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A subsidiary corporation of the International Conference of Building Officials

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ACCEPTANCE CRITERIA FOR GRADING OF WHITE SPRUCE, BLACK SPRUCE AND LOGEPOLE PINE TAPERSAWN SHAKES

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PREFACE

Evaluation reports issued by the ICBO Evaluation Service, Inc. (ICBO ES), are based upon performance features of the *Uniform Building Code*™, *ICBO Uniform Mechanical Code*™ and related codes. Section 104.2.8 of the Uniform Building Code is the primary charging section upon which evaluation reports are issued. Section 104.2.8 reads as follows:

The provisions of this code are not intended to prevent the use of any material, alternate design or method of construction not specifically prescribed by this code, provided any alternate has been approved and its use authorized by the building official.

The building official may approve any such alternate, provided the building official finds that the proposed design is satisfactory and complies with the provisions of this code and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in suitability, strength, effectiveness, fire resistance, durability, safety and sanitation.

The building official shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding its use. The details of any action granting approval of an alternate shall be recorded and entered in the files of the code enforcement agency.

The attached acceptance criteria for the general code sections noted have been issued to provide all interested parties with guidelines on implementing performance features of the codes. The attached acceptance criteria were developed and adopted following public hearings conducted by the Evaluation Committee. These criteria may be revised from time to time as the need dictates.

ICBO ES may consider alternate criteria, provided the proponent submits valid data demonstrating that the alternate criteria are at least equivalent to the attached criteria and otherwise meet the applicable performance requirements of the codes. Notwithstanding that a material, type or method of construction, or equipment, meets the attached acceptance criteria, or it can be demonstrated that valid alternate criteria are equivalent and otherwise meet the applicable performance requirements of the codes, if the material, product, system or equipment is such that either unusual care with its installation or use must be exercised for satisfactory performance, or malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use thereof, ICBO ES retains the right to refuse to issue or renew an evaluation report.

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ACCEPTANCE CRITERIA FOR GRADING OF WHITE SPRUCE, BLACK SPRUCE AND LODGEPOLE PINE TAPERSAWN SHAKES

1. INTRODUCTION

Scope:

The purpose of these criteria is to establish requirements for ICBO Evaluation Service, Inc. (ICBO ES), evaluation reports for recognition of grading rules for white spruce, black spruce and lodgepole pine tapersawn shake roofing products under the 1994 Uniform Building Code (also described as “the code”). The basis of recognition is Section 104.2.8 of the code. The shakes are preservative-treated. Supplementary requirements of the ICBO ES Acceptance Criteria for Special Roofing Systems (AC07) and the ICBO ES Acceptance Criteria for Quality Control Manuals (AC10) are necessary for recognition of the products.

When the treatment process is conducted at a facility not owned or operated by the evaluation report applicant, the treater is required to be an additional listee to the evaluation report.

2. REFERENCE DOCUMENTS

2.1 ICBO ES Acceptance Criteria for Quality Control Manuals (AC10).

2.2 ICBO ES Acceptance Criteria for Special Roofing Systems (AC07).

2.3 Canadian Standards Association Standard No. 0118.3-93 for Northern Pine Tapersawn Shakes.

3. QUALITY CONTROL

3.1 Quality Control Manual:

The following information is necessary:

3.2 There must be a quality control manual prepared in accordance with the ICBO ES acceptance criteria AC10. The grading agency must have an NES or ICBO ES evaluation report recognizing the agency for this purpose. Quality control procedures required by the agency must be approved by ICBO ES.

3.3 The quality control manual must contain the following information:

3.3.1 In-house quality control requirements, including name(s) of the quality control personnel employed at the manufacturing plant.

3.3.1.1 Typical inspection forms used by the grading agency during routine inspections.

3.3.1.2 Anticipated mill production (in squares).

3.3.1.3 Detailed sampling plan, demonstrating that the agency is grading a representative quantity of the product during routine mill audits.

3.3.1.4 Details of preservative treatment, follow-up testing and inspection requirements.

3.4 Frequency of Inspection:

3.5 At a minimum, the grading agency must conduct unannounced grading inspections at intervals not exceeding two weeks. Mills on reduced production may be inspected once every 750 bundles. Field inspections of products manufactured by the mill may be substituted for up to a maximum of one of the required inspections per month at the production facility. More frequent inspections may be necessary for mills on notice because of improper or poor grading.

3.6 Copies of grading agency inspection reports must be maintained on file at the manufacturer’s location for a minimum of two years.

