S-Model Bldgs.

ERECTION GUIDE

ERECTION GUIDE

CUSTOMER RESPONSIBILITES

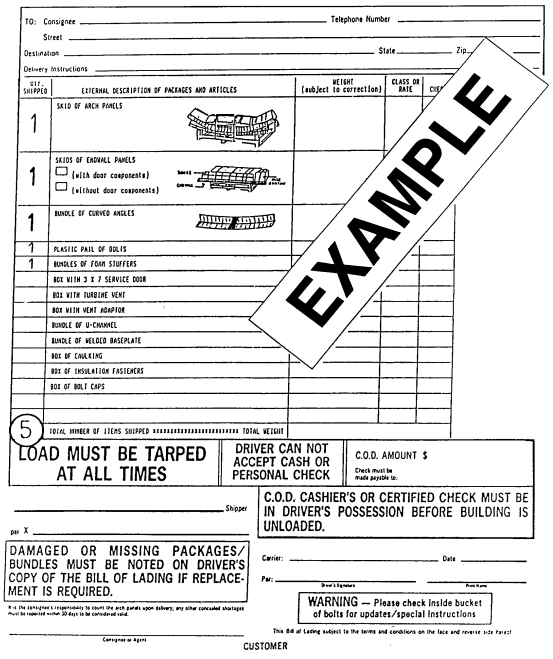
UPON DELIVERY

Be advised that all shipments are via outside trucking companies and are signed for in good condition and completeness at the pick-up location by the driver. **No claim will be honored** unless the following procedures have been followed:

EXTERNAL INVENTORY: At the delivery point, the driver is required to provide you with a **Bill of Lading** (see picture below) which lists and illustrates all **bulk** items and quantities to be received. **Check that the bulk items have been delivered and the quantities match the left column of the Bill of Lading. Any shortage or "external" damage of any bulk items must be noted on all copies of the Bill of Lading**. Retain one copy for your records. Failure to do so will make it impossible for the factory to honor any claim. **No exceptions!!!** Before the driver leaves, it is also required that you receive a **Material Development Report (packing list)** that specifies all internal inventory quantities of individual parts. **The driver does not have to be present for the internal inventory**. You have 30 days to inventory the individual components.

SPECIAL NOTE: Overhead doors and service doors are shipped in cardboard boxes. **It is required that any doors be opened to insure there was no damage during shipping.** If damaged, it **must** be noted on the bill of lading.

BILL OF LADING



INTERNAL INVENTORY: Locate the **Material Development** to inventory the individual building components. The **Material Development** will be in a packing slip on a bucket of bolts or attached to the Bill of Lading**. Valid concealed shortages must be reported to the factory within 30 calendar days. No exceptions!!!** The Glossary in the back of this book can be used to identify parts.

MATERIAL DEVELOPMENT

Parts: no — **Material Development Report** — Page # 1

Factory Order ID: **Dealer Order #**

Dealer: Customer: Attn:

Product ID	Description	Quantity	Done
AP221218	121" Roof Panel 22 Ga Az 8 Bend	38	
APD22658	65" Dp Sht Roof Panel 22 Ga Az 8 Bend	19	
APJ2212114	121" J-Panel 22 Ga Az 14 Bend	38	
APS2246	46" Straight Panel 22 Ga Az	38	
CI121	Inner Curved Angle 121"	4	
CI65	Inner Curved Angle 65"	2	
CIJ121	Inner "J" Curved Angle 107"	4	
CIS46L	Inner Straight Curved Angle 46" L	2	
CIS46R	Inner Straight Curved Angle 46"	2	
CO121	Outer Curved Angle 121"	4	
CO65	Outer Curved Angle 65"	2	
COJ121	Outer "J" Curved Angle	4	
COS46L	Outer Straight Curved	2	
COS46R	Outer Straight Curv ght	2	
DPOLB1110	Lb Connector 11']	1	
EPGEN24	22 Ga. Endwall ds From 33"	1,143	
STUF	Foam Stuffer Lg. (Charcoal)	18	
VE059.5L	Comm Endw Left	1	
VE059.5R	Comm Er 5" Right	1	
VE107.25L	Comm 07.25" Left	1	
VE107.25R	Co n 107.25" Right	1	
VE120	Comm onn 120"	2	
W03825R	Welded Connector 38 1/4" Lg. RIGHT	2	
W06275L	Welded Arch Connector 62 3/4" Lg. LEFT	2	
W12250	Welded Arch Connector 122 1/2" Intermed.	6	
ZBOLT	Bolt/SQ Nut Gr2 JS500 5/16-18 X 3/4	4,299	
AS301522	S30-15 Arch 22 Ga	19	3,458
NS3015	24" Solid Endwall S30-15	1	860
NS30151212	24" Open Endwall S30-15 12hx12w	1	621
VES30	Comm Endwall Conn S-30 (Solid)	1	46
VES30-12	Comm Endwall Conn S-30 W/12' Opening	1	28
WA019	Welded Arch Connector 19 Arches Complet	1	324

Building Weight: 5,337

Customer COD 0.00

NOTE: Arch Strapping

EXAMPLE

Foundation Notice

Attention Builder: **Included in your construction packet is a blueprint showing a factory-approved foundation scenario depicting minimum requirements for your project. From time to time, state or local building codes may require additional design. In such a case, it is advised that you retain a professional engineer or architect for consultation. Please follow this plan in conjunction with the foundation and construction manuals to ensure the maximum strength of your building.**

Deviating from factory foundation specification minimums will void any and all structural warranties whether expressed or implied.

The use of an angle iron or third-part fabricated foundation connectors is prohibited. It may cause deflection (movement) at the base of the building and could ultimately compromise the structural integrity of your building, especially under harsh climatic conditions.

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CHAPTER 1
INTRODUCTION

1-1 IMPORTANT NOTES

DESIGN CHANGES/SUBSTITUTIONS: The manufacturer of your building may make certain changes in the design of the building or in the components during the model year, without notice. In cases of doubt, check with your local representative or contact the factory. The manufacturer cannot accept liability for errors, which despite careful checking, may occur in this guide. Always check for factory updates in the buckets of bolts.

PROTECT YOUR INVESTMENT: It is important that you obtain construction insurance **prior** to beginning the construction. It is usually only a very small cost and quite often can be obtained as an inexpensive rider on an existing policy. This will protect you against sudden climatic changes such as strong winds that may cause serious damage.

HARDWARE: The manufacturer ships 3% more nuts, bolts and caulking (if purchased) with your building than are actually required. Try to avoid losing bolts or the caulking at the construction site due to careless handling. The factory cannot assume responsibility for furnishing additional hardware, nuts, bolts and caulking.

SAFETY FIRST: Pay close attention to basic construction safety rules to **avoid accidents during construction**. Be sure to wear hard hats, boots, safety goggles and safety gloves to protect your hands, etc. Always secure ladders and scaffolding to prevent them from falling over.

TECHNICAL SUPPORT: It is important to review this manual carefully in conjunction with blueprints and any foundation manuals. Make certain that you completely understand all the instructions before you approach the construction. Please contact the factory (412) 771-2944 at any time if you have any questions concerning the building before, during or after the construction. It is important to us that you have service should you need urgent assistance. When calling the factory always try to have your shipping number from your delivery receipt or order number found on your blueprints.

1-2 STORAGE INSTRUCTIONS

The galvanized or Galvalume® steel used in the manufacture of your building was thoroughly inspected before leaving the factory and was in a clean and unstained condition. To ensure that the steel remains in this condition and does not start to stain or discolor, the following precautions must be taken.

1. If at all possible, store the building in a dry, well-ventilated area.

2. Cut the banding on all packages and separate the panels to allow air to flow between each and every sheet.

3. Do not allow any moisture on or between the sheets.

If the building must be stored outside, extra precautions must be taken. It is not sufficient to simply cover the steel with a tarp. In fact, this is probably the worst thing to do.

1. Cut the banding and separate all arch panels with small pieces of dry wood to allow air to flow between all the sheets.

2. The endwall bundles must be totally separated so that no two sheets are in contact with each other.

3. All pieces should be separated and stored on wood blocks up off the ground.

Galvanized or Galvalume® metal, if allowed to become damp either from exposure to rain or condensation, will develop a gray-white (or black) deposit knows as “wet storage stain.” Please follow these instructions to protect the finish on your building panels. Failure to properly store galvanized or Galvalume® products may have a negative impact on your building’s appearance.

1-3 EQUIPMENT LIST

The tools and equipment listed below include everything you'll need for proper construction of your building.. For any anchor bolt requirements, see Sheet 2 of your blueprints. Follow the anchor bolt manufacturer's recommendations for installation. These materials are **not** supplied with your building.

- **Extension Ladder**
- **Tapered Drift Pin (1/4" Dia. 8"-10" Long)**
- **Gloves**
- **Level**
- **Tape Measure**
- **Plumb Bob**
- **Hard Hat**
- **9/16" and 1/2" Wrenches**
- **Scaffolding**
- **Impact Gun with 11/16" 12-Point Socket**
- **Drill with 3/8" Bit**
- **Sheet Metal Nibbler or Shears**
- **100' Rope**
- **"S" Hooks (5/16" Dia. Rod)**
- **Hammer**
- **Sheet Metal Nibbler**

NOTE: If your building is customized, you may require additional tools and equipment.

CHAPTER 2
ERECTION OF ARCHES

Arch Panel

The arches of your building are the major components of the structure acting as both the sidewalls and the roof. If properly erected as outlined in the following pages the building will be watertight. We do suggest, however, that to be 100% sure of avoiding leakage problems from driving rain or extreme weather conditions, you apply caulking to all joints and seams. Models 40' wide and over should use calking.

Our company supplies, as an option, a superior brand of butyl strip caulking which is extremely easy to apply. You can, however, use any good waterproof tube type butyl caulking, which may be purchased from your local hardware or farm supply.

If the building you have purchased has large sliding doors, you should start to erect your building at that end.

NOTE: These are two popular methods of erecting the arches. One method is to assemble complete arches on the ground and raise them into position. This method is described and illustrated in great length on the following pages. The other method is to assemble the arches in half sections, raise the half sections separately, and bolt together to complete the arch. We recommend, for all building greater than 35' wide, the half-arch method be used. It is best if you read both methods carefully and choose the method best suited to your equipment and manpower situation.

NOTE: ALL BOLTS SHOULD BE HAND TIGHTENED ONLY. DO NOT WRENCH TIGHTEN UNTIL ALL ARCHES HAVE BEEN ERECTED.

2-1 ASSEMBLING THE ARCHES

The arch is comprised of 121" Roof Sections, one Short Roof Section, 2 J-Panels, and 2 Straight Panels. See Sheet 1 of your blueprint packet for the specific panel sequence for your building. The Short Roof Section should be alternated from side to side on successive arches to achieve a staggered joint for greater strength. The panels should be assembled into arches on the ground as shown in *Figure 2-1A*.

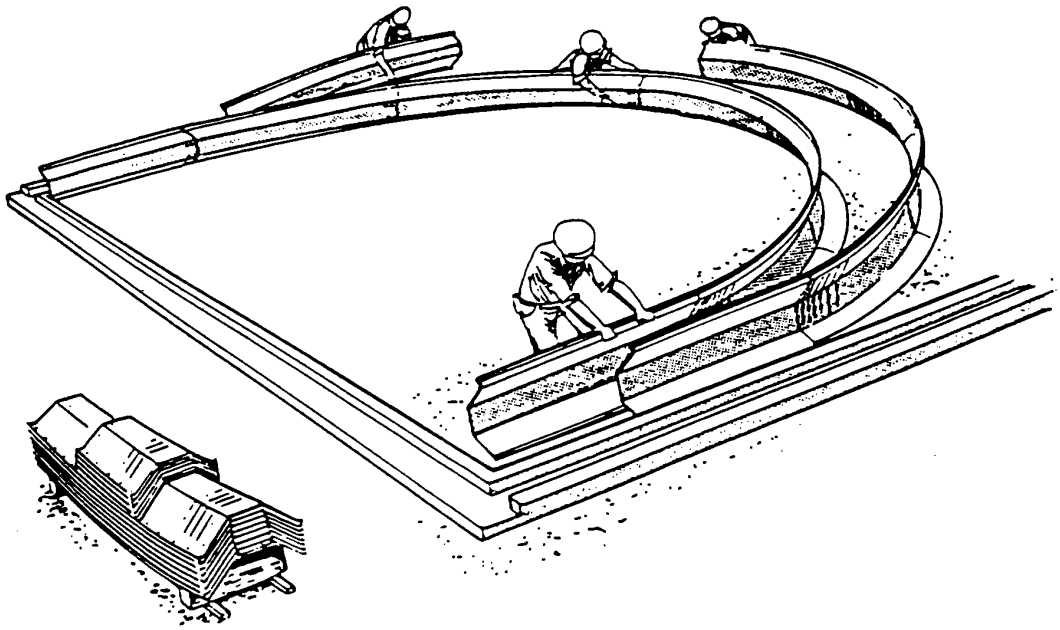


Figure 2-1A

STEP 1

The arch panels have a double lap (2 rows of bolt holes) with each adjacent panel as shown in *Figure 2-1B*.

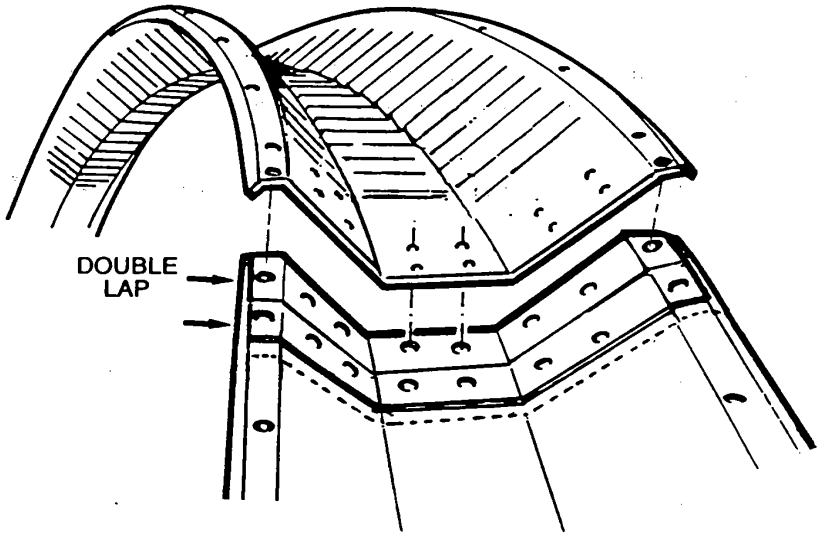


Figure 2-1B

STEP 2

When joining the panels to create the full arch, the pieces should be overlapped properly (the higher arch pieces on top of the lower arch pieces) to ensure that rain will flow down the arch as shown in *Figure 2-1C*.

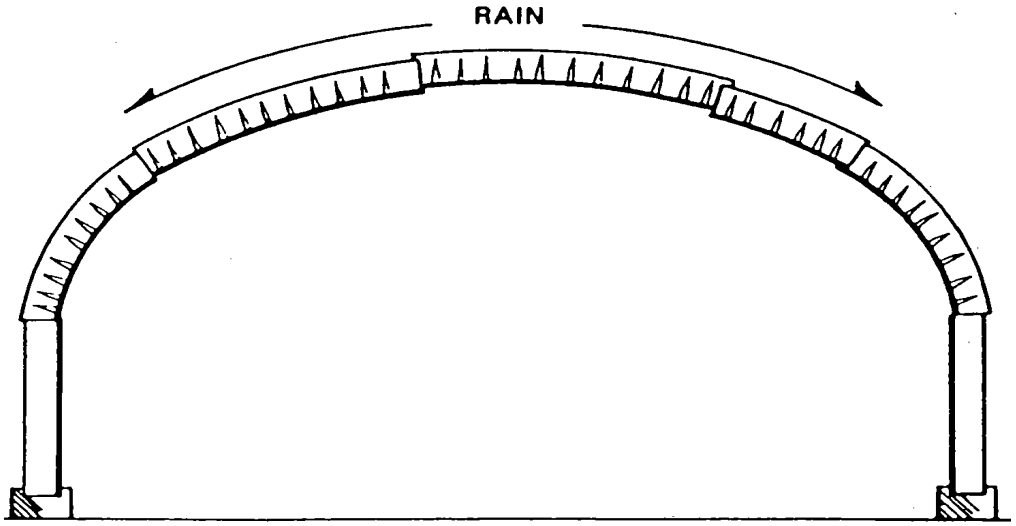


Figure 2-1C*

*** - ARCH PICTURED IS FOR ILLUSTRATIVE PURPOSES ONLY, SEE SHEET 1 OF THE BLUEPRINTS FOR NUMBER OF PANELS IN ARCH**

STEP 3

The panels are bolted end-to-end using drift pins to align the holes as shown in *Figure 2-1D*. The bolts should not be tightened at this time. **CAUTION:** If a bolthole is ripped or excessively enlarged, some caulking should be applied around the bolt head to prevent leaks.

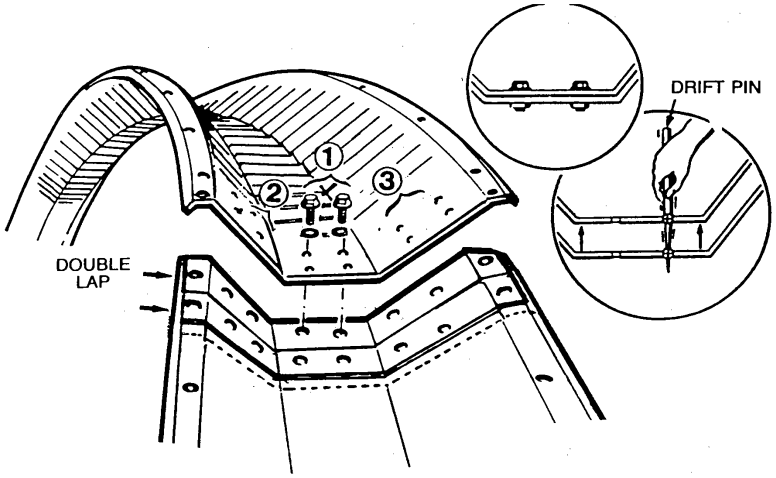


Figure 2-1D

STEP 4

The arch panels should be assembled in a specific sequence as shown in *Figure 2-1E*. The Short Roof Panels should be alternated from side to side on successive arches, to create a staggered joint for greater strength. Once the arch panels have been assembled into complete units you are ready to raise them into position.

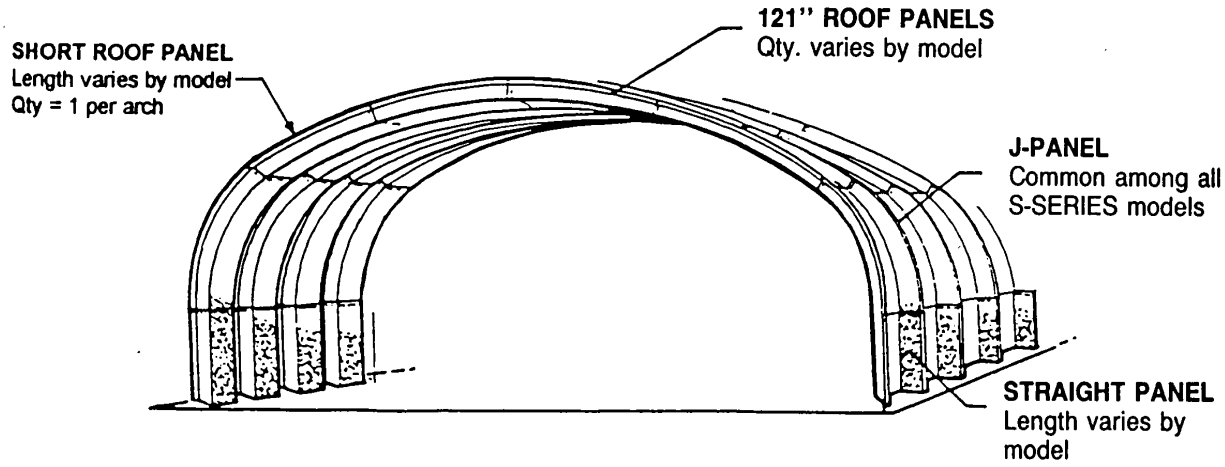


Figure 2-1E

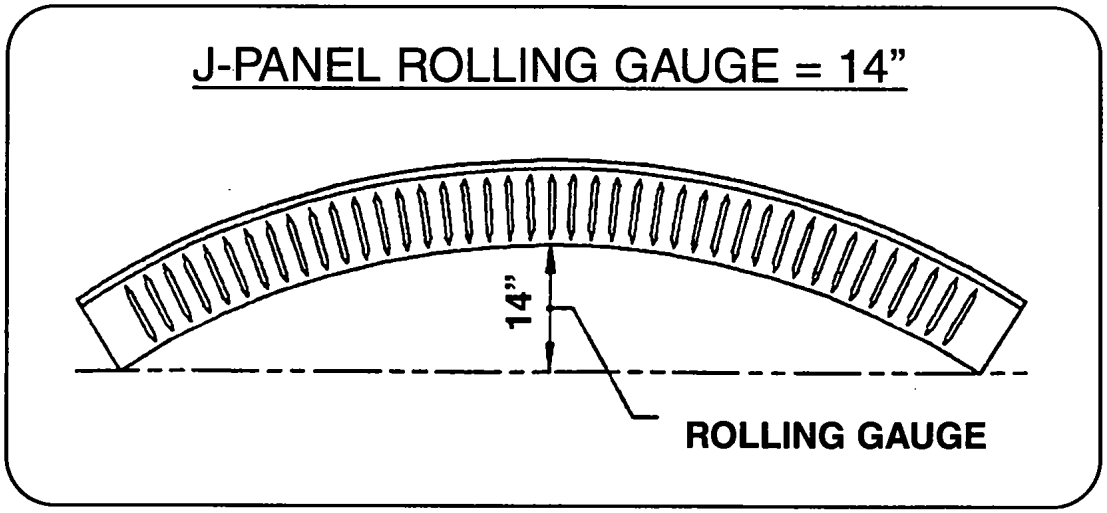
*** - ARCH PICTURED IS FOR ILLUSTRATIVE PURPOSES ONLY, SEE SHEET 1 OF THE BLUEPRINTS FOR NUMBER OF PANELS IN ARCH**

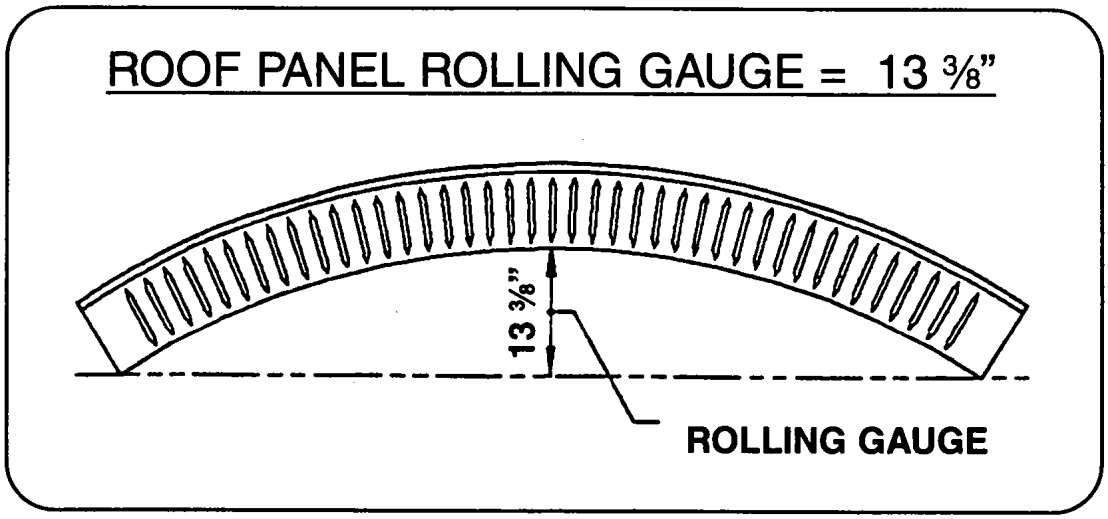
NOTE: ALL BOLTS SHOULD BE HAND TIGHTENED ONLY. DO NOT WRENCH TIGHTEN UNTIL ALL ARCHES HAVE BEEN ERECTED.

C A U T I O N :

S 2 0 – M O D E L S

NOTE: THE ROLLING GAUGE FOR A J-PANEL IS DIFFERENT THAN THE ROLLING GAUGE FOR A ROOF PANEL!!!

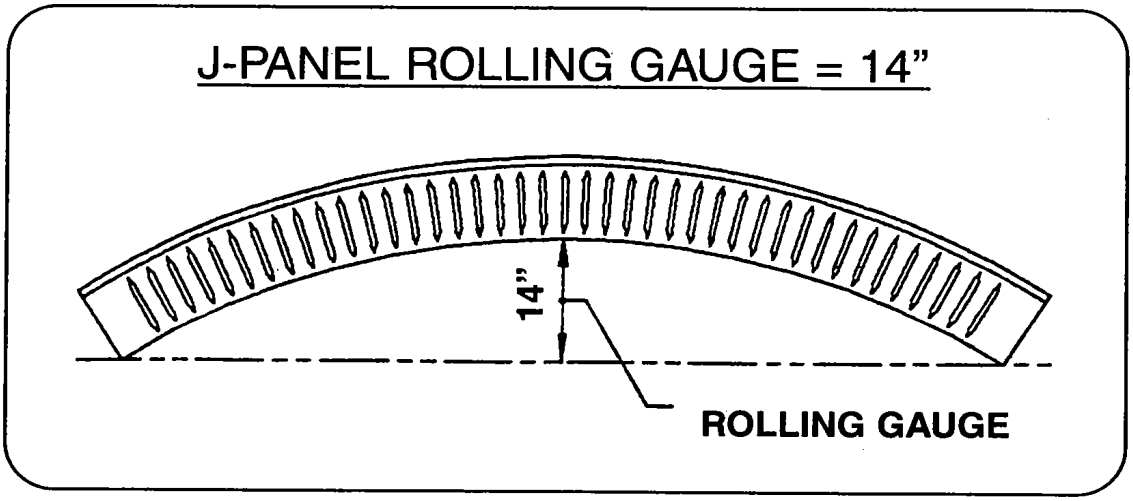


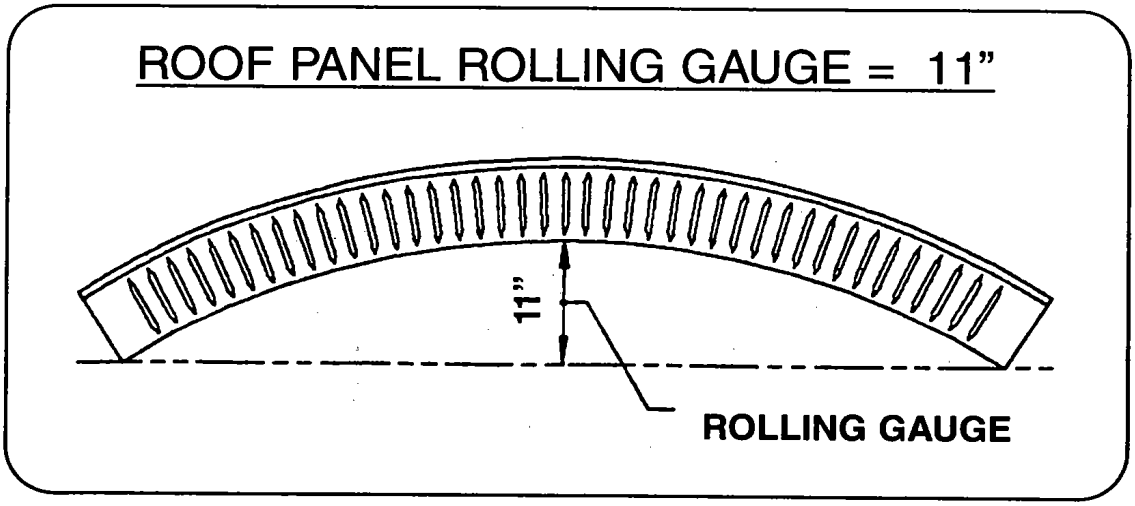


C A U T I O N :

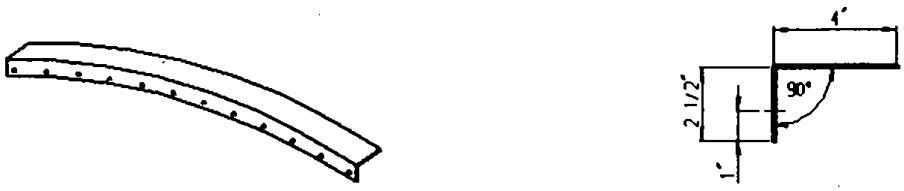
S 2 5 – M O D E L S

NOTE: THE ROLLING GAUGE FOR A J-PANEL IS DIFFERENT THAN THE ROLLING GAUGE FOR A ROOF PANEL!!!

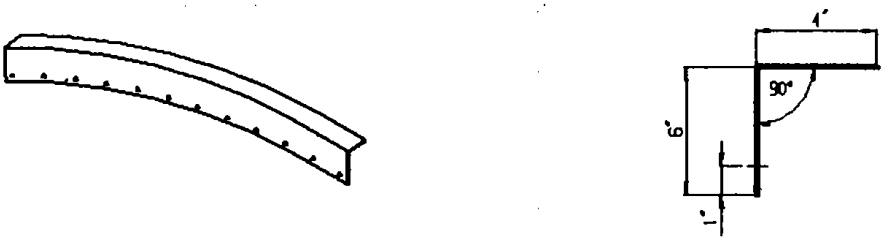




2-2 INSTALLING CURVED ANGLES



Inner Curved Angle



Outer Curved Angle

It is advisable to install the Inner and or Outer Curved Angle onto the first arch before raising. This adds greatly to the stiffness of the first arch section, and makes it much easier to pull up into place. If the builder is supplying their own endwalls the building may only have an Outer or Inner Curved Angle.

STEP 1

The Inner Curved Angle is placed into position first. The Inner Curved Angle is not bolted at this time. It is only placed into position as shown in *Figure 2-2A*.

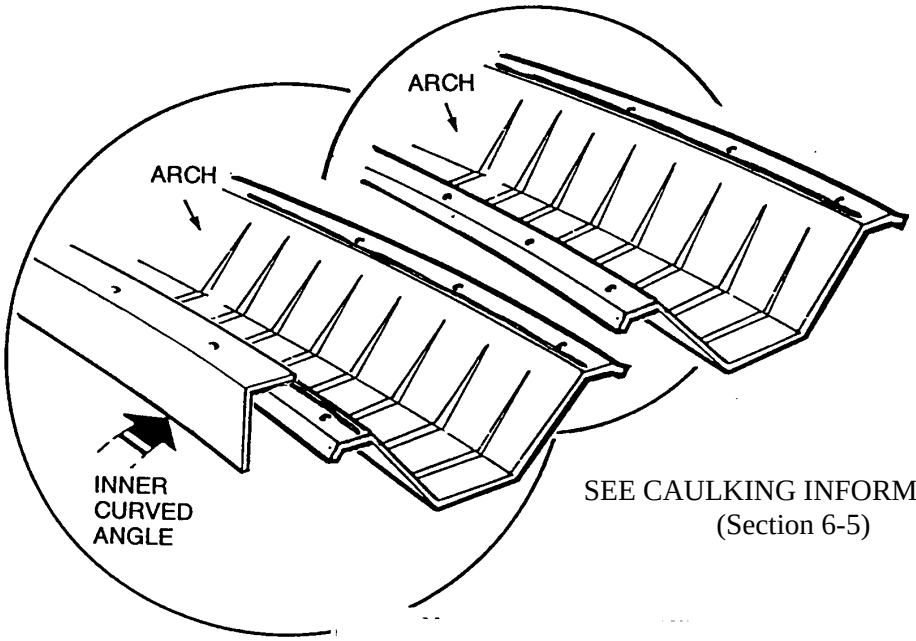


Figure 2-2A

STEP 2

The Outer Curved Angle is now installed on top of the Inner Curved Angle, bolts inserted, and tightened as shown in *Figure 2-2B*.

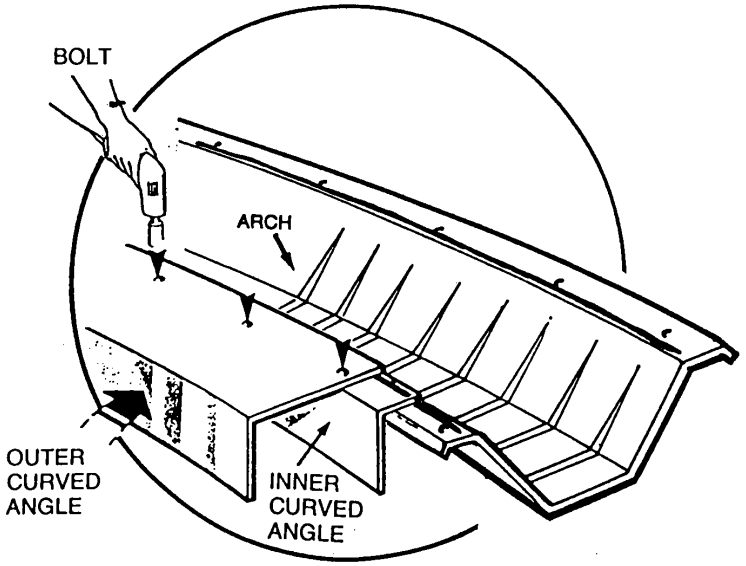


Figure 2-2B

STEP 3

The same rules apply for putting on the curved angles as for bolting up the arches. The overlaps should allow proper rain run-off as shown in *Figure 2-2C*. See *Figure 2-2E* for curved angle overlap specifications.

