1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2012 and 2009 International Building Code® (IBC)

Property evaluated:

Structural

2.0 USES

BauGrid® Reinforcement, also known as BauGrid® Welded Reinforcement Grid (WRG™), as described in Section 3.2 of this report, is used as lateral or transverse reinforcement, replacing ties, cross-ties, and hoops, to confine concrete and to provide lateral support for longitudinal or primary reinforcing bars in concrete shear walls, including special structural walls and for longitudinal or primary reinforcing bars in concrete columns, as permitted in applicable sections of the IBC. BauGrid® Reinforcement, as described in Section 3.2 of this report, is also used as lateral or transverse reinforcement, replacing stirrups, to confine concrete and to provide lateral support for longitudinal or primary reinforcing bars in concrete beams of moment frames and as shear reinforcement in concrete beams as permitted in applicable sections of the IBC.

Ladder-type BauGrid® Reinforcement, as described in Section 3.3 of this report, is used as lateral or transverse reinforcement, replacing ties, cross-ties, and hoops, to confine concrete and to provide lateral support for longitudinal (or vertical) reinforcement and as horizontal shear reinforcement in concrete structural walls as permitted in applicable sections of the IBC.

3.0 DESCRIPTION

3.1 General:

BauGrid® Reinforcement consists of four or more intersecting high-strength plain steel wires complying with ASTM A1064, resistance-welded into rectilinear grids. Additional wires may be added to provide confinement cells within the assembly. Two types, BauGrid® Reinforcement and Ladder-type BauGrid® Reinforcement, are available. Examples of the products and their applications are illustrated in Figures 1 through 11. The resulting grids comply with ASTM A1064 and supplementary requirements described in the BauGrid USA, LLC, quality assurance manual, with a maximum dimensional tolerance of ±1/8 inch (3 mm). Refer to Figure 12 for BauGrid® Reinforcement dimensions.

3.2 BauGrid® Reinforcement:

BauGrid® Reinforcement is manufactured with plain wire complying with ASTM A1064. The wires are arranged at right angles to each other and resistance-welded together at intersections into various rectilinear grid-like shapes. Table 1 presents the available wire sizes. Figures 9 and 12 provide illustrations of BauGrid® Reinforcement configurations.

3.3 Ladder-type BauGrid® Reinforcement:

Ladder-type BauGrid® Reinforcement is manufactured with plain wire complying with ASTM A1064. The wires are arranged with cross wires and longitudinal wires at right angles to each other and resistance-welded together at intersections into various rectilinear ladder-like shapes. Table 1 presents the available wire sizes. Figures 9 and 12 provide illustrations of Ladder-type BauGrid® Reinforcement configurations.

3.4 Concrete:

Normal-weight concrete must conform to Chapter 19 of the IBC. Concrete used in special moment frames and special structural walls must also comply with requirements in ACI 318 Section 21.1.4. The maximum compressive strength for design must comply as follows:

- Columns: 12,000 psi (82.74 MPa).
- Beam–column connections: 7,500 psi (51.71 MPa).
- Walls: 10,000 psi (68.95 MPa).
4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 Concrete: The BauGrid® Reinforcement and Ladder-type BauGrid® Reinforcement must be designed by a registered design professional as alternatives to confinement ties, hoops and stirrups. One- and Two-cell BauGrid® reinforcement used as transverse reinforcement in concrete coupling beams and prestressed concrete is outside the scope of this report. Three-cell BauGrid® reinforcement, as shown in Figure 5 (Beam), BauGrid® Reinforcement System Typical Applications, is allowed in coupling beams. The BauGrid® Reinforcement must be designed for applications in accordance with the IBC and ACI 318 as permitted in Table 2 for reinforced concrete structures.

4.1.2 Masonry: Masonry design in accordance with TMS 402 is outside the scope of this report. Masonry columns, masonry shear walls, and masonry boundary elements of shear walls must be designed by a registered design professional as reinforced concrete structures in accordance IBC, ACI 318 and this evaluation report, with the masonry serving as a non-structural element outside the concrete core and used as formwork, weather protection, or fire-resistance protection in accordance with applicable requirements of the IBC.

4.2 Installation:

The BauGrid® Reinforcement including Ladder-type BauGrid® Reinforcement must be installed in accordance with this report and plans and specifications prepared by a registered design professional and approved by the code official. Details and placement must comply with the applicable requirements for stirrups, ties, cross-ties, and hoops in IBC, ACI 318 and this report. The BauGrid® Reinforcement must be placed with longitudinal reinforcing bars, in shear wall boundary elements, columns or beams passing through the grids and held tightly in position at the intersections of the wires of the ladders and grids. Ladder-type BauGrid® Reinforcement must be placed horizontally in concrete walls. The wire elements of the grids must not be bent unless approved by the registered design professional and the code official.

4.3 Special Inspection:

Special inspection for concrete must be in accordance with Section 1705.3 of the 2012 IBC (Section 1704.4 of the 2009 IBC, as applicable) and Section 1.3 of ACI 318. The special inspector must verify reinforcement identification, wire type, size and designation; grid dimensions; grid placement; support; clearance; concrete cover; and the test certificate required in accordance with Sections 1705.3.1 and 1903.1 of the 2012 IBC (Sections 1704.4.1 and 1903.1 of the 2009 IBC, as applicable).

