DrJ™ CERTIFICATION

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Technical Evaluation Report

TER 1910-01

Shear Wall Performance of Carlisle Coatings and Waterproofing R2+ BASE & R2+ BASE (Class A)

Carlisle Coatings and Waterproofing (CCW)

Product:

R2+ BASE
R2+ BASE (Class A)

Issue Date:

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October 9, 2020

Subject to Renewal:

January 1, 2021

COMPANY INFORMATION:

Carlisle Coatings and Waterproofing (CCW)

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 12 00 - Structural Panels

SECTION: 06 12 19 - Shear Wall Panels

SECTION: 06 16 00 - Sheathing

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

SECTION: 07 27 00 - Air Barriers

1 PRODUCTS EVALUATED[1]

1.1 R2+ BASE
R2+ BASE (Class A)

2 APPLICABLE CODES AND STANDARDS[2,3]

2.1 *Codes*

2.1.1 *IBC—12, 15, 18: International Building Code®*

2.1.2 *IRC—12, 15, 18: International Residential Code®*

2.1.3 *IECC—12, 15, 18: International Energy Conservation Code®*

2.2 *Standards and Referenced Documents*

2.2.1 *ANSI/AWC SDPWS: Special Design Provisions for Wind and Seismic*

2.2.2 *ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*

[1] Building codes require data from valid research reports be obtained from *approved sources*. Agencies who are accredited through ISO/IEC 17065 have met the code requirements for approval by the *building official*. DrJ is an ISO/IEC 17065 ANSI-Accredited Product Certification Body – Accreditation #1131.

Through ANSI accreditation and the IAF MLA, DrJ certification can be used to obtain product approval in any *jurisdiction* or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – "certified once, accepted everywhere."

Building official approval of a licensed *registered design professional* (RDP) is performed by verifying the RDP and/or their business entity complies with all professional engineering laws of the relevant *jurisdiction*. Therefore, the work of licensed RDPs is accepted by *building officials*, except when plan (i.e. peer) review finds an error with respect to a specific section of the code. Where this TER is not approved, the *building official* responds in writing stating the reasons for disapproval.

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, visit drjcertification.org or call us at 608-310-6748.

[2] Unless otherwise noted, all references in this TER are from the 2018 version of the codes and the standards referenced therein (e.g., *ASCE 7, NDS, ASTM*). This material, design, or method of construction also complies with the 2000-2015 versions of the referenced codes and the standards referenced therein.

[3] All terms defined in the applicable building codes are italicized.

2.2.3 *ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings*

2.2.4 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*

2.2.5 *ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*

2.2.6 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

3 PERFORMANCE EVALUATION

3.1 R2+ BASE and R2+ BASE (Class A) were evaluated to determine:

3.1.1 Structural performance under lateral load conditions for use as an alternative to the conventional wall bracing provisions of *IBC* Section 2308.6[4] Method WSP, for Type V construction.

3.1.2 Structural performance under lateral load conditions for both wind and seismic loading for use with the *IBC* performance-based provisions, Section 2306.1 and 2306.3, for light-frame wood wall assemblies.

3.1.2.1 Table 2 provides seismic design coefficients (SDC) that conform to the requirements of *ASCE 7* Section 12.2.1 and Table 12.2-1 for design of wall assemblies in buildings that require seismic design in accordance with *ASCE 7* (i.e., all seismic design categories).

3.1.2.2 The basis for equivalency testing is outlined in Section 12.2.1.1 of *ASCE 7:*[5]

> Use of seismic force-resisting systems not contained in Table 12.2-1 shall be permitted contingent on submittal to and approval by the Authority Having Jurisdiction and independent structural design review of an accompanying set of design criteria and substantiating analytical and test data. The design criteria shall specify any limitations on system use, including Seismic Design Category and height; required procedures for designing the system's components and connections; required detailing; and the values of the response modification coefficient, R; overstrength factor Ω_0; and deflection amplification factor, C_d.

3.1.2.3 The SDC evaluation uses the approach found in documentation entitled "Establishing Seismic Equivalency for Proprietary Prefabricated Shear Panels"[6] using code defined accepted engineering procedures, experience, and good technical judgement.

