

MUNICIPAL DEVELOPMENT FUND OF GEORGIA (MDF)



MUNICIPAL DEVELOPMENT FUND OF GEORGIA  
საქართველოს მუნიციპალური განვითარების ფონდი

# **Rehabilitation and Expansion of the Vani Archeological Museum**

Environmental Review

(ER)

Tbilisi, Georgia

September 2012

## **ABBREVIATIONS**

<b>WB</b>	<b>World Bank</b>
<b>MRDI</b>	<b>Ministry of Regional Development and Infrastructure</b>
<b>MDF</b>	<b>Municipal Development Fund</b>
<b>EMF</b>	<b>Environmental Management Framework</b>
<b>EMP</b>	<b>Environmental management plan</b>
<b>ER</b>	<b>Environmental Review</b>
<b>Moe</b>	<b>Ministry of Environment Protection</b>
<b>Mump</b>	<b>Ministry of Culture and Monument Protection</b>
<b>NACHP</b>	<b>National Agency for Cultural Heritage Preservation</b>
<b>RDP</b>	<b>Regional Development Project</b>
<b>CH</b>	<b>Cultural Heritage</b>

# ***Sub-Project: Rehabilitation and Expansion of the Vani Archeological Museum***

## ***Environmental Screening and Classification***

The proposed subproject envisages construction of new building adjacent to the existing building, rehabilitation of Vani archeological museum existing building, equipping of new exhibition areas, laboratories and storage areas with modern technologies (climate control, fire extinguishing, security and lighting systems), increase of public space and arrangement of museum shop and café, arrangement of special elevators and WC for disabled persons.

- Water supply and sewage systems – Archaeological Museum water supply will be provided by the connection of the existing water supply network from Chanturia Street. The museum has a sewerage collector; there are also holes and sewerage collector at the dining hall and the house of archaeologists. Subproject includes rehabilitation of sewage system and arrangement of compact-block treatment structure with 2 m<sup>3</sup>/24 hr. capacity. After passing through the treatment block, water will be discharged to river Chishura;
- Arrangement of combined heating, cooling and air conditioning system - Provision of the heating and cooling systems will imply installation of steel and plastic pipes operating at 20-80°C temperature. The project considers mounting the pipelines for supplying heating and cooling inside the thermal duct from the boiler to the building. The pipelines will be mounted for supplying heating and cooling in the suspended ceiling under appropriate inclination in order to keep removing the air from within the system. A low pressure natural gas will be used as a fuel for heating
- Exhibition Furniture – based on oak timber fronts on metal framing. Covers / sliding doors: laminated glass.

### **(A) IMPACT IDENTIFICATION**

Has the subproject a tangible impact on the environment?	The project has tangible positive social impact.
What are the significant beneficial and adverse environmental effects of the subproject?	Rehabilitation of Vani museum will improve infrastructure services and institutional capacity to support the development of tourism-based economy and cultural heritage circuits in the Imereti region.

	<p>Initial tourist infrastructure will avoid chaotic actions by visitors; All visits will be organized. Subproject delivery will create opportunity for new jobs for local population and increase their incomes.</p> <p>The expected negative environmental and social impacts are likely to be short term and typical for small to medium scale rehabilitation works: noise, dust, vibration, and emissions from the operation of construction machinery; generation of construction waste; disruption of traffic and pedestrian access.</p> <p>The risk associated with safe and secure temporary storage of museum exhibits includes loss of specimens through misplacement, failure to obtain legal title for acquisitions, failure permanently to record specimen data and effectively to link them to specimens, and a range of other intellectual and legal shortcomings that reduce the utility and value of collections.</p> <p>Improper waste water management has negative impact on environment especially on surface and underground water sources.</p>
<p>Does the subproject have any significant potential impact on the local or affected communities?</p>	<p>No new land take and resettlement are expected. The long term positive social impact will be beneficial (Growth of tourist flow, Attraction of private sector investment in tourism infrastructure (hotels, bars, restaurants, shopping, entertainment, etc.).</p> <p>Negative impacts are short term and limited to the construction site. They are related to the possible disturbance described above.</p>
<p>What impact has the subproject on the human health?</p>	<p>Minor negative impacts are related to dust, emissions, noise and vibration during construction period.</p>

**(B) MITIGATION MEASURES**

<p>What alternatives to the subproject design have been considered and what mitigation measures are proposed?</p>	<p>Given that the subproject envisages rehabilitation-reconstruction of Vani archeological museum, no alternatives have been considered.</p> <p>The expected negative impacts of the construction phase can be easily mitigated by demarcation of the construction site, traffic management, good maintenance of the construction machinery, observance of the established working hours, and well organized disposal of waste to the formally agreed sites.</p>
<p>What lessons from the previous similar subprojects have been incorporated into the project design?</p>	<p>At the initial stage was prepared Program of collection removal and conservation of museum exponents (lesson from Kakheti Regional Development Project).</p>
<p>Have concerned communities been involved and have their interests and knowledge been adequately taken into consideration in subproject preparation?</p>	<p>Vani population was informed about the upcoming Vani museum rehabilitation plans in a meeting held in Vani archeological museum in Vani (05.06.2012) and generated positive reaction of the beneficiary community.</p> <p>Subproject-specific EMP will be made available for Vani population and will be discussed in a consultation meeting prior to the commencement of works.</p>

**(D) CATEGORIZATION AND CONCLUSION**

Based on the screening outcomes,

- Subproject is classified as environmental Category
- A
  - B
  - C

Conclusion of the environmental screening:

- 1. Subproject is declined
- 2. Subproject is accepted

If accepted, and based on risk assessment, subproject preparation requires:

- 1. Completion of the Environmental Management Checklist For Small Construction and Rehabilitation Activities
- 2. Environmental Review, including development of Environmental Management Plan

## ***Risk Assessment of Eligible Subprojects***

<b>Sensitive receptors of the Natural and Social Environment around a subproject site</b>	Yes / No?	<b>Significant potential impact / high risk</b>  (check)	<b>Low potential impact / low risk</b>  (check)
Natural Habitats, fragile ecosystems	No	Forests; wetlands; nesting/breeding areas, rest areas for migratory birds, wildlife corridors connecting protected areas, steep slopes, alpine and subalpine zone, green-fields	Strongly transformed urban or rural landscapes, industrial sites, brown-fields
		N/A	N/A
Surface water bodies	Yes	Major rivers and river floodplains, trans-boundary water bodies and their tributaries, lakes; smaller water bodies which have high value for local communities or biodiversity	Small rivers and streams, artificial reservoirs and ponds which are not indicated as having high value for local communities or biodiversity
			✓
Groundwater sources	No	Deposits of the regional/national importance, mineral and/or thermal water sources, high groundwater table	Regular groundwater table
		N/A	N/A
Valuable landscapes	No	Protected landscapes, landscapes of outstanding aesthetic value, Green-fields, recreational areas	Strongly transformed urban or rural landscapes, industrial sites, brown-fields
		N/A	N/A
Physical cultural resources	Yes	Individual or general protection zones of cultural monuments, historical or traditional sites (religious, burial, ritual)	No cultural resources
		✓	

Human settlements	No	More than 20 affected households; physical relocation needed	Less than 20 affected households, no physical relocation needed, no land take required
		N/A	N/A
Geohazards: severe erosion, landslides, flooding	No	Recorded	Not recorded
		N/A	N/A

If a subproject is expected to carry high risk based on any of the above criteria of assessment, it is considered a high risk subproject. An environmental review has to be carried out and an environmental management plan developed;

If a subproject is not expected to carry high risk based on any of the above criteria of assessment, it is considered a low risk subproject and an Environmental Management Checklist for Small Construction and Rehabilitation Activities has to be completed.



## ***Social and Cultural Resource Screening Of Subprojects***

<b>Social safeguards screening information</b>		<b>Yes</b>	<b>No</b>
1	Is the information related to the affiliation and ownership status of the subproject site available and verifiable? (The screening cannot be completed until this is available)	✓	
2	Will the project reduce other people's access to their economic resources, such as land, pasture, water, public services or other resources that they depend on?		✓
3	Will the project result in resettlement of individuals or families or require the acquisition of land (public or private, temporarily or permanently) for its development?		✓
4	Will the project result in the temporary or permanent loss of crops, fruit trees and Household infra-structure (such as granaries, outside toilets and kitchens, etc.)?		✓
If answer to any above question (except question 1) is "Yes", then OP/BP 4.12 Involuntary Resettlement is applicable and mitigation measures should follow this OP/BP 4.12 and the <b>Resettlement Policy Framework</b>			
<b>Cultural resources safeguard screening information</b>		<b>Yes</b>	<b>No</b>
5	Will the project require excavation near any historical, archaeological or cultural heritage site?	✓	
If answer to question 5 is "Yes", then <b>OP/BP 4.11 Physical Cultural Resources</b> is applicable and possible chance finds must be handled in accordance with OP/BP and relevant procedures provided in the <b>Environmental Management Framework</b> .			

# ENVIRONMENTAL REVIEW

## 1 Introduction

### 1.1 Background Information

The Government of Georgia approved in June 25, 2010 (Government resolution no. 172), the State Strategy on Regional Development of Georgia for 2010-2017, prepared by the Ministry of Regional Development and Infrastructure (MRDI). The main objective of the strategy is to create a favorable environment for regional socio-economic development and improve living standards. These objectives will be attained through a balanced socio-economic development, increased competitiveness and increased socio-economic equalization among the regions.

In order to better utilize the tourism and agriculture potentials that exist in Imereti and reduce internal socio-economic disparities, the Government of Georgia approached the World Bank with the request to provide financial support to the regional development in Imereti. A Regional Development Project II (RDP II) was prepared jointly by the Government of Georgia and the World Bank, and the latter is expected to provide a loan funding for the implementation of RDP II.

Sub-project for the rehabilitation and reconstruction of the Vani archeological Museum is a part of the RDP II and shall be prepared, reviewed, approved, and implemented in agreement with the requirements of the Georgian legislation and the World Bank policies applicable to the RDP II.

MDF has an extensive experience in implementation infrastructure projects. Up to date it has implemented numerous projects for the rehabilitation and construction of the buildings, water supply and sewage systems, power supply and roads in the country. It should be noted that the similar Regional Development project (US\$75.0 million) is being implemented in Kakheti Region and MDF staff has already gained additional experience in similar projects.

Due to the multi-sectoral nature of this RDP II, a Working Group is established which involves all agencies concerned Georgia National Tourism Administration (GNTA), Agency for Culture Heritage Preservation of Georgia (ACHP), Culture Heritage Fund (CHF), Municipal Development Fund (MDF), Georgian National Museum (GNM), Imereti Governor's Office, Ministry of Finance (MoF) and Ministry of Regional Development & Infrastructure (MRDI).

There is also capacity development component that is designed to enhance the institutional capacity and performance of MDF, under which Construction supervision for the Imereti Regional Development will be tendered out to qualified international contractor.

### 1.2 Institutional Framework

The Municipal Development Fund of Georgia (hereinafter: the MDF) is a legal entity of public law, the objective of which is to support strengthening institutional and financial capacity of local government units, investing financial resources in local infrastructure and services and improving on sustainable basis the primary economic and social services for the local population (communities). MDF is designated as an

implementing entity for the RDP and is responsible for its day-to-day management, including application of the environmental and social safeguard policies.

MDF prepares and submits to the World Bank for approval the Subproject Appraisal Reports (SARs), with safeguards documents attached. These may include, as case may be, an Environmental Assessment (EA) along with an Environmental Management Plan (EMP), an EMP prepared using the Environmental Management Checklist for Small Construction and Rehabilitation Activities, and a Resettlement Action Plan (RAP).

### **1.3 Brief Information on Proposed Subproject**

The subproject area is located in West Georgia, Imereti Region, and Town Vani. It is located 270 km west from Tbilisi. Access to site is possible via Tbilisi-Kutaisi-Vani Highway.

The proposed subproject envisages rehabilitation of Otar Lortkipanidze Vani archeological museum, as well as arrangement subsidiary infrastructure.

