

Illawarra Workplace Assessments

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Excavator

August 2000

OHS Certificates of Competency National Assessment Instrument

Loadshifting Equipment

Excavator

ASSESSMENT

Part 1 Performance

Part 2 Oral/Written

AUGUST 2000

Contents

	Page
Assessor Guidelines – General	1
Assessor Guidelines – Specific – Performance	4
Part one – Performance Assessment	6
Assessor Guidelines – Specific – Oral/Written	11
Part two – Oral/Written Assessment	12
Load Chart	27
Oral/Written Answer	28
Assessment Summary	35

ASSESSOR GUIDELINES -GENERAL

1. Introduction

1.1 Scope

These general guidelines apply to all the assessment instruments for the certificates of competency prescribed by the National Guidelines for Occupational Health and Safety Competency Standards for the Operation of Loadshifting Equipment and Other Types of Specific Equipment. (NOHSC: 7019)

Assessors should also be familiar with the publication Assessment guidelines for National Occupational Health and Safety Certification Standard for users and operators of industrial equipment.

1.2 Additional Guidelines

Guidelines that provide additional specific information to certificate assessors are also included in each assessment instrument. Included, where appropriate, are specific instructions on the usefulness of training records (such as logbooks) and other certificates with overlapping competencies.

1.3 Evidence of Competence

Evidence of competence is established in a number of ways. The methods used in the following instruments involve:

- Assessment of practical performance
- Written and/or oral answers to questions on underpinning knowledge.

2. Preparing for the Assessment

2.1 Study the instruments

You need to read the assessment instruments and specific instructions carefully before beginning an assessment.

2.2 Confirm Appointments

Prior to an assessment, you need to confirm the date, time and location of the assessment with the applicants and any other relevant people.

2.3 Equipment Availability

The availability of equipment, materials and a suitable working area must be organised and confirmed, prior to the assessment.

2.4 Workplace Factors

Because procedures and processes vary greatly between workplaces, it is important for assessors to plan their approaches to meet the requirements of the individual workplace.

Make sure you take the timeframe into account when planning the assessment and also make applicants aware of any time limits.

2.5 Selecting Questions

Questions for the written/oral assessment should be randomly Selected, either by hand or using the computer system, if applicable.

3. Conducting the Assessment

3.1 Provide an Explanation

Begin by explaining clearly to the applicant what is required of them. Check that applicant has provided (or has been provided with) the necessary tools and equipment.

3.2 Practical Performance

Complete the practical performance checklist, as the applicant works through the required tasks. Wherever possible, this should be done in a normal working environment.

Do not ask the applicant questions while he/she is performing a task, as this can be distracting, and may affect the time taken to complete the assessment.

If, at any time, the applicant is endangering themself or others, stop the assessment immediately. This indicates that the applicant is not yet competent and may require further training, before been reassessed.

Assessments should also be stopped, if equipment or property is likely to be damaged.

3.3 Knowledge

The oral/written assessment determines the applicant's under pinning knowledge. The model answers provided with the oral/written assessment instruments are not necessarily exhaustive. Use your own judgement when scoring alternative answers.

3.4 Recording Responses

A box accompanies each item and question on the assessment forms you use. Assessors must complete every box as follows:



X NOT YET ACHIEVED

NA NOT APPLICABLE

If a box is marked incorrectly, cross out the mistake, mark the correct response alongside, and initial the change.

4. Determining Competencies

4.1 Assessment Summary

A specific assessment summary is given for each certificate class. This is to be filled in and signed by the assessor and counter signed by the applicant.

Notice of Satisfactory Assessment The original and duplicate are given to the applicant. The applicant provides the original to the certifying authority. The assessor retains the triplicate.

4.2 Competency Requirements

In order for you to deem an applicant competent, he or she must have completed each section of the assessment to the standard required. You should note any time constraints when arriving at your decision.

The standard required for each instrument is specified in the specific guidelines and/or on the summary page at the end of each instrument.

In the case of a re-assessment, the assessor can decide to apply the whole or only that part of the assessment not yet achieved.

4.3 Additional Comments

Where an applicant fails to meet the standard of competence, you should add a written comment on the Assessment Summary, which briefly explains the problem.

Advice to the applicant, on the appropriate remedial action should also be included. This will also assist the certificate assessor, in the event that the applicant undergoes future reassessment.

4.4 Further Investigation

As a certificate assessor, it is your role to determine whether or not an applicant has achieved the standard necessary for the certifying Authority to be able to grant a certificate of competency.

Whenever you are unsure of the applicant's performance or knowledge, ask additional questions, and obtain additional evidence, before making your final decision.

National Guidelines for OHS Competency Standards

Loadshifting Equipment

Excavator

Part 1
Performance Assessment

AUGUST 2000

ASSESSOR GUIDELINES – SPECIFIC (Performance)

ASSESSMENT INSTRUMENT – SPECIFICATIONS

The following performance assessment covers the Loadshifting elements

1.1, 1.2, 1.3, 2.1, 3.1 & 3.2

1. The assessment requires the operator to check the equipment, plan the work and to safely and competently operate the excavator.

The assessment is performed in six sections:

- 1.1 Conduct routine pre-operational check of excavator/equipment and the security of attachments.
- 1.2 Inspect the site, plan work and select and fit appropriate attachments.
- 1.3 Conduct pre-operational and post start up checks
- 1.4 Drive the excavator to the work area.
- 1.5 Operate Excavator.
- 1.6 Shut down the equipment and secure the site.
- 2. Prior learning and experience

An applicant who holds a Front-end loader/Backhoe, front-end loader of a skid-steer type, front-end loader, dragline, or dozer certificate does not require assessment in sections 2, 3 and 4.

