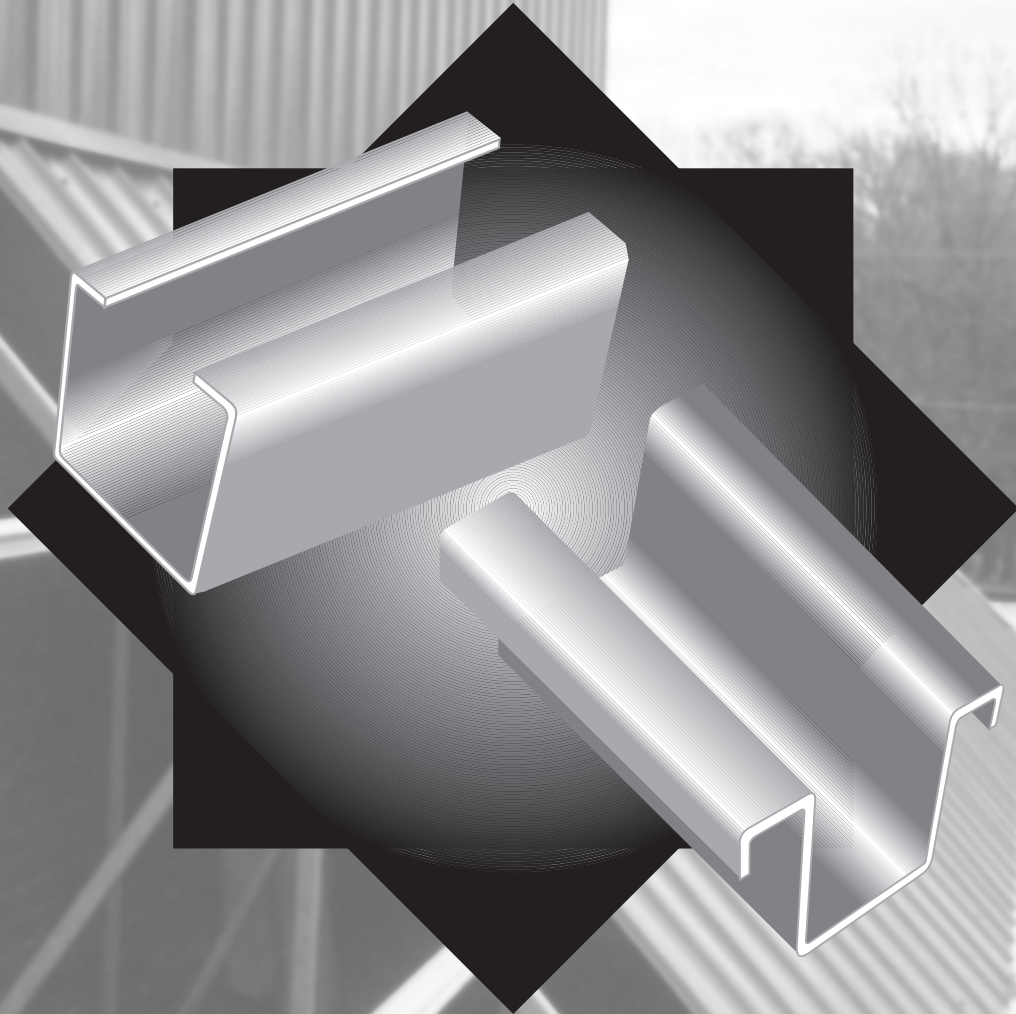


# HAT & CHANNEL

# M A N U A L



**McElroy  
Metal, Inc.**

# TABLE OF CONTENTS

**General Notes** .....1-2

**Erection Suggestions** .....3-8

## **Technical Data for Predesigned Mansard Systems**

Channel Section 18 gauge .....9-10

Hat Section 22 gauge.....11-12

## **Mansard Types**

Sloped Mansard (Below Roof Line) .....13-14

Transitional Mansard (Below Roof Line) .....15-16

Vertical Mansard (Below Roof Line).....17-18

Sloped Equipment Screen.....19-20

Vertical Equipment Screen .....21-22

Vertical Mansard (Above Roof Line Without Back-up Panel) .....23

Sloped Mansard (Above Roof Line Without Back-up Panel) .....24

Vertical Mansard (Above Roof Line With Back-up Panel) .....25

Sloped Mansard (Above Roof Line With Back-up Panel) .....26

**Framing Details** .....27-36

## **Technical data for additional sections**

Channel Section 16 GA.....37-38

Hat Section 20 GA, 18 GA, 16 GA.....39-44



# GENERAL NOTES

## MANSARD SYSTEMS BELOW ROOF LINE

1. The following loads were used in the design of McElroy mansard frames:
  - Dead Load: 3 pounds per square foot.
  - Live Load: 20 pounds per square foot.
  - Wind Load: 90 m.p.h. at 30' height or less. (ASCE7-95)
    - Uplift:  $P = 26.9$  PSF (not reduced).
    - Horizontal:  $P = 26.9$  PSF (not reduced).

Load is based on projected areas.
2. All mansard and fascia frames should be spaced at 5'-0" centers using 22 GA. hat section & 18 GA. channel section. (For 30 pounds per square foot live load use 3'-6" frame spacing).
3. Frame connections between hat/channel sections should be made with (2) #12 x 3/4" self-driller.
4. All stringers (hat sections) should be connected with (2) #12 x 3/4" self-driller.
5. All panels should be connected at stringers with (1) #12 x 1" self-driller.
6. Connection of mansard/fascia frames to the structure is the sole responsibility of the installer.
7. Any substitutions will void engineering of the manual.
8. Hat and channel sections shall be provided in 20' lengths with quantities of 100 pieces or less. Custom lengths are available in 100 pieces or more at a nominal charge.
9. All standard flashing comes in 10', 14', or 20' lengths.
10. Maximum projection above the roof line is 6 inches.

## EQUIPMENT SCREENS

1. All screens are designed for heights up to 75' above grade and 90 m.p.h. wind. (ASCE7-95)
  - Max reaction: vertical 1500 pounds (up/down); horizontal 900 pounds (left/right).
2. All frames should be spaced at 4'-0" on centers using 22 GA. hat section & 18 GA. channel section.
3. Frame connections between hat/channel sections take (4) #12 x 3/4" self-driller at each connection.
4. All stringers (hat sections) should be connected with (2) #12 x 3/4" self-driller.
5. All panels should be connected at stringers with (1) #12 x 1" self-driller.
6. The connection of the frame to the roof is the sole responsibility of the installer.
7. Any substitutions will void the engineering of the manual.
8. Hat and channel sections shall be provided in 20' lengths with quantities of 100 pieces or less. Custom lengths are available in 100 pieces or more at a nominal charge.
9. All standard flashing comes in 10', 14', or 20' lengths.

# GENERAL NOTES

## MANSARD ABOVE ROOF LINE

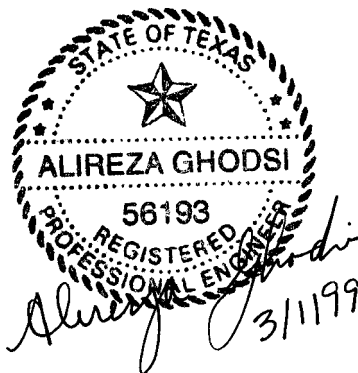
### WITHOUT BACK-UP PANEL

1. Use minimum of (4) #12 x 3/4" self-driller at hat section to structure connections. While (4) #12 x 3/4" self-driller will fulfill the 600# and 1000# vertical load requirements, the integrity of the attaching material is the responsibility of the installer. See Detail J.
2. All other connections will use (2) #12 x 3/4" self-driller (minimum).
3. All frames should be spaced at 4'-0" centers; without back-up panel using 22 GA. hat section & 18 GA. channel section.
4. The frames are designed for 90 m.p.h. wind heights of 30' or less.

### WITH BACK-UP PANEL

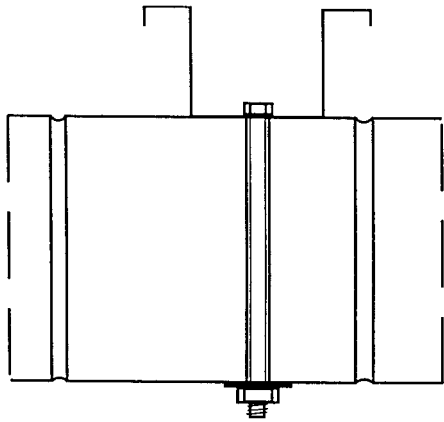
1. Use minimum of (4) #12 x 3/4" self-driller at hat section to structure connections. While (4) #12 x 3/4" self-driller will fulfill the 600# and 1000# vertical load requirements, the integrity of the attaching material is the responsibility of the installer. See Detail J.
2. All other connections will use (2) #12 x 3/4" self-driller (minimum).
3. Space frames according to space chart (pages 25 and 26).
4. The frames are designed for the following loads:
  - Live Load: 20 pounds per square foot (reduced to 16 psf for slopes over 4:12).
  - Wind Load: Based on 90 m.p.h. (P = 26.9 psf not reduced).
  - Uplift: P = 26.9 psf (not reduced).

For areas of 30 pounds or more of snow load, consult McElroy Metal.

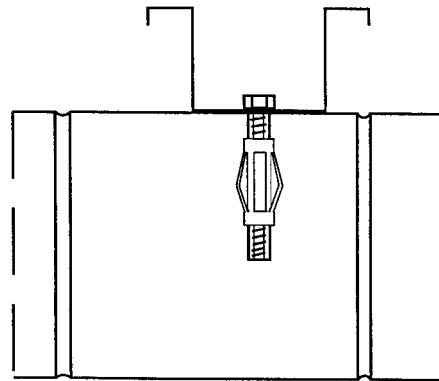


# ERECTION SUGGESTIONS

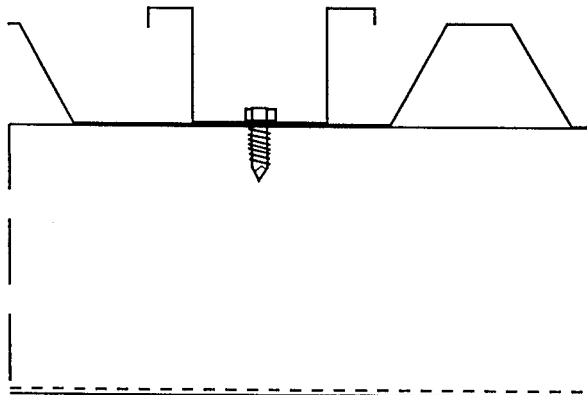
1. Load requirements and the type of materials penetrated should determine the type of fasteners used to connect the frames to the structure. It is recommended that a structural engineer be consulted in determining the proper fastener.



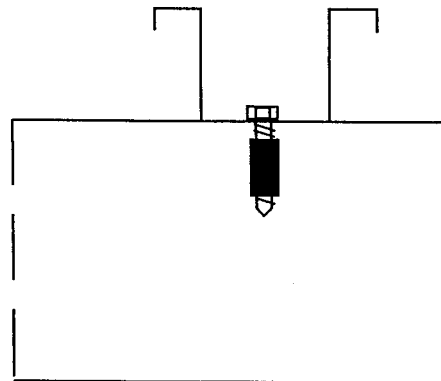
**CMU Attachment**



**Brick or CMU Attachment**



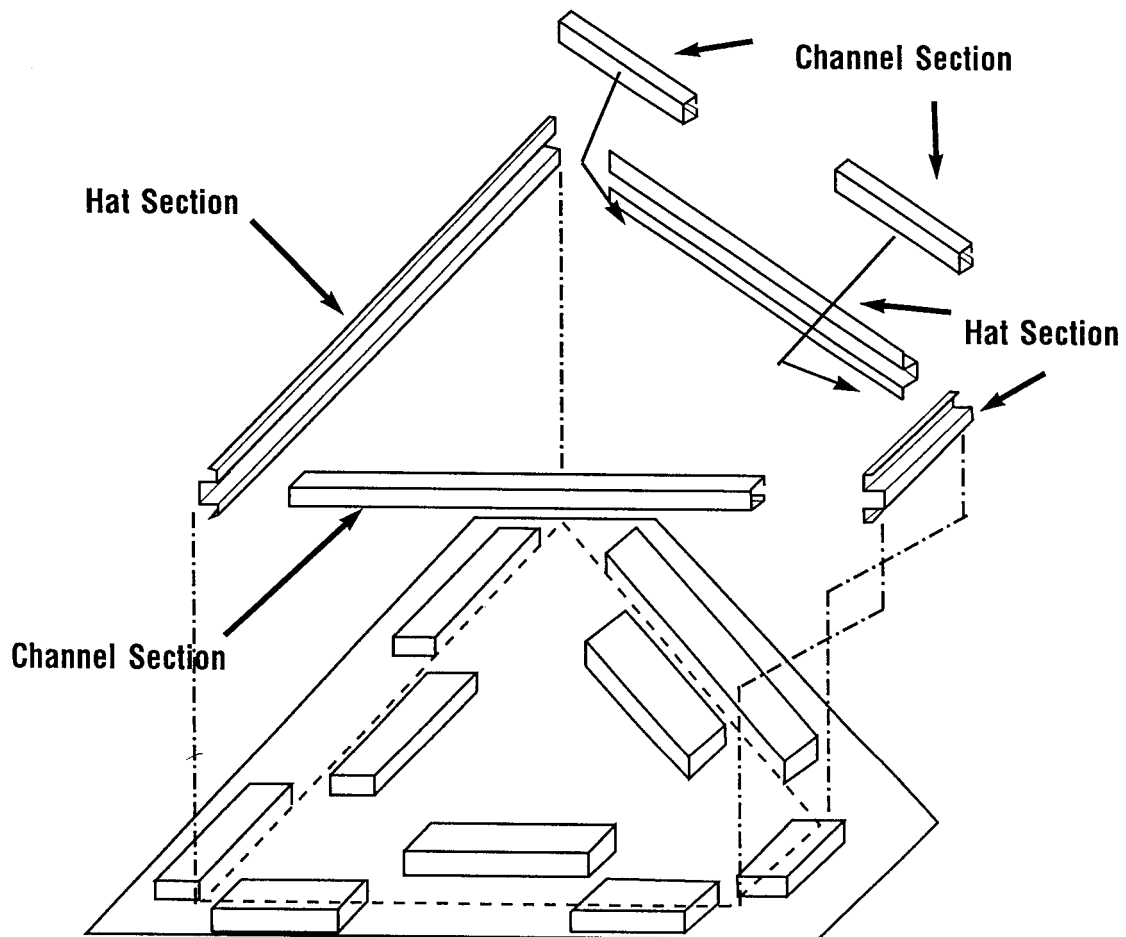
**Metal Building Wall Girt or Purlin Attachment**



**Concrete Tilt Wall Attachment or Brick**

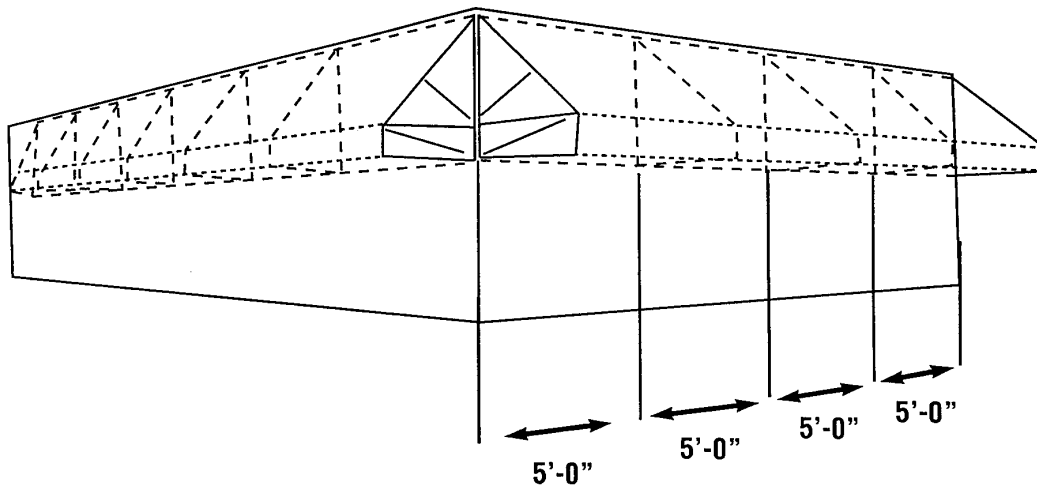
# ERECTION SUGGESTIONS

2. A jig can simplify the construction of the Mansard frames. Any jig type is suitable for this purpose. However, take care not to strip the fasteners. In this example, the diagonal bracing was omitted for increased clarity.



# ERECTION SUGGESTIONS

3. Once the fastener type has been decided, begin by attaching the end frames first. Two frames can be cross-braced to stabilize the ends and aid in aligning the whole structure.

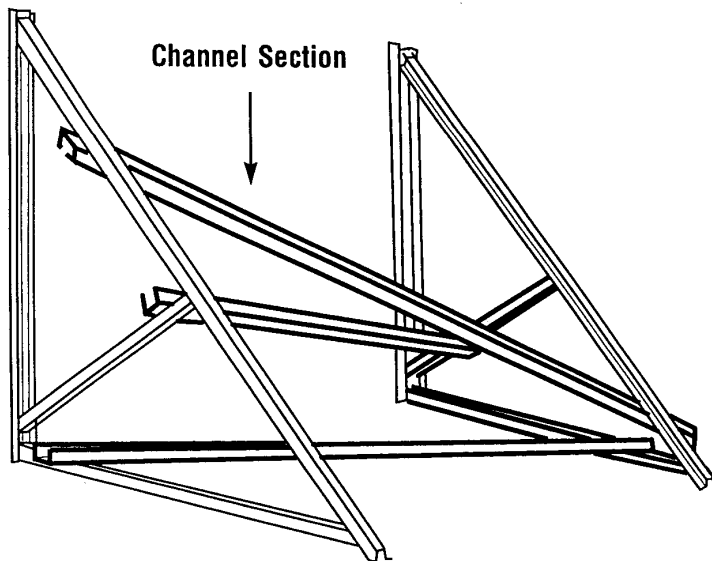


Example shown is a mansard below eave.

Here are some optional ways of cross-bracing two vertical frames with channel sections.

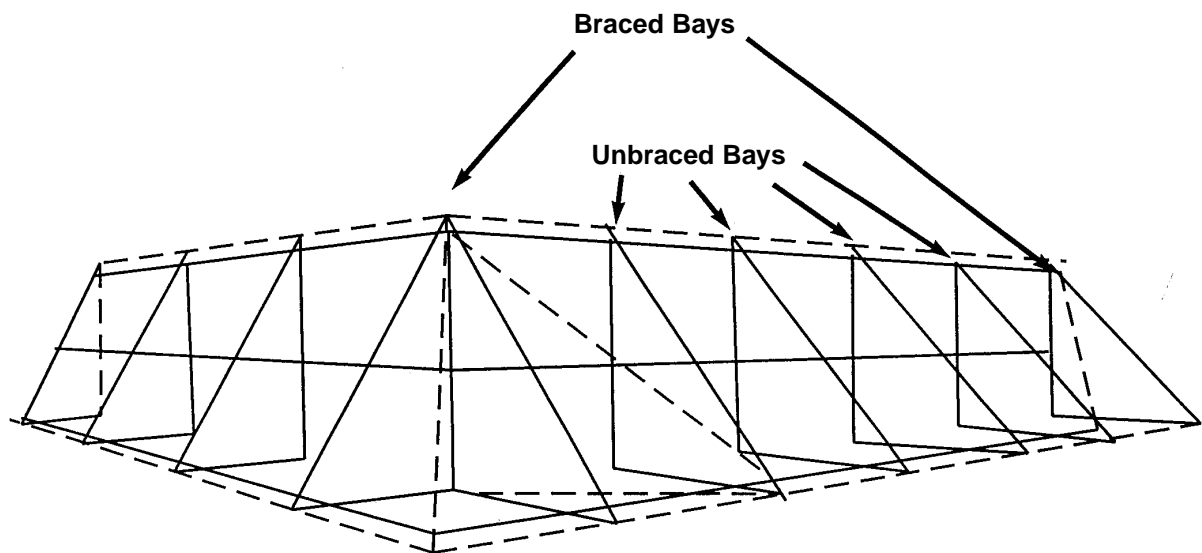
Use #12 x 3/4" self-driller at bracing connections.

