JSC "ALT University named after Mukhamedzhan Tynyshpaev"

APPROVED
by the decision of the
ALT Academic Council from
«27» 03 2025y. (Protocol No. 8)
President - Rector
M.S. Zharmagambetova

EDUCATIONAL PROGRAM

Name of the educational program: 7M07169 Transport Infrastructure Engineering (specialized 1 year)
Level of preparation: Master's degree

Field of study: 7M071 Engineering and Engineering

Educational program group: M210 Main networks and infrastructure

Date of registration in the Register: 30. 06. 25

Registrationnumber: 7M07100478

Almaty, 2025

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1. INFORMATION ON THE REVIEW, APPROVAI,AND ENDORSEMENT OF THE PROGRAM, AS WELL AS ON THE DEVEIOPERS,EXPERTS,AND REVIEWERS

1 DEVELOPED BY:

Candidate of Technical Sciences, Associate Professor _____ Alimkulov M.M.
position Signature

Candidate of Technical Sciences, Associate Professor _____ Bikhozhayeva G.S.
position Signature

Doctor of Technical Sciences, Professor _____ Makhmetova N.M.
position Signature

Doctor of Technical Sciences, Associate Professor _____ Ismagulova S.O.
position Signature

Master of Technical Sciences, Senior Lecturer _____ Imankulova A.S.
position Signature

Master's Student of Group MN-ITI-25-1 _____ Tokusheva A.D.
position Signature

2. EXPERTS

Candidate of Technical Sciences, Associate Professor,
School of Transport Engineering and Logistics,
Satbayev University _____ Zholdassova K.K.
position Signature

Head of the Branch of JSC "NC "KTZ" –
"Almaty Division of the Main Network" –
"Almaty Track Distance" _____ Asanov Zh.Ye.
position Signature

3. REVIEWERS

Chief Engineer of the Branch of JSC "NC "KTZ" –
"Almaty Division of the Main Network" –
"Almaty Track Distance" _____ Abdullayev D.Kh.
position Signature

LLP "GEO TRACK" _____ Nusupov D.K.
position Signature

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" 022025 _____ *AbdreshovSh.A.*

Meeting of the EMS "ALT University named after M. Tynyshpayev" 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

UPDATEDMay 23, 2025

2. REGULATORY REFERENCES

The educational program was developed on the basis of the following regulatory legal acts and professional standards:

1. Law of the Republic of Kazakhstan "On Education" dated July 27, 2007 No. 319-III (as amended and supplemented as of March 27, 2023).
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 field 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 dated November 27, 2019, No. 3.
4. State Compulsory Standard of Higher Education (Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated February 20, 2023 No. 66).
5. 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.
6. Rules for organizing the educational process using credit technology for education in higher and (or) postgraduate education institutions, approved by Order of the Minister of Education and Science of the Republic of Kazakhstan No. 152 of April 20, 2011 (with additions and amendments dated April 4, 2023 No. 145).
7. Classifier of areas of training for personnel with higher postgraduate education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan dated October 13, 2018 No. 569 (with amendments and additions as of June 5, 2020).
8. The algorithm for the inclusion and exclusion of educational programs in the Register of educational programs of higher and postgraduate education, approved by the Order of the Minister of Education and Science of the Republic of Kazakhstan dated December 4, 2018 No. 665 (with additions and amendments as of December 23, 2020 No. 536).
9. RI-ALT-33 "Regulations on the procedure for developing an educational program for higher and postgraduate education."
10. Atlas of New Professions: "Highway Hybridizer"

Educationalprogrampassport

No.	Field name	Note
1	Registrationnumber	7M07100478
2	Area code and classification education	7M07 Engineering, processing And Construction industries
3	Code and classification Areas of training	7M071 Engineering and Engineering
4	Code and group of educational programs	M210 Mainline Networks and Infrastructure
5	Name educational programs	7M07169 Transport Infrastructure Engineering (specialized 1 year)
6	Type of OP	New
7	The purpose of the OP	Training highly qualified specialists for the design, analysis, and operation of transport facilities using modern engineering methods, artificial intelligence, and digitalization technologies, focused on the safety, reliability, and sustainable development of transport systems.
8	ISCED level	7
9	NQF level	7
10	Level according to the ORK	7
11	Distinctive features of the OP	No
	Partner University (SOP)	-
	Partner university (DDOP)	-
12	Form ofstudy	Full-time
13	Language ofinstruction	Kazakh, Russian
14	Volumeofloans	60
15	Awarded academicdegre e	Master's degree techniques And technologies By educational program M07162-Transport infrastructure engineering
16	Availability of an appendix to the license direction preparation frames	No. KZ87LAA00036465 № 004 7M071 Engineering and Engineering
17	Availability of accreditation of the educational institution	Thereis
	Name Accreditationbody	Independent agency By provisionquality assurance in education (IQAA)
	Validityofaccreditation	

4. COMPETENCE MODEL OF A GRADUATE

Objectives of the educational program:

1. Promoting the development of graduates' ability to:

1) demonstrate developmental knowledge and understanding, acquired at higher education level, which provide the basis or opportunity for original development or application of ideas;

2) apply knowledge, understanding, and problem-solving abilities to new or unfamiliar situations in the contexts and frameworks of broader (or interdisciplinary) areas related to the area of study;

3) integrate knowledge, cope with complexity, and make judgments based on incomplete or limited information, taking into account ethical and social responsibility for the application of that judgment and knowledge;

4) clearly and concisely communicate your findings and knowledge and their rationale to specialists and non-specialists;

2. Assistance in developing graduates' readiness:

1) develop design and engineering documentation for the creation and modernization of railways, highways, transport and oil and gas facilities;

2) carry out design and calculation work for the creation and modernization of the transport complex of the Republic of Kazakhstan;

3) develop technical documentation and methodological materials, proposals and activities for the creation and modernization of the transport complex.

4) Conduct technical and economic analysis, comprehensive justification of decisions taken and implemented in the field of operation and repair of railways, bridges, tunnels and subways.

5) apply the results in practice, strive for self-development, improve your qualifications and skills.

