



ICC-ES Evaluation Report

ESR-4921

Reissued June 2023

This report is subject to renewal June 2024.

DIVISION: 31 00 00—EARTHWORK
Section: 31 60 00—Special Foundations and Load-Bearing Elements

REPORT HOLDER:

SURE SAFE EFS

EVALUATION SUBJECT:

VR-1 FOUNDATION SYSTEM

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021 and 2018 *International Building Code*® (IBC)
- 2021 and 2018 *International Residential Code*® (IRC)

Properties evaluated:

- Structural

2.0 USES

The VR-1 Foundation System is a proprietary geotextile fabric formed plain concrete footing pads used to support wood posts in the crawl spaces of Type V construction under the IBC or any construction under the IRC. The footing pads are used as individual, isolated footings supporting gravity loads only.

3.0 DESCRIPTION

3.1 General:

The VR-1 Foundation System consists of a 4 in x 4 in (10.2 cm x 10.2 cm) 11-gauge steel tube, used as a sleeve to receive a wood post, welded to a 12 in x 12 in x 1/4 in (30.5 cm x 30.5 cm x 0.64 cm) steel base plate with a 1/8 inch (3.175 mm) fillet weld all around. See Figure 1. The wood post is to be fastened to the steel tube with lag bolts (not provided by manufacturer). The steel tube and base plate are inserted at the center of a geotextile bag which is then infilled with 1/3 of a cubic yard (0.25 m³) of concrete to embed the steel base plate and form a 3 ft x 3 ft x 10 inch (91.4 cm x 91.4 cm x 25.4 cm) isolated pad footing. See Figure 2.

3.2 Material:

3.2.1 Concrete: Concrete infill must be normal-weight concrete complying with ACI 318 specifications with a

minimum compressive strength of 2,500 psi (17.2 MPa).

3.2.2 Geotextile Fabric Bag: The fabric is a proprietary needle-punched non-woven geotextile made of polypropylene fibers.

3.2.3 Steel Tube and Baseplate: The steel tube and baseplate comply with ASTM A500 GR. B and ASTM A36, respectively.

3.2.4 Wood Post (Not Supplied by Sure Safe EFS): Wood posts must be preservative treated and comply with NDS specifications.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The VR-1 Foundation System is to be designed as a shallow footing pad to support gravity loads applied from the structure above, determined in accordance with the applicable sections of the IBC. Calculations must demonstrate a complete load path from the structure to the post to the VR-1 Foundation System to the soil below.

The connection of the wood post to the steel tube must be designed in accordance with applicable sections of the IBC and NDS. The steel tube and baseplate assembly must be calculated in accordance with the applicable sections of the IBC and AISC 360.

The foundation must be designed based on the allowable soil bearing capacity and overturning must meet the requirements of IBC Chapter 18, Table 1806.2 for sand, silty sand, clayey sand, silty gravel and clayey gravel. Uplift due to overturning is beyond the scope of this report.

The foundation design of the plain concrete footing must be in accordance with the requirements of ACI 318 Chapter 14.

4.2 Installation:

The VR-1 Foundation System must be installed in accordance with the applicable code, this report, manufacturer's published installation instructions and the approved construction documents prepared by a registered design professional. A copy of the manufacturer's published installation instructions and the approved drawings must be available at all times on the jobsite during installation.

The wood post is inserted into the structural steel tube and base plate assembly of the VR-1 Foundation System fastened in place and connected with 3.5-inch (8.9 cm) lag screw (by others). The baseplate is set at 3 to 5 inches (7.6 to 12.7 cm) from the top of the bottom of the form bag above grade with the geotextile bag hanging freely. Concrete is then pumped into the geotextile bag, molding to the contours in the grade below and embedding the steel tube and baseplate in place.

