# SS 210A (ARMCO) PANEL

**CLASSIFIED** (UL)

# UL LISTED CONSTRUCTION NUMBERS

## #90     #180     #176     #238     #238A

## SECTION ANALYSIS REPORT
## AND
## SPAN LOAD TABLES

**16265 E 33rd Dr Suite 40, Aurora, CO 80011**

**PH 303-294-0538  ****   800-574-1717   ****   FAX 303-294-9407**
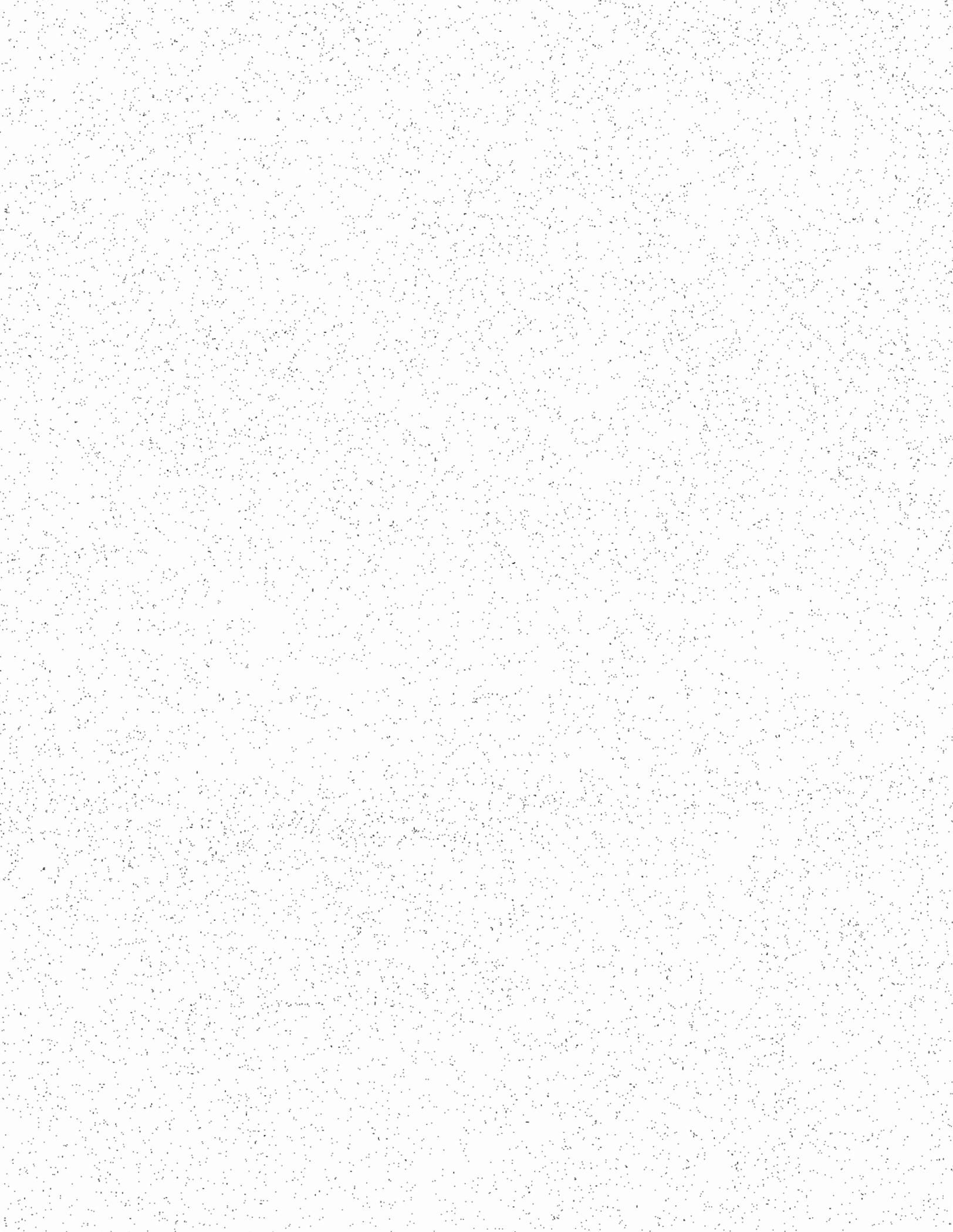
DESCRIPTION

PRODUCT COVERED:

      This section of the Procedure covers a coated steel roof panel which is
identified as "Panel 210A".  The panel is produced at job sites by portable
rolling machines.

      The panel is roll formed from No. 24 MSG minimum gauge coated steel to
the configuration shown in ILL. 1.  The panel may also have a paint finish
over the coating.

                                    *

SPECIFICATIONS OF FINISHED PRODUCT:

                                THICKNESS

      The base metal thickness of the steel used in the fabrication of the
panel shall be not less than .0225 in. (No. 24 MSG minimum gauge).  This
thickness shall not include the coating or any paint finish.

                                DIMENSIONS

      The cross-section dimensions of the panel piece shall be in accordance
with the cross-section shown in ILL. 1.

                                 STRENGTH

      The strength records of the steel shall be reviewed.  The steel used
shall conform to ASTM A653 Grade 50 specifications or the minimum yield point
of the steel shall be 50,000 psi.

**100** a century of
public safety
esL 1894

File R14692
Project 97NK2305

November 13, 1997

CLASSIFICATION BY REPORT

of

METAL ROOF DECK PANEL AND ROOF DECK FASTENERS
IN ROOF DECK CONSTRUCTIONS

New Tech Machinery Corp.
Denver, CO

JH:tjm
NKDLS

### G E N E R A L

The subject of this Report is a Roof Deck Panel which is identified as "Panel 210A".  The panel is used in Construction Nos. 90, 176, 180, 238 and 238A as described in UL's Roofing Materials and Systems Directory.  In addition to the roof deck panels, all constructions utilized steel purlins, Classified panel clips and screw fasteners.

The panel in this Report was previously Classified for New Tech Machinery Corp. by Underwriters Laboratories Inc. for the same construction numbers.  The panel was identified previously as "210 Panel".  The panel in this Report is the same as previously Classified.

The roof deck panels are roll-formed at the construction site.  Therefore, the information provided in this Report replaces the Laboratories' usual factory Follow-Up Service Program for metal roof deck panels for which Follow-Up Service is normally conducted at the point of manufacture.  The program for companies that are "Classified by Report" consists of keeping supplies of up-to-date Reports that are to be distributed to any interested party and requiring the roll forming machines to be covered by the Underwriters Laboratories Inc. Certificate Service.

The roof deck panel clips are covered by the usual Follow-Up Service Program of Underwriters Laboratories Inc. with factory monitored quality control.  The method of use and a description of the Classified panel clips are shown in the Roof Deck Constructions.

# D E S C R I P T I O N

Metal Roof Deck Panels - The roof deck panel is 16 in. wide and 2 in. high at the female rib. The panel is fabricated from coated steel having a minimum thickness of 0.0225 in. (No. 24 MSG) and a minimum yield strength of 50,000 psi (ASTM A653, Grade 50). The panel will be Classified as "Metal Roof Deck Panels" in Underwriters Laboratories Inc.'s Roofing Materials and Systems Directory and will be covered under our Follow-Up Service. The panel is designated as "Panel 210A" by the manufacturer and is shown in ILL. 1.

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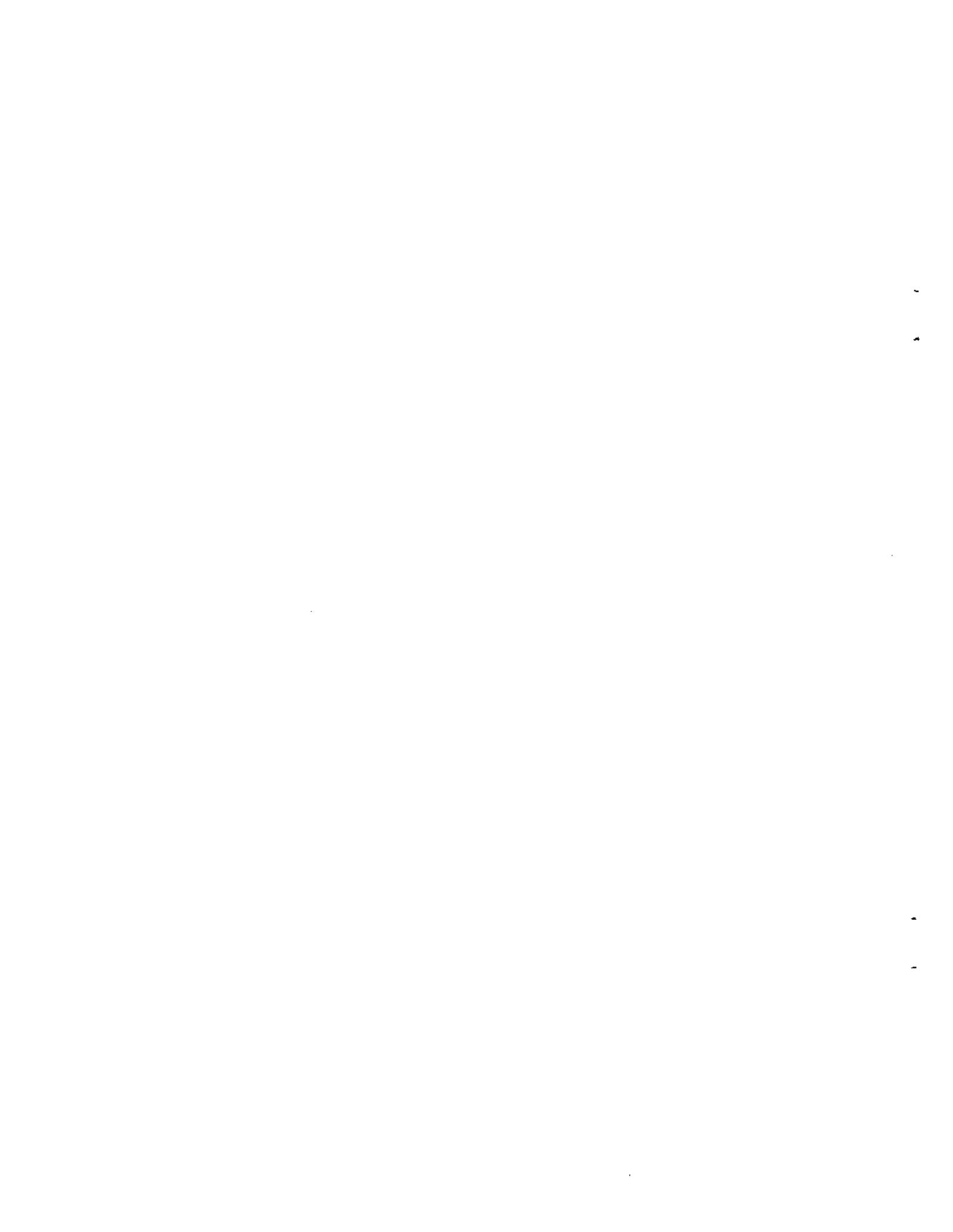
## C O N C L U S I O N

The following conclusions represent the judgement of Underwriters Laboratories Inc., based upon the results of the examination presented in this Report as they relate to established principles and previously recorded data.

### UPLIFT RESISTANCE:

The roof deck assemblies constructed of the materials and in the manner described in Roof Deck Construction Nos. 90, 176, 180, 238 and 238A will afford a Class 90 uplift resistance rating based on the method of test.

Secondary supports (beams, purlins, joists, bulb tees, lateral bracing, etc.), connections of these assemblies to the main structural members (girders, columns, etc.), and construction details along the edges of the roof or around roof openings (mechanical equipment, chimneys, etc.) have not been evaluated.

### PRACTICABILITY:

The materials used in the assemblies can be readily installed by qualified workmen with tools and methods commonly used for construction work of a similar nature.

The materials and installation procedures for the original test assemblies described in these tests were judged to be significant factors in the uplift resistance of the constructions.

### CONFORMITY:

The original assemblies were tested in accordance with the Standard UL 580, entitled "Tests For Uplift Resistance Of Roof Assemblies."

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CLASSIFICATION AND FOLLOW-UP SERVICE:

The roof deck panel, as described herein, is judged to be eligible for Classification and Follow-Up Service of Underwriters Laboratories Inc. Under the Service, the manufacturer is authorized to use the Laboratories' Certification of Classification on the forming machine to produce products which comply with the fabrication specifications in this Report, as shown by ILL. 1, and any other applicable requirements of Underwriters Laboratories Inc. Only those products which are produced with a Certified machine are considered as Classified by Underwriters Laboratories Inc.

In addition, UL Classification Report Reference No. R14692, Project 97NK2305, dated November 13, 1997, should be consulted for compliance with material specifications and metal panel design.

See UL Roofing Materials and Systems Directory

Report by:

JAMES HATCHER
Staff Engineer

Reviewed by:

KENNETH RHODES
Associate Managing Engineer

JH:tjm
NKDLS

NEW TECH MACHINERY CORP
MR G BATTISTELL
1300 40TH ST
DENVER CO 80205

**RE: Project Number(s) - 03NK22866**

Your most recent Certification is shown below. You may also view this information, or a portion of this information (depending on the product category), on UL's Online Certifications Directory at www.ul.com/database. Please review the text and contact the Conformity Assessment Services staff member who handled your project if revisions are required. For instructions on placing an order for this information in a 3 x 5-inch format, you may refer to the enclosed order form for UL Card Service.

**TJPV**                                   November 21, 2003
**Metal Roof Deck Panels**

**NEW TECH MACHINERY CORP**                                   R14692
   **1300 40TH ST, DENVER CO 80205**

Coated steel panels, field – formed.
Underwriters Laboratories Inc. Metal Roof Deck Panels, Fabricated, installed and used in the following roof deck constructions with corresponding panel identifications:
   Coated steel panels identified as "Snap Panel 550" for use in Construction No. 373 .
   Coated steel panels identified as "Panel 210A" for use in Construction Nos. 90, 176, 180, 238, 238A.
   Coated steel or aluminum panels identified as "Snap Panel 675" for use in Construction Nos 254, 255, 261, 303.
   Coated steel panels identified as "SS675" for use in Construction Nos. 343, 508 and 508A.
   Coated steel panels identified as "SS450" for use in Construction No. 370.
   Coated steel panels identified as "SS150" for use in Construction No. 554.
   Coated steel panels identified as "SS100" for use in Construction No. 575.
   Coated steel panels identified as "FF100" for use in Construction No. 529.

See Roof Deck Construction for description of construction numbers.
                   **LOOK FOR LISTING MARK ON PRODUCT**

2"

11/16"

7/16"

12" - 24"

13/16"

1/2"

**NOTE:**
MATERIAL USAGE: 6 1/8"

# Online Certifications Directory

# TGKX.90
# Roof Deck Constructions

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## Roof Deck Constructions

**Guide Information**

**Construction No. 90**

March 30, 2004

**Uplift — Class 90**

**Fire Not Investigated**

**180° SEAM**

**FOR AEP-SPAN PANEL**
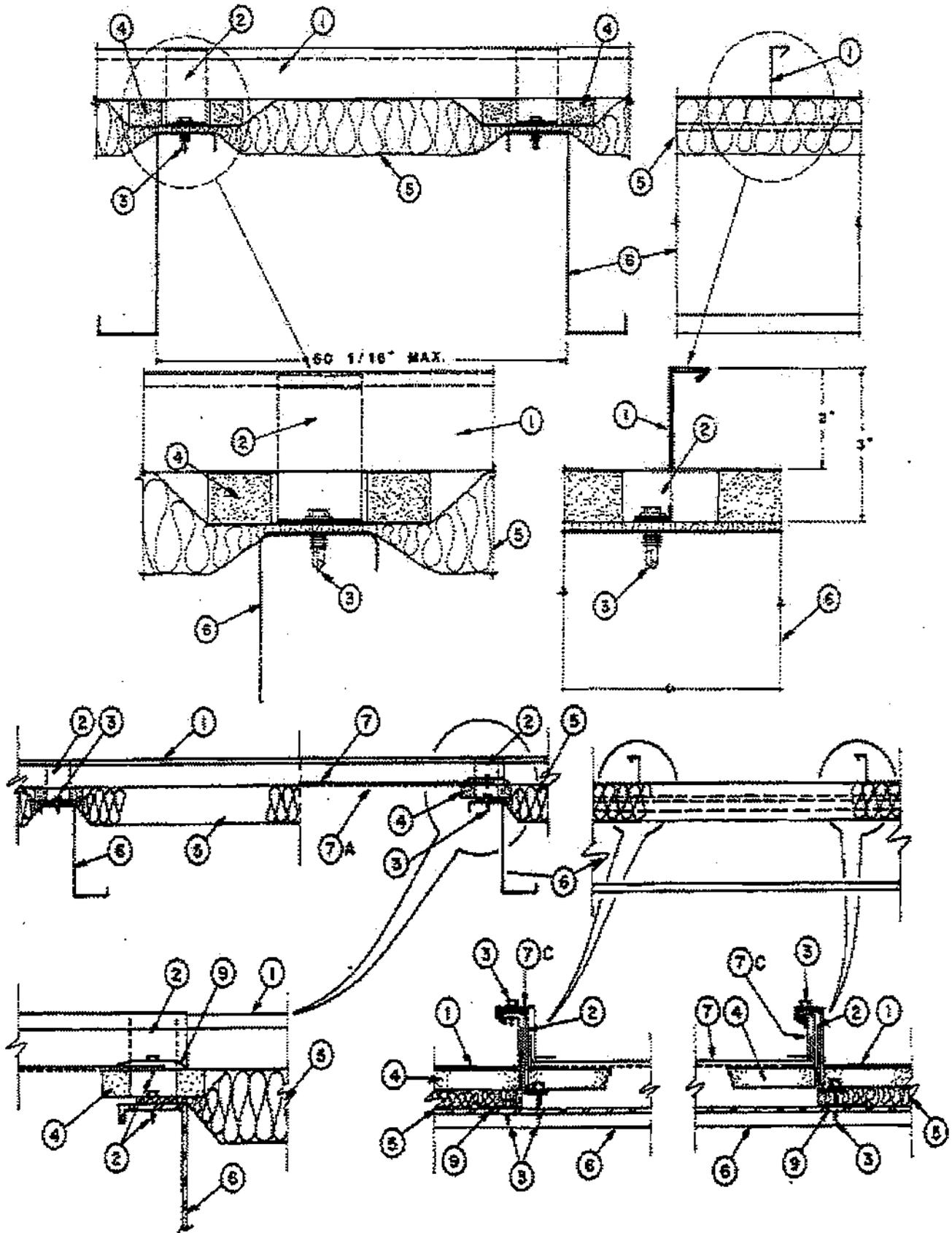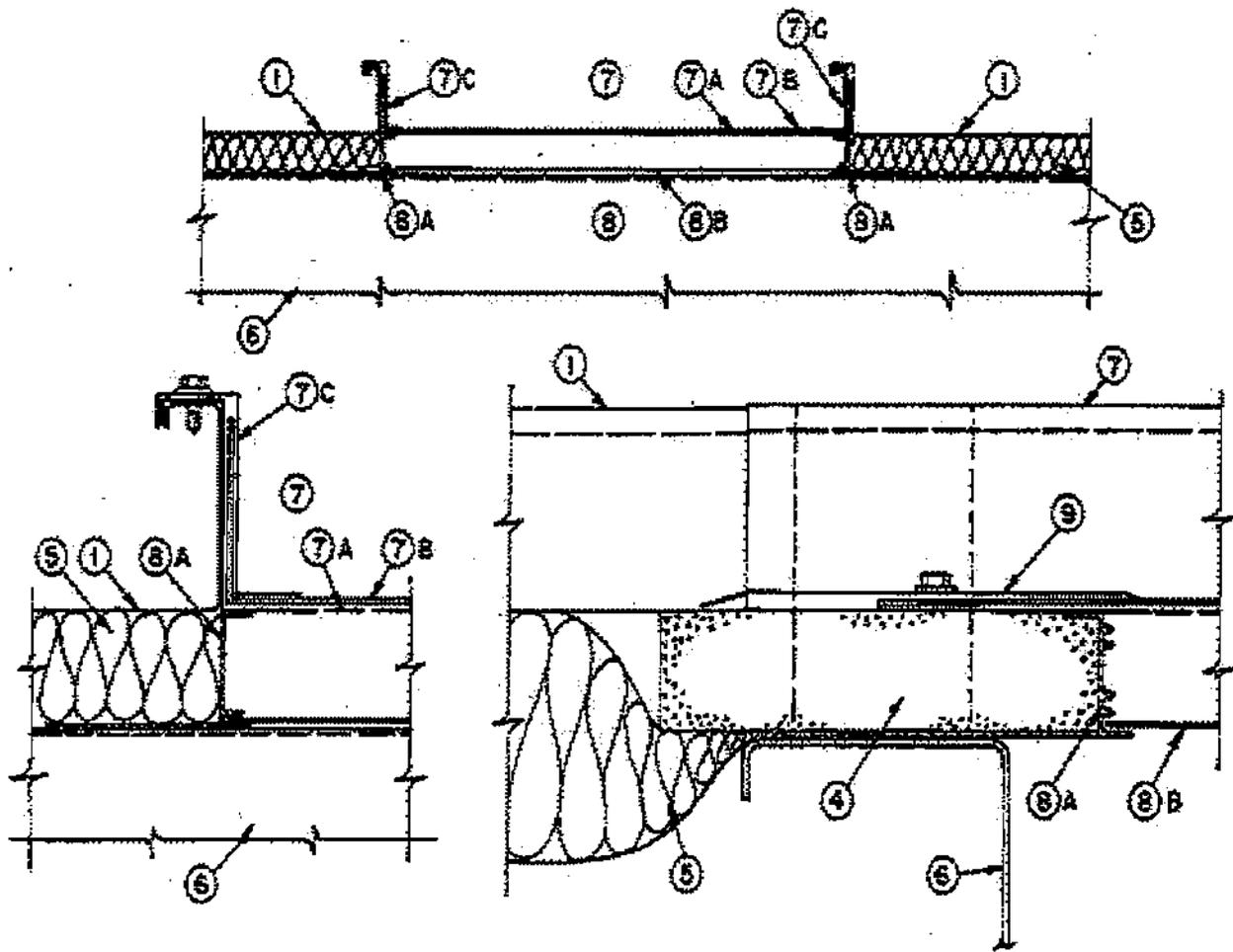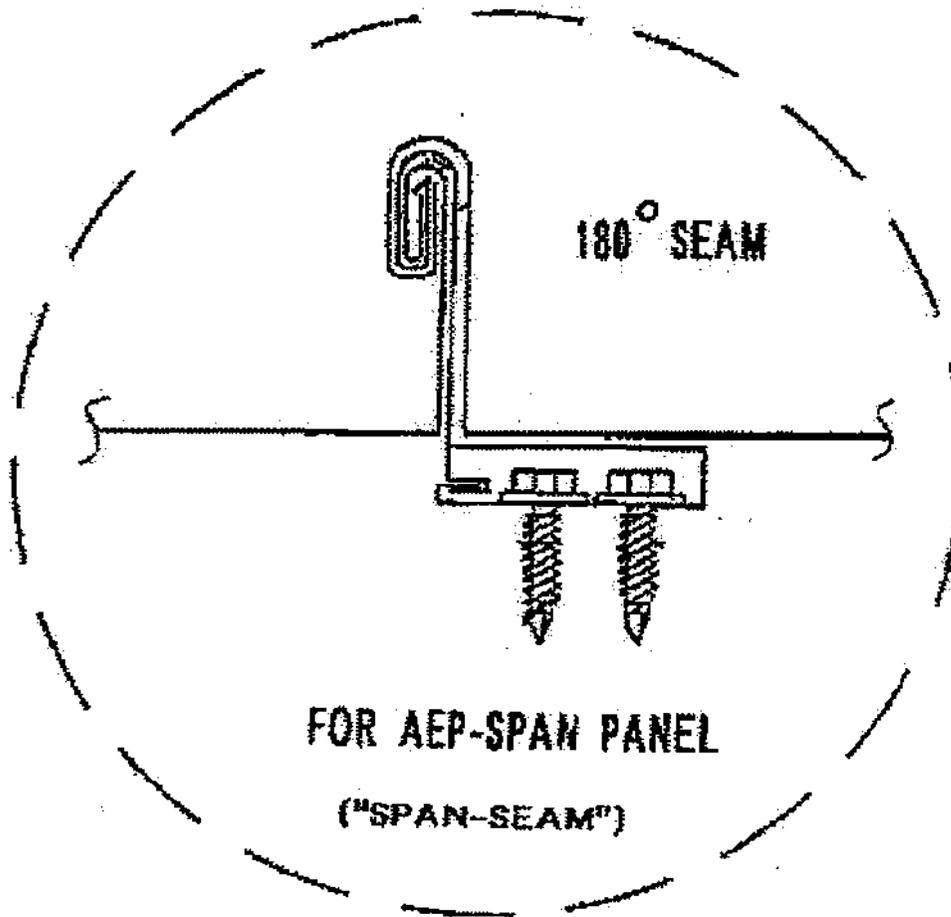
**("SPAN-SEAM")**

1. **Metal Roof Deck Panels*** — No. 24 MSG min gauge coated steel, max width 16 in. Panels continuous over two or more spans. End lap to occur over purlins and to include End Lap Back-up Plate (Item 2B or 2C.) Ends of panels overlapped 6 in. Side laps to be tightened and crimped with a special motorized crimping machine at a minimum 45 degree angle with crimping process to include tabs of Panel Clips (Item 2). A bead of sealing compound may be used at panel end and side laps.