6) to the economical and safe use of natural resources, energy and materials in the operation and repair of railways, bridges, tunnels and subways

Learning outcomes:

PO1 - Apply finite element methods and artificial intelligence technologies to analyze and model transport infrastructure in order to develop operational solutions, assess the technical condition of facilities, and justify engineering solutions in the field of their design and maintenance.

PO2 - Analyze the design features of transport infrastructure facilities and the characteristics of managerial behavior in a professional environment to make effective decisions in design, organization of operation, and management of teams in the transport industry.

PO3 - Organize the maintenance and repair of transport infrastructure facilities using lean manufacturing principles and environmentally sustainable technologies to optimize operational processes, reduce losses, improve system reliability, and efficiently use resources.

PO4 - Monitor the technical condition of transport infrastructure facilities, taking into account management methods, green economy and sustainable entrepreneurship to ensure reliable operation, efficient use of resources and informed management decisions.

PO5 – Use a professionally oriented foreign language to implement SMART technologies and conduct diagnostics of transport infrastructure facilities in order to improve the accuracy of their condition assessment, management efficiency, and integration of modern digital solutions.

Field of professional activity:areas of science and technology related to railway transport and transport infrastructure engineering

Objects of professional activity:

- Local executive authorities in the field of railway transport and transport infrastructure engineering and their regional structures;

Transport and subways, as well as industrial transport;

- Organizations and enterprises of the transport industry in the field of management, operation, technical maintenance of railways, urban rail transport - Organizations and enterprises of the transport industry in the field of technologies of material-processing production during technical maintenance, urban rail transport, subways and industrial transport;

Typesofprofessionalactivity:

- productionandtechnological;
- organizationalandmanagerial;
- experimentalresearch;
- calculationanddesign.

Functionsofprofessionalactivity:

1) managerial activity, suggesting Creation strategiesfunctioning and development of industry structures, organization of conditions;
2) preparation and modernization of infrastructure facilities, main networks and control systems.
3) analysis And production decisions By improvement technologicalprocesses, development of new approaches, use of various methods;
4) solving research and design problems related to increasing the efficiency of managed processes.

List ofspecialistpositions:

- the first head of a production organization (enterprise),
- deputy head of a production organization (enterprise),
- chief engineer of a production organization (enterprise),
- supervisor structural divisions production organizations (enterprises),
- deputy manager structural divisions productionorganizations (enterprises),
- manager, engineering and technical worker, laboratory manager. Professional certificates received upon completion of training: none.

Professional certificates received upon completion of training: not provided

Requirements for previous level of education: Higher education (bachelor's degree).

The educational program of the specialized master's degree includes one type of practical training:

- Industrial practice

Experimental research work of a master's student (EIRM)

The weekly scheduling of the EIRM is determined based on the master's student's standard work time during the week. The number of credits allocated for completing the EIRM in a specific academic period is determined by the professional educational program's curriculum.

EIRM must:

1) correspond to the profile of the master's degree program in which the master's project is being completed and defended;

2) be based on modern achievements of science, technology and production and contain specific practical recommendations, independent solutions to management problems;

3) be carried out using advanced information technologies;

4) contain experimental research (methodological, practical) sections on the main protected provisions.

Within the framework of the EIRM, the individual work plan for a master's student to become familiar with innovative technologies and new types of production provides for mandatory completion of a scientific internship in scientific organizations and (or) organizations in the relevant industries or fields of activity.

EIRM is planned in parallel with other types of educational work or in a separate period.

The results of the experimental research work at the end of each period of its completion are presented by the graduate student in the form of a report.

The final result of the EIRM is a master's project.

The purpose of EIRM is to obtain new results that are important for theory and practice in a given subject area, as well as to master theoretical and experimental methods for studying objects (processes, effects, phenomena, structures, projects) in a given subject area.

The objectives of EIRM are:

- organizing training for master's students in the theory and practice of conducting experimental research work;
- development of creative thinking and independence in graduate students, deepening and consolidating the acquired theoretical and practical knowledge;
- identifying the most gifted and talented graduate students, using their creative and intellectual potential to solve current problems in science and technology;
- developing the student's interest in scientific creativity, teaching them methods and ways to independently solve applied problems.

Research internshipis carried out with the aim of:

- completion of the tasks of the master's thesis;
- familiarization with innovative and technologically advanced technologies and production methods;
- familiarization with the latest theoretical, methodological and technological achievements of domestic and foreign science;
- familiarization with modern methods of scientific research, processing and interpretation of experimental data;

consolidation of theoretical knowledge obtained during the training process, acquisition of practical skills, competencies and experience of professional activity in the studied specialty, as well as mastering advanced foreign experience.

Requirementsfor EIRM:

1) corresponds to the profile of the master's degree program in which the master's project is carried out and defended;

2) is based on modern achievements of science, technology and production and contains specific practical recommendations, independent solutions to management problems;

3) is carried out using advanced information technologies;

4) contains experimental research (methodological, practical) sections on the main protected provisions.

The department where the master's program is implemented determines special requirements for the preparation of the master's student in the research part of the program.

Special requirementsinclude:

- knowledge of contemporary issues related to this subject;
- the presence of specific knowledge on the scientific problem studied by the master's student;
- the ability to practically carry out scientific research and experimental work in a particular scientific field related to the master's program (master's project);

ability to work with specific software products and specific Internet resources.

Scientific supervisors are obliged to ensure high-quality organization of the EIRM and its methodological formulation.

The main thing contents EIRM reflected V
individual plan work of a master's student.

Contents of EIRM

Experimental research work at the department can be carried out in the following forms:

- fulfillment of the assignments of the scientific supervisor in accordance with the approved plan of experimental research work;
- participation in scientific and practical seminars, theoretical seminars (on the topic of research), as well as in the scientific work of the department;
- speaking at conferences for young scientists;
- preparation and publication of abstracts of reports and scientific articles;
- preparation and defense of scientific reports in areas of ongoing scientific research;
- participation in a real research project carried out at the department within the framework of budgetary and extra-budgetary research programs (or within the framework of a received grant), or in a partner organization for the implementation of master's degree training;
- preparation and defense of a master's thesis.

