMENTS FOR THE CONTRACTOR OF GOI WORKS DURING CONSTRUCTION

All requirements for the contractor of GOI works listed below must be included in the prices of individual items and incorporated into the final bid price.

6.1 Active cooperation, coordination, and collaboration of the contractor of the relevant GOI works

with other contractors, subcontractors, and all other participants in Phases 1 and 2 of the new construction of the UL FFA, construction works for the project "Shared access and landscaping of the Faculty of Mechanical Engineering and the Faculty of Pharmacy areas" and with the contractors of the utility infrastructure that is the subject of separate detailed design documents (relocation of the gas pipeline, expansion of the secondary water supply system, and relocation

and rerouting of medium-voltage power lines), and all other contractors of the investment project "Construction and establishment of the research infrastructure of the Faculty of Mechanical Engineering, University of Ljubljana" (RI FS UL). The contracting authority is expected to carry out the following works necessary for the project in cooperation with other contractors for the new UL FS building project:

- interior fittings,
- laboratory furniture,
- laboratory equipment,
- clean rooms,
- audio and video equipment (multimedia),
- food distribution technology,
- works of art,
- other works for the completion of the building and landscaping,
- relocation and construction of gas pipelines, DEE network (MV lines), public water supply and other public infrastructure.

Individual works that are not part of GOI works:

- *The contractor Energetika Ljubljana d.o.o. will relocate the existing S1000 gas distribution pipeline and replace this section of the pipeline in the area of the new UL FFA building, with the exception of site preparation for construction, final road and site construction and organisation of the construction site.*
- *As part of the investment project of constructing the new building of the UL FFA, the contractor Elektro Ljubljana d.d. will carry out all construction and electrical installation works for the relocation and replacement of the DEE network, which includes the reconfiguration of the 20 kV MV cable loop RTP13 Vič 110/20 kV (J17) - (J09). The reconfiguration includes:*
    - *Reconfiguration of the existing MV overhead line, replacement of SM41 with the installation of a new tension pole Z12, surge protection for the transition to the cable network, verification of tension forces on the existing SM40, and control of safety clearances in the span between SM40 and SM41;*
    - *Replacement cabling of a part of the existing MV overhead line network with cable joints and removal of the existing SM42, SM43, SM44;*
    - *Relocation of the existing MV cable network to new cable ducts between the new cable shafts (KJ1 – KJ5) with MV joints and demolition of a part of the existing cable ducts.*
- *The contractor JP VOKA SNAGA d.o.o. will expand and construct a public section of the DN150 secondary water supply system for the connection of UL FS and UL FFA. The new secondary water supply system will be constructed with a diameter of NL DN150 as an extension to or expansion of the existing secondary water supply system.*

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6.2 Compliance with the EIA provisions

The contractor of GOI works must comply with the provisions of the document **Environmental Impact Report** No. 100123-11523, prepared by GIGA-R d.o.o. and E-NET OKOLJE d.o.o.

6.3 Quality assurance

a) DESCRIPTION

Quality assurance is an integral part of the project's technical and economic study. The first part of quality assurance is related to materials, equipment and construction products installed in the structures and the landscaping of the area, including quality control. The second part pertains to the quality control of the execution of the work itself. This involves planning (preparation of the programme and quality control for installed materials, equipment, and construction products, as well as execution of works: the type and number of necessary inspections, tests, measurements, evidence...) to ensure the prescribed quality and assurance of the essential features required by law throughout the entire life span of the structures and the related landscaping.

The existing legislation governing the construction of structures (the Building Act, the Construction Products Act and other regulations) prescribes the procedures for ensuring and demonstrating the quality of construction materials, products, and semi-finished products – construction products – as well as the execution of works. Technical specification (TS) must be prepared for each individual type of work in accordance with legal requirements.

b) HEAD OF QUALITY ASSURANCE

The tenderer is required to ensure quality management and internal quality control and to appoint a professionally qualified head of quality assurance (a quality engineer with experience in the field of quality assurance and control in construction, such as for example the development departments of construction companies or departments in charge of technical preparation of works, performing activities as the person responsible for organisation and implementation of internal quality control of the principal contractor, etc.) who shall assume the following tasks:

