

Technical Bulletin

NTA Listing Report NLR-1070 for Insulspan SIP System Seismic Zones A, B, C, D, E & F

(6 pages attached)

This bulletin addresses quasi-static cyclic (reversed) load tests conducted at APA – The Engineered Wood Association (APA) to evaluate the performance of **Insulspan® SIP System** shear wall assemblies for use in Seismic Design Categories D, E and F. NTA Listing Report NLR-1070 provides shear wall assemblies listed based upon compliance with the applicable sections of the following standards:

1. ASCE/SEI 7-10 Section 11.1.4.
2. ASCE/SEI 7-10 Section 12.2.1.
3. ASTM E72, *Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.*
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.*

The APA test program included testing of **Insulspan SIP System** shear wall assemblies and matched light-frame (conventional) walls sheathed with wood-based structural panels for comparison. The matched conventional walls tested were constructed using the same nail spacing and boundary plate configuration (i.e. top plate, bottom plate and end post) as the **Insulspan SIP System** shear wall assemblies. The interior framing for the matched conventional walls was single 4x lumber spaced at 24" (610 mm) on center for comparison with NTA Design Numbers 1070-1 and 1070-2. The interior framing for the matched conventional walls was double 2x lumber spaced at 24" (610 mm) on center for comparison with NTA Design Number 1070-3.

The **Insulspan SIP System** shear wall designs in Tables 1, 2 and 3 of NLR-1070 are permitted for use in Seismic Design Categories A, B, C, D, E and F. As indicated in section 4.5 of NLR-1070, **Insulspan SIP System** shear wall assemblies are designed using the seismic design coefficients and limitations provided in ASCE 7-10 for conventional light-framed walls sheathed with wood structural panels rated for shear resistance (SFRS A13) using the following factors for design:

- Response Modification Coefficient $R = 6.5$
- System Overstrength Factor, $\Omega_0 = 3.0$
- Deflection Amplification Factor, $C_d = 4.0$

Basic descriptions of the **Insulspan SIP System** shear wall assemblies in NTA Listing Report NLR-1070 for use in **Seismic Zones A, B, C, D, E and F** are provided in Table 1. Refer to the attached NTA Listing Report for detailed description of each shear wall assembly.

Table 1 – NTA Listing Report Designs - Insulspan SIP System

NTA Design Number	Bottom Plates	Top Plates & Chords	Panel to Panel Connection	Nail Spacing
1070-1	4" (89 mm) x	4" (89 mm) x	4" (89 mm) x	8d nails @ 4" (102 mm)
1070-2	4" (89 mm) x	4" (89 mm) x	4 (89 mm) x	8d nails @ 2" (51 mm)
1070-3	2" (38 mm) x	2 - 2" (38 mm) x	OSB Spline or Insulated Spline	8d nails @ 6" (152 mm)
1070-3	2" (38 mm) x	2 - 2" (38 mm) x	2 - 2" (38 mm) x	8d nails @ 6" (152 mm)



NLR-1070
 Issued Date: 03/29/2019
 Revised Date: 07/30/2019
 This report is subject to annual review

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NTA Listing Report

Report Holder
Plasti-Fab Ltd.
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Calgary, Alberta T1Y 7H9
Canada

Manufacturing Location(s)	
PFB Manufacturing, LLC 245 N. Jipson St. Blissfield, MI 49228-1167	Plasti-Fab Ltd. #1, 600 Chester Road, Annacis Business Park Delta, BC V3M 5Y3

1. Product

1.1 Insulspan Structural Insulated Wall Panels

2. Standards

NTA, Inc. is listing the above product(s) for compliance with the applicable sections of the following standards:

2.1 ASCE/SEI 7-10 Section 11.1.4

2.2 ASCE/SEI 7-10 Section 12.2.1

2.3 ASTM E72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction

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

3. Manufacturing Quality Control

NTA, Inc. has evaluated the manufacturer's quality system in accordance with:

3.1 NTA IM 036 Quality System Requirements

4. Design

4.1 Design Approval. Where required by the authority having jurisdiction, structures using *Insulspan Structural Insulated 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.

4.2 Connection to Structure. Designed in accordance with accepted engineering practice to transfer racking forces into the wall at the top and out of the wall at the base.

