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Legacy report on the BOCA® National Building Code/1999 and the 1998 International One- and Two-Family Dwelling Code®

DIVISION: 02—SITEWORK

Section: 02250—Shoring and Underpinning

EVALUATION SUBJECT:

GT250A GRIP-TITE® WALL ANCHOR SYSTEM

REPORT HOLDER:

GRIP-TITE® MANUFACTURING COMPANY
P.O. BOX 111
WINTERSET, IA 50273
www.griptite.com

EVALUATION SCOPE

Compliance with the following codes:

- BOCA® National Building Code/1999
 - # Section 106.4 Alternative materials and equipment
 - # Section 1812.3.2 Thickness based on soil loads, unbalanced backfill height and wall height
 - # Table 1812.3.2 (1) Plain masonry and plain concrete foundation walls
 - # Section 2203.1 General - Structural Steel Construction
- 1998 International One- and Two-Family Dwelling Code®
 - # Section 113.4 Other inspections
 - # Section 401 General - Foundations

DESCRIPTION

GENERAL

GT250 Grip-Tite® Wall Anchor System is used as a reinforcement system to anchor plain concrete block, clay block/brick, timber, and poured concrete walls, as well as steel sheeting, against the forces of unbalanced fill, such as with basement walls. The GT250 System consists of an earth anchor, wall plate, anchor rod, nuts, washer, and wall sleeve. The earth anchor is installed below grade outside the building while the wall plate assembly is installed inside along the foundation wall. An anchor rod, which penetrates the wall, ties the anchor to the wall plate. If the required distance exceeds the standard 9 ft (2743 mm) anchor rod length, then additional anchor rods are joined with locking rod couplers. See Figure 1 of this report for an illustration of the wall anchor installation.

Earth Anchor and Wall Plate: The earth anchor and wall plate are manufactured from 10 gauge C1008-C1010 hot rolled steel in accordance with ASTM A1011, with a nominal thickness of 0.134 in. (3.4 mm). The earth anchor plate edges are flanged and are tack welded at right angles.

Anchor Rod: The anchor rod that connects the earth anchor and wall plate is manufactured from cold-drawn round Grade-1018 steel in accordance with ASTM A 108, nominal diameter of 0.734 in. (18.6 mm), with a minimum tensile strength of 23,000 lbs (101,200 N) and a minimum yield strength of 36,000 psi (248 MPa).

Rod Coupler: The rod coupler is manufactured from DOM mechanical steel tubing conforming to ASTM 513 - Type 5, Grade 1020.

All steel components are hot dip galvanized in accordance with ASTM A153/A153M. See Figure 2 of this report for an illustration of the wall anchor assembly components.

CONDITIONS OF USE

This report is limited to the applications and products as stated herein. The ICC-ES Subcommittee on National Codes intends that the report be used by the code official to determine that the report subject complies with the code requirements specifically addressed, provided that this product is installed in accordance with the following conditions:

- # Grip-Tite® Wall Anchor Systems shall be installed in accordance with this report and the manufacturer's published installation instructions by installers certified by Grip-Tite® Manufacturing Company. The installation shall comply with the approved construction documents, subject to the conditions of this report.
- # Grip-Tite® Wall Anchor Systems shall be limited to the applications and limitations indicated in Table 1 of this report.
- # Special inspections of the installation of Grip-Tite® Wall Anchor Systems shall be provided in accordance with Section 1705.9 of the BOCA® National Building Code/1999 and Section 113.1.4 of the 1998 International One- and Two-Family Dwelling Code®. Items to be confirmed by the special inspector shall include, but not be limited to, evidence of manufacturer's certification of installers, verification of adequacy of soil for installation, and compliance of the installation with the approved construction documents and this report.
- # Determination of anchor capacity for use in soft soils, including loose cohesionless soils, soft organic soils or soft clays, is outside the scope of this report. Verification that the proposed anchor location or locations do not include "soft soils" shall be included in the soils investigation report required in this report.
- # Grip-Tite® Wall Anchor Systems have been evaluated for axial/tensile loading and hydrostatic conditions. Other forms of loading are outside the scope of this report.

ICC-ES legacy 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, Inc., express or implied, as to any finding or other matter in this report, or as to any product covered by the report.

