SEISMIC RESILIENCE AND ENERGY EFFICIENCY
IN PUBLIC BUILDINGS PROJECT
(SREEPB PROJECT)

BOĞAZİÇİ UNIVERSITY
SARITEPE (KİLYOS) CAMPUS

OCCUPATIONAL HEALTH AND SAFETY PLAN

AUGUST
2023

PERSONAL DATA PROCESSING RULES

With respect to the personal data in this document, with"**Law on Protection of Personal Data**" (Official Gazette Date: 07.04.2016 Official Gazette Number: 29677);

The individuals in question have been informed about the following matters.

- Data Controllers,
- For what purpose personal data will be processed,
- Relevant sections of this document where personal data are processed,
- To whom and for what purpose the processed personal data can be transferred,

The real and legal persons reviewing this document must strictly adhere to the rules set out below;

- To prevent unlawful processing of personal data,
- To prevent unlawful access to personal data,
- To take all necessary technical and administrative measures to ensure the appropriate level of security to ensure the preservation of personal data,

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Revision Record

List 1 REVISION RECORD LIST

NO	DATE OF REVISION	REVISION
01	14.07.2023	▪ RISK ANALYSIS LIST WAS FILLED OUT WITHIN THE CONSTRUCTION METHOD FRAMEWORK. ▪ TABLE 7, THE GENERAL WORK SCHEDULE, HAS BEEN ADDED. ▪ THE TITLE "OCCUPATIONAL HEALTH AND SAFETY BUDGET" HAS BEEN ADDED.
02	18.07.2023	▪ THE "REVISION RECORD" SECTION HAS BEEN ADDED. ▪ TABLE 7, THE GENERAL WORK SCHEDULE, HAS BEEN REVISED. – CHANGES HAVE BEEN MADE TO START AND FINISH TIMES. – A ROW FOR "EPOXY ANCHORS AND TESTING" HAS BEEN ADDED.
03	20.07.2023	▪ THE WORKING METHOD AND RISK ANALYSIS LIST HAVE BEEN EVALUATED FOR EACH CONSTRUCTION WORK SEPARATELY.
04	09.08.2023	▪ REVISED ACCORDING TO THE COMMENTS FROM THE WORLD BANK.

1. Terms & Abbreviations

Contractor	As a result of the tender held by the Ministry of Environment, Urbanization and Climate Change, the company is responsible for implementing all renovation activities focused on structural strengthening and energy efficiency.
Subcontractor	The company assigned by the contractor company to carry out a part of the project.
Consultant	Tümaş & ATLASCert® & Hill Joint Venture
Corrective Action	A set of activities aimed at eliminating the root causes of identified non-conformities and unwanted conditions. *(It is mandatory to record corrective actions, including the date of identification, the identifier, responsible unit/persons, description of non-conformity and **root cause**, corrective action recommendations, deadlines, date of resolution of the non-conformity, and the method used.)*
Root Cause Analysis	Root Cause Analysis involves going beyond immediate causes when identifying/evaluating an event, problem, or undesirable outcome, and identifying the main reasons/elements to prevent similar events or problems from recurring in the future. *(Corrective actions should focus on eliminating or correcting these root causes/elements.)*
MoEUCC	Ministry of Environment, Urbanization, and Climate Change
PPE	Personal Protective Equipment
LOTO	Lock Out-Tag Out
PAT	Portable Appliance Test
MSDS	Material Safety Data Sheet
ERT	Emergency Response Team

2. Objective

WB/CS-DESSUP 01 Structural Feasibility, Energy Audit, Structural Energy Enhancement, Project Design, and Construction Supervision Consulting Services Project **STRUCTURAL STRENGTHENING and RENOVATION process**

- Determining the hazards and risks related to construction activities, as well as identifying safety measures to be taken,
- Establishing the minimum requirements for personnel involved in the construction process and preventing those who do not meet these minimum requirements from participating in the work, are the objectives.
- In accordance with this objective, the following have been defined within this document:
- Construction method and risk analysis for the structural reinforcement and renovation process,
- Personnel qualification profiles,
- Control/inspection methods for before, during, and after fieldwork,
- Record forms and methods,
- Additional safety measures to be taken by beneficiary institutions.

3. Scope

WB/CS-DESSUP 01 project BU SARITEPE CAMPUS Consisting of 3 buildings, 6 blocks and 20.898,00m^2 construction area, the building list and satellite images are given under the title "Buildings within the Scope of the Project".

The works to be carried out within this project are described below. This document is limited to the studies specified below.

- Building foundation reinforcement process (mini excavation and injection)
- Strengthening of structural elements of the building
- Renovation of facades and facade components, mechanical, and electrical systems within the framework of energy efficiency
- Sustainable clean energy production (roof-mounted solar power plants)
- Building infrastructure revisions

4. Legal Regulations

This OHSP has been primarily prepared in accordance with the laws and regulations related to Occupational Health and Safety in Turkey. In addition to these, it also complies with the Environmental and Social Standards of the World Bank, particularly focusing on ESS2: Labor and Working Conditions and ESS4: Community Health and Safety. The list of relevant legal regulations is provided below.

Table 1: LIST OF RELEVANT LEGAL REGULATIONS (LAW)

	NO	DATE OF APPROVAL	OFFICIAL GAZETTE NUMBER & DATE
Labor Law (Current Version)	1475	25.08.1971	OG: 01.09.1971/13943
Labor Law	4857	22.05.2003	OG: 10.06.2003/25134
Labor Courts Law	7036	12.10.2017	OG: 25.10.2017/30221
Occupational Health and Safety Law	6331	20.06.2012	OG: 30.06.2012/28726
Misdemeanors Law	5326	30.03.2005	OG: 31.03.2005/25772 M.
Vocational Training Law	3308	05.06.1986	OG: 19.06.1986/19139
Law on Some Regulations Concerning the Vocational Qualifications Authority (Vocational Qualifications Authority Law)	5544	21.09.2006	OG: 07.10.2006/26312
Social Insurance and General Health Insurance Law	5510	31.05.2006	OG: 16.06.2006/26200
Social Insurance Law (Current Version)	506	17.07.1964	OG: 29.07.1964/11766
Law on the Preparation and Implementation of Technical Regulations for Products	4703	29.06.2001	OG: 11.07.2001/24459
European Convention on Human Rights (Universal Declaration of Human Rights)	207 A(III)	10.12.1948	OG: 27.05.1949/7217

Table 2: LIST OF RELEVANT LEGAL REGULATIONS

	OFFICIAL GAZETTE NUMBER & DATE
Subcontracting Regulation	OG: 27.09.2008/27010 Amdt. 25.08.2017/30165
Regulation on the Protection of Employees from Noise-Related Risks	OG: 28.07.2013/28721
Regulation on the Principles and Procedures of Occupational Health and Safety Training for Employees	OG: 15.05.2013/28648 Amdt. 24.05.2018/30430
Regulation on the Principles and Procedures for Health Surveillance of Employees	OG: 20.01.2022/31725
Manual Handling Operations Regulation	OG: 24.07.2013/28717
Hygiene Training Regulation	OG: 05.07.2013/28698
First Aid Regulation	OG: 29.07.2015/29429
Regulation on Health and Safety Conditions for the Use of Work Equipment	OG: 25.04.2013/28628 Amdt. 18.02.2022/31754

Regulation on the Duties, Authorities, Responsibilities, and Training of Occupational Health and Safety Specialists	OG: 29.12.2012/28512 Amdt. 16.04.2020/31101
Regulation on Working Hours Related to the Labor Law	OG: 06.04.2004/25425 Amdt. 25.08.2017/30165
Regulation on Overtime Work and Work with Extra Hours Related to the Labor Law	OG: 06.04.2004/25425 Amdt. 25.08.2017/30165
Regulation on Occupational Health and Safety Risk Assessment	OG: 29.12.2012/28512
Regulation on the Duties, Authorities, Responsibilities, and Training of Workplace Physicians and Other Health Personnel	OG: 20.07.2013/28713 Amdt. 16.04.2020/31101
Regulation on Emergency Situations in Workplaces	OG: 18.06.2013/28681 Amdt. 01.10.2021/31615
Regulation on Work Stoppages in Workplaces	OG: 30.03.2013/28603 Amdt. 11.02.2016/29621
Personal Protective Equipment Regulation	OG: 01.05.2019/30761
Regulation on the Use of Personal Protective Equipment in Workplaces	OG: 02.07.2013/28695
Machinery Safety Regulation (2006/42/EC)	OG: 03.03.2009/27158 Amdt. 28.09.2014/29133
Regulation on Examination, Measurement, Evaluation, and Certification by the Vocational Qualifications Institution	OG: 15.10.2015/29503
Regulation on Health and Safety Signs	OG: 11.09.2013/28762
Regulation on Vocational Training for Workers Employed in Hazardous and Very Hazardous Jobs	OG: 13.07.2013/28706 Amdt. 11.05.2017/30063
Dust Control Regulation	OG: 05.11.2013/28812

5. Management Commitment & OHS Objectives

5.1. Management Commitment

As the manager of the TÜMAŞ | Hill | ATLASCert® Partnership, I commit that throughout the duration of the seismic reinforcement and energy efficiency project in public buildings, covering the preparation and implementation phases until the completion of the project: The health and safety of employees and other stakeholders will be prioritized. All relevant legislation and defined requirements will be strictly adhered to. All necessary measures related to occupational health and safety will be taken promptly. Colletive protection measures will be prioritized when determining and implementing precautions. Employee training and information regarding occupational health and safety will be emphasized. Adequate resources will be provided for occupational health and safety, and necessary expenses will not be spared. Employee suggestions and ideas will be taken into consideration in occupational health and safety practices. Necessary participation, idea exchange, and collaboration in the field of occupational health and safety will be ensured between management and employees. This plan has been prepared for the conditions of this construction site, its employees, and other stakeholders. It will be implemented throughout the project and updated when necessary. Adequate information about their responsibilities under this plan will be provided to all levels of employees, including the highest-level manager involved in the project, as well as visitors. I hereby commit to these principles and responsibilities.

Date : 18.08.2023
Name&Surname: Abdullah Ercan ÖZAL
Signature :

5.2. Policy

We will comply with national and international regulations, ensuring a healthy and safe working environment by:

- Promoting and fostering a culture of occupational health and safety among all stakeholders, encouraging continuous improvement.
- Taking all necessary measures within the framework of occupational health and safety regulations for all relevant parties.
- Working to prevent workplace accidents through effective risk assessment before they occur.
- Providing training for our employees in occupational health and safety that goes beyond regulatory requirements.
- Respecting the rights of our employees, including their rights related to collective bargaining and negotiations, and supporting such initiatives.
- Adopting references such as the Universal Declaration of Human Rights, International Labor Organization (ILO) conventions, United Nations Global Compact, United Nations Sustainable Development Goals, and the Organization for Economic Cooperation and Development (OECD) guidelines for multinational enterprises.
- Ensuring that visitors at all levels, our suppliers, and employees of the companies from which we purchase services comply with occupational health and safety rules.
- Creating a healthy environment where employees feel comfortable, safe, and happy to work and taking mental health issues seriously, providing support to all personnel facing such problems.

Date : 18.08.2023
Name&Surname: Abdullah Ercan ÖZAL
Signature :

5.2 Key Strategies Related to OHSP

- Leadership from management teams,
- Involving all employees by seeking their opinions and suggestions to contribute to OHS requirements and problem-solving,
- Identifying hazards and planning and implementing adequate control measures before workplace accidents occur,
- Ensuring that all employees have sufficient awareness and motivation regarding occupational health and safety.

5.3. Targets

To regularly measure the Occupational Health and Safety (OHS) performance of the project, "**performance criteria**" consistent with the project contract have been established, along with measurable "**targets**" corresponding to each performance criterion, which will be tracked on a monthly basis. During the first week of each month, the OHS Monthly Activity Report, approved by the consultant in the appropriate format for the previous month, will be prepared and submitted to the administration.

TARGET DEFINITION	QUANTITATIVE DATA
Number of Lost-Time Occupational Accidents (maximum)	2
Number of Lost-Time Occupational Injuries (maximum)	0
Number of Near-Miss Incidents (maximum)	2
Accident Frequency Rate (AFR[1]) (maximum)	60
Accident Severity Rate (ASR[2]) (maximum)	0
Occupational Health and Safety (OHS) Training for this Project	20 person.hour
Fire Drill for this Project	1 pcs.
Earthquake Drill for this Project	1 pcs.
Injured Worker Rescue Drill for this Project	1 pcs.

Performance criteria are continuously monitored cumulatively throughout the project duration. The values achieved in comparison to the planned targets are analyzed on a monthly basis to identify deviations and initiate necessary corrective actions. Data and results related to the targets will be communicated to the consultant during the first week of each month, along with the Occupational Health and Safety (OHS) Monthly Activity Report.

The questions that will be addressed as part of the performance measurement are as follows:

- Are we achieving our Occupational Health and Safety (OHS) targets?
- Are we working in compliance with OHS regulations?
- Are the planned control activities resulting from risk assessments effective in reducing risks?
- Are accidents and near-miss incidents being recorded? Is accident investigation and root cause analysis conducted to prevent their recurrence?
- Are Corrective Actions planned and implemented for discrepancies/violations identified in the field (by the Contractor or Consultant)?
- Are the implemented Corrective Actions effective?
- Are necessary changes (revisions) made to the OHSP when needed?

[1] $\text{AFR} = \frac{\text{Total Number of Accidents}}{\text{Total Working Time (hours)}} \times 1.000.000$

[2] $\text{ASR} = \frac{\text{Total Number of Lost Days}}{(\text{Total Working Days} - \text{Non} - \text{Working Days})} \times 1.000$

- Do the provided training sessions effectively build OHS awareness and motivation among employees?

To enable the consultant to monitor the Contractor's OHS performance, the following records will be shared by the Contractor on a monthly basis:

- Accident and near-miss incident reports (including Covid-19)
- Records related to mandatory training (training records, certificates, etc.)
- Periodic inspection reports for machinery/equipment (reports prepared by an A-type inspection organization accredited by TÜRKAK)
- Status of ISG-related discrepancies recorded by the Contractor or Consultant (open/closed, description of corrective actions, etc.).

6. Project Information

6.1. General Information

Information about the consultant company is given in the table below.
Table 3: CONSULTANT INFORMATION TABLE

CONSULTANT	TÜMAŞ TÜRK MÜHENDİSLİK MÜTEAHHİTLİK VE MÜŞAVİRLİK A.Ş.
SSI REGISTRY NUMBER	271120202003584600607-24/000
ADDRESS	TUNUS CADDESİ NO: 43 KAVAKLIDERE/ANKARA
PHONE / E-MAIL	0(312) 417 60 25 (Pbx) / tumas@tumas.com.tr
OCCUPATIONAL HEALTH AND SAFETY EXPERT	Osman ÖZCAN| İGU-239874
WORKPLACE PHYSICIAN	Nail Kireçtepe | İH-3668

6.1.1 Buildings within the Scope of the Project

Table 4: LIST OF BUILDINGS AT BOGAZICI UNIVERSITY KILYOS CAMPUS

	BUILDING NAME	REGION	CONSTRUCTION YEAR	BUILDING CONSTRUCTION AREA m²
01	1st Dormitory Building	İSTANBUL (Europe)	2002	9.482,00
02	School of Foreign Languages Block B	İSTANBUL (Europe)	1991	3.655,00
03	School of Foreign Languages Block A	İSTANBUL (Europe)	1991	5.681,00
04	Recreation Facility & Dormitory	İSTANBUL (Europe)	1994	2.080,00
				20.898,00

Photo 1: BOGAZICI UNIVERSITY KİLYOS CAMPUS (Campus No:3)

General information about the buildings in question is presented to your attention on the next page.

Table 5: BOGAZICI UNIVERSITY KİLYOS CAMPUS 1st STUDENT DORMITORY GENERAL INFORMATION TABLE

BUILDING NAME	BOĞAZİÇİ UNIVERSITY KİLYOS CAMPUS 1ST STUDENT DORMITORY			
BUILDING OWNER	BOGAZICI UNIVERSITY			
ADDRESS	Zekeriyaköy, Gümüşdere Mahallesi Sarıtepe Kampüsü (Boğaziçi Kampüsü Evler 1. Yurt, Küme Sk. 34450 Sarıyer/İstanbul			
CITY	İSTANBUL		POSTAL CODE	34450
CONSTRUCTION YEAR	2002		CONSTRUCTION AREA	9.482 m²
PURPOSE OF USAGE	STUDENT DORMITORY		NUMBER OF BLOCKS IN THE BUILDING GROUP	3 pcs.
USABLE INDOOR SPACE	~9.482m²		TOTAL INDOOR VOLUME	~27.529,95 m³
NUMBER OF USERS	TOTAL	68.451 person/Year		
TECHNICAL RESPONSIBLE	NAME SURNAME	Sercan İSÇAN – Energy Manager		
	CONTACT INFORMATION	PHONE	0 (212) 359 44 50 (49 74)	
		E-MAIL	sercan.iscan@boun.eu.tr	
THE PLANNED WORKS TO BE CARRIED OUT IN THE BUILDING				
All of the manufacturing planned to be done in the building are listed in Table 6.				
DURATION AND SEASON OF THE WORKS				

With the preparation of the tender documents, it is planned that the **Contractor will complete the manufacturing of the 1st Student Dormitory within 8 months following the site delivery date.** Due to the uncertainty of the site delivery time, a clear season cannot be specified and the work will be completed following the tender process planned to take place in 2023.
NUMBER OF WORKERS EXPECTED TO WORK DURING THE RENOVATION WORKS
In order to complete the planned construction activities within the targeted timeframe, it is estimated that 20 workers per day will be employed.

Building Height : ~16,75m (Vertical distance from ground level to the highest point of the building)
Number of Floors : 3+1 (Entrance floor)
Coordinates : 41° 14'36.6"K x 29°00'40.0"D

3D Model : CLICK TO ACCESS THE MODEL![3]

- On the next page, the planned construction activities, the estimated number of personnel, and completion durations are presented in a table format. This table is provided for general information purposes, and it is expected that the contracting company will revise this table according to its own work program/plans.

[3] Modeling was performed by ATLAS®.

Table 6: WORKS PLANNED TO BE MADE IN BU 1ST STUDENT DORMITORY

	GENERAL DESCRIPTION OF THE WORK TO BE DONE	PROJECTED NUMBER OF PERSONNEL	PROJECTED DURATION (WEEKS)
GROUND REINFORCEMENT	DRILLING & MINI PILE	8	4
	INJECTION	6	4
	INFRASTRUCTURE INSPECTION & RENEWAL	10	4
STRUCTURAL REINFORCEMENT	WALL DEMOLITION & DISMANTLING WORKS	10	3
	ELECTRICAL AND MECHANICAL SYSTEM DEMOLITION	8	3
	SUBSTRUCTURE CONCRETE DEMOLITION AND FOUNDATION FILLING	10	2
	EPOXY ANCHORS AND TESTING	6	3
	NEW REINFORCEMENT INSTALLATION	10	4
	FORMWORK AND CONCRETE CASTING	10	3
FINISHING WORKS	WALL CONSTRUCTION	8	3
	PLASTERING	8	5
	PAINTING	4	4
	FLOORING	3	5
	ELECTRICAL & MECHANICAL INSTALLATION	10	11
	AUTOMATION	3	7
OTHER WORKS	BRIDGE DEMOLITION	10	2
	SOLAR PANEL INSTALLATION	6	4
	TESTING & INSPECTION	2	1

The works related to electrical & mechanical installations mentioned in Table 6, as well as the automation, and solar panel installation sections, include energy efficiency measures. These measures are listed below:

GENERAL DESCRIPTION OF THE WORK TO BE DONE:	PROJECTED NUMBER OF PERSONNEL:	PROJECTED DURATION (WEEKS)
Production of Electricity with Photovoltaic System on the Roof: • 130 Units of Panels, 70.85 kWp | System Weight: 4.4 TONS | System Area: 340 m^2	6	1
Replacement of the existing conventional boiler (Demirdöküm brand MK 20 Model, 875,000 kcal/h) from 2007 with 2 units of 500,000 kcal/h capacity CASCADE condensing premix floor-standing boilers.	5	2
Replacement of existing motor and pump elements in the circulation system along with their backups with integrated frequency-controlled high-efficiency systems. • 4 Units of Heating Installation, 4 Units of Domestic Hot Water Line, 2 Units of Hydrofor	2	0,3
Replacement of 741 luminaires, which have not been converted to LED, with high-efficiency LED luminaires of the same size.	5	1
Thermal insulation installation for uninsulated installation elements and heat exchanger.	1	0,2

• 32 pieces of piping elements • 1 piece of MIT M514 heat exchanger		
Installation of thermostatic valves for all 470 radiators. Ensuring the proper use of these valves in accordance with EN ISO 50001 system requirements.	2	1
Energy monitoring system, installation of the automation system in accordance with EN ISO 50001 Energy Management System requirements, and ensuring its effectiveness.	3	3
Replacement of the main entrance door in Block C with a thermally insulated one. (11.5 m^2)	2	0,2

Table 7: BU KİLYOS CAMPUS SOCIAL FACILITY GENERAL INFORMATION TABLE

BUILDING NAME	BOĞAZİÇİ UNIVERSITY KİLYOS CAMPUS SOCIAL FACILITIES & DORMITORY			
BUILDING OWNER	BOGAZICI UNIVERSITY			
ADDRESS	Gümüşdere, Boğaziçi Üniversitesi Sarıtepe Kampüsü, 34450 Sarıyer/İstanbul			
CITY	İSTANBUL		POSTAL CODE	34450
CONSTRUCTION YEAR	1994		CONSTRUCTION AREA	2.080 m^2
PURPOSE OF USAGE	STUDENT DORMITORY		NUMBER OF BLOCKS IN THE BUILDING GROUP	1 pc.
USABLE INDOOR SPACE	~2.080 m^2		TOTAL INDOOR VOLUME	~27.529,95 m^3
NUMBER OF USERS	TOTAL	6.450 Person/Year		
TECHNICAL RESPONSIBLE	NAME SURNAME		Sercan İşçan – Energy Manager	
	CONTACT INFORMATION	PHONE	0 (212) 359 44 50 (49 74)	
		E-MAIL	sercan.iscan@boun.eu.tr	
THE PLANNED WORKS TO BE CARRIED OUT IN THE BUILDING				
All of the manufacturing planned to be done in the building are listed in Table 8.				
DURATION AND SEASON OF THE WORKS				
The preparation of the tender documents and the completion of the construction by the Contractor are planned to be completed within 8 months following the site handover date for the Social Facility & Dormitory building. Due to the uncertainty of the site handover period, a specific season cannot be mentioned, but after the tender process planned to take place in 2023, the completion of the work will be ensured.				
NUMBER OF WORKERS EXPECTED TO WORK DURING THE RENOVATION WORKS				
To complete the planned construction within the targeted timeframe, it is **estimated** that 20 workers per day will be employed.				

Building Height : ~12,25m (Vertical distance from ground level to the highest point of the building)
Number of Floors : 2+1
Coordinates : 41° 14'40.30"K x 29°00'49.00"D

3D Model : CLICK TO ACCESS THE MODEL![4]

- On the following page, the planned tasks, estimated personnel numbers, and completion times are provided in table format. This table is prepared for general information purposes, and it is expected

[4] Modeling was performed by ATLAS®.

that the contracting company will revise this table within the framework of their own work program/plans.

Table 8: WORKS PLANNED TO BE MADE IN BU SOCIAL FACILITY

	GENERAL DESCRIPTION OF THE WORK TO BE DONE	PROJECTED NUMBER OF PERSONNEL	PROJECTED DURATION (WEEKS)
GROUND REINFORCEMENT	DRILLING & MINI PILE	8	3
	INJECTION	6	3
	INFRASTRUCTURE INSPECTION & RENEWAL	8	3
STRUCTURAL REINFORCEMENT	WALL DEMOLITION & DISMANTLING WORKS	8	3
	ELECTRICAL AND MECHANICAL SYSTEM DEMOLITION	8	3
	SUBSTRUCTURE CONCRETE DEMOLITION AND FOUNDATION FILLING	8	2
	EPOXY ANCHORS AND TESTING	6	3
	NEW REINFORCEMENT INSTALLATION	8	4
	FORMWORK AND CONCRETE CASTING	8	3
FINISHING WORKS	WALL CONSTRUCTION	8	3
	PLASTERING	8	5
	PAINTING	4	4
	FLOORING	3	5
	ELECTRICAL & MECHANICAL INSTALLATION	8	4
	AUTOMATION	6	8
	WALL CONSTRUCTION	3	3
OTHER WORKS	SOLAR PANEL INSTALLATION	6	1
	TESTING & INSPECTION	2	1

The works related to electrical & mechanical installations, as well as automation, solar panels, and facade insulation mentioned in Table 8, include tasks to be carried out within the framework of energy efficiency measures. The details of these measures are listed below.

GENERAL DESCRIPTION OF THE WORK TO BE DONE:	PROJECTED NUMBER OF PERSONNEL:	PROJECTED DURATION (WEEKS)
Electricity Production with Monocrystalline PV System on hipped roof. ▪ 213 Units of Panels 116.085 kWp | System Weight: 7 Tons | System Area: 550m^2	8	1,5
Passivation of the SFL Building heating network. Installation of 2 wall-mounted condensing boilers with a capacity of 140 kW each, and a 170 kW heating and 135 kW cooling capacity air-source heat pump.	8	6
Replacement of uninsulated doors, numbers 1, 13, and 25, as identified during field inspections, and the installation of sliding thermal insulation on door number 38 from both inside and outside.	2	0,5
Replacement of 369 fixtures with high-efficiency LED fixtures of the same size.	4	1

Removal of the existing 3 cm facade insulation and installation of an 8 cm EPS thermal insulation cladding (U≤0.031Wm2/K). ▪ Total application area: 656.81 m^2	8	4
Installation of an energy monitoring system to ensure compliance with the EN ISO 50001 Energy Management System requirements for the automation system and its effectiveness	3	2

Table 9: BU KİLYOS CAMPUS SFL A&B BLOCK GENERAL INFORMATION TABLE

BUILDING NAME	BOĞAZİÇİ UNIVERSITY KİLYOS CAMPUS SFL A&B BLOCK			
BUILDING OWNER	BOĞAZİÇİ UNIVERSITY			
ADDRESS	Gümüşdere, Boğaziçi Üniversitesi Sarıtepe Kampüsü, 34450 Sarıyer/İstanbul			
CITY	İSTANBUL		POSTAL CODE	34450
CONSTRUCTION YEAR	1991		CONSTRUCTION AREA	9.336 m^2 (BLOK A 5.681 m^2 + BLOCK B 3.655 m^2)
PURPOSE OF USAGE	EDUCATION BUILDING		NUMBER OF BLOCKS IN THE BUILDING GROUP	4 pcs.
USABLE INDOOR SPACE	~9.336m^2		TOTAL INDOOR VOLUME	~20.613,39 m^3
NUMBER OF USERS	TOTAL	34.526 Person/Year		
TECHNICAL RESPONSIBLE	NAME SURNAME		Sercan İSÇAN- Energy Manager	
	CONTACT INFORMATION	PHONE	0(212) 359 44 50 (49 74)	
		E-MAIL	sercan.iscan@boun.edu.tr	
THE PLANNED WORKS TO BE CARRIED OUT IN THE BUILDING				
All of the manufacturing planned to be done in the building are listed in Table 8.				
DURATION AND SEASON OF THE WORKS				
The preparation of tender documents is planned to be completed following the site handover date, and the Contractor is expected to complete the construction of SFL Blocks A&B within 8 months. Due to the uncertainty of the site handover period, a specific season cannot be specified. However, the completion of the project is planned to take place after the tender process, which is scheduled to occur in the year 2023.				
NUMBER OF WORKERS EXPECTED TO WORK DURING THE RENOVATION WORKS				
To complete the planned construction within the targeted timeframe, it is **estimated** that 20 workers per day will be employed.				

Building Height : ~16m (Vertical distance from ground level to the highest point of the building)
Number of Floors : 3+1 (Entrance floor)
Coordinates : 41° 14'40.10"K x 29°00'45.00"D

3D Model : CLICK TO ACCESS THE MODEL!

- The next page contains a table that provides information on the planned tasks, estimated personnel numbers, and completion durations. This table has been prepared for general information purposes, and it is expected that the contracting firm will revise this table within the framework of its own work program/plans.

Tablo 10: WORKS PLANNED TO BE MADE IN BU SFL BUILDING

	GENERAL DESCRIPTION OF THE WORK TO BE DONE	PROJECTED NUMBER OF PERSONNEL:	PROJECTED DURATION (WEEKS)
GROUND REINFORCEMENT	DRILLING & MINI PILE	8	4
	INJECTION	6	4
	INFRASTRUCTURE INSPECTION & RENEWAL	10	4
STRUCTURAL REINFORCEMENT	WALL DEMOLITION & DISMANTLING WORKS	10	3
	ELECTRICAL AND MECHANICAL SYSTEM DEMOLITION	8	3
	SUBSTRUCTURE CONCRETE DEMOLITION AND FOUNDATION FILLING	10	2
	EPOXY ANCHORS AND TESTING	6	3
	NEW REINFORCEMENT INSTALLATION	10	4
	FORMWORK AND CONCRETE CASTING	10	3
FINISHING WORKS	WALL CONSTRUCTION	8	3
	PLASTERING	8	5
	PAINTING	4	4
	FLOORING	3	5
	ELECTRICAL & MECHANICAL INSTALLATION	10	11
	AUTOMATION	3	7
OTHER WORKS	SOLAR PANEL INSTALLATION	6	4
	TESTING & INSPECTION	2	1

The electrical & mechanical installation works, as well as automation, solar panel installation works listed in Table 10, encompass tasks to be carried out within the framework of energy efficiency measures. The following measures are listed below.

