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Annex II. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

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ENVIRONMENTAL REQUIREMENTS

An Environmental Impact Assessment (EIA) process had been carried out for Halkalı- Kapıkule Railway Line Project between 2015 and 2017 and EIA Positive Decision was granted on June 2017. In the EIA Report, current state of environment is described along the railway line and results of water samplings, air quality measurement, background noise measurements and soil samplings were provided. Environmental Impact Assessment (EIA) Report is attached in Volume 3, General Technical Specification, Annex 1.4.

In addition to the baseline information, likely environmental and social impacts which may be caused by construction and operation activities are described together with relevant mitigation measures.

The Contractor is to ensure that the management systems in place for the monitoring and control of the environmental impacts during the execution of the Works in line with the approved EIA Report. The Contractor shall not perform any activity which is not consistent with the commitments given in the EIA Report. These environmental performance activities should include but not limited to followings:

1. Encourage the establishment and maintenance of a responsible approach to the protection of the environment;
2. Define the environmental baseline from which such degradation is to be measured;
3. Identify those actions of the Contractor that cause degradation of the environment;
4. Describe the measures to be adopted to mitigate such degradation;
5. Monitor the actual environmental changes to determine if the measures are successful;
6. Allow corrective action to be taken if the measures are not successful; and
7. Allow the Employer and/or End Recipient, through its "Engineer" to monitor and audit the implementation and success of the procedures.

It is very crucial to state that borrow pit materials will be provided by quarries which already have relevant EIA Consents (EIA Positive Decision or EIA Not Required Decision). If the Contractor needs to open a new quarry within the scope of the project, it is his responsibility to perform required EIA process.

1. GENERAL

The Contractor shall comply with the provisions of the applicable Turkish legislation on environment protection that may affect the Project (the "Environmental Requirements"). In particular this shall include compliance with the following legislation:

<u>Laws</u>

- Environmental Law
- National Parks Law
- Forest Law
- Pasture Law
- Labor Law
- Aquatic Products Law
- Underground Waters Law
- National Parks Law
- Protection of Cultural and National Property Law

- Coastal Law
- Construction Zoning Law
- Wildlife Improvement and Protection Law
- Municipalities Law
- Metropolitan Municipalities Law
- Tourism Encouragement Law
- Forestation and Erosion Control National Mobilization Law

Regulations

- Regulation on Structures to be built in the Disaster Zones
- Packaging Waste Control Regulation
- Waste Battery and Accumulator Control Regulation
- Waste Oil Control Regulation
- Waste Management Regulation
- Regulation on Preservation of Game Animals and Wild Animals and their Habitats, and Rules and Procedures of Pest Control
- Regulation on Environmental Health Inspection and Inspectors
- Environmental Noise Assessment and Management Regulation
- Regulation on Buildings to be constructed in Earthquake Zones
- Regulation on Control of Excavation, Construction and Demolishing Waste
- Technical Safety and Environment Regulation on the Construction and Operation of Crude Oil and Natural Gas Pipeline Facilities
- Regulation on Water intended for Human Consumption
- Occupational Health and Safety Regulation
- Business License Regulation
- Regulation on Necessary Precautions to be taken to protect Environment and Public Health From Negative Effects caused by Non-Ionizing Radiation
- Regulation on Facilities to be Established and Opened on the Highway Sides
- Regulations on International Trade of Endangered Animal and Plant Species
- Application Regulations for Article 16 of Forest Law, Water Pollution Control Regulation
- Regulation on the Works to be carried out by the Officials in Forest Fires
- Highway Traffic Regulation
- Industrial Air Pollution Control Regulation
- Regulation on Protection of Water Basins and Management Plan Preparation
- Water Pollution Control Regulation
- Aquatic Products Regulation
- Wetland Conservation Regulation
- Regulation on Preservation and Usage of Agricultural Lands
- Medical Waste Control Regulation
- Soil Contamination Control and Point Source Polluted Sites Regulation
- Soil Conservation and Land Usage Law Implementation Regulation
- Regulation on Wildlife Preservation and Wildlife Development Sites
- Regulation on Protection of Underground Waters Against Contamination and Deterioration
- Occupational Health and Safety Code
- Code on Precautions to Be Taken at Businesses and Workplaces Working With Inflammable, Explosive and Hazardous Materials

It should be kept in mind that all environmental legislation in force before and during construction and implementation shall be applicable and the Contractor is liable to ensure their proper application in line with the national legislation as well as international agreement and conventions that Turkey ratified. Contractor shall perform his activities to mitigate adverse impacts by applying national and international standards and best practices.

The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of Project Activities. This shall, wherever possible, be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated. The Contractor will also be required to compensate for any damage, loss, spoilage, or disturbance of the properties and health of the project affected people during construction. In conformance with the Contract Specifications of which these Environmental Provisions are a part, the Employer reserves the right to withhold payments and/or stop construction in the event of serious or repeated violations of the conditions stipulated herein.

The Contractor shall, at his own expense, obtain, retain in force and renew as necessary all Consents provided for by the Environmental Requirements of the Government of Turkey that are required to enable it to meet its obligations in designing and constructing the Project.

2. REQUIREMENTS for ENVIRONMENTAL MANAGEMENT PLAN

2.1. General Information

The Contractor shall establish, implement and maintain an Environmental Management Plan (EMP) and shall document all environmental Operations carried out on the Project during the Contract Period. The Environmental Management Plan shall be prepared to by the Contractor ensure that the application and execution of the mitigation and compensation measures are in compliance with the Environmental Requirements of the Project EIA. The final EMP shall be submitted for approval of the Engineer within 28 days after signature of the contract.

EMP shall be organized in five sections as follows:

- Management Acknowledgements (Item 1.0). A description of the required contents of this section is described below under Item x.2.3.
- Organization & Staffing (Item 2.0). A description of the required contents of this section is described below under Item x.2.4.
- Reporting Procedures (Item 3.0). A description of the required contents of this section is described below under Item x.2.5.
- Environmental Management Provisions (Item 4.0). The environmental mitigation and monitoring obligations required for inclusion within the EMP are described by item under Sections X.3 and X.4 respectively.

Review of the EMP will be provided by the Engineer, Employer and/or End Recipient and representatives of the EU Delegation for Turkey following the receipt of all necessary information and documentation. The EMP shall be subject to the approval of the Engineer. Approval may be conditional as specified by the Engineer/Employer and/or End Recipient/EU. The Engineer may also require periodic reviews, updating and supplements to the EMP in the course of the work. The Contractor shall particularly note that aspects of the EMP will affect the ability to commence work, including the following:

- Appointment and approval of an Environmental Engineer and Environment, Health and Safety (EHS) Manager by the Engineer is required before work can commence. The Contractor shall not undertake any works on the Site until Environmental Engineer and EHS Manager have commenced duties on Site unless specifically agreed in writing by the Engineer.
- Environmental baseline surveys are required at the earliest practical data as specified in detail below.
- Initial Safety Induction Courses are required for Contractor’s staff within their first week on the Site.

Environmental Management Plan will be supported by following plans prepared by the Contractor.

- **Construction Site Management Plan** to ensure construction sites, including demolition and excavation, do not adversely affect health, safety, amenity, traffic or

the environment in the surrounding area. It should be approved by the Engineer in accordance with best practice.