- # The evaluation is limited to use of Grip-Tite® Wall Anchor Systems on buildings designated as Seismic Performance Category A or detached one- and two-family dwellings located in areas with an effective peak velocity-related acceleration (A_v) value less than 0.15, as designated in Section 1610.1 of the BOCA® *National Building Code* 1999. For the 1998 *International One- and Two-Family Dwelling Code*®, this evaluation is limited to use in areas designated as Zones 0, 1, or 2 in Figure 301.2 (2) of that code.
- # This report is subject to periodic re-examination. For information on the current status of this report, contact the ICC-ES.

ITEMS REQUIRING VERIFICATION

The following items are related to the installation of the report subject, but are not within the scope of this evaluation. However, these items are related to the determination of code compliance:

- ✓ Construction documents, including design calculations, indicating compliance with this report.

INFORMATION SUBMITTED

- # Manufacturer's product specifications, and published installation instructions.
- # *Grip-Tite Manufacturing Company Quality Manual*, dated October 29, 2003, signed by representatives of Grip-Tite Manufacturing Company and the third-party inspection agency (Froehling & Robertson, Inc.).
- # Copies of the AWS certification for welders employed by Grip-Tite® Manufacturing Company.
- # Larson Engineering of Wisconsin, Engineering Analysis, dated June 29, 1998, with attached calculations, dated May 21, 1998, containing a comparison of a residential basement wall before and after the installation of the Grip-Tite® Wall Anchor System, signed and sealed by Bradley W. Hughes, P.E.
- # Calculations, dated January 26, 2004, containing evaluation of material stress limitations for the Grip-Tite® Wall Anchor System, signed and sealed by John H. Nedza, P.E.
- # Calculations, dated February 26, 2004, containing evaluation of wall thicknesses for Table 1 of this report, signed and sealed by David E. Stinnette, P.E.

APPLICATION FOR PERMIT

To aid in the determination of compliance with this report, the following represents the minimum level of information to accompany the application for permit:

- # The language "See ICC-ES Legacy Report No. 22-03" or a copy of this report.
- # Construction documents consistent with this report. The individual preparing such documents shall be competent and qualified in the application of the engineering design principles involved, and shall possess registration or license in accordance with the professional registration laws of the state in which the project is constructed. The following items, at a minimum, shall be provided:
 - ! Location of the Grip-Tite® Wall Anchor System along the building wall.
 - ! Required spacing of the earth anchors.
 - ! Depth of the earth anchor.

- ! Distance from the structure to the earth anchor.

- ! A soil investigation report for the proposed construction site provided by a registered design professional, qualified to perform such work. Information provided in the soils investigation report shall include, but not be limited to, the following:

- Soil type at each proposed anchor location.
 - Allowable soil bearing pressure.
 - Indication of the method used by the registered design professional to determine that the soil is adequate for the proposed installation.
 - Location of the ground water table.
 - Maximum anticipated frost depth.
 - The presence or absence of corrosives in the soil and the appropriateness of the use of galvanized steel in the soil.
 - The presence of stone, rocks or other debris in the soil strata and their effects on the suitability of the soil for use with Grip-Tite® Wall Anchor Systems.
 - Recommendations to the registered design professional to prevent settlement due to ground water or overloading of the soil, wall damage due to frost heave or corrosion of the wall anchor materials and the characteristics of the appropriate types of loading for the soil.
 - Suitability of the systems in a seismic area, for areas required to submit seismic calculations.
- ! Structural calculations which shall include, but not be limited to, the following:
- An analysis demonstrating that the Grip-Tite® Wall Anchor System transfers the design loads to the soil without causing any stresses within the structure to exceed their respective allowable stress values.

PRODUCT IDENTIFICATION

Grip-Tite® Wall Anchor Systems components or packaging manufactured in accordance with this report shall bear the following identification:

- # "See ICC-ES Legacy Report No. 22-03"
- # A label that identifies the product and catalog number, the company name, and the third-party inspection agency name or logo (Froehling & Robertson, Inc.).

