

GRADING OF LOGS

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Prepared and presented
by

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1 OBJECTIVES – At the end of the discussion, participants should be able to:

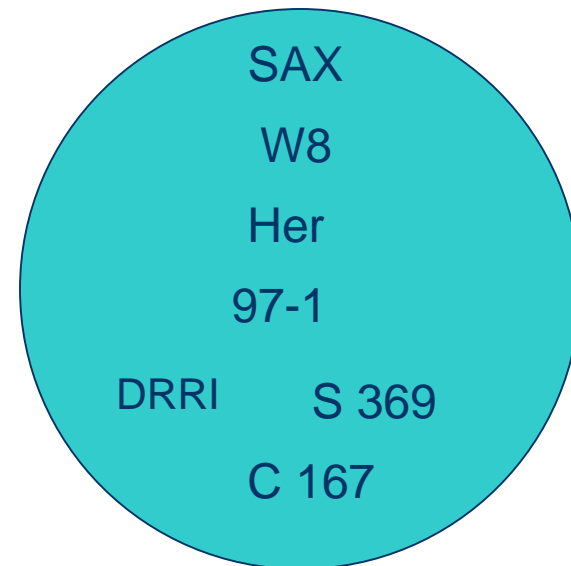
1. Correctly measure log parameters and compute log volume.
2. Learn about various defects and be able to assess and evaluate them
3. Identify defects and award commensurate penalties points
4. Correctly classify logs based on inherent defects
5. Understand and apply the log standard and grading rules.
6. Achieve common understanding, interpretation of the rules and classification of logs by all staff
7. Inspect and grade logs with minimum subjectivity
8. Enhanced confidence of graders and stakeholders in log grading
9. Minimize re-grading in mills
10. Minimize disputes related to log grades

Marking of logs

- Mark each log at both ends with white waterproof paint or deep cutting scribe with the following:

Locality Mark, Property Mark, Specie, Stock Number, Tree Number, Log Number, Compartment No., Reserve Code.

Letters and figures comprising marks made shall be not less than 2½" high and ½" wide Section 6(1) to (4), Trees and Timber Decree, 1974 NRCD 273



2 Measurement and Volume calculation

2.1 Measurement of Diameter

Measure the smallest diameter under bark through the centre of the log at the butt (large) end, d_{b1}

Measure a second diameter perpendicular to the first at the same butt end, d_{b2} . Find the average diameter at the butt end, d_b to the nearest lower centimeter.

Take the same measurements, d_{t1} and d_{t2} at the taper (smaller) end of the log and find the average taper end diameter, d_t to the nearest lower centimeter.

2.2 Measurement and calculation of diameter

- $D_{b1} = 83.0 \text{ cm}$
- $D_{b2} = 86.0 \text{ cm}$
- $D_b = (83+86)/2 = 84.5\text{cm}$ Neglect the fraction and record as 84.0 cm

- $D_{t1} = 65.0 \text{ cm}$
- $D_{t2} = 68.0 \text{ cm}$
- $D_t = (66+69)/2 = 67.5\text{cm}$ Record as 67.0 cm

- Average diameter both ends is
 $(D_b + D_t)/2 = (84+67)/2 = 75.5 \text{ cm}$ Record as 75cm

2.3 Measurement of log length

Measure length in meters as the shortest distance between the top and bottom ends of the log to the nearest lower 10cm

	Actual reading	Recorded Log Length
a)	8.11 to 8.19m	8.10m
b)	7.71 to 7.79m	7.70m
c)	10.31 to 10.39m	10.30m

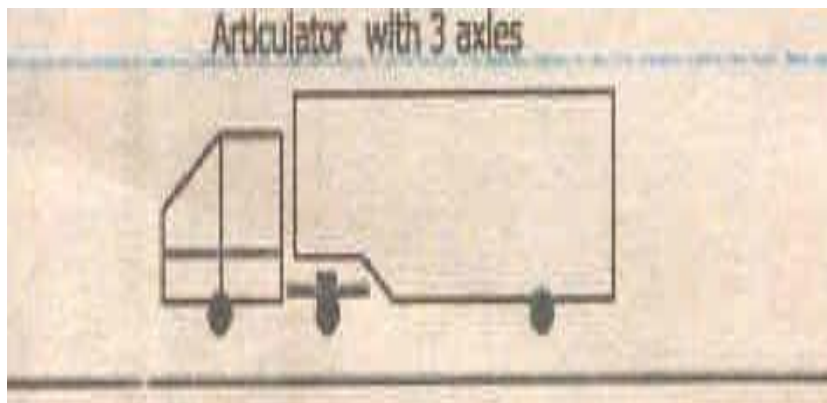
2.4 Determination of log volume

⇒ Volume is calculated from the Smalian's formula:

