

File R7406
Project 06CA51862

August 15, 2007

REPORT

on

JOINT SYSTEM NOS. HW-D-0488, HW-D-0489 AND HW-D-0490

Under The

CLASSIFICATION PROGRAM

Metal Building Manufacturers Association
Cleveland, OH

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GENERAL

This Report covers the fire exposure and hose stream tests conducted on representative samples of dynamic joint systems for fire resistance rated wall assemblies installed beneath non-fire resistance rated steel roof assemblies. This work was requested by Metal Building Manufacturers Association (MBMA) specifically to address recurring questions of regulatory building officials relative to compliance of metal building construction with Sections 713.1 and 713.3 of the 2006 International Building Code (IBC).

Section 713.1 of the 2006 IBC states "Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed." Section 713.3 of the 2006 IBC states "Fire-resistant joint systems shall be tested in accordance with the requirements of either ASTM E 1966 or UL 2079."

Although Section 713.1 of the 2006 IBC explicitly cites "joints installed in or between fire-resistance rated walls, floor or floor/ceiling assemblies and roofs or roof-ceiling assemblies" (ie joints between two fire-resistance rated assemblies), this section is reported to be commonly interpreted to also include joints between fire-rated walls and non-fire resistance rated steel roofs in metal buildings. As such, this interpretation has led to enforcement of Section 713.3, which requires joint testing in accordance with ASTM E 1966 or ANSI/UL 2079. In response to this perceived need, the joint test assemblies replicated common construction conditions for a non-fire resistance rated steel roof assembly with purlins inside the fire resistance rated walls as well as with purlins being parallel and perpendicular to the fire resistance rated walls.

The Scope of Standard ANSI/UL 2079 states that the tests therein are applicable to joint systems of various materials and construction that are intended for use in linear openings between adjacent fire resistive structures. Because Standard ANSI/UL 2079 specifically disallows testing non-fire resistive structures, no Certification can be granted from tests incorporating non-fire resistive structures.

The basic roof assembly used in the assemblies described herein is essentially the same roof structure described in Roof-Ceiling Design Nos. P265, P268 and P516 in the UL Fire Resistance Directory. However, the fire resistive ratings of Roof-Ceiling Design Nos. P265, P268 and P516 are dependent upon the fire resistive performance of the ceiling membranes specified therein. Because Standard ANSI/UL 2079 is not applicable to joint systems installed between fire resistive and non-fire resistive structures, it was determined that, by testing the joint systems beneath the same roof structure described in Roof-Ceiling Design Nos. P265, P268 and P516 but without the ceiling membrane, the results of the tests could be applied to those P200 or P500 Series Roof-Ceiling Designs in the Fire Resistance Directory which specify the use of the basic roof structure.

The fire tests were supplemented by other tests and examinations to furnish information regarding the physical properties of the materials used in the test assemblies.

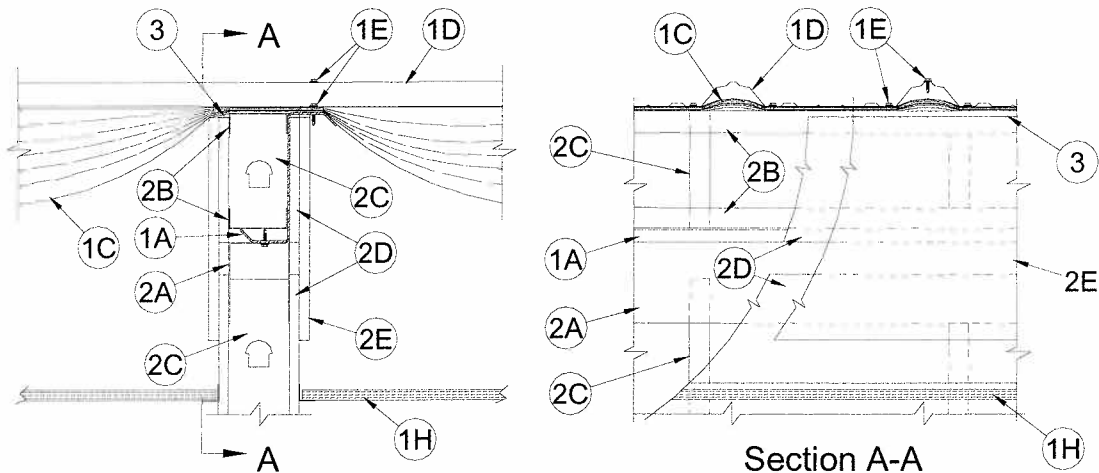
DESCRIPTION

SYSTEMS COVERED:

Joint System Nos. HW-D-0488, HW-D-0489 and HW-D-0490.

