

# PROJECT SUBMITTAL

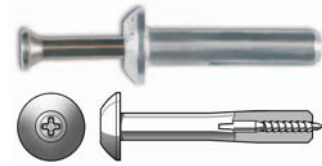


## Zamac Hammer-Screw™ *Pin Anchor*

General Purpose anchoring

Installs in a Variety of Base Materials

Removable Anchor when Screw is Backed Out with a Phillips Head Driver



**Zamac Hammer-Screw**

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### APPROVALS AND LISTINGS

Southern Building Code Conference International (SBCCI) #9944A

Federal GSA Specification Meets the proof load requirements of FF-S-325C, Group V,  
Type 2, Class 3, (superseded) and CID A-A 1925A, Type 1

# PRODUCT SUBMITTAL / SUBSTITUTION REQUEST

TO:

PROJECT:

SPECIFIED ITEM:

Section

Page

Paragraph

Description

## PRODUCT SUBMITTAL / SUBSTITUTION REQUESTED:

The attached submittal package includes the product description, specifications, drawings, and performance data for use in the evaluation of the request.

## SUBMITTED BY:

Name:

Signature:

Company:

Address:

Date:

Telephone:

Fax:

## FOR USE BY THE ARCHITECT AND/OR ENGINEER

**Approved**     **Approved as Noted**     **Not Approved**

(If not approved, please briefly explain why the product was not accepted.)

By:

Date:

Remarks:

## Zamac Hammer-Screw™ Nail Anchor

### PRODUCT DESCRIPTION

The Zamac Hammer-Screw is a unique, one-step nail drive anchor featuring a Phillips type head and a screw thread for use in concrete, block, brick or stone. It is available in 1/4" diameter and lengths ranging from 3/4" to 3". With a body formed from corrosion resistant Zamac alloy and a carbon or stainless steel drive screw, this anchor has been developed as an improvement over standard nailin anchors.

Traditionally, Zamac Nailin anchors have been used for light duty, non-engineered applications and have not been recommended for use overhead. In order to overcome these problems, the Zamac Hammer-Screw has been designed to provide a removable anchor with up to 40% higher tension load capacities when installed in concrete.

While the standard Zamac Nailin has not been recommended for use overhead, the Zamac Hammer-Screw can be used overhead provided it is designed by an engineer who will take the proper design considerations and safety factors into account.

### GENERAL APPLICATIONS AND USES

- Roof Flashings
- Brick Ties and Masonry Anchorage
- Electrical Fixtures
- HVAC and Mechanical Attachments
- Drywall track
- Maintenance

### FEATURES AND BENEFITS

- General purpose anchoring
- Installs in a variety of base materials
- Removable anchor when screw is backed out with a Phillips head driver

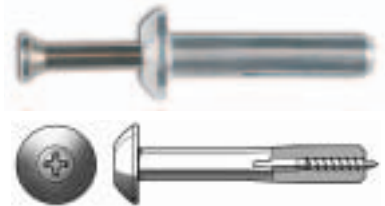
### APPROVALS AND LISTINGS

Southern Building Code Conference International (SBCCI) #9944A  
Federal GSA Specification Meets the proof load requirements of FF-S-325C, Group V, Type 2, Class 3, (superseded) and CID A-A 1925A, Type 1

### GUIDE SPECIFICATIONS

**CSI Divisions:** 03151-Concrete Anchoring, 04081-Masonry Anchorage and 05090-Metal Fastenings. Pin Anchors shall be Zamac Hammer-Screw anchors as supplied by Powers Fasteners, Inc., Brewster, NY.

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Zamac Hammer-Screw

### ANCHOR MATERIALS

Zamac Alloy with Carbon or Stainless Steel Drive Screw

### ANCHOR SIZE RANGE (TYP.)

1/4" x 3/4" to 1/4" x 3" diameter

### SUITABLE BASE MATERIALS

Normal-Weight Concrete  
Hollow Concrete Masonry  
Brick Masonry

## INSTALLATION AND MATERIAL SPECIFICATIONS

### Installation Specifications

| Dimension   | Anchor Diameter, <i>d</i> |
|---|---------------------------|
|   | 1/4"                      |
| ANSI Drill Bit Size, <i>d<sub>bit</sub></i> (in.) | 1/4                       |
| Fixture Clearance Hole (in.)                      | 5/16                      |
| Head Height (in.)                                 | 9/64                      |
| Head Width <i>d<sub>hd</sub></i> (in.)            | 35/64                     |

