ICC-ES Evaluation Report

ESR-5019

Reissued May 2024

Revised April 2025

Subject to renewal May 2025

This report also contains:

- City of LA Supplement
- CA Supplement w/ DSA & OSHPD

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DIVISION: 05 00 00—METALS Section: 05 40 00 – Cold-Formed Metal Framing	REPORT HOLDER: HILTI, INC.	EVALUATION SUBJECT: HILTI MULTI-DUTY CHANNEL SYSTEM (MT)	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015 and 2012 *International Building Code*® (IBC)
- 2024, 2021, 2018, 2015 and 2012 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Property evaluated

- Structural

2.0 USES

The Hilti Multi-Duty Channel System (MT) are cold-formed steel installation channels evaluated for use in interior and exterior, non-load-bearing and load-bearing applications. For use under the IRC, the cold-formed steel framing members must be limited to engineered structures, in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 General:

The products that are evaluated in this report are limited to those products noted in Table 1.

The installation channels MT-20 and MT-20 OC are made of thin-walled steel in C shape. Recesses in the channel profiles in the form of oblong holes and round holes allow the use of fasteners and fixtures.

The installation channels MT-30 S, MT-30, MT-30 S OC, MT-30 OC, MT-50 S, MT-50, MT-50 S OC, MT-50 OC, MT-50 U, MT-60 S, MT-60, MT-60 S OC and MT-60 OC are made of thin-walled steel with parallel flanges and a connecting web. The flanges are turned at the end which makes it possible to force-fit the channels to specific channel system fixtures. Recesses in the back and/or in the flanges of the channels in the form of oblong holes and round holes allow the use of fasteners and fixtures.

The installation channels MT-30D, MT-30D S, MT-30D OC, MT-30D S OC, MT-40D, MT-40D S, MT-40D OC, MT-40D S OC, MT-50D U, MT-50D S, MT-50D, MT-60D, MT-60D OC and MT-60D S are made each of two thin-walled channel profiles in C shape. The profile flanges are turned at the end which makes it possible to force-fit the channels to specific channel system fixtures. In the back area of the channels, the profiles are connected in a shape and force fitting way.

The installation channels MT-70 S OC, MT-70 OC, MT-80 S OC, MT-80 OC, MT-90 S OC, MT-90 OC, MT-90H OC, MT-90H S OC, MT-100 S OC and MT-100 OC are made of thin-walled steel closed profiles in square or rectangular shape with recesses in the form of dome shape round holes on the inner sides to allow use of fasteners and fixtures.

The channels are delivered in lengths up to 6m (19ft – 8in) and can be cut to length as required.

Connectors, fixtures and fasteners to be used in conjunction with the channels are available through Hilti's website (www.hilti.com) and have not been evaluated under this report.

3.2 Material:

Hilti MT-20, MT-20 OC, MT-30 S, MT-30, MT-30 S OC, MT-30 OC, MT-50 S, MT-50, MT-50 S OC, MT-50 OC, MT-50 U, , MT-60 S, MT-60, MT-60 S OC, MT-60 OC, MT-30D, MT-30D S, MT-30D OC, MT-30D S OC, MT-40D, MT-40D S, MT-40D OC, MT-40D S OC, MT-50D U, MT-50D S, MT-50D, MT-60D, MT-60D OC and MT-60D S channels are cold-formed from steel coils complying with European standard EN 10346 Grade S280 GD. Grade S280 steel has a minimum yield strength of 280 MPa (40.6 ksi), a minimum tensile strength of 360 MPa (52.2 ksi), and minimum elongation of 18 percent in a 50-mm gauge length in accordance EN 10346.

Hilti MT closed profiles MT-70 S OC, MT-70 OC, MT-80 S OC, MT-80 OC, MT-90 S OC, MT-90 OC, MT-90H OC, MT-90H S OC, MT-100 S OC and MT-100 OC are cold-formed from steel coils complying with European standard EN 10346 Grade S350 GD. Grade S350 steel has a minimum yield strength of 350 MPa (50.75 ksi), a minimum tensile strength of 420 MPa (60.9 ksi), and minimum elongation of 16 percent in a 50-mm gauge length in accordance with EN 10346.

Hilti MT-20, MT-30 S, MT-30, MT-50 S, MT-50, MT-50 U, MT-60 S, MT-60, MT-30D, MT-30D S, MT-40D, MT-40D S, MT-50D U, MT-50D S, MT-50D, MT-60D and MT-60D S are pre-galvanized parts conforming to ASTM A653/A653M galvanizing, with minimum 0.75 mil zinc coating. These channels are limited to dry, interior locations.

Hilti MT-20 OC, MT-30 S OC, MT-30 OC, MT-50 S OC, MT-50 OC, MT-60 S OC, MT-60 OC, MT-70 S OC, MT-70 OC, MT-80 S OC, MT-80 OC, MT-90 S OC, MT-90 OC, MT-90H OC, MT-90H S OC, MT-100 S OC, MT-100 OC, MT-30D OC, MT-30D S OC, MT-40D OC, MT-40D S OC and MT-60D OC, profiles are coated with zinc-aluminum-magnesium alloy (ZM) by a continuous hot-dip galvanizing process during the steel coil phase in accordance to the ASTM A1046M Standard. Use of these channels are permitted for exterior exposure and damp environments.

4.0 DESIGN AND INSTALLATION

4.1 Design:

Table 1 summarizes channel's material, designation, and length details. Material thickness, yield strength and section properties are set forth in Table 2, for use with the Allowable Strength Design (ASD) as well as the Load and Resistance Factor Design (LRFD).

Analysis and design must be in accordance with IBC Section 2210. Structural capacities are determined in accordance with the applicable edition of the North American Specification for the Design of Cold-Formed Steel Structural Members (AISI-S100), based on structural properties in Tables 1 and 2 of this report. Additional design considerations per AISI S100 must be considered, such as the design of flexural members must address combined bending and shear.

4.2 Installation:

The channels must be installed in accordance with the approved plans and this report. If there is a conflict, this report governs. MT channels can be cut anywhere along the whole length. See Figure 1 for additional information. For open profiles, the distance between the end of the profile and center of the first hole has to be minimum 25 mm (1-in). For closed profiles, the distance between the end of the profile and start of the dome shaped hole has to be minimum 10 mm (0.4-in). Threaded rods and other fixtures are only to be guided through the round holes or long holes of the channel. The approved plans must be available at the jobsite at all times during installation.

