

EXCAVATOR

Learner Workbook



TRAINER'S MARKING GUIDE

RIIMPO320F –

Conduct civil construction excavator operations



This resource was developed by:



Version 2.1 – June 2022



Learner Name: _____

Student Number: _____ Date: _____

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Training support materials

Training package: Resources and Infrastructure Industry Training Package

Unit of competency: RIIMPO319E - Conduct excavator operations

Application / Context of Assessment

This unit describes the skills and knowledge required to operate a excavator to load, distribute and place materials.

This unit applies to those working in site based roles.

Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors, and must be sourced from state jurisdictions prior to applying this unit.

Notes to Candidate:

Practical components of this assessment must be filmed on the operational use of a excavator, Distribution and placement of materials must be safely, effectively and efficiently follow workplace procedures to carry out work activity's on at least two occasions using at least two attachments on each occasion.

Assessment Conditions

Mandatory conditions for assessment of this unit are stipulated below. The assessment must:

Include access to:

- excavator
 - personal protective equipment
 - be conducted in a safe environment; and,
- be assessed in context of this sector's work environment; and,
- be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- confirm consistent performance can be applied in a range of relevant workplace circumstances

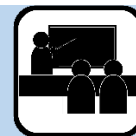
Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated work environment* provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency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

Set Date: Knowledge Assessment



The assessor must be satisfied the candidate has successfully demonstrated each element and performance criteria contained in the Unit of Competency.

Knowledge Assessment Instructions



1. This assessment should be completed in writing (pen not pencil). However, where necessary it may be undertaken verbally. If verbal assessment is undertaken the candidates' responses must be clearly recorded by the assessor. The assessor must clearly note on the assessment that it was undertaken verbally.
2. Candidates should be allowed 10 minutes reading time before commencing the assessment and a further 180 minutes to complete the assessment.
3. The assessment should be completed in a quiet area free from distraction.
4. The assessment is to be completed without the assistance of learning resources. Students may ask the assessor for assistance to clarify questions they do not understand.
5. A pass mark of 90% (77/85) must be achieved for a satisfactory result. The assessor must provide feedback to the candidate to clarify any answers deemed to be incorrect.
6. Reasonable adjustment to the assessment is to be made by the assessor where deemed necessary.



Question 9

What do the job's work instructions explain?

Answer may include but is not limited to:

- What to do in unexpected situations like bad weather
- What the job is
- Where the job is
- How to do the job safely
- How long the job will take
- What tools and equipment you need
- How to do the job from start to finish.



Question 10

If a fire starts what are four (4) steps that should be taken?

1. Remove any person from immediate danger
2. Alert others nearby (and your supervisor if possible) to call the fire services
3. Control and extinguish the fire if possible
4. Evacuate the area if the fire cannot be controlled.



Question 11

How do you choose and set up a location for a stockpile?

- Set up drainage so rainwater doesn't cause the stockpile to slide
- Use well drained, firm level ground (if possible)
- Clear the area of rubbish and debris
- Check you have clear access to the stockpile location
- Choose a location less than 50 metres from the excavation.



Question 12

How can you find out the specifications and limits of the machine you will use?
Specifications include things like:

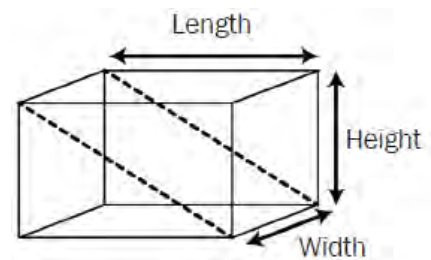
- Load capacity
- Bucket height, volume and width
- Lift height
- Dump clearance.

Read the operator's manual to find out the limits. The lifting capacity may also be marked on the load chart.

Question 13

How do you find the cubic capacity of an excavator bucket?

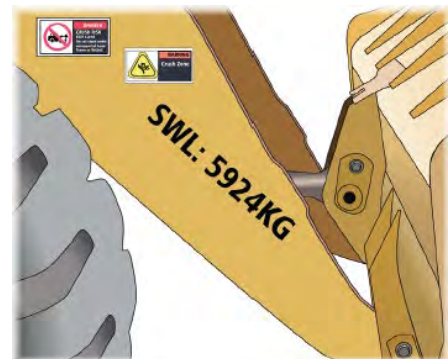
Cubic capacity of bucket = $L \times W \times H \div 2$



Question 14

How can you find out the maximum safe working load (SWL) of the excavator?