- **Traffic Management Plan** to describe procedures and protocols for site access, traffic routing and management. It should be approved by the Engineer in accordance with best practice.
- **Authority and Permit Plan** to describe how to obtain relevant permits (waste discharge, water crossings, 3rd party crossings etc.) from relevant authorities. It should be approved by the Engineer in accordance with best practice.
- **Grievance Management Plan** to develop a strategy to collect the complaints from the local public and respond / avoid these grievances in a timely manner. It should be approved by the Engineer in accordance with best practice.
- **Social Facilities and Services Plan** to develop a strategy to obtain a high quality social facilities. It should be approved by the Engineer in accordance with best practice.

2.2. EMP - Implementation Stages

The Contractor shall establish, implement the EMP in accordance with the table below. It shall advise the Engineer of the evolution or amendments to the EMP.

Table 41 – EMP Requirements

STEP	DESCRIPTION	SCHEDULE
1. Establishment	Preparation of Environment Management Plan including baseline studies.	28 days, at the latest, following Contract signature.
2.Implementation	The implementation of the mitigation and monitoring plans outlined within the EMP.	At the Works Commencement Date.
3. Reporting	Preparation of environmental reports.	On a monthly basis from the Works Commencement Date.
4. Review	Review of the EMP and any updates to the documents.	On an annual 6 month basis following Commencement Date.

2.3. Management Acknowledgements

2.3.1 Certification and Commitment.

The EMP submitted by the Contractor shall provide a signed statement from the Contractor's Project Manager attesting to a commitment that all environmental protection, safety, and industrial health aspects of the Project will be given highest priority in the

discharge of contractual obligations and certifying a commitment to the provisions specified by the EMP as approved by the Engineer.

2.3.2 Statutory Understanding and Compliance.

The Plan shall provide a statement attesting the firm's understanding of, and means of ensuring due compliance with, the statutory regulations relating to construction work in the Government of Turkey, specifically in regard to compliance with all safety and industrial health legislation including, without limitation, the Rules and Regulation of the Government of Turkey and the authorities having jurisdiction and all current environmental laws and regulations, be they national or local.

2.3.3 Availability of Documents.

The Plan shall state where copies of safety and industrial health regulations and documents will be available on the construction Site and verify that all regulations and documents have been or will be available and displayed or kept alongside each other.

2.3.4 Management of Subcontractors.

The Plan shall provide a commitment that the Contractor for the Work shall:

(a) Provide subcontractors with copies of the EMP and will incorporate provisions into all sub-contract documentation to ensure the compliance with the Plan at all tiers of the sub-contracting.

(b) Require all subcontractors to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract; and

(c) Ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the EMP and the statutory regulations.

2.4. Organization and Staffing

2.4.1 Organization Chart.

The Plan shall include an organization chart identifying (by job title and by the name of the individual) the personnel to be engaged solely for environmental protection. The chart and the supporting text shall identify a designated Environment Engineer (EE), EHS Manager (EHSM) and at least one Deputy EE (DEE), and identify other participants and their areas of responsibility.

2.4.2 Identification of Responsibilities.

The Plan shall provide a description of the responsibilities of the Environment Staff appearing on the Organization Chart.

2.4.3 Nomination of the Proposed Environment Engineer and Safety Manager.

The Plan shall indicate the name of the proposed EE and SM.

2.4.4 Certification Related to the Environment Engineer and SM.

The Plan shall certify that:

- The EE and the EHSM will be appointed and assigned duties throughout the period of the Contract entirely connected with the environmental activities on the Site.

- The proposed EE is suitably qualified and experienced to supervise and monitor compliance with the EMP and will, in particular but without limitation, carry out auditing of the operation of the EMP in accordance with a rolling program to be submitted, from time to time, to the Engineer for his consent.

- The EE and the EHSM will not be removed from the Site without the express written permission of the Engineer.

- The EE will be provided with supporting staff in accordance with the staffing levels set out in the Plan. The supporting staff shall include at least one (1) Deputy EE whose appointment is also subject to the Engineers approval. The Deputy EE is required to be capable of assuming the duties and functions of the EE whenever necessary.

- The EE, the EHSM and his staff will be empowered to instruct all employees of the Contractor or Subcontractors at any level to cease operations and take urgent and appropriate action to make safe the Site and prevent unsafe working practices or other infringements of the Plan or the statutory regulations.

- The EE shall maintain a daily Site Diary comprehensively recording all relevant matters concerning Site environmental management, inspections and audits, related incidents and the like. The Site Diary shall be available at all times for inspection by the Engineer.

2.5. Activities of the EE

The EE shall assume, among other things, the following responsibilities:

1. Implementation and maintenance of the EMP;
2. Performance monitoring pertaining to environmental commitments;
3. Monitoring and coordination of internal EMP audits;
4. Triggering and recording of EMP reviews;
5. Implementation and coordination of continuous improvement of the EMP;
6. Implementation and coordination of the corrective and preventive measures program to ensure effective management of Non-Compliances so they do not recur;
7. Preparation of the sections of the Monthly Reports related to the EMP.

The EE shall be supported by other experts throughout the construction activities in order to comply with the commitments presented in the EIA Report. Team of experts will be selected during the construction with the approval of the Engineer. Team may consist but not limited to following disciplines;

- **Ecologist**, to inform the detailed design process for vegetation clearance, revegetation, habitat creation, species transfers, stream diversions, habitat fragmentation, wildlife crossings, monitoring and mitigation and inform Site Specific Ecological Management Plans (SSEMP) for each restoration area (if any),
- **Archaeologist,** to prepare Archaeological Management Plans if any archaeological findings are observed during construction.

2.5.1 Contact Information.

Contact information for all Environment Staff shall be provided in the Plan.

2.5.2 Qualifications of the Proposed Staff.

Curriculum vitae (CVs) and other relevant information explaining the qualifications of the proposed staff and their abilities to perform the duties assigned shall be provided with the Plan.

2.6. Reporting Procedures and Communications

2.6.1 Environmental Reports.

The following environmental reports shall be submitted:

- Initial Environmental Baseline Report. Required environmental baseline data including biodiversity is specified below. The Initial Environmental Baseline Report shall be submitted within two months from contract signature.

- Weekly Environmental Reports. Documented environmental reviews shall be undertaken on weekly basis. Environmental Reports summarizing the results of the reviews shall be submitted on a monthly basis.

- Incorporation of Summaries in the Project Monthly Report. Summaries of the Weekly Environmental Reports will be included in the Project's Monthly Progress Report.

- Nature, Biodiversity and Wildlife Management Plan

2.6.2 Notification of Accidents.

The Plan shall verify that provisions have been made to ensure that:

- The Engineer will be notified immediately of any accidents which occur whether on-Site or off-site in which the Contractor, his personnel or construction plant, or those of

any subcontractors are directly or indirectly involved and which result in any injuries to any persons.

- Such initial notification may be verbal and shall be followed by a written comprehensive report within 24 hours of the accident.

2.6.3 Communications with Sub-Contractors.

The Plan shall specify:

- The means by which environmental and safety management will be communicated to Subcontractors at all levels and their due compliance with the EMP and all relevant statutory regulations is ensured. Subcontractors shall be supplied with copies of the EMP. Additional activities may include attendance at training programs, circulation of newsletters and other means as specified by the Plan.

