

# Environmental Monitoring Report

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## **GEORGIA: GEORGIAN SUSTAINABLE URBAN TRANSPORT INVESTMENT PROGRAM, Tranche 2**

**(Financed by the Asian Development Bank)**

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**July, 2016**

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## Modernization of Tbilisi-Rustavi Section of the Tbilisi- Red Bridge (Azerbaijani Border) Road Project (Sections 1 and 3)

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## ABBREVIATIONS

ADB - Asian Development Bank

BOD - Biochemical Oxygen Demand

CA - Cross section area

CC - Civil Contractor

COD - Chemical Oxygen Demand

DC - Design Consultant

EA - Executing Agency

EIA - Environmental Impact Assessment

EIP - Environmental Impact Permit

EMP - Environmental Management Plan

EMS – Environmental Management System

GoG - Government of Georgia

IA - Implementing Agency

IEE - Initial Environmental Examination

M – Meter

MC - Management Contractor

MoRDI - Ministry of Regional Development & Infrastructure

MDF – Municipal Development Fund of Georgia

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## EXECUTIVE SUMMARY

Upgrading and improvement of local transport and transport-related structures plays a significant role in the development of Georgia infrastructure. To this effect a number of important activities have been implemented and financed from the budget of Georgia and from other sources. Recently several significant programs, financed through state budget, loans and grants, have been implemented with this regard.

On 24 July, 2012 MFF - Sustainable Urban Transport Investment Program, Tranche 2 Loan and Project agreements were signed between Georgia and Asian Development Bank. MFF-Sustainable Urban Transport Investment Program – Tranche 2 (SUTIP T2) includes: (i) Urban Transport Infrastructure Improvement; (ii) Institutional Capacity Development and (iii) Project Management.

The program will provide efficient, reliable and affordable urban transport infrastructure and services, thereby increasing economic growth potential and competitiveness of urban communities, improving livelihoods of over 1.5 million people (approx. 35% of Georgian population). The project also will: (I) improve urban, environment and communities' access to economic opportunities and to public and social services; (II) promote efficient and sustainable urban transportation; and (III) generate income and employment opportunities.

The environment classification for Tranche 2 is Environmental Category B, as the subproject under SUTIP 2 was classified as category B which will not have significant irreversible or permanent negative environmental impacts during or after construction and required preparation of Initial Environmental Examination (IEE). The environmental categorization of subproject was conducted by using ADB's Safeguard Policy Statement (2009).

The Municipal Development Fund of Georgia (MDF) is the project executing and implementing agency. The Project is financed by the loan ADB 2879-GEO. Sustainable Urban Transport Investment Program for Engineering, Procurement, Construction Management and Supervision of the Modernization of Tbilisi-Rustavi Section of the Tbilisi-Red Bridge (Azerbaijani Border) Road of 17.1km from Tbilisi to Rustavi which is part of Tbilisi metropolitan area and located in the south-east of Tbilisi.

At present the Tbilisi – Rustavi road section is one of the busiest and over- trafficked arteries of the city as about 17,000 vehicles per day exceeding traffic capacity. To solve the problems above, the modernization of the Tbilisi-Rustavi road section was declared as the priority project by the Government of Georgia with the goal to upgrade it to a Category - I road with 4 to 6 lanes and 120 km/hr of design speed.

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## 1. INTRODUCTION

### 1.1 Background Information on the Project

1. Design envisages preparation of detailed design and bidding documents for the modernization of Tbilisi-Rustavi section of the Tbilisi–Red Bridge road (Azerbaijan border) S-4. International road Tbilisi–Red Bridge (Azerbaijan border) is an integral part of TRACECA Transport Corridor. The road links Georgia with Azerbaijan as well as with Europe and Asia.
2. Tbilisi-Rustavi section of Tbilisi–Red Bridge (Azerbaijan border) road links Tbilisi with the town Rustavi (administrative center of Kvemo Kartli). The road also links Tbilisi with the regional Centre Gardabani.
3. Currently Tbilisi-Rustavi road is located in Tbilisi and Gardabani district. Technical parameters of the road do not meet safety requirements and do not ensure undisturbed traffic. As it was mentioned before, safety on the road is a problematic issue: frequent accidents leading to injuries and human toll as well as economic loss. The road improvement aims at improved road parameters, decrease in traffic congestions as well as decreased number of road accidents.
4. Detailed design for the modernization of Tbilisi-Rustavi section of Tbilisi-Red Bridge road (Azerbaijan border), which length entirely is 17.1k m. divided into three sections:
  - First section Tbilisi-Ponichala, length 4.0 km;
  - Second section Ponichala, length 6.5 km;
  - Third section Ponichala-Rustavi, length 6.6 km.

