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Environmental and Social Completion Sheet (ESCS)

Overview

Project Name:	BOSPHORUS TUNNEL and BOSPORUS TUNNEL TRANCHE B
Project Number:	1999-0272 and 2013-0129
Country:	TURKEY
Project Description:	The Project, also known as the Marmaray Project, consisted of a rail tunnel crossing underneath the Bosphorus Strait to link the existing commuter lines on the European and Asian sides of Istanbul. It also included the upgrading of these existing lines and the procurement of new rolling stock. This flagship investment constituted the first mass transit system in Istanbul to cross the Bosphorus and link the two sides of the city along 76 km of its southern shores. It also enabled high-speed intercity trains to cross the Bosphorus and reach the heart of the city.

Summary of Environmental and Social Assessment at Completion

EIB notes the following Environmental and Social performance and key outcomes at Project Completion.

Environmental procedures

This project was appraised by the EIB twice, i.e. in 2004 and, following a request for additional financing, in 2013. At the time of the first appraisal, the project did not require a full EIA procedure according to Turkish legislation. However, the Promoter accepted the Bank's request to organise the existing environmental information in a comprehensive document, according to international good practice, covering screening of alternatives, environmental impacts and proposed mitigation measures, public consultation process, monitoring plan etc. A Non-Technical Summary (NTS), as well as a declaration of non-significant impact on protected areas by the competent authority, were prepared before the first disbursement.

The Bank required detailed environmental mitigation and monitoring plans for each work contract to be financed with the loan and an independent tunnel safety audit, which was conducted before starting the limited operation of the rail service under the Bosphorus Strait in October 2013.

Project works were designed, executed and completed with all necessary permits and approvals issued by the competent authorities and no significant environmental impacts. An Environmental Management System (EMS), compliant with ISO 14001, was implemented through an Environmental Manual (EM) and quality assurance plans for the execution of works. The contents of the EM included environmental awareness and procedures, environmental protection policy and objectives, risk assessments, mitigation measures, applicable legislation, emergency responsibilities, audits etc. Topics of the EM related to natural environment, community environment and built environment, including the assessment of potential environmental impacts and appropriate mitigation measures as well as procedures to be used to minimise the impact on the environment during execution of works.

Protection of environment during construction

Contractors working at the Marmaray Project were requested to take all reasonable steps to protect the environment both on and off building sites and limit damage and nuisance to people

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and properties resulting from pollution, noise and other results of construction and operation and to ensure that emissions, surface discharges and effluent from the activities should not exceed the values indicated in the contract and prescribed by applicable legislation.

Effective dialogue with communities was maintained through information on progress of work and associated implications, and community-related issues were rapidly identified and resolved to reduce impacts of construction activities. Traffic management plans, which included alternative traffic routes and temporary walkways for pedestrians, were prepared to mitigate impacts of construction activities on the existing network.

Before the start of construction in each area of work, surveys were carried out on the conditions of the built environment, including all structures, monuments and cultural heritage protected sites, utilities and other facilities within the zone of potential influence of building activities.

Geotechnical monitoring was periodically conducted to detect all significant developments in the subsurface conditions during the execution of works in order to collect the necessary information to verify if modifications and improvements to construction procedures were needed and provide timely information for implementing remedial actions.

Noise and vibration survey reports were prepared to establish a baseline noise level and ground vibration level in residential areas. During construction activities related to the Bosphorus tunnel, although noise levels were not a problem during the immersion of tubes, issues occurred on station sites especially during the loading and unloading of excavated material. Noise barriers and covered workshops were installed for mitigating noise emissions of these activities. Moreover, noise mitigation measures were taken along the entire alignment and also for concrete plants and crushers located in the working area. Noise, vibration and ground borne noise measurements were carried out at 150 locations during the construction and operation trial-run period. Modifications were applied where issues in the wheel-rail contact were identified and noise barriers were installed.

A hydrological survey was conducted to identify water conditions in the Bosphorus Strait and to provide information about all aspects of water movements and water physical characteristics. All provisions and regulations pertaining to protection of marine life and ecological environment in the Bosphorus Strait and the Sea of Marmara were followed and executed and appropriate measures were taken to protect fisheries by taking into account the fish migration regime in coordination with experts from universities and relevant authorities. Time schedule was limited for activities which could substantially increase turbidity, such as dredging and backfilling according to the conditions of the Bosphorus regime. Moreover, activities that substantially increased turbidity, such as dredging and backfilling works and geological soil improvements of the seabed were subject to the conditions of a monitoring program approved by competent authorities.

