

CONSTRUCT BUILDING SUBSTRUCTURE

UNIT CODE: CON/OS/MA/CR/01/4/A

UNIT DESCRIPTION

This unit specifies the competencies required to construct building substructure. It entails interpreting working drawings, estimating and costing materials and supplies, use of tools and equipment, setting out the building, preparing and positioning formwork and reinforcement bars, casting the foundation, construction of foundation walling and ground floor slab.

This standard applies in the Construction industry.

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 of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Interpret working drawings	1. 1 <i>Working drawings</i> are identified based on their features and title block. 1. 2 Scale of the drawing is read based on the drawing. 1. 3 Measurements are converted based on best practice. 1. 4 Symbols are identified based on working drawings standards.
2. Estimate and cost materials and supplies	2.1 <i>Materials and supplies</i> required for masonry works are identified based on the drawing and site. 2.2 Schedule of materials and supplies is prepared based on the drawings. 2.3 Materials and supplies are estimated and costed based on working drawings and specifications.

<p>3. Set-out building</p>	<p>3.1 Personal Protective Equipment is identified and used in line with occupational safety and health regulations.</p> <p>3.2 Masonry tools and equipment are used based on manufacturer's instructions.</p> <p>3.3 Preliminary preparation activities are carried out as per drawings and standard procedures</p> <p>3.4 Reference points are located on the ground as per drawings.</p> <p>3.5 Profiles and profile boards are fixed and levelled on the ground according to drawings and standard procedures.</p> <p>3.6 Measurement and square-ness are checked based on standard procedure.</p> <p>3.7 Profile lines are fixed and marked on the ground according to the drawings.</p> <p>3.8 Masonry tools and equipment are maintained and stored based on manufacturer's instructions.</p>
<p>4. Prepare and position formwork and reinforcement bars</p>	<p>4.1 Excavations and levels are ascertained based on working drawings and best practise</p> <p>4.2 Measurements are transferred to the foundation bed based on specifications.</p> <p>4.3 Blinding is done based on specifications.</p> <p>4.4 Formwork is prepared and positioned based on working drawings and specifications.</p> <p>4.5 Reinforcement bars are prepared positioned and fixed based on working drawings and specifications.</p>
<p>5.Cast foundation walling</p>	<p>5.1 Assemble materials for foundation base as per the specifications</p> <p>5.2 Mix concreting materials as per the specifications</p> <p>5.3 Cast the foundation base as per the specifications.</p> <p>5.4 Concrete is cured as per the standard procedure</p>
<p>6. Construct foundation walling</p>	<p>6.1 Foundation walling units are identified based on specifications.</p> <p>6.2 Foundation walling units are laid as per drawing and specification.</p> <p>6.3 Curing of foundation units is done as per the standard procedure</p> <p>6.4 Excavations are backfilled with stable soil as per best practice and specifications.</p>

	6.5 Soil around and in the building is treated against termites and ants as per the best practice
7. Construct ground floor Slab	<p>7.1 Floor slab bed is prepared based on specifications.</p> <p>7.2 Damp proofing is fixed as per specifications.</p> <p>7.3 Formwork is prepared, positioned and fixed as per specifications and best practice.</p> <p>7.4 Slab steel reinforcement is done according to working drawings and specifications.</p> <p>7.5 Concrete is casted according to working drawings and specifications.</p> <p>7.6 Concrete slab is cured as per standard procedure.</p>

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variables	Range
1. Working drawings may include but not limited to:	<ul style="list-style-type: none"> • Architectural drawings • Structural • MEP drawings • Site development drawings • Survey maps
2. Supplies and Materials may include but not limited to:	<ul style="list-style-type: none"> • Ballast • Sand • Cement • Additives • Water • Timber • boards • Reinforcement Steel Bars • Damp Proofing Materials and Supplies • Lime • Chalk • Termite Control Chemicals • Hard core

