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APPROVAL REPORT

EXAMINATION FOR EXPANDED APPROVALS OF SELECTED HILTI STEEL DECK FASTENERS, POWDER-ACTUATED STEEL DECK FASTENERS AND STEEL DECK SIDE LAP FASTENERS

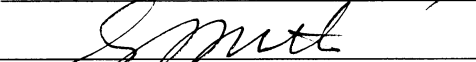
Prepared for:

**HILTI, INC.
5400 S. 122ND E. AVENUE
TULSA, OK 74146**

Project ID: 3036326

Class: 4451

Date of Approval: 26 October 2009

Authorized by: 
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**EXAMINATION FOR EXPANDED APPROVALS OF SELECTED HILTI STEEL DECK
FASTENERS, POWDER-ACTUATED STEEL DECK FASTENERS AND STEEL DECK SIDE
LAP FASTENERS**

from

**HILTI, INC.
5400 S. 122ND E. AVENUE
TULSA, OK 74146**

I INTRODUCTION

1.1 Hilti, Inc. submitted their steel deck fasteners, trade named X-ENP-19 L15, X-ENP-19 L15MX, X-ENP-19 L15MXR, X-EDN19 THQ12M, X-EDNK22 THQ12M, S-SLC 01 HWH, S-SLC 02 HWH, S-SLC 01 M HWH, S-SLC 02 M HWH and S-MD 10-16X7/8 HHWH Pilot, for an Approval examination to determine if they meet the approval requirements of the **Standards** listed below for Class 1 Insulated Steel Roof Decks and for Steel Deck Nominal 1-1/2 in. (38 mm deep) as a Component of Class I Insulated Steel Roof Deck Construction.

1.2 This report may be reproduced only in its entirety and without modification.

1.3 **Standards:**

Title	Class Number	Date
Class 1 Insulated Steel Deck Roof	4450	February, 1989
Approval Standard for Steel Deck Nominal 1-1/2 in. (38 mm deep) as a Component of Class I Insulated Steel Roof Deck Construction	4451	October, 1978

1.4 No testing was performed under this program. Examination included review of submitted product specification data, and review of previously tested products.

1.5 Previous Approvals had been granted to Hilti, Inc. steel deck fasteners. See FM Approvals Reports 0W8A6.AM, 2Y6A7.AM, 3011115, 3021719, and 3031144 for details.

1.6 The results of this Approval examination show that the X-ENP-19 L15, X-ENP-19 L15MX, X-ENP-19 L15MXR, X-EDN19 THQ12M, X-EDNK22 THQ12M, S-SLC 01 HWH, S-SLC 02 HWH, S-SLC 01 M HWH, S-SLC 02 M HWH and S-MD 10-16X7/8 HHWH Pilot, Hilti, Inc. steel deck fasteners, as described in Section II, meet the Approval requirements of the **Standards** listed above for Class 1 Insulated Steel Roof Decks and for Steel Deck Nominal 1-1/2 in. (38 mm deep) as a Component of Class I Insulated Steel Roof Deck Construction, subject to the limitations noted in the **CONCLUSIONS** of this report.

1.7 **Listings:** The manufactured products meet the Approval criteria of FM Approvals when installed as specified in the **CONCLUSIONS** of this report. These products will be listed in RoofNav.

