



# ICC-ES Evaluation Report

## ESR-4678

Reissued June 2022

Revised October 2022

This report is subject to renewal June 2024.

**DIVISION: 01 00 00—GENERAL REQUIREMENTS**  
**Section: 01 45 00—Quality Control**

**DIVISION: 09 00 00—FINISHES**  
**Section: 09 22 16.13—Non-Structural Metal Stud Framing**  
**Section: 09 29 00—Gypsum Board**  
**Section: 09 30 00—Tiling**

**REPORT HOLDER:**

**BATHSYSTEM AMERICA LLC**

**EVALUATION SUBJECT:**

**MODULAR FRAMING MEMBERS, CONNECTORS, AND PANELS**

**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)

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-4678 LABC and LARC Supplement](#).

**Properties evaluated:**

- Structural

**2.0 USES**

Bathsystem America Modules are delivered to the project site, installed into the building, and connected to the building’s plumbing, electrical and mechanical systems.

Plumbing, electrical, and mechanical systems are outside the scope of this report.

**3.0 DESCRIPTION**

**3.1 General:**

The Modules are prefabricated modular rooms. The Modules are framed with non-structural cold-formed steel members and glass fiber reinforced polymer (GFRP) connectors and sheathed with gypsum board. The Modules

are fabricated in a variety of sizes up to 9 feet 10 inches (3 m) interior height, and may contain preinstalled electrical and plumbing systems, access for mechanical systems, fixtures, appliances, cabinets, and vanities. The Modules are uniformly supported by a building structure with adequate strength and stiffness to comply with code requirements. Mechanical connections attaching the Modules to the structural floor must be located no more than 14 feet 9 inches (4.5 m) on-center.

**3.2 Framing Members:**

The cold-formed steel framing members are proprietary profiles. The ceiling and floor perimeter profiles, ‘H’ (wall) and angular (corner) studs, and omega ceiling joists have an overall thickness of 1.2 mm (0.0472 inch), an uncoated base steel thickness of 1.16 mm (0.0457 inch) and a minimum G90 (Z275MAC) galvanized coating. The window opening reinforcement beams have an overall thickness of 3.08 mm (0.1211 inch), an uncoated base steel thickness of 3.04 mm (0.1196 inch), a minimum G90 coating, and are furnished in lengths up to 48 inches.

**3.3 Glass Fiber Reinforced Polymer Connectors**

The GFRP connectors are proprietary molded connectors used along with fasteners to connect the framing members. The GFRP connectors are classified as CC2 in accordance with ASTM D635, have a smoke density less than 75 when tested in accordance with ASTM D2843, and have a self-ignition temperature of 650°F or higher when tested in accordance with ASTM D1929.

**3.4 Floor Underlayment:**

The floor underlayment is installed in the Module and is uniformly supported by a building structure.

**3.4.1 Reinforced Cementitious Sheet Floor Underlayment:**

All reinforced cementitious underlayment floor sheets are 1/2-inch thick (12.5 mm) complying with the ICC-ES Acceptance Criteria for Reinforced Cementitious Sheets Used as Wall and Ceiling Sheathing and Floor Underlayment (AC376) or approved alternative.

**3.4.2 Non-structural Precast Floor Underlayment:**

The floor panel is 2 inches (50 mm) minimum thickness, cast using packaged dry lightweight concrete meeting ASTM C387 and 4x4 D4 welded wire fabric reinforcement meeting ASTM A1064.

### 3.5 Gypsum Board:

The gypsum board must be fiber-reinforced gypsum panels complying with ASTM C1278 or gypsum wallboard complying with ASTM C1396, having a Class A rating in accordance with IBC Section 803.1 when tested in accordance with ASTM E84. Gypsum board must be ½-inch (12.7 mm) minimum nominal thickness, installed in accordance with the relevant requirements of ASTM C840.

### 3.6 Fasteners:

**3.6.1 Cold-formed Steel (CFS) to CFS:** Fasteners used to connect cold-formed steel omega ceiling framing members to plates and ceiling perimeter profiles must be No. 8-by-1/2-inch (4 by 12 mm) self-drilling lath screws complying with ASTM C1513.

