

Project Site-related Information

Paragraph 1.1.

Project title

Programs implementable by the MDF envisage construction-rehabilitation projects for various infrastructural facilities, which inter alia include space-and-planning and technological requirements for arrangement of ice arena in village Bakuriani.

Paragraph 1.2 Description of Services and TOR

1.2.1. Project brief description

The task aims at elaboration of development concept for the sports complex Bakuriani and on the basis of the above-mentioned, preparation of the conceptual (basic) design and specifications for construction of the ice arena to host various sporting events, coaching, etc.

It is advisable to propose a wide-span (about 100 meters) building structure i.e. the one without intermediate posts, to be constructed by using built-up structures made of modern materials. The proposed structures should have assembling-disassembling potential, and should be applicable for urgent need, at any new location. Universal exploitation of the ice arena should be achievable through transformation of the main elements of the sports ground. Following transformation, the ice arena may be used for other sports and cultural events, which will provide for its exploitation at all times and in all seasons.

1.2.2. Terms of Reference

1.2.2.1. General

The contract provides for:

- Carrying out topographic, geological and archaeological (as required) surveys in the design area.
- Technical-economic analysis (feasibility study);
- Development of conceptual (basic) design.
- Preparation of the Employers requirements and Specifications for design–built contract of ice arena and relate facilities.

1.2.2.2. Volumes and main requirements for the deliverable services

Consulting services will be delivered in three stages:

I stage – Survey-investigation works and technical-economic analysis (feasibility study).

II stage -Development of conceptual design.

III stage – Preparation of the Specifications and Employers requirements.

Dimensions and layout of the skating and coaching ice rinks and safety zone parameters should be in line with the rules and regulations set for conducting various sports events and should be specified as a mandatory technological requirement in the process of design. Standard dimensions of hockey grounds are as follows: 60X30 m, minimal dimensions - 56X26 m, with stands for 2300 seats, where except for hockey games, it will also be possible to hold figure skating events.

While designing, climatic factors inherent to the specific region and respective loads on the building should also be taken into consideration, which should be determined based on the data of "Building Climatology" of Construction Norms and Regulations (pn 01.05-08).

Design of the building foundation and structural elements should provide for the requirements of Construction Norms and Regulations "Aseismic Construction" (pn 01.01-09), and "Foundations of buildings and structures" (pn 02.01-08). Physical-mechanic properties of foundation soil used for the design should be defined based on geological/geotechnical investigations and agreed with the employer. Accepted rated seismicity of the construction site should be 8 grade intensity.

For elaboration of the ice arena design documentation, see annex: set of rules for design and construction of the roofed ice arena gymnastic-sports grounds СП31-112-2007 section 3, chapter 3.3 Ice Hockey and chapter 4, ancillary areas.

For reducing heat loss from the building, the design should include energy-efficiency provisions, power saving solutions for heating-conditioning, ventilation and lighting systems. Thermal insulation for roofing and walls should be proposed in view of the existing climatic conditions. Thermal insulator should not be inflammable, fire transmitting.

Calculations for the main and secondary framings should provide for (but not be limited to) the requirements of construction norms and regulations СНиП 2.01.07-85 and СНиП II-23-81.

Design of the load-bearing structures and walls of building should provide for the following requirements:

- Built-up welded and hot finished profiles should be fabricated in accordance with EN 10025 regulations;
- Anticorrosive coating of framing elements should be provided for in accordance with EN ISO 12944 requirements;
- Welding of framing elements, covering with anticorrosive coating and galvanization should be factory-made. In order to economy time and ensure required quality, construction of the building at the project site should be performed by using bolts, screw-nuts, self-tapping screws or steel rivets.
- In case of paint coating the structure, its thickness should be at least 80 microns.
- In case of galvanization of the structural elements - Z 275 gr/sq.m.
- Jointing - with galvanized steel bolts and screw nuts.
- The structure will be fastened to the foundation by means of galvanized steel anchors.
- The roofing should have movement potential during expansion-contraction.