### 1.2 Project area

5. The new alignment study and Economy Analysis accompanying with traffic analysis through actual calculation of cost and field study. Considering the construction cost and compensation cost, new alignment has been recommended and selected by MDF through the detailed comparison of many alternatives.
6. The interventions considered under this Tranche include road shoulder improvement, road widening for development of 4 or 6 lanes from existing 2 lanes, pavement strengthening, drainage improvement, construction of new bridges/railway bridges, retaining walls, interchanges, overpass and underpasses for easy crossing of the local people and animals.
7. The full length of the design road is 17.1k m (including Section 2, with length of 6, 5 km).  
Length for  
Section 1 and 3 is -10,6 km
8. **Section 1 : Tbilisi-Ponichala section** envisaged in the design, starts in Tbilisi in Gulia Street at PK 0+00, goes along the right embankment of the river Mtkvari up to PK 20+00 then joins Vakhtang Gorgasali street and ends at PK 40+00. Length of this section is 4.0 km.
9. **Section 3 : Ponichala-Rustavi section** envisaged in the design starts 56 m before the km 14

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of Tbilisi-Red Bridge road i.e. on km 13+944, PK 105+00 accordingly and ends 400 m before the entrance to Rustavi at km 20+550 PK 171+00 accordingly. Design road axis passes on the right shoulder of the existing road. Length of this section is 6.6 km. Design section Ponichala-Rustavi is entirely located in Gardabani district.



## 1.3. Construction activities and current status

10. Construction Contractor of the project is Sinohydro Corporation Limited (China). Contract with Sinohydro Corporation Limited (China) was signed on March 10, 2014. In order to conduct construction supervision and provide project management and technical assistance to MDF, contract with Dohwa Engineering Co.LTd was signed on January 20, 2012, on Procurement, Construction Management and Supervision of Tbilisi-Rustavi Section of Tbilisi-Red bridge (Azerbaijan Border) Road -SUTIP/C/QCBS-3.
11. The Civil Works Contract was amended extending the construction period from 708 days to 769 days, i.e. from 31 March until May 31, 2016. Time extension by 61 days was originated by delayed handing of site possession rights for Sections of Secondary Road and unexpected utilities located under the given Sections of Secondary Road.
12. Construction works on Section I and Section III were being processed in compliance with the agreed Work Schedule which was amended three times. MDF was fully dedicated and mobilized to ensure smooth implementation of the project. MDF was monitoring construction progress by attending the regular weekly meetings between the Engineer and the Contractor. At these meetings the progress of works was discussed. MDF was requesting from the Engineer and Contractor strict and unconditional compliance with ADB requirements and Georgian legislation in terms of safety and safeguards.
13. By May 31, 2016, substantial parts of permanent works at Sec. I (PK0+00~PK4+00), Sec. III (PK105+00~PK171+00) and Secondary Road (Sec. III), have been completed in accordance with the Contract and to the satisfaction of MDF. Accordingly, taking-over procedures have been started and final inspection by the Employer has been implemented in July 2016.
14. Safety Audit reports have been prepared for Section I and Section III by Individual Road Consultant. All recommended safety features were installed. According to International



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consultant the project was found to be in general compliance with ADB safety guidelines, Georgian law, and applicable design standards.

