



Ref: 262620
File: 195-20/SCAL

April 1, 2021

BY EMAIL

To: Regional Executive Directors

From: Allan Bennett, Director, Timber Pricing Branch

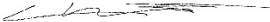
Re: Revision to the Scaling Manual – Amendment No. 4

I hereby approve the revision to the *Scaling Manual* and attach a link to the *Scaling Manual* for your use:

<http://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/timber-pricing/timber-scaling/timber-scaling-manual>

The change reflects Timber Pricing Branch policy and process for interpretation of Interior Grade 6 in Chapter 9.

The revision is effective April 1, 2021. Further amendments or revisions to this manual require my approval.


Allan W. Bennett, RPF
Director
Timber Pricing Branch

Attachments: Revision to the Scaling Manual Chapter 9

pc: Coast Scaling Advisory Committee
Coast Timber Pricing Advisory Committee
Interior Scaling Advisory Committee

Scaling Manual

Effective November 1, 2011

Includes Amendments

Amendment No. 1
Amendment No. 2
Amendment No. 3
Amendment No. 4

Effective Date

December 10, 2015
March 15, 2016
May 7, 2018
April 1, 2021



BRITISH
COLUMBIA

This manual is intended for the use of individuals or companies when conducting business with the British Columbia Government.

Permission is granted to reproduce it for such purposes. This manual and related documentation and publications, are protected under the *Federal Copyright Act*. They may not be reproduced for sale or for other purposes without the express

8.1.1 Determining Grade Reduction for Multiple Defects 8-31	Slab Thickness and Grading	8-32
8.1.1.1 For Coastal Grades.....		8-33
8.1.1.2 For Interior Grades.....		8-34
8.1.2 Determining Trim Allowance.....		8-35
8.1.3 The Application of Trim Allowance for Butt Rots.....		8-39
8.1.4 Trim Allowance and Ring Shake.....		8-42
8.1.5 Trim Allowance and Ring Rot.....		8-45
8.1.6 Trim Allowance and Multiple Ring Rot.....		8-48
8.1.7 Application of Trim Allowance to Checks and Shake		8-52
8.1.8 Application of Trim Allowance to Off Centre and Overlapping Defect		8-54
8.1.9 Determining Grade Reduction for Spiral Checks.....		8-57
8.1.10 Determining Lengths for Grading Purposes – Logs and Log Segments		8-59
8.1.11 Assessing Grade in Logs with Crook, Pistol Grip and Sweep		8-65
8.6.9.1 Crook.....		8-65
8.6.9.2 Pistol Grip.....		8-65
8.6.9.3 Sweep.....		8-66

9 Interior Grading

9.1 Interpreting the Schedule of Interior Timber Grades	9-2
9.1.1 Grade Applicability	9-2
9.1.2 Grade Precedence	9-2
9.1.3 Identifying Undersized Logs in the Interior	9-3
9.2 Physical Characteristics Affecting Log Grades.....	9-4
9.2.1 Compression Wood	9-4
9.2.2 Checks	9-4
9.2.3 Procedures for Assessing Checks under the Grade Code 2 Log Requirements to Make the Grade:.....	9-4
9.2.4 Delay in Scaling.....	9-5
9.3 Potential for Manufacture of Product - Quantity	9-6
9.3.1 Log Size.....	9-6
9.3.2 Insect or Worm Holes.....	9-6
9.4 Potential for Manufacture of Products - Quality	9-7
9.4.1 Occasional Oversized Knots.....	9-7
9.4.2 Knot Spacing	9-7
9.4.3 Twist (Spiral Grain).....	9-8
9.4.4 Non-Permissible Defects	9-8
9.5 Interior Grade Rules and Application.....	9-9
9.5.1 Firmwood Reject - Grade Code Z (weight scale, species code or species code R).....	9-9
9.5.1.1 Grade Rule.....	9-9
9.5.1.2 Application of the Grade Rule.....	9-9
9.5.2 Undersized Log Grade- Grade Code 6	9-9
9.5.2.1 Grade Rule.....	9-9

