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DOGGING

NATIONAL CERTIFICATE OF COMPETENCY

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Dogging

ASSESSMENT

Part 1 Practical

Part 2 Written Assignment

Part 3 Oral/Written

AUGUST 2000

(Revision 1)

Contents

ASSESSOR GUIDELINES –GENERAL

1. Introduction

1.1 Scope

These general guidelines apply to all the assessment instruments for the certificates of competency prescribed by Schedule A of the National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment.[NOHSC: 1006]

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, which provide additional specific information to certificate assessors, are also included in each assessment instrument. Included, where appropriate, are specific instruction of 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 solutions to typical problems, and
- 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 assignment and the oral/written assessment should be randomly selected, either manually or using a computer system, if applicable.

3. Conducting the Assessment

3.1 Provide an explanation.

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

3.2 Practical Performance

Complete the 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 or 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 himself/herself or others, stop the assessment immediately. This indicates that the applicant is not yet competent and may require further training, before being reassessed.

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

3.3 Knowledge

The oral/written assessment determines an 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 Written Assignment

As well as providing a means to determine the applicant's competence in solving work-related problems, the written assignment will clearly demonstrate whether or not the applicant can work without direct supervision. The assessor may assist by reading out a question, but should not prompt or interpret for the applicant.

3.5 Recording responses

Each item and question on the assessment forms you use is accompanied by a box/star. Assessors must complete every box/star as follows:

✓	Correct Performance/Answer
X	Not yet achieved
N/A	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 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 assessment.

4.2 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.

4.3 Further investigation

As a certificate assessor, it is your role to determine whether or not an application 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 Occupational Health and Safety Certification Standard

For

Users and Operators of Industrial Equipment

ASSESSMENT INSTRUMENT

FOR THE

DOGGING

CERTIFICATE OF COMPETENCY

PART 1

PRACTICAL SKILLS PERFORMANCE ASSESSMENT

AUGUST 2000

ASSESSOR GUIDELINES – SPECIFIC– (Performance)

Introductory notes

1. The practical skill performance assessment is one of three assessments which applicants must pass to qualify for a Dogging Certificate of Competency. The other components are oral/written assessment and a written assignment.

2. The practical skills performance assessment for Dogging is a 'closed book' practical exercise covering seven sections.
   In practical skills performance assessment the certificate assessor evaluates the applicant's applied knowledge and understanding, the applicant's dexterity, coordination and motor skills and the applicant' familiarity with lifting equipment and recommended work procedures. The assessor will determine whether the applicant can safely undertake, without direct supervision, the tasks encompassed within each of the two units of competence comprising dogging prescribed by Schedule A of the National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment (NOHSC:1006).

3. The relationship between the seven sections of the performance assessment and the Standard's prescribed performance criteria and range statements is set out on page 12.

   A full assessment should be completed within two hours.

   To pass the assessment, the applicant must complete satisfactorily each of the following sections:
   Section 1: Inspection of equipment
   Section 2: Fibre ropes
   Section 3: Plan work and Prepare work
   Section 4: Slinging Techniques
   Section 5: Load movement
   Section 6: Signals
   Section 7 Load placement

   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.

4. Where a performance element cannot be performed the assessor can simulate or ask a question. The response must be recorded.

5. An applicant who holds a Basic, Intermediate or Advanced Scaffolding Certificate, or who produces proof of having passed a Basic Scaffolding practical skill performance assessment for fibre ropes does not require assessment in Section 2.

6. An applicant undergoing re-assessment need only be re-assessed in the part or whole sections in which he or she previously has not yet achieved.

7. Any other partial or full waiver of assessment should only be permitted in compliance with guidelines, determinations or advice given to certificate assessors by the certifying authority.

CONDITIONS

8. Location

The practical skill assessment can be conducted at any location that has:

- sufficient clear space for the load to be lifted, moved and placed without obstruction and maintaining at least twice the required clearances from power lines or other hazards;
- a suitable supporting surface for the crane: and
- controlled access to people in the vicinity.

9. Minimum serviceable plant and equipment

The assessor should use the following, as a guide. The plant and equipment may vary depending upon availability.

Crane Configuration

The crane used for the assessment should have the following features:

- powered type incorporates a hoist rope and hook block
- has a boom with slewing capability
- has a boom with luffing capability and/or telescoping capability
- has a capacity at least twice that of the loads to be lifted at the radius used.

Lifting Gear

The lifting gear available should be at least twice the capacity of their actual loading during the assessment and of adequate length. The available gear should include, but is not limited to, the following:

- single-leg slings
- four-leg slings
- chain slings
- FSWR slings
- Synthetic webbing sling
- Bow shackles
- A spreader beam
- A turnbuckle or rigging screw
- Suitable packing
- A fibre rope tagline

Miscellaneous

- Barricades, warning signs or similar
- 2.0m of rope and a length of whipping cord for each applicant

10. Minimum unserviceable equipment

Several items of unserviceable equipment must be randomly mixed into the stock of serviceable equipment. The following can be used as a guide by the assessor but can be varied depending upon availability:

- FSWR sling: birdcaged, kinked or an excessive number of broken wires
- Chain sling: proof chain or stretched links
- Shackle: worn crown, no marked SWL, bent pin or distorted bow
- Synthetic webbing sling: visible cuts, no label or damaged eyes.

11. Tools for the applicant

Each applicant must provide (or be provided with) the following tools:

- whistle, hooter or flashing light
- retractable tape measure.

12. Personal protective equipment for the applicant.

Each applicant must provide (or be provided with) the following PPE:

- Safety helmet complying with AS 1801
- Sturdy, non-slip footwear that covers the whole foot
- Close-fitting clothing
- Close fitting protective gloves.

13. Loads

There should be three different types of loads available to be slung, moved and placed. Each load should include at least one of the following features:

- at least one shall be irregular in shape with an eccentric centre of gravity (such as a T or L shape) requiring the use of chain shorteners or a turnbuckle or rigging screw to level the load
- at least one shall be sufficiently flexible to require the use of a spreader beam
- at least one shall be a loose bundle requiring double wrapped choker hitches
- at least one shall require a 3 or 4 leg sling
- at least one shall require the use of one or more shackles.

14. Conduct of Assessment

Applicants should be assessed one at a time. The person operating the crane (not the assessor) must hold the appropriate certificate of competency. A trainee crane operator cannot be used.

The performance of each applicant is to be recorded on the assessor's checklist, a copy of which is included in this document.
At least one load is to be moved using hand signals. At least one load is to be moved using whistle, hooter or light signals.

An applicant passes a practical skills performance assessment when each section has been successfully completed or a satisfactory record of training has been provided where applicable.

15. Safety of Personnel

Where an applicant is working dangerously, recklessly or without the necessary co-ordination and confidence, the assessor must direct the applicant to cease work and terminate those parts of the assessment forthwith.

Notes on individual sections

16. Inspection of Equipment (Section 1)

Note: This section applies to all applicants.

The certificate assessor must ensure that the serviceable equipment and the unserviceable equipment have been randomly mixed prior to the assessment.

The certificate assessor directs the applicant to inspect the equipment and to identify and isolate all unserviceable items.

The certificate assessor directs the applicant to identify the applicable SWL and specific characteristics of selected lifting gear.

To complete this section successfully, the applicant must identify and isolate all the unserviceable items from the available stock of equipment.

17. Fibre ropes (Section 2)

Note: This section does not apply to an applicant who holds a Certificate of Competency for Scaffolding or who have previously passed a Basic Scaffolding practical skills performance assessment for fibre ropes.

The applicant is provided with a length of whipping cord and a 2m length of 3 strand hawser-laid natural fibre rope, 12mm to 16mm in diameter.

The applicant is assessed on the following separate tasks as follows:

a) Whipping (one task)

The certificate assessor directs the applicant to whip one end of the rope. The assessor may choose one of the following methods:

i. Common whipping
ii. West Countryman's whipping
iii. American whipping
iv. Sailmakers' whipping

b) Splicing (one task)

The certificate assessor directs the applicant to splice the other end of the rope. The certificate assessor requests either of the following splices:

i. Back splice (end splice);
ii. Eye splice.

c) Bends and hitches (four tasks)

The certificate assessor directs the applicant to demonstrate four of the following bends and hitches:

i. Clove hitch around a round object;
ii. Rolling hitch around a round object;
iii. Single bowline;
iv. Timber hitch and half hitch around a plank;
v. Sheet bend to another rope.

18. Plan and Prepare Work (Section 3)

The certificate assessor directs the applicant to identify potential hazards associated with the use of cranes and other load moving equipment such as:

1. overhead power lines
   trees
   overhead service lines such as steam, gas, water & telephone
   underground services
   uneven and/or unstable ground
   floor loading
   other workers and persons
   surrounding buildings/vessels/ structures
   barricades
   inadequate lighting
   radio interference

2. Adequate site access and egress.

3. Determine or confirm mass and dimensions of load.

4. Appropriate lifting gear is identified.

5. Job method and sequence is developed to include hazard prevention control measures and safety procedures.

19. Slinging techniques (Section 4)

Note: This section applies to all applicants, but applicants with accepted documentary evidence of adequate experience need only be assessed for one load.

