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PBU PANEL

CSI Sections:

07 41 13 – Metal Roof Panels
07 42 13 – Metal Wall Panels
07 42 13.13 –Formed Metal Wall Panels

1.0 RECOGNITION

The Cornerstone Building Brands PBU Panel recognized in this report has been evaluated for use as a component of walls and horizontal or sloped floor and roof systems supporting out-of-plane loads, in-plane diaphragm shears, and in-plane axial loads. The physical characteristics and structural performance properties of the PBU Panels comply with the intent of the provisions of the following codes and regulations:

- 2024 and 2021 International Building Code® (IBC)
- 2024 and 2021 International Residential Code® (IRC)
- 2022 California Building Code (CBC) – see attached Supplement
- 2023 Los Angeles Building Code (LABC) – see attached Supplement

2.0 LIMITATIONS

Use of the PBU Panel recognized in this report is subject to the following limitations:

2.1 The PBU Panel shall be installed in accordance with the applicable code, the manufacturer's published installation instructions, and this report. Where there is a conflict, the most restrictive requirements shall govern.

2.2 Calculations and details demonstrating that the loads applied to the PBU Panel comply with this report shall be submitted to the building official for approval. Calculations and drawings shall be prepared, signed, and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

2.3 Air infiltration resistance is outside the scope of this report. Water infiltration without underlayment is outside the scope of this report. Weather protection using underlayment for roofs, or water-resistive barrier for walls, shall comply with Section 3.0 of this report.

2.4 PBU Panels used on exterior walls shall be flashed in accordance with IBC Section 1404.4 or IRC Section R905.4.6 and be placed over a water-resistive barrier in accordance with IBC Sections 1402.2, 1403.2, and 1404.2 or IRC Section R703.1.

2.5 The PBU Panel roof slopes shall comply with IBC Section 1507.4.2 or IRC Section R905.10.2.

2.6 Roof flashing shall comply with IBC Sections 1503.2 and 1503.3 or IRC Sections R903.2 and R903.3. Underlayment shall be installed in accordance with IBC Sections 1507.1 and 1507.4.5 considering applicable wind conditions.

2.7 Roof panels shall be limited to installations complying with the requirements of IBC Section 1505.2, Exception 2, or IRC Section R902.1, Exception 2, as Class A roof assemblies. For other conditions, roof assemblies shall be listed as Class A, B, or C in accordance with ASTM E108 or UL 790, by an approved listing agency or shall be considered as non-classified roofing.

2.8 The fire-resistance of walls is outside the scope of this report. Fire-resistance ratings, when required, shall be determined in accordance with IBC Section 703 or IRC Section R302.

2.9 Wind-blown debris resistance is outside the scope of this report.

2.10 Design of panel penetrations and other panel discontinuities shall be the responsibility of the design professional using rational engineering mechanics or in accordance with the manufacturer's installation instructions as approved by the building official.

2.11 Hail resistance is outside the scope of this report.

2.12 Where PBU-Panels wall panels are used as vertical diaphragm shear resistance in walls (shear walls) of light-frame construction for seismic design, the walls shall be classified as a "bearing wall system" or "building frame system" with "light-framed walls with shear panels of all other materials" subject to the conditions of this classification as defined in ASCE/SEI 7 Section 12.2.

2.13 When steel panels are used as the stressed skin shear carrying element of a horizontal or sloped diaphragm as defined in Section 202 of the IBC, the diaphragm length and width shall be limited by one of the following: engineering mechanics; applied loads; shear capacity of the diaphragm; diaphragm shear deflection limited by the requirements of ASCE/SEI 7 in Section 12.8.6 entitled, "Story Drift Determination"; or Section 12.12 entitled, "Drift and

Deformation". Shear deflection shall be based on the shear stiffness for the steel deck diaphragm and equations of mechanics. Common shear deflection equations, as shown in Table 5 of this report, may be used.

2.14 The steel panels recognized in this report are produced by Cornerstone Building Brands in Tolleson, Arizona; Atwater, California; and Salt Lake City, Utah.

3.0 PRODUCT USE

3.1 General: The PBU Panel complies with IBC Sections 1403.5, 1404.2, and 1507.4, and IRC Sections R703.3 and R905.10 as steel wall coverings and metal roof panels and are used as new roof and wall coverings installed directly to steel framing.

3.2 Design: The section properties, determined using AISI S100 design specifications, are shown in Table 1 of this report.

The allowable uniform positive and negative loads for the PBU Panel, installed in accordance with this report and the manufacturer's installation instructions directly to steel framing, are shown in Table 3A and Table 3B, of this report.

Panel attachments shall be designed to equal or exceed the design negative loads. The design shall comply with Section J of AISI S100 and is subject to the approval of the building official.

The allowable horizontal and vertical diaphragm shear strengths and stiffnesses for the PBU Panel, installed in accordance with the manufacturer's installation instructions directly to steel framing, are shown in Table 4A and Table 4B of this report. The tabulated values are for full-width panels. For cut panels, diaphragm shear strength and stiffness shall be evaluated in accordance with AISI S310. A load path to the foundation shall be provided for the uplift, shear, and compression forces as determined by the design professional and approved by the building official. Elements resisting shear wall forces contributed by multiple stories shall be designed for the sum of forces contributed by each story.