### Material Specifications

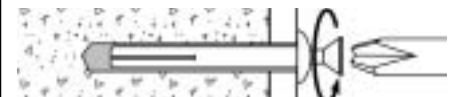
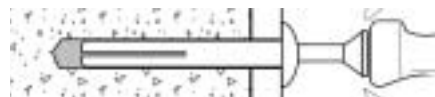
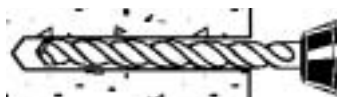
| Anchor Component | Component Material                  |                 |
|------------------|-------------------------------------|-----------------|
|                  | Mushroom Head                       | Mushroom Head   |
|                  | Carbon Steel Screw                  | Stainless Screw |
| Drive Screw      | AISI 1018                           | Type 304 SS     |
| Anchor Body      | Zamac Alloy                         | Zamac Alloy     |
| Screw Plating    | ASTM B 633, SC1, Type III (Fe/Zn 5) | N/A             |
| Screw Coating    | Perma-Seal Fluoropolymer            | N/A             |

### Installation Guidelines

Drill a hole into the base material to a depth of at least 1/4" deeper than the required embedment. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15. Blow the hole clean of dust and other material.

Insert the anchor through the fixture. Drive the screw into the anchor body to expand it. Be sure the head is seated firmly against the fixture and that the anchor is at the proper embedment.

To remove – Press a Phillips screw driver firmly into the screw head and turn counterclockwise. Remove the screw from the anchor body, then pry out the fixture and anchor body simultaneously by working the claw of a hammer under the fixture



**PERFORMANCE DATA**

**Ultimate Load Capacities for Zamac Hammer-Screw in Normal-Weight Concrete<sup>1,2</sup>**

| Anchor Diameter<br><i>d</i><br>in.<br>(mm) | Minimum Embedment Depth<br><i>h<sub>v</sub></i><br>in.<br>(mm) | Minimum Concrete Compressive Strength ( <i>f'<sub>c</sub></i> ) |                       |                         |                       |                         |                       |
|--|--|---|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|
|  |  | 2,000 psi (13.8 MPa)  |                       | 4,000 psi (27.6 MPa)    |                       | 6,000 psi (41.4 MPa)    |                       |
|  |  | Tension<br>lbs.<br>(kN)   | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) |
| 1/4<br>(6.4)                               | 5/8<br>(15.9)  | 675<br>(3.0)  | 650<br>(2.9)          | 850<br>(3.8)            | 880<br>(4.0)          | 890<br>(4.0)            | 880<br>(4.0)          |
|  | 3/4<br>(19.1)  | 790<br>(3.6)  | 805<br>(3.6)          | 1,135<br>(5.1)          | 1,115<br>(5.0)        | 1,190<br>(5.4)          | 1,115<br>(5.0)        |
|  | 7/8<br>(22.2)  | 930<br>(4.2)  | 990<br>(4.5)          | 1,205<br>(5.4)          | 1,230<br>(5.5)        | 1,250<br>(5.6)          | 1,230<br>(5.5)        |
|  | 1 1/8<br>(28.6)  | 1,220<br>(5.5)  | 1,365<br>(6.1)        | 1,350<br>(6.1)          | 1,470<br>(6.6)        | 1,450<br>(6.5)          | 1,470<br>(6.6)        |
|  | 1 3/8<br>(34.9)  | 1,325<br>(6.0)  | 1,555<br>(7.0)        | 1,450<br>(6.5)          | 1,645<br>(7.4)        | 1,530<br>(6.9)          | 1,645<br>(7.4)        |
|  | 1 3/4<br>(44.5)  | 1,480<br>(6.7)  | 1,840<br>(8.3)        | 1,600<br>(7.2)          | 1,910<br>(8.6)        | 1,660<br>(7.5)          | 1,910<br>(8.6)        |
|  | 1 7/8<br>(47.6)  | 1,480<br>(6.7)  | 1,840<br>(8.3)        | 1,600<br>(7.2)          | 1,910<br>(8.6)        | 1,660<br>(7.5)          | 1,910<br>(8.6)        |

1. The values listed above are ultimate load capacities which should be reduced by a minimum safety factor of 4.0 or greater to determine the allowable working load.  
 2. Linear interpolation may be used to determine ultimate loads for intermediate embedments and compressive strengths.