TABLE 1
PLAIN MASONRY AND PLAIN CONCRETE FOUNDATION WALLS WITH GRIP-TITE® WALL ANCHORS

PLAIN MASONRY					
Wall height (ft)	Depth of Unbalanced backfill height (ft)	Soil classes and lateral soil load (psf/foot of depth)			
		GW, GP, SW, SP	GM, SM, SM-SC, ML, inorganic CL, ML-CL	GC, SC, MH	
		30	45	60	
Minimum nominal wall thickness (in.)					
7	4 (or less)	8	8	8	
	5	8	8	8	
	6	8	10 or 8 (grouted)	10 or 8 (grouted)	
	7	8	10 or 8 (grouted)	12 or 10 (grouted)	
8	4 (or less)	8	8	8	
	5	8	8	8	
	6	8	10 or 8 (grouted)	12 or 8 (grouted)	
	7	8	10 or 8 (grouted)	12 or 10 (grouted)	
9	4 (or less)	8	8	8	
	5	8	8	10	
	6	8	10 or 8 (grouted)	12 or 10 (grouted)	
	7	10 or 8 (grouted)	12 or 10 (grouted)	10 (grouted)	
	8	10 or 8 (grouted)	10 (grouted)	12 (grouted)	
	9	12 or 10 (grouted)	12 (grouted)	12 (grouted)	
	PLAIN CONCRETE				
	Wall height (ft)	Depth of Unbalanced backfill height (ft)	Soil classes and lateral soil load (psf/foot of depth)		
GW, GP, SW, SP			GM, SM, SM-SC, ML, inorganic CL, ML-CL	GC, SC, MH	
30			45	60	
Minimum nominal wall thickness (in.)					
7	4 (or less)	7.5	7.5	7.5	
	5	7.5	7.5	7.5	
	6	7.5	7.5	7.5	
	7	7.5	7.5	7.5 (note 2)	
8	4 (or less)	7.5	7.5	7.5	
	5	7.5	7.5	7.5	
	6	7.5	7.5	7.5 (note 2)	
	7	7.5	7.5 (note 2)	7.5 (note 2)	
9	4 (or less)	7.5	7.5	7.5	
	5	7.5	7.5	7.5	
	6	7.5	7.5	7.5 (note 2)	
	7	7.5	7.5 (note 2)	7.5 (note 2)	
	8	7.5 (note 2)	7.5 (note 2)	7.5 (note 2)	
	9	7.5 (note 2)	7.5 (note 2)	7.5 (note 2)	

SI: 1 in. = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 47.9 Pa

Notes to Table 1:

1. Grip-Tite® Wall Anchor located a distance of $0.4 \times$ fill height above the top of the footing.
2. An analysis in compliance with ACI 318 is required