Frame spacing may vary depending on load requirements.



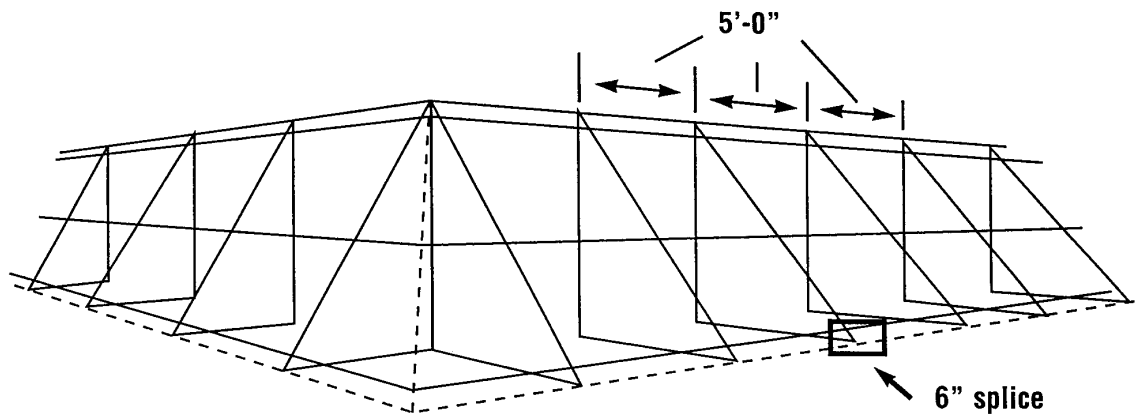
# ERECTION SUGGESTIONS

4. Sometimes cross-bracing is necessary when taking into account the overall design of the mansard. Long and straight runs will generally require bracing. However, if the overall system contains several corners, bracing may not be required. Note that bracing requirements vary from building to building, the design below is a representative of typical bracing layout.

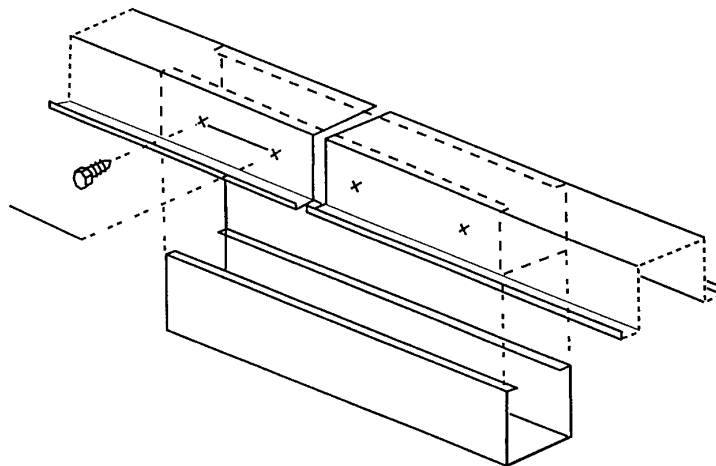


# ERECTION SUGGESTIONS

5. A "String Line" run is required to insure a proper initial alignment. Afterwards, all interior frames can then be accurately aligned. Shimming may be necessary if the attaching wall is not plumb, level or straight. The frames must be straight and true before proceeding. Mis-alignment will create an "oil canned" or wavy, appearance in the finished structure.
6. Once all frames are attached to the wall and spaced properly, the stringers (horizontal members) are ready to be installed. Splices should be made about 6" from each frame and staggered to prevent two splices in one bay. The stringers are attached to each frame with a minimum of 2 #12 x 3/4" self-driller screws.

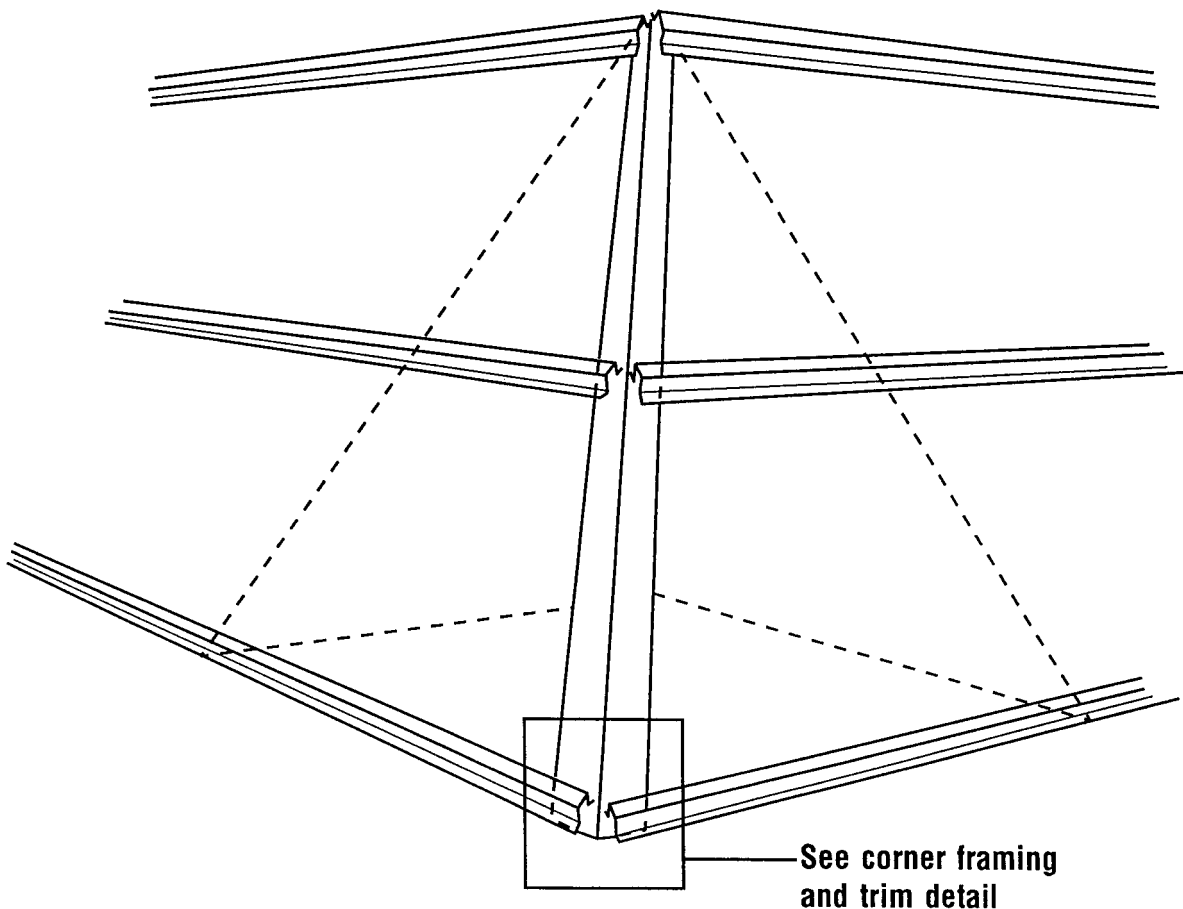


The splices are made by nesting a 6" piece of channel section into the hat sections to be spliced. Then they are connected with (8) #12 x 3/4" self-driller screws.

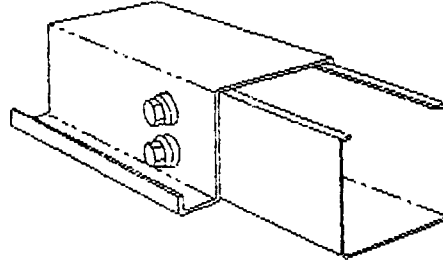
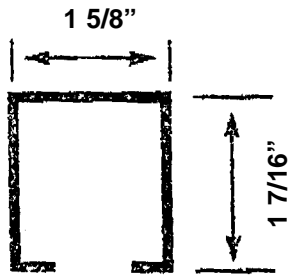


# ERECTION SUGGESTIONS

7. The extension of the stringer at the corners is needy of special attention. A back-up angle can be provided to tie the stringers together, and the angle should have the degree of brake as the hip cover. Attach it to the underside of the converging stringers with #12 x 3/4" self-driller screws.
8. In some cases, the cantilevered stringers require additional bracing, particularly when the distance from the last frame to corner exceeds 5'.



# TECHNICAL DATA CHANNEL SECTION



**18 Ga. Galvanized Steel  
Yield 50,000 PSI**

### Section Properties for Allowable Load Determination (Fully Braced)

| Condition of Bending  | I-NA (IN.4) | S-TOP (IN.3) | S-BTM (IN.3) | Allow. Momt. (KIP-IN.) |
|-----------------------|-------------|--------------|--------------|------------------------|
| Top in compression    | 0.06508     | 0.11166      | 0.07615      | 2.7369                 |
| Bottom in compression | 0.06508     | 0.11166      | 0.07615      | 2.7369                 |

### Allowable Load Capacity and Corresponding Deflection for Positive Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 234         | 0.050 | 234       | 0.013 | 293         | 0.025 | 0.13         | 0.10  |
| 3         | 103         | 0.087 | 103       | 0.037 | 129         | 0.062 | 0.20         | 0.15  |
| 4         | 58          | 0.162 | 58        | 0.062 | 72          | 0.112 | 0.27         | 0.20  |
| 5         | 36          | 0.250 | 36        | 0.112 | 45          | 0.175 | 0.33         | 0.25  |
| 6         | 26          | 0.362 | 26        | 0.150 | 32          | 0.237 | 0.40         | 0.30  |
| 7         | 18          | 0.487 | 18        | 0.200 | 24          | 0.324 | 0.47         | 0.35  |

### Allowable Load Capacity and Corresponding Deflection for Negative Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 234         | 0.050 | 234       | 0.013 | 293         | 0.025 | 0.13         | 0.10  |
| 3         | 103         | 0.087 | 103       | 0.037 | 129         | 0.062 | 0.20         | 0.15  |
| 4         | 58          | 0.162 | 58        | 0.062 | 72          | 0.112 | 0.27         | 0.20  |
| 5         | 36          | 0.250 | 36        | 0.112 | 46          | 0.175 | 0.33         | 0.25  |
| 6         | 26          | 0.362 | 26        | 0.150 | 32          | 0.237 | 0.40         | 0.30  |
| 7         | 18          | 0.487 | 18        | 0.200 | 24          | 0.324 | 0.47         | 0.35  |

Allowable Loads can be increased by 1/3 if load is due to wind.

All calculations for section properties have been made in accordance with the 1995 edition to "Specifications for the Design of Light-Gauge Cold Formed Steel Structures Members," published by the American Iron and Steel Institute (AISI).

All deflection values are in inches.

Fastener Load Values: Each #12 x 3/4" Self-drilling Screw will provide the following ultimate load values for the 18 Ga. hat section.

Pull-out-600 pounds; Shear (single Lap)-753 pounds. (Ultimate Values)

Apply a proper safety factor to these loads.

# TECHNICAL DATA CHANNEL SECTION

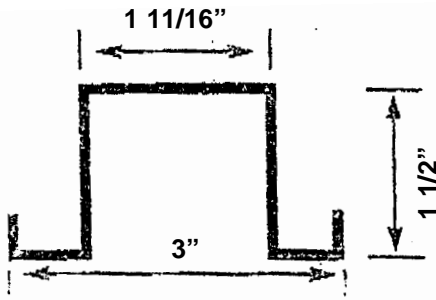
## Channel 18 GA, Fy=50KSI

| Full Section Properties |         |  |      |         |       |                |
|-------------------------|---------|--|------|---------|-------|----------------|
| Area                    | 0.23231 |  | Wt.  | 0.79050 | Width | 4.86000 (Coil) |
| Ix                      | 0.06508 |  | rx   | 0.52929 | Ixy   | -0.00000       |
| Sx(t)                   | 0.11166 |  | y(t) | 0.58283 | Alpha | 90.0000        |
| Sx(b)                   | 0.07615 |  | y(b) | 0.85467 |       |                |
| Iy                      | 0.10677 |  | ry   | 0.67794 | Xo    | 0.00000        |
| Sy(l)                   | 0.13141 |  | x(l) | 0.81250 | Yo    | 1.30017        |
| Sy(r)                   | 0.13141 |  | x(r) | 0.81250 | jx    | -0.00000       |
|                         |         |  |      |         | jy    | -1.48449       |
| I1                      | 0.10677 |  | r1   | 0.67794 |       |                |
| I2                      | 0.06508 |  | r2   | 0.52929 |       |                |
| Ic                      | 0.17185 |  | rc   | 0.86009 | cw    | 0.04258        |
| Io                      | 0.56455 |  | ro   | 1.55890 | J     | 0.00017693     |

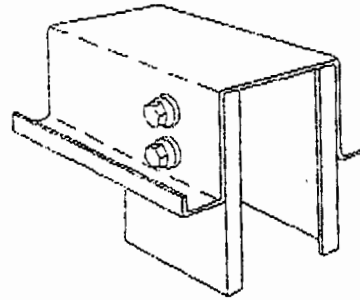
| Fully Braced Allowables |         |                 |         |
|-------------------------|---------|-----------------|---------|
| Compression             |         | Positive Moment |         |
| Pao                     | 5.30207 | Maxo            | 2.73690 |
| Ae                      | 0.20325 | Ixe             | 0.06508 |
|                         |         | Sxe(t)          | 0.11166 |
| Tension                 |         | Positive Moment |         |
| Ta                      | 7.37165 | Sxe(b)          | 0.07615 |
|                         |         | Sye(l)          | 0.13029 |
|                         |         | Sye(r)          | 0.11826 |
|                         |         | Negative Moment |         |
|                         |         | Maxo            | 2.73690 |
| Shear                   |         | Negative Moment |         |
| Vay                     | 0.00000 | Ixe             | 0.06508 |
| Vax                     | 0.00000 | Sxe(t)          | 0.11166 |
|                         |         | Sye(l)          | 0.11826 |
|                         |         | Sxe(b)          | 0.07615 |
|                         |         | Sye(r)          | 0.13029 |



# TECHNICAL DATA HAT SECTION



**22 Ga. Galvanized Steel  
Yield 50,000 PSI**



### Section Properties for Allowable Load Determination

| Condition of Bending  | I-NA (IN.4) | S-TOP (IN.3) | S-BTM (IN.3) | Allow. Momt. (KIP-IN.) |
|-----------------------|-------------|--------------|--------------|------------------------|
| Top in compression    | 0.05515     | 0.07076      | 0.08198      | 2.12280                |
| Bottom in compression | 0.06323     | 0.08812      | 0.08610      | 2.12280                |

### Allowable Load Capacity and Corresponding Deflection for Positive Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 233         | 0.058 | 244       | 0.019 | 305         | 0.039 | 0.13         | 0.10  |
| 3         | 103         | 0.126 | 107       | 0.058 | 135         | 0.087 | 0.20         | 0.15  |
| 4         | 58          | 0.223 | 61        | 0.107 | 75          | 0.155 | 0.27         | 0.20  |
| 5         | 37          | 0.349 | 38        | 0.145 | 48          | 0.242 | 0.33         | 0.25  |
| 6         | 25          | 0.504 | 26        | 0.213 | 34          | 0.349 | 0.40         | 0.30  |
| 7         | 19          | 0.678 | 20        | 0.291 | 25          | 0.475 | 0.47         | 0.35  |

### Allowable Load Capacity and Corresponding Deflection for Negative Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 290         | 0.055 | 278       | 0.018 | 347         | 0.027 | 0.13         | 0.10  |
| 3         | 128         | 0.118 | 123       | 0.055 | 155         | 0.073 | 0.20         | 0.15  |
| 4         | 72          | 0.200 | 69        | 0.082 | 87          | 0.127 | 0.27         | 0.20  |
| 5         | 45          | 0.327 | 44        | 0.127 | 55          | 0.200 | 0.33         | 0.25  |
| 6         | 31          | 0.464 | 30        | 0.182 | 37          | 0.291 | 0.40         | 0.30  |
| 7         | 24          | 0.637 | 22        | 0.255 | 28          | 0.410 | 0.47         | 0.35  |

Allowable Loads can be increased by 1/3 if load is due to wind.

All calculations for section properties have been made in accordance with the 1995 edition to "Specifications for the Design of Light-Gauge Cold Formed Steel Structures Members," published by the American Iron and Steel Institute (AISI).

All deflection values are in inches.

Fastener Load Values: Each #12 x 3/4" Self-drilling Screw will provide the following ultimate load values for the 22 Ga. hat section.

Pull-out-338 pounds; Shear (single Lap)-753 pounds. (Ultimate Values)

Apply a proper safety factor to these loads.