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

4.4 In-Plane Shear Design. Shear walls shall be sized to resist all code required wind and seismic loads without exceeding the allowable loads provided in Tables 1, 2 and 3. Shear wall chords, hold-downs, and connections to transfer shear forces between the wall and surrounding structure shall be designed in accordance with accepted engineering practice. The allowable loads provided in Tables 1, 2 and 3, as published, are limited to assemblies with height-to-width ratios not exceeding 2:1. For assemblies using dimensional lumber splines, if the allowable load is adjusted in accordance with Footnote 4 of Tables 1, 2 and 3, a length-to-width ratio greater than 2:1 but not exceeding 3.5:1 is permitted.

4.5 Seismic Design Categories. The shear wall configurations in Tables 1, 2 and 3 are permitted in Seismic Design Categories A, B, C, D, E and F. Such walls shall be designed using the seismic design coefficients and limitations provided in ASCE 7-10 for light-framed walls sheathed with wood structural panels rated for shear resistance (SFRS A13). These SIP panels shall use the following factors for design: Response Modification Coefficient, $R = 6.5$; System Overstrength Factor, $\Omega_0 = 3.0$; Deflection Amplification Factor, $C_d = 4.0$.^(IM 014 ACU16)

This NLR report is intended to indicate that NTA, Inc. has listed 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).

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4.6 Adhesives and Sealants. Adhesives and sealants shall not be applied at wood-to-wood or spline-to-facing interfaces in shear walls in Seismic Design Categories D, E and F. Adhesives and sealants may be applied to wood-to-foam or facing-to-foam interfaces. Flexible SIP tape may be applied over panel joints

5. Installation

5.1 General. *Insulspan Structural Insulated Wall 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.

6. Evidence Submitted

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.

7. 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 standards noted herein and the criteria as established by NTA, Inc. Furthermore, product must comply with the requirements of this listing report.

This listing report is subject to annual review.

8. Markings

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

- 8.1** The name of the report holder
- 8.2** Identification of the production facility
- 8.3** Project or Batch Number

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

- 8.4** The NTA, Inc. listing mark, shown below.
- 8.5** NTA's NLR No. NLR-1070



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**Table 1 (DESIGN 1070-1): Allowable In-Plane Shear Strength (Pounds per Foot)
 for SIP Shear Walls (Seismic Loads in Seismic Design Categories A, B, C, D, E and F)^{1,2}**

Spline Type	Framing Minimum SG ³	Minimum Facing Connections ²			Shear Strength ⁶ (plf)
		Chord ²	Plate ²	Spline	
4x #2 Douglas Fir ⁴	0.50	0.113-in. x 2-1/2-in. nails, 4-in. on center, 3/4-in. edge distance	0.113-in. x 2-1/2-in. nails, 4-in. on center, 3/4-in. edge distance	0.113-in. x 2-1/2-in. nails, 4-in. on center, 3/4-in. edge distance	540

See Table 3 for footnotes.

**Table 2 (DESIGN 1070-2): Allowable In-Plane Shear Strength (Pounds per Foot)
 for SIP Shear Walls (Seismic Loads in Seismic Design Categories A, B, C, D, E and F)^{1,2}**

Spline Type	Framing Minimum SG ³	Minimum Facing Connections ²			Shear Strength ⁶ (plf)
		Chord ²	Plate ²	Spline	
4x #2 Douglas Fir ⁴	0.50	0.113-in. x 2-1/2-in. nails, 4-in. on center 2 rows staggered, 3/4-in. and 2-1/4-in. edge distance	0.113-in. x 2-1/2-in. nails, 4-in. on center 2 rows staggered, 3/4-in. and 2-1/4-in. edge distance	0.113-in. x 2-1/2-in. nails, 4-in. on center 2 rows staggered, 5/8-in. and 1-1/8-in. edge distance	920

See Table 3 for footnotes.

**Table 3 (DESIGN 1070-3): Allowable In-Plane Shear Strength (Pounds per Foot)
 for SIP Shear Walls (Seismic Loads in Seismic Design Categories A, B, C, D, E and F)^{1,2}**

Spline Type	Framing Minimum SG ³	Minimum Facing Connections ²			Shear Strength ⁶ (plf)
		Chord ²	Plate ²	Spline	
OSB Block Spline ⁵	0.50	0.113-in. x 2-1/2-in. nails, 6-in. on center, 3/4-in. edge distance	0.113-in. x 2-1/2-in. nails, 6-in. on center, 3/4-in. edge distance	0.113-in. x 2-1/2-in. nails, 6-in. on center, 3/4-in. edge distance	360
Double 2x #2 Douglas Fir ⁴	0.50	0.113-in. x 2-1/2-in. nails, 6-in. on center, 3/4-in. edge distance	0.113-in. x 2-1/2-in. nails, 6-in. on center, 3/4-in. edge distance	0.113-in. x 2-1/2-in. nails, 6-in. on center, 3/4-in. edge distance	360

¹Allowable seismic design coefficients are provided in Section 4.5.

