

**Specification of Competency Standards**  
**for the Testing, Inspection and Certification Industry**  
**Unit of Competency**

Functional Area - Testing Operations

Title	Perform basic structural diagnostic tests on concrete structures
Code	105842L4
Range	This unit of competency (UoC) covers the abilities to carry out basic structural diagnostic tests on concrete structures in the building / infrastructure sites by applying appropriate non-destructive (NDT) techniques and evaluate test data to determine the condition of concrete structures.
Level	4
Credit	8 (For Reference Only)
Competency	<p>Performance Requirements</p> <ol style="list-style-type: none"> <li>1. Possess knowledge of NDT techniques applicable to concrete structures <ul style="list-style-type: none"> <li>• Explain the corrosion mechanism of reinforcement steel.</li> <li>• Apply the principles and concepts of NDT techniques and identify test methods/standards used for examining concrete structures.</li> <li>• Specify the concrete strength and quality requirements.</li> <li>• Identify sampling requirements in test methods, e.g. selection of samples, minimum sample size.</li> <li>• Explain the principles and operation of equipment used for NDT tests on concrete structures.</li> <li>• Specify the calibration requirement of equipment.</li> </ul> </li> <li>2. Perform basic structural diagnostic tests on concrete structures <ul style="list-style-type: none"> <li>• Apply appropriate NDT techniques and testing equipment for non-destructive tests on concrete structures, e.g.: <ul style="list-style-type: none"> <li>○ electromagnetic covermeter survey,</li> <li>○ ultrasonic pulse velocity (Pundit) test, hammer tapping survey or carbonation test,</li> <li>○ Schmidt rebound hammer,</li> <li>○ half-cell potential mapping, concrete resistivity test.</li> </ul> </li> <li>• Optimise equipment settings in accordance with test methods/standards.</li> <li>• Carry out NDT tests on concrete structures according to test methods/standards.</li> <li>• Carry out visual inspection on reinforced concrete structure and record visible defects, e.g. cracking, pop-out, exposure of rebar, sign of water leakage.</li> <li>• Collect representative concrete samples by appropriate techniques such as taking cores and collecting powder samples for further physical and chemical laboratory tests.</li> <li>• Carry out required calibration checks on testing equipment and conduct validation checks on test data.</li> <li>• Evaluate test data to determine the condition of concrete structures.</li> </ul> </li> <li>3. Exhibit professionalism <ul style="list-style-type: none"> <li>• Ensure integrity and confidentiality of test data by observing the relevant code of conduct.</li> <li>• Follow established safe work practices and use appropriate personal protective equipment at testing sites.</li> </ul> </li> </ol>
Assessment Criteria	<p>The integrated outcome requirements of this UoC are the abilities to:</p> <ul style="list-style-type: none"> <li>• carry out basic structural diagnostic tests on concrete structures by applying appropriate NDT techniques and testing equipment according to the requirements of test methods/standards and test specifications,</li> </ul>

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	<ul style="list-style-type: none"><li>• evaluate test data to determine the condition of concrete structures by verifying equipment calibration status and checking the validity of test data within the acceptable range specified in test methods/standards.</li></ul>
Remark	