



Australian Government

MEM09211 Produce drawings or models for industrial piping

Release: 1

MEM09211 Produce drawings or models for industrial piping

Modification History

Release 1. Supersedes and is equivalent to MEM09211A Produce drawings or models for industrial piping.

Application

This unit of competency defines the skills and knowledge required to produce detailed, orthogonal, isometric and assembly drawings or models to Australian Standard (AS) 1100.101 Technical drawing - General principles. Critical dimensions and specifications are predetermined, and drawings or models are developed with or without the use of computer-aided design (CAD) systems.

This unit is suitable for those performing drafting work within industrial air conditioning or mechanical services industries preparing drawings for the installation of piping in commercial and industrial buildings or industrial applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

MEM09204 Produce basic engineering detail drawings

MEM09229 Read and interpret technical engineering drawings

Competency Field

Drawing, drafting and design

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine work requirements	1.1 Follow standard operating procedures (SOPs) and comply with work health and safety (WHS) requirements at all times 1.2 Determine purpose, scope and information requirements for drawing or model 1.3 Interpret available information relevant to work requirements, and identify and address further information needs 1.4 Identify and prepare equipment required to complete work

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.5 Apply relevant codes, standards and symbols used for pipe installation drawings or models 1.6 Identify and access organisational files, templates and symbols required for work 1.7 Identify environmental implications of inefficient systems and strategies for minimising impact
2. Analyse piping system components	2.1 Interpret piping and instrumentation diagrams and specifications 2.2 Identify required pipe fittings and flanges and their application 2.3 Identify required function and application of valves and auxiliary equipment 2.4 Identify required components for piping systems
3. Produce drawings or models for installation of industrial piping systems	3.1 Apply operating principles and specifications of piping systems and equipment to drawing or model 3.2 Detail pipes, valves and auxiliary equipment 3.3 Indicate vertical and horizontal offsets and hand wheel orientation 3.4 Apply WHS and environmental factors to drawing detail 3.5 Present drawing or model according to organisational requirements 3.6 Produce process flow, piping and instrumentation diagrams (P&ID) and isometric and spool drawings 3.7 Produce orthogonal single and double-line arrangement drawings of pipe installation systems in accordance with engineer's sketches 3.8 Prepare cutting lists from the arrangement and detail drawings
4. Complete drawing or model task	4.1 Confirm drawing or model accuracy and compliance with industry standard 4.2 File drawing in accordance with SOPs

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Available information includes one or more of the following:	• construction documents • building and coordination information • work specifications • information for plant services equipment • industry codes, standards and regulations • design brief.
Piping systems include one or more of the following:	• petrochemical • gas • hot and cold water • wine and juice.
Piping system fittings and components include one or more of the following:	• ball • stop • gate • angle • cocks • flanges • t-pieces • elbows • plugs • caps • unions • connectors • reducers.
Piping drawings include one or more of the following:	• standard shop details for pipe spools and pipe supports • standard shop drawings for layout and vendor equipment • single line and double line orthogonal arrangement drawings • transferring information from vendor equipment drawings to detail drawings • compiling cutting lists from arrangement and detail drawings.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM09211A Produce drawings or models for industrial piping.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM09211 Produce drawings or models for industrial piping

Modification History

Release 1. Supersedes and is equivalent to MEM09211A Produce drawings or models for industrial piping.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- determining purpose and scope for drawing or model requirements
- analysing piping system fittings and components for inclusion
- producing fully notated and detailed drawings for commercial or industrial piping systems on at least two occasions
- confirming work accurately reflects specifications
- documenting and storing work in accordance with SOPs.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures
- sources for information
- different approaches to drawing and modelling
- copyright and intellectual property issues and legislation in relation to drawing
- quality assurance procedures
- Australian standard specification of pipes, fittings and flanges
- standard valves and auxiliary equipment
- auxiliary equipment used in industrial piping
- principles of producing orthogonal and isometric piping drawings
- types of piping drawings
- types of pipe fittings and components
- different types of industrial pipe systems
- terminology associated with industrial piping systems
- environmental considerations.

Assessment Conditions

- Assessors must:
 - have vocational competency in producing drawings or models for industrial piping at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the Standards for Registered Training Organisations 2015 or its replacement and comply with the National Vocational Education and Training Regulator Act 2011, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>