



### TOTAL INTEGRATED PANEL SYSTEMS

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### TIPS PANELS

CSI Division: 03 00 00 - CONCRETE  
CSI Section: 03 37 00 – Specialty Placed Concrete

#### 1.0 EVALUATION SCOPE

The TIPS Panels described in this report are used in the construction of exterior and interior, load-bearing and non-load-bearing, shear and non-shear walls, floors, and roofs in fire-resistance-rated and non-fire-resistance-rated construction. The structural and fire-resistance properties of the TIPS Panels were evaluated for compliance with the following codes:

- 2021, 2018, and 2015 International Building Code® (IBC)
- 2022 California Building Code (CBC) – Attached Supplement

#### 2.0 LIMITATIONS

Use of the TIPS Panels described in this report is subject to the following limitations:

The TIPS Panels shall be installed in accordance with Section 3.2 of this report, the manufacturer’s installation instructions, and the IBC®. Where conflicts occur, the more restrictive shall govern.

**2.1 Construction documents, statements of special inspections, geotechnical reports, and other data shall be submitted to the building official for approval. The applicable provisions in this report and the IBC®, including IBC® Sections 107, 1603, and 1901.5 shall be incorporated in the construction documents. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. The Structural Design shall comply with Section 3.1 of this report.**

**2.2 Walls, floors, or roofs required to be of fire-resistance-rated construction shall comply with Section 3.2.4 of this report.**

**2.3 Penetrations, openings, and voids are not permitted in the TIPS Panels, except where specified by the registered design professional and approved by the building official. The opening design shall be in accordance with Section 3.1.7 of this report.**

**2.4 Weather protection complying with IBC® Chapter 14 for exterior walls and IBC® Chapter 15 for roofs shall be provided. Wall and roof coverings shall be installed in accordance with the IBC® or as otherwise approved by the building official or authority having jurisdiction (AHJ).**

**2.5 In accordance with IBC® Section 2603.4.1.1, the foam plastic insulation shall be separated from the interior of a building by covering each face with not less than a 2-inch thickness of concrete or shotcrete.**

**2.6 For roof installations, data in accordance with IBC® Sections 1505 and 2603.6 establishing that the TIPS Panels and roof coverings are a Class A, B, or C roof assembly shall be submitted to the building official for approval. The data shall address the effects of hot asphalt and other materials on the Panels. The minimum roofing classification shall be in accordance with IBC® Table 1505.1.**

**2.7 Special inspection shall comply with Section 3.3 of this report.**

**2.8 TIPS Panels are manufactured in Morgan, Utah.**

#### 3.0 DESIGN AND INSTALLATION

##### 3.1 Structural Design:

**3.1.1 General:** The TIPS Panels may function as load-bearing or non-load-bearing walls, shear walls, non-shear walls, roofs, or floors subjected to in-plane and out-of-plane shear, flexure, axial compression, or a combination of these loads. The structural design shall consider each loading combination and conform to applicable strength and serviceability provisions of IBC® Chapters 16 and 19, ASCE/SEI 7, ACI 318, and this report. Loadings shall only be applied to the concrete facings. Locations of the panels, panel span direction, and panel connections shall be specified on the approved construction documents. Figures 1 to 18 of this report illustrate the Panels and common installations. Details for the project-specific conditions shall be prepared by the registered design professional and are subject to the approval of the building official.

##### 3.1.2 Design Assumptions:

**3.1.2.1 Walls:** Each wall panel shall be designed and detailed such that each concrete face is loaded and supported equally. Reinforced concrete end sections at slab bearing locations and the top and bottom of walls are required for this insulated panel to behave as a fully composite panel.

*The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.*





**3.1.2.2 Floors and Roofs:** Each floor or roof panel shall be designed and detailed such that the compression WWR is neglected, the flexural compression zone shall be within the concrete face, and the out-of-plane design shear strength ( $\phi V_n$ ) be limited to the buckling strength and welded joint strength of the diagonal truss wires unless additional shear reinforcement is added.

### 3.1.3 Out-of-Plane Flexure:

**3.1.3.1 Strength:** The flexural strength of TIPS Panels used as walls, roofs, and floors resisting out-of-plane (transverse) loads shall be calculated in accordance with IBC® Chapter 19 and ACI 318 with the following additional requirements:

1. The use of welded-wire steel sheets as compression reinforcement shall be excluded.
2. The determination of  $c$ , the distance from the extreme compression fiber to the neutral axis, shall be such that  $c$  is less than or equal to, the thickness of the concrete face in compression,  $t_c$  ( $c \leq t_c$ ).

**3.1.3.2 Deflection:** The stiffness of the TIPS Panels to resist deflections due to out-of-plane loads shall be determined in accordance with the IBC®, ACI 318, and principles of mechanics of materials with consideration of the contributions of the concrete faces, reinforcement, EPS core and connector wires. Panel deflection serviceability requirements shall be determined in accordance with ACI 318 Chapter 24. Reinforced concrete end sections at panel end bearing points and at the top of walls or at the roof diaphragm and anchorage of the wythes to the foundation at the base of walls are required for fully composite behavior.

**3.1.4 Axial Compression:** The axial compression strength of TIPS Panels used as walls shall be calculated in accordance with IBC® Chapter 19 and ACI 318.

**3.1.5 Combined Axial Compression and Flexure:** TIPS Panels may be subjected to loadings that create simultaneous axial compression and flexure. The strength of the TIPS Panels for combined axial compression and flexure shall be calculated in accordance with IBC® Chapter 19 and ACI 318 Sections 11.5.2 and 22.4 with structural analysis in accordance with ACI 318 Chapter 6.