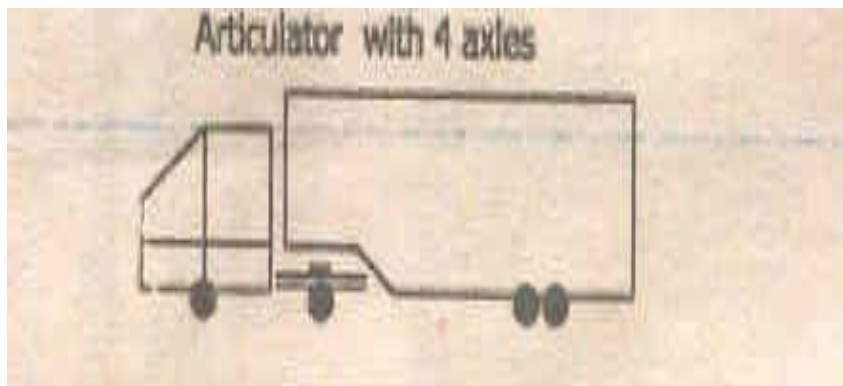
$$V = 0.098L[(d_{b1} + d_{b2})^2] + [(d_{t1} + d_{t2})^2] \times 10^{-4}$$

⇒ Alternatively, knowing d_b , d_t and L , the Tree Bole and Log Volume Ready Reckoner can be used to determine the volume without any rigorous calculations.

Allowable gross weight of timber trucks on trunk roads



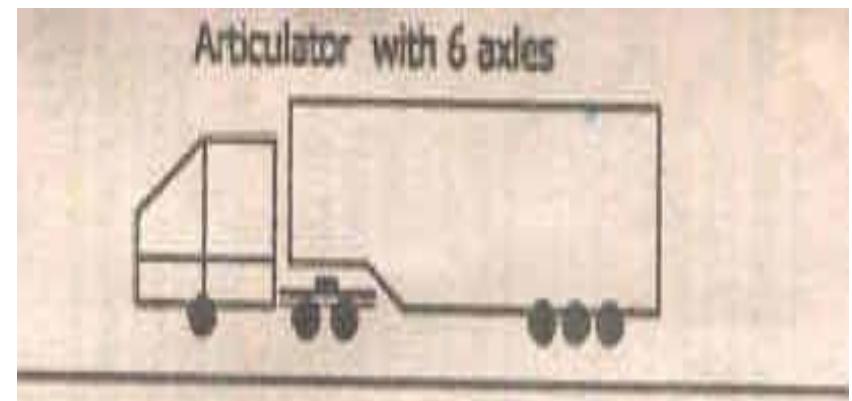
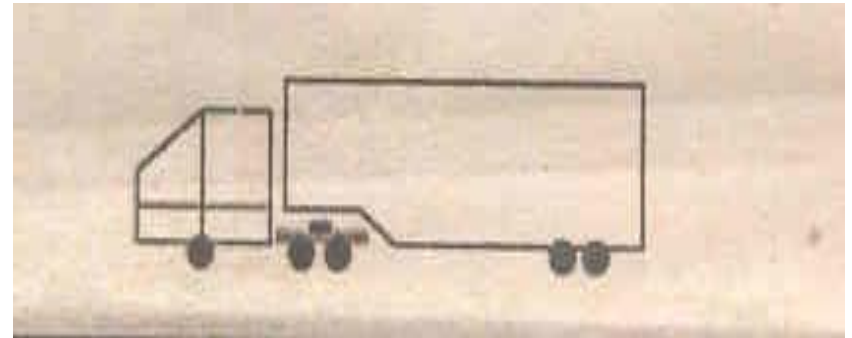
- Articulated truck with 3 axles
- Gross weight 30 tons



- Articulated truck with four axles
- Gross weight 38 tons

Allowable gross weight of timber trucks on trunk roads

- Articulated truck with 5 axles
 - Gross weight 46 tons
-
- Articulated truck with 6 axles
 - Gross weight 51 tons



3.0 DEFECTS IN LOGS

Defects will be discussed under 3 headings in relation to:

PART 1 SHAPE

PART 2 KNOTS, SHAKES, GRAIN ..

