

# **GUYANA TIMBER GRADING RULES**

## **FOR HARDWOODS**

**Field Edition**



**Guyana Forestry Commission**

**2002**

## Foreword

This document was prepared by the Guyana Forestry Commission with support provided through the ACP-EU Trade Development Project.

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# 1. Introduction

## 1.1 Interpretation

The Guyana Timber Grading Rules (GTGR) will be applied throughout Guyana for grading forest produce with type references GR01 to GR13. The rules apply to all local and export markets. A timber marketing certificate will be issued in accordance with the grade for each type of produce.

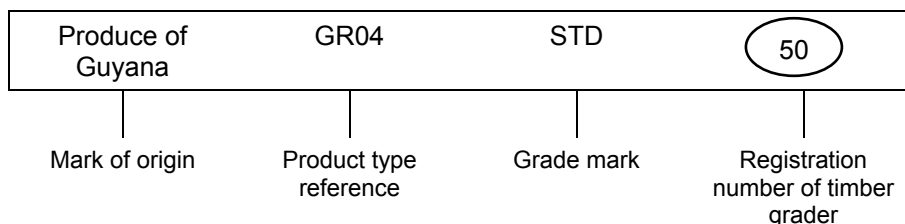
## 1.2 Definitions

The following terms and definitions apply:

Grading authority	The GFC is responsible for supervising all timber grading, employing Quality Control Inspectors, issuing certificates and licences in timber grading and dry-kiln operation and issuing marketing and export certificates
Timber grader	A person who holds a valid timber grading certificate and licence issued by the grading authority
Quality control inspector	An employee of the grading authority who is charged with the task of inspecting the work of timber graders and who carries out re-grading when required.
Supplier or seller	Any person or company in Guyana who supplies timber for the local market and/or export under these rules.
Customer	Any person or company in Guyana or abroad who places a contract for the purchase of timber under these rules.

## 1.3 Grading and grade marks

Unless otherwise stated in these rules, graded timber should be stencilled as follows:



### Notes

1. The full stencil marks shall be placed on two sides of each bundle. All lettering or numbering should be 25 mm in height. The registered number of the timber grader should always be in a circle; no other number may be in a circle.
2. The use of any of the grade marks shall be restricted to timber graded by a timber grader or quality control inspector and covered by a marketing certificate. The approved grade marks that are valid are indicated for each of the forest product types referenced as GR01 to GR13.

#### **1.4 Method of determining the grades**

The GTGR are based on the quality and quantity of “defects” in a piece or parcel. Grading is carried out according to the type of forest produce intended for a certain use so the defect based system of grading is more appropriate than the alternative “cutting based system”.

Permissible defects are defined for each grade. A piece of timber is rejected if it has more defects than are allowed for the product. For example, if a railway sleeper is found to contain sapwood in more than half of the width of the sleeper at either of the rail seats, the sleeper will not meet the required grade and will therefore be rejected.

#### **1.5 Moisture content**

Where the moisture content of seasoned lumber is required to be certified, samples for certification are taken by a timber inspector as follows:

- one sample is taken for every hundred lengths, with a minimum sample size of three
- samples are taken at random, selected over the whole of the stacked lumber in a representative way
- a sample shall consist of a piece 30 cm long, cut from a board no closer than 45 cm from either end
- immediately on cutting, the sample is branded by the inspector with the date, their mark and the marketing certificate serial number of the batch
- the sample is then placed immediately in a separate sealed polyethylene bag
- moisture content is determined for the samples as quickly as possible and not more than one week after sampling.

The determination of moisture content should be started within 24 hours of receipt of the samples. After testing, a test certificate is issued by the GFC showing the moisture content of the samples, dates of sampling and testing, the grading certificate number and the name of the producer or shipper requesting the sampling.

When a timber grader is requested to verify the number of days that the lumber has been in stack to be considered as a shipping dry, the process is as follows:

- before grading, the timber grader makes sure that the timber has been in stack for the required length of period for drying
- the timber grader examines the stacking situation and makes sure that the stacking meets the required stacking standard
- the timber grader verifies that the timber has been in stack and records the seasoning period on the timber marketing certificate.

## 2. Forest products and grades

<b>GR01</b>	Sawn baulks	Prime Select	PRIM SEL
<b>GR02</b>	Hewn squares	Prime	PRIM
<b>GR03</b>	Round timber piles	Prime Select Sound	PRIM SEL SUD
<b>GR04</b>	Sawn timber for building and construction	Prime Select Sound Merchantable	PRIM SEL SUD MERCH
<b>GR05</b>	Sawn timber for dressing and furniture manufacture	Prime Standard Factory-suited Mill-run	PRIM STD F.S. MR
<b>GR06</b>	Dressed products from seasoned timber	Prime Standard	PRIM STD
<b>GR07</b>	Railway sleepers/crossings	Select Standard	SEL STD
<b>GR08</b>	Round transmission poles	Prime Select	PRIM SEL
<b>GR09</b>	Telegraph and electric power cross-arms	Prime	PRIM
<b>GR10</b>	Fencing posts	Select	SEL
<b>GR11</b>	Shingles	Prime	PRIM
<b>GR12</b>	Fence staves	Prime	PRIM
<b>GR13</b>	Hardwood logs	First peeler quality Superior sawmill quality Standard sawmill quality Fair sawmill quality Small sawmill quality Low Quality	FPQ SUP SSQ FSQ SMSQ LQ

## GR01 Sawn baulk

Prime PRIM  
Select SEL

### Purpose

For grading sawn baulk (large scantlings) for marine construction and other civil engineering work as well as for general construction.

### Manufacture

Includes any rectangular section (including squares) with an end nominal cross-section of not less than 280 cm<sup>2</sup>. All timbers must be accurately sawn from sound logs. Surface may be either sawn or planed. All ends shall be cut square and oil painted.

### Dimensions and tolerances

Unless otherwise specified in the contract the following tolerances apply and shall be measured at the time of grading.

Length	+ 150 mm
Width	± 6 mm
Straightness	lengths up to 9.0 m must have less than 25 mm deviation lengths above 9.0 m must have less than 40 mm deviation
Wane	see table

Defect limits by nominal size in metres		
Length up to 9.0 m and less than 625 cm <sup>2</sup> nominal cross-section	Lengths of greater than 9.0 m and up to 12.0 m	Lengths of greater than 12.0 m
Wane on any face should not measure more than 25 mm cross-section. The sum of the wanes along the corners of the piece shall not aggregate more than the length of the piece.	Wane on any face shall not measure more than 1/5 of the nominal width of the face.	Wane on any face shall not measure more than 1/5 of the nominal width of the face. More than 1.5 m from the ends wane may be 1/4 of nominal width.

**Note:** for long length timbers, especially in 16.0 to 22.0 metre class, wane requirements tend to limit supply. Intelligent relaxation of wane requirements in these long lengths by customers in their specifications assists prompt and economic supply of this material.

### Prohibited defects

- Brittle and rotten heart
- Plugged defects

- Severe heart trace and shakes, cross breaks and compression failures in any of the faces

### Grade distinctions

Baulks shall be generally free of defects, which significantly affect the strength of the piece, but the following shall be permitted in accordance with the specific grade requirements.

<b>Prime</b>	<b>Select</b>
Only <i>Chlorocardium rodiaei</i>	Other species may be included
Nominal area of cross-section is no less than 280 cm <sup>2</sup>	
Heartwood is entirely boxed	Heartwood may not be boxed entirely
Curvature shall not exceed 70 mm for every 5 metre length of the baulk.	
Star shake: small and generally tight. Not to extend into any face except as a tight shake.	
Ring shake not more than 75 mm in diameter and tight. Cup shake not to open for more than ¼ of the circumference of the circle it follows, and not longer than ½ of the circumference of this circle.	
End-shake: the aggregate length of the shakes at each end of the baulk shall not exceed 8 cm for every one-metre length of the baulk or less than the maximum width of the piece which ever is smaller. The shakes shall be tight	
Face shakes (spalls): when occurring on three faces maximum penetration of the shake into the piece to be limited to 12 mm when measured from the face to the shake at right angles to the length of the piece. Pieces with such faces to be limited to not more than 10% of the lot.	
Occasional pin hole borer is tolerated	Pin hole borer and shallow worm holes that are not associated with stain are permitted
Sound knots up to 75 mm in diameter and scattered	



## GR02 Hewn squares

Prime PRIM

### Purpose

For grading hewn squares (shipping timbers) produced from sound live trees.

### Manufacture

All sides shall be well hewn, flat, true and free of large through shakes, severe edge shakes and seasoning checks. Ends shall be cut square and oil painted immediately after cross cutting. Finished squares shall be straight and true within the tolerances given below. Spiral grained logs are not permitted. Any piece having plugged defects shall be rejected.

