Technical Evaluation Report

TO ASSIST WITH CODE COMPLIANCE

ReWall® EssentialBoard, NakedBoard & Ceiling Panels **TER No. 1202-02**

Issue Date: March 6, 2012
Updated: December 18, 2013
Subject to Renewal: April 1, 2014

ReWall®

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DIVISION: 06 00 00 – WOOD, PLASTICS AND COMPOSITES
Section: 06 02 00 – Design Information
Section: 06 16 00 – Sheathing
Section: 06 12 00 – Structural Panels
Section: 06 12 19 – Shear Wall Panels

DIVISION: 09 00 00 – FINISHES
Section: 09 21 16 – Gypsum Board Assemblies
Section: 09 51 00 – Acoustical Ceilings
Section: 09 60 13 – Acoustic Underlayment

1. Products Evaluated:

1.1. ReWall® EssentialBoard

1.2. ReWall® NakedBoard

1.3. ReWall® Ceiling Panels

1.4. For the most recent version of this report, visit drjengineering.org.

The *IBC* defines:

- **APPROVED SOURCE** – "An independent person, firm or corporation, *approved* by the *building official*, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses."

DrJ's building construction professionals meet the competency requirements as defined in the *IBC* and can seal their work. DrJ is regularly engaged in conducting and providing engineering evaluations of single-element and full-scale building systems tests. This TER is developed from test reports complying with *IBC* Section 104.11.1 Research reports, which states, "Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources."

2. Applicable Codes and Standards:[1]

2.1. *2006*, *2009* and *2012 International Building Code* (*IBC*)

2.2. *2006*, *2009* and *2012 International Residential Code* (*IRC*)

2.3. *2005* and *2008 ANSI/AF&PA Special Design Provisions for Wind and Seismic* (*SDPWS*) by the American Forest and Paper Association's (AF&PA) American Wood Council (AWC)

3. Performance Evaluation:

3.1. ReWall EssentialBoard and NakedBoard were tested in accordance with ASTM E2126 techniques and the CUREE protocol. Wall assemblies included 4' x 8' single-element walls, which consisted of various ReWall EssentialBoard products and wood studs. Testing evaluated:

3.1.1. Structural performance under lateral load conditions as an alternative to walls braced in accordance with *IRC* Section R602.10.

3.1.2. Structural performance under lateral (shear) load conditions for use as an alternative to the Wood-frame Shear Wall Bracing[2] provisions in *IBC* Section 2306.3.

3.1.3. Structural performance under lateral (shear) load conditions for use as an alternative to the *IBC* Section 2308, Conventional Light-Frame Construction, and specifically, Section 2308.9.3, Method 3 or 5 for Type V construction.

3.2. ReWall EssentialBoard, NakedBoard and Ceiling Panel products were tested in accordance with ASTM 3043 techniques to evaluate:

3.2.1. Structural performance under center-point flexure loading conditions for the purpose of determining the bending stiffness, flexural modulus, and the rupture modulus for bending about each axis.

4. Product Description and Materials:

4.1. ReWall EssentialBoard is a proprietary sheathing material used in light-frame composite wall assemblies. It is comprised of recycled beverage cartons and cups, which are shredded and compressed during the manufacturing process. ReWall EssentialBoard is:

4.1.1. A unique panel product made of 100% recycled material.

4.1.2. Made of a water-resistant core.

4.1.3. Surfaced with a paper facing on both sides.

4.1.4. Manufactured in 1/4", 3/8", ½" and ¾" thicknesses.

4.1.4.1. The 3/8" material has a weight of 1.5 lbs/sf.

4.1.4.2. The 1/2" material has a weight of 1.75 lbs/sf.

4.2. ReWall NakedBoard is a proprietary wall panel material used in light-frame composite wall assemblies. It is comprised of recycled beverage cartons and cups, which are shredded and compressed during the manufacturing process. ReWall EssentialBoard is:

4.2.1. A unique panel product made of 100% recycled material.

4.2.2. Made of a water-resistant core.

4.2.3. Manufactured in ¼" 3/8" and ½" thicknesses.

4.2.3.1. The 3/8" material has a weight of 1.5 lbs/sf.

4.2.3.2. The 1/2" material has a weight of 1.75 lbs/sf.

[1] Unless otherwise noted, code references are from the 2012 versions of the codes. This product is also approved for use with the 2000 and 2003 versions of the *IBC* and *IRC* and the standards referenced therein.

