

# ICC-ES Evaluation Report


ESR-5136

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| <p><b>DIVISION: 09 00 00 — FINISHES</b></p> <p><b>Section: 09 22 26 — Suspension Systems</b></p> | <p><b>REPORT HOLDER: USG INTERIORS, LLC</b></p> | <p><b>EVALUATION SUBJECT: USG DONN® ADVANCESPAN SUSPENSION SYSTEM</b></p> |  |
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## 1.0 EVALUATION SCOPE

### Compliance with the following codes:

- 2018, 2015 and 2012 [International Building Code® \(IBC\)](#)
- 2018, 2015 and 2012 [International Residential Code® \(IRC\)](#)

### Properties evaluated:

- Structural
- Interior Finish

## 2.0 USES

The USG Donn® AdvanceSpan Suspension System described in this report are suspended ceiling assemblies used in interior and/or corridor applications as noted in this report.

## 3.0 DESCRIPTION

The USG Donn Advance Suspension System consists of main tees, cross runners and accessories as described in Sections 3.1, 3.2 and 3.3.

### 3.1 DXAS and DXTAS AdvanceSpan Main Runners:

DXAS and DXTAS main runners are double-webbed T-shape profiles, available in DXAS 15/16-inch (23.81 mm) and DXTAS 9/16-inch (14.28 mm) profiles, as shown in [Figure 1](#). The main runners are cold-formed steel meeting ASTM A653 CS Type B, having a thickness of 0.021-inch (0.533 mm). The main runners are classified as either immediate duty or heavy duty in accordance with ASTM C635, as shown in [Table 1](#).

### 3.2 Cross Runners:

Information regarding cross runners, USG models – DX216/424 and DXT222/424 used in this system is described in assemblies in Section 4.2 and can be found in ESR-1222.

### 3.3 Accessories:

The USG Donn AdvanceSpan Suspension System suspended ceiling system is available with US44 AdvanceSpan Reversible Structural Wall Channel Molding ([Figure 1](#)), US44CC AdvanceSpan Channel Clip ([Figure 2](#)), ASMTTP AdvanceSpan Main Tee Splice Plate ([Figure 3](#)), and ASCBC Cross Brace Clips.

### 3.4 Materials:

The steel body of the suspension system members are hot-dipped galvanized in accordance with ASTM A653 with a coating designation G30, except for the US44CC AdvanceSpan Channel Clips and ASMTTP AdvanceSpan Main Tee Splice Plates which have G90 galvanized coating. The steel has a minimum yield strength of 30 ksi (206.8 MPa).

## 4.0 DESIGN AND INSTALLATION

### 4.1 General:

The suspension systems must be designed and installed in accordance with 2018, 2015 and 2012 IBC Section 808, 1613 and 2506.2.1.

**4.1.1 Main Tees:** The maximum design loads for main runners must be less than or equal to the allowable capacities noted in [Table 1](#) of this report.

**4.1.2 Seismic Design:** Seismic design and installation details of the suspension systems must be in accordance with this report and as determined by registered design professional in Seismic Design Categories C, D, E and F. Where applicable, the provisions in accordance with Section 13.5.6 of ASCE 7-16 for the 2018 IBC (ASCE 7-10 for the 2015 and 2012 IBC) as referenced IBC Section 1613 should be followed as determined by registered design professional. Systems with main runners classified as Intermediate-duty are limited to use in Seismic Design Categories A-C. Systems with main runners classified as Heavy-duty are limited to use in Seismic Design Categories D-F. The suspension system connections comply with the connection requirements described in ASTM E580 Section 5. The following assemblies are based on shake table testing in accordance with AC156:

**4.1.2.1 Alternate Installation No. 1 for Seismic Design Categories D, E and F:** Suspension systems under this installation may be in Seismic Design Categories D, E and F (maximum design spectral response acceleration at short period,  $S_{ds}$ , 3.0 g) supporting a maximum combined weight of 4 psf (19.53 kg/m<sup>2</sup>). With this installation, the main runners (USG model – DXAS) must be heavy duty in accordance to ASTM C635. The main runners must be installed at a maximum spacing of 24 inches on center with maximum clear span of 102 inches. The maximum spacing of cross runners (USG models - DX216 and DX424) must not exceed 48 inches. The main and cross runners are supported by the wall moldings and clips which must be attached to the supporting wall system as determined by registered design professional (without the use of hanger wires, perimeter wire, or splay wires). The US44 AdvanceSpan Reversible Structural Wall Channel Moldings and the US44CC AdvanceSpan Channel Clips are used to secure the main and cross runners to the wall closure (angle) on two adjacent walls (fixed ends) and to allow free movement of the runners on the two opposing walls (floating ends). On the walls where runners are not fixed (or runners are unrestrained), the US44CC AdvanceSpan Channel Clips allow the terminal runner end to move  $\frac{3}{4}$  inch (19.1 mm) towards and way from the wall (See [Figure 4](#)). On the walls where runners are fixed (or runners are restrained), the runner ends must be attached to the US44CC AdvanceSpan Channel Clips as shown in [Figure 5](#).