9.5.2.2	Log Requirements to Make the Grade.....	9-9
9.5.3	Premium Sawlog- Grade Code 1	9-10
9.5.3.1	Grade Rule	9-10
9.5.3.2	Log Requirements to Make the Grade.....	9-10
9.5.4	Sawlog - Grade Code 2.....	9-12
9.5.4.1	Grade Rule	9-12
9.5.4.2	Log Requirements to Make the Grade.....	9-12
9.5.5	Lumber Reject Grade Code 4	9-14
9.5.5.1	Grade Rule	9-14
9.5.5.2	Log Requirements to Make the Grade.....	9-14

10 Coast Grading

10.1	Interpreting the Schedule of Coast Timber Grades	10-2
10.1.1	Grade Applicability	10-2
10.1.2	Grade Precedence	10-2
10.2	Physical Characteristics Affecting Log Grades.....	10-3
10.2.1	Potential for Manufacture of Products - Quantity	10-3
10.2.2	Log Size.....	10-3
10.2.2.1	Length.....	10-4
10.2.2.2	Grade Reduction for Conk, Pin Rot and Indian Paint Rot.....	10-4
10.3	Potential for Manufacture of Products - Quality	10-5
10.3.1	Size of Knots	10-5
10.3.2	Occasional Oversized Knots.....	10-5
10.3.3	Pitch.....	10-5
10.3.4	Growth Rate (Ring Count).....	10-5
10.3.5	Stain.....	10-6
10.4	Coast Grade Rules and Requirements	10-7
10.4.1	Firmwood Reject - All Species - Grade Code Z (species code or code R)	10-7
10.4.1.1	Grade Rule	10-7
10.4.2	Coniferous Grades	10-7
10.4.3	Balsam and Hemlock Grades	10-7
10.4.3.1	No 1 Lumber Balsam and Hemlock, Grade Code D	10-8
10.4.3.2	No. 2 Lumber Balsam and Hemlock, Grade Code F.....	10-8
10.4.3.3	No. 2 Sawlog Balsam and Hemlock, Grade Code H.....	10-9
10.4.3.4	No. 3 Sawlog Balsam and Hemlock, Grade Code I	10-10
10.4.3.5	No. 4 Sawlog Balsam and Hemlock, Grade Code J	10-10
10.4.3.6	No. 5 Chipper Balsam and Hemlock, Grade Code U	10-11
10.4.4	Cedar Grades	10-12

Interior Grading

9

9.1 Interpreting the Schedule of Interior Timber Grades

The Schedule of Interior Timber Grades is part of the *Scaling Regulation*. It is comprised of five grades: firmwood reject code Z, undersized code 6, premium sawlog code 1, sawlog code 2 and lumber reject code 4.

9.1.1 Grade Applicability

Timber must be classified by grade in accordance with the Schedule of Interior Timber Grades. If timber is cut in a forest region (usually Northern and Southern Interior) or part of a forest region where the policies and procedures, approved by the minister under the Act, specify that log selling prices must be used to determine the rates of stumpage applicable to the timber, then those policies will apply.

It is the area of harvest and not the place of scaling which determines the schedule of timber grades that must be used.

9.1.2 Grade Precedence

- The Grade precedence is also part of the Scaling Regulation. For this reason scalers are instructed to record a log against the first grade in order of presentation in the Scaling Regulation.
- As per the Scaling Regulation, where a log meets the criteria of more than one grade, the following grade precedence must be applied.
- A log or portion of a log that qualifies as Firmwood Reject (Grade code Z) takes precedence over all other grades.
- A log that qualifies as Undersized Log Grade (Grade code 6) takes precedence over premium sawlog, sawlog and lumber reject. (Grades code 1, 2 and 4).
- A log that qualifies as a Premium Sawlog (Grade code 1) takes precedence over Sawlog and Lumber Reject. (Grades code 2 and 4).
- A log that qualifies as a Sawlog (Grade code 2) takes precedence over Lumber Reject. (Grade code 4).

9.1.3 Identifying Undersized Logs in the Interior

When scaling interior timber, scalers must assign an undersized grade to logs which are cut from trees which are smaller than the diameter measured outside the bark at a point 15 cm (7.5 rads) from the butt end on candidate logs.

