



Australian Government

Department of Education, Employment and Workplace Relations

NWP608 Design sewerage pumping station systems

Release: 1

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Modification History

NWP608 Release 1: Primary release.

Unit Descriptor

This unit of competency sets out the knowledge and skills required to apply principles of design for a sewerage pumping station system, using appropriate design standards.

Application of the Unit

This unit applies to engineering para-professionals who are required to design sewerage pumping station systems as an element of town sewerage.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the tasks you need to be able to perform, to demonstrate that you can achieve the element. Where ***bold italicised*** text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Clarify and confirm design requirements in the sewerage pumping station system	1.1 Identify system requirements, constraints, and areas requiring clarification from the concept proposal. 1.2 Negotiate alternative options to concept proposal to resolve problems. 1.3 Confirm design standards and specifications relevant to the sewerage pumping station system. 1.4 Define and document detailed design requirements. 1.5 Identify and apply initial data to the design.
2 Prepare sewerage pumping station system design	2.1 Review project design requirements prior to proceeding with detailed design. 2.2 Determine system characteristics (static and dynamic head conditions) 2.3 Establish design pump duties. 2.4 Determine pressure main and pipe work requirements. 2.5 Calculate wet well volume and operating levels. 2.6 Finalise horizontal and vertical pressure main alignment in accordance with project design requirements and design standards and specifications. 2.7 Nominate appropriate pipe materials. 2.8 Prepare structural design of pressure main. 2.9 Determine emergency storage and overflow containment requirements. 2.10 Design starter system to meet project design requirements and design standards and specifications. 2.11 Design to make allowance for OHS during construction in service life. 2.12 Prepare design drawings in accordance with design standards, codes and Water Agency requirements.
3 Manage documentation	3.1 Prepare supporting documentation in accordance with legislative and organisation requirements. 3.2 Maintain engineering and project records in accordance with legislative and organisation requirements.
4 Evaluate design	4.1 Review design to ensure objectives and specifications have been met. 4.2 Identify and evaluate compliance with environmental standards and impacts of the design. 4.3 Identify and evaluate compliance with legislation, codes and standards including OHS. 4.4 Conduct consultations with parties with an interest in the design

ELEMENT**PERFORMANCE CRITERIA**

and report on adjustments and proposed design changes.

4.5 Investigate and assess alternative design options.

4.5 Recommend the most appropriate design proposal for adoption.

Required Skills and Knowledge

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

Required skills:

- interpret and apply legislative requirements, codes and standards
- assess environmental impacts
- apply quality requirements
- analyse complex information
- operate computer software
- conduct investigations
- prepare documentation
- collaborate with a diverse team of specialists
- conduct consultations with a range of community interests
- data management
- project planning

Required knowledge:

- legislative requirements, codes and standards for the design of sewerage pumping station systems including environmental protection and occupational health and safety
- output quality specification requirements
- cost benefit analysis procedures
- risk analysis procedures
- investigation procedures and methodologies
- documentation and information management requirements

Evidence Guide

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.

Overview of assessment

The candidate should:

- perform each task outlined in the elements consistently and in a representative range of contexts
- meet the performance criteria associated with each element by employing the techniques, procedures, information and resources available in the workplace from those listed in the range statement.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The candidate should demonstrate the ability to design sewerage pumping station systems including:

- identifying, analysing and defining sewerage pumping station design requirements, conditions and constraints
- identifying and interpreting legislative, environmental, business and project management requirements
- developing scenario options for future needs and conditions
- analysing a range of factors to determine catchment impacts
- planning, preparing and selecting options for system design
- managing and securing documentation to support and report project management
- evaluating, and consulting on proposals to gauge impact and support
- making recommendations on the planning and design requirements for sewerage pumping station systems

Context of and specific resources for assessment

Access to the workplace and resources including:

- documentation that should normally be available in a water industry organisation
- workplace specific equipment and technology
- supervision and experienced team members to provide observations, feedback and third party reports
- enterprise operating procedures and work allocation
- relevant codes, standards and government regulations

Where applicable, physical resources should include equipment modified for people with disabilities.

Access must be provided to appropriate learning and assessment support when required.

Method of assessment

The following methods are suggested:

- assessment in the workplace or in a simulated workplace

- and under the normal range of workplace conditions
- assessment should also be conducted in conjunction with aspects of technical competencies that are consistent with the work environment
- techniques for gathering evidence of competency may include:
 - observation of performance
 - written and/or oral questioning to assess knowledge and understanding
 - completion of workplace documents and reports produced as part of routine work activities
 - third-party reports from experienced practitioners
 - completion of performance feedback from supervisors and colleagues

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate, and appropriate to the language and literacy capacity of the candidate and the work being performed.

Validity and sufficiency of evidence require that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice
- a decision of competence only taken at the point when the assessor has complete confidence in the person's competence over time and in various contexts
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence
- where assessment is for the purpose of recognition (RCC/RPL), the evidence provided will need to be authenticated and show that it represents competency demonstrated over a period of time
- assessment can be through simulated project-based activity and must include evidence relating to each of the elements in this unit

In all cases where practical assessment is used it will be combined with targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in a manner appropriate to the skill levels of the operator and cultural issues that may affect responses to the questions, and will reflect the requirements of the competency and the work being performed.

Range Statement

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.

<i>Design standards and specifications</i> may include:	• government legislation and by-laws • enterprise and organisational plans, policies and procedures • codes • Australian standards • ISO standards • specific design guidelines • manufacturers' and contractors' conditions, contracts and standards
<i>Sewerage pumping station system</i> may include:	• sewage pumping stations • pressure mains • storage
<i>Initial data</i> may include:	• costs • existing and future flows • customer requirements • locations • catchments • demographics • land use • meteorological information • topographic information
<i>Project design requirements</i> may include:	• sewer sizes, location and staging • pump station location • overflows (licensed) • odour control, ventilation • system layout • staging of developments • system configuration • water quality • pumping stations • pressure main sizes and location • storage tanks • future system expansion options • design flow estimation • design flow containment standard
<i>Legislative and</i>	• Federal and State legislation

organisation requirements may include:

- codes
- national guidelines
- environmental protection agencies

Impacts may include:

- visual
- odour
- noise
- social
- political
- natural
- cultural
- infrastructure

Unit Sector(s)

Not applicable.

Competency Field

Asset Creation.