CSI 06 12 00
PRODUCT: Structural Insulated Panels (SIP)
DIVISION: Wood, Plastics and Composites
SECTION: Structural Panels

Report Holder
Composite Panel Systems, LLC
141 South Willow Street
Eagle River, WI 54521

Manufacturing Locations

Fiber-Tech Industries, Inc.
2000 Kenskill Avenue
Washington Court House, OH 43160

1. SUBJECT

1.1 ***CPS Panels (Epitome Foundation Walls). 9 ft tall, 7 in. overall thickness***

2. SCOPE

NTA, Inc. has evaluated the above product(s) for compliance with the applicable sections of the following codes:
2.1 2012, 2015 International Building Code (IBC)
2.2 2012, 2015 International Residential Code (IRC)

NTA, Inc. has evaluated the above product(s) in accordance with:
2.3 NTA IM 014 Structural Insulated Panel Evaluation
2.4 NTA IM 036 Quality System Requirements

NTA, Inc. has evaluated the following properties of the above product(s):
2.5 Structural performance under transverse and axial loads.
2.6 Resistance to water penetration when assembled into an exterior wall system.

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3. USES

3.1 General. *CPS Panels* are used as structural insulated wall panels capable of resisting transverse, axial and in-plane shear loads.
3.2 Construction Types. *CPS Panels* shall be considered combustible building elements when determining the Type of Construction in accordance with 2012, 2015 IBC Chapter 6. (IM 014 NACU1)

3.3 Fire Resistive Assemblies. *CPS Panels* shall not be used as part of a fire-rated assembly unless suitable evidence and details are submitted and approved by the authority having jurisdiction. (IM 014 ACU14)

4. DESCRIPTION

4.1 General. *CPS Panels* are factory-assembled, fiberglass-faced structural insulated panels (SIPs) with a preformed polyurethane (PUR) foam core. The panels are manufactured with 1-5/8 in. wide studs on the interior surface spaced 16 in. on center. The product is intended for use as load bearing or non-load bearing wall panels. The product is available at a nominal 7 in. overall thickness. The product is manufactured under factory-controlled conditions in a maximum manufactured size of 9 ft tall and up to 24 ft in length.
4.2 Materials.
4.2.1 Facing. The facing consists of a proprietary formed-in-place fiberglass system. The interior and exterior facings are connected through the thickness via formed-in-place fiberglass webs spaced nominally 4 inches on center along the length of the product.
4.2.2 Core. The core material is PUR foam conforming to the Type II, Class 3, Grade 2 specification defined in ASTM C1289. The foam core, in *CPS Panels* up to 7 in. overall thickness, has a flame spread rating not exceeding 75 and a smoke-developed rating not exceeding 450.
4.2.3 Adhesive. Facing materials are adhered to the core material during the facing formation process. The facing formation process is completed in accordance with the in-plant quality system documentation.
4.2.4 Material Sources. The facing and core used in the construction of *CPS Panels* shall be composed only of materials from approved sources as identified in the in-plant quality system documentation.

5. DESIGN

The scope of this report is limited to the evaluation of the SIP component. Panel connections and other details related to incorporation of the panel into the overall structural system of a building are beyond the scope of this report. (IM 014 NACU3)
5.1 Design Approval. Where required by the authority having jurisdiction, structures using *CPS Panels* shall be designed by a registered design professional. Construction documents, including engineering calculations and drawings providing floor plans, window details, door details and connector details, shall be submitted to the code official when application is made for a permit. The individual preparing such documents shall possess the necessary qualifications as required by the applicable code and the professional registration laws of the state where the construction is undertaken. Approved construction documents shall be available at all times on the jobsite during installation. (IM 014 NACU4)

5.2 Design Loads. Design loads to be resisted by the SIPs shall be as required under the applicable building code. Loads on the panels shall not exceed the loads noted in this report.

5.3 Allowable Loads. Allowable transverse and axial loads are provided in Tables 1 through 3. Calculations demonstrating that the loads applied are less than the allowable loads described in this report shall be submitted to the code official for approval. (IM 014 NACU5) For loading conditions not specifically addressed herein, structural members designed in accordance with accepted engineering practice shall be provided to meet applicable code requirements.

