

«APPROVED»

Member of the Board – Vice-Rector
for Science and Innovation
"Abylkas Saginov Karaganda technical university" NJSC



A.D. Mekhtiev
2025

List of goods, works and services planned for purchase for scientific research in 2025 within the framework of the state order

No.	Name	Characteristics (for equipment, it is permissible to indicate the model, brand, country and other information)	Justification for equipment purchases	Estimated cost	Procurement deadlines	Payment terms 50/50%, 30/70 70/30%, 100% %,	Guarantees
1	2	3	4	5	6	7	8
1	APPLE MacBook Pro 14.2" Apple M4 (10C CPU/10C GPU), 16 GB, 512GB, Silver, 2024 (MW2U3)	APPLE MacBook Pro 14.2" Apple M4 (10C CPU/10C GPU), 16 GB, 512GB, Silver, 2024 (MW2U3) • Display: 14.2-inch Liquid Retina XDR with a resolution of 3024 x 1964 pixels, ProMotion support with an adaptive refresh rate of up to 120 Hz. • Processor and graphics: Apple M4 chip with 10-core CPU (4 performance and 6 energy-efficient cores) and 10-core GPU. • RAM: 16 GB unified memory.	We offer the purchase of a MacBook Pro 14.2" Apple M4 (10C CPU/10C GPU), 16 GB, 512 GB, Black, 2024 (MW2U3), which includes the free WinCC Sm@rtClient SIMATIC WinCC OA UI application, which has the functions of SIMATIC WinCC V7.0.	1 114 990	2025	50/50	12 months

	<ul style="list-style-type: none">• Storage: 512GB SSD.• Color: silver• Ports and connectors:<ul style="list-style-type: none">• Three Thunderbolt 4 (USB-C) ports with support for charging, DisplayPort, Thunderbolt 4 (up to 40 Gbps), and USB 4 (up to 40 Gbps).• MagSafe 3 charging port.• SDXC card slot.• HDMI port.• 3.5mm headphone jack.• Wireless capabilities:<ul style="list-style-type: none">• Wi-Fi 6E (802.11ax).• Bluetooth 5.3.• Camera: 12 MP with Center Stage and Desk View function, support for 1080p HD video recording.• Audio:<ul style="list-style-type: none">• Six-speaker audio system with support for spatial audio and Dolby Atmos.• Studio-quality three-microphone array with directional beamforming.• Keyboard and trackpad:<ul style="list-style-type: none">• Backlit Magic Keyboard with 78 (US) or 79 (ISO) keys, including 12 full-size function keys and 4 inverted-T arrow keys.• Touch ID.• Force Touch trackpad.• Battery and power:<ul style="list-style-type: none">• Up to 24 hours of video playback.					
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		<ul style="list-style-type: none"> • Up to 16 hours of wireless internet use. • 72.4 Wh lithium-polymer battery. • 70W USB-C Power Adapter. • Dimensions and weight: • Height: 1.55 cm. • Width: 31.26 cm. • Depth: 22.12 cm. • Weight: 1.55 kg. 					
2	TOMTOC Case Defender-A13 Black for MacBook 15, (A13E3)	<ul style="list-style-type: none"> • Compatibility: Designed for 15-inch laptops, including MacBook Pro 15”. • Material: Made of durable polyester to ensure durability and protection for your device. • Protection: Equipped with CornerArmor technology with reinforced inserts on the corners, which increases the protection of the device during drops and impacts. • Interior Lining: Soft plush lining prevents scratches and damage to your laptop. • Additional Compartments: Features a front zippered pocket to store accessories such as a charger, cables or documents. • Dimensions: • External dimensions: 38 x 25.6 x 2.8 cm. • Internal dimensions of laptop compartment: 35.7 x 24.6 x 1.7 cm. • Weight: About 340 g. 	<p>Made from durable polyester to ensure durability and protection of your device.</p> <p>Equipped with CornerArmor technology with reinforced inserts on the corners, which increases the protection of the device during falls and impacts. The soft plush lining prevents scratches and damage to your laptop.</p>	18 505	2025	50/50	12 months

		<ul style="list-style-type: none"> • Color: Black. 					
3	TOMTOC Case Defender-A13 Dark Blue for MacBook 15, (A13E3)	<p>Compatibility: Designed for 15-inch laptops, including MacBook Pro 15”.</p> <ul style="list-style-type: none"> • Material: Made of durable polyester to ensure durability and protection for your device. • Protection: Equipped with CornerArmor technology with reinforced inserts on the corners, which increases the protection of the device during drops and impacts. • Interior Lining: Soft plush lining prevents scratches and damage to your laptop. • Additional Compartments: Features a front zippered pocket to store accessories such as a charger, cables or documents. • Dimensions: <ul style="list-style-type: none"> • External dimensions: 38 x 25.6 x 2.8 cm. • Internal dimensions of laptop compartment: 35.7 x 24.6 x 1.7 cm. • Weight: About 340 g. • Color: Dark blue. 	<p>Made from durable polyester to ensure durability and protection of your device.</p> <p>Equipped with CornerArmor technology with reinforced inserts on the corners, which increases the protection of the device during falls and impacts. The soft plush lining prevents scratches and damage to your laptop.</p>	18 505	2025	50/50	12 months
4	Laptop	ASUS Vivobook 17 X1704VA (90NB10V2-M00CK0) Processor: Intel Core i7 Processor frequency, GHz: 1.7 Integrated graphics: Intel Iris Xe Graphics RAM, GB: 16 Solid-state drive: 1 TB SSD Screen diagonal, inches: 17.3		939 980	March-April	50/50	12 months

