



# **DIGIT - Digital, Innovation, and Green Technology Project (P180755)**

## **SUB-PROJECT**

**Modernization of the Institute for Adriatic Crops and Karst  
Reclamation Infrastructure as a Precondition for Excellence in  
Mediterranean Agriculture Research (KRŠ)**

## **Environmental And Social Management Plan (ESMP)**



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## ABBREVIATIONS

<b>Abbreviation</b>	<b>Full term</b>
c.m.	Cadastral Municipality
c.p.	Cadastral Parcel
C-ESMP	Contractor-Environmental and Social Management Plan
DIGIT Project	Digital, Innovation, and Green Technology Project
E&S	Environmental and Social
EHSG	Environmental Health and Safety Guidelines
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
GDA	Gross Development Area
GIIP	Good International Industry Practice
GMP	Good Manufacturing Practices
IBRD	International Bank for Reconstruction and Development
IFC	International Finance Cooperation
Institute	Institute for Adriatic Crops and Karst Reclamation
MSEY	Ministry of Science, Education and Youth
NFPA	National Fire Protection Association
NRRP	National Recovery and Resilience Plan 2021-2026
OECD	Organization for Economic Co-operation and Development
OG	Official Gazette
OHS	Occupational Health and Safety
OPCC	Operational Programme Competitiveness and Cohesion 2021-2027
PIU	Project Impelmentation Unit
PPE	Personal Protective Equipment
RDI	Research, Development and Innovation
RoC	Republic of Croatia
S3	The Croatia Smart Specialization Strategy 2021-2027
SEP	Stakeholder Engagement Plan
WB	World Bank
WHO	World Health Organization



## **EXECUTIVE SUMMARY**

### **Project's information**

The Government of the Republic of Croatia and the International Bank for Reconstruction and Development have signed the Loan Agreement (Loan No. 9558-HR) for the **Digital, Innovation, and Green Technology Project (DIGIT Project)** for EUR 106 million on June 28, 2023. Activities under the DIGIT Project will finance research and innovation through Sub-grant schemes, with a focus on digital and green, and will complement and enhance the effectiveness of investments and build the capacities of institutions to deliver on this agenda. The DIGIT Project will also support reforms envisaged in the National Recovery and Resilience Plan 2021-2026, the Croatia Smart Specialization Strategy 2021-2027, Operational Programme Competitiveness and Cohesion 2021-2027, and activities important for the country's accession to the Organization for Economic Co-operation and Development

The **Sub-project *Modernization of the Institute for Adriatic Crops and Karst Reclamation Infrastructure as a Precondition for Excellence in Mediterranean Agriculture Research*** falls under the Subcomponent 1.1. activity: Financing for selected research and technology infrastructure projects.

### **The objective of ESMP**

The main objective of Environmental and Social Management Plan (ESMP) is to ensure that the Sub-project's activities are compliant to national and EU regulations, as well as to World Bank Environmental and Social Framework (WB ESF) in all phases of the Sub-project's lifecycle. Accordingly, ESMP addresses requirements of WB Environmental Health and Safety Guidelines (EHS) and Good International Industrial Practices (GIIP). For that purpose, ESMP defines measures to minimize potential adverse impacts and risks on the biophysical and socio-economic environment during construction and use of the Sub-project.

### **Information on Sub-project**

The objective of the Sub-project is to improve the scientific and research infrastructure of the Institute in order to strengthen scientific research and innovation in the STEM field of biotechnology, with application in agriculture, and to support cooperation with the businesses in Adriatic Croatia.

The Sub-project consists of three Sub-components located in Duilovo-Split and Kaštel Stari (Figure 1):

- Sub-component 1. Reconstruction and equipping of 3 buildings (Buildings 1A, 1B and 1C) in Duilovo – Split<sup>1</sup>
- Sub-component 2. Improvement and equipping of 2 existing buildings (Building 2A and Building 2B (experimental oil mill)) at the location in Kaštel Stari<sup>2</sup>
- Sub-component 3. Improvement of the existing technological infrastructure in Duilovo – Split

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<sup>1</sup> For better clarity, Buildings A, B and C in Duilovo (Sub-component 1) will be named Buildings 1A, 1B and 1C.

<sup>2</sup> For better clarity, Buildings A and B in Kaštel Stari (Sub-component 2) will be named Buildings 2A and 2B.



Figure 1. Locations of the Sub-project

**Sub-component 1** refers to the reconstruction of four existing buildings into the complex building of the for the Centre for Advanced Analytics and Support for the Development of Mediterranean Agricultural Products. The complex building (Centre) consists of buildings 1A, 1B and 1C (Figure 2). A two-story building 1B is the main and largest building in the complex. Buildings 1A and 1C are single-story buildings. The total area of the site is 8,732 m<sup>2</sup> and the total gross area of 3 buildings is 3,598 m<sup>2</sup>.



Figure 2. Visualisation of the Centre for Advanced Analytics and Support for the Development of Mediterranean Agricultural Products

The complex building is designed to fully enable access, movement, residence and work for people with reduced mobility. Access to the first floor is provided by an elevator, which dimensions are adapted to the use of persons with reduced mobility. The sanitary facilities are equipped with a toilet adapted to meet the needs of people with reduced mobility. The parking lot is also adapted for people with reduced mobility.

Building 1A will be auxiliary facility used for controlled cultivation, preservation and processing of plant material (growth chambers, incubators, freezers, distillation lines, etc.) for research purposes. Building 1B will consist of modern polyvalent analytical laboratory (analysis of food, beverages, plant material, water and soil will be carried out there). Three basic units will be established in the analytical laboratory: metabolomics unit, functional genomics unit, and unit for the elemental composition of the ecosystem. In addition to the analytical laboratory, the building will have rooms for phenotypic research, storage for chemicals, multimedia conference hall with a lobby, e-infrastructure (space for network servers), dormitory with four equipped rooms to accommodate foreign and domestic visiting young researchers and scientists, and experimental wine cellar. A total of 140 photovoltaic modules with a power of 450 W will be installed on the roof of Building 1B, which gives a total power of 63 kWp. The existing low-voltage connection will be dismantled and the new low-voltage panel with a module will be installed in the existing substation for the acceptance of the planned photo-voltaic power plant. The dismantling is limited to the existing low-voltage connection and there will be no waste photovoltaics. Chemicals will be placed in the separate fireproof cabinets, which will be equipped with adequate ventilation. Building 1C will be auxiliary facility used for the processing of fruits, vegetables and medicinal plants, as well as the department for separating and preserving seeds for research purposes.

**Sub-component 2** includes the improvement of 2 existing buildings in Kaštel Stari – Buildings 2A and 2B (Figure 3).

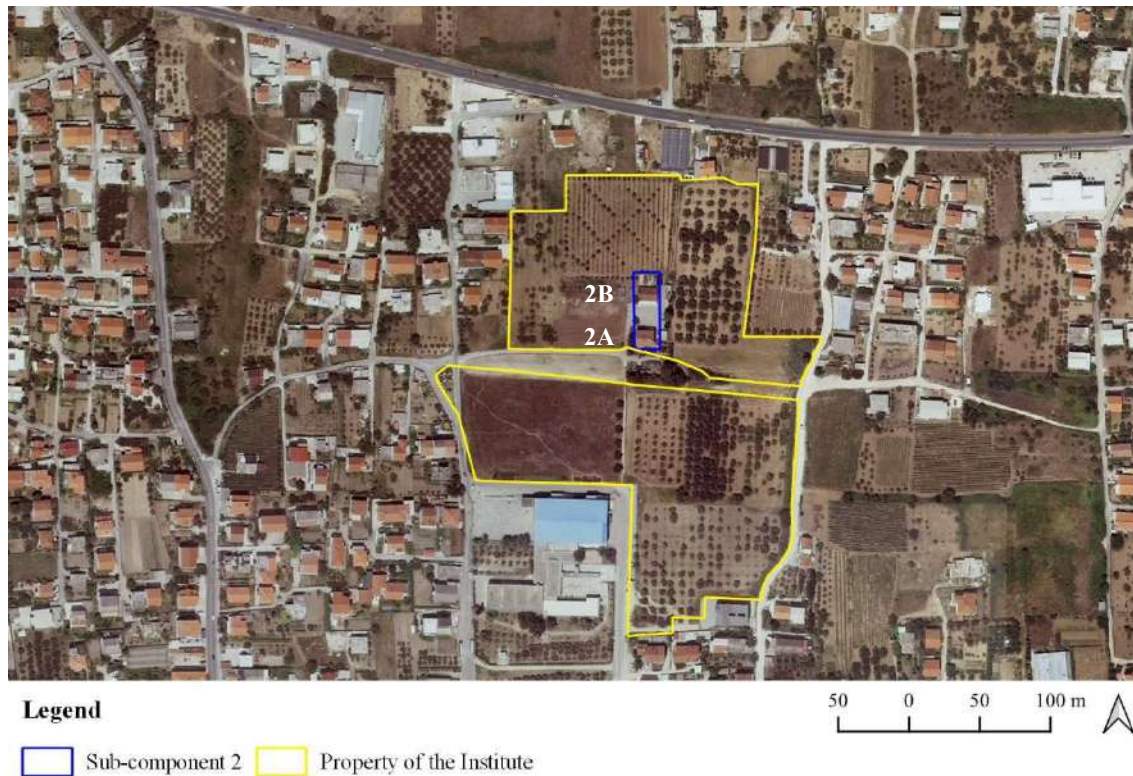


Figure 3. The location of the Sub-component 2 within the property of the Institute (Kaštel Stari)

The total area of the site is 4,654 m<sup>2</sup>. Building 2A is an existing building for residential and business use. The ground floor and first floor are for residential use and are not the subject of the Sub-project. The basement is currently not used due to poor condition, but it is intended for business use. It will be used for basic analysis of samples of plant material and olive fruits - collecting, sorting and marking samples of plant material and olive fruits, as well as a space for meetings and smaller presentations, where interactive workshops on the topic of olive growing and oil production will be held for different users (no laboratory analysis). In the same building, the condition of the attic will be improved by reconstructing the roof which is currently leaking. Building 2B is an existing building intended for processing olives and producing olive oil in the traditional way, with the press. However, it cannot provide conditions for experiments with modern technologies. The current oil mill (which is currently not in use) will be conserved for educational purposes. A new modern oil mill of small to medium capacity will be acquired through the Sub-project, for processing olives according to certain requirements (monovarietal oils, product development, small quantities, etc.). This will enable technological conditions for the production of extra virgin olive oil for experimental purposes as well as cooperation with the economy (innovative approach in olive oil production). The existing common unofficial parking lot between buildings 2A and 2B will be adapted for people with reduced mobility.

**Sub-component 3** consists of the improvement of existing technological infrastructure in Duilovo – Split. The following activities are planned: (3.1) reconstruction of the greenhouse for growing and researching agricultural crops when planting in the soil (dismantling of the greenhouse “Bubalo” and construction of a new greenhouse), (3.2) Structural improvement of 2 auxiliary buildings, (3.3.1) fencing the Institute's property, (3.3.2) construction and

rehabilitation of the macadam paths and access ramps, , and (3.4) arranging and landscaping two forestry educational demonstration parks (Figure 4).

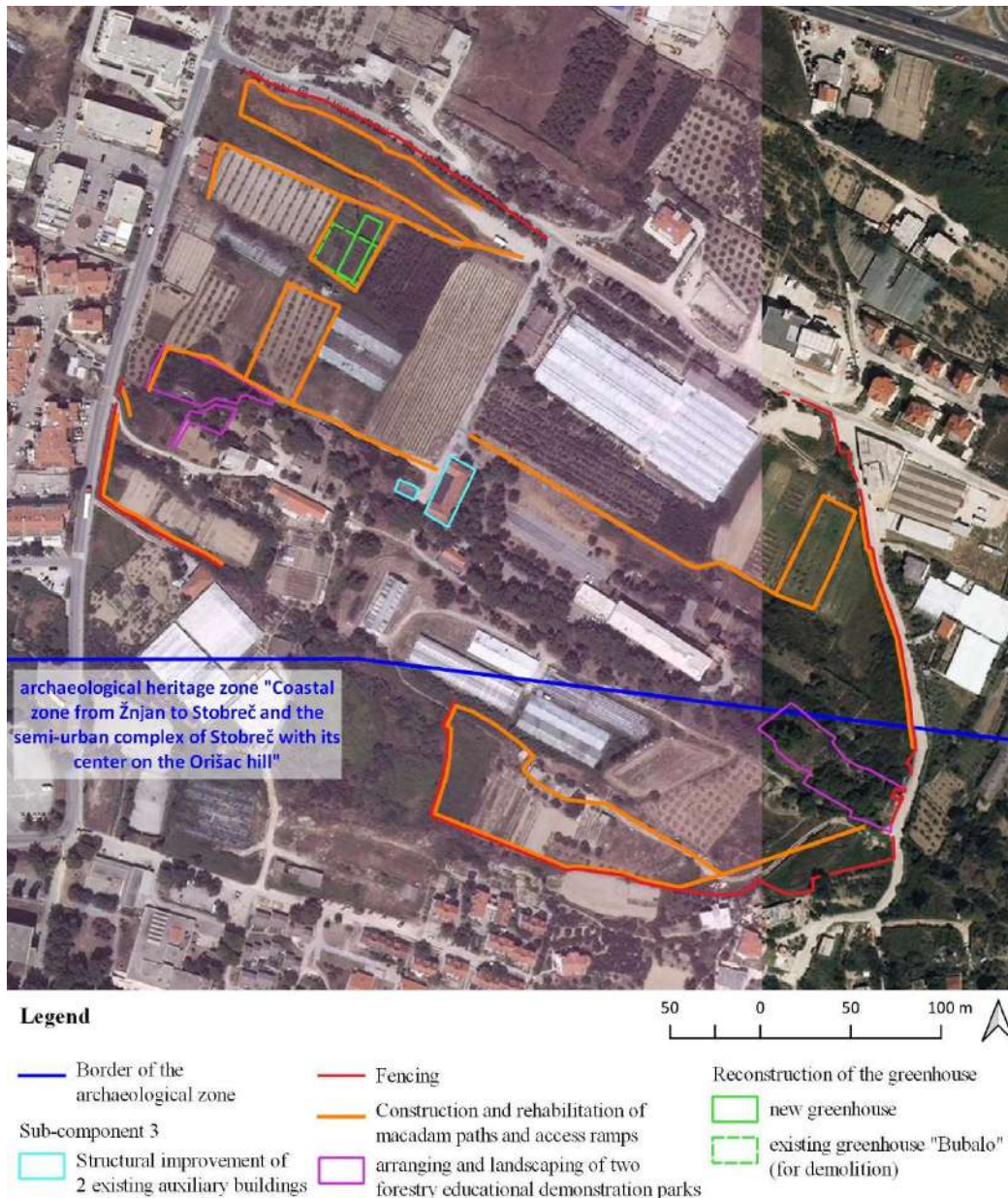


Figure 4. Location of Sub-component 3 - Improvement Works in Duilovo – Split, overlapped with the Area of Archaeological Heritage “The coastal zone from Žnjan to Stobreč, including the semi-urban area of Stobreč centred on the Orišac hill”

Sub-components 1 and 2 also consists of **equipping and furnishing** of:

- the Centre in Duilovo-Split with scientific and research equipment, ready-made and custom-made furniture, laboratory furniture, IT equipment and multimedia, equipment for video-surveillance and telecommunication, as well as equipment for landscaping and maintenance of the green and traffic areas; and

- 2 buildings in Kaštel Stari where it is planned to install a modern mini oil mill in Building 2B in Kaštel Stari, with a capacity of 150 to 200 kg/h which works in 2 phases.

### **Environmental Aspects**

**Land use:** The location Duilovo – Split is situated in the area designated as an area of public and social purpose (D6) – higher education institution. It is surrounded by the area for business use (K) on the north side, and an area intended for mixed use (M1) on the west, east and south sides. There is small area intended for sports and recreational purposes (R) on the south.

The location Kaštel Stari is situated in the area of particularly valuable arable land and the area for higher education purpose (P1/D6). The location is surrounded by an area intended for mixed use (M1) and the area intended for primary and secondary education. There is also a public green area (parks) (Z1) east of the location.

**Air Quality:** both locations of the Sub-project are situated within the agglomeration HR ST. The air quality at the stations nearest to each of the locations was assessed as I. category in 2022 (clean or slightly polluted air).

**Radon emission:** Geogenic radon potential in Split County has not been measured<sup>3</sup> (Figure 34). However, results of the measurements of radon in houses (by random selection in Croatia), average values of radon concentration in Split-Dalmatia County was very low - 1-20 Bq m<sup>-3</sup>

**Noise:** According to the Table 1 of the Ordinance on the highest permissible noise levels with regard to the type of noise source, time and place of occurrence (OG 143/21), both locations are located in the Zone 3 - Zone of mixed, residential use, in which the highest permitted rated noise levels  $L_{R,Aeq}$  are:  $L_{day}$  55dB (A);  $L_{evening}$  55 dB (A);  $L_{night}$  45 dB (A);  $L_{den}$  57 dB (A).

**Biodiversity, Nature protection areas and Natura 2000 Ecological Network:** Both locations are situated in the urban area. According to the habitat map, Sub-components 1 and 3 at Duilovo - Split are located within a complex of habitat categories: Buildings, urban and industrial habitats/ Eu- and steno-Mediterranean rocky pastures and dry grasslands/ Abandoned agricultural lands/ Forests, and surrounded by olive groves, vineyards and mosaic of cultivated fields. Although some habitat types under the habitat category “Eu- and steno-Mediterranean rocky pastures and dry grasslands” which is widespread at the Duilovo – Split location, are listed as endangered, they are unlikely to occur in this location since this is an urbanized area. Sub-component 2 (Kaštel Stari) is located within a complex of habitat types: olive groves/ abandoned agricultural lands/ mosaic of cultivated fields.

Both locations are placed outside the areas protected under the Nature Protection Act and Natura 2000 ecological network. All nature protection areas are more than 500 m away from both locations.

**Water, groundwater and the sea:** There are no surface water bodies within the scope of the Sub-project (both locations), however there are torrential occasional watercourses east of the location in Kaštel Stari and west of the Duilovo-Split, which could potentially flood the surrounding area. However, according to the flood risk map, both locations are located outside the area with a probability of floods. Nevertheless, it should be noted that there were occasional events of soil erosion in Duilovo-Split as a consequence of storms. The erosion occurred in the

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<sup>3</sup> <http://radon.civilna-zastita.hr/radonski-zemljovid/radon-u-tlu/grp-po-zupanijama/>

steep parts of Institute's property (terraced area protected by drywalls, steep parts bordering the residential houses).

Both locations are situated within the grouped body of groundwater LKGIKCPV\_10 Cetina, which is of good quantitative and chemical status. Both locations are located outside the sanitary protection zones and groundwater protection zones.

The sea in the area of Kaštela belongs to the coastal water body 0313-KAS (Kaštelanski zaljev), while the sea in the area of Duilovo - Split belongs to the coastal water body 0423-BSK (Brački i Splitski kanal). The status of coastal water body 0313-KAS (Kaštelanski zaljev) is assessed as "not good" due to poor ecological status, while the status of coastal water body 0423-BSK (Brački i Splitski kanal) is assessed as "good". The project is highly unlikely to contribute to water degradation. Sub-component 2 in Kaštel Stari is located 650 m away from the sea and the nearest sea beach (Đardin) which were assessed as an unsatisfactory annual and final rating due to fecal pollution of the sea in 2023. Sub-component 1 in Duilovo-Split is located approx. 400 m away from the sea, while the southernmost border of the Institute's property is located approx. 150 m away from the sea. The quality of the sea for swimming at the beach "Duilovo" was assessed as excellent during 2023.

Seismic characteristics: Both locations are located within the area of VII. degree of the MCS (Mercalli - Cancani - Sieberg) scale (very strong earthquake, chimneys collapse, tiles fall from the roof, house walls crack) for a return period of 475 years. Looking at the return period of 95 years they are in the zone of VI. level of the MCS scale. The buildings' structures are designed according to Eurocode 8: Design of structures for earthquake resistance.

Climate and climate change: According to the Köppen climate classification, defined according to the mean annual trend of air temperature and precipitation, the coastal area of Split-Dalmatia County has characteristics of a Mediterranean climate with hot summers (Csa). There are expected changes of climatic parameters until 2040 and 2070, i.e. air temperature (increase), precipitation (increase in winter, decrease in other seasons), wind speed (increase in summer and autumn), solar radiation (decrease in the flux of solar energy in winter and spring, but increase in summer and autumn), sea level (average sea level rise in the Adriatic is expected to be between 0 and 5 cm), extreme weather events (increase in frequency).

Historical pollution on the site: There was no historical pollution recorded on the site such as waste disposal, accidents with dangerous substances or any other soil pollution.

Pollutants in the vicinity of the Sub-project: There are no significant polluters (companies that perform activities using significant quantities of hazardous substances or emit pollutants into water, soil or air) in the vicinity of both locations.

### **Social Aspects**

Population: The location of Duilovo is situated in the City District Žnjan with a population of 3,347. The share of the population in Split with higher education in 2021 was 35%.

The City of Kaštela has a population of 37,794 and Kaštel Stari 6,950. The share of the population in Kaštela with higher education in 2021 was 22%.

Socio-economic context: Split is the economic, cultural, and university center of Split-Dalmatia County and the wider macroregion. Its economic development is the result of the location of the city by the sea, good transport position and administrative functions. Besides the Institute for Adriatic Crops and Karst Reclamation, the city is home to the Institute for Oceanography

and Fisheries, the Croatian Hydrographic Institute, the Mediterranean Institute for Life Research (MEDILS), the Franciscan Institute for the Culture of Peace, and others.

Kaštela is an urbanized area with a rich agricultural environment (vines, fruits, vegetables, flowers), developed industry (cement, chemical industry) and tourism. The urbanized part consists of seven almost merged towns, which in the administrative-territorial aspect make up the town of Kaštela (headquarters in Kaštel Sućurac).

Cultural heritage: The southernmost part of the Sub-component 3 in Duilovo – Split is partly located within that Area of Archaeological Heritage “Coastal zone from Žnjan to Stobreč and the semi-urban complex of Stobreč with its center on the Orišac hill”. The Institute obtained the Opinion of the Conservation Department in Split on the requirements while designing and implementing the intervention. The Opinion states that cadastral plots in the ownership of the Institute on which the construction works are planned are located outside of the protected area of cultural heritage. However, in case of archaeological finds during the works, they must be reported to the competent authority as soon as possible.

There are no archaeological sites in the vicinity of the site in Kaštel Stari. The nearest Area of archaeological heritage is Lokva, 320 m to the east.

#### **Potential Environmental and Social Risks**

The activities related to the Sub-project carry low to moderate environmental and social risks typical for construction works. The potential risks and impacts are (i) predictable and expected to be temporary (ii) low to medium in magnitude; (iii) site-specific, without likelihood of impacts beyond the actual footprint of the project; and (iv) low probability of serious adverse effects to human health and/or the environment. The Project’s risks and impacts can be easily mitigated in a predictable manner in the design, planning and constructions, and use phase.

Due to the project characteristics and location, most of the potential risks and impacts are expected during construction phase (low to moderate), and only minor potential risks and impacts during the use phase (providing regulatory and ESMP use phase measures are implemented).

Although there are no direct potential environmental and social adverse impacts during pre-construction phase, if design documentation is not prepared in accordance with the WB environmental and social standards, WB Environmental Health and Safety Guidelines (EHS) and Good International Industry Practice (GIIP) as well as national regulation (stricter ones prevailing) implementation of the project may cause degradation of certain components of the environment, as well as human health and safety, that are likely to take place further downstream in the project life-cycle, e.g. reduced seismic resistance, inadequate resistance to climate change and extreme weather impacts, soil erosion and landslides due to inadequate water management, etc. The implementation of the project will not change the land use of the project area. There will not be changes in the use of the pesticides either. One of the main approaches in experiments of the Institute is cultivation by non-pesticide methods. Therefore, even now Institute use the pesticides only in exceptional cases when there is a significant occurrence of pests that can threaten the entire crop and the experiment.

Potential environmental risks during construction phase are mainly related to: • Dust (potential impact on nearby residents); • Generation of waste (including hazardous waste such as asbestos); • Water, air and soil pollution; • soil erosion (Sub-component 3); • Noise, vibrations; and • Traffic disturbance. Important risks related to design and use phase include, but are not limited to, life and fire safety, seismic resistance, resistance to climate change and extreme



weather, water use, storage of chemicals, waste management (from contaminated packaging to end-of-use PVCs) and use of chemicals, in particular in labs.

Potential social risks during construction phase are related to • Occupational health and safety, and community safety; • intellectual property issues, • labour management, • sexual exploitation and abuse/sexual harassment (SEA/SH), • risk related to labour influx (foreign workers), • poor information dissemination and not sharing information on potential impacts (noise, dust and traffic) during the construction works, • potential chance finds.

Potential environmental and social risks during use are mainly related to waste management, climate change and extreme weather resilience, seismic resilience, and soil erosion, which is easily manageable by proper organisation and adequate design. There is also potential risk of increased indoor radon concentration. To avoid/minimize that impact, already in design (impermeable foundation and floor surfaces, ventilation, etc.) and construction phase appropriate radon-reduction measures will be applied. There is also potential impact related to vandalism, and hazardous substances, life and fire-safety.

### **Environmental and Social Mitigation Measures Overview**

The main objective of the mitigation measures is to reduce the significance of the potential impacts to an acceptable level for all aspects of the Sub-project in relation with the receiving environment.

Mitigation measures are defined for all phases of the Sub-project life cycle (design/preconstruction, construction and use). They are grouped according to the various receptors (air, soil, water, and human environment). Mainly, they are related to construction phase when most of the potentially adverse impacts can occur. Contractor will be obliged to implement them, and supervision engineer to supervise their implementation and report to the PIU's environmental and social experts. The cost of mitigation measures is included in the project cost (contractor cost).

During construction, contractor will be obliged to take care that all legally required permits and licenses are kept on site; construction site is organized in a safe way; generated waste is managed properly and waste streams including disposal/processing is tracked; emission in the air are minimal (watering the surface, machinery and equipment are switched off when not in use); workers wear appropriate personal protective equipment; etc.). Also, contractor will have to ensure that potential adverse impacts on the tenants of buildings within or in immediate vicinity of the border/property of the Institute and nearby community are prevented or minimized. Contractor is also obliged to minimize the labour risk by following the Labour Management Procedures as presented in ESMF<sup>4</sup>, this ESMP and all applicable national laws and by-laws. In addition to key measures overview provided in this section, the complete list of mandatory measures is available in the Mitigation and Monitoring Plan of the ESMP.

Measures and/or procedures during use phase are mandatory for implementation by the Institute. The aim of these mitigation measures is to prevent and reduce the potential adverse impacts during use of the Sub-project on the environment and human health to an acceptable level. The measures include, but are not limited to, waste management measures, occupational

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[https://mpgi.gov.hr/UserDocsImages//dokumenti/Potres/Svjetska%20banka//ESMF\\_Component\\_1\\_January%202022.pdf](https://mpgi.gov.hr/UserDocsImages//dokumenti/Potres/Svjetska%20banka//ESMF_Component_1_January%202022.pdf)

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health and safety and community protection measures, noise reduction measures and measures for storage and use of hazardous substances.

## 1 INTRODUCTION

### 1.1 Project background

The Government of the Republic of Croatia (RoC) and the International Bank for Reconstruction and Development (IBRD) have signed the Loan Agreement (Loan No. 9558-HR) for the **Digital, Innovation, and Green Technology Project (DIGIT Project)** for EUR 106 million on June 28, 2023.

The DIGIT Project will facilitate the digital transformation and the green transition of the economy, increase resources for applied research and experimental development, and support the efforts of the Croatian government to strengthen its institutional capacity to deliver research and innovation policies. Activities under the DIGIT Project will finance research and innovation through Sub-grant schemes, with a focus on digital and green, and will complement and enhance the effectiveness of investments and build the capacities of institutions to deliver on this agenda. The DIGIT Project will also support reforms envisaged in the National Recovery and Resilience Plan 2021-2026 (NRRP), the Croatia Smart Specialization Strategy 2021-2027 (S3), Operational Programme Competitiveness and Cohesion 2021-2027 (OPCC), and activities important for the country’s accession to the Organization for Economic Co-operation and Development (OECD).

The DIGIT Project’s development objective is to advance research and innovation with a digital and green focus through enhancing institutional infrastructure and research performance of research organizations and firms.

The DIGIT Project aims to fill gaps in the institutional and other enabling conditions and financing for research and innovation. The interventions will build the capacities of institutions to deliver on the digital and green research and innovation agenda, complement and enhance the effectiveness of EU-funded investments, and finance digital and green research and innovation.

The Project consists of two (2) components and four (4) subcomponents:

<b>Component 1: Enabling institutional conditions for digital and green research and innovation</b>
<b>Subcomponent 1.1: Strengthening the institutional infrastructure for research and innovation policy</b>
<ul style="list-style-type: none"> <li>• Capacity development for design, implementation, and M&amp;E of research and innovation programs</li> <li>• Institutional support for performance-based funding reform in research organizations</li> <li>• Financing for selected research and technology infrastructure projects</li> </ul>
<b>Subcomponent 1.2: Strengthening effectiveness of research and innovation financing</b>
<ul style="list-style-type: none"> <li>• Funding to enhance the effectiveness of the program mix</li> <li>• Online diagnostic and technology scouting</li> <li>• Professionalization of research centres</li> </ul>
<b>Component 2: Programs for digital and green research and innovation</b>
<b>Subcomponent 2.1: Pre-commercial digital and green R&amp;D support</b>
<ul style="list-style-type: none"> <li>• Grants for pre-commercial digital and green R&amp;D</li> <li>• Challenge program</li> </ul>
<b>Subcomponent 2.2: Synergies program</b>
<ul style="list-style-type: none"> <li>• Synergies program</li> </ul>

Component 1 provides technical assistance and financing to strengthen institutional capacities for Research, Development and Innovation (RDI) support, address gaps in green and digital technology adoption and industry-science collaboration, support the professionalization of research centers, and improve the research and technology infrastructure. Component 2 provides sub-financing to cover the gaps in the program mix, as well as to improve the targeting of research and innovation support to digital and green technology.

The **Sub-project *Modernization of the Institute for Adriatic Crops and Karst Reclamation Infrastructure as a Precondition for Excellence in Mediterranean Agriculture Research*** falls under the Subcomponent 1.1. activity: Financing for selected research and technology infrastructure projects. This activity finances grants to research organizations addressing gaps in the availability of quality equipment and access to research infrastructure. The Sub-project was selected based on a number of non-exclusive criteria, including contribution to digital transformation and green transition, public-private cooperation, private sector demand, performance-based financing reform, lagging regional development.

## **1.2 Objectives of ESMP**

The main objective of Environmental and Social Management Plan (ESMP) is to ensure that the Sub-project's activities are compliant to national and EU regulations, as well as to World Bank Environmental and Social Framework (WB ESF) in all phases of the Sub-project's lifecycle. Accordingly, ESMP addresses mandatory requirements of WB Environmental Health and Safety Guidelines (EHSG) and Good International Industrial Practices (GIIP). For that purpose, ESMP defines measures to minimize potential adverse impacts and risks on the biophysical and socio-economic environment during construction and use of the Sub-project. Application and content of ESMP are guided by the Project's Environmental and Social Commitment Plan (ESCP) and Environmental and Social Management Framework (ESMF), Projects Stakeholder Engagement Plan (SEP), as well as WB Environmental and Social Standards (ESS), WB EHSG and GIIP, and national regulation stricter ones prevailing.

This document will help assess potential environmental and social impacts associated with the proposed Sub-project, identify potential environmental and social improvement opportunities, and recommend measures for the prevention, minimization, and mitigation of adverse environmental and social impacts. Environmental and Social Mitigation Plan and Monitoring Plan encompassing all stages of the Sub-project, with a purpose to supervise E&S compliance and streamline implementation of measures (and corrective actions) are an integral part of the ESMP.

## **1.3 Study Team**

This ESMP was prepared by the Environmental and Social Experts of the Project Implementation Unit (PIU) Team, supported also by the other team members, and team of the Institute for Adriatic Crops and Karst Reclamation (Institute).

## **1.4 Timeline**

ESMP will be developed in following phases:

1. Draft version of ESMP: December 2024;
- 2. Public consultations: December 2024;**
3. Final version of ESMP: January 2025;

4. Implementation, monitoring and reporting: January 2025 – July 2027.

## 2 POLICY FRAMEWORK

### 2.1 National environmental and social legislation

Croatian national legislation covering the field of environmental protection is fully compliant with the regulations of the European Union.

The following most relevant Croatian environmental legal acts (including stemming and/or relevant bylaws) define a legal framework for environmental management, including but not limited to:

<b>Legislation</b>	<b>Overview</b>
<b>Environmental Protection Act (Official Gazette (OG) 80/13, 153/13, 78/15, 12/18, 118/18)</b>	Relevant from the aspect of environmental protection. According to the law, all established preventive environmental protection measures shall be applied during the planning and execution of the intervention, in order to avoid risks and dangers to the environment. Potential risk to the environment can be expected during construction and use.
<b>Nature Protection Act (OG 80/13, 15/18, 14/19,127/19, 155/23)</b>	Relevant from the aspect of biodiversity protection. According to the law, nature protection is the obligation of every physical and legal person and to that end they are obliged to cooperate in order to avoid and prevent dangerous actions and the occurrence of damage to nature. Potential impact on local biodiversity expected during construction is negligible. However, the Sub-project is not located within nor near nature protection areas nor Natura 2000 sites.
<b>Regulation on Environmental Impact Assessment (OG 61/14, 3/17)</b>	Sub-project is not subject to EIA according to national legislation nor ESIA according to WB ESF.
<b>Waste Management Act (OG 84/21, 142/23)</b>	Relevant from the aspect of waste management. It provides a framework for implementing measures for the protection of environment and human health by preventing or reducing waste generation, reducing the negative effects of waste generation and waste management, reducing the overall effects of raw material use and improving the efficiency of raw material use and increasing recycling and reuse, which is necessary for the transition to a circular economy. Generation of waste is expected during construction and use.
<b>Ordinance on the waste management (OG 106/22)</b>	This ordinance prescribes the manner of performing waste management procedures, performing waste trade activities and other details related to waste management.
<b>Air Protection Act (OG 127/19, 57/22)</b>	Relevant from the aspect of air quality. It provides a framework for implementing air protection measures, as well as prevention and reduction of air pollution. Potential impact on air quality is expected during construction.
<b>Water Act (OG 66/19, 84/21, 47/23)</b>	Relevant from the aspect of water quality. It provides a framework for achieving and maintaining good water status in order to protect human life and health, protect their property and protect aquatic and water-dependent ecosystems. It also regulates the use of water

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Legislation	Overview
	for public water supply, as well as discharge, drainage and treatment of wastewater. Potential impact on ground waters is expected during construction and use.
<b>Energy Efficiency Act (OG 127/14, 116/18, 25/20, 32/21, 41/21)</b>	Relevant from the aspect of energy efficiency of the buildings. It provides the framework for improving energy efficiency and implementing energy efficiency measures in building sectors. The design of the building shall consider all relevant and possible energy efficiency measures.
<b>Noise Protection Act (OG 30/09, 55/13, 153/13, 41/16, 114/18, 14/21)</b>	Relevant from the aspect of human health. It provides a framework for establishing measures to avoid, prevent or reduce harmful effects on human health that cause environmental noise. An increased noise level can be expected during construction.
<b>Ordinance on the maximum allowed noise levels with regard to the type of noise source, time and place of occurrence (OG 143/21)</b>	Determines the maximum permissible noise levels with regard to the type of noise source, time and place of origin.
<b>Ordinance on activities for which it is necessary to determine the implementation of noise protection measures (OG 91/07)</b>	Determines the activities for which it is necessary to determine the implementation of noise protection measures, as well as the procedure and method of determining these conditions. The obligation to determine whether noise protection measures have been implemented is subject to all activities that use noise sources, and whose noise emission may cause noise immission in the surrounding living and/or working spaces that exceeds the permitted limits.
<b>Act on Climate Change and Protection of the Ozone Layer (OG 127/19)</b>	Relevant because it, among other things, defines the measures to mitigate climate change, adapt to climate change and protect the ozone layer are applied for the purpose of: <ul style="list-style-type: none"> <li>• protection of the climate system and the achievement of goals in accordance with the Paris Agreement on climate change;</li> <li>• strengthening resistance to climate change and reducing the vulnerability of natural systems and society to climate change, increasing the ability to recover from harmful impacts and exploiting the possible positive effects of climate change;</li> <li>• avoiding, preventing or reducing harmful consequences on human health, quality of life and the environment;</li> <li>• prevention and reduction of pollution affecting the ozone layer and climate change;</li> <li>• the use of more efficient technologies with regard to energy consumption and encouraging the use of renewable energy sources;</li> <li>• ensuring public availability of information on greenhouse gas emissions and consumption of substances that damage the ozone layer and on fluorinated greenhouse gases;</li> <li>• fulfilment of obligations assumed by international agreements to which the RoC is a party, and participation in international cooperation in the field of protecting the ozone layer and mitigating climate change.</li> </ul>

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Legislation	Overview
	Sub-project takes integrates climate change mitigation and adaptation measures.
<b>Act on Fire Protection (OG 92/10, 114/22)</b>	Relevant from the aspect of human health. It provides the framework for establishing and implementing measures for fire safety. Every physical and legal person are obliged to act in a way that cannot cause a fire, as well as to implement fire protection measures. Potential risk of fire can be expected during construction and use.
<b>Act on the Protection and Preservation of Cultural Property (OG 69/99, 151/03, 157/03, 100/04, 87/09, 88/10, 61/11, 25/12, 136/12, 157/13, 152/14, 98/15, 44/17, 90/18, 32/20, 62/20, 117/21, 114/22)</b>	Relevant because it regulates the types of cultural property, the establishment of protection over cultural property, measures for the protection and preservation of cultural property, as well as other issues related to the protection and preservation of cultural goods. Sub-project is partly located within the Area of Archaeological Heritage.
<b>Construction Act (OG 153/13, 20/17, 39/19, 125/19)</b>	According to the Construction Act, the building must be designed and constructed in such a way that during its lifetime it does not pose a threat to the hygiene or health and safety of workers, users or neighbours and that it does not have a significant impact on the environmental quality or climate. It also must be designed and built in such way that it ensures safety and accessibility during use, noise protection, energy efficiency, and sustainable use of natural resources.
<b>Technical regulation for building structures (OG 17/17, 75/20, 7/22).</b>	This regulation prescribes mandatory implementation of EU Eurocode 8: Design of structures for earthquake resistance. This regulation, within the framework of fulfilling the basic requirements for structure, prescribes the technical properties for construction structures in buildings, requirements for design, execution, maintenance, removal and other requirements for construction structures, properties that construction products must have in relation to their essential features and other requirements for building products intended for installation in building structures.
<b>GMO regulation</b>	The GMO regulations are not relevant to this project. Institute does not conduct research which includes genetically modified organisms (plants, animals, microorganisms, or food produced from GMOs). The Institute does not have any plans to conduct research activities with GMOs in the future on the new infrastructure.

Regarding national social legislation, it should be highlighted that the right to equality and non-discrimination is a fundamental human right protected by the Constitution of the Republic of Croatia. The other social legislation include:

- Constitutional Act on National Minorities Rights (OG 155/02, 47/10, 80/10, 93/11, 93/11);
- Labor Act (OG 93/14, 127/17, 98/19, 151/22, 46/23, 64/23);
- Gender Equality Act (OG 82/08, 69/17);



- Anti-discrimination Act (OG 85/08, 112/12);
- Occupational Safety and Health Act (OG 71/14, 118/14, 94/18, 96/18);
- Foreigners Act (OG 133/20, 114/22, 141/22);
- Act on EEA Member States Nationals and Their Family Members (OG 66/19, 53/20, 144/20, 114/22);
- Act on International and Temporary Protection (OG 70/15, 127/17, 33/23);
- Decision of the Government of the Republic of Croatia on the introduction of temporary protection in the Republic of Croatia for displaced persons from Ukraine, March 2022.
- Ratified International Conventions:
  - Convention Concerning Equality of Treatment for National and Foreign Workers as Regards Workmen's Compensation for Accidents (OG 11/03);
  - Employment Policy Convention (OG 11/00);
  - Discrimination (Employment and Occupation) Convention (OG 5/00);
  - The Abolition of Forced Labor Convention (OG 7/97);
  - The Equal Remuneration Convention (OG 3/00);
  - Convention concerning Forced or Compulsory Labor (OG 5/00);
  - Convention Concerning Safety in the Use of Asbestos (OG 11/03);

Main Croatian legislation on right to access information:

- Act on the Right of Access to Information (OG 25/13, 85/15, 69/22);
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention);
- General Data Protection Regulation (GDPR).

More detailed description of environmental and social legislation is elaborated in ESMF<sup>5</sup>.

## **2.2 WB Environmental and Social Framework and Standards**

The World Bank Environmental and Social Framework (ESF) sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity. In addition to vision of sustainability, ESF comprises E&S Standards (ESSs) and E&S Policy for Investment Project Financing. The Environmental and Social Standards set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the World Bank (WB).

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<sup>5</sup> <https://mzo.gov.hr/UserDocsImages/dokumenti/Znanost/Projekt-digit/digit-esmf-2nd-draft-18-04-2023.pdf>

WB ESS, further supported by WB Group ESHG<sup>6</sup> and GIIP (Good International Industry Practice) also mandatory under ESF, are applied in parallel to the national policies where, as a rule, the stricter one prevails.

### **Overview of the World Bank Environment, Health and Safety Guidelines (EHSg)**

Recommendations for the management of EHS impacts during the Sub-project implementation are provided in the General WB EHS Guidelines<sup>7</sup>.

EHSg applicable to the Sub-project:

<b>Environmental</b>	1.1 Air Emissions and Ambient Air Quality 1.2 Energy Conservation 1.3 Wastewater and Ambient Water Quality 1.4 Water Conservation 1.5 Hazardous Materials Management 1.6 Waste Management 1.7 Noise
<b>Occupational health and safety</b>	2.1 General Facility Design and Operation 2.2 Communication and Training 2.3 Physical Hazards 2.4 Chemical Hazards 2.7 Personal Protective Equipment (PPE) 2.9 Monitoring
<b>Community Health and Safety</b>	3.1 Water Quality and Availability 3.2 Structural Safety of Project Infrastructure 3.3 Life and Fire Safety (L&FS) 3.4 Traffic Safety 3.7 Emergency Preparedness and Response
<b>Construction and Decommissioning</b>	4.1 Environment 4.2 Occupational Health and Safety 4.3 Community Health and Safety

### **Overview of the World Bank Environmental and Social Standards (ESS)**

The WB developed an Environmental and Social Framework (ESF) setting out the WB’s commitment to sustainable development through application of Bank Policy (defined in the ESF) and a set of ESS that are designed to support Borrowers’ projects, with the aim of ending extreme poverty and promoting shared prosperity.

The ESS set out the mandatory requirements that apply to the Borrower and projects. They present set of obligatory guidelines and instructions with the main objective to foster efficient and effective identification and mitigation of potentially adverse environmental and social impacts that may occur in the development projects, with proper stakeholder engagement and sustainable management. WB ESS, supported by WB Group ESHG and GIIP also mandatory

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<sup>6</sup> [https://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/sustainability-at-ifc/policies-standards/ehs-guidelines](https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines)

<sup>7</sup> <https://documents1.worldbank.org/curated/en/157871484635724258/pdf/112110-WP-Final-General-EHS-Guidelines.pdf>

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under ESF, are applied in parallel to the national policies where, as a rule, the stricter one prevails.

There are 10 ESSs. Each of the ESSs sets out a number of objectives. The objectives describe the outcomes that each of the ESSs is intended to achieve. The following ESSs are relevant for this Sub-project:

<b>ESS1 Assessment and Management of Environmental and Social Risks and Impacts</b>	It sets out the Borrower’s responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of Sub-project in order to achieve environmental and social outcomes consistent with the ESSs.
<b>ESS2 Labor and Working Conditions</b>	Objectives of this standard are: to promote safety and health at work; the fair treatment, non-discrimination and equal opportunity of project workers; to protect health and safety of workers, to protect workers, including vulnerable workers such as women, persons with disabilities, children (working age) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate; to prevent the use of all forms of forced labour and child labour; to support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law; to provide project workers with accessible means to raise workplace concerns.
<b>ESS3 Resource Efficiency and Pollution Prevention and Management</b>	Objectives of this standard are: to promote the sustainable use of resources, including energy, water and raw materials; to avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; to avoid or minimize project-related emissions of short and long-lived climate pollutants; to avoid or minimize generation of hazardous and non-hazardous waste; to minimize and manage the risks and impacts associated with pesticide use.
<b>ESS4 Community Health and Safety</b>	Objectives of this standard are: to anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and nonroutine circumstances; to promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams, to avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials, to have in place effective measures to address emergency events; to minimize and manage the risks and impacts associated with pesticide use; to ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.
<b>ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources</b>	Objectives of this standard are: to protect and conserve biodiversity and habitats; to apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity and to promote the sustainable management of living natural resources.
<b>ESS8 Cultural Heritage</b>	The Standard sets out (i) general provisions on risks and impacts to cultural heritage from project activities, as well as (ii) presents measures designed to protect cultural heritage throughout the project life cycle. ESS8 recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. Cultural heritage, in its many manifestations, is important as a source of valuable

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	scientific and historical information, as an economic and social asset for development, and as an integral part of people’s cultural identity and practice. Amongst other (ESS7 and ESS10), it is supplemented by ESS6 recognizes the social and cultural values of biodiversity.
<b>ESS10 Stakeholder Engagement and Information Disclosure</b>	Objectives of this standard are: to establish a systematic approach to stakeholder engagement that will help Borrowers to identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties; to assess the level of stakeholder interest and support for the project and to enable stakeholders’ views to be taken into account in project design and environmental and social performance, etc.

More detailed description of ESSs is elaborated in ESMF<sup>8</sup> prepared by the MSEY.

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<sup>8</sup> <https://mzom.gov.hr/UserDocsImages//dokumenti/Znanost/Projekt-digit//digit-esmf-2nd-draft-18-04-2023.pdf>

### **3 DESCRIPTION OF THE SUB-PROJECT**

#### **3.1 The objective of the Sub-project**

The objective of the Sub-project is to improve the scientific and research infrastructure of the Institute in order to strengthen scientific research and innovation in the STEM field of biotechnology, with application in agriculture, and to support cooperation with the businesses in Adriatic Croatia.

#### **3.2 About the Institute for Adriatic Crops and Karst Reclamation**

The Institute conducts scientific and professional research in Mediterranean agriculture, forestry, and biotechnology based on scientific excellence, knowledge, and technology transfer. The Institute operates as a state, public institution, and its scientific research activities are directly connected to the MSEY of the RoC.

The Institute is organized into four departments: Department of Plant Science, Department of Applied Sciences, Department of Forestry, and Central Department.

The history of the Institute begins with the foundation of the Chemical Economic Experimental Station in Split in 1894. The objective was to improve Dalmatian Agriculture especially viticulture and olive growing based on the strictly established scientific research.

The property of the Institute is located at two coastal locations: Duilovo – Split (approx. 10 ha) and Kaštel Stari (approx. 5 ha).

