

TECHNICAL STANDARDS
Nos. O. 10, 11, and 14 to 43—1938

STANDARDS
ASSOCIATION
OF
AUSTRALIA

Australian Standard Grading Rules

for

Jarrah and Karri

(Being also the Grading Rules of
The Forests Department of Western Australia.)

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PREFACE

The Grading Rules published herein have been prepared in close co-operation with the Forests Department of Western Australia and are the result of many years' experience in preparation of timber specifications and their practical application in timber inspection. Foundations for this work were laid by an extensive grading study in 1932 in which officers of the Forests Department, Western Australia, and Division of Forest Products of the Council for Scientific and Industrial Research co-operated. Results of this study were published in 1933 by the Council for Scientific and Industrial Research as Pamphlet No. 41—"The Grading of Western Australian Timbers."

Investigations were continued by the W.A. Forests Department, and a revised series of specifications was issued as Bulletin No. 49 in August, 1935. As a result of further experience gained from practical use of specifications in timber inspection and from general work of various committees, modifications have been made and several new specifications added. The series as now issued supersedes specifications published in C.S.I.R. Pamphlet No. 41, and in W.A. Forests Department Bulletin No. 49.

The classes of product now covered by suitable specifications represent over 90% of jarrah and karri produced. Standard specifications are not available for jarrah pickets, palings, posts, laths and vat timbers or karri wood pipe, motor body stock, bending timbers and staves, but the W.A. Forests Department will assist in preparation of suitable specifications to meet these or other special classes of product if desired.

An inspection service is maintained by the W.A. Forests Department, inspection being carried out at the request of either buyer or seller. The applicant must state, when applying for inspection, the standard specification to be used or, when there is no appropriate specification, provide a reasonably complete specification setting out clearly requirements with regard to size, general quality and condition. In quoting specifications by number, buyers should see that size requirements in particular are fully covered and that the choice of any alternative provided is clearly indicated.

Practically all jarrah and karri is cut to special orders and the ordering of large cross sections or unnecessarily long lengths for re-sawing at destination is considered to be an unsatisfactory practice both from the point of view of the sawmiller and purchaser. Hardwood timbers do not lend themselves to the practice of re-sawing in thickness after partial seasoning and the buyer is urged to specify the size he finally requires (plus any necessary allowance for seasoning and machining).

NOTE.

Since specifications for jarrah and karri were issued as W.A. Forests Department Bulletin No. 49 the specification numbers have been widely used, and these have been retained in the designations of the revised specifications, with the addition of the classification letter O (representing Timber). It is important to note, therefore, when ordering, that the Australian Standard designation should be used. Thus, jarrah sleepers should be ordered by reference to A.S.S. No. O. 10.

As the W.A. Forests Department finds it desirable for departmental purposes to maintain in Bulletin form the complete range of its promulgations, these specifications, as amended, are now to be issued by the Department under the designation of Bulletin No. 51.

**AUSTRALIAN STANDARD GRADING RULES
FOR
JARRAH AND KARRI**

**GENERAL PROVISIONS FOR ALL
SPECIFICATIONS HEREIN.**

1. Interpretation. The terms and trade and botanical names used in these grading rules are to be interpreted in accordance with

A.S.S. No. O. 1, Terms and Definitions used in Timber Grading Rules, and

A.S.S. No. O. 2, Nomenclature of Australian Timbers.

2. Timbers. The timbers permitted under these grading rules shall be :

Jarrah—*Eucalyptus marginata*.

Karri —*Eucalyptus diversicolor*.

3. Limits of Accuracy. The general features only of a grade can be covered by rules, and a total variation of 5% between the grading of individual inspectors is reasonable.

4. Equivalent Defect. When defects not described in these grading rules are encountered, they shall be considered as equivalent in damaging effect to the defects specified as applying to the grade under consideration.

AUSTRALIAN STANDARD SPECIFICATION No. O. 10.

JARRAH SLEEPERS.

Scope. This specification applies to green material. If sleepers are inspected any considerable time after cutting, or re-inspected after a seasoning period, reasonable allowance shall be made for shrinkage, checking and other normal changes in the seasoning process.

Sleepers may be hewn or sawn.

Size. Sleepers shall measure at the time of cutting $\frac{1}{4}$ in. in width and $\frac{1}{8}$ in. in thickness over the nominal size, but a slight variation in cutting will be allowed. The nominal length may be subject to a variation of 1 in. either way.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Sleepers shall be sound wood, free from heart and decay. They shall be cut square and straight and shall not be quarter cut.

Provided that the strength, durability and spike-holding capacity at the rail seat of the sleeper are not unduly impaired, the following defects will be allowed :

- (1) Tight gum veins and small gum pockets.
- (2) End splits or shakes not exceeding 1 in. per lineal foot.
- (3) Pinholes, scattered.
- (4) Camber or twist not exceeding $\frac{1}{2}$ in.
- (5) Sound tight knots, if clear of the rail seat, not exceeding 2 in. diameter.
- (6) Clean knotholes, if clear of the rail seat, not exceeding $1\frac{1}{4}$ in. diameter.

On sleepers showing sapwood, want or wane, the volume of true-wood shall not be materially reduced, and either want or wane at the rail seat shall not exceed 1 in. measured on the bevel on two edges, or $1\frac{1}{2}$ in. if occurring on one edge only. Sapwood, if extending across the face of the sleeper at the rail seat, shall not exceed $\frac{1}{8}$ in. in depth at the centre.

AUSTRALIAN STANDARD SPECIFICATION**No. O. 11.****JARRAH CROSSING TIMBERS.**

Scope. This specification applies to green material. If crossing timbers are inspected any considerable time after cutting, or re-inspected after a seasoning period, reasonable allowance shall be made for shrinkage, checking and other normal changes in the seasoning process.

Size. Crossing timbers shall measure at the time of cutting $\frac{1}{4}$ in. in width and $\frac{1}{8}$ in. in thickness over the nominal size, but slight variation in cutting will be allowed. The nominal length shall be subject to a variation of $1\frac{1}{2}$ in. either way.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Crossing timbers shall be sound wood, free from heart and decay. They shall be sawn square and straight and shall not be quarter sawn.

Provided that the strength, durability and spike-holding capacity of the crossing timbers are not unduly impaired, the following defects will be allowed :

- (1) Tight gum veins and small gum pockets.
- (2) Longitudinal shakes, at the discretion of the inspector, but if running to an end the length shall not exceed the greatest cross-sectional dimension of the piece, nor shall any splits other than minor seasoning cracks run from one face to another at the end section.
- (3) Pin holes, scattered.
- (4) Small clean knots and knot holes.

On crossing timbers of a nominal width exceeding 8 in. want or wane shall be permitted not exceeding 1 in. measured on the bevel on each edge or $1\frac{1}{2}$ in. if occurring on one edge only, but these figures may be doubled on the extreme ends of the crossing : sapwood, if extending across the face of the crossing, shall not exceed $\frac{1}{8}$ in. in depth at the centre. Where the nominal width is 8 in. or less the corresponding allowances shall be reduced to $\frac{5}{8}$ in. and 1 in. respectively and some truewood shall show for the full length on the face of the crossing.

AUSTRALIAN STANDARD SPECIFICATIONS Nos. O. 14 to 19.

STRUCTURAL TIMBERS.

- A.S.S. No. O. 14—Select Quality Small Section Structural Timber—Jarrah.
- A.S.S. No. O. 15—Select Quality Large Section Structural Timber—Jarrah.
- A.S.S. No. O. 16 (a)—Standard Quality Small Section Structural Timber—Jarrah.
- A.S.S. No. O. 16 (b)—Standard Quality Large Section Structural Timber—Jarrah.
- A.S.S. No. O. 16 (c)—Common Quality Small Section Structural Timber—Jarrah.
- A.S.S. No. O. 17—Select Quality Small Section Structural Timber—Karri.
- A.S.S. No. O. 18—Select Quality Large Section Structural Timber—Karri.
- A.S.S. No. O. 19—Standard Quality Structural Timber—Karri.

GENERAL PROVISIONS—A.S.S. Nos. O. 14 to 19.

- (5) Material described in these grading rules shall be graded with due consideration to its suitability for constructional purposes in the shape and size in which it is ordered and shipped. It is not intended to apply to material suitable for re-sawing into smaller sizes.
- (6) Enumerated defects in any grade apply to the lowest quality pieces such grade may contain, but not more than 20% of the pieces in any parcel shall be on the grade limit.
- (7) These specifications apply to green material. If timber is inspected any considerable time after cutting, reasonable allowance shall be made for shrinkage, checking and other normal changes in the seasoning process.
- (8) The moisture content of timber described as seasoned and sold as of these grades shall not exceed 20% in sections up to 25 sq. in. or 25% in sections over 25 sq. in.
- (9) In sections 72 sq. in. and over, the limitation of defects shall be used as a guide only with due consideration given to the general quality of the piece.

- (10) Unless otherwise specified the following will apply with regard to size. The minimum size at time of cutting shall be the nominal size. The following variations in sawing will be allowed in lengths up to 20 ft.

DIMENSION (Inches).	MAXIMUM ALLOWANCE ABOVE NOMINAL SIZE (Inches).
Up to 4	$\frac{1}{4}$
5 and 6	$\frac{5}{16}$
7 and 8	$\frac{3}{8}$
9, 10 and 11	$\frac{7}{16}$
12 and over	$\frac{1}{2}$

In longer lengths, an increase of 25% in total variation will be allowed.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 14.

SELECT QUALITY SMALL SECTION STRUCTURAL
TIMBER—JARRAH.

(Sections up to 25 sq. in.)

Scope. This grade is the highest structural quality recommended for jarrah in smaller sections and should only be specified for special building and construction where maximum strength is the important limiting factor. For general construction purposes, see A.S.S. Nos. O. 16 (a), (b) and (c). For recommended working stresses, see Appendix A.

Grade Description. General provisions 1 to 4 (p. 5) and 5 to 10 (p. 8) apply.

Timber shall be straight and suitable for structural purposes and free from heart, included sapwood, decay, shakes, knot holes and wane. The general slope of the grain in the centre half shall not exceed 1 in 16. Sapwood will be allowed, and any two of the following defects :

- (1) Tight gum veins, individual lengths not exceeding 3 ft. and combined length on any face, not exceeding one-quarter the length of the piece. Complete gum rings running from one face to another on the end section are not permitted.
 - (2) Sound tight knots, if clear of the centre half, not exceeding 1 in. diameter.
 - (3) Clean-edged pinholes, scattered, not more than ten in any one-half square foot.
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AUSTRALIAN STANDARD SPECIFICATION No. O. 15.

