41027 Develop an irrigation system solution

Kaupae | Level	5
Whiwhinga | Credit	15
Whāinga | Purpose	This skill standard is for people working in, or intending to gain skills in, defining technical design parameters and evaluating irrigation methods to develop efficient, compliant, and context-specific irrigation systems. People credited with this skill standard will be able to calculate key irrigation design parameters, determine regulatory constraints, and evaluate and justify method selection to optimise irrigation design outcomes. This skill standard provides a foundation for further training in advanced irrigation system planning, method evaluation, and performance optimisation and has been developed to align with the New Zealand Certificate in Irrigation System Design (Level 4) [Ref: 2557].

Hua o te ako me Paearu aromatawai | Learning outcomes and assessment criteria

Hua o te ako | Learning outcomes	**Paearu aromatawai |** Assessment criteria
1. Calculate key irrigation design parameters including crop water requirements, soil infiltration, and water demand.	a. Perform accurate irrigation requirement calculations, including infiltration rate, application rate, and system capacity.
	b. Calculate crop water requirements based on evapotranspiration rates and climate data.
	c. Assess soil characteristics including water holding capacity and infiltration rates through field tests and incorporate findings into design parameters.
	d. Determine overall water demand by integrating crop needs, soil characteristics, and climatic conditions.
2. Determine regulatory constraints affecting irrigation systems.	a. Identify relevant regulatory requirements and standards governing irrigation systems.
	b. Determine the site-specific consent conditions.

Hua o te ako | Learning outcomes	**Paearu aromatawai |** Assessment criteria
3. Evaluate irrigation system methods for suitability, efficiency, and economic feasibility.	a. Assess the suitability of various irrigation methods considering crop type, field size, and topography.
	b. Conduct economic feasibility analyses including cost-benefit evaluations of different irrigation systems.
	c. Recommend appropriate irrigation methods based on comparative analyses and specific project requirements.
4. Justify the selected irrigation method and layout.	a. Provide a comprehensive justification for the chosen method and layout, supported by client needs and regulatory standards.
	b. Explain how the selected design optimises technical performance and economic viability while meeting client specifications.

Pārongo aromatawai me te taumata paearu | Assessment information and grade criteria

Assessment specifications:

Akōnga/learners must be assessed in a commercial irrigation system context, using naturally occurring evidence.

Activities can be assessed against existing, new or modified irrigation systems.

The irrigation system is for an agricultural or horticultural property, sports turf surface, landscape, golf course, or public grounds.

All activities and evidence must meet the requirements of worksite procedures, accepted industry practice and any subsequent amendments to legislation.

Evidence for all outcomes must be presented in accordance with: New Zealand Piped Irrigation Systems Design Code of Practice; and Irrigation; available from the Irrigation New Zealand website, http://irrigationnz.co.nz/ and any subsequent amendments.

Providers must give due consideration to embedding ngā kaupapa (principles) o Te Tiriti o Waitangi when designing delivery activities relevant to this standard. These principles are outlined in Guidelines for Providers: Embedding Tirohanga Māori.

Providers must give due consideration to the needs and values of Pacific peoples and other cultural groups when designing delivery activities relevant to this standard, ensuring practices are inclusive and equitable.

Definitions*:*

Accepted industry practice refers to approved codes of practice and standardised procedures accepted by the wider tree felling industries as examples of best practice.

Capex is the cost of developing or providing non-consumable parts for the product or system.

Opex is an ongoing cost for running a product, business, or system.

Worksite procedures refer to documented procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to standard operating procedures, site safety procedures, equipment operating procedures, quality assurance procedures, housekeeping standards, procedures to comply with legislative and local body requirements.

Ngā momo whiwhinga | Grades available

Achieved.

Ihirangi waitohu | Indicative content

Key Irrigation Design Parameters

- Crop requirements using Penman Monteith
- Soil infiltration and testing methods
- Principles, factors affecting infiltration, common field tests
- Water demand estimation
- Crop requirements, soil properties, and climate influences.

Environmental, Agronomic, and Regulatory Constraints

- Crop soil, and climate factors influencing irrigation system design
- Environmental considerations in irrigation design; water conservation, ecosystem impacts
- Regulatory frameworks and compliance standards for irrigation systems
- Overview of irrigation system methods
    - Fixed irrigation systems
    - Moveable irrigation systems
    - Drip and micro-irrigation systems.

Irrigation System Methods for Suitability and Feasibility

- Comparative evaluation criteria for irrigation systems (capital and operational costs, scalability efficiency)
- Factors influencing irrigation method selection (crop type, field size, topography)
- Economic feasibility and cost-benefit analysis principles for irrigation systems
- Decision making frameworks for selecting irrigation systems based on project requirements
- Suitability of methods for different crops and soils
- Efficiency and water use considerations
- Economic feasibility and cost analysis
- Environmental sustainability factors.

Irrigation Method and Layout Selection

- Justification principles for irrigation design (client requirements, regulatory compliance
- Design optimisation for technical performance, economic viability, and client specifications.

Rauemi | Resources

Legislation relevant to this skill standard includes but is not limited to:

- Irrigation New Zealand website (codes of practice), http://irrigationnz.co.nz/;
- Health and Safety at Work Act 2015 Health and Safety at Work Act 2015 No 70 (as at 05 April 2025), Public Act Contents – New Zealand Legislation;
- Resource Management Act 1991 Resource Management Act 1991 No 69 (as at 05 April 2025), Public Act Contents – New Zealand Legislation;
- National Policy Statement for Freshwater Management 2014 National Policy Statement for Freshwater Management | Ministry for the Environment;
- Public Works Act 1981 Public Works Act 1981 No 35 (as at 05 April 2025), Public Act Contents – New Zealand Legislation;
- Resource Management (National Environmental Standards for Freshwater) Regulations 2020 Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (LI 2020/174) (as at 01 January 2025) Contents – New Zealand Legislation;
- National Environmental Monitoring Standards (NEMS) National Environmental Monitoring Standards » National Environmental Monitoring Standards (NEMS);
- Site specific water resource consent or water supply agreement, weather data Home | NIWA;
- Descriptions and soil profile data sheets S-Map Online | Manaaki Whenua - Landcare Research;

and any subsequent amendments or replacements.

Pārongo Whakaū Kounga | Quality assurance information

Ngā rōpū whakatau-paerewa | Standard Setting Body	Muka Tangata – People Food and Fibre Workforce Development Council
Whakaritenga Rārangi Paetae Aromatawai | DASS classification	Engineering and Technology > Water Industry > Irrigation
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga | CMR	0052

Hātepe | Process	**Putanga |** Version	**Rā whakaputa |** Review Date	**Rā whakamutunga mō te aromatawai |** Last date for assessment
Rēhitatanga | Registration	1	18 December 2025	N/A
Kōrero whakakapinga | Replacement information	N/A		
Rā arotake | Planned review date	31 December 2030		

Please contact Muka Tangata – People Food and Fibre Workforce Development Council at qualifications@mukatangata.nz to suggest changes to the content of this skill standard.