WorkCover
NEW SOUTH WALES

INTERMEDIATE
SCAFFOLDING

NATIONAL CERTIFICATE OF COMPETENCY

ASSESSMENT INSTRUMENT JUNE 1995

WorkCover NSW Health and Safety Assessment Instrument

Intermediate Scaffolding

ASSESSMENT

Part 1 Practical

Part 2 Assignment

Part 3 Knowledge

June 1995

Order No. 841

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

INTERMEDIATE SCAFFOLDING

CERTIFICATE OF COMPETENCY

PART ONE

PRACTICAL SKILLS PERFORMANCE ASSESSMENT

(Tasks and Model Results)

Intermediate Scaffolding—Practical Skills

CONTENTS

Introductory notes—Practical

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

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

3 The practical skills performance assessment for Intermediate Scaffolding is a 'closed book' practical exercise covering six sections.

In practical skills performance assessment, the certificate assessor evaluates the applicant's applied knowledge and understanding and the applicant's familiarity with scaffolding equipment and recommended work procedures. On completion of the assessment the assessor will determine whether the applicant can safely undertake, without supervision, the tasks encompassed within each of the four units of competence comprising Intermediate Scaffolding 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 six sections of the performance assessment and the Standard's prescribed performance criteria and range statement is set out on page 8.

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: Measuring and marking
Section 2: General scaffold construction
Section 3: Sloping platform construction
Section 4: Spur construction
Section 5: Use of compatible equipment
Section 6: Lashing of planks

5 An applicant who produces a satisfactory record of training (such as a log book) which establishes at least 50 working days of experience in the erection and dismantling of tube-and-coupler scaffolds does not require a practical skills performance assessment for Intermediate Scaffolding.

6 An applicant undergoing re-assessment need only be re-assessed in those sections in 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 certificate assessors by the certifying authority.

Conditions

8 **Location**
The practical skills assessment can be conducted at any location which has:
- sufficient clear space for the scaffold to be erected and dismantled;
- a firm supporting surface for the scaffold.

9 **Minimum serviceable scaffolding equipment**
The following should be used as a guide by the assessor. The actual quantities and dimensions may vary depending upon available stock.

Tubes
(of uniform material complying with AS 1576.3, Suppl 1)

1.2 m	x 4
1.5 m	x 23
1.8 m	x 4
2.4 m	x 4
3.0 m	x 14
3.6 m	x 6

Random planks
(225 mm wide and uniform thickness complying with AS 1577)

1.2 m	x 2
3.6 m	x 14

Couplers
(with compatible characteristics complying with AS 1576.2)

Right angle couplers	x 64
Swivel couplers	x 24
Putlog couplers	x 22

Accessories
(complying with AS 1576.2)

Base plates	x 10
Toeboard clips	x 10

Miscellaneous
A 2.0 m length of 2 mm, 3 mm or 4 mm diameter FSWR for each applicant.

10 **Minimum incompatible equipment**
Several items of incompatible equipment must be randomly mixed into the stock of scaffolding equipment. The following can be used as a guide by the assessor but can be varied depending upon availability:

Right angle couplers: with differing eccentricities from stock	x 4
Putlog couplers: which give different tube gaps from stock	x 4
3.6 m scaffold planks: with different nominal thickness from stock	x 4

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

- scaffold key
- torpedo spirit level
- retractable tape measure or folding rule
- scaffold belt with frogs and holders for the above
- chalk.

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.

13 **Scaffold design**
A suggested scaffold design is given in Attachment A. The assessor can vary the design to suit local circumstances but the constructed scaffold must incorporate all the following features:

- sloping platform;
- spurred section;
- longitudinal and transverse braces;
- random planks and putlogs.

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.

14 **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 six sections have been successfully completed or are not applicable, as appropriate.

15 **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

16 **Measuring and marking (Section 1)**
Using the design drawing as a reference during preparation and during the erection of the scaffold the applicant must:

a Measure and mark the correct positions on transoms, standards, ledgers and guardrail stanchions for the fixing of right angle couplers; and

b use a method of marking which clearly indicates which side of the marked line the coupler is to be aligned to.

To complete this section successfully, all measurements must be within at least 90% of accuracy and at least 90% of marked coupler alignments must be correctly indicated.

17 **General scaffold construction (Section 2)**
During the construction of the scaffold, the certificate assessor uses the following eight items to assess the applicant's general competence in the construction of tube-and-coupler scaffolds:

a right angle couplers are correctly positioned the right way up and square;

b transoms are fixed horizontal and square at the correct spans;

c ledgers, guardrails and midrails are fixed horizontal to the inside of the standards at correct spans;

d braces are fixed close to node points keeping scaffold plumb and rigid;

e standards do not 'float';

f putlogs are fixed horizontal and square above the ledgers at the correct spacings;

g platform planks are closely laid and overhang putlogs by 150 mm to 250 mm; and

h toeboards are fixed to the standards with no gap greater than 10 mm.

To complete this section successfully, the applicant must have achieved at least seven of the eight items.

