

**Joint Stock Company "ALT University named after
Mukhamedzhan Tynyshpayev"**



APPROVED BY
by the decision of US "ALT of the University
named after Mukhamedzhan Tynyshpayev"

dated "27" 03, 2025 (Protocol No. 8)

President-Rector

M.S. Zharmagambetova



EDUCATIONAL PROGRAM

**Name of the educational program: 6B07349 Construction of bridges and
transport interchanges**

Training Level: Undergraduate

Discipline Code and Classification: 6V073 - Architecture and Construction

Code and group of educational programs: V126 - Transport construction

Registry Date: 30.06.25

Registration number: 6B07300224

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1. INFORMATION ON THE REVIEW, APPROVAL, AND ENDORSEMENT OF THE PROGRAM, AS WELL AS ON THE DEVELOPERS, EXPERTS, AND REVIEWERS

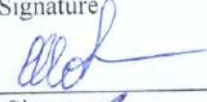
1 DEVELOPED BY:

PhD in T. S., Associate Professor
position


Signature

Bikhozhaeva G.S.

SC "KazDorNII", L. R. Doctor of Technical Sciences
position


Signature

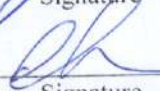
Shalkarov A.A.

PhD in Technical Sciences, Associate Professor
position


Signature

Tulemisov T.Zh.

Master of Technical Sciences, Senior Lecturer
position


Signature

Imankulova A.S.

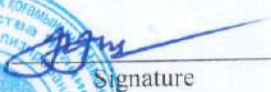
Student of group MTM-22-1k
position


Signature

Gazizov A.M.

2 EXPERTS:

Director of the Branch of JSC "NC "KTZ"
"Specialized Bridge Detachment"
position


Signature

Karbozov K.S.

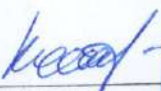
Head of the Production and Technical Department
JSC "NC "KTZ" Specialized Bridge Detachment
position


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Zhantleuova A.T.

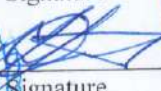
3 REVIEWER:

Satbayev University, PhD in Technical Sciences,
Senior Lecturer of the "SiSM" Department
position


Signature

Каипова А.А.

LLP "GEO TRACK"
position


Signature

Нусупов Д.К.

CONSIDERED AND RECOMMENDED:

Meeting of the AC (Department)

"Transport Construction"

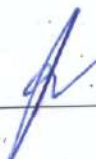
Protocol No. 6, "24" 02 2025



Karibayeva G.B.

*Meeting of the UMBI "Transport and
Construction"*

Protocol No. 7, "28" 02 2025



Abdreshov Sh.A.

*Meeting of the EMS "ALT University
named after M. Tynyshpaev"*

Protocol No. 4, "20" 03 2025



Kodzhabergenova A.K.

APPROVED by the decision of the Academic Council of JSC "ALT University named after M. Tynyshpaev"
from 03/27/2025 No. 8

UPDATED May 23, 2025

2. REGULATORY REFERENCES

The educational program is developed based on the following regulatory legal acts and professional standards:

1. Law of the Republic of Kazakhstan "On Education" dated July 27, 2007 No. 319-III
2. The National Qualifications Framework, approved by the protocol of March 16, 2016, of the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations.
3. Sectoral qualifications framework for the sphere of "Education", approved by the Protocol of the meeting of the sectoral commission of the Ministry of Education and Science of the Republic of Kazakhstan on
Social partnership and regulation of social and labor relations in the field of education and science of November 27, 2019, No. 3.
4. Standard rules for the activities of higher and postgraduate education organizations, Order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018, No. 595
5. State Compulsory Standard of Postgraduate Education, Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022, No. 2
6. Qualification directory of positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of Population of the Republic of Kazakhstan dated August 12, 2022 No. 309. with amendments and additions dated July 25, 2023.
7. Classifier of areas of training for personnel with higher and postgraduate education, approved by the order of the Minister of Education and Science of the Republic of Kazakhstan dated October 13, 2018, with amendments and additions dated July 25, 2023
8. Classifier of areas of training of personnel with higher and postgraduate education, approved by the order of the Minister of Education and Science of the Republic of Kazakhstan dated
October 13, 2018 No. 569 (as amended and supplemented as of May 16, 2023).
9. Rules for maintaining a register of educational programs implemented by higher and (or) postgraduate education organizations, as well as grounds for inclusion in the register educational programs and exclusions from them, order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated October 12, 2022 No. 106
10. RI-ALT-33 "Regulations on the procedure for developing an educational program for higher and postgraduate education."
11. Assembly and installation of prefabricated and monolithic structures 07/28/2019
12. Development of construction projects July 28, 2023
13. Geodetic work in construction 01.09.2023
14. Construction of bridges and tunnels December 21, 2022
15. Atlas of new professions: Digital designer (BIM specialist). <https://atlasbt.enbek.kz/profession/344>

