

## Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
  - Authorities Having Jurisdiction should be consulted before construction.
  - Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
  - When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
  - Only products which bear UL's Mark are considered Certified.
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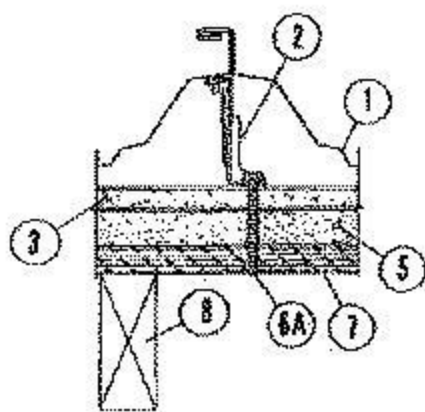
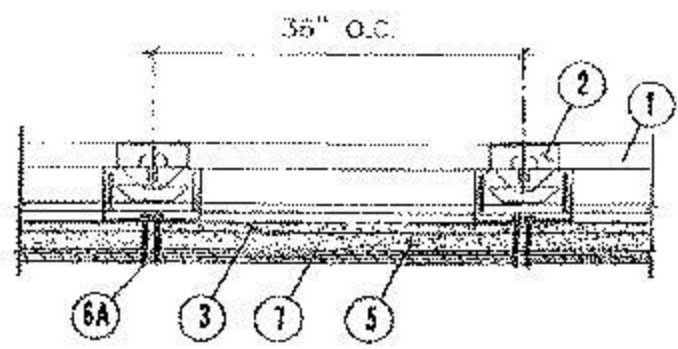
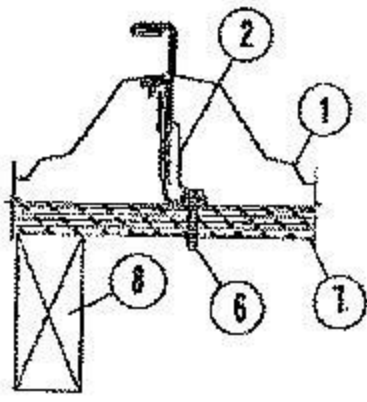
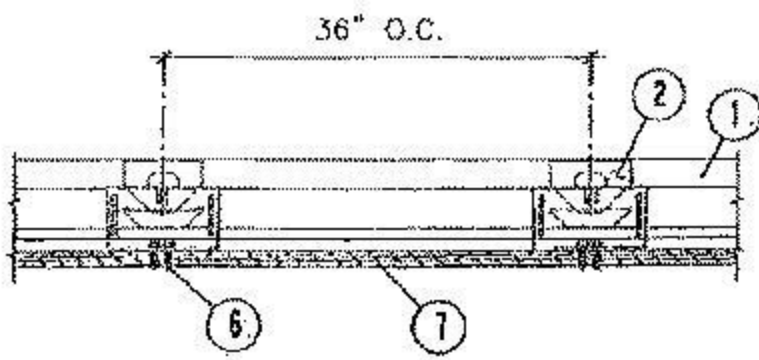
## Roof Deck Constructions

[See General Information for Roof Deck Constructions](#)

Construction No. **552B**

March 8, 2023

**Uplift — Class 90**  
**Fire Not Investigated**



1. **Metal Roof Deck Panels\*** — No. 24 MSG min thickness coated steel. Maximum panel width 24 in., rib height 3 in. Panels continuous over two or more spans. Panel flat area may have optional striations or minor corrugations placed at various locations beginning at a minimum of 2 in. from side ribs. End-laps to occur adjacent to purlins with panels overlapped 2 in. min - 4 in. max. End-laps to be either continuous or single course. An end-lap back-up plate (Item 2B, 2C and 2D) may be used for single course or continuous situations. An alternate end-lap channel (Item 2A) to be used for

continuous end-lap situations. A bead of sealant may be used at panel end-laps and side ribs. Ribs to be seamed with a hand seamer to form a horizontal flange with a tight hem. Seaming operation may be continuous or only at panel clip (Item 2) locations.

