



Australian Government

Department of Education, Employment and Workplace Relations

UEGNSG213A Construct, lay and connect a residential single point gas distribution service to a metal main

Release: 1

UEGNSG213A Construct, lay and connect a residential single point gas distribution service to a metal main

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This competency standard unit covers appropriate excavation bed preparation and the construction and laying of residential single point service and connection to a metal main. This includes the use of relevant tools and equipment, working safely using standard operating procedures, complying with relevant legislative requirements and completing necessary documentation. This competency standard unit excludes any steel welding.

Application of the Unit

Application of the Unit 2)

This competency standard shall apply to any basic and safe work site where Gas Industry operations occur. It could also apply, where applicable to other workplaces in the electricity supply industry (transmission and distribution and generation), the electrotechnology industry and the water industry, subject to all Occupational Health and Safety and duty of care requirements being met for the workplace.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit are not subject to licence regulation other than those directly

License to practice

3)

related to Occupational Health and Safety, gas/electricity/water industry safety and compliance, industrial relations, environmental protection, telecommunications, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limit the age at which a person can operate certain equipment.

Pre-Requisites

Prerequisite Unit(s)

4)

Competencies

4.1)

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed:

UEENEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEGNSG102B	Carry out work activities in a utilities industry work environment
UEGNSG104B	Comply with environmental policies and procedures
UEGNSG105B	Establish the work site
UEGNSG212A	Construct, lay and connect a residential single point gas distribution service to a plastic main
UEGNSG215A	Conduct excavations in the gas industry

Literacy and numeracy skills

4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3
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Employability Skills Information

Employability Skills 5)

This competency standard shall apply to any basic and safe work site where Gas Industry operations occur. It could also apply, where applicable to other workplaces in the electricity supply industry (transmission and distribution and generation), the electrotechnology industry and the water industry, subject to all Occupational Health and Safety and duty of care requirements being met for the workplace.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.
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Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to construct and lay a residential single point service to a metal main	1.1	Instructions for the preparation of the work activity are received and confirmed to ensure clear understanding
		1.2	OHS, environmental and sustainable energy policies and procedures are received and confirmed to ensure they are understood as to be applied in the carrying out of the work
		1.3	Equipment, plant, tools and personal protective equipment needed to construct and lay gas services are identified, scheduled and checked to ensure they work correctly as intended and are safe to use in accordance with established procedures

ELEMENT	PERFORMANCE CRITERIA
2 Carry out construction and laying of a residential single point service to a metal main	1.4 Appropriate persons are consulted to ensure the work is coordinated effectively with others involved
	1.5 Resources and materials needed to construct and lay gas services are confirmed, scheduled and obtained in accordance with established procedures
	1.6 Schedule of work including practices for working safely are confirmed in accordance with established procedures
	2.1 OHS policies and procedures and safe work practices required for constructing and laying gas services are followed to eliminate or minimise incidents and hazards
	2.2 Schedule of work is followed to ensure work is completed in an agreed time, to a quality standard and with a minimum of waste
	2.3 Operational knowledge for utilising correct and safe use of basic equipment and tools to perform work is confirmed to ensure completion in an agreed time and to a quality standard with a minimum of waste according to requirements and established procedures
	2.4 Further instructions are sought from appropriate persons for unplanned events or conditions occurring
	2.5 Excavation is prepared for laying of pipe according to appropriate standards and procedures
	2.6 Construction and laying of gas services are conducted according to appropriate standards and procedures
	2.7 Ongoing checks of quality of the work are undertaken in accordance with instructions and requirements

ELEMENT

PERFORMANCE CRITERIA

3	Complete construction and laying of a residential single point service to a metal main	3.1	Final checks including appropriate tests are performed to ensure the quality of the work in relation to completing the construction and laying of services complies with established procedures and to requirements
		3.2	Appropriate persons are notified of completion of the work
		3.3	Equipment and tools and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures
		3.4	Work area is cleaned up and made safe and sustainable energy practices are followed
		3.5	Appropriate documentation and records are updated in accordance with instructions and established procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices for carrying out work activities in a utilities industry work environment.

KS01- G213A Residential single point gas distribution service to a metal main

- G 2.2.12 Identify nylon or PVC pipeline, fittings and accessories
Evidence shall show an ability to identify the pipeline, fittings and accessories for nylon pipelines on a Gas Industry workplace, including:
- Characteristics of nylon or PVC pipeline, fittings and accessories
 - Nylon or PVC pipe sizes, range of fitting and accessories.

