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# ICC-ES Report

## ESR-2143

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Reissued 03/2016  
This report is subject to renewal 03/2017.

**DIVISION: 13 00 00—SPECIAL CONSTRUCTION**  
**SECTION: 13 20 00—SPECIAL PURPOSE ROOMS**

**REPORT HOLDER:**

**ALLIED MODULAR BUILDING SYSTEMS, INC.**

**642 WEST NICOLAS AVENUE**  
**ORANGE, CALIFORNIA 92868**

**EVALUATION SUBJECT:**

**MODULAR OFFICE BUILDING SYSTEMS**



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**ICC-ES Evaluation Report****ESR-2143**

Issued March 2016

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**DIVISION: 13 00 00—SPECIAL CONSTRUCTION**  
**Section: 13 20 00—Special Purpose Rooms****REPORT HOLDER:****ALLIED MODULAR BUILDING SYSTEMS, INC**  
**642 WEST NICOLAS AVENUE**  
**ORANGE, CALIFORNIA 92868**  
**(714) 630-8660**  
[www.alliedmodular.com](http://www.alliedmodular.com)**EVALUATION SUBJECT****MODULAR OFFICE BUILDING SYSTEMS****1.0 EVALUATION SCOPE****1.1 Compliance with the following codes:**2012, 2009 and 2006 *International Building Code*® (IBC)**Property evaluated:**

Structural

**1.2 Evaluation to the following green code(s) and/or standards:**

- 2013 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2012 and ICC 700-2008)

**Property evaluated:**

See Section 3.0

**2.0 USES**

The Modular Office Building Systems (referenced hereafter as “modular building systems”) are used as office rooms within existing Storage Group S occupancies and are attached to the interior side of an existing concrete wall (attached enclosure systems) or are isolated from the interior sides of an existing building (freestanding enclosure systems).

**3.0 DESCRIPTION**

The modular building systems are constructed in accordance with the plans, dated February 2015, that accompany this report. Allowable loads and a summary of the plans are shown in Table 1. Allowable room width and projections must conform to Table 4 on Sheet S-6 of the plans for the attached enclosure systems and must conform to Sheet S-5 for the freestanding enclosure systems.

Steel moment frames for the freestanding enclosure systems are shop-fabricated assemblies consisting of beams, columns and column base plates. The beams and columns are hollow structural steel sections (HSSs) conforming to ASTM A500, Grade B, with a minimum yield stress of 46 ksi (317 MPa) and a minimum tensile stress of 58 ksi (400 MPa). The column base plates are steel plates conforming to ASTM A36. All aluminum structural members for the modular building systems are produced from 6061-T6 or 6063-T5 aluminum alloy, as indicated in the approved engineering plans accompanying this evaluation report, while the steel decking and angle bracket for attaching the roof/ceiling decking to the existing structure are fabricated from ASTM A653, SS Grade 33 Designation steel. All steel in contact with aluminum, including screws and anchors, must be zinc-coated in accordance with ASTM B633 or zinc electro-plated in accordance with ASTM B695.

The attributes of the modular building systems have been verified as conforming to the provisions of (i) CALGreen Section A4.404.3.3 and (ii) ICC 700-2012 and ICC 700-2008 Section 601.5 for prefabricated structural systems. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

**4.0 DESIGN AND INSTALLATION****4.1 Steel Roof Decking:**

Steel roof decking must be in accordance with Section 4.1.1 or 4.1.2.

**4.1.1 Standard Steel Roof Decking:** Steel roof decking of the modular building systems must be minimum No. 22 gage, Type 3W36 floor deck, or N24 roof decks, with a minimum allowable diaphragm shear of 130 pounds per linear foot, recognized in ICC-ES evaluation report [ESR-1414](#).

**4.1.2 Alternate Steel Roof Decking:** Alternate steel roof decking may be used with the modular building systems, provided all the conditions noted in this section (Section 4.1.2) are met. Steel roof decking used with the modular building systems must be recognized in a current evaluation report and must be approved by the code official. The decking must be designed to withstand applied out-of-plane and in-plane loads. The in-plane loads must include seismic loads, and for the attached enclosure

systems, any reaction loads resulting from the decking laterally supporting the walls of the modular building systems. The out-of-plane gravity loads must include a minimum 10 psf (0.48 kN/m<sup>2</sup>) live load. The decking must be designed for use with the framing details and loads shown in the plans accompanying this report, and must meet the following conditions:

- a. Decking is a cold-formed steel fluted section complying with the American Iron and Steel Institute (AISI) cold-formed steel specifications.
- b. Decking is made from steel conforming to ASTM A653 SS, minimum Grade 33 Designation, and ASTM A924, with a galvanized finish in accordance with ASTM A653, galvanized G-60 minimum coating designation. All steel must have a 38,000 psi (262 MPa) minimum specified yield strength and a 52,000 psi (358.5 MPa) minimum specified tensile strength.
- c. Maximum dead load for the decking is 2.5 psf (0.12 kN/m<sup>2</sup>).
- d. Minimum deck thickness is No. 22 gage [base-metal thickness 0.029 inch (0.737 mm)].
- e. Maximum deck span is limited to 14 feet (4267 mm) for N24-22 deck, and 12 feet (3658 mm) for 3W36-22 deck.
- f. Minimum allowable diaphragm shear is 130 pounds per linear foot.

#### 4.2 Wall Panels:

Filler wall panels of the modular building systems must be in accordance with Section 4.2.1 or 4.2.2.

##### 4.2.1 Allied Modular Building Systems, Inc., Wall Panels:

**4.2.1.1 General:** The wall panels are nonbearing sandwich panels with a nominal overall thickness of 2 or 3<sup>1</sup>/<sub>2</sub> inches (51 or 89 mm), and are designed to support lateral out-of-plane loads acting on the wall panels while spanning horizontally between the supporting mullions and/or posts. Both the 2-inch sections and the 3<sup>1</sup>/<sub>2</sub>-inch (4-inch nominal) sections are used for the attached enclosure systems; while only the 3<sup>1</sup>/<sub>2</sub>-inch (4-inch nominal) sections are used for the freestanding enclosure systems.

##### 4.2.1.2 Materials:

**4.2.1.2.1 Facings:** One-half-inch-thick (12.7 mm) gypsum wallboard complying with ASTM C1396, with a 4-mil [0.004-inch (0.102 mm)] vinyl decorative covering on the exposed face of the gypsum wallboard.

**4.2.1.2.2 Core:** Expanded polystyrene foam plastic must comply with ASTM C578, Type I, with a nominal density of 1.0 pcf (16.02 kg/m<sup>3</sup>). Foam plastic must be recognized in a current ICC-ES evaluation report with recognition under the 2012 and 2009 IBC.

**4.2.1.2.3 Adhesive:** The facings are bonded to both sides of the panel core with a Type II, Class 2, adhesive.

**4.2.2 Alternative Wall Panels:** Alternative wall panels may be used with the framing details shown in the plans accompanying this report, provided all of the following conditions are met:

- a. Wall panels must be recognized in a current evaluation report with recognition under the 2012, 2009 or 2006 IBC, as applicable.
- b. Where allowable panel spans for specific panels are less than those shown in the plans accompanying this

evaluation report, panel spans must be limited to those shown in the evaluation report for the panel; allowable panel span must be checked for an available bearing length of <sup>1</sup>/<sub>2</sub> inch (12.7 mm), as provided by the flanges of the mullions.

