

## ESR-5073

Issued January 2025 This report also contains:

- City of LA Supplement

Subject to renewal January 2026

- <u>CA Supplement</u> - FL Supplement

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DIVISION: 07 00 00— THERMAL AND MOISTURE PROTECTION	REPORT HOLDER: SATIVA BUILDING SYSTEMS, LLC	EVALUATION SUBJECT: SATIVA Z PANELS 2.0	
Section: 07 21 10— Building Insulation			
Section: 07 42 13— Composite Wall Panels			

# **1.0 EVALUATION SCOPE**

Compliance with the following codes:

- 2021 International Building Code® (IBC)
- 2021 International Residential Code® (IRC)
- 2021 International Energy Conservation Code® (IECC)

## **Property evaluated:**

- Structural
- Interior Finish Material
- Thermal Resistance

## **2.0 USES**

The Sativa Z Panel 2.0 described in this report is precast hemp-lime infill panel for use in code-compliant lightframe wood interior and exterior walls in one- and two-story building of Type V construction under the IBC. The Sativa Z Panel 2.0 precast hemp-lime infill panel may also be in buildings regulated under the IRC when an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

# **3.0 DESCRIPTION**

## 3.1 Sativa Z Panel 2.0 Precast Hemp-lime Infill Panel:

The precast hemp-lime infill panel is made of hemp hurd, pumice (natural pozzolan), hydrated type S lime, sand, EIFS fiberglass mesh and water. The density of Sativa Z Panel 2.0 precast hemp-lime infill panel is 22 pcf (352 kg/m<sup>3</sup>). The Sativa Z Panel 2.0 precast hemp-lime infill panel has a thermal resistance, R-value per inch (25.4 mm) thick, of 0.31 m<sup>2</sup>•K/W (1.75 ft<sup>2</sup>•°F•h/BTU), when tested in accordance with ASTM C518, and is classified as Class A interior finish material, when tested in accordance with NFPA 286.

The Sativa Z Panel 2.0 precast hemp-lime infill panel has recesses incorporated into three sides to provide a mechanical interlock vertically with the bottom plate of the wall along with each successive stacked Sativa Z Panel 2.0 precast hemp-lime infill panel. One recess is on the interior face, while the other is on the exterior.



Additionally, there is a recess on the right side of the Sativa Z Panel 2.0 precast hemp-lime infill panel on the interior face to accommodate the vertical stud. The Sativa Z Panel 2.0 precast hemp-lime infill panel has a nominally 2×4 (38 mm x 89 mm actual) wood strip embedded on the interior surface for securing to studs. The Sativa Z Panel 2.0 precast hemp-lime infill panel is available with overall thickness of 12 inches (305 mm), width of 15.75 inches (400 mm) and height of 25.5 inches (648 mm). Figure 1 depicts a Sativa Z Panel 2.0 precast hemp-lime infill panel.

## 3.2 Framing Members:

Framing members to which the Sativa Z Panel 2.0 precast hemp-lime infill panels are attached must be sawn lumber having a minimum specific gravity of 0.50. The wood members are nominally a single 2-by-4 or 2-by-6 (38 mm by 89 mm or 38 mm x 372 mm actual), spaced at a maximum 16 inches (406 mm) on-center.

## 3.3 Framing Ties:

At the locations where the wall studs meet the top and bottom wall plates, Simpson Strong-Tie galvanized reversible stud-plate RSP4 ties (ESR-2613) must be used to connect the wall studs to top and bottom wall plates. The ties were fastened using Simpson Strong-Tie Strong-Drive  $1^{1}/_{2}$ -in. x 0.131-in. (38.1 x 3.3 mm) SCN Smooth-Shank Hot-Dip Galvanized N8D5HDG-R nails, complying ASM F1667.

## 3.4 Connectors and Fasteners:

Fasteners used in connections between Sativa Z Panel 2.0 precast hemp-lime infill panels to wall studs must be either corrosion-resistant or stainless steel fasteners complying with ASTM F1776 or described in a current ICC-ES evaluation report with properly specified, including size, length, dimension, fastener bearing length and location. Connectors and fasteners used in conventional light-frame wood construction must comply with the requirements of IBC Section 2304.10. The lumber treater or report holder (Sativa Building Systems, LLC) must be contacted for recommendations on minimum corrosion resistance and connection capacities of fasteners used with the specific proprietary preservative treated or fire retardant treated lumber.

## **4.0 DESIGN AND INSTALLATION**

## 4.1 Design:

The allowable positive and negative out-of-plane transverse loads for the Sativa Z Panel 2.0 precast hemplime infill panel walls are given in <u>Table 1</u>. The framing members supporting the panels must be designed to resist the applicable forces in accordance with the applicable requirements of the IBC. The construction documents prepared or reviewed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed specifying the wall panels must indicate compliance with this evaluation report and applicable codes and must be submitted to the code official for approval. The construction documents submitted to the code official must demonstrate that the maximum spans, projectspecific fasteners and structural framing members provide a complete load path capable of transferring all loads and forces from their point of origin to load-resisting elements.

