Technical Evaluation Report
TER 1201-04
Fire-Resistance Ratings of GCT Composite Concrete Assemblies - Required Mortar Thickness

Gulf Concrete Technology

Product:
PSM Series Panels and PSG3 and PSG6 Series Panels

Issue Date:
April 28, 2012
Revision Date:
September 4, 2019
Subject to Renewal:
April 1, 2020
Fire-Resistance Ratings of GCT Composite Concrete Assemblies – Required Mortar Thickness

1. Products Evaluated:
   1.1. Gulf Concrete Technology (GCT) composite concrete assemblies for use in wall, roof and floor assemblies
       1.1.1. PSM Series Panels
       1.1.2. PSG3 and PSG6 Series Panels
   1.2. For the most recent version of this Technical Evaluation Report (TER), visit drjcertification.org. For more detailed state professional engineering and code compliance legal requirements and references, visit drjcertification.org/statelaw. DrJ is fully compliant with all state professional engineering and code compliance laws.
   1.3. This TER can be used to obtain product approval in any country that is an IAF MLA Signatory (all countries found here) and covered by an IAF MLA Evaluation per the Purpose of the MLA (as an example, see letter to ANSI from the Standards Council of Canada). Manufacturers can go to jurisdictions in the U.S., Canada and other IAF MLA Signatory Countries and have their products readily approved by authorities having jurisdiction using DrJ’s ANSI accreditation.
   1.4. Building code regulations require that evaluation reports are provided by an approved agency meeting specific requirements, such as those found in IBC Section 1703. Any agency accredited in accordance with ANSI ISO/IEC 17065 meets this requirement within ANSI’s scope of accreditation. For a list of accredited agencies, visit ANSI’s website. For more information, see drjcertification.org.
   1.5. Requiring an evaluation report from a specific private company (i.e. ICC-ES, IAPMO, CCMC, DrJ, etc.) can be viewed as discriminatory and is a violation of international, federal, state, provincial and local anti-trust and free trade regulations.
   1.6. DrJ’s code compliance work:
       1.6.1. Conforms to code language adopted into law by individual states and any relevant consensus based standard such as an ANSI or ASTM standard.
       1.6.2. Complies with accepted engineering practice, all professional engineering laws and by providing an engineer’s seal DrJ takes professional responsibility for its specified scope of work.
2. Applicable Codes and Standards:¹
   2.2. 2012, 2015 and 2018 International Residential Code (IRC)
   2.3. ACI 318 – Building Code Requirements for Structural Concrete
   2.4. ACI 506R – Guide to Shotcrete
   2.5. ASTM C387 – Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar

3. Performance Evaluation:
   3.1. The fire-resistance ratings of the assemblies listed in Section 1 were evaluated in accordance with IBC Section 722 Calculated Fire Resistance.
   3.2. Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

4. Product Description and Materials:
   4.1. GCT insulated concrete panels are prefabricated lightweight structural elements consisting of an expanded polystyrene (EPS) core sandwiched between two layers of galvanized steel welded wire mesh.
     4.1.1. A steel wire connector is pierced completely through the EPS core and welded to each of the outer layer sheets of galvanized steel welded wire mesh.
     4.1.2. Where needed, deformed steel reinforcement bars are used.
     4.1.3. A high-strength mortar achieving 4,000 psi at 28 days is sprayed onto each side of the panels in the field at the jobsite to create monolithic wall, wall/slab and wall/roof concrete elements.
     4.1.4. Application equipment designed specifically for the application of mortar mixes is highly recommended.
   4.2. GCT wall panels designated PSM consist of a single layer of wire mesh on each side of an EPS core varying from 1.6” up to 10” in thickness. A typical section configuration is shown in Figure 1.
     4.2.1. A minimum of 0.75” of mortar cover is required over the outer face of the wire mesh on each side, resulting in an average of 1.4”-thick mortar cover on each side of the panel.

¹ Unless otherwise noted, all references in this code compliant technical evaluation report (TER) are from the 2018 version of the codes and the standards referenced therein, including, but not limited to, ASCE 7, SDPWS and WFCM. This product also complies with the 2000-2015 versions of the IBC and IRC and the standards referenced therein. As required by law, where this TER is not approved, the building official shall respond in writing, stating the reasons this TER was not approved. For variations in state and local codes, if any see Section 8.
4.3. GCT floor or roof panels designated PSM-Slab consist of EPS cores varying from 3" up to 10" in thickness. A typical section configuration is shown in Figure 2.