- responsibility for coordinating and carrying out all the necessary activities for smooth and continuous quality assurance until the completion of construction, the issue of operating permit and successful handover and acceptance;
- responsibility for coordinating and leading the project team to perform regular quality control of installed materials and work execution – internal quality control by the responsible contractor for the entire duration of works execution until the completion of construction, the issue of operating permit and successful handover and acceptance;
- the head of construction and the head of quality assurance are the persons responsible for regular assurance and continuous achievement of the prescribed quality of installed materials, equipment and construction products, as well as the

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execution of all works throughout the entire duration of the project until the completion of construction, the issue of operating permit and successful handover and acceptance;

- responsibility for appointing and coordinating experts performing regular quality control of installed materials, equipment and construction products, as well as the work performed under each individual type of GOI works – own qualified experts, regular cooperation of specialised institutions (insulation, mechanical installations, electrical installations, etc.);
- organisation of regular and continuous implementation of all activities for the assurance and control of the quality of installed materials, equipment and construction products, as well as the execution of works, including the prescribed quality control: timely preparation of technical specifications (TS must be submitted for approval 30 days prior to the beginning of work; approved specifications must be delivered to the construction site at least 7 days prior to the start of individual works), assurance and control of quality in accordance with the approved TS, with quality control plan as an integral part (approved frequency and methods of checking, measurements, evidence, etc.), preparation and review of regular weekly records and monthly reports on quality control of installed materials, equipment and construction products, as well as completed works and achievement of prescribed quality standards; drafting of final reports on achieved quality for each individual type of work; all reports must be approved by the control manager, etc.;
- drafting of appropriate quality assurance coordination scheme (planned activities, responsible persons and experts for implementation, reports and records, etc.) for the entire duration of all works until the completion of construction, the issue of operating permit and successful handover and acceptance;
- immediate suspension of individual works in case the prescribed and appropriate quality is not achieved, and prompt preparation of problem reports (findings reports) and measures to eliminate all identified deficiencies and defects;
- responsibility for ensuring the quality of installed materials, equipment and construction products, as well as the works performed by subcontractors and other contractors on the construction site in the same scope and under the same conditions and requirements; own quality assurance and control of subcontractors and other contractors, as well as suppliers of materials, equipment and construction products intended for installation. If the contracting authority so requests, the contractor shall order special investigations to be performed by an organisation designated by the contracting authority. If a suspicion of non-conformity of materials or works performed is substantiated, the contractor shall be obliged to cover the costs of such investigations;
- coordination and regular cooperation with the contracting authority's authorised representatives in the area of quality assurance: head of supervision and supervisors for specific types of work.

The bases for quality assurance and control are: project and tender documentation, professional standards, applicable legislation and technical specifications, consideration

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of the state-of-the-art in construction technology, which represents the current level of development of technical capabilities of construction products, processes and services based on established science, technology and experience in the field of building construction.

6.4 Tenderer's obligations

Prior to submitting a bid, the tenderer must review the entire tender documentation, including the annexes. The contracting authority recommends a site visit to assess the required scope and complexity of work and the organisation of construction.

Regardless of the information contained in the tender documentation, the tenderer must, prior to submitting a bid, obtain all information relating to the subject matter of the contract under this tender documentation and that could affect the subject matter of the contract, the bid price or the tenderer's obligations. The tenderer shall not be entitled to any price increase justified by the fact that they were not informed of all the conditions and status of the subject matter of the contract.

For the duration of the tender and the contract, communication (both written and oral) between the contractor and the contracting authority shall be in the Slovenian language.