The basic design should provide for (but not be limited to):

1. **Hockey arena with ice rink, 2300 seats**
2. 8 individual dressing rooms and two dressing rooms for the team
3. The ice arena should be transformable for conducting other sports' and cultural events.
4. **Open hockey arena for coaching, with artificial ice.**
5. Arrangement of bowling facility with 6 tracks

6. Restaurant serving 80 persons, overlooking the main ice rink.
7. Arrangement of car and bus parking lot for 300 vehicles. A natural gradient of relief should be provided for under the building for arrangement of the parking under the building.
8. The building elevation should be designed in modern architectural style. Façade materials may include: concrete, glass, wood, stone. A large area of glassed panoramic windows should also be provided for.
9. In terms of its dimensions and appearance, the building should blend with mountainous area.
10. Tentative development area 20,000 sq.m.
11. Arrangement of the information board.
12. Arrangement of the press box, for 20 persons.
13. Arrangement of commentators' booth.
14. Arrangement of the VIP boxes
15. Providing seats for disabled with wheelchairs
16. Arrangement of the area designated for ice arena administration, hockey club and sports school administration.
17. Arrangement of break rooms for personnel.
18. First aid post.
19. Security room.
20. Arrangement of the referees' room.
21. Coaches' room (3 units)
22. Arrangement of gymnasium
23. Arrangement of the work-out hall for the hockey team.
24. Arrangement of the common warm-up hall.
25. Arrangement of the work-out choreographic hall for figure skating.
26. Provision of ancillary and utility amenities. (with calculations)
27. Provision of the area for the movable buffet in the building lobby.
28. Arrangement of the cloak-room and skate rental for the audience.
29. Arrangement of the press centre for 50 persons.
30. Space-and-planning solution should reflect the local relief and natural gradients of the ground heights should be effectively used.
31. Arrangement of approximately 300 m² storage facilities.
32. Number of technical auxiliary facilities shall be determined in the process of design works.
33. In the building adjacent zone, an area should be provided for parking of the buses required for broadcasting activities.
34. Arrangement of shopping centre (souvenirs, sports' items).

Technical solutions for engineering requirements of the ice arena:

1. Intruder alarm and video surveillance.
2. Video surveillance for referees.
3. Arrangement of fire control system.
4. Arrangement of acoustic system for musical cut-ins and announcements during the games.
5. Engineering systems' control room.
6. Lighting system on the ice rink should provide for various operating modes, inter alia including: TV broadcast, concert programs, coaching, emergency, etc.

7. Provision of different climatic modes for the ice rink and stands.
8. Carrying out routine maintenance of the ice rink freeze system no earlier than once a year.

Tentative parameters of the ice arena:

Development area-10,000.00 sq.m.

Total area of the territory -16,800.00 sq.m.

Total structural volume -170,000.00 cub.m.

1.2.2.3. Regulations and Standards

The design should be prepared in accordance with current Georgian construction norms and regulations and in line with the requirements of international regulations. In preparation of design-cost estimation documentation, the requirements of the following valid construction norms and regulations should be observed (but not limited to):

- Decree №41 of the Government of Georgia, on approval of the technical regulations 'for structures'-buildings' safety rules'
- СП 118.13330.2012 Public structures and buildings;
- СП 31-112-2004. Gymnasiums- Sports grounds, part 1, 2;
- СП 31-112-2007. Gymnasiums- Sports grounds, part 3; Roofed ice arenas.
- СНиП 3.02.01-87 «Earthwork structures, bases and foundations»;
- СНиП 3.05.04-85 «Water supply and wastewater outdoor networks and installations»;
- СНиП III-10-75 «Improvement of the area»;
- СНиП 2.05.02-85 «Motor roads»;
- СНиП 12-01-2004 «Construction organization»;
- СНиП 12-03-2001 «Labour safety during construction. Part 1. General Requirements»;
- СНиП 12-04-2002 «Labour safety during construction. Part 2. Works' execution»;
- СНиП 21-01-97* Fire safety for buildings and structures
- СНиП 23-05-95* Natural and artificial lighting
- СНиП 31-03-2001 Industrial buildings
- СНиП 31-04-2001 Storage facilities
- СНиП 35-01-2001 Accessibility of buildings and structures for disabled
- СНиП 41-01-2003 Heating, ventilation and cooling
- СНиП 2.04.01-85* Indoor water supply and wastewater networks
- СНиП 2.04.02-84* Water supply. Outdoor networks and installations
- СНиП 2.04.03-85* Wastewater. Outdoor networks and installations
- СНиП 2.08.02-89* Public structures and buildings
- СНиП 2.09.04-87* Administrative and utility buildings
- СНиП 3.05.06-85 Electro technical devices

