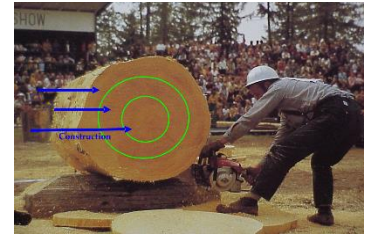


CFLA Sujikai, Neda, Moya, and Hashira

Lesson 15

I. General Information

- Usage:** Lumber containing large knots.
- Stress Grades:** Specify minimum requirements and maximum characteristics.
- CFLA Grading Rule:** Prohibits combinations that reduce strength.



II. CFLA Overview

- a) **Responsibility:** Coast Forest Lumber Association (CFLA) for E120 grades of Canadian coastal lumber (HEM-FIR).
- b) **Grade Application:** Cross-sectional size, form, condition, seasoning, and other characteristics.
- c) **Inspection:** Evaluated and stamped by a grader at the time of inspection.

III. Product Sizes

- a) **Rectangular Cross Sections:**
- i. **Sujikai:** 45 mm x 90 mm.
 - ii. **Neda:** 45 mm x 105 mm.

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IV. Traditional Japanese Uses

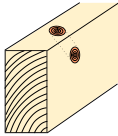
- Sujikai:** Diagonal bracing for structural integrity, especially in earthquake-prone regions.
- Neda:** Wooden floor joists for structural support and aesthetic quality.

V. Kobe Earthquake Impact

- a) **Date:** January 17, 1995.
- b) **Magnitude:** 7.3.
- c) **Damage:** Significant infrastructure damage, leading to changes in building codes and disaster preparedness.



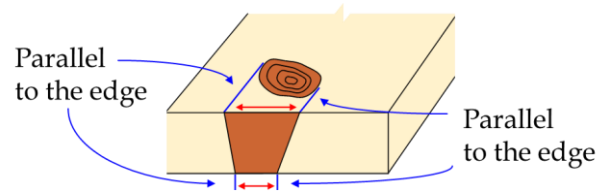
VI. Grading Considerations



- a) **Strength:** Characteristics affecting tensile and compressive strength are strictly controlled.
- b) **Evaluation:** All four faces and both ends must be evaluated.

VII. Knot Evaluation

- a) **Measurement:** Size, quality, form, and shape of knots.
- b) **Knot Area Ratio (KAR):** Measured for size or displacement value.
- c) **Three-Face Knots:** Transform to two-face-round-knots using the same protocols as NLGA Light Framing.



VIII. Additional Characteristics

- a) **E-120:**
 - i. Lumber is "green" at the time of surfacing.
- b) **F-330:**
 - i. Kiln dried lumber.
- c) **Wane Allowance:**
 - i. Up to 10% of any face, full length or equivalent, not exceeding 25% of any face up to 1/4 length.
- d) **Shake:**
 - i. Not through shake limited to 1/4 length, through shake limited to 1/6 length.
- e) **Slope of Grain:**
 - i. Restricted to 1 in 8.
- f) **Pin Holes:**
 - i. 15 per square foot, up to 30 per square foot if high quality.

g) **Grub/Teredo Holes:**

- i. 6 per lineal foot, no concentrations.

h) **Skips:**

- i. Hit and Miss skips of 1.5mm x 4'.

i) **Splits:**

- i. Based on nominal width, measured as average length on both faces.

j) **Sapstain:**

- i. 100% light sapstain allowed.

k) **Honeycomb and Unsound Wood:**

- i. Strictly prohibited.

l) **Rate of Growth:**

- i. 4 rings per inch.

m) **Warp:**

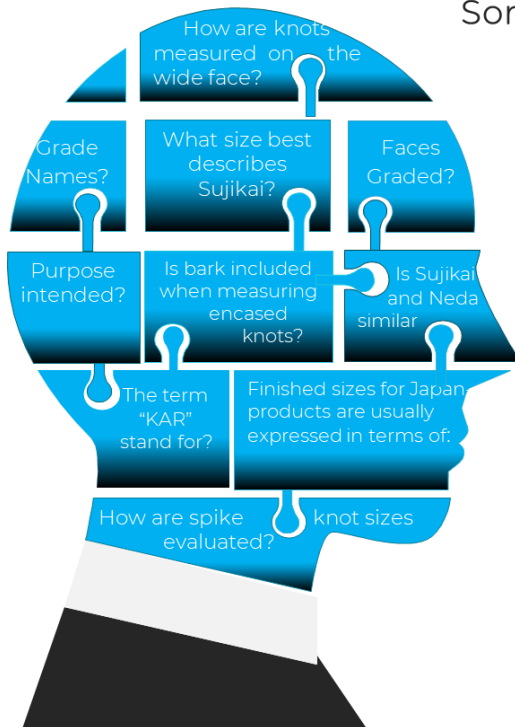
- i. Measured at the point of greatest distance from the straight line.

n) **Twist:**

- i. Deviation flatwise or edgewise, measured as the distance an edge is raised above a flat surface.

