Title	**Demonstrate knowledge, and plan and install pipe-work and ducting for mechanical building services under supervision**		
Level	**3**	**Credits**	**7**

Purpose	This unit standard is intended primarily for use in the training of personnel in the mechanical building services industry and covers installation of pipe-work and ducting for mechanical building services. People credited with this unit standard are able to: demonstrate knowledge of pipe-work, ducting, and duct fittings used in mechanical building services; and evaluate, plan, and install duct and pipe-work at a worksite under supervision.

Classification	Mechanical Engineering > Heating, Ventilating, and Air Conditioning

Available grade	Achieved

Guidance Information

1 References and legislation
Health and Safety at Work Act 2015.
NZS 4219:2009, *Seismic performance of engineering systems in buildings*. Available at www.standards.govt.nz.
Sheet Metal & Air Conditioning Contractors' National Association (SMACNA), HVAC Duct Construction Standards. Edition 3, 2005. ISBN 9781617210303. Available at https://www.smacna.org/.

2 Definitions
Accepted industry practice refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.
Specifications refer to technical standards, documented operating and maintenance procedures or instructions for the system, installation drawings, schematics, manufacturers' data, installation instructions, installation programme schedules, material schedules, and site instructions.
Under supervision – under the guidance of a qualified and authorised mechanical building services person who is responsible for the actions of the candidate, their work output and quality.
Workplace procedures refer to 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, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of pipe-work used in mechanical building services.

Range pipe-work – steel pipe, plastic pipe, copper pipe.

Performance criteria

1.1 Pipe selection parameters are described.

Range application, wall thickness, pressure, temperature, nominal bore, material, cost, seismic, sizing.

1.2 Methods of joining are described with reference to principles and tools.

Range methods of joining – welding, brazing, plastic welding, cementing, threading, grooved fittings, compression fittings, flanged joints.

1.3 Methods of bending pipe are described with reference to principles and tools.

1.4 Pipe-work support and fixings are described.

Range examples are fixing to – timber, steel, concrete.

1.5 Effects of different conditions on pipe-work are identified and their treatment is described.

Range conditions – temperature variation, corrosion, freezing, seismic activity, acoustic isolation.

Outcome 2

Demonstrate knowledge of ducting and duct fittings used in mechanical building services.

Performance criteria

2.1 Duct selection parameters are described.

Range application, gauge thickness, operating pressure, material, nomenclature, size, seismic.

2.2 Methods of joining and strengthening are described with reference to principles and tools.

Range lock-forms, seams, seam-locks, flanges, cementing, cross-breaking, strengthening.

2.3 Duct support and fixings are described.

Range examples are fixing to – timber, steel, concrete.

2.4 Effects of different conditions on ducts are identified and their treatment is described.

Range conditions – temperature variation, corrosion, seismic activity.

Outcome 3

Evaluate, plan, and install duct and pipe-work at a worksite under supervision.

Performance criteria

3.1 Duct and pipe-work is evaluated, and installation is planned in accordance with specifications and supervisor's instructions.

Range may include but is not limited to – schematics, specifications, plans, bills of materials, work orders, safety requirements, permits, working at heights, confined space, tools and equipment, co-ordinating with other trades.

3.2 Duct and pipe work is installed in accordance with supervisor's instructions, specifications, accepted industry practice, and workplace procedures.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	16 July 2010	31 December 2022
Review	2	26 October 2017	31 December 2023
Review	3	1 November 2018	N/A

Consent and Moderation Requirements (CMR) reference	0013

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

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.