4.3.1. Working as floor slabs or a roof system, the upper side is poured with a concrete layer (3,500 psi) and will be 2.4" thick with at least 2" over the wire mesh.

4.3.2. The lower side of the section will require a minimum of 0.75” of mortar cover under the outer face of the wire mesh.

4.4. GCT floor slab or roof panels designated PSG3 consist of EPS cores with voids to form three (3) concrete joists for every 4’ of width. A typical section configuration is shown in Figure 3.

4.4.1. The joist depth will vary from 4” to 10”, according to the requirements.

4.4.2. The upper side is poured with a concrete layer (3,500 psi) and will be 2.4” thick with at least 2” over the wire mesh.

4.4.3. The lower side of the section will require a minimum of 0.75” of mortar cover under the outer face of the wire mesh.

4.4.4. In addition, a minimum (2) #4 rebar is placed on the tension (lower) side of each concrete joist.

4.4.5. When required by the building design, rebar is placed in the top concrete layer.
4.5. GCT floor and roof panels designated PSG6 consist of EPS cores with voids to form six (6) concrete joists for every 4’ of width. A typical section configuration is shown in Figure 4.

4.5.1. The joist depth will vary from 4” to 10”, according to the requirements.

4.5.2. The upper side is poured with a concrete layer (3,500 psi) and will be 2.4” thick with at least 2” over the wire mesh.

4.5.3. The lower side of the section will require a minimum of 0.75” of mortar cover under the outer face of the wire mesh.

4.5.4. In addition, a minimum (2) #4 rebar is placed on the tension (lower) side of each concrete joist.

4.5.5. When required by the building design, rebar is placed in the top concrete layer.
4.6. The concrete and mortar thicknesses required to achieve a given fire-resistance rating are shown in Table 1 and Table 2.

4.7. GCT panels consisting of an EPS core and galvanized wire mesh are prefabricated and delivered to the jobsite where they are installed. The high-strength mortar and concrete are then applied on the jobsite (Figure 5).

4.8. Material

4.8.1. EPS Core
   4.8.1.1. The EPS foam core is made up of Type I EPS foam boards conforming to ASTM C578.
   4.8.1.2. The EPS core is molded into proprietary shapes, which vary depending on the intended application (i.e., wall, floor or roof application).
   4.8.1.3. The EPS core thickness varies depending on the application as described in Section 4.2 to 4.6.
   4.8.1.4. The EPS core has the following characteristics:
      4.8.1.4.1. Minimum Density: 0.9 lbs./cf
      4.8.1.4.2. Flame Spread Index\(^2\): 25 or less
      4.8.1.4.3. Smoke Developed Index\(^2\): 450 or less

4.8.2. Steel Welded Wire Mesh
   4.8.2.1. The galvanized steel welded wire mesh is made from steel with a minimum yield of 85 ksi and a minimum fracture of 95 ksi, and it also complies with ACI 318-14 Section 20.2.1.7 and IBC Section 1903.
   4.8.2.2. Longitudinal or principal direction wires are 3.0 mm (11 gauge) in thickness and have an equivalent spacing of 3.0" o.c.
   4.8.2.3. Transverse or secondary direction wires are 2.5 mm (13 gauge) in thickness and have a uniform spacing of 2.6" o.c.
   4.8.2.4. The front and back wire mesh layers are tied together along the longitudinal direction in six (6) rows with 3.0 mm (11 gauge) wire.

4.8.3. Other Reinforcement
   4.8.3.1. Where required, deformed steel reinforcement bars are used, which have a minimum yield stress of 60 ksi and comply with ACI 318-14 Section 20.2.1.7 and IBC Section 1903.

---

\(^2\) When tested in accordance with ASTM E84 in a 4" thickness and maximum 1.0 pcf density.
4.8.4. Mortar Application

4.8.4.1. Carmelo Structural Mortar Mix is recommended for application on the GCT insulated concrete panels because it has a compressive strength of 4,000 psi.

4.8.4.1.1. Other structural mortar mixes may be used if they provide strength and stiffness that are at least equivalent to the Carmelo Structural Mortar Mix and as described in Section 4.8.4.4.1.

4.8.4.2. Carmelo Structural Mortar Mix is a single component Portland cement-based plaster containing additives to enhance its bonding strength.