- 3. The performance assessment can be conducted at any location which has:
 - sufficient clear space to operate the machine
 - ground suitable for excavating
- 4. Equipment and Resources required:
 - an excavator and equipment
 - suitable site on which to use the excavator and equipment to excavate and backfill a trench.
- 5. Unless the assessor agrees to other arrangements, it will be the responsibility of the applicant, applicant's employer or trainer to provide the required equipment and resources.
- 6. To be assessed an applicant must wear:
 - safety helmet (where required)
 - appropriate footwear
 - other protective clothing and equipment as appropriate.
- 7. The performance of each applicant is to be recorded on the assessor's checklist.
- 8. Safety of personnel: when an applicant is working dangerously, recklessly or without the necessary co-ordination, the assessor must direct the applicant to cease work and terminate those parts of the assessment immediately.
- 9. The applicant must undertake all performance criteria. An assessor must use his/her discretion in assessing competence under each criteria.

 The elements under each criteria must be marked with the appropriate tick, cross or n/a to indicate an applicant's competence level for that element.

Assessors Note: All performance criteria marked with a star are compulsory/critical. To determine a person's competence under each performance criteria, a prescribed number of elements are required to be demonstrated/answered under that criteria. The applicant must achieve the minimum specified number or more, of the performance elements to achieve competence for those criteria. To record the applicant's competence for the criteria a tick must be placed in the star.

- 10. Where an applicant is assessed as 'not yet competent' he/she must be informed of the reason(s) in order to gain further appropriate training.
- 11. The full performance assessment can take up to 1 hour.
- 12. The general assessment requirements are set out in Assessor guidelines general.
- 13. Competence is achieved for a unit when the required number of elements for that unit have been correctly performed and ticked.
- 14. Overall competence is achieved when competence in all units has been achieved.
- 15. Where a performance element cannot be performed the assessor can simulate or ask a question. The response must be recorded.

UNIT 1: CONDUCTS ROUTINE CHECKS.

Performance Criteria 1.1.1 and 1.1.2

Pe	rform	ance Criteria 1.1.1 and 1.1.2		– (at	least 9 elements checked)
1.	exca	duct routine checks on vator (at least 13 elements	•		Attachments for condition and security
	chec	Complete walk around			Damaged or broken parts
		machine Underneath machine for any			Quick hitch attachment/safety device lock
	Ч	water or oil leaks			Fall on protective structure (FOPS)
		Track condition and tension			Roll-over protective structure (ROPS)
		Tyre condition and pressure		_	,
		Fuel		Ш	Loose nuts, bolts and couplings
		Oil level in slew gear box			Bucket for damage
		Hydraulic oil level			Bucket for missing, worn or loose teeth
		Vent hydraulic tank (release pressure)			Worn skid plates/cutting edge
		Transmission oil			Hoses, fittings hydraulic rams for oil leaks
		Engine oil			Connections for missing pins or keeper plates
		Brake fluid			Grease fittings and grease pins
		Power steering	3.		cks other equipment for cts (at least 4 elements
		Battery security, water level and cleanliness		chec	ked)
					Approved lifting lug
		Coolant			Wire slings
	u	Air tank drained			Chain slings
		Air pre-cleaner			Synthetic slings
		Air filter indicator			•
					Shackles
					Other lifting gear

2. Visual check of

structure/attachment for defects

 $\frac{1}{2}$

	PLAN WORK AND CHECK EQUIPMENT			6.	the task (at least 3 elements performed)		
Pe	rform	ance Criteria 1.2.1, 1.2.3 and 1	1.2.5			Suitable tool used	
4.	Insp	ects site and plans work:	$\stackrel{\wedge}{\sim}$		_	Sultuble tool used	
	appl	nazards are identified where icable (at least 8 hazards tified)				Changes bucket	
		Power lines				Secures catches	
		Trees				Correct procedure adopted	
		Overhead service lines				Works safely	
		Bridges		Pe: 7.	Con	nance Criteria 1.3.1 ducts pre-operational start-	△
		Surrounding buildings			man oper	hecks in accordance with ufacturer's specifications/ rating manual - (at least 11	\sim
		Obstructions			Спес	eks made) Window clean	
		Other equipment in area				Mounts correctly	
		Personnel in area				Adjusts seat	
		Dangerous materials				Fastens seat belt	
		Underground services				Transmission in neutral	
		Recently filled trenches				Park brake on	
5.	of L	ropriate safe access and path oad movement is shown – (at : 2 indicated)	$\stackrel{\wedge}{\sim}$			Engine start	
		To the work area				Warning device	
		For the loads been moved				Gauges	
		Traffic control considered				Warm up allowed	
						Rotating hazard light	
						Attachment movement	

	Ш	Clear for travel	Ш	Smoothly operates controls
		Foot brake moving forward & reverse		Completes task in logical sequence
		Parking brake moving forward & reverse		Crowds bucket to fill
		Steering		Picks up material
				Competently shifts material
UN	IT 2 -	- SHIFT LOAD		Equipment operated at a sofe speed
Per	form	ance Criteria 2.1.1 and 2.1.3	Ч	Equipment operated at a safe speed
8.		es to the work area: east 4 elements performed)		Ensures direction of slew is clear
		-		Cuts trench to specifications
		Selects correct controls		Demonstrates excavation around a pipe
	Ч	Raises attachments smoothly		
		Ensures travel direction clear of personnel and obstacles		Deposits material the required distance from excavation
		Selects appropriate route		Minimises spillage and ground damage
		Travels at safe speed		Ensures direction of travel clear
		Carries bucket at safe travelling height and crowded back		Uses appropriate path of travel
	rform .5, 2.1	ance Criteria 2.1.1, 2.1.3, 2.1.4, .6		Has the truck positioned for easy loading
9.	Oper	rates Excavator:		Approaches truck (or trench) correctly
		up excavator and excavates east 20 elements performed)		Smoothly raises and dumps load
		Applies brake		
		Ensures turntable is reasonably	Ц	Repositions bucket ready for reload
	u	level		Maintains stockpile and working surface
		Checks control movements		M 1 1 61
		Personnel & plant clear of operating	u	Moves load safely
	_	radius		Lowers load to designated location

