M721 Entrance Manual
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Safety Precautions

IMPORTANT!
Read this page before any work is performed on elevator equipment. The procedures contained in this manual are intended for the use of qualified elevator personnel. In the interest of your personal safety and the safety of others, do not attempt any procedure that you are not qualified to perform.

All procedures must be accomplished in accordance with the applicable rules in the latest edition of the National Electrical Code, the latest edition of ASME A17.1, and any governing local codes.

Terms in This Manual

CAUTION statements identify conditions that may result in damage to the equipment or other property if improper procedures are followed.

WARNING statements identify conditions that may result in personal injury if improper procedures are followed.

General Safety

CAUTION
Before applying power to the controller, check all relays, contactors, fuse blocks, resistors, terminals on cards, and DIN rail terminals to ensure that the wiring connections installed by manufacturing are tight, because connections loosened during shipment may cause damage or intermittent operation.

Other specific warnings and cautions are found where applicable and do not appear in this summary. See the Elevator Employee Safety and Accident Prevention Program Manual and the Elevator Industry Field Employees’ Safety Handbook for electrical equipment safety information on installation and service.

Electrical Safety

All wiring must be in accordance with the National Electrical Code and be consistent with all state and local codes.

Use the Proper Fuse

To avoid fire hazards, use only a fuse of the correct type, voltage, and current rating. See the job specific drawings sheet (Power Supplies) for fusing information.

Electric shocks can cause personal injury or loss of life. Circuit breakers, switches, and fuses may not disconnect all power to the equipment. Always refer to the wiring diagrams. Whether the AC supply is grounded or not, high voltage will be present at many points.
Electrical Safety

Printed Circuit Cards

Printed circuit boards may be damaged if removed or installed in the circuit while applying power. Before installation and/or removing printed circuit boards, secure all power.

Always store and ship printed circuit cards in separate static bags.

Mainline Disconnect

Unless otherwise directed, always Turn OFF, Lock, and Tag out the mainline disconnect to remove power from elevator equipment. Before proceeding, confirm that the equipment is de-energized with a volt meter. Refer to the Elevator Employee Safety and Accident Prevention Program Manual for the required procedure.

Test Equipment Safety

Always refer to manufacturers’ instruction book for proper test equipment operation and adjustments.

Buzzer-type continuity testers can damage electronic components. Connection of devices such as voltmeters on certain low level analog circuits may degrade electronic system performance. Always use a voltmeter with a minimum impedance of 1M Ohm/Volt. A digital voltmeter is recommended.

When Power Is On

To avoid personal injury, do not touch exposed electrical connections or components while power is ON.

Mechanical Safety

See the Elevator Employee Safety and Accident Prevention Program Manual and the Elevator Industry Field Employees’ Safety Handbook for mechanical equipment safety information on installation and service.

Arrival of Equipment

Receiving

Upon arrival of the equipment, inspect it for damage. Promptly report all visible damage to the carrier. All shipping damage claims must be filed with the carrier.

Storing

During storage in a warehouse or on the elevator job site, precautions should be taken to protect the equipment from dust, dirt, moisture, and temperature extremes.
Static Protection Guidelines

**IMPORTANT!** Read this page before working with electronic circuit boards.

Elevator control systems use a number of electronic cards to control various functions of the elevator. These cards have components that are extremely sensitive to static electricity and are susceptible to damage by static discharge.

Immediate and long-term operation of an electronic-based system depends upon the proper handling and shipping of its cards. For this reason, manufacturing bases warranty decisions on the guidelines below.

**Handling**
- Cards shipped from manufacturing in separate static bags must remain in the bags until time for installation.
- Anti-static protection devices, such as wrist straps with ground wire, are required when handling circuit boards.
- Cards must not be placed on any surface without adequate static protection.
- Only handle circuit cards by their edges, and only after discharging personal static electricity to a grounding source. Do NOT touch the components or traces on the circuit card.
- Extra care must be taken when handling individual, discrete components such as EPROMS (which do not have circuit card traces and components for suppression).

**Shipping**
- Complete the included board discrepancy sheet.
- Any card returned to manufacturing must be packaged in a static bag designed for the card.
- Any card returned to manufacturing must be packaged in a shipping carton designed for the card.
- “Peanuts” and styrofoam are unacceptable packing materials.

Failure to adhere to the above guidelines will void the card warranty!
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SINGLE SPEED INSTALLATION

Interlock Rollers Mounted to Door Panel

Interlock Rollers Mounted to Door Hanger
Single Speed Installation

Install the Wall Angles

See the job layouts and Figure 1 on page 8 for all steps in this procedure.

1. Verify that a running platform with the car sill is installed.

2. Obtain the finished floor height dimension from the contractor.

3. Determine the daylight line location for the strike side.

4. Apply tape to the car sill, and mark the line on the tape.

5. Mark the horizontal position of the inside face of the master (first) wall angle relative to the daylight line nearest the strike column. Extra wall angles are provided if the pit is more than 6 feet deep.

6. Install the wall angle.

   • Where hoistway space allows, turn the wall angles away from the door opening.
   • Wall anchors must be located below the sill support assembly.

7. Drop a plumb line in the front of the hoistway to locate the positions of the remaining master wall angles.

8. Install the remaining master wall angles.

9. Make sure that the master wall angles are square with the platform and plumb with each other. Check the tightness of the wall anchors.

