

Module 4 – Windows and Doors

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Chapter 1

During this module on doors and windows, we'll take a look at the process and procedures for installing windows and doors as well as other framed openings in a metal building.

The first thing an erector should do prior to beginning to install any opening in a metal building is to familiarize himself with the building drawings and specifications. Regardless of how many buildings you may have worked on in the past this step is vital. You will be looking for door and window installation details on the building drawings from the manufacturer in the building specs and from the architectural plans and details. These architectural plans will provide you with details for door and window types including size, location, and swing direction. Many times the manufacturer of the metal building will not include details of any openings. Some manufacturers do not supply door and windows with the building either. It is usually up to the contractor who is furnishing the building or the metal building supplier to order these components from a third-party manufacturer.

When they arrive at the job site they should be inspected for damage, inventoried, then stored in a safe and secure location until they can be installed. Remember that doors and windows are popular components with thieves so make the needed effort to protect them.

When you are ready to begin installation of your doors and windows confirm the inventory, including the required installation hardware packages. Remember that doors, windows and hardware are often times specified by code. These include doors and hardware for the handicapped, special fire-rated doors and closers, panic bars, and various types and sizes of some glass openings in doors. Be sure to confirm all of these details with the architect's plans before installation. Remember that a door frame or window opening could interfere with the structural design of the building if installed improperly.

Chapter 2

Prior to beginning the installation process it is important that you review the door and window assembly instruction for each component. Manufacturers use a variety of parts and procedures to install their units.

Next be sure you have all the parts called for in the instructions. If you are missing any parts that are not in your common inventory notify your supervisor at once. Your supervisor will then be able to secure the needed hardware from another source in order to minimize delays in

the building schedule. The instructions will also help you to determine the tools needed to install the particular component.

Once they do, gather tools for the job. During this module we will be using a tape measure, a level, a marking instrument, a screw gun with various tips, a hammer drill with various concrete bits, extension cords hooked to a GFI power supply, a wrench, a small sledgehammer, and a socket set.

Chapter 3

Here we will show you how a common break down personnel door can be installed. The first step is to confirm the location and size of the opening called for in the building plans. Next measure and mark the opening on the slab. Then confirm that the door position will fall into wall sheet modulation. If you think it will not, check with the manufacturer specs to see if you can adjust for this condition.

Now on the slab lay out the frame with the jambs and header aligned. Next, assemble the frame with the specified fasteners. Then install the hinges on the jamb using the specified screws.

Next, raise the jamb and align the bottom with the door opening marks on the slab. Now attach the girt clips to the jamb with the specified fasteners. Be sure to align the clip for proper anchoring to the girt.

Next, insert the jamb anchor brackets into the bottom of the jamb. Now with a hammer drill and the appropriate concrete bit, drill the holes for the anchor bolts. Then tap the bolts into place. Using a level, you can now plumb the jamb. Then at the top of the jamb, clamp the group bracket in place and fasten it to the jamb.

Next fasten the girt bracket to the girt using the required type and number of fasteners. Now align the leaf with the jamb hinges. Then install the screws through the hinge into the door leaf. You should begin with one screw in the bottom hinge, then one in the top hinge, then one in the middle hinge. Now fill in the remaining hinge screws.

Next the threshold is positioned and the appropriate holes are drilled for anchors in the concrete. Be careful to confirm that the concrete is level. If it is not, you can grind it down or shim one side up. Or you can grout under the threshold to make the threshold level.

Prior to attaching the threshold, apply a bead of sealant on the bottom of the threshold. Now insert the threshold anchor plugs into the pre-drilled holes and install the required fasteners. The threshold should provide a secure seal at the bottom of the door.

Finally, an exterior door sweep is installed as shown with the appropriate fasteners.

Chapter 4

Let's look now at the installation of a pre-assembled or pre-hung door. A pre-hung door comes from the manufacturer with the frame fully assembled and the leaf installed on the hinges. In some cases the hardware package consisting of closers, locksets, or panic bars may also be fully assembled by the manufacturer.

For a pre-hung door you will first need to measure and mark for the proper location as previously shown. Then confirm that the door falls in wall sheet modulation correctly. Next stand the door assembly in place. Now drill the holes in the concrete for the anchors. You can then install the anchor bolts. Be sure to tighten the bolts securely.

Next plumb the door using a level. Now clamp it securely to the girt. Then install the fasteners to the girt. At this point the threshold can be installed as previously demonstrated on the break down door. Normally the door trim is supplied by the metal building manufacturer. This type is installed prior to wall sheeting and will be covered more fully during the Flashing, Trim, and Gutters module in this Quality and Craftsmanship DVD.

Chapter 5

Let's look now at how to install a common door closer. Here while the door is still on the slab measure and locate where the closer bracket will be attached to the leaf. Next install the bracket with the required fasteners. Now the closer is mounted to the bracket using an allen wrench as shown. The cover plates can now be installed. Then the leaf is hung. Finally attach the jamb closer bracket with the fasteners provided and tighten them securely.