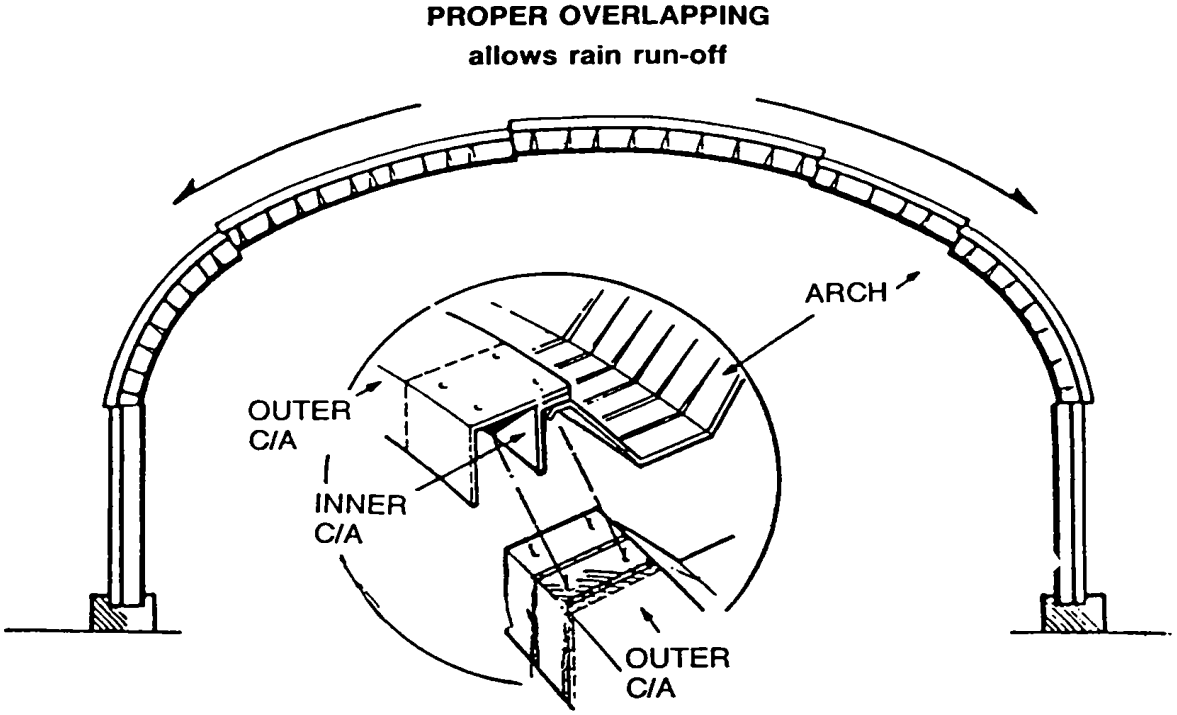


Figure 2-2C

When installing the curved angles, some overlaps are a single lap (share 1 bolt) others are a double overlap (share 2 bolts) as shown in *Figure 2-2D*.

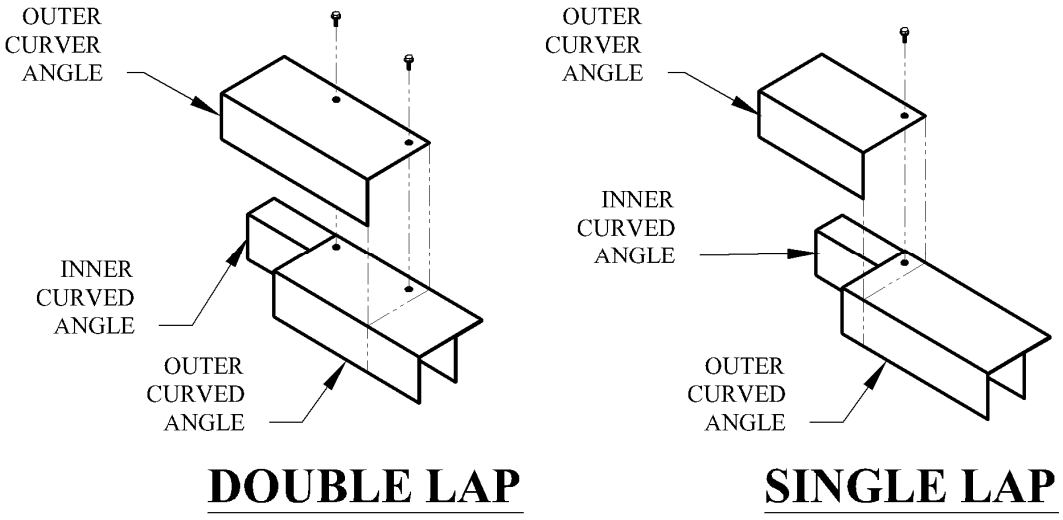


Figure 2-2D

The "J" curved angles have a single lap on each end. All of the other curved angles have a double lap as shown in *Figure 2-2E.* Do not confuse the Curved Angle lapping with the Arch Panel lapping. All Arch Panels are double-lapped.

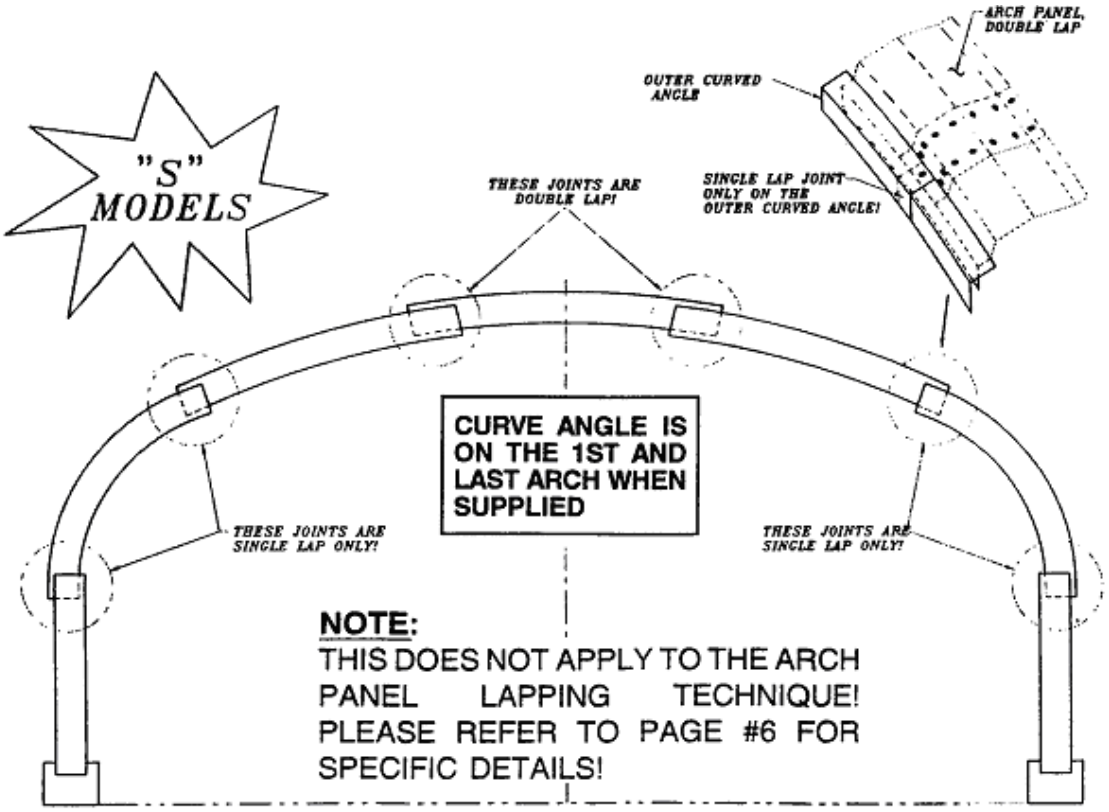


Figure 2-2E

2-3 PREPARING TO RAISE ARCHES

The first arch is the most difficult to raise into position and great care should be taken on this step.

When raising the arches up into position, care must be taken to avoid twisting and distortion. It is better to raise the arches manually rather than use a crane or boom truck, since less distortion is effected.

A few sections of scaffolding will make raising the arches much easier as shown in *Figure 2-3A*. Homemade staging may be employed if no scaffolding is available in the area. Some people find it convenient to build a stage on top of their hay wagon, which provides a rolling platform from which to work.

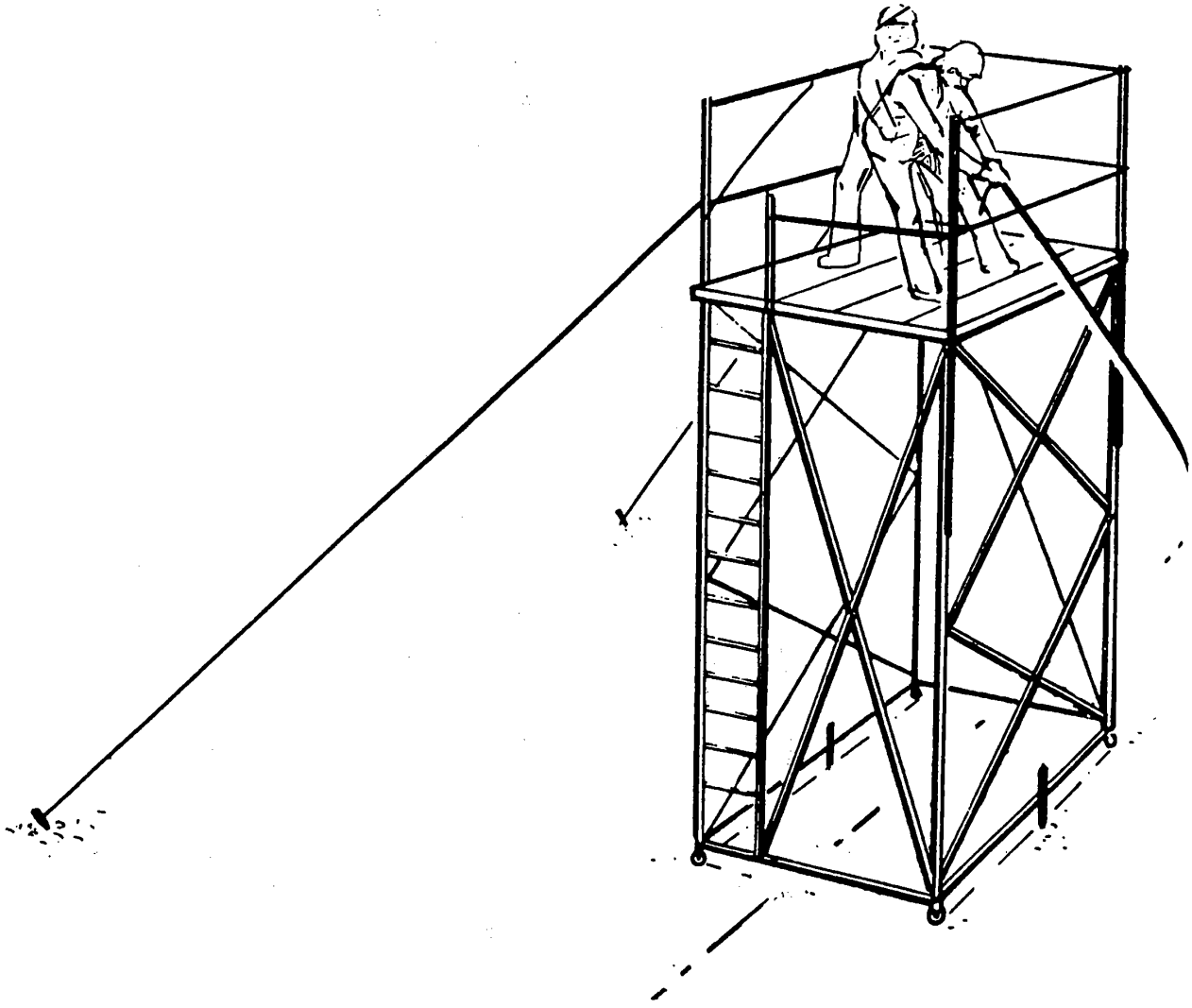


Figure 2-3A

2-4 RAISING THE FIRST ARCH

Two "S" hooks should be fashioned out of 5/16" diameter rod to be used to attach to the arch for raising as shown in *Figure 2-4A*.

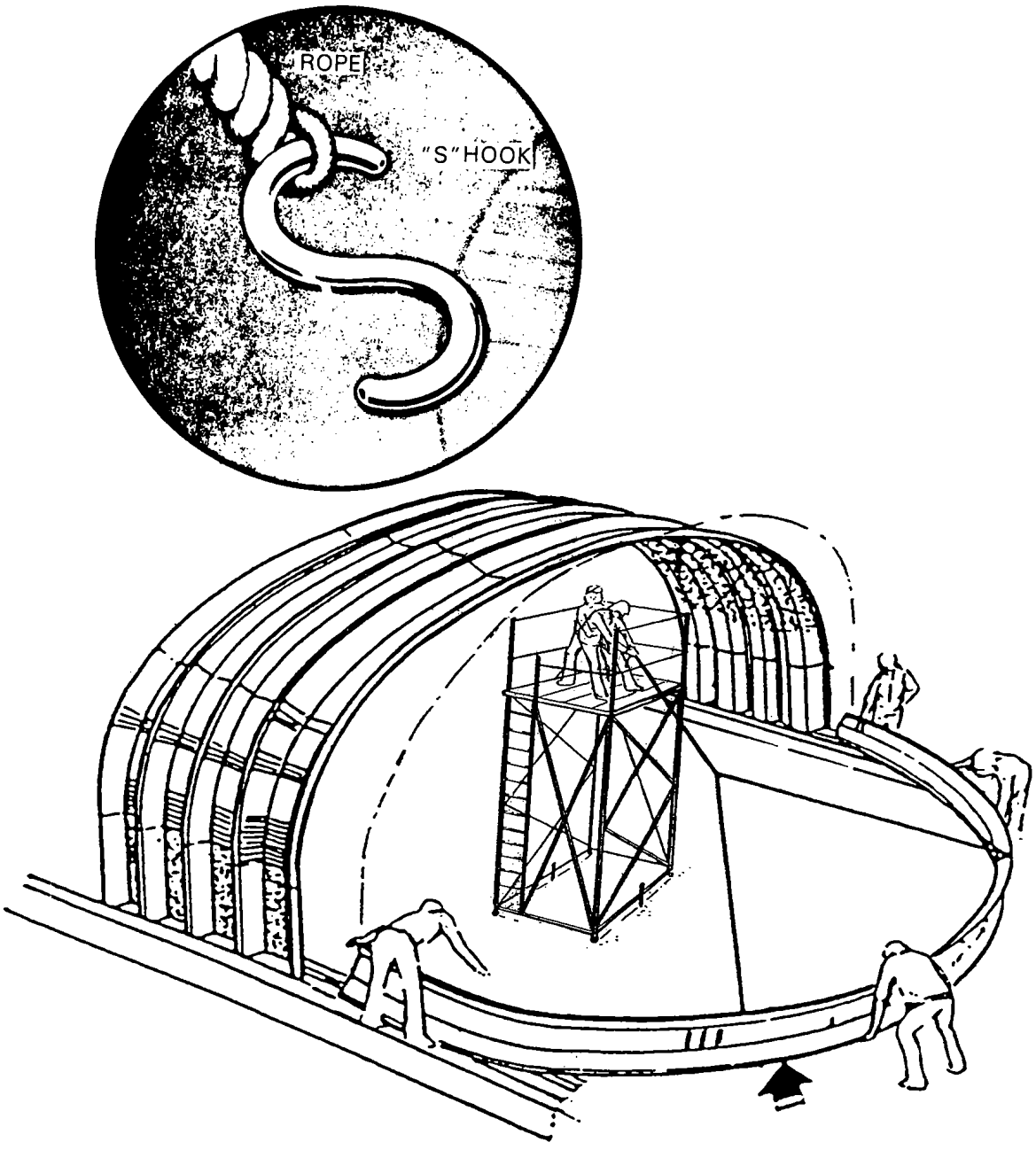


Figure 2-4A

The "S" hooks are tied to the rope and then placed in holes in the arch panel approximately eight to ten holes down from the peak of the arch. The bolthole location changes depending on the height of your scaffold, and the number of men you have. With the ropes and hooks in place, and one or two men on each corner to guide the arch into the trough the first arch is pulled to an upright position.

2-5 POSITIONING THE FIRST ARCH

Once the first arch has been raised it should be positioned at the correct location in the trough. For concrete trough foundations, the hole location of the first arch should extend 2" inside the endwall trough as shown in *Figure 2-5A*. This applies only to buildings with endwall concrete troughs. Refer to your Blueprints on Sheet 2 for foundation details.

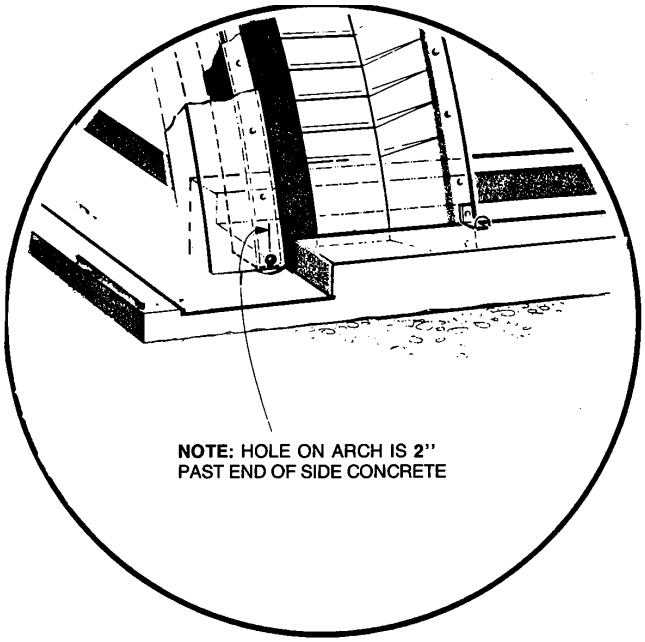


Figure 2-5A

2-6 SECURING THE FIRST ARCH

When the first arch is up into position it should be tied off either to the scaffolding or to stakes driven into the ground as shown in *Figure 2-6A*.

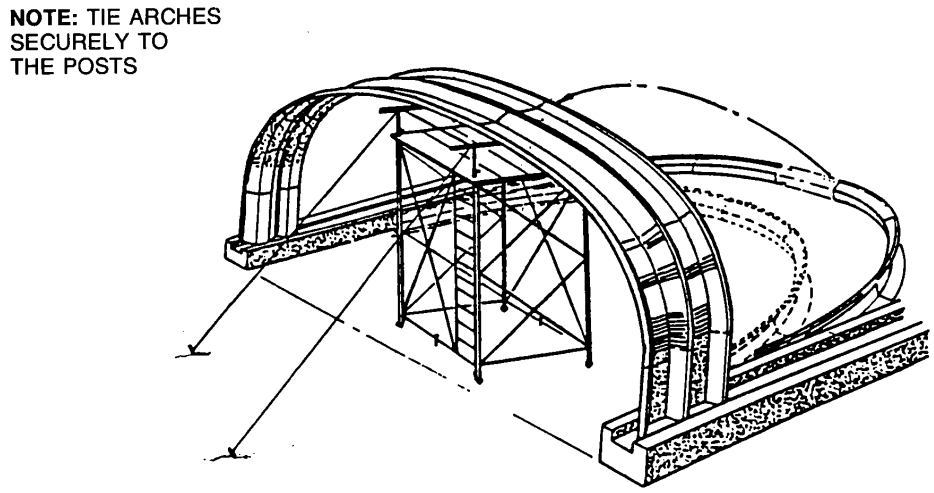


Figure 2-6A

2-7 MAINTAINING THE ARCH SHAPE

At this time, **the center point of the foundation should be found and marked**. A plumb bob should be suspended from the center point of the arch. The arch should then be propped up by means of 2" x 6" wood planks and adjusted so that the plumb bob is directly over the centerline of the building. The arch should also be propped at the peak to maintain the correct height as shown in *Figure 2-7A*. This **bracing of the arches is very important** in maintaining the proper shape. These planks should be used at approximately 10 ft. intervals along the length of the building to maintain the proper height. **NOTE: Building may collapse if not properly braced.**

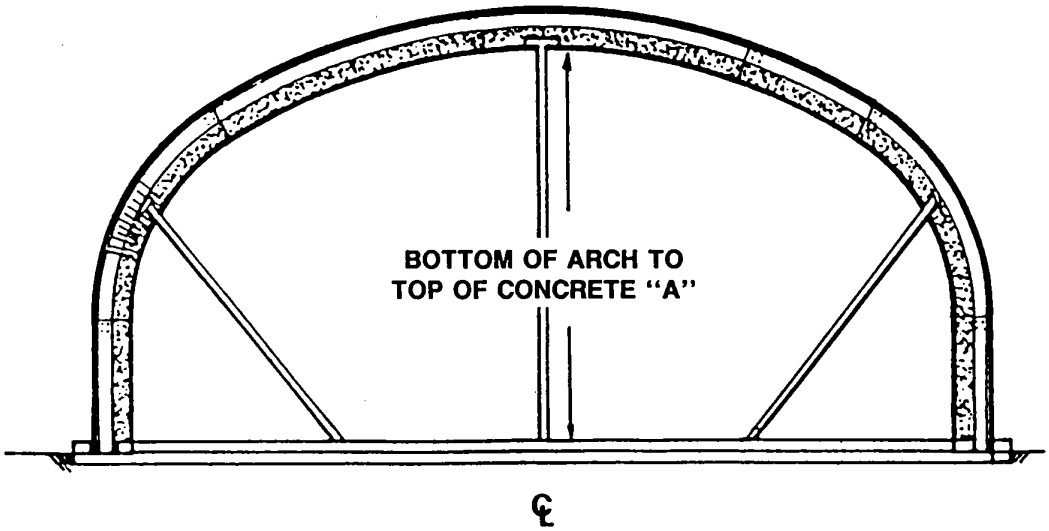


Figure 2-7A

* FOR DIMENSION "A" (See Blueprints)
(Deduct 4" from "A" if concrete trough foundation is used.)

2-8 RAISING THE SECOND ARCH

STEP 1

The second arch is pulled up in the same manner as the first and lifted over the rim of the first arch as shown in *Figure 2-8A*.

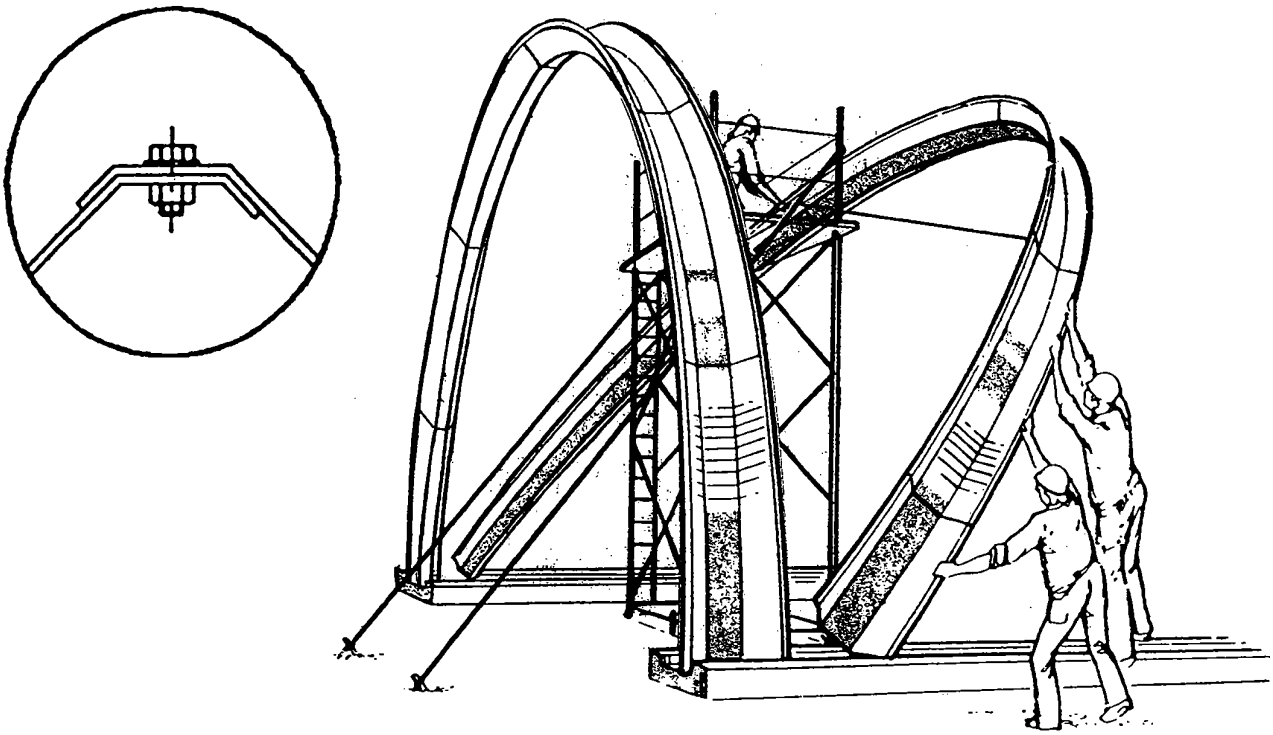


Figure 2-8A

STEP 2

Drift pins should be used to line up the holes as the bolts are inserted as shown in *Figure 2-8B*.

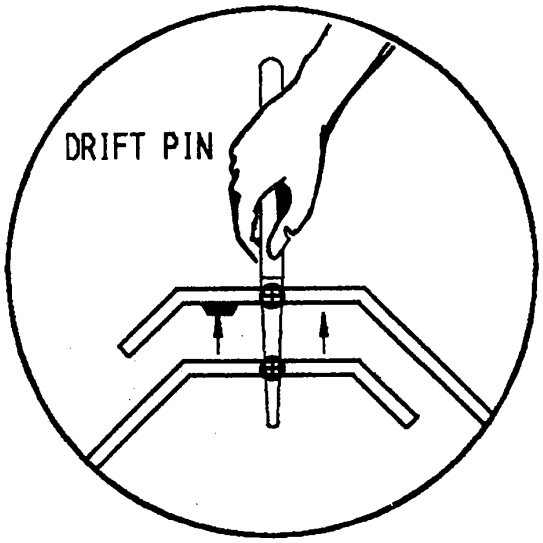


Figure 2-8B

STEP 3

At this stage only every third or fourth bolt need be inserted down each side from the peak to the trough as shown in *Figure 2-8C*. There should be no need to tear or elongate the holes in order to make them line up. By using the pins the holes can be made to line up without damaging the panel. After the arch is attached, insert the remainder of bolts between every third or fourth bolt.

NOTE: BOLTS SHOULD BE HAND TIGHTENED ONLY. DO NOT WRENCH TIGHTEN UNTIL ALL ARCHES HAVE BEEN ERECTED.

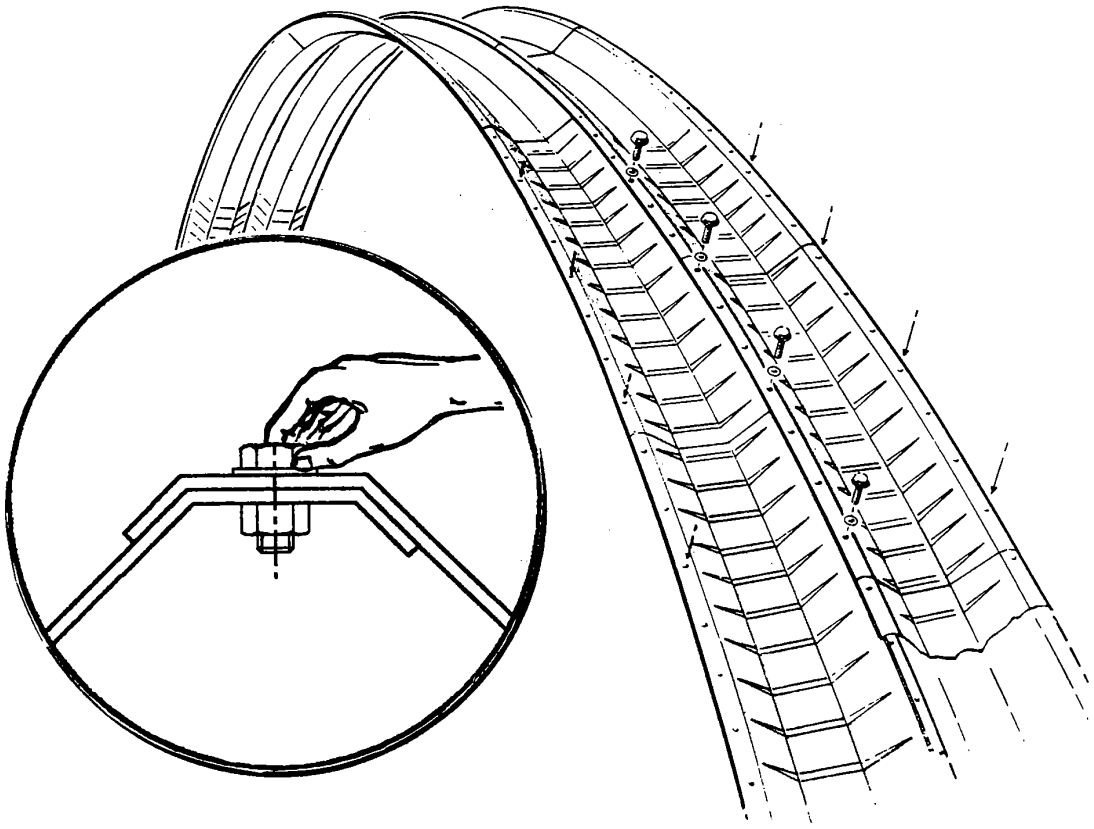


Figure 2-8C

2-9 FASTENING DOWN ARCHES

For concrete trough foundations, as each arch is bolted into place it should be fastened down to the concrete by bolting the arch to the Punched Metal Strapping as shown in *Figure 2-9A*. The Punched Metal Strapping and Anchor Bolts are not supplied with the building kit. The Punched Metal Strapping should be 23 ga. or thicker. The Anchor Bolts shoud be 3/8" Dia. (or larger) x 3½" Long (or longer). The Punched Metal Strapping can be attached to the Arch Panel with the standard Bolts provided with the building. For Connector Plate or U-Channel foundations see Sheet 5 of the blueprints for fastening details.

NOTE: This is very important to prevent a strong wind from lifting the arches out of the trough prior to grouting.

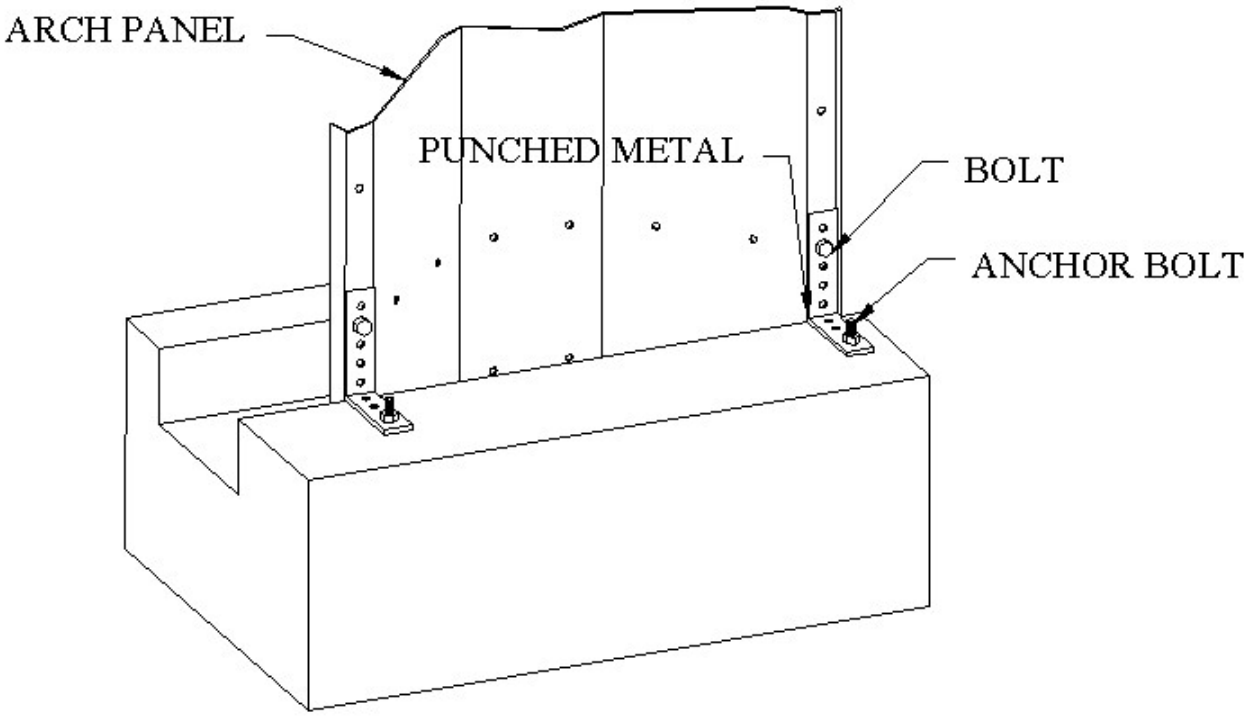


Figure 2-9A

2-10 CHECKING ARCH LENGTH

As the erection progresses the center dimension should be checked approximately every 10 ft. to ensure that the arches are not spreading. The dimensions from the bolthole of one arch to the bolthole of the next arch should be 24 ½" * center-to-center as shown in *Figure 2-10A*.