		Loads placed to ensure stability	Neutralises controls
		Loads placed to avoid causing hazard	Applies parking brake
10.		tifies the following signals correctly to all signals)	Idles down, shuts down, locks ignition
		Stop – hand	Moves controls to release pressure
		Boom up – hand	Applies safety lock
		Boom down – hand	Dismounts correctly
		Slew right – hand	Removes keys
		Slew left – hand	
		Travel / traverse	
11.		solidates and levels surface nonstrates at least 3 elements)	
		Consolidates fill with excavator	
		Levels surface with bucket blade	
		Excess fill for natural compaction	
		Maintains level surface to work from	
		SHUT DOWN EQUIPMENT SURE SITE	
Perf	orma	nce Criteria 3.1.1, 3.1.2 and 3.2.1	
12.	secui	s down equipment and res site: (demonstrated at 7 elements)	
		Parks equipment in a suitable location away from danger areas	
		Attachments lowered to ground	
		Cutting edge of bucket on ground	

National Guidelines for OHS Competency Standards

Loadshifting Equipment

Excavator

Part 2

Oral/Written Assessment

AUGUST 2000

ASSESSOR GUIDELINES – SPECIFIC (Oral/Written)

ASSESSMENT INSTRUMENT – SPECIFICATIONS

The oral/written assessment covers the following Loadshifting elements

1.1, 1.2, 1.3, 2.1, 3.1 & 3.2

- 1. Oral/Written assessment for Excavator is divided into three units and eighteen sections (performance criteria 1.1.1, 1.1.2, etc).
- 2. To satisfy the requirements for competency the applicant must correctly answer (either in writing or orally) all critical questions as indicated by a star and a minimum of 75% of the non-critical questions from each unit.

Assessor note: The assessment summary specifies the appropriate number of non-critical questions to be achieved.

Unit 1.0

- 1.1. Conduct routine checks
 - 1.1.1. (select 12) including 4 stars
 - 1.1.2. (select 2) including 1 star
- 1.2. Plan work
 - 1.2.1. (select 9) including 4 star
 - 1.2.2. (select 7) including 3 star
 - 1.2.3. (select 2)
 - 1.2.4. (select 1)
 - 1.2.5. (select 3) including 1 star
- 1.3. Check controls and equipment
 - 1.3.1. (select 9) including 2 stars
 - 1.3.2. (select 1) which is a star

Unit 2.0

2.1. Shift load

- 2.1.1. (select 2) which are both stars.
- 2.1.2. (select 13) including 1 star

 Note: 2.1.2 is divided into 6

 headings. Each heading

 prescribes the number of
 questions to be selected.
- 2.1.3. (select 12) including 6 stars
- 2.1.5. (select 4)
- 2.1.6. (select 1) which is a star
- 2.1.7. (select 4) including 2 stars

Unit 3.0

- 3.1. Shut down equipment
 - 3.1.1. (select 3)
 - 3.1.3. (select 1)
- 3.2. Secure site
 - 3.2.1. (select 2)
- 3. Prior learning and experience

An applicant, who holds a front-end loader/backhoe, front-end loader, front-end load of the skid-steer loader, dragline or dozer certificate and who answers questions for performance criteria 1.1.1. and 2.1.2 satisfactorily, are not required to complete the rest of the assessment.

- 4. The full oral / written assessment of **eighty-eight questions** can take up to 2 hours to complete.
- 5. The items marked with a star are of critical importance. Failing to get any of these correct means that competency has not been achieved.
- Competence is achieved for a unit when the required number of questions for that unit have been correctly answered and ticked.

Overall competence is achieved when competence in all units has been achieved.

	NIT 1: CONDUCT ROUTINE HECKS.	6. How would you know when the machine that you are operating should be serviced?	
	rformance criteria 1.1.1 (select 12 cluding 4 with a star)		
1.	What precautions must be taken when inspecting under a raised attachment?		
		7. Why are you not permitted to join a chain sling with a bolt?	\Rightarrow
2.	Name three defects to look for when inspecting the hydraulic system.	8. What percentage of broken wires within a rope lay or eight diameters of a wire rope sling would cause it to be discarded?	
3.	When should slings be inspected?	9. List six defects that would condemn a flexible steel wire rope	
4.	What % wear in a shackle would cause it to be discarded?	(FSWR) from safe use?	
5.	What action should you take with tracks that are loose?	10. List six defects that would condemn a lifting chain and hook from safe use?	

11.	What must you do if the SWL tag is missing from the chain sling?	\Rightarrow	16. What checks would you conduct on the tracks of an excavator?	_
12.	How do you fill machine tyres with water ballast?		17. How would you check the tension on the tracks of an excavator?	⊐
13.	What defects would you look for when carrying out the external check on the bucket of an excavator?		18. What is the minimum and the maximum track sag allowable?	_
14.	What defects would you look for on the hydraulic rams and hydraulic pressure hoses?		19. How would you find out the correct track sag or tension for a specific machine?	⊐
15.	When would you check the excavator transmission fluid?		20. What effect would a hydraulic leak in the quick hitch line have on the security of the bucket on an excavator?	_