### Dimensions and tolerances

Unless specified otherwise in the contract the following dimensions and tolerance limits shall apply.

Length	lengths up to 9.0 m, allowances are $\pm 150$ mm. lengths more than 9.0 m, allowances are $\pm 300$ mm.
Cross section	to be measured by calliper half way along the piece in two directions at right angle to each other and in the centre of each face. Allowance specified in each diameter measurement equals $\pm 25$ mm.
Taper	approximately 25 mm deviation in 6.0 m length shall be allowed.
Straightness	up to 16.0 metres length, deviation up to 25mm. lengths between 16.0 m and 18.0 m, deviation up to 40 mm. lengths greater than 18.0 m, deviation up to 50 mm.
Wane	up to 16.0 metres length, wane of 5 mm per 25 mm of face width is permitted. over 16.0 metres length, wane of 5 mm per 20 mm of face width is permitted.

### Defects

Hewn squares shall be generally free of defects, which significantly affect the strength of the piece, but the following shall be permitted.

Knots	sound knots up to 25% of face width are permitted. Unsound knots and knot clusters are not permitted
Pinhole borer	occasional pinhole borer is permitted
Decay and rotten heart	not permitted

Seasoning checks	permitted
Shakes	open star shake and ring shake are permitted only if they do not exceed 75 mm in diameter.
Edge shakes	extending from one face to opposite or adjacent one. Allowable maximum length of edge shake, if tight, is 1½ times the width of the piece.
End shake	for sizes up to 350 mm x 350 mm, the maximum end shake penetration, measured at right angles shall be 40 mm for sizes exceeding this cross-section limit, permitted end shake length can reach 50 mm.

## GR03 Round timber piles

Prime PRIM  
Select SEL  
Sound SUD

### Purpose

For grading natural round timber piling cut from sound living trees.

### Manufacture

Taper	Piles shall have gradual taper throughout their length and be cut one metre above the butt swell of the tree.
Trimming	Piles shall be cleanly trimmed of all branch stubs and knot overgrowths projecting more than 25 mm beyond the general surface of the pile.
Bark	All piles shall be debarked except that occasional bark in-growth is permitted over sound wood.
Sawing	All piles shall be cleanly cut off at butt and tip at right angles to the general axis of the piles.

### Dimensions and tolerances

Length	Up to 12.0 m length, cutting allowance shall be limited to $\pm 300$ mm. For lengths greater than 12.0 m the allowance can be up to 600 mm. The average length of all piles in a shipment shall not be less than the length specified plus half of the tolerance allowance.
Straightness	A straight line joining the centres of the butt and tip of the pile shall lie within the pile. Reverse curvatures and short crooks deeper than 40 mm for every one-metre length are not permitted.

### Prohibited Defects

All grades of piles shall be generally free of defects, which significantly affect the strength or driveability of the pile. The following defects are not permitted:

- Sound knots and knots clusters of group knots with widths greater than one third of the diameter of the section where they occur.
- Rotten and hollow knots except occasional knotholes and scars less than one-third of the diameter where they occur and sound knots not greater than 40 mm in depth.
- Rotten heart
- Shakes and splits in the tip of the pile.
- Large open star shakes and shakes in the butt
- Tight shakes in the butt longer than 450 mm

- Severe bruising or damage caused in falling or handling.
- Spiral grain of pitch steeper than ½ turn (180°) in 6.0 metres.
- Fractures and compression failures

**Minimum butt and tip diameters recommended for Prime grade**

Length in metres	Diameter one metre from butt or larger end in centimetres				
	35.0	32.5	30.0	28.5	25.0
	Diameter at tip or smaller end in centimetres				
<b>9-12</b>	25	23	20	18	15
<b>12-15</b>	23	20	18	15	-
<b>15-21</b>	20	18	15	-	-
<b>21+</b>	18	15	-	-	-

Conforms generally with ASTM D55 - 70 "Round Timber Piles" and CSA standard 056 - 1965 "Round Timber Piles"

**Grade distinctions**

Grading factors	For length up to 21.0 m			For length over 21.0 m		
	Prime	Select	Sound	Prime	Select	Sound
Butt diameter in mm	350 – 450	Not > 500	Not > 500	Not > 500	Not > 500	Not > 600
Tip diameter in mm	180 – 250	Not < 200	Not < 200	180 – 250	Not < 150	Not < 250
Tapering quality (%)	> 75	70 - 75	40 – 70	> 60	50 – 60	40 – 50
Species	CR	IOCS	IOCS	CR	IOCS	IOCS
Diam. of ring shake	< 25	up to 50	up to 75	< 25	up to 50	up to 75
Tight shakes at butt	< 100	up to 300	up to 400	< 150	up to 350	up to 450

Dimensions in millimetres unless stated

CR – *Chlorocardium rodiaei*

IOCS – includes other commercial species

**GR04 Sawn timber for building and construction**

**Prime PRIM  
 Select SEL  
 Sound SUD  
 Merchantable MERCH**

**Purpose**

For grading sawn hardwood timber for framing in building and construction. Both rough sawn and gauged (size matched) timber are included.

**Sawing tolerance**

All timber shall be well and truly sawn to specified nominal dimensions and with square trimmed ends. Marking out of defects without trimming is not permitted.

The following tolerance to nominal sizes at time of sawing shall apply:

Thickness and width up to 75 mm nominal, ± 5 mm  
 above 75 mm nominal, ± 10 mm

Where timber of close dimensional tolerance is produced by machine gauging (planing) after sawing a planing tolerance of ± 3 mm shall be allowed.

**Grade distinctions**

There are four grades allocated for GR04.

Timber may be ordered as a particular species and grade e.g. “Mora Select Grade” or by type of forest product and grade e.g. “GR04 Prime Grade”.

Sawn timber will normally be graded and supplied green; but it may be supplied in “shipping dry” condition by arrangement between the customer and supplier.

Sawn timber meeting this specification shall not contain defects beyond the limits given in the table below.

<b>Grading factors</b>	<b>Prime</b>	<b>Select</b>	<b>Sound</b>	<b>Merchantable</b>
Length	Greater than 2.4m with an interval of 0.1m		Greater than 0.5m with an interval of 0.1m	
Knots, loose, decayed or hollow	Not permitted	Not permitted	Not permitted	One quarter width of face to 75 mm diameter maximum
Knots, sound, tight and inter-grown	Not permitted	25 mm diameter maximum and scattered	50mm diameter or 1/3 width of the face whichever is less.	75 mm diameter or 1/2 width of face whichever is less.

<b>Grading factors</b>	<b>Prime</b>	<b>Select</b>	<b>Sound</b>	<b>Merchantable</b>
End Shakes	None	A quarter width of face in length and at one end only	Half width of face in length at one end only	Width of face in length at one end only
Face shakes	None	Showing on one face only and length not more than 1/3 of the width of that face	Showing on one face only and not more than 60 cm in total length.	Half the length of piece on one face and not more than ¼ maximum width. Must not penetrate through opposite or adjacent faces for more than 60 cm
Sapwood, sound not treated by preservative	Permitted only when the species is in durability Class 1A	Permitted only when the species is of durability Class1 or 1A.	A perimeter measurement of 50 mm or 20% whichever is greater.	A perimeter measurement of 25%.
Sapwood, treated by an approved preservation process	No limit	No limit	No limit	No limit
Sloping grain	None, only local deviations	None, only local deviations	50 - 60 %	> 60 %
Bow	Not permitted	Not permitted	40 mm in 5 m length	60 mm in 5 m length
Spring	Not permitted	Not permitted	20 mm in 5 m length	30 mm in 5 m length
Twist	Not permitted	Not permitted	Slight	Up to 5 mm per 5 m length
Holes, bark and gum pockets	None	5 mm wide and 50 mm long in one face only	10 mm wide and 75 mm long one face only	25 mm wide and 150 mm long
Compression failure	Not permitted	Not permitted	Not permitted	Slight and Occasional
Brittle heart and unsound heart	Not permitted	Not permitted	Not permitted	Not permitted
Sound black heart and heart stain	Slight	No limit	No limit	No limit

<b>Grading factors</b>	<b>Prime</b>	<b>Select</b>	<b>Sound</b>	<b>Merchantable</b>
Insect and grub holes 3 mm diameter and above	None	Scattered and not more than equivalent of 1 per metre of length	Scattered and not more than equivalent of 2 per metre of length	Not clustered but up to 4 per metre of length
Pinhole (ambrosia) borer holes	None	None	Slight on one face only	Moderate but scattered
Seasoning checks	None	Slight	Moderate	Up to 30 mm per metre of length
Wane	None	20 mm perimeter per metre of length maximum	40 mm perimeter per metre of length maximum	60 mm perimeter per metre of length maximum
Wane	Not permitted	Not permitted	Not permitted	Not permitted

**GR05 Sawn timber for dressing and furniture manufacture**

**Prime Standard Factory-suited Mill-run**    **PRIM STD F.S. MR**

**Purpose**

For grading sawn timber up to 75 mm in thickness and not more than 250 cm<sup>2</sup> end cross-section, intended for dressing and furniture manufacturer.

