



Australian Government

Department of Education, Employment and Workplace Relations

RIINHB323A Conduct horizontal directional drilling

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers conducting horizontal directional drilling in the civil construction and drilling industries. It includes: planning and preparing for drilling; boring pilot holes; maintaining equipment; and responding to problems.

Application of the Unit

This unit covers horizontal directional drilling such as might be undertaken for long holes or holes under rivers, lagoons etc, or large diameter bores in hard rock or other difficult geology. The directionally drilled hole may subsequently be reamed and have product pipe installed. This unit is appropriate for those working in driller's roles, at worksites within:

- Civil Construction
- Drilling

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 for drilling	1.1. Access, interpret and apply compliance documentation relevant to horizontal directional drilling work activity 1.2. Obtain, confirm and apply work instructions for the allocated task 1.3. Identify, manage and report all potential hazards 1.4. Resolve coordination requirements with others at the site prior to commencing and during work activities 1.5. Wear all necessary personal protective equipment and protective clothing
2. Bore pilot hole	2.1. Select appropriate cutting tool and drilling rig/components 2.2. Confirm that all preliminary and safety checks have been done 2.3. Fit locating device to drill head and attach drill head to drill stem 2.4. Align drilling head with survey tool and survey control system 2.5. Drill pilot hole according to design alignment 2.6. Monitor drill path ensuring pilot hole meets conformance envelope and dogleg severity is within limits 2.7. Add drill stem sections as required 2.8. Steer drill head to achieve required pitch and direction 2.9. Monitor and interpret all gauge/dial readings 2.10. Monitor and interpret drill fluid return and drill spoil 2.11. Monitor and interpret drill head position and pitch 2.12. Maintain communication with all relevant personnel 2.13. Maintain drill log and reports as required
3. Maintain equipment	3.1. Monitor wear on drill stem, particularly threads

	3.2. Carry out procedures to <i>maintain</i> down hole <i>equipment</i> 3.3. Dress damaged threads or replace drill stem as required 3.4. Check all equipment and hoses 3.5. Monitor wear on drill heads and take required action 3.6. Clean all equipment on completion of bore, ensuring environmental controls are followed 3.7. Ensure drill fluid is appropriately contained/disposed of 3.8. Keep site safe for all possible users for the total duration of the job 3.9. Leave site in a safe and tidy condition which complies with all relevant regulations
4. Respond to problems	4.1. Identify possible <i>problems</i> in equipment or process 4.2. Determine problems needing action 4.3. Determine possible fault causes 4.4. Rectify problem using appropriate solution within area of responsibility 4.5. Follow through items initiated until final resolution has occurred 4.6. Report problems outside area of responsibility to designated person

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 horizontal directional drilling:

- apply legislative, organisation and site requirements and procedures
- apply machine operating techniques
- apply directional drilling equipment operating techniques
- apply ancillary equipment operating techniques, for equipment such as communications equipment, locators and fluid mixers
- maintain down hole equipment

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 horizontal directional drilling:

- basic rock/geology types and their impact on HDD operations
- appropriate drill heads for different geology types
- appropriate back reamers for different geology types
- minimum radius of curvature for drill stem and for different products
- methods of steering or tracking the drill head
- principles of horizontal directional drilling
- types of drill fluid, their uses and make up/adjustment procedures
- relevant state regulations/codes, such as NSW WorkCover *code of practice for excavation* and similar requirements in other states

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 conducting horizontal directional drilling • implementation of requirements, procedures and techniques for the safe, effective and efficient completion of conducting horizontal directional drilling • working with others to undertake and complete the horizontal directional drilling that meets all of the required outcomes • consistent timely completion of horizontal directional drilling 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 horizontal directional drilling operations
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
Work instructions may come from briefings, handovers, plans and work orders and may be written or verbal, formal or informal and may include:	• nature and scope of tasks • specifications • quality of finished works • achievement targets • operational conditions • obtaining of permits required • site layout • out of bounds areas • worksite inspection requirements • lighting conditions, • plant or equipment defects • hazards and potential hazards • coordination requirements or issues • contamination control requirements • environmental control requirements • barricade and signage requirements
Hazards may include:	• buried utilities in path of bore • electrical strike • spread of contaminants as a result of drilling or cleaning processes • working in proximity to drilling rig • use of high pressure air for drilling operations • entanglement in rotating pipes
Coordination requirements may include:	• drillers assistant operators • maintenance personnel

	• supervisors • site personnel
Personal protective equipment includes:	• steel-capped boots and hardhat • gloves • dust mask • eye and hearing protection • general protective and reflective clothing
Fluids may include:	• bentonite clay • polymer • combination of clay and polymer mud • pH adjusting agents such as soda ash
Maintenance tasks may include:	• checking threads with thread gauge • dressing threads • lubricating threads and other components • cleaning all equipment and checking for wear and damage • disassembling, cleaning, inspecting and reassembling cutting heads or directional drilling equipment
Equipment can be:	• dual rod directional boring equipment • down hole fluid assisted directional boring equipment • directional down hole hammers • deflection and jetting bits • rotating nozzle water jet drilling equipment • bent sub systems • other down hole cutting tools
Problems may include:	• buried utilities in path of bore, which could include: • electrical power lines (overhead or buried) • gas pipes • water pipes • waste pipes (including stormwater, trade waste and sewerage) • telephone cables • electrical strike • changing geological formations, particularly cobble, rock or unstable/porous formation • drill string sticking • drill string breaking • fluid breakout (to surface or cavities/services in proximity)

	• reliable communications with assistant(s) • loss of sensor information • selection of best drill head and back reamer
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Unit Sector(s)

Drilling (General)

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.