	<ul style="list-style-type: none"> • Nails • Strings • Murram • BRC • Poles
3. Personal Protective Equipment may include but not limited to:	<ul style="list-style-type: none"> • Hard hat / helmet • Dust Mask • Goggles • Ear plugs / ear muffs • Dust coat / coverall • Gloves • Safety boots • Gum boots • Reflector jackets
4. Masonry tools and equipment may include but not limited to:	<ul style="list-style-type: none"> • Mason square • Spirit level • Plumb bob • Trowels • Spades • Wheel barrow • Dumper • Mason string • Straight edge • Float • Concrete mixer • Dumpy level • Vibrator • Compactor • Hammer • Mattock • Machete • Sledge Hammer • Buckets • Mixing platform • Hose Pipe
5. Preliminary preparation activities may include but not limited to:	<ul style="list-style-type: none"> • Site clearance • Hoarding • Site services • Site office/hut

6. Reference points may include but not limited to:	<ul style="list-style-type: none"> • Datum • Building line • Temporary bench mark (TBM)
7. Foundation walling may include but not limited to:	<ul style="list-style-type: none"> • Natural quarry stones • Engineering bricks • High density concrete blocks
8. Foundation may include but not limited to:	<ul style="list-style-type: none"> • Slab Foundation / Raft • Suspended Foundation • Strip Foundation • Concrete Masonry Units Foundation • Footing & columns • Piles
9. Damp proofing may include but not limited to:	<ul style="list-style-type: none"> • Damp Proofing Membrane • Damp Proof Spray • Waterproofing additives
10. Curing may include but not limited to:	<ul style="list-style-type: none"> • Water • Jute Sacks • Blankets • Sand • Curing agents

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Interpersonal
- Communication
- Drawing
- Interpretation of working drawings

- Problem-solving
- Critical thinking
- Organizing
- Measuring
- Numeracy
- Mortar handling
- Concrete materials mixing
- Masonry units handling
- Tool and equipment handling
- Team work
- Time management

Required Knowledge

The individual needs to demonstrate knowledge of:

- Interpretation of drawings and symbols
- Calculations
- Conversion of units
- Square-ness checking techniques
- Concrete mix ratios (Batching)
- Aggregates
- Cement types and uses
- Types of foundations and applications
- Soil type, structures and stabilization techniques
- Types of timber
- Water
- Formwork
- Levelling
- Steel reinforcement fixing
- Masonry units
- Use and maintenance of tools and equipment

EVIDENCE GUIDE

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

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> 1.1 Identified working drawings correctly. 1.2 Read drawing scale correctly. 1.3 Converted measurements accurately. 1.4 Identified symbols correctly. 1.5 Identified masonry materials, supplies, tools and equipment correctly. 1.6 Prepared schedule of materials, supplies, tools and equipment appropriately. 1.7 Identified appropriate personal protective equipment. 1.8 Used personal protective equipment correctly. 1.9 Used and maintained masonry tools and equipment appropriately. 1.10 Carried out preliminary preparation activities appropriately. 1.11 Located reference points on the ground accurately. 1.12 Fixed and levelled profiles and profile boards on the ground accurately. 1.13 Checked measurement and square-ness correctly. 1.14 Fixed and marked profile lines on the ground accurately. 1.15 Maintained and stored masonry tools and equipment appropriately. 1.16 Transferred measurements to the foundation bed accurately. 1.17 Laid blinding layer correctly. 1.18 Prepared and positioned formwork accurately. 1.19 Prepared and positioned reinforcement bars accurately. 1.20 Mixed concrete materials correctly 1.21 Casted foundation base correctly. 1.22 Identified foundation walling units correctly. 1.23 Laid foundation walling units correctly. 1.24 Backfilled and stabilized excavations appropriately. 1.25 Treated soil around and in the building appropriately. 1.26 Prepared floor slab bed appropriately. 1.27 Laid damp proofing appropriately. 1.28 Prepared, positioned and fixed formwork accurately. 1.29 Fixed and positioned slab reinforcement accurately. 1.30 Casted concrete slab appropriately. 1.31 Cured concrete slab appropriately.
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	1.32 Demonstrated understanding of construction of building substructure.
2. Resource implications for competence certification	The following resources should be provided: 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place 2.3 Materials relevant to the proposed activity or tasks
3. Methods of assessment	Competency may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Written tests 3.4 Portfolio 3.5 Third party report
4. Context of Assessment	Assessment may be done: 4.1. On-the-job, 4.2. Off-the-job or 4.3. During Work placement.
5. Guidance information for assessment	The unit may be assessed alone or together with other related units.