5.0 CONDITIONS OF USE:

The Hilti MT channels 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 Channels, dimensions and other installation parameters are as set forth in this report.

5.2 The channels must be installed in accordance with the manufacturer's published instructions and this report. In case of conflict, this report governs.

5.3 Design values must be established in accordance with Section 4.1 of this report.

5.4 Web crippling and concentrated loads are outside the scope of this evaluation report.

5.5 Hilti proprietary connectors, fixtures and fasteners have not been evaluated and are outside the scope of this report.

5.6 Complete plans and calculations verifying compliance with this report must be submitted to the code official for each project. The calculations and drawings must be prepared and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is constructed.

5.7 Use of pre-galvanized channel is limited to dry, interior locations.

5.8 Use of channels with ZM coating in this report are permitted for exterior exposure and damp environments.

5.9 Channels are manufactured by Hilti AG under an approved quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members (AC46), dated October 2024.

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5019) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, the Hilti Multi-Duty Channel System (MT) is identified by packaging labeled with the manufacturer's name (Hilti, Inc.) and contact information, channel name, and evaluation report number (ESR-5019).

7.3 The report holder's contact information is the following:

HILTI, INC.
7250 DALLAS PARKWAY, SUITE 1000
PLANO, TEXAS 75024
(918) 872-8000
www.hilti.com

TABLE 1—SHAPE, DIMENSIONS, AND MATERIAL OF CHANNELS[1,2]

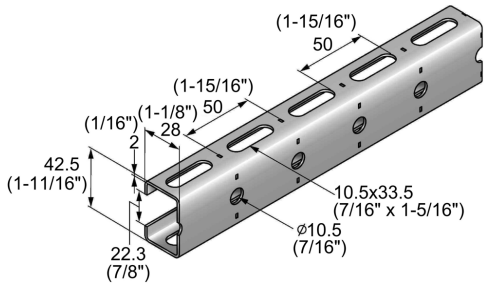
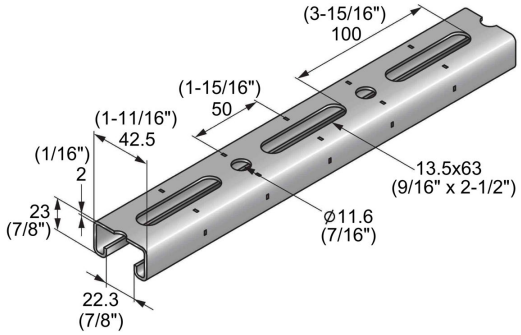
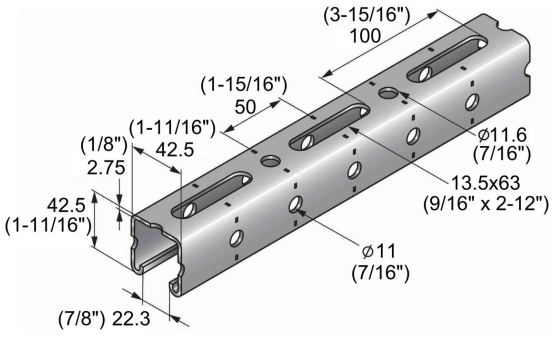
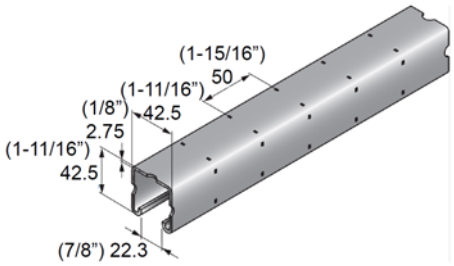
Illustration	Item Number	Designation	Length [m]	Materials and coatings
	2268495	MT-20	2	S280GD+ Z275-M-A-C EN 10346
	2268496	MT-20 OC	2	S280GD+ ZM310-A-C EN 10346
	2268497	MT-30 S	3	S280GD+ Z275-M-A-C EN 10346
	2268498	MT-30	6	S280GD+ Z275-M-A-C EN 10346
	2268499	MT-30 S OC	3	S280GD+ ZM310-A-C EN 10346
	2268500	MT-30 OC	6	S280GD+ ZM310-A-C EN 10346
	2268509	MT-50 S	3	S280GD+ Z275-M-A-C EN 10346
	2268510	MT-50	6	S280GD+ Z275-M-A-C EN 10346
	2268511	MT-50 S OC	3	S280GD+ ZM310-A-C EN 10346
	2268512	MT-50 OC	6	S280GD+ ZM310-A-C EN 10346
	2362808	MT-50 U	6	S280GD+ Z275-M-A-C EN 10346

TABLE 1—SHAPE, DIMENSIONS, AND MATERIAL OF CHANNELS[1,2]

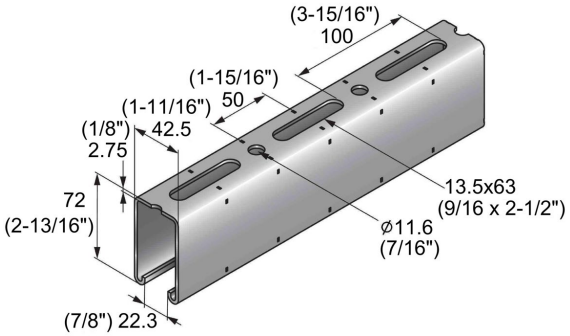
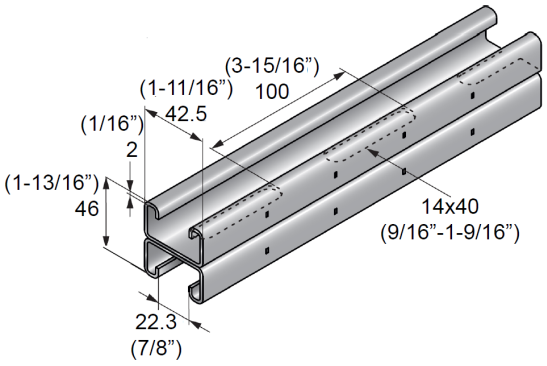
Illustration	Item Number	Designation	Length [m]	Materials and coatings
	2268513	MT-60 S	3	S280GD+ Z275-M-A-C EN 10346
	2268514	MT-60	6	S280GD+ Z275-M-A-C EN 10346
	2268515	MT-60 S OC	3	S280GD+ ZM310-A-C EN 10346
	2268516	MT-60 OC	6	S280GD+ ZM310-A-C EN 10346
	2362706	MT-30D	6	S280GD+ Z275-M-A-C EN 10346
	2362707	MT-30D OC	6	S280GD+ ZM310-A-C EN 10346
	2362708	MT-30D S	3	S280GD+ Z275-M-A-C EN 10346
	2362709	MT-30D S OC	3	S280GD+ ZM310-A-C EN 10346