- Situations in which a nylon or PVC pipeline is used
- Appropriate selection of transition fittings and adaptors to other materials
- Benefits of using a nylon or PVC pipeline
- Material cost versus Installation savings
- Differentiate nylon or PVC from other materials
- Awareness of solvent properties and benefits of current solvent over earlier versions
- Read and interpret MSDS applying appropriate measures

G 2.2.13 Join nylon or PVC pipeline and fittings

Evidence shall show an ability to join nylon or PVC pipes and fittings for a nylon or PVC pipeline on a Gas Industry workplace, indicated by the following:

- Selection and use of equipment, tools and materials required for joining nylon or PVC pipe, pipeline and fittings
- Demonstrate function and use of equipment, tools and materials
- Follow safety requirements and procedures for cutting and joining nylon or PVC pipe
- Undertake cutting and tapping procedures for nylon or PVC pipe using a variety of methods
- Pressure testing procedures
- Understand jointing requirements under various conditions, inclement weather etc
- Demonstrate procedures and safety requirements for joining nylon or PVC pipe to other pipelines

G 2.2.15 Determine depth of nylon or PVC pipeline in ground

Evidence shall show an ability to determine the depth at which a pipe should be inserted in the ground for a gas distribution pipeline in a Gas Industry workplace, specifically:

- Identify depth of cover required for nylon or PVC pipeline in various locations
- Identify obstacles affecting minimum depth of cover for pipeline
- Develop solutions for dealing with obstacles affecting the depth of cover including transitioning to other approved materials and applying protection.

G 2.2.16 Install nylon or PVC pipe

Evidence shall show an understanding of the requirements to install nylon or PVC on Gas Industry pipelines, including:

- Application of Australian Standards and Gas Industry

- standards for installing nylon or PVC pipeline
- Conditions for direct installation or insertion of pipeline
- Procedures for installing nylon or PVC pipeline, trace wire and marker tape
- Procedures for terminating nylon or PVC pipeline
- Understand the procedures for installation of nylon or PVC pipeline under various conditions
- Static Electricity in gas pipes

G 2.2.17 Install PE pipeline, fittings and accessories

Evidence shall show an ability to install polyethylene pipelines, fittings and accessories in a Gas Industry workplace, including an understanding of:

- Differentiate PE from other materials
- Situations in which a PE pipeline is used
- Advantages and disadvantages of using a PE pipeline
- Suppliers specifications
- Appropriate selection of transition fittings and adaptors to other materials
- Various couplings & service connection tees
- Characteristics of PE HP, MP and LP pipeline, fittings and accessories
- Dimensions for series 2 pipe - Gas (SDR) from AS/NZS 4130
- PE pipe sizes, range of fitting and accessories eg differences between PE80 and PE100
- Allowable pipe damage
- Static Electricity in gas PE pipes
- Procedures for installing (including insertion, drilling and open cut method) PE pipeline, trace wire and marker tape
- Read and interpret MSDS applying appropriate measures

G 2.2.18 Join PE pipes and fittings

Evidence shall show an understanding of the requirements to join PE pipes and fittings for Gas Industry pipelines, indicated by the following:

- Identify environmental and safety hazards, assess risks and implement control measures
- Correct manual handling techniques
- Electrofusion safety requirements eg working in the rain
- Selection, purpose and use of equipment, tools and materials required for joining PE pipe, pipeline and fittings
- Pipe preparation
- Follow safety requirements and procedures for cutting

and joining PE pipe

- Demonstrate function and use of equipment, tools and materials
 - Butt Fusion equipment small & Large
 - Saddle fusion equipment
 - Electro fusion equipment
 - Socket Fusion equipment
- Procedures for joining pipe of differing thickness
- Cooling time for moving pipe, tapping a saddle and pressure testing
- Identify the difference between a compliant and non-compliant joint
- Undertake cutting and tapping procedures for PE pipe using a variety of methods
- Pressure testing procedures
- Understand jointing procedures under various conditions, inclement weather and conditions
- Demonstrate procedures and safety requirements for joining PE pipe to other pipelines