SYSTEM DETAILS:

System No. HW-D-0488
 Assembly Rating - 1 Hr
 Nominal Joint Width - 2 in.
 Class II Movement Capabilities - 100% Compression and Extension



*1. Roof-Ceiling Assembly - The fire rated roof-ceiling assembly shall be constructed of the materials and in the manner described in the individual P200 or P500 Series Roof-Ceiling Designs in the Fire Resistance Directory and shall include the following construction features:

A. Purlin - Min 16 ga coated steel. Max spacing as specified in the individual Roof-Ceiling Design.

B. Lateral Bracing - (Not Shown) - As required.

C. Batts and Blankets* - Insulation - Any faced compressible glass-fiber blanket insulation having a min 6 in. (152 mm) thickness before compression and a min density of 0.6 pcf (9.6 kg/m³). Insulation draped over purlins prior to installation of panel clips (Item 1F) and/or metal roof deck panels (Item 1D). Side edges of the batts shall be butted or overlapped a max of 3 in. (76 mm).

See Batts and Blankets (BZJZ) category in the UL Fire Resistance Directory or Batts and Blankets (BKNV) category in the UL Building Materials Directory for names of manufacturers.

D. Metal Roof Deck Panels* - Min 26 ga coated steel. Panels continuous over two or more spans. Roof panel end laps, if required, centered over purlins with min 3 in. (76 mm) panel overlap as specified in the individual Roof-Ceiling Design. A line of tube sealant or tape sealant may be used at panel end and side laps.

See Metal Roof Deck Panels (TJPV) category in the UL Roofing Materials and Systems Directory for names of manufacturers.

E. Fasteners - Fasteners used for panel-to-purlin and panel-to-panel connections to be self-tapping, hex-head, plated steel or stainless steel screws with either an integral or a separate steel washer fitted with a compressible sealing washer. Fastener type, length, pilot hole diam and spacing to be as specified in the individual Roof-Ceiling Design.

F. Roof Deck Fasteners* - Panel Clips - (Not Shown) - Panel clips used for panel-to-purlin connections to be secured to purlin through insulation as specified in the individual Roof-Ceiling Design.

See Roof Deck Fasteners (TLSX) category in the UL Roofing Materials and Systems Directory for names of manufacturers.

G. Thermal Spacer Blocks - (Not Shown) - Expanded polystyrene strips cut to fit between panel clips (Item 1F) as specified in the individual Roof-Ceiling Design. Thermal spacer blocks, when used, are to be installed between insulation (Item 1C) and metal roof deck panels (Item 1D) over purlins.

H. Ceiling Membrane - The Steel Framing Members*, Acoustical Material*, Gypsum Board* and other ceiling membrane components shall be as specified in the individual Roof-Ceiling Design.

2. Wall Assembly - The 1 h fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. Ceiling Deflection Channel - U-shaped channel formed from min 16 ga steel sized to accommodate steel studs (Item 2C) and provided with 5 in. (127 mm) flanges. Deflection channel installed parallel with and aligned with web of purlin and secured to bottom flange of purlin with min No. 14 self-tapping, hex-head, plated steel or stainless steel screws spaced max 24 in. (610 mm) OC.

B. Steel Floor and Ceiling Runners - Floor runner of the wall assembly and the floor and ceiling runners of the cripple wall above the wall assembly shall consist of min 1-1/4 in. (32 mm) deep min 25 ga galv steel channels sized to accommodate steel studs (Item 2C). Floor runner of cripple wall aligned with and resting atop flange of purlin. Ceiling runner of cripple wall installed to compress insulation (Item 1C) to min thickness of 3/8 in. (10 mm) by wedging lengths of stud (Item 2C) between the runners. Steel studs of cripple wall attached to web of purlin with steel screws driven through opposite side of purlin web.

C. Studs - Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut max 2 in. (51 mm) less in length than assembly height with bottom nesting in and resting on the floor runner and with top nesting in ceiling deflection channel without attachment. Width of stud to be equal to or greater than width of purlin flange. Stud spacing not to exceed 24 in. (610 mm) O.C. Studs of cripple wall cut to length as required to compress insulation (Item 1C) to min thickness of 3/8 in. (10 mm) and spaced max 24 in. (610 mm) OC.

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