5.4 Concentrated Loads. Axial loads shall be applied to the SIP through continuous members such as structural insulated roof or floor panels or repetitive members such as joists, trusses or rafters spaced at regular intervals of 24 in. on center or less. Such members shall be fastened to a rim board or similar member to distribute the load to the SIP. For other loading conditions, reinforcement shall be provided. This reinforcement shall be designed in accordance with accepted engineering practice. (IM 014 ACU12)

5.5 Eccentric and Side Loads. Axial loads shall be applied concentrically to the top of the SIP. Loads shall not be applied eccentrically or through framing attached to one side of the panel (such as balloon framing) except where additional engineering documentation is provided. (IM 014 ACU13)

5.6 Openings.

5.6.1 General. Openings in panels shall be reinforced with wood or steel designed in accordance with accepted engineering practice to resist all loads applied to the opening as required by the adopted code. Details for door and window openings shall be provided to clarify the manner of supporting transverse, axial and/or in-plane shear loads at openings. Such details shall be shown on approved design documents and subject to approval by the local authority having jurisdiction. (IM 014 ACU8)

5.6.2 Exterior Use. When the product serves as the water-resistant exterior wall envelope, window openings are permitted when installed in accordance with the manufacturer's installation instructions, Figure 1 or as determined by a design professional. (IM 014 ACU9)

5.7 Combined Loads. Panels subjected to any combination of transverse, axial or in-plane shear loads shall be analyzed utilizing a straight line interaction.

6. INSTALLATION

6.1 General. *CPS Panels* shall be fabricated, identified and erected in accordance with this report, the approved construction documents and the applicable code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report shall govern. Approved construction documents shall be available at all times on the jobsite during installation. (IM 014 NACU7)

6.2 Splines. *CPS Panels* are interconnected at the panel edges through the use of a spline. The spline is an H-Profile proprietary component, *CPS Panel Connector*, supplied by Composite Panel Systems, LLC. The spline shall be secured in place with not less than 1/4 in. x 1 in. self-drilling unslotted hex washer head screws, spaced 14 in. on center on the interior side of the panel, or an approved equivalent fastener. All joints shall be sealed in accordance with the SIP manufacturer's installation instructions and, when applicable, this report.

6.3 Plates. The top plate of the panels shall be dimensional or engineered lumber sized to match the overall thickness of the panel. The plate shall be secured, at minimum, using a Simpson Strong-Tie L70 bracket in the center of the interior surface of each panel bay. Through the bracket, the plate shall be fastened with not less than (4) #10-16 x 1-1/2 in. self-piercing unslotted hex washer head screws and the facing shall be fastened with not less than (4) #10-16 x ¾ in. self-drilling unslotted hex washer head screws, or approved equivalent fasteners.

A second plate composed of 1-1/8 in. minimum thickness dimensional or engineered lumber with a specific gravity of 0.42 sized to match the overall thickness of the panel shall be secured to the first top plate using, at minimum, a single row of 0.131 in. x 3 in. nails spaced 24 in. oc. or an approved equivalent fastener. The plates will also be secured to the interior panel facing with a Simpson Strong-Tie H2.5 Hurricane Tie spaced on every other stud (32 in. on center). Through the Hurricane Tie, each top plate will be fastened with not less than (2) 10-1/4 gauge x 1-1/2 in. nails and the facing shall be fastened with not less than (3) #10-16 x ¾ in. self-drilling unslotted hex washer head screws, or approved equivalent fasteners.

The connections above have not been evaluated for load capacity and must be evaluated by a design professional.

6.4 Cutting and Notching. No field cutting or routing of the panels shall be permitted except as shown on approved drawings. (IM 014 NACU6)

6.5 Below Grade Use. *CPS Panels* are permitted to be used below grade provided the exterior facing is continuous and any joints or penetrations are protected in accordance with Figure 2 of this report and the manufacturer's installation instructions. (IM 014 ACU6) (IM 014 ACU7)

6.6 Heat-Producing Fixtures. Heat-producing fixtures shall not be installed in the panels unless protected by a method approved by the code official or documented in test reports. This limitation shall not be interpreted to prohibit heat-producing elements with suitable protection. (IM 014 NACU9)

6.7 Voids and Holes.

6.7.1 Voids in Core. Voids in the core may be placed in the panels during fabrication at predetermined locations only. Voids in the core are only permitted when designed in accordance with section 5.7. (IM 014 ACU11)

