Australian Government

RIINHB315X Conduct top hammer drilling

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Release: 1

RIINHB315X Conduct top hammer 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 top hammer drilling operations in drilling and related resources and infrastructure work environments. It applies to operators working with top hammer drills, who work within site, manufacturer and authorisation requirements, maintain situational awareness and adjust drilling techniques in response to changing ground and operating conditions.

This unit does not apply to down hammer or reverse circulation (RC) drilling.

Licensing/Regulatory Information

Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of this unit.

Pre-requisite unit(s)

No pre-requisite units

Competency field(s)

N/A

Unit sector(s)

Drilling

Elements and Performance Criteria

1. Plan and prepare for top hammer drilling	1.1 Access, review and apply drilling documentation, work instructions and site procedures, and confirm the work activity is compliant 1.2 Inspect and prepare work area according to site requirements

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	1.3 Identify, assess, manage and report hazards, risks and environmental conditions and implement required control measures 1.4 Confirm emergency procedures and exclusion zones according to site requirements 1.5 Select, inspect and wear personal protective equipment according to site requirements 1.6 Coordinate work activities with relevant personnel and confirm required briefing, and handover information is communicated and understood
2. Verify and establish drilling requirements	2.1 Conduct pre-start inspection and start up operational checks in accordance with manufacturer specifications and site requirements 2.2 Position, level and stabilise the drill according to manufacturer specifications and workplace procedures 2.3 Use drill onboard systems to confirm drilling information and operating parameters, where fitted 2.4 Review and confirm rod type, thread form, drill string components and bit to suit hole design and ground conditions, and confirm thread compatibility and make-up requirements, according to manufacturer specifications 2.5 Use rod handling equipment according to manufacturer specifications and workplace procedures
3. Conduct top hammer drilling	3.1 Collar hole to meet parameters of drill plan and according to manufacturer specifications 3.2 Add and remove drill rods and top hammer equipment according to manufacturer specifications 3.3 Monitor and adjust drilling parameters to ground conditions and maintain required penetration rate according to manufacturer specifications 3.4 Measure and verify hole depths are within tolerance according to manufacturer specifications and drilling plan 3.5 Apply dust suppression and hole-cleaning methods appropriate to drilling conditions and site requirements 3.6 Identify and respond to abnormal drilling conditions and emergencies within scope of own responsibility

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	3.7 Complete drill hole according to required depth, location and specifications, conduct required quality checks and protect the hole 3.8 Record completed drill hole information using approved recording method
4 Carry out post-operational procedures	4.1 Carry out shutdown drill procedures and secure equipment according to manufacturer specifications and site requirements 4.2 Carry out serviceability checks, cleaning and housekeeping according to scope of own role, environmental requirements and site procedures 4.3 Complete record keeping and reporting requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit and are described below to support training and assessment.

SKILL	DESCRIPTION
Reading	Interpret drilling documentation, work instructions, manufacturer specifications, site procedures, onboard system information, alarms and equipment records.
Numeracy	Measure bits and drill-string components, calculate hole depth, interpret hole dimensions, angles, tolerances, pressures, flow rates, temperatures and drilling parameters.
Oral communication	Receive and clarify instructions, coordinate drill movements and interactions, communicate hazards and drilling conditions, report faults and complete shift handovers.
Digital literacy	Navigate onboard systems, positioning, navigation, drill-guidance.
Problem solving	Interpret changes in drilling response, ground conditions, returns, pressures, vibration and equipment condition and determine authorised corrective action.
Self-management	Monitor hazards, maintain situational awareness, follow exclusion and line-of-fire controls, and remain within operating, training and authorisation limits.

Range of conditions

N/A

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Assessment Requirements for RIINHB315X Conduct top hammer drilling

Performance Evidence

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

- conduct top hammer drilling on at least two occasions, one of which must require the candidate to make adjustments within authorised limits in response to changing ground or hole conditions.

During the above, the candidate must:

- locate and apply relevant work documentation, policies and procedures to confirm the selected top hammer drilling method and equipment configuration is appropriate to the work activity
- identify and manage hazards, risks and emergency situations, including selecting and wearing personal protective equipment
- prepare, monitor or use drilling fluids as required to control dust and maintain hole conditions
- monitor the drilling operation, identify and respond to abnormal drilling conditions within scope of own responsibility, and report according to workplace procedures
- complete shutdown, serviceability checks, housekeeping and record-keeping requirements on completion of drilling activities
- communicate and coordinate effectively with others throughout the work activity, including reporting discrepancies between approved drilling information and physical work area conditions.

Knowledge Evidence

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

- key legislation, procedures, documentation and site requirements for top hammer drilling operations, including:
    - environmental
    - housekeeping
    - operating drill rig
    - personal protective equipment selection, inspection and use
- work, health and safety (WHS) requirements, including statutory regulations, codes and standards relevant to top hammer drilling

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- the scope of top hammer drilling and its distinction from down-hole hammer and reverse circulation (RC) drilling methods
- purpose of isolation, test for dead, pre-start, start-up, park-up and shutdown procedures, and the consequences of not following site procedures and manufacturer specifications
- principles and techniques for:
    - rattling out drill rods, drill bits and drill string components
    - selecting, matching and maintaining drill string, thread and bit components, including:
        - wear limits on pipe and threads
        - bit selection and measurement to suit ground conditions
        - the consequences of incorrect matching, torque, wear or bit selection for drill string integrity and drilling performance
    - positioning, levelling, stabilising and operating the drill, including:
        - the use of onboard systems
        - how percussive action, feed pressure and rotation rate affect penetration rate and bit life
        - monitoring gauges, pressures, flow rates and temperatures, and interpreting deviations as indicators of conditions at the bit
    - collaring, drilling and completing a hole to specification, including:
        - hole alignment
        - confirming completed hole depth, location and condition against required specifications
    - air, flushing and fluid, including:
        - how air pressure, volume and hole and rod diameter affect chip removal and sample recovery
        - the selection and use of drilling and dust control fluids
- indicators of changing ground and drilling conditions and their effect on drilling parameters and sample quality, including:
    - air return
    - colour
    - chip size
    - ground water
    - penetration rate
- causes of blockages in the hole and sample delivery systems, clearing methods and associated hazards, and hose restraint device requirements for pressure and sample delivery hoses

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- indicators that drilling must stop, and the criteria for determining a condition cannot be safely or effectively rectified within scope of own responsibility
- emergency response procedures for fire, accident and other emergency situations

Assessment Conditions

The assessment must:

- include access to:
    - personal protective equipment
    - equipment required to conduct top hammer drilling operations
    - workplace documentation, including drill plans, site 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.

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.

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Unit Mapping Information

Previous Code and Title	Equivalence	Comments
RIINHB315D Conduct top-hole hammer 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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