# TECHNICAL DATA HAT SECTION

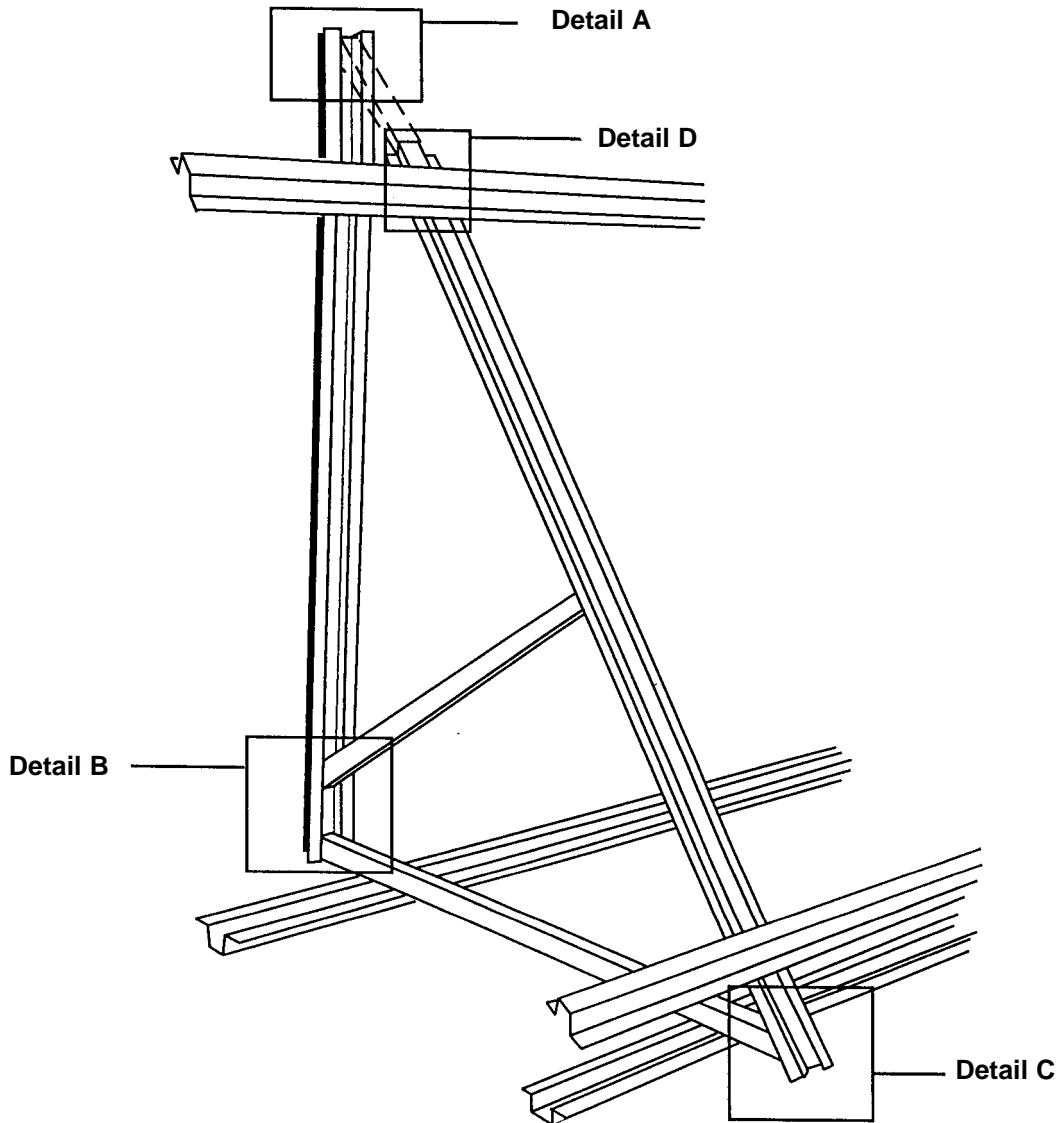
## Hat 22 GA, Fy=50KSI

| Full Section Properties |         |  |      |         |       |                |
|-------------------------|---------|--|------|---------|-------|----------------|
| Area                    | 0.18628 |  | Wt.  | 0.63386 | Width | 6.23000 (Coil) |
| Ix                      | 0.06323 |  | rx   | 0.58263 | Ixy   | 0.00000        |
| Sx(t)                   | 0.08812 |  | y(t) | 0.71755 | Alpha | -90.0000       |
| Sx(b)                   | 0.08610 |  | y(b) | 0.73445 |       |                |
| Iy                      | 0.16027 |  | ry   | 0.92756 | Xo    | -0.00000       |
| Sy(l)                   | 0.10540 |  | x(l) | 1.52060 | Yo    | 1.19721        |
| Sy(r)                   | 0.10540 |  | x(r) | 1.52060 | jx    | 0.00000        |
|                         |         |  |      |         | jy    | -1.58270       |
| I1                      | 0.16027 |  | r1   | 0.92756 |       |                |
| I2                      | 0.06323 |  | r2   | 0.58263 |       |                |
| Ic                      | 0.22350 |  | rc   | 1.09536 | cw    | 0.02741        |
| Io                      | 0.49049 |  | ro   | 1.62270 | J     | 0.00005551     |

| Fully Braced Allowables |         |                 |         |                 |         |
|-------------------------|---------|-----------------|---------|-----------------|---------|
| Compression             |         | Positive Moment |         | Positive Moment |         |
| Pao                     | 4.04441 | Maxo            | 2.12280 | Mayo            | 3.12126 |
| Ae                      | 0.15504 | Ixe             | 0.05515 | Iye             | 0.15902 |
|                         |         | Sxe(t)          | 0.07076 | Sye(l)          | 0.10511 |
| Tension                 |         | Sxe(b)          | 0.08198 | Sye(r)          | 0.10404 |
| Ta                      | 5.82449 |                 |         |                 |         |
|                         |         | Negative Moment |         | Negative Moment |         |
|                         |         | Maxo            | 2.90961 | Mayo            | 3.12126 |
| Shear                   |         | Ixe             | 0.06323 | Iye             | 0.15902 |
| Vay                     | 0.00000 | Sxe(t)          | 0.08812 | Sye(l)          | 0.10404 |
| Vax                     | 0.00000 | Sxe(b)          | 0.08610 | Sye(r)          | 0.10511 |



# SLOPED MANSARD (BELOW ROOF LINE)

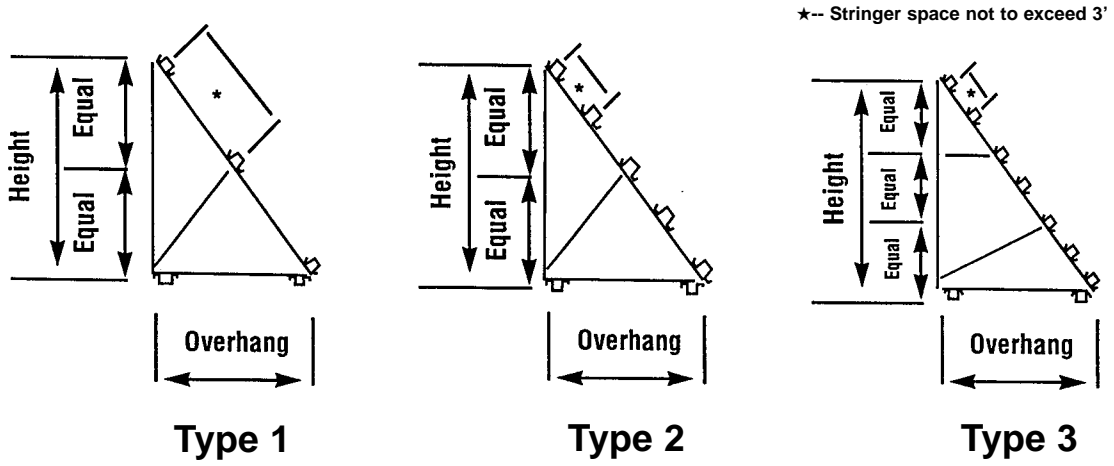


All frames to be constructed from  
18 GA. Channel Section, 22 GA. Hat Section

All frames spaced 5'-0" on centers for 20# Live Load.

All frames spaced 3'-6" on centers 30# Live Load.

# SLOPED MANSARD (BELOW ROOF LINE)



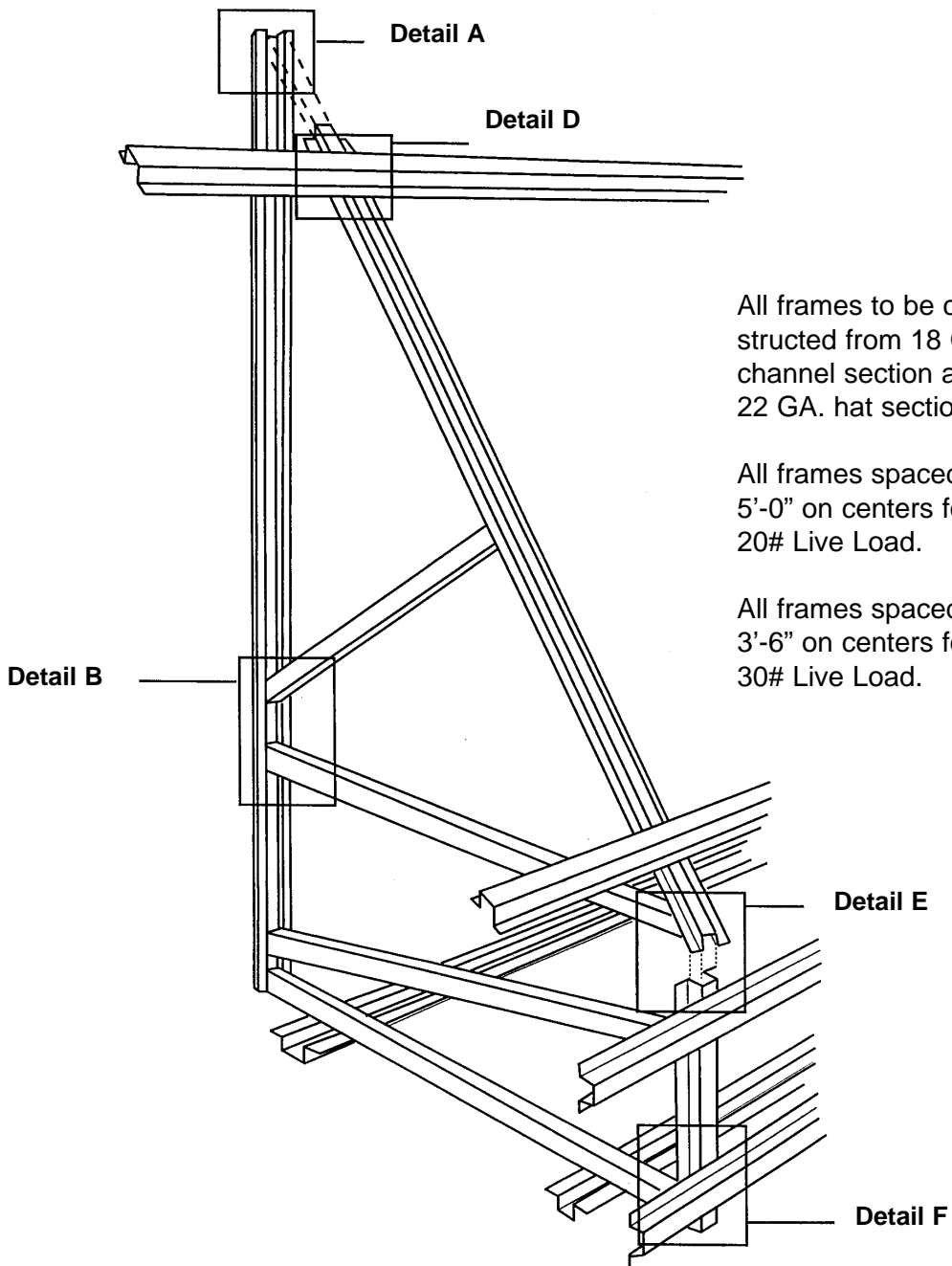
## Mansard Framing Sloped Mansard

### Mansard Overhang

|               | 2'-0" | 3'-0" | 4'-0" | 5'-0" |
|---------------|-------|-------|-------|-------|
| <b>4'-0"</b>  | 1     | 1     | 1     | -     |
| <b>5'-0"</b>  | 1     | 1     | 2     | 2     |
| <b>6'-0"</b>  | 2     | 2     | 2     | 2     |
| <b>7'-0"</b>  | 2     | 2     | 2     | 2     |
| <b>8'-0"</b>  | 2     | 2     | 2     | 2     |
| <b>9'-0"</b>  | 3     | 3     | 3     | 3     |
| <b>10'-0"</b> | 3     | 3     | 3     | 3     |
| <b>11'-0"</b> | 3     | 3     | 3     | 3     |
| <b>12'-0"</b> | 3     | 3     | 3     | 3     |
| <b>13'-0"</b> | -     | 3     | 3     | -     |

**Mansard  
Height**

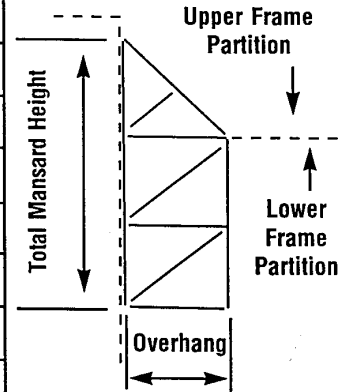
# TRANSITIONAL MANSARD (BELOW ROOF LINE)



# TRANSITIONAL MANSARD (BELOW ROOF LINE)

## MANSARD OVERHANG

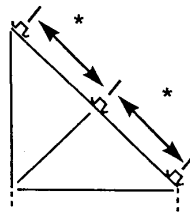
| MANSARD HEIGHT | 1'-0 | 2'-0 | 3'-0 | 4'-0 | 5'-0 |
|----------------|------|------|------|------|------|
| 2'-0           | 1A   | -    | -    | -    | -    |
| 3'-0           | 1A   | 1A   | -    | -    | -    |
| 4'-0           | 1A   | 1A   | 1A   | -    | -    |
| 5'-0           | 1A   | 1A   | 1A   | 1A   | -    |
| 6'-0           | 1A   | 1A   | 1A   | 1A   | 1A   |
| 7'-0           | 1B   | 1A   | 1A   | 1A   | 1A   |
| 8'-0           | 1B   | 1B   | 1A   | 1A   | 1A   |
| 9'-0           | 1B   | 1B   | 1B   | 1A   | 1A   |
| 10'-0          | 1B   | 1B   | 1B   | 1B   | 1A   |
| 11'-0          | 1B   | 1B   | 1B   | 1B   | 2B   |
| 12'-0          | 1C   | 1B   | 1B   | 1B   | 2B   |
| 13'-0          | 1C   | 1C   | 1B   | 1B   | 2B   |
| 14'-0          | 1C   | 1C   | 1C   | 1B   | 2B   |



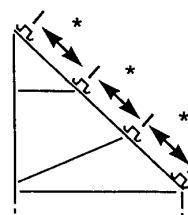
### UPPER FRAMES

\*--NOT TO EXCEED 3'-0"

ROOF SLOPES 1:1



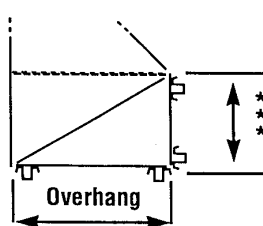
**TYPE 1**



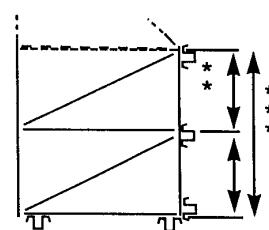
**TYPE 2**

**NOTE**  
FRAMES ARE  
FABRICATED AS  
ONE UNIT.

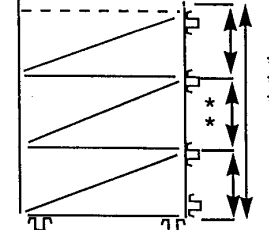
### TYPE A



**TYPE B**

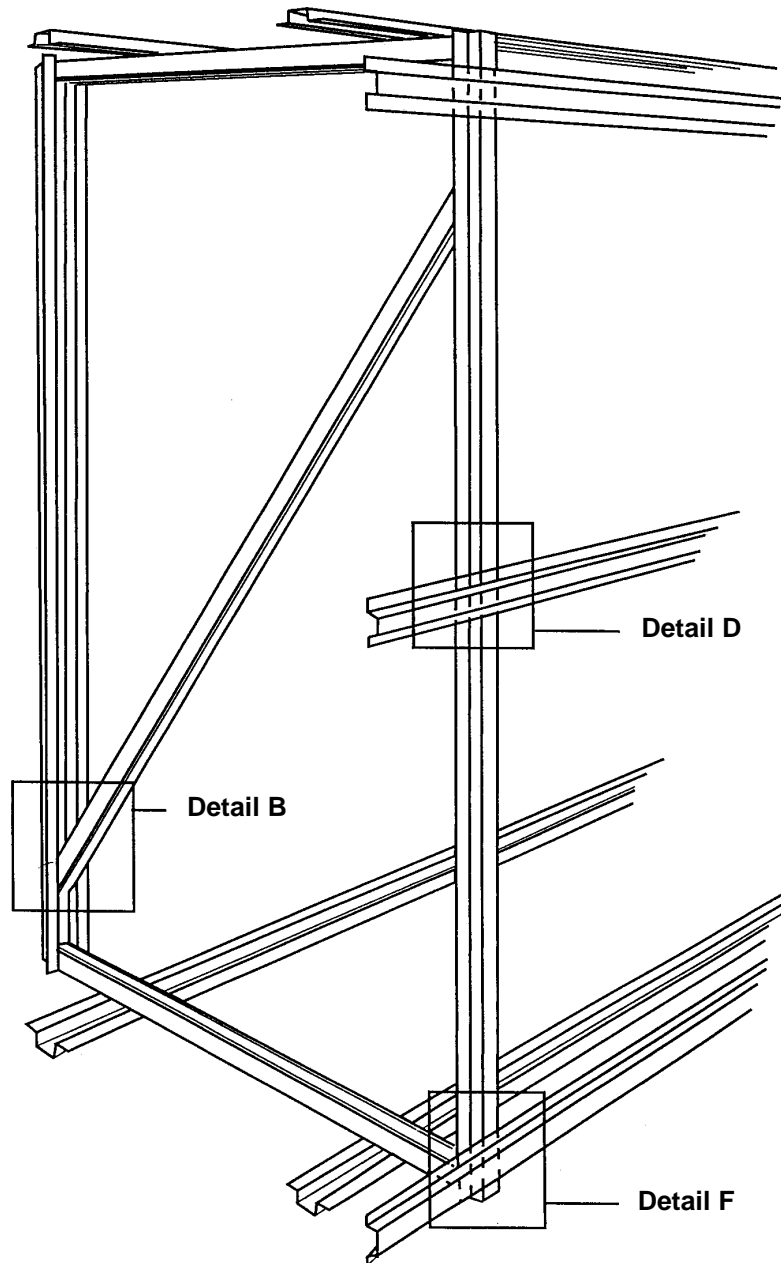


**TYPE C**



**LOWER  
FRAMES**  
\*\*--EQUAL SPACING  
\*\*\*--VARIES

# VERTICAL MANSARD (BELOW ROOF LINE)

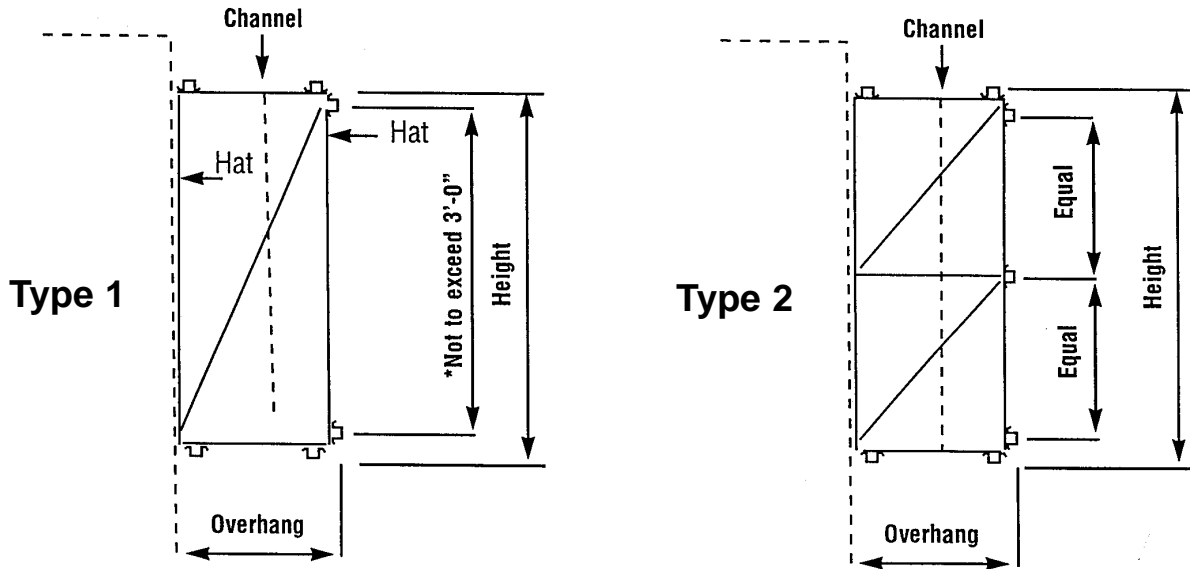


All frames to be constructed from 18 GA. channel section and 22 GA. hat section.

