AYGM

HALKALI - HALKALI - ISPARTAKULE - CERKEZKOY RAILWAY LINE

Non-Technical Summary

70069878
APRIL 2021

PUBLIC

AYGM

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Non-Technical Summary

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ABBREVIATIONS

AIIB	Asian Infrastructure Investment Bank
CESMP	Construction Environmental and Social Management Plan
EBRD	European Bank for Reconstruction and Development
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
EU	European Union
GHG	Greenhouse Gas
LRF	Livelihood Restoration Framework
LRP	Livelihood Restoration Plan
OESMP	Operation Environmental and Social Management Plan
NTS	Non-Technical Summary
PR	Performance Requirements
SEP	Stakeholder Engagement Plan

1 INTRODUCTION

1.1.1. Turkish Republic Ministry of Transport and Infrastructure, General Directorate of Infrastructure Investments (AYGM) intends to construct a new high-speed railway line from Halkali to Ispartakule and from Ispartakule to Çerkezköy (herein referred to as 'the Project'), in two different tenders and sections. The Project will be located within the region of Istanbul and province of Tekirdag (the land upon which the railway is to be built is herein referred to as 'the Site'). Once operational the Project would be operated by TCDD and TCDD Transport.

1.1.2. The Project will provide passenger and freight services connecting Istanbul (at the existing Halkali Station) to the district of Çerkezköy and will link to the under-construction Çerkezköy-Kapikule railway to form one integrated railway system with full interoperability.

1.1.3. The European Bank for Reconstruction and Development (EBRD) and the Asian Infrastructure Investment Bank (AIIB), collectively called the 'Lenders', are considering financing components of the Project, specifically the railway between Ispartakule and Çerkezköy. The Project and this Non-Technical Summary (NTS) have therefore been developed on behalf of AYGM in accordance with these Lenders policies and requirements.

2 WHAT IS THE PURPOSE OF THE NON-TECHNICAL SUMMARY?

2.1.1. This NTS provides an easy to understand summary of the information that is provided in the Environment and Social Impact Assessment (ESIA) report. The purpose of the NTS is to help the public and stakeholders to understand: the project need and background, project description, the ESIA process (including stakeholder engagement and grievance mechanism), the potential adverse and beneficial environmental and social effects of the Project, and the mitigation measures that will be implemented to avoid or reduce adverse effects and enhance the benefits.

3 PROJECT NEED AND BACKGROUND

3.1.1. The principal need for the Project is to increase the freight and passenger rail capacity in the strategically critical area of Thrace. The area is critical as a European-Asian meeting point of the European rail network and is predicted to become an increasing bottleneck unable to meet future demand.

3.1.2. The Project is a response to key transport policies and strategic infrastructure initiatives which aim to address this capacity constraint including:

- Trans-European Transport Network (TEN-T) policy objective is to close gaps, remove bottlenecks and technical barriers, as well as to strengthen social, economic and territorial cohesion in the EU.
- The Project is a subcomponent of the TRACECA Project (Transport Corridor Europe-Caucasus-Asia) which aims to strengthen economic relations, trade and transport in the regions of the Black Sea basin, South Caucasus and Central Asia; and
- The Project is one of the key Major Infrastructure Projects identified in Turkey's Sector Operational Programme for Transport (SOPT) (2014-2020).

4 WHAT ARE THE AIMS OF THE PROJECT?

4.1.1. The Project aims are as follows:

- Contribute to achieving a sustainable, safe, inclusive and efficient national transport system which results in a shift from individual to public modes of transport at the national level, and further integrates Turkey with the Single European Transport Area;
- Solve the capacity constraints of the railway link from Europe to eastern Anatolia; and
- Encourage a shift from road to railway transportation through the removal of railway capacity limitations.

5 WHAT DOES THE PROJECT INVOLVE?

5.1.1. The Project is composed of two sections (i) Halkali- Ispartakule and (ii) Ispartakule-Çerkezköy which together will provide a new 76km high speed electric rail link connecting Istanbul (at the existing Halkali Station) to a location 1 km to the east of the existing Çerkezköy Station (at this location it will link to the under-construction Çerkezköy-Kapikule railway). Halkali Station is located within Istanbul province and Çerkezköy is located within Tekirdag province, both in the north-west of Turkey. Both passenger and freight trains will operate on the new railway. The location of the Project is shown in **Figure 5-1**.

5.1.2. The Project will consist of:

- A new double track 9km line (i.e. two new lines) between Halkali Station and Ispartakule. In order for the Project to pass under the proposed Kanal Istanbul project a 6km twin-bored tunnel will be constructed in this section. The twin-bored tunnel tracks will be suitable for use by both conventional and high-speed trains. Conventional trains will re-join the existing railway prior to Ispartakule Station;
- A new double track 67km line from Ispartakule to a location adjacent to the east of Çerkezköy Station (approximately 1km from the centre of Çerkezköy);
- Modification of existing infrastructure, but not buildings, at the 3 existing stations (Halkali (0km), Ispartakule (9km from Halkali) and Çatalca (32km from Halkali)), including the provision of footbridges, platforms and additional tracks;
- New structures, such as bridges, viaducts, tunnels, overpasses and underpasses;
- Supporting power supply systems, inclusive of overhead lines and substations; and
- Supporting electrification, signalling and control systems.

SUMMARY OF THE DESIGN

5.1.3. The design summary is shown in **Table 5-1**.

Table 5-1 – Design Summary

Parameter		Specification / Number
Line Type		Electric
	Passenger Trains	200km/h

Parameter		Specification / Number
Design Speed (Maximum)	Freight Trains	120km/h
Structures	Bridges	9
	Viaducts	2
	Tunnels	8
	Overpasses	17
	Underpasses	26
Railway Corridor[1]		50m
Fencing		Between 1.5 and 2m in height[2] both sides of the rail track

5.1.4. An example cross section of the rail track is shown in **Figure 5-2**. The location of the structures listed in **Table 5-1** is shown in **Figure 5-3**.

[1] The 50m railway corridor for the Project cover the area required for the railway track and the overhead line system, but excludes any additional areas of permanent land that may required (such as for embankments, cuttings and station parking).
[2] A safety measure to prevent people and fauna having access to the line, reducing the risk of collisions with trains.

THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

Legend

- Town
- Railway Station (Current)
- Existing Railway Route
- Proposed Railway Route

Note:

Drawing Status: FINAL

Job Title: HALKALI – CERKEZKOY HIGH SPEED RAILWAY

Drawing Title: Figure 5 -1 - Project Location

Scale at A4: 1:300,000

Drawn			
DG			
Stage 1 check	Stage 2 check	Originated	Date
JK	JW	DG	22/02/2021

0 1.25 2.5 5 7.5 10 Km

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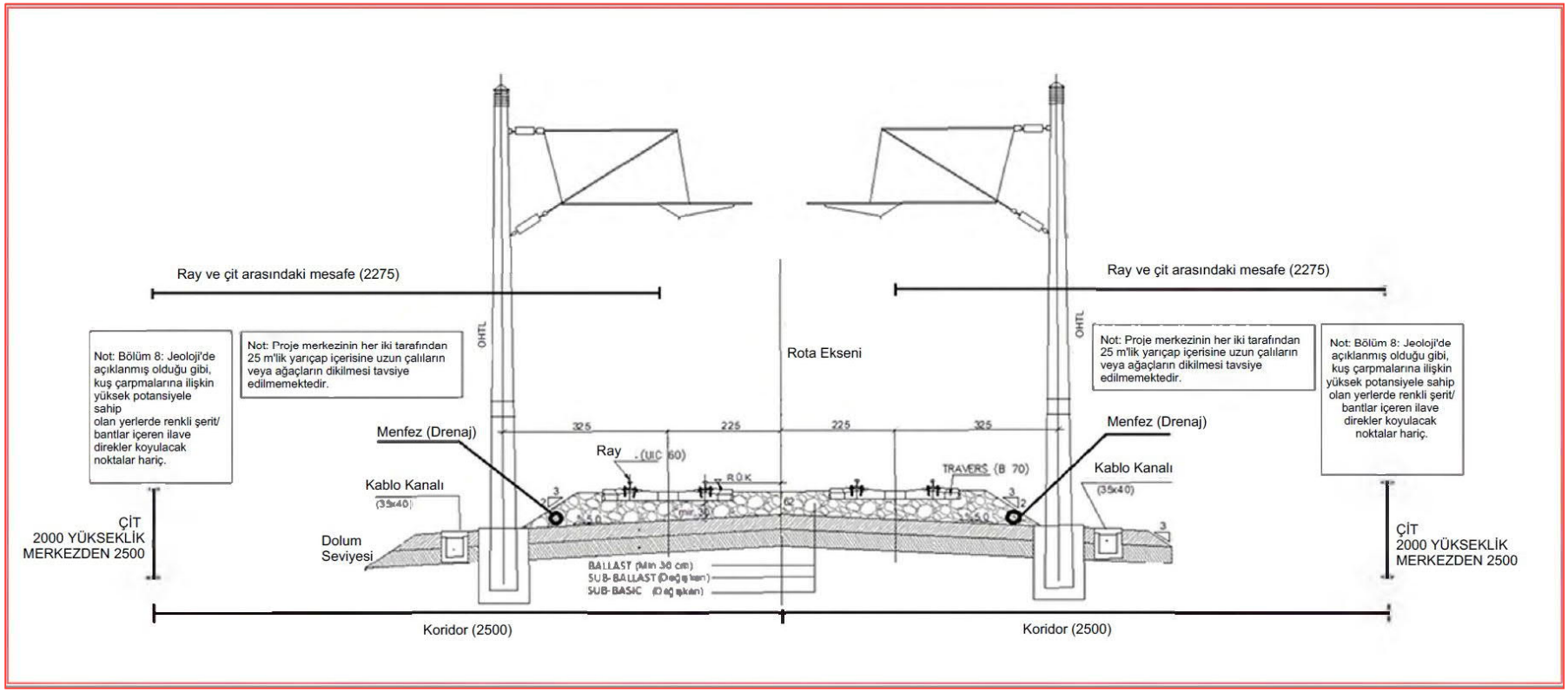
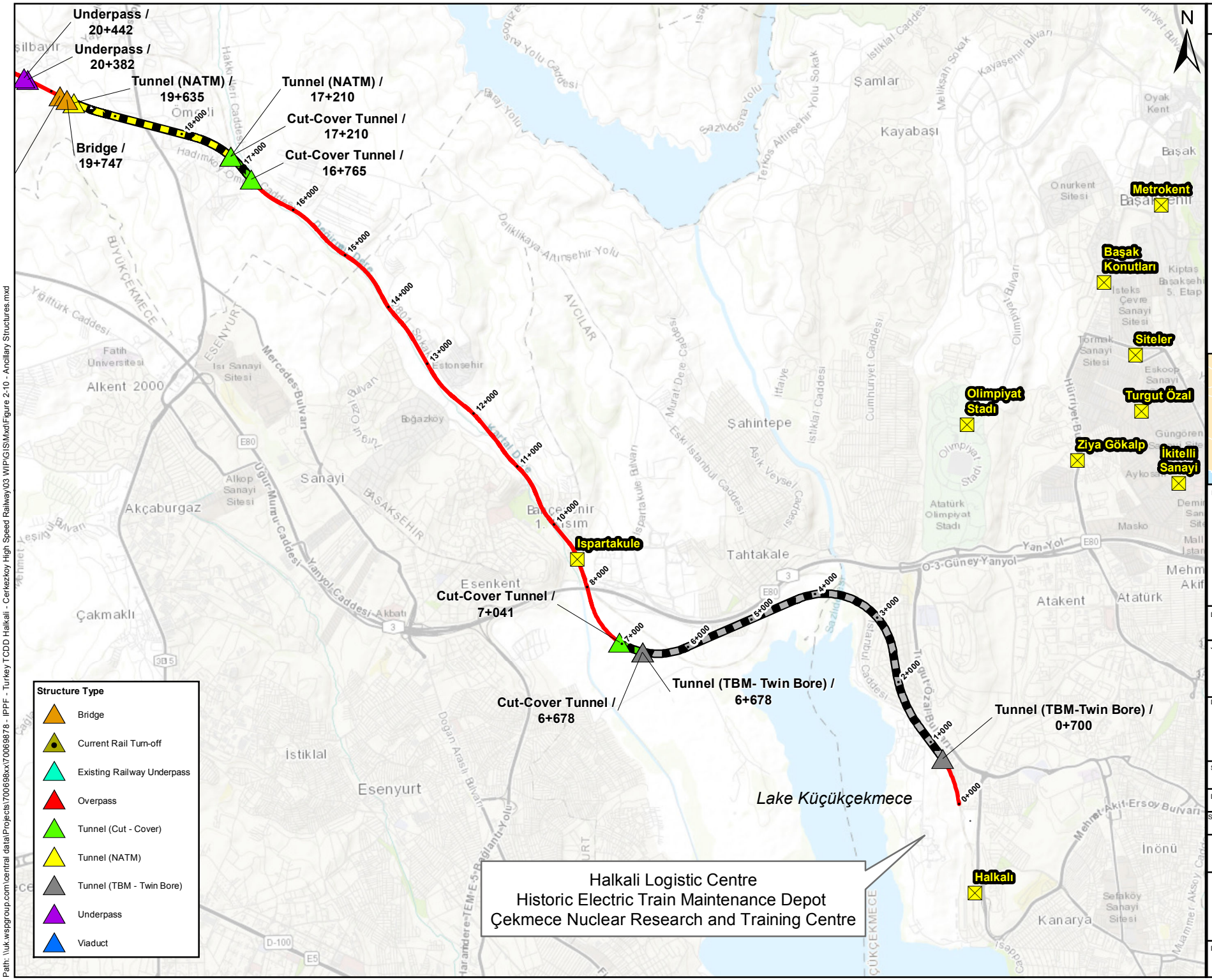
Drawing Number: Figure 5 -1

Path: \\uk.wspgroup.com\central data\Projects\700698xx\70069878 - IPPF - Turkey TCDD Halkali - Cerkezkoy High Speed Railway\03 WIP\GIS\Mxd\Figure 2-1 - Project Location.mxd

Figure 5-2 - Example Rail Track Section Drawing





THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

Legend

- Railway Station (Current)
- Proposed Railway Route
- Tunnel (TBM - Twin Bore)
- Tunnel (NATM)
- Tunnel (Cut - Cover)

Note:

Drawing Status: FINAL

Job Title: HALKALI – CERKEZKOY HIGH SPEED RAILWAY

Drawing Title: Figure 5-3 - Structures

Scale at A4: 1:70,000

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BR	JW	DG	22/02/2021

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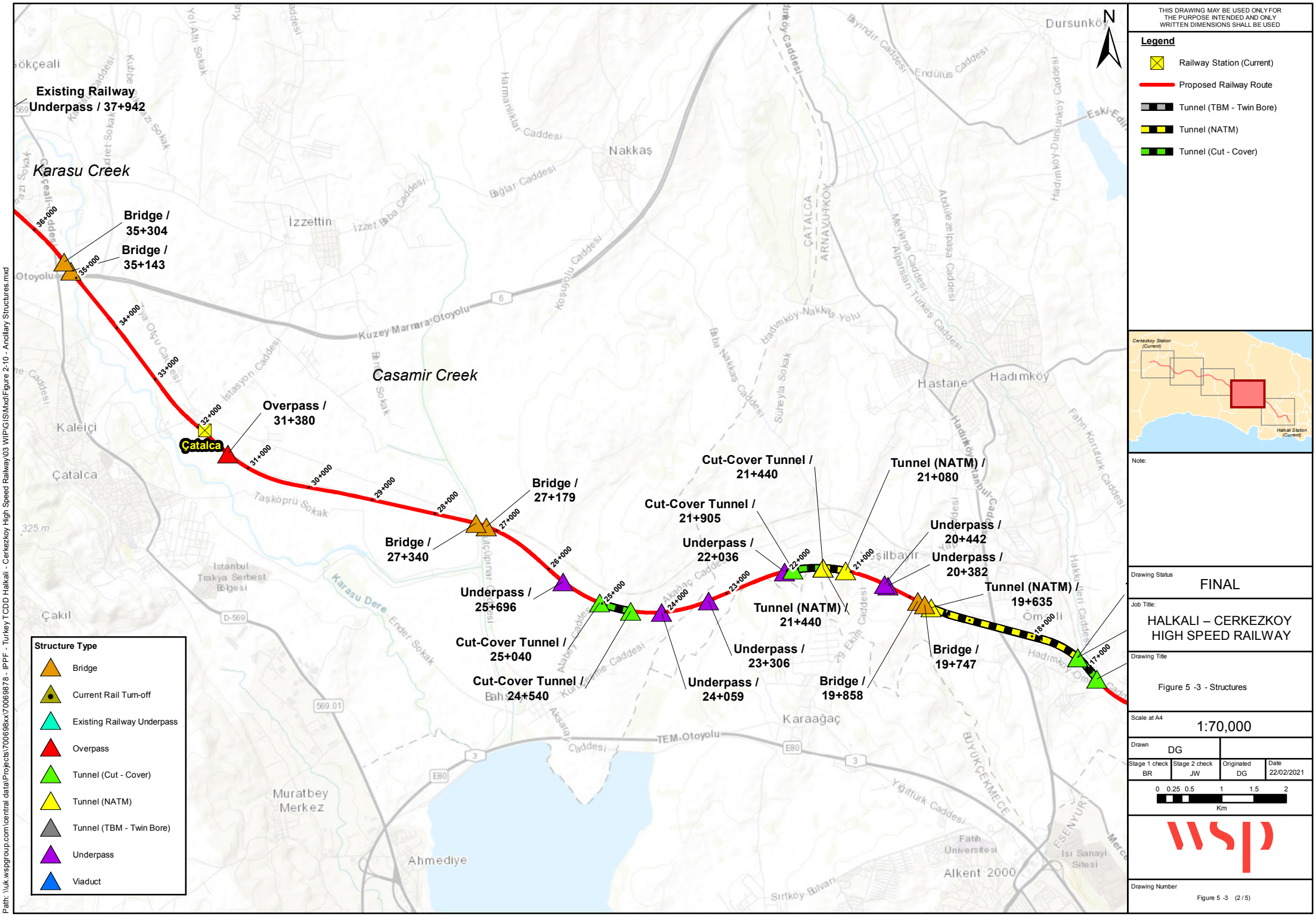
Drawing Number: Figure 5-3 (1 / 5)

Path: \\uk.wspgroup.com\central data\Projects\700698xx\700698878 - IPPF - Turkey TCDD Halkali - Cerkezkoy High Speed Railway\03 WIP\GIS\Mxd\Figure 2-10 - Ancillary Structures.mxd


Existing Railway Underpass / 37+942
Karasu Creek
Bridge / 35+304
Bridge / 35+143
Casamir Creek
Overpass / 31+380
Çatalca
Bridge / 27+179
Bridge / 27+340
Underpass / 25+696
Cut-Cover Tunnel / 25+040
Cut-Cover Tunnel / 24+540
Underpass / 24+059
Underpass / 23+306
Cut-Cover Tunnel / 21+905
Cut-Cover Tunnel / 21+440
Underpass / 22+036
Tunnel (NATM) / 21+440
Tunnel (NATM) / 21+080
Underpass / 20+442
Underpass / 20+382
Bridge / 19+858
Bridge / 19+747
Tunnel (NATM) / 19+635
Kuzey Marmara Otoyolu
TEM Otoyolu
Nakkaş
İzzettin
Kaleiçi
Çakıl
Karaağaç
Hastane
Hadımköy
Ahmediye
Muratbey Merkez
Alkent 2000
Fatih Üniversitesi
Dursunköy
Ömerli
Şilbayır
Structure Type
Bridge
Current Rail Turn-off
Existing Railway Underpass
Overpass
Tunnel (Cut - Cover)
Tunnel (NATM)
Tunnel (TBM - Twin Bore)
Underpass
Viaduct
N
THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED
Legend
Railway Station (Current)
Proposed Railway Route
Tunnel (TBM - Twin Bore)
Tunnel (NATM)
Tunnel (Cut - Cover)
Cerkezkoy Station (Current)
Halkali Station (Current)
Note:
Drawing Status
FINAL
Job Title:
HALKALI – CERKEZKOY HIGH SPEED RAILWAY
Drawing Title
Figure 5 -3 - Structures
Scale at A4
1:70,000
Drawn
DG
Stage 1 check
BR
Stage 2 check
JW
Originated
DG
Date
22/02/2021
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Km
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Drawing Number
Figure 5 -3 (2 / 5)
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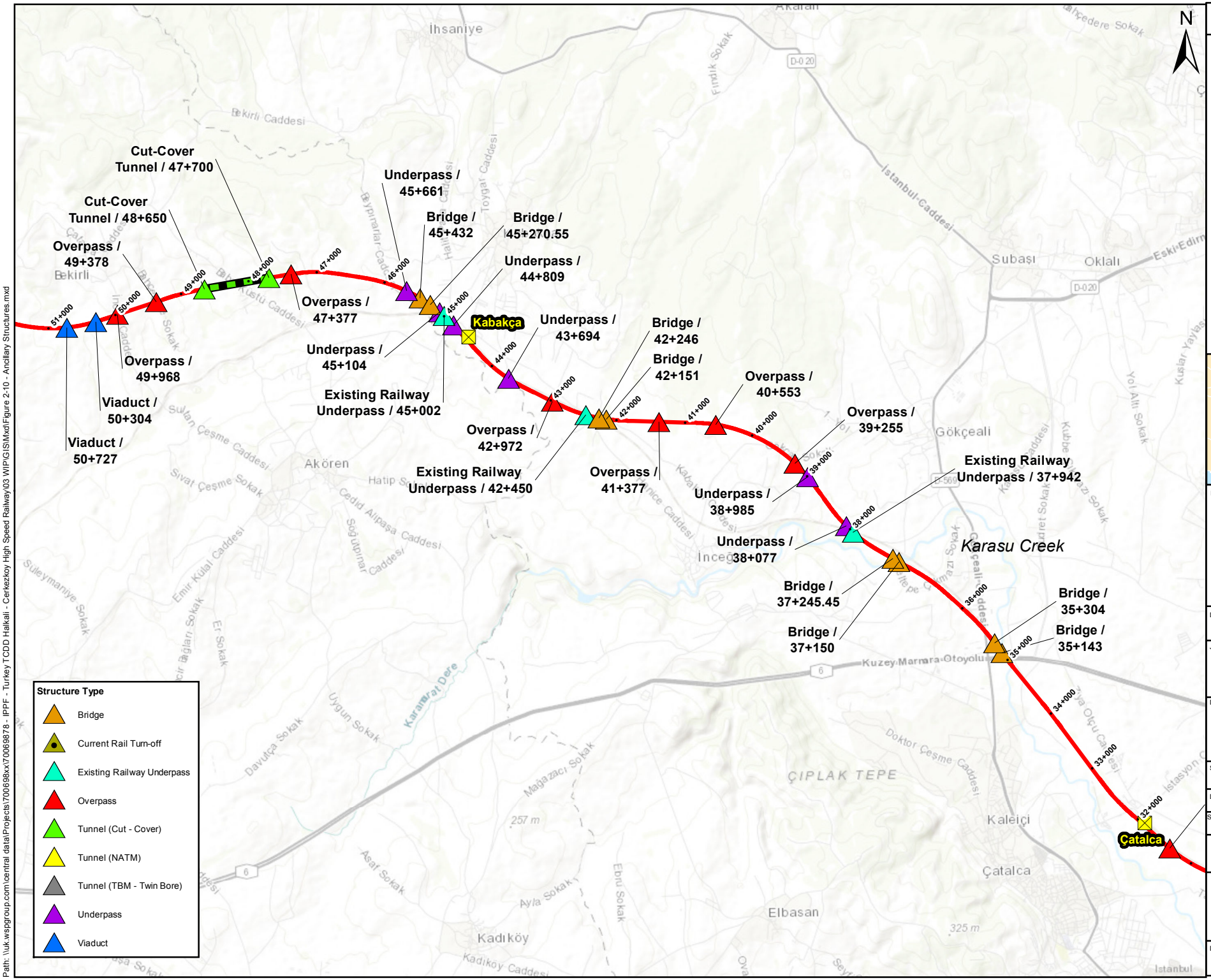
Cut-Cover Tunnel / 47+700
Cut-Cover Tunnel / 48+650
Overpass / 49+378
Underpass / 45+661
Bridge / 45+432
Bridge / 45+270.55
Underpass / 44+809
Overpass / 47+377
Underpass / 45+104
Kabakça
Underpass / 43+694
Bridge / 42+246
Bridge / 42+151
Overpass / 40+553
Overpass / 39+255
Overpass / 49+968
Viaduct / 50+304
Viaduct / 50+727
Existing Railway Underpass / 45+002
Overpass / 42+972
Existing Railway Underpass / 42+450
Overpass / 41+377
Underpass / 38+985
Existing Railway Underpass / 37+942
Underpass / 38+077
Karasu Creek
Bridge / 37+245.45
Bridge / 37+150
Bridge / 35+304
Bridge / 35+143
Çatalca
51+000
50+000
49+000
48+000
47+000
46+000
45+000
44+000
43+000
42+000
41+000
40+000
39+000
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36+000
35+000
34+000
33+000
32+000
İhsaniye
Bekirli
Akören
Gökçeali
Subaşı
Oklalı
Kuzey Marmara Otoyolu
ÇIPLAK TEPE
Kaleiçi
Çatalca
Elbasan
Kadıköy
İstanbul
257 m
325 m
D-020
6
N
Structure Type
Bridge
Current Rail Turn-off
Existing Railway Underpass
Overpass
Tunnel (Cut - Cover)
Tunnel (NATM)
Tunnel (TBM - Twin Bore)
Underpass
Viaduct
THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED
Legend
Railway Station (Current)
Proposed Railway Route
Tunnel (TBM - Twin Bore)
Tunnel (NATM)
Tunnel (Cut - Cover)
Cerkezkoy Station (Current)
Halkali Station (Current)
Note:
Drawing Status
FINAL
Job Title:
HALKALI – CERKEZKOY HIGH SPEED RAILWAY
Drawing Title
Figure 5-3 - Structures
Scale at A4
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Figure 5-3 (3 / 5)
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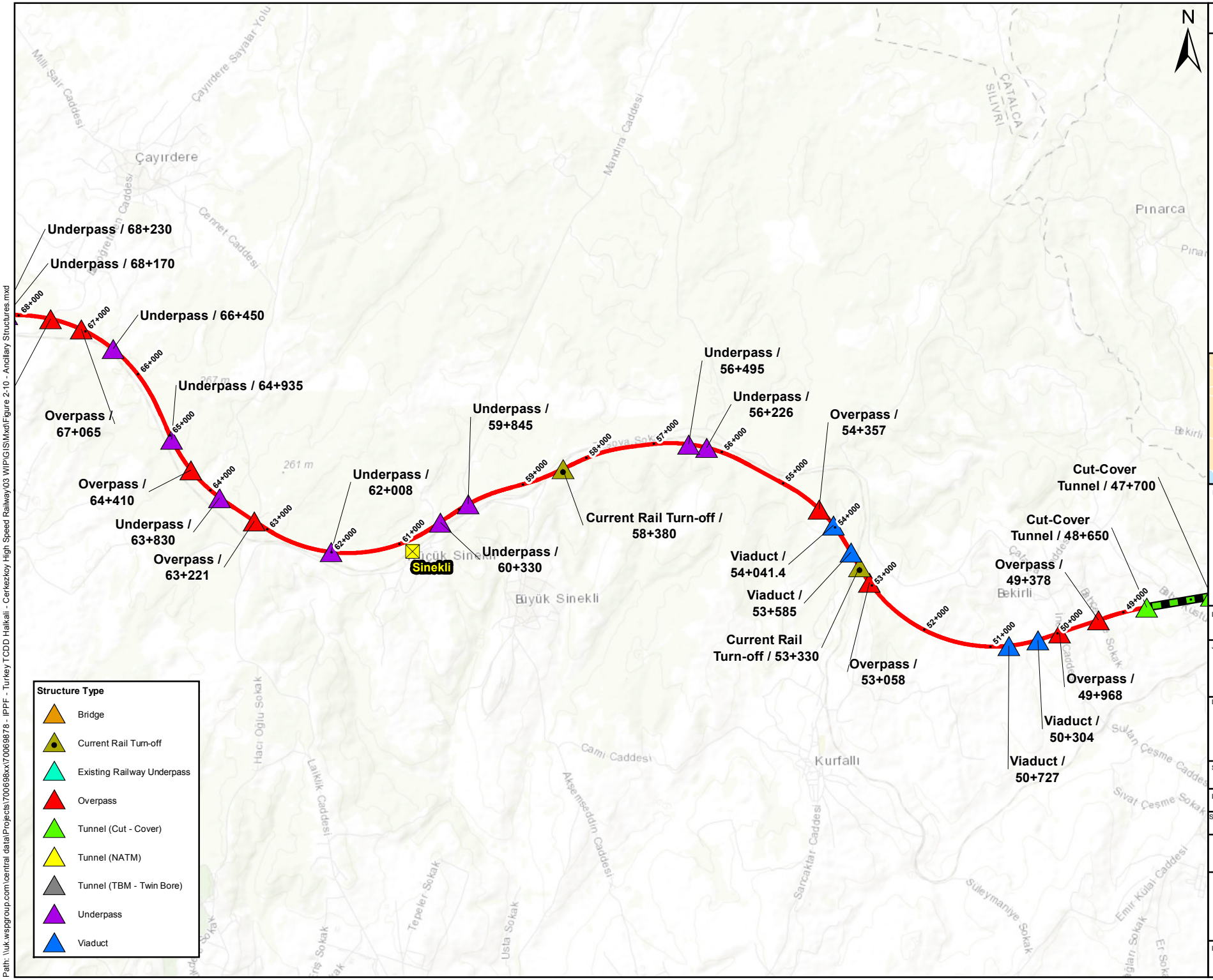

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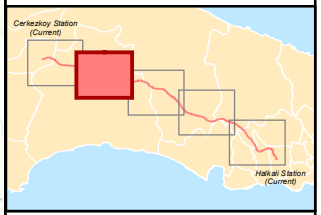
THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