- The method by which the procedures and practices proposed by subcontractors will be reviewed for compliance with the EMP and statutory regulations. This could include, for example, the inclusion of environmental and safety criteria as a part of daily and/or weekly Site inspections.

2.6.4 Internal Audits

The Contractor shall develop and maintain an internal auditing process to ensure that the Operations are in compliance with the EMP and to be able to determine all necessary corrective and preventive measures to ensure compliance with the requirements.

The EE shall carry out internal audits to ensure regular review of the main programs and processes covered by the EMP. Follow-up audits will be carried out to ensure that the necessary corrective and preventive measures are taken at the suitable time. Internal audits have been foreseen according to the importance of the process to be verified and results of preceding audits. The Contractor shall provide the Authority with a copy of the internal audit schedule and an updated copy of the schedule if amendments were made.

2.6.5 Ongoing Improvement

The Contractor shall take all the necessary measures towards ensuring ongoing improvement of the EMP. It shall establish a process for the implementation, follow-up and effective execution of the EMP and take necessary measures to correct Non-Compliances and benefit from improvement possibilities. This process shall be such so as to enable precise recording of all information pertaining to a given Non-Compliance including the time and date of the occurrence of this Non-Compliance and information regarding the person responsible for the enquiry and implementation of corrective or preventive measures. The process shall include provisions to establish the dates for implementing proposed corrective and preventive measures and for analyzing the effectiveness of these measures.

The EE shall be responsible for the implementation and maintenance of the processes for corrective and preventive measures and shall regularly prepare reports on the status of problems detected.

The Contractor shall make its employees, suppliers and Sub-Contractors aware of the importance of the environmental issues and the ongoing improvement of the EMP and encourage them to contribute actively in its effective implementation.

2.6.6 Environmental Impact Assessment (EIA)

The Contractor shall comply with the Environmental Regulations of Turkey for the entire Contract Period. In particular the Contractor shall comply with the findings and recommendations of the EIA prepared for the Halkalı - Kapıkule Railway Project. The EIA proposes a number of environmental mitigation and monitoring actions to reduce potential environmental degradation during the course of project works. These mitigation and monitoring requirements of the EIA are described below. The Contractor shall read the following in conjunction with the EIA and shall comply with the same. In the event of any conflict the requirements set below shall prevail.

2.6.7 Environmental Baseline Work Program.

The following are required as a part of the environmental baseline survey (EBS):

1. Air Quality Baseline. Air quality baseline monitoring shall be carried out within two months from Contract signature, to determine ambient dust (TSP) levels at each of the monitoring stations specified by the EIA or as determined by the Engineer and/or the End Recipient. The baseline monitoring is required to be carried out for a one-week period with measurements to be taken every day at each monitoring station. The Plan shall indicate when the Contractor proposes to undertake the required baseline air quality survey and shall provide references to locations. The proposed locations require the approval of the Engineer and the End Recipient.

2. Water-Sediment Quality Baseline. Pre-construction water/sediment quality monitoring shall be carried out twice within a one-week period to establish baseline conditions at locations specified in the EIA or as determined in consultation with the End Recipient and shall include locations likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.) and shall include:

   - pH
   - Suspended solids (SS);
   - Chemical oxygen demand (COD);
   - Heavy metals;
   - Dissolved oxygen (DO);
   - Conductivity;
   - Fecal coliform, and
   - Oil and grease levels.

3. Noise Baselines. Prior to the closure of the existing End Recipient operations on the Çerkezköy – Kapıkule Section of the Halkalı - Kapıkule Railway Project, a train pass-by noise survey shall be conducted to establish a baseline noise level and ground

vibration level in residential areas as determined by the EIA and the End Recipient. The points at which the noise shall be measured shall include:

- The centre of the facing side of all residential buildings within 50 m of the centreline of the tracks;
- Both tangents and mid-point of all track curves;
- A point 200 m from the approach end of the platform at all stations.

The point of measurement for noise shall be 1 m from the facing vertical surface of the building at a height of 1.5 and 3.0 m. Ground vibration shall be recorded at the same location but at a depth of 500 mm below ground. The approximate chainage of the location shall be documented. Digital photos shall be taken at each location to document exact position of the measurement. Where buildings are particularly close to the railway ROW (≤ 15 m from the centerline of the tracks) measurements shall be made in at least 4 locations from one side to the other to obtain a profile of the noise exposure.

A photograph shall be taken of the place where each measurement was taken, to facilitate future comparison measurements in that exact location.

Measurements shall be taken:

1. during the day time working hours when the ambient noise level is representative of the street traffic;
2. during the night hours when street traffic is at a minimum;
3. for both electric and diesel-hauled trains, passenger and freight.

The measurements shall include:

1. Peak dBA on a fast response setting
2. Average dBA on a slow response setting
3. The integration times required to calculate the L eq based on the train headways and pass-by intervals, and the ambient L eq.
4. The type and approximate height of the building where the measurements were made.

A noise survey report shall be prepared documenting:

1. the ambient Leq for both the day and night conditions;
2. the Leq inclusive of train pass-by noise for both day and night;
3. the peak dBA measured for both ambient and train pass-by;
4. the type of train;
5. explanation of peak transients due to, for example, wheel screech on curves, and
6. the type and approximate height of the building where the measurements were made.

4. Biodiversity Baseline. Baseline information for flora and fauna as well as existing protected and natural areas including potential NATURA2000 sites needs to be included.

5. EBS Report

The EBS report shall be submitted to the End Recipient for review. The report shall include noise maps clearly indicating where Turkish noise limits are exceeded and propose mitigation measures to reduce the impact of noise in the affected areas.

Site Access and Site Reinstatement

2.7. Site Areas

The Site includes:

1. Work Areas – that are areas to be made available to the Contractor for the delivery of Plant and Materials, for office accommodation, workshops, equipment parking and the like and for access to the Works. They are to be returned to the End Recipient when the need for these areas is, in the opinion of the End Recipient, ended.

2. Permanent Track Facility Areas (PTFA) – these are land areas for the construction of the Permanent Works. The PTFA cover those parts of the Permanent Works that appear on the surface of the ground.

2.8. Site Access

The Contractor shall ensure that:

- Access to and possession, to the degree required, of the Site shall be "as is", which includes existing structures and vegetation. Unless otherwise specified, the removal of structures and vegetation and the preparation of the Site for working, including any road diversions and the like, shall be the responsibility of the Contractor. No existing access may be closed without an alternative access being provided. None of the Work Areas shall be used for rock crushing operations (except as approved by the Engineer), or for purposes other than for the execution of the Works.

- Construction activities will be carried out within the expropriated land. Similarly, the construction vehicles will use only the access roads and will not enter into arable land. If construction is to be carried out in an agricultural area, a fence will be placed around the construction site in order to protect vegetation.

2.8. Reinstatement of Site

On completion of the Works the Site shall be returned to the End Recipient in a neat and tidy condition; with all holes properly backfilled and evidence of construction activities removed and to the original line and levels, with the exception, unless expressly stated otherwise, of any areas excavated for the provision of Materials.