When preparing the tender and calculating unit prices for individual items, the tenderer must take into account that the tender price must, among other things, include the works and costs to be covered by the tenderer, as listed below, in particular:

- the costs related to the contracting authority's requirements and conditions specified in the bills of quantities;
- the costs of preparatory works;
- the costs of ensuring occupational safety and health, especially all works and measures arising from the provisions of applicable occupational safety regulations and the requirements of the Safety Plan;
- the costs of drafting a study of the existing situation prior to the beginning of construction, in which the existing situation of the site, the existing situation of the neighbouring structures, the surroundings of the structure, and the road surfaces to be used during construction are determined and documented in the form of written records, photo documentation and video recordings; the contractor is obliged to deliver a copy of the video recording (USB drive) to the contracting authority or the supervisor;
- the costs of drafting a construction site organisation plan with a detailed schedule and a plan of construction access roads, including the connection to the public road and the arrangement of the traffic regime on public roads for the duration of construction, obtaining the relevant permits;
- the costs of participation in operational meetings at the construction site;
- the costs of transportation, shared use of auxiliary facilities, installations and insurance at the construction site;

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- the costs of obtaining all necessary approvals and permits related to road excavations, road closures, transports, crossings of utility lines, costs of protecting the utility infrastructure and various fees and costs of operators or their representatives;
- the costs related to transport on public roads and highways: any compensation, any road repairs due to damage during construction, provision of necessary temporary areas for transport routes and construction outside the construction site;
- the costs of restoration after the completion of works and the restoration of surrounding land and structures, as well as the work zone and all construction areas, to the original state and the repair of any damage caused by construction to the existing infrastructure, utility lines, other structures, facilities, areas and access roads, landscaping, as well as utility, traffic, and energy infrastructure (permits, compensations, etc.);
- the costs related to the registration, installation, insurance, organisation, fencing, security and protection of the construction site and construction facilities, staking of existing utility lines within the construction site by the operators, installation of construction signs and traffic signage and restoration of the roadway at the construction site access/exit in accordance with the municipal ordinance, ensuring adequate safety on the construction site;
- the costs of insurance during the execution of works and insurance of workers and materials on the construction site during the execution of works, from the beginning until the handover and acceptance of the building. The insurance must be taken out with an authorised insurance company;
- the costs of controlling access to the construction site;
- security of the construction site (video surveillance, technical security), including vehicle records, security of the construction site during times when the contractor is not on site, for the entire duration of construction until the final handover and acceptance;
- the costs of official site staking, staking protection and all necessary surveying work for the entire construction period, as well as the transfer of all elevations and axes;
- the costs of setting up temporary landfills, regular maintenance and cleaning of the construction site and its surroundings;
- the costs related to compliance with environmental protection legislation;
- the costs related to the storage or temporary warehousing of waste generated during construction work, sorted by type of construction waste from the waste classification list, so that they do not pollute the environment, as well as all fees and costs of removal of excavated material to temporary and permanent landfills, including the costs of all necessary investigations, studies and fees for obtaining the relevant permits, record sheets and the preparation of a Construction Waste Management Report. The selected tenderer must submit a certificate of appropriate and controlled disposal of excess material to the supervising authority, all in accordance with the latest applicable Decree on management of waste arising from construction work and other legislation in the field of environmental protection;

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- the costs related to compliance with the Decree on the prevention and reduction of particulate emissions from construction sites, including a particulate matter emission report;
- the costs of installing and removing, upon completion of construction, temporary storage areas and a temporary structure with office space for operational meetings, including regular maintenance and cleaning;
- the costs of all works needed to prepare and restore the facilities to a suitable condition for the beginning or continuation of work (removal of temporary protective measures, removal of water, protection of temporary landfill of excavated material and other necessary safety measures from the takeover of work from the previous contractor and commencement of work until project completion);
- the costs of all necessary tasks prescribed and specified by the applicable occupational safety regulations, such as protection of openings, shoring, slopes, expansions and similar;
- the costs of preparing the land for the relocation and construction of the gas pipeline, final restoration of roadways and land and construction site organisation;
- the costs of cooperation and coordination with the contractor of the relocation and construction of the gas pipeline – Energetika Ljubljana d.o.o.;
- the costs of cooperation and coordination with the contractor of the relocation and construction of the DEE network (MV lines) – Elektro Ljubljana d.d.;
- the costs of cooperation and coordination with the contractor of the construction of the water supply system – JP VO-KA SNAGA d.o.o.;
- the costs of water, electricity, internet connection and other construction site connections and other operating costs (rental of construction equipment, cleaning of portable toilets, etc.) for the entire duration of construction until final handover and acceptance;
- the costs of geomechanical inspection of foundation ground before and during foundation works, supervision of execution, and preparation of a report;
- the costs of appropriate protection of the excavation pit for the building and other minor individual excavations for the construction of utility infrastructure without encroachment on neighbouring lands;
- the costs of leasing sheet piles for a period of 12 months with the guarantee of a fixed monthly lease price for a 24-month period and the option of transferring the lease contract to the contractor of Phase 2 of the new UL FS building;
- coordination of archaeological supervision, if required;
- the costs of performing control measurements during and after the securing of the construction pit;
- the costs of all necessary measures to secure the construction site and its surroundings, as well as neighbouring structures and infrastructure during construction, with an emphasis on the safety of workers and passers-by;