### 3.1.6 In-plane Shear:

**3.1.6.1 Strength:** The shear strength of TIPS Panels used as walls resisting in-plane shear shall be calculated in accordance with IBC® Chapter 19 and ACI 318. Where the IBC®, ACI 318, and ASCE/SEI 7 require special reinforced concrete shear walls, design, and detailing shall conform to requirements for special structural walls in Chapter 18 of ACI 318, Section 12.2 of ASCE/SEI 7, Section 1905 of the IBC®, and the following additional requirements:

1. The wall thickness,  $h$ , or wall area,  $A_{cw}$ , shall be based on the sum of the two faces.

2. Shear wall and wall pier Height-to-Length Ratio shall be less than or equal to 1.0 ( $\leq 1.0$ ). Height-to-length ratio determinations shall comply with Figure 12.3-2 of ASCE/SEI 7. Alternatively, shear walls with a Height-to-length ratio exceeding 1.0 shall be designed based on the relative rigidity of wall sections and in accordance with ACI 318.

3. For resistance to seismic motions, the equivalent lateral force procedure shall be based on the following coefficients and factors:

- a. response modification coefficient,  $R \leq 3.5$ ;
- b. deflection amplification factor,  $C_d \geq 3.5$ ;
- c. overstrength factor,  $\Omega_0 \geq 3.0$ .

**3.1.6.2 In-plane Deflection:** For a structural wall constructed of the TIPS Panels subjected to in-plane shear load, both flexural and shear deformation shall be considered in calculating the displacement. In this case, the displacement at the top of the wall panel due to lateral in-plane force ( $V_u$ ) is calculated in accordance with Eq. 3-1 or Eq. 3-2:

For a cantilever wall:

$$\Delta_t = \Delta_f + \Delta_v = (V_u h_w^3 / 3E_c I_e) + (1.2 V_u h_w / G A_{cw}) \quad (3-1)$$

For a wall supported at each end:

$$\Delta_t = \Delta_f + \Delta_v = (V_u h_w^3 / 12E_c I_e) + (1.2 V_u h_w / G A_{cw}) \quad (3-2)$$

Where:

- $\Delta_t$  = Total in-plane deflection at the top of a wall pier or segment with respect to the base, in.
- $\Delta_f$  = Flexural component of in-plane deflection, in.
- $\Delta_v$  = Shear component of in-plane deflection, in.
- $V_u$  = factored shear force at wall section, kips
- $h_w$  = height of the entire wall from base to top, or clear height of wall segment or wall pier considered, in.
- $E_c$  = Modulus of elasticity of concrete, ksi
- $A_{cw}$  = area of concrete faces of an individual panel or horizontal wall segment, resisting shear, in<sup>2</sup>
- $I_e$  = Effective moment of inertia, in<sup>4</sup>
- $G$  = Shear modulus or modulus of rigidity, ksi

$$G = 0.4E_c \quad (3-3)$$

The determination of  $\Delta_t$  shall consider the effects of cracked sections and openings. Structural modeling shall comply with Chapter 6 of ACI 318. Cracked section analysis is required for earthquake loadings in accordance with Section 12.7.3 of ASCE/SEI 7.

The story shears shall be distributed to the shear walls and other elements of the lateral force-resisting system in proportion to the relative lateral stiffness or rigidity of the



shear wall, other vertical elements, and the diaphragm, in accordance with IBC<sup>®</sup> Section 1604.4 and ASCE/SEI 7 Section 12.8.4. The design story and total drift shall comply with ASCE/SEI 7 Section 12.12 and ACI 318-19 Section 18.10.6.2. The story drift capacity for the structure shall be the least drift capacity for any wall in that story.

**3.1.7 Openings:** TIPS Panels are permitted to have openings. Figures 13 through 16 of this report illustrate typical openings. A registered design professional shall design the perforated wall systems for openings. The horizontal wall segment above the openings shall be designed for flexure, shear, and deflection. Vertical wall segments adjacent to openings shall be designed to support additional loads from openings for axial compression, and out-of-plane forces. For special structural shear walls, wall piers created by openings shall comply with ACI 318 Section 18.10.8. The design shall comply with IBC<sup>®</sup> Chapter 19 and ACI 318.

**3.1.8 Collector Elements:** Collector Elements shall be designed in accordance with ASCE/SEI 7 Section 12.10.2 incorporating Section 12.10.2.1 for seismic force effects including overstrength.

### 3.2 Installation:

**3.2.1 Panels:** The TIPS Panels shall be delivered, stored, and handled in such a manner that the insulation is not punctured, and the welded-wire fabric is not deformed. On-site, the TIPS Panels shall be erected/arranged adjacent to each other, in accordance with the approved construction documents. WWR and/or reinforcement are installed for the structural connection of the panels to each other and the supporting structure. The joints between the panel EPS cores shall be tightly closed and EPS core faces aligned to be flush to ensure uniform thickness of concrete or shotcrete over the whole panel and to avoid thermal bridging. Small amounts of expansion spray foam may also be used to close any joint gaps.

Vertical or horizontal, internal and external corners formed between Panels shall be reinforced with welded wire reinforcement (WWR) attached to the WWR sheets of the panels. Openings shall be reinforced by placing reinforcing at a 45° angle near corners inside the WWR at each side of the panel. WWR strips, bent into a U-Mesh, shall be placed around doors, windows, and parapet lintels. WWR strips bent into an inside or outside corner mesh configuration are used to connect panels at the interior and exterior wall or roof intersections. Figures 8 and 13 through 16 of this report provide representative details.

Panels shall be temporarily braced to ensure stability and alignment, and to resist environmental forces before the application of concrete or shotcrete. Floor or roof panels shall be shored in accordance with Figure 17 of this report prior to placement of shotcrete or concrete.