## 4.2 Installation:

The Sativa Z Panel 2.0 precast hemp-lime infill panel must be installed in a vertical orientation (panel height along the length of wall studs) over wall studs of the conventional light-frame wood construction with fasteners complying Section 3.4 installed through the embedded nominally 2x4 (38 mm x 89 mm actual) wood strip on the interior face of the infill panels to wood studs and must be interlocked at the panel recess profiles. The panels may be installed from either right to left or from left to right along the wall line. A series of Sativa Z Panel 2.0 precast hemp-lime infill panels, stacked on top of each other and mated to a stud and top and bottom plate, will form a rectangular cuboid, where the combination of lumber framing and the Sativa Z Panel 2.0 precast hemp-lime infill panel will result in flat surfaces. The conventional light-frame wood construction must comply with IBC Section 2308.5. in addition, the wall studs must be tied to the top and bottom wall plates using the framing ties and installed in accordance with Section 3.3 of this report. The conventional light-frame wood construction with Sativa Z Panel 2.0 precast hemp-lime infill panels must be designed by a registered design professional and installed in accordance with the manufacturer's published installation instructions. Figure 2 depicts typical installations.

## **5.0 CONDITIONS OF USE:**

The Sativa Z Panel 2.0 precast hemp-lime infill panels described in this report comply with, or are a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

**5.1** The Sativa Z Panel 2.0 precast hemp-lime infill panels described in this report must be installed in accordance with this report and the manufacturer's published installation instructions. A copy of

manufacturer's published installation instructions must be available at the jobsite. In the event of a conflict between this report and the manufacturer's published installation instructions, the more restrictive governs.

- **5.2** The construction documents prepared or reviewed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed specifying the Sativa Z Panel 2.0 precast hemp-lime infill panels must indicate compliance with this evaluation report and applicable codes and must be submitted to the code official for approval.
- **5.3** The Sativa Z Panel 2.0 precast hemp-lime infill walls are limited to use in dry service conditions, i.e. the moisture content in the wood is less than 16 percent.
- **5.4** The exterior surface of the Sativa Z Panel 2.0 precast hemp-lime infill panel walls must be protected with a weather-resistive barrier in accordance with 2021 IBC Section 1404. A code-complying exterior wall covering must be installed.
- **5.5** The Sativa Z Panel 2.0 precast hemp-lime infill panel is classified as Class A interior finish material, when tested in accordance with NFPA 286. A code-compliant thermal barrier may not be required to protect the interior surface of the Sativa Z Panel 2.0 precast hemp-lime infill panel walls.
- **5.6** Labeling of the Sativa Z Panel 2.0 precast hemp-lime infill panel must comply with IECC Section C303.1.1.1 or R303.1.1.1, as applicable.
- **5.7** Wall openings and penetrations must be flashed using the code-compliant flashing materials and must be placed in accordance with 2021 IBC Section 1404.4
- **5.8** The distance between the Sativa Z Panel 2.0 precast hemp-lime infill panel walls in contact with exterior foundation walls and the exposed earth must not be less than 8 inches (203 mm).
- **5.9** The connections between Sativa Z Panel 2.0 precast hemp-lime infill panel and wall framing must be accompanied by the complete detailing that are satisfactory to the code official. Fasteners used in connections must be either corrosion-resistant or stainless steel fasteners complying with ASTM F1776 or described in a current ICC-ES evaluation report with properly specified, including size, length, dimension, fastener bearing length and location.
- **5.10** Use Sativa Z Panel 2.0 precast hemp-lime infill panel walls as shearwalls has not been evaluated and must be braced with a code-compliant bracing method.
- **5.11** The fire-resistance rating of Sativa Z Panel 2.0 precast hemp-lime infill panel walls has not been evaluated. Sativa Z Panel 2.0 precast hemp-lime infill panel walls will be limited to use in non-fire-resistance-rated construction.
- **5.12** The Sativa Z Panel 2.0 precast hemp-lime infill panels must be fabricated under a quality program with inspections by ICC-ES.

# 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for the Precast Hemp-lime Infill Panels for Use in Light-Frame Construction (AC542), dated October 2022.

# 7.0 IDENTIFICATION

- **7.1** The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5073) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- **7.2** In addition, each Sativa Z Panel 2.0 precast hemp-lime infill panel is identified with a product label containing the product name (Sativa Z Panel 2.0) and R-value complying with IECC Section C303.1.1.1 or R303.1.1.1.
- 7.3 The report holder's contact information is the following:

SATIVA BUILIDNG SYSTEMS, LLC N6416 BANNER ROAD WITTENBERG WISCONSIN 54499 (715) 470-0677 www.sativabuildingsystems.com

## TABLE 1—WIND PRESSURES FOR SATIVA Z PANEL 2.04

PRESSURE DIRECTION			PRESSURE (PSF)		
	Ultimate	Pressure at L/180	Pressure at L/240	Pressure at L/360	Allowable <sup>3</sup>
Positive <sup>1</sup>	162	29	20	12	54
Negative <sup>2</sup>	80	28	21	14	26.6

For **SI**: 1 psf = 47.88 Pa.