All frames spaced 5'-0" on centers for 20# Live Load.

All frames spaced 3'-6" on centers for 30# Live Load.

# VERTICAL MANSARD (BELOW ROOF LINE)



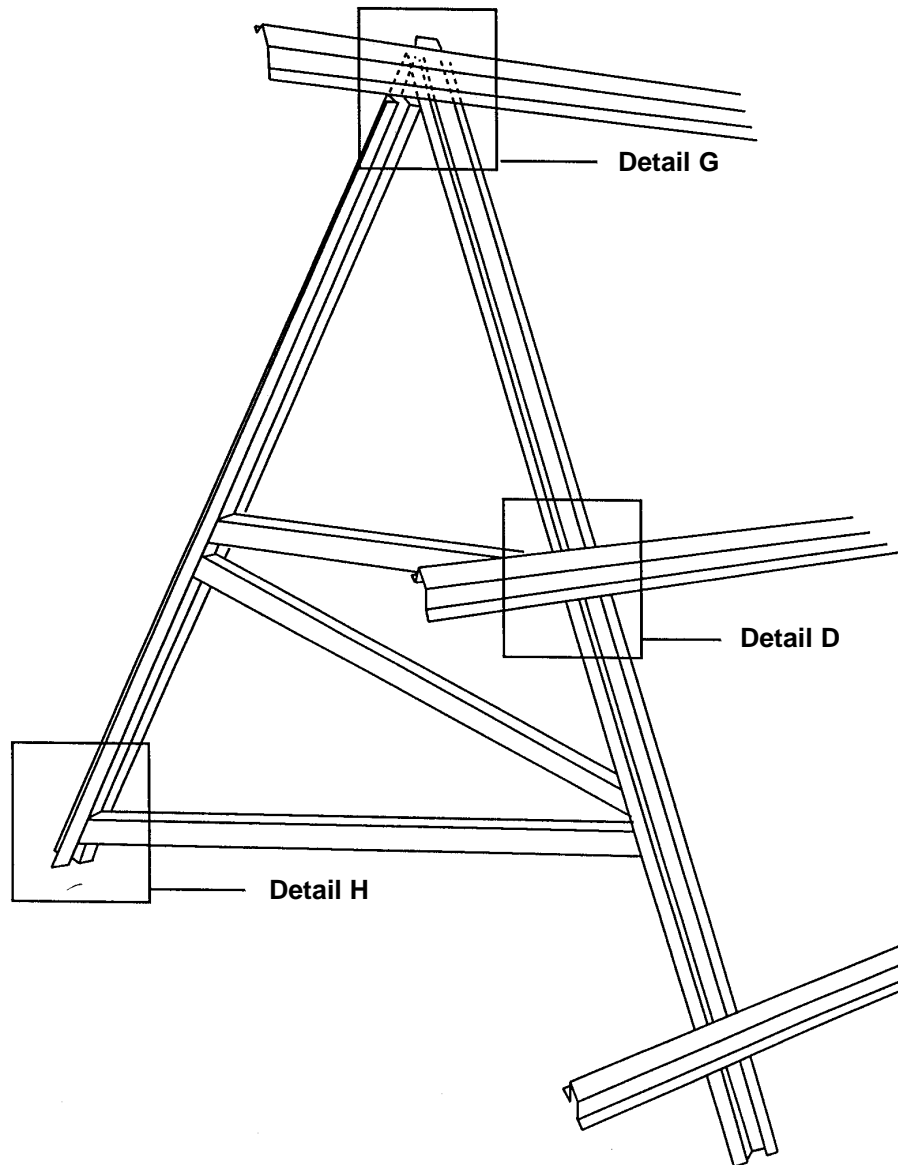
**Mansard Overhang**

|        | 1'-0" | 2'-0" | 3'-0" | 4'-0" |
|--------|-------|-------|-------|-------|
| 2'-0"  | 1     | 1     | 1     | 1     |
| 3'-0"  | 1     | 1     | 1     | 1     |
| 4'-0"  | 1     | 1     | 1     | 1     |
| 5'-0"  | 1     | 1     | 1     | 1     |
| 6'-0"  | 2     | 2     | 2     | 2     |
| 7'-0"  | 2     | 2     | 2     | 2     |
| 8'-0"  | 2     | 2     | 2     | 2     |
| 9'-0"  | 2     | 2     | 2     | 2     |
| 10'-0" | 2     | 2     | 2     | 2     |

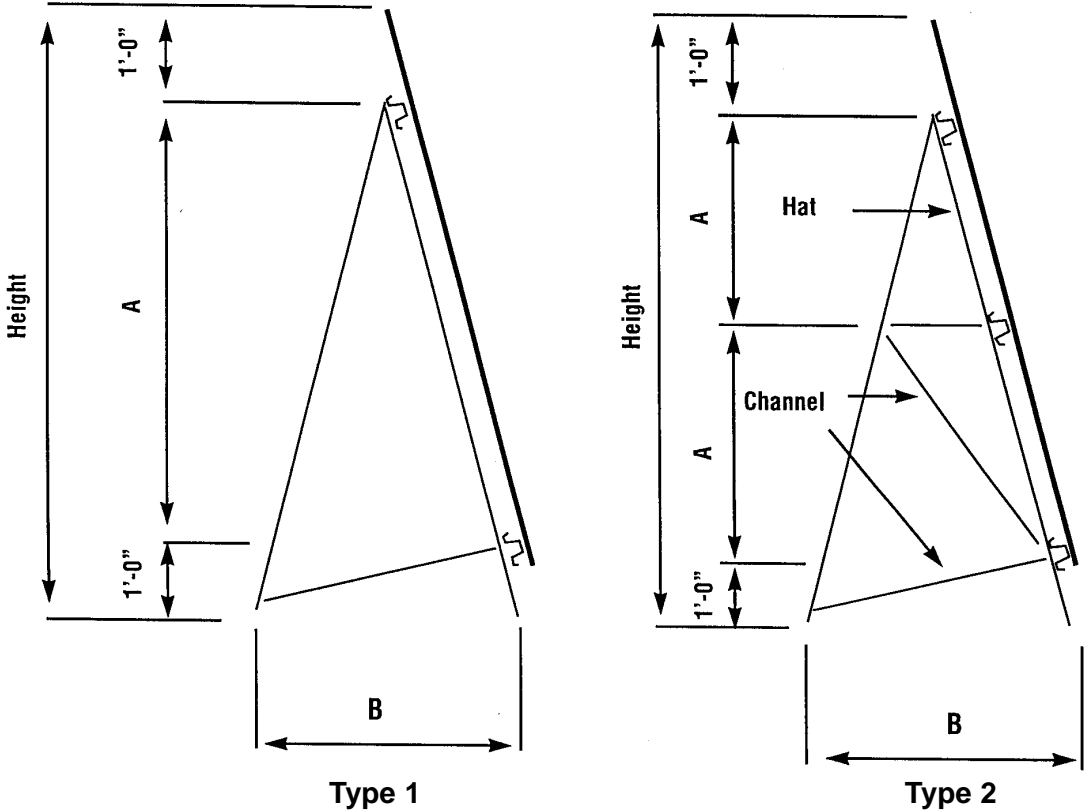
**Mansard  
Height**

# SLOPED EQUIPMENT SCREEN

All frames to be constructed from 18 GA. channel section and 22 GA. hat section  
All frames spaced at 4'-0" O.C.



# SLOPED EQUIPMENT SCREEN

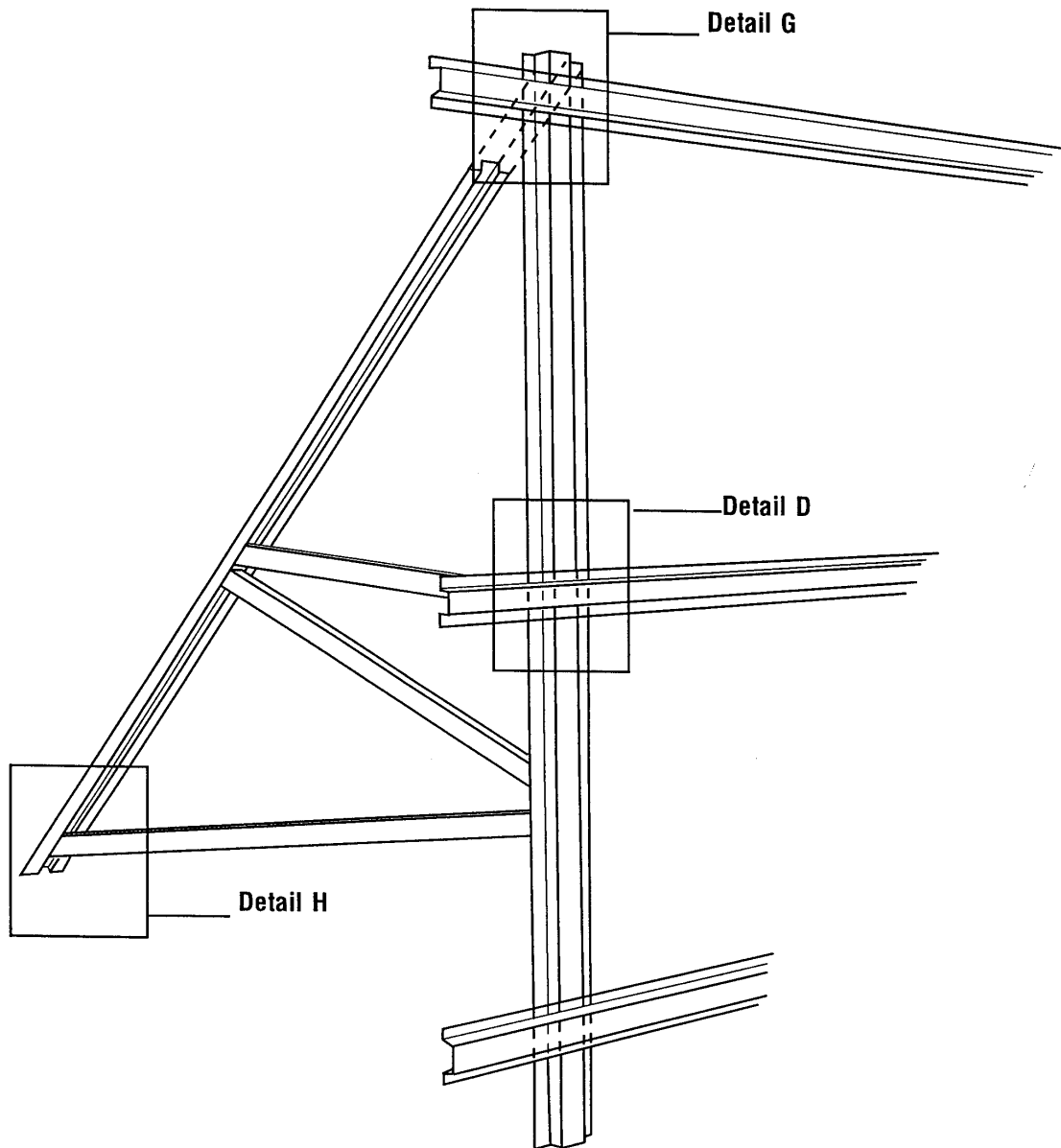


All frames spaced at 4'-0" O.C.

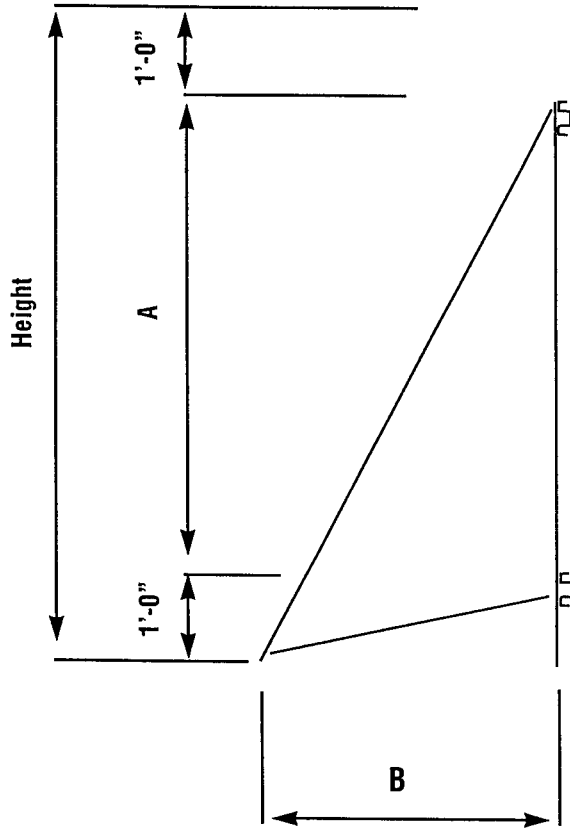
|               |              |              |              |              |              |              |               |               |
|---------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
| <b>Height</b> | <b>4'-0"</b> | <b>5'-0"</b> | <b>6'-0"</b> | <b>7'-0"</b> | <b>8'-0"</b> | <b>9'-0"</b> | <b>10'-0"</b> | <b>11'-0"</b> |
| <b>Type</b>   | <b>1</b>     | <b>1</b>     | <b>1</b>     | <b>1</b>     | <b>2</b>     | <b>2</b>     | <b>2</b>      | <b>2</b>      |
| <b>Dim A</b>  | <b>1'-0"</b> | <b>2'-0"</b> | <b>3'-0"</b> | <b>4'-0"</b> | <b>2'-6"</b> | <b>3'-0"</b> | <b>3'-6"</b>  | <b>4'-0"</b>  |
| <b>Dim B</b>  | <b>2'-0"</b> | <b>2'-0"</b> | <b>2'-0"</b> | <b>2'-6"</b> | <b>3'-0"</b> | <b>3'-6"</b> | <b>4'-0"</b>  | <b>4'-6"</b>  |

# VERTICAL EQUIPMENT SCREEN

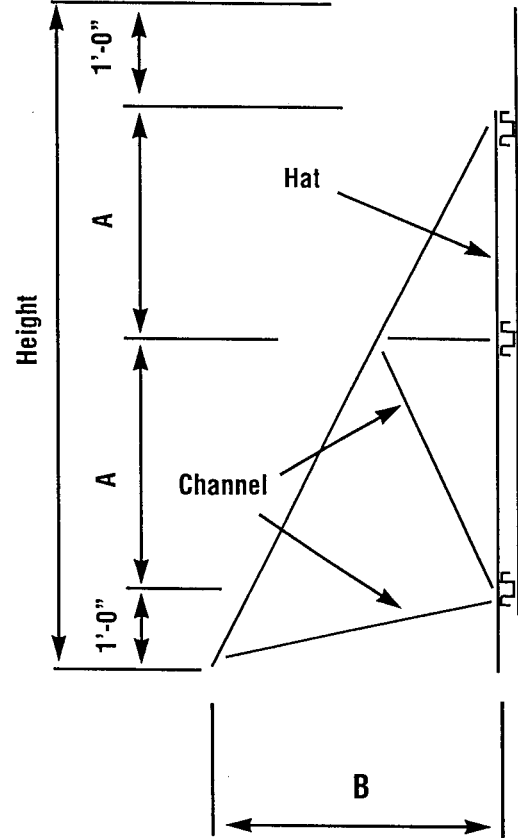
All frames to be constructed from 18 GA. channel section and 22 GA. hat section  
All frames spaced at 4'-0" O.C.



# VERTICAL EQUIPMENT SCREEN



Type 1

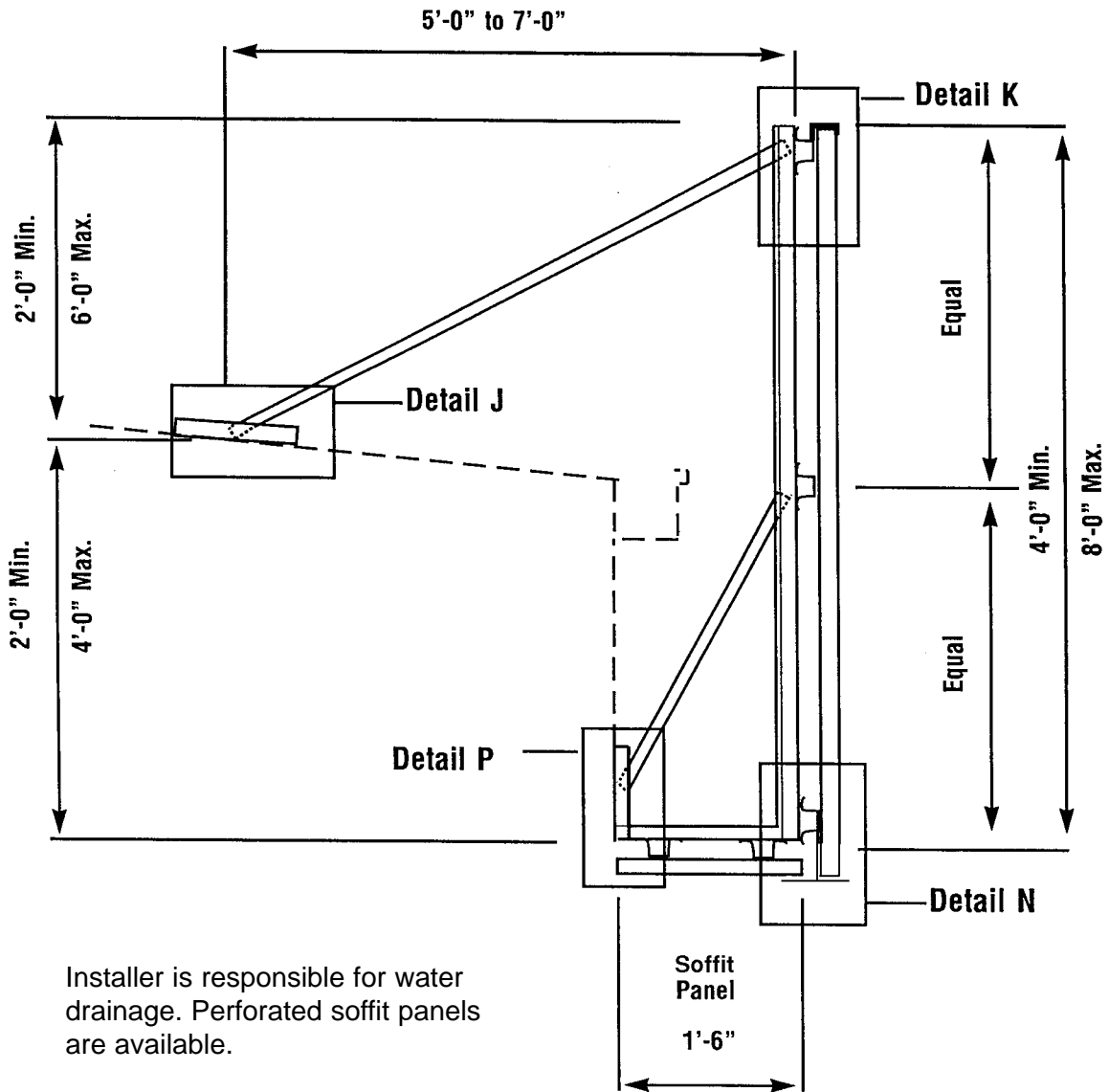


Type 2

All frames spaced at 4'-0" O.C.