**A & M BUILDERS/ROOFING**

**TECHNOLOGIES L L C** — "SS200"

**A & S BUILDING SYSTEMS L P** — "BattenLok " or "SuperLok"

**A-LERT STANDING SEAM ROOF SYSTEMS** — "A-Lert Loc"

**AEP SPAN, DIV OF**

**ASC PROFILES** — "SL-216" (90° Seam), "SPS-216" (180° Seam)

ALLWINE ROOFING & CONSTRUCTION INC — "A2-16", "A2-16 Fluted" and "A2-16 with Clip Offset"

ARCHITECTURAL BUILDING COMPONENTS INC — "JSM 200"

ARCHITECTURAL SHEETMETAL PRODUCTS INC — "ASP-2500"

CECO BUILDING SYSTEMS, DIV OF

ROBERTSON-CECO CORP — "CRP 16"

CENTURION INDUSTRIES INC, DBA

TFC CANOPY — "Centurion 1624M"

CONSOLIDATED METALS OF FLORIDA, DIV OF

ALUMINUM SERVICE INC — "CSS-210A"

CONSTRUCTION METAL PRODUCTS INC — "CMP Series 2500"

CSC SALES INC — "CSC-SS2000"

DALEY CONSTRUCTION & METAL ROOFING — "3D Forever Lock"

ENGLERT INC — "Series 2500"

HCI STEEL BUILDING SYSTEMS INC — "Mark 1622" and "Mark 1624"

HI-TEC ROOFING INC — "MRS 210A"

J M METALS ROOFING MFRS — "JM 2.0"

KNUDSON MFG INC — "ULTRALOK"

MBCI — "BattenLok" or "SuperLok"

MESCO METAL BUILDINGS — "BattenLok" or "SuperLok"

METAL-FAB MFG LLC — "Met-Fab III"

METAL PANEL SYSTEMS INC — "MP-200"

METAL SALES MFG CORP — "T-Span" or "T-Span 180" (180° Seam)

METAL WORX SYSTEMS INC — "SS 2000"

NCI BUILDING SYSTEMS L P — "BattenLok" or "SuperLok"

NEW TECH MACHINERY CORP — "Panel 210A"

NORTH COAST COMMERCIAL

ROOFING SYSTEM OF PA INC — "Series 2500"

PETERSEN ALUMINUM CORP — "Tite-Loc" and "Tite-Loc Plus"

ROL-TEC SYSTEMS INC — "UltraLok"

R S S P INC — "SS2000"

STEELOX SYSTEMS L L C — "Steelox LRX 262", "Steelox LRX 264", "Steelox PRX 262" or "Steelox PRX 264" (Fabricated from either coated or stainless steel)

SUPERIOR METAL SYSTEMS INC — "SMS 416"

UNITED STRUCTURES OF AMERICA INC — "Sure-Lok" or "Supreme-Lok"

ZIMMERMAN METALS INC — "SS2000"

2. **Roof Deck Fasteners\* (Panel Clips)** — Two part assembly: Base, 1 in. wide approximately 1-1/4 in. long with upper segment folded over lower end of tab. Fabricated from 0.050 in. thick coated or stainless steel. Upper tab 3 in. wide, maximum tab height 3-1/2 in. with lower end formed to engage base. Fabricated from 0.023 in. thick coated or stainless steel.

**STEELOX SYSTEMS L L C** — "CF Sliding Clip"

Spacing for clip to be 5 ft 0-1/16 in. OC with clips located over purlins (Item 6).

2A. **Roof Deck Fasteners\*** — (Panel Clips)(Not Shown) — No. 22 MSG min coated steel. Clips located at panel sides. Guide Holes in bottom of clip to accommodate two screw fasteners (Item 3).

**ARCHITECTURAL BUILDING COMPONENTS INC** — "JSM 200 Utility"

**CECO BUILDING SYSTEMS, DIV OF**

**ROBERTSON-CECO CORP** — "CL3, CL4, CL7, CL8 Series""CRP16 Panel Clips"

**HCI STEEL BUILDING SYSTEMS INC** — "SS16 High or Low Stationary Clip" or "SS16 High or Low Expansion Clip"

**NCI BUILDING SYSTEMS L P** — "BattenLok High or Low, Fixed or Floating Clip"; "BattenLok Utility Clip" — "SuperLok High or Low, Fixed or Floating Clip"; "SuperLok Utility Clip"

2B. **End Lap Back-Up Plate\*** — (Not shown) — No. 18 MSG min gauge coated steel. Max length 48 in. Width varies with type of purlin with a max of 6-1/2 in.

**STEELOX SYSTEMS L L C** — "End Lap Backing Plate".

2C. **End Lap Back-Up Plate\*** — (Not shown) — No. 16 MSG min coated steel.

**NCI BUILDING SYSTEMS L P** — "BattenLok Back-Up Plate" or "SuperLok Back-Up Plate".

2D. **End Lap Back up Plate** — (Not shown) — used with HCI Steel Products' Panels - 6 in. wide, 15-1/2 in. long, fabricated from 16 MSG min thick steel (50,000 psi min yield strength).

2E. **Roof Deck Fastener\*** — (End Lap Back up Plate) — (Not Shown) — Used with AEP-Span "SL-216" panels. Length 10-1/2 in., width 15-3/4 in., No. 16 MSG min thick coated steel. Slipped under lower panel at end lap. Panels fastened together using four No. 1/4-14 by 1-1/8 in. long self-drilling, self-tapping, hex-washer head, plated steel screws with a 5/8 in. OD steel washer and a sealing washer. Screws spaced 4 in. OC beginning 2 in. from ribs.

**AEP SPAN, DIV OF**

**ASC PROFILES** — "SL-216 End-Lap Back-Up Plate"

2F. **Roof Deck Fasteners\*** — (Panel Clip) — (Not Shown) — Two part assembly; A base fabricated from No. 16 MSG min coated steel and an upper tab fabricated from No. 22MSG min coated steel. Clips fastened to purlins with two fasteners per clip. See Item No. 3 for description of fasteners.

**AEP SPAN, DIV OF**

**ASC PROFILES** — "SL-2.5 in. Standard Clip"

2G **Roof Deck Fasteners\*** — (Panel Clip) — (Not Shown) — Two part assembly; A base fabricated from No. 16 MSG min coated steel and upper tab fabricated from No. 22 MSG min coated steel. Clips fastened to purlins using two fasteners per clip. See Item No. 3 for description of fasteners.

**METAL SALES MFG CORP** — " T-Span Clip"

2H. **Roof Deck Fasteners\*** — (Panel Clips) — (Not Shown) — Used with "Tite-Loc" or "Tite-Loc Plus" panels.

One piece assembly; 3 in. wide, approximately 2 in. high with two or three guide holes in base. Fabricated from No. 22 MSG coated steel.

**PETERSEN ALUMINUM CORP** — " Tite-Loc Utility Clip" and "Tite-Loc Plus Utility Clip"

One piece assembly; 3 in. wide, approximately 2-3/8 in. or 3 in. high, with three guide holes in base. Fabricated from No. 22 MSG coated steel.

**PETERSEN ALUMINUM CORP** — " Tite-Loc Low/High Fixed Clip" and "Tite-Loc Plus Low/High Fixed Clip"

Two piece assembly; base approximately 2 in. wide, 1-11/16 in. long formed to engage upper tab. Fabricated from No. 16 MSG coated steel. Tab approximately 4-5/16 in. wide; 2-3/8 in. or 2-7/8 in. high, formed to engage base. Fabricated from No.

22 MSG coated steel. Base to have two guide holes.

**PETERSEN ALUMINUM CORP** — " Tite-Loc Sliding Clip" and "Tite-Loc Plus Sliding Clip"

3. **Fasteners** — (Screws) — For attaching panel clips to purlins- 1/4 - 14 by 1 in. long shoulder or stand off type, self-drilling, self-tapping, hex-head plated steel screws. One screw per clip to be used. As an alternate fastener for panel clip to purlin attachment a No. 12-14 by 1 in. long self-drilling, self-tapping, hex-head plated steel screw may be used. Fasteners used at end laps-1/4 - 10 by 1 in. long self-drilling, self-tapping, hex-head plated steel screws with 1/2 in. OD metal backed sealing washer, spaced on a 1, 3, 3-1/2, 3-1/2, 3, 1 in. pattern.

For Building Unit-to-Panel side lap connections-No. 18-9 by 1 in. long self-drilling, self-tapping, hex-head plated steel screws with a separate 1/2 in. OD plated steel washer and a neoprene sealing washer. One fastener required at each end and one at midspan of each rib of the Building Unit.

For Reinforcing Plate-to-Building Unit end lap connection-No. 18-9 by 1 in. long self-drilling, self-tapping, hex-head plated steel screws with a separate 1/2 in. OD plated steel washer and a neoprene sealing washer. Spacing to be nom 2-1/2, 5-1/2, 5-1/2 in. beginning at the female rib of the Building Unit.

4. **Thermal Spacer Block** — Used over purlins. Expanded polystyrene 1 in. thick, 5 in. wide, 48 in. long with cutout to accommodate panel clips.

4A. **Thermal Spacer Block** — (Optional) — (Not Shown) — Used over purlins. Expanded polystyrene 1 in. thick max, 3 in. wide, cut to fit between panel clips (For use with Item 2A only.

5. **Insulation** — (Optional) — Any compressible blanket type 4 in. max thickness before compression. An additional 2 in. max thickness of compressible blanket insulation may be used between purlins. The additional insulation shall not be sandwiched between the upper flange of the Purlin and the Metal Roof Deck Panel.

As an alternate method of installation, a max of 6 in. of compressible blanket insulation may be used. The insulation is to be laid over the purlins and slit along the purlins to a depth of 5 in. (1 in. above the purlin) in such a manner that no material in excess of 4 in. is sandwiched between the purlins and the Roof Deck Panels.

6. **Purlins** — Z-shaped, 0.056 in. min thickness steel (40,000 psi min yield strength) or min "H" series open web steel joists. Maximum spacing 60-1/4 in.

7. **Building Units** — * (Optional) — Prefabricated assemblies of a Skylight Panel, (Item 7B), mounted in a Perforated Metal Roof Deck Panel, (Item 1), with Flashings, (Item 7C). Assembly continuous over two spans erected in the same manner as for Metal Roof Deck Panels.

**STEELOX SYSTEMS L L C** — "264 Steelox-Skylight".

**NCI BUILDING SYSTEMS L P** — "BattonLok Light Transmitting Panel" or "SuperLok Light Transmittting Panel".

**7A. Perforated Metal Roof Deck Panels** — No. 24 MSG min gauge coated steel perforated in the flat portion.

**7B. Plastic Skylight** — * (Translucent, glass fiber reinforced plastic panel) — Thickness 0.04 in. (nom) formed to fit the Perforated Metal Roof Deck Panel, (Item 7A).

**7C. Flashing** — No. 20 MSG min gauge coated steel. Attached to the Building Unit to retain and flash the Plastic Skylight to the Perforated Metal Roof Deck Panel.

**8. Insulating Units** — (Optional) — Prefabricated assemblies of a Plastic Insulating Skylight Pan, (Item 8B), mounted in an Aluminum Frame, (Item 8A). Assembly spans between adjacent Purlins beneath a Building Unit only.

**8A. Aluminum Frame** — Extruded aluminum alloy, 0.055 in. min thickness, shop assembled.

**8B. Plastic Insulating Skylight Pan** — (Translucent, glass fiber reinforced modified acrylic plastic panel). Shop assembled in Aluminum Frame, (Item 8A).

**9. Insulation Trim** — No. 24 MSG min gauge coated steel. Used at the sides of the Building Unit.

**10. Reinforcing Plate** — (Not Shown) — Min 0.05 in. thick coated steel. Max length 15-1/2 in., width 5-1/4 in. Used at downslope end lap of Building Unit to Metal Roof Deck Panel.

Refer to General Information, Roof Deck Constructions (Roofing Materials and Systems Directory) for items not evaluated.

*Bearing the UL Classification Mark

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**Products**                       **Components**                    **Canada**

**Online Certifications Directory**

# TGKX.176
# Roof Deck Constructions

## Roof Deck Constructions

**Guide Information**

Construction No. 176

March 30, 2004

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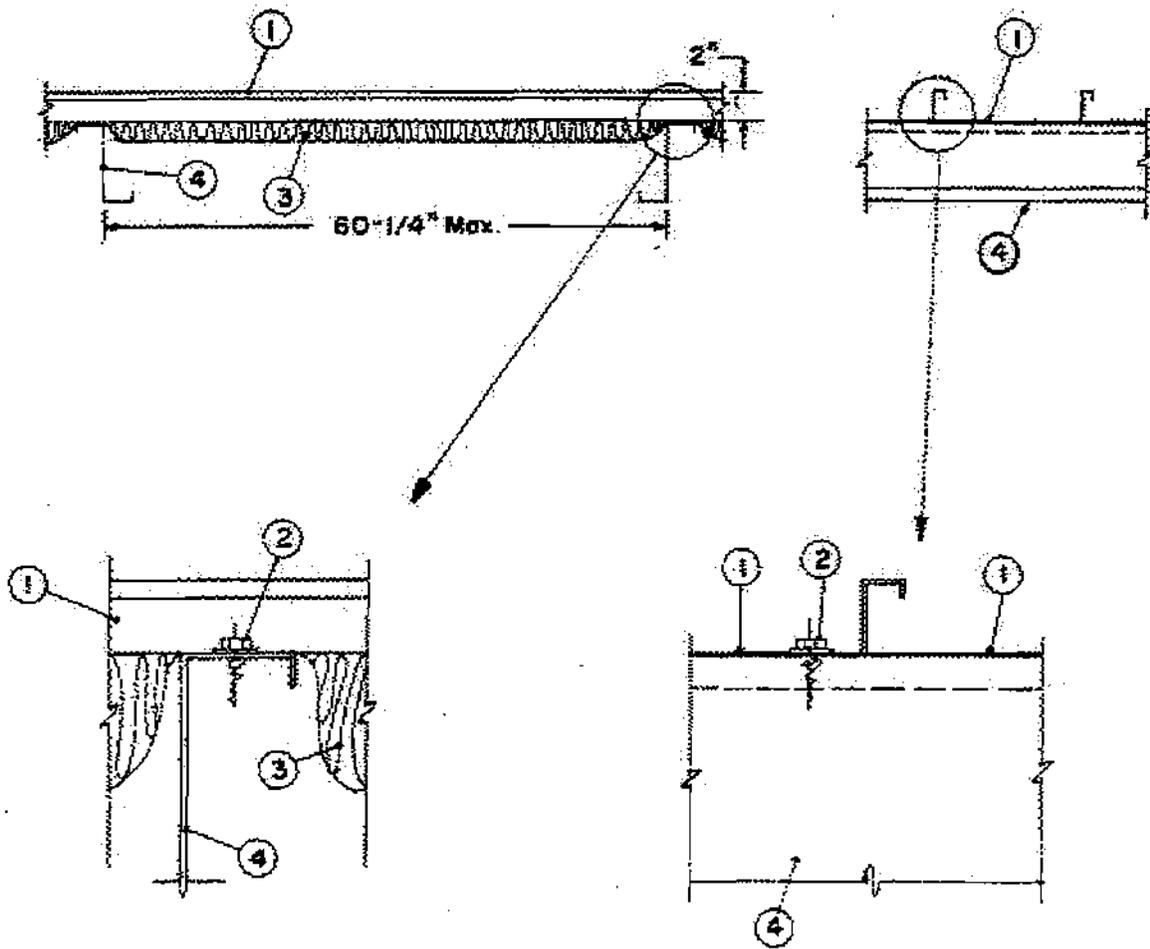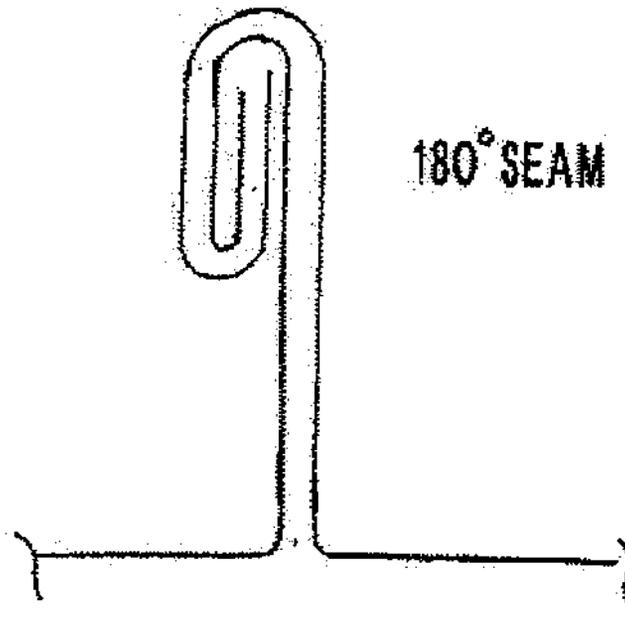
**Fire Not Investigated**

**180° SEAM**

**FOR AEP-SPAN PANEL**

**("SPAN-SEAM")**

1. **Metal Roof Deck Panels*** — No. 24 MSG min gauge coated steel, 16 in. max width. Panels continuous over two or more spans. End lap to occur over purlins with panels overlapped 6 in. with lap beginning 1 in. from purlin rib and extending across purlin flange. Side joints to be crimped with a special motorized crimper to a minimum 45 degree angle. A bead of sealing compound may be used at panel end and side laps. For Morin Corp., seams may be 45°, 90°, or 180°.

**A & M BUILDERS/ROOFING**

**TECHNOLOGIES L L C** — "SS200"

**A & S BUILDING SYSTEMS L P** — "BattenLok" or "SuperLok"

**A-LERT STANDING SEAM ROOF SYSTEMS** — "A-Lert Loc"

**AEP SPAN, DIV OF**

**ASC PROFILES** — "SL 216" (90° Seam), "SPS-216" (180° Seam)

**ALLWINE ROOFING & CONSTRUCTION INC** — "A2-16", "A2-16 Fluted" and "A2-16 with Clip Offset"

**ARCHITECTURAL BUILDING COMPONENTS INC** — "JSM 200"

**ARCHITECTURAL SHEETMETAL PRODUCTS INC** — "ASP-2500"

**CENTURION INDUSTRIES INC, DBA**

**TFC CANOPY** — "Centurion 1624M"

**CONSOLIDATED METALS OF FLORIDA, DIV OF**

**ALUMINUM SERVICE INC** — "CSS-210A"

**CONSTRUCTION METAL PRODUCTS INC** — "CMP Series 2500"

**CSC SALES INC** — "CSC-SS2000"

**DALEY CONSTRUCTION & METAL ROOFING** — "3D Forever Lock"

**ENGLERT INC** — "Series 2500"

**HCI STEEL BUILDING SYSTEMS INC** — "Mark 1622", "Mark 1624"

**HI-TEC ROOFING INC** — "MRS 210A"

**J M METALS ROOFING MFRS** — "JM 2.0"

**KNUDSON MFG INC** — "ULTRALOK"

**MBCI** — "BattenLok" or "SuperLok"

**MESCO METAL BUILDINGS** — "BattenLok" or "SuperLok"

**METAL-FAB MFG LLC** — "Met-Fab III"

**METAL PANEL SYSTEMS INC** — "MP-200"

**METAL SALES MFG CORP** — "T-Span" or "T-Span 180" (180° Seam)

**METAL WORX SYSTEMS INC** — "SS 2000"

**MORIN CORP** — "SLR-12", "SLR-14", "SLR-16"

**NCI BUILDING SYSTEMS L P** — "BattenLok" or "SuperLok"

**NEW TECH MACHINERY CORP** — "Panel 210A"

**NORTH COAST COMMERCIAL**

**ROOFING SYSTEM OF PA INC** — "Series 2500"

**PETERSEN ALUMINUM CORP** — " Tite-Loc" and "Tite-Loc Plus"

**ROL-TEC SYSTEMS INC** — "ULTRALOK"

**R S S P INC** — "SS 2000"

**STEELOX SYSTEMS L L C** — "Steelox LRX 262", "Steelox LRX 264", "Steelox PRX 262" or "Steelox PRX 264" (Fabricated from either coated or stainless steel)

**SUPERIOR METAL SYSTEMS INC** — "SMS 416"

**UNITED STRUCTURES OF AMERICA INC** — "Sure-Lok" or "Supreme-Lok"

**ZIMMERMAN METALS INC** — "SS2000"

2. **Fasteners** — For panel to purlin connections to be No. 12-14 by 1 in. self-drilling,

self-tapping, hex-head plated steel screws with a separate 1/2 in. OD plated steel washer and a neoprene sealing washer. Spacing to be 16 in. OC with one fastener located 2 in. from the female side of each panel. Spacing at end lap to be in a 1-1/2, 3, 3-1/2, 3-1/2, 3-1/2, 1 in. pattern beginning from the female side rib.

3. **Insulation** — (Optional) — Any compressible blanket insulation, 4 in. max thickness before compression.

3A. **(Optional)** — An additional 2 in. max thickness of compressible blanket insulation may be used between purlins. The additional insulation shall not be sandwiched between the upper flange of the purlin and the roof deck panel.

4. **Purlins** — 0.056 in. min thickness steel (40,000 psi min yield strength).

Refer to General Information, Roof Deck Constructions (Roofing Materials and Systems Directory) for items not evaluated.

