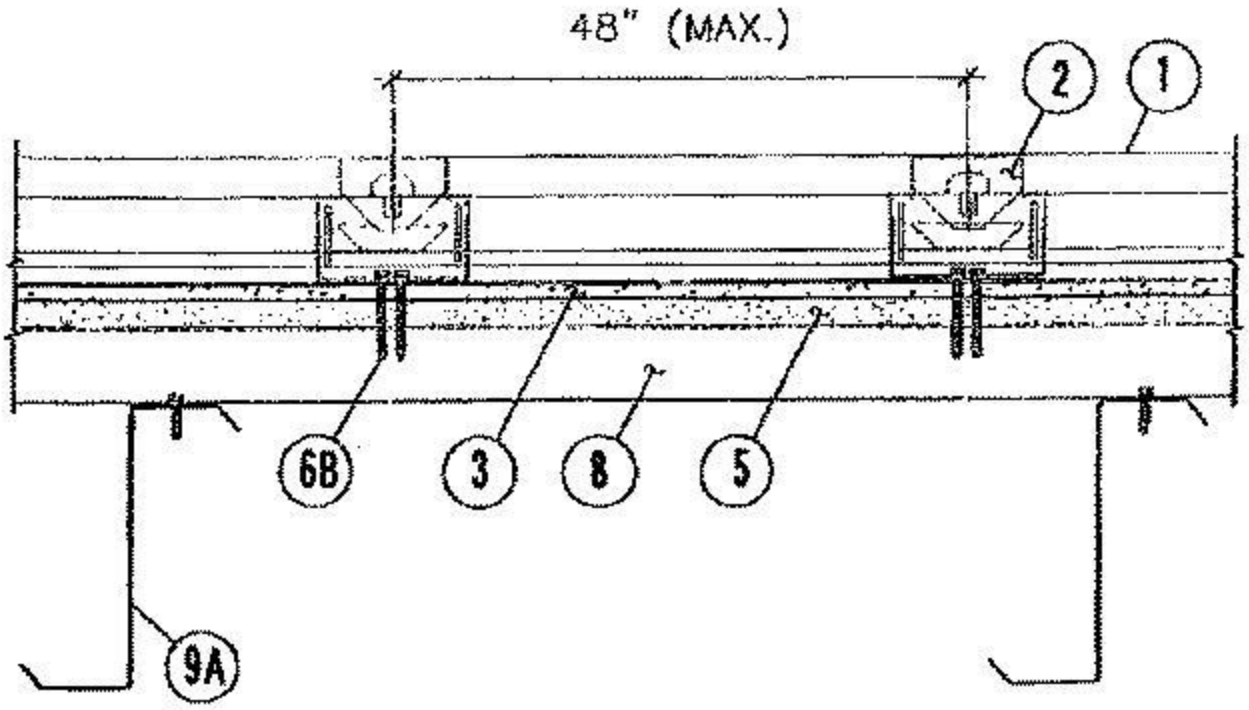
Roof Deck Constructions

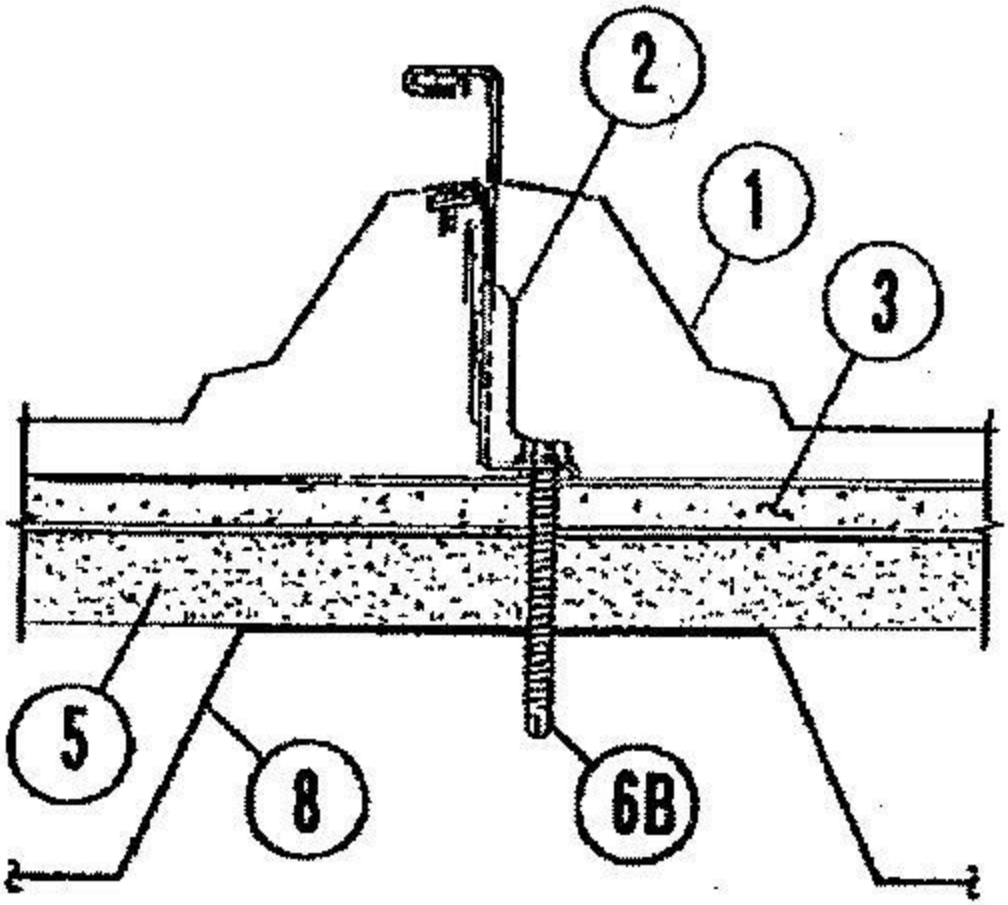
See General Information for Roof Deck Constructions