GENERAL DESCRIPTION OF THE WORK TO BE DONE:	PROJECTED NUMBER OF PERSONNEL:	PROJECTED DURATION (WEEKS)
generation with a monocrystalline PV system on the hipped roof. ▪ 252 Panels → 137.34 kWp | System Weight: 8.2 TONS | System Area: 650 m^2	8	1,5
Integration of an air-source heat pump with a heating capacity of 700 kW and a cooling capacity of 560 kW into the existing HVAC system. Efficient operation of this device via the automation system according to climate conditions.	10	6
Replacement of A Block doors numbered 1 and 3 (16.8 m^2) and B Block doors numbered 3 and 4 (7.2 m^2) with thermal insulated doors. Application of thermal insulation on the inner and outer sides of door number 5 in B Block (6x12 m^2).	2	0,5
Replacement of 1631 luminaires with high-efficiency LED luminaires of the same dimensions.	6	2
Replacement of the existing asynchronous motor and connected pumps used in the circulation system with integrated frequency-controlled wet rotor high-efficiency motor & pump combinations (0.7 kW - 3 units, 2.2 kW - 2 units)	2	0,3
Thermal insulation for all uninsulated piping elements. ▪ 7 units DN65 | 11 units DN100 | 21 units DN125	1	0,2

▪ Installation of a thermal insulation jacket for the MIT Park plate heat exchange		
Installation of an energy monitoring system to ensure compliance with the EN ISO 50001 Energy Management System requirements for the automation system and its effectiveness	3	3

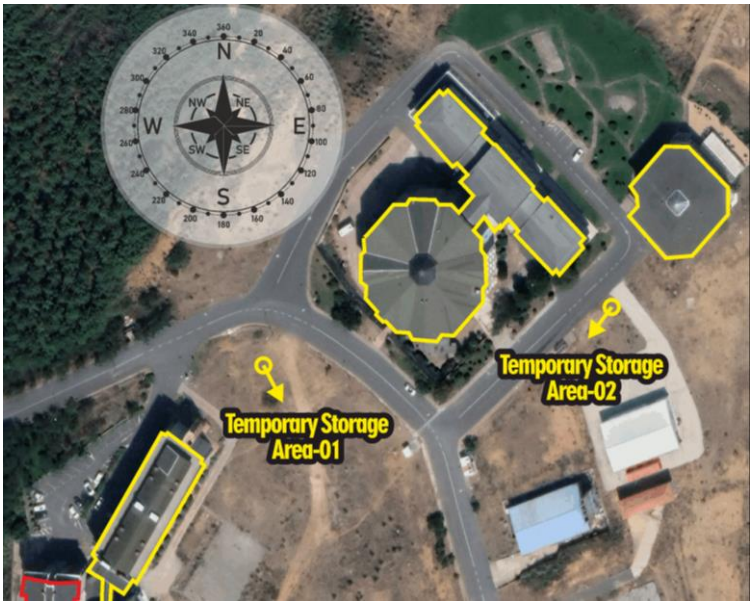
6.2 Pre-construction Information & Site Plans

Regarding the campuses where the study will be carried out; site data, building approach areas, traffic action plans, temporary storage areas, work vehicles and machinery parking areas, and risky areas such as elevation differences are stated in ANNEX 1.

6.3 General Construction Site Rules

- The entry and exit of vehicles (including construction equipment) to the work areas and parking areas are specified in the previous section. (See also Annex 1).
- The buildings within the scope of the project are out of use during the activities. Therefore:
  - It is not possible to install a structure such as a container etc. within the scope of the construction site in the work areas.
- Specific areas for dining and resting of workers are not allocated. The areas within the buildings where workers can use for general and humane needs (such as toilets, break/rest areas, dining rooms, etc.) will be determined by the beneficiary institution's technical and administrative units and communicated to the contractor.
- Workers will not be accommodated within the campus area. The contractor and subcontractors will arrange suitable places (hotels, motels, etc.) for the accommodation of workers.
- Temporary storage areas *(outside of the buildings*) are specified on a building basis. Temporary storage is not allowed in areas other than those specified.

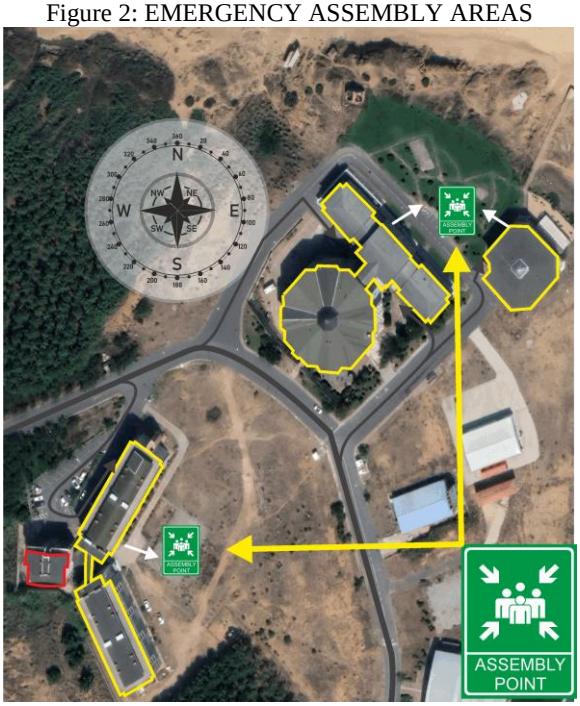
Figure 1: TEMPORARY STORAGE AREAS SATELLITE LOCATIONS



- During temporary storage, the necessary precautions must be taken by the contracting company to stack materials and equipment in a way that does not create risks, protects them from environmental conditions, and prevents the leakage of hazardous chemicals into the ground. The contracting company must describe how these issues will be addressed before the use of these storage areas. Otherwise, the use of temporary storage areas will not be allowed.

- Emergency assembly areas for each building are specified below. Warning signs will be provided in these areas, and all employees will be informed about the assembly areas by the Occupational Health and Safety specialist.

Figure 2: EMERGENCY ASSEMBLY AREAS



  - The specified emergency assembly areas will be used in all Occupational Health and Safety (OSH) drills. The responsible OSH Specialists will determine the emergency assembly times for each drill.
  - The emergency assembly areas will be included in the Occupational Health and Safety (OSH) training materials.

- Indoor toilets will be used for restroom needs.
- Employees' shower needs will be provided in the accommodations arranged by the contractor and subcontractors (hotels, etc.). Indoor sinks will be used for washing hands.
- Drinking water will be supplied to all employees in plastic bottles. It is not allowed to drink water from the toilets. Warning signs, as specified below, will be installed in all toilets.

- Smoking is prohibited inside the buildings and temporary storage areas. Warning signs, as specified below, will be installed at building entrances and temporary storage areas. *(An open flame prohibition sign will be installed in temporary storage areas.)*

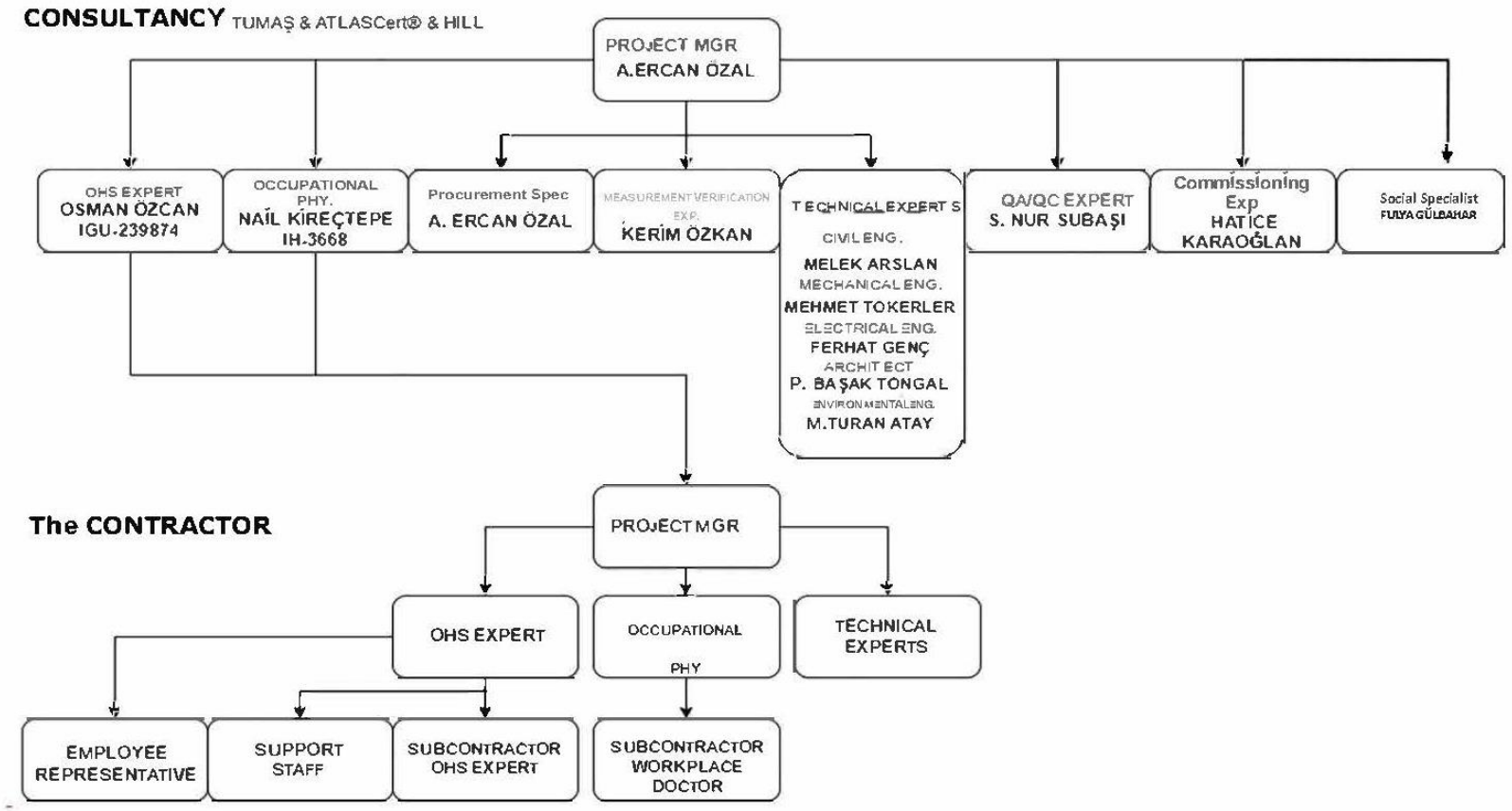
- Outdoor smoking areas, located at least 5 meters away from building entrance doors, can be designated. These areas should be clearly marked with the warning sign specified below, and all employees should be informed about the designated smoking areas.

- All machinery and electrical equipment used during construction activities must bear the CE marking and comply with the relevant regulations. Products falling under the scope of the "CE" MARKING REGULATION5 and not meeting the requirements associated with this symbol are not permitted for use.

[5] Relevant Directives:
- MACHINERY SAFETY DIRECTIVE (2006/42/EC)
- LOW VOLTAGE ELECTRICAL EQUIPMENT DESIGNED FOR CERTAIN VOLTAGE LIMITS DIRECTIVE (2014/35/EU)
- PRESSURE EQUIPMENT DIRECTIVE (2014/68/EU)
- GAS APPLIANCES DIRECTIVE (2016/426/EU)

Relevant standards (must be reviewed separately for each device.)
- - TS EN ISO 12100 Safety in machinery - General principles for design - Risk assessment and risk reduction
- - TS EN 60204-1 Safety in machines – Electrical equipment of machines – part 1: General rules
- - TS EN 60335-1 Safety rules - For electrical devices used in homes and similar places - Part 1: General rules
- - TS 1203 EN 286-1 Tanks – Simple – Non-flammable – Pressurized
- - TS 10116 Cranes – Test and inspection methods
- - TS ISO 9927-1 Cranes-Inspections-Part 1: General

7. Health & Safety Organization



• The duties and responsibilities of the units specified in the organization chart are described under separate headings on the next page.

7.1. Consultant

7.1.1. Duties of the Project Manager

The Project Manager has been appointed as the employer's representative, limited to this project. In this context, the employer has undertaken its duties.[6]

In this framework;

1. Ensure the implementation of the Occupational Health and Safety Plan and compliance with legal regulations and best practices within the scope of the project.
2. Review and assess the construction methods and risk analyses prepared by the contractor, focusing on technical, administrative, and occupational safety aspects. If found inadequate[7], provide reasons and monitor the revision process.
    a) The construction methods and risk analyses prepared by the contractor should cover the entire project, including subcontractor activities.
    b) Ensure that the contractor and sub-contractors control and oversee the following aspects regarding risks and precautions:
        i. Properly informing all employees.
        ii. Providing the necessary resources (equipment, materials, workforce).
        iii. Ensuring compliance with all rules by all managers and employees.
3. Ensure the suitability and sufficiency of risk assessments through field inspections.
    a) Any non-compliance identified during these inspections will be recorded as corrective actions. Ensure that identified non-compliances are rectified adequately and within the specified timeframe.
    b) Identified non-compliances or corrective actions may necessitate a revision of risk analyses. In such cases, ensure that risk analyses are reissued with the revision number, date, and justifications, following the necessary approval processes.
4. Ensure that employees obtain periodic health reports and are monitored based on the tasks they perform. Do not allow those who cannot provide reports indicating the suitability of their health for their assigned tasks to work.
5. Ensure that the educational status of employees is verified, and that they have received training in compliance with legal requirements. Do not allow those who cannot prove they have received appropriate training to work.
6. Ensure that employees' vocational qualifications are checked and do not allow those who cannot prove appropriate vocational competence within the scope of their duties to work.
7. Ensure the identification, procurement, and proper delivery of necessary Personal Protective Equipment (PPE) to employees.

[6] 6331 OCCUPATIONAL HEALTH AND SAFETY LAW (Official Gazette Date: 30.06.2012 Official Gazette Number: 28339) Article 3 2nd Paragraph: Employer representatives acting on behalf of the employer and taking part in the management of the work and workplace are considered employers for the purposes of the implementation of this Law.

[7] It should be evaluated within the scope of Corrective Action (detection dates, justifications, corrective action suggestions, deadlines, etc.) and recorded.

8. Determine, procure, and properly install safety equipment (protective nets, guardrails, lifelines, etc.) required to be present at the work sites.
9. Ensure that work accidents are reported in accordance with Article 14 of the Occupational Health and Safety Law No. 6331.
10. Fulfill the employer's defined responsibilities within the framework of Law No. 6331 on Occupational Health and Safety.
    a) In order to achieve this, the Project Manager must comply with the **up to date** law no. 6331 and other relevant regulations; It should be reviewed together with the OHS Specialist and Workplace Physician.

7.1.2. Duties of the OHS Specialist

The duties of OHS Experts specified in Article 9 of the REGULATION ON DUTIES, AUTHORITIES, RESPONSIBILITIES AND TRAINING OF OCCUPATIONAL SAFETY EXPERTS *(Official Gazette Date: 29.12.2012 Official Gazette Number: 28512)* are given below. He/she will manage occupational health and safety activities in accordance with the duties given below.

1. Guidance;
    a) To ensure that work is planned, organized, and implemented in accordance with occupational health and safety legislation and general occupational safety rules, including the condition, maintenance, selection of design, machinery, and other equipment used in the workplace, as well as the selection, procurement, use, maintenance, storage, and testing of personal protective equipment, and to make recommendations to the employer regarding work carried out and changes to be made in the workplace.
    b) To inform the employer in writing about the precautions that need to be taken in terms of occupational health and safety.
    c) To conduct investigations into the causes of workplace accidents and occupational diseases and make recommendations to the employer on measures to prevent their recurrence.
    d) To conduct investigations into incidents that occur in the workplace, which may not result in death or injury but have the potential to cause harm to employees, equipment, or the workplace, and make recommendations to the employer.
2. Risk Assessment;

    Participating in the work related to occupational health and safety risk assessment and its implementation, making recommendations to the employer regarding the health and safety measures to be taken as a result of the risk assessment, and monitoring its implementation.
3. Workplace Surveillance:
    a) Supervising the workplace, planning and monitoring the periodic maintenance, inspections, and measurements required by occupational health and safety legislation, and ensuring their implementation.
    b) Participating in efforts to prevent accidents, fires, or explosions in the workplace, making recommendations to the employer in this regard, monitoring the implementation of practices; participating in the preparation of emergency plans for natural disasters, accidents, fires, or explosions, ensuring that periodic training and drills related to this issue are conducted, and monitoring and controlling compliance with the emergency plan.
4. Training, Information, and Records;

a) Planning the occupational health and safety training of employees in accordance with the relevant legislation, presenting it to the employer for approval, and implementing or supervising the implementation.

b) Recording the results of occupational health and safety activities related to the workplace and workplace surveillance.

c) Organizing informative activities for employees, presenting them to the employer for approval, and controlling their implementation.

d) Preparing occupational health and safety instructions and work permit procedures for use in necessary locations, presenting them to the employer for approval, and controlling their implementation.

5. Collaboration with Relevant Departments:

a) Conduct assessments, along with the occupational physician, related to workplace accidents and occupational diseases, prepare necessary preventive action plans to prevent the recurrence of accidents, and monitor the implementation.

b) Prepare the annual work plan for occupational health and safety activities to be carried out in the following year in collaboration with the occupational physician.

c) Collaborate with the occupational health and safety committee of which they are a member if available.

d) Provide support to employee representatives and support staff and collaborate with these individuals.

Within this framework:

1. Review construction methods and risk analyses and prepare a report on their compliance. Transmit the prepared report to the Project Manager and the Contractor Project Manager.
2. Obtain and control the periodic inspection reports of work machines *(Maximum interval: 1 year).*
3. Ensure that personal protective equipment specified in the risk analysis is delivered to all employees *(control of PPE delivery records and questioning the suitability of these equipment during field inspections).*
4. Verify the authorization and appointment of the Contractor and Subcontractor OHS Specialists and Occupational Physicians.
5. Develop and update this document based on field findings.
6. Control employee personnel files.
7. Check records and certificates of past OHS training for employees *(maximum interval: 1 year).*
8. Attend weekly and monthly OHS meetings and report them to management.
9. Verify the professional qualification certificates of employees.
10. Review work reports from an OHS perspective and assess any work or equipment that may violate OHS rules.
11. Conduct daily field inspections, evaluate the adequacy of risk analyses and identified precautions, and assess the compliance with OHS rules.
12. Review reports of field inspections conducted by Contractor and Subcontractor OHS Specialists. Monitor and control identified non-compliances.
13. Review records of current training provided by Contractor and Subcontractor OHS Specialists (Risk Analysis, Toolbox Talks, etc.). Question their adequacy (duration, content).

14. Maintain contact with employee representatives, request feedback, and report any issues raised by employee representatives to the Project Coordinator. Determine and implement necessary actions.
15. Obtain accident reports prepared by Contractor and Subcontractor OHS Specialists, review them at the content and incident sequence levels, and check if notifications were made in compliance with legal requirements.
16. Check suggestion and grievance boxes. Evaluate feedback provided through printed or digital channels within the framework of OHS *(ensure that feedback providers are informed, evaluate requests, and determine necessary actions). (During this process, collaboration with the Social Specialist is required)*
17. Inform the Project Manager without delay based on field observations, feedback, information obtained from the Contractor and Subcontractor OHS specialists, and workplace accidents.

7.1.3. Duties of Occupational Physicians

The duties of occupational physicians are outlined below, as specified in THE REGULATION ON THE DUTIES, POWERS, RESPONSIBILITIES, AND TRAINING OF OCCUPATIONAL PHYSICIANS AND OTHER HEALTH PERSONNEL *(Official Gazette Date: 20.07.2013 Official Gazette Number: 28713)* Article 9:

1. Guidance;

a) Provide guidance to the employer regarding the health monitoring of employees and the surveillance of the work environment within the scope of occupational health and safety services.

b) Offer recommendations to the employer for ensuring that the design and organization of the workplace, including the use of substances, comply with occupational health and safety legislation and general workplace safety rules, particularly in relation to the planning, organization, and implementation of work and the selection of personal protective equipment.

c) Advise the employer on activities aimed at improving the health of employees in the workplace.

d) Participate in research related to occupational health and safety, as well as conduct research to ensure the harmony between work and the capabilities of employees, considering ergonomic and psychosocial risks in the workplace, and protect employees from stress factors in the work environment. Take into account the results of these research activities in guidance activities.

e) Continuously monitor and inspect the general hygiene conditions of workplace buildings and facilities, including cafeterias, dining halls, dormitories, changing rooms, showers, and toilets, and provide recommendations for ensuring that employees receive the necessary nutrition and access to suitable drinking water based on the requirements of the work being performed.

f) Investigate the causes of workplace accidents and occupational diseases and make recommendations to the employer on measures to prevent their recurrence.

g) Conduct investigations into incidents in the workplace that, while not resulting in death or injury, have the potential to cause harm to employees, equipment, or the workplace, and provide recommendations to the employer.

h) Communicate in writing to the employer the precautions and measures that need to be taken in the field of occupational health and safety.

2. Risk Assessment:

   Participate in activities related to occupational health and safety risk assessment and its implementation. Provide recommendations to the employer regarding health and safety measures that need to be taken based on the results of the risk assessment and ensure their follow-up.

3. Health Surveillance:

   a) Inform and obtain the consent of employees regarding pre-employment and periodic medical examinations and tests conducted as part of health surveillance.
   b) Conduct health surveillance for employees, including those working night shifts.
   c) Repeat periodic medical examinations annually (unless otherwise recommended by the occupational health physician).
   d) Determine if there is a correlation between health-related work absences and potential health hazards in the workplace. Plan for environmental measurements if necessary, seek the employer's approval, and evaluate the results in terms of employee health.
   e) Conduct return-to-work medical examinations for employees who have been absent from work due to health reasons. Recommend suitable tasks for those whose previous roles may pose health risks based on their current health status and seek the employer's approval.
   f) Take measures to control infectious diseases, prevent their spread, and conduct immunization campaigns. Provide necessary hygiene training, ensure medical examinations and tests are performed, and promote a healthy work environment.
   g) Maintain records of health surveillance activities in the workplace. Collaborate with the occupational health and safety specialist to assess workplace accidents and occupational diseases. Prepare preventive action plans to prevent the recurrence of accidents and submit an annual work plan, including these topics, to the employer for approval. Monitor the implementation of these plans and prepare an annual evaluation report.
   h) Check whether health reports demonstrating the fitness of employees sent temporarily to the workplace by another employer or subcontracted workers are still valid.

4. Training, Information, and Records:

a) Plan and conduct employee occupational health and safety training in accordance with relevant regulations. Present these plans to the employer for approval and ensure their implementation or oversee the training programs.
b) Organize and provide training for first aid and emergency response services at the workplace, following the relevant regulations.
c) Provide training to managers, occupational health and safety committee members (if applicable), and employees on general health, occupational health and safety, hygiene, the hazards of substance abuse, personal protective equipment, and collective protection methods. Ensure the continuity of these training programs.
d) Inform employees about workplace risks, health surveillance, and pre-employment and periodic medical examinations.
e) Collaborate with the occupational health and safety specialist to prepare an annual evaluation report documenting the results of occupational health and safety efforts and health surveillance.
f) Report information related to occupational health and safety topics determined by the Ministry to the General Directorate through the Occupational Health and Safety Automation System (ISG Katip).

5. Collaboration with Relevant Departments:
    a) Recommend, based on the results of health surveillance, the conduct of necessary measurements within the scope of workplace monitoring in collaboration with the occupational health and safety specialist, and evaluate the measurement results.
    b) Collaborate with the occupational health and safety committee (if applicable) to work on providing information and training on occupational health and safety topics in the workplace.
    c) Collaborate with relevant parties to provide information and education on workplace health and safety.
    d) Participate in the development of programs aimed at improving existing practices, analyzing occupational accidents and occupational diseases, evaluating new technologies and equipment from a health perspective, and making recommendations for the prevention of accidents.
    e) Collaborate with authorized hospitals for the preparation of health board reports related to occupational diseases according to the Regulation on the Rate of Incapacity to Work and Occupational Accidents and cooperate with relevant units for the rehabilitation of employees who have suffered workplace accidents or contracted occupational diseases.
    f) Contribute to the preparation of occupational health and safety instructions and work permit procedures for use in necessary areas.
    g) Provide support to employee representatives and support personnel in their activities and collaborate with these individuals.

Within this framework:

1. Verify the authorization and appointments of occupational health physicians for contractors and subcontractors.
2. Develop and update this document in line with field findings.
3. Support the risk analysis control process by examining construction methods and data related to work areas provided by subcontractors and other specialists.
4. Verify employee personnel files.
5. Review employees' periodic health reports.
6. Review weekly work reports from an occupational health perspective and evaluate any inappropriate work or equipment presence.
7. Review reports of field inspections conducted by occupational health physicians from contractors and subcontractors. Track and control identified non-conformities.
8. Review records of current training provided by occupational health physicians from contractors and subcontractors. Verify their appropriateness in terms of duration and content.
9. Communicate with employee representatives, request feedback, report issues to the Social Specialist and Project Manager determine necessary actions for occupational health, and implement them.
10. Obtain and review occupational disease reports prepared by occupational health physicians from contractors and subcontractors. Ensure compliance with legal requirements for reporting.
11. Evaluate feedback obtained through the suggestion and grievance system in terms of occupational health, based on requests from the Social Specialist, and determine necessary actions.

12. Inform the Project Manager without delay about field observations, feedback, information obtained from contractors and subcontractor occupational health physicians, and workplace accidents.

7.1.4. OHS Duties of Technical Experts

The Technical Expertise Unit, composed of disciplines in Civil Engineering, Mechanical Engineering, and Electrical Engineering, will perform the following tasks in OHS processes:

1. Inform OHS experts about the technical details and processes of the work.
2. Ensure that the work they oversee is conducted in a way that protects the health and safety of employees.
3. Examine the construction methods prepared by the contractor and make judgments regarding their adequacy.
4. Technically evaluate the aspects mentioned in risk analyses (hazards, risks, and measures) and make judgments regarding their suitability.
5. If deemed necessary by the OHS expert, participate in the work permit system, respond to inquiries from the OHS expert, and assess and query documents transmitted by the OHS expert within this framework.
6. Evaluate, from a technical perspective, OHS training content provided by the contractor. Make judgments about its adequacy (e.g., LOTO systems, scaffold installation and usage, etc.).

7.1.5. OHS Duties of the Social Specialist

1. Receive and compile printed suggestion and grievance forms submitted to the OHS expert.
2. Review feedback obtained within the framework of the suggestion and grievance system. If necessary, involve the OHS expert and workplace physician in the feedback evaluation process.
3. Maintain contact with Employee Representatives and support the establishment of a healthy and strong communication between the OHS expert, workplace physician, and Employee Representatives.

7.1.6. Duties of Support Staff

Carry out the tasks requested by the Occupational Health and Safety (OHS) Specialist and Workplace Physician.

7.2 Contractor Company

7.2.1. Employer and Employer Representative Duties

The Project Manager has been designated as the employer representative for this project, and as such, they are responsible for the following tasks[8]:

1. As the employer, ensure the fulfillment of all duties specified within the Occupational Health and Safety Law No. 6331.

[8] 6331 OCCUPATIONAL HEALTH AND SAFETY LAW (Official Gazette Date: 30.06.2012 Official Gazette Number: 28339) Article 3 2nd Paragraph: Employer representatives acting on behalf of the employer and taking part in the management of the work and workplace are considered employers for the purposes of the implementation of this Law.

2. Ensure that this document, as provided by the Consultant OHS Specialist, is communicated to all relevant units and understood.
3. Ensure the preparation of construction methods and risk analysis and their submission to the Consultant before fieldwork begins.
4. Promptly provide the Consultant OHS Specialist and Workplace Physician with the requested information and documents.
5. Promptly provide the requested information and documents to the Consultant Social Worker.
6. Establish and ensure the effectiveness of the recommendation and grievance system provided by the Consultant Social Worker.
7. Attend meetings and discussions requested by the Consultant Project Manager.
8. Monitor and control the performance of the appointed OHS Specialist and Workplace Physician.
9. Review and fulfill requests made by the Consultant OHS Specialist regarding the performance of the OHS Specialist and Workplace Physician (e.g., changes, warnings, etc.).
10.

