Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 2210-09

Issue Date: January 20, 2023

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Subject to Renewal: January 1, 2027

Performance Characteristics of Plantd Structural Panels

Trade Secret Report Holder:

Plantd, Inc.

Phone: 919-695-7882 Website: www.plantdmaterials.com Email: huade@plantdmaterials.com

CSI Designations:

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

1 Innovative Product Evaluated[1]

1.1 Plantd Structural Panels

2 Product Description and Materials

2.1 The innovative product evaluated in this report is shown in **Figure 1**.



Figure 1. Plantd Structural Panels

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2.2 Plantd Structural Panels are manufactured from fibers from monocotyledonous plants of the family Poaceae[2] or Loblolly Pine, which are processed and formed into structural panels.

2.3 Plantd Structural Panels are designed as an alternative to wood structural panels for use in wall applications in accordance with the IBC and IRC, subject to the scope, design values, installation requirements, and conditions of use in this report.

2.4 Plantd Structural Panels are available in 4' x 8' and 4' x 9' panel sizes.

2.4.1 The nominal thickness of Plantd Structural Panels is $^{7}/_{16}$".

2.5 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions[3]

3.1 New Materials[4] are defined as building materials, equipment, appliances, systems, or methods of construction, not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[5] The design strength and permissible stresses shall be established by tests[6] and/or engineering analysis.[7]

3.2 Duly authenticated reports[8] and research reports[9] are test reports and related engineering evaluations that are written by an approved agency[10] and/or an approved source.[11]

3.2.1 This report utilizes intellectual property and/or trade secrets to create public domain material properties for commercial end-use.

3.2.1.1 This report protects confidential Intellectual Property and trade secrets under the regulation, 18.US.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).[12]

3.3 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[13]

3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed RDP.

3.5.1 The Center for Building Innovation (CBI) is ANAB[14] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[15] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[16] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[17]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.[18] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[19] and can be used in any country that is an MLA signatory found at this link: https://iaf.nu/en/recognised-abs/

3.9 Approval equity is a fundamental commercial and legal principle.[20]

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4 Applicable Local, State, and Federal Approvals; Standards; Regulations[21]

4.1 *Local, State, and Federal*

4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, St. Louis County, Texas Department of Insurance, and Wichita.[22]

4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.[23]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[24] and Part 3280[25] pursuant to the use of ISO/IEC 17065 duly authenticated reports.

4.1.4 Approved means complying with the requirements of local, state, or federal legislation.

4.2 *Regulations*

4.2.1 *IBC – 18, 21, 24: International Building Code®*

4.2.2 *IRC – 18, 21, 24: International Residential Code®*

4.2.3 *IECC – 18, 21, 24: International Energy Conservation Code®*

4.3 *Standards*

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

4.3.2 *AWC NDS: National Design Specification (NDS) for Wood Construction*

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

4.3.4 *ASTM D1037: Standard Test Methods for Evaluating Properties of Wood-Base Fiber*

4.3.5 *ASTM D5764: Standard Test Method for Evaluating Dowel-Bearing Strength of Wood and Wood-Based Products*

4.3.6 *ASTM D7989: Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels*

4.3.7 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

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

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

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4.4 Structural performance for shear wall assemblies used as lateral force resisting systems in Seismic Design Categories A through F have been tested and evaluated in accordance with the following standards:

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

4.4.2 *ASTM D7989: Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels*

4.4.2.1 ASTM D7989 is accepted engineering practice used to establish Seismic Design Coefficients (SDC).

4.4.2.2 Tested data generated by ISO/IEC 17025 approved agencies and/or professional engineers, which use ASTM D7989 as their basis, are defined as intellectual property and/or trade secrets.

4.4.2.3 All professional engineering evaluations are defined as an independent design review (i.e., listings, certified reports, duly authenticated reports from approved agencies, and/or research reports, are prepared independently by approved agencies and/or approved sources, when signed and sealed by licensed professional engineer pursuant to registration law.

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

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

5 Listed[26]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (e.g., CBI), an approved agency (e.g., CBI and DrJ), and/or an approved source (e.g., DrJ), or other organization(s) concerned with product evaluation (e.g., DrJ), that maintains periodic inspection (e.g., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 Plantd Structural Panels are used in the following applications:

6.1.1 As structural wall sheathing in light-frame wood construction in accordance with the applicable provisions of the IBC and IRC and subject to the design values, limitations, and installation requirements of this report.

6.1.2 As structural wall sheathing to provide in-plane lateral-load resistance due to wind and seismic, as specifically set forth in this section.

6.1.3 As structural wall sheathing to provide resistance to transverse loads acting normal to the wall assembly within the design values and limitations specified herein.

6.1.4 As structural wall sheathing to provide resistance to uplift loads for wall assemblies used in light-frame wood construction within the design values and limitations specified herein.