TABLE 1—SHAPE, DIMENSIONS, AND MATERIAL OF CHANNELS[1,2]

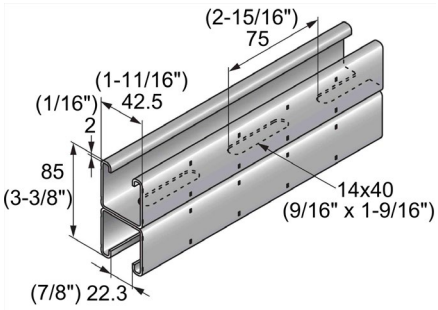
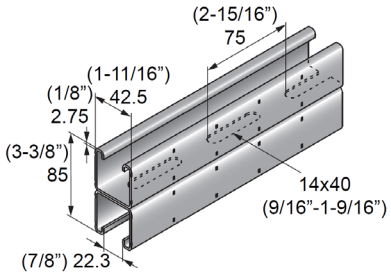
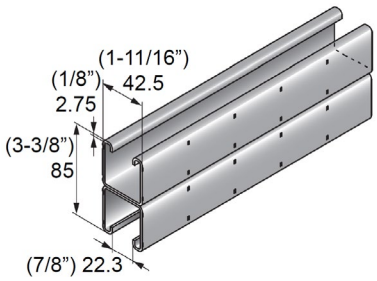
Illustration	Item Number	Designation	Length [m]	Materials and coatings
	2268517	MT-40D S	3	S280GD+ Z275-M-A-C EN 10346
	2268518	MT-40D	6	S280GD+ Z275-M-A-C EN 10346
	2268519	MT-40D S OC	3	S280GD+ ZM310-A-C EN 10346
	2268520	MT-40D OC	6	S280GD+ ZM310-A-C EN 10346
	2362803	MT-50D	6	S280GD+ Z275-M-A-C EN 10346
	2362804	MT-50D S	3	S280GD+ Z275-M-A-C EN 10346
	2362807	MT-50D U	6	S280GD+ Z275-M-A-C EN 10346

TABLE 1—SHAPE, DIMENSIONS, AND MATERIAL OF CHANNELS[1,2]

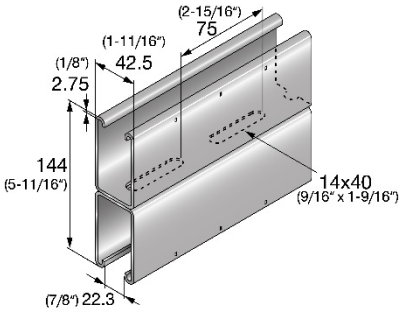
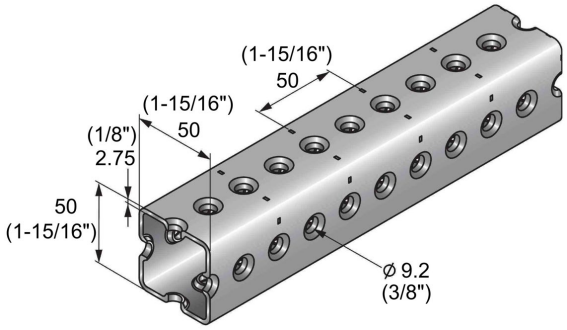
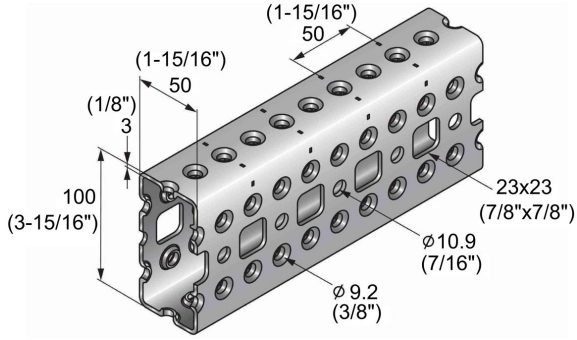
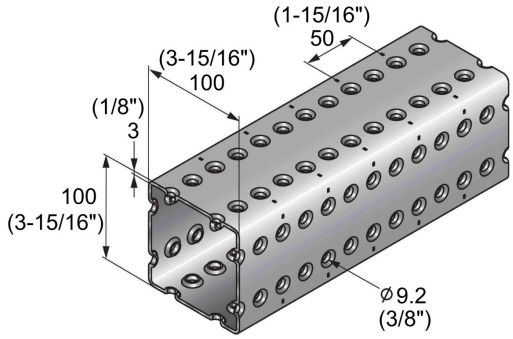
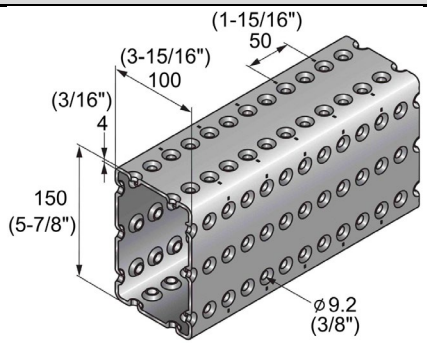
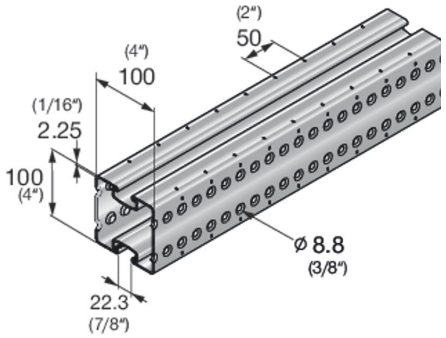
Illustration	Item Number	Designation	Length [m]	Materials and coatings
	2362800	MT-60D	6	S280GD+ Z275-M-A-C EN 10346
	2362801	MT-60D OC	6	S280GD+ ZM310-A-C EN 10346
	2362802	MT-60D S	3	S280GD+ Z275-M-A-C EN 10346
	2268364	MT-70 S OC	3	S350GD+ ZM310 A-C EN 10346
	2268365	MT-70 OC	6	S350GD+ ZM310 A-C EN 10346
	2268366	MT-80 S OC	3	S350GD+ ZM310 A-C EN 10346
	2268367	MT-80 OC	6	S350GD+ ZM310 A-C EN 10346
	2268368	MT-90 S OC	3	S350GD+ ZM310 A-C EN 10346
	2268369	MT-90 OC	6	S350GD+ ZM310 A-C EN 10346

TABLE 1—SHAPE, DIMENSIONS, AND MATERIAL OF CHANNELS[1,2]

Illustration	Item Number	Designation	Length [m]	Materials and coatings
	2268490	MT-100S OC	3	S350GD+ ZM310 A-C EN 10346
	2268491	MT-100 OC	6	S350GD+ ZM310 A-C EN 10346
	2430776	MT-90H OC	6	S350GD+ ZM310 A-C EN 10346
	2431073	MT-90H S OC	3	S350GD+ ZM310 A-C EN 10346

For **SI:** 1 inch = 25.4 mm.

