

# Re-Fab, LLC

## Re-Fab Rails

### Description:

Re-Fab rails is a type of shear reinforcement consisting of large headed shear studs welded to steel rails. Re-Fab rails enhance shear resistance of flat concrete slabs, generally offered from column capitals, stirrups, and drop panels. Figure 1 provides available dimensions.

### Materials:

**Shear Studs:** The shear studs used to produce Re-Fab rails are manufactured by Cox Industries and comply with the material requirements and specifications of the American Welding Society's Structural Welding Code-Steel (AWS D1.1). The shear studs used are formed from ASTM A 108 Grades 1010 through 1020 steel and comply with the following physical requirements:

- 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, minimum

**Flat Steel Bar:** The flat steel bar which the shear studs are welded to is formed from steel complying with ASTM A 36 specs and meeting with the following physical requirements:

- 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), minimum

### Stud Welding:

Re-Fab rails are welded in compliance with AWS D1.1

### Design:

**General:** General requirements for shear resistance design are available in Section 1911 of the *Uniform Building Code*<sup>TM</sup>. Special provisions must be observed in Section 1911.12 during the design. ACI 421.1R-99 summarizes the design regulations as they apply to shear stud reinforcement. The quantity of studs per Re-Fab rail, stud spacing (s), rail height (OAH), rail length (OAL), and the distance between the column facade

and first line of studs ( $s_o$ ) are determined by the structural design.

### Installation:

Installation of the Re-Fab rails must comply with Chapter 19 and approved design. To maintain proper bottom concrete cover, Re-Fab rails are set on plastic chairs or tied to rubber coated slab runners at the installer's choice. If plastic chairs are used the rails must be secured by nailing the chairs to the formwork.

### Special Inspection:

Continuous special inspection is required to conform to Section 1701.5.1 of the code. The special inspector is responsible for verifying identification of the Re-Fab rail and its condition, clearances, positioning, and concrete covering.

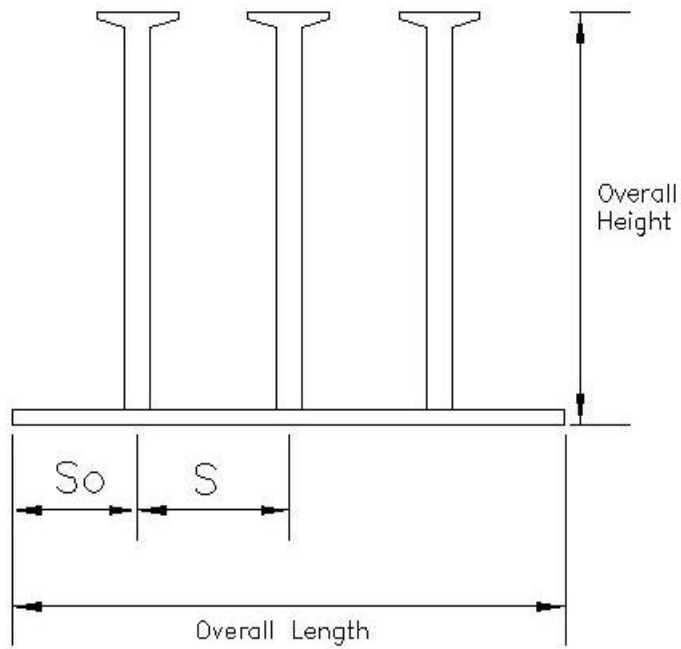
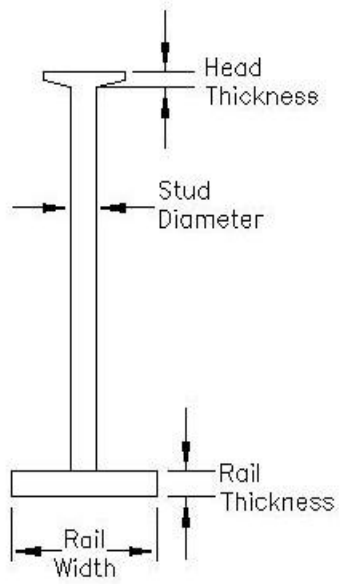
### Identification:

Re-Fab rails are identified in packaging with a part name, part number, manufacturers name and address, color code, project name, and steel mill certs.

**Table 1**

Stud Diameter in. (mm)	Shank Area in <sup>2</sup> (mm <sup>2</sup> )	Head Diameter in. (mm)	Head Thickness in. (mm)	Rail Width in. (mm)	Rail Thickness in. (mm)
3/8 (9.5)	0.11 (71)	1.19 (30.1)	0.21 (5.3)	1 (25.4)	3/16 (4.8)
1/2 (12.7)	0.196 (127)	1.58 (40.2)	0.28 (7.1)	1-1/4 (31.8)	1/4 (6.5)
5/8 (15.9)	0.307 (199)	1.98 (50.2)	0.35 (8.9)	1-3/4 (44.5)	5/16 (7.9)
3/4 (19.1)	0.442 (287)	2.37 (60.2)	0.42 (10.7)	2 (50.8)	3/8 (9.5)

Note: Overall length (OAL) of the Re-Fab rails are determined by the approved drawing and the overall height (OAH) of the stud is determined by the slab thickness and required concrete cover.



Note: See Table 1 for appropriate stud and rail sizes