21.	attachment to ensure it will not fall off?	\Rightarrow	broken could you use the sling? Explain your answer.
22.	What action would you take if during the routine check you found excessive wear in the power arms and connections that made the excavator dangerous to operate?	\Rightarrow	PLAN WORK Performance criteria 1.2.1 (select 9 including 4 with a star) 27. What underground services would you check for before starting to excavate?
23.	What would you do if a strand were broken in a flexible steel wire sling?		28. Who should be contacted in order to find out the location of underground services?
inc	rformance criteria 1.1.2 (select 2 luding 1 with a star) What must be done to a lowered bucket before travelling?		29. Name six hazards that must be checked on the work site before operating the excavator?
25.	What must be provided on an excavator before it is used as a crane?	\Rightarrow	

30.	What is the minimum distance any part of the excavator is allowed to operate from:	$\stackrel{\wedge}{\bowtie}$	34. Name five (5) site hazard checks that you would make of the work area?]
	a) Distribution powerlinesb) High voltage transmission lines			
	NOTE: Assessors must ensure that the applicant is aware of State Authority regulations.		35. What is the danger of starting and running an internal combustion engine in an enclosed space?	☆
31.	What precautions should you take	П		
	when cutting a trench across a footpath?	_	36. What action must be taken before starting up and whilst operating an internal combustion engine in an enclosed space?	_
32.	If using an excavator to lay pipes in a trench, what precautions should be taken?		37. What must be provided and maintained on the exhaust of an internal combustion engine when	_
			operated in a confined space?	
33.	What precautions would you take if a person were in a trench while you are lowering pipes into the trench?	$\stackrel{\wedge}{\Rightarrow}$		
			38. Why is it important to keep the floor plates free from oil, grease and tools?	_
				

inc	formance criteria 1.2.2 (select 7 luding 3 with a star) What must be provided to prevent a person falling into a trench?	\Rightarrow	44. What is the minimum type of footwear that an operator should wear to operate loadshifting equipment?	
40.	When should hearing protection (ear muffs) be worn?		45. Under what conditions can a passenger ride on a machine with the operator?	
41.	When a danger exists on a site what should be posted or erected to warn people of the danger?		46. How do you calculate the cubic capacity of the bucket of an excavator?	
42.	When should an operator wear a safety helmet?		47. What are two conditions that would result in a trench shield or shoring been used?	Δ
43.	When would you be required to shore an excavation?	\Rightarrow	48. You have to cut an excavation deeper than 1.5m. The workers have to enter this excavation and there is a likelihood that the walls may collapse. Using the excavator what could you do to make the excavation safe to enter?	

49.	You have to load a truck with large boulders using your excavator. You are on the same level as the truck. What are the dangers?	53. To travel down or up a steep incline would you change gears on the incline or select the appropriate gear before travelling on the incline?
Per	rformance criteria 1.2.3 (select 2)	
50.	When travelling on a sloping surface which is the safest route of travel?	Performance criteria 1.2.4 (select 1) 54. What documentation would you be required to obtain from an authorised person to operate an excavator in a hazardous working area?
51.	What gear should be selected to travel down a steep sloping surface?	55. What must you obtain before digging up a footpath with an excavator?
52.	What hazards would you check for on a travel route before moving the excavator to perform work?	Performance criteria 1.2.5 (select 3 including 1 with a star) 56. What attachment would you fit to an excavator to break up reinforced concrete?

57.	When an excavator is used in a demolition process what must be	$\stackrel{\wedge}{\Longrightarrow}$	CHECK CONTROLS AND EQUIPMENT:				
	provided on the machine to protect the operator?		Performance criteria 1.3.1 (select 9 including 2 with a star)				
			61. What action would you take if you noticed a bulge form in on of your machines hydraulic hoses?				
58.	Name four types of attachments that may be used on an excavator?						
			62. When should the operator carry out tests, checks and inspections on the excavator that is to be operated?	$\stackrel{\wedge}{\Rightarrow}$			
59.	On a construction site who would you contact to confirm the job requirements for the work to be						
	performed with the excavator?		63. Describe how you would safely mount/dismount an excavator.	$\stackrel{\wedge}{\bowtie}$			
60.	How do you select the appropriate bucket to perform the excavation						
	work?		64. Where can the start up / shut down procedures for each excavator be found?				
			65. Before performing the work with an excavator, what should you do if you have not used the machine before?				