- Check the load chart
- Check the data plate
- Read the markings on the loader itself
- Read the operator's manual.



Question 15

Using the information provided on the load chart below, determine how much can the excavator lift in the following configuration?

- Radius = 4.6 m
- Hook height = 1.5 m over side.

Excavator load Chart										
22 tonne excavator fitted with a 3.05m long arm, 1m ³ bucket and 600mm slides										
Radius	Max reach		7.6m		6.1m		4.6m		3.0m	
Hook height	Front	Side	Front	Side	Front	Side	Front	Side	Front	Side
6.1 m	*3100	*3100	*3450	*3250						
4.6 m	*3150	2650	*3950	3250	*4100	*4100				
3.0 m	*3300	2400	*4450	3050	*5050	4500	*6450	*6450	*10750	*10750
1.5 m	3550	2300	4550	2950	*6050	4200	*8300	*6450	8450	*5450
0 m	3600	2300	4450	2850	6200	4000	*9650	6050	*6900	*6900
-1.5 m	3900	2500	4350	2750	6100	3850	*9650	6050	*10200	*10200
-3.0 m	4654	2950			6100	3900	9650	6000	*14900	12300
-4.6 m	6650	4250					9200	6100	*13800	12700

The ratings are based on 75% tipping load, stationary on firm level ground as per AS 1418.5.
 * The ratings do not exceed 87% of hydraulic lifting capacity of 75% of tipping load.
 For 'pick and carry loads' on firm level ground the load shall not be greater than 66.7% of tipping load as per AS1418.5 OR 89.9% of the SWL.
 Where ground is sloping, rough or not firm, the load must be dramatically reduced.

Question 16

Using the information provided on the load chart below, determine how much can the excavator lift in the following configuration?

- Radius = 7.6 m
- Hook height = 1.5 m over front.

Excavator load Chart										
22 tonne excavator fitted with a 3.05m long arm, 1m ³ bucket and 600mm slides										
Radius	Max reach		7.6m		6.1m		4.6m		3.0m	
Hook height	Front	Side	Front	Side	Front	Side	Front	Side	Front	Side
6.1 m	*3100	*3100	*3450	*3250						
4.6 m	*3150	2650	*3950	3250	*4100	*4100				
3.0 m	*3300	2400	*4450	3050	*5050	4500	*6450	*6450	*10750	*10750
1.5 m	3550	2300	4550	2950	*6050	4200	*8300	*6450	8450	*5450
0 m	3600	2300	4450	2850	6200	4000	*9650	6050	*6900	*6900
-1.5 m	3900	2500	4350	2750	6100	3850	*9650	6050	*10200	*10200
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Question 17

Why is it important to co-ordinate your work activities with others at the worksite both before and during operation?

This is important so work can be planned in a way where it will not interfere with the work of others. During work activities you must continue to co-ordinate activities with others so changes can be made to work plans if necessary.

Question 18

What are some hazards you must look for before starting work?

Answer may include but is not limited to:

- Other people
- Buildings
- Uneven or unstable ground
- Embankments and drop offs
- Hidden holes and trenches
- Obstructions
- Underground services
- Powerlines
- Other equipment and machinery
- Trees
- Dangerous materials.

Question 19

The Hierarchy of Hazard Control is a list of controls that you can use to eliminate or lower the danger from a hazard in the workplace.

What are the six (6) levels in the hierarchy from the first choice to the last choice?

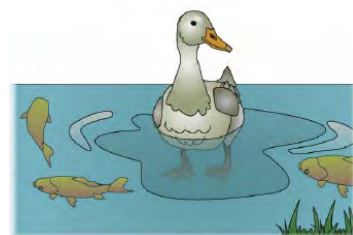
1. Elimination
2. Substitution
3. Isolation
4. Engineering control measures
5. Administrative practices
6. Personal protective equipment (PPE).



Question 20

What does the Environmental management plan (EMP) tell you?

- Possible risks to the environment on the worksite
- How to work in a way that reduces damage to the environment
- How the worksite meets all environmental protection laws
- Who is responsible for what

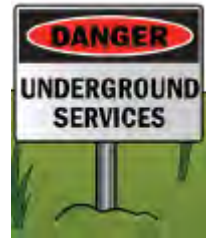


Question 24

How can you tell you are near an underground service?

Answer may include but not limited to:

- Warning signs
- Broken tiles
- Clean sand
- Loose soil
- Used tape
- Sand bags



Question 25

What should you use to excavate if you think there's an underground service nearby?

