

ICC-ES Evaluation Report

ESR-5025

Reissued January 2024

This report also contains:



- FBC Supplement

Subject to renewal January 2025

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<p>DIVISION: 03 00 00 — CONCRETE</p> <p>Section: 03 41 00 — Precast Structural Concrete</p> <p>DIVISION: 04 00 00 — MASONRY</p> <p>Section: 04 22 26 — Autoclaved Aerated Concrete Unit Masonry</p>	<p>REPORT HOLDER: LITECON CORPORATION</p> 	<p>EVALUATION SUBJECT: LITECON PRECAST AUTOCLAVED AERATED CONCRETE (PAAC) PANELS</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018 and 2015 [International Building Code® \(IBC\)](#)
- 2021, 2018 and 2015 [International Residential Code® \(IRC\)](#)

Properties evaluated:

- Structural
- Non-Combustibility
- Thermal conductivity
- Fire resistance

2.0 USES

Litecon Precast Autoclaved Aerated Concrete (PAAC) Panels are used as exterior wall panels in wood or steel-framed construction. The PAAC panels may also be used under the IRC where an engineering design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 General:

Litecon PAAC panels, shown in [Figure 1](#), are reinforced precast, noncombustible panels manufactured from autoclaved aerated concrete (AAC), and comply with ASTM C1694 and ASTM C1693. The panels are reinforced with plain steel wire complying with ASTM A82, as required by ASTM C1694. The reinforcing steel wires are nominally $7/64$ inch (3 mm) in diameter. All reinforcing wire is protected with rust inhibitor in compliance with ASTM C1694. The wall panels are manufactured with square edges. The PAAC panels come in two nominal thicknesses of 2 and 3 inches (51 and 76 mm). The 2-inch-thick panels come in the following nominal dimensions; 2-feet-by-4-feet, 2-feet-by-7-feet and 2-feet-by-8-feet. The 3-inch-thick panels come in the

following nominal dimensions; 2-feet-by-4-feet and 2-feet-by-7-feet. The 2-inch-thick panels' actual dimensions are 1.97-inches-thick (50 mm) by 1.96-feet-by-4-feet (600 by 1220 mm), 1.96-feet by 6.67-feet (600 by 2035 mm) and 1.96 feet by 8 feet (600 by 2440 mm). The 3-inch-thick panels' actual dimensions are 2.95-inches-thick (75 mm) by 1.96-feet-by-4-feet (600 by 1220 mm) and 1.96-feet by 6.67-feet (600 by 2035 mm). The PAAC panels weight approximately 5.12 psf (25 kg/m²) for the 2-inch-thick or 7.67 psf (37.4 kg/m²) for the 3-inch-thick.

The Litecon PAAC panels comply with ASTM C1694 and are available in strength class AAC-4 in accordance with ASTM C1693. See [Table 1](#) for the panel physical properties and thermal characteristics. The PAAC panels are classified as noncombustible when tested in accordance with ASTM E136.

3.2 Framing: The PAAC panels must be mechanically fastened to wood or cold-formed steel framing complying with applicable sections of IBC Chapters 22 and 23, respectively. The framing must be designed by registered design professional where required by the statutes of the authority having jurisdiction.

3.3 Fasteners: The fasteners used to attach the PAAC panels to the wood framing must be corrosion-resistant No. 10 coarse-thread Type 17 point screws. The fasteners used to attach the PAAC panels to the cold-formed steel framing must be corrosion-resistant No. 8 self-drilling screws.

3.4 Thin-Bed Mortar:

The thin-bed mortar must comply with the autoclaved aerated concrete thin-bed mortar requirements of Section 2103.2.1 of the IBC.

4.0 DESIGN AND INSTALLATION

4.1 Design: The Litecon PAAC panels must not exceed the allowable design loads noted in [Table 2](#) and [3](#) of this report. When used as shearwalls, PAAC panels are limited to Seismic Design Categories A and B. The framing supporting the PAAC panels must be designed to resist the applicable forces.

