

# TGKX.93 - Roof Deck Constructions

## 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.

## Roof Deck Constructions

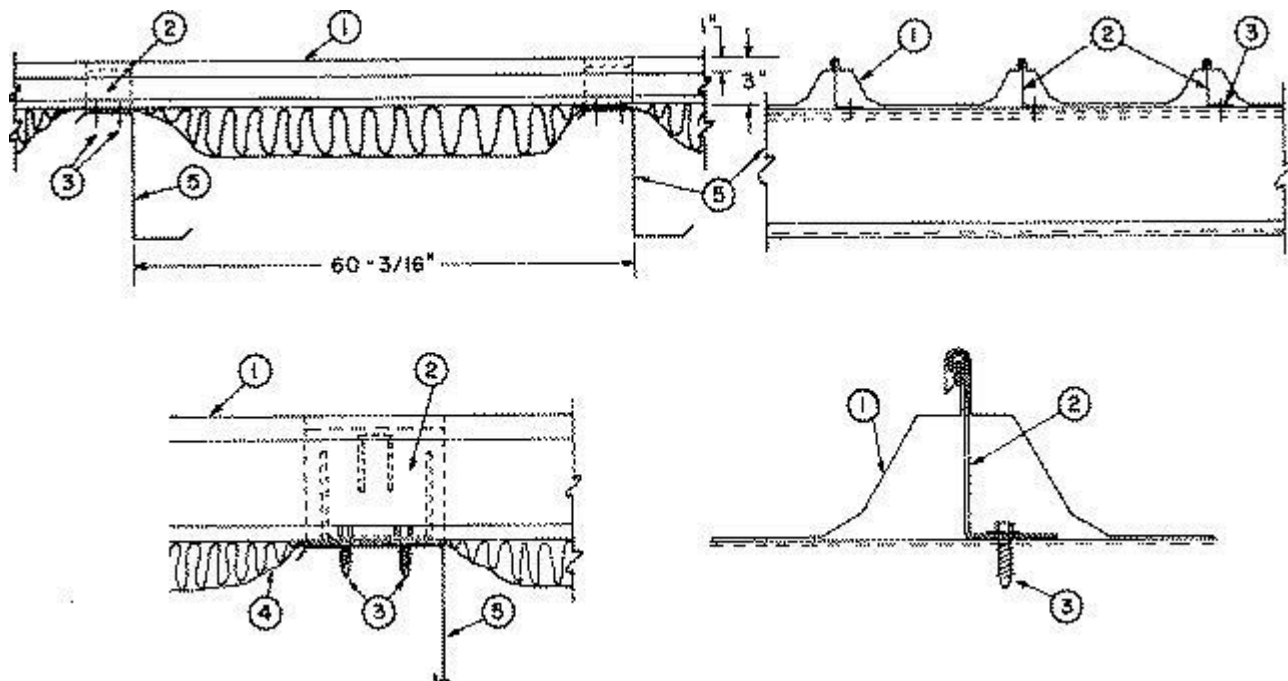
[See General Information for Roof Deck Constructions](#)

