

ICC-ES Evaluation Report

ESR-2708

Reissued August 2024


This report also contains:

Subject to renewal August 2026

- CBC Supplement
- FBC Supplement
- LABC Supplement

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.

Copyright © 2024 ICC Evaluation Service, LLC. All rights reserved.

| | | | |
|---|---|---|---|
| <p>DIVISION: 03 00 00— CONCRETE</p> <p>Section: 03 15 00— Concrete Accessories</p> <p>Section: 03 21 00— Reinforcing Bar</p> | <p>REPORT HOLDER:</p> <p>SUNCOAST POST-TENSION, LTD</p> | <p>EVALUATION SUBJECT:</p> <p>SUNCOAST STUD REINFORCEMENT SYSTEM®</p> |  |
|---|---|---|---|

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015 and 2012 [International Building Code® \(IBC\)](#)

For evaluation for compliance with codes adopted by [Los Angeles Department of Building and Safety \(LADBS\)](#), see [ESR-2708 LABC Supplement](#).

Property evaluated:

- Structural

2.0 USES

The Suncoast Stud Reinforcement System® (Suncoast SRS®) is a form of shear reinforcement using headed studs, factory-welded to flat steel bars. The Suncoast SRS® provides punching shear resistance in flat reinforced concrete slabs and footings, replacing or supplementing resistance provided by stirrups, drop panels, or column capitals.

See [Tables 1](#) and [2](#) for Suncoast SRS® component dimensions, and [Figure 1](#) for assembly configuration.

3.0 DESCRIPTION

3.1 General:

The Suncoast SRS®, as described in this evaluation report, conforms to ASTM A1044 and Section 20.5.1 of ACI 318-14 (IBC 2018 and 2015) or 3.5.5 of ACI 318-11 (IBC 2012).

3.2 Material:

3.2.1 Headed Studs: The shear studs used in the Suncoast SRS® assemblies are ³/₈-, ¹/₂-, ⁵/₈- and ³/₄-inch-diameter (9.5, 12.7, 15.9 and 19.1 mm) headed studs recognized in an ICC-ES evaluation report as described in the manufacturer’s quality documentation. The headed studs comply with the material requirements and specifications of ASTM A1044. The studs are made from carbon steel complying with ASTM A29 Grades 1010 through 1020, and have the following physical properties:

- Minimum yield strength: 51,000 psi (350 MPa).
- Minimum tensile strength: 65,000 psi (450 MPa).
- Minimum elongation: 20 percent in 2 inches (51 mm).
- Minimum reduction of area: 50 percent.

3.2.2 Flat Steel Bars: The flat steel bars are formed from carbon steel complying with ASTM A36 and complying with the following physical properties:

- Minimum yield strength: 44,000 psi (303 MPa).
- Minimum tensile strength: 65,000 psi (450 MPa).
- Minimum elongation: 20 percent in 8 inches (203 mm).
- Minimum reduction of area: 50 percent in 8 inches (203 mm).

3.2.3 Stud Welding: The headed studs are factory-welded by Suncoast Post-Tension, Ltd., to the flat steel bars using equipment in accordance with procedures recommended by the stud manufacturer. All welding complies with ASTM A1044 and AWS D1.1 requirements.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: Structural design and installation of the Suncoast SRS® (a specified type of headed shear stud reinforcement assembly) used as punching shear reinforcement in reinforced concrete slabs or footings must comply with the applicable provisions of ACI 318-14 (IBC 2018 and 2015) or ACI 318-11 (2012 IBC).

4.1.2 Design Considerations: The structural design must specify the following items, based on design requirements of this report.

- The number of studs per rail
- Stud spacing (S).
- Shear rail assembly overall height (OAH)
- Stud shank diameter (D)
- Distance between column face and first peripheral line of studs (S_o)
- Base rail length (L)
- Arrangement of headed shear stud reinforcement

4.1.3 Earthquake-resistant Structures:

4.1.3.1 General: The provisions in this section apply to structures in Seismic Design Categories C, D, E, and F.

4.1.3.2 Shear Strength: The applicable provisions of ACI 318-14 (IBC 2018 and 2015) or ACI 318-11 (2012 IBC) shall apply except the nominal shear strength provided by concrete in the presence of the headed shear stud reinforcement referenced in Section 22.6.6.1 of ACI 318-14 (IBC 2018 and 2015) or Section 11.11.5.1 of ACI 318-11 (2012 IBC), must be revised as follows:

$$V_c = 1.5\lambda\sqrt{f'_c}(b_0d) \quad \text{Eq. 1}$$

This revision requires the nominal shear strength, V_n , and the nominal shear stress, v_n , to be revised accordingly.