1. Mechanical properties of EN 10346 Grade S280 GD meet or exceed the mechanical properties of ASTM A653/A1046 SS Grade 37
2. Mechanical properties of EN 10346 Grade S350 GD meet or exceed the mechanical properties of ASTM A653/A1046 SS Grade 50 Cl4

TABLE 2—CHANNELS SECTION PROPERTIES[1,2,3,4,5,6]

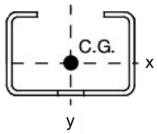
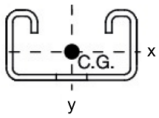
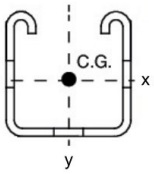
Symbol	Unit	MT-20 / MT-20 OC		MT-30 S / MT-30 / MT-30 S OC / MT-30 OC		MT-50 S / MT-50 / MT-50 S OC / MT-50 OC	
-	-						
t	in (mm)	0.069	(1.75)	0.079	(2.00)	0.108	(2.75)
w	lb/ft (kg/m)	0.84	(1.250)	1.1	(1.64)	1.97	(2.93)
F_y	ksi (Mpa)	40.6	(280)	40.6	(280)	40.6	(280)
Gross Properties							
A	in^2 (mm^2)	0.29	(188)	0.32	(208)	0.58	(374)
I_x	in^4 (mm^4)	0.049	(20349)	0.035	(14621)	0.201	(83829)
I_y	in^4 (mm^4)	0.127	(52943)	0.127	(53018)	0.259	(107679)
s_x	in^3 (mm^3)	0.07	(1216)	0.07	(1098)	0.22	(3532)
s_y	in^3 (mm^3)	0.15	(2491)	0.15	(2495)	0.31	(5067)
R_x	in (mm)	0.41	(10.4)	0.33	(8.4)	0.59	(15.0)
R_y	in (mm)	0.66	(16.8)	0.63	(16)	0.67	(17.0)
Effective Properties							
$I_{x\text{-}eff}$	in^4 (mm^4)	0.044	(18439)	0.033	(13594)	0.1986	(82651)
$I_{y\text{-}eff}$	in^4 (mm^4)	0.090	(37509)	0.126	(52608)	0.26	(107662)
$s_{x\text{-}eff}$	in^3 (mm^3)	0.07	(1102)	0.06	(1021)	0.21	(3482)
$s_{y\text{-}eff}$	in^3 (mm^3)	0.11	(1765)	0.15	(2476)	0.31	(5066)
$M_{al\text{-}x}$	k-in (kN.m)	1.85	(0.208)	1.92	(0.216)	6.66	(0.752)
$\phi M_{l\text{-}x}$	k-in (kN.m)	2.77	(0.313)	2.89	(0.325)	10.01	(1.130)
$M_{al\text{-}y}$	k-in (kN.m)	2.88	(0.325)	4.21	(0.476)	8.39	(0.948)
$\phi M_{l\text{-}y}$	k-in (kN.m)	4.33	(0.488)	6.33	(0.715)	12.61	(1.424)
$M_{ad\text{-}x}$	k-in (kN.m)	1.68	(0.190)	1.77	(0.199)	5.99	(0.677)
$\phi M_{d\text{-}x}$	k-in (kN.m)	2.53	(0.286)	2.66	(0.299)	9.00	(1.017)
$M_{ad\text{-}y}$	k-in (kN.m)	2.50	(0.283)	3.79	(0.428)	8.39	(0.948)
$\phi M_{d\text{-}y}$	k-in (kN.m)	3.76	(0.425)	5.7	(0.643)	12.61	(1.425)
$V_{a\text{-}x}$	lb (N)	1466	(6516)	1628	(7240)	1979	(8807)
ϕV_x	lb (N)	2228	(9794)	2476	(10882)	3008	(13386)
$V_{a\text{-}y}$	lb (N)	1735	(7712)	1416	(6295)	4082	(18165)
ϕV_y	lb (N)	2637	(11591)	2153	(9461)	6205	(27611)
L_u	ft (m)	2.4	(0.71)	2.2	(0.65)	3.9	(1.19)
Torsional Properties							
J	in^4 (mm^4)	0.0005	(191.50)	0.0007	(277.26)	0.0023	(942)
C_w	in^6 (mm^6)	0.0368	(9881442)	0.0323	(8685395)	0.157	(42031234)
X_0	in (mm)	0	(0)	0	(0)	0	(0)
Y_0	in (mm)	0.988	(25.10)	0.868	(22.05)	1.59	(40.3)
R_0	in (mm)	1.258	(31.95)	1.122	(28.49)	1.82	(46.2)

TABLE 2—CHANNELS SECTION PROPERTIES (CONTINUED) [1,2,3,4,5,6]