The list of forms of experimental research work at the department for master's degree students in specialized education can be specified and supplemented, depending on the specifics of the master's program.

EIRM results

In addition to the above forms, the result of experimental research work is:

In thefirstsemester:

- the project topic approved by the Academic Council of the Academy;
- a developed and approved individual work plan for the master's student, indicating the main activities and deadlines for their implementation;
- definition of goals, objectives, scope, and subject of research;

inthesecondsemester:

- study and collection of practical material for the master's project, including the development of a methodology for collecting data, methods for processing results, and an assessment of their reliability;

- completion of at least 50% of the volume of theoretical and experimental work on the research topic;

- implementation of other activities provided for by the individual work plan of the master's student;

inthethirdsemester:

- processing and analysis of factual material for the master's project, including an assessment of its sufficiency for completing the project, development and construction of graphic images and other illustrations on the research topic;

- completion of 100% of the theoretical and experimental work on the research topic;

- publication of at least 1 publication and/or 1 presentation at a scientific and practical conference;

- implementation of other activities provided for by the individual work plan of the master's student;

- passing the semester certification based on the results of the EIRM;

- preparation of the final text of the master's thesis.

Final certification of a master's studentis carried out in the form of writing and defending a master's thesis.

The purpose of the final certification of a master's studentis an assessment of the master's degree student's profile level, developed professional and managerial competencies, readiness to independently perform professional tasks and compliance of his/her training with the requirements of the master's degree educational program.

Students who have completed the educational process in accordance with the requirements of the educational program, the working curriculum and working curricula, and who have also passed a preliminary defense (extended meeting) based on the results of their dissertation research are admitted to the final certification.

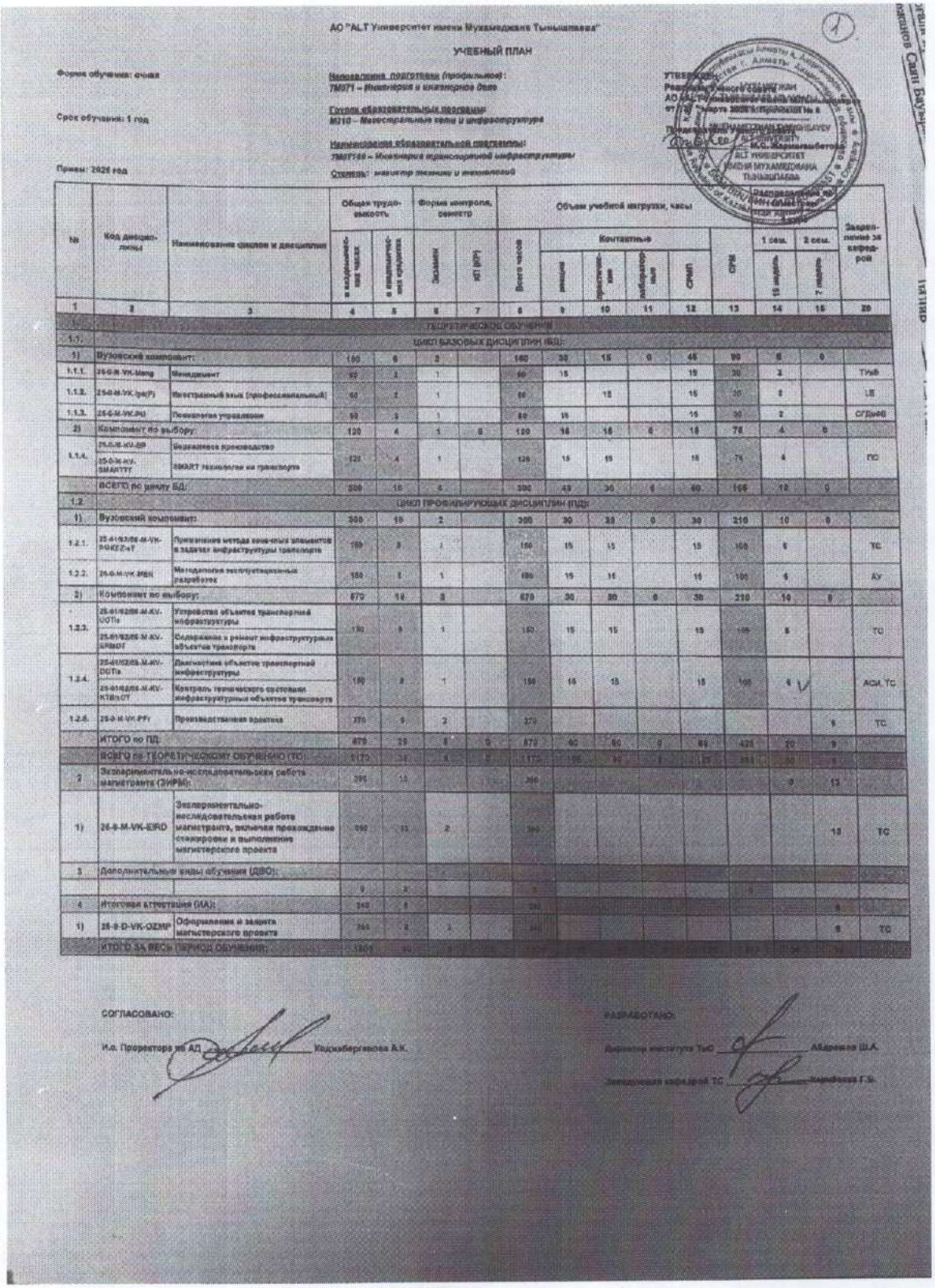
5. MATRIX OF CORRELATION OF LEARNING RESULTS IN EDUCATIONAL PROGRAM WITH ACADEMIC DISCIPLINES/MODULES