18 **Sloping platform construction (Section 3)**
During the construction of the scaffold, the certificate assessor uses the following three items to assess the applicant's competence to construct sloping platforms:

a the lower ends of the sloping ledgers bear on the soleplate;

b the sloping ledgers are fixed at the correct slope to the transoms with right angle couplers; and

c the sloping guardrails and midrails are fixed parallel to the platform at the correct heights to the inside of the standards with swivel couplers.

*To complete this section successfully, the applicant must have achieved **all** three items.*

19 **Spur construction (Section 4)**
During the construction of the scaffold, the certificate assessor uses the following three items to assess the applicant's competence to construct spurs:

a the spurs are fixed to transoms with right angle couplers;

b the spurs are tensioned to prevent deflection in the platform; and

c the spurs are provided with correctly positioned check couplers at each end.

*To complete this section successfully, the applicant must have achieved **all** three items.*

20 **Use of compatible equipment (Section 5)**
During the construction of the scaffold, the certificate assessor uses the following two items to assess the applicant's ability to determine the compatibility of components:

a only compatible couplers are used in the one lift; and

b. platform planks are of uniform thickness.

To complete this section successfully, the applicant must have achieved ***both*** *items.*

21 **Lashing of planks (Section 6)**
At an appropriate point in the erection procedure, the assessor will direct the applicant to lash the full width of platform planks to a putlog. During this procedure, the certificate assessor uses the following three items to assess the applicant's ability to competently secure scaffold planks:

a the lashing is commenced with a spliced eye or clove hitch;

b a half hitch is made around the putlog between each plank;

c the lashing is finished tight and secure with no trip hazard.

To complete this section successfully, the applicant must have achieved ***all*** *three items.*

Note: If the scaffold shown in Attachment A were to be commissioned for service, the planks of the sloping access way would require cleating on their upper surfaces.

Cleating is not necessary for the purposes of this assessment.

Assessment form: Intermediate Scaffolding

Applicant's name .....

Performance items

1 Measuring and marking
Applicant achieved at least 90% accuracy in both items:
- positions correctly measured and marked ☐
- marking method indicates position of coupler ☐

2 General scaffold construction
Applicant completed at least seven of the eight items correctly:
- right angle couplers positioned and square ☐
- transoms horizontal, square and spanned ☐
- ledgers, G/rails and M/rails horizontal, inside and spanned ☐
- braces positioned, scaffold plumb and rigid ☐
- no 'floating' standards ☐
- putlogs horizontal, square, above ledgers and spaced
- platform planks set closely and overhang putlogs ☐
- toeboards positioned and fixed ☐

3 Sloping platform construction
Applicant completed all items correctly:
- end of ledgers bearing on soleplate ☐
- ledgers sloped and fixed to transoms ☐
- G/rails and M/rails parallel to platform and fixed inside ☐

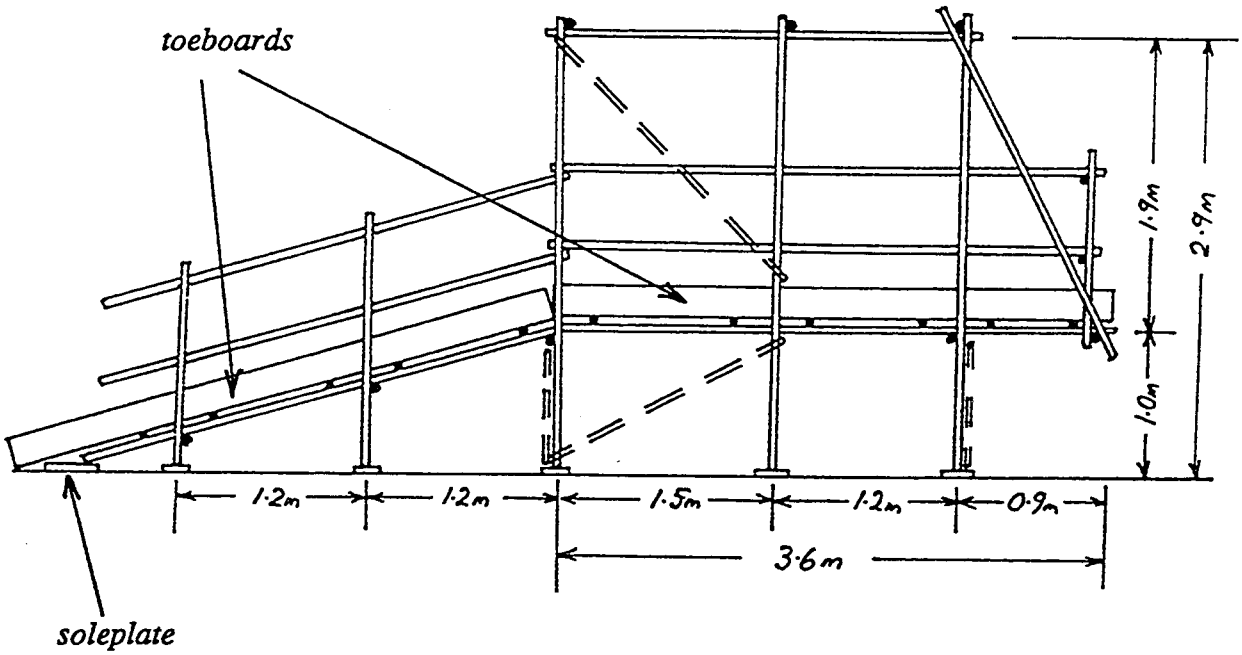
4 Spur construction
Applicant completed all items correctly:
- spurs positioned and fixed ☐
- spurs tensioned ☐
- check couplers positioned and fixed ☐