| Height | 4'-0" | 5'-0" | 6'-0" | 7'-0" | 8'-0" | 9'-0" | 10'-0" | 11'-0" |
|--------|-------|-------|-------|-------|-------|-------|--------|--------|
| Type   | 1     | 1     | 1     | 1     | 2     | 2     | 2      | 2      |
| Dim A  | 1'-0" | 2'-0" | 3'-0" | 4'-0" | 2'-6" | 3'-0" | 3'-6"  | 4'-0"  |
| Dim B  | 2'-0" | 2'-0" | 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0"  | 4'-6"  |

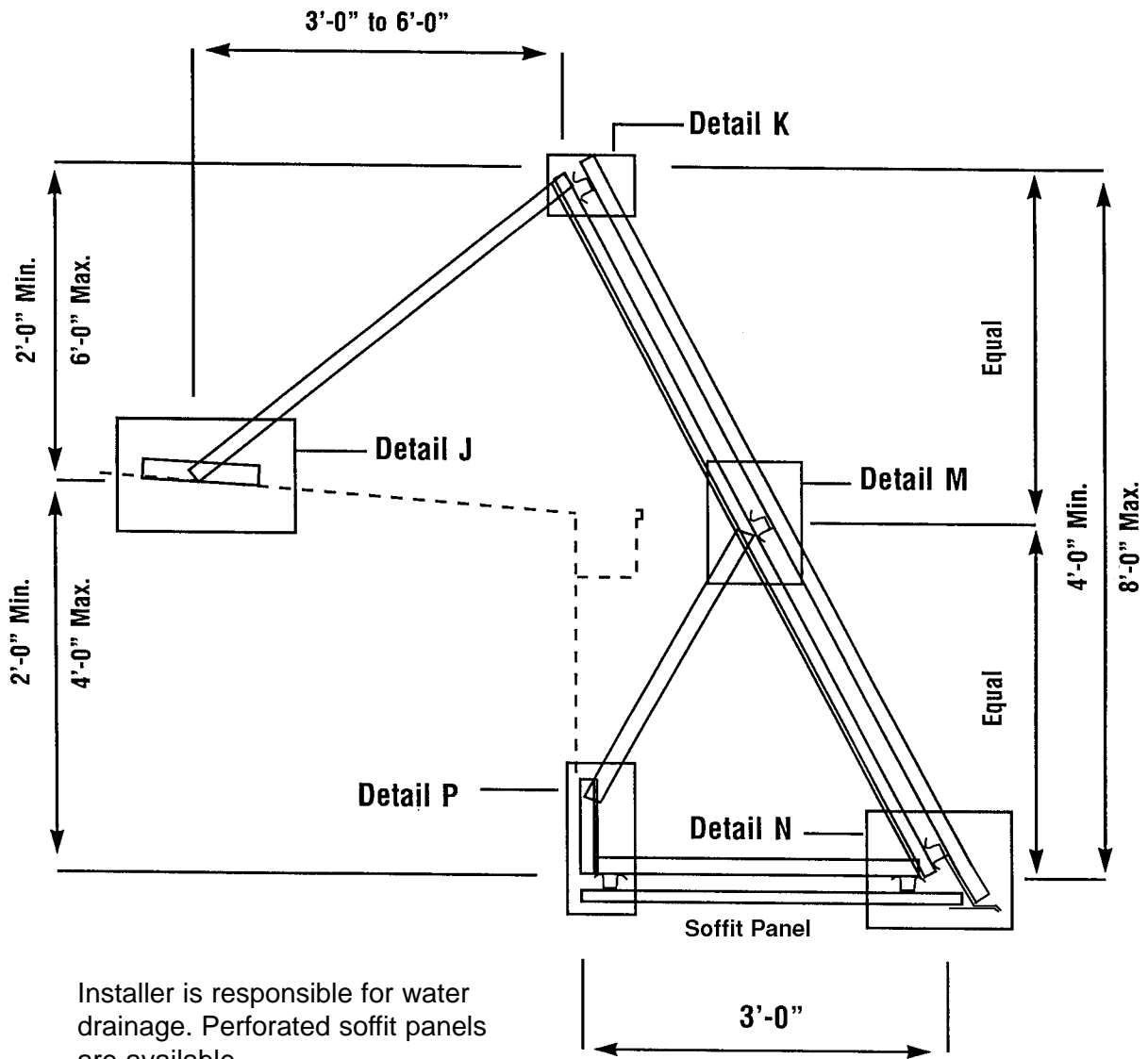
# VERTICAL MANSARD (ABOVE ROOF LINE WITHOUT BACK-UP PANEL)



All frames to be constructed from 18 GA. channel section and 22 GA. hat section.

Frame spacing to be as noted in table on page 25.

# SLOPED MANSARD (ABOVE ROOF LINE WITHOUT BACK-UP PANEL)

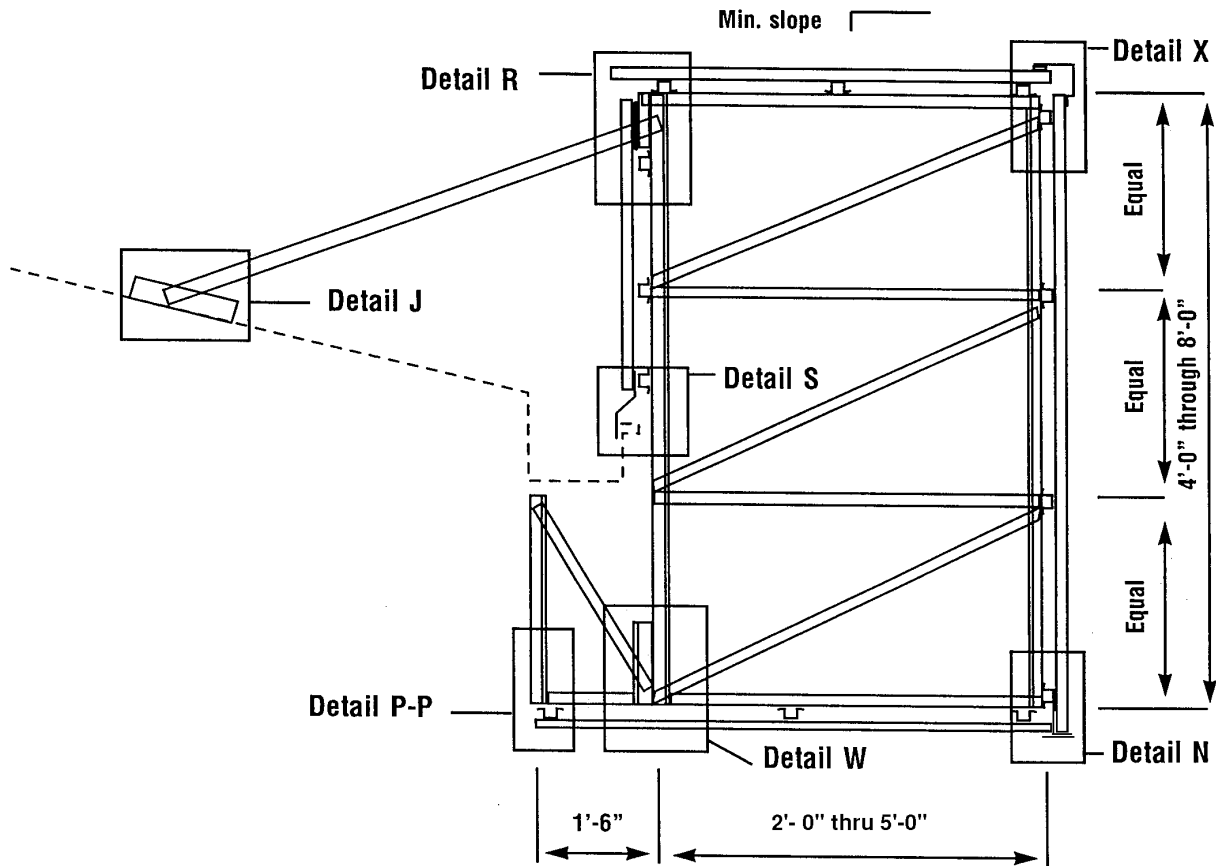


Installer is responsible for water drainage. Perforated soffit panels are available.

All frames to be constructed from 18 GA. channel section and 22 GA. hat section.

Frame spacing to be as noted in table on page 25.

# VERTICAL MANSARD (ABOVE ROOF LINE WITH BACK-UP PANEL)



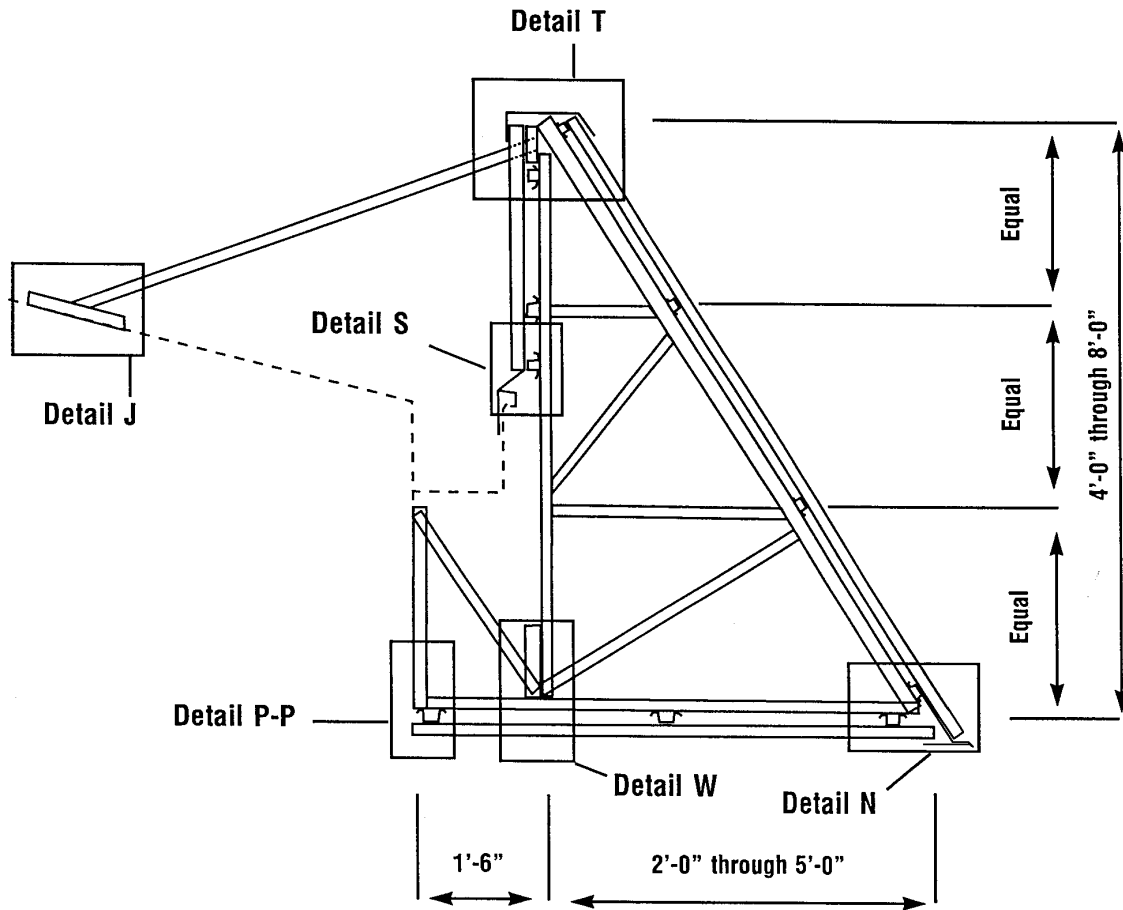
## Vertical Mansard

Frame Spacing Table Overhang

|              |                            |                            |                            |                            |
|--------------|----------------------------|----------------------------|----------------------------|----------------------------|
|              | <b>3'-6"</b><br>2' + 1'-6" | <b>4'-6"</b><br>3' + 1'-6" | <b>5'-6"</b><br>4' + 1'-6" | <b>6'-6"</b><br>5' + 1'-6" |
| <b>4'-0"</b> | --                         | <b>5'-0"</b>               | <b>5'-0"</b>               | --                         |
| <b>5'-0"</b> | <b>5'-0"</b>               | <b>5'-0"</b>               | <b>5'-0"</b>               | <b>4'-0"</b>               |
| <b>6'-0"</b> | <b>5'-0"</b>               | <b>5'-0"</b>               | <b>5'-0"</b>               | <b>4'-0"</b>               |
| <b>7'-0"</b> | <b>5'-0"</b>               | <b>5'-0"</b>               | <b>5'-0"</b>               | <b>4'-0"</b>               |
| <b>8'-0"</b> | <b>5'-0"</b>               | <b>5'-0"</b>               | <b>5'-0"</b>               | <b>4'-0"</b>               |

Mansard  
Height

# SLOPED MANSARD (ABOVE ROOF LINE WITH BACK-UP PLATE)



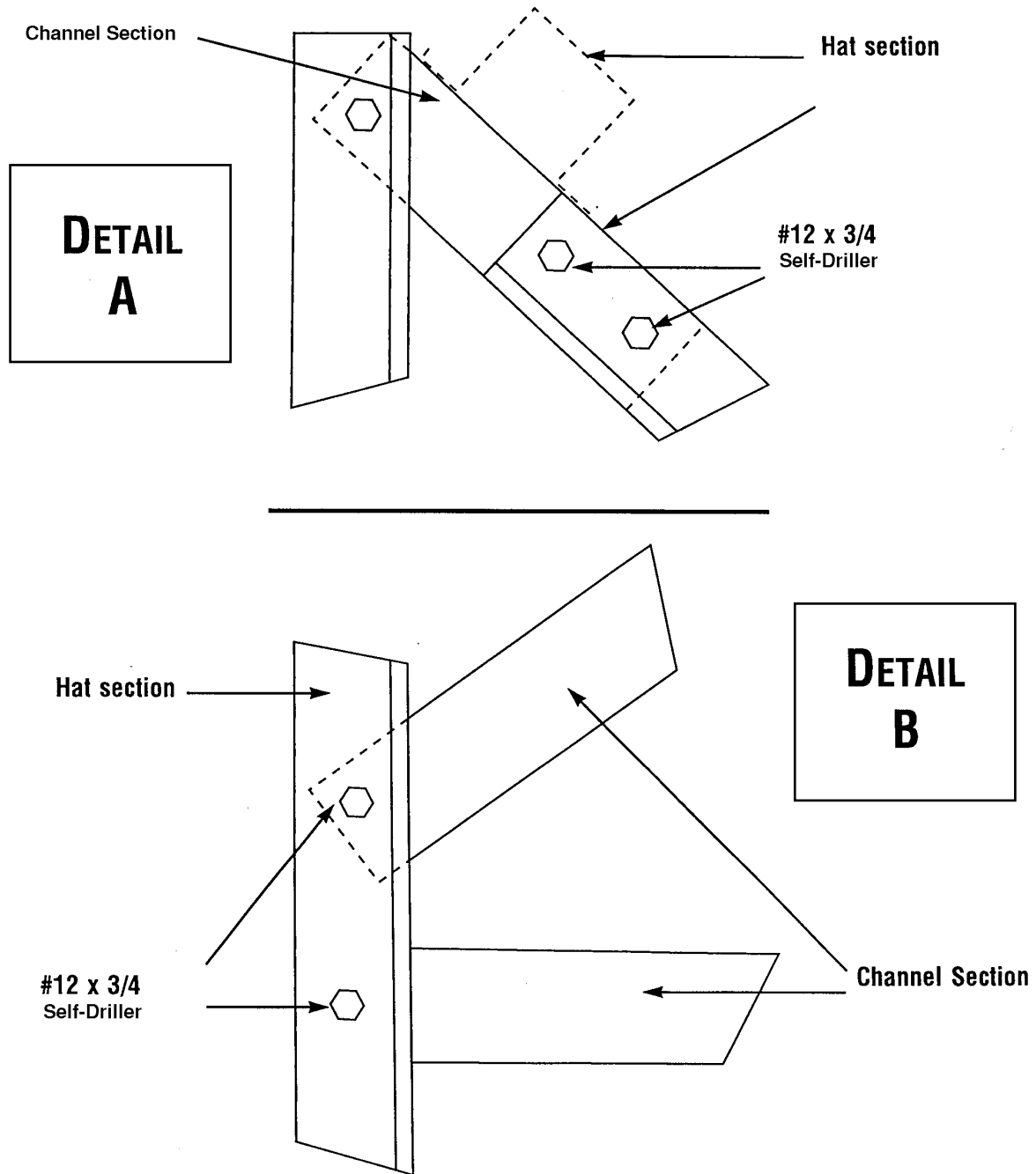
## Sloped Mansard

Frame Spacing Table Overhang

|              | 3'-6"<br><small>2' + 1'-6"</small> | 4'-6"<br><small>3' + 1'-6"</small> | 5'-6"<br><small>4' + 1'-6"</small> | 6'-6"<br><small>5' + 1'-6"</small> |
|--------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| <b>4'-0"</b> | --                                 | <b>6'-0"</b>                       | <b>6'-0"</b>                       | --                                 |
| <b>5'-0"</b> | <b>5'-0"</b>                       | <b>6'-0"</b>                       | <b>6'-0"</b>                       | <b>5'-0"</b>                       |
| <b>6'-0"</b> | <b>5'-0"</b>                       | <b>5'-0"</b>                       | <b>5'-0"</b>                       | <b>5'-0"</b>                       |
| <b>7'-0"</b> | <b>4'-0"</b>                       | <b>5'-0"</b>                       | <b>5'-0"</b>                       | <b>5'-0"</b>                       |
| <b>8'-0"</b> | --                                 | <b>4'-0"</b>                       | <b>4'-0"</b>                       | <b>4'-0"</b>                       |

