FLORIDA BUILDING CODE EVALUATION REPORT

Date	September 29, 2020
File No.	0074-1-2
For	Shakertown 1992, Inc.
Address	P.O. Box 400, 1200 Kerron St., Winlock, WA 98596

Subject

Shakertown Cedar Siding: Craftsman, Tahoe, Cedar Cove exterior cladding panels

Evaluation Scope

This report is provided to assist registered design professionals and building officials in the United States with determining compliance to the performance objectives in the named building codes. The product(s) described herein have been evaluated to the 2020 Florida Building Code (FBC) and Residential Code (FBC-R).

CSI DIVISION: 07 00 00 THERMAL AND MOISTURE PROTECTION
SUBDIVISION: 07 46 00 Siding

FBC CATEGORY: Panel Walls
SUB-CATEGORY: Siding

CODE SECTIONS AND STANDARDS:

FBC Section	Description	Referenced Standard or Code Section[1]	Year
1403.2	Performance Requirements, Weather protection	-	-
1403.3	Performance Requirements, Structural	Ch 16	2020
1405.2	Installation of Wall Covering, Weather protection	Table 1405.2	2020
1609.1.1	Determination of Wind Loads	ASCE 7	2016
1609.1.3	Testing to Allowable or Nominal Loads	ASCE 7	2016
1709.2	Load Test Procedures Specified	ASTM E330 (Ch 35)	2014
Ch 35	Referenced Standards, Drainage Test Method	ASTM E2273	2003(11)

FBC-R Section	Description	Referenced Standard or Code Section[1]	Year
R703.1.1	Water Resistance	-	-
R703.1.2	Wind Resistance	Table R301.2(2) ASTM E330	2020 2014
703.5.3	Horizontal Wood Siding	Table R703.3(1)	2020
R Ch 46	Referenced Standards, Drainage Test Method	ASTM E2273	2003(11)

1. Only the applicable reference standards and code sections sited in the main body text are listed. (-) indicates that the main body text covers the full explanation of the objective.

Compliance Statement: Shakertown Craftsman, Tahoe, and Cedar Cove cedar siding exterior cladding panels, as produced by Shakertown 1992, Inc., installed as described in this report, have demonstrated compliance with the listed sections of the 2020 Florida Building Code and Residential Code (FBC-R), in accordance with the code-referenced Standards. Design and performance information can be found in Section 2 of this report.

This report has been prepared and reviewed on behalf of Boca Engineering Co. by:

Christopher Bowness, P.Eng., P.E.

2020-09-29
Date

Evaluation

1.0 PRODUCT DESCRIPTION:

1.1 **General Description:** Shakertown cedar siding panels consist of cedar shakes adhered to a plywood backing, and serve as an exterior wall covering.
The panels are constructed with Western red cedar board shingles, placed side by side and adhered to a 5/16-inch-thick by 96-inch-long three-ply C-C exterior grade or better plywood backing. The plywood backing edge is located 2 ½, 1 ¼, or 1-inch from the butt edge of the shingles to act as a self-aligning guide for the corresponding 2 ½, 1 ¼, or 1-inch overlap. Panels with keyways have a 5/32-inch-wide-by-⅛-inch-deep keyway cut between each cedar board, with a minimum wood thickness of ⅛-inch at the thinnest point of the keyway. Panels are available in either even-butt or staggered-butt styles.
A drainage channel on the backside of the plywood panel is made with ½-inch wide grooves placed every 6 ½ -inches along the top edge of the panel. The groove is 3/16-inch deep at the top edge and tapers flush with the back surface 1 ½ -inches from the top.

1.2 **Craftsman:** Shingle dimension of 16 ½, 8 ¼, or 5 ½ -inch-long by 3 to 14-inch-wide, with tapered thickness of ⅛ to ⅜-inch, adhered to a 14, 7, or 4 ½ -inch tall plywood backing with 2 ½, 1 ¼, or 1-inch overlap from the butt edge which provides for a 14, 7 or 4 ½ -inch exposure, respectively.

1.2 **Tahoe:** Shingle dimension of 8 ¼ -inch long by 3 to 14-inch wide, with tapered thickness of ⅛ to ½ -inch, adhered to 7-inch tall plywood backing to create a 1 ¼ -inch overlap and 7-inch exposure.

1.3 **Cedar Cove:** Shingle dimension of 6-inch long by 3 to 14-inch wide with tapered thickness of ⅛ to ⅜-inch, adhered to 5-inch tall plywood backing to create a 1-inch overlap and 5-inch exposure.