3.3 Installation: Roof slope shall comply with IBC Section 1507.4.2.1 or 1507.4.2.2, or IRC Section R905.10.2.1 or R905.10.2.2.

For walls, a water-resistive barrier shall be provided in accordance with IBC Sections 1403.2 and 1404.2 or IRC Section R703.2; flashing shall be provided in accordance with IBC Section 1405.4 or IRC Section R703.4.

The PBU panel shall be secured using No.12-14 by 1¼-inch long (32 mm) corrosion-resistant galvanized steel HWH self-drilling tapping screws spaced as shown in Figure 2 of this report and direct to the No.16 gage [0.0568 inch (1.44 mm)] steel supports having a minimum yield strength of 55 ksi (379 MPa) and complying with the applicable code in Section 1.0 of this report.

4.0 PRODUCT DESCRIPTION

The Cornerstone Building Brands PBU Panels described in this report are cold-formed from steel sheets conforming to ASTM A792 SS Grade 50 Class 1 or Class 4 and ASTM A792 SS Grade 80 Class 1 into panels with fluted sections. The panels are 36 inches (914 mm) wide and have an ASTM A792 AZ60 coating. Profile dimensions are as noted in Figure 1 of this report.

The PBU Panel is a through-fastened metal roof and wall covering that is rolled and pressure-formed from sheet steel complying with ASTM A792, SS, Grade 50 (Class 1 or 4), or ASTM A792, SS, Grade 80 with an AZ50 aluminum-zinc alloy coating. The No. 22 gauge panel minimum base-metal design thickness is 0.0286 inch (0.0.73 mm). The No. 24 gage panel minimum base-metal design thickness is 0.0224 inch (0.57 mm). The No. 26 gage is 0.0176 inch (0.45 mm). The panel width is 36 inches (914 mm), and the panel height is $^{3}/_{4}$ inch (19 mm) with 6-inch-on-center (152 mm) continuous corrugations.

5.0 IDENTIFICATION

The bundle of Cornerstone Building Brands PBU Panels is identified with a label with the company name (Cornerstone Building Brands), address, the product name, steel specification, base metal thickness, steel gauge, and evaluation report number (IAPMO UES ER-953). The IAPMO Uniform Evaluation Service Mark of Conformity may also be used as shown below:

IAPMO UES ER-953

6.0 SUBSTANTIATING DATA

Data in accordance with the IAPMO Uniform Evaluation Service Evaluation Criteria EC-011, Adopted October 2024, Evaluation Criteria for Single Skin Steel Roof and Wall Panels.

7.0 REFERENCE CODE SECTIONS

The code references apply to the recognition provided in this report but may not include every code section related to the use of this product.

International Building Code:

- 2024 IBC Section 104.2.3 (2021 IBC Section 104.11) Alternative materials, design, and methods of construction and equipment.
- 2024 IBC Section 2205 (2021 IBC Section 2210.1) General
- 2024 IBC Section 2208 (2021 IBC Section 2210.1.1) Steel Decks
- 2024 IBC Section 2206.1 (2021 IBC Section 2211.1) Structural framing.

International Residential Code:

- 2024 IRC Section R104.2.2 (2021 IRC Section R104.11) Alternative materials, design, and methods of construction and equipment.
- 2024 and 2021 IRC Section R301.1.3 Engineered design.
- 2024 and 2021 IRC Section R703.3 Wall covering nominal thickness and attachments.
- 2024 and 2021 IRC Section R905.10 Metal roof panels.

8.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Cornerstone Building Brands PBU Panel to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Products are manufactured at locations noted in Section 2.14 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

SI conversion factors for tables:

1 inch = 25.4 mm
1 ksi = 6.89 MPa
1 psf = 48 Pa
1 lbf = 4.45 N
1 in^3 = 16.39 cm^3
1 in^4 = 62 cm^4
1 kip-in = 11.30 kN-cm

TABLE 1—SECTION PROPERTIES

PBU PANEL				POSITIVE BENDING (Top in Compression)				NEGATIVE BENDING (Bottom in Compression)			
Panel Gauge	Yield Strength (F_y)	Design Thickness (inch)	Weight (psf)	$I_{xx\text{-}gross}$ (in^4/ft)	$I_{xx\text{-}eff+}$ (in^4/ft)	$S_{xx\text{-}eff+}$ (in^3)	M_{ax} (lb-ft)	$I_{xx\text{-}gross}$ (in^4/ft)	$I_{xx\text{-}eff-}$ (in^4/ft)	S_{xe} (in^3)	M_{ax} (lb-ft)
26	50	0.0181	0.88	0.027	0.025	0.044	110	0.027	0.017	0.040	99
26	60	0.0181	0.88	0.027	0.024	0.043	128	0.027	0.016	0.038	114
24	50	0.0223	1.09	0.033	0.032	0.058	144	0.033	0.022	0.054	134
24	60	0.0223	1.09	0.033	0.031	0.056	168	0.033	0.022	0.051	154
22	50	0.0286	1.39	0.043	0.043	0.078	194	0.043	0.030	0.071	178
22	60	0.0286	1.39	0.043	0.043	0.077	231	0.043	0.030	0.070	211

1. Minimum bare metal thickness of panels shall be no less the 95 percent of design thickness.
2. Panel width is 36 inches.