7.2.2. Duties of the OHS Specialist

1. Fulfill all responsibilities as specified in the REGULATION ON THE DUTIES, AUTHORITIES, RESPONSIBILITIES, AND TRAINING OF OHS SPECIALISTS in full compliance with the regulation.
2. Ensure the creation of a risk analysis within the framework of the construction method and submit it to the Consultant OHS Specialist before fieldwork begins.
3. Provide records and certificates of past OHS training for employees to the Consultant OHS Specialist.
4. Provide current training to employees based on this document and risk analysis within the scope of the project. Keep training records and submit them to the Consultant OHS Specialist.
5. Plan and implement additional training requested by the Consultant OHS Specialist. Keep records of training and provide them to the Consultant OHS Specialist.
6. Submit employees' Occupational Competency Certificates to the Consultant OHS Specialist.
7. Inform all employees about the recommendation and grievance system implemented specifically for this project.
8. Submit machine periodic inspection reports to the Consultant OHS Specialist.
9. Provide the lists of Personal Protective Equipment (PPE) (standard, quantity, etc.) and delivery receipts to the Consultant OHS Specialist.
10. Participate in field inspections conducted by the Consultant OHS Specialist and have the requested information and documents readily available.
11. Submit records of work accidents to the Consultant OHS Specialist.
12. Implement corrective actions communicated by the Consultant and inform the Consultant OHS Specialist and/or Workplace Physician regarding the process.
13. Plan, attend, and report on weekly and monthly OHS meetings.

7.2.3. Duties of Subcontractor Workplace Physicians

1. Fulfill all responsibilities as specified in the REGULATION ON THE DUTIES, AUTHORITIES, RESPONSIBILITIES, AND TRAINING OF WORKPLACE PHYSICIANS in full compliance with the regulation.
2. Ensure the creation of a risk analysis within the framework of the construction method.
3. Submit employees' periodic occupational health reports to the Consultant Workplace Physician.
4. Provide records and certificates of past occupational health training for employees to the Consultant Workplace Physician.
5. Plan and implement additional training requested by the Consultant Workplace Physician. Keep records of training and provide them to the Consultant Workplace Physician.
6. Submit records of occupational diseases to the Consultant Workplace Physician.

7.2.4. Technical Experts' OHS Duties:

The Technical Expertise Unit consisting of Civil Engineering, Mechanical Engineering, and Electrical Engineering disciplines will perform the following tasks within OHS Processes:

1. Inform OHS Specialists about the technical details and processes of the work.
2. Ensure that the work being carried out is done in a way that protects the health and safety of employees.
3. Develop construction methods and communicate them to the OHS Specialist.
4. Technically evaluate the aspects specified in risk analyses (hazards, risks, and measures) and make judgments regarding their appropriateness.
5. Participate in the work permit system if deemed necessary by the OHS Specialist, answer questions posed by the OHS Specialist, and assess and query documents provided by the OHS Specialist.
6. Ensure the technical improvement of OHS training content (e.g., LOTO system, scaffold installation and usage, etc.).

7.2.5. Employee Representative Duties:

1. Fulfill all responsibilities and duties as specified in the 6331 OCCUPATIONAL HEALTH AND SAFETY LAW (Official Gazette Date: 30.06.2012 Official Gazette Number: 28339).
2. Participate in risk analysis studies within the framework of the construction method.
3. Support the OHS Specialist in implementing the feedback from other employees through the project-specific Suggestions & Grievances system, and provide information to employees about this.
4. Establish strong communication with the Consultant OHS Specialist, Workplace Physician, and Social Specialist, and provide information about the general requests and conditions of employees.
5. Report situations related to avoiding work to the Consultant OHS Specialist without delay.
6. Inform the Consultant Social Specialist of any situations that may negatively affect the effectiveness of the suggestion and grievance system.

7.2.6. Support Personnel Duties:

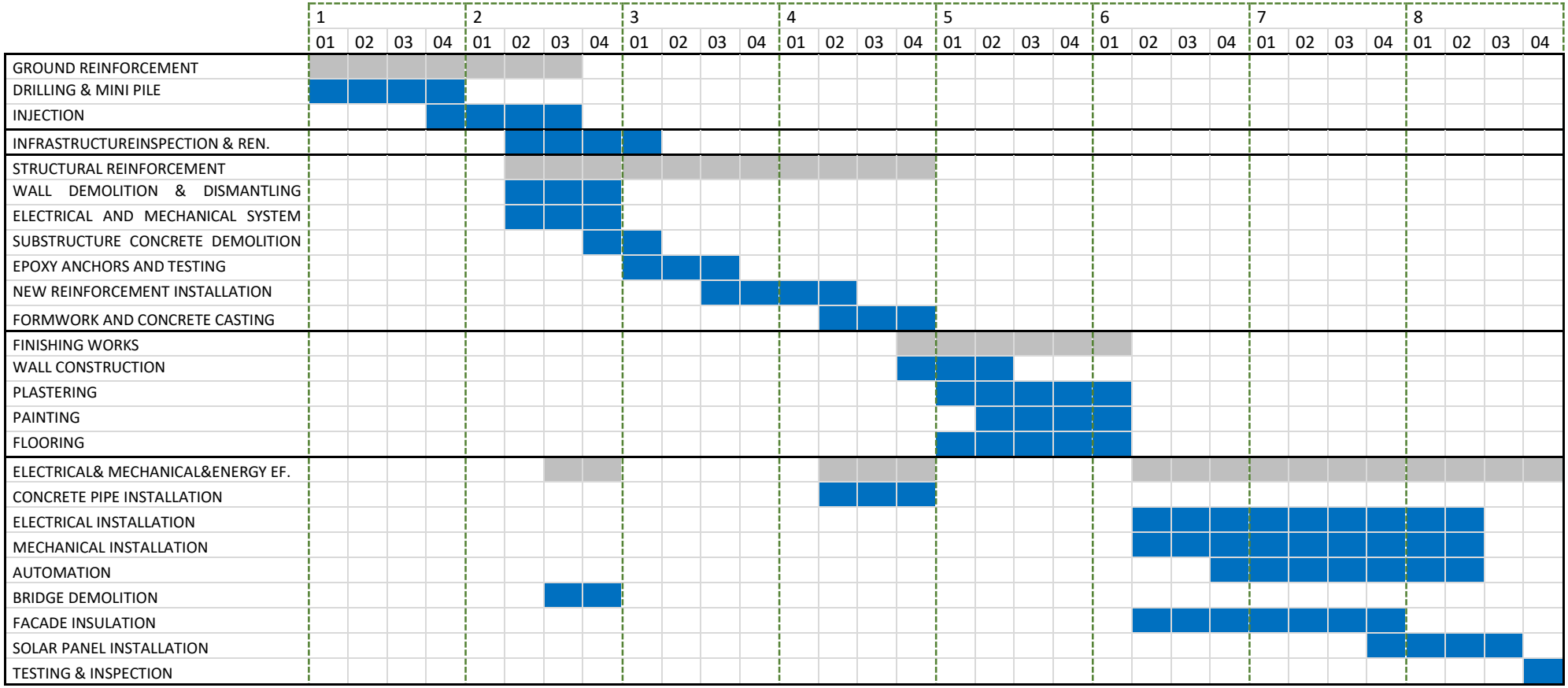
Complete tasks requested by the OHS Specialist and Workplace Physician. Two occupational health and safety workers will perform regular duties in the field.

8.Management of Works

General Work Program and Cross Interaction

The general work program is presented below for your attention. This program is not final but has been created for the purpose of identifying cross-interaction risks during the work. A detailed work program/plan should be created by the contractor and submitted to the consultant.

Table 11: GENERAL WORK PROGRAM



8.1 Working Methods

The following general descriptions of the construction process are provided to guide the contractor in preparing detailed construction methods and risk analysis studies. The contractor must prepare the construction method and risk analysis for each new project and submit it for approval by the consultant. Work may commence only after obtaining approval.

8.1 Structural Reinforcement

Within the scope of structural strengthening, the following work will be carried out for all buildings listed in the "BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS BUILDING LIST".

- The items listed below are provided by the contractor as sample and basic information for the preparation of OHS reports. The contractor must define detailed construction methods for the committed works and submit them to the Consultant before starting the work.

8.1.1 Ground Reinforcement

As a result of the conducted surveys, the risk of liquefaction has been identified in the building's foundations. To prevent this, the construction of intersecting (interlocking) mini piles followed by cement grout injection into the structure's foundation base is planned. The construction items are listed below:

- Waterproof curtain made with intersecting bore piles with a diameter of Ø30 cm *(0.00-16.00 m)*
- Pressurized Water Test Between 0.00-100.00 Meters
- Determination of YAS well-aquifer hydraulic values through tests
- Portland cement *(Bagged) (TS EN 197-1 CEM I 42.5 N)*
- Bentonite *(EN ISO 13500:2008)*
- Cement Grouting in Alluvial and Loose Soils

Drilling & Mini Pile Application

Mini bored pile manufacturing will be carried out at depths of 2.00 and 5.00m around the building *(2-3m from the structure) (adjacent pile holes are drilled with mini piling machines and concrete is poured after the reinforcement is laid. Drilling operations will be carried out by competent drillers.)*

Photo 2: DRILLING EXAMPLE WITH MINI DRILLING MACHINES

Photo 3: REINFORCEMENT FACILITY SAMPLE VISUAL

The drilling process will also cut the electrical infrastructure. Therefore, it is necessary to excavate the electrical supply column line carefully before the construction to reveal it. At this stage, the power supply should be cut off, and no energy should be provided during the work. Major points to be noted are as follows:

- Cable route detection devices may be required to determine the underground line's location. It is essential that the line is open and accessible during the use of these devices. However, the energy can be cut off after the line detection process is completed.
- The process of cutting off the energy line should be carried out by authorized Electrical Engineers or Electrical and Electronics Engineers or under their supervision by technical personnel with professional competence. LOTO rules should be applied to the switchgear equipment where the energy is cut off. For this, the employees who will perform this task should undergo LOTO training.
- Excavation work should be carried out carefully to prevent damage to the existing cable. If the cable is damaged, repair work will be carried out in accordance with the TEDAŞ - AG CABLE TEAM AND EXTERNAL HEAD TECHNICAL SPECIFICATION.
- The identified underground line will be recorded on the existing as-built plans.
- The process of exposing and securing the underground cable to the surface and the re-establishment of the line at the end of the work will be carried out by technical personnel with professional competence under the supervision of an Electrical Engineer or Electrical and Electronics Engineer.
- Before restoring power to the electrical line, the insulation resistance of the line will be checked using calibrated insulation test devices by competent Electrical or Electrical and Electronics Engineers. Power will not be provided to the line without insulation resistance confirmation.

Table 12: DRILLING & MINI PILE APPLICATION CONTROL CHART

<table>
<tr><td>Work to do:</td><td>Drilling & Mini Pile Application</td></tr>
<tr><td colspan="2">WORKING METHOD</td></tr>
<tr><td colspan="2"><u>Technical Description and Requirements</u>
Construction Technique and Technology
The sub-heading Drilling & Mini Pile Application has been explained in 6 points.
Work Equipment Usage
– MINI DRILLING MACHINE
– HAND TOOLS FOR REINFORCEMENT PROCESSING
– TAPE MEASURE
– CALIPER
– HAMMER & CHISEL
– EXTENSION CORD
Use of Chemical Substances
– It is not intended to use any chemicals
Access to the Work Area
– Access road is provided in the section Pre-construction Information & Site Plans in a plan format.
• The maximum speed within the campus area is limited to 20 km/h for trucks.
• The maximum speed within the campus area is limited to 20 km/h for mobile cranes.
Transportation & Supply of Materials
– Details regarding the lifting, transportation, and unloading of consumables and related technical materials are specified and explained under the General Site Rules subheading.</td></tr>
<tr><td>PPE - GENERAL</td><td>Need for Trained Personnel</td></tr>
<tr><td>• SAFETY HELMET
TS EN 397+A1
• EARPLUG
TS EN 352-2
• PROTECTIVE GLASSES
TS EN ISO 16321-3
• GENERAL-PURPOSE WORK GLOVES
TS EN ISO 21420
TS EN ISO 20345
• WORK SHOES
TS EN 12568,
• HALF FACE MASK
TS EN 140</td><td>• TRUCK DRIVER WITH C CLASS DRIVER'S LICENSE
• MOBILE CRANE OPERATOR
• GEOLOGICAL ENGINEER
• CIVIL ENGINEER
• DRILLER
• CONSTRUCTION WORKER (LEVEL 2)</td></tr>
</table>

Table 13: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Drilling (5m, Ø30-40cm)	Drilling machine	▪ Injury due to collision during drilling machine maneuvering. ▪ Pinching or cutting of limbs during drilling machine adjustment and part replacement.	▪ The drilling machine's compliance should be verified with a periodic inspection report. ▪ Before starting the drilling machine, it should be visually inspected by the Driller, and the presence of any physical defects should be assessed. ▪ The drilling machine should only be operated by authorized Drillers. The Driller's professional qualifications and certificates should be checked and verified. ▪ Unauthorized personnel and experts (other than the Driller, Driller Assistant, Mechanical Engineer, etc.) should not be allowed to intervene with the drilling machine. ▪ The drilling machine's work area should be separated by safety barriers, and safety signs should indicate that approaching the machine is prohibited. ▪ Personnel involved in the drilling process must wear work boots, protective eyewear, a hard hat, dust mask, and earmuffs.
The transportation of drilling elements and other equipment	Truck	▪ Traffic accident ▪ Material falling ▪ Accident during maneuver	▪ The truck can be operated by drivers with a C-type driver's license. ▪ All doors of the truck trailer must be closed and checked before moving. ▪ All materials inside the truck must be properly secured taking into account the force of acceleration. ▪ The truck will move in accordance with the campus traffic action plan.
Natural Gas Line Interventions	Gas Leakage and Explosion	▪ Trauma ▪ Severe burn ▪ Limb loss ▪ Death	▪ Prior to drilling operations, it must be verified through İGDAŞ that there are no natural gas pipelines in the relevant area. ▪ Natural gas pipeline operations must be shut down and protected through the LOTO system before any intervention. ▪ Interventions in existing pipeline systems or the establishment of new pipeline systems will be carried out under the supervision of a Natural Gas Infrastructure Construction Control Personnel Level 4 (12UY0042-4). ▪ Personnel involved in the task are required to wear safety boots, protective goggles, a helmet, dust mask, and ear protection. ▪ The work areas will be separated by safety barriers, and safety signs indicating risks will be displayed.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Identifying Underground Power Lines	Intervening with the cable while the power is on	Electric shock	▪ Underground energy lines will be determined using cable route detection devices. During this process, there will be energy in the line due to the nature of the work. However, after the detection process is completed, it is essential to cut off the energy at the column switch in the transformer low-voltage cells and secure it with the LOTO system. (All personnel involved in the task must receive LOTO training.) ▪ Cable intervention and, if necessary, additional jointing work will be carried out by technical personnel with professional competence in accordance with the TEDAŞ - AG CABLE TEAM AND EXTERNAL HEAD TECHNICAL SPECIFICATION. ▪ The process of cutting off the power supply line, tagging, locking, and checking, excavation works, changing cable routes, additional joints, and restoring energy will all be carried out under the supervision of authorized Electrical or Electrical Electronics Engineers. ▪ The identified energy line will be marked on the existing as-built plans. Before each excavation work in the field, as-built plans will be checked. ▪ Before energy is restored to the line, passive tests will be conducted with insulation test devices, and it will be verified that the cable's insulation value is suitable (³999MW). This process will be carried out by authorized Electrical or Electrical Electronics Engineers. ▪ Personnel involved in the task are required to wear a hard hat, protective goggles, a dust mask, as well as **insulated** gloves and work shoes.
Replacement of sewage, drinking water, and rainwater pipelines.	Hydrogen Sulfide (H2S) poisoning, collapse occurring around the excavation site.	Injury, poisoning, loss of life.	▪ Before changing the lines, H2S measurements will be made. Working with an externally supplied gas mask will be done in risky areas. ▪ Methane gas measurement will be done in the lines. If the values exceed the limit, work will not be carried out. ▪ The edges of the excavation will be supported with reinforcements, and the soil removed from the excavation will be stored away from the excavation edge. ▪ While changing pipes, workers will be at a safe distance, and control ropes will be used to lower materials underground.

Water Pressure Test

This is a test conducted to determine the permeability of rocks. It is based on the principle of determining the flow rate of absorbed water by providing water at different pressures to a vertical borehole or well, sealed with plugs, which has been drilled. It is named the Lugeon test because it was first conducted by Maurice Lugeon.

- The Lugeon unit (LU) is the amount of water in liters that flows from a 1-meter length of the test zone in 1 minute under an effective pressure of 10 kg/cm².

Photo 4: PRESSURIZED WATER TEST SAMPLE IMAGE

The major points to be aware of are listed below.

- While pressurized liquids may not pose a danger, inflation devices such as Peceker pose a risk of explosion due to pressurized gas. It is recommended to use pressurized equipment only after inspection and approval by an expert Mechanical Engineer.

Photo 5: PECEKER INFLATION DEVICE SAMPLE IMAGE

Aquifer[9] Test

This test is conducted to determine the presence and location of boundary conditions, potential flow between neighboring aquifers and their quantities, and to establish whether the flow conditions are confined or unconfined. It can be performed as a pump test or slug test.

Photo 6: AQUIFER TEST SAMPLE IMAGE

Bentonite Application

During drilling, bentonite is mixed into the drilling fluid to achieve high fluidity efficiency.

Injection

The mixture of drilling fluid with bentonite is injected into the ground through the drill string and drill bit. Depending on the project, a packer is placed at the application point on the well to ensure the injection mixture penetrates the ground. When the ground is saturated with the injection mixture, the packer is moved higher to allow the injection mixture to be delivered to higher levels. The process of saturating the ground is referred to as injection reflux, and the mixture is recirculated to the injection station. The injection is completed by starting with a fine mixture, transitioning to a coarse mixture after reflux, and then finishing with a fine mixture application.

[9] They are underground rock layers saturated with groundwater.

Photo 7: INJECTION PROCESS SAMPLE PICTURES

Major considerations that should be taken into account are listed below:

- High-pressure compressors will be used. Before starting work, the compressor should be inspected by a competent Mechanical Engineer, and a report verifying its suitability should be prepared.
- Since bagged cement will be used, it is important to provide training to the workers on manual handling procedures.
- There is a high probability of damage to electrical cables. Additionally, wet ground conditions at the work sites increase the risk of electric shock. When selecting work boots, these factors should be taken into consideration.

Table 14: PRESSURIZED WATER TEST & AQUIFER TEST & BENTONITE APPLICATION & INJECTION CONTROL TABLE

Work to do:	Basınçlı Su Deneyi & Akifer Testi & Bentonit Uygulama & Enjeksiyon

WORKING METHOD

Technical Description and Requirements

Construction Technique and Technology

- It is explained under the subheadings of Pressurized Water Test, Aquifer Test, Bentonite and Injection.

Work Equipment Usage

- MINI DRILLING MACHINE
- INJECTION COMPRESSOR
- PECEKER INFLATION DEVICE
- AQUIFER TEST DEVICE
- HAND TOOLS FOR REINFORCEMENT PROCESSING
- TAPE MEASURE
- CALIPER
- MORTAR MIXER
- HAMMER & PLUG
- EXTENSION CABLE

Use of Chemical Substances

- Concrete to be injected
- Bentonite

Access to the Work Area

- Access road is provided in the section Pre-construction Information & Site Plans in a plan format.
  - The maximum speed for trucks within the campus is limited to 20 km.

Transportation & Supply of Materials

- Details regarding the lifting, transportation, and unloading of consumables and related technical materials are specified and explained under the General Site Rules subheading.

PPE - GENERAL	Need for Trained Personnel
• HELMET TS EN 397+A1 • EARPLUG TS EN 352-2 • PROTECTIVE GLASSES TS EN ISO 16321-3 • GENERAL-PURPOSE WORK GLOVES TS EN ISO 21420 TS EN ISO 20345 • WORK SHOES TS EN 12568, • HALF FACE MASK TS EN 140	• TRUCK DRIVER WITH CLASS C DRIVER'S LICENSE • MACHINE ASSEMBLER (AQC: 12UY0105-3 | LEVEL 3) • GEOLOGICAL ENGINEER • CONSTRUCTION ENGINEER • MECHANICAL ENGINEER • SONDER • CONSTRUCTION WORKER (LEVEL 2)

Table 15: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Drilling (5m, Ø30-40cm)	Drilling machine	▪ Injury due to collision during drilling machine maneuvering. ▪ Pinching or cutting of limbs during drilling machine adjustment and part replacement.	▪ The drilling machine's compliance should be verified with a periodic inspection report. ▪ Before starting the drilling machine, it should be visually inspected by the Driller, and the presence of any physical defects should be assessed. ▪ The drilling machine should only be operated by authorized Drillers. The Driller's professional qualifications and certificates should be checked and verified. ▪ Unauthorized personnel and experts (other than the Driller, Driller Assistant, Mechanical Engineer, etc.) should not be allowed to intervene with the drilling machine. ▪ The drilling machine's work area should be separated by safety barriers, and safety signs should indicate that approaching the machine is prohibited. ▪ Personnel involved in the drilling process must wear work boots, protective eyewear, a hard hat, dust mask, and earmuffs.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Identifying Underground Power Lines	Intervening with the cable while the power is on	Electric shock	▪ Underground energy lines will be determined using cable route detection devices. During this process, there will be energy in the line due to the nature of the work. However, after the detection process is completed, it is essential to cut off the energy at the column switch in the transformer low-voltage cells and secure it with the LOTO system. (All personnel involved in the task must receive LOTO training.) ▪ Cable intervention and, if necessary, additional jointing work will be carried out by technical personnel with professional competence in accordance with the TEDAŞ - AG CABLE TEAM AND EXTERNAL HEAD TECHNICAL SPECIFICATION. ▪ The process of cutting off the power supply line, tagging, locking, and checking, excavation works, changing cable routes, additional joints, and restoring energy will all be carried out under the supervision of authorized Electrical or Electrical Electronics Engineers. ▪ The identified energy line will be marked on the existing as-built plans. Before each excavation work in the field, as-built plans will be checked. ▪ Before energy is restored to the line, passive tests will be conducted with insulation test devices, and it will be verified that the cable's insulation value is suitable (³999MW). This process will be carried out by authorized Electrical or Electrical Electronics Engineers. ▪ Personnel involved in the task are required to wear a hard hat, protective goggles, a dust mask, as well as **insulated** gloves and work shoes.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Use of Peceker inflation devices	Pressure vessel. Device electrical supply.	Injury due to sudden discharge of high pressure gases. Shock due to electrical leakage.	▪ All pressurized equipment must have periodic inspection reports obtained and their compliance verified before use. ▪ These devices can only be used by experienced technical personnel. ▪ The area around the equipment must be separated by a safety barrier, and warning signs must be posted to indicate pressurized equipment. ▪ All electrical equipment must undergo a PAT Testing before use to ensure electrical safety. ▪ Extension cables and device power cables and plugs must be physically protected. Cables should not be left on the ground in an ordinary manner, and the passage of machinery, hand trucks, and workers over them should not be allowed. ▪ The power cable must not come into contact with water (use of cables in puddles, mud, etc.).
Injection	Pressure vessel. Device electrical supply.	Injury due to sudden discharge of high pressure gases. Shock due to electrical leakage.	▪ All pressurized equipment must have periodic inspection reports obtained, and their compliance should be verified before use. ▪ All electrical equipment must undergo PAT Testing to confirm their electrical safety. ▪ Extension cables and device power cables should be physically protected. Cables should not be left on the ground in an ordinary manner, and the passage of machinery, hand trucks, and workers over them should not be allowed. ▪ Device power connections (secondary panel, switchboard connections) will be carried out by technical personnel with professional competence. ▪ The power cable must not come into contact with water (use of cables in puddles, mud, etc.).
Transporting cement bags	Heavy lifting Use of chemicals	▪ Orthopedic injuries, muscle spasms, and tears. ▪ Respiratory problems. ▪ Chemical contact with the eyes.	▪ All personnel involved in the task must have a minimum Construction Worker Level 2 Certificate. ▪ Training on manual handling rules will be provided to all personnel who carry loads manually. ▪ The necessity of eye wash should be determined by the company doctor, considering dust and chemical use. ▪ Personnel on duty must wear safety shoes, protective goggles, helmets, dust masks, and ear protection as required.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Natural Gas Line Interventions	Gas Leakage and Explosion	▪ Trauma ▪ Severe burn ▪ Limb loss ▪ Death	▪ Prior to drilling operations, it must be verified through İGDAŞ that there are no natural gas pipelines in the relevant area. ▪ Natural gas pipeline operations must be shut down and protected through the LOTO system before any intervention. ▪ Interventions in existing pipeline systems or the establishment of new pipeline systems will be carried out under the supervision of a Natural Gas Infrastructure Construction Control Personnel Level 4 (12UY0042-4). ▪ Personnel involved in the task are required to wear safety boots, protective goggles, a helmet, dust mask, and ear protection. ▪ The work areas will be separated by safety barriers, and safety signs indicating risks will be displayed.

8.2 Structural Reinforcement & Infrastructure Works

1. After the ground improvement process is completed, both superstructure strengthening and new infrastructure construction can begin simultaneously. Infrastructure construction around the buildings will be carried out using traditional methods, including land surveying, route excavations, adjustment of route elevations, laying of infrastructure, and the creation of chimneys, as well as connecting the existing infrastructure from the building to the new chimneys. Major considerations to be taken into account are listed below.

    - The use of construction machinery is crucial. Excavation work involves the use of excavators, loaders, and trucks. The periodic inspection reports and user competency certificates (operator's license, Class C driver's license) of these machines must be checked before work begins.
    - During excavations, it is important to thoroughly examine the underground plans and identify natural gas, electricity, telecommunications, water, and wastewater lines *(excluding sections that will not change).* Especially, natural gas and electricity lines pose a serious risk of injury or even death.
    - In areas where underground natural gas pipelines are involved, the work must be carried out under the supervision of a Natural Gas Infrastructure Construction Control Personnel Level 4 (12UY0042-4).

Photo 8 EXCAVATION WORK SAMPLE IMAGE

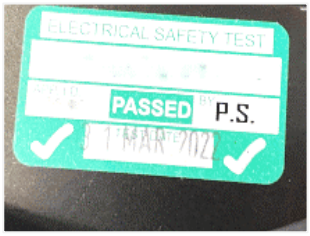
2. In the superstructure strengthening application, dismantling processes will be carried out from upper floors to lower floors. Walls on the axes where strengthening curtains and column jackets will be applied will be marked, and demolition will start from the top floor using hammers and breakers. Before demolishing walls, any items that may be damaged, such as doors, windows, fixtures, countertops, electrical, and mechanical equipment, should be removed and protected. Major considerations to be taken into account are listed below.

    - The danger of demolished structural elements containing electrical wiring should be considered. Disconnecting the power supply to the area in question and prioritizing the use of other lines for the electrical needs of tools such as breakers, drills, etc., is essential. Electrical elements such as junction boxes, sockets, lighting fixture wiring, switches, etc., should be checked before demolition, and it should be verified that there is no electricity. During this process, the use of control items alone is not sufficient. At a minimum, control devices such as phase voltage detectors should be used. These test devices should undergo daily functional checks *(can be done by using working sockets).*

Photo 9: PHASE DETECTOR SAMPLE IMAGE

- All electrical hand tools must have undergone PAT Tests. PAT test reports will be requested and checked before work begins. During field inspections, the presence of PAT control and approval labels on electrical devices will be verified. Devices and equipment that do not have a compliance label are not allowed to be used. (Extension cables are also included in this scope.)

Photo 10: PAT TEST LABEL SAMPLE IMAGE



- Care must be taken to ensure that electrical extension cables are not damaged and that these cables do not come into contact with water. Extension cables and other electrical device power cables will be inspected daily. The use of damaged cables is not allowed.
- Both sides of the walls must be inspected during demolition, and necessary restrictions (such as restricting access, monitoring the impact areas of the walls to be demolished, using warning signs and signage, etc.) must be in place to prevent workers from being trapped under debris.
- In wall demolitions that affect the exterior of the building, the impact areas should be determined, and entry to these areas should be prohibited.
- Before wall demolition, reinforced areas should be marked. It is essential to ensure that these reinforced elements (structural components) are not damaged. The demolition team will be reminded of this on a daily basis.
- To avoid damaging the flooring during demolition work, walls should be broken into pieces and brought down in a controlled manner. Techniques that should be applied to prevent walls from being demolished in one piece should be communicated to the workers. Protective covers of appropriate thickness should be used for surfaces that need to be protected.

Photo 11: WALL DEMOLITION SAMPLE IMAGE

- Workers responsible for transporting debris must be informed about manual handling rules. Throwing debris from a height without control is prohibited. The method for removing debris from the site will be determined and communicated by the contracting company.
- During the demolition process, workers must use dust masks and protective goggles to protect themselves from dust.
- Earplugs or earmuffs are mandatory for workers to protect themselves from noise during the demolition process.
- Workers must use protective goggles to protect themselves from flying debris during the demolition process.

3. After the dismantling process, sub-foundation concrete needs to be broken and the foundation interior needs to be excavated to connect the strengthening elements to the foundations. These breaking and excavation operations will be carried out manually (with the help of breakers and sledgehammers) and/or with small machinery that can enter the building (such as a bobcat, etc.).