1.4 **Materials:**
Cedar Boards: Craftsman and Tahoe are vertical grain red cedar boards, and Cedar Cove is mixed grain red cedar boards.
Plywood: 5/16-inch thick, 3-ply Douglas Fir C-C exterior grade plywood complying with US DOC PS-1.
Adhesive: Cedar boards are adhered to plywood backing with an exterior grade glue line in accordance with US DOC PS-1.
The materials are assembled in the factory to make finished panels 96” long which may be field cut to width.

2.0 TECHNICAL EVALUATION:

2.1 INSTALLATION

2.1.1 Shakertown cedar siding panels shall be installed in accordance with the Florida Building Code and this report, subject to the Limitations in Section 3. The requirements specified in this report govern over any conflicts with applicator instructions.

2.1.2 Wall framing construction and water resistive barrier for which the siding panels are to be installed over shall be designed and installed in accordance with the Florida Building Code.

2.1.3 ASSEMBLY INSTALLATION DETAILS WITH DESIGN WIND PRESSURE
See attachment 1 of this report, Tables 1 and 2 and assembly diagrams.

2.2 CODE SECTIONS REVIEW:

FBC Section	Description
1403.2	**Performance Requirements, Weather protection** FBC 1403.2 and IRC 703.1.1 call for "a means of draining to exterior water that penetrates the exterior cladding." A method for evaluating drainage of exterior cladding assemblies is found in Chapter 14, where FBC 1408.4.1 calls for a 90% efficiency of drainage by testing to ASTM E2273 for another type of cladding system. The Shakertown Siding system has been tested to this standard for comparison and achieved a 98% efficiency, satisfying the performance requirements of FBC 1403.2 and IRC 703.1.1.
1403.3	**Performance Requirements, Structural** The structural design loads described in this report are in accordance with Ch 16 of the FBC.
1405.2	**Installation of Wall Covering, Weather Protection** The plywood backing and wood shingle veneer of the cladding panels meet the minimum material thickness of weather coverings as required in Table 1405.2.
1609.1.1	**Determination of Wind Loads** Wind load pressure (psf) applied to the cladding for use with the design values published in this report is determined in accordance with Chapter 30 of ASCE 7.
1609.1.3	**Testing to Allowable or Nominal Loads** The ASD conversion factor for tested allowable loads has been applied in accordance with this code section.
1709.2	**Load Test Procedures Specified** The load test procedure in FBC referenced standard ASTM E330 was used to determine allowable wind pressure.
Ch 35	**Drainage Test Method** Shakertown cedar siding products covered in this report meet the criteria prescribed by ASTM E2273, referenced in Ch35.

FBC-R Section	Description
R703.1.1	**Water Resistance** Same as this report commentary to FBC 1403.2.
R703.1.2	**Wind Resistance** Allowable wind pressure values published in this report may be used with Tables R301.2(2) and R301.2(3) for walls using an effective wind area of 10 square feet. The load test procedure in FBC referenced standard ASTM E330 was used to determine allowable wind pressure.
703.5.3	**Horizontal Wood Siding** Shakertown cedar siding products comply with the minimum thickness of wood siding as required in Table R703.3(1). Fastening details as described in this report supersede the minimum fastening requirements of Table R703.3(1).
R Ch 46	**Drainage Test Method** Same as this report commentary to drainage test method of FBC Ch 35.

3.0 LIMITATIONS:

3.1 This Evaluation is for the base code requirements of the building system as addressed in this report. In some building applications, additional performance objectives may be required by Code which must be addressed in the building design for those specific cases.

3.2 Design calculations, drawings, and special inspections are to be furnished for building projects by registered professionals as required by the respective jurisdictional authorities and Codes.

3.3 This Evaluation Report is for Shakertown Cedar Siding panels for use in non-HVHZ jurisdictions, installed as exterior veneer cladding on wood-framed exterior walls.

3.4 The installation details of each assembly evaluated for maximum design wind uplift pressure are described in Tables 1 and 2, and limited to those conditions.

3.5 Materials used as components in the wall assembly shall comply with the FBC, and if applicable, possess the required product approval certification and labeling.

3.6 Building framing and wall sheathing must be designed and installed in accordance with Code for capability of supporting the imposed loads, including but not limited to positive and negative wind loads.

3.7 If used in mansard roof applications, the minimum mansard slope is 60˚ to the horizontal. Water from the main roof is not to flow on to the shingle panels.

