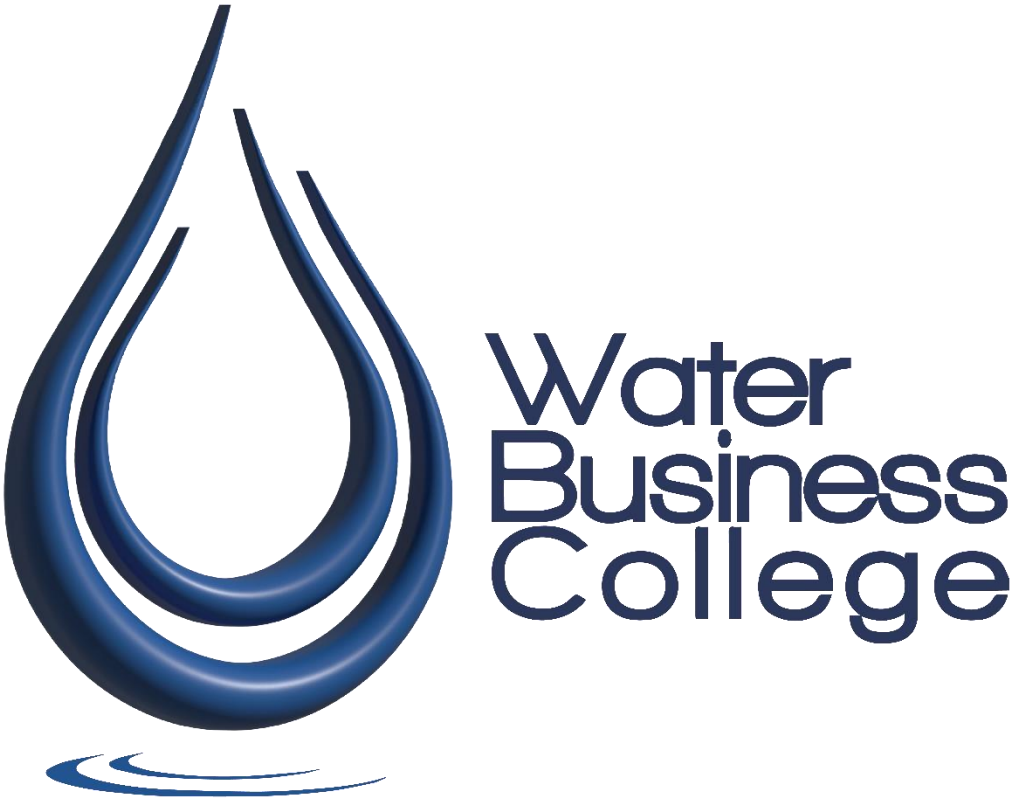
CONFIDENTIAL PROPERTY OF WATER BUSINESS COLLEGE



OCCUPATIONAL CERTIFICATE: WATER RETICULATION PRACTITIONER

SAQA ID: 102581 – NQF LEVEL 4

MODULE 5

Module 5 - Module Information

Code	Learning Outcomes
KM-05-KT01	• Explain the concept hydrology • Use a diagram to describe the various elements of the natural water cycle • Identify and explain the physical forms of water in terms of their properties • Explain the effects of land use on the quantity and quality of water • Identify and describe the chemicals and nutrients polluting water • Explain the relevant sections of legislation that controls the use of water • Discuss ground and surface water as resources of water • Identify and describe the factors that may pollute groundwater • Describe the natural chemical contaminants to determine groundwater use • Explain the methods of collecting and extracting groundwater and collecting and abstractingsurface water • Identify water users in terms of their needs • Explain the meaning of potable water • Explain what is meant by water resource management • Discuss water as a scarce resource in the South African context
KM-05-KT02	• Describe the purpose of water supply systems in terms of protection of public health • Discuss the raw water in terms of types, quality, quantity, size, and elevation • Describe raw water systems briefly • Describe treatment options in terms of Drinking Water standards • Describe the types of water reticulation systems and identify and describe the components of awater reticulation system • Describe the primary distribution systems in terms of supply security and peak flow management • Describe service reservoirs in terms of their position, functions, and valves • Describe trunk/bulk, reticulation, and secondary reticulation mains in terms of