**Unseasoned**

Timber green off saw, partially seasoned or shipping dry will be regarded as unseasoned. Where a particular time in stack is specified by the customer this shall be verified as far as possible by the grader but no guarantee as to actual moisture content can be given.

**Seasoned**

Seasoned timber in these rules means timber seasoned in air, kiln or a combination of methods to moisture content below 18%. This shall be verified as far as possible by the grader and on request a certificate covering sampling for moisture content of a shipment can be given.

**Dimensions and tolerances**

All timber shall be well sawn to specified dimensions and with square-trimmed ends. The following allowances to the nominal sizes need to be ascertained, at the time of grading, unless specially agreed between the customer and supplier.

Thickness	up to 75 mm nominal thickness the allowance shall be ± 5 mm for 75 mm nominal and thicker the allowance shall be ± 10 mm
Width	up to 75 mm nominal the allowance shall be ± 10 mm
Length	trimmed lengths shall measure 0 to 100 mm longer than nominal for Prime and Standard grades  there shall be additional 25 mm allowance to the length specified by the customer. The same allowance applies to Mill-Run grade.



## Grade distinctions

Grading factors	Factory-suited	Prime	Standard	Mill-Run
Purpose	A quality equal or superior to prime but cut to size by arrangement with the customer. For use in furniture, parquet etc.	For the highest quality work	Very good quality for normal use in building, joinery and utility furniture construction	Moderate to low quality for normal use in building, joinery and utility furniture in local markets
Length	Customer specified	Minimum of 1.8 m	Minimum of 1.8 m	Length greater than 0.6 m
Knots, dead, loose or decayed	Not permitted	Not permitted	25 mm diameter maximum	Permitted
Knots, sound, tight inter-grown	25 mm diameter 1 per piece in 10% of the lot.	25 mm diameter 1 per 2 metres in 20% of lot	75 mm diameter maximum	Permitted
Edge Shakes	Not permitted	At one end only up to 75 mm in length	At one end only 75 mm or half width of face	Permitted at both ends only if the aggregate length does not exceed 1/5 of the length
Face Shakes	Not permitted	On worse face only 150 mm total length per piece in 10% of lot	On worse face only 900 mm long total length by 3 mm wide	On worse face only Up to 75 mm per metre of length of the piece in up to 25% of lot
Sapwood, sound, not <i>Lyctus</i> susceptible	No limit unless specified by customer. In many timbers sapwood is not strongly differentiated in colour from heartwood and is not <i>Lyctus</i> susceptible. However in some species the sapwood is of different colour and may or may not be desired depending on species. A customer may specify the timber free of sap in which case it will be limited as for sapwood, <i>Lyctus</i> susceptible. Sapwood may be preserved by an approved process, as defined in the Timber Marketing Act in which case it will be of natural colour and not <i>Lyctus</i> susceptible.			
Sapwood, sound <i>Lyctus</i> susceptible	18 mm, one corner only	25 mm perimeter	100 mm perimeter	150 mm perimeter
Sloping grain	Up to 15%	Up to 15%	Up to 15%	Up to 20%
Bow	Not permitted	10 mm per metre length	20 mm per metre length	Up to 40 mm per metre length
Spring	Not permitted	5 mm per metre of length evenly distributed	5 mm per metre of length evenly distributed	Up to 25 mm per metre of length evenly distributed
Twist	Not permitted	Slight in 10% of lot	Slight in 15% of lot	Slight in 20% of lot

<b>Grading factors</b>	<b>Factory-suited</b>	<b>Prime</b>	<b>Standard</b>	<b>Mill-Run</b>
Pin holes ( <i>Ambrosia</i> ) borer	Occasional on one face only in 10% of lot	3 mm diameter Maximum 3 in 5 metres length in 10% of lot	3 mm diameter 3 per metre of length	Up to 4 mm diameter Up to 5 per metre of length
Grubholes	Not permitted	1 per 2 m in 10% of lot	Average of 1 per 2 m length	Average of 1 per 1.5 m length
Check-seasoning	Slight on one face only	Slight on one face only	Slight on one face only	One face or one side edge only
Brittle heart	Not permitted	Not permitted	Not permitted	One face only where sound, up to 75 mm long
Log stain and incipient decay	Not permitted	Not permitted	Not permitted	Slight and occasional
Holes, bark pockets	Not permitted	To be classified as loose knots	To be classified as loose knots	To be classified as loose knots

**GR06 Dressed products from seasoned timber**

**Prime Standard PRIM STD**

**Purpose**

For grading dressed products from seasoned hardwoods.

The Prime grade is intended for finishing and construction work of the highest quality. Standard grade is intended for general construction and finishing purposes where sound lumber well milled but of lesser visual quality than grade A is adequate.

The following products are included under these rules.

- Tongue and groove siding
- Tongue and groove flooring
- Secret nail flooring
- Channel lining
- V-joint lining
- Spring and rebate siding
- Dressed boards, square edged.

Standard profiles are given for these products in figure 1.

**Moisture Content**

All dressed products meeting these rules shall have a moisture content not less than 10% and not more than 15% at the time of dressing. The oven drying method shall be used to determine moisture content.

**Quality of Dressing**

All products shall be of sound wood, well milled to a smooth surface and free from defects on the face other than those described for the particular product and grade.

**Tolerance**

Tolerance in thickness and width at the time of milling shall be plus 1 mm minus 0 mm. Tongue and groove shall match as described and each product shall conform to the standard profiles.

**Branding**

All dressed products shall be indelibly marked on the back by the grader to show.

- the grader's registered number.
- the grade of the dressed item PRIM or STD and the type reference number of this forest product.

In addition, the registered brand or name of the manufacturer shall be applied.

## End trimming

All dressed products shall be trimmed square at the ends. Marking out of defects without trimming is not allowed.

## Species

Dressed products of any hardwood species may be graded under these rules and may be supplied either as lots comprising a single nominated species or in lots comprising several species by arrangement between customer and supplier.

## Grade distinctions

The limits of defects affecting appearance and performance of the two grades are given below. Limits refer to defects appearing on the better face. Any imperfections may appear on the back of the piece providing they do not significantly affect the strength or fixing of the products. No defect is allowed at the edges where it would result in fitting problem.

Grading factors	Prime	Standard
Knots, sound, tight and inter-grown	¼ face width or 25 mm diameter maximum	½ face width or 50 mm diameter maximum
Knots, dead, decayed and knot holes	Not permitted	12 mm diameter 1 per 4 meters length
Pin holes ( <i>Ambrosia</i> borer)	4 per 5 metres of length	Occasional, well scattered
Unsound heart and pith	Not permitted	Not permitted
Gum and bark pockets	Not permitted	12 mm wide x 75 mm long and tight 1 in 4 meters of length
Wane	Not permitted	Not permitted
Bow	16 mm in a metre length	18 mm in a metre length
Spring	5 mm in a metre length and evenly distributed	8 mm in a metre length, evenly distributed
Shake	Not permitted	Occasional and less than 150 mm long
Compression failure	Slight	Slight
Sound sapwood not treated by an approved preservation process not immune to <i>Lyctus</i>	Not permitted (see note)	25 mm width on face
Sapwood – sound meaning treated by an approved preservation process or naturally immune to <i>Lyctus</i>	Not limited	Not limited

Grading factors	Prime	Standard
Seasoning checks	50 mm long not more than 1 in a metre	Slight well scattered
Mismatch	Not permitted	0.5 mm maximum in 10% of parcel
Skip (hit and miss)	Not permitted	Not greater than 80 mm long and 2 mm deep in 5 metre length
Broken, missing & short tongues	Not permitted	Maximum 110 mm long per metre in 10% of parcel
Broken & missing groove	Not permitted	Not permitted
Kick out	Not permitted	Not permitted

**Note:** In many Guyana hardwoods the sapwood is similar in colour and texture to heartwood and is not Lyctus borer susceptible. In these timbers sound sapwood would be admitted without limit under these rules. Where sapwood is distinctly different in colour it may be desired for its decorative effect e.g. Wamara, in other cases it may not be desired e.g. Purpleheart. In Prime grade a customer may specify by arrangement that the timber be sap free. Where sapwood has been treated by an approved preservation process as defined in the Timber Marketing Act then it will be of natural colour and perfectly sound.