Two-way slabs without beams designated as part of the seismic-force-resisting system must comply with Section 18.4.5.8 of ACI 318-14 (IBC 2018 and 2015) or 21.3.6.8 of ACI 318-11 (IBC 2012), except that V_c must be limited as set forth in Eq. (1) of this report.

Two-way slabs without beams not designated as part of the seismic-force-resisting system must comply with Section 18.14.5.1 of ACI 318-14 (IBC 2018 and 2015) or Section 21.13.6 of ACI 318-11, (IBC 2012), except that V_c must be limited as set forth in Eq. (1) of this report, and the design story drift ratio specified in Section 18.14.5.1 of ACI 318-14 (IBC 2018 and 2015) or Section 21.13.6(b) of ACI 318-11 (IBC 2012), must not exceed the drift ratio specified in Table 12.12-1 of ASCE/SEI 7-10.

4.2 Installation:

Installation of the Suncoast SRS® must comply with applicable provisions of the 2018, 2015, and 2012 IBC and the approved engineering plans. The Suncoast SRS® assemblies must be positioned correctly around columns and set in accordance with the IBC and the approved engineering plans and details. Concrete cover must comply with Section 20.6.1.3.5 of ACI 318-14 (IBC 2018 and 2015) or Section 7.7.5 of ACI 318-11 (2012 IBC). See [Figure 2](#) for typical installation details.

4.3 Special Inspection:

Special inspection must be provided in accordance with Section 1705.3 of the IBC. The special inspector is responsible for verifying identification of the Suncoast SRS[®] assembly per section 7.0 of this report, along with its condition, location, positioning, clearance, and concrete cover in accordance with the approved plans.

5.0 CONDITIONS OF USE:

The Suncoast SRS[®] described in this report complies with, or is 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 The Suncoast SRS[®] must be designed and installed in accordance with the applicable code, this report (Sections 4.1 and 4.2 for structural design; Section 4.3 for installation) and the manufacturer's instructions. In case of conflict between the manufacturer's published installation instructions and this report, this report governs.
- 5.2 Calculations and details demonstrating that the applied loads are less than the resistance of the reinforced concrete must be submitted to the code official for approval. Calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.3 Special inspection is provided in accordance with Section 4.4 of this report.
- 5.4 The Suncoast SRS[®] is manufactured at Suncoast Post-Tension, Ltd., 15422 Lillja Road, Houston, Texas, under a quality-control program with third-party inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Headed Shear Stud Reinforcement Assemblies for Concrete Slabs or Footings \(AC395\)](#), dated June 2017 (editorially revised November 2017).

7.0 IDENTIFICATION

- 7.1 The Suncoast SRS[®] assembly is identified on the packaging with a part name; part number; color code; Suncoast Post-Tension, Ltd., manufacturing facility name and address; project name and number; project level; and evaluation report number (ESR-2708); and the name of the third-party inspection agency.
- 7.2 The report holder's contact information is the following:

SUNCOAST POST-TENSION, LTD
15422 LILLJA RD
HOUSTON, TEXAS 77060
(281) 445-8886
www.suncoast-pt.com
engineer@suncoast-pt.com

