

## TERMS OF REFERENCE

for manufacturing and supply of modular units for construction of  
three-storey living blocks (1,888 beds) at Kumtor Mine

Item No.	List of Key Data and requirements	Key Data and Requirements
1	Facility Location	Kumtor Gold Mine, Jety-Oguz District, Issyk-Kul Region, Kyrgyz Republic
2	Client	Kumtor Gold Company CJSC
3	Contractor	to be appointed by the Client
4	Purpose of Equipment	Living blocks for camp
5	Special construction conditions	<p>The camp construction site is located in the high mountain area - at an elevation of 3666 m above sea level.</p> <p>Climate data:</p> <ul style="list-style-type: none"> <li>- Humidity zone - dry</li> <li>- Climate Subdistrict - IA</li> <li>- Estimated average temperature of the coldest five days -31 deg.;</li> <li>- Estimated average temperature of the coldest days -49 deg. ;</li> <li>- Absolute maximum air temperature +23 deg</li> <li>- Construction site seismicity is 8 on the MSK scale - 64;</li> <li>- Average wind speed 9 m/sec;</li> <li>- Estimated snow cover weight <math>P=67\text{kgf/m}^2</math>;</li> </ul>
6	General description of work	<p>As per the assignment of the Client and in compliance with the applicable KR norms and regulations, to manufacture and deliver modular units required for construction of three-storey living blocks: (total bed capacity of 1888):</p> <ul style="list-style-type: none"> <li>- Living Block No.16 for 356 beds;</li> <li>- Living Block No.17 for 420 beds;</li> <li>- Living Block No.18 for 400 beds;</li> <li>- Living Block No.19 for 344 beds;</li> <li>- Living Block No.20 for 178 beds;</li> <li>- Living Block No.21 for 190 beds.</li> </ul> <p>2- and 4-bedded living rooms.</p> <p>Modular structures shall meet the following requirements:</p> <ul style="list-style-type: none"> <li>- strength, rigidity and stability requirements for construction of 3-storey living blocks for the Kumtor mine rotation-based employees;</li> <li>- thermal requirements taking into account the climatic conditions of the area;</li> <li>- manufacturing materials shall comply with the fire safety requirements.</li> </ul> <p>Contractor's work as per the project stages:</p> <ol style="list-style-type: none"> <li>1. Architectural Solutions (AS) Designing. Agree water and sewer connections.</li> <li>2. Metal Structures (MS) Section Calculation and Development.</li> <li>3. Electrical Designing (internal power supply).</li> <li>4. Detailed Metal Structures (DMS) Section Designing.</li> <li>5. Modules manufacturing.</li> </ol>

		<p>6. Modules Delivery.  7. On site installation  8. Completion of work performed.  Each stage shall be agreed with the Client in writing.</p>
7	Relocatable Module Requirements	<p>The relocatable modules shall be manufactured in compliance with the following requirements:</p> <ul style="list-style-type: none"> <li>- Modular unit size 10.0x3,135x2.85 (h) m.</li> <li>- Thermal insulation of walls: mineral fiber slabs with wooden bar coating for interior decoration.</li> <li>- The module roofing shall be flat, the third floor roof shall have an additional double-pitch roof made of thin-walled rolled profile and profiled sheet (be sectional for quick installation and coating). Provide roof assemblies for construction of the second and third floors, taking into account the ease of transportation.</li> <li>- Roof insulation slabs: ISOVER <math>\delta=150\text{mm}</math> and Penoplex <math>\delta=50\text{mm}</math>. of MDF or metal siding, with wooden bar coating.</li> <li>- Floor insulation slabs: ISOVER <math>\delta=150\text{mm}</math> and Penoplex <math>\delta=50\text{mm}</math>. The thermal insulation thickness shall be calculated by the engineering thermal calculation methods.</li> <li>- Floor construction order: Linoleum of Commercial Use Class 31-34, OSB 18 mm, insulation of wood floor framing.</li> <li>- Interior wall decoration: MDF panels for living rooms, PVC Lambri panels for sanitary facilities, metal siding for utility rooms and corridor.</li> <li>- Exterior decoration of the modules: metal siding SD 16x145x0.7 as per ST 24507-1910-AO-02-2008 made of thin-sheet galvanized steel with beige polymer coating.</li> <li>- Exterior doors — insulated metal with Antipathic system, interior doors — PVC, windows — five-chamber metal plastic, three-chamber glazing.</li> </ul> <p>Ventilation: natural ventilation in the living rooms ; in the corridor — mechanical exhaust ventilation with natural air inflow through external door louvers; in the bathrooms and laundry rooms- forced ventilation with air input from the lower door grills, supply and exhaust vent system with natural inflow. Install axial fans in bathrooms and showers.</p> <ul style="list-style-type: none"> <li>- The fire alarm and fire suppression system in the living blocks will be designed by another Contractor and will be installed by the Client.</li> <li>-Reinforced concrete bands will be used as foundations, i.e. each module will be positioned transversely in 3-4 places.</li> </ul>
8	Modular units equipping requirements	<p><i>The furnishings will be done by the Client.</i></p> <p><i>Plumbing solutions:</i>  The water supply and sewage system, plumbing fixtures (boiler, washing machines, drying machines, shower cabins, toilet cabins, sinks, toilets, urinals) will be purchased and installed by the Client.</p> <p><i>Electrical solutions:</i></p> <p>1.1. To organize the distribution of electricity to consumers, use input distribution boards (IDB). To provide additional fire safety, a residual current device (RCD) to be installed at entrance to input distribution boards (IDB) for the appropriate rated current and leakage current setting.</p> <p>1.2. To protect against electric shock during operation of electrical networks and electric receivers, all metal non-current carrying parts of electrical installations to be grounded by the neutral protective</p>