²Chords, hold-downs and connections to other structural elements must be designed by a registered design professional in accordance with accepted engineering practice.

³Required connections must be made on each side of the panel. Dimensional or engineered lumber shall have an equivalent specific gravity not less than specified.

⁴The maximum assembly height-to-width ratio shall be 2:1 for the allowable loads as published. For design to resist seismic forces, shear wall height-to-width ratios greater than 2:1, but not exceeding 3.5:1, are permitted provided the allowable shear strength values in this table are multiplied by 2w/h.

⁵The maximum assembly height-to-width ratio shall be 2:1 when used in Seismic Design Categories A, B and C. The maximum assembly height-to-width ratio shall be 1:1 when used in Seismic Design Categories D, E and F.

⁶Shear strength values are based on conventionally constructed wood frame wall sheathed with wood-based structural panels mechanically fastened to wood framing members found in ESR-1539 which have been determined to be equivalent.

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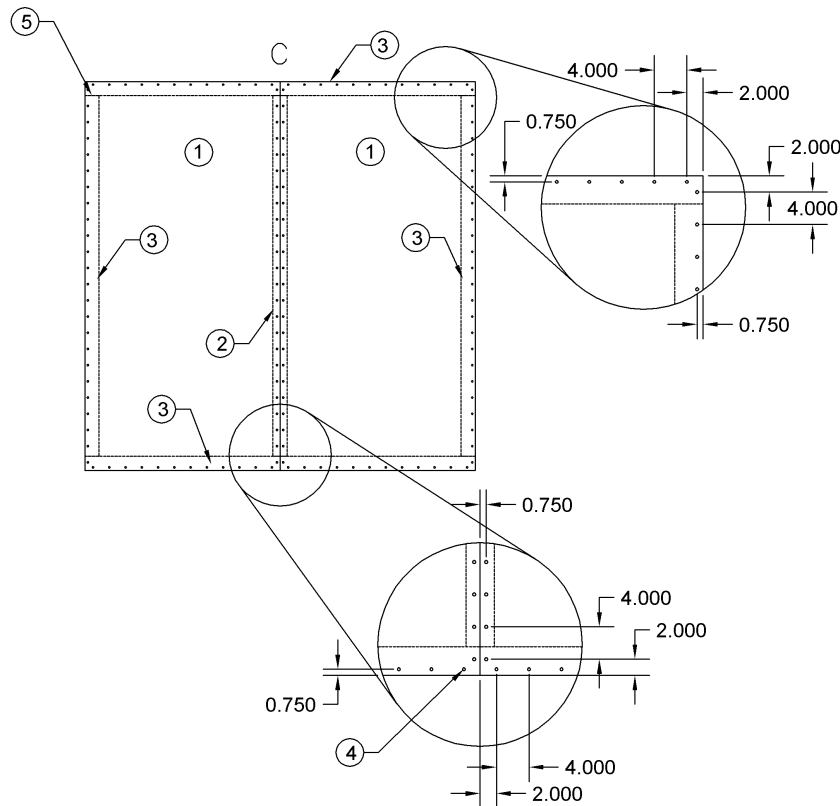
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DESIGN LISTING 1070-1
Insulspan Structural Insulated Wall Panels
For Use in Seismic Design Categories A, B, C, D, E, and F
ASCE/SEI 7-10 Section 11.1.4, ASCE/SEI 7-10 Section 12.2.1, ASTM E72, ASTM E2126



Insulspan Structural Insulated Wall Panels For Use in Seismic Design Categories A, B, C, D, E, and F

DESCRIPTION

(#1) Structural Insulated Panels. *Insulspan Structural Insulated Panels* consisting of minimum nominal 5-1/2-in. thick EPS core laminated between two sheets of 7/16-in. thick oriented strand board (OSB). SIPs shall bear the ESR-1295 listing mark.

(#2) Splines. *Insulspan Structural Insulated Panels* for use in seismic construction are interconnected with #2 Douglas Fir 4x lumber along the full length of the spline connections at maximum 48-in. on center.