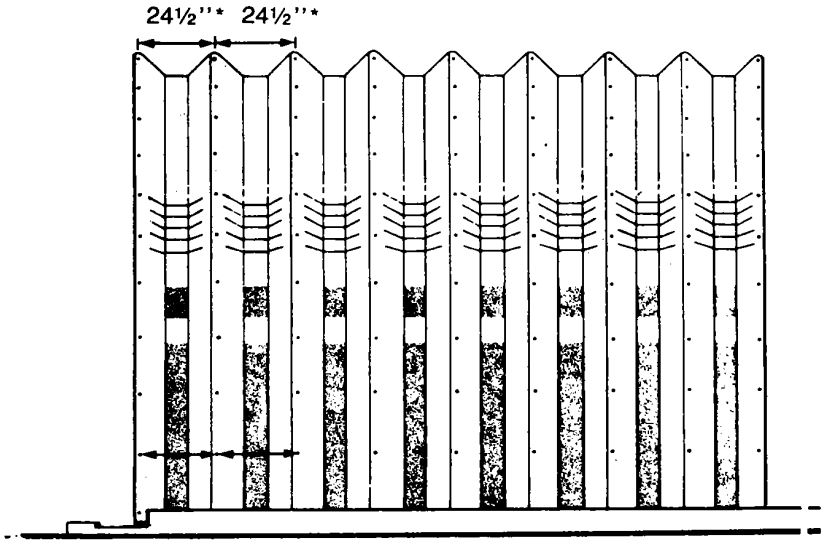


Figure 2-10A

The dimension should be checked on both sides of the building as well as the peak. If the structure is tending to creep ahead, it can be adjusted by pushing back on the arch sections from the inside of the building as shown in *Figure 2-10B*. Two or three men can move five arches back one or two inches to bring the building back into line.

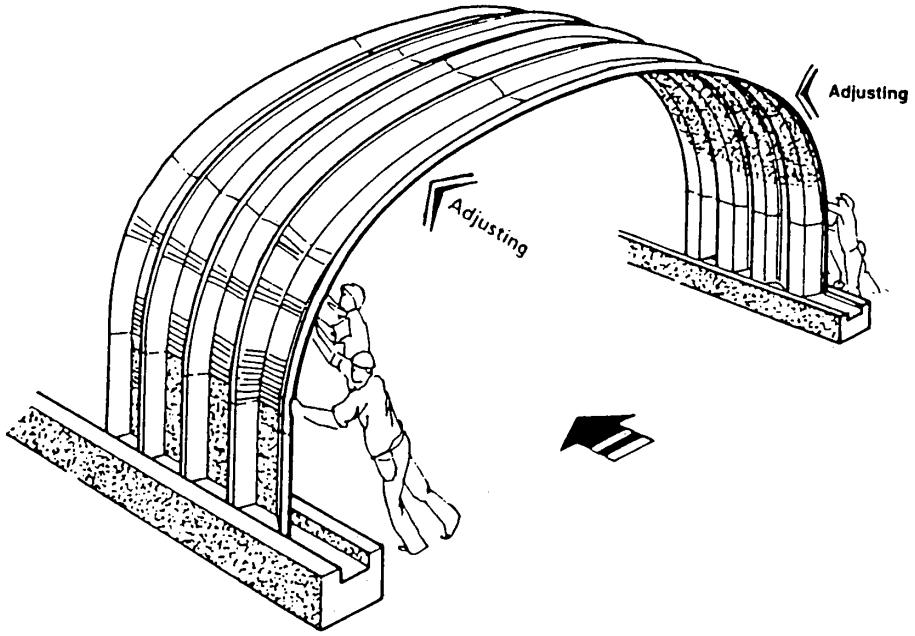
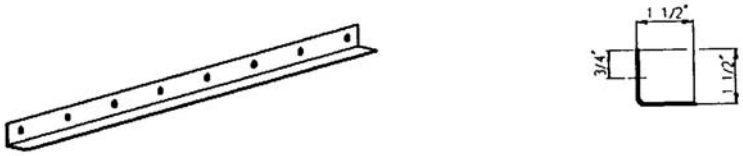


Figure 2-10B

2-11 ARCH STRAPPING



Arch Strapping Template

We recommend that you use metal angles that are punched at 24 ½" centers to help maintain the proper center-to-center dimensions of the arches as shown in *Figure 2-11A*. Please note that the factory does not supply arch strapping.

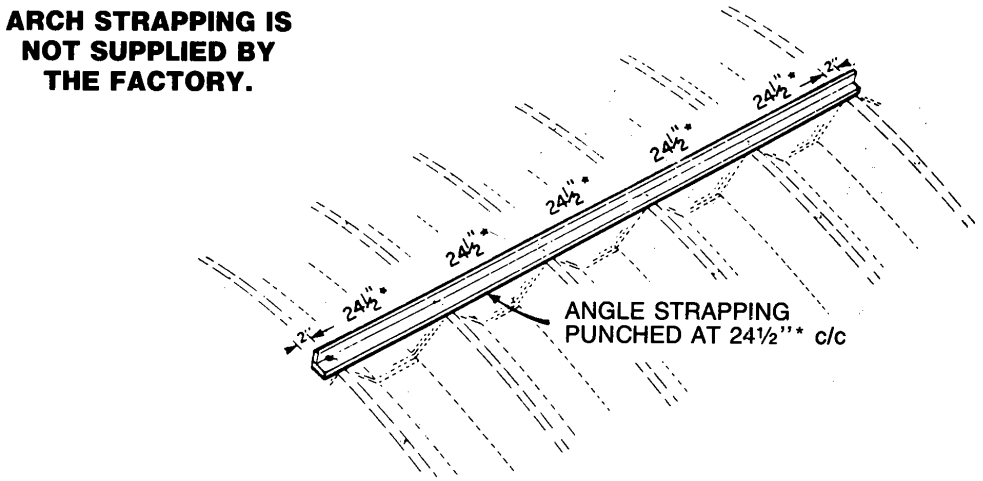


Figure 2-11A

Between 3 and 5 of these straps should be bolted onto the arches; one on each side close to the middle of the J-Panel, and one at the peak as the erection proceeds as shown in *Figure 2-11B*. On some of the wider models, extra runs of strapping are used to prevent creeping.

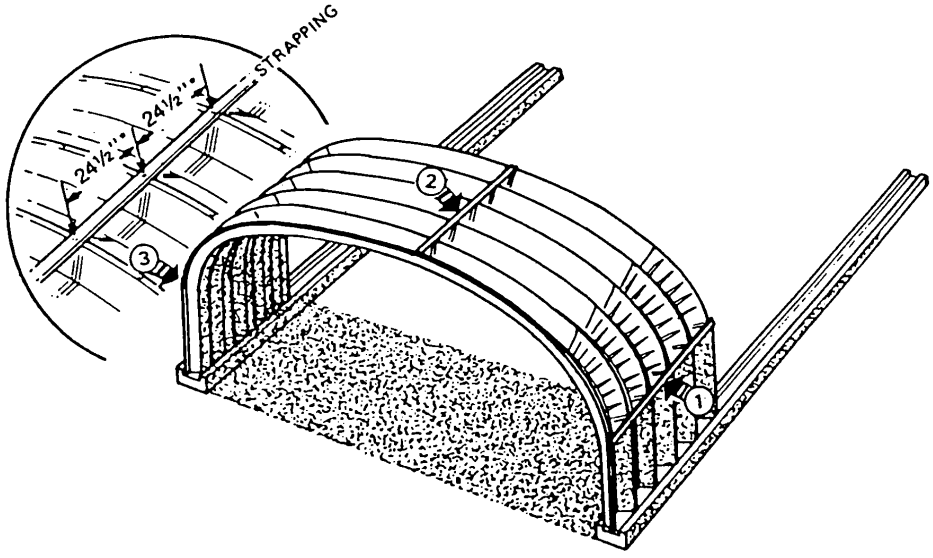


Figure 2-11B

As the erection of arches continues the other straps are installed in the same manner as shown in *Figure 2-11C*.

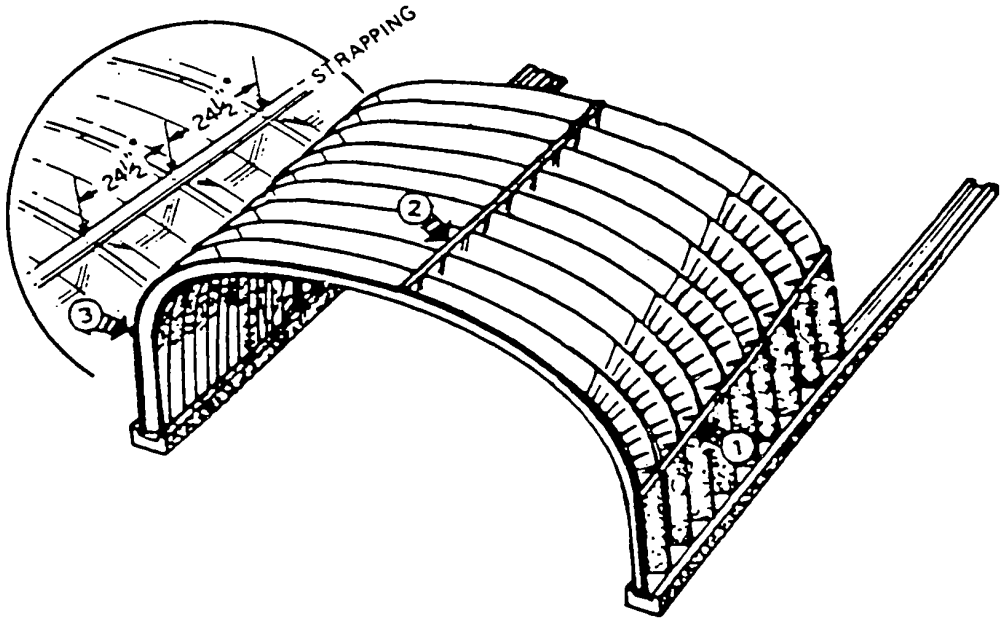


Figure 2-11C

As more arches are erected the first three straps are removed and moved along to maintain the centers in this fashion as shown in *Figure 2-11D*. This system is repeated until all the arches have been erected.

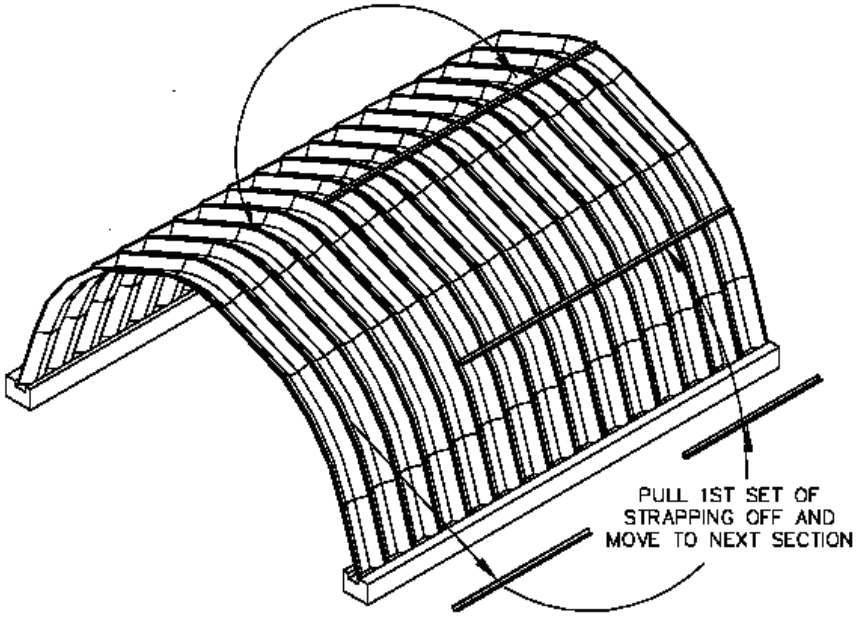


Figure 2-11D

2-12 ALTERNATIVE HALF ARCH METHOD

As mentioned previously there is an alternative method of erecting the arches. If you do not have enough manpower, you may elect to erect the building in half sections. The following diagrams show how to raise the arches using the half arch method.

All directions regarding caulking and lapping of joints are the same for this method as for the entire arch method.

STEP 1

Assemble arches in half sections on the ground as shown in *Figure 2-12A*. Remember to caulk all joints (if caulking is used) and to lap panels in the correct manner.

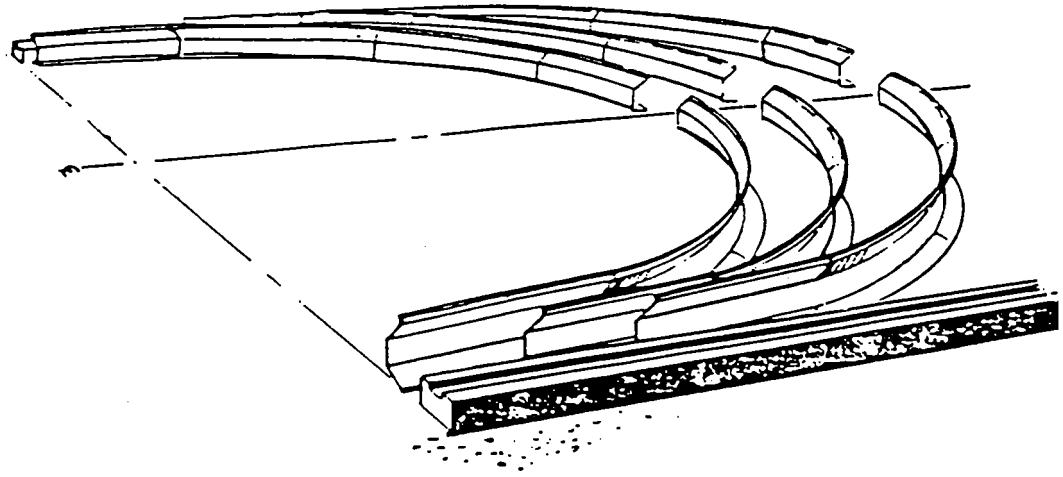


Figure 2-12A

STEP 2

Using the rope method explained in the whole arch section, raise half of the arch and support on scaffolding as shown in *Figure 2-12B*.

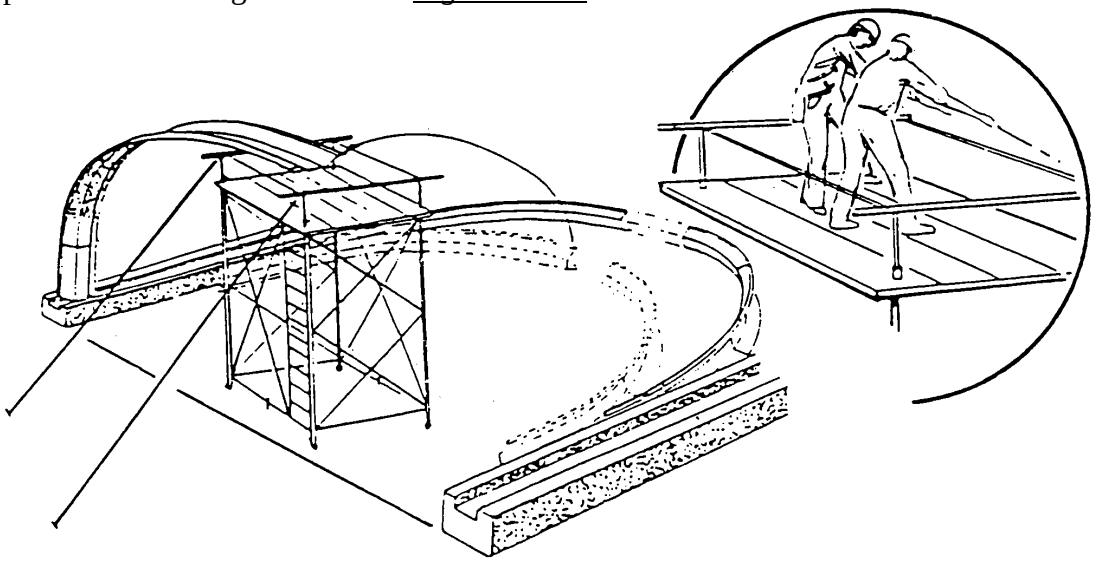


Figure 2-12B

STEP 3

Raise the other half of the first arch and bolt the two halves together to form a complete arch as shown in *Figure 2-12C*.

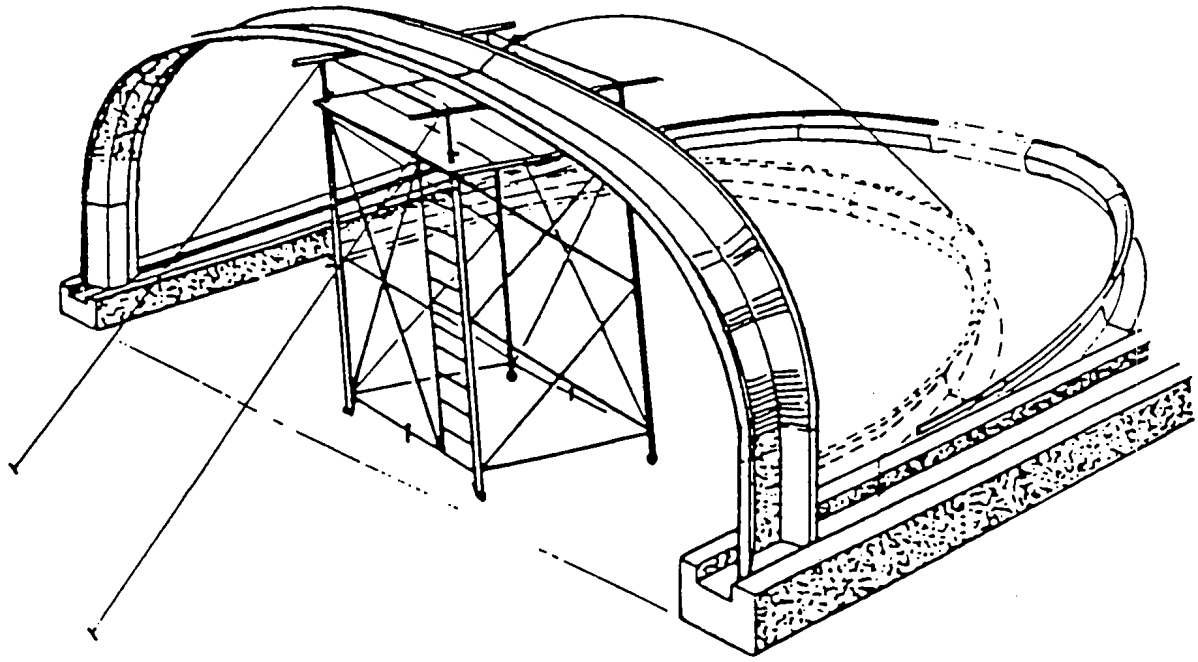


Figure 2-12C

STEP 4

Raise another half section of arch and bolt every third or fourth hole along the arch as shown in *Figure 2-12D*.

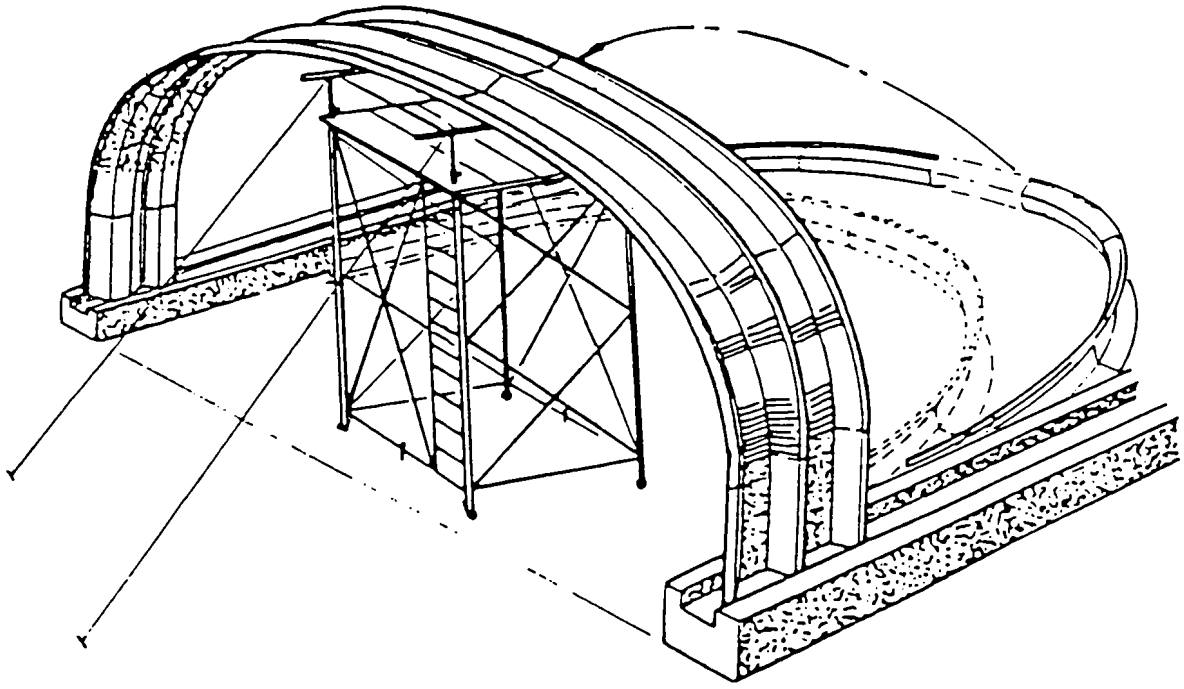


Figure 2-12D

STEP 5

Raise the remaining half of the second arch to complete the section as shown in *Figure 2-12E*.

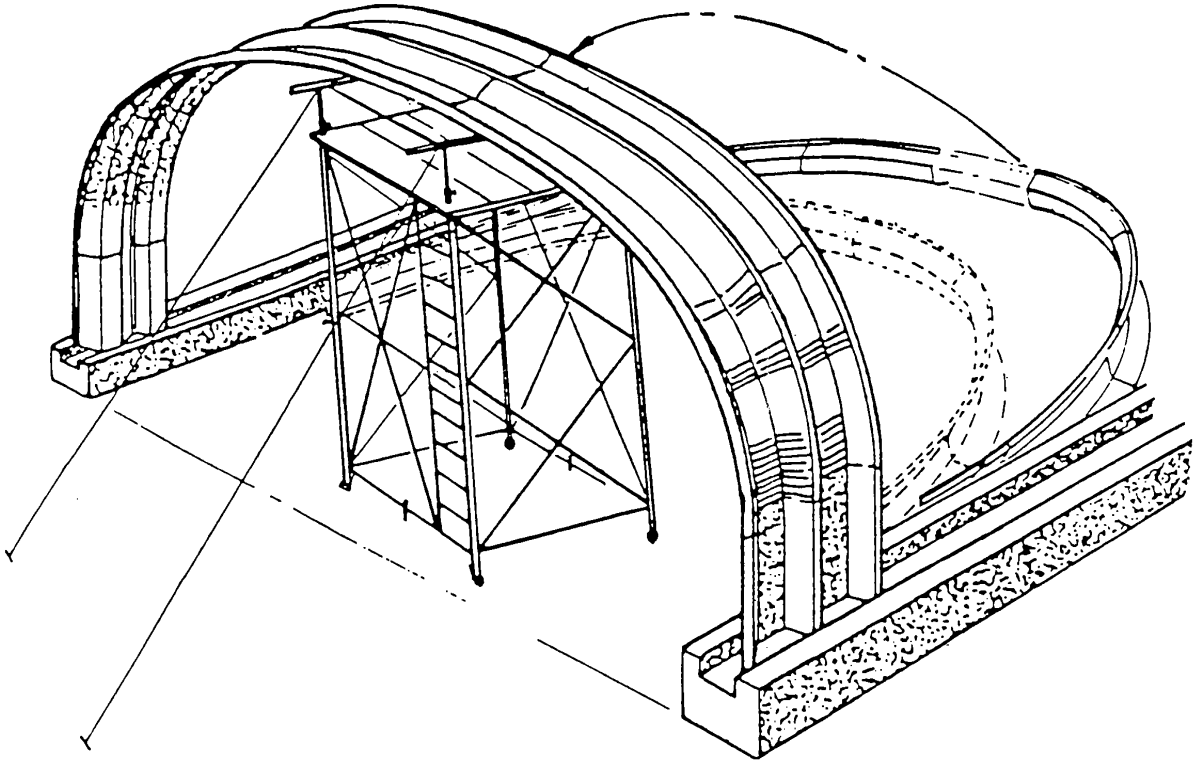


Figure 2-12E

NOTE:

Continue in this manner until all arches are completed. Check back to ensure that the overlapping and installation of the curved angles is according to direction.

2-13 RAISING THE LAST ARCH

When the last arch is ready to be raised, the curved angle may be bolted into place on the ground or after the arch is up and in position. Again, this depends on your preference and the availability of help.

Refer back to section 2-2 on curved angles near the front of the manual.

If you have purchased fiberglass skylights, the steel sheets will have been removed from your order. As you progress with erection of the arches you should remove the panels from the area where you wish to install the fiberglass. Do not install the skylights until all the arches have been erected and tightened (see special section on installation of skylights). For installation of skylights refer to Section 6-3

2-14 TIGHTENING THE BOLTS

All bolts should be tightened prior to endwall erection. Check outside height and width to ensure proper arch shape.

When using an impact wrench you must be very careful not to over tighten the bolts. Over tightening creates two major problems, the plastic washer is split and is no longer 100% waterproof and also the plating on the bolt is scraped off and a possible rusty bolt situation is inevitable. Both of these problems are serious and should be avoided.

When tightening the bolt, the gun should be turned off as soon as the clutch begins to slip. This slipping is indicated by a banging noise from the gun. As soon as you hear this banging, the bolt is tight and you must stop immediately.

It is wise to practice using the gun on some scrap pieces to get the feel of the gun. After 5 or 6 practice bolts you will know exactly when to turn off the gun.

The best way to avoid scratching the protective plating on the bolts is to tighten the nuts from the inside of the building. Use a closed wrench to hold the bolts in place on the outside of the building. Do not use pliers for this purpose.

CAUTION: Painted Bolts must be tightened from the inside nut to avoid corrosion.

NOTE!!! Torque Rating for Bolts is
8.42 Ft./LBS

Or

101 inch/LBS

2-15 SUMMARY

The methods described above for erecting the arches we feel are the easiest and most efficient methods. If for some reason these methods are not acceptable, the arches may also be erected piece by piece. The methods of erection are many, all of which have their advantages and disadvantages. There are, however, certain rules that should be adhered to regardless of the method chose.

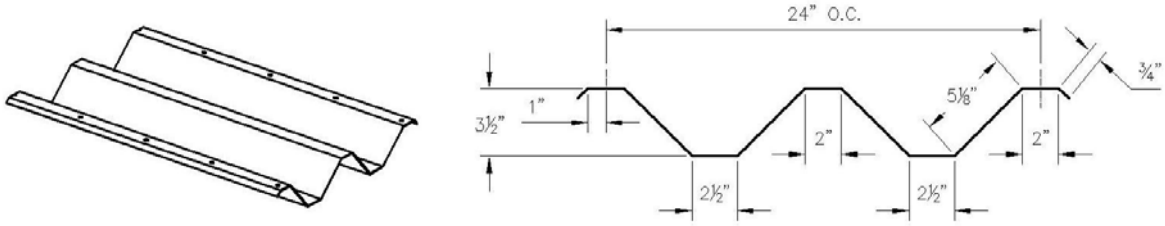
- Lap all joints to ensure proper rain run-off.
- Start erection at door end as shown on section 2-5
- Stagger short panels from side to side.
- All arches must be bolted to punched metal strapping and anchored to concrete.
- Arches should be braced and plumbed to maintain center height and proper shape.
- Check and maintain 24½" center-to-center dimension of arches for entire length of building.
- Keep all bolts finger tight – do not tighten with wrench until all arches are raised.
- If caulking is used make sure to lap all joints and seams with caulking.

By observing the above recommendations and reading the instruction carefully, the arches will be centered and symmetrical and will allow for easy installation of endwalls.

CAUTION

THE ERECTED ARCHES ARE VERY SUSCEPTIBLE TO WIND DAMAGE UNTIL THEY ARE GROUTED IN AND FULLY TIGHTENED. MAKE SURE THERE ARE AMPLE TEMPORARY HOLD DOWNS FASTENING THE STRUCTURE.

CHAPTER 3
ERECTION OF ENDWALLS

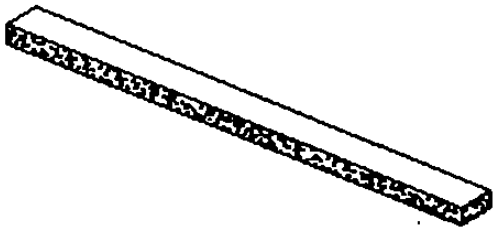


Endwall Panel

The erection of the endwalls is very important and extra care should be taken at this stage. The instructions should be read carefully until all the steps are clear in your mind before you attempt to install the ends. Do not start erecting the endwalls without reviewing the endwall numbering sequence in the blueprints. Caulking of the endwall panels is not required and no caulking is supplied for this purpose.

NOTE: ALL ARCH BOLTS SHOULD BE WRENCH TIGHTENED PRIOR TO ENDWALL ERECTION. CHECK OUTSIDE HEIGHT AND WIDTH TO ENSURE PROPER ARCH SHAPE.

3-1 FOAM WEATHERSTOP



Foam Stuffer

The strips of foam weatherstop are an optional item that is supplied by the factory at no extra cost. Although this weatherstop is not essential for all applications it does provide a good seal between the endwall and the arches.

The pieces should be inserted into the curved angles end to end, before the endwall is installed as shown in *Figure 3-1A*. Where the flat endwall panels are used above the doors, weatherstop is not necessary.

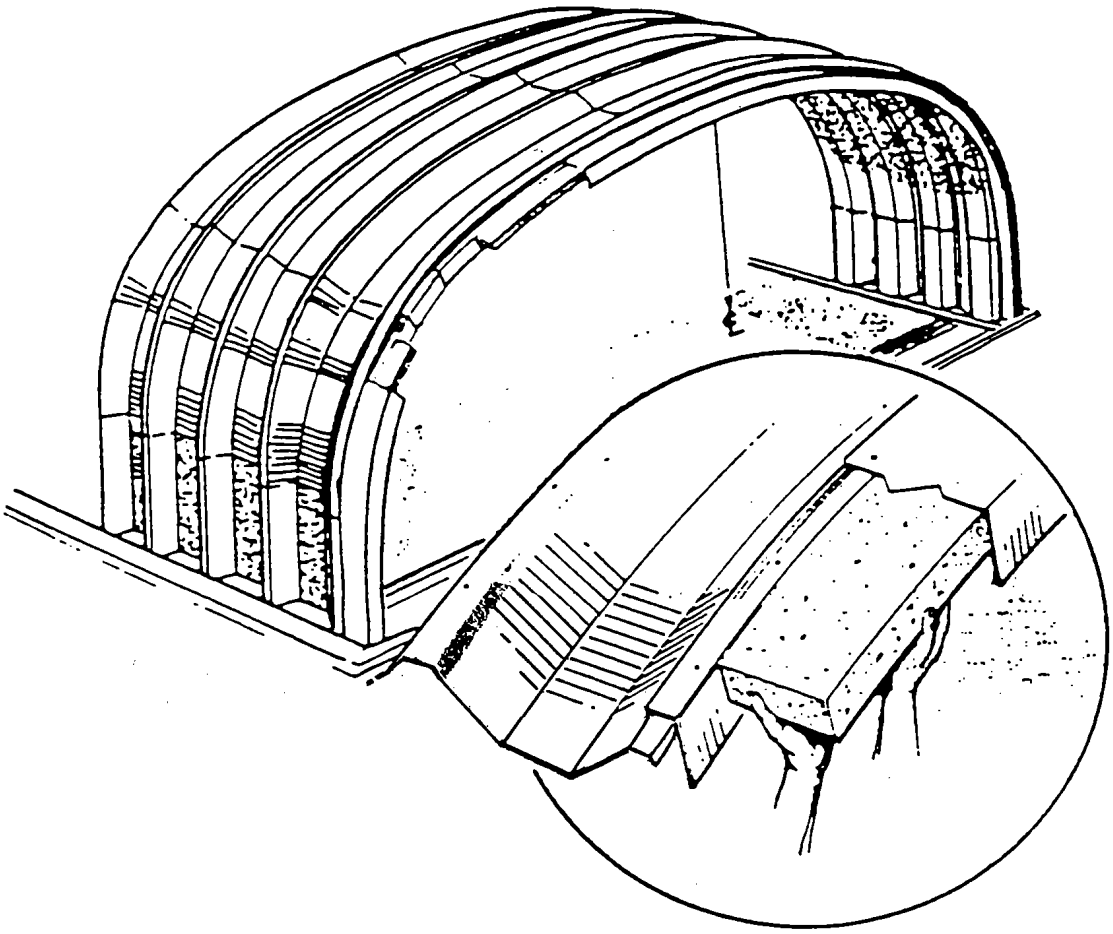


Figure 3-1A

3-2 ENDWALL WITH DOOR OPENING

STEP 1

The endwall with the doors should be erected first. To start the erection, the centerline of the concrete should be found and marked as shown in *Figure 3-2A*. This centerline acts as the starting point from which your dimensions are taken.