6.7.2 Holes in Panels. Holes may be placed in panels during fabrication at predetermined locations only. Holes are only permitted when designed in accordance with section 5.7. (IM 014 ACU15)

6.8 Panel Cladding.

6.8.1 Exterior Wall Covering. *CPS Panels* may serve as a water-resistive barrier, as required in IBC Section 1403.2, when installed in accordance with Figure 1. (IM 014 ACU9) The exterior facing shall be covered with weather protection as required by the adopted building code or other approved materials. (IM 014 ACU10)

6.8.2 Interior Finish. *CPS Panels* are a Class A finish exempt from the thermal barrier requirements of IBC Section 2603.4 and may be directly finished without the use of ½ in. gypsum over the interior facing.

7. CONDITIONS OF USE

CPS Panels as described in this report comply with the codes listed in Section 2 above, subject to the following conditions:

7.1. Installation complies with this report and the approved construction documents.

7.2. This report applies only to the panel thicknesses specifically listed herein. (IM 014 ACU3)

7.3. In-use panel heights shall not exceed the values listed herein. Extrapolation beyond the values listed herein is not permitted. (IM 014 ACU2)

7.4. The panels are manufactured in the production facility noted in this report. (IM 014 NACU8)

8. EVIDENCE SUBMITTED

NTA, Inc. has examined the following evidence to evaluate this product:

8.1 Review of plant quality assurance manual in accordance with NTA IM 036

8.2 Plant certification inspection of manufacturer's production facilities, test procedures, frequency and quality control sampling methods, test equipment and equipment calibration procedures, test records, dates and causes of failures when applicable in accordance with NTA IM 036.

8.3 Qualification test data in accordance with NTA IM 014 Standard Evaluation Plan 01 (IM 014 SEP 01).

8.4 Periodic quality assurance audits of the production facility.

8.5 Periodic verification testing in accordance with NTA, Inc. NTA IM 014

Evaluation evidence and data are on file with NTA, Inc. NTA, Inc. is accredited by the International Accreditation Service (IAS) as follows:

ISO 17020 Inspection Agency (AA-682)
ISO 17025 Testing Laboratory (TL-259)
ISO 17065 Product Certification Agency (PCA-102)

The scope of accreditation related to testing, inspection or product certification pertain only to the test methods and/or standard referenced therein. Design parameters and the application of building code requirements, such as special inspection, have not been reviewed by IAS and are not covered in the accreditation. Product evaluations are performed under the direct supervision of Professional Engineers licensed in all jurisdictions within the United States as required by the building code and state engineering board rules.

9. FINDINGS

All products referenced herein are manufactured under an in-plant Quality Assurance program to ensure that the production quality meets or exceeds the requirements of the codes noted herein and the criteria as established by NTA, Inc. Furthermore, product must comply with the conditions of this report.

This report is subject to annual review.

10. IDENTIFICATION

Each eligible product shall be permanently marked to provide the following information:

10.1 The NTA, Inc. certification mark, either
- **10.1.1** NTA's NER No. CPS053013-7, or
- **10.1.2** NTA's NER No. NER-1030

10.2 In-plant quality assurance stamp
10.3 Identifier for production facility
10.4 Project or batch number

NTA LISTED CPS053013-7

NTA CERTIFIED

NER-1030

Table 1: Allowable Uniform Transverse Loads (Positive Pressure Loading) (psf) [1, 3, 4]

Panel Length (ft)	7 in. Overall Thickness		
	Deflection Limit[2]		
	L/180	L/240	L/360
9	326	249	168

Table 2: Allowable Uniform Transverse Loads (Negative Pressure Loading) (psf) [1, 3, 4]

Panel Length (ft)	7 in. Overall Thickness		
	Deflection Limit[2]		
	L/180	L/240	L/360
9	140	140	140

[1] Table values assume a simply supported panel with 2 in. of continuous bearing on facing at supports. Values do not include the dead weight of the panel.
[2] Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of adopted building code. Values are based on loads of short duration only and do not consider the effects of creep.
[3] Tabulated values are based on the product's studs oriented parallel to the direction of panel bending.