Legend

- Railway Station (Current)
- Proposed Railway Route
- Tunnel (TBM - Twin Bore)
- Tunnel (NATM)
- Tunnel (Cut - Cover)



Note:

Drawing Status: FINAL

Job Title: HALKALI – CERKEZKOY HIGH SPEED RAILWAY

Drawing Title: Figure 5-3 - Structures

Scale at A4: 1:70,000

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0 0.25 0.5 1 1.5 2 Km

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Drawing Number: Figure 5-3 (4 / 5)

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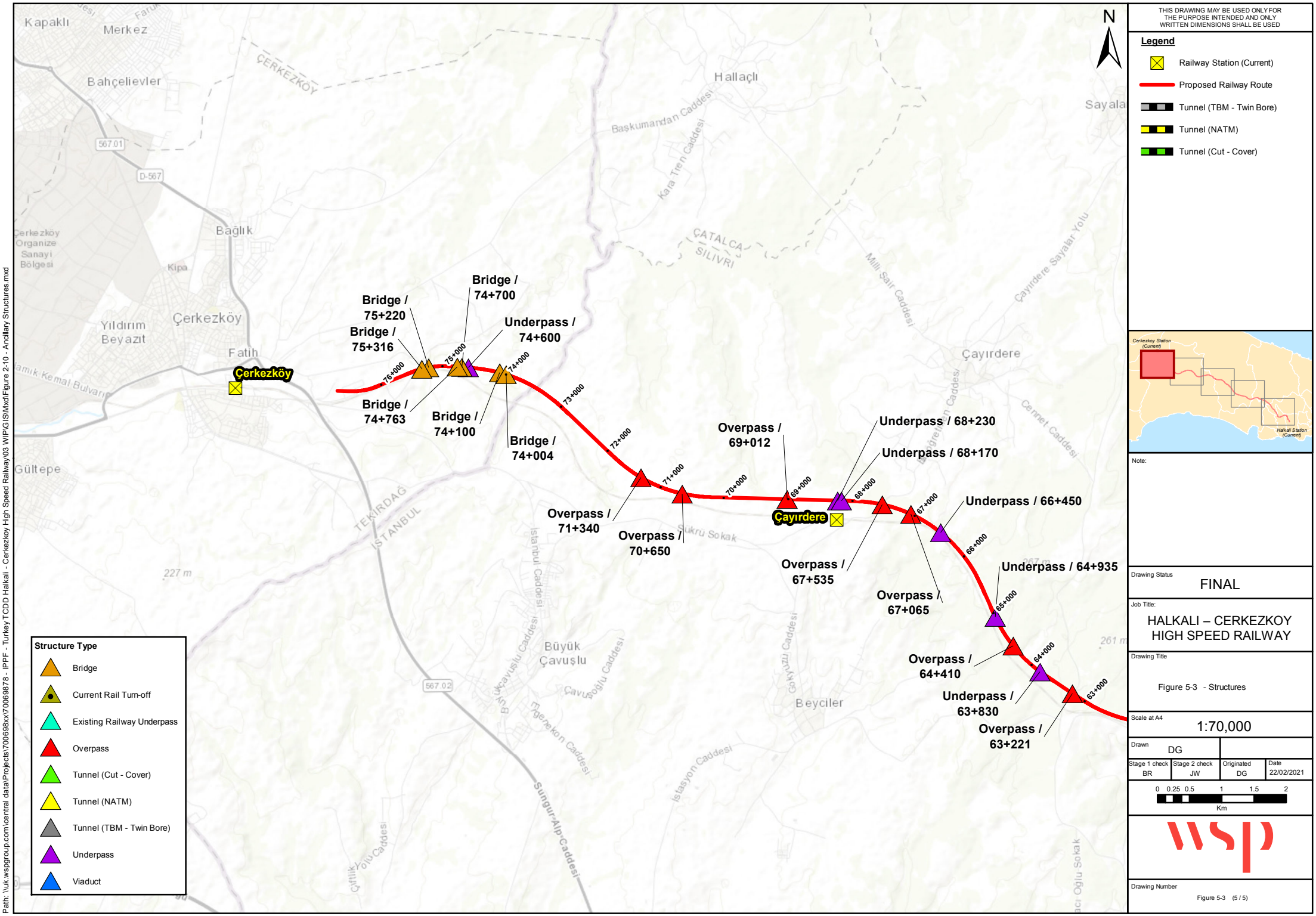

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Legend

- Railway Station (Current)
- Proposed Railway Route
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Note:

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Job Title: HALKALI – CERKEZKOY HIGH SPEED RAILWAY

Drawing Title: Figure 5-3 - Structures

Scale at A4: 1:70,000

Drawn			
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Stage 1 check	Stage 2 check	Originated	Date
BR	JW	DG	22/02/2021

0 0.25 0.5 1 1.5 2 Km

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Drawing Number: Figure 5-3 (5 / 5)

Path: \\uk.wspgroup.com\central data\Projects\70069878xx\70069878 - IPPF - Turkey TCDD Halkali - Cerkezkoy High Speed Railway\03 WIP\GIS\Mxd\Figure 2-10 - Ancillary Structures.mxd

Figure 5-4 - Example of Structures

Bridge

Underpass

Overpass

Viaduct

Tunnel

CONSTRUCTION

5.1.10. The Project is due to be tendered in 2021, with construction commencing in December 2021, and the Project becoming operational in 2026. Throughout all construction activities the Contractor will comply with the Environmental and Social Management Plan (ESMP) (summarised in Chapter 6) and the Contractor Management Plan (CMP) that have been developed for the Project.

5.1.11. Temporary construction compounds will be required along the Project. They will provide worker accommodation, offices, healthcare facilities, sport facilities, parking, storage areas, fuel stores, waste segregation facilities and catering/canteen facilities. The Contractor will be responsible for negotiating agreements with landowners to temporarily use land for construction compounds. The selection of suitable locations will be in accordance with the environmental, social and economic criteria, national laws and Lender requirements, that the Contractor is required to apply in the ESMP.

5.1.12. There are likely to be 3 construction compounds along the Project. It is assumed that a compound will be required at either end of the Project, located at Esenyurt (near Halkali) and Çerkezköy, with a further third compound located centrally near Kabakca. All 3 compounds are expected to cover an area of between 5,000m^2 and 9,000m^2, and be located alongside existing road infrastructure.

5.1.13. There will be an estimated total construction workforce of 1,100 workers. It is expected that approximately 330 of the workers involved in construction will be from the local communities, 670 will be Turkish nationals and the remaining 100 will be international workers.

6 WHAT STANDARDS WILL THE PROJECT MEET?

6.1.1. An ESIA has been undertaken to identify environmental and social impacts throughout the Project's lifecycle. The ESIA presents the findings of the assessment for environmental and social topics, identifying the potential for significant effects and suitable mitigation measures. Summaries of these topic assessments are set out below in Chapter 11.

6.1.2. The Project has been structured to comply with all applicable national legislation, transport strategies, EU environmental and social standards and Lenders Environmental and Social requirements. The ESIA has been prepared to comply with the EBRD Environmental and Social Policy (ESP) and Performance Requirements (PRs) 2014

6.1.3. The Project will be compliant with AIIB's Environmental and Social Framework 2016. The AIIB have elected to apply the EBRDs Environmental and Social requirements on the Project.

6.1.4. This ESIA also conforms to:

- Turkish Environmental and Social regulatory standards;
- International environmental and social conventions and protocols ratified by Turkey;
- EU Environmental Standards; and
- Other international guidelines, such as those by the International Finance Corporation and World Bank Group.

6.1.5. A national EIA that is compliant with Turkish EIA regulations, requirements and processes, was prepared for the Project, and approved in 2017. The Project design has evolved since 2017, and this NTS is based on the revised design.

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1.0. An ESMP has been prepared for the Project to:

- Set out the key environmental and social risks, impacts and sensitivities related to the Project (as identified throughout the **ESIA**);
- Ensure that the Project will comply with the relevant standards, as set out in Chapter 4 of the **ESIA**;
- Describe the mitigation measures and management procedures (as identified throughout the **ESIA**);
- Set out how the effectiveness of the mitigation measures and management procedures will be monitored;
- Identify roles and responsibilities for the mitigation measures and management procedures;
- Facilitate a continual review of Project activities based on performance data and consultation feedback; and
- Implement corrective actions or adaptive management procedures, as required.

7.1.1. It represents a commitment by AYGM (design and construction) and TCDD&TCDD Transport (operation and maintenance) to environmental and social sustainability, and this commitment will also apply their contractors and sub-contractors and supply chain.

7.1.2. The Contractor will be required to develop the **ESMP** into the Construction Environmental and Social Management Plan (CESMP) prior to the start of construction. TCDD Transport and TCDD will be required to develop the **ESMP** into the Operation Environmental and Social Management Plan (OESMP) prior to the start of operation.

7.1.3. Both the CESMP and the OESMP will contain several sub-plans as shown in **Table 7-1**.

Table 7-1 - CESMP and OESMP Sub-plans

CESMP	OESMP
▪ Construction Biodiversity Management Plan (based on the Biodiversity Management Plan) ▪ Construction Emergency Response Plan (based on the Emergency Response Framework) ▪ Design Change and Management Procedure; ▪ Supply Chain Management Plan; ▪ Air Quality and Dust Management Plan; ▪ Construction Traffic Management Plan; ▪ Construction Travel Plan; ▪ Construction Compound Selection and Management Plan; ▪ Construction Worker's Accommodation Management Plan; ▪ Cultural Heritage Management Plan;	▪ Operational Emergency Response Plan (based on the Emergency Response Framework) ▪ Landscape Management Plan; ▪ Operational Soil Management Plan; ▪ Waste Management Plan; ▪ Operational Maintenance Plan; ▪ Tunnel Operational Management Plan; ▪ Employment Plan; ▪ Labour Management Plan; ▪ Supply Chain Management Plan; ▪ Community Health, Safety and Security Plan; ▪ Health, Safety and Security Plan; and ▪ Rail System Plan.

▪ Landscape Management Plan (and Landscape / Planting Plans); ▪ Noise and Vibration Management Plan; ▪ Waste Management Plan and Materials Management Plan; ▪ Health, Safety and Security Plan (including occupational health and safety (OHS); ▪ Surface Water Management Plan; ▪ Spoil Management Plan; ▪ Tunnel Construction Plan; ▪ Tunnel Handover Plan; ▪ Blasting Management Plan; ▪ Construction and Design Risk Register; ▪ Employment Plan; ▪ Labour Management and Monitoring Plan; ▪ Training Plan; and ▪ Workforce Demobilisation Plan.	

8 WHAT STAKEHOLDER ENGAGEMENT HAS TAKEN PLACE?

8.1.1. A series of consultation meetings and surveys were undertaken during preparation of the National EIA for the Project (2017) and further meetings and surveys were undertaken during the preparation of the ESIA in 2020. The consultation activities included:

- Meetings with district governorships, municipalities and Mukhtars in July and August 2020;
- Focus group consultations, including 5 for communities and 9 for women in July 2020; and
- Household surveys as part of the Resettlement Action Plan (RAP).

8.1.2. The key issues and concerns raised during the stakeholder engagement were as follows:

- Lack of Project information available to potentially affected persons.
- Lack of consultations with potentially affected persons.
- Concerns around construction-related noise, emissions and overseas workers.
- Concerns around the potential effects on health, safety and security of women and harassment mainly during construction.
- Concerns around the potential effects on local lands and livelihoods.
- Concerns around the lack of access rights to agricultural land.

Figure 8-1 - Focus Group Meetings

- Concerns around disruption to roads and access.
- Community safety around the rail.
- Train noise during operation.

8.1.3. Major concerns around the land acquisition process were in relation to the following: details about expropriation price; worries about loss of land; and restricted access and passing points for agricultural machinery, cattle and charcoal activities.

8.1.4. These issues and concerns have been considered throughout the ESIA, and mitigations described in later sections of this NTS. A **Stakeholder Engagement Plan** (SEP) has been developed, and it sets out the further stakeholder engagement will be undertaken throughout the design, construction and operation of the Project.

8.1.5. This NTS and the following disclosure documents will be disclosed for a period of 120 days, at the locations listed in Chapter 13 of this NTS. This will be done using the approach in the **SEP**, which is in accordance with Lender requirements:

- **ESIA** (including the **ESMP**);
- **Environmental and Social Action Plan** (**ESAP**);
- **SEP**;
- **RAP**;
- **Biodiversity Management Plan** (**BMP**);
- **Contractor Management Plan** (**CMP**); and
- **Emergency Response Framework** (**ERF**).

8.1.6. Following completion of the disclosure period, feedback gained throughout will inform the continued development of the Project. If applicable the disclosure documentation [such as the ESIA (including the ESMP) and the SEP] will be updated to capture the feedback gained throughout the disclosure period. Further information on how to provide feedback is provided in Chapter 13 of this NTS.

9 WHAT ALTERNATIVES HAVE BEEN CONSIDERED?

9.1.1. The alternatives shown in **Figure 9-1**. were considered prior to, and during, the preparation of the ESIA.

Figure 9-1 - Summary of Alternatives Considered

Do-nothing Scenario	Alternative Non-rail Options	Alternative Rail Options	Alternatives to Reduce Resettlement	Micro-routing of the Project
▪ Upgrade of the Halkali to Kapikule Railway Line (HKRL) would remain incomplete; ▪ Preference for road transport over public transport would continue; ▪ Rail capacity, travel times and train frequency would be unchanged and unable to meet increasing demands; ▪ Turkey would be unable to integrate into the Single European Transport Area and TEN-T; and ▪ Accident risk on highways would remain unaltered, with an increased accident risk in the future.	▪ The 2 main state highways which connect Istanbul to Turkey's European border (D100 and E84) could be improved as an alternative to the Project. ▪ This would not support a shift from the use of carbon-intensive private road vehicle travel (passengers and freight) to public transport. A rail option has therefore been selected in preference to a road option.	▪ A rail alternative from Halkali to Kapıkule was considered in 2008. This alternative was to run to the north of the existing railway towards Boyalık before looping back to join the route of the existing railway near Bekirli. It was not considered economically viable. ▪ A further 10 rail alternative scenarios, were then considered with 3 developed further, due to being the most feasible based on design and cost.	▪ The chosen design was selected as it was expected to result in fewer people being displaced than the other 2 alternatives. ▪ The Project route has also aimed to reduce land acquisition where practicable, and to avoid the acquisition of residential properties. The route of the Project primarily follows the existing railway, as shown in Figure 5-1, which takes advantage of an infrastructure corridor where residential development and private land ownership is lower, thus reducing physical resettlement. ▪ The risk and magnitude of severance and access restrictions is also reduced by forming one transport corridor.	▪ Refinements were made to the chosen design to further minimise the extent of expropriation, as follows: -The construction of a 3km tunnel in Omerli to avoid the Hadımköy Organised Industrial Zone; - A divergence from the existing railway to avoid Incegiz Village; - A divergence from the existing railway to avoid the urban areas of Kurfalli and Bekirli, and follow a more direct route; and - A divergence from the existing railway approximately 1.75km east of the existing Çayırdere Railway Station to reduce the loss of woodland and follow a more direct route.

9.2 CHOSEN RAIL OPTION

9.2.1. The chosen design is being developed as two separate sections that will have full interoperability, the first section is the Çerkezköy to Kapikule railway project, which is currently under construction, and the second section is this Project.