TABLE 2—SHEAR AND WEB CRIPPLING

Gauge Number	V_n/Ω lbs per ft	Web Crippling (R_n/Ω), lbs/ft One Flange Loading - End Bearing	Web Crippling (R_n/Ω), lbs/ft One Flange Loading - Interior Bearing
26	1003	266	375
26	1197	319	450
24	1233	389	560
24	1480	467	672
22	1577	612	900
22	1893	734	1080

Deck fastened to supports with 1.5 inch minimum bearing length at all supports.

TABLE 3A—BPU PANEL (50 ksi) ALLOWABLE (ASD) UNIFORMLY DISTRIBUTED LOADS (psf)

Span (ft)		1-Span			2-Span			3-Span		
		Base Steel Thickness (in)			Base Steel Thickness (in)			Base Steel Thickness (in)		
		0.0181	0.0223	0.0286	0.0181	0.0223	0.0286	0.0181	0.0223	0.0286
2	Positive	214	280	377	150	224	343	170	255	409
	Negative	92	113	113	74	90	90	84	102	102
	L/180	279	354	473	673	854	1140	527	669	893
2.5	Positive	138	181	244	120	168	222	136	204	275
	Negative	74	90	90	59	72	72	67	82	82
	L/180	143	181	242	344	437	584	270	342	457
3	Positive	97	126	170	87	117	155	108	145	193
	Negative	62	75	75	49	60	60	56	68	68
	L/180	83	105	140	199	253	338	156	198	265
3.5	Positive	71	93	126	64	86	115	80	108	143
	Negative	53	64	64	42	51	51	48	58	58
	L/180	52	66	88	125	159	213	98	125	167
4	Positive	55	72	96	49	66	88	61	83	110
	Negative	46	56	56	37	45	45	42	51	51
	L/180	35	44	59	84	107	143	66	84	112
4.5	Positive	43	57	76	39	53	70	48	65	87
	Negative	39	50	50	33	40	40	37	45	45
	L/180	25	31	42	59	75	100	46	59	78
5	Positive	35	46	62	31	43	57	39	53	71
	Negative	32	43	45	30	36	36	34	41	41
	L/180	18	23	30	43	55	73	34	43	57
5.5	Positive	29	38	51	26	35	47	32	44	58
	Negative	26	35	41	27	33	33	31	37	37
	L/180	13	17	23	32	41	55	25	32	43
6	Positive	24	32	43	22	30	39	27	37	49
	Negative	22	30	38	24	30	30	28	34	34
	L/180	10	13	18	25	32	42	20	25	33
6.5	Positive	21	27	37	19	25	34	23	32	42
	Negative	19	25	34	21	27	28	26	31	31
	L/180	8	10	14	20	25	33	15	19	26
7	Positive	18	23	32	16	22	29	20	27	36
	Negative	16	22	29	18	23	26	22	29	29
	L/180	7	8	11	16	20	27	12	16	21
7.5	Positive	16	20	28	14	19	25	18	24	32
	Negative	14	19	25	16	20	24	19	25	27
	L/180	5	7	9	13	16	22	10	13	17
8	Positive	14	18	24	12	17	22	15	21	28
	Negative	12	17	22	14	18	23	17	22	26
	L/180	4	6	7	11	13	18	8	10	14
8.5	Positive	12	16	21	11	15	20	14	18	25
	Negative	11	15	20	12	16	21	15	20	24
	L/180	4	5	6	9	11	15	7	9	12
9	Positive	11	14	19	10	13	18	12	16	22
	Negative	10	13	18	11	14	19	14	18	23
	L/180	3	4	5	7	9	13	6	7	10
9.5	Positive	10	13	17	9	12	16	11	15	20
	Negative	9	12	16	10	13	17	12	16	21
	L/180	3	3	4	6	8	11	5	6	8
10	Positive	9	12	16	8	11	14	10	13	18
	Negative	8	11	14	9	12	16	11	14	19
	L/180	2	3	4	5	7	9	4	5	7

TABLE 3B—BPU PANEL (80 ksi) ALLOWABLE (ASD) UNIFORMLY DISTRIBUTED LOADS (psf)