4.2 Installation:

4.2.1 General: The Litecon PAAC panels must be installed in accordance with this report and the approved construction plans. A copy of the plans and this report must be available at the jobsite at all times during installation.

4.2.2 Wall Panels: The Litecon PAAC panels must be fastened to wood or cold-formed steel framing spaced as indicated in [Table 2](#) of this report and Section 4.3 using fasteners described in Section 3.3 of this report, as applicable. The location of the fasteners attaching PAAC panels to framing must be as indicated in [Table 2](#) and Section 4.3 of this report, as applicable. The PAAC panels must be installed in a running bond pattern staggered up the wall. A thin layer of $\frac{1}{8}$ -inch-thick (3.2 mm) adhesive mortar (Section 3.4) must be applied on the mating faces of the PAAC panels.

4.3 Fire Resistance-rated Construction (Rated Both Sides):

4.3.1 One-hour Load-bearing Wood Stud Wall: Nominal 2-by-4 studs spaced up to 16 inches on center. The interior side of the framing must be cladded with one layer of $\frac{5}{8}$ -inch-thick (15.9 mm) Type X gypsum wallboard complying with ASTM C1396. The exterior side of the wall must be cladded with minimum 2-inch-thick (50.8 mm) PAAC panels. The gypsum board must be installed in a vertical orientation secured to the framing members with No. 6 by $1\frac{5}{8}$ -inch-long (41.3 mm) coarse-thread, bugle head drywall screws spaced at 8 inches on center (203.2 mm) around the perimeter and field. Gypsum board joints must be treated with tape and joint compound complying with ASTM C840 or GA216. Screw heads are finished with a layer of joint compound. The PAAC panels must be installed so that all panel vertical joints are backed by framing. No blocking is needed on the panels horizontal joints. The panels must be secured to the framing using No. 10 corrosion resistant screws with sufficient length to penetrate 1.5-inches (38.1 mm) into framing, spaced at a maximum 8 inches on center (203.2 mm) with fasteners installed at a minimum of $\frac{1}{2}$ -inch (12.7 mm) from the vertical joints or edges and 3 inches (76.2 mm) from the horizontal joints. The fasteners must be countersunk $\frac{1}{2}$ -inch (12.7 mm) from the panel surface and filled with mortar. Allowable bearing loads must not exceed 2,086 pounds per stud (946.2 kg per stud), 100 percent of the allowable F'_c or 100 percent of the calculated stress with studs having a slenderness ratio, l_e/d of 33, whichever is less. The panels must also be installed in accordance with Section 4.2.2 of this report.

4.3.2 One-hour Non-load Bearing Cold-formed Steel Framed Wall: Nominal 3.5-inch-deep by 20 gage cold-formed steel studs spaced up to 16 inches on center. The interior side of the framing must be cladded with one layer of $\frac{5}{8}$ -inch-thick (15.9 mm) Type X gypsum wallboard complying with ASTM C1396. The exterior

side of the wall must be clad with minimum 2-inch-thick (50.8 mm) PAAC panels. The gypsum board must be installed in a vertical orientation secured to the framing members with No. 6 by 1⁵/₈-inch-long (41.3 mm) coarse-thread, bugle head drywall screws spaced at 8 inches on center (203.2 mm) around the perimeter and field. Gypsum board joints must be treated with tape and joint compound complying with ASTM C840 or GA216. Screw heads are finished with a layer of joint compound. The PAAC panels must be installed so that all panel vertical joints are backed by framing. No blocking is needed on the panels horizontal joints. The panels must be secured to the framing using No. 8 corrosion-resistant self-drilling screws with sufficient length to penetrate framing with at least three screw threads, spaced at a maximum 8 inches on center (203.2 mm) with fasteners installed a minimum of 1/2-inch (12.7 mm) from the vertical joints or edges and 3 inches (76.2 mm) from the horizontal joints. The fasteners must be countersunk 1/2-inch (12.7 mm) from the panel surface and filled with mortar. The panels must also be installed in accordance with Section 4.2.2 of this report.

4.4 Thermal Insulation:

The PAAC panels, tested in accordance with ASTM C518, have overall thermal transmission values as shown in [Table 1](#).

