WorkCover
NEW SOUTH WALES

BASIC RIGGING

NATIONAL CERTIFICATE OF COMPETENCY

ASSESSMENT INSTRUMENT 1995

WorkCover. **Watching out for you.**

Basic Rigging

ASSESSMENT

Part 1 Practical

Part 2 Assignment

Part 3 Knowledge

June 1995

Order No. 844

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.*

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 instructions on the usefulness of training records (such as log books) 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/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 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 are likely to be damaged.

3.3 Knowledge
The knowledge assessment covers both oral and written exercises. The model answers provided with the knowledge 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. Assessors must complete every box as follows:


CORRECT PERFORMANCE/ANSWER


NOT YET ACHIEVED

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 countersigned by the applicant.

The original and duplicate are given to the applicant. The applicant provides the original to the certifying authority. The triplicate is retained by the assessor.

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 assessment.

In the case of a repeat assessment, the assessor can decide to apply the whole or only part of the assessment.

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.

Likewise, if an applicant demonstrates outstanding or remarkable performance, this should be noted.

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 or performance, 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

BASIC RIGGING

CERTIFICATE OF COMPETENCY

PART ONE

PRACTICAL SKILLS PERFORMANCE ASSESSMENT

(Tasks and Model Results)

Basic Rigging—Practical Skills

CONTENTS

Introductory notes—Practical

1 The Basic Rigging Certificate encompasses the requirements for the Dogging Certificate. It is preferable that an applicant for the Basic Rigging Certificate already holds a Dogging Certificate or has previously passed a practical skills assessment for the Dogging Certificate. Otherwise the assessment for an applicant for the Basic Rigging Certificate must incorporate the requirements of both the Dogging and Basic Rigging Certificate assessment.

2 The practical skills performance assessment is one of three assessments which applicants must pass to qualify for a Basic Rigging Certificate of Competency. The other components are a knowledge assessment and a written assignment.

3 The practical skills performance assessment for Basic Rigging is a 'closed book' practical exercise covering four sections.

In practical skills performance assessment the certificate assessor evaluates the applicant's applied knowledge and understanding and the applicant's familiarity with rigging equipment and recommended work procedures and rigging techniques. 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 Basic Rigging prescribed by Schedule A of the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment* (NOHSC: 1006, 1992).

4 The relationship between the four sections of the performance assessment and the Standard's prescribed performance criteria and range statements is set out on page 14.

A full assessment should be completed within three hours.

To pass the assessment, the applicant must complete satisfactorily each of the following sections:

Section 1: Preparing rigging gear
Section 2: Erecting structural steel
Section 3: Using a safety harness
Section 4: Working at heights

5 An applicant who holds a Basic, Intermediate or Advanced Scaffolding Certificate or who produces satisfactory evidence of having passed a Basic Scaffolding practical skills performance assessment in erection and dismantling skills does not require assessment in Section 4.

6 An applicant who holds an Advanced Scaffolding Certificate, or who produces proof of having passed an Advanced Scaffolding practical skills performance assessment in the use of a safety harness does not require assessment in Section 3.

7 An applicant who produces a satisfactory record of training (such as a log book) which establishes at least 25 working days of practical rigging experience in the erection of steel structures greater than 4 m in height does not require assessment in Section 2.

8 An applicant undergoing re-assessment need only be re-assessed in those sections in which he or she previously failed.

9 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

10 **Location**
The practical skills assessment can be conducted at any location which has:
- sufficient clear space for the portal frame to be erected;

- a firm supporting surface for the portal frame structure;
- a suitable bench or similar structure for FSWR splicing.

11 **Minimum plant and equipment**
The following should be used as a guide by the assessor. The actual quantities and types may vary depending on availability:

- crane, winch and purchases or fibre rope tackle sufficient to erect the portal frame structure;
- fibre rope and cordage;
- FSWR and wire rope splicing equipment;
- adequate structural steel, bolts, washers, nuts, braces, adjustable props, ladders, guys, etc. to erect the portal frame.

12 **Tools for the applicant**
Each applicant must provide (or be provided with) the following tools:

- 2 x M 16 podger spanners;
- rigging belt with frogs and a bolt bag;
- retractable tape measure;
- suitable spirit level.

13 **Personal protective equipment for the applicant**
Each applicant must provide (or be provided with) the following PPE:

- safety helmet complying with AS 1801;
- safety harness and lanyard complying with AS 1891;
- self-locking anchorage complying with BS 5062;
- sturdy, non-slip footwear that covers the whole foot;
- close-fitting clothing.

14 **Structural design**
A suggested structural design, based on a temporary gantry, is given in Attachment D. The assessor can vary the design to suit local circumstances but the portal frame structure must incorporate the following features:

- at least four columns;
- at least two transverse beams or trusses;
- at least two longitudinal beams;
- bracing;
- a height of at least 3.0 m above the supporting surface.

Each applicant is to be provided with a copy of the design drawing which must be returned to the assessor at the conclusion of the assessment.

15 **Conduct of assessment**
Wherever possible, applicants should be assessed in groups of two or three. Where a single applicant is to be assessed, the assessor should arrange for another person to assist (or the assessor may assist).

Where two or more applicants are assessed simultaneously, the assessor must ensure that the various tasks are evenly shared so that a full assessment of each applicant can be made. This may involve some repetition of tasks.

The performance of each applicant is to be recorded on the assessor's check list, a copy of which is included in this document.

An applicant passes a practical skills performance assessment when each of the four sections have been successfully completed or are not applicable, as appropriate.

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

Notes on individual sections

17 **Preparing rigging equipment (Section 1)**

Note: This section applies to all applicants.

INTRODUCTION

The applicant is provided with the following:

- 2 x 2 m lengths of three-strand hawser-laid natural fibre rope, 12 mm to 16 mm in diameter;
- a suitable length of six-strand FSWR, 10 mm to 14 mm in diameter;
- thimble;
- suitable length of whipping wire;
- pair of wire nippers;
- vice mounted on a bench or similar;
- marlin spike;
- wooden mallet or copper hammer;
- open hook;
- suitable length of whipping cord.

The applicant is also provided with a copy of Attachment B.

The applicant is assessed on eight separate tasks as follows:

(1) **Fibre rope splicing** (one task)
The certificate assessor directs the applicant to join the two lengths of fibre rope with a short splice.

Attachment A illustrates the splicing method for the benefit of the assessor.

(2) **Bends and hitches** (five tasks)
The certificate assessor directs the applicant to demonstrate with the fibre rope each of the following bends and hitches:

a an unseized becket or buntline hitch to an eye;
b double bowline;
c running bowline;
d bowline on the bight;
e sheepshank to secure a load.

Attachment A illustrates these bends and hitches for the benefit of the assessor.

(3) **Mousing a hook** (one task)
The certificate assessor directs the applicant to mouse an open hook supporting two FSWR soft eyes with cord or wire.

Attachment A illustrates this method for the benefit of the assessor.

(4) **FSWR splicing** (one task)
The certificate assessor directs the applicant to form a thimble cross-tucked eye splice with three full-strand tucks and two half-strand tucks. (For the purposes of this assessment, serving the splice is not required.)

Attachment B illustrates the common splicing method for the benefit of *both* the applicant and the assessor.

To complete this section successfully, the applicant must correctly perform at least seven of the eight tasks.

18 **Erecting structural steel (Section 2)**

Note: This section does not apply to applicants with accepted documentary evidence of adequate experience.