**4.1.2.2 Alternate Seismic Installation No. 2 Seismic Design Categories D, E and F:** Suspension systems under this installation may be in Seismic Design Categories D, E and F (maximum design spectral response acceleration at short period,  $S_{ds}$ , 3.0 g) supporting a maximum combined weight of 4 psf (19.53 kg/m<sup>2</sup>). With this installation, the main runners (USG models – DXAS) must be heavy duty in accordance to ASTM C635. The maximum spacing of cross runners (USG models - DX216 or DX424) must not exceed 24 inches. The main runners must be installed at a maximum spacing of 48 inches on center with maximum clear span of 84 inches. The main and cross runners are supported by the wall moldings and clips which must be attached to the supporting wall system as determined by registered design professional (without the use of hanger wires, perimeter wire, or splay wires). The US44 AdvanceSpan Reversible Structural Wall Channel Moldings and the US44CC AdvanceSpan Channel Clips are used to secure the main cross runners to the wall closure (angle) on two adjacent walls (fixed ends) and to allow free movement of the runners on the two opposing walls (floating ends). On the walls where runners are not fixed (or runners are unrestrained), the US44CC AdvanceSpan Channel Clips allow the terminal runner end to move  $\frac{3}{4}$  inch (19.1 mm) towards and way from the wall (See [Figure 4](#)). On the walls where runners are fixed (or runners are restrained), the runner ends must be attached to the US44CC Advance Span Channel Clips as shown in [Figure 5](#).

**4.1.2.3 Alternate Seismic Installation No. 3 Seismic Design Categories C:** Suspension systems under this installation may be in Seismic Design Categories C (maximum design spectral response acceleration at short period,  $S_{ds}$ , 2.75 g) supporting a maximum combined weight of 3 psf (14.65 kg/m<sup>2</sup>). With this installation,

the main runners (USG models – DXAS) must be immediate duty in accordance to ASTM C635. The main runners must be installed at a maximum spacing of 48 inches on center with maximum unsupported length of 96 inches. The maximum spacing of cross runners (USG models - DX216 or DX424) must not exceed 24 inches. The main and cross runners are supported by the wall moldings and clips which must be attached to the supporting wall system as determined by registered design professional (without the use of hanger wires, perimeter wire, or splay wires). The US44 AdvanceSpan Reversible Structural Wall Channel Moldings and the US44CC AdvanceSpan Channel Clips are used to secure the main and cross runners to the wall closure (angle) to allow free movement of the runners on the two opposing walls (floating ends). The US44CC AdvanceSpan Channel Clips allow the terminal runner end to move 3/8 inch (9.5 mm) towards and way from the wall (See [Figure 6](#)). On the walls where runners are fixed (or runners are restrained), the runner ends must be attached to the US44CC Advance Span Chanel Slips as shown in [Figure 5](#).

**4.1.2.4 Alternative Seismic Installation No. 4 Seismic Design Categories D, E and F:** Suspension systems under this installation may be in Seismic Design Categories D, E and F (maximum design spectral response acceleration at short period,  $S_{ds}$ , 3.0 g) supporting a maximum of combined weight of 4 psf (19.53 kg/m<sup>2</sup>). With this installation, the main runners (USG models – DXTAS) must be heavy duty as described in accordance to ASTM C635. The main runners must be installed at a maximum spacing of 24 inches on center with maximum unsupported length of 102 inches. The maximum spacing of cross runners (USG models – DXT222 and DXT424) must not exceed 48 inches. The main and cross runners are supported by the wall moldings and clips which must be attached to the supporting wall system as determined by registered design professional (without the use of hanger wires, perimeter wire, or splay wires). The US44 AdvanceSpan Reversible Structural Wall Channel Moldings and the US44CC AdvanceSpan Channel Clips are used to secure the main and runners to the wall closure (angle) on two adjacent walls (fixed ends) and to allow free movement of the runners on the two opposing walls (floating ends). On the walls where runners are not fixed (or runners are unrestrained), the US44CC AdvanceSpan Channel Clips allow the terminal runner end to move 3/4 inch (19.1 mm) towards and way from the wall (See [Figure 4](#)). On the walls where runners are fixed (or runners are restrained), the runner ends must be attached to the US44CC AdvanceSpan Channel Clips as shown in [Figure 5](#).

