

**REPUBLIC OF ARMENIA  
MINISTRY OF TRANSPORT AND COMMUNICATION  
TRANSPORT PIU SI**

**LIFELINE ROAD NETWORK IMPROVEMENT  
PROJECT**

**ENVIRONMENTAL MANAGEMENT PLAN  
FOR SMALL SCALE ROAD REHABILITATION**

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**REHABILITATION OF THE SECTION AT KM 6+500 – KM 10+834  
OF THE ROAD M 11 MARTUNI-VARDENIS OF THE RA  
GEGHARKUNIK MARZ**

**March 2016**

## PART 1: GENERAL PROJECT AND SITE INFORMATION

INSTITUTIONAL & ADMINISTRATIVE		
Country	Armenia	
Project title	Rehabilitation of M 11, Martuni-Vardenis road section.	
Scope of project and activity	<p>The project envisages rehabilitation of the km 6+500 – km 10+834 section of the M 11 road.</p> <p>Design work is done in accordance with acting norms and standard designs.</p> <p>The main technical parameters adopted in the design:</p> <ul style="list-style-type: none"> <li>➤ Subgrade width 13.2m</li> <li>➤ Carriageway width 7.8m</li> <li>➤ Width of shoulders 2.7m</li> <li>➤ Sidewalk 0.5-1.5m</li> </ul> <p>The following works are designed on the basis of visual observation, topography and geological surveys, laboratory test result and environmental measures:</p> <ul style="list-style-type: none"> <li>➤ Rehabilitation of the subgrade.</li> <li>➤ Restoration of the drainage system (repair and construction of culverts), construction of side ditches and chutes.</li> <li>➤ Restoration of pavement.</li> <li>➤ Filling and levelling of shoulders.</li> <li>➤ Road furnishing (access ramps, sidewalks, guardrails, traffic signs and road marking).</li> </ul>	
Institutional arrangements (Name and contacts)	<b>WB</b> Nargis Ryskulova, Task Team Leader	<b>Project Management</b> Transport Projects Implementation Unit SI
Implementation arrangements (Name and contacts)	<b>Safeguard Supervision</b> Darejan Kapanadze, Environment Lennifer Shkabatur, Social	<b>Contactor</b> Construction Contractor (to be selected)
SITE DESCRIPTION		
Name of site	M 11 Martuni-Vardenis road section	
Describe site location	Gegharkunik Marz	Attachement 1: Site Map [x]Y [ ] N
Who owns the land?	Community / State	
Description of geographic, physical, biological, geological, hydrographic and socio-economic context	<p>Administratively, the road section belongs to Gegharkunik marz at Martuni region. The section starts km 6+500 of M-11, Martuni-Vardenis road and ends at the km 10.834. The relief is mountainous and plateau. Altitude marks vary between 1950 and 1960m. The section is located in the landscape-hydrological zone of the Sevan. The construction site is located in III Climatic zone. Weather in summer is warm and weather in winter is moderate cold. Annual average air temperature 5.4°C. Average temperature in the coldest month -5.8°C. Average temperature in the warmest month 16.0°C. Absolute maximum temperature in summer 34°C. Minimum temperature in winter -32°C. Annual average wind speed 2.7 m/sec. Annual precipitation 501 mm. Maximum depth of soil freezing 116 cm.</p> <p>The project road is near of the Vardenik village. The number of main population of this community is about 9880 people, from which about 48.8% are women.</p>	
Locations and distance for material sourcing, especially aggregates, water, stones	Water to be supplied for construction works will be delivered to construction sites in tanks or provided from a source for which the Water Use Permit is issued to allow water intake. Aggregates will be obtained from the licensed providers located within the project area. Contractor may also extract aggregates, in this case contractor must obtain an extraction license prior to commencement of extraction. Asphalt will be purchased from an official supplier.	