SELECT QUALITY LARGE SECTION STRUCTURAL TIMBER—JARRAH.

(Sections over 25 sq. in. and up to 140 sq. in.)

Scope. This grade is the highest structural quality recommended for jarrah in larger sections and should only be specified for special building and construction where maximum strength is the important limiting factor. For general construction purposes, see A.S.S. No. O. 16 (a), (b) and (c). For recommended working stresses, see Appendix A.

Grade Description. General provisions 1 to 4 (p. 5) and 5 to 10 (p. 8) apply.

Timber shall be straight and suitable for structural purposes and free from heart and decay. The general slope of the grain in the centre half shall not exceed 1 in 12. Sapwood will be allowed and any one of the following defects:

- (1) Wane, not exceeding one-sixth the length of the piece or one-eighth the width of the faces on which it occurs.
- (2) Gum pockets, on any face not more than one in any 5 lineal feet varying in size from 5 in. \times $\frac{3}{8}$ in. at 50 sq. in. cross section to 7 in. \times $\frac{1}{2}$ in. in cross sections 120 sq. in. and over. Pockets to be measured radially for width.
- (3) Tight gum veins:
 - (a) *Sections up to 50 sq. in.* Individual lengths not exceeding 5 ft. and combined length on any face not exceeding one-half the length of the piece.
 - (b) *Sections over 50 sq. in.* Individual lengths not exceeding 6 ft. and combined length on any face not exceeding three-quarters the length of the piece.

In totalling the length, tight gum veins less than 10 in. shall be ignored.
- (4) Sound tight knots:
 - (a) *Sections up to 50 sq. in.* Not exceeding 1 in. diameter within the centre half or 1½ in. diameter clear of the centre half and not more than one such knot in either case in any 5 lineal ft.
 - (b) *Sections over 50 sq. in.* Not exceeding 2 in. diameter within the centre half and not more than one such knot in any 5 lineal ft.
- (5) Clean-edged pinholes, scattered, not more than fifteen in any one-half square foot.
- (6) Shakes, in sections over 50 sq. in. longitudinal shakes, will be allowed provided the length does not exceed the greatest cross sectional dimension of the piece. No shake other than small seasoning cracks shall run from one face to another.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 16 (a).

STANDARD QUALITY SMALL SECTION STRUCTURAL
TIMBER—JARRAH.

(Sections up to 25 sq. in.)

Scope. This grade combines fair appearance with moderate strength, and is recommended as the standard grade for export scantling in small sections. The grades for Select Quality Structural and Standard Quality Structural overlap and normal parcels of timber under A.S.S. No. O. 16 (a) will contain upwards of 70% material within the Select Structural Grade. For recommended working stresses see Appendix A.

Grade Description. General provisions 1 to 4 (p. 5) and 5 to 10 (p. 8) apply.

Timber shall be free from heart, decay, shakes and knot holes. The general slope of the grain in the centre half shall not exceed 1 in 8, and the initial curvature shall not exceed 1 in. in 12 ft. Sapwood will be allowed and any one of the following defects :

- (1) Wane, not exceeding one-sixth the length of the piece and one-eighth the width of the faces on which it occurs.
- (2) Gum pockets, not exceeding 4 in. \times $\frac{3}{8}$ in. and not more than one in any 5 lineal ft. Gum pockets to be measured radially for width.
- (3) Tight gum veins, combined length on any face not exceeding three-quarters the length of the piece.
- (4) Sound tight knots, not exceeding 1 in. diameter within the centre half or $1\frac{1}{2}$ in. diameter clear of the centre half and not more than one such knot in either case in any 5 lineal ft.
- (5) Clean-edged pinholes, scattered, not more than fifteen in any one-half square foot.

In addition a combination of smaller defects equivalent to one of the above will be allowed, provided the combination of defects on all faces at any section does not materially impair the strength of the piece.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 16 (b).

STANDARD QUALITY LARGE SECTION STRUCTURAL
TIMBER—JARRAH.

(Sections over 25 sq. in.)

Scope. This grade is recommended for all forms of heavier building construction where stiffness rather than ultimate strength is the main consideration. The grades for Select Quality Structural and Standard Quality Structural overlap and normal parcels of timber under A.S.S. No. O. 16 (b) will contain upwards of 70% material within the Select Structural grade. For recommended working stresses, see Appendix A.

Grade Description. General provisions 1 to 4 (p. 5) and 5 to 10 (p. 8) apply.

Timber shall be suitable for structural purposes, free from heart and decay, except that sections 12 in. \times 12 in. and over, unless otherwise specified, may be supplied heart-in, provided heart is sound and well boxed in. The general slope of the grain in the centre half shall not exceed 1 in 8, and the initial curvature shall not exceed 1 in. in 12 ft. Sapwood will be allowed and any one of the following defects :

- (1) Wane, not exceeding one-quarter the length of the piece and for cross section dimensions :
 - (a) Under 6 in. not exceeding 1 in.
 - (b) 6 in. and over not exceeding one-sixth the width of the faces on which it occurs.
- (2) Gum pockets, on any face, not more than one in any 5 lineal ft., varying in size from 5 in. \times $\frac{3}{8}$ in. in sections 25 sq. in. in area to 9 in. \times $\frac{5}{8}$ in. in sections 120 sq. in. and over. Gum pockets to be measured radially for width.
- (3) Tight gum veins :
 - (a) Sections up to 50 sq. in. Combined length, on any face, not exceeding the length of the piece.
 - (b) Sections over 50 sq. in. Combined length, on any face, not exceeding one and one-half times the length of the piece.

In totalling the length, tight gum veins less than 10 in. shall be ignored.

(4) Sound tight knots :

(a) *Sections up to 50 sq. in.* Not exceeding $1\frac{1}{2}$ in. diameter within the centre half or 2 in. diameter clear of the centre half and not more than one such knot in either case in any 5 lineal ft.

(b) *Sections over 50 sq. in.* Any number. In addition, gummy, loose or unsound knots not exceeding 2 in. diameter.

(5) Clean-edged pinholes, scattered, not more than twenty in any one-half square foot.

(6) Shakes. In sections over 50 sq. in., longitudinal shakes will be allowed at the discretion of the inspector, provided the length of an end shake does not exceed the greatest cross sectional dimension of the piece and provided it is not likely to extend further.

In addition, a combination of smaller defects equivalent to one of the above will be allowed, provided the combination of defects on all faces at any section will not materially impair the strength of the piece for purposes indicated in the Scope Clause.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 16 (c).

COMMON QUALITY SMALL SECTION STRUCTURAL
TIMBER—JARRAH.

(Sections up to 25 sq. in.)

Scope. This grade is recommended as the standard grade for small section scantling on the local market for uses where stiffness rather than ultimate strength is the main consideration as in ordinary house framing. For this reason no working stresses have been given for this grade. The grades for A.S.S. Nos. O. 16 (a) and (c) overlap, but parcels under A.S.S. No. O. 16 (c) need contain no material above the grade limit for Select Quality covered by A.S.S. No. O. 14.

Grade Description. General provisions 1 to 4 (p. 5) and 5 to 10 (p. 8) apply.

Timber shall be free from heart, decay and end shakes. The general slope of the grain in the centre half shall not exceed 1 in 6. Sapwood will be allowed and any two of the following defects :

- (1) Wane, not exceeding one-quarter the length of the piece or one-quarter the width of the faces on which it occurs, with a maximum of 1 in.
- (2) Gum pockets, on any face, not more than one in any 5 lineal ft., varying in size from 4 in. \times $\frac{3}{8}$ in. in sections under 12 sq. in. in area to 6 in. \times $\frac{3}{8}$ in. in sections 25 sq. in. Gum pockets to be measured radially for width.
- (3) Tight gum veins, combined length, on any face not exceeding one and one-half times the length of the piece.
- (4) Sound tight knots, not exceeding 1 $\frac{1}{2}$ in. diameter within the centre half or 2 in. diameter clear of the centre half and not more than one such knot in either case in any 5 lineal ft.
- (5) Clean-edged pinholes not more than twenty in any one-half square foot.

In addition, a combination of smaller defects equivalent to one of the above will be allowed, provided the combination of defects on all faces at any section will not materially impair the utility of the piece for purposes indicated in the Scope Clause.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 17.

SELECT QUALITY SMALL SECTION STRUCTURAL
TIMBER—KARRI.

(Sections up to 25 sq. in.)

Scope. This grade is the highest structural quality recommended for karri in smaller sections and should only be specified where exceptional strength is essential. Standard Quality Structural karri, A.S.S. No. O. 19, is suitable for building and construction purposes even where maximum strength is the important limiting factor. Where used in damp locations or in contact with the ground, treatment with an approved preservative process is recommended. For recommended working stresses, see Appendix A.

Grade Description. General provisions 1 to 4 (p. 5) and 5 to 10 (p. 8) apply.

Timber shall be straight and suitable for structural purposes, free of heart, decay, shakes and wane. The general slope of the grain in the centre half shall not exceed 1 in 16. If treated by an approved preservative process, sapwood will be allowed without limit, but if untreated, this grade shall be practically free from sapwood. Any two of the following defects will be allowed:

- (1) Tight gum veins, individual lengths not exceeding 2 ft. and combined length, on any face, not exceeding one-sixth the length of the piece.
 - (2) Sound tight knots, not exceeding 1 in. diameter if clear of the centre half.
 - (3) Grub holes, not exceeding $\frac{3}{8}$ in. in diameter, not more than one in any 2 lineal ft.
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AUSTRALIAN STANDARD SPECIFICATION
No. O. 18.

SELECT QUALITY LARGE SECTION STRUCTURAL
TIMBER—KARRI.

(Sections over 25 sq. in.)

Scope. This grade is the highest structural quality recommended for karri in larger sections, and should only be specified where exceptional strength is essential. Standard Quality Structural karri A.S.S. No. O. 19 is suitable for building and construction purposes even where maximum strength is the important limiting factor. Where used in damp locations or in contact with the ground, treatment with an approved preservative process is recommended. For recommended working stresses, see Appendix A.

