



**ALLIED MODULAR**  
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## ALLIED MODULAR BUILDING SYSTEMS

### CSI Sections:

- 13 20 00 Special Purpose Rooms**
- 13 26 00 Fabricated Rooms**
- 13 34 00 Fabricated Engineered Structures**
- 13 42 00 Building Modules**

### 1.0 RECOGNITION

Allied Modular Building Systems described in this report were evaluated for use as business use, one-story structures within other buildings. The material composition and structural performance properties of the Allied Modular Building Systems were evaluated for compliance with the following codes:

- 2015, 2012, 2009, and 2006 International Building Code® (IBC)

### 2.0 LIMITATIONS

Use of the Allied Modular Building Systems recognized in this report are subject to the following limitations:

- 2.1** Allied Modular Attached Building System and the Free-Standing Building System are installed within existing buildings with an occupancy group classification of either Group B, F-1, M, or S-1.
- 2.2** Allied Modular Attached and Free-Standing Building Systems are limited to interior use. As such, wind loading was not a design consideration; however, a 5 psf lateral load was considered on all walls.
- 2.3** Allied Modular Attached and Free-Standing Building Systems are limited to one-story installations.
- 2.4** Allied Modular Building Systems shall be constructed in accordance with this report, the attached Allied Modular Construction Documents, UES ER-0416 dated December 2017, and the manufacturer’s instructions. Where conflicts occur, the more restrictive shall govern.

**2.5** Allied Modular Free-Standing Building System's maximum room size is 28 feet by 20 feet. This is based on a 20-foot maximum allowable span for a standard metal deck (dust cover) and a maximum aspect ratio of 2:1 for flexible diaphragms.

**2.6** The Allied Modular Attached Building Systems maximum allowable room size is shown in Table 4 on Sheet S-6 of the attached Allied Modular Construction Documents, dated December 2017.

**2.7** Construction documents establishing that the construction indicated is in accordance with the IBC and this report shall be submitted to the code official for approval. The construction documents shall be prepared by a registered design professional when required by the statutes of the jurisdiction in which the project is to be constructed. When the code official determines that the proposed project is not included within the configurations permitted by this report, site-specific engineering documentation, bearing the seal and signature of a registered design professional, shall be permitted.

**2.8** The Allied Modular Building Systems wall panels and the steel moment frames are produced by the Allied Modular Building Systems, Orange, California.

### 3.0 PRODUCT USE

**3.1 General:** Allied Modular Building Systems consist of modular wall and roof panels and steel frames used to construct one-story structures located within another structure. The systems are either attached to the other structure or freestanding. In accordance with Section 304 of the IBC, the systems are intended for uses permitted under Business Group B occupancies. IBC Table 508.4 permits Business Group B occupancies to be located within Group B, F-1, M, or S-1 occupancies without fire barriers. The panels and frames comply with IBC Appendix Section K107 as prefabricated construction.

### 3.2 Design:

**3.2.1 General:** The Allied Modular construction documents, summarized in Table 1 of this report, show the size, section, and relative locations of structural members with column centers and offsets dimensioned. The design loads and other information pertinent to the structural design required by IBC Section 1603 are shown on the construction documents and described below:

*The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.*





1. Limited to risk category II.
2. Seismic importance factor,  $I_e$ , of 1.0
3. Mapped spectral response acceleration parameters,  $S_S \leq 1.5g$  (ASCE 7-10, Section 12.8.1.3) and  $S_I < 0.9g$ .
4. Site class A, B, C, or D.
5. Seismic Design Category A, B, C, D, or E.

**TABLE 1—SUMMARY OF CONSTRUCTION DOCUMENTS<sup>1</sup>**

SHEET NO.	DESCRIPTION
S-1	General Notes and Abbreviations
S-2A	Attached Enclosure System Plans and Elevations
S-2B	Free Standing Enclosure System Plans and Elevations
S-3	2-Inch Sections and Details
S-4	4-Inch Sections and Details
S-5	Free Standing Enclosure System Sections and Details
S-6	Room System Tables
D-1	2-Inch System Components
D-2	4-Inch System Components

<sup>1</sup> Construction documents summarized in Table 1 are dated December 2017.

**3.2.2 Steel Roof Decking:** The Allied Modular Building Systems are provided with minimum No. 20 gage steel deck panels (manufactured by ASC Steel Deck) for roofing material. The decking is either Type 3W36 floor deck panels or N-32 roof deck panels, with a minimum allowable diaphragm shear strength of 130 lbs/ft.

Alternatively, any cold-formed steel decking may be used as the roofing material provided it is approved by the code official and conforms to the following requirements:

1. The decking shall be designed to withstand applied out-of-plane and in-plane loads. The in-plane loads shall include seismic loading, and for the attached building systems, any reaction loads resulting from the decking laterally supporting the walls of the modular building systems. Out-of-plane gravity loads shall include a minimum 10 psf live load.
2. Decking shall comply with the American Iron and Steel Institute (AISI) S100.
3. Decking shall be fabricated from steel conforming to ASTM A653 SS, Grade 33, minimum, and ASTM A924, with a galvanized finish in accordance with ASTM A653, G-60. Minimum specified yield and tensile strengths shall be 38 ksi and 52 ksi, respectively.
4. Maximum dead load for the roof decking is 2.5 psf.
5. Minimum base-metal thickness of the decking is 0.0359 inch (No. 20 gage).
6. Minimum allowable diaphragm shear strength is 130 lbs/ft.