INTRODUCTION

The certificate assessor ensures that the applicants are provided with a copy of the relevant design drawing and sufficient materials and equipment to erect a portal frame bay using a crane, winch or fibre rope tackle.

During the course of erection the applicant must clearly demonstrate that:

a the correct number, type and size of bolts, nuts and washers are used;

b any ground-level assembly is carried out with members level and properly aligned;

c temporary bracing or guying is adequate to maintain the stability of the structure at all stages;

d sequence of erection is logical and ensures that no member or connection is over-stressed;

e appropriate tools and equipment are selected and properly used;

f he/she works confidently and safely within the team;

g finished structure complies with the design specifications.

An example of a suitable design drawing is given in Attachment C.

To complete this section successfully, the applicant must clearly demonstrate proficiency in relation to each of the items.

19 **Using a safety harness (Section 3)**

Note: This section does not apply to applicants who hold an Advanced Scaffolding Certificate or who have previously passed an Advanced Scaffolding practical skills performance assessment in the use of a safety harness.

INTRODUCTION

The applicant is provided with a safety harness and lanyard and an inertia reel.

The applicant is assessed on four separate tasks as follows:

a safety harness is inspected in accordance with Appendix A of AS 2626;

b inertia reel is inspected in accordance with Appendix B of AS 2626;

c harness is correctly fitted, adjusted and connected;

d fall arrest system is correctly located and fixed to an anchorage point with a capacity of at least 1500 kg.

Relevant extracts from AS 2626 are given in Attachment D for the benefit of the assessor.

To complete this section successfully, the applicant must correctly complete all four tasks.

20 **Working at heights (Section 4)**

Note: This section does not apply to applicants who hold a Scaffolding Certificate or who have previously passed a Basic Scaffolding practical skills performance assessment in erection and dismantling skills.

While working on an open steel framework, the applicant's performance is assessed against the following three items:

a work locations are accessed safely and confidently;

b work is performed safely and confidently;

c hand tools are used safely and confidently.

To complete this section successfully, the applicant must clearly demonstrate proficiency in relation to each of the three items.

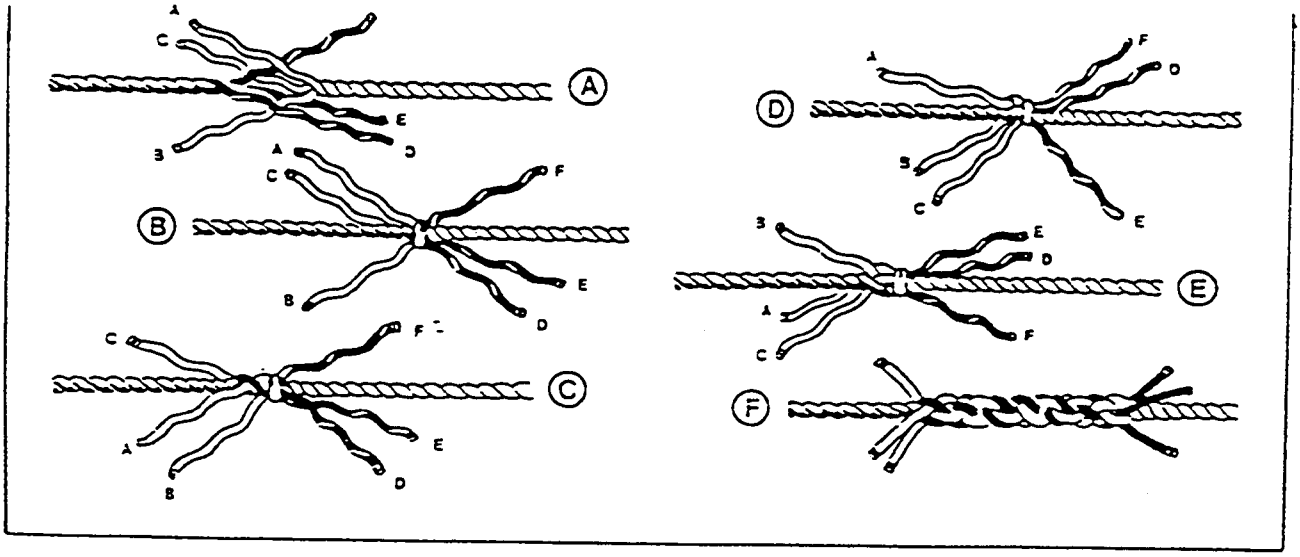
Assessment form: Basic Rigging

Applicant's name .....

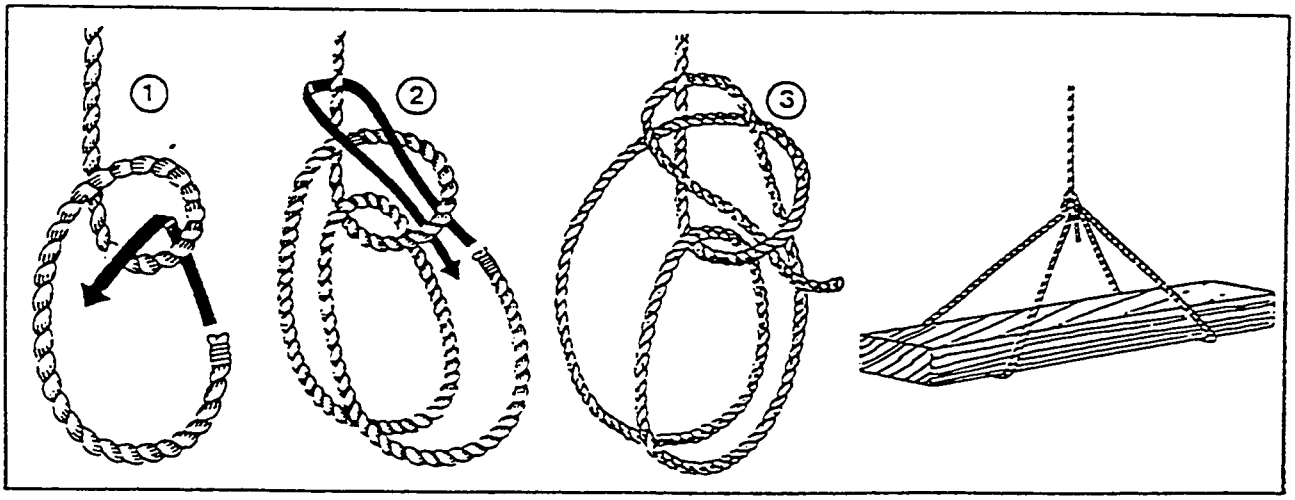
Performance items	
1 Preparing rigging equipment Applicant completed: • fibre rope splicing (short splice) ☐ • bends and hitches – becket hitch ☐ – double bowline ☐ – running bowline ☐ – bowline on the bight ☐ – sheepshank ☐ • mousing a hook ☐ • FSWR splicing (thimble eye splice) ☐ **2 Erecting structural steel** Applicant: • provided and used correct bolts, nuts and washers ☐ • ensured members level and aligned during ground assembly ☐ • ensured temporary bracing/guying adequate and stable ☐ • ensured erection sequence prevents over-stress of members ☐ • selected and used tools and equipment correctly ☐ • worked safely and confidently within team ☐ • ensured structure complied with design specification ☐	**3 Using a safety harness** Applicant: • inspected harness correctly ☐ • inspected inertia reel correctly ☐ • fitted, adjusted and connected harness correctly ☐ • anchored fall arrest system correctly ☐ **4 Working at heights** Applicant: • accessed work locations safely and confidently ☐ • performed work safely and confidently ☐ • used hand tools safely and confidently ☐