Grade Description. General provisions 1 to 4 (p. 5) and 5 to 10 (p. 8) apply.

Timber shall be straight and suitable for structural purposes, free from heart and decay. The general slope of the grain in the centre half shall not exceed 1 in 14. Sapwood will be allowed and any one of the following defects:

- (1) Wane. (a) If timber is treated with an approved preservative process, not exceeding one-sixth the length of the piece or one-eighth the width of the faces on which it occurs.
(b) If untreated, not exceeding one-twelfth the width of the faces on which it occurs.
- (2) Gum pockets, on any face, not more than one in any 5 lineal ft., varying in size from 5 in. \times $\frac{3}{8}$ in. in sections 50 sq. in. in area to 7 in. \times $\frac{1}{2}$ in. in sections 120 sq. in. and over. Gum pockets to be measured radially for width.
- (3) Tight gum veins:
 - (a) *Sections up to 50 sq. in.* Individual lengths not exceeding 3 ft. and combined length, on any face, not exceeding one-quarter the length of the piece.
 - (b) *Sections over 50 sq. in.* Combined length on any face not exceeding one-third the length of the piece.

In totalling the length, tight gum veins less than 10 in. shall be ignored.

(4) Sound tight knots :

- (a) *Sections up to 50 sq. in.* Not exceeding 1 in. diameter within the centre half or $1\frac{1}{2}$ in. diameter clear of the centre half and not more than one such knot in either case in any 5 lineal ft.
- (b) *Sections over 50 sq. in.* Not exceeding 2 in. diameter within the centre half and not more than one such knot in any 5 lineal ft.

(5) Grub holes :

- (a) *Sections up to 50 sq. in.* Not exceeding $\frac{1}{2}$ in. diameter, not more than one in any 1 lineal ft.
- (b) *Sections over 50 sq. in.* Scattered, not exceeding $\frac{5}{8}$ in. diameter.

(6) Shakes. In sections over 50 sq. in. longitudinal shakes will be allowed provided the length does not exceed the greatest cross-sectional dimension of the piece. No shake other than small seasoning cracks shall run from one face to another.

In addition, a combination of smaller defects equivalent to one of the above will be allowed, provided the combination of defects on all faces at any section will not materially impair the strength of the piece for purposes indicated in the Scope Clause.

**AUSTRALIAN STANDARD SPECIFICATION
No. O. 19.**

STANDARD QUALITY STRUCTURAL TIMBER—KARRI.

(All Sizes.)

Scope. This grade is recommended for all forms of ordinary building construction. Karri is essentially a structural timber, and in this standard quality can be recommended for most purposes where ultimate strength is a limiting factor. The grades for Select Quality Structural and Standard Quality Structural overlap and normal parcels under A.S.S. No. O. 19 will contain upwards of 70% of material within the Select Quality. Where used in damp locations or in contact with the ground, treatment with an approved preservative process is recommended. For recommended working stresses, see Appendix A.

Grade Description. General provisions 1 to 4 (p. 5) and 5 to 10 (p. 8) apply.

Timber shall be suitable for structural purposes, free from heart and decay. The general slope of the grain in the centre half shall not exceed 1 in 12, and the initial curvature shall not exceed 1 in. in 12 ft. Sapwood will be allowed and any one of the following defects :

- (1) Wane. (a) If timber is treated with an approved preservative process, not exceeding one-fourth the length of the piece, or for cross section dimensions :
 - (i) Under 6 in., not exceeding one-quarter the width of the faces on which it occurs, with a maximum of 1 in.
 - (ii) 6 in. and over, not exceeding one-sixth the width of the faces on which it occurs.
 (b) If timber is untreated, not exceeding one-tenth the width of the faces on which it occurs.
- (2) Gum pockets, on any face, not more than one in any 5 lineal ft., varying in size from 4 in. \times $\frac{3}{8}$ in. in sections under 12 sq. in. in area to 6 in. \times $\frac{3}{8}$ in. in sections 50 sq. in. in area and 9 in. \times $\frac{3}{8}$ in. in sections 120 sq. in. and over. Gum pockets to be measured radially for width.
- (3) Tight gum veins :

Sections up to 50 sq. in. Individual length not exceeding 4 ft. and combined length not exceeding one-third the length of the piece.

Sections over 50 sq. in. Individual length not exceeding 6 ft. and combined length not exceeding one-half the length of the piece.

In totalling the length, tight gum veins less than 10 in. shall be ignored.

(4) Sound tight knots :

Sections up to 50 sq. in. Not exceeding 1½ in. diameter within the centre half or 2 in. diameter clear of the centre half and not more than one such knot in either case in any 5 lineal ft.

Sections over 50 sq. in. Any number. In addition, gummy, loose or unsound knots not exceeding 2 in. diameter.

(5) Grub holes, scattered.

(6) Shakes. In sections over 50 sq. in., longitudinal shakes will be allowed provided the length does not exceed the greatest cross-sectional dimension of the piece. No shake other than small seasoning cracks shall run from one face to another.

In addition, a combination of smaller defects equivalent to one of the above will be allowed provided the combination of defects on all faces at any section will not materially impair the strength of the piece for purposes indicated in the Scope Clause.

AUSTRALIAN STANDARD SPECIFICATION No. O. 20.

JARRAH CROSS ARMS.

Scope. This specification applies to green material. If arms are inspected any considerable time after cutting, reasonable allowance shall be made for shrinkage, checking and other normal changes in the seasoning process.

Size. As specified by the buyer, with the following tolerances :

Cross section :

Minimum—Order size.

Maximum— $\frac{3}{16}$ in. above the order size in breadth and depth.

Length: From order size to $\frac{1}{2}$ in. over.

Cutting. Cross arms shall be well sawn with adjacent sides at right angles and ends docked square and to length before inspection.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Cross arms shall be sound wood free from heart, decay and shakes, but the following defects will be allowed :

- (1) Sapwood, on the intersection of two adjacent sides provided the combined width of sapwood measured on the two faces does not exceed $1\frac{1}{2}$ in.
- (2) Tight gum veins, not exceeding 12 in. \times $\frac{1}{8}$ in., provided that :
 - (a) No gum vein exceeds 18 in. in length.
 - (b) Combined lengths on any face do not exceed 36 in. in length.
 - (c) No gum vein shall show continuously from one face to an adjoining face or one face to an end.
- (3) Clean-edged pinholes on any face, not more than five in any 1 lineal ft.
- (4) Cross grain. The cross arms shall be generally straight grained, with the grain approximately in the same direction as the length of the arm. Slight localised cross grain will be allowed away from the centre third of the arm provided the grain does not run from any face to within a third of the distance of the opposite face.

NOTE.—Where material is supplied in random lengths, the following modifications will apply :

- (1) Docking will follow general practice with ordinary scantling.
- (2) The allowance for combined gum veins will be applied to each 6 ft. length.
- (3) Limitations with regard to position of defects will not apply.

AUSTRALIAN STANDARD SPECIFICATION No. O. 21.

KARRI CROSS ARMS.

Scope. This specification applies to green material. If arms are inspected any considerable time after cutting, reasonable allowance shall be made for shrinkage, checking and other normal changes in the seasoning process.

Size. As specified by the buyer, with the following tolerances :

Cross section :

Minimum—Order size.

Maximum— $\frac{3}{16}$ in. above the order size in breadth and depth.

Length : From order size to $\frac{1}{2}$ in. over.

Cutting. Cross arms shall be well sawn with adjacent sides at right angles and ends docked square and to length before inspection.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Cross arms shall be sound wood free from heart, decay and shakes, but the following defects will be allowed :

- (1) Sapwood, on the intersection of two adjacent sides, provided the combined width of sapwood measured on the two faces does not exceed 1 in.
- (2) Tight gum veins, not exceeding 6 in. \times $\frac{1}{8}$ in., and not to show on the end of the arm, combined lengths on any face not exceeding 18 in.
- (3) Clean-edged pinholes, on any face not more than five in any 1 lineal ft.
- (4) Cross grain. The cross arms shall be generally straight grained with the grain approximately in the same direction as the length of the arm. Slight localised cross grain will be allowed away from the centre third of the arm, provided the grain does not run from any face to within a third of the distance of the opposite face.
- (5) Grub holes, on any face, not exceeding $\frac{1}{4}$ in. diameter, not more than two, provided none occur within the centre foot of the arm.

NOTE.—Where material is supplied in random lengths, the following modifications will apply :

- (1) Docking will follow general practice with ordinary scantling.
- (2) The allowance for combined gum veins and grub holes will be applied to each 6 ft. length.
- (3) Limitations with regard to position of defects will not apply.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 22.

JARRAH MINE GUIDES.

Scope. The specification applies to green material.

Size. Unless otherwise specified the minimum size at time of sawing shall be not less than the nominal size, but variations in sawing will be allowed provided the maximum size does not exceed the nominal size by more than $\frac{3}{8}$ in. in width or $\frac{1}{4}$ in. in thickness.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Mine guides shall be sound wood free from heart, decay, unsound knots, and shakes. The general slope of the grain shall not exceed 1 in 15 and spring shall not exceed 1 in. in 25 ft. Pieces to have one good face and two good edges, with defects limited as below. The junction of the better face and edges shall be free from wane but sapwood will be allowed. In guides where the thickness approaches the width, larger defects will be allowed on the edges towards the worse face. On the better face or either edge the following defects will be allowed :

- (1) Gum pockets, not exceeding 5 in. \times $\frac{3}{8}$ in., not more than one in any 5 lineal ft.
- (2) Tight gum veins, combined length, not exceeding one-quarter the length of the piece.

In totalling the length, tight gum veins less than 10 in. shall be ignored.

- (3) Sound tight knots, not exceeding $1\frac{1}{2}$ in. diameter, not more than one in any 5 lineal ft.

On the other face, defects in excess of the above will be allowed, wane at the junction of face and edge limited to one-sixth the dimensions of either face on which it occurs.

All provided combination of defects at any section does not seriously impair the utility of the piece for a mine guide.

AUSTRALIAN STANDARD SPECIFICATION No. O. 23.

KARRI MINE GUIDES.

Scope. The specification applies to green material.