Fasteners used to connect cold-formed steel angular (corner) and H (stud) framing members to plates must be three No. 8-by-1/2-inch (4 by 12 mm) self-drilling lath screws complying with ASTM C1513 or three 3/16-inch-by-9/16-inch (4.8 by 14 mm) rivets complying with IFI 114.

**3.6.2 CFS to GFRC Connectors:** Fasteners used to connect cold-formed steel plates to GFRC connectors must be M10-1.5x20 mm hex head flange bolts complying with ISO 898, Property Class 8.8.

**3.6.3 Gypsum Board to CFS framing:** Gypsum boards shall be affixed to studs and ceiling profiles with adhesive complying with AAMA 805.2 and No. 8-by-1/2-inch self-drilling lath screws complying with ASTM C1513, or optionally in tiled areas, 3/16-inch-by-1-inch (4.8 by 14 mm) rivets complying with IFI 114. Fasteners are spaced 4 inches (100 mm) from each end and 24 inches (610 mm) on-center.

**3.6.4 Reinforced Cementitious Sheet Floor Underlayment to CFS framing:** Fasteners used to connect 1/2-inch (12.5 mm) reinforced cementitious sheet floor underlayment to CFS floor perimeter profiles must be No. 8-by-1-inch (4 by 12 mm) self-drilling flat head screws with zinc plated finish complying with ASME B18.6.4. Fasteners are spaced 4 inches (100 mm) from each end and 12 inches (305 mm) on-center.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

All CFS framing, GFRC connectors, sheathing, and underlayment components are assembled at the fabrication facility in accordance with the approved construction documents. Module framing is capable of resisting a 5 psf interior partition load with adequate stiffness to meet IBC Table 1604.3 deflection limits for brittle finishes when studs are spaced no more than 24 inches (610 mm) on-center.

### 4.2 Installation:

Installation of the Module must be in accordance with the applicable code, the approved construction documents, and this report. If there is a conflict between this report and the documents submitted for approval, this report governs.

## 5.0 CONDITIONS OF USE

The Bathsystem America Inc. Modular Components described in this report comply with, or are a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

**5.1** When proprietary alternative fiber-reinforced gypsum boards complying with Bathsystem America's approved quality control documentation are used as wall panels in wet areas and as tile backer, they must be protected by a waterproof membrane complying with ANSI A118.10. This includes areas within two feet of water closets and sinks areas under the IBC.

**5.2** Proprietary alternative underlayment panels must be protected by a waterproof membrane complying with ANSI A118.10. The membrane shall extend 4 inches (100 mm) up the wall in accordance with the membrane manufacturer's cove detail.

**5.3** Use in fire-resistance rating construction is outside the scope of this report.

**5.4** Prior to fabrication of the Modules, the code official or designated representative (ICC NTA) must conduct a plan review of the fabrication drawings for compliance with the approved construction documents and the applicable code. Copies of all test and inspection records must be submitted to the local code official as required by IBC 1703.6.2.

**5.5** When approved alternatives are used, as mentioned in Sections 3.4.1 and 3.5, approval must be by the code official or designated representative (ICC NTA) and is outside the scope of this report.

**5.6** Bathsystem America Inc. must prepare and submit a certificate of compliance to the owner or the owner's authorized agent for submittal to the building official stating that the fabrication was performed in accordance with the IBC and the approved construction documents as required by IBC Section 1704.2.5. An example of the certificate of compliance is shown in Figure 2.

**5.7** When the Modular Components are installed in the building at the project site, the structural anchorage to the building and the electrical and plumbing connections to the building, which are outside of the scope of this report, must be special inspected and tested as required by the applicable code.

**5.8** The Modules must be installed in the building such that gravity and lateral loads from the building (including fenestration) are not transferred through the Module framing.

**5.9** The subfloor must be designed with adequate strength and stiffness to support a brittle finish as outlined in IBC Chapter 16.

**5.10** Plumbing, electrical, and mechanical systems are outside the scope of this report. Mechanical systems are installed at the project site.

**5.11** The Modules are fabricated in Houston, TX under a quality-control program with semi-annual inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

**6.1** Reports of testing in accordance with ASTM D635, ASTM D2843, and ASTM D1929 for the GFRC connectors.

**6.2** Reports of physical property testing in accordance with ASTM C473 for the proprietary alternative Fiber-Reinforced Gypsum Panels.