Span (ft)		1-Span			2-Span			3-Span		
		Base Steel Thickness (in)			Base Steel Thickness (in)			Base Steel Thickness (in)		
		0.0181	0.0223	0.0286	0.0181	0.0223	0.0286	0.0181	0.0223	0.0286
2	Positive	250	328	449	180	269	407	205	306	491
	Negative	95	113	113	76	90	90	86	102	102
	L/180	274	350	473	661	842	1140	518	660	893
2.5	Positive	161	212	291	143	193	264	164	239	326
	Negative	76	90	90	61	72	72	69	82	82
	L/180	140	179	242	338	431	584	265	338	457
3	Positive	113	148	203	100	135	184	124	168	229
	Negative	63	75	75	50	60	60	57	68	68
	L/180	81	104	140	196	250	338	153	195	265
3.5	Positive	83	109	150	74	99	136	92	124	169
	Negative	54	64	64	43	51	51	49	58	58
	L/180	51	65	88	123	157	213	97	123	167
4	Positive	64	83	115	56	76	104	70	95	130
	Negative	47	56	56	38	45	45	43	51	51
	L/180	34	44	59	83	105	143	65	82	112
4.5	Positive	50	66	91	45	60	83	56	75	103
	Negative	42	50	50	34	40	40	38	45	45
	L/180	24	31	42	58	74	100	45	58	78
5	Positive	41	54	74	36	49	67	45	61	84
	Negative	36	45	45	30	36	36	34	41	41
	L/180	18	22	30	42	54	73	33	42	57
5.5	Positive	34	44	61	30	41	56	37	51	69
	Negative	30	41	41	28	33	33	31	37	37
	L/180	13	17	23	32	40	55	25	32	43
6	Positive	28	37	51	25	34	47	31	43	58
	Negative	25	34	38	25	30	30	29	34	34
	L/180	10	13	18	24	31	42	19	24	33
6.5	Positive	24	32	44	21	29	40	27	36	50
	Negative	21	29	35	23	28	28	26	31	31
	L/180	8	10	14	19	25	33	15	19	26
7	Positive	21	27	38	19	25	34	23	31	43
	Negative	19	25	32	21	26	26	25	29	29
	L/180	6	8	11	15	20	27	12	15	21
7.5	Positive	18	24	33	16	22	30	20	27	37
	Negative	16	22	30	18	24	24	23	27	27
	L/180	5	7	9	13	16	22	10	13	17
8	Positive	16	21	29	14	19	26	18	24	33
	Negative	14	19	26	16	21	23	20	26	26
	L/180	4	5	7	10	13	18	8	10	14
8.5	Positive	14	19	26	13	17	23	16	21	29
	Negative	13	17	23	14	19	21	18	23	24
	L/180	4	5	6	9	11	15	7	9	12
9	Positive	13	17	23	11	15	21	14	19	26
	Negative	11	15	21	13	17	20	16	21	23
	L/180	3	4	5	7	9	13	6	7	10
9.5	Positive	11	15	20	10	14	19	13	17	23
	Negative	10	14	19	11	15	19	14	19	22
	L/180	3	3	4	6	8	11	5	6	8
10	Positive	10	13	18	9	12	17	11	15	21
	Negative	9	12	17	10	13	18	13	17	20
	L/180	2	3	4	5	7	9	4	5	7

Notes to Table 4A:

1. Structural fasteners to supports: #12 SMS, 12" o.c. (alternating low flutes) along interior supports and 6" o.c. (every low flute) along end supports.
2. Structural fasteners at edge panels parallel to panel ribs: #12 SMS spaced as indicated in the table.
3. Stitch fasteners: #14 SMS spaced as indicated in the table.
4. Supports are minimum 0.0566" thick steel with F_u = 65 ksi minimum.
5. Panels are not subject to uplift.
6. Installations where insulation is placed between the panel and the support are outside the scope of this table.
7. Bearing length at exterior supports is 1.5 inches minimum.
8. Loads are allowable (ASD) loads.

TABLE 4A—PBU PANELS DIAPHRAGM SHEAR STRENGTH AND STIFFNESS
ASTM A792 Grade 50 Class 1 or 4
#12 Screws to Supports and #14 Screws at Sidelaps

26 Gauge (0.0181 inch) Thickness									
Sidelap Connection & Edge Fastener Spacing = 12" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	312.1	271.4	24.62	257.4	223.8	30.71	237.4	206.4	33.96
4	276.5	240.4	27.16	232.2	201.9	32.04	216.5	188.3	34.44
5	253.5	220.4	28.78	216.5	188.3	32.74	203.6	177.0	34.60
6	237.4	206.4	29.87	205.8	178.9	33.14	194.8	169.4	34.64
7	225.6	196.1	30.64	198.0	172.1	33.39	188.5	163.9	34.63
8	197.1	186.7	31.20	192.0	167.0	33.55	183.7	159.7	34.60
Sidelap Connection & Edge Fastener Spacing = 16" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	285.8	248.6	24.00	227.2	197.5	29.19	205.9	179.0	31.75
4	247.6	215.3	26.15	200.4	174.3	29.97	183.8	159.8	31.68
5	222.6	193.5	27.40	183.8	159.8	30.23	170.1	147.9	31.44
6	202.1	175.7	28.15	171.4	149.0	30.29	160.9	139.9	31.18
7	187.4	163.0	28.62	162.2	141.1	30.26	153.8	133.8	30.94
8	176.4	153.4	28.92	155.3	135.1	30.20	148.3	129.0	30.72
Sidelap Connection & Edge Fastener Spacing = 20" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	269.1	234.0	23.56	208.1	181.0	28.11	186.1	161.8	30.17
4	229.3	199.4	25.43	180.4	156.9	28.48	163.3	142.0	29.70
5	199.6	173.5	26.40	161.2	140.2	28.42	148.4	129.1	29.17
6	179.0	155.7	26.90	148.4	129.0	28.23	138.2	120.1	28.69
7	164.4	142.9	27.15	139.2	121.1	28.00	130.8	113.8	28.27
8	153.4	133.4	27.26	132.3	115.1	27.77	125.3	109.0	27.92

(Table 4A continued on next page.)