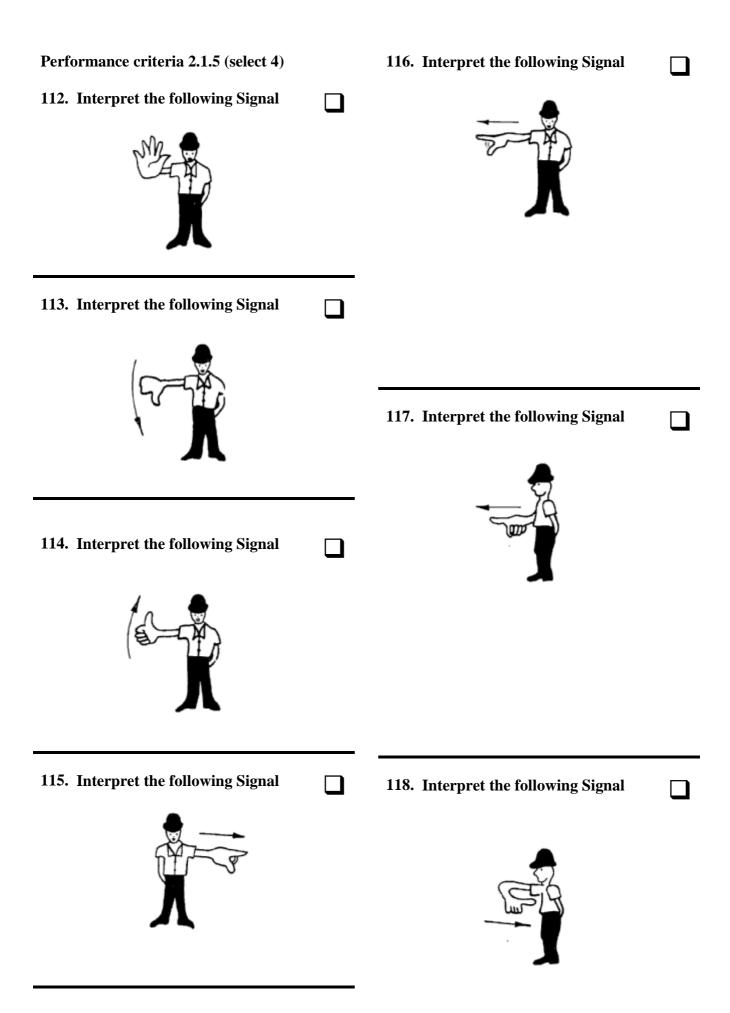
66.	On mounting the excavator what should you do before attempting to start the engine?	71. Your excavator has run out of diesel, you refill the tank but the motor will not start. What could be the possible cause?	3
67.	Once sitting in the operator's seat and before driving off, what should you do for safety and comfort?	Performance criteria 1.3.2 (select 1) with star. 72. What action would you take with damage and defects found on the machine?	a A
68.	What should be referred to for the correct start up and shut down procedure for the equipment?	UNIT 2 - SHIFT LOAD:	
69.	Before moving off what should be done with grounded attachments?	Performance criteria 2.1.1 (select 2) with star. 73. Why are you not allowed to hoist persons with the bucket of an excavator?	a A
70.	Before reversing an excavator, what action should you take?	74. Why are you not allowed to attach slings to the teeth of the bucket?	^

	rformance criteria 2.1.2 (select 2 luding 1 with a star)		79. From excavator load chart "Appendix A" what is the SWL to be hoisted over the side at a radius
75.	You are required to operate an excavator on soft and uneven ground. What effect would this have on the load you could raise and carry with the excavator?	\Rightarrow	of 6.1 metre and at a hook height of (minus) – 3.0 metres?
			Weight of materials (select 2)
76.	How would you establish the load that can be safely lifted by an excavator?		80. List two ways that you would assess the weight of a load to be hoisted?
77.	What must be provided on an excavator to attach slings so that the excavator may be used as a crane?		81. What is the approximate weight of cubic metre of concrete?
			82. Of topsoil or clay which is harder to excavate, push and spread?
Lo	ad Charts (Select 1)		
	From excavator load chart "Appendix A" what is the SWL to be hoisted over the side at a radius of 3.0 metre and at a hook height of 3.0 metres?		Load factors (select 2) 83. What effect does a choker hitch around a square load have on the WLL for the sling?
			WLL for the sling?

84.	A four legged bridle sling arrangement is attached to a rigid load. How many and which sling legs would be assumed to support the load?	89. State the formula for calculating the WLL of grade 30 to grade 75 lifting chain?
85.	What effect does a choker hitch around a round load have on the WLL for a wire rope sling?	SWL of slings (select 4) 90. What is the WLL of a 12mm diameter wire rope sling?
	le of thumb formula (select 2) State the rule of thumb formula to calculate the WLL of wire rope.	91. What is the diameter of a single leg wire rope sling that is required to hoist a 2048 kg load?
87.	State the rule of thumb formula to calculate the diameter of the wire rope sling required to lift a specified load?	92. What is the WLL of a flexible steel wire rope (FSWR) 16mm in diameter?
88.	State the rule of thumb formula to calculate the WLL of a grade 80 lifting chain?	93. When a sling is reeved around a square load how is the WLL altered?

94.	What is the WLL of an 8mm diameter flexible steel wire rope (FSWR)?		98.	Is it permissible for loads to be slewed over the cabin of the truck been loaded? Explain your answer.	
95.	For variation of question 94 use: • 5.5mm • 10mm • 18mm What is the WLL of a 12mm mild steel chain?		99.	List three precautions that must be taken when dumping material into a truck using an excavator?	
96.	What is the WLL of a 7.1mm diameter 80-grade chain?		100.	What action should be taken if you discover a large rock in the side of a trench that you are digging?	
	For variation of question 96 use: • 8mm grade 80 • 10mm grade 30 • 13mm grade 80		101.	How far must people be kept away from the excavator when it is digging?	Δ
	formance criteria 2.1.3 (select 12 luding 6 with a star)				
97.	,	$\stackrel{\wedge}{\sim}$	102.	Name two methods that should be used to prevent a cave in of a trench or excavation?	$\stackrel{\wedge}{\sim}$

103.	What would be the indications that you are excavating quiet close to an underground service?		108.	When loading trucks using an excavator, where should the truck driver and other observers be?	
104.	While excavating you suspect there could be an underground service in the area of the excavation, what action would you take?		109.	What is the minimum diameter size tag line that can be used to control loads?	
105.	How high must the bucket be kept above the ground when driving forward?		110.	How are vehicles/machines stopped from coming too close to an excavation?	\Rightarrow
106.	The load you are going to lift is likely to swing, how would you prevent this from happening?		111.	What are the dangers of driving your excavator close to the edge of an excavation?	Δ
107.	Before reversing a machine what precaution should be taken?	\Rightarrow			







Perfestar.	ormance criteria 2.1.6 (Select 1) wit	ch a	124.	The excavator you are operating overheats and needs to be checked for applications.			
120.	How far away from an excavation must material be dumped?	$\stackrel{\bullet}{\mathcal{M}}$		for coolant level. What precautions would you take prior to removing the radiator cap and topping up the coolant?			
	ormance criteria 2.1.7 (select 4 inclu th a star)	uding	125.	If you are operating an excavator	Λ,		
121.	How would you dismount a machine that contacted live power lines, which could not be released, or the power turned off?	$\stackrel{\bullet}{\mathcal{M}}$		and it makes contact with powerlines what should you do?	λ		
	of the power turned off.						
				IT 3 - SHUT DOWN UIPMENT			
122.	If the slings shifted on a load been			ormance criteria 3.1.1 (select 3)			
	hoisted, what action would you take?	_	126.	Name three areas where you would not park the excavator.			
123.	If you accidentally damaged an underground electrical cable, whom would you immediately contact to render the power supply safe?		127.	When leaving the excavator what should be done with all hydraulically raised attachments?			
			128.	What type of surface is the ideal type to park an excavator on?			