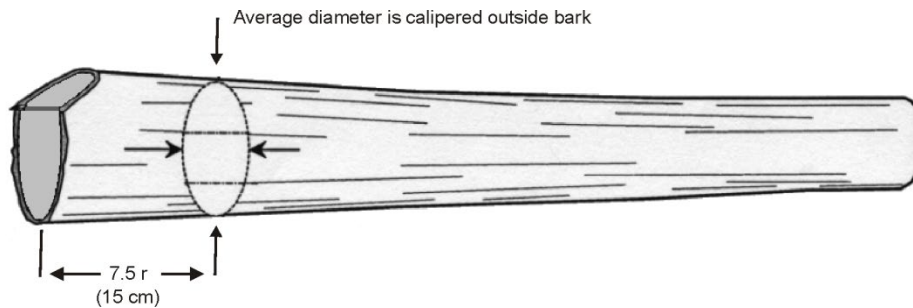


Figure 9.1 Measuring Diameter for Interior Undersize Grade. To

be considered for the undersized grade:

- A log must show **two or more characteristics** such as an undercut, butt flare, feller buncher cut, thick bark or other butt characteristics to indicate it comprises a tree and not a top cut, and
- the outside bark measurement (averaged) at a point 15 cm from the butt face must be less than the minimum diameter specified.
- Scalers are to use minimum of 15 cm (7.5 rads) for Lodgepole pine and 20 cm (10 rads) for all other species.

If there is no evidence a log was cut from an undersized tree, it must not be graded as Grade 6. **Scalers must ensure that the characteristics determining Grade 6 are butt characteristics and not from an irregularly shaped top log.**

9.2 Physical Characteristics Affecting Log Grades

Some aspects of the factors affecting log grades have been explained in the Timber Grading chapter, while others require further explanation specific to interior grading.

9.2.1 Compression Wood

This is a consideration for Grade Code 1 timber only. See **the** Compression Wood section under the Timber Grading chapter for a detailed discussion of compression wood and its effects on merchantable timber.

9.2.2 Checks

Checks over 4 cm in depth are a non-allowable defect for Grade code 1 logs. See Section 8.3.1.1 for more information on grading for checks

9.2.3 Procedures for Assessing Checks under the Grade Code 2 Log Requirements to Make the Grade:

- Measure the end and count the number of end or surface checks over 4 cm in depth.
- Determine if there is more or less than 50% bark covering the bole.
- Determine whether the number of checks available for grade reduction meet the requirements of Section 9.5.4.2 and determine the length of the check.
- **If YES**, the section is 100% grade reduction.
- **If NO**, the section **can not** be 100% grade reduction for surface checks alone. Each check is boxed with trim allowance and the grade reduction is calculated using the appropriate method. This is also the method for determining grade reduction for checks on ends greater than 10 rads.

If there are insufficient numbers of checks to downgrade using the Grade Code 2 Log Requirements, then all checks 4 cm or greater must be assessed by adding trim allowance to the grade reduction and using an appropriate deduction method.

For logs with blue stain or beetle galleries, if the surface check is visible at the log end, but not visible on the surface of the log, the convention is to run the check half the length of the log, or 2.5 m (metres), whichever is less. This convention must only be used if the length of the check cannot be determined due to ice, snow, or mud. This convention is not to be used if the bole is bark covered, or if the actual length of the check can be determined.

9.2.4 Delay in Scaling

A delay in scaling is determined as follows:

- logs have been decked for a period of time such that the ends of the logs are dark and weathered,
- a field scale was previously conducted on the timber, or
- a determination has been made by the District Manager that a delay has occurred.

In circumstances where surface and end checks are due to delays in scaling the Ministry will order these checks to be disregarded.

9.3 Potential for Manufacture of Product - Quantity

Grade descriptions specify percentages of the gross scale that must be suitable to cut out lumber.