The Contractor shall reinstate to the functional level available to the public on the Base Date all roads and footpaths that fall within the boundaries of the Site except where there

is specific provision in the Contract for the closing, diversion or alteration of such roads and footpaths. Where it is necessary to interfere with the use of such roads and footpaths during the execution of the contract, the Contractor shall provide diversions agreeable to the authority that is responsible for such roads and footpaths.

Except as otherwise may be agreed by the Employer, the surface of earth slopes shall be shaped to ensure effective drainage and spread with topsoil of a quality and thickness necessary to support the healthy growth of grass. The soil shall be harrowed to a tilth and seeded with grass suitable for the location and climatic conditions, and appropriately fertilized. During the Defects Notification Period such grassed areas shall be regularly cut, weeded and re-fertilized, and any bare patches made good by further seeding.

Quarry areas shall be left in such a condition as is acceptable to the owners thereof.

On completion of any part of the Works executed within an easement the Contractor shall reinstate the easement to the condition that existed immediately before the execution of that part of the Works.

2.9. Related to Air Quality

2.10.1 General

The Contractor shall:

Ensure that all activities comply with the standards set by The Regulation for the Assessment and Control Air Pollution 2009.

1. Treat unpaved access roads in urban areas with water when the quantity of dust raised by a passing vehicle is higher than 40 mg/m³.
2. Ensure that any excavation and backfilling operations coincide in a single operation, in order to minimize the quantity of material stored, transported and manipulated by heavy machinery.
3. Spray / water unpaved surfaces which are exposed to winds and erosion, as often as necessary (several times a day) using watering trucks to ensure a high humidity level of the soil, thus minimizing dust. This activity should apply to sites within 250 meters of urban areas.
4. Ensure that materials stored in piles retain a high level of humidity by frequently spraying them during dry periods (approximately twice a day).
5. Be responsible for monitoring air quality according to the terms indicated in the EIA. Parameters, locations, schedules and responsibilities for the monitoring program will be developed by the Contractor EE and authorized by the Engineer and the End Recipient.
6. Ensure that construction traffic routes shall be optimized to ensure that that they bypass urban areas where practical to prevent noise, vibration and air quality impacts.
7. Areas of reclamation shall be completed, including final compaction, as quickly as possible consistent with good practice to limit the creation of windblown dust.
8. All vehicles, while parked on the Site, will be required to have their engines turned off.

9. All equipment and machinery on the Site will be checked at least weekly and make all necessary corrections and or repairs to ensure compliance with safety and air pollution requirements.
10. All vehicles will be properly cleaned (bodies and tires are free of sand and mud) prior to leaving the Site areas. The necessary cleaning facilities will be provided on Site to ensure that no water or debris from such cleaning operations is deposited off-site.
11. All trucks used for transporting materials to and from the Site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s).
12. Construction walls will be provided in all locations where strong winds could cause the blowing of dust and debris.

2.10.2 Concrete Batching and Rock Crushing

At any concrete batching plant or crushing plant being operated associated with project works the following additional conditions shall be complied with:

1. Dust nuisance as a result of its activities will be avoided. An air pollution control system shall be installed and shall be operated whenever the plant is in operation.
2. Where dusty materials are being discharged to vehicles from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust fans shall be provided for this enclosure and vented to a suitable fabric filter system.
3. Any vehicles with an open load carrying area used for moving potentially dust-producing materials shall have properly fitting side and tailboards. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin in good condition. The tarpaulin shall be properly secured and shall extend at least 300 millimeters over the edges of the side and tailboards.
4. The concrete batching plant and crushing plant sites and ancillary areas will be frequently cleaned and watered to minimize any dust emissions.
5. Dry mix batching shall be carried out in a totally enclosed area with exhaust to suitable fabric filters.

2.10. Related to Surface Water Quality

The Contractor shall, where applicable:

- Ensure that all construction activities comply with the Water Pollution Control Regulation 2004.
- Use retention works to limit migration of soil and sediments towards bodies of water.
- Carry out chemical analyses (screening parameters) before any pumped water is discharged in the natural environment (to ensure compliance with water quality criteria for various uses).
- Restore, stabilise and replant sectors affected by the Project, using indigenous species
- Not carry out landscaping or excavation work near watercourses during high water periods or during heavy rains.
- Sectors which stand cleared for a long period of time and are threatened by erosion will receive temporary stabilization measures before the completion of the Works.

- No tools or machinery shall be washed in any water source or areas that shall drain into an existing watercourse, stream, or canal.
- All temporary construction facilities shall be located at least 50 meters away from a water course, stream, or canal.
- Equipment will be checked weekly for prevention of oil and or lubrication leaks. All equipment oil and lubrication replacements shall be performed only in maintenance and repair areas.
- All existing stream courses and drains within, and adjacent to the Site are kept safe and free from any debris and any excavated materials arising from the Works.
- Chemicals and concrete agitator washings are not deposited into watercourses.
- All water and waste products arising on the Site shall be collected, removed from the Site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.
- Related to Quarries
- In the event that new quarries are required the contractor will be made responsible for setting up their own dedicated quarries and crusher plants. Prior to opening of the sites, the contractor will require approval from the relevant local authorities and the Engineer to ensure that appropriate land ownership expropriation has taken place and that the sites are not located in an area likely to cause significant detriment to the local environment. To ensure that this is the case the contractor should ensure that quarries are:
- Located at least 500 meters from urban areas to prevent noise and air quality impacts;
- Located outside of agricultural land; and
- Where possible located on government owned lands.

2.11. Related to Ballast and Sub-Ballast

Ballast and sub ballast shall be obtained from quarries that are approved by the Engineer or from existing ballast which complies with the required standards and has been salvaged from within the Site and subsequently cleaned and washed.

2.12. Related to Soils and Sediments

The Contractor shall:

1. Stabilize cleared areas, such as embankments, in order to avoid sediment release.
2. Manage contaminated soils during excavation and handling of soils.
3. Shall immediately transport the excavated contaminated materials off-site (or store them in a safe manner on-site, before their transportation towards other sites authorized for final deposit).
4. Ensure that any excavated topsoil, where practical, shall be stored and reused. This requires that topsoil be separated from subsoil during any initial excavation. The more fertile topsoil will later be deposited on the slopes to form a superficial layer conducive to seedling establishment. The rest of topsoil shall be utilized for other purposes working in coordination with local authorities and any other public interest to restore eroded land and/or re-forestation in the vicinity of the route. This may require coordination with the Ministry of Environment, local authorities and municipalities

along the route. Remaining part of the top soil shall be transported by the contractor at the using area (excluding slopes to form a superficial layer), if needed.

5. Ensure that lands temporary occupied during construction works, e.g. construction camps, temporary detours, etc, will be restored to their normal use after the completion of the construction works.
6. Ensure that no earth, rock or debris is deposited on public or private rights of way as a result of its operations, including any deposits arising from the movement of Construction Plant or vehicles.
7. In the event of any spoil or debris from construction works being deposited on adjacent land or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.

Top Soil Excavation

Topsoil will be recovered using appropriate equipment. Depending on compaction and recovery rates, deep ripping may be required to maximize topsoil recovery with care taken not to mix topsoil with sodic subsoil.

During the stripping process there may be some unexpected changes in the depth and the nature of the soil. Where practical the inclusion of obviously poorer quality material will be avoided such as subsoil clay with mottles, saline material and material dominated with stones. Proposed pre-stripping assessments will help manage unexpected topsoil changes.