TABLE 4A—PBU PANELS DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (continued)
ASTM A792 Grade 50 Class 1 or 4
#12 Screws to Supports and #14 Screws at Sidelaps

24 Gauge (0.0223 inch) Thickness									
Sidelap Connection & Edge Fastener Spacing = 12" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	398.0	346.1	34.14	332.7	289.3	39.80	308.8	268.5	42.45
4	355.6	309.2	36.48	302.6	263.2	40.52	283.8	246.8	42.29
5	328.0	285.2	37.78	283.8	246.8	40.74	268.3	233.3	42.01
6	308.8	268.5	38.54	270.9	235.5	40.79	257.7	224.1	41.74
7	294.6	256.2	39.01	261.5	227.4	40.75	250.1	217.4	41.49
8	264.3	246.8	39.31	254.4	221.2	40.69	244.3	212.4	41.28
Sidelap Connection & Edge Fastener Spacing = 16" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	363.1	315.7	33.08	292.4	254.3	37.52	266.7	231.9	39.37
4	317.1	275.7	34.85	260.1	226.2	37.56	240.0	208.7	38.57
5	287.4	249.9	35.65	240.0	208.7	37.28	223.4	194.3	37.85
6	266.4	231.7	35.98	226.2	196.7	36.94	212.3	184.6	37.25
7	248.4	216.0	36.09	216.3	188.1	36.60	204.2	177.5	36.76
8	234.8	204.2	36.08	207.9	180.8	36.29	198.1	172.2	36.35
Sidelap Connection & Edge Fastener Spacing = 20" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	340.7	296.3	32.33	266.8	232.0	35.92	240.1	208.8	37.19
4	292.5	254.4	33.70	233.2	202.8	35.46	212.4	184.7	35.94
5	260.3	226.3	34.13	212.0	184.4	34.82	195.3	169.8	34.90
6	235.0	204.3	34.16	196.2	170.6	34.19	183.3	159.4	34.06
7	216.9	188.6	34.00	184.9	160.8	33.63	174.3	151.6	33.39
8	203.4	176.8	33.76	176.5	153.5	33.15	167.5	145.7	32.84
22 Gauge (0.0286 inch) Thickness									
Sidelap Connection & Edge Fastener Spacing = 12" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	532.6	463.1	48.36	452.6	393.5	52.45	423.1	367.9	54.03
4	480.6	417.9	49.86	415.5	361.3	52.10	392.2	341.1	52.91
5	446.8	388.5	50.40	392.2	341.1	51.60	373.0	324.4	52.02
6	423.1	367.9	50.53	376.3	327.2	51.11	360.0	313.0	51.32
7	405.6	352.7	50.48	364.7	317.1	50.68	350.5	304.8	50.77
8	392.2	341.1	50.35	355.8	309.4	50.31	343.3	298.6	50.32
Sidelap Connection & Edge Fastener Spacing = 16" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	483.9	420.8	46.49	396.0	344.4	48.99	363.9	316.5	49.65
4	426.7	371.1	47.20	355.7	309.3	47.83	330.5	287.4	47.82
5	389.7	338.9	47.08	330.5	287.4	46.74	309.8	269.4	46.43
6	363.9	316.5	46.68	313.3	272.4	45.82	295.8	257.2	45.38
7	345.0	300.0	46.20	300.8	261.6	45.06	285.6	248.4	44.56
8	330.5	287.4	45.71	291.4	253.4	44.43	278.0	241.7	43.91
Sidelap Connection & Edge Fastener Spacing = 20" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	452.4	393.4	45.20	359.8	312.8	46.58	326.2	283.6	46.62
4	392.0	340.9	45.34	317.5	276.1	44.85	291.3	253.3	44.27
5	353.1	307.1	44.77	291.3	253.3	43.35	269.8	234.6	42.54
6	325.3	282.9	43.99	273.4	237.7	42.12	255.2	221.9	41.23
7	302.2	262.8	43.20	259.9	226.0	41.12	244.7	212.8	40.22
8	284.8	247.7	42.46	249.0	216.5	40.30	236.7	205.8	39.42

Notes to Table 4B:

1. Structural fasteners to supports: #12 SMS, 12" o.c. (alternating low flutes) along interior supports and 6" o.c. (every low flute) along end supports.
2. Structural fasteners at edge panels parallel to panel ribs: #12 SMS spaced as indicated in the table.
3. Stitch fasteners: #14 SMS spaced as indicated in the table.
4. Supports are minimum 0.0566" thick steel with Fu = 65 ksi minimum.
5. Panels are not subject to uplift.
6. Installations where insulation is placed between the panel and the support are outside the scope of this table.
7. Bearing length at exterior supports is 1.5 inches minimum.
8. Loads are allowable (ASD) loads.