3.1.3 Structural performance under lateral load conditions for use as a perforated shear wall.

3.1.4 Resistance to transverse loads for wall assemblies in accordance with *IBC* Section 1609.1.1.

3.1.5 Performance for use as an air barrier in accordance with *IRC* Section N1102.4.1.1 and *IECC* Section R402.4.1.1 and C402.5.1.1.[7]

3.1.6 Performance in accordance with *ASTM E84* for flame spread and smoke-developed index ratings in accordance with *IBC* Section 2603.5.4.

3.2 Fire resistance-rated wall assemblies in accordance with *IBC* Section 2603.5.1 are outside the scope of this TER.

3.3 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

3.4 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within DrJ's professional scope of work.

[4] 2012 *IBC* Section 2308.9.3

[5] 2010 *ASCE 7* Section 12.2.1

[6] https://www.structuremag.org/wp-content/uploads/2014/08/C-StructuralPerformance-Nelson-Aug081.pdf

[7] 2012 *IECC* Section C402.4.1.1

4 PRODUCT DESCRIPTION AND MATERIALS

4.1 The products evaluated in this TER are shown in Figure 1.

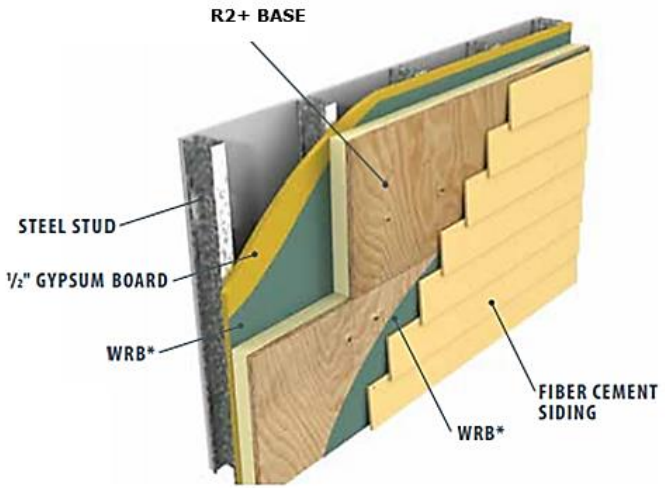


FIGURE 1. R2+ BASE AND R2+ BASE (CLASS A)

4.2 R2+ BASE and R2+ BASE (Class A) are Type II Class 2 high thermal rigid insulation panels composed of a closed cell polyisocyanurate foam core bonded to a premium performance coated glass facer on one side and ⅝" or ¾" fire treated plywood on the other. Both are designed for use in Types I-IV commercial wall applications to provide continuous insulation within the building envelope.

4.3 *Material Availability*

4.3.1 Thickness: 1.6" (41 mm) through 4.7" (119 mm)

4.3.2 Standard Product Width: 48" (1219 mm)

4.3.3 Standard Length: 96" (2438 mm)

5 APPLICATIONS

5.1 R2+ BASE and R2+ BASE (Class A) are used in the following applications:

5.1.1 Wall sheathing in buildings constructed in accordance with *IBC* and *IRC* for light-frame wood construction.

5.1.2 Structural wall sheathing to provide lateral load resistance (wind and seismic) for braced wall panels used in light-frame wood construction.

5.1.3 Structural wall sheathing in buildings constructed in accordance with the *IBC* requirements for Type V light-frame construction.

5.1.4 Structural wall sheathing to provide resistance to transverse loads for wall assemblies used in light-frame wood construction.

5.2 *Structural Applications*

5.2.1 Except as otherwise described in this TER, R2+ BASE and R2+ BASE (Class A) shall be installed in accordance with the applicable building codes listed in Section 2 using the provisions set forth therein for the design and installation of wood structural panels (WSP).

5.2.1.1 R2+ BASE and R2+ BASE (Class A) are permitted to be designed in accordance with *SDPWS* for the design of shear walls using the methods set forth therein, including the perforated shear wall methodology, and subject to *SDPWS* boundary conditions, except as specifically allowed in this TER.