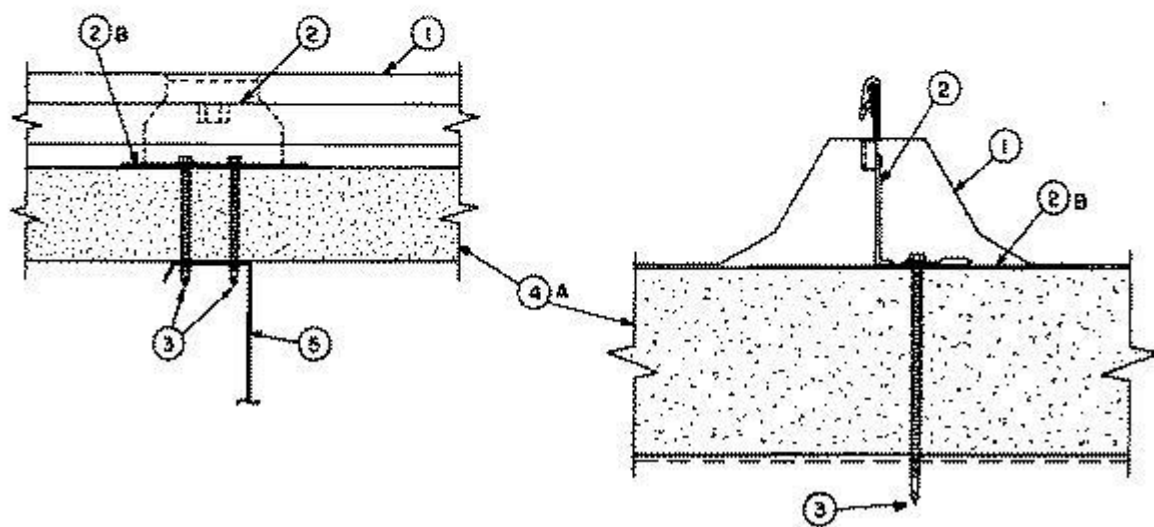
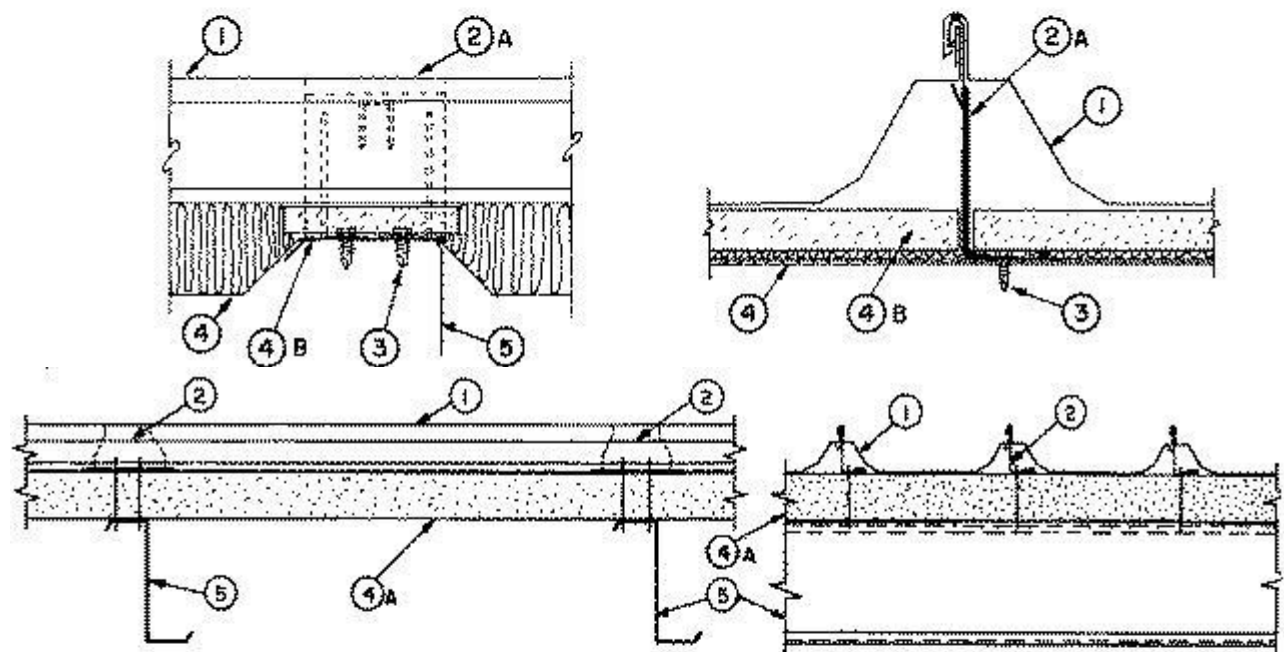
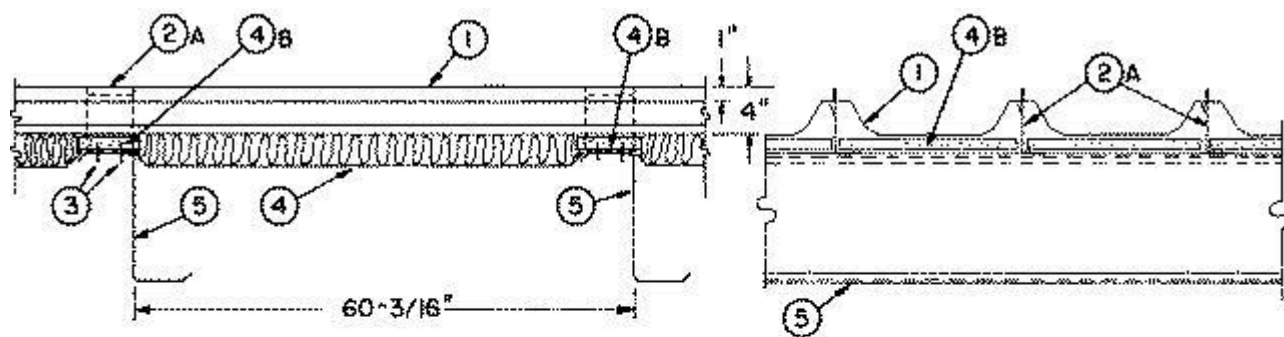
### Construction No. 93