4.5 Special Inspections:

Special inspections must conform to Section 1704 of the IBC. The special inspector's duties are, at minimum, to verify panel and mortar identification, panel placement, mortar preparation and application.

5.0 CONDITIONS OF USE:

The Litecon Precast Autoclaved Aerated Concrete (PAAC) Panels as described in this report comply with, or are suitable alternatives to the codes noted in this report, subject to the following conditions:

- 5.1 The published installation manual, the approved construction plans and this report must be available at all times at the jobsite during construction. The instructions within this report govern if there are any conflicts between the manufacturer's installation manual and this report.
- 5.2 Framing members supporting the panels must be designed by registered design professional and must be able to resist the applied loads noted in [Tables 2](#) and [3](#) of this report.
- 5.3 The PAAC panels must be installed on exterior walls on buildings over 40 feet (12 192 mm) in height above the grade plane of Types I, II III and IV construction with water-resistive barrier complying with Exception 2 of 2021 and 2018 IBC Section 1402.5 (Exception 2 of 2015 IBC Section 1403.5).
- 5.4 The panels must be installed with an approved exterior wall covering.
- 5.5 Litecon Precast Autoclaved Aerated Concrete (PAAC) panels are manufactured under a quality control program with inspections by ICC Evaluation Service, LLC.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the requirements of ASTM C518.
- 6.2 Data in accordance with the requirements of ASTM C1694 and ASTM C1693.
- 6.3 Data in accordance with the transverse load testing requirements of ASTM E330.
- 6.4 Data in accordance with racking shear load testing requirements of ASTM E72.
- 6.5 Data in accordance with the fire-resistance requirements of ASTM E119.
- 6.6 Data in accordance with the noncombustibility requirements of ASTM E136.
- 6.7 Quality Documentation in accordance with the [ICC-ES Acceptance Criteria for Quality Documentation \(AC10\)](#).

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5025) 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 pallet of Litecon AAC panels must be identified by a stamp or a label on the pallet that includes the name of the report holder (LITECON Corporation), identification of the manufacturing facility, and production date or lot number.

7.3 The report holder’s contact information is the following:

LITECON CORPORATION
18911 HARDY OAK BOULEVARD NO. 190
SAN ANTONIO, TEXAS 78258
(210) 605-7052
www.liteconusa.com

TABLE 1—PHYSICAL PROPERTIES AND THERMAL CHARACTERISTICS OF PAAC PANELS PER INCH OF THICKNESS

STRENGTH CLASS	NOMINAL DRY BULK DENSITY (pcf)	THERMAL RESISTANCE <i>R</i> (ft ² · h · F/Btu-in)	THERMAL CONDUCTIVITY <i>k</i> (Btu · in / ft ² · h · F)	NOMINAL COMPRESSIVE STRENGTH (psi)
AAC-4	31.0	1.193	0.839	580

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m³, 1 ft²·h·°F/Btu = 0.1761 m²·k/W, 1 Btu · in./h·ft²·°F = 0.144 W/m·K, 1 psi = 6894.8 Pa.

TABLE 2—ALLOWABLE POSITIVE AND NEGATIVE TRANSVERSE LOADS¹

Minimum PAAC Panel Nominal Thickness, inches	Framing Member Type	Framing Member Maximum Spacing, inches	Fastener	Fastener Locations	Allowable Positive Transverse Loads, psf			Allowable Negative Transverse Loads, psf		
					Strength	Deflection		Strength	Deflection	
						L/120	L/180		L/120	L/180
2	Minimum 2 by 4 Southern Yellow Pine	16	Section 3.3 with minimum length to penetrate 1.5 inches	See Figure 3	68	68	63	55	55	48
2	Minimum 600S162-43 C-stud, 33 ksi	24	Section 3.3 with minimum length to penetrate three screw threads	See Figure 4 ²	66	66	66	34	34	34

For SI: 1 inch= 25.4 mm, 1 psf= 47.9 Pa.