The main building, built in 1963, with administrative, offices and research laboratories, meeting room and library is located in Duilovo-Split. Laboratories are equipped for soil analysis, plant protection, wine analytics, olive and fruit analytics and molecular biology. These labs support research in crop science and environmental studies. The Institute does not perform nor it intend to perform genetic modifications on plants, microorganisms, or animals. The Institute does not introduce nor it plans to introduce genetically modified organisms into the environment as part of its test fields and/or laboratories. There are also greenhouses and experimental fields for controlled experiments and cultivation of various crops, particularly those suited to the Adriatic climate and karst soil (grapevine, olive, other Mediterranean fruits and vegetables, aromatic and medicinal herbs). Most of the greenhouses were built in the period from the 1970s to the 1980s, so they are not quite suitable for the Institute's research needs. The site is supplied with water through the existing connection to the public water supply network, as well as electricity via the transformer station placed in the main building. Municipal waste, including separately collected fractions (paper, plastics, glass, food and bio waste etc.) is taken away by the municipal utility company while laboratory waste is also separately collected, safely stored and labeled as hazardous waste as well as collected by an authorized company. The location has a vehicular entrance from the main road. The property is only partially fenced. Most of the Institute's *ex situ* plantations are included in the National Program for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture in the RoC. The Institute also actively participates in the European Cooperative Program for Plant Genetic Resources and the Integrated European Genebank System. The Institute's collections contain a significant number of varieties and accessions of cultivated and wild plants within traditional Mediterranean plant species. Of particular note are the Institute's collections of Mediterranean agricultural crops such as olives, grapevines, pomgranate and sour cherries, which contain a unique genetic diversity extremely important for global agricultural

production. In addition, research is carried out under controlled conditions, in several greenhouses (hrv: “staklenici” or “plastenici”).

The second property of the Institute experimental olive orchards are situated in Kaštel Stari, approx. 20 km from location in Split. It includes an old experimental oil mill (the facility is not in use) and auxiliary building (the basement and the attic of this building are Institute’s properties) which were built in 1939. There are also approx. 5 ha of experimental plantations with emphasis on olive, pomegranate and aromatic plants collections. The site is supplied with water through the existing connection to the public water supply network, as well as electricity. Municipal waste is taken away by the municipal utility company. Since the oil mill is not in operation, presently there is no need for disposal of waste from olive processing. The location has a vehicular entrance from the main road.

The Institute maintains experimental field collection of grapevines, orchards of fruit tree species and smaller demonstration-educational forest community on its property. With the implementation of the Sub-project, the Institute will plant new trees and establish new experimental orchards, which will positively impact agricultural farming in Croatia. The Institute is obliged to comply with the Croatian Law on Genetically Modified Organisms (Official Gazette 126/2019), which regulates issues related to GMOs, particularly regarding cultivation, placing on the market, and use of GMOs. The law is aligned with the European Union (EU) legal framework, which covers genetically modified plants, microorganisms, and animals. However, the Institute does not intend to perform genetic modifications on plants, microorganisms, or animals, nor plan to introduce genetically modified organisms into the environment as part of its test fields and/or laboratories.

The implementation of the research is largely carried out/based on the collection plantations and experimental areas of the Institute. The largest part of the area is planted with ex situ field collection plantations with crops used for research purposes: olive, fig, pomegranate, almond, cherry, grapevine, immortelle, sage, lavender, Dalmatian pyrethrum/tansy, sea fennel / rock samphire, onions and legumes. The primary focus of research activities and projects is understanding and preserving plant biodiversity, improving crop varieties, and studying plant behavior under different environmental conditions. Biodiversity studies aim at cataloging and preserving a wide range of plant species, including collecting samples, identifying species, and maintaining germplasm field repositories. Crop improvement involves characterization of plants (research of traits such as yield, disease resistance, physiology traits, drought tolerance). Ecological studies investigate how plants interact with their environment, including soil, water, and other organisms, helping in understanding ecosystem dynamics and plant adaptation strategies. Phenotyping and genotyping analyze the morphological and genetic characteristics of plants to understand their growth patterns, pest and disease resistance, and other traits. Agronomic practices focus on studying and developing best practices for planting, irrigation, and crop management to optimize growth and yield.

Maintenance of plantations involves the use of standard fertilizers, which provide essential nutrients to plants, enhancing growth and yield, and include both organic (compost, manure) and inorganic types. They can be applied to the soil, foliage, with proper application rates and timing being critical to avoid nutrient leaching and environmental pollution. Based on Institute's experts' assessments of pest population density/diseases infestation intensity, plant protection products are occasionally used and are mandatory registered to the **List of registered plant protection products (active ingredient) in Republic of Croatia** (<https://fis.mps.hr/fis/javna-trazilica-szb/>). The most harmful pest/disease in Institute’s groves

are olive fruit fly and vine powdery mildew. The use of plant protection products is in accordance with the manufacturer's instructions and with the emphasis to minimize negative impact on environment and to avoid pest resistance development. Moreover, in addition to the rich experience in integrated pest management (IPM) research, in the recent period, the Institute carries out projects in which it investigates non-chemical methods of olive protection (<http://beerby-4-olivefly.krs.hr/en/> , <http://lovefly.krs.hr/> ) or genetic tolerance (REN 1) of grapevine on powdery mildew (<http://tolvin.krs.hr/> ). This is in accordance with the „European Green Plan” to reduce pesticide consumption in agricultural production by 50% until 2030 and by 100% until 2050. Otherwise, applied research methodologies involve field trials, which are large-scale experiments conducted in fields helping to understand their real-world impact. Controlled experiments are conducted in greenhouses or growth chambers to control environmental variables and precisely measure the effects of specific treatment on plant growth. Longitudinal studies involve long-term monitoring of plant collections to observe the effects of treatments over multiple growing seasons. Safety and environmental considerations include integrated pest management (IPM), which combines biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks. Sustainable practices and strict adherence to legislation emphasize the judicious use of chemicals and the promotion of sustainable farming practices to protect biodiversity and soil health. Regulatory compliance ensures adherence to local and international regulations regarding the use of agricultural chemicals to ensure safety and environmental protection. This research approach aims to develop sustainable agricultural practices that maximize crop productivity while minimizing negative impacts on the environment.

The Institute has 54 employees, 38 of whom are scientists or assistant scientists, and 16 other professionals. There are 14 young researchers, 7 of which are doctoral students and 7 recently obtained their doctorate. Women make more than 50% of the staff.

### **3.3 Scope of the Sub-project**

The Institute's needs have outgrown the capacities of the existing infrastructure, and modernization is necessary. The main building in Duilovo-Split built in 1963, and the experimental oil mill and auxiliary facilities in Kaštel Stari (1939) do not meet standards for the performance of modern research and the installation of advanced analytical equipment.

The infrastructure modernization is accompanied by the implementation of the organizational reform, as a starting point for the transformation of the Institute into an internationally competitive scientific institution. The planned infrastructure will increase the capacity of the Institute for RDI. It will enable the improvement of instrumental analytics and precise technologies in the biotechnical sciences of agronomy, forestry, and food technology.

The Institute's current organization will be improved by establishing two new units instead of the existing Central Department:

- Centre for Advanced Analytics and Support for the Development of Mediterranean Agricultural Products, with three basic analytical units: metabolomics, functional genomics, and elemental composition of the ecosystem
- Centre for Experimental Fields and Collection Plantations

The Institute plans to employ up to 60 staff members until 2027 i.e. 3 technicians and 3 scientists. The total of approx. 65 staff members are planned after the new facilities are

completed. The focus is on the employment of young researchers to strengthen their skills and knowledge at the new facilities.

### **Sub-components**

The Sub-project consists of the following Sub-components:

Sub-component 1.	Reconstruction and equipping of 3 buildings at the location in Duilovo-Split
Sub-component 2.	Improvement and equipping of 2 existing buildings at the location in Kaštel Stari
Sub-component 3.	Improvement of existing technological infrastructure in Duilovo, Split - (3.1) reconstruction of the greenhouse for growing and researching agricultural crops when planting in the soil (dismantling of the greenhouse “Bubalo” and construction of a new greenhouse), (3.2) Structural improvement of 2 auxiliary buildings, (3.3.1) fencing the Institute's property, (3.3.2) construction and rehabilitation of the macadam paths and access ramps, , and (3.4) arranging and landscaping two forestry educational demonstration parks

Due to the Sub-project blended financing, the DIGIT Project & NRRP, the design documentation was developed before the ESMP as required in the Call for proposal for direct award - since the Call encompasses both funding sources, and the DIGIT Project also required the documentation to be completed in advance.

### **Timeframe**

<b>Reconstruction at Duilovo - Split &amp; Improvement works at Kaštel Stari</b>	February 2025 – June 2026
<b>Improvement of existing technological infrastructure (Duilovo - Split)</b>	February 2025 – June 2027
<b>Equipment Installation</b>	July 2026 – June 2027

### **3.4 General information**

<b>Name of the Sub-project</b>	The Modernization of the Institute for Adriatic Crops and Karst Reclamation Infrastructure as a Precondition for Excellence in Mediterranean Agriculture Research
<b>Purpose</b>	Scientific
<b>Beneficiary</b>	Institute for Adriatic Crops and Karst Reclamation, Put Duilova 11, 21000 Split
<b>Locations (address, City/Municipality, County)</b>	<ul style="list-style-type: none"> <li>• Put Duilova 11, 21000 Split, City of Split, Split-Dalmatia County (Sub-components 1 &amp; 3)</li> <li>• Put Banovine 8, 21216 Kaštel Stari, City of Kaštela, Split-Dalmatia County (Sub-component 2)</li> </ul> (Figure 5)
<b>Cadastral parcel and municipality</b>	<u>Sub-component 1:</u> Cadastral Parcel (c.p.) No. 7376/2, Cadastral Municipality (c.m.) Split <u>Sub-component 2:</u> c.p. No. 1492/1, c.m.Kaštel Stari



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	<u>Sub-component 3</u> : c.p.No. 7362, 7363, 7364/1, 7364/2, 7366, 7367, 7368/1, 7368/2, 7369, 7371, 7372, 7373, 7374, 7376/1, 7377/1, 7385/1, 7386/2, 7389/1, 7397/1, 10285/2, 10285/3, 10286/1, 10286/2, 10289/1, c.m.Split.
<b>Landowner</b>	Institute for Adriatic Crops and Karst Reclamation, Put Duilova 11, 21000 Split The land has settled property and legal relations, and no additional costs are foreseen for the purchase and conversion of the land. The Institute remains the owner of the land, buildings and other basic assets after the completion of the Sub-project. No land acquisition, restrictions on land use and involuntary resettlement are needed for the implementation of the Sub-project and no private property will be affected. An overview of the Institute's ownership of the Sub-project areas is given in Annex 4.
<b>Are there any associated facilities<sup>9</sup> related to the Sub-project?</b>	NO
<b>Is the Sub-project aligned with spatial planning documents?</b>	YES, according to the statements from designers <u>Sub-component 1 &amp; 3</u> <ul style="list-style-type: none"> <li>• Spatial Plan of the City of Split (City of Split OG No. 31/05, 38/20, 46/20)</li> <li>• General Urban Plan of Split (City of Split OG No. 1/06, 15/07, 3/08, 3/13, 32/13, 52/13, 41/14 i 55/14)</li> </ul> <u>Sub-component 2</u> <ul style="list-style-type: none"> <li>• Spatial Plan of the City of Kaštela (City of Kaštela OG No. 2/06, 2/09, 2/12, 14/19, 16/19, 17/19)</li> <li>• General Urban Plan of Kaštela (City of Kaštela OG No. 2/06, 2/09, 2/12, 14/19, 17/19)</li> </ul>
<b>Is the Sub-project protected cultural heritage?</b>	NO
<b>Is the Sub-project located within the archaeological/cultural protection zones?</b>	Partly. The southernmost part of the Sub-component 3 (Duilovo – Split) is located within the Area of Archaeological Heritage “The coastal zone from Žnjan to Stobreč, including the semi-urban area of Stobreč centered on the Orišac hill” defined by the provisions of the General Urban Plan of Split. This Sub-component includes improvement of technological facilities. The works planned within the Area of Archeological Heritage include fencing; construction, and rehabilitation of the macadam paths; arranging and landscaping of the forestry educational demonstration park – location 2. Therefore, small earthworks will be needed, but no deep excavation nor construction of the buildings are planned within the Area of Archeological Heritage.

<sup>9</sup> According to the World Bank's Environmental and Social Standards (ESS), the term „Associated Facilities“ means facilities or activities that are not funded as part of the project and are: (a) directly and significantly related to the project; and (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist. For facilities or activities to be Associated Facilities, they must meet all three criteria. Associated Facilities should meet the requirements of the ESSs, to the extent that the Borrower has control or influence over such Associated Facilities.

	Ministry of Culture and Media, Conservation Department in Split issued the Opinion on Works on the Property of the Institute on 25 June 2024: <i>The cadastral parcels owned by the Institute, on which the works of arrangement, renovation, and construction of the infrastructure are planned, are located outside the protected zone, so the provisions of the Protection and Preservation of Cultural Property Act do not apply concerning it. If archaeological finds are found during the works, they must be reported to the competent authority as soon as possible (Article 45 of the Protection and Preservation of Cultural Heritage Act). (The Opinion is given in Annex 3.)</i>
<b>Is the Sub-project located within the nature protection areas or Natura 2000 sites?</b>	NO



Figure 5. Locations of the Sub-project

### 3.5 Sub-component 1: Reconstruction of 3 buildings at the location in Duilovo, Split.

#### 3.5.1 Background information and current state at the sites

Under the Sub-component 1, the reconstruction of four existing buildings into the complex building of the Center for Advanced Analytics and Support for the Development of Mediterranean Agricultural Products is planned on the c.p. 7376/2. (Figure 6)

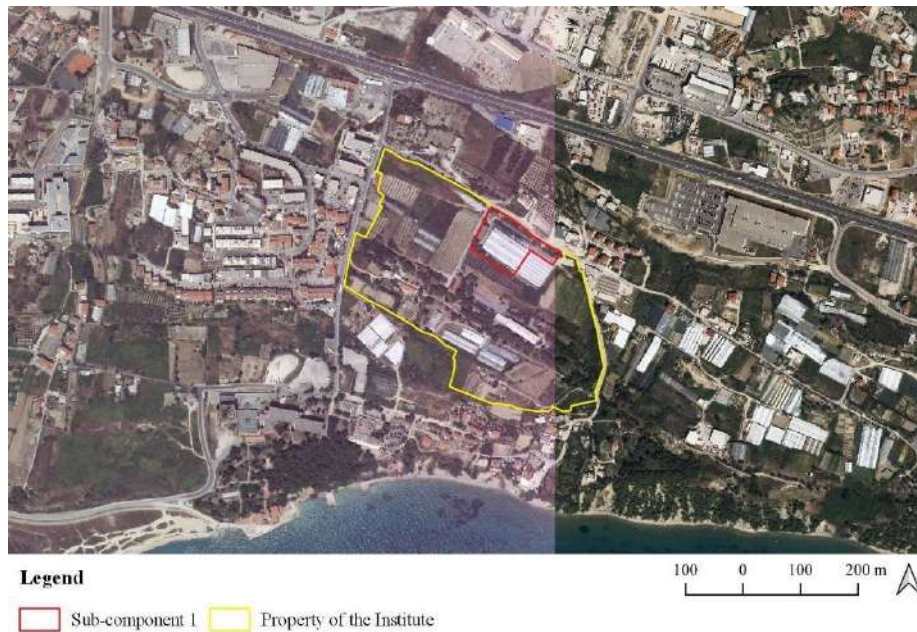


Figure 6. The location of the Sub-component 1 within the property of the Institute (Duilovo, Split)

Currently, there are 4 one-storey high buildings on the site (Figure 7), i.e. groundfloor with grossareas:

- Entrance building (A) (Figure 8) .....281 m<sup>2</sup>
- Greenhouse (B) (Figure 9).....3,040 m<sup>2</sup>
- Technical building (C) and Storage (E) (Figure 10). 141 m<sup>2</sup> + 384 m<sup>2</sup>

The entrance building (A) and the greenhouse (B) are currently leased by the florist company “Vaš vrt” Ltd . The technical building (C) and storage (E) are out of use. Upon the inspection of the status of the existing buildings, it was determined that only part of them can be repaired, while the majority must be removed.

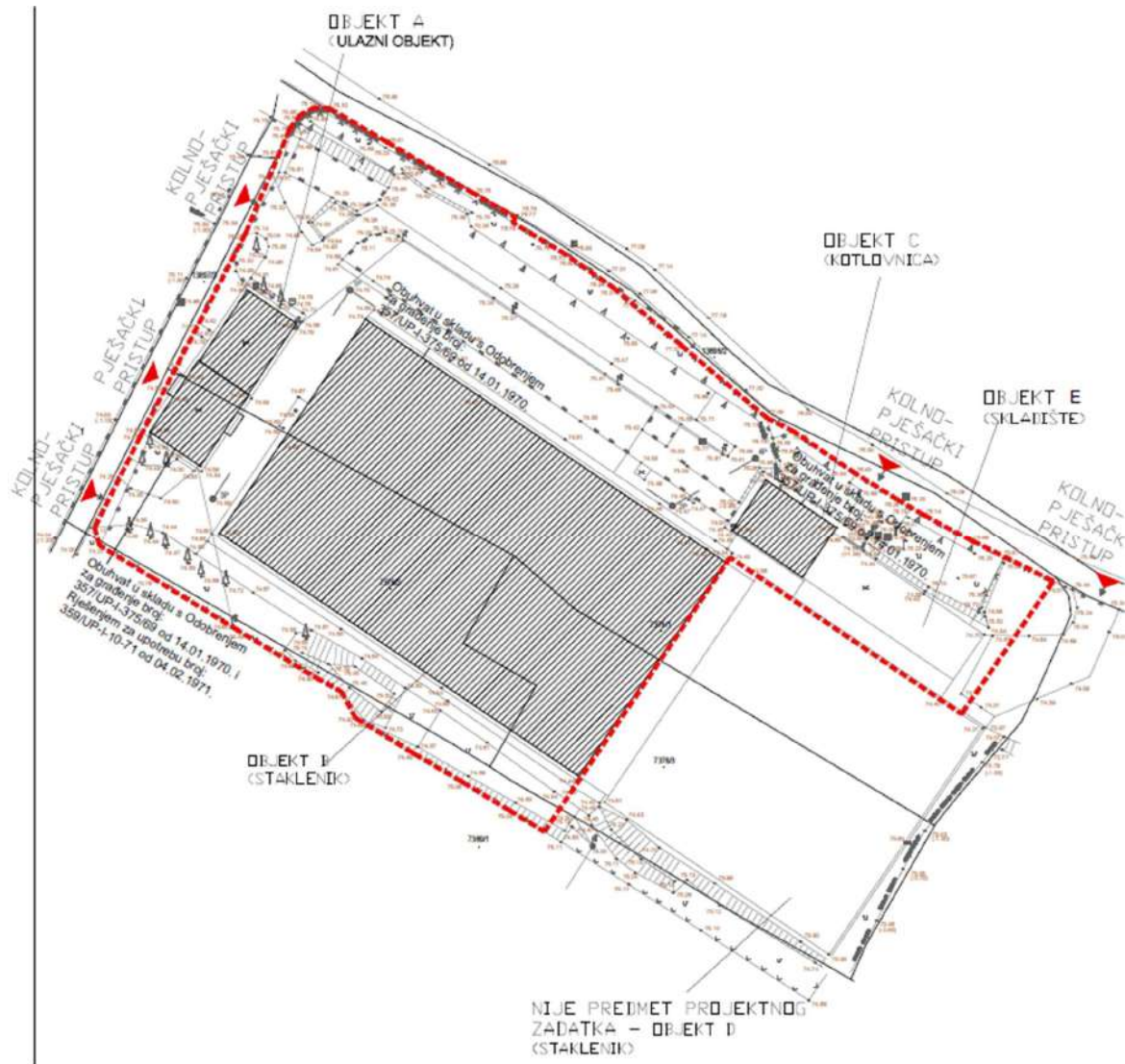


Figure 7. Existing Site Plan - c.p. No. 7376/2, c.m. Split; source: Main Design, 09/2023



Figure 8. The existing Building A planned for reconstruction



Figure 9. The existing Building B (greenhouse) planned for reconstruction



Figure 10. The existing Buildings C and E planned for reconstruction (future Building C)

### 3.5.2 Spatial parameters

Table 1 **Error! Reference source not found.** and Table 2 shows the spatial parameters of the Sub-component 1

**Total footprint area:** Existing buildings have a total footprint area of 3,846 m<sup>2</sup> or 44% of the building plot. New Buildings 1A, 1B and 1C will have total footprint area of 2,588 m<sup>2</sup> or 30%, i.e. less than existing (Table 1). The share of the planned green area is 43%.

**Total gross area:** Existing building have total gross area of 3,846 m<sup>2</sup>, while Buildings 1A, 1B and 1C will have total gross area of 3,598 m<sup>2</sup>, i.e. less than existing. (Table 2)

Table 1. Total footprint area of the Sub-component 1

Building	Gross Area
Building plot area	8,732 m <sup>2</sup>
Footprint	2,588 m <sup>2</sup>
Construction coefficient	0.3 (30 %)
Efficiency coefficient	0.42
Green area	3,730 m <sup>2</sup> / 43%

*Table 2. Total gross area of the Sub-component 1*

<b>Building</b>	<b>Stories</b>	<b>Gross Area</b>
Building 1A	Ground floor	193 m <sup>2</sup>
Building 1B	Ground & first floor	3,062 m <sup>2</sup>
Building 1C	Ground floor	343 m <sup>2</sup>
<b>Total</b>		<b>3,598 m<sup>2</sup></b>

### **3.5.3 Technical Description**

The future organizational unit of the Institute - Center for Advanced Analytics and Support for the Development of Mediterranean Agricultural Products will be located in the complex building built by the reconstruction of 4 existing buildings (A, B, C and E) and will consists of three buildings (1A, 1B and 1C). The total area of the building plot is 8,732 m<sup>2</sup>. (Figure 11, Figure 12)

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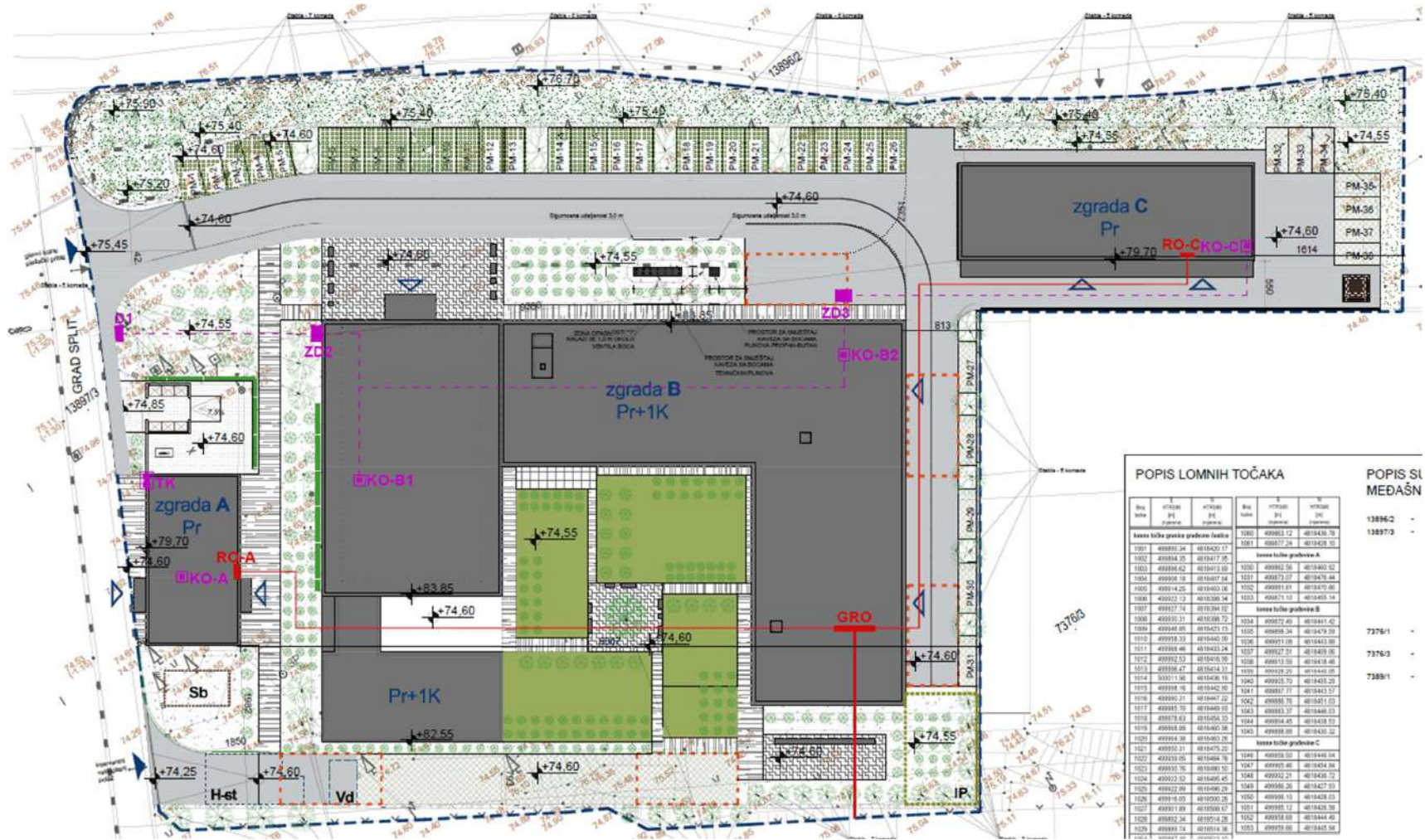


Figure 11. Site Plan - c.p. No. 7376/2, c.m. Split; source: Main Design, 09/2023

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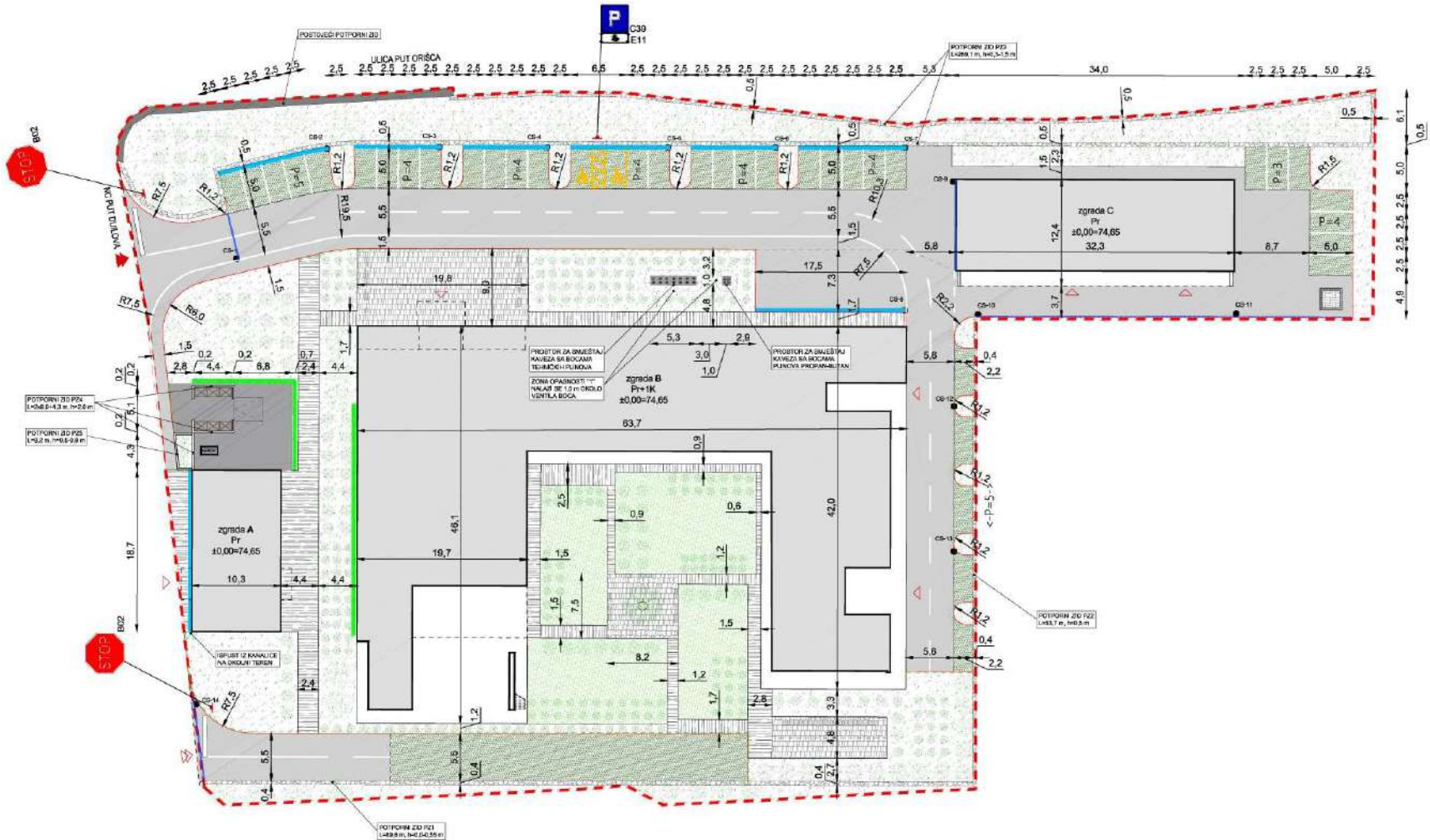


Figure 12. Landscape plan - c.p. No. 7376/2, c.m. Split; source: Main Design, 09/2023





*Figure 13. Visualisation of the Centre for Advanced Analytics and Support for the Development of Mediterranean Agricultural Products*

### **Building 1A**

Building 1A will be reconstructed into areas for growing and storing plants in controlled conditions, with high hygiene standards that will enable development of new varieties of Mediterranean plants using modern biotechnological methods. It will be a single-storey building (ground floor), with max. floor plan dimensions of 10.31 x 18.74 m, max. height 3.90 m. The main entrance will be on the northwest, while the service entrance will be on the southeast.

### **Building 1B**

Building 1B is the most comprehensive part of the Sub-project. The existing greenhouse will be reconstructed into a modern building, with a polyvalent analytical laboratory for plant material, agricultural and food products, soil, and water. Three basic analytical units will be established in this laboratory: metabolomics, functional genomics, and elemental composition of the ecosystem. Building 1B will also have a library, a laboratory for phenotypic research, and a multimedia three-part conference hall (150 seats) with a lobby. Furthermore, there will be a space for network servers (e-infrastructure), an experimental wine cellar with ampelometry for processing small quantities of grapes, equipped for testing new technologies in wine production, and a storage for chemicals. Furthermore, a dormitory will be placed at the first floor, with four rooms to accommodate max 8 foreign and domestic visiting young researchers (doctoral students, postdoctoral students) and scientists. The central temporary storage room for short-term chemical storage is planned on the ground floor of the building, in a room measuring 34.74 m<sup>2</sup>. The chemical storage will contain various chemicals, but considering their hazard classification according to EU regulations, flammable and dangerous chemicals are separated. Each cabinet has double doors and can hold up to 15 litres of flammable liquids and 40 litres of hazardous chemicals. The procurement of six safety cabinets is planned within DIGIT project, and the expected quantities of chemicals will not exceed the capacity of these cabinets. The room will be equipped with adequate ventilation to ensure safety. To align with

operational processes and ensure the highest occupational health and safety standards, chemicals used for daily analyses will be temporarily stored in specialized rooms within laboratories or separate units (storage rooms) on the first floor. There will be three storage rooms – one for each unit – in which chemicals used for daily analyses will be temporarily stored.

Building 1B will be two-storey (ground floor and first floor), with max. floor plan dimensions of 63.70 x 48.96 m, designed in the U shape and a maximum height of 7.90 m. The main entrance to the Building 1B will be on the northeast, while the service entrance will be on the southeast. The roof will be flat, with several levels. Access to the roof will be through the skylight located in the northern staircase. Air conditioners and heat pumps will be located on the roof, as well as photovoltaic panels.

### **Building 1C**

Building 1C will be reconstructed into a unit for processing fruits, vegetables, medicinal plants, and extracting and preserving seeds of Mediterranean cultivated and wild plants. The building will be a one-story (ground floor), with maximum floor plan dimensions of 32.31 x 12.37 m, and max. height of 3.90 m. The main entrance to the Building 1C will be on the southwest, while service entrances, i.e. accesses to the waste disposal area will be on the southwest and southeast.

### **Structural design**

The location is within the area of VII. degree of the MCS (Mercalli - Cancani - Sieberg) scale (very strong earthquake, chimneys collapse, tiles fall from the roof, house walls crack) for a return period of 475 years. Looking at the return period of 95 years they are in the zone of VI. level of the MCS scale.

The buildings' structures are designed according to Eurocode 8: Design of structures for earthquake resistance.

### **Water supply**

The complex building will be supplied with the necessary amounts of sanitary water and water for fire protection by connecting to the public water supply network. Since the existing water connection is not of a satisfactory profile, it will be reconstructed to a larger profile.

### **Firefighting infrastructure<sup>10</sup>**

The required amount of fire water (153,000 l) will be provided from the internal water tank charged and topped up directly from the public water supply network.

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<sup>10</sup> The applied regulations, all in accordance with the certificates issued by the public authorities: - Ordinance on fire resistance and other requirements that buildings must meet in case of fire (Official Gazette 29/13, 87/15); Rulebook on conditions for fire-fighting approaches (Official Gazette 35/94, 55/94 142/03); Rulebook on fire alarm systems (Official Gazette 56/99); Rulebook on hydrant network for fire extinguishing (Official Gazette 8/06); Austrian guidelines OIB guideline 2 (April 2019) – Fire protection and OIB Guideline - 2.1. (Fire protection in commercial buildings); Law on Flammable Liquids and Gases, NN no. 108/95 and 56/10; Rulebook on technical norms for ventilation or air conditioning systems (Official Gazette 038/89, NN 69/97); Ordinance on flammable liquids (Official Gazette 054/1999); Technical regulations on ventilation systems, partial air conditioning and building air conditioning (Official Gazette 3/07); Technical regulations for low-voltage electrical installations (05/10); Technical regulations for lightning protection systems on buildings (Official Gazette 87/08, 33/10).

To prevent the outbreak and spread of fire, the following firefighting equipment and installations will be provided in Buildings 1A and 1C: fire extinguishers, security lighting, automatic fire alarm system and external and internal hydrant network. The internal hydrant network will be designed in such a way as to achieve complete coverage of the space. The external hydrant network will have a safe source of water of such capacity to enable the supply of the minimum prescribed flow rate of water required to protect the fire sector with the highest fire load of the building being protected. The capacity of the safe source must be proven by the pumping process in the most unfavourable meteorological conditions, except in the case when a water supply network, non-drying natural reservoir or water tank is used as a safe source.

The following firefighting equipment and installations will be provided in Building 1B: fire extinguishers, security lighting, automatic fire alarm system, external and internal hydrant network, CO<sub>2</sub> detection in the wine cellar, and smoke and heat exhaust system in the staircase.

For the external hydrant network, new DN100 above-ground hydrants will be constructed, which will be connected to the internal pipeline. For a constant and reliable supply of water to the hydrant network, it will be necessary to build a water tank and install a hydro-station to raise the pressure. The required amount of water of 72,000 l for the external hydrant network and 9,000 l for the internal hydrant network will be provided from the internal water storage tank with a useful volume of 81,000 l, which will be filled from the public network. In the event of a complete loss of water in the public network, the initial filling should be done with a special vehicle in agreement with the distributor. The hydro-station will need to be installed in an external tank. It is necessary to bring the line to the water tank to supply the sprinkler system.

**Sprinkler** - In accordance with fire protection measures, a stable installation for fire extinguishing - a sprinkler system was designed in accordance with the VdS CEA 4001 regulation (Guidelines for the design of sprinkler systems) or equivalent. The Republic of Croatia does not have its own regulation for sprinklers and some of the globally accepted regulations VdS, NFPA or FM are used. Which regulation will be used is agreed by the designer of the fire protection, the sprinkler designer, the requirements of the Ministry of Interior and the client and depends on the type of building. The VdS CEA 4001 regulation is used, which is fully in line with Croatian regulations. The VdS can in principle be considered a German regulation because it originated from an association of German insurance companies and has become the most widespread and generally accepted sprinkler regulation in Europe. Sprinkler system protection is considered the most favourable due to the high efficiency of extinguishing and the economic cost of installation. In addition, the sprinkler installation enables simultaneous notification and fire extinguishing, and only those nozzles that are affected by the fire are activated. The fire is extinguished on the principle of extinguishing and cooling, and the possibility of backfires does not exist, that is, it is reduced to a minimum. Accumulation tank with main sprinkler pump of 18 kW will be supplied with electricity from a safe supply (substation - diesel generator). Heating and cooling systems cover the entirety of buildings.

### **Wastewater collection and management**

The Institute is located in an area without public sewage network. Therefore, wastewater network and treatment will be established on the plot. Sewage and rainwater system will be separated. The connection to the public sewage system will be possible after the construction of the sewage collector planned in the subject area, i.e. in the street north of the plot.

**Sanitary wastewaters** will be discharged into a watertight, closed collection pit with a volume of 20 m<sup>3</sup> that will be emptied every 10 days. Before connecting the collection system from the

building to the collection pit, it is necessary to test it for impermeability and obtain the opinion of an authorized institution that the pit is impervious. Currently, there is one cesspit north of the Building 1A. This cesspit will be put out of service and removed or properly backfilled after emptying. The existing main building has its own cesspit, which will remain functional.

**Technological (processed) wastewater** from the wine processing is characterized by a high proportion of organic load with a very complex composition and elevated concentrations of nutrient salts, macro and micro elements. The composition and volume of the technological wastewater depend on the production phase and season. Total annual volume of wine for all experimental varieties is expected to be 1,000-1,500 l. The wastewater from the technological process will be drained through the main pipeline, separated from the sanitary wastewater to the biological treatment plant with 2<sup>nd</sup> degree of purification by recirculation of activated sludge, pH regulation and defoaming. The system consists of tanks for equalization, neutralization and deposition of coarse waste, a biological purifier with the technology of continuous recirculation of activated sludge with a capacity of 20 ES, and devices for membrane filtration of treated water in buried tank. The biological purifier will use wastewater treatment technology without a primary precipitator in order to avoid the appearance of unpleasant odours during the operation of the device. Biological purifier with 2<sup>nd</sup> degree of purification meets the values prescribed by Table 2 from Annex 1 of the Ordinance on limit values of wastewater emissions (OG 26/20). Wastewaters from laboratories will be connected to the biological treatment plant as well.

After the biological pre-treatment, technological waters created by the processing of grapes are drained into a separate watertight collection pit ( $V=18 \text{ m}^3$ ) that will be emptied every 6 days (during the production of wine). The disposal of by-products in the treatment system shall be handled by the drainage operator (external).

Emptying cess pits can be only carried out by authorised companies.

**Drainage of rainwater** includes drainage of the roof water and water from traffic surfaces. Rainwater drainage from the roof of the building will be carried out by a vacuum system and will be discharged directly into the land. Rainwater from the roads and parking lot will be collected via a linear grid to a collection pit with a sedimentation tank, after which the water will be led via pipelines and inspection wells to the light liquids' (grease and oil separator) separator. After pre-treatment in the light liquids' separator, the rainwater will be discharged into the soil via an infiltration field placed east of the Building 1B.

Tanks and oil and grease separators will be regularly maintained by authorised companies and water quality tested at least quarterly. The absorption of the soil will be tested before installing infiltration field. Cleaning and inspections are required at intervals according to the manufacturer's instructions. The soil around the infiltration field does not have to be re-examined since its characteristics should remain unchanged, except in case of blockage.

### **Electrical installations**

The building plot has an existing low-voltage connection with a power of 13.80 kW and electric cabinet, which will be dismantled.

The new low-voltage connection of 400 kW in the direction of taking over from the network, and low-voltage panel will be carried out, according to the study of the optimal technical solution for the connection (EOTRP) and the electricity consent (EES), in the existing substation "Duilovo 1" at the c.p. 7386/1, c.m. Split (east side of the existing main Institute's

building). A low-voltage panel with a module will be installed in the existing substation (maintained by Croatian Electricity Company - HEP) for accepting the planned photo-voltaic power plant. The main distribution cabinet of the Center will be powered from the substation, which will be located in a covered outdoor space next to the Building 1B (see the label GRO, Figure 11). It will power the sub-cabinets in buildings 1A, 1B and 1C. In order to optimally connect the Centre to the power grid, it is necessary, along with the installation of a new panel, to replace the existing transformer with an installed capacity of 400 kVA with a new transformer with an installed capacity of 1000 kVA.

The total power of the photo-voltaic power plant will be limited to 63 kW. Photovoltaic modules will be placed on a flat roof at an angle of 15°. A total of 140 modules with a power of 450 W will be installed, which gives a total power of 63 kWp.

### **Mechanical installations (heating, cooling and ventilation)**

Each of three buildings will have separate heating, cooling and ventilation systems.

In Building 1A, a heat pump will be installed on the roof of the building, fan coils and a ventilation system with heat recovery to ventilate the space.

Building 1B will have several separate heating, cooling and ventilation system: one for the planned dormitory, a separate one for the laboratories, and for specific rooms requiring different microclimate conditions.

The source of heat/cooling will be air/water heat pumps, as well as Variable Refrigerant Flow (VRF) and split systems, depending on the requirements of the room. The engine room will be installed on the ground floor, while the heat pumps will be installed on the roof of the building. The source of heat for the air conditioning chambers on the roof will be separate heat pumps. Ventilation of other spaces in buildings will be carried out through ventilation devices on the roof and through under-ceiling air conditioning chambers in the building. In the building, the distribution of technical gases will be designed according to the provided foundations by the investor with the positions of the connection of individual gas drawn.

In Building 1C, a heat pump will be installed on the roof of the building, fan coils and a ventilation system with heat recovery to ventilate the space.

### **Traffic and parking lots at the location**

The existing vehicular and pedestrian accesses from the northwest and northeast are retained. The main functional pedestrian access is from Put Duilova Street, northwest of the Center.

The parking lot will be located along the internal road northeast (26 parking spaces – of which 2 will be adapted for people with disabilities and reduced mobility) and southeast (5 parking spaces) of the Building 1B. Additional 7 parking spaces will be located east of the Building 1C. In total, there will be 38 parking spaces on the plot. Trees will be planted every 4<sup>th</sup> parking space which is assessed sufficient to reduce risk from creating heat island (in the long run). Concrete grass pavers will be used for the parking area and fire brigade access area.

### **Accessibility of the building to persons with disabilities and persons with reduced mobility**

The complex building is designed to fully enable access, movement, residence and work for people with reduced mobility. Within the Building B, people with disabilities and reduced mobility will have unimpeded access, movement, stay and work to all facilities offered by the Center. Access to the first floor will be provided by an elevator located in the entrance area.

Size of the elevator will be adapted to the use of persons with reduced mobility. The sanitary facilities will be equipped with a toilet adapted to meet the needs of people with reduced mobility, as well as the parking lot. Two parking spaces north of the Building 1B, each of which will be a size of 650 x 500 cm with an intermediate space of 150 cm, will be located near the main entrance to the Building 1B to allow people with reduced mobility to park as close as possible to it. All footpaths will be connected and provided without any obstacles.

### **Landscaping**

The share of the planned green area of the building plot will be 42.72% (3,730.11 m<sup>2</sup>). A total of 65 trees are planned to be planted on the undeveloped part of the plot. Other areas on the plot will be constructed as pedestrian areas with a finish of concrete slabs, concrete, a gravel surface made of crushed stone aggregate and green areas that will be arranged as a grassy with a possibility for planting trees.

### **3.5.4 Project activities**

#### **Preparatory works**

Due to the Sub-project blended financing, the DIGIT Project & NRRP, the design documentation was developed before the ESMP as required in the Call for proposal for direct award - since the Call encompasses both funding sources, and the DIGIT Project also required the documentation to be completed in advance. Table 3 shows documentation prepared and permits issued so far for the reconstruction works under the Sub-component 1.

*Table 3. Design documentation prepared for 3 buildings in Duilovo – Split*

<b>Mandatory documentation/permits</b>	<b>Status</b>	<b>Year</b>	<b>Comments</b>
<b>Conceptual Design</b>	YES	January 2023	Design Company: STUDIO NEXAR Ltd., Ivanec & Split
<b>Preliminary Design</b> (Design Company: STUDIO NEXAR Ltd., Ivanec & Split)	YES	March 2023	Design Company: STUDIO NEXAR Ltd., Ivanec & Split
<b>Special Requirements</b>	YES	January/ February 2023	Special Requirements are issued, by the authorities in charge, as part of the regular procedure for obtaining a location permit: <ul style="list-style-type: none"> <li>• Requirements related to fire safety</li> <li>• Requirements for connection to the water supply and sewerage network</li> <li>• Requirements for connection to the electricity network</li> <li>• Sanitary and noise protection requirements</li> <li>• Hydrological requirements</li> <li>• Traffic requirements</li> <li>• Requirements related to the connection to the communication network</li> </ul>
<b>Location Permit</b>	YES	June 2023	Location Permit, CLASS: UP/I-350-05/23-01/000009, NO. 2181-1-10-3/4-23-0013, 27 June 2023, issued by the City of Split,

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Mandatory documentation/permits	Status	Year	Comments
			Administrative Department for Urban Planning and Construction
<b>Main Design Certificates</b>	YES	September/October 2023	<p>Certificates are issued as part of the regular procedure for obtaining building permit by relevant authorities confirming that Main Design is in line with the special requirements:</p> <ul style="list-style-type: none"> <li>• Croatian Regulatory Agency for Network Activities (HAKOM)</li> <li>• HEP-Operator distribution system Ltd.</li> <li>• Croatian Waters</li> <li>• City of Split, Administrative Department for Communal Affairs, Department for Transport and Communal Maintenance</li> <li>• Ministry of the Interior</li> <li>• State Inspectorate, Split Regional Office, Sanitary Inspection Service</li> <li>• Water Supply and Sewage Ltd.</li> </ul>
<b>Main Design</b>	YES	September 2023	<p>Design Company: STUDIO NEXAR Ltd., Ivanec &amp; Split</p> <p>Main Design has been prepared. It includes the following folders:</p> <ul style="list-style-type: none"> <li>• Folder 1/10: Architectural Design (including Study on fire protection measures)</li> <li>• Folder 2/10: Rational Use of Energy and Thermal and Acoustic Design</li> <li>• Folder 3/10: Structural Design</li> <li>• Folder 4/10: Electrical Installations Design</li> <li>• Folder 5/10: Electrical Installations Design – Photovoltaic Power Plant</li> <li>• Folder 6/10: Mechanical Installations Design (heating, cooling, ventilation)</li> <li>• Folder 7/10: Hydrotechnical Installations Design</li> <li>• Folder 8/10: Sprinkler Installations Design</li> <li>• Folder 9/10: Elevator Design</li> <li>• Folder 10/10: Site Design</li> </ul> <p>The following studies are part of the Main Design</p> <ul style="list-style-type: none"> <li>• Occupational safety study</li> <li>• Geotechnical Study</li> <li>• Construction Works Plan</li> </ul> <p>Report on the control of the main project, no. 119/17-291 of June 28, 2023, made by an authorized auditor for mechanical resistance</p>

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Mandatory documentation/permits	Status	Year	Comments
			and stability of concrete and masonry structures Ante Mihanović, M. Civil Eng.
<b>Building Permit</b>	YES	October / November 2023	Building Permit, CLASS: UP/I-361-03/23-01/000181, NO. 2181-1-10-3/4-23-0026, 5 October 2023, issued by the City of Split, Administrative Department for Urban Planning and Construction Certificate on the Final and Effective Building Permit, CLASS: UP/I-361-03/23-01/000181, NO. 2181-1-10-3/4-23-0027, 7 November 2023, issued by the City of Split, Administrative Department for Urban Planning and Construction
<b>Bill of Quantities for Construction Works</b>	YES	September 2023	Developed based on the Main Design
<b>Equipment Design &amp; Bill of Quantities</b>	YES	October 2023	Design company: Mijić Haklička Studio Ltd.
<b>Detailed Design</b>	NO	-	Detailed design will be one of the tasks within the bidding document and contract for construction works.
<b>Usage Permit</b>	NO	-	Not started

**Construction works and as-built documentation**

For the Sub-component 1, Main design was prepared, and Building Permit obtained. Bidding document for civil works is under preparation. It is expected that civil works will last by the end of June 2026.