5.2.2 Anchorage for in-plane shear shall be provided to transfer the induced shear force into and out of each shear wall. Shear wall anchorage shall be in accordance with the applicable code referenced in Section 2.

5.2.3 Installation is permitted for single top plate or double top plate applications.

5.2.4 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

5.2.5 *Prescriptive IBC Conventional Light-Frame Wood Construction:*

5.2.5.1 R2+ BASE and R2+ BASE (Class A) may be used to brace exterior walls of buildings as an equivalent alternative to Method 3 of the *IBC* when installed with blocked or unblocked ½" gypsum fastened with a minimum 5d cooler nail (0.086" diameter x 1⅝") or #6 type W or S screw spaced a maximum of 16" o.c. at panel edges and 16" o.c. in the field. Bracing shall be in accordance with the conventional light-frame construction method of *IBC* Section 2308.6[8] and this TER.

5.2.6 *Performance-Based Wood-Frame Construction:*

5.2.6.1 R2+ BASE and R2+ BASE (Class A) used in wall assemblies designed as shear walls are permitted to be designed in accordance with the methodology used in *SDPWS* for WSP using the capacities shown in Table 1 and Table 2.

5.2.6.2 R2+ BASE and R2+ BASE (Class A) shear walls are permitted to resist horizontal wind load forces using the allowable shear loads (in pounds per linear foot) set forth in Table 1.

5.2.7 R2+ BASE and R2+ BASE (Class A) shear walls that require seismic design in accordance with *IBC* Section 1613 shall use the seismic allowable unit shear capacities set forth in Table 2.

5.2.8 The response modification coefficient, R, system overstrength factor, Ω_0, and deflection amplification factor, C_d, indicated in Table 2 shall be used to determine the base shear, element design forces, and design story drift in accordance with *ASCE 7* Chapter 12 and Section 14.5.

5.2.8.1.1 For Limit States Seismic Design, see Table 3 for the specified shear strength, ductility, and overstrength factors.

TABLE 1. R2+ BASE AND R2+ BASE (CLASS A) ALLOWABLE STRENGTH DESIGN (ASD) CAPACITY (WIND)[1,2,3,4,5]

Product	Fastener (Spaced 3":12")	Maximum Stud Spacing (in)	Gypsum Wallboard (GWB)	Gypsum Wallboard Fastener Spacing (edge:field) (in)	Allowable Unit Shear Capacity (plf)
R2+ BASE and R2+ BASE (Class A)	3 ¼" x 0.131" Smooth Shank Nail	16 o.c.	No GWB	N/A	324
			½" GWB	8:8	350
R2+ BASE and R2+ BASE (Class A) ⅝" FRT Plywood + 1" Polyiso	3 ¼" x 0.131" Smooth Shank Nail	16 o.c.	No GWB	N/A	700

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

1. For R2+ BASE and R2+ BASE (Class A) design values shall be reduced in accordance with the fire retardant treatment manufacturer's published strength design reduction factors for fasteners.
2. R2+ BASE and R2+ BASE (Class A) attached with a minimum 3 ¼" x 0.131" smooth shank nail. Fasteners are to be spaced a maximum of 3" o.c. at the edges and 12" o.c. in the field with a minimum edge distance of ⅜". Minimum fastener penetration of ¾" required. Maximum product thickness is 2⅝" (2" foam plus ⅝" wood structural panel).
3. Gypsum attached with minimum 5d cooler nail or #6 type W or S screws 1¼" long. Fastener spacing shall be as required above.
4. R2+ BASE and R2+ BASE (Class A) joints shall be butted at framing members and a single row of fasteners must be applied to each panel edge into the stud below.