It was prohibited to bury in the ground any kind of waste materials, both solid and liquid. In case of discharging polluting materials, special mitigation measures were taken, in coordination with the authorities. Disposal areas for all surplus material originating from the execution of works complied with international, national and municipal regulations and differentiated for contaminated and uncontaminated material. All excavated materials from construction sites were controlled and sent to the registered disposal areas. Other materials were screened and used for construction of the project.

In particular, dredged material was subject to specific procedures and disposed or reused according to its characteristics. Oil spills and wastewater treatment plants of the marine vessels during the dredging and transportation of the material were controlled periodically during dredging and transportation of the material. Bentonite slurry treatment plants and wastewater treatment plants were built at station locations and wastewater discharges were analysed

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periodically. The Contractor was only allowed to use low sulphur diesel oil (green oil) for all his powered equipment according to EU standard EN590 and unleaded petrol for all equipment.

During marine operations, detailed work plans and programmes were prepared in compliance with the legislation and requirements of the related national and international authorities and necessary measures were taken not to cause any damage and disturb the urban, national and international maritime traffic.

Moreover, air pollution measurements were performed periodically during construction operations.

Cultural heritage

Most part of the Marmaray project alignment is located within archaeological or protected urban sites and partly within the UNESCO cultural heritage areas of Istanbul. The Promoter required the Contractor to design and execute works taking into account the nature of the environment within which the works were performed, to ensure the integrity of all antiquities and historical structures and liaise effectively with any local committees appointed by the Natural and Historical Heritages Preservation Organisation having jurisdiction over the areas in which the works were located to obtain the necessary information regarding the historical registration status along the right of way. Protection measures were taken to safeguard historic structures and buildings and retrofitting techniques were determined and undertaken in accordance with the requirements and consent of all relevant authorities.

Archaeological excavations were undertaken in ten separate areas in coordination with the Preservation Committees for Cultural Heritage and under the supervision of the Ministry of Culture and Istanbul Archaeological Museum Directorate. All findings were delivered to the Museum Directorate and protection measures were implemented for buildings with an historic architectural relevance.

Bakirköy and Yeşilköy historic station buildings (station canopies, waiting halls, ticket halls and Bakirköy station entrance building), located on the existing platform, were relocated within the station area due to the interaction with the new track superstructure and restored in accordance with the restoration design approved by the Preservation Committee. The structures at Bakirköy transfer station are now used as a station building for intercity trains. The historic Göztepe station building was restored and the bridge under the building, which spanned over the double tracks, was demolished and reconstructed, due to the new 3 track arrangement, without any damage to the historical station building by taking special measures.

Major archeological findings came to light with the works in the area of Haydarpasa station, the historic landmark terminal station on the Asian side of Istanbul. Archaeological excavations started in May 2018 and were completed for half of the total 140,000 sqm excavation area. Archaeological investigations are still ongoing in station platform areas. Documentation and protection of findings are being carried out, together with the excavations, under the supervision of the Preservation Committee for Monuments and Istanbul Archaeological Museums Directorate. Considering the imporance of the archaeological findings, the Promoter decided to revise the track layout plan and platform arrangement to eliminate the interaction of works with the remains and make archaeological findings visible to the public. The works related to the new concept design are still ongoing.

Expropriations

Marmaray Project at-grade sections, both on the Asian and European sides have been built on the existing right-of-way. Only minor expropriations were carried out at some station entrance locations. New depot and workshop facilities were built on the railway infrastructure manager’s

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property. In the area of the Bosphorus tunnels, 24 dilapidated buildings were expropriated in accordance with the relevant legislation.

Health and safety

Health and safety measures during construction and operations were implemented through health and safety plans in accordance with the regulations of the various organisations having a legislative or statutory role with respect to health and safety.

Environmental and social supervision

Environmental and social issues were supervised by Avrasyaconsult JV who had the role of Project Implementation Unit on behalf of the Promoter.

Positive project impacts

The project contributes to reduce traffic congestion in Istanbul through a significant modal shift from road to rail and consequent decrease of road accident rates, noise emission levels, air pollution and GHG emissions. The project brings improved accessibility to public transport as well as a new framework for developments in land use.

Summary opinion of Environmental and Social aspects at completion

EIB is of the opinion, based on reports from the promoter, site visits by the EIB team and inputs provided by the work supervision team, during construction and operations, that the Project has been implemented in line with EIB Environmental and Social Standards, applicable at the time of appraisal.