



THE REPUBLIC OF KENYA

**NATIONAL OCCUPATIONAL STANDARDS
FOR
BUILDING TECHNICIAN**

**KNQF LEVEL 6
ISCED PROGRAM CODE: 0732 554B**



**TVET CDACC
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EXECUTE SUBSTRUCTURE WORKS

UNIT CODE: CON/OS/BUT/CR/05/6/A

UNIT DESCRIPTION

This unit describes the competences required to perform substructure works. It involves setting out the building, excavating foundation, laying building foundation, erecting foundation, constructing solid ground floor and finishing substructure works.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENTS	PERFORMANCE CRITERIA <i>(Bold and italicized terms are elaborated in the Range)</i>
1. Set out the building	1.1 Building drawings are interpreted as per <i>working drawings</i> 1.2 Ground measurement are taken as per the working drawings 1.3 Position of walls and columns are marked as per foundation plan 1.4 Profile boards are erected and marked as per the plan 1.5 Accuracy of setting out is determined as per architectural and structural details
2. Excavate building foundation	2.1 Foundation is excavated as per working drawings 2.2 Foundation timbering is done as per soil analysis report 2.3 Dewatering is carried out as per <i>dewatering method</i>
3. Lay building foundation	3.1 Foundations levels are taken according to <i>type of foundation</i> and structural specifications 3.2 Foundation blinding is laid according to building specifications 3.3 Foundation formwork is erected as per specifications 3.4 Foundation reinforcement is positioned as per the structural details 3.5 Concreting is carried out according to design requirements
4. Erect foundation walls	4.1 Foundation wall is set out as per working drawing 4.2 Foundation walling is constructed as per structural specifications
5. Construct solid ground floor	5.1 Floor base is levelled and compacted according to building code requirement 5.2 Hard-core layer is laid and compacted as per specifications and building code 5.3 Blinding layer is laid and compacted as per building code

	5.4 Anti- termite is sprayed as per building code and manufacturers specifications 5.5 DPM is laid as per building code 5.6 BRC is laid as per building code 5.7 Spacer blocks are positioned as per specifications 5.8 Formwork to edges of slab is erected 5.9 Concrete is placed according to building code
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RANGE

Variable	Range
1. Dewatering method may include but is not limited to:	<ul style="list-style-type: none"> • Sump • Electoral osmosis • Freezing • Furrow • Pumping out
2. Type of foundation may include but is not limited to:	<ul style="list-style-type: none"> • Strip • Pile • Pad • Raft • Piers
3. Working drawings may include but is not limited to:	<ul style="list-style-type: none"> • Architectural • Structural • Plumbing • Mechanical • Electrical • Services • Civil engineering drawings
4. Building code may include but is not limited to:	<ul style="list-style-type: none"> • BS 8110 • BS 449

REQUIRED KNOWLEDGE

- Surveying/levelling
- Basic arithmetic
- Masonry
- Concrete technology

- Structural reinforcement
- Methods of setting out
- Types of foundations
- Scheduling
- Concreting
- Bar bending and fixing

SKILLS

- Levelling
- Concrete and Mortar mixing
- Wall construction
- Measuring
- Bar bending and fixing
- Computation
- Concreting

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	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Interpreted building drawings 1.2 Recorded ground measurements 1.3 Set building 1.4 Excavated foundation trenches 1.5 Timbered foundation trenches 1.6 Dewatered foundation trenches 1.7 Prepared bar bending schedule 1.8 Positioned foundation reinforcement 1.9 Placed foundation concrete 1.10 Constructed foundation wall 1.11 Constructed solid ground floor 1.12 Finished substructure works
2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Measuring tools 2.2 Working drawing 2.3 Laptops 2.4 Desktop PCs 2.5 Printer/plotting device 2.6 Calculator

	2.7 Surveying tools 2.8 Internet 2.9 Masonry tools and equipment 2.10 Timber/steel boards and nails 2.11 Concrete constituents 2.12 Stationery
3. Methods of Assessment	Competency may be accessed through: 3.1 Written Tests 3.2 Practical Tests 3.3 Interview/Oral Questioning
4. Context of Assessment	Competency may be assessed in an off and on the job setting
5. Guidance information for assessment	Holistic assessment with other units relevant to the building sector, workplace and job role is recommended.