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- the costs of any agreements on the use of adjacent land at the contractor's request, since construction is taking place in the immediate vicinity of the boundary;
- the costs of additional measures due to the fact that works would be carried out in winter conditions and during the rainy season;
- the costs of all necessary basic, auxiliary, mobile and facade scaffolding and fencing to ensure continuous work, GOI works and cleaning of all elements upon the completion of works;
- the costs of anti-corrosion protection for all metal elements and structures that could be exposed to atmospheric and other corrosive impacts;
- the costs of grounding, concealed and connected to the building's general grounding system, for ALU and steel elements, in accordance with regulations;
- the costs of working in retaining wall sections due to difficult geological conditions; the costs of complex excavation in wet terrain, excavation in water, crossing of streams, etc.
- all works for the drainage of rainwater, source water, and groundwater during construction (including the necessary pumping), removal of snow, to ensure continuous and controlled drainage and prevent water retention and waterlogging of excavated or backfilled materials as well as buildings under construction;
- regular removal of all waste and auxiliary materials, cleaning of buildings, the surrounding area, transport routes, access points, and public access roads, and final rough cleaning of buildings and individual rooms prior to each quality inspection and prior to handovers and acceptances;
- construction and removal of all necessary temporary crossings and protective barriers, costs of potential changes to traffic regime and construction site paths;
- removal of all obstacles encountered during work, except for those of cultural and historical significance;
- preparation of a technical and economic study;
- regular and final terrain cleaning after the completion of works and removal of excess material, connection with the existing temporary or permanent arrangements in adjacent areas;
- the costs of setting up a closed and covered space for the inspection of all key materials to be installed in the building based on approved material samples; a sample of each finishing material is installed in the building, the unit constructed as a whole including exterior parts, a sample of the facade, fixtures and fittings, balcony railings, etc., in accordance with the schedule and the contracting authority's instructions, approval is obtained from the designer, supervisor and the contracting authority
- for the drafting of technical specifications for individual types of work and quality control programmes for monitoring the quality of materials, equipment and work performance in accordance with the applicable legislation and the contracting authority's internal guidelines;

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- - the costs of the performance of quality controls of all installed materials, equipment and works in accordance with the project and tender documentation and the applicable legislation, standards and regulations (measurements, certificates, tests, etc.) and in accordance with the programme setting out the average frequency of tests for internal controls of works, which has been approved by the supervisory authority, and the sending of the findings of the internal quality controls to the contracting authority;
- the costs of removing unsuitable materials and repairing inadequate work so as to ensure compliance with professional standards;
- pressure tests, disinfection of installations, flushing;
- the costs of air permeability tests of building elements;
- cleaning and flushing of the sewer system, performing a sewer leak test, inspecting the sewer system with a camera robot, including delivery of a video recording;
- the costs of supervising the implementation of project-specific fire safety measures, preparation of a fire safety report and fire safety regulation;
- the costs of all necessary measurements of electrical and mechanical installations required by the supervisory and inspection authorities;
- the costs of sound insulation measurements for all constructions and installed elements; the measurement results must comply with the requirements of the applicable regulations or standards, as well as the compiled noise protection study for buildings and noise protection certificate. The contracting authority or the head of supervision will not accept any works that do not meet the conditions set forth in this paragraph and will require such works to be redone;
- the costs of supervising the implementation of project-specific noise protection measures, the drafting of a noise protection certificate for the building upon the completion of construction, and the performance of the required noise measurements for individual rooms;
- the costs of start-up and trial operation, as well as training of the building manager;
- the costs of obtaining approvals from the public utility and energy infrastructure operators (approving authorities) and, if confirmed in the documentation at the contractor's request, the cost of extending the PZI project approvals and connection approvals, together with the related costs;
- the costs of construction site insurance and insurance for unforeseen events and damages up to the full value. The insurance must be taken out with an authorised insurance company and must be in effect until the handover and acceptance of the building;
- the costs of preparing a security plan in accordance with occupational safety and health legislation for temporary and mobile construction sites, which must be coordinated with the contractor's construction site organisation;
- a survey of completed works;