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II DESCRIPTION

- 2.1 A brief description of the steel roof deck attachment fasteners are as follows:
- 2.2 X-ENP-19 L15, X-ENP-19 L15MX (magazine version) and X-ENP-19 L15MXR (magazine version) fasteners are powder-actuated steel deck frame fasteners that are used with supporting steel thicknesses of greater than or equal to 1/4 in. (6.4 mm). The fastener has a tapered and fully knurled shank with two pre-mounted cupped steel washers.
- 2.3 X-EDN19 THQ12 and X-EDN19 THQ12M (magazine version) are powder-actuated frame fasteners that are used with supporting steel thicknesses of 3/16 to 3/8 in. (4.8 to 9.5 mm). The fastener has a tapered and knurled shank with pre-mounted, bell and flat steel washers.
- 2.4 X-EDNK22 THQ12 and X-EDNK22 THQ12M (magazine version) are powder-actuated steel deck frame fasteners that are used with supporting steel thicknesses of 1/8 to 1/4 in. (3.2 to 6.4 mm). The fastener has a tapered and knurled shank.
- 2.5 S-SLC 01 HWH and S-SLC 01 M HWH (magazine version) steel deck side lap fasteners are 3/4 in. (19 mm) long and contain 23 threads per 1 in. (25 mm) length of threaded shaft and a 0.40 in. (10.15 mm) diameter washer head. The threads have a nominal 0.19 in. (4.8 mm) major diameter, 0.14 in. (3.5 mm) minimum minor diameter and a minimum 0.01 in. (0.35 mm) point diameter. The fastener is a self piercing steel screw with a 5/16 in. (7.74 mm) hexagon drive head.
- 2.6 S-SLC 02 HWH and S-SLC 02 M HWH (magazine version) steel deck side lap fasteners are 1 in. (25 mm) long and contain 14 threads per 1 in. (25 mm) length of threaded shaft and a 0.41 in. (10.5 mm) diameter washer head. The threads have a minimum 0.209 in. (5.31 mm) major diameter, 0.157 in. (3.99 mm) minimum minor diameter and a minimum 0.134 in. (3.4 mm) point diameter. The fastener is a self drilling steel screw with a 5/16 in. (7.78 mm) hexagon drive head.
- 2.7 S-MD 10-16X7/8 HHWH Pilot steel deck side lap fasteners are 7/8 in. (22 mm) long and contains 16 threads per 1 in. (25 mm) length of threaded shank and a 0.39 in. (10 mm) diameter washer head. The threads have a minimum 0.183 in. (4.65 mm) major diameter, 0.135 in. (3.43 mm) minimum minor diameter and a minimum 0.122 in. (3.1 mm) point diameter. The fastener is a self drilling steel screw with a 5/16 in. (7.78 mm) hexagon drive head.

III MARKING

- 3.1 The manufacturer shall mark each packing container with the manufacturer's name and product trade name. In addition the packing container must be marked with the Approval Mark of FM Approvals.
- 3.2 Markings denoting Approval by FM Approvals shall be applied by the manufacturer only within and on the premises of manufacturing locations that are under the FM Approvals Facilities and Procedures Audit program.
- 3.3 The manufacturer agrees that use of the FM Approvals name or Approval Mark is subject to the conditions and limitations of the Approval by FM Approvals. Such conditions and limitations must be included in all references to Approval by FM Approvals.

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IV REMARKS

- 4.1 The securement of the roof system must be enhanced at the building corners and perimeter as outlined in FM Global Property Loss Prevention Data Sheet 1-29.
- 4.2 The roof system must be installed using a roof perimeter flashing system Approved by FM Approvals. See the current edition of the FM Approval Guide.

V FACILITIES AND PROCEDURES AUDITS

The Hilti manufacturing locations in Jau Yeou, Taiwan; Sheh Fung, Taiwan; and Schaan, Liechtenstein are subject to periodic audit inspections to determine that the quality and uniformity of the materials have been maintained and will provide the same level of performance as originally Approved. The facilities and quality control procedures in place have been found to be satisfactory to manufacture product identical to that examined and tested as described in this report.

VI MANUFACTURER'S RESPONSIBILITIES

- 6.1 To assure compliance with these procedures in the field, the manufacturer shall supply to the deck installer such necessary instruction or assistance required to produce the desired performance achieved in the tests.
- 6.2 The manufacturer shall notify FM Approvals of any planned change in the Approved products, prior to general sale or distribution, using Form 797, Approved Product Revision Report.

VII DOCUMENTATION

The following documents describe Hilti steel deck fasteners and are filed under Project ID 3036326.