<b>LEGISLATION</b>	
Identify national & local legislation & permits that apply to project activity	<p><i>Environmental permits required for accomplishing the works envisaged by the project:</i></p> <ul style="list-style-type: none"> <li>➤ <i>Construction license to be possessed by Construction Contractor,</i></li> <li>➤ <i>Construction permit to be obtained by the Construction Contractor from rural municipality,</i></li> <li>➤ <i>Mining license to be possessed by Construction Contractor in case it operates a borrow pit,</i></li> <li>➤ <i>Agreement for disposal of construction waste to be obtained by Construction Contractor from Community leader.</i></li> </ul>
<b>PUBLIC CONSULTATION</b>	
Identify when / where the public consultation process took place	<i>Public consultations have been carried out in the project area; this included the presentation and discussion of EMP to the population and representatives of the local municipalities. The minutes of the public consultation, photos, questions and answers are attached (See Attachment 3).</i>
<b>INSTITUTIONAL CAPACITY BUILDING</b>	
Will there be any capacity building?	[x] N or [ ]Y if Yes, Attachment 2 includes the capacity building program

## PART 2: SAFEGUARDS SCREENING AND TRIGGERS

ENVIRONMENTAL /SOCIAL SCREENING FOR SAFEGUARDS TRIGGERS			
Will the site activity include/involve any of the following?	Activity/Issue	Status	Triggered Actions
	A. Roads rehabilitation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If “Yes”, see Section <b>A</b> below
	B. New construction of small traffic infrastructure	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If “Yes”, see Section <b>A</b> below
	C. Impacts on surface drainage system	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If “Yes”, see Section <b>B</b> below
	D. Historic building(s) and districts	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If “Yes”, see Section <b>C</b> below
	E. Acquisition of land <sup>1</sup>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If “Yes”, see Section <b>D</b> below
	F. Hazardous or toxic materials <sup>2</sup>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If “Yes”, see Section <b>E</b> below
	G. Impacts on forests and/or protected areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If “Yes”, see Section <b>F</b> below
	H. Risk of unexploded ordinance (UXO)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If “Yes”, see Section <b>G</b> below
	I. Traffic and Pedestrian Safety	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If “Yes”, see Section <b>H</b> below

<sup>1</sup> Land acquisitions includes displacement of people, change of livelihood encroachment on private property this is to land that is purchased/transferred and affects people who are living and/or squatters and/or operate a business (kiosks) on land that is being acquired.

<sup>2</sup> Toxic / hazardous material includes but is not limited to asbestos, toxic paints, noxious solvents, removal of lead paint, etc.

## PART 3: MITIGATION MEASURES

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
<b>0.</b> General Conditions	Notification and Worker Safety	<ul style="list-style-type: none"> <li>(a) The local construction and environment inspectorates and communities have been notified of upcoming activities</li> <li>(b) The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works).</li> <li>(c) All legally required permits have been acquired for construction and/or rehabilitation.</li> <li>(d) The Contractor formally agrees that all work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment.</li> <li>(e) Workers' PPE will comply with international good practice (hardhats, as needed masks and safety glasses, harnesses and safety boots).</li> <li>(f) Appropriate signposting of the sites will inform workers of key rules and regulations to follow.</li> </ul>
<b>A.</b> General Rehabilitation and /or Construction Activities	Air Quality	<ul style="list-style-type: none"> <li>(g) During excavation works dust control measures shall be employed, e.g. by spraying and moistening the ground.</li> <li>(h) Demolition debris, excavated soil and aggregates shall be kept in controlled area and sprayed with water mist to reduce debris dust.</li> <li>(i) During pneumatic drilling or breaking of pavement and foundations dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site.</li> <li>(j) The surrounding environment (sidewalks, roads) shall be kept free of soil and debris to minimize dust.</li> <li>(k) There will be no open burning of construction / waste material at the site.</li> <li>(l) All machinery will comply with the national emission regulations, will be well maintained and serviced and there will be no excessive idling of construction vehicles at sites.</li> </ul>
	Noise	<ul style="list-style-type: none"> <li>(a) Construction noise will be limited to restricted times agreed to in the permit.</li> <li>(b) During operations the engine covers of generators, air compressors and other powered mechanical equipment shall be closed, and equipment placed as far away from residential areas as possible.</li> </ul>
	Water Quality	<ul style="list-style-type: none"> <li>(a) The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in canalization and nearby streams and rivers.</li> </ul>