TABLE 1—SUNCOAST SRS® STUD DIMENSIONS

| STUD SHANK DIAMETER, D [inch (mm)] | HEAD DIAMETER, H [inches (mm)] | $\frac{H}{D}$ Ratio | SHANK AREA, S _A [inch ² (mm ²)] | HEAD AREA, H _A [inch ² (mm ²)] | $\frac{H_A}{S_A}$ Ratio | HEAD THICKNESS, T [inch (mm)] |
|------------------------------------|--------------------------------|---------------------|---|--|-------------------------|-------------------------------|
| $\frac{3}{8}$ (9.5) | 1.19 (30.1) | 3.17 | 0.110 (71) | 1.112 (712) | 10.1 | 0.26 (6.6) |
| $\frac{1}{2}$ (12.7) | 1.58 (40.2) | 3.16 | 0.196 (127) | 1.961 (1269) | 10.0 | 0.33 (8.4) |
| $\frac{5}{8}$ (15.9) | 1.98 (50.2) | 3.17 | 0.307 (199) | 3.079 (1979) | 10.0 | 0.40 (10.2) |
| $\frac{3}{4}$ (19.1) | 2.37 (60.2) | 3.16 | 0.442 (287) | 4.412 (2846) | 10.0 | 0.47 (11.9) |

TABLE 2—SUNCOAST SRS® BASE RAIL PLATE MINIMUM DIMENSIONS

| STUD DIAMETER, D [inch (mm)] | WIDTH, W [inches (mm)] | THICKNESS, T _B [inch (mm)] | LENGTH |
|------------------------------|------------------------|---------------------------------------|--|
| $\frac{3}{8}$ (9.5) | 1.25 (31.8) | 0.250 (6.5) | Determined by the registered design professional |
| $\frac{1}{2}$ (12.7) | 1.25 (31.8) | 0.250 (6.5) | Determined by the registered design professional |
| $\frac{5}{8}$ (15.9) | 1.75 (44.5) | 0.375 (9.5) | Determined by the registered design professional |
| $\frac{3}{4}$ (19.1) | 2.00 (50.8) | 0.375 (9.5) | Determined by the registered design professional |