Table 3: Allowable Axial Loads (plf)[1,2,3,4,5]

Lateral Brace Spacing (ft)	7 in. Overall Thickness
9	7748

[1] Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.
[2] All values are for normal duration and may not be increased for other durations.
[3] Axial loads shall be applied concentrically to the top of the panel through repetitive members spaced not more than 24 in. on center. Such members shall be fastened to a rim board or similar member to distribute along the top of the product.
[4] The ends of both facings must bear on the supporting foundation or structure to achieve the tabulated axial loads.
[5] Tabulated values are based on the product's studs oriented parallel to the direction of applied load and facing the interior of the building.

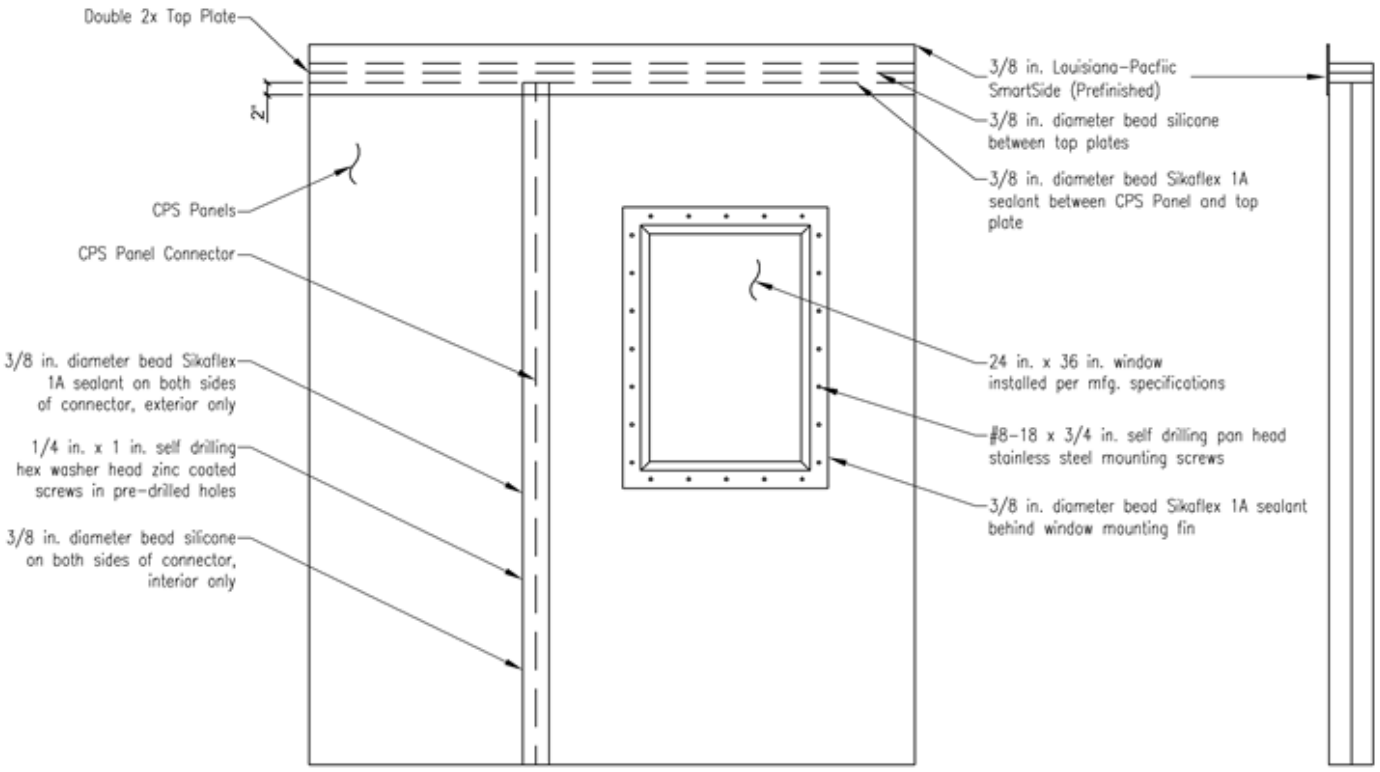

Figure 1: Exterior Use Wall Assembly Construction Details

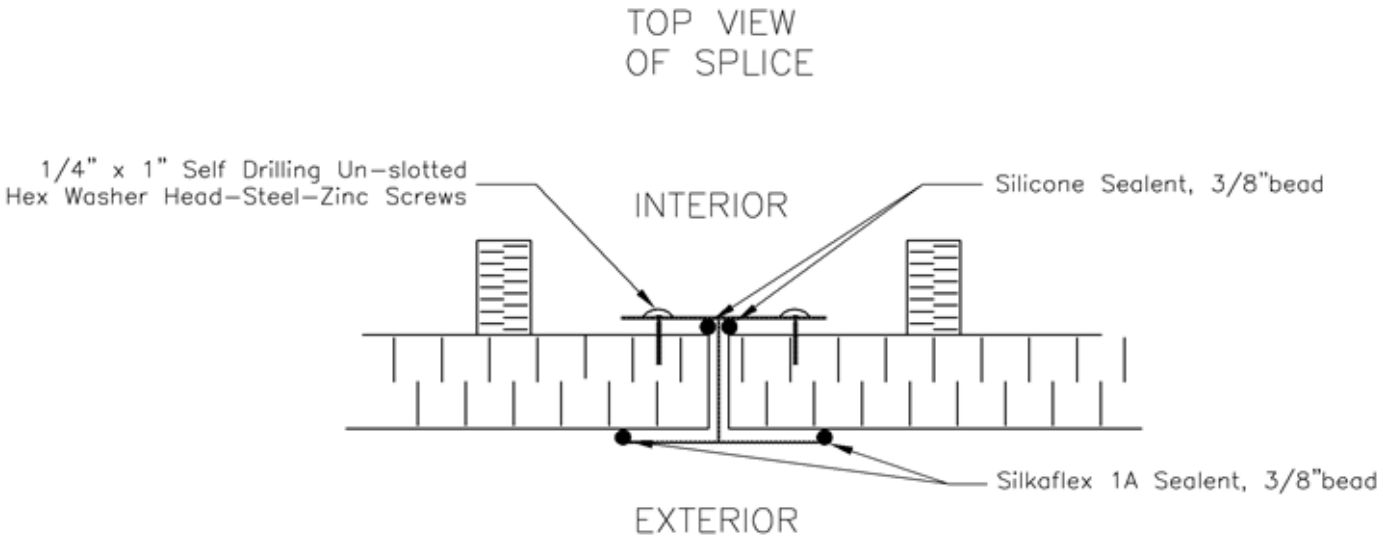

Figure 2: Below Grade Use Joint Protection Details

This NER report is intended to indicate that NTA, Inc. has evaluated the product described and found it to be eligible for labeling. Product not labeled as specified herein is not covered by this report. NTA, Inc. makes no warranty, either expressed or implied, regarding the product covered by this report. For more information or questions regarding this report please contact NTA at 1-833-NER-HELP (833-637-4357).

