



Australian Government

Department of Education, Employment and Workplace Relations

RIICWM504A Prepare civil works bill of quantities

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers the preparation of civil works bills of quantities in Civil Construction. It includes planning for the civil works bills of quantities process, identifying and calculating the on-site labour, materials and on-site sub-contractor service requirements, the finalising of the civil works bills of quantities process and supporting and reviewing the application of the bill of quantities.

Application of the Unit

This unit is appropriate for those working in a management role or as a technical specialist, for the preparation of a civil works bills of quantities within:

- Civil construction

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan for the civil works bills of quantities	1.1. Access, interpret and apply <i>compliance documentation</i> relevant to the work activity 1.2. Identify and <i>confirm</i> the civil works <i>project requirements and information</i> for the preparation of a <i>civil works</i> bill of quantities 1.3. Prepare a draft works program that details the various tasks or activities to be undertaken to complete the required civil works 1.4. Gain agreement on the draft works program
2. Identify and calculate on-site labour requirements	2.1. Interpret and analyse the relevant data and identify the types and numbers of on-site labour required to undertake each task 2.2. Analyse and identify the total number of on-site labour required at each stage and overall to safely, effectively and efficiently meets the required project outcomes 2.3. Complete the documentation of the stage by stage and overall labour requirements
3. Identify and calculate materials requirements	3.1. Interpret and analyse the relevant data and identify the types and quantities of materials required to undertake each task in the agreed draft works program 3.2. Analyse and identify the total quantity of materials required to safely, effectively and efficiently meets the required project outcomes 3.3. Complete the documentation of the total materials requirements
4. Identify and calculate the on-site sub-contractor service requirements	4.1. Interpret and analyse the relevant data and identify the types and numbers on-site sub-contractor services required to undertake each task 4.2. Analyse and identify the number of on-site sub-contractor services required to undertake each stage of the works 4.3. Complete the documentation of the stage by stage and overall on-site subcontractor services requirements

5. Finalise civil works bills of quantities process	5.1. Ensure filing of bill of quantities is completed 5.2. Complete and submit bill of quantities and other reporting 5.3. Gain approval of the bill of quantities
6. Support and review the application of the bill of quantities	6.1. Provide clarification and advice to those applying the bill of quantities 6.2. Review the application of the bill of quantities and recommend changes for the continuous improvements of civil works bill of quantities preparation processes

Required Skills and Knowledge

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

Required skills

Specific skills are required to achieve the performance criteria in this unit, particularly for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to prepare a civil works bills of quantities:

- apply legislative, organisation and site requirements and procedures
- interpret plans and drawings
- interpret specifications
- interpret Australian and other appropriate standards
- interpret engineering survey information
- interpret hydrological data
- interpret geotechnical information
- interpret civil works construction materials test results
- interpret meteorological data
- interpret cultural and heritage data
- carry out risk assessments
- interpret civil works options selection data
- select civil works options
- size civil works components
- choose appropriate construction techniques
- calculate areas, volumes, labour hours, materials quantities, sub-contractor service capabilities, productivity and required hours
- apply computer based works planning technology
- maintain cost records
- provide clarification and advice
- apply client feedback techniques

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following, as required to prepare a civil works bills of quantities:

- risk assessment and management requirement and procedures
- statutory compliance requirements and procedures
- occupational Health and Safety requirements and procedures
- environmental management requirements and procedures
- cultural and heritage requirements and procedures
- quality management requirements and procedures

- communication requirements and procedures
- Australian and other relevant standards requirements and procedures
- industry and organisational construction procedures and practice
- current industry best practice
- civil works options
- potential hazards, constraints and conditions that may affect civil works construction
- current industry best practice in civil works construction
- techniques for choosing preferred options
- operational techniques required for the execution of civil works construction tasks
- civil works construction plant and equipment capabilities
- labour, materials and sub-contractor services estimation techniques
- bill of quantities review principles and procedures
- documentation requirements
- reporting requirements and procedures
- bills of quantities approval requirements and procedures
- bills of quantities records filing requirements and procedures

Evidence Guide

<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p>Overview of assessment</p>	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following:</p> <ul style="list-style-type: none"> • knowledge of the requirements, procedures and instructions for the preparation of civil works bills of quantities • implementation of procedures and techniques for the safe, effective and efficient preparation of civil works bills of quantities • the identification of the relevant information and scope of the work required to meet the required outcomes • the identification of viable options and the selection of a civil works bills of quantities that best meet the required outcomes • working with others to undertake and complete the preparation of civil works bills of quantities • consistent successful preparation of civil works bills of quantities
<p>Context of and specific resources for assessment</p>	<ul style="list-style-type: none"> • This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • Evidence for assessment is best gathered using the outcomes of products and processes of the workplace. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of

	<p>assessment should not be greater than those required on the job.</p> <ul style="list-style-type: none"> • Customisation of assessment and delivery environment to sensitively accommodate cultural diversity. • Aboriginal people and other people from a non English speaking background may have second language issues. • Assessment of this competency requires typical resources normally used in a civil works environment. Selection and use of resources for particular worksites may differ due to site circumstances. • Where applicable, physical resources should include equipment modified for people with disabilities. • Access must be provided to appropriate learning and/or assessment support when required.
<p>Method of assessment</p>	<p>This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods:</p> <ul style="list-style-type: none"> • written and/or oral assessment of the candidate's required knowledge to apply in undertaking of the preparation of civil works bills of quantities • observed, documented and/or first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • implementation of appropriate procedures and techniques for the safe, effective and efficient achievement of the required outcomes • identification of the relevant information and scope of the work required to meet the required outcomes • identification of viable options and the selection of a civil works bills of quantities that best meet the required outcomes • consistently achieving the required outcomes • first hand testimonial and documentary evidence of the candidate's:

	<ul style="list-style-type: none">• working with others to undertake and complete the preparation of civil works bills of quantities• provision of clear and timely required support and advice on the preparation of civil works bills of quantities
Guidance information for assessment	Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.

Range Statement

<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<p>Relevant compliance documentation may include:</p>	<ul style="list-style-type: none"> • legislative, organisational and site requirements and procedures • manufacturer's guidelines and specifications • Australian standards • code of practice • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
<p>Confirm may include:</p>	<ul style="list-style-type: none"> • consultation with the clients (internal and external) • consultation with others within the organisation • consultation with relevant authorities • conducting a risk assessment of the existing and potential hazards • obtaining further site data, including: <ul style="list-style-type: none"> • known and potential hazards, constraints and conditions • cultural and heritage data • geological data • geotechnical data • hydrological data • survey data • metrological data
<p>Project requirements and information may include:</p>	<ul style="list-style-type: none"> • project specifications • contractual requirements • client's requirements • project site geological data • project site hydrological data • project site engineering survey data • project site cultural and heritage constraints • existing project design and drawings • Australian or other relevant standards
<p>Civil works</p>	<ul style="list-style-type: none"> • land clearing

may include:	<ul style="list-style-type: none"> • bulk earthworks • surface drainage construction and maintenance • subsurface drainage construction and maintenance • water storage dams construction and maintenance • tailings dams construction and maintenance • topsoil management • rehabilitation works • road works preparation (including the sub grade) • pavement construction and maintenance, including: <ul style="list-style-type: none"> • flexible pavements, including: <ul style="list-style-type: none"> • natural pavement materials • manufactured pavement materials • asphalt placement • spray seal application • stabilisation • rigid pavement • underground services construction and maintenance • applying trenchless technology • construction and maintenance of civil structures • tunnelling • dredging
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Unit Sector(s)

Civil Works (Management and Supervision)

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.