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- the costs of conducting a trial operation of the entire building with a focus on all installations;
- preparation of an energy performance certificate for the building;
- preparation of a building energy performance statement;
- the costs of regular recording of changes during the construction or deviations from the PZI documentation, including the costs of preparing a description of the changes and the handover of the templates or drawings at the PZI level with included changes made during construction as a result of changes to project solutions, replacement of materials or equipment, which serve as the template/basis for the preparation of the PID documentation;
- the costs of designing changes to the PZI documentation due to the changes in individual project solutions proposed by the contractor; prior to ordering a change, the contractor must obtain approval for the proposed change from the project manager, the head of supervision and the contracting authority;
- the complete required documentation specified by the applicable legislation in the area of building construction as an integral part of the application for the operating permit, including all attachments (survey plan of the new land status after construction, evidence of building reliability, maintenance and operation instructions, all of these for all works for which an operating permit is being obtained;
- all costs up to the point of handing over of the building to the contracting authority, such as: consumption of electricity, water, heating, security, janitorial services, regular and final cleaning (prior to quality inspections, prior to handover and acceptance and after each repair of defects), protection of works, risk of damage or destruction;
- the use of the contracting authority's platform for communication and storage, sharing of project and technical documentation, reports, status updates, etc. (Common Data Environment - CDE). Should the contracting authority use specific software for managing the project of executing contractual works, the contractor shall supply the relevant data to the contracting authority and its authorised representatives and use the selected software in the manner specified by the contracting authority;
- assembly and shop drawings must be prepared in a manner suitable for execution and approved by the project manager;
- the costs of ensuring sustainable construction and obtaining a gold certificate under the DGNB sustainable construction certification system. Only materials that do not adversely affect human health or the environment shall be used for the construction. For this purpose, the UL tender annex "03_JULFS--6X9001#DGNB_Razredi_SI" shall be used;
- the costs of preparing and submitting documentation and information required to obtain a sustainable construction certificate under the DGNB system;
- the costs of infrastructure connections;
- the costs of covering the damage caused by the contractor to the building or its surroundings (damage to paving, staircases, roofs, walls, building fixtures and any other constructed elements);