3.8 Panels are a veneer cladding, they are not to be used as a nailing base or as structural sheathing.

3.9 Installations are limited to Type V construction.

4.0 FIRE CLASSIFICATION:

Fire classification has not been evaluated.

5.0 QUALITY ASSURANCE ENTITY:

The products evaluated in this report are surveyed at the approved manufacturing locations with third-party quality assurance inspections in accordance with Rule 61G20-3 by Timber Products Inspection, Inc.

6.0 MANUFACTURING PLANTS:
Manufacturing and labeling location(s): Winlock, WA

7.0 LABELING:
Labeling shall be in accordance with the requirements of FBC and the Accredited Quality Assurance Agency.

8.0 EVALUATION RENEWALS: This Evaluation Report expires Dec 31, 2023. Renewals are published with applicable updates. Up to the renewal date, the report is valid until such time as the named product(s) changes, the Quality Assurance Agency changes, or provisions of the Code that relate to the product change.

9.0 REFERENCE TESTING AND EVALUATION DOCUMENTS:

Entity	Entity No.	Standards	Report No.	Issue Date
QAI Laboratories	IAS TL-220	ASTM E330	RJ1922-E	2012-07-26
Intertek Testing Services	IAS TL-274	ASTM E2273	3131525COQ-003	2007-10-26
Intertek Testing Services	IAS TL-274	ASTM E72	3045854-1	2003-10-27
Intertek Testing Services	IAS TL-274	ASTM E72	3045854-2	2003-10-27
Timber Products Inspection	FBC QUA1963	Quality Assurance	NA	2020-09-29

1. Testing, certification, evaluation, and inspection agencies referenced have been verified as accredited for the applicable scope in accordance to Rule 61G20-3 at the time of publication. All technical reference documents are valid as of this report's date.

10.0 CERTIFICATION OF INDEPENDENCE:
1. Boca Engineering Co., it's employees and shareholders, do not have, nor do they intend to acquire or will acquire, a financial interest in any company manufacturing or distributing products that they evaluate.
2. Boca Engineering Co. is not owned, operated or controlled by any company manufacturing or distributing products that they evaluate.

11.0 EVALUATION REPORT TERMS:
This report is a general evaluation of the building code section requirements as identified and applies only to the samples that were evaluated. It does not imply any endorsement or warranty, nor that the signatory Engineer is the Designer of Record for any construction project of which the information is used.

Rule 61G20-3 (17)(a) Definition: Evaluation report means a report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity or a licensed Florida professional engineer or architect indicating that the product was evaluated to be in compliance with the Code or the intent of the Code and that the product complies with the Code or is, for the purpose intended, at least equivalent to that required by the Code.

ATTACHMENTS:

- END -

ATTACHMENT 1: GENERAL ASSEMBLY DETAILS

Wall Framing: No. 2 Grade Douglas Fir (S.G. 0.5) or better, nominal 2x6 dimension lumber spaced at maximum 24"on center, installed per Code.

Wall Sheathing: Minimum wall bracing (sheathing or lumber), installed per Code attached to the wall framing to resist the required lateral design pressures.

Water-Resistive Barrier, Flashing: Water-resistive barrier and flashing installed per Code.

Shingle Panel Anchorage: Galvanized nails, 0.127-inch diameter shank, 3-inch Length, 0.406-inch diameter head, in compliance with ASTM F1667. One fastener is installed through the cladding at each stud location in to the center of the stud. At vertical panel joints, each panel is fastened to the stud with a minimum ½ -inch edge distance.
Concealed nails are spaced no less than ¾ -inch or more than 1-inch from the top edge of the cladding piece.
Face nails are placed at the mid-span of the vertical exposure distance +/- ½ -inch.
The nail head is to be flush with the surface of the shingle panel and must not be overdriven.
The shingle panels must span at least one wall stud spacing. Vertical edge joints are to be staggered and land on studs.

Clearance: A minimum 6" clearance between wood panel and exterior earth surface or 2" clearance from exterior concrete surface is required per FBC Ch 23.

Joint Seal: Flush cut joints to be sealed with caulk per code.