PART 3 DETERIORATIONS

PART ONE - SHAPE

- 1.1 Conicity Fig 1
- 1.2 Bend or Curve Fig 2 and 3
- 1.3 Flattened Section Fig 4
- 1.4 Buttress Fig 5 and 6
- 1.5 Humps Fig 7 and 8

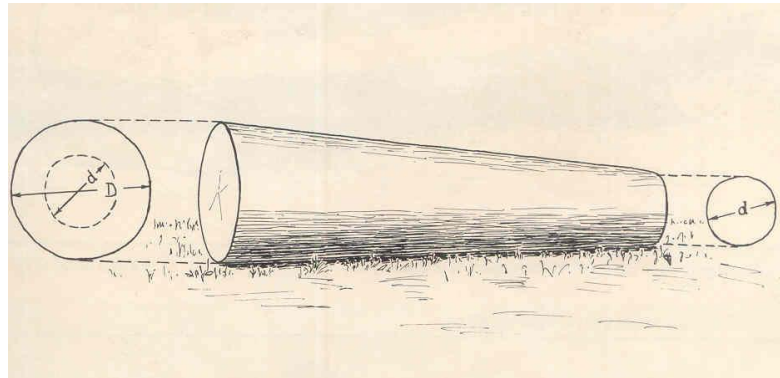
PART TWO - KNOTS, SHAKES, GRAIN

- 2.1 Knots and Knobs
- 2.2 In bark, galls, blister grain, thorns
- 2.3 Splits, cracks, breaks
- 2.4 Cup shakes, Ring shakes
- 2.5 Abnormal heart
- 2.6 Spiral grain, Entangled grain

PART THREE - DETERIORATIONS

- 3.1 Pinholes, shot holes,
- 3.2 Grub holes, Teredo holes
- 3.3 Heart decay
- 3.4 Discoloration

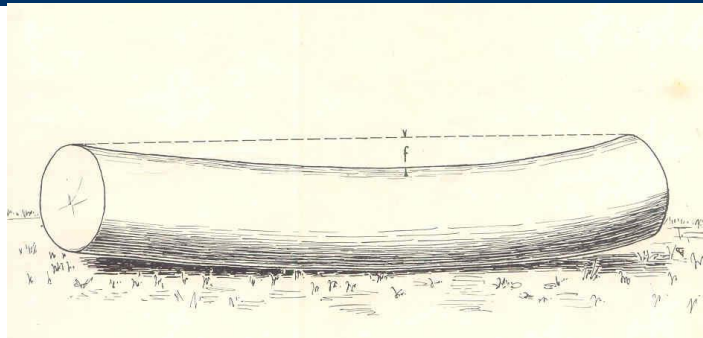
1.1 CONICITY – $(D_b - D_t)/L \times 100\%$



Penalty points

- Up to 3% regarded as normal 0
- Over 3% (grader's appreciation) ... 1 to 4

1.2 CURVE/BEND $\geq L/2$ Fig 2



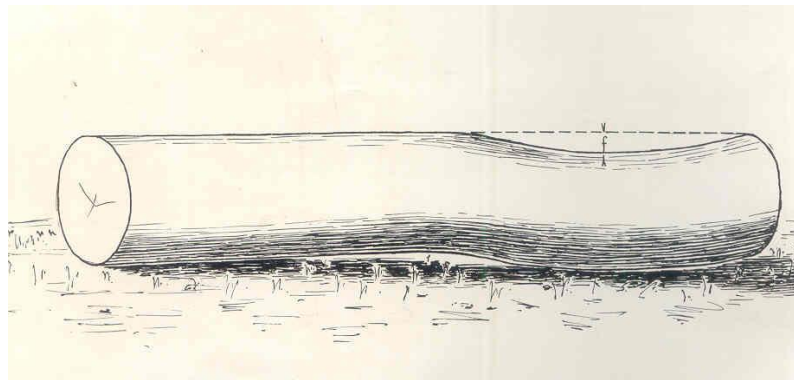
For lengths up to 8m log length
Dip in % curved length