129.	What is the danger of parking near an excavation?	134.	Before leaving the site what must be provided to restrict access to the site?
130.	Describe the correct way to park an excavator.	135.	List eight things that must be done when parking the machine?
Perf	formance criteria 3.1.3 (select 1)		
131.	What post-operational checks of an excavator should the operator carry out?		
	CURE SITE: ormance criteria 3.2.1 (select 2)		
	What shall be provided when an excavator has to be parked on or protrudes on to an access way?		
133.	For what reason should the key be removed from ignition of the machine?		

APPENDIX A

Load Chart for Excavator - Stationary on firm level ground

EXCAVATOR LOAD CHART

22 Tonne Excavator fitted with a 3.05m long arm, 1m³ bucket and 600mm shoes

Radius	Max reach		7.6m		6.1m		4.6m		3.0m	
Hook height	Front	Side	Front	Side	Front	Side	Front	Side	Front	Side
6.1m	*3100	*3100	*3450	*3250						
4.6m	*3150	2650	*3950	3250	*4100	*4100				
3.0m	*3300	2400	*4450	3050	*5050	4500	*6450	*6450	*10750	*10750
1.5m	3550	2300	4550	2950	*6050	4200	*8300	*6450	5450	*5450
0m	3600	2300	4450	2850	6200	400	*9650	6050	*6900	*6900
-1.5m	3900	2500	4350	2750	6100	3850	*9650	5900	*10200	*10200
-3.0m	4654	2950			6100	3900	9650	6000	*14900	12300
-4.6m	6650	4250					9200	6100	*13800	12700

The ratings are based on 75% of tipping load, stationary on firm level ground as per AS 1418.5

* The ratings do not exceed 87% of hydraulic lifting capacity or 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 AS 1418.5 or 88.9% of the SWL.

Where ground is sloping, rough or not firm, the load must be dramatically reduced.

ANSWERS TO ORAL/WRITTEN QUESTIONS

UNIT 1: CONDUCT ROUTINE CHECKS.

Performance criteria 1.1.

 Chocks, Blocks or safety bars must be used to prevent the raised bucket from falling.

2.

- Oil leaks
- □ Loose connections
- Splits
- Fractures or bulges in hoses
- □ Bent piston rods
- 3. Prior to and after their use. (AS1666.1)
- 4. 10% wear.
- 5. Have the track tension adjusted.
- 6. By the hour meter, manufacturer's recommendation and log book.
- 7. Because the bolt is not an approved joining method and it does not have a load rating.
- 8. 10%

9.

- One broken wire immediately above or below a terminal or end fitting.
- Core collapse
- Corrosion
- □ Kinks
- Crushed
- □ Birdcaging
- Damaged splices
- □ 10% of broken wires in 8 diameter of rope
- Stretched
- □ Affected by heat
- □ Knotted

10.

- Cracks in links
- □ Over 10% wear
- □ Over 10% elongation
- □ Over 5% wear or stretch in throat of hook
- □ Over 10% wear in bite hook
- □ Twisted or damaged links
- □ No SWL tag
- □ Rusted
- Chain or hook affected by heat
- □ Spot welded links

11. Check for grade marking and calculate WLL, on completion of use, return it to the manufacturer for SWL tagging

- 12. Wheel jacked up with the valve at the top of the wheel, fill with water to manufacturer's specifications, add antifreeze if required and then add air pressure.
- 13. Worn or missing teeth or a worn cutting edge and other damage to the actual bucket and bucket pivot pins.
- 14. Leaks from seals, spilt or fractured hoses, and bent or damaged rams.
- 15. When the transmission is cold or after the transmission is hot and as per the manufacturer's specifications.
- 16. Check for any visual damage to the track and the track tension
- 17. By placing a straight edge on the track from the roller to the driver wheel and measuring the distance from the straight edge to the track.
- 18. Not less than 2.5cm or more than 3.8cm.
- 19. From the manufacturer's manual

- 20. The leak would cause a reduction in the pressure of the hydraulic line which could cause the quick hitch to release the bucket attachment, particularly when the engine was stopped
- 21. That the safety pins and keeper plates are in place.
- 22. Inform supervisor/authorised person, tag equipment and refrain from operating the excavator until repairs have been carried out.
- 23. It must never be used and it should be discarded.

Performance criteria 1.1.2

- 24. Raise the bucket and secure it. Carry the bucket as per manufacturer's guide.
- 25. A manufacturer's approved lifting lug with SWL marked on the machine.
- 26. Yes. You can use the wire rope sling provided that the one wire is not broken immediately below or above a terminal or end fitting then it cannot be used.

PLAN WORK:

Performance criteria 1.2.1

- 27. Check for power, telephone, gas, water, sewer, drainage, and fiber optic cable lines.
- 28. The site supervisor who will contact the supply authorities for council maps of the site.

29.

