Australian Government

RIINHB312X Conduct raise boring

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Release: 1

RIINHB312X Conduct raise boring

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 raise boring in metalliferous mining and drilling. It includes planning and preparing for raise boring, locating the collar and drilling the pilot hole, monitoring pilot hole progress and break-through, reaming the raise bore, responding to operational problems, and completing equipment maintenance and housekeeping.

This unit is appropriate for raise bore operators and drillers working in operational roles who set up and operate raise boring rigs to establish raises in underground mining environments, interpreting drill plans and ground conditions to adjust drilling and reaming techniques.

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)

Drilling

Metalliferous mining

Elements and Performance Criteria

1. Plan and prepare for raise boring	1.1 Access, interpret and apply raise boring 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 Inspect and assess site conditions to identify and manage possible scaling requirements and misfires according to workplace procedures 1.6 Communicate and coordinate activities with others throughout the work activity according to work requirements 1.7 Obtain and interpret emergency procedures, and be prepared for fire/accident/emergency
2. Locate collar and drill pilot hole	2.1 Carry out pre-start and start up procedures according to manufacturer specifications and workplace procedures 2.2 Identify, select and apply rig operational controls according to work requirements and manufacturer specifications 2.3 Inspect and assemble collaring starter equipment according to manufacturer specifications 2.4 Install dust suppression and extraction systems according to manufacturer specifications and workplace procedures 2.5 Confirm and set drill direction accurately and collar hole as specified in the drill plan 2.6 Install assemblies in collared hole to allow pilot hole drilling according to manufacturer specifications
3. Drill and monitor progress of pilot hole	3.1 Continually monitor hazards and risks, and ensure safety of self, other personnel, plant and equipment according to workplace procedures 3.2 Interpret drill plans and drill holes to design 3.3 Operate equipment within working environment limitations and ground conditions according to manufacturer specifications and workplace procedures 3.4 Monitor ground conditions and adjust drilling techniques and components to maintain required drilling progress according to manufacturer specifications 3.5 Monitor drilling progress using equipment indicators according to workplace procedures 3.6 Carry out and monitor drill break-through procedures and inspect break through according to workplace procedures

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	3.7 Remove housing assemblies according to manufacturer specifications
4. Ream raise bore	4.1 Coordinate personnel to attach the reaming head to drill string according to workplace procedures 4.2 Coordinate removal of raise bore cuttings according to workplace procedures 4.3 Monitor ground conditions and adjust reaming techniques to maintain required drilling progress according to manufacturer specifications 4.4 Determine causes of reaming problems, take action to manage them and advise designated personnel according to workplace procedures 4.5 Remove and store reamer according to workplace procedures
5. Respond to problems	5.1 Identify possible operational problems in equipment, process or mud 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
6. Complete equipment maintenance and housekeeping	6.1 Carry out shutdown and secure equipment according to manufacturer specifications and workplace procedures 6.2 Monitor wear and recognise symptoms of malfunction, including checking oil drops for signs of repairs needed, according to manufacturer specifications 6.3 Check all equipment, hoses, seals and connections according to manufacturer specifications 6.4 Replace, adjust and report items needing attention according to manufacturer specifications 6.5 Service gear and adjust glands where required according to manufacturer specifications 6.6 Complete maintenance schedule according to manufacturer specifications and workplace procedures 6.7 Maintain inspection and service records according to workplace procedures

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	6.8 Confirm housekeeping activities are completed according to workplace procedures 6.9 Process records according to workplace procedures

Range of conditions

N/A

Assessment Requirements for RIINHB312X Conduct raise boring

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 raise boring using a raise boring rig, according to the drill plan, manufacturer specifications and workplace procedures, on at least two (2) separate occasions, including:
    - setting up the rig and collaring the hole
    - drilling a pilot hole through to break-through
    - reaming the raise bore

During the course of the above, the candidate must:

- plan and prepare for each occasion by interpreting drill plans and work requirements, assessing site conditions, and identifying hazards and applying controls relevant to the work
- communicate and coordinate with other personnel involved in the raise boring operation, including personnel at the break-through level, before and during the work
- monitor ground conditions and equipment indicators during both pilot hole drilling and reaming, and adjust technique in response to maintain hole alignment and required progress
- identify and respond to at least one operational problem, either occurring in the course of the work or introduced by the assessor on the rig, resolving it within their area of responsibility or reporting it to the designated person
- complete shutdown, maintenance checks, housekeeping and records following each occasion, with records accurately reflecting the work completed, ground conditions encountered and any issues identified

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:

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  - site safety and environmental requirements for:
  - work health and safety
  - environmental protection
  - site isolation
  - dealing with misfires
  - emergencies, including fire and accidents
  - working underground
  - equipment procedures for:
  - site and equipment inspections
  - start-up and shutdown
  - operating the drill rig and auxiliary services
  - identifying and recovering from down hole problems
  - equipment cleaning and housekeeping
  - site storage and towing
- drilling equipment processes, technical capability and limitations, including manufacturer specifications, and the consequences of operating outside those limitations
- geological and technical data, including rock types encountered in raise boring, and how ground conditions affect penetration rate, cutter wear, torque, hole stability and the drilling and reaming technique required
- indicators of changing ground conditions observable during drilling and reaming, including changes in penetration rate, torque, thrust, vibration and cuttings character, and what each indicates about conditions at the head
- the reasons site conditions are assessed for scaling requirements and misfires before work commences
- the reasons dust suppression and extraction systems are used, and the consequences of inadequate control in an underground environment
- the reasons pilot hole alignment determines the position of the reamed raise, and the consequences of pilot hole deviation
- the reasons break-through is monitored and inspected, and the hazards associated with break-through
- the reasons drill string tension, thrust and rotation are controlled during reaming, and the effect of each on cutter life, raise wall condition and drill string integrity
- the causes and consequences of raise instability, and of the raise becoming blocked by cuttings

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Assessment Conditions

The assessment must:

- include access to:
    - personal protective equipment
    - an operational raise boring rig and associated equipment required to conduct raise boring 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.

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. Simulation must not replace the candidate's operation of a raise boring rig.

*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
RIINHB312D Conduct raise boring	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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