The civil works will include:

- Preparation works: cleaning and clearing the area around the building, protection of tall trees within the project area that will not be removed, etc.
- Demolition and dismantling (together with waste disposal): demolition of the existing buildings A, B (greenhouse), C and E includes removal of the existing metal cover over the entire surface of the roof and roof structure, existing glass cover of the greenhouse, the damaged wall finish on retaining walls the existing interior carpentry of the building A, etc.
- Excavation: mechanical excavation of humus in a layer of 30 cm. Since the works includes reconstruction of existing buildings, large amounts of soil are not expected. The soil and humus will be temporarily stored at the location and later reapplied at the same location (green areas). Unless, the storage of soil is at the location, it should be approved by the local authorities (City of Split).
- Concrete and reinforced concrete works.
- Masonry works.
- Insulation works.



- Finishing works.
- Installation works.
- Interior works.
- Landscaping works.

The access to the construction site will be established through the Put Orišca Street and Vrgoračka Street. Contractor shall develop as-built documentation according to the specifications in the Bidding Document.

**Expected type, quantities and location of flammable liquids, gases and other substances that are stored or used**

For the technological needs of the laboratories, it will be necessary to provide several types of **technical gases**. Therefore, the installation of technical gases will be provided. The laboratory will have centrally located cylinders with technical gases in a separate room.

The use of the technical gases for the needs of the laboratory is very small: 50-liter bottles at a pressure of 200 bar. The gases that will be used are the following: carbon dioxide (CO<sub>2</sub>), oxygen (O<sub>2</sub>), argon (Ar), helium (He), nitrogen (N<sub>2</sub>), compressed air, and hydrogen (H). Oxygen belongs to the group of oxidizing gases; it does not burn but supports burning. It must not be stored with acetylene and other explosive and flammable gases and materials. Measures for safe storage and maintenance of the technical gases is integrated in the design in line with the Austrian norm ONORM M 7379, as requested by the Ministry of Interior. The norm ONORM M 7379 was taken into account, which elaborates gas storage in detail, both flammable and non-flammable. The following measures from the relevant standard were applied: the method of gas storage in the open air, geometric safety distances in the case of gas storage in the open air, which includes the determination of the protective area, the tightness of gas installations, marking of gas storage facilities, regulations for the operation of gas storage facilities with combustible gases or combustible gas mixtures. The specified standard includes and deals with the properties of gases, the method of gas storage, safety distances, protection area, open air storage and special gas storages, and gas labeling. At the same time, the relevant norm prescribes additional measures depending on the properties of the gases (combustible gases, combustible gas mixtures, toxic gases and toxic gas mixtures). In the same standard, the geometric design of safety distances for gas storage in the open, which was applied during the creation of the main project, was given.

Hydrogen is very explosive gas in certain concentration. The hydrogen used for laboratory purposes will not be stored within the laboratories themselves, but in a designated, separate area. In laboratories where hydrogen is handled, appropriate safety measures will be implemented, including proper storage and clear labelling. Personnel will undergo training on safety procedures and will use the required personal protective equipment. Additionally, staff will be trained on important safety procedures such as evacuation and alarm protocols in case of emergencies, proper use of fire extinguishers.

All the other gases belong to the group of inert gases.

Cages for technical gases (including flammable and explosive gases – hydrogen, oxygen, and compressed air) are placed on the green area north of the Building 1B (Figure 14). Inside the cage for placing technical gases, the distance between flammable and explosive gases (H<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, Ar, He, compressed air) will be minimum 2.0 m. The safety distance around the gas cage will be 3.0 m. The safety distance between the LPG cage and the cage of other technical gases will be at least 3.0 m.



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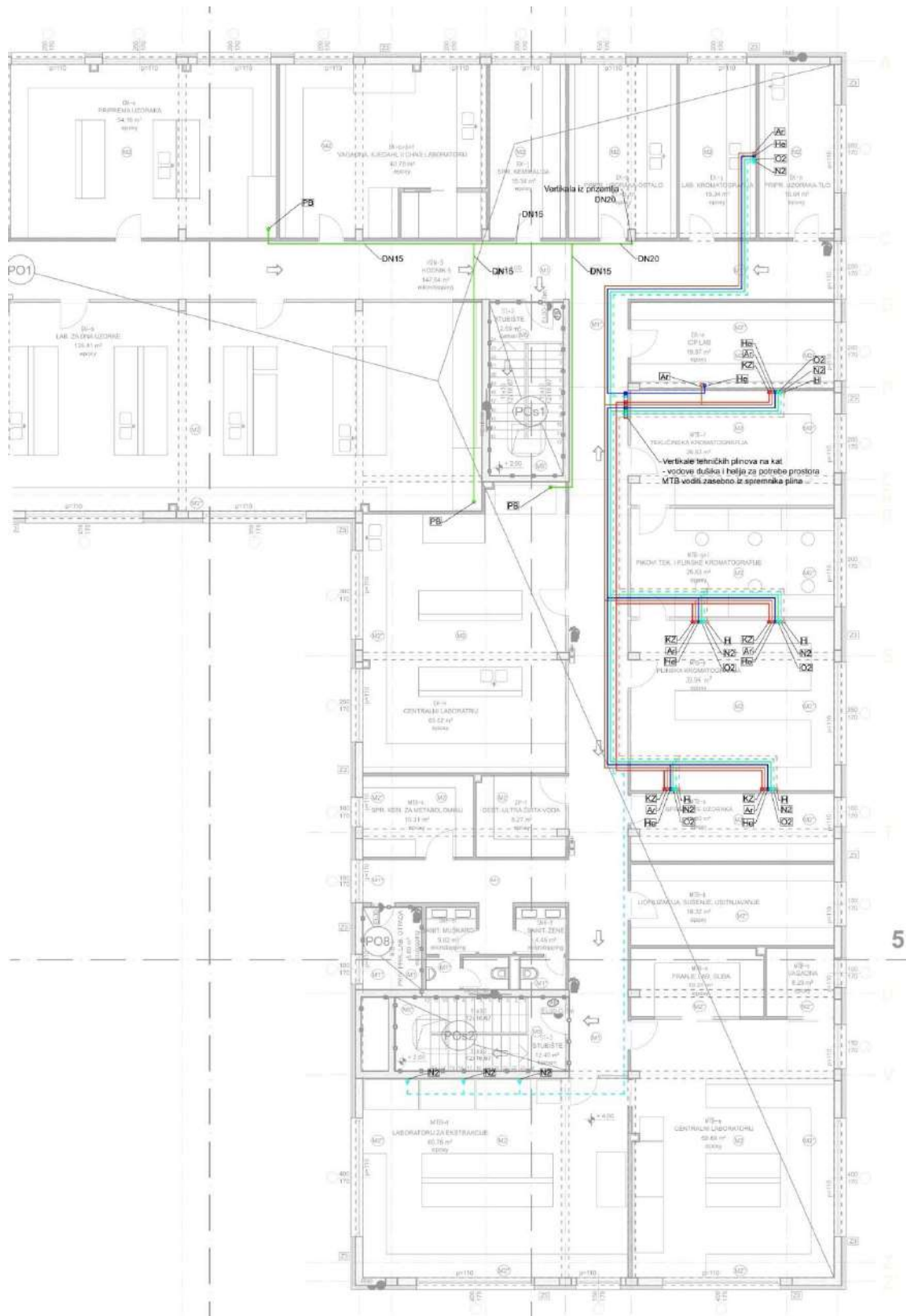


Figure 15. Distribution of technical gasses to the bottles on the first floor (source: Main design, 09/2023)

In addition to technological gasses, various types of chemicals will also be needed for conducting the scientific projects. Chemicals will be placed in the central storage intended for temporary use only (only for the project's need), not for long-term storage.

Table 4 shows the characteristic and amounts of chemicals that will be accommodated in the facility (according to the Main Design). The Institute does not plan to extend the storage for chemicals nor add volumes.

*Table 4. Characteristics and amounts of chemicals that will be accommodated in the facility (Building 1B, Duilovo)*

Compound	Approximated max. quantities	Flammability, explosiveness	Degree of flammability (amounts for risk assessment under the law)	Other characteristics/issues
<b>Acetic Acid</b>	3 l	Combustible, but hardly flammable	3rd category (H226) Amounts for risk assessment – 100 t	Corrosive Health risk Harmful to aquatic life with long lasting effects
<b>Glacial acetic acid</b>	7 l	Flammable liquid and gas	3rd category (H226) Amounts for risk assessment – 100 t	Corrosive Health risk
<b>Methanol</b>	15 l	Flammable	2 <sup>nd</sup> category; H225. Amounts for risk assessment – 10t	Health risk Acutely toxic
<b>Ammonium nitrate</b>	1 kg	Oxidizer, may intensify fire	H272 Amounts for risk assessment – 100 kg	Health risk: To be kept separately from the flammable compounds (MSDS)
<b>Dimethylformamide</b>	250 ml	Flammable	3rd category (H226)	Acutely toxic, reproductive toxic, other health risks: producing toxic fumes
<b>Silver nitrate</b>	5 g	Oxidizer, may intensify fire	H272	Corrosive Health risk Harmful to aquatic life with long lasting effects
<b>Tetramethylethylenediamine</b>	250 ml	Highly flammable liquid and vapour; Forms explosive mixtures with air at ambient temperatures.	2 <sup>nd</sup> category (H225) Amounts for risk assessment – 100 t	Corrosive and toxic, bioaccumulative
<b>Ammonium persulfate</b>	20 g	Oxidizer, may intensify fire, may explode in container if exposed to high temperatures	H272 Amounts for risk assessment – 100 kg	Allergen, harmful if inhaled
<b>Ethanol</b>	10 l	Highly flammable liquid and vapour	2 <sup>nd</sup> category (H225) Amounts for risk assessment – 100 t	/
<b>Isopropanol</b>	5 l	Highly flammable liquid and vapour	2 <sup>nd</sup> category (H225) Amounts for risk assessment – 100 t	Irritant

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<b>Sodium dodecyl sulphate</b>	250 g	Flammable solid	H228	Harmful if swallowed or if inhaled Irritant Harmful to aquatic life with long lasting effects
<b>Hydrogen peroxide</b>	2 l	Oxidizer, may intensify fires	H272 Amounts for risk assessment – 100 kg	Irritant
<b>Potassium nitrate</b>	1 kg	Oxidizer, may intensify fires	H272 Amounts for risk assessment – 100 kg	Irritant
<b>Acetone</b>	5 l	Highly flammable liquid and vapor	2 <sup>nd</sup> category; H225 Amounts for risk assessment – 100 t	Irritant
<b>Liquid nitrogen</b>	10 l	Exposure to fire may cause containers to rupture/explode	N/A	Contains refrigerated gas; may cause cryogenic burns or injury
<b>Tris(hydroxymethyl) aminomethane Buffer substance</b>	1 kg	N/A	N/A	Irritant
<b>Diethyl-ether</b>	5 l	Extremely flammable liquid and vapour	1 <sup>st</sup> category (H224)	Health risk if swallowed
<b>Chloroform</b>	2 l		N/A	Irritant, Health risk if swallowed or inhaled; Acute toxic
<b>Pentane</b>	3 l	Flammable liquid and vapour	2 <sup>nd</sup> category (H225)	Health risk if swallowed or inhaled. Harmful to aquatic life with long lasting effects
<b>Hexane</b>	5 l	Flammable liquid and vapour	2 <sup>nd</sup> category (H225)	Irritant, Health risk if swallowed or inhaled. Harmful to aquatic life with long lasting effects
<b>Acetonitrile</b>	10 l	Flammable liquid and vapour	2 <sup>nd</sup> category (H225)	Irritant, Health risk if swallowed or inhaled
<b>Nitric acid</b>	3 l	Oxidizer, may intensify fires	H272	Corrosive; Irritant, Health risk inhaled
<b>Ammonia 50t - anhydrous</b>	2 l	Flammable gas; Contains gas under pressure; may explode if heated	H280	Irritant, Health risk inhaled; Harmful to aquatic life with long lasting effects
<b>Coomassie brilliant blue G-250</b>	2 g	Flammable liquid and vapour	2 <sup>nd</sup> category (H225)	Irritant, Health risk if swallowed or inhaled; Harmful to aquatic life with long lasting effects

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Compound	Approximated max. quantities	Flammability, explosiveness	Degree of flammability (amounts for risk assessment under the law)	Other characteristics/issues
Potassium chloride	100 g	N/A	N/A	Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008 Health risk if swallowed or inhaled;
Potassium iodide	100 g	N/A	N/A	Causes damage to organs through prolonged or repeated exposure
Cyclohexane	1 l	Flammable liquid and vapour	2 <sup>nd</sup> category (H225)	Irritant, Health risk inhaled; Very harmful to aquatic life with long lasting effects
Folin – Ciocalteu reagent	100 ml	N/A	N/A	Corrosive; Irritant, Health risk inhaled;
Ethyl acetate	1 l	Flammable liquid and vapour	2 <sup>nd</sup> category (H225)	Irritant
Potassium permanganate	100 g	Oxidizer, may intensify fires	H272	Irritant, Health risk swallowed; Very harmful to aquatic life with long lasting effects
H225 - Highly flammable liquid and vapour (category 2) H226 - Flammable liquid and vapour (category 3) H272 - May intensify fire; oxidiser H280 - Contains gas under pressure; may explode if heated				

**Chemicals will be placed in separate fireproof cabinets inside the dedicated rooms**, which will be equipped with adequate ventilation. All flammable liquids must be stored in a separate and locked area. There must be a sufficient number of fire extinguishers, first aid cabinets, and the area must be protected by hydrants, sprinklers, fire/smoke sensors and alarms. Safety signs and instructions for working safely with individual devices or chemicals must be displayed on the walls. Workers must be professionally trained and trained to work in a safe manner and under medical supervision. The laboratory must have a written quality assurance program that ensures work in accordance with the principles of good practice. The program will be prepared and communicated to staff before use phase commences.

Given that all the listed chemicals will be stored in quantities far below the thresholds requiring a risk assessment, the fact that they will be temporary stored in separate fireproof cabinets only for the needs of the specific project, and that the Institute does not plan to extend the storage capacity, no hazard risk is expected. The Institute’s activities are not subject to the Seveso Directive. Therefore, there is no need for hazard risk assessment.

**Fire safety measures**

The eventual occurrence of fire can occur in laboratories, rooms where chemicals are located, and on installations inside the facility.

The building is designed and constructed so that it does not present unacceptable risks of accidents or damage during use or operation, such as slips, falls, collisions, injuries from explosions and burglaries. All floors will be flat, stable and anti-slip and easy to clean and maintain.

Complex building is divided into multiple fire compartments<sup>11</sup>, both structurally and functionally. Each fire compartment is designed with specific fire resistance and smoke control properties to prevent the spread of fire and smoke within the building or to adjacent structures for a defined period. Chemical storage is not planned as a separate fire compartment because it will be placed in separate fireproof cabinets.

Each building will have a fire alarm system designed per the Ordinance on Fire Alarm Systems (OG 56/99), covering all floors, spaces, and areas between suspended ceilings (up to 0.3m high) with cable ducts and safety lines, excluding sanitary areas. In addition to that, the Institute has a centralized surveillance system equipped with cameras that are connected to a contracted security company. In the event of any unusual activity, the security company notifies the Institute, and, when necessary, the police or fire department ensuring a response time of no more than 15 minutes. Since this system has proven effective, the Institute plans to continue with this practice in the future Centre.

Fire compartments, including load-bearing structures and evacuation route elements, will be constructed from fire-resistant materials in accordance with the Ordinance on Fire Resistance (OG 29/13, 87/15). Fire-resistant doors will be installed at compartment boundaries, meeting both Ordinance and space-specific requirements. To prevent fire spread, fire-resistant breaks matching the compartment boundary resistance will be implemented. Wall and ceiling penetrations (e.g., installations, pipelines) will be sealed with fire-resistant materials. Ventilation ducts and air distribution elements will be made of non-combustible galvanized steel or aluminium. All building components, including fire doors and ventilation systems, will use certified materials and comply with prescribed technical standards.

Central chemical storage is located on the ground floor of the north wing of Building 1B. Chemicals will be placed in separate fireproof cabinets and the room equipped with adequate ventilation to ensure safety. There will be a total of 6 fireproof cabinets with a capacity of 15 l for flammable and 40 l for hazardous chemicals. In total, the storage facility will be able to store max. 90 l of flammable and 240 l of hazardous chemicals. However, the actual required quantity of chemicals is, according to the table above (Table 4), smaller (approx. 89 l + 3 kg of flammable or hazardous chemicals). The cabinets will have filtration and extraction systems for the combined storage of chemical products, acids, bases, and flammable liquids, certified according to EU compliant standards EN 14470-1, EN 61010-1, EN 16121, EN 16122, and TEST PPP 52125A. In case of fire, the cabinets will close automatically and have a fire resistance of Type 90, indicating that a building element, such as a wall, ceiling, door, or other fire-rated component, can withstand fire and maintain its structural integrity for at least 90 minutes under standard testing conditions which should be sufficient for successful evacuation of the Building B. Considering that the cabinets are fireproof (their own fire zone), there is no need for fire separation of the entire chemical storage room.

On the first floor, there are three specialized rooms (for each department separately) where chemicals required for immediate use will be stored in fireproof cabinets. A smaller amount of

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<sup>11</sup> A fire compartment is a section of a building separated from other areas by fire-resistant partition structures and elements.

chemicals needed for specific experiments will be taken from the central storage and used for the experiment on a daily basis. At the end of each working day, unnecessary chemicals will be kept in these specialized rooms. At the end of each workday, all laboratory employees will ensure the proper redistribution, removal, or safe storage of any remaining hazardous substances in their laboratory.

The dormitory is located on the first floor of the east wing of Building 1B, diagonally opposite the chemical storage room on the ground floor (Figure 16). The rooms are located 75–80 meters horizontal distance (walking distance) within the building from the nearest room for storing daily quantities of chemicals on the first floor, 95–100 meters from the second room, and 115–125 meters of horizontal distance (walking distance) within the building from the farthest room for storing daily quantities of chemicals (Figure 17).

The dormitory is not a separate fire zone, but the rooms have a separate exit from the building via staircase that leads directly to an outdoor area. It consists of 4 double-bed bedrooms for maximum 8 people who work in the building, and it is intended for the stay of guest students/researchers (but it is not intended for permanent use/residence).



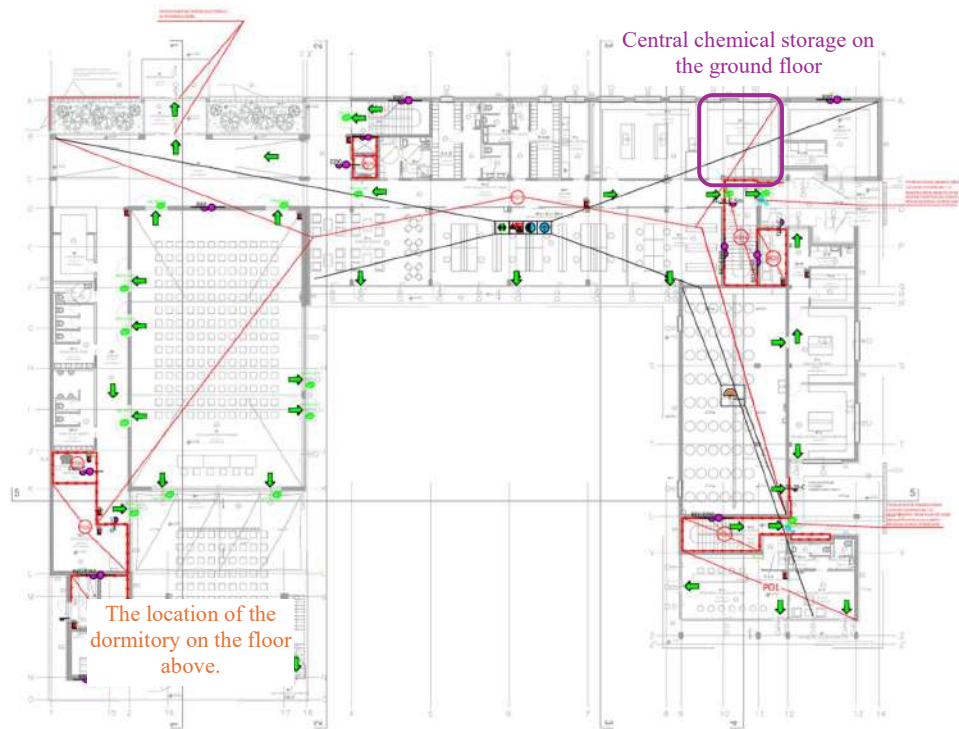


Figure 16. The location of the dormitory in relation to the central chemical storage (green arrows indicate evacuation routes).

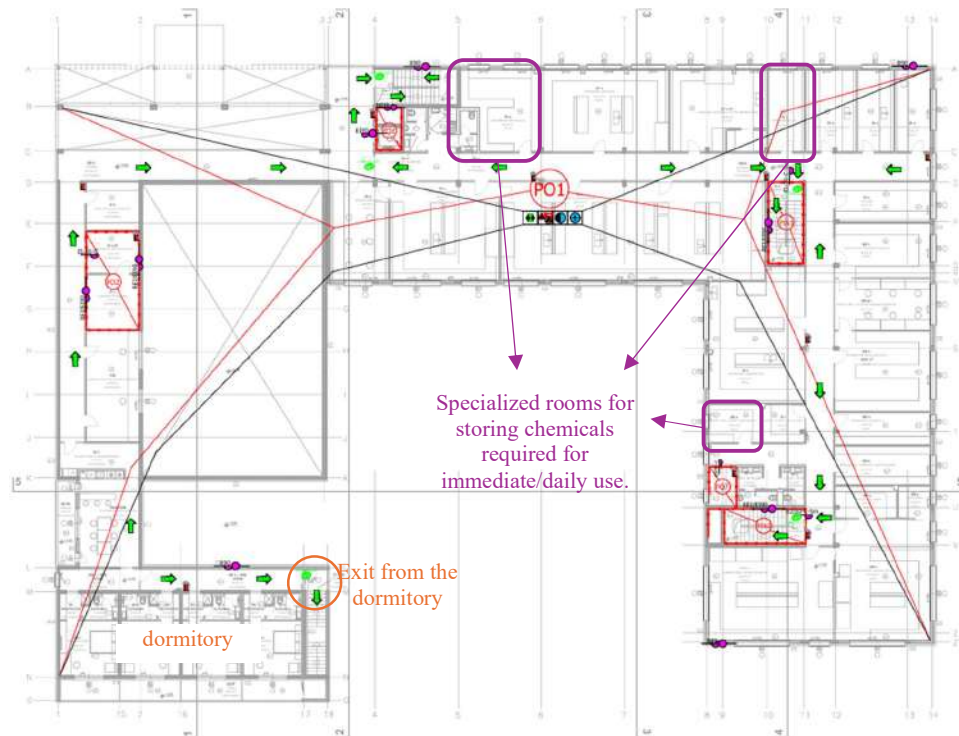


Figure 17. The location of the dormitory in relation to the specialized rooms for storing chemicals required for immediate/daily use on the 1st floor (green arrows indicate evacuation routes).

A sprinkler system covers the entire building, and in the event of a fire, the spread of fire and toxic gases will be minimized. At the same time, all safety staircases are provided with a smoke and heat removal system, as well as elevator shafts.

The exits from complex building comply with the Ordinance on fire resistance and other fire safety requirements (OG 29/13, 87/15) depending on the number of people that are expected to be inside the building (max 17 in the Building 1A, max 315 in the Building 1B and max 29 people in the Building 1C). Evacuation routes will be clearly marked with standardized signs (HRN ISO 6309). Any door, passage, or staircase not used as an exit but potentially mistaken for one will be visibly marked to indicate its actual purpose.

Evacuation route doors will meet Croatian norms (HRN EN 179/1125) and European Confederation of Fire Protection Associations CFPA–E Guideline No. 2, featuring handles, pressure bars, and similar mechanisms, and will open in the direction of escape. The evacuation route width is designed to ensure smooth and quick evacuation.

Fire safety instructions and plans showing exits, fire extinguisher locations, the main power switch, and high-risk areas will be displayed near the entrance. An evacuation elevator for people with reduced mobility will operate during alarms for 90 minutes, descending to the ground floor before shutting down.

The design includes a smoke extraction system at the top of staircases POs1 and POs2 with a minimum cross-section of 1.0 m<sup>2</sup>, operating independently of the main power supply. The system features a control panel connecting all components and can be activated by a detector or manually via an activation button. The panel is equipped with rechargeable batteries. A smoke detector in the elevator shaft will activate fire mode during alarms, and fires in the machine room or shaft will block the elevator, moving it to a safe position. The elevator will have backup power.

Automatic doors on evacuation routes will be connected to the fire alarm system, feature emergency opening buttons, and have backup power.

The building's detached location and a distance of over 3 meters from neighbouring buildings ensure a safe minimum distance to prevent fire spread. In addition, access for fire trucks and equipment is provided in compliance with the Ordinance on the Conditions for Fire Access.

The main evacuation route will be through the stairs that connect all floors of the building and have exits to the external open space at the ground floor level with the possibility of moving away from the building. An additional evacuation route will be provided by the action of professional firefighting teams for extinguishing and rescuing people and property. There are more than 2 independent exits from the building, some of which are provided as security. There is also an independent exit from the dormitories directly to the open outdoor safe space.

Evacuation from Building 1A - the evacuation from the ground floor is possible directly to the outdoors through 2 double doors (180 cm wide) and a single door (100 cm wide).

Evacuation from Building 1B – the evacuation from the ground floor is possible:

- from the entrance area through the 320 cm wide automatic door directly to the outdoors
- from the multipurpose hall directly to the outdoors through 4 double doors (width 180 cm), across the corridor to the 250 cm wide double doors directly to the outdoors and through the entrance space

- from the living room, staff room, and library through 3 single-wing doors 100 cm wide directly to the outdoor and through the corridor to the entrance area
- from the wine cellar and the adjoining room through 2 single-wing doors with a width of 100 cm and double doors 280 cm wide door directly to the outside area
- from the sensory evaluation of wine and the associated room via 3 single-leaf doors with a width of 100 cm directly to the outside space

Evacuation from the 1st floor is possible through the corridors to the nearest stairs.

There are 4 staircases:

- staircase of the dormitory: 125 cm
- central staircase: 120 cm
- staircase of the east wing: 120 cm
- staircase of the east wing: 120 cm

The stairs of the east wing are designed for safety and have exits directly to the outdoor area.

**Evacuation from Building 1C** - The evacuation from the ground floor is possible directly to the outside through 2 double doors (250 cm)) and a single door (100 sm).

### **3.5.5 Equipping of the buildings 1A, 1B and 1C in Duilovo - Split**

The Equipment Design and Bill of Quantity is developed for the Center for Advanced Analytics i.e. building 1A, 1B, and 1C in Duilovo, Split. The instruments procured as part of the project do not emit ionizing radiation in the conventional sense.

The equipment that is planned in the Equipment Desing and Bill of Quantities:

- Scientific Research Equipment,
- Ready-Made Furniture and Custom-Made Furniture,
- Laboratory Furniture,
- IT Equipment and Multimedia,
- equipment for video surveillance and telecommunications equipment and
- equipment for maintaining the open and traffic areas.

The core part of the Sub-project is the scientific research equipment which is organized into four categories:

1. Elemental Equipment
2. Genomics Equipment
3. Controlled Conditions Equipment
4. Metabolomics Equipment

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Category	Equipment
<b>Elemental Equipment</b>	<ul style="list-style-type: none"> <li>• Elemental analyzer for determining carbon, hydrogen, nitrogen, sulfur, and oxygen,</li> <li>• Microwave digestion system,</li> <li>• Mass spectrometry with inductively coupled plasma,</li> <li>• Inductively coupled plasma with optical emission spectrometry,</li> <li>• UV/Vis spectrophotometry of high photometric performance,</li> <li>• Ion chromatograph,</li> <li>• Fourier transform infrared spectroscopy,</li> <li>• Digestion system according to Kjeldah,</li> <li>• Lyophilizer.</li> </ul>
<b>Genomics Equipment</b>	<p>The most important Genomics Equipment are:</p> <ul style="list-style-type: none"> <li>• Next Generation Sequencer (NGS)</li> <li>• Third generation sequencer (NGS)</li> <li>• Device for capillary electrophoresis</li> <li>• Real-time PCR device</li> <li>• Nano-photometer</li> <li>• Cryohomogenizer</li> <li>• Bioanalyzer</li> <li>• Spectrophotometer</li> <li>• Autoclave</li> <li>• Lyophilizer</li> <li>• Equipment for bioinformatics research</li> <li>• Laminar</li> <li>• Benchtop flow cytometer</li> <li>• Fluorescent research microscope with camera.</li> </ul>
<b>Controlled Conditions Equipment</b>	<p>The most important Controlled Conditions Equipment are:</p> <ul style="list-style-type: none"> <li>• Walk-in growth chamber</li> <li>• Small growth chamber</li> <li>• Separator</li> <li>• Biological filter for vegetable water</li> <li>• Chamber dryer for fruits, vegetables, and medicinal herbs</li> <li>• Chopper for preparing plant material for essential oils</li> <li>• Walk-in cold storage (post-harvest)</li> <li>• Plant for the extraction of conifer seeds</li> <li>• Microwave assisted distillation and extraction system</li> <li>• Liquid nitrogen tank</li> <li>• Water distillation system</li> <li>• Digester</li> </ul>
<b>Metabolomics Equipment</b>	<ul style="list-style-type: none"> <li>• Gas chromatograph - mass spectrometer</li> <li>• Liquid chromatograph - mass spectrometer</li> <li>• MALDI TOF mass spectrometer</li> <li>• Gas chromatograph - TOF mass spectrometer</li> <li>• FTIR spectrophotometer for automatic analysis of wine and must</li> <li>• Automatic fat and oil extractor</li> <li>• SPE Vacuum Automatic</li> </ul>

Category	Equipment
	<ul style="list-style-type: none"> <li>• Rotary vacuum evaporator</li> <li>• Water bath</li> <li>• Lyophilizer</li> </ul>

### 3.6 Sub-component 2: Improvement of 2 existing buildings at the location in Kaštel Stari

#### 3.6.1 Background information and current state at the site

Approximately 20 km west from the main location in Duilovo – Split, in Kaštel Stari, the building with experimental oil mill and auxiliary building are located. Both buildings are situated at the c.p. No. 1492/1, c.m. Kaštel Stari (on flat terrain), and were built in 1939. They are surrounded by approx. 5 ha of experimental plantations. Besides the c.p. No. 1492/1, the Institute’s property comprises a series of cadastral parcels, all in c.m. Kaštel Stari. The property is divided into two parts – the southern and northern part. (Figure 18)

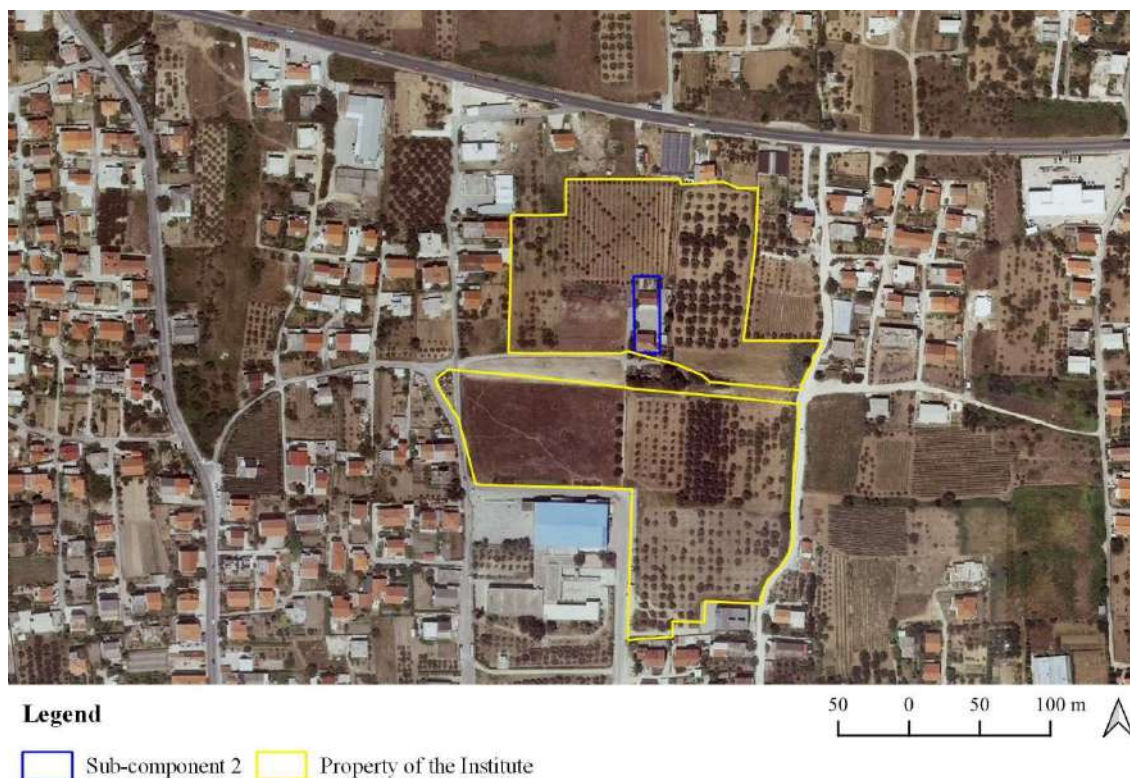


Figure 18. The location of the Sub-component 2 within the property of the Institute (Kaštel Stari)

Largest part of the site are *ex situ* collection plantations of Mediterranean plants, mostly olive orchards for research purposes (Table 5).

Table 5. Ex situ Field Collection Plantations in Kaštel Stari

Plantation		Cadastral Parcel No., Cadastral Municipality Kaštel Stari	Area (m <sup>2</sup> )
<b>OLIVE</b>	domestic, domesticated and introduced varieties	1489/1; 1489/2	6,000
	domestic	1480	3,000
	autochthonous, domesticated, introduced, wild and hybrid varieties	1493; 1475; 1476/2; 1477; 1478/2; 1483; 1481; 1474/5; 1472/1; 1471/1; 1470/1; 1474/7; 1472/4; 1471/3; 1470/3; 1474/6; 1472/3; 1472/2	25,000
<b>POMEGRANATE</b>	introduced varieties	1492/2; 1492/1	4,200
<b>IMMORTELLE</b>	domestic genotypes	1484	400
<b>LAVANDER AND DALMATIAN PYRETHRUM</b>	domestic genotypes	1484	1,000
<b>TOTAL AREA</b>			<b>39,600</b>

Cadastral parcel no. 1492/1 with the auxiliary building (Building 2A) and experimental oil mill (Building 2B) is situated in the middle of the northern half of the property. These buildings are the subject of the Sub-component 2 of the Sub-project. There is also the other building on the parcel – auxiliary laboratory, which is not subject of this Sub-project.

The auxiliary building is mixed-use – business and residential use. The basement and attic are the property of the Institute and the ground floor and first floor are in residential use and are the property of former employees of the Institute. The gross areas of the buildings are:

- Residential - business building (2A) (Figure 20, Figure 21, Figure 22)... 457 m<sup>2</sup>
- Experimental oil mill (2B) (Figure 23, Figure 24) ..... 170 m<sup>2</sup>

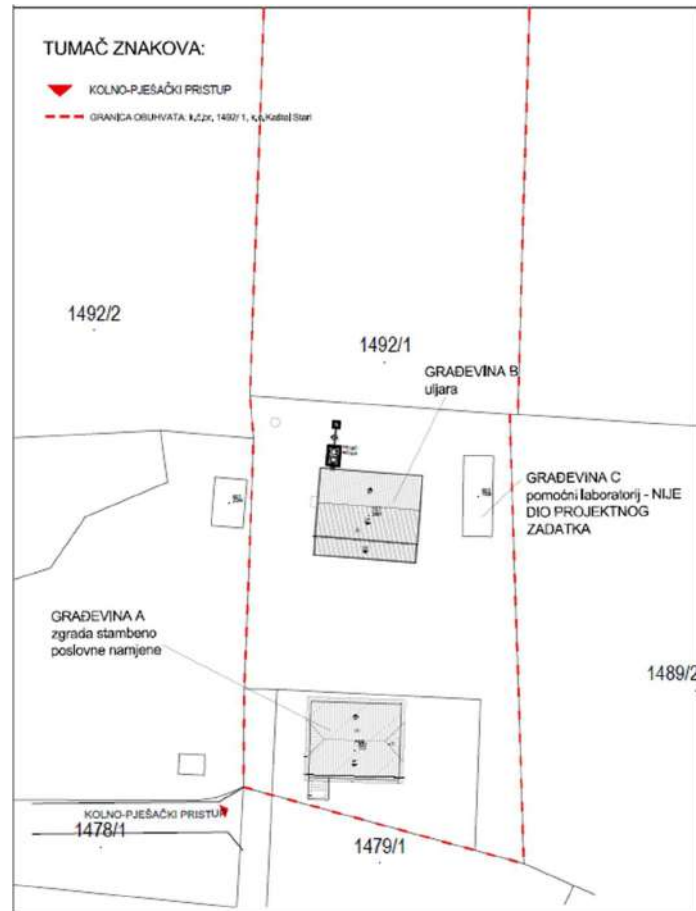


Figure 19. Existing Site Plan, cadastral parcel No. 1492/1, cadastral municipality Kaštel Stari; source: Main Design, 02/2023



Figure 20. The existing Building 2A planned for improvement of basement and attic



*Figure 21. The basement of the Building 2A*



*Figure 22. The attic of the Building 2A*



*Figure 23. The existing Building 2B (experimental oil mill) planned for improvement*





Figure 24. Rooms in the Building 2B

### 3.6.2 Spatial parameters

Table 6 shows the spatial parameters of the Sub-component 2

Table 6. Spatial parameters of the Sub-component 2 - Gross Area

Building	Stories	Gross Area
Building 2A – auxiliary	Basement (107 m <sup>2</sup> ) & attic 117 m <sup>2</sup> ground floor and first floor (not subject of Sub-project)	224 m <sup>2</sup>
Building 2B – oil mill	Ground floor	122 m <sup>2</sup>
<b>Total</b>		<b>346 m<sup>2</sup></b>

### 3.6.3 Technical Description

The improvement of buildings 2A and 2B are planned, as well as construction of a watertight collection pit. The total area of the building plot is 4,654 m<sup>2</sup>. Works will be carried out following the Ordinance on Simple and Other Buildings and Works i.e. no building permit is needed for the planned construction works.

The improvements of Buildings 2A & 2B are planned within the existing volume i.e. both footprint and gross area will not change.

#### **Building 2A**

The existing Building 2A (residential and business use) has a rectangular floor plan, dimensions 11.80 x 9.90 m, gross area of 107 m<sup>2</sup>. The activities will include the improvement of the basement and the non-residential attic. The ground floor and first floor are not subject to the Sub-project since they are not the property of the Institute.

The basement will consists of a space for collecting, sorting, and labeling samples of plant material, space for meetings, smaller presentations, and workshops on the topic of olive growing and oil production for different users, as well as women's and men's sanitary facilities.

In the unused attic (gross area of 117 m<sup>2</sup>), works will include raising the roof by 60 cm, changing the roof structure, adding thermal insulation, and waterproofing.

The basement walls will be thermally insulated both outside and inside. It is also planned to install waterproofing on the outside, and where it is not possible, on the inside of the external load-bearing walls. No significant changes in the buildings exterior will take place.

### **Building 2B**

The existing Building 2B is an experimental oil mill. The floor plan of the building is 13.35 m x 11.4 m, ground floor height, and a sloping gable roof. The gross area is 122 m<sup>2</sup>.

The internal layout of the space will be changed by the need to create men's and women's toilets and toilets for people with disabilities and reduced mobility. The old plant of the mill will not be changed, and the plant itself will be preserved for educational purposes. After the improvement works include installation of a new modern oil mill. Walls and ceiling towards the unheated attic will be thermally insulated, on the inside, to reduce heat losses, i.e. to improve the energy efficiency of the building.

The existing canopy 1 is also rectangular in plan, measuring 13.35 x 2.52 m, designed as a single roof, with a slope to the south. Due to poor condition, a new replacement canopy will be constructed, and a system of photovoltaic panels will be installed.

### **Structural design**

The location is within the area of VII. degree of the MCS (Mercalli - Cancani - Sieberg) scale (very strong earthquake, chimneys collapse, tiles fall from the roof, house walls crack) for a return period of 475 years. Looking at the return period of 95 years they are in the zone of VI. level of the MCS scale.

The buildings 2A & 2B were built in 1939. The retrofitting of the structures is not designed according to Eurocode 8: Design of structures for earthquake resistance. The retrofitting does not have a negative impact on the technical properties of the buildings as the Article 24. Of the Technical Regulation for Building Structures (OG 17/17, 75/20, 7/22) prescribes. Moreover, the reconstruction of the floor structure between first floor and attic of building A is a composite ceiling structure (timber & reinforced concrete) that will improve seismic stability and resistance.

### **Water supply**

Buildings will be supplied with the necessary amounts of water through the existing connection to the public water supply network. Existing connection satisfies the capacity, and its reconstruction is not foreseen.

### **Wastewater collection and management**

Rainwater from the roofs of both buildings will be discharged onto the surrounding land to water green areas. The discharge will be designed to prevent localized flooding as well as soil erosion and other degradation of soil in the regular as well as extreme weather conditions.

Partial reconstruction of the existing sanitary water collection system will be conducted in order to enable the acceptance of the designed installations. The following works will be carried out: sewage vertical sanitary and fecal sewage with polypropylene low-noise pipes, sewage distribution from sanitary devices, distribution inside the building, and external distribution to the new watertight collection pit north of the Building 2B.

In Building 2A, an internal pipeline system for wastewater drainage was built and will be retained and the sanitary wastewater will be collected in the pit north of the Building B.

In Building 2B, all wastewater from the olive processing plant is drained via an independent grease sewage installation to the existing oil separator. After treatment, wastewater is discharged into the existing internal sanitary drainage system. For the needs of the oil mill, a protective pipe DN150 is planned for the subsequent laying of the drainage pipe of the thin

pomace to the intended composting plant. The exact method of discharge, i.e. the operation of the composting plant and the characteristics of the compost are not the subject of the Main Design.

### **Electrical installations**

Electrical installations in the Building 2A includes the lighting, sockets, computer installation and power supply of thermotechnical devices.

In Building 2B, the existing connection power in the direction of taking over from the network is 13.80 kW. Due to the supply of a new oil mill, it will be necessary to increase the connected power to 17.25 kW.

The photo-voltaic power plant will be installed on the roof of Building 2B with the purpose of producing electricity that would be used for the own needs. Photovoltaic power plant, located on the replacement canopy will reduce the need for electricity from the network. A total of 11 photovoltaic modules are planned, each with a power of 450W in one string. The peak power of the power plant is  $11 \cdot 450 \text{ W} = 4950 \text{ Wp}$ . The planned production of the power plant is 6190 kWh/year. This would cover most of the annual consumption.

### **Mechanical installations (heating, cooling and ventilation)**

For the needs of heating and cooling of both buildings, a split air conditioning system will be installed in the construction of an air-to-air heat pump. The outdoor unit of the split system will be protected from weather conditions, with a built-in inverter compressor, air-cooled condenser and all necessary elements for protection, control and regulation of the device and functional operation. The working substance is R32, which has a much smaller effect on climate change because it contributes to reducing the amount of partially halogenated fluorinated hydrocarbons (HFC). An anti-vibration barrier (anti-vibration rubber pads) of the outdoor air conditioning unit will mitigate the noise transmission from the device housing to the load-bearing structure. The wall-mounted indoor units with a mask are equipped with a fan, a three-speed electric motor, a heat exchanger with direct freon expansion, and all the necessary elements for protection, control and regulation of the device and temperature.

### **Traffic and parking lots at the location**

Vehicular and pedestrian access will be achieved from the public road Put Banovine in the southwest corner of the building plot.

The common parking lot will be located in the area between buildings 2A and 2B in such a way that three parking spaces west of building B and one of the seven located along the eastern border will belong to Building 2B (oil mills), while the others will belong to the Building 2A. This separate place along the eastern border of the building plot will be suitable for people with reduced mobility because that parking spot will be closest to the entrance to the Building 2B.

### **Accessibility of the building to persons with disabilities and persons with reduced mobility**

Building 2A is not subject to the requirements of the Ordinance on ensuring the accessibility of buildings for people with disabilities and reduced mobility.

Building 2B (oil mill) will be accessible for people with disabilities and reduced mobility. The access to the building will be secured from the north side and near the entrance the toilet for people with disabilities. Communication in the building is without thresholds. The parking space closest to the north entrance is designed for people with reduced mobility.

### 3.6.4 Project activities

#### Preparatory works

Due to the Sub-project blended financing, the DIGIT Project & NRRP, the design documentation was developed before the ESMP as required in the Call for proposal for direct award - since the Call encompasses both funding sources, and the DIGIT Project also required the documentation to be completed in advance. Table 7 shows documentation prepared in the process of realization the Sub-project.

*Table 7. Design documentation prepared for 2 building in Kaštel Stari*

<b>Mandatory documents/permits</b>	<b>Status</b>	<b>Year</b>	<b>Comments</b>
<b>Conceptual Design</b>	YES	December 2022	Design Company: STUDIO NEXAR Ltd., Ivanec & Split
<b>Main Design</b>	YES	February 2023	Design Company: STUDIO NEXAR Ltd., Ivanec & Split Main Designs for 2A & 2B building have been prepared. It includes the following folders: <ul style="list-style-type: none"> <li>• Folder 1/6: Architectural Design</li> <li>• Folder 2/6: Rational Use of Energy and Thermal and Acoustic Design</li> <li>• Folder 3/6: Structural Design</li> <li>• Folder 4/6: Electrical Installations Design</li> <li>• Folder 5/6: Mechanical Installations Design (heating, cooling, ventilation)</li> <li>• Folder 6/6: Hydrotechnical Installations Design</li> </ul> The following studies are part of the Main Design <ul style="list-style-type: none"> <li>• Occupational safety study</li> <li>• Fire Protection Measures</li> </ul>
<b>Building Permit</b>	n/a		Not required to obtain a building permit for the planned construction works according to the Ordinance on Simple and Other Buildings and Works (OG 112/17, 34/18, 36/19, 98/19, 31/20, 74/22, 155/23) Article 3 Points 1, 3, 5, Point 11, Sub-point a; Article 5, Point 2, Point 3, Sub-points c & d, Point 9, Sub-point a
<b>Bill of Quantities (Building 2A)</b>	YES	February 2023	Developed based on the Main Design.
<b>Bill of Quantities (Building 2B)</b>	YES	September 2024; October 2023	Developed based on the Main Design; Equipment - The olive oil plant is listed in the Equipment Bill of Quantities for location in Duilovo (Design Company: Mijić Haklička Studio Ltd)
<b>Detailed Technical Design of the Roof for building 2A</b>	YES	October 2024	Design Company: STUDIO NEXAR Ltd., Ivanec & Split The Detailed Technical Design of the Roof (including the floor structure between the first floor and the attic) was developed to ensure that no damage will be done to the apartment on the first floor during construction.

### **Construction works and as-built documentation**

For the Sub-component 2, Main design was prepared. Building Permit was not required. Bidding document for civil works is under preparation. It is expected that civil works will start in February 2025 and will last until the end of June 2026.

The civil works will include:

- Demolition and dismantling: dismantling the existing roof of the Building 2A, removal of bearing and partition walls (stone, concrete, brick...), removal of window and door disassembly
- Excavation: mechanical excavation for the watertight collection pit
- Concrete, reinforced concrete works.
- Masonry and carpentry works.
- Insulation works.
- Installation works.
- Interior works.
- Landscaping.