*Bearing the UL Classification Mark

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**Online Certifications Directory**

# TGKX.180
# Roof Deck Constructions

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## Roof Deck Constructions

**Guide Information**

**Construction No. 180**

March 30, 2004

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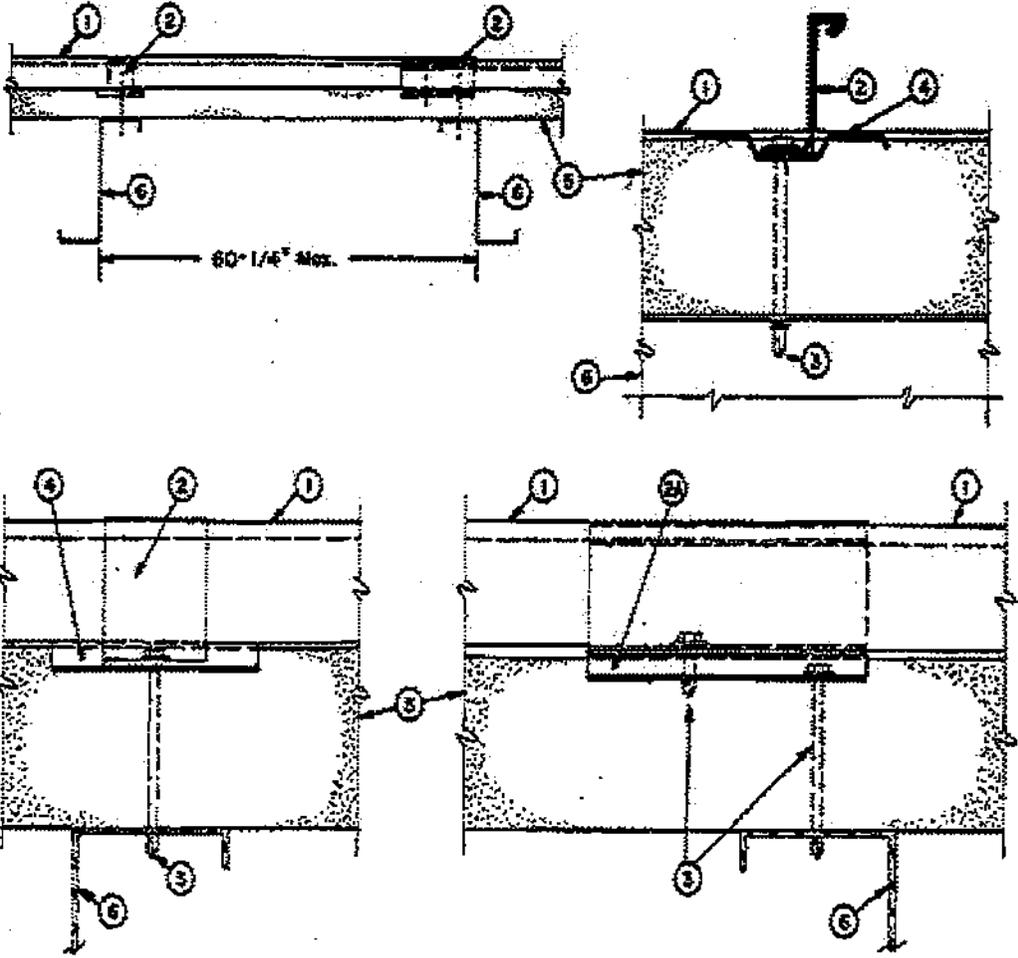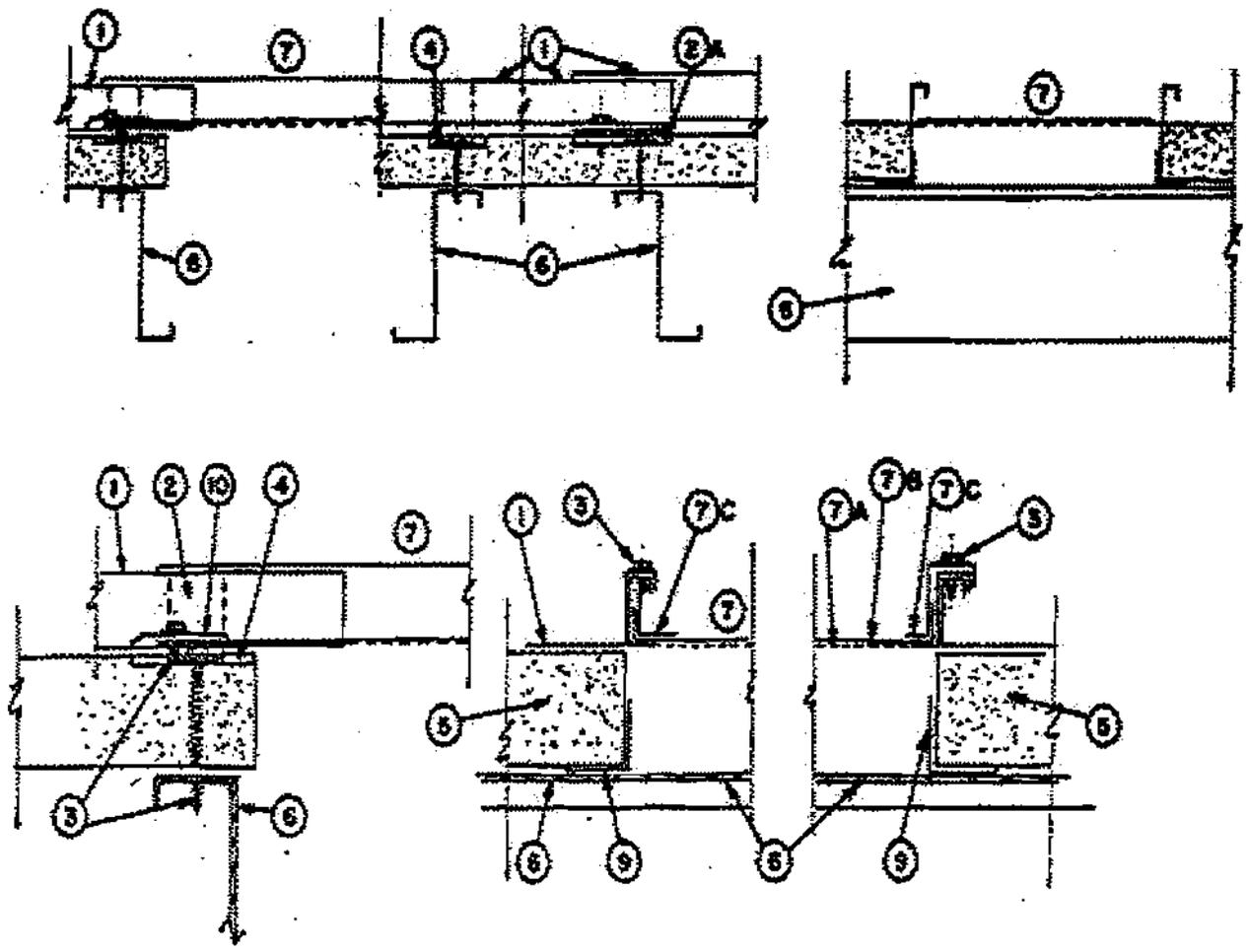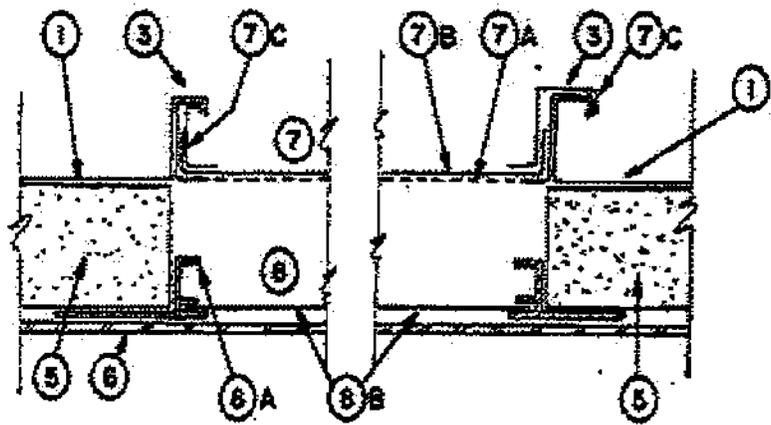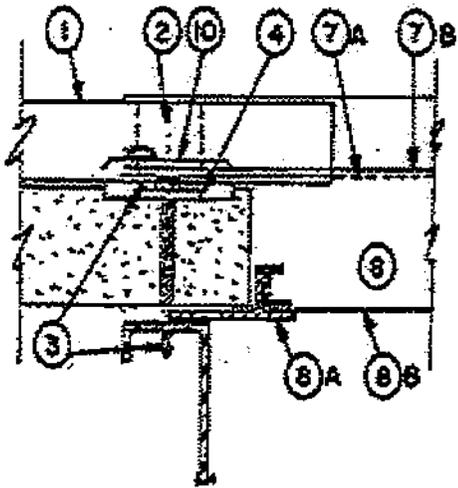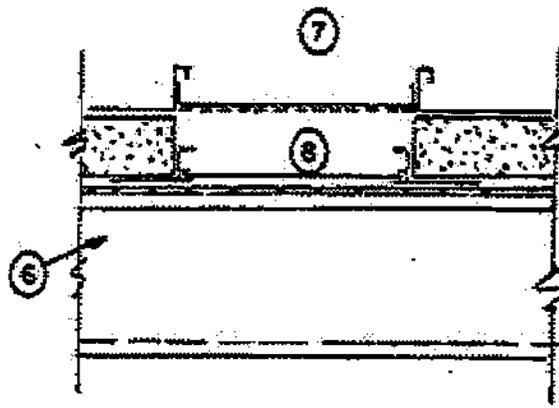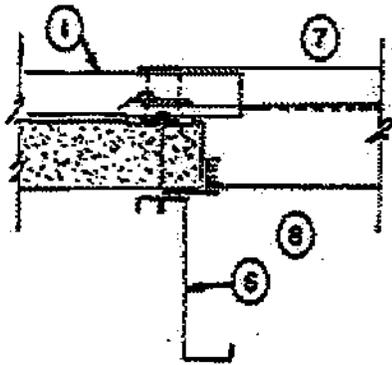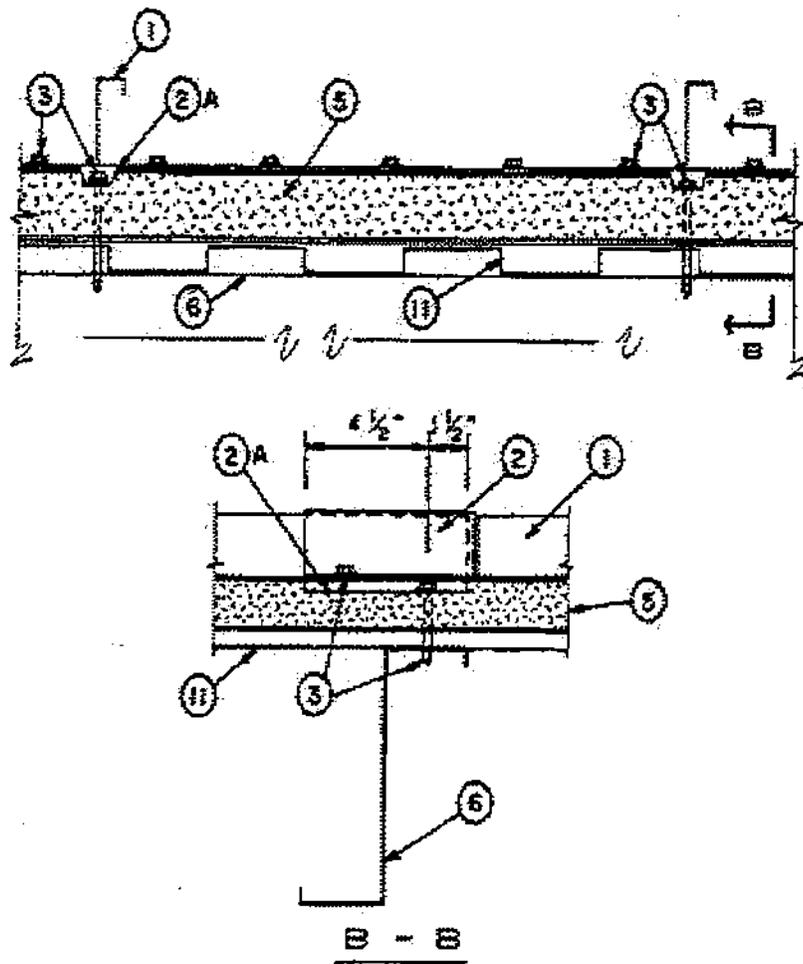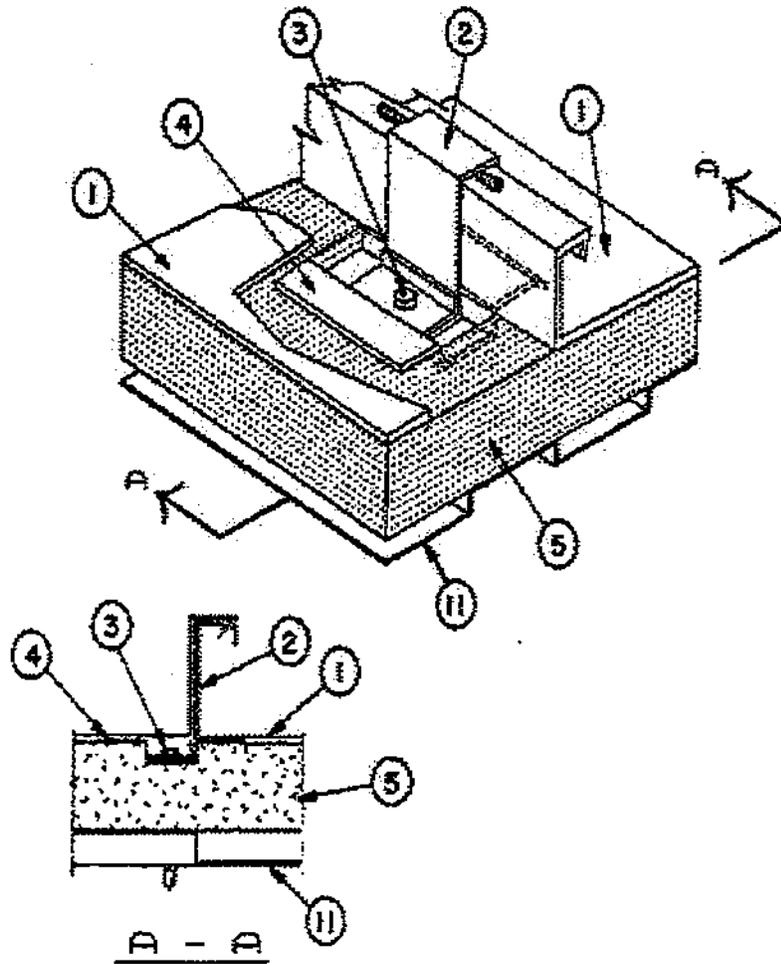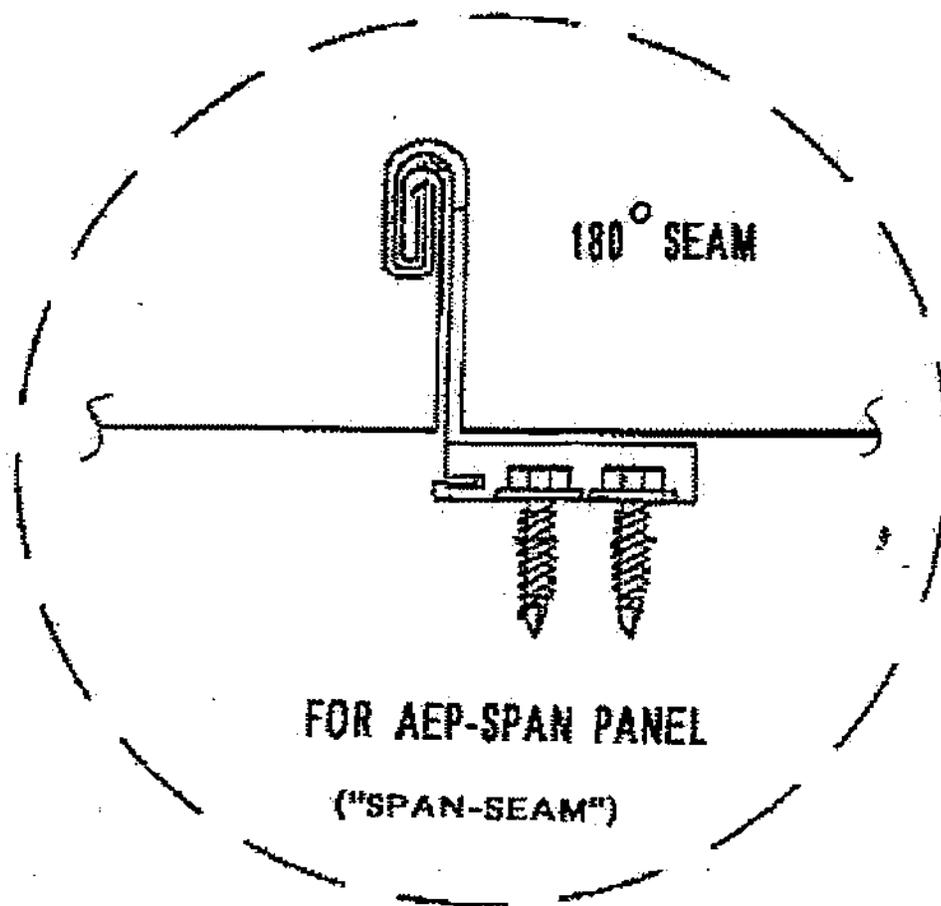
**Fire Not Investigated**

B - B

A - A

180° SEAM

FOR AEP-SPAN PANEL

("SPAN-SEAM")

1. **Metal Roof Deck Panels** — * — No. 24 MSG min gauge coated steel, 16 in. max width. Panels continuous over two or more spans. End lap to occur over purlins and to include End Lap Back-Up Plate (Item 2A or 2B ). Ends of panels overlapped 6 in. beginning 1 in. from purlin web and extending across purlin upper flange. Side laps to be tightened and crimped with special motorized crimping machine to a minimum 45 degree angle with crimping process to include tabs of panel clips (Item 2). A bead of sealing compound may be used at panel laps and side joints. For Morin Corp., seams may be 45°, 90°, or 180°.

**A & M BUILDERS/ROOFING**

**TECHNOLOGIES L L C** — "SS200"

**A & S BUILDING SYSTEMS L P** — "BattenLok" or "SuperLok"

**A-LERT STANDING SEAM ROOF SYSTEMS** — "A-Lert Loc"

**AEP SPAN, DIV OF**

ASC PROFILES — "SL-216" (90° Seam), "SPS-216" (180° Seam)

ALLWINE ROOFING & CONSTRUCTION INC — "A2-16", "A2-16 Fluted" and "A2-16 with Clip Offset"

ARCHITECTURAL BUILDING COMPONENTS INC — "JSM 200"

ARCHITECTURAL SHEETMETAL PRODUCTS INC — "ASP-2500"

CENTURION INDUSTRIES INC, DBA

TFC CANOPY — "Centurion 1624M"

CONSOLIDATED METALS OF FLORIDA, DIV OF

ALUMINUM SERVICE INC — "CSS-210A"

CONSTRUCTION METAL PRODUCTS INC — "CMP Series 2500"

CSC SALES INC — "CSC-SS2000"

DALEY CONSTRUCTION & METAL ROOFING — "3D Forever Lock"

ENGLERT INC — "Series 2500"

HI-TEC ROOFING INC — "MRS 210A"

J M METALS ROOFING MFRS — "JM 2.0"

KNUDSON MFG INC — "ULTRALOK"

MBCI — "BattenLok" or "SuperLok"

MESCO METAL BUILDINGS — "BattenLok" or "SuperLok"

**METAL-FAB MFG LLC** — "Met-Fab III"

**METAL PANEL SYSTEMS INC** — "MP-200"

**METAL SALES MFG CORP** — "T-Span" or "T-Span 180" (180° Seam)

**METAL WORX SYSTEMS INC** — "SS 2000"

**MORIN CORP** — "SLR-12", "SLR-14", "SLR-16"

**NCI BUILDING SYSTEMS L P** — "BattenLok" or "SuperLok"

**NEW TECH MACHINERY CORP** — "Panel 210A"

**NORTH COAST COMMERCIAL**

**ROOFING SYSTEM OF PA INC** — "Series 2500"

**PETERSEN ALUMINUM CORP** — " Tite-Loc" and "Tite-Loc Plus"

**ROL-TEC SYSTEMS INC** — "ULTRALOK"

**R S S P INC** — "SS 2000"

**STEELOX SYSTEMS L L C** — "Steelox LRX 262", "Steelox LRX 264", "Steelox PRX 262" or "Steelox PRX 264" (Fabricated from either coated or stainless steel)

**UNITED STRUCTURES OF AMERICA INC** — "Sure-Lok" or "Supreme-Lok"

**ZIMMERMAN METALS INC** — "SS2000"

2. **Roof Deck Fasteners\* (Panel Clips)** — Two part assembly: Base, 1 in. wide approximately 1-1/4 in. long with upper segment folded over lower end of tab. Fabricated from 0.050 in. thick coated or stainless steel. Upper tab 3 in. wide, maximum tab height 3-1/2 in. with lower end formed to engage base. Fabricated from 0.023 in. thick coated or stainless steel.

Spacing for clip to be 5 ft 0-1/16 in. OC with clips located over purlins (Item 6).

**STEELOX SYSTEMS L L C — "CF Sliding Clip"**

**2A. Roof Deck Fasteners\* (End Lap Back-Up Plate)** — (Not shown) — No. 18 MSG min gauge coated steel. Max length 48 in. Width varies with type of purlin with a max of 6-1/2 in.

**STEELOX SYSTEMS L L C — "Backing Plate"**

**2B. End Lap Back-Up Plate\*** — (Not Shown) — No. 16 MSG min coated steel.

**NCI BUILDING SYSTEMS L P — "BattenLok Back-Up Plate" or "SuperLok Back-Up Plate"**

**2C. Roof Deck Fasteners\*** — (Panel Clip) (Not Shown) — Either of the following: Fixed or Utility Clip-one piece assembly fabricated from No. 22 MSG min gauge steel, 3 in. wide. Floating Clip-two piece assembly with a base fabricated from No. 16 MSG min gauge steel, 1-5/8 in. wide, and a top fabricated from No. 22 MSG min gauge steel, 4-1/4 in. wide. One clip to be used per panel at each purlin location.

**NCI BUILDING SYSTEMS L P — "BattenLok High or Low, Fixed or Floating Clip"; "BattenLok Utility Clip"--- "SuperLok High or Low, Fixed or Floating Clip"; "SuperLok Utility Clip"**

**ARCHITECTURAL BUILDING COMPONENTS INC — "JSM 200 Utility"**

**2D. Roof Deck Fastener\*** — (End Lap Back up Plate) — (Not Shown) — Used with AEP-Span "SL-216" (90° Seam), "SPS-216" (180° Seam) panels. Length 10-1/2 in., width 15-3/4 in., No. 16 MSG min thick coated steel. Slipped under lower panel at end lap. Panels fastened together using four No. 1/4-14 by 1-1/8 in. long self-drilling, self-tapping, hex-washer head, plated steel screws with a 5/8 in. OD steel washer and a sealing washer. Screws spaced 4 in. OC beginning 2 in. from ribs.

**AEP SPAN, DIV OF**

**ASC PROFILES — "SL-216 End-Lap Back-Up Plate"**

**2E. Roof Deck Fasteners\*** — (Panel Clip) (Not Shown) — Two part assembly; A base fabricated from No. 16 MSG min coated steel and an upper tab fabricated from No. 22MSG min coated steel. Clips fastened to purlins with two fasteners per clip. See Item No. 3 for description of fasteners.

**AEP SPAN, DIV OF**

ASC PROFILES — "SL-2.5 in. Standard Clip"

**2F. Roof Deck Fasteners\*** — (Panel Clip) (Not Shown) Used with "Tite-Loc" or "Tite-Loc Plus" Panels.

One piece assembly; 3 in. wide, approximately 2 in. high with two or three guide holes in base. Fabricated from No. 22 MSG coated steel.

**PETERSEN ALUMINUM CORP** — "Tite-Loc Utility Clip", "Tite-Loc Plus Utility Clip"

One piece assembly; 3 in. wide, approximately 2-3/8 in. or 3 in. high, with three guide holes in base. Fabricated from No. 22 MSG coated steel.

**PETERSEN ALUMINUM CORP** — "Tite-Loc Low/High Fixed Clip", "Tite-Loc Plus Low/High Fixed Clip"

Two piece assembly; base approximately 2 in. wide, 1-11/16 in. long formed to engage upper tab. Fabricated from No. 16 MSG coated steel. Tab approximately 4-5/16 in. wide; 2-3/8 in. or 2-7/8 in. high, formed to engage base. Fabricated from No. 22 MSG coated steel. Base to have two guide holes.

**PETERSEN ALUMINUM CORP** — "Tite-Loc Sliding Clip", "Tite-Loc Plus Sliding Clip"

**2G. Roof Desk Fasteners\*** — (Panel Clip) (Not Shown) — Two part assembly; A base fabricated from No. 16 MSG min coated steel and upper tab fabricated from No. 22 MSG min coated steel. Clips fastened to purlins using two fasteners per clip. See Item No. 3 for description of fasteners.

**METAL SALES MFG CORP** — T-Span Clip

**2H. Roof Deck Fasteners** — (Panel Clips) - Two types, both two piece assemblies. Type 330 base approximately 1.88 in. by 1.70 in.; Type 330B base approximately 1.11 in. by 2.00 in. Both types fabricated from No. 16 MSG coated steel and formed to fold over upper tab. Type 330 upper tab 4.30 in. wide and 2.91 in. high max. Type 330B upper tab 4.30 in. wide and 3.34 in. high max. Both types formed to engage base. Clips spaced 5 ft, 0-1/16 in. maximum.

**MORIN CORP** — "SLR-330 Clip" (for 45° seam)

**MORIN CORP** — "SLR-330B Clip" (for 90° & 180° seam)

3. **Fasteners (Screws)** — For attaching panel clips to purlins-to be 1/4-14 shoulder or stand-off type; self-drilling, self-tapping, hex-head, plated steel screws. Fastener length to vary with thickness of insulation and to be min of 3/4 in. longer than nom thickness of rigid insulation. One fastener per clip to be used at each purlin. As an alternate fastener for panel clip to purlin attachment, a No. 12-14 self-drilling, self-tapping, hex-head plated steel screw may be used. Same length detail as for 1/4-14 screws to apply. Fasteners used at end laps to be 1/4-10 by 1 in. long self-drilling, self-tapping, hex-head plated steel screws with 1/2 in. OD metal backed sealing washers. Spaced in a 1, 3, 3-1/2, 3-1/2, 3, 1 in. pattern.

For Building Unit-to-Panel side lap connections — No. 18-9 by 1 in. long self-drilling, self-tapping, hex-head plated steel screws with a separate 1/2 in. OD plated steel washer and a neoprene sealing washer. One fastener required at each end and one at midspan of each rib of the Building Units.

For Reinforcing Plate-to-Building Unit end lap connection — No. 18-9 by 1 in. long self-drilling, self-tapping, hex-head plated steel screws with a separate 1/2 in. OD. plated steel washer and a neoprene sealing washer.

4. **Roof Deck Fastener * (Bearing Clip)** — No. 18 MSG min gauge coated steel; 3 in. wide by 3-1/4 in. long with 3/8 in. legs. Used under Panel Clips (Item 2) over purlins and rigid insulation. Three 1/4 in. dia guide holes located in base.

STEELOX SYSTEMS L L C — "Bearing Clip"

5. **Foamed Plastic*(Rigid insulation)** — Rigid type. Supplied in 4 ft wide sheets. Min thickness 1 in., max thickness 3 in. Butt joints to occur over purlins.

ATLAS ROOFING CORP — "Classic Shield".

6. **Purlins** — 0.056 in. min thickness steel (min yield strength 40,000 psi) or min "H" series open web steel joists. Maximum spacing 60-1/4 in.