ATTACHMENT A

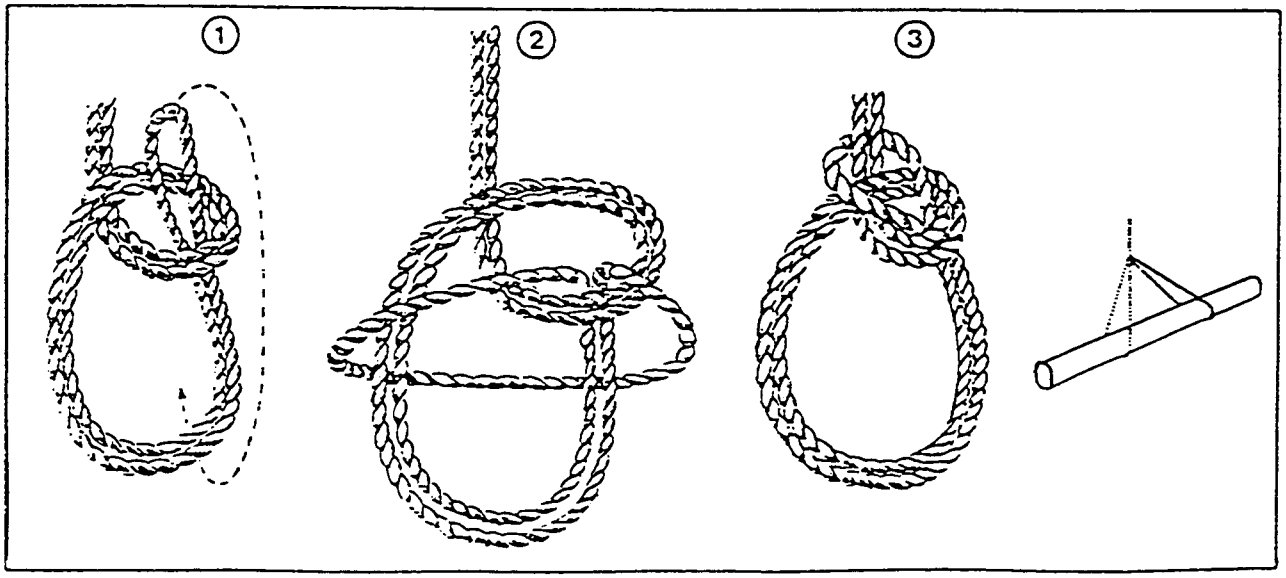
Fibre rope splicing, bends and hitches and mousing



Double Bowline

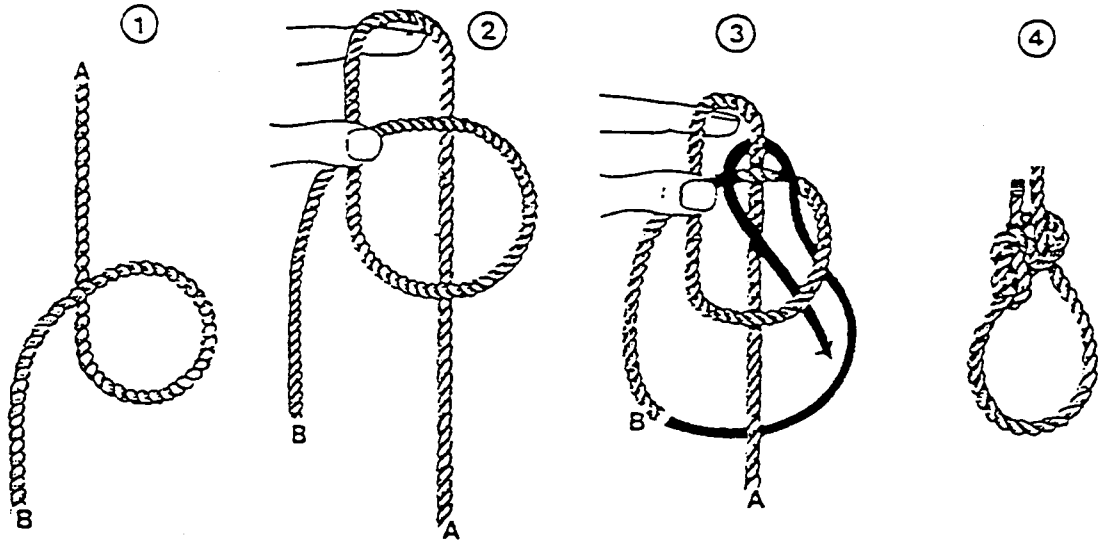


Bowline on the Bight



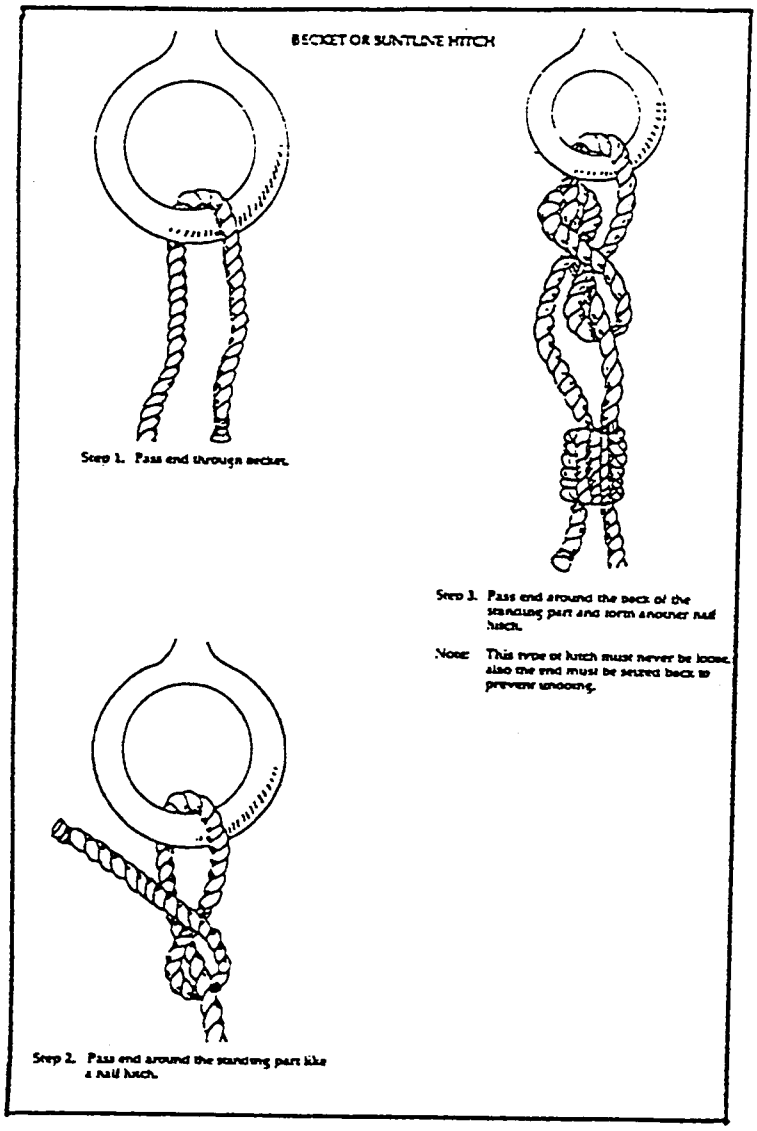
ATTACHMENT A

Fibre rope splicing, bends and hitches and mousing (cont.)