5	Mouse	Defender Fame GM-516, White, Bluetooth, USB Sensor type: Optical Sensor: Pixart P3325 Maximum resolution, dpi: 10000 Acceleration, g: 20 Power: Built-in battery		17 980	March-April	50/50	12 months
6	Office paper	A4 format, density 80g/m2, 500 sheets in a pack, CIE 146%, class C		130,000	March-April	50/50	12 months
7	Projector	Projector Acer X1827, Stationary projector. SpecificationsUID MR.JWK11.00P Manufacturer Acer Model: X1827 Type: Stationary projector Technology More details: DLP Original resolution More details 3840 x 2160 (UltraHD 4K) Supported resolution More details: UHD (3840 x 2160) Aspect ratio More details: 4:3, 16:9 Luminous flux, Lm More details: 4000 Number of lamps 1 Lamp power, W More details: 240 Lamp life, hours More details: 5000 Lamp life, hours (in economy mode) More details: 12000 Video standards More details EDTV, PAL, SECAM, NTSC, HDTV, SDTV Horizontal scan frequency More details: 135 kHz Vertical scan frequency More details: 15 kHz Keystone correctionMore detailsV ±30°, H ±30°, Vertical, HorizontalProjection optionsMore detailsRear, front, ceiling mountContrast ratioMore details 10000:1ZoomMore details 2.0xVideo connectorsMore details1 x VGA input, 2 x HDMI input, Component inputAudio connectorsMore details1 x S/PDIF, 1 x Audio input (Mini jack), 1 x Audio output (Mini jack)Other connectors1 x USB	Due to the savings in the expense item “Scientific and organizational support” in the amount of 1,800,000 (one million eight hundred thousand) tenge, it is necessary to reallocate the savings to the expense item “Purchase of materials, equipment and (or) software” named “Projector” in the total amount of 1,797,000 (one million seven hundred ninety-seven thousand) tenge. “Purchase of materials, equipment and (or) software” reallocate the saved funds to purchase the name “Projector”. Stefan K.B., who reported that for the development of an API service for exchanging data between modules of an expert system, it makes sense, at the current stage of development, to use free solutions.	1,797,000	June - August	50/50	12 months

		(Type A)Built-in speakersMore details 1 x 10 WRemote controlMore details NoFeaturesMore detailsHDR support, Built-in speakersColor used in designMore details WhiteAdditionalNoise level - 26 dB 4K UHD supportHDR10 support1080p resolution at 240Hz refresh rateISFccc calibrationKeystone distortion correctionDimensions (W x H x D)31.3 x 11.3 x 24 cmPackage dimensions (W x H x D)39 x 34 x 16 cmProduct weight3.1 kgWeight with packaging4.3 kgWarranty period (months)More details 12					
8	Laptop	General information Product UID 81C38EA ManufacturerHP Model: Omen 16-wd0009ci operating system operating system Absent Attention: Don't forget to buyoperating system CPU CPU: Intel Core i5 Processor model: i3420H Processor frequency, GHz: 2.1 Maximum processor frequency, GHz4.6 Number of cores:8 L3 Cache: 12 MB Video card Video card type Integrated graphics on processor, Discrete video card Integrated graphics: Intel UHD Graphics	Stefan K.B., who reported that there is no need to purchase expensive specialized Exsys Developer software for developing expert system modules and a knowledge base, but free programming languages such as Java SE Development Kit, PHP, SQL can be used. These programming languages are compatible with the main operating systems used, independent of a specific DBMS, standardized, which makes them the most suitable for achieving the project goals. At the same time, one of the results of developing an expert system is to provide visualization of the decisions made. For their successful implementation of the planned results, a powerful video card is also needed, so a	500,000	July-August	50/50	12 months

	<p>GPU Series GeForce RTX 40 Series Discrete video card model GeForce RTX 4050 Video memory capacity: 6 GB RAM RAM type:DDR5 RAM capacity, GB16 RAM frequency 5200 MHz RAM Configuration: 2 x 8 GB Number of RAM slots:2 Data storage devices Hard Drive:HDD no Solid State Drive 512GB SSD M.2 slot for SSD with PCIe interface (drive installed) Screen: Features IPS matrix,144 Hz Screen diagonal, inches:16.1 Screen resolution 1920 x 1080 Full HD Screen brightness, cd/m2:250 Screen surface:Matte Nutrition Battery type Non-removable Battery capacity: 70 Wh Power adapter: 19.5V, 230W Interfaces Connectors:HDMI,RJ-45,microphone input/headphone output (combo)</p>	<p>laptop will be required for these works.</p>				
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		<p>Number of USB 3.0/ USB 3.2 Gen 1 ports:3 Number of USB Type-C1 connectors Network connections Communication tools Gigabit Ethernet (1000 Mbps),Wi-Fi (802.11ac), Bluetooth Functions and Features Multimedia Webcam, Speakers, Microphone Finishing materials:Plastic Features of the webcam Physical shutter on the camera Keyboard Features Key illumination Color used in the design Black Additionally Bang & Olufsen audio systemTwo speakers Dimensions and weight Dimensions (W x H x D) 36.9 x 26 x 2.8 cm Weight, kg: 2.4 Package dimensions (W x H x D) 59 x 34 x 7 cm Weight with packaging: 4.2 kg Factory data Warranty period (months): 12</p>					
9	Scanner electrons microscope JEOL JCM-7000	<p>Jeol JCM-7000 (Japan) Desktop Scanning Electron Microscope JEOL JCM -7000: - Magnification: from 10x to 100,000x; - Acceleration voltage: 5, 10, 15 kV; Electronic optics:</p>	Thus, the main purpose of the service is to keep the water cooler	31 156 598	February-April	50/50	12 months

		<ul style="list-style-type: none"> - Electron gun with tungsten cathode; - Capacitor with permanent magnet and electromagnetic lens; - Objective electromagnetic lens; - 8-pole astigmatism compensation electromagnetic lens; - Scanning 2-level deflection coil; - Electrical image shift (D=6mm); - 4-segment semiconductor detector reflected electron detector; - Secondary electron detector for the mode <p>variable vacuum (UVD);</p> <ul style="list-style-type: none"> - Play image backwards scattered electrons; - Reproduction of images in secondary electrons; - Reproduction of an image obtained by mixing signals from backscattered and secondary electrons; <p>Air extraction system:</p> <ul style="list-style-type: none"> - Pumping control is fully automatic, electromagnetic valve method; - Vacuum control with Pirani sensor; - Pumping time from atmospheric conditions to <p>Workers: no more than 3 minutes</p> <ul style="list-style-type: none"> - Three vacuum modes: 3-5 Pa (BSE mode) 30 Pa (standard mode) 50 Pa (charge removal mode) - Motorized stage - Maximum sample diameter: 80 mm - Maximum sample height: 50 mm 					
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10	JEOL JCM-7000 microscopes use different materials	<p>Consumables for electronics microscope JEOL JCM-7000:</p> <ul style="list-style-type: none"> - Navigation system based on the optical image of the sample; Rotating sample holder; - Double-sided conductive carbon tape for mounting samples (Main material - non-woven fabric, surface - black glue containing carbon powder as a conductive filler) - Wenelt cylindrical electrode (for installation in an electron gun.); - Sample holder (32*10 x 10 pcs). 	JEOL JCM-7000 microscope	24 171 300	February-April	50/50	12 months
11	Energy dispersive spectrometer	<p>Energy Dispersive Spectrometer (EDS) for SEM JCM-7000:</p> <ul style="list-style-type: none"> - Silicon drift detector; - EDX connection kit included (Vacuum flange, wire set); - Active area not less than 30 mm²; - Energy resolution no worse than 129 eV (Mn Kα line); - The range of determined elements is not narrower than B(5) Cf(98); - Cooling system: Two-stage Peltier type; - Multichannel analyzer of at least 4,096 channels (2.5 eV/channel); - Counting speed not less than 60,000 imp./sec. - Qualitative analysis: Automatic and manual peak identification; - Quantitative analysis: without reference <p>Elemental mapping:</p> <ul style="list-style-type: none"> - Resolution: not less than 1024 × 768 pixels; 	JEOL JCM-7000 microscope	26 999 952	February-April	50/50	12 months