[8] 2012 *IBC* Section 2308.9.3

TABLE 2. R2+ BASE AND R2+ BASE (CLASS A) ALLOWABLE STRENGTH DESIGN (ASD) CAPACITY & SEISMIC DESIGN COEFFICIENTS (SEISMIC)[1,2,8,9]

Seismic Force-Resisting System	Maximum Stud Spacing (in)	Gypsum Wallboard (GWB)	Seismic Allowable Unit Shear Capacity (plf)[3]	Apparent Shear Stiffness, G_a (kips/in)	Response Modification Factor, R[4]	System Overstrength Factor, Ω_0[5]	Deflection Amplification Coefficient, C_d[6]	Structural System Limitations and Building Height Limit[7] (ft)				
								Seismic Design Category				
								B	C	D	E	F
Light-Frame (Wood) Walls Sheathed with R2+ BASE and R2+ BASE (Class A)	16 o.c.	½" GWB	280	9.4	6.5	3	4	NL	NL	65	65	65
		No GWB	260	3.7								

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

1. For R2+ BASE and R2+ BASE (Class A) design values shall be reduced in accordance with the fire retardant treatment manufacturer's published strength design reduction factors for fasteners.
2. R2+ BASE and R2+ BASE (Class A) attached with a minimum 3¼" x 0.131" smooth shank nail. Fasteners are to be spaced a maximum of 3" o.c. at the edges and 12" o.c. in the field with a minimum edge distance of ⅜". Minimum fastener penetration of ¾" required. Maximum product thickness is 2⅝" (2" foam plus ⅝" wood structural panel).
3. All seismic design coefficients follow the equivalency procedures as defined in Section 3 of this TER.
4. Allowable unit shear capacity is based on a safety factor of 2.5 in accordance with *ASCE 7* Chapter 12.
5. Response modification coefficient, R, for use throughout *ASCE 7*. Note R reduces forces to a strength level, not an allowable stress level.
6. The tabulated value of the overstrength factor, Ω_0, is permitted to be reduced by subtracting one-half (0.5) for structures with flexible diaphragms.
7. Deflection amplification factor, C_d, for use with *ASCE 7* Sections 12.8.6, 12.8.7, and 12.9.2
8. NL = Not Limited. Heights are measured from the base of the structure as defined in *ASCE 7* Section 11.2.
9. Gypsum attached with minimum #6 type W or S screws 1¼" long spaced 8" o.c. at panel edges and in the field. Maximum stud spacing is 16" o.c.
10. Drift limits are required to be checked in accordance with and shall not exceed those as allowed by *ASCE 7* Table 12.12-1.

TABLE 3. R2+ BASE AND R2+ BASE (CLASS A) LIMIT STATES DESIGN CAPACITY & SEISMIC DESIGN COEFFICIENTS (SEISMIC)[1,2,3]

Seismic Force-Resisting System	Maximum Stud Spacing (in)	Gypsum Wallboard (GWB)	Seismic Specified Shear Strength (plf)	Ductility, R_d	Overstrength Factor, R_0
Light-Frame (Wood) Walls Sheathed with R2+ BASE and R2+ BASE (Class A)	16 o.c.	½" GWB	370	4.0	1.7
		No GWB	350	3.0	1.7

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

1. For R2+ BASE and R2+ BASE (Class A) design values shall be reduced in accordance with the fire retardant treatment manufacturer's published strength design reduction factors for fasteners.
2. R2+ BASE and R2+ BASE (Class A) attached with a minimum 3¼" x 0.131" smooth shank nail. Fasteners are to be spaced a maximum of 3" o.c. at the edges and 12" o.c. in the field with a minimum edge distance of ⅜". Minimum fastener penetration of ¾" required. Maximum product thickness is 2⅝" (2" foam plus ⅝" wood structural panel).
3. Gypsum attached with minimum #6 type W or S screws 1¼" long spaced 16" o.c. at panel edges and in the field. Maximum stud spacing is 16" o.c.

5.3 *Transverse Wind Loading*

5.3.1 Transverse wind load design shall be in accordance with *IBC* Section 2304.6.1. Fasteners must be minimum 6d common nail (2" x 0.113") with 1½" penetration or 8d common nail (2½" x 0.131") with 1¾" penetration.