7. **Building Units** — * — (Optional) — Prefabricated assemblies of a Skylight Panel, (Item 7B), mounted in a Perforated Metal Roof Deck Panel, (Item 7A), with Flashings, (Item 7C). Assembly continuous over two spans erected in the same manner as Metal Roof Deck Panels.

STEELOX SYSTEMS L L C — "264 Steelox-Skylight"

NCI BUILDING SYSTEMS L P — "BattonLok Light Transmitting Panel" or "SuperLok Light Transmittting Panel".

7A. **Perforated Metal Roof Deck Panels** — No. 24 MSG min gauge coated steel perforated in the flat portion.

**7B. Plastic Skylight\* (Translucent, Glass Fiber Reinforced Plastic Panel)** — Thickness 0.04 in. (nom) formed to fit the Perforated Metal Roof Deck Panel, (Item 7A).

**7C. Flashing** — No. 20 MSG min gauge coated steel. Attached to the Building Unit to retain and flash the Plastic Skylight to the Perforated Metal Roof Deck Panel.

**8. Insulating Units** — (Optional) — Prefabricated assemblies of a Plastic Insulating Skylight Pan, (Item 8B), mounted in an Aluminum Frame, (Item 8A). Assembly spans between adjacent purlins beneath a Building Unit only.

**8A. Aluminum Frame** — Extruded aluminum alloy, 0.055 in. min thickness shop assembled.

**8B. Plastic Insulating Skylight Pan** — (Translucent, glass fiber reinforced modified acrylic plastic panel). Shop assembled in Aluminum Frame (Item 8A).

**9. Insulation Trim** — No. 24 MSG min gauge coated steel. Used at the sides of the Building Unit.

**10. Reinforcing Plate** — Min 0.05 in. thickness coated steel. Max length 15-1/2 in., width 5-1/4 in. Used at downslope end lap of Building Unit to Metal Roof Deck Panel.

Refer to General Information, Roof Deck Constructions (Roofing Materials and Systems Directory) for items not evaluated.

**11. Liner Panel** — (Optional) — The following liner panel types may be used:

> A. No. 27 MSG min coated steel;.7 in. deep with major ribs having a 2 in. wide crest and spaced 8 in. O.C. cover width 32 in. Panel to be installed with major ribs down. (Min. yield strength to be 40,000 psi.)

> B. No. 29 MSG min coated steel; 9/16 in. deep with ribs having a 3/4 in. wide crest and spaced 2.667 in. O.C. (Min. yield strength to be 80,000 psi.)

> C. 0.018 in. min thickness aluminum (3105 H 194 alloy). 9/16 in. deep with ribs having a 3/4 in. wide crest and spaced 2.667 in. O.C. (Min. yield strength 30,000 psi)

> All types to have adjacent widths overlapped min. of one corrugation at sides. End laps to be located over purlins with min. overlap to be 3 in. Liner panels to be fastened to purlins using No. 18-9 by 1 in. self-drilling, self-tapping, hex-head plated steel screws with an optional 1/2 in. O.D. plated steel washer and a neoprene sealing washer. Fasteners to be located one at each side lap and one in the approximate center of each panel width.

Refer to General Information, Roof Deck Constructions (Roofing
Materials and Systems Directory) for items not evaluated.

*Bearing the UL Classification Mark

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**UL Listed and Classified**  **UL Recognized**  **Products Certified for**
**Products**      **Components**     **Canada**

# Online Certifications Directory

# TGKX.238
# Roof Deck Constructions

# Roof Deck Constructions

## Guide Information

**Construction No. 238**

March 30, 2004

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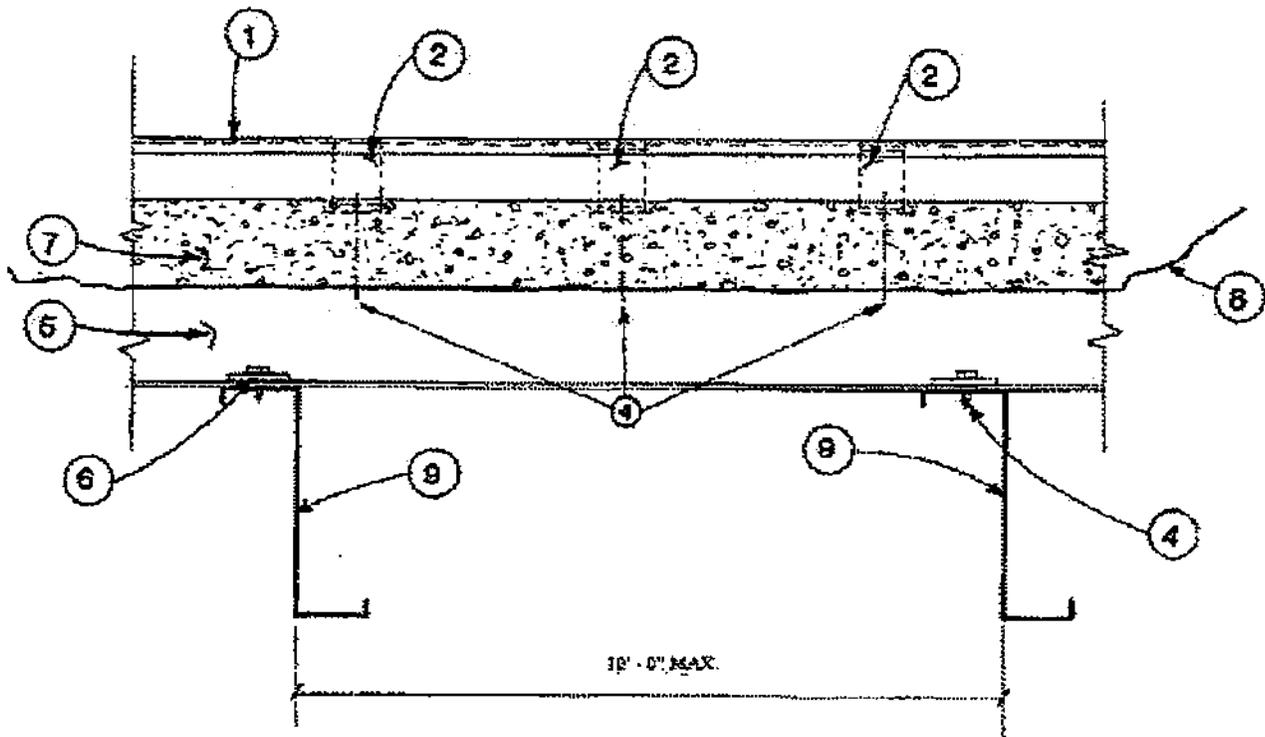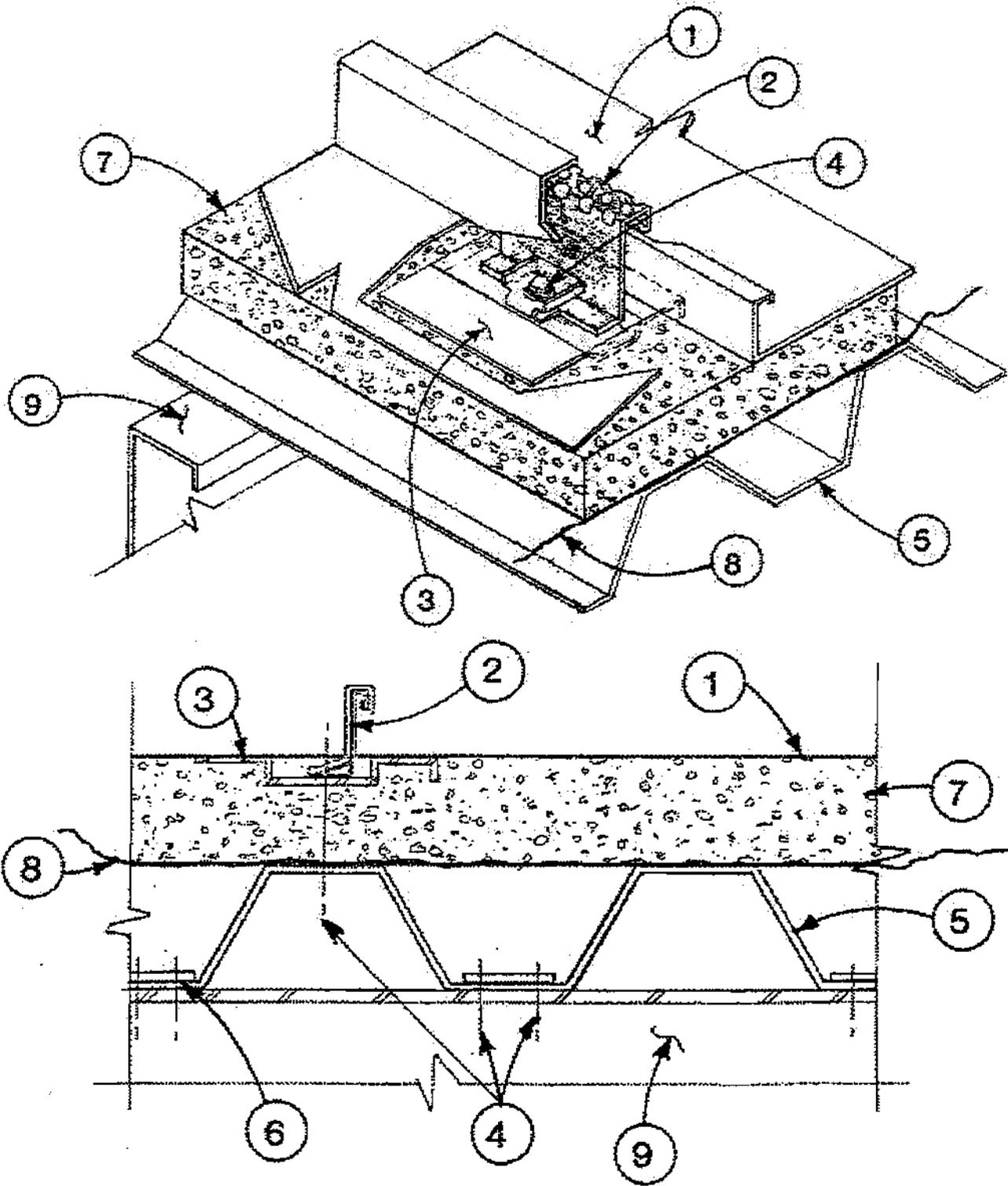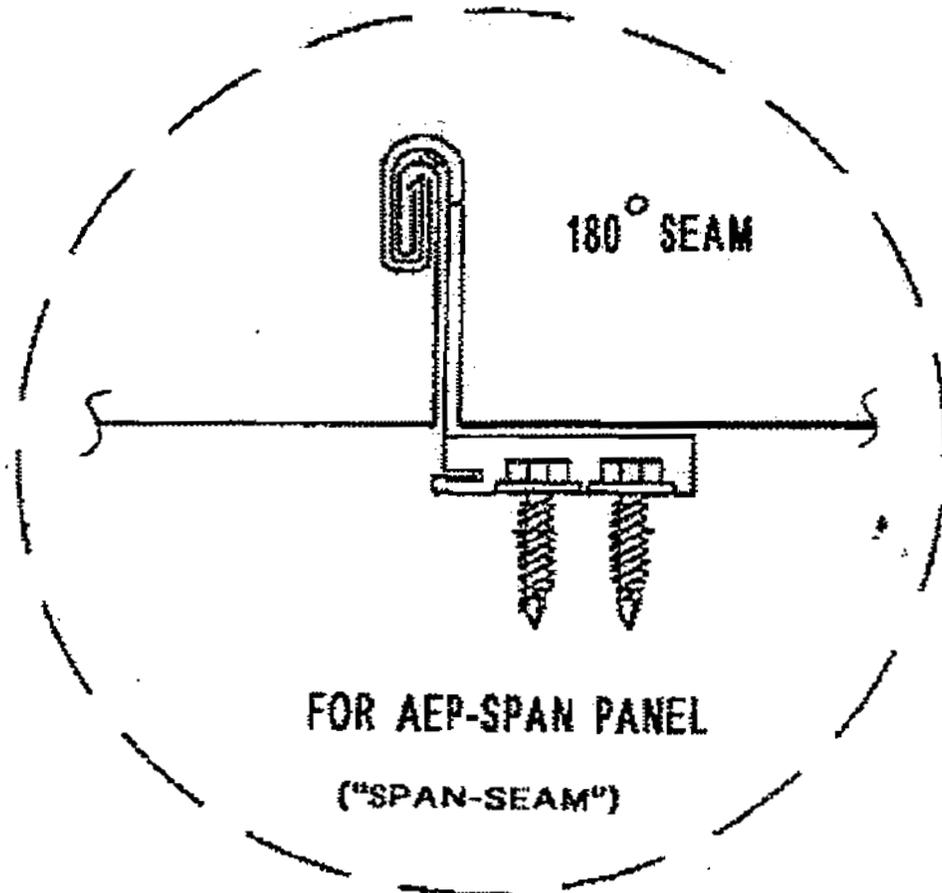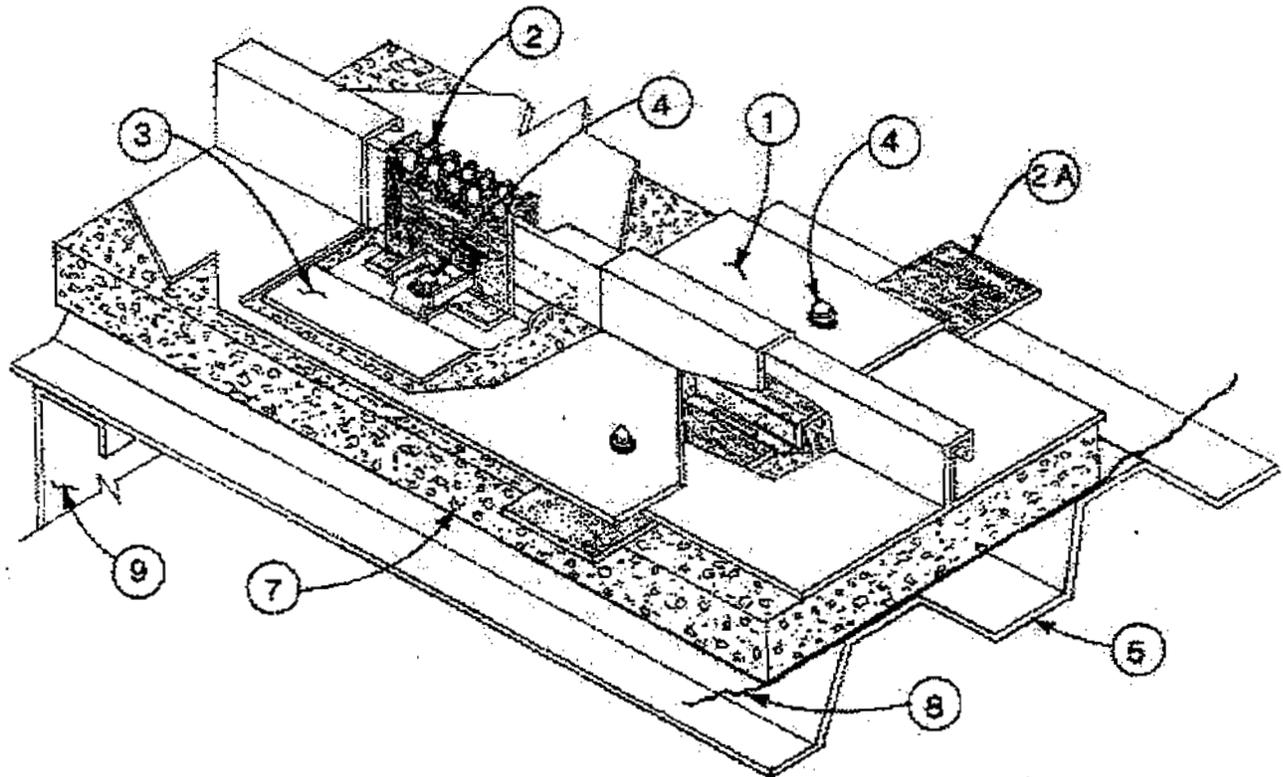
**Fire Not Investigated**

180° SEAM

FOR AEP-SPAN PANEL

("SPAN-SEAM")

1. **Metal Roof Deck Panels\*** — No. 24 MSG min coated steel. Panels 16 in. wide, 2 in. high at side ribs. Panels continuous over two or more spans. End laps to occur near panel clip locations and to include end lap back up plate (Item 2A). Ends of panels overlapped 6 in. Side laps to be tightened and crimped with a special motorized crimping machined at an approximate 45 degree angle with crimping process to include tabs of panel clips (Item 2). A bead of sealing compound may be used at panel end laps and side joints. For Morin Corp., seams may be 45°, 90°, or 180°.

**A & M BUILDERS/ROOFING**

**TECHNOLOGIES L L C** — "SS200"

**A-LERT STANDING SEAM ROOF SYSTEMS** — "A-Lert Loc"

**AEP SPAN, DIV OF**

**ASC PROFILES** — " SL-216" (90° Seam), "Span-Seam" (180° Seam)

**ALLWINE ROOFING & CONSTRUCTION INC** — "A2-16", "A2-16 Fluted" and "A2-16 with Clip Offset"

**AMERICAN BUILDINGS CO** — "Loc-Seam,""Loc-Seam 360."

**ARCHITECTURAL SHEETMETAL PRODUCTS INC** — "ASP-2500"

**CENTURION INDUSTRIES INC, DBA**

**TFC CANOPY** — "Centurion 1624M"

**CONSOLIDATED METALS OF FLORIDA, DIV OF**

**ALUMINUM SERVICE INC** — "CSS-210A"

**CONSTRUCTION METAL PRODUCTS INC** — "CMP Series 2500"

**CSC SALES INC** — "CSC-SS2000"

**DALEY CONSTRUCTION & METAL ROOFING** — "3D Forever Lock"

**ENGLERT INC** — "Series 2500"

**HI-TEC ROOFING INC** — "MRS 210A"

**J M METALS ROOFING MFRS** — "JM 2.0"

**KNUDSON MFG INC** — "ULTRALOK"

**METAL-FAB MFG LLC** — "Met-Fab III"

**METAL PANEL SYSTEMS INC** — "MP-200"

**METAL SALES MFG CORP** — "T-Span" or "T-Span 180" (180° Seam)

**METAL WORX SYSTEMS INC** — "SS 2000"

**MORIN CORP** — "SLR-12", "SLR-14", "SLR-16"

**NEW TECH MACHINERY CORP** — "Panel 210A"

**NORTH COAST COMMERCIAL**

**ROOFING SYSTEM OF PA INC** — "Series 2500"

**ROL-TEC SYSTEMS INC** — "ULTRALOK"

**R S S P INC** — "SS 2000"

**STEELOX SYSTEMS L L C** — "Steelox LRX 262", "Steelox LRX 264", "Steelox PRX 262" or "Steelox PRX 264" (Fabricated from either coated or stainless steel)

**SUPERIOR METAL SYSTEMS INC** — "SMS 416"

**ZIMMERMAN METALS INC** — "SS2000"

2. **Roof Deck Fasteners (Panel Clips)** — Two part assembly: Base, 1 in. wide approximately 1-1/4 in. long with upper segment folded over lower end of tab. Fabricated from 0.050 in. thick coated or stainless steel. Upper tab 3 in. wide, maximum tab height 3-1/2 in. with lower end formed to engage base. Fabricated from 0.023 in. thick coated or stainless steel.

**STEELOX SYSTEMS L L C** — "CF Sliding Clip"

2A. **Roof Deck Fasteners (End Lap Back-Up Plate)** — (Not Shown) — No. 18 MSG min gauge coated steel. Max length 48 in., width 6-1/2 in.

**METAL SALES MFG CORP** — "T-Span Clip"

**STEELOX SYSTEMS L L C** — "Backing Plate"

2B. **Roof Deck Fasteners** — (Panel Clips) - Two types, both two piece assemblies. Type 330 base approximately 1.88 in. by 1.70 in.; Type 330B base approximately 1.11 in. by 2.00 in. Both types fabricated from No. 16 MSG coated steel and formed to fold over upper tab. Type 330 upper tab 4.30 in. wide and 2.91 in. high max. Type 330B upper tab 4.30 in. wide and 3.34 in. high max. Both types formed to engage base. Clips spaced 48 in. maximum.

**MORIN CORP** — "SLR-330 Clip" (for 45° seam)

**MORIN CORP** — "SLR-330B Clip" (for 90° & 180° seam)

3. **Roof Deck Fastener\* (Bearing Clip)** — No. 18 MSG min gauge coated steel; 3 in. wide by 3-1/4 in. long with 3/8 in. legs. Used under Panel Clips (Item 2) over purlins and rigid insulation. Three 1/4 in. dia guide holes located in base.

**STEELOX SYSTEMS L L C** — "Bearing Clip"

4. **Fasteners (screws)** — Fasteners used to attach the bearing plates to the liner panels to be No. 11 by 3-3/4 in. long self-drilling, stand-off plated steel, flat torx-head screws. Three fasteners per bearing plate used, driven into liner panel. Fasteners used to attach panel clips (Item No. 2) to the bearing plates (Item 3) to be No. 18 by 1 in. long self-drilling, self-tapping, hex-washer-head, plated steel screws. One screw used for each panel clip. Fasteners used to attach the liner panels to the purlin supports to be No. 12-14 by 1-1/4 in. self-drilling, self-tapping, hex-head, plated steel screws with a separate 5/8 in. diameter steel washer and a neoprene sealing washer. Two fasteners to be used at each support with fasteners located in every valley. Fasteners used at liner panel side laps to be the same type as liner panel screws and spaced 20 in. OC. Fasteners used at end laps to be 1/4-10 by 1 in. long self-drilling, self-tapping,

hex-head, plated steel screws with 1/2 in. OD. metal backed sealing washers. Spacing to be in a 1, 3, 3-1/2, 3-1/2, 3, 1 in. pattern.

5. **Liner Panel** — The liner panel to be 3 in. deep and fabricated from No. 22 MSG min steel. Top of crests to be 5-1/2 in. wide, valleys to be 2-1/2 in. wide at top. Yield strength to be min 33,000 psi. Liner panel to be fastened to supports with screws indicated under Item 4 or with welds and weld washers of type indicated by manufacturer of liner panel. Welds to be located in every valley.

6. **Fastener Reinforcement (Bearing Plate)** — The reinforcements used with the screws attaching the liner panels to the purlins to be 0.125 in. min thick and to have an area of approximately 2 sq in.

7. **Foamed Plastic** — (Rigid Insulation) — Supplied in 4 ft wide sheets. Min thickness to be 1 in. Density to be min of 2.0 PCF or see products Classified under TJBX.

8. **Vapor Barrier** — Used between the liner panel and the foamed plastic to be a 6 mil plastic sheeting.

9. **Purlins** — No. 12 MSG min gauge steel (min yield strength 40,000 psi) or min type H open web joists.

Refer to General Information, Roof Deck Construction, (Roofing Materials and Systems Directory) for Items not evaluated.