[2] Definitions from the *IBC* – **Braced Wall Line.** A series of braced wall panels in a single story that meets the requirements of Section 2308.3 or 2308.12.4. **Braced Wall Panel.** A section of wall braced in accordance with Section 2308.9.3 or 2308.12.4. **Shear Wall.** A wall designed to resist lateral forces parallel to the plane of a wall. **Shear wall, perforated.** A wood structural panel sheathed wall with openings, that has not been specifically designed and detailed for force transfer around openings. **Shear wall segment, perforated.** A section of shear wall with full-height sheathing that meets the height-to-width ratio limits of Section 4.3.4 of AF&PA *SDPWS*.

4.3. ReWall Ceiling Panels are proprietary products used for building ceiling panel grids. These products are comprised of recycled beverage cartons and cups, which are shredded and compressed during the manufacturing process. ReWall Ceiling Panels are:

4.3.1. A unique panel product made of 100% recycled material.

4.3.2. Made of a water-resistant core.

4.3.3. Surfaced with a paper facing on both sides; panels can be covered with any color paper or a choice of veneers for easy cleaning.

4.3.4. Manufactured in a standard thickness of **1/4**" (6.4 mm).

Figure 1: ReWall EssentialBoard Sheathing (Left), NakedBoard (Center) & Ceiling Panels (Right)

4.4. Material Availability:

4.4.1. ReWall EssentialBoard and NakedBoard are manufactured in 4' widths (+/- 1/8").

4.4.2. ReWall EssentialBoard and NakedBoard are manufactured in 4' to 12' lengths (+/- 1/4").

4.4.3. ReWall Ceiling Panel sizes include 2' x 2' and 2' x 4'.

4.4.3.1. The 2' x 2' panel has an actual size of 23-3/4" x 23-3/4" (603 mm x 603 mm) and weighs 3 lbs.

4.4.3.2. The 2' x 4' panel has an actual size of 23-3/4" x 47-3/4" (603 mm x 1213 mm) and weighs 6 lbs.

4.5. Material Properties

4.5.1. ReWall EssentialBoard material properties are listed in Table 1.

ReWall EssentialBoard Sheathing Material Properties					
Thickness	**Composition**	**Bending Orientation**	**Bending Stiffness (EI) [lb-in²/ft of Width]**	**Flexural Modulus (E) [psi]**	**Rupture Modulus (S_b) [psi]**
1/4"	Cartons & Their Components A	Y-Axis	4,530	121,200	670
		X-Axis	4,220	110,400	1,040
3/8"	Cartons & Their Components A	Y-Axis	19,080	131,800	950
		X-Axis	13,270	99,300	850
	Cartons & Their Components B	Y-Axis	15,160	178,800	1,000
		X-Axis	9,400	85,800	830
	Cartons & Their Components C	Y-Axis	11,070	164,800	1,090
		X-Axis	9,980	133,600	1,090
	Cartons & Their Components E	Y-Axis	15,610	136,300	930
		X-Axis	12,550	104,300	1,050
1/2"	Cartons & Their Components A	Y-Axis	4,420	80,900	560
		X-Axis	2,290	55,100	620
	Cartons & Their Components B	Y-Axis	15,750	121,300	770
		X-Axis	8,620	79,600	750
	Cartons & Their Components D	Y-Axis	13,580	124,000	1,010
		X-Axis	9,830	86,600	940