5 Use of compatible equipment
Applicant completed all items correctly:
- compatibility of couplers used in each application ☐
- uniformity of platform plank thickness achieved ☐

6 Lashing of planks
Applicant completed all items correctly:
- commencement of lashing ☐
- half hitches between planks ☐
- finished tight without trip hazards ☐

ATTACHMENT A

Suggested scaffold design



NOTES:

1. Longitudinal bracing to both faces.
2. Spurs to both faces.
3. Access-way gradient not to exceed 1 in 3.
4. Edge protection to both faces and end.
5. Transverse standard spacing: 1.275 m.

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 scaffolding equipment and recommended work practices which are necessary to carry out the four units of competence for Intermediate Scaffolding 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 Erect scaffolding/equipment
3.0 Inspect, repair and alter scaffolding/equipment
4.0 Dismantle scaffolding/equipment

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: 1.1.3, 1.1.4, 1.1.7, 1.1.12, 1.1.16, 2.1.4, 2.2.1, 2.2.3, 2.2.6, 3.2.3, 3.2.4, 4.2.1 and 4.2.2.

Relevant performance criteria which are not reflected in the Intermediate Scaffolding Assessment have been covered in the Basic Scaffolding Assessment and do not require additional assessment.

THE RANGE STATEMENT

The tasks making up the practical skills performance assessment are focussed around the erection of an independent tube-and-coupler scaffold which incorporates a sloping platform and a spurred bay.

These three features represent the most complex of the equipment types listed in the National Standard's Range Statement for Intermediate Scaffolding.

The model results apply the requirements of the *National Standard for Plant* and the design requirements of its referenced Standard AS 1576, *Scaffolding,* to the obligations under State/Territory occupational health and safety legislation of a person who erects, alters or dismantles scaffolding within the scope of the Intermediate Scaffolding certificate of competency.

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ASSESSMENT INSTRUMENT

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PART TWO

WRITTEN ASSIGNMENT

(Questions and Answers)

Intermediate Scaffolding—Written Assignment

CONTENTS

Introductory notes—Assignment

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

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

3 The written assignment for Intermediate Scaffolding is a 'closed book' examination consisting of a total of 10 separate tasks.

In the written assignment the certificate assessor evaluates the applicant's conceptual understanding of scaffold construction, his/her ability to apply simple mathematics and physics and ability to prepare line drawings from technical specifications. On completion of the assessment the assessor will determine whether the applicant can safely undertake, without supervision, the tasks encompassed within each of the four units of competence comprising Intermediate Scaffolding 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 six sections of the assignment and the Standard's prescribed performance criteria and range statements is set out on page 22.

A full assignment includes five minutes reading time and up to 55 minutes to complete.

5 To pass the assignment, the applicant must achieve at least 11 marks out of a possible 14 marks for Task 1, and must have correctly completed at least seven of the remaining nine tasks.

6 An applicant undergoing re-assessment shall be re-assessed in all 10 tasks.

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 This assessment instrument contains three alternative scaffold information sheets for the assignment (Scaffolds A, B, C). The certificate assessor must randomly select an information sheet for each applicant which must be returned to the assessor at the conclusion of the assessment.

9 The model answers to the tasks and the method of determining satisfactory completion of each section are provided on pages 19–21.

INSTRUCTIONS TO APPLICANTS

1 Equipment

To complete this assignment you will need pens or pencils and a straight edge or ruler.

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 before you start work.

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

3 The assignment

The assignment contains:

- one information sheet;
- one drawing sheet; and
- 10 tasks for you to do.

WRITE YOUR NAME AT THE TOP OF EACH PAGE.

4 Time allowed

You have 55 minutes to complete all 10 tasks.

Directions: Tasks 1 to 10

INTRODUCTION

You are required to erect an independent tube-and-coupler scaffold on the outside face of a building. The scaffold must comply with the specifications given in AS 1576.3, Suppl 1: *Metal Tube-and-Coupler Scaffolding—Deemed to Comply.*

The certificate assessor will provide you with the specifications for the scaffold you are required to erect.

The following method of construction is to be used:

- ledgers will be fixed to the inside of the standards;
- the first lift will be fixed with transoms set below the ledgers;
- the working lifts will be fixed with putlogs and putlog couplers;
- braces will be fixed to the standards with swivel couplers;
- guard rails and midrails will be fixed to the standards with right angle couplers;
- all joints will be fixed with sleeve-type end-to-end couplers.

Available tube lengths are 1.2, 1.5, 1.8, 2.1, 2.4, 2.7, 3.0, 3.6, 4.2, 4.8, 5.4, 6.0 and 6.3 m.

Task 1: On the attached drawing sheet, use line sketches to show a front elevation and end elevation of the scaffold. Show all joints in standards and ledgers. (Do NOT show tie assemblies. Do NOT show access.

Task 2: What length of available tube would you use to start the first standard?

Task 3: What length of available tube would you use to start the second standard?