6.2 *Structural Applications*

6.2.1 Except as otherwise described in this report, Plantd Structural Panels shall be installed in accordance with the applicable building codes listed in **Section 4** using the provisions set forth herein for the design and installation of Wood Structural Panels (WSP).

6.2.1.1 Design loads shall be determined in accordance with the applicable building code and ASCE/SEI 7, where applicable.

6.2.1.2 Plantd Structural Panels assemblies are permitted to be designed in accordance with SDPWS for the design of shear walls using the methods set forth therein and are subject to the SDPWS boundary conditions, except as specifically allowed in this report.

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6.2.2 Plantd Structural Panels used as structural wall sheathing shall be installed over wood framing with a minimum published specific gravity of 0.42 and fastened in accordance with the applicable configuration specified in the tables of this section.

6.2.3 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 4**.

6.2.4 Hold-downs, anchors, collectors, boundary members, and other elements required to resist overturning or transfer forces into adjoining construction shall be designed in accordance with the applicable building code and accepted engineering practice.

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

6.2.5.1 Walls shall be constructed in accordance with IBC Section 2308.9.3.2[27] and IRC Section R602.3.2.

6.3 *Prescriptive Applications*

6.3.1 *Simplified IRC Bracing Provisions:*

6.3.1.1 Plantd Structural Panels are permitted to be used in accordance with the simplified bracing method of IRC Section R602.12, as modified by **Table 1**.

6.3.1.2 All other provisions of the IRC simplified bracing method shall be met.

Table 1. Plantd Structural Panels - Simplified Bracing Table[1-8]

Structural Sheathing Product	Ultimate Design Wind Speed (mph)	Story Level	Eave to Ridge Height (ft)	Minimum Number of Bracing Units Required (Long Side)						Minimum Number of Bracing Units Required (Short Side)					
				Length of Short Side (ft)						Length of Long Side (ft)					
				10	20	30	40	50	60	10	20	30	40	50	60
Plantd Structural Panels	115	One Story or Top of Two or Three Story	10	1	1	2	2	3	3	1	1	2	2	3	3
		First of Two Story or Second of Three Story		1	2	3	4	5	5	1	2	3	4	5	5
		First of Three Story		2	3	4	5	6	8	2	3	4	5	6	8
		One Story or Top of Two or Three Story	15	1	1	3	3	4	4	1	1	3	3	4	4
		First of Two Story or Second of Three Story		1	2	3	5	6	6	1	2	3	5	6	6
		First of Three Story		2	3	4	6	7	9	2	3	4	6	7	9
Plantd Structural Panels	130	One Story or Top of Two or Three Story	10	1	2	2	3	3	4	1	2	2	3	3	4
		First of Two Story or Second of Three Story		2	3	4	5	6	7	2	3	4	5	6	7
		First of Three Story		2	4	5	7	8	10	2	4	5	7	8	10
		One Story or Top of Two or Three Story	15	1	3	3	4	4	5	1	3	3	4	4	5
		First of Two Story or Second of Three Story		2	3	5	6	7	8	2	3	5	6	7	8
		First of Three Story		2	4	6	8	9	11	2	4	6	8	9	11

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Table 1. Plantd Structural Panels - Simplified Bracing Table[1-8]

Structural Sheathing Product	Ultimate Design Wind Speed (mph)	Story Level	Eave to Ridge Height (ft)	Minimum Number of Bracing Units Required (Long Side)						Minimum Number of Bracing Units Required (Short Side)					
				Length of Short Side (ft)						Length of Long Side (ft)					
				10	20	30	40	50	60	10	20	30	40	50	60

SI: 1 in = 25.4 mm, 1 mph = 1.61 km/h

1. This simplified bracing table is based on the provisions of IRC Section R602.12. All provisions therein shall be observed, except that this table shall replace IRC Table R602.12.4, and Plantd Structural Panels shall replace the sheathing material.
2. Interpolation shall not be permitted.
3. Cripple walls or wood-framed basement walls in a walk-out condition shall be designated as the first story and the stories above shall be redesignated as the second and third stories, respectively, and shall be prohibited in a three-story structure.
4. Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.
5. For Exposure Category C, multiply bracing units by a factor of 1.20 for a one-story building, 1.30 for a two-story building, and 1.40 for a three-story building.
6. Maximum stud spacing is 16" o.c.
7. Plantd Structural Panels shall be attached with minimum 8d box nails (0.113" x 2 3/8") fastened 6" o.c. at panel edges and 12" o.c. in the field. Minimum fastener edge distance shall be 3/8".
8. Minimum 1/2" gypsum wallboard attached to the interior side of the wall with minimum #6 x 2 3/8" Type W screws fastened 16" o.c. at panel edges and 16" o.c. in the field. Minimum fastener edge distance shall be 3/8".