Table 1: Material Properties for ReWall EssentialBoard

4.5.2. ReWall NakedBoard material properties are listed in Table 2.

ReWall NakedBoard Sheathing Material Properties					
Thickness	**Composition**	**Bending Orientation**	**Bending Stiffness (EI) [lb-in²/ft of Width]**	**Flexural Modulus (E) [psi]**	**Rupture Modulus (S_b) [psi]**
3/8"	Cartons & Their Components B	Y-Axis	866	14,926	252
		X-Axis	1,923	24,815	357

Table 2: Material Properties for ReWall NakedBoard

4.5.3. ReWall Ceiling Panel material properties and performance properties are listed in Table 3.

ReWall Ceiling Panel Bending Performance Properties					
Thickness	**Composition**	**Bending Orientation**	**Bending Stiffness (EI) [lb-in²/ft of Width]**	**Flexural Modulus (E) [psi]**	**Rupture Modulus (S_b) [psi]**
1/8"	Cartons & Their Components A	Y-Axis	1,420	63,600	600
		X-Axis	2,140	108,100	810
	Cartons & Their Components C	Y-Axis	1,890	105,800	1,060
		X-Axis	2,330	153,900	930
1/4"	Cartons & Their Components D	Y-Axis	3,560	104,100	1,290
		X-Axis	2,670	142,200	790
3/8"	Cartons & Their Components B	Y-Axis	1,150	48,100	550
		X-Axis	1,530	63,000	580
1/2"	Cartons & Their Components D	Y-Axis	3,990	82,700	810
		X-Axis	3,620	77,500	580

Table 3: Bending Performance Properties for ReWall Ceiling Panel

5. Applications:

5.1. ReWall Ceiling Panels can be used in standard ceiling grid systems or applied directly to the ceiling.

5.2. Walls sheathed with ReWall EssentialBoard and NakedBoard are used to resist lateral (shear), transverse and gravity loads in conventional light-frame construction as detailed in Section 3.

5.3. ReWall EssentialBoard may also be used as floor underlayment or as a tile backer if approved by the flooring or tile manufacturer.

5.4. ReWall EssentialBoard and NakedBoard are used in structures complying with the braced wall provisions of *IRC* Section R602.10.

5.5. ReWall EssentialBoard and NakedBoard are used in structures complying with the braced wall provisions of *IBC* Sections 2306.3 and 2308.

5.6. An engineered design is needed for top plates that are required to resist uplift or combined lateral and uplift loads due to wind.

5.7. Structural Applications:

5.7.1. Prescriptive *IRC* Bracing Applications

5.7.1.1. ReWall EssentialBoard and NakedBoard may be used in braced wall lines as an equivalent alternative to the *2006*, *2009* and *2012 IRC* Method WSP or Method GB, when installed in accordance with *IRC* Section R602.10 and this Technical Evaluation Report (TER).

5.7.1.2. Braced wall line length equivalency factors, based on equivalency testing, are used to comply with Method WSP and Method GB of the *2009* and *2012 IRC*.

5.7.1.2.1. ReWall EssentialBoard equivalency factors in Table 4 allow the user to determine the minimum total length of braced wall panels required along a braced wall line by multiplying the factor from Table 4 into the lengths shown in Table R602.10.3(1-4).

5.7.1.2.2. For applications where the interior gypsum board finish (or equivalent) is omitted from the inside face of braced wall panels, the minimum total length of braced wall panels shall be multiplied by the factors as shown in Table 4.