## 2. ENVIRONMENTAL COMPLIANCE AUDIT

### 2.1 Audit Goals and Objectives

15. This Environmental Compliance Audit Report is being prepared to comply with the 2009 ADB's SPS and Georgian legislation, including Safeguards Requirement and aims to identify past and present concerns from the construction activities that related to impacts on environment. The specific objectives of the audit can be summarized as follows:

- Determine and verify whether all environmental requirements, criteria and constraints, prescribed in IEE, SSEMP/EMP and the Concessionaire's Environmental Policy have been adhered to during the construction phase;
- Determine and verify whether the mitigation actions and rehabilitation requirements contained in the SSEMP/EMP have been appropriate and successful to prevent or control environmental pollution and/or damage;
- Ensure that an appropriate environmental monitoring and control program exists to follow up on mitigation and rehabilitation works completed during the construction phase;
- Ensure that appropriate environmental monitoring and control program exists for monitoring of all environmental aspects during the operational phase;
- To identify any shortcomings in the SSEMP /EMP and EMS system implemented during the construction phase and to recommend alterations to the EMS applicable to the operational phase.

### 2.2 Methodology

16. The compliance environmental audit of Modernization of Tbilisi-Rustavi Section of the Tbilisi-Red Bridge (Azerbaijani Border) Road Project was done in several stages. At stage one so called 'desk audit' was conducted and the available materials were studied. The following documents were analyzed at the given stage:

- Initial Environmental Examination (IEE) for the subproject;
- SSEMPs;
- Bi-Annual Environmental Monitoring Reports;
- Quarterly Environmental Reports developed by the Supervision Consultant (DOHWA);
- Records of Environmental Monitoring conducted by the Supervision Consultant DOHWA.

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17. At stage two, the meetings with the Project participants with different degrees of responsibility for meeting the environmental requirements and monitoring were held.
18. At stage three, visit to the site and collection of evidences was accomplished.

## 2.3 Inspection, Monitoring and Reporting

19. The main institutions involved in IEEs/EMPs/SSEMPs implementation and monitoring, are the executing agency (EA) - MDF, the Supervision Consultant(SC), the Construction Contractors and to a lesser extent the Ministry of Environmental and Natural Resources Protection and Municipal Authorities.
20. According to Contract's safeguards issues, Construction Contractor should comply with all applicable national environmental laws and regulations, measures and requirements set forth in the IEE and EMP/ SSEMPs. For managing environmental impacts, carrying out all of the monitoring and mitigation measures set for IEE and EMP/SSEMPs documents Contractor should establish an effective operational system and submit adequate reports to the Supervision Company (DOHWA) on the carrying out of such measures.
21. Contractor's environmental specialist Lasha Gorgiladze (hired in September, 2014) performed daily inspection of construction sites. Construction Contractor, through its environmental specialist prepared monthly status reports on the EMP/SSEMPs implementation. Such reports included information on the main types of activities carried out within the reporting periods, status of any clearances'/permits/licenses which were required for carrying out such activities, mitigation measures applied and any environmental issues emerged in relations with suppliers, local authorities, affected communities etc. Contractor's monthly status reports were submitted to the technical supervisor and MDF.
22. Environmental specialist of the Supervision Company Paata Chankotadze performed regular monitoring of construction site. Prepared monthly reports on the status of EMP/SSEMPs implementation and environmental performance of the Contractor. These reports were based on the contractor's reports and analyzing of their contents. Technical supervisor assessed how accurate was the factual information provided in the contractor's reports, filled any gaps identified in them, and evaluated adequacy of mitigation measures applied by contractor. Technical supervisor highlighted any cases of non-compliance with EMP/SSEMPs, informed on any acute issues brought up by contractor or revealed by supervisor himself, and proposed corrective actions.
23. The non-compliances that were mainly revealed by the Supervision Consultant environmental specialist, were reflected in relevant reports. 36 non-compliances have been identified during the construction period. Corrective actions were planned and implemented for each of 36 non-compliances. The quality of performance of corrective actions was controlled. Identified non-compliances and performed corrective actions were reflected in a monthly and quarterly reports prepared by the Supervision Consultant, as well as in Bi-annual EMRs submitted to the ADB by MDF.

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24. An individual and joint on-site monitoring activities were conducted by Environmental Monitoring Specialist of SC and Environmental Specialist of MDF. 36 non-compliances have been identified during the construction period. Corrective actions have been designed for each non-compliance. Furthermore, the SC and MDF have conducted environmental monitoring to assess effectiveness of implementation of designed corrective actions.
25. Contractor submitted to the SC monthly progress reports that included environmental issues. SC developed quarterly progress reports, including environmental monitoring and submitted to the Employer. The MDF environmental specialist prepared bi-annual environmental monitoring reports based on the information submitted by the Contractor and Supervision Consultant and the regular monitoring of the sites.