- c. The panel materials must be equivalent to the materials described in Section 4.2.1.2.
- d. Maximum dead load for panels is 5 psf (0.24 kN/m<sup>2</sup>).
- e. The wall panels must have an approved thermal barrier on each face; thermal barrier requirements must comply with Section 2603.4 of the IBC.

#### 4.3 Steel Moment Frames:

Steel moment frames of the freestanding enclosure systems are one-story, single-bay, steel ordinary moment frames designed and fabricated in accordance with applicable codes and the approved quality documentation. The beam and columns are HSS conforming to ASTM A500, Grade B, shop-welded together to form moment connections in the manufacturer's facility, and a steel base plate, conforming to ASTM A36, is shop-welded to each column base. A <sup>11</sup>/<sub>16</sub> inch (17.5 mm) diameter hole is shop-drilled at each base plate to facilitate jobsite installation of concrete anchors.

#### 4.4 Installation:

Modular Office Building Systems must be installed in accordance with this evaluation report (ESR-2143) and with the plans, dated February 2015, that accompany this report.

#### 4.5 Special Inspection:

Special inspections must be provided in accordance with applicable codes, including 2012 IBC Sections 1705.2 and 1705.11 (2009 and 2006 IBC Sections 1704.3 and 1707) and the ICC-ES evaluation reports for concrete anchors specified in the accompanying plans.

### 5.0 CONDITIONS OF USE

The Modular Office Building Systems described in this report comply with, or are suitable alternatives to what is specified in, the codes indicated in Section 1.0 of this report, subject to the following conditions:

- 5.1** Installation of the modular building systems complies with this evaluation report, the manufacturer's published instructions and the plans, dated February 2015, that accompany this report. In the event of conflict, this report governs.
- 5.2** The remaining portions of the structure are designed and constructed in accordance with the applicable code. For the attached enclosure system, the existing concrete wall to which the modular building system is attached is investigated for the loads imposed by the modular building system including in-plane shear and out-of-plane overturning forces from the horizontal roof diaphragm of the attached enclosure system. For both the attached enclosure systems and the freestanding enclosure systems, engineering analysis must be provided to ensure the structural adequacy of existing concrete slab foundation subjected to the loading from the enclosure systems.
- 5.3** Drawings and calculations verifying compliance with this report and the applicable code must be submitted to the code official for approval. The drawings and calculations are to be prepared by a registered design professional when required by the statutes of the

jurisdiction in which the project is to be constructed.

- 5.4 For the freestanding systems, the separation between the freestanding enclosure systems and the existing building must be in accordance with the approved plans accompanying this report.
- 5.5 No storage is permitted on the roof decking. The design roof/ceiling live load is posted in accordance with IBC Section 106.1 for the 2012 and 2009 IBC (Section 1603.3 for the 2006 IBC). The posted label on the structure must also state that no storage on top of the building system is permitted.
- 5.6 The building system is limited to dry, interior locations.
- 5.7 The sandwich panels and the steel moment frames described in Sections 4.2.1 and 4.3, respectively, are fabricated at the Allied Modular Building Systems, Inc., plant at 642 West Nicholas Avenue, Orange, California, under an approved quality control program with inspections by ICC-ES.

**6.0 EVIDENCE SUBMITTED**

- 6.1 Reports of transverse load tests complying with the ICC-ES Acceptance Criteria for Sandwich Panels (AC04), dated February 2012 (editorially revised August 2013).
- 6.2 Plans and calculations complying with the applicable code.
- 6.3 Quality control documentation in accordance with the ICC-ES Acceptance Criteria for Quality Documentation (AC10).

**7.0 IDENTIFICATION**

Each steel roof deck is identified by a label bearing the name and address of the manufacturer and the ICC-ES evaluation report number.

Except for the alternative wall panels, each wall panel is identified by a label bearing the name and address of Allied Modular Building Systems, Inc., the ICC-ES evaluation report number (ESR-2143). The alternative wall panels must be labeled in accordance with the evaluation report that applies to the panels.

Each installation of the Modular Office Building System bears an identification tag specifying the manufacturer's name (Allied Modular Building Systems, Inc.) and address (Orange, California); design loads; and the evaluation report number (ESR-2143). The design roof live load [10 psf (0.48 kN/m<sup>2</sup>)] must be conspicuously posted by the owner using a durable metal sign, in accordance with Section 106.1 of the 2012 and 2009 IBC (Section 1603.3 of the 2006 IBC). Additionally, the packaging for the building systems as they are shipped to each project site must bear the manufacturer's name (Allied Modular Building Systems, Inc.) and address, the evaluation report number (ESR-2143), the job name, and the job number.

**TABLE 1—ALLOWABLE LOADS AND SUMMARY OF THE CONSTRUCTION PLANS**

DRAWING NUMBER	DESCRIPTION	DESIGN LOAD (psf)		SEISMIC	DATE SIGNED
		Roof Live	Lateral (Horizontal)	Design Category (IBC) <sup>1</sup>	
S-1	Cover Sheet (General Notes and Abbreviations)	10	5	E (Maximum)	February 6, 2015
S-2A	Attached Enclosure System Plans and Elevations	10	5	E (Maximum)	February 6, 2015
S-2B	Free Standing Enclosure System Plans and Elevations	10	5	E (Maximum)	February 6, 2015
S-3	2-inch Section and Details	—	—	—	February 6, 2015
S-4	4-inch Section and Details	—	—	—	February 6, 2015
S-5	FreeStanding Enclosure System Sections and Details			E (Maximum)	February 6, 2015
S-6	Room System Tables	10	5	E (Maximum)	February 6, 2015
D-1	2-inch System Components	—	—	—	February 6, 2015
D-2	4-inch System Components	—	—	—	February 6, 2015

For SI: 1 psf = 0.048 kN/m<sup>2</sup>.

<sup>1</sup>For compliance with the IBC, designs are limited to the following conditions:

- a. Limited to Risk Category II for the 2012 IBC (Occupancy Category II for the 2009 and 2006 IBC) as defined in Section 1604.5 of IBC.
- b. Limited to Site Classes A, B, C and D.
- c. Seismic Design Category may be A, B, C, D or E.
- d. Allowable room width and projection is in accordance with Table 4 on Drawing No. S-6 for attached enclosure systems and per Sheet S-5 for freestanding enclosure systems.
- e. For modular building height limitation, refer to Sheet S-6 for attached enclosure systems, and sheet S-5 for freestanding enclosure systems.



ALIED MODULAR BUILDING SYSTEMS, INC.

GENERAL NOTES AND SPECIFICATIONS

GENERAL NOTES AND SPECIFICATIONS

1. THE STRUCTURES COMPRISED WITHIN THESE DOCUMENTS CONFORM TO THE STRUCTURAL REQUIREMENTS OF THE 2010 AND 2012 INTERNATIONAL BUILDING CODES (IBC) AND REFERENCED STANDARDS AS FOLLOWS: IBC: 2010 AND 2012; IBC: 2010 AND 2012; IBC: 2010 AND 2012; IBC: 2010 AND 2012...

2. ATTACHED ENCLOSURE SYSTEM SHEETS 5-24) IS NOT REQUIRED FOR UNFUT LOANS. SHOULD UNFUT LOANS BE REQUIRED, ENCLOSURE SYSTEM SHEETS SHALL BE PROVIDED FOR ALL UNFUT LOANS IN THE ATTACHED ENCLOSURE SYSTEM SHEETS. REFER TO ENCL. SHEETS 5-24) FOR UNFUT LOANS (E.G. WIND IS NOT APPLICABLE).

