

TERMS OF REFERENCE

Abastumani Observatory Interactive Science Museum Content development

I. Introduction

The Municipal Development Fund of Georgia (MDF) is a Legal Entity under Public Law (LEPL) with the objective of assisting to enhancement of institutional and financial capacities of local self-governmental bodies, making investments in local infrastructure and services, and improvement of main economic and social conditions for the local population. MDF implements the significant infrastructural projects such as: urban renovation of the cities, arrangement of infrastructure at tourist and cultural heritage monuments, construction and rehabilitation of schools and kindergartens, improvement of infrastructure aimed at preventing the natural disasters, creation of sustainable economic base for IDPs, rehabilitation of WS and WSSs, construction of shelters for homeless animals, arrangement of the cable ways, renovation of sports infrastructure, and enhancement of the component in support of State and Private Sector Investments (PPI).

The MDF is implementing the Third Regional Development Project (RDP III) financed by the World Bank Group and the Government of Georgia (GoG).

The main objective of the project is to create an infrastructure, which will contribute to improvement of living conditions of the town and support the development of the tourism-based economy in Abastumani and largely in Samtskhe-Javakheti region.

Development of Abastumani is one of the flagship investments of RDPIII. Two important projects have recently been completed: Rehabilitation of Historic Heritage houses, rehabilitation of the Observatory building and landscaping of the area. The resort has already experienced both tangible and intangible benefits of the above mentioned projects. The RDP3 continues to support further development of the region and the resort with planned investments still to be implemented in Abastumani. Sustainability and operationalization of the Abastumani Observatory building being one of those.

II. About National Astrophysical Observatory

Nowadays, Abastumani serves as one of the last enclaves of a strong scientific community within Georgia and a potential tourist attraction due to its history and nature. Abastumani has a potential to become a place of inspiration for future generations of astronomers, scientists and researchers, and this transformation can start by modernizing the National Astrophysical Observatory area and making it more attractive and engaging for different visitors.

The Rehabilitation the Observatory building, and landscaping of the area was completed in March 2020. Second and third floors rooms are designated for administration which will be furnished and equipped through the Project by early 2021 and the first floor will host the Interactive Science Museum.

Georgian National Astrophysical Observatory (GENAO) was founded in 1932 by Academician Eugene Kharadze on Mountain Kanobili, near resort Abastumani, Samtskhe-Javakheti (Southeastern Georgia).

Currently the Observatory is an independent Legal Entity of Public Law operating under the Ministry of Education, Science, Culture and Sport of Georgia.

The observatory is located ~250 km from the capital Tbilisi, being distant from the air pollution and sky illumination together with excellent natural conditions (hilly landscape covered with coniferous forest) makes this place being among the best observatories at the same altitude range. Weather is stable, no harsh and sudden changes.

The Observatory is running wide-profile research, spanning different fields of Astronomy and Astrophysics and investigation of the upper layers of the Earth's atmosphere. The observatory includes up to 20 telescopes.

III. Overall scope and Objectives

Following recent rehabilitation through RDPIII, the Observatory central building will reopen to host visitors and offer new unique experience through the venues which will be known as Abastumani Observatory Interactive Science Museum.

The core Mission of the Abastumani Interactive Science Museum is to inspire the visitors with passion towards scientific endeavor and to showcase macro and micro physics in a fun and interactive way. The museum will utilize latest input technologies as well as unorthodox display methods, this will create an environment in which physics can be learned as if you could literally and physically interact with it. An interactive educational center, that would serve and educate the local community and the visitors/tourists. The Interactive Science Museum will be a part of the overall Abastumani Observatory and will be created and conceptualized in conjunction with both the clients as well as the scientific and management personnel of Abastumani Observatory.

Because of the rarity of such venues as well as a great interest in them across the world it could easily become a highlight within Abastumani both as a learning experience as well as a completely unique entertainment attraction. Additionally, the museum will be unique in that it is entirely digital and interactive translating the best global practices of digital and interactive venues into a science museum. This will make the learning experience a lot more fun and natural not to mention that it allows a relatively small space of Abastumani Observatory to accommodate content and virtual space that far exceeds the literal physical space in which it is displayed.