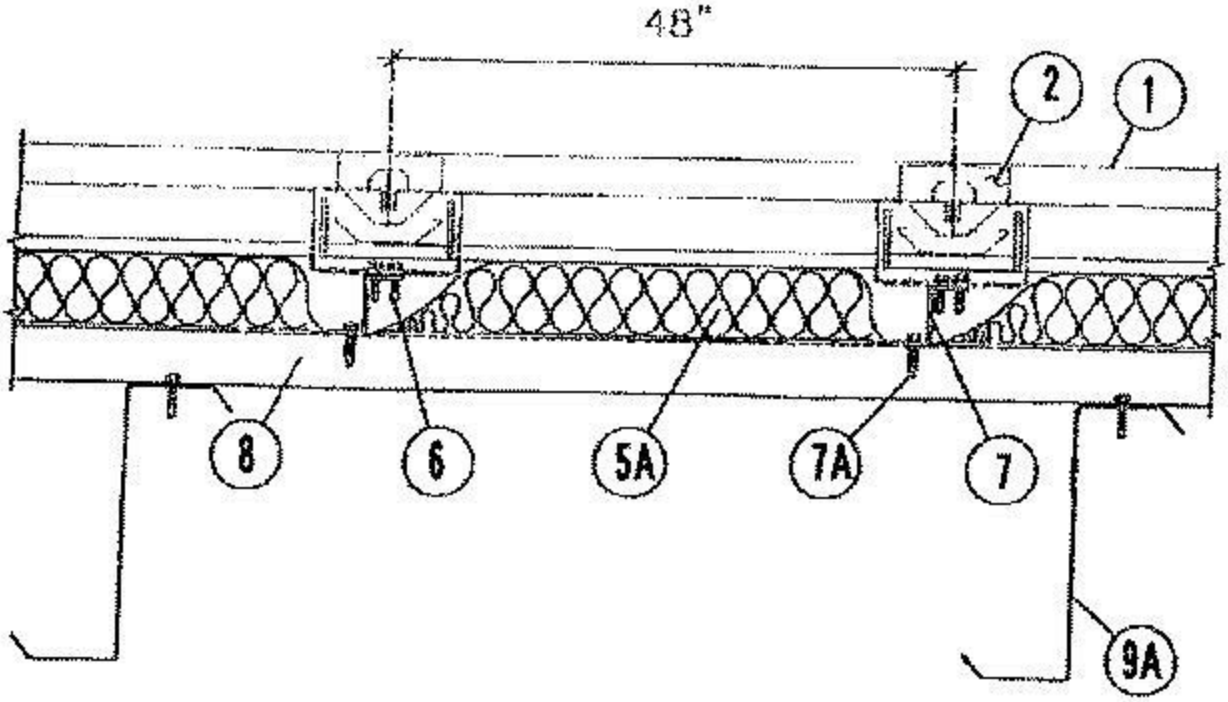
Construction No. 552A

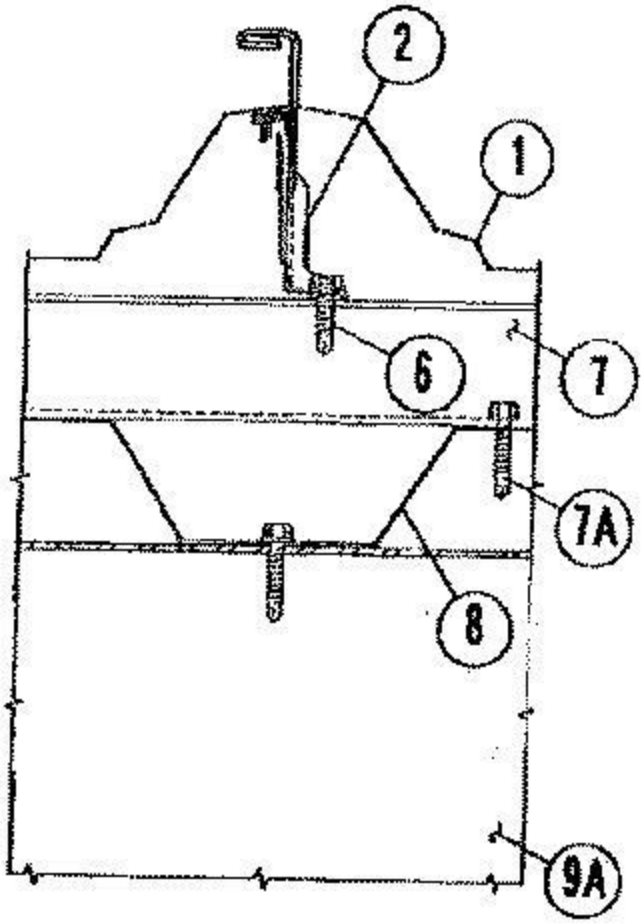
March 8, 2023

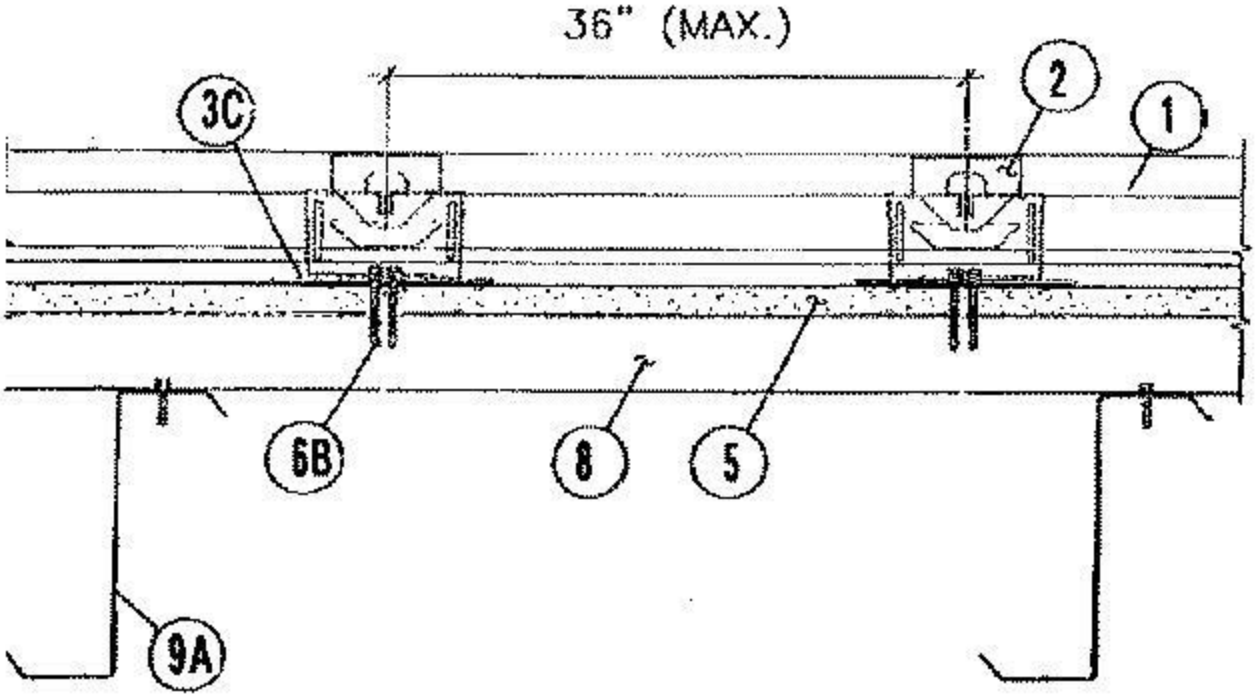
Uplift — Class 90
Fire Not Investigated

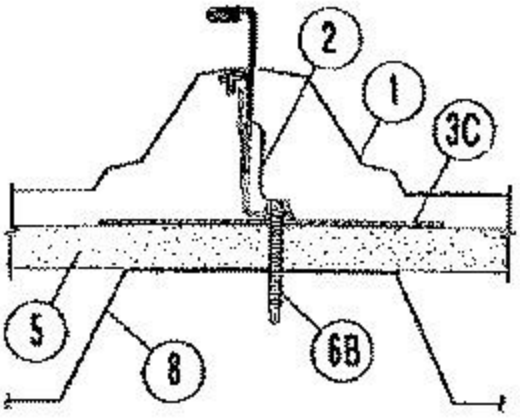


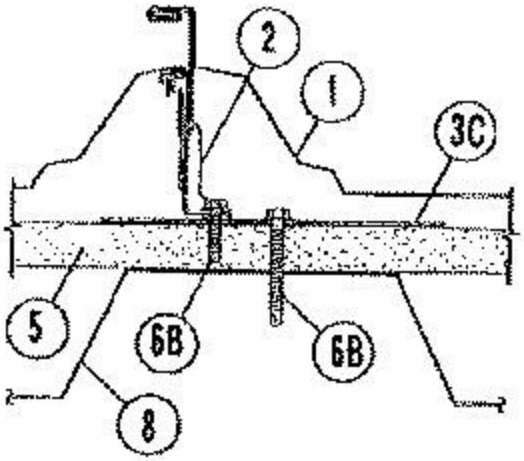












1. **Metal Roof Deck Panels* —** No. 24 MSG min thickness coated steel. Maximum panel width 24 in., rib height 3 in. Panels continuous over two or more spans. Panel flat area may have optional striations or minor corrugations placed at various locations beginning at a minimum of 2 in. from side ribs. 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 Clips) —** Located over sides of panels as follows:
Over Sub-Structure (Items 3, 3A, 3B or 3C) —When fastened directly to liner panel, maximum spacing 48 in. OC.

Over Sub-Structure (Item 3A) when fastened directly to plywood (Item 3C), maximum spacing 36 in. OC.

Over Sub-Purlins (Item 7) — Maximum spacing 48 in. OC.

Over Liner Panel Supports (9A) when fastened directly through liner panel (Item 8) to purlin, maximum spacing 60 in OC.

Any of the following clip types may be used:

Floating Clip* — (Not Shown)— Two piece assembly with base fabricated from No. 16 MSG min coated steel. Base width 3-|n# 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 "

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 4-1/4 in., height 3 in. min, 4.30 in. max.
BUILDING RESEARCH SYSTEMS INC (View Classification) — "Challenger Series 460 Fixed Clip", "MPS-607 Floating Clip", "MPS-608 Floating Clip" or "MPS-609 Floating 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 6).
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.
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 steel deck (Item 8) or the rigid insulation (Item 5). Combined thickness of the gypsum board and rigid insulation not to exceed 4 in. All gypsum board joints to be taped with 2.5 in. wide joint tape.