wire PE in the shield.

- 1.3. Install a group panel for every four living rooms. Provide circuit breakers for outlets and lighting in the group panel.
- 1.4. Divide all lighting fixtures by lighting zones.
- 1.5. Use VVGNGLS cable to install power lines of lighting. Lay the cable from the main line to the lighting fixtures in the corrugated PVC pipe.
- 1.6. Power supply to a safety and evacuation lighting shall be carried out in accordance with the Requirements for Electrical Installations Cl. 6.1 and 6.2, as well as SNiP 23-05-95 "Natural and artificial lighting".
- 1.7. According to the Cl.7.1.49. of the Requirements for Electrical Installations, the premises shall be equipped with at least 16A power sockets with a protective contact, shall be equipped with a protective device that automatically closes socket when the connector is plugged out. Install nightlights over beds and double 220V sockets in living rooms.
- 1.8. Electrical wiring of socket network and electrical lighting network shall be laid in the corrugated PVC pipes using with copper core cable VVGngLS 3h2.5, laid in PVC pipes embed in the cavities of the panel plates, walls and covered by the plaster coat. PVC pipes shall have a fire safety certificate as per Fire Regulations 246-97.
- 1.9. In accordance with the Cl. 7.1.38: of the Requirements for Electrical Installations: electrical networks laid behind false ceilings and wall partitions are treated as hidden wiring and shall be carried out: behind ceilings and in void wall partitions in non-flammable metal pipes or PVC pipes having with the localization capacity, and in closed boxes; behind ceilings and in wall partitions made of non-flammable materials, in non-flammable pipes and boxes, as well as using non-flammable cables.
- 1.10. Install switches at 1000mm, except the ones indicated otherwise.
- 1.11. Electrical sockets in the WC rooms must be IP-44 moisture proof.
- 1.12. The height of the socket location is 1000mm, except indicated otherwise.
- 1.13. The sockets binding shall be made in the center of the group.
- 1.14. Position the LED light switches at 1500 mm before entering the room.
- 1.15. Lighting set for working lighting of living rooms and corridors shall be of LED type (Panasonic).
- 1.16. To heat living rooms and corridors, install 1500 watt 220 volt wall mounted converter heaters with thermostats. (Atlantic).
- 1.17. Installation work must be carried out by a specialized organization at the construction stage, in strict compliance with applicable norms and regulations for installation.
- 1.18. Perform the installation and check-out work after completion of the safety measures in accordance with SNIP 111-A-80 and drawing the acceptance test act.
- 1.19. When working with power tools, it is necessary to ensure compliance with GOST 12.2.013-87
- 1.20. Provide that grounding conductor connections to grounding bars are in places that are accessible for inspection and repair.
- 1.21. For the normal operation of electrical appliances, provide for each user an additional (3rd) ground wire connected to the

		<p>corresponding grounding circuit.</p> <p>1.22. Provide emergency lighting at corridor exits, sanitary facilities and staircases.</p>
9	Modular Block Manufacturing Requirements	<ol style="list-style-type: none"> <li>1. In order to manufacture the blocks, the Contractor shall have the appropriate licenses and permits.</li> <li>2. The Contractor shall provide calculations (as required by the general description of work) and designs of modular units (AS, MS, DMS, Electrical sections) prior to manufacture for approval by the Client. The Contractor will agree the materials and equipment used with the Client.</li> <li>3. All materials and equipment necessary for manufacturing are provided by the Contractor.</li> <li>4. Duration of work performance - according to the terms of the Contract.</li> </ol>
10	Documentation Requirements	<ol style="list-style-type: none"> <li>1. A commercial proposal must be sufficiently detailed and contain the following information: calculation and design, manufacturing of each unit with a list of necessary materials and equipment. Provide estimates for each scope of work. The Contractor can provide a quotation for several options for modular units (different dimensions, different frame designs, materials used...), except for the length of the module - the length of the module must not exceed 10 m.</li> <li>2. Specify required deadlines for each scope of work.</li> <li>3. The manufacturing contractor shall provide the relevant product certificates, manufacturers' datasheets for the materials and equipment used, and the Certificates of Conformity for those subject to mandatory certification.</li> </ol>
11	The Client provides:	Living Blocks Design and Location Plan