4.8.4.3. The mortar contains micro-spheres with pozzolanic action to make it less permeable, in addition to making it easy to place and finish.

4.8.4.4. Low-pressure mortar application equipment is highly recommended for speed and quality consistency.

4.8.4.4.1. The mortar used must have the following characteristics:

4.8.4.4.1.1. Comply with ASTM C387, Type M

4.8.4.4.1.2. Minimum compressive strength at 28 days of 4,000 psi, according to ASTM C387

4.8.4.4.1.3. Maximum aggregate size of 3/16”

4.8.4.4.1.4. Aggregate must conform to ACI 506R Table 2.1

4.8.5. Concrete

4.8.5.1. The placed concrete must be a normal weight complying with IBC Chapter 19 and have the following characteristics.

4.8.5.1.1. Compressive strength: 3,500 psi minimum at 28 days

4.8.5.1.2. Slump: minimum 2”

4.8.5.1.3. Aggregate size: 1/2” maximum

5. Applications:

5.1. Fire-Resistance Applications

5.1.1. Table 1 and Table 2 list the required mortar thickness for GCT assemblies to achieve various fire-resistance ratings.

### Table 1: Required Mortar Thickness for GCT Wall Assemblies to Achieve the Listed Fire-Resistance Ratings

<table>
<thead>
<tr>
<th>Assembly Name</th>
<th>Assembly Type</th>
<th>1-Hour Rating</th>
<th>2-Hour Rating</th>
<th>3-Hour Rating</th>
<th>4-Hour Rating</th>
<th>Assembly Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSM</td>
<td>Wall</td>
<td>0.5”</td>
<td>1.25”</td>
<td>2”</td>
<td>2.5”</td>
<td>Figure 1</td>
</tr>
</tbody>
</table>

Note: an additional ¾” is required under the wire mesh on each side.
### Table 2: Required Mortar Thickness for GCT Roof/Floor Assemblies to Achieve the Listed Fire-Resistance Ratings

<table>
<thead>
<tr>
<th>Assembly Name</th>
<th>Assembly Type</th>
<th>1-Hour Rating</th>
<th>2-Hour Rating</th>
<th>3-Hour Rating</th>
<th>4-Hour Rating</th>
<th>Assembly Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Top Bottom</td>
<td>Top Bottom</td>
<td>Top Bottom</td>
<td>Top Bottom</td>
<td>Top Bottom</td>
<td></td>
</tr>
<tr>
<td>PSM</td>
<td>Roof</td>
<td>2″ 0.75″</td>
<td>2″ 1.25″</td>
<td>2″ 2.5″</td>
<td>2″ 3.5″</td>
<td>Figure 3</td>
</tr>
<tr>
<td>PSG3</td>
<td>Floor/Roof</td>
<td>2″ 0.75″</td>
<td>2″ 1.25″</td>
<td>2″ 2.5″</td>
<td>2″ 3.5″</td>
<td>Figure 4</td>
</tr>
<tr>
<td>PSG6</td>
<td>Floor/Roof</td>
<td>2″ 0.75″</td>
<td>2″ 1.25″</td>
<td>2″ 2.5″</td>
<td>2″ 3.5″</td>
<td>Figure 5</td>
</tr>
</tbody>
</table>

Note: an additional ¾” is required under the wire mesh on bottom side.

### 5.2. Calculation Methodology

5.2.1. The following outlines the methodology used to calculate the fire-resistance of the various assemblies listed in Section 1, Table 1 and Table 2.

5.2.2. Figure 6 shows the general makeup of a GCT wall assembly. The welded wire reinforcing inherent to all GCT panels is not shown for clarity. This figure provides details and concepts used in the fire-resistance calculation per the IBC. The same methodology is used to calculate the fire-resistance rating of floor and roof assemblies.
5.2.3.  **IBC Section 722** contains provisions for calculating the fire-resistance rating of specific materials or combinations of materials. The pertinent sections follow, along with commentary to explain the calculations.

5.2.3.1.  **IBC Table 722.2.1.2(2)** shows the required value for $R^{0.59}$ needed to achieve a desired fire-resistance rating.

