DIVISION: 03 00 00—CONCRETE  
Section: 03 16 00—Concrete Anchors  
Section: 03 41 00—Precast Structural Concrete  
Section: 03 47 00—Site-cast Concrete  

REPORT HOLDER:  
MAGMATECH LTD  

EVALUATION SUBJECT:  
MAGMATECH YETI-ANCHOR  
FIBER-REINFORCED WYTHE CONNECTORS FOR INTEGRALLY INSULATED WALL PANELS  

1.0 EVALUATION SCOPE  
Compliance with the following codes:  
Property evaluated:  
- Structural  
- Environmental  
- Physical and Mechanical  

2.0 USES  
Yeti-Anchor connectors (40H, 40D, 50H and 50D) are used as panel connections in integrally insulated concrete walls (commonly known as sandwich walls) to resist static and transient tension (40H, 40D, 50H and 50D) and shear loads (40H and 50H) in uncracked, normal-weight concrete having a specified strength, \( f'c \), of 2,500 psi to 6,000 psi. The connectors are alternatives to cast-in-place steel anchors described in Section 1901.3 of the 2018 and 2015 IBC, Sections 1908 and 1909 of the 2012 IBC, or Sections 1911 and 1912 of the 2009 IBC.  

3.0 DESCRIPTION  
3.1 Connectors:  
Yeti-Anchor connectors (40H, 40D, 50H and 50D) referred to as “connectors” in this report are fiber-reinforced composite connectors with dove-tail anchors at both ends for anchorage into wet concrete with a plastic stopper in the middle of the connector.  
The connectors are illustrated in Figures 1 and 2. The connectors are produced by a pultrusion process from a polymer composite consisting of glass fiber reinforced epoxy vinylester. The stopper component is injection-molded from acrylonitrile butadiene styrene (ABS). Yeti-Anchor connectors measure 0.315 inch (8 mm) diameter.  

3.2 Concrete:  
Normal-weight concrete must conform to Section 1903 of the 2018, 2015 and 2012 IBC, or Section 1905 of the 2009 IBC, as applicable, and comply with the compressive strength requirements in Tables 3 and 4.  

4.0 DESIGN AND INSTALLATION  
4.1 Physical and Material Properties of the Connectors:  
Design must be based on the physical and mechanical properties described in Tables 1 and 2.  

4.2 Design for Tension and Shear:  
Design must be performed using the applicable sections of the applicable codes with the allowable loads as noted in Tables 3 and 4. Allowable loads for Yeti-Anchor connectors subjected to interaction of shear and tension forces must be determined by the following equation:  
\[
\left( \frac{P_s}{P_l} \right)^{5/3} + \left( \frac{V_s}{V_l} \right)^{5/3} \leq 1
\]
where:  
- \( P_s \) = Applied Service Tension Load (lbf or N)  
- \( P_l \) = Service Tension Load (lbf or N)  
- \( V_s \) = Applied Service Shear Load (lbf or N)  
- \( V_l \) = Service Shear Load (lbf or N)  

4.3 Displacement of the Connectors:  
The displacement due to gravity loads must be limited to 0.1 inch (2.54 mm). When the connector displacement exceeds the limiting value of 0.1 inch (2.54 mm) due to the gravity loads, the free end of the connector must be supported to maintain fixity by other means. The displacement must be calculated as follows (neglecting any contribution from the insulation in the intended application):  
\[
\Delta g = \frac{Q_g \cdot d_A^3}{12 \cdot E_{AB} \cdot I_A}
\]
where:  
- \( Q_g \) = Gravity load on the connector, typically the weight of the fascia layer of the tributary area for the connector  
- \( \Delta g \) = Displacement due to gravity load (inch or mm)  
- \( d_A \) = Diameter of the connector

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5.0 CONDITIONS OF USE

The Yeti-Anchor connectors 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 Connector sizes, dimensions, and installation must comply with the information in this report and MagmaTech Ltd’s published installation instructions. In case of a conflict between this report and any other documentation, this report governs.

5.2 Allowable tension and shear loads must be used as noted in Table 3 & 4.

5.3 Calculations and details demonstrating compliance with this report must be submitted to the code official for approval. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.4 Design and installation of concrete wall panels, except as specifically noted in this report, is outside the scope of this report and must comply with the applicable code.

5.5 Connectors may be recognized for interior exposure, exterior exposure or damp environments.

5.6 Connectors must not be permitted in contact with preserve-treared and fire-retardant-treated wood.

5.7 Special inspection must be provided in accordance with Section 4.5 of this report.

5.8 Since ICC-ES acceptance criteria for evaluating data to determine the performance of connectors subjected to fatigue or shock loading is unavailable at this time, the use of these connectors under these conditions is beyond the scope of this statement.

5.9 Since an ICC-ES acceptance criteria for evaluating data to determine the performance of fiber-reinforced connectors in cracked concrete is unavailable at this time, the use of these connectors must be limited to installation in uncracked, normal-weight concrete.

5.10 Connectors must not be permitted for use in conjunction with fire-resistant-rated construction, except when connectors resist wind loading only, or for other than wind loading, special consideration is given to fire exposure conditions.

5.11 Use of the connectors to resist seismic loads is beyond the scope of this report.

5.12 Connectors are manufactured by MagmaTech Ltd, under a quality control program with inspections conducted by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Fiber-reinforced Composite Connectors Anchored in Concrete (AC320), dated October 2015 (editorially revised October 2019), including creep tests.