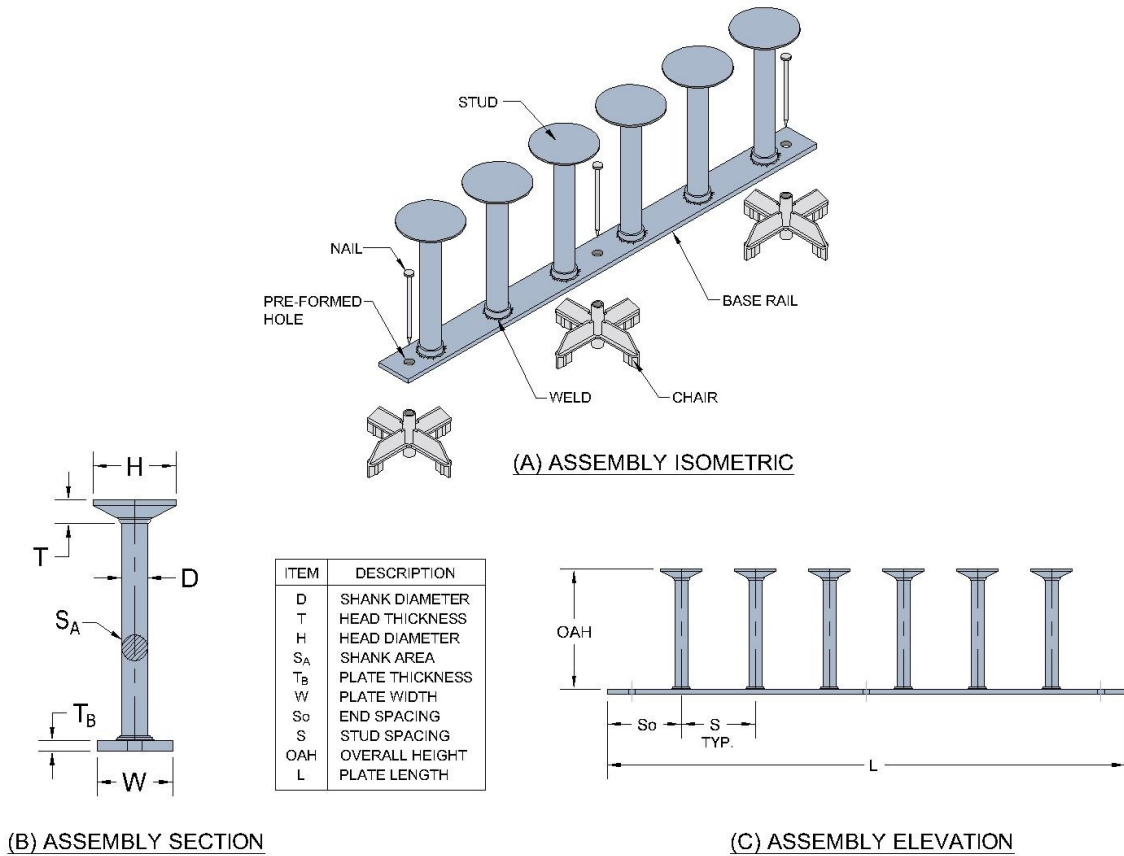
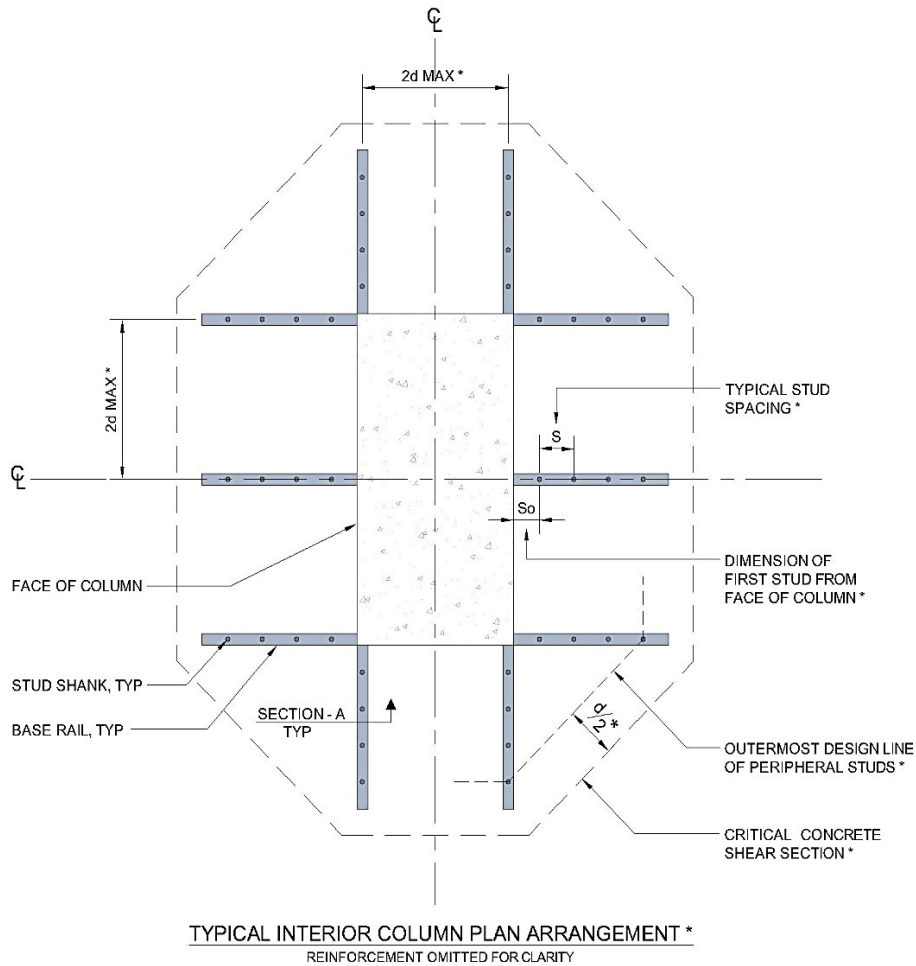