**6.3** Reports of surface-burning tests in accordance with ASTM E84 for the proprietary Reinforced Cementitious Sheet Floor Underlayment and proprietary alternative Fiber-Reinforced Gypsum Panels.

**6.4** Data in accordance with the ICC-ES Acceptance Criteria for Reinforced Cementitious Sheets used as Wall and Ceiling Sheathing and Floor Underlayment (AC376) dated August 2012 (editorially revised April 2020) for the proprietary Reinforced Cementitious Sheet Floor Underlayment.

**6.5** Data and reports of load testing for connection strengths and uniform static load for the entire Module.

6.6 Fabrication procedures.

6.7 Quality documentation.

**7.0 IDENTIFICATION**

7.1 Each Module must be labeled with the report holder's name and address; the manufacturing location; and ESR-4678.

7.2 The report holder's contact information is the following:

**BATHSYSTEM AMERICA, INC.**  
**5301 POLK STREET, BUILDING 20**  
**HOUSTON, TX 77023**  
**(281) 888-5007**  
[www.bathsystemusa.com](http://www.bathsystemusa.com)  
[info@bathsystemusa.com](mailto:info@bathsystemusa.com)

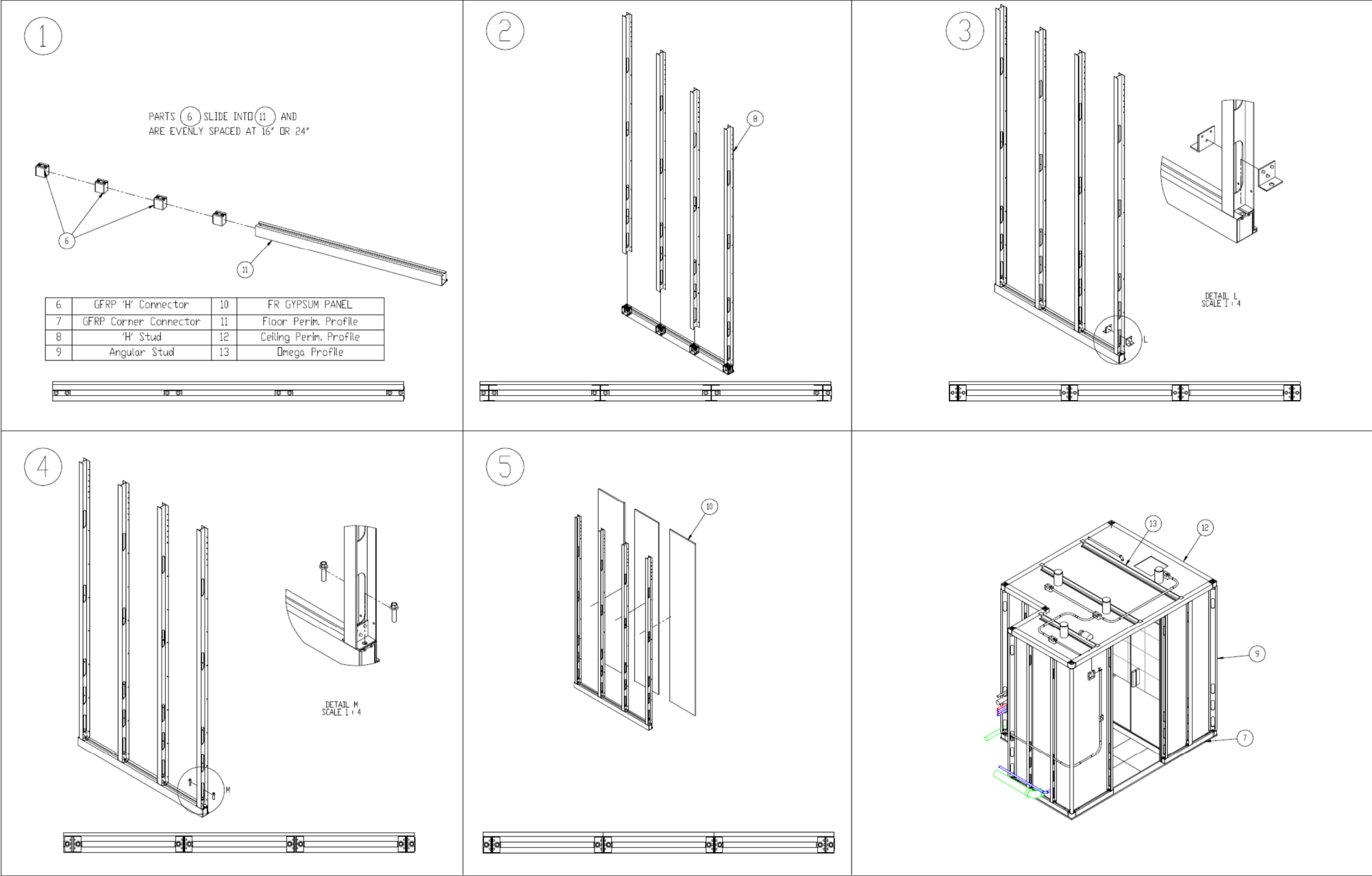


FIGURE 1—TYPICAL MODULE FRAMING



## CERTIFICATE OF CONFORMANCE

CUSTOMER:

CONTRACT NUMBER:

SHIP TO:

ITEM	QTY	DESCRIPTION

I hereby certify that Bathsystem America, LLC. Furnished the bathroom and/ or kitchen components for the above contract in accordance with all applicable requirements. I further certify that the supplies are of the quality specified and conform in all respects with the contract requirements including specifications, drawings, packaging, marking requirements and are in the quantity on thus acceptance document.

The product(s) above have been assembled in accordance with ICC-ES report specifications.

This certificate is expedited on the XX day of Month, Year.

SIGNATURE: \_\_\_\_\_

Quality Representative  
 On behalf of  
 Bathsystem America, LLC.

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BATHSYSTEM AMERICA LLC – 5301 POLK ST. BLD.20 HOUSTON, TX 77023. | MAIN:+1 281.888.5007 | www.bathsystemusa.com

**FIGURE 2—CERTIFICATE OF COMPLIANCE**

**DIVISION: 01 00 00—GENERAL REQUIREMENTS**

Section: 01 45 00—Quality Control

**DIVISION: 09 00 00—FINISHES**

Section: 09 22 16.13—Non-Structural Metal Stud Framing

Section: 09 29 00—Gypsum Board

Section: 09 30 00—Tiling

**REPORT HOLDER:**

BATHSYSTEM AMERICA LLC