5.7.1.2.3. All *IRC* prescriptive bracing provisions must still be met.

ReWall EssentialBoard Equivalency Factors Per Comparative Equivalency Testing for *IRC* Prescriptive Wall Bracing Applications					
Thickness	Composition	Blocking	Fastener Spacing	Wind and SDC A,B and Detached C	
				SPF Framing – 6d (2 3/8" x .113") Nails	
				Method WSP w/ Interior Gypsum	Method WSP w/o Interior Gypsum
1/2"	Cartons & Their Components D	Yes	6:12	1.32	2.12
3/8"	Cartons & Their Components A	Yes	6:12	1.53	2.70
	Cartons & Their Components B	Yes	6:12	1.35	2.20
	Cartons & Their Components C	Yes	6:12	1.40	2.33
	Cartons & Their Components E	Yes	6:12	1.28	2.02

Table 4: ReWall EssentialBoard Braced Wall Line Length Equivalency Factors Based on Equivalency Testing for Use with the *IRC*
IRC tabulated bracing amounts must be multiplied by the factors in the appropriate *IRC* tables
to determine ReWall EssentialBoard bracing lengths.

ReWall NakedBoard Bracing Factors Per Comparative Equivalency Testing for *IRC* Prescriptive Wall Bracing Applications					
Thickness	Composition	Blocking	Fastener Spacing	Wind and SDC A,B and Detached C	
				SPF Framing – #6 1 1/4" Type W Screw	
				Method WSP w/ Interior Gypsum	Method WSP w/o Interior Gypsum
3/8"	Cartons & Their Components B	Yes	6:12	2.19	5.88

Table 5: ReWall NakedBoard Braced Wall Line Length Equivalency Factors Based on Equivalency Testing for Use with the *IRC*
IRC tabulated bracing amounts must be multiplied by the factors in the appropriate *IRC* tables
to determine ReWall NakedBoard bracing lengths.

5.7.2. *IBC* and *SDPWS* Wall Bracing

5.7.2.1. ReWall EssentialBoard and NakedBoard may be used to brace walls of buildings (shear walls) as an equivalent alternative to Method 3 (Method WSP) or Method 5 (Method GB) shear walls (wall bracing) as found in the *IBC* when installed in accordance with *IBC* Section 2306.3, *SDPWS* Section 4.3 and this TER.

5.7.2.2. The Nominal Unit Shear Capacities (NUSC) for ReWall EssentialBoard and NakedBoard shear walls for use with the *2006*, *2009* and *2012 IBC* and *2008 SDPWS* are found in Table 6, Table 7, and Table 8.

5.7.2.3. The NUSC values in Table 6, Table 7, and Table 8 may not be adjusted for Duration of Load (DOL) per the *National Design Specification*® (*NDS*®) *for Wood Construction*.

Nominal Unit Shear Capacities for ReWall EssentialBoard Shear Walls for Use with the *2006, 2009 & 2012 IBC & 2008 SDPWS*							
						Wind	Seismic
Thickness	**Composition**	**Fastener**	**Fastener Spacing**	**Wall Framing & Stud Spacing**	**Hold-Down Connection**	***IBC* Nominal Unit Shear Capacity (plf)**	***IBC* Nominal Unit Shear Capacity (plf)**
1/2"	Cartons & Their Components D	6d nails (0.113 x 2-3/8")	6:12	2x4 SPF, 16" o.c. Max.	Yes	330	235
3/8"	Cartons & Their Components A	6d nails (0.113 x 2-3/8")	6:12	2x4 SPF, 16" o.c. Max.	Yes	260	185
	Cartons & Their Components B	6d nails (0.113 x 2-3/8")	6:12	2x4 SPF, 16" o.c. Max.	Yes	320	225
	Cartons & Their Components C	6d nails (0.113 x 2-3/8")	6:12	2x4 SPF, 16" o.c. Max.	Yes	300	215
	Cartons & Their Components E	6d nails (0.113 x 2-3/8")	6:12	2x4 SPF, 16" o.c. Max.	Yes	345	245

Table 6: Nominal Unit Shear Capacities for ReWall EssentialBoard Shear Walls for Use with the *2006, 2009 & 2012 IBC & 2008 SDPWS*