		<ul style="list-style-type: none"> - Maximum number of measured elements: not less than 30; - Mixing cards: at least 3 elements - Spectrum export format: BMP, TIFF, JPEG, EMSA, Text, Excel, Word, PDF. 					
12	Carrying out X-ray fluorescence and magnetic resonance analysis of experimental samples	<ul style="list-style-type: none"> Carrying out X-ray phase analysis (XPA) of experimental samples Preparation of samples for X-ray fluorescence analysis Taking and interpreting diffraction patterns Adjusting the diffractometer 	Manganets TOO	11,500,000	April-September	50/50	12 months
13	Rent of a production site and auxiliary equipment for the development of the KVES smelting technology	<ul style="list-style-type: none"> Salary of the personnel of JSC "Manganets" Melting furnace and equipment Charge materials for smelting, kg Depreciation charges (building, transport) 	TOO Manganets	12,000,000	April-September	50/50	12 months
14	Vacuum pump	<ul style="list-style-type: none"> Type Vane-rotor Productivity, m3/hour90 Power, kW 2.2 Maximum residual pressure, mbar 0.00001 Noise level, dB75 Purpose Industrial NVR series Subseries 2NVR Model 2NVR-90D Oil content: Oily Weight, kg100 	Exogenous casting requires a vacuum	1,500,000	April-September	50/50	12 months
15	Complex modifiers	<ul style="list-style-type: none"> Titanium powder PT-Ch coarse fraction up to 500 microns Molybdenum powder grade MK 	For alloying castings	7 200 000	April-September	50/50	12 months

		Tungsten powder 99.99% grade PVC					
16	From the same material, take care of any problems	<p>FIREPROOF RUL/CIC 421 NETZSCH Temperature range: room ... 1700°C Heating elements: 4 super-tantalum 1800 Heating and cooling rates: 0.01 K/min ... 5 K/min Sample holder: Al2O3 Load range: 1 N ... 1000 N (in increments from 1 N to 100 N) Maximum 0.5 N/mm2 depending on sample size Measurement range: 20000 µm Δl resolution: 5 nm Temperature measurement: thermocouples (internal and external) Sample length: 50 mm Sample diameter: 50 mm Atmospheres: air, static c-DTA® Measuring System</p>	Metallurgy ondirisi ushin peshterdi futerleude otka otimdi materialdardyn beriktigin anaktauz kazhet	15,000,000	sau-kyrkuiyek	50/50	12 months
17	Measuring and computing complex for determining stresses in mine conditions	<p>Portable device "Prognoz-L2" for local impact hazard assessment, "Engineer" version (complete with charging station, contact pads, 1 rod and documentation) Dynamic range ~99 dB Frequency range - 1 ... 30 kHz Weight of the device – 600 g Dimensions (LxWxD) - 226x90x45 mm The degree of protection of the device shell is IP65 Piezoceramic sensors AR2085-1000 surface-mounted type Axial sensitivity (± 10%) – 1000 mV/g Relative transverse sensitivity < 5%</p>	Local Impact Hazard Monitoring Device "Prognoz-L2" is designed to record elastic vibration pulses, emitted during the process of irreversible deformation of rocks (natural acoustic emission process) and output to dplay measurement results in the form of intensity indicators acoustic emission and impact hazard criteria.	12,500,000		50/50	12 months

		<p>Operating temperature range -40...+ 125 °C</p> <p>Supply voltage - (15...30) V</p> <p>The material of the surface-mounted sensor body is titanium.</p> <p>Weight of the surface-mounted sensor (without cable) – 35 g</p> <p>Piezoceramic sensors AR2085-1000 borehole type</p> <p>Axial sensitivity ($\pm 10\%$) – 1000 mV/g</p> <p>Relative transverse sensitivity < 5%</p> <p>Operating temperature range -40...+ 125 °C</p> <p>Supply voltage - (15...30) V</p> <p>Sensor body material – duralumin</p> <p>Weight of borehole sensor – 245 g</p> <p>Prognoz-L2View software</p>					
18	Core sampler (rig for non-impact rotary drilling of roof rocks)	Rotary drilling rig MQT-130/3.2 Drilling diameter 50 mm Drilling depth 15 m	A core sampler is required for collecting rock samples.	1 776 062		50/50	12 months
19	Uniaxial compression device	<p>Device PSN-0.16.10 with equipment for determining deformation characteristics</p> <p>Mechanical-hydraulic unit of the device PSN-0.16.10 with equipment for determining deformation characteristics</p> <p>Flat stamp 75 mm Flat stamp with spherical support 90 mm</p>	Determination of tensile/compressive strength, as well as deformation modulus, elastic modulus, contact deformation modulus, transverse deformation coefficient and other deformation characteristics of rocky and semi-rocky soils by the method of destruction of samples of irregular and specified shape by counter spherical indenters, as well as flat stamps	3,500,000		50/50	12 months
20	Diamond crowns 15 pieces	Diamond core drills Segment 15 pieces Drilling diameter 50 mm	Diamond crowns are required for the operation of the core sampler	750,000		50/50	12 months