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- the costs of surveying services during construction (building stake-out, elevation surveys, structural verticality checks, setting up of construction profiles, etc., for the entire duration of construction and for all works);
- the costs of preparing the handover and acceptance documentation, which must include the complete documentation, especially declarations of conformity, a fire safety certificate, a certificate of inspection of the PID EEO (EX study), and other statements and mandatory tables. The contractor must prepare and submit in a timely manner the certificate of building reliability (DZO), all required studies, a certified survey of the as-built situation, certificates and attestations of installed materials and equipment, test and measurement records, instructions for use and maintenance, and all other documents foreseen by the regulations and contractual provisions.
- all other works-related costs, including for technical inspection;
- costs for active cooperation, coordination and the smooth progress of work of other contractors on the project to be selected by the contracting authority, and organise work in such a way that other contractors are inducted into the work in a timely manner, especially contractors, subcontractors and all other participants engaged by the contracting authority within the scope of this contract or for subsequent phases of the new UL FS building and the supply and installation of equipment, and all contractors that perform work in connection with the construction of the new UL FFA building, the execution of the shared access and landscaping project for the UL FS and FFA areas, the execution of the project to relocate the S1000 gas pipeline in the OPPN65 area - Biotechnical Centre, the implementation of the project for the expansion of the public section of the DN150 water supply system for the connection of the Faculty of Mechanical Engineering and the Faculty of Pharmacy, and the implementation of the project for the redesign of the 20 kV MV cable loop RTP13 Vič 110/20 kV (J17) – (J09) in the area of the Faculty of Mechanical Engineering and the Faculty of Pharmacy, including all other contractors on the site (MOL, JP VOKA SNAGA, ELEKTRO Ljubljana, ENERGETIKA LJUBLJANA,…), all up to the completion of works under this contract;
- costs for work with the contractor of Phase 2 of the new UL FS building and coordination of the performance of works with them in order to ensure that the contractual obligations are performed in good time and that the transition to Phase 2 is as quick and smooth as possible, whereby individual Phase 2 works can take place in parallel with Phase 1 works;
- the costs of cooperation, coordination and alignment with all other contractors within the scope of the operation “Construction and establishment of the research infrastructure of the Faculty of Mechanical Engineering, University of Ljubljana” (RI FS UL);
- The selected contractor may, at all locations (contractually agreed estimate) where the required material or equipment is specified by brand, type, or manufacturer, offer material or equipment that is at least equivalent to the required specifications, especially in terms of: technical characteristics, quality, durability, design comparability and suitability, environmental acceptability, maintenance and servicing costs, availability of replacement parts, service responsiveness, state-of-the-art technology, warranty and life span of individual material or equipment, etc. In the event of a replacement of material or equipment, a technical study must be compiled for each offered material or piece of

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equipment to demonstrate equivalence and ensure essential features; Prior to installation, the equivalence of the material or equipment must be confirmed by the designer, the supervisor and the contracting authority. If the material, equipment or construction product does not comply with the requirements, the burden of proof lies with the tenderers.

6.5 Compliance with sustainable construction requirements under the DGNB certification system

All of the following requirements for the GOI works contractor must be included in the unit prices of individual items and in the final tender price.

The project in question will be constructed using the certified sustainable construction system: DGNB, which focuses on ecological, economic, social and technical sustainability. It is a comprehensive source of information on sustainable construction, materials and measures that ensure more sustainable future-oriented buildings.

DGNB certification offers various certification levels. The requirement for the project in question is to achieve the gold DGNB certificate, which the contractor must factor into the tender price. Only materials that do not harm human health or the environment shall be used for the construction. The requirements and additional measures related to this assessment within the certification process were taken into account for pre-certification during the design phase. It is essential that these criteria are considered and implemented during the actual execution – construction of the building.

In addition to the project solutions, the contractors and subcontractors of all works are required to comply with the requirements for supplied and installed materials and components as well as additional requirements regarding:

- Installation quality assurance
- Observe and implement measures to reduce dust and noise emissions, prevent the risk of soil and groundwater contamination with hazardous substances and properly collect and separate waste on the construction site.
- Use construction materials and install equipment that do not harm human health or the environment and that meet the requirements of the project documentation for achieving DGNB Quality Level 3 and/or 4 in accordance with the attached DGNB materials table (»03_JULFS--6X9001#DGNB_Razredi_SI«).
- Regularly collect the relevant documentation pertaining to installed materials and equipment, including the manufacturer's or supplier's declaration that the requirements of criterion ENV1.2 are met, as required by the attached table (»03_JULFS--6X9001#DGNB_Razredi_SI«).

Contractors and subcontractors are required to appropriately document the installed materials and perform regular quality control of the installation, which is necessary to avoid incorrect installation that would only be detected upon completion of the building. The contractor shall be required to ensure that the information and supporting documents are available in the appropriate format and with the content as required by the DGNB certificate.

