

TECHNICAL TASK

To develop design specifications and estimates for the “Roasting of Mill flotation concentrates at Kumtor Mine”

№	Title	Content
1	Project Company	Determined based on the results of the tender
2	Customer	“Kumtor Gold Company” CJSC
3	Facility Name	Roasting of Mill flotation concentrates
4	Address	Head office in Bishkek 720031, Kyrgyz Republic, Bishkek, st. Ibraimova, 24 Tel.: (+996 312) 90-07-07, 90-08-08 Fax: (+996 312) 59-15-26
		Construction location KUMTOR mine, Jety-Oguz district, Issyk-Kul region
5	Functional purpose of the object	Oxidizing roasting of sulphide flotation concentrates
6	Construction category	Repurposing / Reconstruction
7	Construction stages	One stage
8	Design stages and planned types of work	Adjusting technological study;
		Development of technological regulations;
		Feasibility study of options - FS
		Design documentation;
		Detailed documentation.
9	Initial data for design	Site development plan
		Geotechnical survey report
		Reports of technological laboratory studies on roasting of flotation concentrates
		Topographic survey
		Technical specifications for connection to water supply and sewerage networks;
		Technical specifications for connection to heat supply networks;
		Technical specifications for connection to electrical networks
Drawings of existing building		

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10	Main technical and economic features of the existing building for the location of the roasting shop	Existing building
		The total area of the building – 468 m ² ;
		Building area – 468,0 m ²
		Content of the building – 6926,4 m ³ .
		The indicators of the plant may change as a result of the development of design documentation.
11	Climate characteristics	The average annual wind speed of 80% is 9 m/s. Ice loading, possible 1 time in 25 years, - 50 mm. Air temperature: average annual temperature is 8°C below 0, maximum is 23 °C above 0, minimum is 49 °C below 0. Snow load - 67 kg/m ² . Elevation of the proposed location of the facility is 4000m above sea level.
12	Seismic activity	According to the Construction Code of the Kyrgyz Republic 20-02:2024 "Seismic construction", Appendix 1, initial seismicity magnitude of the work area is 8.
13	Plant efficiency	3000 tons of concentrate per day (24 hrs)
14	Roast temperature	650-750°C
15	Setup of the roasting plant	1. Roasting furnace; 2. Burner and blower; 3. Elevator; 4. Vertical precipitation cyclones; 5. Electrofilter; 6. Sulphuric acid or gypsum site; 7. Power recuperation assembly;
16	Roasting method and type of furnaces	The roasting method, type of furnaces and the type of energy carrier used, should be selected and justified on the basis of a feasibility study
17	Requirements to purification of exhaust gas	The degree of purification of exhaust gases is 99.9%. MPC SO ² m.s. (maximum permissible concentration in atmospheric air, maximum single): 0.5 mg/m ³ MPC SO ² d.a (maximum permissible concentration in atmospheric air daily average): 0.05 mg/m ³
18	Composition of flotation concentrates	S total - 14.7%; C total - 3.45%; C organic - 1.78%; Au -12.9 g/t

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19	Requirements for the composition and structure of the Feasibility Study	<p>Feasibility Study shall include:</p> <ul style="list-style-type: none"> • Explanatory note with a general description of the construction facility; • General layout of the facility and transport interchange; • List with justification of the adopted technological, architectural, constructional and other decisions; • List and characteristics of engineering equipment, raw materials, etc.; • Environmental section; • Cost estimates, economic calculations, etc. <p>As a result of the Feasibility Study of the project, forecasts on operation of the facility are provided in terms of technical and financial potential of the facility and its competitiveness.</p>
20	Requirements for the composition and execution of Technical regulations	<p>Technical regulations contain the following sections:</p> <ul style="list-style-type: none"> • General characteristics of production; • Description of characteristics of materials, raw materials, chemical agents, intermediate products; • Description of the technological process and flow sheet of production; • Norms of technology operation modes; • Description of the process flow monitoring; • Description of the start and stop of production; • Description of the safe operation of the production; • Description of solid waste, wastewater and air emissions indicating methods of their processing and disposal; • Brief description of technical, pump-compressor, regulating and protective equipment; • List of regulatory documents and mandatory instructions; • Graphic technological diagram of production..

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21	Requirements for the composition and execution of the project	<p>Section 1– Explanatory Note Section 2– General Layout Section 3 – Architectural solutions Section 4 – Structural and spatial planning solutions Section 5 – Information about engineering equipment, engineering support networks, list of engineering and technical measures, content of technological solutions Subsection – Water supply system Subsection – Sewerage system Subsection – Heating, ventilation and air conditioning, heating networks Subsection – Communication networks Subsection – Fuel supply system Subsection – Technical solutions Section 6 – Construction management project Section 7 – List of environment protection measures Section 8 – Fire safety measures Section 9 – Measures to ensure compliance with energy efficiency requirements Section 10 – Estimates for the construction of capital construction facilities Section 11 – Power supply systems Section 12 – Integrated automation Other documentation in case provided for by the legislation of the Kyrgyz Republic Author of the project shall make adjustments to the draft according to comments of the Customer</p>
22	Main requirements for architectural, structural and space-planning solutions, finishing work	<p>The building is framed with a set of rooms and finishes. The quality of the premises must comply with structural, fire protection, energy saving and other standards and rules in accordance with current legislation, as well as the requirements of technical and urban planning regulations.</p>
23	Basic requirements for structural solutions and materials of structural system and enclosing structures	<p>Provide for building structures with improved performance characteristics. Foundations of equipment – to be determined by calculation.</p> <p>External and internal enclosing structures – to determine on the basis of thermal engineering calculation of "Sandwich" panels.</p> <p>Pitched roof (metal tiles) with an organized drain.</p> <p>When adjusting the design documentation, apply technical solutions that minimize the volume of construction and installation work and materials used, as well as minimize the negative impact on the environment.</p>
24		<p>Provide for the possibility of connecting to existing utility networks</p>