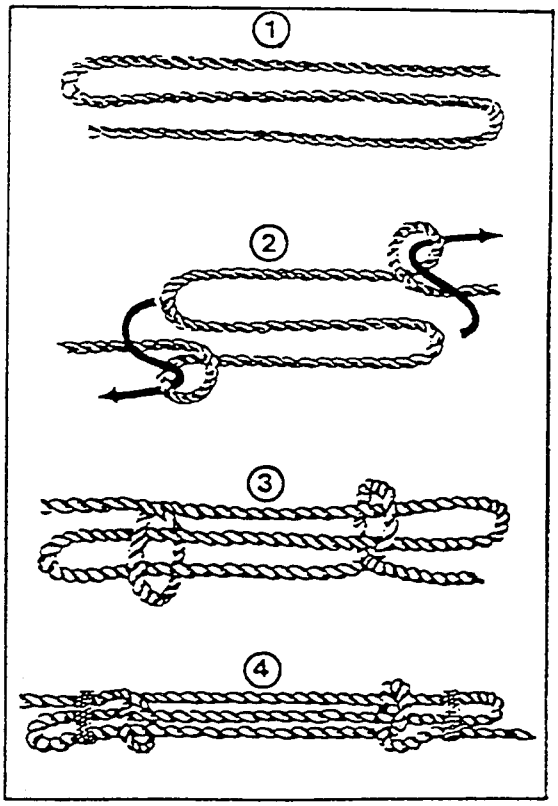


ATTACHMENT A

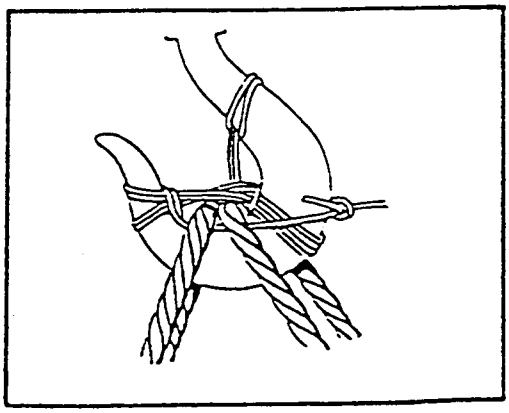
Fibre rope splicing, bends and hitches and mousing (cont.)



Sheepshank



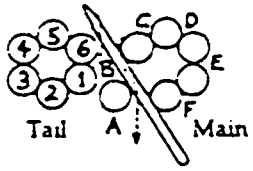
HOOK MOUSING



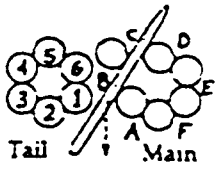
ATTACHMENT B

FSWR thimble eye splice

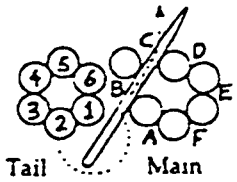
The following methods of splicing a six stranded rope with a five tuck splice is a generally accepted safe method.



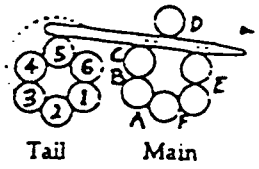
First tuck



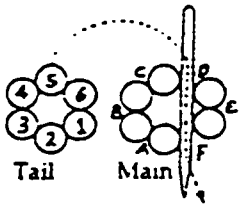
Second tuck



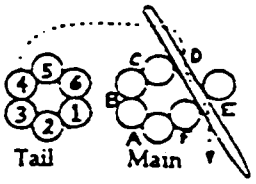
Third tuck



Fourth tuck



Fifth tuck



Sixth tuck

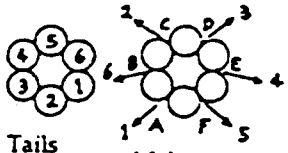


Diagram showing emergence of tails after the first series is completed

Six Stranded Rope: Five Tuck Splice

Thimble in vice. Rope vertical. Main part of rope on right hand. Tail stands on left hand.

Thimble seized at crown and both flanks.

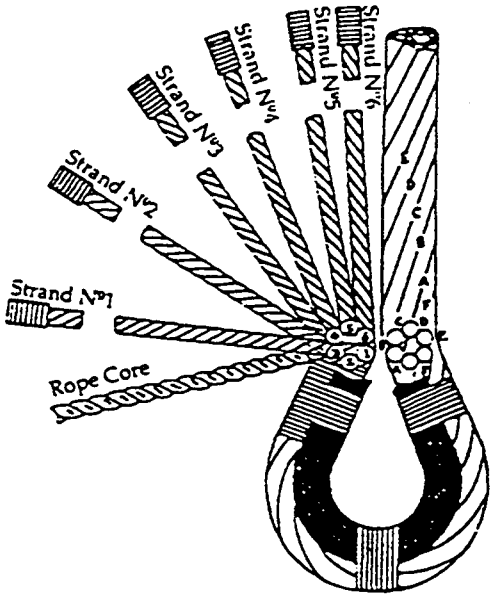
Strands for the tails separated and whipped at one end.

Length of tails for a five tuck splice 100 mm for each 3 mm diameter of rope.

First Series of Tucks

A fibre main core should be tucked with Tail N° and then cut off. A wire main core must be split up, distributed among the tails and tucked with them for at least three series.

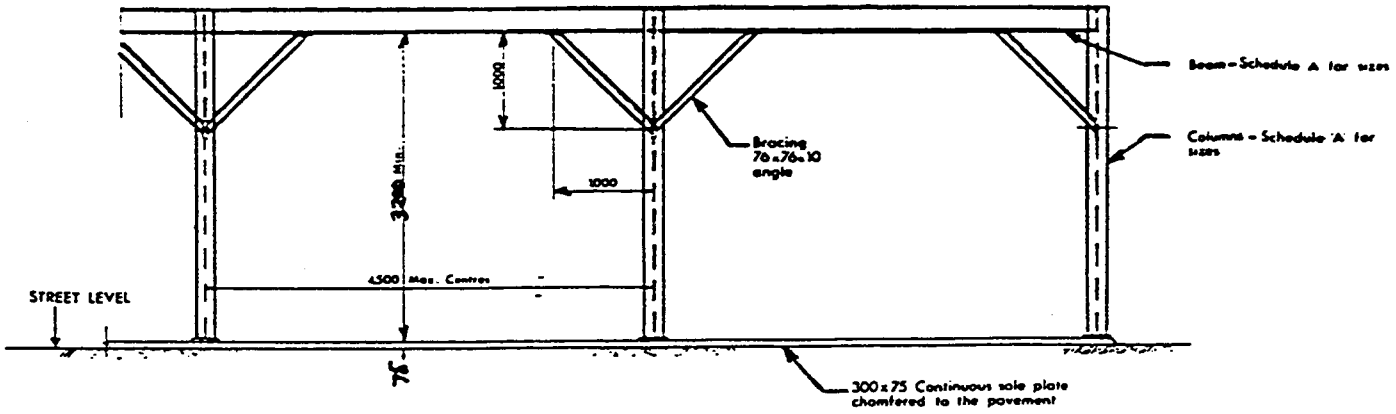
FIRST SERIES		
Tail N°	In at	Out at
1	B	A
6	C	B
2	B	C
3	C	D
5	D	F
4	D	E