**ACI BUILDING SYSTEMS INC** ([View Classification](#)) — "StratoShield", "StratoShield 324"

**ALLIANCE STEEL INC** ([View Classification](#)) — "Alliance Seam 24"

**ALLSOUTH PRE-ENGINEERED COMPONENTS L L C** ([View Classification](#)) — APEC 324

**BUTLER MANUFACTURING, DIV OF BLUESCOPE BUILDINGS NORTH AMERICA INC** ([View Classification](#)) — "ClassicLoc"

**BEHLEN MFG CO** ([View Classification](#)) — "ZL-24"

**BIGBEE STEEL BUILDINGS INC** ([View Classification](#)) — "BigbeeLok-324"

**CO BUILDING SYSTEMS** ([View Classification](#)) — "TS-324"

**DEAN STEEL BUILDINGS INC** ([View Classification](#)) — "Pro Lock"

**HORIZON STRUCTURAL SYSTEMS** ([View Classification](#)) — "TS-324"

**METAL PANELS INC** ([View Classification](#)) — "StrongSeam TS-324"

**MUELLER INC** ([View Classification](#)) — "RT324"

**NUCOR CORP. (NUCOR BUILDINGS GROUP)** ([View Classification](#)) — "CFR"

**OAKLAND METAL BUILDINGS INC** ([View Classification](#)) — "Oakland Standing Seam Panel"

**RIGID GLOBAL BUILDINGS L L C** ([View Classification](#)) — "HI-Tech Series"

**SBI METAL BUILDINGS** ([View Classification](#)) — "TSS-324"

**SCHULTE BUILDING SYSTEMS INC** ([View Classification](#)) — "TS-324"

**STANDARD STRUCTURES INC** ([View Classification](#)) — "TS 324"

**TRIAD CORRUGATED METALS INC** ([View Classification](#)) — "TS324"

**USAS BUILDING SYSTEM (SHANGHAI) CO LTD** ([View Classification](#)) — "LSIII"

**VARCO PRUDEN BUILDINGS, DIV OF BLUESCOPE BUILDINGS NORTH AMERICA INC** ([View Classification](#)) — "HWR"

**2. Roof Deck Fasteners\* — (Panel Clip)** — Located at side of panels over purlins (Item 8). Max spacing 36 in. Any of the following:

**Floating Clip\*** — (Not Shown) — Two piece assembly with base fabricated from No. 16 MSG min coated steel. Base width 3- $\frac{1}{2}$  inches; Tab fabricated from No. 20 MSG minimum coated steel. Tab width 6, 8, 12, or 16 inches. Tab height 3.41 inches minimum, 4.41 inches maximum.

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "BA 600 Series" Clip.

**Fixed Clip\*** — (Not Shown) — One piece assembly fabricated from No. 22 MSG min coated steel. Width 4.3 inches. Height 3, 3.5, 4.5, 5, 5.5, or 6 inches.

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "FC 600 Series" Clip.

**Floating Clip\*** — Two piece assembly with a reinforced base fabricated from No. 17 MSG min coated steel; width 4-1/4 in., height 2 in. min, 3.30 in. max. Upper tab fabricated from No. 22 MSG min coated steel. Width 3 in., height 1-15/16 in.

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "Challenger Series 460 Floating Clip"

**Floating Clip\*** — (Not Shown) — Two piece assembly with base fabricated from No. 16 MSG min coated steel. Base width 3-3/8 in. Tab fabricated from No. 20 MSG min coated steel. Tab width 4.3 in., height 4.91 in. min, 5.91 in. max.

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "MPS Floating Clip", "MPS-607 Floating Clip", "MPS-608 Floating Clip" or "MPS-609 Floating Clip"

**Floating Clip\*** — (Not Shown) — Two piece assembly with base fabricated from No. 16 MSG min coated steel. Base width 2-1/4 in; Tab fabricated from No. 20 MSG min coated steel. Tab width 4.3 in., height 3.41 in. min, 4.41 in. max.

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "MPS-3 Floating Clip"

**Fixed Clip** — (Not Shown) — One piece assembly fabricated from No. 22 MSG min coated steel. Width 4.30 in., height 3 in. min, 4-1/2 in. max.

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "Challenger Series 460 Fixed Clip"

2A. **End-Lap Back-Up Channel\*** — (Optional) — (Not Shown) — (For continuous end-lap situations only) No. 16 MSG min coated steel channel, 3 in. wide with two 3/8 in. deep legs. Located under panel end-lap, 6 to 12 in. from purlin (Item 8).