Photo 12: OPENING AROUND THE COLUMN AND SHEAR WALL MANTLE SAMPLE IMAGE

The major points to be considered are listed below:

- During excavation works, it is essential to first check the periodic inspection reports and user competence certificates (operator license) for small excavators and loaders that will be used.
- During maneuvers with construction machinery in confined spaces, responsible operators should be informed in advance to prevent damage to walls and reinforced components that need protection. The construction methods for using these machines

inside the building should be communicated to the consultant beforehand. *(This document should specify whether there is a risk of permanent damage during the transportation of the construction machine to the working area, its placement inside the building, and the walls to be demolished.)*

- Warning tapes should be placed around the excavated areas. If night work is carried out, these tapes should have reflective properties.

4. After the demolition and excavation processes are completed, anchor rods are installed in the existing columns, beams, and foundations. Anchor holes are drilled in accordance with the dimensions in the detailed projects, and this process involves drilling holes into existing elements using rotary drills, cleaning the holes with compressed air, *injecting epoxy adhesive into the holes, and inserting the previously prepared anchor steel (prepared from regular construction steel) into the hole.*

Photo 13: INSTALLING ANCHOR RODS SAMPLE IMAGE

Major considerations to be taken into account are listed below:

- Anchor rods with exposed ends pose a serious risk of injury or even death in the event of a fall. Areas with such risks should be enclosed with warning labels and workers should be alerted as long as they pose a risk. *(Care should be taken to ensure that the ends of anchor rods are not sharp or cutting.)* Especially in areas where the risk of falling exists, they should be surrounded by warning tape based on the principle of the affected area.
- All electrical hand tools must have undergone PAT Tests. PAT test reports will be requested and checked before work begins. During site inspections, the presence of PAT control and approval labels on electrical devices will be checked. Devices that do not have compliance labels are not allowed for use. (Extension cables are also included in this scope.)
- Care must be taken to ensure that electrical extension cables are not damaged and that they do not come into contact with water. Extension cables and other electrical power cables will be checked daily. The use of damaged cables is not allowed.
- There is a risk of anchor rods to fall from outside the building to the ground. Workers should consider this risk when stacking and installing these ribbed irons. The use of helmets is a minimum requirement for all workers within the work area.
- Anchor rods are likely to be rusty. Therefore, workers must use suitable protective gloves. In addition, all workers must have received tetanus vaccinations. *(During workplace physician training, workers should be informed about infections caused by rusty metals and tetanus.)*
- Compressors to be used for hole cleaning must be checked by competent mechanical engineers and their compliance must be verified.

- The MSDS (Material Safety Data Sheet) of epoxy adhesives must be checked by workplace physicians, and workers must be informed *(volatile properties, eye contact, etc.).*
- The necessity of eye wash in case of dust and chemical use should be determined by the workplace physician.
- Personnel working with reinforcement bars must have a Level 3 Reinforced Concrete Ironworker (11UY0012-3) certificate.

5. Carrying out the installation of strengthening element reinforcement along with anchor manufacturing.

Photo 14: SAMPLE IMAGE OF INSTALLING REINFORCEMENT ELEMENTS

Attention should be paid to the following major points:

- During the placement of reinforcement metals, the risk of piercing or cutting should be considered, and their ends should not be left in a dangerous condition.
- Reinforcement metals that carry a risk of piercing should have their ends covered with plastic wedges and marked with warning signs, especially if they are difficult to see due to differences in elevation, etc.
- Reinforcement bars are likely to be rusty. Therefore, workers must use suitable protective gloves. In addition, all workers should have received tetanus vaccinations. *(During occupational health and safety training, workers should be informed about infections and tetanus caused by rusty metals.)*
- When using machines for bending or cutting reinforcement bars, the machines must have passed PAT tests if applicable. PAT test reports should be requested and checked before work begins. During field inspections, the presence of PAT control and approval labels on electrical devices will be checked. Devices without compliance labels are not allowed for use. (Extension cables are also included in this category.)
- Personnel working on the shaping of reinforcement bars must have a Level 3 Concrete Reinforcer Certificate (11UY0012-3).

6. After the control organization receives the test results and reinforcement samples, plywood molds are closed, and "self-compacting concrete" *(fine-aggregate, superplasticizer-enhanced concrete)* is poured into the molds from a hole opened from the upper floor or a so-called "bird's beak" mold. The concrete pouring process is carried out using a transit mixer and concrete pump. If the pump's nozzle cannot reach certain areas within the existing structure, mobile pipes *(corrugated pipes, etc.)* or manual pouring may be necessary. After the concrete

is poured for one level's strengthening elements and at least 2 days have passed, the concrete for the upper level is poured. Any potential gaps between existing and new strengthening elements due to the concrete not reaching are filled with high-strength polymer fiber-reinforced repair mortars. Major points to consider at this stage include:

- All electrical tools *(such as mobile concrete mixers, vibrators, concrete pumps, etc.)* must have undergone PAT tests. PAT test reports should be requested and checked before work begins. During field inspections, the presence of PAT control and approval labels on electrical devices will be checked. Devices without compliance labels are not allowed for use. (Extension cables are also included in this category.)
- Care must be taken to ensure that electrical extension cables are not damaged, and these cables must not come into contact with water. Extension cables and other electrical power cables will be checked daily. The use of damaged cables is not permitted.
- Materials such as repair mortars must have their MSDS checked by occupational health professionals, and workers must be informed *(regarding inhalation, eye contact, etc.).*
- During the access of transit mixers to the work area, traffic action plan rules must be followed. Access by unrelated workers to the vicinity of transit mixers should be restricted with warning tapes.
- Personnel involved in formwork work must have a Level 3 Wooden Formworker Certificate (11UY0011-3).
- Personnel involved in concrete pouring work must have a Level 3 Concrete Worker Certificate (12UY0049-3).

7. After the completion of the rough construction, repair work begins. The interior and exterior surfaces of the strengthening walls are finished with plaster, paint, insulation, etc. Levelling concrete and coating materials are applied to damaged floors, electrical installations, mechanical installations, and if necessary, door and window manufacturing is completed, thus finishing the strengthening work. Major points to consider at this stage include:

- Personnel responsible for scaffold installation must have a Level 3 Scaffold Installation Worker Certificate *(12UY0056-3).*
- Personnel working on electrical installations must, at a minimum, have an Electrical Installer Level 3 Certificate *(15UY0241-3).*
- Personnel involved in the assembly of electrical panels and boards must, at a minimum, have an Electrical Panel Assembler Level 3 Certificate *(12UY0075-3).*
- Torque-controlled screwdrivers and tightening equipment should be used during the assembly of electrical panels and boards. Appropriate tightening forces should be determined in advance based on the type of switchgear or the size of bolts and nuts and communicated to the responsible personnel.
- Personnel involved in mechanical installations must, at a minimum, have a Heating and Natural Gas Internal Installation Worker Level 3 Certificate *(11UY0031-3).*
- Personnel responsible for wall construction must have a Wall Builder Level 3 Certificate *(12UY0048-3).*

- Personnel performing plastering work must have a Plasterer Level 3 Certificate *(11UY0024-3).*
- Personnel performing gypsum work must have a Gypsum Plaster Applicator Level 3 Certificate *(12UY0055-3).*
- Personnel working on ceramic tile work must have a Ceramic Tile Layer Level 3 Certificate *(12UY0051-3).*
- Personnel involved in painting work must have a Construction Painter Level 3 Certificate *(11UY0023-3).*
- Field personnel must, at a minimum, have a Construction Worker Level 2 Certificate *(16UY0253-2).*
- Material Safety Data Sheets (MSDS) for repair mortars, paints, and other chemicals should be checked by occupational health professionals, and workers should be informed *(regarding inhalation, eye contact, etc.).*
- All personnel handling heavy loads should receive training in manual lifting and handling.

Table 16: STRUCTURAL REINFORCEMENT & INFRASTRUCTURE WORKS CONTROL TABLE

Work to do:	Structural Reinforcement & Infrastructure Works

WORKING METHOD

Technical Description and Requirements

Construction Technique and Technology

- Under the subheading Structural Reinforcement and Infrastructure Works the following 7 main points and their subpoints have been explained.

Work Equipment Usage

- EXCAVATOR LOADER
- TRANSMIXER
- TRUCK
- BREAKER DRILL
- SPIRAL
- MORTAR MIXER
- COMPRESSOR
- MOBILE CONCRETE MIXER
- REBAR BENDING MACHINE
- REBAR CUTTING MACHINE
- CORDLESS / FIXED DRILL
- CORDLESS SCREW/NUT TIGHTENING
- PHASE VOLTAGE DETECTOR
- MULTIMETER
- TORQUE-CONTROLLED SCREWDRIVER
- TORQUE-CONTROLLED FASTENING
- INDOOR SCAFFOLD (MOBILE / FIXED)
- HAMMER & CHISEL
- CORDLESS SCREWDRIVER
- EXTENSION CABLE

Use of Chemical Substances

- CEMENT, PLASTER, EPOXY ADEHESIVE, PAINT, PAINT SOLVENT

Access to the Work Area

- Access road is provided in the section Pre-construction Information & Site Plans in a plan format.
  - The maximum speed within the campus area is limited to 20 km/h for trucks.
  - The maximum speed within the campus area is limited to 20 km/h for mobile cranes.

Transportation & Supply of Materials

– Details regarding the lifting, transportation, and unloading of consumables and related technical materials are specified and explained under the General Site Rules subheading.

PPE - GENERAL	Need for Trained Personnel
• SAFETY HELMET TS EN 397+A1 • EARPLUG TS EN 352-2 • PROTECTIVE GLASSES TS EN ISO 16321-3 • GENERAL PURPOSE WORK GLOVES TS EN ISO 21420 • WORK SHOES TS EN 12568, • HALF FACE MASK TS EN 140 • FULL BODY SAFETY HARNESS EN 361 • ROPE DESCENT SYSTEM EN 353 • SAFETY HOOK EN 362 • FALL ARREST SYSTEM • EMNİYET HALATLARI SAFETY ROPES EN 355	• MECHANICAL ENGINEER • ELECTRICAL ENGINEER • CIVIL ENGINEER • ARCHITECT • SCAFFOLD INSTALLER LEVEL 3 (12UY0056-3) • ELECTRICAL INSTALLER LEVEL 3 (15UY0241-3) • HEATING AND NATURAL GAS INTERIOR INSTALLER LEVEL 3 (11UY0031-3) • BRICKLAYER LEVEL 3 (12UY0048-3) • PLASTERER LEVEL 3 (11UY0024-3) • GYPSUM PLASTER APPLICATOR LEVEL 3 (12UY0055-3) • CERAMIC TILE LAYER LEVEL 3 (12UY0051-3) • CONSTRUCTION PAINTER LEVEL 3 (11UY0023-3) • CONSTRUCTION WORKER LEVEL 2 (16UY0253-2)

Table 17: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Excavation work	Construction machinery	▪ Injury due to collision during machine maneuvering. ▪ Limb entanglement and cutting during machine adjustment and parts replacement.	▪ The machine should be visually inspected by the operator before starting and any physical defects should be assessed. ▪ Machines must be functionally checked by the operator before each operation (reverse maneuver warning siren, warning lights, etc.). ▪ Only authorized operators are allowed to use the machine. The professional qualifications of the operator should be checked and verified. ▪ Unauthorized personnel and experts (operators, machine engineers, etc.) are not allowed to intervene in the machine. ▪ The working area of the machine will be separated by safety barriers, and safety signs indicating that approaching the machine is prohibited should be posted. ▪ Personnel on duty must wear work boots, protective goggles, helmets, dust masks, and ear protection

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Natural Gas Line Interventions	Gas Leakage and Explosion	▪ Trauma ▪ Severe burn ▪ Limb loss ▪ Death	▪ Prior to drilling operations, it must be verified through İGDAŞ that there are no natural gas pipelines in the relevant area. ▪ Natural gas pipeline operations must be shut down and protected through the LOTO system before any intervention. ▪ Interventions in existing pipeline systems or the establishment of new pipeline systems will be carried out under the supervision of a Natural Gas Infrastructure Construction Control Personnel Level 4 (12UY0042-4). ▪ Personnel involved in the task are required to wear safety boots, protective goggles, a helmet, dust mask, and ear protection. ▪ The work areas will be separated by safety barriers, and safety signs indicating risks will be displayed.
Wall demolition	▪ Being trapped under heavy loads. ▪ Electric shock.	▪ Crushing ▪ Trauma ▪ Electric shock	▪ Consider the risk of the structure to be demolished containing electrical lines. Disconnect the energy supply of the area; the power needs of devices like jackhammers should be supplied from different sources. ▪ Implement LOTO regulations in case of a power outage. ▪ Before work commences, check for the presence of electrical equipment such as sockets, switches, commutators, distribution boxes, etc., on the walls and, if needed, follow the instructions of an Electrical Engineer to dismantle equipment and cables. ▪ Verify that there is no electricity using a phase voltage detector on sockets, distribution boxes, and switches before demolition. ▪ Ensure that all jackhammers and other demolition equipment have passed PAT Tests and are electrically sound. ▪ Take necessary precautions to prevent damage to electrical extension cords and ensure they don't come into contact with water. Check electrical extension cords and other power cables daily, and do not use damaged cables. ▪ Use safety barriers and warning signs to separate the other sides of the walls to be demolished and indicate the demolition zone. ▪ Demolish walls in controlled, piece-by-piece fashion. ▪ Ensure that personnel involved in the demolition wear proper work shoes, safety goggles, hard hats, dust masks, and ear protection.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Wall Demolition	▪ Construction machinery	▪	▪ The building perimeter will be separated with safety barriers and warning signs. ▪ High-risk areas where pieces of the demolished wall may fall will be identified before work and supervised by responsible personnel. ▪ Personnel involved in wall demolition will use full-body safety harnesses and fall prevention equipment. These devices will be attached to secure structures. (Personnel working at heights should receive training.) ▪ Sections of the demolished wall will be temporarily secured with guardrails and warning tape/signs until a new wall is established. If nighttime work is performed, the tape and signs should be reflective. ▪ Personnel on duty must wear work boots, protective goggles, hard hats, dust masks, and ear protection.
The opening of the curtain wall and column mantles	Construction machinery	▪ Injury due to collision during the maneuvering of the construction equipment. ▪ Crushing or cutting of limbs during adjustments and part replacements of the construction equipment.	▪ The suitability of the construction equipment should be verified through periodic inspection reports. ▪ Before starting the construction equipment, the operator should visually inspect it and evaluate the presence of any physical defects. ▪ Construction equipment should be functionally checked by the operator before each operation (reverse maneuver warning siren, warning lights, etc.). ▪ Only authorized operators are allowed to operate the construction equipment. The professional qualifications of the operator should be checked and verified. ▪ Unauthorized personnel and experts are not allowed to interfere with the construction equipment. ▪ The construction equipment's work area should be separated by safety barriers, and safety signs should indicate that approaching the equipment is prohibited. ▪ Personnel involved in the operation should wear safety boots, protective goggles, helmets, dust masks, and ear protection.
The opening of the curtain wall and column mantles	Pit	Injury due to falling into a pit.	▪ Warning tapes and signs should be placed around the excavated areas. In case of nighttime work, these tapes and signs should have reflective properties.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
The anchoring bars should be fixed to the existing columns, beams, and foundations.	Rusty metal Sharp, pointed parts Use of power tools	▪ Serious trauma due to cutting or impalement. ▪ Tetanus. ▪ Respiratory problems. ▪ Foreign body or small particles entering the eyes. ▪ Electric shock.	▪ All electric equipment used for drilling and cutting rebar must undergo PAT testing to ensure electrical safety. ▪ Extension cords and device power cables must be physically protected. Cables should not be left lying on the ground haphazardly, and they should not be allowed to be passed over by hand trucks or workers during this time. Cables should not be allowed to sit in puddles of water. ▪ Before use, electric equipment should be visually inspected, and devices with physical defects should be taken out of use. ▪ Areas where anchor rods are installed should be marked with warning tape and signs. If nighttime work is done, the tape and signs should have reflective properties. ▪ All employees must have their tetanus vaccinations. (Occupational physicians should inform employees about infections caused by rusty metals and tetanus during training.) ▪ All employees must wear appropriate protective gloves. ▪ The necessity of eye washing for dust and chemical use should be determined by the company physician. ▪ Personnel who work with rebar should have a Level 3 Certificate in Reinforced Concrete Ironwork (11UY0012-3). ▪ Sharp and pointed ends should be tapered with suitable cutting tools or a grinder. If the sharp, pointed ends cannot be corrected, rubber bumpers should be installed. ▪ Employees must wear appropriate work boots, safety goggles, hard hats, dust masks, and hearing protection.
The anchoring bars should be fixed to the existing columns, beams, and foundations.	Epoxy adhesives	Chemical contact-related disorders.	▪ The MSDS of epoxy adhesives should be checked by workplace physicians, and employees should be informed (volatile properties, eye contact, etc.). ▪ The need for eye washing due to dust and chemical usage should be determined by the workplace physician.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Installation of reinforcement element	Metal cutting, bending Rusty metal Sharp, pointed parts Use of electrical tools	▪ Cutting and piercing related serious trauma ▪ Limb entrapment ▪ Tetanus ▪ Respiratory issues ▪ Foreign objects or small particles entering the eyes ▪ Electric shock	▪ Personnel working with reinforcement bars must have a Level 3 Concrete Reinforcement Worker (11UY0012-3) certificate. ▪ All electric equipment used for cutting and bending reinforcement bars must undergo a PAT test to confirm their electrical safety. ▪ Extension cords and device power cables should be physically protected. Cables should not be left lying on the ground where they can be run over by carts or walked on by workers. Cables should not be allowed to sit in puddles of water. ▪ Prior to use, electric equipment should be visually inspected, and devices showing physical defects should be taken out of service. ▪ When using electric reinforcement bending equipment, protective gloves should be removed before conducting work near the bending heads. ▪ Sharp, pointed edges should be properly dulled using appropriate cutting or spiral tools. If sharp, pointed edges cannot be corrected, rubber bumpers should be installed. ▪ Personnel involved in the tasks should wear safety shoes, protective goggles, hard hats, dust masks, and ear protection.
Installation of reinforcement element	Temporary scaffold	▪ Falling from heights ▪ Injuries due to objects falling from heights	▪ Regardless of their size, the construction of work scaffolds must comply with the TS EN 12811-1 standard. All personnel working on these scaffolds must have received training in working at heights and are required to use full-body safety harnesses and fall prevention equipment. ▪ Personnel on duty are required to wear work boots, protective goggles, helmets, dust masks, and ear protection.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Concreting	Temporary scaffold. Use of electrical equipment Chemical substance use	▪ Falling from height ▪ Traumas due to the impact of objects falling from a height. ▪ Disorders due to chemical contact. ▪ Electric shock	▪ Personnel working on formwork tasks must have a Level 3 Wooden Formworker certificate (11UY0011-3). ▪ Personnel involved in concrete pouring work must have a Level 3 Concrete Worker certificate (12UY0049-3). ▪ Regardless of their size, the installed work scaffolds must comply with TS EN 12811-1 standard conditions. All personnel working on these scaffolds must have received training on working at heights and must use full-body safety harnesses and fall prevention equipment. ▪ All electric equipment such as vibrators must undergo a PAT test to confirm their electrical safety. ▪ Extension cables and equipment power supply cables must be physically protected. Cables should not be left on the ground in a haphazard manner, and workers and hand carts should not be allowed to pass over them. Cables should not be allowed to sit in puddles. ▪ MSDS for repair mortars and similar materials must be checked by workplace doctors, and employees should be informed about them (inhalation, eye contact, etc.). ▪ Personnel on duty must wear work shoes, protective eyewear, a hard hat, dust mask, and ear protection.
Wall Construction	Heavy load transportation Chemical substances Temporary work scaffold	▪ Orthopedic disorders ▪ Disorders due to chemical contact ▪ Falling from height ▪ Traumas due to the impact of objects falling from a height.	▪ Personnel involved in wall construction must have the Wall Builder Level 3 (12UY0048-3) certificate. ▪ Regardless of the size, the construction scaffolds to be installed must comply with the TS EN 12811-1 standard. All personnel working on these scaffolds must have received training for working at heights, and they must use full-body safety harnesses and fall prevention equipment. ▪ Material Safety Data Sheets (MSDS) for mortar and similar materials must be reviewed by workplace health professionals, and employees must be informed about them, including issues related to inhalation and eye contact. ▪ Personnel on duty are required to wear work boots, protective goggles, helmets, dust masks, and ear protection.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Electrical installation	Temporary scaffolding Electricity	▪ Falling from a height ▪ Traumas due to the impact of objects falling from a height ▪ Electric shock	▪ Personnel working on electrical installations must have a minimum of Electrical Installer Level 3 (15UY0241-3) certification. ▪ Personnel performing panel and board assembly must have a minimum of Electrical Panel Assembler Level 3 (12UY0075-3) certification. All electrical work will be carried out under the supervision of a responsible Electrician or Electrical Engineer. ▪ Torque-controlled screwdrivers and tightening equipment must be used during electrical panel/board assembly. Appropriate tightening forces should be predetermined based on the type of switchgear or the size of nuts and bolts and communicated to responsible personnel. ▪ All personnel must use appropriate insulating gloves and work boots in accordance with low-voltage safety limits. The suitability of these personal protective equipment (PPE) should be determined through standards and CE markings by an Occupational Health and Safety Specialist. ▪ Regardless of the size, all scaffolding structures must meet the TS EN 12811-1 standard requirements. All personnel working on these scaffolds must have received training in working at heights and must use full-body safety harnesses and fall prevention equipment.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Lighting element installation	Temporary scaffolding Electricity	▪ Falling from a height ▪ Traumas due to the impact of objects falling from a height. ▪ Electric shock	▪ The personnel working on electrical installations must have a minimum of Level 3 certification in Electrical Installation (15UY0241-3). ▪ Before mounting lighting fixtures, the electrical energy to the relevant line should be cut off through the switchgear equipment and secured using the EKED system. ▪ Before disassembly, the electrical energy should be checked using control devices such as phase voltage detectors on switchgear equipment connections, switches, etc. ▪ Regardless of their size, the scaffolding systems to be set up must comply with the TS EN 12811-1 standard. All personnel working on these scaffolds must have received training in working at heights and must use full-body safety harnesses and fall prevention equipment. ▪ All responsible personnel must use insulated electrical gloves and work shoes that are suitable for low voltage safety limits. The compliance of these PPE items must be verified by an Occupational Health and Safety Specialist through standards and CE marking.
Application of gypsum plaster	Temporary work scaffolding Chemical substances Electricity	▪ Falling from heights ▪ Traumas caused by objects falling from heights ▪ Electric shock ▪ Orthopedic disorders ▪ Disorders due to contact with chemicals	▪ Personnel responsible for plastering/rendering work must have a Level 3 Plastering Applicator Certificate (12UY0055-3). ▪ Regardless of their size, all scaffolds must comply with TS EN 12811-1 standard conditions. All personnel working on these scaffolds must have received training for working at heights, use full-body safety harnesses, and fall prevention equipment. ▪ All electrical equipment, including control lighting, mixers, etc., must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Extension cables and device power cables must be properly maintained to avoid hazards. Cables should not be left haphazardly on the ground, and personnel or carts should not pass over them. They should also be protected from water accumulation. ▪ Safety Data Sheets (MSDS) for materials like repair mortar, plaster, etc., must be reviewed by workplace physicians, and employees must be informed about their use, including potential exposure and eye contact risks. ▪ Personnel must wear safety footwear, protective eyewear, hard hats, dust masks, and ear protection.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Painting	Temporary scaffolding Electricity	▪ Falling from heights ▪ Traumas caused by objects falling from heights ▪ Electric shock ▪ Disorders due to contact with chemicals	▪ Personnel involved in painting work must possess a Level 3 Construction Painter Certificate (11UY0023-3). ▪ Regardless of their size, all scaffolds must comply with TS EN 12811-1 standard conditions. All personnel working on these scaffolds must have received training for working at heights, use full-body safety harnesses, and fall prevention equipment. ▪ All electrical equipment, including control lighting, mixers, etc., must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Extension cables and device power cables must be properly maintained to avoid hazards. Cables should not be left haphazardly on the ground, and personnel or carts should not pass over them. They should also be protected from water accumulation. ▪ Safety Data Sheets (MSDS) for materials like repair mortar, paint, solvents, etc., must be reviewed by workplace physicians, and employees must be informed about their use, including potential exposure and eye contact risks. ▪ Personnel must wear safety footwear, protective eyewear, hard hats, dust masks, and ear protection.
Ceramic tile etc. flooring works	Temporary work scaffolding Chemical substances Electricity	▪ Electric shock ▪ Disorders due to contact with chemicals	▪ Personnel involved in ceramic tile work must possess a Level 3 Ceramic Tile Installer Certificate (12UY0051-3). ▪ All electrical equipment, including mixers, breakers, and drills, must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Extension cables and device power cables must be properly maintained to avoid hazards. Cables should not be left haphazardly on the ground, and personnel or carts should not pass over them. They should also be protected from water accumulation. ▪ Safety Data Sheets (MSDS) for materials such as adhesive mortars must be reviewed by workplace physicians, and employees must be informed about their use, including potential exposure and eye contact risks. ▪ Personnel must wear safety footwear, protective eyewear, hard hats, dust masks, and ear protection.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Mechanical installation	Electricity	▪ Electric shock	▪ Personnel involved in the mechanical installation process must have a minimum of Level 3 Heating and Natural Gas Interior Installation Worker Certificate (11UY0031-3). ▪ All electrical equipment must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Extension cables and device power cables must be properly maintained to avoid hazards. Cables should not be left haphazardly on the ground, and personnel or carts should not pass over them. They should also be protected from water accumulation. ▪ Personnel must wear safety footwear, protective eyewear, hard hats, dust masks, and ear protection.

8.3 Bridge Dismantling

It has been concluded that the metal construction pedestrian bridge located between the A and B blocks in the 1st student dormitory, which is within the scope of the project, needs to be removed due to earthquake risks. The structure in question is as follows:

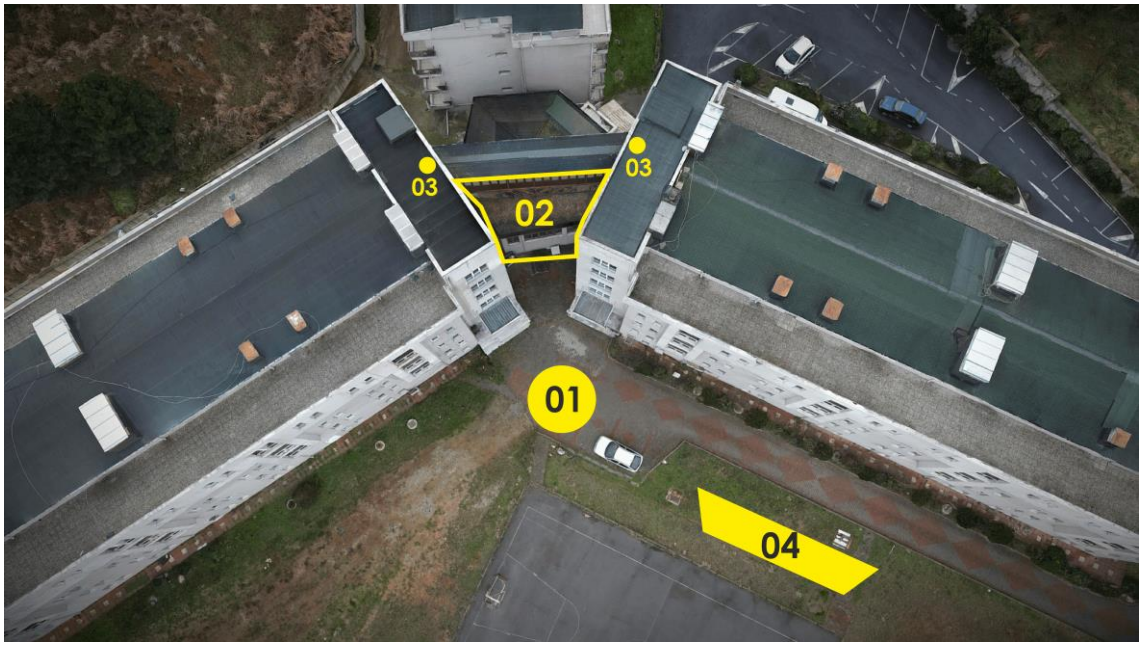
Photo 15: METAL BRIDGE BETWEEN A-B BLOCK 3D IMAGE_01

The disassembly of the C block (entrance block) located just below the said structure poses a risk of damage.

Photo 16: UNDER METAL BRIDGE C BLOCK LOCATION

During the disassembly process, there is a high probability of the bridge's components falling and causing damage to Block C. Therefore, a construction method specific to this disassembly should be developed, and after approval, work should commence within the framework of the work permit system. The next page outlines the key points for preparing the construction method.

Photo 17: DISASSEMBLY, LIFTING AND TRANSPORTATION PLAN IMAGE_01



Using the 3D scans[10] created with this project, the following aspects related to the crane, scaffold, hoist, and temporary storage area should be clearly defined. The following details should be provided within this plan:

1. Weight of the metal structural bridge.
2. Mobile crane capacity *(carrying capacity based on jib boom length and angle).*
3. Types of hooks and slings and their carrying capacities.
4. Mobile crane position (01).
5. Type and installation method of temporary scaffolding *(an outward projection on the scaffold is required due to the C-block indentation).*
6. Temporary scaffold location (02).
7. Detailed plan of the temporary scaffold.
8. Height and attachment points of the safety net.