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
	Waste management	<ul style="list-style-type: none"> <li>(a) Waste collection and disposal pathways and sites will be identified for all major waste types expected from excavation, demolition and construction activities.</li> <li>(b) Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers.</li> <li>(c) Construction waste will be collected and disposed properly by licensed collectors.</li> <li>(d) The records of waste disposal will be maintained as proof for proper management as designed.</li> <li>(e) Whenever feasible Contractor will reuse and recycle appropriate and viable materials (except when containing asbestos).</li> </ul>
<b>B.</b> Impacts on surface drainage system	Water Quality	<ul style="list-style-type: none"> <li>(a) There will be no unregulated extraction of groundwater, nor uncontrolled discharge of process waters, cement slurries, or any other contaminated waters into the ground or adjacent streams or rivers; the Contractor will obtain all necessary licenses and permits for water extraction and regulated discharge into the public wastewater system.</li> <li>(b) There will be proper storm water drainage systems installed and care taken not to silt, pollute, block or otherwise negatively impact natural streams, rivers, ponds and lakes by construction activities.</li> <li>(c) There will be procedures for prevention of and response to accidental spills of fuels, lubricants and other toxic or noxious substances.</li> <li>(d) Construction vehicles and machinery will be washed only in designated areas where runoff will not pollute natural surface water bodies.</li> </ul>
<b>C.</b> Historic building(s)	Cultural Heritage	<ul style="list-style-type: none"> <li>(a) If construction works take place close to a designated historic structure, or are located in a designated historic district, notification shall be made and approvals/permits be obtained from local authorities and all construction activities planned and carried out in line with local and national legislation.</li> <li>(b) It shall be ensured that provisions are put in place so that artifacts or other possible “chance finds” encountered in excavation or construction are noted and registered, responsible officials contacted, and works activities delayed or modified to account for such finds.</li> </ul>
<b>D.</b> Acquisition of land	Land Acquisition Plan/Framework	<ul style="list-style-type: none"> <li>(a) Land acquisition is not expected along the road.</li> <li>(b) If expropriation of land was not expected but is required, or if loss of access to income of legal or illegal users of land was not expected but may occur, that the Bank’s Task Team Leader shall be immediately consulted.</li> </ul>

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
<b>E. Toxic materials</b>	Asbestos management	(a) If asbestos is located on the project site, it shall be marked clearly as hazardous material. (b) When possible the asbestos will be appropriately contained and sealed to minimize exposure. (c) The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust (d) Asbestos will be handled and disposed by skilled & experienced professionals. (e) If asbestos material is be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately. Security measures will be taken against unauthorized removal from the site. (f) The removed asbestos will not be reused.
	Toxic / hazardous waste management	(a) Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information. (b) The containers of hazardous substances shall be placed in a leak-proof container to prevent spillage. (c) The wastes shall be transported by specially licensed carriers and disposed in a licensed facility. (d) Paints with toxic ingredients or solvents or lead-based paints will not be used.
<b>F. Affected forests, wetlands and/or protected areas</b>	Ecosystem protection	(a) All recognized natural habitats, wetlands and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities. (b) A survey and an inventory shall be made of large trees in the vicinity of the construction activity, large trees shall be marked and cordoned off with fencing, their root system protected, and any damage to the trees avoided. (c) Adjacent wetlands and streams shall be protected from construction site run-off with appropriate erosion and sediment control feature to include by not limited to hay bales and silt fences. (d) There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.
<b>G. Risk of unexploded ordinance (UXO)</b>	Hazard to human health and safety	(a) Before start of any excavation works the Contractor will verify that the construction area has been checked and cleared regarding UXO by the appropriate authorities.

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
<b>H</b> Traffic and pedestrian safety	Direct or indirect hazards to public traffic and pedestrians by construction activities	<p>(a) In compliance with national regulations the Contractor will insure that the construction site is properly secured and construction related traffic regulated. This includes but is not limited to:</p> <ul style="list-style-type: none"> <li>▪ Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards,</li> <li>▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes,</li> <li>▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement,</li> <li>▪ If required, active traffic management by trained and visible staff at the site for safe passage for the public,</li> <li>▪ Ensuring safe and continuous access to all adjacent office facilities, shops and residences during construction.</li> </ul>