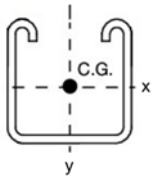
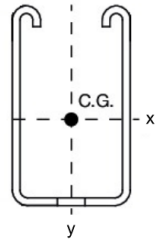
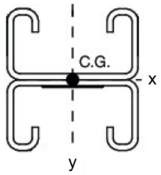
Symbol	Unit	MT-50 U		MT-60 S / MT-60 / MT-60 S OC / MT-60 OC		MT-30D S / MT-30D / MT-30D S OC / MT-30D OC	
-	-						
t	in (mm)	0.108	(2.75)	0.108	(2.75)	0.079	(2.00)
w	lb/ft (kg/m)	1.96	(2.91)	2.83	(4.21)	1.98	(2.94)
F_y	ksi (Mpa)	40.6	(280)	40.6	(280)	40.6	(280)
Gross Properties							
A	in^2 (mm^2)	0.58	(374)	0.83	(538)	0.64	(416)
I_x	in^4 (mm^4)	0.201	(83829)	0.790	(329006)	0.164	(68266)
I_y	in^4 (mm^4)	0.259	(107679)	0.415	(172864)	0.255	(106035)
s_x	in^3 (mm^3)	0.22	(3532)	0.51	(8432)	0.18	(2968)
s_y	in^3 (mm^3)	0.31	(5067)	0.50	(8135)	0.30	(4990)
R_x	in (mm)	0.59	(15.0)	0.97	(24.7)	0.50	(12.8)
R_y	in (mm)	0.67	(17.0)	0.71	(17.9)	0.63	(16.0)
Effective Properties							
$I_{x\text{-}eff}$	in^4 (mm^4)	0.201	(83841)	0.780	(324725)	0.164	(68195)
$I_{y\text{-}eff}$	in^4 (mm^4)	0.259	(107667)	0.415	(172858)	0.253	(105123)
$s_{x\text{-}eff}$	in^3 (mm^3)	0.22	(3532)	0.51	(8323)	0.18	(2965)
$s_{y\text{-}eff}$	in^3 (mm^3)	0.31	(5067)	0.50	(8135)	0.30	(4947)
$M_{al\text{-}x}$	k-in (kN.m)	6.74	(0.761)	15.53	(1.755)	5.66	(0.639)
$\phi M_{l\text{-}x}$	k-in (kN.m)	10.13	(1.144)	23.34	(2.638)	8.50	(0.960)
$M_{al\text{-}y}$	k-in (kN.m)	8.78	(0.992)	12.80	(1.446)	9.04	(1.021)
$\phi M_{l\text{-}y}$	k-in (kN.m)	13.20	(1.491)	19.24	(2.173)	13.59	(1.535)
$M_{ad\text{-}x}$	k-in (kN.m)	6.74	(0.761)	12.41	(1.402)	5.66	(0.639)
$\phi M_{d\text{-}x}$	k-in (kN.m)	10.13	(1.144)	18.65	(2.107)	8.50	(0.960)
$M_{ad\text{-}y}$	k-in (kN.m)	8.78	(0.992)	11.88	(1.342)	9.04	(1.021)
$\phi M_{d\text{-}y}$	k-in (kN.m)	13.20	(1.491)	17.86	(2.017)	13.59	(1.535)
$V_{a\text{-}x}$	lb (N)	1979	(8807)	2103	(9348)	3257	(14494)
ϕV_x	lb (N)	3008	(13386)	3197	(14050)	4951	(22030)
$V_{a\text{-}y}$	lb (N)	4082	(18165)	8036	(35720)	2833	(12607)
ϕV_y	lb (N)	6205	(27611)	12215	(53687)	4306	(19162)
L_u	ft (m)	3.6	(1.10)	6.0	(1.81)	2.6	(0.79)
Torsional Properties							
J	in^4 (mm^4)	0.0023	(942)	0.0033	(1357)	0.0013	(555)
C_w	in^6 (mm^6)	0.157	(42031234)	0.599	(160884400)	0.065	(17370780)
X_0	in (mm)	0	(0)	0	(0)	0	(0)
Y_0	in (mm)	1.59	(40.3)	2.740	(69.6)	0	(0)
R_0	in (mm)	1.82	(46.2)	2.992	(76.0)	0.81	(20.5)

TABLE 2—CHANNELS SECTION PROPERTIES (CONTINUED) [1,2,3,4,5,6]

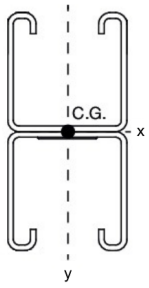
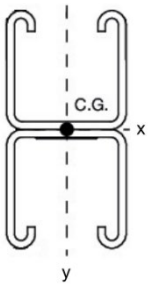
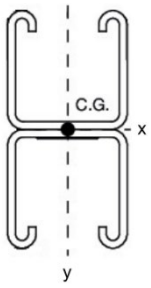
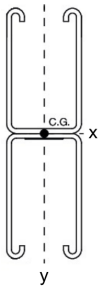
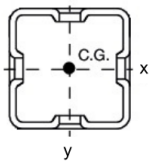
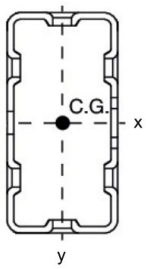
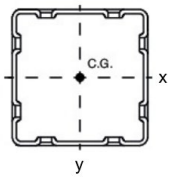
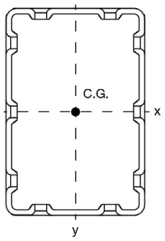
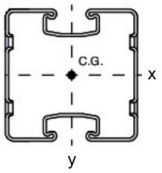
Symbol	Unit	MT-40D S / MT-40D / MT-40D S OC / MT-40D OC		MT-50D/ MT-50D S		MT-50D U	
-	-						
t	in (mm)	0.079	(2.00)	0.108	(2.75)	0.108	(2.75)
w	lb/ft (kg/m)	3.01	(4.48)	3.91	(5.82)	3.91	(5.82)
F_y	ksi (Mpa)	40.6	(280)	40.6	(280)	40.6	(280)
Gross Properties							
A	in^2 (mm^2)	0.89	(572)	1.16	(748)	1.16	(748)
I_x	in^4 (mm^4)	0.824	(342808)	1.035	(430883)	1.035	(430883)
I_y	in^4 (mm^4)	0.409	(170072)	0.517	(215317)	0.517	(215317)
s_x	in^3 (mm^3)	0.49	(8066)	0.62	(10139)	0.62	(10138)
s_y	in^3 (mm^3)	0.49	(8003)	0.62	(10133)	0.62	(10133)
R_x	in (mm)	0.96	(24.5)	0.95	(24.0)	0.95	(24.0)
R_y	in (mm)	0.68	(17.2)	0.67	(17.0)	0.67	(17.0)
Effective Properties							
$I_{x\text{-}eff}$	in^4 (mm^4)	0.823	(342737)	1.035	(430675)	1.035	(430883)
$I_{y\text{-}eff}$	in^4 (mm^4)	0.406	(169144)	0.514	(214068)	0.517	(215317)
$s_{x\text{-}eff}$	in^3 (mm^3)	0.49	(8064)	0.62	(10134)	0.62	(10138)
$s_{y\text{-}eff}$	in^3 (mm^3)	0.49	(7960)	0.62	(10080)	0.62	(10133)
$M_{al\text{-}x}$	k-in (kN.m)	15.38	(1.738)	19.33	(2.184)	19.34	(2.185)
$\phi M_{l\text{-}x}$	k-in (kN.m)	23.12	(2.612)	29.05	(3.283)	29.07	(3.284)
$M_{al\text{-}y}$	k-in (kN.m)	13.33	(1.506)	17.46	(1.973)	17.56	(1.984)
$\phi M_{l\text{-}y}$	k-in (kN.m)	20.03	(2.264)	26.24	(2.965)	26.40	(2.982)
$M_{ad\text{-}x}$	k-in (kN.m)	15.38	(1.738)	19.33	(2.184)	19.34	(2.185)
$\phi M_{d\text{-}x}$	k-in (kN.m)	23.12	(2.612)	29.05	(3.283)	29.07	(3.284)
$M_{ad\text{-}y}$	k-in (kN.m)	13.33	(1.506)	17.46	(1.973)	17.56	(1.984)
$\phi M_{d\text{-}y}$	k-in (kN.m)	20.03	(2.264)	26.24	(2.965)	26.40	(2.983)
$V_{a\text{-}x}$	lb (N)	3257	(14494)	3959	(17618)	3959	(17618)
ϕV_x	lb (N)	4951	(22030)	6018	(26779)	6018	(26779)
$V_{a\text{-}y}$	lb (N)	6513	(28983)	8164	(36330)	8164	(36330)
ϕV_y	lb (N)	9900	(44054)	12409	(55221)	12409	(55221)
L_u	ft (m)	4.6	(1.40)	4.9	(1.49)	5.0	(1.52)
Torsional Properties							
J	in^4 (mm^4)	0.0018	(763)	0.0045	(1885)	0.0045	(1885)
C_w	in^6 (mm^6)	0.294	(78960286)	0.313	(84065153)	0.313	(84065153)
X_0	in (mm)	0	(0)	0	(0)	0	(0)
Y_0	in (mm)	0	(0)	0	(0)	0	(0)
R_0	in (mm)	1.18	(29.9)	1.16	(29.4)	1.16	(29.4)