9.2.2. Further refinement of the Project has resulted in a reduction of the number of tracks between Halkali and Ispartakule (from 4-track to 2-track) and introduction of a twin bored tunnel between Halkali and Ispartakule under the proposed Kanal Istanbul.

9.2.3. The Project crosses the alignment of the proposed Kanal Istanbul and will either need to pass over it on a bridge, or under it in either an immersed or bored tunnel. A bored tunnel has been selected as the chosen crossing method. This method would pass beneath the Kanal Istanbul project, and unlike an immersed tunnel it would not affect its depth or capacity to accommodate large vessels. It would also have a lower impact on the aquatic environment than an immersed tunnel. Its visual impact would be localised and limited to the portals, and it would be less exposed to climatic and channel processes than either an immersed tunnel or a bridge.

9.2.4. In addition, the tunnel underneath the Kanal Istanbul project will avoid the expropriation of households in residential areas of Yarımburgaz (to the east of the tunnel) and a further small residential area to the west of the tunnel (to the south of Ispartakule).

10 WHAT ARE THE LIKELY EFFECTS OF THE PROJECT?

10.1 AIR QUALITY

BASELINE

10.1.1. A desk study was undertaken to identify sources of air emissions that have the potential to affect existing air quality near the Project. This identified numerous quarries / areas of mining activity that generate dust and particulate matter (PM10)[3]. There is also a large industrial area close to the western edges of Istanbul, where there were several sources of industrial emissions.

10.1.2. WSP monitoring of existing air quality in 2020, showed that the concentration of pollutants is higher towards the larger urban areas, and lower in the rural regions of the Project. There were higher concentrations of PM10 and nitrogen dioxide (NO2) in Istanbul and Çerkezköy (PM10 only) compared to other locations along the Project. During monitoring, it was found that dry, dusty areas of ground, in the absence of rain, resulted in increased background particulate matter concentrations.

[3] Particulate matter is a mix of extremely small particles made up of acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Particles that are 10 micrometers or smaller can pass through the throat and nose and enter the lungs, causing serious health effects.

CONSTRUCTION EFFECTS AND MITIGATION

10.1.3. Construction activities (including demolition, earthworks, construction and trackout[4]) have the potential to generate and/or re-suspend dust and PM_{10}. Additionally, emissions from construction vehicles and plant have the potential to result in adverse effects on local air quality, particularly near where construction vehicles will be entering the Site.

10.1.4. The construction activities are likely to temporarily increase PM10 concentrations, and the dust that will be generated during construction, is likely to lead to dust soiling. Following the application of mitigation within the ESMP, the effects of dust and PM10 emissions during construction will be reduced and will not be significant. The mitigation measures include good construction practice measures, monitoring and remedial actions.

OPERATIONAL EFFECTS AND MITIGATION

10.1.5. The Project will result in a reduction in local air quality emissions along the road network between Çerkezköy and Halkali, and a reduction in overall regional emissions of nitrogen oxides and PM10, due to the shift from road-based transport to rail. There will be a small increase in human exposure to PM10 emissions arising from brake and rail wear during the operation of the Project, although this will represent a very small portion of overall emissions. Overall, as the trains will be electric, it is unlikely that the Project would give rise to any significant operational air quality effects.

10.2 NOISE AND VIBRATION

BASELINE

10.2.1. A baseline noise survey (**Figure 10-1**) was undertaken in 2020 to determine the existing noise levels in residential areas near the Project. The noise climate in most surveyed locations was observed to be typical of a rural nature, with agricultural noise and occasional road traffic noise. Noise levels in residential areas towards the east of the Project were affected by constant road traffic noise. The survey results indicate that the existing baseline noise climate generally exceeds World Bank Group guidelines values. This is due to existing road traffic noise and train pass by events on the existing railway, as well as agricultural activity.

Figure 10-1 – Noise Monitoring

[4] Trackout is the movement of dust and dirt from a construction area onto the public road network, where it may be deposited and then re-suspended by vehicles using the network.

CONSTRUCTION EFFECTS AND MITIGATION

Noise

10.2.2. Construction activities have the potential to give rise to significant adverse noise effects for most community areas within 300m of the Project. The community areas of Bahçeşehir, Kaleiçi, İnceğiz, Kabakça and İstasyon are likely to be worst affected by noise during construction.

10.2.3. As required in the ESMP, the construction contractor will implement good practice measures to minimise the noise and vibration effects on the surrounding environment, including, but are not limited to, the use of site hoardings, non-vibratory construction equipment and limiting night-time working.

10.2.4. The Project will be constructed in sections, therefore, noise generating activities will only affect local communities for a small proportion of the overall construction programme. Local communities will also be given advance notification of noise generating activities.

Vibration

10.2.5. The construction activities that are most likely to result in significant vibration effects are:

- Tunnelling undertaken via boring machine;
- Blasting undertaken for any borrow pits, if required;
- Blasting for the New Austrian Tunnelling Method (NATA) tunnels;
- Surface compaction undertaken with vibratory rollers; and
- Piling activities undertaken during the construction of any structures.

10.2.6. The Project has the potential to result in a significant effect (disturbance) due to levels of vibration being experienced at properties along the Project during construction. A noise and vibration monitoring programme will be undertaken at sensitive receptor locations, as set out in the ESMP. Vibration will be reduced through measures such as, the selection of low or non-vibratory piling equipment, and no start-up or shut down of vibratory plant within 50m of residential properties.

10.2.7. Temporary rehousing will be offered, particularly for the 427 residential properties within 60m of the tunnel within Halkali, to those who would like it (it will not be compulsory) when a significant effect will occur for a duration exceeding:

- 10 or more days or nights in any 15 consecutive days or nights; or
- A total of number of days exceeding 40 in any 6 consecutive months.

OPERATIONAL EFFECTS AND MITIGATION

Noise

10.2.8. During the operation of the Project, properties in Çatalca, Gökçeali, Kabakça, İstasyon, Kaleici and İnceğiz have the potential to experience a significant adverse effect. However, with mitigation measures in place, including noise barriers (**Figure 10-2**), cuttings and improved glazing for residential properties, the residual effect will not be significant.

Figure 10-2 – Example Noise Barrier

Vibration

10.2.9. Some properties within 25m of the Project in Kabakça and Kaleiçi are likely to experience a significant effect due to freight movements at night. However, with mitigation measures in place, including such as vibration reducing ballast mats, the residual effect will not be significant. Other residential receptors along the Project are not anticipated to experience significant vibration effects.

10.3 ECOLOGY

BASELINE

10.3.1. Important ecological receptors in relation to the Project are set out in **Table 10-1**.

Table 10-1 - Receptors of Ecological Importance in Relation to the Project

Receptors	
▪ Büyükçekmece Lake - Important Bird Area ▪ Küçükçekmece Basin - Important Bird Area ▪ Terkos Basin - Important Bird Area and Key Biodiversity Area ▪ Habitats (general) ▪ Habitats (oak / hornbeam forests) ▪ Centaurea hermannii ▪ Rare Plants - 6 species identified of increased conservation interest due to their listing on the Turkey Red List (TRL) of plants ▪ European Ground Squirrel - IUCN Endangered ▪ Marbled Polecat - IUCN Vulnerable ▪ Bats – 20 species which are listed on Annex II of the Bern Convention and 6 of which are listed on Annex II of the Habitats Directive	▪ Other fauna – includes some species listed on Annex II of the EU Habitats Directive and Annex II of the Bern Convention ▪ Spur-thighed Tortoise - IUCN Vulnerable ▪ Common Pochard - IUCN Vulnerable ▪ Red-Breasted Goose - IUCN Vulnerable ▪ White-Headed Duck - wetlands within the study area are Critical Habitat for the species ▪ Imperial Eagle - listed as Vulnerable within the three IUCN threatened categories ▪ Aquatic Ecology (fish) - 2 IUCN CR sturgeon species (Russian sturgeon and beluga sturgeon) are present within Küçükçekmece Basin

CONSTRUCTION EFFECTS AND MITIGATION

10.3.2. Results from pre-construction ecological surveys will be used to update the **Biodiversity Management Plan** (**BMP**) that has been produced for the Project. The **BMP** identifies mitigation measures and is a specific requirement of the **ESAP**.

10.3.3. An Ecological Clerk of Works (ECoW) will be employed by the Contractor to provide biodiversity support in advance of, and throughout, the construction of the Project. The ECoW will have the authority to stop works at any point if they consider the potential ecological impacts associated with an activity to be unacceptably high.

10.3.4. Construction effects will comprise the following:

- Land-take and associated habitat loss – including the Project and all associated infrastructure;
- Disturbance – including noise/vibration and visual disturbance;
- Injury or killing of fauna as a result of construction activities; and
- Spread of alien/invasive species.

Protected Areas

10.3.5. The Project crosses 3 Important Bird and Biodiversity Areas (IBAs) as shown in **Figure 10-3**. Construction activities are not expected to result in significant effects to the integrity of the three IBAs as summarised below.

Figure 10-3 - Protected Areas

Habitats

10.3.6. The overall effect on habitat loss due to the Project is not considered to be significant. It will result in a loss of 179 ha of the dense shrub/scrubland habitat that is available in the wider area (1.5%), 162.9 ha of the agricultural field habitat (1.5%), 93.2 ha of the woodland habitat (0.1%), 82ha of the lowland grassland habitat (1.7%), 20ha of built-up area and no wetlands or aquatic habitats. Typical habitats are shown in **Figure 10-4**.

Dense Shrub/Scrubland

Agricultural Fields

Woodland

Low Grassland

Built-up Areas

Wetlands

Aquatic Habitats

Figure 10-4 - Example Habitats

Oak / Hornbeam Woodland

10.3.14. Natural oak / hornbeam woodland is the most valued habitat. There must be no loss of this habitat due to the Project. The losses will be compensated for by replanting 74.3ha of this habitat in locations close to the Project.

Flora – Rare Plants

10.3.15. The Project has the potential to result in the loss of individuals from 6 threatened plant species populations. To prevent this, a translocation programme will be undertaken as outlined in the **BMP**.

10.3.16. There is a risk that construction could result in the spread of invasive plant species and threatened plant species could be lost. If any invasive plant species are identified at any time, an **Invasive Species Management Plan** will be produced, to stop the spread of invasive plant species.

Fauna (excluding birds)

10.3.17. The construction of the Project is not expected to have a significant effect on marbled polecat, long-fingered bats, other bats, the spur-thighed tortoise and other fauna.

10.3.18. The burrows of species such as European ground squirrel and marbled polecat will be identified and protected during construction, wherever possible. Where it is not possible to prevent damage to these features, construction activities will be timed so that this damage occurs when these features are not in use (such as outside the breeding periods for these animals).

10.3.19. Throughout construction activities the ECoW will oversee works and remove animals (such as reptiles and amphibians) which may not be able to disperse quickly enough and would therefore be at risk of mortality. These animals will be moved to nearby suitable habitat.

Birds (non-IBA qualifying species)

10.3.20. The construction of the Project is not expected to have a significant effect on white-headed ducks and imperial eagle.

10.3.21. In certain areas, construction activities will be timed to avoid the breeding bird season. To help minimise the impact of this measure upon the overall construction programme, where works cannot avoid the breeding bird season, necessary vegetation clearance will take place in advance of works, and measures will be taken to dissuaded birds from nesting in these areas during construction.

Aquatic Ecology

10.3.22. There is the potential for loss of, or degradation to, habitat resulting from pollution/sedimentation for aquatic ecology, will be manged by the robust mitigation within the **ESMP**, such as controlling water flow during construction and using sediment traps to capture sediment. The Project will not have a significant effect on aquatic ecology.

OPERATIONAL EFFECTS AND MITIGATION

10.3.23. The operation of the Project is not expected to result in significant effects in relation to habitats and flora. The measures to manage the increased risk of spreading invasive plants has been discussed within the preceding section.

Protected Areas

10.3.24. The Project will have the following effects on the 3 IBAs crossed by the Project:

- Büyükçekmece Lake IBA – the assessment identified an area of potential bird/train collision associated with specific bird species, within the IBA. In areas of highest potentially collision risk, the fencing for the Project will be adapted by installing additional pole sections to a height to 3m, and coloured ribbons/tape will be attached to the top of these poles to influence bird flight behaviour away from the rail corridor. If areas of high potential collision risk remain after implementing these measures, fencing may be adapted, further monitoring undertaken and if needed then speed limits on the trains will be imposed at certain times of the year.
- Küçükçekmece Basin IBA - the Project will extend beneath the IBA in a tunnel, therefore there will not be a significant collision risk. There is some disturbance risk to water birds, but this is not considered significant, due to the large extent of suitable habitat for water birds in the wider area.
- Terkos Basin IBA and Key Biodiversity Area (KBA) – None of the IBA trigger species are considered at risk of collision, electrocution or disturbance, due to the distance of suitable wetland habitat within the Terkos Basin from the Project.

Fauna

10.3.25. The operation of the Project will not have significant effects on fauna, with the application of mitigation measures.

10.3.26. Animal underpasses (**Figure 10-5**) will be installed at key crossing points where animals are particularly sensitive to becoming trapped within the tracks, or at risk of collision.

Figure 10-5 – Example Animal Underpass

Birds

10.3.27. The Project is not expected to result in significant visual and noise disturbance effects on foraging birds, due to the narrow, linear nature of the Project, and the extent of the foraging areas available on the waterbodies important to this species. The white-headed duck may migrate between the Büyükçekmece Lake and Küçükçekmece Basin, which may result in a collision risk, however most flights are likely to avoid the Project completely as it located along the very northern edge of both sites. Therefore, the effects are not expected to be significant.

10.3.28. The Project is not expected to have a significant disturbance effects on the imperial eagle, to the distance from the Project of the known eagle nest site/territory, and the nesting eagles already having tolerance to train activity on the existing alignment. Due to this species hunting strategy, which includes low level flights across habitats found alongside the Project, the effect from collision risk is expected to be significant. Mitigation will be implemented to reduce this effect.

10.4 CULTURAL HERITAGE

BASELINE

10.4.1. There are no assets of international significance on the UNESCO World Heritage Site List within study area (1km either side of the Project).

10.4.2. A total of 13 assets of significance, as registered by the Regional Board for the Protection of Cultural Assets, were located within, or in close proximity to, the expropriation corridor. Ömer Dede Tomb (a grave believed to date from the 20th century) was also identified during the household surveys. Images of a selection of the assets are shown in **Figure 10-6**.

10.4.3. The Project also has potential to impact on possible, previously unrecorded remains for all periods, which may be affected by ground disturbance.

10.4.4. The contribution of intangible cultural heritage to the heritage significance of tangible heritage assets, where appropriate, has been considered. The Project has the potential to affect the traditional practice of charcoal making, by restricting access to the forest. However, this risk will be managed as the Contractor will be required to ensure the construction works are planned safely and to minimise congestion, road safety risks and disruption for all road users (this will include access to the forest for charcoal making). The Project design also includes underpasses and overpasses in proximity to the charcoal makers, to maintain access during operation.

CONSTRUCTION EFFECTS AND MITIGATION

10.4.5. During construction there is potential for impacts on below-ground heritage assets within the vicinity of the Project, due to ground works such as excavation. The potential impacts on known cultural heritage assets and the mitigation, which will be included in the **Cultural Heritage Management Plan**, are summarised in **Table 10-2**. **Table 10-2** focusses on only the assets where Project impacts are expected and where specific mitigation will be implemented.

