### Why the Change?

- NZ radiata pine is changing with a general decline in properties. (There is actual data on this).
- End users are less tolerant of poor performance (lack of straightness and movement etc.).
- The product produced does not always have the properties required. Highlighted recently by CHH and Consumer visual grade checks.
- Timber competes with other Quality Assured products, without changes it risks loss of market share.
New Zealand Standards

NZS3603 Timber Structures Standard.
- Design of larger timber structures
- Used as a basis for NZS3604.
- Contains design stresses & procedures

NZS3604 Timber Framed Buildings.
- Design of timber houses.
- Currently based on No 1Framing (MoE = 8GPa).

NZS3622 Verification of Timber Properties

Time Line

NZS3603 Timber Structures Standard.
- Amendment initiated 2002 (The two major corporates played a significant role in getting the amendment started).
- All industry bodies were ultimately represented on committee
- Published by Standards Feb 2005
- Was to be cited by DBH 1 December 2005 but dead line missed already.

NZS3604 Timber Framed Buildings.
- Amendment initiated 2005 to cover changes in NZS3603
- Out for Public Comment Nov 2005, closes Jan 2006
- Published by Standards & Cited by DBH April 2006

Likelihood that NZS3603 will be held back and cited with NZS3604 in April 2006?
### Visually Graded Timber

#### Table 2.2 Characteristic stresses for visually graded timber NZS3603 A4

<table>
<thead>
<tr>
<th>Species</th>
<th>Grade</th>
<th>Moisture Content – Dry (m/c = 16%)</th>
<th>Moisture Content – Green (m/c = 25%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Bending Strength MPa</td>
<td>Compression Strength MPa</td>
</tr>
<tr>
<td>Radiata pine</td>
<td></td>
<td>20.0</td>
<td>20.0</td>
</tr>
<tr>
<td>and Douglas Fir</td>
<td>VSG10</td>
<td>14.0</td>
<td>18.0</td>
</tr>
<tr>
<td></td>
<td>VSG8</td>
<td>10.0</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>No 1Framing</td>
<td>7.5</td>
<td>11.0</td>
</tr>
<tr>
<td></td>
<td>G8</td>
<td>11.7</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>No 1Framing</td>
<td>7.5</td>
<td>11.0</td>
</tr>
</tbody>
</table>

#### Based on Structural Properties

<table>
<thead>
<tr>
<th>OLD GRADE</th>
<th>NEW GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>No 1F</td>
<td>If verified becomes VSG8</td>
</tr>
<tr>
<td>No 1F</td>
<td>If not verified is called No 1F</td>
</tr>
</tbody>
</table>

G8 is a verified green version of VSG8

### Machine Stress Graded Timber

#### Table 2.3: Characteristic stresses for machine graded timber NZS3603 A4

<table>
<thead>
<tr>
<th>Moisture Content – Dry (m/c = 16%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species</td>
</tr>
<tr>
<td>Radiata Pine &amp; Douglas Fir</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

#### Comparison with Visual Grades

- MSG 10 broadly equates to the old Engineering grade & MGP10
- MSG 8 is equivalent to VSG8 (the verified No 1F)
- MSG6 is equivalent to the unverified No 1F
Verification of Properties

**NZS3622**

- Applies to both MSG & VSG timber, not LVL, plywood, Glulam or round timbers.
- VSG has never had this form of verification whereas MSG has had AS/NZS1748 (Similar - but has issues).
- The (Independent!) Third Party Audit requirement is new.
- Sampling, testing, monitoring, acceptance criteria along with marking and retest provisions.

Brings Solid Timber more into line with its competing non-wood and other wood-based products.

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**NZS3604 - Light Timber Framing**

- Is being amended to incorporate the NZS3603 changes, both for design stresses and single member situations.
- Current span tables based on MoE = 8GPa, $f_b = 17.7$MPa
- The majority of tables will be unaffected as MoE critical
  - Some Lintel, bearers, isolated beams will be affected.
- Span Tables for MoE = 6 & 10 GPa to be introduced.
NZS3604 - Light Timber Framing

- Majority of members in a house are designed (i.e., studs are just 'composite' vertical beams and thus rely on a level of performance)
- The old No 2F will be permitted in non-load bearing situations i.e., internal walls. Not permitted in exterior walls
- Green framing will still be permitted with propping as required.
- It will be possible to build a house out of MoE 6 GPa timber
- The intention with NZ Standards is not control the timber industry.

Visual Grading

- Good at grading for Strength
- Poor at Grading for Stiffness
- Grades by visual criteria only, i.e., knot size, knot location, presence of pith, etc..
- Still a common form of structural grading in wides.
- The VSG8 & VSG10 can only be achieved by verification to NZS3622
- No 1Framing (MoE = 6 GPa) is unverified
**Availability & Verification of VSG**

- VSG10 grade will be virtually limited to Douglas fir
- Some Radiata producers will be limited to unverified No 1F (MoE = 6 GPa)
- VSG8 will require in many cases additional effort in terms of knowledge of forests, log sorting, cutting patterns, possibly stricter limits on visual characteristics.
- It is proving difficult for some to constantly satisfy the verification acceptance criteria. (Stiffness)
- Many VSG producers have or are considering machine stress grading as they see the long term demise of visual grading.

**Machine Stress Grading**

- Good at grading for Stiffness
- Poor at Grading for Strength
- A visual override is required for strength. (50% KAR)
- Many different types of grading machines but all with the same verification procedures (NZS3622).
- End-users buy timber not grading machines so focus on the output of the verification procedures.
- MSG producers increasing in both North & South Is (There are now 28 MSG’s in NZ with 17 in production; up from 10)
- A well run MSG operation should have little difficulty in constantly satisfying the verification requirements.
Machine Stress Grading

MSG Grade Colours standardised as:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG 6</td>
<td>Blue</td>
</tr>
<tr>
<td>MSG 8</td>
<td>Black</td>
</tr>
<tr>
<td>MSG 10</td>
<td>Green</td>
</tr>
<tr>
<td>MSG 12</td>
<td>Purple</td>
</tr>
<tr>
<td>MSG 15</td>
<td>Orange</td>
</tr>
</tbody>
</table>

MSG grade marks can either be:
- A series of 100mm marks along length of one or more colours with a longer tail spray denoting overall piece grade.
- A series of 100mm marks along length of the same colour
- An inkjet marking at 1500mm along length stating grade.

MSG timber is also marked with:
- Grading standard, Producer, Date
- Dimension, Treatment, Drying, other advisory information.

Availability of MSG

- MSG15 will be very rare, if available at all
  - Check with suppliers before specifying

- MSG12 availability will be limited in volume, dimension and by region
  - Check with suppliers before specifying

- MSG10 & MSG8 will be the most common grades, however availability of MSG10 maybe limited in certain regions

- MSG6 may not be that common as many producers use that grade for their re-manufactured products.
  - Check with suppliers before specifying
**Questions**

- Grade marking of Green timber or timber that has a visual requirement?
- Can a Green MSG product be produced?
- What will happen to the small sawmills, can they afford the verification costs etc…?
- What will the retailers want to stock? Preference for MSG?
- Who checks the checkers? (The verification agencies)
- Will there be a phase in period for the new grades?..  
- Are there more changes to come?