21	PhpStorm Software 2021.0.14	Cross-platform integrated development environment for PHP, developer: JetBrains	The need for licensed software for programming, debugging and testing web applications	500,000	April - May	50/50	12 months
22	HP Server HPE ProLiant DL360 Gen10 4208 2.1GHz 8-core 1P 16GB-R P408i-a 8SFF 500W PS Server + HPE 1.8TB SAS 12G 10K SFF	High-performance computing server, HP ProLiant DL360 Gen10 model, Intel Xeon Silver 4208 2.1GHz processor, 8 cores, 16 GB RAM, P408i-a RAID controller, 8 SFF drive slots, 500W power supply, comes with an HPE 1.8TB SAS 12G 10K SFF drive	Critical hardware for processing large amounts of data, cloud computing, virtualization, and hosting complex, high-load information systems. Allows simultaneous execution of analytical operations, modeling, and machine learning, ensuring uninterrupted operation of applications and databases with high fault tolerance and data protection.	4,500,000	April - June	50/50	12 months
23	UTM-500 Rock Soil Testing System for Uniaxial Compression Modulus Determination Complete	Basic specification: The system includes an integrated rig for testing rock samples under uniaxial compression (sets of 54.7 mm diameter plates), rig for determining the deformation characteristics of the rock by the contact method with direct measurement of the axial and diametrical deformation of the sample. Easy-to-use testing system for rock testing. Servo-hydraulic system with servo control, implementing tests under uniaxial compression with automatic control by load or deformation. Simple software allows the user to pre-program all test parameters and does not require operator intervention at the testing stage. All main components: load frame, controller, hydraulic pump, are integrated in a single	The UTM-500 system is required to conduct studies to determine the elastic modulus, deformation and strength characteristics of rocks under uniaxial compression to prepare the initial data for numerical modeling of the stress-strain state of the massif. The system is designed to determine the strength and deformation characteristics of the rock under uniaxial compression with a load of up to 500 kN.	36,900,000	within 24 working weeks from the date of receipt of the advance payment.	50/50	12 months

		<p>housing. The load frame includes and provides the following characteristics:</p> <ul style="list-style-type: none"> -Stroke 50mm (2 inches). -Static compressive load 500 kN. - Strain sensor, range 50 mm, accuracy 0.05%. -The distance between columns is 24 cm. -Vertical working area up to 55 cm (maximum distance for installing equipment and sample). -Four columns. -Hydraulic control column includes pressure control solenoid with on/high modes and accumulator to minimize pressure pulsation. -High frequency proportional valve. -Integrated hydraulic pumping station. - Mounted on a rigid base (mobile base, fixed during final installation). -The weight of the system with equipment is approximately 500 kg. - Overall dimensions (depth, width, height): 66cm x 95cm x 213cm. -Power supply 220 V, 50 Hz, 15 A, 1 phase. <p>The SR-LC-LP500 +/-500 kN (112 kip) load cell is a low-profile precision general-purpose load cell.</p> <ul style="list-style-type: none"> - Accuracy 0.25% . -Load +/-500 kN <p>A set of attachments for monitoring sample deformation, including:</p> <ul style="list-style-type: none"> -Three strain gauges, sensor travel, +/- 4mm (8mm) travel, linearity 1% FS -Maximum sample diameter 54.7 mm. 					
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		<p>-Working core diameter from 25 mm to 54.7 mm.</p> <p>- Includes two mounting rings with spring-loaded screws and guide pins for installing axial strain gauges (sensors are installed diametrically opposite at an angle of 180 degrees, two strain gauges are used to account for rock heterogeneity) and a high-precision chain with block for installing a radial deformation sensor.</p> <p>Compression plate set RKU-PLAT-NX</p> <p>- Upper and lower plates for samples with a diameter of 54.7 mm.</p> <p>-Each plate is made of hardened stainless steel (RC 58-60).</p> <p>Cable set CBL-SET1</p> <p>- Complete set of cables for SCON controller and sensors.</p> <p>Integrated single-channel servo controller SCON-ST</p> <p>Microprocessor-based digital servo controller, function generator, data acquisition and digital I/O unit. Advanced servo control with "real-time" data transfer switching between connected converters (sensors, control channel).</p> <p>Includes and provides:</p> <p>-24-bit resolution.</p> <p>-Four (4) ADC channels with excitation, simultaneous sampling, internal filtering and configurable input range (DC and SG sensor types)</p>					
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		<ul style="list-style-type: none"> -Four (4) ADC channels with a fixed range of ± 10 VDC. -(1) Servo proportional control output with ± 10V output signal or ± 100mA current output. -TCP/IP communications. -Waterproof keyboard screen for control. -Power supply: 24VDC, 5A. APP-UNC Integrated Software -Easy to use uniaxial rock testing application with a graphical user interface allowing entry of specimen geometry data and calculation of Young's modulus, Poisson's ratio and uniaxial compressive strength. 					
24	Electric generator Eurolux G4000A / 3kW / 220V 64/1/38	<ul style="list-style-type: none"> Nominal power: 3 kW Mains voltage: 220 V Launch system type: manual starter Number of engine strokes: 4 Fuel type: gasoline Availability of automatic start in the kit (AVR): no Product class: household Fuel tank capacity: 15 l Battery included: no Net weight: 38.36 kg Generator type: synchronous Availability of wheels: no Availability of oil sensor: yes Availability of fuel level indicator: yes Noise level: 68 dB Number of sockets (16A/220V): 1 Cooling type: forced 	To implement the project, it is planned to purchase consumables for the manufacture of a test bench, processing of pump components, and the manufacture of a prototype, namely: biological and mineral hydraulic oils with various parameters, homogenates, and a generator. Various types of oils and homogenates (royal jelly) are necessary to confirm the hypothesis of the possibility of pumping liquid of any viscosity.	109 397		50/50	12 months