JAS Sujikai / Neda Review

Some Thought-Provoking Concepts

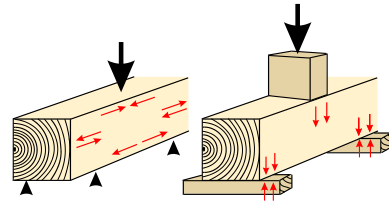


- | | | | |
|---|--|----|--|
| 1 | How are knots measured on the wide face?
Between lines parallel to the edges | 4 | What size best describes Sujikai?
45mm x 90mm |
| 2 | Grade Names?
Sujikai and Neda | 5 | Purpose Intended?
Strength |
| 3 | Faces Graded?
All faces | 6 | Is bark included in the measurement of encased knots?
Yes |
| 7 | What does the term "KAR" stand for?
"Knot Area Ratio" | 8 | Finished sizes for Japanese products are usually expressed in terms of:
Metric Sizes |
| 9 | Is the grade of Sujikai and Neda similar?
Yes, exactly. | 10 | What size best describes Neda?
45mm x 105mm |

IX. Moya and Hashira

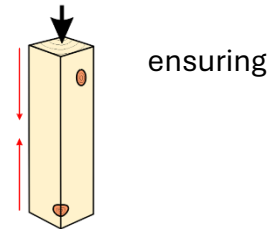
a) Moya:

- i. High-quality product for horizontal applications in roof construction.



b) Hashira :

- i. High-quality product for vertical post applications, stability and suitability for end notching.



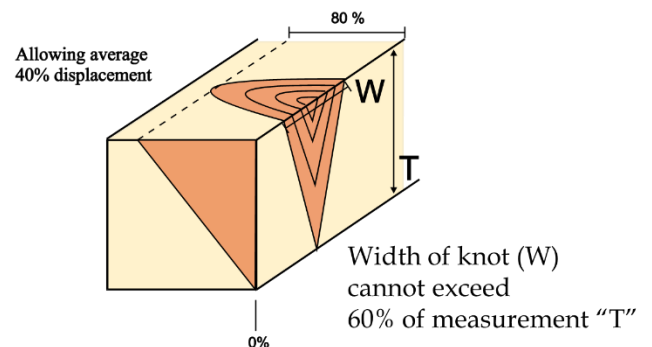
X. End-Notching

- a) **Technique:** Traditional woodworking method in Japanese architecture.
- b) **Purpose:** Creates interlocking joints at beam and post ends for structural integrity without nails or metal fasteners.
- c) **Example:** Auto-robotic drill carves out end notching for beams.



XI. Knot Area Ratio (KAR)

- a) **Definition:** Fraction of the cross section occupied by knots.
- b) **Measurement:** Average of two wide face measurements.
- c) **Open Face Adjacent Knots:** Restricted to 40% KAR, width controlled to 60%.

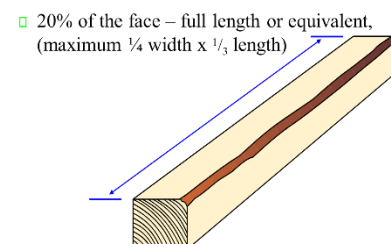


XII. Lumber Types

- a) **E-120:** Green lumber, 80% Free of Heart Centre (FOHC).
- b) **F-330:** Kiln dried lumber, no FOHC restriction.

XIII. Wane Allowance

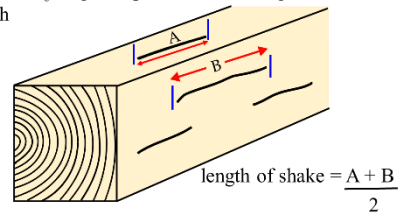
- a) **20% Surface:** Up to 20% of any face, full length or equivalent, not exceeding 25% of any face up to 1/3 length.