TABLE 4B—PBU PANELS DIAPHRAGM SHEAR STRENGTH & STIFFNESS
ASTM A792 Grade 80 Class 1
#12 Screws to Supports and #14 Screws at Sidelaps

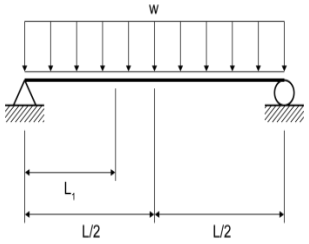
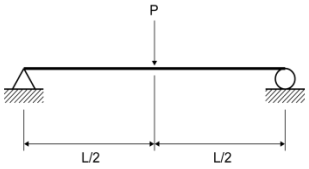
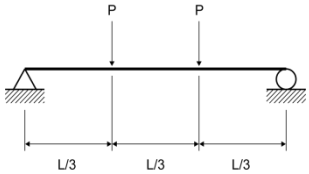
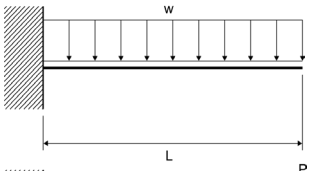
26 Gauge (0.0181 inch) Thickness									
Sidelap Connection & Edge Fastener Spacing = 12" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	319.9	278.2	24.62	263.8	229.4	30.71	243.3	211.6	33.96
4	283.4	246.5	27.16	238.0	207.0	32.04	221.9	193.0	34.44
5	259.8	225.9	28.78	221.9	193.0	32.74	208.7	181.5	34.60
6	243.3	211.6	29.87	210.9	183.4	33.14	199.7	173.6	34.64
7	231.2	201.0	30.64	202.9	176.4	33.39	193.2	168.0	34.63
8	197.1	191.4	31.20	196.8	171.2	33.55	188.2	163.7	34.60
Sidelap Connection & Edge Fastener Spacing = 16" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	293.0	254.8	24.00	232.8	202.5	29.19	211.0	183.5	31.75
4	253.8	220.7	26.15	205.4	178.6	29.97	188.4	163.8	31.68
5	228.1	198.4	27.40	188.4	163.8	30.23	174.4	151.6	31.44
6	207.1	180.1	28.15	175.7	152.8	30.29	164.9	143.4	31.18
7	192.1	167.0	28.62	166.3	144.6	30.26	157.7	137.1	30.94
8	180.8	157.2	28.92	159.2	138.5	30.20	152.0	132.2	30.72
Sidelap Connection & Edge Fastener Spacing = 20" o.c.									
	1-Span			2-Span			3-Span		
	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness	Strength (lb/ft)		Stiffness
Span (ft)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)	Wind	Seismic	(k/in)
3	275.9	239.9	23.56	213.3	185.5	28.11	190.7	165.9	30.17
4	235.0	204.4	25.43	185.0	160.8	28.48	167.4	145.6	29.70
5	204.6	177.9	26.40	165.2	143.7	28.42	152.1	132.3	29.17
6	183.5	159.6	26.90	152.1	132.2	28.23	141.6	123.1	28.69
7	168.5	146.5	27.15	142.7	124.1	28.00	134.1	116.6	28.27
8	157.2	136.7	27.26	135.6	118.0	27.77	128.5	111.7	27.92

(Table 4B continued on next page.)

TABLE 4B—PBU PANELS DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (continued)
ASTM A792 Grade 80 Class 1
#12 Screws to Supports and #14 Screws at Sidelaps