Size. Unless otherwise specified, the minimum size at time of sawing shall be not less than the nominal size, but variations in sawing will be allowed provided the maximum size does not exceed the nominal size by more than $\frac{3}{8}$ in. in width or $\frac{1}{4}$ in. in thickness.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Mine guides shall be sound wood free from heart, decay, unsound knots, shakes and wane. The general slope of the grain shall not exceed 1 in 15 and spring shall not exceed 1 in. in 25 ft. Pieces to have one good face and two good edges with defects limited as below. In guides where the thickness approaches the width larger defects will be allowed on the edges towards the worse face.

On the better face or either edge the following defects will be allowed :

- (1) Gum pockets, not exceeding 5 in. \times $\frac{3}{8}$ in., not more than one in any 5 lineal ft.
- (2) Tight gum veins, combined length, not exceeding one-sixth the length of the piece.

In totalling the length, tight gum veins less than 10 in. shall be ignored.

- (3) Sound tight knots, not exceeding $1\frac{1}{2}$ in. diameter, not more than one in any 5 lineal ft.
- (4) Grub holes, not exceeding $\frac{3}{8}$ in. diameter, well scattered. Individual surface grub tracks not exceeding 16 in. \times $\frac{3}{8}$ in. and $\frac{1}{4}$ in. in depth.

On the other face defects in excess of the above will be allowed.

All provided combination of defects at any section does not seriously impair the utility of the piece for a mine guide.

AUSTRALIAN STANDARD SPECIFICATIONS Nos. O. 24 and 25.

SAWN FLOORING BOARDS.

A.S.S. No. O. 24. Select Quality Sawn Boards for Strip Flooring—Jarrah.

A.S.S. No. O. 25. Merchantable Quality Sawn Boards for Strip Flooring—Jarrah.

GENERAL PROVISIONS—A.S.S. Nos. O. 24 and 25.

- (11) Enumerated defects are intended to cover the lowest quality boards the grade may contain, but not more than 20% shall contain defects on the grade limit.
- (12) Size—Unless otherwise specified the following will apply :

Sizes for Sawn Boards for Strip Flooring.

<i>Nominal.</i>	<i>Cutting Size.</i>	<i>Minimum Size of Boards described as Dry for Milling.</i>
6 in. × 1 in.	$6\frac{3}{16} \times 1\frac{1}{16}$	$5\frac{5}{8} \times \frac{15}{16}$
5 in. × 1½ in.	$5\frac{3}{16} \times 1\frac{3}{16}$	$4\frac{5}{8} \times 1\frac{3}{16}$
5 in. × 1 in.	$5\frac{3}{16} \times 1\frac{1}{16}$	$4\frac{5}{8} \times \frac{15}{16}$
4 in. × 1½ in.	$4\frac{3}{16} \times 1\frac{3}{16}$	$3\frac{3}{4} \times 1\frac{3}{16}$
4 in. × 1 in.	$4\frac{3}{16} \times 1\frac{1}{16}$	$3\frac{3}{4} \times \frac{15}{16}$

Occasional variations in sawing will be allowed from the cutting size in the table, as below :

In width $\frac{1}{8}$ in. below and $\frac{3}{16}$ in. above cutting size.

In thickness $\frac{1}{16}$ in. below and $\frac{1}{8}$ in. above cutting size.

Boards will be supplied in random lengths 8 ft. and up in Select Quality and 6 ft. and up in Merchantable Quality.

- (13) Condition—Sawn boards for flooring may be sold as :

- (a) Green.
- (b) Semi-dry.
- (c) Dry for milling.

The moisture content of boards described as semi-dry shall not exceed 25% at time of inspection.

Unless otherwise specified, the moisture content of boards described as dry for milling shall not exceed 16% at time of inspection.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 24.

SELECT QUALITY SAWN BOARDS FOR STRIP
FLOORING—JARRAH.

Scope. This specification applies to sawn jarrah boards intended for the production of milled strip flooring equivalent in quality to that of A.S.S. No. O. 27. This latter grade gives a face free from sapwood and practically free from other defects, but with natural variations in colour no defect—a grade suitable for all first class floors such as hospitals, dance floors, public buildings, exposed floors in residences, etc. The grade under A.S.S. No. O. 24 is the highest recommended for sawn boards, but the buyer should realise that any parcel of Select Sawn Boards will not give 100% Select Milled Boards owing to unavoidable losses in seasoning and milling.

Grade Description. General provisions 1 to 4 (p. 5) and 11 to 13 (p. 25) apply.

Boards shall be sound wood, well sawn, free on the better face and adjacent half edges from sapwood and all defects other than :

- (1) Tight gum veins, not exceeding $\frac{1}{16}$ in. in width, individual lengths not exceeding 9 in. and combined length not exceeding 3 in. per square foot of face area.
- (2) Holes, clean-edged pinholes not more than two per 3 sq. ft., not more than three being grouped in any 6 sq. in. or holes not exceeding $\frac{1}{8}$ in. diameter, not more than one per 5 sq. ft. of face area.
- (3) End splits. Green boards shall be free from end splits, but semi-dry or dry boards may have a straight end split not exceeding 4 in. in length on one end or its equivalent on both ends.

The lower half of the edges and back may contain sapwood and defects which will not prevent machining of a firm tongue and groove or defect the laying or strength of the floor.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 25.

MERCHANTABLE QUALITY SAWN BOARDS FOR
STRIP FLOORING—JARRAH.

Scope. This specification applies to sawn jarrah boards aiming at the production of milled strip flooring equivalent in quality to that of A.S.S. No. O. 28 (*a*). This latter grade provides a class of floor suitable for all ordinary home construction where the greater part of the floor is usually covered with linoleum or other floor covering and for factory floors. This is not a mixed grade, and parcels need contain no board which would be accepted as of Select Quality.

Grade Description. General provisions 1 to 4 (p. 5) and 11 to 13 (p. 25) apply.

Boards shall be sound wood, well sawn, free on the better face and adjacent half edges from all defects other than any one of the following :

- (1) Sapwood, not exceeding one-fifth the width of the board.
- (2) Tight gum veins, not exceeding $\frac{1}{8}$ in. in width, individual lengths not exceeding 3 ft. and combined length not exceeding 1 ft. per square foot of face area.
- (3) Sound tight knots, not exceeding one-quarter the width of the board or one knot flecked with bark or gum not exceeding one-eighth the nominal width of the board, not more than one in any 5 lineal ft.
- (4) Holes, clean-edged pinholes not more than four per 1 sq. ft., not more than six being grouped in any 6 sq. in. or holes not exceeding $\frac{1}{4}$ in. diameter, not more than one in any 5 lineal ft.
- (5) End splits. Green boards to be free from end splits, but semi-dry or dry boards will allow a straight end split not exceeding 6 in. in length on one end or its equivalent on both ends.

The lower half of the edges and back may contain defects which will not prevent machining of a firm tongue and groove or affect the laying or strength of the floor.

AUSTRALIAN STANDARD SPECIFICATIONS Nos. O. 26 to 28 (b).

MILLED FLOORING BOARDS.

(See Footnote.)

- A.S.S. No. O. 26. Specially Select Quality Milled Flooring—Jarrah.
 A.S.S. No. O. 27. Select Quality Milled Flooring—Jarrah.
 A.S.S. No. O. 28 (a). Merchantable Quality Milled Flooring—Jarrah.
 A.S.S. No. O. 28 (b). Merchantable B Quality Milled Flooring—Jarrah.

GENERAL PROVISIONS—A.S.S. Nos. O. 26 to 28 (b).

- (14) The enumerated defects in any grade cover the lowest quality boards the grade may contain, but not more than 20% shall contain defects on the grade limit.
- (15) Size and Profile. Unless otherwise specified, boards shall be accurately milled in the properly seasoned state to the dimensions of the standard profile specified and to the following sizes :

	<i>Nominal Size.</i>		<i>Milled Cover Size.</i>
	6 in. × 1 in.	..	$5\frac{1}{2} \times 1\frac{13}{16}$
	5 in. × 1 $\frac{1}{4}$ in.	..	$4\frac{1}{2} \times 1\frac{1}{16}$
T. and G. Flooring	5 in. × 1 in.	..	$4\frac{1}{2} \times \frac{13}{16}$
	4 in. × 1 $\frac{1}{4}$ in.	..	$3\frac{3}{8} \times 1\frac{1}{16}$
	4 in. × 1 in.	..	$3\frac{3}{8} \times \frac{13}{16}$
Shot Flooring	4 in. × 1 in.	..	$3\frac{5}{8} \times \frac{13}{16}$
	3 in. × 1 in.	..	$2\frac{5}{8} \times \frac{13}{16}$

- (16) Moisture Content. Unless otherwise specified the moisture content shall not exceed 16% at the time of inspection.
- (17) For the purpose of computing the limitation of defects, the face area of the board in square feet shall mean its length in feet multiplied by its nominal width in feet.

**AUSTRALIAN STANDARD SPECIFICATION
No. O. 26.**

**SPECIALLY SELECT QUALITY MILLED FLOORING—
JARRAH.**

Scope. This grade represents the best it is possible to produce, and is recommended for show floors only.

Grade Description. General provisions 1 to 4 (p. 5) and 14 to 17 (p. 28) apply.

Boards shall be taken from Select Quality, selection being based on the provision of a perfect face and a fair average even colour in the boards.

AUSTRALIAN STANDARD SPECIFICATION No. O. 27.

SELECT QUALITY MILLED FLOORING—JARRAH.

Scope. This grade gives a face free from sapwood and practically free from other defects, but with natural variations in colour no defect. It is recommended for all first class floors such as hospitals, dance floors public buildings, exposed floors in residences, etc.

Grade Description. General provisions 1 to 4 (p. 5) and 14 to 17 (p. 28) apply.

Boards shall be sound wood, well milled, free on the face and the edges above the tongue and groove from sapwood and defects other than any two of the following :

- (1) Tight gum veins, not exceeding $\frac{1}{8}$ in. in width, individual lengths not exceeding 9 in. and combined length not exceeding 3 in. per square foot of face area.
- (2) Clean-edged pinholes, not more than two per 3 sq. ft. of face area, not more than three being grouped in any 6 sq. in.
- (3) Holes, not exceeding $\frac{1}{8}$ in. diameter, not more than one per 5 sq. ft. of face area.
- (4) End splits not exceeding 4 in. in length on one end or its equivalent on both ends.