Nominal Unit Shear Capacities for ReWall EssentialBoard Shear Walls for Use with the *2006, 2009 & 2012 IBC & 2008 SDPWS*							
						Wind	Seismic
Thickness	**Composition**	**Fastener**	**Fastener Spacing**	**Wall Framing & Stud Spacing**	**Hold-Down Connection**	***IBC* Nominal Unit Shear Capacity (plf)**	***IBC* Nominal Unit Shear Capacity (plf)**
1/2"	Cartons & Their Components D	#6 1-1/4" Type W Screw	6:12	2x4 SPF, 16" o.c. Max.	Yes	325	325
3/8"	Cartons & Their Components A	#6 1-1/4" Type W Screw	6:12	2x4 SPF, 16" o.c. Max.	Yes	290	290
	Cartons & Their Components B	#6 1-1/4" Type W Screw	6:12	2x4 SPF, 16" o.c. Max.	Yes	265	265
	Cartons & Their Components C	#6 1-1/4" Type W Screw	6:12	2x4 SPF, 16" o.c. Max.	Yes	330	330
	Cartons & Their Components E	#6 1-1/4" Type W Screw	6:12	2x4 SPF, 16" o.c. Max.	Yes	335	335

Table 7: Nominal Unit Shear Capacities for ReWall EssentialBoard Shear Walls for Use with the *2006, 2009 & 2012 IBC & 2008 SDPWS*

Nominal Unit Shear Capacities for ReWall NakedBoard Shear Walls for Use with the *2006, 2009 & 2012 IBC & 2008 SDPWS*							
						Wind	Seismic
Thickness	**Composition**	**Fastener**	**Fastener Spacing**	**Wall Framing & Stud Spacing**	**Hold-Down Connection**	***IBC* Nominal Unit Shear Capacity (plf)**	***IBC* Nominal Unit Shear Capacity (plf)**
3/8"	Cartons & Their Components B	#6 1 1/4" Type W Screw	6:12	2x4 SPF, 16" o.c. Max.	Yes	125	125

Table 8: Nominal Unit Shear Capacities for ReWall NakedBoard Shear Walls for Use with the *2006, 2009 & 2012 IBC & 2008 SDPWS*

6. Installation:

6.1. Vertical Installation

6.1.1. ReWall EssentialBoard and NakedBoard shear walls must be installed over framing having a nominal width of not less than 2" (50.8 mm) and nominal depth not less than 4" (101.6 mm), spaced a maximum of 16" (610 mm) o.c. Fasteners must be placed not less than $^3/_8$" (9.5 mm) average from sheathing edges.

6.1.2. Sheathing joints must be butted at framing members, and a single row of fasteners must be applied to each panel edge into the stud below.

6.2. Horizontal Installation

6.2.1. ReWall EssentialBoard and NakedBoard shear walls must be installed over framing having a nominal width of not less than 2" (50.8 mm) and nominal depth not less than 4" (101.6 mm), spaced a maximum of 16" (610 mm) o.c. Fasteners must be placed not less than $^3/_8$" (9.5 mm) average from sheathing edges.

6.2.2. Sheathing joints must be butted at framing members, and a single row of fasteners must be applied to each panel edge into the stud below.

6.2.3. Horizontal joints must be blocked and the sheathing attached per Table 6, Table 7 and Table 8.

6.2.4. ReWall Ceiling Panels should be installed into ceiling panel grid systems as recommend by the grid system manufacturer.

6.3. Seismic Provisions

6.3.1. ReWall EssentialBoard and NakedBoard shear walls have been structurally tested and evaluated for use in seismic design categories (SDC) A through C.

6.3.2. Buildings for which high seismic analysis is required by *IRC* Section R301.2.2 or *IBC* Section 2308.2 are currently outside the scope of this TER.

7. Test and Engineering Substantiating Data:

7.1. Bending testing in accordance with *ASTM D3043*; November 4, 2011.

7.2. Cyclic lateral testing in accordance with *ASTM E2621*; November 2, 2011.

7.3. Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate as it undertakes its engineering analysis.

