



Australian Government

Department of Education, Employment and Workplace Relations

AHCIRG309A Interpret and apply instructions to install pumps

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This Unit covers the process of interpreting instructions to install pumps and defines the standard required to: organise resources for installation work; set out and prepare site; site the pump and place it on a base; connect suction and discharge lines; and commission the pumping system.

Application of the Unit

This Unit applies to skilled workers in the irrigation servicing, food and fibre production and amenity horticulture industries, and is likely to be carried out under routine supervision within enterprise guidelines.

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 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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Source irrigation system requirements	1.1 Location of pump is determined following site inspection 1.2 Pump base requirements are identified from drawings and specifications using relevant information 1.3 Required materials and equipment are identified, ordered and collected in accordance with workplace procedures 1.4 Materials and equipment are checked for compliance with relevant Australian standards, docket and order form, and for acceptable condition 1.5 Sustainability principles and concepts are applied to work preparation and application
2 Plan and sequence installation tasks from instructions	2.1 Drawings and specifications are obtained 2.2 OHS requirements associated with installing water pump sets, and workplace environmental requirements, are adhered to throughout the work 2.3 Workplace instructions are identified and adhered to 2.4 Tasks are planned and sequenced in conjunction with others involved in or affected by the work and statutory and regulatory authority requirements 2.5 Work area is prepared to support efficient installation of water pump sets
3 Select and check tools and equipment for serviceability	3.1 Tools and equipment for installing water pumps are selected and checked for serviceability 3.2 PPE is selected and used to meet workplace OHS requirements
4 Install and commission pumping and flow control components	4.1 Pump base is set out to comply with drawings and specifications 4.2 Pump base is constructed in accordance with drawings and specifications 4.3 Pump and pump controls are installed in accordance with relevant Australian standards, drawings, specifications and manufacturer instructions 4.4 Suction and discharge lines and flow control devices are connected 4.5 Delivery and distribution components connected to pump comply with relevant specifications and manufacturer instructions 4.6 Pressure testing of pumping system is conducted in accordance with specifications 4.7 Pump is tested in accordance with specifications and test data is recorded in required format
5 Clean up after installation	5.1 Work area is cleared and materials disposed of, reused or recycled according to legislation, regulations, codes of practice and job specification

- 5.2 Tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturer recommendations and workplace procedures
 - 5.3 Documentation is completed in accordance with workplace requirements
- 6 Review, record and report activities.
 - 6.1 Equipment, tools and materials are checked, maintained and stored according to manufacturer guidelines and organisational procedures
 - 6.2 Work site is restored to meet environmental and organisational requirements
 - 6.3 Activities are recorded and reported according to organisational procedures

Required Skills and Knowledge

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

Required skills include:

Ability to:

- match pump output and flow rate to pipe diameter
- position pumps and valves
- prime and operate pumps
- open and close valves
- monitor performance of valves
- follow plans, charts and instructions
- perform work-related calculations
- organise equipment and materials for installation work
- use power tools and hand tools
- handle materials safely
- install irrigation components
- identify hazards and adopt safe work practices
- identify and respond to operational problems
- communicate with work team members, supervisors, contractors and consultants
- use literacy skills to follow sequenced written instructions and record information accurately and legibly
- use numeracy skills to estimate, calculate and record routine workplace measures
- use interpersonal skills to relate to people from a range of social, cultural and ethnic backgrounds and with a range of physical and mental abilities.

Required knowledge includes:

Knowledge of:

- properties of water including pressure and flow rates
- basic principles of hydraulics (flow vs. pressure), energy loss due to friction
- types of pumps and application in irrigation
 - centrifugal
 - vertical turbine
 - submersible
 - propeller
- advantages and disadvantages of each pump type
- types suitable as booster and floating pumps
- discharge and flow rates
- pump components and their principles of operation
- pump gauges and controls
- types of valves

- automatic pump switches
 - timers
 - pressure switches
 - irrigation controllers
 - flow switches
- impellers, rotors, stators
- pump performance and pressure testing
- the SI system of measurement
- characteristics and application of different valves, pipes and fittings including fixing and joining techniques and methods
- JSA's/Safe work method statements
- electrical licensing requirements
- installation procedures for irrigation pumps
- welding skills (poly and steel)
- servicing requirements
- workplace and equipment safety 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	
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: • organise resources for installation work • set out and prepare site • site the pump and place it on a base • connect suction and discharge lines • commission the pumping system.
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

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>OHS requirements</i> may include:	solar radiation, dust, noise, air- and soil-borne micro-organisms, chemicals and hazardous substances, sharp hand tools and equipment, manual handling, holes, and slippery and uneven surfaces.
<i>Water pump sets</i> may include:	• centrifugal • Archimedes screw type • submersible • positive displacement.
Personal protective clothing and equipment (<i>PPE</i>) may include:	steel capped boots/shoes, overalls, gloves, sun hat, sunscreen lotion, safety goggles, face mask and hearing protection, and any protection required for the use of equipment.
<i>Pumping and flow control components</i> may include:	all types of pumps and pumping systems (including filters and valves) used to move water to or through an irrigation system.
<i>Flow control devices</i> may include:	• flow directional gates • regulators • valves • sluice • gate • blade • non-return • doors, drop structures and bars.

Unit Sector(s)

Irrigation