6.3.2 *Prescriptive IRC Bracing Applications:*

6.3.2.1 Plantd Structural Panels may be used on braced wall lines as an equivalent alternative to Method WSP and CS-WSP of the IRC, when installed in accordance with IRC Section R602.10, except where modified by this report.

6.3.2.2 Required braced wall panel lengths for Plantd Structural Panels shall be as determined by the equivalency factor shown in **Table 2** and IRC Table R602.10.3(1) through IRC Table R602.10.3(4), including all footnotes.

6.3.2.2.1 The braced wall line length equivalency factors in **Table 2** are based on equivalency testing and are used to comply with Method WSP and CS-WSP of the IRC.

6.3.2.2.2 Plantd Structural Panels tested equivalency factors in **Table 2** allow the user to determine the length of bracing required by multiplying the factor from **Table 2** by the length shown in the WSP or CS-WSP columns in IRC Table R602.10.3(1) and IRC Table R602.10.3(3), as modified by all applicable factors in IRC Table R602.10.3(2) and IRC Table R602.10.3(4), respectively.

6.3.2.3 All IRC prescriptive bracing minimums, spacing requirements, and rules must also be met.

6.3.2.4 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 IRC Section R301.1.

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Table 2. IRC Braced Wall Panel Equivalency for Plantd Structural Panels

Product	Maximum Stud Spacing (in)	Fastener[1]	Maximum Fastener Spacing (edge/field) (in o.c.)	Gypsum Wallboard[4,5] Fastening Spacing (edge/field) (in o.c.)	Equivalency Factors[3] to IRC WSP or CS-WSP
Plantd Structural Panels	16 o.c.	8d box nails (0.113" x 2 3/8")	6:12	16:16	0.97

SI: 1 in = 25.4 mm

1. Minimum fastener edge distance shall be 3/8".
2. Plantd Structural Panels tested equivalency factors allow the user to determine the length of bracing required, by multiplying the factor by the length of bracing shown in the WSP or CS-WSP columns in IRC Table R602.10.3(1) and IRC Table R602.10.3(3), as modified by all applicable factors in IRC Table R602.10.3(2) and IRC Table R602.10.3(4), respectively.
3. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths in IRC Table R602.10.3(1) and IRC Table R602.10.3(3), as modified by all applicable factors in IRC Table R602.10.3(2) and IRC Table R602.10.3(4), shall be used, except the factor for omitting the gypsum wallboard shall be 1.4. Valid for single top plate (advanced framing method) wall installations or double top plate wall installations.
4. Gypsum wallboard shall be installed according to the provision listed in IRC Table R702.3.5

6.3.2.5 *Wind Bracing:*

6.3.2.5.1 For wind design, required braced wall panel lengths for the Plantd Structural Panels shall be as shown in **Table 3**, and shall be used in conjunction with IRC Table R602.10.3(2), which provides the required adjustments.

6.3.2.5.2 These tables shall be used in place of IRC Table R602.10.3(1).

Table 3. Required Bracing Lengths Plantd Structural Panels – Wind[1-9]

Condition	Braced Wall Line Spacing (ft)	Length of Wall Line to be Braced (ft)											
		Intermittent Sheathing						Continuous Sheathing					
		Wind Speeds[7] (mph)											
		< 95	≤ 110	≤ 115	≤ 120	≤ 130	< 140	< 95	≤ 110	≤ 115	≤ 120	≤ 130	< 140
One Story or the Top of Two or Three Stories	10	1.5	1.9	1.9	2.4	2.4	2.9	1.5	1.5	1.9	1.9	2.4	2.4
	20	2.4	3.4	3.4	3.9	4.9	5.3	2.4	2.9	3.4	3.4	3.9	4.9
	30	3.9	4.9	5.3	5.8	6.8	7.8	3.4	4.4	4.4	4.9	5.8	6.8
	40	4.9	6.3	6.8	7.8	8.7	10.2	3.9	5.3	5.8	6.3	7.3	8.7
	50	5.8	7.8	8.7	9.2	10.7	12.6	4.9	6.8	7.3	7.8	9.2	10.7
	60	6.8	9.2	10.2	11.2	12.6	14.6	5.8	7.8	8.7	9.2	10.7	12.6
First Story of Two Stories or Second Story of Three Stories	10	2.9	3.4	3.9	4.4	4.9	5.8	2.4	2.9	3.4	3.4	4.4	4.9
	20	4.9	6.3	7.3	7.8	9.2	10.7	4.4	5.3	6.3	6.8	7.8	8.7
	30	6.8	9.2	10.2	11.2	13.1	15.0	5.8	7.8	8.7	9.2	11.2	12.6
	40	9.2	12.1	13.1	14.6	17.0	19.4	7.8	10.2	11.2	12.1	15.0	16.5
	50	11.2	15.0	16.0	17.5	20.9	23.8	9.7	12.6	13.6	15.0	17.5	20.4
	60	13.1	17.5	19.4	20.9	24.3	28.1	11.2	15.0	16.5	17.9	20.9	24.3