It is preferable for material to be stripped when it is in a lightly moist condition; soil is slightly moist when colour is darker than when it is dry and the soil cannot be rolled by hand into a bolus.

Disturbance areas will be stripped progressively, as required, in order to reduce erosion and sediment generation, to reduce the extent of topsoil stockpiles and to utilise stripped topsoil as soon as possible for rehabilitation. Rehabilitation of disturbed areas, such as roads, embankments and batters, will be undertaken as soon as practicable after these structures are completed or as areas are no longer required for operational purposes.

Topsoil stockpile locations will be strategically located to assist the sequence of future rehabilitation.

Stockpile locations will be subject to the following management actions.

Overland water flow onto or across stockpile site will be kept to a practical minimum. Where possible, stockpile sites will be selected to maximize protection from `the prevailing winds, particularly if the material is friable in nature (e.g. sand or silt). Establishing stockpiles within a buffer treed zone or in the lee of hills, may be appropriate for these circumstances.

All long-term topsoil material stockpiles will be located outside the active construction site and away from drainage lines. Drainage from higher areas will be diverted around

stockpile areas to prevent erosion. As required, sediment controls will be installed downstream of stockpile areas to collect any run-off.

Topsoil Stockpile Design

Separate stockpiles for topsoil and subsoil will be formed in low mounds of minimum height (3 m maximum) and maximum flat surface area, consistent with the storage area available. Stockpiling using a greater number of low (<2 m high) mounds, rather than a few high spoiltype dumps, is preferable. Long term stockpiles will be revegetated to minimize loss of soil quality. Revegetating stockpiles will minimize weed infestation, maintain soil organic matter levels, maintain soil structure and microbial activity and maximize the vegetative cover of the stockpile. Stockpiles to be retained for a period greater than six months will be sown with a cover crop if a natural vegetative cover does not establish. Topsoil stockpiles will be clearly signposted for easy identification and to avoid any inadvertent losses. The establishment of declared plants on the stockpiles will also be monitored and control programs implemented as required.

The Contractor will prepare a **Sedimentation and Erosion Control Plan and Top Soil Management Plan**.

2.13. Related to Drainage

The Contractor shall ensure that:

- All track work shall be drain freely so that there shall be no moisture build-up leading to degradation of the track structure.
- The design of drainage shall minimize the need for drain cleaning, the possibility of clogging and the consequent flooding of the track work subgrade. The drainage shall be achieved by open ditches based on 50 year, and culverts based on 100 year rainfall intensities published by the State Meteorological Service.
- A gutter or trough interceptor drain shall be provided at the top of cut slopes to prevent erosion of the cut slope by water.
- The drainage of all areas of depots and sidings shall be such as to prevent pounding, flooding and consequent weakening of the supporting track structure.
- Open ditches or trenches with concrete walls and covered with easily removable covers, shall be utilized wherever possible. Minimum slope of unpaved ditches planted with grass shall be 2%. The minimum slope of paved ditches shall be 1%. The bottom of ditches shall be stepped in all instances where the slope would otherwise become more than 10%.
- Drains shall be used wherever a flat surface exists between two tracks and where open ditches and covered trenches are not feasible. Drains shall be sloped at not less than 1%. All closed drains shall be accessible and maintainable by machines. Drain cleaning shafts shall be provided at regular distances. These distances, as well as the size of shafts and minimum diameter of the drains, shall be compatible with the tools and methods intended for cleaning operations.
- The bottom of any ditch or drain in a cut shall be placed at least 200 mm below the lowest edge of the subgrade surface. If the lowest level of the drainage system has no natural gravity outlet, a pump and outlet pipe shall be provided to convey drain water to an acceptable natural outlet.

2.14. Related to the Protection of River Banks

The Contractor shall:

- Stabilize the soil in places where there is risk of erosion.
- Locate access roads at least 60 meters from surface water courses.
- Restore the state of ditches damaged by machinery (damage to the gradient, shoulder construction of the embankments, etc.).
- Prohibit the fording of machinery in the watercourses and on the banks.
- Prohibit the cleaning of machinery in the watercourses and on the banks.
- Replant the riverbanks with indigenous species to limit the risks of erosion.

2.15. Related to Operations in Aquatic Environment (General Measures)

The Contractor shall, where applicable:

1. Use sheet piling cofferdams, or any other technique (E.g.: concrete blocks, Aquadam) that does not contain fine particles. It is prohibited to block more than two-thirds of the watercourse.
2. Install retention works (filter berms, sediment traps and sedimentation basins) and set up a sufficient quantity of sedimentation basins and sediment traps in work areas to limit sediment migration in suspension in the water.
3. Ensure that the sedimentation basins and sediment traps shall be operational at all times.
4. Set up fine sediment (sand) catch systems downstream from the drainage system, before it reaches the natural surface water, in order to avoid disrupting fish habitats and especially plugging up spawning beds. The basins shall be operational at all times.
5. Until the beginning of the in-water works, preserve at least 20 meters of woodlands on the shoreline from the average spring high water line to protect bank stability from erosion and preserve the quality of the water.
6. Permanently stabilize all areas that were reshaped, as the Works are completed. If there is delay, erosion control measures shall remain in place in order to prevent erosion and to intercept all eroded materials.
7. Restore as soon as possible the sites that were unexpectedly impacted, by carrying out landscaping.
8. Implement rip-rapping of bridge abutments two meters outside the average spring high water line.
9. Set up culverts with a minimal diameter of 900 millimeters for small watercourses.
10. Ensure free circulation of water and fish at all times without creating a negative unauthorized impact on the fish habitat and by limiting the effects upstream and downstream of affected watercourses.
11. Examine all options, during the design work for the plans and specifications for reducing the impact on fish habitat.
12. Preserve the bed profile of the watercourse during implementation of the structure protection works (E.g.: rip-rapping around the pillars and culverts).

2.16. Related to Groundwater

The Contractor shall ensure that:

1. There is no permanent dewatering levels below the pre-existing water table;
2. There is no temporary lowering of groundwater levels at locations where the change in groundwater level may cause adverse settlement of neighbouring structures, utilities or other facilities according to condition survey results;
3. Adjacent structures are unaffected by dewatering;
4. Temporary dewatering systems secure at all times a dry and stable excavation;
5. Measures are provided for the proper disposal of contaminated water and/or water with visible sediment content;
6. New structures shall be protected against buoyancy during all stages of construction. Where necessary, temporary under-drain systems shall be designed, installed, operated and maintained to relieve excess water pressure beneath structures until the structure has sufficient weight to resist buoyancy, with the required minimum factor of safety;
7. Lateral drains are provided in the sides of the excavation, where necessary, to collect the groundwater before it discharges onto the excavation face.

2.17. Related to Biological Resources

Flora

The Contractor shall:

- Restrict tree-clearing as well as minimise damage to endemic and rare species to the areas set out for the Project.
- Restore, stabilize and replant sectors affected by the Project using local species.

Fauna

The Contractor shall:

- Minimise damage to endemic and rare species to the areas set out for the Project.
- Take required measures to minimise the impacts of habitat fragmentation and allow wildlife mobility during construction and operation.
- Develop and implement structural and/or non-structural measures to protect wildlife (e.g. mammals and birds etc.) during construction and operation.