3. Educational program passport

No	Field name	Note
1	Registration number	6B07300206
2	Code and classification of the field of education	6B07 Engineering, manufacturing and construction industries
3	Code and classification of training areas	6B073 Architecture and Construction
4	Code and group of educational programs	B126 – Transport Construction
5	Name of the educational program	6B07349 Construction of bridges and interchanges
6	Type of OP	New
7	The purpose of the OP	Training in-demand personnel with the necessary theoretical foundation and practical skills in the field of project development, construction, and operation of bridges and transport interchanges.
8	ISCED level	6 - Bachelor's degree
9	NQF level	6 - Bachelor's degree
10	Level according to the ORK	6 - Bachelor's degree
11	Distinctive features of the OP	No
	Partner university (SOP)	
	Partner university (DDOP)	
12	Form of study	Full-time
13	Language of instruction	Kazakh, Russian, English
14	Volume of loans	241
15	Awarded academic degree	Bachelor of Engineering and Technology in the educational program "6B07349 Construction of Bridges and Transport Interchanges"
16	Availability of an appendix to the license for the direction of personnel training	No. 0106B073 Architecture and Construction to the license KZ87LAA00036465
17	Availability of accreditation of the educational institution	Eat
	Name of the accreditation body	Independent Kazakhstan Agency for Quality Assurance in Education and Science of the Republic of Kazakhstan
	Validity of accreditation	5 years

4. Competency model of a graduate

Objectives of the educational program:

1. To develop an individual capable of self-improvement and professional growth, with diverse social, humanitarian, natural scientific, specialized and core knowledge and interests.
2. Developing the ability to critically rethink accumulated experience, change the profile of one's professional activity if necessary, awareness of the social significance of one's future profession, and possessing high motivation to perform professional activity.
3. Developing the ability to: find a compromise between various requirements (cost, quality, safety and deadlines) in long-term and short-term planning and make optimal decisions in the design, construction and operation of transport facilities; conduct work in research organizations under the guidance of leading specialists; possess a culture of thinking.
4. Development of the ability to: generalize, analyze and perceive information; set goals and choose ways to achieve them.
5. Assistance in developing the graduate's readiness to: perform design and calculation work; develop design and technical documentation; develop methodological materials, proposals and activities for the design, construction, operation and modernization of transport buildings and structures.
6. To develop graduates' readiness to conduct technical and economic analysis, substantiate decisions made and implemented in the design, construction, operation, and modernization of transport buildings and structures; apply the results in practice; and strive for self-development and improvement of their qualifications and skills.
7. Promoting the development of graduates' readiness for the economical and safe use of natural resources, energy and materials in the design, construction, operation and modernization of transport buildings and structures.

Learning outcomes: according to Unified State Educational Institution of Higher Education

PO1 - Apply basic programming, digital modeling, and professional communication skills to solve design problems related to the reconstruction of bridges and interchanges, taking into account the requirements of digital inclusion.

PO2 - Use fundamental engineering, physical and computational principles to analyze and calculate the strength, stability and performance characteristics of building structures.

PO3 - Assess geological and soil conditions of construction sites, calculate foundations and structures, and develop safe and efficient design solutions for transport interchanges and bridges, ensuring load-bearing capacity and operational reliability, taking into account natural and man-made factors.

PO4 - Analyze the choice of design solutions taking into account the properties of materials and chemical compositions, using mechanical and mathematical methods for calculating and assessing the reliability of bridge structures under real operating conditions

PO5 - Develop projects for engineering structures in accordance with regulatory documents, taking into account geodetic data using elements of artificial intelligence, construction organization, ensuring the validity of decisions made.

PO6 - Apply methods of structural mechanics to the calculation and design of bridges, pipes, interchanges, tunnels and subways, ensuring their reliability and compliance with regulatory requirements.

PO7 - Organize technological processes for the construction of ground transport infrastructure facilities using specialized equipment, mechanized complexes, and environmentally sustainable technologies.

PO8 - Demonstrate project management and decision-making skills taking into account legal, economic and environmental aspects to ensure sustainable development of entrepreneurship.

PO9 - Design transport interchanges at the intersection of any obstacles, including water, with the preparation of cost estimates, assessment of strength and economic indicators

PO10 - Assess the technical condition of bridges, interchanges and tunnels using diagnostic and inspection methods, justify decisions on repair and maintenance, taking into account occupational health and safety requirements.