¹ Vertical panel joints must be installed over framing. No blocking on horizontal panel joints.

² See [Figure 3](#) for fastener locations at 16 inches on center.

TABLE 3—ALLOWABLE RACKING SHEAR LOADS¹

Minimum PAAC Panel Nominal Thickness, inches	Framing Member Type ²	Framing Member Maximum Spacing, inches	Fastener	Fastener Locations ³	Allowable Racking Shear Loads, plf		
					Strength	Net Deflection, inches	
						0.125	0.20
2	Minimum 2 by 4 Southern Yellow Pine	16	Section 3.3 with minimum length to penetrate 1.5 inches	See Figure 3	142	103	138
2	Minimum 600S162-43 C-stud, 33 ksi	24	Section 3.3 with minimum length to penetrate three screw threads	See Figure 4 ⁴	108	38	54

For SI: 1 inch= 25.4 mm, 1 plf= 14.59 N/m

¹ Allowable racking shear loads are based on testing 8 foot by 8 foot assembly in accordance with ASTM E72.

² Vertical panel joints must be installed over framing. No blocking on horizontal joints.

³ PAAC panels are not required to be fastened to top and bottom plates.

⁴ See [Figure 3](#) for fastener locations at 16 inches on center.

LITECON CLADDING DIMENSIONS

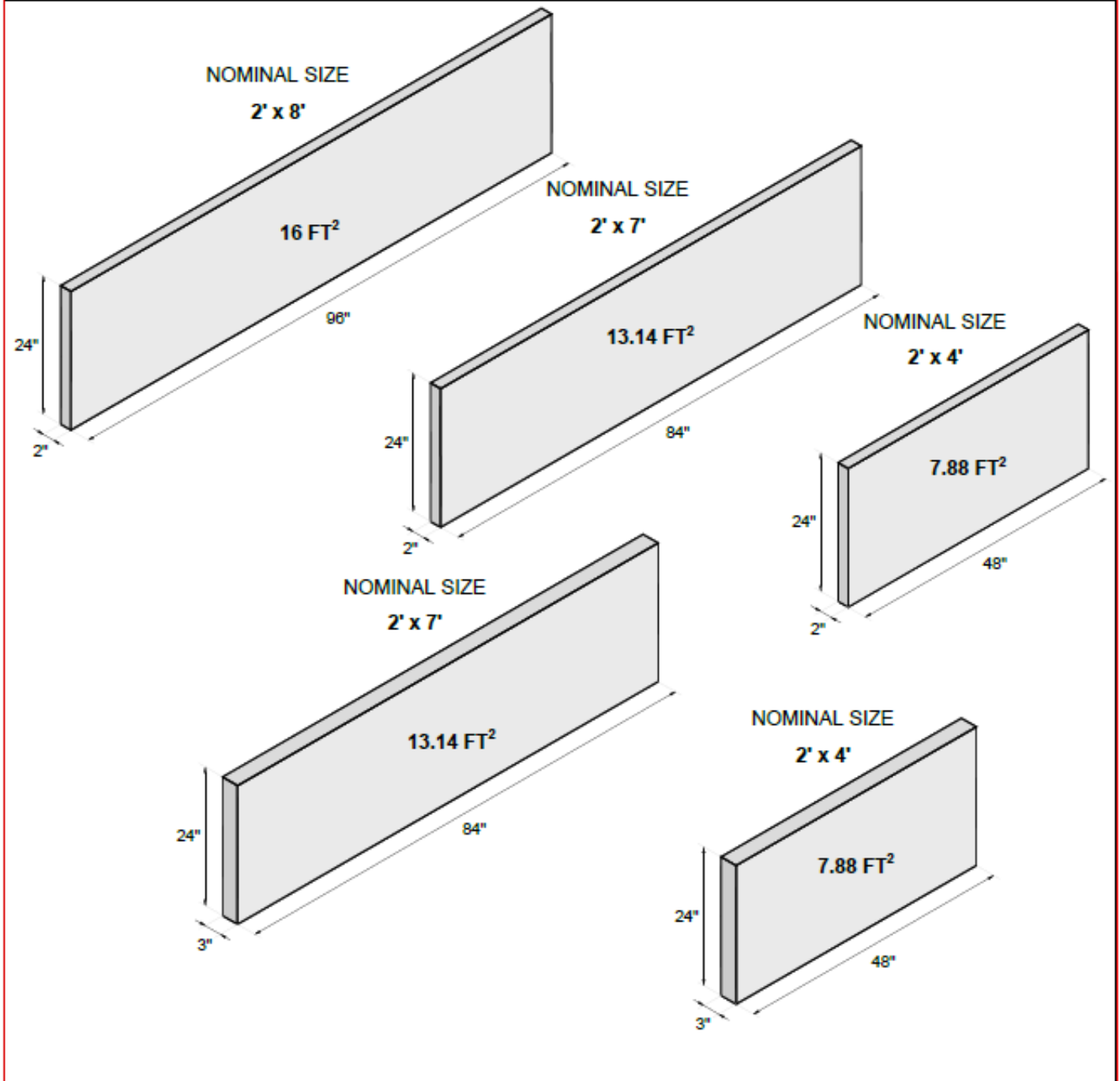


FIGURE 1—ILLUSTRATION OF PAAC PANELS

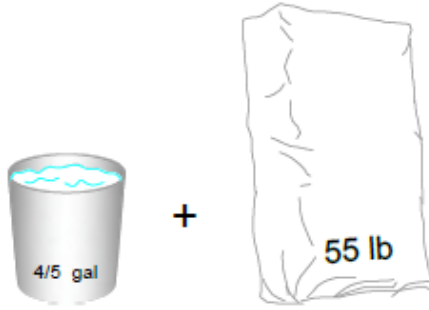


INSTALLATION GUIDE

VERSION:
NOVEMBER 22

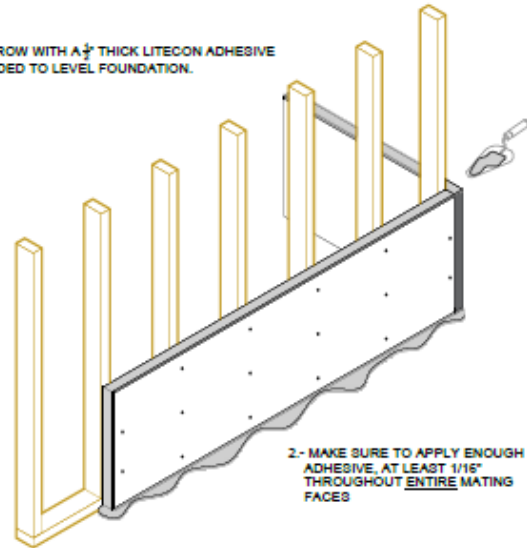
PRODUCT:
LITECON CLADDING 2"

FIRST ROW AND ADHESIVE APPLICATION



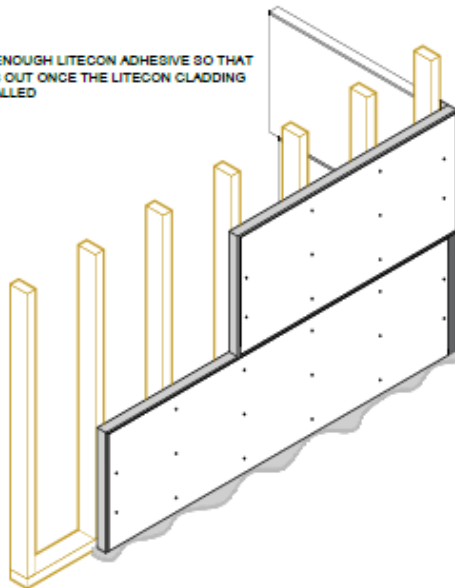
MIX 4/5 gal OF WATER FOR EACH 55 lb OF LITECON ADHESIVE. MIX TO OBTAIN A UNIFORM WORKABLE CONSISTENCY WITH NO CLUMPS. LET REST FOR 5 MINUTES, MIX AGAIN AND APPLY

1.- SET FIRST ROW WITH A 1/2" THICK LITECON ADHESIVE OR AS NEEDED TO LEVEL FOUNDATION.