		<p>Protection class: IP23 Max. number of revolutions: 3600 rpm Oil pan capacity: 0.6 l Fuel consumption (at 80% rated power load): 1.3 l/h Availability of automatic start system:no Presence of noise-proof casing:no Dimensions without packaging (LxWxH): 610x440x440 mm</p>					
25	Mineral oil Rimula R4X 15 w 40	Shell Rimula R4 Multi is designed to maintain engine and oil performance throughout its service life. This reduces maintenance costs and improves engine reliability. Shell Rimula R4 Multi is suitable for use in most heavy-duty on- and off-road engines.		5*46 000= 230,000		50/50	12 months
26	Hydraulic oil VMGZ (50l)	Hydraulic oil VMGZ (-60) is an all-season oil produced on the basis of low-viscosity, low-freezing base oils and a composition of additives.		2*31 544= 63 088		50/50	12 months
27	Royal jelly natural (10 g)	A homogeneous, opaque, creamy mass. Colour: White with a yellowish tint or slightly creamy.		170*6000= 1,020,000		50/50	12 months
28	Automatic control kit	Tilt sensors NI I82P-4P12-P-33-C, pressure sensors, interface units BC N2-2R-AR-DC24, power supplies BP2.8-15V DC, touch buttons KD-22ESH-3PA-GR.	The automation kit for elevator control is designed for automated control and management of the movement of a passenger pneumatic lift, ensuring its safe and stable operation	5*488 396= 2 441 980	June 2025	50/50	12 months
29	Elevator shaft bumper made of integral polyurethane foam	Elevator shaft bumper made of integral polyurethane foam,	Elevator shaft bumper made of integral polyurethane foam	2*23 200= 46 400	May 2025	50/50	12 months

30	Polyurethane wheel	AV 50x40x9K-B polyurethane wheel, base - steel, Diameter - 50 mm Width – 40 mm, 40 pcs;	Guides for the shaft	60*20 000= 1,200,000	July 2025	50/50	12 months
31	Polyurethane wheel	GRS 50X25/12-10K-B polyurethane wheel, base - steel, Diameter - 50 mm	Guides for the shaft	20*17 100= 342,000	July 2025	50/50	12 months
32	ALTERA FPGA Cyclone IV EP4CE6E22C8N Debug Board	FPGA Cyclone IV EP4CE6E22C8N, 64 MB SDRAM	Used to implement and test convolutional code decoding algorithms	6*46 290= 277 740	May 2025	50/50	12 months
33	STM32F103C8T6 Debug Board	ARM Cortex-M3 microcontroller, 64 KB flash memory	It is used in software and hardware implementation of algorithms	20*3 500= 70,000	May 2025	50/50	12 months
34	Arduino MKR Vidor 4000 board	FPGA Intel Cyclone 10, SAMD21 Cortex-M0+	Provides a hybrid environment for working with FPGA and RF signals	8*68 540= 548 320	May 2025	50/50	12 months
35	Digital oscilloscope Rigol DS1054Z	50 MHz, 4 channels, 1 GS/s	Used for signal analysis and testing of processing algorithms	4*375 185= 1 500 740	May 2025	50/50	12 months
36	USB Blaster Altera CPLD/FPGA Programmer	USB interface, Altera compatibility	Used for programming FPGA devices	10*1 730= 17 300	May 2025	50/50	12 months
37	Radio Channel Fading Simulation Kit	Signal Generator + Fading Simulator Modulator	Creates conditions for testing algorithms in real radio channels	4*300 000= 1,200,000	May 2025	50/50	12 months
38	Additional accessories (cables, connectors, power supplies, antennas)	Set of cables, connectors, power supplies	To connect and operate the equipment	61 770	May 2025	50/50	12 months
39	Filling the knowledge base	Processing of categorical and numerical features of mine workings parameters, their normalization and preparation of files in .csv format for use in machine learning models and expert decision-making system on issues of supporting and maintaining mine workings. Using preprocessing methods One-Hot	AP19680292 "Development of an expert decision-making system on issues of support and maintenance of mine workings" (contract No. 319/23-25 dated 03.08.2023)	3,000,000	May 2025	50/50	12 months

		Encoding and Ordinal Encoding, Min-Max Scaling, Robust Scaling, Z-score Standardization, Python programming language (Pandas, NumPy, Scikit-learn), R, PostgreSQL and visualization tools (Matplotlib, Seaborn).					
40	Service	Conducting technological support for smelting at the production site	Technological support of smelting using briquettes from highly dispersed dust of ferrosilicon production	6,700,000	until the end of June	50/50	12 months
41	Ash content meter	Zolar, Russia, Krasnoyarsk	To develop a new technology for nuclear-geophysical testing of coals using spectrometry of natural gamma radiation of natural radioactive elements (U238, Th232, K40) with selective consideration of the specific activity of each radionuclide based on the interpretation and algorithmic justification of complex gamma-spectrometric measurements, ensuring high sensitivity of coal quality assessment in large masses.	1,898,000 rubles		50/50	12 months
42	Filling with content, testing the digital platform, technical support at the pilot stage		Implementation of the calendar plan	2 600 000	June, 2025	50/50	12 months
43	Assessment of the market value of exclusive intellectual property rights and preparation of a licensing agreement	National Institute of Intellectual Property	The main purpose of the service is to provide a professional assessment of the value of intellectual property rights and the preparation of a legally sound licensing agreement, which allows the parties to ensure the legality of the transaction and	2,000,000		50/50	12 months

			effectively manage intellectual property rights.				
44	Manufacturing of injection anchor	Breaking load, kN-110; Breaking strength, N/mm ² -400; Diameter, external, mm -22; Diameter, internal, mm-12; Thread at the end of the anchor, mm -200/600 Length of the sealant, mm -250; Working pressure, bar* -200; Maximum pressure, bar* -250; Membrane response at, bar -60	Practical implementation of the proposed developments with the aim of introducing them into industrial enterprises.	1,500,000	October 2025	50/50	12 months
45	Manufacturing of a pressure rope anchor	Breaking load, kN-110; Breaking strength, N/mm ² -400; Diameter, external, mm -22; Diameter, internal, mm-12; Thread at the end of the anchor, mm -200/600 Length of the sealant, mm -250; Working pressure, bar* -200; Maximum pressure, bar* -250; Membrane response at, bar -60	Practical implementation of the proposed developments with the aim of introducing them into industrial enterprises.	1,800,000	October 2025	50/50	12 months
46	Manufacturing of a pressure tube	Breaking load, kN-110; Breaking strength, N/mm ² -400; Diameter, external, mm -22; Diameter, internal, mm-12; Thread at the end of the anchor, mm -200/600 Length of the sealant, mm -250; Working pressure, bar* -200; Maximum pressure, bar* -250; Membrane response at, bar -60	Practical implementation of the proposed developments with the aim of introducing them into industrial enterprises.	750,000	October 2025	50/50	12 months
47	Manufacturing of shaft and cabin housings	Mine and cabin housings with installation at the place of operation	Mine and cabin housings with installation at the place of operation	5,000,000	September 2025	50/50	12 months
48	Service: Manufacturing and installation of pylons and marks (reference points fixed on the	The monitoring pylon is a reinforced concrete column with a depth below the soil freezing depth (at least 1.5 m). The middle part of the pylon is reinforced with a concrete frame at ground level. The upper part is protected with a plastic	Monitoring pylons are necessary for creating stationary reference points for monitoring a hydraulic engineering facility (the Sherubay-Nurin reservoir embankment). They ensure high accuracy of geodetic	4,000,000	3 months	50/50	12 months