3. EACH INSTALLATION SHALL BEAN AN IDENTIFYING TAG (WITH THE NAME AND ADDRESS OF THE MANUFACTURER) THE IBC IS REVIEW NUMBER AND THE DESIGN USE LOADS.

4. DESIGN LOADS

Table with 2 columns: USE OR OCCUPANCY, DESIGN LOAD (PSF) / WIND SPEED (MPH)

6. FOR COMPLIANCE WITH IBC, DESIGN ARE LIMITED TO THE FOLLOWING CONDITIONS: I. LIMITED TO 10 FT CLEARANCE FROM THE FLOOR (OCCUPANCY CATEGORY I FOR THE IBC); II. LIMITED TO USE CLASS A, B, C, OR D; III. SEISMIC DESIGN CATEGORY MAY BE A, B, C, OR E; IV. 100 MINIMUM WIND-BRISTAL RESPONSE MODIFICTION IN PARALLEL AT SHORT PERIODS (S); V. THE WINDING MEMBER SPECIAL RESPONSE MODIFICTION IN PARALLEL AT SHORT PERIODS (S); VI. FLOOR SYSTEMS DESIGNER SHALL VERIFY MINIMUM FLOOR DEFLECTION SHALL BE LIMITED TO L/180 WITH A MINIMUM DEFLECT LIMIT OF 0.21"

7. CONSTRUCTION SHALL VERIFY ARCHITECTURAL REQUIREMENTS SUCH AS FINISHES AND PLUMBING OF DOORS FOR ACCESS, W/ EXCLUDING SPECIAL FINISH TO CONSTRUCTION.

8. SOIL UNDERPINNING SHALL FOR MODULAR BUILDING SYSTEMS SHALL BE MIN-FRANCHISE AND HAVE A MINIMUM BEARING CAPACITY OF 1000 PSF.

II. MATERIALS

1. STEEL - UNLESS OTHERWISE NOTED: a. SHEETS, PLATES, BARS, AND ANV b. CONCRETE UNDER FLOOR: PER ASTM A900, GRADE B. (ASTM)

2. ALUMINUM FRAMING SHALL BE ALLOY AND TEMPER 6061-T6 (6061) CONFORMING TO THE A900-2010 FOR THE 2012 IBC (A900-20) FOR THE 2008 IBC).

3. ALL STEEL IN CONTACT WITH ALUMINUM SHALL BE HOT-DIP GALVANIZED OR ZINC ELECTROPLATED CONFORMING TO SECTION 7.7 OF AIA-2010 FOR THE 2012 IBC (SECTION 6.7 OF AIA-10 FOR THE 2008 IBC).

4. ALUMINUM IN CONTACT WITH WOOD, CONCRETE, OR MASONRY SHALL BE COATED OR ANODIZED. ALL COATING SHALL BE PER SECTION 7.7 OF AIA-2010 FOR THE 2012 IBC (SECTION 6.7 OF AIA-10 FOR THE 2008 IBC).

5. ALL WELDS SHOWN IN STEEL SHALL BE FANDED IN THE FIELD WITH A MINIMUM OF ONE CORN OF ONE THICK THROUGH PENNER.

6. WELDING - UNLESS OTHERWISE NOTED: a. ALL WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS AND SHALL CONFORM TO THE REQUIREMENTS OF THE WELDING CODE AND THE WELDING CODE SHALL CONFORM TO AWS D1.1 AND AWS D1.5.

7. SHEET METAL STROKES (SMA) SHALL BE 1/2" x 1/4" MIN. THE QUALITY TENS 1. SHEET AS DEFINED IN THE EVALUATION REPORT NO. ESR-2023 SHALL BE MANUFACTURED FROM STEEL CONFORMING TO THE REQUIREMENTS OF SECTION 7.7 OF AIA-2010 FOR THE 2012 IBC (SECTION 6.7 OF AIA-10 FOR THE 2008 IBC).

8. SHEET METAL STROKES (SMA) SHALL BE 1/2" x 1/4" MIN. THE QUALITY TENS 1. SHEET AS DEFINED IN THE EVALUATION REPORT NO. ESR-2023 SHALL BE MANUFACTURED FROM STEEL CONFORMING TO THE REQUIREMENTS OF SECTION 7.7 OF AIA-2010 FOR THE 2012 IBC (SECTION 6.7 OF AIA-10 FOR THE 2008 IBC).

9. SHEET METAL STROKES (SMA) SHALL BE 1/2" x 1/4" MIN. THE QUALITY TENS 1. SHEET AS DEFINED IN THE EVALUATION REPORT NO. ESR-2023 SHALL BE MANUFACTURED FROM STEEL CONFORMING TO THE REQUIREMENTS OF SECTION 7.7 OF AIA-2010 FOR THE 2012 IBC (SECTION 6.7 OF AIA-10 FOR THE 2008 IBC).

10. INTERNAL WIND BRACING SHALL BE TO SUPPORT DL BRACE NUMBER 10E OR 10E1 AS SHOWN IN ESR 2010 ESR 2002.

III. CONCRETE WALL, SLAB & FOUNDATION

1. WHERE SUPPORT PROVIDED BY A CONCRETE SLAB, THE CONCRETE SLAB (NEW OR EXISTING) SHALL BE IN GOOD SOUND CONDITION (MIN. 28 DAY COMPRESSIVE STRENGTH OF 2500 PSI) WITH NO EVIDENCE OF CRACKING, WATER SEEPAGE, OR UNSATISFACTORY CHARACTERISTICS. STRUCTURAL INTEGRITY OF EXISTING/NEW CONCRETE SHALL BE VERIFIED BY THE APPLICABLE JURISDICTION. SHALL BE BY A REGISTERED DESIGN PROFESSIONAL IN THE APPLICABLE JURISDICTION.

2. WHERE A NEW SLAB AND/OR FOUNDATION IS INSTALLED, SLO-TITE SHALL BE HIGH-DENSITY POLYURETHANE FOAM CONCRETE TO BE INSTALLED TO PROVIDE INSULATION AND BONDING TO THE EXISTING CONCRETE.

3. UNLESS OTHERWISE NOTED, MINIMUM THICKNESS CONCRETE SLAB (NEW EXISTING) SHALL BE 4-INCHES.

4. WHERE SCHEDULE FOR FLOOR FINISHES OR WHERE REQUIRED BY LOCAL JURISDICTION, A FURNISHED FINISH SHALL BE PROVIDED BELOW FINISH AND FOR BEARING WALLS, TENSILE PROFILES SHALL BE INSTALLED ON A COBE OR COBE BESS BY AN ENGINEER LISTED IN THE APPLICABLE JURISDICTION.

5. THE FINISHING CONCRETE WALL AND WALL FOUNDATION PROVIDING SUPPORT FOR THE MODULAR BUILDING SYSTEM SHALL BE IN GOOD SOUND CONDITION (MIN. 28 DAY COMPRESSIVE STRENGTH OF 2500 PSI) WITH NO EVIDENCE OF CRACKING, WATER SEEPAGE, OR UNSATISFACTORY CHARACTERISTICS. STRUCTURAL INTEGRITY OF EXISTING/NEW CONCRETE SHALL BE VERIFIED BY THE APPLICABLE JURISDICTION. SHALL BE BY A REGISTERED DESIGN PROFESSIONAL IN THE APPLICABLE JURISDICTION.

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TABLE OF CONTENTS table with columns: SHEET NUMBER, SHEET TITLE, SHEET NO.