**Allowable Load Capacities for Zamac Hammer-Screw in Normal-Weight Concrete<sup>1,2,3</sup>**

| Anchor Diameter<br><i>d</i><br>in.<br>(mm) | Minimum Embedment Depth<br><i>h<sub>v</sub></i><br>in.<br>(mm) | Minimum Concrete Compressive Strength ( <i>f'<sub>c</sub></i> ) |                       |                         |                       |                         |                       |
|--|--|---|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|
|  |  | 2,000 psi (13.8 MPa)  |                       | 4,000 psi (27.6 MPa)    |                       | 6,000 psi (41.4 MPa)    |                       |
|  |  | Tension<br>lbs.<br>(kN)   | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) |
| 1/4<br>(6.4)                               | 5/8<br>(15.9)  | 170<br>(0.8)  | 165<br>(0.7)          | 215<br>(1.0)            | 220<br>(1.0)          | 225<br>(1.0)            | 220<br>(1.0)          |
|  | 3/4<br>(19.1)  | 200<br>(0.9)  | 200<br>(0.9)          | 285<br>(1.3)            | 280<br>(1.3)          | 300<br>(1.4)            | 280<br>(1.3)          |
|  | 7/8<br>(22.2)  | 235<br>(1.1)  | 250<br>(1.1)          | 300<br>(1.4)            | 310<br>(1.4)          | 315<br>(1.4)            | 310<br>(1.4)          |
|  | 1 1/8<br>(28.6)  | 305<br>(1.4)  | 340<br>(1.5)          | 340<br>(1.5)            | 370<br>(1.7)          | 365<br>(1.6)            | 370<br>(1.7)          |
|  | 1 3/8<br>(34.9)  | 330<br>(1.5)  | 390<br>(1.8)          | 365<br>(1.6)            | 410<br>(1.8)          | 385<br>(1.7)            | 410<br>(1.8)          |
|  | 1 3/4<br>(44.5)  | 370<br>(1.7)  | 460<br>(2.1)          | 400<br>(1.8)            | 480<br>(2.2)          | 415<br>(1.9)            | 480<br>(2.2)          |
|  | 1 7/8<br>(47.6)  | 370<br>(1.7)  | 460<br>(2.1)          | 400<br>(1.8)            | 480<br>(2.2)          | 415<br>(1.9)            | 480<br>(2.2)          |

1. Allowable load capacities listed are calculated using an applied safety factor of 4.0.  
 2. Linear interpolation may be used to determine allowable loads for intermediate embedments and compressive strengths.  
 3. Critical and minimum spacing and edge distances as well as reduction factors for intermediate spacing and edge distances are listed in the Design Criteria section.

**PERFORMANCE DATA**

**Ultimate and Allowable Load Capacities for Zamac Nailin in Hollow Concrete Masonry<sup>1,2</sup>**

| Anchor Diameter<br><i>d</i><br>in.<br>(mm) | Minimum Embedment Depth<br><i>h<sub>v</sub></i><br>in.<br>(mm) | <i>f'<sub>m</sub></i> ≥ 1,500 psi (10.4 MPa) |                       |                         |                       |
|--|--|--|-----------------------|-------------------------|-----------------------|
|  |  | Ultimate Load                                |                       | Allowable Load          |                       |
|  |  | Tension<br>lbs.<br>(kN)                      | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) |
| 1/4<br>(6.4)                               | 5/8<br>(15.9)  | 420<br>(1.9)                                 | 1,160<br>(5.2)        | 85<br>(0.4)             | 230<br>(1.0)          |
|  | 3/4<br>(19.1)  | 825<br>(3.7)                                 | 1,215<br>(5.5)        | 165<br>(0.7)            | 245<br>(1.1)          |
|  | 1<br>(25.4)  | 1,000<br>(4.5)                               | 1,265<br>(5.7)        | 200<br>(0.9)            | 255<br>(1.1)          |
|  | 1 1/8<br>(28.6)  | 1,090<br>(4.9)                               | 1,290<br>(5.8)        | 220<br>(1.0)            | 260<br>(1.2)          |
|  | 1 3/8<br>(34.9)  | 1,145<br>(5.2)                               | 1,345<br>(6.1)        | 230<br>(1.0)            | 270<br>(1.2)          |
|  | 1 1/2<br>(38.1)  | 1,145<br>(5.2)                               | 1,345<br>(6.1)        | 230<br>(1.0)            | 270<br>(1.2)          |

1. Tabulated load values are for anchors installed in minimum 6-inch wide, Grade N, Type II, medium and normal-weight and lightweight concrete masonry units. Mortar must be minimum Type N. Masonry compressive strength must be 1,500 psi minimum at the time of installation.
2. Tabulated load values are applicable to anchors with carbon and stainless steel drive screws. The values listed above are ultimate load capacities which should be reduced by a minimum safety factor of 5.0 or greater to determine the allowable working load.