Protected areas and potential NATURA2000 sites

The Contractor shall:

- Ensure that no construction activities shall occur within one kilometre of any protected areas or reserves as outlined in the EIA.
- Ensure that there will be no impact to biodiversity in and around existing and potential protected areas.

- Ensure that no trees are cut from any protected areas during construction works for fuel or any other construction related use.

The Contractor will prepare **Nature, Biodiversity and Wildlife Management Plan** in order to describe relevant mitigation measures in order not to have adverse impacts on flora and fauna.

According to EIA and relevant reports, the Contractor should take necessary environmental mitigation measures such as wild-life crossing, noise barriers, etc. The cost of the implementations should be covered by the Contractor under the Provisional Sum of Accepted Contract Amount (BoQ B2-Environmental Measures). Construction of these structures for protection wild-life and noise barriers, if it is necessary, shall be constructed by the Contractor after approving Engineer.

2.18. Related to Solid Waste

The Contractor shall:

Ensure that all construction activities comply with the national Waste Management Regulation.

1. Conclude a contract with a specialized company in order to ensure the transportation and treatment of waste. The details of the contracts shall be kept as part of the EMP.
2. **Develop a Waste Management Plan (WMP).** In the first instance the WMP is based on a management hierarchy whereby the priority will be to:
3. Avoid generating the waste in the first place;
4. Minimize the amount that is produced;
5. Recover wastes through recycling and reuse;
6. Treat and process the waste, without causing secondary impacts to soils, Water resources and air quality;
7. Dispose of the waste in a controlled way (i.e., to a licensed facility), without compromising existing waste management capacity.
8. Relevant Turkish waste regulations are listed below; these must be taken into account while preparing the WMP:

    - Regulation on control of solid waste;
    - Regulation on control of hazardous waste;
    - Regulation on control of medical waste;
    - Regulation on control of waste oil;
    - Regulation on control of excavation material;
    - Regulation of control of packaging wastes.

2.19. Related to Liquid Waste and Accidental Spills

The Contractor shall:

1. Ensure the proper state of machinery (clean and free from leaks) before it used to avoid accidental losses of hydrocarbons.
2. Always have a complete petroleum product recovery kit to handle small accidental spills and ensure the recovery, storage of soiled material and management of soils and contaminated materials.
3. Ensure that refueling, oil changes and mechanical checks are carried out more than 60 meters from watercourses and in appropriate places for this purpose.
4. Not carry out cleaning of equipment near watercourses.
5. Ensure that all waste oil is managed according to the Waste Oil Control Regulation (21.01.2004 dated and 25353 numbered Official Gazette.) and also according to the WMP.
6. Send waste oil, from the use of machinery, and other waste products off-site from the Works, to sites that are provided for this purpose.
7. Provide on-site watertight, well-identified recipients for handling petroleum products and waste.
8. Place cans or recipients containing hydrocarbons and other dangerous products in a container or on a sufficiently thick tarp for handling any leakage.
9. Keep machinery at a distance from the watercourse when it is no longer in use.
10. Not discharge any waste, oil or chemical product or other contaminants in the watercourse. Waste shall be disposed of according to the standards in place at the sites authorized to handle them. All debris introduced accidentally in the aquatic environment shall be removed as quickly as possible.
11. Have on hand and know how to use emergency equipment in case of accidental spills.
12. Ensure that surface water washed from the surfaces of construction camps and any other ancillary camps and waste waters generated by production processes and the domestic waste waters will be collected within the sewerage networks arranged on the locations of the sites. The waters shall be filtered and discharged into the nearest local utility system or collected into a septic tank from where they will be emptied and transported into an urban filtering station.
13. Construct all service areas with adequate drainage and filtration systems including sedimentary basins and grease/oil separators. The sludge collected by these systems should be collected periodically by a licensed contractor.

2.20. Related to Hazardous Waste

The Contractor shall ensure that:

- Hazardous chemicals shall be handled with care to avoid (if possible) or to minimize the generation of hazardous wastes. The transportation, usage, storage and entrance and exit of these materials to and off the site shall be recorded and carried out under supervision.
- The storage areas where the hazardous materials are stored shall be equipped with necessary systems according to the relevant regulations. These required systems such as heating, ventilation, isolation, lightning conductor, alarm and fire extinguishing shall be built with suitable materials. Notifications shall be made by appropriate

warning signs at or near the storage areas. The hazards that might arise during loading, unloading and usage as well as the corresponding precautions against these hazards shall be posted. The chemical products used shall be properly labelled.

- Material Safety Data Sheets (MSDS) shall be produced for these chemicals and kept near the storage tanks. The employees shall be sufficiently trained for using these materials. Empty containers and/or drums shall be disposed of in accordance with these sheets.
- There shall be banded areas around the tanks used for storage of fuels, chemicals, lubricants and other fluids for containment of hazardous materials such as waste oil, oil-containing items (e.g. oil filters, batteries, hydraulic fluids and any other wastes) arising from power generation as well as all other related activities such as vehicle maintenance and servicing. Suitable drainage channels or pits constructed for waste containment shall be inspected regularly. All fuel tanks shall either be of a double skinned construction or the tank shall be located within an integral bund of 110% capacity of the tank.
- Handling and disposal of hazardous wastes, which shall be evaluated in the detail within the WMP, shall be carried out in accordance with the Turkish regulations.

2.21. Related to Noise

The Contractor shall ensure that:

- The project construction activities comply with relevant Turkish noise level standards (The regulation for the assessment and management of environmental noise (2008).
- The contractor shall also be responsible for designing the project to ensure that during its operational phase noise levels do not exceed the relevant Turkish noise level standards for daytime and nighttime as specified in the EIA.
- Noise barriers are erected in the locations specified in the EIA. The specifications of the noise barriers, including their height, length, construction materials, etc, shall follow the guidelines set by the EIA.
- Noise generated by the combination of a typical Commuter Rail bogie and the track structure shall be analyzed and documented in the Conceptual Design Submission. A grinding strategy will then be developed to maintain the noise level below the statutory limit.
- All tracks shall be continuously welded.
- Rail expansion joints shall be designed to meet the impact noise requirement as specified by Turkish law.
- Rail fasteners shall be selected in accordance with the noise and vibration requirements as specified in the EIA.
- All traction power supply equipment (including motors, cooling fans and pantograph noise) shall not exceed Turkish noise limits.
- Noise emissions from signalling equipment shall not exceed 65 dBA.
- Silent crossings should be developed in urban areas to reduce horn use in residential areas.
- Elevated structures (bridges and viaducts) should be of concrete construction and not of light-weight steel.

- On elevated structures where the track is fastened directly to the concrete slab, appropriate rail isolation techniques are to be applied to reduce the reradiated noise.
- Where possible, the elevated sections of track should be on fill rather than structure.
- During construction that the Contractor complies with the following:
- All powered mechanical equipment used in the Works shall be effectively sound reduced using the most modern techniques available; and
- Construct acoustic screens or enclosures around any parts of the Works from which excessive noise may be generated;
- Select equipment with considerations for using equipment with lowest noise levels and ensure that all equipment is regularly maintained to ensure the level;
- Ensure that all equipment engines and motors are equipped with proper mufflers.
- Take all necessary means and measures to assure that the machinery used on site provide compliance with requirements stated herein.
- Be responsible for repairing any damage caused as the result of vibrations generated from or by the use of his equipment, plant, and machinery
- Construction workers shall be provided with appropriate noise reduction headwear for the operation of machinery.