The content within the Interactive Science Museum will focus on the fundamental physics that allow our world to operate on both atomic and cosmic scale, this information will be presented in a way that is complementary to the vast knowledge of astrophysics that the Observatory itself provides. The content within the Interactive Science Museum will be easily replicable thanks to its digital nature, these updates can come either as new thematic experiences or in form of knowledge updates in case of new scientific discoveries or to touch upon other fields of STEM (Science, Technology, Engineering, and Math). Existence of this venue will allow Abastumani to further cement the role of an important scientific inspiration hub for Abastumani

Installation rooms within the museum will follow similar basic guidelines, that is to create room sized interactive experiences primarily either through motion sensors, body tracking or touch display technologies. These installations will provide an interactive alternative reality learning experience for the user, each focused on a particular phenomenon within physics.

The Abastumani Interactive Science Museum fits in within the strong history and heritage of Abastumani, since it is one of the primary scientific hubs in Georgia with even greater importance during the Soviet Union. Interactive Science Museum will provide new life and context for Abastumani scientific community, as well as create an scientists can share their discoveries in a digestible and fun way.

IV. Overall Scope

The scope of this Terms of Reference is to:

- Develop Interactive Science Museum Concept and respective Digital Content to transform the Museum building into new tourism destination as well as contribute to popularization of the Observatory and astrophysical sciences and STEM (Science, Technology, Engineering, and Math) disciplines.
- Develop list of specifications for latest interactive and digital display technologies required to operate the Interactive Science Museum.

V. Objectives of Creating the Interactive Science Museum

- To provide pre-production of a unique and interactive venue that will aid in the study of science and STEM (Science, Technology, Engineering, and Math) A truly 21st century experience.
- To act as a one of a kind entertainment venue that will attract both tourists/visitors and locals.
- To transform Abastumani and its Observatory area into a widely recognizable hub of physics research and scientific inspiration.

VI. Scope of Assignment

Under this assignment the consultant is expected to provide:

Stage 1. Museum Concept and Digital Content

The Consultant shall provide the Client with the Interactive Science Museum Visual Concept and Content, covering the following:

- Definition of the main/constant overarching themes that will stay between the Exhibitions of the Interactive Science Museum;
- The overall Concept development for the first fully digital and interactive Exhibition that will be hosted within the Museum;
- Adaptation of chosen scientific topics into planned content that is compatible with the rooms and hardware provided within the Museum. These topics that will be adapted into the concepts to be used within the Exposition must be done so in collaboration with the scientific community and professionals within the Abastumani Observatory;
- Design of the exhibition narrative, sequence and thematic organization of the rooms;
- Interior design concept that must be seamlessly merge with the utilized display technology;
- Planned Content for the fully digital exhibition, in the form of Visualization/graphics/videos that will be projected and displayed in the rooms in the rooms;

- Museum content brand identity to define the unified visual style in which all future content must be developed in.

Stage 2. Museum interior design and technical specifications for hardware and Software specifications

- Drawings for Distribution of hardware and display technology across the rooms according to the 2D and 3D plans specific to the room and content that is supposed to be there.;
- Detailed Design of technological supports to be included within the exhibition rooms;
- Input Hardware and motion sensors planning and installation management;
- Informational material in Georgian and English, as well as the display method to show
- Design of the museum information signs (evacuation, prohibition, etc.).
- Visitors movement scheme(s) at the exhibition spaces (including evacuation plan);
- Technical specifications for various Motion Sensors and Input Hardware;
- Interpretation texts and exhibition annotations (Georgian and English)
- Preparation of the interpretation texts and exhibition materials for the persons with disabilities;
- Media server room planning;
- Full hardware cabling;
- Motion/body input and tracking hardware planning;
- Hardware upgradability plans to support future technology that could provide Museum with superior content eventually;
- Projection mapping and software to hardware interfacing of all the rooms;
- A publication concerning the history of the Observatory, its transformation into a museum and its main digital/interactive activities; Project cost estimation and bill of quantities.

The Museum shall house interactive rooms suited for each scientific theme presented under Museum concept, these rooms will be equipped with latest display and holographic technologies as well as unorthodox motion tracking and input sensors to provide a unique and interactive experience.

These rooms will need to be supported by dedicated media servers that will handle both the video content and the interactive real time content, additionally this hardware and media servers must be interconnected in a way that allows these rooms to react and interact to changes between them. The hardware and media servers must be advanced enough to allow modularity and change of content.

Stage3. Museum management plan

The Consultant shall develop a management plan, which will respond to the needs of the museum.

The Management Plan is a detailed document covering the strategic planning of the museum and considering its financial and economic sustainability.

The management plan should cover a short-term (1 to 5 years), medium-term (10 years) and long-term (20/25 years) plan on how the museum will be managed and maintained. The plan is a live document and it should offer the milestones for revision and adaptation.