7.3.1. DrJ does not assume responsibility for the accuracy of data provided by testing facilities, but relies on each testing agency's accuracy and accepted engineering procedures, experience, and good technical judgment.

7.4. Where appropriate, DrJ relies on the derivation of design values, which have been codified into law through the codes and standards (e.g., *IRC*, *WFCM*, *IBC*, *SDPWS*, etc.), to undertake the review of test data that is comparative or shows equivalency to an intended end-use application.

7.4.1. DrJ does not assume responsibility for the accuracy of any code-adopted design values but relies upon their accuracy for engineering evaluation.

7.4.2. DrJ also relies on the fact that manufacturers of code-adopted products stand behind the legally established design values that have been created by the associations that publish code-defined design values for a given commodity product.

7.4.3. DrJ evaluates all equivalency testing and related analysis using this code-defined engineering foundation.

8. Conditions of Use:

8.1. ReWall EssentialBoard and NakedBoard shear walls as described in this TER comply with, or are suitable alternatives to, the applicable sections of the *2006*, *2009* and *2012 IBC* and *IRC,* and are subject to the following conditions:

8.1.1. This TER, when required by the authority having jurisdiction, shall be submitted at the time of permit application.

8.1.2. Where a building, or portion thereof, does not comply with one or more of the bracing requirements within the prescriptive section of the *IRC*, those portions shall be designed and constructed in accordance with Section R301.1.

8.1.3. When used as exterior wall sheathing, ReWall EssentialBoard and NakedBoard must be protected with an air barrier, water-resistant barrier and a weather-resistant wall covering in accordance with the provisions of the *IRC* or *IBC* as applicable.

8.1.4. Evaluation for use where fire-resistance ratings are required is outside the scope of this TER.

8.1.5. Evaluation of performance under fire conditions is outside the scope of this TER.

9. Identification:

9.1. The products shall have labels that show ReWall, LLC (P.O. Box 1818, Des Moines, IA 50305), the product names that are given in this report (ReWall EssentialBoard, NakedBoard or Ceiling Panels), and the TER number of this report.

9.2. Additional technical information can be found at rewallmaterials.com.

10. Review Schedule:

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

10.2. For information on the current status of this report, contact DrJ.

Responsibility Statement

The information contained herein is a product, engineering or building code compliance research report performed in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering procedures, experience and good technical judgment. Product, design and code compliance quality control is the responsibility of the referenced company. Consult the referenced company for the proper detailing and application for the intended purpose. Consult your local jurisdiction or design professional to assure compliance with the local building code. DrJ (drjengineering.org) research reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by DrJ, express or implied, as to any finding or other matter in this report or as to any product covered by this report.

Appendix A:
TERs Are Comparable to, Compatible with, and Equivalent to the Purpose of an ICC-ES ESR

1. Technical Evaluation Reports (TERs), drafted and maintained by DrJ (professional engineering firm and ISO/IEC 17065 applicant through ANSI/ACLASS), assess how specific products comply with the provisions of the building code. DrJ is a code-defined "approved source," and DrJ employs professional engineers and follows state professional engineering rules and regulations.

2. TERs are comparable to, compatible with, and equivalent to the purpose of an ICC Evaluation Service (ICC-ES) Evaluation Service Reports (ESRs).[3]

2.1. ICC Evaluation Service does not provide an engineer's seal on any of its ESRs.

2.2. Furthermore, the ICC-ES Evaluation Report Purpose is defined as follows[4]:

ICC EVALUATION SERVICE

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ICC EVALUATION SERVICE, LLC,
RULES OF PROCEDURE FOR EVALUATION REPORTS

1.0 PURPOSE

These rules set forth procedures governing ICC Evaluation Service, LLC (ICC-ES), issuance and maintenance of evaluation reports on building materials and products, methods of construction, prefabricated building components, and prefabricated buildings.