Table 4: Fastener Performance (Interior Facing)

Fastener	Property	Value[2] (lbf)
#10-16 x 2-1/2 in. self-drilling unslotted hex washer head screw	Lateral Capacity[1]	740
	Withdrawal Capacity	240
	Head Pull-Through Capacity	560

[1] Fastener installed 1-3/8 in. from edge of board

[2] Characteristic test value (5th percentile with 75% confidence). It is the responsibility of the designer of record to use an appropriate factor of safety.

Table 5: Fastener Performance (Exterior Facing)

Fastener	Property	Value[2] (lbf)
#10-16 x 2-1/2 in. self-drilling unslotted hex washer head screw	Lateral Capacity[1]	475
	Withdrawal Capacity	170

[1] Fastener installed 1-3/8 in. from edge of board

[2] Characteristic test value (5th percentile with 75% confidence). It is the responsibility of the designer of record to use an appropriate factor of safety.

Table 6: Characteristic Properties[1]

Property	Interior Facing (psi)	Exterior Facing (psi)
Tensile Strength, F_t	9800	9000
Elastic Modulus, Min. (Tension.), E_{tmin}	290,000	285,000
Elastic Modulus (Tension.), E_t	445,000	370,000

[1] All properties are based on a minimum panel width of 24 in. and direction of load parallel to the height of the wall panel.

[2] Characteristic test value (5th percentile with 75% confidence). It is the responsibility of the designer of record to use an appropriate factor of safety.