- ГОСТ 24214-80 Loud-speaking communication. Terms and definitions. General ergonomic requirements.
- ГОСТ 12.1.004-91 ССБТ. Fire safety. General requirements.
- СП 31-110-2003 Design and installation of electrical installations in residential and public buildings.
- СП 31-112-2004 (1) Gymnasiums- Sports grounds. part 1
- СП 31-112-2004 (2) Gymnasiums- Sports grounds. part 2
- СП 4723-88 Sanitary regulations for arrangement and operation of centralized hot water supply systems.
- СанПиН 2.1.4.1074-01 Potable water. Hygienic regulations for the quality of centralized potable water supply systems. Quality control.
- ВСН 1-73 Guidelines for electric lighting of sport facilities.
- НПБ 88-2001* Firefighting and alarm installations. Norms and regulations for the design of НПБ 104-03 warning and evacuation management system applicable during fires in the buildings and structures.
- НПБ 110-03 List of buildings, structures, facilities and equipment subject to protection with automatic fire extinguishing installations and automatic fire alarm.
- ПУЭ Rules for arrangement of electrical installations
- Handbook to СНиП 2.08.02-89*. Designing gymnasiums, sports facilities, facilities for health-improving activities and roofed skating rinks with artificial ice.

1.2.2.4. List of deliverable services, contents and sequence of design-cost estimation documentation, and requirements to be taken into account in the process of elaboration of design-cost estimation documentation:

STAGE I

- Survey-investigation works and Feasibility Study

1. Cadastral documentation (to include in the design and status quo topographic plans the registered land plot(s) outline with indication of cadastral boundaries and codes);
2. Topographic survey of the area;
3. General geologic survey of the area;
4. Information on existing utilities;
5. A list of depreciated buildings existing in the area should be drawn-up;
6. Feasibility study of the project to cover all possible alternatives, analysis of problems and risks, parameters and scope of the project (including financial scope), tentative method and schedule of implementation. Background information on potable water and power supply to the project site, and its connection to wastewater and storm water systems.

Environmental and Social Impact Assessment (as a part of feasibility study):

- Brief description of relief, geology and soil, based on archive data and as a result of visual survey; information regarding existence or probability of hazardous geological processes, necessity for conducting of explosive works; depth of location of ground water;

- Hydrology and water quality of the water body in which treated waste water from toilets will be discharged;
- Brief description of climate conditions;
- Brief information on vegetation and flora species on and around of SP site;
- Identification of any Red Listed flora and fauna species that may be occur in the SP site;
- Suggested sites for disposing of excess material and construction waste identified through consultations with Borjomi Municipality Gamgeoba, including cadastral information and maps of suggested sites;
- Assessment of generation of hazardous waste during construction and operation phases and assessment of hazardous waste disposal options;
- Assessment of generation of non-hazardous waste during construction and operation phases and on nearest municipal landfill, where non-hazardous waste have to be disposed;
- Assessment of possible emission into the ambient air and waterbodies during the construction and operation phases;
- Locations and distances to the nearest licensed borrow pits producing natural construction materials that maybe required for construction works under the SP;
- Land ownership and land use issues: a) Cadastral data of the project implementation site. b) Formally attested information whether the project impacts on privately owned, or leased land plots or not (temporal disturbance; loss of the part of the land plot or whole land plot by the owner; loss of the property being on the land plot; loss of income etc.);
- Information on archeological zones if these are nearby;
- Brief social-economic information on surrounding area, including tourism, and on potential beneficiaries, local population, tourists, etc.
- Map of Project implementation site with cadastral information;
- Photos for sites defined for separate structures.

In order to obtain information and advice, it would be expedient to engage in the operations the associated service of the Municipality.

For conceptual design, description of the scope of works and tasks to be undertaken should be performed in three stages:

Phase 1 – Status quo analysis: Analysis of sports’ events’ traditions existing in Bakuriani and the whole region in general; Conducting research to identify existence of sports’ facilities, including skating rinks, and general purpose sports facilities in Bakuriani and throughout the region. Analysis of overall economic situation in the region (business activities). Description of the existing transport infrastructure. Review of the tourist flow (local and international) and how the village/town infrastructural development affects its growth.