Table 1: ASSEMBLY INSTALLATION DESIGN PRESSURE DETAILS[1]

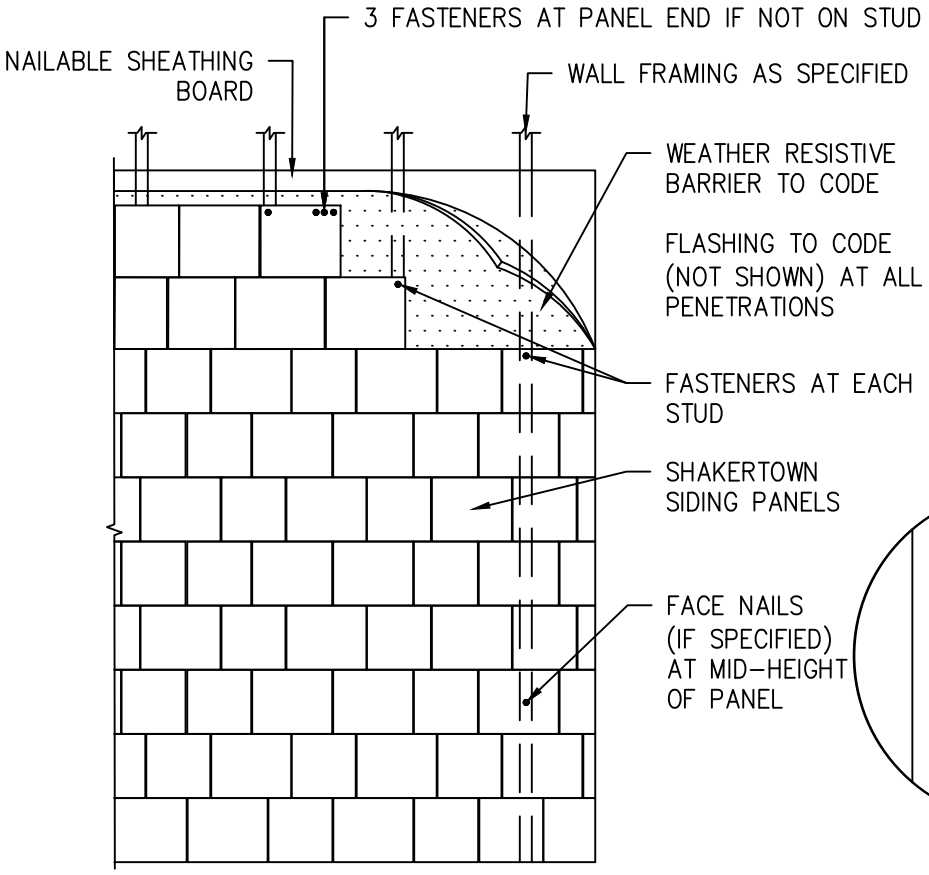
Assembly	Style	Exposure (inches)	Nail Location	Allowable Design Pressure (psf) (ASD)[2,3,4]
1	Craftsman	14	Face nail @ mid-height + Concealed nail	-81.0
2	Craftsman	7	Face or Concealed	-78.0
3	Craftsman	4 ½	Face or Concealed	-78.0
4	Tahoe	7	Face or Concealed	-78.0
5	Cedar Cove	5	Face or Concealed	-78.0

1. All component material and installation specifications listed in "General Assembly Details" on this page must be followed to use this table.
2. Allowable wind pressure (ASD), determined by ultimate strength tested value divided by a safety factor of 3, or allowable nail withdrawal strength calculated by 2018 NDS, whichever governs.
3. Allowable pressure (ASD), as defined in defined in ASCE 7-16 2.4.1 and FBC 2020 1605.3.1 as 0.6W. To convert to strength (LRFD) design pressure, multiply by 1.67.
4. Allowable pressure (ASD) per this table may be used in conjunction with FBC Residential table R301.2(2) to determine Ultimate Design Wind Speed (V_{ULT}).