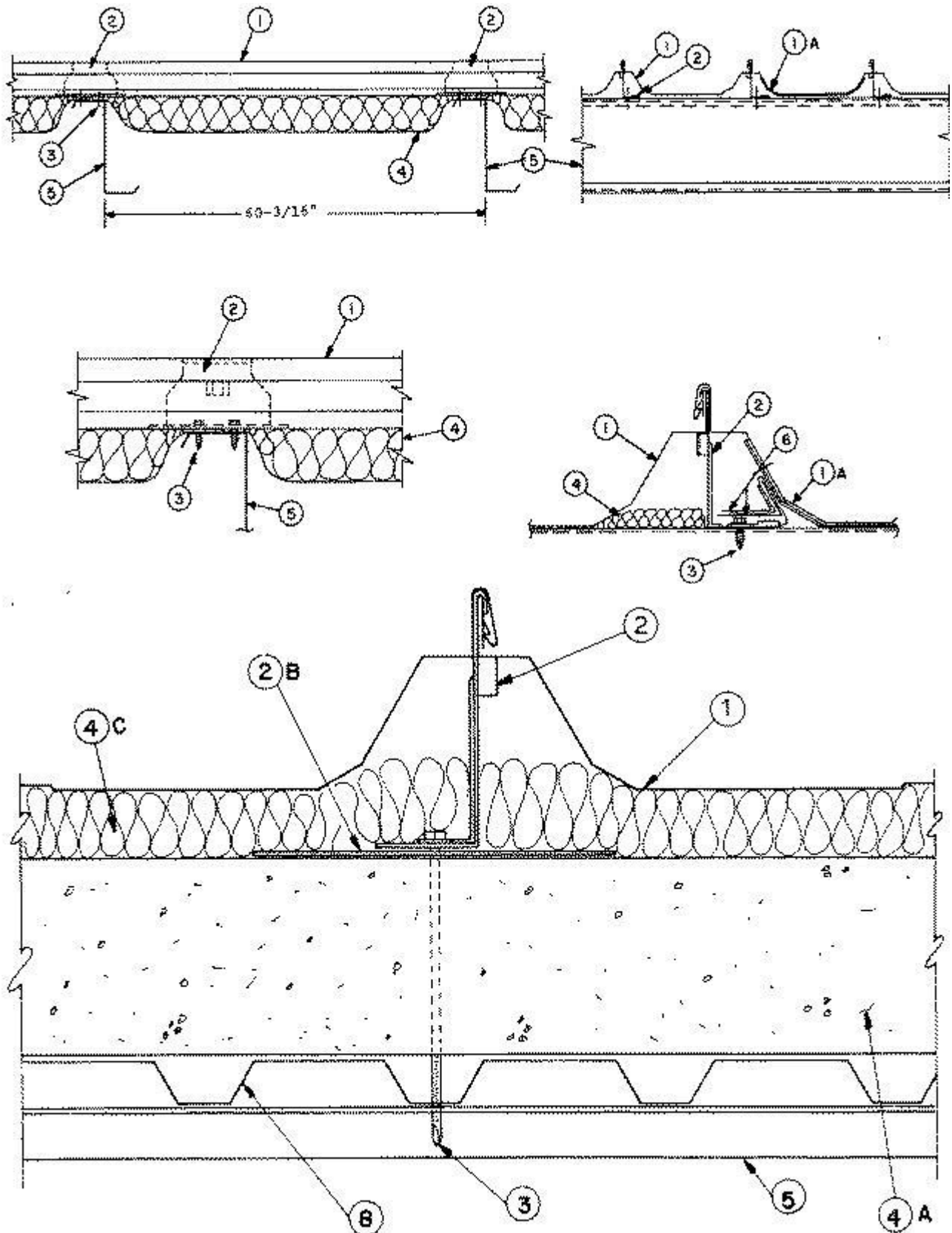
November 22, 2019

### Uplift — Class 90

### Fire Not Investigated







1. **Metal Roof Deck Panels\*** — No. 24 MSG minimum gauge coated steel. Panels continuous over two or more spans. Panels to be joined at side ribs by snapping adjacent interlocking sides together. Mechanical seaming operation optional for "Standing Seam II" panel and required for "Standing Seam 360" panel. End laps to occur over purlins with panels overlapped 6 in. with laps centered over purlin upper flange. A line of sealant may be used at panel end laps and side joints.

**AMERICAN BUILDINGS CO** ([View Classification](#)) — "Standing Seam II" or "Standing Seam 360"

**KIRBY BUILDING SYSTEMS INC** ([View Classification](#)) — "Standing Seam 360 (SS360)"

1A. **Building Units\*** — (Optional) Translucent, glass fiber reinforced plastic panels with metal rib sides. Plastic thickness nominal 1/16 in. formed to basic configuration of metal panels. A lower skin is attached to the upper skin using an adhesive. A foamed plastic is located between the skins. Panels continuous over two or more spans.