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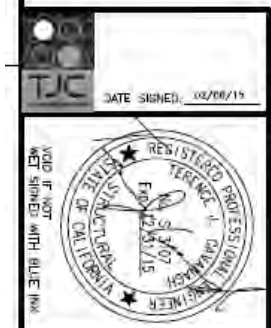
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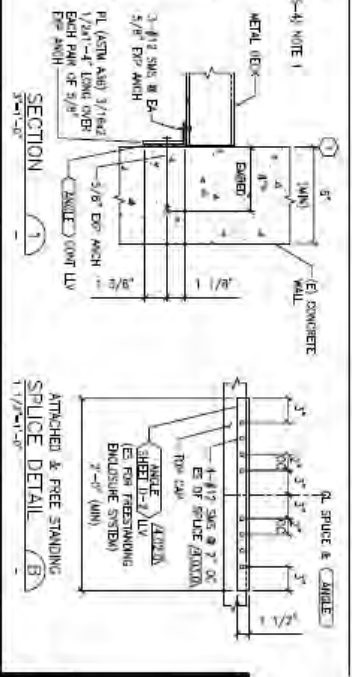
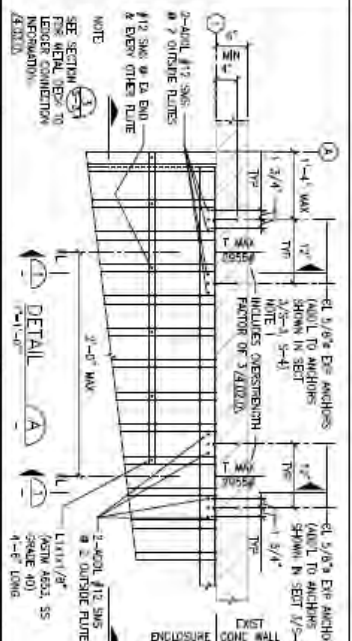
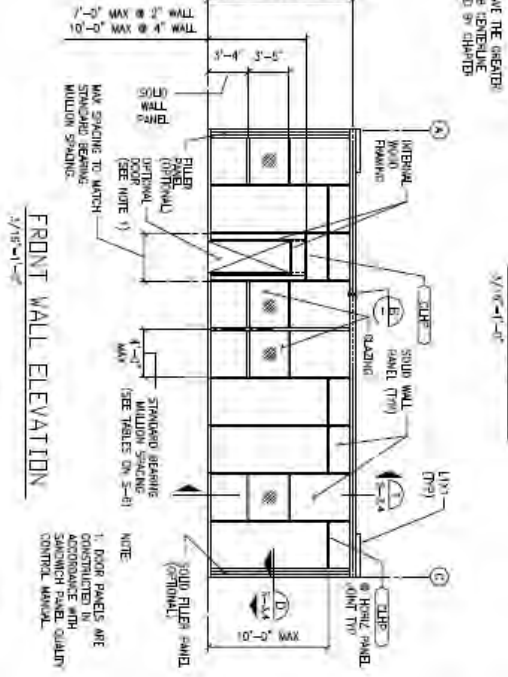
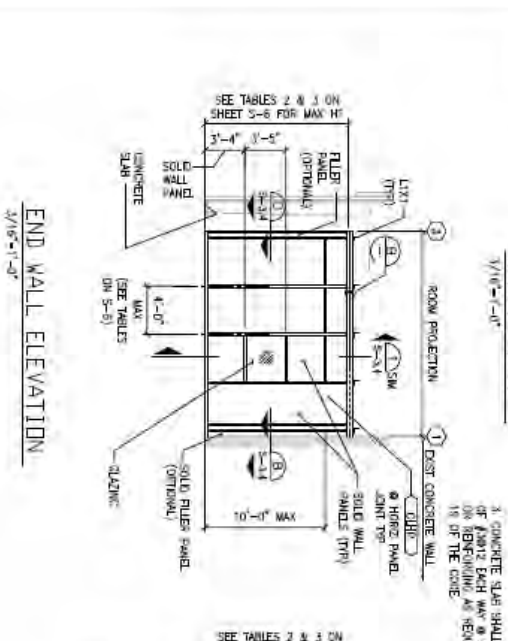
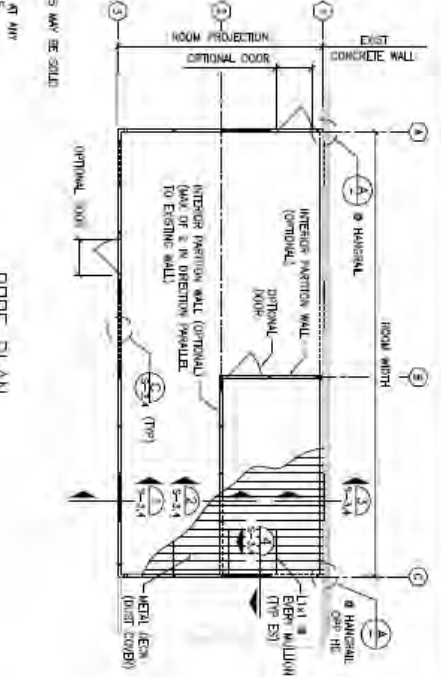
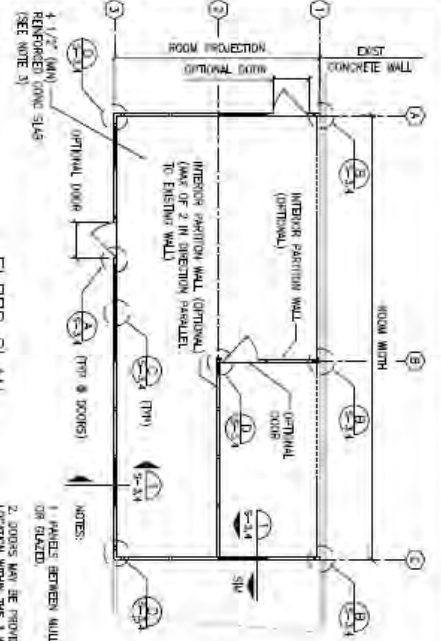
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ANALYSIS	DESIGN LOADS	WIND	SEISMIC
BACK WIND SPEED (1-SECOND GUST)	N/A - WIND-RESISTANT STRUCTURE	100	100
WIND IMPROVANCE FACTOR (I <sub>w</sub> )	N/A	1.0	1.0
RISK CATEGORY	N/A	1.0	1.0
WIND EXPOSURE CATEGORY	N/A	1.0	1.0

ANALYSIS	DESIGN LOADS	WIND	SEISMIC
SEISMIC RESPONSE FACTOR (R)	1.00	1.00	1.00
SEISMIC IMPORTANCE FACTOR (I <sub>e</sub> )	1.0	1.0	1.0
SEISMIC DESIGN CATEGORY (SDC)	A, B, C, D, E	A, B, C, D, E	A, B, C, D, E
SEISMIC DESIGN CATEGORY (SDC)	A, B, C, D, E	A, B, C, D, E	A, B, C, D, E

ANALYSIS	DESIGN LOADS	WIND	SEISMIC
SEISMIC RESPONSE FACTOR (R)	1.00	1.00	1.00
SEISMIC IMPORTANCE FACTOR (I <sub>e</sub> )	1.0	1.0	1.0
SEISMIC DESIGN CATEGORY (SDC)	A, B, C, D, E	A, B, C, D, E	A, B, C, D, E
SEISMIC DESIGN CATEGORY (SDC)	A, B, C, D, E	A, B, C, D, E	A, B, C, D, E