5.2.3.1.1.  $R =$ Fire endurance of the assembly, minutes

5.2.3.1.2.  $R_{1}^{0.59}, R_{2}^{0.59}$ and $R_{n}^{0.59} =$ Fire endurances of the individual wythes (layers) in minutes

5.2.3.1.3.  $R^{0.59}$ is used in the **IBC Section 722.2.1.2.1 Equation 7-4** to calculate the fire-endurance rating of an assembly. The value of $R^{0.59}$ when raised to the power of 1.7, results in the fire-endurance rating of the component that $R^{0.59}$ represents.

**IBC Table 722.2.1.2(2): Fire-Resistance Ratings Based on $R^{0.59}$**

<table>
<thead>
<tr>
<th>$R^{a},$ MINUTES</th>
<th>$R^{0.59}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>11.20</td>
</tr>
<tr>
<td>120</td>
<td>16.85</td>
</tr>
<tr>
<td>180</td>
<td>21.41</td>
</tr>
<tr>
<td>240</td>
<td>25.37</td>
</tr>
</tbody>
</table>

*a Based on Equation 7-4.*

5.2.4.  **IBC Section 722.2.1.2.1** provides the method for determining the fire-resistance rating of concrete walls with more than one wythe. The referenced tables are also shown here.

**722.2.1.2.1 Two or more wythes.** The fire-resistance rating for wall panels consisting of two or more wythes shall be permitted to be determined by the formula:

$$R = (R_{1}^{0.59} + R_{2}^{0.59} + \cdots + R_{n}^{0.59})^{1.7}$$  \hfill (Equation 7-4)

Values of $R_{n}^{0.59}$ for use in Equation 7-4 are given in Table 722.2.1.2(1). Calculated fire-resistance ratings are shown in Table 722.2.1.2(2).

5.2.4.1.  Equation 7-4 can be rewritten to the following form, so direct substitution of the values in **IBC Table 722.2.1.2(2)** can be achieved:

$$R = R_{1}^{0.59} + R_{2}^{0.59} + \cdots + R_{n}^{0.59}$$

5.2.5.  **IBC Table 722.2.1.2(1)** provides the values for $R_{n}^{0.59}$ for various thicknesses of concrete materials.

**IBC Table 722.2.1.2(1): Values of $R_{n}^{0.59}$ for Use in Equation 7-4**

<table>
<thead>
<tr>
<th>TYPE OF MATERIAL</th>
<th>THICKNESS OF MATERIAL (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1(\frac{1}{2})</td>
</tr>
<tr>
<td>Siliceous aggregate concrete</td>
<td>5.3</td>
</tr>
<tr>
<td>Carbonate aggregate concrete</td>
<td>5.5</td>
</tr>
<tr>
<td>Sand-lightweight concrete</td>
<td>6.5</td>
</tr>
<tr>
<td>Lightweight concrete</td>
<td>6.6</td>
</tr>
<tr>
<td>Insulating concrete(^a)</td>
<td>9.3</td>
</tr>
</tbody>
</table>

Airspace\(^b\) | — | — | — | — | — | — | — | — | — | — | — | — |

For SI: 1 inch = 25.4 mm, 1 pound per cubic foot = 16.02 kg/m\(^3\)

*a Dry unit weight of 35pcf or less and consisting of cellular, perlite or vermiculite concrete.

b The $R_{n}^{0.59}$ value for one 1\(\frac{1}{2}\) to 3\(\frac{1}{2}\) airspace is 3.3. The $R_{n}^{0.59}$ value for two 1\(\frac{1}{2}\) to 3\(\frac{1}{2}\) airspaces is 6.7.

c The fire-resistance rating for this thickness exceeds 4 hours.

5.2.5.1.  GCT assemblies are made using carbonate aggregate concrete.
5.2.6.  *IBC Section 722.2.1.2.2* provides the fire-resistance rating of the foam core material.

**721.2.1.2.2 Foam plastic insulation.** The fire-resistance ratings of precast concrete wall panels consisting of a layer of foam plastic insulation sandwiched between two wythes of concrete shall be permitted to be determined by use of Equation 7-4. Foam plastic insulation with a total thickness of less than 1 inch (25 mm) shall be disregarded. The \( R_n \) value for thickness of foam plastic insulation of 1 inch (25 mm) or greater, for use in the calculation, is 5 minutes; therefore \( R_{0.59} = 2.5 \).