Vani museum was founded in 1985 and is house to the archaeology collection (more than 4.000 items) excavated in Vani and nearby territories. The Gold Treasury was open at the museum in 1987, after the discovery of the rich burial. Treasury presents unique samples of goldsmith works from Vani site.

The existing museum building is not satisfying international requirements for museums, namely:

1. There is no access for disabled;
2. There is no elevator – neither for cargo nor for visitors;
3. There is no public space, dedicated to:
  - Ticket sales, information boots;
  - Wardrobe;
  - Public toilets for disabled;
  - Museum shop;
  - Cafeteria;
  - Auditorium.
4. There is no adequate space for library hall (existing one is only 15 m<sup>2</sup>);
5. There is no space for the all significant artifacts;
6. There is no space for restoration laboratory/research;
7. There is no photo studio (all artifacts need photo fixation with high resolution, and this is not possible under existing circumstances);
8. There is no fire exit;
9. There is no temporary exhibition space, and therefore the artifacts stored in the basement cannot be displayed;
10. There are no zones for the receiving the collections and for quarantine;
11. There are no following necessary attributes for the museum:
  - Climate control and regulation (for the funds and exhibition areas);
  - HVAC (for whole building);
  - Automatic fire alarm and extinguishing systems;
  - Security alarm systems;
  - Video surveillance, etc.

Building itself is depreciated, hydro and heat insulation is not sufficient; construction stability is compromised and thus puts in danger exhibits and artifacts stored in museum.

All abovementioned justifies the need for rehabilitation and museum expansion.

Vani Museum Rehabilitation Sub-project envisages undertaking of the following works:

- Rehabilitation of the communications existed outside of the territory (red lines);

- Improvement of territory and landscaping;
- Rehabilitation of museum building;
- Arrangement of external water-wastewater and storm-water drainage network, including a compact block wastewater treatment structure at 6 m<sup>3</sup>/24hr capacity;
- Internal wastewater, cold and hot water piping;
- Arrangement auditorium rooms for translation, overlooking the auditorium with glass windows and properly connected to the audio system;
- The storage will have only one access facing corridors open to the public (now there are three), and such access should have two steel doors with proper locking one after each other, for security. The area between the two doors should be equipped with video surveillance. If the storage will have windows, they should have metal bars, extremely safe steel windows, and a security system. Museum storages are supposed to keep artifacts even before they are added to the museum inventory, thus they need high level of security, like exhibition areas;
- The video surveillance of the building will allow connections with the surveillance system of the archaeological area, so the security room should be designed in a way to accommodate displays that will be connected with the cameras that will be installed in the archaeological area;
- Arrangement of museum with a generator or batteries, at least to make the surveillance system of the museum and the archeological area work during power shortages. It will serve 24 hours a day;
- HVAC supply and installation;
- Arrangement of electrical system;
- Installation of fire alarm system;
- Installation of video surveillance system;
- Installation of security alarm system;
- Conference hall sounding system;
- Arrangement of fire extinguishing system;
- Internal telephone station and computer network;
- Lighting of façade and yard;
- Supply and installation of elevator.

Rehabilitation of existing building implies the complete planning of the building in accordance with the floors. The lift will be arranged beside the exiting staircase. The sunroofs will be arranged between the floors for the installation of the lift. The mentioned roofs are made of ferroconcrete tiles, which should be removed part by part through the hollows. After the dismantlement, there will be roofed the unit over the metal girders, where a hollow is envisaged for the lift. Besides, there will be arranged a hole for the lift at the first level of the building.

The total planning of the floor will be performed at the existing building: the bulkheads will be replaced and new holes will be built in the walls, especially at the facades. These new holes are framed with metal constructions.

The evacuation metal stairs will be arranged at the construction, connected to the existing building by means of a bridge.

New part of building will be located at the adjacent territory of existing museum building. here will be located New exhibition areas, laboratories and storage areas equipped with modern technologies (climate control, fire extinguishing, security and lighting systems), museum shop and café , special elevators and WC for disabled persons; water supply and sewerage will be connected to the Museum, heating and air conditioning will be provided.

The subproject main works include:

1. Position of extension on site:
  - Display boards positioned at points of interest along Visitor's Trail.
  - Steel framed display board with bench consisting of:

- Steel frame with light grey powder coated niche.
  - Timber Bench.
  - Printed aluminum information board.
2. Design concept
- New building structure reflects the functional requirements, the topographic preconditions & the existing building.
  - New angled volume of 3 levels for additional accommodation & glass gap as a connecting link to existing building.
  - Turn front part of the building to angle of existing plaza.
  - Define edge of plaza by new building volume.
  - Create funnel tube from generous new entrance plaza through building to splendid views over the valley.
  - New semitransparent façade of old building attracts visitors with bronze shimmer & leads to new entrance.
  - Separation of staff & visitor zones by usage of given site level changes.
3. Exhibition furniture
- Base: oak timber fronts on metal framing. Covers / sliding doors: laminated glass.
  - Optional: mini climate control unit in base of showcase.
  - Types 3+4 with integrated lighting system, Types 1+2 to be illuminated externally.

### Water Supply and sewage Systems

The subproject envisages rehabilitation of water supply and sewage systems of Vani Archeological Museum.

Vani Archaeological Museum water supply will be provided by the connection of the existing water supply network from Chanturia street by means of the polyethylene pipe  $d=110$  mm; the outlet pipe will be organized by  $d=50$  mm water pipe, which will deliver water to the design pressure-rising pump, after which water will be delivered through pressure penstock  $d=63$  mm polyethylene pipe PN8, length  $L=480$  meter, to the reservoir arranged at the Museum. Difference in heights equals to  $H=88-52=36$  meter. Volume of water to be delivered will equal to  $q=0.5\div 1.5$  l/sec. The pump will be operated periodically and it will deliver water to the design stainless steel reservoir – cistern of  $30\text{ m}^3$  capacity. The project provides organization of heat insulation for the reservoir. According to the project the reservoir will be arranged on the elevated place located near the museum. In the pumping station two pressure-rising pumps stipulated by the project will be installed: one – working and the other –reserve, power provision of which will be realized from the near located power source,  $L=200$  meter. Pressure-raising pump of the capacity  $q=0.5\div 1.0$  l/sec; pressure raising height  $H=45-50$  meter, power  $N=1.5\div 2$  kW. Water that leaves the reservoir by gravity pipe will be delivered to museum, palace and the house of archaeologists by means of the polyethylene pipe  $d=40$  mm;  $L=400$  meter. Pump starting devices will be installed in the building of a pumping station, control buttons will be installed in the building of the museum, in a guard room, while the breakers should be arranged near the pump, according to the safety rules.

The museum has its current sewerage collector; there are also holes and sewerage collector at the dining hall and the house of archaeologists. The project envisages cleaning of the existing sewage holes, ordering and restoration and replacement of the pipes  $d=150$  mm'  $L=100$  meter.

Sewage system collector will be arranged by using of corrugated polyethylene pipe  $d=150$  mm. Length  $550$  meter, which will deliver sewage water by gravity, to the sewage water treatment module-block. The compact-block treatment structure with  $6\text{ m}^3/24$  hr. capacity will be located near the bank of the river Chishura, at the upper marks of the zone of flooding, on the state owned free land plot. Sewage water

from Vani Archaeological Museum, the dining hall and house of archaeologists located near the museum will flow into treatment structure. After treatment passing through treatment block, water will be discharged into the river Chishura. Such solution of the project fully corresponds to the fixed norms and ecological demands.

### Sanitation system

A biological treatment unit based on modern technologies will be used for treatment of the sanitary sewage. The capacity of treatment unit is 6m<sup>3</sup> daily. The unit consists of a cylinder made of polypropylene, hermetically sealed from the bottom. It is lined with polypropylene from inside and divided into several areas of treatment. It is characterized with:

1. High quality of waste water treatment.
2. Electric power saving technology.
3. The facility is fully automated. No necessity of permanent supervision. The process of treatment of waste waters is fully automated, which enables optimization of the process of treating. It means that in the process of treatment of waste waters it can switch according to the flow automatically to the first, second and third saving modes. And moreover, it can operate in forced mode. The facility is equipped with emergency warning system when:
  - Electric power is switched off.
  - Any unit fails.
  - Filling of the receiver cell with large, rough items.
4. The sewer can be operated remotely from the watch house.
5. No need for cesspool truck for removing of waste. Accumulation of excess active slime is made in the bag inside the treatment facility, which is removed manually and put into a closed container. A new bag is put in its place.
6. Water treatment technology is made so that methane and hydrogen are not liberated, which enables the treating facility to be close to the building. Moreover, the process of nitrification and denitrification is repeated there several times, which enables reducing of phosphorus and nitrogen in the treated water.
7. In case of power outages, it can push earlier treated water from its sewer and continue working as multistage sediment chamber, which enables purification of waste waters from grease and floating waste. Upon restoration of power supply the facility starts operating in the normal mode.
8. A sewer is made by means of controllable lifts, which is expected to receive maximum volley expenditures, enabling avoidance of leakage of untreated water from the facility.
9. The facility is made of polypropylene, which is not chemically active. It does not corrode, it is hermetic, it is small and light-weight.
10. With new technical solutions, high reliability, long-term service, low power consumption and high quality treatment of waste water.

The treating facility envisages chlorination of waste water. It will be located under the manhole. Supply of already prepared hypochlorite is performed automatically. Technical characteristics of treating facility are as follows:

Data	Characteristics of treating facility	
	Input	Output
<b>BOD, mg O<sub>2</sub>/l</b>	<b>≈390</b>	<b>5÷7</b>
<b>COD, mg O<sub>2</sub>/l</b>	<b>≈480</b>	<b>≤50</b>
<b>NH<sub>4</sub> mg/l</b>	<b>20</b>	<b>≤1</b>
<b>Particles mg/l</b>	<b>220</b>	<b>≤5÷8</b>
<b>Coli index</b>	<b>&gt;100 000</b>	<b>1 000</b>

Operations & Maintenance of the treatment unit will be responsibility of the United Water Supply Company (UWSC).

### **Heating and air conditioning systems**

There is envisaged arrangement of Combined Heating & Cooling Plant for museum heating and air conditioning. The system for heating and cooling and supplying fresh air has been engineered based on the following principle:

- In summer “Chiller + Fan Coil + AHU”;
- In winter “Boiler + Fan Coil + AHU”, through equipment’s, fresh air is provided;
- In summer “Chiller + Air Handling Unit”;
- In winter “Boiler + Air Handling Unit”, through equipment.

Two hot water boilers will be placed in the boiler located at +0.00 indicators for the Vani museum. It is designed for serving heating-ventilation and hot water supply systems for the museum building. A low pressure natural gas will be used as a fuel for heating.

In the heating and cooling supply systems is considered both steel and plastic pipes operating at 20-80°C temperature. The project considers mounting the pipelines for supplying heating and cooling inside the thermal duct from the boiler to the building. The pipelines will be mounted for supplying heating and cooling in the suspended ceiling under appropriate inclination in order to keep removing the air from within the system.

The security and anti-fire measures will be strictly protected during the construction period; especially, it deals with the dismantlement of the existing building and performing the ground works.

At the initial stage was prepared Program of collection removal and conservation of museum exponents (lesson from Kakheti Regional Development Project).

National museum will give all furnish specification for Vani museum and MDF has under the project sufficient funds for the equipment, office furniture and arrangement of showcases of the museum and all support offices after the rehabilitation. After completion of rehabilitation works, all necessary equipment will be installed.

To turn Vani into a functioning and economically viable attraction, activities will be divided in three contracts: one for the museum rehabilitation and expansion, one for museography and furniture, and one for the safety of the archaeological area nearby. From a technical point of view, it is clear that without these three contracts, the destination will not take off.