**4.1.2.5 Alternate Seismic Installation No. 5 Seismic Design Categories D, E and F:** Suspension systems under this installation may be in Seismic Design Categories D, E and F (maximum design spectral response acceleration at short period,  $S_{ds}$ , 3.0 g) supporting a maximum combined weight of 4 psf (19.53 kg/m<sup>2</sup>). With this installation, the main runners (USG models – DXTAS) must be heavy duty in accordance to ASTM C635. The main runners must be installed at a maximum spacing of 48 inches on center with maximum unsupported length of 84 inches. The maximum spacing of cross runners (USG models - DXT222 or DXT424) must not exceed 24 inches. The main and cross runners are supported by the wall moldings and clips which must be attached to the supporting wall system as determined by registered design professional (without the use of hanger wires, perimeter wire, or splay wires). The US44 AdvanceSpan Reversible Structural Wall Channel Moldings and the US44CC AdvanceSpan Channel Clips are used to secure the main runners and cross runners to the wall closure (angle) on two adjacent walls (fixed ends) and to allow free movement of the runners on the two opposing walls (floating ends). On the walls where runners are not fixed (or runners are unrestrained), the US44CC AdvanceSpan Channel Clips allow the terminal runner end to move 3/4 inch (19.1 mm) towards and way from the wall (See [Figure 4](#)). On the walls where runners are fixed (or runners are restrained), the runner ends must be attached to the US44CC AdvanceSpan Channel Clips as shown in [Figure 5](#).

**4.1.2.6 Alternate Seismic Installation No. 6 Seismic Design Categories C:** Suspension systems under this installation may be in Seismic Design Categories C (maximum design spectral response acceleration at short period,  $S_{ds}$ , 2.75 g) supporting a maximum combined weight of 3 psf (14.65 kg/m<sup>2</sup>). With this installation, the main runners (USG models – DXTAS) must be immediate duty in accordance to ASTM C635. The main runners must be installed at a maximum spacing of 48 inches on center with maximum unsupported length of 96 inches. The maximum spacing of cross runners (USG models – DXT222 or DXT424) must not exceed 24 inches. The main and cross runners are supported by the wall moldings and clips which must be attached to the supporting wall system as determined by registered design professional (without the use of hanger wires, perimeter wire, or splay wires). The US44 AdvanceSpan Reversible Structural Wall Channel Moldings and the US44CC AdvanceSpan Channel Clips are used to secure the main runners and cross runners to the wall closure (angle) to allow free movement of the runners on the two opposing walls (floating ends). The US44CC AdvanceSpan Channel Clips allow the terminal runner end to move 3/8 inch (9.5 mm) towards and way from

the wall (See [Figure 6](#)). On the walls where runners are fixed (or runners are restrained), the runner ends must be attached to the US44CC AdvanceSpan Channel Clips as shown in [Figure 5](#).

#### 4.2 Installation:

Installation of the USG Donn® AdvanceSpan Suspension System must be in accordance with this report, the approved plans and the manufacturer's printed installation instructions. The manufacturer's printed installation instructions must always be available at the jobsite during installation.

#### 4.3 Special Inspection:

Where special inspections are required by the building official, suspended ceilings in Seismic Categories C, D, E and F, shall be subjected to periodic special inspections during the installation of the suspended ceiling systems and their anchorage, in accordance with the following requirements: For installations in accordance with Section 4.2 of this report, special inspection must be conducted as required by the building official during enforcement of the 2018 and 2015 IBC Sections 1705.1.1, 1704.5 and 1705.13.2 (2012 IBC Sections 1705.1.1, 1705.11.4 and Section 1705.12), as applicable. The special inspector must verify that the ceiling system is as described in this report, and complies with the installation instructions in this report, and with the approved construction documents.

Where special inspections are required by the building official, a statement of special inspections must be provided as required in 2018, 2015 and 2012 IBC Section 1704.3.