Phase 2 – Preparation of the draft investment budget for the project, preparation of cost-benefit analysis, project site management strategy, and its organizational structure and financial model.

Phase 3 – Development of the basic, conceptual design proposed for Bakuriani sports’ complex.

Phase 1. Description of tasks.

Task 1. Analysis of sports' events' traditions existing in Bakuriani and the whole region in general;

Task 2. Conducting research to identify existence of sports' facilities in Bakuriani and throughout the region.

Task 3. Analysis of overall economic situation in the region (business activities).

Task 4. Description of the existing transport infrastructure.

Task 5. Review of the tourist flow (local and international) and how the village/town infrastructural development affects its growth.

Phase 2. Description of tasks.

Task 1. Preparation of the draft investment budget.

- Estimation of design costs
- Estimation of construction and building finishing costs
- Estimation of outdoor networks' construction costs
- Estimation of building accomplishment costs
- Estimation of project management costs
- Estimation of such other contingent associated costs

Task 2. SWOT analysis

- Preparation of SWOT matrix, determining mostly effective target profile for the sports' facility.

Task 3. Financial model of the project

- Preparation of the cost-benefit analysis.
- Financial model for three scenarios - „pessimistic“, „realistic“, „optimistic “.

Task 4. Development of project site management arrangements and strategy

- Development of the demand (occupation) concept for the sports' facility.
- Development of the project site organizational structure, and its management strategy.
- Definition of required human resources.
- Recommendations for the staff capacity building.

STAGE II.

Description of tasks.

Task 1. Development of the basic, conceptual design proposed for Bakuriani sports' complex.

- Development of the conceptual design for the sports' facility. The design to meet the following criteria:
 - ✓ The proposed building should adhere to ISO 9001 and CSA A660 standards and have modern design.
 - ✓ For minimizing cost of the proposed building, it would be expedient for the building roofing to have spatial solution, without intermediate posts, since the latter requires a large quantity of steel and therefore, is the most costly segment of the building assembly.
 - ✓ It would be advisable to propose a galvanized light steel built-up structure for the building. Working of steel should be carried out through application of recent technologies.
 - ✓ It is advisable to propose a wide-span (about 100 meters) building structure, which will provide for unlimited utilization of the useful area, as required.
 - ✓ The proposed structures should have assembling-disassembling potential, and should be applicable for urgent need, at any new location.
 - ✓ For achieving maximal energy-efficiency, the building should be designed as completely hermetic, with observance of current energy-efficiency requirements.
 - ✓ The proposed construction technology should guarantee the possibility of construction and mounting activities in any climatic conditions, throughout the year.
 - ✓ The structure should permit rapid mounting, advisably without using welding.
 - ✓ The building should have modern design and aesthetic appearance; It should not require any additional finishing works.
 - ✓ The building should be cost-saving in service, which is achievable through application of modern and efficient energy-saving technologies proposed for the building.
 - ✓ The building should conform to the parameters of the proposed investment budget.
 - ✓ Useful life of the building, without capital repair and required repainting should at least average 15 years.
 - ✓ The building should meet the most recent standards and requirements of fire safety.

Task 2. Development of the model of the facility

- Elaboration of the structural-spatial solution of the facility (3D models).
- Preparation of the design-project - A3 format booklet.

Task 3. Cost Estimations

- General Executive Summary for the cost estimations' part, which should include title page of the project, list of applicable documentation, and information on the rule of calculation of

charges (contingencies, overhead costs, planned accumulation, preparation of the territory, temporary structures. etc.);

- Summary cost estimations for civil works, equipment and other installations;
- Cost estimations performed through unit rate breakdown by resources.

Task 4. Operations' Part

- Information on average annual operation costs for the design site, on purchase of electric power.
- Information on average annual operation costs for the design site, on purchase of natural gas.
- Information on average annual operation costs for the design site, on purchase of diesel fuel for power supply in emergency conditions.
- Information on average annual operation costs for the design site, on purchase of potable and industrial water.
- Average annual costs of service for the main plants (generator, continuous power supply units, heating-cooling and ventilation systems).
- Information on average annual operation costs for the design site, on cleaning and sanitary services.
- Recurrence of routine maintenance of the main elements of the buildings and its aggregate costs.
- Determining expected life span of the buildings, until their capital repair.
- Information on the average annual land charges and such other budgetary fees.