Span (ft)	1-Span Strength (lb/ft) Wind	1-Span Strength (lb/ft) Seismic	1-Span Stiffness (k/in)	2-Span Strength (lb/ft) Wind	2-Span Strength (lb/ft) Seismic	2-Span Stiffness (k/in)	3-Span Strength (lb/ft) Wind	3-Span Strength (lb/ft) Seismic	3-Span Stiffness (k/in)
24 Gauge (0.0223 inch) Thickness									
Sidelap Connection & Edge Fastener Spacing = 12" o.c.									
3	407.9	354.7	34.14	341.0	296.6	39.80	316.5	275.2	42.45
4	364.5	316.9	36.48	310.2	269.7	40.52	290.9	252.9	42.29
5	336.2	292.4	37.78	290.9	252.9	40.74	275.0	239.1	42.01
6	316.5	275.2	38.54	277.6	241.4	40.79	264.1	229.7	41.74
7	302.0	262.6	39.01	268.0	233.1	40.75	256.3	222.9	41.49
8	264.3	252.9	39.31	260.7	226.7	40.69	250.4	217.7	41.28
Sidelap Connection & Edge Fastener Spacing = 16" o.c.									
3	372.2	323.6	33.08	299.7	260.6	37.52	273.4	237.7	39.37
4	325.0	282.6	34.85	266.6	231.8	37.56	246.0	213.9	38.57
5	294.5	256.1	35.65	246.0	213.9	37.28	229.0	199.2	37.85
6	273.1	237.5	35.98	231.9	201.6	36.94	217.6	189.2	37.25
7	254.6	221.4	36.09	221.7	192.8	36.60	209.3	182.0	36.76
8	240.7	209.3	36.08	213.1	185.3	36.29	203.0	176.5	36.35
Sidelap Connection & Edge Fastener Spacing = 20" o.c.									
3	349.3	303.7	32.33	273.5	237.8	35.92	246.1	214.0	37.19
4	299.8	260.7	33.70	239.1	207.9	35.46	217.7	189.3	35.94
5	266.8	232.0	34.13	217.3	189.0	34.82	200.2	174.1	34.90
6	240.8	209.4	34.16	201.1	174.9	34.19	187.9	163.4	34.06
7	222.3	193.3	34.00	189.6	164.8	33.63	178.6	155.3	33.39
8	208.4	181.3	33.76	180.9	157.3	33.15	171.7	149.3	32.84
22 Gauge (0.0286 inch) Thickness									
Sidelap Connection & Edge Fastener Spacing = 12" o.c.									
3	545.9	474.7	48.36	463.9	403.4	52.45	433.7	377.1	54.03
4	492.6	428.4	49.86	425.9	370.3	52.10	402.0	349.6	52.91
5	458.0	398.2	50.40	402.0	349.6	51.60	382.4	332.5	52.02
6	433.7	377.1	50.53	385.7	335.4	51.11	369.0	320.8	51.32
7	415.8	361.5	50.48	373.8	325.0	50.68	359.3	312.4	50.77
8	395.9	349.6	50.35	364.7	317.2	50.31	351.9	306.0	50.32
Sidelap Connection & Edge Fastener Spacing = 16" o.c.									
3	496.0	431.3	46.49	405.9	353.0	48.99	373.0	324.4	49.65
4	437.4	380.4	47.20	364.6	317.0	47.83	338.8	294.6	47.82
5	399.5	347.4	47.08	338.8	294.6	46.74	317.6	276.1	46.43
6	373.0	324.4	46.68	321.1	279.2	45.82	303.2	263.6	45.38
7	353.6	307.5	46.20	308.3	268.1	45.06	292.8	254.6	44.56
8	338.8	294.6	45.71	298.6	259.7	44.43	284.9	247.7	43.91
Sidelap Connection & Edge Fastener Spacing = 20" o.c.									
3	463.7	403.2	45.20	368.8	320.7	46.58	334.3	290.7	46.62
4	401.8	349.4	45.34	325.5	283.0	44.85	298.6	259.6	44.27
5	362.0	314.8	44.77	298.6	259.6	43.35	276.5	240.4	42.54
6	333.5	290.0	43.99	280.2	243.7	42.12	261.6	227.4	41.23
7	309.7	269.3	43.20	266.4	231.6	41.12	250.8	218.1	40.22
8	291.9	253.8	42.46	255.2	221.9	40.30	242.6	211.0	39.42

TABLE 5: DIAPHRAGM SHEAR WEB DEFLECTION EQUATIONS

Type of Loading	Loading Condition	Shear Deflection	
Simple Beam at Center	Uniform Load, w	$\Delta_w = \frac{wL^2}{8bG'}$	
Simple Beam at L_1	Uniform Load, w	$\Delta_w = \frac{q_{ave}L_1}{G'}$	
Simple Beam at center	Point Load, P	$\Delta_w = \frac{PL}{4bG'}$	
Simple Beam at 1/3 points	Point Loads, P	$\Delta_w = \frac{PL}{3bG'}$	
Cantilever Beam at End	Uniform Load, w	$\Delta_w = \frac{PL^2}{2bG'}$	
Cantilever Beam at End	Point Load, P	$\Delta_w = \frac{PL}{bG'}$	
Relationship between flexibility factor and stiffness factor		$f = \frac{1000}{G'}$	

b = Depth of diaphragm (ft)
f = Flexibility factor (micro in/lbs)
G' = Stiffness factor (kips/in)
L = Diaphragm Length (ft)
L_1 = Distance to the point where deflection is calculated (ft)
P = Concentrated load (lbs)
q_{ave} = Average diaphragm shear (lbs/ft)
w = Uniform load (lbs/ft)
Δ_w = Web deflection (in)