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

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

3C. **Substructure — (Bearing Plate) —** (Optional) Bearing plate to be used in lieu of gypsum board (Item 3) to be 4 by 4 in. by No. 18 MSG min thick coated steel (33 ksi yield strength). Used under each clip (Item 2) only when rigid insulation (Item 5) is located directly under panel (Item 1). See Item 6B.

4. **Vapor Barrier —** (Optional) — (Not Shown) Single ply, used between the substructure (Item 3, 3A or 3B) and 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 are used. Min bearing strength to be 20 psi, 1.8 pcf min density.

5A. **Insulation —** (Optional)— Any compressible blanket insulation, maximum 12 inches thick before compression thickness before compression when used with sub-purlins (Item 8).

6. **Fasteners — (Screws) —** Fasteners used to attach panel clips (Item 2) to steel sub-purlins (Item 7) to be No. 1/4-14 by min 1 in. self-drilling, self-tapping, hex-washer-head, plated steel screws. Two fasteners used per clip.

6A. **Fasteners (Screws) —** (Not Shown) Used at end-lap of panel 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 to be inserted into predrilled guide holes when the optional cinch strap is used.

6B. **Fasteners — (Screws) —** Fasteners used to attach panel clips through gypsum board, OSB, or bearing plate (Item 3, 3B or 3C, respectively) and rigid insulation (Item 5) into liner panel (Item 8) to be No. 12-13, No. 3 Phillips drive, truss head coated steel screws. Fastener length to penetrate liner panel 1/2 in. 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 bearing plates and into the liner panel. Min penetration 1/2 in.

6C. **Fasteners (Screws) —** (Optional) Screws used to attach gypsum and OSB substructure (Item 3 and 3B) to steel deck to be No. 14-13, No. 3 Phillips drive, truss head steel screws. Fastener length to penetrate steel 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.

6D. **Fasteners (Screws) —** (Not Shown) Fasteners used to attach plywood Substructure (Item 3A) through rigid insulation (Item 5) to Liner Panel (Item 8) to be 14-13, No. 3 Phillips drive truss head screws. Fastener length to penetrate liner panel 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 3-9-12-12-12-12-12-12-9-3 in. pattern and the three center rows are in a 2-21-24-24-21-3 in. pattern. All spacing from board edges. Fasteners used to attached panel clips (Item 2) to plywood (when plywood is fastened to liner panel as indicated above) to be No. 10-12 by 1 in. long pancake head wood screw with No. 2 Phillips drive, or No. 10-12 by 1 in. long hex-head wood screw. Two fasteners per clip.

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 or 1/4-14 x 1 1/4" minimum type Self-Drilling, Self-Tapping Plated Steel Screw 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. **Sub-Purlin —** No. 16 MSG min thick coated steel (50 ksi min yield strength). Hat section, min 3/4 in. deep, 2 in. wide or Zee section, 2 in. wide, flanges 2 in. deep. Max spacing between sub-purlins to be 48 in. OC.

7A. **Fasteners (Screws) —** Fasteners used to attach sub-purlin to liner panel to be No. 12-13, No. 3 Phillips drive, truss head, coated steel screws. Max fastener spacing to be 12 in. OC for Zee section with fasteners located in center of lower flange. For hat section, two screws, spaced 24 in. OC, located at each side of channel to be used.

8. **Liner Panel — (Steel Deck) —** No. 22 MSG min thick coated steel. Fabricated to various profiles (33 ksi min yield strength). Steel deck depth and profile, support spacing (max 6 ft), method of positioning (end and side laps), and fastening of deck to supports to be per deck manufacturer's and local code requirements for uplift loading.

9. **Liner Panel Supports: —**
A. **Purlins —** No. 16 MSG min thick steel (50 ksi min yield strength) spacing to depend on design considerations for uplift loading: max 6 ft, 0 in. OC.

B. **Joists —** (Optional) — (Not Shown) Open web steel joist having a min No. 16 MSG upper flange (50 ksi min yield strength) or a min 1/8 in. thick upper flange (33 ksi min yield strength). Max spacing 6 ft, 0 in. OC.

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.**

Last Updated on 2023-03-08