	ground for a long time) in the amount of 5 pieces	pipe to eliminate the influence of temperature factors. A metal plate with a diameter of 150 mm and a thickness of 10 mm with a welded bolt with a 5/8 inch thread for attaching geodetic instruments is installed on the upper end. The diameter of the frame reinforcement is 10 mm. Operating temperature range: from -40 ° C to + 50 ° C.	measurements, minimizing errors caused by seasonal temperature fluctuations and deformations of soil foundations. The use of this design increases the safety of operation of facilities and meets the requirements of regulatory documents in the field of mine surveying and geotechnics.				
49	Service: Acquisition of current images and analysis of high-precision satellite radar images of the territory of a hydraulic structure in the amount of 14 pieces	The required accuracy of spatial resolution of satellite radar images is 10 meters/pixel or more.	The purchase and analysis of up-to-date high-precision radar images is necessary for conducting comprehensive area monitoring of the condition of a hydraulic structure	4 560 000	6 months	50/50	12 months
50	Tabletop lathe	Processing diameter over the machine bed, not less than 80 mm length of the workpiece, not less than 300 mm machining diameter above support, not less than 120 mm carriage stroke, not less than 75 mm quill stroke, not less than 60 mm required voltage 220V spindle speed 15-2500 rpm	The device will be used for sample preparation for mechanical testing, dilatometer testing and will be installed in ILIP "KORMS"	796,000	April-May 2025	50/50	12 months
51	Laptop Lenovo LOQ 15IRX9, Core i7-13650HX/15.6"WQHD/24GB/1TB/GF RTX4060 8GB/LAN/DOS	Product UID - 83DV00YMRK, Manufacturer - Lenovo Model - LOQ 15IRX9, Operating System - None Processor - Intel Core i7, Processor Model - 13650HX	A laptop is required to work with modeling programs used in mining, as well as for working with programs for processing acoustic sounding.	679 990	until November 15, 2025	50/50	12 months

	<p>Processor frequency, GHz - 2.6 Maximum processor frequency, GHz - 4.9 Number of cores – 14, L3 cache – 24 MB Video card type - Integrated graphics, Discrete graphics card Integrated graphics in the processor - Intel UHD Graphics GPU Series- GeForce RTX 40 Series Discrete graphics card model - GeForce RTX 4060 Video memory capacity - 8 GB, RAM type - DDR5 RAM capacity, GB - 24, RAM frequency - 4800 MHz RAM Configuration - 2 x 12 GB Number of RAM slots - 2 Maximum RAM - 32 GB Hard Drive - No HDD, Solid State Drive - 1TB SSD M.2 slot for SSD - with PCIe interface (drive installed), with PCIe interface (free) Features - IPS matrix, 165 Hz, Screen diagonal, inch -15.6 Screen resolution - 2560 x 1440 QHD, Screen brightness, cd/m2 - 350 Screen surface - Matte Battery Type - Lithium-Ion (Li-Ion), Non-removable Battery capacity - 60 Wh, Power adapter - 20 V, 230 W Connectors - HDMI, RJ-45, microphone input/headphone output (combo), Number of connectors USB 3.0/ USB 3.2 Gen 1-3</p>					
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		<p>Number of USB Type-C connectors - 1 Communications - Gigabit Ethernet (1000 Mbps), Wi-Fi (802.11ax), Bluetooth, Bluetooth Version - 5.2 Multimedia - Webcam, Speakers, Microphone Finishing materials - Plastic Webcam Features - Camera Power Switch, 1080p FHD Resolution Keyboard Features - Numeric Keypad, Key Backlight The color used in the design is Gray Additionally - 2 speakers with a power of 2 W Bidirectional microphone AI Chip: LA1</p> <p>TÜV Rheinland Low Blue Light Certification HDMI 2.1 supports resolutions up to 8K at 60Hz USBType-C connector supports Power Delivery 140W, Display Port1.4 Dimensions (W x H x D) - 35.9 x 25.8 x 2.3 cm, Weight, kg - 2.4 Package dimensions (W x H x D) - 54 x 35.5 x 8.5 cm Weight with packaging - 3.8 kg</p>					
52	operating system	Microsoft Windows 11 Professional, 64bit, Russian 1pk DSP, Kazakhstan Only DVD, OEI	The operating system is required to operate the laptop and to work with the modeling programs used in mining, as well as to work with the programs for processing acoustic sounding.	98 990	until November 15, 2025	50/50	12 months

53	Laptop bag	15.6" Tucano BSLOOP15-BK, Gray	A laptop bag is essential for convenience and mobility when working with a laptop.	14 030	until November 15, 2025	50/50	12 months
54	Mouse for laptop	Logitech M190, Gray, Wireless, Optical, 1000dpi, 1 x AA, USB	A laptop mouse is required for working on a laptop and working with modeling programs used in mining, as well as for working with programs for processing acoustic sounding.	6 990	until November 15, 2025	50/50	12 months
55	Xerox paper	A4 SVETOCOPY	Paper is necessary for working with documentation within the project.	48 100	until November 15, 2025	50/50	12 months
56	Clamp	19mm black	Paper is necessary for working with documentation within the project.	1,900	until November 15, 2025	50/50	12 months
57	Creation of an information system "Calculation of fares for travel on existing socially significant inter-district (intercity intra-regional) routes of the Karaganda agglomeration"	The information system (IS) "Calculation of fares for travel on existing socially significant inter-district (intercity intra-regional) routes of the Karaganda agglomeration" must calculate fares for travel on existing socially significant inter-district (intercity intra-regional) routes, including those covering the Karaganda agglomeration, in accordance with the approved Methodology for calculating fares for the provision of services for the transportation of passengers and baggage on regular routes dated October 13, 2011 No. 614. All the following information must be entered into the IS "Calculation of fares for travel on existing socially significant inter-district (intercity intra-regional) routes of the Karaganda agglomeration"		4,500,000		50/50	12 months