In order to ensure standard application of grade reduction procedures some additional information on assessment of defect on interior timber is provided

9.3.1 Log Size

In applying the diameter criteria, note the following:

- Diameter for purposes of applying interior grade rules is the gross diameter inside bark at the small end of the log for logs up to and including 8.0 m in length and the mid-point diameter for logs longer than 8.0 m. The gross diameter is the actual measured diameter before making any deduction for any defect, including sap rot, for all species.

9.3.2 Insect or Worm Holes

A number of insects lay eggs under the bark of trees and the larvae will bore through the wood as they develop. When the presence of borings is observed the quality of potential products may be reduced and the log grade affected.

Grade code 1 does not permit 5 or more insect holes to penetrate beyond the sapwood and/or heartwood of the tree per running metre, except for those of the ambrosia beetle which are disregarded altogether.

The Ambrosia beetle attacks felled timber and the small holes made by this insect are common. This is not a serious defect for sawlog grades which require merchantable quality lumber.

9.4 Potential for Manufacture of Products - Quality

As well as prescribing a percentage of the gross scale that must be suitable to produce manufactured products, each grade rule above Grade code 4 includes a specification regarding the quality of the potential product. Specifically, percentages of the lumber are required to be "merchantable".

Each grade rule has guidelines appended which state requirements regarding quality factors.

9.4.1 Occasional Oversized Knots

All sawlog grades can have occasional oversized knots. Knots which exceed the maximum for the log diameter are considered as oversized. Interior grading allows one oversized knot for every 2.5 m of log length. An exception to this rule is **that** the section of a log between 5 rads (10 cm) to 7 rads (15 cm) in diameter does not allow any oversized knots.

The location and frequency of oversized knots is a key determinant in assessing the merchantability of potential lumber recovery.

9.4.2 Knot Spacing

Knot spacing is only a consideration for Grade 1 logs. Knots ≥ 3 cm must be spaced at least 30 cm apart when measured lengthwise, and they must be 10 cm apart when considering knots measured side-to-side. As well, a single knot spacing consideration is permitted for every 2.5 m much the same as oversized knots. Adventitious knots are not considered for knot spacing.

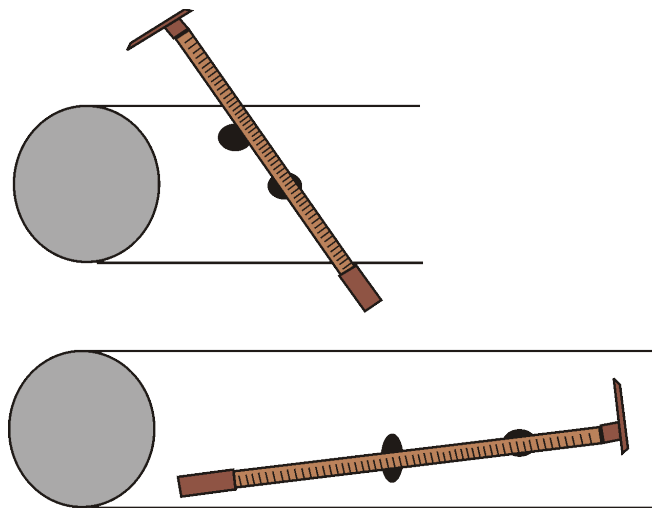


Figure 9.2 Knot Spacing Measurement.

9.4.3 Twist (Spiral Grain)

Measure twist over a 15 rads (30 cm) log section. To manufacture merchantable lumber the grain deflection over the 15 rad (30 cm) section cannot exceed 7 percent for grade code 1 and 15 percent for grade code 2, of the reference diameter. See the Timber Grading chapter for a more detailed explanation on measuring grain deflection.

9.4.4 Non-Permissible Defects

There are a number of defects which are not permitted to be present in certain grades of logs. Where such a defect is present the log is disqualified from the grade. An example of defect which is not permitted in certain grades is checks deeper than 4 cm in a Grade 1 code log.

Some grades permit certain defects only to a clearly defined limited extent. An example of this is the number of insect holes allowed in Interior Grade code 1 logs. When the defect is not confined to the stated limit it is treated as a non-permissible defect for that grade.