(#3) Chords and Top and Bottom Plates. *Insulspan Structural Insulated Panels* for use in seismic construction shall use #2 Douglas Fir 4x Top Plate, Chords and Bottom Plate.

(#4) 8d Nails, 0.113-in. x 2-1/2-in. applied 4-in. on center. around the panel perimeter and 4-in. on center on both sides of the spline connection.

(#5) 10d Nails, 0.131-in. x 3-in. (4) fasteners used to toe nail the top and bottom plates at each chord.

Hold-downs. Designed in accordance with accepted engineering practice to resist design chord forces.

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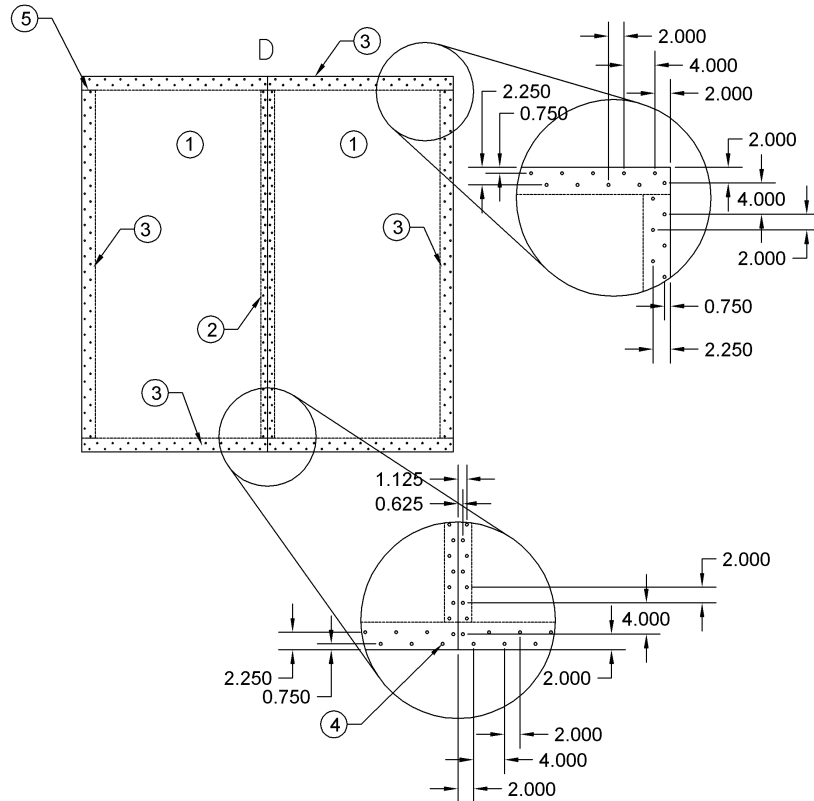
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DESIGN LISTING 1070-2
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For Use in Seismic Design Categories A, B, C, D, E, and F
ASCE/SEI 7-10 Section 11.1.4, ASCE/SEI 7-10 Section 12.2.1, ASTM E72, ASTM E2126



Insulspan Structural Insulated Wall Panels For Use in Seismic Design Categories A, B, C, D, E, and F

DESCRIPTION

(#1) Structural Insulated Panels. *Insulspan Structural Insulated Panels* consisting of minimum nominal 5-1/2-in. thick EPS core laminated between two sheets of 7/16-in. thick oriented strand board (OSB). SIPs shall bear the ESR-1295 listing mark.

(#2) Splines. *Insulspan Structural Insulated Panels* for use in seismic construction are interconnected with #2 Douglas Fir 4x lumber along the full length of the spline connections at maximum 48-in. on center.

(#3) Chords and Top and Bottom Plates. *Insulspan Structural Insulated Panels* for use in seismic construction shall use #2 Douglas Fir 4x Top Plate, Chords and Bottom Plate.

(#4) 8d Nails, 0.113-in. x 2-1/2-in. applied 4-in. on center., 2 rows staggered around the panel perimeter and 4-in. on center, 2 rows staggered on both sides of the spline connection.

(#5) 10d Nails, 0.131-in. x 3-in. (4) fasteners used to toe nail the top and bottom plates at each chord.

Hold-downs. Designed in accordance with accepted engineering practice to resist design chord forces.

