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İşin Adı : Mersin-Adana-Osmaniye-Gaziantep Yüksek Standartlı Demiryolu Hattı
The Name of : İnşaatı ile Elektromekanik Sistemlerinin Temini
the Job : Construction of Mersin-Adana-Osmaniye-Gaziantep Hight Standard Railway
Line With Supply Of Electromechanical Systems

Rapor Adı : NOISE AND VIBRATION
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1.PURPOSE

Purpose of Noise Monitoring and Control Procedure;

- Defining country legislation and standards,
- Identification of international standards to which the project must comply,
- Defining the duties and responsibilities of the personnel,
- Identification and identification of impact sources, baseline noise levels and ways to avoid impact and mitigation measures for construction noise management.

2.SCOPE

This procedure refers to potential sources of noise during project construction activities and identifies the measures envisaged to minimize noise impacts at adjacent community receptors. Noise levels will be monitored from noise receptor sources, and noise levels arising from construction activities will be evaluated according to national and international standards and background noise levels. If noise levels are found to exceed national legal requirements, corrective and preventive actions will be undertaken by REC International with the aim of reducing the noise to a reasonable level.

Noise and its effects may arise from the following project activities:

- Loading and unloading of ballast
- Construction traffic including heavy vehicles, loading equipment,
- Heavy machinery on the line
- Superstructure works
- Excavation and filling works
- Excavator, dozer uses,
- Trucks that bring materials to and from the construction site,
- Buses and special vehicles that transport workers to and from the construction site.



3.REFERENCES

- Applicable Turkish Laws and national standards
- IFC General Environmental, Health and Safety Guidelines Noise
- “IFC Performance Standard 3: Resource Efficiency and Pollution Prevention

4.DEFINITIONS AND ABBREVIATIONS

HSE	:Occupational Health and Safety and Environment
Leq	: Equivalent Sound Level (It qualifies the noise environment as a single sound value for any desired time. Leq is sometimes known as Average Sound Level.)

5. DUTIES AND RESPONSIBILITIES

REC International will ensure that adequate resources are allocated to meet the requirements of this procedure and that the personnel responsible for the execution of the duties and conditions under the procedure are competent on the basis of training and experience.

Project Manager

- It has overall responsibility for the development, review, approval and coordination of various activities to initiate, execute and complete construction activities, and overall responsibility for the compliance of construction phase noise levels with Turkish Regulations.
- Ensuring that this procedure is prepared and updated as necessary on the basis of activities and operations undertaken by REC International as part of the project.
- Ensuring that adequate resources are available to implement the procedures and guidelines outlined in this procedure.

HSE Manager

- Development, implementation and regular revision of the procedure during construction,
- Ensuring that adequate training has been given to all site personnel to cover these procedures and guidelines,
- Establishing appropriate control procedures and performing necessary audits.



- Employing, training and supervising the Environmental Engineer and supporting them in fulfilling their responsibilities as necessary,
- Developing the necessary monitoring and reporting forms, establishing appropriate document control procedures,
- Ensuring the execution and recording of noise monitoring programs,
- Review of noise monitoring results in accordance with national regulations and international standard requirements,
- If the noise levels exceed these requirements, examining the exceeded amount and ensuring that instant corrective actions have been taken by the Environmental Engineer and Site Manager,
- Whether the required plan repeats measurements to verify compliance.
- Prompt handling of noise complaints received through grievance mechanisms,

Environmental Engineer

It is responsible for immediately notifying the HSE manager of the disruptions that occur in the execution of the plan in accordance with the standards covering the construction activities. At the same time, it is responsible for making changes in the plan and keeping it updated in case of changes in the project conditions, revision of legal regulations, revisions in international conditions.

Headquarter E&S Manager

Responsible for managing infrastructure and superstructure projects regarding environmental and social governance issues and member of the Executive E&S Committee on behalf of the REC.

SubRECs and Employees

- Understanding and acting in accordance with the methods and guidelines outlined in this procedure.
- Understanding the noise control conditions relevant to their job and acting in accordance with this procedure during their duties.
- Following the instructions or recommendations of supervisors in accordance with noise control and monitoring conditions.