Storage on the Allied Modular Building Systems steel roof decking is beyond the scope of this report. The design live load on the roof deck shall be posted in accordance with 2015, 2012, and 2009 IBC Section 106.1 or 2006 IBC Section 1603.3. The posted sign shall indicate no storage on the roof decking is permitted.

**3.2.3 Wall Panels:** Allied Modular Building Systems, Inc., manufactures a laminated sandwich wall panel for use with their Attached and Free-Standing Building Systems. The panels are non-load-bearing sandwich panels that are designed to resist a 5 psf lateral load. The panel is manufactured in two thicknesses, 2 and 3<sup>1</sup>/<sub>2</sub> inches, and one configuration. The elements that are combined to produce individual wall panels are panel facing material; the EPS (expanded polystyrene) foam plastic core board, complying with ASTM C578, Type I, with a nominal density of 1.0 pcf; and a proprietary Type II, Class 2 adhesive used to adhere the panel facings to the EPS core.

The wall facing material consists of 1/2-inch-thick gypsum wallboard, with the designation Gypsum Sheetrock<sup>®</sup> MH Gypsum Ceiling and Wall Panels (ASTM C1396), with a 4-mil vinyl decorative covering on the exposed face.

**3.2.4 Steel Moment Frame:** Allied Modular Free-Standing Building System includes shop-fabricated steel moment frames. The frames are one-story, single-bay, ordinary steel moment frames designed and fabricated in accordance with the applicable codes and approved quality documentation. The beams and columns are hollow structural steel (HSS) sections conforming to ASTM A500, Grade B, with a minimum yield stress of 46 ksi and a minimum tensile stress of 58 ksi. The base plates are fabricated from steel conforming to ASTM A36 with circular holes to accommodate concrete anchorage. All components are welded together.

**3.2.5 Existing Concrete Walls and Floors:** The structural adequacy of the existing concrete wall and foundation slab is not included within this analysis of the attached Allied Modular Construction Documents. The wall and floor slab shall be designed to withstand the anticipated loads from their point of origin in accordance with the IBC.

**3.3 Installation:** Allied Modular Attached Build System and the Free-Standing Building System shall be installed in accordance with this evaluation report and with the Allied Modular Construction Documents that accompany this report (summarized in Table 1 of this report). The location of the system within the building shall be shown on the approved plans.

**3.4 Special Inspections:** Special inspections may be required in accordance with applicable codes, including 2015 and 2012 IBC Section 1705, 2009 IBC Section 1704, or 2006 IBC



1707 for connections to concrete and seismic resistance. A statement of special inspections shall be prepared as applicable.

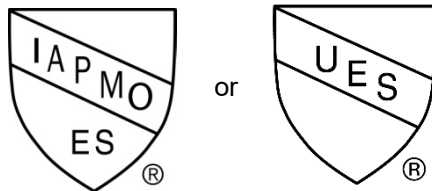
#### 4.0 PRODUCT DESCRIPTION

Allied Modular Attached Building Systems and Free-Standing Building Systems are one-story structures, typically used as a Group B occupancy group, used within another building, having an occupancy group classification of either Group B, F-1, M, or S-1.

Section 3.2 of this report provides descriptions of major components. The attached Construction Documents, as summarized in Table 1 in Section 3.2.1 of this report, provide detailed descriptions of system components.

#### 5.0 IDENTIFICATION

The Allied Modular Building Systems are identified by specific labels that include the evaluation report number (ER-416) occurring at the door jamb within the building and the steel frame of the free-standing structure. Wall panels described in Section 3.2.3 of this report have labels that include the Allied Modular Building Systems' name and address, serial number, the evaluation report number (ER-416) applied to an edge of each panel. Either IAPMO Uniform Evaluation Service Mark of Conformity may also be used as shown below:



IAPMO UES ER-416

#### 6.0 SUBSTANTIATING DATA

6.1 Manufacturer's descriptive literature and installation instructions.

6.2 Reports of load testing on panels of sandwich construction in accordance with ASTM E72. Test results are from laboratories in compliance with ISO/IEC 17025.

6.3 Engineering calculations.

6.4 Plans and drawings.

6.5 Quality Manuals.

#### 7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on Allied Modular Building Systems produced in Orange, California, to assess conformance to the codes and standards shown in Section 1.0 of this report and documents the product's certification. The Allied Modular Building Systems are produced at locations noted in Section 2.8 of this report under a quality control program with periodic inspections under the supervision of IAPMO UES.

For additional information about this evaluation report please visit [www.uniform-es.org](http://www.uniform-es.org) or email us at [info@uniform-es.org](mailto:info@uniform-es.org)