Rigid or flexible conduit and piping shall be placed by removing EPS such that the conduit/pipe is flush with the EPS. Metal-clad cable (MC cable) having a maximum diameter of ½ inch may be placed inside the WWR in single runs. Bundled runs shall be set flush with the face of the EPS. Electrical fixtures, plumbing, and other components shall be installed and secured in accordance with the approved construction documents and the building official or AHJ.

The interior and exterior finishes shall be applied as described on the approved plans and in accordance with the IBC<sup>®</sup>. Accent grooves or other linear penetrations into the structural face are not permitted except by providing non-structural concrete at the face to accommodate the groove or penetration. Evaluation of the finishes is beyond the scope of this report.

**3.2.2 Concrete Placement:** Concrete shall be placed on each side of the TIPS panel to the thickness given on the approved construction documents, but no less than 2-inches on each side of the Panels. Concrete shall be placed in accordance with IBC<sup>®</sup> Chapter 19, ACI 318, and the manufacturer's instructions. Where placed in formwork for horizontal or vertical applications, concrete shall be placed from the top. Concrete shall be at least 2-inches thick on each side of the Panels. Formwork shall comply with ACI 318 Section 26.11. Concrete may be applied manually by hand or by various pneumatic methods such as shotcrete (wet or dry) in accordance with Section 3.2.3 of this report, pressurized plastering equipment, or pumping for formed horizontal or vertical conditions.

### 3.2.3 Shotcrete

**3.2.3.1 Placement:** Shotcrete shall be placed on each side of the TIPS panel to the thickness given on the approved construction documents, but no less than 2-inches on each side of the Panels. Shotcrete placement shall comply with IBC<sup>®</sup> Section 1908, ACI 318 Section 26.5 ACI 506.2-13, ACI 506.5-16, the manufacturer's instructions, and the sequence specified in Figure 18 of this report.

**3.2.3.2 Tests:** Due to the thin wythes of TIPS Panels and each wythe having an embedded layer of WWR, shotcrete testing shall be completed by preparing 2-inch x 2-inch x 2-inch cube specimens for testing in accordance with ASTM C780 including Annex A6. A minimum of three sets of cubes shall be collected for each nozzle operator throughout duration of the project. Additional sets of specimens shall be collected for larger projects as established by the registered design professional. The test cubes are prepared by placing cube forms against a test wall and shooting shotcrete into the cube form at a 90 degree angle to the wall.

**3.2.4 Fire-resistance-rated Construction:** TIPS Panels, have fire-resistance-ratings shown in Table 1 of this report.

**3.3 Special Inspection:** Special inspection shall comply with the IBC<sup>®</sup> Sections 1704, 1705.3, and 1908, as applicable. A



statement of special inspections complying with Sections 1704.2.3, 1704.3, and 1704.4 shall be submitted as part of the construction documents. The duties of the special inspector include verification of compliance with the approved construction documents, and this report, including, but not limited to, welded-wire reinforcement size, cover, and spacing; concrete or shotcrete design mixtures; formwork for location, dimensions, and debris; sampling fresh concrete for strength test specimens; slump and air content tests; concrete temperature at time of placement; concrete and shotcrete placement; curing temperatures; and identification of TIPS Panels in accordance with Section 7.0 of this report. In addition, for shotcrete application, the duties of the special inspector include verification of sampling and preparation of test specimens and conformance with acceptance criteria in the IBC® Section 1908.

#### 4.0 PRODUCT DESCRIPTION

**4.1 General:** The TIPS Panels consist of a three-dimensional grid of two sheets of galvanized steel welded-wire reinforcement (WWR), joined with diagonal connectors of galvanized steel wire welded to the WWR; and a core of expanded polystyrene (EPS) foam plastic insulation, between the two WWR sheets, which is penetrated by the connectors. The welded diagonal connectors provide rigidity and shear transfer for composite behavior. After the panels are connected into position as wall, floor, or roof elements, shotcrete and/or concrete is applied on both panel faces. Additional reinforcement may be required for the loading condition and where openings such as doors and windows occur. The result is a composite sandwich panel with two layers of concrete reinforced by the WWR and with any additional reinforcing steel. Figure 1 of this report describes possible panel types. Figures 2 through 18 of this report illustrate certain construction considerations. Details for the specific project shall be provided on approved plans and specifications

#### 4.2 Materials:

**4.2.1 Expanded Polystyrene (EPS) Foam Plastic:** EPS foam plastic insulation complying with UL-18546-01 and ASTM C578 as Type I, with a 1 pcf nominal density, forms the core. The EPS is manufactured by producers recognized in the approved quality documents. The EPS has a flame-spread index of 25 or less and a smoke-developed index of 450 or less to comply with ASTM E84 at a maximum 5-inch thickness in conformance with IBC® Section 2603.3.

**4.2.2 Wire Reinforcement:** The welded wire reinforcement (WWR) and diagonal truss wires comply with ACI 318 Section 20.2.1.7 and ASTM A1064 as plain carbon steel wire with a Class 1 galvanized coating in accordance with ASTM A641. The wire sizes for WWR are No. 11 gauge (0.1205-inch) and for truss wires are No. 9 gauge (0.1483-inch). The minimum specified yield and tensile strengths are as follows: for the WWR ( $f_y = 60,000$  psi and  $F_u = 70,000$  psi) and for the diagonal truss wire

( $f_y = 65,000$  psi and  $F_u = 75,000$  psi). WWR sheets are positioned one inch from the EPS Core, as shown in Figure 1 of this report.