On the rest of the edges and the back, sapwood and defects which will not affect the laying or strength of the floor shall be permitted. Skip shall be allowed in the middle of the back, but at the edges it shall not reduce the bearing area by more than one-fifth at any section.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 28 (a).

MERCHANTABLE QUALITY MILLED FLOORING—
JARRAH.

Scope. This grade is suitable for average flooring in domestic and factory buildings.

Grade Description. General provisions 1 to 4 (p. 5) and 14 to 17 (p. 28) apply.

Boards shall be sound wood, well milled, free on the face and edges above the tongue and groove from defects other than any one of the following :

- (1) Sapwood, not exceeding one-fifth the nominal width of the board, not exceeding 2 sq. in. per square foot of face area.
- (2) Tight gum veins, not exceeding $\frac{1}{8}$ in. in width, individual lengths not exceeding 3 ft. and combined length not exceeding 1 ft. per square foot of face area.
- (3) Sound tight knots, not exceeding one-quarter the nominal width of the board or one knot flecked with bark or gum not exceeding one-eighth the nominal width of the board, not more than one in any 5 lineal ft.
- (4) Holes, clean-edged pinholes not more than three per lineal foot, not more than six being grouped in any 6 lineal in. or holes not exceeding $\frac{1}{4}$ in. diameter, not more than one in any 5 lineal ft.
- (5) Torn grain, not exceeding $\frac{1}{16}$ in. in depth.

On the rest of the edges and the back, sapwood and defects which will not affect the laying or strength of the floor shall be permitted. Skip in the middle of the back shall be allowed, but on the edge it shall not reduce the bearing area by more than 2 in. at any section.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 28 (b).

MERCHANTABLE B QUALITY MILLED FLOORING—
JARRAH.

Scope. This specification applies to the practice on the local market of supplying a grade necessitating some docking by the buyer before laying. With this docking on the job the grade will make a floor quite suitable for ordinary home construction and factories.

Grade Description. General provisions 1 to 4 (p. 5) and 14 to 17 (p. 28) apply.

At least two-thirds of the boards as tallied shall fall within the grade limit for Merchantable Quality—see A.S.S. No. O. 28 (a). Including as waste any piece less than 20 in. in length, the necessary docking by the buyer in the remaining third to bring boards within the grade limit shall not exceed one-sixth the length of individual boards. The necessary docking from either end shall not exceed one foot.

Any board with over one-sixth loss to the buyer may be marked by a heavy bar and stroke in timber crayon on the face and the marked length of such board shall not be tallied.

AUSTRALIAN STANDARD SPECIFICATION No. O. 29.

SAWN WOOD BLOCK FLOORING—JARRAH.

Scope. This specification applies to the supply of sawn jarrah boards for the production of wood block flooring.

Size. (See footnote.)

Unless otherwise specified the following will apply :

Minimum size at time of cutting : Order size.

Maximum size at time of cutting : Width $\frac{3}{16}$ in. above order size ;
thickness $\frac{1}{8}$ in. above order size.

The minimum size of boards described as dry for milling shall be $\frac{1}{4}$ in. and $\frac{1}{16}$ in. below the order size in width and thickness respectively.

Condition. Boards may be sold as :

- (a) Green.
- (b) Semi-dry.
- (c) Dry for milling.

The moisture content of boards described as semi-dry shall not exceed 25% at time of inspection. Unless otherwise specified the moisture content of boards described as dry for milling shall not exceed 16% at time of inspection.

Grade Description. General provisions 1 to 4 (p. 5) apply.

The better face and adjacent half edges shall be free from sapwood and all defects which will not machine out. On the back and lower half edges, sapwood and any one of the following defects will be allowed :

- (1) Tight gum veins, not more than one at any section.
- (2) Grub holes not exceeding $\frac{1}{4}$ in. diameter, not more than one in any 1 lineal ft.
- (3) Sound tight knots not exceeding $\frac{1}{2}$ in. diameter, not more than one in any 1 lineal ft.
- (4) Clean-edged pinholes, scattered, not more than four in any 1 lineal ft.

In supply of wood block flooring to the United Kingdom it is usual to cut full compared with the order size, but there appears to be no standard practice in this connection. Where inspection is called for, the buyer must state clearly the minimum green cutting size or the minimum size of dry board he will take. In the latter case, an increase on the minimum green sizes will be made to cover shrinkage if necessary.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 30.

MILLED WOOD BLOCK FLOORING—JARRAH.

Scope. This specification applies to the supply of seasoned and milled jarrah flooring blocks. The grade is suitable for all classes of floor, a perfect face being aimed at, but with natural variations in colour no defect.

Size and Design. According to buyers' requirements.

Condition. Unless otherwise specified the moisture content at time of inspection shall not exceed 16%.

Bundling. Bundles to be securely tied in an approved fashion, so that with reasonable care in handling negligible damage to blocks should take place in transit.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Not less than 70% to be free from sapwood and all defects.

In the remaining 30%, the better face and edges above the tongue and groove shall be free from sapwood and all defects, except that surface checks of total length less than 2 in. and of no appreciable width and slight torn grain which will be removed in sanding will each be allowed to the extent of 5% of the total number of blocks.

In addition, the rest of the edges and back will allow sapwood and slight skip up to one-quarter the area, and any one of the following defects:

- (1) Tight gum veins, not more than one at any section.
 - (2) One grub hole not exceeding $\frac{1}{4}$ in. diameter.
 - (3) One sound tight knot not exceeding $\frac{1}{2}$ in. diameter.
 - (4) Four clear-edged pinholes in any block.
-

**AUSTRALIAN STANDARD SPECIFICATION
No. O. 31.**

**SAWN BOARDS FOR END MATCHED FLOORING—
JARRAH.**

Scope. This specification applies to the supply of sawn short boards for the production of end matched flooring—see A.S.S. No. O. 32. It is a grade suitable for use in ordinary homes and factories.

Size. Unless otherwise specified the following will apply :

<i>Nominal.</i>	..	<i>Cutting Size.</i>	..	<i>Minimum Size of Boards described as Dry for Milling.</i>
4 in. × 1 in.	..	$4\frac{1}{8} \times 1\frac{1}{16}$	..	$3\frac{3}{4} \times \frac{15}{16}$
3 in. × 1 in.	..	$3\frac{1}{8} \times 1\frac{1}{16}$	..	$2\frac{3}{4} \times \frac{15}{16}$

Occasional variation in sawing will be allowed from the cutting size as below :

In width, $\frac{1}{16}$ in. below and $\frac{3}{16}$ in. above cutting size.

In thickness, $\frac{1}{16}$ in. below and $\frac{1}{8}$ in. above cutting size.

Boards may be supplied in any length from 2 ft. to 6 ft.

Condition. Sawn boards may be sold as :

- (a) Green.
- (b) Semi-dry.
- (c) Dry for milling.

The moisture content of boards described as semi-dry shall not exceed 25% at time of inspection. Unless otherwise specified the moisture content of boards described as dry for milling shall not exceed 16% at time of inspection.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Boards shall be sound wood, well sawn. Grading shall be on the better face. This face and adjacent half edges of at least 50% by volume shall be free from sapwood and other defects. In the remaining 50% the face and adjacent half edges will allow any defect which will mill out and in addition any one of the following :

- (1) Sapwood not exceeding one-quarter the width of the board.
- (2) Tight gum veins not exceeding $\frac{1}{8}$ in. in width, combined length not exceeding one-half the length of the board.

- (3) One sound tight knot not exceeding 1 in. diameter or one knot flecked with bark or gum not exceeding $\frac{1}{2}$ in. diameter in any board.
- (4) Holes, clean-edged pinholes, not more than four per lineal foot, not more than six being grouped in any 6 in. of length, or one hole not exceeding $\frac{1}{4}$ in. diameter in any board.
- (5) End splits. Green boards to be free from end splits, but semi-dry or dry boards will allow a straight end split not exceeding 6 in. in length on one end or its equivalent on both ends.

The lower half of the edges and back may contain defects which will not prevent machining of a firm tongue and groove or affect the laying or strength of the floor.

AUSTRALIAN STANDARD SPECIFICATION No. O. 32.

MILLED END MATCHED FLOORING—JARRAH.

Scope. This specification applies to the supply of end matched short flooring in random lengths from 2 ft. to 6 ft. suitable for use in ordinary homes and factories.

Size and Profile. Unless otherwise specified, boards shall be accurately milled in the properly seasoned state to the dimensions of the standard profile specified and to the following sizes :

<i>Nominal Size.</i>				<i>Milled Cover Size.</i>
4 in. × 1 in.	..	..	..	$3\frac{3}{8} \times \frac{13}{16}$
3 in. × 1 in.	..	..	..	$2\frac{7}{16} \times \frac{13}{16}$

Boards shall be tallied for length out of block stacks to the nearest foot length.

Moisture Content. Unless otherwise specified, the moisture content shall not exceed 16% at time of inspection.

Grade Description. General provisions 1 to 4 (p. 5) apply.

At least 50% in volume shall be free on the face and edges above the tongue and groove from sapwood and other defects. In the remaining 50% the face and edges above the tongue and groove shall be free from defects other than any one of the following :

- (1) Sapwood not exceeding one-quarter the width of the board.
- (2) Tight gum veins not exceeding $\frac{1}{8}$ in. in width, combined length not exceeding one-half the length of the board.
- (3) One sound tight knot not exceeding 1 in. diameter or one knot flecked with bark or gum not exceeding $\frac{1}{2}$ in. diameter in any board.
- (4) Torn grain not exceeding $\frac{1}{16}$ in. in depth.
- (5) Holes, clean-edged pinholes not more than four per lineal foot not more than six being grouped in any 6 in. of length, or one hole not exceeding $\frac{1}{4}$ in. diameter in any board or equivalent hole which can be effectively filled.

On the rest of the edges and the back, sapwood and defects which will not affect the laying or strength of the floor will be permitted. Skip in the middle of the back will be allowed, but on the edges it shall not reduce the bearing area by more than one-half at any section.

AUSTRALIAN STANDARD SPECIFICATION No. O. 33.

WAGGON SCANTLING—JARRAH AND KARRI.

Scope. This specification applies to the supply of both jarrah and karri for use as waggon scantling, but the two species shall not be mixed indiscriminately in the one consignment.