Task 4: What length of available tube would you use to start the first ledger?

Task 5: What length of available tube would you use to start the second ledger?

Task 6: What is the shortest available tube length you would use for the transoms?

Task 7: What is the shortest available tube length you would use for the putlogs?

Task 8: How many right angle couplers are needed to construct the scaffold? (Do NOT include couplers for tie assemblies.)

Task 9: How many swivel couplers are needed to construct the scaffold?

Task 10: How many putlog couplers are needed to construct the scaffold?

Intermediate Scaffolding—Written Assignment

Task 1 **Applicant's name** .....

DRAWING SHEET

Intermediate Scaffolding—Written Assignment

Tasks 2-10 **Applicant's name** .....

ANSWER SHEET

Task 2:

Task 3:

Task 3:

Task 4:

Task 5:

Task 6:

Task 7:

Task 8:

Task 9:

Task 10:

Intermediate Scaffolding—Written Assignment

Tasks 1-10

INFORMATION SHEET

Scaffold A

The scaffold must meet the following requirements:

- height to top lift: 8 m;
- length between end standards: 14.4 m;
- centre-to-centre transverse standard spacing: 1.225 m;
- number of platforms: three full-length working platforms;
- location of platforms: on the upper three lifts;
- platform planks: 225 mm x 38 mm x 3.6 m oregon;
- platform width: five planks between the standards and two planks cantilevered towards the working face;
- platform duty category: heavy duty;
- edge protection: guardrails, midrails and toeboards on outside and ends of platforms;
- longitudinal bracing will be fixed to each outside panel in the end bays and in one intermediate bay.

Intermediate Scaffolding—Written Assignment

Tasks 1-10

INFORMATION SHEET

Scaffold B

The scaffold must meet the following requirements:

- height to top lift: 8 m;
- length between end standards: 19.2 m;
- centre-to-centre transverse standard spacing: 1.625 m;
- number of platforms: three full-length working platforms;
- location of platforms: on the upper three lifts;
- platform planks: 225 mm x 50 mm x 4.8 m oregon;
- platform width: seven planks between the standards and two planks cantilevered towards the working face;
- platform duty category: medium duty;
- edge protection: guardrails, midrails and toeboards on outside and ends of platforms;
- longitudinal bracing will be fixed to each outside panel in the end bays and in one intermediate bay.

Tasks 1-10

INFORMATION SHEET

Scaffold C

The scaffold must meet the following requirements:

- height to top lift: 10 m;
- length between end standards: 12 m;
- centre-to-centre transverse standard spacing: 950 mm;
- number of platforms: four full-length working platforms;
- location of platforms: on the upper four lifts;
- platform planks: 225 mm x 63 mm x 3.0 m oregon;
- platform width: four planks between the standards and two planks cantilevered towards the working face;
- platform duty category: light duty;
- edge protection: guardrails, midrails and toeboards on outside and ends of platforms.
- longitudinal bracing will be fixed to each outside panel in the end bays.

Explanatory notes for Certificate assessors

1 In marking the assignment, the assessor needs to be aware that several of the tasks are linked. Therefore a wrong solution to one task may affect the answer given in a following task.

2 Where the assessor has identified an initial calculation as incorrect, any subsequent use of this incorrect figure should not necessarily be penalised. The assessor should calculate answers to subsequent questions using the incorrect figure, thereby ensuring that the applicant is credited for subsequent correct calculations.

3 Answers to all tasks in Scaffolds A-C are shown under each task number with the alternative answer in brackets or where appropriate, separately.

Task answer and commentary

Task 1:
Note: This question assesses the applicant's ability to produce a legible drawing from a set of specifications and his/her understanding of AS 1576.3, Suppl.1.

To pass Task 1, the applicant must have correctly shown, on the drawing, 11 of the following 14 features.

Scaffolds A and B:

(1) both a front elevation and end elevation have been drawn;

(2) eight bays of equal spacings have been shown;

(3) four lifts of equal heights have been shown;

(4) all standards extend to the top guardrail;

(5) all ledgers extend for the full length of the scaffold;

(6) standard joints are staggered between lifts and are close to ledgers;

(7) ledgers are shown on the inside of standards;

(8) ledger joints are staggered between bays, are not in end bays and are close to standards;

(9) nine transoms are shown immediately below the ledgers of the first lift;

(10) 16 putlogs are shown above the ledgers on each of the upper three lifts and are located in pairs around each intermediate standard;

(11) the end elevation shows the putlogs on each working lift cantilevered on the inside of the scaffold;

(12) the end elevation shows one transverse brace in each lift (either zig-zagged or fixed in parallel);

(13) the front elevation shows one longitudinal brace in each lift of each end bay and in either the 4th or the 5th bay;

(14) guardrails and midrails are shown fixed to the inside of the outer and end standards above the upper three lifts.