### Standard profiles for GR06

Tongue and groove siding



Tongue and groove flooring



Secret nail flooring



Channel lining



V-joint lining



Spring and rebate siding



## GR07 Railway sleepers & crossings

Select **SEL**  
Standard **STD**

### Purpose

For grading of sawn or hewn railway sleepers, or bridge or other timbers, on which rail seats are fixed constants determined by the gauge of the railway. The rule also enables grading of hewn or sawn railway crossings or other timbers used at junctions where rail seats are varied.

### Standard sizes

Railway gauges are usually classified as follows:

- wide gauge from 140 to 160 cm
- medium gauge from 90 to 110 cm
- narrow gauge from 60 to 80 cm

The top and bottom shall be cut as near as possible to parallel and the thickness of the sleeper should be no less than half of the width. Sleepers should be cut slightly larger than the specified dimensions with size tolerance permitted at the time of the inspection shown in the table below.

Not more than 5% of the sleepers may be undersize in any dimension (length, width or thickness).

The maximum variation in thickness (excluding wane) between the thinnest and the thickest point on a sleeper shall not exceed 5 mm.

Type of gauge	Cross section in mm	Tolerances in mm		Length in centimetres	Tolerances in mm
		Width	Thickness		
Wide gauge	250 x 125	+ 13	+ 13	275, 260, 240	± 75
Medium gauge	225 x 112	+ 13	+ 13	215, 200, 185	± 50
Narrow gauge	200 x 100	+ 13	+ 13	150, 120	± 25

Sleepers of other sizes can be graded under these rules but the tolerances shown in the table shall apply

### General requirements

All sleepers must be free from decay and such shakes, hollow knots, compression failures, bark or other defects that, in the opinion of the timber grader, would render any piece unsuitable for use as a sleeper. Sleepers must be free from heart (pith) unless otherwise specified in the contract in which case, the heart must be sound.

## **Straightness**

Sleepers should be reasonably straight. Permissible deviations from straightness are as follows:

Spring	A string stretched from the mid-point on one end to the mid-point of the other end of the sleeper on the wide face should be wholly within the sleeper.
Cup	A straight edge laid across the wide face of the sleeper should not be more than 6 mm from the deepest part of the cup.
Twist	For sleepers, a string stretched diagonally on either wide face should not be more than 10 mm from any point on the face. For crossings, twist is permitted provided it can be removed by adzing.
Bow	A string stretched from the mid-point of one end of the sleeper to the mid-point of the other end on the edge (narrow face), should not deviate from the centre line of this face by more than 4 mm per metre length of the sleeper or crossing.

## **Knots**

Both rail seats shall be free from knots of 25 mm diameter and wider. One tight sound knot of less than 25 mm diameter may be permitted at the rail seat. Tight sound knots up to 75 mm may be permitted away from the rail seat.

For crossings, sound knots are permitted provided that there is no more than one knot of up to 75 mm diameter per each metre of length.

## **End shakes**

The aggregate length of the longest shakes at each end of the sleeper shall not exceed 80 mm per metre length of the piece. Any single shake of length exceeding 160 mm per metre length of the sleeper shall be adequately clamped with an S-hook or other approved device.

## **Included phloem**

Sleepers containing included phloem which runs from one end of the sleeper to the other or from one face to the other and is less than 30° to the vertical, will be rejected. Strands of included phloem should not be numerous or grouped so as to materially affect the strength of the piece.

## Grade distinctions

Grading factors	Railway sleepers		Railway crossings	
	Select	Standard	Select	Standard
Sapwood	One wide face shall be free from sapwood. The other face may contain sapwood provided it does not exceed $\frac{1}{4}$ of the width of the sleeper at either the rail seat or $\frac{1}{2}$ the width elsewhere	Sound sapwood is admitted without limit. However the sapwood must be well impregnated.	One wide face shall be free from sapwood. The other face may contain sapwood provided it does not exceed in the aggregate $\frac{1}{3}$ of the width of the face or edge on which it occurs	Sound sapwood is admitted without limit.
Wane	One wide face shall be free from wane. The other side may contain wane provided it does not exceed $\frac{1}{4}$ of the width of the sleeper at either rail seat or $\frac{1}{2}$ the width elsewhere	Wane is permitted on only one of the wide faces and the width of the rail seat shall not be reduced by more than 25% due to the wane.	One wide face shall be free from wane. The other side may contain wane provided it does not exceed in the aggregate $\frac{1}{3}$ of the width of the face or edge on which it occurs	Wane shall not be present on both faces or exceed in the aggregate $\frac{1}{5}$ of the width of the face
Phloem	No phloem is allowed.	Phloem not stretching fully end to end or side to side	No phloem is allowed.	Phloem not stretching fully end to end or side to side
Side shakes	Maximum penetration of side shake measured at right angles to the length of the sleeper in any face or edge is 25 mm	Maximum penetration of side shake measured at right angles to the length of the sleeper in any face or edge is 50 mm	Maximum penetration of side shake measured at right angles to the length of the crossing in any face or edge is 25 mm	Maximum penetration of side shake measured at right angles to the length of the crossing in any face or edge is 50 mm

**Note:** The two most suitable sleeper and crossings timbers in Guyana are *Chlorocardium rodiaei* and *Mora gonggrijpii*. The Select grade is naturally durable. The Standard grade should be impregnated.

Rail seats shall be on the better face. However when wane is present on one face, they shall be on that face. Rail seat is defined as that portion of the sleeper lying on either side of the centre line of each rail, 580 mm wide for wide gauge, 560 mm wide for medium gauge and 150 mm for narrow gauge railways. The centre line of the rail will be taken as half the gauge + 50 mm from the centre line of the sleeper.



## GR08 Round transmission poles

Prime Select    PRIM SEL

### Purpose

For grading round transmission poles cut from sound living trees.

### Species

This specification is written for the species Wallaba (*Eperua spp.*) but may be used for other species by arrangement between customer and supplier.

### Manufacture

All poles shall be of first quality with bark and sapwood removed, and shall not show any sign of heart rot. They shall have uniform taper and be reasonably round and straight. The tip of the pole shall be roofed or pointed, while the butt shall be square to the length.

### Length tolerance

Up to 12 metres, + 150 mm

Over 12 metres, + 250 mm

### Straightness

A straight line from centre of the butt to centre of the tip shall be at no point less than one-tenth of the diameter of the pole from the near side at point of consideration.

### Permitted defects

Poles shall be generally free of defects, which significantly affect the strength of the pole, but the following shall be permitted:

Shake at butt	up to 380 mm long
Grub holes	slight and occasional
Sound knots	except in clusters and of a diameter not more than 25% of the diameter of the pole at a point where they occur
Spiral grains	half turn (180°) in 9 metres
Clean heart shakes	showing on surface of pole, aggregate length not more than 10% of length of pole
Season checks	moderate
Sapwood	occasional short surface streaks of sapwood are allowed, while patches of ingrown sapwood of maximum width or length not exceeding the diameter of the pole where they occur and not more than 6 mm in thickness shall be permitted in 10% of lot
Side spalls	not in excess of 6 mm in depth in 10% of the lot.

### Prohibited defects

Plugged defects and holes larger than 25 mm

Decay and rotten heart

Tight shake at tip longer than 75 mm

Compression failure and cross break

### Anti-shaketing devices

Nail plates or other approved anti-shaketing devices may be applied to butts and/or tips where shaketing is likely to occur.

### Grade distinctions

The minimum butt and tip diameters in millimetres for specified lengths are shown below:

Length in metres	Prime		Select	
	Diameter 1.5 m from butt	Diameter at tip	Diameter 1.5 m from butt	Diameter at tip
Under 9			180 – 240	120 – 180
9 - 12	180 – 300	140 – 240	200 – 280	120 – 220
12 – 15	220 – 360	180 – 260	260 – 360	180 – 220
15 – 18	300 – 400	220 – 300	300 – 380	200 – 280
over 18	340 – 420	220 – 300	320 – 400	200 – 280

## GR09 Telegraph and electric power cross-arms

Prime PRIM

### Purpose

For grading of sawn hardwood cross-arms manufactured for carrying telegraph wires or electric power lines.

### Manufacture

All cross-arms shall be free of pith and accurately produced from sound logs. Surface may either be sawn or dressed. All ends shall be cut square and oil painted.

### Ordering

Cross-arms may be ordered under these rules as a particular species or by class number.