9.5 Interior Grade Rules and Application

The following sections state each of the five interior grade rules as they appear in the Scaling Regulation. The sections entitled "Application of the Grade Rule" which follows each grade rule includes information on how to apply the grade rule and enter the grade on the scale tally sheet or into a scaling computer.

9.5.1 Firmwood Reject - Grade Code Z (weight scale, species code or species code R)

The Firmwood Reject grade rule is identical for all species. The species code is always used for all **scaled** loads.

9.5.1.1 Grade Rule

1. A log where:
 - a. heart rot or hole runs the entire length of the log and the residual collar of the firmwood constitutes less than 50 percent of the gross scale of the log,
 - b. rot is in the log and the scaler estimates the net length of the log to be less than 1.2 m, or
 - c. sap rot or charred wood exists and the residual firmwood is less than 10 cm in diameter at the butt end of the log.
2. That portion of a log that is less than 10 cm in diameter or that portion of a slab that is less than 10 cm in thickness.

9.5.1.2 Application of the Grade Rule

1. Portions of logs and slabs less than 10 cm (5 rads) must be recorded as separate logs and graded as firmwood reject.
2. The correct species is always entered against all grades for piece scale and can be entered for weight scale. For weight scaling the letter R can also be used for samples.

9.5.2 Undersized Log Grade- Grade Code 6

9.5.2.1 Grade Rule

A log higher in grade than firmwood reject and cut from a tree that was below the minimum diameter, including the bark, at stump height.

9.5.2.2 Log Requirements to Make the Grade

The criteria outlined under Identifying Undersized Logs in the Interior (**Section 9.1.3**) of this manual must be closely followed.

To conclude that a log was cut from an undersized tree:

- the logs must show **two or more characteristics** that they are cut from undersized trees such as an undercut, butt flare, feller-buncher cut, or other butt characteristics to indicate that it comprises a tree and not a top cut or second cut log from a larger tree,
- the outside bark measurement must be taken at a point 15 cm from the butt face, and
- it must be less than the minimum diameter of 15 cm for Lodgepole Pine and 20 cm for all other species.

9.5.3 Premium Sawlog- Grade Code 1

9.5.3.1 Grade Rule

A log 2.5 m or more in length and 10 cm or more in radius, or a slab 2.5 m or more in length and 20 cm or more in width and 20 cm or more in thickness measured at right angle to the growth rings, where:

1. For a hemlock, cedar or balsam log or slab, at least 90 percent of the gross scale can be manufactured into lumber,
2. For all other species, at least 75 percent of the gross scale can be manufactured into lumber, and
3. For all species at least 75 percent of the lumber will be merchantable.

9.5.3.2 Log Requirements to Make the Grade

1. Internal rot/hole defect is not allowed in cedar slabs.
2. Sap rot or burnt/charred wood (excluding bark), where the total is at least 25% of the circumference of the log and at least 10% of the log length is affected by the defect is not allowed.
3. Section of the log where five or more insect holes per running metre, penetrating the sapwood and/or heartwood of the tree is not allowed.
4. Ambrosia beetle holes and surface beetle galleries are allowed.
5. Outside surface checking 4 cm or more in depth is not allowed.
6. Section of the log with a catface which is greater than 2 cm in depth, by 2 cm in width, by 2 cm in length is added to the grade reduction.
7. Heart pith displacement of more than 20% from the geometrical centre of the log is a grade consideration. The affected shape of the compression wood defect for up to a 2.0 m length section is added to the grade consideration.

8. Section of the log that exceeds, the maximum twist permitted over 30 cm of length is 7 percent of the diameter from a minimum deviation of 2 cm up to a maximum deviation of 6 cm is added to the grade consideration.
9. By log radii, maximum knot size diameters that should not prevent the manufacture of the merchantable lumber requirements of the grade are:

Log Radius	Knot size diameter
5-7 cm	2 cm
8-13 cm	3 cm
14-18 cm	4 cm
19-24 cm	5 cm
25-37 cm	6 cm
38 + cm	7 cm

10. Section of the log where there is less than 30 cm spacing measured lengthwise and section of log where there is less than 10 cm spacing physically measured from side to side between knot centres are grade considerations. One spacing of less than 30 cm for length or 10 cm for side to side is allowed per 2.5 m of running length. This applies to all knots 3 cm or larger. The section of log affected by knot spacing is added to the grade consideration. Adventitious knots are not considered for knot spacing.
11. Other defects as per the scaling manual are allowed providing that the portion of the log free from these defects is sufficient to meet the grade rule.