**AMERICAN BUILDINGS CO** ([View Classification](#)) — "Standing Seam II Skylight" or "Standing Seam 360 Skylight".

**F & F ASSEMBLIES INC** ([View Classification](#)) — "SKY-BRITE", "American Building Company", "Nucor Building System", "UltraDek/DoubleLok", "Schulte Building Systems" or "BRS style Panel"

**KIRBY BUILDING SYSTEMS INC** ([View Classification](#)) — "Standing Seam 360 (SS360) Skylight"

2. **Roof Deck Fasteners\*** — (**Not shown**) — Two piece clip. Upper tab aluminized or galvanized steel 0.033 in. thick. Base No. 12 MSG Coated steel. Minimum height 3-3/16 in. (nominal) when no spacer block is used (Item 4B). height 4-5/8 in. or 5-1/2 in. (nominal) when spacer block (Item 4B) or when liner panel (Item 8) is used.

**AMERICAN BUILDINGS CO** ([View Classification](#)) — "Standing Seam 360 Clips"

**KIRBY BUILDING SYSTEMS INC** ([View Classification](#)) — "Standing Seam 360 (SS360) Clips" or "Shur-Lok 360 Clips"

2A. **Roof Deck Fasteners\* (Panel Clips)** — Two piece clip. Upper tab SAE High Carbon Spring Steel 0.031 in. thick. Base 12 Ga. Galvanized Steel, ASTM A446 Grade D (50 KSI Minimum) Min. height 3-3/16 in. (nominal) when no spacer block is used. Max height 4-5/8 in. (nominal) when spacer block is used.

**AMERICAN BUILDINGS CO** ([View Classification](#)) — "Standing Seam II Clips"

**KIRBY BUILDING SYSTEMS INC** ([View Classification](#)) — "Shur-Lok Snap Clips"

2B. **Panel Clip Bearing Plate** — Used with rigid insulation. Located under the Roof Deck Fasteners (Item 2 or 2A), over rigid insulation (Item 4A); 5-1/2 in. square, fabricated from 0.043 in. thick minimum coated steel.

3. **Fasteners** — (Screws) — Fasteners, used to attach panel clips (Item 2 or 2A) to purlins when using compressible blanket insulation to be No. 12-14 by 1-1/4 in. minimum self-drilling, self-tapping, hex-head, plated steel screws. Length to be 1-1/4 in. minimum for insulation up to 3 in. and 1-1/2 in. minimum for insulation over 3 in. thick or when using thermal spacers (Item 4B). Two fasteners per clip inserted into preformed holes to be used.

Fasteners used to attach the panel clips (Item 2 or 2A) to the purlins when using rigid insulation (Item 4A) to be same type. Length to vary with thickness of rigid insulation with minimum penetration to be 3/4 in. Two fasteners per clip to be used inserted into guide holes.

Fasteners used to attach panel clips (Item 2 or 2A) to purlins when using liner panel (Item 8) to be No. 12-14 self-drilling, self-tapping, hex-head, plated steel screws. Minimum length to be equal to combined thickness of liner panel depth and foamed plastic thickness plus 3/4 in. Two fasteners per clip to be used inserted into guide holes.

Fasteners used to attach liner panel to purlins to be No. 12-14 by 1 in. minimum long self-drilling, self-tapping, hex-head, plated steel screws with a separate 1/2 in. OD steel washer and a neoprene sealing washer. Spacing to be 12 in. OC. Fasteners used at liner panel side laps to be No. 14 by 3/4 in. minimum long, Type A plated steel screws with a separate 9/16 in. OD steel washer and a bonded neoprene sealing washer. Spacing to be 24 in. OC.

Spacing at end laps to be in a 3-4-4-4-3 in. pattern driven through optional upper strap into lower plate (Item 6). Pattern to be 2-3/4-2-1/4-2-7/8-2-1/4-2-7/8-2-1/4-2-3/4 when optional end lap strap not used.

For panel clips and end lap connections: As an alternate fastener, No. 1/4-14 by 1 in. minimum Type A plated steel screws with a separate 9/16 in. OD steel washer and a bonded neoprene sealing washer may be used. Pilot holes to be 3/16 in. diameter.

Or: No. 14-14 by 1 in. minimum Type AB self-drilling, self-tapping, hex-head, plated steel screws with a separate 1/2 in. OD formed steel washer and a separate neoprene sealing washer may be used. Spacing to be same for all types.