Vani features a unique archaeological area, associated with the myth of the Golden Fleece, which is already branded internationally. Moving as many artifacts as possible from Tbilisi back to Vani and display them to the new museum will surely help develop it as a destination, and the discussion is taking the right direction. Vani is known worldwide, and its attractiveness is based not so much on the museum alone, but on its archaeological area, which is currently in very poor conditions. Including not only the museum, but also a wider investment on the archaeological area through a phased approach is therefore necessary, to ensure the economic viability of the investment. The archeological area needs investment for fencing, lighting, pathways, signage, presentation, etc., will be implemented as Phase II under the RDPII.

**Key Stakeholders**

Grant Recipient/ Borrower: Government of Georgia represented by the Ministry of Finance

Local Representation: Municipality of Town Vani

Sources of Funding/Financing: World Bank (WB) and Municipal Government (MG)/Government of Georgia (GOG)

Implementing Agency: Municipal Development Fund of Georgia (MDF)

**Financial Arrangements**

The Appraisal as well as the design comprises Rehabilitation of Vani Archeological Museum in Town Vani. The estimated project costs to be financed: 7 428 000.00 GEL.

**Implementation Structure**

World Bank (WB) Loan Agreement with the Government of Georgia; Project Implementation Agreement between the Borrower (Georgia) and MDF for the project; Investment Financing Agreement (IFA) for the funding of the Rehabilitation and Reconstruction of Vani Archeological Museum between MDF and the Municipal Government (MG) of Town Vani.

**2 Legislation and Regulations**

According to the law of Georgia on the Permit for Environmental Impact (2008), the subproject does not require Environmental Impact Assessment (EIA) and obtaining of a Permit for Environmental Impact.

The subproject triggers to the OP/BP 4.01 Environmental Assessment and OP/BP 4.11 Physical Cultural Resources of the World Bank.

According to the above mentioned safeguard policies and the Environmental Management Framework adopted for the current program, the subproject has been classified as B (+) category and requires preparation of Environmental Review (ER) and Environmental Management Plan (EMP), in compliance with recommendations of EMF.

The subproject is approved by the local self-governing (LSG) body of Vani Municipality.

**3 Baseline Environmental Conditions****Physical-geographical Description, Geology, Geomorphology,**

Vani is located on Sulori River (left tributary of Rioni River) bank on Imereti plain, altitude: 60 m from the sea level, 19 km distance from Samtredia Railway Station, 41 km distance from regional center Kutaisi, 35 km from the nearest airport Kopitnari and 80 km from the nearest Poti port.

**Climate**

The subproject site is located on Imereti plain between Rioni and Tskhenistskali Rivers and represents one of the most important interchange and industrial point in West Georgia. The climate is humid subtropical. It is characterized with warm winter and hot summer. Average annual air temperature is - 14.4°C, in January which is the coldest month - 4.7°C and in July which is the hottest month of the year - 23.2°C. Absolute minimum of air temperature is - (-17)°C and absolute maximum - 41°C. Annual total of precipitations is - 1530 mm.

**Precipitations**

At the subproject site the annual average number of total precipitations for the whole period amounts to 1375 mm. The main maximum of precipitations is in Autumn-Winter (from 130 mm to 150 mm). The driest months are March-April when the number of precipitations fluctuates within 78-64.



## Geology

According to geo-tectonic districting of Georgia the site of survey belongs to western Molas sinking zone (vat in the middle of the mountains of the district) of the Transcaucasia intermountain plain. At the surface there are found mainly the Molas precipitations of the Neogene –Quaternary age that are placed on lightly dislocated rocks of Cretaceous and Paleogene.

Neogene ( $N_1$ ) is represented with 4 horizons:

- Loam set ( $N_1^2$  tr) – sandstone, clay and marls. Total capacity of the horizon is – 10 m;
- Chokraki set ( $N_1^2$  C) – conglomerates, sandstones, limestone and marl with the total capacity of 35 m;
- Caragana set ( $N_1^2$  kr) - sandstone, marls and limestone with the total capacity of 90 m;
- Sarmati horizon ( $N_1^3$  S) - clays, sandstones with the total capacity of 300 m.

## Hydrology

The main artery of the rivers for the region territory is Rioni River. It is the river of the mixed nourishment which is supplied with rain, snow, glacier and underground waters. Lack of water is noted in July-August and sustainable lack of water in winter. Total area of Rioni River basin is 13 400 m<sup>2</sup> with the total length of 327 km and average annual runoff - 12.6 m<sup>3</sup>. The subproject site is located at left tributary of Rioni at Sulori River.

**Sulori** – River in West Georgia, in Vani Municipality. It takes a rise on northern hem of Meskheta mountain range, 2140 m height from the sea level. Length - 33 km, basin area – 189 sq. m. It is supplied with snow, rain and underground water. Flashflood is noted throughout the year, flood – in spring. Average annual discharge 3,95 m<sup>3</sup>/sc.

## Flora and Fauna

Diversity of the climate of the region is characterized with diversity of plants. Diapason of flora of this region includes diversity of plants, starting from alpine plants ending up with subtropical ones.

Vani district is rich with flora and fauna. On its site the forest massifs occupy majority of the territory that is beautifully merged with mountainous landscape. The maximum height from the sea level is 2500-2800 m. Together with the leafy forests, here are met the coniferous and mixed forests. Representatives of fauna that is characteristic for the Caucasus, in particular: Caucasian bear, goat, deer, roe, wolf, fox and jackal. Various types of birds are represented here widely. Ecologic cleanness and wild untouched nature is interesting for the traveler. Such zones are as follows: Mepis Chala, Katrebi, Massifs of Kumuri, Sulori, Ukhuti, Kortkha Forest that are the richest with flora and fauna. At 2700 meter height in alpine zone as well there is located the rarity of nature that is "Jajis" Tba (Lake) that makes great possibility for creation of new infrastructure on site.

Together with diversity of flora of Georgia its animal world is diverse too. It is inhabited by up to 100 types of mammalians, up to 350 types of birds, up to 50 types of reptiles, more than 10 types of amphibians and up to 160 types of fish. There are met thousand types of invertebrates the whole composition of which is not totally defined yet. The animals are mainly spread in accordance with zoning.

The zoning to which type of zoning the section of the planned activity is located is characterized with spreading of various types of animals. There are met especially many rabbits, vole-mice, gray hammers, field mice, from predatory animals – jackal, field fox of the Transcaucasia. From the reptiles there are met the Caucasian toad, grass-snake, meadow lizards. From the snakes the special attention is to be paid to blind snake, cat-eyed snake, field snake, ordinary and water snakes "Ankara". In this zone there are met various kind of birds, in particular quail, dove, pigeon, blackbird, magpie, starling, oriole, goldfinch, shrike, finch, as well as swallow, sparrow and larks of various kind and turtle-dove, partridge; From predatory animals there are many sparrow-hawk, lute, raven, gray raven and hawk.

It needs to be noted a well that the project does not have actual impact on flora and fauna of local and surrounding site. The site of the planned activity represents the site of the city in the surrounding of which there are inhibited units and it is natural during its operating it will not have impact on flora and fauna.

### ***Description & brief history of town Vani:***

Vani is the city-site situated along the Imereti plain on the bank of the river Sulori (left tributary of the river Rioni). During the antique epoch Vani turned into one of the most important towns of the Colchian kingdom and reached its acme in the 3rd – 1st centuries BC.

Regular excavations have been carried out since 1947. Urban settlement was founded on the basis of the ancient city. Remnants of the old town were revealed near Vani territory (Kechinara, Tsikhesulori, Gora, Bagineti, Inashauri, Sulori, Dzulukhi, Bugnari, Bzvani) and also to the east from Vani (Phersati, Zekari, Bagdadi).

Archaeological material uncovered from Vani is dated to the 8th - 6th centuries BC and represents fragments of ceramic. During the period when Vani was regarded as a city two main stages can be indicated: 6th-4th centuries BC and Beginning of the 3rd century – Middle of the 1st century BC.

The first phase was represented by wooden cultic and dwelling structures, sacrificial altars cut in the rocky ground, cultural layers containing ceramics and rich burials (granulated diadems with forged images, earrings, temple pendants, bracelets with animal images, a bowl, heraldic portrayals, necklaces etc.). Silver adornments, bronze and clay vessels were also revealed at the site. Imported clay (black figured, red figured, black glazed) and metal vessels (patera, oinochoe, kylixes, aryballos) were uncovered from the cultural layers. It is assumed that on this stage (6th -4th) Vani was the centre of a political-administrative unit (skeptukhs) of the Colchian kingdom and also the residence of the ruling class.

On the second stage (3rd century BC) Vani turned into a temple city. As a result of the excavations defensive wall, gateway complex, building with counterforts, round sanctuary, seven stepped altar, dwelling and cultic buildings were revealed. The monumental sculptures of the lion's head, altars, and capital decorated with high relief of the goddess' images, burnt clay and bronze small-sized sculptures and masks, local and Greek ceramics were also found at the site.

The ancient town of Vani was destroyed in the mid-1st century BC.

There's the process of defining some of the artistic or architectural details. The project is agreed with National Agency for Cultural Heritage Preservation of Georgia and local municipality. It will assist to the maintenance initial appearance and status of Cultural Heritage monuments.

## **4 Analysis of Potential Impacts**

### **4.1 Construction Phase**

#### **Social Impacts**

- **General set of social issues.** No significant social issues are associated with implementation and operation of this subproject.
- **Resettlement Issues.** Subproject does not imply private land acquisition and no permanent impacts are envisaged on private or leased agricultural lands and private assets or businesses.
- **Positive impact related to Job opportunities for construction workers.** Limited and temporary during construction and limited during operation.
- **Health issues related to noise, emissions, and vibration.** Limited and temporary.

- **Traffic Disruption.** Local traffic can be impacted limited and temporary by transport activities related to the project.
- **Safety and Access.** There will be reduced access to areas adjacent to rehabilitation and potential hazards to vehicles and pedestrians during rehabilitation downtime.

### **Impacts on the physical Cultural Property**

The subproject will be implemented on the territory of a cultural heritage site, including historical buildings, exhibits of history and art. Risks related to restoration and upgrading of the site are: damage to old constructions due to earth works and vibration on site; impact on the historical and aesthetic values of the site; physical damage or loss of exhibits.

In course of rehabilitation and construction activities and especially during soil excavation works, in case of observing any suspicious object, the rehabilitation works will be suspended and will restart only upon issuance of the permit by the National Agency for Cultural Heritage Preservation.

### **Environmental Impacts**

Improper handling, storage, use and disposal of construction materials and wastes could pose a risk of water/ soil contamination at the construction site and storage site. Improper maintenance and fueling of equipment could also lead to the potential contamination of soil and to some extent – water (near the crossings of the unnamed seasonal stream). The later impact is less probable.

#### **Soil Pollution**

Potential pollutants from a project of this nature include the following (this list is not exhaustive):

- Diesel fuel, lubrication oils and hydraulic fluids, antifreeze, etc. from construction vehicles and machinery
- Miscellaneous pollutants (e.g. cement and concrete)
- Construction wastes (packaging, stones and gravel, cement and concrete residue, wood, etc.)

#### **Water Pollution**

Water pollution may result from a variety of sources, including the following:

- Spillages of fuel, oil or other hazardous substance, especially during refueling
- Releasing silty water from excavations
- Disturbance of watercourse banks and bed during watercourse crossings by heavy machinery
- Silt suspended in runoff waters (“construction water”)
- Washing of vehicles or equipment
- Exposure of contaminated land and groundwater

Spillages etc. may travel quickly downhill to a watercourse or water body. Once in a watercourse, it can be difficult to contain the pollution which can then impact over a wide area downstream. It is therefore vital that prompt action is taken in the event of any potential water pollution incident.

Once the working width has been stripped of topsoil, the subsoil becomes exposed. During earthworks in a wet weather this may result in uncontrolled release of suspended solids from the work area.

#### **Air Pollution and Noise**

Potential impact of air pollution is minimal and related to operation of vehicles and heavy machinery at the construction site and during transportation of materials.