*Bearing the UL Classification Mark

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**UL Listed and Classified**     **UL Recognized**             **Products Certified for**
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**Online Certifications Directory**

# TGKX.238A
# Roof Deck Constructions

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## Roof Deck Constructions

**Guide Information**

### Construction No. 238A

March 30, 2004

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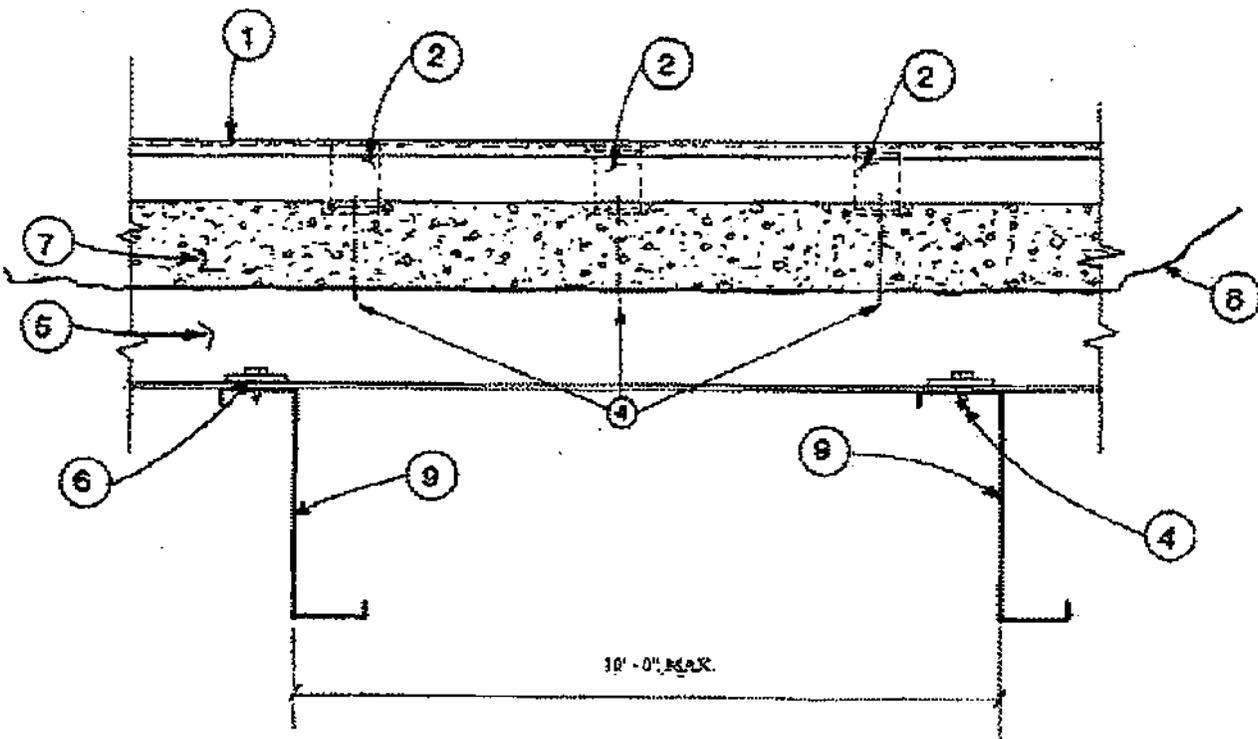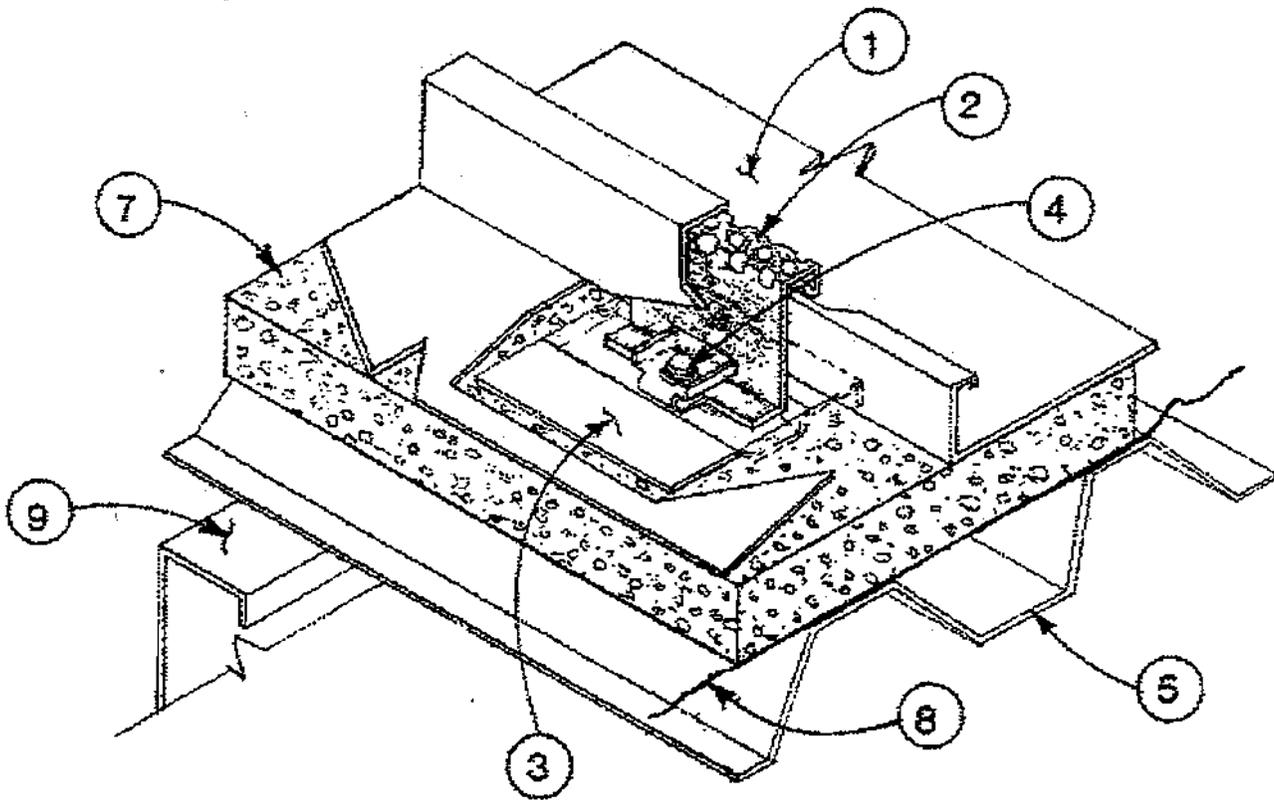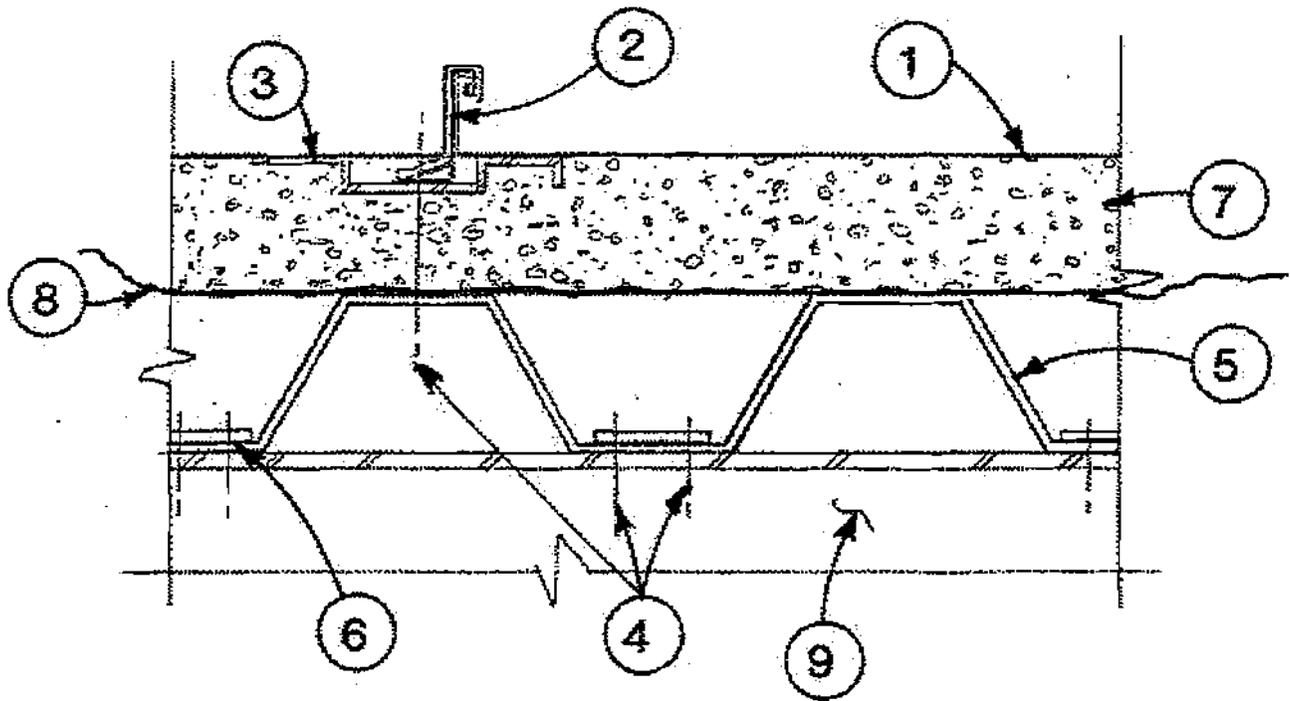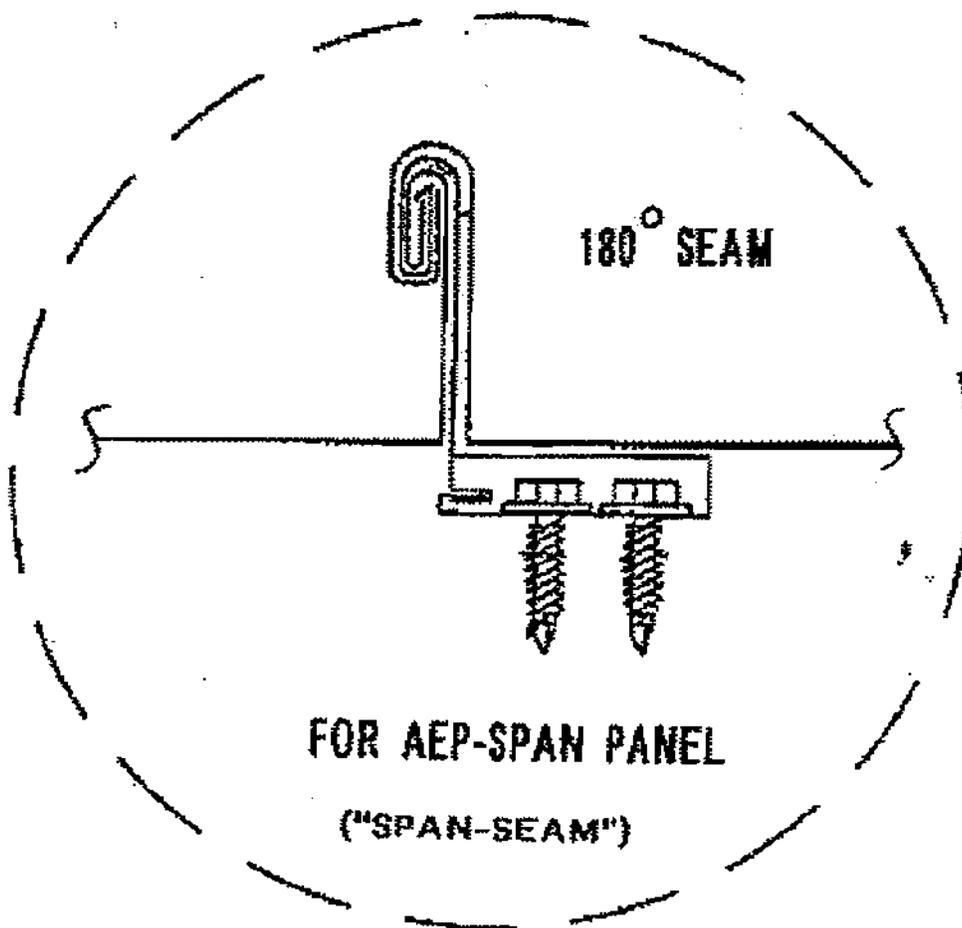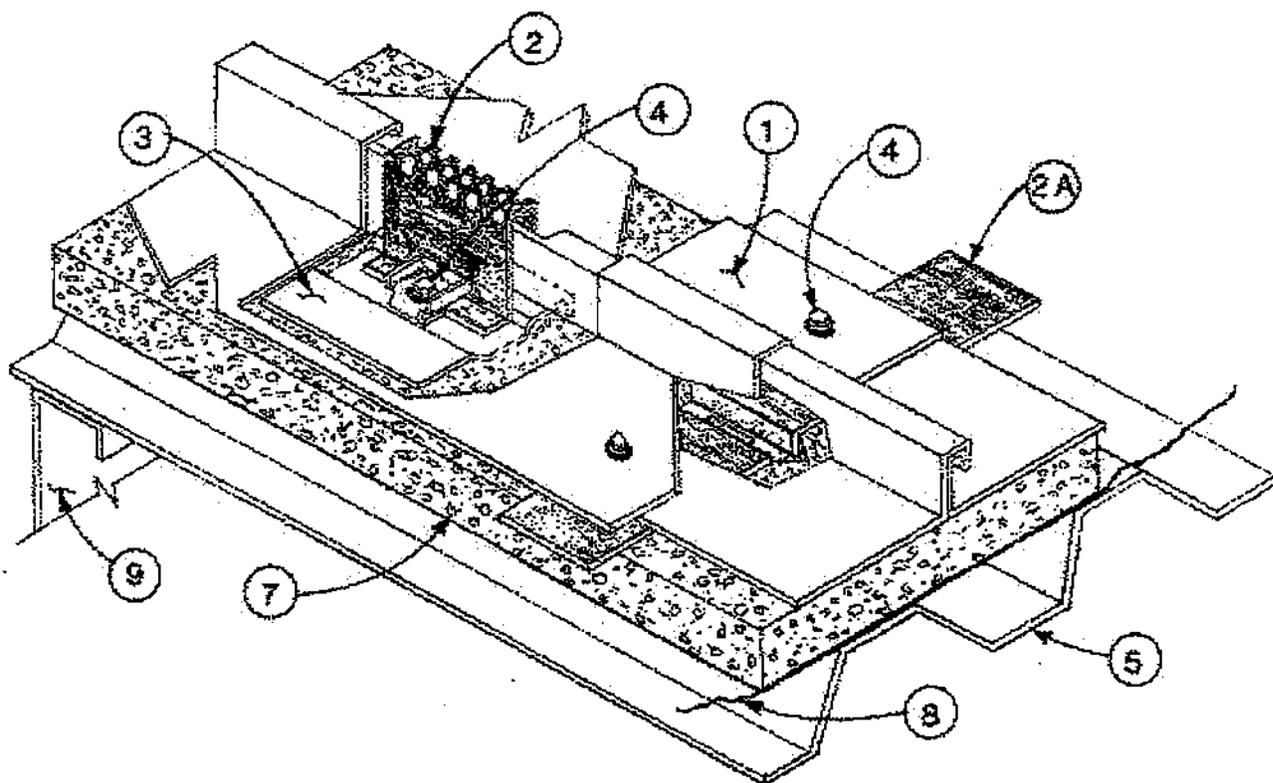
**Fire Not Investigated**

180° SEAM

FOR AEP-SPAN PANEL

("SPAN-SEAM")

**1. Metal Roof Deck Panels\*** — No. 24 MSG min coated steel. Panels 16 in. wide, 2 in. high at side ribs. Panels continuous over two or more spans. End laps to occur near panel clip locations and to include end lap back-up plate (Item 2A). Ends of panels overlapped 6 in. Side laps to be tightened and crimped with a special motorized crimping machine at an approximate 45 degree angle with crimping process to include tabs of panel clips (Item 2). A bead of sealing compound may be used at panel end laps and side joints. For Morin Corp., seams may be 45°, 90°, or 180°.

**A & M BUILDERS/ROOFING**

**TECHNOLOGIES L L C** — "SS200"

**A-LERT STANDING SEAM ROOF SYSTEMS** — "A-Lert Loc"

**AEP SPAN, DIV OF**

**ASC PROFILES** — "SL-216" (90° Seam), "SPS-216" (180° Seam)

**ALLWINE ROOFING & CONSTRUCTION INC** — "A2-16", "A2-16 Fluted" and "A2-16 with Clip Offset"

**AMERICAN BUILDINGS CO** — "Loc-Seam,""Loc-Seam 360."

**CONSOLIDATED METALS OF FLORIDA, DIV OF**

**ALUMINUM SERVICE INC** — "CSS-210A"

**ARCHITECTURAL BUILDING COMPONENTS INC** — "JSM 200"

**CONSTRUCTION METAL PRODUCTS INC** — "CMP Series 2500"

**CSC SALES INC** — "CSC-SS2000"

**DALEY CONSTRUCTION & METAL ROOFING** — "3D Forever Lock"

**ENGLERT INC** — "Series 2500"

**HI-TEC ROOFING INC** — "MRS 210A"

**J M METALS ROOFING MFRS** — "JM 2.0"

**KNUDSON MFG INC** — "ULTRALOK"

**METAL-FAB MFG LLC** — "Met-Fab III"

**METAL PANEL SYSTEMS INC** — "MP-200"

**METAL SALES MFG CORP** — T-Span or "T-Span 180" (180° Seam)

**METAL WORX SYSTEMS INC** — "SS 2000"

**MORIN CORP** — "SLR-12", "SLR-14", "SLR-16"

**NEW TECH MACHINERY CORP** — "Panel 210A"

**NORTH COAST COMMERCIAL**

**ROOFING SYSTEM OF PA INC** — "Series 2500"

**ROL-TEC SYSTEMS INC** — "ULTRALOK"

**R S S P INC** — "SS 2000"

**STEELOX SYSTEMS L L C** — "Steelox LRX 262", "Steelox LRX 264", "Steelox PRX 262" or "Steelox PRX 264" (Fabricated from either coated or stainless steel)

**SUPERIOR METAL SYSTEMS INC** — "SMS 416"

**CENTURION INDUSTRIES INC, DBA**

**TFC CANOPY** — "Centurion 1624M"

**ZIMMERMAN METALS INC** — "SS2000"

2. **Roof Deck Fasteners\* (Panel Clips)** — Two part assembly: Base, 1 in. wide approximately 1-1/4 in. long with upper segment folded over lower end of tab. Fabricated from 0.050 in. thick coated or stainless steel. Upper tab 3 in. wide, maximum tab height 3-1/2 in. with lower end formed to engage base. Fabricated from 0.023 in. thick coated or stainless steel. Clips spaced 30 in. OC.

**ARCHITECTURAL BUILDING COMPONENTS INC — "JSM 200 Utility"**

**STEELOX SYSTEMS L L C — "CF Sliding Clip"**

**SUPERIOR METAL SYSTEMS INC — "SMS-24SCC"**

2A. **Roof Deck Fasteners\* (End Lap Back-Up Plate)** — No. 18 MSG min gauge coated steel. Max length 48 in., width 6-1/2 in.

**STEELOX SYSTEMS L L C — "Backing Plate"**

2B. **Roof Deck Fasteners\* (Panel Clips)** — (Not Shown) — Two part assembly. A base fabricated from No. 16 MSG min thick coated steel and a tab fabricated from No. 22 MSG min thick coated steel. Clips spaced 30 in. OC maximum. Clips fastened to liner panel (Item 5). Two screws used per clip. (See Item 4 for description of screws).

As an alternate the following described clip may be used: Two part assembly consisting of a base with a vertical leg 5 in. long and either 2 in. or 3 in. high and a tapered upper tab maximum 3 in. long formed to interlock with the base. Base fabricated from No. 18 MSC coated steel and to have two 1/4 in. guide holes. Upper tab fabricated from No. 24 MSC coated steel.

**AEP SPAN, DIV OF**

**ASC PROFILES — "SL-2.5 in. Standard Clip", "SL-2 in. Profile Clip"**

2C. **Roof Deck Fasteners\* (Back-Up Plates)** — (Not Shown) — Used with AEP-Span "SL-216" panels. No. 16 MSG coated steel length 10-1/2 in., width 15-3/4 in. slipped under lower panel at end-lap. Panels fastened together at end-lap using four No. 1/4 - 14 by 1-1/8 in. long self-drilling self-tapping, hex-washer-head, plated steel screws with a 5/8 OD steel washer and a sealing washer. Screws spaced 4 in. OC beginning 2 in. from ribs.

**AEP SPAN, DIV OF**

**ASC PROFILES — "SL-216 End-Lap Back-Up Plate"**

**2D. Roof Deck Fasteners* (Panel Clip)** — (Not Shown) — Two part assembly; A base fabricated from No. 16 MSG min coated steel and an upper tab fabricated from No. 22 MSG min coated steel. Clips fastened to purlins using two fasteners per clip. See Item No. 3 for description of fasteners.

**METAL SALES MFG CORP** — "T-Span Clip"

**3. Roof Deck Fastener* (Bearing Clip)** — No. 18 MSG min gauge coated steel; 3 in. wide by 3-1/4 in. long with 3/8 in. legs. Used under Panel Clips (Item 2) over purlins and rigid insulation. Three 1/4 in. dia guide holes located in base.

**STEELOX SYSTEMS L L C** — "Bearing Clip"

**3A. Roof Deck Fasteners* (Bearing Plate)** — (Not Shown) — No. 18 MSG min gauge coated steel. 4 in. wide, 8 in. long used under each panel clip (Item 2B).

**AEP SPAN, DIV OF**

**ASC PROFILES** — "SL Bearing Plate"

**4. Fasteners (Screws)** — Fasteners used to attach panel clips (Item No. 2) to the liner panels (Item No. 5) to be No. 11 by min 3-3/4 in. long self-drilling, plated steel flat Phillips head screws. One screw used for each panel clip. Fasteners used to be No. 12-14 by 1-1/4 in. self-drilling, self-tapping, hex-head, plated steel screws with a separate 5/8 in. diameter steel washer and a neoprene sealing washer. Two fasteners to be used at each support with fasteners located in every valley. Fasteners used at liner panel side laps to be the same type as liner panel screws and spaced 20 in. OC. Fasteners used at metal roof deck panel end laps to be 1/4-10 by 1 in. long self-drilling, self-tapping, hex-head, plated steel screws with 1/2 in. OD metal backed sealing washers. Spacing to be in a 1, 3, 3-1/2, 3-1/2, 2, 1 in. pattern.

**5. Liner Panel** — The liner panel to be min 1-1/2 in. deep Type A, B, F, or N Deck fabricated from No. 22 MSG min gauge steel. Yield strength to be min 33,000 psi. Liner panel to be fastened to supports with screws indicated under Item 4 or with welds and weld washers of type indicated by manufacturer of liner panel. Welds to be located in every valley.

**6. Fastener Reinforcement (Bearing Plate)** — The reinforcements used with the screws attaching the liner panels to the purlins to be 0.125 in. thick and to have an area of approximately 2 sq/in.

**7. Foamed Plastic (Rigid Insulation)** — Supplied in 4 ft wide sheets. Min thickness to be 1 in. Density to be min of 2.0 lb/cu ft or see products Classified under TJBX.

**8. Vapor Barrier** — Used between the liner panel and the foamed plastic to be a 6 mil plastic sheeting.

9. **Purlins** — No. 12 MSG min gauge steel (min yield strength 40,000 psi) or min Type H Open web joists.

Refer to General Information, Roof Deck Construction, (Roofing Materials and Systems Directory) for Items not evaluated.

*Bearing the UL Classification Mark

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# J=3Λ

# JOHN F. BUTTS & ASSOC., INC.

CONSULTING ENGINEERS
2480 VANTAGE DRIVE   COLORADO SPRINGS, CO 80919
(719) 598-7666   FAX (719) 598-0258

April 22, 1999

New Tech Machinery Corporation
1300 40$^{th}$ Street
Denver, CO 80205-3311

Re: Panel Analysis Report
New Tech SS150 Panel
New Tech SS200 Panel
New Tech SS210-A Panel
New Tech SS550 Panel
New Tech SS675 Panel
JFBA Job No. 183-04

Gentlemen:

Per your request, we have completed an analysis of the above referenced panels. The panels, with the structural properties indicated in this report, is certified to meet or exceed the requirements of the following design specifications:

American Iron and Steel Institute, *Specifications for the Design of Cold-Formed Steel Structural Members*, 1996 edition.

The following documents are enclosed for your records:

Panel cross-section
Panel analysis, pages 1 to 183
Panel Span Load tables, pages S1 to S71

Panels widths greater than 14 inches exceed the AISI allowable ratios for the panel width element. The AISI specifications, Section B1.1(a) states:

"...stiffened elements having w/t ratios larger than 500 can be used with adequate design strength to sustain the required loads; however; substantial deformations of such elements usually will invalidate the design equations of this specification."

Before using the enclosed panel span tables, you will need to review the analysis reports for each panel. It is our opinion that the panels with w/t ratio elements exceeding 500 should be verified by testing before using the respective panel span tables.

Please note that the panel analysis and Load Tables have been evaluated based on the assumption that the proper bearing, side laps, end laps, bracing, anchorage and structural supports are being utilized in the member's installation. We do not certify the installation method, attachment and supporting materials.

If you have any questions, please call or write the undersigned.