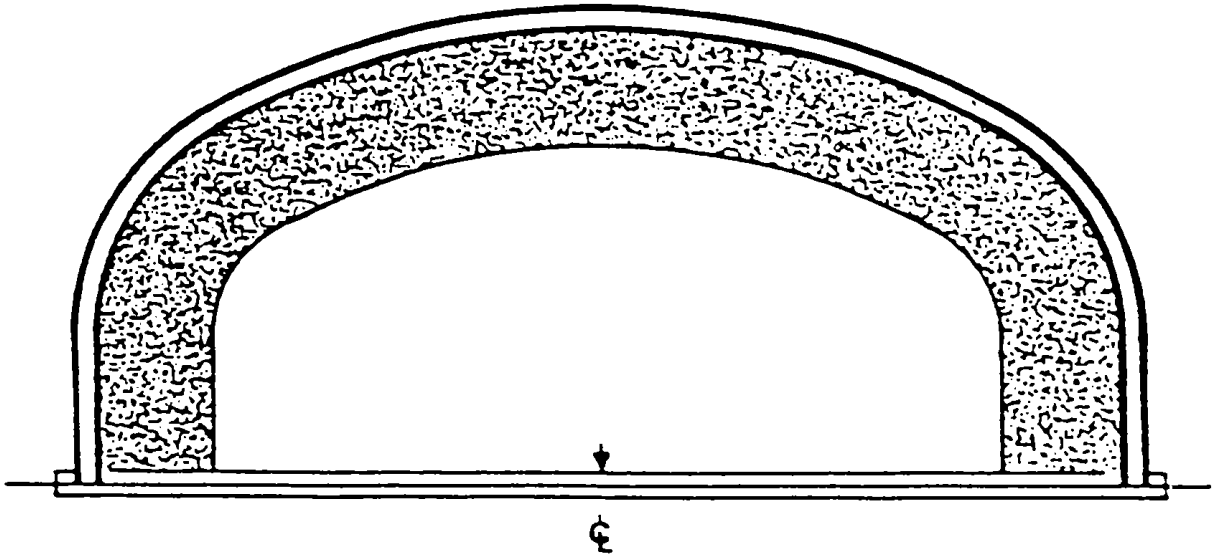


Figure 3-2A

STEP 2

From the centerline, measure off "B" in both directions and mark on the concrete as shown in *Figure 3-1B*. Actual door opening width is always 3" less than nominal door width.

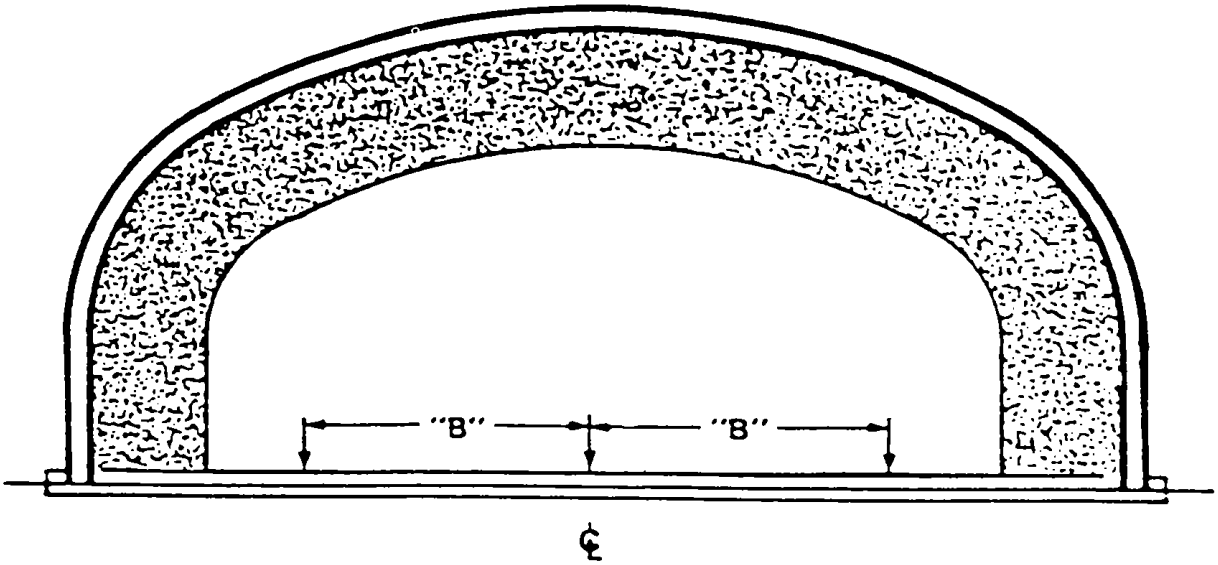


Figure 3-2B

STEP 3

The endwall panels on both sides of the opening are placed in position as shown in *Figure 3-2C*. Dimension "B" is measured from the centerline to the edge of the panel.

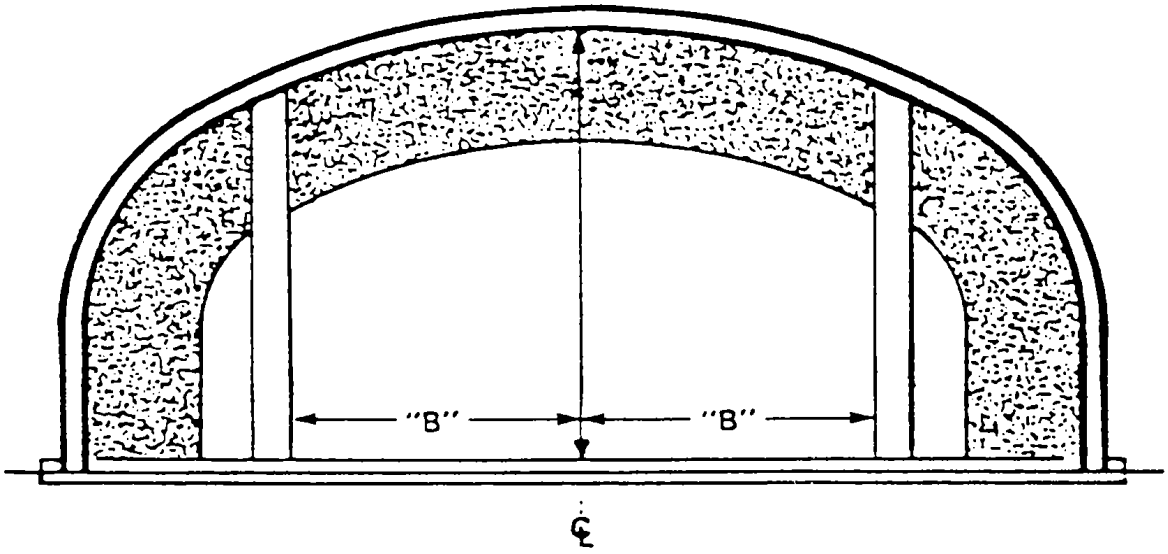


Figure 3-2C

STEP 4

The remaining endwall panels should now be installed one at a time, fastened by four or five bolts, finger tight as shown in *Figure 3-2D*. The correct panel sequence is shown in the blueprint packet. It is extremely important to follow this sequence. A certain amount of field cutting and drilling will be required during the erection of the endwalls. You will need to trim off the top of the panel with a sheet metal nibbler to fit the contour of the curved angles. Always follow the panel numbering sequence. **If you become confused, do not start cutting panels. If you are having difficulty, call the factory at once.**

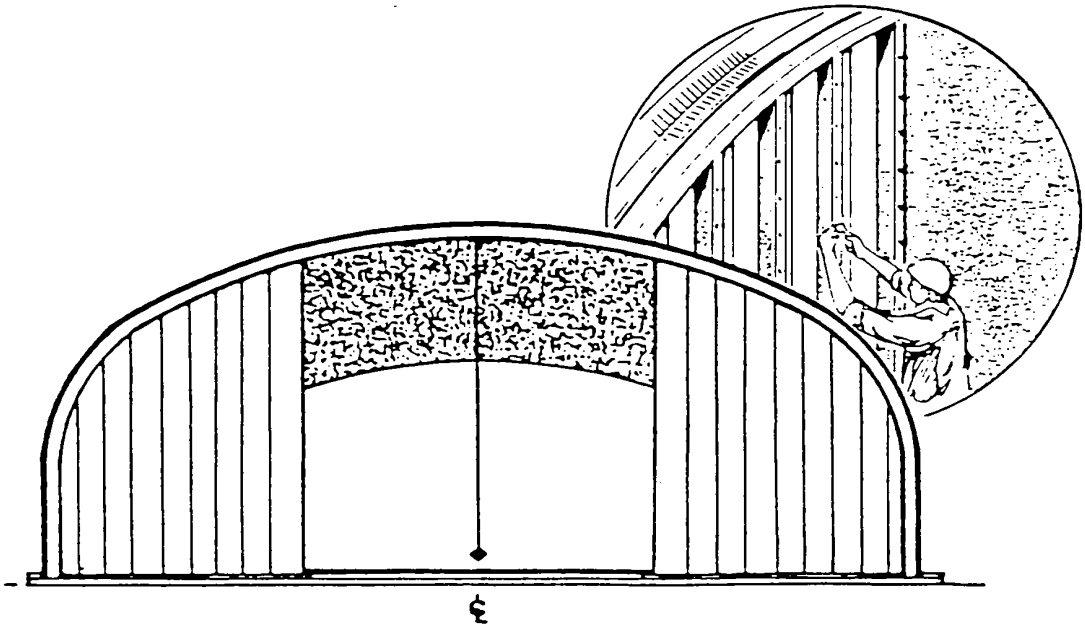


Figure 3-2D

3-3 SQUARING THE OPENING

Now that all the endwall panels are in place, the opening should be squared. The panels should be adjusted so that the opening is perfectly square diagonally. Dimension "B" should be checked at the top and bottom of the panels and is measured from the centerline to the edge of the panel as shown in *Figure 3-3A*.

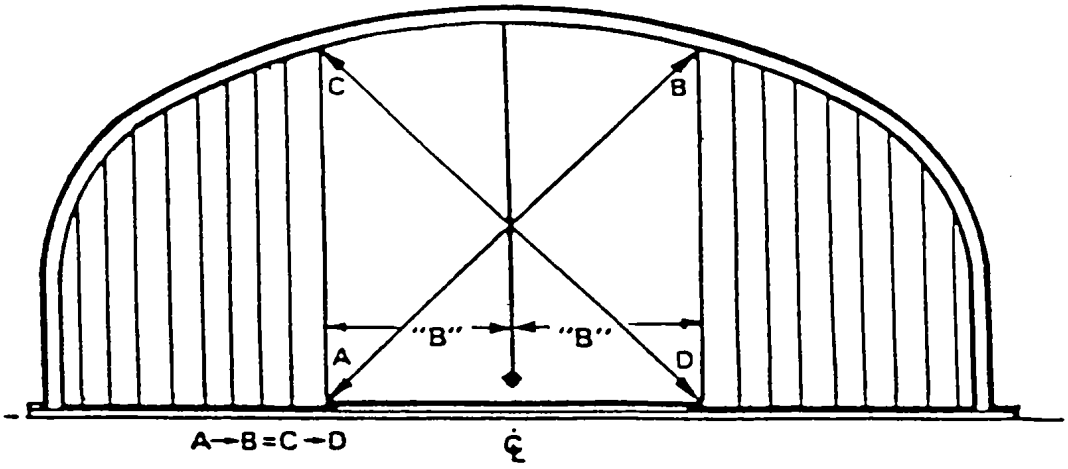


Figure 3-3A

Flat panels are sometimes used above the door opening when factory sliding doors are utilized. However, if the distance between the center building height and the door height exceeds 3' then the panels above the door will be corrugated. Always install the corrugated panels above the door starting at the center of the building. Be sure to follow the endwall panel numbered sequence on your blueprints.

3-4 SECURING ENDWALL TO CURVED ANGLES

When these dimensions have been checked and the opening is diagonally square, holes should be drilled through the inner and outer curved angles and endwall panels fastened to the curved angles. It is best to start with the panels at the door opening and work to the corner panels.

STEP 1

One hole should be drilled through the center of the curved angle in line with the bolt holes of the endwall panel, insert a bolt and tighten with a wrench as shown in *Figure 3-4A*.

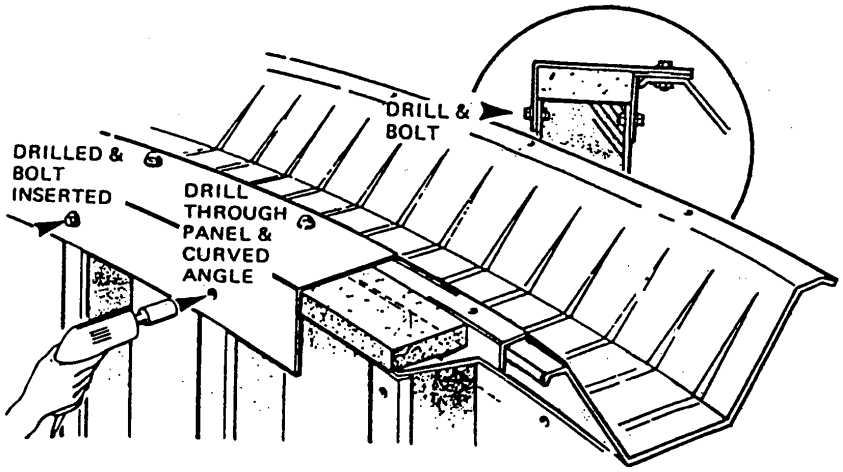


Figure 3-4A

STEP 2

One hole should also be drilled from inside the building, through the inner curved angle on every endwall panel as shown in *Figure 3-4B*.

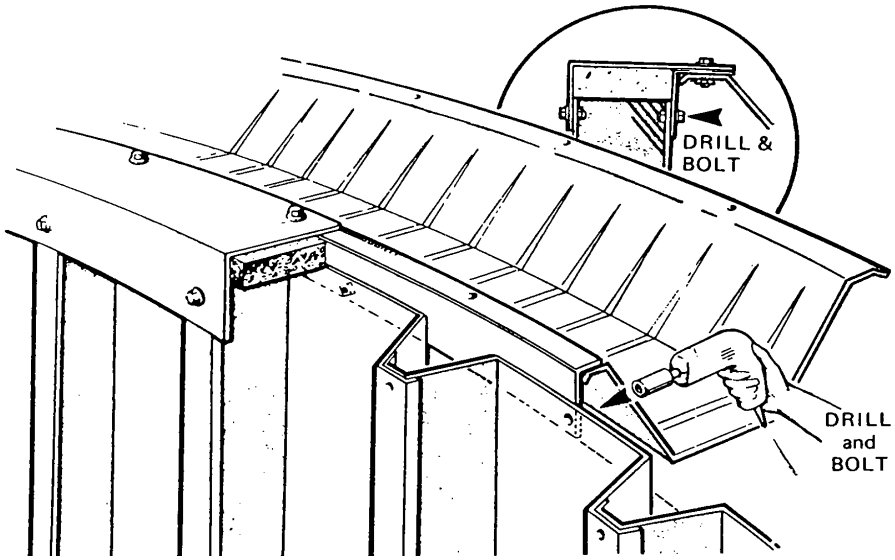


Figure 3-4B

STEP 3

The two corner panels must also be fastened to the curved angle. These panels may need to be cut vertically. Holes must be drilled every 12" along either the inner or outer curved angle and the panel bolted up as shown in *Figure 3-4C*. **NEVER start installing endwall from the corner panels.**

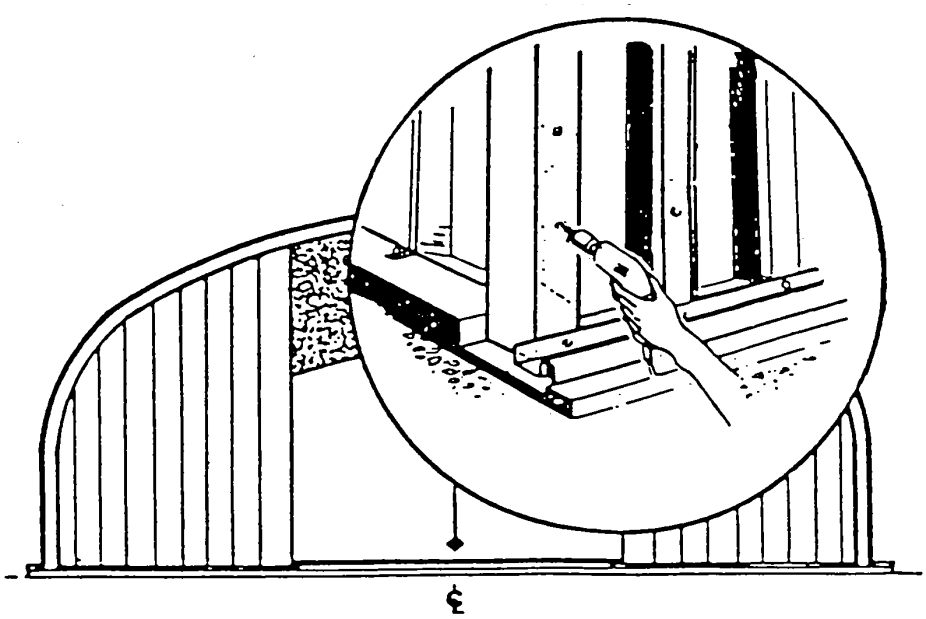


Figure 3-4C

3-5 SOLID ENDWALL ASSEMBLY

Always start installing the endwall panels at the center of the building as shown in *Figure 3-5A*, never start installing panels from the side or corner panel of the building. Check the endwall numbering sequence drawing in your blueprint packet to determine if there are two panels meeting at the centerline *Figure 3-5A*, or one panel centered on the centerline *Figure 3-5B*. Check the endwall numbering sequence drawing in your blueprint packet.

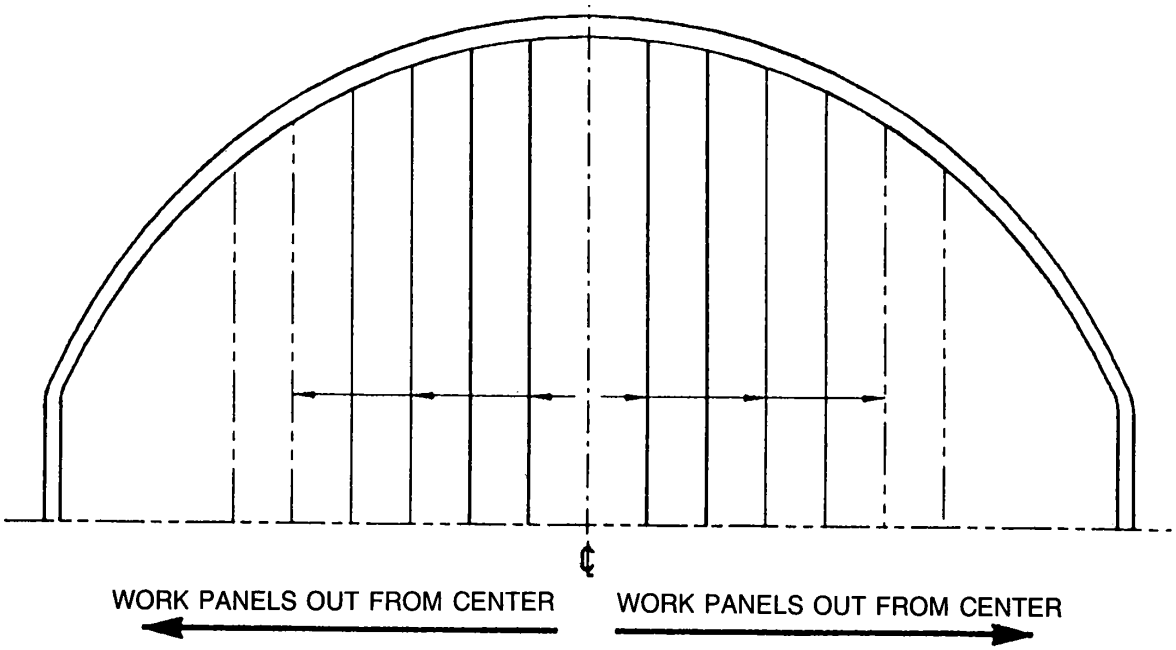


Figure 3-5A
(endwall with two panels meeting at the centerline)

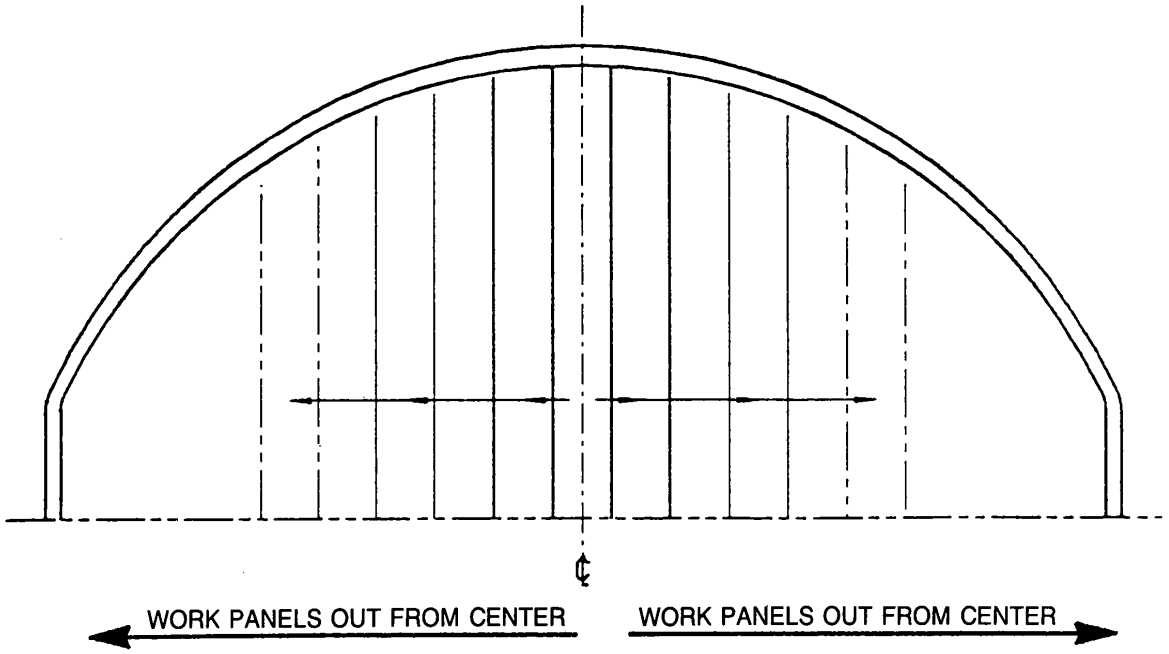


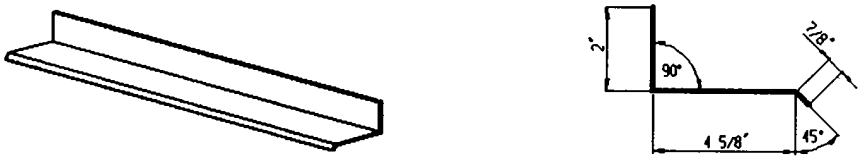
Figure 3-5B
(endwall with one panel centered on the centerline)

CHAPTER 4
ENDWALL OPENING FRAMING

There are two types of endwall scenarios detailed in Chapter 4; endwalls without doors, and endwalls with doors. If a sliding door is ordered with your building, please refer to the sliding door manual at this time.

Endwalls without doors do not need frames around the opening. An L-Bracket connector is provided for rain deflection above the opening. This L-Bracket connector also stiffens the panels above the opening. If an endwall is ordered without doors, but a door is to be put in, contact the door manufacturer and or your distributor for framing requirements.

4-1 ENDWALL OPENING WITHOUT DOORS



LB Connector

If an endwall with an opening is ordered with the building, it must be carefully framed in to avoid leaks. An "L" shaped rain deflection should be bolted at the top of the opening to prevent water from running down the endwall into the building as shown in *Figure 4-1A*. The factory provides an "LB" connector that serves this purpose.

If a door is not going to be installed, the "LB" connector will help to stiffen the endwall panels above the opening. On larger buildings some pipe brace stiffeners should be used to brace the panels above the door opening, if a door is not to be installed.

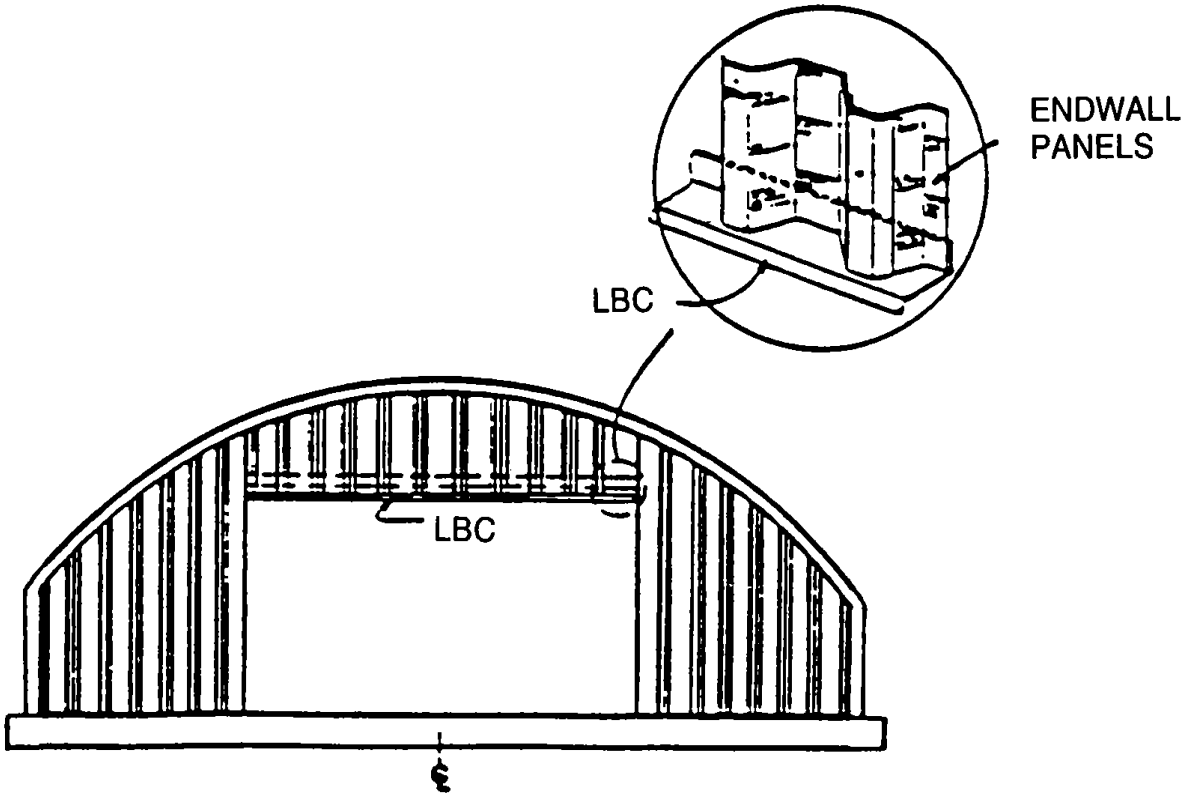
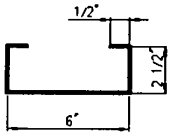
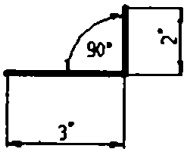


Figure 4-1A

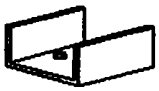
4-2 FRAMED OPENINGS

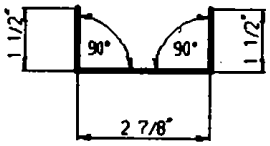


*Overhead Frame-**

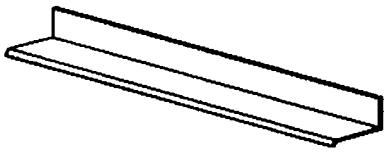


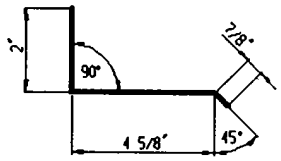
Overhead Jamb/Header Clip





Overhead Jamb/ Floor Clip

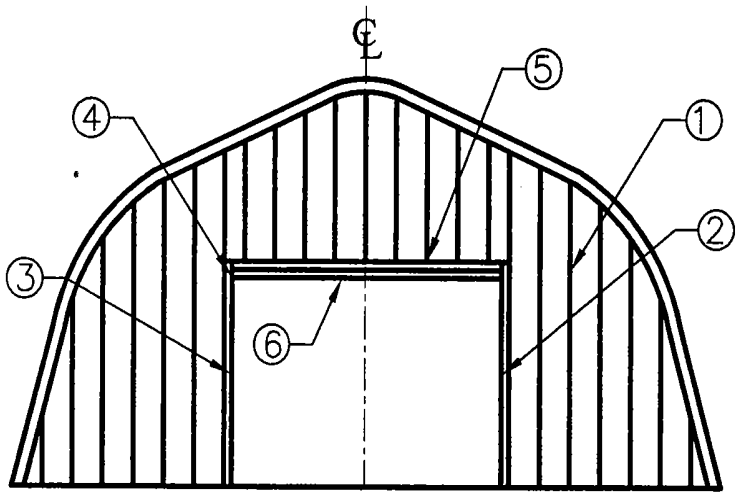




LB Connector

* - Overhead Frame may be 10” wide for high wind speed requirements

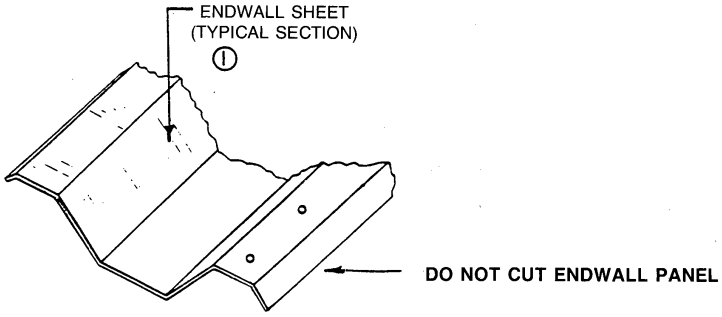
DOOR FRAME INSTALLATION



DOOR OPENING ELEVATION

STEP "A"NOTE: FIT ENDWALL SHEETS IN ACCORDANCE TO BLUEPRINT!