### Sawing tolerance

Unless otherwise specified in the contract cross-arms shall be sawn with the following tolerance:

Dimensional	up to 75 mm nominal, + 6 mm, - 0 mm above 75 mm nominal, + 9 mm, - 3 mm
Length	+ 25 mm, - 0 mm
Dressed	less than 25 mm, - 6 mm above 25 mm, - 9 mm

A planing tolerance of  $\pm 3$  mm shall be allowed on these dimensions

### Defects

All cross-arms shall be generally free of such defects that may affect their strength.

Sapwood which is not treated by preservation	Not permitted except for <i>Chlorocardium rodiaei</i> which only allows 20% perimeter measurement
Sapwood treated by preservation	No limitation
Sloping grain	Generally grain should run parallel to the length; but a maximum of 50 mm deviation from parallel per metre of length is permitted
Knots	Sound, tight and inter-grown, not in cluster and up to 25 mm in diameter are permitted
End and surface checks	Moderate
Pin holes	Permitted if scattered
Compression failures	Not permitted
Heart shakes	Not permitted

## GR10 Fencing posts

Select SEL

### Purpose

For grading of machine or hand-shaped fencing posts of Wallaba (*Eperua spp.*).

### Manufacture

All fencing posts shall be generally round and shall have approximately the same diameter throughout their length with the ends cut square.

### Dimensions and tolerances

Unless otherwise specified in the contract the following dimensional and length tolerances shall apply:

1.8 to 3.0 m length and 80 to 120 mm diameter	+ 75 mm, - 0 mm allowance
3.0 to 5.5 m length and 120 to 150 mm diameter	+ 150 mm, - 0 mm allowance

### Straightness

A straight line drawn at the side of the post shall show a maximum deviation of:

1.8 to 3.0 m length	20 mm deviation
3.0 to 5.5 m length	25 mm deviation

### Permitted defects

All posts shall be generally free of defects that may significantly affect the strength of the post. The following shall be permitted:

Knots: loose, decayed or hollow	Permitted if the diameter does not exceed 40 mm
Knots: sound and ingrown	Permitted but only in 1/3 of the circumference of the post
End shakes	Permitted when maximum length at one end does not exceed 100 mm
Shakes	Permitted but not to extend throughout the length of the post
Sapwood	12 mm maximum thickness at both ends but not exceeding 1/3 of the circumference of the post
Grub Holes	Permitted if scattered
Pinholes	Permitted
Seasoning checks	Permitted

## **GR11 Shingles for roofing and panelling**

**Prime PRIM**

### **Purpose**

For grading machine and hand-made shingles made from Wallaba (*Eperua spp.*) for roofing and panelling purposes.

### **Manufacture**

All shingles shall be of sound wood, free of sapwood, generally flat, and free of holes, cracks and fissures which are likely to affect their serviceability. The ends shall be cut square and the sides shall be generally true to the length of the piece and parallel.

### **Dimensions and tolerances**

Unless otherwise specified the length of each shingle shall be 450 mm with a tolerance of + 25 mm, - 0 mm.

Unless specially ordered the widths of shingles shall be 100, 125, 150 or 175 mm with a cutting allowance of  $\pm 5$  mm.

The thickness of each shingle shall be 5 to 8 mm at the butt and 3 to 5 mm at the tip.

### **Packing**

Shingles shall be properly packed and securely bundled in sets of fifty. An additional amount of reject shingles shall be placed around the bundle to fully protect the shingles while in transit or under storage.

## **GR12 Fencing staves**

**Prime PRIM**

### **Purpose**

For grading hand and machine-made fencing staves made from Wallaba (*Eperua*) and other species that are intended to be used for fencing.

### **Manufacture**

All staves shall be of sound wood, free of sapwood, generally flat, and free of holes, cracks and fissures which are likely to affect the serviceability of the staves. The ends shall be cut square and the sides shall be generally true to the length of the piece and parallel.

### **Dimensions and tolerances**

Unless otherwise specified the length of each stave shall be 1.5 m with a tolerance of + 50 mm, - 0 mm.

Unless specially ordered the widths of staves shall be 75, 100, 125, 150, 175, 200 mm with a tolerance of  $\pm 5$  mm.

The thickness of each stave shall be not less than 5 mm and not more than 15 mm.

### **Packing**

Staves shall be properly packed and securely bundled in sets of not more than twenty-five. The bundle shall be well strapped at three places to fully protect the staves while in transit.

## **GR13 Hardwood logs**

<b>First peeler quality</b>	<b>FPQ</b>
<b>Superior sawmill quality</b>	<b>SUP</b>
<b>Standard sawmill quality</b>	<b>SSQ</b>
<b>Fair sawmill quality</b>	<b>FSQ</b>
<b>Small sawmill quality</b>	<b>SMSQ</b>
<b>Low quality</b>	<b>LQ</b>

### **Purpose**

For grading hardwood round logs

### **General requirements**

- Logs shall not have rotten knot
- The minimum radial sound shell must be at least 15 cm or 1/3 of the cross-section diameter of the log whichever is the larger
- Logs shall be fresh cut, straight with both ends well trimmed and representing a true circle.
- One or two shakes are permitted provided their aggregate length does not exceed 5% of the total length of the log.
- Trimmed buttress are permitted.

### **A. First peeler quality (FPQ)**

A first peeler grade suitable for back and face veneers

#### **Length**

Minimum of 6 metres

#### **Diameter**

60 cm or larger at mid girth of the log measured under bark

The diameter at the smaller end shall measure not less than 85% of the diameter measured at the larger end.

Straight-grained. Maximum deviation of the grain from straightness (spiral grain) shall not exceed 1 cm in every 5 metre length along the log projected into the plane.

Heart must be well centred and must be confined within 10% of the geometrical centre of the cross-sectional diameter of the log. This requirement applies to both ends of the log.

## **B. Superior sawmill quality (SSQ)**

A second peeler grade suitable for back, face and core veneers and also for good sawmill material

### **Length**

Minimum of 6 metres

### **Diameter**

60 cm or larger at mid-girth of the log measured under bark

The diameter at the smaller end shall measure not less than 80% of the diameter measured at the larger end

Straight-grained, maximum deviation of the grain from straightness (spiral grain) shall not exceed 1 cm in every 1 metre length along the log projected into the plane.

Heart must be well centred and must be confined within 10% of the geometrical centre of the cross-sectional diameter of the log. This requirement applies to both ends of the log.

### **Allowable defects**

The following additional defect may be permitted for this grade:

- One or two shakes where aggregate length does not exceed 5% of the total length of the log
- One sound knot that does not exceed 15% of the average log diameter for every 5 metre length along the log
- Concentration of pinholes of 15 to 20 within 144 cm<sup>2</sup> within the total of the log surface
- One or two shakes where aggregate length does not exceed 5% of the length of the log.
- Simple curvature where the deviation of the longitudinal axis of the log from a straight line at the deepest point is up to 20% of the log diameter.

## **C. Standard sawmill quality (SSQ)**

A third peeler grade that is suitable for back, face and core veneers and also for sawmill conversion.

### **Length**

Minimum of 4.6 metres

### **Diameter**

60 cm or larger at mid girth of the log measured under bark



The diameter at the smaller end shall measure not less than 75% of the diameter measured at the larger end

Straight-grained, maximum deviation of the grain from straightness (spiral grain) shall not exceed 1 cm on every 90 cm length along the log projected into the plane.

Heart must be well centred and must be confined within 15% of geometrical centre of the cross-sectional diameter of the log and must be corresponding on both ends.

### **Allowable defects**

The following additional defect may be permitted

- One or two shakes where aggregate length does not exceed 5% of the total length of the log.
- One sound knot that does not exceed 20% of the average log diameter for every 5 metres length along the log.
- Up to 50 shotholes for every 3 m log length scattered over the surface of the log but not extending beyond the sapwood.
- Shakes at one or both ends of the log where aggregate length is over 5% and up to 15% of the length of the log.
- Simple curvature where the deviation of the longitudinal axis of the log from a straight line at the deepest point is 20 to 30% of the average log diameter
- Heartwood rot or hollow on the butt end only, and not exceeding 10% of the cross-sectional area of the log.

### **D. Fair sawmill quality (FSQ)**

A fourth peeler grade suitable for sawmill conversion and core veneer use.

#### **Length**

Minimum of 4.6 metres

#### **Diameter**

50 cm or larger at mid girth of the log measured under bark

The diameter at the smaller end shall measure not less than 70% of the diameter measured at the larger end.

Straight-grained, maximum deviation of the grain from straightness (spiral grain) shall not exceed 1 cm on every 90 cm length along the log projected into the plane.

Heart must be well centred and must be confined within 20% of geometrical centre of the cross-sectional diameter of the log and must be corresponding on both ends.