10.4.6. The construction of the Project has the potential to have an impact on any previously unrecorded archaeological remains that might be present. A Chance Find Procedure, will be set up to mitigate for potential chance finds during construction. If a chance find is discovered the Contractor must stop works, notify AYGM, the Regional Directorate and the Ministry of Culture and Tourism and put a cordon around the chance find. The Contractor will not disturb any find until a designated and qualified heritage specialist has been contacted who can identify the find, record it and identify the importance.

10.4.7. The construction of the Project is not expected to result in significant short-term and temporary effects from increased vibration and traffic, or cosmetic damage, on above ground heritage assets. Assets that could be affected by vibration will be subject to pre-condition surveys by an independent surveyor and monitored during construction. Construction methodologies will be refined to reduce vibration levels, if required.

Figure 10-6 - Example of Heritage Assets

Traditional House in Omerli

Korugan Old Military Bunker

Çayırdere Station Building

Kaleiçi Historical Bridge

Kabakca Station Buildings

Anastasuis's Wall

Table 10-2 - Potential Direct Impacts on Known Cultural Heritage Assets During Construction

Name	Direct Impact	Mitigation
Hoşdere Mahallesi, including Ispartakule Station and Surrounds (130-ada-1-parsel)	A section of the existing railway line is within the expropriation corridor. If any historic railway infrastructure (such as signal boxes, bridges, water towers, engine sheds) is present within the expropriation corridor, it could be impacted.	A 10m buffer zone will be applied to this asset during construction. If construction activities are to take place within the 10m buffer it will be necessary for the Contractor to contact the Ministry of Culture and Tourism and inform them of the details of planned construction activities before commencement.
Ömer Dede Tomb	The grave is located near a cut and cover tunnel entrance. There could be an impact from construction activities.	A 10m buffer zone will be applied to this modern grave during the construction phase. If construction activities are to take place within the 10m buffer it will be necessary for the Contractor to contact both the Ministry of Culture and Tourism and the Ministry of Family and Social Policies[5] and inform them of the details of planned construction activities before commencement.
Historical Civil Architecture Sample, Traditional House in Omerli (663-parsel)	A cut and cover tunnel will be constructed at this location. The house is 30m south of the expropriation corridor. There could be impacts from construction activities, including movement of machinery.	Measures would aim to ensure that construction activities, including movement of machinery, would not have an impact upon the building (e.g. measures to prevent accidental strike damage)
Korugan Old Military Bunker	There is the possibility that underground structures (Bunker 2) may extend into the expropriation corridor for Project. These	Korugan Old Military Bunker is adjacent to the expropriation corridor. Measures would aim to ensure that construction activities, including movement of machinery, would not have

[5] Responsible for the maintenance and preservation of the memorials, tombs, graves and cemeteries in Turkey.

Name	Direct Impact	Mitigation
	structures could be impacted by construction activities, such as movement of machinery.	an impact upon the building (e.g. measures to prevent accidental strike damage). Qualified archaeological specialists will be retained on-site due to the possibility of underground structures of the bunker within the Project alignment.
Bahşayış Bastion and Protection Zone	The expropriation corridor extends into the Protection Zone for this asset. A cut and cover tunnel will be constructed at this location, and excavations would remove any below-ground heritage assets within the footprint of the tunnel.	Qualified archaeological specialists will be retained onsite during construction in the Protection Zone of Bahşayış Bastion to ensure that 'preservation by record' is undertaken through watching brief during the construction process.
Kaleiçi Historical Bridge (Çatalca – Kaleiçi)	This asset is immediately south of the expropriation corridor. There could be impacts on this asset from construction activities, including movement of machinery.	Pre-condition surveys and monitoring during construction of heritage assets sensitive to vibration.
İnceğiz Mahallesi 879-parsel	A section of the existing railway line, which is located partly within the expropriation corridor. If any historic railway infrastructure (such as signal boxes, bridges, water towers, engine sheds) is present within the expropriation corridor it could be impacted.	A 10m buffer zone will be applied to this asset during the construction phase. If construction activities are to take place within the 10m buffer it will be necessary for the Contractor to contact the Ministry of Culture and Tourism and inform them of the details of planned construction activities before commencement
Kabakça Mahallesi, including Kabakca Station Buildings (Çatalca – Kabakça) (1005-parsel)	A section of the existing railway line, which is located partly within the expropriation corridor. If any historic railway infrastructure (such as signal boxes, bridges, water towers, engine sheds) is present within the expropriation corridor it could be impacted. Kabakca Station Buildings are 20m north of the expropriation corridor. There would be no impact on these buildings.	A 10m buffer zone will be applied to this asset during the construction phase. If construction activities are to take place within the 10m buffer it will be necessary for the Contractor to contact the Ministry of Culture and Tourism and inform them of the details of planned construction activities before commencement.
Anastasuis's Wall	The Project extends into the Protection Zone for this asset, where a new track would be constructed. Excavations for the new track would remove any below-ground heritage assets within the footprint. There is the potential for a large adverse impact, within the area of excavation without mitigation. The	The Istanbul Regional Directorate of Protection of Cultural Heritage has stated that construction activities need to be conducted under the supervision of the Museum Directorate. Qualified archaeological specialists will be retained onsite during construction in the Protection Zone of Anustasius's Wall

Name	Direct Impact	Mitigation
	total length of the Protection Zone is approximately 45km. The expropriation corridor covers 100-200m of the Protection Zone.	to ensure that 'preservation by record' is undertaken through watching brief during the construction process. The Regional or General Directorate will be formally consulted prior to construction to enable them to make arrangements for providing supervision.
Çayırdere Mahallesi 705-parsel, including Çayırdere Station Building	A section of the existing railway line partly within the expropriation corridor. If any historic railway infrastructure (such as signal boxes, bridges, water towers, engine sheds) is present within the expropriation corridor it could be impacted. Çayırdere Station Building is 150m south of the expropriation corridor. There would be no impact on this building.	A 10m buffer zone will be applied to this asset during construction. If construction activities are to take place within the 10m buffer it will be necessary for the Contractor to contact the Ministry of Culture and Tourism and inform them of the details of planned construction activities before commencement.

OPERATIONAL EFFECTS AND MITIGATION

10.4.14. During operation no significant effects are expected on buried cultural heritage assets, as once the Project has been completed, no substantial further ground disturbance should occur. TCDD Transport and TCDD will ensure those undertaking maintenance activities are aware of the potential for previously undiscovered buried cultural heritage remains to exist and require any maintenance contractors to establish a policy and procedure for managing any chance finds during ground disturbance.

10.4.15. No significant effects would be expected for above ground heritage asset during operation. The assessment of the potential for cosmetic damage due to operational ground vibration concluded that the vibration thresholds for cosmetic damage are unlikely to be exceeded at any of the above ground heritage assets along the Project.

10.5 LANDSCAPE AND VISUAL

BASELINE

Landscape Designations and Features

10.5.1. The 1km study area does not contain any areas of international importance for landscape, National Parks, Nature Parks or Wildlife Protection and Development Areas.

Landscape Character

10.5.2. The Project and the study area are located within the Marmara Region, which is under the influence of its smaller inner sea, the Sea of Marmara, and has temperate broadleaf and mixed forest on a changing coastline. The Marmara Region encompasses the Provinces of Istanbul and Tekirdag, within which the Project is located.

10.5.3. The Province of Istanbul covers the majority of the Project and Study area (central and eastern sections). The City of Istanbul, Turkey's largest and most developed city, is located to the south-east of the wider province, with predominantly open countryside making up the remainder of the landscape. There are three main lakes within the Province of Istanbul, referred to as Terkos, Küçükçekmece and Büyükçekmece. The vegetation is characteristic of that of the Black Sea Region, while to the south the vegetation is more in keeping with that of the Marmara Region. Cherries and hazelnuts are grown in the region in abundance. The province is of relatively low altitude with gentle undulations, there are no substantial mountain ranges.

10.5.4. The Province of Tekirdag contains a small proportion of the Project and study area. The province of Tekirdag comprises wide, open flat fertile soils, with a large proportion of the countries sunflower and wheat production being produced within the province. The Tekirdag province lacks any natural lakes, although Tekirdag does have a commercial port on the Marmara Sea.

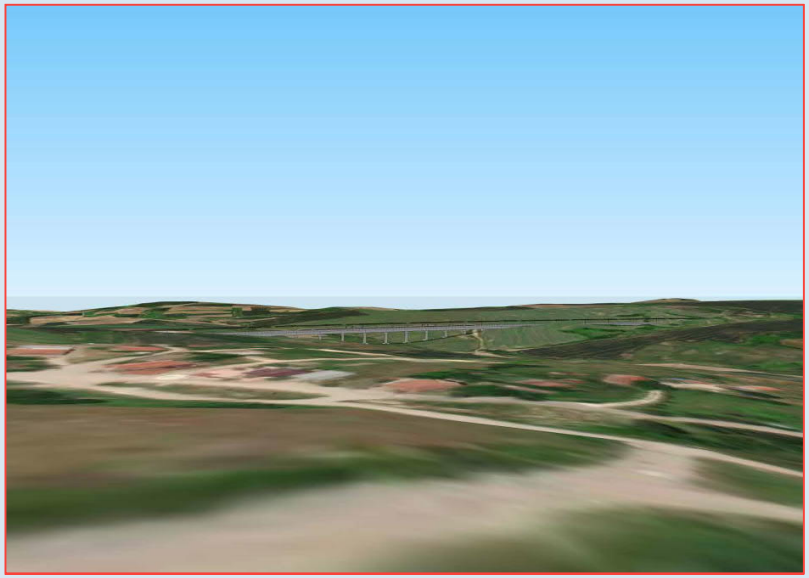
Visual Receptors

10.5.5. The following main visual receptor types have been identified within the 1km study area:

- Views from residential properties;
- Views from adjoining public open spaces, such as the Bahcesehir Golet Park;
- Views from commercial / industrial properties; and
- Views along the existing transport network, including both road and rail users.

10.5.6. Fifteen views were selected to represent both long-range and short-range views of the Project, from a range of different visual receptors along the length of the Project. A selection of views, with the Project, are shown in **Figure 10-7** below.

Illustrative view looking west from Hurmet Sokak (Sk) (representative of residential properties at Deliklikaya)



Illustrative view looking south-east from Akincik Sk, along the eastern edge of Bekirli

Figure 10-7 – Illustrative Views

CONSTRUCTION EFFECTS AND MITIGATION

Effects on Landscape Character

10.5.9. The Project will result in direct impacts to landscape character, due to changes to land use, alterations to topography, loss of established woodland/scrub, and alteration of structures. The Project will result in a permanent change to the character of the landscape through the addition of a new, permanent linear feature and associated infrastructure. The Project, for the most part, closely follows the alignment of the existing railway. This reduces impacts on surrounding receptors as the new railway would be seen together with the existing railway and its infrastructure (rather than as new, detracting features). In these locations, the Project is not anticipated to adversely impact the existing landscape character.

10.5.10. Where the Project diverges from the alignment of the existing railway, the impacts will be greater, and they will need to be managed. As required in the ESMP, a Landscape Management Plan will be produced that will contain measures to minimise landscape character effects, such as replacement tree planting. Following the application of the Landscape Management Plan, the Project is expected to result in the following effects on landscape character, during construction:

- Province of Istanbul – significant, due to the permanent change to the nature of the landscape at a local level, including habitat loss and the erosion of the rural character, introduction of structures, and changes in topography.
- Province of Tekirdag - not significant, due to the relatively short length of the Project in this province (only 3km) and its location within a predominantly built up area that has already undergone a high-level of change and disturbance.

Visual Amenity

10.5.11. The Project will result in visual impacts associated with demolition of properties, visual awareness of construction activities, vegetation clearance resulting in the opening up of views, and changes to views, due to the introduction of new structures. The greatest visual effects will occur where the Project is in close proximity to residential areas.

10.5.12. Following the application of measures in the Landscape Management Plan and ESMP, the Project is expected to have temporary significant visual effects on the following settlements and residential properties during construction:

- Risalet Sokagi (within the main settlement of Omerli);
- Isolated Farmstead (chainage 24+800);
- Residential Properties (to the west of the D569, Kaleici, at chainage 36+499);
- Residential Properties (near Akoren-Incegiz Yolu, between chainage 42+150 – 42+246);
- Residential Properties (at Kabakca, off Akoren Yolu, at chainage 44+600);
- Residential Properties (to the north of Akoren and along Bekirli Yolu); and
- Residential Properties (at Istasyon, chainage 76+000 – 76+700).

OPERATIONAL EFFECTS AND MITIGATION

Landscape Character

10.5.13. The operation of the Project is expected to result in effects as outlined below:

- Province of Istanbul – significant, due to the permanent change to the nature of the landscape at a local level, including habitat loss and the erosion of the rural character, introduction of structures, and changes in topography.
- Province of Tekirdag - not significant, due to the relatively short length of the Project in this province (only 3km) and its location within a predominantly built up area that has already undergone a high-level of change and disturbance.

Visual Amenity

10.5.14. During the first year that the Project is operational, effects are anticipated to be significant. Settlements and residential properties most affected by the Project will include Omerli (properties on the southern side); Yesibayir (all properties); Kabakca (properties on the southern side); Akoren (properties along the northern edge and scattered farmsteads); and at Bekirli (all properties).

10.5.15. The majority of these significant effects will reduce to not significant after 15 years, once landscape planting is established; with the exception of the following location, where significant effects will remain, due to the presence of the Project, that will remain visible and cannot be mitigated:

- Residential Properties near Akoren-Incegiz Yolu (between chainage 42+150 – 42+246)

10.6 SURFACE WATER ENVIRONMENT

BASELINE

10.6.1. The Project crosses, or is located in close proximity to, five large watercourses which include:

- Küçükçekmece Lake – catchment that includes the Sazli Stream and Hadımköy Stream / Eşkinoz Creek.
- Büyükçekmece Lake – catchment that includes Karasu Stream.
- Durugöl Lake – catchment that includes Kumluca / Karacaköy / Binkiliç Creek that extends to the north of the Project.
- Kinikli Creek – catchment that extends to the south of the Project.
- Corlu Creek – catchment that encompasses Çerkezköy to the west of the Project.

10.6.2. The Project also crosses approximately 70 smaller tributaries and overland flow routes that drain to these key watercourses.

10.6.3. The majority of the Project will pass through the drainage catchments of Küçükçekmece Lake and Büyükçekmece Lake.

10.6.4. Water samples were taken from watercourses in January 2016 and July 2020 and analysed to determine the existing water quality. The water quality varies across the Project, in some watercourses it is good (for example Sazli Stream, Camasir Creek and Corlu Creek) and in others it is poor (for example Karasu Stream and Azinlar Creek).

10.6.5. The Project is generally at low risk of flooding, although it may be located in areas of flood risk from rivers or streams at the following locations:

- Where the Project traverses parallel to the Hadımköy Stream / Eşkinoz Creek for approximately 9.7km (between approximate chainage 7+500 to chainage 17+200).
- Where the Project crosses an unnamed tributary of Büyükçekmece Lake (between approximate chainage 22+000 and chainage 23+500).