Consultant shall prepare a package of documentation, inter alia including (but not limited to) the following:

1. Executive Summary (describing status quo and project activities);
2. Topographic plan with indication of cadastral boundaries and code;
3. General location plan of the design facility _ scale 1:2000 or 1:1000;
4. Master plan for improvement of the building adjacent area, showing tentative pedestrian routes, access roads, connections, parking lot;
5. Architectural and structural solutions: graphic and textual material – layouts, sections, facades;
6. Graphic material demonstrating architectural solutions – visual and photo material;
7. Engineering systems (heating-cooling, ventilation-conditioning) selection and layout drawings.

Basic design shall include all necessary information and instructions for preparation of detail design by design-build Contractor.

STAGE III

Employer's Requirements and Specifications

Employer's requirements and Technical Specifications should be presented as separate attachment to design documentation, including general instructions and recommendations for bidder/contractor. As well as detailed specifications of applied materials, equipment and machinery with indication of all necessary standards for works performance/testing methods and quality control.

- Detailed description of qualitative characteristics of applicable construction materials, goods, equipment and plants;
- Consistent, detailed description of the process of construction-assembling operations with indication of handling abilities, for conducting quality control of their performance;
- Detailed description of test conditions and sequence of testing for construction materials, processes, and plants and equipment subject to testing;
- Specifications shall be elaborated for each of the referred parts of design documentation.

Below is provided general requirements for detail design, which shall be reflected in Employers Requirements and Specifications.

Elaboration of the detailed design implies preparation of the complete set of design-cost estimation documentation, based on which it will be possible to carry out construction and mounting works. Detailed design documentation should be accompanied with:

1. Executive summary: Executive summary to include description of design solutions, justification of structural solutions/associated calculations, with indication of the date on the design values for loads and foundation soils (to be accompanied with layouts, tables, visual materials, etc.), as well as the list of construction works, volumes of works and recommendations for construction organization, Environmental part, to include applied construction norms and regulations, and calculation methods. Class of the building-structure should also be determined (in accordance with the Decree #57 of the Government of Georgia "on the rule of issuance of construction permit and licensing conditions" dated March 24, 2009).
2. Cadastral information for the area;
3. Topographic survey in UTM (international) coordinates' system
4. **Architectural part:**
 - General executive summary for architectural part, to include information on the master plan and individual buildings-structures;
 - General location plan of the project site, in small scale, showing town infrastructure. Scale (1:5000 or 1:10 000);
 - Master plan of the project site, in large scale (1:200 or 1:500);

- 3D high quality rendering of the design building (so called visual material in high resolution);
- Facades of the design building, scale (1:50 or 1:100);
- Functional layouts of the design building with indication of the purpose of utility rooms, scale (1:50 or 1:100)
- Longitudinal and cross sections of the design building, scale (1:50 or 1:100);
- Building roof layouts, with demonstration of water diversion arrangements, scale (1:50 or 1:100), detailed drawings and units of drainage fragments (scale 1:5, 1:10 or 1:20), quantitative specifications for works and materials (as required);
- Layouts of the walls and partitions of the design building, demonstrating their types, scale (1:50 or 1:100), detailed drawings and units of the types of wall and partition fragments (scale 1:5, 1:10 or 1:20), quantitative specifications for works and materials;
- Finishing plan for the floors and ceilings of the design building, demonstrating finishing types, scale (1:50 or 1:100), detailed drawings and units of the types of floor and ceiling fragments (scale 1:5, 1:10 or 1:20), quantitative specifications for works and materials;
- Interior finishing layouts for the walls of the design building, scale (1:50 or 1:100), detailed drawings and units of the types of wall finishing fragments (scale 1:5, 1:10 or 1:20), quantitative specifications for works and materials;
- Layouts of the design building apertures and types of door-windows, scale (1:50 or 1:100), detailed drawings of door-window types (scale 1:5, 1:10 or 1:20) quantitative specifications for articles;
- Drawings of architectural details and units of the design building (stairs, handrails, roof units and other details) scale (1:5, 1:10 or 1:20);
- BoQ for exterior and interior finishing of utility rooms;
- Building evacuation plans, scale (1:50 or 1:100);