- Noise and vibration arising from heavy machinery and vehicles
- Air emissions (from vehicles, bulldozers, excavators etc.)
- Dust (from vehicles).
- Fumes may be a concern linked to supply and transportation of materials

### **Construction Related Wastes**

#### **Inert Construction Wastes**

The following types of inert waste are anticipated to be produced from these activities:

- Natural materials (soil and rock);
- Contaminated soil with non-hazardous substance or objects

#### **Non Hazardous Construction Wastes**

In summary the main non-hazardous construction wastes will include the following:

- Timber (small amount of removed trees and bushes).
- Metals (including scrap metal and wire) – negligible amount of metal waste is expected.

#### **Hazardous Construction Wastes**

Small quantities of the hazardous wastes will arise mainly from the vehicle maintenance activities. A number of hazardous wastes, which could be generated, include:

- liquid fuels;
- lubricants, hydraulic oils;
- chemicals, such as anti-freeze;
- contaminated soil;
- spillage control materials used to absorb oil and chemical spillages;
- machine/engine filter cartridges;
- Oily rags, spent filters, contaminated soil, etc.)

#### **Transport related impacts**

- Noise & Vibration Impacts
- Traffic congestion (nuisance)
- Air pollution
- Mud on roads
- Refueling, maintenance and vehicle cleaning and related risks of soil and water contamination

#### **Topsoil losses due to topsoil stripping**

- Topsoil washout due to improper storage and reinstatement
- Silt runoff to watercourses and water bodies
- Exposure of contaminated land

Risks & challenges during infrastructural works are not expected & obvious. Entrance of the monument is located pretty closed from work field. For conservation works, delicate actions, minimizing shakes are required

- **Flora.** Potential impact is minimal, although the project design envisages cutting of very limited amount of bushes. The project does not envisage woodcutting.
- **Fauna:** Not a single species found in the project area is protected by either the national legislation of Georgia or any other international agreements and treaties. Besides, the project site is not a wintering, feeding or migrating place for the mentioned species. The birds which are presented at site in the summer time can move without any problem
- **Landscape.** The project design does not envisage any substantial changes of landscape. The preexisting relief will be reinstated. The only irreversible impact is limited to cutting of small amount of bushes

## **4.2 Potential Impacts - Operation Phase**

1. Increase of the number of tourists will result in the increased volume of trash.
2. Increased visitation resulting in proportionally greater sewage generation.

3. The traffic will increase in adjacent area of CH sites, which will result in the increased level of local emissions and noise as well as traffic safety issues. 95% of tourists are moving around with cars and other vehicles. In Vani archeological site adjacent area the number of cars will increase, which will result in the increased level of emissions and noise.
4. Risks related to management of visitation, securing exhibits from unfavorable storage conditions and preventing vandalism on site

## 5 Environmental Management Plan

This Environmental Management Plan (EMP) has been prepared to ensure that negative environmental impacts associated with this project are minimized.

### 5.1 Mitigation Measures

#### 5.1.1 Construction Phase

A number of restrictions and mitigation measures are to be taken into account during the rehabilitation and construction process:

Application of the heavy machinery and equipment is prohibited, especially before completion of strengthening works:

1. The machinery should move only along the preliminarily agreed route;
2. The maximum allowed speed will be restricted on the adjacent territory of the museum;
3. The frequency of movement of the machinery will be restricted;
4. The main works, in particular in the museum area, should be executed without application of the machinery (manually);
5. On the museum territory, the marginally allowable rates of vibration, noise and emissions will be by 20% decreased of maximum admissible levels of atmospheric air pollution, vibration and noise<sup>1</sup>;
6. Storage of hazardous wastes on the cultural heritage rehabilitation area will be prohibited
7. Any construction or municipal wastes produced during rehabilitation stage should remove from the cultural heritage rehabilitation area every day at the end of working hours.
8. Every worker at mobilization stage will undergo the respective training on working on the high sensitivity site. The institute provide such training and module of the training should be agreed with National Agency for Cultural Heritage Preservation
9. In course of rehabilitation and construction activities and especially during soil excavation works, in case of observing any suspicious object, the rehabilitation works will be suspended and will restart only upon issuance of the permit by the National Agency for Cultural Heritage Preservation.

#### Noise Related Impact

Noise is one of typical impacts related to the construction activities. The compliance with the environmental requirements is even more significant for the project area due to the considerations regarding the construction activities list to be implemented within the territory of historical monument area, because it will involve the transportation of heavy cargo with heavy vehicles and fairly intensive traffic in the direct proximity of the historical monuments of the greatest importance.

In case of absence of special measures and disregard to the restrictions the transport and devices could inflict serious damage.

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<sup>1</sup> 'Law on public health', the environmental qualitative norms are approved by decrees of the Minister of Labor, Health and Social Security of Georgia (Decrees Nos. 297/N of 16.08.2001, including the changes made to it by further decrees of the Ministry Nos. 38/N of 02.24.2003, 251/N of 09.15.1006, 351/N of 12.17.2007)

Contractor construction organization should adopt special measures to receive the appropriate construction permit and achieve agreement with all stakeholder organizations both on cargo transportation.

### **Mitigation Measures**

- The selected movement route of the heavy vehicles should be maximally distances from historical monuments and densely populated districts of Vani archeological site. In exceptional cases the allowed intensity of the vehicle traffic and speed should be determined;
- The import of the inert material shall be conducted from the licensed quarries nearby project area. The rout of the transport movement during the transportation of inert material and any other construction material should be agreed upon with the appropriate regional services and overload with the trucks and violation of the allowed traffic intensity should not take place;
- The maximum speed should be restricted to the safety level during the pass of the trucks in the proximity of the historical monuments;
- The contractor organization should develop and submit to the customer the risk factors, their mitigation measures and emergency situation action plan prior to the beginning of the works;
- In case of emergency the measures agreed with the customer should be implemented under the surveillance of the interested organizations and with due regard to their comments;

In course of rehabilitation and construction activities and especially during soil excavation works, in case of observing any suspicious object, the rehabilitation works will be suspended and will restart only upon issuance of the permit by the National Agency for Cultural Heritage Preservation.

### **Pollution Prevention Measures:**

Water/Soil Pollution. Specific mitigation measures should implemented at the construction site for prevention of water and soil pollution:

Prevent operation of vehicles in the watercourses (e.g. unnamed stream near crossing sites) and if there is no alternative, revision of vehicles will be required to ensure that there is no leakage of fuel and lubricating materials.

Contractors will ensure the proper handling of lubricants, fuel and solvents. Fuel and lubricant storage tanks will not be located within 50m of any watercourse, well or dry river bed (first of all, the dry gorge where the water main passes). All tanks will be placed in a bund of at least 110% of the tank's maximum capacity. If more than one tank is stored within the bund, the system must be capable of storing 110% of the biggest container's capacity or 25% of their total capacity, whichever is greater. The bund will be impermeable (e.g. concrete-lined), without drainage points or other breaches. Accumulated rainwater in bunds will be pumped out of the bund to either drains or the ground if uncontaminated. In case of fuel spillage the spilled fuel should be recollected and contaminated bund treated by the absorbents: sawdust, sand or straw.

All fuel / hydrocarbon dispensing nozzles are to be of a drip control design and securely locked when not in use.

No fuel storage or refueling of vehicles or equipment will be allowed within 50m of any watercourse, water body, well, dry gorge or within any designated wetland area or aquifer. Vehicles will not be left without supervision during refueling process. All refueling operations on the working sites will use absorbent pads and/or straw to minimize spills, which will be put in place prior to the commencement of refueling operations. Ground water and surface water pollution risk will be reduced or eliminated in case of immediate removal of polluted ground. Soiled ground and absorbents will be removed, stored and treated as hazardous waste. In case of significant spill authorized and responsible person will be informed, works will be stopped till the elimination of pollution risk Refueling will always be carried out with the

correct equipment (i.e. nozzles of the appropriate size), and only by suitably trained and experienced Refueling Operators. Fuel supply equipment will be regularly revised to prevent leakage due to inappropriate condition of refueling equipment. Equipment and storages will be isolated and guarded to prevent pollution due to cases of stealing or vandalism. All mobile plant, including but not limited to cranes, compressors, generators, bulldozers, excavators etc. and storage tanks will be maintained and operated such that all leaks and spills of materials will be minimized. Daily plant checks (Vehicle Maintenance Procedure) will be undertaken to ensure no leaks or other problems are apparent. Vehicle maintenance, cleaning, degreasing etc. will be undertaken in designated areas of hard-standing, not over made ground. Maintenance points will not be located within 50m of any watercourse, well or dry gorge. The storage of potentially polluting materials, refueling and maintenance of mobile plant within 50m of all watercourses/water bodies, dry riverbeds and within designated wetlands and aquifers will be prohibited. Erosion control measures will be applied during construction activities to prevent increased runoff into the watercourses.

Contractor will plan all excavations, topsoil and subsoil storage so as to reduce to a minimum any runoff. Contractors will be required to organize and cover material storage areas and to isolate wash down areas from watercourses by selecting areas that are not free draining into any watercourse.

Where any area of the spread is at risk from silt pollution washing off into a watercourse or water body, effective measures will be put in place to ensure that such pollution does not occur. Such measures may include:

- Use of silt fences
- Use of straw bales to deflect and filter water
- Use of a system of bunds and grips to prevent water from entering watercourses, etc.
- Use of holding/settling lagoons to store water running off the spread. It is intended to use natural settling rather than flocculants to facilitate sedimentation following which clean water can be disposed.

Wet cement and/or concrete will not be allowed to enter any watercourse, pond or ditch.

Where the aquifer is directly affected by the works (i.e. the excavation will be through permeable / water-bearing strata), the methodology employed will ensure that no contamination can enter the aquifer. This may involve the use of impermeable layers being placed in the trench and/or the use of clay stanks (plugs) along the trench.

### **The disposal of excess soil and rock**

- Allow local communities to utilize any excess rock, which may be left following reuse. Suitable access to the materials will be agreed with the local authorities in consultation with the community.
- Distribute the excess rocks (less than 7m<sup>3</sup>) using it for improving the local unpaved road to the headworks.
- Transport any further material, if required, to the nearest licensed spoil disposal pit (agreed with the local authorities). Spoil disposal pits used for final disposal must meet the requirements for Inert Landfills by the MoE.

### **Waste Handling**

All waste from the construction site will be disposed of in accordance with environmental regulations and at approved landfills.

Small quantities of hazardous wastes will be generated as a result of vehicle operations and the maintenance activities.

### **Mitigation Measures**

There are no specific hazardous waste treatment facilities in Georgia, so the common construction practice accepted by the authorities is to dispose of these types of wastes at the municipal landfills. However, prior

to disposal appropriate consultation and agreement of MoE is required, and controlling will be required to obtain the necessary approvals. To ensure good practice they will also be required to store, transport and deposit all hazardous materials in secure watertight containers.

### **Other Wastes from Construction Activities**

#### **Municipal Waste**

Municipal waste may be generated on the Storage area. Mainly this is rubbish, plastic or glass bottles, glasses, waste food, etc. and a stationary waste. Waste should be collected both by the specially assigned personnel and the workshop workers on the area. The waste is placed into 0.24m<sup>3</sup> plastic containers and further a local Sanitary Service takes it to Akhmeta landfill.

The following should be taken into account:

- Generation of dust should be avoided;
- Plastic containers should be closed to prevent spread of the smell and also to avoid contact of rodents and insects with the waste.

The personnel involved in the handling of hazardous and non-hazardous waste will undergo specific training in:

- Waste handling
- Waste treatment; and
- Waste storage.

Burning of waste on any construction site is forbidden with the exception of stub and small branches from felled trees and bushes, which is better to be burned in order to avoid pest dissemination.

#### **Nonhazardous construction waste**

Nonhazardous construction waste may be generated on the Storage and construction area and will be collected by contractor's workers. Waste disposed first on the sites of origin, and then moved to construction waste temporary storage facility before transferred to a contractor (the cost of the transportation should be included in the contract).