[10] To access the 3D model https://sketchfab.com/3d-models/bogazici-uni-kilyos-kampusu-yurt-binas-39aa2add49de4877bedf68e7d618e097

Photo 18: SECURITY NET PORTS SAMPLE IMAGE

9. Detailed safety net connection diagram.
10. Access methods and details for safety net connection points.
11. Points for setting up temporary scaffolding, mobile crane, and guiding ropes (03) for cutting wall connections while maintaining the stability of the structure.
12. Wall connection cutting/dismantling method.
13. Additional supports required to keep the structure intact during transportation.
14. Procedure for guiding and moving the free-standing structure to the transport point.
15. Area where the structure will be stored (04) and the type of temporary platform to be placed underneath.
16. Explanation of dismantling and transportation operations.

- During the dismantling, a safety net should be installed over the C-block roof to prevent the risk of bridge parts falling. The net's elasticity and the likely sizes of the parts should be considered during net installation (Clause 7-8-9).

- The suitability of the mobile crane, spreader, hooks, and slings to be used in the lifting and transportation operation must be verified by a qualified mechanical engineer *(Periodic Inspection Report).*

- The operator's certificate of the person controlling the mobile crane should be checked and confirmed.

- Personnel responsible for installing guide ropes and support slings must have the Signalman Level 2 (15UY0218-2) Slinger Training certificate.

- Personnel responsible for scaffold installation must have the Scaffold Installation Worker Level 3 (12UY0056-3) certificate

Table 18: BRIDGE DISMOUNTING WORK CONTROL TABLE

<table>
<tr><td>Work to do:</td><td>Köprü Söküm Çalışması</td></tr>
<tr><td colspan="2">WORKING METHOD</td></tr>
<tr><td colspan="2"><u>Technical Description and Requirements</u>
Construction Technique and Technology
– Under the subheading Bridge Dismantling the relevant explanations are provided in bullet points, and the major issues have been detailed in the 16 points.
Work Equipment Usage
– MOBILE CRANE
– TRUCK
– SAFETY NET
– GUIDANCE ROPES/STRAPS
– PLATFORM FOR TEMPORARY STORAGE
– SPIRAL
– CRUSHER DRILLING
– LEG / CARRYING SLINDER / CHAIN
– SCAFFOLD
Use of Chemical Substances
– It is not intended to use any chemicals
Access to the Work Area
– Access road is provided in the section Pre-construction Information & Site Plans in a plan format.
• The maximum speed within the campus area is limited to 20 km/h for trucks.
• The maximum speed within the campus area is limited to 20 km/h for mobile cranes.
Transportation & Supply of Materials
– Details regarding the lifting, transportation, and unloading of consumables and related technical materials are specified and explained under the General Site Rules subheading.</td></tr>
<tr><td>PPE - GENERAL</td><td>Need for Trained Personnel</td></tr>
<tr><td>• SAFETY HELMET (TS EN 397+A1)
• PROTECTIVE GLASSES (TS EN ISO 16321-3)
• GENERAL PURPOSE WORK GLOVES (TS EN ISO 21420)
• SAFETY SHOES (TS EN ISO 20347)
• HALF-FACE MASK (TS EN 140)
• FULL-BODY HARNESS (EN 361)
• FALL ARREST SYSTEM (EN 353)
• SAFETY HOOK (EN 362)
• FALL ARRESTER (EN 355)
• SAFETY ROPES (EN 355)
• SAFETY NET (EN 355)</td><td>• MECHANICAL ENGINEER
• SCAFFOLDING ASSEMBLER LEVEL 3 (12UY0056-3)
• CRANE OPERATOR
• SIGNALMAN / RIGGER
• DRIVER WITH CLASS C DRIVER'S LICENSE</td></tr>
</table>

Table 19: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Bridge Dismantling	Construction Machinery Work Scaffold Working at Heights Heavy Load Lifting Mobile Crane Use of Electrical Tools	▪ Injury due to collision during machine operation. ▪ Pinching and cutting of limbs during machine adjustment and part replacement. ▪ Injury from falling from heights. ▪ Injury due to falling objects from heights. ▪ Multiple injuries and fatalities due to heavy objects falling from heights.	▪ The detailed construction methods of the bridge dismantling should be described in detail (Operation involving the dismantling and transportation of heavy loads should be evaluated and defined by technical experts experienced in the field. The names of these technical experts and their experience should be supported by objective evidence.) and submitted for consultant approval. Work cannot commence without consultant approval. ▪ After the construction methods are determined, detailed risk analyses for each stage should be created. Work cannot start until the risk analysis and identified measures are approved by the consultant. ▪ Once the method of transportation is determined, measures to prevent each piece from breaking during transportation (temporary reinforcement, strapping/chaining, etc.) should be defined. ▪ The bridge should be disassembled before transportation, including all fragile components such as glass/windows, frames, etc. ▪ The machine's suitability should be verified with a periodic inspection report. ▪ Lifting and transportation equipment (spreader bar, hook, chain, sling) should be verified with a periodic inspection report. This equipment should be physically checked before each use, and damaged equipment should not be used. ▪ The mobile crane should be determined based on the fixed point and the weight of the bridge. (Transport capacity depends on the jib boom length and angle.) ▪ The mobile crane should be visually inspected by the operator before it is operated, and the presence of any physical defects should be assessed. ▪ The mobile crane should be functionally checked by the operator before each operation (reverse maneuver warning siren, warning/indicator lights, etc.). ▪ Only authorized Operators should use the mobile crane. Operator's professional suitability certificates should be checked and verified. ▪ No one other than authorized personnel and experts (Operator, Machine Engineer, etc.) should be allowed to interfere with the mobile crane.

Bridge Dismantling (Continued from the previous page)	Construction Machinery Work Scaffold Working at Heights Heavy Load Lifting Mobile Crane Use of Electrical Tools	▪ Injury due to collision during machine operation. ▪ Pinching and cutting of limbs during machine adjustment and part replacement. ▪ Injury from falling from heights. ▪ Injury due to falling objects from heights. ▪ Multiple injuries and fatalities due to heavy objects falling from heights.	▪ Regardless of the size, any scaffolding to be installed must meet the TS EN 12811-1 standard conditions. All personnel working on these scaffolds must have received training in working at heights and are required to use full-body safety harnesses and fall prevention equipment. ▪ Personnel responsible for scaffold installation must hold a Level 3 Scaffold Installation Personnel Certificate (12UY0056-3). ▪ Personnel working at heights must have received training in working at heights. ▪ Personnel working at heights are required to use full-body safety harnesses and fall prevention equipment. ▪ Bridge/bridge parts should be directed using suitable ropes. ▪ Temporary protection should be provided on surfaces with a high risk of collision and friction during transportation. This temporary protection should allow the dissipation of energy during impact and absorb the impact force. ▪ Personnel setting up guiding ropes and supporting slings should have a Level 2 Signaller (15UY0218-2) Slinging Training Certificate. ▪ The work area will be separated with safety tapes, and safety signs indicating that approaching the work area is prohibited should be displayed. ▪ The lower part of the bridge should be protected by a safety net. This net should have the capacity to hold parts that may detach during lifting and transportation. ▪ During the bridge transportation, only authorized personnel should be present in the work area, and even they should maintain a suitable distance from the material dropping risk. ▪ Personnel on duty must wear safety boots, protective goggles, helmets, safety harnesses, dust masks, and ear protection.

8.4 Energy Efficiency

Energy efficiency-oriented renovation topics are listed below.

- Electricity production with monocrystalline PV system on the demolished roof.

Roofs and layout plans where PV systems will be installed are presented below for your attention.

Figure 3: 1. STUDENT DORMITORY BUILDING ROOF TOP PV LAYOUT PLAN

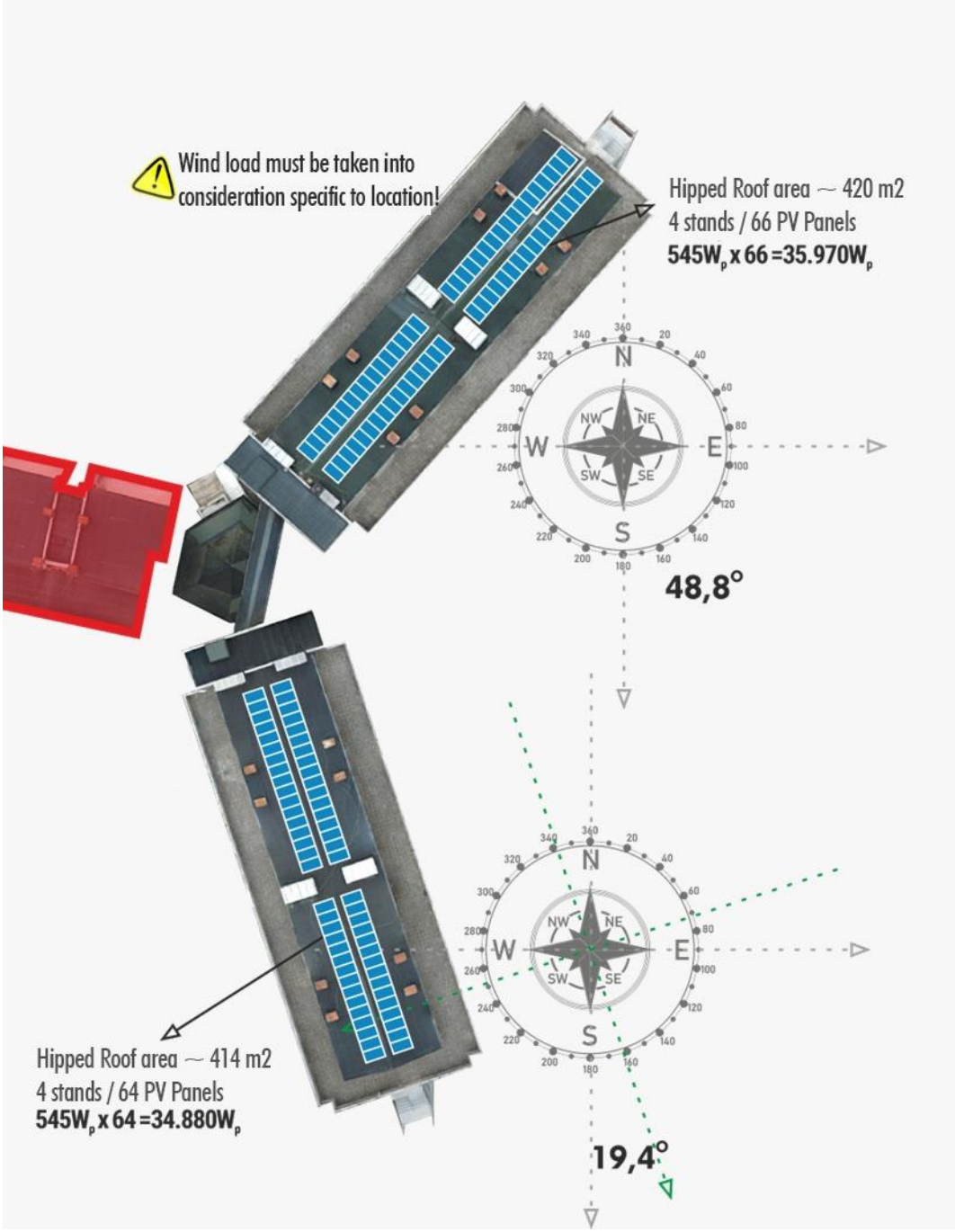


Figure 4: SFL B BLOCK BUILDING ROOF TOP PV LAYOUT PLAN

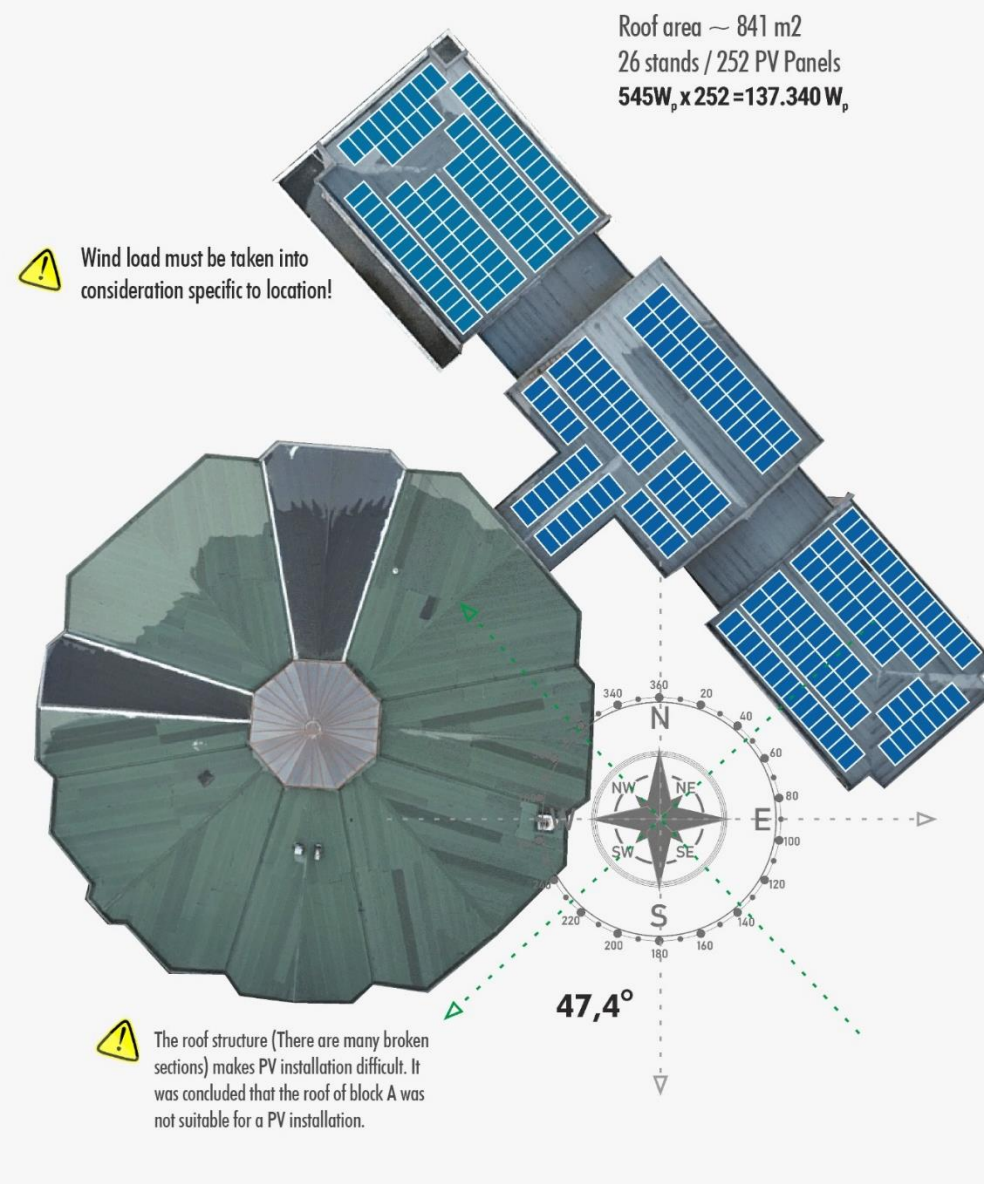
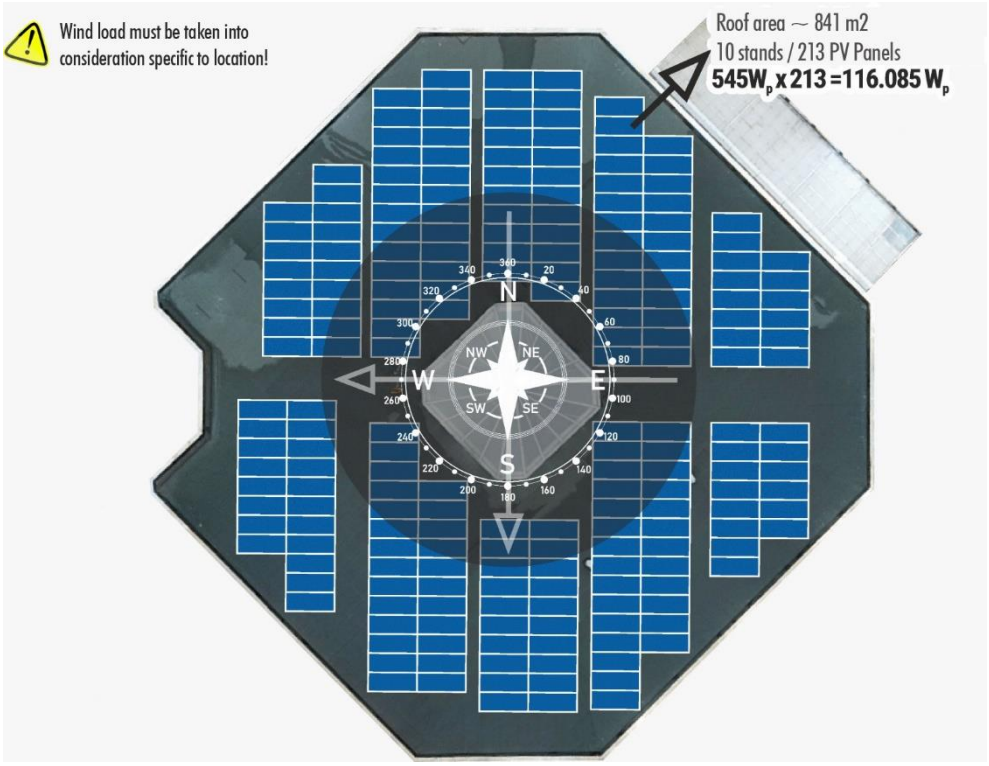
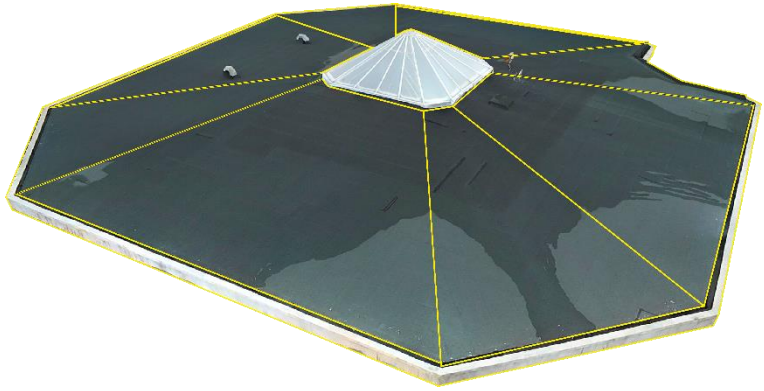


Figure 5: SOCIAL FACILITY ROOF TOP PV LAYOUT PLAN



- When we look at the demolition details of the social facility roof, it is observed that in order to achieve the layout mentioned above, a special metal carcass needs to be prepared for each table.



- All work must be carried out under the supervision of a qualified Electrical or Electrical Electronics Engineer.
- All personnel involved in the work must have received training for working at heights.
- All personnel involved in the work must use full-body safety harnesses and fall prevention equipment.
- A horizontal safety line must be installed on roofs for the connection of fall prevention equipment.

Photo 19: REPRESENTATIVE IMAGE OF MOVEMENT RESTRICTOR

- Measures must be taken to secure the lifting and transportation operation with the mobile crane, including preventing access to areas at risk of falling.
- Inspection reports for the mobile crane, mapas, and slings must be checked for compliance before use.
- The operator controlling the mobile crane must have their operator's license verified.
- Personnel responsible for installing guiding ropes and slings must have a Level 2 Signaler Certification (15UY0218-2).
- All electrical tools *(such as mobile concrete mixers, vibrators, concrete pumps, etc.) must* have undergone Portable Appliance Testing (PAT), and PAT test reports will be requested and checked before work commences. During site inspections, the presence of PAT test and approval tags on electrical equipment will be verified. Equipment that lacks conformity tags will not be allowed for use (extension cables fall under this category).
- Personnel working on electrical installations must have a minimum of Level 3 Electrician certification (15UY0241-3).
- Personnel responsible for mounting electrical panels and boards must have a minimum of Level 3 Panel Board Installation certification (12UY0075-3).
- Torque-controlled screwdrivers and tightening tools must be used during electrical panel/board installation. Appropriate tightening forces should be predetermined based on the type of switchgear or the size of screw nuts and communicated to responsible personnel.
- The grounding line of the electrical system must be reported by authorized Electrical or Electrical Electronics Engineers.
- Insulated work gloves (suitable for low-voltage conditions) and insulated work shoes must be used to prevent electrical shocks.

Work to do:	Establishment of Photovoltaic Energy Facility

WORKING METHOD

Technical Description and Requirements

Construction Technique and Technology

- Panel fixation will be carried out using lightweight construction on the roof, secured with drills, tightening screw-nut kits. Panels transported to the roof using a mobile crane will be attached to the mentioned structure in compliance with the project specifications, and connection cables will be installed. Energy and grounding cables, which are connected using connectors, will be linked to the main switchboard and the Solar Power Plant panel.

Work Equipment Usage

- Truck
- Mobile crane
- Load carrying equipment (eyebolt, sling, hook, chain)
- Torque wrench
- Cordless drill
- Screwdriver set
- Multimeter
- Cable cutting and stripping hand equipment (chisel, pliers, needle nose, etc.)
- Silicone gun

Use of Chemical Substances

- Silicone

Access to the Work Area

- Access road is provided in the section Pre-construction Information & Site Plans in a plan format.
  - The maximum speed within the campus area is limited to 20 km/h for trucks.
  - The maximum speed within the campus area is limited to 20 km/h for mobile cranes.

PPE - GENERAL	Need for Trained Personnel
• EN 397 – Safety Helmet • EN 420 - Insulating Gloves • EN 345 - Insulating Safety Shoes with 200J • EN 340 - General Workwear • Full Body Safety Harness (EN 361) • Rope Fall Arrest System (EN 353) • Safety Hook (EN 362) • Fall Arrestor (EN 355)	• Electrical and Electronic Engineer • •ruck Driver with Class C License • Mobile Crane Operator (Certificate: 13UY0172-3 | Level 3) • Signalman (Certificate: 15UY0218-2 | Level 2) • Electrical Panel Assembler (Certificate: 12UY0075-3 | Level 3)

Table 20: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Transportation of materials	Truck	Injury, death as a result of traffic accident	▪ The truck will be operated by employees with a Class C driver's license. ▪ The urban speed limit will not be exceeded (50 km/h). ▪ The building campus area has a speed limit of 20 km/h. Intra-site movements and maneuvers will be supervised by the OHS specialist.
Transportation of materials	PV panels and mounting parts	Injury or death due to PV panels or parts falling over	▪ All materials will be placed evenly in the truck bed, taking the center of gravity into consideration. ▪ The unit will be secured with straps. ▪ Assembly components will be transported packaged on a pallet. ▪ The sides and rear doors of the truck will be closed and secured.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Transport and unloading of materials	Mobile Crane & lifting equipment	Injury or death as a result of the load falling during lifting, carrying and lowering	▪ The mobile crane can be operated by the Mobile Crane Operator (Cert. No: 13UY0172-3 | Level 3). ▪ Rigging and guiding will be carried out by certified signalpersons. ▪ The crane's periodic inspection report will be checked and verified by the OHS specialist before work begins (to be obtained within a maximum 6-month period). ▪ Slings, chains, shackles, hooks, and rigging gear will be visually inspected before work commences to verify their capacity and physical condition. ▪ The mobile crane's hydraulic stabilizing feet will be secured to the ground. ▪ Before the lifting operation, the main boom angle and lifting capacities associated with that angle will be verified for the mobile crane. ▪ The load will be guided by a signalperson using a control line. ▪ Access to the work area will be restricted during the lifting and transport operation. Passing under a suspended load is prohibited. ▪ Warning signs will be installed. ▪ The work will be subject to the WORK PERMIT SYSTEM.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Installation work	Working at height	Fall from height, material fall	▪ T-type safety nets or edge protection railings will be installed at the main entrance gate and on roof #4 to prevent large objects and workers from falling. ▪ According to TS EN 1263-2 standard, the minimum width of the T-type safety net should be 2 meters, and the maximum vertical installation height should be 1 meter. ▪ Workers must have completed the Working at Heights by Rope Access training before starting work. These training sessions will be conducted by experts with a minimum of IRATA (Industrial Rope Access Trade Association) International Level 2 certification. ▪ During work on the roof, especially when there is a high risk of falling near the edge, restraining systems (horizontal lifelines) will be used within 1 meter from the edge. ▪ Materials to be assembled will not be kept near the edges, and during non-working hours, they will be secured to the ground with free material fixing nets. ▪ The perimeter of the building where assembly will be performed will be marked with safety barriers to prevent access by workers and third parties.
Cutting off line energy via electrical panel	Power board, line cable	Injury or death due to electric shock due to unauthorized switching on of the energy by other people or technical problems	▪ Panel intervention will be carried out by at least an Electrical Panel Installer (Certification: 12UY0075-3 | Level 3) under the supervision of an electrical engineer or an electrical/electronic engineer. ▪ • After the power is cut off, it will be verified that there is no energy in the neutral and ground lines using a multimeter. ▪ • The panel in question will be locked and labeled. ▪ • The LOTO (Lockout/Tagout) lock system key will be kept by the technician who locks it. It is prohibited to give this key to someone else before the work is completed. ▪ • Before disconnecting device connections and making new connections, it will be verified again that there is no energy using a multimeter.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Cutting off and re-energizing the line via the electrical panel	Power board, line cable	Electric shock during work carried out inside the panel.	▪ Panel intervention will be carried out by at least an Electrical Panel Installer (Certification: 12UY0075-3 | Level 3) under the supervision of an electrical engineer or an electrical/electronic engineer. ▪ During electrical work, 1kV insulated gloves in compliance with EN 60903:2003 standard, insulated electrician's shoes in compliance with EN 344 standard, and an insulated mat (EN 60243-1) or table (EN 60243-1) will be used on the floor. ▪ The work will be carried out by at least two technical workers. These individuals will not come into contact with each other during the work. ▪ Technical personnel who will perform this work will receive training on the effects of electric shock and first aid, and practical exercises will be conducted.
PV Panel and construction Installation	Assembly works	Cutting off limbs and getting trapped while mounting PV panels and construction.	▪ PV panels and structural assembly will be performed by a Machine Installer (Certification: 12UY0105-3 | Level 3). ▪ During assembly, helmets and general-purpose work gloves will be used to prevent head and hand injuries.

- Establishment of Cascade-sliced condensing premix floor-standing boiler

  The method of work for the dismantling of existing boilers, removal from the building, transportation processes, and the transportation, placement, and assembly of new boilers shall be prepared by the contracting company and submitted for consultant approval. Work can commence only after the method has been approved. The main elements and points to consider in the boiler plant process are listed below:

  - The entire work must be carried out under the supervision of a competent Mechanical Engineer.
  - The method for the disassembly and removal of existing boilers and their delivery to the university must be described.
  - The truck used for the transportation of the dismantled boiler and the delivery of the new boiler must adhere to the traffic action plan.
  - The route to be used for removing the dismantled boiler and bringing in the new boiler must be outlined in the construction method. In case of wall demolition and reconstruction, personnel with Level 3 Mason certification (12UY0048-3) are required.
  - Personnel participating in the mechanical installation process must have a minimum of Level 3 Heating and Natural Gas Domestic Installation Personnel (11UY0031-3) certification.
  - The suitability of equipment used to lift and transport the boiler within the indoor environment must be verified through periodic inspection reports issued by Authorized Mechanical Engineers.
  - To prevent unauthorized personnel from entering the heating center during the renovation process, the area should be cordoned off with caution tape.
  - Personnel responsible for electrical installations and panel assembly should have at least Level 3 Electrical Panel Assembler certification (12UY0075-3).
  - The grounding line of the electrical system must be reported by authorized Electrical or Electrical and Electronics Engineers.
  - To protect against electrical shocks, insulated work gloves (suitable for low voltage conditions) and insulated work shoes must be used.
  - All personnel handling heavy loads must receive training in manual lifting and handling.

Work to do:	Natural gas boiler installation

WORKING METHOD

Technical Description and Requirements

Construction Technique and Technology

- The existing boiler will be dismantled, instead of the boiler, a smaller sized boiler will first be fixed to the floor, and then the burner natural gas line connection, flow and return hot water connections will be made.

İş Ekipmanı Kullanımı

- Truck
- Mobile crane
- Load handling equipment (Lever hoist, sling, hook, chain)
- Torque wrench
- Cordless drill
- Screwdriver set
- Multimeter
- Cable cutting and stripping hand tools (cable cutter, pliers, needle-nose pliers, etc.)
- Mechanical assembly equipment (pipe cutting, bending)

Use of Chemical Substances

- Cleaning chemicals
- Mechanical system oils

Access to the Work Area

- Access road is provided in the section Pre-construction Information & Site Plans in a plan format.
  - The maximum speed within the campus area is limited to 20 km/h for trucks.
  - The maximum speed within the campus area is limited to 20 km/h for mobile cranes.