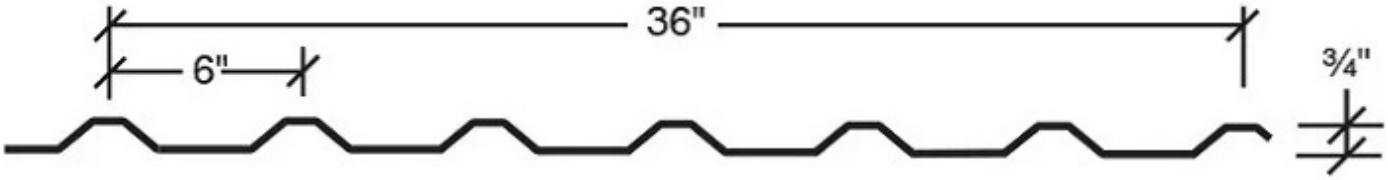


FIGURE 1—PBU PANEL

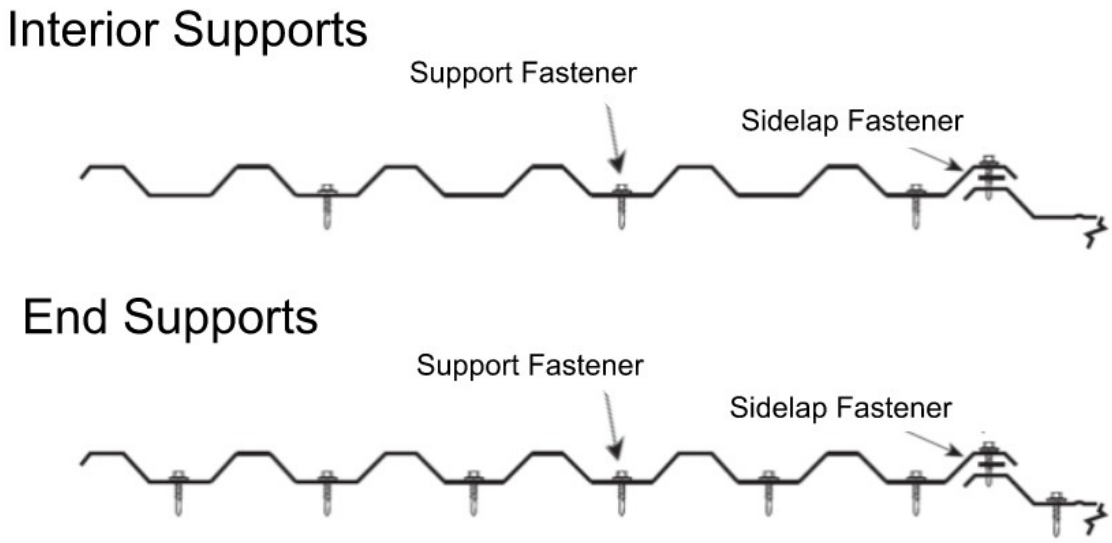


FIGURE 2—FASTENER PATTERN

CALIFORNIA SUPPLEMENT

CORNERSTONE BUILDING BRANDS
13105 Northwest Fwy
Houston, Texas 77040
(877) 713-6224
www.cornerstone-bb.com

PBU PANEL

CSI Sections:

07 41 13 – Metal Roof Panels
07 42 13 – Metal Wall Panels
07 42 13.13 –Formed Metal Wall Panels

1.0 RECOGNITION

Cornerstone Building Brands PBU Panels, described in IAPMO UES ER-953 and this supplement, have been evaluated for use as components of floor and roof systems. The structural properties of the PBU Panel were evaluated for compliance with the following codes and regulations:

- 2022 California Building Code (CBC)

2.0 LIMITATIONS

Use of the Cornerstone Building Brands PBU Panel recognized in this report is subject to the following limitations:

2.1 Diaphragm deflections shall not exceed the permitted relative deflection of walls between the diaphragm level and the floor below. The flexibility limitations shown in Table 1604A.4 of the California Building Code may be used as a guide in lieu of a rational analysis of the anticipated deflections.

2.2 As applicable, in accordance with CBC Section 2210A.1.1.2, the minimum base steel thickness of the steel deck shall be 0.0359 inches (0.9 mm), except for single-story open structures, where the steel deck is not used as a diaphragm and there are no suspended hangers or bracing for nonstructural components attached to the deck.

2.3 Special Inspections are required in accordance with CBC Sections 1705.2 and 1705A.2, Steel Construction; and CBC Sections 1705.3 and 1705A.3, Concrete Construction.

2.4 Structural Observation is required in accordance with CBC Sections 1704.6 and 1704A.6.

2.5 Concrete tests and materials shall comply with CBC Sections 1909.2, 1903A, and 1910A, as applicable.

2.6 This supplement expires concurrently with ER-953.

CITY OF LOS ANGELES SUPPLEMENT

CORNERSTONE BUILDING BRANDS
13105 Northwest Fwy
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PBU PANEL

CSI Sections:

07 41 13 – Metal Roof Panels
07 42 13 – Metal Wall Panels
07 42 13.13 –Formed Metal Wall Panels

1.0 RECOGNITION

Cornerstone Building Brands PBU Panels as evaluated and represented in IAPMO UES Evaluation Report ER-953 and with changes as noted in this supplement are satisfactory alternatives for use in buildings built under the following codes (and regulations):

- 2023 City of Los Angeles Building Code (LABC)

2.0 LIMITATIONS

Roof panels recognized in this report supplement are subject to the following limitations:

2.1 Cornerstone Building Brands PBU Panels shall be installed and identified in accordance with this report, codes listed in Section 1.0 of this report, and the manufacturer's instructions. Where conflicts occur, the more restrictive shall govern.

2.2 Cornerstone Building Brands PBU Panels shall comply with the provisions applicable to the 2022 CBC in the California supplement to IAPMO UES ER-953.

2.3 Prior to installation, calculations and details demonstrating compliance with this approval report and the LABC shall be submitted to the structural plan check section for review and approval. The calculations and details shall be prepared, stamped, and signed by a California registered design professional.

2.4 The design, installation, and inspection of the Cornerstone Building Brands PBU Panels shall be in accordance with LABC Chapters 15, 16, and 17 as applicable, due to local amendments to these chapters.

2.5 This supplement expires concurrently with ER-953.