**Ultimate and Allowable Load Capacities for Zamac-Hammer Screw in Solid or Hollow Clay Brick Masonry<sup>1,2</sup>**

| Anchor Diameter<br><i>d</i><br>in.<br>(mm) | Minimum Embedment Depth<br><i>h<sub>v</sub></i><br>in.<br>(mm) | <i>f'<sub>m</sub></i> ≥ 1,500 psi (10.4 MPa) |                       |                         |                       |
|--|--|--|-----------------------|-------------------------|-----------------------|
|  |  | Ultimate Load                                |                       | Allowable Load          |                       |
|  |  | Tension<br>lbs.<br>(kN)                      | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) |
| 1/4<br>(6.4)                               | 5/8<br>(15.9)  | 680<br>(3.1)                                 | 1,400<br>(6.3)        | 135<br>(0.6)            | 280<br>(1.3)          |
|  | 3/4<br>(19.1)  | 930<br>(4.2)                                 | 1,600<br>(7.2)        | 185<br>(0.8)            | 320<br>(1.4)          |
|  | 1<br>(25.4)  | 990<br>(4.5)                                 | 1,600<br>(7.2)        | 200<br>(0.9)            | 320<br>(1.4)          |
|  | 1 1/8<br>(28.6)  | 1,040<br>(4.7)                               | 1,600<br>(7.2)        | 210<br>(0.9)            | 320<br>(1.4)          |
|  | 1 3/8<br>(34.9)  | 1,150<br>(5.2)                               | 1,600<br>(7.2)        | 230<br>(1.0)            | 320<br>(1.4)          |
|  | 1 1/2<br>(38.1)  | 1,260<br>(5.7)                               | 1,600<br>(7.2)        | 250<br>(1.1)            | 320<br>(1.4)          |

1. Tabulated load values are for anchors installed in Grade SW multiple wythe, brick masonry conforming to ASTM C62.
2. Tabulated load values are applicable to anchors with carbon and stainless steel drive screws. Allowable loads are calculated using an applied safety factor of 5.0.

**DESIGN CRITERIA**

**Combined Loading**

For anchors loaded in both shear and tension, the combination of loads should be proportioned as follows:

$$\left(\frac{N_u}{N_n}\right) + \left(\frac{V_u}{V_n}\right) \leq 1$$

Where: *N<sub>u</sub>* = Applied Service Tension Load  
*N<sub>n</sub>* = Allowable Tension Load  
*V<sub>u</sub>* = Applied Service Shear Load  
*V<sub>n</sub>* = Allowable Shear Load

**Load Adjustment Factors for Spacing and Edge Distances**

| Anchor Installed in Normal-Weight Concrete |                   |  |   |                                     |  |
|--|-------------------|--|---|-------------------------------------|--|
| Anchor Dimension                           | Load Type         | Critical Distance (Full Anchor Capacity) | Critical Load Factor                              | Minimum Distance (Reduced Capacity) | Minimum Load Factor                                |
| Spacing ( <i>s</i> )                       | Tension and Shear | <i>s<sub>cr</sub></i> = 10 <i>d</i>      | <i>F<sub>N</sub></i> = <i>F<sub>V</sub></i> = 1.0 | <i>s<sub>min</sub></i> = 5 <i>d</i> | <i>F<sub>N</sub></i> = <i>F<sub>V</sub></i> = 0.50 |
| Edge Distance ( <i>c</i> )                 | Tension           | <i>c<sub>cr</sub></i> = 12 <i>d</i>      | <i>F<sub>N</sub></i> = 1.0                        | <i>c<sub>min</sub></i> = 5 <i>d</i> | <i>F<sub>N</sub></i> = 0.80                        |
|  | Shear             | <i>c<sub>cr</sub></i> = 12 <i>d</i>      | <i>F<sub>V</sub></i> = 1.0                        | <i>c<sub>min</sub></i> = 5 <i>d</i> | <i>F<sub>V</sub></i> = 0.50                        |