While disposal construction wastes both on the sites and at the temporary storage facilities the following requirements are to meet:

1. Place of disposal of the waste concerned must be enclosed.
2. The waste must not have access to drainage water.
3. Waste must be immediately removed from the working sites.
4. Waste must be placed in secondary protective basins.
5. This waste can be transferred only to a certified contractor.

#### **Dust and emissions**

All vehicles shall be maintained so that their emissions do not cause nuisance to workers or local people. Activities will be limited to daylight working hours to reduce impacts. All vehicles will be checked and repaired in case of need to eliminate increased level of noise due to damaged parts.

Regular maintenance of diesel engines will be undertaken to ensure that emissions are minimized, for example by cleaning fuel injectors. Routine maintenance will be to a high standard to ensure that vehicles are safe and that emissions and noise are minimized. All plant used on site will be regularly maintained so as to be in good working order at all times to minimize potentially polluting exhaust emissions.



Vehicle refueling will be undertaken so as to avoid fugitive emissions of volatile organic compounds through the use of fuel nozzles and pumps and enclosed tanks (no open containers will be used to stored fuel).

If deemed necessary in dry conditions or where significant quantities of dust are being or are likely to be produced mitigation measures will be arranged with the Construction Manager. Mitigation measures will include:

- Damping down using water bowsers with spray bars or other technical means;;
- Sheeting of construction materials and storage piles; and
- Use of defined haulage routes and reductions in vehicle speed where required. Materials will be transported to site in off peak hours.
- Materials transported to site will be covered/ wetted down to reduce dust. The construction site will be watered as appropriate. Protective equipment will be provided to workers as necessary. All vehicles will be checked and repaired in case of need to eliminate increased emission due to damaged parts.

Such measures will be used, in particular, where human or animal receptors lie within 300m of the ROW.

### **Subsoil Storage**

The storage of subsoil in stockpiles, no more than 3m high with side slopes at a maximum angle of 60°, will take into consideration the following:

- Dedicated storage locations where the stockpiles will not be compacted by vehicle movements or contaminated by other materials; and
- Segregation from topsoil stockpiles.

In the event that the subsoil stockpiles experience significant erosion Contractor will institute corrective action such as installing erosion matting over the stockpiles.

### **Reinstatement of Subsoil**

- Erosion and run-off control
- Relief and landscape; where relief will not be reinstated to its initial conditions (new channels) – clean it from construction wastes and harmonies it with the natural landscape.
- Surface water drainage; and

No further reinstatement will be undertaken until the joint inspection has been undertaken and any corrective action necessary completed.

### **Temporary Erosion Control Measures**

The measures, by which Contractor will address the protection of “slopes” of the dam against erosion before permanent reinstatement, are outlined in this section. Temporary erosion control measures will be introduced as necessary, paying special attention to:

Construction activities that increase the potential for erosion from the check dam sides and/or sediment mobilization in watercourses;

Temporary erosion control measures will be left in place. The purpose of temporary erosion control measures is to:

- Interrupt surface water run-off;
- Slow the velocity of water runoff to the extent practical;
- Divert water off exposed check dam areas;
- Prevent and minimize sediment transportation off the construction sites; and
- Straw bale barriers in locations requiring small volumes of sediment interception;
- Land clearance. Uprooting stubs of the felled and removed trees and bushes. Cleaning the area of bushes, sweeping by using rake, moving to 50 m distance, burning and re-burning of heaps.
- Licensed material supply sites will be used. .

- Safety and Access. Alternate access will be provided for vehicles and pedestrians. Appropriate lighting and signs will be employed.

### 5.1.2 Temporary storage of the museum exposition

The collections of Opt. Lortkipanidze Vani Archaeological Museum carry items of the non-organic origin. Vani Archaeological Museum in particular preserves the exhibits of metal, ceramic, glass and stone material dated VIII-I centuries B.C. With regard to commencing rehabilitation works at the Museum, there was raised the issue of temporal evacuation of the collections aiming at their conservation. On June 12-13 of the current year the employees of the National Museum of Georgia and the Union of Berlin Museums went on business trip to Vani and together with Vani Museum employees planned the strategy for evacuation of collections. The plan included:

- Evacuation of a part of the collection comprising stone artifacts to the first floor of the archaeological base located nearby the Museum building. Using the entrance door from the side of terrace for bringing exhibits into the base building. Covering windows of the terrace side with light filters and equipping the building with an alarm system.
- Evacuation of a part of the collection comprising metallic items to the S. Jana Shia Museum of Georgia (at so called Vani Treasury Chamber) and the second part (metal artifacts to be restored) to the restoration laboratory of Archaeological Survey Center. This decision is due to the climatic conditions in Vani (extremely high RH), which carries high risk factor for metallic artifacts.
- Replacing old paperboard boxes damaged by moisture with plastic containers for storing exhibits.
- Establishing on-site a grievance unit.

The detailed program of collection removal and conservation of the museum exhibits see annex 1

According to the Order # 280 of 10.08.2011 of the Georgian National Museum pertaining protection of the collection and its temporary evacuation in the course of the Museum rehabilitation and extension, a special commission was set up. Under abovementioned Order, the Vani Archeological Museum was closed for visitors from 10 August, 2012 and the special commission took responsibility for the preparation, transportation, and protection of exhibits as well as for the documentation of the processes.

On 15 August, 2012 evacuation of the collection was accomplished. More than 36 000 exhibits were evacuated to the Archeological Research Centre of Tbilisi Museum, in particular:

1. Precious metals (gold, silver), bronze, glass and stone artifacts (457 units);
2. bronze, silver, glass, amber and steal exhibits (902 units) for restoration;
3. Clay, bronze, silver and glass artifacts for restoration and analysis (300 units);

Part of the stone items and restored clay pitchers remained in the Vani Museum building, properly packed and protected, as transportation of these items would carry excessively risks of damage. The remainder of exhibits was evacuated into archeological expedition base in Vani.

### 5.1.3 Operation phase

1. Increased visitation will result in the increased volume of waste.

Mitigation measures:

- The number and volume of containers to be placed in the tourists gathering centers depends on the following factors: the expected number of tourists; the area of the territory, existence of access roads. Based on the calculations, for the expected 300 tourists one 1.1 m<sup>3</sup> capacity metal container should be placed. It should be taken into consideration that the distance between containers should not exceed 50m and at the same time the 1.1 m<sup>3</sup> containers should be easily

accessible by the respective vehicles and there should be space for maneuvering. If the abovementioned requirements cannot be met, a smaller size easily portable 0.24 m<sup>3</sup> plastic containers should be used.

- **Imposing of penalty sanctions<sup>2</sup> against littering of the site**

Placement of the containers will have no tangible result, if the penalty sanctions are not imposed and exercised. The effectively implementation of the penalty mechanisms will lead to accelerated achievement of the target.

2. Increase in the number of visitors and related services necessarily results in proportionally greater sewage generation. This impact will be mitigated by collection and treatment of sewage in a package type plant.

Mitigation measures:

- Water treatment technology is made so that methane and hydrogen are not liberated, which enables the treating facility to be close to the building. Moreover, the process of nitrification and denitrification is repeated there several times, which enables reducing of phosphorus and nitrogen in the treated water;
- A sewer is made by means of controllable lifts, which is expected to receive maximum volley expenditures, enabling avoidance of leakage of untreated water from the facility.
- The facility is made of polypropylene, which is not chemically active. It does not corrode, it is hermetic, it is small and light-weighting.
- With new technical solutions, high reliability, long-term service, low power consumption and high quality treatment of waste water.

3. The traffic will increase in the area adjacent to the Museum, which will result in the increased level of local emissions and noise as well as traffic safety issues.

Mitigation measures:

- Parking lots are located in the nearest streets of Vani museum. The car parking area and lots are located so that cars and buses will be able to stop and maneuver uninterruptedly;
- The proper management services will reduce negative impacts, imposed by traffic jams causing increased volumes of emissions and noise, on the site.

## 6 Monitoring

MDF carries overall responsibility for monitoring of the implementation of the environmental mitigation measures. A consulting firm hired for supervision of works will supplements MDF's in-house capacity for tracking environmental and social compliance of works undertaken under this subproject. Field monitoring checklist will be filled out and photo material attached on monthly basis. Narrative reporting on the implementation of EMP will be provided on quarterly basis as part of the general progress reporting of MDF. MDF will also be expected to obtain from contractors and keep on file all permits, licenses, and agreement letters which contractors are required have according to the Georgian law for extracting material, operating asphalt/concrete plants, disposing various types of waste, etc.

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<sup>2</sup> "The General Administrative Code of Georgia" Articles 52, 82 and 142

## **7 Costs of Implementation**

Costs of implementing the proposed individual mitigation measures are small and difficult to single out from the costs of construction operations. Nonetheless, it is recommended that Bill of Quantities presented in the tender documentation carries a line item for the disposal of waste and excess materials. Other costs of adherence to good environmental practice and compliance with this EMP are expected to be integrated into the pricing of various construction activities.

## PART D: MONITORING MANAGEMENT PLAN

<b>Activity</b>	<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>Who</b> (Is responsible for monitoring?)
<b>CONSTRUCTION PHASE</b>						
Supply with construction materials	Purchase of construction materials from the officially registered suppliers	In the supplier's office or warehouse	Verification of documents	During conclusion of the supply contracts	To ensure technical reliability and safety of infrastructure	MDF, Construction supervisor
Transportation of construction materials and waste  Movement of construction machinery	Technical condition of vehicles and machinery  Confinement and protection of truck loads with lining  Respect of the established hours and routes of transportation	Construction site	Inspection	Unannounced inspections during work hours and beyond	Limit pollution of soil and air from emissions;  Limit nuisance to local communities from noise and vibration;  Minimize traffic disruption.	MDF, Construction supervisor, Traffic Police
Restoration works	Compliance with design approved by NACHP	Construction site	Inspection	In the course of restoration works	Prevention of damage of historical features of building and historical site in hole.	MDF, Construction supervisor  NACHP

<b>Activity</b>	<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>Who</b> (Is responsible for monitoring?)
Earth works	<p>Temporary storage of excavated material in the pre-defined and agreed upon locations;</p> <p>Backfilling of the excavated material and/or its disposal to the formally designated locations;</p> <p>In case of chance finds immediate suspension of works, notification of the Ministry of Culture and Monument Protection, and resumption of works exclusively upon formal consent of the Ministry.</p>	Construction site	Inspection	In the course of earth works	<p>Prevent pollution of the construction site and its surroundings with construction waste;</p> <p>Prevent damage and loss of physical cultural resources</p>	<p>MDF,</p> <p>Construction supervisor</p> <p>NACHP</p>

<b>Activity</b>	<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>Who</b> (Is responsible for monitoring?)
Sourcing of inert material	<p>Purchase of material from the existing suppliers if feasible;</p> <p>Obtaining of extraction license by the works contract and strict compliance with the license conditions;</p> <p>Terracing of the borrow area, backfilling to the exploited areas of the borrow site, and landscape harmonization;</p> <p>Excavation of river gravel and sand from outside of the water stream, arrangement of protective barriers of gravel between excavation area and the water stream, and no entry of machinery into the water stream.</p>	Borrowing areas	<p>Inspection of documents</p> <p>Inspection of works</p>	In the course of material extraction	<p>Limiting erosion of slopes and degradation of ecosystems and landscapes;</p> <p>Limiting erosion of river banks, water pollution with suspended particles and disruption of aquatic life.</p>	MDF, Construction supervisor

<b>Activity</b>	<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>Who</b> (Is responsible for monitoring?)
Generation of construction waste	Temporary storage of construction waste in especially allocated areas;  Timely disposal of waste to the formally designated locations	Construction site;  Waste disposal site	Inspection	Periodically during construction and upon complaints	Prevent pollution of the construction site and nearby area with solid waste	MDF,  Construction supervisor
Traffic disruption and limitation of pedestrian access	Installation of traffic limitation/diversion signage;  Storage of construction materials and temporary placement of construction waste in a way preventing congestion of access roads	At and around the construction site	Inspection	In the course of construction works	Prevent traffic accidents;  Limit nuisance to local residents	MDF,  Construction supervisor
Collection removal and conservation of museum expositions	Compliance with the plan of temporary storage approved by NACHP	Construction site;  Removal road;  New site for temporary storage.	Inspection	Till museum exhibits will be returned at Vani Museum	Prevent damage or loss of museum exhibits  Prevent traffic accidents	MDF,  Construction supervisor  NACHP



