

Install, test, commission, and maintain solar water heating systems

Level 4

Credits 7

Purpose This unit standard is for people who work in the plumbing industry.

People credited with this unit standard are able to: demonstrate knowledge of solar water heating systems; prepare for installation of solar water heating systems; install, commission, and test solar water heating systems; maintain solar water heating systems; work safely and with care; and demonstrate knowledge of regulatory requirements, selection of methods and materials, and underpinning concepts and principles, as applied to the installation, commissioning, testing, and maintenance of solar water heating systems.

Subfield Plumbing, Gasfitting and Drainlaying

Domain Plumbing

Status Registered

Status date 25 October 2007

Date version published 25 October 2007

Planned review date 31 December 2012

Entry information Prerequisites: Current plumbing certificate or licence as issued under the Plumbers, Gasfitters, and Drainlayers Act 2006; and Unit 21884, *Install and maintain roofing, rainwater handling, and cladding systems, and flashings*; or demonstrate equivalent knowledge and skills.

Accreditation Evaluation of documentation and visit by NZQA and industry.

Standard setting body (SSB) Plumbing, Gasfitting and Drainlaying ITO Ltd

Accreditation and Moderation Action Plan (AMAP) reference 0008

This AMAP can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Special notes

- 1 Legislation, standards, and codes applicable to this unit standard include but are not limited to:
Plumbers, Gasfitters, and Drainlayers Act 2006;
Health and Safety in Employment Act 1992;

Building Act 2004;
Plumbers, Gasfitters, and Drainlayers Regulations 1977;
AS/NZS 2712:2007 *Solar and heat pump water heaters – Design and Construction*;
and
AS/NZS 3500.4:2003 *Plumbing and drainage – Heated water services*; and
NZS 3604:1999 *Timber Framed Buildings*; and
NZS 5261:2003 *Gas installation*; all available at <http://www.standards.co.nz>;
New Zealand Building Code, Clause E1 Surface Water, Clause E2 External Moisture,
Clause G10 Piped Services, and Clause G12 Water Supplies, current versions and
any related compliance documents, available at <http://www.dbh.govt.nz>.
*Code of Practice for Manufacture and Installation of Solar Water Heating Systems in
New Zealand*, May 2003, available at
http://www.solarindustries.org.nz/info_solar.html#pub;
Any legislation, standard, or code superseding any of the above will apply, pending
review of this unit standard.

2 Range

Installation of at least two solar water heating systems covering – direct, indirect,
thermosiphon, pump.

3 This unit standard requires the application of theory as included in the Plumbers,
Gasfitters, and Drainlayers Regulations 1977. These Regulations are currently under
review to align them with the newer Plumbers, Gasfitters, and Drainlayers Act 2006.

4 Definitions

Job requirements refers to specific requirements of the job at hand not covered by
job specifications.

Job specifications, for the purpose of this unit standard, refers to instructions (oral,
written, graphic) and may include any of the following: manufacturers' instructions;
design drawing detail specifications; specifications from a specialist source such as
an architect, designer, engineer, or a supervisor; and site or work specific
requirements. Where job specifications are in conflict with applicable legislation,
standards, and/or codes, such legislation, standards, and/or codes shall take
precedence for the purpose of assessment.

Maintain may refer to all or any of – repair, upgrade, alter, remove.

Other services refers to any existing installed services.

Regulatory requirements, for the purpose of this unit standard, refers to applicable
legislation, standards, and codes.

Elements and performance criteria

Element 1

Demonstrate knowledge of solar water heating systems.

Performance criteria

- 1.1 Types of solar water heating systems are described in terms of their operation and components.
- Range operation – pump systems, thermosiphon systems, closed loop, open loop;
components – collector, tank, pump, controllers, pipework, valving.
- 1.2 Solar water heating systems are described in terms of loading support and fixing requirements.
- 1.3 Solar water heating systems are described in terms of penetration and weathertightness.

Element 2

Prepare for installation of solar water heating systems.

Performance criteria

- 2.1 Building consent is confirmed in accordance with job specifications.
- 2.2 Positioning, pipework layout, and structural and aesthetic requirements are confirmed in accordance with job specifications and customer requirements.
- 2.3 Height and lifting safety requirements are met in accordance with relevant legislation and codes.
- 2.4 Materials and equipment are prepared in accordance with job specifications and job requirements.

Element 3

Install, commission, and test solar water heating systems.

Performance criteria

- 3.1 Fixing and/or support are confirmed in accordance with job specifications.
- 3.2 Brackets and any other required fixing support are installed in accordance with job specifications.
- 3.3 Solar water heating systems are fixed in accordance with job specifications.

- 3.4 Penetration for pipes and/or wiring is made in accordance with job specifications.
- 3.5 Pipes are installed and connected as required and any wiring required is confirmed with other trade personnel as required, in accordance with job specifications.
- 3.6 Systems are commissioned and tested as required in accordance with relevant legislation, standards, and codes.
- 3.7 The customer is informed of operation and maintenance requirements in accordance with job specifications.
- 3.8 The installation meets requirements of the Building Act 2004.

Element 4

Maintain solar water heating systems.

Performance criteria

- 4.1 Installed solar water heating systems are assessed in accordance with maintenance requirements.
- 4.2 Faults are identified in terms of causes and means of rectification.
- 4.3 Faults are rectified in accordance with maintenance requirements, job specifications, and relevant standards and codes.

Element 5

Work safely and with care.

Performance criteria

- 5.1 Practical activities are carried out avoiding harm to people and damage to property, other services, materials, tools, and equipment.

Element 6

Demonstrate knowledge of regulatory requirements, selection of methods and materials, and underpinning concepts and principles, as applied to the installation, commissioning, testing, and maintenance of solar water heating systems.

Performance criteria

- 6.1 Applicable sections of legislation, standards, and codes are described in terms of their application to the installation, commissioning, testing, and maintenance of solar water heating systems.

- 6.2 Selection of methods and materials is justified.
- Range job specifications, job requirements, operation of the installed system and components.
- 6.3 Underpinning concepts and principles are explained in terms of their application to the installation, commissioning, testing, and maintenance of solar water heating systems.
- Range capillary attraction, corrosion, friction, heat transfer, point loading, seismic forces, structural support, thermosiphon, wind forces, wind loading.

Please note

Providers must be accredited by NZQA, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact the Plumbing, Gasfitting and Drainlaying ITO Ltd info@ito.co.nz if you wish to suggest changes to the content of this unit standard.