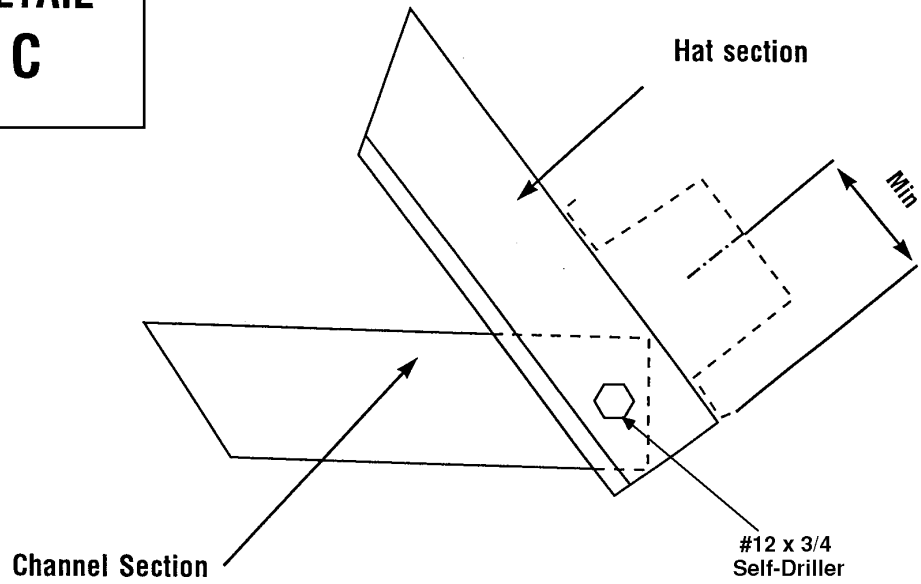
Mansard  
Height

# FRAMING DETAILS

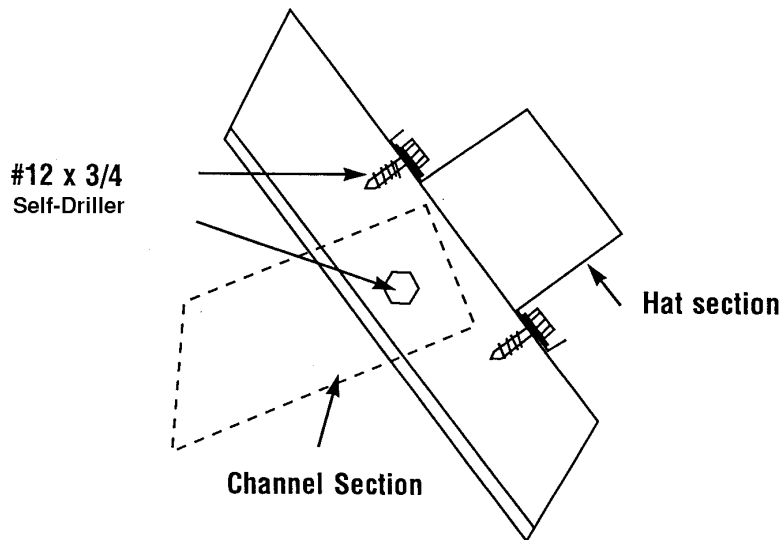


# FRAMING DETAILS

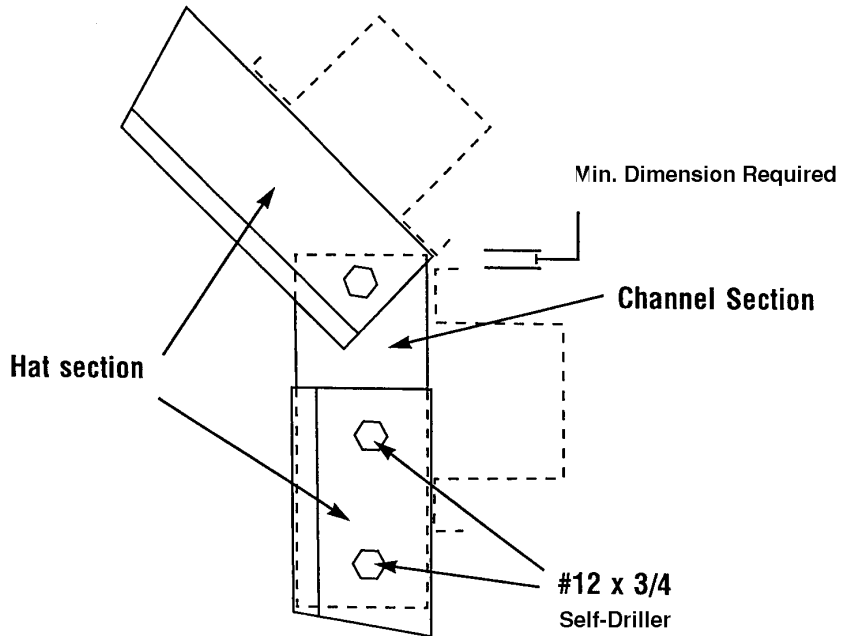
**DETAIL  
C**



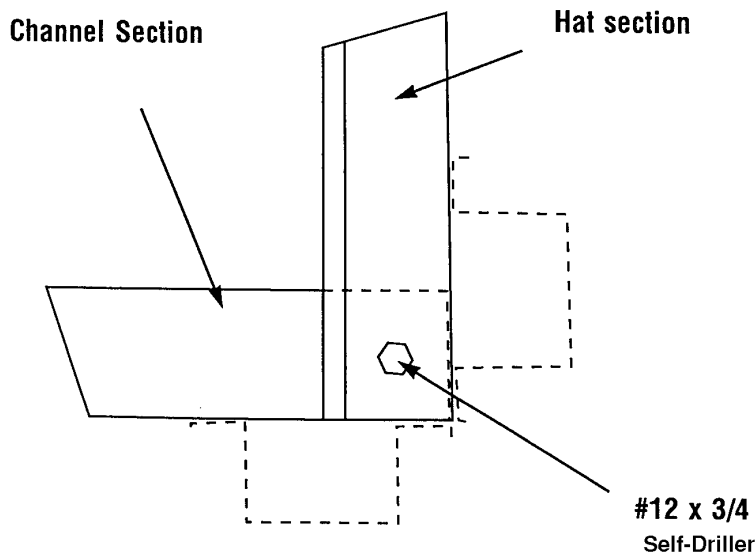
**DETAIL  
D**



# FRAMING DETAILS



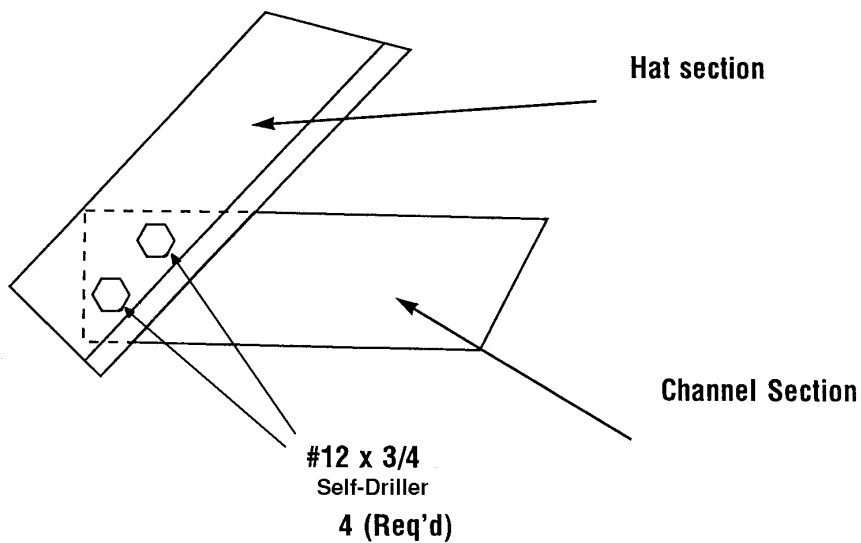
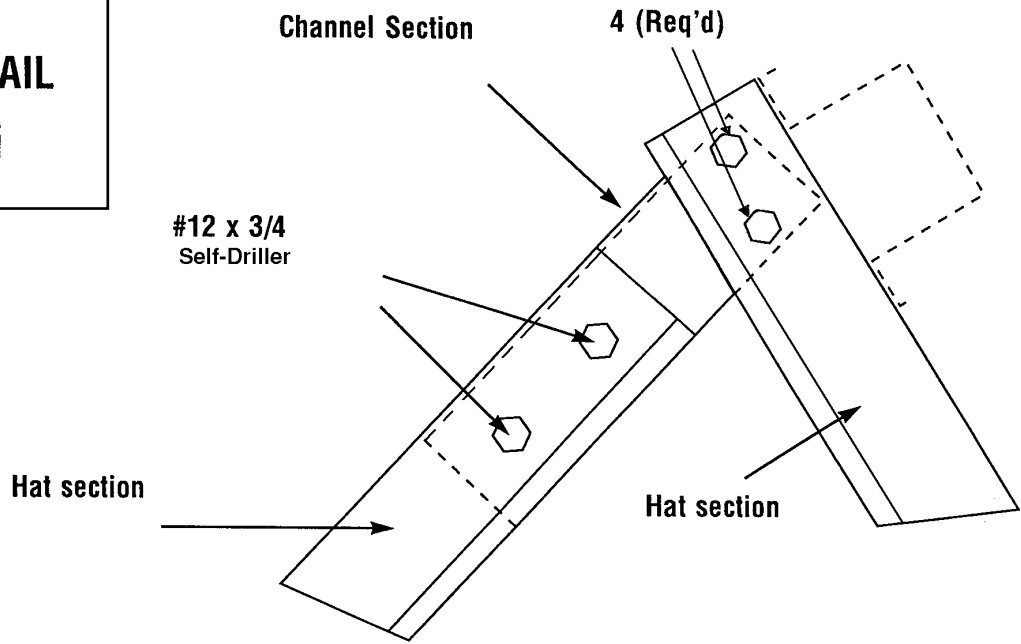
**DETAIL  
E**



**DETAIL  
F**

# FRAMING DETAILS

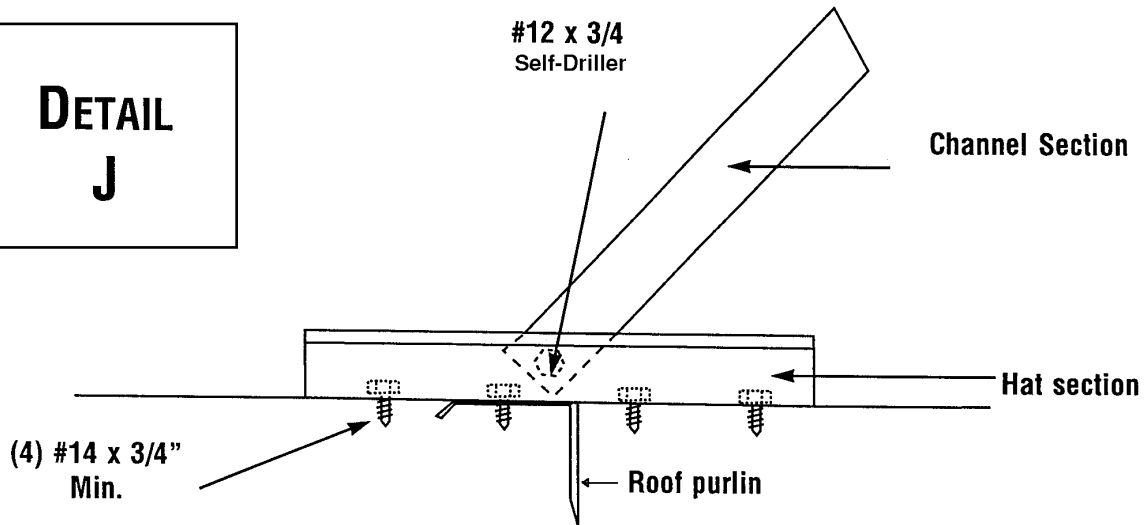
**DETAIL  
G**



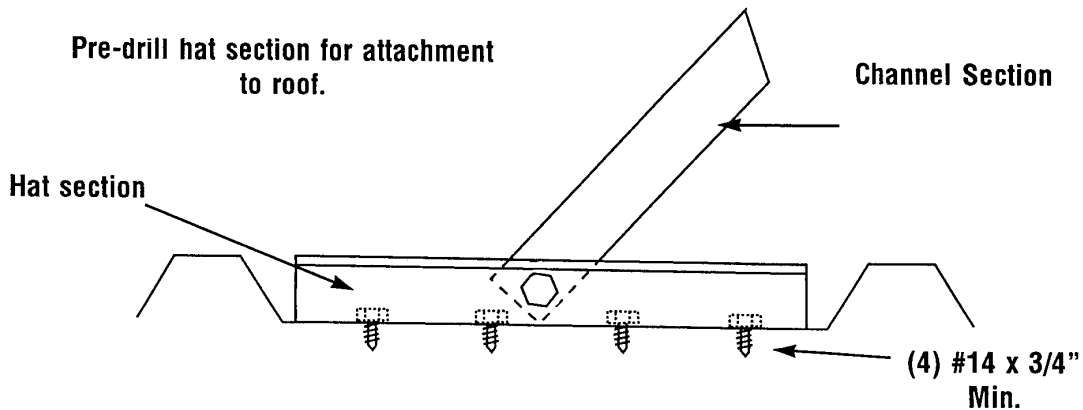
**DETAIL  
H**

# FRAMING DETAILS

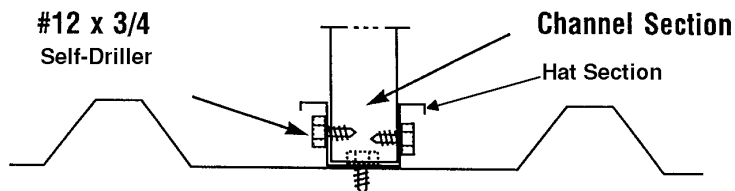
**DETAIL  
J**



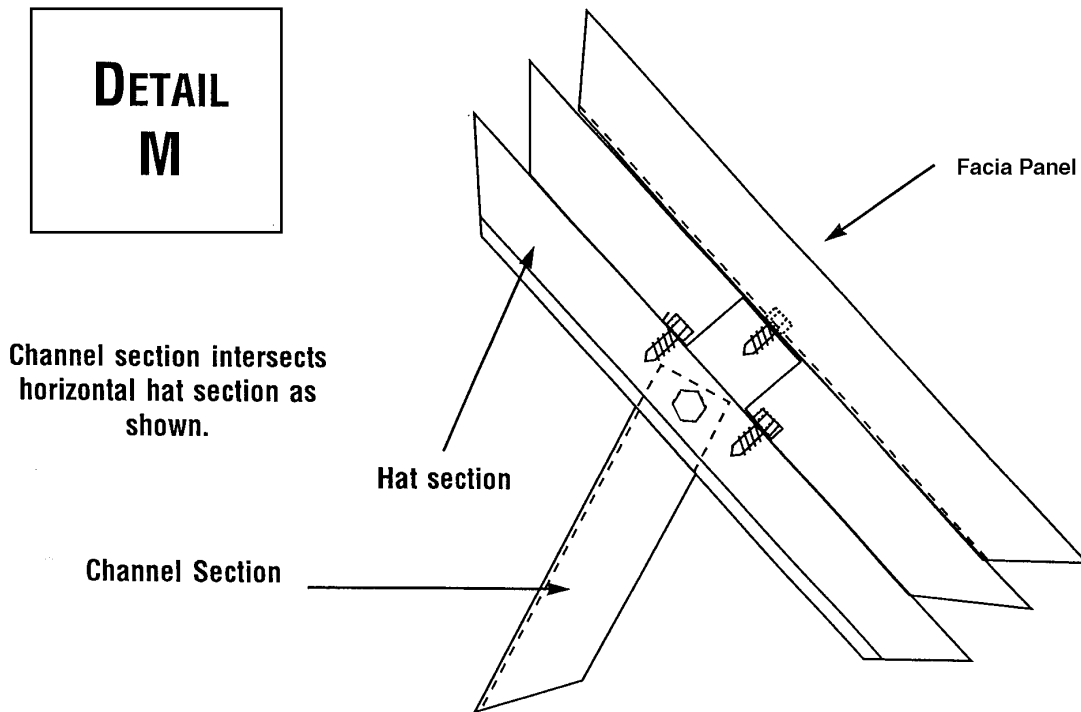
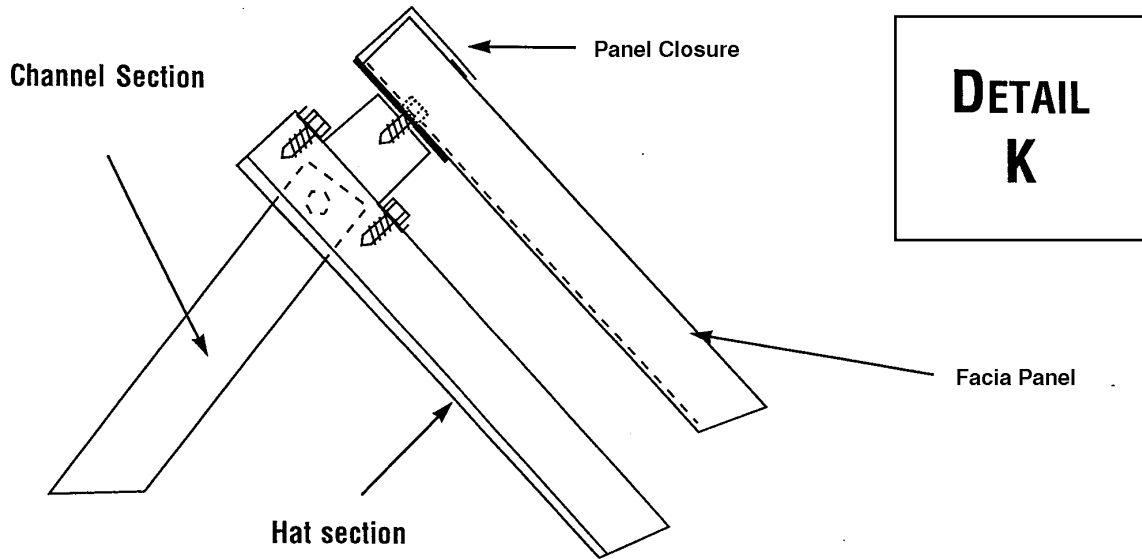
## Roof Connection at Eave