## 3. PROJECT SITE AUDIT

### 3.1 Construction Camp

26. In the Construction phase, the Employer passed to the Contractor the territory on the southern side bordering with the PK 110 of construction corridor to build a construction camp. The construction materials needed for the project were temporarily stored in the construction area. The camp was also used as a dwelling space and office for the Contractor and the Consultant. On the territory of the Construction camp, the Contractor has installed asphalt and batching plants, beam factory and garage. Asphalt plant was installed on the territory of construction camp in July 2015. Environmental permit has been received from MoENRP. For batching plants, the Contractor has prepared "*Inventories of Emissions of Hazardous Materials in to Ambient Air*" and agreed calculated emissions with the Ministry of Environmental and Natural Resources Protection of Georgia (MoENRP).
27. The camp area was connected to the central water supply system. In addition, there was a 25-m<sup>3</sup>-capacity septic concrete tank located on the territory of the camp where wastewaters were collected.
28. The camp area was not reinstated to preconstruction condition due to the possibility of its re-use during the construction of section 2.

### 3.2 Construction and inert Waste

29. The Contractor has signed agreement with "Tbiliservice Group" for disposal of construction waste on Gldani municipal landfill. Sometimes the Contractor disposed it on landfill at section 1.
30. The Contractor has disposed inert waste on Gardabani and Tbilisi municipal landfills. According to the Engineer's instruction the Contractor has removed illegally stored inert waste at the land plot, located at PK 128.
31. Used tires were collected on construction camp. The Contractor has delivered tires to the licensed sub-contractor "N electric cable".

### 3.3 Hazardous waste

32. Hazardous waste was collected in the containers which were disposed in covered building. Most of hazardous waste was reused (used oil was using for oiling of forms for beams, used electrical accumulators were sending to supplier).

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33. The Contractor passed hazardous waste to licensed subcontractor, “Sarini” Ltd, based on written agreement.

## 3.4 Borrow Pits

34. Contractor has provided licenses N1002015; N1002016; N1002318; N1002388; N1001909 for 5 borrow pits. Borrow Pits Treatment Plans (BPTP), requested by Georgian legislation have been prepared by the Contractor and submitted to the Engineer. According to ADB’s CSR Mission (conducted in May 2015) instruction, the Contractor has prepared and submitted to the Engineer Borrow Pit Treatment Plans (BPTPs) in SSEMP format for each borrow pit during June-September period. BPTPs were revised and approved by MDF’s environmental specialist and submitted to ADB/RETA National Environmental Safeguards Consultant as well.

35. The Contractor has reinstated borrow pit, located at PK 107. Other borrow pits probably will be used during construction of section 2 (Contractor has no obligation to reinstate all borrow pits immediately after completion of the Project).

## 3.5 Existing Infrastructure facilities (communications)

36. During implementation of construction activities the Contractor has damaged several water pipes and underground power wires. Currently all damaged facilities have been rehabilitated.

## 3.6 Tree planting

37. According to EIA and IEE requirements the Contractor has prepared compensation plans for ordinary and red data list trees. Planting locations have been agreed with Gardabani and Tbilisi municipalities and MoE. The Contractor has planted 5,474 different species of trees in total. Only 14-15 % of planted trees were withered. Especially, many trees were withered at PK 20. According to Contract requirements, the Contractor will replant trees in autumn 2016. 1 year of Guarantee on replanted trees should be started in moment of replanting. The Employer will monitor planting activities and check condition of trees in May and in autumn 2017.

## 3.7 Grass Seeding

38. Due to significant top soil losses during its stripping and storing, the Contractor has covered slopes of embankment of section 3 and median of both sections by subsoil, extracted from borrow pit, located at PK 110 instead topsoil. For implementation of grass seeding activities the Contractor has employed qualified subcontractor (“Doctor ENGS” ltd). Grass seeding on both sections was completed on 15.05.2016. Currently significant sprouts cannot be found on seeded areas. According to sub-contractor - “Doctor ENGS” ltd’s explanation all slopes will be reseeded in autumn 2016 and in spring 2017 all seeded areas will be covered by grass; After each rain significant erosion processes are activating on slopes of embankment of section 3. The Contractor fills cracks using subsoil, extracted from borrow pit. In May 2017 the Employer/the Engineer will conduct site audit. If the grass will not cover all slopes and erosion processes will be visible on slopes, actual price

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of covering of slopes by topsoil and grass seeding will be deducted from amount of guarantee.