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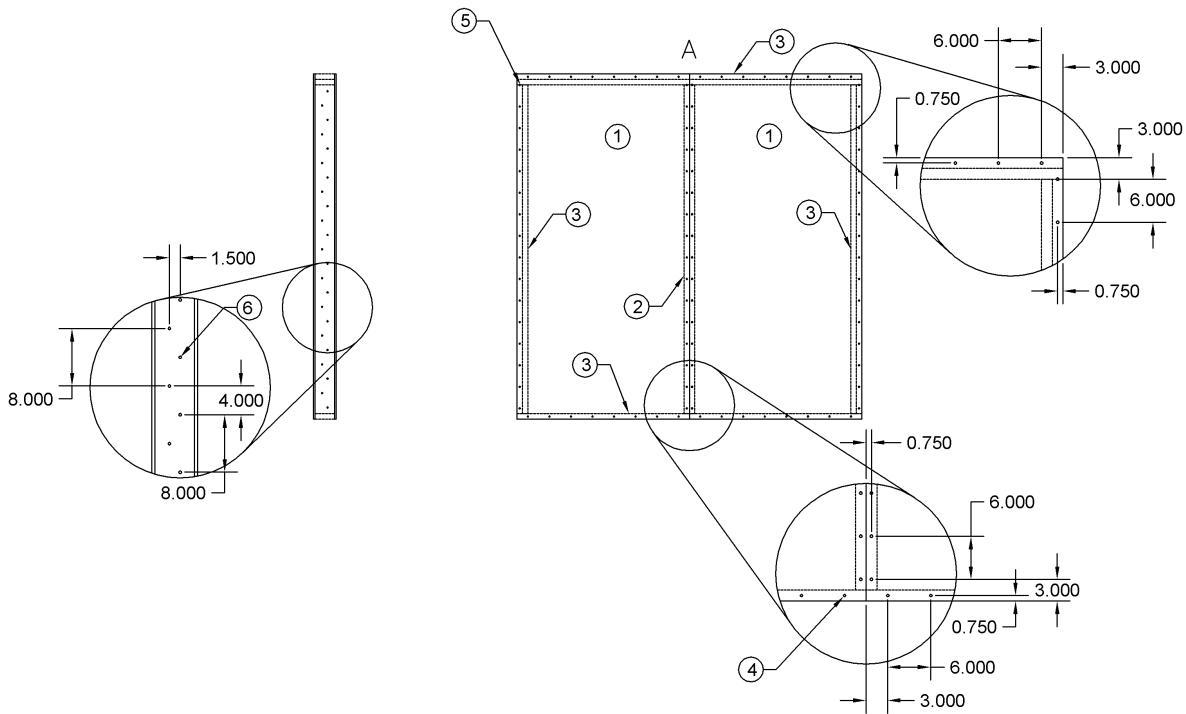
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DESIGN LISTING 1070-3
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ASCE/SEI 7-10 Section 11.1.4, ASCE/SEI 7-10 Section 12.2.1, ASTM E72, ASTM E2126



Insulspan Structural Insulated Wall Panels For Use in Seismic Design Categories A, B, C, D, E, and F

DESCRIPTION

(#1) Structural Insulated Panels. *Insulspan Structural Insulated Panels* consisting of minimum nominal 5-1/2-in. thick EPS core laminated between two sheets of 7/16-in. thick oriented strand board (OSB). SIPs shall bear the ESR-1295 listing mark.

(#2) Splines. *Insulspan Structural Insulated Panels* for use in seismic construction are interconnected with insulated OSB (Block) splines, 3-in. wide and overall thickness equal to the core thickness of the SIP, along the full length of the spline connections at maximum 48-in. on center. The spline is composed of 7/16-in. thickness OSB and an EPS core. Alternatively, #2 Douglas Fir Double 2x lumber may be used in place of the block spline.

(#3) Chords and Top and Bottom Plates. *Insulspan Structural Insulated Panels* for use in seismic construction shall use #2 Douglas Fir Double 2x Top Plates and Chords with a single 2x Bottom Plate.

(#4) 8d Nails, 0.113-in. x 2-1/2-in. applied 6-in. on center around the panel perimeter and 6-in. on center on both sides of the spline connection.

(#5) 10d Nails, 0.131-in. x 3-in. (3) fasteners used to end nail the top and bottom plates at each chord.

(#6) 10d Nails, 0.131-in. x 3-in. used for double plates, #2 Douglas Fir Double 2x lumber spline, and chords 8-in. on center in two rows, staggered.

Hold-downs. Designed in accordance with accepted engineering practice to resist design chord forces.

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