- Accordingly, those who are unsure of their legal, administrative or political practices are responsible for taking administrative or supervisory direction.

Sub-RECs are responsible for allocating individual responsibility within their organization for the control of construction noise at the construction site.

PIU (Project Implementation Unit)

- **PIU Physics Engineer** who is responsible for supervising health and safety for the Project.
- **PIU Department Manager (Superstructure / Civil Engineer)** will be responsible for overseeing the implementation of all health, safety and social measures, as specified within the disclosure package of the Project, and regular reporting to AYGM PIU.
- **PIU Department Manager (Environmental and Feasibility / Environmental Engineer)** will be responsible for supervising the implementation of all environmental and biodiversity measures, as specified within the disclosure package of the Project, and regular reporting to AYGM PIU.

Executive Environmental and Social Management Committee

- Executive E&S Committee Project Manager (Department Head / Branch Manager /Head of Department) will be ultimately responsible for overseeing the activities undertaken by the AYGM/TCDD specialists (listed below), overseeing the implementation of mitigation measures and management procedures specified within the disclosure package of the Project, and overseeing the preparation and implementation of a CESMP, which will be based on this ESMP.
- Executive E&S Committee Environmental, Health and Safety, and Social (EHSS) Manager (Specialist / Engineer) will be responsible for overseeing all matters that relate to environment, health, safety and social aspects of the Project. Also, s/he will be appointed to be responsible for supporting the implementation of the SEP, by conducting regular consultation with affected communities on any concern regarding the Project. CLOs will also have responsibility for disseminating the Project disclosure package as described in the SEP. They will also conduct regular inspections of records relating to grievances received and their resolution. S/He will report regularly to AYGM PIU.

Further technical staff may be required during the course of the Project, who will be assigned internally by the AYGM, either by means of permanent or temporary basis until the completion of relevant tasks under the Project whilst they undertake their current responsibilities

6. IMPLEMENTATION

Pre-Construction Phase (Design):

The Project benefits from cuttings at sensitive locations. These structures will provide a noise level reduction of between 5 and 10 dB when line-of-sight is obstructed.

Noise barriers have been modelled and predicted to be installed in the following locations:

- Akdeniz, 0+750-1+300, Height 3m
- Akdeniz, 3+500-3+900, Height 3m
- Akdeniz, 3+600-4+000, Height 3m
- Akdeniz, 4+450-4+550, Height 3m
- Akdeniz, 4+400-5+000, Height 3m
- Akdeniz, 5+500-6+000, Height 3m
- Akdeniz, 6+000-6+250, Height 3m
- Akdeniz, 6+800-7+000, Height 3m
- Akdeniz, 7+600-7+850, Height 3m
- Akdeniz, 8+050-8+200, Height 3m
- Akdeniz, 7+750-8+950, Height 3m
- Akdeniz, 13+000-13+250, Height 3m
- Akdeniz, 18+600-20+000, Height 3m
- Tarsus, 40+250-40+900, Height 3m
- Tarsus, 41+650-43+200, Height 3m
- Tarsus, 42+000-43+100, Height 3m
- Seyhan, 350+800-351+400, Height 3m
- Seyhan, 367+650-368+050, Height 3m
- Ceyhan, 404+200-404+750, Height 3m
- Ceyhan, 410+900-411+150, Height 3m
- Ceyhan, 411+150-411+300, Height 3m
- Ceyhan, 441+400-441+600, Height 3m
- Toprakkale, 446+600-447+000, Height 3m
- Toprakkale, 448+400-448+850, Height 3m
- Hasanbeyli, 2+800-3+150, Height 3m
- Hasanbeyli, 6+850-7+100, Height 3m
- Düziçi, 41+400-42+300, Height 3m
- Bahçe, 3+000-3+650, Height 3m
- Nurdağı, 13+500-14+500, Height 3m
- Nurdağı, 13+500-14+500, Height 3m
- Nurdağı, 16+300-78+300, Height 3m
- Nurdağı, 96+150-96+300, Height 3m
- Nurdağı, 97+000-97+600, Height 3m
- Nurdağı, 97+80-98+800, Height 3m

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Noise barriers should comply with the design requirements set in BS EN 1793:1998, Road traffic for noise reducing devices - Test method for determining the acoustic performance, Part 2, or equivalent. The airborne sound insulation for the barrier panels should be at least 24 dB.