- Where the Project crosses the Camasir Creek, which forms the inlet channel of Büyükçekmece Lake and follows the alignment of Karasu Stream (between approximate chainage 25+500 and chainage 38+000).
- Where the Project crosses the upper extents and tributaries of the Karasu Stream (between approximate chainage 42+500 and chainage 45+750).

CONSTRUCTION EFFECTS AND MITIGATION

Risk of Impact Due to the Release of Sediment or Pollutants

10.6.6. As required in the **ESMP**, best practice construction techniques and procedures, such as sediment barriers, coffer dams and silt curtains, storage measures and provision of spill kits, will be implemented to reduce sedimentation and spillage of harmful substances, so the construction works will not have a significant effect.

10.6.7. Dewatering of the excavated material from the TBM tunnel beneath the Sazli Stream (and Kanal Istanbul) is required, the water may be discharged to Küçükçekmece Lake or, alternatively, to the lower reaches of Sazli Stream or Hadımköy Stream / Eşkinoz Creek. The impact on Küçükçekmece Lake will not be significant, as any water would be treated prior to discharge, furthermore, the Lake will provide dilution of pollutants and it is not used for drinking water supply. If discharge to Sazli Stream or Hadımköy Stream / Eşkinoz Creek is proposed, any water would be treated prior to discharge, to reduce the potential effects to a level that is not significant.

Risk of Impact Due to Increased Water Demand and Wastewater

10.6.8. All non-potable water will either be pumped from groundwater resources or sourced from the local water network (water pipes) and drinking water will be provided in bottled containers. There will not be any significant effects associated with water supply.

10.6.9. The risk associated with the release of untreated wastewater to receiving waterbodies will be avoided though the application of measures in the **ESMP,** such as the use of municipal wastewater utilities, the pre-treatment of wastewater, and avoiding works within or adjacent to watercourses as far as practicable. These measures will ensure the effects are not significant.

Flood Risk

10.6.10. There is the potential for increased flood risk during construction associated with temporary works within fluvial floodplains and watercourses, and increased flood risk associated with water discharges, including dewatering from the twin bore tunnel (if required). As required in the **ESMP**, watercourse connectivity will be maintained throughout construction and appropriate mitigation will be implemented to manage increased risk to adjacent properties and infrastructure. There will therefore not be a significant flood risk effect.

OPERATIONAL EFFECTS AND MITIGATION

10.6.11. As required in the **ESMP**, the Contractor will be required to undertake a Topographic Survey, to identify smaller watercourses and flow routes, and implement specific Surface Water Design Measures at the detailed design stage of the Project in order to mitigate effects that may arise during operation of the Project.

Risk of impact due to Surface Water Run Off

10.6.12. Typical pollutants, such as oils and fuels are unlikely to be present due to the Project being electrified. Maintenance trains or vehicles might not be electrified and could pose a risk of diesel or oil leaks, though this risk is low. No significant effects are anticipated on the quality of the surface water environment from run off.

Risk of Impact Due to Railway Station Water Demand and Wastewater Discharge

10.6.13. The increased in use of the stations due to the Project will not be significant, as the existing water supply and wastewater infrastructure will be used to manage any increase in demand. Furthermore, if any amendments are required to these systems, the necessary agreements will be obtained from the relevant DSi Regional Directorate.

Drainage

10.6.14. A new drainage system will drain the track within the rail corridor, with lines installed to ensure surface flows and natural drainage flows are maintained. Measures set out in the ESMP will ensure that drainage systems are regularly inspected, cleared and maintained so any effect will not be significant.

Flood Risk Caused by Displacement of Flood Water Storage

10.6.15. The connectivity of all watercourses will be maintained through the construction of culverts and bridges, and watercourse crossings will be designed to maintain riverbanks and flood defences. The final detailed design of the Project will be informed by further assessment of impacts to floodplain storage and conveyance, and of climate change effect. It will also give further consideration of the inclusion of flood defence structures at the entrance of the tunnel beneath the Kanal Istanbul project and inclusion of a flood warning system. This will ensure the potential flood risk effect on people, property and infrastructure located close to the Project is not significant.

Hydrology, Hydromorphology and Flow Dynamics

10.6.16. The connectivity of all watercourses will be maintained through the design of the watercourse crossings and other drainage culverts. Natural water flows will also be maintained by the drainage system. The effect on surface water features will not be significant. Watercourse crossings, diversions or realignments could change erosion and sedimentation patterns through a watercourse, however, with the implementation of measures in the **ESMP**, the effect on watercourses crossed by the Project will not be significant.

10.7 GEOLOGY AND HYDROGEOLOGY

BASELINE

Geology

10.7.1. The bedrock geology beneath the Project comprises Pliocene deposits of the Ergene group (sandy, shaley conglomerates) and sedimentary strata of Oligocene and Miocene deposits of the Yenimuharcir Group (sandstones, shales, minor coal, siltstones, limestones). This is overlain by superficial deposits of Alluvium (sand, clays, silts and gravels). The Project is largely located on

topsoil, with Made Ground6 present beneath the areas of hardstanding or the existing railway. Outcroppings of igneous or metamorphic rock are present to the north and south of the Project.

Hydrogeology

10.7.2. The Ergene and Yenimuhacir groups are permeable and are known to contain groundwater in quantities capable of supplying public water supply.

10.7.3. The majority of the Project is located within Istanbul Province. Groundwater is limited in Istanbul and this is considered to be a water stressed area. The groundwater level is very close to the surface near Küçükçekmece Lake, creating wetland habitats.

10.7.4. The western extent of the Project is located within Tekirdağ Province. There are a large number of artificially opened wells in the settlements, used for industrial and industrial irrigation purposes, the opening of wells is now restricted.

CONSTRUCTION EFFECTS AND MITIGATION

10.7.5. During construction, the Contractor will implement relevant sections of the ESMP, including measures to reduce pollution and contamination, manage materials and waste, health and safety, and emergencies, including spills. This will ensure a safe environment for construction workers, and local communities.

10.7.6. Revegetation requirements to minimise erosion will be included in the CESMP and in the Landscape Management Plan. These will include measures to reinstate and restore lost fertile topsoil on agricultural land.

10.7.7. A detailed Hydrogeological Model and Risk Assessment and Ground Investigation will be undertaken in particular for the design of the tunnel under the proposed Kanal Istanbul, to understand geological and hydrogeological conditions. Long term and seasonal groundwater monitoring will be undertaken prior to construction, to allow for baseline conditions to be understood and monitor changes during the boring of the TBM tunnel under Kanal Istanbul, such as to identify potential degradation of the groundwater resource or potential quality of water supply.

10.7.8. As required in the **ESMP**, Foundation Risk Assessments and Piling Risk Assessments will be undertaken for all bridges, overpasses, underpasses and cut and cover tunnels, and will outline measures to protect groundwater resources as part of the design and during construction.

10.7.9. With the implementation of the above mitigation measures no significant effects are anticipated.

OPERATIONAL EFFECTS AND MITIGATION

10.7.10. The **ESMP** will include measures to inspect and maintain drainage and treatment systems, as well as measures to stabilise cuttings and embankments and areas at risk of landslide along the Project.

[6] A term used to describe soil which has been subject to human intervention, such as through farming, landscaping or construction activities.

10.7.11. The **ERF** will be elaborated to prepare an operational Emergency Response Plan prior to operation, which will cover seismic activity, natural disaster response as well as pollution prevention procedures. The Operational Maintenance Plan and Tunnel Operational Management Plan will include measures to manage potential impacts on groundwater quality, flow and recharge.

10.7.12. With the implementation of the above mitigation measures no significant effects are anticipated.

10.8 MATERIALS AND WASTE

BASELINE

Materials and Site Arisings

10.8.1. There are sufficient mineral resources within Turkey for the main bulk construction materials (aggregate, concrete and steel) needed to construct the Project. Site arisings from the current land uses within the Project are anticipated to be minimal given the current land use comprising vegetated and agricultural land and the existing railway.

CONSTRUCTION EFFECTS AND MITIGATION

Materials

10.8.2. The key construction materials required for the Project are aggregate, asphalt, concrete, imported and reused fill, metals, plastic, precast concrete, rock and stone. The total quantity of these materials is approximately 67 million tonnes.

10.8.3. The amount of aggregate, rock fill material and store required represents approximately 12% of the available regional quarry reserves. The percentage of material resource consumption for the Project is 0.8% and 4% of the national production of steel and concrete respectively. The Project is not considered to have a significant effect on material resource consumption, however the **ESMP** includes best practice methods to further reduce material consumption.

Waste

10.8.4. During construction, the Project is anticipated to generate earthwork volumes in the region of 39 million tonnes, with 87% of this to be re-used within the Project (34 million tonnes). The waste metal (1,600 tonnes) generated during construction will be recycled and therefore diverted from landfill.

10.8.5. The Project has the potential to generate over 6 million tonnes of waste, with the majority comprising of earthwork arisings / spoil. The disposal of these wastes could potentially reduce non-hazardous landfill capacity by 6-10% and hazardous landfill capacity by <0.5-1%. However, the measures in the Waste and Material Management Plan and Spoil Management Plan will reduce the volume of waste disposed to landfill to prevent the Project having a significant effect on landfill capacity. This includes measures such as ensuring that where earthwork arisings are suitable, they will be disposed of at spoil disposal sites rather than landfill.

10.9 CLIMATE CHANGE – GREENHOUSE GAS RELEASE

BASELINE

10.9.1. The existing situation is that the release of GHG is occur constantly and widely as a result of human and natural activity including energy consumption (fuel, power), industrial processes, land use and land use change. There are currently no construction emissions, and operational emissions have

been calculated based on a 30-year operational life of the Project (2026-2055) for rail and end-user vehicles.

CONSTRUCTION EFFECTS AND MITIGATION

10.9.2. The Project is anticipated to contribute to a 0.01% increase relative to total national release of GHG for Turkey and 0.54% increase compared to total releases of GHG from Manufacturing and Construction. Mitigation and enhancement measures within the ESMP such as minimising energy consumption and fuel usage will be implemented, however the effect GHG released during the construction of the Project will still be considered as significant.

OPERATIONAL EFFECTS AND MITIGATION

10.9.3. The operation of the Project will have a significant beneficial effect with regard to the release of GHG, due the transfer of passengers from the existing railway to the Project, and the switch from road travel to rail travel (a reduction of 850,471 tCO2e7 over the first 30 years of operation). The Project will result in some release of GHG due to the electricity used to power the railway and facilities (approximately 21,470 tCO2e per year), but the ESMP, includes measures to reduce energy use and GHG releases, such as the use of energy meters and efficient lighting throughout the Project.

10.10 CLIMATE CHANGE – CLIMATE RESILIENCE

BASELINE

10.10.1. The climate resilience assessment considers the vulnerability of the Project to climate change. Baseline climate information for Çerkezköy has been used as representative of the climate of the Project. Çerkezköy is located in the Marmara region which experiences both a Mediterranean and humid subtropical climate. Summers are hot, humid and moderately dry whereas winters are cold and wet and sometimes snowy. The coastal climate keeps the temperatures relatively mild in comparison to the rest of the country.

10.10.2. The monthly temperature for Çerkezköy in 2080-2099, is expected to be 3.3°C to 6°C hotter than it was in 1986-2005. There will also be an increase in extreme temperatures (i.e. the temperature experienced during heatwaves).

10.10.3. Annual precipitation in Turkey is predicted to decrease over the period 2080-2099, and during all four seasons, with the maximum decrease in November. Monthly precipitation is also predicted to decrease in the range of 3mm to 17mm. The intensity of rainfall events will not change.

10.10.4. The Project study area has a ‘Low’ storm hazard risk[8].

[7] Tonnes of carbon dioxide equivalents (tCO_2e)
[8] Swiss Re (2020) CatNet – the online natural hazard atlas.

10.10.5. Global mean sea level is projected to rise over the coming century. The projected change in relative sea level for 2081-2100 for the Turkish coast is a 0.2-0.4m change under the lowest scenario, and greater than 0.6m under the highest scenario.

CONSTRUCTION EFFECTS AND MITIGATION

10.10.6. The Project may be vulnerable to the following during construction, as a result of increased average and extreme temperatures, due to climate change:

- Drying out and cracking of ground and access road surfaces, leading to slower vehicle movements and repair work, resulting in construction delays.
- Temperature effects on construction materials including melting or deformation and shorter drying times.
- Overheating of construction plant and equipment.
- Health and safety risks to construction workers from heatstroke and UV radiation and vulnerability of buildings to overheating.

10.10.7. Following the adoption of the inherent mitigation measures set out in the **ESMP**, such as spraying surfaces, selection of resilient materials, maintaining vehicles, and measures to protect workers, no significant effects for climate resilience are anticipated.

OPERATIONAL EFFECTS AND MITIGATION

10.10.8. The potential impacts associated with the operation of the Project in relation to climate change related increases in average temperatures, extreme temperatures, wind speed increases, sea level rise, decrease in rain events and drought have been assessed. Following the adoption of the inherent mitigation measures identified in the **ESMP**, which includes design measures set out in the Technical Specification, no significant effects for climate resilience are anticipated.

10.11 SOCIAL

10.11.1. This considers the potential social, occupational health and safety (OHS) and rail safety effects of the Project. The assessment was informed by household surveys, Mukhtar surveys, focus group discussions (including women-only groups) and site drive throughs undertaken between June and August 2020.

BASELINE

Social

10.11.2. The Project is located in close proximity to 25 communities. The leaders of the relevant administrative structures (governors, mayors, Mukhtars etc) were engaged to obtain important information in relation to the views and concerns of the populations and communities that they represent. The 25 communities are shown in **Figure 5-1** and will potentially be affected by: the expropriation of privately-owned land parcels, including those with residential houses, businesses, and secondary structures; and the acquisitions of publicly-owned land parcels, that are used on both a formal and informal basis. This is detailed in the RAP and summarised in the **GLAC**.

10.11.3. The population in the majority of these 25 communities increased by at least 1% between 2018 and 2019, however the population at Bahşayış has not changed, and several communities experienced a reduction in their populations (Yeşilbayır, Kaleiçi, Kurfallı, Nakkaş, Gökçeali, Bekirli, Kabakça and Şamlar).

10.11.4. The people in the study area are mainly Turks with the following also ethnicities also present:

- Roma - Roma are present in Karaağaç. There is a Roma Association at the entrance to the suburban area (confirmed during the site drive through).
- Kurds - Kurds are present in Kabakça in the study area and are mainly seasonal agricultural workers.
- During the focus group, it was confirmed that both Roma and Kurds have official legal citizenship status and therefore they are entitled to same legal rights as Turks.

Employment, Labour and Working Conditions, and Gender Equality

10.11.5. The Project has the potential to create employment opportunities during both construction and operation, and enhance access to employment opportunities, business and trade. Therefore, it has the potential to reduce unemployment and poverty, as discussed in the construction and operation sections. The highest poverty rate within the area affected by the Project (13.5%) in 2018 was reported in Tekirdag, Edrine and Kirklareli, which is similar to the national poverty rate for Turkey of 13.9% over the same period.

10.11.6. Turkey has ratified key International Labour Organisation conventions on forced labour, collective bargaining, minimum working age, discrimination, child labour and health and safety of labour. In 2018 Europe and Central Asia had a prevalence of 3.9 people in modern slavery for every 1,000 people[9].