7.0 IDENTIFICATION

7.1 The connectors must be identified in the field by dimensional characteristics and packaging. The packaging label indicates the MagmaTech Ltd name and address, and the ICC-ES report number (ESR-3820).

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

MAGMATECH LTD
110 GLOUCESTER AVENUE
LONDON NW1 8HX
UNITED KINGDOM
www.magmatech.co.uk
### TABLE 1—PHYSICAL AND MECHANICAL PROPERTIES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>Yeti 40 H AND 40 D</th>
<th>Yeti 50 H AND 40 D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Customary Units</td>
<td>SI Units</td>
</tr>
<tr>
<td>Cross-sectional area</td>
<td>0.078 in²</td>
<td>50.3 mm²</td>
</tr>
<tr>
<td>Moment of inertia</td>
<td>0.000483 in⁴</td>
<td>201 mm⁴</td>
</tr>
<tr>
<td>Embedment Depth (H - horizontal configuration)</td>
<td>1.60 inches</td>
<td>40 mm</td>
</tr>
<tr>
<td>Embedment depth (D - diagonal configuration perpendicular to panel)</td>
<td>1.50 inches</td>
<td>38 mm</td>
</tr>
<tr>
<td>Embedment Depth (D - Diagonal Configuration)</td>
<td>2.10 inches</td>
<td>54 mm</td>
</tr>
<tr>
<td>Bending elastic modulus (flexural modulus)</td>
<td>7,291,448 psi</td>
<td>50,272 MPa</td>
</tr>
</tbody>
</table>

### TABLE 2—INSTALLATION PARAMETERS

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>Yeti 40 H²</th>
<th>Yeti 40 D³</th>
<th>Yeti 50 H²</th>
<th>Yeti 50 D³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedment Depth¹</td>
<td>1.60 inches</td>
<td>2.10 inches</td>
<td>2.00 inches</td>
<td>2.60 inches</td>
</tr>
<tr>
<td>Critical Edge Distance</td>
<td>4.00 inches</td>
<td>4.00 inches</td>
<td>4.00 inches</td>
<td>4.00 inches</td>
</tr>
<tr>
<td>Critical Spacing</td>
<td>8.00 inches</td>
<td>8.00 inches</td>
<td>8.00 inches</td>
<td>8.00 inches</td>
</tr>
<tr>
<td>Minimum Concrete Depth</td>
<td>2.00 inches</td>
<td>2.00 inches</td>
<td>3.00 inches</td>
<td>3.00 inches</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

¹ According to Figure 3 of this report.
² Horizontal configuration.
³ Diagonal configuration.

### TABLE 3—ALLOWABLE TENSION AND SHEAR VALUES IN NORMAL-WEIGHT CONCRETE 1.6-INCH EMBEDMENT DEPTH¹

<table>
<thead>
<tr>
<th>CONCRETE COMPRESSIVE STRENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,500psi (17MPa)</td>
</tr>
<tr>
<td>Yeti 40 H Static Tension (90 degrees to panel)</td>
</tr>
<tr>
<td>Yeti 40 D Static Tension (45 degrees to panel)</td>
</tr>
<tr>
<td>Yeti 40 H Static Shear (90 degrees to panel)</td>
</tr>
</tbody>
</table>

¹ Allowable loads have been determined by applying a factor of safety of 4 to the test results.

### TABLE 4—ALLOWABLE TENSION AND SHEAR VALUES IN NORMAL-WEIGHT CONCRETE 2-INCH EMBEDMENT DEPTH¹

<table>
<thead>
<tr>
<th>CONCRETE COMPRESSIVE STRENGTH</th>
</tr>
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<tbody>
<tr>
<td>2,500psi (17MPa)</td>
</tr>
<tr>
<td>Yeti 50 H Static Tension (90 degrees to panel)</td>
</tr>
<tr>
<td>Yeti 50 D Static Tension (45 degrees to panel)</td>
</tr>
<tr>
<td>Yeti 50 H Static Shear (90 degrees to panel)</td>
</tr>
</tbody>
</table>

¹ Allowable loads have been determined by applying a factor of safety of 4 to the test results.
FIGURE 1—YETI 40 HORIZONTAL (H) AND DIAGONAL (D) CONFIGURATIONS

FIGURE 2—YETI 50 HORIZONTAL (H) AND DIAGONAL (D) CONFIGURATIONS
FIGURE 3—EMBEDMENT DETAIL OF YETI H AND YETI D
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that the Magmatech Yeti-Anchor Fiber-Reinforced Wythe Connectors for Integrally Insulated Wall Panels, recognized in ICC-ES master evaluation report ESR-3820, have also been evaluated for compliance with the codes noted below:

Applicable code editions:
- 2017 Florida Building Code—Building
- 2017 Florida Building Code—Residential

2.0 CONCLUSIONS

The Magmatech Yeti-Anchor Fiber-Reinforced Wythe Connectors for Integrally Insulated Wall Panels, described in master evaluation report ESR-3820, comply with the Florida Building Code—Building and the Florida Building Code—Residential, when designed and installed in accordance with the 2015 International Building Code® provisions noted in the master report.

Use of the Magmatech Yeti-Anchor Fiber-Reinforced Wythe Connectors for Integrally Insulated Wall Panels for compliance with the High-Velocity Hurricane Zone Provisions of the Florida Building Code—Building and the Florida Building Code—Residential has not been evaluated and is outside the scope of this supplement.

For products falling under Florida Rule 9N-3, verification that the report holder’s quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued October 2019 and revised November 2019.