Field of professional activity: Rail and road transport: design, construction, maintenance and repair of bridges and interchanges.

Objects of professional activity:

- local executive authorities in the field of railway and automobile transport and their regional structures;
- organizations and enterprises of the transport industry in the field of design, construction, maintenance and repair of bridges and tunnels of the main railway network, subways and access railways, and highways of industrial enterprises;
- organizations and enterprises in the field of manufacturing building materials and structures for transport and communications facilities.

Types of professional activity:

- production and technological;
- organizational and managerial;
- service and operational;
- design.

Functions of professional activity:

- 1) Organization of production of building materials and structures for transport and communications facilities; organization of design, construction, maintenance and repair of bridges and transport interchanges; use of standard methods for calculating the reliability of bridge structures and transport interchanges;
- 2) Management of production processes, analysis of the results of production activities; management of work on the implementation of design and construction work, technical maintenance and repair of bridges, transport interchanges; technical diagnostics of bridges, tunnels and subways, the use of measuring equipment of bridge testing laboratories; analysis and assessment of production and non-production costs or resources for high-quality design, construction, technical maintenance and repair of bridges, transport interchanges;
- 3) Development of new technologies, development of design and technological documentation using computer technologies; calculation of strength and stability under various types of loading of bridges, tunnels and underground transport interchanges, development of projects for new and reconstruction (modernization) of existing railway and highway bridges and tunnels; selection of building materials for the manufacture of bridge structures, transport interchanges, justification of technical solutions; development of technical assignments and technical conditions for projects for new and reconstruction (modernization) of existing railway and highway bridges and tunnels, bridge structures, transport interchanges, technological processes for technical maintenance and repair of bridges, transport interchanges, means of technical diagnostics of bridges, transport interchanges using modern information technologies and computer programs; design of new structures of bridges, transport interchanges that meet the latest achievements of science and technology, safety requirements.

List of specialist positions: Head of Capital Construction Department, Head of Production (Technical, Production-Technical) Department, Site (Workshop) Head, Head of Material and Technical Supply Department, Head of Occupational Health and Safety Department, Head of Normative Research Labor Laboratory, Head of Tool Department, Head of Production Laboratory (Production Control), Head of Quality Control Department, Head of Bridge Testing Laboratory, Bridge Master, Tunnel Master, Construction Master, Work Foreman, Industrial Training Master, Foreman for Current Maintenance and Repair of Artificial Structures, Inspector of Artificial Structures, Project Manager, Project Manager, Lead Engineer, Design Engineer, Process Engineer (Process Engineer), Repair Engineer, Engineer for Inventory of Buildings and Structures, Metrology Engineer, Labor Organization Engineer, Labor Standards Engineer, Occupational Health and Safety Engineer, Environmental Protection Engineer (Ecologist), Laboratory Engineer, Engineer, Chief Specialist, Leading Specialist, Specialist, Design Technician, Site Technician, Process Technician, Technician for Inventory of Buildings and Structures, Technician in metrology, labor technician, technician, laboratory technician, laboratory assistant.

Professional certificates received upon completion of training: Repairman of artificial structures, cladding worker.

Requirements for previous level of education: general secondary, technical and vocational, post-secondary, higher education (bachelor's degree).

During the training process, students undergo various types of professional practice:

- educational;
- production;
- production (pre-graduation).

Educational practice (geodetic)

The internship program is designed to familiarize undergraduate students with areas of professional activity and training profiles, as well as skills in geodetic surveying, forward and reverse traverse, leveling, referencing to benchmarks, setting out points and elevation marks from a map, and solving typical engineering and geodetic problems. The program also includes a field trip to the department's branch office at Saulet SKB LLC. Assessment is based on a report defense.

Industrial practice 1.

The main objectives of the industrial internship are to reinforce theoretical knowledge and practical skills in the chosen educational program in a production setting, gain organizational experience, obtain a trade specialty, and develop practical skills and competencies while completing the bachelor's degree program. The internship is conducted at the internship centers of the companies assigned to the educational program. The assessment is based on a report defense.

Pre-graduation/industrial practice 2.

The purpose of the internship for bachelor's students is to ensure a connection between the theoretical knowledge acquired in the chosen educational program and practical work. The objectives of this internship are to consolidate and deepen the theoretical knowledge acquired by students during their studies, gather information for their final thesis, study best practices at the enterprise, and gain experience in independent research and mastery of various research methods. It is conducted at the internship bases at the enterprises according to this educational program. The assessment method is a report defense.

Final certification

The objectives of the thesis are to assess the bachelor's degree program content, evaluate their readiness for independent work within the program, and consolidate and deepen their practical skills. A comprehensive exam is also included.