The certificate assessor will nominate:

- Three loads to be slung, moved and positioned
- The assumed weight of each load (which shall be at least twice their actual weight)
- Whether the load is to be moved and positioned with its greater dimension horizontal or vertical.

The applicant must ensure that:

- the appropriate lifting gear is selected for each load; and
- each load is correctly slung.

20. Load movement (Section 5)

Note: This section applies to all applicants but evidence of adequate experience need only be assessed for one load out of the crane operator's vision and a demonstration to the assessor of all hand signals.

The assessor will nominate:

- Where each load is to positioned
- The location of any simulated hazards or obstructions (such as power lines); and
- Whether the load is in view or out of view of the crane operator. (Where out of view cannot be naturally achieved, the crane operator's window can be covered for the duration of that lift.

The applicant must ensure that:

(1) the hook is positioned over the centre of gravity of the load;
(2) the hook is positioned at a suitable height to connect the lifting gear safely;
(3) the lifting gear is correctly fixed to the hook;
(4) where appropriate, a tagline is secured to the load;
(5) the load is slung correctly

(6) where appropriate, crane signals are delivered clearly, correctly timed and in correct sequence for the duration of the movement;
(7) the movement of the load is controlled at all times;
(8) the load and all parts of the crane are maintained within the necessary clearances;
(9) the load is moved within the crane' operating radius in a logical and efficient sequence;

21. Signals (Section 6)

This section applies to all applicants.

When directed by the assessor, all crane signal not previously used are correctly demonstrated via hand signals and via whistle, hooter or light signals.

All signals will be assessed both during and following the load movement/placement process both for clarity and timing.

22. Load placement (Section 7)

Note: This section applies to all applicants, but applicants with accepted documentary evidence of adequate experience need only be assessed for one load.

In placing each load, the applicant must ensure that:

(i) appropriate clearances are maintained;
(ii) the load will remain stable;
(iii) the lifting gear can be freely removed without snagging;
(iv) the load is positioned in the manner directed by the assessor.

To successfully complete the performance assessment the applicant must complete each section as indicated on the assessment form.

ASSESSMENT FORM: DOGGING

Number of loads assessed for Section 3 to 5 (1 or 3 loads) _____

Applicants name _____ **Assessment Date**_____

Performance items

1. Inspection of equipment
(correctly complete all 3 elements)

- ❑ Applicant identified and isolated ALL unserviceable items
- ❑ Applicant explains what he/she would do with the unserviceable items
- ❑ Applicant to explain the characteristics/ SWL of the applicable lifting gear (Assessor to select chain or FSWR slings or webbing slings)

2. Fibre Ropes
Applicant completes whipping and splicing correctly

- ❑ Whipping (common/West Countryman's/American/Sailmakers) **(Assessor to select one)**
- ❑ Splicing back splice/eye splice **(Assessor to select one)**

Applicant completes bends and hitches: (Four correctly demonstrated, assessor to select).

- ❑ Clove hitch
- ❑ Rolling hitch
- ❑ Single bowline
- ❑ Timber hitch and half hitch
- ❑ Sheet bend

3. Plan work and Prepare Work: and identifies site hazards:

Applicant plans, prepares work and identifies on-site hazards.

Plan and Prepare Work
(Applicant must complete 4 items)

- ❑ Adequate site access and egress.
- ❑ Determine or confirm mass and dimensions of load.
- ❑ Appropriate lifting gear is identified.
- ❑ Job method and sequence is developed to include hazard prevention control measures and safety procedures.
- ❑ Barricades and traffic control
- ❑ Warning signs and flashing lights

Identifies on-site hazards
(Applicant must identify 9 hazards)

Applicant identifies on-site hazards. Puts in place and also explains suitable methods for controlling hazards and minimising risks.

- ❑ Overhead power lines
- ❑ Trees
- ❑ Overhead service lines such as steam, gas, water & telephone
- ❑ Underground services
- ❑ Uneven and/or unstable ground
- ❑ Hazardous materials
- ❑ Floor loading
- ❑ Other workers and persons
- ❑ Surrounding buildings/vessels/ structures
- ❑ Inadequate lighting
- ❑ Radio interference

4. Slinging techniques.
Applicant demonstrates correct slinging techniques (6 elements demonstrated correctly)

- ❑ Assesses weight of load if not marked
- ❑ Checks SWL/WLL of lifting gear
- ❑ Checks crane capabilities
- ❑ Conducts test lift and checks slings
- ❑ Identifies and inspects loads destination
- ❑ Checks specific site requirements for slinging (if applicable)
- ❑ Explains Selection of lifting gear
- ❑ Explains alternate slinging methods (shackles, webbing slings, spreader beams, eye bolts)

5. Load movement:
Applicant directs crane competently:
(All demonstrated correctly)

- ❑ Positioned hook over load's centre of gravity
- ❑ The hook is positioned at a suitable height to connect the lifting gear safely
- ❑ Secured lifting gear correctly to hook
- ❑ Secured tagline as appropriate
- ❑ Load slung correctly
- ❑ Timed and sequenced crane signals correctly
- ❑ Controlled load movement
- ❑ Maintained load and crane within stated clearances.
- ❑ Move load within the operating radius of the crane.

6. Demonstrate the following signals.
(All 20 correctly demonstrated)

- ❑ Stop – hand
- ❑ Stop – whistle
- ❑ Hoist up – hand
- ❑ Hoist up – whistle
- ❑ Hoist down – hand
- ❑ Hoist down – whistle
- ❑ Luff boom down – hand
- ❑ Luff boom down – whistle
- ❑ Luff boom up – hand
- ❑ Luff boom up – whistle
- ❑ Slew left – hand
- ❑ Slew left – whistle
- ❑ Slew right – hand
- ❑ Slew right – whistle
- ❑ Travel – hand
- ❑ Telescope – in (hand)
- ❑ Telescope – in (whistle)
- ❑ Telescope – out (hand)
- ❑ Telescope – out (whistle)
- ❑ Creep – hand

Note: Assessor may use alternate approved signalling methods where appropriate eg. Lights and buzzers.

7. Load Placement
Applicant places load competently:
(All 4 demonstrated correctly)

- ❑ Maintained clearances as appropriate
- ❑ Ensured load remained stable
- ❑ Positioned load as directed
- ❑ Ensured lifting gear freely removed

DOGGING PRACTICAL
ATTACHMENT A

Crane Signals

MOTION	HAND SIGNAL	WHISTLE, BELL OR BUZZER SIGNAL		MOTION	HAND SIGNAL	WHISTLE, BELL OR BUZZER SIGNAL
Hoisting raise		2 short ••		Hoisting lower		1 long —
Luffing boom up		3 short •••		Luffing boom down		4 short ••••
Slewing right		1 long, 2 short — ••		Slewing left		1 long, 1 short — •
Jib-trolley out: telescoping boom extend		1 long, 3 short —•••		Jib-trolley in; telescoping boom retract		1 long, 4 short —••••
Travel and traverse		Not applicable		STOP		1 short •
CREEP SPEED: APPROPRIATE HAND SIGNAL FOR MOTION WITH HAND OPENING AND CLOSING						

RELATIONSHIP TO THE NATIONAL CERTIFICATION STANDARD

THE UNITS OF COMPETENCE:

The tasks set for the practical skills performance assessment are intended to assess the applicant's applied knowledge and understanding, the dexterity, coordination and motor skills, and the familiarity with lifting equipment and recommended work practices which are prescribed by Schedule A of the ***National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment. [NOHSC 1006]***

These are as follows:

1.0 Plan and prepare work
2.0 Complete dogging work

Each unit of competence is sub-divided into elements of competence, for which performance criteria are prescribed.

THE PERFORMANCE CRITERIA:

The relationship between each section of the practical assessment and the National Standard's performance criteria is as follow:

Section 1: Inspection of Equipment
The task in this section reflects performance criteria 1.2.1.

Section 2: Fibre Ropes
The tasks in this section reflect performance criteria 1.2.2, 2.1.1, 2.1.2, 2.1.3 & 2.1.7.

Section 3: Plan and Prepare Work
These tasks reflect performance criteria 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.10, 1.1.12, 2.1.4 and 2.1.5.
Also covered in oral / written assessment

Section 4: Slinging Techniques
The tasks in this section reflect performance criteria 1.1.7, 1.1.8, 1.1.10, 1.1.12, 1.2.2, 1.2.3, 2.1.1, 2.1.2, 2.1.5 & 2.1.7.

Section 5: Load & Movement.
The tasks in this section reflect performance criteria 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.13, 2.1.6 & 2.1.7.

Section 6: Signals
The tasks in this section reflect performance criteria

Section 7: Load Placement
The tasks in this section reflect performance criteria 1.1.1, 1.1.2, 1.1.4, 1.1.4, 1.1.5, 1.1.6, 1.1.13, 2.1.6 & 2.1.7.

THE RANGE STATEMENT:

The tasks making up the practical skills performance assessment are focused around typical dogging skills using common types of lifting equipment.

The model results apply to the requirements of the ***National Standard for Plant*** and the requirements of applicable parts of its referenced Standard ***AS 2550.1, Cranes –Safe Use Part 1 – general requirements***, to the obligations under State/Territory occupational health and safety legislation of a person who carries out work tasks within the scope of the Dogging Certificate of Competency.