- Powerlines
- □ Trees
- Overhead service lines
- □ Bridges
- □ Surrounding buildings and structures
- Obstructions
- Other equipment
- □ Dangerous materials \

- Underground services (gas, electricity, sewerage, water, communication lines)
- □ Personnel
- ☐ Ground conditions / recently filled trenches

30.

- □ at least 2 metres from domestic powerlines
- □ at least 6 metres from high voltage transmission lines

NOTE: Assessors must ensure that the applicant is aware of Statutory Authority regulations

31.

- Obtain information from relevant authorities who may run services under the footpath
- □ Excavate towards any underground services, slowly
- Provide appropriate barricades and signs
- 32. An approved lifting lug must be used and the SWL must be marked on the machine. Persons are to be cleared from the trench where the pipe is to be layed.
- 33. Ensure the person is not under the load been lowered and is standing well clear of either end of the pipe, make sure you are lowering the pipes in a location where the trench will not cave in.

34.

- Hidden holes
- Drop offs
- □ Embankment
- Over head obstructions
- Underground services
- Overhead power lines
- □ Telephone lines
- Other obstructions that could be dangerous
- Personnel
- □ Plant & Equipment

- 35. Exhaust fumes from the internal combustion engine in an enclosed space can kill.
- 36. The 'enclosed space' must be adequately ventilated.
- 37. An approved exhaust control unit, catalytic converter (scrubber).

38.

- ☐ To prevent the foot plates from becoming slippery and causing operator to slip when mounting or dismounting
- ☐ To prevent the tools from fouling controls
- 39. Barricades, guardrails or fencing.
- 40. When the noise level could contribute to the loss of hearing. (eg; above 85 dba)
- 41. Warning signs barricades, guardrails or fencing.
- 42. Where there is a possibility that the operator could be struck on the head.
- 43. When the excavation is greater than 1.5 metres in depth.
- 44. Footwear that encloses the foot and has a non-slip sole.
- 45. Only if a special seat and seatbelt has been provided within the confines of the machine for a passenger.
- 46. <u>LxWxHt</u>
- 47. A trench into which a person is to enter which is 1.5 metres or more in depth & where the soil is unstable or backfilled.
- 48. Bench, batter sides, drop in trench shields
- 49. As you raise the bucket the boulders could tip out of the bucket onto the truck

Performance criteria 1.2.3

- 50. Directly up or down a sloping surface.
- 51. The lowest possible gear
- 52.
- Hidden holes
- Drop offs
- Embankments
- Overhead obstructions
- □ Underground services
- Overhead power lines
- □ Telephone lines
- Other obstructions that could be dangerous
- Personnel
- □ Plant & equipment

Performance criteria 1.2.4

- 53. Select the appropriate gear before travelling on the incline.
- 54. The required hazardous work permits.
- 55. A permit from the relevant local government authority.

Performance criteria 1.2.5

- 56. Hydraulic hammer attachment.
- 57. A falling object protective structure. (FOPS)
- 58.
- Excavating bucket
- □ Rock bucket
- Hydraulic hammer
- Magnet attachment
- □ Trench bucket
- Mower attachment
- ☐ Approved lifting lug for slinging loads
- □ Log grapple
- □ Blade grader

59. The person in charge on the site or other person authorised to confirm job requirements

60.

- □ Type of material to be excavated
- □ Size of the excavation or trench to be considered

CHECK CONTROLS AND EQUIPMENT:

Performance Criteria 1.3.1

- 61. Stop operating, tag the machine and make sure the hose is replaced before the machine is used.
- 62. Daily before use.
- 63. Facing the machine use the grab-rail or handrail and steps to mount /dismount the machine (Three points of contact).
- 64. In the manufacturer's manual.
- 65. Read the operators manual to familiarise yourself with the machine (e.g. controls and decal information).
- 66. Make sure controls are in neutral or park and park brake is on.
- 67. Adjust seat until comfortable, adjust mirror (if applicable) and secure safety belt.
- 68. Always refer to the manufacturer's operation manual for the correct procedure.
- 69. Attachments should be raised to the correct travelling height or stowed.
- 70. Look back over both shoulders to ensure the path of travel is clear and sound horn twice before moving unless there is a reversing/motion alarm fitted.

71. Air in the fuel system and the fuel system needs bleeding.

Performance criteria 1.3.

72. Tag the machine, put it out of service and report the damage and defects to the authorised person.

UNIT 2: SHIFT LOAD:

Performance criteria 2.1.1

- 73. The manufacturer did not design the machine to hoist persons and it is against all safe operating procedures.
- 74. You may break off the teeth and/or the sling could slip off the teeth and cause the load to fall, which may injure or kill someone or damage the load. It is against regulations to sling loads using an excavator without the appropriately approved lifting connection fitted.

Performance criteria 2.1.2

- 75. It would reduce the weight of the load that could be safely carried.
- 76. By the load chart on the excavator.
- 77. A specially designed and approved lifting lug.

Load charts

- 78. 10750 kg
- 79. 3900 kg

Weight of materials

80.

- □ By calculating the weight
- Delivery dockets
- □ Weighbridge certificate
- □ Weight marked on the item

- 81. 2.4 Tonnes
- 82. Clay

Load factors

- 83. Reduces the SWL/WLL by 50%
- 84. Two opposite diagonal slings must be capable of supporting the load.
- 85. Reduces the SWL/WLL by 25% or to 75% of SWL/WLL

Rule of thumb formula

- 86. Diameter in mm squared x 8 = WLL in kg.
- 87. Square root of load in kg/8 = Diameter in mm
- 88. Diameter in mm squared x 32 = WLL in kg or Diameter in mm squared x 0.4 x grade = WLL in kg
- 89. Diameter in mm squared x 0.3 x grade of chain = WLL in kg

SWL of slings

- 90. $12 \times 12 \times 8 = 1152$ kg.
- 91. Square root of (2048/8) = 16mm.
- 92. $16 \times 16 \times 8 = 2048 \text{ kg}$.
- 93. Reduces SWL/WLL by 50%
- 94. $8 \times 8 \times 8 = 512 \text{ kg}$.