2.22. Related to Electro Magnetic Interference (EMI)

The Contractor shall ensure that the Traction Power Supply equipment and the Overhead Catenary System shall be immune to external EMI and shall not generate EMI which affects other systems. Details are given in the relevant Technical Specifications.

2.23. Related to Cultural, Historical and Archaeological Resources

To avoid potential adverse impacts to historic and cultural resources, the Contractor shall:

1. Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Turkey.

2. The Contractor shall consult with the Natural and Historical Heritages Preservation Organization prior to the start of project works to ensure that there are no potential sites within the site that maybe affected by project works.

3. In the event of unanticipated discoveries of cultural or historic artefacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the Engineer / EO and concerned provincial-level and central government levels representatives of the Natural and Historical Heritages Preservation Organization. If continuation of the work would endanger the finding, work shall be suspended until a solution for preservation of the artefacts is agreed upon.

2.24. Related to Aesthetics

The Contractor shall ensure that the visual intrusion of the completed traction power supplies installation shall be minimized.

2.25. Related to Protection of Utilities

In order to avoid potential adverse impacts to utilities (electrical, gas, telecoms, water supply, sewage and petroleum networks), the Contractor shall:

1. Before Works Commencement Date, undertake a survey to establish the detailed location of all utilities affected by the Works. The survey results shall be recorded in plan form and surface pegs fixed on the site to indicate the location of all underground utilities. These pegs shall remain for the Contract Period.

2. Commence Works only after consultation with the owners of the affected networks and Consent has been received from the owners of the networks for the commencement of Works.

3. Where either Temporary Works or Permanent Works are to be undertaken by the Contractor in the vicinity of utilities, adopt appropriate construction methods, provide adequate protective devices and take precautionary measures, in order to avoid damage to the utilities. Any damage to utilities caused directly or indirectly by the Works shall be the Contractor's responsibility.

4. Be responsible for locating all existing structures affected by the Project prior to the Works Commencement Date. Any delay or extra expense to the Contractor due to the encountering of existing structures shall not constitute a claim for extra work, additional payment, time or damages.

2.26. Related to Construction Camps

The Contractor shall:

- Not locate construction camps or any other production base within one kilometre of urban areas.
- Ensure that the construction sites will be signed with warning panels that inform the drivers that they must reduce their speed in the area of the construction site,
- Pay more attention to the traffic, in order to avoid any accidents with the locals that drive on the connecting roads.

2.27. Related to Traffic Management

The Contractor shall prepare **Traffic Management Plan** which demonstrate how the impacts of construction traffic on communities and the requirements of municipal and other government agencies have been taken into consideration. As a minimum the planning shall:

1. Identify work to be undertaken on the roads prior to construction activities, to upgrade or stabilise the roads or any bridges or culverts to accommodate abnormal loads;
2. Identify permit requirements for abnormal loads;
3. Identify the routes that will be used, with the estimated numbers of traffic movements, speeds and times of travel;
4. Identify procedure for axle load control;
5. Identify procedure for dust and mud control and cleaning;
6. Justify where the routes have to pass through residential areas and the measures that will be used to ensure the safety of the community and minimise the nuisance impact of traffic movements;
7. Identify how existing road development plans have been taken into account in the identification of routes and road restoration measures;
8. Identify the programme of road restoration measures that are likely to be required post construction;
9. Identify how access will be maintained to residential and commercial properties;
10. Identify what road closures and diversions are required, and how they are to be planned, applied for and communicated to the authorities (including emergency services) and affected communities in advance

2.28. Environmental Monitoring

2.29.1 The Contractor's Monitoring Responsibilities

The Contractor shall be responsible for implementing the environmental monitoring plan outlined in the EIA. Monitoring activities may be sub-contracted to third-parties.

2.29.2 Proposed Monitoring Schedules.

The following scheduling provisions shall apply in regard to routine periodic monitoring during the life of the Project:

1. Air Quality. Air quality impact shall be monitored during the course of the Works. Monitoring results shall be submitted to End Recipient two (2) working days after the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required.
2. Water Quality Monitoring. Water quality shall be monitored during the course of the Works. Monitoring results shall be submitted to End Recipient two (2) working days of the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required. Additional monitoring of runoff from Site areas, construction camps, staging areas and camps etc., may be required at the discretion of the EO if warranted by Site observations.
3. Noise Monitoring. Off-site noise levels due to construction activities shall not exceed an Leq of 70 dBA at any time and, insofar as possible, shall not exceed those specified by Turkish noise standards. Monitoring results shall be submitted to End Recipient two (2) working days after the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required and may include periodic meetings between the Contractor, Engineer and End Recipient.

4. Observational Monitoring. Inspections shall be carried out on a regular basis by the EO to ensure that the mitigation measures outlined in section x.3 are adhered to. Results of the visual inspections shall be incorporated in progress reports and maintained on Site by the Contractor until Project completion.
5. **Biodeversity monitoring.**

3. ENVIRONMENT

The Contractor is obliged to plan and perform the Works in such a way not to cause disturbance and damage to environment. While doing this, the expenses of any kind of precaution and damages that might be incurred are the responsibility of the Contractor. The Contractor shall submit an Environment Management Plan as a pre-requisite of access to the site.

The Environment Management Plan is given as annex to General Terms.

3.1. Protection of Public Property and Private Property

The Contractor shall protect the following items that shall be affected directly or indirectly:

- Underground lines and facilities,
- Overhead lines and facilities,
- Car ways, pedestrian ways, pavements, bridges and passages,
- Parks, gardens, fences, railings and walls,
- Biodiversity,
- Official and private buildings,

and carry out processes of necessary obstacles, temporary supports, tensioning and suspension.

The Contractor shall inform the surrounding people of the circumstances from which they can be affected during the Work. Temporary occupancy, prevention, change, arrangement, etc. shall be informed to the surrounding people in a reasonable time before the implementation so that they can take necessary precautions. There shall be main information such as what the disturbance is, what the features are and when it shall be eliminated in this information that shall also be approved by the Engineer.

The Contractor is responsible for recovering any kind of structure, facility and area that has been damaged or distorted as a result of either utilization or negligence. The Contractor shall conclude the recovery works under the directives of the Engineer:

- Renovating the structures and facilities by eliminating their faults and disorders,

- Returning the vegetation to its previous state in parks, gardens and empty spaces and performing additional forestation

The Contractor shall aim at eliminating the disturbance of the environment and the Works in the work sites shall not be deemed to have been completed before recovery works are completed.

3.2. Traffic Arrangements

3.2.1. Protection of Traffic

The Contractor shall arrange the Work in such a way that it overlaps with pedestrian or vehicle traffic the least. When it is necessary to cut or interrupt public or private roads, the Contractor shall ensure traffic flow by taking necessary precautions that the Engineer shall approve. In open excavation street passages, no more than the half of the street shall be occupied in order not to interrupt the traffic and other half shall be open to traffic by taking necessary precautions.