## PART 4: MONITORING PLAN

<b>What</b> (Is the parameter to be monitored?)	<b>Where</b> (Is the parameter to be monitored?)	<b>How</b> (Is the parameter to be monitored?)	<b>When</b> (Define the frequency / or continuous?)	<b>Why</b> (Is the parameter being monitored?)	<b>Cost</b> (if not included in project budget)	<b>Who</b> (Is responsible for monitoring?)
<b>CONSTRUCTION PHASE</b>						
The community is notified of upcoming activities	at community leader's office	discussion/ observation	visit before construction works	to ensure awareness on the project works	included in project budget	PIU
All required permits are obtained	at community leader's office and construction contractor	review of documents	visit before construction works	to ensure availability of all required permits and agreements	included in project budget	PIU
Workers use PPE	at construction site	inspection	visit during construction	to ensure safety of workers	included in project budget	PIU
The dust is suppressed at site	at construction site	inspection	visit during construction	to ensure minimal generation of dust	included in project budget	PIU
There is no open burning of construction / waste material at the site	at construction site	inspection	visit during construction	to ensure minimal air pollution	included in project budget	PIU
There is no excessive idling of construction vehicles at site	at construction site	inspection	visit during construction	to ensure minimal air pollution	included in project budget	PIU
Construction noise is limited to day-	at construction site	inspection	visit during construction	to ensure minimal generation of noise	included in project budget	PIU

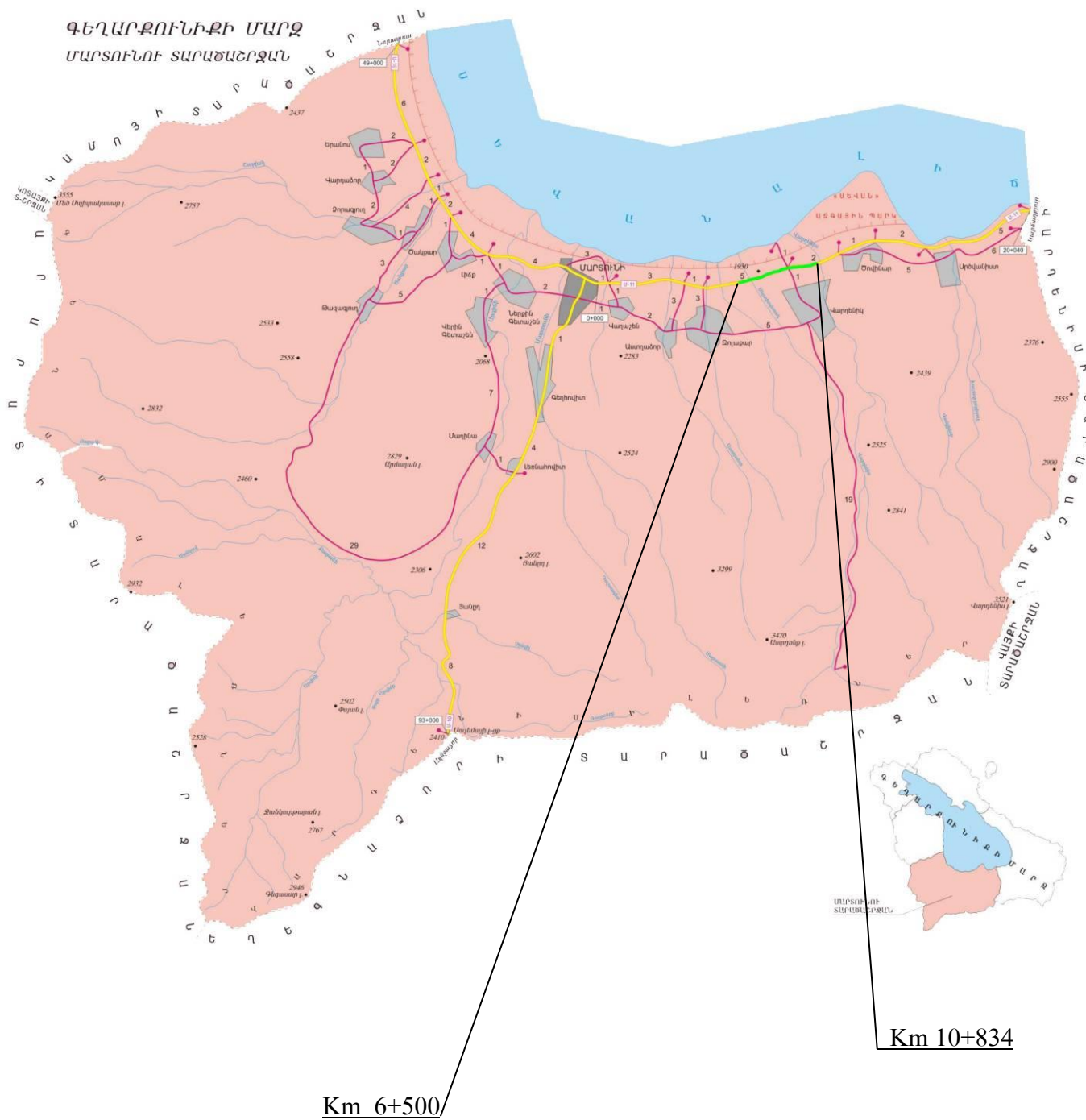
<b>What</b> (Is the parameter to be monitored?)	<b>Where</b> (Is the parameter to be monitored?)	<b>How</b> (Is the parameter to be monitored?)	<b>When</b> (Define the frequency / or continuous?)	<b>Why</b> (Is the parameter being monitored?)	<b>Cost</b> (if not included in project budget)	<b>Who</b> (Is responsible for monitoring?)
time hours						
Waste temporary collection places are identified at the site	at construction site	inspection	visit during construction	to ensure waste is collected at specially designated places	included in project budget	PIU
Construction waste is regularly collected and disposed at the agreed site	at construction site	inspection	visit during construction	to ensure timely removal of waste from construction site	included in project budget	PIU
Construction vehicles and machinery are washed only in designated areas where runoff will not pollute natural surface water bodies	at construction site	inspection	visit during construction, in case of vehicles/machinery washing	to ensure minimal water pollution	included in project budget	PIU
In case of chance finds the works are stopped and information is provided by Ministry of Culture	at construction site	inspection	in case of chance finds	to ensure minimal impact on artifacts	included in project budget	PIU
There are no unlicensed borrow pits, quarries or unapproved waste	at construction contractor's office, at construction site	review of documents, inspection	visit during construction	to ensure minimal impact on environment	included in project budget	PIU