ANALYSIS	DESIGN LOADS	WIND	SEISMIC
SEISMIC RESPONSE FACTOR (R)	1.00	1.00	1.00
SEISMIC IMPORTANCE FACTOR (I <sub>e</sub> )	1.0	1.0	1.0
SEISMIC DESIGN CATEGORY (SDC)	A, B, C, D, E	A, B, C, D, E	A, B, C, D, E
SEISMIC DESIGN CATEGORY (SDC)	A, B, C, D, E	A, B, C, D, E	A, B, C, D, E

DATE SIGNED: 02/06/15

REGISTERED PROFESSIONAL ENGINEER  
VERENCE T. DAMACHER  
NO. 51307  
STATE OF CALIFORNIA

DESIGNED BY: TJC  
DRAWN BY: ADAM  
CHECKED BY: RKT  
SCALE: AS SHOWN  
DATE: OCTOBER 20, 2013

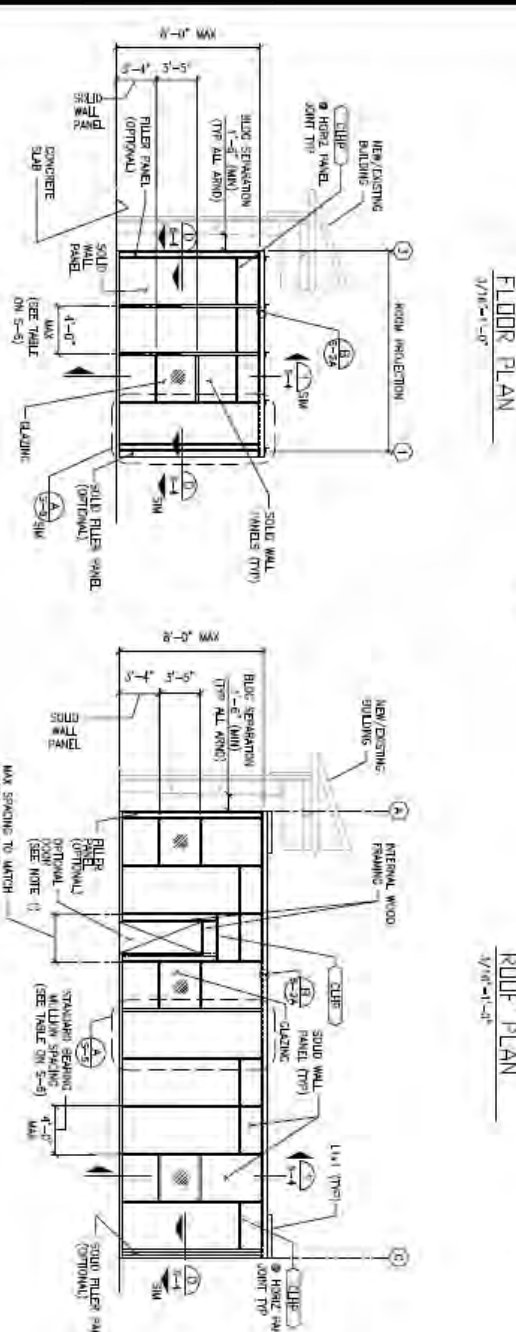
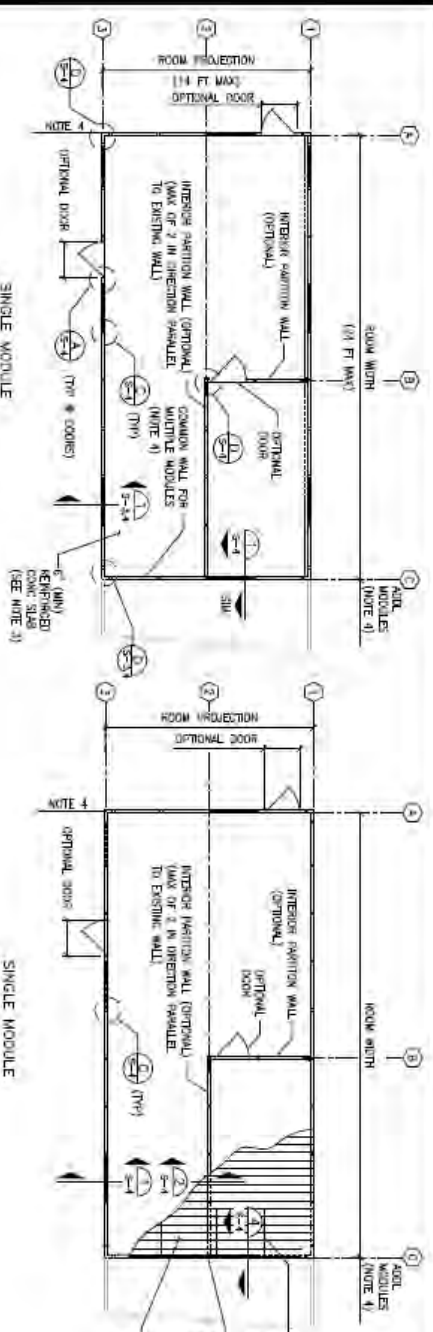
MODULAR BUILDING SYSTEM  
ATTACHED ENCLOSURE SYSTEM  
PLANS AND ELEVATIONS

SHEET NO. S-2A  
SHEET 2 OF 9

ALLIED MODULAR  
492 W. NICOLAS AVENUE  
CHICO, CALIFORNIA 95926  
(714) 833-5555  
FAX: (714) 833-8376

THIS DRAWING SCALES EXACTLY ONE INCH PER FULL SCALE

REV.	DATE	BY	COMMENT
001	02/11/15	TJC	ICD-ES COMMENTS
002	02/11/15	TJC	ICD-ES COMMENTS
003	02/11/15	TJC	ICD-ES COMMENTS
004	02/11/15	TJC	CODE UPDATES
005	02/11/15	TJC	CODE UPDATES
006	02/11/15	TJC	RESPONSE TO ICC COMMENTS
007	02/11/15	TJC	RESPONSE TO ICC COMMENTS
008	02/11/15	TJC	RESPONSE TO ICC COMMENTS



**END WALL ELEVATION**  
3/16"=1'-0"

**FRONT & BACK WALL ELEVATION**  
3/16"=1'-0"

- NOTES**
1. PANEL MEMBER WIDTHS MAY BE SOLID OR CLAD.
  2. DOORS MAY BE PROVIDED AT ANY LOCATION WITHIN THE 3 WALLS.
  3. CONCRETE SLAB SHALL HAVE THE GRADE OF FINISH EACH WAY 1/8" ABOVE FINISH OR REDUCING AS REQUIRED BY CHAPTER 19 OF THE CODE.
  4. FOR ROOM WIDTHS GREATER THAN 24 FEET AND/OR MULTIPLE MODULES, METAL ANCHOR OR TWO HSS-FRAMES WITH EACH FEET. INSTALL TWO HSS-FRAMES WITH EACH COMMON TRANSVERSE WALL.
  5. MAXIMUM SPACING (GENERAL TO EXTENDING OF HSS-FRAME SHALL BE ONE-HALF TOTAL ROOM WIDTH MINIMUM SPACING) (CONTINUE TO DEVELOPER SHALL BE 7'-4"
  6. MAXIMUM ROOM PROJECTION SHALL BE 11 FEET.
  7. DOOR PANELS ARE CONSTRUCTED IN ACCORDANCE WITH SANDWICH PANEL QUALITY CONTROL MANUAL.
  8. STEEL UPRIGHT FRAME (A) MAY BE LOCATED AT ANY LOCATION WITHIN WALL.