G 2.2.20 Identify cast iron pipe and fittings

Evidence shall show an understanding of the knowledge required to install cast iron pipelines, fittings and accessories in a Gas Industry workplace, indicated by the following:

- Characteristics of cast iron pipeline, pipe sizes
- Situations in which a cast iron pipeline is used
- Range of fittings and accessories for cast iron
- Cast iron lead & hemp joints and how they are constructed
- Appropriate selection of transition fittings and adaptors to other materials
- Advantages/disadvantages in using cast iron pipe
- Read and interpret MSDS applying appropriate measures

G 2.2.21 Work with cast iron pipe and fittings

Evidence shall show an understanding of the requirements to work with cast iron pipelines and fittings on a Gas Industry pipeline, indicated by the following:

- Identify environmental and safety hazards, assess risks and implement control measures
- Dangers of working with live gas
- Equipment, tools and materials required for working with cast iron pipelines
- Purpose and function of equipment, tools and materials
- Requirements of Australian Standards and gas industry

- standards for working with cast iron pipe and fittings
- Safety requirements and procedures for using equipment, tools and materials
- Procedures for joining cast iron pipeline to other pipeline

G 2.2.23 Install steel pipeline, fittings and accessories

Evidence shall show an understanding of the requirements to install steel pipelines, fittings and accessories in a Gas Industry workplace (distribution), indicated by the following:

- Identify environmental and safety hazards, assess risks and implement control measures
- Dangers of working with live gas
- Safety considerations when working on steel such as bonding leads and voltage testers
- Characteristics of steel pipeline, fittings and accessories
- Benefits of using a steel pipeline
- Steel pipe sizes, range of fitting and accessories.
- Situations in which a steel pipeline is used in the distribution network
- Appropriate selection of transition fittings and adaptors to other materials
- Handling/Storage
- Cleaning internally
- Differentiate steel from other materials
- Corrosion mitigation
- Insulated joints
- Welding specifications
- Pressure testing
- Read and interpret MSDS applying appropriate measures
- Coating types and repair

G 2.2.24 Work with steel pipeline and fittings

Evidence shall show an understanding of the requirements to work with steel pipelines and fittings on a Gas Industry pipeline (distribution), indicated by the following:

- Identify environmental and safety hazards, assess risks and implement control measures
- Dangers of working with live gas
- Requirements of Australian Standards and Gas Industry standards for working with steel pipe and fittings
- Equipment, tools and materials required for working with steel pipelines
- Purpose and function of equipment, tools and materials
- Pipe cutting methods
- Stop off equipment for steel

- Safety requirements and procedures for using equipment, tools and materials
- Coating types and repair

G 2.2.26 Determine depth of steel pipeline in ground

Evidence shall show an ability to undertake the measurement of the depth that the pipeline should be buried on a Gas Industry pipeline (distribution), indicated by the following:

- Depth of cover requirements - AS1697
- Identify depth of cover required for steel pipeline in various locations
- Identify obstacles affecting minimum depth of cover for pipeline
- Develop solutions for dealing with obstacles affecting the depth of cover including transitioning to other approved materials and applying protection
- Trench widths
- Bedding requirements
- Support of steel pipe
- Backfilling requirements
- Reinstatement

G 2.2.27 Identify copper pipeline, fittings and accessories (only required in jurisdictions that have copper services)

Evidence shall show an understanding of the processes required to identify copper pipeline, fittings and accessories on a Gas Industry pipeline, indicated by the following:

- Characteristics of copper pipeline, fittings and accessories
- Copper pipe sizes, range of fitting and accessories.
- Situations in which a copper pipeline is used
- Appropriate selection of transition fittings and adaptors to other materials
- Differentiate copper from other materials
- Read and interpret MSDS applying appropriate measures

G 2.2.28 Bend and join copper pipeline and fittings (only required in jurisdictions that have copper services)

Evidence shall show an ability to bend and join copper pipe and fittings for a Gas Industry pipeline, indicated by the following:

- Equipment, tools and materials required for joining copper pipeline and fittings
- Purpose and function of equipment, tools and materials
- Safety requirements and procedures for cutting and joining copper pipeline including mechanical and

soldered or welded joints

- Procedures for cutting and tapping copper pipeline
- Procedures for pressure testing a pipeline
- Procedures and safety requirements for joining copper pipeline to other pipeline
- Procedures for joining copper pipeline