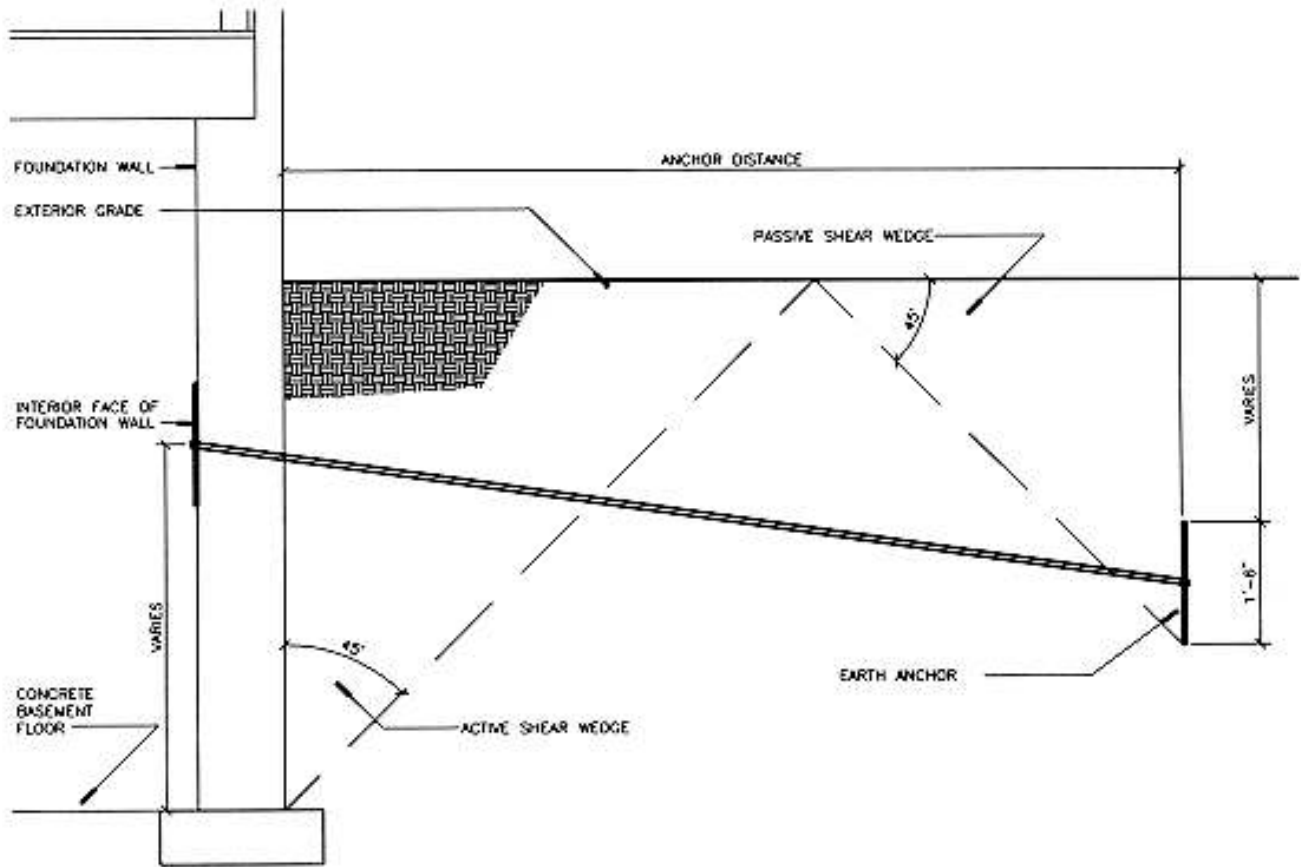


FIGURE 1*—TYPICAL WALL ANCHOR INSTALLATION

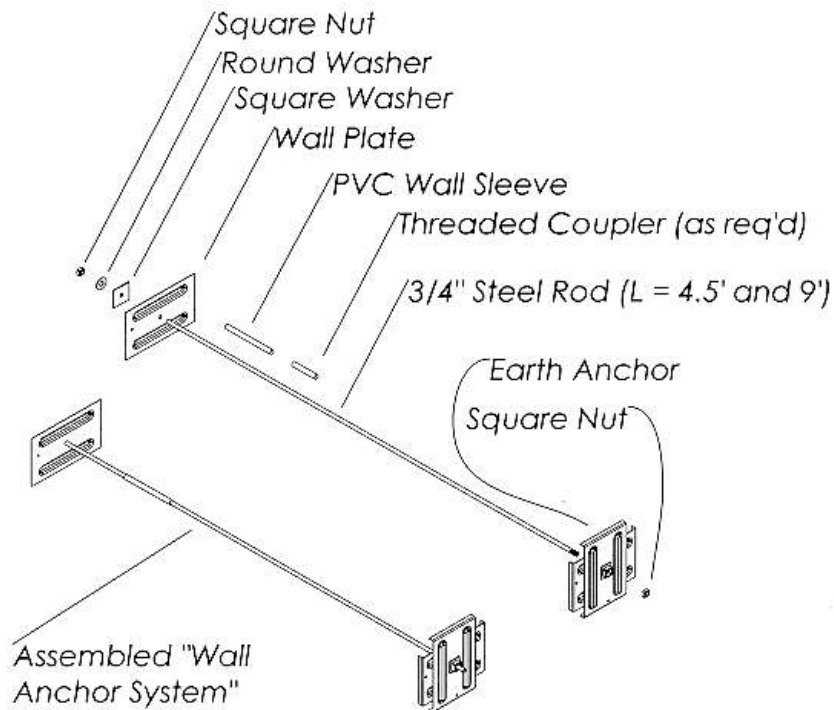


FIGURE 2*—WALL ANCHOR ASSEMBLY COMPONENTS

*THIS DRAWING IS FOR ILLUSTRATION PURPOSES ONLY. IT IS NOT INTENDED FOR USE AS A CONSTRUCTION DOCUMENT FOR THE PURPOSE OF DESIGN, FABRICATION OR ERECTION.