### **Allowable defects**

The following additional defects may be permitted:

- One or two shakes where aggregate length does not exceed 5% of the total length of the log.
- One sound knot that does not exceed 50% of the average log diameter for every 5 metres length along the log
- Up to 50 shotholes for every 3 m log length scattered over the surface of the log but not extending beyond the sapwood.
- Shakes at one or both ends of the log where aggregate length is over 15 to 40% of the length of the log.
- Simple curvature or compound curvature (two crooks) where the deviation of the longitudinal axis of the log from a straight line at the deepest point is over 30 to 40% of the average log diameter, provided that the first curvature must reach a length of 3.5 metres.
- Heartwood rot or hollow on one or both ends, and over 10 to 20% of the cross-sectional area of the log.

#### **E. Small sawmill quality (SMSQ)**

A grade that includes all small and super small logs. The upper portion of larger trees may also be graded under this class.

##### **Length**

Minimum of 4.6 metres

##### **Diameter**

Forty centimetres or larger at mid girth of the log measured under bark.

Logs need not be fresh cut, but must be free from decay and fungal attack except for the allowance given below.

The diameter at the smaller end shall measure not less than 70% of the diameter measured at the larger end

Straight-grained, maximum deviation of the grain from straightness (spiral grain) shall not exceed 1 cm on every 20 cm length along the log projected into the plane.

Heart must be well centred and must be confined within 60% of geometrical centre of the cross-sectional diameter of the log and must be corresponding on both ends.

##### **Allowable defects**

The following additional defects may be permitted:

- One or two shakes where aggregate length does not exceed 5% of the total length of the log.

- One sound knot that does not exceed 20% of the average log diameter for every 5 metres length along the log
- Up to 50 shotholes for every 3 m log length scattered over the surface of the log but not extending beyond the sapwood.
- Shakes at one or both ends of the log whose aggregate length is over 15% and up to 40% of the length of the log.
- Simple curvature or compound curvature where the deviation of the longitudinal axis of the log from a straight line at the deepest point is over 30% to 40% of the average log diameter, provided that the first curvature must reach a length of 3.5 metres.
- Heartwood rot or hollow on one or both ends, and over not more than 20% of the cross-sectional area of the log.

#### **F. Low quality (LQ)**

Includes all logs which have the required length and diameter but with excessive defects that disqualifies them from any of the above grades. They are only suitable for sawmilling and the conversion is expected to be low. Most large hollow logs can be categorised under this grade.

##### **Length**

Minimum of 4.6 metres

##### **Diameter**

35 cm or larger at mid-girth of the log measured under bark.

Logs with the defects described above are permitted provided the average minimum radial sound shell must reach 15 cm or 1/3 of the cross-sectional diameter of the log, whichever is the larger.

### 3. Definitions

**Average length or width**

For a parcel of timber the simple average length or width of the timber in the parcel is calculated by dividing the sum of the nominal lengths of the pieces by the number of pieces to give the average length or by dividing the sum of the nominal widths of the pieces by the number of pieces to give the average width

**Board foot**

A unit of timber measurement equivalent in volume to a piece having nominal dimensions of one foot (length) by twelve inches (width) one inch (thickness). This unit is abbreviated to FBM (feet board measure) or simply BM. In this rule measurements are made using metric units

**Borer holes**

A defect caused by insects which tunnel in the wood. Insect damage may occur in the living tree or shortly after felling while it is green. Usually caused by *Ambrosia* or pinhole borers and *Bostrychid* borers or after seasoning by *Lyctus* borers, termites, etc. In these rules borer attack is graded under three headings:

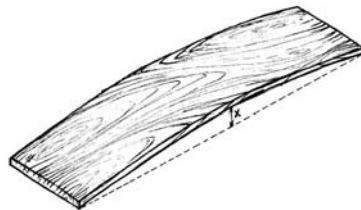
- pinhole borer: holes up to 3 mm diameter with or without associated staining
- grub holes: holes 6 mm and larger
- *Lyctus* borer: holes about 2 mm diameter and associated with destruction of the sapwood timber by the borer

Unless severely clustered so as to weaken the timber, pinhole and grub hole borer affects appearance only and can be tolerated in some grades, especially structural. *Lyctus* attack usually leads to destruction of the sapwood and is not permitted in any grade except in some framing grades where the amount of *Lyctus* susceptible sapwood is strictly limited

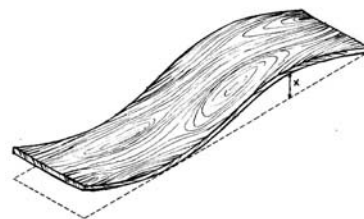
**Bow**

Curvature along the length on the wide face of lumber usually resulting from stress in the log. Measured as the greatest deviation of the surface of a piece from a projection of the flat surface. Allowable limits for bow are expressed as millimetres of offset per metre of length

Simple bow

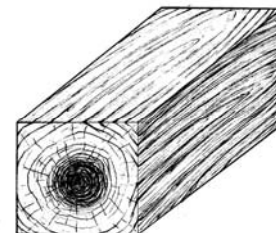


Compound bow



**Boxed heart**

A term used when the heart is enclosed within the four surfaces of a hewn or sawn timber through its entire length and reasonably well centred at both ends

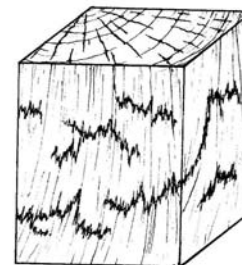


**Brittle heart** The wood in the zone adjacent to the pith, usually about 100 mm diameter which in an old tree may become brittle and decayed. Wood with brittle heart may often appear normal but will exhibit abrupt failure rather than splintering when broken under load; c.f. heart, heartwood

**Clear** Free of all visual defects, sound

**Close stacked** Lumber that is stacked solid without stickers. Also called block stacked

**Compression failures** Fractures in the grain of timber running transversely to the grain, often at approximately 45 degrees. They are the result of failure of the timber under severe compression stresses. These compression stresses may result from growth stresses induced in the living tree that place the centre of the tree under severe compression and the outer zone under tension. This type of failure may be found towards the pith in older trees. Compression failure may also be the result of severe stresses caused by wind or when the falling tree hits the ground. These failures are found in the outer zones of the tree. Compression failures may be only visible when the timber is dressed. This defect is not permitted in structural grades



**Cubic foot** The volume of timber equivalent to a cube with sides measuring 1 foot in length, and is equal to 12 board feet or  $0.028 \text{ m}^3$

**Cubic metre** The volume of timber equivalent to a cube with sides measuring 1 metre in length. The standard of timber measurement under the metric system. Equals 424 FBM

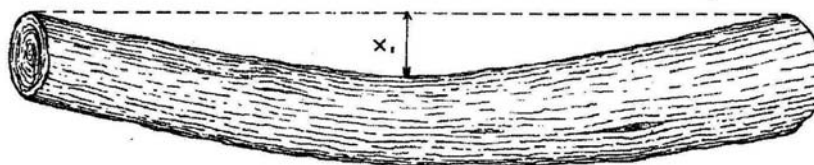
**Cup, cupping** Curvature in a piece of timber across the grain after sawing. Usually caused by drying stresses. Cup is measured as the greatest deviation from a straight line across the width of the piece, expressed in millimetres or as fractions of the width



**Curvature** Deviation of the longitudinal section of the log from a straight line. Curvature is normally expressed as a percentage of the log diameter. Also referred to as bend.

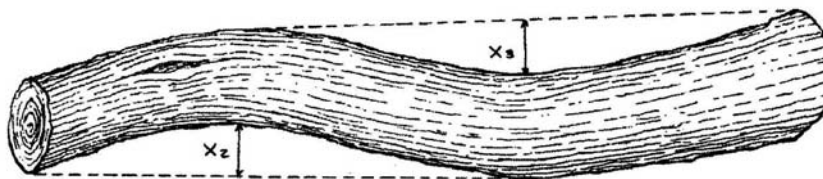
**Simple curvature** Bend of the log characterised by one crook only. Measured as the deviation of the longitudinal axis from a straight line

Simple curvature



**Compound curvature** Bend of the log characterised by two or more crooks in one or several planes. Each bend or curvature is assessed separately

Compound curvature

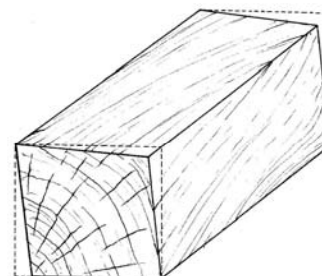


**Cylindrical log** Perfect round log where both ends represent a true circle. The standard is rarely achieved. Roundness is determined by measuring the largest diameter and the diameter at right angles to it and is expressed by the lesser diameter as a percentage of the greater diameter