<b>Activity</b>	<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>Who</b> (Is responsible for monitoring?)
Workers' health and safety	Provision of uniforms and safety gear to workers;  Informing of workers and personnel on the personal safety rules and instructions for operating machinery/equipment, and strict compliance with these rules/instructions	Construction site	Inspection	Unannounced inspections in the course of work	Limit occurrence of on-the-job accidents and emergencies	MDF,  Construction supervisor
<b>OPERATION PHASE</b>						
Management of Vani museum premises	Household waste management  Maintenance of water supply and sanitation system  Control installation of new physical constructions and infrastructure within the site	Vani Museum site	Inspection	During operation of facilities	Prevent littering of the site  Prevent malfunction of fountains, public WCs, and utilities in the administration buildings  Preserve historical and aesthetic value of the site	Administration of the Vani Museum  UWSC  Vani municipality

<b>Activity</b>	<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>Who</b> (Is responsible for monitoring?)
Conservation of historical and art exhibits within Vani museum premises	Smooth operation of climate control and security devices of the museum.	Vani Historical Museum	Inspection	During operation of facilities	Prevent physical damage and loss of exhibits	Administration of the Vani Historical Museum
Management of visitation to Vani museum	Development and implementation of a site management plan	Vani Historical Museum	Inspection	Prior to the rehabilitated site re-entering into operation and throughout operation	Prevent over-crowding of the site and dissatisfaction of visitors	Administration of the Vani Historical Museum

## **Annex 1 Methodology for Transportation and Temporary Storage of Movable Monuments of Cultural Heritage of Georgia**

### **Introduction**

Georgian National Museum is a unification of the most important museums in Georgia. Most part of the mobile monuments of cultural heritage are united under the roof of this unification.

A well-structured, effective mechanism of collections management is being created in the Georgian National Museum, which will support to the optimal management and popularization of protected collections.

One of the most important documents of collections management is „Georgian National Museum collections removal and conservation program“, which aims to determine standards for objects removal and conservation and their adoption in the GNM space.

This program is a range of standard protective-conservative procedures, in whole creating a general process of protecting objects. This process starts with the identification of the objects and removal from museum and ends with their location in the exhibition halls or storage rooms.

### **Program of collection removal and conservation**

#### **Planning and defining priorities**

##### **Planning methodology**

When moving collections and determining conservation program each museum and relevant storage should first of all create an analytical scheme, which is helpful to define a group of objects which are under maximal risk. Finally, there should be priorities exactly defined in the program of collections removal and conservation. This methodology helps program management to evaluate main components of planning: quality of risk, which is threatening to the collections in case of unfavorable factors; Precious part of collection; Existing resources; Technical expertise; financial resources and definition of exact activities. Evaluation of results helps to the definition of priorities.

##### **Evaluation of risk quality**

When defining museum collections removal and conservation program, it is necessary to have initial data. These data should cover information about damages to the collections and type of these damages, environmental collections, where the artifacts are stored, technical providence of the building.

##### **Review of collections state**

Every collection of the museum has to be described to see what kind of damages there are, what kind of preventive activities have to be undertaken. It is also necessary to have a database, where there will be a complete list of collections uploaded. Before starting the removal, the collections have to be listed in the excel program. The selected program makes it possible to meet the demands of the museum conservation work, namely it becomes possible to see the movement of the objects within the Excel program, to have an exact list. In the excel program a current also temporary and final location of the objects has to be indicated. Conservators put in the same program future activities to be done for each object before the process starts. The following data have to be put in the Excel format:

- Packing number
- Inventory number
- Name

- Material
- Size, weight
- Location (current, temporary, final)
- Simple condition report
- Cleaning
- Conservation – enforcement for transportation
- Decontamination
- Future restoration (If necessary)
- Photo
- Last name, date

### **Review of environmental conditions**

Planning data of environmental conditions includes registration of relative humidity and temperature throughout day-night as in old storages as well as in old ones, or exhibition spaces, which is defined for final location of collections. Registration of environmental conditions will help the museums to define exactly and improve the current situation. Climate monitoring should be done before collections removal and should cover at least 2 months data.

The question how exactly the micro-climate should be monitored and studied should be decided by the management. Decision depends on the local conditions and resources.

### **Our resources**

Collected information about environmental conditions and other factors, information about evaluation of collections and their state refer to such issues (currently as well as in future) like technical resources of the organization. Only after this the planning process is continued by realistic opportunities and afterwards the activities have to be defined, which should be practically implemented. Based on this data initial differentiation of collections takes place, necessary boxes for the collections' removal have to be defined, as well as packing materials (quantity, compatibility with the object), collections' removal route is defined,

**Transportation issue** (number of workers, transport means and quantity to be defined).

### **Art of management**

Any planning process should include a situation, in which the planned program should take place. Therefore we should be very attentive in management issues as well as with obstacles and with the non-existence of resources. Success of the conservation program depends on the readiness of collections' curators and on their support to recommended changes. Their participation should be clear from the very beginning of the project and they should support the project during a long period. Every working process should be planned by the curators, during implementation process – reports have to be written on what has been done and what recommendations they have. Much is depended also on the cooperation between the collaborators. During planning, possible conflicts have to be avoided, therefore each collaborator should be included in the project implementation. The project manager decides in which time-frame the whole project should be implemented. According to the materials of the collections and working time-period could be defined as well the number of participants in the process and number of working groups. Each group makes a list of works to be done and inventory necessary for the storage (shelving, wardrobe, safe) and characteristics.

Before collections' removal program there should be preliminary works done:

- A list of objects to be removed should be prepared
- Photo documentation of exhibition and storages
- Preparation of packing and cleaning space

- Preparation of storages (cleaning, climate, pest monitoring)
- Preparation of space for anoxia

### **Cleaning, to clean from dust**

#### Diagnostic checking

Dust is visible sediment which blocks to find out the identity of the object. Due to its hygroscopic character (or humidity absorbent) and chemical composition (existence of pollutants) dust is an important factor of object surface damage.

Cleaning/dust removal respectively is an important factor of getting the object better, which is carried out after diagnostic checking of object, searching the information in data base on its material character and determining the function.

Cleaning/dust removal is a mandatory activity which includes determination of object surface form, quality, its structure and surface condition, function of obvious external and internal sediments.

Considering these parameters strategy of works shall be elaborated; what shall be removed, what shall be kept and select respective technique for selective cleaning.

Restorer evaluates risks and contra-indications connected with such care. He/she should rely on personal professional skills, experience, to be sure that works carried out will have good result.

### **Interference quality**

Different parameters have to be considered:

- characteristics of material content of objects surface
- structural condition of the object
- condition of object surface
- internal and external characteristics of sediment

### **Diagnostic checking**

Full cleaning/Dust removal	Selective cleaning/Dust removal	Cleaning/Dust removal is not allowed
Objects which surface is in good condition (intermolecular attraction, cohesion is good)	Objects which some parts of surface (local) are in bad condition, dust shall be removed only from the parts, which are in good condition. E.g. rusty metal (correctional), metal, dry leather	Objects surface of which is in bad condition and is falling apart
Stable objects which surface are homogeneous (e. g. wood, which has homogeneous patina)	Objects with some places of surface (local) are external sediments, surface is less glutinous or less corrosion, dust is removed from the	Objects surface of which is falling apart, is glutinous and less corrosion

	places where the above damages are not at all. E. g. wood where paint particles transformed into powder, food remains in container	
Examples: obsidian, stone, glass, ceramics, wood, bone, ivory, horn, etc.	Examples, objects which require partial removal of dust, for example: feather, plant remains and etc. Compiled objects, which consist of parts with different stability, dust shall be removed from less risky parts	Examples: powdered painting substance, liquid patina, tree-fern, leather, from which hair is falling in some places, spider web and etc.

### Equipment and cleaning material

Different tools and cleaning material are necessary to remove dust from organic and inorganic objects, which help to clean/remove dust.

It is necessary to avoid spreading the dust and re-accumulation of its particles. The list below shows which technology can be used on different type of object.

Equipment	Object Type		
Material and equipment	Organic and inorganic objects with good condition	Fragile organic and inorganic objects	Inorganic objects
Micro vacuum cleaner	X	X	X
Vacuum cleaner with filter	X		X
Synthetic and natural paint brushes and brushes	X	X	X
Soft eraser rubber	X		
Soft textile	X		
Different solvents: ethanol, acetone, (white) spirit			X
Distilled water	X		

### Metal objects

First conservation measure that has to be taken in connection with metal object collection determination of active focuses of corrosion.

Signs of deterioration changes of metal condition are: growth in size because of product created during rusting, parts pulled and peeled from surface become powdered; objects are easily broken and turned into crumbs.

Metal objects containing active corrosion shall be definitely placed separate, isolated. Object condition and corrosion quality is checked by a restorer. If active corrosion process is determined, respective objects are placed in separate container, which is labeled as "active corrosion".

Only those objects made totally of metal are placed in metal container. It is not necessary to place mixed objects, objects compiled of inorganic and organic substances separately, and they follow ordinary flow, because conservation conditions necessary for metal objects are unsuitable or organic substances.

### **Packing**

Metal objects that shall be removed are packed in neutral paper, then in bubble polyethylene and is fixed with scotch, packed material is put on 5cm sponge. Packed objects place in boxes are separated with sponge sheets. Boxes of objects that shall be removed are numbered, sealed, one copy of list of objects that are there is put into box, and another one is attached to the box.

Objects labelled as "active corrosion" are placed in separate boxes, which have inscription "active corrosion".

### **Packing of brittle, fragile objects (glass, ceramics, porcelain)**

Temporary carcass shall be made for big size brittle objects, which shall be wrapped by soft material to avoid touching of artefacts with hard surface of carcass. Small objects are wrapped in bubble polyethylene and fixed by scotch; wrapped material is placed on 5cm-thick sponge. Objects placed in box are separated by sponge sheets. Box with objects subject to transportation is numbered and sealed. One copy of the list of the objects placed in the box is put into the box, another is glued on the box.

### **Painting Packing**

Most reliable packing method for painting is to put them into special box with sections. However usually simple method is used. Painting is selected according to the size. Paintings are wrapped in mica tape, or aed free paper (can be used graph paper) and bubble polyethylene and placed in box. Free space is filled by packing material (foam rubber, corrugated cardboard).

Big size painting without frame is rolled on beam together with mica tape and placed in box.

### **Textile Packing**

Please consider the following while packing and storing an object:

- Avoid to create folds, which makes textile weak and causes its damage;
- Ensure the support which will fit the object to distribute the pressure on the object;
- When it is necessary to fold the textile, it is better not to cross and use lot of softness;
- When several parts of costume are placed in cardboard box or container, heaviest objects shall be placed on the bottom.

### **Packing of wooden objects**

Wooden objects are wrapped according to size and condition. Bubble polyethylene, 5cm-thick sponge, foam plastic can be used as packing material.

### **Fungicide Processing**

Organic and inorganic objects which have signs of mould or fungus shall be processed by fungicides. After disinfecting they are stored in stable environmental conditions, which are appropriate for object content and hinders to renew biologic activity.

Visible signs of mould and fungus are:

- appearance of local small dots;
- appearance of white or colored signs;
- fibers are spread from the center;
- Appearance of separate dots and stains are indicating that infection is started in lower layer of the object.

### **What shall be done**

Objects that have mould or fungus signs can undergo two disinfecting operations:

- Disinfection by fungicides, isopropanol can be used.

### **Anoxic treatment**

Organic artefacts shall be examined by respective restorers. If they find some kind of damage which is caused by living organisms, anoxic treatment process is necessary.