Between 2 and 5%
Between 5 and 8%
Over 8%

Penalty point
Curved part in %
overall length

$\geq L/2$	$< L/2$
2	2
3	4
5	

1.2 CURVE/BEND < L/2 Fig 3



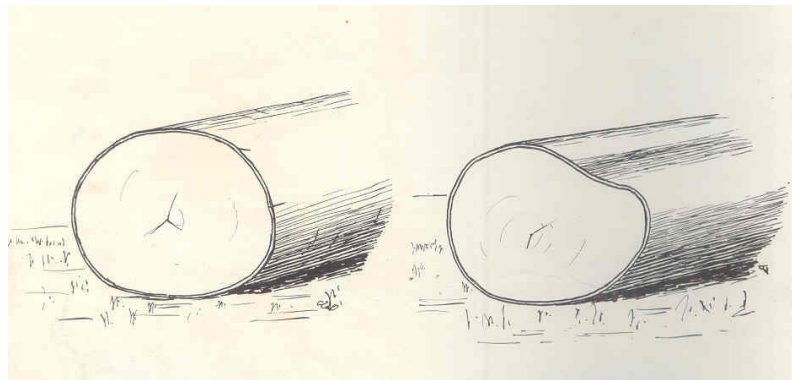
For lengths up to 8m log length
Dip in % curved length

Between 2 and 5%
Between 5 and 8%
Over 8%

Penalty point
Curved part in %
overall length

$\geq L/2$	$< L/2$
2	2
3	4
5	

1.3 FLATTENED SECTION Fig 4

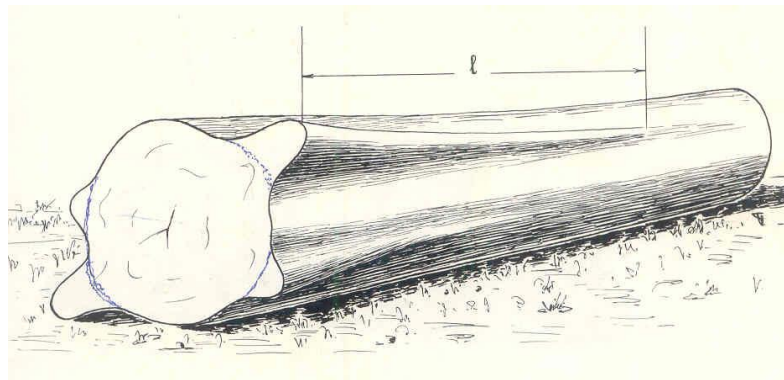


Penalties

Subject to grader's appreciation of
seriousness

0 to 3

1.4 Buttress Figs 5 and 6



- Up to 30% log length
- Over 30 and up to 60% log length
- Over 60% log length

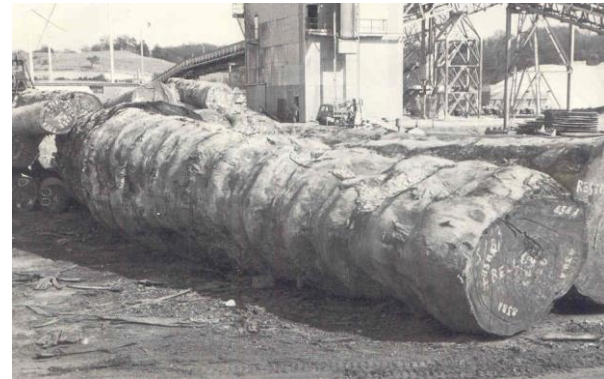
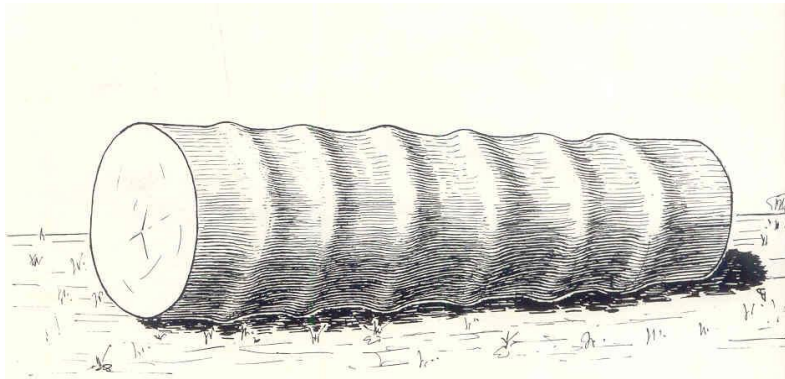
Penalty

1 to 2

3 to 5

6 to 7

1.5 Humps Fig 7



- Up to 30% overall surface
- Between 30 to 60% overall surface
- Over 60% overall surface

Penalty

1 to 2

3 to 5

6 to 7

END OF PART ONE - SHAPE RELATED DEFECTS

THANK YOU
FOR YOUR
ATTENTION