TABLE 2—CHANNELS SECTION PROPERTIES (CONTINUED) [1,2,3,4,5,6]

Symbol	Unit	MT-60D / MT-60D OC / MT-60D S		MT-70 S OC / MT-70 OC		MT-80 S OC / MT-80 OC	
-	-						
t	**in (mm)**	0.108	(2.75)	0.108	(2.75)	0.118	(3.00)
w	**lb/ft (kg/m)**	5.66	(8.42)	2.63	(3.914)	6.01	(8.944)
F_y	**ksi (Mpa)**	40.6	(280)	50.75	(350)	50.75	(350)
Gross Properties							
A	**in^2 (mm^2)**	1.67	(1074)	0.775	(500.28)	1.303	(840.82)
I_x	**in^4 (mm^4)**	4.395	(1829170)	0.4382	(182390)	2.5576	(1064540)
I_y	**in^4 (mm^4)**	0.828	(344783)	0.4382	(182390)	0.8663	(360568)
s_x	**in^3 (mm^3)**	1.55	(25405)	0.4452	(7296)	1.2993	(21291)
s_y	**in^3 (mm^3)**	0.99	(16225)	0.4452	(7296)	0.8801	(14423)
R_x	**in (mm)**	1.62	(41.3)	0.752	(19.09)	1.401	(35.58)
R_y	**in (mm)**	0.71	(17.9)	0.752	(19.09)	0.815	(20.71)
Effective Properties							
$I_{x\text{-}eff}$	**in^4 (mm^4)**	4.394	(1828975)	0.4382	(182390)	2.3832	(991957)
$I_{y\text{-}eff}$	**in^4 (mm^4)**	0.825	(343526)	0.4382	(182390)	0.6451	(268521)
$s_{x\text{-}eff}$	**in^3 (mm^3)**	1.55	(25402)	0.4452	(7296)	1.2107	(19839)
$s_{y\text{-}eff}$	**in^3 (mm^3)**	0.99	(16166)	0.4452	(7296)	0.6555	(10741)
$M_{al\text{-}x}$	**k-in (kN.m)**	48.46	(5.476)	15.137	(1.710)	41.759	(4.718)
$\phi M_{l\text{-}x}$	**k-in (kN.m)**	72.84	(8.230)	22.751	(2.570)	62.764	(7.091)
$M_{al\text{-}y}$	**k-in (kN.m)**	26.38	(2.981)	15.137	(1.710)	21.008	(2.374)
$\phi M_{l\text{-}y}$	**k-in (kN.m)**	39.65	(4.480)	22.751	(2.570)	31.575	(3.568)
$M_{ad\text{-}x}$	**k-in (kN.m)**	40.71	(4.600)	N.A.		N.A.	
$\phi M_{d\text{-}x}$	**k-in (kN.m)**	61.19	(6.914)	N.A.		N.A.	
$M_{ad\text{-}y}$	**k-in (kN.m)**	23.56	(2.662)	N.A.		N.A.	
$\phi M_{d\text{-}y}$	**k-in (kN.m)**	35.41	(4.000)	N.A.		N.A.	
$V_{a\text{-}x}$	**lb (N)**	4090	(18191)	6329	(28132)	6727	(29902)
ϕV_x	**lb (N)**	6216	(27650)	9620	(42282)	10225	(44943)
$V_{a\text{-}y}$	**lb (N)**	15956	(70974)	6329	(28132)	12723	(56554)
ϕV_y	**lb (N)**	24252	(107880)	9620	(42282)	19339	(85001)
L_u	**ft (m)**	8.67	(2.64)	N.A.[6]		N.A.[6]	
Torsional Properties							
J	**in^4 (mm^4)**	0.0065	(2708)	0.7146	(297456)	2.1217	(883107)
C_w	**in^6 (mm^6)**	1.192	(320071600)	0.0001	(39434)	0.1693	(45468000)
X_0	**in (mm)**	0.000	0.000	0.000	0.000	0.000	0.000
Y_0	**in (mm)**	0.000	0.000	0.000	0.000	0.000	0.000
R_0	**in (mm)**	1.77	(44.982)	1.063	(27.00)	1.621	(41.17)

For **SI:** 1 inch = 25.4 mm.