### 5.0 CONDITIONS OF USE:

The USG Donn® AdvanceSpan Suspension System described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Installation of the USG Donn® AdvanceSpan Suspension System must be in accordance with this report, the approved plans and the manufacturer's printed installation instructions. In the event of a conflict between this report and the manufacturer's printed installation instructions, the more restrictive requirement governs.
- 5.2 All construction, wood or steel framing, beams, joist, stringers and associated connections needed to support the USG Donn® AdvanceSpan Ceiling system are outside the scope of this report. All constructions shall follow applicable codes or be designed by a registered design professional.
- 5.3 The ceiling systems are limited to ceilings not considered accessible in accordance with Item 28 of the 2018, 2015 and 2012 IBC Table 1607.1.
- 5.4 The ceiling systems are limited to interior application. The system shall not be installed where directly exposed to sun or weather.
- 5.5 Lighting fixtures and mechanical services may be supported by the suspended ceiling systems or structure above. The connection of the fixture to the suspended ceiling systems must be designed to withstand 100 percent of the fixture weight.
- 5.6 USG Donn® AdvanceSpan Suspension System are manufactured in Westlake, Ohio under an approved quality control program with inspections by ICC-ES.

### 6.0 EVIDENCE SUBMITTED

- 6.1 Uniform load test data of main runners installed in a manner representative of field installation in accordance with the ASTM C635.
- 6.2 Connection test data to show compliance with ASTM E580 requirements.
- 6.3 Data in accordance with the [ICC-ES Acceptance Criteria for Seismic Certification by Shake-table Testing of Nonstructural Components \(AC156\)](#), dated October 2010 (editorially revised December 2020).

### 7.0 IDENTIFICATION

- 7.1 Cartons of main and cross runners, clips and accessories are identified with the name and address of USG Interiors, LLC, the manufacturing location, the main and cross runners designations and the evaluation report number (ESR-5136).

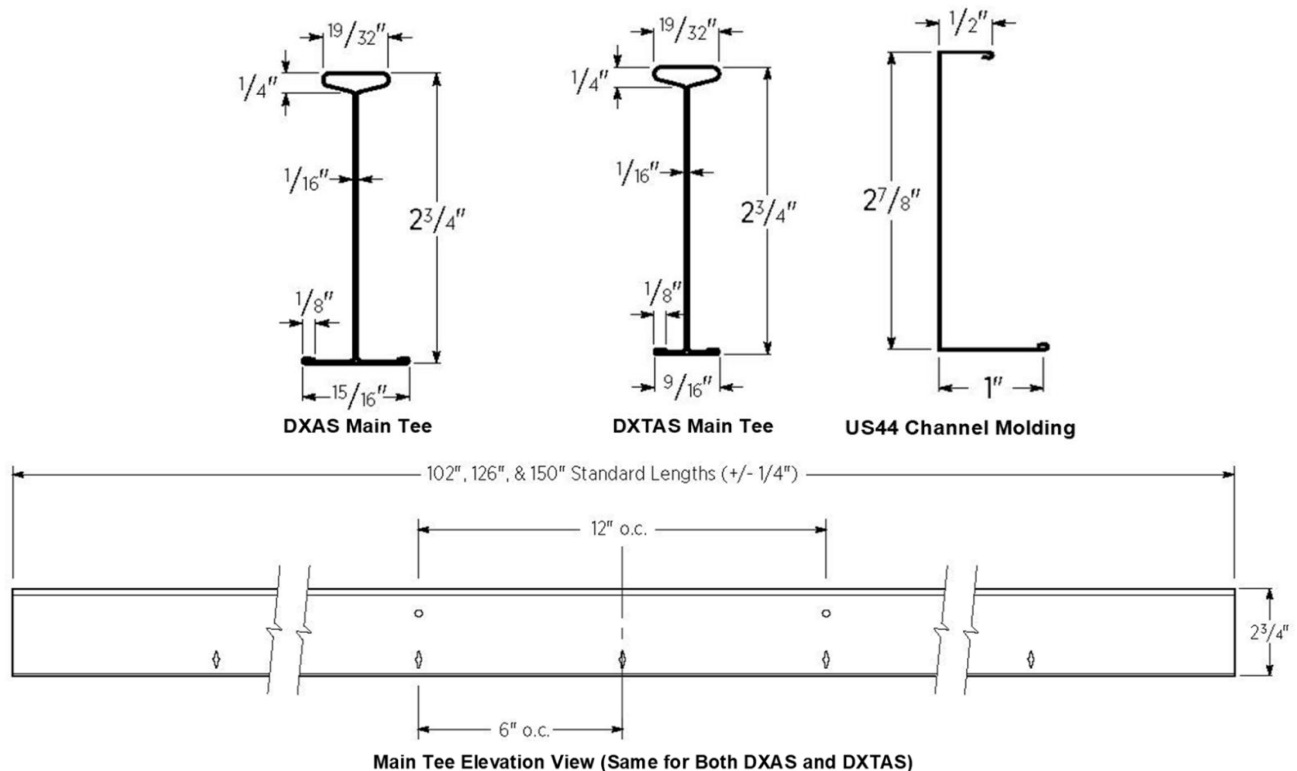
7.2 The report holder’s contact information is the following:

**USG INTERIORS, LLC**  
**550 WEST ADAMS STREET**  
**CHICAGO, ILLINOIS 60601**  
**(800) 874-4968**  
[www.usg.com](http://www.usg.com)

**TABLE 1—ASTM C635 RATED LOADS<sup>1</sup>**

| Part Number | Member   | Load Classification <sup>2</sup> |                     | Allowable Uniform Load (pounds per lineal foot) |                     |                         |
|-------------|----------|----------------------------------|---------------------|---|---------------------|-------------------------|
|             |          | 8-foot Maximum Span              | 7-foot Maximum Span | 7-foot Maximum Span                             | 8-foot Maximum Span | 8-1/2-foot Maximum Span |
| DXAS-HRC    | Main Tee | Intermediate Duty                | Heavy Duty          | 16.0  | 12.0                | 5.0                     |
| DXTAS-HRC   | Main Tee | Intermediate Duty                | Heavy Duty          | 16.0  | 12.0                | 5.0                     |

1. Rated loads are based on the deflection limit of L/360.
2. ASTM C635 Class, Light Duty: ≥5 lb/ft; Intermediate Duty: ≥12lb/ft; Heavy Duty: ≥16lb/ft. Ceiling grid should be installed in accordance with ASTM C636 and/or ASTM E580.



**FIGURE 1—DONN ADVANCESPAN SYSTEM MAIN TEE AND CHANNEL MOLDING DETAILS**

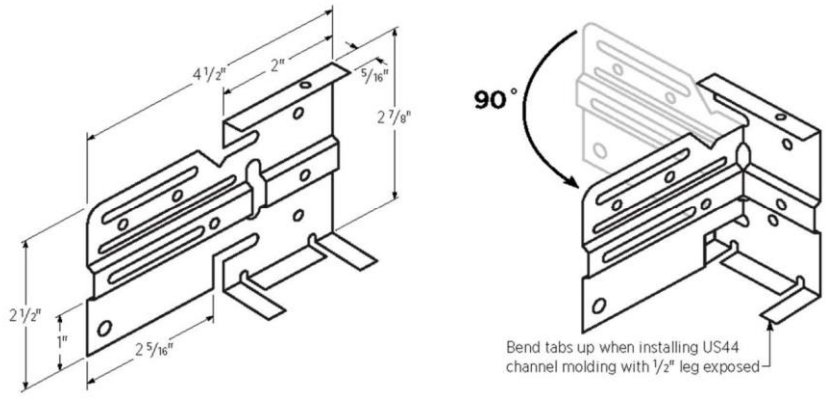


FIGURE 2—ADVANCESPAN CHANNEL CLIP (US44CC)

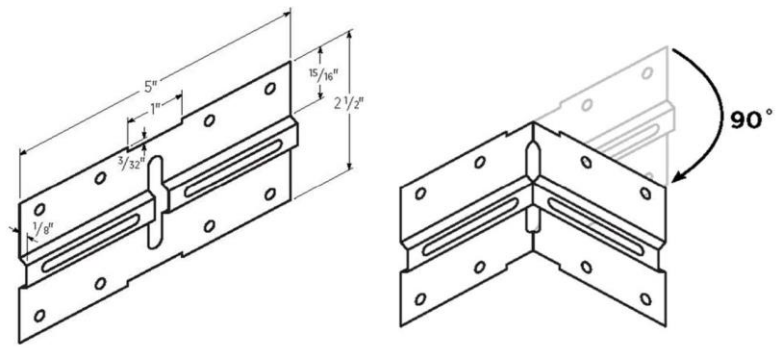


FIGURE 3—ADVANCESPAN MAIN TEE SPLICE PLATE (ASMTTP)

