Australian Government

RIINHB323X Conduct horizontal directional drilling

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Release: 1

RIINHB323X Conduct horizontal directional drilling

Modification History

Release	Comments
1	This unit of competency was first released in RII Resources and Infrastructure Industry Training Package Release 13.0.

Application

This unit describes the skills and knowledge required to conduct horizontal directional drilling to bore a pilot hole in the civil construction and drilling sectors.

It includes planning and preparing for drilling, setting up the drilling rig and drill head, boring and steering the pilot hole to design alignment, maintaining equipment and completing housekeeping, and responding to problems.

This unit applies to those working in driller roles who conduct horizontal directional drilling operations.

Licensing/Regulatory Information

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

Pre-requisite unit(s)

No pre-requisite units

Competency field(s)

N/A

Unit sector(s)

Civil construction

Drilling

Elements and Performance Criteria

1. Plan and prepare for horizontal directional drilling	1.1 Access, interpret and apply horizontal directional drilling documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret, clarify and confirm work requirements

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	1.3 Identify and address potential risks, hazards and environmental issues and implement control measures according to workplace procedures 1.4 Select and wear personal protective equipment appropriate for work activities 1.5 Communicate and coordinate activities with others throughout the work activity according to work requirements 1.6 Obtain and interpret emergency procedures, and be prepared for fire/accident/emergency
2. Set up drilling rig and drill head	2.1 Select cutting tool, drilling rig and components to suit ground conditions and bore design according to manufacturer specifications 2.2 Carry out pre-start and start-up procedures, and apply rig operational controls according to manufacturer specifications and workplace procedures 2.3 Fit locating device to drill head, attach drill head to drill stem, and align with survey tool and survey control system according to manufacturer specifications
3. Bore pilot hole	3.1 Drill pilot hole to design alignment, adding drill stem sections according to manufacturer specifications 3.2 Steer drill head to achieve required pitch and direction to suit design alignment and ground conditions 3.3 Monitor drill head position, pitch and drill path to confirm pilot hole remains within conformance envelope and dogleg severity limits 3.4 Interpret gauge readings, drill fluid return and drill spoil to determine conditions at the drill head according to workplace procedures 3.5 Maintain drill log and reports according to workplace procedures
4. Complete equipment maintenance and housekeeping	4.1 Carry out shutdown and secure equipment according to manufacturer specifications and workplace procedures 4.2 Monitor wear on drill stem and threads, and on drill heads, against wear limits and take required action according to manufacturer specifications 4.3 Carry out procedures to maintain down hole equipment according to manufacturer specifications 4.4 Dress damaged threads or replace drill stem as required according to manufacturer specifications

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	4.5 Check all equipment and hoses according to manufacturer specifications 4.6 Clean all equipment on completion of bore, ensuring environmental controls are followed, according to workplace procedures 4.7 Confirm drill fluid is contained and disposed of according to workplace procedures 4.8 Confirm housekeeping activities are completed according to workplace procedures 4.9 Process records according to workplace procedures
5. Respond to problems	5.1 Identify possible problems in equipment or process according to workplace procedures 5.2 Determine possible causes of problems and action required according to workplace procedures 5.3 Rectify problems within area of responsibility and follow through until final resolution has occurred according to workplace procedures 5.4 Report problems outside area of responsibility to designated person according to workplace procedures

Range of conditions

N/A

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Assessment Requirements for RIINHB323X Conduct horizontal directional drilling

Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements and performance criteria of this unit, including evidence of the ability to:

- conduct horizontal directional drilling to complete at least two pilot bores, including:
    - planning each bore from site documentation and work requirements, and coordinating with others throughout
    - setting up the rig and drill head to suit the bore design and ground conditions
    - steering the bore and adjusting drilling parameters in response to changing ground conditions to keep the bore path within design tolerances
    - recording ground conditions, drilling parameters and changes made in the drill log

During the above, the candidate must:

- locate and apply relevant documentation, policies and procedures
- implement the requirements, procedures and techniques for the safe, effective and efficient completion of conducting horizontal directional drilling including:
    - applying rig operating techniques
    - operating ancillary equipment
    - maintaining down hole equipment
- work effectively with others to undertake and complete the horizontal directional drilling that meets all of the required outcomes including:
    - complying with written and verbal reporting requirements and procedures
    - communicating clearly and concisely with others to receive and clarify work instructions
    - communicating clearly and concisely with others to resolve coordination requirements prior to commencing and during work activities

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements and performance criteria of this unit, including knowledge of:

- workplace procedures and requirements for:
    - work health and safety, including personal protective equipment and emergency response
    - environmental protection, including drill fluid containment and disposal

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    - rig operation
    - housekeeping and records
- ground and geology types and how they affect cutting tool selection, steerability and bore stability
- principles of steering and tracking a drill head, including how position and pitch are determined
- purpose of the conformance envelope and dogleg severity limits, and the consequences of exceeding them for the drill stem and the product to be installed
- common causes and consequences of departure from the design alignment, including risks to adjacent services and structures
- types of drill fluid, and how ground and water conditions affect fluid selection and adjustment
- functions of drill fluid in a pilot bore, and what changes in gauge readings, fluid return and drill spoil indicate about conditions at the drill head
- how drill fluid flow removes cuttings from the bore, and the consequences of inadequate bore cleaning, including increased drag and stuck drill string
- causes and consequences of drill fluid escaping to the surface
- wear limits for drill stem, threads and drill heads, and maintenance requirements for down hole equipment
- common equipment and process problems, their likely causes, and the limits of own area of responsibility

Assessment Conditions

The assessment must:

- include access to:
    - personal protective equipment
    - equipment required to conduct horizontal directional drilling operations
    - workplace documentation such as, drill plans, site plans and procedures, manufacturer instructions and safety data sheets
- be conducted in a safe environment
- be assessed in the context of this sector's work environment
- be assessed in compliance with relevant legislation/regulation and using policies, procedures and processes directly related to the industry sector for which it is being assessed
- confirm consistent performance can be applied in a range of relevant workplace circumstances.

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Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated work environment* provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

*Guidance on simulated environments has been stipulated in the RII Companion Volume Implementation Guide.

Industry Experts

An industry expert engaged by an RTO to wholly or partially conduct assessment, independently or together with another assessor, or be involved in an assessment judgement, must also satisfy the assessor requirements in applicable vocational education and training legislation, frameworks and/or standards.

Assessors and industry experts delivering training in the drilling industry sector must also have a minimum of three (3) years industry experience, directly relevant to the training and assessment being provided.

Mandatory Workplace Requirements

Assessment of performance evidence may be in a workplace setting or an environment that accurately represents a real workplace.

Unit Mapping Information

Previous Code and Title	Equivalence	Comments
RIINHB323D Conduct horizontal directional drilling	Equivalent	Updates to application, elements and performance criteria, performance and knowledge evidence, and assessment conditions

Links

Companion volumes, including implementation guides, are found on the national training register - https://training.gov.au/training/details/RII.

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