The access to the construction site will be established through the existing Put Banovine Street. Contractor shall develop as-built documentation according to the specifications in the Bidding Document.

### **Expected type, quantities and location of flammable liquids, gases and other substances that are stored or used**

The following hazardous materials will be used on the construction site: oil D-1 and D-2 for driving machines and vehicles, and oil for lubrication. All hazardous materials that will be used on the construction site will be brought in smaller quantities. Storage of flammable liquids and gases is not planned at the locations.

### **Fire safety**

Evacuation from Building 2A (basement, ground floor, first floor & attic) is possible via staircase directly to the outside through the northern and southern exits. However, these exits are not officially designated as evacuation routes in the Main Design.

Evacuation from Building 2B (single-storey) is possible four double doors, each 120 cm and 140 cm wide, leading directly to the outside. Both rooms in this building will have two exits, positioned on opposite sides.

### **3.6.5 Equipping of the two buildings in Kaštel Stari**

It is planned to install mini oil mill plan in the Building 2B.

The mini oil mill with a capacity of 150 to 200 kg/h works in 2 phases. The by-product of olive oil production in two phases is olive pomace. This by-product consists of olive residues after oil extraction, including stones, skin, pulp, and minor residual oil content, which will be stored in a concrete insulated collection pit. In the two-stage olive oil production process, no water is added, which results in smaller amounts of waste water compared to the traditional three-stage process.

The pomace produced in this process will be recycled and reused in several ways:

- Agricultural use: as organic fertilizer
- Composting: the pomace will be composted and used to improve soil quality.
- Raw material for heating: in case of production of larger quantities.

Note: Wastewater and waste management from olive oil production and characteristics of the compost pit are not elaborated in the Main Design and shall be elaborated in detailed design.

To ensure all aspects of the ecological disposal of by-products by ecological standards and the law:

- wastewater and waste management will be taken into account
- monitoring and reporting: the oil mill will have a monitoring and reporting system for the management of by-products to ensure transparency and compliance with environmental standards and laws. Regular monitoring will enable timely identification and resolution of potential problems.

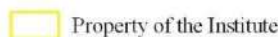
### **3.7 Sub-component 3: The Improvement Works of Existing Technological Infrastructure and Landscaping at the Location in Duilovo, Split**

#### **3.7.1 Background information**

The property of the Institute in Duilovo, Split is approx. 10 h, of which approx 3 ha are experimental fields with collection plantations of Mediterranean plant species and areas for plants growing under controlled conditions, vegetative chambers, and greenhouses. There are two auxiliary buildings on the site, one of which is in use as an experimental wine cellar. At the site in Duilovo, there are several greenhouses, intended for research under controlled conditions. Three greenhouses with a total area of 2,000 m<sup>2</sup> are currently in operation. (Figure 25)



#### **Legend**

 Property of the Institute  Sub-component 3


100 0 100 200 m 

Figure 25. The location of the Sub-component 3 within the property of the Institute (Duilovo-Split)

Large part of the site is *ex situ* collection plantations of Mediterranean plants for research purposes. All planted varieties present non-invasive species and are allowed under the law. (Table 8).

Table 8. *Ex situ* Field Collection Plantations in Duilovo, Split

Plantation		Cadastral parcel, cadastral municipality Split	Area (m <sup>2</sup> )
<b>OLIVE</b>	domestic and domesticated varieties	7374	2,100
	introduced varieties	7389/1	3,500
	2-year-old collection plantation of cultivated, wild and hybrid olives	7362; 7363; 7373; 7456/2; 7455/2	4,000
<b>FIGS</b>	domestic and domesticated varieties	7377/1	3,600
<b>ALMONDS</b>	domestic and domesticated varieties	10285/2; 10285/3; 10289/1; 10286/1	3,600
<b>MARASCA SOUR CHERRIES</b>	domestic varieties	10286/1	1,100
<b>CHERRIES (due to age, diseases and pests a large number of plants have failed)</b>	domestic, domesticated and introduced varieties	7368/1; 7368/2; 7369	1,500
	domestic, domesticated and introduced varieties	7366	900
	introduced varieties	7364/1	2,100
<b>POMEGRANATE</b>	domestic and domesticated varieties	7367	700
<b>GRAPEVINE</b>	autochthonous grape varieties	7373	5,000
	virus-free grape varieties	13922/6	800
<b>IMMORTELLE</b>	domestic genotypes	7377/1	400
<b>SAGE</b>	domestic genotypes	7377/1	600
<b>SEA FENNEL</b>	domestic and introduced genotypes/equitypes	10286/2	600
<b>VEGETABLES (onions and legumes...)</b>		7393, 10286/2, 10286/1	2,000
<b>TOTAL AREA</b>			<b>32,500</b>



*Figure 26. Experimental fields (western part)*



*Figure 27. Greenhouses*



*Figure 28. Auxiliary building 1 (Storage – cadastral parcel no. 7372) for storing tools, etc.*



*Figure 29. Auxiliary building 2 (Storage – cadastral parcel no. 7391; experimental wine cellar)*





Figure 30. Area of the future forestry educational demonstration park (Location 2 'Karst Landscape')

The area designated for the future forestry educational demonstration park (Location 1 “Nature in the city”) is located on a relatively flat terrain, with prominent stone structures on the north side. In the north, it borders the existing 150 m long path, while the southern side is bounded by a wall that separates it from the utilitarian garden in a length of approx. 56 m. The wall is partly of concrete construction, and partly of live stone. On the west side there is a landscaped olive grove bordering the 15 m plot, while some buildings are built on the east side. A dry ditch of approx. 12 m in length and 0.5 m in width runs through the middle of the area in a north-south direction. In the central part, there is a neglected and completely demolished wooden shack with an area of approx. 100 m<sup>2</sup>, to which an electricity cable laid on the ground leads. There is also a part of neglected drywall. The area is overgrown and access to the surface is possible only from its southern side. The area is overgrown and neglected and largely impassable (70% trees and bushes, 30% low vegetation). The following species are recorded: olive (*Olea europaea* L.), almond (*Prunus dulcis* L.), common fig (*Ficus carica* L.), mahaleb cherry (*Prunus mahaleb* L.), pubescent oak (*Quercus pubescens* Willd), evergreen oak (*Quercus ilex* L.), aleppo pine (*Pinus halepensis* Miller), broad-leaved phillyrea (*Phillyrea latifolia* L.), pomegranate (*Punica granatum*). The area covered with maquis contains lentisc (*Pistacia lentiscus* L), bay laurel (*Laurus nobilis* L.), cade juniper (*Juniperus oxycedrus* L.), and to a lesser extent strawberry tree (*Arbutus unedo* L.) and the area where bamboo (*Bambusa* sp.). A wild nettle tree (*Celtis australis* L.) and several wild palms (*Arecaceae* spp.) were also observed. In addition, there are also grass species, Christ’s thorn tree (*Paliurus spina-christi* Mill.), butcher's broom (*Ruscus aculeatus* L.), asparagus (*Asparagus officinalis* L.), and on the slopes we find common ivy (*Hedera helix* L.), old man's beard (*Clematis vitalba* L.) and honeysuckle (*Lonicera caprifolium* L.). Iris (*Iris* sp.) also appeared next to the existing dry ditch bordered by stone, and it is the only group of species that is included in the list of Ordinance of strictly protected species. The trees are full of dry branches.

Forestry educational demonstration park at location 2 covers an area of approx. 2,100 m<sup>2</sup>. On the north side it is bordered by a stone wall, while the arable land of the Institute is on the south side. On the eastern side, it is bordered by Vrgoracka Street. A macadam path 1 m wide runs across the area in an east-west direction, which descends more steeply towards the south. On

the north side, the area is terraced with the existing stone sub-walls. Greater damage to the supporting walls was observed. The surface is overgrown, and inside it there are several narrow "goat" paths. The terrain is rocky and relatively steep and consists of 4 terraces separated by stone walls (drywall) (Figure 31).

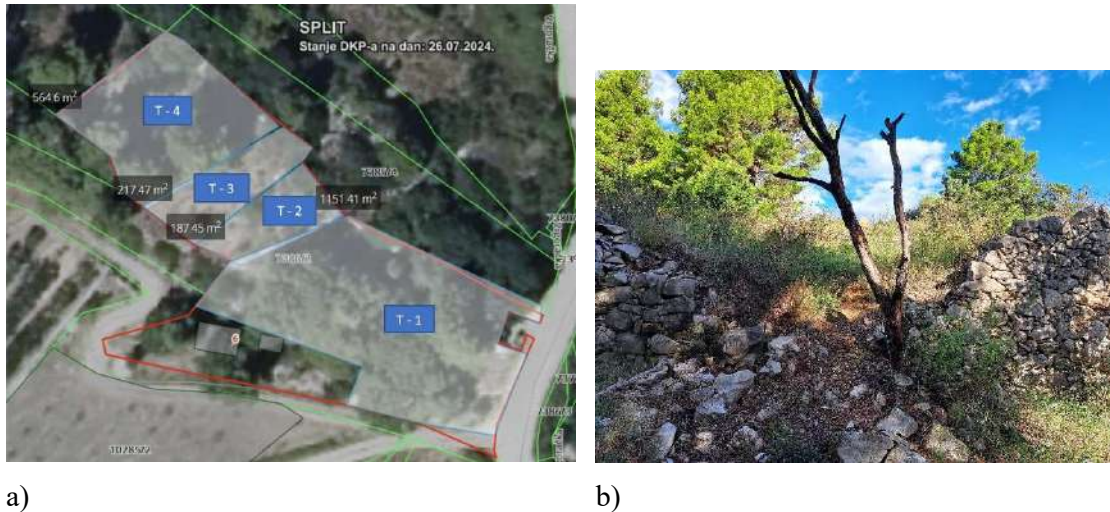


Figure 31. Terraces at the future Forestry educational demonstration park at location 2 (a) and damaged drywall planned to be removed (b)

Occasionally erosion may occur at several parts of few meters wide, mainly where the drywalls are already damaged. However, that occurs rarely because the surface soil is usually overgrown with vegetation. According to the Institute's experience so far, there was only one event of the erosion at that location. There are two approaches to the area, one from the Institute, and the other from the direction of Vrgoracka Street. On the northwest side there is a group of white limestone rocks. The main plant species found at this location is the Aleppo pine (a total of 50 individuals with a trunk diameter of 10-50 cm and a height of up to 24 meters). There are also groups of lentisc, young evergreen oaks, laurel bushes and cade juniper. There are also strawberry trees, broad-leaved phillyrea and manna ash (*Fraxinus ornus* L.). The parterres are overgrown with grass in places. The central part is less overgrown, while the densest vegetation is located on the southeastern and southwestern parts of the surface. On the northwestern part of the surface there is a bare part of the rock and an open communication with the institute building is visible. A lot of dry bushes and branches were observed, as well as the poor vitality of aleppo pine trees. As there is a potential danger to people and property, 12 trees must be removed.

### 3.7.2 Technical description

Sub-component 3 consists of improvement of existing technological infrastructure (greenhouse, ancillary facilities) and landscaping of open areas in Duilovo – Split. The following activities are planned (Figure 32):

- 3.1 Reconstruction of the greenhouse for growing and researching agricultural crops when planting in the soil (dismantling of the greenhouse "Bubalo" and construction of a new greenhouse)
- 3.2 Structural improvement of 2 existing auxiliary buildings

- 3.3.1 Fencing the Institute's property
- 3.3.2 Construction and rehabilitation of the macadam paths and access ramps
- 3.4 Arranging and landscaping two forestry educational demonstration parks

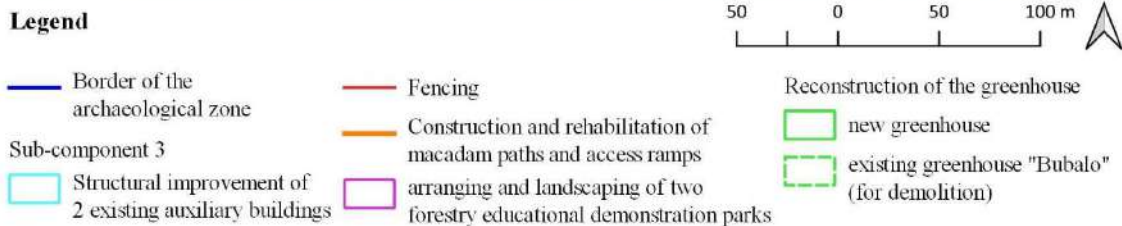
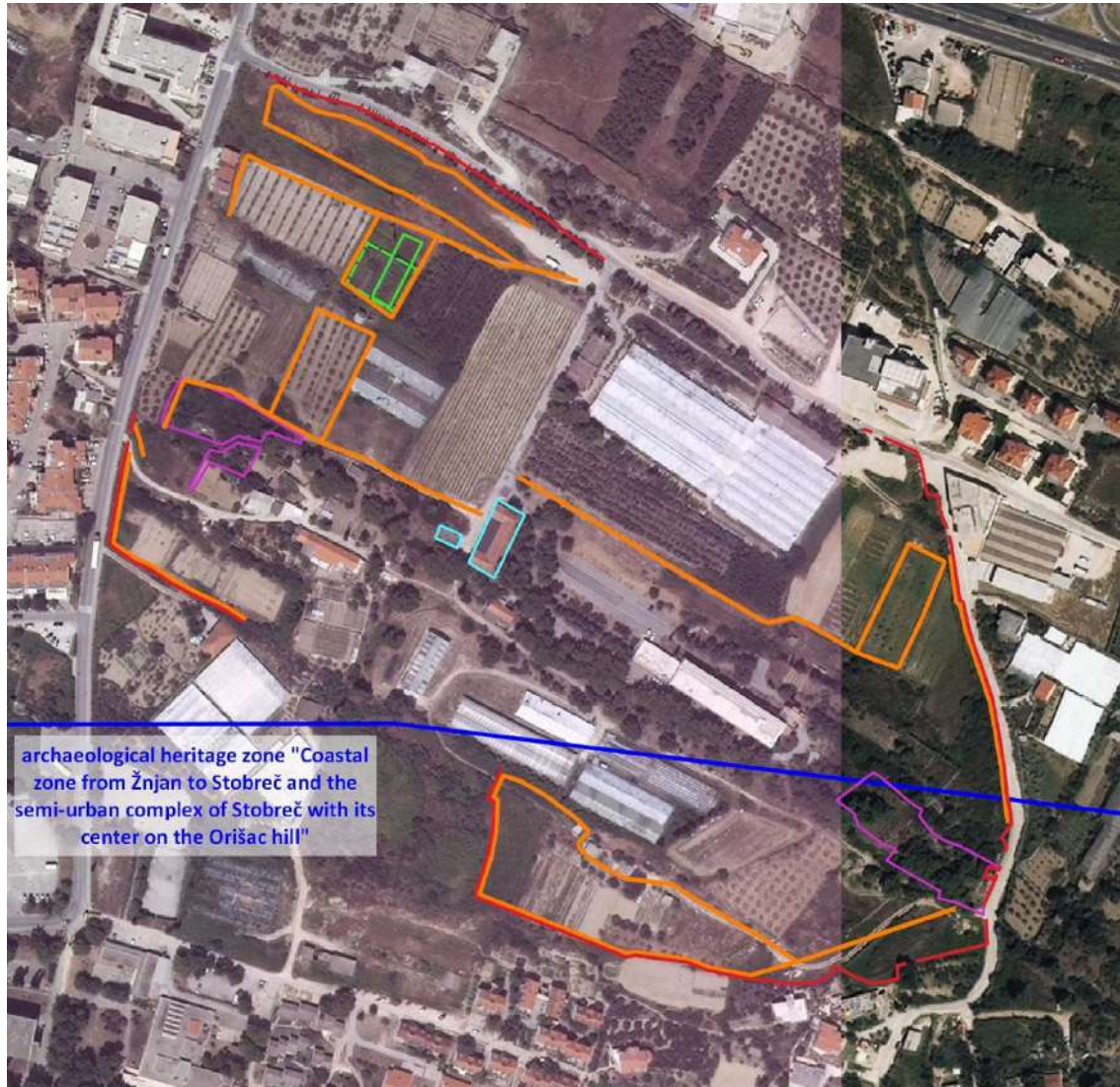


Figure 32. Location of Sub-component 3 - Improvement Works in Duilovo – Split, overlapped with the Area of Archaeological Heritage “The coastal zone from Žnjan to Stobreč, including the semi-urban area of Stobreč centred on the Orišac hill”

### **Sub-component 3.1. Reconstruction of the greenhouse**

Due to exposure to extreme environmental factors and age, the existing greenhouse ‘Bubalo’ is planned to be replaced by a new greenhouse. The greenhouse is used for growing and researching crops.

Greenhouse ‘Bubalo’ has floorplan dimensions of 28,7 m x 27,7 m and a height 3,05 m (footprint area of 737,6 m<sup>2</sup>). The new greenhouse will have a floorplan dimension of 10,0 m x 36,0 m and a height 4,8 m (footprint area of 360 m<sup>2</sup>).

The dismantling and construction is performed on the c.p. 7364/2 in the c.m. Split.

### **Sub-component 3.2. Structural improvement of 2 existing auxiliary buildings**

#### **Storage – cadastral parcel no. 7372**

Located at c.p. no. 7372, with a floor plan area of 41 m<sup>2</sup>, the building is single-story, with a gable roof with structural damage. The structural improvements including the renewal of the roof are planned.

In the Main Structural Design, structural stability was tested by analyzing the structural system, which satisfies the condition that the ratio of the surface area of the walls in both directions is greater than the gross surface area of the floor plan. Damage from wear and tear and weathering will be repaired.

The low single-story building with a single roofed rectangular floor plan and massive stone walls is stable and resistant to seismic impacts; seismic force is transmitted to the ground by shear therefore no bending and no need for seismic reinforcing steel in walls.

#### **Storage – cadastral parcel no. 7391**

The building is located at c.p. no. 7391, with an area of 1007 m<sup>2</sup>, while the ground floor building has a total area of 481 m<sup>2</sup>. The building is used as an experimental wine cellar and storage. The structural improvements include the renewal of the roof, replacement of doors and windows, new and thermal façade plaster, and lightning protection.

In the Main Structural Design, structural stability was tested by analyzing the structural system, which satisfies the condition that the ratio of the surface area of the walls in both directions is greater than the gross surface area of the floor plan. Damage from wear and tear and weathering will be repaired.

The building was originally designed to have sufficient seismic resistance. U floor plan, height ground floor and attic, 30 to 40 cm thick walls is in accordance with Eurocode 8.

### **Sub-component 3.3.1, Fencing**

The fence around the Institute’s property is foreseen. Fencing includes - the construction of fence walls with a maximum height of up to 1.60 m and supporting walls with a maximum height of up to 1.0 m, construction, and installation of fences with a maximum height of up to 1.60 m, placed on fence walls or individual foundations.

The fencing is planned on the c.p. 7362, 7363, 7374, 7377/1, 7386/2, 10289/1, 10285/3, 10286/1, 10286/2, 7397/1, 7385/1, 7376/1 in the c.m. Split.

### **Sub-component 3.3.2. Construction and rehabilitation of the macadam paths and access ramps**

Concerning the configuration of the terrain, macadam paths should be built or improved, including ramps for the maintenance machinery access and execution of works on plantations.

The works are planned on the c.p. 7362, 7363, 7374, 7373, 7364/1, 7364/2, 7366, 7367, 7368/1, 7368/2, 7369, 7371, 7372, 7397/1, 7389/1, 7377/1, 10285/2, 10285/3, 10286/1 & 10286/2 in the Cadastral Municipality Split.

### **Sub-component 3.4. Arranging and landscaping two forestry educational demonstration parks**

Two areas, west (Location 1) and east (Location 2) of the main Institute's building, are planned for the forestry educational demonstration parks. The landscaping is envisaged predominantly by planting trees, and to a lesser extent by shrubs and aromatic herbs and keeping existing greenery as much as possible. The demonstrative research facilities and facilities for rest will be installed. The purpose of these parks is education on the biodiversity of Mediterranean plant species and the presentation of the research work.

Location 1 - 'Nature in the City': The forestry educational demonstration park is planned on parts of the c.p. 7366, 7367, 7397/1, 7368/1 & 7368/2 in the c.m. Split, with of approx. 1500 m<sup>2</sup> and the theme 'Nature in the City'. The installation of gazebo/canopy, 20 m<sup>2</sup>, a wooden 'bridge' over a dry ditch and 8 wooden benches is planned. In total, 22 trees will be removed (6 aleppo pines, 8 olive trees, 4 laurels, and 1 of the following trees: pubescent oak, evergreen oak, almond and fig).

While keeping as much as possible existing plants, cleaning the area of aggressive plant species and dry branches, sanitary sewer and planting the new material is planned to form six landscape areas:

1. Fruits, spices, Dalmatian pyrethrum
2. Lentisk, laurel, cade juniper
3. Pine forest
4. Evergreen oak forest
5. Oak forest (pubescent oak, cork oak, turkey oak)

Location 2 - 'Karst Landscape': The forestry educational demonstration park is planned on part of the c.p. 7386/2 in the c.m. Split, with approximately 2100 m<sup>2</sup> and the theme 'Karst Landscape'.

The area is an example of a Mediterranean drywall cascading landscape. The 150 m of drywall will be restored. Of the existing 50 trees, 15 are planned to be replaced with new plants of black pine and stone pine. The organization of places for rest and educational workshops is planned as well as amphitheatre with seating capacity of approx. 80 people.

### **3.7.3 Project activities**

#### **Preparatory works**

Table 9. shows design documentation prepared for the improvement works of existing technological infrastructure and landscaping in Duilovo – Split under Sub-component 3.

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For the construction works planned under Sub-component 3 building permit is not required (according to the Ordinance on Simple and Other Buildings and Works (OG 112/17, 34/18, 36/19, 98/19,3 1/20, 74/22, 155/23)).

*Table 9. Design documentation prepared for Sub-component 3 – The Improvement Works of Existing Technological Infrastructure and Landscaping at the Location in Duilovo, Split*

Activity	Date	Design documentation prepared	In line with the provisions of the Ordinance on Simple and Other Buildings and Works	In line with the provisions of the General Urban Plan of Split
<b>Sub-component 3.1</b> Reconstruction of the greenhouse (dismantling of the greenhouse "Bubalo" and construction of a new greenhouse)	July 2024	Bill of Quantities for dismantling of the 'Bubalo' greenhouse & Design Company: i-KONST Ltd., Višnjevac Main Structural Design for construction of the greenhouse Bill of Quantities for construction of the greenhouse	Article 4, Paragraph 1, Point 12 (Designer's statement)	Designer's statement
<b>Sub-component 3.2</b> Structural Improvement of Auxiliary Building (7372)	July 2024	Design Company: GENISTA Ltd., Split Main Structural Design Bill of Quantities	Article 3, Paragraphs 1, 2, 3; Article 5, Paragraphs 1, 9	Designer's statement
<b>Sub-component 3.2</b> Structural Improvement of Auxiliary Building (7391)	July 2024	Design Company: GENISTA Ltd., Split Main Designs includes the following folders: Folder 1/2: Structural Design Folder 2/2: Electrical Installations Design Bill of Quantities	Article 3, Paragraphs 1, 2, 3; Article 5, Paragraphs 1, 9	Designer's statement
<b>Sub-component 3.3.1</b> Fencing the Institute's property	July 2024	Design Company: KAPAR Ltd., Split Elaboration of Environmental Planning - Structural Design (Elaborat uređenja okoliša – Građevinski projekt) Bill of Quantities	Article 2, Paragraph 1; Points 3 &4; Article 3, Point 4	Designer's statement
<b>Sub-component 3.3.2</b> Construction and rehabilitation of the macadam paths & ramps				
<b>Sub-component 3.4</b> Arranging and landscaping forestry educational demonstration parks	July 2024	Design Company: VIPA d.o.o., Osijek Elaboration of Simple Work on the Arrangement of a Forestry Demo Area List of Costs		

**Construction works**

Construction works for each activity of the Sub-component 3 include:

<b>Activity</b>	<b>Construction works</b>
<b>Sub-component 3.1</b> <b>Reconstruction of the greenhouse for growing and researching agricultural crops when planting in the soil (dismantling of the greenhouse "Bubalo" and construction of a new greenhouse)</b>	<ul style="list-style-type: none"> <li>• dismantling of the "Bubalo" greenhouse (29 x 28 m)</li> <li>• construction of the greenhouse (10 x 36 m)</li> </ul>
<b>Sub-component 3.2.</b> <b>Structural improvement of existing auxiliary building 1 (c.p. 7372)</b>	<ul style="list-style-type: none"> <li>• dismantling of asbestos roofing</li> <li>• dismantling of wooden roof structure</li> <li>• structural improvement of walls</li> <li>• new carpentry roof structure</li> <li>• tile roofing</li> <li>• finishing works</li> </ul>
<b>Sub-component 3.2.</b> <b>Structural improvement of existing auxiliary building 2 (c.p. 7391)</b>	<ul style="list-style-type: none"> <li>• dismantling of tile roofing</li> <li>• dismantling of wooden roof structure</li> <li>• structural improvement of walls</li> <li>• new carpentry roof structure</li> <li>• tile roofing</li> <li>• finishing works</li> <li>• lightning protection installation</li> </ul>
<b>Sub-component 3.3.1.</b> <b>Fencing the Institute's property</b>	<ul style="list-style-type: none"> <li>• Dismantling of dilapidated parts of wire fence and fence walls</li> <li>• Fence walls and wired fence construction</li> </ul>
<b>Sub-component 3.3.2.</b> <b>Construction and rehabilitation of the macadam paths and access ramps</b>	<ul style="list-style-type: none"> <li>• Rehabilitation of existing paths and ramps</li> <li>• Construction of new paths and ramps</li> </ul>
<b>Sub-component 3.4.</b> <b>Arranging and landscaping two forestry educational demonstration parks</b>	<ul style="list-style-type: none"> <li>• cleaning the areas, shaping of trees and removal of existing dry trees</li> <li>• sowing flowering meadow at the part of the area</li> <li>• planting new trees, shrubs and perennials</li> <li>• forming the paths across the areas</li> <li>• restoring of drywalls</li> <li>• installing canopys and benches</li> </ul>

### 3.8 Do No Significant Harm principles

DNSH principle identifies six criteria for determining how each economic activity substantially contributes to protecting the ecosystem, without undermining any of the environmental goals:

<b>Climate change mitigation</b>	An economic activity must not lead to significant emissions of greenhouse gases (GHG)
<b>Climate change adaptation</b>	An economic activity must not have an increased negative impact on the current and future climate, on the activity itself or on people, nature or property
<b>Sustainable use and protection of water and marine resources</b>	An economic activity must not be detrimental to the good health of water bodies (surface, groundwater or marine) or harm its quality or reduce its ecological potential
<b>Transition to the circular economy, including waste prevention and recycling</b>	An economic activity must not result in significant inefficiencies in the use of recovered or recycled materials, increase the direct or indirect use of natural resources, or significantly increase waste or the burning or disposal thereof, causing significant long-term environmental damage.
<b>Prevention and reduction of air, water and soil pollution</b>	An economic activity must not cause increased emissions of pollutants in the air, water or soil.
<b>Protection and restoration of biodiversity and health of ecosystems.</b>	An economic activity must not harm the good condition and resilience of ecosystems or the conservation status of habitats and species, including those of interest to the Union.

The Sub-project meets all the stated requirements of the DNSH principle, meaning that it will not cause significant damage to any of the six environmental objectives listed above.

The implementation of the project will be climate and environmentally friendly, and the project is harmonized with the appropriate national and EU regulations, especially with the criteria of the EU Taxonomy. The project was prepared to be adapted to climate change and its climate resilience was ensured during the entire life cycle. The project complies with national regulations on energy efficiency. From an energy point of view, the project defines: the possibility of increasing protection from winds (it is located in an area exposed to strong north winds), effective non-flammable insulation of the building, quality of materials and the possibility of reducing energy consumption and carbon footprint, energy-efficient lighting, energy-efficient heating and similar. The buildings in Duilovo, Split are designed as a nearly zero-energy smart building (nZEB) that has very high energy properties. Both Sub-component 1 and 2 will significantly use energy from renewable sources (RES), which will be produced in and on the buildings.

The design documentation was prepared in accordance with the technical guidelines for the preparation of infrastructure for climate change in the period 2021-2022 (EC, C/2021/5430) taking into account local climate conditions and future climate change. The design documentation was prepared in accordance with the identified climate risks in the National Climate Change Adaptation Strategy in the Republic of Croatia for the period up to 2040 in relation to 2070 and the Strategic Environmental Impact Study of the Climate Change Adaptation Strategy in the Republic of Croatia for the period up to 2040 with a view to the year 2070.

The project ensures the sustainable use and protection of water and marine resources in accordance with Directive 2011/92/EU on the assessment of the effects of certain public and



private projects on the environment. All relevant water devices to be installed (showers with a mixer, faucets, toilets, etc.) are classified in the first two water consumption classes of the EU Water Label (<http://www.europeanwaterlabel.eu/>).

The Sub-project will implement circular economy practices in waste management from construction so that at least 70% of non-hazardous construction and demolition waste generated on site is prepared for reuse, recycling and other material use, including backfilling operations for waste replacing other materials, in accordance with waste hierarchy and the EU Protocol on construction waste management and demolition.

The Sub-project will not lead to a significant increase in emissions of pollutants into the air, water or soil. Measures will be taken to reduce the emission of noise, dust and pollutants during construction works. The construction parts and used materials contain asbestos in small amounts which will be properly managed, but do not contain substances of very high concern, as determined on the basis of the list of substances for which approval is required in Annex XIV. Regulation (EC) no. 1907/2006.

The Sub-project is not located in/or near areas sensitive to biological diversity (including Natura 2000, UNESCO World Heritage and Key Biodiversity Areas, as well as other protected areas under the Nature Protection Act) nor will affect them. In the area of the building plot under the Sub-component 1, there is an “original part of the environment”, which is a rocky area with autochthonous vegetation, wild bushes and flowers, which is strictly maintained with an emphasis on the preservation of biological diversity.

## **4 ENVIRONMENTAL BASELINE OF SUB-PROJECT AREA**

### **4.1 Land use**

#### **Duilovo – Split**

According to the Map 1. Use and purpose of the areas (GUP Split), the location Duilovo – Split is located in the area designated as an area of public and social purpose (D6) – higher education institution. It is surrounded by the area for business use (K) on the north side, and an area intended for mixed use (M1) on the west, east and south sides. There is small area intended for sports and recreational purposes (R) on the south (Figure 33).

The terrain is mixed – relatively flat on some parts and steep on the others (terraced area protected by drywalls at the area of future forest educational park at location 2 (east side), south-east side bordering the residential houses, east border next to the Vrgoračka street). There were occasional events of soil erosion in Duilovo-Split as a consequence of storms. The erosion occurred in the steep parts of Institute’s property (terraced area protected by drywalls and steep parts bordering the residential houses).

#### **Kaštel Stari**

According to the Map 1. Use and purpose of the areas (GUP Kaštela), the location Kaštel Stari is located in the area of particularly valuable arable land and the area for higher education purpose (P1/D6). The location is surrounded by an area intended for mixed use (M1) and the area intended for primary and secondary education. There is also a protective green and landscaped area east of the location (Figure 33).

The terrain is relatively flat with negligible risk for erosion.

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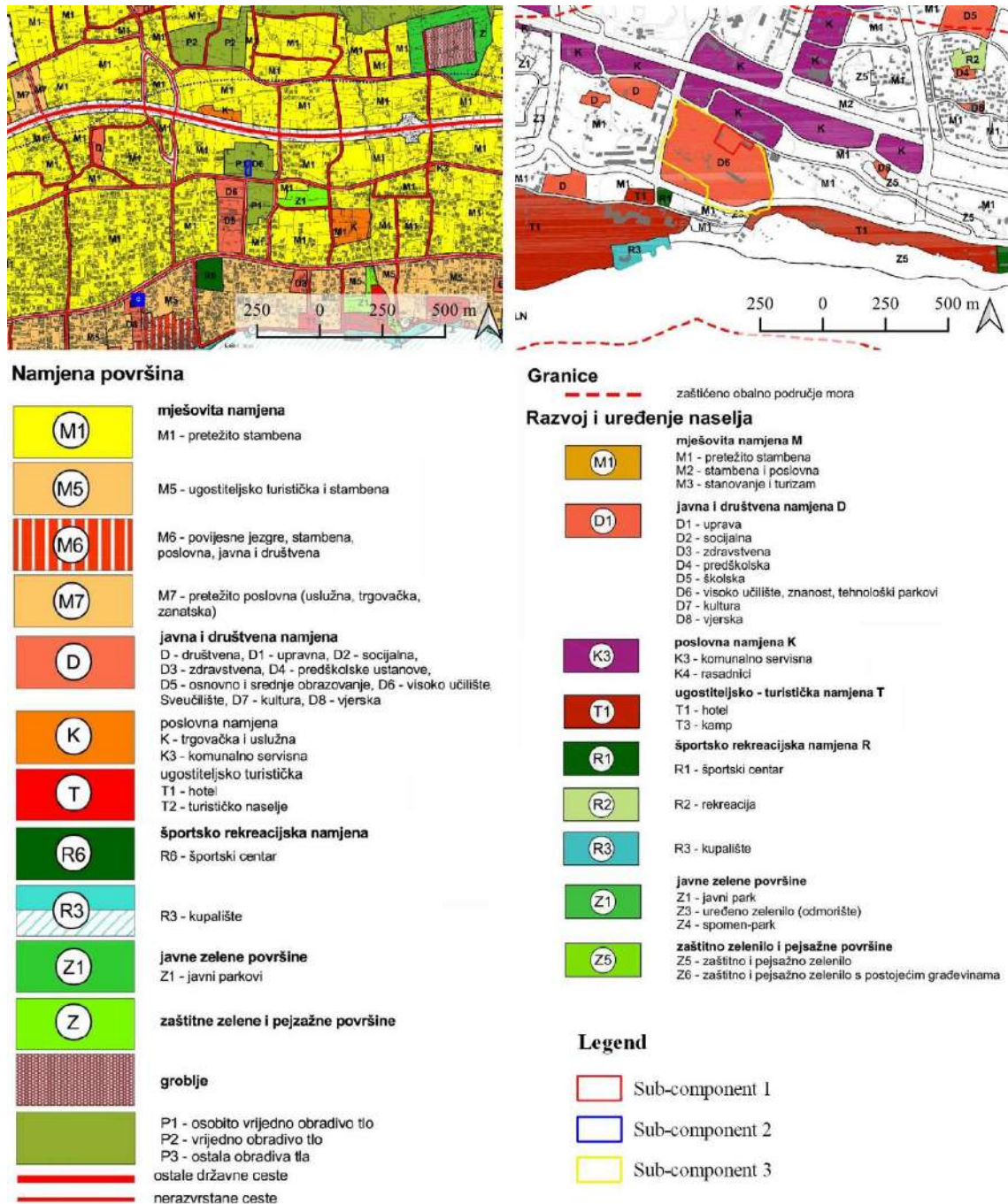


Figure 33. Excerpt from the general urban plans of the City of Kaštela (left) and of the City of Split (right) (Map 1. Use and purpose of the space)

## 4.2 Air quality

According to the Decree on the designation of zones and agglomerations according to the levels of air pollution in the territory of the Republic of Croatia (Official Gazette 1/14), the Sub-project is located within the agglomeration HR ST (City of Split), which includes both City of Split and City of Kaštela.

The nearest measuring station for air quality measurement in relation to the location Duilovo – Split is “Split-1”, at a distance of around 4 km west of the location. The nearest measuring station in relation to the location Kaštel Stari is “Kaštel Sućurac”, at the distance of around 7 km east of the location. According to the Report on air quality monitoring on the territory of the Republic of Croatia in 2022, the air quality at both stations was assessed as I. category (clean or slightly polluted air, consistent with the limit value for 1-hourly and the limit value for 24-hour concentrations with regard to the protection of human health) for PM<sub>10</sub>, PM<sub>2,5</sub>, SO<sub>2</sub>, NO<sub>2</sub>. In 2022, measurements of the ground ozone (O<sub>3</sub>) were not carried out or validated data were not available. Agglomeration HR-ST were also in compliance with the limit value for the maximum daily 8-hour values of CO concentrations with regard to the protection of human health.

## 4.3 Radon emission

Radon is formed by the radioactive decay of radium found in soil and rocks and is found everywhere in the earth's crust. Guided by various transport mechanisms, it easily exits the ground into the air. The concentration of radon in the outdoor air is small (between 5 and 15 Bqm<sup>-3</sup>) and generally it does not cause any health problems. However, it can be high in indoor air (residential houses, schools, hospitals etc.) from 10 to several thousand Bqm<sup>-3</sup> and in extreme values up to one million Bqm<sup>-3</sup>).

The main sources of radon in indoor air are: soil just below the building (85 - 90%), building materials (5 - 10 %), groundwater (about 5 %) and natural gas (less than 1 %). The parameters that affect the concentration of radon in buildings can be natural (geological composition and soil structure, climatic and meteorological parameters) and technical or technological (construction methods) as well as people's habits (ventilation of rooms, way of heating, etc.). Due to such a large number of different parameters that directly or indirectly define the concentration of radon in buildings, it is practically impossible to develop a satisfactory model that will predict the concentration of radon in the house. Therefore, direct measurement is the only correct way to assess radon risk.

The national (and EU) reference level for radon concentration in indoor air is 300 Bqm<sup>-3</sup>. So far, indoor measurements have been carried out with a total of about 6.000 detectors (727 schools, 228 kindergartens and 1.400 residential buildings) in 10 counties, however not in Split County<sup>12</sup>.

Geogenic radon potential in Split County has not been measured<sup>13</sup> (Figure 34). However, results of the measurements of radon in houses (by random selection in Croatia), average values of radon concentration in Split-Dalmatia County was very low - 1-20 Bq m<sup>-3</sup> (Figure 35).

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<sup>12</sup> <http://radon.civilna-zastita.hr/>

<sup>13</sup> <http://radon.civilna-zastita.hr/radonski-zemljovid/radon-u-tlu/grp-po-zupanijama/>

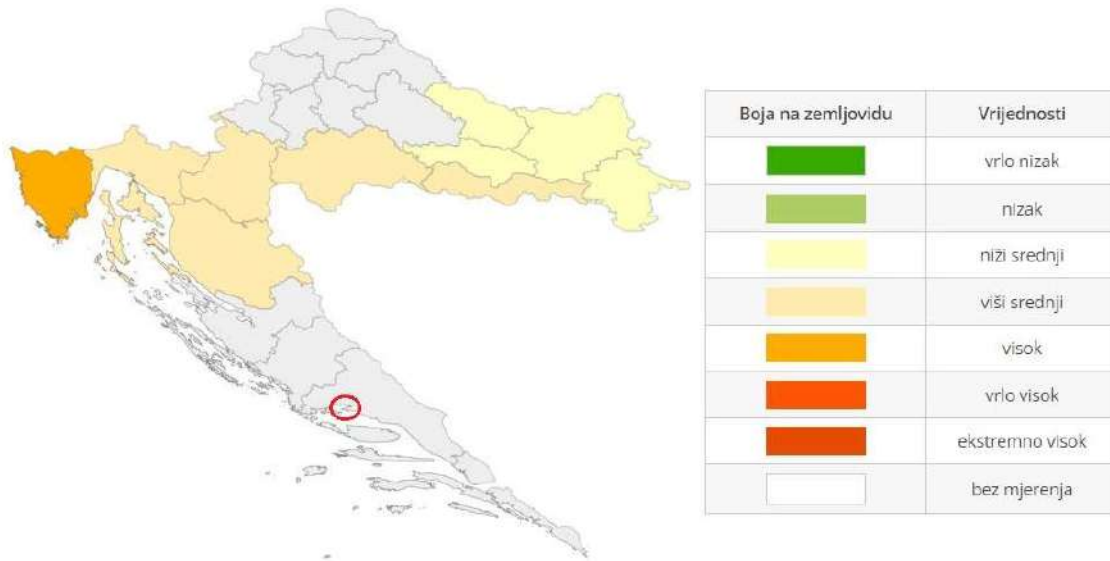


Figure 34. Geogenic radon potential in Croatia

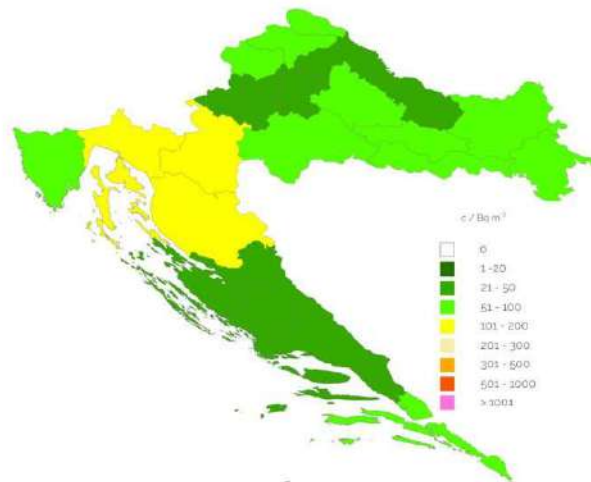


Figure 35. Average values of radon concentration in houses

#### 4.4 Noise

According to the valid spatial planning documentation, location Duilovo is placed within the zone of public and social (higher education institution) purposes, while the location Kaštel Stari is placed within the zones of particularly valuable arable land and the area for higher education purpose (P1/D6). The surrounding areas of both locations are categorized mainly as zones for mixed use (M).

According to Table 1 of the Ordinance on the highest permissible noise levels with regard to the type of noise source, time and place of occurrence (OG 143/21), both locations are located in the Zone 3 - Zone of mixed, residential use, in which the highest permitted rated noise levels

$L_{R,Aeq}$  are:

- $L_{day}$  55dB (A);
- $L_{evening}$  55 dB (A);
- $L_{night}$  45 dB (A);
- $L_{den}$  57 dB (A).

Permissible noise level for the construction site is determined by the provisions of the Ordinance on the maximum allowed noise levels with regard to the type of noise source, time and place of occurrence (OG 143/21). The permitted equivalent noise level of the construction site at the most exposed point of sound emission of the open living space during day and evening period is 65 dB(A). According to the mentioned ordinance, it is allowed to exceed that level for an additional 5 dB in the period from 8 to 18 hours. When performing construction works during the "night" period, the equivalent noise level must not exceed 45 dB. Exceeding the permissible noise levels shall be allowed if necessary for the technological process of the construction site and for up to three nights within a consecutive period of thirty (30) days. A minimum of two full night periods shall be provided between periods when exceeding allowable noise levels is anticipated without exceeding allowable noise levels during the night period.

#### **4.5 Biodiversity, Nature protection areas and Natura 2000 Ecological Network**

##### **Habitats**

Sub-components 1 and 3 (Duilovo – Split) are located within the urban area. According to the habitat map, they are located within a complex of habitat types: buildings, urban and industrial habitats (J)/ eu- and steno-Mediterranean rocky pastures and dry grasslands (C.3.6.1.)/ abandoned agricultural lands (I.1.8.)/ Forests, and surrounded by olive groves (I.5.2.), vineyards (I.5.3.) and mosaic of cultivated fields (I.2.1.).

Sub-component 2 (Kaštel Stari) is located within the urban area. According to the habitat map, it is located within a complex of habitat types: olive groves (I.5.2.)/ abandoned agricultural lands (I.1.8.)/ mosaic of cultivated fields (I.2.1.).

According to the Ordinance on the list of habitat types, habitat maps and endangered and rare habitat types (OG 27/21), some habitat types under the habitat category “Eu- and steno-Mediterranean rocky pastures and dry grasslands” which is widespread at the Duilovo – Split location, are listed as endangered in the Ordinance, however they are unlikely to occur in this location since this is an urban area.

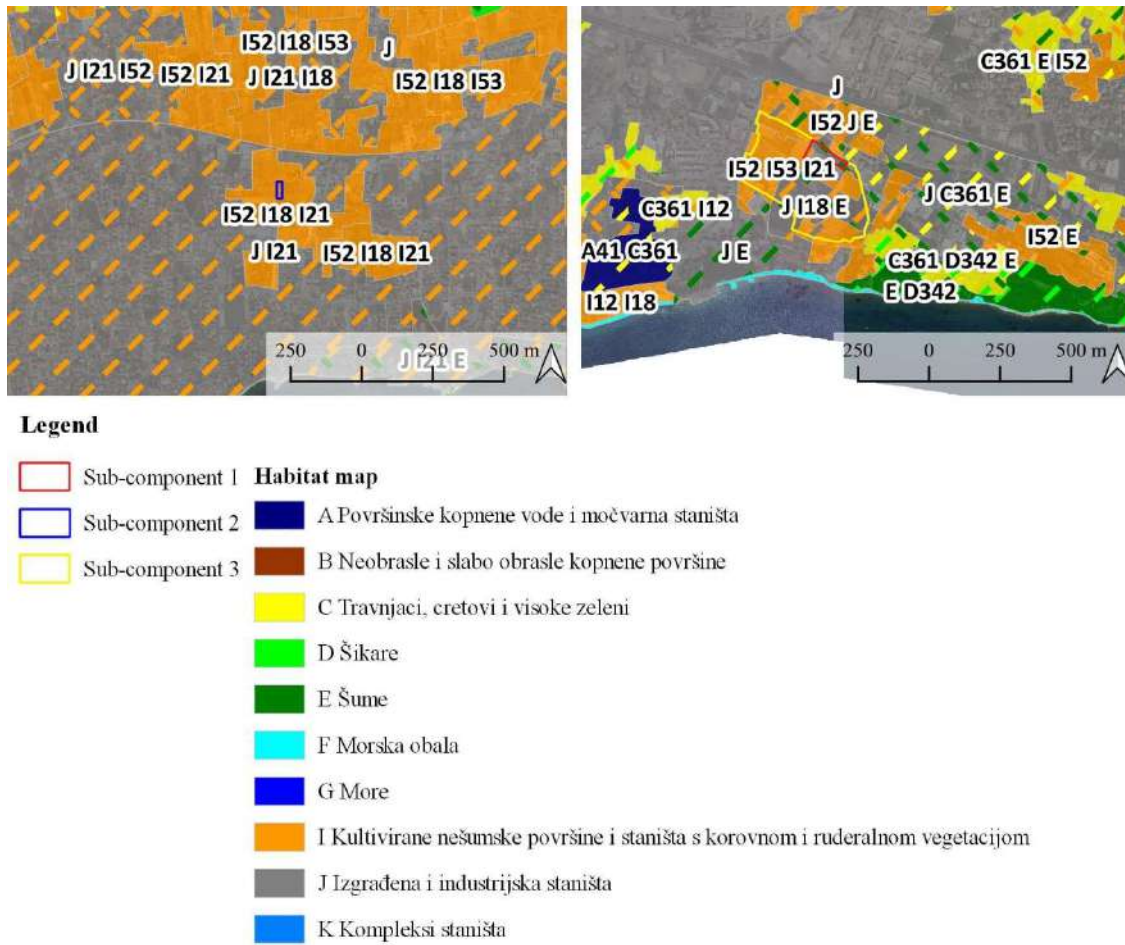


Figure 36. Habitat map – Kaštel Stari (left) and Duilovo - Split (right)

### Protected Areas

According to the Register of Protected Areas, both location Duilovo - Split and Kaštel Stari are placed outside the areas protected under the Nature Protection Act (OG 80/13, 15/18, 14/19, 127/19, 155/23) (Figure 23.).