Sincerely,
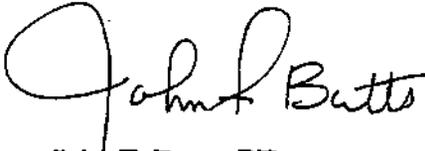
John F. Butts, PE
President

13/16"

1/2"

7/16"

11/16"

2"

12" - 24"
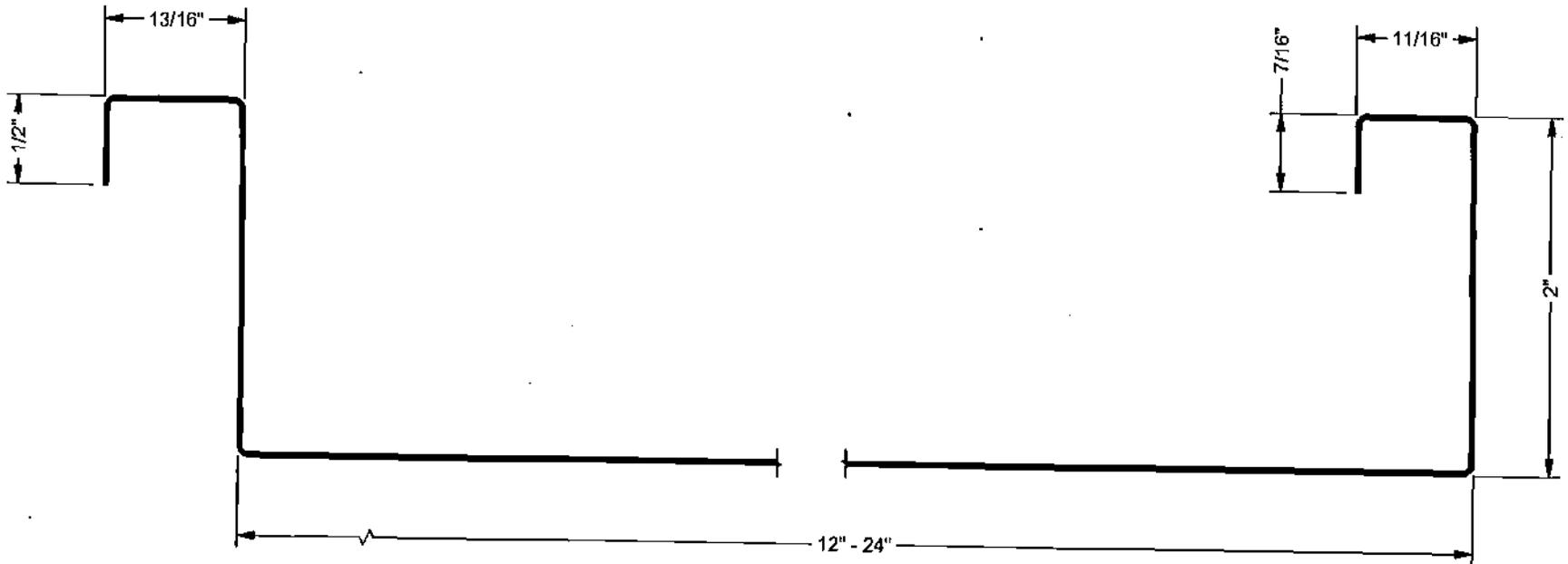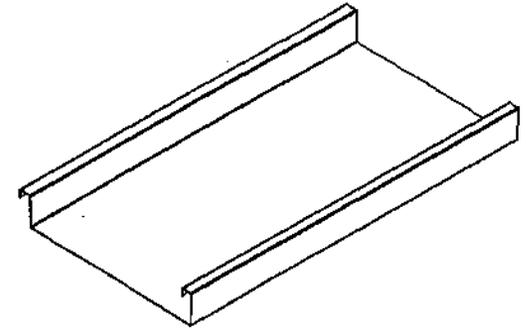
**NOTE:**
MATERIAL USAGE: 6 1/8"

| MATERIAL | | | LENGTH | | FINISH | | | *NEW TECH MACHINERY CORP.* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | REV | ECN NO. | DATE | RELEASED BY | TOLERANCES | | DRAWN BY SAWYER | PART NAME | | | | |
| REVISION HISTORY | | | | | .XX = ± .01 | | | SS210A PANEL PROFILE | | | | |
| | | | | | .XXX = ± .005 | | DATE 9/16/2002 | | | | | |
| | | | | | FRACTION = ± 1/32" | | CHECK BY | SIZE A | SHEET 1 OF 1 | | | REVISION 0 |
| | | | | | ANGLE = ± 1/2° | | DATE | SCALE NONE | PART NUMBER SS210 | | | |

John F. Butts & Associates, Inc.
2480 Vantage Drive
Colorado Springs, CO 80919
(719) 598-7666

**PROFILE ANALYSIS & DESIGN**

Per AISI Cold-Formed Steel
Design Manual, 1996 Edition

**New Tech SS210-A Panel**
==================================================================
        FILE NAME: NT210

**DIMENSIONS**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Line # 1 | Angle | (R) = | -90.000 deg | Line # 1 | Angle | (L) = | 90.000 deg |
| | Radius | (R) = | 0.040 in | | Radius | (L) = | 0.040 in |
| | Length | (R) = | 1.872 in | | Length | (L) = | 1.872 in |
| Line # 2 | Angle | (R) = | 90.000 deg | Line # 2 | Angle | (L) = | 90.000 deg |
| | Radius | (R) = | 0.040 in | | Radius | (L) = | 0.040 in |
| | Length | (R) = | 0.671 in | | Length | (L) = | 0.546 in |
| Line # 3 | Angle | (R) = | 90.000 deg | Line # 3 | Angle | (L) = | 90.000 deg |
| | Radius | (R) = | 0.070 in | | Radius | (L) = | 0.070 in |
| | Length | (R) = | 0.406 in | | Length | (L) = | 0.174 in |

Panel Bottom Width   = 11.872 in
Panel Overall Width  = 12.000 in
Panel Overall Height = 2.000 in

**SPECIAL CONDITIONS**

Seam Rotation : 90 deg.

Alloy: ASTM A653, G50
        Fy = 50.00 ksi
        Fv = 21.18 ksi

QUALIFICATIONS PER AISI SPECIFICATIONS
        (a) Maximum w/t Ratio's Exceeded [SEC. B1.1(a)]| No
        (b) Maximum h/t Ratio's Exceeded [SEC. B1.2(a)]| No

PROPERTIES FOR LOAD/SPAN TABLES
        Aweb= 0.098 in2
        Sxp = 0.123 in3        Sxp (per ft. of width) = 0.123 in3
        Sxn = 0.078 in3        Sxn (per ft. of width) = 0.078 in3
        Ixp = 0.214 in4        Ixp (per ft. of width) = 0.214 in4
        Ixn = 0.115 in4        Ixn (per ft. of width) = 0.115 in4
        Weight= 1.47 lb/lf

**New Tech SS210-A Panel**

================================================================================

| Member – New Tech SS210-A Panel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | Name | Gage | Hgt (in) | Width (in) | Lip (in) | t (in) | Weight lb/ft | Coil Width (in) |
| Panel | PNL | 24 | 2.000 | 12.000 | 0.000 | 0.0240 | 1.470 | 18.00 |

| Gross Section Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Area (in2) | Ix (in4) | Sx (in3) | Rx (in) | Ycg (in) | Iy (in4) | Sy (in3) | Ry (in) | Xcg (in) |
| 0.432 | 0.226 | 0.146 | 0.723 | 0.454 | 8.707 | 1.316 | 4.490 | 6.166 |

| Effective Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ix (in4) | Sx (in3) | Iy (in4) | Sy (in3) | Mnx (in-k) | Mny (in-k) | Vnx (kip) | End Bearing Pne (kip) | Pnei (k/in) |
| 0.214 | 0.123 | 0.000 | 0.000 | 3.92 | 0.00 | 2.069 | 0.181 | 0.159 |

| Torsional Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Xo (in) | Ro (in) | Beta | Cw (in6) | Jv*1000 (in4) | Fy (ksi) | Fu (ksi) | E (ksi) | G (ksi) |
| -1.198 | 4.703 | 0.935 | 6.00 | 0.083 | 50 | 65 | 29500 | 11300 |

Shear, moment and bearing values shown are nominal values and must be modified by the appropriate factors of safety (ASD) or resistance factors (LRFD).

Factors of Safety (ASD)  Resistance Factors (LRFD)
$\Omega$ (Compression)   = 1.80    $\phi$ (Compression)   = 0.85
$\Omega$ (Tension)       = 1.67    $\phi$ (Tension)       = 0.95
$\Omega$ (Web Crippling) = 1.85    $\phi$ (Web Crippling) = 0.75
$\Omega$ (Bending)       = 1.67    $\phi$ (Bending)       = 1.11
$\Omega$ (Shear)         = 1.67    $\phi$ (Shear)         = 0.90

**New Tech SS210-A Panel**

========================================================================

Moment of Inertia @ 90 degree Rotation

| ELEMENT | L | Y | LY | LYY | Io |
|---------|------|--------|--------|---------|----------|
| 1 | 0.082 | 11.969 | 0.978 | 11.702 | 0.0000 |
| 2 | 1.872 | 11.988 | 22.442 | 269.029 | 0.0000 |
| 3 | 0.082 | 12.007 | 0.981 | 11.776 | 0.0000 |
| 4 | 0.671 | 12.375 | 8.304 | 102.766 | 0.0252 |
| 5 | 0.129 | 12.763 | 1.644 | 20.982 | 0.0001 |
| 6 | 0.406 | 12.793 | 5.194 | 66.446 | 0.0000 |
| 14 | 11.872 | 6.000 | 71.232 | 427.392 | 139.4410 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 0.012 | 0.022 | 0.000 | 0.0000 |
| 23 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 24 | 0.546 | 0.337 | 0.184 | 0.062 | 0.0136 |
| 25 | 0.075 | 0.662 | 0.050 | 0.033 | 0.0001 |
| 26 | 0.227 | 0.692 | 0.157 | 0.109 | 0.0000 |
| | 17.997 | | 111.193 | 910.297 | 139.4800 |

$Ix$ = 8.707 in4
$Ycg$= 6.178 in

## New Tech SS210-A Panel

=================================================================
LOAD

### ELEMENT VALUES FOR POSITIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---|---|---|---|---|---|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.580 | 1.340 | -0.777 | -1.041 | -0.0163 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.292 | 1.760 | 0.514 | 0.904 | 0.0056 |
| 14 | 11.872 | 0.012 | 0.142 | 0.002 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.580 | 1.340 | -0.777 | -1.041 | -0.0163 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 16.723 | | 6.439 | 9.672 | 1.0667 |

Sx =  0.123 in3
Ix =  0.198 in4
Ycg=  0.385 in

Webs Fully Effective  [SEC. B2.3(a)] No

## New Tech SS210-A Panel

=======================================================================

### DEFLECTION

#### ELEMENT VALUES FOR POSITIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---|---|---|---|---|---|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.235 | 1.417 | -0.333 | -0.472 | -0.0011 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.369 | 1.721 | 0.636 | 1.095 | 0.0056 |
| 14 | 11.872 | 0.012 | 0.142 | 0.002 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.235 | 1.417 | -0.333 | -0.472 | -0.0011 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 17.491 | | 7.449 | 10.999 | 1.0970 |

Sx =   0.136 in3
Ix =   0.214 in4
Ycg=   0.426 in

Webs Fully Effective  [SEC. B2.3(a)]| No

**New Tech SS210-A Panel**
=================================================================

LOAD

## ELEMENT VALUES FOR NEGATIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---|---|---|---|---|---|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.355 | 0.510 | -0.181 | -0.092 | -0.0037 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.406 | 1.703 | 0.691 | 1.177 | 0.0056 |
| 14 | 1.086 | 0.012 | 0.013 | 0.000 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.355 | 0.510 | -0.181 | -0.092 | -0.0037 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 6.501 | | 7.679 | 11.840 | 1.0917 |

$Sx =$ 0.078 in3
$Ix =$ 0.093 in4
$Ycg=$ 1.181 in

Webs Fully Effective [SEC. B2.3(a)]| No

## New Tech SS210-A Panel

==================================================================

DEFLECTION

### ELEMENT VALUES FOR NEGATIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|-------|-------|-------|--------|--------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| ·5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.406 | 1.703 | 0.691 | 1.177 | 0.0056 |
| 14 | 1.652 | 0.012 | 0.020 | 0.000 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 7.777 | | 8.048 | 12.025 | 1.0992 |

$Sx$ =  0.111 in3
$Ix$ =  0.115 in4
$Ycg$=  1.035 in

Webs Fully Effective  [SEC. B2.3(a)]| Yes

**New Tech SS210-A Panel**
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MAXIMUM NOMINAL MOMENTS - [Section C3.1.1(a)]

    Mnx  [positive bending] =   +6.137 k-in
    Mnx  [negative bending] =   -3.923 k-in

MAXIMUM ALLOWABLE REACTIONS - [Table C3.4-1]

    N/t= 83.33
    k  = 1.515
    C1 = 0.887
    C2 = 0.960
    C3 = 0.830
    C4 = 0.900
    C9 = 1.000
    C0 = 1.000  - Element 2, 22

    Pend= t^2*k*C3*C4*C9*C0[217 - 0.28(h/t)][0.71 + 0.015(N/t)]
    h/t = 78.00 | Pe( 2)= 1 *  0.249 kips =  0.249 kips
    h/t = 78.00 | Pe(22)= 1 *  0.249 kips =  0.249 kips
    Pend=  0.499 kips

    Pint= t^2*k*C1*C2*C9*C0[538 - 0.74(h/t)][0.75 + 0.011(N/t)]
    h/t = 78.00 | Pi( 2)= 1 *  0.595 kips =  0.595 kips
    h/t = 78.00 | Pi(22)= 1 *  0.595 kips =  0.595 kips
    Pint=  1.189 kips


MAXIMUM NOMINAL SHEAR - [Section C3.2]

    E  =  29,500 ksi
    Fy =  50.00 ksi
    kv =   5.34        - for unreinforced webs
    0.960*Sqr(Ekv/Fy) = 53.88
    1.415*Sqr(Ekv/Fy) = 79.42

    h/t = 78.00 | V( 2) = 1 *  1.035 kips =  1.035 kips    (Eq. C3.2-2)
    h/t = 78.00 | V(22) = 1 *  1.035 kips =  1.035 kips    (Eq. C3.2-2)

    Vn  =  2.069 kips

**New Tech SS210-A Panel**
================================================================

Sheet Gauge = 0.0240 in, 24 gauge

PANEL ELEMENTS EXCEEDING AISI ALLOWABLE RATIOS

Element No. 14 : w/t>250   -Actual w/t = 495

NOTE: AISI Specifications, Section B1.1(a) states ....

stiffened compression elements that have w/t ratios  exceeding
approximately 250 are likely to develop noticeable deformation
at the full design strength,  without affecting the ability of
the member to develop the required strength.

John F. Butts & Associates, Inc.
2480 Vantage Drive
Colorado Springs, CO 80919
(719) 598-7666

**PROFILE ANALYSIS & DESIGN**

Per AISI Cold-Formed Steel
Design Manual, 1996 Edition

**New Tech SS210-A Panel**
===================================================================

FILE NAME: NT210

**DIMENSIONS**

| | | | | |
|---|---|---|---|---|
| Line # 1 Angle (R) = -90.000 deg | | Line # 1 Angle (L) = 90.000 deg | | |
| Radius (R) = 0.040 in | | Radius (L) = 0.040 in | | |
| Length (R) = 1.872 in | | Length (L) = 1.872 in | | |
| Line # 2 Angle (R) = 90.000 deg | | Line # 2 Angle (L) = 90.000 deg | | |
| Radius (R) = 0.040 in | | Radius (L) = 0.040 in | | |
| Length (R) = 0.671 in | | Length (L) = 0.546 in | | |
| Line # 3 Angle (R) = 90.000 deg | | Line # 3 Angle (L) = 90.000 deg | | |
| Radius (R) = 0.070 in | | Radius (L) = 0.070 in | | |
| Length (R) = 0.406 in | | Length (L) = 0.174 in | | |

Panel Bottom Width  = 13.872 in
Panel Overall Width = 14.000 in
Panel Overall Height= 2.000 in

**SPECIAL CONDITIONS**

Seam Rotation : 90 deg.

Alloy: ASTM A653, G50
    $F_y$ = 50.00 ksi
    $F_v$ = 21.18 ksi

QUALIFICATIONS PER AISI SPECIFICATIONS
    (a) Maximum w/t Ratio's Exceeded [SEC. B1.1(a)]⌐ No
    (b) Maximum h/t Ratio's Exceeded [SEC. B1.2(a)]⌐ No

PROPERTIES FOR LOAD/SPAN TABLES
    Aweb= 0.098 in2
    Sxp = 0.123 in3    Sxp (per ft. of width) = 0.105 in3
    Sxn = 0.079 in3    Sxn (per ft. of width) = 0.067 in3
    Ixp = 0.221 in4    Ixp (per ft. of width) = 0.189 in4
    Ixn = 0.115 in4    Ixn (per ft. of width) = 0.099 in4
    Weight= 1.63 lb/lf

## New Tech SS210-A Panel

====================================================================

| Member - New Tech SS210-A Panel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | Name | Gage | Hgt (in) | Width (in) | Lip (in) | t (in) | Weight lb/ft | Coil Width (in) |
| Panel | PNL | 24 | 2.000 | 14.000 | 0.000 | 0.0240 | 1.633 | 20.00 |
| Gross Section Properties | | | | | | | | |
| Area (in2) | Ix (in4) | Sx (in3) | Rx (in) | Ycg (in) | Iy (in4) | Sy (in3) | Ry (in) | Xcg (in) |
| 0.480 | 0.234 | 0.147 | 0.699 | 0.410 | 12.620 | 1.657 | 5.128 | 7.166 |

### Effective Properties

| Ix (in4) | Sx (in3) | Iy (in4) | Sy (in3) | Mnx (in-k) | Mny (in-k) | Vnx (kip) | End Bearing Pne (kip) | Pnei (k/in) |
|---|---|---|---|---|---|---|---|---|
| 0.221 | 0.123 | 0.000 | 0.000 | 3.93 | 0.00 | 2.069 | 0.181 | 0.159 |

| Torsional Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Xo (in) | Ro (in) | Beta | Cw (in6) | Jv*1000 (in4) | Fy (ksi) | Fu (ksi) | E (ksi) | G (ksi) |
| -1.102 | 5.291 | 0.957 | 8.44 | 0.092 | 50 | 65 | 29500 | 11300 |

Shear, moment and bearing values shown are nominal values and must be modified by the appropriate factors of safety (ASD) or resistance factors (LRFD).

| Factors of Safety (ASD) | | Resistance Factors (LRFD) | |
|---|---|---|---|
| $\Omega$ (Compression) | = 1.80 | $\phi$ (Compression) | = 0.85 |
| $\Omega$ (Tension) | = 1.67 | $\phi$ (Tension) | = 0.95 |
| $\Omega$ (Web Crippling) | = 1.85 | $\phi$ (Web Crippling) | = 0.75 |
| $\Omega$ (Bending) | = 1.67 | $\phi$ (Bending) | = 1.11 |
| $\Omega$ (Shear) | = 1.67 | $\phi$ (Shear) | = 0.90 |

**New Tech SS210-A Panel**

=========================================================================

### Moment of Inertia @ 90 degree Rotation

| ELEMENT | L | Y | LY | LYY | Io |
|---------|--------|--------|---------|----------|----------|
| 1 | 0.082 | 13.969 | 1.141 | 15.939 | 0.0000 |
| 2 | 1.872 | 13.988 | 26.186 | 366.283 | 0.0000 |
| 3 | 0.082 | 14.007 | 1.144 | 16.025 | 0.0000 |
| 4 | 0.671 | 14.375 | 9.646 | 138.665 | 0.0252 |
| 5 | 0.129 | 14.763 | 1.902 | 28.073 | 0.0001 |
| 6 | 0.406 | 14.793 | 6.006 | 88.846 | 0.0000 |
| 14 | 13.872 | 7.000 | 97.104 | 679.728 | 222.4518 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 0.012 | 0.022 | 0.000 | 0.0000 |
| 23 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 24 | 0.546 | 0.337 | 0.184 | 0.062 | 0.0136 |
| 25 | 0.075 | 0.662 | 0.050 | 0.033 | 0.0001 |
| 26 | 0.227 | 0.692 | 0.157 | 0.109 | 0.0000 |
|  | 19.997 |  | 143.547 | 1333.765 | 222.4908 |

$I_x$ =   12.620 in4
$Y_{cg}$=    7.178 in

**New Tech SS210-A Panel**

================================================================

LOAD

### ELEMENT VALUES FOR POSITIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|--------|-------|--------|--------|---------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.613 | 1.321 | -0.810 | -1.069 | -0.0192 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.292 | 1.760 | 0.514 | 0.904 | 0.0056 |
| 14 | 13.872 | 0.012 | 0.166 | 0.002 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.613 | 1.321 | -0.810 | -1.069 | -0.0192 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 18.657 | | 6.397 | 9.615 | 1.0608 |

$Sx$ = 0.123 in3
$Ix$ = 0.204 in4
$Ycg$ = 0.343 in

Webs Fully Effective [SEC. B2.3(a)] | No

## New Tech SS210-A Panel

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DEFLECTION

### ELEMENT VALUES FOR POSITIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|-------|-------|--------|--------|---------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.258 | 1.402 | -0.362 | -0.507 | -0.0014 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.370 | 1.721 | 0.637 | 1.097 | 0.0056 |
| 14 | 13.872 | 0.012 | 0.166 | 0.002 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.258 | 1.402 | -0.362 | -0.507 | -0.0014 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 19.446 | | 7.417 | 10.931 | 1.0963 |

$S_x$ = 0.136 in3
$I_x$ = 0.221 in4
$Y_{cg}$= 0.381 in

Webs Fully Effective  [SEC. B2.3(a)] No

**New Tech SS210-A Panel**

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LOAD

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### ELEMENT VALUES FOR NEGATIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|-------|-------|--------|--------|---------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.355 | 0.510 | -0.181 | -0.092 | -0.0037 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.406 | 1.703 | 0.691 | 1.177 | 0.0056 |
| 14 | 1.089 | 0.012 | 0.013 | 0.000 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.355 | 0.510 | -0.181 | -0.092 | -0.0037 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 6.504 | | 7.679 | 11.841 | 1.0917 |

$S_x$ = 0.079 in3
$I_x$ = 0.093 in4
$Y_{cg}$= 1.181 in

Webs Fully Effective [SEC. B2.3(a)] No

## New Tech SS210-A Panel

========================================================================

DEFLECTION

### ELEMENT VALUES FOR NEGATIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|-------|-------|-------|--------|--------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.406 | 1.703 | 0.691 | 1.177 | 0.0056 |
| 14 | 1.660 | 0.012 | 0.020 | 0.000 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 7.785 | | 8.048 | 12.025 | 1.0992 |

$S_x$ = 0.112 in3
$I_x$ = 0.115 in4
$Y_{cg}$= 1.034 in

Webs Fully Effective  [SEC. B2.3(a)] Yes

**New Tech SS210-A Panel**

==========================================================================

MAXIMUM NOMINAL MOMENTS - [Section C3.1.1(a)]

    Mnx   [positive bending] =   +6.142 k-in
    Mnx   [negative bending] =   -3.930 k-in

MAXIMUM ALLOWABLE REACTIONS - [Table C3.4-1]

    N/t= 83.33
    k  = 1.515
    C1 = 0.887
    C2 = 0.960
    C3 = 0.830
    C4 = 0.900
    C9 = 1.000
    C0 = 1.000  - Element 2, 22

    Pend= t^2*k*C3*C4*C9*C0[217 - 0.28(h/t)][0.71 + 0.015(N/t)]
    h/t = 78.00 | Pe( 2)= 1 * 0.249 kips = 0.249 kips
    h/t = 78.00 | Pe(22)= 1 * 0.249 kips = 0.249 kips
    Pend= 0.499 kips

    Pint= t^2*k*C1*C2*C9*C0[538 - 0.74(h/t)][0.75 + 0.011(N/t)]
    h/t = 78.00 | Pi( 2)= 1 * 0.595 kips = 0.595 kips
    h/t = 78.00 | Pi(22)= 1 * 0.595 kips = 0.595 kips
    Pint= 1.189 kips

MAXIMUM NOMINAL SHEAR - [Section C3.2]

    E  = 29,500 ksi
    Fy =  50.00 ksi
    kv =   5.34      - for unreinforced webs
    0.960*Sqr(Ekv/Fy) = 53.88
    1.415*Sqr(Ekv/Fy) = 79.42

    h/t = 78.00 | V( 2) = 1 * 1.035 kips = 1.035 kips  (Eq. C3.2-2)
    h/t = 78.00 | V(22) = 1 * 1.035 kips = 1.035 kips  (Eq. C3.2-2)

    Vn  = 2.069 kips

## New Tech SS210-A Panel
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Sheet Gauge = 0.0240 in, 24 gauge

PANEL ELEMENTS EXCEEDING AISI ALLOWABLE RATIOS

Element No. 14 : w/t>500     -Actual w/t = 578

NOTE: AISI Specifications,  Section B1.1(a) states ....

stiffened elements having w/t ratios larger than 500 can be used
with adequate design strength  to sustain  the  required  loads;
however; substantial deformations of such elements usually  will
invalidate the design equations of this Specification.

John F. Butts & Associates, Inc.
2480 Vantage Drive
Colorado Springs, CO 80919
(719) 598-7666

**PROFILE ANALYSIS & DESIGN**

Per AISI Cold-Formed Steel
Design Manual, 1996 Edition

**New Tech SS210-A Panel**

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FILE NAME: NT210

**DIMENSIONS**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Line # 1 | Angle | (R) = | -90.000 deg | Line # 1 | Angle | (L) = | 90.000 deg |
| | Radius | (R) = | 0.040 in | | Radius | (L) = | 0.040 in |
| | Length | (R) = | 1.872 in | | Length | (L) = | 1.872 in |
| Line # 2 | Angle | (R) = | 90.000 deg | Line # 2 | Angle | (L) = | 90.000 deg |
| | Radius | (R) = | 0.040 in | | Radius | (L) = | 0.040 in |
| | Length | (R) = | 0.671 in | | Length | (L) = | 0.546 in |
| Line # 3 | Angle | (R) = | 90.000 deg | Line # 3 | Angle | (L) = | 90.000 deg |
| | Radius | (R) = | 0.070 in | | Radius | (L) = | 0.070 in |
| | Length | (R) = | 0.406 in | | Length | (L) = | 0.174 in |

Panel Bottom Width  =  15.872 in
Panel Overall Width =  16.000 in
Panel Overall Height=   2.000 in

**SPECIAL CONDITIONS**

Seam Rotation : 90 deg.