5.0 CONDITIONS OF USE

The VR-1 Foundation System 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 Installation must comply with this report, the applicable code and the manufacturer’s published installation instructions. If there is a conflict between the manufacturer’s installation instructions and this report, this report governs.
- 5.2 A registered design professional must prepare calculations for the VR-1 Foundation System in accordance with the requirements of ASCE 7 as indicated in the IBC. Engineering calculations must demonstrate a complete load path for the load acting on the VR-1 Foundation System and must be submitted to the code official.
- 5.3 The VR-1 Foundation System is used to support wood posts in crawl spaces for Type V construction under the IBC or any construction under the IRC.
- 5.4 The VR-1 Foundation System must be used as individual isolated footings to resist bearing loads only and must not be used to resist lateral or uplift loads.

- 5.5 Concrete mix design must be in accordance with the IBC or IRC and is outside the scope of this report. In areas where repeated freezing and thawing under saturated conditions occur, the registered design professional must verify the mix design is acceptable for freeze-thaw applications.

6.0 EVIDENCE SUBMITTED

- 6.1 Design requirements in accordance with the IBC and ACI 318.
- 6.2 Quality documentation in accordance with ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated January 2019.

7.0 IDENTIFICATION

- 7.1 Product packaging labels must include the name and address of the report holder (Sure Safe EFS), product identification and evaluation report number (ESR-4921).
- 7.2 The report holder’s contact information is the following:

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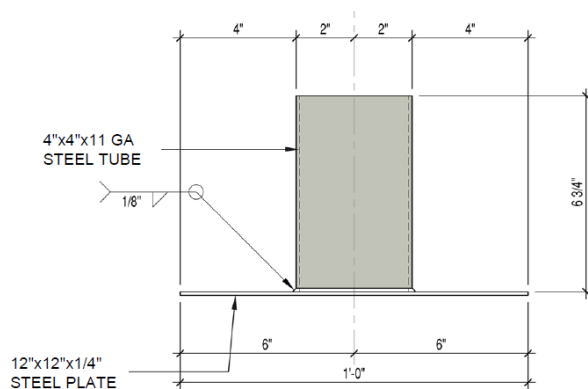


Figure 2: Steel Tube and Baseplate Assembly

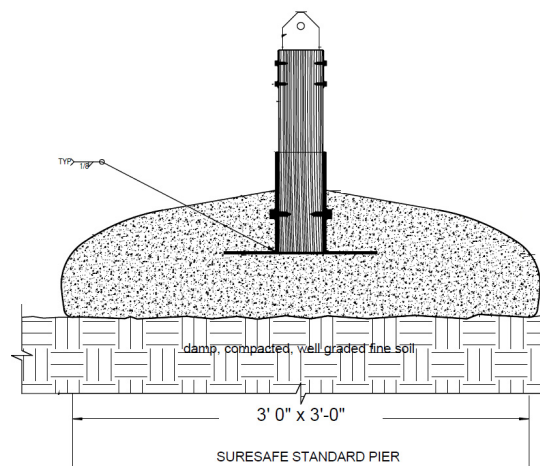


Figure 1: VR-1 Foundation Assembly

DIVISION: 31 00 00—EARTHWORK**Section: 31 60 00—Special Foundations and Load-Bearing Elements****REPORT HOLDER:****SURE SAFE EFS****EVALUATION SUBJECT:****VR-1 FOUNDATION SYSTEM****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the VR-1 Foundation System, described in ICC-ES evaluation report ESR-4921, has also been evaluated for compliance with the codes noted below.

Applicable code edition(s):

- 2019 *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 Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)

2.0 CONCLUSIONS**2.1 CBC:**

The VR-1 Foundation System, described in Sections 2.0 through 7.0 of the evaluation report ESR-4921, complies with CBC Chapter 18, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 18, as applicable.

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

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

2.2 CRC:

The VR-1 Foundation System, described in Sections 2.0 through 7.0 of the evaluation report ESR-4921, complies with CRC Section R301.1.3, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapter 4, as applicable.

This supplement expires concurrently with the evaluation report, reissued June 2023.