APPLY BUILDING MATERIALS SCIENCE

UNIT CODE: CON/OS/ARC/CC/03/6/A

UNIT DESCRIPTION

This unit describes the competence in applying building materials science. It involves identifying essential and properties of construction materials, manufacturing construction materials, selecting quality construction materials, using construction materials properly, testing construction materials and handling construction materials safely.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT **These describe the key outcomes which make up workplace function.**	**PERFORMANCE CRITERIA** **These are assessable statements which specify the required level of performance for each element.** ***(Bold and italicized terms are elaborated in the Range)***
1 Identify essential construction materials	1.1 Bills of quantities and working drawings are obtained and interpreted 1.2 Essential ***construction materials*** are identified based on construction requirements and project scope
2 Identify properties of construction materials	2.1 ***Physical properties*** of construction materials are identified based on the type of construction material and codes of practice 2.2 ***Chemical properties*** of construction materials are identified based on the type of construction material and codes of practice 2.3 ***Mechanical properties*** of construction materials are identified based on the type of construction material and codes of practice
3 Manufacture construction materials	3.1 Raw materials are identified based on construction materials to be produced 3.2 Construction materials are manufactured as per manufacturing procedures
4 Select quality construction materials	4.1 Cost implications of construction materials are evaluated and analyzed 4.2 Quality construction materials are selected based on their costs and project requirements
5 Use construction materials appropriately	5.1 Construction materials, tools and equipment are assembled based on construction methods

ELEMENT **These describe the key outcomes which make up workplace function.**	PERFORMANCE CRITERIA **These are assessable statements which specify the required level of performance for each element.** ***(Bold and italicized terms are elaborated in the Range)***
	5.2 Construction materials are used based on construction process
6 Test construction materials	6.1 Construction materials are sampled randomly as per SOPs 6.2 ***Test parameters*** are identified as per the construction requirements and engineer's instructions 6.3 Construction materials are tested as per the SOPs
7 Handle construction materials safely	7.1 Construction materials to be handled are identified 7.2 Safety requirements are identified based on the construction materials 7.3 Construction materials are handled safely based on the safety requirements

RANGE

Variable	Range
1. Construction materials may include but not limited to:	• stones • bricks • clay and clay products • lime • cement • timber and timber products • metals and alloys • paints and varnishes • roofing materials
2. physical properties may include but not limited to:	• porosity • surface texture • strength • density • thermal conductivity • wear and tear
3. chemical properties may include but not limited to:	• corrosion resistance • chemical resistance
4. Mechanical	• Toughness

properties may include but not limited to:	• Hardness • Fatigue • Stress and strain • Creep and stress rapture
5. Test parameters may include but not limited to:	• Compression • Weathering • Durability • Water absorption • Impurity tests • Tensile tests

REQUIRED KNOWLEDGE

- Applied science
- Construction materials
- Materials testing
- Quality assurance
- Management of material resources
- Engineering mathematics
- Bills of quantities
- Materials handling safety procedures

SKILLS

- Analytical
- Quality control analysis
- Complex problem solving
- Critical thinking
- Engineering drawings interpretation
- Monitoring
- Numeracy

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified essential construction materials 1.2 Selected quality construction materials 1.3 Tested construction materials 1.4 Manufactured construction materials 1.5 Identified properties of construction materials 1.6 Appropriately used construction materials 1.7 Handled construction materials safely
2. Resource	The following resources should be provided:

	Implications	2.1 Samples of construction materials 2.2 Material Testing Laboratories 2.3 Safety equipment 2.4 Computers 2.5 Calculators 2.6 Materials testing tools and equipment
3.	Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
4.	Context of Assessment	Competency may be assessed 4.1 On The Job 4.2 Off The Job 4.3 During Industrial Attachment.
5.	Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.