Chapter 6

There are many types of locksets which can be installed on doors. Here we will install a common door lever often used for handicap approved access. First insert the lock assembly as shown in the direction required to operate correctly with a strike plate. Install the required fasteners through the leaf. Now insert the outside lever through the lock assembly. Next attach the cylinder stabilizer bracket with the provided screws. Here the cylinder ring is installed as shown tightening it clockwise against the stabilizer bracket. Now a keeper bracket is installed using the screws provided. Next a stainless trim cover is attached to the keeper bracket by twisting it clockwise until it is tight.

At this point you can install the interior lever over the cylinder and snap it into place. Finally install a strike plate on the jamb with the provided fasteners. Once the doors are installed you should consider removing the door leaf to prevent damage during the completion of the building project. Talk to your supervisor to see if that is what will be needed. At that time be sure and give your supervisor the keys to the lock set. He will then give them to the general contractor.

Chapter 7

Now we will demonstrate the installation of a common pre-assembled window frame. This will normally happen right after the major framing components have been assembled and the iron has been detailed, including installation of base angles or in this case C Channel.

The first step is to unpack the window, removing the protective materials. Next, find the installation instructions and read them carefully. Then, confirm that this is the window called for in the building plans. Now, measure and place a preliminary mark at the base indicating the location called for in the building plans. Next, confirm that the window falls in wall sheet modulation correctly. Here, the base trim is marked on 3-foot increments from the corner of the wall. This manufacturer has designed this window to fall in the low of a wall sheet panel. Now the installers can calculate the difference and adjust for the wall sheeting modulation. You should refer to the manufacturer's recommendations if you determine you need to alter the window to fit off modulation. The manufacturer will indicate if this is possible.

Next, using a speed square, alignment marks are placed on top of the C channel on the right and left sides and on the inside and outside of the C Channel. Now position the window assembly aligning the window channels with your marks. Then, with a drill and the correct metal bit, drill a hole through the C Channel. Now, with the required concrete bit and hammer drill, complete the holes for the concrete anchors. Next, the concrete anchors can be tapped into place and tightened securely. Next, position and clamp the girt clip provided to the window channels, if it was not already attached by the manufacturer. It should be adjusted to fit securely to the girt. With the fasteners provided, attach the girt clip to the window channels. Then, plumb the frame with a level and clamp it to the girt. Now, install the required fasteners to the girt. Later, the wall sheeting will be cut and fastened around the window.

After the wall sheeting installation is complete, you will need to install the window trim. First, trim away the excess insulation around the window frame that may interfere with a proper nesting of the window trim. Then, measure to determine the trim depth needed for a proper fit. The manufacturer molds the trim with grooves at varying depths. Now measure your trim and

establish the groove you will use as a guide. Then, use a set of duckbills to snap the trim for a proper fit. Now install one side of the trim in the window track and snap it securely into place.

Finally, repeat the same process for the other side trim piece. Be aware that some manufacturers will call for foam closures to be installed around windows. Refer to your erection guide for details. In some instances manufacturers have designed windows that need to be installed after the wall sheeting installation is complete. Here the erectors are installing the window in a pre-cut hole that is square and level, and fastening it through the panel into the support track with the appropriate fasteners.

Chapter 8

In this section we will look at the process of installing framed openings for overhead doors. After looking at the manufacturer's specifications and the architectural plans, we will determine where those framed openings should be located. Then, mark the slab for the jam location. Double check the layout for wall sheeting demodulation and trim installation. The next step in the process is to assemble the header and two jams on the ground using the hardware supplied. Then attach the girt clips to the door jambs using the hardware provided. Now stand at the frame and position it for anchoring. You may need to use material lifting equipment to do this.

Now with a hammer drill, drill the holes using the right size concrete bit needed for your anchors using the sill plate as a template. With a hammer, tap in the anchors until they are fully seated. At this point plumb the door frame using a level or laser. Clamp the frame to the girt or eave strut.

Now with the required fasteners attach the jamb clip to the girt or eave strut depending on the height of the wall. Confirm that the header is level. If it is not level the elevation of the header can be adjusted at the jamb header connections.

Now you can install the intermediate girts at the proper elevations into the jamb. Some manufacturers require that door trim be installed prior to wall sheeting. If so, follow the erection guide.

Chapter 9

Finally let's consider a framed opening for something other than an overhead door. Before beginning an installation task you'll want to review the manufacturer specifications as well as the architecturals, to be sure of the exact location size and type of opening needed. The most common types of openings are storefront windows, duct penetrations or louvers. All of these are installed very similar to overhead doors and windows. In some situations you will need to apply the proper exterior caulking to assure weather tight seal. Be sure to follow the directions from the manufacturer carefully when installing any of these types of openings.

After installation of any door, window, or framed opening be sure to clean up around the area you are working in. Remember that a clean site is also a key part of a safe site. Look for any extra parts that may have been missed. If you find any you will need to carefully determine if these parts should have been installed or if they are simply extras included by the manufacturer of the particular hardware package.

This concludes the module on doors and windows. This presentation was created by the Metal Buildings Institute and is one of several training modules available to metal building erectors. We hope that it has helped you in understanding the basic procedures for installing doors windows and framed openings in metal buildings.