



Australian Government

Department of Education, Employment and Workplace Relations

AHCIRG402A Determine hydraulic parameters for an irrigation system

Release: 1

AHCIRG402A Determine hydraulic parameters for an irrigation system

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers determining hydraulic parameters for an irrigation system and defines the standard required to: calculate water volumes and pressure required to deliver water; and select system components to deliver the required rate of irrigated water.
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Application of the Unit

Application of the unit	This unit applies to irrigation installers and designers.
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Not Applicable

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
1. Confirm water delivery specifications for irrigation system	1.1. Soil characteristics are confirmed and hydraulic properties determined. 1.2. Plant/crop water requirements are gathered for various stages of growth. 1.3. Peak water requirements are determined for each area to be irrigated.
2. Determine pressures required to deliver required amount of water over specified area	2.1. Static pressures between water source and delivery points are determined. 2.2. Dynamic pressure necessary to achieve required water volume is calculated.
3. Analyse technical drawings to determine pressure losses through system	3.1. Losses resulting from fittings, laterals and elevation differences are calculated. 3.2. Losses resulting from flow through canals, culverts and pipes of varying sizes and diameters within a system are determined. 3.3. Total friction loss is calculated. 3.4. Hydraulic parameters for system are determined.
4. Select system components to deliver water efficiently	4.1. Water delivery components are selected to achieve the most efficient delivery rate and pressure. 4.2. Flow direction and control components are selected to be compatible with pipes and to achieve minimal friction losses.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- read contour maps and interpret elevations and distances
- calculate pressures, flows, velocities and friction losses
- determine efficiency of the system with varying system components
- identify adverse environmental impacts of irrigation activities and appropriate remedial action
- apply hydraulic principles to manual and computerised irrigation systems
- follow relevant enterprise Occupational Health and Safety (OHS) and environmental procedures

REQUIRED SKILLS AND KNOWLEDGE

- use literacy skills to read, interpret and follow organisational policies and procedures, develop sequenced written instructions, record information collected accurately and legibly, and select and apply procedures to a range of tasks
- use oral communication skills/language competence to fulfil the job role as specified by the organisation, including questioning, active listening, asking for clarification, negotiating solutions and responding to a range of views
- use interpersonal skills to work with others and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities.

Required knowledge

- intermediate hydraulic principles, such as static and dynamic pressure, pressure loss, friction loss, flow rate and velocity, effect of gradient on flow rate, contact time and drainage
- irrigation system components
- types and pressure ratings for pipes, fittings and outlets
- environmental impacts of irrigation, using water from any ground or underground source
- enterprise and environmental requirements.

Evidence Guide

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	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The evidence required to demonstrate competency in this unit must be relevant to workplace operations and satisfy holistically all of the requirements of the performance criteria and required skills and knowledge and include achievement of the following: • calculate water volumes and pressure required to deliver water • select system components to deliver the required rate of irrigated water.
Context of and specific resources for assessment	Competency requires the application of work practices under work conditions. Selection and use of resources for some worksites may differ due to the regional or enterprise circumstances.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole.	
This standard covers:	• pressurised irrigation systems, such as micro-irrigation systems and spray irrigation systems • gravity-fed irrigation systems.
Irrigation systems may include	• manual operation and monitoring to fully automated with computer control and monitoring.

Unit Sector(s)

Unit sector	Irrigation
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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