STEP "B"



IDENTIFY ENDWALL SHEET ON EITHER SIDE OF OPENING

NUMBERED NOTES

① **ENDWALL**
SEE ENLARGED DETAIL THIS PAGE STEP "B"

② **JAMB/FLOOR CLIP DETAIL**
SEE ENLARGED PLAN PAGE 42 STEP "C"

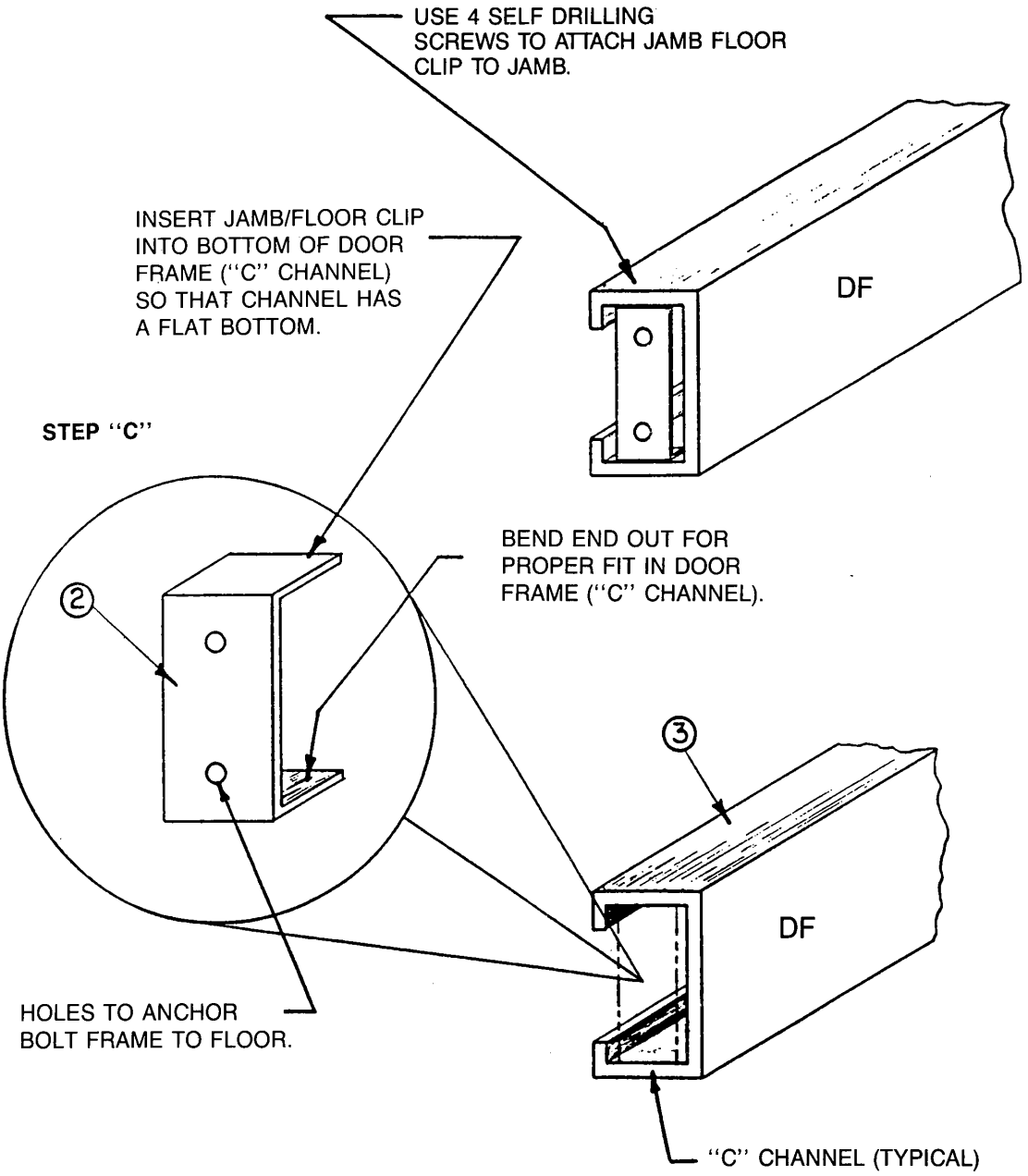
③ **DOOR FRAME DETAIL (Vertical)**
SEE ENLARAGED PLAN PAGE 43, STEP "D"

④ **JAMB/HEADER CLIP DETAIL**
SEE ENLARGED PLAN PAGE 44, STEP "E"

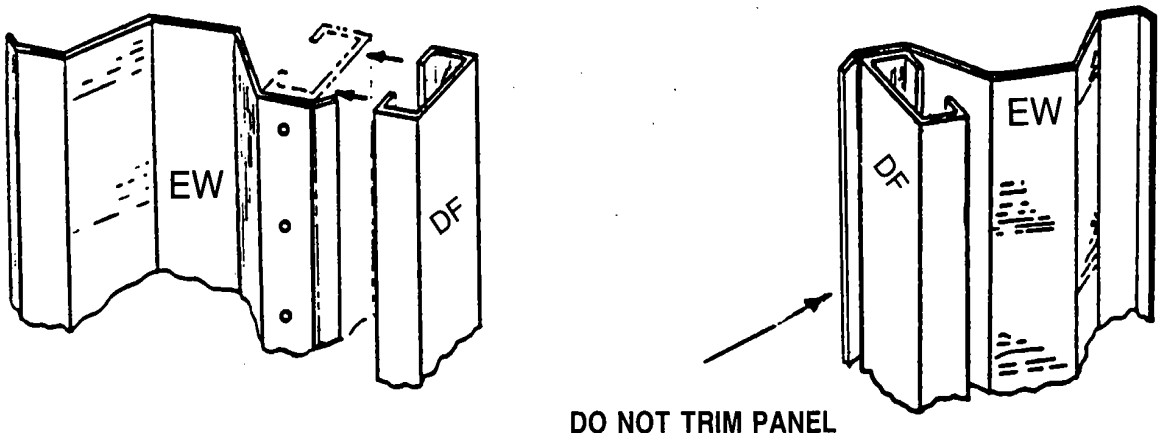
⑤ **DOOR FRAME DETAIL (Horizontal)**
SEE ENLARGED PLAN PAGE 45, STEP "F"

⑥ **"LB" CONNECTOR**
SEE ENLARGED DETAIL PAGE 46, STEP "G"

DOOR FRAME AND JAMB/FLOOR CLIP DETAIL

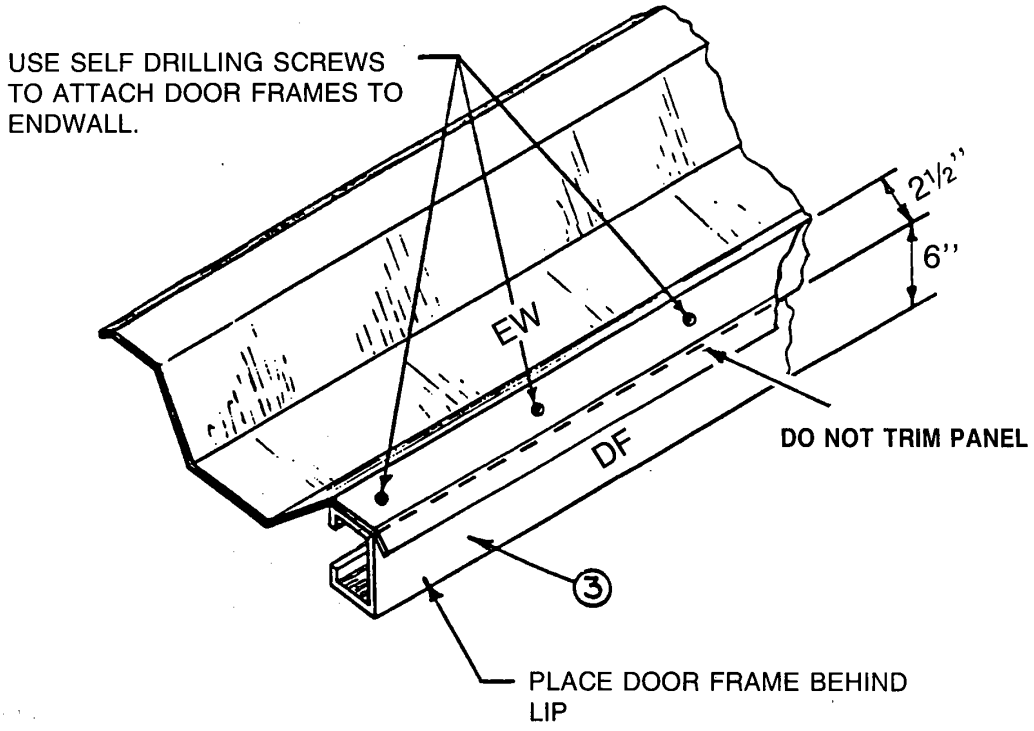


VERTICAL OVERHEAD DOOR FRAME – SECTION



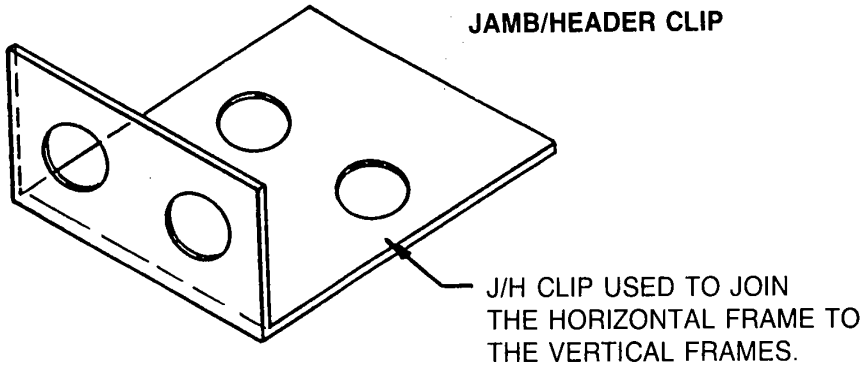
FRONT VIEW **REAR VIEW**

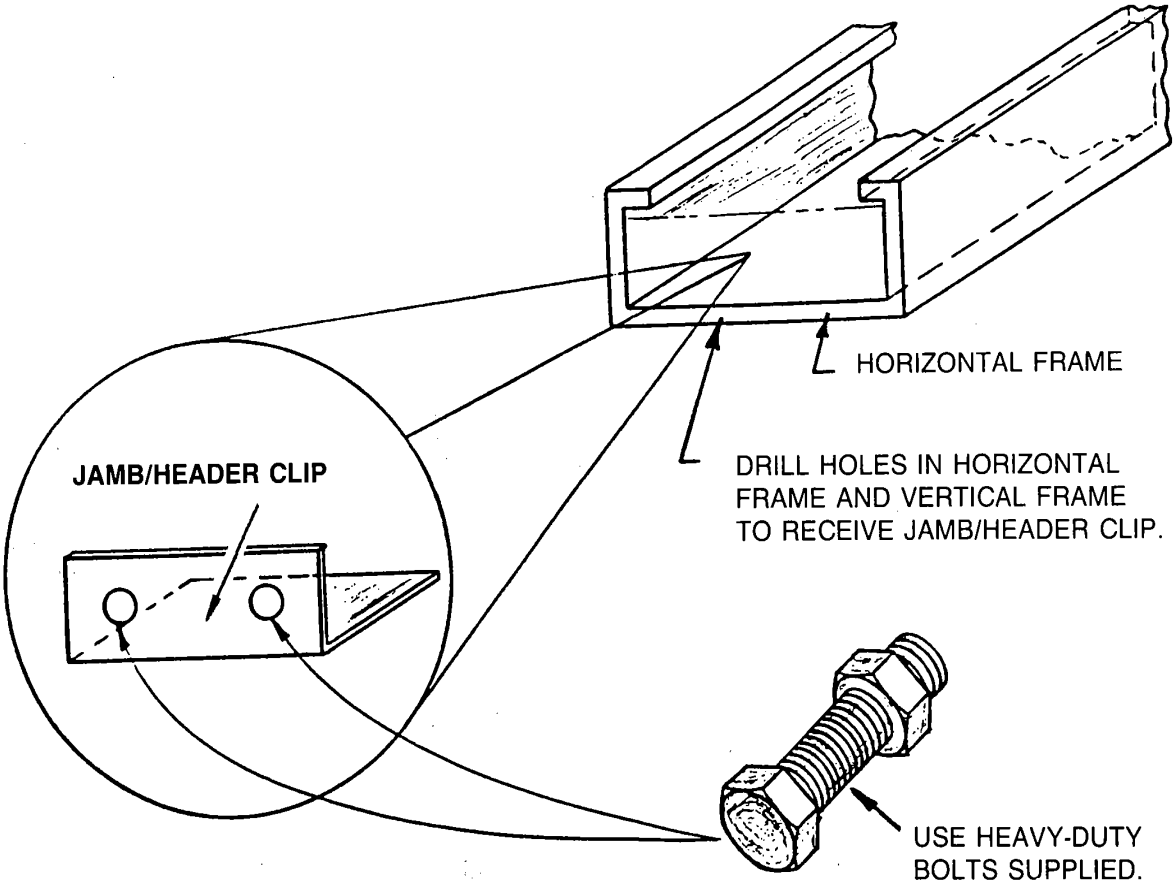
STEP "D"



JAMB/HEADER CLIP DETAIL

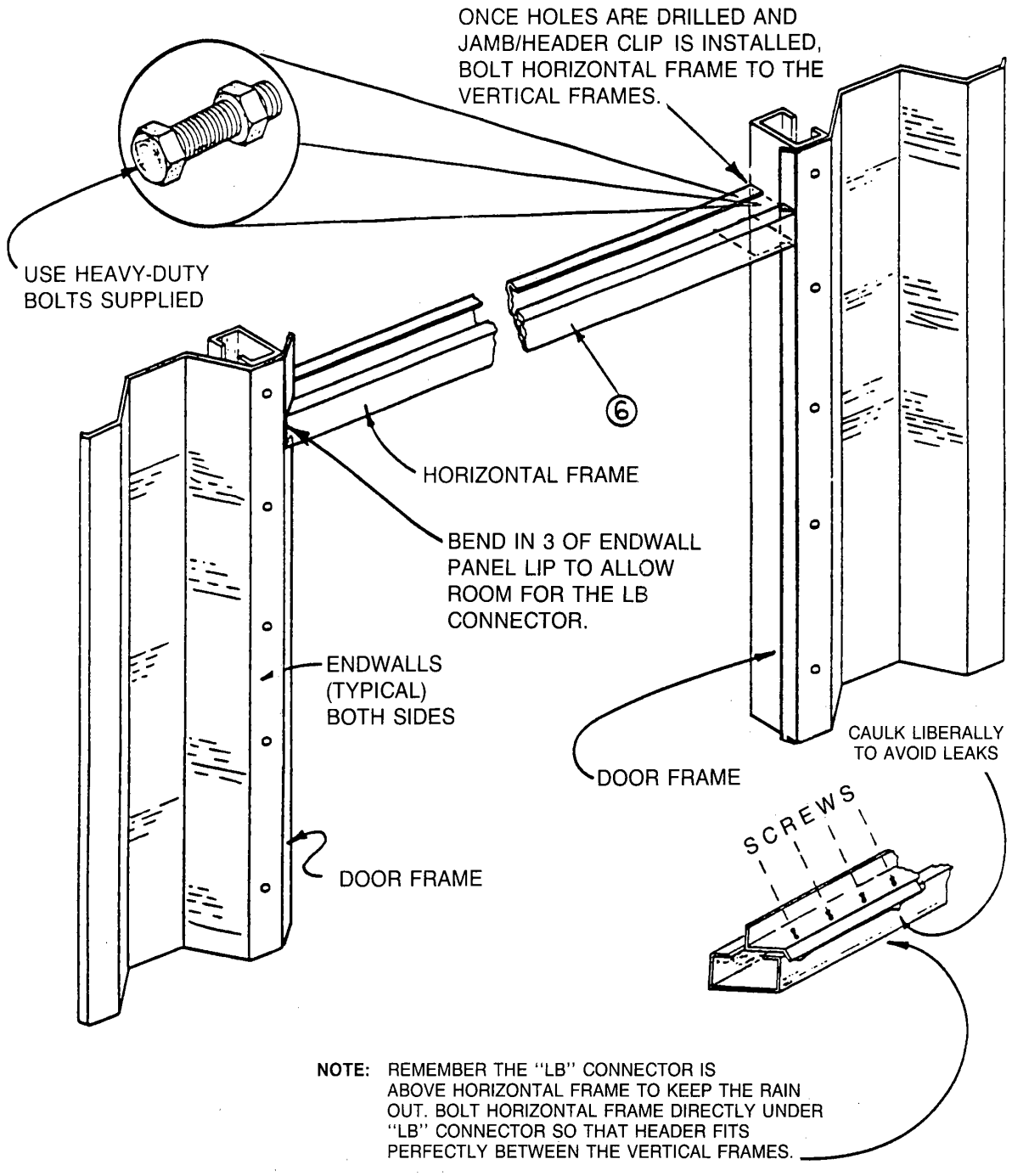
STEP "E"





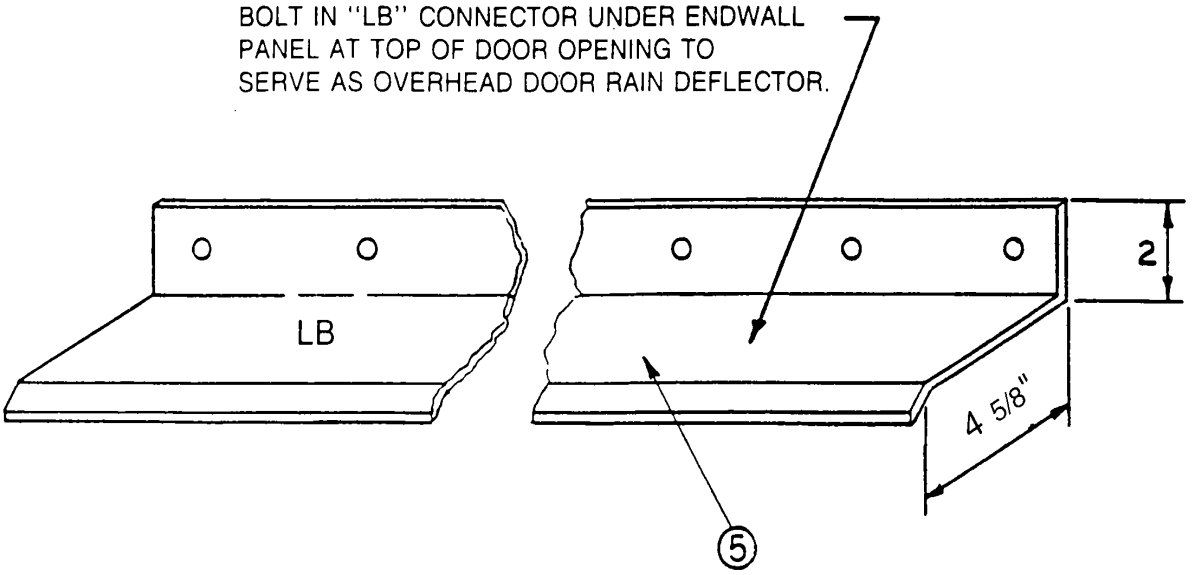
HORIZONTAL FRAME CONNECTION – DETAIL

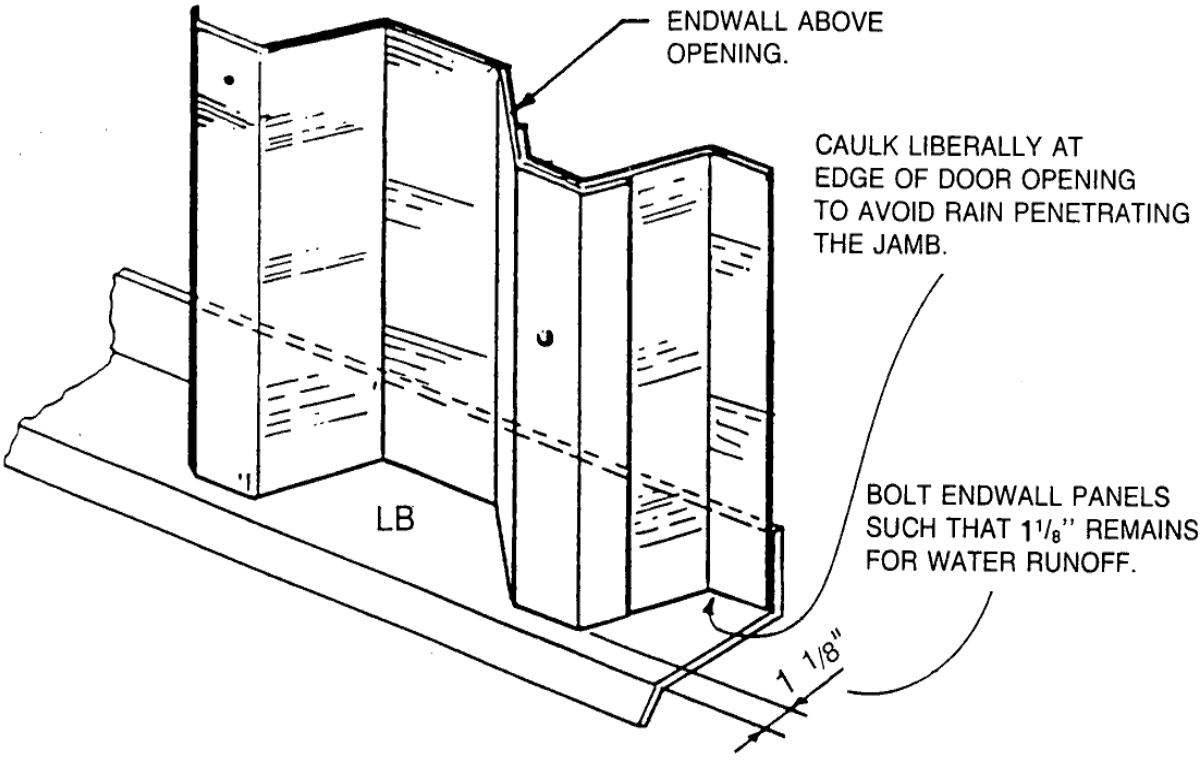
STEP "F"



"LB" CONNECTOR – DETAIL

STEP "G"





4-3 OVERHEAD DOORS

The commercial overhead steel door included in your building (if ordered from the distributor) is very well made and will provide you years of trouble free service. Since there is no tract or hardware mounted outside the building the overhead door will not require the maintenance that many types of sliding doors would need. It is very important to closely follow the instruction on installing the overhead door frame whether using wood or steel. The actual opening width should always be 3" less than the nominal width of the door.

In addition to the information provided in this manual, a detailed blue print is sent with the overhead door. The actual detailed installation instructions for the overhead door are sent along with the building on delivery and can be found in the overhead door hardware box.

The correct mounting of the overhead door shaft and springs is critical if the door is to operate properly. All doors 14h x 16w or smaller are usually ordered with a low headroom rear mount, (unless otherwise requested). This means that the shaft/springs will mount at the end of the tract, NOT above the closed door. The other mounting systems, low headroom FRONT mount and standard headroom are supplied only on larger or heavy gauge doors.

TABLE

DOOR SIZE	MOUNTING SYSTEM
14h x 16w or smaller	Low headroom rear mount
14h x 18w or larger	Low headroom front mount

Several pieces of heavy gauge 1 ½ x 1 ½ perforated angle is furnished with the overhead door in order to mount the horizontal tract to the roof of the building. Both horizontal tracks should be mounted to several arches for stability and to prevent sagging.

If the center building height is considerably larger than the overhead door height, you may wish to purchase a vertical high lift. This type of tracking system allows the door to slide vertically to the maximum height allowed and then slide parallel to the roof. It is typically ordered when the top of the door opening is more than 4' from the center building height. Vertical high lift is not a standard feature and must be ordered 4-6 weeks in advance.

The most important aspect of the overhead door installation is the proper positioning of the color coded drums and winding the springs. Follow the instructions carefully when winding the torsion springs with the winding bars furnished by the factory. Once the door is installed and the springs are properly wound, the door should open with very little effort. If at any time during the overhead door installation, you experience difficulty, contact the factory at once or call the Clopay Door Commercial Hotline at (800) 526-4301.

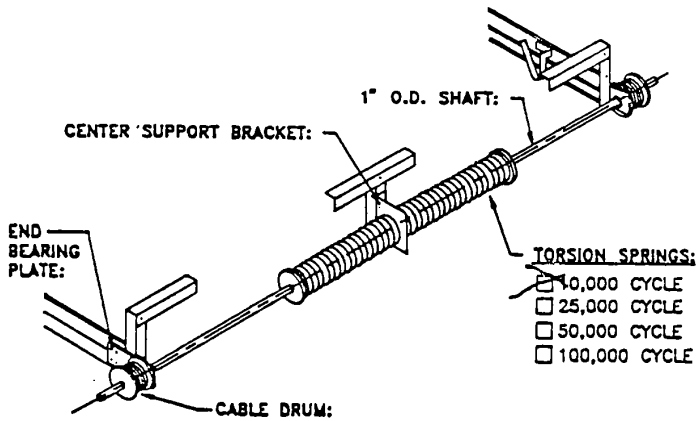
LOW-HEADROOM REAR MOUNT TRACK

WEIGHT LIMIT:
500 POUNDS MAX.

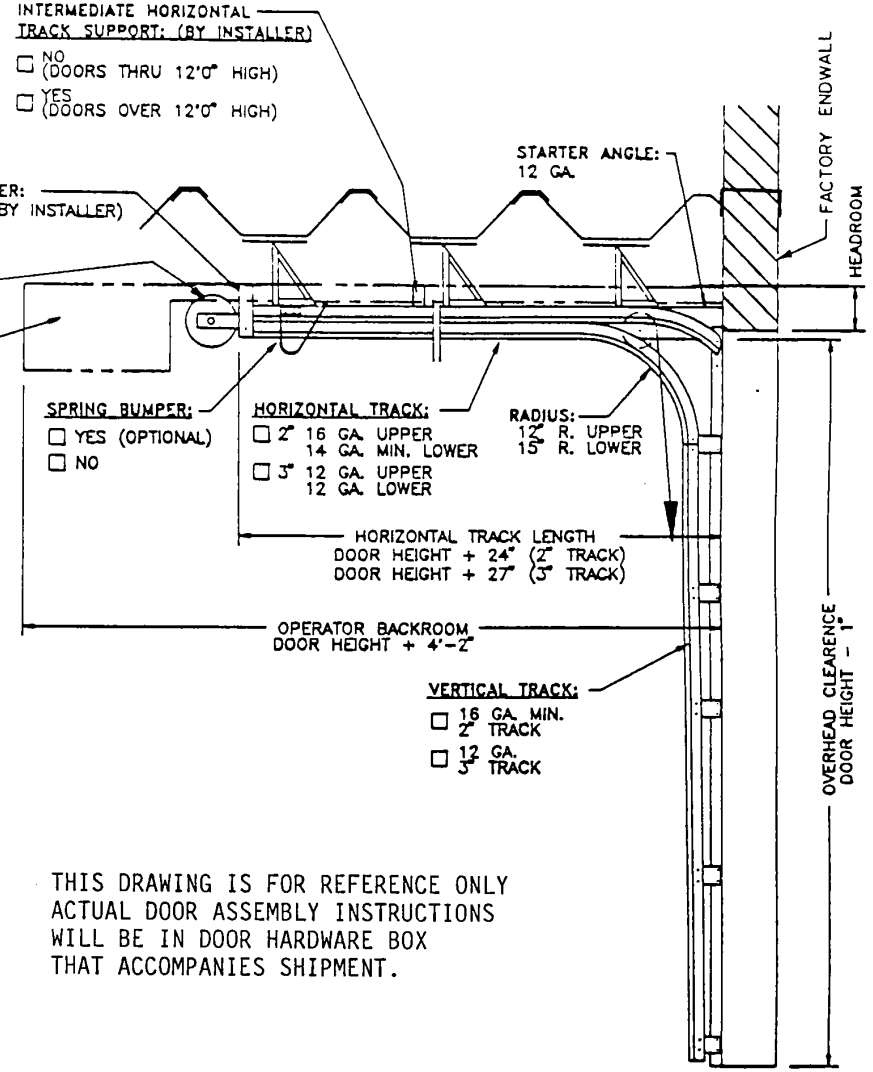
HEADROOM REQUIREMENTS
2" TRACK: 4 1/2"
3" TRACK: 5 1/2"
3" ADDITIONAL HEADROOM FOR TROLLEY OPERATOR

MOST OVERHEAD DOORS SHIPPED ARE WITH REAR MOUNT LOW HEADROOM. THIS MEANS THAT THE SPRING/SHAFT IS MOUNTED BEHIND THE TRACK NOT ABOVE THE DOOR. (ONLY DOORS LARGER THAN 14' x 14' WILL HAVE STANDARD HEADROOM.)

NOTE:
SPRING SIZE AND CONFIGURATION INDIVIDUALLY CALCULATED TO COUNTERBALANCE DOOR LOAD. AN EXACT SPRING LAYOUT CAN BE FURNISHED UPON APPROVAL OF BID. SOME DOORS MAY REQUIRE 6" SPRINGS.



TORSION SPRINGS:
☐ 10,000 CYCLE
☐ 25,000 CYCLE
☐ 50,000 CYCLE
☐ 100,000 CYCLE



THIS DRAWING IS FOR REFERENCE ONLY ACTUAL DOOR ASSEMBLY INSTRUCTIONS WILL BE IN DOOR HARDWARE BOX THAT ACCOMPANIES SHIPMENT.

LOW-HEADROOM REAR MOUNT	TRACK SIZE:	OPERATOR MODEL:_____	HOR. TRACK LENGTH:_____	SHEET 'T-3'
OPENING SIZE: ___'___" W x ___'___" H		OPERATOR BACKROOM:_____	AVAILABLE HEADROOM:_____	DATE: _____
DOOR SIZE: ___'___" W x ___'___" H		OVERHEAD CLEARANCE:_____	HEADROOM REQUIRMENT:_____	BID #: _____
				PAGE ___ of ___

CHAPTER 5
GROUTING OF BUILDING

When the entire structure has been assembled and all the accessories have been installed, the troughs must be filled with a non-porous concrete grout. Grout for this purpose is a sand, water, and cement mixture. In order for the grout to be non-porous it must not have any gravel added to the mix. Commercial non-porous grout may be used or you can mix your own. **The typical grout is a 50/50 mix of sand and Portland cement (by weight).**

The ends of the panels, both inside and out, should be coated with a thin layer of lacquer or polyurethane. This is suggested, as Galvalume® steel is sensitive to concrete during the curing period.

NOTE: Grout must not have any type of calcium chloride additive.

NOTE: Grouting should be done immediately upon completion of the building.

5-1 GROUTING OF ARCHES

The outside of the trough is grouted with a slight slope away from the steel as shown in *Figure 5-1A*. The inside of the trough is grouted with a slight slope 2 inches above the centerline of 2nd set of bolt holes. Inside grouting should be higher than the outside grouting.

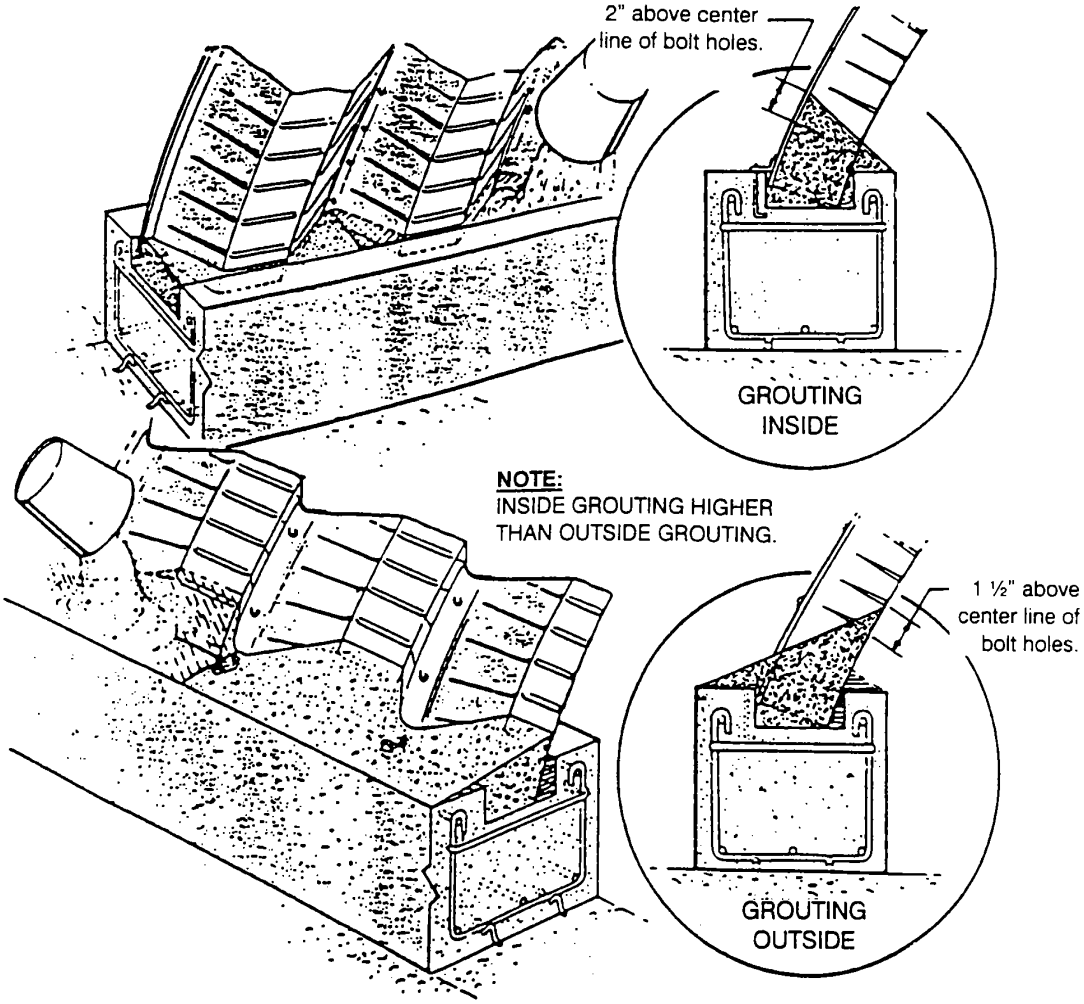


Figure 5-1A

5-2 GROUTING OF ENDWALLS

The solid endwall trough is also grouted, both inside and out. By sloping the grout away from the steel no water will sit on the foundation, but will run off easily. Use a 20º slope outside the building and a 25º slope inside as shown in *Figure 5-2A*.