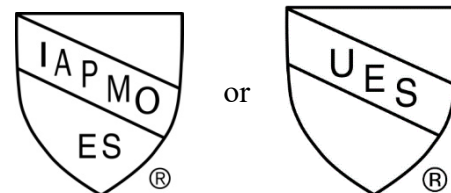
**4.2.3 Reinforcing Bars:** Deformed steel reinforcing bars, shall comply with Section 20.2.1.3 of ACI 318. For use in special structural shear walls, the reinforcement shall comply with ACI 318 Sections 18.2.6.1 and 20.2.2. The minimum specified yield strength,  $f_y$ , is 60,000 psi. For use as special structural shear walls, the maximum value of  $f_y$  permitted in design calculations is 60,000 psi.

**4.2.4 Concrete:** Normalweight concrete is required and shall comply with Chapter 19 of ACI 318. The following additional requirements shall apply: 1) maximum aggregate size shall comply with Section 26.4.2 of ACI 318; 2) maximum fresh concrete slump is 4-inches; and 3) minimum specified compressive strength,  $f'_c$ , is 3,500 psi at 28 days. Documentation of the mixtures shall comply with ACI Section 26.4.4.1 (a).

**4.2.5 Shotcrete:** Shotcrete shall be of normalweight concrete and comply with IBC® Section 1908 and ACI 318 Section 26.4. The following additional requirements shall apply: 1) maximum aggregate size is 3/8-inch; 2) aggregate gradation shall be Gradation No. 1 in Table 1.1.1 of ACI 506R-16; 3) minimum compressive strength,  $f'_c$ , is 3,500 psi at 28 days. Documentation of the mixtures shall comply with ACI Section 26.4.4.1 (d). Packaged preblended dry materials shall comply with ACI 318 Section 26.4.1.7.

#### 5.0 IDENTIFICATION

For field identification, the face or edge of the insulation on each TIPS panel and all packages of the delivered TIPS Panels covered by this report shall bear the name and trademark of the manufacturer (Total Integrated Panel Systems), the panel name (TIPS), and the evaluation report number (ER-593). Either IAPMO UES Mark of Conformity also may be used as shown below:



IAPMO UES ER-593

#### 6.0 SUBSTANTIATING DATA

**6.1** Data in accordance with the ICC-ES Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems (AC15) dated February 2010, editorially revised in March 2021.



Originally Issued: 05/23/2019

Revised: 06/25/2024

Valid Through: 06/30/2025

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12) dated June 2015, editorially revised December 2020.

6.3 Quality Control Manual and documentation of compliance.

6.4 Test reports are from laboratories in compliance with ISO/IEC 17025.

### 7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Total Integrated Panel Systems (TIPS Panels) to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Products are manufactured at the location noted in Section 2.8 of this report under a quality control program with third-party inspections under the supervision of IAPMO UES.

For additional information about this evaluation report please visit [www.uniform-es.org](http://www.uniform-es.org) or email us at [info@uniform-es.org](mailto:info@uniform-es.org)

TABLE 1 – FIRE-RESISTANCE RATING OF TIPS WALLS<sup>1</sup>

CONCRETE FACING THICKNESS (EQUAL ON BOTH SIDES)	FIRE-RESISTANCE RATING (IBC® Equation 7-4) <sup>2</sup>	
	Carbonate Aggregate	Siliceous Aggregate
Inches 2	2 hours	1.75 hours
2.25	2.4 hours	2 hours
2.5	2.8 hours	2.4 hours
3	3.5 hours	3 hours

<sup>1</sup> The fire-resistance ratings are applicable only to concrete walls and slabs consisting of TIPS Panels recognized under this evaluation report and job site applied concrete or shotcrete facings.

<sup>2</sup> Fire resistance ratings for alternate material types and thickness may be determined in accordance with IBC® Section 722.2.1.2 for multi-wythe walls.