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Table 3. Required Bracing Lengths Plantd Structural Panels – Wind[1-9]

Condition	Braced Wall Line Spacing (ft)	Length of Wall Line to be Braced (ft)											
		Intermittent Sheathing						Continuous Sheathing					
		Wind Speeds[7] (mph)											
		< 95	≤ 110	≤ 115	≤ 120	≤ 130	< 140	< 95	≤ 110	≤ 115	≤ 120	≤ 130	< 140
First Story of Three Stories	10	3.9	5.3	5.8	6.3	7.3	8.2	3.4	4.4	4.9	5.3	6.3	7.3
	20	7.3	9.7	10.7	11.2	13.1	15.5	6.3	8.2	8.7	9.7	11.2	13.1
	30	10.2	13.6	15.0	16.5	18.9	22.3	8.7	11.6	12.6	14.1	16.5	18.9
	40	13.1	17.9	19.4	21.3	24.7	28.6	11.2	15.0	16.5	17.9	21.3	24.3
	50	16.5	21.8	23.8	26.2	30.6	35.4	14.1	18.4	20.4	22.3	25.7	30.1
	60	19.4	25.7	28.1	31.0	36.4	41.7	16.5	22.3	24.3	26.2	30.6	35.4

SI: 1 in = 25.4 mm, 1 mph = 1.61 km/h

1. Plantd Structural Panels shall be attached with minimum 8d box nails (0.113" x 2 3/8") fastened 6" o.c. at panel edges and 12" o.c. in the field. Minimum fastener edge distance shall be 3/8".
2. Demonstrates equivalency to IRC Table R602.10.3(1).
3. All adjustment factors from IRC Table R602.10.3(2) shall be applied.
4. A minimum of 1/2" GWB (minimum lightweight) sheathing shall be applied to the interior side of the wall assembly and fastened with a #6 x 1 1/4" Type W or S screws spaced 16" o.c. at panel edges and 16" o.c. in the field of the panels.
5. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.4 per IRC Table R602.10.3(2).
6. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in Section 4 that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.
7. Wind speeds are V_{ult} in accordance with ASCE 7. Convert to equivalent V_{asd} wind speed per IBC Section 1609.3.1.
8. Linear interpolation is permitted.

6.3.2.6 *Seismic Bracing:*

6.3.2.6.1 For seismic design, the required braced wall panel lengths for Plantd Structural Panels shall be as shown in **Table 4**, and shall be used in conjunction with IRC Table R602.10.3(4), which provides the required adjustments.

Table 4. Required Bracing Lengths for Plantd Structural Panels – Seismic[1-8]

Condition	Braced Wall Line Length (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line							
		Intermittent Sheathing				Continuous Sheathing			
		Seismic Design Category (SDC)							
		C	D_0	D_1	D_2	C	D_0	D_1	D_2
One Story or the Top of Two or Three Stories	10	1.6	1.7	1.9	2.4	1.4	1.6	1.6	2.1
	20	3.1	3.5	3.9	4.9	2.6	3.0	3.3	4.2
	30	4.7	5.3	5.8	7.3	4.0	4.5	4.9	6.2
	40	6.2	7.0	7.8	9.7	5.3	5.9	6.6	8.2
	50	7.8	8.7	9.7	12.1	6.6	7.4	8.2	10.3

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Table 4. Required Bracing Lengths for Plantd Structural Panels – Seismic[1-8]

Condition	Braced Wall Line Length (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line							
		Intermittent Sheathing				Continuous Sheathing			
		Seismic Design Category (SDC)							
		C	D_0	D_1	D_2	C	D_0	D_1	D_2
First Story of Two Stories or Second Story of Three Stories	10	2.9	3.7	4.3	5.4	2.5	3.1	3.7	4.6
	20	5.8	7.3	8.7	10.6	4.9	6.2	7.4	9.1
	30	8.7	11.0	13.1	16.0	7.4	9.3	11.2	13.6
	40	11.7	14.5	17.5	21.3	9.9	12.4	14.9	18.1
	50	14.5	18.2	21.8	26.7	12.4	15.5	18.5	22.7
First Story of Three Stories	10	4.3	5.1	5.8	NP (7)	3.7	4.3	4.9	NP
	20	8.7	10.2	11.7	NP	7.4	8.7	9.9	NP
	30	13.1	15.3	17.5	NP	11.2	13.0	14.9	NP
	40	17.5	20.3	23.3	NP	14.9	17.4	19.8	NP
	50	21.8	25.5	29.1	NP	18.5	21.6	24.7	NP