5. **Structural part:**

- Executive summary for the structural part, to include description of design solutions, justification of structural solutions/associated calculations, with indication of loads and design values.
- Structural shop drawings (layouts, details, units (scale. 1:100, 1:50, 1:25);
- Quantitative specifications for works and materials;

6. **Electrics:**

- Executive summary for electrical part, to include power demand of the whole project site, as well as individual buildings and structures (values of installed and rated capacities), category and type of design power networks, rules of installation of power lines. The same to include calculations for grounding mats (basic and secondary).
- Plans of interior lighting networks of the building (scale 1:50, 1:100), quantitative specifications for works and materials;
- Plans of interior emergency lighting networks of the buildings (scale 1:50, 1:100), quantitative specifications for works and materials;
- Plans of internal power mains of the buildings (scale 1:50, 1:100), quantitative specifications for works and materials;

- Schemes of distribution and service switchboards of the buildings , quantitative specifications for works and materials;
- Layouts of critical parts of internal power mains and systems for provision of continuous power supply to the emergency lighting network of the buildings (continuous power supply units, accumulators, etc.), quantitative specifications for works and materials;
- Diagram of connections of main and service switchboards and continuous power supply sources of the buildings.
- Drawings of metalware grounding (potential balancing) mat of the building and quantitative specifications for respective works and materials – as required.
- Schemes of the systems applying renewable energy for power supply to the design buildings (if any).
- Layouts of internal power supply networks of the site (power network, lighting of the area, secondary grounding network), cable trench sections, cable register, quantitative specifications for works and materials.
- Assembly drawings for the stand-by power supply generator.
- Drawings of secondary grounding mats, quantitative specifications for works and materials;
- Layout of the main switchboard of the site, quantitative specifications for works and materials;
- General block-diagram of power supply to the building (main power line, main switchboard, generator, internal power supply network and distribution switchboard connection diagram).

7. Weak Current Systems:

- Executive Summary for weak current systems, which will include characteristics of design networks (telephone, computer, fire alarm, access control and video surveillance networks). The same shall specify need of the weak current systems designed in the building for support of the municipal communication networks (required number of telephone couplers, required parameters of internet-communication);
- Layouts of local computer networks of the buildings (scale 1:50, 1:100), quantitative specifications for works and materials;
- Block-diagrams of internal computer networks of the buildings;
- Layouts of internal fire alarm networks of the buildings (scale 1:50, 1:100), quantitative specifications for works and materials;
- Block-diagrams of internal fire alarm networks of the site and building; Drawings of internal fire alarm networks of the site (scale 1:200, 1:500), quantitative specifications for works and materials;
- Layouts of local safety alarm networks of the buildings (scale 1:50, 1:100), quantitative specifications for works and materials;
- Block-diagrams of local safety alarm networks of the buildings;

8. Plumbing part:

- Executive Summary for the plumbing part, which will include characteristics of the design network. The same shall specify cold and hot potable water demand (24 hour, per minute and per second water discharge rate) of the whole site, and of individual buildings, and volume of

associated waste water effluent. The executive summary shall also include information on the industrial water demand, required for fire extinguishing purposes.

- Plumbing equipment layouts of the buildings (scale 1:50 or 1:100), quantitative specifications for works and materials;
- Layouts of internal cold-water networks of the buildings (scale 1:50 or 1:100), quantitative specifications for works and materials;
- Axonometric schemes of internal cold water networks of the buildings;
- Layouts of internal hot water networks of the buildings (scale 1:50 or 1:100), quantitative specifications for works and materials;
- Axonometric schemes of internal hot water networks of the buildings;
- Layouts of local fire line networks of the buildings (scale 1:50 or 1:100), quantitative specifications for works and materials;
- Axonometric schemes of local fire line networks of the buildings;
- Layouts of internal wastewater networks of the buildings (scale 1:50 or 1:100), quantitative specifications for works and materials;
- Axonometric schemes of internal wastewater networks of the building;
- Layout and scheme of the hot water preparation unit (boiler equipment), quantitative specifications for works and materials;
- Layouts of internal plumbing networks (potable water, fire line, irrigation system, wastewater, drainage) of the design site (scale 1:200, 1:500), quantitative specifications for works and materials;
- Longitudinal profiles of internal plumbing networks, trenches, drawings and schemes of inspection wells and service line wells, scheme of the water flowmeter unit. Quantitative specifications for works and materials;
- Drawings and schemes of potable and fire extinguishing water storage facility (as required). Quantitative specifications for works and materials;