DATE SIGNED: 02/19/15

REGISTERED PROFESSIONAL ENGINEER  
TERENCE W. CAYMAN  
E.O. 12812  
EXPIRES 12/31/15  
STATE OF CALIFORNIA

VOID IF NOT  
WET SIGNED WITH BLUE INK

REV	DATE	BY	COMMENT

**ALLIED MODULAR**  
442 W. HEBBAC AVENUE  
ORANGE, CALIFORNIA 92668  
(714) 630-8880  
FAX: (714) 830-8315

DESIGNED BY: TJC  
DRAWN BY: ADM  
CHECKED BY: RMT  
SCALE: AS SHOWN  
DATE: OCTOBER 2013

THIS BAR  
SCALES EXACTLY  
ONE HALF  
INCH AT  
FULL SCALE

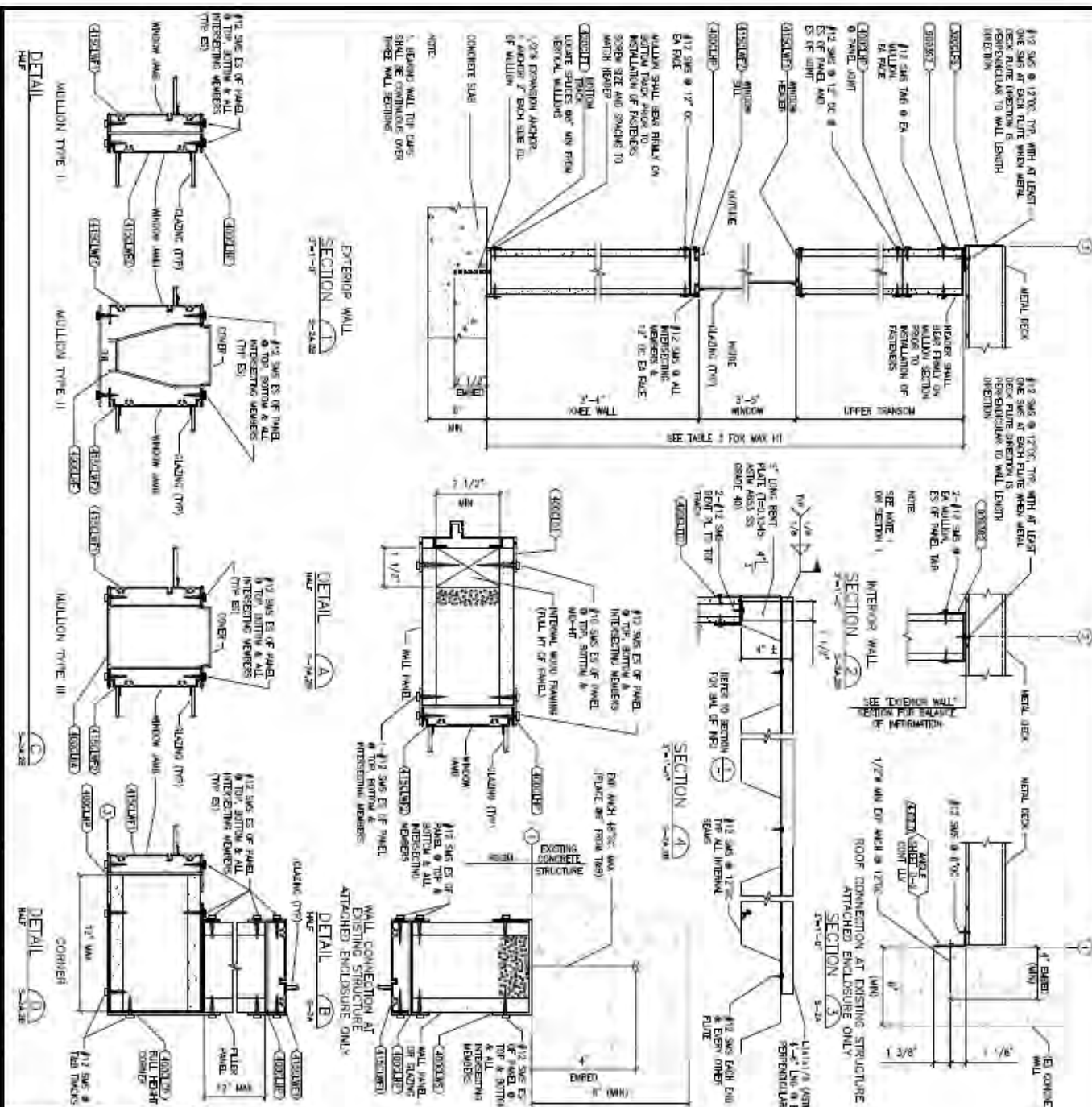
**MODULAR BUILDING SYSTEM**  
FREE STANDING  
ENCLOSURE SYSTEM  
PLANS AND ELEVATIONS

SHEET NO:  
**S-2B**  
SHEET 3 OF 9









DATE SIGNED: 02/06/14

REGISTERED PROFESSIONAL ENGINEER  
EDWARD J. S. YOST  
STATE OF CALIFORNIA  
LICENSE NO. 44271  
EXPIRES 07/31/15

NET SIGNED DOCUMENT HAS NOT SHOWN WITH BLUE INK

NET SIGNED DOCUMENT HAS NOT SHOWN WITH BLUE INK

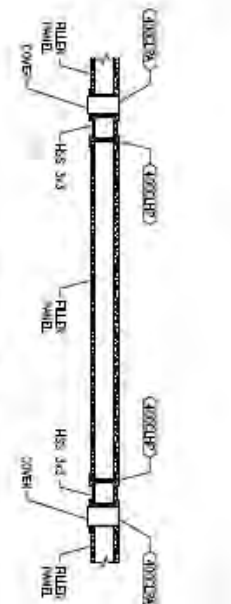
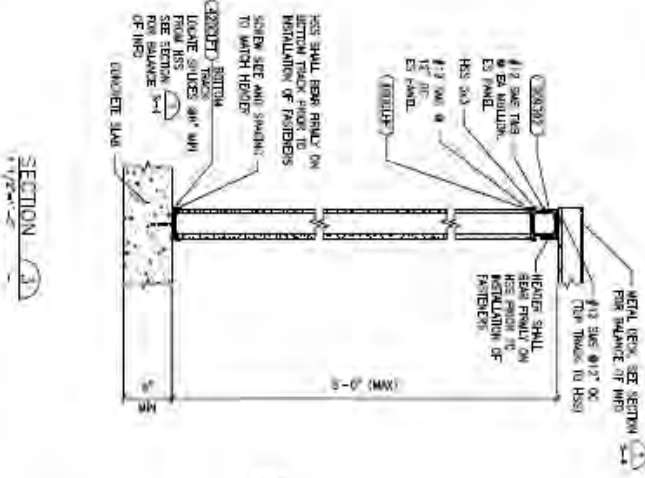
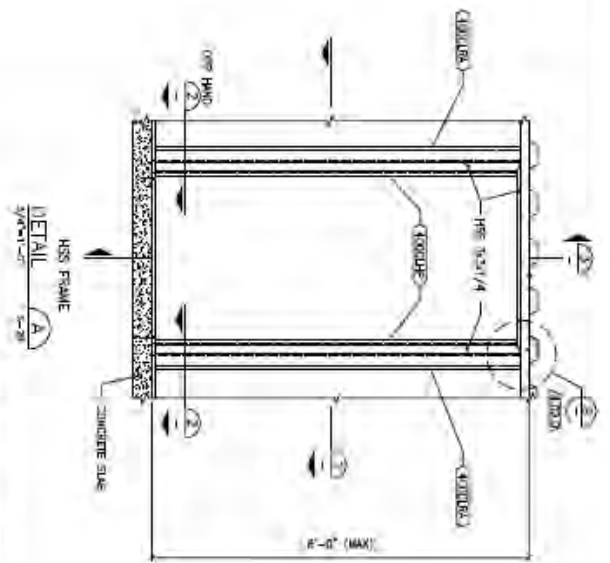
REV.	DATE	BY	COMMENT
001	11/14	TJC	CC-ES COMMENTS
002	08/14	TJC	CC-ES COMMENTS
003	11/14	TJC	CODE UPDATES
004	07/08	TJC	CC-ES COMMENTS
005	08/09	TJC	CC-ES COMMENTS
006	08/09	TJC	CODE UPDATES
007	07/08	TJC	RESPONSE TO RFP COMMENTS
008	06/04	TJC	RESPONSE TO RFP COMMENTS
009			
010			