5.2.7. The value of \( R_{0.59} \) for each wythe of the assembly is as follows:

5.2.7.1. Find the required \( R_{0.59} \) from *IBC Table 722.2.1.2(2)*. For example, for a 2-hour rating (120 minutes), an \( R_{0.59} \) of 16.85 is required.

5.2.7.2. From *IBC Section 722.2.1.2.2*, the foam core has an \( R_{0.59} \) of 2.5.

5.2.7.3. Subtract this from the required \( R_{0.59} \). For this example:

\[
16.85 - 2.5 = 14.35
\]

5.2.7.4. Assuming a symmetrical assembly (i.e., the wythe on each side of the wall is the same thickness), each side would then need an \( R_{0.59} \) of 7.18.

5.2.7.5. From *IBC Table 722.2.1.2(1)* for carbonate aggregate concrete, this would require just over 2" of cover.

5.2.7.6. However, since the mortar cover on the GCT panels is not of uniform thickness, the minimum thickness, \( t \), or the equivalent thickness, \( t_e \), must be used (see *Figure 6*).

5.2.7.7. *IBC Section 722.2.1.1.4* provides the method for determining whether the minimum thickness or the equivalent thickness must be used.

**722.2.1.1.4 Ribbed or undulating surfaces.** The equivalent thickness of panels with ribbed or undulating surfaces shall be determined by one of the following expressions:

\[
t + \left( \frac{4t}{s} - 1 \right) \left( t_e - t \right) \quad \text{(Equation 7-3)}
\]

where:

\[
s = \text{Spacing of ribs or undulations.}
\]

\[
t = \text{Minimum thickness.}
\]

\[
t_e = \text{Equivalent thickness of the panel calculated as the net cross-sectional area of the panel divided by the width, in which the maximum thickness used in the calculation shall not exceed } 2t.
\]

5.2.7.8. Per *Figure 6*, the spacing of the undulations, \( s \), is equal to 4".

5.2.7.9. For this example, to achieve the 2-hour rating, the required cover, either \( t \) or \( t_e \) as applicable, must be 2".

5.2.7.10. The first equation in *IBC Section 722.2.1.1.4* shows the value of \( t \), if \( s \geq 4t \). So in this case, this statement is true where the minimum thickness, \( t \), is 1" or less. Since 2" is needed, check the next equation.
5.2.7.11. The next equation says the equivalent thickness is \( t_e \), if \( s < 2t \). This statement is true where the minimum thickness, \( t \), is 2" or more. Since the equivalent thickness, \( t_e \), is always greater than the minimum thickness, \( t \), the equivalent thickness, \( t_e \), is a value greater than 2". Since exactly 2" is desired, check the third condition.

5.2.7.12. The third condition says to use Equation 7-3 to determine the thickness to use. There are three variables in the equation and only one is known, \( s \), which equals 4".

5.2.7.13. The undulations in the mortar cover are approx. 0.4" in height. It can be estimated that the dashed line representing the equivalent thickness, \( t_e \), (Figure 6) is located at the minimum thickness, \( t \), plus one half of the undulation height, or: \( t + 0.2" \). This can be substituted for \( t_e \) in Equation 7-3.

5.2.7.14. Finally, for this example, the target is 2", so the equation can be set up to equal 2" and solve for \( t \).

\[
t + \left( \frac{4t}{s} - 1 \right) (t - t) = 2 \\
\text{or} \quad t + \left( \frac{4t}{s} - 1 \right) ((t + 0.2) - t) = 2 \\
\text{or} \quad t + (t - 1)(0.2) = 2 \\
\text{or} \quad t + (0.2t - 0.2) = 2 \\
\text{or} \quad 1.2t - 0.2 = 2 \\
\text{or} \quad 1.2t = 2.2 \\
\text{or} \quad t = 1.833 \approx 2.0" 
\]

5.2.7.15. Hence, 2" mortar cover is needed to conservatively achieve the 2-hour fire-resistance rating.

5.3. Surface Burning Characteristics

5.3.1. The EPS core used as a component in GCT panels must have a flame-spread index of not more than 75 and a smoke-developed index of not more than 450 when tested in accordance with ASTM E84 or UL 723 in a maximum thickness of 4" in accordance with IRC Section R316.3 and IBC Section 2603.3.

5.4. Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and good technical judgment.

6. Installation:

6.1. Installation shall comply with this TER, the manufacturer’s installation instructions and the applicable code. In the event of conflict, the more restrictive shall govern.