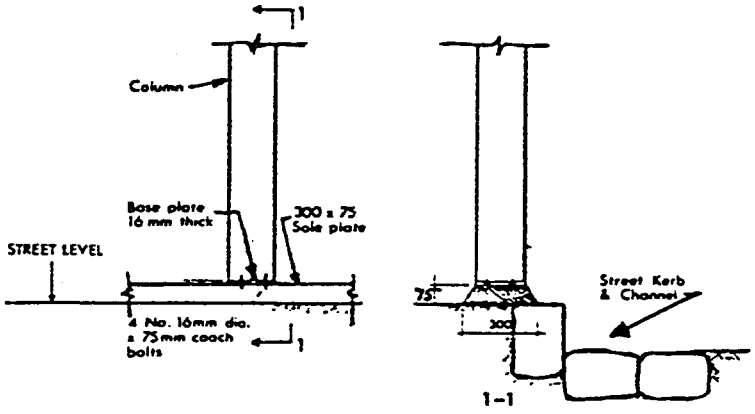
	SECOND SERIES		THIRD SERIES	
Tail N°	In at	Out at	In at	Out at
1	B	C	D	E
6	C	D	E	F
2	D	E	F	A
3	F	F	A	B
4	E	A	B	C
5	A	B	C	D
	FOURTH SERIES		FIFTH SERIES	
Tail N°	In at	Out at	In at	Out at
1	F	A	B	C
6	A	B	C	D
2	B	C	D	E
3	C	D	E	F
4	D	E	F	A
5	E	F	A	B

ATTACHMENT C

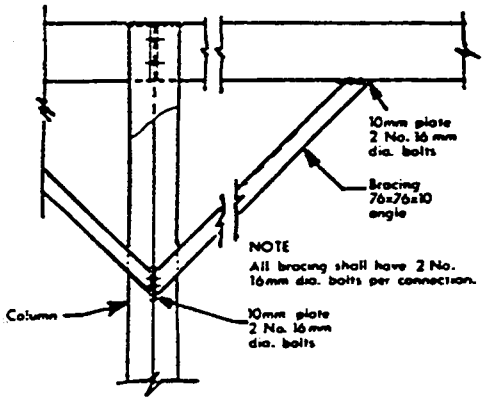
Suggested portal frame design



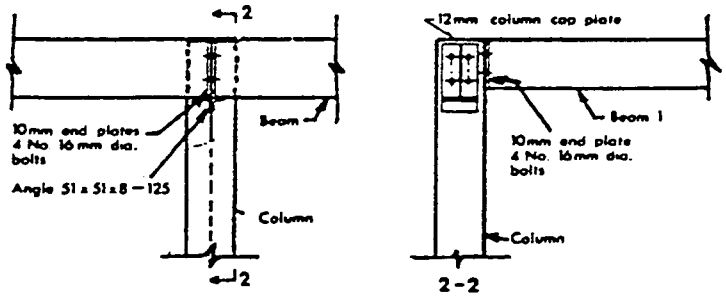
Elevation



Sole Plate Details



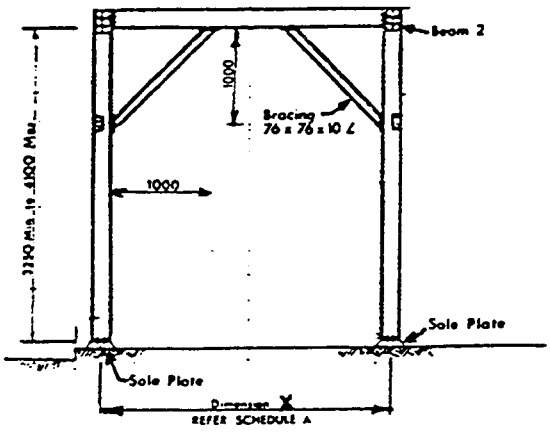
Bracing Connection Detail



Column to Beam Connection Details

DIMENSION X (-)	COLUMN SIZES	BEAM SIZES	
		BEAM 1	BEAM 2
up to 2.700	150 UC 29.8	200 UB 29.8	250 UB 31.3

Schedule A



End Elevation

ATTACHMENT D

Extracts from AS 2626

INSPECTION OF BELTS AND HARNESSES—CHECK LIST

This Appendix lists items of safety belts and harnesses to be inspected and those conditions/faults to be checked.

Component	Condition/fault to be checked
Webbing	Cuts or tears Abrasion damage especially where there is contact with hardware Excessive stretching Damage due to contact with heat, corrosives, or solvents Deterioration due to rotting, mildew, or ultraviolet exposure
Snap hooks	Distortion of hook or latch Cracks or forging folds Wear at swivels and latch pivot pin Open rollers Free movement of the latch over its full travel Broken, weak or misplaced latch springs (compare if possible with a new snap hook) Free from dirt or other obstructions, e.g. rust
D-rings	Excessive 'vertical' movement of the straight portion of the D-ring at its attachment point on to the belt, so that the corners between the straight and curved sections of the D become completely exposed NOTE: Excessive vertical movement of the D-ring in its mounting can allow the nose of larger snap hooks to become lodged behind the straight portion of the D, in which position the snap hook can often accidentally 'roll out' of the D under load. Cracks, especially at the intersection of the straight and curved portions Distortion or other physical damage of the D-ring Excessive loss of cross-section due to wear
Buckles and adjusters	Distortion or other physical damage Cracks and forging laps where applicable Bent tongues Open rollers
Sewing	Broken, cut or worn threads Damage or weakening of threads due to contact with heat, corrosives, solvents or mildew
Ropes	Cuts Abrasion or fraying Stretching Damage due to contact with heat, corrosives, solvents, etc Deterioration due to ultraviolet light or mildew NOTE: See also Appendix C.
Chains	Physical damage Security of attachments to snap hooks, rings, and similar components

ATTACHMENT D

Extracts from AS 2626 (cont.)

INSPECTION OF SELF-LOCKING ANCHORAGES—CHECK LIST

This Appendix lists items of self-locking anchorages to be inspected and particular conditions/faults to be checked.

Component	Condition/fault to be checked
Rope (Fully extend rewind drum anchorage)	Cuts Abrasion or fraying Stretching Damage due to contact with heat, corrosives, or solvents Excessive dirt or grease impregnation NOTE: See also Appendix C. With rewind anchorages give a firm pull with the rope fully extended to check that the rope end is securely anchored to the drum
Anchorage body	(a) *Mounting ring:* Physical damage or wear, especially at any pivot points Cracks, especially in corners Mounting security (b) *Anchorage body proper:* Physical damage such as significant dents, distortion, or corrosion As far as possible but, without dismantling, check for the entry of foreign bodies such as small stones Loose or missing screws, nuts or similar objects (external check only) Position of the clutch compression indicator button (fitted only to rewind drums with steel rope)
Locking mechanism and rope guides	Check externally visible rope guides for excessive wear or ridging Check that the rope-locking mechanism locks and holds securely when the rope is given a sharp tug Ensure that the rope runs freely through the anchorage with no tendency to stick or bind, and that on rewind drum anchorages the rope rewinds completely without loss of tension
Hardware	Examine the condition and locking action of any associated snap hooks or links

RELATIONSHIP TO THE NATIONAL CERTIFICATION STANDARD

THE UNITS OF COMPETENCE

The tasks set for practical skills performance assessment are intended to assess the applied knowledge and understanding and the familiarity with rigging equipment and recommended work practices, additional to those required for Dogging, which are necessary to carry out the two units of competence for Basic Rigging 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 rigging work

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

THE PERFORMANCE CRITERIA

The tasks involved in undergoing the practical skills performance assessment reflect the National Standard's following performance criteria: 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.11, 1.1.16, 1.1.18, 1.2.7, 2.2.2, 2.2.12, 2.3.1, 2.3.2, 2.3.3, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4 and 2.4.5.