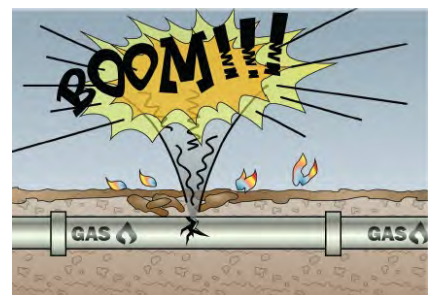
Stop. Use a hand tool to expose the service lines. Dig carefully so you won't cause damage.



Question 26

What could happen if you damage an underground gas line?

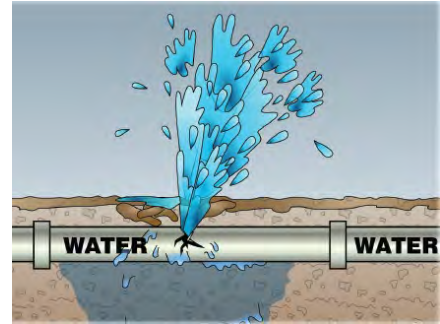
You could cause a gas leak, and maybe an explosion.



Question 27

What could happen if you damage an underground water pipe?

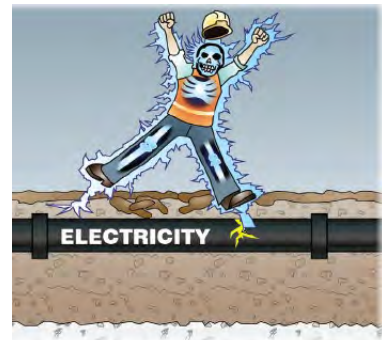
You could cause a water leak, and the water could be polluted.



Question 28

What is the danger if you damage an underground electrical cable?

There is a risk of an electric shock.



Question 29

Who do you talk to if you damage an underground cable, gas line or other service?

You must tell your supervisor. Your supervisor will tell the relevant authority.



Practical Assessment



The assessor must be satisfied the candidate has successfully demonstrated each element and performance criteria contained in the Unit of Competency.

It is the assessor's responsibility to decide if the candidate has competently demonstrated a skill. The assessor may question a candidate further if their demonstration needs clarification.



Practical assessment instructions



Practical assessment should be performed in a normal working environment where possible. However, under some circumstances may occur in a simulated work environment (refer to assessment conditions for further information).

The Assessor must:

- Clearly explain to the candidate what is expected of them
- Check that the candidate has been provided with the necessary tools and equipment
- Complete checklists as the candidate goes through the tasks
- Only question a candidate during a practical task if it is safe to do so
- Stop the assessment immediately if the candidate is doing something dangerous
- Stop the assessment immediately if the machine or objects are likely to be damaged
- Inform the candidate of the result of the assessment

If an assessor needs to stop the assessment because of danger or possible damage, the candidate must be marked as not yet competent. If the assessment is stopped, further training would need to take place before a re-assessment can be undertaken.

Tasks in the assessment do not have to be assessed in isolation, they may be done as one continual task, a simple example of this may be to:



Summary of practical assessment task.

The candidate is to demonstrate the ability to:

- Operate a excavator,
- Distribute and
- Place Materials,
- Safely, effectively and efficiently following workplace procedures to carry out work activity on at least two occasions using at least two attachments on each occasion.

The assessor is to submit 2 work orders to candidate to follow which outlines work to be performed for at least 2 different material types such as the following:

- mixing materials
- stripping/spreading materials
- trench excavation
- backfilling
- lifting and carry materials
- loading dump trucks, wagons, hoppers or chutes
- cutting/boxing

Attachments that can be used are the following:

- extending devices
- tilt bucket
- buckets
- compaction wheel
- ripper, plate compactor
- rock breaker
- auger
- broom
- mower/slasher
- forklift
- 4 in 1 bucket and free/rock grab

Examples of a work order / job (requirements), might be the following;

Example 1 / Work Order 1. Dig a trench so that concrete sewerage pipe can be laid and place concrete pipe into trench then back fill in trench. Use rock breaker to break up concrete of foot path and drive way to place sewerage pipe.

Example 2 / Work Order 2. Move a large amount of gravel from front of a house to the back of a house to form a flat drive way. Then move any excess dirt from site into a dump truck.

Note: Performing the actual practical task must be filmed and noted of where the video file is stored.