3.2.2. Temporary Bridges

The Contractor shall build temporary bridges at points necessary for the traffic flow.

Vehicle bridges shall comply with specifications and shall have sufficient capacity to convey regional traffic safely.

The width of the pedestrian bridges shall not be less than 1 meter and they shall feature any kind of safety precaution.

3.2.3. Temporary Roads

The Contractor shall maintain traffic flow by building temporary roads passing outside the working site in the event that traffic flow is interrupted due to works. There shall be any kind of safety and traffic utilities such as barricades, lighted and unlighted signals, railings, etc. on these roads.

3.2.4. Traffic Arrangements, Barricades and Lighting

The Contractor shall determine all of the requests and proposals of the Police and Highways Authorities related to traffic arrangements and road safety precautions and perform these requests and proposals.

The public roads that are closed, limited or changed shall be protected by appropriate warnings and information tools.

All of the barricades, obstacles and marks shall be illuminated from dusk to sunrise.

3.2.5. Keeping Public Roads Clean

The Contractor shall clean all public roads from wastes and darts that are caused by him or his Subcontractors. Any kind of damage that these vehicles cause during the utilization of public roads shall be compensated by the Contractor.

Any claim that might arise due to non-performance of these requirements is under the responsibility of the Contractor.

3.3. Noise Control

Noise and disturbance to environment in the working sites shall be kept at minimum level. In order to achieve this condition, it is the responsibility of the Contractor to:

- Equip the construction machinery and motor vehicles with mufflers and practical noise repressing tools,
- Use noise filters, barriers and acoustic curtains that shall reduce noise,
- Equip the machines, equipment and radios with devices that shall prevent them from interfering with surrounding radios and televisions.

The Contractor shall carry out noise inspections with measurements and take other precautions that might be deemed necessary by the Engineer.

3.4. Dust and Dirt Control

The Contractor shall take precautions against the dust and dirt that might cause discomfort and damage to environment and Work Site created by the work on the Site.

Dusted surfaces shall be regularly watered and chemical substances that prevent dust shall be used.

The machines and equipment that shall be damaged by dust shall be protected by dust filters.

Maintenance of motor vehicles, machines and equipment working on the site shall be done regularly and exhaust gases of these items shall be kept under control.

Drains and water courses shall be prevented from being contaminated by sanitary installation wastes, residues and debris. Sanitary installation wastes shall not be permitted to enter any other drain or water course other than sewerage pipes.

3.5. Wildlife Crossing Bridges and Underpasses

Observations on the planned rail line route with regard to wild animals are;

•Forested land around the Sinekli Lake is a critical region primarily for roe deer (Capreolus capreolus). This area is in close vicinity of Çilingöz Wildlife Development Area. In this region, it is necessary to increase the permeability of railroad for wildlife. In order to increase permeability, there should be at least two wildlife bridges separated by a distance of 3-4 km.
•One of the wildlife bridges shall be constructed within the neighborhood of the oak forest/woodland area in Babaeski.

•The second wildlife bridge shall be constructed within 3-4 km distance from the first one, where the railroad permeability is lower – with least amount of other type of wildlife passages/crossing structures.
- The locations of the other two wildlife bridges shall be determined after the field studies and GIS analysis are completed.
- In addition to these four wildlife bridges, six wildlife-underpasses should be built on the locations where high wildlife activity/density is found.
- For the determination of the location of wildlife bridges and underpasses, results of species distribution models – low resolution maps are given below - shall be utilized.
- Field and GIS studies shall be aimed especially at roe deer (Capreolus capreolus), wild boar (Sus scrofa), red fox (Vulpes vulpes) and golden jackal (Canis aureus), which are known to be present in the area from literature, and suitable habitats are found according to species distribution models.

In addition to the presence and habitat suitability for above-mentiones individual species, the overall wildlife density and habitat suitability for wildlife species shall be evaluated to determine the localities of the rest of the wildlife bridges and underpasses. Especially small mammals and reptiles shall also be included in these evaluations

Technical Features

The width of the wildlife bridge shall not be smaller than 20 m. and the length of the crossing structure will be long enough to connect the both sides of the railroad with a natural slope profile similar as the profile at the connected areas of the land. The wildlife underpasses shall be minimal in length, depending on the width of the railroad at this location, and these shall be mounted with light-obstructing panels.
Once the preliminary location of the wildlife bridges and underpasses are determined, exact locations and the technical features of these constructs will be determined so as to provide and fulfil the items given in the list below.
1.Road elevation between steel constructions is 1280 meters.
2.Ecological pass elevation between steel constructions is 1290,32 meters.
3.4 reinforced concrete foundations with 90 meters length will be built for assembling of steel bridges.
4.For the insulation of reinforced concrete foundations, 360 meters of bitumen protection will be applied.
5.In order to stabilize slope at the entries and the exits of the ecological bridges and create a better view, 1440 square meters of stone pitching will be applied.
6.For directing the water flowing from the slope at the entries and the exits of the ecological bridges out of the road, 150 meters of intercepting ditch will be assembled.
7.In order to stabilize slope at the entries and the exits of the ecological bridges 4 pieces of reinforced concrete caps, 25 cubic meters in total, will be made.
8.In order to ease the manufacturing of the reinforced concrete caps made for stabilizing slope at the entries and the exits of the ecological bridges and to contribute the bridge's aesthetic, 4 pieces, 60 square meters in total, steel caps will be manufactured.
9.In order to prevent the water leaking from the filling on the steel structure to reach the construction, sandwich insulation will be applied. For this, the products listed below will be used;
10.3560 square meters geotextile felt (500g/m²)
11.3560 square meters geomembrane (1,5mm pp or hdpe)
12.3560 square meters geotextile felt (500g/m)

13.In order to remove the water held by the sandwich insulation lengthwise, perforated drainpipe with 160 mm diameter and 130 meters length will be laid at the end of the insulation.
14.In order to remove the water that may be filled in the reinforced concrete foundations of the steel construction lengthwise, perforated drainpipe with 200 mm diameter and 720 meters length will be laid.
15.2 meters high and in total 540 meters long refractor panels will be used on slopes in order to prevent the disturbance of the animals using the ecological passage from the lights of the cars coming near to bridge, direct the animals to the bridge and prevent the animals go out of the passage.
16. Introduction and warning signs will be put around the bridge in order to inform the drivers using the highway.
Landscape Features of the Ecological Bridge and Its Compatibility with the Immediate Environment
• On the bridge, vegetable soil that is taken from the immediate natural environment should be used and the depth of the soil should be 2-3 meters. In order to provide the drainage, a slope of 2-3 % should be given from the middle of the bridge to the sides.
• Woody species (bushes and trees) that will be used on the ecological bridge should be chosen among the species that have natural spread around. Exotic and invasive species should never be used.
• Vegetation on and around the ecological bridge should be heterogeneous, in a way of a habitat mosaic where trees and bushes form a closedness and open herbaceous fields are intertwined.
• The landscape of the ecological bridge should be planned by imitating the natural landscape of the immediate environment.
• On the ground of the bridge, pits and bulges can be used to create a small-scale ruggedness.
• There should be no structure like a road etc. at the immediate environment of the ecological bridge, especially at the entrance.
• Structuring at the areas on and around the ecological bridge should not be allowed.
Underpass examples