**Defect** Any feature whether occurring in the living tree naturally or produced in the process of conversion of lumber that affects the appearance or utility of sawntimber. Defect is the basis of the GTGR, which permits the sorting of hardwood timbers into groups and grades with definite end uses. The permitted incidence of the several types of defects in the various grades is defined in the rules

**Degrade** Occurs through poor storage, transport or handling when additional defects are developed in timber which would not have been permitted during initial grading

**Diamonding** A form of warp resulting from greater tangential than radial shrinkage that may cause a piece of green timber cut square or rectangular in cross-section to become diamond shaped. Occurs when the rays of the timber are not parallel to the face or edge of the piece and is severe when the rays are at 45 degrees to these faces and the timber species has a high differential between its radial and tangential shrinkage. In most species this ratio is about 1.5 to 2.0



**Dressed timber** Timber, which has been planed to remove the marks of sawing on one or more faces. It is also called surfaced timber. Often abbreviated S1S (surfaced one side) up to S4S (surfaced 4 sides) and D1S (dressed one side), D1S1E (dressed one side and one edge), etc. up to DAR (dressed all round)

**Equilibrium moisture content** The moisture content eventually attained in wood exposed to a given level of relative humidity (RH) and temperature. Since relative humidity is constantly changing the equilibrium moisture content (EMC) of timber also changes. In Georgetown EMC ranges from 12 to 16%. EMC in fully air conditioned buildings is usually 9 to 12% and calls for special care in seasoning timber for these situations

**Faces** Longitudinal surfaces representing the width or wide surface of rectangular sawn stock; c.f. edges

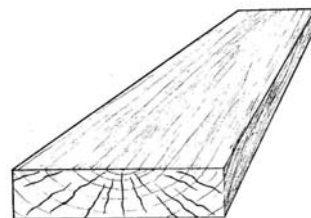
**Better face** Is the face having the superior appearance in visual grading

**Worse face** Is the face having the inferior appearance in visual grading

**Flat crack** A simple form of star shake consisting of a single shake lying along a diameter of the log. See shake

**Flat sawn (backsawn)**

Timber sawn so that the wide face is generally parallel to the growth rings and at an angle to the rays of the timber. The extreme limit of flat sawn stock is when the rays make an angle of 45 degrees to the faces



**Full sawn**

When timber is cut so that its true measured size is greater than the nominal or ordered size. Usually done to allow for shrinkage of width and thickness during seasoning, c.f. tolerance

**Gum vein, gum pocket**

Gum is a resin-like substance produced as a normal growth process by most trees, and may be dispersed through the wood or accumulated in veins, pockets or cavities. In some species this may become noticeable after seasoning

**Hardwoods**

A term used to describe all timbers of the broad-leafed tree species. The structure of hardwood timber is different (fibres and vessels) to that of the softwoods (tracheids). The forests of Guyana consist of tropical hardwoods

**Heart**

The central portion of the cross-section of a log immediately surrounding the pith. In older trees this area may be defective due to decay or excessive brittleness. See brittle heart, heartwood, boxed heart, sound heart

**Heartwood**

The inner part of the tree beneath the sapwood where the cells are no longer taking part in the growth process of the tree. Usually darker than sapwood in colour due to pigment deposits in the vessels, which also increases resistance to insect and fungal attack

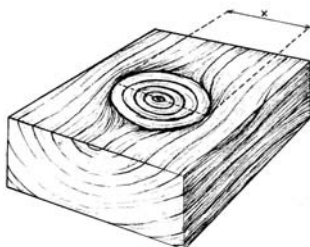
**Hewn timber**

Timber which has been squared from a log by an axe or adze rather than by sawing. Often used for heavy engineering timbers

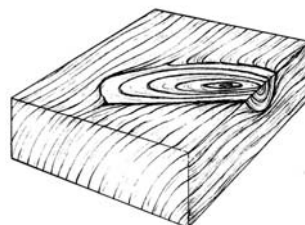
**Knot**

Portions of branches embedded in the wood. Knots are categorised by their position in the piece, mutual position, and degree of inter-growth or condition of the wood. When the log is sawn the knots appear as transverse round or oval sections (round knots) in the wide face of flat sawn timber or as longitudinal sections (spike knots) in the wide face of quarter sawn timber. Knots as defects are measured as their width across the face on which they occur whether round or spike. The size of a knot is measured from the point where the fibres of the wood forming the knot terminate, often at a fine line of bark tissue. Any area of dark heartwood surrounding the knot is ignored, as it is not part of the knot itself.

Round knot

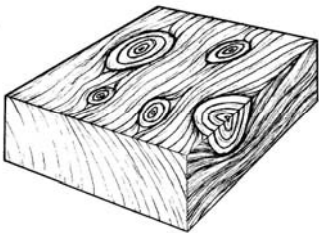
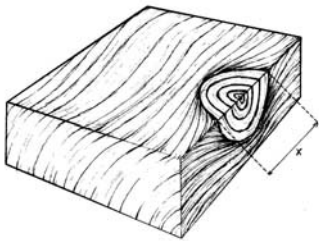
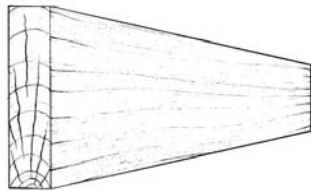


Spike knot



**Scattered knots**

Knots located separately so that the distance between them in longitudinal direction of the piece is greater than their width, or in cases where the width exceeds 150 mm, are greater than 150 mm apart

<b>Group (cluster) knots</b>	Round, oval and <i>arris</i> knots forming a group of two or more knots in an area where the length is equal to the width, or in case where the width exceeds 150 mm, in an area 150 mm long. They are measured by the sum of the sizes of all knots. Each round or oval knot is measured by the minimum diameter of the knot cross-section while <i>arris</i> knots are measured by the extension of the knot on the <i>arris</i>	
<b>Arri knots</b>	Knots exposed on the <i>arris</i> . Measured as the length of the knot along the <i>arris</i>	
<b>Dead knots</b>	Knots with their annual rings not inter-grown with the surrounding wood, or inter-grown with it only to a length $\frac{1}{4}$ or less of the cross-sectional perimeter of the knot	
<b>Hollow knot or knothole</b>	Where the section of the knot produced in sawmilling has fallen out or decayed to leave a hole	
<b>Rotten knot</b>	Knots in which more than $\frac{1}{3}$ of the cross-section is rotten	
<b>Sound knot</b>	Knots showing no indication of decay	
<b>Unsound knot</b>	Knots in which not more than $\frac{1}{3}$ of the cross section is rotten	
<b>Moisture content</b>	The amount of water wood contains expressed as a percentage of its oven dry weight. Green timber freshly sawn may contain 70 to 100% moisture, shipping dry timber 20 to 30% and air seasoned timber about 12 to 16%. For furniture and joinery products most timber will need to be kiln dried to a final moisture content of between 9 and 12% depending on ambient conditions	
<b>Pipe</b>	Hollowness in a log or timber along the centre of the heart following the pith and caused usually by attack of subterranean termites on the standing tree	
<b>Pith</b>	The spongy central core 3 to 6 mm diameter in the exact growth centre of the log section. Pith is the remains of the growing tip of the tree	
<b>Punk, punky heart</b>	Unsound decayed wood usually part of the heart of the log. Also called fireheart	
<b>Quarter sawn</b>	The opposite to flat or backsawn. Sawnwood cut so that its width is substantially parallel with the rays of the timber. Pieces are considered quarter sawn under these rules when the rays make an angle of not more than 45 degrees to the wide face; c.f. flat sawn	
<b>Radial direction</b>	The direction measured from the pith along a radius of the cross section of log or tree stem; c.f. tangential direction	