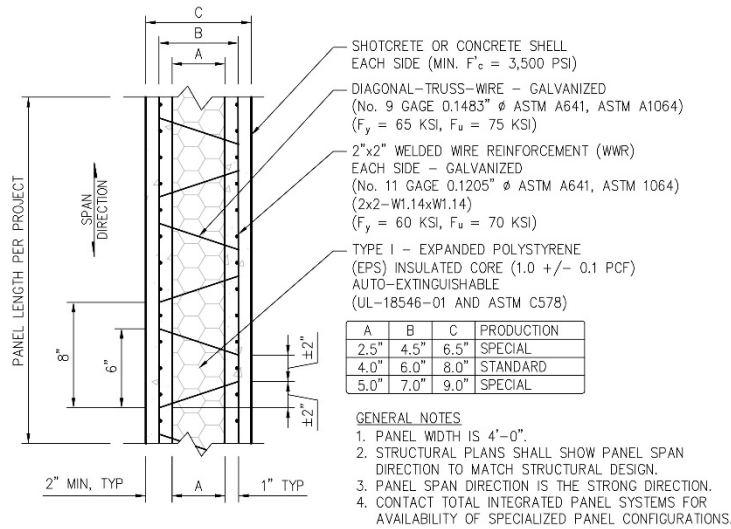


FIGURE 1 - TIPS PANEL TYPES - SECTION VIEW

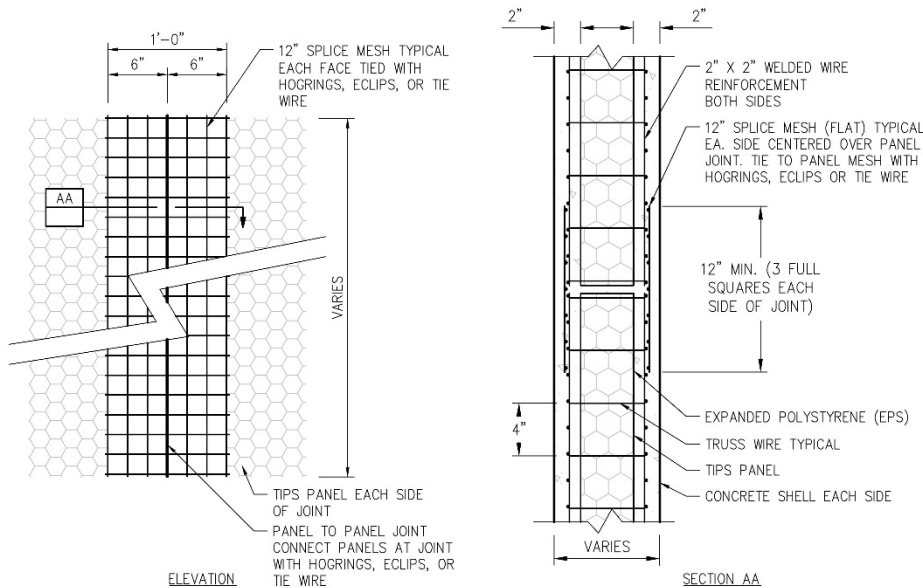
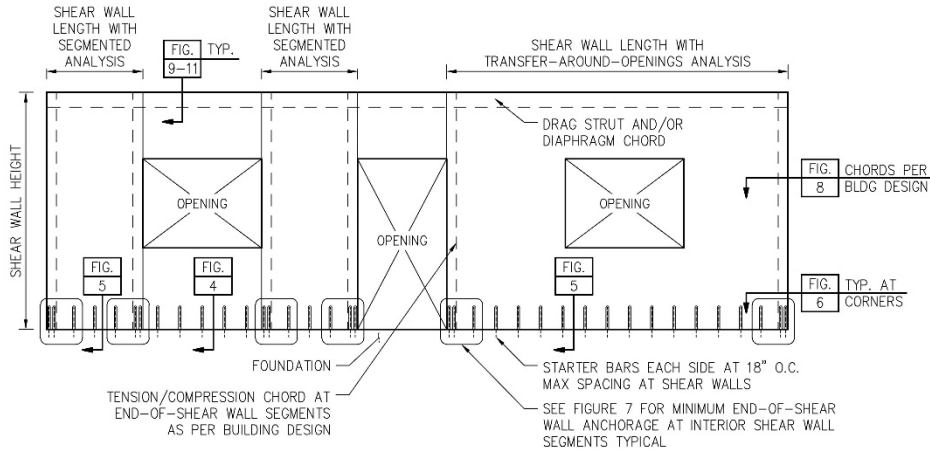
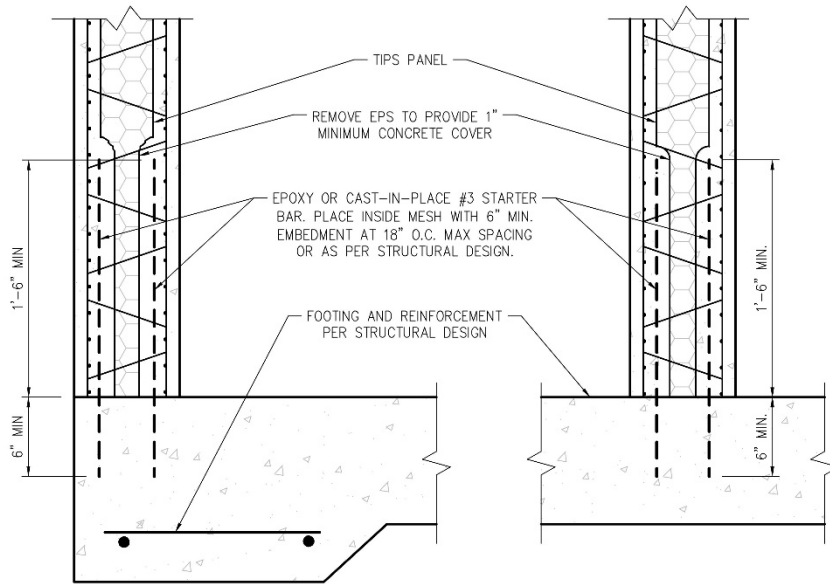


FIGURE 2 - TIPS PANEL SPLICE - ELEVATION AND SECTION VIEWS

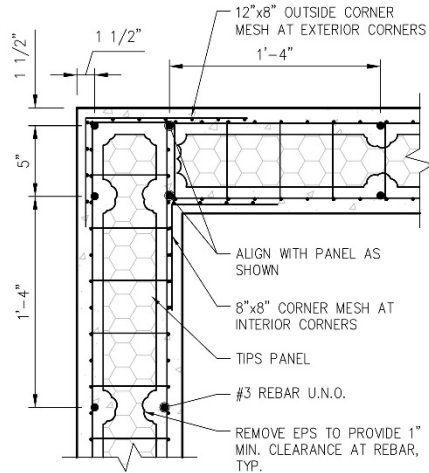


**FIGURE 3 - SHEAR WALL - ELEVATION VIEW**

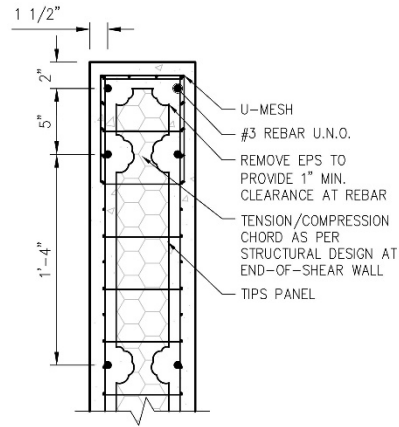


**FIGURE 4 - NON-DESIGNATED SHEAR WALL SECTION VIEW**

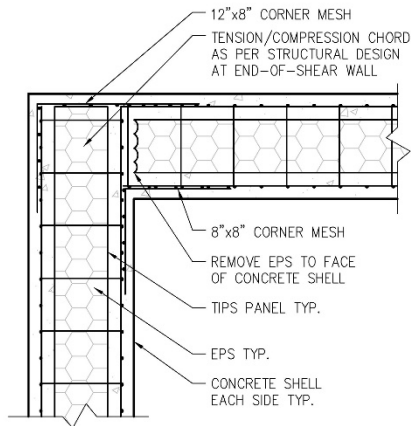
**FIGURE 5 - DESIGNATED SHEAR WALL SECTION VIEW**