All nature protection areas are more than 500 m away from both location. In Kaštel Stari, there are three monuments of park architectures: 1. Park u Kaštel Starom (approx. 650 m to the south-east), 2. Školski botanički vrt osnovne škole "Vjeko Butir" u Kaštel Lukšiću (approx 1200 m to the south-east) and 3. Park Vitturi u Kaštel Lukšiću (approx. 1400 m to the south-east); and one monument of nature (Stara maslina u dvorištu dječjeg vrtića "Braće Perišić" u Kaštel Štafiliću)

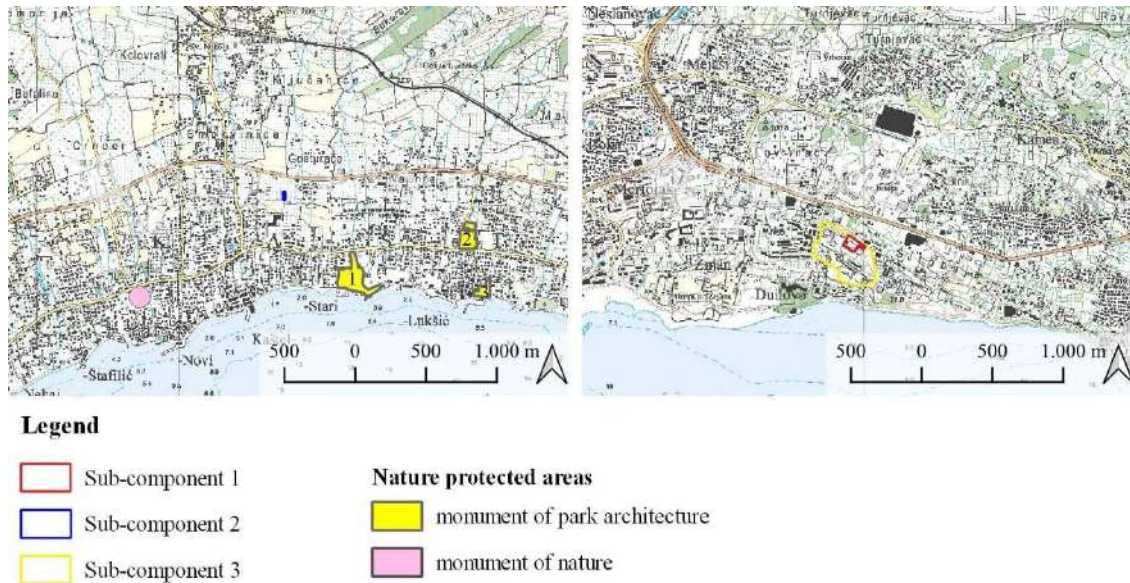


Figure 37. Map of nature protected areas – Kaštel Stari (left) and Duilovo - Split (right)

### **Ecological network / Natura 2000**

According to the Regulation on the Ecological Network and Competences of Public Institutions for the Management of Ecological Network Areas (OG 80/19, 119/23), the Sub-project is located outside the area of the Natura 2000 ecological network (Figure 38).

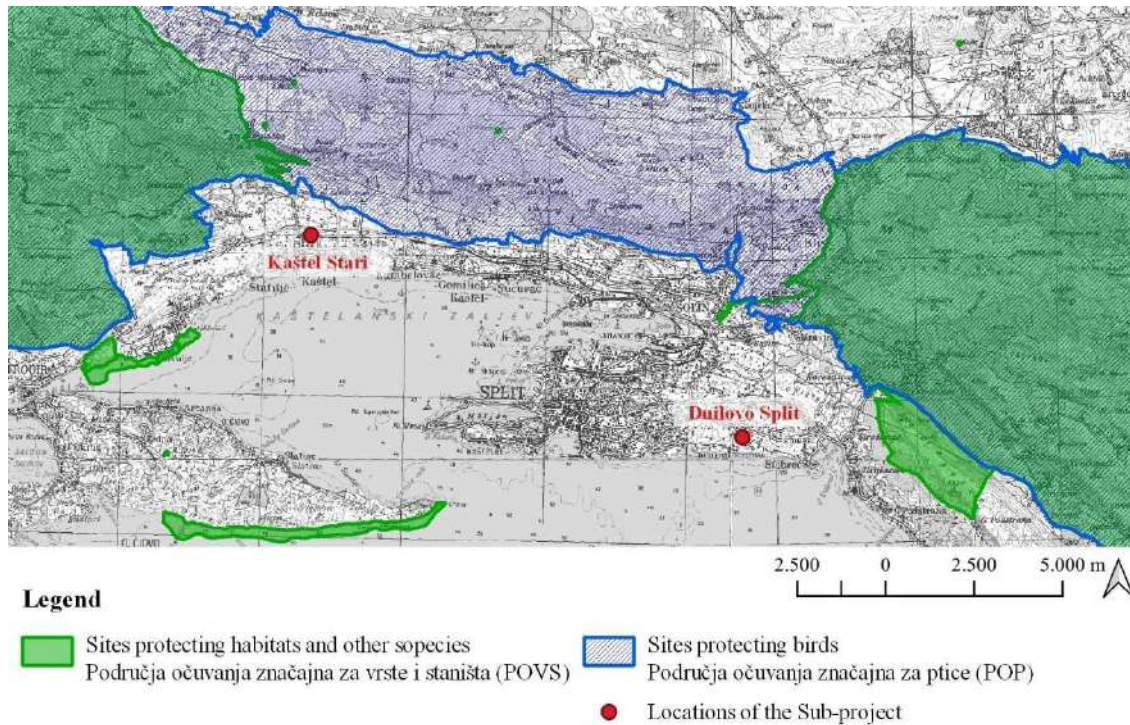


Figure 38. Map of Natura 2000 areas



#### 4.6 Surface Waters, Groundwaters and the Sea

There are no surface water bodies within the scope of the Sub-project (both locations). Both locations are situated within the grouped body of groundwater LKGIKCPV\_10 Cetina, which is of good quantitative and chemical status. The sea in the area of Kaštela belongs to the coastal water body 0313-KAS (Kaštelanski zaljev), while the sea in the area of Duilovo - Split belongs to the coastal water body 0423-BSK (Brački i Splitski kanal). The status of coastal water body 0313-KAS is assessed as “not good” due to poor ecological status, while the status of coastal water body 0423-BSK is assessed as “good”. (Figure 39)

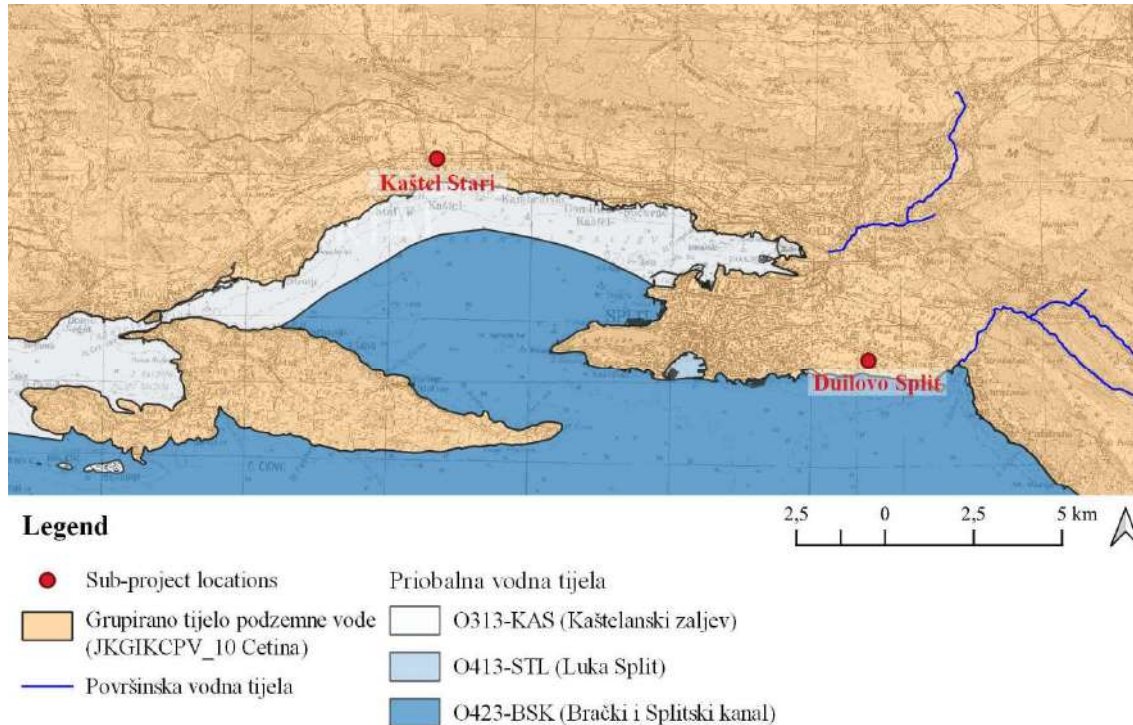


Figure 39. Surface water bodies, groundwater bodies and coastal water bodies

#### **Flooding**

Although there are no surface water bodies within the scope of the Sub-project (both locations), there are torrential occasional watercourses east of the location in Kaštela and west of the Duilovo-Split, which could potentially flood the surrounding area. According to the flood risk map, both locations of the Sub-projects are located outside the area with a probability of floods (Figure 40). Nevertheless, it should be noted that there were occasional events of soil erosion in Duilovo-Split as a consequence of storms. The erosion occurred in the steep parts of Institute’s property (terraced area protected by drywalls, steep parts bordering the residential houses).



**Legend**

- |   |                 |  |
|---|-----------------|--|
|  | Sub-component 1 | Opasnost od poplava - 3 scenarija plavljenja |
|  | Sub-component 2 |  |
|  | Sub-component 3 |  |
- 
- |   |                   |  |                      |   |                     |
|---|-------------------|--|----------------------|---|---------------------|
|  | mala vjerojatnost |  | srednja vjerojatnost |  | velika vjerojatnost |
|---|-------------------|--|----------------------|---|---------------------|

Figure 40. Flood risk ma p– Kaštel Stari (left) and Duilovo - Split (right)

**Groundwater and sensitive and protection zones**

Both locations of the Sub-project are located outside the sanitary protection zones (Figure 41) and groundwater protection zones (Figure 42).



Figure 41. Sanitary protection zones



Figure 42. Areas of water protection for human consumption – Groundwater protection zones

Sub-component 2 in Kaštel Stari is located within the Sensitive catchment area Kaštelanski zaljev, while the Sub-components 1 and 3 in Duiłovo Split are outside of it (Figure 43).

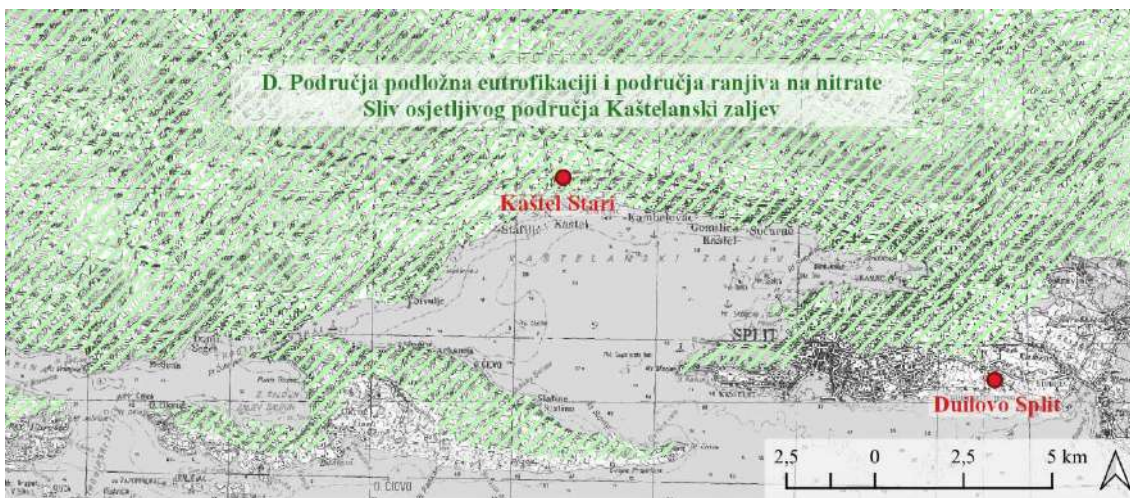


Figure 43. Areas subject to eutrophication and areas vulnerable to nitrates – Sensitive catchment area Kaštelanski zaljev

## Sea

Sub-component 1 in Duiłovo-Split is located approx. 400 m away from the sea, while the southernmost border of the Institute's property is located approx. 150 m away from the sea. The location of the Sub-project in Kaštel Stari is located 650 m away from the sea and the nearest sea beach (Đardin) (Figure 44).

According to The Report on the examination of the quality of the sea for swimming in the area of Split-Dalmatia County in 2023, sea beach "Đardin" were assessed with an unsatisfactory annual and final rating due to fecal pollution of the sea which were determined in several cycles of the testing. The quality of sea of the sea for swimming at the beach "Duiłovo" was assessed as excellent for the same year (2023).

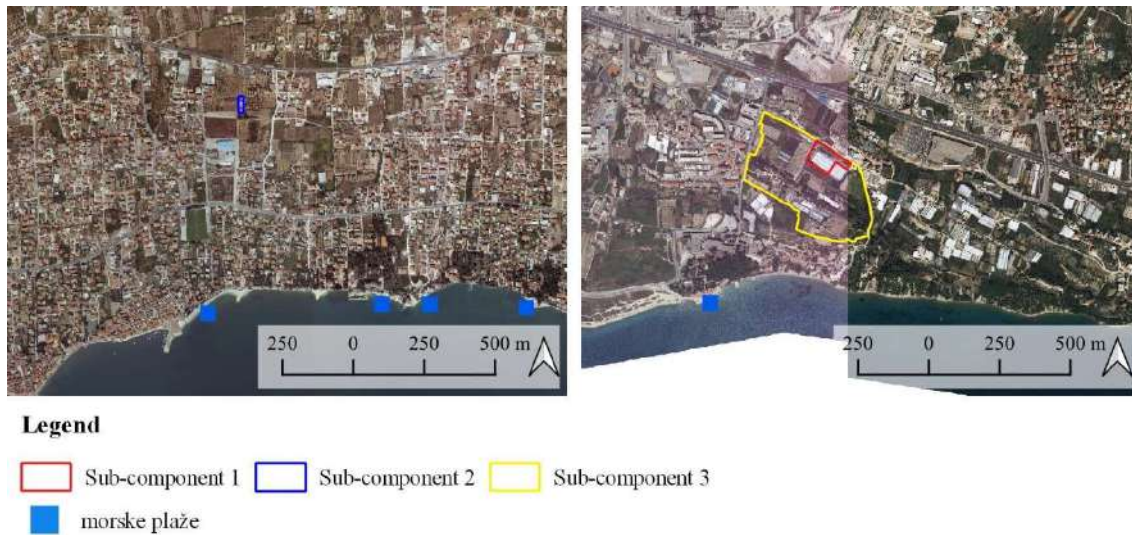


Figure 44. Sea beaches – Kaštel Stari (left) and Duilovo - Split (right)

#### 4.7 Seismic characteristics and soil stability

According to the Seismic Map of RoC from 2012, for a return period of 475 years, both locations are located within the area with a peak acceleration of 0,220 – 0,225 g, where g is the acceleration of the gravity field, 9,81 m/s<sup>2</sup>. The acceleration corresponds to VII. degree of the MCS (Mercalli - Cancani - Sieberg) scale (very strong earthquake, chimneys collapse, tiles fall from the roof, house walls crack). Looking at the return period of 95 years on the Seismic Map of Republic of Croatia, the peak acceleration at the location amounts 0,112 – 0,114 g, which corresponds to VI. level of the MCS scale (Figure 45).

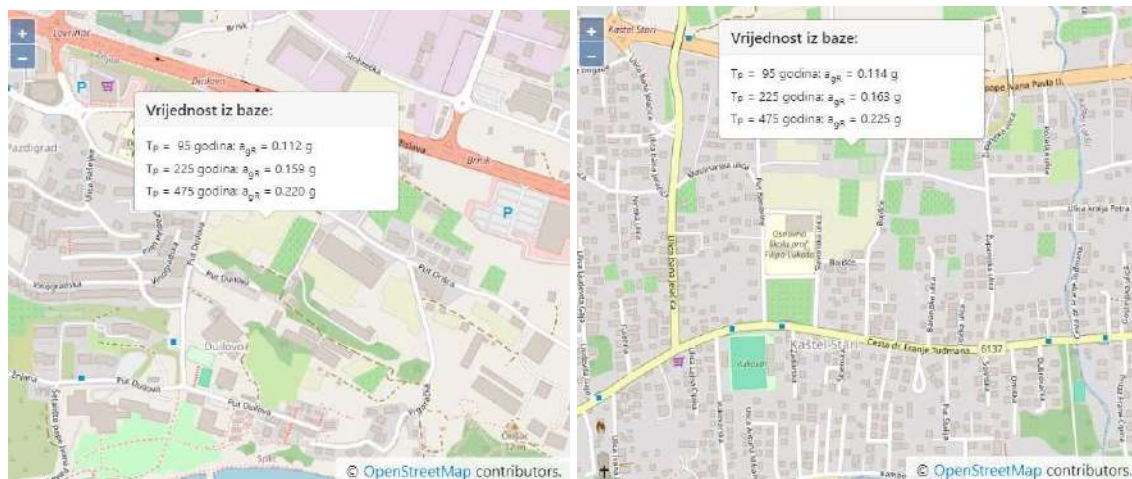


Figure 45. Seismic map of Republic of Croatia (source: [Maps of earthquake areas of the Republic of Croatia \(gfz.hr\)](http://maps.of.earthquake.areas.of.the.Republic.of.Croatia.gfz.hr))

#### 4.8 Climate and climate change

According to the Köppen climate classification, defined according to the mean annual trend of air temperature and precipitation, the coastal area of Split-Dalmatia County has characteristics of a Mediterranean climate with hot (Csa). The average temperature of the warmest month is higher than 22°C, and the coldest month is higher than 4°C. The annual course of precipitation is maritime, which means that most of the precipitation falls in the colder half of the year in the form of rain. Data on precipitation and temperature from the weather station Split - Marjan shows that the annual trend of precipitation and temperature are inversely related. In the warm part of the year, the temperature is maximum, and precipitation is minimum, while in the cold part of the year, the opposite is true. The precipitation maximum, in accordance with the Köppen distribution of climate types, is in late autumn (November) when it averages 114.9 mm, while the precipitation minimum is reached in July when it amounts to about 27.4 mm. The average annual amount of precipitation is 812.4 mm. January is the coldest month in which the average daily temperature is 7.9°C, and the lowest recorded temperature is -9°C. In July, as the hottest month of the year, the average daily temperature is 26.1°C, while the absolute maximum recorded in July is 38.6°C.<sup>14</sup>

Split- Dalmatia County has prepared its Program for mitigating climate change, adapting to climate change and protecting the ozone layer in 2023. The results relevant to the planned Sub-project are presented in the Table 10

*Table 10. Expected changes in the climate parameters until 2040 and 2070*

Parameter	Description
Air temperature	A uniform increase in ground temperature between 1 and 1.5°C is expected in all seasons until 2040, while in the period until 2070, the largest increase in average air temperature is up to 2.2°C. An increase in maximum temperature between 1 and 1.5°C is predicted by 2040. It is assumed that this trend will continue in the period until 2070, with a range of 1.4 to 2.3°C. The largest projected increase in the minimum temperature until 2040 in the winter months is 1.4°C. In the period 2041-2070, an increase in the minimum temperature is expected again - from 1.8 to 2°C in winter, and up to 2.2°C in the summer months on the islands.
Precipitation	Until 2040, a smaller increase in the amount of precipitation (approx. 5%) is expected in winter, while a decrease in the amount of precipitation is expected in all other seasons. In the period until 2070, an increase in the amount of precipitation is expected in all seasons, except in autumn, when a decrease is expected. The biggest reduction will be in spring and summer between 10 and 15%.
Wind speed (at 10 m altitude)	Until 2040: The mean wind speed will not change in winter and spring, but will increase somewhat in summer and autumn (about 0.2 m/s). 2041-2070: no change in mean wind speed is expected in winter and spring, while the trend of increasing wind speed continues in summer and autumn.

<sup>14</sup> Climate change mitigation, climate change adaptation and ozone protection program; Strategic Environmental Assessment of Amendments of Spatial plan of City of Split

Solar radiation	Until 2040: a decrease in the flux of solar energy is expected in winter and spring, while in summer and autumn an increase in values is expected compared to the reference period. 2041-2070: in all seasons, except winter, an increase in the flux of incoming solar energy is expected in the middle of the ensemble, and in summer the increase is most pronounced from 4 to 8 W/m <sup>2</sup> .
Sea level	In the future climate until 2040, the average sea level rise in the Adriatic is expected to be between 0 and 5 cm. In the period 2041-2070, the sea level change in the Adriatic will remain within the framework of the change from the period until 2040.
Extreme weather events (storms)	Increasing frequency and intensity of extreme storms is expected in the future climate.

#### **4.9 Historical pollution on the site**

There was no historical pollution recorded on the site of the planned Sub-project such as waste disposal, accidents with dangerous substances or any other soil pollution.

#### **4.10 Pollutants in the vicinity of the Sub-project**

There are no significant polluters (companies that perform activities using significant quantities of hazardous substances or emit pollutants into water, soil or air) in the vicinity of both locations of the Sub-project. According to the Register of facilities where hazardous substances are present (<https://envi.azo.hr/?topic=9>) the closest facilities to the both locations are petrol stations (600 m north-east of the Kaštel Stari; 200 m north of the Duilovo-Split) (Figure 46).

DIGIT – Digital, Innovation and Green Technology Project (P180755)  
**Modernization of the Institute for Adriatic Crops and Karst Reclamation Infrastructure as a  
 Precondition for Excellence in Mediterranean Agriculture Research**  
 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

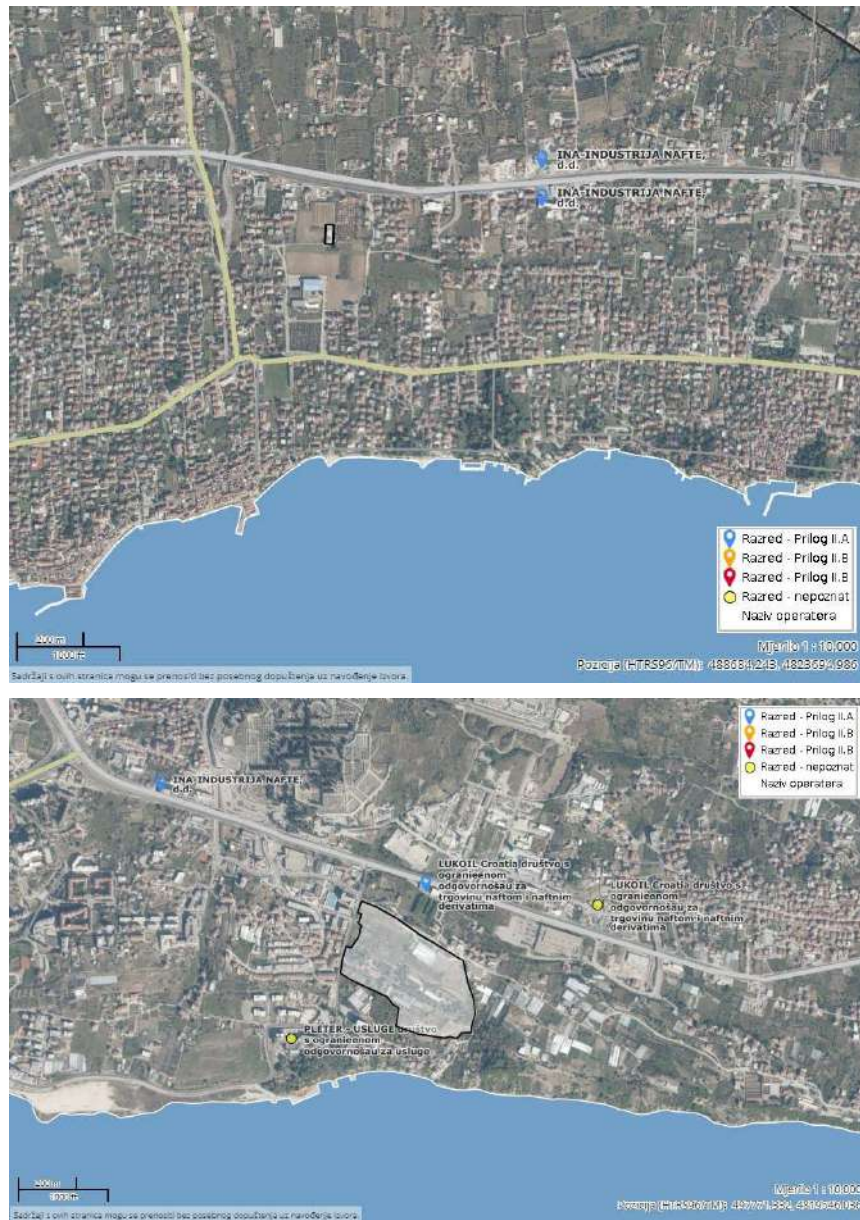


Figure 46. Pollutants in the vicinity of the Sub-project (Kaštel Stari – above; Duiilovo- Split – below)

## 5 SOCIAL-ECONOMIC BASELINE OF SUB-PROJECT AREA

### 5.1 Population

#### Split

The City of Split is the second largest city in the Republic of Croatia in terms of population and is the administrative center of Split-Dalmatia County. The administrative unit has 160,577 and the city itself has 149,830 inhabitants<sup>15</sup>. The location of Duilovo is situated in the City District Žnjan with a population of 3,347. The share of the population in Split with higher education in 2021 was 35%.

#### Kaštel Stari

The City of Kaštela is administratively part of Split-Dalmatia County and is part of the agglomeration of Split. The name 'Kaštela' refers to a series of seven connected settlements one of which is Kaštel Stari. The City of Kaštela has a population of 37,794 and Kaštel Stari 6,950. The share of the population in Kaštela with higher education in 2021 was 22%.

### 5.2 Socio-economic context

#### Split

Split is the economic, cultural, and university center of Split-Dalmatia County and the wider macroregion. Its economic development is the result of the location of the city by the sea, good transport position and administrative functions. With the construction of the Zagreb-Split highway in 2005, the city and its surroundings gained new momentum in economic activity (a business zone was built in Dugopolje not far from the city). Some traditional industries have been preserved: shipbuilding (Brodosplit), cement industry, food products, etc. Split is an important maritime and shipping center (Jadroplov, Brodospas ship salvage company). In recent years, in addition to transit tourism (mostly to the central Dalmatian islands), cultural, congress and event tourism has also been developing.

The University of Split was founded in 1974 and has the faculties of economics, natural sciences and mathematics, electrotechnical-mechanical-shipbuilding, construction-architectural, chemical-technological, medical, law, maritime, philosophical, Catholic theological faculties, the Academy of Arts and the University the Center for Marine Studies, the University Study Center for Professional Studies and the Inter-University Study of Mediterranean Agriculture. Besides the Institute for Adriatic Crops and Karst Reclamation, the city is home to the Institute for Oceanography and Fisheries, the Croatian Hydrographic Institute, the Mediterranean Institute for Life Research (MEDILS), the Franciscan Institute for the Culture of Peace, and others.

#### Kaštela

Kaštela is an urbanized area with a rich agricultural environment (vines, fruits, vegetables, flowers), developed industry (cement, chemical industry) and tourism. Split airport is located in the western part of Kaštela. The urbanized part consists of seven almost merged towns, one of which is Kaštel Stari, making in the administrative-territorial aspect the City of Kaštela.

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<sup>15</sup> Source: The Croatian Bureau of Statistics, 2021 Census



### **5.3 Buildings and infrastructure in the vicinity of the planned Sub-project**

#### **Split, Duilovo**

The site of the Institute in Duilovo – Split is, according to the GUP of Split, situated in the zone of public use, D6 – higher education, science, and technological parks. East, west, and south of the site are areas of mixed-use, M1 – mostly housing. North of the site is the area for business use (K) - there is a supermarket and a recycling yard. Due to the proximity of the sea, which is 200 m away, there are also tourist areas of the hotel (T1). The residential area east of the site is mostly built, and the Žnjan-Pazdigrad Primary School is 200 m away. The south of the site residential buildings are being built. On the west, the area is mostly in agricultural use.

The Institute leased the area of Sub-component 1 to the florist company “Vaš vrt” Ltd. An open call for lease of the area on east to a florist company is in progress: the greenhouse (c.p. 7376/3 and 7376/1), and part of the unbuilt c.p. 7377/1. Only tender submitted was by “Vaš vrt” Ltd. The tender is selected and signing of the contract is expected soon.

The existing main Institute’s building with 53 employees is surrounded with the area of activities and is approx. 50 m south of the Sub-component 1.

There are two groups of sensitive receptors:

- A. The identified closest sensitive receptors at the location Duilovo - Split are:
  - A.1. The tenants and owners of the apartments and houses within the area of the Institute’s property
  - A.2. Owners and tenants of the family house(s) and apartment buildings bordering the property of the Institute
  - A.3. Employees of the Institute
  - A.4. Florist company Vaš vrt d.o.o.
- B. Other sensitive receptors at the location are:
  - B.1. Students at the Žnjan - Pazdigrad Primary School (approx. 300 m west of the Institute)
  - B.2. Tenants and owners of the family houses and apartment buildings in the neighbourhood

#### **Kaštel Stari**

The site of the Institute in Kaštel Stari is, according to the GUP of Kaštela, situated in the zone of agricultural use and university use (P1 – a highly valuable arable land; D6 – higher education, science, and technological parks).

The site in Kaštel Stari is 5 ha of agricultural land surrounded by family houses. Prof. Filip Lukas’s Primary School is 100 m south of the site.

It is located 650 m away from the sea and the nearest sea beach (Đardin).

There are two groups of sensitive receptors:

- C. The identified nearby sensitive receptors at the location Kaštel Stari are:
  - C.1. Tenants and owner(s) of the apartment on the ground floor of the building 2A
  - C.2. Tenants and owner(s) of the apartment on the first floor of the building 2A

D. Other sensitive receptors at the location are:

D.1. Students at the Prof. Filip Lukas’s Primary School

D.2. Tenants and owners of the family houses in the neighbourhood



Figure 47. Sensitive receptors at the location Duiłovo – Split

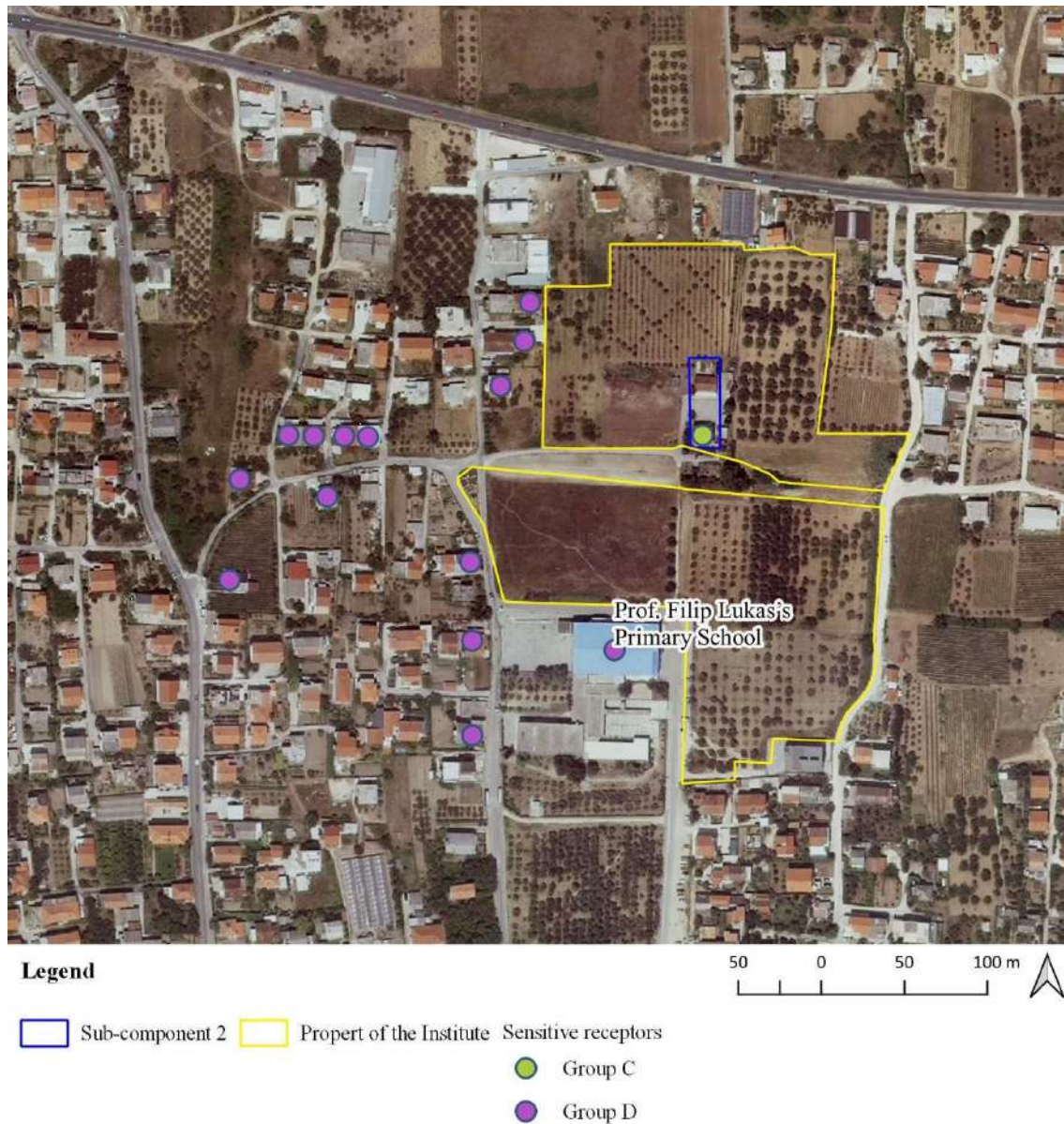


Figure 48. Sensitive receptors at the location Kaštel Stari

## 5.4 Cultural Heritage

### Split

Historical Complex of Split with the Palace of Diocletian is on the UNESCO list of world cultural heritage. The Complex is approx. 4.5 km away from the location in Duilovo. According to the Register of Cultural Property by the Ministry of Culture and Media of the Republic of Croatia, there is no cultural property on site or near the site.

An Area of Archaeological Heritage that includes the coastal zone from Žnjan to Stobreč and the semi-urban complex of Stobreč with its center on the Orišac hill is defined in the GUP of Split. The southernmost part of the Sub-component 3 is partly located within that Area of Archaeological Heritage.

For the Area of Archaeological Heritage, the Provisions of the General Urban Plan of Split in Art. 94 determined:

*During construction works that encroach on the cultural layers underground and on archaeological areas marked as archaeological areas on the cartographic representations of the General Plan (number of representations), archaeological excavation supervision is mandatory, and the contractor is obliged to stop the work and report the finding to the authority responsible for protection of cultural assets.*

*In the areas where the General Plan envisages the construction of buildings within archaeological zones, the operator of the project is obliged to ensure archaeological reconnaissance and sounding of the area before the start of any works, and following the results of the reconnaissance to ensure protective archaeological research. In the case of the presentation of archaeological findings in situ, it is necessary to create an implementation document of spatial planning that will define the relationship between the presented findings and the planned construction.*

The Institute obtained the Opinion of the Conservation Department in Split on the requirements while designing and implementing the intervention (Annex 3). The Opinion states that cadastral plots in the ownership of the Institute on which the construction works are planned are located outside of the protected area of cultural heritage. However, in case of archaeological finds during the works, they must be reported to the competent authority as soon as possible.

### **Kaštel Stari**

There are no archaeological sites in the vicinity of the site in Kaštel Stari. The nearest Area of archaeological heritage is Lokva, 320 m eastern.

## **6 STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE**

Considering that the Sub-project is implemented at two locations, two SEPs are created: (i) a general SEP that refers to all Sub-components and engages the stakeholder relevant to the entire Sub-project and more concretely for the Duilovo – Split site (Sub-components 1 and 3), and (ii) SEP focused on stakeholder engagement in Kaštel Stari (Sub-component 2). The Sub-project stakeholder engagement plans are in Annex 1 and Annex 2.

### **6.1 Previous stakeholder engagement activities regarding Sub-components 1 & 2**

The Institute so far implemented an elaborate stakeholder engagement process. From the very early stage of the project, the Institute's management engaged the scientific staff in the overall project development, particularly in the design documentation (design brief, conceptual, and main design). Therefore, the Sub-project activities reflect the real research needs that are defined by engagement of Institute's employees, primarily scientists.

The design documentation was co-financed by the European Regional Development Fund, the OPCC. Thus, the stakeholder engagement process followed the rules of the OPCC. In addition, the Institute's management introduced activities to fully use the capacities of the researcher in the project development.

#### **6.1.1 Initial Survey**

In 2017 at the initial stage of the project, the Institute surveyed its research staff to determine:

- key areas and directions of development of each scientific-organizational unit
- identification of specialized equipment necessary for the development
- scientific research and possible commercial activities as a result of the use of the acquired equipment
- the main expected achievements, contributions, and applications as a result of the implementation of the activities in the identified areas of work.
- how the future scientific research activities will contribute to the acceleration of the transfer of knowledge to the Institute's commercial activities.

The survey results were finalized in 2018 and served as the inputs for the development of the design brief and list of scientific research equipment.

#### **6.1.2 Activities during the Design Phase**

The design development process started in December 2021 by engaging 4 assistant scientists i.e. younger generation as the coordinators of the units of the future Center for Advanced Analytics. The Coordinators were involved in a series of activities in the design process. The management consulted the Coordinators in all stages of the design process and they formulated, in cooperation with their team, the comments and suggestions on the design documentation. The process was finalized in June 2023 with the Coordinators' approval of the Main Design. Only after the approval was the design documentation for issuing the building permit submitted.

### 6.1.3 Initial and Final Conference

The project was officially launched in July 2021 when the Initial Conference was held at the lecture hall of the main Institute's building. The objective was to inform public administration bodies, scientific and economic institutions, and the general public about the project. Twenty-three participants attended the conference.

The information on the project has been available to the public through the web page and promotional material.

On the final conference which was held in November 2023 after the Building Permit was in force, the Institute's management presented the Main Design to the Heads of Units of all Departments.

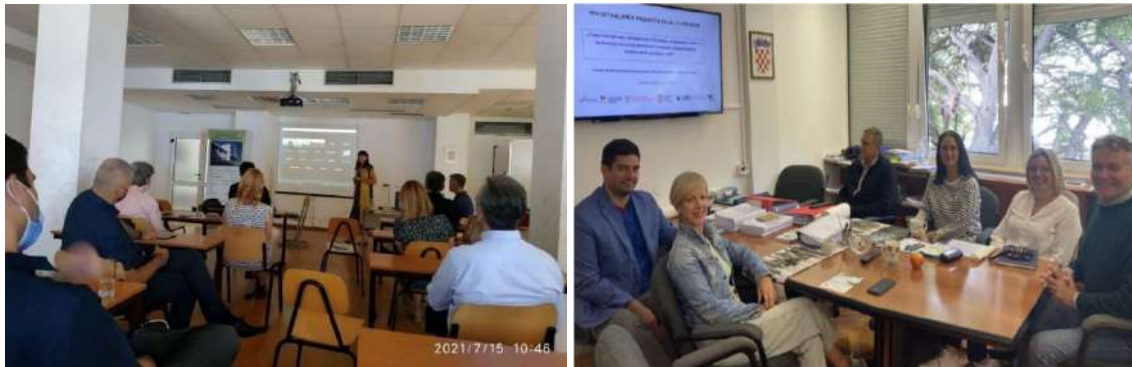


Figure 49. Initial Conference, July 2021; Final Conference, November 2023



Figure 50. Promotional material available at the entrance hall of the main Institute's building (roll-up posters, leaflets), June 2024

#### 6.1.4 Overview of the Previous Stakeholder Engagement Activities

Timeframe	Stakeholder	Method	Results
2017 – 2018	Scientists & Assistant Scientists	Survey	Institute's development directions Future research activities & contributions Specialized equipment defined
2019 –	Researchers	Consultations with the team	Implementation capacities established: project manager, administrator, assistant administrator, 11 researchers
2017 –	Scientific Council Management Council	Regular sessions	Informed and engaged from the very early stage
2021 –	General Public & Institute's visitors	Web page: <a href="http://infrastruktura.krs.hr/">http://infrastruktura.krs.hr/</a> Roll-up banner Leaflets	General public & visitors of the Institute informed
07/2021	Public Administration Public Institutions General Public Media	Initial Conference / Public presentation (online & live)	Public administration and institutions as well as general public and media informed of the project 23 participants (Institute of Oceanography and Fisheries; Split, Faculty of Science; Department of Biology; Split, Croatian Chamber of Economy; County Chamber Split, Split-Dalmatia County, Cooperative Union of Dalmatia; Split, City of Vrgorac, Media, Employees) Article in the regional daily newspaper Slobodna Dalmacija
12/2021 – 06/2023	Coordinators of Units of the Center for Advanced Analytics	Meetings Electronic communication	Coordinators of Units of the Center for Advanced Analytics appointed (4) in December 2021 Inputs for Design Brief Comments and suggestions on the draft Conceptual Design Comments and suggestions on the draft Main Design Approval of the Main Design in June 2023
12/2021 – 06/2023	Other Researchers & employees	Meetings Electronic communication	Coordinators of Units of the Center for Advanced Analytics (4) consulted researchers and other employees in their team in all stages of the design development
11/2023	Heads of Units of all Departments	Final Conference / Presentation	Heads of Units were informed on the finalizing the design process; the Main Design and Building Permit 8 participants

## **6.2 Previous stakeholder engagement activities regarding Sub-component 3**

The activities for Improvement Works of Existing Technological Infrastructure and Landscaping at the Location in Duilovo - Split (the Sub-component 3) have been developed over several months. The Institute organized a team for each activity consisting of heads of units and their deputies and included experts relevant to each activity. The work has been coordinated and consulted by the body comprising the heads of units and approved by the Management Board.

## **6.3 The sensitive receptors engagement activities**

### **6.3.1 Location Duilovo - Split**

Two focus groups were held on 24 September 2024 at the premises of the Institute. Focus Groups were held to initially inform and engage the sensitive stakeholders: Focus Group 1 was for tenants and owners within the Institute's property (Chapter 5.3.; A.1) and Focus Group 2 was for tenants and property owners bordering the Institute's property at Duilovo – Split (Chapter 5.3.; A.2).

All the findings and questions raised at the Focus Groups are addressed in Chapter 7.13.

The participants agreed with the Sub-project and considered it useful and necessary. The concerns raised were:

- There is potential risk of erosion due to the fencing in the immediate vicinity of the tenants bordering the Institute in the south-east (c.p. 10285/3, c.m. Split); already experienced the erosion above their house during intensive storms (addressed in Chapter 7.3)
- Buzzing from the existing substation in the existing main building in Duilovo-Split by the tenant living above it (addressed in chapters 7.7 and 7.13)

### **6.3.2 Location Kaštel Stari**

According to the Institute, the project was previously informally well communicated with the tenants i.e. owners of two apartments in building 2A, and they informally agreed with the works that will be carried out as they will eventually improve the living conditions in the building.

On 24&25 September 2024 an interview was held with the owners of two apartments on the ground floor and first floor to inform and engage them and check if they as sensitive receptors have any concerns or questions. Eventually, some concerns were raised, and the mitigation measures were agreed.

All the findings and questions raised are addressed in Chapter 7.13.

Mitigation measures taken so far:

- The Detailed Technical Design of the Building 2A Roof (including the floor structure between the first floor and the attic) was developed to ensure no damage will be done to the apartments
- The Detailed Technical Design of the Building 2A Roof was presented to the owners
- The owners gave the written consent for the construction works on building 2A



#### 6.4 Information Disclosure

The draft ESMP will be disclosed at the DIGIT's<sup>16</sup> and the Institute's<sup>17</sup> website for minimum two weeks. During that period, public presentation will be held. After the public consultations, the final version of the ESMP and the Stakeholder Engagement Report will be completed and re-disclosed on the DIGIT's website, including the feedback on the comments and questions received during the process of public consultations.

#### 6.5 Information Flow and Responsibilities for providing information

	ACTIVITY	FLOW OF INFORMATION AND RESPONSIBILITY
<b>A</b>	Development of ESMP document	BENEFICIARY (providing needed inputs) → PIU ↔ STAKEHOLDERS, INSTITUTIONS, MEDIA AND GENERAL PUBLIC
<b>B</b>	Development of Detailed Design	STAKEHOLDERS ↔ KRS ↔ DESIGNERS
<b>C</b>	Specific information on the potential archaeological findings and the measures for their protection	C1/ RESPONSIBLE CONSERVATION DEPARTMENT IN SPLIT → BENEFICIARY → PIU C2/ RESPONSIBLE CONSERVATION DEPARTMENT IN SPLIT → ARCHAEOLOGICAL AND CONSERVATION RELATED INSTITUTIONS AND ORGANISATIONS, GENERAL PUBLIC C3/ PIU → ARCHAEOLOGICAL AND CONSERVATION RELATED INSTITUTIONS AND ORGANISATIONS, GENERAL PUBLIC
<b>D</b>	Information on potential impacts from construction works (traffic, dust and noise)	PIU / BENEFICIARY → DIRECTLY AFFECTED STAKEHOLDERS, MEDIA AND GENERAL PUBLIC
<b>E</b>	Information on Ethics Code, WB's ESS, GRM	E1/ PIU / BENEFICIARY → DIRECTLY AFFECTED STAKEHOLDERS, MEDIA AND GENERAL PUBLIC E2/ PIU → Construction Company → Construction workers
<b>F</b>	Received complaints, comments and suggestions on GRM	F1/ STAKEHOLDERS → GRMs (CONSTRUCTION COMPANY / BENEFICIARY / PIU) → PIU Ethics Committee F2/ PIU (responses) → STAKEHOLDERS / CONSTRUCTION COMPANY / BENEFICIARY
<b>G</b>	Information on occurred incidents	G1/ CONSTRUCTION COMPANY / SUPERVISING ENGINEER → PIU ↔ MSEY / WB G2/ PIU (feedback / requests) → CONSTRUCTION COMPANY / SUPERVISING ENGINEER

<sup>16</sup> <https://mzo.gov.hr/istaknute-teme/znanost/digitalne-inovativne-i-zelene-tehnologije-DIGIT/5463>

<sup>17</sup> <https://www.krs.hr/>

## 7 POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS, IMPACTS AND MITIGATION MEASURES

The ESMF recognizes that activities under subcomponent 1.1. carry moderate environmental risks typical for construction works (dust and noise emissions, surface or ground water pollution, soil pollution, traffic disruption, generation of large quantities of construction waste, usage of chemicals and hazardous materials, unsafe working conditions, poor occupational health and safety practices, life and fire safety related risks, impact on protected cultural and historical entity, impact to biodiversity) and social risks (risk related to community health and safety, intellectual property issues, labour management, sexual exploitation and abuse/sexual harassment (SEA/SH), risk related to labour influx (foreign workers).

The potential risks and impacts are (i) predictable and expected to be temporary (ii) low to medium in magnitude; (iii) site-specific, without likelihood of impacts beyond the actual footprint of the project; and (iv) low probability of serious adverse effects to human health and/or the environment. The Project's risks and impacts can be easily mitigated in a predictable manner in the design, planning and constructions, and use phase.

Following the requirements which arise from the ESMF (which adheres to the WB's ESF, WB EHSO, WHO, national regulation and GIIP), this ESMP has been prepared in order to analyse in more details potential environmental and social risks and impacts of this Sub-project, as well as to provide appropriate mitigation measures in order to mitigate the potential impact to the extent possible and to establish an appropriate monitoring program.

Due to the project characteristics and location, most of the potential risks and impacts are expected during construction phase (low to moderate), and only minor potential risks and impacts during the usage phase.

Although there are no direct potential environmental and social adverse impacts during pre-construction phase, if design documentation is not prepared in accordance with the WB environmental and social standards, WB Environmental Health and Safety Guidelines (EHSO) and Good International Industry Practice (GIIP) as well as national regulation (stricter ones prevailing) implementation of the project may cause degradation of certain components of the environment, as well as human health and safety, that are likely to take place further downstream in the project life-cycle, e.g. reduced seismic resistance, inadequate resistance to climate change and extreme weather impacts, soil erosion and landslides due to inadequate water management, etc. The implementation of the project will not affect the land use of the project area.