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	Basic requirements for engineering and technological equipment	<p>The equipment must be certified and comply with the standards of the Kyrgyz Republic</p> <p>To provide a set of measures for the efficient and rational use of energy resources during the operation of the Plant</p>
25	Main requirements for the section "Measures to ensure fire safety requirements"	<p>Provide fire protection systems</p> <p>Ensure connection to the existing fire protection system</p> <p>Ensure connection to the existing alerting system</p>
26	Basic ventilation requirements	Forced: combined supply and exhaust ventilation with the possibility of installing a heat recovery system from roasting
27	Requirements for the implementation of the cost estimate documentation	The estimate documentation must be compiled in the program in force at the time of costing, using the base and index method
28	Assumptions	<ol style="list-style-type: none"> 1. Roasting site with a system for capturing and neutralizing exhaust gases should be placed in the existing mill building for ultrafine grinding of flotation concentrates. Building sizes 18000x26000mm, height 14800mm. 2. To provide for the use as energy carriers of POL wastes from the Kumtor Mine; 3. When calculating energy carriers' costs, provide for the natural autogenic properties of "organic" carbon, capable of ignition with the release of a large amount of heat. 4. Application of part of the SO₂ neutralization products in the INCO process – neutralization of common tailings from Mill; 5. Substitution of electricity due to the recovery of heat generated from the roasting process.
29	Requirements for the development of design options for the implementation of demonstration materials, their composition and form	<p>Demonstration materials on tablets – 1 copy.</p> <p>Facility certificate – <i>Album A3 (general plan, facades, sections, floor plans, decoration, TEP technology and brief explanations, external and internal networks, equipment, etc.) – 2 copies.</i></p>
30	Requirements for the development of design and estimate documentation	<p>Supplier shall provide the Customer with:</p> <ol style="list-style-type: none"> 1. Act of acceptance and delivery of design documentation. 2. The act of acceptance and delivery of a positive expert opinion on the results of engineering surveys and design documentation, positive expert opinion on verifying the reliability of determining the estimate cost of construction.

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		<p>3. A tablet on the 1st copy of A1 format with a reflection of at least three perspective views, plans, a section and a TEP;</p> <p>4. Project design passport on paper in 2 copies and on CD-R discs in 2 copies.</p> <p>5. Materials of the project design documentation in 4 hardcopies and 2 copies of CD-R discs (<i>after receiving a positive expert opinion and correcting comments</i>).</p> <p>6. Design and working documentation in 4 hardcopies and 2 copies of CD-R discs.</p> <p>Composition and content of the disc must correspond to the set of documentation. Each physical section of the set (<i>volume, book, drawing album, etc.</i>) must be represented in a separate disk directory by a file (<i>group of files</i>) of an electronic document or an electronic document sample. The name of the catalog must match the name of the section.</p> <p>Electronic files of design and work documentation should be submitted in editable dwg and pdf formats (stitched by sections), text files in pdf and MS Office Word, Excel or compatible with them, estimate documentation – in xlsx and xml formats.</p>
34	Description of the process flow diagram	<p>Thickened flotation concentrate will be filtered in a press filter and with a humidity of 12-14% will be sent to the roasting process.</p> <p>As a result of roasting, sulfide minerals are completely oxidized, the concentration of organic carbon decreases from 1.78% to 0.05-0.06%. PMI index decreases below the level of 5% against PRI=60-90% of the initial level in the concentrate.</p> <p>After roasting, the roasted product will be sent for regrinding and further into the CIL process.</p> <p>Roasting site with a system for capturing and neutralizing exhaust gases and roasting products is planned to be located at the mill site for ultrafine grinding of flotation concentrates. Building sizes 18000x26000mm, height 14800mm.</p> <p>As a result of integration of the roasting process, issues of sulfide destruction and neutralization of “organic” carbon will be resolved at the roasting site, and the existing ultrafine concentrate grinding mill will be excluded from the technological process.</p> <p>Construction and installation work of the site will be carried out without stopping the main technological line of the Mill, since the planned building is located separately, there is a possibility of equipment access and gates are provided.</p>

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		Initial data on the roasting of flotation concentrates: "Report on metallurgical tests" by BLUECOASTRESEARCH PJ5414 dated August 30, 2023, and the results of roasting tests at the Kingston Process Metallurgy Laboratory (KPM) in 2023.