5.4 *Perforated Shear Walls*

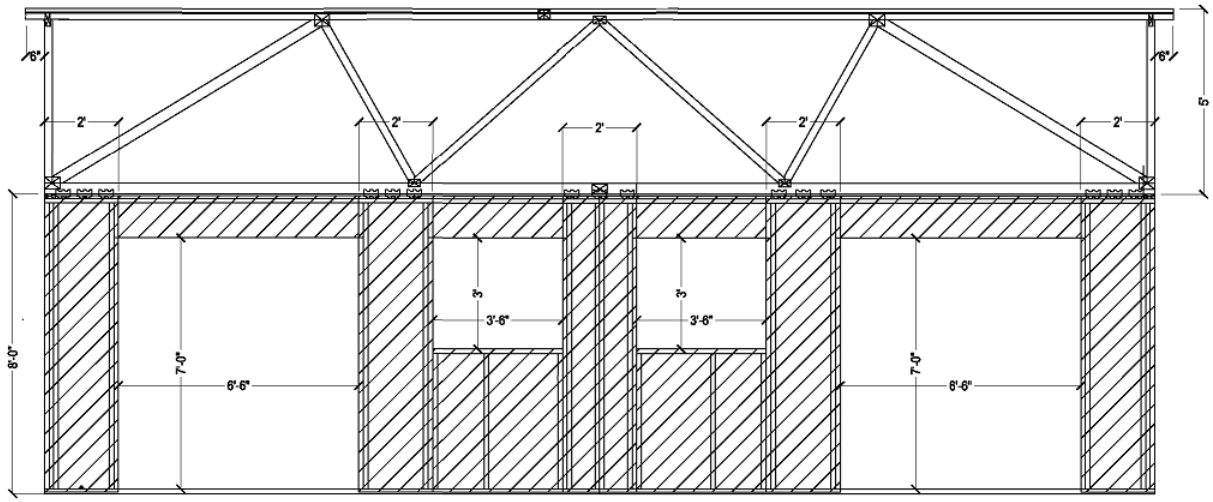
5.4.1 R2+ BASE and R2+ BASE (Class A) shear walls are permitted to be designed in accordance with the methodology found in *SDPWS* Section 4.3.3.5 with the following exceptions:

5.4.1.1 *SDPWS* Equation 4.3-5 for C_o shall be replaced with the equation from Table 4.

TABLE 4. C_0 FOR USE WITH *SDPWS* PERFORATED SHEAR WALL METHODOLOGY

Wall Assembly	Replace *SDPWS* Eq. 4.3-5 with the Following
R2+ BASE and R2+ BASE (Class A)	$C_o = \frac{r}{(0.6 + 0.4 * r)} * \frac{L_{tot}}{\sum L_i}$

5.4.2 The following example shows how to calculate the capacity of a perforated shear wall with R2+ BASE and R2+ BASE (Class A) using Table 4.



1. The total length of the perforated shear wall, L_{tot}, is 30'.
2. The height of the perforated shear wall, h, is 8'.
3. The sum of the perforated shear wall segment lengths, ΣL_i, is 10'.
4. The total area of the openings, A_o, is:
   4.1. Two (2) 7' x 6' 6" openings – 45.5 sq. ft. x 2 = 91 sq. ft.
   4.2. Two (2) 3' x 3' 6" openings – 10.5 sq. ft. x 2 = 21 sq. ft.
   4.3. Total opening area is: 91 + 21 = 112 sq. ft.
5. Using *SDPWS* Equation 4.3-6, the sheathing area ratio, r, is:

$$r = \frac{1}{1 + \frac{A_o}{h\Sigma L_i}} = \frac{1}{1 + \frac{112}{8 * 10}} = 0.417$$

6. Using Table 4, the shear capacity adjustment factor, C_o, is:

$$C_o = \frac{r}{0.6 + 0.4 * r} * \frac{L_{tot}}{\Sigma L_i} = \frac{0.417}{0.6 + 0.4 * 0.417} * \frac{30}{10} = 1.63$$

7. From Table 1, the allowable unit shear capacity, v, is: 325 plf.
8. In accordance with *SDPWS* Section 4.3.3.5, the total ASD shear capacity of this perforated shear wall, $V_{perforated}$, is:

$$V_{perforated} = v * \Sigma L_i * C_o = 325\ plf * 10\ ft. * 1.63 = 5298\ lbs.$$

FIGURE 2. EXAMPLE OF A PERFORATED SHEAR WALL

5.5 *Air Barrier*

5.5.1 R2+ BASE and R2+ BASE (Class A) may be used as air barrier materials as prescribed in *IRC* Section N1102.4.1.1 and *IECC* Section R402.4.1.1 and C402.5.1[9] (Table 5).