National Occupational Health and Safety Certification Standard

for

Users and Operators of Industrial Equipment

ASSESSMENT INSTRUMENT

FOR THE

DOGGING

CERTIFICATE OF COMPETENCY

PART 2

WRITTEN ASSIGNMENT

AUGUST 2000

Contents

ASSESSOR GUIDELINES – SPECIFIC (Written Assignment)

Introductory notes

1 The written assignment for Dogging is one of three assessments which applicants must pass to qualify for a Dogging Certificate of Competency.

2 The written assignment for Dogging is a 'closed book' examination consisting of a total of six separate tasks. The tasks cover two sections, with three tasks in each section.

In the written assignment the certificate assessor evaluates the applicant's conceptual understanding of crane usage and slinging techniques, his/her ability to apply simple mathematics and physics, and ability to read and comprehend the English language. On completion of the assessment, the assessor will determine whether the applicant can safely undertake, without direct supervision, the tasks encompassed within each of the two units of competence, comprising Dogging, prescribed by Schedule A of the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment* (NOHSC: 1006).

3 The relationship between the two sections of the assignment and the Standard's prescribed performance criteria and range statements is set out on page 27.

A full assignment includes five minutes reading time and up to 30 minutes to complete.

4 To pass the assignment, the applicant must satisfactorily complete each task in each of the following sections:

Section 1: Slinging techniques (three tasks)

Section 2: Crane usage (three tasks).

Assessors should highlight in Tasks 1-5 the combination of variables required for completion of each task.

5 An applicant undergoing reassessment need only be re-assessed in those sections/tasks that he or she previously failed to achieve competency.

6 Any other partial or full waiver of assessment should only be permitted in compliance with guidelines, determinations or advice given to the certificate assessor by the certifying authority.

7 The model answers to the tasks and the methodology used for determining answers are provided on pages 23-26.

INSTRUCTION TO APPLICANTS

1 Equipment

To complete this assignment you will need pens or pencils.

You MAY use an eraser and a calculator.

BOOKS AND PREPARED NOTES ARE NOT TO BE USED

2 Reading time

You have five minutes to read the assignment and the attached material before you start writing.

During this five minutes you may ask the assessor questions about the assignment tasks and the illustrations provided.

3 The Assignment

The assignment contains:

- three information sheets;
- Six tasks to be completed.

Your assessor will indicate on the task direction sheets the specifications you are to use.

WRITE YOUR NAME AT THE TOP OF EACH PAGE

4 Time allowed

You have 30 minutes to complete all six tasks and 5 minutes reading time.

DIRECTIONS: SECTIONS 1

Note: Assessor should indicate the combination of variables required for each task.

SECTION ONE:
SLINGING TECHNIQUES

INTRODUCTION TASK 1

A drum filled with water is to be lifted with two vertical flexible steel wire (FSWR) slings fixed to a spreader as shown in Figure No 1, Information sheet 1.

Task: 1A

Calculate the volume of the drum based on the following dimensions:

The drum's diameter is:
(a) 0.9m **or** (b) 1.1m **or** (c) 1.6m

The drum's height is:
(a) 1.7m **or** (b) 1.9m **or** (c) 2.2m

AND

Task: 1B

Calculate the total weight to be lifted when the drum is filled with water.

- Water weighs one tonne per cubic meter
- Weight of the empty drums is 260kgs

AND

Task: 1C

Using the calculated weight of the load determined above, calculate the minimum diameter of FSWR slings (in whole millimetres)

INTRODUCTION TASK 2

A box with built-in lifting lugs is to be lifted, as shown in Figure No 2, Information sheet 1.

The included angle between the diagonally opposite sling legs is 60 degrees.

The chain slings are:
(a) Grade (L) **or** (b) Grade (M) **or** (c) Grade (T)

The chain diameter is:
(a) 8mm **or** (b) 13mm **or** (c) 16mm

Task 2:

Using the chain diameter and grade chosen by the assessor, calculate the maximum load that can be lifted (rounded down to the nearest 10^{th} of a tonne).

ASSESSOR NOTE:

Grade M is the correct grade classification for what was previously referred to incorrectly as Grade P in the Guide for Dogging. The grade designation remains unchanged.
L = grade 30
M = grade 40
P = grade 50
T = grade 80

INTRODUCTION TASK 3

A pair of flexible FSWR reeved slings is to be used to lift a steel beam, as shown in Figure No 3, Information sheet 1.

The angle between the sling legs is 90 degrees.

The diameter of the slings is:
(a) 12mm **or** (b) 14mm **or** (c) 16mm

The steel beam weighs:
(a) 125 kg/m **or** (b) 147 kg/m **or** (c) 173 kg/m

Task 3

Using the diameter of the sling and the weight of the beam chosen by the assessor, calculate the maximum length of beam that can be lifted (in whole metres)

OR

ALTERNATE TASK 3 (i) Use these questions instead of the one above:
As shown in Figure 3

Task 3 (i):

What would be the maximum load that could be lifted using a two legged 13mm, grade 80 chain, used in a choke hitched on a *square load* at an angle of

(a) 60 degrees **or** (b) 90 degrees **or** (c) 120 degrees

ALTERNATE TASK 3

(ii) Use this question instead of either of the other two questions for task 3:
As shown in Figure 3(ii)

Task 3 (ii)

What would be the maximum load that could be lifted using a two legged 13mm, grade 80 chain, used in a choke hitched on a round load at an angle of

(a) 60 degrees **or** (b) 90 degrees **or** (c) 120 degrees

SECTION TWO: CRANE USAGE

Note: Assessor should indicate the combination of variables required for each task

INTRODUCTION TASK 4

A mobile lattice-boom crane is to be set up, as shown in ***Figure No 4, Information sheet 2.***

There are two outriggers on each side.

The load to be lifted plus half the boom weight (W) is:
(a) 5.5 t **or** (b) 13.0 t

The distance from the load to the back wheel support (R) is:
(a) 6m **or** (b) 12m

The distance from the end of the outrigger to the back wheel (B) is:
(a) 3m **or** (b) 5m

The bearing pressure of the soil (V) is:
(a) 20 t/m^2 **or** (b) 40 t/m^2

Outrigger packing pads are available in the following four sizes:

0.3m x 0.3m, 0.6m x 0.6m, 0.9m x 0.9m, 1.2m x 1.2m.

Task 4

Using the combination of variables provided by the assessor, calculate the smallest packing pad needed for each outrigger.

INTRODUCTION TASK 5

A crane displays the load chart shown in Figure No 5, Information sheet 3.

The crane is set up on fully extended outriggers and is rigged with a 20 t hook block weighing 250 kg.

The radius is:
(a) 6.0m **or** (b) 7.0m **or** (c) 8.0m

The boom length is;
(a) 10.1 **or** (b) 18.1 m **or** (c) 26.0 m

The load is to be lifted:
(a) over the rear **or** (b) over the side

Task 5

Using the combination of variables provided by the assessor, calculate the maximum load that can be lifted when the crane is set up using this particular combination of variables.

INTRODUCTORY TASK 6

The crane is set up as for Task 5

What could happen to the crane if it were overloaded – structural damage, or instability

DOGGING - WRITTEN ASSIGNMENT
INFORMATION SHEET 1

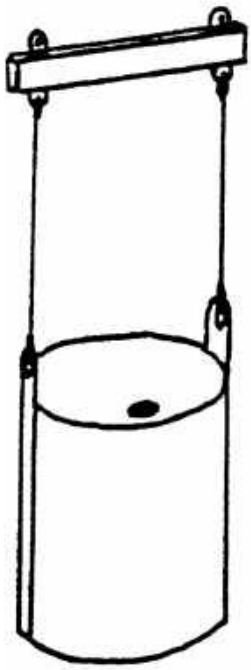


Figure 1
(for Task 1)

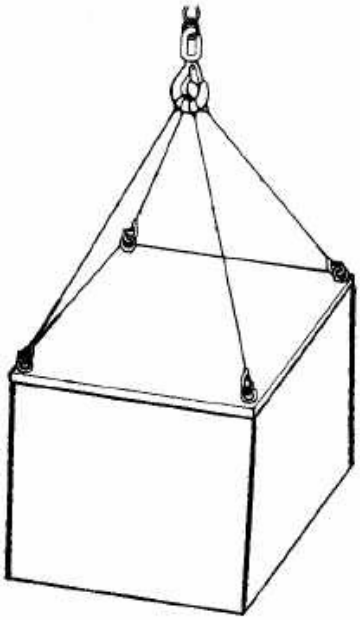


Figure 2
(for Task 2)

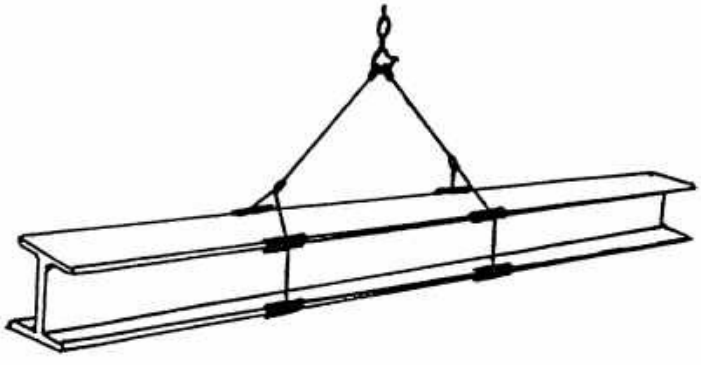


Figure 3
(for Task 3)