Size. Unless otherwise specified the following will apply. Timber shall be cut full, the minimum and maximum allowances above nominal size being as follows :

<i>Size.</i>	<i>Minimum Allowance.</i>	<i>Maximum Allowance.</i>
Up to 8 in.	$\frac{1}{8}$ in.	$\frac{7}{16}$ in.
9, 10, 11 in.	$\frac{3}{16}$ in.	$\frac{5}{8}$ in.
12 in. and over	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Timber must be inspected, taking into consideration its suitability for ordinary railway waggon construction in the shape and sizes in which it is ordered and shipped.

Timber shall be free from heart, decay, shakes, wane and cross-grain exceeding 1 in 15, but will allow any two of the following defects :

(1) Sapwood :

- (a) Sections up to 25 sq. in. to be free from sapwood.
- (b) Sections over 25 sq. in. will allow sapwood on the intersection of two adjacent sides provided the combined width of sapwood does not exceed 3 in. in jarrah and $1\frac{1}{2}$ in. in karri.

(2) Tight gum veins, on any face, not exceeding one-half the length of the piece provided no complete gum ring is formed from one face to another on the end section.

(3) Sound tight knots not exceeding $1\frac{1}{4}$ in. diameter, not more than one in any 5 lineal ft.

(4) Clear-edged pinholes, not more than ten in any $\frac{1}{2}$ sq. ft.

The enumerated defects are intended to cover the lowest quality pieces allowed, but not more than 20% of the pieces in any parcel shall be on the grade limit.

AUSTRALIAN STANDARD SPECIFICATIONS Nos. O. 34 and 35.

MILLED LINING—JARRAH.

- A.S.S. No. O. 34. Select Quality Milled Lining—Single Face—Jarrah.
A.S.S. No. O. 35. Select Quality Milled Lining—Double Face—Jarrah.

GENERAL PROVISIONS—A.S.S. Nos. O. 34 and O. 35.

- (18) Enumerated defects are intended to cover the lowest quality boards the grade may contain, but not more than 20% shall contain defects on the grade limit.
- (19) **Size and Profile.** Unless otherwise specified boards shall be accurately milled in the properly seasoned state to the dimensions of the standard profile specified and to the following sizes :

<i>Nominal Size.</i>	<i>Milled Size.</i>	<i>Minimum Thickness.</i>
	<i>Cover.</i>	
6 in. × $\frac{3}{4}$ in. or $\frac{3}{8}$ in.	5 $\frac{1}{4}$	$\frac{9}{16}$ or $\frac{7}{16}$
5 in. × $\frac{3}{4}$ in. or in.	4 $\frac{1}{4}$	$\frac{9}{16}$ or $\frac{7}{16}$
4 in. × $\frac{3}{4}$ in. or in.	3 $\frac{3}{8}$	$\frac{9}{16}$ or $\frac{7}{16}$
3 in. × $\frac{3}{4}$ in. or in.	2 $\frac{7}{16}$	$\frac{9}{16}$ or $\frac{7}{16}$

- (20) **Moisture Content.** Unless otherwise specified the moisture content shall not exceed 16% at time of inspection.
- (21) **Face Area.** For the purpose of computing the limitation of defects, the face area of the board in square feet shall mean its length in feet multiplied by its nominal width in feet.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 34.

SELECT QUALITY MILLED LINING—SINGLE
FACE—JARRAH.

Scope. This grade gives one face practically free from defects other than sapwood, but with natural variations in colour no defect. It is recommended for all first class purposes where one face only is exposed. If required free of sapwood on the better face, this shall be specially stated.

Grade Description. General provisions 1 to 4 (p. 5) and 18 to 21 (p. 39) apply.

Boards shall be sound wood, well milled, free on the face and edges above the tongue and groove from any defects other than the following :

- (1) Sapwood not exceeding one-quarter the width of the board or 2 sq. in. per square foot of face area.
- (2) Tight gum veins not exceeding $\frac{1}{8}$ in. in width, individual lengths not exceeding 12 in. and not more than one limiting vein in any 5 lineal ft.
- (3) Clean-edged pinholes, not more than two per square foot of face area, not more than four being grouped in any 6 in. of length.
- (4) Spring 1 in. in 12 ft.

On the back, sapwood and other defects will be allowed which do not affect the fixing of the lining. Skip shall not exceed one-quarter the area or extend more than one-half the width across the back at any section.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 35.

SELECT QUALITY MILLED LINING—DOUBLE FACE—
JARRAH

Scope. This grade gives both faces free from sapwood and practically free from other defects, but with natural variations in colour no defect. It is recommended for use only where both faces will be exposed, such as office partitions.

Grade Description. General provisions 1 to 4 (p. 5) and 18 to 21 (p. 39) apply.

The grade is the same as for A.S.S. No. O. 34, Select Quality Single Face lining, except that limitation of defects shall apply to both faces, and both faces shall be free from sapwood.

**AUSTRALIAN STANDARD SPECIFICATION
No. O. 36.**

**JOINERY STOCK (MOULDING, ARCHITRAVES, Etc.)—
JARRAH.**

Scope. This specification applies to the supply of joinery stock (mouldings, architraves, etc.) for interior trim.

Size and Profile. Unless otherwise specified boards shall be accurately milled in the properly seasoned state to the dimensions of the profile specified.¹

Moisture Content. Unless otherwise specified the moisture content shall not exceed 16% at time of inspection.

Grade Description. General provisions 1 to 4 (p. 5) apply.

The exposed faces shall be free from sapwood and defects other than the following :

- (1) Tight gum veins, not exceeding $\frac{3}{2}$ in. in width, individual length not exceeding 12 in.
- (2) Clean-edged pinholes, not more than one per lineal foot, not more than three being grouped in any 6 in. of length.

¹ Standard sizes, profiles and shapes for mouldings, architraves, etc., used in Western Australia will be found in the current price-list issued by the Timber Merchants' Association of W.A.

AUSTRALIAN STANDARD SPECIFICATIONS
Nos. O. 37 and 38.

SEASONED MILLED WEATHERBOARDS—JARRAH.

A.S.S. No. O. 37. Select Quality Seasoned Milled Weatherboards—Jarrah.

A.S.S. No. O. 38. Merchantable Quality Seasoned Milled Weatherboards—Jarrah.

GENERAL PROVISIONS—A.S.S. Nos. O. 37 and 38.

- (22) Enumerated defects cover the lowest quality boards the grade may contain, but not more than 20% of boards shall contain defects on the grade limit.
- (23) **Size and Profile.** Unless otherwise specified weatherboards shall be accurately milled in the properly seasoned state to the dimensions of the standard profile specified.
- (24) **Moisture Content.** Unless otherwise specified the moisture content shall not exceed 18% at the time of inspection.
- (25) **Exposed Area.** In determining the exposed area, a strip equal to one-eighth the width of the board at the top shall be considered as being covered by the next board.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 37.

SELECT QUALITY SEASONED MILLED
WEATHERBOARDS—JARRAH.

Scope. This grade should only be specified where appearance is of first importance.

Grade Description. General provisions 1 to 4 (p. 5) and 22 to 25 (p. 43) apply.

Boards shall be sound wood, well milled, free on the exposed area from defects other than any two of the following :

- (1) Tight gum veins, not exceeding $\frac{1}{8}$ in. in width, individual length not exceeding 12 in. and combined length not exceeding 3 ft. in any 12 lineal ft.
- (2) Smooth tight knots, not exceeding 1 in. diameter, not more than one per 5 lineal ft.
- (3) End splits, not exceeding 6 in. in length.
- (4) Clean-edged pinholes, not more than one per lineal foot, not more than three being grouped in any 6 sq. in.
- (5) Torn grain, not exceeding $\frac{1}{2}$ in. in depth.

On the back of the board and covered strip, sapwood and other defects will be allowed, providing they do not affect the fixing of the boards.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 38.

MERCHANTABLE QUALITY SEASONED MILLED
WEATHERBOARDS—JARRAH.

Scope. This specification covers the supply of a class of weather-board suitable for all ordinary purposes and should be regarded as the standard grade.

Grade Description. General provisions 1 to 4 (p. 5) and 22 to 25 (p. 43) apply.

Boards shall be sound wood, well milled, free on the exposed area from defects other than any two of the following :

- (1) Sapwood, not exceeding 12 sq. in. in area or $1\frac{1}{2}$ in. in width.
- (2) Tight gum veins, not exceeding $\frac{1}{8}$ in. in width, individual lengths not exceeding 3 ft. and combined length not exceeding 6 ft.
- (3) One smooth tight knot, not exceeding one-quarter the width of the face.
- (4) Clean-edged pinholes, not more than two per lineal foot, not more than six being grouped in any 6 sq. in., or small holes which can be effectively filled.
- (5) End splits, not exceeding 6 in. in length.
- (6) Torn grain, not exceeding $\frac{1}{16}$ in. in depth.

On the back of the board and covered strip, sapwood and other defects will be allowed, provided they do not affect the fixing of the boards.

AUSTRALIAN STANDARD SPECIFICATIONS
Nos. O. 39 (a) and (b).

MERCHANTABLE QUALITY GREEN
WEATHERBOARDS—JARRAH.

(a) SAWN.

(b) MILLED.

Scope. The specification applies to the supply of green boards of similar quality to A.S.S. No. O. 38, Merchantable Quality Seasoned Milled Weatherboards. The grade should only be specified where boards can be used a short period after supply or can be protected, as otherwise warping will take place.

Enumerated defects cover the lowest quality board the grade may contain, but not more than 20% of the boards shall contain defects on the grade limit.

Size and Profile. Standard sizes for green weatherboards are 7 in. \times $\frac{5}{8}$ in. for parallel and 7 in. \times 1 in. to $\frac{1}{4}$ in. for feather edged weatherboards.

Sawn boards shall stand up full to their nominal sizes. Milled green weatherboards may be plain dressed and chamfered or checked and chamfered according to the profile specified.

Exposed Area. In determining the exposed area, a strip $\frac{3}{4}$ in. wide at the top shall be considered as being covered by the next board.

Grade Description. General provisions 1 to 4 (p. 5) apply.