G 2.2.30 Determine depth of copper pipeline in ground (only required in jurisdictions that have copper services)

Evidence shall show an ability to determine the appropriate depth that copper pipe should be laid in a trench for a Gas Industry pipeline, indicated by the following:

- Depth of cover requirements - AS1697
- Identify depth of cover required for copper pipeline in various locations
- Identify obstacles affecting minimum depth of cover for pipeline
- Develop solutions for dealing with obstacles affecting the depth of cover including transitioning to other approved materials and applying protection
- Trench widths
- Bedding requirements
- Support of copper pipe
- Backfilling requirements
- Reinstatement

Evidence Guide

EVIDENCE GUIDE

9) The Evidence Guide forms an integral part of this Unit and shall be used in conjunction with all components parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment

is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with industry and regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included in the Assessment Guidelines of this Training Package.

**Critical aspects
of evidence
required to
demonstrate
competency in
this unit**

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines — UEG11'. Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and range
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment
 - Demonstrate an appropriate level of skills enabling employment
 - Conduct work observing the relevant Anti discrimination legislation, regulations, policies and workplace procedures
- Demonstrate performance across a representative range of contexts from the prescribed items below:

Complete Groups A & B, Complete at least one from Group from C & D, Complete Groups E, F, G, H, I.

Range of tools/equipment/procedures/workplace		
Group No	The minimum number of items on which skill is to be demonstrated	Item List
A	All	Complete risk assessment/JSA Interpret technical drawings and symbols Isolate, vent and purge gas services Operation of gas detector Emergency response procedures
B	All	Practical application of AS4645.3 'gas distribution networks plastics pipe

		systems'
C	At least 3	Nylon (Polyamide) pipeline laying techniques Nylon gluing Connection of Nylon to other materials UPVC pipeline laying techniques UPVC solvent cemented joints UPVC moulded joints UPVC compression couplings or flanges Connection of UPVC to other materials Connection of copper to other materials Silver brazing Copper bending
D	At least 4	PE pipeline laying techniques PE Electrofusion PE Butt Fusion Compression couplings or flanges Connection of PE to other materials
E	At least 2	Steel pipeline coating repair Steel pipeline coating testing Steel field joint coating
F	At least 3	Connection of steel to other materials Sleeve application Clamp application Working knowledge of AS1697 'Installation and maintenance of steel pipe systems for gas'
G	All	Work utilising relevant OHS legislation, regulations, codes of

		practice, policies and procedures Working knowledge of AS2865 relevant confined compliance code
H	All	Install services in accordance with procedures and with minimum impact on landscaping Connect and test services
I	At least one occasion	Deal with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

Context of and specific resources for assessment 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this Unit.
- Appropriate environmental regulation and work practices.
- Appropriate organisational requirements.
- Appropriate work environment, equipment and tools.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency in constructing and laying a distribution gas service to a metal main.

Assessment of this competency must also be undertaken in either an actual workplace or under a simulated work environment.

Assessment must also integrate the key competencies.

**Method of
assessment**

9.4)

This Unit shall be assessed by methods given in Volume 1 Part 3 'Assessment Guidelines'.

Note: Competent performance with inherent safe working practices is expected in the Industry to which this Unit applies. This requires that the specified Essential Knowledge and Associated Skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the Essential Knowledge and Associated Skills described in this unit.

**Concurrent
assessment and
relationship with
other units**

9.5)

There are no recommended concurrent assessments with this unit, however in some cases efficiencies may be gained in terms of learning and assessment effort being concurrently managed with allied Units where listed.

UEGNSG102B Carry out work activities in a utilities industry work environment

UEENEEE101 Apply Occupational Health and Safety regulations, codes and practices in the workplace
A

UEGNSG104B Comply with environmental policies and procedures

UEGNSG105B Establish the work site

UEGNSG215 Conduct excavations in the gas industry
A

UEGNSG212 Construct, lay and connect a residential single point gas distribution service to a plastic main
A

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Unit shall/may be demonstrated in relation to carrying out work activities in a utilities industry work environment.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section of this volume and form an integral part of the Range Statement of this unit:

Services (2)

Appropriate persons (2)

Materials (2)

Tools and equipment (2)

Safe working procedures (2)

Legislative requirements (2)

Standards

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Distribution discipline.