Attachment 1

QUALIFICATION STANDARD

Title of qualification	**WATER ENGINEERING TECHNICIAN**

BASIC CHARACTERISTICS OF QUALIFICATION	
CLASSNQFS[1]/ ISCED-F2013	0732 - Building and civil engineering
NQFS level[2]	4
EQF level[3]	4
Type of qualification	Vocational
Scope of qualification	4 years
Preconditions for the acquisition of qualification	NQFS Level 1 – primary education, primary adult education, primary ballet education and primary music education
Forms of learning	- Formal education - Recognition of prior learning.
Type of public document	- Diploma; - Testimonial of passed exams within the completed educational profile programme.

RELEVANCE OF QUALIFICATION FOR EMPLOYMENT AND CONTINUATION OF EDUCATION	
Permeability in the qualification system	NQFS 5 NQFS 6 (sublevel 6.1, sublevel 6.2) NQFS 7 (sublevel 7.1)
Occupation	3118.06 Civil engineering draughtsperson 3112.12 Water engineering technician
Occupational standard [4]	-

LEARNING OUTCOMES

[1]The system for qualification classification and codification in the NQFS, aligned with the International Standard Classification of Education ISCED 13-F.

[2]National Qualifications Framework of the Republic of Serbia (NQFS)

[3] European Qualifications Framework

[4]Until occupational standard is adopted, the relationship between the qualification standard Water Engineering Technician and the labour market is based on the occupational data determined in accordance with the regulations from the work and employment area (in line with: The Law on NQFS, art. 50), as well as the description of work from the initial proposal for qualification standard within the Initiative for the development and adoption of the qualification standard Water Engineering Technician.

General description of qualification	A water engineering technician performs technical tasks related to the construction of hydropower plants, docks and other hydraulic structures; performs works related to the construction of water supply facilities in residential areas, wastewater (sewage) collection systems, river engineering structures, land irrigation structures and facilities (land reclamation). Additionally, a water engineering technician participates in the preparation and elaboration of construction designs; in the technical and technological preparation of construction work, as well as in the preparation of construction-related documents and technical and design documentation. A water engineering technician is trained to perform different kinds of calculations required for the planning and construction of hydraulic structures, water supply systems, sewerage systems, irrigation systems, retaining walls, etc. Communicates skillfully in different contexts and does so effectively in one foreign language, thus contributing actively to fostering the culture of speech; productively applies mathematical models, technical and technological knowledge, and information and communications technology (ICT) in problem solving; efficient in learning, advances personal skills and develops personal career; actively participates in initiating and implementing projects which contribute to the community welfare and sustainable development. Actively contributes to fostering tolerance, human rights and cultural tradition and heritage within the organisation and in different social contexts; responsible towards personal health and ready to take part in the activities aimed at preserving the living and working environment. The level of general and vocational knowledge, skills, abilities and attitudes within the acquired competencies enable a water engineering technician to get employment and continue education.
Competencies	- participating in the elaboration of water engineering designs; - participating in planning, designing or managing water environment by means of hydroinformatics systems and software tools; - technical and technological preparation of construction work; - operational organisation of the work on hydraulic structures; - operational organisation of flood control work; - preparation of construction-related documents and technical and design documentation; - health protection and environmental protection; - key competences.[5]

[5] In line with *The Rulebook on General Standards of Achievement for the End of General Secondary Education and for the Part of Secondary Vocational Education Consisting of General Education Subjects* (RS Official Gazette, No 117/13).

After acquiring qualification, the person will be able to:	
Knowledge	- explain how long and cross profiles of a river are displayed; - describe the types and purpose of on-site structures and main on-site traffic routes; - specify the components and explain the procedure of water supply network dimensioning; - describe the role and components of dikes and drainage channels; - explain the method of surveying watercourses and groundwater; - explain the calculation method for stream and sediment flow in natural and regulated watercourses; - explain the role of all components of the main water control structures; - explain the method of soil water regime management by means of drainage and irrigation; - explain the method of defence against catastrophic floods; - specify water supply facilities and explain the method of water exploitation, maintenance of waterworks and repair of defects; - describe the maintenance and repair procedures related to sewerage facilities; - describe the characteristics, advantages and limitations of modern modelling techniques and the application of information technology in water management; - explain the characteristics of natural watercourse regulation works and specify their classification; - describe the characteristics of hydroelectric power system; - explain the types and main components of hydropower plants; - explain the methods of river flow regulation; - explain the method and organisation of flood control work; - describe the simulation models applied to water-based systems in a wide spectrum of hydrological situations in the environment; - explain the function of dock parts; - explain the preparation of a priced bill of quantities; - explain the method of preparation of specific construction-related documents; - specify the procedure of risk assessment, and hazardous and harmful occurrences; - describe the types of waste and explain its effects on the environment.