## 3.8 Asphalt Plant

39. Asphalt plant has been removed by the Contractor from the construction camp to Kobuleti Bypass Project (L2843: Road Corridor Investment Program).

## 4. NON-COMPLIANCIES

40. Site -monitoring visit for preparing of this audit report took place on 12 July, 2016. In order to determine the degree of effectiveness of conducted restoration works following the completion of the project the Consultant performed the field audit along the Construction corridor. The Consultant also audited construction camp and Planting areas. During final site audit two non-compliances have been identified:

41. **Non-Compliance N1: Requirement:** Coverage of the slopes of embankment by topsoil and seeding. (Source: Technical specifications Item 618 and 3005).

**Existing situation:** Slopes of the Embankment at section 3 are covered by subsoil instead of topsoil. Erosion processes on slopes were activated.

**Proposed Corrective action:** The Contractor shall fill all cracks and ensure growing of grass on the slopes of section 3. In the case, if in May 2017 cracks on the slopes will be visible and grass will not grow, the Employer will deduct adequately calculated amount from the Contractor's guaranty and appoint another contractor to restore the slopes of embankment.

**Figures 1 and 2: Erosion of slopes of embankment**



42. **Non-Compliance 2:** At section 1 on PK20 195+823 = 1,018 trees were planted in total, from which approximately 300 trees were withered, which is 30% of planted trees on mentioned location. It should be noted that at this place withering rate was highest. In other places withering was quite low. In general only 13-14% of all planted trees (5,474) were withered.

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**Requirement:** Planting of trees at the land plots, allocated by Tbilisi and Rustavi Municipalities (Source: Technical specifications, Item 3006)

**Proposed Corrective action:** The Contractor shall plant new trees instead of withered ones in autumn 2016. Important, that guaranty period (1 year) should be started from autumn 2016. The Employer will monitor planting activities and check condition of trees in May and in autumn 2017.

**Figures 3 and 4: 30% of trees, planted on PK20 of section 1 were withered**



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## 5. POST-CONSTRUCTION ENVIRONMENTAL AUDIT CHECK-LIST

Site: 1 and 3-d sections of Tbilisi-Rustavi highway

Time: 12.07.2016

No.	Activity	Impacts	Measure/s suggested as per EIA/SSEMP/EMP	Check	Measures Implemented
1	Project site vegetation rehabilitation (re-vegetation)	Change of land cover, erosion resulting from the construction activities	Plantation and vegetation measures (trees, grass etc.)	DHWA`s Environmental specialist Paata Chankotadze	<p><b>Reinstatement of dividing strip, slopes of embankment and interchanges</b></p> <p>Due to significant top soil losses during its stripping and storing, the Contractor has covered slopes of embankment of section 3 and median of both sections by subsoil, extracted from borrow pit, located at PK 110, instead topsoil. For implementation of grass seeding activities the Contractor has employed qualified subcontractor (Doctor ENGS ltd). Grass seeding (method of hydraulic seeding was used) on both sections was completed on 15.05.2016. Currently significant sprouts cannot be found on seeded areas, however, that process is started is visible and obvious. According Doctor ENGS ltd`s explanation all slopes will be reseeded in autumn 2016 and in spring 2017 all seeded areas will be covered by grass;</p>

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					<p>After each rain significant erosion processes are activating on slopes of embankment of section 3. The Contractor fills cracks using subsoil, extracted from borrow pit.</p> <p>In May 2017 the Employer/the Engineer will conduct site audit. If the grass will not cover all slopes and erosion processes will be visible on slopes, actual price of covering of slopes by topsoil and grass seeding will be deducted from amount of guarantee.</p> <p><b>Tree planting</b></p> <p>According EIA and IEE requirements the Contractor has prepared compensation plans for ordinary and red data list trees. Planting locations have been agreed with Gardabani and Tbilisi municipalities and MoE. Totally the Contractor has planted 5,474 trees. Some trees at PK 20 were withered. According to Contract requirements the Contractor will replant trees in autumn 2017. 1 year of Guarantee on replanted trees should be started in moment of replanting.</p>
2	Oil management (Used oils)	Equipment and machinery repairing	Proper disposal of used oil	DHWA`s Environmental specialist Paata Chankotadze	Used oil was used by the Contractor for lubricating of forms on beam plant.
4	Waste management	Waste accumulation,	Collect and disposal all wastes at designated	DHWA`s Environmental	Used tires were collected on construction camp. The Contractor has delivered tires