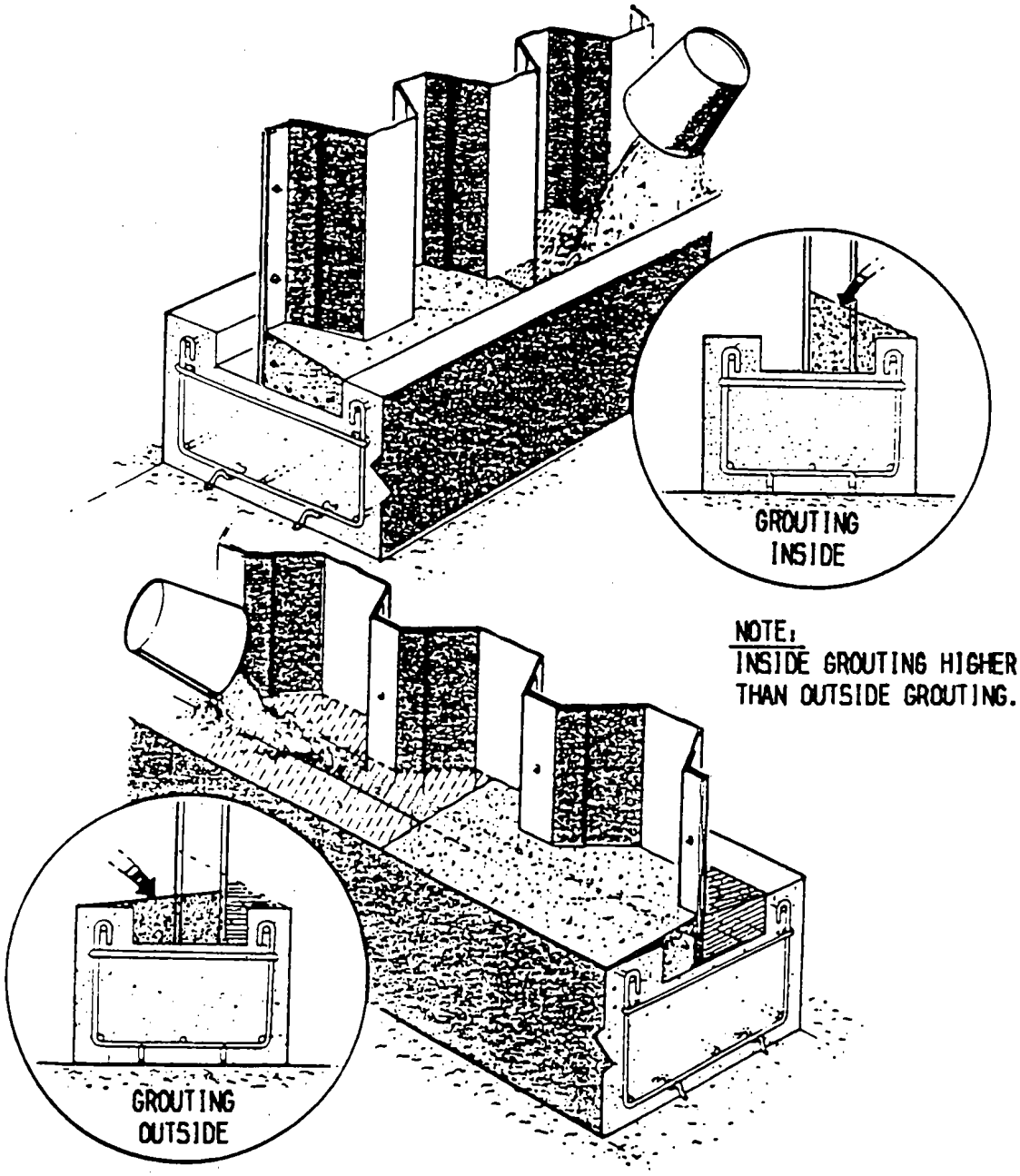
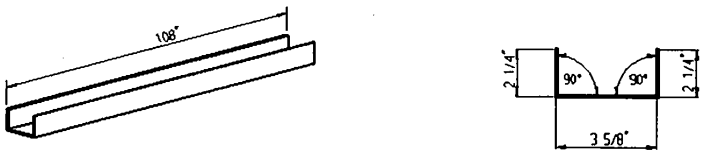


Figure 5-2A

CHAPTER 6
ACCESSORIES

All of the accessories listed in Chapter 6 may be ordered from your distributor.

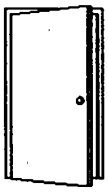
6-1 ENDWALL SERVICE DOORS



Service Door Channel

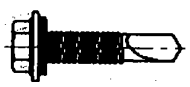
Service Door LB Connector

Service Door Clip



2'-8" x 6'-8" Service Door

Standard Lockset



Self Drilling Screw – 12-24 x 1" w/seal washer

The following instructions are for a factory supplied service door and frame. If the door is not factory supplied, the instructions may need altered to accommodate the size of the service door. If the door is to be put into an Endwall with an opening for a garage door, you must leave at least one half of an Endwall panel between the large door and the service door.

For Concrete Trough Foundations
The Endwall Service Door should be installed **before** the endwall is grouted.
The Service Door should always be installed at the finished floor level.

For Commercial Connector or U-Channel Foundations
The Endwall anchoring system (U-Channel or Commercial Connector) should be field cut at the service door location.

STEP 1
Unbolt and remove two (2) adjacent endwall panels as shown in *Figure 6-1A*.

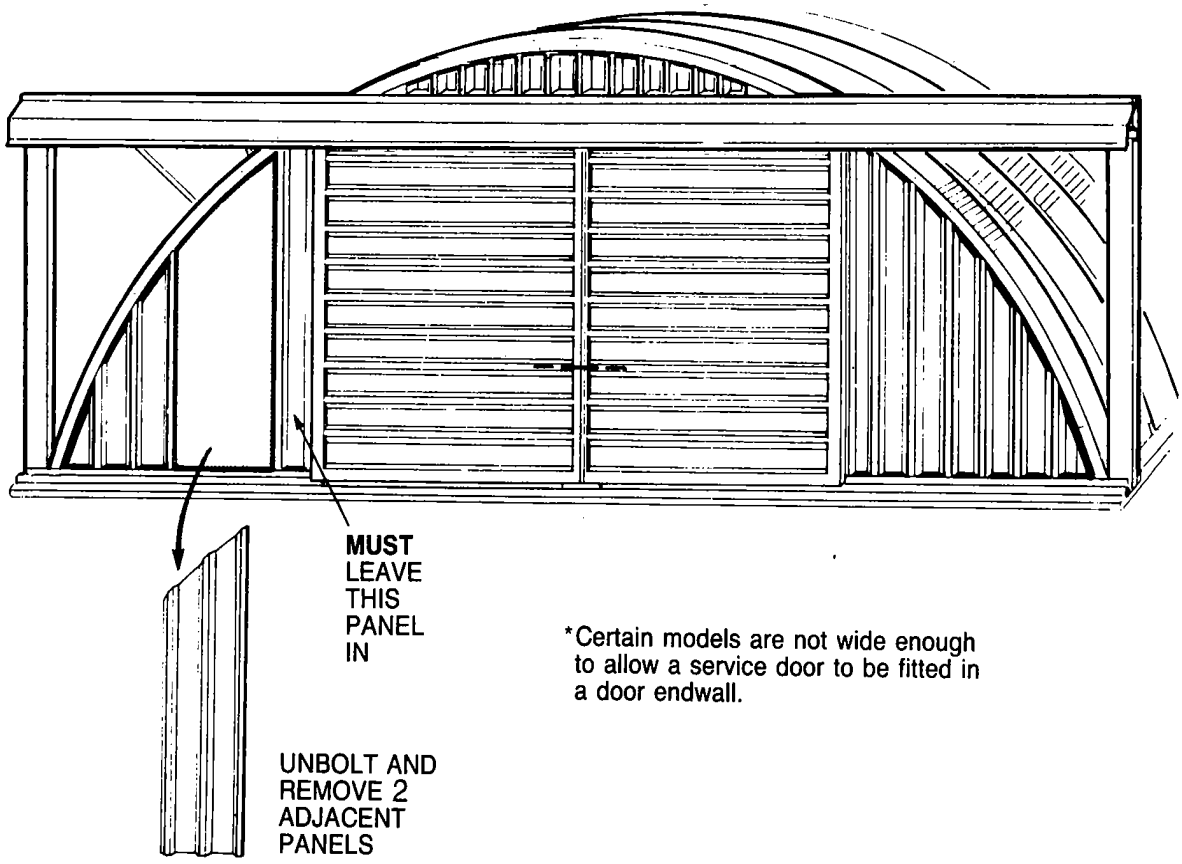


Figure 6-1A

NOTE: IT IS STRONGLY RECOMMENDED THAT A SERVICE DOOR BE PUT IN THE REAR ENDWALL TO PROVIDE AN ADDITIONAL EXIT IN CASE OF FIRE. CHECK YOUR LOCAL REGULATIONS.

STEP 2

The two removed Endwall Panels are then marked and cut as shown in *Figure 6-1B*. The First Endwall Panel is to be cut completely across horizontally to the height of the service door. The Second Endwall Panel is cut partially across horizontally and then vertically. The dimensions shown are for a factory supplied door only.

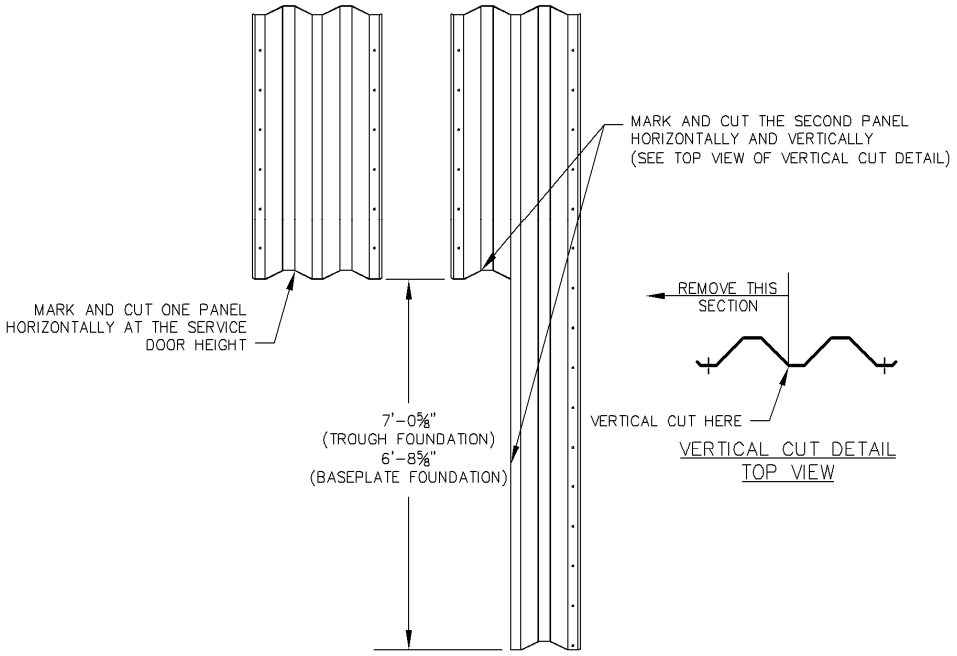


Figure 6-1B

STEP 3

Replace the two removed endwall panels and remove the overlap flange on the opposite side as shown in *Figure 6-1C*.

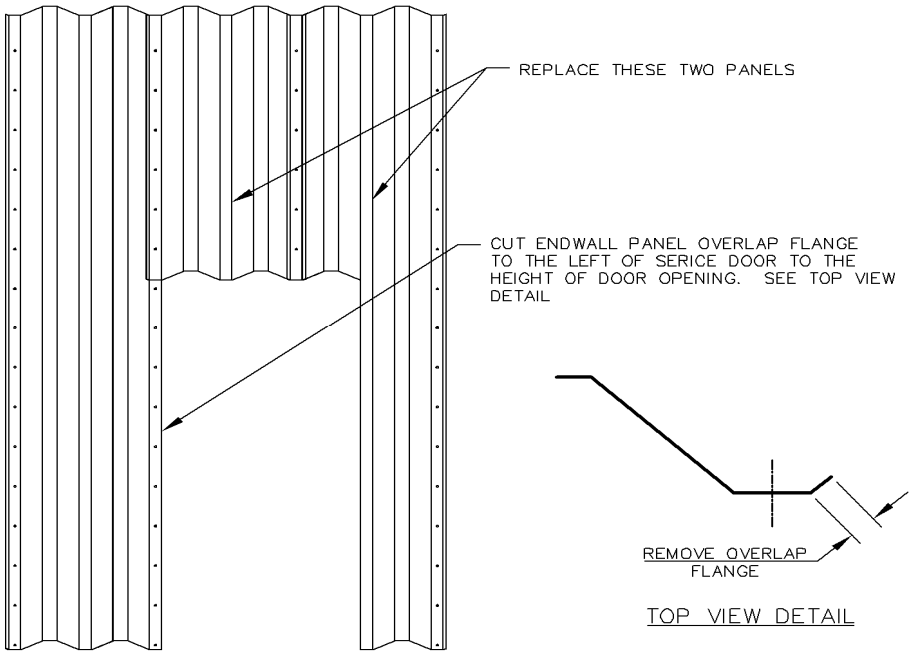


Figure 6-1C

STEP 4

Cut the Service Door Channels to the height of the door (7' - 0 5/8" for trough foundations or 6' – 8 5/8" for baseplate foundations). Place the Service Door Frames around the Service Door Jambs, then use self drilling metal screws to attach to the endwall panels as shown in *Figure 6-1D*.

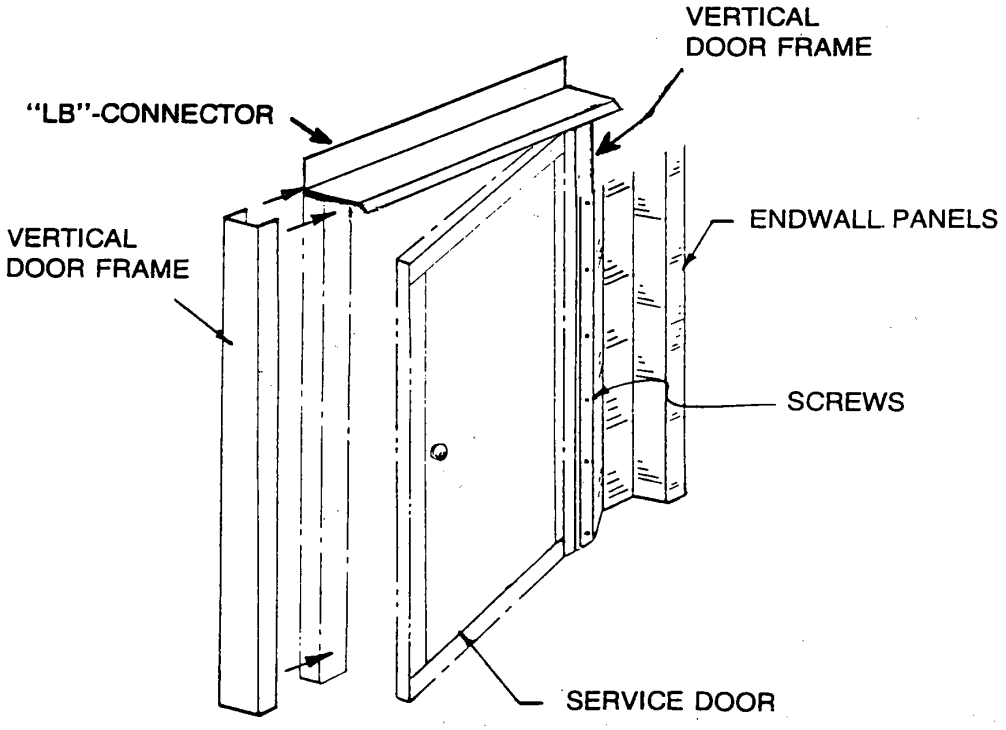


Figure 6-1D

STEP 5

The LB Connector (rain shedder) is attached next. The LB Connector is 36" long, and the distance between the Endwall Panel edges is 34". In order for the LB Connector to be positioned, a small 1" cut must be made in the Endwall Panel to the left and right of the Service Door, at the height of the top of the Service Door as shown in *Figure 6-1E*.

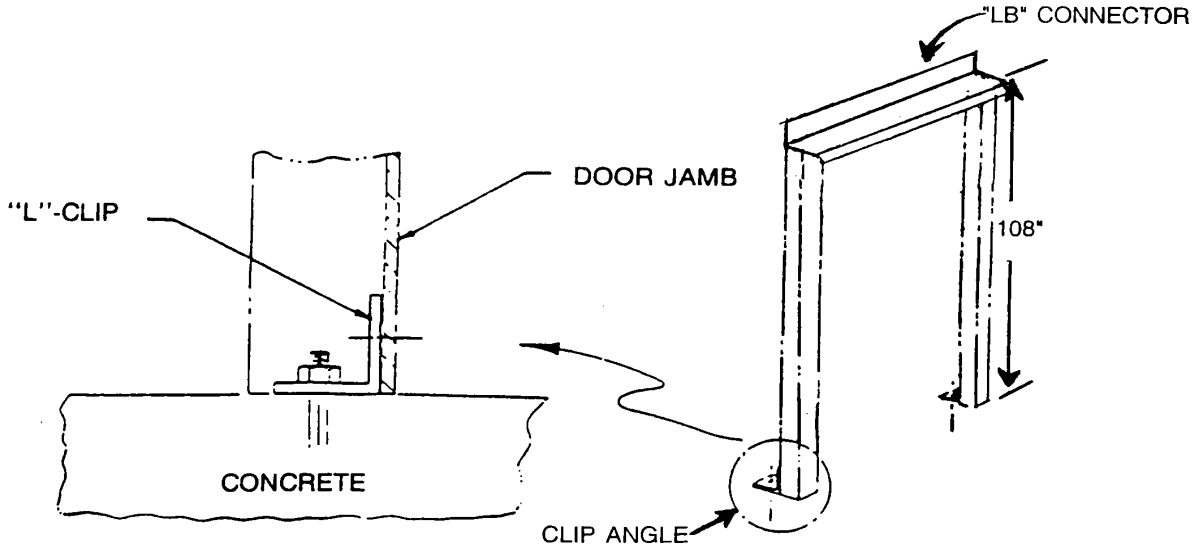


Figure 6-1E

STEP 6

From the inside of the building use self drilling screws to attach the “LB” connector to the back of the endwall panels as shown in *Figure 6-1F*.

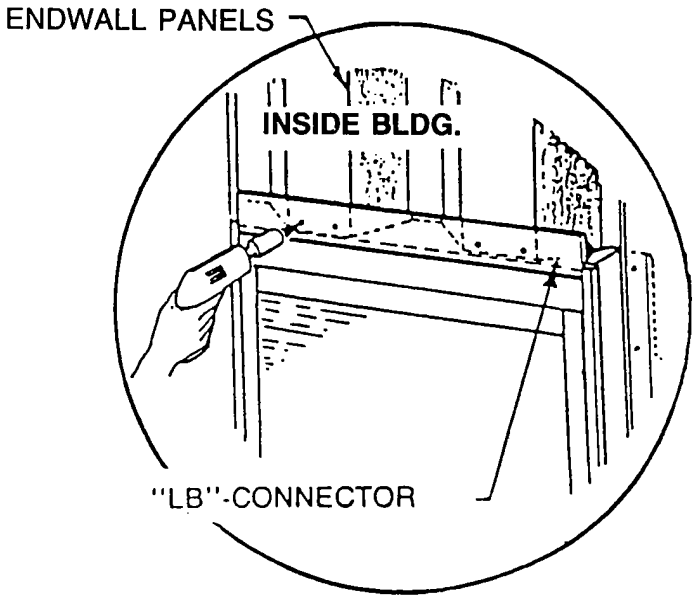


Figure 6-1F

STEP 7

Caulk between “LB” connector and endwall panels as shown in *Figure 6-1G*.

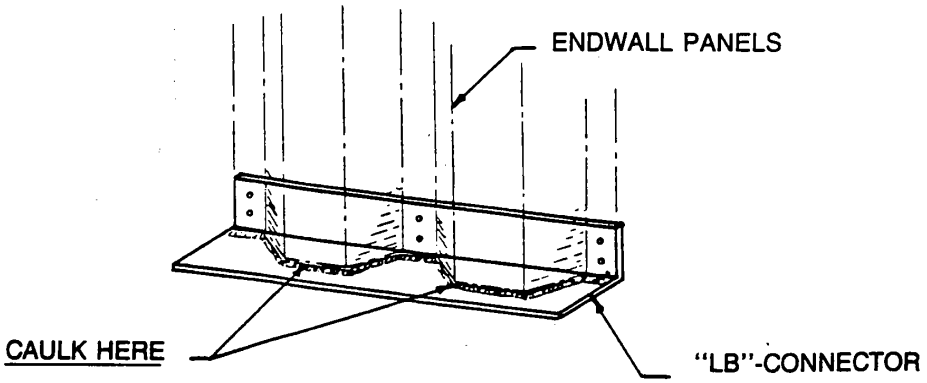


Figure 6-1G

STEP 8

If door is not rigid use angle iron on both sides of door on the inside wall, bolting to the door jambs and extending over two (2) or three (3) wall panels for additional strength as shown in *Figure 6-1H*.

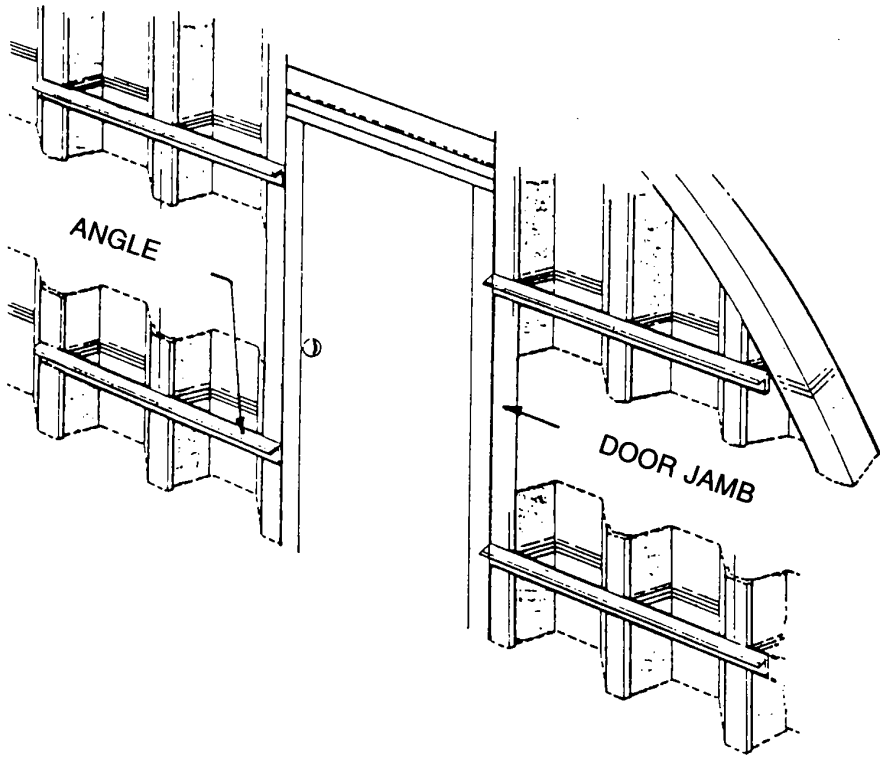
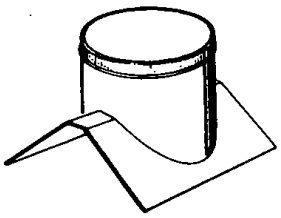
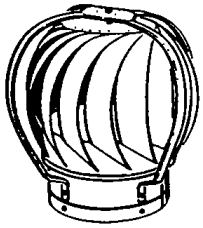


Figure 6-1H

6-2 TURBINE VENT



Vent Adaptor



Vent

NOTE: ADEQUATE VENTILATION OF YOUR BUILDING HELPS REDUCE WORKING HAZARDS. ALWAYS INSTALL SUFFICIENT VENTILATION TO MEET THE INTENDED USE OF THE BUILDING. CHECK YOUR LOCAL REGULATIONS.

The circular roof vent is comprised of two main sections, the turbine vent and the vent adaptor as shown in *Figure 6-2A*.

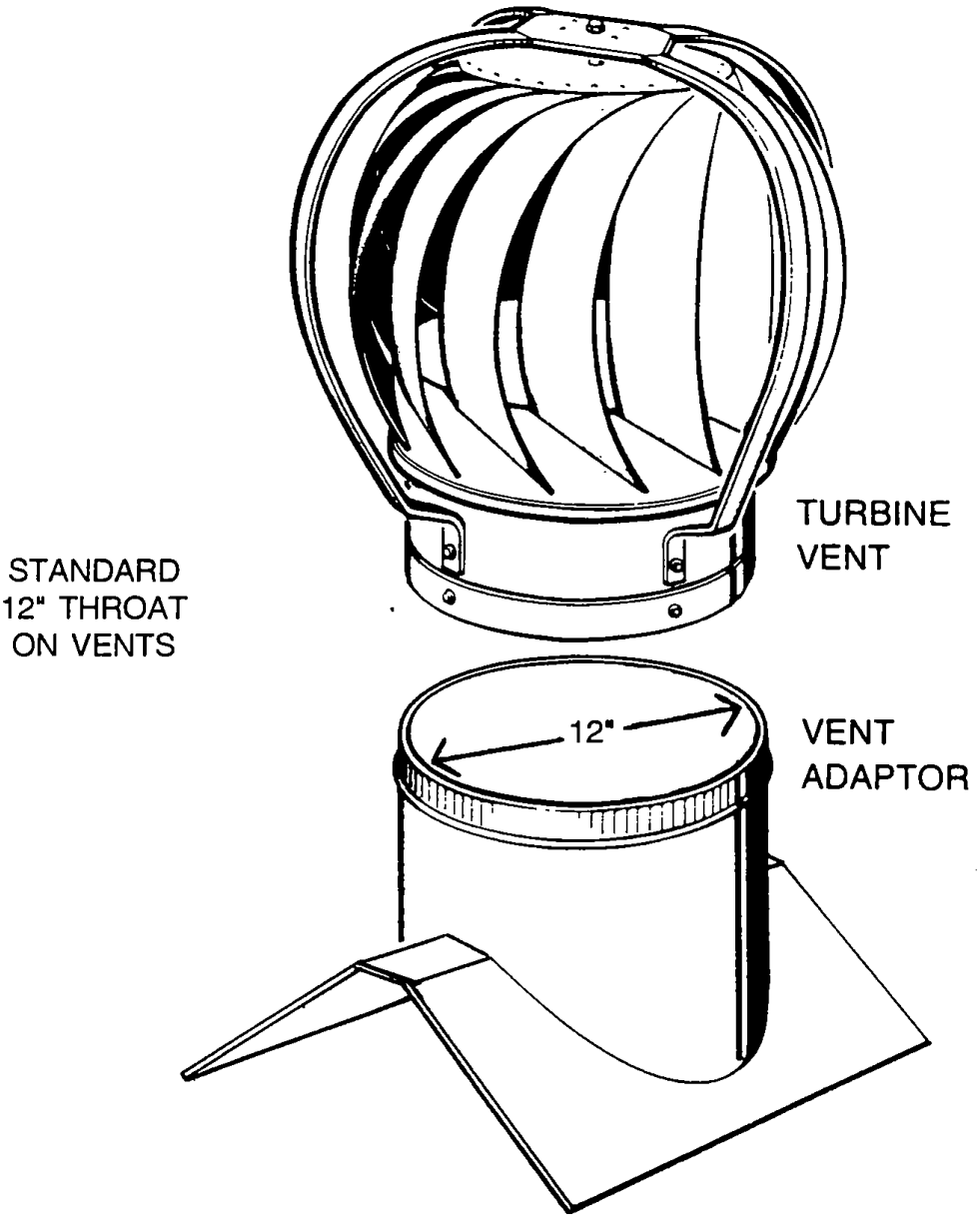


Figure 6-2A

NOTE: The vent should be installed on the very peak of the building on the ridge where two adjacent arches are bolted up.

STEP 1

Place the adapter on the peak of the building where it is to be installed and inside trace the circular opening onto the steel arch with a marking pen as shown in *Figure 6-2B*.

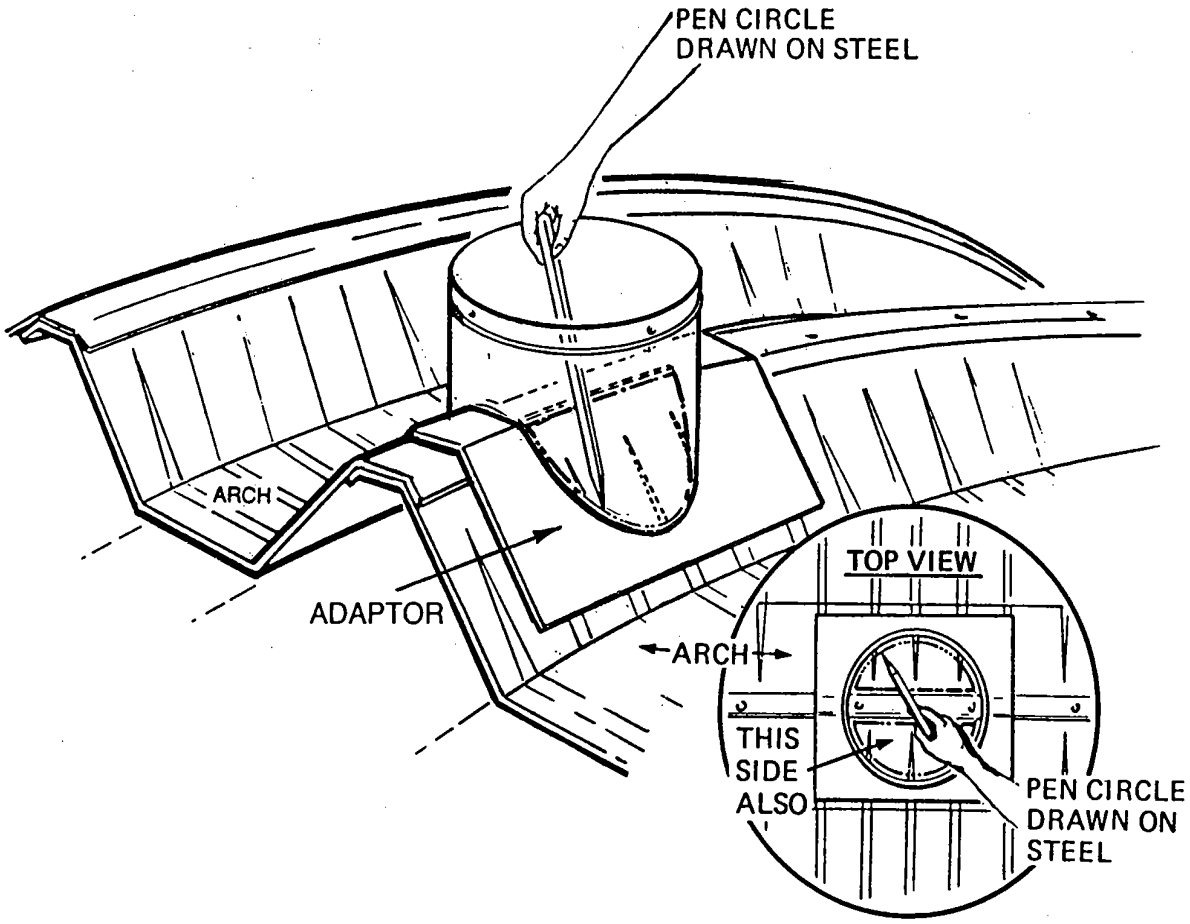


Figure 6-2B

STEP 2

To start the hole that has to be cut out, drill a hole large enough to set the saw into, inside the circle just below the lap of the two sheets as shown in *Figure 6-2C*.

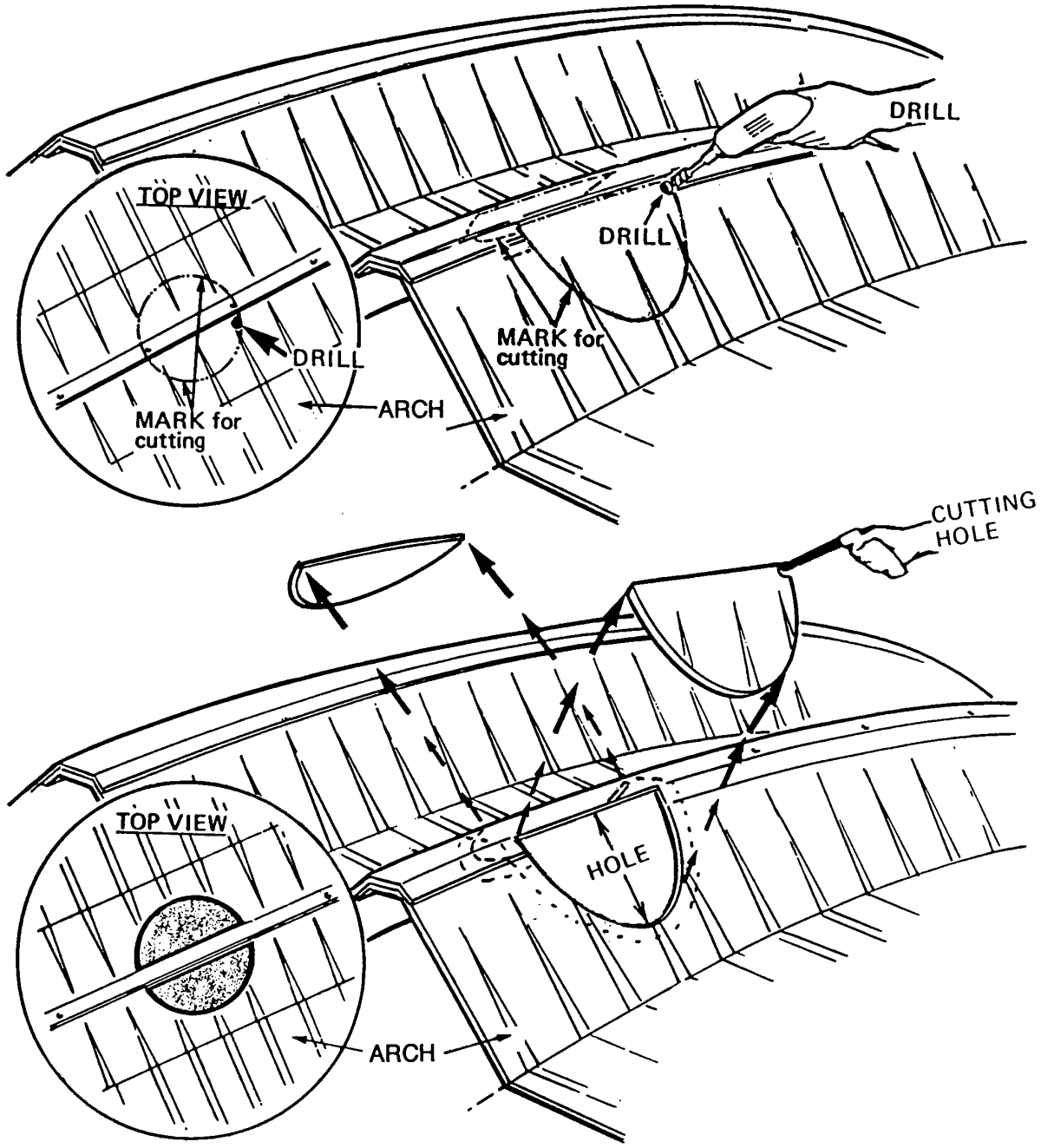


Figure 6-2C

STEP 3

Cut out the semi-circular shapes as shown in *Figure 6-2C.*

STEP 4

Place adaptor back over the hole and drill holes through the adaptor and the arch panels. Insert bolts and tighten down assembly as shown in *Figure 6-2D*.