TABLE 5. AIR PERMEABILITY

Product Name	Air Pressure (Pa)	Air Permeability (L/s*m²)
R2+ BASE and R2+ BASE (Class A)	75	< 0.02

SI: 1 psi = 0.00689 MPa

1. Foam core tested in accordance with *ASTM E2178.*
2. Air pressure and permeability numbers shown represent R2+ BASE and R2+ BASE (Class A) compliance and are not intended to represent the performance under actual conditions.

5.6 *Fire Safety Performance*

5.6.1 *Surface Burn Characteristics:*

5.6.1.1 R2+ BASE and R2+ BASE (Class A) were evaluated to assess performance with regard to flame spread and smoke developed index as shown in Table 6.

TABLE 6. SURFACE BURN CHARACTERISTICS

Product Name	Flame Spread Index	Smoke-Developed Index
R2+ BASE	≤ 75	≤ 450
R2+ BASE (Class A)	≤ 25	≤ 450

1. Foam core tested in accordance with *ASTM E84*.
2. Flame spread and smoke-developed indexes are shown for comparison purposes only and are not intended to represent the performance under actual fire conditions.

6 INSTALLATION

6.1 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.

6.2 *Installation Procedure*

6.2.1 Protect surrounding areas and surfaces from damage.

6.2.2 A water resistive barrier complying with *IBC* Section 1403.2[10] shall be installed over the R2+ BASE and R2+ BASE (Class A).

6.2.3 R2+ BASE and R2+ BASE (Class A) shall not be applied over walls while they are vulnerable to water intrusion from above or behind.

6.2.4 Do not block flashing, weeps, or other drainage paths with R2+ BASE and R2+ BASE (Class A).

6.2.5 Do not span expansion joints with R2+ BASE and R2+ BASE (Class A).

6.2.6 During installation, take precautions to minimize moisture intrusion behind insulation.

6.2.7 Beginning at the base of the wall, apply R2+ BASE and R2+ BASE (Class A) horizontally or vertically using maximum board lengths to minimize the number of joints.

6.2.8 Pre-cut R2+ BASE and R2+ BASE (Class A) to fit openings and penetrations.

6.2.9 Offset R2+ BASE and R2+ BASE (Class A) board joints a minimum of 6". Do not form four-corner intersections.

6.2.10 Form a "corner lock" pattern by staggering vertical joints at inside and outside corners.

[9] 2012 *IECC* Section C402.4.1

[10] 2015 *IBC* Section 1404.2

6.2.11 Fill gaps greater than ⅛" between R2+ BASE and R2+ BASE (Class A) boards with expanding spray foam or approved sealant and strike flush. Expanding spray foam may also be applied onto the R2+ BASE and R2+ BASE (Class A) board edges during installation.

6.2.12 Abut all joints tightly and ensure an overall flush, level surface.

6.2.13 Verify all materials are installed in accordance with current Carlisle Coatings and Waterproofing published literature and local code requirements.

6.2.14 Additional information on the installation and detailing of R2+ BASE and R2+ BASE (Class A) can be found at carlisleccw.com.