REC will undertake optimisation of the noise barriers (height and length), to refine their dimensions and locations.

Vibration impact have been modelled and at following locations rail pads are suggested to intalled in order to minimize the vibration impact to surrounding builds and structures:

- Tarsus, 27+100 - 27+500
- Tarsus, 28+200 - 28+500
- Tarsus, 41+700 - 42+000
- Seyhan, 367+550 - 368+000
- Seyhan, 368+250 - 368+600
- Toprakkale, 447+200 - 447+500
- Hasanbeyli, 2+900 - 3+050
- Nurdağı, 16+550 - 16+700
- Şehitkamil, 124+650 - 125+000

PIU will report to the Lenders on incidents in the monthly EHSS Report.

Construction Phase Mitigation Measures for Noise:

- Monitoring programme will be implemented for defined sensitive receptor locations and specific mitigation measures to be implemented.
- Construction Traffic Management Plan and construction Method Statements will include any agreed noise and vibration mitigation measures.
- Empty vehicles will not have loose chains or other noise “generating parts on the loading platform.
- During off-loading, materials will dropped from an appropriate height to avoid noise disturbance to the surrounding receptors or to minimize noise from the site in general.
- Position of all auxiliary plant (e.g. generators, compressors) should be determined to cause minimal noise disturbance.
- Additional driver training, temporary speed restrictions, improved driving monitoring, etc., will be provided as necessary or required.
- Movement of construction traffic through sensitive receptor community areas will be prevented or limited, wherever possible. If this cannot be avoided, additional measures defined in the Traffic Management Plan such as slower driving rules, physical speed restrictions) will be applied.
- Working hours for some construction equipment or operations with greater noise and vibration impact will be limited to core daytime hours or routes where the area is less susceptible to noise.
- In order to overcome construction noise related problems possible alternative mitigation should be applied by the REC which suits best the practical dynamics of the construction activities;

- Speed limit applications should be applied throughout site for the project vehicles that will transport construction materials/equipment.
- Where possible, noise generating activities will be avoided during quiet times of the day.
- Machinery, equipment and vehicles with lower sound power levels and sound reduced models will be preferred.
- Properly refurbished and/or new machinery, equipment and vehicles will be use to the extent possible.
- Maintenance of construction vehicles will be conducted regularly by means of a regular vehicle maintenance and repair program as per the recommendations of the manufacturer.
- Where applicable, silencers will be installed on the exhaust of vehicles.
- Portable barriers and acoustic enclosures will be put around equipment where necessary.
- Natural topography will be used to create a barrier against noise where feasible.
- Construction traffic through the settlements will be avoided, whenever alternative routes and/or service roads are available.
- Idling of construction vehicles will be avoided.
- Noise monitoring will be carried out throughout the active construction sites in order to prevent any kind of public complaint and nuisance.

These parameters will be monitored and audited:

- Noise monitoring results
- Warnings/penalties given by public authorities
- Complaint records
- Maintenance records of vehicles

Construction Phase Mitigation Measures for Vibration:

Within the scope of the Project, a ground survey study should be carried out and the vibration impact assessment should be updated by evaluating the outputs of this study.

Additional measures will be taken to reduce vibration effects if standards are exceeded, and, if necessary, to change operating methods to use equipment that generates lower vibration levels.

These parameters will be monitored and audited:

- Vibration measurements
- Quality Inspection Records
- Warnings/penalties given by public authorities
- Complaint records

7.MONITORING, ASSURANCE AND VERIFICATION

Key success indicators (KPIs) of this procedure will be monitored, verified and evaluated by the relevant parties in accordance with their responsibilities set forth in the E&S Governance document, within the scope of the MAOG-RECU-GB-GNL-IS-PRG-0007-0 HSE Monitoring, Assurance and Verification Procedure.



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