Main and Detail Design must be in line with WB ESSs, WB EHSO, GIIP, and requirements from the national legislative described in section 2. *Policy framework*, and the ESMF<sup>18</sup>.

Direct E&S impacts in the design phase are mostly negligible, however, indirect ones, that take place downstream from the design phase (but are created in the design) potentially might be notable for this project, they include risks related to:

- Life and fire safety (including structural and seismic safety);

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<sup>18</sup> <https://mzom.gov.hr/UserDocsImages//dokumenti/Znanost/Projekt-digit/Digit-azurirano-11-10-2023//digit-esmf-11-10-2023.pdf>

- Traffic disturbance and safety;
- Climate change resilience;
- Emissions of odour;
- Noise emissions, and other.

Activities during the **construction phase** within this Sub-project carry moderate risks typical for all construction works:

- dust and noise emissions;
- traffic disruption;
- generation of large amounts of construction waste;
- unsafe working conditions (e.g. exposure of workers to hazardous materials such as materials containing asbestos);
- poor occupational health and safety practices;
- labour working conditions;
- labour influx;
- poor information dissemination and not sharing information on potential impacts (noise, dust and traffic) during the construction works;
- potential chance finds (the Sub-component 3 is partly located within the Area of Archaeological Heritage).

With regards to the risk for Cultural Heritage (CH), although the Sub-component 3 in Duilovo – Split is partly located within the Area of Archaeological Heritage “*The coastal zone from Žnjan to Stobreč, including the semi-urban area of Stobreč centered on the Orišac hill*”, potential risk is pre-assessed as medium since there is possibility of chance finds within the Area of Archaeological Heritage. The works in the Area of Archaeological Heritage include only fencing, construction, and rehabilitation of the macadam paths, and arranging and landscaping forestry educational demonstration park – “Karst Landscape” at Location 2. Conservation Department in Split issued the Opinion on Works on the Property of the Institute on 25 June 2024 (Annex 3): *The cadastral parcels owned by the Institute, on which the works of arrangement, renovation, and construction of the infrastructure are planned, are located outside the protected zone, so the provisions of the Protection and Preservation of Cultural Property Act do not apply concerning it. If archaeological finds are found during the works, they must be reported to the competent authority as soon as possible (Article 45 of the Protection and Preservation of Cultural Heritage Act).* Therefore, full CHMP is not needed upfront (but may be required in the case of chance finds). Potential risks to the Area of Archaeological Heritage are elaborated in the ESMP and adequate mitigation measures prescribed.

The construction phase is expected to extend for a total period of approx. twenty (20) months. Main receptors are onsite workers, Institute’s employees, tenants in two buildings within the Sub-project scope and residents in nearby neighbourhood.

Due to the project characteristics and location, most of the potential risks and impacts are expected during construction phase (moderate), and only low potential risks and impacts during the use phase.

Potential environmental and social risks during **use phase** are mainly related to:

- waste management;
- increased indoor radon concentration;
- increased noise and deteriorated air quality due to use of the new building;
- vandalism;
- localised flooding and resilience to climate change induced extreme weather;
- hazardous substances, life and fire-safety.

### **Distribution of responsibilities and supervision arrangements**

Contractor is obliged to implement mitigation measures as prescribed in this ESMP, and Supervising Engineer is obliged to supervise their implementation and submit E&S compliance monthly report to E&S Specialists and E&S Experts at PIU. The cost of mitigation measures shall be included in the project cost (contractor cost).

During construction, contractor is obliged to take care that all legally required permits and licenses are kept on site; construction site is organized in a safety way; generated waste is managed properly; emission in the air are minimal (watering the surface, machinery and equipment are switched off when not in use); workers wear appropriate personal protective equipment; etc. Also, contractor will have to ensure that potential adverse impacts on the tenants of buildings within or in immediate vicinity of the border/property of the Institute and nearby community are prevented or minimized.

For the Sub-component 3, Contractor is obliged to ensure that measures for the protection of cultural heritage are implemented as stated in this ESMP in the way that does not adversely impact the Area of Archaeological Heritage and its elements and organize close supervision of compliance with ESMP and conservation requirements.

Contractor is also obliged to minimize the labour risk by following the Labor Management Procedures as presented in ESMF<sup>19</sup>, this ESMP and all applicable national laws and by-laws.

Measures and/or procedures during **use phase** are meant to be considered and implemented as appropriate by the Institute. The aim of these mitigation measures is to prevent and reduce the potential adverse impacts during use of the Sub-project on the environment and human health to an acceptable level. The measures include, but are not limited to, waste management measures, occupational health and safety and community protection measures, noise reduction measures and measures for storage and use of hazardous substances.

In the following sub-chapters, the impacts of the Sub-project construction and use phases for all Sub-components are described according to individual environment components and social

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[https://mpgi.gov.hr/UserDocsImages//dokumenti/Potres/Svjetska%20banka//ESMF\\_Component\\_1\\_January%202022.pdf](https://mpgi.gov.hr/UserDocsImages//dokumenti/Potres/Svjetska%20banka//ESMF_Component_1_January%202022.pdf)

issues. Also, measures for design, construction and use phases are prescribed to mitigate these impacts.

## **7.1 Ambient air quality**

### **7.1.1 Potential impact**

#### **Construction phase**

Dust and gaseous emissions can adversely affect air quality and cause environmental nuisance to the Sub-project and surrounding areas. It is expected on both locations (Kaštel Stari and Duilovo-Split) and from all three Sub-components.

Fugitive dust and PM will be generated during the construction and improvement works. This will lead to a localized reduction of air quality. The main adverse impacts expected to result from the generation of dust:

- nuisance and disturbance;
- impacts on health of onsite workers, tenants and employees of the Institute and neighbouring residents;
- visual disturbances to neighbouring communities.

According to the research, large particles responsible for nuisance dust are most likely deposited within 100 m of the source, while smaller particles can travel up to 1 km. Therefore, most of the dust generated is likely to be deposited within the Sub-project area. However, there may also be additional dust deposited offsite during material and equipment transport in case of off-road vehicle movements.

Emissions of fugitive dust and PMs will potentially depend on the wind speed and direction and will persist as long as the construction is ongoing. Dust and PM are expected to increase temporarily during the construction phase.

Another contributor to the air quality reduction will be gas emissions from vehicle-exhaust during site clearing and grading, transport of material and equipment and due to equipment use. These emissions include:

- Sulphur dioxide (SO<sub>2</sub>): the amount of SO<sub>2</sub> in exhaust gases is directly dependent on the sulphur content of the used fuel;
- Nitrogen oxides (NO<sub>x</sub>): NO<sub>x</sub> emissions from equipment or activities contribute to pollution in the form of acid rain, disturbances of the ozone layer and local health problems;
- Carbon oxide (CO): The release of carbon monoxide (CO) occurs because of incomplete combustion of fuel in engines.

Emissions of exhaust gases are expected to be generated from vehicles, site machinery, and heavy equipment used for construction activities. Heavy equipment such as bulldozers will produce exhaust emissions from diesel engines leading to temporary increase in SO<sub>x</sub> and NO<sub>x</sub> concentrations and reduction of air quality. Impacts will be localized and temporary and will persist as long as the construction activities last.

The significance of adverse impacts from the construction activities is expected to be moderate and localized. The reduction of air quality is considered to potentially affect.:

- workers onsite,

- sensitive receptors A, B, C & D (identified in Chapter 5.3.)

### **Use phase**

No significant increase in exhaust gases and adverse impacts on the air quality are expected. The Sub-project does not include facilities with emissions of pollutants into the air. Auxiliary energy sources (32 kW diesel generators) will be used for sprinklers and elevators in the case of power cuts.

The use of diesel generators results in the emission of CO<sub>2</sub> and CO, but with the observance of all legally prescribed protective measures as well as CO<sub>2</sub> and CO sensors, design of ventilation and position of the exhaust pipe, during use and the use of the generator only as a backup power source, the impact can be considered negligible. The exhaust gases will not be significant, however, can present a risk for employees and other users of premises and surrounding if the power room is not sealed, does not have adequate ventilation and /or the gases accumulate for any other reasons. The planned design of all the buildings under the Sub-components 1 and 2 are in accordance with the principles of energy-efficient and sustainable construction, as so-called nZEB building<sup>20</sup>, whereby the production of thermal and electrical energy for the needs of the building is partly foreseen using renewable energy sources (photo-voltaic panels and heat-pumps). All of the above will contribute to reducing the consumption of heat and of electricity from fossil fuel.

### **7.1.2 Mitigation measures**

#### **Design phase**

Diesel generator is located outdoor, north of a Building A in Duilovo - Split. The floor of the Diesel generator area will be made of non-flammable material and impermeable to water and fuel.

#### **Construction phase**

Detailed description of mitigation measures is presented in the chapter 10.1.

#### **Use phase**

Auxiliary diesel generators, ventilation systems, sensors and alarms will be regularly maintained.

### **7.2 Indoor air quality**

#### **7.2.1 Potential impact**

#### **Construction phase**

Although radon can easily migrate from the soil to the surrounding outdoor space, its concentration in outdoor space decreases to the level it does not pose a health risk. Therefore, no impact on human health is expected due to radon emissions during the construction phase.

#### **Use phase**

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<sup>20</sup> NZEB is applied when the energy property of the building and the share of renewable energy sources meet the requirements for “almost zero energy buildings”

Every building has the potential from elevated levels of radon. The risk of getting radon-induced lung cancer increases as exposure to radon increases (either because the radon level in the room is higher or the exposure is longer)<sup>21</sup>. National (and EU) reference level is 300 Bq m<sup>-3</sup>. Geogenic radon potential in Split-Dalmatia County has not been measured, but according to the results of the measurements of radon in houses, average values of radon concentration in Split-Dalmatia County was very low - 1-20 Bq m<sup>-3</sup>. The Action plan on radon protection 2019-2024 is in force in the Republic of Croatia, according to which all public and social facilities, especially health and educational institutions, during the phase of obtaining a usage permit, must also have a positive test result on the presence of radon in the building under prescribed limits. Radon concentrations in the soil in the area of Sub-project are currently unknown, but testing should be done upon completion of the building.

Other potential pollutants typical for use of buildings include PAHs, VOCs (e.g., formaldehyde sources include furniture and cooking), dichloromethane (from solvents), and others.

## **7.2.2 Mitigation measures**

### **Design phase**

The so-called "passive protection" consisting of installing appropriate films that protect the entire space of buildings (both in Kaštel Stari and Duilovo-Split), primarily from moisture, and meet the following norms will be sufficient to prevent radon from passing into the building:

- EN 13967:2017 Flexible waterproofing strips -- Plastic and elastomeric strips for protection against moisture and water from the soil -- Definitions and Features (EN 13967:2012 +A1:2017)
- EN 13984:2013 Flexible waterproofing strips -- Plastic and elastomeric steamperming tapes -- Definitions and Features (EN 13984:2013)

### **Construction phase**

Measurement of radon concentration upon completion of the building - a mandatory result as a condition for obtaining a use permit.

### **Use phase**

The insulation should be fully functioning as soon as construction is finished in order to eliminate radon passing to the building. The buildings shall be tested (indoor air quality monitored) before use. In case passive systems turn out not to be fully functional, they shall be upgraded with active sub-slab or sub-membrane depressurization system, radon drainage, etc. and re-tested until the results are acceptable (below 300 Bq/m<sup>3</sup>).

## **7.3 Soil**

### **7.3.1 Potential impact**

#### **Construction phase**

Construction activities may affect soil characteristics due to general site clearance and grading, excavations, and foundations of buildings. The impacts on soil (permanent loss of its ecological

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<sup>21</sup> US EPA, Office of Air and Radiation, 2001: Building Radon Out, A Step-by-Step Guide on How To Build Radon-Resistant Homes

and regulatory function) can be expected only due to the construction of Building 1B of Sub-component 1 and improvement of technological infrastructure of Sub-component 3 (macadam paths, fencing and educational forestry parks). Due to the steep terrain at Duilovo, soil erosion (and landslides) is possible during the construction of fence (Sub-component 3.3.1) in the south-east and east border of the Institute's property. This can pose a risk to the sensitive receptors A, more concretely inhabitants of houses below the Institute (for more details, see the chapter 7.13 Community Health and Safety).

All other works relate to the improvement of existing auxiliary buildings and green-house. Given that these surfaces are already built and that the primary soil functions have been lost, the impact can be considered as negligible.

Waste soil will be re-used safely as much as possible; the rest of the mineral waste will be deposited on a designated location with an approval from the competent authorities.

#### **Use phase**

No impact on soil is expected during use phase, providing safety and maintenance (including waste management) procedures are adhered to. There is a potential risk for soil erosion at Duilovo in case that fencing or the drywalls are not constructed properly at the steep parts (see also the potential impact during construction phase). As the risk from soil erosion is present the Institutes plants in the collection plantations **vegetation cover that helps manage soil moisture, reduces water runoff from the soil surface and erosion.**

There will be no fuelling or waste dumping at the site. All equipment and devices of thermotechnical and electrical installations that may contain pollutants (e.g. transformer oil in transformation station, diesel generator), are planned indoors, on the roofs, or on impermeable substrates, which prevents their possible reaching the soil and underground.

### **7.3.2 Mitigation measures**

#### **Construction phase**

Measures to mitigate the risk of soil pollution due to spills or spill leakage are mainly related to the proper management of hazardous and non-hazardous liquid waste, proper use of oils and fuels on construction site, prevention of spillage coming from tanks, containers construction equipment and vehicles, adequate response measures in case of an accident etc.

Potential erosion and landslides at Duilovo will be addressed in the Detailed design for fencing the Institute's property (Sub-component 3.3.1). The Detailed design will analyze the risks of erosion and landslides taking into account extreme weather conditions and prescribe necessary measures to prevent soil erosion and potential landslides. Detailed description of mitigation measures is presented in the chapter 10.1.

#### **Use phase**

Tanks containing hazardous substances (diesel, transformation oil) will be protected from weather conditions and located on the impermeable floor. End of use waste (oil and fuel contaminated machinery, etc.) will be handed over to a licensed collector and landfilled/processed by a licensed company. In addition to application of Stockholm Convention. Drywalls, retention walls, and other soil erosion/landslides control and prevention infrastructure will be regularly checked and maintained.

Collection pits for wastewater will be leakproof, as well as a compost pit.



## **7.4 Water Quality**

### **7.4.1 Potential impact**

#### **Construction phase**

Since there are no surface water bodies in the vicinity of Sub-project's locations (Kaštel Stari and Duilovo-Split), no impacts on surface water bodies are expected.

Impacts on groundwater quality during the construction phase may be the result of incidental spills, which could result in introducing organic matter, hydrocarbons (oils), coliforms or heavy metals to the groundwater aquifer. Organic or hydrocarbon contamination could increase the biochemical oxygen demand (BOD) load on the groundwater. Since the Sub-project is located outside the groundwater protection zones and sanitary protection zones, no decrease in the quality of drinking water for local communities is expected. The risk can be categorized as low to moderate (if all mitigation measures are in place).

Although both locations are situated in the karst area in the near vicinity of the sea, it is not expected that the contamination would be in such extent that could cause the contamination of the sea water. The impact is expected to be of localized nature (limited to the project area).

#### **Use phase**

Potential pollutants during the use of the Sub-project can be present in wastewater (sanitary-fecal, technological and storm water) and oils from the diesel generator fuel.

#### **Sub-component 1**

Sanitary wastewaters will be discharged into a watertight, closed collection pit with a volume of 20 m<sup>3</sup> that will be emptied every 10 days. Wastewater from the wine processing process is characterized by a high proportion of organic load with a very complex composition and elevated concentrations of nutrient salts, macro and micro elements. The composition and volume depend on the production phase and season. The wastewater from the technological process will be drained through the main pipeline, separated from the sanitary wastewater to the biological device with 2<sup>nd</sup> degree of purification by recirculation of activated sludge, pH regulation and defoaming. Wastewaters from laboratories will be connected to the biological treatment plant as well. After the biological pre-treatment, technological waters created by the processing of grapes are drained into a separate watertight collection pit that will be emptied every 6 days (during the production of wine) by a licensed company and treated adequately.

Rainwater drainage from the roof of the building will be carried out by a vacuum system and will be discharged into infiltration field. Rainwater from the roads will be collected via linear grid to a sump with a sedimentation tank, after which the water is led via pipelines and inspection wells to the light liquid separator. After pre-treatment in the light liquids separator, the rainwater will be discharged in the infiltration field east of the Building 1B in the way that is preventing localized flooding and soil erosion even in the extreme weather conditions.

#### **Sub-component 2**

In Building 2A, an internal pipeline system for wastewater drainage was built and will be retained and the sanitary wastewater will be collected in the pit north of the Building B. In Building 2B, all wastewater from the olive processing plant is drained via an independent

grease sewage installation to the existing oil separator. After treatment, wastewater is discharged into the cesspit which is regularly emptied and maintained. Rainwater from the roofs of both buildings will be discharged onto the surrounding land to water green areas.

Using the planned wastewater collection and drainage system, under regular conditions of Sub-project use, pollution due to their discharge is not expected. All equipment and devices of thermotechnical and electrical installations are provided indoors or on the roofs, or on impermeable substrates, which may prevent the maturity of pollutants that these installations may contain (e.g. diesel generator) into the soil and underground.

Given all of the above, during the use, no negative impact on the condition of surface- or groundwater bodies is expected.

There is a risk in case of inadequate waste management and illegal dumping on the site which will be prevented/monitored through system of waste manifests and records.

#### **7.4.2 Mitigation measures**

##### **Design phase**

When designing the water supply system, it is necessary to respect the obtained special requirements of the competent authorities.

Sanitary sewage and all technological waters of Sub-components 1 and 2 will be discharged into a watertight, closed collection pits. Before connecting the drainage from the building to the sump, it is necessary to test it for impermeability, and obtain the opinion of an authorized institution that the pit is impermeable. The watertightness test must be performed by an authorized legal entity.

##### **Construction phase**

All Sub-components: Measures to mitigate the risk of pollution of groundwater due to spill leakage include proper management of liquid waste, proper use of oils and fuels on construction site, prevention of spillage coming from tanks, containers construction equipment and vehicles, adequate response measures in case of an accident, isolation of wash down areas of concrete and other equipment from watercourses, forbid groundwater extraction on unregulated way, forbid discharge of contaminated waters into the ground od streams or rivers etc.

Detailed description of mitigation measures is presented in the chapter 10.1.

##### **Use phase**

Sub-component 1: It is necessary to ensure that the composition of sanitary, technological and rainwater from the traffic manipulative surfaces is in accordance with the limit values of wastewater emissions prescribed by the Ordinance on wastewater emission limit values (OG 26/29). There will be no fuelling or waste dumping at the site. All equipment and devices of thermotechnical and electrical installations that may contain pollutants (e.g. transformer oil in transformation station, diesel generator), are planned indoors or on the building itself, or on impermeable substrates, which prevents their possible reaching the soil and underground.

Tanks containing hazardous substances (diesel, transformation oil) will be protected from weather conditions, and placed on the impermeable floor.

## 7.5 Climate change

### 7.5.1 Potential impacts to the climate change

There will not be significant emission of GHG, therefore no impact on climate change is expected.

On the contrary, the Sub-project will contribute to increasing the use of renewable energy sources at the location by installing a photo-voltaic plant for the production of electricity. The buildings and their installations are designed in such a way that the amount of energy they require remains at a low level, taking into account the users and the climatic conditions of the building's location.

### 7.5.2 Vulnerability to the climate change

Climate parameter	Potential impacts to the buildings
<b>Change in precipitation patterns and increased share of precipitation</b>	<ul style="list-style-type: none"> <li>• Erosion of the surface layers of buildings and structures by strong gusts of rain and/ or hail</li> <li>• Expansion of reinforcement that causes cracks in parts of structures due to acid rain and increased rainfall intensity and/or sea level rise</li> <li>• Flooding and saturation of drainage systems</li> <li>• Increased water consumption due to prolonged dry periods and droughts during the summertime</li> </ul>
<b>Floods</b>	<ul style="list-style-type: none"> <li>• Since the Sub-project is located outside the flooding areas, it is not vulnerable to the floods. However, it can be prone to localized flooding in the case of heavy rains.</li> <li>• Consequent increased risks to soil stability, soil availability and landslides</li> </ul>
<b>Sea level rise</b>	<ul style="list-style-type: none"> <li>• No impact is expected. The property of Institute is located at a higher altitude compared to sea level.</li> </ul>
<b>Thermal oscillations</b>	<ul style="list-style-type: none"> <li>• Formation of heat islands and difficult/uncomfortable stay in open spaces</li> <li>• Change and emergence of uncomfortable climatic conditions in construction facilities</li> <li>• Buckling/cracking of material due to heat waves</li> <li>• Pressures on the structure and materials due to thermal expansion</li> <li>• Stronger pressures on materials due to greater temperature differences inside and outside buildings</li> </ul>
<b>More frequent and stronger storm events</b>	<ul style="list-style-type: none"> <li>• Threat of existing and planned facilities located in flood areas (flooding of existing and planned construction areas)</li> <li>• Increased material erosion and increased pressure on structures due to stronger and alternating gusts of wind</li> </ul>

### 7.5.3 Mitigation measures

In order to effectively deal with the projected climate changes, the Institute pays more attention to short-term and long-term strategies in research and recently founded a climatological research group at the Institute.

The Sub-project complies with national regulations on energy efficiency. From an energy point of view, the Sub-project defines: the possibility of increasing wind protection (it is located in

an area exposed to strong north winds), effective non-flammable insulation of the building, quality of materials and the possibility of reducing energy consumption and carbon footprint, energy-efficient lighting, energy-efficient heating and similar.

The Sub-project documentation was prepared in accordance with the Technical guidelines for the preparation of infrastructure for climate change in the period 2021-2022 (EC, C/2021/5430) taking into account local climate conditions as well as climate change. The project documentation was prepared in accordance with the identified climate risks in the National Climate Change Adaptation Strategy in the Republic of Croatia for the period up to 2040 in relation to 2070 and the Strategic Environmental Impact Study of the Climate Change Adaptation Strategy in the Republic of Croatia for the period up to 2040 with a view to the year 2070.

To reduce heat islands landscape design will be prepared as part of the Detailed design for Subcomponent 1. In addition, to reduce the water consumption during the prolonged dry periods and droughts, Detail design will envisage also the possibility of water harvesting for the irrigation and the landscaping.

## **7.6 Biodiversity, Nature Protection Areas and Natura 2000**

### **Design and Construction phase**

The Sub-project is located in already built area. Minor clearance of mostly sparse vegetation (grasses and shrubs) is expected. The impact of the construction activities on the terrestrial biodiversity is expected to be insignificant on the construction site.

During the construction work, it is possible to enter and/or spread invasive plant species due to human movement and mechanization.

Since the Sub-project is located outside and far from nature protection areas as well as Natura 2000 sites, no significant impact is expected. However, a number of protected species is possible to be found in the area e.g. vipers (e.g. horned viper) and turtles (Hermann's Tortoise). The potential adverse impact could be expected mainly during the construction works on Sub-component 3 since works will be conducted within unbuilt area.

### **Use phase**

Photo-voltaic panels can cause the so-called "lake effect" which implies the appearance of a water surface due to the reflection of light from the panels, which can affect birds in flight. Although the area occupied by the photovoltaic cells is small, the potential negative impact is assessed as low. To further reduce this impact, it is necessary to use Anti Reflective Coatings on the panels

It is possible to introduce invasive species with inadequate landscape and greening design (e.g. bamboo).

#### **7.6.1 Mitigation measures**

### **Design and Construction phase**

#### **All Sub-components**

Measures to mitigate the risk to flora and fauna are related to the restriction of movement of heavy machinery to the access road corridor, avoiding cutting down trees and other natural vegetation where possible, using autochthonous plant species for the landscape management.

Setting fires will be strictly prohibited.

#### Sub-components 1 & 2

In order to reduce the impacts of photo-voltaic panels during the use phase, Anti Reflective Coatings on the panels shall be used.

#### Sub-components 3

Since there is a possibility for a disturbance of the strictly protected species, the site needs to be inspected every day before commencement of works.

Detailed description of mitigation measures is presented in the chapter 10.1.

### **Use phase**

#### All Sub-components

For the landscape design, native vegetation, bushes and trees that are bees and bird friendly etc. will be selected.

No invasive species will be planed or otherwise introduced. No GMOs will be introduced to nature.

#### Sub-components 1 & 2

In order to reduce the impacts of photo-voltaic panels, Anti Reflective Coatings on the panels shall be used as appropriate. In the case of finding bird carcasses from collision, competent authority will be notified, and additional corrective measures must be prescribed by the competent authority (city of Split, Department for nature protection).

## **7.7 Noise exposure**

### **7.7.1 Potential impact**

#### **Construction phase**

Noise is an unavoidable environmental and social impact during construction works. It occurs during the operation of machines and equipment at the site (mainly in the processes like transport, loading/unloading machinery etc.). This impact will be limited to the construction area and the near vicinity and will cease after foreseen completion of works (approx. 20 months).

Permissible noise level for construction site is determined by the provisions of the Ordinance on the maximum allowed noise levels in the environment in which people work and live (OG 143/21) and amounts 65dB. According to the mentioned ordinance, it is allowed to exceed that level for an additional 5 dB in the period from 8 to 18 hours. The equivalent noise level of the construction site in the open or closed part of the building during the night time at the most exposed place of sound immission must not exceed 45 dB for the mixed predominantly residential area. According to aforementioned Ordinance exceeding the permissible noise levels is allowed if necessary for the technological process of construction for up to three (3) nights within a consecutive period of thirty (30) days. A minimum of two full night periods shall be provided between periods when exceeding allowable noise levels is anticipated without exceeding allowable noise levels during the night period.

Increased noise levels are expected to be local and will directly affect the closest sensitive receptors - A & C (identified in Chapter 5.3).

It should be born in mind that there is already noise pollution in the surrounding area at the Duilovo site (Sub-components 1& 3) due to the extensive construction works on mainly new residential buildings. Therefore, the cumulative impact is expected. However, due to the fact that duration of construction works is planned for the period of max. 20 month the impact is considered temporary and moderate.

### **Use phase**

#### **Sub-components 1&2**

During the use, the adverse impact is expected due increased noise level from the electricity and heat infrastructure. Devices for the production of electricity and heat (heat pumps) are planned in separate room inside the building, and will not cause noise emission into the environment.

#### **Sub-component 1**

The connection of the photo-voltaic power plant to the existing substation on the east side of the main building (installation of the low-voltage panel with a module) and the replacement of the transformer (from current 400 kVA to planned 1000 kVA) might slightly increase the noise level of the substation. Due to the immediate vicinity of the substation to the sensitive receptors, it is recommended to measure the noise level of the substation before and after the connection of the Centre to the station.

## **7.7.2 Mitigation measures**

### **Construction phase**

Mechanisms available to monitor potential impacts and introduce mitigation measures in a timely manner will be used. The Sub-project-affected parties will be adequately informed about the Sub-project and contractors' GRM. It will be ensured that the GRMs are functional. The Sub-project-affected parties will be kept informed about construction schedules, progress, and safety precautions.

It is necessary to choose and apply adequate noise protection measures: adjustment of operating time; use of temporary movable noise barriers; use of alternative working machines with lower noise emission levels.

### **Use phase**

Exceeding the permissible noise level during the regular use of the Centre at both location is not expected; therefore, no measures are necessary. In case that generated noise levels exceed the maximum permitted noise levels (monitoring in the case of complaints), it is necessary to choose and apply adequate noise protection measures, such as noise barriers around major noise sources.

Nevertheless, noise emission level of the existing substation on the east side of the existing main building (Sub-component 1, Duilovo-Split) shall be measured at the appropriate location near the sensitive receptor before and after the connection of the Centre to the existing substation. In case that increased noise emission exceed the maximum allowed noise level as defined by Ordinance on the maximum allowed noise levels in the environment in which people work and live (OG 143/21), appropriate noise protection measures shall be applied.

## **7.8 Vibration**

### **7.8.1 Potential impact**

#### **Construction phase**

Since the Sub-project does not foresee activities that could affect the stability of the surrounding area, there is no risk of endangering the stability of the surrounding buildings.

Potential adverse impact from vibration during construction is expected to be local. There is a potential risk of vibration effect on the stability of the Area of Archaeological Heritage, however, the impact is assessed as low since there are no deep excavation works.

Vibration from operation of the equipment/vehicles can affect:

- workers at the site (especially workers in operating machines and equipment)
- Closest sensitive receptors - A & C (identified in Chapter 5.3)

### **7.8.2 Mitigation measures**

#### **Construction phase**

During the execution of the works, GRM will be available to submit complaints.

## **7.9 Traffic**

### **7.9.1 Potential impact**

#### **Construction phase**

Delivery of construction materials and equipment to the construction site will be by road transport. The transportation of material and equipment to the construction sites will cause a temporary increase in traffic and heavy machinery along the roads outside the Sub-project area. Access to the plot will be provided through the Put Orišca Street, Vrgoračka Street, and Put Duilova (Duilovo – Split) and through the Maslinarska Street (Kaštel Stari). All activities of Sub-project construction will be carried out in a way they do not endanger the safety and normal flow of traffic. Short temporary disruptions to parking or accessibility are possible. Given all the above, the impact on traffic during the construction of the project is considered low.

A temporary increase of heavy machinery may potentially affect:

- Sensitive receptors A., B., C. & D. (Identified in Chapter 5.3.)

Short temporary disruptions to parking or accessibility may potentially affect:

- Sensitive receptors A.1., A.3., C.1. & C.2. (Identified in Chapter 5.3.)

#### **Use phase**

No adverse impact during the use phase is expected.

### **7.9.2 Mitigation measures**

#### **Construction phase**

Mitigation measures include adequate organization of temporary traffic arrangements to improve signage, visibility and overall safety of roads, timely information dissemination through media and placing the signs and warnings at the location of construction works and near vicinity.

The organization plan for the construction site will be presented to the sensitive receptors A.1., A3., C.1. & C.2. (Identified in Chapter 5.3.).

Sensitive receptors A., B., C. & D. will be directly informed on any potential traffic impacts.

Adequate organization of temporary traffic arrangements must be performed according to Ordinance on Temporary Traffic Regulation and Signing and Safety of Road Works (OG 92/19). Temporary traffic arrangements will be approved by the Traffic Police. Safe passages for pedestrians and cyclists will be ensured. The temporary ban of heavy civil works defined by the local authorities will be taken into account when planning works.

### **Use phase**

No mitigation measures are foreseen in the use phase.

## **7.10 Cultural Heritage**

### **7.10.1 Potential impact**

#### **Construction phase**

There is a potential of adverse impacts on the Area of Archaeological Heritage “The coastal zone from Žnjan to Stobreč, including the semi-urban area of Stobreč centered on the Orišac hill” in the southernmost part of the Sub-component 3 (Duilovo – Split) during construction works (reconstruction/ upgrading of the existing and building new macadam paths, fencing, and arranging and landscaping two forestry educational demonstration parks. Therefore, small earthworks will be needed, but no deep excavation nor construction of the buildings are planned within the Area of Archaeological Heritage.

The Ministry of Culture and Media, Conservation Department in Split issued the Opinion on Works on the Property of the Institute on 25 June 2024 (Annex 3): *The cadastral plots/cadastral parcels owned by the Institute, on which the works of arrangement, renovation, and construction of the infrastructure are planned, are located outside the protected zone, so the provisions of the on the Protection and Preservation of Cultural Property Act do not apply in relation to it. If archaeological finds are found during the works, they must be reported to the competent authority as soon as possible (Article 45 of the Protection and Preservation of Cultural Heritage Act).* Therefore, the potential impact is considered as low. However, there is a possibility of chance findings.

#### **Use phase**

Risks during the use phase is excepted only in case of chance finds. Potential risks that can adversely affect the preservation of potential archaeological finds are natural disasters (floods, earthquakes), vandalism, etc.

### **7.10.2 Mitigation measures**

#### **Design and construction phase**

According to the GUP of City of Split, archaeological excavation supervision is mandatory for the construction works within the areas marked as archaeological areas on the Map 4a of the GUP, and the contractor is obliged to stop the work and report the findings to the authority responsible for protection of cultural assets.



Therefore, a competent archeological supervision will have to be in place during the earthworks for some activities under the Sub-component 3 which are located within the archeological area (fencing and macadam paths in the southernmost part of the Institute, and arranging forestry educational park “Karst Landscape” at Location 2). If chance finds are found during the works, they must be reported to the competent authority as soon as possible (Article 45 of the Act on Protection and Preservation of Cultural Heritage). Excavations in this area will not be done with heavy machinery.

### **Use phase**

The Sub-component 3 envisages fencing the Institute’s property which will prevent the entry of unemployed persons and thereby reduce the risk of vandalism.

## **7.11 Land acquisition**

### **7.11.1 Potential impact**

The land has settled property and legal relations, and no additional costs are foreseen for the purchase and conversion of the land. The Institute remains the owner of the land, buildings and other basic assets after the completion of the Modernization of the Institute for Adriatic Crops and Karst Reclamation Infrastructure as a Precondition for Excellence in Mediterranean Agriculture Research Sub-project.

No land acquisition restrictions on land use and involuntary resettlement are needed to implement the Sub-project and no private property will be affected.

### **7.11.2 Mitigation measures**

No mitigation measures are foreseen since no land acquisition is needed.

## **7.12 Labour and Working Conditions and Occupational Health and Safety**

### **7.12.1 Potential impact**

#### **Construction phase**

The Labour Management Procedures (LMP) have been prepared as part of ESMF and shall be followed.

Contracted and subcontracted workers will have access to GRM. At this stage the exact number of workers is unknown, it will be known when the construction works begin.

Although contractors and workers employed in construction activities are likely to be locally based, there is a potential of labour influx since the contractor may engage migrant workers (local from outside the area or foreigners) subject to meeting national requirements for work permit or a work registration certificate.

Regarding the potential labour risks, they are in detail described in Labor Management Procedures within the ESMF, with the following conclusions:

- no instances of child or forced labour are likely to happen under the project as legislation on employment and labour are fully harmonized with the International Labor Organization (ILO) conventions (particularly ILO Forced Labor Convention No. 29 ratified by the Republic of Croatia) and the European Union Directives inclusive of convention on forced labour and convention on elimination of child labour and protection

of children and young persons. Therefore, people under the age of 14 will not be employed under the Project;

- Project activities do not include activities that have a high potential for harming people or the environment;
- since construction works are of small to medium-scale, there is low risk related to gender-based violence (GBV) including SEA/SH. Deployment of security forces is not envisaged.

Potential risks during construction phase include general occupational health and safety hazards such as:

- working at height;
- electrocutions and electrical works;
- traffic accidents;
- lifting of heavy structures;
- accidents with exposed rebars;
- exposure to construction airborne agents (dust, etc.);
- ergonomic hazards during construction;
- vibration of heavy construction equipment;
- use of rotating and moving equipment, using heavy machinery;
- noise exposure;
- lack of workers' awareness on occupational health and safety requirements such as the use of personal protective equipment (PPE) and safe workplace practices;
- exposure to hazardous substances (e.g. paints, varnishes, asbestos);
- working with heavy and dangerous machinery;
- working around pits, ditches, stacked materials, traffic, loading and unloading, etc.;
- seismic active area;
- exposure to extreme weather conditions (high temperatures, strong winds, etc.)
- risk of disease spreading.

Site personnel may experience heat stress (heat rash, cramps, heat exhaustion, heat stroke, etc.) due to a combination of elevated ambient temperatures and the concurrent use of PPE. This will largely depend on the type of work and the time of year. In addition, overexposure to UV radiation in sunlight can result in sunburn to exposed skin. Similarly, storms, strong wind, and other extreme weather conditions pose a risk. There is a risk of increased number of mosquitoes during the summer, but malaria or significant outbreak of other mosquito-borne diseases has not been recorded in the area.

Potential risks regarding labour influx are related to:

- language barriers;
- different attitudes of foreign workers toward safety and risk perception, absence or low skills for certain types of works that can lead to accidents (H&S risks);
- exploitation and unfair treatment – contractual arrangements (unfair wages, excessive working hours, working in unsafe conditions, inadequate accommodation);
- integration in community: risks and impact on community related to foreign workers due to difficulty of their integration into community (e.g., the feelings of anxiety and fear for unsafe environment among the local residents when there are foreign workers living in the same building or in vicinity);
- potential cases of discrimination of foreign workers at the working place and within the

community.

### **Use phase**

#### **Sub-component 1**

Labor and working conditions and occupational health and safety include exposure to hazardous materials/waste, and life and fire safety. To align with operational processes and ensure the highest occupational health and safety standards, chemicals used for daily analyses will be temporarily stored in specialized rooms within laboratories or units (storage rooms) on the first floor. This ensures that chemicals are not kept in active workspaces, reducing the risk of accidents and contamination. The storage of chemicals on workbenches will be minimized to limit the presence of unprotected chemicals that could pose fire hazards or be easily knocked over. Each chemical will have a designated storage location, and it will be returned to that location immediately after use. Similarly, the storage of chemicals in fume hoods will be minimized. At the end of each workday, all chemicals not stored in their designated areas will be checked, and any unused chemicals will be returned to the storage rooms within each unit. Upon leaving the Center, all laboratory personnel will ensure the proper redistribution, removal, or safe storage of any hazardous materials remaining in their laboratories.

The hydrogen used for laboratory purposes will not be stored within the laboratories themselves, but in a designated, separate area.

The eventual occurrence of fire can occur in laboratories, rooms where chemicals are located, and on installations inside the building.

#### **Sub-component 2**

The potential occurrence of a fire in the building 2A can occur in the kitchen and on the installations inside the building.

### **7.12.2 Mitigation measures**

#### **Design phase**

Measures to reduce exposure to hazardous materials/waste are included in the Waste Management Measures described in Chapter 7.14.2. Furthermore, with regard to the fire safety measures, all new buildings accessible to the public are designed, constructed, and operated in full compliance with local building codes, local fire department requirements and national (EU compliant) regulations, local legal/insurance requirements, and in accordance with an internationally accepted life and fire safety (L&FS) standard (in the absence of Croatian regulations for a specific area). Recognized rules of technical practice are (Österreichisches Institut für Bautechnik (OIB), British Standard (BS), National Fire Protection Association (NFPA). Designers and professional consulting engineers demonstrated that the building meets these life and fire safety objectives. Life and fire safety systems and equipment are designed and installed using appropriate prescriptive standards and/or performance-based design, and sound engineering practices.

The Occupational Safety Study was developed as a part of the Main Design providing measures and technical solutions for occupational safety rules to prevent injuries and occupational diseases.

Construction Works Plan which provides measures regarding occupational safety was prepared as part of the Main Design.

### **Construction phase**

Mitigation measures for occupational health and safety risks:

- measures related to workers safety (defined in Safety at Work Plan, Fire Safety Plan and Emergency Preparedness and Response Plan prepared by the contractor as a part of the Management Strategies and Implementation Plans (MSIPs), WB EHSG and GIIP, aligned with the material objectives of ESS2);
- measures defined in Construction Works Plan related to organization of the construction site, occupational safety, traffic security, electric installations, foreign workers
- Use of PPE at all times;
- Organise work in safe manner and other available in the Mitigation Plan;
- measures to address discrimination against women/vulnerable groups in the hiring process of workers;
- measures to address risks associated with labour influx;
- taking into account weather conditions when organising works, avoid works during harsh weather conditions, supply sufficient water and isotonic drinks during periods with increased temperatures, etc.;
- measures to prevent Sexual Exploitation and Abuse (SEA)/ Sexual Harassment (SH).

Detailed description of mitigation measures is presented in the Mitigation plan and chapter 9.2.

### **Use phase**

In laboratories where hydrogen is handled, appropriate safety measures will be implemented, including proper storage and clear labelling. Personnel will undergo training on safety procedures and will use the required personal protective equipment. Additionally, staff will be trained on important safety procedures such as evacuation and alarm protocols in case of emergencies, proper use of fire extinguishers.

Workers must be professionally trained and trained to work in a safe manner and under medical supervision. The laboratory must have a written quality assurance program that ensures work in accordance with the principles of good practice. The program will be prepared and communicated to staff before use phase commences.

## **7.13 Community Health and Safety (including Life and Fire Safety)**

### **7.13.1 Potential impact**

#### **There is a risk that fire safety is not adequately addressed as some works do not trigger fire-safety study under the law. Construction phase**

Regarding community health and safety, several factors that could affect community health and safety have been identified. Based on the analysis of each of these factors, it is concluded that the construction work will have low to moderate impact on the health and safety of the community.

#### **Disruption of working conditions of the Institute's employees (sensitive receptors A.3.)**

There will be no relocation of the employees during the Sub-project implementation (they will continue working in the existing main building in Duilovo-Split). However, the increased levels of dust, emissions to air, noise and vibrations or temporary disruptions to traffic, risk of road accidents, disruptions in utility services due to accidents or planned interventions (water, gas, electricity) will affect the working condition of the Institute's employees. The potential impact will be temporary (for duration period of approximately 20 months) and is assessed as moderate.

#### Disruption of nearby communities (sensitive receptors A.1., A.2., A.4., B.1., B.2.)

Civil works may cause disruptions to nearby communities and in the Institute's existing facilities (for duration period of approximately 20 months) such as: increased levels of dust, emissions to air, noise and vibrations or temporary disruptions to traffic, risk of road accidents for pedestrians, disruptions in utility services due to accidents or planned interventions (water, gas, electricity), etc. The most affected receptors will be the ones that are closest to the construction works (sensitive receptors A and C). The distance of the school from the construction site in Duilovo-Split is approx. 300 m, whilst the distance of the school from the construction site in Kaštel Stari is approx. 100 m. Since the current noise level in Kaštel Stari is relatively low (there are no other noisy activities) the impact is assessed as moderate. On the other hand, the school in Split is located in the area with increased noise level (other construction sites in surrounding area, busy traffic etc.); therefore, the potential impact is assessed as low.

One of the key potential risks associated with the construction works is the increased risk of road accidents due to increased traffic of construction vehicles. It can have impact on the sensitive receptors A, B, C & D (Chapter 5.3.).

During the sensitive receptors' engagement activities in Kaštel Stari, the concerns were raised whether it would be possible to carry out the construction work of the roof and floor structure between the first floor and attic without damage to the apartment on the first floor. Regarding the fact that the tenants are living in the building on which the construction works will be carried out, there is a possibility that living conditions will deteriorate significantly during the part of construction works due to noise and dust.

#### Earthquakes

The project area is prone to earthquakes which poses the risk of accidents, for workers and the community, if earthquake occurs (e.g., demolition of a crane or other machinery). However, by properly organized construction site and applying defined protocols and standards this risk should be minimized. Since the buildings are located within the Institute's property and separated from public areas, the potential risk of injuries of the passers-by in the event of an earthquake is low. Buildings 1A, 1B and 1C in Duilovo (Sub-component 1) are designed in accordance with the Eurocode 8, while the auxiliary buildings (Duilovo-Split, Sub-component 3.2) and Buildings 2A and 2B in Kaštel Stari (Sub-component 2) will be a subject of structural improvements.

#### Exposure to the hazardous materials

The risk of exposure of the community to hazardous materials is limited. Management of hazardous materials, including hazardous waste, is related to construction activities and is short-term (finite duration of the construction activities). This risk will be mitigated in accordance with national labour and OHS policies, and relevant WB policies as well as adhering to appropriate measures.

#### Potential sexual exploitation and abuse and sexual harassment

Given the growing presence of foreign construction labour in the RoC, foreign workers from neighbouring countries can be expected, as well as workers from further afield. During construction, due to potential labour influx, there is a risk of a potential sexual exploitation and abuse and sexual harassment within the community and/or creation of concern among local residents. Although the risk exists, it is considered small.

#### Fire

In case of fire, the risk is assessed as moderate for the sensitive receptors, more concretely the tenants and owners of the apartments and houses within the area of the Institute's property (A.1), and employees of the Institute (A.3) in Duilovo-Split, as well as tenants and owner(s) of the apartment in the building 2A in Kaštel Stari (C.1 and C.2). Evacuation from Building 2A (basement, ground floor, first floor & attic) is possible via the staircase directly to the outdoors on the north and south exit, although the existing doors at the north are not marked as a evacuation exit in the Main Design.

#### Soil erosion

There is a potential risk of erosion due to the construction of fences (Sub-component 3.3.1) in the immediate vicinity of the tenants bordering the Institute in the south-east (c.p. 10285/3, c.m. Split). This concern was raised during the meeting with focus group 2 in Duilovo-Split by the tenants who already experienced the erosion above their house during intensive storms. The erosion is possible also during the fencing on the east border of the Institute's property along the Vrgoračka street, in which case passers-by could be affected.

#### Use phase

Disruption of working conditions of the Institute's employees

No disruption is expected. On the contrary, working conditions should be improved after moving to the new Centre in Duilovo-Split and improved condition in Kaštel Stari.

#### Disruption of nearby communities (sensitive stakeholders A.1., A.2., A.4., B.1., B.2.)

Regarding the health of the local community, no significant impacts on the quality of the surrounding air, noise level, traffic disturbance, etc. are expected. As explained in chapter 7.7 Noise exposure, there is a potential adverse impact on the tenant living above the existing substation and the Institute's employees in case that increased noise emission due to the replacement of old transformer (400 kVA) with a new transformer (1000 kVA) in the existing substation exceed the maximum allowed noise level as defined by Ordinance on the maximum allowed noise levels with regard to type of noise source, time and place of origin (OG 143/21). In such case, appropriate noise protection measure shall be applied.

In addition to that, there is also potential adverse impact due to the increased electromagnetic radiation. The risk is low due to the non-ionizing radiation regulations that must be followed.

There is no risk of the flooding since the Sub-project is not located in a flooding area.

In the basement of building 2A, there will occasionally be activities in which a maximum of 13 people will participate as part of research projects carried out by the Institute. The negative impact on the living conditions of the tenants on the ground floor and on the first floor of building 2A is assessed as low.

### Earthquakes

The potential risks to the community due to the earthquakes is minimized by implementing the Eurocode 8 (Design of structures for earthquake resistance) standards in the buildings' structures. The buildings are located within the Institute's property and separated from public areas by green and parking areas; therefore, passers-by are not expected to be injured in the event of an earthquake.

The reconstruction of the floor structure between first floor and attic of building 2A in Kaštel Stari is a composite ceiling structure (timber & reinforced concrete) that will improve seismic stability and resistance.

### Fire

The same as during construction, the risk is assessed as moderate for the stakeholders A and C, more concretely the tenants and owners of the apartments and houses within the area of the Institute's property (A.1), and employees of the Institute (A.3) in Duilovo-Split, as well as tenants and owner(s) of the apartment in the building 2A in Kaštel Stari (C.1 and C.2). However, as a part of the Main Design, Fire Protection Study was carried out by a licensed fire safety expert for Sub-components 1 and 2. The fire protection measures described in chapter 3.5.3. and 3.6.4. will be applied and therefore reduce the risk of fire. In both locations there are sufficient number of evacuations exits.

There is a potential risk of the forest fires (Sub-component 3) to the sensitive receptors (A and B) within or in the immediate vicinity of the Institute's borders. The risk is low due to the constant cultivation of vegetation and planned arrangement of two forest educational parks.

At least 2 fire evacuation exits are ensured in all buildings.

### Soil erosion

With regard to the soil erosion (and potentially landslide) due to intensive rainy and stormy weather, there is a potential risk for the local population on the south-east border of the Institute (explained above for the construction phase) in case that fencing is not properly constructed and stabilized.

## **7.13.2 Mitigation measures**

### **Design phase**

#### Sub-component 2

Detailed Technical Design of the building 2A roof including floor structure between the first floor and the attic was developed to ensure that no damage is done to the apartments. The owners have signed the agreement on planned construction works.