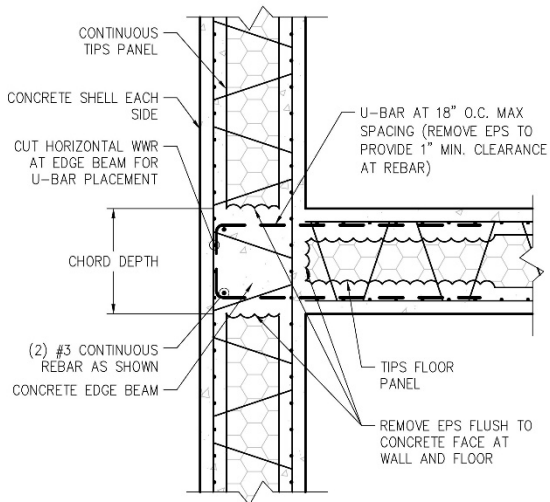
**FIGURE 6 - END-OF-SHEAR WALL ANCHORAGE AT CORNER - PLAN VIEW**



**FIGURE 7 - END-OF-SHEAR WALL ANCHORAGE AT OPENING - PLAN VIEW**

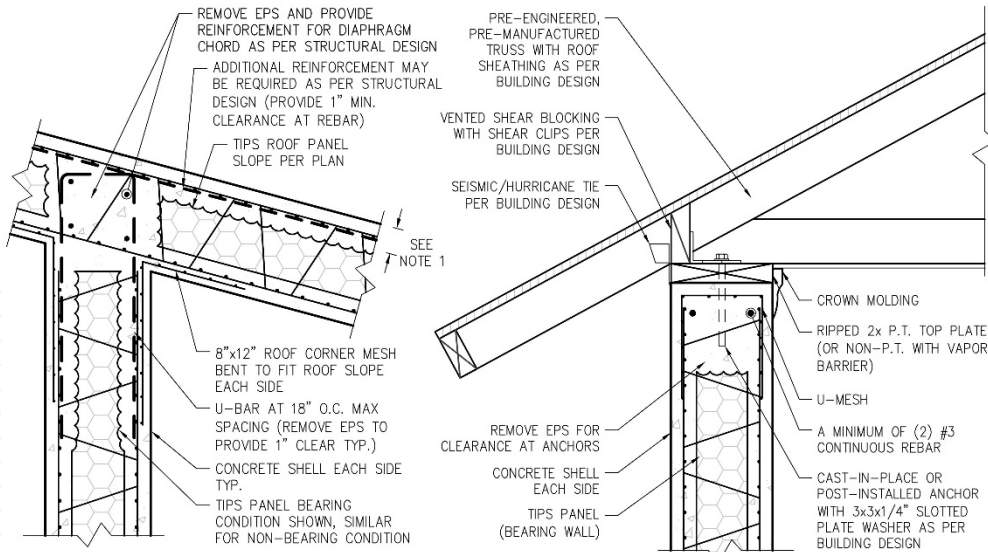


**FIGURE 8 - WALL CORNER - PLAN VIEW**



**FIGURE 9 - CHORD AT MULTI-LEVEL CONSTRUCTION FLOOR-TO-BEARING WALL - SECTION VIEW**

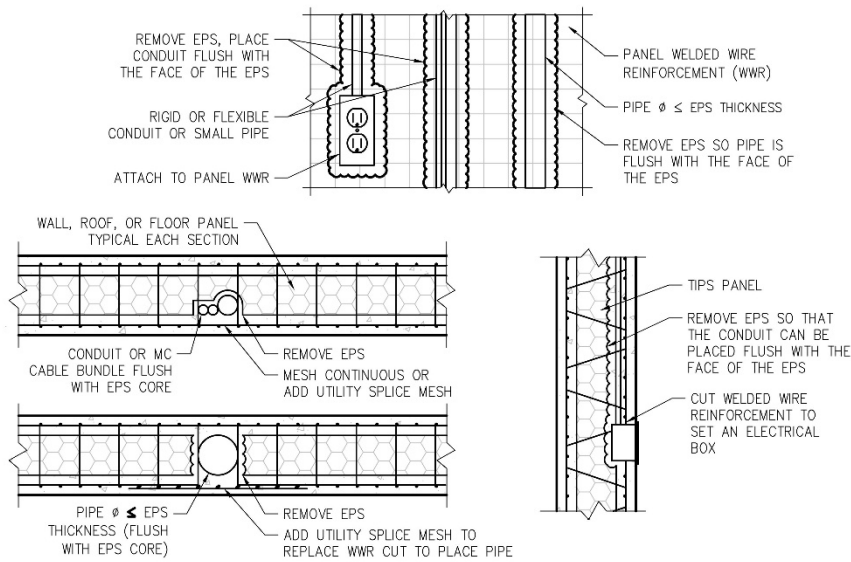




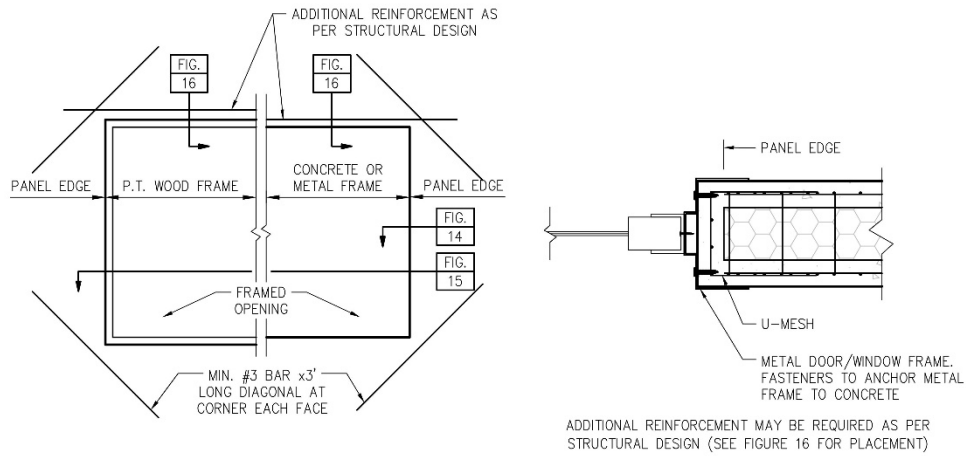
GENERAL NOTES:  
1. 2" MIN. THICKNESS OF TOP SHELL. A THICKER TOP SHELL OR WATERPROOFING ADDITIVES MAY BE REQUIRED AS PER ROOFING SYSTEM AND STRUCTURAL DESIGN.

**FIGURE 10 - CHORD AT BEARING ROOF PANEL - SECTION VIEW**

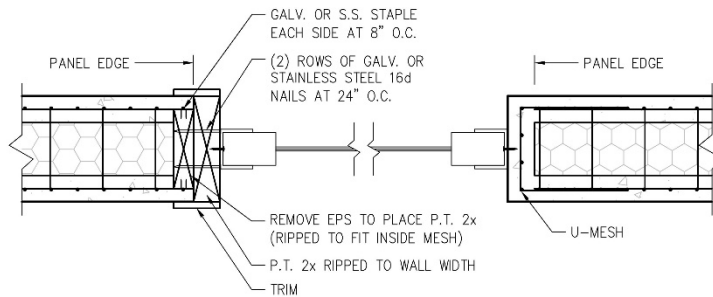
**FIGURE 11 - CHORD AT BEARING TRUSS ROOF SYSTEM - SECTION VIEW**



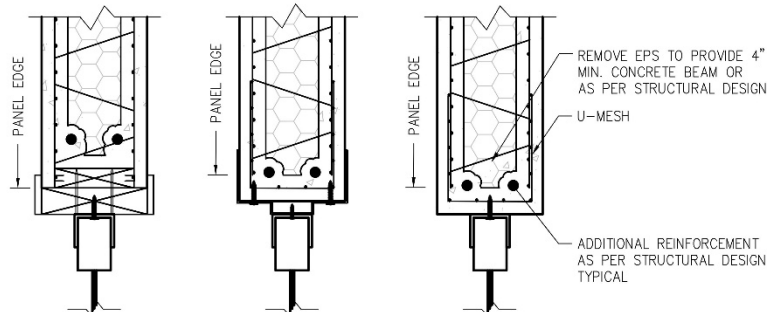