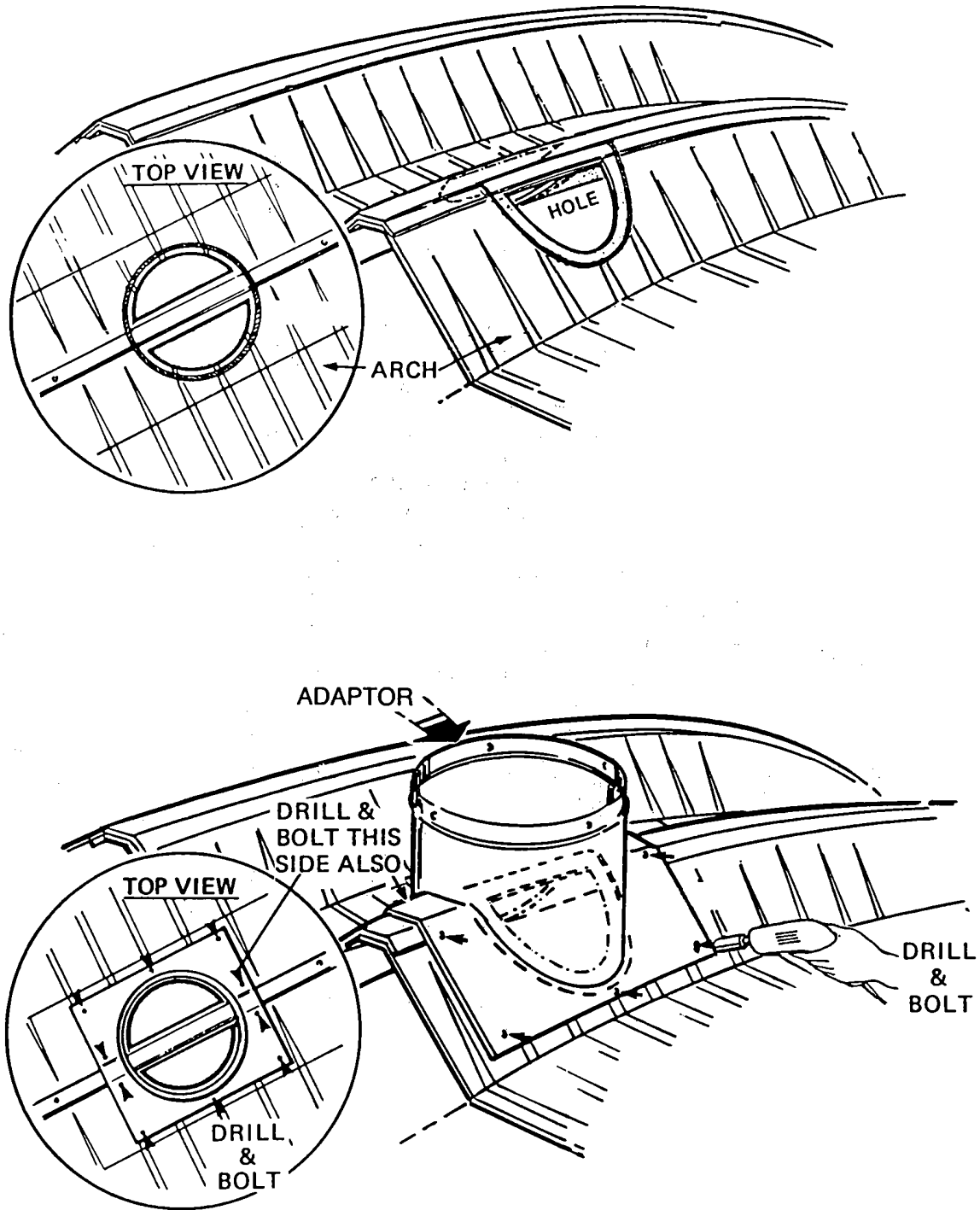


Figure 6-2D

STEP 5

The turbine vent is now placed into position on top of the adaptor as shown in *Figure 6-2E.*

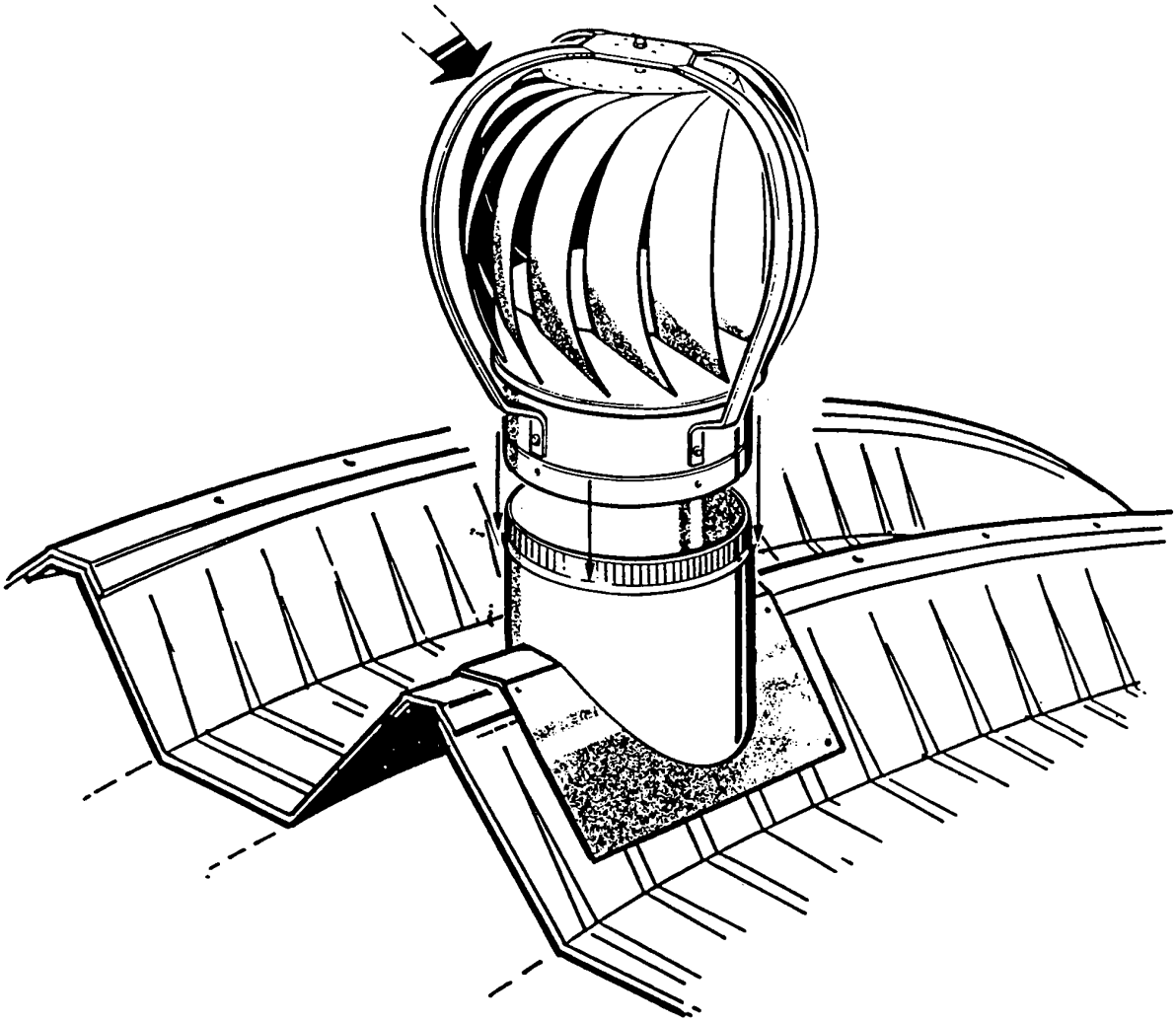


Figure 6-2E

STEP 6

Holes are drilled and bolts are inserted as shown in *Figure 6-2F*.

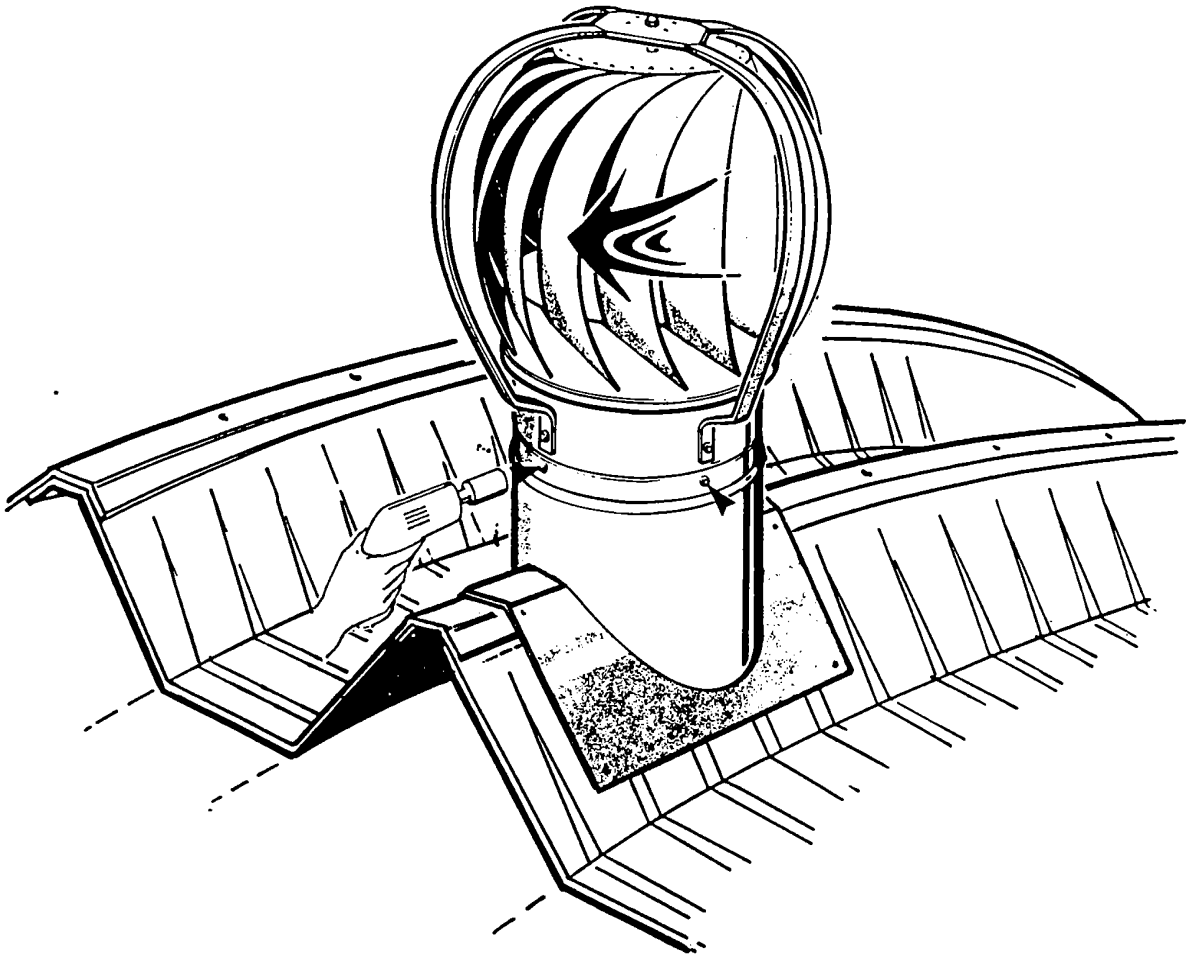
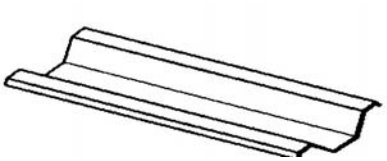
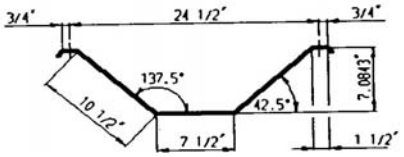


Figure 6-2F

6-3 ARCH SKYLIGHTS





Fiberglass Arch Skylights

CAUTION – SKYLIGHT RESTRICTIONS

The following restrictions must be adhered to when using skylights:

1. Only install 1 or 2 skylights every 20 feet (10 arches). If 2 skylights are installed every 20' they must be on opposite sides of the peak.

2. The skylight should not be installed as the first or second panel from the ground.

3. Skylights cannot be used at any job site/area requiring over **40 PSF** live load.

4. Never walk or step on skylights or the panel(s) adjacent to it.

5. Never suspend anything directly from a skylight.

NOTE: To guarantee the structure integrity of the building the skylights must be installed according to the erection manual installation instructions and the above restrictions.

For each skylight one steel panel is always removed from your building at the factory. Before any skylights are installed the roof panels must be tightened up with an impact wrench, except for the steel panel you are going to remove.

Skylight should be placed close to the peak of the building to allow maximum passage of light. There should only be one skylight in any one arch and there should be at least four complete arches between any arches containing skylights.

STEP 1

A steel panel should be unbolted and removed (if not already removed during erection of arches) from the building in the area where you wish to install the skylights as shown in *Figure 6-3A*.

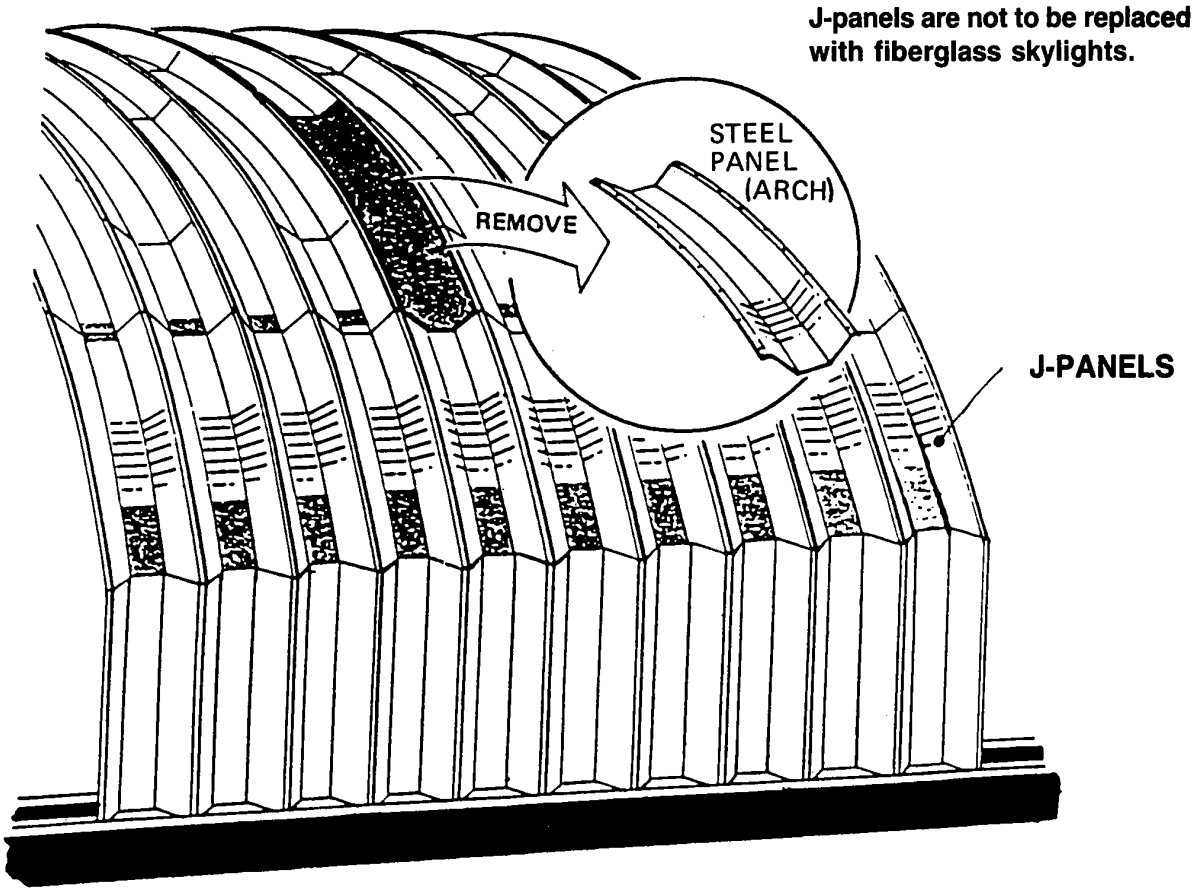


Figure 6-3A

NOTE: Two skylights every 20' may be used, only if installed on opposite sides of the peak.

STEP 2

The skylight should be placed into the opening, making sure to lap the adjacent sheets in the correct direction and using the holes marked on the skylights as a template as shown in *Figure 6-3B*.

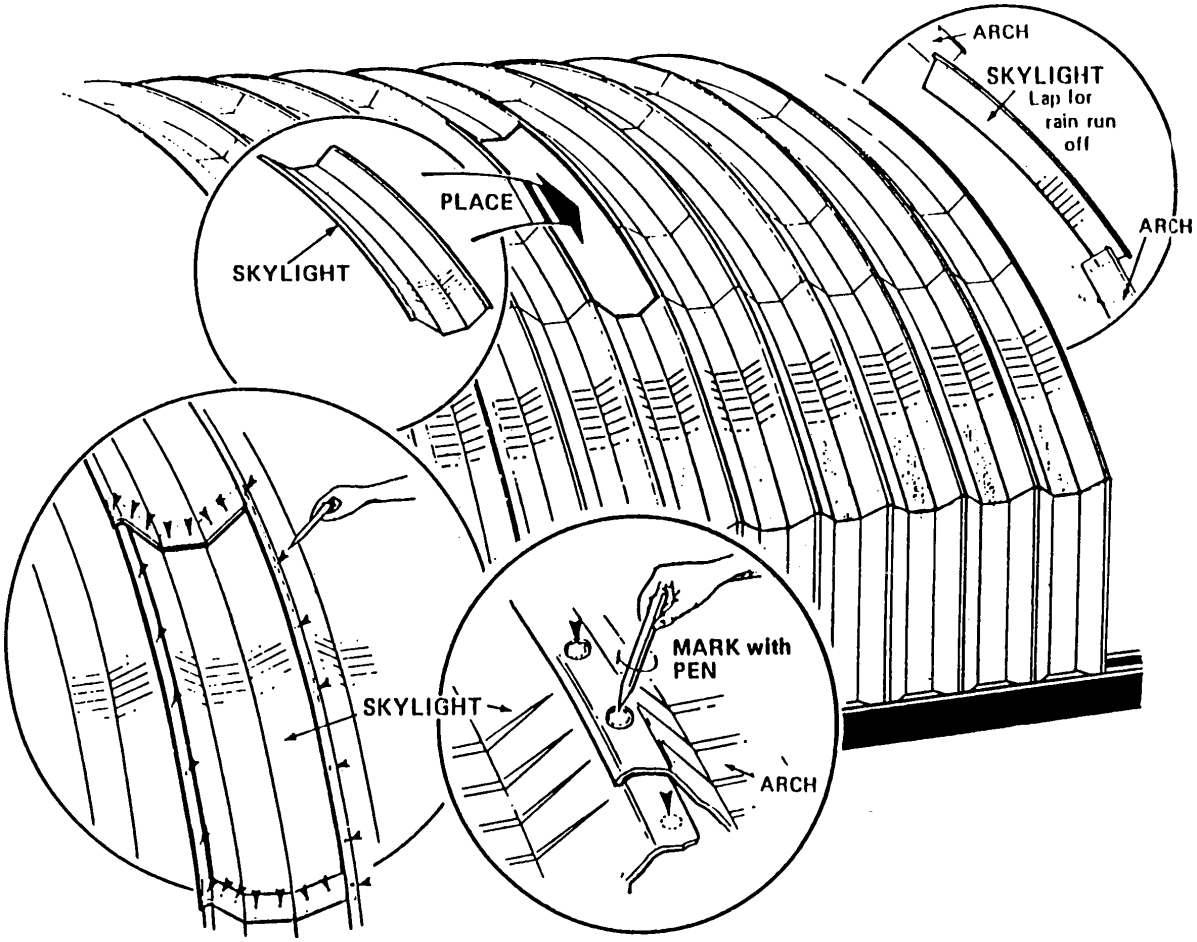


Figure 6-3B

STEP 3

Remove and drill skylight as shown in *Figure 6-3C*.

NOTE: Never drill the skylight through the steel panel.

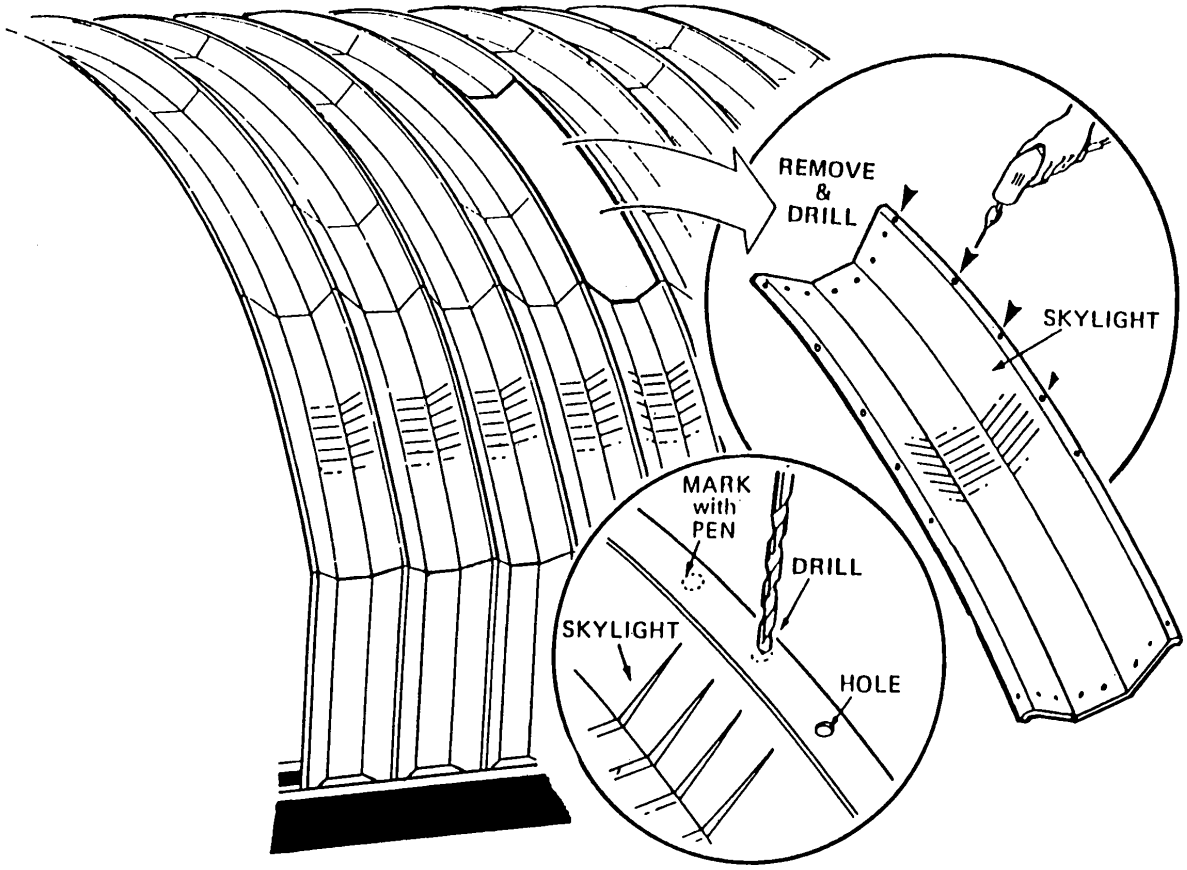


Figure 6-3C

STEP 4

Replace the skylight into the opening, making sure to lap the panel for proper rain run off and insert bolts and tighten as shown in *Figure 6-3D*.

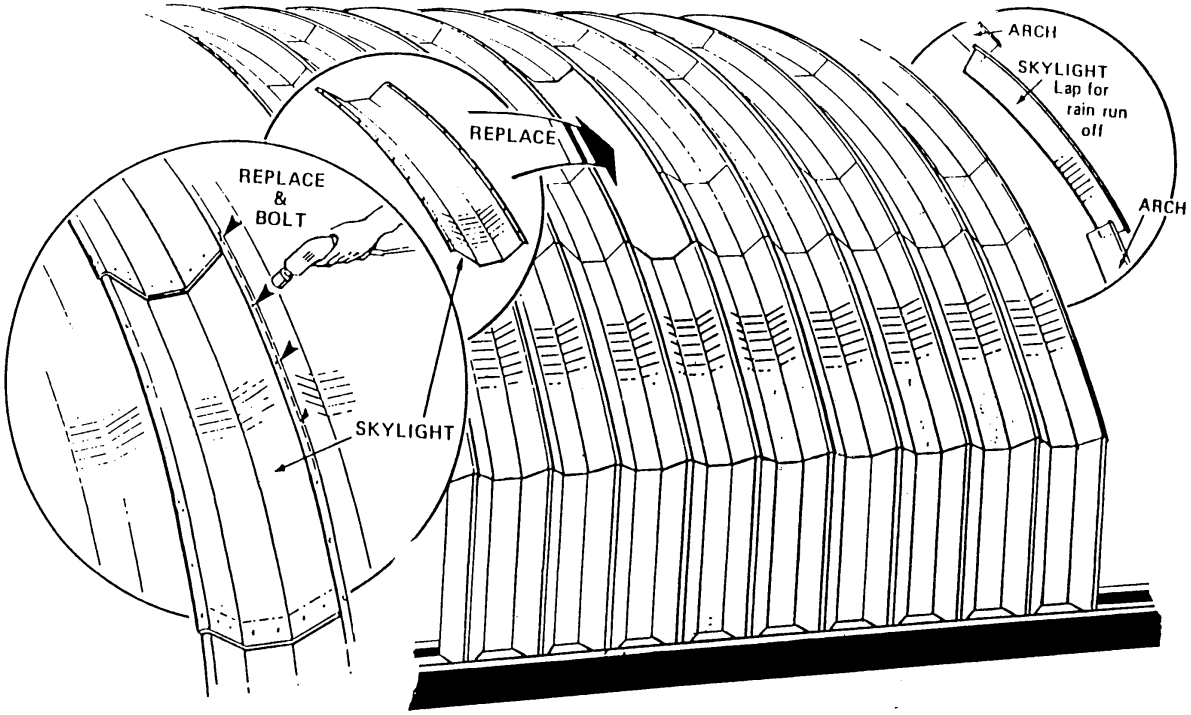
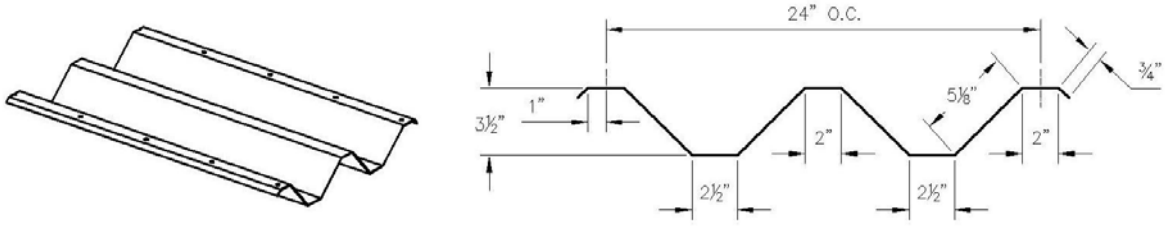


Figure 6-3D

6-4 ENDWALL SKYLIGHTS



Fiberglass Endwall Skylights

STEP 1
Remove a section of one (1) endwall panel as shown below in *Figure 6-4A*.

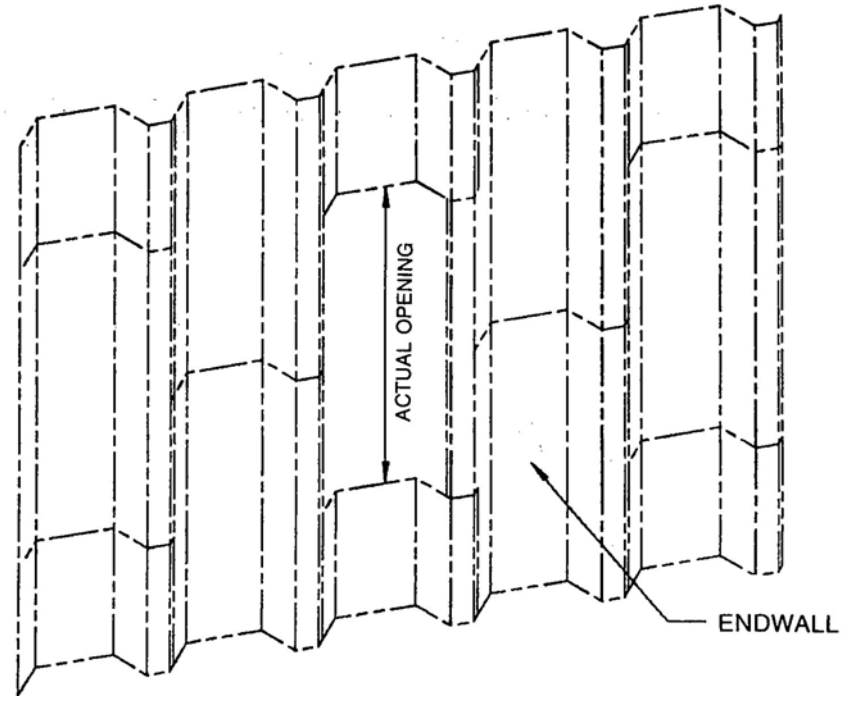
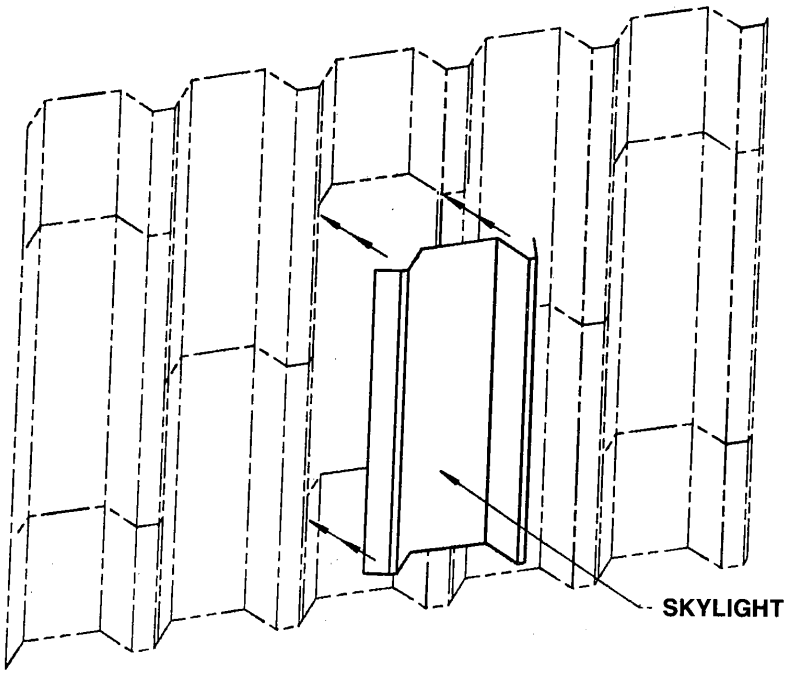


Figure 6-4A

STEP 2

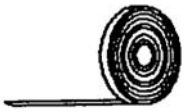
Mark, drill, and bolt endwall skylight into opening as show from the outside of the building as shown in *Figure 6-4B*. After the endwall skylight is installed, caulk all joints to avoid leaks.



OUTSIDE OF BUILDING

Figure 6-4B

6-5 CAULKING APPLICATION



Rubber Butyl Caulking – 35' roll

If caulking is utilized, it must be applied to every seam of the building as shown in *Figure 6-5A*, *Figure6-5B*, and *Figure6-5C*.