The north door that leads directly to the outdoor area is going to be designed as evacuation exit.

#### Sub-component 3

The detailed design will envisage in detail the measures for safety fencing, with the special focus on the vicinity of bordering houses.

For the overgrown areas planned to be arranged and landscaped as the forest educational parks the detailed landscape design will be developed.

Where the law does not require preparation of fire safety study, measures will be required from the national/local competent authorities including firefighting brigades or and WB EHSO will be applied.

Risks from landslides will be carefully inspected at Duilovo.

### **Construction phase**

#### **General measures**

By properly organized construction site and applying defined protocols and standards, risk will be minimized. Waste management must be in line with the national legislation and WB policies.

During construction, due to potential labour influx application of adequate labour management procedures have to be envisaged to prevent any potential sexual exploitation and abuse and sexual harassment within the community and/or creation of concern among local residents. A contractor will be required to prepare and enforce a Code of Conduct for Workers. Also, GRM project mechanism is available.

As such, adverse impacts relating to the presence of non-local and migrant workers within the community are unlikely to occur.

Stakeholder engagement activities and safe routing will mitigate the increased risk of road accidents.

Due to vicinity of the tourism facilities safety notices should be both in Croatian and English.

Mitigation measures for other risk related to community health and safety are analysed in previous sub-chapters (increased levels of noise, dust, or temporary disruptions to traffic, risk of road accidents for pedestrians, disruptions in utility services due to accidents or planned interventions (water, gas, electricity) and poor occupational health and safety practices).

#### **Sub-component 2**

The contractor will present the timeline of the construction work to the tenants and will make an assessment will it be possible to live in the apartments during the construction works due to noise and dust. If the living conditions deteriorates, the Institute will assist in tenants' temporary housing.

#### **Sub-component 3**

The risk of potential erosion can be reduced by the proper construction of the fence and the implementation of all necessary protection measures. The precise positioning of the wall foundation will stabilize the slope towards the houses and the existing road (Vrgoračka street). On a foundation, a fence/retention wall (or other soil control measures) will be built/applied and a fence will be installed providing safety from potential erosion.

### **Use phase**

Risk assessment and Operational plan of legal entities that perform activities using dangerous substances shall be developed according to Law on the Civil Protection System Act (OG 82/15, 118/18, 31/20, 20/21, 114/22). In the case of complaints regarding noise or other impacts from any other devices, the Institute will carry out monitoring based on which corrective measures will be tailored and executed.



### Sub-component 1

Measures related to noise protection as defined in Chapter 7.7.

The level of electromagnetic radiation of the existing substation on the east side of the existing main building (Duilovo-Split) shall be measured at the appropriate location near the sensitive stakeholders before and after the connection of the Centre to the existing substation. In case that increased electromagnetic radiation exceed the maximum allowed electromagnetic radiation level as defined by Ordinance on protection against electromagnetic fields, appropriate protection measures shall be applied.

### Sub-component 2

The tenants in Building 2A will be timely informed on the increased activities in the basement.

## **7.14 Waste Management**

### **7.14.1 Potential impact**

#### **Construction phase**

Main waste types from the following waste groups are expected to occur at the locations:

- group 08 - wastes from the manufacture, formulation, supply and use of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks – some subcategories might be hazardous;
- group 13 - oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19 of waste catalogue) – some subcategories might be hazardous;
- group 15 - waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified;
- group 17 - construction waste and waste from the demolition of buildings (including excavated earth from contaminated sites), including
  - insulating materials and building materials containing asbestos (17 06) – hazardous waste
- group 20 - municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions (paper, plastics, glass, food waste etc.) – some subcategories might be hazardous.

According to design documentation, asbestos waste is expected to occur only during demolition of auxiliary building 1 (Sub-component 3.2). However, following precautional principles, asbestos waste can potentially occur during demolishing of other buildings (Sub-components 1 and 2).

#### **Use phase**

The planned Sub-project is expected to generate several groups of waste, including hazardous (marked with \*) during use phase:

- group 02 - waste from agriculture, horticulture, aquatic culture production, forestry, hunting and fishing, food preparation and processing; e.g.
  - waste plant tissues (02 01 03)
  - waste from chemicals used in agriculture, which contains dangerous substances (02 01 08\*)
  - waste from chemicals used in agriculture, which is not included in 02 01 08\*

- waste from the preparation and processing of fruits, vegetables, grains, edible oils, cocoa, coffee, tea and tobacco; canning; production of yeast and yeast extracts, preparation and fermentation of molasses (02 03)
- waste from the production of alcoholic and non-alcoholic beverages (excluding coffee, tea and cocoa) (02 07)
- group 06 - waste from inorganic chemical processes
- group 07 - waste from organic chemical processes
- group 13 - oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19) – hazardous waste, including
  - content from the oil/water separator (13 05);
- group 15 - waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified;
- group 16 - waste not specified elsewhere, e.g.
  - waste from electrical and electronic equipment (16 02),
  - gases in pressure vessels and discarded chemicals (16 05),
  - batteries and accumulators (16 06),
  - waste from transport tanks, storage tanks and from cleaning barrels (except 05 and 13) (16 07),
  - oxidizing substances (16 09);
- group 20 - municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions (paper, plastics, glass, food waste, discarded electrical and electronic equipment etc.).

Waste management from olive oil production in Building 2B (Sub-component 2) and characteristics of the compost pit are not elaborated in the Main Design.

#### **7.14.2 Mitigation measures**

##### **Design phase**

A separate area was designed for separate collection of waste.

Waste management from olive oil production in Building 2B (Sub-component 2) shall be addressed in the detailed design, subject to the PIU and WB approval.

##### **Construction phase**

The project shall implement circular economy practices in construction waste management so that at least 70% of non-hazardous construction and demolition waste generated on site is prepared for reuse, recycling and other material use, including backfilling operations for waste replacing other materials, in accordance with waste hierarchy and the EU Protocol on construction waste management and demolition.

Waste Management Plan that defines waste management procedures at the construction site for each category of waste generated during construction, method and place of storage of individual categories of waste will be prepared by the Contractor.

Each type of generated waste at the location must be temporarily stored in separate waste containers which have to be labelled with waste type name and waste code. All waste, including construction waste, asbestos waste, soil, must be disposed exclusively at the licensed construction waste landfills and processing plants. Whenever feasible the contractor shall reuse and recycle appropriate and viable materials. Burning or illegal dumping of waste is strictly prohibited. Records (waste manifests, landfill/processing receipts, etc.) will be kept and checked.

Since environmentally harmful materials (asbestos, etc.) were installed on one of the buildings (auxiliary building 1 of Sub-component 3.2), there is a need for disposal of such waste. Therefore, Asbestos Removal and Management Plan shall be prepared based on disposal measures prescribed by the Croatian law (Ordinance on construction waste and waste containing asbestos (OG 69/16), Instructions on handling waste containing asbestos (OG 89/08), Waste Management Act (OG 84/21, 142/23 - Decision of the Constitutional Court)), and WB EHS and GIIP, stricter ones prevailing. The Plan is subject to WB approval. Work and handling with asbestos must be performed by a licensed Contractor with appropriate qualifications and experiences and with not-defaulted proven past performance references, adequate tools and protection for the safe removal of asbestos cover. The same will apply for weakly bound asbestos.

In the case asbestos is found in other buildings, e.g. the old pipes, asbestos management plan will be prepared and implemented as well as described above, subject to WB approval.

### **Use phase**

Institute must ensure separate collection of non-hazardous and hazardous waste at the place of origin, keep records, store waste in appropriate containers and temporarily store waste in a specially separated area until processing or until handing over to an authorized person.

Sub-component 1: Municipal waste will be collected on the site. The space is located north of the planned building 1A and is easily accessible, and is accessed from Put Duilova Street, which is located northwest of the complex building. As part of building 1C, in its eastern corner, there is a space for disposing of compost waste. Within it, the temporary disposal of waste (in 4 bins) from the compost pile to the final destination - a watertight composting facility located southeast of building 1C is planned. Also, on the building plot in question, in its western corner, southwest of building 1A, a watertight collection point will be located closed pit.

Sub-component 2: Waste management from olive oil production in Building 2B shall be carried out according to the measures described in the detailed design (subject to the PIU and WB approval).

## **7.15 Intellectual Property**

### **7.15.1 Potential impact**

#### **Design phase**

Regarding the fact that detailed design development will be the obligation of the contractor i.e. detailed design services will be the subject of the public procurement for works, it is possible that the architect of the detailed design is not the same natural person as the architect of so far developed design documentation. Therefore, potential social impact related to the intellectual property could be expected.

### **7.15.2 Mitigation measures**

#### **Design phase**

The potential impact related to the intellectual property can be easily mitigated by following the provisions of the Act on Copyright and other related rights (OG 111/21):

- A copyright shall belong, by its nature, to a natural person who has created a copyright work (Article 4 (1)),
- A copyright work shall be an original intellectual creation in the literary, scientific and artistic domain, having an individual character, irrespective of the manner and form of its expression, its type, value or purpose, unless otherwise provided for in this Act (Article 14 (1)),
- A copyright works shall be (among others) works of architecture, such as sketches, studies, plastic and other representations, drawings, conceptual designs, preliminary designs, main designs, detailed designs, plans and constructed buildings and interventions in the field of architecture, urbanism and landscape architecture (Article 14 (2))
- The author may grant to another person a right of exploitation of a copyright work or may entrust him the exercise of copyright by a contract, by giving the authorisation for use, or by other legal transaction (Article 58 (1)).

The use of the developed design documentation shall be regulated before the start of the detailed design development. This way, proper credit to intellectual property will be given to author of the design documentation developed so far, and plagiarism will be avoided.

### **7.16 Positive social impacts**

The implementation of the Sub-project will strengthen scientific research and innovation in the STEM field of biotechnology, with application in agriculture, and support cooperation with the businesses in Adriatic Croatia, as well as:

- raise the standards of the scientific and research community, international networking, and cooperation with the business sector,
- strengthen the role of biotechnical sciences in the scientific, educational, and economic system of the RoC,
- support the solving social challenges in the field of green research and technologies, energy, environment, food, health, safety, and connection of applied research with a Mediterranean orientation,
- strengthen cooperation with the business sector through the direct transfer of knowledge from the academic community into practice, encouraging innovation and the competitiveness of the economy
- create capacities for implementation of educational programs and raise the level and quality of education and multidisciplinary workshops,
- improve the conditions for education and work and career development of young researchers,
- better working conditions for the researchers and an increase in their mobility.

## 8 INSTITUTIONAL ARRANGEMENT

To ensure the effective implementation of this ESMP, there is a need for defining a clear roles, responsibilities and reporting procedures by various institutions. As part of the environmental and social management, MSEY must ensure that this ESMP is part of the contract documents for the construction works on the Sub-project.

MSEY, through the PIU will have the responsibility to ensure that the ESMP and the monitoring plan are implemented. They must ensure that all stakeholders in the process (the Contractor, sub-contractors, goods supplier, service provider or others engaged or employed by the Contractor), are familiar with the contents of the ESMP and their roles, that they understand and adopt ESMP, that resources are available and key staff for implementing the activities are adequately trained.

Contractor will be required to develop the following Environmental and Social Management Strategies and Implementation Plans (ES-MSIP) to manage key environmental and social risks if awarded the contract:

### Waste Management Plan

- defines waste management procedures at the construction site for each category of waste generated during construction, method and place of storage of individual categories of waste.

### Asbestos Removal and Management Plan (subject to WB approval)

- defines procedures for removing materials containing asbestos before proceeding with the removal of the building structures, describes application of necessary measures to protect workers health and safety, all according to Ordinance on the protection of workers from risk related to exposure to asbestos (OG 40/07) and Ordinance on construction waste and waste containing asbestos (OG 69/16).

### Plan for establishing Grievance Redress Mechanism (GRM)

- describes action for planning the establishment of protocols for receiving and resolving complaints and managing incidents and accidents, internal (within the contractor's company) and external (receiving and resolving complaints from the community). GRM should ensure special referral pathways for grievances on GBV and SEA/SH.

### Safety at Work Plan

- measures to reduce health hazards and to ensure safety at work during the execution of works according to Ordinance on occupational safety at temporary construction sites (OG 048/18), WB EHSG and GIIP);
- includes Occupational Health and Safety (OHS) measures during the execution of construction works, accommodation conditions, food and transportation of workers, sanitary facilities and wardrobe, organization of first aid, personal protective equipment, workplaces with special working conditions and medical examination of workers, training of workers in occupational safety, safety measures in the work of subcontractors.

### Emergency Preparedness and Response Plan

- actions that must be taken to ensure staff safety in an emergency (spills, accidents, fire, explosion, earthquake...), including a list of all emergency equipment at the construction

site (such as fire extinguishing systems, spill control equipment, communications), and alarm systems (internal and external), and decontamination equipment, contacts of responsible persons, competent authorities, other emergency numbers, communication procedures and evacuation plan.

#### Fire Safety Plan

- includes a list of major workplace fire hazards, including the ones caused by flammable and explosive technical gases (oxygen, hydrogen), their proper handling and storage procedures, potential ignition sources and control procedures, and a description of fire protection, trainings documentation, equipment, and systems, as well as maintenance and plans for safety drills.

These MSIPs collectively comprise the Contractor’s Environmental and Social Management Plan (C-ESMP). Contractor ESMP (C-ESMP) will be developed and continuously updated (minimum every 6 months) to enable implementation of mitigation measures.

In addition to regular activities of professional supervision of construction, the activities of Site Supervising Engineers will also include:

- regular monitoring and assessment of measures to prevent and/or mitigate negative environmental and social impacts of the Sub-project in accordance with the ESMP;
- regular submission of monthly reports on monitoring carried out to the E&S Specialists and/or E&S Experts;

The following monitoring reports will be produced:

- the Contractor will prepare monthly reports according to the requirements defined in the chapter 10 and contract for works;
- the Site Supervising Engineer will prepare monthly reports on the implementation of the ESMP for the PIU Environmental and Social Specialists. The monthly report will include information on monitoring and the implementation of the ESMP on the location of Sub-project that have been collected by the Site Supervising Engineer in accordance with the prescribed Metric for Progress Reports (which includes reporting of implementation of all mitigation measures during construction proposed by this ESMP);
- Quarterly Progress Reports on ESMP compliance until differently agreed. Sub-project progress reports will be prepared by the E&S Specialists at PIU, by combining monthly reports and the results of review meetings. The progress report shall reports in detail on progress in the preparation and the quality and success of ESMP implementation and highlights the environmental and social issues resulting from the activities supported by the Sub-project, the status of mitigation measures and the necessary follow-up steps. The status of mitigation measures and the follow-up steps will be submitted to the World Bank (Environmental & Social Experts) for review. In case non-compliances are noted in the implementation of the ESMP and the World Bank policies and procedures, ESMP measures and / or national legislation, the PIU will suggest corrective measures. If the non-compliances are significant, they will notify the World Bank Environmental & Social Specialists without a delay. **In the event of major non-compliances or failure to implement corrective measures, financial measures against the contractor are also possible, including withholding payments (until acceptable E&S report), which in the worst case include the termination of the contract;**

- Notification Reports on incidents and accidents during construction: E&S Specialists at PIU will prepare and implement an incident reporting procedure, indicating details of the incident, institutional responsibilities, immediate measures to address the reported incident and information requirements to be provided by the Supervising Engineer. Supervising Engineer will have to fulfil the Notification Report and promptly notify the PIU E&S Specialists and/or E&S Experts within the 12 hours of any incident or accident related to the construction works activities which have, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers including health and safety serious injuries and road accidents. E&S Specialist will then notify the WB within 48 hours after learning of the incident or accident.

*Table 11. Capacity building plan for implementation of the ESMP*

<b>Activity</b>	<b>Target Group/ Participants</b>	<b>Responsibility</b>	<b>Timeline</b>
In line with ESCP, organise training on mitigation, monitoring and reporting under ESF, waste management, GRM, OHS, and asbestos management when deemed needed	Contractor workers and Beneficiary	PIU	Once Sub-project is awarded and prior to implementation of the Sub-project
Specific training on directing the complaints from the community to Project GRM	Contractor's employees	PIU Social Expert	Prior to commencement of the construction works
Training on Contractor's GRM and protocol in case of any incidents and accidents	Contractors and sub-contractors' workers	Contractor	Prior to commencement of the construction works
Training on the Code of Conduct (part of which is SEA/SH sensitization)	Contractors and sub-contractors' workers	Contractor	Prior to commencement of the construction works and when deemed needed

## **9 GRIEVANCE REDRESS MECHANISM**

The main objective of the GRM is to allow the Sub-project's stakeholders to submit complaints, feedback, queries, suggestions, or even compliments, related to the overall management and implementation of the Sub-project. The GRM should address issues and complaints reported by the stakeholders in an efficient, timely, and cost-effective manner. It should ensure transparent and credible processes for fair, effective and lasting outcomes. It should build trust and cooperation as an integral component of broader community inclusion that facilitates corrective actions.

### **9.1 Project's GRM**

The Project's GRM will be available over the Project's website by using dedicated email address ([grmdigit@mzom.hr](mailto:grmdigit@mzom.hr)) or make a call over the telephone (+385 1 4594 341), to receive potential complaints or to report on occurred (or noticed) incidents. The GRM will also enable postal delivery (Donje Svetice 38, 10 000 Zagreb) for those persons who are not comfortable in using electronic ways of communication. The GRM will allow anonymous complaints to be raised and addressed, in accordance with Croatian law.

Information on GRM will be communicated on the Project's website and by its various communication materials, including through flyers at the construction site. The local community will submit their complaints only through Project GRM. As part of the GRM training for the contractor's workers, the workers will be trained to direct members of the local community, who want to submit complaints, to the Project's GRM.

### **9.2 Contractors GRM**

#### **Labor GRM**

The Contractor will be required to prepare and enforce a Code of Conduct for workers and report on regularly basis all related incidents that might occur during the construction works.

Contractor will develop Plan for establishing Contractor GRM as one of ES-MSIP where the protocol for receiving and resolving complaints and administering incidents and accidents and training program for contractor and all subcontract workers will be defined.

Finally, C-ESMP will be developed containing a detailed description of Contractors GRM. After establishment of Contractor's GRM, Contractor will also provide training for all sub-workers on Contractor's GRM. A list of all complaints received, and corrective actions taken will be included in monthly reports for the PIU E&S Specialists and/or E&S Experts.

#### **Community GRM**

The Contractor and all sub-contractors will direct complaints received from the local community to the PIU (Sub-project GRM). GRM training will be held by the PIU Social Specialist for the Contractor's employees to educate them on directing the complaints to Project GRM.

Both Project and Contractors GRM will ensure special referral pathways for grievances on GBV and SEA/SH.



## 10 ENVIRONMENTAL AND SOCIAL MITIGATION AND ENHANCEMENT PLAN

This section considers mitigation of the potential adverse impacts resulting from the realization of the Sub-project that were identified and evaluated in Chapter 7.

The main objective of the mitigation measures is to reduce potential significant impacts to an acceptable level for all aspects of the Sub-project in relation to the environment.

Mitigation measures are defined for design and construction phase, as well as for use phase of the Sub-project. They are grouped according to the various receptors (air, soil, water, and human environment).

Since the Sub-project consists of three Sub-components, for each mitigation measure it is indicated to which Sub-component is related. Three Sub-components are:

- |                  |   |
|------------------|---|
| Sub-component 1. | Reconstruction and equipping of 3 buildings at the location in Duilovo, Split   |
| Sub-component 2. | Improvement and equipping of 2 existing buildings at the location in Kaštel Stari   |
| Sub-component 3. | Improvement of existing technological infrastructure in Duilovo, Split:<br><b>3.1.</b> reconstruction of the greenhouse (dismantling of the greenhouse "Bubalo" and construction of a new greenhouse); <b>3.2.</b> structural improvements of 2 auxiliary buildings; <b>3.3.1.</b> fencing the Institute's property; <b>3.3.2.</b> construction and rehabilitation of the macadam paths ad ramps; <b>3.4.</b> Arranging and landscaping two educational demonstration parks |

### 10.1 Environmental and social mitigation plan – Design and Construction phase

Environmental and social mitigation plan for Design and Construction Phase is presented in Table 12.

Table 12. Environmental and social mitigation plan for Design and Construction Phase

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
<b>General conditions</b>					
<b>Permits and certificates; Design</b>	1. All required permits must be acquired prior to works and kept on site (e.g., building permit).	All	Included in project cost	Building contractor, PIU	Supervising Engineer, PIU
	2. All required studies including fire safety studies must be prepared and measures/conditions obtained from competent authorities. In the case, the law does not trigger fire safety study preparation, fire protection measures will be obtained from competent authorities and local fire fighting units. WB EHSO will apply.	All	Included in project cost	Building contractor, PIU	Supervising Engineer, PIU
	3. Should the detailed design be developed by the other architects, the use of the existing design documentation for the development of detailed design(s) shall be regulated by copyright contract(s).	Sub-components 1 and 3	Included in project cost	Institute, Building contractor	Supervising Engineer, PIU
	4. Contractor and subcontractors must have valid operating licenses.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	5. The state inspectorate must be notified of upcoming activities and the copy of notification must be available at the construction site.	All	Included in project cost	PIU	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	6. Materials quality certificates, vehicles attest, certificates for working at heights, health and safety certificates for workers (e.g. to operate heavy machinery and vehicles) must be in place before works commence.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	7. The Detailed design shall assess and review the Main Design's fire protection technical solution for the storage of chemicals. This applies to both building parts and equipment.	Subcomponent 1	Included in project cost	Building contractor, Institute	Supervising Engineer, PIU
Site organization	8. Construction Work Plan must be available at the construction site (in case that two or more contractors perform construction activities). 9. All occupational health and safety measures must be ensured: 10. Contractor must develop Environmental and Social Management Plan (C-ESMP), to enable implementation of mitigation measures for environmental and social risks. C-ESMP comprises of ES- Management Strategies and Implementation Plans MSIPs: Waste Management Plan, Asbestos Removal and Management Plan, Plan for establishing Grievance Redress Mechanism (GRM), Safety at Work Plan, Emergency Preparedness and Response Plan, Fire Safety Plan.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	11. Emergency Preparedness and Response Plan must be prepared for works (as part of C-ESMP) and it must cover actions that must be taken to ensure staff safety from emergencies. It shall include, but it is not limited to a list of all emergency equipment at the construction site (such as fire extinguishing systems, spill control equipment, communications), and alarm systems (internal and external), and decontamination equipment (where this equipment is required), contacts of responsible persons, competent authorities, other emergency numbers, communication procedures and evacuation plan. EPR must be	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	<p>kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.</p> <p>12. Staff shall be trained/instructed in all emergencies, waste management, first aid and firefighting and other relevant procedures. Procedures shall be available at the site.</p>				
	13. Temporary material storage on the construction site should be clearly marked.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	14. There shall be no temporary storage of construction materials and waste within any type of private property.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	15. The surrounding area near the project must be kept clean and good maintenance practices must be applied at the site. Works must be carried out in a safe way.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	16. Stockpiles must be located away from drainage lines, natural waterways and places susceptible to land erosion.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	17. Stockpiles must not exceed 2 m in height to prevent dissipation and risk of fall. Materials to be lifted by forks, cranes cannot be placed under or in the vicinity of overhead transmission lines.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	18. Producer of asphalt, gravel, concrete must possess all necessary concessions, working and OHS permits, and emission permits, quality certifications and labour and working conditions requirements.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	19. During earthworks (and where applicable) utility providers must be consulted to avoid damages to other infrastructure. In areas where other infrastructure is present, only manual work shall be applied.				
	20. All transportation vehicles and machinery must be equipped with appropriate emission control equipment, regularly maintained and attested.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	21. There shall be no unlicensed borrow pits, quarries, or waste dumps in adjacent areas, especially not in protected areas.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Occupational Health and Safety and Community Safety</b>					
<b>Worker's safety</b>	<p>22. Safety at Work Plan (as part of the C-ESMP) must be prepared and shall include:</p> <p>a. measures to reduce health hazards and to ensure safety at work during the execution of works according to Ordinance on occupational safety at temporary construction sites (OG 048/2018), this ESMP, WB Environmental, Health and Safety Guidelines (EHSG) and Good International Industrial Practice (GIIP), stricter ones prevailing;</p> <p>b. occupational health and safety (OHS) measures during the execution of all construction works, accommodation conditions, food and transportation of workers, sanitary facilities and wardrobe, organization of first aid, personal protective equipment, workplaces with special working conditions and medical examination of workers, training for workers and visitors of construction site in occupational safety, safety measures in the work of subcontractors.</p> <p>c. measures for identified risks from weather extremes such as strong winds, excessive heat, storms, etc.</p>	All	Included in project cost	Building contractor	Institute, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	23. Staff must be properly trained (and certified if applies) for the positions and work performed, workers must hold valid workers certificates for e.g., certificates for electrical safety (for licensed electrician), working with asbestos materials, working at heights, operating dangerous machinery, etc.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	24. Engaged workers must use protective equipment, workers' personal protective equipment and safety procedures comply with legislation and international good practice (ESH and safety glasses, safety boots, harnesses when needed, personal hearing protection equipment when needed, and other work specific protective equipment, appropriate masks or respirators when dealing with the asbestos, etc.). Contractor must ensure that sufficient quantities and quality of equipment is available.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	25. Appropriate informative and warning signposting of the sites shall inform workers (and authorized visitors) of key rules and regulations to follow.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	26. Appropriate marking in and out of the construction sites /section by section and speed-reduction signs must be ensured.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	27. All dangerous spots in the working sites such as pits, trenches, etc. must be clearly marked and fenced.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	28. The transportation routes outside the construction areas (local, county and state roads) must be kept clean.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	29. Machines must be handled only by experienced and appropriately trained personnel, certified in line with the national regulation (where applicable), thus reducing the risk of accidents.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	30. Fire Safety Plan (as part of C-ESMP) must be prepared and shall include a list of major workplace fire hazards, their proper handling and storage procedures, potential ignition sources and control procedures, and a description of fire protection, trainings documentation, equipment, and systems.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	31. Devices, equipment and fire extinguishers must be attested and functional, so in case of need they could be used rapidly and efficiently.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	32. Constant presence of attested firefighting devices must be ensured on sites in case of fire or other damage. Their position must be communicated to workers and marked. The level of fire-fighting equipment must be assessed and evaluated through a typical risk assessment.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	33. First aid kits shall be available on the site and personnel trained to use it.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	34. Procedures for cases of emergency (including spills, accidents, etc.) as part of the Emergency Preparedness and Response Plan must be available at the construction site and conveyed to all workers.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	35. Adequate sanitary facilities (toilets and washing areas) must be provided at the construction site with adequate supplies of hot and cold running water and soap.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	36. Work must be aligned with weather conditions which can factor in safe organization of works and OHS measures. E.g, sufficient water and isotonic drinks must be provided to workers, workplans will be adjusted in the case of strong winds (no works at heights), etc.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	37. Materials Safety Data Sheet (MSDS) requirements and measures must be strictly followed and adhered to. Procedures for handling safely oxygen, hydrogen and potentially other tanks with explosive substances and cylinders will be readily available and communicated. All tanks will be stored securely, safe from falling or damaging or accidental leaking.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Worker's health due to improper asbestos handling</b>	38. Asbestos Removal and Management Plan (as part of C-ESMP), subject to PIU and WB approval, must be prepared and include procedures for removing materials containing asbestos before proceeding with the removal of the building structures, describes application of necessary measures to protect workers health and safety, all according to Ordinance on the protection of workers from risk related to exposure to asbestos (OG 40/7), Ordinance on construction waste and waste containing asbestos (OG 69/16), Instructions on handling waste containing asbestos (OG 89/2008) and the Law on waste management (OG 84/21), WB Environmental Health and Safety Guidelines (EHSG) and Good International Industry Practices (GIIP).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	39. Workers must be equipped with appropriate personal protective equipment for respiratory protection and other personal protective equipment, which workers must continually use.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Discrimination against women/vulnerable groups in the hiring process of workers and during Sub-</b>	40. The workers have to be explicitly informed of their rights and also on GRM.	All	Included in project cost	Building contractor	Supervising Engineer, PIU through GRM
	41. Wages and contract conditions offered to all staff should be in keeping with Croatian labour laws or higher set standards which should be competitive in all categories of workers including foreign workers.	All	Included in project cost	Building contractor	Supervising Engineer, PIU



ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
project implementation					through GRM
	42. Access to safe GRM for workers (Contractor GRM) must be ensured and also other grievance mechanisms (unions, arbitration).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
Labor influx	43. Information regarding Worker Code of Conduct and information on GRM availability and access, must be provided in local language and language accessible to foreign workers.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	44. Workers should be hired through national employment service in order to avoid hiring “at the gate” and therefore to discourage spontaneous influx of job seekers. The contractors employing the foreign workers directly should guarantee that foreign workers are provided with working conditions and accommodation that comply with both national laws and ESS2 (fair recruitment): employment contracts are comprehensible, equitable, and transparent, and are given in a language that the worker can understand. The foreign workers should be informed about their rights and responsibilities, as well as the resources they can access if they encounter exploitation or discrimination. All contractors and their sub-contractors must respect and implement the World Bank Group Code of Ethics. Any such complaint or shared information shall be subject of Ethics Review by the DIGIT project.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
Sexual Exploitation and Abuse (SEA)/	45. Contractor’s Personnel shall not engage in Sexual Harassment, which means unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature with other Contractor’s or Employer’s Personnel.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
<b>Sexual Harassment (SH)</b>	46. Workers shall not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	47. Workers shall not engage in Sexual Abuse, which means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	48. Workers shall not engage in any form of sexual activity with individuals under the age of 18.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	49. All relevant competent authorities shall be notified of commencement of works (police, state inspectorate, firefighters, etc.).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	50. Grievance Redress Mechanism shall be available to for receiving and resolving complaints. Complaints received must be dealt with in accordance with the article 134. of Labor Act (OG 93/14, 127/17, 98/19, 151/22, 46/23, 64/23), WB ESF and Sub-project GRM.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	51. SEA/SH sensitization (education for contract workers) shall be performed as part of the Code of Conduct training. All workers shall sign a code of conduct on SEA/SH.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Community safety</b>	52. All relevant competent authorities shall be notified of commencement of works (police, state inspectorate, firefighters, etc.).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	53. Local community shall be timely informed in case of power shortages. Transformers will continue to be maintained by Croatian electricity company. Stockholm Convention will apply.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	54. The construction site shall be properly fenced and marked. Due to vicinity of tourism facilities the safety notices shall be both in Croatian and English.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	55. Safe passages shall be provided for the pedestrians and timely announce of the alternative traffic regulation and routes.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	56. Entry for unemployed person within the construction site shall be prohibited (within the warning tapes and fences when/where deem needed).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	57. The surrounding area near the construction site shall be kept clean. No temporary storage of construction materials and waste cannot occur within any type of private property.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	58. Waste management must be in line with the national legislation, this ESMP, WB EHSR and GIIP, stricter ones prevailing.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	59. Scaffolds and other protection installations shall be installed in line with the regulation, and best industry best practices (GIIP). It shall consider past climate change extremes such as strong winds.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	60. Measures to minimize dusts, noise, water and ground pollution (described in following lines) shall be applied.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	61. The contractor will present the timeline of the construction work to the building 2A tenants and assess if it will be possible to live in the apartments during the construction works due to noise and dust.	Sub-component 2	Included in project cost	Building contractor	Institute; PIU
	62. If the living conditions of the tenants of Building 2A deteriorate significantly during the execution of works on the roof of	Sub-component 2	Included in project cost	Institute	PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	Building 2A, the Institute will assist them in finding temporary accommodation.				
	63. The north doors on the intermediate landing between the basement and ground floor of Building 2A shall be designed and built as evacuation exit.	Sub-component 2	Included in project cost	Building contractor	Supervising Engineer, PIU
	64. Detailed Design shall be prepared for the Institute's property fencing project, which will analyze potential erosion and landslide risks taking into account extreme weather conditions and define/ design solutions (e.g. retaining wall construction, gabions, etc.) to prevent further soil erosion and potential landslides.	Sub-component 3.3.1	Included in project cost	Building contractor	Supervising Engineer, PIU
	65. If it is considered necessary, the risk of erosion and landslides in the area of Duilovo and Kaštel Stari will be assessed (except for the fencing project - subcomponent 3.3.1, for which this is an obligation) and appropriate prevention measures will be proposed (e.g. construction retaining wall, gabions, etc.) that will be included in the Detailed design.	All (except Sub-component 3.3.1)	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Air quality</b>					
<b>Radon emission</b>	66. Measurement of radon concentration before obtaining the Use Permit. The building can be used if legally prescribed limits are met.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Reduced air quality in the nearby construction area and access road</b>	67. Sprinkle water at the construction materials and non-asphalted roads where appropriate and when needed (e.g., during dry and/or windy periods). Use water where and when appropriate to reduce dust at land clearing, grubbing, scraping, excavation, land levelling, grading, cut and fill and demolition activities which may cause dusting and particles emissions.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
<b>due to emission of dust and particulates</b>	68. Cover load (surfaces) with plastic coverings during material storage and transportation to avoid dust spreading. Cover bulk materials when not in use.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	69. Adequate locations for storage, mixing and loading of construction materials should be established.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	70. Limit vehicles speed (30 km/h) in the construction area and on the access roads near the residential houses.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	71. Construction site and access roads must be regularly cleaned from debris.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	72. Prevent offsite spread of dust using appropriate screens - a mechanical barrier between the work site and the functional part of the clinic.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	73. Avoid unnecessary journeys.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Reduced air quality in the nearby area due to gaseous emissions</b>	74. Use modern attested construction machinery to minimize emissions, provided with mufflers and maintained in good and efficient operation condition.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	75. Use low Sulphur content fuel, when possible, for machinery and equipment to reduce SO2 emissions from engines whenever possible. Fuel is purchased only from licensed distributors.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	76. Machinery and equipment should be switched off when not in use (idle mode).	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	77. Regularly maintain, service and tune the engines and service construction equipment. All vehicles and machinery must be attested.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	78. To minimize dust (mainly PM10) from construction material collection, material retention time at the site should be reduced to a minimum, in order to minimize exposure to wind.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	79. Diesel generator for auxiliary power supply: a. designed in such a way that do not endanger the lives, health or quality of life of other users of the building and the wider community; b. protected from rain, sun, and wind; c. area not accessible to unauthorized persons d. should be made in an anti-noise design - aggregate sound pressure of 67 dB(A) +/-3 dB(A) L=7m, H=1m measured in open space according to ISO 3744 standards e. The generator must have the second containment vessel (bunded) with 110% capacity of the tank. f. It will be positioned in the way to prevent concentration of exhaust gasses.	Sub-component 1	Included in project cost	Building contractor	Supervising Engineer, PIU
	80. Burning of waste at the site (or elsewhere) is strictly forbidden.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	81. Sheltered parking of bicycles in Kaštel Stari and Duilovo shall be planned and carried out before the end of works.	Sub-components 1 & 2	Included in project cost	Building contractor	Supervising Engineer, PIU

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
<b>Noise</b>					
<b>Increased noise level in the nearby area</b>	82. Ensuring that generated noise levels do not exceed the maximum permitted noise levels defined in Ordinance on the maximum allowed noise levels with regard to the type of noise source, time and place of occurrence (OG 143/21).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	83. The Sub-project-affected parties, especially tenants in Building 2A (Sub-component 2) and tenants in residential building within Sub-component 3 shall be adequately informed about the Sub-project and contractors' GRM. The Sub-project-affected parties shall be kept informed about construction schedules, progress, and safety precautions. It is necessary to choose and apply adequate noise protection measures during construction phase: adjustment of operating time; use of temporary movable noise barriers; use of alternative working machines with lower noise emission levels.	All (special attention is needed for Sub-components 2 and 3)	Included in project cost	Building contractor	Supervising Engineer, PIU
	84. Plan heavy construction works as much as possible outside of working hours and during the summer and winter holidays, if this would not cause the unwanted impact on the dynamics of construction works.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	85. All equipment must be maintained in good operating condition and be attested.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	86. During operations the engine covers of generators, air compressors and other powered mechanical equipment shall be closed, and equipment placed as far as possible from the residential houses.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	87. When necessary, night work shall be scheduled carefully. Noise during night work must not exceed the limit values defined in the Ordinance on the maximum allowed noise levels with regard to the type of noise source, time and place of occurrence (OG 143/21).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Water and groundwater quality / Soil quality</b>					
<b>Risk of pollution of surface water, groundwater and soil due to spill leakage</b>	88. Hazardous liquid waste must be collected separately (by type), managed by authorized companies and treated/disposed only at licensed sites. Collection containers should have secondary containment system (e.g., double walled or banded containers) with sufficient volume to contain a spill from the largest fuel tank in the structure (minimum 110 %) and should be protected from impact of weather conditions.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	89. Containers with hazardous substances must be kept closed, except when adding or removing materials/waste. They must not be handled, opened, or stored in a manner that may cause them to leak.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	90. Non-hazardous liquid waste and/or wastewaters must not be discharged into nature without a prior treatment. Surface runoff will not be discharged uncontrollably in the nature recipient so it would not cause soil degradation, localized flooding or any other degradation of ecological components.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	91. It is necessary to designate a special and limited area for refueling construction vehicles to avoid spillage. Fuel and oil handling shall be performed on impermeable surfaces with retention in a safe and responsible manner. Avoid storing fuel and other hazardous liquids and materials on construction site. If installation of fuel storage tanks is needed, they should be secondary tanks with sufficient volume to contain a spill from	All	Included in project cost	Building contractor	Supervising Engineer, PIU



ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	the largest fuel tank in the structure (minimum 110%) and shall be protected from impact of weather conditions.				
	92. Handling and management of all materials must be in accordance with instructions included in Material Safety Data Sheets (MSDS) and Technical Data Sheets (TDS) which must be available at the construction site.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	93. Material storage areas must be organized and covered.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	94. Hazardous spillage coming from tanks, containers (mandatory secondary containment system, e.g., double walled or banded containers), construction equipment and vehicles (regular maintenance and check-ups of oil and gas tanks) must be prevented.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	95. It is necessary to comply with measures and standards for construction machinery.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	96. Digging foundation and demolition shall be carried out in the way that it does not jeopardize or disturb stability of surrounding buildings.	Sub-component 1	Included in project cost	Building contractor	Supervising Engineer, PIU
	97. In case of an accident, hazardous liquid must be removed from the soil using adsorption materials such as sand, sawdust or mineral adsorbents. Such waste material must be collected in tanks, stored in the space provided for hazardous waste storage and handed over to authorized companies for hazardous waste. This waste shall be managed and treated/disposed as hazardous waste.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

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Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	98. Wash down areas of concrete and other equipment must be isolated from watercourse by selecting areas for washing that are not free draining directly or indirectly into watercourse as well as those that are placed on impermeable surfaces and equipped with/connected to municipal water collection system.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	99. It is forbidden to extract groundwater on unregulated way, or discharge cement slurries, or any other contaminated waters into the ground or adjacent streams or rivers.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	100.				
<b>Biodiversity (flora and fauna)</b>					
<b>Risk of endangering flora and fauna by removing vegetation and polluting water and soil</b>	101. Restrict the movement of heavy machinery to the access road corridor. Construction sites should take up only necessary space.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	102. Cutting down trees and other natural vegetation should be avoided, where possible. In the case of removing vegetation, the areas from which the vegetation will be removed should be clearly marked to prevent unnecessary loss of vegetation in the project area. Removal of larger numbers of trees is not envisaged under the Sub-project.	Sub-components 1 and 3	Included in project cost	Building contractor	Supervising Engineer, PIU
	103. Landscape design shall be prepared within the detailed design, taking into account to reduce cutting down the trees and other natural vegetation as much as possible. Autochthonous plant species that occur in the vegetation communities present in the wider area of the Sub-project should be used for landscaping.	Sub-component 1	Included in project cost	Building contractor	Supervising Engineer, PIU
	104. Detailed landscape design shall be prepared for the arranging and landscaping of two forestry educational demonstration parks, taking into account to reduce cutting down the trees and	Sub-component 3.4	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	other natural vegetation as much as possible. Autochthonous plant species that occur in the vegetation communities present in the wider area of the Sub-project should be used for landscaping.				
	105. In order to reduce the impacts of photo-voltaic panels, Anti Reflective Coatings on the panels must be used.	Sub-component 1 &2	Included in project cost	Building contractor	Supervising Engineer, PIU
	106. In order to reduce the risk of entering and/or spreading invasive plant species due to human movement and mechanization it is necessary to regularly remove newly grown ruderal and weed vegetation in the working belt and the scope of the Sub-project.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	107. For the landscape management and greening, autochthonous plant species that occur in the vegetation communities present in the wider area of the Sub-project should be used.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Climate change adaptation</b>					
<b>Heat islands</b>	108. See the measures 102, 103 and 104 for Biodiversity.	Sub-component 1 and 3.4	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Water consumption</b>	109. In order to reduce water consumption in the face of water scarcity as a consequence of climate change, Detail design shall implement the technical solution to collect the rainwater for irrigation of landscape areas.	Sub-component 1 and 2	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
<b>Material management</b>					
<b>Risk of environmental pollution through inadequate handling of dangerous substances</b>	110. The subcontractor must have all the necessary skills and experience and precautionary systems in place to prevent a wash off of bituminous materials (primer or primer binder).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	111. Water in bitumen emulsion production or concrete should not be contaminated (however, technological water is preferred).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	112. Equipment shall be cleaned in areas where there will be no impact to the environment or danger of surface run-off (e.g., areas where water is collected to retention basins and transported to proper water treatment, and waste is separated and appropriately disposed).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	113. All materials have to be approved by the Supervising Engineer.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	114. Materials temporarily stored on site shall be protected and separated. HDPE pipes are not to be in touch or stored next to oil, coatings, solvents, etc.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Traffic disturbance</b>					
<b>Increased road traffic</b>	115. Traffic management has to be conducted in accordance with provisions of traffic legislation and ESF (e.g., appropriate lighting, traffic safety signs, barriers and flag persons that are seen easily or are easy to follow, road speed shall be clearly posted).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	116. Traffic must be organized in a safe manner. Access road speed must not exceed 30 km/h. Major transport activities should be avoided during rush hours.	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	117. Safe passages and crossings for pedestrians and workers where construction traffic interferes must be ensured.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	118. All materials prone to dusting and susceptible to weather conditions must be protected from atmospheric impacts either by windshields, covers, watered or other appropriate means.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	119. Roads must be regularly swept and cleaned at critical points. Spilled materials should be immediately removed from the road and cleaned. Access roads must be well maintained.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	120. Access of the construction and material delivery vehicles must be strictly controlled, especially during the wet weather.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	121. In an event where the traffic will be interrupted the Contractor needs to organize alternative routes and timely announce alternative traffic regulation to the local communities in line with the SEP.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	122. Adequate organization of temporary traffic arrangements must be performed according to Ordinance on Temporary Traffic Regulation and Signing and safety of road works (OG 92/19).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Waste generation and management</b>					
<b>Waste generation</b>	123. Waste Management Plan that defines waste management procedures at the construction site for each category of waste generated during construction, method and place of storage of individual categories of waste shall be prepared by the Contractor (as part of the Management Strategies and Implementation Plans (MSIPs).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	124. Each type of generated waste on the location must be temporary stored in separate waste container which have to be labelled	All	Included in project cost	Building contractor	Supervising Engineer, PIU

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	with waste type name and waste code and located at the solid surface foreseen for that purpose on the construction site.				
	125. Mineral (soil) waste must be disposed exclusively at the designated locations, approved by competent authorities, or be reused. Records of this must be kept.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	126. Records on waste streams and amounts must be kept for each type of waste generated at the location. Keeping records of waste generated is the obligation of the contractor. Records shall be shared with PIU upon request.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	127. All waste must be handed over with appropriate documentation to the companies authorized for the waste management (companies that have adequate waste management permit). Waste can be disposed/processed only at licensed landfills/processing plants.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	128. For all waste, information on handing over waste to the final destination must be obtained.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	129. Whenever feasible the contractor shall reuse and recycle appropriate and viable materials (except asbestos).	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	130. Mineral (natural) construction and demolition wastes have to be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and temporarily stored in appropriate containers. Depending on its origin and content, mineral waste has to be reapplied to its original location or reused.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	131. Excess soil should be adequately disposed of at the designated location, i.e. act in accordance with the Ordinance on the treatment of surplus excavation, which represents mineral raw material when carrying out construction works (OG 79/14).	All	Included in project cost	Building contractor	Supervising Engineer, PIU

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Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	132. Transportation of hazardous substances and waste conduct in line with Act on the Transport of Dangerous Goods (OG 79/07, 70/17) and other relevant national legislation and World Bank EHSR and GIIP.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	133. Burning or illegal dumping of waste is strictly prohibited.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	134. Potential asbestos located on the Project site must be marked clearly as hazardous material. 135. The strong-bound asbestos prior to removal must be treated with a wetting agent to minimize asbestos dust. In case of soft-bound asbestos is found, specific measures for asbestos removal shall be applied in line with the national legislation and best practices. Asbestos Removal Plan must be prepared, subject to the WB approval.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	136. After removal, asbestos waste must be properly stored at the location and handed over to the authorized waste collector/waste treatment facility as early as possible in accordance with the waste management regulations.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	137. Asbestos waste must be stored in a covered container or tightly closed bags (for construction rubble), thus preventing spreading, dispersing and spillage of that waste out of construction site due to weather conditions.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	138. It is forbidden to dispose asbestos waste into the mixed municipal waste and mixing with other waste and other non-waste materials.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	139. The removed asbestos must not be reused. It shall be disposed to a licensed landfill before closing of the Sub-project.	All	Included in project cost	Included in project cost	Supervising Engineer, PIU

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Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	140. Technological Design on the discharge of the oil mill's nusproducts and the operation of the composting plant shall be prepared before the beginning of the construction works. It shall provide detailed description of waste management from olive oil production and characteristics of the compost pit. It is subject to the World Bank approval.	Sub-component 2	Included in project cost	Included in project cost	Supervising Engineer, PIU
<b>Accidents and emergencies</b>					
<b>Accident/incident</b>	141. Emergency Preparedness and Response Plan (as part of the C-ESMP) must be prepared and shall include actions that must be taken to ensure staff safety in an emergency (spills, accidents, fire, explosion, earthquake...), including a list of all emergency equipment at the construction site (such as fire extinguishing systems, spill control equipment, communications), and alarm systems (internal and external), and decontamination equipment, contacts of responsible persons, competent authorities, other emergency numbers, evacuation plan.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
	142. In the case of significant accident/incident (fatality, serious injury, larger spilling, fire, and similar) Supervising Engineer shall notify the PIU (E&S specialists) without delay and fulfil the Notification report. Activities shall be carried out in accordance with the Project's Incident/Accident Procedure.	All	Included in project cost	Building contractor	Supervising Engineer, PIU
<b>Cultural heritage</b>					
<b>Chance finds</b>	143. Archaeological supervision in coordination with cultural heritage competent authority shall be in place for the works being carried out within the archaeological area (fencing and macadam paths in the southernmost border of the Institute, forestry educational park "Karst Landscape" at Location 2). All phases of earthworks within the area of potential archaeological	Sub-component 3.3.1, 3.3.2 & 3.4	Included in the Project	Contractor	Supervising engineer



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Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	findings shall be photo-documenting, planned and executed in coordination with the competent authority.				
	144. In case of chance finds, works must stop immediately, PIU and competent authorities must be notified without delay and their instruction followed. Works can re-commence only upon approval of the competent authority (Ministry of Culture and Media, the Conservation Department in Split).	Sub-component 3.3.1, 3.3.2 & 3.4	Included in the Project	Contractor	Supervising engineer
	145. Drywalls will be built in line with the traditional techniques, unless there are safety issues related	Sub-component 3.3.1, 3.3.2 & 3.4	Included in the Project	Contractor	Supervising engineer
<b>Stakeholder engagement</b>					
<b>Engagement of Local Community</b>	146. Public is informed on the works through appropriate notification in the media and/or at publicly accessible communication channels (including the site of the works) according to Sub-project SEP.	All	Included in project cost	Building contractor, Institute and PIU in coordination	PIU
	147. The PIU team established Project Grievance Redress Mechanisms for local community and the Institute users (and also site workers) for receiving and resolving complaints. Complaints from the local community that will be addressed to Contractor GRM shall be redirected to Project GRM.	All	Included in project cost	PIU	PIU
<b>Social conflicts arising from presence of construction personnel</b>	148. Code of Conduct for Workers to be prepared, disseminated, signed and enforced. Training courses on the Code of Conduct are organized for all workers.	All	Included in project cost	Building contractor	PIU, Supervising Engineer
	149. Stakeholders' engagement shall be conducted prior, during and after construction works, all in accordance with Sub-project SEP developed by the PIU Team.	All	Included in project cost	PIU	PIU

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Environmental and Social aspect	Proposed mitigation measure (Design and Construction Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
and construction works	150. A Contractor Grievance Redress Mechanism will be prepared and implemented. Plan for establishing Grievance Redress Mechanism (GRM) as part of the ESMP must be prepared by the Contractor and must include action for planning the establishment of protocols for receiving and resolving complaints and managing incidents and accidents, internal (within the Contractor’s company) and external (direct complaints to the PIU team).	All	Included in project cost	Building contractor	PIU, Supervising Engineer
	151. Person who oversees communication with and receiving requests/complaints must be assigned (communication with and receiving requests/complaints from construction workers).	All	Included in project cost	Building contractor	Supervising Engineer, PIU

## 10.2 Environmental and social mitigation plan - Use Phase

Environmental and social mitigation plan for use phase is presented in Table 13.