Alloy: ASTM A653, G50
        Fy =   50.00 ksi
        Fv =   21.18 ksi

QUALIFICATIONS PER AISI SPECIFICATIONS
        (a) Maximum w/t Ratio's Exceeded [SEC. B1.1(a)] | No
        (b) Maximum h/t Ratio's Exceeded [SEC. B1.2(a)] | No

PROPERTIES FOR LOAD/SPAN TABLES
        Aweb=   0.098 in2
        Sxp =   0.123 in3    Sxp (per ft. of width) =   0.092 in3
        Sxn =   0.079 in3    Sxn (per ft. of width) =   0.059 in3
        Ixp =   0.226 in4    Ixp (per ft. of width) =   0.169 in4
        Ixn =   0.115 in4    Ixn (per ft. of width) =   0.087 in4
        Weight=  1.80 lb/lf

## New Tech SS210-A Panel

====================================================================

| Member – New Tech SS210-A Panel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Type | Name | Gage | Hgt (in) | Width (in) | Lip (in) | t (in) | Weight lb/ft | Coil Width (in) |
| Panel | PNL | 24 | 2.000 | 16.000 | 0.000 | 0.0240 | 1.796 | 22.00 |

| Gross Section Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Area (in2) | Ix (in4) | Sx (in3) | Rx (in) | Ycg (in) | Iy (in4) | Sy (in3) | Ry (in) | Xcg (in) |
| 0.528 | 0.241 | 0.148 | 0.676 | 0.374 | 17.493 | 2.031 | 5.756 | 8.166 |

| Effective Properties | | | | | | | End Bearing | |
|---|---|---|---|---|---|---|---|---|
| Ix (in4) | Sx (in3) | Iy (in4) | Sy (in3) | Mnx (in-k) | Mny (in-k) | Vnx (kip) | Pne (kip) | Pnei (k/in) |
| 0.226 | 0.123 | 0.000 | 0.000 | 3.93 | 0.00 | 2.069 | 0.181 | 0.159 |

| Torsional Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Xo (in) | Ro (in) | Beta | Cw (in6) | Jv*1000 (in4) | Fy (ksi) | Fu (ksi) | E (ksi) | G (ksi) |
| -1.021 | 5.885 | 0.970 | 11.36 | 0.101 | 50 | 65 | 29500 | 11300 |

Shear, moment and bearing values shown are nominal values and must be modified by the appropriate factors of safety (ASD) or resistance factors (LRFD).

| Factors of Safety (ASD) | | Resistance Factors (LRFD) | |
|---|---|---|---|
| $\Omega$ (Compression) | = 1.80 | $\phi$ (Compression) | = 0.85 |
| $\Omega$ (Tension) | = 1.67 | $\phi$ (Tension) | = 0.95 |
| $\Omega$ (Web Crippling) | = 1.85 | $\phi$ (Web Crippling) | = 0.75 |
| $\Omega$ (Bending) | = 1.67 | $\phi$ (Bending) | = 1.11 |
| $\Omega$ (Shear) | = 1.67 | $\phi$ (Shear) | = 0.90 |

**New Tech SS210-A Panel**

=====================================================================

Moment of Inertia @ 90 degree Rotation

| ELEMENT | L | Y | LY | LYY | Io |
|---|---|---|---|---|---|
| 1 | 0.082 | 15.969 | 1.304 | 20.830 | 0.0000 |
| 2 | 1.872 | 15.988 | 29.930 | 478.513 | 0.0000 |
| 3 | 0.082 | 16.007 | 1.307 | 20.928 | 0.0000 |
| 4 | 0.671 | 16.375 | 10.988 | 179.933 | 0.0252 |
| 5 | 0.129 | 16.763 | 2.159 | 36.195 | 0.0001 |
| 6 | 0.406 | 16.793 | 6.818 | 114.494 | 0.0000 |
| 14 | 15.872 | 8.000 | 126.976 | 1015.808 | 333.2067 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 0.012 | 0.022 | 0.000 | 0.0000 |
| 23 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 24 | 0.546 | 0.337 | 0.184 | 0.062 | 0.0136 |
| 25 | 0.075 | 0.662 | 0.050 | 0.033 | 0.0001 |
| 26 | 0.227 | 0.692 | 0.157 | 0.109 | 0.0000 |
| | 21.997 | | 179.901 | 1866.906 | 333.2457 |

Ix =  17.493 in4
Ycg=   8.178 in

**New Tech SS210-A Panel**

==============================================================

LOAD

### ELEMENT VALUES FOR POSITIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---|---|---|---|---|---|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.648 | 1.301 | -0.843 | -1.097 | -0.0227 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.292 | 1.760 | 0.514 | 0.904 | 0.0056 |
| 14 | 15.872 | 0.012 | 0.190 | 0.002 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.648 | 1.301 | -0.843 | -1.097 | -0.0227 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
|  | 20.587 |  | 6.355 | 9.560 | 1.0538 |

Sx = 0.123 in3
Ix = 0.208 in4
Ycg= 0.309 in

Webs Fully Effective  [SEC. B2.3(a)]| No

**New Tech SS210-A Panel**

===========================================================================

DEFLECTION

ELEMENT VALUES FOR POSITIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---|---|---|---|---|---|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.291 | 1.381 | -0.402 | -0.555 | -0.0021 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.371 | 1.720 | 0.639 | 1.099 | 0.0056 |
| 14 | 15.872 | 0.012 | 0.190 | 0.002 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.291 | 1.381 | -0.402 | -0.555 | -0.0021 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 21.381 | | 7.362 | 10.838 | 1.0951 |

Sx = 0.136 in3
Ix = 0.226 in4
Ycg= 0.344 in

Webs Fully Effective  [SEC. B2.3(a)]| No

## New Tech SS210-A Panel

=============================================================================
LOAD

### ELEMENT VALUES FOR NEGATIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|--------|-------|--------|--------|---------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.355 | 0.510 | -0.181 | -0.092 | -0.0037 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.406 | 1.703 | 0.691 | 1.177 | 0.0056 |
| 14 | 1.091 | 0.012 | 0.013 | 0.000 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.355 | 0.510 | -0.181 | -0.092 | -0.0037 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 6.507 | | 7.679 | 11.841 | 1.0917 |

$S_x$ =   0.079 in3
$I_x$ =   0.093 in4
$Y_{cg}$= 1.180 in

Webs Fully Effective  [SEC. B2.3(a)]| No

## New Tech SS210-A Panel

=====================================================================

DEFLECTION

ELEMENT VALUES FOR NEGATIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---|---|---|---|---|---|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.406 | 1.703 | 0.691 | 1.177 | 0.0056 |
| 14 | 1.666 | 0.012 | 0.020 | 0.000 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 7.791 | | 8.048 | 12.025 | 1.0992 |

$S_x$ = 0.112 in3
$I_x$ = 0.115 in4
$Y_{cg}$= 1.033 in

Webs Fully Effective  [SEC. B2.3(a)] Yes

**New Tech SS210-A Panel**

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MAXIMUM NOMINAL MOMENTS - [Section C3.1.1(a)]

    Mnx  [positive bending] =   +6.139 k-in
    Mnx  [negative bending] =   -3.934 k-in

MAXIMUM ALLOWABLE REACTIONS - [Table C3.4-1]

    N/t= 83.33
    k  = 1.515
    C1 = 0.887
    C2 = 0.960
    C3 = 0.830
    C4 = 0.900
    C9 = 1.000
    C0 = 1.000  - Element 2, 22

    Pend= t^2*k*C3*C4*C9*C0[217 - 0.28(h/t)][0.71 + 0.015(N/t)]
    h/t = 78.00 | Pe( 2)= 1 *  0.249 kips =  0.249 kips
    h/t = 78.00 | Pe(22)= 1 *  0.249 kips =  0.249 kips
    Pend=  0.499 kips

    Pint= t^2*k*C1*C2*C9*C0[538 - 0.74(h/t)][0.75 + 0.011(N/t)]
    h/t = 78.00 | Pi( 2)= 1 *  0.595 kips =  0.595 kips
    h/t = 78.00 | Pi(22)= 1 *  0.595 kips =  0.595 kips
    Pint=  1.189 kips

MAXIMUM NOMINAL SHEAR - [Section C3.2]

    E  =  29,500 ksi
    Fy =   50.00 ksi
    kv =   5.34       - for unreinforced webs
    0.960*Sqr(Ekv/Fy) = 53.88
    1.415*Sqr(Ekv/Fy) = 79.42

    h/t = 78.00 | V( 2) = 1 *  1.035 kips =  1.035 kips    (Eq. C3.2-2)
    h/t = 78.00 | V(22) = 1 *  1.035 kips =  1.035 kips    (Eq. C3.2-2)

    Vn  =  2.069 kips

## New Tech SS210-A Panel
===================================================================================

Sheet Gauge = 0.0240 in, 24 gauge

PANEL ELEMENTS EXCEEDING AISI ALLOWABLE RATIOS

Element No. 14 : w/t>500    -Actual w/t = 661


NOTE: AISI Specifications,  Section B1.1(a) states ....

stiffened elements having w/t ratios larger than 500 can be used
with adequate design strength  to sustain  the  required  loads;
however; substantial deformations of such elements usually  will
invalidate the design equations of this Specification.

John F. Butts & Associates, Inc.
2480 Vantage Drive
Colorado Springs, CO 80919
(719) 598-7666

**PROFILE ANALYSIS & DESIGN**

Per AISI Cold-Formed Steel
Design Manual, 1996 Edition

**New Tech SS210-A Panel**
===================================================================

FILE NAME: NT210

### DIMENSIONS

| | | | | | |
|---|---|---|---|---|---|
| Line # 1 Angle (R) = | -90.000 deg | | Line # 1 Angle (L) = | 90.000 deg | |
| Radius (R) = | 0.040 in | | Radius (L) = | 0.040 in | |
| Length (R) = | 1.872 in | | Length (L) = | 1.872 in | |
| Line # 2 Angle (R) = | 90.000 deg | | Line # 2 Angle (L) = | 90.000 deg | |
| Radius (R) = | 0.040 in | | Radius (L) = | 0.040 in | |
| Length (R) = | 0.671 in | | Length (L) = | 0.546 in | |
| Line # 3 Angle (R) = | 90.000 deg | | Line # 3 Angle (L) = | 90.000 deg | |
| Radius (R) = | 0.070 in | | Radius (L) = | 0.070 in | |
| Length (R) = | 0.406 in | | Length (L) = | 0.174 in | |

Panel Bottom Width  = 17.872 in
Panel Overall Width = 18.000 in
Panel Overall Height= 2.000 in

### SPECIAL CONDITIONS

Seam Rotation : 90 deg.

Alloy: ASTM A653, G50
$F_y$ =  50.00 ksi
$F_v$ =  21.18 ksi

QUALIFICATIONS PER AISI SPECIFICATIONS
(a) Maximum w/t Ratio's Exceeded [SEC. B1.1(a)] | No
(b) Maximum h/t Ratio's Exceeded [SEC. B1.2(a)] | No

PROPERTIES FOR LOAD/SPAN TABLES
Aweb= 0.098 in2
$S_{xp}$ = 0.123 in3      $S_{xp}$ (per ft. of width) = 0.082 in3
$S_{xn}$ = 0.079 in3      $S_{xn}$ (per ft. of width) = 0.053 in3
$I_{xp}$ = 0.229 in4      $I_{xp}$ (per ft. of width) = 0.153 in4
$I_{xn}$ = 0.116 in4      $I_{xn}$ (per ft. of width) = 0.077 in4
Weight= 1.96 lb/lf

**New Tech SS210-A Panel**

================================================================

| Member – New Tech SS210-A Panel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | Name | Gage | Hgt (in) | Width (in) | Lip (in) | t (in) | Weight lb/ft | Coil Width (in) |
| Panel | PNL | 24 | 2.000 | 18.000 | 0.000 | 0.0240 | 1.960 | 24.00 |

| Gross Section Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Area (in2) | Ix (in4) | Sx (in3) | Rx (in) | Ycg (in) | Iy (in4) | Sy (in3) | Ry (in) | Xcg (in) |
| 0.576 | 0.247 | 0.149 | 0.655 | 0.343 | 23.421 | 2.436 | 6.377 | 9.166 |

| Effective Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ix (in4) | Sx (in3) | Iy (in4) | Sy (in3) | Mnx (in-k) | Mny (in-k) | Vnx (kip) | End Bearing Pne (kip) | Pnei (k/in) |
| 0.229 | 0.123 | 0.000 | 0.000 | 3.94 | 0.00 | 2.069 | 0.181 | 0.159 |

| Torsional Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Xo (in) | Ro (in) | Beta | Cw (in6) | Jv*1000 (in4) | Fy (ksi) | Fu (ksi) | E (ksi) | G (ksi) |
| -0.952 | 6.481 | 0.978 | 14.78 | 0.111 | 50 | 65 | 29500 | 11300 |

Shear, moment and bearing values shown are nominal values and must be modified by the appropriate factors of safety (ASD) or resistance factors (LRFD).

Factors of Safety (ASD)
$\Omega$ (Compression)    = 1.80
$\Omega$ (Tension)        = 1.67
$\Omega$ (Web Crippling)  = 1.85
$\Omega$ (Bending)        = 1.67
$\Omega$ (Shear)          = 1.67

Resistance Factors (LRFD)
$\phi$ (Compression)    = 0.85
$\phi$ (Tension)        = 0.95
$\phi$ (Web Crippling)  = 0.75
$\phi$ (Bending)        = 1.11
$\phi$ (Shear)          = 0.90

**New Tech SS210-A Panel**

==========================================================================

Moment of Inertia @ 90 degree Rotation

| ELEMENT | L | Y | LY | LYY | Io |
|---------|-------|--------|---------|----------|----------|
| 1 | 0.082 | 17.969 | 1.468 | 26.374 | 0.0000 |
| 2 | 1.872 | 17.988 | 33.674 | 605.719 | 0.0000 |
| 3 | 0.082 | 18.007 | 1.471 | 26.485 | 0.0000 |
| 4 | 0.671 | 18.375 | 12.330 | 226.569 | 0.0252 |
| 5 | 0.129 | 18.763 | 2.417 | 45.347 | 0.0001 |
| 6 | 0.406 | 18.793 | 7.630 | 143.390 | 0.0000 |
| 14 | 17.872 | 9.000 | 160.848 | 1447.632 | 475.7055 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 0.012 | 0.022 | 0.000 | 0.0000 |
| 23 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 24 | 0.546 | 0.337 | 0.184 | 0.062 | 0.0136 |
| 25 | 0.075 | 0.662 | 0.050 | 0.033 | 0.0001 |
| 26 | 0.227 | 0.692 | 0.157 | 0.109 | 0.0000 |
| | 23.997 | | 220.256 | 2521.720 | 475.7445 |

Ix = 23.421 in4
Ycg= 9.178 in

**New Tech SS210-A Panel**

===============================================================================

LOAD

## ELEMENT VALUES FOR POSITIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|-------|-------|--------|--------|---------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.676 | 1.285 | -0.869 | -1.116 | -0.0257 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.292 | 1.760 | 0.514 | 0.904 | 0.0056 |
| 14 | 17.872 | 0.012 | 0.214 | 0.003 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.676 | 1.285 | -0.869 | -1.116 | -0.0257 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 22.531 | | 6.327 | 9.521 | 1.0477 |

$Sx$ = 0.123 in3
$Ix$ = 0.211 in4
$Ycg$= 0.281 in

Webs Fully Effective  [SEC. B2.3(a)] | No

**New Tech SS210-A Panel**

================================================================================

DEFLECTION

ELEMENT VALUES FOR POSITIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|------|------|------|------|------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.321 | 1.363 | -0.437 | -0.596 | -0.0028 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.372 | 1.720 | 0.639 | 1.100 | 0.0056 |
| 14 | 17.872 | 0.012 | 0.214 | 0.003 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.321 | 1.363 | -0.437 | -0.596 | -0.0028 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 23.321 | | 7.316 | 10.758 | 1.0937 |

Sx =   0.136 in3
Ix =   0.229 in4
Ycg=   0.314 in

Webs Fully Effective  [SEC. B2.3(a)]│ No

**New Tech SS210-A Panel**
===========================================================================
LOAD

| | | ELEMENT VALUES FOR NEGATIVE BENDING | | | |
|---|---|---|---|---|---|
| ELEMENT | L | Y | LY | LYY | Io |
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 2a | -0.354 | 0.509 | -0.180 | -0.092 | -0.0037 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.406 | 1.703 | 0.691 | 1.177 | 0.0056 |
| 14 | 1.093 | 0.012 | 0.013 | 0.000 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 22a | -0.354 | 0.509 | -0.180 | -0.092 | -0.0037 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 6.511 | | 7.681 | 11.842 | 1.0918 |

$Sx$ =  0.079 in3
$Ix$ =  0.093 in4
$Ycg$= 1.180 in

Webs Fully Effective  [SEC. B2.3(a)]│ No

**New Tech SS210-A Panel**
=====================================================================
DEFLECTION

ELEMENT VALUES FOR NEGATIVE BENDING

| ELEMENT | L | Y | LY | LYY | Io |
|---------|------|------|------|------|------|
| 1 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 2 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 3 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 4 | 0.671 | 1.988 | 1.334 | 2.652 | 0.0000 |
| 5 | 0.129 | 1.958 | 0.252 | 0.494 | 0.0001 |
| 6 | 0.406 | 1.703 | 0.691 | 1.177 | 0.0056 |
| 14 | 1.670 | 0.012 | 0.020 | 0.000 | 0.0000 |
| 21 | 0.082 | 0.031 | 0.003 | 0.000 | 0.0000 |
| 22 | 1.872 | 1.000 | 1.872 | 1.872 | 0.5467 |
| 23 | 0.082 | 1.969 | 0.161 | 0.317 | 0.0000 |
| 24 | 0.546 | 1.988 | 1.085 | 2.158 | 0.0000 |
| 25 | 0.075 | 1.958 | 0.148 | 0.289 | 0.0001 |
| 26 | 0.227 | 1.964 | 0.447 | 0.877 | 0.0000 |
| | 7.796 | | 8.048 | 12.025 | 1.0992 |

$S_x$ = 0.112 in3
$I_x$ = 0.116 in4
$Y_{cg}$= 1.032 in

Webs Fully Effective [SEC. B2.3(a)] Yes

**New Tech SS210-A Panel**
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MAXIMUM NOMINAL MOMENTS - [Section C3.1.1(a)]

    Mnx  [positive bending] =   +6.137 k-in
    Mnx  [negative bending] =   -3.939 k-in

MAXIMUM ALLOWABLE REACTIONS - [Table C3.4-1]

    N/t= 83.33
    k  = 1.515
    C1 = 0.887
    C2 = 0.960
    C3 = 0.830
    C4 = 0.900
    C9 = 1.000
    C0 = 1.000  - Element 2, 22

    Pend= $t^2 \cdot k \cdot C3 \cdot C4 \cdot C9 \cdot C0[217 - 0.28(h/t)][0.71 + 0.015(N/t)]$
    h/t = 78.00 | Pe( 2)= 1 *  0.249 kips =  0.249 kips
    h/t = 78.00 | Pe(22)= 1 *  0.249 kips =  0.249 kips
    Pend=  0.499 kips

    Pint= $t^2 \cdot k \cdot C1 \cdot C2 \cdot C9 \cdot C0[538 - 0.74(h/t)][0.75 + 0.011(N/t)]$
    h/t = 78.00 | Pi( 2)= 1 *  0.595 kips =  0.595 kips
    h/t = 78.00 | Pi(22)= 1 *  0.595 kips =  0.595 kips
    Pint=  1.189 kips

MAXIMUM NOMINAL SHEAR - [Section C3.2]

    E  =  29,500 ksi
    Fy =   50.00 ksi
    kv =   5.34     - for unreinforced webs
    0.960*Sqr(Ekv/Fy) = 53.88
    1.415*Sqr(Ekv/Fy) = 79.42

    h/t = 78.00 | V( 2) = 1 *  1.035 kips =  1.035 kips   (Eq. C3.2-2)
    h/t = 78.00 | V(22) = 1 *  1.035 kips =  1.035 kips   (Eq. C3.2-2)

    Vn  =  2.069 kips

**New Tech SS210-A Panel**
==========================================================================

Sheet Gauge = 0.0240 in, 24 gauge

PANEL ELEMENTS EXCEEDING AISI ALLOWABLE RATIOS

   Element No. 14 : w/t>500   -Actual w/t = 745


NOTE: AISI Specifications,  Section B1.1(a) states ....

   stiffened elements having w/t ratios larger than 500 can be used
   with adequate design strength  to sustain  the  required  loads;
   however; substantial deformations of such elements usually  will
   invalidate the design equations of this Specification.

## New Tech SS210-A Panel

======================================================================
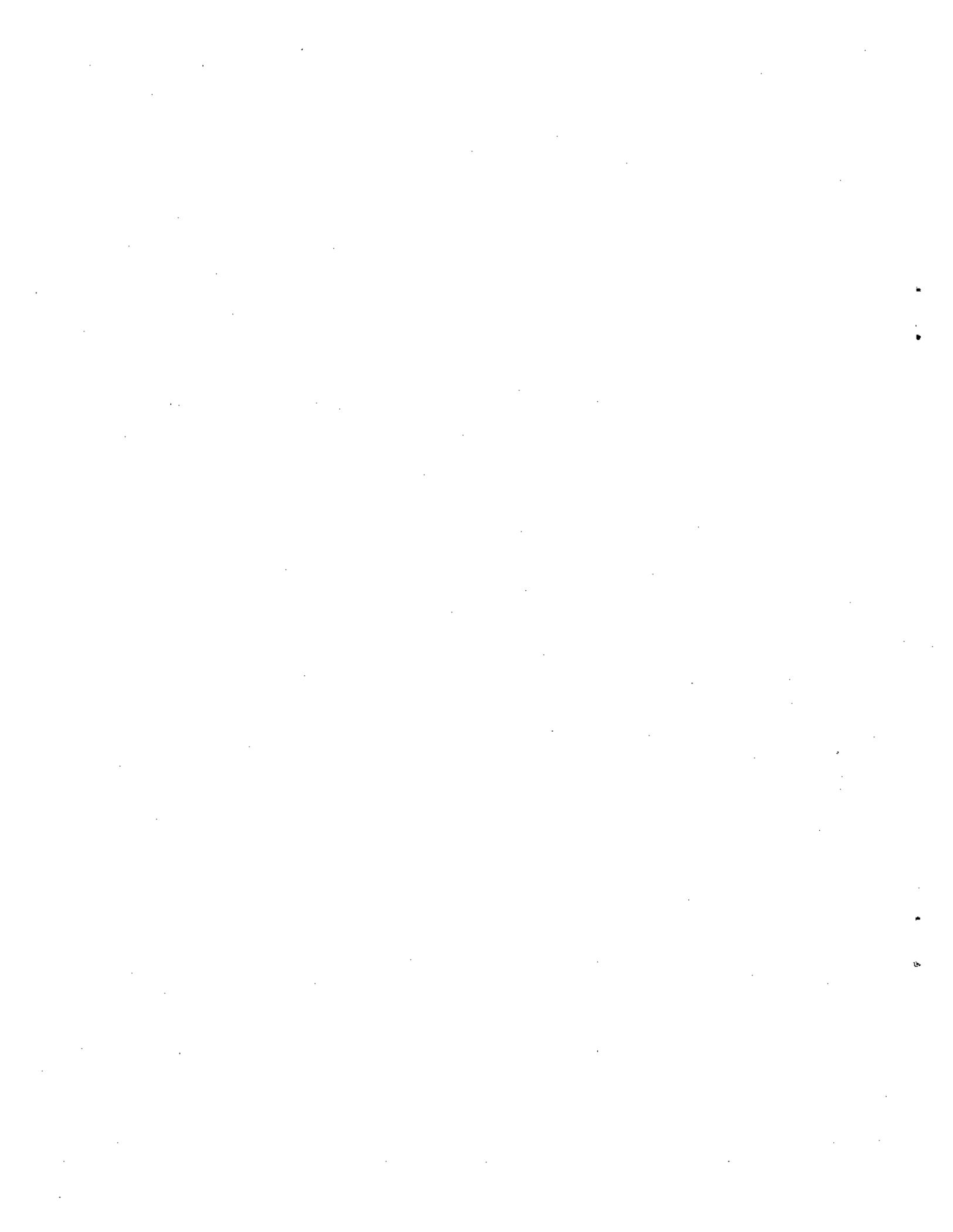
| | |
|---|---|
| Width | 12.00 in |
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

| SPAN | DEFLECTION | ALLOWABLE STRENGTH DESIGN (ASD) Wind Load Factor = 1.0 ALLOWABLE UNIFORM LOAD (PSF) SPAN LENGTH (Feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2.00 | 2.25 | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 | 3.75 | 4.00 |
| 1 | L/180 | 268 | 238 | 214 | 195 | 173 | 147 | 126 | 110 | 96 |
| | L/240 | 268 | 238 | 214 | 195 | 173 | 147 | 126 | 110 | 96 |
| | L/360 | 268 | 238 | 214 | 195 | 173 | 147 | 126 | 110 | 96 |
| 2 | L/180 | 336 | 286 | 234 | 195 | 173 | 147 | 126 | 110 | 96 |
| | L/240 | 336 | 286 | 234 | 195 | 173 | 147 | 126 | 110 | 96 |
| | L/360 | 336 | 286 | 234 | 195 | 173 | 147 | 126 | 110 | 96 |
| 3 | L/180 | 336 | 298 | 268 | 225 | 191 | 163 | 142 | 124 | 109 |
| | L/240 | 336 | 298 | 268 | 225 | 191 | 163 | 142 | 124 | 109 |
| | L/360 | 336 | 298 | 268 | 225 | 191 | 163 | 142 | 124 | 109 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   - $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$
   Two Span   - $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$
   Three Span - $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E) = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)      [AISI C3.2]
   b) Combined Bending and Shear       [AISI C3.3]
   c) Combined Bending & Web Crippling [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)       = 1.67
   $\Omega$ (Shear)         = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  8.666 ft  (L/180)
   Two Span    : Max. Span = 10.411 ft  (L/180)
   Three Span +: Max. Span = 10.666 ft  (L/180)