The management plan shall include:

- List of required roles and job descriptions of staff needed for the museum operation (number of employees, required work experience for each position, etc.);
- The museum visitor management plan;
- Information about the content within the museum and training plans for the future Guides;
- Offerings for the marketing policy and branding;
- Marketing campaign and strategic planning;
- Multimedia campaign planning as well as a long term advertising strategy;
- Recommended strategies and actions for future development;
- Risk assessment, Emergency Management Plan (for personnel, visitor and collection safety), including the safety emergency action plan with marking of emergency exits for rapid evacuations, etc.
- Financial Plan.

Stage 4. Installation Supervision

The consultant shall supervise the installation process and coordinate with the company responsible for supply and installation of the digital as well as non-digital (furniture) equipment.

VII. Safeguard Requirements

The consultant will advise the Employer on the potential risks of operating the Interactive Science Museum on the health and safety of personnel and visitors, including likelihood and expected impacts of any emergencies that may occur. Mitigation measures should be provided, costed and integrated into the design document.

VIII. Timeframe and Deliverables

The tentative duration of the Contract is **4 months**.

The client should deliver following reports and activities during the project duration according to the following schedule (the consultant is allowed to change the deadlines as per the proposed action plan to be agreed with the client in writing):

Deliverables	Submission Date	Language	Format	Correlation Rate to Contract Price
<p>Stage 1 Museum Concept and Digital content development</p>	<p>Within 1 Month after the contract signature</p>	<p>Georgian/English</p>	<ul style="list-style-type: none"> • 4 printed copies for each project, in A4, A3 size; • An electronic copy of all reports, plans and related CAD, Excel, Word, PDF etc. Files; • The package of documents and related documents will be submitted as per bid requirements and in line with World Bank Guidelines; • 2d and 3d concept art packages for each of the future possible rooms within the Museum; • Digital/animated demonstrations and demos of future interactive content within the Museum rooms; • Visual file that will allow the production team to fully realize it; 	<p>40%</p>
<p>Stage 2 Museum interior design and hardware</p>	<p>Within 3 Month after the contract signature</p>	<p>Georgian/English</p>	<ul style="list-style-type: none"> • 4 printed copies for each project, in A4, A3 size; • An electronic copy of all reports, plans and related CAD, Excel, Word, PDF etc. Files; • The package of documents and related documents will be submitted as per bid requirements and in line with World Bank Guidelines; • 2d and 3d concept art packages for each of the future possible rooms within the Museum; • Digital/animated demonstrations and demos of future interactive content within the Museum rooms; • Visual file that will allow the production team to fully realize it; 	<p>30%</p>
<p>Stage 3 Museum Management Plan</p>	<p>Within 4 Month after the contract signature</p>	<p>Georgian/English</p>	<ul style="list-style-type: none"> • 4 printed copies for each project, in A4, A3 size, plans in A1, A0 etc. • An electronic copy of all reports, plans and related CAD, Excel, Word, PDF etc. files. • The package of documents and related documents will be submitted as per bid requirements and in line with World Bank Guidelines; 	<p>20%</p>

Stage 4 Author's supervision	During the whole period of installation	Georgian/ English	The consultant shall supervise the installation process and coordinate with the company responsible for supply and installation of the digital as well as non-digital (furniture) equipment.	10%
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#	Deliverable	Timeline	Payment %
1	Museum Concept and Digital content development (Stage 1)	Within 1 Month after the contract signature	40%
2	Museum interior design and hardware (Stage 2)	Within 3 Month after the contract signature	30%
3	Museum Management Plan (Stage 3)	Within 4 Month after the contract signature	20%
4	Installation Supervision (Stage 4)	During the whole period of installation	10%

The Employer for this assignment is the LEPL Municipal Development Fund of Georgia, while the Beneficiary is the Georgian *National Astrophysical Observatory* (GENAO). Consultant, with consultation of beneficiary, should prepare the deliverables and submit to the Employer for approval. The Employer should seek beneficiary's clearance on deliverables before issuing the acceptance act. The Employer is represented by the Project Manager, responsible for the implementation of the contract and final approval. The Beneficiary's representative should be [head of Georgian National Astrophysical Observatory (GENAO)], who will be designated co-approving authority from GENAO. All deliverables must be submitted in Georgian and English, in hard copy and electronically.

IX. TEAM PROFILE AND KEY PERSONNEL

The consultant should propose a team of experts who will implement the project. Level of effort for each expert should be discussed and agreed with the client.