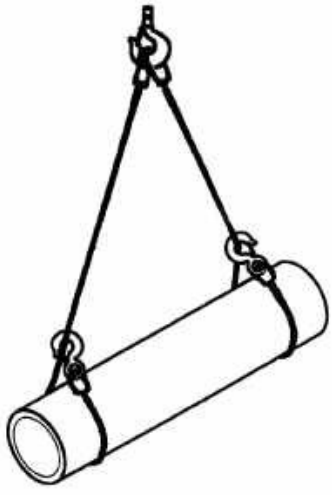


Figure 3(ii)
(for Task 3)

DOGGING - WRITTEN ASSIGNMENT
INFORMATION SHEET 2

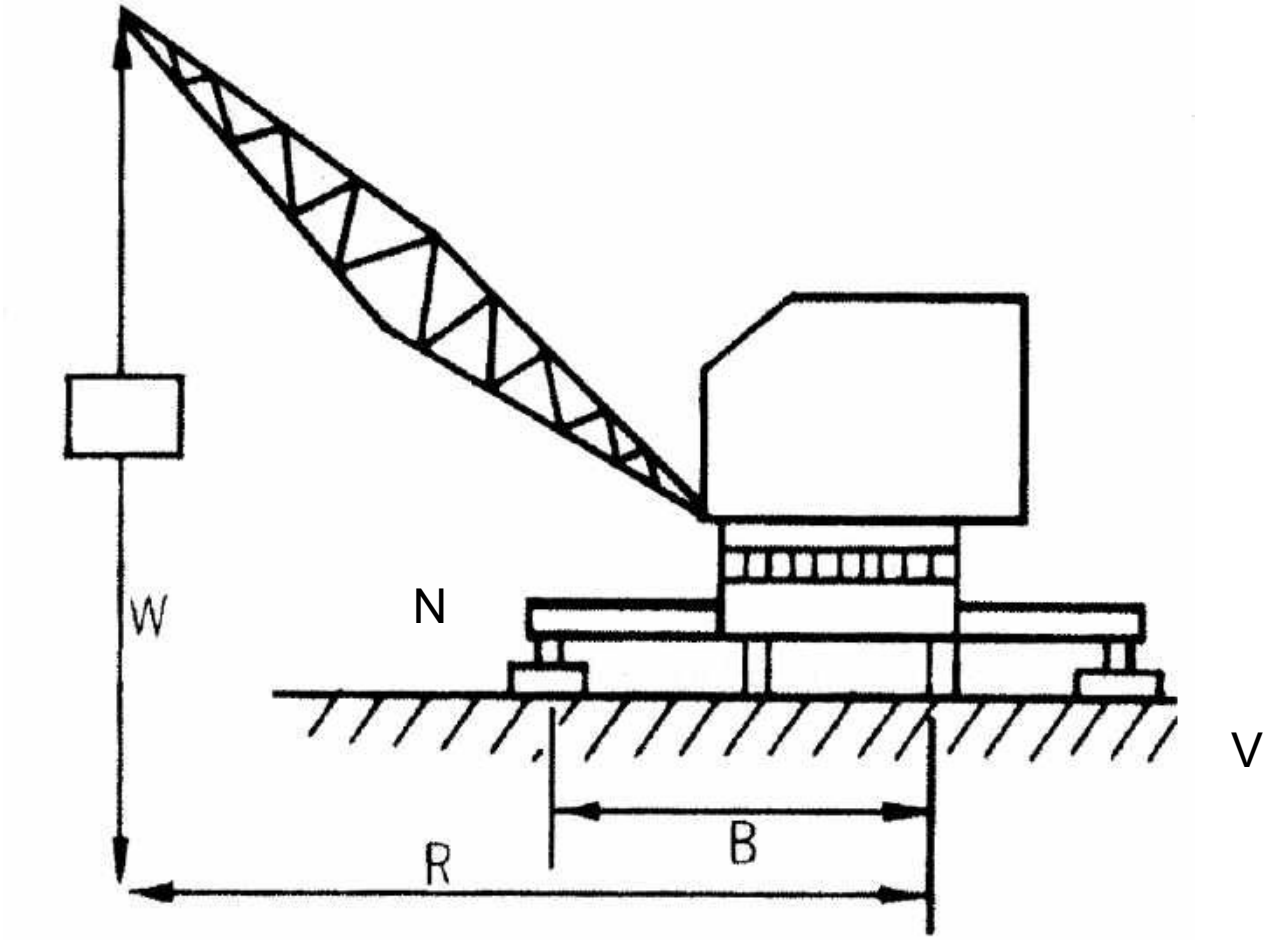


Figure 4 (for Task 4)

DOGGING – WRITTEN ASSIGNMENT

INFORMATION SHEET 3

CRANE LOAD CHART
Showing Rated Lifting Capacity (in tonnes) on Fully Extended Outriggers

Radius	10.1m Boom		18.1m Boom		26.0m Boom	
(m)	Over Rear	Over Side	Over Rear	Over Side	Over Rear	Over Side
3.0	25.00	25.00	14.00	14.00		
3.5	21.70	21.70	13.40	13.40		
4.0	18.50	18.50	12.75	12.75		
4.5	15.50	15.50	12.15	12.15		
5.0	12.80	12.80	11.60	11.60	7.40	7.40
5.5	10.50	10.50	10.00	10.00	7.10	7.10
6.0	8.80	8.80	8.70	8.70	6.65	6.65
6.5	7.70	7.55	7.70	7.70	6.40	6.40
7.0	6.85	6.60	6.85	6.60	6.10	6.10
7.5	6.20	5.70	6.20	5.70	5.75	5.75
8.0	5.60	4.95	5.60	4.95	5.40	5.40
8.5	5.05	4.36	5.05	4.35	5.00	4.80
9.0			4.60	3.85	4.60	4.35
10.0			3.90	3.10	3.90	3.50
11.0			3.30	2.65	3.30	2.95
12.0			2.80	2.25	2.80	2.50
13.0			2.40	1.95	2.40	2.15
14.0			2.10	1.55	2.10	1.80
16.0					1.55	1.30
18.0					1.20	0.95
20.0					0.90	0.60
22.0					0.70	0.40
24.0					0.55	0.25

Figure 5

(for Task 5 and Task 6)

MODEL ANSWERS

SECTION ONE:
SLINGING TECHNIQUES

Note: This section contains three tasks (Tasks 1 to 3). In order to pass this section, the applicant must provide the correct answer to each task.

Task 1:

Note: this task assesses the applicant's ability to calculate volume from dimensions, calculate weight from volume, apply the load factor for a pair of vertical slings and use the common formula for calculating FSWR diameter.

To determine the correct answer the applicant must first calculate the volume of the drum using the formula:

Volume (in m3)=Diameter x Diameter (in m) x 0.79 x Height (in m) or Volume (in m3) = Radius x Radius x Pi x Height.

The weight of the total can now be calculated using the formula:

Weight (in kg) = Volume x 1000kg (water weight per m3) plus 260kg (tare of drum)

The load on each sling is then determined by dividing the weight by the load factor.

The sling diameter can now be calculated using the formula:

Diameter (in mm) = √load ÷ 8÷2

The answers for the nine possible combinations are as follows:

Calculations based on using .79

a/a	10mm	(rounded up from 9.178)
a/b	10mm	(rounded up from 9.604)
a/c	11mm	(rounded up from 10.210)
b/a	11mm	(rounded up from 10.854)
b/b	12mm	(rounded up from 11.391)
b/c	13mm	(rounded up from 12.153)
c/a	16mm	(rounded up from 15.203)
c/b	17mm	(rounded up from 16.013)
c/c	18mm	(rounded up from 17.156)

Calculation based on using Pi

a/a	10mm	(rounded up from 9.1580)
a/b	10mm	(rounded up from 9.5825)
a/c	11mm	(rounded up from 10.1862)
b/a	11mm	(rounded up from 10.8288)
b/b	12mm	(rounded up from 11.3642)
b/c	13mm	(rounded up from 12.1232)
c/a	16mm	(rounded up from 15.1645)
c/b	16mm	(rounded up from 15.9720)
c/c	18mm	(rounded up from 17.1120)

Note: For combination c/b, there can be two other acceptable answers.

These are:

- 16mm because the exact solution is less than 0.1mm above 16mm; and
- 18mm (because 17mm is not a standard rope diameter).

Task 2:

Note: This task assesses the applicant's understanding of load transfer by multi-legged slings, the understanding of angle factors, the understanding of grade markings on lifting chain and the ability to use the common formula for determining the SWL of chain.

To determine the correct answer, the applicant must firstly calculate the SWL for the chain using the formula:

SWL (in kg's) = D squared (in mm) x G (grade factor) x 0.3

SWL (in kg's) = D squared (in mm) x 32 or D squared (in mm) x grade x 0.4 (for grade "T")

For multi legged slings, it must be assumed that at least two slings are capable of taking the load. Therefore, the permissible load is calculated for one pair of diagonally opposite slings.