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		air and soil pollution	location;	specialist Paata Chankotadze	to the licensed sub-contractor; Construction waste was disposed on Gardabani and Tbilisi municipal landfills based on written agreement; Hazardous waste was passed to ltd "Sarini"
			Scrap metals properly stored to be sent to designated organization for recycling		Scrap will be sent to designated organization. Currently it is stored on construction camp.
5	Remove disabled equipment	Housekeeping matters	Equipment of the Contractor's property removed or stockpiled to be removed;		Some equipment is still disposed on construction camp.
			Contractor equipment and machinery removed;		
7	Borrow sites and quarries	Land slide, soil erosion, change in riverbed and landscape, accidents	Borrow sites and quarries restored	DHWA's Environmental specialist Paata Chankotadze	The Contractor has reinstated borrow pit, located at PK 107. Other borrow pits will be used during construction of section 2 (THE Contractor has no obligation to reinstate all borrow pits immediately after completion of the Project).
8	Existing Infrastructure facilities (communications)	Damage or disturbance to existing services (supply of electricity, water, gas,	Reinstatement to pre-construction conditions or proper relocation, to be certified by the service companies	DHWA's Environmental specialist Paata Chankotadze	During implementation of construction activities the Contractor has damaged several water pipes and underground power wires. Currently all damaged facilities have been rehabilitated.

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		telecom etc.)			
9	Camp site facilities	Residual pollution and disturbance to the localities	All temporary facilities removed and cleaned up	DHWA`s Environmental specialist Paata Chankotadze	The construction camp was constructed on the land plot, temporarily passed by the Ministry of Economy to the Employer. Probably already installed camp facilities will be used during construction of section 2 (construction activities will be started in autumn 2017. Final reinstatement of camp site will be subject of discussion between the Employer and the Contractor.
10.	Road Safety signs			DHWA`s Environmental specialist Paata Chankotadze	Road safety signs were installed according to the project requirements.

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## 6. RECOMMENDATIONS

43. Along with the above-mentioned findings the Consultant made the following recommendations:

- The Contractor shall fill all cracks and ensure growing of grass on the slopes of section 3.
- The Contractor shall plant new trees instead of withered ones, in autumn 2016. Important, that guaranty period (1 year) should be started in autumn 2016. The Employer should monitor planting activities and check condition of trees in May and in autumn, 2017.

44. More detailed recommendations with indication of the entities responsible for their implementation as well as the terms for implementation the recommendations are provided in the table 2.

**Table 2: Recommendations Matrix**

#	Recommendation	Responsible entity for Audit	Terms of Implementation	Implementation deadline	Responsible entity for restoration
1	The Contractor shall fill all cracks and ensure growing of grass on the slopes of section 3. In the case, if in May 2017 cracks on the slopes will be visible and grass will not grow, the Employer will deduct actual price from Contractor's guaranty and appoint another contractor to restore the slopes of embankment	MDF, DOHWA	After implementation of corrective actions	Before defect liability period	Construction Contractor
2	The Contractor shall plant new trees instead of withered ones in autumn 2016. Important, that guaranty period (1 year) should be started in autumn 2016.	MDF, DOHWA	After implementation of corrective actions	Before defect liability period	Construction Contractor

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## 7. COMPLAINTS

45. The representative of Auto-House 2011 (Auto-Market), approached MDF and ADB putting forward a concern about the recently completed section of road. The concern relates to hindrance to access to their business from the road, demand to elevate of the level of the car yard to the road pavement level, and demand for compensation for financial losses that the company has experienced since the new road was built. A series of meetings were held between the complainant, MDF and ADB between June-July 2016 in order to address the concerns and to resolve the problem.