**FIGURE 12 - UTILITY PLACEMENT - ELEVATION, PLAN, & SECTION VIEWS**



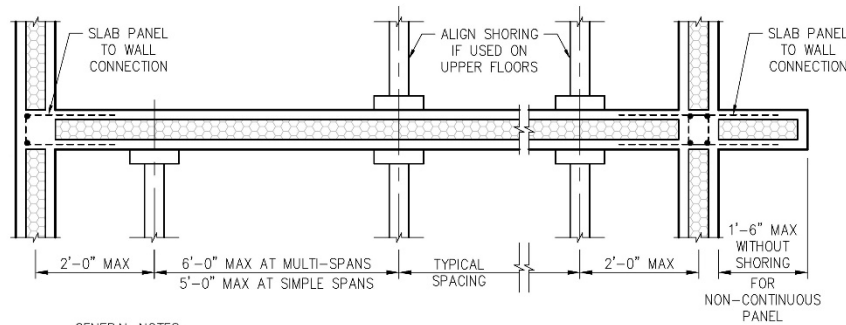
**FIGURE 13 - FRAMED OPENINGS - ELEVATION VIEW**    **FIGURE 14 - METAL FRAME - SECTION VIEW**



**FIGURE 15 - WOOD AND CONCRETE FRAMES - SECTION VIEW**



**FIGURE 16 - HEADER WITH ALL FRAMES TYPES - SECTION VIEW**



**GENERAL NOTES:**

1. THIS DETAIL SPECIFIES THE RECOMMENDED MINIMUM SHORING REQUIREMENTS. THE CONTRACTOR IS REQUIRED TO PROVIDE ALL SHORING AND BRACING AS NEEDED TO PROVIDE THE FINISHED PRODUCT WITHOUT SAGGING BETWEEN SUPPORTS. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE PANEL SHORING, BRACING, AND PLACEMENT TO MEET THE APPLICABLE ACI CONSTRUCTION TOLERANCES.
2. SHORING AND FORMWORK SHALL COMPLY WITH ACI 318 SECTION 26.11.