TABLE 2—CHANNELS SECTION PROPERTIES (CONTINUED) [1,2,3,4,5,6]

Symbol	Unit	MT-90 S OC / MT-90 OC		MT-100 S OC / MT-100 OC		MT-90H OC / MT-90H S OC	
-	-						
t	**in (mm)**	0.118	(3.00)	0.157	(4.00)	0.089	(2.25)
w	**lb/ft (kg/m)**	6.01	(8.944)	10	(14.882)	6.16	(9.170)
F_y	**ksi (Mpa)**	50.75	(350)	50.75	(350)	50.75	(350)
Gross Properties							
A	**in^2 (mm^2)**	1.768	(1140.80)	2.937	(1894.80)	1.812	(1169.30)
I_x	**in^4 (mm^4)**	4.2536	(1770469)	14.2854	(5946036)	3.9526	(1645192)
I_y	**in^4 (mm^4)**	4.2536	(1770469)	7.6536	(3185651)	3.5653	(1483982)
S_x	**in^3 (mm^3)**	2.1608	(35409)	4.8380	(79280)	2.0078	(32903)
S_y	**in^3 (mm^3)**	2.1608	(35409)	3.8880	(63713)	1.8111	(29679)
R_x	**in (mm)**	1.551	(39.39)	2.205	(56.02)	1.477	(37.51)
R_y	**in (mm)**	1.551	(39.39)	1.614	(41.00)	1.403	(35.63)
Effective Properties							
$I_{x\text{-}eff}$	**in^4 (mm^4)**	3.8584	(1605985)	12.0259	(5005546)	3.7254	(1550611)
$I_{y\text{-}eff}$	**in^4 (mm^4)**	3.8584	(1605985)	6.4751	(2695127)	3.2861	(1367793)
$S_{x\text{-}eff}$	**in^3 (mm^3)**	1.9601	(32120)	4.0728	(66741)	1.8924	(31011)
$S_{y\text{-}eff}$	**in^3 (mm^3)**	1.9601	(32120)	3.2894	(53903)	1.6705	(27374)
$M_{al\text{-}x}$	**k-in (kN.m)**	61.75	(6.977)	134.73	(15.222)	64.48	(7.285)
$\phi M_{l\text{-}x}$	**k-in (kN.m)**	92.810	(10.486)	202.499	(22.879)	96.909	(10.949)
$M_{al\text{-}y}$	**k-in (kN.m)**	61.75	(6.977)	101.91	(11.514)	52.24	(5.902)
$\phi M_{l\text{-}y}$	**k-in (kN.m)**	92.810	(10.486)	153.171	(17.306)	78.509	(8.870)
$M_{ad\text{-}x}$	**k-in (kN.m)**	N.A.		N.A.		N.A.	
$\phi M_{d\text{-}x}$	**k-in (kN.m)**	N.A.		N.A.		N.A.	
$M_{ad\text{-}y}$	**k-in (kN.m)**	N.A.		N.A.		N.A.	
$\phi M_{d\text{-}y}$	**k-in (kN.m)**	N.A.		N.A.		N.A.	
$V_{a\text{-}x}$	**lb (N)**	15579	(69249)	19828	(88135)	7760	(34519)
ϕV_x	**lb (N)**	23680	(104081)	30139	(132467)	11795	(52468)
$V_{a\text{-}y}$	**lb (N)**	15579	(69249)	31631	(140600)	8910	(39634)
ϕV_y	**lb (N)**	23680	(104081)	48079	(211322)	13543	(60242)
L_u	**ft (m)**	N.A.[6]		N.A.[6]		N.A.[6]	
Torsional Properties							
J	**in^4 (mm^4)**	6.6870	(2783333)	15.8713	(6606148)	2.7256	(1134474)
C_w	**in^6 (mm^6)**	0.0023	(610560)	1.2794	(343560000)	2.1380	(574110000)
X_0	**in (mm)**	0.000	0.000	0.000	0.000	0.000	0.000
Y_0	**in (mm)**	0.000	0.000	0.000	0.000	0.000	0.000
R_0	**in (mm)**	2.193	(55.71)	2.733	(69.42)	2.037	(51.73)

For **SI:** 1 inch = 25.4 mm.

1. Tabulated gross properties, including torsional properties, are based on the full unreduced cross section of the members away from the punch-outs.
2. For deflection calculations, use the effective moment of inertia.
3. Allowable moment is the lesser of M_{al} and M_{ad}. Distortional buckling moment, M_{ad}, is based on assumed $K\varphi = 0$.
4. LRFD design moment strength is the lesser of ϕM_l and ϕM_d. Distortional buckling moment, ϕM_d, is based on assumed $K\varphi = 0$.
5. Members are assumed to be adequately braced at a maximum spacing of L_u to develop full moment capacity.
6. Global buckling does not need to be considered for members with unbraced length up to 40 ft (12 m)
7. Definitions of structural property symbols:

F_y: Yield Strength.
w: The weight per foot of the full unreduced cross-section of the members, away from the punch-outs.
t: Design thickness.

Gross Properties

A: The cross-sectional area of the full unreduced cross-section of the members, away from the punch-outs.
I_x: Moment of inertia of the gross section about axis X.
I_y: Moment of inertia of the gross section about axis Y.
S_x: Gross section-modulus about axis X.
S_y: Gross section-modulus about axis Y.
R_x: Radius of gyration of the gross section about axis X.
R_y: Radius of gyration of the gross section about axis Y.

Effective Properties

$I_{x\text{-}eff}$: Effective moment of inertia about axis X at stress = Fy.
$I_{y\text{-}eff}$: Effective moment of inertia about axis Y at stress = Fy.
$S_{x\text{-}eff}$: Effective section modulus about axis X at stress = Fy.
$S_{y\text{-}eff}$: Effective section modulus about axis Y at stress = Fy.
$M_{al\text{-}x}$: Allowable bending moment based on local buckling about axis X. Safety factor considered for bending strength is Ω_b=1.67.
$\phi M_{l\text{-}x}$: LRFD design bending moment strength based on local buckling about axis X. Resistance factor considered for bending strength is ϕ_b=0.9.
$M_{al\text{-}y}$: Allowable bending moment based on local buckling about axis Y. Safety factor considered for bending strength is Ω_b=1.67.
$\phi M_{l\text{-}y}$: LRFD design bending moment strength based on local buckling about axis Y. Resistance factor considered for bending strength is ϕ_b=0.9.
$M_{ad\text{-}x}$: Allowable distortional bending moment about axis X. Safety factor considered for bending strength is Ω_b=1.67.
$\phi M_{d\text{-}x}$: LRFD design distortional bending moment about axis X. Resistance factor considered for bending strength is ϕ_b=0.9.
$M_{ad\text{-}y}$: Allowable distortional bending moment about axis Y. Safety factor considered for bending strength is Ω_b=1.67.
$\phi M_{d\text{-}y}$: LRFD design distortional bending moment about axis Y. Resistance factor considered for bending strength is ϕ_b=0.9.
$V_{a\text{-}x}$: Allowable shear about X axis. Safety factor considered for shear strength is Ω_v=1.6.
ϕV_x: LRFD design shear about X axis. Resistance factor considered for shear strength is ϕ_v=0.95.
$V_{a\text{-}y}$: Allowable shear about Y axis. Safety factor for considered bending strength is Ω_v=1.6.
ϕV_y: LRFD design shear about Y axis. Resistance factor for considered bending strength is ϕ_v=0.95.
L_u: Limit of unbraced length below which lateral-torsional buckling for bending about the axis perpendicular to the web is not considered. Members are considered fully braced when unbraced length is less than L_u. Global buckling shall be checked for the other direction.