6.2. Each installation shall provide GCT verification that confirms the fundamental design properties of the mortar and the panels.

6.3. Each installation shall provide verification that the GCT panels were installed in accordance with the GCT installation instructions and connection details.

6.3.1. Installation shall be done by GCT certified installers.

7. Test and Engineering Substantiating Data:

7.1. The product(s) evaluated by this TER fall within the scope of one or more of the model, state or local building codes for building construction. The testing and/or substantiating data used in this TER is limited to buildings, structures, building elements, construction materials and civil engineering related specifically to buildings.

7.2. The provisions of model, state or local building codes for building construction do not intend to prevent the installation of any material or to prohibit any design or method of construction. Alternatives shall use consensus standards, performance-based design methods or other engineering mechanics based means of compliance. This TER assesses compliance with defined standards, accepted engineering analysis, performance-based design methods, etc. in the context of the pertinent building code requirements.

7.3. Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate, as it undertakes its engineering analysis.
7.4. DrJ has reviewed and found the data provided by other professional sources are credible. The information in this TER conforms with DrJ’s procedure for acceptance of data from approved sources.

7.5. DrJ’s responsibility for data provided by approved sources conforms to IBC Section 1703 and any relevant professional engineering law.

7.6. Where appropriate, DrJ’s analysis is based on design values that have been codified into law through codes and standards (e.g., IRC, WFCM, IBC, SDPWS, NDS®, ACI®, AISI, PS-20, PS-2, etc.). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g. lumber, steel, concrete, etc), DrJ relies upon grade/properties provided by the raw material supplier to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8. Findings:

8.1. The GCT assemblies meet the calculated fire-resistance ratings found in Table 1 and Table 2 when installed in accordance with the manufacturer’s installation instructions, this TER and the applicable building code.

8.2. IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.9 are similar) states:

104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

8.3. This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes that are applicable to this evaluation, they are listed here:

8.3.1. No known variations

8.4. This TER uses professional engineering law, the building code, ANSI/ASTM consensus standards and generally accepted engineering practice as its criteria for all testing and engineering analysis. DrJ’s professional engineering work falls under the jurisdiction of each state Board of Professional Engineers, when signed and sealed.

9. Conditions of Use:

9.1. Where required by the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.

9.2. Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the code official for review and approval.

9.3. Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.

9.4. Design

9.4.1. Building Designer Responsibility

9.4.1.1. Unless the AHJ allows otherwise, the Construction Documents shall be prepared by a Building Designer for the Building and shall be in accordance with IRC Section R106 and IBC Section 107.

9.4.1.2. The Construction Documents shall be accurate and reliable and shall provide the location, direction and magnitude of all applied loads and shall be in accordance with IRC Section R301 and IBC Section 1603.
9.4.2. Construction Documents

9.4.2.1. Construction Documents shall be submitted to the Building Official for approval and shall contain the plans, specifications and details needed for the Building Official to approve such documents.

9.5. Responsibilities

9.5.1. The information contained herein is a product, material, detail, design and/or application TER evaluated in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering practice, experience and technical judgment.

9.5.2. DrJ TERs provide an assessment of only those attributes specifically addressed in the Products Evaluated or Code Compliance Process Evaluated sections.

9.5.3. The engineering evaluation was performed on the dates provided in this TER, within Dr.J's professional scope of work.

9.5.4. This product is manufactured under a third-party quality control program in accordance with IRC Section R104.4 and R109.2 and IBC Section 104.4 and 110.4.

9.5.5. The actual design, suitability and use of this TER, for any particular building, is the responsibility of the Owner or the Owner's authorized agent, and the TER shall be reviewed for code compliance by the Building Official.

9.5.6. The use of this TER is dependent on the manufacturer’s in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer’s instructions, the Building Official’s inspection and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10. Identification:

10.1. GCT insulated concrete panels described in this TER are identified by a label on the panel or packaging material bearing the manufacturer’s name, product name, label of the third-party inspection agency, and other information to confirm code compliance.

10.2. Additional technical information can be found at www.gctm2.com.

11. Review Schedule:

11.1. This TER is subject to periodic review and revision. For the most recent version of this TER, visit drjcertification.org.

11.2. For information on the current status of this TER, contact DrJ Certification.

- Mission, Belief and Independence
- Product Evaluation Policies
- Product Approval – Building Code, Administrative Law and P.E. Law