SI: 1 ft = 0.3048 m

1. Plantd Structural Panels shall be attached with minimum 8d box nails (0.113" x 2⅜") fastened 6" o.c. at panel edges and 12" o.c. in the field. Minimum fastener edge distance shall be ⅜".
2. Demonstrates equivalency to IRC Table R602.10.3(3). All adjustment factors from IRC Table R602.10.3(4) shall be applied.
3. A minimum of ½" GWB (minimum lightweight) sheathing shall be applied to the interior side of the wall assembly and fastened with a #6 x 1¼" Type W or S screws spaced 16" o.c. at panel edges and 16" o.c. in the field of the panels. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.5 per IRC Table R602.10.3(4).
4. Tabulated bracing lengths are based on the following:
   a. Soil Class D
   b. Wall height = 10'
   c. 10-psf floor dead load
   d. 15-psf roof/ceiling dead load
   e. Braced wall line spacing ≤ 25'
5. Linear interpolation is permitted.
6. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in Section 4 that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.
7. NP = Not Permitted

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

6.3.3.1 Plantd Structural Panels may be used to brace exterior walls of buildings as an equivalent alternative to Method WSP of the IBC, when installed with blocked ½" GWB, fastened with a minimum 5d cooler nail 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 2308.10[28] and this report.

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6.4 *Performance-Based Wood-Framed Construction:*

6.4.1 *In-Plane Lateral Resistance:*

6.4.1.1 Plantd Structural Panels 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 unit shear capacities shown in **Table 5** for Allowable Stress Design (ASD). Walls sheathed with Plantd Structural Panels may be designed to resist wind loads.

6.4.1.1.1 Plantd Structural Panels used in wall assemblies designed as shear walls are permitted to resist lateral wind load forces using the allowable shear loads (in pounds per linear foot) set forth in **Table 5**.

6.4.1.2 Plantd Structural Panels used in wall assemblies designed as shear walls are permitted to resist seismic load forces using the seismic allowable unit shear capacities set forth in **Table 6** when seismic design is required in accordance with IBC Section 1613, ASCE 7 and SDPWS, as applicable, except as modified by this report.

6.4.1.2.1 The response modification coefficient, R, system overstrength factor, Ω_0, and deflection amplification factor, C_d, indicated in **Table 6** shall be used to determine the base shear, element design forces, and design story drift in accordance with ASCE 7, Chapter 12 and ASCE 7, Section 14.5, as applicable.

Table 5. Allowable Stress Design (ASD) Capacity for Plantd Structural Panels – Wind[1,2]

Structural Sheathing Product	Minimum Fastener Size (in)	Fastener Spacing (edge:field) (in o.c.)	Stud Spacing (in o.c.)	Gypsum Wallboard[2] (GWB)	GWB Fastener Spacing[3] (edge:field) (in)	Allowable Unit Shear Capacity (plf)
Plantd Structural Panels	8d box nails (0.113" x 2 3/8")	6":12"	16" o.c.	1/2" GWB	16":16"	375
				No GWB	-	345

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

1. Tested in accordance with ASTM E564.
2. Plantd Structural Panels installed with butted joints on nominal 2x studs with a minimum published specific gravity of 0.42 spaced as listed in this table, and fastened with the specified fastening schedule. Fastener edge distance shall be a minimum of 3/8".
3. GWB (minimum lightweight) shall be attached with minimum #6 Type W or S screws 1 1/4" long with a minimum edge distance of 3/8".

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Table 6. Seismic Allowable Unit Shear Capacity (ASD) and Seismic Design Coefficients for Light-Frame (Wood) Walls Sheathed with Plantd Structural Panels[1]

Seismic Force Resisting System	Gypsum Wallboard[2] (GWB)	Seismic Allowable Unit Shear Capacity[3] (plf)	Apparent Shear Stiffness G_a (kips/in)	Response Modification Factor, R[4]	System Over-strength Factor Ω_0[5]	Deflection Amplification Coefficient C_d[6]	Structural System Limitations and Building Height Limit[7] (ft)				
							SDC[9]				
							B	C	D	E	F
Light-Frame (Wood) Walls Sheathed with Plantd Structural Panels	1/2" GWB	315	21.6	6.5	3.0	4.0	NL (8)	NL	65	65	65
	No GWB	250	17.6	6.5	3.0	4.0	NL	NL	65	65	65

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m, 1-psi = 0.00689 MPa

1. Plantd Structural Panels shall be installed with butted joints on nominal 2x studs spaced no greater than 16" o.c. with minimum 8d box nails (0.113" x 2 3/8") fastened 6" o.c. at panel edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of 3/8".
2. GWB shall be fastened with minimum #6 type W or S screws 1 1/4" long spaced 16" o.c. along the perimeter and in the field. Fasteners shall maintain a minimum edge distance of 3/8".
3. All seismic design parameters follow the equivalency as defined in Section 4.4 and Section 8.
4. Response modification coefficient, R, for use throughout ASCE 7. *Note:* R reduces forces to a strength level, not an allowable stress level.
5. 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.
6. Deflection amplification factor, C_d, for use with ASCE 7, Section 12.8.6, ASCE 7, Section 12.8.7, and ASCE 7, Section 12.9.1.2
7. Heights are measured from the base of the structure as defined in ASCE 7, Section 11.2.
8. NL = Not Limited
9. SDC = Seismic Design Category

6.4.2 *Transverse Load Resistance:*

6.4.2.1 Plantd Structural Panels are permitted to resist transverse wind load forces using the allowable transverse loads set forth in **Table 7**.