<b>What</b> (Is the parameter to be monitored?)	<b>Where</b> (Is the parameter to be monitored?)	<b>How</b> (Is the parameter to be monitored?)	<b>When</b> (Define the frequency / or continuous?)	<b>Why</b> (Is the parameter being monitored?)	<b>Cost</b> (if not included in project budget)	<b>Who</b> (Is responsible for monitoring?)
dumps used for the project						
Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards	at construction site	inspection	visit during construction	to ensure safety of workers and inhabitants	included in project budget	PIU
Provision of safe passages and crossings for pedestrians where construction traffic interferes	at construction site	inspection	visit during construction	to ensure safety of workers and inhabitants	included in project budget	PIU
<b>OPERATION PHASE</b>						
Cleaning road surface and shoulders from litter deposited out of moving vehicles and from bodies of animals accidentally overrun by vehicles	carriageway and shoulders of the road section	inspection	regular, to be determined by local municipality	to ensure safety of traffic and aesthetic appearance of the road corridor	to be included in the local municipal budget	Vardenik rural municipality

<b>What</b> (Is the parameter to be monitored?)	<b>Where</b> (Is the parameter to be monitored?)	<b>How</b> (Is the parameter to be monitored?)	<b>When</b> (Define the frequency / or continuous?)	<b>Why</b> (Is the parameter being monitored?)	<b>Cost</b> (if not included in project budget)	<b>Who</b> (Is responsible for monitoring?)
Keeping road drainage system operational	carriageway and shoulders of the road section	inspection	regular, to be determined by local municipality	to ensure safety of traffic and decrease frequency and costs of road rehabilitation	to be included in the local municipal budget	Vardenik rural municipality
Timely confinement, deactivation, and removal of liquid or powder spills of cargo in case of road accidents	carriageway and shoulders of the road section	inspection	as required in response to an accident	to ensure safety of traffic and prevent environmental pollution	to be included in the local municipal budget	Traffic Police;  Vardenik rural municipality
Collection and timely disposal of waste from road maintenance works to a designated landfill	carriageway and shoulders of the road section	inspection	as required in response to an accident	to ensure safety of traffic and prevent environmental pollution	to be included in the local municipal budget	Vardenik rural municipality