**DESIGN CRITERIA**

**Load Adjustment Factors for Normal-Weight Concrete**

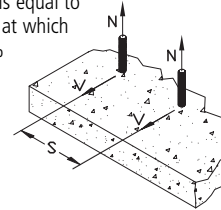
| Spacing, Tension ( $F_N$ ) & Shear ( $F_V$ ) |        |
|--|--------|
| Dia. (in.)                                   | 1/4    |
| $S_{cr}$ (in.)                               | 2 1/2  |
| $S_{min}$ (in.)                              | 1 1/4  |
| Spacing, $s$ (in.)                           | 1 1/4  |
|  | 1 3/8  |
|  | 1 9/16 |
|  | 1 5/8  |
|  | 1 7/8  |
|  | 2 1/8  |
|  | 2 1/2  |

| Edge Distance, Tension ( $F_N$ ) |       |
|----------------------------------|-------|
| Dia. (in.)                       | 1/4   |
| $C_{cr}$ (in.)                   | 3     |
| $C_{min}$ (in.)                  | 1 1/4 |
| Edge Dist., $c$ (in.)            | 1 1/4 |
|                                  | 2     |
|                                  | 2 1/4 |
|                                  | 2 1/2 |
|                                  | 3     |

| Edge Distance, Shear ( $F_V$ ) |       |
|--------------------------------|-------|
| Dia. (in.)                     | 1/4   |
| $C_{cr}$ (in.)                 | 3     |
| $C_{min}$ (in.)                | 1 1/4 |
| Edge Dist., $c$ (in.)          | 1 1/4 |
|                                | 2     |
|                                | 2 1/4 |
|                                | 2 1/2 |
|                                | 3     |

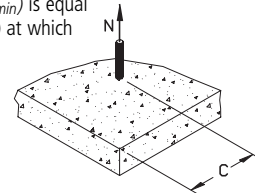
Notes: For anchors loaded in tension and shear, the critical spacing ( $s_{cr}$ ) is equal to 10 anchor diameters ( $10d$ ) at which the anchor achieves 100% of load.

Minimum spacing ( $s_{min}$ ) is equal to 5 anchor diameters ( $5d$ ) at which the anchor achieves 50% of load.

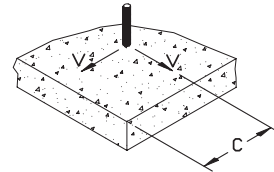


Notes: For anchors loaded in tension, the critical edge distance ( $c_{cr}$ ) is equal to 12 anchor diameters ( $12d$ ) at which the anchor achieves 100% of load.

Minimum edge distance ( $c_{min}$ ) is equal to 5 anchor diameters ( $5d$ ) at which the anchor achieves 80% of load.



Notes: For anchors loaded in shear, the critical edge distance ( $c_{cr}$ ) is equal to 12 anchor diameters ( $12d$ ) at which the anchor achieves 100% of load. Minimum edge distance ( $c_{min}$ ) is equal to 5 anchor diameters ( $5d$ ) at which the anchor achieves 50% of load.



**ORDERING INFORMATION**

**Mushroom Head with No. 2 Phillips Head Screw**

| Catalog Number |    | Anchor Size   | Drill Diameter | Standard Box | Standard Carton | Wt./100 |
|----------------|----|---------------|----------------|--------------|-----------------|---------|
| CS             | SS |               |                |              |                 |         |
| 2848           | —  | 1/4" x 2 1/4" | 1/4"           | 100          | 500             | 3 1/2   |
| 2850           | —  | 1/4" x 3"     | 1/4"           | 100          | 500             | 4 1/4   |

\*Discontinued item once current stock is exhausted.



**Master Pack**

| Catalog Number | Anchor Size   | Drill Diameter | Standard Box | Standard Carton | Wt./100 |
|----------------|---------------|----------------|--------------|-----------------|---------|
| 2939           | 1/4" x 3/4"   | 1/4"           | 1,000        | 1,000           | 1 1/2   |
| 2940           | 1/4" x 1"     | 1/4"           | 1,000        | 1,000           | 1 3/4   |
| 2942           | 1/4" x 1 1/4" | 1/4"           | 1,000        | 1,000           | 2 1/4   |
| 2944           | 1/4" x 1 1/2" | 1/4"           | 1,000        | 1,000           | 2 1/2   |
| 2946           | 1/4" x 2"     | 1/4"           | 1,000        | 1,000           | 3       |
| 2948           | 1/4" x 2 1/4" | 1/4"           | 1,000        | 1,000           | 3 1/2   |
| 2949           | 1/4" x 3"     | 1/4"           | 1,000        | 1,000           | 4 1/4   |

**Mushroom Head with No. 2 Phillips Head Perma-Seal Screw**

| Catalog Number   | Anchor Size   | Drill Diameter | Standard Box | Standard Carton | Wt./100 |
|------------------|---------------|----------------|--------------|-----------------|---------|
| 2817             | 1/4" x 1 1/4" | 1/4"           | 100          | 500             | 2 1/4   |
| 2818 Master Pack | 1/4" x 1 1/4" | 1/4"           | 1,000        | 1,000           | 2 1/4   |