Torsional and Other Properties

J: St. Venant Torsional Constant
C_w: Torsional warping constant.
X_o: Distance from the shear center to the centroid along the principal X-axis.
Y_o: Distance from the shear center to the centroid along the principal Y-axis.
R_o: Polar radius of gyration about the shear center.

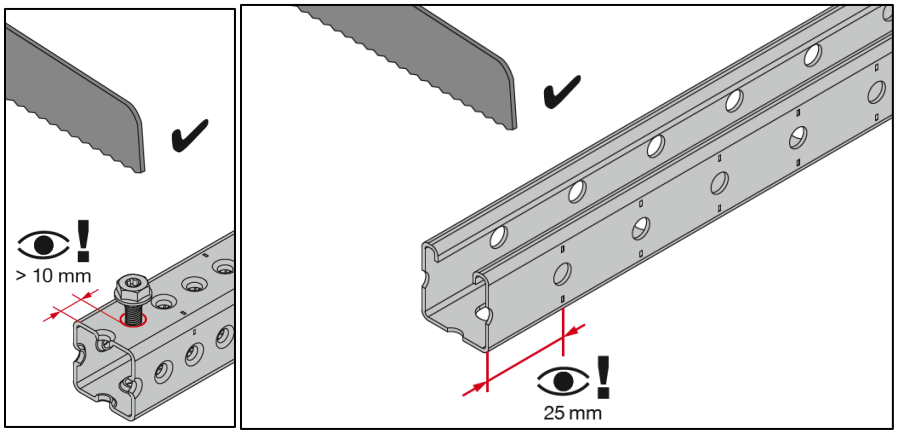


FIGURE 1—TYPICAL CUTTING DETAILS

DIVISION: 05 00 00—METALS
Section 05 40 00 – Cold-Formed Metal Framing

REPORT HOLDER:

HILTI, INC.

EVALUATION SUBJECT:

HILTI MULTI-DUTY CHANNEL SYSTEM (MT)

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Hilti Multi-Duty Channel System (MT), described in ICC-ES evaluation report ESR-5019, has also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Hilti Multi-Duty Channel System (MT) described in Sections 2.0 through 7.0 of the evaluation report ESR-5019, complies with the LABC Chapter 22, and the LARC, and is subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Hilti Multi-Duty Channel System (MT) described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-5019.
- The design, installation, conditions of use and identification of the Hilti Multi-Duty Channel System (MT) are in accordance with the 2021 *International Building Code*® (IBC) and 2021 *International Residential Code*® (IRC) provisions, as applicable, noted in the evaluation report ESR-5019.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued May 2024 and revised April 2025.

DIVISION: 05 00 00—METALS
Section 05 40 00 – Cold-Formed Metal Framing

REPORT HOLDER:

HILTI, INC.

EVALUATION SUBJECT:

HILTI MULTI-DUTY CHANNEL SYSTEM (MT)

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Hilti Multi-Duty Channel System (MT), described in ICC-ES evaluation report ESR-5019, has also been evaluated for compliance with the code*(s)* noted below.

Applicable code edition*(s)*:

- 2022 *California Building Code* (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architects (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2022 *California Building Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Hilti Multi-Duty Channel System (MT), described in Sections 2.0 through 7.0 of the evaluation report ESR-5019, complies with CBC Chapter 22, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 22, as applicable.

2.1.1 OSHPD:

The Hilti Multi-Duty Channel System (MT), described in Sections 2.0 through 7.0 of the evaluation report ESR-5019, complies with CBC amended Chapters 16, 17 and 22, and Chapters 16A, 17A and 22A, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions, as applicable, noted in the evaluation report and the additional requirements in Sections 2.1.1.1 and 2.1.1.2 of this supplement:

2.1.1.1 Conditions of Use:

1. All loads applied to the cold-formed steel members shall be determined by the registered design professional and shall comply with applicable loads from CBC Chapter 16 and amendments [OSHPD 1R, 2, 3 and 5] and Chapter 16A [OSHPD 1 and 4].

2.1.1.2 Special Inspection Requirements:

1. Special inspection shall be required in accordance with CBC Section 1705 and amendments [OSHPD 1R, 2, 3 and 5] and CBC Section 1705A [OSHPD 1 and 4], as applicable.

2.1.2 DSA:

The Hilti Multi-Duty Channel System (MT), described in Sections 2.0 through 7.0 of the evaluation report ESR-5019, complies with CBC amended Chapters 16 and 22, and Chapters 16A, 17A and 22A, provided the design and

installation are in accordance with the 2021 *International Building Code*® (IBC) provisions, as applicable, noted in the evaluation report and the additional requirements in Sections 2.1.2.1 and 2.1.2.2 of this supplement:

2.1.2.1 Conditions of Use:

1. All loads applied to the cold-formed steel members shall be determined by the registered design professional and shall comply with applicable loads from CBC Chapter 16 and amendments [DSA-SS/CC] and Chapter 16A [DSA-SS].

2.1.2.2 Special Inspection Requirements:

1. Special inspection shall be required in accordance with CBC Section 1705A [DSA-SS/CC and DSA-SS], as applicable.

2.2 CRC:

The Hilti Multi-Duty Channel System (MT), described in Sections 2.0 through 7.0 of the evaluation report ESR-5019, complies/comply with CRC Chapter 3, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions, as applicable, noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 22, as applicable.

This supplement expires concurrently with the evaluation report, reissued May 2024 and revised April 2025.