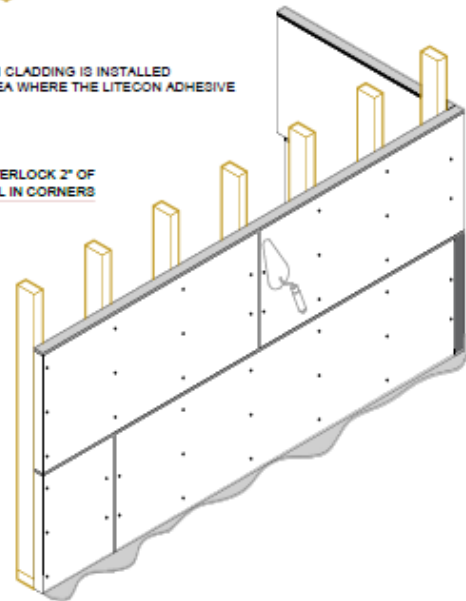
2.- MAKE SURE TO APPLY ENOUGH ADHESIVE, AT LEAST 1/16" THROUGHOUT ENTIRE MATING FACES

3.- APPLY ENOUGH LITECON ADHESIVE SO THAT IT SPITS OUT ONCE THE LITECON CLADDING IS INSTALLED



4.- AFTER THE LITECON CLADDING IS INSTALLED SMOOTHEN THE AREA WHERE THE LITECON ADHESIVE SPAT OUT


BE SURE TO INTERLOCK 2" OF PANEL IN CORNERS



NOTES

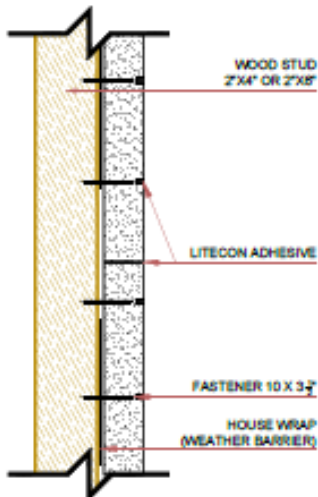
- 1.- LEVEL FIRST ROW WITH LITECON ADHESIVE
- 2.- MAKE SURE TO APPLY ENOUGH ADHESIVE, AT LEAST 1/16" THROUGHOUT THE ENTIRE MATING FACES
- 3.- BE SURE TO INTERLOCK 2" OF PANEL IN CORNERS
- 4.- WHEN DRILLING THROUGH THE PANELS, MAKE SURE THE SCREW ENTERS THE WOOD STUD
- 5.- FASTENERS HEADS MUST BE COUNTERSUNK 1/2" INTO THE PANEL
- 6.- FILL THE 1/2" GAP GENERATED BY THE FASTENER WITH LITECON ADHESIVE TO PREVENT WATER INTRUSION TO THE STUD
- 7.- ALLOW LITECON ADHESIVE TO DRY FOR A MINIMUM OF 24 HOURS PRIOR TO APPLYING ANY LOAD
- 8.- ONCE THE ADHESIVE IS MADE OR MIXED WITH WATER IT SHOULD BE USED WITHIN A MAXIMUM OF 30 MINUTES

FIGURE 2—TYPICAL INSTALLATION PAAC PANELS ON LIGHT-FRAME STRUCTRE

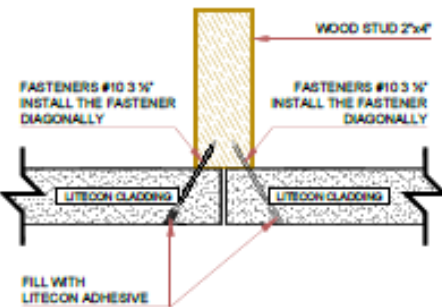
	INSTALLATION GUIDE
VERSION: NOVEMBER 22	PRODUCT: LITECON CLADDING 2"