3A. Fasteners used to attach the liner panels (Item 8A) to the purlins to be No. 12-14 by 1 in. minimum long self-drilling, self-tapping, hex head plated steel screws. (Liner panel to joists use No. 12-24 by 7/8 in. minimum long self-drilling, self-tapping, hex head plated steel screws). Spacing of fasteners to purlins or joists to be 12 in. O.C. at intermediate supports. Fasteners spaced at 6 in. O.C. at liner panel end laps. Fasteners used at liner panel side laps to be No. 12-14 by 7/8 in. minimum long hex head plated steel stitch screws. Spacing of liner panel side lap fasteners to be maximum 30 in. when liner panel supports are 5 ft-0 in. O.C. and maximum 36 in. O.C. for 6 ft -6 in. O.C. or 6 ft -0 in. O.C. support spacing.

4. **Insulation** — (Optional) — Any compressible blanket insulation 12 in. maximum thickness before compression.

4A. **Foamed Plastic\*** — (Rigid Insulation)(Optional) — maximum thickness 8 in. supplied in 4 ft widths.

4B. **Spacer Block** — (Optional) — Used with compressible insulation (Item 4) only — 3 in. by 24 in. by 1 in. (nominal) thick polystyrene foam.

4C. **Insulation** — Used when liner panel (Item 8) is used. Any compressible blanket insulation 1 in. maximum thickness before compression. Located between metal roof deck panel (Item 1) and foamed plastic (Item 4A).

4D. **Insulation\*** — (Optional) - Rigid Type (Foamed Plastic) — Supplied in 4 ft wide sheets; minimum thickness 1/2 in., maximum thickness 8 in.

**THE DOW CHEMICAL CO** ([View Classification](#)) — Types Thermaximum Sheathing, Thermaximum Light Duty Insulation, Thermaximum Heavy Duty Insulation, Thermaximum Metal Building Board, Thermaximum White Finish Insulation, Thermaximum ci Exterior Insulation, Thermaximum XARMOR, TUFF-R™ ci Insulation, Thermaximum IH Insulation, Type Thermaximum Plus Liner Panel and Thermaximum Heavy Duty Plus (HDP)

5. **Purlin** — No. 16 MSG minimum gauge steel (50,000 psi minimum yield strength) or Type H or J open web joists. Spacing to be maximum 60-3/16 in.

5A. **Purlins** — When liner Panel (Item 8A) used No. 16 MSG minimum gauge steel (50,000 psi minimum yield strength) or hot rolled shapes or open web joists. **Spacing** - For No. 16 minimum gauge steel. For all classes - 60 in. maximum **Spacing** - For open web joists or hot rolled shapes. For Class 90- 78 in. maximum (1.5B Deck) 72 in. maximum (1.5F Deck).

6. **End Lap Strap (Optional) and Plate** — (Not shown) — Lower plate used at the end lap to be 12-1/2 in. long and approximately the full panel width, fabricated from 0.051 in. thick coated steel. Upper strap to be 1-1/2 in. long and approximately the full panel width. Optional upper strap fabricated from 0.122 in. thick aluminum and to have eight guide holes for screw fasteners. Both pieces formed to the general profile of the panels with lower plate to have three guide holes.

7. **Insulation Trim** — (Not shown) — Used at skylight location, (see Item 1A) to consist of a lower angle having a 1-9/16 in. wide horizontal leg and a 1 in. leg slanted to a 50 degree angle. Fabricated from 0.050 in. thick coated steel. Upper angle to have a 1-1/8 in. horizontal leg and a 9/16 in. thick leg slanted to a 50 degree angle. Fabricated from 0.026 in. thick coated steel.

8. **Liner Panel** — (Optional) — No. 26 MSG minimum thickness coated steel depth 3/4 in., pitch 6 in., or 1-3/16 in. depth with major ribs located 12 in. O/C. and 3/32 in. deep minimum ribs located 3-1/2 in. O/C. in the flat section of panel, width 36 in. Sides overlapped one corrugation. End lap width minimum 2 in., located over purlins.

8A. **Liner Panel** — 1.5B Deck (Panels 36 in. wide and 1-1/2 in. deep with 3-1/2 in. wide crests spaced 6 in. O.C) or 1.5F Deck (Panels 36 in. wide and 1-1/2 in. deep with 4-1/4 in. wide crests spaced 6 in. O.C) Panels fabricated from No. 22 MSG thick steel having a yield strength of 33,000 psi minimum.

8B. **Liner Panel** — minimum thickness No. 22 MSG coated steel (33,000 PSI minimum yield strength). minimum depth 1-1/2, maximum pitch 6 in. fabricated to various profiles. Fastened to supports (Item 9) with fastener type and spacing per liner panel manufacturer's instructions for uplift loading.

9. **Supports (Not Shown)** — Used to support liner panels (Item 8B), to be cold formed or hot rolled sections. Gauge, yield strength and spacing to be per liner panel manufacturer's specifications for uplift loading.