Relevant performance criteria which are not reflected in the Basic Rigging assessment have been covered in the Dogging assessment and do not require additional assessment.

THE RANGE STATEMENT

The tasks making up the practical skills performance assessment include the preparation and use of ropes for general rigging work and the erection of steel structures. These are adequate to determine practical competency in the full range of Basic Rigging work.

The model results apply the requirements of the *National Standard for Plant* to the obligations under State/Territory occupational health and safety legislation of a person who carries out rigging work within the scope of the Basic Rigging Certificate of Competency.

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

ASSESSMENT INSTRUMENT

FOR THE

BASIC RIGGING

CERTIFICATE OF COMPETENCY

PART TWO

WRITTEN ASSIGNMENT

(Questions and Answers)

Basic Rigging—Written Assignment

CONTENTS

Introductory notes—Assignment

1 The Basic Rigging Certificate encompasses the requirements for the Dogging Certificate. It is preferable that an applicant for the Basic Rigging Certificate already holds a Dogging Certificate. Otherwise the assessment for an applicant for the Basic Rigging Certificate must incorporate the requirements of both the Dogging and Basic Rigging Certificate assessment.

2 The written assignment for Basic Rigging is one of three assessments which applicants must pass to qualify for a Basic Rigging Certificate of Competency. The other components are a knowledge assessment and a performance assessment.

3 The written assignment for Basic Rigging is a 'closed book' examination consisting of two tasks.

In the written assignment the certificate assessor evaluates the applicant's conceptual understanding of rigging techniques, his/her ability to apply simple mathematics and physics, and ability to apply technical information. 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 Basic Rigging prescribed by Schedule A of the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment* (NOHSC: 1006, 1992).

4 The relationship between the two tasks of the assignment and the Standard's prescribed performance criteria and range statements is set out on page 21.

A full assignment includes five minutes reading time and up to 10 minutes to complete.

5 To pass the assignment, the applicant must provide a satisfactorily answer to the question in each of the following sections:

Section 1: Fleet angles (One task)
Section 2: Loads in running gear (One task)

6 An applicant undergoing re-assessment need only be re-assessed in those sections which he or she previously failed.

7 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.

8 The model answers to the tasks and the method of determining satisfactory completion of each section are provided on page 20.

INSTRUCTIONS 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 or the information provided.

3 The assignment

The assignment contains:

- one sketch; and
- two questions.

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 10 minutes to complete both tasks.

Directions: Sections 1 and 2

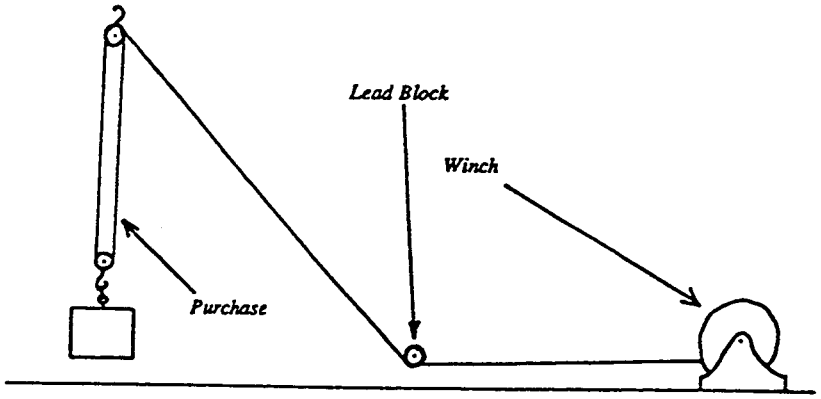
Note:
The assessor should indicate the combination of variables required for each task.

With the help of these materials, you are to complete the following tasks.

INTRODUCTION

You are required to use a powered winch to lift a load.

The arrangement of the winch, purchase and load is shown below.



SECTION ONE:
FLEET ANGLES

The width of the winch drum is:
(a) 0.6 m **or** (b) 0.8 m **or** (c) 1.0 m

The winch drum is:
(a) Grooved **or** (b) Plain

Task 1: Using the width and type of drum chosen by the assessor, calculate the minimum distance between the lead block and the winch drum.

SECTION TWO:
LOADS IN RUNNING GEAR

The total load on the lower block is:
(a) 7 t **or** (b) 8 t **or** (c) 9 t

The number of sheaves in the purchase is:
(a) 4 **or** (b) 5 **or** (c) 6

The allowance for friction is 5% per sheave.

Task 2: Using the combination of variables provided by the assessor, calculate the load in the lead rope during hoisting (rounded up to the nearest 10th of a tonne).

SECTION ONE: FLEET ANGLES

Task answer and commentary

Task 1:
Note: This question assesses the applicant's ability to apply the common rule for maximum fleet angles to determine minimum distance to a lead block.

The answer is calculated by multiplying half the drum width by either 12 (for a grooved drum) or 19 (for a plain drum).

This can be expressed by the formula:

Distance to lead block (in m) = drum width (in m) ÷ 2 x fleet angle ratio.

The answers to the six possible combinations are as follows:

a/a 3.6 m
a/b 5.7 m
b/a 4.8 m
b/b 7.6 m
c/a 6.0 m
c/b 9.5 m

SECTION TWO: LOADS IN RUNNING GEAR

Task answer and commentary

Task 2:
Note: This question assesses the applicant's ability to use the common formula for calculating becket load and the common formula for calculating the tension in a lead rope.

To determine the answer, the applicant must first establish the becket load using the formula:

BL = total load on lower block ÷ number of parts in purchase

The load in the lead rope can then be calculated using the formula:

Lead load = BL + (BL x number of sheaves x friction allowance)

In this case, the friction allowance is 5%. Therefore:

Lead load = BL + (BL x number of sheaves ÷ 20)

The answers to the nine possible combinations are as follows:

a/a 2.2 t [1.75 + (1.75 x 5 ÷ 20) = 2.1875 t]
a/b 1.9 t [1.40 + (1.40 x 6 ÷ 20) = 1.8200 t]
a/c 1.6 t [1.17 + (1.17 x 7 ÷ 20) = 1.5795 t]

b/a 2.5 t [2.00 + (2.00 x 5 ÷ 20) = 2.5000 t]
b/b 2.1 t [1.60 = (1.60 x 6 ÷ 20) = 2.0800 t]
b/c 1.8 t [1.33 + (1.33 x 7 ÷ 20) = 1.7955 t]

c/a 2.9 t [2.25 + (2.25 x 5 ÷ 20) = 2.8125 t]
c/b 2.4 t [1.80 + (1.80 x 6 ÷ 20) = 2.3400 t]
c/c 2.1 t [1.50 + (1.50 x 7 ÷ 20) = 2.0250 t]

END OF MODEL ANSWERS

Basic Rigging—Written Assignment

RELATIONSHIP TO THE NATIONAL CERTIFICATION STANDARD

THE UNITS OF COMPETENCE

The two tasks which comprise the written assignment are intended to assess the conceptual understanding, numeracy and technical comprehension, additional to those required for Dogging, which are required to carry out the two units of competence for Basic Rigging 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 rigging work

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

THE PERFORMANCE CRITERIA

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

Task 1: **Fleet angles**
This task reflects performance criteria 1.1.18, 1.2.7 and 2.1.3.

Task 2: **Loads in running gear**
This task reflects performance criteria 1.1.1, 1.1.2, 1.2.6, 2.1.3 and 2.2.6.