<sup>1</sup>The tabulated pressure values are based on the lowest measured pressures.

<sup>2</sup>Ths tabulated pressure values are based on the average measured pressures.

<sup>3</sup>The allowable pressure are based on the tabulated ultimate pressure adjusted by a 3.0 safety factor. <sup>4</sup>L is the height of the wall, 8 feet (2438 mm).



FIGURE 1—SATIVA Z PANEL 2.0 PRECAST HEMP-LIME INFILL PANEL



FIGURE 2—ILLUSTRATION OF A TYPICAL INSTALLATION



# ESR-5073 City of LA Supplement

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DIVISION:07 00 00—THERMAL AND MOISTURE PROTECTION Section: 07 21 10—Building Insulation Section: 07 42 13—Composite Wall Panels

### **REPORT HOLDER:**

SATIVA BUILDING SYSTEMS, LLC

#### **EVALUATION SUBJECT:**

SATIVA Z PANELS 2.0

### 1.0 REPORT PURPOSE AND SCOPE

#### Purpose:

The purpose of this evaluation report supplement is to indicate that Sativa Z Panel 2.0, described in ICC-ES evaluation report <u>ESR-5073</u>, has/have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

#### Applicable code editions:

- 2023 City of Los Angeles Building Code (LABC)
- 2023 City of Los Angeles Residential Code (LARC)

### 2.0 CONCLUSIONS

The Sativa Z Panel 2.0, described in Sections 2.0 through 7.0 of the evaluation report <u>ESR-5073</u>, complies with the LABC Chapter 14, and the LARC, and is subject to the conditions of use described in this supplement.

#### 3.0 CONDITIONS OF USE

The Sativa Z Panel 2.0 described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-5073.
- The design, installation, conditions of use and identification of the Sativa Z Panel 2.0 are in accordance with the 2021 International Building Code<sup>®</sup> (IBC) and 2021 International Residential Code<sup>®</sup> (IRC) provisions, as applicable, noted in the evaluation report <u>ESR-5073</u>.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16. 17 and 23, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, ESR-5073, issued January 2025.





# **ESR-5073 CA Supplement**

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DIVISION:07 00 00—THERMAL AND MOISTURE PROTECTION Section: 07 21 10—Building Insulation Section: 07 42 13—Composite Wall Panels

**REPORT HOLDER:** 

SATIVA BUILDING SYSTEMS, LLC

**EVALUATION SUBJECT:** 

**SATIVA Z PANELS 2.0** 

### 1.0 REPORT PURPOSE AND SCOPE

#### Purpose:

The purpose of this evaluation report supplement is to indicate that Sativa Z Panel 2.0, described in ICC-ES evaluation report ESR-5073, has also been evaluated for compliance with the codes noted below.

### Applicable code edition(s):

### ■ 2022 California Building Code (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

■ 2022 California Residential Code (CRC)

#### 2.0 CONCLUSIONS

## 2.1 CBC:

The SATIVA Z PANELS 2.0, described in Sections 2.0 through 7.0 of the evaluation report ESR-5073, complies with CBC Chapter 14, provided the design and installation are in accordance with the 2021 *International Building Code*<sup>®</sup> (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 23, as applicable.

The products have not been evaluated under Chapter 7A for use in the exterior design and construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

#### 2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

### 2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

#### 2.2 CRC:

The SATIVA Z PANELS 2.0, described in Sections 2.0 through 7.0 of the evaluation report ESR-5073, complies/comply with CRC Chapter3, provided the design and installation are in accordance with the 2021 *International Residential Code*<sup>®</sup> (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapter 3.

The products have not been evaluated under CRC Section R337 for use in the exterior design and construction of new buildings located in a Fire Hazard Severity Zone within State Responsibility Areas or any Wildland–Urban Interface Fire Area.

The products recognized in this supplement have not been evaluated for compliance with the *International Wildland–Urban Interface Code*<sup>®</sup>.

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# ESR-5073 FL Supplement

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DIVISION:07 00 00—THERMAL AND MOISTURE PROTECTION Section: 07 21 10—Building Insulation Section: 07 42 13—Composite Wall Panels

### **REPORT HOLDER:**

SATIVA BUILDING SYSTEMS, LLC

**EVALUATION SUBJECT:** 

SATIVA Z PANELS 2.0

### 1.0 REPORT PURPOSE AND SCOPE

#### Purpose:

The purpose of this evaluation report supplement is to indicate that Sativa Z Panel 2.0, described in ICC-ES evaluation report ESR-5073, has also been evaluated for compliance with the codes noted below.

#### Applicable code edition:

- 2023 Florida Building Code—Building
- 2023 Florida Building Code—Residential

### 2.0 CONCLUSIONS

The Sativa Z Panel 2.0, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-5073, comply with the *Florida Building Code—Building and the Florida Building Code—Residential*. The design requirements must be in accordance with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-5073 for the 2021 *International Building Code®* meet the requirements of the *Florida Building Code—Building and the Florida Building Code—Residential*, as applicable.

Use of the Sativa Z Panel 2.0 in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* has not been evaluated and is outside the scope of this evaluation report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

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