FIGURE 1—TYPICAL SUNCOAST STUD REINFORCEMENT SYSTEM® ASSEMBLY



(* NOTE: REFERENCE APPLICABLE ACI STANDARDS AND COMMITTEES FOR DESIGN, LAYOUT, SPACINGS AND COVER REQUIREMENTS

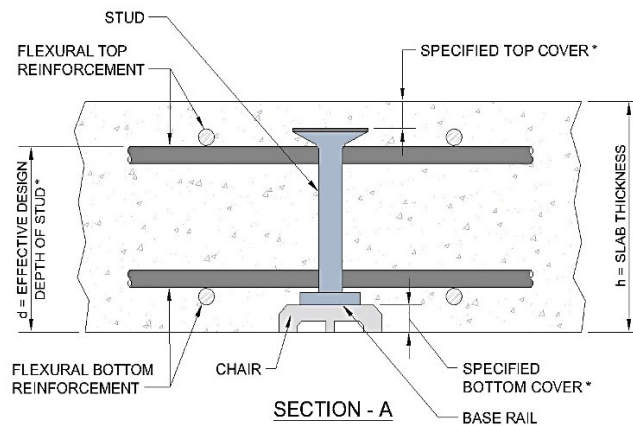


FIGURE 2—TYPICAL SUNCOAST STUD REINFORCEMENT SYSTEM® DETAILS

DIVISION: 03 00 00—CONCRETE
Section: 03 15 00—Concrete Accessories
Section: 03 21 00—Reinforcing Bar

REPORT HOLDER:**SUNCOAST POST-TENSION, LTD****EVALUATION SUBJECT:****SUNCOAST STUD REINFORCEMENT SYSTEM® (SUNCOAST SRS®)****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that Suncoast Stud Reinforcement System® (Suncoast SRS®), described in ICC-ES master evaluation report [ESR-2708](#), has also been evaluated for compliance with the code noted below as adopted by Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2017 *City of Los Angeles Building Code* (LABC)

2.0 CONCLUSIONS

The Suncoast Stud Reinforcement System® (Suncoast SRS®), described in Sections 2.0 through 7.0 of the master evaluation report [ESR-2708](#), complies with LABC Chapter 19, and is subjected to the conditions of use described in this report.

3.0 CONDITIONS OF USE

The Suncoast Stud Reinforcement System® (Suncoast SRS®) described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the master evaluation report [ESR-2708](#).
- The design, installation, conditions of use and labeling of the Suncoast Stud Reinforcement System® (Suncoast SRS®) are in accordance with the 2015 *International Building Code*® (2015 IBC) provisions noted in the master evaluation report [ESR-2708](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.

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

DIVISION: 03 00 00—CONCRETE
Section: 03 15 00—Concrete Accessories
Section: 03 21 00—Reinforcing Bar

REPORT HOLDER:

SUNCOAST POST-TENSION, LTD

EVALUATION SUBJECT:

SUNCOAST STUD REINFORCEMENT SYSTEM® (SUNCOAST SRS®)

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Suncoast Stud Reinforcement System® (Suncoast SRS®), recognized in ICC-ES master evaluation report ESR-2708, has also been evaluated for compliance with Chapter 19 of the code noted below.

Applicable code edition:

2016 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS

2.1 CBC:

The Suncoast Stud Reinforcement System® (Suncoast SRS®) described in Sections 2.0 through 7.0 of the master evaluation report ESR-2708, complies with CBC Chapter 19, provided the design and installation are in accordance with the 2015 *International Building Code*® (IBC) provisions noted in the master report and the additional requirements of the CBC Chapters 16, 17, and 19, as applicable.

2.1.1 OSHPD:

OSHPD applications are beyond the scope of this supplement.

2.1.2 DSA:

DSA applications are beyond the scope of this supplement.

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

DIVISION: 03 00 00—CONCRETE
Section: 03 15 00—Concrete Accessories
Section: 03 21 00—Reinforcing Bar

REPORT HOLDER:

SUNCOAST POST-TENSION, LTD

EVALUATION SUBJECT:

SUNCOAST STUD REINFORCEMENT SYSTEM® (SUNCOAST SRS®)

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Suncoast Stud Reinforcement System® (Suncoast SRS®), recognized in ICC-ES master evaluation report ESR-2708, has also been evaluated for compliance with the code noted below.

Applicable code edition:

- 2017 Florida Building Code—Building

2.0 CONCLUSIONS

The Suncoast Stud Reinforcement System® (Suncoast SRS®), described in Sections 2.0 through 7.0 of the master evaluation report ESR-2708, complies with the *Florida Building Code—Building*, provided the design and installation is in accordance with the 2015 *International Building Code*® provisions noted in the master report.

Use of Suncoast Stud Reinforcement System® (Suncoast SRS®) has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the Florida Building Code—Building.

For products falling under Florida Rule 9N-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 August 2024.