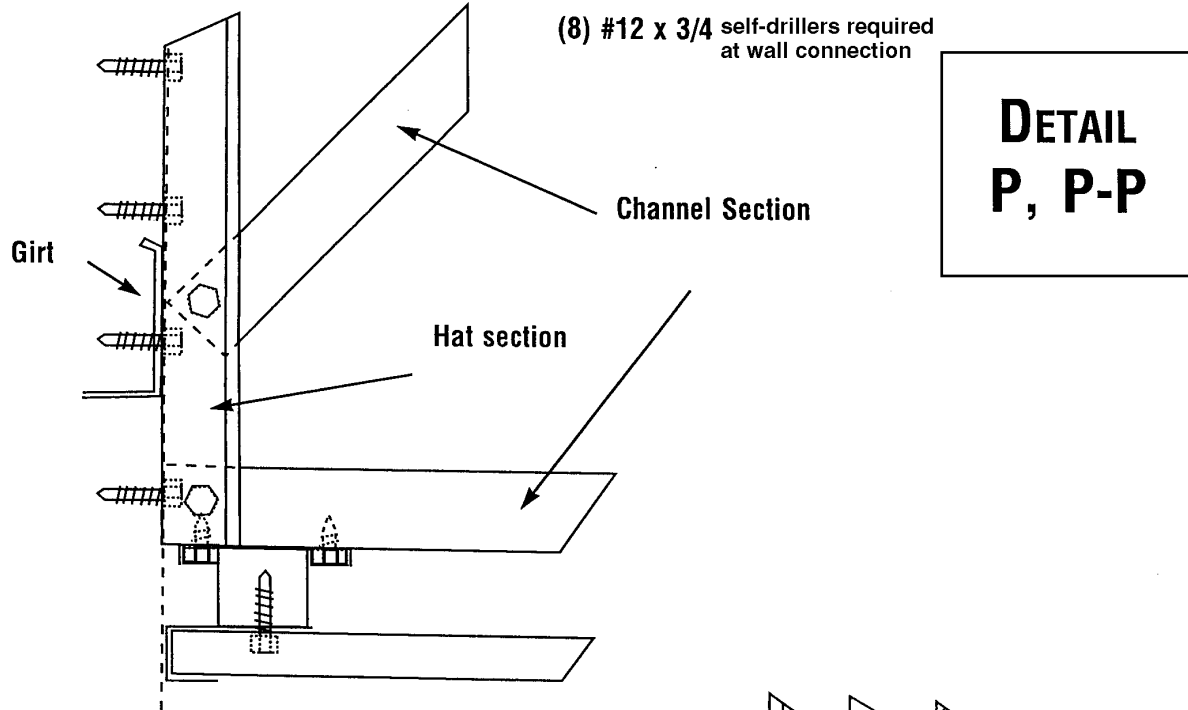
## Roof Connection at Rake



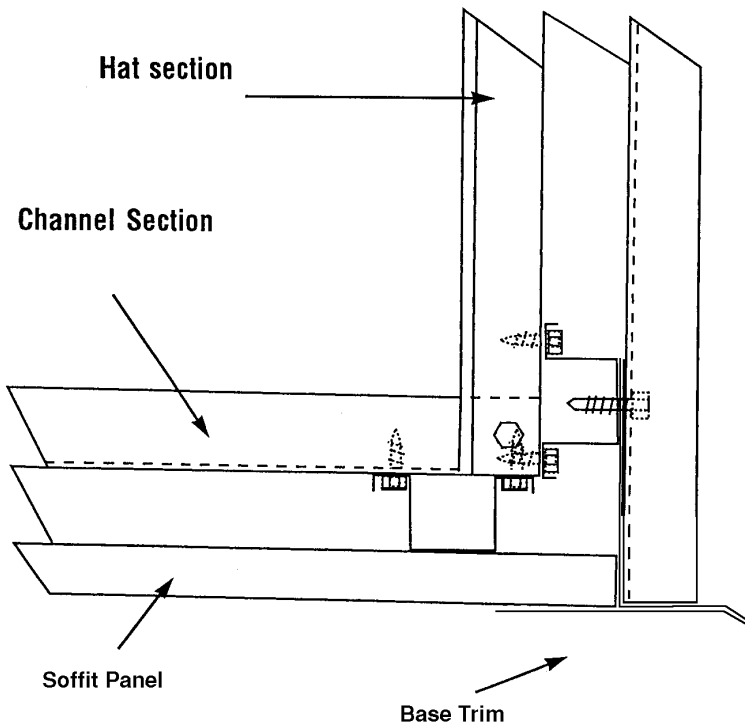
# FRAMING DETAILS



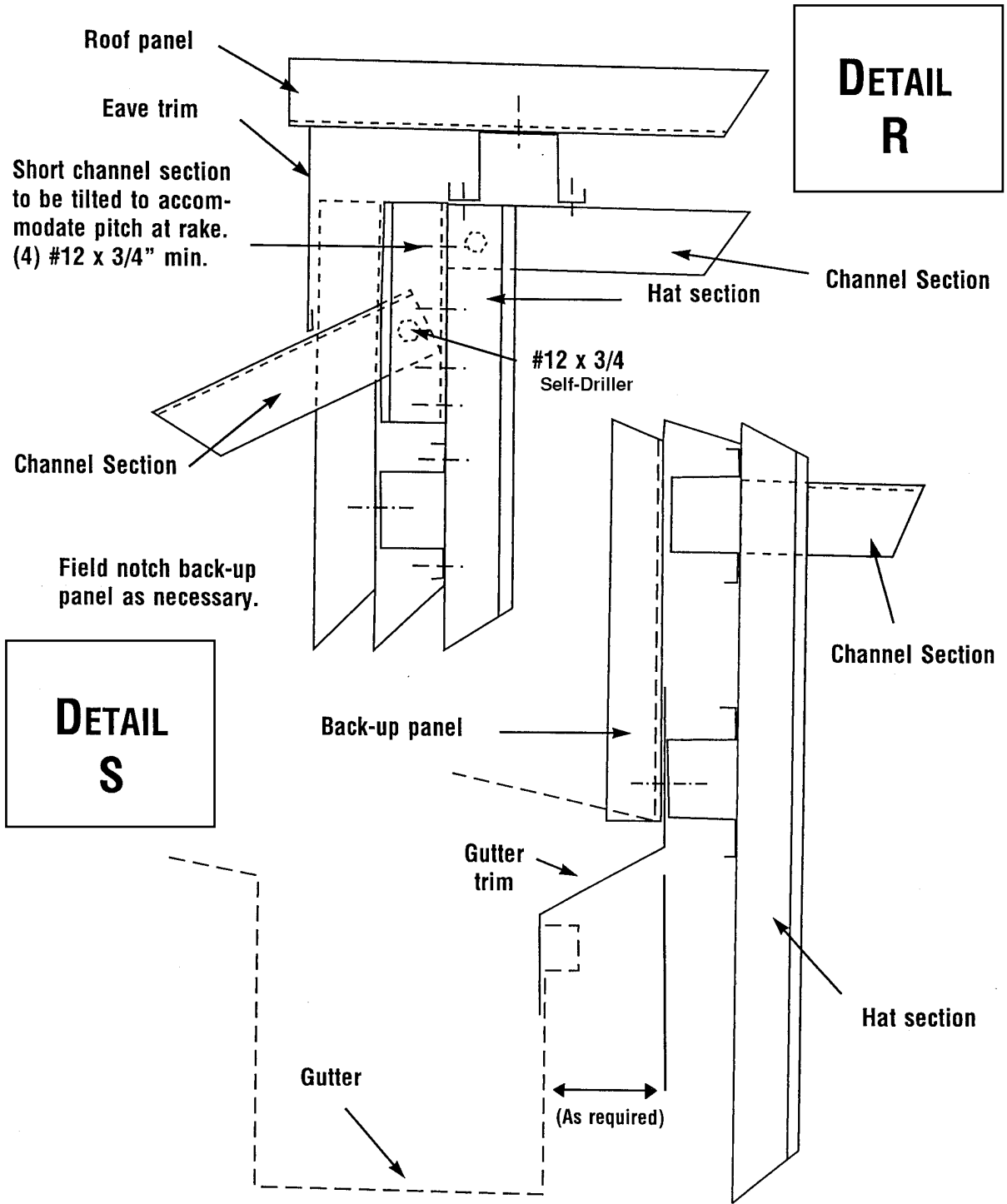
# FRAMING DETAILS



**DETAIL N**

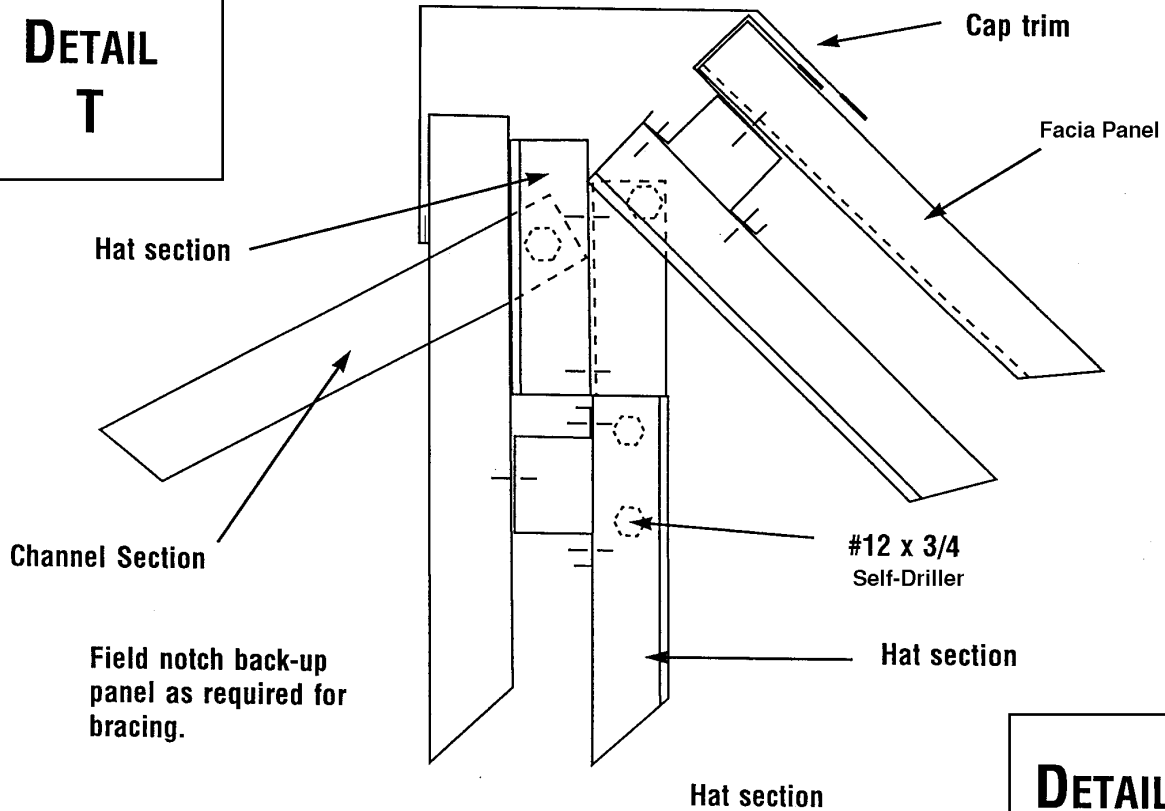


# FRAMING DETAILS

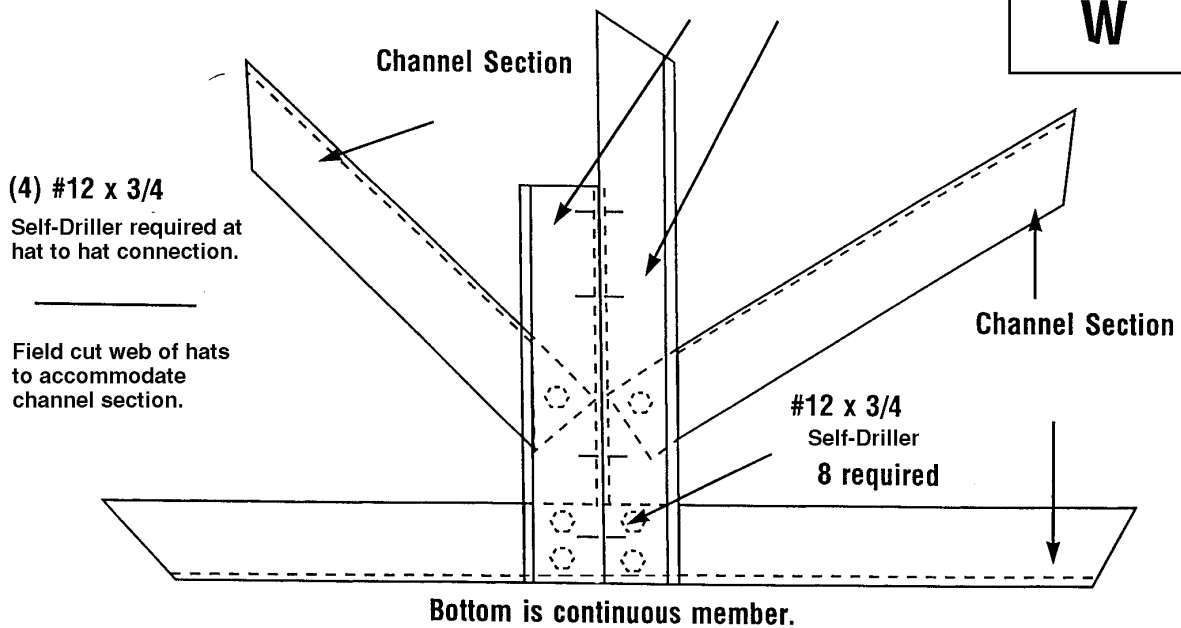


# FRAMING DETAILS

## DETAIL T

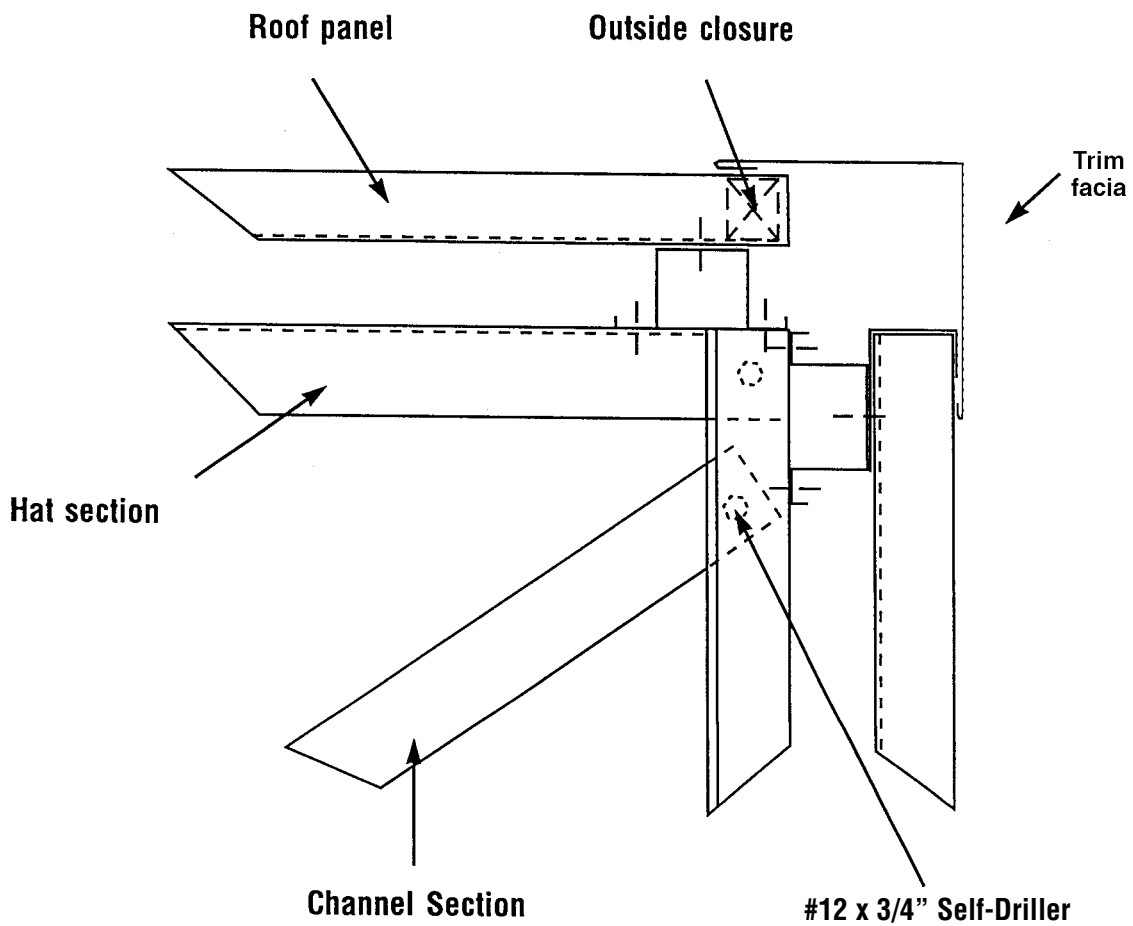


## DETAIL W

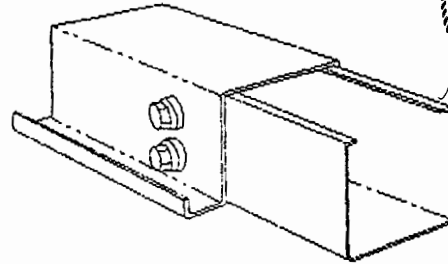
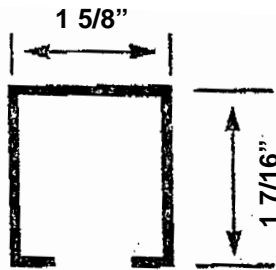


# FRAMING DETAILS

## Detail X



# TECHNICAL DATA CHANNEL SECTION



**16 Ga. Galvanized Steel  
Yield 50,000 PSI**

### Section Properties for Allowable Load Determination

| Condition of Bending  | I-NA (IN.4) | S-TOP (IN.3) | S-BTM (IN.3) | Allow. Momt. (KIP-IN.) |
|-----------------------|-------------|--------------|--------------|------------------------|
| Top in compression    | 0.08130     | 0.13659      | 0.09651      | 3.53407                |
| Bottom in compression | 0.08130     | 0.13659      | 0.09651      | 3.53407                |

### Allowable Load Capacity and Corresponding Deflection for Positive Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 286         | 0.04  | 286       | 0.01  | 358         | 0.02  | 0.13         | 0.10  |
| 3         | 127         | 0.07  | 127       | 0.03  | 158         | 0.05  | 0.20         | 0.15  |
| 4         | 71          | 0.13  | 71        | 0.05  | 88          | 0.09  | 0.27         | 0.20  |
| 5         | 45          | 0.20  | 45        | 0.09  | 57          | 0.14  | 0.33         | 0.25  |
| 6         | 32          | 0.29  | 32        | 0.12  | 39          | 0.19  | 0.40         | 0.30  |
| 7         | 22          | 0.39  | 22        | 0.16  | 29          | 0.26  | 0.47         | 0.35  |

### Allowable Load Capacity and Corresponding Deflection for Negative Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 286         | 0.04  | 286       | 0.01  | 358         | 0.02  | 0.13         | 0.10  |
| 3         | 127         | 0.07  | 127       | 0.03  | 158         | 0.05  | 0.20         | 0.15  |
| 4         | 71          | 0.13  | 71        | 0.05  | 88          | 0.09  | 0.27         | 0.20  |
| 5         | 45          | 0.20  | 45        | 0.09  | 57          | 0.14  | 0.33         | 0.25  |
| 6         | 32          | 0.29  | 32        | 0.12  | 39          | 0.19  | 0.40         | 0.30  |
| 7         | 22          | 0.39  | 22        | 0.16  | 29          | 0.26  | 0.47         | 0.35  |

Allowable Loads can be increased by 1/3 if load is due to wind.

All calculations for section properties have been made in accordance with the 1995 edition to "Specifications for the Design of Light-Gauge Cold Formed Steel Structures Members," published by the American Iron and Steel Institute (AISI).

All deflection values are in inches.

Fastener Load Values: Each #12 x 3/4" Self-drilling Screw will provide the following ultimate load values for the 16 Ga. hat section.

Pull-out-770 pounds; Shear (single Lap)-753 pounds. (Ultimate Values)

Apply a proper safety factor to these loads.