9. Technological part

- General Executive Summary of Technological Part;
- Technological plans displaying exact layout of furniture, appliances and equipment by floors or/and functional zoning;
- Specifications of plants, devices and equipment;
- Layouts, sections technological schemes and specifications for passenger and service elevators (or escalators) (if any).

10. Heating, conditioning, ventilation part

a) Heating.

- Heating design shall comprise of as follows: Explanatory Note (to provide detailed characteristics of planned systems), specification (in English and Georgian languages); plans, technical features

of separate devices (power and thermal loads by air flow, absorbance discharge and pressure losses) (to be provided as the Table), axonometric scheme, sections with its marks, boiler plan on separate page and a principal scheme.

- At first stage there shall be conducted the thermo-technical calculation of the building - thermal losses and required internal temperature of separate facility rooms shall be determined in accordance with their types, with consideration of norms and standards, being effective in Georgia (to be enclosed to the design as the Table).
- Heat flow at the facility rooms shall be provided partially by means of modern devices (fan coil convector or similar one) along with the panel radiators and towel driers at WCs, depending on where inner heat supplying devices will be placed. Fan coils or convectors will also provide cooling of some facility rooms.
- Piping in case of heating shall be of a 2-pipe Czech type. It shall be packed by specific thermal insulation material of high quality to be granted the fire safety Certificate.
- Relocation shall be executed in a mechanic manner, by means of circulation pumps to be placed at the boiler.

b) Ventilation.

- Design on ventilation shall be determined by means of clean airflow and eviction of contaminated air, to be executed mechanically. It is provided by air flow-absorbent device (it is desired to be provided by means of recuperative heat exchanger) and various types of absorbent fans. Air blowing and absorbance at facility rooms is executed by high qualitative regulating special diffusers or grates that will be placed on various marks (e.g. at chairs on tribunes). In order the noise to be avoided all devices shall be equipped with noise suppressers of respective sizes.
- Design on ventilation comprises of the Explanatory Note, plans in accordance with the elevations, principal scheme, features of devices, specification, sections, scheme for each flow device on separate page, axonometric or 3D scheme. The air discharge shall be indicated at each section of airway as well as at either diffuser or at grates.
- Aimed at maintaining temperature balance on skating rink there shall be installed the thermal curtains on outdoor exit door in order temperature balance to be maintained.
- Packing material for the airways shall have been grated the special Fire Safety Certificate.
- Clean air flow per sportsman shall be 80m³/hr, whilst for the audience being on tribunes it shall amount to 20 m³/hr.
- The air speed at skating rink surface shall not exceed 0.25 m/sec.

c) Cooling.

- Design on cooling envisages provision of cooling throughout the building (including air filtration and treatment), whilst on the skating rink and tribunes the air shall be cooled, humidity regime shall be maintained and air shall be cooled.
- Conditioning impedes dissemination of fog throughout the skating rink and tribunes.

- In order the high quality of ice cover to be maintained it is essential the skating rink to be provided with the clean air to have the low humidity content (less than 5.8 g/kg). Due to the changes of humidity content, it shall reach the required indicator in various periods of the year.
- The conditioning system shall provide the permanent temperature of ice surface, making up 5°C (temperature change may be regulated as per requirement), whereas at 1,5 meter from the ice surface it shall make up +6°C, and above it +14°C and at the zone of the tribunes +25°C.