6.4.2.2 Required component and cladding loads to be resisted are found in IBC Section 1609.1.1, IRC Table R301.2.1(1), and IRC Table R301.2.1(2).[29]

Table 7. Transverse (Out-of-Plane) Wind Load Resistance (ASD)[1,2,3]

Product	Maximum Stud Spacing (in)	Allowable Design Value (psf)	Fastener Schedule	ASD Wind Speed, V_{asd} (mph)	Basic Wind Speed, V_{ult} (mph)
Plantd Structural Panels	16" o.c.	+160	Minimum 8d box nails (0.113" x 2 3/8") fastened 6" o.c. at panel edges and 12" o.c. in the field	155	200
		-80			

SI: 1 in = 25.4 mm, 1-psf = 0.0479 kN/m², 1 mph = 1.61 km/h

1. Design wind load capacity shall be in accordance with IBC Section 1609.1.1.
2. Capacities assume minimum 1/2" gypsum wallboard installed on the interior side of the wall. Where gypsum wallboard in not installed on the interior side of the wall, a forty percent (40%) reduction in wind pressure resistance shall be applied (V_{asd} wind speed less than 90 mph, V_{ult} less than 120 mph).
3. Allowable wind speeds are based on the following: Components and Cladding wind loads, Mean roof height 30', Exposure C, 10 sq. ft. effective wind area. See the applicable building code for any adjustment needed for specific building location and configuration.

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6.4.3 *Uplift Resistance:*

6.4.3.1 Wall assemblies with Plantd Structural Panels were evaluated for uplift resistance in accordance with ASTM E72.

6.4.3.1.1 Walls sheathed with Plantd Structural Panels are permitted to resist uplift forces using the allowable uplift loads (in pounds per linear foot) set forth in **Table 8**.

Table 8. Uplift Performance[1,2]

Structural Sheathing Product	Fastener Schedule	Stud Spacing (in. o.c.)	Allowable Uplift Capacity (plf)
Plantd Structural Panels	Minimum 8d box nails (0.113" x 2 3/8") fastened 4" o.c. at panel edges and 12" o.c. in the field	16" o.c.	85 (3)

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

1. The capacities shown are for the purpose of providing information on the hold-down capacity of the sheathing to the bottom plate connection independent of lateral loading. Where combined shear and uplift loading is needed, consult a professional engineer.
2. Attachment to wood framing having a minimum specific gravity of 0.42. Fastener edge distance shall be a minimum of 3/8".
3. *Single row nails:* Plantd Structural Panels shall overlap the top member of the double top plate and bottom plate by 1 1/2" and a single row of nails shall be placed 3/4" from the panel edge.

6.5 *Fastener Performance*

6.5.1 The allowable fastener design values for the Plantd Structural Panels is shown in **Table 9**.

Table 9. Plantd Structural Panels - Fastener Performance[1,4]

Structural Panel	Dowel Bearing Strength[2] (psi)	Head Pull-Through[3] (lb)	Withdrawal[3] (lb/in)
Plantd Structural Panels	4,650	67	32

SI: 1 in = 25.4 mm, 1 lb. = 4.45 N, 1-psi = 0.00689 MPa

1. The tabulated fastener design values are based on a minimum equivalent specific gravity of 0.50.
2. Listed dowel bearing strength is based on the value established in NDS Table 12.3.3B for wood structural panels having an equivalent specific gravity of 0.50, as stated in Footnote 1, and dowel-type fasteners having a diameter 1/4" or less.
3. Withdrawal and Head Pull-through values are based on 8d (0.131" x 2 1/2") common nail with a nominal head diameter of 0.281".
4. Tabulated fastener design values shall be multiplied by all applicable adjustment factors per NDS Table 11.3.1.

6.6 Alternative techniques shall be permitted in accordance with accepted engineering practice and experience. These provisions for the use of alternative materials, designs, and methods of construction are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed herein. This includes, but is not limited to, the following areas of engineering: mechanics of materials, structures, building science, and fire science.

7 Certified Performance[30]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[31]

7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.[32]

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8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Plantd Structural Panels complies with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Plantd Structural Panels are evaluated as an alternative material under the alternative-material provisions of the IBC and IRC for the applications and design values stated in this report.