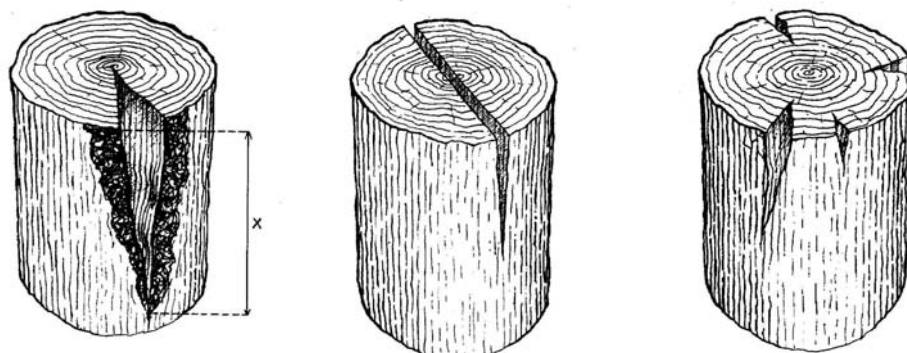


<b>Sapwood</b>	The outer layer of wood in a tree stem adjacent to the bark and playing an active part in the growth process of the tree (alburnum). Sound sapwood is as strong as heartwood and is normally included in sawn wood. The sapwood of some species is subject to <i>Lyctus</i> Borer attack and may become discoloured due to staining fungi. Under the GTGR sound sapwood, not <i>Lyctus</i> susceptible, is admitted in all grades unless excluded by special arrangement
<b>Sawn timber (lumber)</b>	Timber usually of rectangular cross section and cut square at each end produced in a sawmill from logs
<b>Scale</b>	Closely spaced small shakes giving the face of sawn or dressed lumber a scaly appearance (see shake)
<b>Scant (sawn)</b>	Timbers which when graded measure less by at least half of the cutting allowance in the nominal dimension. Normally such a scant causes rejection by the GTGR unless subject to special conditions agreed with the customer
<b>Scantlings</b>	Sawn timber more than 25 mm thick and 75 mm wide of end section and less than about 280 square centimetres. Usually intended for use in construction and building work
<b>Seasoning</b>	The process of drying wood to the point where the moisture content is sufficiently low to enable its product to be used satisfactorily in service without degrade
<b>Seasoning checks</b>	Separations of wood cells along the grain as a result of uneven shrinkage, most common on end-grain surfaces of timber
<b>Shake</b>	Separation of the wood fibres along the grain. In the case of a log, shakes are broadly divided by their position in the log: end shake and side shake. In the case of sawn lumber, shakes are divided by their type, their position in the piece, and their depth
<b>Log shakes</b>	Measured as the length in centimetres along the longitudinal axis of the log

Side shake

Through shake

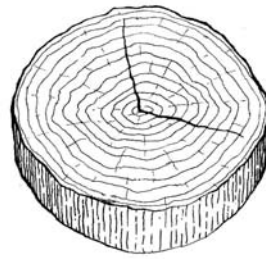
Drying shake



Single heart shake



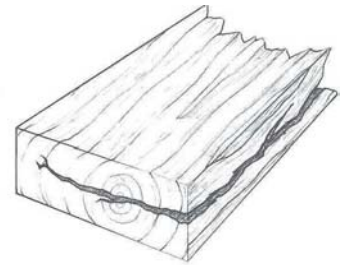
Compound heart shake



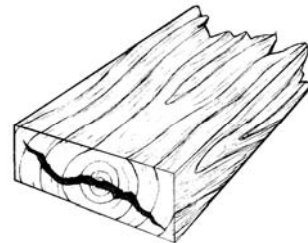
**Cup shake** Ring shake c.f., extending for less than half a diameter

**Deep shakes** Shakes deeper than 5 mm for pieces of not more than 50 mm in thickness, and those deeper than 1/10 of the thickness in the thicker pieces, but not appearing on the other side of the piece

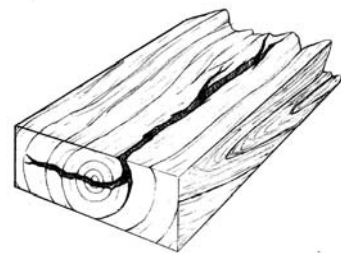
**Edge shakes** Shakes appearing on an edge but which may also appear on the ends. They are measured by their maximum penetration (in millimetres or as fractions of the thickness or width of the piece) and by their length (in centimetres or as fractions of the length of the piece)



**End shakes** Shakes appearing on an end but not appearing on the faces or on the edges. They are measured on the end by their length in millimetres or on that side of the piece where their projection is greater as a fraction of the width. If it is an end-ring shake forming less than half a circle, it is measured by the chord. Those forming half a circle and more are measured by the diameter

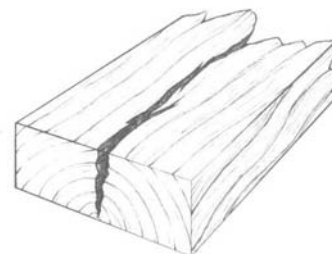


**Face shake** Shakes appearing on a face but which may also appear on the ends

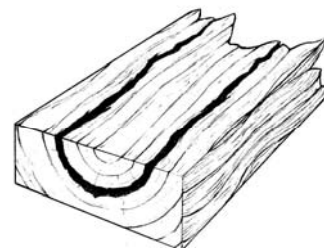


**Frost cracks** Radial-directed shakes extending from the sapwood to the heartwood and characterised by a considerable extension lengthwise along the piece. They are developed in the standing tree and are accompanied by a darkening of the adjoining wood and by local curvatures in the annual rings

**Heart shake** Radial shade extending from the heart and characterised by a considerable extension lengthwise along the piece



**Ring shakes** A separation of wood structure parallel to the growth rings, often in the first layer(s) of earlywood, usually occurring in the standing tree and characterised by a considerable extension lengthwise along the piece. Also known as ring failure, shell shake

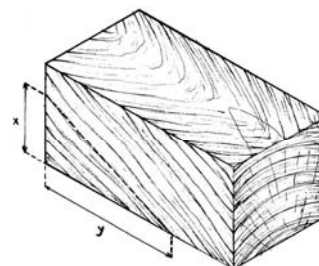


**Shallow shakes** Shakes no deeper than 5 mm for pieces of not less than 50 mm in thickness or not deeper than 1/10 of the thickness in the thicker pieces but not appearing on the other side of the piece

**Through shakes** Shakes appearing on two sides, or twice on one side of the piece in the case of ring shakes

**Shorts** Pieces of sawn timber less than 2.4 m long

**Sloping grain** Divergence of grain from the direction of the longitudinal axis of the piece. Sloping grains are measured in the most characteristic place of the grain over a length of not less than double the width of the piece. The value of the deviation of grain (without taking into consideration local deviations) is measured and expressed as a percentage. Sloping grain affects the strength of a piece of timber and must be limited in timber intended for engineering use

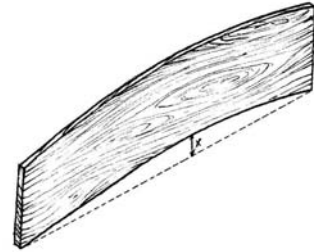


**Interlocked grain** Repeated alternation of left and right-hand spiral grain, each reversal usually distributed over several growth rings. Interlocked grain has no serious effect on strength but makes the timber difficult to split and may produce an attractive ribbon stripe figure in the timber on quarter sawn faces. It should not be confused with sloping grain

**Sound heart** When the wood surrounding the pith of the log is free of decay, severe shakes and is otherwise sound it is described as sound-heart and lumber sawn to include it is said to include sound-heart; c.f. heart

**Spall** A shake, which is running along the grain mainly from the face or side of sawn or hewn timbers. It is a fault arising during manufacture

**Spring** Curvature along the length of the edge of a board. Also called crook and side-bend. Limits for spring are given in the grading rules as millimetres of offset per metre of length. As for bow, allowable offset increases as the square of the length. Thus 25 mm deviation from the flat plain in a 3.5 m length becomes equivalent to 100 mm deviation in a 7 m length



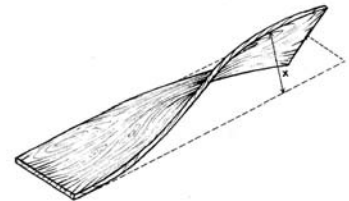
**Stickers** The strips of wood placed at regular intervals between each layer of timber when it is stacked for seasoning to permit free circulation of air.

**Tangential direction** The direction in a cross-section of a piece of timber at right angles to the medullary rays and parallel to the growth rings where they are present

**Tolerance** A portion of the length, width or thickness of log or timber provided to maintain its nominal length as specified in a standard. Usually given as a plus and minus amount.

For example, sawnwood of size 2.5 m  $\pm$  25 mm, would be acceptable as long as it measures 2.5 m plus an additional allowance of between 0 and 25 mm (between 2.50 m and 2.75 m). If the order is written as 2.5 m + 10 mm, - 8 mm, the timber would be accepted when the allowance is between (10 - 8 =) 2 mm and 10 mm, i.e. as long as it measures between 2.52 m and 2.60 m

**Twist** A form of warp in which the four corners of a flat surface (board) are no longer in the same plane. Twist is measured as the greatest deviation of the surface of a piece from the plane surface in millimetres or as fractions of the length of the piece



**Undressed timber** Sawn timber which has not been smoothed by planing to a regular dimension

**Wane** The lack of wood on any face or edge of sawn wood due to it being sawn too close to the surface of the log. Bark may or may not be present. Incidence of wane is limited in the GTGR. Wane is measured by the maximum difference between the width of the corresponding sides of the piece in millimetres or as fraction of the width of the corresponding sides; c.f. want