Boards shall be sound wood, well (a) sawn free on the exposed area from defects other than any one of the following :

- (1) Sapwood, not exceeding 12 sq. in. in area or $1\frac{1}{2}$ in. in width at any one place.
- (2) Tight gum veins, not exceeding $\frac{1}{8}$ in. in width, individual lengths not exceeding 3 ft. and combined length not exceeding 6 ft.
- (3) One smooth tight knot, not exceeding one-quarter the width of the face.
- (4) Clean-edged pinholes, not more than four per lineal foot, not more than six being grouped in any 6 sq. in., or small holes which can be effectively filled.

On the back of the board and covered strip, sapwood and other defects will be allowed, provided they do not affect the fixing of the boards.

AUSTRALIAN STANDARD SPECIFICATIONS Nos. O. 40 to 43.

WIDE BOARDS AND JOINERY—JARRAH AND KARRI.

- A.S.S. No. O. 40. Select Quality Joinery—Jarrah and Karri.
 A.S.S. No. O. 41. Select Quality Joinery—Shorts—Jarrah and Karri.
 A.S.S. No. O. 42. Standard Quality Joinery—Jarrah and Karri.
 A.S.S. No. O. 43. Standard Quality Joinery—Shorts—Jarrah and Karri.

GENERAL PROVISIONS—A.S.S. Nos. O. 40 to 43.

- (26) **Scope.** The specification applies to the supply of jarrah and karri, but the two species shall not be mixed indiscriminately in the one consignment. It is intended that either one or the other as specified shall be supplied.
- (27) **Size.** No responsibility in inspection will be taken with regard to size unless the basis is clearly stated in the contract. For green material the minimum and maximum sawing sizes should be given, and for semi- or kiln dry material the minimum actual size acceptable should be stated.
- (28) **Condition.** Timber may be sold as :
- (a) Green.
 - (b) Semi-dry.
 - (c) Dry for manufacture.
- The moisture content of timber described as semi-dry shall not exceed 25% at the time of inspection. Unless otherwise specified the moisture content of timber described as dry for manufacture shall not exceed 16% at the time of inspection in inch material or 18% in heavier material.
- (29) **Seasoning Defects.** Where material is inspected some time after cutting, excessive seasoning checks indicating failure to take precautions against rapid initial drying will cause rejection. Slight seasoning checks will be admitted in both green and dry material, but larger checks will be considered according to their equivalence with standard defects listed below.
- (30) **Standard Defects.**
- (a) One tight gum vein $\frac{3}{32}$ in. in width and not exceeding 12 in. in length or its equivalent, one defect. For each additional gum vein or each additional foot of length, add one defect.

- (b) Bright sapwood 1 in. on one edge or its equivalent on both edges—one defect.

Each additional inch or part inch of bright sapwood to be considered as equal to one defect. The amount of sapwood in any piece will be calculated on the average width of such sapwood throughout the length of the piece.

- (c) One intergrown knot $\frac{5}{8}$ in. to $1\frac{1}{4}$ in. diameter or equivalent—one defect.
- (d) Clean-edged pinholes, scattered, not exceeding one per 2 sq. ft.—one defect. Add one defect for each additional pinhole per 2 sq. ft.
- (e) One end split, or splits at each end not exceeding in total length in inches the surface measure in square feet, each split opening out not more than $\frac{1}{2}$ in. to the foot in length—one defect.

Longer splits on one end to be docked or not tallied.

- (f) Spring, $\frac{1}{2}$ in. in 10 ft. will be allowed in all pieces, but each additional $\frac{1}{2}$ in. spring will be calculated as one defect. Not more than two such defects will be allowed in any piece.
- (g) Cup in seasoned material to the extent of $\frac{1}{8}$ in. in 8 in. for 1 in. material and $\frac{3}{16}$ in. in 8 in. for 2 in. material will be considered as one defect. An additional $\frac{1}{16}$ in. cup will be considered as a second defect, and no piece shall contain more than two such defects.

- (31) A piece shall be considered as free from defects when the combination of any blemishes is less than the equivalent of one standard defect as defined above.

AUSTRALIAN STANDARD SPECIFICATION
No. O. 40.

SELECT QUALITY JOINERY—JARRAH AND KARRI.

Scope. This specification applies to the supply of panelling, wide boards and planks and general joinery sizes other than shorts of a quality suitable for all high grade purposes in the shape and size as sold where the natural surface of the wood is polished or varnished and where a large proportion of the whole surface is exposed.

Grade Description. General provisions 1 to 4 (p. 5) and 26 to 31 (p. 47) apply.

Size. Section, as specified. Length, 7 ft. and up.

Material shall be well sawn full to size. Not less than 70% shall be free from all defects, including all pieces less than 6 ft. face measure. The remaining 30% will be inspected on the worse face. Defects will be allowed as follows :

<i>Pieces Containing</i>	<i>Allow</i>
6- 8 surface feet	1 standard defect
8-12 " "	2 standard defects
12-16 " "	3 " "
Over 16 " "	4 " "

AUSTRALIAN STANDARD SPECIFICATION
No. O. 41.

SELECT QUALITY JOINERY—SHORTS—JARRAH
AND KARRI.

Scope. This specification applies to the supply of short material for high grade purposes, including cabinet squares.

Grade Description. General provisions 1 to 4 (p. 5) and 26 to 31 (p. 47) apply.

Size. Sections, as specified. Length, up to 6 ft.
Material shall be free from defects on all faces.

AUSTRALIAN STANDARD SPECIFICATION No. O. 42.

STANDARD QUALITY JOINERY—JARRAH AND KARRI.

Scope. This specification is intended to apply to the standard grade to be supplied for panelling, wide boards, planks and general joinery sizes other than shorts for use in the size and shape as sold. The grade is suitable for most high grade purposes where one face is usually concealed.

Grade Description. General provisions 1 to 4 (p. 5) and 26 to 31 (p. 47) apply.

Size. Section, as specified. Length, 7 ft. and up.

Material shall be well sawn.

Grading will be on the better face and edge. Not less than 70%, including all pieces less than 6 sq. ft. of face and edge combined, shall be free from defect on one face and one edge.

In the remaining 30% the total number of defects on the better face and edge must not exceed the following allowance:

<i>Face and Edge Combined.</i>				<i>Allow.</i>
6- 8 square feet	..	..		1 standard defect
8-12 " "	..	..		2 standard defects
12-16 " "	..	..		3 " "
Over 16 " "	..	..		4 " "

The worse face and edge may contain sapwood and other defects which will not affect the general utility of the piece.

**AUSTRALIAN STANDARD SPECIFICATION
No. O. 43.**

**STANDARD QUALITY JOINERY—SHORTS—JARRAH
AND KARRI.**

Scope. This specification is intended to apply to the standard grade to be supplied for joinery shorts.

Grade Description. General provisions 1 to 4 (p. 5) and 26 to 31 (p. 47) apply.

Size. Section, as specified. Length, up to 6 ft.

At least 50% of the pieces shall be free from all defects. In the remaining 50% one face and one edge shall be free from defects, the remaining face and edge allowing sapwood and defects which will not affect the general utility of the piece.

APPENDIX A.

RECOMMENDED ALLOWABLE WORKING STRESSES FOR
JARRAH AND KARRI.

Working stresses are given for three conditions of service.

Condition A assumes use in interior locations or protected construction, not subject to excessive dampness or high humidity. The following methods of establishing working stresses have been developed by the Forest Products Laboratory at Madison, Wisconsin, U.S.A., and have been generally adopted. The high working stresses given can be justified on the better conditions of service alone, but are only recommended for use with seasoned timber. The use of seasoned timber with consequent reduction in movement after erection, allows use of higher stresses apart from the increase in actual strength in smaller sections. It is not usual to allow any increase in working stresses with seasoning in larger sizes as developments of defects in seasoning partially balances increase in strength through lower moisture content. Very large sizes will not ordinarily be used under such conditions, but in any case results published by Julius¹ indicate that there is a definite increase in strength with seasoning even with the large sizes, so that it is considered unnecessary to place a maximum limit on sections for which the higher stresses can be used.

Condition B. Occasionally wet—assumes use in exterior structures such as bridges, trestles, grandstands and exposed framework in open sheds, etc.—conditions embracing use of the greater proportion of heavy structural timber.

Condition C. Usually wet—would apply to material such as wharf construction exposed to wave action or tidal waters, or timber in contact with the ground, or used in buildings in portions that would be more or less continuously wet.

Fibre Stress in Bending. The allowable working stresses in bending are based on the average green modulus of rupture with cumulative reductions to allow for (1) variability in strength of clear wood; (2) the effect of long time loading; (3) the effect of allowable defects in the grade; (4) a small factor of safety to allow for accidental overloads; and (5) variations in conditions of service.

Horizontal Shear. Allowable horizontal shear is derived by applying a straight-out factor of 6 to the shear strength of karri and then making an allowance for the effect of injurious defects. Figures from Julius¹ indicate that shear strengths of jarrah and karri are approximately the same.

¹ Julius, G. A., *The Physical Characteristics of the Hardwoods of Western Australia*, 1906.

Allowable values for horizontal shear are maximum values. The maximum unit horizontal shear in a beam is one and one-half times the average unit shear obtained by dividing the total shear by the cross sectional area.

It has been realised for some time that the generally accepted theory of shear stresses in beams is in error, the discrepancy being serious with concentrated loads near the ends.

A simple method of design that tends to the conservative side is as follows: In calculating the shear at one end of a beam, concentrated loads between the end and the nearer quarter point, or between that end and a point distant three times the depth of the beam from it, whichever would be the lesser distance from the support, may be considered as acting at that point.

Modulus of Elasticity. The average value given is used to compute average deflection under short time loads. Long time loading will cause sagging which is usually allowed for in design by doubling the dead load but not the live load when computing the deflection.

Bearing Perpendicular to the Grain. Allowable working stresses are based on a factor of safety of $1\frac{1}{2}$ at the limit of proportionality on the value for green timber. At one-tenth inch deformation the factor of safety is between 3 and 4. The factor of safety rises rapidly above the apparently low figure of $1\frac{1}{2}$ at the limit of proportionality with hardening of the surface due to partial seasoning. Greater unit stresses can be allowed with narrower plates, but with wider plates the allowable stresses should be reduced slightly.

Bearing Parallel to the Grain and Strength of Columns. The allowable stresses for columns are based on the eccentricity formula,² assuming an equivalent eccentricity of $\frac{l}{360}$ for select quality, and $\frac{l}{240}$ for standard quality. (l =length of column in inches.)