Scaffold C:

(1) both a front elevation and end elevation have been drawn;

(2) four bays of equal spacings have been shown;

(3) five lifts of equal heights have been shown;

(4) all standards extend to the top guardrail;

(5) all ledgers extend for the full length of the scaffold;

(6) standard joints are staggered between lifts and are close to ledgers;

(7) ledgers are shown on the inside of standards;

(8) ledger joints are staggered between bays, are not in end bays and are close to standards;

(9) five transoms are shown immediately below the ledgers of the first lift;

(10) eight putlogs are shown above the ledgers on each of the upper three lifts and are located in pairs around each intermediate standard;

(11) the end elevation shows the putlogs on each working lift cantilevered on the inside of the scaffold;

(12) the end elevation shows one transverse brace in each lift (either zig-zagged or fixed in parallel;

(13) the front elevation shows one longitudinal brace in each lift of each end bay;

(14) guardrails and midrails are shown fixed to the inside of the outer and end standards above the upper four lifts.

Task 2:
Note: Tasks 2 and 3 assess the applicant's ability to apply the rules for standard joints in AS 1576.3, Suppl 1 to a given scaffold configuration.

The acceptable answers to Task 2 for *all* scaffolds are 2.1 m, 4.2 m or 6.3 m.

These lengths give a joint spacing of within 300 mm of a ledger. 1.8 m is not acceptable because, although the joint would be within 300 mm of the first ledger, it could not be fixed to that ledger. 6.0 m is not acceptable because there would be insufficient clearance for a sleeve-type end-to-end coupler.

Task 3:
The acceptable answers to Task 3 for *all* scaffolds are 2.1 m, 4.2 m, 6.3 m, *provided the applicant has not chosen the length given in answer to Task 2.*

Task 4:
Note: Tasks 4 and 5 assess the applicant's ability to apply the rules for ledger joints in AS 1576.3, Suppl.1 to a given scaffold configuration.

Scaffold A:
The acceptable answers are 2.1 m, 3.6 m, 4.2 m, 5.4 m or 6.0 m.

Note: Those lengths avoid end bay joints while enabling joints to occur within 300 mm of a standard. 1.8 m is not acceptable because there would be insufficient clearance for a sleeve-type end-to-end coupler.

Scaffold B:
The acceptable answers are 2.7 m, 4.8 m or 5.4 m.

Note: These lengths avoid end bay joints while enabling joints to occur within 300 mm of a standard. 2.4 m is not acceptable because there would be insufficient clearance for a sleeve-type end-to-end coupler.

Scaffold C:
The acceptable answers are 6.0 m or 6.3 m.

Note: These lengths avoid end bay joints while enabling joints to occur within 300 mm of a standard. 3.0 m is not acceptable because there would be insufficient clearance for a sleeve-type end-to-end coupler. 4.2 m, 4.8 m and 5.4 m are unacceptable because a further joint would then occur in either an adjacent bay or the end bay.

Task 5:
Scaffold A:
The acceptable answers are:

a 4.2 m, 5.4 m or 6.0 m (in the case of an applicant whose answer to Task 4 was 2.1 m or 3.6 m); or

b 2.1 m, 3.6 m or 6.0 m (in the case of an applicant whose answer to Task 4 was 4.2 m or 5.4 m); or

c 2.1 m, 3.6 m, 4.2 m or 5.4 m (in the case of an applicant whose answer to Task 4 was 6.0 m).

Scaffold B:
The acceptable answers are:

a 5.4 m (in the case of an applicant whose answer to Task 4 was 2.7 m or 4.8 m); or

b 2.7 m or 4.8 m (in the case of an applicant whose answer to Task 4 was 5.4 m).

Scaffold C:
The acceptable answers are 6.0 m or 6.3 m *providing the applicant has not chosen the length given in answer to Task 4.*

Task 6:
Note: This task assesses the applicant's ability to apply the requirement on tube extension given in AS 1576.1 to a given scaffold configuration.

The only acceptable answers are 1.5 m (A); 1.8 m (B); 1.2 m (C).

Task 7:
Note: This task assesses the applicant's ability to apply the rules for cantilevered putlogs in AS 1576.3, Suppl.1 to a given scaffold configuration.

The only acceptable answers are 1.8m(A); 2.1 m (B); 1.5 m (C).

Task 8:
Note: This task assesses the applicant's ability to apply the rules for fixing of ledgers, transoms, guardrails and midrails in AS 1576.3, Suppl.1. to a given scaffold configuration.

The correct answer is 168 (A and B); 132 (C).

Note: The only acceptable variations to this would be where the applicant has shown either continuous longitudinal bracing or the wrong number of bays or lifts in his/her calculations for Task 1. In these cases, the assessor should calculate the number of right angle couplers for the bays and lifts shown. Where this calculation is the same as the applicant's answer to Task 8, the answer is acceptable.)

Task 9:
Note: This task assesses the applicant's ability to apply the bracing rules in AS 1576.3, Suppl.1. to a given scaffold configuration.

The correct answer for *all* scaffolds is 40.

Note:
The only acceptable variations to this would be where the applicant has shown either continuous longitudinal bracing or the wrong number of lifts in his/her calculations for Task 1. In these cases, the assessor should calculate the number of swivel couplers from the applicant's drawing. Where this calculation is the same as the applicant's answer to Task 9, the answer is acceptable.

Task 10:
Note: This question assesses the applicant's ability to comprehend the relationship between maximum putlog spacing and plank thickness and the ability to apply the rules for putlogs in AS 1576.3, Suppl.1. to a given scaffold configuration.

The correct answer is 96 (A and B); 64 (C).