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "BRS Back-Up Channel"

2B. **End-Lap Back-Up Plate\*** — (Optional) — (Not Shown) — (For single panel width or continuous end-lap situations only) No. 16 MSG min coated steel, fabricated to the general profile of the panel, 5-3/4 in. wide. Located under the panel end-lap, adjacent to purlin. To be used in lieu of Items 2A, 2C and 2D.

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "BRS Back-Up Plate"

2C. **End Lap Back-Up Plate\*** — (Optional) — (Not Shown) — (For single panel width or continuous end-lap situations) — No. 16 MSG min coated steel, fabricated to the general profile of the panel, 12-1/2 in. wide. Located under the panel end lap, adjacent to purlin. To be used in lieu of item 2A, 2B and 2D.

**NUCOR CORP. (NUCOR BUILDINGS GROUP)** ([View Classification](#)) — "NBS CFR 12 1/2 in. Back-up Plate"

2D. **End Lap Back-Up Plate\*** — (Optional) — (Not Shown) — (For single panel width or continuous end-lap situations) — No. 16 MSG min coated steel, fabricated to the general profile of the panel, 6 in. wide. Located under the panel end lap, adjacent to purlin. To be used in lieu of item 2A, 2B and 2C.

**NUCOR CORP. (NUCOR BUILDINGS GROUP)** ([View Classification](#)) — "NBS CFR 6 in. Back-up Plate"

2E. **Cinch Strap\*** — (Optional) — (Not Shown) 1-1/2 in. wide, fabricated from 0.091 in. thick aluminum or No. 20 MSG, 300 Series stainless steel to the general form of the panel (Item 1).

**BUILDING RESEARCH SYSTEMS INC** ([View Classification](#)) — "BRS Cinch Strap"

3. **Substructure — (Gypsum Board)** — (Optional) Minimum thickness 1/2 in. thick. To be placed either on the top of the plywood decking (Item 7) or the rigid insulation (Item 5). Combined thickness of the gypsum board and rigid insulation not to exceed 4 in. All joints to be taped with 2-1/2 in. wide joint tape.

3A. **Substructure — (Plywood)** — (Optional) — (Not Shown) Plywood decking used in lieu of gypsum board (Item 3) to be nom 1/2 in. thick, (15/32 in. actual) exposure 1 APA Rated sheathing, C-D, 40/20 plywood. Located over rigid insulation (Item 5). Combined thickness of the plywood and rigid insulation (Item 5) not to exceed 4 in.

3B. **Substructure — (OSB)** — (Optional) — (Not Shown) OSB decking used in lieu of gypsum board (Item 3) to be 1/2 in. thick. Located over rigid insulation. Combined thickness of the OSB and rigid insulation (Item 5) not to exceed 4 in.

3C. **Substructure — (Bearing Plate)** — (Optional) — (Not Shown) Bearing plate used in lieu of gypsum board (Item 3) to be 4 by 4 in. by No. 18 MSG min thick coated steel (Yield Strength 33,000 psi). Used under each clip only when rigid insulation (Item 5) is located directly under metal roof deck panel (Item 1).

4. **Vapor Barrier** — (Optional) — (Not Shown) Single ply, used between the substructure (Item 3, 3A or 3B) or plywood decking (Item 7) and metal roof deck panels (Item 1) to be a min 30 lb roofing felt.

5. **Foamed Plastic — (Rigid Insulation)** — Foamed plastic max thickness 3-1/2 in. when gypsum board (Item 3), plywood (Item 3A) or OSB (Item 3B) is used and 6 in. when bearing plates (Item 3C) are used. Min bearing strength to be 20 psi, min density 1.8 pcf.

6. **Fasteners — (Screws)** — Fasteners used to attach panel clips (Item 2) to plywood substructure (Item 3A) or plywood decking (Item 7) to be No. 10-12 pancake head, No. 2 Phillips drive, A-point, coated steel screws. Fastener length to penetrate plywood by min 1/2 in. Two fasteners used per clip.

6A. **Fasteners (Screws)** — Fasteners used at to attach panel clips through gypsum board, OSB, bearing plate (Item 3, 3B or 3C, respectively) and foamed, plastic (Item 5) into plywood deck to be No. 12-13 pancake head, No. 2 Phillips drive, A-point, coated steel screw. Two fasteners used per clip.