8.1.2 Structural performance under lateral load conditions (wind and seismic) for use as an alternative to the IRC Intermittent Wall Bracing provisions of IRC Section R602.10 and the IRC Continuous Wall Bracing provisions of IRC Section R602.10.4 Method CS-WSP (Continuously Sheathed Wood Structural Panel).

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

8.1.3.1 **Table 6** provides Seismic Design Coefficients (SDC) that conform to the requirements in ASCE 7 Section 12.2.1.1 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).

8.1.3.2 The basis for equivalency testing is outlined in Section 12.2.1.1 of ASCE 7:

> 12.2.1.1 Alternative Structural Systems. 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.

8.1.3.3 The basis of the seismic evaluation performed as part of this report is based on ASTM D7989 and testing per ASTM E2126 to establish SDC that conform to the requirements of ASCE 7, Section 12.2.1.1.

8.1.4 Structural performance under lateral load conditions for use as an alternative to SDPWS Section 4.3 Wood Frame Shear Walls.

8.1.5 Resistance to transverse loads for wall assemblies used in light-frame wood construction in accordance with IBC Section 1609.1.1 and IRC Section R301.2.1.

8.1.6 Resistance to uplift loads for wall assemblies used for light-frame wood construction in accordance with IBC Section 1609 and IRC Section R301.2.1.

8.2 Perforated shear-wall design methods are outside the scope of this report.

8.3 IRC portal-frame methods, including PFH and CS-PF, are outside the scope of this report.

8.4 Any building code, regulation and/or accepted engineering evaluations (e.g., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[33] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[34] respectively.

8.5 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is also its areas of professional engineering competence.

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9 Installation

9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report, and the applicable building code.

9.2 In the event of a conflict between the manufacturer installation instructions and this report, contact the manufacturer for counsel on the proper installation method.

9.3 Where a structural capacity in **Section 6** is based on a specific panel orientation, framing configuration, fastener type, fastener spacing, gypsum wallboard configuration, anchorage condition, or other assembly detail, the installation shall conform to that configuration.

9.4 *Installation Procedure*

9.4.1 Plantd Structural Panels may be installed vertically or horizontally for general wall-sheathing applications, except where a specific orientation is required by the structural provisions of this report.

9.4.2 For shear-wall assemblies evaluated in **Section 6**, Plantd Structural Panels shall be installed vertically with the 8' panel dimension parallel to the wall studs, consistent with the evaluated wall configurations.

9.4.3 A nominal $^{1}/_{8}$" gap shall be provided at panel edge and end joints unless otherwise specified by the manufacturer.

9.4.4 Supported panel joints shall occur approximately along the centerline of framing or blocking.

9.4.5 All Plantd panel edges within blocked shear walls shall be supported by wood framing or blocking. Blocking at horizontal joints shall be sized and connected to transfer the applicable shear forces.

9.4.6 Panels shall be installed directly against the framing.

9.4.6.1 Framing shall be spaced no more than 16" o.c.

9.4.7 *Fastening*

9.4.7.1 Unless a different fastening schedule is specifically established in **Section 6**, Plantd Structural Panels used in structural wall applications shall be attached to wood framing with minimum 8d box nails having dimensions of 0.113" × $2^{3}/_{8}$".

9.4.7.1.1 Gypsum wallboard shall be attached with minimum #6 Type S or Type W drywall screws, $1^{1}/_{4}$" long.

9.4.7.2 For the shear-wall configurations recognized in **Section 6**, Plantd Structural Panels fasteners shall be spaced not more than:

9.4.7.2.1 6" o.c. along supported panel edges; and

9.4.7.2.2 12" o.c. along intermediate framing members.

9.4.7.3 Plantd panel fasteners shall be located not less than $^{3}/_{8}$" from panel edges and ends, except where a greater edge distance is specifically required for an uplift or combined shear-and-uplift configuration.

9.4.7.4 Nails shall be driven with the nail head flush with the surface of the Plantd Structural Panels.

10 Substantiating Data

10.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

10.1.1 Transverse load testing in accordance with ASTM E330

10.1.2 Uplift load testing in accordance with ASTM E72

10.1.3 Lateral load testing and data for determining comparative equivalency for use as an alternative material in accordance with ASTM E564 and ASTM E2126, and analysis per ASTM D7989

10.1.4 Dowel bearing strength testing in accordance with ASTM D5764

10.1.5 Fastener withdrawal and head-pull-through testing in accordance with ASTM D1037

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10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or an RDP. Accuracy of external test data and resulting analysis is relied upon.

10.3 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

10.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.

10.5 *Testing and Engineering Analysis*

10.5.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[35]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for Plantd Structural Panels on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, Plantd Structural Panels has performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, Plantd Structural Panels shall be approved for the following applications:

11.2.1 As structural sheathing on exterior walls of Type V construction in accordance with the IBC.

11.2.2 As structural sheathing on exterior walls constructed in accordance with IRC Section R602.

11.2.3 Lateral load resistance due to wind and seismic loads carried by shear walls, as described in **Table 5** and **Table 6** for wood-framed walls.