Refer to General Information, Roof Deck Constructions, (On-Line Certification Directory) 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 2019-11-22

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# TGKX.210A - Roof Deck Constructions

## Design/System/Construction/Assembly Usage Disclaimer

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- 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.

## Roof Deck Constructions

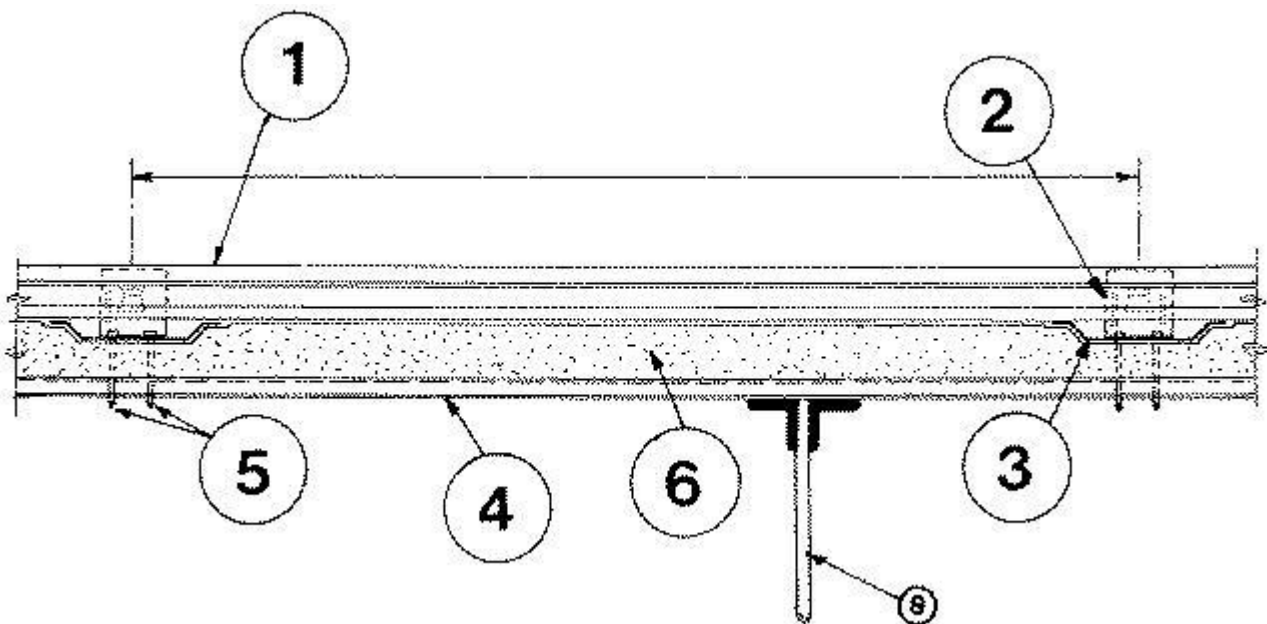
[See General Information for Roof Deck Constructions](#)