No.	Name ofthediscipline	Number ofcredits	Results correlation matrix training according to an educational program with academic disciplines					
			EO1	EO 2	EO 3	EO 4	EO 5	EO 6
1	2	3	4	5	6	7	8	9
1	Management	2	+					
2	Foreign language (professional)	2		+				
3	Psychologyof Management	2	+					
4	Leanmanufacturing	4	+					
5	Smart technologiesintransport	4	+					
6	Application of the finite element method in problems Transport infrastructure	5					+	
7	Methodologyofoperationaldevelopment	5		+			+	
8	Diagnostics of transport infrastructure facilities	5						+
9	Technical control Conditions of transport infrastructure facilities							+
10	Arrangement of objects Transport infrastructure	5		+				
11	Maintenance and repair Transport infrastructure facilities			+				
12	Industrial practice	9				+		+
13	Experimental research Work of a master's student including an internship and completion of a master's thesis dissertations	13	+					+
14	Registration and protection Master's thesis	8	+	+	+	+	+	+

6. STRUCTURE OF THE EDUCATIONAL PROGRAM OF THE MASTER'S DEGREE IN THE SPECIALIZED AREA

No.	Name of the discipline cycles	Total laborintensity	
		inacademic hours	V academiccredits
1.	Theoreticaltraining	1170	39
1.1	**Cycle of basic disciplines (BD)**	**300**	**10**
1)	University component (UC):	300	10
	Management	60	2
	Foreign language (professional)	60	2
	Psychologyof Management	60	2
2)	ComponentofChoice (COC)	270	9
1.2	**Cycle of core disciplines (CD)**	**1470**	**49**
1)	University component	300	10
2)	Componentofchoice	570	19
2.	**Experimentalresearchgraduatestudent's work**		
1)	Experimental research work of a master's student, including an internship and the completion of a master's thesis dissertations	390	13
3	**Additional types of education (ATE)**	-	-
4	**Final assessment (FA)**	**240**	**8**
1)	Preparation and defense of a master's thesis Dissertations (OiZMD)	240	8
	Total	**1800**	**60**

7. WORKING CURRICULUM FOR THE ENTIRE PERIOD OF TRAINING



АО "ALT Университет имени Мухамеджана Тынышпаева"

УЧЕБНЫЙ ПЛАН

Форма обучения: очная

Срок обучения: 1 год

Наименование ОП: (профильное):
7М071 – Инженерия и инженерное дело

Группа образовательных программ:
М110 – Транспортные услуги и инфраструктура

Наименование образовательной программы:
7М07166 – Инженерия транспортной инфраструктуры

Степень: магистр техники и технологий

Прием: 2026 год

№	Код дисциплины	Наименование циклов и дисциплин	Общая трудоемкость		Форма контроля, семестр		Объем учебной нагрузки, часы								Закрепление за кафедрой
			в академических часах	в кредитах (единицах)	Экзамен	КП (КР)	Всего часов	Контактные				СРМ	1 сем.	2 сем.	
								лекции	практические	лабораторные	СРМП		15 недель	7 недель	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	20
1.1.		ТЕОРЕТИЧЕСКОЕ ОБУЧЕНИЕ													
1.1.1.		ЦИКЛ БАЗОВЫХ ДИСЦИПЛИН (БД):													
1)	Вузовский компонент:		180	6	2		180	30	15	0	45	90	6	0	
1.1.1.	25-0-M-VK-Meng	Менеджмент	90	3	1		90	15			15	30	3		ТиМ
1.1.2.	25-0-M-VK-Ipr(P)	Иностранный язык (профессиональный)	90	3	1		90		15		15	30	3		ИЯ
1.1.3.	25-0-M-VK-PU	Психология управления	90	3	1		90	15			15	30	2		СПиК
2)	Компонент по выбору:		120	4	1	0	120	15	15	0	15	75	4	0	
1.1.4.	25-0-M-VU-BP	Цифровое производство	120	4	1		120	15	15		15	75	4		ПО
	25-0-M-KV-SMARTIT	SMART технологии на транспорте													
	ВСЕГО по циклу БД:		300	10	3		300	45	30	0	60	165	10	0	
1.2		ЦИКЛ ПРОФИЛИРУЮЩИХ ДИСЦИПЛИН (ПД):													
1)	Вузовский компонент:		300	10	2		300	30	30	0	30	210	10	0	
1.2.1.	25-01/02/05-M-VK-PrKEZ+T	Применение метода конечных элементов в задачах инфраструктуры транспорта	150	5	1		150	15	15		15	105	5		ТС
1.2.2.	25-0-M-VK-MBN	Методология эксплуатационных разработок	150	5	1		150	15	15		15	105	5		АУ
2)	Компонент по выбору:		870	18	3		870	30	30	0	30	210	10	0	
1.2.3.	25-01/02/05-M-KV-UOTIs	Устройство объектов транспортной инфраструктуры	150	5	1		150	15	15		15	105	5		ТС
	25-01/02/05-M-KV-EPMOT	Содержание и ремонт инфраструктурных объектов транспорта													
1.2.4.	25-01/02/05-M-KV-DOTIs	Диагностика объектов транспортной инфраструктуры	150	5	1		150	15	15		15	105	5		АСИ, ТС
	25-01/02/05-M-KV-KTSbOT	Контроль технического состояния инфраструктурных объектов транспорта													
1.2.5.	25-0-M-VK-PPr	Производственная практика	270	9	2		270							9	ТС
	ИТОГО по ПД:		870	29	6	0	870	60	60	0	60	420	20	9	
	ВСЕГО по ТЕОРЕТИЧЕСКОМУ ОБУЧЕНИЮ (ТО):		1170	39	9	0	1170	105	90	0	120	585	30	9	
2	Экспериментально-исследовательская работа магистранта (ЭИРМ):		390	13			390						0	13	
1)	25-0-M-VK-EIRD	Экспериментально-исследовательская работа магистранта, включая прохождение стажировки и выполнение магистерского проекта	390	13	2		390							13	ТС
3	Дополнительные виды обучения (ДВО):														
			0	0			0						0		
4	Итоговая аттестация (ИА):		240	8			240							8	
1)	25-0-D-VK-OZMP	Оформление и защита магистерского проекта	240	8	1		240							8	ТС
	ИТОГО ЗА ВЕСЬ ПЕРИОД ОБУЧЕНИЯ:		1800	60	10		1800	105	90	0	120	585	30	30	

СОГЛАСОВАНО:

И.о. Проректора по АД _____ Коджабергенова А.К.