**EVALUATION SUBJECT:**

MODULAR FRAMING MEMBERS, CONNECTORS, AND PANELS

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Bathsystem America Modular Framing Members, Connectors, and Panels described in ICC-ES evaluation report [ESR-4678](#) have also been evaluated for compliance with the code noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

**Applicable code editions:**

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

**2.0 CONCLUSIONS**

The Modular Framing Members, Connectors, and Panels, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4678](#), comply with the LABC and LARC and are subject to the conditions of use described in this supplement.

**3.0 CONDITIONS OF USE**

The Modular Framing Members, Connectors, and Panels, described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the master evaluation report [ESR-4678](#).
- The design, installation, conditions of use, and identification of the Modular Framing Members, Connectors, and Panels are in accordance with the 2018 *International Building Code*® (IBC) and *International Residential Code*® (IRC) provisions noted in the evaluation report [ESR-4678](#), as applicable.
- The design, installation, and inspection are in accordance with additional requirements of the LABC Chapters 16 and 17 and LARC, as applicable.

This supplement expires concurrently with the evaluation report, reissued June 2022 and revised October 2022.

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**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Bathsystem America Modular Framing Members, Connectors, and Panels described in ICC-ES evaluation report ESR-4678, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2019 *California Building Code* (CBC)
- 2019 *California Residential Code* (CRC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.2 and 2.3 below.

**2.0 CONCLUSIONS****2.1 CBC and CRC:**

The Bathsystem America Modular Framing Members, Connectors, And Panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4678, comply with the CBC and CRC, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) and 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of the 2019 CBC Chapters 16 and 17 and CRC, as applicable.

**2.2 OSHPD:**

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement

**2.3 DSA:**

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement

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