XIV. Shake

- a) **Limit:** Maximum 1/6 length, restricted to 1/2 thickness if continuous between faces.
- b) **Ring Shake:** Not allowed.

□ limited to $\frac{1}{6}$ length of piece - both through and not through



XV. Slope of Grain

- a) **Restriction:** 1 in 8.

XVI. Pin Holes

- a) **Allowance:** 30 per square foot, not interfering with intended use.

XVII. Grub/Teredo Holes

- a) **Allowance:** 6 per lineal foot, can be clustered if not detrimental.

XVIII. Skips

- a) **Allowance:** Hit and Miss skips of 1.5mm x 4', not on opposite faces.

XIX. Splits

- a) **Allowance:** Based on nominal width, measured as average length on both faces, restricted to total split allowance.

XX. Stains and Specks

- a) **Light Sapstain:** Slight discoloration, up to 100%.
- b) **Medium Heartstain:** Pronounced color difference, up to 100%.
- c) **Light White Specks:** Up to 25% of volume.

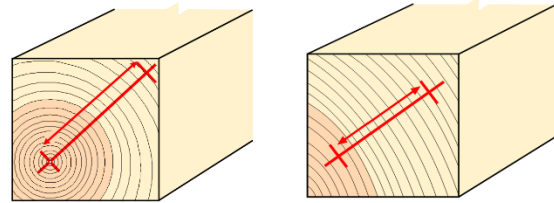
XXI. Prohibited Characteristics

- a) **Honeycomb and Unsound Wood:** Not allowed.

XXII. Rate of Growth

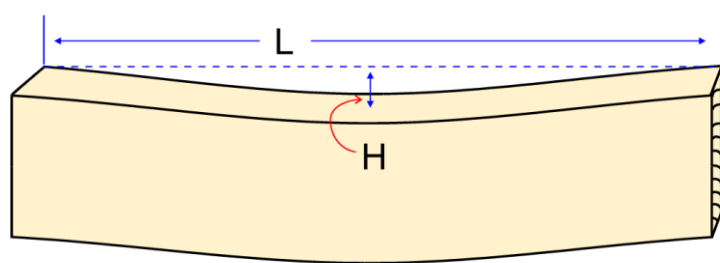
□ Moya / Hashira - 4 rings per inch

- a) **Measurement:** Average width of annual growth rings or number of rings per inch.
- b) **Allowance:** 4 rings per inch.



XXIII. Warp

- a) **Definition:** Deviation from a true or plane surface.
- b) **Measurement:** Greatest distance from the straight line.
- c) **Allowance:**
 - i. 8' = 10mm
 - ii. 10' = 12mm
 - iii. 12' = 14mm
 - iv. 13' = 16mm
 - v. 14' = 18mm
 - vi. 16' = 20mm
 - vii. 18' = 22mm
 - viii. 20' = 24mm

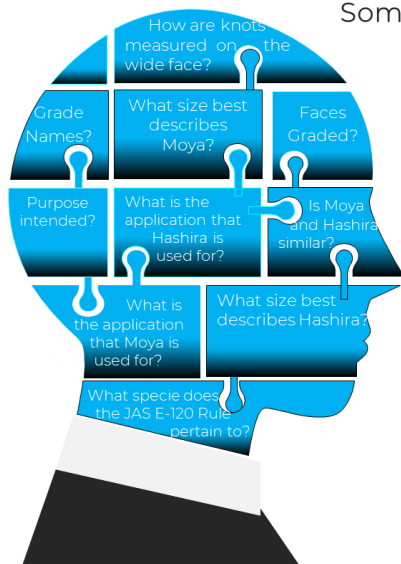


XXIV. Twist

- a) **Definition:** Deviation in the form of a curl or spiral.
- b) **Allowance:** Not allowed at the time of grading.

JAS Moya / Hashira Review

Some Thought-Provoking Concepts



- | | |
|---|--|
| 1 How are knots measured on the wide face?
Between lines parallel to the edges | 4 What size best describes Moya?
90mm x 90mm |
| 2 Grade Names?
Moya and Hashira | 5 Purpose Intended?
Strength |
| 3 Faces Graded?
All faces | 6 What is the application that Hashira is used for?
Vertical post |
| 7 What is the application that Moya is used for?
Horizontal roof member | 8 What species does the JAS E-120 Rule pertain to?
Hem-Fir only |
| 9 Is the grade of Moya and Hashira similar?
Yes, exactly. | 10 What size best describes Hashira?
105mm x 105mm |