Note:
The only acceptable variations to this would be where the applicant has shown the wrong number of working lifts or the wrong number of bays in his/her calculations for Task 1. In these cases, an answer to Task 10 which is twice the number of putlogs required for the lifts and bays shown is acceptable.

Intermediate Scaffolding—Written Assignment

RELATIONSHIP TO THE NATIONAL CERTIFICATION STANDARD

THE UNITS OF COMPETENCE

The ten tasks which comprise the written assignment are intended to assess the conceptual understanding, numeracy and technical drawing skills, additional to those required for Basic Scaffolding, which are required to carry out the four units of competence for Intermediate Scaffolding 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 Erect scaffolding/equipment
3.0 Inspect, repair and alter scaffolding/equipment
4.0 Dismantle scaffolding/equipment

Each unit of competence is subdivided 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: Line sketches
This task reflects performance criteria 1.1.4, 1.1.6, 1.1.7, 1.1.12, 1.1.16, 2.2.1, 2.2.3, 2.2.4, 3.1.2, 3.2.1, 3.2.3, 4.1.1, and 4.2.1.

Tasks 2 to 10: Material selection
These tasks reflect performance criteria 1.1.3, 1.1.4, 1.1.7, 1.1.16, 1.2.1, 1.3.1, 2.2.1, 2.2.3, 2.2.4, 2.2.6, 3.1.1, 3.2.1, 3.2.3, 4.1.1, 4.1.2, and 4.1.3.

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

THE RANGE STATEMENT

The tasks making up the written assignment are related to tube-and-coupler scaffolding.

This type of scaffolding was selected because it is regarded as representing the most complex of the equipment types listed in the National Standard's range statement for Intermediate Scaffolding.

The model answers apply the requirements of the *National Standard for Plant* and the design requirements of its referenced Standard AS 1576, *Scaffolding,* to the obligations under State/Territory occupational health and safety legislation of a person who erects, alters or dismantles scaffolding within the scope of the Intermediate Scaffolding certificate of competency.

In particular, the model answers are consistent with the specifications given in AS 1576.3, Supplement 1, *Metal Tube-and-Coupler Scaffolding—Deemed to Comply,* 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 Intermediate Scaffolding.

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

ASSESSMENT INSTRUMENT

FOR THE

INTERMEDIATE SCAFFOLDING

CERTIFICATE OF COMPETENCY

PART THREE

KNOWLEDGE ASSESSMENT

(Questions and Answers)

Intermediate Scaffolding—Knowledge Assessment

CONTENTS

Introductory notes—Knowledge

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

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

3 The knowledge assessment for Intermediate Scaffolding is a 'closed book' short-answer examination divided into three sections. The questions in each section are to be randomly selected from a bank which contains a total of 52 questions.

In the knowledge 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 supervision, the tasks encompassed within each of the four units of competence comprising Intermediate Scaffolding 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 32.

5 A full knowledge assessment consists of 15 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: Tube-and-coupler scaffold specifications
(9 selected from 25)
Section 3: Particular scaffold requirements
(3 selected from 15)

7 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.

8 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.

9 The model answers to the bank of questions are on pages 30–31.

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

10 Applicants may use alternative compatible metric units from 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.

11 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.

12 An applicant who uses an imperial unit of measurement must be given the opportunity by means of oral questioning to convert the answer correctly to an appropriate metric measurement. An inability to convert an imperial measurement correctly is regarded as a failure to answer the question.

Intermediate Scaffolding—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 an Intermediate Scaffolding Certificate allowed to construct a personnel and materials hoist?

1 (b) Is a person with an Intermediate Scaffolding Certificate allowed to install a cantilevered crane loading platform?

1 (c) Is a person with an Intermediate Scaffolding Certificate allowed to carry out all work covered by the Basic Scaffolding Certificate?

1 (d) Is a person with an Intermediate Scaffolding Certificate allowed to construct a hung scaffold?

1 (e) Is a person with an Intermediate Scaffolding Certificate allowed to construct a barrow ramp?

1 (f) Is a person with an Intermediate Scaffolding Certificate allowed to construct a single-pole tube-and-coupler scaffold?

1 (g) Is a person with an Intermediate Scaffolding Certificate allowed to construct a boatswain's chair?

1 (h) Is a person with an Intermediate Scaffolding Certificate allowed to construct a tube-and-coupler covered way or gantry?

1 (i) Is a person with an Intermediate Scaffolding Certificate allowed to construct a mast climber?

1 (j) Is a person with an Intermediate Scaffolding Certificate allowed to construct a swing stage?

1 (k) Is a person with an Intermediate Scaffolding Certificate allowed to construct a cantilevered or spurred scaffold?

SECTION TWO: TUBE-AND-COUPLER SCAFFOLD SPECIFICATIONS

Note to assessors: Select nine questions at random from the following 25. To pass this section, the applicant must correctly answer at least five of the selected questions.

Note to applicants: The questions in this section assess your knowledge of AS 1576.3, Supplement 1: Metal Tube-and-Coupler Scaffolding—Deemed to Comply. Answers which comply with that specification are the only acceptable answers.

2 (a) What is the maximum specified height for a tube-and-coupler scaffold?