### **Anoxic Treatment**

When it is necessary to treat collection of Georgian National Museum by anoxic method, you should apply to GNM Collection Management and Restoration Department. Application shall include list of objects to be treated (including size and material).

### **Transportation**

What shall be done before transportation?

- Examine route: doors, stairs, narrow passes;
- Transport “nonstandard” objects with special consideration. How are you going to pass them through doors?
- Ask for help to open the door;
- Always take one object at one time;
- If you are taking several objects, use containers, place objects well, to avoid vibration;
- Do not go backwards while taking an objects;
- Do not hurry

When GNM collection is moved from one museum to another, you should apply to GNM Collection Management and Restoration Department. Application shall include following information:

- transportation date
- which collection belongs to
- list of boxes
- number of boxes
- number of objects

Collection Management and Restoration Department is obliged to provide with the above information General Director.



Project manager fills in transportation form with following information:

- transportation date and time
- collection transportation route
- transportation type

Any transportation of GNM collections shall be carried out only based on respective order.

## **Annex 2. Plan for the Temporary Storage of the Vani Museum Collections**

### **Standards and requirements applicable**

Special area is needed for the security of the museum collection repository. It's compulsory the area should only serve museum collection. It's for repository area it should be totally isolated from the office and research area as stable security condition is necessary for museum collections.

Along with the security system the repository should meet the following demands:

- . To control the level of temperature and relative humidity
- . To reduce the fluctuation of temperature and relative humidity
- . To protect objects from dust and pollution
- . To protect objects from damage caused by light
- . To protect objects from biological damage (Insects, rodents)

The area chosen for the repository should for see the number of the objects, characteristic, installation of special equipment and area for museum collection further increase.

### **Requirements for the storage area**

Museum collections should be arranged in the repository. In the area should be ensured a free replacement and usage of technical equipment. Distance between rows should not be less than 122cm. It enables us to move safety between rows and distance large exhibits and stellates.

The Number of windows and doors should be limited to maintain the security and necessary regimes. We must arrange so that repository walls should not be used as external walls. This provides for the stability of temperature and external conditions with relationship to climate changes and it increases security and protection quality. Water supply system should the jeopardy of damaging exhibits in the case of water leaking.

Note:

Plumbing connected with the fire prevention system is permissible if a drainage system will be provided with adequate drainage.

Electrical booths, water, gas, electric meter should be installed as far as possible from the repository to exclude admission of random people in the funds and repository. (People who have nothing to do with funds).

Repository should be used only for the keeping of collections. Offices, research labs (and other auxiliary areas) should be arranged near the depository and not inside it. While arranging the depository electrical wiring should be set up according to modern standards.

Daylight should not fall directly in the repository.

Illumination should not exceed 200. Depository windows should be arranged such that daylight will not (enter) fall straight into the repository.

Ensure darkness in the room, when there is no necessity to work there. The walls should be covered with paint that contains Titanium Dioxide pigment, which absorbs the ultraviolet radiation caused by daylight or artificial lighting.

### **Storage equipment**

Museum material with relevant wrapping should be placed in special containers and boxes in order to keep all the sizes for optimum protection and preservation.

It's advisable to use approbated special containers, shelves, and stellates.

More often iron shelves and stillage are used: Iron shelves are mostly used for the boxes. Stellates are used the large and heavy objects. Iron shelves and stellates should be covered with special several layer paint that protects shelves from rust and is neutral with other objects.

While taking decision how to use museum equipment the following should be for seen:

- Research of object should precede to the process of planning shelves and cases. It's better to place objects according to their size and material than by their origin, geographical location or any museum criteria.
- Its desirable windows and shelves not touch exterior walls.
- Stellates, cases and shelfe should be checked to determine if they are corroded, have good locks and may be moved softly (carefully)
- Drawers should not be loaded more than 23 kilos.
- Shelves shouldn't be arranged too high as it'll be inconvenient to use them.
- All museum cases and stellates should be installed 15cm above from the floor. The high will secure objects from possible flood.
- It's easier to clean up.
- It's reduced danger of appearance of insects and bacteria.
- It's recommended to use closed-cell foam plastic in the museum cases.
- All shelves, stellates, cases and drawers should be attached with identification number that will help us to identify the location of the desirable object. About this should be indicated in the museum data.
- The fund should meet the fire prevention security extreme demands.
- It should have fire prevention security spare exit and corresponding fire prevention equipment. Repository should be under the supervision of the technical authority.
- It's expedient to have a special storage for the new material (where it should be checked, select). To have an isolator and disinfection chamber is desirable as well.
- Special storage for keeping economic implements (stretchers, lamps, trolleys, ladders, rope. etc.), vacuum cleaner, brooms wrapping material.
- Spare storage for show cases, frames and glass.
- After creating depository there will exist two main security levels.

II Furniture for arranging objects.

- Cases
- Stellages, Shelves
- Special furniture, portable shelves.

III Containers

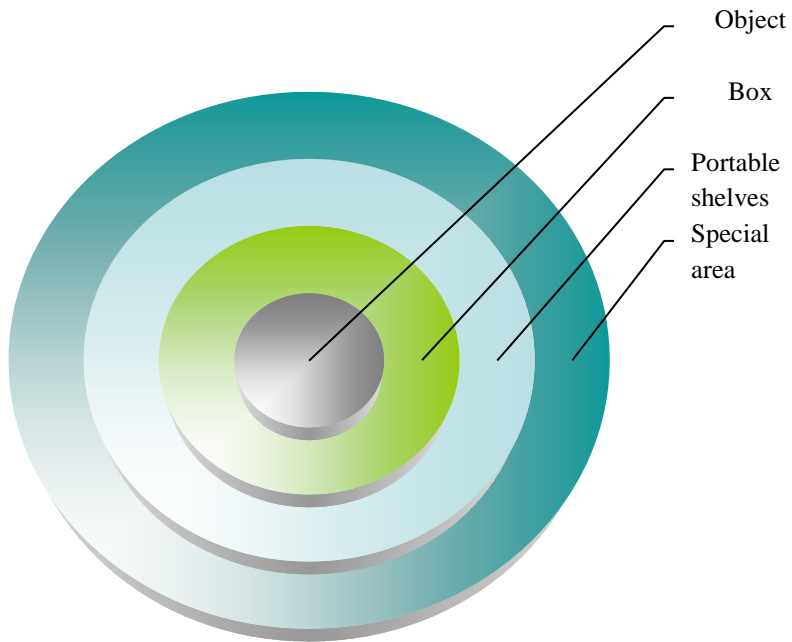
- Boxes of different size.
- Paper case

The layers of the object protection in the repository:

- Object
- Box
- Portable shelves

- Special area

The layers of the exhibit protection in the repository



**Annex 3. Order #280 of the Director General of the Georgian National Museum of August 10, 2011 on the Transportation and Temporary Storage of the Exhibits of Vani Museum**



ბ რ ძ ა ნ ე ბ ა № 280

ქ. თბილისი

10.08. 2011 წ.

სარეკონსტრუქციო სამუშაოებთან დაკავშირებით საქართველოს ეროვნული მუზეუმის ოთ. ლორთქიფანიძის სახელობის ვანის მუზეუმში დაცული სამუზეუმო კოლექციების დროებითი გადაადგილების შესახებ

ოთ. ლორთქიფანიძის სახელობის ვანის მუზეუმში დაცული კოლექციების სჯანაშიას სახელობის საქართველოს მუზეუმში, არქეოლოგიურ კვლევის ცენტრში და ვანის არქეოლოგიური ექსპედიციის ბაზაზე დროებით გადაადგილების მიზნით

ე ბ რ ძ ა ნ ე ბ ა :

1. დაიხუროს დროებით ამა წლის 10 აგვისტოდან ვანის არქეოლოგიური მუზეუმში დამთავალიერებულათვის დაგეგმილ სარეკონსტრუქციო სამუშაოებთან დაკავშირებით.
2. შეიქმნას კომისია შემდეგი შემადგენლობით:
  - ო. ვაბუნია - რეგიონალური მენეჯერი, კომისიის თავმჯდომარე;
  - დ. კაჭარავა - კონსერვატორი, კომისიის წევრი;
  - ნ. კალანდაძე - დეპარტამენტის უფროსი, კომისიის წევრი;
  - ა. ჭყონია - უფროსი მეცნიერ-თანამშრომელი, კომისიის წევრი;
  - დ. ახვლედიანი - უფროსი მეცნიერ თანამშრომელი, კომისიის წევრი;
  - მ. ფირცხალავა - უფროსი მეცნიერ-თანამშრომელი, კომისიის წევრი;
  - ნ. მათიაშვილი - კონსულტანტი, კომისიის წევრი;
  - ს. ხარაბაძე - მეცნიერ თანამშრომელი, კომისიის წევრი;
  - ზ. ახვლედიანი - ტექნიკური მენეჯერი, კომისიის წევრი;
  - ვ. ფხაკაძე - კოლექციების კურატორი, კომისიის წევრი.
3. კომისიამ უზრუნველყოს ექსპონატების სევეაკუაციოდ მომზადების, ტრანსპორტირების, დაბინავების პროცესის ხელმძღვანელობა და მუდმივი მონიტორინგი მუზეუმში დადგენილი სამართლებრივი ნორმების შესაბამისად.
4. დაევალოს რესტავრაცია-კონსერვაციისა და კოლექციების მართვის დეპარტამენტს (ნ. კალანდაძე) ექსპონატების მომზადება ტრანსპორტირებისათვის, გადატანასთან დაკავშირებული დოკუმენტაციის გაფორმება და ექსპონატების დაცვისათვის შესაბამისი პირობების უზრუნველყოფა.
5. დაევალოს გიდ-პედაგოგებს მ. ვაშაყმაძეს, ლ. აბრამიძეს, ბ. დვალისხილს, ნ. დარსალიას, ს. რამიშვილს კომისიის საქმიანობის ხელშეწყობა.
6. დაევალოს ექსპონატების გადაბარების დოკუმენტაციის მომზადება და მიღება-ჩაბარების აქტების გაფორმება კოლექციების (ფონდები), დაცვა-აღრიცხვისა და მართვის სამსახურის ჯგუფის უფროსს ო. შარიქაძეს, ისტორიის კოლექციების მენეჯერს

მ.კალაძეს, საინფორმაციო კოლექციების ასისტენტს, არქეოლოგიური კვლევის ცენტრის კოლექციების მენეჯერის მოვალეობის შემსრულებელს ხ. ჯორბენაძეს და ისტორიის კოლექციების მთავარ კურატორს მ. ჯალაბაძეს.

7. დაევალოს მთავარ კურატორს (მ. ჯალაბაძე) ძვირფასი ლითონების ექსპონატების ფონდ-საცავში განთავსება და მათი დაცვის უზრუნველყოფა.
8. დაევალოს ასისტენტს, არქეოლოგიური კვლევის ცენტრის კოლექციების მენეჯერის მოვალეობის შემსრულებელს ხ. ჯორბენაძეს არქეოლოგიის კვლევის ცენტრში გადასატანი ექსპონატების ჩაბარება და მათზე მატერიალური პასუხისმგებლობა.
9. დაევალოს ვანის არქეოლოგიური ექსპედიციის ბაზაზე გადასატანი ექსპონატების ჩაბარება მენეჯერს მ. კალაძეს და მათზე მატერიალური პასუხისმგებლობა.
10. დაევალოს შიდა უსაფრთხოების სამსახურს (დ. ჩიხრაძე) ექსპონატების ტრანსპორტირებისა და დაცვის პროცესზე შკაცრი კონტროლის განხორციელება.
11. დაევალოს ტექნიკური სამსახურის უფროსს (ნ. მიქაძე) ექსპონატების ტრანსპორტირების უზრუნველყოფა.
12. კონტროლს ბრძანების შესრულებაზე განვახორციელებ პირადად.
13. ბრძანება ძალაშია ხელმოწერისთანავე.