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During the project, **the contractor must appoint a certification coordinator in the field of sustainable construction according to the DGNB system** to perform the following tasks:

- Advising the contracting authority and the contractors on the requirements of the DGNB certification system,
- Advising the contractors and subcontractors on finding alternative suitable materials (related to DGNB requirements),
- Checking the accuracy and completeness of documentation (ENV1.2 requirements – requirements related to hazardous substances – and ENV1.3 requirements – requirements related to the origin of materials),
- Monitoring the contractors' activities in accordance with DGNB requirements (noise, dust, spills, waste, worker informing, regular quality control, documentation upon completion, handover and acceptance, assistance in preparing the rooms for indoor air quality measurements, etc.),
- Visiting the construction site at regular intervals and documenting observations – as an additional independent supervision from the point of view of DGNB requirements (pointing out irregularities that could affect the final quality),
- Collecting and organising the relevant supporting documentation provided to them upon request by contractors or the contracting authority,
- Recording any deviations from the PZI project documentation and promptly forwarding the information to the contracting authority, the supervisor and the designer. Entering the approved changes into the PID templates,
- Submitting the prepared and organised evidence to the DGNB auditor and, if necessary, coordinating the details with them to achieve a better final result,
- Compiling the final table of constructions and materials (from the PID documentation), verifying the completeness of the information contained therein and assisting the designers in determining the quantities (primarily kg), which serve as the basis for conducting the LCA analysis and other calculations,
- Ensuring the smooth flow of information among all project stakeholders relevant to obtaining the DGNB certificate and the DGNB auditor authorised by the contracting authority,
- Training all the participants and familiarising them with the relevant concepts, studies and documents that define sustainable construction practices for the following areas:
    - noise protection,
    - dust protection,
    - soil and groundwater protection,
    - construction waste management.

During the project, the contractor must prepare and submit the documentation and information required to obtain the sustainable construction certificate under the DGNB system.

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6.6 Management of the Common Data Environment (CDE) – contractor's obligation

All of the following requirements for the GOI works contractor must be included in the unit prices of individual items and in the final tender price.

The Common Data Environment (hereinafter: the CDE environment) is intended to serve as the primary hub for the exchange and transfer of information. It is anticipated that all communication will take place within the selected CDE environment.

The use of the selected Common Data Environment is mandatory for contractors, subcontractors and stakeholders involved in every construction phase.

6.6.1 Roles and responsibilities of the principal contractor's CDE coordinator

The principal contractor must appoint a responsible person within the team to perform the duties and responsibilities of the CDE coordinator, who shall be responsible for the appropriate use of the selected shared CDE environment throughout the construction process.

Prior to commencing work, the contractor of GOI works shall set up a test environment and demonstrate the professional competencies of the team. The principal contractor must also appoint a responsible person within the team to perform the duties and responsibilities of the CDE coordinator, who shall be responsible for the appropriate use of the selected shared CDE environment throughout the construction process.

6.6.2 Definition of processes to be carried out during construction as part of the use of the Common Data Environment (CDE)

A. Communication processes

The principal contractor and other contractors shall be required to participate in various communication processes. The goal is to ensure that all operational communication takes place within the selected CDE environment

- Requests for assistance
- Requests for information

B. Recording processes

The principal contractor and other contractors shall be required to participate in various recording processes.

- For recording identified changes and deviations (recording of changes during construction)
- For recording detected non-conformities or quality control of execution
- For collecting documentation in accordance with the requirements for obtaining the DGNB certification

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- Occupational safety
- Schedules

C. Processes for approving materials, equipment, technical documentation and project documentation

The principal contractor and other contractors shall be required to participate in various approval processes.

- Protocol 1: for approving substitution
- Protocol 2: for approving samples
- Protocol 3: for approving workshop drawings and technical specifications
- Protocol 4: for the approval, submission and review of 2D and 3D documentation
- Other protocols, if the need arises during construction

D. Additional obligations of the contractor included in the contract price

The principal contractor shall be obliged to record the work by conducting site walks and taking 360° photos.

According to the construction phase and/or periodically as instructed by the contracting authority and the supervisor, photo albums will be created and published in the CDE environment.

- The contractor shall also create 360-degree images, Site Walks, and publish them in the CDE – photographs shall be taken using an appropriate camera for creating 360-degree images that is compatible with the selected CDE environment; the camera must also support the “SiteWalk” service. The appropriate camera shall be supplied by the contractor. 360-degree images shall be prepared according to the construction phase and/or periodically as instructed by the contracting authority and the supervisor.