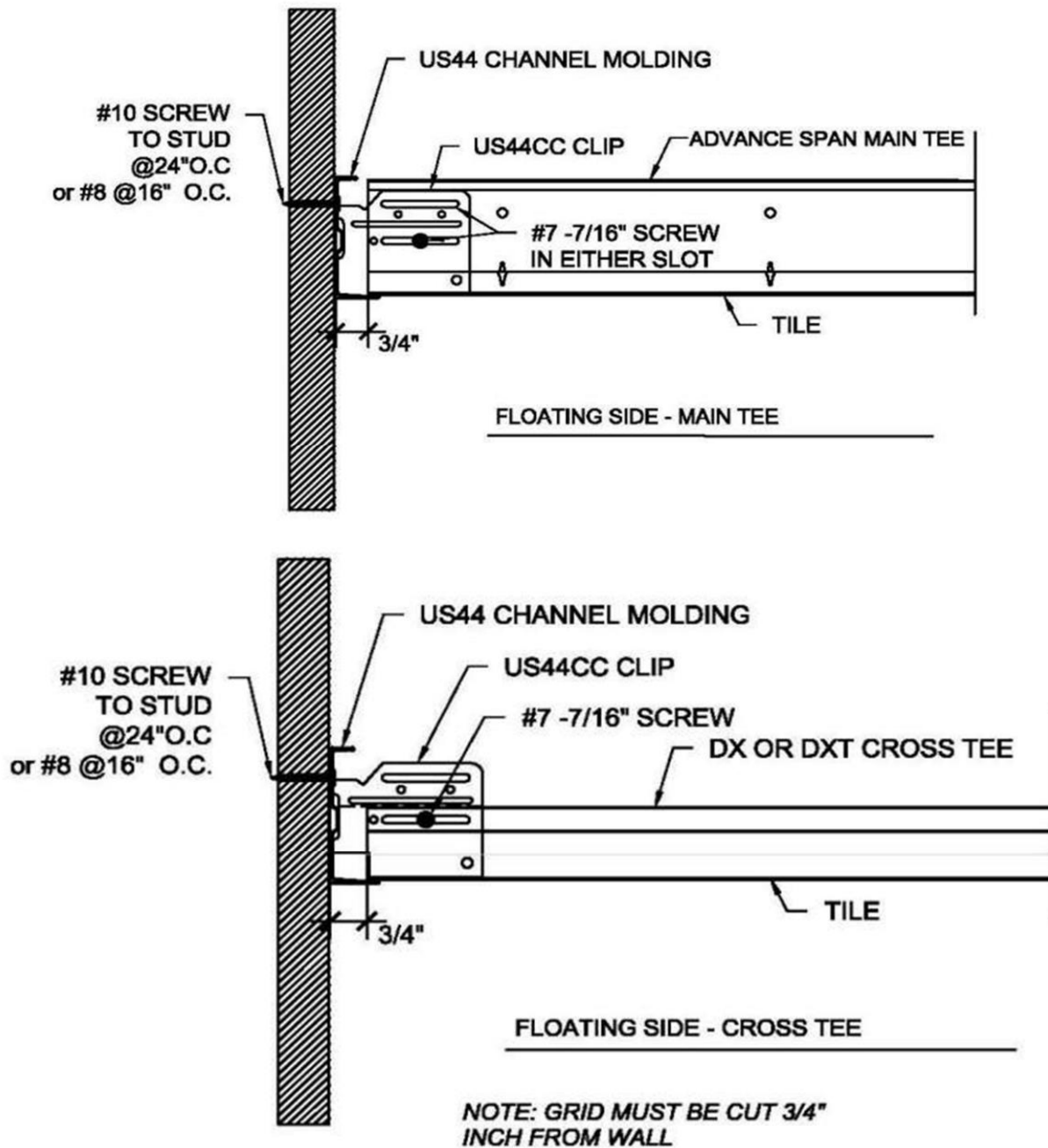


FIGURE 4—HEAVY DUTY “FLOATING SIDE” DETAILS

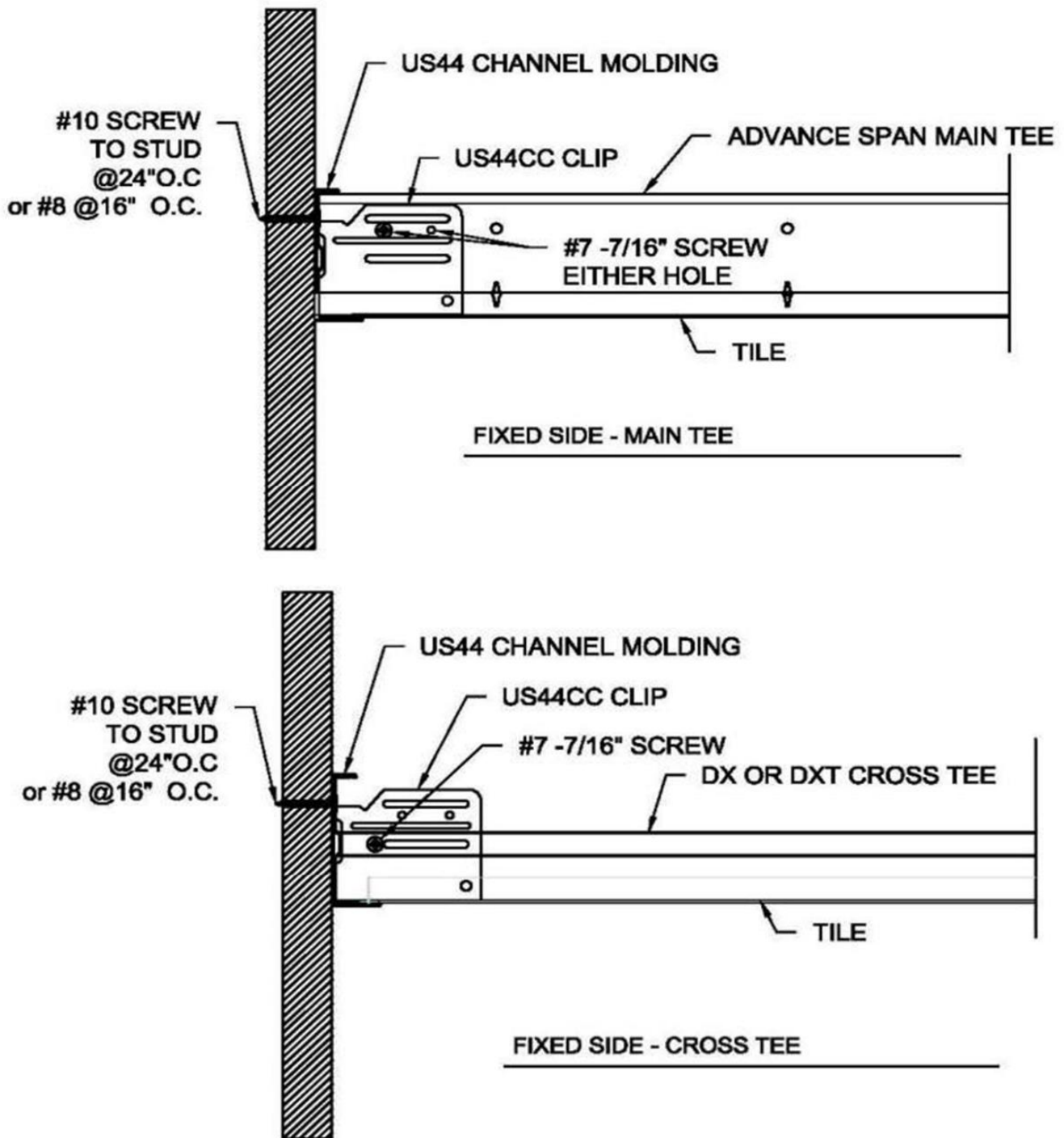