The applicant must multiply the SWL by the angle factor (1.73 for a pair of slings with an included angle of 60 degrees) to calculate the maximum load of the box. This is then converted to tonnes and rounded down to the nearest 0.1t.

The answers for the nine possible combinations are as follows:

a/a 0.9 t (rounded down from 996.48kg) a/b 2.6 t (rounded down from 2631.33kg) a/c 3.9 t (rounded down from 3985.92kg) b/a 1.3 t (rounded down from 1328.64kg) b/b 3.5 t (rounded down from 3508.44kg) b/c 5.3 t (rounded down from 5314.56kg) c/a 3.5 t (rounded down from 3543.04kg) c/b 9.3 t (rounded down from 9355.84kg) c/c 14.1 t (rounded down from 14172.16kg)

Task 3

Note: This task assesses the applicant's ability to use the common formula for calculating the SWL of FSWR, apply the appropriate angle factors and reeve factors and calculate length from weight.

To determine the correct answer, the applicant must calculate the SWL of FSWR by using the formula:

SWL (in kg's) = D^2 (in mm) x 8.

The sling SWL is then multiplied by the angle factor (1.41 for a pair of slings with an included angle of 90°), and then multiplied by the reeve factor (0.5 for slings reeved around rectangular sections). This is expressed by the formula:

Maximum load = SWL x angle factor x reeve factor.

The result is then divided by the weight per meter of the beam (in kg's).

The final answer is rounded down to whole meters.

The answers for the nine possible combinations are as follows:

a/a	6m	(rounded down from 6.497 m)
a/b	5m	(rounded down from 5.525 m)
a/c	4m	(rounded down from 4.695 m)
b/a	8m	(rounded down from 8.844 m)
b/b	7m	(rounded down from 7.520 m)
b/c	6m	(rounded down from 6.390 m)
c/a	11m	(rounded down from 11.551 m)
c/b	9m	(rounded down from 9.822 m)
c/c	8m	(rounded down from 8.346 m)

Task 3 (i):

SWL x load factor x angle factor

The answers for the three possible combinations are as follows:

(a) 5408 x 0.5 x 1.73 = 4677 kg's
(b) 5408 x 0.5 x 1.41 = 3812 kg's
(c) 5408 x 0.5 x 1.00 = 2704 kg's

Task 3 (ii):

SWL x load factor x angle factor

The answer for the three possible combinations is as follows:

(a) 5408 x 0.75 x 1.73 = 7016 kg's
(b) 5408 x 0.75 x 1.41 = 5718 kg's
(c) 5408 x 0.75 x 1.00 = 4056 kg's

SECTION TWO:
CRANE USAGE

Note: This section contains three tasks (Tasks 4 to 6). In order to pass this section, the applicant must provide the correct answer to each question.

Task 4:

Note: This task assesses the applicant's ability to apply the common formula for the outrigger packing of mobile cranes.

The formula is:

$$\sqrt{\frac{W \times R}{B \times N \times V}} = \text{Area (in square meters)}$$

Where

W = Load plus half the mass of the boom (in tonnes);

R = Distance from load to back wheel support (in meters);

B = Distance from end of outrigger to back wheels (in meters);

N = Number of outriggers on the loaded side; and

V = Soil bearing pressure (in tonnes per square metre).

The answer for the 16 possible combinations is as follows:

a/a/a/a: 0.6 m x 0.6 m (rounded up from 0.524 sq m)

a/a/a/b: 0.6 m x 0.6 m (rounded up from 0.371 sq m)

a/a/b/a: 0.6 m x 0.6 m (rounded up from 0.406 sq m)

a/a/b/b: 0.3 m x 0.3 m (rounded up from 0.288 sq m)

a/b/a/a: 0.9 m x 0.9 m (rounded up from 0.741 sq m)

a/b/a/b: 0.6 m x 0.6 m (rounded up from 0.524 sq m)

a/b/b/a: 0.6 m x 0.6 m (rounded up from 0.574 sq m)

a/b/b/b: 0.6 m x 0.6 m (rounded up from 0.406 sq m)

b/a/a/a: 0.9 m x 0.9 m (rounded up from 0.806 sq m)

b/a/a/b: 0.6 m x 0.6 m (rounded up from 0.570 sq m)

b/a/b/a: 0.9 m x 0.9 m (rounded up from 0.624 sq m)

b/a/b/b: 0.6 m x 0.6 m (rounded up from 0.441 sq m)

b/b/a/a: 1.2 m x 1.2 m (rounded up from 1.140 sq m)

b/b/a/b: 0.9 m x 0.9 m (rounded up from 0.806 sq m)

b/b/b/a: 0.9 m x 0.9 m (rounded up from 0.883 sq m)

b/b/b/b: 0.9 m x 0.9 m (rounded up from 0.624 sq m)

Task 5 and 6:

Note: Task 5 assesses the applicant's ability to interpret simple information from crane load charts.

Task 6 assesses the applicant's understanding of the relationship between a crane's structural capacity and its stability and the applicant's ability to recognise, which of these factors is critical in a given configuration.

To determine the correct answer to **Task 5**, the applicant must find the correct loading on the chart and then deduct the weight of the hook block (0.25 t)

To determine the correct answer to **Task 6**, the applicant must determine whether the combination is above the line (in which case overloading may result in structural damage) or below the line (in which case overloading may result in instability).

The answer to the 18 possible combinations, is as follows:

COMBINATION	QUESTION 5	QUESTION 6
a/a/a:	8.55 t	Structural damage
a/a/b:	8.55 t	Structural damage
a/b/a:	8.45 t	Structural damage
a/b/b:	8.45 t	Structural damage
a/c/a:	6.40 t	Structural damage
a/c/b:	6.40 t	Structural damage
b/a/a/:	6.60 t	Structural damage
b/a/b:	6.35 t	Instability
b/b/a:	6.60 t	Structural damage
b/b/b:	6.35 t	Instability
b/c/a:	5.85 t	Structural damage
b/c/b:	5.85 t	Structural damage
c/a/a:	5.35 t	Instability
c/a/b:	4.70 t	Instability
c/b/a:	5.35 t	Structural damage
c/b/b:	4.70 t	Instability
c/c/a:	5.15 t	Structural damage
c/c/b:	5.15 t	Structural damage

Dogging – Written Assignment

RELATIONSHIP TO THE NATIONAL CERTIFICATION STANDARD

THE UNITS OF COMPETENCE

The tasks set within the two sections of the written assignment are intended to assess the conceptual understanding, English language literacy and numeracy required to carry out the two units of competence for Dogging prescribed by Schedule A of the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment.*

These are as follows:

1.0 Plan and prepare work
2.0 Complete dogging work

Each unit of competence is subdivided into elements of competence, for which performance criteria are prescribed.

THE PERFORMANCE CRITERIA

The relationship between each section of the written assignment and the National Standard's performance criteria is as follows:

Section 1: Slinging techniques
The three tasks in this section reflect performance criteria 1.1.7, 1.1.8, 1.1.12, 1.2.2, 1.2.3, 2.1.1, 2.1.2 and 2.1.7.

Section 2: Crane usage
The three tasks in this section reflect performance criteria 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.10,1.1.12, 1.2.3, 2.1.1 and 2.1.7.

THE RANGE STATEMENT

The tasks making up the written assignment assess conceptual understanding, literacy and numeracy in relation to dogging work.

The model answers apply the requirements of the *National Standard for Plant* and the requirements of its applicable parts of referenced Standard AS 2550, *Cranes –Mobile, Tower and Derrick – Selection and Operation*, the obligations under State/Territory occupational health and safety legislation of a person who carries out work tasks within the scope of the Dogging certificate of competency.

The formulas used to determine model answers are those given in the 5th edition (1997) of *A Guide for Dogging,* published by the Authority of NSW, which the WorkSafe Australia Scaffolding and Rigging Expert Working Group has endorsed as a suitable text for the determination of the applicants' answers for Dogging assessments.

National Occupational Health and Safety Certification Standard
for
Users and Operators of Industrial Equipment

ASSESSMENT INSTRUMENT

FOR THE

DOGGING

CERTIFICATE OF COMPETENCY

PART 3

ORAL/WRITTEN ASSESSMENT

AUGUST 2000

Contents

ASSESSOR GUIDELINES – SPECIFIC (Oral/Written)

Introductory notes: –

1. The oral/written assessment for Dogging is one of three assessments which applicants must pass to qualify for a Dogging Certificate of Competency. The other components are a written assignment and a performance assessment.

2. The oral/written assessment for Dogging is a 'closed-book' short-answer examination divided into four sections. The questions in each section are to be randomly selected from a bank which contains a total of 126 questions.

   In the oral/written assessment the certificate assessor evaluates the applicant's underpinning knowledge. On completion of the assessment the assessor will determine whether the applicant can safely undertake, without direct supervision, the tasks encompassed within each of the two units of competence comprising Dogging prescribed by Schedule A of the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment* (NOHSC: 1006).

3. The relationship between the questions and the Standard's prescribed performance criteria is set out on page 50.

4. A full oral/written assessment consists of 40 questions and can take up to 60 minutes to complete. The time permitted for partial assessments should be approximately one minute per question.