РАЗРАБОТАНО:

Директор института ТиС _____ Абдрахов Ш.А.

Заведующая кафедрой ТС _____ Карабаева Г.Б.

8. CATALOGUE OF DISCIPLINES OF THE UNIVERSITY COMPONENT

CATALOGUE OF DISCIPLINES OF THE UNIVERSITY COMPONENT

EDUCATIONAL PROGRAM 7M07169 – Transport Infrastructure Engineering (specialized)

Education level: Master's degree **Duration of study: 1 year** **Year of admission: 2025 years**

Cycle	Component	Name ofthediscipline	General laborintensity		Semestr	Learning outcomes	Brief description of the discipline	Prerequisites	Postrequizity
			academichours	academiccredits					
1	2	3	4	5	6	7	8	9	10
BD	VK	Management	60	2	1	EO1	Develops knowledge about the organization as an object of management, examines situational and process approaches to management, engineering and reengineering of business processes, explores theories and practices of management, examines the role functions of the manager and subordinates, studies methods of planning management strategy, motivating performers to high-performance work, organizing effective control, etc., provides practical skills in developing a management style and tactics for making management decisions.	Basic school knowledge of mathematics	Basic and core disciplines of doctoral studies
BD	VK	Foreign language (professional)	60	2	1	EO2	Mastery of professional English at an advanced level (for non-linguistic fields), grammatical characteristics of scientific style in its oral and written forms, professional oral communication in monologue and dialogic forms according to the educational program, as well as the ability to present research results in the form of reports, essays, publications, and public discussions; interpret and present the results of scientific research in a foreign language.	Basic school knowledge of a foreign language	Basic and core disciplines of doctoral studies
BD	VK	Psychologyof Management	60	2	1	EO1	The course is aimed at studying the theoretical and methodological foundations of management psychology, the main socio-psychological problems of management and ways of solving them, familiarization with methods of studying important socio-psychological characteristics of the individual and the team, professional, interpersonal and intrapersonal problems by means of management psychology.	Basic knowledge of a bachelor's degree	

									master's degree
PD	VK	Applicationfinite element method in tasks transport infrastructure	150	5	1	EO5	Studies the theoretical foundations of constructing computational finite element models of transport infrastructure using the fundamental principles of the theory of elasticity, plasticity, mechanics of deformable solids and numerical analysis, the basic techniques for constructing matrices of elements, algorithms for solving stationary, dynamic and physically nonlinear problems in order to develop competencies in the field of applying finite element analysis for modeling	Basic and specialized disciplines of the bachelor's degree	Basic and core disciplines of doctoral studies
PD	VK	Methodologyofoperationaldevelopment	150	5	1	EO2,5	This course focuses on the principles, methods, and technologies for maintaining, optimizing, and upgrading radio, electronic, and telecommunications systems during their operational phase. It addresses issues of reliability, sustainability, and efficiency of operating communication systems, as well as maintenance, diagnostics, and equipment lifecycle management. Particular attention is paid to performance evaluation methods, the implementation of automated monitoring systems, and modern approaches to technical support for telecommunications infrastructure.	Basic and specialized disciplines of the bachelor's degree	Basic and core disciplines of doctoral studies
PD	VK	Industrial practice	210	7	3	EO4, 6	Consolidation of theoretical knowledge acquired during the training process; acquisition of skills in the practical use of professional knowledge acquired during the period of theoretical training; training in the skills of solving practical and managerial problems; familiarization with the specifics of the professional activity of a bachelor in a specific industry; formation of a professional position specialist, style of behavior, mastering professional ethics.	Diagnosticia nand transport facilities infrastructure tours	Experim ental no-researche r skayawo rkmaster 's degree
PD	VK	Experimental-researcher-Master's student's thesis	540	18	1,2,3	EO4, 5,6,	Formed professional and managerial competencies, readiness to independently perform professional tasks and compliance of his/her training with the requirements of the Master's degree program	The arrangement of transport facilities infrastructure tours	Experim ental no-researche r skaya work master's degree

PD	VK	FINAL CERTIFICATION	241	8	3	E O4,5 ,6	The objectives of the thesis are to assess the bachelor's degree in mastering the curriculum, to assess their readiness for independent work within the curriculum, and to consolidate and deepen their practical skills. A comprehensiveexaminationisalsoincluded.	Technical controlstate of infrastructure transport facilities	Experim ental no-researche r skayawo rkmaster - welt
Total			**840**		**28**				

CATALOGUE OF DISCIPLINES OF OPTIONAL COMPONENTS

EDUCATIONAL PROGRAM 7M07169 – Transport Infrastructure Engineering (specialized)

Education level: **Master's degree** **Duration of study: 1 year Admission year: 2025G.**

Cycle	Component	Name ofthediscipline	Total laborintensity		Semester	Learning outcomes	Brief description of the discipline	Prerequisites	Postrequisites
			academichours	academiccredits					
1	2	3	4	5	6	7	8	9	10
BD	KV	Leanmanufacturing	120	4	1	EO 1	Students master methods for minimizing losses and increasing production efficiency. They develop management competencies in process analysis, decision-making, and the implementation of lean approaches. They develop the ability to develop productivity improvement projects based on the rational use of resources. They study the principles of lean thinking, which focuses on sustainable development, automation, and improvement at all levels of production and management activities.	Basic and specialized disciplines of the bachelor's degree	Basic and core disciplines of doctoral studies
		Smart technologiesin transport				EO 1	This course explores intelligent technologies for digital monitoring, automation, and management of transport infrastructure facilities using modern IT solutions. It develops competencies in the application of the Internet of Things, predictive analytics, artificial intelligence systems, and digital twins to improve operational safety, reliability, and efficiency. Students master methods for building smart systems, digital modeling, data analysis, and forecasting to ensure sustainable transport development.	Basic and specialized disciplines of the bachelor's degree	Basic and core disciplines of doctoral studies
PD	KV	Construction of transport infrastructure facilities	150	5	1	EO 2	The study of modern methods, techniques and technical means of mechanization, mechanisation and automation for the development of technological processes for complex systems and individual types of work on the current maintenance and repair of transport infrastructure facilities, taking into account their technical, technological and operational characteristics and the feasibility study of capital investments and operating costs.	Basic and specialized disciplines of the bachelor's degree	Basic and core disciplines of doctoral studies
		Maintenance and repair of				EO 2	Study of public and strategic service transport infrastructure facilities by type of transport depending on	Basic and specialized	Basic and core disciplines of

