

Title	Select, install and commission wireless systems		
Level	4	Credits	30

Purpose	<p>This unit standard is for service technicians and servicepersons, who develop and install wireless communications systems.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – prepare for installation of radio wireless systems hardware; – establish requirements for ancillary systems. – install radio frequency equipment; – perform configuration routines of radio wireless hardware; – perform testing and commissioning of wireless hardware and – handover site to customer on completion of installation.
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Classification	Electrical Engineering > Electrotechnology
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Available grade	Achieved
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Prerequisites	<p>Unit 27911, <i>Demonstrate knowledge of workplace safety in an electrotechnology or telecommunications environment</i>; Unit 28881, <i>Enhance workplace safety and mitigate environmental impacts in an electrotechnology or telecommunications environment</i>; or demonstrate equivalent knowledge and skills.</p>
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Guidance Information

- 1 This unit standard has been developed for learning and assessment on-job or off-job in a simulated workplace environment or combination, and where electrical work is included under adequate supervision as defined in the Electricity Act 1992, unless the candidate is registered and licenced under the Electricity Act 1992.
- 2 Recommended unit standards for entry:
Unit 30651, *Explain regulatory requirements for installing and servicing extra-low and low voltage customer premises systems*;
Unit 32984 *Demonstrate knowledge of radio theory and installation practice*.
- 3 References
AS/NZS 4509.1:2009 *Stand-alone power systems Part 1: Safety and installation*, available from <https://www.standards.govt.nz>;

AS/NZS 4509.2:2010 *Stand-alone power systems Part 1: System design*, available from <http://www.standards.govt.nz>;
AS/NZS 5033:2014 *Installation and safety requirements for photovoltaic (PV) arrays*, available from <https://www.standards.govt.nz>;
AS/NZS 5070.1 *Siting and operation of radiocommunications facilities – Guidelines for fixed, mobile and broadcasting services*;
Compliance Standards for EMC and Radio, available from <https://www.rsm.govt.nz>;
Consumer Guarantees Act 1993;
Contract and Commercial Law Act 2017, Part 3 Sale of Goods;
Electricity Act 1992;
Electricity (Safety) Regulations 2010;
Fair Trading Act 1986;
Hazardous Substances and New Organisms Act 1996;
Health and Safety at Work (Hazardous Substances) Regulations 2017;
Health and Safety at Work Act 2015;
New Zealand Electrical Codes of Practice, ISSN 0114-0663, available from <https://www.worksafe.govt.nz>;
Official Information Notices, available from <https://www.rsm.govt.nz/>;
Resource Management Act 1991;
and all subsequent amendments and replacements.

4 Definitions

CoC – Certificate of compliance.

Company practice – those practices and procedures that have been circulated by the company for use by their employees.

ESC – Electrical Safety Certificate.

Industry conventions – a set of agreed, specified, or generally accepted standards.

Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.

Non-standard – three or more services/network types, hardware or subsystems used or operating together to provide a purpose built mobile or re-locatable installation solution based on customer or installation requirements.

Safe and sound practice – relating to the installation of electrical equipment as defined in AS/NZS 3000:2018 *Electrical Installations - Known as the Australian/New Zealand Wiring Rules*.

5 Assessment

a Competence may be assessed on:

- i Systems installations may include but are not limited to – radio, low voltage, extra-low voltage supplies, data and voice, standalone power systems, solar;
- ii Locations may include but are not limited to – vehicles, caravans, mobile homes, transmission and reception sites, repeaters, mobile sites;
- iii Cabling and communications may include but are not limited to – copper, twisted-pair, coaxial copper, data cable, Wi-Fi, bluetooth or some combination of these;

b Evidence of three different wireless installations is required for each outcome of this unit standard, except where otherwise indicated. The installations must be relevant to, and in context for the industry sector the candidate works in.

6 Range

- a All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with:
- i legislation;
 - ii policies and procedures;
 - iii ethical codes;
 - iv Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010;
 - v safe and sound practice;
 - vi applicable site, company and industry practice, and industry conventions;
 - vii where appropriate or applicable, environmental requirements, manufacturer instructions, specifications, data sheets and manufacturer, supplier and company health and safety procedures.