FASTENERS DISTRIBUTION - WOOD STUD

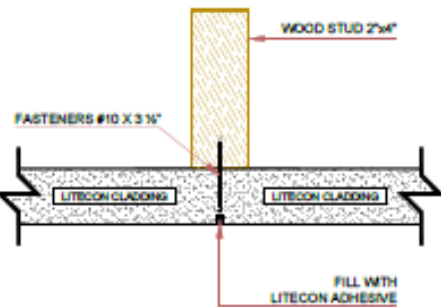
SECTION A (WOOD STUD)



DETAIL 1 (WOOD STUD)



DETAIL 2 (WOOD STUD)



NOTES

- 1- THE 2' X 4' PANEL MUST BE INSTALLED WITH 10 FASTENERS
- 2- THE 2' X 7' PANEL MUST BE INSTALLED WITH 16 FASTENERS
- 3- THE 2' X 8' PANEL MUST BE INSTALLED WITH 19 FASTENERS
- 4- WHEN DRILLING THROUGH THE PANELS, MAKE SURE THE SCREW ENTERS THE WOOD STUD
- 5- FASTENERS HEADS MUST BE COUNTERSUNK 1/2" INTO THE PANEL
- 6- FILL THE 1/2" GAP GENERATED BY THE FASTENER WITH LITECON ADHESIVE TO PREVENT WATER INTRUSION TO THE STUD

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FIGURE 3- FASTENING DETAILS FOR LIGHT-FRAMED ASSEMBLIES AT MAXMIMUM STUD SPACING OF 16 INCHES ON CENTER