Options

242kg

800kg

2592kg

- 95. $12 \times 12 \times 30 \times 0.3 = 1296 \text{kg}$.
- 96. $7.1 \times 7.1 \times 32 = 1613.12 \text{ kg}.$

Options

2048kg 900kg 5408kg

Performance criteria 2.1.3

- 97. The machine could overturn.
- 98. No. The driver of the truck may be in the cabin and in the event of an accident the bucket could strike the cabin, or load could be dropped on the cabin.
- 99.
- ☐ The truck must be correctly positioned.
- □ No load must pass over the cabin of the truck
- ☐ A layer of soil must be laid first to take the impact if large rocks are to be loaded
- ☐ The loaded bucket must be within the SWL of the machine.
- 100. The rock should be removed.
- 101. The operating radius of the machine.
- 102. Shoring, battering, benching or trench shields.
- 103. Observe the spoil, the appearance of the following foreign materials is an indication that the area has been previously excavated:
 - Crushed blue metal
 - □ Plastic tape
 - Clean sand
 - □ Sand bags
 - Broken tiles
 - Moisture

Any other unusual material

- 104. Stop operating immediately and hand dig to investigate further and check relevant statutory authority maps and plans.
- 105. Only high enough to provide ground clearance at all times.
- 106. Attach tag lines to the load.

- 107. Sound the horn look in the mirrors and over both shoulders and ensure the direction of travel is clear
- 108. All persons must be in view of the operator and at a safe distance from the loading operation.
- 109. Not less then 16mm diameter
- 110. By using barricades and warning signs.
- 111. The excavation could collapse causing the excavator to over turn or to fall into the excavation.

Performance criteria 2.1.5

- 112. Stop.
- 113. Boom down.
- 114. Boom up.
- 115. Slew right.
- 116. Slew left.
- 117. Retract boom.
- 118. Extend boom
- 119. Travel and Traverse

Performance criteria 2.1.6

120. Not closer than 1 metre with material coming to rest no closer than 0.5 metres from the excavation.

Performance criteria 2.1.7

- 121. Jump well clear of machine ensuring contact with the ground and machine is not at the same time.
- 122. Carefully lower the load to the ground and have the slings re-positioned and secured.

- 123. Supervisor who would contact the electrical supply authority.
- 124. Allow the machine to cool down, use a cloth to protect from hot water burns and remove the radiator cap slowly.

125.

- Stay calm, remain in seat, warn others to keep away, try to break contact by lowering bucket (if possible), try and get someone to switch off the power
- ☐ If it is unsafe to remain on the machine jump well clear of the machine, don't make contact with the ground and the machine at the same time. If you have made contact with underground power cables, be aware the area around the machine could be electrified.
- □ Remain a safe distance from the machine and warn others to keep clear. Have someone notify the site manager/supervisor who should report immediately to the appropriate authority.

UNIT 3: SHUT DOWN EQUIPMENT:

Performance criteria 3.1.1

- 126. Access ways, near overhangs, refuelling sites, tidal or flood areas, adjacent to an excavation.
- 127. Attachments should be lowered with the cutting edge flat on ground and pressure removed from hydraulic lines.
- 128. A firm level surface.
- 129. The weight of the excavator could cause the excavation to cave in, particularly if the ground is effected by rain.

130. Park on level ground, apply park brake or place in park, lower bucket to ground with cutting blade resting on the ground, turn off machine.

Performance criteria 3.1.3

131. Check the machine and equipment for defects and wear. Check the oil, fuel and water levels.

SECURE SITE:

Performance criteria 3.2.1

- 132. Barricades, lights and signs.
- 133. To prevent unauthorised movement.
- 134. Barricades or fences.

135.

- □ Parked away from access ways
- overhangs
- □ fuelling site
- □ Parked away from excavations and trenches
- Parked clear of fire hazard
- □ Parked clear of entrances, exits
- □ Parked away from firefighting and electrical equipment
- □ Parked on firm level ground or if on an incline facing up the slope
- □ Lower bucket with cutting edge on ground
- □ Engine stopped in accordance with manufacturer's operation manual (idle engine before turning off)
- □ Secure parking brake or leave in park position
- □ Remove keys

EXCAVATOR ASSESSMENT SUMMARY



ORAL/WRITTEN ASSESSMENT

-						_				
	Operatio nal Area UNIT	Number of critical criteria required	Number of Number of critical non-critical criteria criteria achieved required		Number of non- critical criteria achieved		Compe (tic YES			
	1	16		21						
	2	12		18						
	3	0		5						
	Assessmen	t start time:	: am/pm	Finish time:	: am/pm					
ļ	Oral/Writte	en Assessment com	oleted within time	allowed – approx 2	2 hours] [
	PERFO	ORMANCE A	SSESSMEN	NT						
Operatio Number of nal Area criteria required			Number	Number of criteria achieved			Compe (tic YES			
	1	7								
	2	4								
	3	1								
	Assessmen	t start time:	:	am/pm						
	Assessmen	t finish time:	:	am/pm		F				
ļ	Performano	ce Assessment comp	pleted within time	allowed – approx	l hour					
A	pplicant i	s:		COMPETENT	Γ					
(t	ick or circ	le the result obta	ined)	NOT YET CO	OMPETENT					
N	ame of As	ssessor:		Name	of Applicant:					
					ture					
D	ate/	<i>1</i>								
C	omments	Feedback (Asse	essor to make add	itional comments w	hich clarify the asses	sment re	sults)			