10.11.7. The minimum working age in Turkey is 18. Turkey has a total of 720,000 children, below the working age, engaged in economy activity. Turkey has focused on this issue and has been developing policies to reduce child labour since the 1990s. AYGM, TCDD and TCDD Transport have confirmed that they comply with national laws and the ILO conventions associated with the minimum working age and forced labour.

10.11.8. The female labour participation rate is reported as about 32% compared to 71% male labour participation which demonstrate a significant gap in gender equality in employment. According to the Constitution of Turkey “Article 10” all the public sector institutions including TCDD and TCDD Transport should comply with the rule on gender equality. Within the State Railways of the Republic of Turkey (TCDD) there is a substantial gender imbalance, with a total of 12,967 male employees in comparison to 687 female employees. Within the Ministry of Transport and Infrastructure (AYGM), the total number of male employees is 270 and female employees is 380. However, this trend is gradually changing with further opportunities to be provided for women to work as drivers and other transport related jobs.

Contractors and Supply Chain

10.11.9. AYGM is undertaking preparations ahead of commencing the tendering process to appoint the construction contractor. AYGM will use a procurement process referred to ‘International Competitive Bidding (ICB) for the Project, as it is funded by International Finance Institutions, which aligns with

[9] Global Slavery Index (2018). Available at: https://www.globalslaveryindex.org/resources/downloads/.

the Lenders EHSS requirements. The procurement of the supervision consultant, Contractor and PIU related contracts will follow the ICB process. However, other related contracts associated with this Project will be in accordance with Public Procurement Law, 2002 (No. 4734) and the Public Procurement Contracts Law, 2002 (No. 4735). AYGM and TCDD&TCDD Transport will include EHSS requirements in all contracts and terms of references for this Project.

Health and Safety

10.11.10. There is a high risk of accidents in the rail sector in Turkey, with an average of 1.3 fatalities per million train km[10]. The number of rail accidents in Turkey is approximately three times the world average[11]. This report does not include fatalities or injuries to operational workers not caused by train accidents. Rail workers are often required to work in shifts, with irregular working hours which can result in fatigue. Fatigue, particularly among drivers, signallers, maintenance workers, and others whose work is critical to safe operation, can pose a serious safety risk for railway workers and the general public.

Vulnerable Groups

10.11.11. Based on the EBRD definition of vulnerable people, this category includes people, who, by virtue of their gender, ethnicity, age, physical or mental disability, economic disadvantage or social status may be more adversely affected by displacement than others. The following category of vulnerable groups have been identified for this Project:

- People who cannot read, who will be further affected due to lack of access to written Project information;
- Informal businesses and residents which their land use rights are not recognised by national law;
- Residents who may need to relocate and may find the move difficult due to ties to their place of residence, particularly the location dependent elderly;
- People with health conditions (including those relating to COVID-19), the elderly who are poor, the disabled, who would be exposed further to the impacts of the Project, due to their sensitive physical and/or well-being status;
- People taking on the role of primary carer for a household member;
- People that are significantly affected in terms of income and land take by the Project – Households who are significantly affected by the Project in terms of their primary income (including those PAPs who have not had regular wage-based income with a job at which they work for more than one year), and/or land take use for agricultural land (including animal husbandry) are considered vulnerable.
- Women who are further exposed to project impacts such as potential GBVH risks, gender inequality and loss of livelihood due to their sensitive status;
- People with lack of access to basic infrastructure, mainly water;
- People that have been affected by previous land expropriation (including loss of land rights); and

[10] Annual Statistics (2014-2018). General Directorate of Turkish State Railways 2019.

[11] Railway news (2020). Available at: https://www.raillynews.com/2020/07/positive-train-accident-in-Turkey-three-times-the-world-average/

- People categorised as 'Poor' – defined as people receiving less than a 1/3 of the minimum wage with the minimum wage in Turkey being 2,825.90 TL as of 2021.

CONSTRUCTION EFFECTS AND MITIGATION

Land Acquisition / Use and Livelihood Restoration

10.11.12. Some land acquisition for the Project, and resulting resettlement, will be necessary, and this will require the compensation for, or provision of replacement land, and some houses / structures. In some cases, the Project may also cause the temporary restriction on use of land and access during the construction of the Project.

10.11.13. Overall, the impacts associated with land acquisition are considered to be substantial given that approximately 5,391,151m2 of land over 1,256 parcels (904 private; and 352 public), including at least 59 residential properties, 509 secondary structures (including businesses) and 812 agricultural land plots used for growing crop (4,347,770m2), will be expropriated. In addition, informal businesses and land users could lose their income and livelihood. This includes impacts on the various vulnerable groups identified. A **RAP** is required and has been prepared. Following the implementation of the mitigation measures in the **RAP**, the effects are not expected to be significant.

Temporary Construction Compounds and Construction Workers Accommodation

10.11.14. There are not expected to be significant effects associated with the temporary use of land for the construction compounds and construction access roads, as the land will be selected using the selection criteria in the **ESMP**, such as prioritising the use of land used is barren and has no residential properties. Any potential temporary land acquisition impacts on land users have been included in the in the **RAP** to ensure livelihood of such PAPs will be restored as a minimum. The **RAP** principles and mitigation measures will be followed by the Contractor when gaining entry to and returning the land secured for these temporary construction compounds and access roads.

10.11.15. The location of the construction compounds, which will contain the construction workers' accommodation, will be carefully selected and agreed through consultations with the local communities, to reduce the potential traffic and disturbance effects associated with workers movement in and out of a local area. They will also be selected using the selection criteria in the ESMP, and in consultation with local communities, as required in the **SEP**.

Employment and Economy

10.11.16. The construction effects in relation to employment opportunities and improvements to the local economy, are expected the be significant and beneficial, due to the 1,100 direct employment opportunities.

Labour Influx

10.11.17. Labour influx is associated with migration of overseas workers into the Site, and the various tensions, increased risk of communicable diseases, safety concerns and community disturbance it may cause. The 670 construction workers that are Turkish national, but not from the local community, together with the 100 international construction workers will occupy the workers accommodation in the construction compounds (approximately 185 workers per construction compound) and will adhere to the construction Workers Code of Conduct in the **CMP**. The effects of labour influx will therefore not be significant.

Labour and Working Conditions

10.11.18. The Project will provide formal contracts, adequate facilities for workers, measures to avoid discrimination, monitoring and inspections on site, including in relation to child labour, forced labour and other unlawful activities. The required mitigation will ensure the risks associated with labour and working conditions are not significant.

Contractors and Supply Chain

10.11.19. AYGM's initial labour management procedures for the Project require due diligence to be undertaken for any suppliers with potential risks associated with child labour and forced labour. If any risks related to child and forced labour are identified, AYGM will prepare procedures to address these risks. Following the implementation of the Supply Chain Management Plan, as required in the **ESMP**, the effects are not considered to be significant.

Occupational Health and Safety

10.11.20. Common activities undertaken during construction such as the movement of heavy machinery, demolition and excavation, electrical works, handling of chemicals, and works undertaken at height, can all introduce significant risk to the health and safety of the construction workforce. The Project Technical Specifications details the specifications and standards that need to be complied with by the contractor, once they have been appointed. Following the implementation of the mitigation required in the **ESMP**, effects to occupational health and safety are not considered significant.

Community Wellbeing, Health, Safety and Security

10.11.21. Construction can lead to an increase in noise and air pollution, reduced safety due to the movement of construction plant and construction activities, and reduced safety as a result of unauthorised access to construction works and equipment. The influx of foreign labour may also reduce safety or the feeling of safety and security for local families, women and children. Community health, safety and security impacts will mainly affect the residential areas that are in closest proximity to the Project, such as the residential areas surrounding Halkali Station, Bahçeşehir and some part of Yeşilbayır.

10.11.22. The construction activities could have a particular adverse effect on vulnerable groups, such as the health of the elderly, the disabled and people with chronic health issues. However, following the implementation of the mitigation measures (such as the provision of site security, signage around construction areas to protect the public and regular engagement with the Community Liaison Officers for the Project), the community wellbeing, health, safety and security effects on these communities are not considered to be significant.

Community Access Rights

10.11.23. During construction, it will be necessary to have some temporary closures of the existing railway. The Project has the potential to temporarily restrict access for the local community to residential properties, agricultural land, and community infrastructure (including schools and hospitals), which could lead to disruption and loss of local income and livelihood during this period. It is anticipated that community access effects will be not significant following the implementation of the required mitigation measures, such as providing temporary access roads and routes, repair of any damage and liaising with affected communities.

Gender

10.11.24. In the rural areas surrounding the Project, there are mainly traditional communities where women are mainly housewives and/or work in the farming sector. Therefore, women and girls may be disproportionately affected, through exposure to harassment from mostly male construction workers., exposure to construction pollution in the home, and being restricted by family from leaving the home due to security concerns. It is anticipated that gender effects will be not significant following the implementation of the required mitigation measures, which include a Construction Workers Code of Conduct, training and awareness raising and consultation with women in affected communities.

OPERATIONAL EFFECTS AND MITIGATION

10.11.25. There are no significant effects associated with physical and economic displacement in relation to the operation stage as the land, access decisions will be obtained prior to the construction stage in 2021 and registrations will follow in courts. Furthermore, there will be no continued economic displacement during the operation of the Project as all resettlement and livelihood restoration activities, including the return of any land required on a temporary basis during construction, will have been completed prior to operation.

Employment and Economy

10.11.26. During operation the Project will create employment opportunities at the local stations and additional train drivers will be recruited. It will also create indirect service sector employment opportunities for catering, cleaning and maintenance. The local economy is likely to improve as a result of these jobs, and improved regional access, which would make it easier for people to find job opportunities further away. Therefore, the Project is expected to result in some beneficial effects on employment and economy.

Labour and Working Conditions and Supply Chain

10.11.27. TCDD&TCDD Transport have advised that they will have contracts for all the operational workers and will follow national laws covering aspects such as minimum wage, paid leave, insurance, equal opportunity and any collective dismissal. The **ESMP** set out further measures that will be implemented to enhance these processes.

10.11.28. TCDD&TCDD Transport will monitor suppliers in relation to social and labour aspects and include requirements in their procurement contracts in addition to health and safety and technical requirements. It is anticipated that labour, working conditions and supply chain effects will not be significant, following the implementation of the required mitigation measures.

Community Health and Safety and Security

10.11.29. The operational health and safety impacts on local communities, will be reduced by the design measures to exclude them from the Project, such as security fencing and the provision of regularly spaced underpasses and overpasses, bridges, viaducts and

Figure 10-8 – Example Fencing

tunnels, instead of level crossings. The existing stations along the Project where the trains will stop (Halkali, Ispartakule and Çatalca), will be equipped with security guards and gates. Halkali Station has allocated seats for the elderly, disabled and those with reduced mobility, and it has warning signs, marking and announcements for better accessibility. Ispartakule and Çatalca Station buildings are heritage assets. At present these historic stations do not currently have design measures in place for accessibility, but staff are available to help passengers requiring assistance to trains.

10.11.30. The passenger trains that will used during operation, will be accessible for elderly, disabled and those with reduced mobility and will include allocated seats and CCTV will be installed in the cars. These facilities will provide improved health and safety for the local community in terms of usage of local transport and will provide better facilities for vulnerable groups. In addition, passengers, some of whom would otherwise travel in their cars (or motorbikes), will see a safety benefit since the safety of railways is generally much better than cars. The Project is expected to result in a significant beneficial effect on Community Health and Safety and Security.

Community Access Rights

10.11.31. The potential for the Project to permanently restrict access to residential and farming lands by the local community, will be reduce though the provision of 4 agricultural underpasses and 17 overpasses, together with additional underpasses for vehicles. The locations will be finalised in consultation with the affected communities. It is expected that local community will be able to use the cattle underpasses and local overpasses and therefore no significant effects are expected.

Gender

10.11.32. The risks associated with gender aspects including health and safety, security and harassment will be potentially reduced compared to the existing situation, as a result of improved security within stations and on passenger trains, better facilities on trains, and enhanced accessibility. Furthermore, this provision is expected to be an improvement compared to the existing provision, which is primarily the use of the existing railway, and the use of road-based alternatives, such as buses. TCDD& TCDD Transport will also introduce measures to promote gender equality in the workforce, such as mentoring, pay transparency, training and zero-tolerance on discrimination. This is anticipated to result in a minor beneficial effect which is not significant.

Community Wellbeing

10.11.33. While rail operations are likely to cause local disturbance for some households, community wellbeing is expected to be enhanced, due to access to and improved and affordable transport services, and enhanced connectivity to urban areas and employment opportunities, and increased use of public transport. This is anticipated to result in a minor beneficial effect that is not significant.

Occupational Health and Safety (OHS) and Rail Safety

10.11.34. There will be OHS risks during operation, associated with maintenance and inspection requirements. The severity and likelihood of risks during operation will be dependent on the frequency and requirements of planned and unplanned maintenance. The operation and maintenance team will be required to prepare a robust Operational Maintenance Plan to appropriately manage these risks, as set out in the **ESMP**.

10.11.35. The Project has the following features that will mitigate rail safety risks:

- The detailed design will be developed to ensure compliance with EU and national technical requirements;
- Further measures for safety management are as follows:
  - A **Hazard Log** has been produced and will need to be maintained by AYGM complying with EU safety management processes and the Contractor will be mandated to use this to show how hazards are being managed;
  - A **Railway Safety Plan** has been produced by AYGM that mandates all the activities the Contractor will need to undertake in order to manage safety according to the national and EU requirements
- The final design and construction will be reviewed by an independent body to verify compliance required safety and technical requirements.
- An **Emergency Response Framework** has been prepared and will be developed into a detailed plan for construction and operation phases.

10.12 MAJOR ACCIDENTS AND DISASTERS

BASELINE

10.12.1. The assessment considered the vulnerability of the Project to major events such as accidents, disasters related to natural hazards or manmade hazards (including operational failure). Major events are events or scenarios that have the potential to affect the Project causing immediate, or delayed, serious damage to human health, property and/or the environment.

10.12.2. The following sensitive receptors were considered in relation to major events:

- Members of the public and local communities;
- Infrastructure and the built environment;
- The natural environment, including ecosystems, land and soil quality, air quality, surface and groundwater resources and landscape;
- The historic environment, including archaeology and built heritage; and
- The interaction between the factors above.

10.12.3. The following major event types were identified as being most relevant for the Project.

Table 10-3 - Major Event Types in Relation to the Project

Major Event	
■ Earthquakes; ■ Landsides; ■ Groundwater flooding; ■ Weather, including cyclones, hurricanes, typhoons, thunderstorms, and gales; extreme temperatures and snow; ■ Severe Space Weather, Solar Flares; ■ Wildfires; ■ Poor air quality; ■ Spread of invasive plants;	■ Major accident at chemical sites or hazard pipelines; ■ Dam breaches; ■ Mines and storage caverns; ■ Fires; Road or rail transport accidents; ■ Use of waterways; ■ Air, Land or Water Pollution Accidents; ■ Electricity utilities failure; ■ Unexploded ordnance; ■ Malicious Cyber Attacks; ■ Demolition accidents; and ■ Tunnel failure/fire.