Document	Issue	Description
Audit Manual of Hilti @ Jau Yeou, Taiwan	July 2009	Steel deck fasteners
Audit Manual of Hilti @ Sheh Fung, Taiwan	July 2009	Steel deck fasteners
Audit Manual of Hilti @ Schaan, Liechtenstein	July 2009	Steel deck fasteners

VIII CONCLUSIONS

- 8.1 The results of this Approval examination show that X-ENP-19 L15, X-ENP-19 L15MX, X-ENP-19 L15MXR, X-EDN19 THQ12M, X-EDNK22 THQ12M, S-SLC 01 HWH, S-SLC 02 HWH, S-SLC 01 M HWH, S-SLC 02 M HWH and S-MD 10-16X7/8 HHWH Pilot, Hilti, Inc. steel deck

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fasteners submitted for evaluation meet the Approval requirements when installed as follows:

- 8.1.1 The following Hilti fasteners meet FM Approvals requirements for securing FM Approved steel roof deck in Class 1-60, Class 1-75 or Class 1-90 insulated steel deck roof constructions (See Table 1).
- 8.1.2 The following Hilti fasteners meet FM Approvals requirements for securing side laps of FM Approved steel roof deck (See Table 2). The longitudinal edge of the deck must possess an overlap type joint.

Table 1: Steel Deck Fasteners for Securing Steel Deck

Deck Type ¹	Fastener Spacing ² Along the supports	Fastener Type	Deck Gauge	Maximum Span ³
FM Approved nominal 1-1/2 in. (38 mm) deep steel deck (B Type)	12 in. o.c. (300 mm)	X-ENP-19 L15 X-ENP-19 L15MXR X-ENP-19 L15MX X-EDNK22 THQ12 X-EDNK22 THQ12M X-EDN19 THQ12 X-EDN19 THQ12M	22	6'-3" (1.9 m)
			20	6'-7" (2.0 m)
			18	7'-9" (2.4 m)
FM Approved nominal 3 in. (76 mm) deep steel deck (N Type)	8 in. o.c. (200 mm)	X-ENP-19 L15 X-ENP-19 L15MXR X-ENP-19 L15MX X-EDNK22 THQ12 X-EDNK22 THQ12M X-EDN19 THQ12 X-EDN19 THQ12M	22	19'-0" (5.8 m)
			20	
			18	

1. Hilti fasteners may be used with additional FM approved steel deck types, see RoofNav for details.
2. Intermediate fastener spacings may be utilized.
3. Maximum span may be further limited to the maximum span of the deck itself.

Table 2: Steel Deck Side Lap Fasteners for Securing Side Laps

Deck Type ¹	Fastener Type	Acceptable Deck Gauges	Maximum Fastener Spacing ²
FM Approved nominal 1-1/2 in. (38 mm) deep steel deck (B Type)	S-SLC 01 HWH S-SLC 01 M HWH	22 and 20	3'-0" (0.9 m)
	S-SLC 02 HWH S-SLC 02 M HWH S-MD 10-16x7/8 Pilot	22, 20 and 18	
FM Approved nominal 3 in. (76 mm) deep steel deck (N Type)	S-SLC 01 HWH S-SLC 01 M HWH	22 and 20	
	S-SLC 02 HWH S-SLC 02 M HWH S-MD 10-16x7/8 Pilot	22, 20 and 18	

1. Hilti fasteners may be used with additional FM approved steel deck types, see RoofNav for details.
2. Intermediate fastener spacings may be utilized.

8.2 Since a duly signed Master Agreement is on file for this customer, Approval is effective as of the

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date of this report. The products will be listed in the RoofNav, an online resource of FM Approvals.

- 8.3 Continued Approval will depend upon satisfactory field experience and periodic Facilities and Procedures Audits.

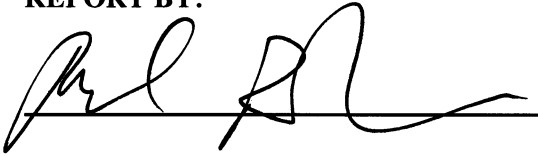
TESTING SUPERVISED BY: N/A

PROJECT DATA RECORD: None

ORIGINAL TEST DATA: 0W8A6.AM, 2Y6A7.AM, 3011115, 3021719, and 3031144

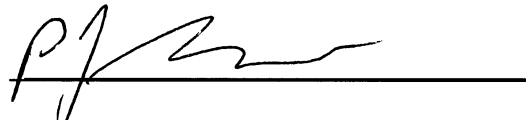
ATTACHMENTS: None

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