



Australian Government

Department of Education, Employment and Workplace Relations

RIINHB306A Conduct large diameter auger drilling

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers the conducting of large diameter auger drilling in civil construction and drilling industries. It includes planning and preparing for drilling, operating the drill, maintaining equipment, and responding to problems.

Application of the Unit

Large flight augers include short-flight and bucket augers and are used for foundation construction drilling. This unit is appropriate for those working in a operational 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

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>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.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for conducting of large diameter auger drilling	1.1. Access, interpret and apply <i>compliance documentation</i> relevant to the work activity 1.2. Obtain, confirm and apply <i>work instructions</i> for the allocated task 1.3. Identify, manage and report all potential <i>hazards</i> 1.4. Resolve <i>coordination requirements</i> with others at the site prior to commencing and during work activities 1.5. Induct site visitors as required by procedures
2. Operate large diameter auger drill	2.1. Collar borehole, start hole, maintain hole alignment, take corrective action for deflections 2.2. Make up appropriate drill string 2.3. Handle additional drill stems, inserting them in the drill string 2.4. Use appropriate gears, rotation, feed and holdback so that flights or bucket are substantially full for the soil being drilled at any given depth 2.5. Interpret drilling factors to determine conditions at the bit 2.6. Make and break auger string and drive head connections safely 2.7. Maintain a clear hole and a clear bottom and deploy tools for cleaning hole bottom at completed depth 2.8. Interpret or calculate actual depth at any point during drilling, interpret depth of strata changes and identify fill depth in any bore 2.9. Select appropriate strategies for recovery of dropped augers 2.10. Recover drill string using winch and/or head/kelly 2.11. Insert surface casing and deepen hole using smaller diameter auger or bucket, if required 2.12. Disassemble drill string and change

	<p>augers and bit components</p> <p>2.13. Select bits for formation being drilled</p> <p>2.14. Select appropriate augering method for situation</p> <p>2.15. Maintain spoil removal from hole collar with appropriate safety protocols</p> <p>2.16. Cover and secure bores to ensure safety of others and crew</p> <p>2.17. Communicate effectively with crew, clients and management</p> <p>2.18. Prepare and submit paperwork for daily activities</p> <p>2.19. Ensure appropriate <i>personal protective equipment</i> and work clothing for the task is worn</p> <p>2.20. Constantly maintain safe working conditions</p> <p>2.21. Select and use water and drilling <i>fluids</i> as appropriate</p> <p>2.22. Bell foundation piles, if required</p> <p>2.23. Clean pile bases and insert reinforcement cages, if required</p> <p>2.24. Deploy bucket augers through surface casing and when drilling under bentonite muds</p> <p>2.25. Use spin off and side casting of spoil as appropriate</p> <p>2.26. Record daily hole depths and progress</p>
3. Maintain equipment	<p>3.1. Monitor external wear in drill string, rotate string elements to ensure even wear</p> <p>3.2. Interchange drill bits and/or drill bit elements to maintain free cutting ability</p> <p>3.3. Check all string and equipment elements for wear and proper function</p> <p>3.4. Replace worn elements in string, bits and equipment and recycle 'out of specification' <i>equipment</i> for repair or redundancy</p> <p>3.5. Apply lubrication as appropriate</p> <p>3.6. Maintain good housekeeping on site and for equipment in storage</p>
4. Respond to problems	4.1. Identify possible <i>operational problems</i> in

	<p>equipment or process</p> <ul style="list-style-type: none">4.2. Identify symptoms of problems needing remedial action4.3. Determine possible fault causes4.4. Rectify problem using appropriate solution within area of responsibility4.5. Follow through items initiated until final resolution has occurred4.6. Report problems outside area of responsibility to designated person
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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 large diameter auger drilling:

- apply legislative, organisation and site requirements and procedures for the conducting of large diameter auger drilling
- apply occupational health and safety requirements and procedures
- apply techniques for rig carrier to positioning and movement between holes, and reaching several holes from the one set up position where turntable or boom deployment of rotary head is used
- apply rig stabilisation and levelling techniques
- identify components for various auger techniques and sizes
- apply equipment assembly, inspection and servicing procedures
- apply rig operating functions and controls with safety
- apply water levels recording procedures
- apply grout mixing techniques and placement application methods
- apply mechanical and manual handling safety requirements and procedures
- apply metric and imperial units conversion
- apply mathematical calculations using addition, subtraction, multiplication and division
- use a calculator to calculate hole volume

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 large diameter auger drilling:

- occupational health and safety responsibilities
- environmental protection measures and aspects
- basic geological formations expected and their properties
- equipment and spares identification and characteristics
- technical capabilities, system limitations, gauge readings and their interpretation
- site hazards identification, assessment and control measures requirements and procedures
- operational maintenance procedures for rig and equipment including pre-start checks
- use of diagrams, plans and instructions for positioning, recording work or progress
- use of tape measures and devices for assessing depth drilled

- use of water, mud and foam injection for jet auger drilling and/or screw pipe drilling

Evidence Guide

<p>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.</p>	
<p>Overview of assessment</p>	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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:</p> <ul style="list-style-type: none"> • knowledge of the requirements, procedures and instructions for conducting of large diameter auger drilling • implementation of requirements, procedures and techniques for the safe, effective and efficient completion of large diameter auger drilling tasks • working with others to undertake and complete the large diameter auger drilling tasks that meets all of the required outcomes • consistent timely completion of large diameter auger drilling that safely, effectively and efficiently meets the required outcomes
<p>Context of and specific resources for assessment</p>	<ul style="list-style-type: none"> • 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

	<p>language issues.</p> <ul style="list-style-type: none"> • 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	<p>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:</p> <ul style="list-style-type: none"> • written and/or oral assessment of the candidate's required knowledge • observed, documented and/or first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • working with others to undertake and complete large diameter auger drilling tasks
Guidance information for assessment	<p>Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.</p>

Range Statement

<p>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.</p>	
<p>Relevant compliance documentation may include:</p>	<ul style="list-style-type: none"> • 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
<p>Work instructions may come from:</p>	<ul style="list-style-type: none"> • briefings, handovers, plans and work orders and may be written or verbal, formal or informal and may include: <ul style="list-style-type: none"> • 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
<p>Hazards include:</p>	<ul style="list-style-type: none"> • underground services and other hazards • overhead utilities (e.g. electricity)
<p>Hazard management includes:</p>	<ul style="list-style-type: none"> • appropriate personal protective equipment • following safe working practices
<p>Coordination requirements may</p>	<ul style="list-style-type: none"> • drill team

include	<ul style="list-style-type: none"> • other equipment operators • maintenance personnel • supervisors • worksite personnel
Personal protective equipment includes:	<ul style="list-style-type: none"> • steel-capped boots and hardhat • gloves • dust mask • eye and hearing protection • general protective and reflective clothing
Fluids may include:	<ul style="list-style-type: none"> • water, mud foam used to assist cutting removal in screw pile or jet auger applications
Equipment may include:	<ul style="list-style-type: none"> • short flight augers with a range of spirals • jet augers and long screw pile augers • bucket augers • bellings or under-reaming tools (pier hole) • auger recovery tools
Operational problems may include:	<ul style="list-style-type: none"> • straighten holes and starting straight holes • encountering excessive water • cork screwing effect when hold back not set properly • balancing bit cutting action with hole clearing action • occupational health and safety issues relating to rotating plant including catching long hair, loose clothing, finger injuries, safety with lifting and carrying • obstructions in hole • proximity to embankments

Unit Sector(s)

Drilling (General)

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.