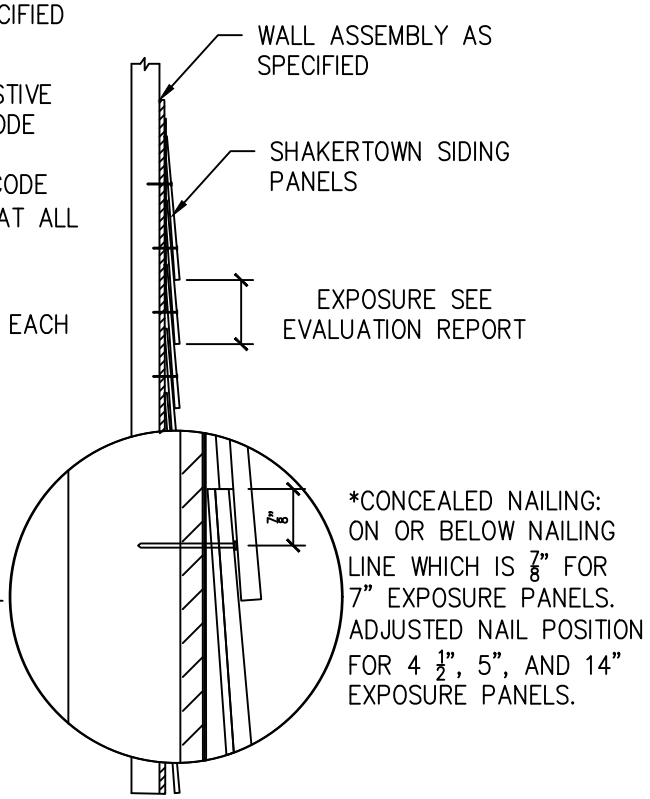
Table 2: Maximum Wind Speeds of Wall Cladding Installed at Various Building Heights and Exposure Categories - 2020 FBC Non-HVHZ[1]												
Framing	Max Siding Exposure	Sheathing	Fastener	Allowable Pressure[2,3] (psf)(ASD)	Exposure Category[6]	Maximum Basic Wind Speed V_{ult} (mph)[5,8]						
						Building Height (ft)[7]						
						15	20	25	30	40	50	60
See Table 1 of this report				81	B	210	210	210	210	210	210	210
					C	210	209	204	200	194	190	187
					D	195	191	187	184	179	176	173
See Table 1 of this report				78	B	210	210	210	210	210	210	210
					C	210	205	201	196	191	186	184
					D	192	187	184	181	176	173	170

1. All component material and installation specifications listed in Table 1"General Assembly Details" must be followed to use this table.
2. Allowable wind pressure (ASD), determined by ultimate strength tested value divided by a safety factor of 3, or allowable nail withdrawal strength calculated by 2018 NDS, whichever governs.
3. Allowable pressure (ASD), as defined in defined in ASCE 7-16 2.4.1 and FBC 2020 1605.3.1 as 0.6W. To convert to strength (LRFD) design pressure, multiply by 1.67.
4. Table limiting heights and wind velocity values are for low-rise buildings of maximum 60 ft height, developed in accordance with ASCE7-16, Table 30.3-1. Design input values: GC_p = -1.4, GC_{pi} = 0.18, K_{zt} = 1, K_d = 0.85, K_e = 1, I_w = 1.0.
5. Wind speed conversion corresponds to the maximum Zone 5 pressure with effective area of 10 ft^2. Table wind speeds are only valid under the design conditions stated. For other site conditions and/or building dimensions, designers can use the published Allowable Pressure (psf) (ASD) to determine allowable wind speeds with FBC-R Table R301.2(2) or calculations to FBC Ch 16.
6. Wind exposure categories as defined in ASCE7-16, section 26.7.
7. Interpolation not permitted. For heights in between those listed, use next highest height column.
8. NA indicates that the installation condition is not acceptable within the design limits of the table.

SHAKERTOWN SIDING
SECTIONS AND NOTES FOR WIND LOAD RESISTANCE ASSEMBLIES



A/1 GENERAL SIDING INSTALLATION
ELEVATION VIEW NOT-TO-SCALE



B/1 SIDING INSTALLATION
SECTION VIEW NOT-TO-SCALE

NOTES:

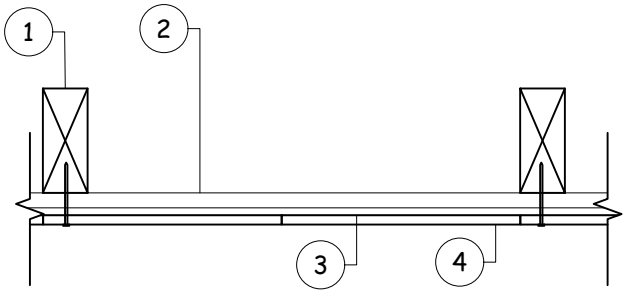
1. THE INSTALLATION DETAILS DESCRIBED ARE OF THE LABORATORY TESTED ASSEMBLY AND MAY NOT REFLECT ACTUAL CONDITIONS FOR A SPECIFIC SITE. IF SITE CONDITIONS DEVIATE FROM THE REQUIREMENTS DETAILED HEREIN, THE LICENSED ENGINEER OR ARCHITECT PREPARED SITE-SPECIFIC DOCUMENTS SHALL BE USED.
2. THE STRUCTURAL FRAMING AND SHEATHING SHALL BE DESIGNED AND ANCHORED TO PROVIDE LATERAL BRACING AND PROPERLY TRANSFER ALL LOADS TO THE STRUCTURE. FRAMING DESIGN AND INSTALLATION IS THE RESPONSIBILITY OF THE ENGINEER OR ARCHITECT OF RECORD FOR THE PROJECT OF INSTALLATION.
3. THESE DRAWINGS APPLY TO THE TESTING ASSEMBLY ONLY AND DO NOT IMPLY THAT THE SIGNATORY ENGINEER IS THE DESIGNER OF RECORD FOR ANY FUTURE CONSTRUCTION ON WHICH THEY ARE USED.
4. SOME NON-STRUCTURAL COMPONENTS NOT SHOWN AND DO NOT IMPACT STRENGTH FOR ATTACHMENT. TO BE INSTALLED PER CODE AND MAY INCLUDE: FLASHING, INTERIOR INSULATION, INTERIOR FINISH.