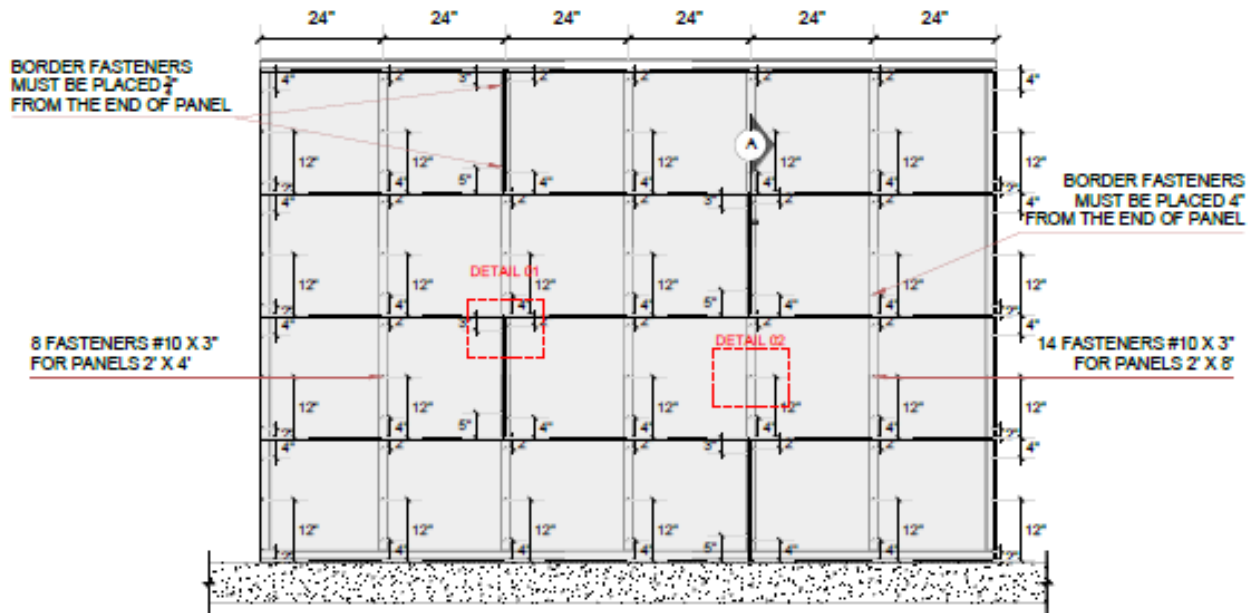


INSTALLATION GUIDE

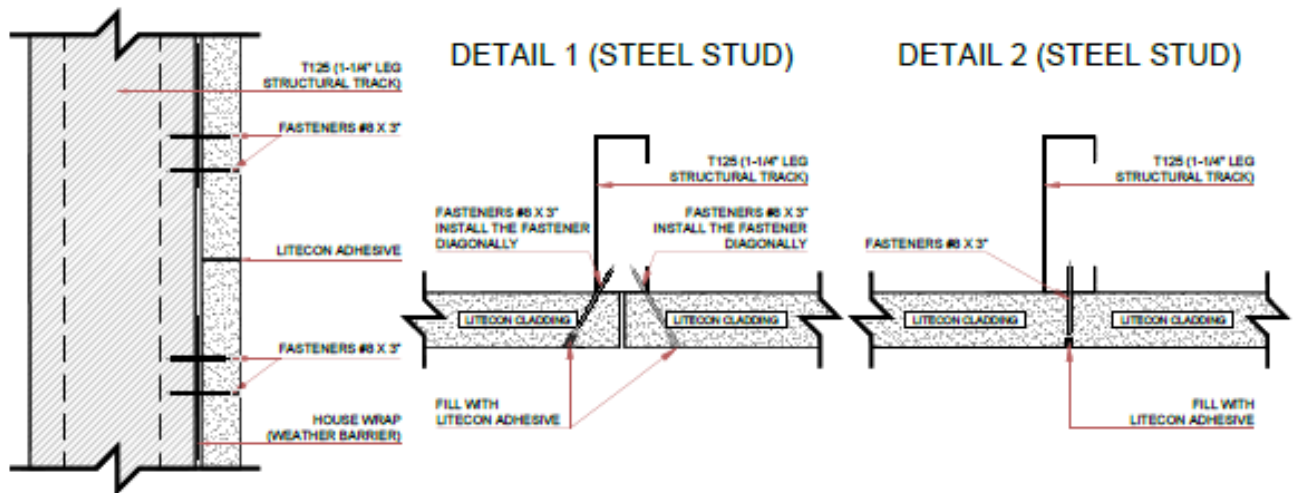
VERSION:
NOVEMBER 22

PRODUCT:
LITECON CLADDING 2"

FASTENERS DISTRIBUTION - STEEL STUD



SECTION A (STEEL STUD)



NOTES

- 1.- THE 2' X 4' PANEL MUST BE INSTALLED WITH 8 FASTENERS
- 2.- THE 2' X 7' PANEL MUST BE INSTALLED WITH 11 FASTENERS
- 3.- THE 2' X 8' PANEL MUST BE INSTALLED WITH 14 FASTENERS
- 4.- WHEN DRILLING THROUGH THE PANELS, MAKE SURE THE SCREW ENTERS THE WOOD STUD
- 5.- FASTENERS HEADS MUST BE COUNTERSUNK 1/2" INTO THE PANEL
- 6.- FILL THE 1/2" GAP GENERATED BY THE FASTENER WITH LITECON ADHESIVE TO PREVENT WATER INTRUSION TO THE STUD

FIGURE 4- FASTENING DETAILS FOR STEEL FRAMED ASSEMBLIES

DIVISION: 03 00 00—CONCRETE

Section: 03 41 00—Precast Structural Concrete

DIVISION: 04 00 00—MASONRY

Section: 04 22 26—Autoclaved Aerated Concrete Unit Masonry

REPORT HOLDER:

LITECON CORPORATION

EVALUATION SUBJECT:

LITECON PRECAST AUTOCLAVED AERATED CONCRETE (PAAC) PANELS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the Litecon PAAC panels, described in ICC-ES evaluation report ESR-5025, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 *Florida Building Code—Building*
- 2020 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Litecon PAAC panels, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-5025, comply with the *Florida Building Code—Building* and *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-5025 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Litecon PAAC panels for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential* has not been evaluated and is outside the scope of this supplemental 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).

This supplement expires concurrently with the evaluation report, reissued January 2024.