გენერალური დირექტორი

დავით ლორთქიფანიძე

**Annex 4. Report on the Transportation of the Exhibits of Vani Museum and  
Their Placement for Temporary Storage  
(September 14, 2012)**

საქართველოს ეროვნული მუზეუმის  
გენერალურ დირექტორს  
ბატონ დავით ლორთქიფანიძეს

უფორსი კონსერვატორი  
დარეჯან კაჭარავას

კოლექციების მართვისა და რესტავრაცია-კონსერვაციის  
დეპარტამენტის უფროსის  
ნინო კალანდაძის

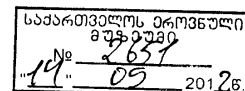
#### ანგარიში

მოგახსენებთ, რომ ამა წლის 15 აგვისტოს დასრულდა საქართველოს ეროვნული მუზეუმის ოთ. ლორთქიფანიძის სახელობის ვანის არქეოლოგიური მუზეუმის კოლექციების ევაკუაცია.

საქართველოს ეროვნული მუზეუმის ოთ. ლორთქიფანიძის სახელობის ვანის არქეოლოგიური მუზეუმის კოლექციების გადატანამდე, 2012 წლის 12-13 ივნისს, საქართველოს ეროვნული მუზეუმის თანამშრომლები და გერმანელი ექსპერტები (ბერლინის მუზეუმების გაერთიანების თანამშრომლები) მივლინებულ იყვნენ ვანში, სადაც ვანის მუზეუმის თანამშრომლებთან ერთად დაისახა კოლექციების ევაკუაციის სტრატეგია. ევაკუაციისათვის შერჩეულ იქნა ე.წ. არქეოლოგიური ბაზის I სართული. 2012 წლის ივლისის დასაწყისში მოხდა ვანის მუზეუმისა და საექსპოზიციო სივრცეების ფოტო დოკუმტაცია.

ვანის არქეოლოგიური მუზეუმის კოლექციების გადაადგილებამდე შესრულდა შემდეგი სამუშაოები:

- შედგა გადასატანი ნივთების სია
- მომზადდა შეფუთვისა და გაწმენდის სივრცე
- მომზადდა დროებითი საცავი (სიგნალიზაცია, დაცვის პუნქტის შექმნა, სტელაჟების შექმნა და მონტაჟი)

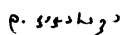


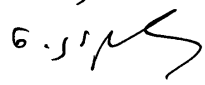


თქვენი N 280 ბრძანების (სარეკონსტრუქციო სამუშაოებთან დაკავშირებით საქართველოს ეროვნული მუზეუმის ოთ. ლორთქიფანიძის სახელობის ვანის მუზეუმში დაცული სამუზეუმო კოლექციების დროებითი გადაადგილების შესახებ) თანახმად, ვანის მუზეუმში დაცული 36 600-ზე მეტი ექსპონატიდან თბილისში ევაკუირებულ იქნა:

1. საგანგებო მონაპოვართა ფონდში დაცული ძვირფასი ლითონების (ოქრო, ვერცხლი), ბრინჯაოს, მინისა და ქვის არტეფაქტები (457 ერთ.), რომლებიც ამჟამად დაცულია ს. ჯანაშიას სახელობის მუზეუმის ძვირფასი ლითონების საცავში;
2. ბრინჯაოს, ვერცხლის, მინის, ქარვისა და რკინის ნივთები ფონდებიდან და გამოფენიდან (902 ერთეული) – სარესტავრაციოდ, რომლებიც ამჟამად დაცულია ოთარ ლორთქიფანიძის არქეოლოგიის ცენტრის ქიმიურ-სარესტავრაციო ლაბორატორიაში;
3. თიხის, ბრინჯაოს, ვერცხლისა და მინის არტეფაქტები აღსადგენად და საანალიზოდ, რომლებიც დაბინავებულია ს. ჯანაშიას მუზეუმში (300 ერთეული);
4. მუზეუმის საგამოფენო დარბაზსა და პოლში დარჩა ქვის არქიტექტურული დეტალები და რესტავრირებული ქვევრები, რომელთა ტრანსპორტირება სახიფათოა. ისინი შეფუთულია დაზიანებისაგან დასაცავად;
5. დანარჩენი, ძირითადი მასალა გადატანილ იქნა ვანის არქეოლოგიური ექსპედიციის ბაზაზე.

პატივისმით,

დ. კაჭარავა 

ნ. კალანდაძე 

### **Annex 5. Minutes of Public Consultation Meeting on ER for Rehabilitation and Expansion of Vani Archaeological Museum**

In order to discuss the environmental documentation prepared for the projects envisaged under the Imereti Regional Development Project Vani Archeological Museum Rehabilitation Sub-Project, on August 21, 2012 a meeting was held at the Vani Municipality Conference Hall.

The inhabitants were informed about the public hearing in advance as the respective Statements were placed at the information boards of Gamgeoba building.

At the meeting were discussed the works with regard to the project as well as the expected impacts on environment and health of the people. There were discussed also the mitigation measures in order to minimize the potential negative impacts in the process of the project implementation. The attendees were informed about their rights and possible involvement in the construction process. In the process of the discussions concerning the Environmental Management Plans, those present were enabled to pose questions and express their critical attitudes in order to influence the plan finalization process.

#### **Those present:**

<b>name</b>	<b>organization</b>
Nino Patarashvili	Municipal Development Fund
Irakli Kaviladze	Environmental Consultant

Public Consultation was attended by attorneys of the territorial entities of Vani Municipality and representatives of population (See photos below)





**List of attendees (interested population)**

იმერეთის რეგიონული განვითარების პროექტი

ქ. ვანში დაგეგმილი ვანის არქეოლოგიური მუზეუმის რეაბილიტაციის ქვეპროექტის გარემოსდაცვითი დოკუმენტაციის საჯარო განხილვა

შეხვედრაზე დამსწრეთა სია

ქ. ვანი

20.08.2012 წ.

#	სახელი და გვარი	მოქალაქე/ორგანიზაცია	საკონტაქტო ინფორმაცია	ხელმოწერა
1.	ქაჩია ვაჟა	სოფლის და სპორტის კვლევითი ცენტრი	595 90-80-57	
2.	მშინა ბანაძე	სოფლის და სპორტის ს. რაი. კვლევითი ცენტრი	593 653 657	ქ. ბანაძე
3.	მშინა ხუციანი	სოფლის და სპორტის საოპერაციო დეპარტამენტი	551 752800	ქ. ხუციანი
4.	სოფია ნუციაძე	სოფლის და სპორტის ს. რაი. კვლევითი ცენტრი	551 14-50-12	ს. ნუციაძე
5.	სამხა კახიანი	სოფლის და სპორტის ს. რაი. კვლევითი ცენტრი	595 77-64-28	ს. კახიანი
6.	ქვია თამარი	ს. რაი. კვლევითი ცენტრი	595-90-85-39	ქ. თამარი
7.	მშინა მარცხაძე	სოფლის და სპორტის ს. რაი. კვლევითი ცენტრი	595-90-80-62	ქ. მარცხაძე

#	სახელი და გვარი	მოქალაქე/ორგანიზაცია	საკონტაქტო ინფორმაცია	ხელმოწერა
8.	სანაღირაძე ვანო	სოფლის მეურნეობის დასავლეთი რეგიონი	599-91-96-98	ვ. სანაღირაძე
9.	ამყარაძე იესო	საინჟინრო-საინფორმაციო სისტემების უფროსი	595908064	ი. ამყარაძე
10.	ნახია ქვიციანი	ვანის მუნიციპალიტეტის სსიპ "საგანმანათლებლო ცენტრი" დირექტორი	595908520	ქ. ნახია
11.	ხევაძე ვაჟა	ვანის მუნიციპალიტეტის სსიპ "საგანმანათლებლო ცენტრი" დირექტორი	59563-75-08	ვ. ხევაძე
12.	ქვიციანი ვანო	ვანის მუნიციპალიტეტის სსიპ "საგანმანათლებლო ცენტრი" დირექტორი	568272043	ვ. ქვიციანი
13.	ჩიბინიძე გიორგი	ვანის სოფლის მეურნეობის დასავლეთი რეგიონის დირექტორი	579 559-554	გ. ჩიბინიძე
14.	ვახუშტი ვანო	საინჟინრო-საინფორმაციო სისტემების უფროსი	593482021	ვ. ვახუშტი
15.	ბაღვაძე თეონა	საინჟინრო-საინფორმაციო სისტემების უფროსი	598-58-53-15.	თ. ბაღვაძე
16.	სოჭავაძე გიორგი	საინჟინრო-საინფორმაციო სისტემების უფროსი	579-90-85-21	გ. სოჭავაძე
17.	სოჭავაძე გიორგი	საინჟინრო-საინფორმაციო სისტემების უფროსი	595-90-80-76	გ. სოჭავაძე

#	სახელი და გვარი	მოქალაქე/ორგანიზაცია	საკონტაქტო ინფორმაცია	ხელმოწერა
18.	გაბრიელაძე ივანე	საინჟინრო-საინფორმაციო სისტემების უფროსი	855-322909	ი. გაბრიელაძე
19.	ქვიციანი ვანო	საინჟინრო-საინფორმაციო სისტემების უფროსი	595-90-80-63	ვ. ქვიციანი
20.	სანაღირაძე ვანო	საინჟინრო-საინფორმაციო სისტემების უფროსი	558-18-19-66	ვ. სანაღირაძე
21.	ამყარაძე იესო	საინჟინრო-საინფორმაციო სისტემების უფროსი	595908547	ი. ამყარაძე
22.	ქვიციანი ვანო	საინჟინრო-საინფორმაციო სისტემების უფროსი	59348-25-46	ვ. ქვიციანი
23.	ვახუშტი ვანო	საინჟინრო-საინფორმაციო სისტემების უფროსი	593440570	ვ. ვახუშტი
24.	ქვიციანი ვანო	საინჟინრო-საინფორმაციო სისტემების უფროსი	593 99 57 43	ვ. ქვიციანი
25.	სოჭავაძე გიორგი	საინჟინრო-საინფორმაციო სისტემების უფროსი	597 04-19-21	გ. სოჭავაძე
26.				
27.				

Irakli Kaviladze, Environmental Consultant of the MDF presented to the attendees the report on the Environmental Review(ER) for the above mentioned sub-project and Environmental Management Plan (EMP) which is part of this ER.

The meeting was opened by Nino Patarashvili, representative of the Municipal Development Fund of Georgia, she informed the attendees of the meeting about importance of Vani Archeological Museum Rehabilitation in terms of improvement the social and economic conditions in the region and the Municipality.

At the meetings were discussed the works with regard to the project as well as the expected impacts on environment and health of the people. There were discussed also the mitigation measures in order to minimize the potential negative impacts in the process of the project implementation. The attendees were informed about their rights and possible involvement in the construction process.

The following main topics were presented during the meeting:

- Brief description of existing situation;
- Reviewing and analysis of design-construction solutions;
- Analysis of the existing environmental condition on the project sites;
- Evaluation and analysis of possible negative impact on environment;
- Mitigation measures, Environmental Management and Monitoring;
- Expected involvement of population in monitoring of construction process.

The presentation was followed by debates. The Q&A session held by the MDF staff is given in annex in the form of the table #1.

## Q&amp;A session:

Question/Comment	Comments
1. Will the existing museum building be subject to demolition?	The existing museum building is not subject to demolition. It will be rehabilitated. The project also envisages extension of the building for accommodation of the ancillary infrastructure of the museum.
2. Who must be addressed in case of violation of environmental requirements by the contractors?	The ongoing project will be permanently monitored by the MDF representative, which can be addressed in case of any complaints.  Though, if required, you are entitled to directly address the court.
When will the project be launched?	The bidding is announced for the selection of the contractor, the identity of the contractor will be revealed in the near future. Afterwards, the contractor himself will determine the terms required for preparatory works.
As you have noted, the sewage system of the museum will be connected to the central system, to date there is no central sewage system existing in Vani and how is it possible to connect the museum system to the non-existing central system?	As you are aware, currently the Vani sewage system is being rehabilitated under another project, which will be completed soon, according to the schedule. This very system will be connected with the museum system.