² Timoshenkos and MacCullough, Gleason H., Elements of Strength of Materials, D. Van Nostrand Co., Inc., New York.

RECOMMENDED ALLOWABLE WORKING STRESSES—JARRAH AND KARRI.
(All Stresses in lb. per sq. in.)

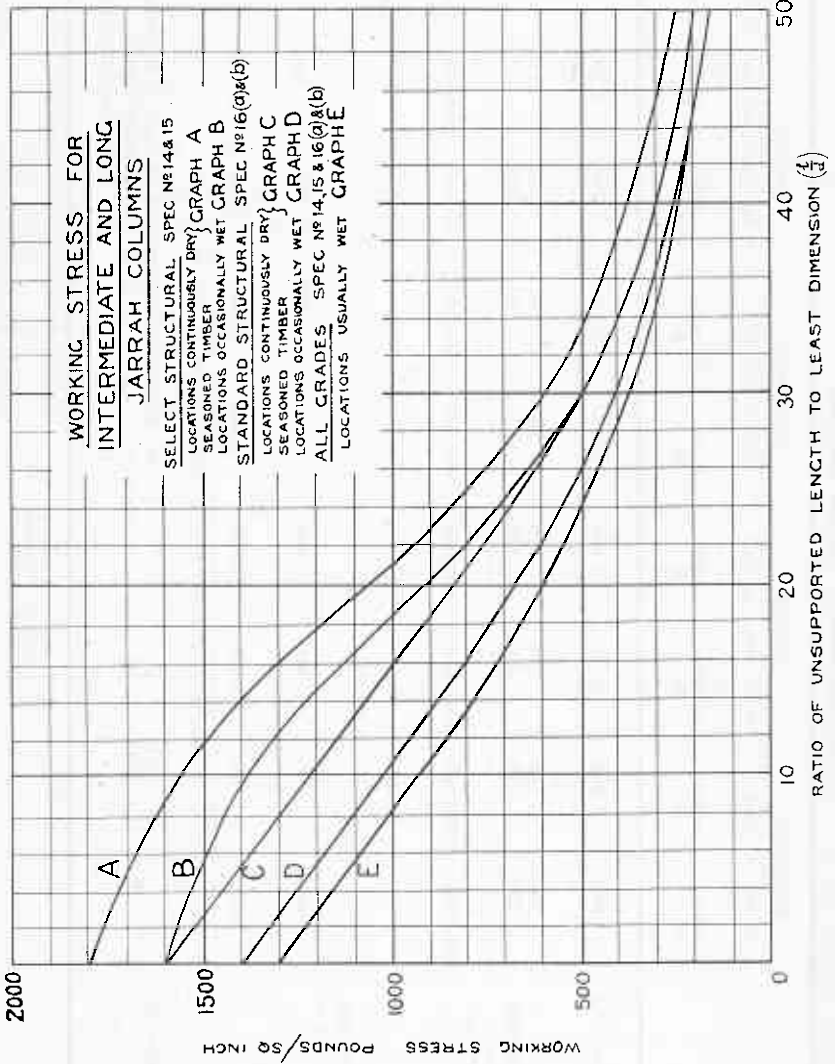
STRESS.	STANDARD STRUCTURAL JARRAH [A.S.S. Nos. 16 (a) and (b).]		SELECT STRUCTURAL JARRAH. (A.S.S. Nos. 14 and 15.)		STANDARD STRUCTURAL KARRI. (A.S.S. No. 19.)		SELECT STRUCTURAL KARRI. (A.S.S. Nos. 17 and 18.)		ALL GRADES. (A.S.S. 14-19.)
	Condition A.	Condition B.	Condition A.	Condition B.	Condition A.	Condition B.	Condition A.	Condition B.	
Fibre Stress in Bending	1,600	1,400	2,100	1,800	2,400	2,100	2,700	2,300	1,200
Shear :									
(a) In beams ..	180	160	200	180	180	160	200	180	160
(b) In joint details	270	240	300	270	270	240	300	270	240
Modulus of Elasticity :									
Average ..	2,400,000	2,000,000	2,400,000	2,000,000	2,800,000	2,300,000	2,800,000	2,300,000	Jarrah : 2,000,000 Karrri : 2,300,000
Bearing perpendicular to grain—Width of Plate, $\frac{1}{2}$ in. ..	600	500	600	500	700	600	700	600	400
Bearing parallel to grain	2,000	1,800	2,000	1,800	2,300	2,100	2,300	2,100	1,600
Columns									
Bearing at angle to grain									

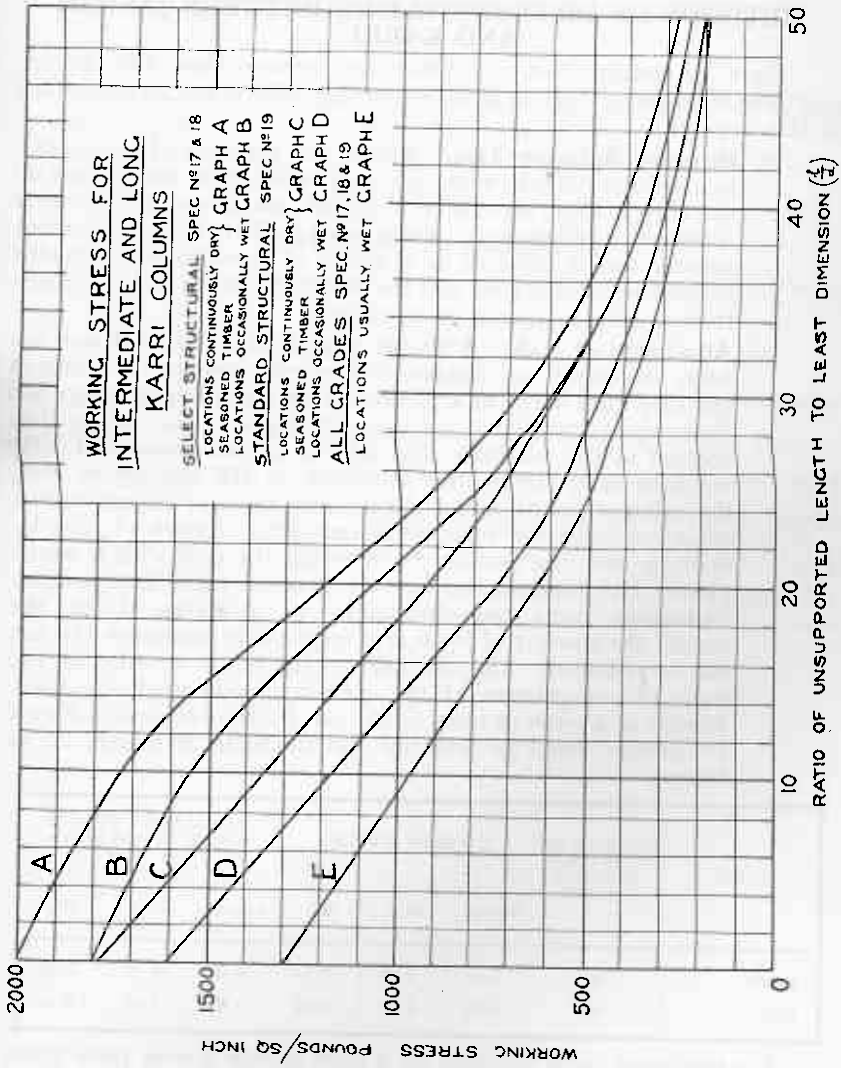
See Figure 1 for Jarrah and Figure 2 for Karri.

$$n = \frac{pq}{p \sin^2 R + q \cos^2 R} \quad \text{where } p = \begin{matrix} \text{allowable bearing stress at angle } R \text{ to grain.} \\ \text{parallel to grain.} \\ \text{perpendicular to grain.} \end{matrix}$$

Conditions of Service—A. Location continuously dry, using seasoned timber
B. Locations occasionally wet.
C. Locations usually wet.

NOTE.—The values given above may be used without allowance for impact up to 100 per cent. of the live and dead loads. For stresses due to wind loads or by combination of wind loads and dead and live loads, the stresses given may be increased by 50 per cent., provided the resultant size of members is not less than required for live and dead loads alone.





APPENDIX B.

METHODS OF DIFFERENTIATING BETWEEN JARRAH AND KARRI.

There are definite chemical differences between these two species, and these differences, together with the burning splinter test, are described in this appendix.

- (i) **Burning Splinter Test.** Match size splinters of karri burn to a definite full ash, white in colour, while those from jarrah do not burn readily, leave little or no ash, and generally give what is termed a carbon end. Tests made indicate that the burning splinter test is effective as a means of identification provided sound truewood is used and the sample has not previously been treated with inorganic preservatives.
- (ii) **Alkalinity of Ash.** A simple quantitative chemical test has been developed as follows: Weighed samples of sawdust (10-15 g.) are burnt in a platinum dish and the percentage ash determined (calculated on oven-dry basis). The ash is then treated in the platinum dish with a known amount of N/10 sulphuric acid (10-20 ml.¹ according to the amount of ash), the mixture gently boiled for 10 minutes and stirred with a glass rod until the reaction is complete. Losses of acid by spitting, etc., are avoided by covering the dish with a watch glass. The resulting mixture is titrated with N/10 sodium hydroxide, using phenolphthalein as indicator. From the results the amount of N/10 acid required to neutralise the ash can be obtained. The alkalinity of the ash is recorded on the basis of one gramme of the oven-dry wood originally used. Results of a series of tests carried out by the Division of Forest Products, Council for Scientific and Industrial Research, are as follows:

NAME.	NUMBER OF INDIVIDUAL SAMPLES TESTED.	% ASH BY WEIGHT.			ALKALINITY OF ASH in ml N./10 Acid per gm. O.D. Wood.		
		Average.	Max.	Min.	Average.	Max.	Min.
Jarrah. . .	55	0.14	0.49	0.04	0.00	0.12	0.02
Karri . . .	29	0.30	0.86	0.12	0.83	1.85	0.42

The minimum value recorded for a karri sample is over three times the maximum recorded for a jarrah sample. The results of these experiments with jarrah and karri show that the chemical methods of identification are very important, and that they are, in this instance, effective when other methods fail.

¹ ml. = millilitre.

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A list of Australian Standard Specifications and Codes is available gratis on application to any office of the Association.

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