The following list of qualifications serve as a guide and Consultant Team may with justification propose additional staff. The Consultant Team shall also propose the time allocation for each of the staff dedicated to their respective tasks and the breakdown of the time that those work will be performed on location or remotely. The proposed team composition shall be:

N	Consultants	Number	Month	Input, person/month
Key Experts				
1	Project Manager	1	4	4
2	Art Director	1	4	4
3	Economics expert	1	2	2
4	Architect	1	3	3
5	Chief Technical Officer	1	4	4
6	Chief Electrical Engineer	1	1	1
7	Chief Software developer	1	4	4
8	Marketing Expert	1	2	2
9	Web Master	1	2	2
10	Social Media Manager	1	2	2
Non-Key Experts				
1	Venue Operator	1	2	2
2	CGI Artists	2	4	8
3	Game Engine Programmer	1	3	3
4	Shading Artist/Programmer	1	3	3
5	Graphical Designer	1	2	2

#	Expert(s)	Experience	Job description according to TOR
1	Project Manager	3 years of experience in managing and administration of projects related to museums, multimedia venues or interactive projects.	<ul style="list-style-type: none"> - Project administration; - Responsibility for project implementation and guidance of the team of experts
2	Economics expert /Financial Manager	3 years of experience in developing museums and/or multimedia venues.	<ul style="list-style-type: none"> - Determining economic sustainability of the museum - Resolving financial issues of the project implementation - Analyzing anticipated revenues

3	Art Director	Digital and multimedia focused portfolio with 3-5 years of experience, there must be at least one large venue multimedia project done under their supervision.	<ul style="list-style-type: none"> - Art direction of current and future exhibitions - Communication and supervision of the content production team - Creation of a unified design language/framework that affects both the interior design as well as the content production - Development and supervision of visual brand identity of the Museum
4	Architect-designer	Must have fulfilled at least 2 large venue multimedia or museum projects.	<ul style="list-style-type: none"> - Development of the exposition space design according to the exhibition concept; - Determining the showcase design with lighting; - Design of the museum information signs (direction, evacuation, prohibition etc.); - Preparation of the list of equipment, furniture and accessories for all the museum's spaces (including public spaces, indoor & outdoor cafes); - Development of projects reflecting safe and efficient illumination systems of the exposition spaces showcases and installations; - Design of outer café pergolas, illumination, greenery, etc - Preparation of the list of advice for the future development of the Museum's outdoor additional space.
5	Chief Technical Officer (CTO)	Must have past experience of server management for large venue Media intensive projects. This includes hardware installation, cable management, alternative input hardware management and software operation.	<ul style="list-style-type: none"> - Will choose the necessary input hardware that can support/display the content and the vision that the museum wishes to provide. - Media server management - Unification of various hardware elements under one controllable system - Hardware maintenance planning and specifications - Supervision of specialized software development

6	Chief Electric Engineer	Must have past experience of engineering and managing hardware for large venue shows and media projects, such as concerts, museums or other. This primarily includes cabling and hardware interconnectivity.	<ul style="list-style-type: none"> - Long distance cable planning - Hardware interconnectivity through necessary boards or media splitters - Network cable planning for all of the hardware - Electrical safety planning
7	Venue operator/Projection mapping specialist	Must have past experience on at least 2 large venue multimedia or concert projects. This experience includes software to hardware interfacing for both the visual and audio components as well as whatever mapping and interfacing techniques are necessary to display and produce the content within the venue.	<ul style="list-style-type: none"> - Preparation of the hardware and software for the content - Creation of a unified projection mapping file for the whole Museum to be re-used for all projects - Calibration and fixing both the projection mapping as well as other software/hardware interfacing issues should they arise - Management of specialized software on the media server
8	Chief Software developer	At least 3 years of working on multimedia software and hardware interfacing, preferably with motion sensor or other alternative input methods. Must have completed at least 4 projects in this field, this includes projects done in conventional game engines such as Unreal and Unity.	<ul style="list-style-type: none"> - Preparation of specialized software primarily for interactivity with the hardware. - Long term software support and elimination of future bugs should they arise.
9	Marketing expert	At least 5 years of experience in multimedia marketing and campaign operations with at least 3 successfully launched campaigns, preferably for similar venues.	<ul style="list-style-type: none"> - Responsibility for preparation of the marketing plan as well as the supervision of the multimedia marketing campaign - Responsibility for coordinating the advertising team should they be necessary - Long term brand and identity management for the Museum