CONSTRUCTION AND OPERATIONAL EFFECTS AND MITIGATION

10.12.4. The assessment identified mitigation measures that will be incorporated into the detailed design, in particular, the development of a construction and design risk register for the Project and ongoing reviews of this against specific major events. This will reduce the risk associated with the identified major events, to the point where the risk would be as low as reasonably practicable. The mitigation measures include, but are not limited to the following:

- Development of a construction and design risk register;
- Managing risks in accordance with the **ESMP**;
- Implementation of the **ERF**;
- Compliance with design standards; and
- Implementation of the **Rail Safety Plan** and Hazard log;
- Consideration of groundwater seepage into the tunnel under Kanal Istanbul; and
- Further consideration of BEKRA sites during the design finalisation.

10.12.5. Further mitigation measures have already been identified in the topic assessments, and these have been incorporated in the **ESMP**.

10.13 CUMULATIVE EFFECTS

10.13.1. Two types of cumulative effects have been considered within this assessment:

- Effect Interactions – cumulative impacts from the Project; and
- In-combination effects – cumulative impacts from different projects (in combination with this Project).

EFFECT INTERACTIONS

10.13.2. Construction Effects and Mitigation Receptors or resources that could be affected by more than one environmental and social topic, and therefore be subject to more than one residual effect, are known as common receptors.

10.13.3. Following the implementation of mitigation measures set out in the topic chapters of the ESIA, the overall effect interactions on common receptors, during construction, is not significant except for:

- Residents and Residential Properties – significant adverse effects are anticipated from Noise and Vibration and Landscape and Visual at the following locations: Bahçeşehir, Ömerli, Kabakça, Çayırdere and İstasyon. Mitigation measures for these effects have been proposed within the technical chapters and however even with the application of these measures, impacts will be significant.

Operational Effects and Mitigation

10.13.4. Following the implementation of mitigation measures, the overall effect interactions during operation on common receptors are as follows is not significant except for:

- Residents and Residential Properties – significant adverse effects are anticipated from Noise and Vibration and Landscape and Visual at Kabakca and Kaleici. Mitigation measures for these effects have been identified within the technical chapters and further mitigations will be developed during detailed design and in consultation with affected residents.

IN-COMBINATION EFFECTS

10.13.5. The Project and individual developments in the vicinity of the Project are likely to have significant adverse effects, such as the Kanal Istanbul, 3rd Bridge over the Bosporus rail connection. The purpose of the in-combination is to determine if the interaction of the other developments with the Project would make adverse effects significantly worse.

10.13.6. A study area of 10km from the Project was used, and a total of 46 planned developments were identified, due to their natural and scale, to have potential for in-combination effects.

Construction Effects and Mitigation

10.13.7. The overall in-combination effects during construction were identified as follows:

- Noise and Vibration – not significant;
- Ecology – not significant;
- Landscape and Visual – not significant;
- Surface Water Environment – not significant;
- Geology and Hydrogeology – not significant;
- Social – not significant.

10.13.8. The construction phase in-combination effects assessment identified minor adverse (but not significant) effects. Should construction programmes of nearby projects overlap with that of the Project, the Project contractor will liaise with the other developers and aim to identify additional mitigation as necessary to reduce potential construction effects further.

Operational Effects and Mitigation

10.13.9. Overall in-combination are not significant, no mitigation measures are required for the operation stage.

11 HOW WILL THE PROJECT MANAGE AND MONİTOR PROJECT RELATED EFFECTS?

11.1.1. An **ESMP** has been produced for the Project, which contains the mitigation identified in relation to the above effects. This will be maintained as a live document and its implementation will be a requirement of AYGM, TCDD, TCDD Transport and their contractors. Fulfilment of these **ESMP** commitments will be further monitored by the Lenders.

11.1.2. The construction contractor will be required to fully implement the requirements of the **ESIA** and the **ESMP**, during their preparation of the final design and during construction. Independent audits will be undertaken to ensure that these requirements are fully implemented.

12 STAKEHOLDER ENGAGEMENT PLAN AND GREVANCE MECHANISM

12.1.1. A **SEP** has been developed for the Project, it identifies key stakeholders and set out engagement activities to ensure that, where relevant, stakeholders are informed in a timely manner of the potential effects of the Project. Stakeholders are individuals and organisations that may be directly

or indirectly affected by the Project either in a positive or negative way, who wish to express their views.

12.2 GRIEVANCE MECHANISM

12.2.1. A Project-level Grievance Mechanism (GM) has been established and is a process for receiving, evaluating and addressing Project-related complaints for anyone with concerns about, or affected by, the Project. Complaints can be raised verbally or written, via the following channels during construction:

- **Telephone:**
  - PIU Social and Resettlement Specialist: Murat Yağcı, Tel: 0535822887
  - Hotline of AYGM: 03122031000
  - PIU Stakeholder Engagement Specialist: Açelya Yenilmez, Tel: 505053841616
- **AYGM Complaints Email Address**: muratygc@gmail.com or acelya.yenilmez@uab.gov.tr
- **Face to Face:**
  - Stakeholders, including the public, can discuss their grievance with assigned personnel of AYGM at local offices.
- **Public Grievance Mechanism Paper Form:**
  - Stakeholders including the public, can fill in the paper grievance form in Appendix A and either send it to AYGM's offices, or email it to muratygc@gmail.com or acelya.yenilmez@uab.gov.tr.
- **Online application:**
  - Stakeholders can fill out the grievance form forms online at: https://aygm.uab.gov.tr/ispartakule-cerkezkoy-demiryolu-hatti-projesi

12.2.2. The above contact details will be updated by TCDD & TCDD Transport prior to operation of the Project and publicly disclosed on TCDD & TCDD Transport's website.

13 FURTHER INFORMATİON AND CONTACT DETAILS

13.1.1. A disclosure website, hosted by AYGM, is available here https://aygm.uab.gov.tr/ispartakule-cerkezkoy-demiryolu-hatti-projesi. Information available on this site includes;

- All Project documents for disclosure;
- A mini video / webinar in Turkish;
- A feedback form / form to submit questions;
- CLO contact details;
- Information on the grievance mechanism; and
- Responses to frequently asked questions (which will be updated throughout disclosure).

13.1.2. Hard copies of Project documentation will be available in the following locations:

Table 13-1 - Location of Hardcopies of Project Documentation

Available Documentation	
NTS, RAP and GLAC	**NTS and GLAC**
▪ Başakşehir Municipality Office; ▪ Arnavutköy Governorship Office; ▪ Arnavutköy Municipality Office; ▪ Çatalca Governorship Office; ▪ Çatalca Municipality Office; ▪ İstanbul Governorship Office; ▪ Silivri Governorship Office; ▪ Silivri Municipality Office; ▪ Büyükçekmece Governorship Office; ▪ Büyükçekmece Municipality Office; ▪ Çerkezköy Governorship Office; ▪ Çerkezköy Municipality Office; ▪ Tekirdag Governorship Office; and ▪ AYGM office.	▪ Halkalı Mukhtarship ▪ Firuzköy Mukhtarship ▪ Altınşehir Mukhtarship ▪ Bahçeşehir 2. Kısım Mukhtarship ▪ Şamlar Mukhtarship ▪ Deliklikaya Mukhtarship ▪ Ömerli Mukhtarship ▪ Yeşilbayır Mukhtarship ▪ Karaağaç Mukhtarship ▪ Bahşayış Mukhtarship ▪ Nakkaş Mukhtarship ▪ Ferhatpaşa Mukhtarship ▪ İzzettin Mukhtarship ▪ Kaleiçi Mukhtarship ▪ Gökçeali Mukhtarship ▪ İnceğiz Mukhtarship ▪ Kabakça Mukhtarship ▪ Akören Mukhtarship ▪ Bekirli Mukhtarship ▪ Kurfallı Mukhtarship ▪ Büyüksinekli Mukhtarship ▪ Küçük Sinekli Mukhtarship ▪ Çayırdere Mukhtarship ▪ Gazi Mustafa Kemal Paşa Mukhtarship ▪ İstasyon Mukhtarship (a minimum of 3 copies, with extra copies available if affected people would like to take a copy with them)

13.1.3. The protocols for viewing hard copies of documents at these locations will be reviewed according to local COVID-19 restrictions, and as a minimum will require;

- Use of hand sanitiser before and after viewing documents (to be provided at each location);
- Face masks to be worn when viewing documents;

- Only 1 household to view the documents at a time; and
- 2m social distancing to be maintained when waiting to view the documents.

13.1.4. Hard copies of the **GLAC** will be distributed by the Community Liaison Officers and other support staff to Project affected landowners and land users.

13.1.5. Documents associated with the Project, including the ESIA Report can be requested from:

Contact Information	
Name	Murat Yağcı or Acelya Yenilmez
Title	PIU Social and Resettlement Specialist / Stakeholder Engagement Specialist
Telephone	03122031000
Address	Hakkı Turayliç Cad. No:5 06338 Emek/Çankaya/ANKARA
Email	muratygc@gmail.com or acelya.yenilmez@uab.gov.tr
Website	https://aygm.uab.gov.tr/ispartakule-cerkezkoy-demiryolu-hatti-projesi

13.1.6. A Public Consultation Questionnaire has been produced to gather views on the Project, including the **ESIA**. This feedback will inform the continued development of the Project. A copy of this questionnaire is provided in **Appendix B** of this **NTS**, and hard copies will also be available from the locations listed above.

Appendix A

PUBLIC GRIEVANCE FORM

Complaint Register No:		**Date:**	
Location of Complaint Received:		**Co-ordinates of Area subject to Complaint:**	
Land Parcel No, if complaint is related to Land:			
COMPLAINANT INFORMATION			
Full Name			
Note: *you can remain anonymous if you prefer or request not to disclose your identity to the third parties without your consent*	☐ I wish to raise my grievance anonymously ☐ I request not to disclose my identity without my consent		
Contact Information Please mark how you wish to be contacted (mail, telephone, email).	☐ By Post: Please provide mailing address: _____ _____ _____ ☐ By Telephone: _____ ☐ By Email: _____		
Language Please mark your preferred language for communication	☐ Turkish ☐ Other		
DESCRIPTION OF CONCERN, INCIDENT OR GRIEVANCE			
Description of Incident or Grievance:	What happened? Where did it happen? Who did it happen to? What is the result of the problem?		
Date of Incident/Grievance:			
	☐ One-time incident/grievance (date _____) ☐ Happened more than once (how many times? _____) ☐ On-going (currently experiencing problem)		

SOLUTION REQUESTED BY COMPLAINANT			
What would you like to see happen to resolve the problem?			
Registrar Name:		**Complainant Name:**	
Registrar Signature:		**Complainant Signature:**	
Date:		**Date:**	

Please return this form to: muratygc@gmail.com or acelya.yenilmez@uab.gov.tr.

Appendix B

PUBLIC CONSULTATION QUESTIONNAIRE

HALKALI – ISPARTAKULE – CERKEZKOY RAILWAY LINE

PUBLIC CONSULTATION QUESTIONNAIRE

HAVE YOUR SAY

The purpose of this consultation questionnaire is to seek your views on the Halkali – Ispartakule – Çerkezköy Railway Line Project. Your feedback will inform the continued development of the Project. This is your opportunity to give your views on the Project.

THE PROJECT

The Turkish General Directorate of the Infrastructural Investment (AYGM) intends to construct a new high speed railway line from Halkali to Ispartakule and from Isparakule to Çerkezköy in two different tenders and sections. The Project will be located within the region of Istanbul and province of Tekirdag. Once operational the Project would be operated by TCDD and TCDD Taşımacılık (TCDD Transport) .

The Project will consist of the following:

- A new double track 9km line (i.e. two new lines) between Halkali Station and Ispartakule. In order for the Project to pass under the proposed Kanal Istanbul project a 6km twin-bored tunnel will be constructed in this section.
- A new double track 67km line from Ispartakule to a location adjacent to the east of Çerkezköy Station (approximately 1km from the centre of Çerkezköy);
- Modification of existing infrastructure, but not buildings, at the 3 existing stations (Halkali (0km), Ispartakule and Çatalca including the provision of footbridges, platforms and additional tracks;
- New ancillary structures, inclusive of bridges, viaducts, tunnels, overpasses and underpasses;
- Supporting power supply systems electrification, signalling and control systems.

The Project is due to be tendered in 2021, with construction commencing in 2021, and the Project becoming operational in 2026.

HOW CAN I FIND FURTHER INFORMATION?

An Environmental and Social Impact Assessment (ESIA) and supplementary documentation has been prepared in English and Turkish in accordance with requirements of potential Lenders to the Project.

The supplementary document is inclusive of a Non-Technical Summary (NTS), a Stakeholder Engagement Plan including GRM form and contact information, an Environmental and Social Action Plan and a Resettlement Action Plan. The NTS provides an easy to understand summary of the information that is provided in the ESIA Report.

THE NTS AND THE SUPPLEMENTARY DOCUMENTATION ARE AVAILABLE HERE:

https://aygm.uab.gov.tr/

Hard copies of the NTS and supplementary documentation are available to view at the AYGM office, as well as at affected governorship and municipality offices, and Mukhtar offices within each affected settlement. Protocols for viewing hard copies in a safe manner with respect to COVID-19 will be in place.

If you are unable to access the link above, or reach a location to view a hard copy, a copy of the NTS can be sent via post. To request a postal copy please contact Murat Yağcı, PIU Social and Resettlement Specialist, telephone: 03122031000, email: muratygc@gmail.com.

HOW DO I HAVE MY SAY?

We would be grateful if you would take the time to answer the following questions in relation to the Halkali – Ispartakule – Çerkezköy Railway Line Project.

The consultation period runs from May 2021 to September 2021. Please return your response by the 25th of September 2021.

Once we have taken your feedback into consideration, a summary report on the consultation feedback will be published. At the end of the disclosure period September 2021, loan decisions will be finalised, and the Project is anticipated to begin construction in 2021.

DATA PROTECTION

The first questions are about you. These questions are optional, but your answers will help us to make decisions fairly and ensure that we are attracting a wide range of people to respond to this consultation.

Personal information you give us will remain strictly confidential and will be used for monitoring purposes only, in accordance with Turkish and EU Data Protection Regulations. Information will be stored for the life of the Project and will not be used outside of this Project. Personal details will not be shared in any circumstance with organisations outside of the Project.

1. Gender (Optional)	
Male	
Female	
Other	
2. Age	
Under 18	
18-25	
26-35	
36-45	
46-55	
56-65	

Over 65	
3. Are you responding on behalf of an organisation/business?	
No	
Yes	
Which organisation/business:	
4. Are you a landowner in proximity to the Project?	
No	
Yes	
Is the land agricultural?	
No	
Yes	
5. Which village or community are from?	
6. Do you support the overall Project?	
No	
Yes	
No opinion	
Comments:	
7. How important is the opening of the new railway line to you?	
8. What is the most important issue associated with the Project to you?	

9. Do you think the Project will be beneficial to the surrounding area?
10. Do you think that the environmental and social mitigation measures proposed for the Project are appropriate?

No	
Yes	
No opinion	

Comments:
11. Do you have any further comments about this Project?
12. If you would like to be provided with the summary report on the consultation feedback please provide your details below:
Email address:
Postal address:

8 First Street
Manchester
M15 4RP

wsp.com