   There are two ways in which the oral/written assessment can be conducted. These are:

   - *By written examination.* Where this method is used, the applicant must be given the chance to be orally assessed on any questions which are not completed in writing;
   - *By oral examination.* Where this method is used, the assessor will enter the applicant's answers onto the assessment paper.

5. 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 Section.

   Assessor note: The assessment summary specifies the appropriate number of non-critical questions to be achieved. Questions should be selected as follows:

   Section 1: Site hazards
   (Select 8 including 2 stars)

   Section 2: Cranes
   (Select 10 including 3 stars)

   Section 3: Lifting gear
   (Select 10 including 2 stars)

   Section 4: Slinging and moving loads
   (Select 12 including 7 stars)

6. An applicant undergoing re-assessment need only be re-assessed in the part or whole sections that he or she previously failed to successfully complete.

7. Any other partial or full waiver of oral/written assessment should only be permitted in compliance with guidelines, determinations or advice given to the certificate assessor by the certifying authority.

8. The model answers to the bank of questions are on pages 45 - 49.

   Where appropriate, model answers include acceptable alternatives given in brackets.

9. Applicants may use alternative compatible metric units to those given in the model answers. For example, where the model answer is 250mm, an answer of 25cm or 0.25m is acceptable.

10. Where the model answer includes a unit of measurement, an applicant's answer which is not qualified with a unit of measurement is unacceptable. For example, where the model answer is 250mm, an answer of 250 is NOT acceptable.

11. An applicant who uses an imperial unit of measurement in an answer must be given the opportunity by means of oral questioning to convert the answer correctly to an appropriate metric measurement. A failure to convert an imperial measurement correctly is regarded as not yet competent.

DOGGING – ORAL/WRITTEN

SECTION 1: SITE HAZARDS

(Select 8 questions including 2 with a star).

1. Which has the greater bearing pressure, soft clay or dry sand? ❑

2. Which has the greater bearing pressure, shale or dry sand? ❑

3. Which has the greater bearing pressure, dry clay or gravel? ❑

4. What three hazards would you check for before a crane is taken 'off-road'? ❑

5. When operating near powerlines, which type of tagline would you use, natural fibre rope or a synthetic fibre rope? (Explain your answer). ❑

6. What can happen to the crane boom when a heavy load is released under powerlines? ❑

7. Why is it dangerous for a person to stand close to the chassis or outriggers of a slewing mobile crane? ❑

8. Which type of two-way radio is recommended for dogging on large city building sites, a trunked radio, or a conventional radio? ❑

9. What type of synthetic slings are damaged by acids? ❑

10. Where a crane has to lift over power lines what two actions can be taken to these lines, to eliminate, or control the hazard? ❑

11. What is the minimum distance any part of a crane or load is allowed to set up near:

1. distribution powerlines;
2. high voltage transmission lines.

Note: Assessors must ensure that the applicant is aware of State Authority regulations.

12. What type of synthetic slings are damaged by alkaline substances such as caustic soda?

13. What type of synthetic slings are damaged by organic solvents such as paint, coal tar and paint stripper?

14. If you want to work closer than the prescribed distances from power lines what can you do?

15. Before placing a heavy load on a floor or temporary formwork and falsework what should the person dogging the load ensure?

16. What hazards would you look for before directing a crane onto a site in a built up area?

17. You are about to set up on site, List six hazards that would need to be taken into account in the crane set up plan?

18. What hazard control measures would you need to consider in directing and controlling crane movement and loads involving the following:

a) Public safety;
b) Vehicles on site;
c) Maintain suitable vision at night.

19. To prevent injury, what minimum PPE should a person dogging the load use?

20. What should be provided where the crane is to lift loads over pedestrians on a footpath? ❑

21. Why is it important to consult with the relevant workplace personnel and OHS officer before commencing to work on a site? ❑

22. What must be obtained before commencing crane and dogging work on a site? ❑

23. What type of mobile crane is most suitable to carry a load across an unprepared surface? ❑

SECTION TWO: CRANES
(Select 10 questions including 3 with a star).

24. When setting up a mobile crane, would you place the top layer of packing in line with the outrigger beam or at right angles to the outrigger beam? ❑

25. What is the minimum thickness of timber you would use for the base layer of packing under a mobile crane's outrigger? ❑

26. In what position would you place a layer of outrigger packing to the previous layer of packing? ❑

27. Where would you find a crane's rated capacity for a particular boom length at a particular radius? ★

28. What are two effects of overloading a mobile crane? ❑

29. When mobiling a load up a slope, what can happen to the crane's boom if it is positioned too close to vertical? ❑

30. When lifting a load, would you use rail clamps instead of outriggers on a locomotive crane? ❑

31. When would you chock the wheels of a locomotive crane?

32. What is the load chart and what does it tell you?

33. When dealing with a crane load chart, what is meant by the term 'operating radius'?

34. Give two reasons why you are not permitted to snig a load?

35. With a fly jib attached, how do you find the cranes altered capacity?

36. In general, how does using a fly jib affect the lifting capacity of a crane?

37. How does using a fly jib affect the crane's radius?

38. Can you mobile a loaded crane across the side of a hill? (Explain your answer).

39. When booming/luffing down with a load, what effect does it have on the crane?

40. When mobiling a load how high must you keep the load and at what speed should you travel?

41. Why do you have to fully extend the outriggers of a mobile crane?

42. What hazards would arise when setting outriggers close to any excavation?

43. Where must the person dogging the load be positioned if a lift box and crane is used to hoist a worker? ❑

44. Why should a crane carrying a heavy load be directed down a sloping surface backwards? ❑

45. Before hoisting the load where should the top sheave of the crane be in relation to the load? ❑

46. What is the smallest diameter wire rope sling that can be used to hoist a load? ❑

SECTION THREE: LIFTING GEAR

(Select 10 questions including 2 with a star) .

47. What is meant by 6 x 24 FC RHOL FSWR? ❑

48. What is meant by 8 x 25 FC LHOL FSWR? ❑

49. Are the strands of a right hand lay rope laid clockwise or anticlockwise around the core? ❑

50. In an ordinary lay FSWR, are the wires laid in the same direction as the strands, or in the opposite direction from the strands? ❑

51. What is the minimum FSWR construction you would use for slings? ❑

52. In the construction of rope does the lay of a rope affect its SWL? ❑

53. Does the lay of a rope affect its spin? ❑

54. What letter is often used to mark Grade 80 chain? ❑

55. What letter is often used to mark Grade 40 chain? ❑

56. What letter is often used to mark Grade 30 chain? ❑

57. For a vertical lift (direct) what is the SWL of a synthetic sling colour-coded red? ❑

58. For a vertical lift (direct) what is the SWL of a synthetic sling colour-coded green? ❑

59. For a vertical lift (direct) what is the SWL of a synthetic sling colour-coded blue? ❑

60. What is the smallest diameter fibre rope you would use as a tagline? ❑

61. What type of shackle would you use for multiple slings? ❑

62. What type of eyebolts would you use with multiple leg slings when the pull on the slings is to centre to the axis of the eye bolts? ❑

63. What will condemn a fibre rope for safe use for lifting purposes? List at least five defects? ❑

64. What is the smallest diameter fibre rope allowed to support loads? ❑

65. What is the formula or rule of thumb for determining the working load limit (SWL) of an unidentified synthetic rope? ❑

66. What defects will condemn a flexible steel wire rope (FSWR) from safe use for lifting purposes? List at least four defects. ❑

67. What is the formula that indicates the maximum amount of broken wires permitted in FSWR? ❑

68. Calculate the maximum number of broken wires allowed in a FSWR 6 x 19 construction, diameter of 25mm.

69. What is the maximum temperature FSWR can be subjected to without causing damage? ❑

70. What will condemn chain from safe use for lifting purposes? (List at least five defects) ❑

71. What is the maximum safe exposure temperature for: ❑

(i) Grade 30 chain
(ii) High tensile grade 80 chain

72. What is the smallest size diameter alloy chain allowable for safe load handling for: ❑

(i) Grade 30 chain
(ii) High tensile grade 80 chain

73. What is the maximum amount of wear permitted in the link of a lifting chain? ❑

74. What is the maximum amount of stretch permitted in the link of a lifting chain? ❑

75. What action would you take if a chain has:

(i) no SWL tag

(ii) no SWL tag & grade markings

76. How do you find out the lifting capacity of synthetic webbing slings?

77. What factors should be considered when inspecting synthetic webbing slings for safe use? List at <u>least six</u> factors.

78. Why shouldn't synthetic web slings be twisted when supporting loads?

79. What will condemn synthetic slings from safe use for lifting purposes? List at least five defects.

80. Name two principal shapes of shackles generally used for lifting purposes?

81. What is the maximum amount of wear permitted in a shackle?

82. Where do you find the SWL of a shackle?

83. What will condemn shackles from safe use for lifting purposes? List at least three defects

84. Who would be responsible for checking all lifting gear, for example chains and slings?

85. Are you permitted to allow a person to ride upon the lifting hook, sling attachment, or suspended load? Explain your answer.