		transport infrastructure facilities					various target functional purposes, classifications, types, technical and operational parameters, design and technical and economic solutions, design methods and calculations of transport structures under various force impacts, taking into account their regional physical-geographical and natural-climatic location.	disciplines of the bachelor's degree	doctoral studies
PD	KV	Diagnostics of transport infrastructure facilities	150	5	1	EO 5	Studies the logical correspondence between various requirements of regulatory literature in the diagnostics of transport infrastructure facilities (calculation of load-bearing capacity, load and impact, bearing capacity, deformations and displacements, technical and economic indicators, development of survey and testing programs, proposals and measures for effective and safe diagnostic methods) in order to make the most optimal decisions on assessing their technical condition.	Basic and specialized disciplines of the bachelor's degree	Basic and core disciplines of doctoral studies
		Monitoring the technical condition of transport infrastructure facilities				EO 5	Studies the fundamentals of analyzing the technical condition of transport infrastructure facilities based on the results of surveys, the development of methodological materials, proposals and activities for effective and safe methods of surveying and testing transport infrastructure facilities, fundamental methods and techniques for surveying and testing artificial structures necessary for solving practical problems in assessing their technical condition	Basic and specialized disciplines of the bachelor's degree	Basic and core disciplines of doctoral studies

EXPERT CONCLUSION

on the Professional Master's Degree Program
7M07169 – "Transportation Infrastructure Engineering"
Object of Evaluation:
Educational Program – 7M07169 "Transportation Infrastructure Engineering"
Educational Level: Professional Master's Degree, duration – 1 year
Expert Opinion:

As a researcher in the field of engineering, sustainable development, and digitalization of infrastructure systems, I note that this educational program possesses a number of key advantages, making it a modern and significant tool for engineering education in the context of rapid technological change.

1. Review of the Scientific and Educational Concept:

The program is structured at the intersection of engineering, digital, and management disciplines, making it interdisciplinary and focused on developing systems thinking among students. This approach is especially relevant in the era of smart and sustainable infrastructure, where traditional engineering methods are complemented by IT competencies, data analysis, and automation.

2. Innovative Orientation:

The program emphasizes the following areas:
Intelligent Transport Systems (ITS);
Digital modeling and BIM technologies;
Sustainable development and eco-design of transport infrastructure;
Big data analytics and spatial modeling;
Integration of geoinformation platforms.

This enables students not only to master applied tools but also to work with innovative methods, forming future-oriented competencies required in research and engineering centers.

3. Opportunities for Scientific Growth:

Despite the short duration of study, the program provides opportunities for participation in research projects, applied developments, and preparation of scientific publications. With proper organization of research activities and collaboration with external partners (research institutes, industry companies), graduates can become potential candidates for doctoral studies or research engineers in laboratories.

4. Relevance to Modern Challenges:

Transport infrastructure is influenced by global trends such as climate resilience, digitalization, and the transition to smart mobility. The program 7M07169 demonstrates a clear understanding of these challenges and offers practical responses through its modules and project-based learning.

General Remarks and Recommendations:

It is advisable to expand networking and cooperation with research institutions to strengthen the scientific component.

The introduction of elective courses focused on research methods and modeling in infrastructure engineering would be beneficial.

Encouraging English-language publication activity among students will enhance the program's scientific potential.

Conclusion:

The educational program 7M07169 – "Transportation Infrastructure Engineering" aligns with current scientific and educational trends, possesses high innovative potential, and can effectively contribute to training a new generation of research-oriented engineers.

The program is recommended for implementation.

Associate Professor, Department of "SiSM"
Satbayev University **Zholdassova K.K.**

"20" 02 2025 y.

EXPERT CONCLUSION

on the Professional Master's Degree Program

7M07169 – "Transportation Infrastructure Engineering" (duration of study – 1 year)

General Characteristics of the Program:

The professional master's program 7M07169 – "Transportation Infrastructure Engineering" is an intensive one-year training course aimed at practice-oriented education of specialists in the field of transport engineering. The program focuses on developing modern engineering competencies necessary for effective design, operation, and management of transport infrastructure.

Program Objectives and Tasks:

The main objective of the program is to train practice-oriented specialists capable of applying modern engineering solutions in the transport sector, ensuring the sustainable development of infrastructure facilities, and effectively using digital technologies in the management of transport systems.

The program tasks include:

developing applied skills in transport infrastructure design and analysis;

mastering modern methods of digital modeling and engineering calculations;

developing skills for integrating geoinformation technologies and intelligent systems into infrastructure processes;

preparing graduates to work in conditions of digital transformation of the industry.

Relevance:

With the dynamic development of the transport system and the digitalization of infrastructure, there is an increasing demand for engineers with strong practical skills and the ability to adapt quickly to modern challenges. The program 7M07169 meets these requirements by preparing specialists in high demand both nationally and internationally.

Structure and Content of the Program:

The program includes courses aimed at developing applied and analytical competencies:

Intelligent Transport Systems (ITS);

Geoinformation Technologies in Engineering;

Sustainable Development of Transport Infrastructure;

Digital Modeling and Data Analysis;

Modern Construction Technologies in Infrastructure Projects;

Management and Legal Aspects in the Transport Sector.

The final stage of the program is the completion of a project (master's) work focused on solving a specific engineering problem or analyzing a real-life case from professional practice.

Staffing and Resource Support:

The educational process is provided by highly qualified faculty members with practical industry experience and scientific publications in transport engineering. The program is implemented using a modern material and technical base, including laboratories, specialized software, and access to professional databases.