Note: The panel clip may be fastened to the bearing plate using two No. 10-16 by 1 in. long, self-driving, self-tapping, pancake head, No. 2 Phillips drive coated steel screws. The panel clip/bearing plate combination is then to be fastened to the steel deck using two No. 12-13 truss head screws described above, inserted through guide holes in the clip and bearing plates and into the plywood deck.

6B. **Fasteners (Screws)** — (Optional) Screws used to attach gypsum and OSB substructure (Item 3 and 3B) to plywood deck to be No. 8-18, No. 2 Phillips drive, bugle or trumpet head, self-drilling, self-tapping corrosion resistant coated steel screws supplied by the manufacturer. Fastener length to penetrate plywood deck by min 1/2 in. Fasteners located in three rows along the 8 ft length of the substructure beginning 6 in. from the 8 ft edges with a row down the center with 3 screws in each row spaced 6 in. from the 4 ft edges and at the center. A total of 9 fasteners used for each 4 ft by 8 ft board.

6C. **Fasteners (Screws)** — (Not Shown) Fasteners used to attach plywood substructure (Item 3A) through rigid insulation (Item 5) into plywood deck (Item 7) to be No. 14-13, No. 3 Phillips drive, truss head screws. Fastener length to penetrate plywood deck min 1/2 in. Total of 33 fasteners per 4 by 8 ft plywood sheet to be used. Fasteners located in five rows along the 4 ft length in a 3-9-12-12-9-3 in. pattern. The two outer rows are in a 3-9-12-12-12-12-12-9-3 in. pattern and the three center rows are in a 3-21-24-24-21-3 in. pattern. All spacing from board edges.

6D. **Fasteners (Screws)** — Fasteners used at end lap to be one of the following: No. 1/4-14 by 1 in. long Type AB point self-drilling, self-tapping hex washer head plated or stainless steel screws or No. 12-14 by 1-1/4 in. long self-drilling, self-tapping hex-washer-head plated steel screws. Spacing to be in a 1-5-6-6-5-1/2 in. pattern. Screws may be inserted into pre-drilled guide holes when optional cinch strap (Item 2E) is used.

6E. **Fasteners (Screws)** — (Used on Optional End Lap) For panel to purlin attachment to be No. 1/4 - 14 by 1 1/4 in. min. long self-drilling, self tapping, hex head, plated steel screws. Two fasteners used per clip. Fasteners used at the end lap to be No. 12-14 x 1 1/4 in. min. long self drilling, self tapping, hex head, plated steel screws with a EPDM sealing washer. As an alternate fastener, No. 17-14 x 1 1/4 in. min long type AB, self tapping, hex head, plated steel, screws with a EPDM sealing washer may be used. Spacing to be 2 1/2 in. O.C. One fastener is located in the shoulder of each side of the major rib. All fasteners located 1 in. from end of panel. (10) fasteners total used on each lap. When used with item 2C or 2D.

7. **Plywood Decking** — Plywood decking to be graded per PS83 specifications, 19/32 in. thick, exposure 1, APA rated sheathing, 40/20, square edged. Butt ends not locked.

8. **Supports** — Spaced a maximum of 24 in. OC. Any of the following types may be used:

A. No. 16 MSG min thick coated steel. (50,000 psi min yield strength).

B. Graded dimension lumber, No. 2 or better.

8A. **Plywood Fasteners** — (Not Shown) Fasteners used to attach the plywood deck to be supports to be as follows:

a. For plywood-to-wood supports No. 8-18 by 1-7/8 in. long bugle-head steel screws with a No. 2 Phillips drive, a "Hi-Low" thread pattern and a "S-Point".

b. As an alternate to Item a, 8d deformed shank nails may be used.

c. For plywood-to-steel supports for a steel thickness less than No. 20 MSG No. 7-19 by 1-1/4 in. long bugle-head steel screws with a No. 2 Phillips head drive, a "Hi-Low" thread pattern and a "S-Point". For a steel thickness greater than No. 20 MSG to No. 16 MSG, No. 6-20 by 1-1/4 in. long bugle-head steel screws with a No. 2 Phillips drive and a S12 (TEK/3) point. Spacing: Fastener spacing for all fastener types to be 6 in. OC at the plywood edges and 12 in. OC in the interior.

Refer to general information, Roof Deck Construction, for Items not evaluated.

**\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

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