4. GRADING REQUIREMENTS FOR TAPERSAWN SHAKES

4.1 Scope:

The purpose of this section is to provide grading rules for white spruce, black spruce and lodgepole pine tapersawn shake roofing products. The shakes shall be graded in accordance with these criteria at the time of manufacture, and their use shall be governed by the provisions of the published evaluation report and the manufacturer’s installation requirements.

4.2 Definitions:

For purposes of this section, certain words and phrases are defined as follows:

4.2.1 **BEST FACE** refers to the side of the shake expected to be installed face up.

4.2.2 **BOXED HEART** is a term used where the pith is enclosed entirely within the four faces of a piece of wood.

4.2.3 **BUNDLE** is a packaged unit comprised of a sufficient amount of material of the same grade and length to cover a specified area at recommended exposures.

4.2.4 **BUTT** is the thickest end of a shake.

4.2.5 **CHECK** is any lengthwise separation of wood.

4.2.6 **COMPRESSION WOOD** is a high-density section of wood which has a higher shrinkage rate than normal, causing curvature or warping of the wood. Compression wood is normally identified by its darker than normal color because of the greater proportion of summerwood and its relatively lifeless appearance.

4.2.7 **EDGE** is the long side of a shake.

4.2.8 **EXPOSURE LINE** is the imaginary line across a shake at a distance above the butt that is equal to the maximum recommended weather exposure.

4.2.9 **FEATHER TIP, SHIM** is a condition of the manufacturing process found on the thin end of shakes where the saw exited the wood prematurely, producing a thin, feather-like tip that is uneven or has sawn-off corners.

4.2.10 **GRAIN** is the direction, size, arrangement, appearance, or quality of the fibers in wood. To have a specific meaning, the term must be qualified, as below:

4.2.10.1 **EDGE GRAIN, VERTICAL GRAIN** is the condition in which the annual rings form an angle of 45 degrees or more with the face of a shake. This condition results from the wood being cut in a plane approximately perpendicular to the annual rings.

4.2.10.2 **FLAT GRAIN** is the condition in which the rings form an angle of less than 45 degrees with the face of a shake. This condition results from the wood being cut in a plane approximately tangential to the annual rings.

4.2.10.3 **MIXED GRAIN** is the condition in which flat and edge grain are present in the same piece of wood.

4.2.11 **HOLE** is any opening in the wood which may extend partially or entirely through the piece. The hole may be from any cause, including:

4.2.11.1 An opening in the wood left by a knot that did not remain in place.

4.2.11.2 A hole or passage burrowed by a worm or insect.

4.2.12 **INBARK, BARK POCKET** is bark that is completely or partially enclosed in the wood.

4.2.13 **KNOT** is that portion of a branch or limb which has been surrounded by the subsequent growth of the tree. Knots may include the following types:

4.2.13.1 **BLACK** is a knot resulting from a dead branch; it is very dark in color and usually encased.

4.2.13.2 **ENCASED** is a knot whose rings of annual growth are not intergrown with those of surrounding wood.

4.2.13.3 INTERGROWN is a knot whose growth rings are partially or completely intergrown with the growth rings of the surrounding wood.

4.2.13.4 LOOSE is a knot that is not held firmly in place by growth or position and can not be relied on to remain in place.

4.2.13.5 SOUND is a knot that is solid across its face, is at least as hard as the surrounding wood and shows no indication of decay.

4.2.13.6 TIGHT is a knot that is held firmly in place and can be relied on to remain in place.

4.2.13.7 WATERTIGHT is a knot that has its growth rings completely intergrown with those of the surrounding wood on either face.

4.2.14 KNOT, DIAMETER OF, is the dimension of a knot measured along a line across the knot and perpendicular to the edge of the shake.

4.2.15 LINEAL INCHES is the measure used for the total width of any given number of shakes when laid edge to edge.

4.2.16 PITH is the small cylinder of primary tissue of a tree stem around which the annual rings form.

4.2.17 REVERSE FACE refers to the side of the shake expected to be installed face down.

4.2.18 ROT DECAY, DOTE is the decomposition of wood substance caused by the action of wood-destroying fungi, resulting in softening, loss of strength and weight, and change of texture and color.

4.2.19 SHAKE TYPES: Shakes shall be one of the following types:

4.2.19.1 HIP AND RIDGE UNIT is an assembly manufactured from two tapersawn shakes in an inverted V-shape, fastened together to produce the cap for the hip or ridge of the roof. One edge of each shake must be beveled to provide a weathertight joint at the required slope.