	their functions andfittings • Describe property services in terms of their component parts and sizing • Explain the importance of reticulation plans and list the information contained in them
KM-05-KT03	• Discuss the concept of water quality • Describe the effects of the water quality standard • Describe the sources of contamination in terms of its origin • Discuss the consequences of contamination • Describe the techniques used for cleaning and disinfecting water mains in terms of their cleaningand disinfecting efficiency • Discuss the use of chlorine compounds for microbiological contamination • Explain how disinfection practices are used to prevent contamination • Describe backflow in terms of the implications for localised contamination of drinking watersupplies, and for compliance with the Drinking Water Standard (SANS 241) • Describe how risk assessments are performed
KM-05-KT04	• Explain pressure in terms of static pressure and variation of pressure • Describe the causes of pressure losses and their effect on flowrate • Describe the internal forces in terms of anchorage requirements • Describe the role of pumps in terms of flow and pressure • Define hydraulic gradient and explain its relevance in water reticulation system
KM-05-KT05	• Explain the importance of and reasons for obtaining permission from relevant authorities beforestarting excavation activity • Describe the procedures to plan and prepare to excavate a trench • Describe site preparation procedures • Describe some of the common road signs used when digging trenches and other traffic controlmeasures to ensure safety of motorists and workmen • Identify and describe the two classifications of soil and rock conditions • Identify and describe other risks or dangers associated with digging a trench

	• Describe the different methods of excavating a trench • Identify problems that can be present during excavation • Discuss trenching • Describe the component parts, limitations, dangers, and sequence of operations for the types oftimbering • Describe the different shoring installation procedures • Describe the materials for shoring and show how and when they are used • Describe the procedures to test compaction
KM-05-KT06	• Describe the procedures to mark out, dig and box foundations • Describe the procedures to mix concrete and pour into foundation • Describe the procedures to build simple brickwork • Describe the procedures to construct thrust block and top of structure • Describe the procedures to construct alternative manholes using concrete rings • Describe the reinstatement procedures post construction
KM-05-KT07	• Identify and describe backfill materials • Describe backfill, bedding and pipe manufacturing requirements • Identify and describe compaction equipment • Describe the procedures to prepare for and to compact materials
KM-05-KT08	• Describe the preparation procedures for connecting • customer to the system • Describe the risks presented by the location and the required safety measures • Describe the procedures to locate existing mains and water pipes • Describe the procedures to connect the water supply for different pipe sizes • Identify the tool required to connect customer to a water connection • Describe the procedures to install, connect and take readings of water meters • Explain the different types of trenchless technologies, including the advantages anddisadvantages of each type • Explain the preparation for the execution of trenchless technologies

	• Explain the different methods of providing road crossings for water supply connections
KM-05-KT09	• Describe all aspects related to pressure and flow • Describe pressures in networks in terms of accepted levels for minimum and maximum pressure • Describe the measurement of water pressure in terms of the methods used and implications ofresults • Describe a pumping system in terms of its influence on pressure • Describe backflow prevention devices in terms of their operation, and methods of testing forsatisfactory operation • Describe backflow prevention techniques in terms of their suitability for consumer situations • Explain how pressure management assists in reducing leakage • Describe the discrete zones for pressure management
KM-05-KT10	• Describe the different types of maps, images, and systems, • and their purposes/uses • Interpret symbols on maps • Determine a range of services, potential obstructions, irrigation areas and illegal water works,natural and artificial features, servitudes and right of way from maps • Determine the work site from the map • Interpret symbols and services on construction drawings and diagrams • Interpret the scale of construction drawings • Describe servitudes, right of ways and wayleaves • Demonstrate how to prepare a material list from construction drawings • Demonstrate the location of reticulation valves which could be used to isolate an area • List the information in a site drawing • Describe how to use an electronic plotting system

KM-05-KT11	• Discuss the volume in a water reticulation system and explain the unit of measurement • Discuss flowrate, velocity, and cross-sectional area in a water reticulation system and explainthe units of measurement • Discuss pressure/vacuum in a water reticulation system and explain the units of measurement • Discuss gravity/head in a water reticulation system and explain the units of measurement • Explain the negative influences affecting water flow in pipelines • Describe flow characteristics in the design of a water reticulation system • Describe flow and pressure measuring devices and calculate water flows • Explain the importance of pipe condition with respect to water flow