Relevant performance criteria which are not reflected in the Basic Rigging assessment have been covered in the Dogging assessment and do not require additional assessment.

THE RANGE STATEMENT

The tasks making up the written assignment are related to the setting up and use of winches and purchases.

These types of rigging equipment were selected because they are regarded as representing the most complex equipment used to carry rigging work within the scope of the Basic Rigging Certificate.

The model answers apply the requirements of the *National Standard for Plant* to the obligations under State/Territory occupational health and safety legislation of a person who installs and uses rigging equipment within the scope of the Basic Rigging Certificate.

In particular, the model answers are consistent with the standard formulas given in *A Guide for Riggers*, published by the WorkCover Authority of NSW, which the Worksafe Australia Scaffolding and Rigging Expert Working Group has endorsed as a suitable text for the determination of applicant's responses to assignment tasks for Basic Rigging.

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

ASSESSMENT INSTRUMENT

FOR THE

BASIC RIGGING

CERTIFICATE OF COMPETENCY

PART THREE

KNOWLEDGE ASSESSMENT

(Questions and Answers)

Basic Rigging—Knowledge Assessment

CONTENTS

Introductory notes—Knowledge

1 The Basic Rigging Certificate encompasses the requirements for the Dogging Certificate. It is preferable that an applicant for the Basic Rigging Certificate already holds a Dogging Certificate. Otherwise the assessment for an applicant for the Basic Rigging Certificate must incorporate the requirements of both the Dogging and Basic Rigging Certificate assessment.

2 The knowledge assessment for Basic Rigging is one of three assessments which applicants must pass to qualify for a Basic Rigging Certificate of Competency. The other components are a written assignment and a performance assessment.

3 The knowledge assessment for Basic Rigging 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 56 questions.

In the knowledge assessment the certificate assessor evaluates the extent 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 Basic Rigging prescribed by Schedule A of the *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment* (NOHSC: 1006, 1992).

4 The relationship between the questions and the Standard's prescribed performance criteria is set out on page 31.

5 A full knowledge assessment consists of 14 questions and can take up to 15 minutes to complete. The time permitted for partial assessments should be approximately one minute per question.

There are two ways in which the knowledge 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 on to the examination paper.

6 To pass the assessment, the applicant must correctly answer (either in writing or orally) a majority of the randomly selected questions in each of the following sections:

Section 1: Certification (3 selected from 12)
Section 2: Steel erection (3 selected from 12)
Section 3: Purchases, tackles and winches (5 selected from 20)
Section 4: Associated equipment requirements (3 selected from 12)

7 An applicant who holds a Basic, Intermediate or Advanced Scaffolding Certificate, or who produces evidence of having passed a Basic Scaffolding knowledge assessment in Associated Equipment Requirements does not require assessment in Section 4.

8 An applicant undergoing re-assessment need only be re-assessed in those sections in which he or she previously failed to answer a majority of selected questions correctly.

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

10 The model answers to the bank of questions are on page 29–30.

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

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

12 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 250 mm, an answer of 250 is NOT acceptable.

13 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 a failure.

Basic Rigging—Knowledge Questions

SECTION ONE:
CERTIFICATION

Note: Select three questions at random from the following 12. To pass this section, the applicant must correctly answer at least two of the selected questions.

1 (a) Is a person with a Basic Rigging Certificate allowed to carry out dogging work?

1 (b) Is a person with a Basic Rigging Certificate allowed to use load equalising gear?

1 (c) Is a person with a Basic Rigging Certificate allowed to erect a mast climber?

1 (d) Is a person with a Basic Rigging Certificate allowed to supervise dual lifts?

1 (e) Is a person with a Basic Rigging Certificate allowed to erect structural steel?

1 (f) Is a person with a Basic Rigging Certificate allowed to erect a double barrow hoist?

1 (g) Is a person with a Basic Rigging Certificate allowed to install a cantilevered crane loading platform?

1 (h) Is a person with a Basic Rigging Certificate allowed to supervise the erection of tilt-slabs?

1 (i) Is a person with a Basic Rigging Certificate allowed to erect a swing stage or boatswain's chair?

1 (j) Is a person with a Basic Rigging Certificate allowed to install a safety net?

1 (k) Is a person with a Basic Rigging Certificate allowed to install a static line?

1 (l) Is a person with a Basic Rigging Certificate allowed to supervise demolition rigging?

SECTION TWO:
STEEL ERECTION

Note: Select three questions at random from the following 12. To pass this section, the applicant must correctly answer at least two of the selected questions.

2 (a) What identification marks would you find on the head of a high-strength structural bolt?

2 (b) What marks would you find on a high-strength structural nut?

2 (c) How would you know if a washer was a high-strength structural washer?

2 (d) How are the first-placed structural members levelled and plumbed?

2 (e) What type of shackle can be used from a lower level to release the running gear from a column?

2 (f) At what angle would you fix an access ladder?

2 (g) When a roof truss is lifted by the top chord, is the bottom chord loaded in compression or in tension?

2 (h) Would you sling a roof truss away from the panel points or at the panel points?

2 (i) Would you position and fix girts from the bottom up or from the top down?

2 (j) Would you work on the open framework of a structure without fall protection?

2 (k) When field bolting or linking beams, why should you place bolts at diagonally opposite corners?

2 (l) How many hands would you use to podger a purlin into place?

SECTION THREE: PURCHASES, TACKLES AND WINCHES

Note: Select five questions at random from the following 20. To pass this section, the applicant must correctly answer at least three of the selected questions.

3 (a) Can fibre rope be safely used in a wire rope purchase block?

3 (b) Can FSWR be safely used in a fibre rope tackle block?

3 (c) What is the minimum groove depth in a fibre rope tackle block?

3 (d) What is the minimum groove depth in a wire rope purchase block?

3 (e) For the same rope diameter, is the sheave diameter of a wire rope purchase block smaller or larger than the sheave diameter of a fibre rope tackle block?

3 (f) What is the minimum included angle of flare between the two sides of the groove of a sheave in a wire rope purchase block?

3 (g) What is the maximum included angle of flare between the two sides of the groove of a sheave in a wire rope purchase block?

3 (h) What type of damage is caused by sheaves where the groove is too large for the rope?

3 (i) What type of damage is caused by sheaves where the groove is too small for the rope?

3 (j) What is a gantline?

3 (k) What is a gun tackle?

3 (l) What is a handy billy?

3 (m) What is the minimum depth of groove for a grooved winch drum?

3 (n) What is the minimum height of flanges on an ungrooved winch drum?

3 (o) What is the minimum distance which the flanges of a winch drum should extend above the surface of the outer layer of rope?

3 (p) On what side of an underwound winch drum would you fix a right-hand lay rope?

3 (q) On what side of an underwound winch drum would you fix a left-hand lay rope?

3 (r) On what side of an overwound winch drum would you fix a right-hand lay rope?

3 (s) On what side of an overwound winch drum would you secure a left-hand lay rope?

3 (t) What is the minimum number of full turns which must remain on a winch drum when the load on the rope is fully lowered?

SECTION FOUR: ASSOCIATED EQUIPMENT REQUIREMENTS

Note: Select three questions at random from the following 12. To pass this section, the applicant must correctly answer at least two of the selected questions.

Note: Applicants who hold a National Scaffolding Certificate have already been assessed on this section and do not require re-assessment.

4 (a) What is the maximum mesh size of a safety net?

4 (b) What maximum gap would you allow between the edge of a safety net and the building or structure?

4 (c) What are the two maximum fall distances which you might find marked on the label of a safety net?