4.2.19.2 STARTER COURSE is the bottom layer(s) of the first row of roof shakes at the eaves.

4.2.19.3 TAPERSAWN SHAKES are shakes tapering from butt to tip and with sawn faces and backs.

4.2.20 STAIN, BLUE SAP STAIN is a bluish or grayish discoloration in the sapwood, caused by the growth of certain dark-colored fungi, that is not accompanied by softening or other deterioration of the wood.

4.2.21 STAIN, RED is a red-grayish to brown discoloration in the sapwood, caused by the growth of certain dark-colored fungi, that is not accompanied by softening or other deterioration of the wood.

4.2.22 TIP is the thin end of the shake.

4.2.23 WANE is the lack of wood from any cause on the edges of shakes.

4.3 Quality Standards:

4.3.1 General: Shakes shall be manufactured from white spruce (*Picea glauca*), black spruce (*Picea mariana*) or lodgepole pine (*P. contorta*, Dougl., var. *latifolia*, Engelm.). Shakes shall be graded from the *best face*.

4.3.2 Dimensions and Tolerances:

4.3.2.1 Length: Nominal shake lengths shall be 18 inches or 24 inches. A variation of 2 inches over and 1 inch under the nominal length of 18-inch shakes shall be permitted, and feather tips may be contained within the specified variation. A variation of 2 inches over and 2 inches under the nominal length of 24-inch shakes shall be permitted, and feather tips may be contained within the specified variation.

4.3.2.2 Width: Shakes shall be manufactured in random widths ranging from 3¹/₂ inches to 8 inches.

4.3.2.3 Butt Thickness: Both 18-inch and 24-inch shakes shall have a nominal butt thickness of ³/₄ inch, except thicker shakes may be produced provided the nominal butt thickness is identified in packaging information. Butt thickness shall be measured not closer than ¹/₂ inch from either edge. A plus or minus tolerance of ¹/₈ inch from the nominal butt thickness shall be permitted in up to 10 percent of the lineal inches of shakes in each bundle.

4.3.2.4 Tip Thickness: Tip thickness of both 18-inch and 24-inch shakes shall be ¹/₈ to ³/₈ inch, measured at a point 17 inches from the butt for 18-inch shakes and 22 inches from the butt for 24-inch shakes.

4.3.2.5 Edges: Edges shall be parallel within ⁵/₈ inch.

4.3.2.6 Curvature: Curvature of shakes shall not exceed ¹/₂ inch from a level plane in the length of the shake, when measured with the tip down and the butt raised.

4.3.3 Other Defects:

4.3.3.1 Bark: Edges and faces shall be free of bark or inbark.

4.3.3.2 Boxed heart shall not be allowed to run the full length of shakes exceeding 4 inches in width.

4.3.3.3 Butts and Faces: Butts and faces shall be smooth.

4.3.3.4 Checks within the minimum required length of the shake are not permitted.

4.3.3.5 Color: Variation in the color of the wood is a natural characteristic and shall be allowed. In addition, black, blue and red stain (not red rot), attributable to microorganisms and which disappears while the shakes are drying, shall be allowed.

4.3.3.6 Compression wood is not permitted if in readily identifiable and damaging form. Damaging form includes, but is not limited to, bands of compression wood exceeding ³/₄ inch in width, or bands running along an edge, or solid blocks of compression wood.

4.3.3.7 Feather tip shall be permitted within tolerances specified in Sections 4.3.2.1 and 4.3.2.4.

4.3.3.8 Holes: Shakes shall not have holes.

4.3.3.9 Insects: Shakes shall not have insects dwelling in them.

4.3.3.10 Knots: Solid, sound knots in shakes shall be limited as follows:

4.3.3.10.1 On the exposed face, watertight, sound knots up to a diameter of 1¹/₂ inches shall be allowed if a minimum of ³/₈ inch from the edges and provided the combined diameter at any given line does not exceed 1¹/₂ inches (see Section 4.2.14).

4.3.3.10.2 On the covered face, a cumulative total of sound and tight knots up to 4 inches in a line shall be permitted, a minimum of ³/₈ inch from the edges and not exceeding an individual diameter of 2¹/₂ inches.

4.3.3.10.3 Edge knots to a maximum diameter of ³/₄ inch shall be allowed.

4.3.3.10.4 Sound tight knots not exceeding ³/₈ inch in diameter shall be allowed on the exposed face.

4.3.3.11 Pith: Pith shall be permitted within 1 inch of an edge if not through the shake.

4.3.3.12 Rot: Shakes shall not contain rot.

4.3.3.13 Wane: Shake shall be allowed a maximum of ¹/₂ inch wane measured widthwise for the full length of the shake. Shakes containing wane shall not exceed 6 percent of the total lineal inches of shakes in a bundle.