Conclusion:

The professional master's degree program 7M07169 – "Transportation Infrastructure Engineering" is relevant, practice-oriented, and meets modern requirements for the training of engineering personnel. The program provides a sufficient level of professional preparation within a short period (1 year), enhances the qualification of specialists, and meets the needs of the transport sector.

Recommended for implementation.

Head of the Branch of JSC "NC "KTZ" –
"Almaty Division of the Main Network" –
"Almaty Track Distance" **Asanov Zh.Ye.**

20.02.25y

КАДРЛАР БӨЛІМІ
ОТДЕЛ КАДРОВ

REVIEW

of the Professional Master's Program 7M07169 – "Transportation Infrastructure Engineering" (duration of study – 1 year)

I, Abdullayev D.Kh., Chief Engineer of the Branch of JSC "NC "KTZ" – "Almaty Division of the Main Network" – "Almaty Track Distance", have reviewed the content of the professional master's program 7M07169 – "Transportation Infrastructure Engineering" and consider it relevant and in high demand in the context of the development of modern transport systems.

The program reflects the real needs of industrial practice and is aimed at training specialists capable of immediately engaging in design, construction, and operational activities.

It is especially important that the program emphasizes:

the use of digital technologies in the design and modeling of transport infrastructure;

the application of geoinformation systems and intelligent transport solutions;

the implementation of sustainable and energy-efficient approaches in infrastructure projects.

From the employer's perspective, graduates of this program will possess the practical knowledge and skills required in such areas as:

construction and reconstruction of roads and engineering structures;

operation of transport facilities;

technical supervision, expertise, and project support.

I also positively assess the inclusion of courses on legal regulation, project management, and digital data analysis — these competencies are particularly valuable in modern engineering teams.

Conclusion:

The educational program 7M07169 meets the needs of the transport industry and can be recommended for the training of engineering personnel for transport-sector enterprises.

Reviewer:
Chief Engineer of the Branch of JSC "NC "KTZ" –
"Almaty Division of the Main Network" –
"Almaty Track Distance" **Abdullayev D.Kh.**

КАДРЛАР БӨЛІМІ
ОТДЕЛ КАДРОВ

14.04.25 ж.

REVIEW

Limited Liability Partnership "GEO TRACK"

Director: D.K. Nusupov

Educational program: 7M07169 – "Engineering of Transport Infrastructure"

Level of training: Specialized Master's program

Duration of study: 1 year

Field of study: 7M071 – Engineering, Manufacturing and Construction Industries

The educational program "7M07169 – Engineering of Transport Infrastructure" is aimed at training professionals with advanced knowledge and practical skills in the design, construction, operation, and management of transport infrastructure facilities.

The program meets current industry standards and integrates research-oriented and applied components. The curriculum includes courses on innovative construction technologies, transport logistics, digital modeling, infrastructure system management, and project administration.

Special emphasis is placed on practical training and the development of analytical and engineering decision-making skills in real industrial environments.

CONCLUSION:

The program content fully meets the modern demands of the transport and construction sectors. It ensures the preparation of highly qualified specialists capable of contributing to the sustainable development of transport infrastructure.

It is positively evaluated and recommended for implementation.

Director: _____ **D.K. Nusupov**

LLP "GEO TRACK"

14.04.25 г.

LETTER OF RECOMMENDATION

Branch of JSC "National Company
'Kazakhstan Temir Zholy' --
'Almaty Mainline Network Branch'

JSC "ALT University
named after Mukhamedzhan Tynyshpayev"

The Almaty Mainline Network Branch of Joint Stock Company "National Company 'Kazakhstan Temir Zholy'" hereby supports and recommends for implementation the master's degree programme 7M07169 "Transport Infrastructure Engineering" developed by JSC "ALT University named after Mukhamedzhan Tynyshpayev".

Practical Orientation and Completeness of Competencies.

The programme is aimed at training master's graduates for railway transport and mainline networks. The curriculum covers the design and engineering of railway track, superstructure and subgrade, calculation of the stress–strain state of structural elements, diagnostics, repairs and the organisation of track maintenance. This content provides graduates with a full range of professional competencies required for work in track maintenance services and design and survey units.

Innovation and Digitalization.

A key feature of the programme is its focus on modern digital technologies: information modelling (BIM) of transport infrastructure, computer modelling of the stress–strain state, analysis of diagnostic data and the use of specialised engineering software. This enables graduates to confidently apply innovative solutions in the design and operation of infrastructure.

Readiness for Managerial Work.

The structure of the programme includes issues related to organising routine track maintenance and repair, planning measures to enhance reliability, and managing risks and resources. The development of skills in business communication, reporting and making technically sound decisions master's that graduates are ready to perform the functions of section heads, line engineers and specialists responsible for the operational reliability of infrastructure.

Our branch is interested in graduates of this programme, is ready to provide a base for internships and to consider the best master's students as candidates for engineering and managerial positions in our units. The master's degree programme 7M07169 "Transport Infrastructure Engineering" deserves support and further implementation.

Director of the Branch
JSC "National Company 'Kazakhstan Temir Zholy'"
Almaty Mainline Network Branch **A.T. Zheksenbiyev**

АО «ALT Университет им. МухамеджанаТынышпаева»

ПРОТОКОЛ № 6

заседания Академического комитета по образовательной программе 7М07169 Инженерия транспортной инфраструктуры (профильная 1 год), и ведущих преподавателей кафедры «Транспортное строительство»

г. Алматы «24» февраля 2025 года

Председатель: Карибаева Г.Б.

Секретарь: Кусман Б.К.

Присутствовали: члены Академического комитета, ведущие ППС кафедры

Представители с производства: Главный инженер филиала АО «НК» «КТЖ» - «Алматинское отделение Магистральной сети» - «Алматинская дистанция пути» Абдуллаев Д.Х., Директор ТОО «GeoTrack» Нусупов Д.К.

Обучающиеся: Магистрант МН-ИТИ-25-1- Токушева А.Д.