2 (b) What is the maximum bay width for a light duty independent scaffold?

2 (c) What is the minimum bay width for a medium duty independent scaffold?

2 (d) What is the maximum bay width for a heavy duty independent scaffold?

2 (e) What is the maximum bay length for a light duty independent scaffold?

2 (f) What is the maximum bay length for a medium duty independent scaffold?

2 (g) What is the maximum bay length for a heavy duty independent scaffold?

2 (h) What is the maximum bay length for a single-pole scaffold?

2 (i) What is the maximum lift height for a normal independent scaffold?

2 (j) How far from a standard can a ledger be joined?

2 (k) How far from a ledger can a standard be joined?

2 (l) When putlogs are cantilevered to support extra planks, what is the minimum bay width?

2 (m) How many 225 mm planks can be supported by the cantilevered portion of putlogs?

2 (n) How many full length working platforms can be carried on a 15 m high steel tube scaffold?

2 (o) How many full length working platforms can be carried on a 45 m high aluminium tube scaffold?

2 (p) How many full length working platforms can be carried on a 45 m high steel tube scaffold?

2 (q) At what lift is the first level of ties fixed on a single-pole scaffold?

2 (r) What is the maximum height of a mobile scaffold?

2 (s) What is the maximum angle from the vertical for spurs in an access opening?

2 (t) What is the maximum height for puncheons in an access opening?

2 (u) Where double standards are used, what is the maximum first lift height?

2 (v) What is the maximum angle for sloping putlogs on a cantilevered catch platform?

2 (w) What is the maximum spacing between intermediate sloping putlogs on a cantilevered catch platform?

2 (x) What is the maximum width of a cantilevered catch platform?

2 (y) How close to the castors is the first lift of ledgers and transoms on a mobile scaffold?

SECTION THREE: PARTICULAR SCAFFOLD REQUIREMENTS

Note: Select three questions at random from the following 15. To pass this section, the applicant must correctly answer at least two of the selected questions.

3 (a) What is the maximum allowable slope of a working platform?

3 (b) What is the maximum allowable slope of a cleated barrow ramp?

3 (c) How far apart would you fix the cleats on the platform of a barrow ramp?

3 (d) What size gap would you leave for the wheel of a barrow in a barrow ramp cleat?

3 (e) How many lifts would you support with a single set of spurs?

3 (f) What is the minimum width of a steel beam you would use as a needle for a cantilever scaffold?

3 (g) How much of a cantilever scaffold needle should be inboard?

3 (h) How would you stop the nuts from loosening on the anchorage bolts of a cantilever scaffold needle?

3 (i) What type of baseplate would you use to fix the standards of a cantilever scaffold to the needles?

3 (j) Where would you place the first lift of ledgers and transoms on a cantilever scaffold?

3 (k) What is the minimum diameter of bolts you would use to anchor the inboard end of a cantilever scaffold needle?

3 (l) Would you use drilled-in anchors to fix the inboard end of a cantilever scaffold needle?

3 (m) When a spur is in compression, what would be its maximum length between node points?

3 (n) What type of coupler would you use to fix a spur to the scaffold framework?

3 (o) What is the maximum angle from the vertical at which you would fix a spur?

END OF QUESTIONS

Model answers

SECTION ONE: CERTIFICATION

Question	Answer	Reference
1 (a)	No	AS XXXX, Clause 7.3
1 (b)	Yes	AS XXXX, Clause 7.3
1 (c)	Yes	AS XXXX, Clause 7.3
1 (d)	No	AS XXXX, Clause 7.3
1 (e)	Yes	AS XXXX, Clause 7.3
1 (f)	Yes	AS XXXX, Clause 7.3
1 (g)	No	AS XXXX, Clause 7.3
1 (h)	Yes	AS XXXX, Clause 7.3
1 (i)	Yes	AS XXXX, Clause 7.3
1 (j)	No	AS XXXX, Clause 7.3
1 (k)	Yes	AS XXXX, Clause 7.3

SECTION TWO: TUBE-AND-COUPLER SPECIFICATIONS

Question	Answer	Reference
2 (a)	45 m	AS 1576.3, Supl.1 Clause 1.1
2 (b)	2.4 m (or 10 planks)	AS 1576.3, Supl.1 Table 3.1
2 (c)	950 mm (or 4 planks)	AS 1576.3, Supl.1 Table 3.1
2 (d)	1.275 m (or 5 planks)	AS 1576.3, Supl.1 Table 3.1
2 (e)	3 m	AS 1576.3, Supl.1 Table 3.1
2 (f)	2.4 m	AS 1576.3, Supl.1 Table 3.1
2 (g)	1.8 m	AS 1576.3, Supl.1 Table 3.1
2 (h)	1.8 m	AS 1576.3, Supl.1 Clause 4.1(a)
2 (i)	2 m	AS 1576.3, Supl.1 Clause 3.2(f)
2 (j)	300 mm	AS 1576.3, Supl.1 Clause 3.2(e) (v)
2 (k)	300 mm	AS 1576.3, Supl.1 Clause 3.1(f) (iv)
2 (l)	950 mm (or 4 planks)	AS 1576.3, Supl.1 Clause 3.7(f)
2 (m)	2	AS 1576.3, Supl.1 Clause 3.8 (i)
2 (n)	4	AS 1576.3, Supl.1 Table 3.3
2 (o)	1	AS 1576.3, Supl.1 Table 3.3
2 (p)	2	AS 1576.3, Supl.1 Table 3.3
2 (q)	The first lift	AS 1576.3, Supl.1 Clause 4.5(b)
2 (r)	3 times its least base width	AS 1576.3, Supl.1 Clause 5.3(g)
2 (s)	45 degrees	AS 1576.3, Supl.1 Clause 5.4(d) (i)
2 (t)	30 m	AS 1576.3, Supl.1 Clause 5.4(e)