6.2.15 *Fastener Type:*

6.2.15.1 Minimum 3¼" (82 mm) x 0.131" (3.5 mm) smooth shank nail with the underside of the head flush with the surface of the sheathing

6.2.16 *Fastener Spacing:*

6.2.16.1 Maximum 3" o.c. at the perimeter and 12" o.c. in the field with minimum ⅜" from board edges.

6.2.17 *Gypsum Wallboard:*

6.2.17.1 Where required, gypsum wallboard shall be installed with a minimum:

6.2.17.1.1 #6 x 1¼" (32 mm) Type W or S screws

6.2.17.1.2 5d cooler nails

7 Test Engineering Substantiating Data

7.1 Test reports and data supporting the following material properties and wall assembly performance:

7.1.1 Flame spread and smoke developed ratings in accordance with *ASTM E84* by Factory Mutual.

7.1.2 Lateral load testing in accordance with *ASTM E2126* by Qualtim Inc., under contract with SBCRI.

7.1.3 Air permeability testing in accordance with *ASTM E 2178* by Intertek.

7.2 Some information contained herein is the result of testing and/or data analysis by other sources which conform to *IBC* Section 1703 and relevant professional engineering law. DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.

7.3 Where appropriate, DrJ's analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC, IRC, NDS®,* and *SDPWS*). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8 FINDINGS

8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the product(s) listed in Section 1 are approved for the following:

8.1.1 Lateral load resistance due to wind and seismic loads carried by shear walls.

8.1.2 Transverse load resistance due to components and cladding pressures on building surfaces.

8.1.3 Performance for use as an air barrier material in accordance with *IRC* Section N1102.4.1.1 and *IECC* Section R402.4.1.1 and C402.5.1.[11]

8.2 *IBC* Section 104.11 (*IRC* Section R104.11 and *IFC* Section 104.9 are similar) states:

> **104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code…Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.

8.3 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this evaluation, they are listed here.

8.3.1 No known variations

9 CONDITIONS OF USE

9.1 R2+ BASE and R2+ BASE (Class A) are subject to the following conditions:

9.1.1 This TER and the installation instructions, when required by a code official, shall be submitted at the time of permit application.

9.1.2 When R2+ BASE and R2+ BASE (Class A) are not installed for use as wall bracing, as described in this TER, the walls shall be braced by other materials, in accordance with the applicable code.

9.1.3 When used as part of a continuous air barrier assembly, all sheathing panel edges at the top and bottom of the wall assemblies, and all joints between sheathing panels, shall be sealed with an approved construction tape.

9.1.4 When used in accordance with the *IBC* in Seismic Design Categories C, D, E, or F, special inspections shall comply with *IBC* Section 1705.12.[12]

9.1.5 When used in accordance with the *IBC* in high wind areas, special inspections shall comply with *IBC* Section 1705.11.[13]

9.1.6 Loads applied shall not exceed those recommended by the manufacturer as follows:

9.1.6.1 Allowable shear loads do not exceed values in Table 1 for wind loads and Table 2 for seismic loads.

9.1.6.2 Transverse design loads shall not exceed those described in *IBC* Section 2304.6.1, unless an approved exterior wall covering capable of separately resisting loads perpendicular to the face of the walls is installed over the sheathing.

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[11] 2012 *IECC* Section C402.4.1

[12] 2012 *IBC* Section 1705.11

[13] 2012 *IBC* Section 1705.10

9.1.7 The manufacturer's installation instructions shall be available on the jobsite for inspection.

9.1.8 When used in shear wall applications, all panel edges shall be supported by wall framing or solid blocking a minimum of 2" (51 mm) nominal in thickness.

9.2 Where required by the *building official*, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of *permit* application.

9.3 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.

9.4 Design loads shall be determined in accordance with the building code adopted by the *jurisdiction* in which the project is to be constructed and/or by the Building Designer (e.g., *owner* or *registered design professional*).

9.5 At a minimum, this product shall be installed per Section 0 of this TER.

9.6 This product is manufactured under a third-party quality control program in accordance with *IBC* Section 104.4 and 110.4 and *IRC* Section R104.4 and R109.2.

9.7 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the *owner* or the owner's authorized agent. Therefore, the TER shall be reviewed for code compliance by the *building official* for acceptance.

9.8 The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the *building official's* inspection, and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10 IDENTIFICATION

10.1 The product(s) listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.

10.2 Additional technical information can be found at carlisleccw.com.

11 REVIEW SCHEDULE

11.1 This TER is subject to periodic review and revision. For the most recent version of this TER, visit drjcertification.org.

11.2 For information on the current status of this TER, contact DrJ Certification.