



Australian Government

Department of Education, Employment and Workplace Relations

RIICTT303A Control micro tunnelling and pipe-jacking

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers the conduct of micro-tunnelling and pipe-jacking in civil construction. It includes the planning and preparing for operations, checking equipment, driving the bore and cleaning up when undertaking micro-tunnelling and pipe-jacking activities associated with horizontal directional drilling.

Application of the Unit

This unit includes pipe-jacking systems, micro-tunnelling systems, jacking frames, pipes, lubrication and shafts for boring under roadways, railways, and footpaths. Micro-tunnelling includes laser guidance, remote controlled, steerable, controlled evacuation tunnelling methods for pipelines of one metre diameter or less and up to lengths of two hundred metres. Pipe-jacking is used to aid spoil removal and includes removal by auger, slurry conversion or vacuum extraction.

The unit is appropriate for those working in operational roles, at worksites within:

- Civil Construction

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare	1.1. Access, interpret and apply compliance documentation relevant to the work activity 1.2. Obtain, confirm and apply work instructions, including plans, specifications, quality requirements and operational details to the allotted task 1.3. Obtain and confirm safety requirements from the site safety plan and organisational policies and procedures, and apply to the allotted task 1.4. Identify, obtain and implement signage requirements from the project traffic management plan 1.5. Ensure plant, tools and equipment selected to carry out tasks are consistent with the requirements of the job, check for serviceability and rectify or report any faults 1.6. Identify and confirm environmental protection requirements from the project environmental management plan, and apply to the allotted task
2. Prepare for boring operations	2.1. Determine location, alignment direction, level and grade of bore from drawings and specifications 2.2. Use above and below ground survey instruments to determine the bore pathway for underground vertical and horizontal alignment 2.3. Conduct visual geological investigation of alignment to determine the differing soil types and groundwater conditions 2.4. Select bore head and drilling fluid for the strata 2.5. Position, anchor/stake down boring equipment in accordance with manufacturer's and/or site requirements
3. Conduct equipment checks	3.1. Identify and apply safety requirements 3.2. Carry out start-up, shutdown and communication procedures 3.3. Check equipment controls and functions,

	including implements or other attachments, anchors and/or stabilising equipment for serviceability and report faults 3.4. Conduct inspection and fault finding in accordance with manufacturer's specifications and/or site requirements 3.5. Carry out equipment maintenance tasks regularly
4. Drive bore hole	4.1. Construct launch and receiving pits to specifications to accommodate bore rig and tools 4.2. Identify and implement trench collapse prevention for launch and receiving pits 4.3. Establish thrust wall to specific design in accordance with pipe size and soil characteristics 4.4. Determine traverse line of pilot hole to receiving pit in accordance with plans and specifications 4.5. Confirm traverse line of pilot hole to receiving pit at specified distances 4.6. Collect and dispose spoil in accordance with job specifications 4.7. Select and attach augers to drilling machine in accordance with design specifications 4.8. Jack through casings/pipes to receiving pit in compliance with design specifications 4.9. Monitor equipment for continuity of production in varied site conditions
5. Clean up	5.1. Clear work area and dispose of or recycle materials in accordance with project environmental management plan 5.2. Clean, check, maintain and store plant, tools and equipment

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Specific skills are required to achieve the performance criteria in this unit, particularly for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to conduct micro-tunnelling and pipe-jacking:

- apply legislative, organisation and site requirements and procedures
- apply equipment operational requirements and procedures
- apply site and equipment safety requirements
- use drilling fluids
- apply categories of horizontal directional drilling
- use laser control equipment
- apply manual handling
- apply electronic cable locating devices
- apply slinging procedures
- interpret engineering drawings, plans and specifications
- identify equipment types, characteristics, technical capabilities and limitations
- apply operational, maintenance and basic diagnostic procedures
- apply site isolation and traffic control responsibilities
- apply materials safety data sheets and materials handling methods
- apply project quality requirements
- apply JSA's/safe work method statement

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following, as required to conduct micro-tunnelling and pipe-jacking:

- site and equipment safety requirements
- drilling fluids
- categories of horizontal directional drilling
- laser control equipment
- manual handling
- confined space entry
- electronic cable locating devices
- slinging procedures
- processes for interpreting engineering drawings
- equipment types, characteristics, technical capabilities and limitations
- operational, maintenance and basic diagnostic procedures

- site isolation and traffic control responsibilities and authorities
- materials safety data sheets and materials handling methods
- project quality requirements
- civil construction terminology
- micro-tunnelling and pipe-jacking requirements and procedures
- apply JSA's/safe work method statement

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following: • knowledge of the requirements, procedures and instructions for the conduct of micro-tunnelling and pipe-jacking • implementation of requirements, procedures and techniques for the safe, effective and efficient completion of at least 50 metres micro-tunnelling and pipe-jacking • working with others to undertake and complete micro-tunnelling and pipe-jacking that meets all of the required outcomes • consistent timely completion of micro-tunnelling and pipe-jacking that safely, effectively and efficiently meets the required outcomes
Context of and specific resources for assessment	• This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate cultural diversity. • Aboriginal people and other people from a non

	English speaking background may have second language issues. • Assessment of this competency requires typical resources normally used in the work environment. Selection and use of resources for particular worksites may differ due to site circumstances. • Where applicable, physical resources should include equipment modified for people with disabilities. • Access must be provided to appropriate learning and/or assessment support when required.
Method of assessment	This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods: • written and/or oral assessment of the candidate's required knowledge • observed, documented and/or first hand testimonial evidence of the candidate's: • implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes • consistently achieving the required outcomes • first hand testimonial evidence of the candidate's: • working with others to undertake and complete micro-tunnelling and pipe-jacking
Guidance information for assessment	Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant compliance documentation may include:	• legislative, organisational and site requirements and procedures • manufacturer's guidelines and specifications • Australian standards • code of practice • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
Pipe-jacking pipes may include:	• steel • hobar • clay • concrete pipes
Signage may include:	• site safety signage • temporary signage for the benefit of motorists and pedestrians • barricades • traffic conditions signage
Tools and equipment may include:	• micro-tunnelling and pipe-jacking equipment • pumps • compressors • hoses • tape measures • marking equipment • crow bars • spanners • adjustable • wrenches • shovels • picks • hammers (sledge/hand) • string lines • spirit levels • dumpy levels

	• theodolites • brooms • hacksaws • hand saws • electronic tracking devices • slings and cranes
Environmental protection requirements may include:	• organisational/project environmental management plan • waste management • water quality protection • noise • vibration • dust • clean-up management

Unit Sector(s)

Trenchless Technology

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.