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**Site Map Road M11 Martuni - Vardenis**  
**Section Km 6+500 - Km 10+834**



## Attachment 2: Photos

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### Attachment 3:

#### STATEMENT

#### Public Consultation

"12" "03" 2016

The Detail Design and Environmental Management Plan of the M11, Martuni-Vardenis km 6+500-km 10+834 road rehabilitation has been prepared by the Local Company "Dorproject Institute" within the framework of the World Bank financed Lifeline Roads Network Improvement Project. The project road passes through the community of Vardenik. During the survey and design the engineering team had closely worked with the head of communities to incorporate the public requests, suggestion and comments into the final Detail Design. The aim of this public consultation is to present and discuss the prepared Detail Design and Environmental Management Plan, and to insure that the public concerns are incorporated in the project. Head of communities were informed prior about the date, time and place of the public consultation.

The design provides for all works for pavement rehabilitation, sidewalk and drainage restoration, and excavation and embankment, as well as there are presented an Environmental Management Plan for the mentioned road section, in particular potential adverse environmental impacts during implementation of rehabilitation works and after their completion, measures to be taken to prevent, mitigate and minimize those impacts, and parties responsible for implementation. Also, there have been submitted the main four sections of the Environmental Management Plan developed in a checklist format. Taking into account that the designed works are rehabilitation in their nature and will be carried out on the existing road, one can conclude that potential adverse impacts on the environment will be low-level, short-term and entirely work-related, and there will arise no need for right-of-way.

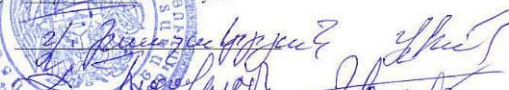
The Environmental Management Plan was thoroughly discussed with the authorities and residents of the community of Vardenik. During discussions, the designers presented works designed for all repair sections, including earthworks, carriageway rehabilitation, sidewalk construction, repair of drainage system, repair of approach roads and access ramps, especially access ramps to the main public places.

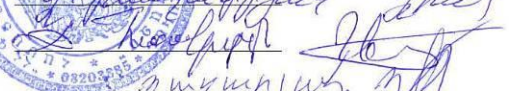
During works for rehabilitation of the road section passing through the village, no land or other property issue will arise on the whole territory of the Vardenik community. At the same time, design works include solutions for the necessary drainage and safety, as well as pavement rehabilitation problems. Places of agricultural crossings are agreed with heads of communities.

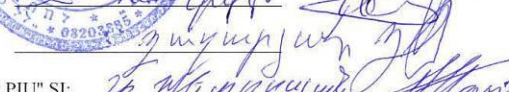
After the presentation the participants were welcomed to ask questions. The questions raised during the meeting and corresponding answers as well as photos made are attached to this statement below. In the end of the Public consultation the participants were asked to sign the statement of the Public Consultation as an approval of the Detail Design and Environmental Management Plan for the M11, Martuni-Vardenis km 6+500-km 10+834 road.

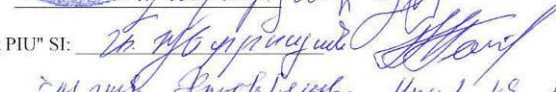
We hereby give our consent to the Detail Design and Environmental Management Plan for the M11, Martuni-Vardenis km 6+500-km 10+834 road and confirm that our request and suggestions are incorporated.

Head of Vardenik community:  H. Hoveyan

Member of the community: 

Member of the community: 

Member of the community: 

Representative of "Transport PIU" SI: 

Experts: 



1. Question (Head of Vardenik community) – What measures have been designed for removing mudflow?
  - Answer (CPE M. Aleksanyan) – It is designed to install metal culvert  $d=720\text{mm}$  at km 8+838 based on the calculations.
2. Question (Head of Vardenik community) – Whether repair works of the damaged bridge at M-11-Vardenik intersection is included in the design?
  - Answer (CPE M. Aleksanyan) – It is designed new bridge with 1.0m span instead of the existing one at km 8+950.5.
3. Question (Head of Vardenik community) – What kind of works are necessary for bridge repair at km 10+650 section?
  - Answer (CPE M. Aleksanyan) – It is designed to repair the carriageway and railings of the existing bridge. At bridge approaches partial changes should be done for the longitudinal profile of the road.