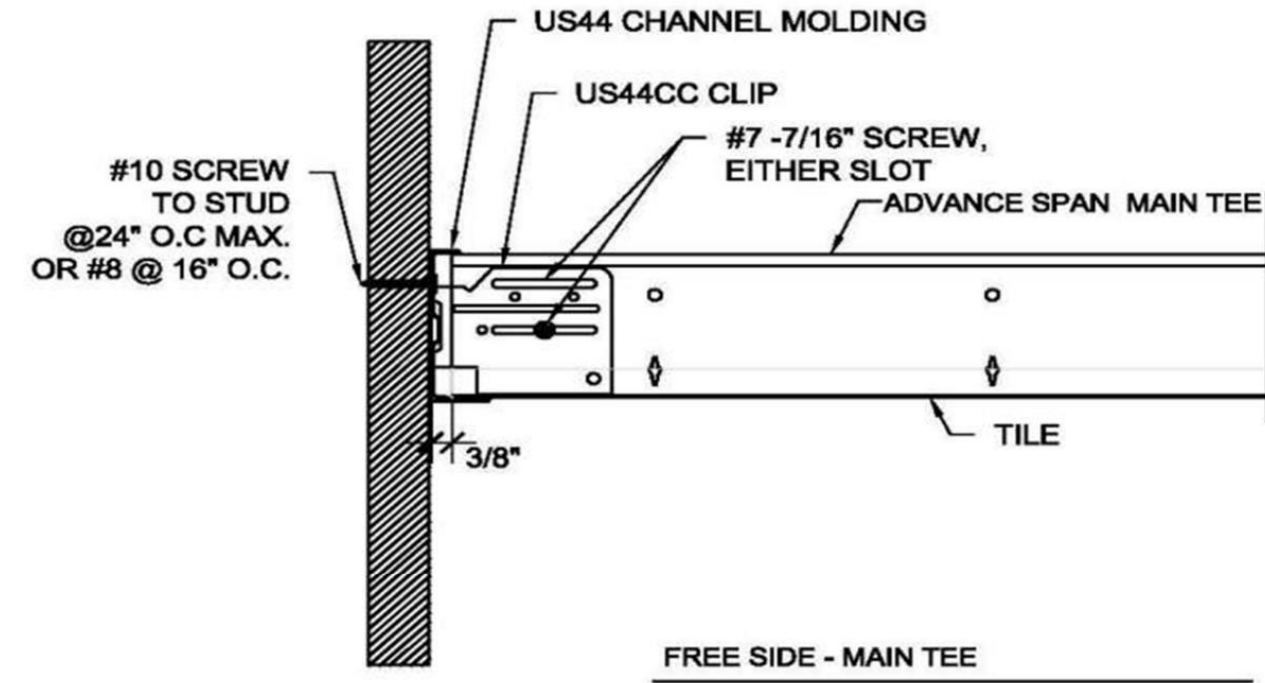
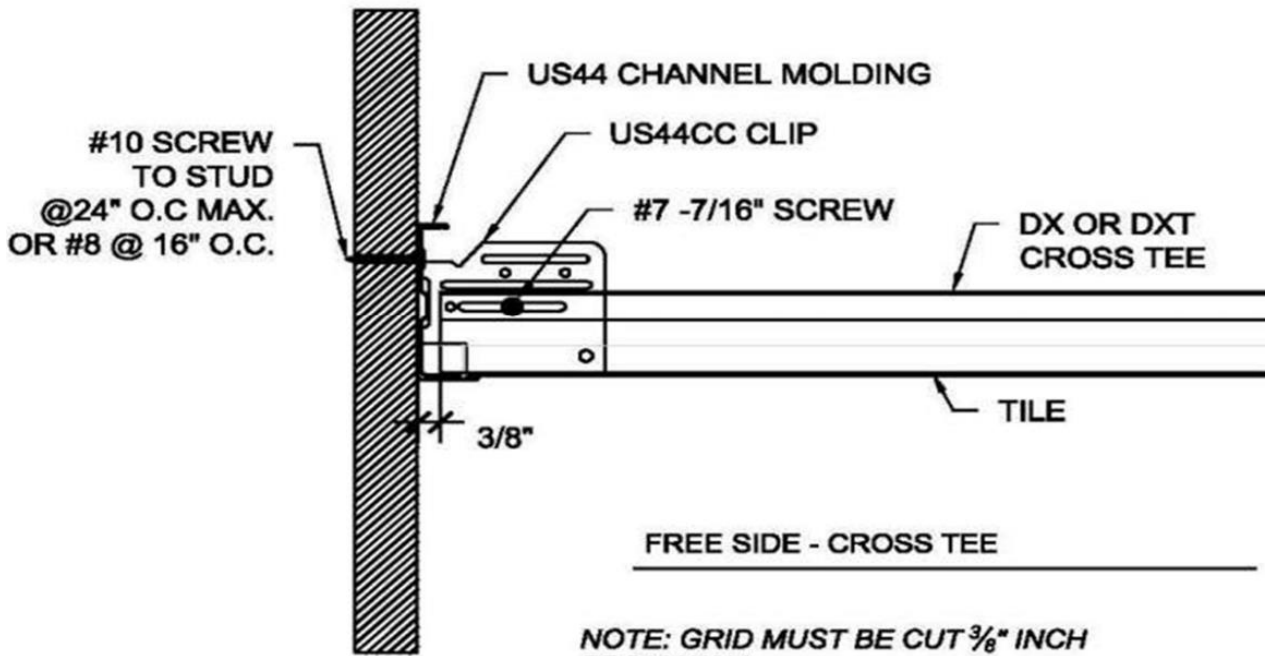


FIGURE 5—HEAVY DUTY AND IMMEDIATE DUTY “FIXED SIDE” DETAILS





NOTE: GRID MUST BE CUT 3/8" INCH FROM WALL



NOTE: GRID MUST BE CUT 3/8" INCH FROM WALL

FIGURE 6—IMMEDIATE DUTY “FLOATING SIDE” DETAILS