Table 13. Environmental and social mitigation plan for use phase

Environmental and Social aspect	Proposed mitigation measure (Use Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
<b>Occupational Health and Safety and Community Safety</b>					
<b>Worker’s health and safety and labour and working conditions</b>	1. It must be ensured that indoor levels of natural radon during the use phase of the Centre for Advanced Analytics and Support for the Development of Mediterranean Agricultural Products premises are in line with Act on Radiological and Nuclear Safety (OG 141/13, 39/15, 130/17, 118/18, 21/22, 114/22) and its by-laws (less than 300 Bqm <sup>-3</sup> ). The building must be tested before use (measure radon emission).	Sub-components 1 and 2	Included in project cost	Institute	City of Split, City of Kaštela
	2. Moving in must be preceded by obtaining the use permit.	Sub-components 1 and 2	Operating costs and maintenance	Institute	City of Split, City of Kaštela
	3. Emergency Preparedness and Response Plan must be prepared prior to use phase. The fire alarm and fire systems must be regularly maintained and certified.	Sub-components 1 and 2	Operating costs and maintenance	Institute	City of Split, City of Kaštela
	4. Hazardous materials that must be managed (that is, used, stored, and handled) in accordance with WBG EHSGs requirements from Section 1.5 “Hazardous Materials”. Their use must include the safety guidelines for these materials and equipment. <b>The safety guidelines aligned with the WB EHSGs will be produced and communicated to relevant staff before use permit.</b>	Sub-components 1 and 2	Operating costs and maintenance	Institute, PIU	City of Split, City of Kaštela

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Environmental and Social aspect	Proposed mitigation measure (Use Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	5. Safety and maintenance plan for all equipment shall be prepared before use and regularly implemented.	All	Operating costs and maintenance	Institute	City of Split
	6. Space shall be reserved for access of fire protection vehicles to the building at any time.	All	Operating costs and maintenance	Institute	City of Split
	7. Ensuring working conditions and management of worker relationships (terms and conditions of employment, Non-discrimination and equal opportunity, prohibition of child labour, etc.) according to Labor Act (OG 93/14, 127/17, 98/19, 151/22, 46/23, 64/23), WB EHSG and GIIP.	All	Operating costs and maintenance	Institute	City of Split
<b>Community Health and Safety</b>	8. The level of electromagnetic radiation of the existing substation on the east side of the existing main building (Duilovo-Split) shall be measured at the appropriate location near the sensitive receptors before and after the connection of the Centre to the existing substation. In case that increased electromagnetic radiation exceeds the maximum allowed electromagnetic radiation level as defined by Ordinance on the protection from electromagnetic fields (OG 146/14), appropriate protection measures shall be applied.	Sub-component 1	Operating costs and maintenance	Institute & HEP	City of Split
	9. Retention wall and other soil-control and landslides prevention measures and infrastructure will be regularly checked and maintained at Duilovo (and other places if needed).	All	Operating costs and maintenance	Institute	City of Split

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Environmental and Social aspect	Proposed mitigation measure (Use Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	10. Fire alarms, sprinklers, and other fire-fighting equipment must always be supplied with power to operate uninterruptedly. Fire escapes and corridors must be kept clear of objects and doors automatically unlocked when fire alarms and on or other danger is imminent. Secondary alarming/security system is in place to ensure all personnel is evacuated during the day or night.	Subcomponent 1	Operating costs and maintenance	Institute	City of Split
	11. Fire drills are regularly carried out. All users of the dormitory are informed of the risks and safety/evacuation procedures. Fire and other alarms and equipment are regularly maintained and attested.	Subcomponent 1	Operating costs and maintenance	Institute	Inspection
<b>Waste management</b>					
<b>Waste generation, collection and storage</b>	12. A sufficient number of containers must be installed for the separate collection of the main waste fractions. Waste must be collected separately, kept and temporarily stored in the safe manner and handed over for processing and disposal to licensed companies, all in line with the EU regulation and best practices described in this ESMP.	All	Operating costs and maintenance	Institute	City of Split
	13. It must be ensured that the local municipal company regularly collects waste for recovery or disposal in authorized facilities.	All	Operating costs and maintenance	Institute	City of Split
	14. The oil and grease separator must be regularly maintained and emptied. The emptied sludge must be disposed of in accordance with the waste legislation and secondary regulations.	Sub-components 1 and 2	Operating costs and maintenance	Institute	City of Split

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Environmental and Social aspect	Proposed mitigation measure (Use Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
	15. Dismantle dangerous equipment in the safe manner. Handling of waste, transport and final disposal or processing shall be carried out by licensed companies.	Sub-components 1 and 2	Operating costs and maintenance	Institute	City of Split
<b>Air quality</b>					
<b>Indoor air quality</b>	16. Regularly monitor indoor air quality (for relevant parameters e.g. radon, and other relevant)	Sub-components 1 and 2	Operating costs and maintenance	Institute	City of Split
<b>Noise</b>					
<b>Increased noise emission</b>	17. It must be ensured that the noise does not exceed the permitted levels during regular day and night work. In case that generated noise levels exceed the maximum permitted noise levels, it is necessary to choose and apply adequate noise protection measures (design of noise barriers around major noise sources).	Sub-components 1 and 2	Operating costs and maintenance	Environmental inspector according to the inspection plan or by invitation to intervention	City of Split
	18. Noise emission level of the existing substation on the east side of the existing main building (Duilovo-Split) shall be measured at the appropriate location near the sensitive receptors before and after the connection of the Centre to the substation. In case of increased noise emission level, appropriate noise protection measures shall be applied.	Sub-component 1	Operating costs and maintenance	Institute & HEP Ltd.	City of Split
<b>Cultural heritage</b>					
<b>Protection of potential findings in the</b>	19. If some findings occur in the archaeological area, Plan for protection from vandalism, flooding and preservation in the	Sub-components 3	Operating costs and	Institute	Conservation Department in Split

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Environmental and Social aspect	Proposed mitigation measure (Use Phase)	Sub-component	Cost	Responsibility	
				Implementation	Supervision
<b>Area of Archeological Heritage</b>	dismantling phase shall be prepared before the issuance of the use permit.		maintenance		
<b>Hazardous substances</b>					
<b>Risk of accidents and danger to human health</b>	20. Operation and Maintenance plan for the diesel generator shall be prepared prior to the building handover. Diesel generator must remain located outside of premises on a well ventilated spot. Concentration of exhaust gasses will be prevented.	Sub-component 1	Operating costs and maintenance	Environmental inspector according to the inspection plan or by invitation to intervention	City of Split
	21. All equipment is regularly maintained in line with the yearly maintenance plan, legislation and GIIP, including but not limited to: CO sensors, fire safety equipment and alarms, etc.	All	Operating costs and maintenance	Institute	Inspection
	22. Amounts of chemicals stored at the premises must not significantly change. Chemicals that can produce considerable toxic vapour will be stored outside of the building and away from the dormitory in sufficiently aired rooms. Chemicals will be securely locked at all times and available only to licensed and adequately trained staff. Procedures for safe management of chemicals are readily available to staff in the laboratories and other relevant premises.	Subcomponent 1	Operating costs and maintenance	Institute	Inspection
	23. Potable water quality is monitored regularly and in the case of incompliance with national regulation, corrective measures are implemented.	All	Operating costs and maintenance	Institute	Inspection

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				Implementation	Supervision
	24. Materials Safety Data Sheet (MSDS) requirements and measures will be strictly followed and adhered to. Procedures for handling safely oxygen, hydrogen and potentially other tanks with explosive substances and cylinders will be readily available and communicated. All tanks will be stored securely, safe from falling or damaging or accidental leaking.	All	Operating costs and maintenance	Institute	Inspection
<b>Biodiversity</b>					
	25. In order to reduce the impacts of photo-voltaic panels, Anti Reflective Coatings on the panels must be used.	Sub-component 1 & 2	Operating costs and maintenance	Institute	Inspection/ Ministry in charge of environmental protection.



## 11 ENVIRONMENTAL AND SOCIAL REPORTING AND MONITORING PLAN

Building contractor is responsible for the establishment and continuous implementation of mitigation measures proposed by this ESMP and for monthly reporting to PIU Environmental and Social Specialists and Environmental and/or Social Experts on the implementation of the ESMP (according to proscribed Metrics for Reporting). Metrics for Reporting will be a part of the contract for works.

Supervising Engineer will be monitoring the implementation of ESMP and also monthly reporting to PIU Environmental and Social Specialists and/or Environmental and Social Experts on any non – compliances.

PIU Environmental and Social Specialists and/or and Environmental and Social Experts are responsible for the environmental and social measures defined by ESMP, as well as monitoring and supervision of implementation of mitigation measures for environmental protection and OH&S according to the Monitoring plan and reporting to the WB on the results.

Table 14. Environmental and social monitoring plan – Civil Works

	What (is the parameter to be monitored?)	Where (is the parameter to be monitored?)	How (is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)	
							Implementation/r eporting	Monitoring
<b>CONSTRUCTION PHASE (monitoring according to Metrics for Reporting)</b>								
<b>GENERAL CONDITIONS</b>								
1.	Obtaining permits and certificates	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	At the start of construction works	To ensure workers safety and minimize the risks of accidents	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	PIU’s Environmental and Social Specialists and/or Environmental and Social Experts

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	What (is the parameter to be monitored?)	Where (is the parameter to be monitored?)	How (is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)	
							Implementation/r eporting	Monitoring
2.	Site organization	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	Monthly	To ensure workers and community safety and minimize the risks of accidents	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	Institute and PIU's Environmental and Social Specialists and/or Environmental and Social Experts
<b>OCCUPATIONAL HEALTH AND SAFETY AND COMMUNITY SAFETY</b>								
3.	Worker's safety	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	Daily	To ensure workers safety	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	PIU's Environmental and Social Specialists and/or Environmental and Social Experts
4.	Discrimination against women/vulnerable groups in the hiring process of workers and during Sub-project	On construction site	By inspecting the site and keeping written records, GRM records, Supervising Engineer report	Monthly	To prevent discrimination and gender biases at work and ensure workers and community safety	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	PIU's Environmental and Social Specialists and/or Environmental and Social Experts

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	What (is the parameter to be monitored?)	Where (is the parameter to be monitored?)	How (is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)	
							Implementation/r eporting	Monitoring
	implementation							
5.	Worker's health due to improper asbestos handling	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	Monthly	To ensure proper handling with asbestos and workers safety	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	PIU's Environmental and Social Specialists and/or Environmental and Social Experts
6.	Labor influx	On construction site	By inspecting the site and employment records, keeping written records, Supervising Engineer report	Monthly	To ensure workers and community safety	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	PIU's Environmental and Social Specialists and/or Environmental and Social Experts
7.	Sexual Exploitation and Abuse (SEA)/ Sexual Harassment (SH)	On construction site	By inspecting the site and keeping written GRM records, Supervising Engineer report	Monthly	To ensure workers and community safety	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	PIU's Environmental and Social Specialists and/or Environmental and Social Experts

**Modernization of the Institute for Adriatic Crops and Karst Reclamation Infrastructure as a Precondition for Excellence in Mediterranean Agriculture Research**

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

	What (is the parameter to be monitored?)	Where (is the parameter to be monitored?)	How (is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)	
							Implementation/r eporting	Monitoring
8.	Community safety	On construction site	By inspecting the site, GRM records, and keeping written records, Supervising Engineer report	Monthly	To ensure community safety	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	INSTITUTE and PIU's Environmental and Social Specialists and/or Environmental and Social Experts
<b>AIR QUALITY</b>								
9.	Reduced air quality in the nearby construction area and access road due to emission of dust and particulates	On construction site	By inspecting the site and keeping written records, Supervising Engineer report; by measuring PM10 and PM2.5, metals and other relevant parameters upon complaints	Monthly, and upon complaints	To ensure air quality	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	Institute and PIU's Environmental and Social Specialists and/or Environmental and Social Experts
10.	Reduced air quality in the nearby area	On construction site	By inspecting the site and keeping written records,	Monthly	To minimize the impact on air quality	Included in project budget	Building contractor and sub-contractors/	Institute and PIU's Environmental and Social

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							Implementation/r eporting	Monitoring
	due to gaseous emissions		Supervising Engineer report				Supervising Engineer	Specialists and/or Environmental and Social Experts
<b>NOISE</b>								
11.	Increased noise level in the nearby area	On construction site	By inspecting the site and keeping written records, Supervising Engineer report; measuring levels upon complaints	Monthly and upon complaints	To minimize the noise emission	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	Institute and PIU's Environmental and Social Specialists and/or Environmental and Social Experts
<b>WATER AND GROUNDWATER QUALITY / SOIL QUALITY</b>								
12.	Risk of pollution of surface water, groundwater and soil due to spill leakage	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	Daily	To minimize the risks of air, soil, groundwater and surface water pollution	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	Institute and PIU's Environmental and Social Specialists and/or Environmental and Social Experts

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	What (is the parameter to be monitored?)	Where (is the parameter to be monitored?)	How (is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)	
							Implementation/r eporting	Monitoring
<b>BIODIVERSITY (FLORA AND FAUNA)</b>								
13.	Risk of endangering flora and fauna by removing vegetation and polluting water and soil	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	Daily	To minimize the risks on biodiversity by introducing alien invasive species	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	Institute and PIU's Environmental and Social Specialists and/or Environmental and Social Experts
<b>MATERIAL MANAGEMENT</b>								
14.	Risk of environmental pollution through inadequate handling of dangerous substances	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	Daily	To ensure workers and community safety and minimize the risks of accidents	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	Institute and PIU's Environmental and Social Specialists and/or Environmental and Social Experts
<b>TRAFFIC DISTURBANCE</b>								
15.	Increased road traffic	On construction site	By inspecting the site and keeping written records,	Monthly	To ensure traffic safety, to ensure workers and community safety	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	Institute and PIU's Environmental and Social Specialists

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							Implementation/r eporting	Monitoring
			Supervising Engineer report					and/or Environmental and Social Experts
<b>WASTE MANAGEMENT</b>								
16.	Waste generation and management	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	Randomly, at least once a week	To ensure proper waste management	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	PIU's Environmental and Social Specialists and/or Environmental and Social Experts
<b>ACCIDENT AND EMERGENCIES</b>								
17.	Accident/incident	On construction site	By inspecting the site and keeping written records, Supervising Engineer report	Daily	To ensure workers and community safety	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer	PIU's Environmental and Social Specialists and/or Environmental and Social Experts
<b>CULTURAL HERITAGE</b>								
18.	Protection of the Area of Archaeological Heritage	On construction site – Subcomponent 3	By inspecting the site and keeping written records,	Daily during construction earthworks.	To protect possible finding in the Area of Archaeological Heritage	Included in project budget	Building contractor and sub-contractors/ Supervising Engineer and	Conservation Department Split, Institute and

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							Implementation/r eporting	Monitoring
			Supervising Engineer report				Conservation Supervision	PIU's Environmental and Social Specialists and/or Environmental and Social Experts
<b>STAKEHOLDER ENGAGEMENT</b>								
19.	Social conflicts arising from the presence of construction personnel and construction works	On construction site	By interviewing the Contractor and Supervising Engineer and keeping written records, GRM records, conducting activities defined by Sub-project SEP	During construction	To keep records of all complaints	Included in project budget	Building contractor and sub-contractors/	Institute and PIU
20.	Contractor's GRM	On construction site	The Contractor will be required to prepare and enforce a Code of Conduct for workers and report on regularly basis	During construction	To raise workplace concerns	Included in project budget	Building contractor and sub-contractors/	Institute and PIU



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	What (is the parameter to be monitored?)	Where (is the parameter to be monitored?)	How (is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)	
							Implementation/r eporting	Monitoring
			all related incidents that occur during the construction works. The workers GRM will be set.					
21.	Project GRM	N/A	By e-mail, telephone, post, and Contractor monthly report	During construction on daily basis	To keep records of all complaints.	Included in project budget	PIU's Environmental and Social Specialists	/
<b>USE PHASE</b>								
1.	Was moving into the building carried out after the use permit had been issued?	On project site	By inspecting the site and keeping written records	Once before the Center starts to operate	To ensure employee's and student's safety	Inspection costs covered by the State Inspectorate  Institute	Building inspector according to the inspection plan or by invitation to intervention. Persons in charge of area maintenance	PIU's Environmental and Social Specialists and/or Environmental and Social Experts City of Split
2.	Are fire protection equipment and system regularly	On project site	By inspecting the site and keeping written records	During use phase	To ensure employee's and patient's safety	Inspection costs covered by the State Inspectorate	Building inspector according to the inspection plan or by invitation to intervention	City of Split

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	What (is the parameter to be monitored?)	Where (is the parameter to be monitored?)	How (is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)	
							Implementation/r eporting	Monitoring
	maintained and certified?					Institute	Persons in charge of area maintenance	
3.	Is there sufficient number of waste containers?	On project site	By inspecting the site and keeping written records	During use phase	To ensure proper waste management	Inspection costs covered by the State Inspectorate	Environmental/ Sanitary inspector according to the inspection plan or by invitation to intervention.	City of Split
4.	Is oil and grease separator regularly maintained, and content is handed over to authorized company?	On project site	By inspecting the site and keeping written records	During use phase	To ensure proper waste management	Inspection costs covered by the State Inspectorate	Environmental/ Sanitary inspector according to the inspection plan or by invitation to intervention.	City of Split
5.	Noise levels during day and night work do not exceed the permissible levels	On project site	By inspecting the site and keeping written records	During use phase	To minimize the noise emission	Inspection costs covered by the State Inspectorate.	Environmental inspector according to the inspection plan or by invitation to intervention.	City of Split
6.	Indoor radon concentration	Indoor spaces of Center	By monitoring indoor in line with the EU	After construction works and when	To check if employees and students are	Inspection costs covered by the	Institute / or City of Split	PIU's Environmental and Social

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

	What (is the parameter to be monitored?)	Where (is the parameter to be monitored?)	How (is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)	
							Implementation/r eporting	Monitoring
			acceptable standards and methodologies at the site and keeping written records	needed (depending on the results of the radon concentration measurement after the construction works are completed and before the use permit is issued)	exposed to excessive concentrations of indoor radon ( $300 \text{ Bq m}^{-3}$ )	State Inspectorate		specialists and/or Environmental and Social Experts City of Split
7.	Wastewater quality from laboratory, pathology and cytology	Discharge after neutralization	Sampling	In line with the Law on Water for Human Consumption (OG 30/23)	To prevent spreading of pathogens and contamination	Institute	City of Split	MSEY
8.	Soil stability/erosion and risk from landslides	At Duilovo	Visual check and geomechanical testing if needed	Regularly, and after extreme weather events	To prevent soil erosion and landslides, protect safety of surrounding community	Institute	Institute	Institute

## 12 ANNEXES

### ANNEX 1. Stakeholder engagement plan for all Sub-components

STAKEHOLDERS	PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE			
	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	
<b>PROJECT AFFECTED PARTIES</b>										
<b>BENEFICIARY - INSTITUTE FOR ADRIATIC CROPS AND KARST RECLAMATION</b>	Coordinators of Units of the Centre for Advanced Analytics and Centre for Experimental Fields and Collection Plantation	Informing and engaging in the development of Detailed Design and ESMP	Methods: Focus group with Heads of Units  Indicators: All Heads of Units, are consulted.	Timeframe: December 2024 –  Responsibility: PIU with the support of the Institute	Timely informed on the start and end date of the construction works. Concerns about the potential dust, noise and accessibility impacts and related protection/mitigation options.	Method: Institute’s internal communication channels: information board, electronic system used to inform the staff, regular meetings with the staff.  Indicators: Information is accessible to all	Timeframe: Information will be provided at the start and during the whole period of the construction works.  Responsibility: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility Level of satisfaction.	Method: Institute’s internal communication channels: information board, electronic system used to inform the staff, regular meetings. Survey  Indicators: Information is accessible to all	Timeframe: After the completion of the construction works and equipment installment.  Responsibility: PIU with the support of the Institute
	Scientists Assistant scientists Young researchers Other employees	Informing and engaging in the development of Detailed Design and ESMP	Methods: Meetings with Head of Units Internal communication channels: information board, electronic ways of communication  Indicators: Information accessible to all	Timeframe: December 2024 –  Responsibility: PIU with the support of the Institute	Timely informed on the start and end date of the construction works. Concerns about the potential dust, noise and accessibility impacts and related protection/mitigation options.	Method: Institute’s internal communication channels: information board, electronic system used to inform the staff, regular meetings with the staff.  Indicators: Information is accessible to all	Timeframe: Information will be provided at the start and during the whole period of the construction works.  Responsibility: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility Level of satisfaction.	Method: Institute’s internal communication channels: information board, electronic system used to inform the staff, regular meetings. Survey  Indicators: Information is accessible to all	Timeframe: After the completion of the construction works and equipment installment.  Responsibility: PIU with the support of the Institute
	Scientific Council Management Board	Informing and engaging in the development of Detailed Design and ESMP	Methods: Regular sessions Internal communication channels: information board, electronic ways of communication	Timeframe: December 2024 –  Responsibility: the Institute with the support of PIU	Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise and accessibility impacts and related	Methods: Regular sessions Internal communication channels: information board, electronic ways of communication	Timeframe: Information will be provided at the start and during the whole period of the construction works.  Responsibility:	Information on the completion of the construction works Options for using the new facility Level of satisfaction	Methods: Regular sessions Internal communication channels: information board, electronic ways of communication	Timeframe: After the completion of the construction works and equipment installment.  Responsibility:

STAKEHOLDERS		PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE		
		Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities
			Indicators: Information accessible to all members of the Scientific Council & Management Board		protection/mitigation options.	Indicators: Information accessible to all members of the Scientific Council & Management Board	PIU with the support of the Institute		Survey Indicators: Information accessible to all members of the Scientific Council & Management Board	PIU with the support of the Institute
PUBLIC ADMINISTRATION AND INSTITUTIONS	Ministry of Agriculture, Forestry and Fisheries Regional Service for Professional Support - Regional Unit Split	Informing and engaging in the Main Design and draft ESMP Benefits of the Project for Adriatic agriculture and forestry	Methods: Public consultations & Public presentation of the Main Design and draft ESMP Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Timeframe: December 2024  Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works and implementation progress.	Method: DIGIT website & Institute's website. Public presentation immediately before the start of construction works Indicators: Number of stakeholders timely informed	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute's website. Public presentation Indicators: Number of stakeholders timely informed	Timeframe: After the completion of the construction works and equipment installment. Responsibility: PIU with the support of the Institute
	Croatian Chamber of Economy / County Chamber Split	Informing and engaging in the Main Design and draft ESMP Benefits of the Project for economy	Methods: Public consultations & Public presentation of the Main Design and draft ESMP Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Timeframe: December 2024  Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works and implementation progress.	Method: DIGIT website & Institute's website. Public presentation immediately before the start of construction works Indicators: Number of stakeholders timely informed	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute's website. Public presentation Indicators: Number of stakeholders timely informed	Timeframe: After the completion of the construction works and equipment installment. Responsibility: PIU with the support of the Institute
	University of Split, Faculty of Science & Faculty of Chemistry and Technology	Informing and engaging in the Main Design and draft ESMP Benefits of the Project for education in biotechnical sciences	Methods: Public consultations & Public presentation of the Main Design and draft ESMP Indicators: Participation in Public consultations & Public	Timeframe: December 2024  Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works and implementation progress.	Method: DIGIT website & Institute's website. Public presentation immediately before the start of construction works Indicators:	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute's website. Public presentation Indicators: Number of stakeholders timely informed	Timeframe: After the completion of the construction works and equipment installment. Responsibility: PIU with the support of the Institute

STAKEHOLDERS	PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE		
	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities
		presentation of the Main Design and draft ESMP			Number of stakeholders timely informed				
Cooperative Union of Dalmatia, Split	Informing and engaging in the Main Design and draft ESMP Benefits of the Project for Adriatic agriculture and forestry	Methods: Public consultations & Public presentation of the Main Design and draft ESMP Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Timeframe: December 2024  Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works and implementation progress.	Method: DIGIT website & Institute’s website. Public presentation immediately before the start of construction works Indicators: Number of stakeholders timely informed	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute’s website. Public presentation Indicators: Number of stakeholders timely informed	Timeframe: After the completion of the construction works and equipment installment. Responsibility: PIU with the support of the Institute
Institute of Oceanography and Fisheries, Split	Informing and engaging in the Main Design and draft ESMP Benefits of the Project for Adriatic agriculture and forestry	Methods: Public consultations & Public presentation of the Main Design and draft ESMP Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Timeframe: December 2024  Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works and implementation progress.	Method: DIGIT website & Institute’s website. Public presentation immediately before the start of construction works Indicators: Number of stakeholders timely informed	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute’s website. Public presentation Indicators: Number of stakeholders timely informed	Timeframe: After the completion of the construction works and equipment installment. Responsibility: PIU with the support of the Institute
Split-Dalmatia County, Administrative Department of Economy, EU funds and Agriculture	Informing and engaging in the Main Design and draft ESMP Benefits of the Project for Adriatic agriculture and forestry	Methods: Public consultations & Public presentation of the Main Design and draft ESMP Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Timeframe: September 2024  Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works and implementation progress.	Method: DIGIT website & Institute’s website. Public presentation immediately before the start of construction works Indicators: Number of stakeholders timely informed	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute’s website. Public presentation Indicators: Number of stakeholders timely informed	Timeframe: After the completion of the construction works and equipment installment. Responsibility: PIU with the support of the Institute

STAKEHOLDERS		PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE		
		Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities
City of Split, Administrative Department for Social Activities	Informing and engaging in the Main Design and draft ESMP	Main Design and draft ESMP	Timeframe: December 2024	Timely informed on the start and end date of the construction works and implementation progress.	Public presentation immediately before the start of construction works	Timeframe: Information will be provided at the start and during the whole period of the construction works.	Information on the completion of the construction works	Method: DIGIT website & Institute's website.	Timeframe: After the completion of the construction works and equipment installment.	
	Benefits of the Project for the City	Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Responsibilities: PIU with the support of the Institute		Indicators: Number of stakeholders timely informed	Responsibilities: PIU with the support of the Institute	Options for using the new facility.	Public presentation	Responsibility: PIU with the support of the Institute	
City of Vrgorac	Informing and engaging in the Main Design and draft ESMP	Main Design and draft ESMP	Timeframe: December 2024	Timely informed on the start and end date of the construction works.	Public presentation immediately before the start of construction works	Timeframe: Information will be provided at the start and during the whole period of the construction works.	Information on the completion of the construction works	Method: DIGIT website & Institute's website.	Timeframe: After the completion of the construction works and equipment installment.	
	Benefits of the Project for Adriatic agriculture and forestry	Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Responsibilities: PIU with the support of the Institute		Indicators: Number of stakeholders timely informed	Responsibilities: PIU with the support of the Institute	Options for using the new facility.	Public presentation	Responsibility: PIU with the support of the Institute	
Ministry of Culture and Media Conservation Department in Split	The issue of the Area of Archaeological Heritage in the southern part of the Institute's property.	Method: Request for an opinion on planned activities within the Area of Archaeological Heritage	Timeframe: June 2024	The protection of the Area of Archaeological Heritage in the southern part of the Institute's property.	Method: If archaeological finds are found during the construction works, they must be reported to the Conservation Department in Split	Timeframe: During the whole period of the construction works.	-	-	-	
LOCAL COMMUNITY	Informing and engaging in the Main Design and draft ESMP	Methods: Public consultations & Public presentation of the Main Design and draft ESMP	Timeframe: December 2024	Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts, potential traffic disturbances and temporarily traffic arrangements, possible interruptions in water supply and power supply and related	Methods: DIGIT website & Institute's website, social networks, press-releases, media.	Timeframe: Information will be provided at the start and during the whole period of the construction works.	Information on the completion of the construction works	Method: DIGIT website & Institute's website.	Timeframe: After the completion of the construction works and equipment instalment.	
	The impact of the Project on their living conditions. Fencing the Institute's property The grievance mechanism process.	Indicators: All tenants participating in the focus group Participation in Public consultations & Public	Responsibilities: PIU with the support of the Institute		Public presentation immediately before the start of construction works	Timeframe: Information will be provided at the start and during the whole period of the construction works.	Options for using the new facility	Public presentation	Responsibility: PIU with the support of the Institute	
					Direct communication: posting notes in	Responsibilities: Institute through direct communication and with support of contractor &		Indicators: Number of stakeholders timely informed		

STAKEHOLDERS	PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE		
	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities
		presentation of the Main Design and draft ESMP		protection/mitigation options. The grievance mechanism process.	building premisses. Safety notices at construction site. Indicators: Number of stakeholders timely informed	supervising engineer			
Vaš vrt Ltd.	Informing and engaging in the Main Design and draft ESMP The grievance mechanism process.	Methods: Public consultations & Public presentation of the Main Design and draft ESMP Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Timeframe: December 2024 Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts, potential traffic disturbances and temporarily traffic arrangements, possible interruptions in water supply and power supply and related protection/mitigation options. The grievance mechanism process.	Public presentation immediately before the start of construction works. Direct communication: posting notes in building premisses. Safety notices at construction site. Indicators: of the stakeholder timely informed	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: Institute through direct communication with support from contractor & supervising engineer.	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute's website. Public presentation Indicators: Number of stakeholders timely informed	Timeframe: After the completion of the construction works and equipment instalment. Responsibility: PIU with the support of the Institute
Neighbours of the Institute's property (Put Orišća, Put Duilova, Vrgoračka ulica)	Informing and engaging in the Main Design and draft ESMP The impact of the Project on their living conditions. The grievance mechanism process.	Methods: Public consultations & Public presentation of the Main Design and draft ESMP Indicators: Participation in Public consultations & Public presentation of the Main Design and draft ESMP	Timeframe: December 2024 Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts, potential traffic disturbances and temporarily traffic arrangements, possible interruptions in water supply and power supply and related protection/mitigation options. The grievance mechanism process	DIGIT website & Institute's website, social networks, press-releases, media. Public presentation immediately before the start of construction works Direct communication: posting notes in building premisses. Safety notices at construction site. Indicators:	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: Institute with support from contractor & supervising engineer.	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute's website. Public presentation Indicators: Number of stakeholders timely informed	Timeframe: After the completion of the construction works and equipment instalment. Responsibility: PIU with the support of the Institute



STAKEHOLDERS	PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE		
	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities
					Number of stakeholders timely informed				
City of Split, City District Žnjan	<p>Informing and engaging in the Main Design and draft ESMP</p> <p>The impact of the Project on their living conditions.</p> <p>The grievance mechanism process.</p>	<p>Methods: Public consultations &amp; Public presentation of the Main Design and draft ESMP</p> <p>Indicators: Participation in Public consultations &amp; Public presentation of the Main Design and draft ESMP</p>	<p>Timeframe: December 2024</p> <p>Responsibilities: PIU with the support of the Institute</p>	<p>Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts, potential traffic disturbances and temporarily traffic arrangements , possible interruptions in water supply and power supply and related protection/mitigation options.</p> <p>The grievance mechanism process</p>	<p>DIGIT website &amp; Institute’s website, social networks, press-releases, media.</p> <p>Public presentation immediately before the start of construction works.</p> <p>Direct communication: posting notes in building premisses.</p> <p>Indicators: Number of stakeholders timely informed</p>	<p>Timeframe: Information will be provided at the start and during the whole period of the construction works.</p> <p>Responsibilities: Institute with support from contractor &amp; supervising engineer.</p>	<p>Information on the completion of the construction works</p> <p>Options for using the new facility</p>	<p>Method: DIGIT website &amp; Institute’s website. Public presentation</p> <p>Indicators: Number of stakeholders timely informed</p>	<p>Timeframe: After the completion of the construction works and equipment installment.</p> <p>Responsibility: PIU with the support of the Institute</p>
Žnjan-Pazdigrad Primary School	<p>Informing and engaging in the Main Design and draft ESMP</p> <p>Student safety when leaving and coming from school</p> <p>The grievance mechanism process</p>	<p>Methods: Public consultations &amp; Public presentation of the Main Design and draft ESMP</p> <p>Indicators: Participation in Public consultations &amp; Public presentation of the Main Design and draft ESMP</p>	<p>Timeframe: December 2024</p> <p>Responsibilities: PIU with the support of the Institute</p>	<p>Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts , potential traffic disturbances and temporarily traffic arrangements , possible interruptions in water supply and power supply and related protection/mitigation options.</p> <p>Student safety when leaving and coming from school</p> <p>The grievance mechanism process</p>	<p>DIGIT website &amp; Institute’s website, social networks, press-releases, media.</p> <p>Public presentation immediately before the start of construction works.</p> <p>Direct communication: posting notes in building premisses.</p> <p>Indicators: Number of stakeholders timely informed</p>	<p>Timeframe: Information will be provided at the start and during the whole period of the construction works.</p> <p>Responsibilities: Institute with support from contractor &amp; supervising engineer.</p>	<p>Information on the completion of the construction works</p> <p>Options for using the new facility</p>	<p>Method: DIGIT website &amp; Institute’s website. Public presentation</p> <p>Indicators: Number of stakeholders timely informed</p>	<p>Timeframe: After the completion of the construction works and equipment installment.</p> <p>Responsibility: PIU with the support of the Institute</p>

STAKEHOLDERS	PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE		
	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities
<b>PROJECT WORKERS</b>									
Construction Workers	-	-	-	Informed on their rights, timely noted of all work and safety related procedures, as well as informed on potential specific cultural issues (in case of labour influx), implementation of Code of Conduct, but also how to use the project's / subproject's GRM and contractors' workers GRM.  The initial training should be provided in cooperation of the contractor and Institute with the support of PIU, before the start of the works	Information provided at the start of the construction works and during the whole period of construction works	Timeframe: During the whole period of the construction works Responsibilities: Institute, Contractor (by use of their websites, social networks, trainings and other forms of information dissemination, as well as regular reports and reports on eventual incidents). PIU (Project's website; monitoring of the construction works and through the reports and information provided by the Institute and the contractor)	-	-	-
<b>OTHER INTERESTED PARTIES</b>									
Media and Journalists	Informing and engaging in the Main Design and draft ESMP  Benefit of the Project  The impact of the Project on the living conditions of the local community  The grievance mechanism process	Methods: Public consultations & Public presentation of draft ESMP Indicators: Participation of at least 2 at the Public presentation of the Main Design and draft ESMP Information is accessible to all media in Split-Dalmatia County.	Timeframe: December 2024 Responsibilities: PIU with the support of the Institute	Timely informed on the start and end date of the construction works. Concerns about the potential project's risks, impacts and mitigation measures.  The impact of the Project on the living conditions of the local community  The grievance mechanism process	Method: DIGIT website & Institute's website. Press-releases Public presentation immediately before the start of construction works Indicators: Information is accessible to all media in Split-Dalmatia County.	Timeframe: Information will be provided at the start and during the whole period of the construction works. Responsibilities: PIU with the support of the Institute	Information on the completion of the construction works Options for using the new facility	Method: DIGIT website & Institute's website. Press-releases Public presentation Indicators: Information is accessible to all media in Split-Dalmatia County.	Timeframe: After the completion of the construction works and equipment installment. Responsibility: PIU with the support of the Institute

ANNEX 2. Stakeholder engagement plan for local community in Kaštel Stari

STAKEHOLDERS	PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE			
	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	
<b>PROJECT AFFECTED PARTIES</b>										
<b>LOCAL COMMUNITY</b>	Tenants of the Building 2A	<p>Informing and engaging in the Main Design and draft ESMP</p> <p>The impact of the Project on their living conditions.</p> <p>The grievance mechanism process.</p>	<p>Methods:</p> <p>Interview</p> <p>Public consultations &amp; Public presentation of the Main Design and draft ESMP</p> <p>Indicators:</p> <p>Both tenants of 2 apartments participating in the Interview</p> <p>Participation in Public consultations &amp; Public presentation of the Main Design and draft ESMP</p>	December 2024	<p>Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts, potential traffic disturbances and temporarily traffic arrangements, possible interruptions in water supply and power supply and related protection/mitigation options.</p> <p>The grievance mechanism process.</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website, social networks, press-releases, media.</p> <p>Public presentation immediately before the start of construction works.</p> <p>Direct communication: posting notes in building premisses.</p> <p>Safety notices at construction site.</p> <p>Indicators:</p> <p>Number of stakeholders timely informed</p>	<p>Timeframe:</p> <p>Information will be provided at the start and during the whole period of the construction works.</p> <p>Responsibilities:</p> <p>Institute with support from contractor &amp; supervising engineer.</p>	<p>Information on the completion of the construction works</p> <p>Options for using the new facility</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website.</p> <p>Public presentation</p> <p>Indicators</p> <p>Number of stakeholders timely informed</p>	<p>Timeframe:</p> <p>After the completion of the construction works and equipment installment.</p> <p>Responsibility:</p> <p>PIU with the support of the Institute</p>
	City of Kaštela	<p>Informing and engaging in the Main Design and draft ESMP</p> <p>Benefits of the Project for the City</p> <p>The grievance mechanism process</p>	<p>Methods:</p> <p>Public consultations &amp; Public presentation of draft ESMP</p> <p>Indicators:</p> <p>Participation in Public consultations &amp; Public presentation of draft ESMP</p>	December 2024	<p>Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts, potential traffic disturbances and temporarily traffic arrangements, possible interruptions in water supply and power supply and related protection/mitigation options.</p> <p>The grievance mechanism process.</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website, social networks, press-releases, media.</p> <p>Public presentation immediately before the start of construction works</p> <p>Indicators:</p> <p>Number of stakeholders timely informed</p>	<p>Timeframe:</p> <p>Information will be provided at the start and during the whole period of the construction works.</p> <p>Responsibilities:</p> <p>Institute with support from contractor &amp; supervising engineer.</p>	<p>Information on the completion of the construction works</p> <p>Options for using the new facility</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website.</p> <p>Public presentation</p> <p>Indicators</p> <p>Number of stakeholders timely informed</p>	<p>Timeframe:</p> <p>After the completion of the construction works and equipment installment.</p> <p>Responsibility:</p> <p>PIU with the support of the Institute</p>

STAKEHOLDERS	PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE		
	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities
Local Board Kaštel Stari	<p>Informing and engaging in the Main Design and draft ESMP</p> <p>The impact of the Project on their living conditions.</p> <p>The grievance mechanism process</p>	<p>Methods:</p> <p>Public consultations &amp; Public presentation of draft ESMP</p> <p>Indicators:</p> <p>Participation in Public consultations &amp; Public presentation of draft ESMP</p>	December 2024	<p>Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts, potential traffic disturbances and temporarily traffic arrangements, possible interruptions in water supply and power supply and related protection/mitigation options.</p> <p>The grievance mechanism process.</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website, social networks, press-releases, media.</p> <p>Public presentation immediately before the start of construction works.</p> <p>Direct communication: posting notes in building premisses.</p> <p>Safety notices at construction site.</p> <p>Indicators:</p> <p>Number of stakeholders timely informed</p>	<p>Timeframe:</p> <p>Information will be provided at the start and during the whole period of the construction works.</p> <p>Responsibilities:</p> <p>Institute with support from contractor &amp; supervising engineer.</p>	<p>Information on the completion of the construction works</p> <p>Options for using the new facility</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website.</p> <p>Public presentation</p> <p>Indicators</p> <p>Number of stakeholders timely informed</p>	<p>Timeframe:</p> <p>After the completion of the construction works and equipment installment.</p> <p>Responsibility:</p> <p>PIU with the support of the Institute</p>
‘Radić Brothers’ Secondary School, Kaštel Štafilic (agricultural technician -gardener students; agritourism technician students; vocational subjects professors)	<p>Informing and engaging in the Main Design and draft ESMP</p> <p>The benefits of the Project for vocational education</p>	<p>Methods:</p> <p>Public consultations &amp; Public presentation of draft ESMP</p> <p>Indicators:</p> <p>Participation in Public consultations &amp; Public presentation of draft ESMP</p>	December 2024	<p>Timely informed on the start and end date of the construction works.</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website, social networks, press-releases, media.</p> <p>Public presentation immediately before the start of construction works</p> <p>Indicators:</p> <p>Number of stakeholders timely informed</p>	<p>Timeframe:</p> <p>Information will be provided at the start and during the whole period of the construction works.</p> <p>Responsibilities:</p> <p>PIU with the support of the Institute</p>	<p>Information on the completion of the construction works</p> <p>Options for using the new facility</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website.</p> <p>Public presentation</p> <p>Indicators</p> <p>Number of stakeholders timely informed</p>	<p>Timeframe:</p> <p>After the completion of the construction works and equipment installment.</p> <p>Responsibility:</p> <p>PIU with the support of the Institute</p>
Prof. Filip Lukas’s Primary School, Kaštel Stari	<p>Informing and engaging in the Main Design and draft ESMP</p> <p>Student safety when leaving and coming from school</p>	<p>Methods:</p> <p>Public consultations &amp; Public presentation of the Main Design and draft ESMP</p> <p>Indicators:</p>	December 2024	<p>Timely informed on the start and end date of the construction works. Concerns about the potential dust and noise impacts, potential traffic disturbances and temporarily traffic arrangements</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website, social networks, press-releases, media.</p> <p>Public presentation immediately before</p>	<p>Timeframe:</p> <p>Information will be provided at the start and during the whole period of the construction works.</p> <p>Responsibilities:</p>	<p>Information on the completion of the construction works</p> <p>Options for using the new facility</p>	<p>Method:</p> <p>DIGIT website &amp; Institute’s website.</p> <p>Public presentation</p> <p>Indicators</p>	<p>Timeframe:</p> <p>After the completion of the construction works and equipment installment.</p> <p>Responsibility:</p>

STAKEHOLDERS	PRE-CONSTRUCTION PHASE			CONSTRUCTION PHASE			POST-CONSTRUCTION PHASE		
	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities	Concerns	Methods / Indicators	Timeframe / Responsibilities
	The grievance mechanism process	Participation in Public consultations & Public presentation of the Main Design and draft ESMP		, possible interruptions in water supply and power supply and related protection/mitigation options. Student safety when leaving and coming from school The grievance mechanism process	the start of construction works. Direct communication: posting notes in building premisses. Safety notices at construction site. Indicators: Number of stakeholders timely informed	Institute with support from contractor & supervising engineer.		Number of stakeholders timely informed	PIU with the support of the Institute

**ANNEX 3. The Opinion of the Ministry of Culture and Media, Conservation  
Department in Split, 25 June 2024**



REPUBLIKA HRVATSKA  
MINISTARSTVO KULTURE I MEDIJA

Uprava za zaštitu kulturne baštine  
Konzervatorski odjel u Splitu

Klasa: 612-08/24-01/1185  
URBROJ: 532-05-02-15/2-24-2  
Split, 25. lipnja 2024.

INSTITUT ZA JADRANSKE KULTURE  
I MELIORACIJU KRŠA SPLIT  
Put Duilova 11  
21 000 Split

**Predmet: Radovi na posjedu Instituta za jadranske kulture i melioraciju krša Split  
-mišljenje, daje se**

Poštovani,

Katastarske čestice u vlasništvu Instituta na kojima se planiraju radovi uređenja, obnove i izgradnje infrastrukturne namjene se nalaze izvan zaštićene zone, pa se u odnosu na nju ne primjenjuju odredbe Zakona o zaštiti i očuvanju kulturnih dobara.

Ukoliko prilikom radova dođe do pronalaska arheoloških nalaza iste je potrebno dojaviti nadležnom tijelu što je prije moguće (Članak 45. Zakona o zaštiti i očuvanju Kulturne baštine).

S poštovanjem,

Voditelj područnog odjela za konzervatorske poslove:

dr.sc. Radoslav Bužančić



Na znanje:

1. Naslovu
2. Pismohrana

**Modernization of the Institute for Adriatic Crops and Karst Reclamation Infrastructure as a Precondition for Excellence in Mediterranean Agriculture Research**

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

**ANNEX 4. Overview of Ownership Data**

Sub-component	Cadastral Parcel No.	Land Registry Parcel No.	Land Registry Extract No.	Cadastral Municipality
<b>SUB-COMPONENT 1</b>				
Reconstruction and equipping of 3 buildings	7376/2	1812/2	6298	Split
<b>SUB-COMPONENT 2</b>				
Improvement and equipping of 2 existing buildings	1492/1	1492/1	995	Kaštel Stari
<b>SUB-COMPONENT 3</b>				
Structural Improvement Auxiliary Building	7372	1778	16866	Split
Structural Improvement Auxiliary Building	7391	1780/2	5049	Split
Reconstruction of the greenhouse (dismantling of the greenhouse "Bubalo" and construction of a new greenhouse)	7364/2	1820/1	13559	Split
Arranging and landscaping forestry educational demonstration park – location 1	7366	1762	1714	Split
	7367	1765	16866	
	7397/1	1754/1	16866	
	7368/1	1769	13559	
	7368/2	1770	13559	
Arranging and landscaping forestry educational demonstration park – location 2	7386/2	1794/1	16866	Split
Fencing the Institute's property	7362	1818	16866	Split
	7363	1826	13559	
	7374	1820/2	7272	
	7373	1816	16866	
	7377/1	1804/1	9258	
	7386/2	1794/1	16866	
	10289/1	1957/1	16866	
	10285/3	1734/2	16866	
	10286/1	1740	8481	
	10286/2	1746/1	16866	
	7397/1	1754/1	16866	
	7385/1	1797	9258	
	7376/1	1810	6327	
Construction and rehabilitation of the macadam paths	7362	1818	16866	Split
	7363	1826	13559	
	7374	1820/2	7272	
	7373	1816	16866	
	7364/1	1823	13559	
	7364/2	1820/1	13559	
	7366	1762	1714	
	7367	1765	16866	
	7368/1	1769	13559	
	7368/2	1770	13559	
	7369	1772	16866	

DIGIT – Digital, Innovation and Green Technology Project (P180755)  
**Modernization of the Institute for Adriatic Crops and Karst Reclamation Infrastructure as a Precondition  
for Excellence in Mediterranean Agriculture Research**

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Sub-component	Cadastral Parcel No.	Land Registry Parcel No.	Land Registry Extract No.	Cadastral Municipality
	7371	1775	13559	
	7372	1778	16866	
	7397/1	1754/1	16866	
	7389/1	1784/2	5049	
	7377/1	1804/1	9258	
	10285/2	1734/1	16866	
	10285/3	1734/2	16866	
	10286/1	1740	8481	
	10286/2	1746/1	16866	