# TECHNICAL DATA CHANNEL SECTION

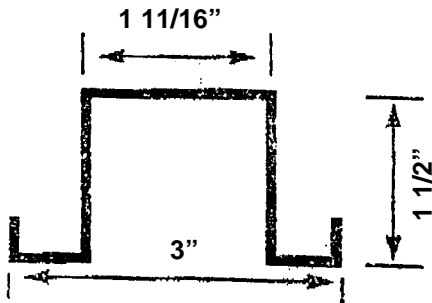
## Channel 16 GA, Fy=50KSI

| Full Section Properties |         |  |      |         |       |                |
|-------------------------|---------|--|------|---------|-------|----------------|
| Area                    | 0.29063 |  | Wt.  | 0.98895 | Width | 4.86000 (Coil) |
| Ix                      | 0.08130 |  | rx   | 0.52889 | Ixy   | 0.00000        |
| Sx(t)                   | 0.13659 |  | y(t) | 0.59518 | Alpha | -90.0000       |
| Sx(b)                   | 0.09651 |  | y(b) | 0.84232 |       |                |
| Iy                      | 0.13014 |  | ry   | 0.66917 | Xo    | -0.00000       |
| Sy(l)                   | 0.16017 |  | x(l) | 0.81250 | Yo    | 1.31718        |
| Sy(r)                   | 0.16017 |  | x(r) | 0.81250 | jx    | 0.00000        |
|                         |         |  |      |         | jy    | -1.48581       |
| I1                      | 0.13014 |  | r1   | 0.66917 |       |                |
| I2                      | 0.08130 |  | r2   | 0.52889 |       |                |
| Ic                      | 0.21144 |  | rc   | 0.85294 | cw    | 0.05649        |
| Io                      | 0.71566 |  | ro   | 1.56923 | J     | 0.00034643     |

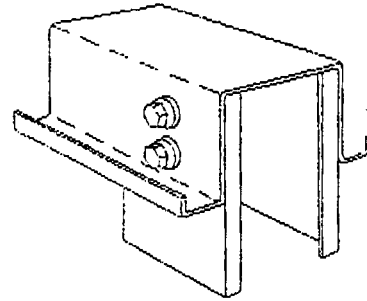
| Fully Braced Allowables |         |                 |         |
|-------------------------|---------|-----------------|---------|
| Compression             |         | Positive Moment |         |
| Pao                     | 7.22094 | Maxo            | 3.53407 |
| Ae                      | 0.27680 | Mayo            | 4.69517 |
|                         |         | Ixe             | 0.12873 |
|                         |         | Sxe(t)          | 0.13659 |
|                         |         | Sye(l)          | 0.16041 |
| Tension                 |         | Positive Moment |         |
| Ta                      | 9.34865 | Sxe(b)          | 0.15651 |
|                         |         | Sye(r)          | 0.16041 |
|                         |         | Negative Moment |         |
|                         |         | Maxo            | 3.53407 |
|                         |         | Mayo            | 4.69517 |
| Shear                   |         | Negative Moment |         |
| Vay                     | 0.00000 | Ixe             | 0.12873 |
| Vax                     | 0.00000 | Sxe(t)          | 0.13659 |
|                         |         | Sye(l)          | 0.15651 |
|                         |         | Sxe(b)          | 0.16041 |
|                         |         | Sye(r)          | 0.16041 |



# TECHNICAL DATA HAT SECTION



**20 Ga. Galvanized Steel  
Yield 50,000 PSI**



### Section Properties for Allowable Load Determination

| Condition of Bending  | I-NA (IN.4) | S-TOP (IN.3) | S-BTM (IN.3) | Allow. Momt. (KIP-IN.) |
|-----------------------|-------------|--------------|--------------|------------------------|
| Top in compression    | 0.06891     | 0.09095      | 0.09924      | 2.72840                |
| Bottom in compression | 0.07485     | 0.10398      | 0.10223      | 3.52969                |

### Allowable Load Capacity and Corresponding Deflection for Positive Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 299         | 0.046 | 313       | 0.016 | 391         | 0.031 | 0.13         | 0.10  |
| 3         | 133         | 0.101 | 138       | 0.047 | 173         | 0.070 | 0.20         | 0.15  |
| 4         | 74          | 0.178 | 77        | 0.085 | 96          | 0.124 | 0.27         | 0.20  |
| 5         | 47          | 0.279 | 49        | 0.116 | 61          | 0.194 | 0.33         | 0.25  |
| 6         | 32          | 0.403 | 33        | 0.171 | 44          | 0.279 | 0.40         | 0.30  |
| 7         | 24          | 0.542 | 25        | 0.233 | 32          | 0.380 | 0.47         | 0.35  |

### Allowable Load Capacity and Corresponding Deflection for Negative Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 342         | 0.046 | 329       | 0.015 | 410         | 0.023 | 0.13         | 0.10  |
| 3         | 151         | 0.099 | 145       | 0.046 | 183         | 0.062 | 0.20         | 0.15  |
| 4         | 85          | 0.169 | 81        | 0.070 | 103         | 0.108 | 0.27         | 0.20  |
| 5         | 53          | 0.277 | 52        | 0.108 | 65          | 0.169 | 0.33         | 0.25  |
| 6         | 37          | 0.392 | 35        | 0.154 | 44          | 0.246 | 0.40         | 0.30  |
| 7         | 28          | 0.538 | 26        | 0.215 | 33          | 0.346 | 0.47         | 0.35  |

Allowable Loads can be increased by 1/3 if load is due to wind.

All calculations for section properties have been made in accordance with the 1995 edition to "Specifications for the Design of Light-Gauge Cold Formed Steel Structures Members," published by the American Iron and Steel Institute (AISI).

All deflection values are in inches.

Fastener Load Values: Each #12 x 3/4" Self-drilling Screw will provide the following ultimate load values for the 20 Ga. hat section.

Pull-out-400 pounds; Shear (single Lap)-753 pounds. (Ultimate Values)

Apply a proper safety factor to these loads.

# TECHNICAL DATA HAT SECTION

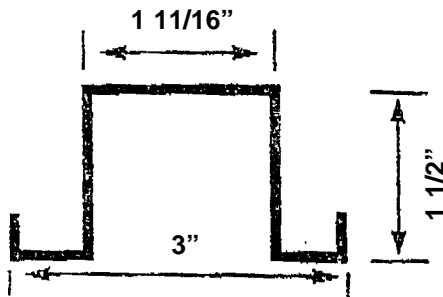
## Hat 20 GA, Fy=50KSI

| Full Section Properties |         |  |      |         |       |                |
|-------------------------|---------|--|------|---------|-------|----------------|
| Area                    | 0.22366 |  | Wt.  | 0.76106 | Width | 6.23000 (Coil) |
| Ix                      | 0.07485 |  | rx   | 0.57849 | Ixy   | -0.00000       |
| Sx(t)                   | 0.10398 |  | y(t) | 0.71982 | Alpha | 90.0000        |
| Sx(b)                   | 0.10223 |  | y(b) | 0.73218 |       |                |
| Iy                      | 0.19294 |  | ry   | 0.92880 | Xo    | -0.00000       |
| Sy(l)                   | 0.12739 |  | x(l) | 1.51460 | Yo    | 1.18440        |
| Sy(r)                   | 0.12739 |  | x(r) | 1.51460 | jx    | -0.00000       |
|                         |         |  |      |         | jy    | -1.57014       |
| I1                      | 0.19294 |  | r1   | 0.92880 |       |                |
| I2                      | 0.07485 |  | r2   | 0.57849 |       |                |
| Ic                      | 0.26779 |  | rc   | 1.09422 | cw    | 0.03302        |
| Io                      | 0.58154 |  | ro   | 1.61249 | J     | 0.00009608     |

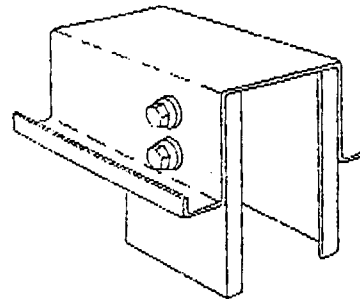
| Fully Braced Allowables |         |                        |         |
|-------------------------|---------|------------------------|---------|
| <b>Compression</b>      |         | <b>Positive Moment</b> |         |
| Pao                     | 5.31477 | Maxo                   | 2.72840 |
| Ae                      | 0.20373 | Mayo                   | 4.48768 |
|                         |         | Ixe                    | 0.06891 |
|                         |         | Iye                    | 0.19294 |
|                         |         | Sxe(t)                 | 0.09095 |
|                         |         | Sye(l)                 | 0.12739 |
| <b>Tension</b>          |         | <b>Positive Moment</b> |         |
| Ta                      | 7.05019 | Sxe(b)                 | 0.09924 |
|                         |         | Sye(r)                 | 0.12739 |
|                         |         | <b>Negative Moment</b> |         |
|                         |         | Maxo                   | 3.52969 |
|                         |         | Mayo                   | 4.48768 |
| <b>Shear</b>            |         | <b>Negative Moment</b> |         |
| Vay                     | 0.00000 | Ixe                    | 0.07485 |
| Vax                     | 0.00000 | Iye                    | 0.19294 |
|                         |         | Sxe(t)                 | 0.10398 |
|                         |         | Sye(l)                 | 0.12739 |
|                         |         | Sxe(b)                 | 0.10223 |
|                         |         | Sye(r)                 | 0.12739 |



# TECHNICAL DATA HAT SECTION



18 Ga. Galvanized Steel  
Yield 50,000 PSI



### Section Properties for Allowable Load Determination

| Condition of Bending  | I-NA (IN.4) | S-TOP (IN.3) | S-BTM (IN.3) | Allow. Momt. (KIP-IN.) |
|-----------------------|-------------|--------------|--------------|------------------------|
| Top in compression    | 0.09599     | 0.13208      | 0.13235      | 3.96252                |
| Bottom in compression | 0.09666     | 0.13360      | 0.13269      | 4.77119                |

### Allowable Load Capacity and Corresponding Deflection for Positive Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 435         | 0.033 | 455       | 0.011 | 568         | 0.022 | 0.13         | 0.10  |
| 3         | 193         | 0.072 | 200       | 0.033 | 251         | 0.050 | 0.20         | 0.15  |
| 4         | 107         | 0.128 | 113       | 0.061 | 140         | 0.089 | 0.27         | 0.20  |
| 5         | 69          | 0.200 | 71        | 0.083 | 89          | 0.139 | 0.33         | 0.25  |
| 6         | 47          | 0.289 | 49        | 0.122 | 64          | 0.200 | 0.40         | 0.30  |
| 7         | 34          | 0.390 | 36        | 0.167 | 47          | 0.273 | 0.47         | 0.35  |

### Allowable Load Capacity and Corresponding Deflection for Negative Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 440         | 0.036 | 422       | 0.012 | 527         | 0.018 | 0.13         | 0.10  |
| 3         | 195         | 0.077 | 186       | 0.036 | 235         | 0.048 | 0.20         | 0.15  |
| 4         | 110         | 0.131 | 104       | 0.054 | 132         | 0.083 | 0.27         | 0.20  |
| 5         | 68          | 0.214 | 67        | 0.083 | 84          | 0.131 | 0.33         | 0.25  |
| 6         | 47          | 0.303 | 45        | 0.119 | 57          | 0.190 | 0.40         | 0.30  |
| 7         | 36          | 0.416 | 34        | 0.167 | 42          | 0.268 | 0.47         | 0.35  |

Allowable Loads can be increased by 1/3 if load is due to wind.

All calculations for section properties have been made in accordance with the 1995 edition to "Specifications for the Design of Light-Gauge Cold Formed Steel Structures Members," published by the American Iron and Steel Institute (AISI).

All deflection values are in inches.

Fastener Load Values: Each #12 x 3/4" Self-drilling Screw will provide the following ultimate load values for the 18 Ga. hat section.

Pull-out-600 pounds; Shear (single Lap)-753 pounds. (Ultimate Values)

Apply a proper safety factor to these loads.

# TECHNICAL DATA HAT SECTION

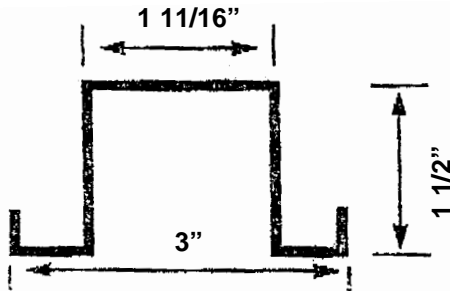
## Hat 18 GA, Fy=50KSI

| Full Section Properties |         |  |      |         |       |                |
|-------------------------|---------|--|------|---------|-------|----------------|
| Area                    | 0.29779 |  | Wt.  | 1.01333 | Width | 6.23000 (Coil) |
| Ix                      | 0.09666 |  | rx   | 0.56973 | Ixy   | 0.00000        |
| Sx(t)                   | .013360 |  | y(t) | 0.72352 | Alpha | -90.0000       |
| Sx(b)                   | 0.13269 |  | y(b) | 0.72848 |       |                |
| Iy                      | 0.25804 |  | ry   | 0.93086 | Xo    | -0.00000       |
| Sy(l)                   | 0.17172 |  | x(l) | 1.50270 | Yo    | 1.15788        |
| Sy(r)                   | 0.17172 |  | x(r) | 1.50270 | jx    | 0.00000        |
|                         |         |  |      |         | jy    | -1.54363       |
| I1                      | 0.25804 |  | r1   | 0.93086 |       |                |
| I2                      | 0.09666 |  | r2   | 0.56973 |       |                |
| Ic                      | 0.35470 |  | rc   | 1.09138 | cw    | 0.04433        |
| Io                      | 0.75395 |  | ro   | 1.59116 | J     | 0.00022680     |

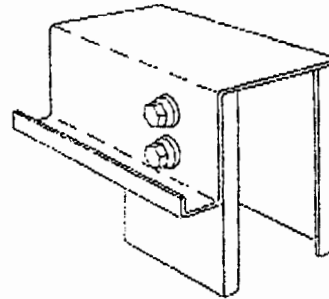
| Fully Braced Allowables |         |                 |         |                 |         |
|-------------------------|---------|-----------------|---------|-----------------|---------|
| Compression             |         | Positive Moment |         | Positive Moment |         |
| Pao                     | 7.71556 | Maxo            | 3.96252 | Mayo            | 6.14102 |
| Ae                      | 0.29576 | Ixe             | 0.09599 | Iye             | 0.25804 |
|                         |         | Sxe(t)          | 0.13208 | Sye(l)          | 0.17172 |
|                         |         | Sxe(b)          | 0.13235 | Sye(r)          | 0.17172 |
| Tension                 |         |                 |         |                 |         |
| Ta                      | 9.53742 |                 |         |                 |         |
|                         |         | Negative Moment |         | Negative Moment |         |
|                         |         | Maxo            | 4.77119 | Mayo            | 6.14102 |
|                         |         | Ixe             | 0.09666 | Iye             | 0.25804 |
| Vay                     | 0.00000 | Sxe(t)          | 0.13360 | Sye(l)          | 0.17172 |
| Vax                     | 0.00000 | Sxe(b)          | 0.13269 | Sye(r)          | 0.17172 |



# TECHNICAL DATA HAT SECTION



**16 Ga. Galvanized Steel  
Yield 50,000 PSI**



### Section Properties for Allowable Load Determination

| Condition of Bending  | I-NA (IN.4) | S-TOP (IN.3) | S-BTM (IN.3) | Allow. Momt. (KIP-IN.) |
|-----------------------|-------------|--------------|--------------|------------------------|
| Top in compression    | 0.11693     | 0.16102      | 0.16111      | 5.3021                 |
| Bottom in compression | 0.11693     | 0.16102      | 0.16111      | 5.3021                 |

### Allowable Load Capacity and Corresponding Deflection for Positive Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 530         | 0.027 | 555       | 0.009 | 693         | 0.018 | 0.13         | 0.10  |
| 3         | 235         | 0.060 | 244       | 0.027 | 306         | 0.041 | 0.20         | 0.15  |
| 4         | 131         | 0.105 | 137       | 0.050 | 171         | 0.073 | 0.27         | 0.20  |
| 5         | 84          | 0.164 | 86        | 0.069 | 109         | 0.114 | 0.33         | 0.25  |
| 6         | 58          | 0.238 | 60        | 0.101 | 78          | 0.164 | 0.40         | 0.30  |
| 7         | 42          | 0.320 | 44        | 0.137 | 58          | 0.224 | 0.47         | 0.35  |

### Allowable Load Capacity and Corresponding Deflection for Negative Loads in Pounds Per Linear Foot

| Span (FT) | Simple Span |       | Two Spans |       | Three Spans |       | Allow. Defl. |       |
|-----------|-------------|-------|-----------|-------|-------------|-------|--------------|-------|
|           | Load        | Defl. | Load      | Defl. | Load        | Defl. | L/180        | L/240 |
| 2         | 530         | 0.030 | 509       | 0.010 | 635         | 0.015 | 0.13         | 0.10  |
| 3         | 235         | 0.064 | 225       | 0.030 | 284         | 0.039 | 0.20         | 0.15  |
| 4         | 132         | 0.108 | 126       | 0.044 | 160         | 0.069 | 0.27         | 0.20  |
| 5         | 83          | 0.177 | 81        | 0.069 | 100         | 0.108 | 0.33         | 0.25  |
| 6         | 57          | 0.251 | 55        | 0.098 | 69          | 0.157 | 0.40         | 0.30  |
| 7         | 43          | 0.344 | 41        | 0.138 | 51          | 0.221 | 0.47         | 0.35  |

Allowable Loads can be increased by 1/3 if load is due to wind.

All calculations for section properties have been made in accordance with the 1995 edition to "Specifications for the Design of Light-Gauge Cold Formed Steel Structures Members," published by the American Iron and Steel Institute (AISI).

All deflection values are in inches.

Fastener Load Values: Each #12 x 3/4" Self-drilling Screw will provide the following ultimate load values for the 16 Ga. hat section.

Pull-out-770 pounds; Shear (single Lap)-753 pounds. (Ultimate Values)

Apply a proper safety factor to these loads.

# TECHNICAL DATA HAT SECTION

## Hat 16 GA, Fy=50KSI

| Full Section Properties |         |  |      |         |  |       |                |
|-------------------------|---------|--|------|---------|--|-------|----------------|
| Area                    | 0.37255 |  | Wt.  | 1.26773 |  | Width | 6.23000 (Coil) |
| Ix                      | 0.11693 |  | rx   | 0.56024 |  | Ixy   | 0.00000        |
| Sx(t)                   | 0.16102 |  | y(t) | 0.72619 |  | Alpha | 90.0000        |
| Sx(b)                   | 0.16111 |  | y(b) | 0.72581 |  |       |                |
| Iy                      | 0.32390 |  | ry   | 0.93242 |  | Xo    | 0.00000        |
| Sy(l)                   | 0.21728 |  | x(l) | 1.49070 |  | Yo    | 1.12966        |
| Sy(r)                   | 0.21728 |  | x(r) | 1.49070 |  | jx    | -0.00000       |
|                         |         |  |      |         |  | iy    | -1.51495       |
| I1                      | 0.32390 |  | r1   | 0.93242 |  |       |                |
| I2                      | 0.11693 |  | r2   | 0.56024 |  |       |                |
| Ic                      | 0.44083 |  | rc   | 1.08778 |  | cw    | 0.05605        |
| Io                      | 0.91626 |  | ro   | 1.56825 |  | J     | 0.00044409     |

| Fully Braced Allowables |         |                 |         |
|-------------------------|---------|-----------------|---------|
| Compression             |         | Positive Moment |         |
| Pao                     | 10.5403 | Maxo            | 5.3021  |
| Ae                      | 0.37255 | lxe             | 0.11693 |
|                         |         | Sxe(t)          | 0.16102 |
|                         |         | Sxe(b)          | 0.16111 |
| Tension                 |         | Positive Moment |         |
| Ta                      | 12.1213 | Mayo            | 7.8529  |
|                         |         | Iye             | 0.32390 |
|                         |         | Sye(l)          | 0.21728 |
|                         |         | Sye(r)          | 0.21728 |
|                         |         | Negative Moment |         |
|                         |         | Maxo            | 5.3021  |
|                         |         | Mayo            | 7.8529  |
| Shear                   |         | Negative Moment |         |
| Vay                     | 0.00000 | Iye             | 0.32390 |
| Vax                     | 0.00000 | Sxe(t)          | 0.16102 |
|                         |         | Sye(l)          | 0.21728 |
|                         |         | Sxe(b)          | 0.16111 |
|                         |         | Sye(r)          | 0.21728 |





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