4.4 Packing:

Except as provided in the Note below, a bundle of 24-inch shakes packed at 5 bundles per 100 square feet shall contain a minimum of 268 lineal inches of on-grade shakes. A bundle of 18-inch shakes packed at 6 bundles per 100 square feet shall contain a minimum of 298 lineal inches of on-grade shakes.

Note: The minimum lineal inches specified by this section are typical and are based on maximum weather exposures shown in Table 15-C of the code. These minimums must be adjusted proportionately if packing a different number of bundles per square.

5. GRADING REQUIREMENTS FOR TAPERSAWN SHAKE HIP AND RIDGE

5.1 Scope:

The purpose of this section is to provide grading rules for shake hip and ridge product. Hip and ridge units shall be graded in accordance with these criteria at the time of manufacture, and their use shall be governed by the provisions of the published evaluation report and the manufacturer's installation requirements.

5.2 Quality Standards:

5.2.1 General: Except as provided in Section 5.2.2, hip and ridge units shall be manufactured from shakes meeting the requirements of Section 4.

5.2.2 Dimensions and Tolerances:

5.2.2.1 Length: Nominal lengths for hip and ridge units shall be 18 inches and 24 inches.

5.2.2.2 Width: Tapersawn shake hip and ridge assemblies shall be a minimum of 9 inches wide, measured on the underside of the assembly at the butt end. Outer edges of the units shall be approximately 90 degrees to the face of the shakes. Butt misalignment of assemblies in excess of $\frac{1}{4}$ inch is not permitted. The narrow component shall have a minimum width of $4\frac{1}{2}$ inches at the butt end.

5.2.2.3 Pitch: Individual hip and ridge units are made up of one wide and one narrow shake. Units shall be manufactured to a 4:12 pitch or steeper.

5.2.2.4 Fasteners: Units shall be joined with not fewer than two fasteners between 1 inch and 8 inches from the butt. Fasteners shall be hot-dipped galvanized nails or stainless steel staples or nails spaced approximately 4 inches apart.

5.2.3 Packing:

Hip and ridge units shall be packed at 20 units per bundle with an equal number of right-hand and left-hand units. Each off-grade shake hip and ridge unit is counted as 5 percent. More than two off-grade units per bundle shall preclude a passing grade.

6. GRADING REQUIREMENTS FOR TAPERSAWN SHAKE STARTER COURSE

6.1 Scope:

The purpose of this section is to provide grading rules for shake starter-course products. The starter-course products shall be graded in accordance with these criteria at the time of manufacture, and their use shall be governed by the provisions of the published evaluation report and the manufacturer's installation requirements.

6.2 Quality Standards:

6.2.1 General: Starter-course shakes are manufactured in random widths and are used as the bottom layer(s) of the first row of roof shakes at the eaves. Except as provided in Section 6.2.2, starter-course shakes shall meet the requirements of Section 4.

6.2.2 Dimensions and Tolerances:

6.2.2.1 Length: Starter-course shakes shall be manufactured to a minimum length of 15 inches and a maximum length of 17 inches.

6.2.2.2 Thickness: Nominal butt thickness shall be $\frac{5}{8}$ inch measured not closer than $\frac{1}{2}$ inch from either edge. A plus or minus tolerance of $\frac{1}{8}$ inch from the nominal butt thickness shall be permitted in up to 10 percent of the lineal inches of shakes in each bundle.

6.3 Packing:

Bundles of starter-course shakes shall conform to the requirements for shakes set forth in Section 4.4 for 24-inch tapersawn shakes.

7. IDENTIFICATION

7.1 Pallets:

Prior to treatment at the mill, each pallet of shakes shall be identified by a tag, substantially attached, noting the following:

7.1.1 Product description and dimensions.

7.1.2 Producer name and address.

7.1.3 Grading standard.

7.1.4 The name of the quality control agency.

7.1.5 Wood species.

7.1.6 Date manufactured.

7.1.7 Signature of the responsible mill quality control person.

7.2 Bundle Labels:

Each individual bundle may only be labeled after verification of successful treatment. The following information is required on each bundle label:

7.2.1 Wood species.

7.2.2 Product installation instructions or reference to appropriate installation instructions.

7.2.3 The evaluation report number of the product.

7.2.4 Name and address of the manufacturer, names of the treater and the quality control agency.

7.2.5 Product dimensions.

7.2.6 Coverage and exposure information.

7.2.7 Treatment type and retention level.

The label should be designed to facilitate attachment after treatment and should remain intact through delivery to the job-site.