DRAWING FOR SHAKERTOWN CEDAR SIDING ENGINEERING EVALUATION REPORT – NOT FOR USE AS CONSTRUCTION DESIGN DOCUMENTS

REV	DATE	ISSUE	APP
0	2020/09/22	FOR PUBLICATION	CB

CLIENT:	PROJECT:	TITLE:	DRAWING NO.	DES
SHAKERTOWN 1992, INC.	SHAKERTOWN CEDAR SIDING	SHAKERTOWN CEDAR SIDING WIND LOAD INSTALLATION DETAILS	0074-1-1	CB
			DATE: SEPTEMBER 22, 2020	DRN: LI
				CHK: CB

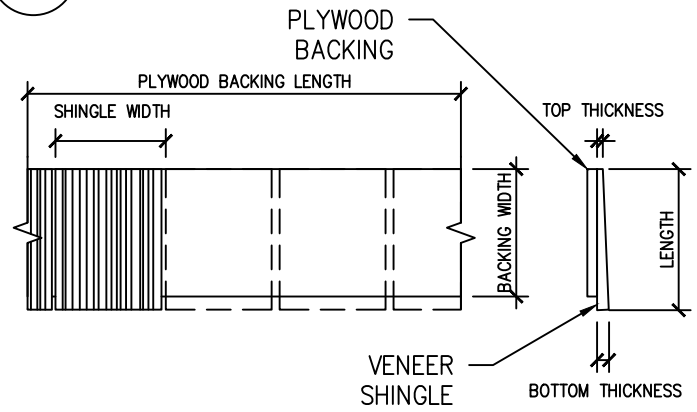
SHAKERTOWN SIDING
DETAILS FOR STRENGTH ATTACHMENT OF SIDING FOR WIND LOAD RESISTANCE



WOOD–FRAMED STUD & SHEATHING ASSEMBLY INTERIOR TO EXTERIOR	
1	NO.2 GRADE DOUGLAS FIR OR BETTER MIN. 2X6 DIMENSIONED LUMBER @ MAX. 24" O.C. SEE EVALUATION REPORT.
2	SHEATHING FASTENED TO STUDS PER CODE, SEE ENGINEERING EVALUATION REPORT
3	WATER RESISTIVE BARRIER TO CODE
4	SHAKERTOWN SIDING PANELS FASTENING PER ENGINEERING EVALUATION REPORT

A/2 SHAKERTOWN SIDING OVER STUD WALL & PLYWOOD SHEATHING

SECTION VIEW — NOT–TO–SCALE



SHAKERTOWN SIDING PANEL DIMENSIONS					
PRODUCT	SHINGLE			PLYWOOD BACKING	
	LENGTH (IN.)	WIDTH (IN.)	THICKNESS (IN.)	LENGTH (IN.)	HEIGHT (IN.)
CRAFTSMAN	$5\frac{1}{2}$, $8\frac{1}{4}$, $16\frac{1}{2}$	3 – 14	$\frac{1}{8}$ – $\frac{3}{8}$	96	$4\frac{1}{2}$, 7, 14
TAHOE	$8\frac{1}{4}$	3 – 14	$\frac{1}{8}$ – $\frac{1}{2}$	96	7
CEDAR COVE	6	3 – 14	$\frac{1}{8}$ – $\frac{3}{8}$	96	5

B/2 GENERAL CLADDING PANEL COMPOSITION

ELEVATION & SECTION VIEW — NOT–TO–SCALE

NOTES:

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			DATE: SEPTEMBER 22, 2020	DRN: LI
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