Outcomes and performance criteria**Outcome 1**

Prepare for installation of wireless systems hardware.

Performance criteria

1.1 Establish the scope and timing of equipment provision.

Range may include but is not limited to – contract, job specification, drawings, timelines, customer requirements, company policies and procedures.

1.2 Determine the requirements of the installation and develop the plans for the radio hardware installation.

Range may include but is not limited to – resources, materials, site access requirements, work plan, installation plan, specifications, drawings.

1.3 Evaluate standard and non-standard solutions to meet customer requirements.

Range solutions may include but are not limited to – usability, reliability, interoperability, scalability, security.

1.4 Prepare and present recommended solution to customer for approval.

1.5 Arrange the required permits or consents.

Range may include but is not limited to – Permit to Work, site access, security consents, customer consent.

Outcome 2

Establish requirements for ancillary systems.

Performance criteria

- 2.1 Power and battery back-up requirements are calculated for the load.
- Range includes but is not limited to – mains availability, renewable energy, battery capacity, system loads, protection device sizing, operational duty cycle, required duration of operation under back-up conditions.
- 2.2 Ventilation requirements are checked to confirm they are adequate for the system.
- 2.3 Site security requirements are checked to confirm they are adequate for the system.
- 2.4 Alarm and remote monitoring requirements are checked to confirm they are appropriate for the system.

Outcome 3

Install radio frequency equipment.

Performance criteria

- 3.1 Prepare for installation.
- Range may include but is not limited to – additional required resources and trade services, required materials, site access requirements, work plan, site safety plan, installation plan, specifications and drawings, supervisor or manager guidance.
- 3.2 Install and terminate cabling required for the installation.
- Range may include but is not limited to – power, feeder, data, voice and equipment interconnection.
- 3.3 Conduct the earthing and weatherproofing of feeders, structures and equipment.
- 3.4 Install the wireless and weatherproof the grounding systems.
- 3.5 Manage the cables in accordance with customer requirements.
- Range may include but is not limited to – labelling, securing, cable tray, trunking, records.
- 3.6 Conduct the mechanical fixing practices in accordance with customer and manufacturer's specifications.
- Range may include but is not limited to – security, seismic resilience, fastening, appropriate work practices.

Outcome 4

Perform configuration routines of radio wireless hardware.

Performance criteria

- 4.1 Label equipment and complete as-built documentation and record the installation progress in accordance with company requirements.
- 4.2 Perform antenna alignment by selection and use appropriate test equipment.
- 4.3 Configure hardware using appropriate software for the radio wireless service or system.
- 4.4 Configure installed hardware in accordance with specification requirements.

Outcome 5

Perform testing and commissioning of wireless hardware.

Performance criteria

- 5.1 Select and use test equipment to perform commissioning testing of installed equipment and/or system.

Range may include but is not limited to – manufacturer's instructions, company procedure, client requirements, licencing conditions.
- 5.2 Select appropriate termination impedance for each required test.
- 5.3 Perform tests in a manner which does not impact on the performance of other working systems or equipment.
- 5.4 Compare test results against design specification to confirm performance within permitted tolerances and licencing conditions.

Outcome 6

Handover site to customer on completion of installation.

Performance criteria

- 6.1 Restore the site to customer expectations in accordance with specification requirements.

6.2 Hand over support materials to the customer in accordance with contract and company practice.

Range may include but is not limited to – as-built drawings, performance certification, test and commissioning results, maintenance material, product leaflet and instructions, testing instructions, troubleshooting guide, recording in electronic records system, product guarantee, producer statement, ESC, COC, documentation from other trades involved.

6.3 Provide system familiarisation and training as required.

6.4 Obtain customer acceptance of system operation.

6.5 Ensure completion of post job tasks in accordance with company practice.

Range may include but is not limited to – log and file information in relevant systems, complete customer reports as required, close out job tasks in record systems.

Planned review date	31 December 2026
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 November 2021	N/A

Consent and Moderation Requirements (CMR) reference	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council qualifications@waihanga.nz if you wish to suggest changes to the content of this unit standard.