9.5.4 Sawlog - Grade Code 2

9.5.4.1 Grade Rule

A log 2.5 m or more in length and 5 cm or more in radius, or a slab 2.5 m or more in length and 15 cm or more in width and 15 cm or more in thickness measured at right angle to the growth rings, where:

1. For a hemlock or cedar log or slab, at least 75 percent of the gross scale can be manufactured into lumber.
2. For a balsam log, at least 67 percent of the gross scale can be manufactured into lumber.
3. For all other species at least 50 percent of the gross scale can be manufactured into lumber.
4. For all species, at least 50 percent of the lumber will be merchantable.

9.5.4.2 Log Requirements to Make the Grade

1. For logs with **less than 50 % bark** covering (visual estimate $\pm 10\%$) and also displaying blue stain or beetle galleries, the following applies:
 - Section of the log, 5 cm to 7 cm in radius, where there is **1 or more surface check** (4 cm or more in depth) is added to the grade reduction.
 - Section of log 8 cm in radius, where there are **2 or more surface checks** (4 cm or more in depth), or **1 spiral check** (4 cm or more in depth) affecting more than one quadrant of the log, is added to the grade reduction.
 - Section of log 9 cm in radius where there are **3 or more surface checks** (4 cm or more in depth), or **1 spiral check** (4 cm or more in depth) affecting more than one quadrant, is added to the grade reduction.
 - Logs equal to or greater than 10 cm of radius, **subtract 2 cm of radius** from the diameter as a grade reduction. Logs ≥ 10 cm of radius cannot be downgraded for surface checks alone. They must display other defects as per Chapter 8 of the *Scaling Manual*.

2. For logs with **more than 50 %** bark covering (visual estimate $\pm 10\%$) and also displaying blue stain or beetle galleries, the following applies:
 - Section of logs, 5 cm to 7 cm in radius, where there is **1 or more surface check** (4 cm or more in depth) is added to the grade reduction.
 - Section of logs 8 cm or more in radius, where there are **3 or more surface checks** (4 cm or more in depth) or **2 spiral checks** (4 cm or more in depth) affecting more than two quadrants, is added to the grade reduction.
 - Section of logs 9 cm in radius with **4 or more surface checks** (4 cm or more in depth) or **2 spiral checks** (4 cm or more in depth) and affecting more than two quadrants, is added to the grade reduction.
 - Logs equal to or greater than 10 cm of radius cannot be downgraded for surface checks alone. They must display other defects as per Chapter 8 of the *Scaling Manual*.
3. Section of a log that exceeds, the maximum twist permitted over 30 cm of length is 15 percent of the diameter, from a minimum deviation of 4 cm up to a maximum deviation of 9 cm, is added to the grade consideration.
4. By log radii, maximum knot size diameters that should not prevent the merchantable manufacture of the lumber requirements of the grade are:

Log Radius	Knot size diameter
5-7 cm	4 cm
8-13 cm	6 cm
14-18 cm	8 cm
19-24 cm	10 cm
25-37 cm	12 cm
38 + cm	14 cm

5. The section of log between 5 rads (10 cm) to 7 rads (15 cm) does not allow any oversized knots.
6. Other defects as per the scaling manual are allowed providing that the portion of the log free from these defects is sufficient to meet the grade rule.

9.5.5 Lumber Reject Grade Code 4

9.5.5.1 Grade Rule

A log or slab lower in grade than sawlog and higher in grade than firmwood reject.

9.5.5.2 Log Requirements to Make the Grade

1. Logs and slabs which do not meet the requirements of the sawlog code 2 grade fall into this grade unless:
 - they meet the firmwood reject definition, or
 - they are cut from trees that are undersized.