4 (d) What minimum and maximum initial sag would you allow for a safety net?

4 (e) What minimum clearance would you ensure below a safety net?

4 (f) What minimum horizontal distance should an outrigged safety net extend past the outermost working position?

4 (g) What maximum spacing would you use between ties along the border chord of a safety net?

4 (h) What is the minimum over-run? distance between the hoist rope attachment and the head sheave on a cantilevered platform hoist?

4 (i) What is the minimum and maximum horizontal clearance between the moving platform of a cantilevered hoist and any landing or floor?

4 (j) What is the minimum height of a landing gate for a cantilevered platform hoist?

4 (k) What maximum distance would you use between lateral braces of a cantilevered platform hoist?

4 (l) How high would you free-stand the tower of a cantilevered platform hoist above its last tie?

END OF QUESTIONS

SECTION ONE: CERTIFICATION

Question	Answer	Reference
1 (a)	Yes	NOHSC: 1006, page 21
1 (b)	No	NOHSC: 1006, page 24
1 (c)	Yes	NOHSC: 1006, page 24
1 (d)	No	NOHSC: 1006, page 24
1 (e)	Yes	NOHSC: 1006, page 24
1 (f)	Yes	NOHSC: 1006, page 24
1 (g)	Yes	NOHSC: 1006, page 24
1 (h)	No	NOHSC: 1006, page 24
1 (i)	No	NOHSC: 1006, page 24
1 (j)	Yes	NOHSC: 1006, page 24
1 (k)	Yes	NOHSC: 1006, page 24
1 (l)	No	NOHSC: 1006, page 24

SECTION TWO: STEEL ERECTION

2 (a)	3 radial lines and '8.8'	AS 1252, Clause 5.1.1
2 (b)	3 arcs	AS 1252, Clause 5.1.2
2 (c)	It has 3 nibs	AS 1252, Clause 5.1.3
2 (d)	With temporary bracing or guying	GFR, page 170
2 (e)	A remote release (or ratchet release) shackle	HRP, page 162
2 (f)	1 horizontal to 4 vertical (or 75°)	GFR, page 176
2 (g)	In compression	GFR, page 176
2 (h)	At the panel points	GFR, page 176
2 (i)	From the bottom up	GFR, page 178
2 (j)	No	HRP, page 158
2 (k)	To stop the beam from rolling	GFR, page 180
2 (l)	One	GFR, page 178

SECTION THREE: PURCHASES, TACKLES AND WINCHES

Question	Answer	Reference
3 (a)	Yes	GFR, page 70
3 (b)	No	GFR, page 70
3 (c)	Rope diameter ÷ 2	GFR, page 70
3 (d)	Rope diameter x 1.5	GFR, page 70
3 (e)	Larger	GFR, page 71
3 (f)	42°	GFR, page 72
3 (g)	52°	GFR, page 72
3 (h)	Flattening of the rope	GFR, page 73
3 (i)	Pinching and abrasions of the rope	GFR, page 73
3 (j)	A single fixed block	GFR, page 49

Question	Answer	Reference
3 (k)	Two double blocks	GFR, page 49
3 (l)	One double block and one treble block	GFR, page 49
3 (m)	Rope diameter ÷ 3	GFR, page 72
3 (n)	Rope diameter x 3	GFR, page 72
3 (o)	Rope diameter x 2	GFR, page 72
3 (p)	Right hand side	GFR, page 74
3 (q)	Left hand side	GFR, page 74
3 (r)	Left hand side	GFR, page 74
3 (s)	Right hand side	GFR, page 74
3 (t)	Two	GFR, page 72
SECTION FOUR: ASSOCIATED EQUIPMENT REQUIREMENTS		
4 (a)	100 mm	AS XXXX, Appendix H
4 (b)	200 mm	AS XXXX, Appendix H
4 (c)	1 m and 6 m	AS XXXX, Appendix H
4 (d)	$^1/_4$ and $^1/_5$ of the shortest side length	AS XXXX, Appendix H
4 (e)	$^2/_3$ of the shortest side length or 2 m, whichever is greater	AS XXXX, Appendix H
4 (f)	$^2/_5$ of the maximum fall height plus 2 m	AS XXXX, Appendix H
4 (g)	750 mm	AS XXXX, Appendix H
4 (h)	1.5 m	AS XXXX, Appendix G
4 (i)	25 mm and 100 mm	AS XXXX, Appendix G
4 (j)	1.8 m	AS XXXX, Appendix G
4 (k)	6 m	AS XXXX, Appendix G
4 (l)	3 m	AS XXXX, Appendix G

END OF MODEL ANSWERS

LIST OF REFERENCES

The references used to compile this assessment instrument are:

NOHSC: 1006, *National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment.* (Worksafe Australia, 1992)

AS 1252, *High Strength Steel Bolts with Associated Nuts and Washers for Structural Engineering.* (Standards Australia, 1983)

AS/NZS XXXX, *Guidelines for Scaffolding.* (Standards Australia and Standards New Zealand. This reference is currently being updated for publication.)

A Handbook of Rigging Practice, by Peter Amjah. (NSW TAFE, 1991)

A Guide for Riggers, 8th Edition. (Department of Industrial Relations and Employment, NSW, 1985)

Please note: A new revised edition of *A Guide for Riggers* will be published by the Workcover Authority of NSW during 1994. It is expected that this edition will contain all the necessary information for the National Rigging knowledge assessments.

Basic Rigging—Knowledge 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 underpinning knowledge, additional to that required for Dogging, which is required to carry out the two units of competence for Basic Rigging 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 rigging 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: Certification
These questions reflect performance criteria 1.1.7 and 1.1.15.

Section 2: Steel erection
These questions reflect performance criteria 1.1.1, 1.1.2, 1.1.3, 1.1.5, 1.1.10, 1.1.16, 1.1.18, 2.2.1, 2.2.2, 2.2.4, 2.2.5, 2.2.8, 2.2.10, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.4.2 and 2.4.4.

Section 3: Purchases, tackles and winches
These questions reflect performance criteria 1.1.6, 1.1.7, 1.1.14, 1.1.16, 1.1.18, 1.2.3, 1.2.4, 1.2.7, 2.1.3, 2.2.1, 2.2.3 and 2.2.12.

Section 4: Associated equipment requirements
These questions reflect performance criteria 1.1.1, 1.1.2, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.11, 1.1.18, 1.1.19, 1.2.1, 2.1.3, 2.2.3 and 2.2.13.

Relevant performance criteria which are not reflected in the Basic Rigging assessment have been covered in the Dogging assessment and do not require additional assessment.

THE RANGE STATEMENT

The bank of questions assesses knowledge which directly relates to the full equipment range listed in the National Standard's Range Statement for Basic Rigging. This is as follows:

- movement of plant and equipment;
- steel erection;
- particular hoists;
- safety nets.

The model answers apply the requirements of the *National Standard for Plant* and its relevant referenced Standards to the obligations under State/Territory occupational health and safety legislation of a person who carries out dogging and rigging work within the scope of the Basic Rigging Certificate of Competency. In particular, the model answers are consistent with the following referenced Standards:

- AS 1418, *Cranes (Including Hoists and Winches);*
- BS 3913, *Industrial Safety Nets.*

The model answers are expected to be consistent with the forthcoming 1994 edition of *A Guide for Riggers,* to be published by the WorkCover Authority of NSW, which the Worksafe Australia Scaffolding and Rigging Expert Working Group has foreshadowed as a suitable text for the determination of applicants' answers for Basic Rigging.

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