Skills	- calculate the required water consumption according to the types of consumers; - calculate the main supply pipe in a branch- or a ring-type network; - calculate the quantity of water drained through a sewerage system; - dimension canal networks and drain pipes; - dimension a drainage canal and the velocity of water in open canals, - draw plans of structures on canals; - dimension the pipes of an artificial rain irrigation system; - calculate the cumulative water inflow and the consumption required to balance the water inflow; - perform levelling of water and reservoirs; - calculate the loss of energy in hydropower plants; - select an optimum diameter of a tunnel; - draw a plan of the route and a long profile, and dimension a navigation channel cross-section; - calculate the depth, water area, height of land, and length of operational quay; - calculate the number of quay rail terminal wagons and tracks, number of storage wagons and tracks, gross and net storage areas; - select a wider area and a closer location, as well as the most favourable layout of the terminal; select the most favourable type of cantilever retaining wall and the most favourable types of transshipment and transshipment machinery; - efficiently apply information technology in the performance of tasks (such as: numerical simulation of water flow and related processes, collection of relevant data), as well as for record-keeping; - successfully manage the learning process, develop personal career and competencies based on personal experience and cooperation with colleagues; - communicates skillfully and effectively, thus contributing actively to fostering the culture of speech; - communicate effectively in one foreign language in both professional and non-professional contexts; - creatively and productively apply technical, technological and ICT-related knowledge, as well as mathematical models; - efficiently implement all prescribed occupational health and safety measures, environmental protection measures and fire protection measures within the scope of work of a water engineering technician; - show responsibility and productiveness while participating in the life of business organisation and social life of the community.

Abilities and attitudes	- perform the organisation tasks and works related to the construction of hydraulic structures independently, responsibly, accurately, and in an orderly manner, in accordance with the technical and technological procedures and quality standards; - recognize the social nature of the water management problems and, for that matter, of efficient expert decision-making; - organise personal work and/or the work of a smaller group of people, and is responsible for the selection of procedures and equipment for personal and/or other people's work; - efficiently plan and organise time and activities while observing deadlines; - display a positive attitude towards the importance of implementation of regulations and current standards at work, and towards professional norms and values; - display a positive attitude towards functionality and proper operation of devices and tools used for the completion of tasks; - adapt to the changes in work process; - identify problems and take part in solving thereof, as well as while performing non-standard tasks; - promote the values of cooperation in professional and living environments, and contribute to the culture of appreciation and cooperation; - display a responsible attitude towards health and environmental protection, and is willing to become involved in this field; - initiate learning and participate actively and responsibly in the lifelong learning process; - promote the concept of efficient use of energy and sustainable development.

Type of assessment of learning outcomes	Monitoring the development and progress of students in achieving outcomes and standards of achievement, as well as progress in developing competencies, is done by formative and summative assessment. The assessment is descriptive and numerical. Numerical grades are: - excellent (5), - very good (4), - good (3), - sufficient (2) and - insufficient (1). The grade 'insufficient' (1) is not a passing grade. The assessment is carried out by applying different methods and techniques (project, working tasks, etc.). Summative assessment is performed at the end of the semester, end of the school year and on the Vocational Matura.

QUALITY ASSURANCE OF QUALIFICATION	
Qualifications of programme implementer	Appropriate education: • NQFS level 5, • NQFS level 6 (sublevel 6.1, sublevel 6.2) and • NQFS level 7 (sublevel 7.1), in accordance with Art. 140–142 of the Law on the Foundations of the Education System.
Organisation responsible for issuing a public document	Vocational secondary schools