PPE - GENERAL	Need for Trained Personnel
1. EN 397 SAFETY HELMET 2. EN 420 GENERAL PURPOSE GLOVES 3. EN 345 SAFETY FOOTWEAR 200J 4. EN 420 INSULATED GLOVES 5. EN 345 INSULATED SAFETY SHOES 200J 6. EN 340 GENERAL WORKWEAR	1. MECHANICAL ENGINEER 2. TRUCK DRIVER WITH A CLASS C LICENSE 3. MOBILE CRANE OPERATOR (CERTIFICATION: 13UY0172-3 | LEVEL 3) 4. SIGNAL PERSON (CERTIFICATION: 15UY0218-2 | LEVEL 2) 5. HEATING AND NATURAL GAS INTERIOR INSTALLATION PERSONNEL (CERTIFICATION: 11UY0031-3 | LEVEL 3) 6. ELECTRICAL PANEL ASSEMBLER (CERTIFICATION: 12UY0075-3 | LEVEL 3)

Table 21: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Transportation of materials	Truck	Injury and death due to traffic accident	▪ The truck will be operated by employees with a Class C driver's license. ▪ The speed limit within the city will not be exceeded (50 km/h). ▪ The campus area of the building is limited to a speed of 20 km/h. Movements and maneuvers within the site will be monitored by the OHS specialist.
Transportation of materials	PV panels and mounting parts	Injury or death due to PV panels or parts falling over	▪ All materials will be placed in the truck bed in a balanced manner, considering the center of gravity. ▪ The units will be secured with straps. ▪ Assembly parts will be transported on pallets in packaged form. ▪ The side and rear doors of the truck will be closed and secured.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Transport and unloading of materials	Mobile Crane & lifting equipment	Injury or death as a result of the load falling during lifting, carrying and lowering	▪ The mobile crane will be operated by an Operator with a Mobile Crane Operator Certificate (Certification No.: 13UY0172-3 | Level 3). ▪ Rigging and guiding will be carried out by authorized signallers holding the necessary certificates. ▪ The mobile crane's periodic inspection report will be reviewed and verified by the HSE specialist before starting work. The report must be obtained within a maximum period of 6 months. ▪ Periodic inspection reports for slings, chains, shackles, and hooks will also be checked and verified by the HSE specialist before work. These reports must be obtained within a maximum period of 6 months. ▪ The slings, shackles, and hooks will undergo a visual inspection before work. Their load capacity and physical condition will be verified. ▪ The mobile crane's hydraulic stabilizing legs will be secured to the ground. ▪ Before lifting operations, the mobile crane's boom angle and the lifting capacities for that angle will be checked. ▪ The load will be directed by a signaller using a control line. ▪ Access to the work area will be restricted throughout the lifting and transportation operations. Passing under the load is prohibited. ▪ Warning signs will be installed. ▪ All work will be subject to the WORK PERMIT SYSTEM.
Natural gas line cut	Natural gas	Fire, explosion and flash	▪ Prior to dismantling, the natural gas line must be cut and secured LOTO. ▪ Gas detection devices should be used to ensure that there is no gas leak. ▪ After the new line connections are completed, gas must be reintroduced in accordance with the rules set by LOTO. After opening the gas valves, gas detection devices should be used to check for leaks.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Cutting off the line energy and re-energizing it via the electrical panel	Power board, line cable	Electric shock during work carried out inside the panel.	▪ Panel intervention will be carried out by an Electrical Panel Assembler (Certification Level: 12UY0075-3 | Level 3). ▪ During electrical work, 1kV insulated gloves in compliance with EN 60903:2003 standard and insulated electrician work shoes compliant with EN 344 standard will be used. An insulated mat (EN 60243-1) or table (EN 60243-1) will be placed on the floor for insulation. ▪ At least two technical workers will be involved in the work. During the work, these individuals should not come into contact with each other. ▪ Technical personnel responsible for this work will receive training on the effects of electric shock and first aid, and practical exercises will be conducted.

- Replacement of existing motor & pump elements in the circulation system with their spares and integrated frequency-controlled high-efficiency systems.
    - Personnel responsible for motor line and electrical panel control equipment connections must have a minimum of Electrical Panel Assembler Level 3 (12UY0075-3) certification.
    - Torque-controlled screwdrivers and tightening equipment must be used during electrical panel and switchgear assembly. Appropriate tightening forces should be determined in advance based on the type of switchgear or nut size and communicated to responsible personnel.
    - To protect against electric shocks, insulated work gloves (appropriate for low-voltage conditions) and insulated work shoes must be used.
    - LOTO system must be used for panel safety.
    - All personnel who will handle heavy loads must receive training in manual lifting and carrying.

Work to do:	Installation of integrated frequency controlled motor & pump combinations.

WORKING METHOD

Technical Description and Requirements

Construction Technique and Technology

- The existing motor power will be cut off. Electrical connections will be removed first using tightening and appropriately sized screwdrivers, and then fastening connections will be removed and stacked on the floor. Pumps will be removed from their positions using suitable hand tools and stacked on the floor. Combined motor and pump components will be securely fixed to the pipeline according to the project specifications, and electrical connections specified by the manufacturer will be made.
- During panel assembly, appropriate-sized cable glands will be used, and live ends will not be left exposed.

Work Equipment Usage

- Electrical hand tools (pliers, voltage tester, screwdriver, etc.)
- Multimeter

Use of Chemical Substances

- It is not intended to use any chemicals

Access to the Work Area

- The heating center is located inside the building.

Transportation & Supply of Materials

- Materials will be carried manually. (Manual handling training should be given.)

PPE - GENERAL	Need for Trained Personnel
1. EN 420 GENERAL PURPOSE GLOVES 2. EN 345 SAFETY FOOTWEAR 200J 3. EN 420 INSULATED GLOVES 4. EN 345 INSULATED SAFETY SHOES 200J 5. EN 340 GENERAL WORKWEAR	1. Electrical Panel Installer (Auth. C.:12UY0075-3 | Level 3)

Table 22: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Cutting off line energy via electrical panel	Power board, line cable	Injury or death due to electric shock due to unauthorized switching on of the energy by other people or technical problems	▪ Panel intervention will be carried out by at least an Electrical Panel Assembler (Cert. No: 12UY0075-3 | Level 3) under the supervision of an Electrical or Electrical Electronics Engineer. ▪ After the power is cut, a multimeter will be used to confirm that there is no energy in the neutral and ground lines. ▪ The panel will be properly labeled and locked according to LOTO rules. ▪ Before disconnecting device connections and making new connections, it will be confirmed again with a multimeter that there is no energy.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Installation, re-energizing	Power board, line cable	Electric shock during motor and panel connection.	▪ Motor connections will be made by at least an Electrical Panel Assembler (Cert. No: 12UY0075-3 | Level 3) under the supervision of an Electrical or Electrical Electronics Engineer. ▪ Panel intervention will be carried out by at least an Electrical Panel Assembler (Cert. No: 12UY0075-3 | Level 3) under the supervision of an Electrical or Electrical Electronics Engineer. ▪ During electrical work, 1kV insulated gloves compliant with EN 60903:2003 and insulated electrician's shoes compliant with EN 344 will be used, and an insulated mat (EN 60243-1) or table (EN 60243-1) will be placed on the floor. ▪ At least two technical workers will perform the work, and they will not make physical contact during the process. ▪ Technical personnel involved in this work will receive training on the effects of electric shock and initial intervention, including practical exercises.

- Replacement of non-converted fixtures with high-efficiency LED fixtures of identical dimensions.
    - Personnel performing fixture replacement must have a minimum of Level 3 Electrical Installer *(15UY0241-3*) certification.
    - Insulated work gloves (suitable for low-voltage conditions) and insulated work shoes must be used to prevent electrical shock.
    - Personnel responsible for panel connections must hold an Electrical Panel Assembler (12UY0075-3 | Level 3) certification.
    - LOTO system must be used for panel safety.
    - If the lighting circuit protection fuse is not labeled, it should be labeled.
    - Mobile work scaffolds must comply with TS EN 12811-1 standard requirements. All personnel working on these scaffolds must have received working at heights training, use full-body safety harnesses, and fall prevention equipment.
    - Personnel responsible for scaffold assembly must hold a Scaffold Assembly Technician Level 3 *(12UY0056-3)* certification.

Photo 20: MOBILE SCAFFOLDING SAMPLE IMAGE

Work to do:	Completion of the Conversion of Existing Lighting Fixtures to LED

WORKING METHOD

Tekn Technical Description and Requirements

Construction Technique and Technology

- The power supply to the lighting fixture will be disconnected from the column and line, and it will be checked with a multimeter.
- Existing lighting fixtures will have their securing screws removed. The fixture will be taken down, and terminal connections will be exposed.
- Cable power connections will be disconnected using screws suitable for the terminal connections. The cable will be visually inspected and prepared for the new fixture connection.
- The new fixture will be connected through the terminal, and the connection's integrity will be manually checked. The fixture will be secured to the ceiling using connection elements provided by the manufacturer.

Work Equipment Usage

- Electric hand tools (Pliers, control pen, screwdriver, etc.), H or L type mobile scaffolding

Use of Chemical Substances

- It is not intended to use any chemicals
  - The newly acquired LED fixtures will be assembled and installed

Access to the Work Area

- The work area is located at various points inside the building. Interior access routes will be used.

Transportation & Supply of Materials

- Materials will be carried manually.

PPE - GENERAL	**Need for Trained Personnel**
1. EN 397 HELMET 2. EN 420 INSULATED ELECTRICAL GLOVES 3. EN 345 INSULATED SAFETY SHOES 4. EN 340 GENERAL WORKWEAR 5. FULL BODY HARNESS (EN 361) 6. ROPE RESTRAINT SYSTEM (EN 353) 7. SAFETY HOOK (EN 362) 8. FALL ARRESTER (EN 355)	1. ELECTRICIAN LEVEL 3 (15UY0241-3) 2. ELECTRICAL PANEL INSTALLER (Certification No.: 12UY0075-3 | Level 3)

Table 23: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Cutting off line energy via electrical panel	Power panel, line cable	Unauthorized access to energy or electrical shock due to technical problems, resulting in injury or death.	▪ The electrical panel intervention will be carried out under the supervision of at least an Electrical Panel Assembler (Cert. No: 12UY0075-3 | Level 3) or an Electrical Electronics Engineer. ▪ After cutting off the power supply, it will be verified that there is no electricity in the neutral and ground lines using a multimeter. ▪ The mentioned panel will be locked and labeled in accordance with LOTO regulations. ▪ Before dismantling device connections and making new connections, it will be verified again with a multimeter that there is no electricity.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Dismantling and assembly	Scaffold	Falling from height, Material falling	▪ An H or L type mobile scaffold will be set up. The scaffold must comply with TS EN 1004-1 standards. The assembly of the scaffold will be carried out by personnel holding the Scaffold Installation Worker certificate. (Competence Code: 12UY0056-3 | Level 3) ▪ Mobile scaffolds that have been set up must be secured with anchoring elements provided by the manufacturer before work begins. Working in a moving position is strictly prohibited. ▪ Completed scaffold installations will be inspected and approved by the Site HSE Specialist. Using scaffolds that have not been approved is prohibited. ▪ Information on the maximum load capacity of the scaffold and warning signs will be placed on the scaffold. ▪ There will be toe boards on the scaffold to prevent material falls.
Dismantling, Assembly, and Re-energizing	Power panel, line cable	Electric shock while working inside the panel.	▪ Dismantling and assembly of luminaires will be carried out by technical personnel with at least Electrical Installer Level 3 (15UY0241-3) competence certificate. ▪ • Before dismantling, it will be verified with a multimeter that there is no electrical current. During this process, not only phase lines but also grounding and neutral lines will be checked. ▪ • Panel intervention will be carried out under the supervision of an Electrical or Electrical Electronic Engineer, at a minimum, by a technical personnel with Electrical Panel Assembler Level 3 (12UY0075-3) competence certificate. ▪ • During electrical work, 1kV insulated gloves compliant with EN 60903:2003, insulated electrician shoes compliant with EN 344, and an insulated mat (EN 60243-1) or table (EN 60243-1) will be placed on the floor. ▪ • The work will be carried out by at least two technical workers. These individuals will not come into contact with each other during the work. ▪ • Technical personnel performing the work will receive training on the effects of electrical shock and first aid, and practical exercises will be conducted.

- Thermal insulation installation for uninsulated piping and heat exchangers.
    - Technical personnel involved in the mechanical installation process must have a minimum of Level 3 qualifications in Heating and Natural Gas Interior Piping Construction Personnel (11UY0031-3).

Work to do:	Plumbing Insulation
WORKING METHOD	
Technical Description and Requirements **Construction Technique and Technology** Insulated jackets of appropriate size will be fitted over the piping elements, and they will be secured using jacket fasteners or Velcro straps. **Work Equipment Usage** – - The use of any equipment is not anticipated. **Use of Chemical Substances** – It is not intended to use any chemicals **Access to the Work Area** – - The work area is in the basement of the building and existing transportation routes will be used. **Transportation of Materials** – Materials will be carried manually.	
PPE - GENERAL	**Need for Trained Personnel**
1. EN 397 SAFETY HELMET 2. EN 420 GENERAL PURPOSE GLOVES 3. EN 345 SAFETY FOOTWEAR WITH 200J EN 340 GENERAL WORKWEAR	1. Heating and Natural Gas Interior Installation Workman Level 3 (11UY0031-3)

- A specific risk list was not deemed necessary for this matter. General risk analysis rules apply.

- The energy monitoring system should be established and maintained in accordance with the EN ISO 50001 Energy Management System requirements for the automation system's effectiveness.
    - Personnel involved in the energy monitoring system and automation systems in the facility must have at least Automation Systems Assembler Level 4 (12UY0076-4) certification.
    - To protect against electric shocks, insulated work gloves (suitable for low voltage conditions) and insulated work shoes should be used.
    - The LOTO system must be used for panel safety.

Work to do::	Electronic Building Management System & Automation System General Construction Technique

WORKING METHOD

Technical Description and Requirements

Construction Technique and Technology

- Central HVAC system control cables and flow meter cables will be routed to the MCC & DCC panels.
- Motor pump control cables will be routed to the MCC & DCC panels, and frequency inverter inputs will be set up.
- Line pressure differential and temperature sensors will be connected to the installation as per the project requirements, and signal cables will be routed to the MCC & DCC panels.
- MCC & DCC floor cables will be routed to the central panel, and switch connections, etc., will be established.

Work Equipment Usage

- - Electrical tools (Pliers, control pen, screwdriver, etc.), cable cutting/stripping accessories, multimeter

Use of Chemical Substances

- It is not intended to use any chemicals

Access to the Work Area

- - Work will be carried out throughout the building and existing transportation routes will be used.

Transportation of Materials

- Materials will be carried manually.

PPE - GENERAL	Need for Trained Personnel
1. EN 397 SAFETY HELMET 2. EN 420 GENERAL PURPOSE GLOVES 3. EN 345 SAFETY FOOTWEAR WITH 200J 4. EN 340 GENERAL WORKWEAR	1. ELECTRICAL PANEL INSTALLER (ADJ. C.:12UY0075-3 | LEVEL 3) 2. AUTOMATION SYSTEMS INSTALLER (12UY0076-4 | LEVEL 4)

Table 24: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Cutting off the line energy via the electrical panel	Power panel, line cable	Electric shock	▪ Panel intervention will be carried out by a minimum of Electrical or Electrical Electronic Engineer and an Electrical Panel Assembler (Competence Code: 12UY0075-3 | Level 3), under the supervision of a minimum of Electrical or Electrical Electronic Engineer. ▪ After the power is cut, a multimeter will be used to verify the absence of energy in the neutral and ground lines. ▪ The panel in question will be locked and tagged according to LOTO regulations. ▪ Before disassembling device connections and making new connections, a multimeter will be used again to verify the absence of energy. ▪ A minimum of two technical workers will carry out the work, ensuring they do not come into contact with each other during the process. ▪ Technical personnel responsible for this operation will be given training on the effects of electrical shocks and first aid, and practical drills will be carried out.

- Insulation with insufficient insulation on building facades.
  - The construction method for facade insulation, along with scaffolding plans, must be prepared.
  - Trucks carrying facade insulation materials should move in accordance with the traffic action plan.
  - It is essential that the work scaffolds meet the TS EN 12811-1 standard, and all personnel working on these scaffolds should have received training in working at heights, use full-body safety harnesses, and fall prevention equipment.
  - Personnel responsible for scaffold installation must have a Scaffold Installation Technician Level 3 (12UY0056-3) certificate.
  - Personnel involved in facade insulation must hold an Insulation Worker Level 3 (12UY0057-3) certificate.
  - MSDS for adhesives and similar chemicals should be checked by occupational health physicians, and employees should be informed (e.g., regarding inhalation, eye contact, etc.).
  - All electrical hand tools must have undergone PAT Test, and PAT test reports will be requested and checked before work begins. During site inspections, the presence of PAT control and approval labels on electrical devices will be verified. Devices and equipment without compliance labels will not be permitted for use. (Extension cords fall under this scope.)
  - Great care should be taken to prevent damage to electrical extension cords, and these cords should not come into contact with water. Extension cords and other power cables for electrical devices will be checked daily. Damaged cables will not be allowed for use.
  - The risk of objects falling from heights in work areas should be taken into consideration, and the affected areas should be delineated using caution tape.

Work to do:	Facade Insulation

WORKING METHOD

Technical Description and Requirements

Construction Technique and Technology

- A safety perimeter will be established around the building. Secure scaffolding installation will be carried out, and ground and surface anchoring connections will be established.
- Facade cladding materials will be transported to the work area by trucks and properly stacked.
- The existing facade will be removed, and it will be prepared for the new insulation facility. Obstructions such as rain gutters on the facade will be removed.
- Insulation material will be affixed to the facade using adhesives and anchors recommended by the manufacturer, and mesh will be applied to mitigate the risk of cracking and similar issues.
- The general information outlined above will be detailed by the consulting firm and conveyed to the consultant in the form of a construction method. Work cannot commence until the construction method is approved by the consultant!

Work Equipment Usage

- Truck
- Work scaffolding
- Adhesive etc chemical mixer.
- Hammer drill

Use of Chemical Substances

- Adhesive chemicals, mineral plaster, paint

Transportation & Supply of Materials

- Trucks can move within the campus at a maximum speed of 20 km. A traffic action plan was prepared.

PPE - GENERAL	**Need for Trained Personnel**
1. EN 397 SAFETY HELMET 2. EN 420 GENERAL PURPOSE GLOVES 3. EN 345 SAFETY FOOTWEAR 200J 4. EN 340 GENERAL WORKWEAR 5. FULL BODY SAFETY HARNESS (EN 361) 6. ROPE RESTRAINT SYSTEM (EN 353) 7. SAFETY HOOK (EN 362) 8. FALL ARREST SYSTEM (EN 355)	9. Mechanical Engineer 10. Scaffolding Installation Specialist Level 3 (12UY0056-3) 11. Thermal Insulation Specialist Level 3 (12UY0057-3)

Table 25 RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Exterior Insulatıon	Work scaffolding Working at height Electrical equipment	▪ Injury due to falling from height. ▪ Injury due to falling object from height. ▪ Electric shock	▪ All personnel involved in the project must hold a professional competence certificate Level 3 for Thermal Insulation Specialist (12UY0057-3). ▪ The construction of work scaffolds must comply with the TS EN 12811-1 standards. All personnel working on these scaffolds must have received training in working at heights, use full-body safety harnesses, and fall prevention equipment. ▪ The personnel responsible for scaffold installation must possess the Scaffold Installation Specialist Level 3 (12UY0056-3) certificate. ▪ Horizontal and vertical lifelines must be inspected by authorized Mechanical Engineers. Their load capacities and the maximum number of personnel that can be connected simultaneously should be displayed on signs. ▪ All electrical equipment must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Proper storage of extension cables and device power cables is essential. Cables should not be left lying haphazardly on the ground and should not be crossed over by hand trucks or workers. Cables should not be allowed to remain in puddles of water. ▪ The work area should be demarcated with safety barriers and warning signs indicating that approaching the work area is prohibited. ▪ Personnel involved in the project must wear safety shoes, protective goggles, a hard hat, dust masks, and earmuffs as necessary.

- Replacement of doors with inappropriate thermal insulation level.
    - All personnel involved in the project who will handle heavy loads must receive training in manual lifting and carrying.
    - All field personnel must have a minimum of Construction Worker Level 2 (16UY0253-2) professional competence certificate.
    - The assembly of door panels can be performed by personnel holding the PVC Joiner Level 3 (313UMS0311-3) professional competence certificate.
    - The work area boundary should be defined, and the area should be marked with safety tapes and signs.

Work to do:	Replacement of doors
WORKING METHOD	
<u>Technical Description and Requirements</u> **Construction Technique and Technology** – Existing doors will be disassembled without damaging the glass and will be stacked and stored in the location specified by the consultant. – Doors will be installed properly, ensuring that they do not allow heat escape, by making frame insulations according to the technical specifications. – Wing mechanisms will be inspected and checked for proper operation. **Work Equipment Usage** – Truck – Hand tools – Brush **Use of Chemical Substances** – POLYURETHANE FOAM – THERMAL COATING CHEMICAL	

Transportation & Supply of Materials	
– Trucks can move within the campus at a maximum speed of 20 km. A traffic action plan was prepared.	
PPE - GENERAL	**Need for Trained Personnel**
1. EN 397 SAFETY HELMET 2. EN 420 GENERAL PURPOSE GLOVES 3. EN 345 SAFETY FOOTWEAR 200J 4. EN 340 GENERAL WORKWEAR 5. 5. TS EN ISO 16321-3 PROTECTIVE GLASSES	1. PVC JOINERY ASSEMBLER LEVEL 3 (13UMS0311-3)

Table 26: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Replacement of doors	Dropping the doors. Chemical use	▪ Injury ▪ Chemical contact with eyes	▪ Trucks will be operated by drivers with a class C driver's license. ▪ All personnel involved in the assembly must have a professional qualification certificate for Level 3 PVC Joinery Assembly (13UMS0311-3). ▪ Even if the door is secured with suitable wedges, it will not be left unattended until the assembly is completed. ▪ Protective goggles should be worn when applying polyurethane foam.

- Installation of heat pump, integration into existing air conditioning system
    - The entire work must be carried out under the supervision of a competent Mechanical Engineer.
    - Trucks used for the transportation of the heat pump and system components must adhere to the traffic action plan.
    - Personnel involved in the mechanical installation process must have a minimum qualification of Level 3 Heating and Natural Gas Interior Installation Construction Personnel (11UY0031-3).
    - The suitability of the mobile crane used for lifting and moving the heat pump must be verified through periodic inspection reports prepared by *authorized Mechanical Engineers.*
    - Crane operators must have their operator certificates verified.
    - During the renovation process, the heat pump installation area and the surroundings of the heat center must be cordoned off with caution tape to prevent unauthorized personnel access.
    - Personnel responsible for electrical installation and switchboard assembly must have a minimum qualification of Level 3 Electrical Switchboard Assembler (12UY0075-3).
    - The electrical system grounding must be reported by authorized Electrical or Electrical and Electronics Engineers.
    - Insulated work gloves (suitable for low voltage conditions) and insulated work shoes must be used to prevent electrical shocks.
    - All personnel responsible for carrying heavy loads must undergo training on safe manual lifting and carrying techniques.

Work to do:	Installation of heat pump

WORKING METHOD

Technical Description and Requirements

Construction Technique and Technology

- The area where the heat pump will be installed will be prepared with reinforced concrete.
- The heat pump will be transported to the designated locations on the plan using a truck and then lowered to the installation point with a mobile crane.
- The manufacturer's recommended method will be followed for the installation of the heat pump's base connections.
- Electrical connections will be made in accordance with the manufacturer's specifications.
- Flow and return water pipe connections will be established.
- Necessary modifications for internal system integration will be carried out.
- The contractor, in relation to the heat pump installation, will prepare a detailed construction method that goes beyond the general elements mentioned above and submit it for approval by the consultant. Work cannot commence until the construction method is approved by the consultant.

Work Equipment Usage

- Truck
- Mobile crane
- Breaker
- Spiral
- Hand tools
- Torque wrench
- Multimeter

Use of Chemical Substances

- Mechanical system oils

Transportation & Supply of Materials

- Trucks can move within the campus at a maximum speed of 20 km. A traffic action plan was prepared.

PPE - GENERAL	**Need for Trained Personnel**
1. EN 397 SAFETY HELMET 2. EN 420 GENERAL PURPOSE GLOVES 3. EN 345 SAFETY FOOTWEAR 200J 4. EN 420 INSULATED WORK GLOVES 5. EN 345 INSULATED WORK SHOES 200J 6. EN 340 GENERAL WORKWEAR	1. TRUCK DRIVER WITH CLASS C DRIVER'S LICENSE 2. MOBILE CRANE OPERATOR (CERTIFICATION: 13UY0172-3 | LEVEL 3) 3. SIGNALER (CERTIFICATION: 15UY0218-2 | LEVEL 2) 4. MACHINE ASSEMBLER (CERTIFICATION: 12UY0105-3 | LEVEL 3) 5. ELECTRICAL PANEL ASSEMBLER (CERTIFICATION: 12UY0075-3 | LEVEL 3)

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Transportation of the heat pump	Truck	Injury, death as a result of traffic accident	▪ Trucks will be operated by employees with a Class C driver's license. ▪ The urban speed limit will not be exceeded (50km/h). ▪ The speed limit within the building campus area is restricted to 20 km/h. In-campus movement and maneuvers will be monitored by the OHS specialist.
Transportation of the heat pump	Heat pump and its parts	Injury or death as a result of the transported heat pump or its parts falling over	▪ The heat pump will be placed in the center of the truck bed, considering the center of gravity. ▪ The unit will be secured with straps. ▪ Assembly parts will be transported in packaged form on a pallet. ▪ The truck's side and rear doors will be closed and secured.
Lifting, transporting and lowering the heat pump	Mobile Crane & lifting equipment	Injury or death as a result of the load falling during lifting, carrying and lowering	▪ The crane will be operated by a Mobile Crane Operator (Certification Code: 13UY0172-3 | Level 3). ▪ Rigging and guidance will be carried out by qualified signalpersons. ▪ The crane's periodic inspection report will be reviewed and verified by the OHS specialist before work commences (with a maximum interval of 6 months). ▪ Slings, chains, shackles, and hooks will be visually inspected before each operation. Their carrying capacity and physical condition will be verified. ▪ The hydraulic stabilizing feet of the mobile crane will be secured to the ground. ▪ Prior to lifting operations, the main boom angle and lifting capacities associated with that angle will be checked. ▪ A signalperson will guide the load via a control line. ▪ Access to the work area will be restricted during lifting and transport operations. Passing under the load is strictly prohibited. ▪ Warning signs will be installed. ▪ All work will be subject to the work permit system.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Lifting, transporting and lowering the heat pump	Mobile Crane & lifting equipment	Injury or death as a result of the load swinging during lifting, carrying and lowering	▪ The crane can be operated by a Mobile Crane Operator (Certification Code: 13UY0172-3 | Level 3). ▪ Rigging and guidance will be carried out by certified signalpersons. ▪ The hydraulic stabilizing feet of the mobile crane will be secured to the ground. ▪ Prior to lifting operations, the main boom angle and lifting capacities associated with that angle will be checked. ▪ The load will be guided by a signalperson using a control line. ▪ Access to the work area will be restricted during lifting and transport operations. Passing under the load is strictly prohibited. ▪ Warning signs will be installed. ▪ All work will be subject to the Work Permit System
Cutting off the line energy via the electrical panel	Power panel, line cable	Injury or death due to electric shock due to unauthorized switching on of the energy by other people or technical problems	▪ Panel interventions will be carried out by a minimum of Electric Panel Assembler (Certification Code: 12UY0075-3 | Level 3) under the supervision of an electrical or Electrical and Electronic Engineering professional. ▪ After cutting off the power supply, a multimeter will be used to verify the absence of electricity in the neutral and ground lines. ▪ The panel in question will be locked and tagged (LOTO). ▪ Prior to disconnecting device connections and making new connections, a multimeter will be used to verify the absence of electricity. ▪ A minimum of two technical workers will perform the tasks without making physical contact with each other. ▪ Technical personnel conducting the work will receive training on the effects of electric shock and first aid, and practical exercises will be carried out. ▪ Isolated gloves and safety shoes will be used.