ALLIED MODULAR  
 642 W. NICOLAS AVENUE  
 CHICO, CALIFORNIA 95926  
 (714) 620-8860  
 FAX: (714) 620-8345

DESIGNED BY: TJC  
 DRAWN BY: ADM  
 CHECKED BY: SBT  
 SCALE: AS SHOWN  
 DATE: OCTOBER 2013

MODULAR BUILDING SYSTEM  
 4 INCH SECTIONS AND DETAILS

SHEET NO.  
 S-4  
 SHEET 8 OF 9



Room Width (FT.)

Room Projection (FT.)

Sheet Design System (SDS)

1'-0" x 1'-0"

Room Width (FT.)	Room Projection (FT.)
10	1.00
11	1.10
12	1.20
13	1.30
14	1.40
15	1.50
16	1.60
17	1.70
18	1.80
19	1.90
20	2.00
21	2.10
22	2.20
23	2.30
24	2.40
25	2.50
26	2.60
27	2.70
28	2.80
29	2.90
30	3.00

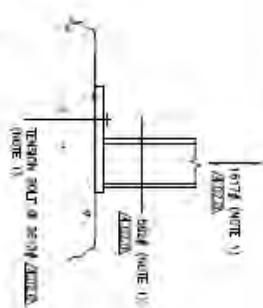
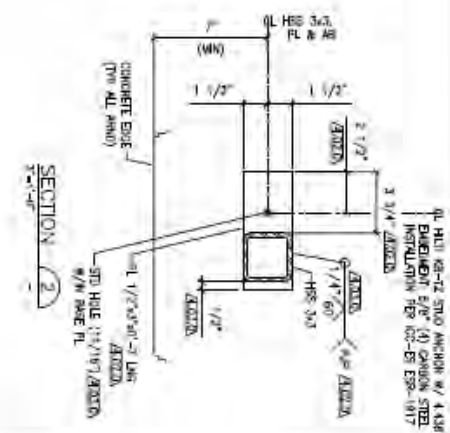
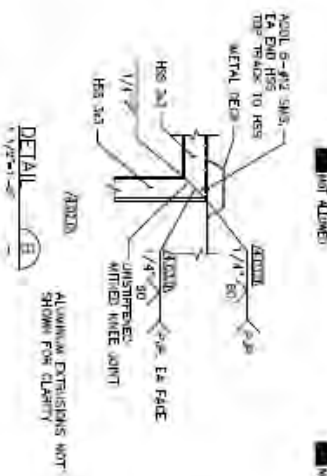
Room Width (FT.)

Room Projection (FT.)

Sheet Design System (SDS)

1'-0" x 1'-0"

Room Width (FT.)	Room Projection (FT.)
10	1.00
11	1.10
12	1.20
13	1.30
14	1.40
15	1.50
16	1.60
17	1.70
18	1.80
19	1.90
20	2.00
21	2.10
22	2.20
23	2.30
24	2.40
25	2.50
26	2.60
27	2.70
28	2.80
29	2.90
30	3.00



DATE SIGNED: 02/16/15

REGISTERED PROFESSIONAL ENGINEER

TERENCE J. CAMPBELL

EXPIRES 12/31/17

STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ARCHITECT

TERENCE J. CAMPBELL

EXPIRES 12/31/17

STATE OF CALIFORNIA

REV	DATE	BY	COMMENT

ALLIED MODULAR

442 W. MOLAS AVENUE

SAN CALISTO, CA 94366

(714) 620-8800

FAX: (714) 620-8375

DESIGNED BY: TJC

CHECKED BY: RKT

SCALE: AS SHOWN

DATE: OCTOBER 2013

MODULAR BUILDING SYSTEM

FREE STANDING ENCLOSURE SYSTEM

SECTIONS AND DETAILS

SHEET NO. 5

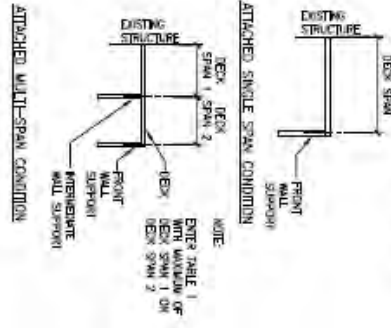
SHEET 6 OF 9



**TABLE 1**  
Tributory Deck Span (ft)

Roofspan Deck	Front Wall Support	Intermediate Wall Support
1 ft	2.0	2.0
2 ft	3.0	3.0
3 ft	4.0	4.0
4 ft	5.0	5.0
5 ft	6.0	6.0
6 ft	7.0	7.0
7 ft	8.0	8.0
8 ft	9.0	9.0
9 ft	10.0	10.0
10 ft	11.0	11.0
11 ft	12.0	12.0
12 ft	13.0	13.0
13 ft	14.0	14.0
14 ft	15.0	15.0

NOTE: Tributary deck span is defined as the tributary width to be used when calculating the load applied to supporting walls.



**TABLE 2**  
Maximum Allowable Mullion Height (ft)  
(2-inch Construction)

Tributory Deck Span (ft)	Mullion Spacing (ft)	Mullion Type	
		Typical	Max
0.5	24	2.2	2.6
0.5	36	2.2	2.6
0.5	48	2.2	2.6
0.5	60	2.2	2.6
0.5	72	2.2	2.6
0.5	84	2.2	2.6
0.5	96	2.2	2.6
0.5	108	2.2	2.6
0.5	120	2.2	2.6
0.5	132	2.2	2.6
0.5	144	2.2	2.6
0.5	156	2.2	2.6
0.5	168	2.2	2.6
0.5	180	2.2	2.6

**TABLE 3**  
Maximum Allowable Mullion Height (ft)  
(4-inch Construction)

Tributory Deck Span (ft)	Mullion Spacing (ft)	Mullion Type	
		Typical	Max
0.5	24	4.2	4.8
0.5	36	4.2	4.8
0.5	48	4.2	4.8
0.5	60	4.2	4.8
0.5	72	4.2	4.8
0.5	84	4.2	4.8
0.5	96	4.2	4.8
0.5	108	4.2	4.8
0.5	120	4.2	4.8
0.5	132	4.2	4.8
0.5	144	4.2	4.8
0.5	156	4.2	4.8
0.5	168	4.2	4.8
0.5	180	4.2	4.8