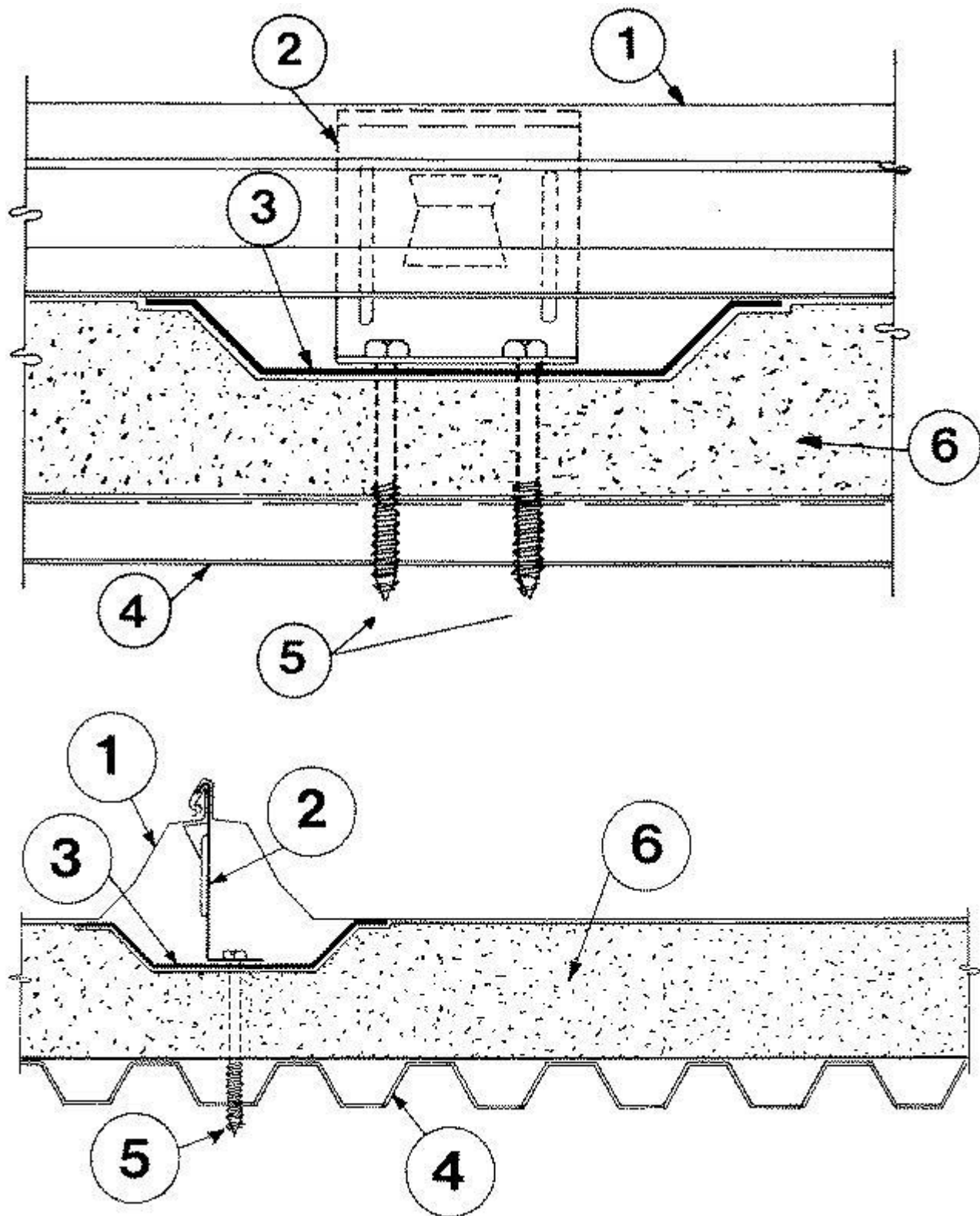
### Construction No. 210A

November 22, 2019

**Uplift — Class 90**

**Fire Not Investigated**





**1. Metal Roof Deck Panels\*** — No. 24 MSG minimum gauge coated steel. Panels nominal 24 in. wide and 3 in. high at the side ribs. Panels continuous over two or more spans. End laps to occur near supports. Panel overlapped 2-5/8 in. minimum. A bead of sealant may be used at the panel end laps. Panel side joints designed to snap together and to be furnished with factory applied mastic.

**AMERICAN BUILDINGS CO** ([View Classification](#)) — "Seam-Loc -12, -16, -18", "Standing Seam II" or "Standing Seam 360"

**KIRBY BUILDING SYSTEMS INC** ([View Classification](#)) — "Standing Seam 360 (SS360)"

1A. **Building Units\*** — (Optional) Translucent, glass fiber reinforced plastic panels with metal rib sides. Plastic thickness nominal 1/16 in. formed to basic configuration of metal panels. A lower skin is attached to the upper skin using an adhesive. A foamed plastic is located between the skins. Panels continuous over two or more spans.

**AMERICAN BUILDINGS CO** ([View Classification](#)) — "Standing Seam II Skylight or Standing Seam 360 Skylight"

**F & F ASSEMBLIES INC** ([View Classification](#)) — "SKY-BRITE", "American Building Company", "Nucor Building System", "UltraDek/DoubleLok", "Schulte Building Systems" or "BRS style Panel"

**KIRBY BUILDING SYSTEMS INC** ([View Classification](#)) — "Standing Seam 360 (SS360) Skylight"

2. **Roof Deck Fasteners\* (Panel Clips)** — Two part system consisting of an upper section and an interlocking base section. Width to be 3-1/4 in. Height to be 3-1/4 in. when thermal blocks are not used or 4-5/8 in. or 5-1/2 in. when thermal blocks are used. Panel clips to be fastened to liner panel and spaced 60 in. O.C. maximum. Bearing Plate used under each panel clip (Item 3).

**AMERICAN BUILDINGS CO** ([View Classification](#)) — "Standing Seam II Panel Clips" or "Standing Seam 360 Clips"

**KIRBY BUILDING SYSTEMS INC** ([View Classification](#)) — "Standing Seam 360 (SS360) Clips", "Shur-Lok Snap Clips" or "Shur-Lok 360 Clips"

2A. **Roof Deck Fasteners\* (Panel Clips)** — Two piece clip. Upper tab SAE High Carbon Spring Steel 0.031 in. thick. Base 12 Ga. Galvanized Steel, ASTM A446 Grade D (50 KSI Minimum) Min. height 3-3/16 in. (nominal) when no spacer block is used. Max height 4-5/8 in. (nominal) when spacer block is used.