86. When should slings be inspected? ❑

87. What should you do with a flat webbing synthetic sling that has the information tag removed? ❑

88. What should your employer do with any chain sling that cannot be repaired? ❑

89. Up to what percentage wear is permitted in the bite of the hook used on a chain sling? ❑

90. Up to what percentage increase is permitted in the throat opening of a hook used on a chain sling? ❑

SECTION FOUR:
Slinging and Moving Loads.

Select 12 questions including 7 with a star)

91. What is the recommended maximum angle between two legs of a sling? ❑

92. What is the recommended angle between the vertical and any leg of sling? ❑

93. When a three-legged sling is used to lift a rigid load, how many legs are assumed to be taking the weight? ★

94. When you fix a shackle to a crane hook, does the pin rest on the hook or does the crown rest on the hook? ❑

95. How would you protect a sling from damage caused by the sharp edges of a load? ❑

96. What is the maximum evenly distributed load you would place on a standard hardwood lifting pallet?

97. When lifting a pallet of bricks, what should be used to prevent loose bricks falling?

98. What could happen to formwork if a kibble load of concrete is discharged in one spot?

99. What minimum clearance would you keep between stacked loads and a railway track?

100. What minimum clearance between stacked loads would you keep for walkways?

101. What minimum clearance around stacked loads would you keep for truck access?

102. Before a round load is released, what would you do to stop it from rolling away?

103. When mobiling a load, would you keep the load close to the boom, or close to the ground?

104. How would you stop a load that is been mobiled, from swaying too much?

105. List three correct lifting methods used for handling steel sheet plate?

106. A load of pipes is to be lifted, describe a safe method of slinging the load.

107. What is the correct method of lifting a loose bundle of steel?

108. Two cranes are required to position a large column to vertical. One of the cranes is floating the base of the column into position. What certificate should the person in charge of the operation hold?

109. What would you use to hoist pallets of bricks or blocks to the floors of a building?

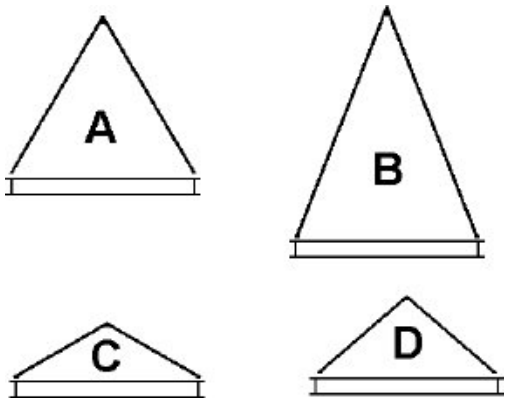
110. What could you use to safely lift a long bundle of roofing iron onto a roof?

111. How would you determine the lifting points for long precast concrete beams?

112. How does an increase in angle affect the WLL of lifting slings?

113. How do you determine the maximum angle of a four legged sling?

114. From the drawings below select the angle closest to 90 degrees.



115. What type of eye-bolts should be used to connect two leg slings to a load where the lift is not vertical.

116. When using two slings to lift a load, what are the three main factors that determine the length and capacity of the slings required?

117. When using a flexible steel wire rope (FSWR) sling, how much reduction is there in the working load limit (WLL) as a result of using a choker hitch around a square load? ❑

118. What load factor should be used when a flexible steel wire rope (FSWR) sling is choker hitch around a round load? ❑

119. How much reduction is there in the working load limit (WLL) as a result of using a choker hitch around a round load? ❑

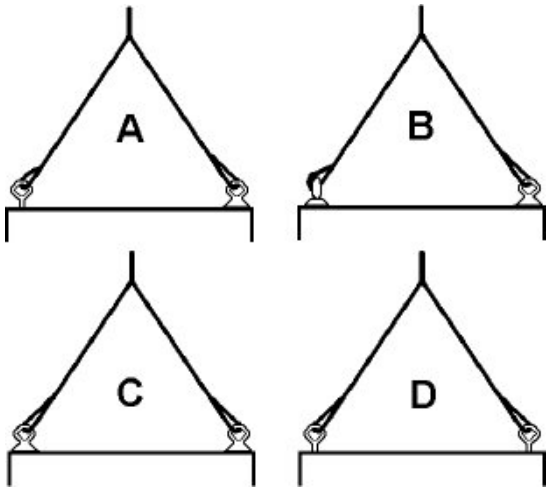
120. What load factor should be applied when using a natural fibre rope sling in a basket hitch around a round load? ❑

121. What load factor should be applied when using two leg slings directly attached with an included angle of 120^{O}? ❑

122. What load factor should be applied when using two leg slings directly attached with an included angle of 60^{O}? ❑

123. What type of slinging configuration must be used with un-collared eye bolts? ❑

124. Select the correct method of using eye-bolts with a two legged sling? ❑



125. In slinging a load, what action would you take to ensure the load was secure before hoisting the load to the top of the building? ★

126. On the job, what method can you use to determine a 60^{O} included angle between the sling legs?

ANSWERS TO WRITTEN QUESTIONS

SECTION ONE: SITE HAZARDS

1. Dry sand

2. Shale

3. Gravel

4. Any three of the following:
   - ❑ Potholes and soft or rough ground
   - ❑ Overhead obstructions
   - ❑ Powerlines
   - ❑ Persons working in the area
   - ❑ Traffic flow
   - ❑ Underground services
   - ❑ Pedestrians

5. Natural fibre rope. (Because it is non conductive)

6. Boom head can spring up and come in contact with power line.

7. The person can be jammed or crushed by the rotating counterweight.

8. Trunked radio.

9. Nylon (or polyamide)

10. The power should be turned off or if this is not possible the power lines must be insulated.

11. a) at least two metres or more from domestic powerlines;
    b) at least six metres or more from high voltage transmission lines.
    NOTE: Assessors must ensure that the applicant is aware of State Authority regulations.

12. Polyester.

13. Polypropylene.

14. Must seek an exemption from the relevant authority, where possible have the electrical power shut off.

15. That the heavy load can be safely supported by the floor or formwork and falsework ie. backpropping.

16. Powerline clearances and other overhead service lines, underground services, uneven or unstable ground, dangerous materials.

17. Be aware of:
    - ❑ Powerlines
    - ❑ Trees
    - ❑ Overhead service lines
    - ❑ Bridges
    - ❑ Surrounding structures
    - ❑ Obstructions
    - ❑ Facilities
    - ❑ Other equipment
    - ❑ Dangerous materials
    - ❑ Underground services
    - ❑ Soil conditions, eg. recently filled trenches
    - ❑ Vehicle traffic

18. a) Warning signs and barriers;
    b) Traffic control measures;
    c) Suitable artificial lights and lighting.
    d) Flag person.
    e) Flashing hazard lights

19. Safety helmet and adequate footwear.

20. A hoarding, gantry or scaffolding.

21. To ensure that the workplace rules and procedures are adhered to.

22. Approval for the work to be performed.

23. A rough terrain crane.

SECTION TWO: CRANES

24. At right angles

25. 75mm.

26. At right angles.

27. The crane's load chart located in the crane cabin.

28. Overturning and structural damage.

29. It can topple over backwards.

30. No.

31. When the locomotive crane is operating on a slope.

32. It is a chart which must be in the cabin of all cranes which explains the SWL of the crane under all configurations.

33. The distance of the hook from a known point on the crane at which a crane can operate safely with a known load.

34.
- ❑ The load can swing uncontrollably towards the crane.
- ❑ Can cause structural damage to the crane.
- ❑ Can cause damage to the load.
- ❑ Can turn the load over.
- ❑ Can damage the sling.

35. Refer to the load chart.

36. It reduces the crane lifting capacity, or as per the cranes load chart.

37. It generally increases the radius –refer to the load chart.

38. No. It will result in:
- ❑ Severe load swing;
- ❑ Possibility of overturning;
- ❑ Pull on the boom.

39. Booming/luffing down increases the radius that in turn reduces the crane capacity.

40. Always carry the load as close to the ground as possible, travel slowly to reduce load swing.

41. To make sure you maintain the stability of the crane.

42. The possibility of the bank collapsing under the pressure.

43. In the lift box with the worker.

44. The crane will have greater stability travelling backwards.

45. Directly above the load to be lifted.

46. 5mm diameter.

SECTION THREE: LIFTING GEAR

47. 6 strands of 24 wires, fibre core, right hand ordinary lay flexible steel wire rope.

48. 8 strands of 25 wires, fibre core, left hand ordinary lay flexible steel wire rope.

49. Clockwise.

50. The opposite direction.

51. 6 x 19 (or 6/19).

52. No.

53. Yes.

54. T. or other manufacturers markings.

55. M.

56. L.

57. 5 t.

58. 2 t.

59. 8 t.

60. 16mm.

61. A bow shackle.

62. Collared eyebolts.

63.
- ❑ Brittleness;
- ❑ Discolouration due to excessive heat;
- ❑ Sun-rot;
- ❑ Mildew;
- ❑ Effects of acid or corrosive agents;
- ❑ Overloading (stretched)
- ❑ High stranding;
- ❑ Cut or broken yarns/strands
- ❑ Knotted.