The general risk analysis table, which has been prepared taking into account all of the work, is provided below:

Table 27: RISK ANALYSIS

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Carrying cement bags.	Heavy Lifting Chemical Substance Use	▪ Orthopedic injuries, muscle spasms, and tears. ▪ Respiratory tract disorders. ▪ Chemical contact with the eyes.	▪ All personnel involved in the task must have at least a Level 2 Construction Worker Certificate. ▪ Training on manual handling rules will be provided to all personnel responsible for manual lifting. ▪ The necessity of eye wash in case of dust and chemical exposure will be determined by the workplace physician. ▪ Personnel on duty must wear work shoes, protective goggles, helmets, dust masks, and ear protection.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Natural Gas Line Interventions	Gas Leakage and Explosion	▪ Trauma ▪ Severe burn ▪ Limb loss ▪ Death	▪ Prior to any intervention in natural gas pipes, they must be shut off and protected by the LOTO system. ▪ Any intervention in existing pipeline or the establishment of new pipe systems will be conducted under the supervision of an authorized mechanical engineer. ▪ Personnel on duty must wear work shoes, protective goggles, helmets, dust masks, and ear protection. ▪ The work areas will be demarcated with safety tapes, and risk information will be displayed on safety signs.
The opening of the curtain wall and column mantles	Pit	Injury due to falling into a pit.	▪ Warning tapes and signs should be placed around the excavated areas. In case of nighttime work, these tapes and signs should have reflective properties.
Electrical installation	Temporary scaffolding Electricity	▪ Falling from a height ▪ Traumas due to the impact of objects falling from a height ▪ Electric shock	▪ Personnel working on electrical installations must have a minimum of Electrical Installer Level 3 (15UY0241-3) certification. ▪ Personnel performing panel and board assembly must have a minimum of Electrical Panel Assembler Level 3 (12UY0075-3) certification. All electrical work will be carried out under the supervision of a responsible Electrician or Electrical Engineer. ▪ Torque-controlled screwdrivers and tightening equipment must be used during electrical panel/board assembly. Appropriate tightening forces should be predetermined based on the type of switchgear or the size of nuts and bolts and communicated to responsible personnel. ▪ All personnel must use appropriate insulating gloves and work boots in accordance with low-voltage safety limits. The suitability of these personal protective equipment (PPE) should be determined through standards and CE markings by an Occupational Health and Safety Specialist. ▪ Regardless of the size, all scaffolding structures must meet the TS EN 12811-1 standard requirements. All personnel working on these scaffolds must have received training in working at heights and must use full-body safety harnesses and fall prevention equipment.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Lighting element installation	Temporary scaffolding Electricity	▪ Falling from a height ▪ Traumas due to the impact of objects falling from a height. ▪ Electric shock	▪ The personnel working on electrical installations must have a minimum of Level 3 certification in Electrical Installation (15UY0241-3). ▪ Before mounting lighting fixtures, the electrical energy to the relevant line should be cut off through the switchgear equipment and secured using the LOTO system. ▪ Before disassembly, the electrical energy should be checked using control devices such as phase voltage detectors on switchgear equipment connections, switches, etc. ▪ Regardless of their size, the scaffolding systems to be set up must comply with the TS EN 12811-1 standard. All personnel working on these scaffolds must have received training in working at heights and must use full-body safety harnesses and fall prevention equipment. ▪ All responsible personnel must use insulated electrical gloves and work shoes that are suitable for low voltage safety limits. The compliance of these PPE items must be verified by an Occupational Health and Safety Specialist through standards and CE marking.
Application of gypsum plaster	Temporary work scaffolding Chemical substances Electricity	▪ Falling from heights ▪ Traumas caused by objects falling from heights ▪ Electric shock ▪ Orthopedic disorders ▪ Disorders due to contact with chemicals	▪ Personnel responsible for plastering/rendering work must have a Level 3 Plastering Applicator Certificate (12UY0055-3). ▪ Regardless of their size, all scaffolds must comply with TS EN 12811-1 standard conditions. All personnel working on these scaffolds must have received training for working at heights, use full-body safety harnesses, and fall prevention equipment. ▪ All electrical equipment, including control lighting, mixers, etc., must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Extension cables and device power cables must be properly maintained to avoid hazards. Cables should not be left haphazardly on the ground, and personnel or carts should not pass over them. They should also be protected from water accumulation. ▪ Safety Data Sheets (MSDS) for materials like repair mortar, plaster, etc., must be reviewed by workplace physicians, and employees must be informed about their use, including potential exposure and eye contact risks. ▪ Personnel must wear safety footwear, protective eyewear, hard hats, dust masks, and ear protection.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Painting	Temporary scaffolding Electricity	▪ Falling from heights ▪ Traumas caused by objects falling from heights ▪ Electric shock ▪ Disorders due to contact with chemicals	▪ Personnel involved in painting work must possess a Level 3 Construction Painter Certificate (11UY0023-3). ▪ Regardless of their size, all scaffolds must comply with TS EN 12811-1 standard conditions. All personnel working on these scaffolds must have received training for working at heights, use full-body safety harnesses, and fall prevention equipment. ▪ All electrical equipment, including control lighting, mixers, etc., must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Extension cables and device power cables must be properly maintained to avoid hazards. Cables should not be left haphazardly on the ground, and personnel or carts should not pass over them. They should also be protected from water accumulation. ▪ Safety Data Sheets (MSDS) for materials like repair mortar, paint, solvents, etc., must be reviewed by workplace physicians, and employees must be informed about their use, including potential exposure and eye contact risks. ▪ Personnel must wear safety footwear, protective eyewear, hard hats, dust masks, and ear protection.
Mechanical installation	Electricity	▪ Electric shock	▪ Personnel involved in the mechanical installation process must have a minimum of Level 3 Heating and Natural Gas Interior Installation Worker Certificate (11UY0031-3). ▪ All electrical equipment must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Extension cables and device power cables must be properly maintained to avoid hazards. Cables should not be left haphazardly on the ground, and personnel or carts should not pass over them. They should also be protected from water accumulation. ▪ Personnel must wear safety footwear, protective eyewear, hard hats, dust masks, and ear protection.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Exterior Insulatıon	Work scaffolding Working at height Electrical equipment	▪ Injury due to falling from height. ▪ Injury due to falling object from height. ▪ Electric shock	▪ All personnel involved in the project must hold a professional competence certificate Level 3 for Thermal Insulation Specialist (12UY0057-3). ▪ The construction of work scaffolds must comply with the TS EN 12811-1 standards. All personnel working on these scaffolds must have received training in working at heights, use full-body safety harnesses, and fall prevention equipment. ▪ The personnel responsible for scaffold installation must possess the Scaffold Installation Specialist Level 3 (12UY0056-3) certificate. ▪ Horizontal and vertical lifelines must be inspected by authorized Mechanical Engineers. Their load capacities and the maximum number of personnel that can be connected simultaneously should be displayed on signs. ▪ All electrical equipment must undergo Portable Appliance Testing (PAT) to ensure electrical safety. ▪ Proper storage of extension cables and device power cables is essential. Cables should not be left lying haphazardly on the ground and should not be crossed over by hand trucks or workers. Cables should not be allowed to remain in puddles of water. ▪ The work area should be demarcated with safety barriers and warning signs indicating that approaching the work area is prohibited. ▪ Personnel involved in the project must wear safety shoes, protective goggles, a hard hat, dust masks, and earmuffs as necessary.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Rooftop solar panel installation	Working at height Electric	▪ Injury due to falling from height. ▪ Injury due to falling object from height. ▪ Electric shock	▪ The suitability of the mobile crane that will carry the panels must be confirmed with a periodic inspection report. ▪ Lifting and handling equipment (hooks, chains, slings, etc.) must be verified with a periodic inspection report. Before use, these equipment should be physically checked, and damaged equipment should not be used. ▪ The mobile crane should be selected based on the point where it will be anchored and the bridge weight, taking into account variables related to its lifting capacity, jib boom length, and angle. ▪ Before operating the mobile crane, the operator should visually inspect it and assess the presence of any physical defects. ▪ The mobile crane should be functionally checked by the operator before each operation (e.g., reverse maneuver warning siren, warning lights, etc.). ▪ Only authorized operators should use the mobile crane. The operator's professional qualification certificates should be checked and verified. ▪ Unauthorized personnel, other than authorized individuals and experts (operator, mechanical engineer, etc.), should not be allowed to intervene with the crane. ▪ Panels and electrical connections should be carried out under the supervision of experienced Electrical or Electrical Electronic Engineers. ▪ Personnel involved in panel assembly, cable installation, and electrical system connections should have experience and appropriate professional qualifications in photovoltaic systems. ▪ All electrical equipment should undergo a Portable Appliance Testing (PAT) to confirm electrical safety. ▪ Extension cables and device power cables should be physically protected. Cables should not be left on the ground haphazardly to prevent them from being run over by hand trucks or personnel. Cables should not be allowed to remain in puddles. ▪ Work areas should be separated by safety tapes and safety signs, indicating that approaching the work area is prohibited. ▪ All personnel working on the roof should have received training in working at heights.

WORK TO DO	SOURCE OF DANGER	RISKS	PRECAUTION
Rooftop solar panel installation (Continued from the previous page)	Working at height Electric	▪ Injury due to falling from height. ▪ Injury due to falling object from height. ▪ Electric shock	▪ All personnel working on the roof should use full-body safety harnesses and fall prevention equipment. ▪ Lifelines should be installed on the roof to secure the attachment of safety harnesses. ▪ Horizontal and vertical lifelines should be inspected by specialists or authorized individuals designated by the manufacturer. Load capacities and the maximum number of personnel who can be connected simultaneously should be displayed on signs. ▪ Personnel who will perform electrical panel and board assembly should have a minimum of an Electrical Panel Assembly Level 3 (12UY0075-3) qualification. All electrical work should be conducted under the supervision of a responsible Electrical or Electrical Electronics Engineer. ▪ Torque-controlled screwdrivers and tightening equipment should be used during electrical panel and board assembly. Proper tightening forces should be pre-determined based on the type of switchgear or the size of screws and nuts and communicated to the responsible personnel. ▪ All personnel should use insulated electrical gloves and work shoes that are suitable for low voltage safety limits. The suitability of these Personal Protective Equipment (PPE) should be assessed by a Health and Safety Specialist based on standards and CE markings.

- **Risk analysis lists have been prepared as examples. The contracting company should conduct detailed risk analyses for each work they are responsible for, taking these lists into consideration. Risk analyses should be prepared in accordance with the Occupational Health and Safety Risk Assessment Regulation (Official Gazette: 29.12.2012/28512) and should be revised as necessary.**

1. Determination of Risks & Control Measures

9.1 Determination of Risks and Control Measures Affecting the General Construction Site

The entire construction sites have been examined through solid models created by drones, and efforts have been made to identify site risks. The risks identified as a result of this examination are listed below in bullet points. Objective evidence for these items is provided under the "Pre-Construction Information & Site Plans" heading in this report.

- The areas mentioned below must be inspected by the Contractor's OHS Specialist, and if necessary, additional safety measures must be communicated to the workers.
- Site risks may not be limited to these findings; if the Contractor encounters risky areas beyond these findings, they must immediately report this to the Main Contractor's OHS Specialist.

a) Near buildings numbered 2-3, a retaining wall is observed by the roadside. The height of this retaining wall along the road is low, and there are no additional guardrails.

The entrance door of building number 2 is accessed through a passage constructed over an area with level differences. Guardrails are present in this structure. The strength of these guardrails will be checked before work commences. Areas with level differences have been observed around building number 2. The height of the concrete retaining wall constructed for these areas is low. Appropriate measures will be taken for safe passage in these areas before commencing work.

9.2 Determining Possible Business-Related Risks and Control Measures and Evaluating the Impact on Third Parties

As part of the project, risks related to the structural feasibility process are presented in tabular form under the heading "General Construction Rules and Management of Works". Apart from the risks in question;

- In addition to these risks, the following points should be considered regarding accidents that may occur when workers access the buildings within the project:
    - Actions must be taken in accordance with the traffic action plans specified in the report.
    - All individuals inside the vehicle, including rear seat passengers, are required to wear seat belts.
    - Vehicle drivers must strictly adhere to traffic regulations and speed limits.
    - Visual checks, such as fuel, oil leakage, tire treads, and pressure status, must be performed by the driver before vehicle operation. The use of faulty or defective vehicles is prohibited. Identified defects will be immediately reported to the Subcontractor's OHS Specialists.
    - Passengers should not refrain from warning the drivers if they encounter any behavior by the drivers that violates traffic rules. This should be immediately reported to the Subcontractor's OHS Specialists.
- The maneuvers of trucks, drilling machines, and other construction machinery, especially around the building, inherently involve risks. Before accessing the site, internet access to building floor models should be provided, and the areas where work will be conducted, road elevations and slopes, road width, and approach limits should be evaluated. Access links to building floor models can be requested from the main contractor via phone or email.

- Pedestrian movements should be taken into account when cars, vans, trucks, and construction machinery are used in the vicinity of the building. Pedestrian crossings should always be given priority. The proper functioning of the reversing warning sirens on trucks, vans, and construction machinery should be checked before using any vehicle.
- Except in necessary cases, the use of trucks and construction machinery is not permitted during nighttime hours. In urgent situations, the work permit system will be activated, and permission will be requested from the HSE specialist with a justification.
- Third parties and stakeholders should not be allowed to approach within 20 meters of drilling operations and machinery operations. For this purpose, safety barriers should be placed around the work area, and warning signs should be installed.

9.3 Risks Arising from Overlapping Tasks in Terms of Time and Space

The plans have been reviewed, and no risks have been observed due to overlapping tasks. In the event of encountering overlapping tasks in terms of time and space after the construction work has begun, the contractor will evaluate this situation in the work plan and risk analyses and report it to the consultant. After taking appropriate measures to address the risks, work will commence following the approval of the Consultant.

2. Determination of Equipment Needs and Specifications

- The contracting firm must determine all devices and equipment it will use during the work, specifying safety directives[11] CE Marking Regulation), relevant standards,[12] and providing a list along with periodic inspection reports to the Consultant.
- All electrical devices and equipment must undergo Portable Appliance Testing (PAT), and their electrical suitability must be indicated by PAT approval labels.

[11] Relevant Directives;
- MACHINERY SAFETY REGULATION (2006/42/EC)
- REGULATION ON ELECTRICAL EQUIPMENT DESIGNED FOR CERTAIN VOLTAGE LIMITS (2014/35/EU)
- PRESSURE EQUIPMENT REGULATION (2014/68/EU)
- REGULATION ON GAS-BURNING DEVICES (2016/426/EU)

[12] Relevant standards (must be reviewed separately for each device.)
- TS EN ISO 12100 Safety in machinery - General principles for design - Risk assessment and risk reduction
- TS EN 60204-1 Safety in machines – Electrical equipment of machines – part 1: General rules
- TS EN 60335-1 Safety rules - For electrical devices used in homes and similar places - Part 1: General rules
- TS 1203 EN 286-1 Tanks – Simple – Non-flammable – Pressurized
- TS 10116 Cranes – Test and inspection methods
- TS ISO 9927-1 Cranes-Inspections-Part 1: General

10.1 Determination of Protective Equipment Needs

10.1.1 Collective protection Systems

Table 28: LIST OF COLLECTİVE PROTECTİON SYSTEMS

TYPE OF PROTECTION	PLACE OF USE	DURATION OF USE	STANDARDS
SAFETY STRIP	RISKY WORK AREAS (PIECES FALLING FROM HEIGHT, USE OF WORK MACHINE, RISK OF FALLING, WORKING WITH ELECTRICITY, CARRYING HEAVY LOAD)	Until the local work is completed.	-
ACCESS / FALL RESTRICTOR RAILWAY	EXCAVATION, DRILLING AREAS, DEMOLISHED EXTERIOR WALL EDGES.	Until the local work is completed.	TS EN 13374+A1
LIFELINE	WORKS ON SCAFFOLDINGS, WORKS ON THE ROOF, WORKS CLOSE TO DEMOLISHED FACADE WALLS.	Until the local work is completed.	TS EN 795
SAFETY NET	1. STUDENT DORMITORY A-B Block under the transition bridge.	Until the dismantling process is completed.	TS EN 1263-2

10.1.2 Personal Protective Equipment

Table 29: PPE TABLE

DEFINITION	CATEGORY	MAINTENANCE/RENOVATION PERIOD	MAX USAGE TIME	STANDARDS	COLOR CODE
SAFETY HELMET	II	1 YEAR	CONTINUALLY	TS EN 397+A1	White: Engineer Yellow: Employee Red: OHS Specialist. Green:ERT[13]
EARPLUG	I	DAILY	DURING NOISY OPERATION (³80dB)	TS EN 352-2	-
PROTECTIVE GOGGLES	I	3 MONTHS	DURING ANY WORK DURING THE RISK OF OBJECTS INTO THE EYES AS SPECIFIED IN THE RISK ANALYSIS	TS EN ISO 16321-3	-
GENERAL PURPOSE WORK GLOVES	I	3 MONTHS	CONTINUALLY	TS EN ISO 21420	-
WORK SHOES	II	1 YEAR	CONTINUALLY	TS EN ISO 20347	-
HALF FACE MASK	I	DAILY	DUSTY WORK	TS EN 140	-
FULL-BODY SAFETY HARNESS	II	1 YEAR	ALL KINDS OF WORKING AT HEIGHT	TS EN 361	-
FALL PREVENTIVE	II	1 YEAR	ALL KINDS OF WORKING AT HEIGHT	EN 355	-

[13] EMERGENCY RESPONSE TEAM

EQUIPMENT AND LIFE LINES					
INSULATED GLOVES AND WORK SHOES	I	3 MONTHS	ELECTRICAL WORKS	TS EN ISO 21420	-

3. Work Permit System

The actions subject to the work permit system are listed below:

- All types of night work.
  Work cannot be conducted without approval from the OHS Specialist. Elements to be checked for night work are listed as follows:
  - Approval from building management and technical units.
  - Adequate lighting and light level control for outdoor work.
  - Whether technical teams from the building can accompany the work.
  - Work hours of the employees.
  - Information about the working environment (Photos).
  - Professional qualifications of the employees.
- Working at height.

  In case a driller needs to climb the drilling tower for maintenance and repair, the following elements will be checked:

  - Reason for climbing the tower.
  - Current condition of the tower's position and fixing connections (Photos).
  - Proper usage of safety harness and attachment apparatus (Photos).
  - Training of the personnel working at heights (Working at Heights Training) and the statement of suitability for working at heights in health examination reports.
- Working at height
  Thermal insulation installation on the façade.

  - The scaffolding must be installed in accordance with TS EN 12811-1 standard.
  - The scaffolding should be fixed to the ground and the façade at suitable points.
  - Horizontal and vertical lifelines should be installed.
  - The capacities of the scaffolding and lifelines should be indicated (total number of users - weight).
  - Personnel working at heights should be trained (Working at Heights Training), and the statement of suitability for working at heights in health examination reports.

- Within the scope of this project, working in enclosed spaces, welding, plasma cutting, and similar works are not anticipated. However, if there is a need for such work, even in partial and simple tasks, the work permit system will be implemented.

The work permit system will be completed through a Google Form on mobile phones and will be provided with approval from the OHS specialist. The link to the form must be requested from the Subcontractor OHS Specialists.

The process is described below:

1. It is mandatory to prepare and request approval for the WORK PERMIT form for activities listed under work permits. However, once the form is registered in the system, work can only begin after approval is granted. Starting work without approval is prohibited.

a) Necessary personal protective equipment must be provided and used consistently.
   - Before starting work, the personal protective equipment to be used must be visually inspected, and any physical defects, the end of service life, or any similar issues must be immediately replaced with new ones. Under no circumstances should unsuitable personal protective equipment be used.

b) Individuals without professional qualifications are not allowed to participate in work that requires a work permit. Therefore, professional qualification certificates related to such work must be kept in the employees' personnel files or uploaded in digital format.
   - Before starting work, it is crucial to verify the validity of professional qualification certificates. Individuals whose certificates have expired or need renewal are not permitted to work on-site.

Use of the Form

The digital work permit form will be filled out using smartphones and sent for approval from the OHS specialist.

Description of job of work
Describe the work(s) you will do in general in this section.

Your Answer:

A GENERAL EXPLANATION SHOULD BE MADE REGARDING THE WORK FOR WHICH PERMISSION IS REQUESTED (INCLUDING THE REASON FOR WORK) AND THE EXACT WORK DATE AND HOUR SHOULD BE SPECIFIED.

*Working Date and Time**
Date *Time*

DD.MM.YYYY 🗓 :

Personal Protective Equipment*

Please Tick the Personal Protective Equipment to be Used During Work!

- ☐ Earplug & Protective Headphone
- ☐ Work Glasses
- ☐ Welder Goggles / Barrier
- ☐ Safety Helmet
- ☐ Dust mask
- ☐ Safety Belt
- ☐ Work Shoes (General)
- ☐ Work shoes (Electrical)
- ☐ Safety Glove
- ☐ Safety Anti-Static Glove (Electrical-Low Voltage)
- ☐ Safety Anti-Static Glove (Electrical-High Voltage)
- ☐ Safety Glove (Wleding)
- ☐ Isolated Mat
- ☐ Insulated Stool
- ☐ Protective Work Clothing Against Electric Arc
- ☐ Other _____

PERSONAL PROTECTIVE EQUIPMENT TO BE USED DURING WORK SHOULD BE MARKED. MEANWHILE, IT SHOULD BE REMEMBER THAT MORE THAN ONE SELECTION WILL BE MADE AND A VISUAL CHECK OF THE PPE IN SAME SHOULD BE CARRIED OUT BEFORE MARKING.

Certificate Of Professional Competence-01

Are the Professional Competence Certificates of the employees included in their personnel files?

- ☐ *Yes*
- ☐ *No*

IF THE PROFESSIONAL QUALIFICATION DOCUMENTS REGARDING THE PERSONNEL TO BE WORKED ARE AVAILABLE IN THE PEOPLE'S FILE, "YES" SHOULD BE MADE. IF THEY ARE NOT AVAILABLE (EMPLOYERS WITH TEMPORARY WORK ORDER, ETC.), THE SECTION MUST BE MARKED "NO" AND PROCEED TO THE NEXT SECTION.

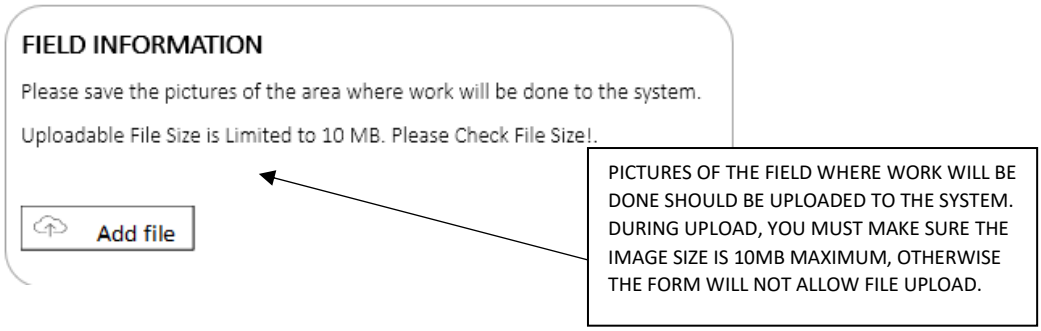
Certificate Of Professional Competence-01

Please Save the Vocational Competence Certificate in the System!*

Uploadable File Size is Limited to 10 MB. Please Check File Size!.

Add file

DOCUMENTS OF EMPLOYEES WHO DO NOT HAVE THEIR VOCATIONAL QUALIFICATION CERTIFICATE IN THEIR PERSONNEL FILE (TEMPORARY ASSIGNMENT, ETC.) MUST BE UPLOADED TO THE SYSTEM. DURING UPLOAD, YOU MUST MAKE SURE THE FILE SIZE IS 10MB MAXIMUM, OTHERWISE THE FORM WILL NOT ALLOW THE FILE UPLOAD.



PICTURES OF THE FIELD WHERE WORK WILL BE DONE SHOULD BE UPLOADED TO THE SYSTEM. DURING UPLOAD, YOU MUST MAKE SURE THE IMAGE SIZE IS 10MB MAXIMUM, OTHERWISE THE FORM WILL NOT ALLOW FILE UPLOAD.

AFTER FORM DATA ENTRY IS COMPLETED, YOU SHOULD WAIT FOR APPROVAL BY PHONE BY PRESSING THE "SEND" BUTTON.
THE WORKS IN QUESTION CAN BE STARTED AFTER THE APPROVAL.

4. LOTO System

Energetic Systems and devices are used in controlling, maintaining, and replacing natural gas lines, and during these operations, there's a risk of unexpected energy or gas release, operational issues, electrical shock, fire, explosions, etc. To mitigate these risks, physical barriers and informational tags are used together, referred to as LOTO[14].
During these operations:

- It is mandatory for all personnel involved in the task to receive lockout/tagout training.
- The necessary lockout/tagout equipment must be provided and readily available by the contracting company.
- The neutral and ground lines of the devices should also be disconnected from the bus/connection point. This helps prevent electrical shocks from other systems/devices.
- Valves feeding the section that will be worked on to release energy due to pressure must be closed and locked. Existing pressure should be vented with pressure relief valves or discharged safely.

Photo 21 LOCKOUT TAGGING TRAINING SAMPLE

DANGER
Definitely Don't Operate!
EQUIPMENT LOCKED

Locking
It is the use of locking mechanisms **designed to prevent access** and/or operation of machinery, electrical panels, switchgear, valves, etc.

The locking process must be **announced with labels/warning signs.** Otherwise, it is possible to encounter situations such as locks being opened or forced without permission.

Labeling
It is the use of labels that clearly state that actions such as opening, operating, energizing are prohibited for a certain period of time.

It is definitely not recommended to use labels/warning signs **alone** in high-risk studies.

Electrical & Insurance Locks

Multiple lock system visual

Providing suitable locking elements
Considering the equipment and processes used; **It is the employer's responsibility to provide appropriate locking elements and keep them ready for use when needed.**

[14] lockout/tagout

5. Observation and Inspection

A minimum checklist, as presented below, will be used for routine field inspections. Inspection forms will also be prepared by the contractor as per the nature of the work.

Table 30: OCCUPATIONAL HEALTH AND SAFETY (OHS) CONTROL CHECKLIST

NO	CONTROL SUBJECT	SCORE	DEADLINE	RESPONSIBLE	ACTION
01	Have the necessary OHS trainings been provided to the employees?				
02	Is the continuity of measures taken regarding OHS observed?				
03	Is regular information obtained from employee representatives and support staff about the workplace?				
04	Are employees' entry examinations and periodic examinations conducted regularly?				
05	Are health records stored in accordance with the principle of confidentiality?				
06	Is harmony between work and employees ensured, and guidance provided to protect them from stress factors in the working environment?				
07	Are potential occupational diseases in the sector identified, and workplace observations regarding these diseases conducted?				
08	Are measures identified for controlled entry and exit to the workplace, and is the employer informed?				
09	Are near-miss records evaluated?				
10	Are records of work accidents and occupational diseases evaluated?				
11	Is regular participation ensured in the Occupational Health and Safety Board, and board decisions monitored?				
12	Are occupational health and safety instructions prepared, submitted to the employer for approval, and controlled for implementation?				
13	Are work permit procedures prepared, submitted to the employer for approval, and controlled for implementation?				
14	Are hygiene and safety conditions evaluated for suitable living areas (cafeteria, dormitory, shower, WC, etc.) meeting the legal requirements?				
15	Are environmental physical-chemical-biological factors taken into consideration?				
16	Is the employer informed about the determination of first aid, firefighting, search-rescue-evacuation teams, and the training they receive?				
17	Is the emergency action plan prepared according to the field?				
18	Are escape routes and assembly points determined and marked for emergencies?				
19	Have precautions against fire been taken?				
20	Are emergency drills conducted, monitored, and evaluated?				
21	Is the risk assessment prepared suitable for the field?				
22	Is the risk assessment carried out with the team specified in the legislation?				
23	Are control steps followed after the risk assessment?				
24	Is the risk assessment renewed in cases specified in the legislation?				
25	Is work done for special groups requiring specific policies?				

NO	CONTROL SUBJECT	SCORE	DEADLINE	RESPONSIBLE	ACTION
26	Are suitable Personal Protective Equipment (PPE) selections made for employees, and on-site training provided about their usage?				
27	Are necessary environmental measurements determined at the workplace, and information provided to the employer?				
28	Is information given about the compliance of equipment used in the workplace with standards?				
29	If pedestrian paths and vehicle use are involved, are vehicle paths determined appropriately?				
30	Are suitable storage areas determined for products or equipment to be stored, or parking areas for machinery?				
31	Are periodic inspections of work equipment followed?				
32	Are the competencies of employees using work equipment checked?				
33	Are approved ledger copies kept regularly by the occupational safety specialist and workplace physician during each workplace visit?				
34	Has a realistic annual work plan for the workplace been prepared?				
35	Is the work calendar in the prepared annual work plan followed?				
36	Is there a realistic annual evaluation report for the workplace?				

6. Employee Training

- All employees must receive training according to the minimum requirements stated in the "Regulation on the Principles and Procedures of Occupational Health and Safety Training of Employees" (Official Gazette Date: 15.05.2013, Official Gazette Number: 28648) and the "Hygiene Training Regulation" (Official Gazette Date: 05.07.2013, Official Gazette Number: 28698). Training records and certificates of Subcontractor personnel will be requested and checked.

  Occupational health and safety training records should include the personnel's name, position, start date, training titles, and dates, and these records should be listed and sent to the consultant Occupational Safety Specialist.

- For this project, all employees will undergo a minimum of 2 person-days of training based on this document and risk analyses. The training will be provided by Contractor and subcontractor Occupational Safety Specialists. Training records will be communicated to the Consultant.
- Employees must have completed Working at Heights Rope Access Training before starting work. This training will be provided by experts holding at least an IRATA (Industrial Rope Access Trade Association) International Level 2 Certificate.

Monitoring Personnel Health Conditions

- Periodic health reports of employees will be checked, and their fitness for the tasks will be verified through these reports.
- Health reports must list the personnel's name, position, start date, occupational health training titles, and dates. These records should be listed and sent to the Consultant Occupational Health Physician.