58	Creation of an information system "Determination of the intensity of traffic flow on the roads of the Karaganda agglomeration depending on changes in the intensity of traffic flows"	<p>The information system (IS) "Determination of the intensity of traffic flow on the roads of the Karaganda agglomeration depending on the change in the intensity of traffic flows" should allow studying all the patterns of development of the transport system of the Karaganda agglomeration taking into account the changes that arise in the system with forecasting for the future - depending on changes in various objects of the agglomeration, namely, from the growth or decrease in the indicators of industrial enterprises or trade enterprises, etc. and their impact on the transport system of the Karaganda agglomeration as a whole.</p> <p>All the roads of the Karaganda agglomeration under study must be included in the IS "Determination of the intensity of traffic flow on the roads of the Karaganda agglomeration depending on the change in the intensity of traffic flows".</p> <p>The IS should determine the traffic flow intensity on the roads of the Karaganda agglomeration, including the following main settlements: Karaganda city; Temirtau city, Aktau settlement, Saran city, Aktas settlement, Shakhtinsk city, Shakhan settlement, Dolinka settlement, Abay city; Karabas settlement; Topar settlement, etc.</p>		9,016,000		50/50	12 months
59	Experimental-	Experimental assessment of the error due to the heterogeneity of coals (selection	Estimation of error due to heterogeneity of coals, obtaining	522,000	June 2025	50/50	12 months

	estimate of the error due to the heterogeneity of coals (sampling error): - selection of point (primary) samples weighing 9 kg; - determination of heavy element content with sample preparation	error);radiochemical (nuclear-physical) determination of uranium, thorium and potassium-40; determination of ash content of coal.	data on the concentration of radionuclides (U238, Th232 and K40) in prepared coal samples and ash and slag waste using gamma spectrometric and nuclear-physical methods, determination of coal ash content				
60	Radiochemical (nuclear-physical) determination of uranium, thorium and potassium-40	Radiochemical (nuclear-physical) determination of uranium, thorium and potassium-40 by the neutron activation method (at the WWR-K nuclear reactor using the relative method for short-lived radionuclides and long-lived radionuclides), gamma-spectrometric method (spectrometers with coaxial semiconductor detectors of high-purity germanium (SPD HPG) GEM40P4-83, ORTEC and GC2018, CANBERRA.)	Obtaining data on the concentration of radionuclides (U238, Th232 and K40) and rare earth elements in prepared samples of different sizes (~5 mm) and ash content.	3 125 000	June 2025	50/50	12 months
61	Determination of ash content of coal	Calculated data on the correlation links between the ash content of the tested coal and the specific activity of radionuclides.	Selection of an interpretation algorithm that increases the unambiguity of gamma-spectrometric measurements in conditions of a variety of radiogeochemical and petrophysical characteristics of the analyzed coals.	720,000	June 2025	50/50	12 months
62	Digital deflection meter PSK-MG4.01	Range of deflection meter readings, mm 0...9999 Linear displacement measurement	It is proposed to purchase a digital deflection meter PSK-MG4.01 due to the need to improve the accuracy and efficiency of	1 009 200	until November 15, 2025	50/50	12 months

		<p>range, mm 0...200</p> <p>Limits of absolute error of displacement measurements, mm, in the range: – from 0 to 10 mm ± 0.05</p> <p>– over 10 to 100 mm ± 0.1</p> <p>– over 100 to 200 mm ± 0.5</p> <p>Price of the smallest unit, mm, in the range: - from 0 to 999 mm 0.01</p> <p>– over 999 to 9999 mm 0,1</p> <p>Nominal value of string diameter, mm 0.25 - 0.6</p> <p>Range of string diameter values, mm, no more than 0.01</p> <p>Leading block diameter, mm 19.2 \pm 0.5</p> <p>Tension load weight, kg 1 \pm 0.05</p> <p>Modes: Operational, Observation, Waiting</p> <p>Volume of archived information, values 4000</p> <p>Overall dimensions (L x W x H), mm, no more than – electronic unit 155 x 80 x 70</p> <p>- electronic unit with clamp 310 x 110 x 120</p> <p>Supply voltage, V 3.7 V (Li-Polymer)</p> <p>Network adapter / USB port</p> <p>Power consumption, mW, no more than: 25</p>	<p>measurements of deformations and deflections of structures during technical inspections and tests. The device provides high accuracy (up to 0.01 mm), digital indication, autonomous operation in the field and the ability to transfer data to a PC, which allows to significantly increase the reliability and efficiency of measurements. The use of PSK-MG4.01 meets the requirements of regulatory documentation and is necessary to ensure the quality of control and diagnostic work.</p>				
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		Weight, kg, not more than 0.75					
63	Case for digital deflection meters PSK-MG4 and PSK-MG4.01	Manufacturer SKB Stroypribor Country of origin Russia	The purchase of a case for digital deflection meters PSK-MG4 and PSK-MG4.01 is justified by the need to ensure the safety, ease of transportation and safe storage conditions of precision measuring equipment. The case protects the devices from mechanical damage, dust, moisture and other external influences, which is especially important when used in the field. The use of a specialized case allows you to extend the service life of the equipment, maintain its metrological characteristics and reduce the risk of failure during transportation, which makes its purchase advisable and economically justified.	89 900	until November 15, 2025	50/50	12 months
64	Oscilloscope 2-channel 60 MHz Hantek DSO5062B	HANTEK's range of digital oscilloscopes includes dual-channel desktop 5000B, 5000BM, 5000P series oscilloscopes. And also mixed signal oscilloscopes MSO 5000 D series. The 5000B and 5000BM series differ only in memory capacity. The 5000B has 1M, the 5000BM has 2M. The 5000P series differs from the	The purchase of the Hantek DSO5062B dual-channel oscilloscope is justified by the need to conduct accurate diagnostics and analyze electrical signals during repair, adjustment and research work. The device ensures high measurement accuracy, display of the signal shape in real time, allows you to analyze both low-frequency and	259 491	until November 15, 2025	50/50	12 months