**TABLE 4**  
Allowable Room Width / Provision Constraints

Room Height	Room Width (ft)
7	210 ft
8	215 ft
9	220 ft
10	225 ft
11	230 ft
12	235 ft
13	240 ft
14	245 ft
15	250 ft
16	255 ft
17	260 ft
18	265 ft
19	270 ft
20	275 ft
21	280 ft
22	285 ft
23	290 ft
24	295 ft
25	300 ft

**TABLE NOTES:**

**TABLE 2 & 3:**

- FOR INTERIOR USE ONLY
- EXCEPT WHEN APPROVED BY THE BUILDING OFFICIAL, MEMBERS OF EXCESS STORIES SHALL HAVE CLEAR HEIGHT NOT LESS THAN 7 FEET MEASURED VERTICALLY FROM THE FINISH SURFACE TO THE LOWEST PROJECTION FROM THE CEILING OR OVERHEAD STRUCTURE.
- TABLE IS FOR APPLIED METAL DECK LITE LOADS OF 10 PSF
- TABLE IS FOR HORIZONTAL WALL LOADS OF 5 PSF
- TRIBUTORY DECK SPAN SHALL TO 100 FEET MAX BE USED TO DETERMINE ALLOWABLE MULLION HEIGHTS FOR NON-REINFORCED WALLS
- 2-INCH CONSTRUCTION SHALL NOT BE USED FOR PRESTRESSING ENCLOSURE SYSTEMS
- SEE 5-22 FOR MAXIMUM WALL HEIGHT TO BE USED WITH PRESTRESSING ENCLOSURE SYSTEMS

**TABLE 4:**

- WIDTH TO PROJECTION LIMITS ARE BASED ON THE QUARTER OF THE RULE DERIVED FROM THE TRANSFER OF LOADS THROUGH DECK M/S-28 INTO THE EXISTING CONCRETE WALL
- LATERAL LOADS APPLIED TO WALLS SHALL NOT EXCEED 3 PSF
- METAL DECK SPANS SHALL BE LIMITED TO 12'-0" FOR 100S-22 & 14'-0" FOR 100S-22
- IN NO CASE SHALL THE DECK SPAN BE GREATER THAN THE WIDTH OF THE ROOM
- SEE 5-3 FOR PRESTRESSING ENCLOSURE SYSTEM ALLOWABLE ROOM WIDTH/PROJECTION RATIO

DATE SIGNED: 02/06/15

REGISTERED PROFESSIONAL ENGINEER  
T. J. C.  
STATE OF CALIFORNIA  
EXPIRES 12/31/17

REV.	DATE	BY	COMMENT
01/01/14	TJC	100-ES	COMMENTS
01/01/14	TJC	100-ES	COMMENTS
01/01/14	TJC	CODE	UPDATES
01/01/14	TJC	100-ES	COMMENTS
01/01/14	TJC	CODE	UPDATES
01/01/14	TJC	RESPONSE TO	1000 COMMENTS
01/01/14	TJC	RESPONSE TO	1000 COMMENTS
REV.	DATE	BY	COMMENT

**ALLIED MODULAR**  
ALLIED MODULAR  
642 W. MOULAS AVENUE  
ORANGE, CALIFORNIA 92668  
(714) 835-1888  
FAX: (714) 832-8375

DESIGNED BY: TJC  
DRAWN BY: ADM  
CHECKED BY: RKT  
SCALE: AS SHOWN  
DATE: OCTOBER 2013

**MODULAR BUILDING SYSTEM**  
**ROOM SYSTEM TABLES**

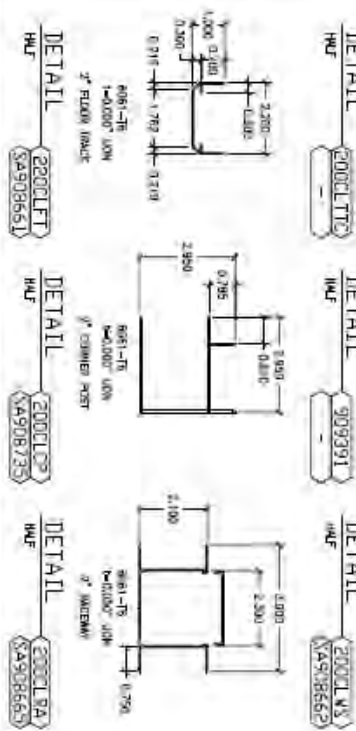
SHEET NO. **S-6**  
SHEET 7 OF 9



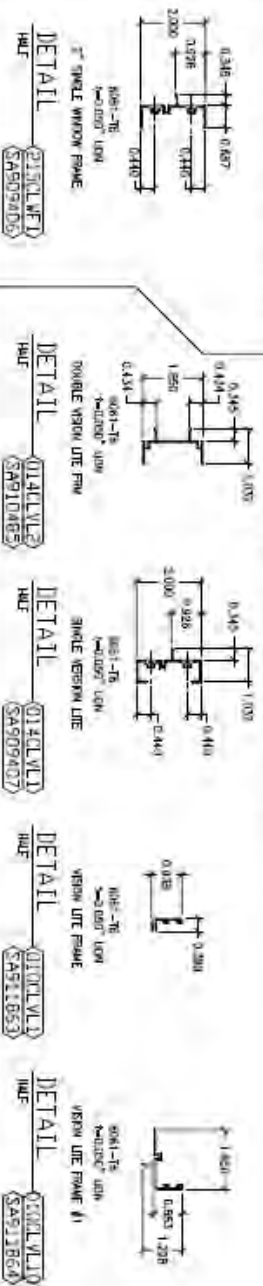
2" PRIMARY WALL SECTIONS



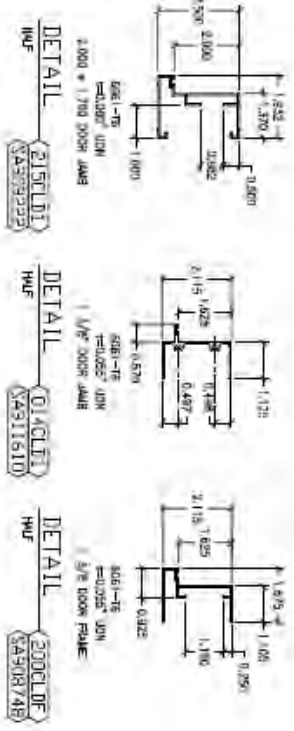
2" WINDOW/LITE SECTIONS



2" & 4" VISION LITE SECTIONS (DOORS)



2" DOOR SECTIONS



NOTE:  
DIMENSIONS SHOWN ARE FOR INFORMATION ONLY REFER TO MANUFACTURER'S DRAWINGS FOR EXACT SPECIFICATIONS.

TJC DATE SIGNED: 05/08/14

REGISTERED PROFESSIONAL ENGINEER  
STATE OF CALIFORNIA  
S. S. YOT  
E050291715  
MECHANICAL

REV	DATE	BY	COMMENT

REV	DATE	BY	COMMENT

ALLIED MODULAR  
4115 S. 10TH AVE  
DUNSMuir, CALIFORNIA 92028  
(714) 835-1100  
FAX: (714) 835-8395

DESIGNED BY: TJC  
DRAWN BY: SDW  
CHECKED BY: SNT  
SCALE: AS SHOWN  
DATE: OCTOBER 2013

MODULAR BUILDING SYSTEM  
2 INCH SYSTEM COMPONENTS

SHEET NO:  
D-1  
SHEET 8 OF 8