d) Cooling system for skating rink

- Cold load of the skating rink fluctuates approximately from 350 to 450 sq. Aimed at specifying there shall be conducted the cold calculation and design shall be enclosed with the calculation principle.
- Cold supply shall be of closed type.
- The applied Freon shall be of R410 A type, or the equivalent agent. The cold carrier liquid shall consist of ethylene glycol as well as anti-corrosion liquid with respective percentage indicators. The freezing temperature of the glass 33°C.
- The cooling device shall consist of its special fittings that are to be located at either technical facility room or on the roof (depending on architectural solution). The system shall have the connection with the atmosphere.
- The cooling system shall be wholly automatized and shall not require to be under permanent supervision. It shall consist of automatic regulation and protective systems. Permanent temperature regime shall be provided to supplying as well as to return lines.
- The cooling system in working mode works as per the scheme (scheme represents the specific example for approximate representation, it can be replaced by the scheme of another type based on prior agreement) as follows: liquid solution of ethylene glycol in cooling device turns cold up to minus 13°C and moves by means of the mainlines at the collectors. Out of which it enters the pipeline system of the skating rink where the heat exchange takes place and it is added by temperature (approximately 3°C.) and it returns to the collector and the cycle repeats again.

- **Cover of the Staking Rink**

Aimed at ice cover preparation there shall be arranged the layers of various composition, inter alia:

- The first upper ice cover of 30 mm thickness.
- The concrete layer of high grade of 120 mm thickness through which the freezing pipes of the skating rink pass. Distance between the pipes (of relevant diameter) shall be at least 100 mm.
- Layer of insulation material of at least 100 mm thickness.
- Gravelled layer of 500 mm thickness through there pass the thermal pipes (of respective diameter). Distance between the pipes shall be at least 500 mm.
- The layer of concrete foundation of 500 mm thickness.

11. Construction Organization Part:

- Executive Summary for the construction organization part, which will include information on duration of construction works, demand for energy, material and labour resources, storage and amenity areas. The Executive Summary shall also specify required accident prevention and environmental measures.
- Master plan (scale 1:500) displaying temporary buildings (temporary buildings usable for administrative and personal service purpose, temporary indoor and outdoor storage facilities, temporary roads and construction machinery manoeuvring spaces, temporary power and water supply networks, lighting of the area, etc.).

Time schedule of construction works.

1.2.4. Employer's Contribution

The employer shall grant to the supplier access to all available materials, which may be required for the service performance.

Clause 1.3. Reporting and Schedule

1.3.1 Within a 5 (five) weeks period following contract execution, the supplier shall submit in writing to the employer, outcomes of all survey-investigation works and feasibility study.

1.3.2. The employer, or the authorized representative of the employer shall consider the exploration work-related documentation and within a one (1) week period following the workday next to the date of expiration of the term stipulated by clause 1.3.1 of the present document, shall furnish the supplier with its comments concerning survey-investigation works (if any) in writing or through email.

Based on results of feasibility study employer will make decision for continuation of elaboration of basic design for selected version.

1.3.3. Within a 8 (eight) weeks period after receipt by the supplier of the employer's or its authorized representative's comments relating to survey-investigation works and feasibility study, the supplier shall in writing furnish the employer with basic design documentation and Specifications and Employer's requirements for selected option, prepared in line with provisions of respective clauses of the present TOR ;

1.3.4. The employer, or the authorized representative of the employer shall within a 1 (one) week period submit to the supplier comments on basic design and Specifications and Employer's requirements in writing or through email.

1.3.5. Within a 2 (two) weeks period after receipt by the supplier of the employer's or its authorized representative's comments relating to the basic design and Specifications and Employer's requirements,

the supplier shall in writing furnish the employer with the final version basic design and Specifications and Employer's requirements.

Clause 1.4. Format and Venue of Service Delivery

1.4.1. All reports at all stages shall be submitted in writing.

1.4.2. The final documentation shall be submitted in Georgian and English languages, in electronic and printed versions. Drawings and other graphical part shall be in vectoral dwg or dxf, pln, net, doc, xls extension file AutoCAD or ArchiCAD vectoral, - in PDF files and textual - in Word and Excel files, in compact discs (CD or DVD)). Hard copies (A4; A3; A2 and A1 format) in 4 (four) copies, in the album format.

1.4.3. The service delivery report and final design-cost estimation documentation shall be submitted to the following address: Municipal Development Fund of Georgia - LEPL, #150 Davit Aghmashenebeli Avenue, Tbilisi.