**FIGURE 17 - TIPS PANEL SHORING REQUIREMENTS**

TIPS PANEL SYSTEM – RECOMMENDED ITEMS OF "ROUGH-IN" OBSERVATION

"ROUGH-IN" OBSERVATION ITEMS TO BE REVIEWED BEFORE SHOTCRETE IS APPLIED SEE "INTRODUCTION TO THE TIPS SMART PANEL/EVG-3D CONSTRUCTION SYSTEM" FOR ADDITIONAL REQUIREMENTS				
OBSERVATION ITEMS	CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1. SPLICE MESH TO JOIN PANEL JOINTS (SEAMS, CORNERS, ETC.) & OVER UTILITIES CUTTING PANEL MESH.	---	X	MANUFACTURER RECOMMENDED	NONE
2. FRAMED OPENING SPLICE MESH (1'-0" x 2'-0" WWR) PLACE DIAGONALLY AT ALL CORNERS OF FRAMED OPENINGS.	---	X	MANUFACTURER RECOMMENDED	NONE
3. STARTER BARS EXTENDING FROM THE FOUNDATION SYSTEM OR FROM FLOOR/WALL FOR MULTI-STORY SYSTEMS WHERE DETAILED. STARTER BARS LAPPED WITH SHEAR WALL CHORD REINFORCEMENT WHERE APPLICABLE.	---	X	MANUFACTURER RECOMMENDED	NONE
4. ADDITIONAL REINFORCING AT HEADERS, JAMBS, BEAMS, COLUMNS, WALLS, SLABS, ROOF PANELS, & CONNECTIONS. ADDITIONAL REINFORCING BARS ARE TYPICALLY BEHIND PANEL WWR AND A 1" MIN. CLEAR PROVIDED TO EPS.	---	X	MANUFACTURER RECOMMENDED	NONE
5. VERIFY EPS HAS BEEN REMOVED TO PROVIDE A MINIMUM OF 1" CLEARANCE AROUND ADDITIONAL REINFORCING BARS AND STARTER BARS.	---	X	MANUFACTURER RECOMMENDED	NONE
6. VERIFY EPS HAS BEEN REMOVED FOR CONDUIT AND/OR OTHER UTILITIES. UTILITIES SHALL BE PLACED INSIDE THE 4" EPS THICKNESS, PROVIDING THE 1" CLEAR TO THE PANEL WWR.	---	X	MANUFACTURER RECOMMENDED	NONE
7. VERIFY GUIDE WIRE LOCATION PROVIDES 1" COVER TO THE PANEL WWR. OTHER METHODS MAY ALSO BE USED TO ESTABLISH CONCRETE COVER.	---	X	MANUFACTURER RECOMMENDED	NONE
8. ADDITIONAL OBSERVATION ITEMS MAY BE REQUIRED IN REGARDS TO THE SEISMIC SYSTEM ACCORDING TO THE IBC.	---	X	---	1704.6.1 ITEM 5

WHEN WORKING WITH THE TIPS PANEL SYSTEM, BOTH WET AND DRY SHOTCRETE PUMPS MAY BE USED. AS A RULE, THE FOLLOWING ORDER OF THE CONCRETE/SHOTCRETE APPLICATION IS RECOMMENDED:

1. 1ST LAYER (OR FULL THICKNESS) OF SHOTCRETE ON THE WALLS (INSIDE AND OUT)
2. 1ST LAYER (OR FULL THICKNESS) OF SHOTCRETE ON THE BOTTOM SIDE OF SLABS (OR ROOFS).
3. SHOTCRETE OR CONCRETE ON THE TOPSIDE OF SLABS (OR ROOFS).
4. COMPLETION OF THE SHOTCRETE ON WALLS AND ON THE SLABS (OR ROOFS).

NOTE: 1ST LAYER IS FROM EPS TO OUTSIDE OF MESH WWR. LEAVE ROUGH AND HYDRATE BEFORE APPLYING FINAL LAYER.

**FIGURE 18 - RECOMMENDED "ROUGH-IN" OBSERVATION & SHOTCRETE SEQUENCING**



## CALIFORNIA SUPPLEMENT

### TOTAL INTEGRATED PANEL SYSTEMS

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Morgan, Utah 84050  
(801) 510-7770

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[kblackburn@tipspanel.com](mailto:kblackburn@tipspanel.com)

### TIPS PANELS

CSI Division: 03 00 00 - CONCRETE  
CSI Section: 03 37 00 – Specialty Placed Concrete

#### 1.0 EVALUATION SCOPE

The TIPS Panels evaluated in IAPMO UES ER-593 comply with the intent of the provisions of the following codes and regulations:

- 2022 California Building Code (CBC)
- 2022 California Residential Code (CRC)
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#### 2.0 LIMITATIONS

The TIPS Panels, described in this report, comply with the codes listed in Section 1.0 of this supplement, subject to the following limitations:

- 2.1 Provisions set forth in ER-593 for the 2021 IBC and 2021 IRC shall apply, except as specifically noted in this supplement.
- 2.2 The limitations in Section 2.0 of ER-593 shall apply.
- 2.3 For applications regulated by DSA or HCAi (formerly OSHPD), construction documents shall comply with CBC Section 1603A.
- 2.4 Inspections shall comply with CBC Chapter 17A as applicable.

2.5 For applications regulated by DSA, applicable provisions in CBC Section 1909 shall be observed.

2.6 For applications regulated by HCAi (formerly OSHPD), applicable provisions in CBC Sections 1910 and 1911 shall be observed.

2.7 For applications regulated by DSA or HCAi (formerly OSHPD), material requirements and testing in Sections 1903A and 1910A shall be observed.

2.8 For applications regulated by DSA or HCAi (formerly OSHPD), design amendments in Section 1905A shall apply.

2.9 For applications regulated by DSA or HCAi (formerly OSHPD), shotcrete shall comply with Section 1908A.

2.10 This supplement expires concurrently with ER-0593.

For additional information about this evaluation report please visit [www.uniform-es.org](http://www.uniform-es.org) or email us at [info@uniform-es.org](mailto:info@uniform-es.org)