6.6.3 Training in the use of the Common Data Environment (CDE)

Participation in training sessions that will be essential for the implementation and optimal use of the Common Data Environment (CDE) will be mandatory for the contractors. The roles and responsibilities of the CDE coordinator appointed by the principal contractor shall be defined in the contracting authority’s PTP document. Participation in training sessions that will be essential for the optimal use of the Common Data Environment (CDE) will be mandatory for the contractors.

6.6.4 Common Data Environment (CDE)

The contracting authority will enable the principal contractor and other contractors to use the Common Data Environment (CDE) so that they can meet their obligations.

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6.6.5 Naming of document and model files

The use of naming conventions, which unambiguously defines the content of documents as well as the discipline and model system, is mandatory. The naming code list must enable the automatic logical classification of documents in the selected CDE environment.

The contractor shall be required to use the following modules within the CDE environment:

- "Field" (e.g., workflows, tasks, confirmations, approvals, occupational safety, forms, minutes, creation of photo albums, creation of 360-degree images, etc.).
- Location module (reviewing of all key plans will be enabled via the location module)
- "Box" (e.g., access to all project documents).

The detailed content of the protocols and processes will be defined in the contracting authority's Project digitalisation plan, which will contain the plan of cooperation between the GOI works contractor and the contracting authority within the CDE.

6.6.6 Description of the principal mandatory CDE functionalities:

- Mandatory use of instructions for naming document files and models
- Tracking workflows and tasks with direct references to locations and views in the project documentation, as well as regular monitoring and timely updates.
- Completing forms to record identified changes, deviations, non-conformities, and execution quality control, etc. – this also includes the entry of data for the PID, the Certificate of building reliability (DZO), and the Operation and maintenance manual (NOV).
- Handover of documents and evidence regarding installed materials, devices and equipment (DZO, NOV).
- Mandatory use of instructions for naming document files and models
- Open collaboration and communication with other participants (BCF) via direct references to locations and views in the project documentation through modules and functionalities provided by the selected CDE environment.
- Tracking workflows and tasks with direct references to locations and views in the project documentation, as well as regular monitoring and timely updates.
- Completing forms to record identified changes, deviations, non-conformities, and execution quality control, etc. – this also includes the entry of data for the PID, the Certificate of building reliability (DZO), and the Operation and maintenance manual (NOV).
- Ensuring the quality of the information prepared.

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6.6.6 Submission of documents

The contractor of GOI works is obliged to submit a digital version of the documentation to the selected Common Data Environment (CDE) and on an external portable storage device for digital content in the appropriate formats, as agreed. The documentation must be submitted to the CDE environment in accordance with the instructions for use of the selected CDE. The scope of the programme of preparing and submitting the documentation will be agreed upon in more detail in the contracting authority's PTP (Project digitalisation plan) document. The person in charge appointed by the contractor of GOI works shall be responsible for the appropriate use of the selected Common Data Environment (CDE) for the entire period of construction.

The documentation and models must be aligned. The alignments are approved by the designer, the supervisor, and the contracting authority. The contractor undertakes to prepare all internal work documentation for mutual and cross alignment. UNI drawings (coordination plans) are foreseen, comprising all elements of the building, equipment installations, and all elements relevant and important for the execution and obtaining of all necessary permits.

6.7 Preparation of PID project documentation

For the preparation of PID project documentation in the BIM environment, the contracting authority has signed a contract with the designer. A BIM approach is not envisaged for the GOI works contractor for Phase 1.

The contractor of GOI works is obliged to regularly and timely provide the relevant information in the form of documents and models to enable the principal designer to prepare the PID documentation regularly and timely. The CDE environment is used for transparent communication in accordance with the processes and protocols specified in contracting authority's PTP (Project digitalisation plan) document.

Recording of changes and deviations from the project documentation that occur before and during construction, which are entered into the record of changes and deviations in the CDE environment, does not relieve the contractor of its contractual obligations and provisions regarding the notification of changes.

The principal contractor is obliged to submit documents with included changes in the selected CDE environment, which arose during construction as a result of changed project solutions, replacement of materials or equipment, and which form the basis for the preparation of PID project documentation.

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