11.2.4 Transverse load resistance due to components and cladding pressures on building surfaces as described in **Table 7**.

11.2.5 Axial load resistance due to uplift loads induced by wind as described in **Table 8**

11.2.6 Fastener performance as shown in **Table 9**.

11.3 Unless exempt by state statute, when Plantd Structural Panels is to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Plantd, Inc.

11.5 IBC Section 104.2.3[36] (IRC Section R104.2.2[37] and IFC Section 104.2.3[38] are similar) in pertinent part state:

> 104.2.3 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 is not specifically prohibited by this code and has been approved.

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11.6 **Approved:**[39] Building regulations require that the building official shall accept duly authenticated reports.[40]

11.6.1 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited.

11.6.2 An approved source is *"approved"* when an RDP is properly licensed to transact engineering commerce.

11.6.3 Federal law, Title 18 US Code Section 242, requires that, where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

11.7 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB Accredited Product Certification Body – Accreditation #1131.

11.8 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[41]

12 Conditions of Use

12.1 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

12.2 As listed herein, Plantd Structural Panels shall be subjected to the following conditions:

12.3 When used in accordance with the IBC in Seismic Design Categories C, D, E, or F, special inspections shall comply with IBC Section 1705.13.[42]

12.4 When used in accordance with the IBC in high wind areas, special inspections shall comply with IBC Section 1705.12.[43]

12.5 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.

12.5.1 Loads applied shall remain within the limits set forth in **Section 6**:

12.5.1.1 Demand shear loads shall remain within the limits in **Table 5** for wind loads and **Table 6** for seismic loads.

12.5.1.2 Demand uplift loads shall remain within the limits in **Table 8**.

12.5.1.3 Demand wind loads shall remain within the limits in **Table 7** unless an approved exterior wall covering capable of separately resisting loads perpendicular to the face of the walls is installed over the sheathing.

12.5.1.4 Demand fastener connection loads shall remain within the limits in **Table 9**.

12.6 When required by adopted legislation and enforced by the building official, also known as the Authority Having Jurisdiction (AHJ) in which the project is to be constructed:

12.6.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.6.2 This report and the installation instructions shall be submitted at the time of permit application.

12.6.3 At a minimum, this innovative product shall be installed per **Section 9**.

12.6.4 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.

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12.6.5 This innovative product has an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

12.6.6 The application of this innovative product in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2, and any other regulatory requirements that may apply.

12.7 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall make, or cause to be made, the necessary tests and investigations; or the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.2.3"*, all of IBC Section 104, and IBC Section 105.3.

12.8 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.9 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

13 Identification

13.1 Plantd Structural Panels, as listed in **Section 1.1**, is identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.plantdmaterials.com.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit www.drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

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Notes

1 For more information, visit drjcertification.org or call us at 608-310-6748.

2 Also known as Gramineae

3 Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of TPI 1, the NDS, AISI S202, US professional engineering law, Canadian building code, Canada professional engineering law, Qualtim External Appendix A: Definitions/Commentary, Qualtim External Appendix B: Project/Deliverables, Qualtim External Appendix C: Intellectual Property and Trade Secrets, definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

4 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702

5 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3

6 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.2:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests

7 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.1:~:text=Conformance%20to%20Standards-,The%20design%20strengths%20and%20permissible%20stresses,-of%20any%20structural

8 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20make%2C%20or%20cause%20to%20be%20made%2C%20the%20necessary%20tests%20and%20investigations%3B%20or%20the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.2.3.

9 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2

10 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency

11 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source

12 https://www.law.cornell.edu/uscode/text/18/1832 (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of $5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. The federal government and each state have a public records act. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

13 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

14 https://www.cbitest.com/accreditation/

15 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code

16 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3 AND https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#105.3.1

17 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

18 https://iaf.nu/en/about-iaf-mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

19 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

20 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

21 Unless otherwise noted, the links referenced herein use un-amended versions of the 2024 International Code Council (ICC) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the IBC 2024 and the IRC 2024 are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.

22 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by the local jurisdiction. https://up.codes/codes/general

23 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by state. https://up.codes/codes/general

24 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14

25 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

26 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed AND https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled

27 2021 IBC Section 2308.5.3.2

28 2021 IBC Section 2308.6

29 2018 IRC Table R301.2(3)

30 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4

31 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

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[32] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

[33] Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

[34] https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH

[35] See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition: https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

[36] 2021 IBC Section 104.11

[37] 2021 IRC Section R104.11

[38] 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

[39] Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 (https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

[40] https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

[41] Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.

[42] 2018 IBC Section 1705.12

[43] 2018 IBC Section 1705.11

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