64. 12mm diameter

65. Diameter in mm squared = the WLL in kg.
Note: If unknown, the formula for fibre rope should apply or be accepted.

66.
- ❑ 10% of wires are broken over a length of 8 x diameter of the rope;
- ❑ Kinked;
- ❑ Sun-rot;
- ❑ Crushed;
- ❑ Knotted;
- ❑ Corroded;
- ❑ Stretched;
- ❑ Affected by heat
- ❑ Affected by acid & alkaline
- ❑ birdcaging.

67. Where 10% of the total number of wires are broken in one rope lay or in 8 diameters of the rope.

68. Rope diameter = 25mm
25 x 8 = 200 length
Total number of wires in 6 x 19 Construction = 114
10% of 114 = 11.4
Maximum number of broken wires allowable in a length of 200mm = 11

69. Should not exceed 95 degrees Celsius.

70.
- ❑ Twisted;
- ❑ Kinked, knotted;
- ❑ Stretched, locked or does not move freely;
- ❑ Gouged, cut or worn more than 10% of the links original diameter;
- ❑ Pitting;
- ❑ Affected by heat
- ❑ Cracked links
- ❑ Spot welded.

71.
(i) Basic grade 30 = 260ºC
(ii) High tensile grade 80 = 400ºC
Note: If 260ºC is exceeded, the WLL of the chain is reduced

72.
(i) Basic grade 30 = 8mm
(ii) High tensile grade 80 = 5.5mm

73. 10% wear

74. 10% elongation.

75.
(i) Check the grade markings and use accordingly until a new tag is obtained. If unsure about markings treat as mild steel grade 30, until the chain is checked by a competent person.
(ii) It should be removed from service immediately as it is not a lifting chain.

76. By colour coding or by reading the SWL tag on the sling.

77.

- ❑ No external wear; abrasions
- ❑ No internal wear; is often indicated by the thickness of the sling or the presence of grit and dirt.
- ❑ No damage caused by high temperatures, sunlight or chemicals
- ❑ No damage to the stitching.
- ❑ No damage to eyes, terminal attachments or end fittings.
- ❑ Label / Tag has not been removed, destroyed and is legible.
- ❑ No damage to sleeve or protective coating.
- ❑ Sling has not come into contact with acids, organic solvents such as paint, coal tar or paint stripper etc.
- ❑ No visible cuts or tears or contusions.

78. The SWL is based on the slings been in a straight formation.

79.

- ❑ External wear; abrasions
- ❑ Internal wear; is often indicated by the thickness of the sling or the presence of grit and dirt.
- ❑ Damage caused by high temperatures, sunlight or chemicals
- ❑ Damage to the stitching
- ❑ Damage to eyes, terminal attachments or end fittings
- ❑ Label / Tag has been removed, destroyed or is not legible
- ❑ Damage to sleeve or protective coating
- ❑ Sling has not come into contact with acids, organic solvents such as paint, coal tar or paint stripper etc.
- ❑ Visible cuts or tears or contusions.

80.

- ❑ D shackles
- ❑ Bow shackles

81. 10% of the diameter.

82. It is marked on the shackle.

83.

- ❑ Bent.
- ❑ Deformed.
- ❑ Damaged.
- ❑ Cracked.
- ❑ Cut, gouged or worn by 10% or more.
- ❑ SWL missing or illegible.
- ❑ Incorrect fitting pin.

84. The crane operator. The person dogging the load and the rigger.

85. No, unless a person is secured in a suspended work box which meets all necessary requirements, including relevant statutory requirements.

86. Prior to use.

87. Tag the sling as unserviceable, remove it from service and return it to the manufacturer for testing and re-tagging.

88. Destroy it.

89. 10%

90. 5%

SECTION FOUR: SLINGING & MOVING LOADS

91. 90 degrees.

92. 45 degrees.

93. Any two legs must be capable of taking the load.

94. The pin.

95. Use packing (or lagging, or dunnage).

96. 2,000kg (or 2t).

97. A brick cage.

98. The formwork can be overloaded.

99. 3m

100. 1m

101. 3.5m

102. Block it (or chock it).

103. Close to the ground.

104. Bridle the load back on to the crane.

105.
- ❑ Two leg slings;
- ❑ Maximum sling angle 60º;
- ❑ Plate clamps;
- ❑ Shackles;
- ❑ Spreader beams.

106.
Answer should include:
- ❑ Two slings must be used;
- ❑ Double wrap the slings;
- ❑ Reeve the eye.

107. Answer should include:
- ❑ Double wrapped choke hitch;
- ❑ Bites are in same direction;
- ❑ No pressure on safety latches.

108. An Intermediate Riggers Certificate.

109. An appropriately designed and manufactured brick cage or lift box.

110. A spreader beam or long leg slings.

111. By the specific lifting points marked on the concrete beams by the manufacturer/designer.

112. Reduces the WLL of the slings.

113. The greater of the two angles between any of the two opposite diagonal angle legs of the sling.

114. Correct sketch is D.

115. Collared eye bolts.

116.
- ❑ The mass of the load;
- ❑ The included angle between the slings;
- ❑ Method of slinging the load (loading factor).

117. 50% reduction

.

118. 0.75

119. 25% reduction

120. Load factor of 2.

121. Load factor of 1.

122. Load factor of 1.73

123. Slings used vertically only.

124. Correct answer is 'C'.

125. Lift the load off the ground and ensure the slings are tightly secured.

126. The distance between the lifting points is equal to the length of one sling leg.

LIST OF REFERENCES

The reference used for this assessment is:
A Guide for Dogging, 5th Edition, 1997, published by the Authority of NSW.

DOGGING – ORAL/WRITTEN QUESTIONS

RELATIONSHIP TO THE NATIONAL CERTIFICATION STANDARD

THE UNITS OF COMPETENCE

The questions selected at random from the four sections of the knowledge assessment are intended to assess the underpinning knowledge which is required to carry out the two units of competence for Dogging prescribed by Schedule A of the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment*.

These are as follows:

1.0 Plan and prepare work

2.0 Complete dogging work

Each unit of competence is subdivided into elements of competence, for which performance criteria are prescribed.

THE PERFORMANCE CRITERIA

The relationship between each group of questions and the National Standard's performance criteria is as follows:

Section 1: Site hazards

These questions reflect performance criteria 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.10, 1.1.12, 2.1.4 and 2.1.5.

Section 2: Cranes

These questions reflect performance criteria 1.1.1, 1.1.2, 1.1.4, 1.1.10, 1.1.12 and 2.1.7.

Section 3: Lifting gear

These questions reflect performance criteria 1.1.2, 1.1.8, 1.1.12, 1.2.1, 1.2.2, 2.1.2 and 2.1.3.

Section 4: Slinging & moving loads

These questions reflect performance criteria 1.1.1, 1.1.4, 1.1.5, 1.1.10, 1.1.12, 1.2.2, 1.2.3, 2.1.1, 2.1.2, 2.1.3, 2.1.5 and 2.1.7.

THE RANGE STATEMENT

The model answers apply the requirements of the *National Standard for Plant* and its relevant referenced Standard AS2550 to the obligations under State/Territory Occupational Health and Safety Legislation of a person who carries out dogging work, ie. the application of slinging techniques including the selection and inspecting of lifting gear and the direction of the crane/hoist operator in the movement of the load, including when the load is out of view of the operator.

The model answers are taken from the 5th (1997) edition of *A Guide for Dogging*, published by the Authority of NSW, which the WorkSafe Australia Scaffolding and Rigging Expert Working Group has endorsed as a suitable text for the determination of applicants' answers for Dogging.

ORAL/WRITTENASSESSMENT

Section	Number of **critical** criteria required	Number of **critical** criteria achieved	Number of **non-critical** criteria required	Number of **non-critical** criteria achieved	**Competent?** (tick) YES	NO
1	**2**		**5**			
2	**3**		**5**			
3	**2**		**6**			
4	**7**		**4**			
Assessment start time:		: am/pm	Finish time:	: am/pm		
Oral/Written Assessment completed within time allowed – approx 1 hour						

WRITTEN ASSIGNMENT

TASK No.	Number of **critical** criteria required	Number of **critical** criteria achieved	Number of **non-critical** criteria required	Number of **non-critical** criteria achieved	**Competent?** (tick) YES	NO
1	**1**		**Nil**	**na**		
2	**1**		**Nil**	**na**		
3	**1**		**Nil**	**na**		
4	**1**		**Nil**	**na**		
5	**1**		**Nil**	**na**		
6	**1**		**Nil**	**na**		
Assessment start time:		: am/pm	Finish time:	: am/pm		
Written Assessment completed within time allowed – approx 30 minutes						

PERFORMANCE ASSESSMENT

OPERAT -IONAL AREA	Number of criteria required	Number of criteria achieved	Competent? (tick) YES	NO
1	**3**			
2	**6**			
3	**12**			
4	**6**			
5	**9**			
6	**20**			
7	**4**			
Assessment start time:		: am/pm		
Assessment finish time		: am/pm		
Performance assessment completed within time allowed – approx 2 hours				

Applicant is: □ **COMPETENT**

(tick or circle the result obtained) □ **NOT YET COMPETENT**

Name of Assessor:…….. **Name of Applicant**:……..……

Signature:……..……. **Signature**:…….

Date: …./…./….

Comments/Feedback (Assessor to make additional comments which clarify the assessment results)

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