## New Tech SS210-A Panel

| Width | 12.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)

| SPAN | DEFLECTION | SPAN LENGTH (Feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 4.25 | 4.50 | 4.75 | 5.00 | 5.25 | 5.50 | 5.75 | 6.00 | 6.25 |
| 1 | L/180 | 85 | 76 | 68 | 61 | 55 | 50 | 46 | 42 | 39 |
| | L/240 | 85 | 76 | 68 | 61 | 55 | 50 | 46 | 42 | 39 |
| | L/360 | 85 | 76 | 68 | 61 | 55 | 50 | 46 | 42 | 38 |
| 2 | L/180 | 85 | 76 | 68 | 61 | 55 | 50 | 46 | 42 | 39 |
| | L/240 | 85 | 76 | 68 | 61 | 55 | 50 | 46 | 42 | 39 |
| | L/360 | 85 | 76 | 68 | 61 | 55 | 50 | 46 | 42 | 39 |
| 3 | L/180 | 97 | 86 | 78 | 70 | 64 | 58 | 53 | 49 | 45 |
| | L/240 | 97 | 86 | 78 | 70 | 64 | 58 | 53 | 49 | 45 |
| | L/360 | 97 | 86 | 78 | 70 | 64 | 58 | 53 | 49 | 45 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span    — $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$
   Two Span    — $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$
   Three Span — $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E)  = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)        [AISI C3.2]
   b) Combined Bending and Shear        [AISI C3.3]
   c) Combined Bending & Web Crippling  [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)       = 1.67
   $\Omega$ (Shear)         = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  8.666 ft  (L/180)
   Two Span    : Max. Span = 10.411 ft  (L/180)
   Three Span +: Max. Span = 10.666 ft  (L/180)

**New Tech SS210-A Panel**

====================================================================

| Width | 12.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

| | | ALLOWABLE STRENGTH DESIGN (ASD) Wind Load Factor = 1.0 ALLOWABLE UNIFORM LOAD (PSF) SPAN LENGTH (Feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SPAN | DEFLECTION | 6.50 | 6.75 | 7.00 | 7.25 | 7.50 | 7.75 | 8.00 | 8.25 | 8.50 |
| 1 | L/180 | 36 | 33 | 30 | 28 | 26 | 25 | 23 | 22 | 20 |
|   | L/240 | 36 | 33 | 30 | 28 | 26 | 25 | 23 | 22 | 20 |
|   | L/360 | 34 | 30 | 27 | 25 | 22 | 20 | 18 | 17 | 15 |
| 2 | L/180 | 36 | 33 | 30 | 28 | 26 | 25 | 23 | 22 | 20 |
|   | L/240 | 36 | 33 | 30 | 28 | 26 | 25 | 23 | 22 | 20 |
|   | L/360 | 36 | 33 | 30 | 28 | 26 | 25 | 23 | 22 | 20 |
| 3 | L/180 | 41 | 38 | 35 | 33 | 31 | 29 | 27 | 25 | 24 |
|   | L/240 | 41 | 38 | 35 | 33 | 31 | 29 | 27 | 25 | 24 |
|   | L/360 | 41 | 38 | 35 | 33 | 31 | 29 | 27 | 25 | 24 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   - $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$
   Two Span   - $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$
   Three Span - $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E)  = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)      [AISI C3.2]
   b) Combined Bending and Shear     [AISI C3.3]
   c) Combined Bending & Web Crippling [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)      = 1.67
   $\Omega$ (Shear)        = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  8.666 ft  (L/180)
   Two Span   : Max. Span = 10.411 ft  (L/180)
   Three Span +: Max. Span = 10.666 ft  (L/180)

## New Tech SS210-A Panel

========================================================================

| Width | 12.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

---

ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)
SPAN LENGTH (Feet)

| SPAN | DEFLECTION | 8.75 | 9.00 | 9.25 | 9.50 | 9.75 | 10.00 | 10.25 | 10.50 | 10.75 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L/180 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 13 | 12 |
| | L/240 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 |
| | L/360 | 14 | 13 | 12 | 11 | 10 | 9 | 9 | 8 | 8 |
| 2 | L/180 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 13 | 12 |
| | L/240 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 13 | 12 |
| | L/360 | 19 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 11 |
| 3 | L/180 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 |
| | L/240 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 |
| | L/360 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span  — Mp= .125wl$^2$, Mn= .125wl$^2$, x= .0130wl$^4$/EI
   Two Span  — Mp= .125wl$^2$, Mn= .096wl$^2$, x= .0092wl$^4$/EI
   Three Span — Mp= .080wl$^2$, Mn= .107wl$^2$, x= .0069wl$^4$/EI
   Modulas of Elasticity (E)  = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)      [AISI C3.2]
   b) Combined Bending and Shear       [AISI C3.3]
   c) Combined Bending & Web Crippling [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)      = 1.67
   $\Omega$ (Shear)        = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  8.666 ft  (L/180)
   Two Span    : Max. Span = 10.411 ft  (L/180)
   Three Span +: Max. Span = 10.666 ft  (L/180)

## New Tech SS210-A Panel

| Width | 14.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)
SPAN LENGTH (Feet)

| SPAN | DEFLECTION | 2.00 | 2.25 | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 | 3.75 | 4.00 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L/180 | 230 | 204 | 183 | 167 | 148 | 126 | 108 | 94 | 83 |
|   | L/240 | 230 | 204 | 183 | 167 | 148 | 126 | 108 | 94 | 83 |
|   | L/360 | 230 | 204 | 183 | 167 | 148 | 126 | 108 | 94 | 83 |
| 2 | L/180 | 287 | 245 | 201 | 167 | 148 | 126 | 108 | 94 | 83 |
|   | L/240 | 287 | 245 | 201 | 167 | 148 | 126 | 108 | 94 | 83 |
|   | L/360 | 287 | 245 | 201 | 167 | 148 | 126 | 108 | 94 | 83 |
| 3 | L/180 | 287 | 255 | 230 | 193 | 164 | 140 | 121 | 106 | 94 |
|   | L/240 | 287 | 255 | 230 | 193 | 164 | 140 | 121 | 106 | 94 |
|   | L/360 | 287 | 255 | 230 | 193 | 164 | 140 | 121 | 106 | 94 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   - Mp= .125wl$^2$, Mn= .125wl$^2$, x= .0130wl$^4$/EI
   Two Span   - Mp= .125wl$^2$, Mn= .096wl$^2$, x= .0092wl$^4$/EI
   Three Span - Mp= .080wl$^2$, Mn= .107wl$^2$, x= .0069wl$^4$/EI
   Modulas of Elasticity (E)  = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)       [AISI C3.2]
   b) Combined Bending and Shear        [AISI C3.3]
   c) Combined Bending & Web Crippling   [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)        = 1.67
   $\Omega$ (Shear)          = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  8.302 ft  (L/180)
   Two Span    : Max. Span =  9.786 ft  (L/180)
   Three Span +: Max. Span = 10.025 ft  (L/180)

## New Tech SS210-A Panel

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| Width | 14.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)
SPAN LENGTH (Feet)

| SPAN | DEFLECTION | 4.25 | 4.50 | 4.75 | 5.00 | 5.25 | 5.50 | 5.75 | 6.00 | 6.25 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L/180 | 73 | 65 | 58 | 52 | 47 | 43 | 39 | 36 | 33 |
|   | L/240 | 73 | 65 | 58 | 52 | 47 | 43 | 39 | 36 | 33 |
|   | L/360 | 73 | 65 | 58 | 52 | 47 | 43 | 39 | 36 | 33 |
| 2 | L/180 | 73 | 65 | 58 | 52 | 47 | 43 | 39 | 36 | 33 |
|   | L/240 | 73 | 65 | 58 | 52 | 47 | 43 | 39 | 36 | 33 |
|   | L/360 | 73 | 65 | 58 | 52 | 47 | 43 | 39 | 36 | 33 |
| 3 | L/180 | 83 | 74 | 67 | 60 | 54 | 50 | 45 | 42 | 38 |
|   | L/240 | 83 | 74 | 67 | 60 | 54 | 50 | 45 | 42 | 38 |
|   | L/360 | 83 | 74 | 67 | 60 | 54 | 50 | 45 | 42 | 38 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   — $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$
   Two Span   — $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$
   Three Span — $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E)   = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)        [AISI C3.2]
   b) Combined Bending and Shear         [AISI C3.3]
   c) Combined Bending & Web Crippling   [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)       = 1.67
   $\Omega$ (Shear)         = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  8.302 ft  (L/180)
   Two Span    : Max. Span =  9.786 ft  (L/180)
   Three Span +: Max. Span = 10.025 ft  (L/180)

**New Tech SS210-A Panel**

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| Width | 14.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)
SPAN LENGTH (Feet)

| SPAN | DEFLECTION | 6.50 | 6.75 | 7.00 | 7.25 | 7.50 | 7.75 | 8.00 | 8.25 | 8.50 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L/180 | 30 | 28 | 26 | 24 | 23 | 21 | 20 | 18 | 17 |
|   | L/240 | 30 | 28 | 26 | 24 | 23 | 21 | 20 | 18 | 17 |
|   | L/360 | 30 | 27 | 24 | 22 | 20 | 18 | 16 | 15 | 13 |
| 2 | L/180 | 30 | 28 | 26 | 24 | 23 | 21 | 20 | 18 | 17 |
|   | L/240 | 30 | 28 | 26 | 24 | 23 | 21 | 20 | 18 | 17 |
|   | L/360 | 30 | 28 | 26 | 24 | 23 | 21 | 20 | 18 | 17 |
| 3 | L/180 | 35 | 33 | 30 | 28 | 26 | 24 | 23 | 21 | 20 |
|   | L/240 | 35 | 33 | 30 | 28 | 26 | 24 | 23 | 21 | 20 |
|   | L/360 | 35 | 33 | 30 | 28 | 26 | 24 | 23 | 21 | 20 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   - $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$
   Two Span   - $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$
   Three Span - $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E) = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)          [AISI C3.2]
   b) Combined Bending and Shear            [AISI C3.3]
   c) Combined Bending & Web Crippling      [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)        = 1.67
   $\Omega$ (Shear)          = 1.67
   $\Omega$ (Web Crippling)  = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span  : Max. Span =  8.302 ft  (L/180)
   Two Span     : Max. Span =  9.786 ft  (L/180)
   Three Span +: Max. Span = 10.025 ft  (L/180)

**New Tech SS210-A Panel**

===========================================================================

| Width | 14.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

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ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)

| SPAN | DEFLECTION | SPAN LENGTH (Feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 8.75 | 9.00 | 9.25 | 9.50 | 9.75 | 10.00 | 10.25 | 10.50 | 10.75 |
| 1 | L/180 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | 11 | 10 |
| | L/240 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | 11 | 10 |
| | L/360 | 12 | 11 | 10 | 10 | 9 | 8 | 8 | 7 | 7 |
| 2 | L/180 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | 11 | 10 |
| | L/240 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | 11 | 10 |
| | L/360 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | 10 | 9 |
| 3 | L/180 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 13 | 12 |
| | L/240 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 13 | 12 |
| | L/360 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 13 | 12 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span    - $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$
   Two Span    - $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$
   Three Span - $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E)  = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)      [AISI C3.2]
   b) Combined Bending and Shear       [AISI C3.3]
   c) Combined Bending & Web Crippling [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)       = 1.67
   $\Omega$ (Shear)         = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  8.302 ft  (L/180)
   Two Span    : Max. Span =  9.786 ft  (L/180)
   Three Span +: Max. Span = 10.025 ft  (L/180)

**New Tech SS210-A Panel**

| Width | 16.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)
SPAN LENGTH (Feet)

| SPAN | DEFLECTION | 2.00 | 2.25 | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 | 3.75 | 4.00 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L/180 | 201 | 178 | 160 | 146 | 130 | 110 | 95 | 82 | 72 |
|   | L/240 | 201 | 178 | 160 | 146 | 130 | 110 | 95 | 82 | 72 |
|   | L/360 | 201 | 178 | 160 | 146 | 130 | 110 | 95 | 82 | 72 |
| 2 | L/180 | 251 | 215 | 176 | 147 | 130 | 110 | 95 | 82 | 72 |
|   | L/240 | 251 | 215 | 176 | 147 | 130 | 110 | 95 | 82 | 72 |
|   | L/360 | 251 | 215 | 176 | 147 | 130 | 110 | 95 | 82 | 72 |
| 3 | L/180 | 251 | 223 | 201 | 169 | 143 | 123 | 106 | 93 | 82 |
|   | L/240 | 251 | 223 | 201 | 169 | 143 | 123 | 106 | 93 | 82 |
|   | L/360 | 251 | 223 | 201 | 169 | 143 | 123 | 106 | 93 | 82 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:

   One Span   — $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$

   Two Span   — $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$

   Three Span - $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$

   Modulas of Elasticity (E) = 29,500 ksi

2. Allowable uniform loads are determined per the following:

   a) Allowable Shear Stress (Fv)       [AISI C3.2]

   b) Combined Bending and Shear        [AISI C3.3]

   c) Combined Bending & Web Crippling  [AISI C3.5]

3. Factors of Safety used to determine uniform loads:

   $\Omega$ (Bending)       = 1.67

   $\Omega$ (Shear)         = 1.67

   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in

   Simple Span : Max. Span = 7.849 ft (L/180)

   Two Span    : Max. Span = 9.253 ft (L/180)

   Three Span +: Max. Span = 9.479 ft (L/180)

## New Tech SS210-A Panel

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| Width | 16.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

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ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)
SPAN LENGTH (Feet)

| SPAN | DEFLECTION | 4.25 | 4.50 | 4.75 | 5.00 | 5.25 | 5.50 | 5.75 | 6.00 | 6.25 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L/180 | 64 | 57 | 51 | 46 | 41 | 38 | 34 | 31 | 29 |
|   | L/240 | 64 | 57 | 51 | 46 | 41 | 38 | 34 | 31 | 29 |
|   | L/360 | 64 | 57 | 51 | 46 | 41 | 38 | 34 | 31 | 29 |
| 2 | L/180 | 64 | 57 | 51 | 46 | 41 | 38 | 34 | 31 | 29 |
|   | L/240 | 64 | 57 | 51 | 46 | 41 | 38 | 34 | 31 | 29 |
|   | L/360 | 64 | 57 | 51 | 46 | 41 | 38 | 34 | 31 | 29 |
| 3 | L/180 | 73 | 65 | 58 | 52 | 48 | 43 | 40 | 36 | 33 |
|   | L/240 | 73 | 65 | 58 | 52 | 48 | 43 | 40 | 36 | 33 |
|   | L/360 | 73 | 65 | 58 | 52 | 48 | 43 | 40 | 36 | 33 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   - Mp= .125wl$^2$, Mn= .125wl$^2$, x= .0130wl$^4$/EI
   Two Span   - Mp= .125wl$^2$, Mn= .096wl$^2$, x= .0092wl$^4$/EI
   Three Span - Mp= .080wl$^2$, Mn= .107wl$^2$, x= .0069wl$^4$/EI
   Modulas of Elasticity (E)  = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)      [AISI C3.2]
   b) Combined Bending and Shear       [AISI C3.3]
   c) Combined Bending & Web Crippling  [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)       = 1.67
   $\Omega$ (Shear)         = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  7.849 ft  (L/180)
   Two Span    : Max. Span =  9.253 ft  (L/180)
   Three Span +: Max. Span =  9.479 ft  (L/180)

New Tech SS210-A Panel
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| Width | 16.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

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ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)

| SPAN | DEFLECTION | SPAN LENGTH (Feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 6.50 | 6.75 | 7.00 | 7.25 | 7.50 | 7.75 | 8.00 | 8.25 | 8.50 |
| 1 | L/180 | 27 | 25 | 23 | 21 | 20 | 18 | 17 | 16 | 15 |
| | L/240 | 27 | 25 | 23 | 21 | 20 | 18 | 17 | 16 | 15 |
| | L/360 | 27 | 24 | 22 | 19 | 18 | 16 | 14 | 13 | 12 |
| 2 | L/180 | 27 | 25 | 23 | 21 | 20 | 18 | 17 | 16 | 15 |
| | L/240 | 27 | 25 | 23 | 21 | 20 | 18 | 17 | 16 | 15 |
| | L/360 | 27 | 25 | 23 | 21 | 20 | 18 | 17 | 16 | 15 |
| 3 | L/180 | 31 | 28 | 26 | 25 | 23 | 21 | 20 | 19 | 18 |
| | L/240 | 31 | 28 | 26 | 25 | 23 | 21 | 20 | 19 | 18 |
| | L/360 | 31 | 28 | 26 | 25 | 23 | 21 | 20 | 19 | 18 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   — $M_p= .125wl^2$, $M_n= .125wl^2$, $x= .0130wl^4/EI$
   Two Span   — $M_p= .125wl^2$, $M_n= .096wl^2$, $x= .0092wl^4/EI$
   Three Span — $M_p= .080wl^2$, $M_n= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E)  = 29,500 ksi.

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)     [AISI C3.2]
   b) Combined Bending and Shear      [AISI C3.3]
   c) Combined Bending & Web Crippling [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)       = 1.67
   $\Omega$ (Shear)         = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  7.849 ft  (L/180)
   Two Span    : Max. Span =  9.253 ft  (L/180)
   Three Span +: Max. Span =  9.479 ft  (L/180)

## New Tech SS210-A Panel

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| Width | 16.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. |

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ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)
SPAN LENGTH (Feet)

| SPAN | DEFLECTION | 8.75 | 9.00 | 9.25 | 9.50 | 9.75 | 10.00 | 10.25 | 10.50 | 10.75 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | L/180 | 14 | 13 | 12 | 12 | 11 | 10 | 10 | 9 | 9 |
|   | L/240 | 14 | 13 | 12 | 12 | 11 | 10 | 10 | 9 | 9 |
|   | L/360 | 11 | 10 | 9 | 9 | 8 | 7 | 7 | 6 | 6 |
| 2 | L/180 | 14 | 13 | 12 | 12 | 11 | 10 | 10 | 9 | 9 |
|   | L/240 | 14 | 13 | 12 | 12 | 11 | 10 | 10 | 9 | 9 |
|   | L/360 | 14 | 13 | 12 | 12 | 11 | 10 | 10 | 9 | 8 |
| 3 | L/180 | 16 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 10 |
|   | L/240 | 16 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 10 |
|   | L/360 | 16 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 10 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span $-$ Mp= .125wl$^2$, Mn= .125wl$^2$, x= .0130wl$^4$/EI
   Two Span $-$ Mp= .125wl$^2$, Mn= .096wl$^2$, x= .0092wl$^4$/EI
   Three Span $-$ Mp= .080wl$^2$, Mn= .107wl$^2$, x= .0069wl$^4$/EI
   Modulas of Elasticity (E) = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)       [AISI C3.2]
   b) Combined Bending and Shear        [AISI C3.3]
   c) Combined Bending & Web Crippling   [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)       = 1.67
   $\Omega$ (Shear)         = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  7.849 ft  (L/180)
   Two Span    : Max. Span =  9.253 ft  (L/180)
   Three Span +: Max. Span =  9.479 ft  (L/180)

**New Tech SS210-A Panel**

| Width | 18.00 in |
|---|---|
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

ALLOWABLE STRENGTH DESIGN (ASD)
Wind Load Factor = 1.0
ALLOWABLE UNIFORM LOAD (PSF)

| SPAN | DEFLECTION | SPAN LENGTH (Feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2.00 | 2.25 | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 | 3.75 | 4.00 |
| 1 | L/180 | 178 | 158 | 142 | 129 | 115 | 98 | 84 | 73 | 64 |
| | L/240 | 178 | 158 | 142 | 129 | 115 | 98 | 84 | 73 | 64 |
| | L/360 | 178 | 158 | 142 | 129 | 115 | 98 | 84 | 73 | 64 |
| 2 | L/180 | 223 | 191 | 156 | 130 | 115 | 98 | 84 | 73 | 64 |
| | L/240 | 223 | 191 | 156 | 130 | 115 | 98 | 84 | 73 | 64 |
| | L/360 | 223 | 191 | 156 | 130 | 115 | 98 | 84 | 73 | 64 |
| 3 | L/180 | 223 | 198 | 178 | 150 | 127 | 109 | 94 | 83 | 73 |
| | L/240 | 223 | 198 | 178 | 150 | 127 | 109 | 94 | 83 | 73 |
| | L/360 | 223 | 198 | 178 | 150 | 127 | 109 | 94 | 83 | 73 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   - $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$
   Two Span   - $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$
   Three Span - $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E)  = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)      [AISI C3.2]
   b) Combined Bending and Shear       [AISI C3.3]
   c) Combined Bending & Web Crippling [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)       = 1.67
   $\Omega$ (Shear)         = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  7.462 ft  (L/180)
   Two Span    : Max. Span =  8.797 ft  (L/180)
   Three Span +: Max. Span =  9.012 ft  (L/180)

### New Tech SS210-A Panel

| | |
|---|---|
| Width | 18.00 in |
| Alloy | ASTM A653, G50 (Fy= 50 ksi) |
| Gauge | 24 (0.024 in) |
| Seam Rotation : 90 deg. | |

**ALLOWABLE STRENGTH DESIGN (ASD)**
**Wind Load Factor = 1.0**
**ALLOWABLE UNIFORM LOAD (PSF)**

| SPAN | DEFLECTION | SPAN LENGTH (Feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 4.25 | 4.50 | 4.75 | 5.00 | 5.25 | 5.50 | 5.75 | 6.00 | 6.25 |
| 1 | L/180 | 57 | 50 | 45 | 41 | 37 | 33 | 30 | 28 | 26 |
| | L/240 | 57 | 50 | 45 | 41 | 37 | 33 | 30 | 28 | 26 |
| | L/360 | 57 | 50 | 45 | 41 | 37 | 33 | 30 | 28 | 26 |
| 2 | L/180 | 57 | 50 | 45 | 41 | 37 | 33 | 30 | 28 | 26 |
| | L/240 | 57 | 50 | 45 | 41 | 37 | 33 | 30 | 28 | 26 |
| | L/360 | 57 | 50 | 45 | 41 | 37 | 33 | 30 | 28 | 26 |
| 3 | L/180 | 64 | 58 | 52 | 47 | 42 | 38 | 35 | 32 | 30 |
| | L/240 | 64 | 58 | 52 | 47 | 42 | 38 | 35 | 32 | 30 |
| | L/360 | 64 | 58 | 52 | 47 | 42 | 38 | 35 | 32 | 30 |

1. Formula's used in Load Tables for FLEXURE and DEFLECTION are:
   One Span   − $Mp= .125wl^2$, $Mn= .125wl^2$, $x= .0130wl^4/EI$
   Two Span   − $Mp= .125wl^2$, $Mn= .096wl^2$, $x= .0092wl^4/EI$
   Three Span − $Mp= .080wl^2$, $Mn= .107wl^2$, $x= .0069wl^4/EI$
   Modulas of Elasticity (E)  = 29,500 ksi

2. Allowable uniform loads are determined per the following:
   a) Allowable Shear Stress (Fv)      [AISI C3.2]
   b) Combined Bending and Shear       [AISI C3.3]
   c) Combined Bending & Web Crippling  [AISI C3.5]

3. Factors of Safety used to determine uniform loads:
   $\Omega$ (Bending)      = 1.67
   $\Omega$ (Shear)        = 1.67
   $\Omega$ (Web Crippling) = 1.85

4. Allowance has been made for member Dead Weight.

5. Minimum panel support bearing length = 2.00 in

6. Concentrated load = 150 lb at mid-span, load width = 4 in
   Simple Span : Max. Span =  7.462 ft  (L/180)
   Two Span    : Max. Span =  8.797 ft  (L/180)
   Three Span +: Max. Span =  9.012 ft  (L/180)