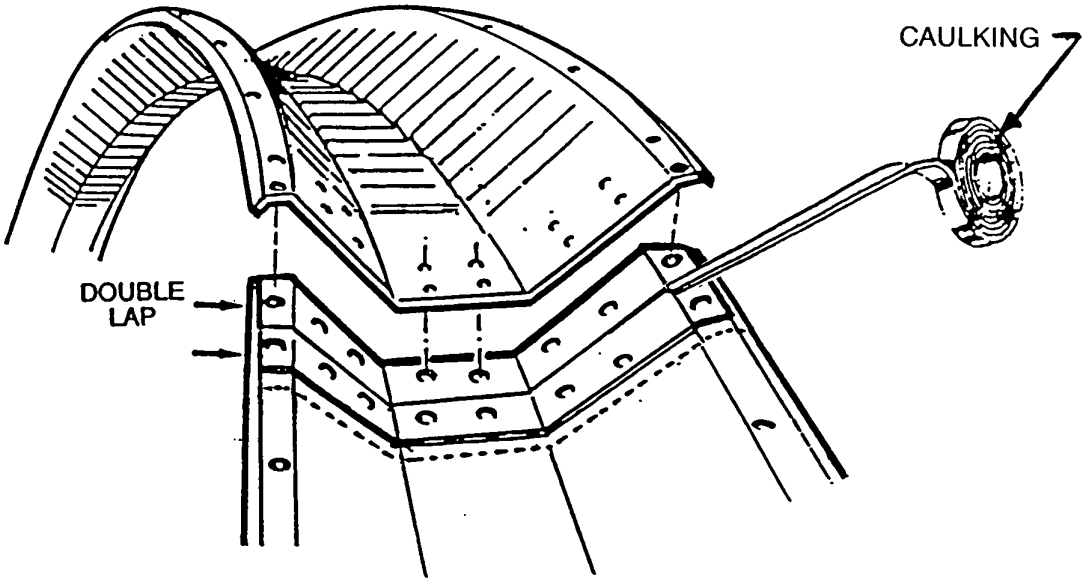
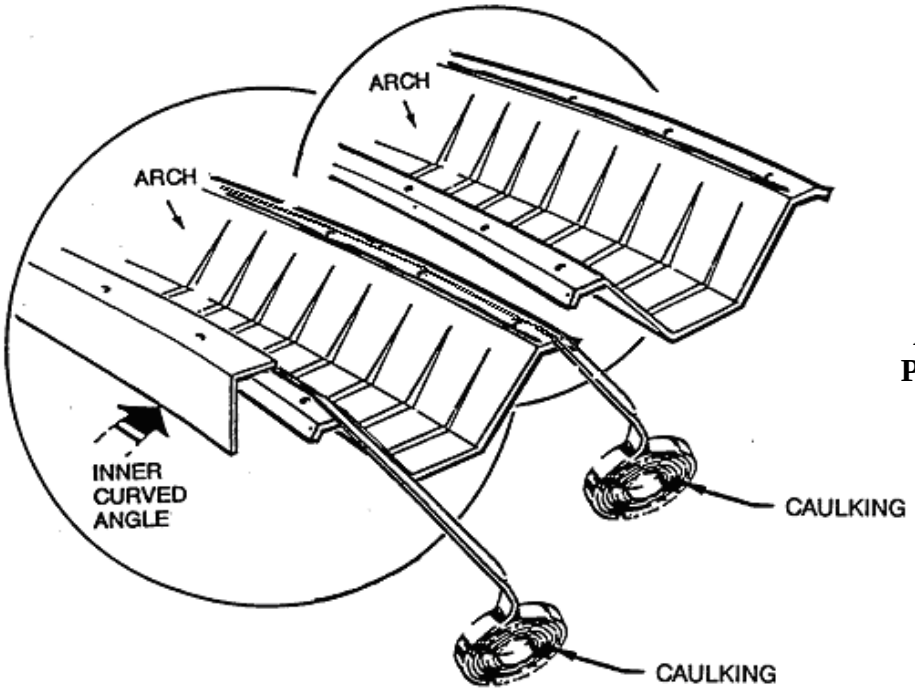


Figure 6-5A

Curved Angle caulking should be applied as shown in *Figure 6-5B* and *Figure 6-5C*.



CAULK CURVED ANGLE AND ARCH PANELS AS SHOWN

Figure 6-5B

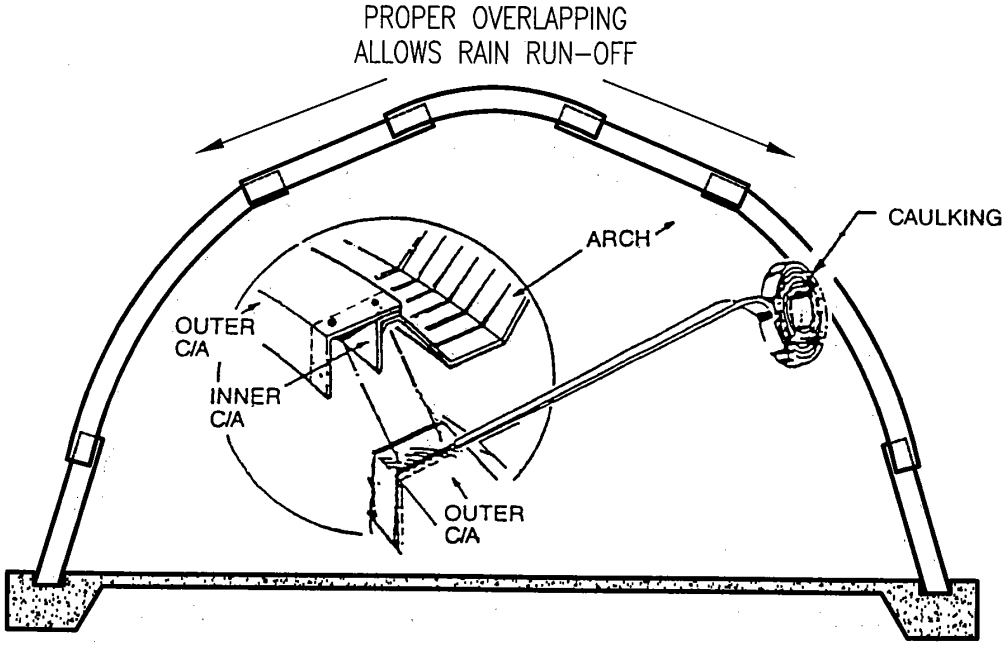


Figure 6-5C

6-6 INSULATION SYSTEM

NOTE: Apply (1) one pin and washer approximately every square yard as shown in *Figure 6-6A*.

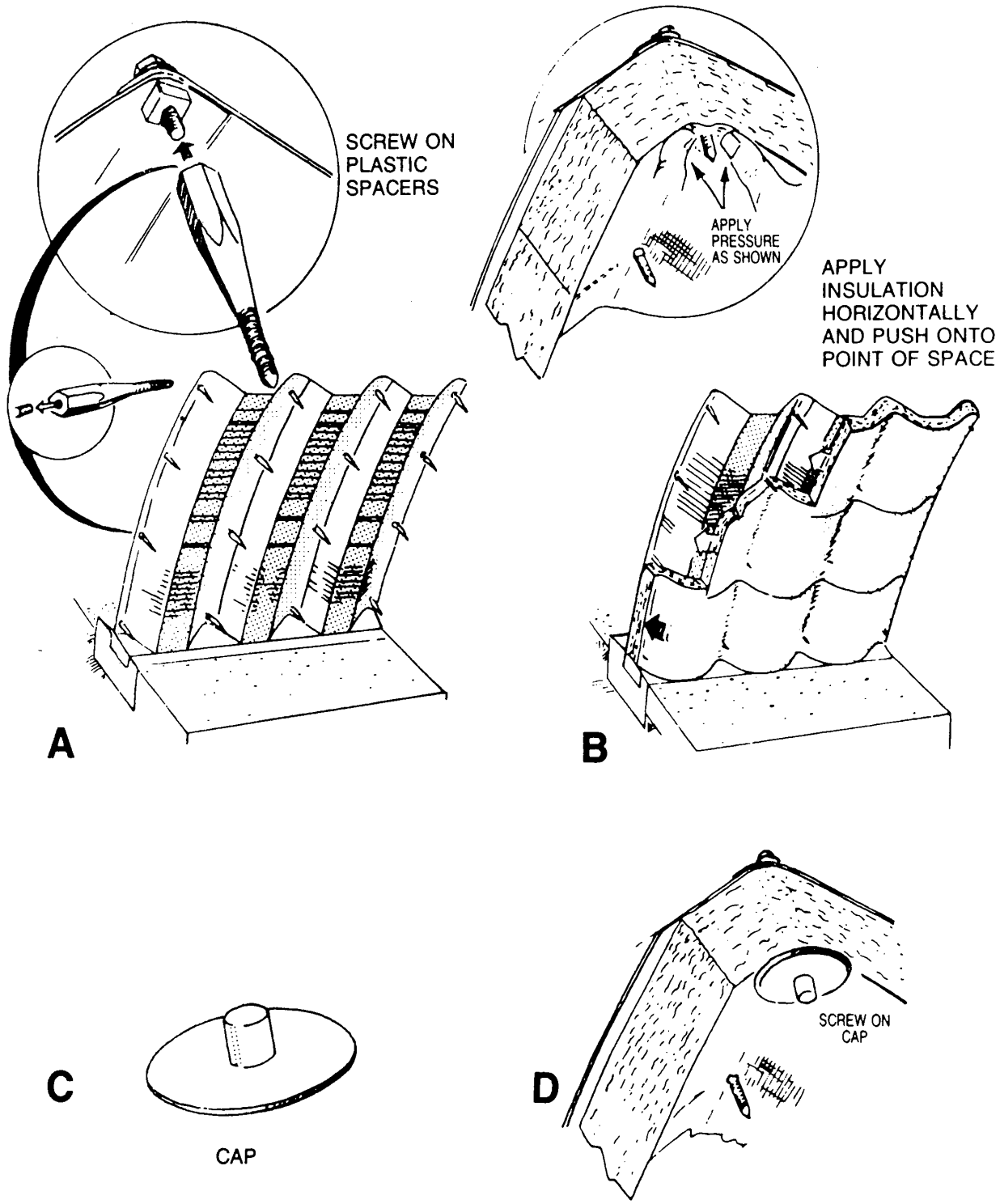


Figure 6-6A

6-7 INTERIOR PARTITION WALL

The interior partition is installed like an endwall with only slight variation. The interior partition must be attached directly beneath an arch panel as shown in *Figure 6-7A*.

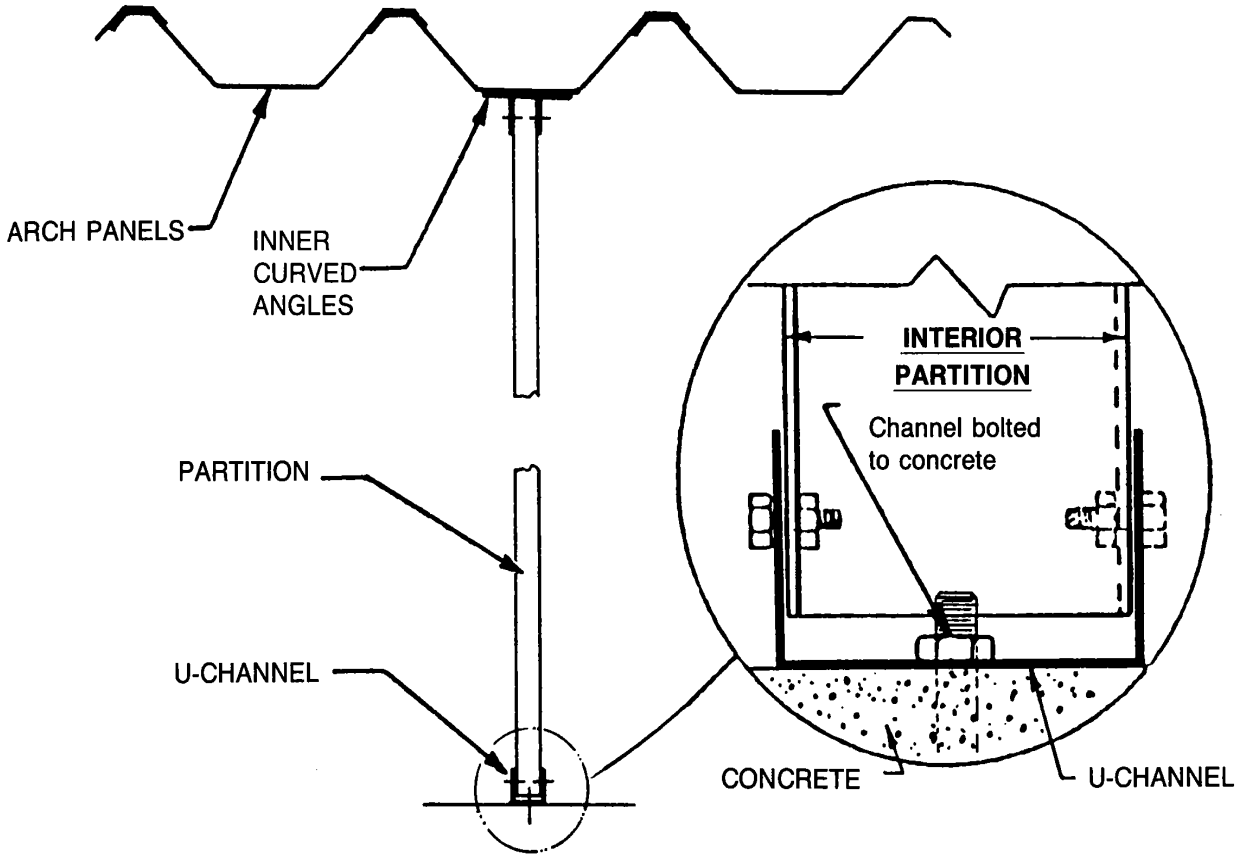


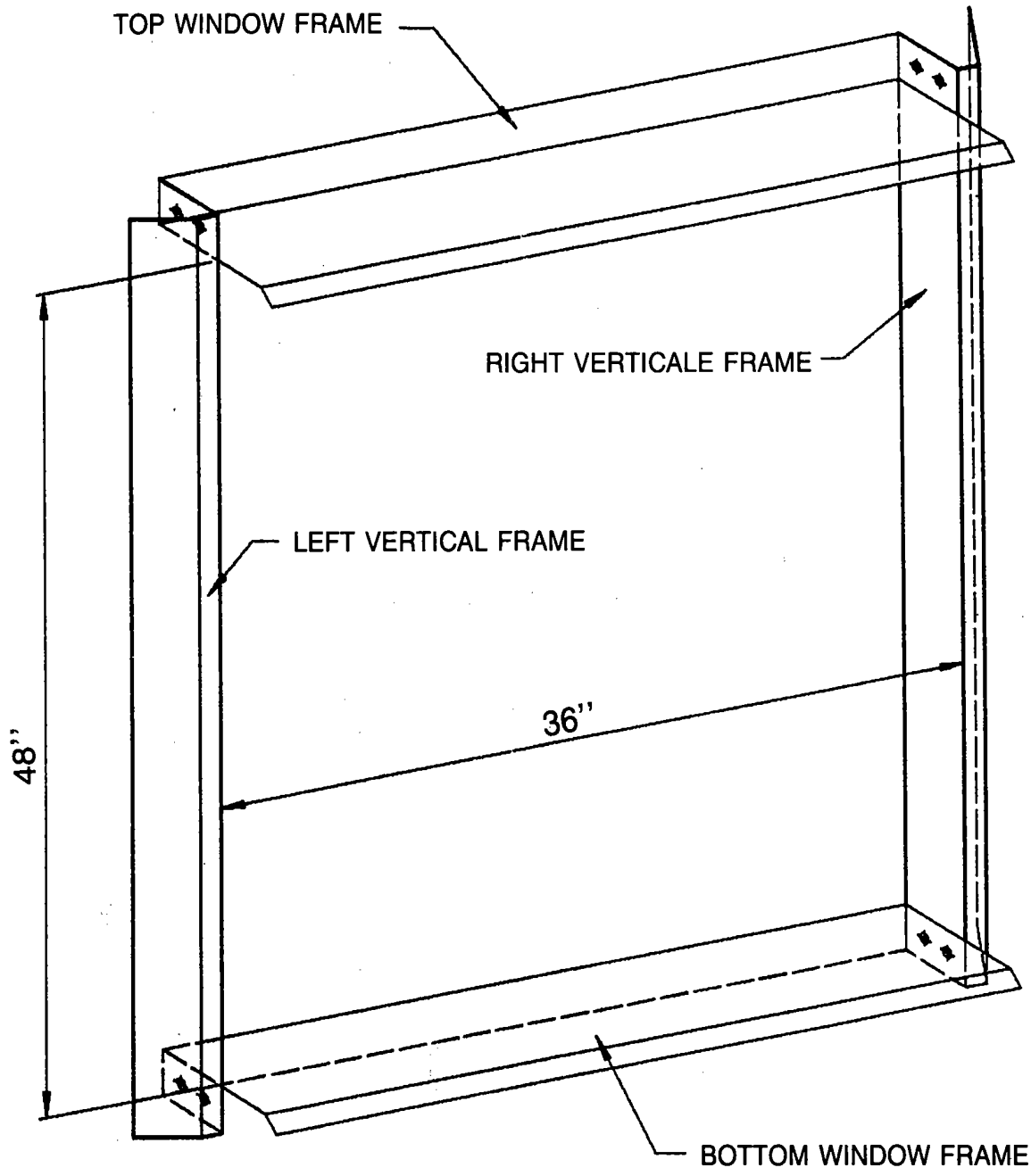
Figure 6-7A

Anchor bolt the "U"-Channel in place at desired location. Then bolt one set of the curved angles to the arch panel. It is critical that the partition is vertical when placed in the "U"-Channel and attached to the curved angle. Install all the partition panels using the same procedure as a solid endwall. Once all the panels are bolted to the first curved angle, the second curved angle is then bolted in place. The partition panels should now be bolted to the "U"-Channel.

6-8 ENDWALL WINDOW FRAME

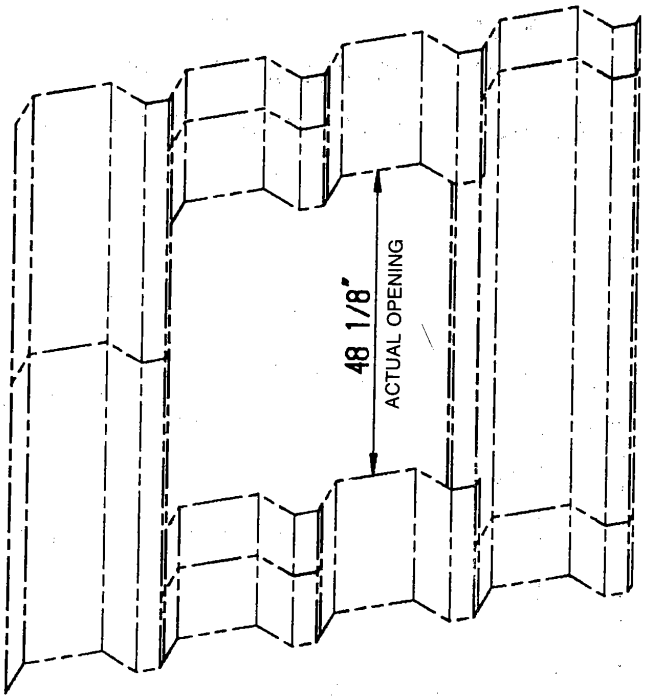
36” Wide x 48” High

-- ASSEMBLE WINDOW FRAME AS SHOWN BELOW –



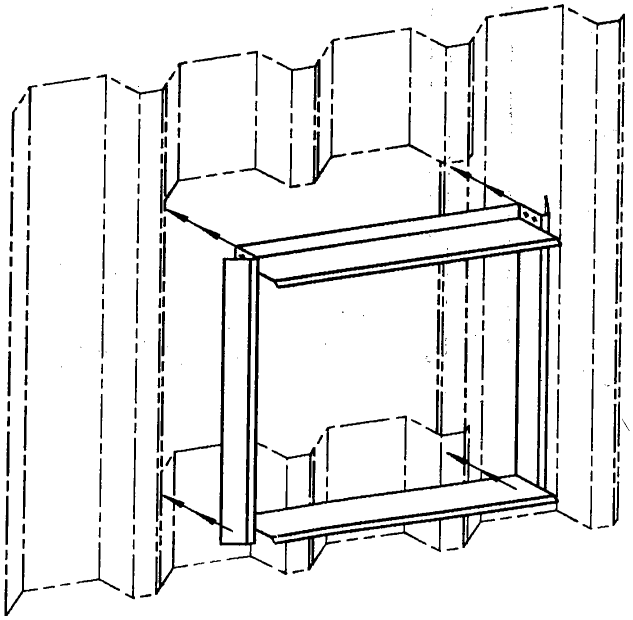
STEP 1

Remove a section of two (2) endwall panels. The opening must be cut to 48 1/8" as shown below to install window frame.



STEP 2

Install window frame into opening as shown from the outside of the building. After the window frame is installed, caulk all joints to avoid leaks.



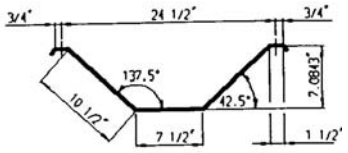
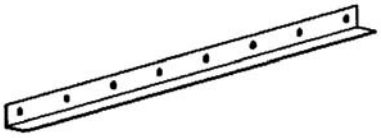
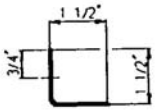
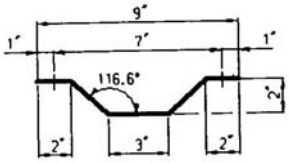
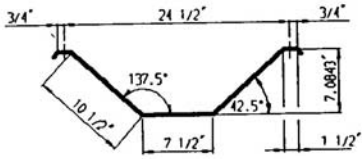
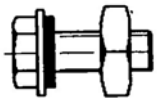
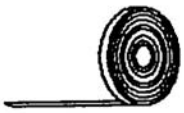
OUTSIDE OF BUILDING

PARTS GLOSSARY

THIS GLOSSARY IS INTENDED FOR THE USE OF PART IDENTIFICATION ONLY. YOU MAY HAVE PURCHASED A PACKAGE THAT DOES NOT INCLUDE SOME OF THE ITEMS LISTED IN THE GLOSSARY. YOU MUST REFER TO A MATERIAL DEVELOPMENT REPORT OR PACKING LIST IS WITH THE BILL OF LADING. THIS WILL IDENTIFY THE ACTUAL PARTS THAT YOUR PACKAGE CONSISTS OF FOR YOUR BUILDING. YOU CAN OBTAIN THE PACKING LIST FROM THE TRUCK DRIVER THAT DELIVERS YOUR BUILDING COMPONENTS.

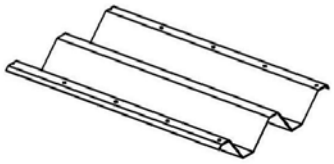
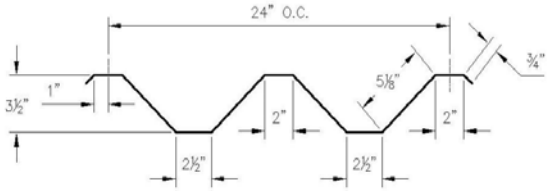
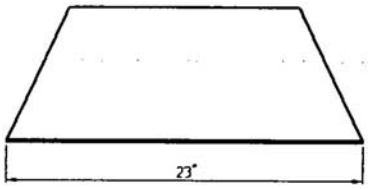
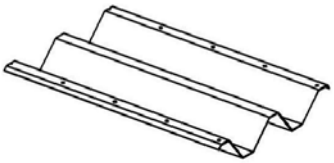
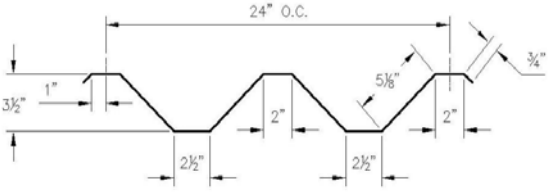
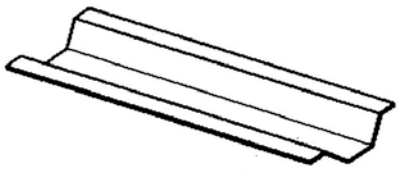
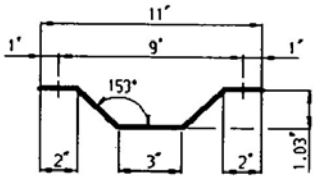
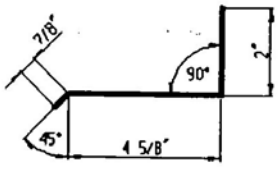
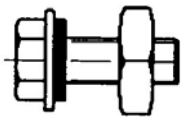
PARTS GLOSSARY

ARCH PARTS:

ARCH PANEL Note: Panels can be straight or curved depending on the building model.	 
ARCH STRAPPING TEMPLATE	 
ARCH STIFFENER Optional: For heavy gauge arch systems only.	 
FIBERGLASS ARCH SKYLIGHTS	 
BOLT - 5/16” X ¾” 18 TPI	
RUBBER BUTYL CAULKING - 35 FT. ROLL	

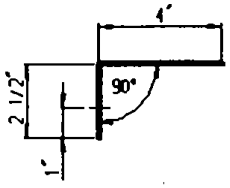
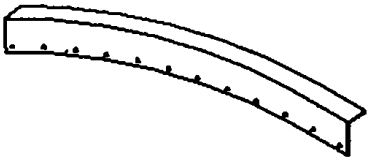
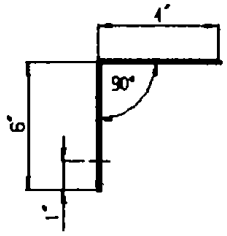
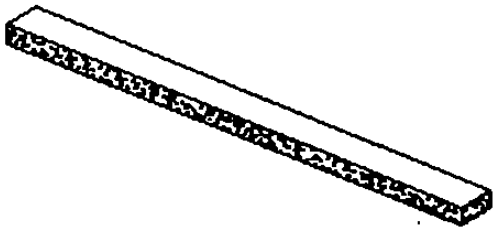
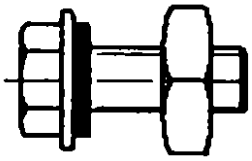
PARTS GLOSSARY

ENDWALL PARTS:

ENDWALL PANELS	 
RIFFLED FLATS (ENDWALL)	
ENDWALL SKYLIGHT Note: 4 ft or 8 ft lengths.	 
ENDWALL STIFFENER Optional: Generally used with heavy gauge arch systems.	 
LB CONNECTOR	 
BOLT - 5/16” X ¾” 18 TPI	

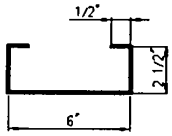
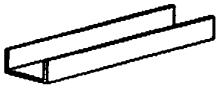
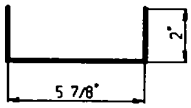
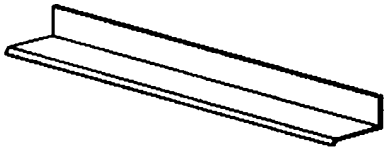
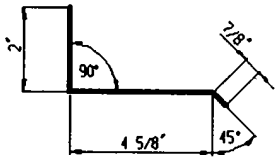
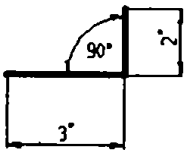
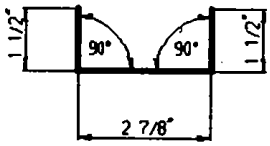
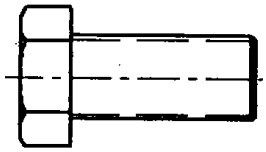
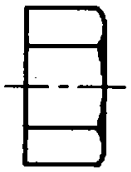
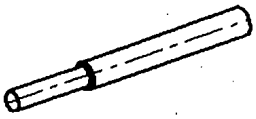
PARTS GLOSSARY

CURVED ANGLE PARTS:

CURVED ANGLE (INNER)	 
CURVED ANGLE (OUTER)	 
FOAM STUFFER	
BOLT - 5/16" X ¾" 18 TPI	

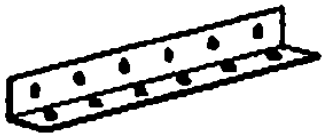
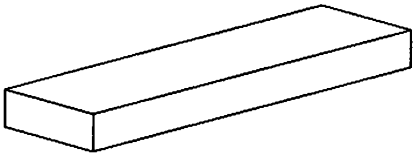
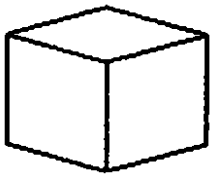
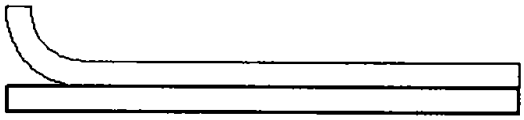
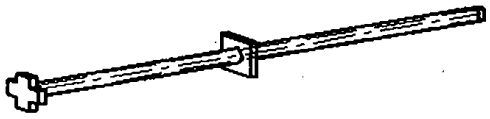
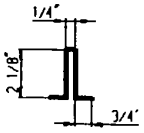
PARTS GLOSSARY

OVERHEAD DOOR PARTS:

OVERHEAD FRAME	 
OVERHEAD SPLICER	 
OVERHEAD LB CONNECTOR	 
OVERHEAD JAMB / HEADER CLIP	 
OVERHEAD JAMB / FLOOR CLIP	 
GALVANIZED BOLT - ½" X 1 ¼" 13 TPI	
GALVANIZED NUT - ½" 13 TPI	
WINDING BAR	

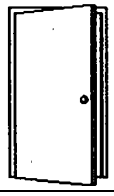
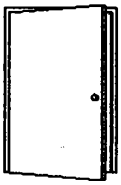
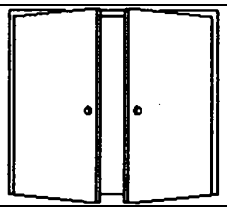
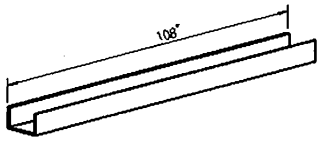
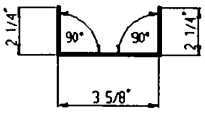
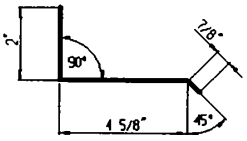
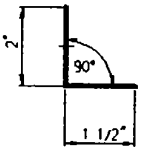
PARTS GLOSSARY

OVERHEAD DOOR PARTS: Continued

PERFORATED ANGLE	
SELF DRILLING SCREW - 12-24 X 1" W/SEAL WASHER	
CARTONS OF OVERHEAD DOOR SECTIONS	
HARDWARE BOX	
TRACK BUNDLES	
TORSION SPRING ASSEMBLY	
TORSION TYPE	
STRUTS	 

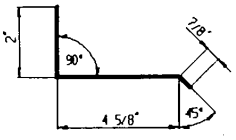
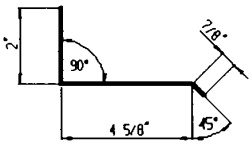
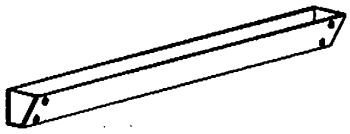
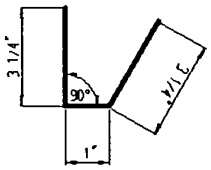
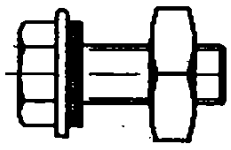
PARTS GLOSSARY

SERVICE DOOR PARTS: (End Type)

3' x 7' SERVICE DOOR	
4' X 7' SERVICE DOOR	
6' X 7' SERVICE DOOR	
SERVICE DOOR CHANNEL	 
SERVICE DOOR LB CONNECTOR	 
SERVICE DOOR CLIP	 
STANDARD LOCK SET	
SELF DRILLING SCREW - 12-24 X 1" W/ SEAL WASHER	

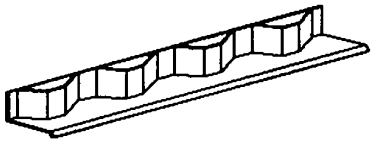
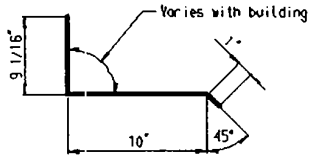
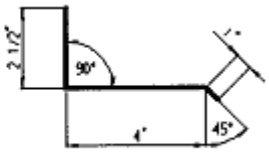
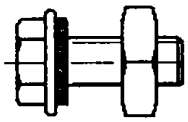
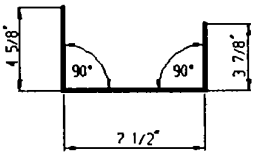
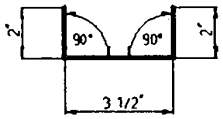
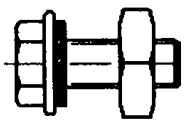
PARTS GLOSSARY

3'W X 4'H ENDWALL WINDOW FRAME:

TOP WINDOW FRAME	 
BOTTOM WINDOW FRAME	 
LEFT/RIGHT VERTICAL FRAME	 
BOLT - 5/16" X 3/4" 18 TPI	

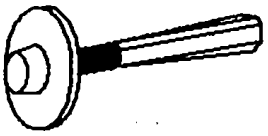
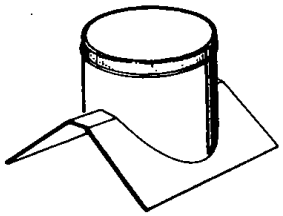
PARTS GLOSSARY

BASE CONNECTOR PARTS:

WELDED ARCH CONNECTOR	 
COMMERCIAL ENDWALL CONNECTOR	 
BOLT - 5/16" X 3/4" 18 TPI	
ARCH U CHANNEL (14 GA.) OR (12 GA.)	 
ENDWALL U CHANNEL	 
BOLT - 5/16" X 3/4" 18 TPI	

PARTS GLOSSARY

ACCESSORIES:

INSULATION PIN & WASHER	
VENT ADAPTOR	
VENT