Personnel Professional Competence

- The required professional competence qualifications are specified in this document. The Contractor company must list all employees, including the personnel's name, position, start date, professional competence certificate, certificate date, and validity period. This list must be submitted to the Consultant Occupational Safety Specialist.

7. Emergency Preparedness

An emergency action plan, as per Article 11 of the Occupational Health and Safety Law No. 6331, will be prepared by the Contractor. This plan will contain specific parameters and instructions for emergencies, mapped and diagrammed. The prepared emergency action plan may vary or be applicable according to the envisaged emergency situations.

Table 311: LIST OF EMERGENCY SITUATIONS AND PREVENTIVE MEASURES

EMERGENCY	**PREVENTIVE AND LIMITING MEASURES**
Fire and Explosion	• Periodic maintenance and checks of electrical and grounding installations, lightning protection installations, generators, fire extinguishing, and fire detection and warning systems. • Restricting areas where smoking is allowed and marking these areas. • Removing dry grass and tree branches that can catch fire. • Having fire detection and warning systems (alarm, gas, smoke detectors, etc.) and keeping them in continuous working condition. • Periodic checks of the heating system and preventing unauthorized access to boiler rooms. • Proper labeling and storage of chemicals used. • Proper labeling and storage of chemicals. • Proper storage of flammable, combustible, and explosive materials away from heat sources. • Designating the locations of accessible installations such as gas valves and electrical panels for authorized personnel to intervene immediately in case of energy cuts. • Conducting environmental measurements.
Spread from Hazardous Chemicals	• Proper storage of chemicals according to their properties and hazards, preventing situations that may cause leaks, and ensuring adequate ventilation. • Preventing unauthorized personnel from entering chemical storage areas. • Providing employees with appropriate personal protective equipment according to standards and ensuring correct usage. • Posting Safety Data Sheets (SDS) in visible locations where chemicals are present in the workspace. • Having an intervention card for hazardous substances. • Conducting environmental measurements.
Poisoning	• Checking the expiration dates of food products. • Preparing meals under hygienic conditions. • Keeping materials such as plates, forks, trays, etc., clean. • Taking witness samples from meals. • Providing training to personnel serving meals. • Providing general hygiene training to all personnel. • Meal servers using appropriate gloves, caps, work clothes, etc.
Epidemic Disease	• Vaccination. • Preventive medications. • Pest control and disinfection. • Ensuring hygiene. • Establishing a First Aid Team and providing necessary training. • Regular checks of drinking water and water coolers. • Taking witness samples from meals.

Sabotage	• Establishing a security unit. • Installing security cameras in necessary locations for continuous monitoring. • Controlled entry and exit. • Keeping records of external persons, checking identities at entry, and issuing visitor cards. • Controlled opening of incoming shipments. • Checking of transport vehicles. • Restricting unauthorized access to high-security areas. • Adequate indoor and outdoor lighting.
Natural Disasters	• Strengthening the ground. • Securing cabinets and shelves, placing large tools and equipment in safe positions. • Checking the earthquake resistance of buildings. • Providing training to all employees on what to do in an earthquake. • Having an earthquake bag ready with first aid supplies, flashlight, batteries, radio, etc. • Checking and maintaining rainwater channels. • Prioritizing afforestation. • Portable obstacles for windows and doors in enclosed workplaces. • Using emergency valves for rapid and safe disconnection of electricity (electricity, gas, etc.) and assigning competent individuals. • Having equipment ready for use during and after disasters.
Occupational Accidents	• Providing occupational health and safety training. • Conducting health surveillance (periodic examinations and tests, etc.). • Providing additional training for tasks requiring special skills, such as working at heights, working in confined spaces, etc., and having reports demonstrating fitness for these jobs. • Keeping the Risk Assessment up to date and continuously monitoring the measures taken. • Investigating near-miss incidents and taking necessary measures to prevent their recurrence. • Conducting accident investigation and root cause analysis. • Not assigning personnel to tasks they are not qualified for. • Implementing an incentive/warning system for occupational health and safety and working on workplace safety culture. • Implementing an effective inspection mechanism. • Monitoring the correct and active use of Personal Protective Equipment. • Avoiding working alone. • Ensuring that personnel employed through service procurement are employed in compliance with occupational health and safety legislation. • Establishing a First Aid Team and providing necessary training.
Cyber Attacks	• Providing employees with training on cyber risks and security. • Installing and keeping antivirus and anti-spyware software up-to-date. • Using a firewall for internet connections. • Updating operating systems and applications. • Regularly backing up data and information. • Controlling physical access to computers and servers. • Ensuring the security and privacy of Wi-Fi and LAN networks. • Assigning individual usernames and passwords to each employee. • Creating authorization levels for accessing information within the network.

General	• Posting evacuation plans, entrance and exit of workplace buildings and extensions, floors, and evacuation paths at heights visible to employees. • Indicating the locations of fire extinguishing equipment and first aid materials and evacuation routes on the evacuation plan. • Determining the meeting place after evacuation and showing it on the plan. • Having suitable emergency escape routes and emergency exit doors with appropriate signs. • Placing appropriate signs indicating escape routes in visible places. • Establishing emergency response teams and providing necessary training. • Posting visible contact numbers for emergencies. • Parking vehicles in a way that allows forward movement. • Informing employees about possible emergencies and emergency plans. • Conducting regular emergency drills and ensuring the participation of all employees. • Informing customers, visitors, and other individuals present in the workplace about emergencies and emergency plans. • Keeping emergency plans up-to-date. • Keeping the equipment that emergency teams will use ready for use at all times. • Using a sound and/or light alarm system to alert employees in emergencies. • Marking the location of the First Aid kit, ensuring it is accessible to all employees, ensuring that it contains the necessary number and competence of materials, and continuously checking their expiration dates. • Providing accompaniment for the evacuation of the elderly, disabled, or pregnant individuals.

The contractor company must, at a minimum, prepare detailed emergency action plans regarding the above-mentioned issues and forward them to the Consultant OHS Specialist and Workplace Physician.

Emergency Gathering Points

- Emergency gathering points have been determined for each structure and integrated into detailed plans. Emergency gathering areas have been determined taking into account earthquake risks and building dimensions. These locations are indicated using EMERGENCY GATHERING AREA SIGNS in the section titled "Pre-construction Information & Site Plans."

Emergency Response Teams and First Aid Personnel

The contractor and subcontractors must list the names, duties, start dates, dates of emergency preparedness training, and the expiry dates of the first aid certificates of the emergency response teams (ERT) and first aid personnel they have designated, considering legal requirements.

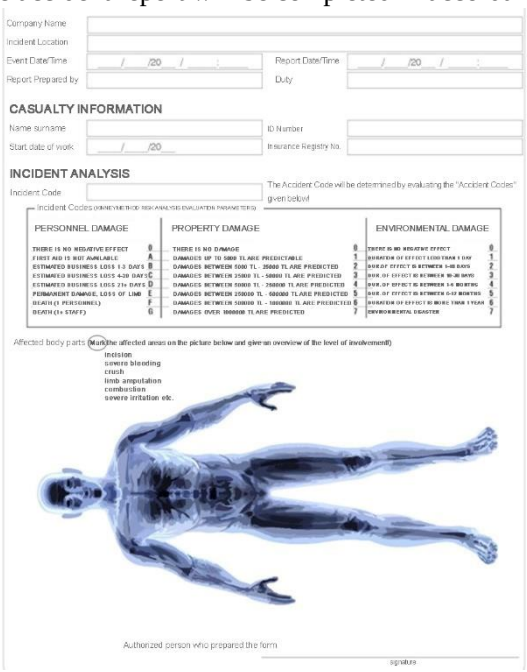
- All these teams must participate in emergency drills at least once, and the participation reports must be submitted to the Consultant OHS Specialist and the Occupational Health Physician.

8. Accident and Incident Investigation

- The report form to be used for investigating and reporting accidents, incidents, and near misses that can occur in the field is given below.

- Major environmental accidents and workplace accidents (such as injuries resulting in death, environmental spills such as spills, etc.) that may occur during construction activities will be shared with the Consultant and CIASB on the same day; it will be reported to the Ministry of Labor and Social Security within 3 working days. CIASB will inform the World Bank about the accident within 48 hours. The contractor will send the accident report to CIASB within 30 working days along with the root cause analysis. CIASB will share this information with the World Bank simultaneously.

The accident report will be completed in accordance with the rules stated below:


Company Name
Incident Location
Event Date/Time
Report Date/Time
Report Prepared by
Duty
CASUALTY INFORMATION
Name surname
ID Number
Start date of work
Insurance Registry No.
INCIDENT ANALYSIS
Incident Code
The Accident Code will be determined by evaluating the "Accident Codes" given below
Incident Codes
PERSONNEL DAMAGE
PROPERTY DAMAGE
ENVIRONMENTAL DAMAGE
Affected body parts (Mark the affected areas on the picture below and give an overview of the level of involvement)
incision
severe bleeding
crush
limb amputation
combustion
severe irritation etc.
Authorized person who prepared the form
signature

- Care must be taken to fill out all sections of the accident report completely.
- The accident code must be determined and defined according to the procedure specified in the report.
- The sections where the injured person is injured must be indicated on the first page on the graphic, and the information about the injury must be described in accordance with the procedure specified in the report.
- The elements causing the accident must be selected from the list specified on page 2 of the Accident Report.
- When describing the accident and the root causes causing the accident on page 3, great care must be taken, the accident must be thoroughly investigated, and care must be taken not to use expressions that can be misunderstood.
- Two personnel who witnessed the accident must be identified on page 3 of the Accident Report.
- If the number of personnel witnessing the accident is more than 2, efforts should be made to select neutral personnel who can describe the accident appropriately from among the witnesses.
- Witnesses described on page 3 must sign the ACCIDENT RECORD given on page 7.

- Incident site photos, photos of the injured, photos of the device causing the accident, equipment, etc., objective evidence must be provided and attached to page 4 of the Report. If the number of photos is high, important photos should be specified in this section, and other photos should be kept in the appendix of the report. (A note stating that additional photos are available in the report appendix should be written at the bottom of page 4.)

- The PPE used by the personnel during the accident must be specified on page 5 of the report. In this section, the PPE used by the personnel, not the PPE delivered to the personnel, must be identified with care. The report appendix will contain the minutes related to the PPE delivered to the personnel.

- Measures to be taken immediately after the accident and measures to prevent the accident from recurring must be specified separately on page 6 of the Accident Report.

- If possible, the personnel who directly experienced the accident must fill out the accident record given on page 7. If this is not possible, selected personnel among the witnesses specified in the report must fill out this section in their own handwriting. If there are no witnesses to the accident, the employer or employer representatives will be asked to fill out this section in their own handwriting.

- The prepared report must be signed by the OHS Specialist, Occupational Health Physician, Employer/Employer Representative.
- The following documents must be included in the prepared Accident Report appendix:
    - PPE delivery report,
    - Participation forms and certificates regarding the training given until the accident date,
    - Orientation training form,
    - Certificates, diplomas regarding professional competence,
    - Health report showing suitability for the job,
    - Overtime work approval form (if the accident occurs outside working hours),
    - Pre-prepared warning letters (if related to the cause of the accident),
    - Records prepared regarding occupational health and safety,
    - SSI occupational accident notification form,
    - Health report obtained after the accident,
    - Doctor's report indicating work disability,
    - Insured job entry declaration.

It should not be forgotten that accidents can happen no matter how many precautions are taken. It is important to act calmly during and after the accident, both for the injured person and for the company. Therefore, it is recommended to conduct EMERGENCY RESCUE drills with seriousness before fieldwork related to WORK ACCIDENTS/RESCUE OF INJURED PERSONS.

Post-accident measures: corrections that need to be made urgently and corrections aimed at eliminating the ROOT cause that caused the accident should be evaluated in two separate categories. After a work accident, it is essential to eliminate the elements that caused the accident in a way that will not be repeated.

Post-Accident Considerations;

- During inspections, necessary arrangements will be made in the field to facilitate inspectors' access to the site. All information and documents related to the injured person will be readily available. It should be noted that the access time to the information and documents requested by the inspector is crucial.
- The occupational accident notification to the Social Security Institution (SSI) will be made within a maximum of 3 days from the accident date. (Together with the visit report)
- If available, control reports of the machinery and equipment causing the accident and regular maintenance records will also be kept in the accident report for inspections.
- All documents kept in the Accident Report appendix will be copies. However, necessary preparations will be made to provide access to the original documents to the inspectors if requested.

9. OHS Budget:

The OHS Budget presented below has been created for general informative purposes. It is assumed that the bid to be submitted by the contractor includes the budget necessary for taking measures related to occupational health and safety.

Table 322: Estimated OHS Budget

	QUANTITY	UNIT	UNIT PRICE (₺)	TOTAL(₺)
CATEGORY II HELMET (TS EN 397+A1)	300	AD.	₺200,00	₺60.000,00
CATEGORY I EARPLUG (TS EN 352-2)	9600	AD.	₺15,00	₺144.000,00
CATEGORY I PROTECTIVE GOGGLES (TS EN ISO 16321-3)	300	AD.	₺60,00	₺18.000,00
GENERAL PURPOSE WORK GLOVES (TS EN ISO 21420)	300	AD.	₺30,00	₺9.000,00
ELECTRICAL WORK GLOVES (LOW VOLTAGE) (TS EN ISO 21420)	50	AD.	₺750,00	₺37.500,00
WORK SHOES (TS EN ISO 20347)	300	AD.	₺450,00	₺135.000,00
ISOLATED WORK SHOES (LOW VOLTAGE) (TS EN ISO 20347)	50	AD.	₺1.100,00	₺55.000,00
DUST MASK	9600	AD.	₺5,00	₺48.000,00
HALF FACE MASK (TS EN 140)	75	AD.	₺500,00	₺37.500,00
CATEGORY II FULL BODY SAFETY HARNESS (TS EN 361)	150	AD.	₺450,00	₺67.500,00
FALL ARREST DEVICES (EN 355)	150	AD.	₺250,00	₺37.500,00
LIFE LINES (EN 355)	200	m.	₺450,00	₺90.000,00
SAFETY STRAP	1000	m.	₺2,50	₺2.500,00
SAFETY NET (EN 355)	150	m²	₺350,00	₺52.500,00
			TOTAL:	**₺794.000,00**
			VAT:	**₺142.920,00**
			GRAND TOTAL:	**₺936.920,00**

Attachment 1: Traffic Plan, Emergency Gathering Area, Risky Areas

The sections related to the structures included in the BOÜN Kilyos campus project, such as construction site traffic plan, parking areas, emergency gathering areas, and sections where significant level differences are observed, are presented below for your attention.

Figure 6: BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS CONSTRUCTION SITE TRAFFIC PLAN

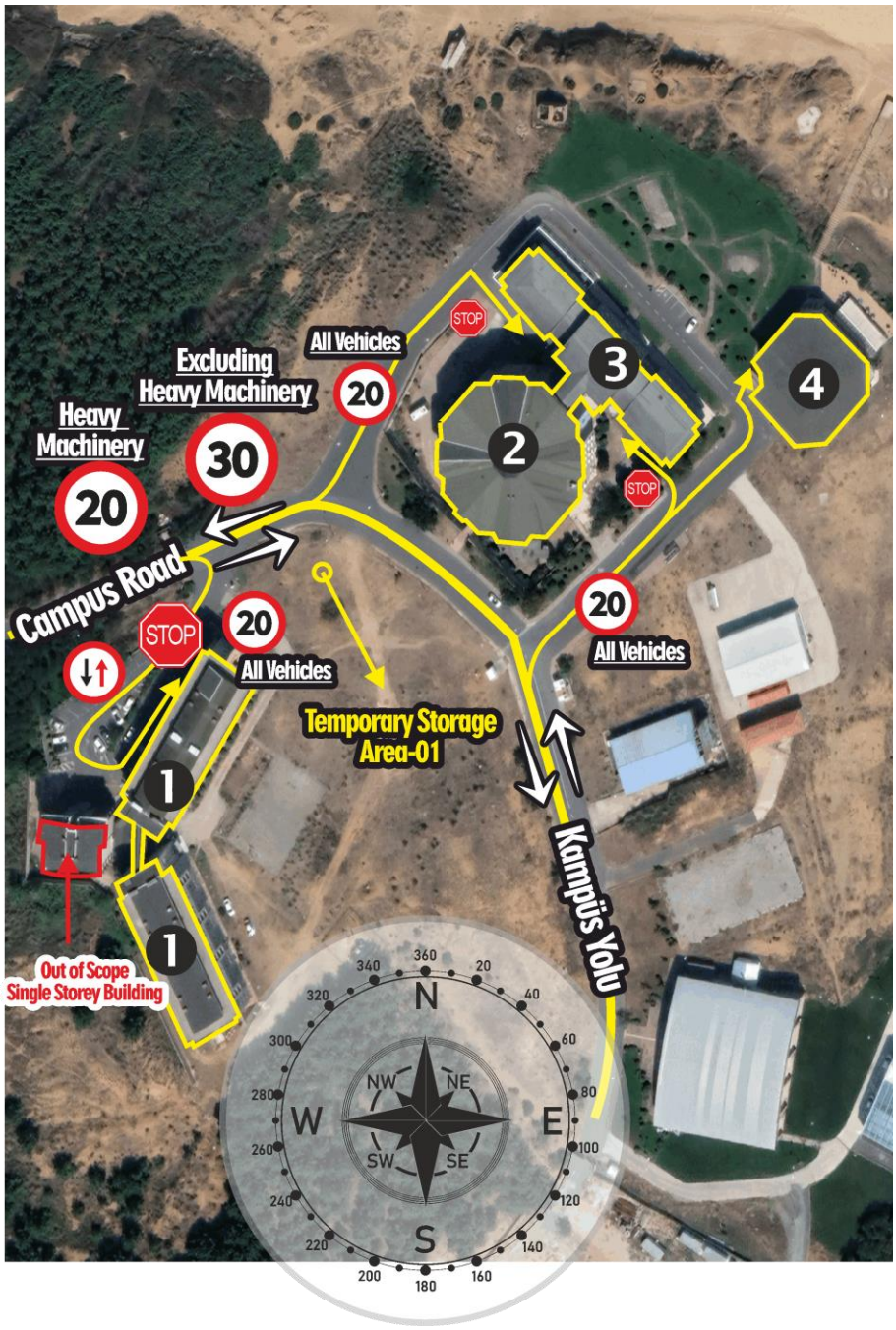


Figure 7: BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS BUILDING 1 PARKING AREAS - VEHICLE MANEUVER RESTRICTIONS

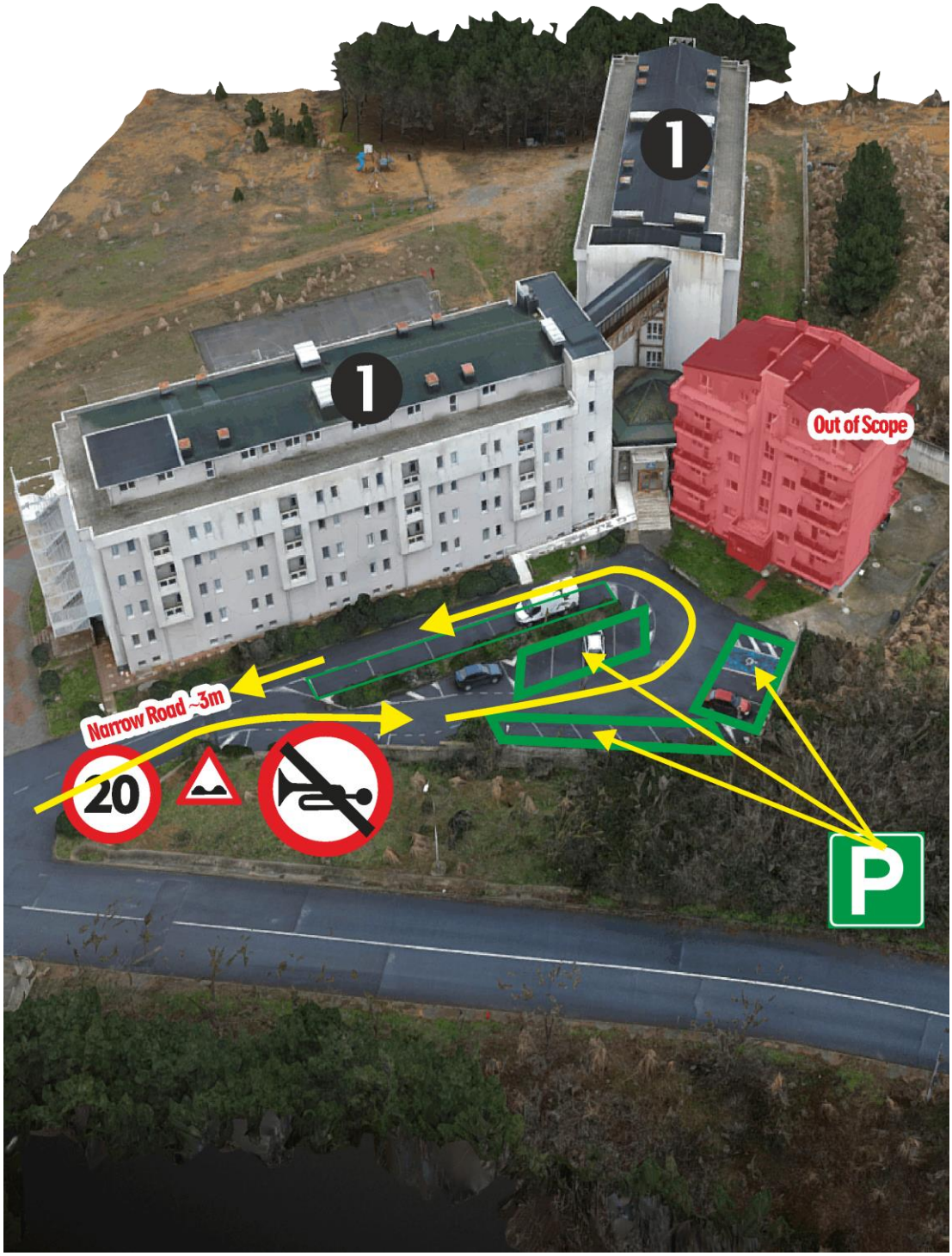


Figure 8: BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS BUILDING 1 EMERGENCY GATHERING AREA

Figure 9: BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS BUILDINGS 2-3 LEVEL DIFFERENCE WARNING

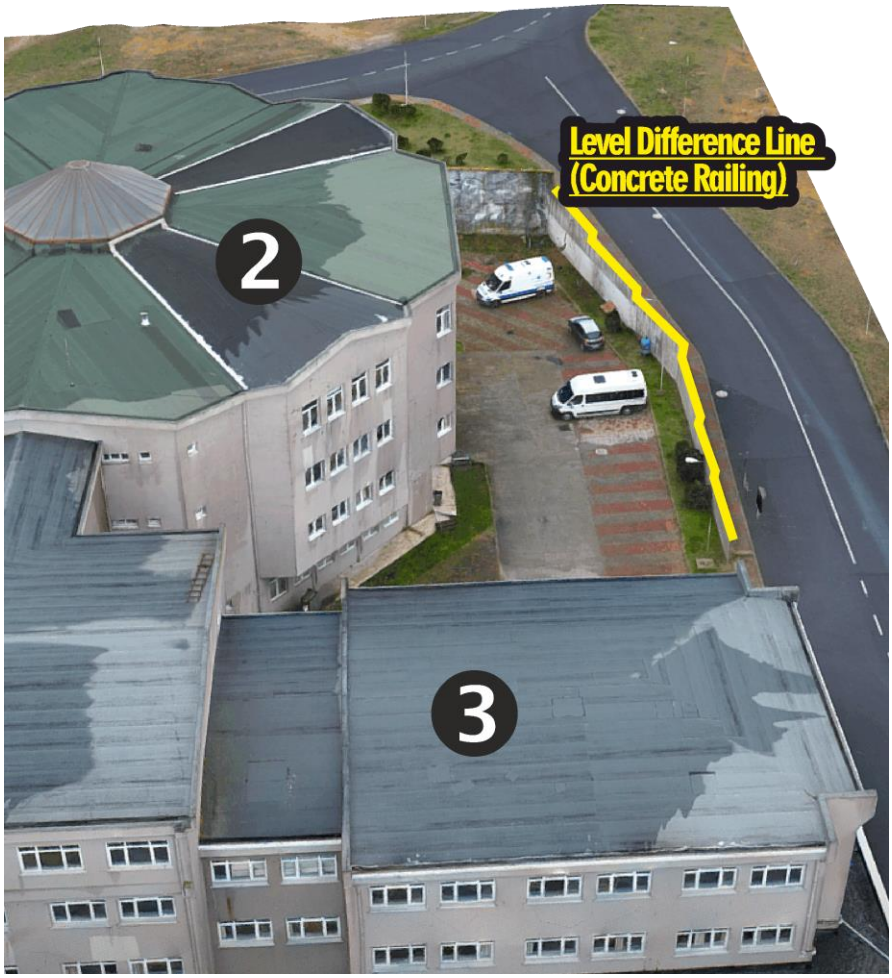


Figure 10: BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS BUILDING 2 LEVEL DIFFERENCE WARNING (FALL RISK)

Figure 11: BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS BUILDINGS 2-3 PARKING AREAS

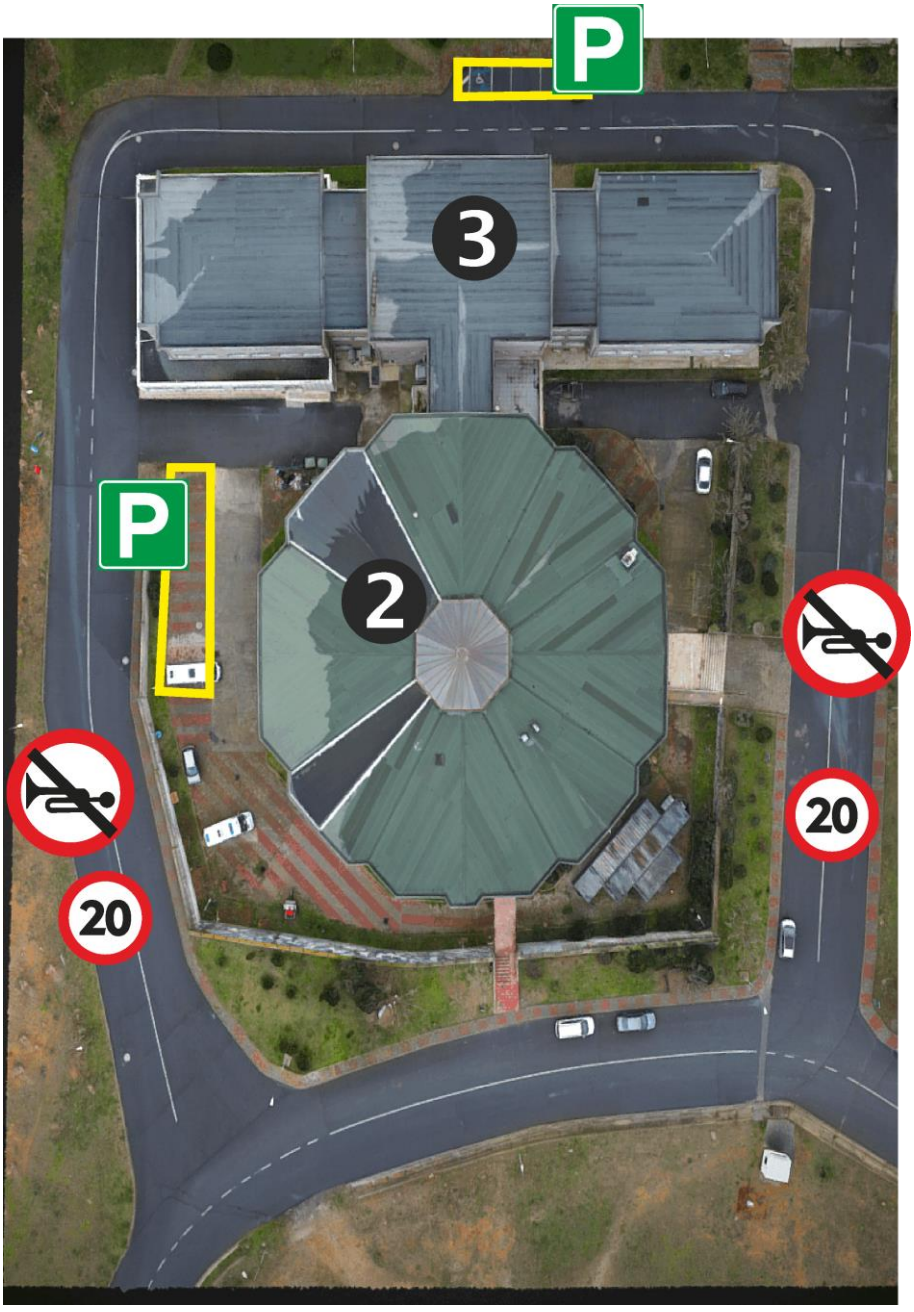


Figure 12: BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS BUILDING 2 LEVEL DIFFERENCE WARNING & EMERGENCY GATHERING AREA

Figure 13: BOĞAZİÇİ UNIVERSITY KILYOS CAMPUS BUILDING 4 VEHICLE ENTRANCE