Question	Answer	Reference
2 (u)	3 m	AS 1576.3, Supl. 1 Clause 5.5(d)
2 (v)	60 degrees (or 30 degrees to the horizontal)	AS 1576.3, Supl. 1 Clause 5.10(b)
2 (w)	600 mm	AS 1576.3, Supl. 1 Clause 5.10(c)
2 (x)	1.125 m (or 5 planks)	AS 1576.3, Supl. 1 Clause 5.10(g)
2 (y)	As close as possible	AS 1576.3, Supl. 1 Clause 5.3(a)

SECTION THREE: PARTICULAR SCAFFOLD REQUIREMENTS

Question	Answer	Reference
3 (a)	7 degrees (or 1 in 8)	AS XXXX, Clause 6.1.6
3 (b)	20 degrees (or 1 in 3)	AS 1576.3, Supl. 1 Clause 5.7(e)
3 (c)	450 mm	AS 1576.3, Supl. 1 Clause 5.7(c)
3 (d)	100 mm	AS 1576.3, Supl. 1 Clause 5.7(a)
3 (e)	5	AS XXXX, Clause 6.4
3 (f)	75 mm	AS XXXX, Clause 6.5
3 (g)	3 times the outboard (or 3 quarters, or 75%)	AS XXXX, Clause 6.5
3 (h)	Use lock nuts	AS XXXX, Clause 6.5
3 (i)	U-heads (or forkheads)	AS XXXX, Clause 6.5
3 (j)	As close to the needles as possible	AS XXXX, Clause 6.5
3 (k)	15 mm	AS XXXX, Clause 6.5
3 (l)	No	AS XXXX, Clause 6.5
3 (m)	2 m	AS XXXX, Clause 6.4
3 (n)	Right angle (or double or ninety degree) coupler	AS XXXX, Clause 6.4
3 (o)	45 degrees	AS XXXX, Clause 6.4

END OF MODEL ANSWERS

LIST OF REFERENCES

The references used for this assessment are:

AS 1576.3, Supplement 1—1991 (inc. Amendment No. 1), *Metal Tube-and-Coupler Scaffolding—Deemed to Comply;*

AS/NZS XXXX—1994, *Guidelines for Scaffolding.*

Please Note: This reference is currently being updated for publication. When available, this assessment instrument will be reviewed to ensure accuracy of questions, answers and referenced clauses.

Intermediate Scaffolding—Knowledge Questions

RELATIONSHIP TO THE NATIONAL CERTIFICATION STANDARD

THE UNITS OF COMPETENCE

The questions selected at random from the three sections of the knowledge assessment are intended to assess the underpinning knowledge, additional to the knowledge required for Basic Scaffolding, which is required to carry out the four units of competence for Intermediate Scaffolding 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 Erect scaffolding/equipment
3.0 Inspect, repair and alter scaffolding/equipment
4.0 Dismantle scaffolding/equipment

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 1.1.8 and 1.1.13.

Section 2: Tube-and-coupler scaffold specifications
These questions reflect performance criteria 1.1.7, 1.1.16, 2.1.4, 2.2.1, 2.2.3, 2.2.4, 3.1.2, 3.2.1, 3.2.2, 3.2.3, 4.1.1, 4.1.2, 4.1.3, and 4.2.1.

Section 3: Particular scaffold requirements
These questions reflect performance criteria 1.1.7, 1.1.16, 2.1.4, 2.2.1, 2.2.3, 2.2.4, 3.1.2, 3.2.1, 3.2.3, 4.1.1, 4.1.2, 4.1.3 and 4.2.1.

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

THE RANGE STATEMENT

The bank of questions assesses knowledge which directly relates to the most complex types of scaffolding listed in the National Standard's range statement for Intermediate Scaffolding. These are as follows:

- tube-and-coupler scaffolds;
- cantilevered and spurred scaffolds; and
- barrow ramps and sloping platforms.

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 erects, alters or dismantles scaffolding and associated equipment within the scope of the Intermediate Scaffolding certificate of competency. In particular, the model answers are consistent with the referenced Standard AS 1576, *Scaffolding*.

The model answers are taken from AS/NZS XXXX, *Guidelines for Scaffolding* and AS 1576.3, Supplement 1, *Metal Tube-and Coupler Scaffolding—Deemed to Comply*, which the Worksafe Australia Scaffolding and Rigging Expert Working Group has endorsed as suitable texts for the determination of applicants' answers for Intermediate Scaffolding.

Note: It is intended that a future revision of this instrument will include questions relating to mast climbers once appropriate Australian Standards have been developed.

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