**AMERICAN BUILDINGS CO** — "Standing Seam II Clips"

3. **Bearing Plate** — Used under each panel clip. Bearing Plate 3-1/2 in. wide, 8-1/2 in. long formed in a dish shape 1/2 in. deep. Fabricated from No. 22 MSG coated steel.

4. **Liner Panels** — 1.5B Deck (Panels 36 in. wide and 1-1/2 in. deep with 3-1/2 in. wide crests spaced 6 in. O.C.) or 1.5F Deck (Panels 36 in. wide and 1-1/2 in. deep with 4-1/4 in. wide crests spaced 6 in. O.C.). Panels fabricated from No. 22 MSG thick steel having a yield strength of 33,000 psi minimum.

5. **Fasteners (Screws)** — Fasteners used for attaching the panel clips (Item 2) to the liner panels to be No. 14 Type A self-tapping, hex-washer head, plated steel screws used without washers. Length to vary with thickness of insulation (Item 6) and to be minimum of 2 in. longer than nominal thickness of insulation. Two fasteners used with each clip driven into liner panels. Pilot holes to be 5/32 in. diameter

Fasteners used to attach the liner panels (Item 4) to the purlins to be No. 12-14 by 1 in. min. long self-drilling, self-tapping, hex head plated steel screws. (Liner panel to joists use No. 12-24 by 7/8 in. min. long self-drilling, self-tapping, hex head plated steel screws). Spacing of fasteners to purlins or joists to be 12 in. O.C. at intermediate supports. Fasteners spaced at 6 in. O.C. at liner panel end laps. Fasteners used at liner panel side laps to be No. 12-14 by 7/8 in. min. long hex head plated steel stitch screws. Spacing of liner panel side lap fasteners to be max 30 in. when liner panel supports are 5 ft-0 in. O.C. and max 36 in. O.C. for 6 ft-6 in. O.C. or 6 ft-0 in. O.C. support spacing.

Fasteners used at metal roof deck end laps to be No. 17 self-tapping, plated steel screws with a 5/8 in. O.D. steel washer with a bonded neoprene sealing washer. Five fasteners to be used at each end lap.

5A. **Weld** — (Alternate for attaching liner panel to support structure). Liner panel welded to supports through optional 1/16 in. thick welding washers. Welds, 3/4 in. diameter (1.5B Deck) or 3/8 in. diameter (1.5F Deck), located at 12 in. O.C. at intermediate supports and 6 in. O.C. at liner deck end laps.

6. **Foamed Plastic** — (Rigid Insulation) — Extruded foamed plastic minimum density 2.00 pcf, minimum thickness 1 in., maximum thickness 8 in.

6A. **Foamed Plastic** — (Rigid Insulation) — Composite board consisting of a layer of mineral aggregate board and a bonded layer of 2.0 pcf density foamed plastic. Minimum thickness of 1-1/2 in. with 1 in. of foamed plastic, maximum thickness of 8 in. Mineral aggregate board layer located next to the steel roof deck.

7. **End Lap Assembly (Not Shown)** — The assembly used at the panel end lap is to consist of a back-up plate 5 in. wide, 22 in. long with its 5 in. sides bent in the shape of the panel side ribs. The plate is to have four tabs formed to engage the lower panel section. The plate is formed from No. 16 MSG coated steel. An upper cinch strap (optional) is to be located over the panel end lap and is to be 28 in. long, 1-1/4 in. wide and formed in the configuration of the panel profile. Five No. 17 self-tapping fasteners are to be used at each end lap driven through the cinch strap into the back-up plate. When a single end lap is used (i.e., panels on each side not having an end lap), the cinch strap must be field modified to add a second rib profile and an additional fastener is then placed through the cinch strap, metal roof deck panels and back up plate on each side rib (two per panel).

8. **Purlins** — No. 16 MSG minimum gauge steel (50,000 psi minimum yield strength) or hot rolled shapes or open web joists.

|                  |                                                                          |
|------------------|--------------------------------------------------------------------------|
| <b>Spacing —</b> | For No. 16 minimum gauge steel.                                          |
|                  | For all classes — 60 in. maximum.                                        |
| <b>Spacing —</b> | For open web joists or hot rolled shapes.                                |
|                  | For Class 90 — 78 in. maximum (1.5B Deck)<br>72 in. maximum (1.5F Deck). |

Refer to General Information Roof Deck Constructions (On-Line Certification Directory) for items not evaluated.

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Last Updated on 2019-11-22

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