		<p>B/BM series in its smaller memory capacity and maximum input voltage in 1:1 mode 35V. At the same time, 5000P has a faster memory, which allows higher sampling rates to be used in some combinations memory size and time/division than 5000B/BM.</p> <p>DSO-5000B Series Features</p> <p>Excellent industrial design. Keys for each channel, time, trigger, multimeter</p> <p>Large 7-inch screen with a resolution of 800*480.</p> <p>USB 2.0 interface, USB host, easy to control with PC</p> <p>High refresh rate (2500 fps)</p> <p>High sampling rates - 1GHz, 25GHz in equivalent mode.</p> <p>FFT, +, -, *, /, XY, 23 kinds of automatic measurements, template check Different trigger modes, separate time base for ALT trigger, easy to observe two signals with different frequencies, video trigger. Recording and saving signals</p> <p>Completeness:</p> <p>Device -1pc</p> <p>Power cable -1pc</p> <p>USB cable - 1pc</p>	<p>high-frequency processes, which is especially important when working with digital and analog circuits. The presence of two channels expands the possibilities of comparing signals and analyzing the interactions between them. The Hantek DSO5062B oscilloscope is compact, has a USB connection to a PC, an intuitive interface and meets modern requirements for measuring equipment, which makes its purchase justified and necessary for improving the quality of technical diagnostics and training.</p>				
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		<p>Probes - 2 pcs.</p> <p>Technical parameters:</p> <p>Type: digital</p> <p>Number of analog channels: 2</p> <p>Number of digital channels: no</p> <p>Bandwidth, MHz: 60</p> <p>Sampling frequency per channel, GHz: 1</p> <p>Series: dso5000</p>					
65	<p>NORDBERG JACK N32032 super low trolley 3 tons, H=75-500 mm</p>	<p>Manufacturer Nordberg</p> <p>Country of origin: China</p> <p>Load capacity 3000 kg</p> <p>Lifting height 500 mm</p> <p>Pick-up height 75 mm</p> <p>Rolling jack Yes</p> <p>Overall dimensions</p> <p>Width 400 mm</p> <p>Length 780 mm</p> <p>Height 165 mm</p>	<p>The purchase of the NORDBERG N32032 trolley jack is justified by the need to carry out prompt installation and repair work as part of the implementation of the mobile overpass project. This jack provides high lifting capacity with a minimum pickup height, which is critical when working with low-profile structures and equipment. The compactness, maneuverability and reliability of the design allow it to be used in limited spaces and on temporary construction sites. A robust body and resistance to loads ensure safety during operation, and a lifting range of up to 500 mm allows you to perform a wide range of tasks during the installation of overpass elements.</p>		<p>until November 15, 2025</p>	<p>50/50</p>	<p>12 months</p>

66	Laboratory scales Gosmetr VLTE-310 (310 g, 0.001 g, external calibration)	<p>Maximum weighing limit (MWL or Max), g 310</p> <p>Discreteness (division value) (d), g 0.001</p> <p>Accuracy class High (II)</p> <p>Calibration External</p> <p>Adjustment weight 200 g F2 *</p> <p>Minimum weighing limit (MWL), g 0.02</p> <p>Verification division value (e), mg 10</p> <p>Limits of permissible error in weighing intervals during verification, mg:</p> <ul style="list-style-type: none"> - from 0.02 g to 50 g inclusive; ± 5; - over 50 g up to and including 200 g; ± 10; - over 200 g up to and including 310 g; ± 15 <p>Time to establish readings, s, no more than 3</p> <p>Scale bowl diameter, mm $\varnothing 120$</p> <p>Overall dimensions (L x W x H), mm 260×190×125</p> <p>Weight, kg, not more than 1.7</p> <p>Power consumption, V A, no more than 5.0</p> <p>Powered by AC mains via AC adapter with 5V rated output (voltage/frequency)</p> <p>230±23 V; 50±1 Hz</p>	<p>The purchase of Gosmetr VLTE-310 laboratory scales is justified by the need to carry out high-precision measurements of the mass of materials and components within the framework of the mobile overpass project. The scales provide the accuracy required for dosing and monitoring the mass of structural mixtures, chemical reagents and small parts, which is critically important for compliance with technological standards during the assembly and operation of mobile structures. The presence of external calibration allows maintaining the accuracy of measurements in the field. Their compact size and ease of use make them convenient for use at mobile and temporary sites, which makes their purchase justified and necessary to ensure the quality of work on the mobile overpass.</p>	496 213	until November 15, 2025	50/50	12 months
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		Average service life, years, not less than 10					
67	External SSD Drive 2 TB, Kingston XS1000, Red	<p>Product UID SXS1000R/2000G</p> <p>Manufacturer Kingston</p> <p>Model XS1000</p> <p>Hardware Type USB SSD</p> <p>Memory capacity, GB 2000</p> <p>Read speed, up to 1050 MB/s</p> <p>Write speed up to 1000 MB/s</p> <p>Interface type USB 3.2 Gen 2, USB 3.2 Gen 2 Type-C</p> <p>Compatibility Android, Chrome OS, Linux, macOS, Windows</p> <p>Color used in the design</p> <p>Red, Power Indicators</p> <p>Case Aluminum alloy + ABS</p> <p>Powered by USB port</p> <p>Additional Storage temperature from -20°C to +85°C</p> <p>Dimensions and weight Dimensions (W x H x D)</p> <p>6.9 x 1.3 x 3.2 cm</p> <p>Package dimensions (W x H x D) 8 x 12 x 2.5 cm</p> <p>Product weight 0.02 kg</p> <p>Weight with packaging 0.06 kg</p> <p>RTL packaging</p> <p>Factory data Warranty period (months) 60</p> <p>Link to the manufacturer's website</p> <p>www.kingston.com/ru</p>	An external SSD drive is essential for storing experimental results, reports, diagrams, graphs, and other project documentation. In addition, the device's mobility facilitates the exchange of information between team members, especially when using the drive to transfer data between labs, presentations, or remote work.	71 990	until November 15, 2025	50/50	12 months

68	Service	Consultation on calculation of metal structures, development of overpass drawings at TOO Institute Gradient Project.	To develop an experimental stand for a mobile overpass, in particular: 1) development of the main units of the overpass structure; 2) preparation of technical specifications for the design of the overpass; 3) development and research of a mathematical model of the overpass operation taking into account the load of the soil base; 4) development of a calculation and explanatory note; 5) development of operating instructions; 6) development of a program and methodology for experimental research.	4 005 036	until November 15, 2025	50/50	12 months
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Note: Commercial offers should be sent by e-mail INTP.department@ktu.edu.kz

Director of the Department of Science and Innovation



B.D. Suleev