ICC-ES evaluation reports assist those enforcing model codes in determining whether a given subject complies with those codes. An evaluation report is not to be construed as representing a judgment about aesthetics or any other attributes not specifically addressed in the report, nor as an endorsement or recommendation for use of the subject of the report. Approval for use is the prerogative and responsibility of the Code Official; ICC-ES does not intend to assume, nor can ICC-ES assume, that prerogative and responsibility.

2.3. ICC ESR Disclaimer[5]:

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.

[3] ICC Evaluation Service, LLC and the ICC-ES Evaluation Reports logo are registered trademarks of ICC-ES.
[4] See the "ICC-ES Rules of Procedure" at www.icc-es.org/pdf/rules_evalrpts.pdf.
[5] Page 1 footer of each ICC-ES report that can be found at www.icc-es.org/reports/index.cfm.

3. DrJ Sealed Engineering

3.1. DrJ engineers have undertaken the rigorous engineering and analysis work to determine the subject of this report's compliance with the codes and standards referenced in Section 2.

3.2. DrJ work:

3.2.1. Complies with accepted engineering procedures, experience and good technical judgment.

3.2.2. Is the work of an independent person, firm or corporation who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.

3.3. A Technical Evaluation Report generated by DrJ is in all "code-compliance-evaluation-processing" respects equivalent to an ICC-ES ESR, as ICC-ES defines its approach, with one material difference.

3.3.1. DrJ will seal all TERs, as needed, so that responsibility for the work is well-defined.

3.3.2. The DrJ responsibility statement is identical to that provided in ICC-ES ESRs.

> DrJ (drjengineering.org) research reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by DrJ express or implied as to any finding or other matter in this report or as to any product covered by this report.

Appendix B:
Legal Aspects of Product Approval

1. Product Approval

1.1. In general, the model and local codes provide for the use of alternative materials, designs and methods of construction by having a legal provision that states something similar to:

> The provisions of this code/law 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/law, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the compliance official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code/law, and that the material, design, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code/law.

1.2. In concert with preserving "free and unfettered competition as the rule of trade", should this alternative material, design or method of construction not be approved, the building official shall respond in writing, stating the specific reasons for non-code-compliance and/or for non-professional engineering regulation compliance.

> Congress passed the first antitrust law, the Sherman Act, in 1890 as a "comprehensive charter of economic liberty aimed at preserving free and unfettered competition as the rule of trade." In 1914, Congress passed two additional antitrust laws: the Federal Trade Commission Act, which created the FTC, and the Clayton Act. With some revisions, these are the three core federal antitrust laws still in effect today.
>
> …Yet for over 100 years, the antitrust laws have had the same basic objective: to protect the process of competition for the benefit of consumers, making sure there are strong incentives for businesses to operate efficiently, keep prices down, and keep quality up….
>
> The Sherman Act outlaws "every contract, combination, or conspiracy in restraint of trade," and any "monopolization, attempted monopolization, or conspiracy or combination to monopolize." For instance, in some sense, an agreement between two individuals to form a partnership restrains trade, but may not do so unreasonably, and thus may be lawful under the antitrust laws. On the other hand, certain acts are considered so harmful to competition that they are almost always illegal.
>
> The penalties for violating the Sherman Act can be severe. Although most enforcement actions are civil, the Sherman Act is also a criminal law, and individuals and businesses that violate it may be prosecuted by the Department of Justice.[6]

2. Legal Validity of this TER

2.1. This TER is a code-defined (e.g., *2009 IBC* and *IRC* Section 104.11.1 and *2009 IBC* Section 1703.4.2) "research report" that provides supporting data to assist in the approval of materials, designs or assemblies not specifically provided for in this code.

2.2. Therefore, this TER is a valid research report from a professional engineering company that complies with the code definition of "approved source." If required by the authority having jurisdiction, this TER can also be sealed to comply with professional engineering laws and regulations.

[6] http://www.ftc.gov/bc/antitrust/antitrust_laws.shtm