ПОВЕСТКА ДНЯ:

1. Рассмотрение и обновление образовательной программы «7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)».
2. Рассмотрение возможности включения дисциплин в Учебный план, в Каталог дисциплин вузовского компонента и в Каталог компонента по выбору для приёма 2025 года.

По первому вопросу:

СЛУШАЛИ: зав. кафедрой, Карибаеву Г.Б., которая предложила обсудить вопрос по пересмотру и обновлению образовательной программы. Компетентностная модель выпускника является составной частью образовательной программы. Предложила обсудить вопрос о включении новых дисциплин в Учебный план, в Каталог дисциплин вузовского компонента и в Каталог компонента по выбору для приёма 2025 года.

Компетентностная модель выпускника включает в себя следующие части:
Цель и задачи образовательной программы;
Результаты обучения;
Область, объекты, виды и функции профессиональной деятельности;
Перечень должностей по образовательной программе;
Профессиональные сертификаты, полученные по окончании обучения;
Требования к предшествующему уровню образования.

ВЫСТУПИЛ:

Представитель работодателей: Главный инженер филиала АО «НК «КТЖ» - «Алматинское отделение Магистральной сети» - «Алматинская дистанция пути» Абдуллаев Д.Х., с поддержкой и рекомендацией к реализации образовательной программы магистратуры. Отметила, что Компетентностная модель выпускника для рассматриваемой образовательной программы актуальна и отвечает требованиям рынка труда и предложили оставить её без изменений. Включить в Учебный план, Каталог дисциплин вузовского

компонента и Каталог компонента по выбору образовательных программ для приёма 2025 года новые дисциплины и отметили актуальность и своевременость введения дисциплин в учебный план образовательных программ.

ВЫСТУПИЛИ:

- члены Академического комитета по образовательной программе «7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)»: Махметова Н.М., Исмагулова С.О. и Токушева А.Д. которые подтвердили актуальность Компетентностной модели выпускника по рассматриваемой образовательной программе.

Было предложено оставить без изменений действующую Компетентностную модель выпускника для образовательной программы «7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)» без изменений.

ПОСТАНОВИЛИ:

1. Информацию принять к сведению.
2. Рекомендовать образовательную программу к рассмотрению на УМБ института «Транспорт и строительство».
3. После редакции предполагаемых без изменений передать Учебный план, Каталог дисциплин вузовского компонента и Каталог компонента по выбору образовательных программ приёма 2025 года для рассмотрения на заседании Учебно-методического бюро института «Транспорт и строительство».

Председатель: **Карибаева Г.Б.**

Секретарь: **Кусман Б.Қ.**

АО «ALT Университет имени Мухамеджана Тынышпаева»
Институт «Транспорт и строительство»

ПРОТОКОЛ № 8

заседания Учебно-методического бюро института «Транспорт и строительство»

г. Алматы **«17» марта 2025 года**

Председатель: Председатель Учебно-методического бюро института «Транспорт и строительство», доктор PhD Абдрешов Ш.А.

Секретарь: к.т.н., ассоциированный профессор Мурзалина Г.Б.

Присутствовали: члены Учебно-методического бюро и Академического комитета по образовательной программе магистратуры «7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)».

Представитель Работодателей: Член Академического комитета, Директор ТОО «GeoTrack» Нусупов Д.К.

Обучающийся: Член Академического комитета, Магистрант МН-ИТИ-25-1- Токушева А.Д.

ПОВЕСТКА ДНЯ:

1. Рассмотрение Рабочего учебного плана, Каталогов дисциплин вузовского компонента и компонента по выбору, Паспорта и Компетентностной модели выпускника образовательной программы магистратуры **«7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)»**.

СЛУШАЛИ: Председателя Академического комитета по образовательной программе магистратуры **«7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)» Алимкулов М..М.,** которая представила на рассмотрение Рабочий учебный план, Каталоги дисциплин вузовского компонента и компонента по выбору, Паспорта и Компетентностную модель выпускника образовательной программы магистратуры **«7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)»**, Она сообщила о том, что все замечания и предложения Работодателей были учтены в ходе совместной работы. Предлагается рекомендовать для рассмотрения и утверждения на заседаниях Учебно-методического совета и Ученого совета ALT Университета Рабочий учебный план, Каталоги дисциплин вузовского компонента и компонента по выбору, Паспорт и Компетентностью модель выпускника образовательной программы магистратуры **«7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)»**.

ВЫСТУПИЛИ: Члены Академического комитета по образовательной программе магистратуры **«7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)»**.

ПОСТАНОВИЛИ:

1. Рекомендовать для рассмотрения и утверждения на заседаниях Учебно-методического совета и Ученого совета ALT Университета Рабочий учебный план, Каталоги дисциплин вузовского компонента и компонента по выбору, Паспорт и Компетентностью модель выпускника образовательной программы магистратуры **«7М07169 Инженерия транспортной инфраструктуры (профильная 1 год)»**.

Председатель **Абдрешов Ш.А.**

Секретарь **Мурзалина Г.Б.**

14. APPROVAL SHEET

№	Full name	Place of work/study	Post	Date of approval	Signature
1	Абдулшиев	ITaho C	director	24.02.2025	[signature]
2	Talgatbinova A.	F and DTI	director	24.02.2025	[signature]
3	Musayeva G.S.	L and B	director	24.02.2025	[signature]
4	Karybaeva E.B	TC	Head of depar	24.02.2025	[signature]
5	Mukhaliyeva R.D	ALT, TUB	Head of department	24.02.2025	[signature]
6	[illegible] Y	каф. LE	и.о. зав каф	24.02.2025	[signature]
7	Abdiraiymova A.S	Head Sam H.D.	Head of the Department	24.02.2025	[signature]
8	[illegible] T.O.	АГТ [illegible] ПС	и.о. зав каф.	24.02.2025	[signature]
9	Kerymsekova N.	AC	Head of dep	24.02.2025	[signature]
10	Kalmanov K.S	A and const engin	Head of the Dep	24.02.2025	[signature]

15. LIST OF CHANGES REGISTRATION

No.	Section, paragraph of the document	Type of change (replace, cancel, add)	Numbe randda te notifications	Change made	
				Date	Last name and initials, signature, position