5.0 CONDITIONS OF USE

The BauGrid® Reinforcement and Ladder-type BauGrid® Reinforcement described in this report comply with or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 BauGrid® Reinforcement including Ladder-type BauGrid® Reinforcement used as ties, cross-ties, hoops, and stirrups must be designed, manufactured and installed in accordance with this report and the IBC.

5.2 Special inspection must be provided in accordance with Section 4.3 of this report.

5.3 BauGrid® Reinforcement used as ties, cross-ties, hoops, and stirrups for reinforced concrete shear walls and concrete moment frames serving as the lateral force–resisting system for building structures, must be designed in accordance with this report and the IBC.

5.4 One- and Two-cell BauGrid® reinforcement used as transverse reinforcement in concrete coupling beams and prestressed concrete is outside the scope of this report.

5.5 Ladder-type BauGrid® Reinforcement is limited as lateral or transverse reinforcement, replacing ties, cross-ties, and hoops, to confine concrete and to provide lateral support for longitudinal (or vertical) reinforcement and as horizontal shear reinforcement in concrete structural walls.

5.6 For masonry structures reinforced with BauGrid® Reinforcement including Ladder-type BauGrid® Reinforcement, compliance with Section 4.1.2 is required.

5.7 The BauGrid® Reinforcement must be manufactured at the Xinglian Steel Mesh (Shenzhen) Co., Ltd. facility in Shenzhen, China, or CaliBaja Manufacturing, Inc. facility in Mexicali, Mexico, under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Baugrid® Reinforcement (AC403), dated October 2008 (editorially revised April 2015).

7.0 IDENTIFICATION

7.1 The grids are identified by an attached ticket bearing the company name (BauGrid USA, LLC), the name “BauGrid®”, the wire size, the designation “ASTM A1064”, and the evaluation report number (ESR-2352).

7.2 The report holder’s contact information is the following:

BAUGRID USA, LLC
4445 EASTGATE MALL ROAD, SUITE 200
SAN DIEGO, CALIFORNIA 92121
(858) 382-4258
www.baugridusa.com
# TABLE 1—AVAILABLE WIRE SIZES

<table>
<thead>
<tr>
<th>SIZE NUMBER (ASTM A1064)</th>
<th>WIRE DIAMETER in. [mm]</th>
<th>WIRE AREA in.² [mm²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>W11</td>
<td>3/8 [9.50]</td>
<td>0.110 [71]</td>
</tr>
<tr>
<td>W20</td>
<td>1/2 [12.70]</td>
<td>0.200 [127]</td>
</tr>
<tr>
<td>W31</td>
<td>5/8 [15.88]</td>
<td>0.310 [198]</td>
</tr>
<tr>
<td>W45</td>
<td>7/8 [19.10]</td>
<td>0.450 [287]</td>
</tr>
</tbody>
</table>

# TABLE 2—APPLICABLE CODE SECTION REFERENCES FOR BAUGRID® REINFORCEMENT IN CONCRETE STRUCTURES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>REQUIREMENT</th>
<th>ACI 318-11 and -08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Wall</td>
<td>General Design of Walls / Minimum Reinforcement¹ (Horizontal Reinforcement)</td>
<td>11.9, 14.2, 14.3.3</td>
</tr>
<tr>
<td></td>
<td>Shear Wall Reinforcement (Horizontal Reinforcement)</td>
<td>21.9.2, 21.10.2</td>
</tr>
<tr>
<td></td>
<td>Structural Wall Shear Strength (Horizontal Reinforcement)</td>
<td>21.9.4</td>
</tr>
<tr>
<td></td>
<td>Boundary Element (Ties Only)</td>
<td>21.9.6</td>
</tr>
<tr>
<td></td>
<td>Coupling Beam² (Ties Only)</td>
<td>21.9.7</td>
</tr>
<tr>
<td>Concrete Ties</td>
<td>Ties for Compression Members</td>
<td>7.10.5</td>
</tr>
<tr>
<td></td>
<td>Lateral Reinforcement For Flexural Members</td>
<td>7.11</td>
</tr>
<tr>
<td>Concrete Stirrups</td>
<td>Shear Strength Provided by Shear Reinforcement</td>
<td>11.4, 11.5</td>
</tr>
<tr>
<td>Concrete Hoops</td>
<td>Transverse Reinforcement – Flexural Members</td>
<td>21.5.3, 21.5.4</td>
</tr>
<tr>
<td></td>
<td>Transverse Reinforcement – Bending and Axial Loaded Members</td>
<td>21.6.4, 21.6.5</td>
</tr>
<tr>
<td></td>
<td>Transverse Reinforcement for Joints of Moment Frames</td>
<td>21.7.3</td>
</tr>
</tbody>
</table>

¹In accordance with ACI 318, welded wire reinforcement with wire size up to W31 must comply with ACI 318 Section 11.9 or Section 14.3.3, as applicable; welded wire reinforcement with wire size larger than W31, such as W45, must comply with ACI 318 Section 11.9.

²Refer to Section 4.1.1 of this report for limitations.