10. Create a gauge stick for the slave wall angle. Cut a piece of light, but stiff material (e.g., $\frac{3}{4}$" EMT) for Dimension "A".

11. Place the gauge stick against the master wall angle and locate, mark, and install the slave wall angles at all floors.
Install the Wall Angles (continued)

Locate the top of the wall angle a minimum of 2¾" above the finished floor.

<table>
<thead>
<tr>
<th>Door Opening Width (inches)</th>
<th>Dimension “A” (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>73¾</td>
</tr>
<tr>
<td>36</td>
<td>81¾</td>
</tr>
<tr>
<td>42</td>
<td>93¾</td>
</tr>
<tr>
<td>48</td>
<td>105¾</td>
</tr>
</tbody>
</table>

Figure 1 - Wall Angle Placement
Install the Wall Angles
(continued)

Welding Detail

1. Before welding, make sure the steel is clean. Remove burrs, paint, or coating in weld area.
2. Welding of elevator parts that are specified in ASME A17.1 Safety Code For Elevators And Escalators, shall conform to A17.1, Section 8.8, Welding.
3. Perform all welding in a well ventilated area, ANSI Z49.1 Safety In Welding, Cutting And Allied Processes.
4. Weld entrance wall angles to structural mild steel in two or more locations. Use horizontal fillet welds on square edges of the wall angle (recommended, but not required). The total effective length of fillet welds should equal or exceed 4 inches. **Example:** \( L_1 + L_2 + L_3 + L_4 + \ldots + L_n = 4 \text{ inches minimum. The length of each fillet should be a minimum of } 3/4 \text{ inches.} \)
5. The type of filler metal used will depend on the welding process, but in no case shall the nominal tensile strength of the filler metal be less than 60,000 PSI.
6. For suitable structural mild steel or preheat specifications, refer to AWS D1.1 or AWS D1.3 whichever is applicable.

Architectural Hand Identification

Left Hand - Front/Rear Openings
Door opens LEFT when standing inside the car, facing the door.

Right Hand - Front/Rear Openings
Door opens RIGHT when standing inside the car, facing the door.
Stack the Struts

See Figure 2 on page 11 for all steps in this procedure.

1. Set two struts on the pit floor, and fasten them to the wall angles. A compression splice is required every 32 feet.

2. Adjust the struts so that they are 1 1/4" from the car sill. The strut to car sill adjustment will set the final sill clearance.

3. Clip a strut splice to the top of the two struts. Triangles in splices must match the direction (up or down) of triangles in the struts.

4. Install the second set of struts.
   a. Clip the second set of struts to the splices.
   b. Use a splice bar and a hammer to drive the upper strut onto the splice.
   c. Fasten the struts to the next set of wall angles.
   d. At each landing, verify that the struts are 1 1/4" from the car sill.

5. Repeat this procedure until all of the struts are stacked, spliced, and fastened to wall angles.

6. Check all struts for plumb on two sides, and then securely fasten them.
Stack the Struts

(continued)

![Diagram of strut assembly and installation]

To permit slippage, place the flat washer behind the flange nut

3/8" to 1/4" Gap Between Struts

3/8" x 3/4" Hex Head Flange Screw with 3/8" Flat Washer and Flange Nut (3 sets per strut end)

Assemble a Compression Splice

Use the splice bar and a hammer to drive the upper strut onto the splice

All triangles in a stack must point in the same direction

Assemble the Strut Splice

Assemble the Strut to the Wall Angle

Figure 2 - Stack and Assemble the Struts
Install the Hoistway Sill

1. Determine the strike side of the hoistway sill.

2. Locate the two slots in the sill support.

3. Remove the hex head cap screws from the column mounting brackets, and slip them into the slot on the back side of the sill. See Figure 3.

4. Loosely attach each mounting bracket, and then adjust the bracket’s tab to fit into the slot.

5. Tighten the brackets to the sill.

Figure 3 - Column Bracket Installation for Standard Sill
Install the Sill Support to the Struts

For all steps in this procedure, see Figure 4 on page 14.

1. Hang the sill leveling tool in the slots or oval cutout on the back of each entrance strut.

2. Use the adjustment trigger to set the tool so that the support angle is roughly 2" inches below the finished floor.

3. Lay the sill and/or sill support on the support angles.

4. At each end of the sill and on each side of the strut, install a carriage bolt outside the assembly and a flange nut inside the assembly into matching slots of the sill support and strut.

5. Hand-tighten the bolt and nut.

6. Raise the sill to the finished floor level.

7. Level the sill side-to-side and front-to-back.

8. Move the sill up so that the daylight lines and the centerline (stamped into the header) are even with the car sill. Ensure that the adjustment is correct because this determines the accuracy of the entrance frame installation.

9. Verify that the vertical surface of the sill support is even with the angled fascia hanger on the sill.

10. Tighten the fasteners on the hall side.

11. Tighten the fasteners on the car side.

12. Repeat this procedure for all landings.
Install the Sill Support to the Struts

(continued)

1. Tighten Hall Side Fasteners (shown)
2. Tighten Car Side Fasteners

Figure 4 - Install the Sill Support to the Struts
Install the Hoistway Header

Gauge sticks are needed for this procedure.

- For standard door height (84") - two gauge sticks are provided for each job.
- For non-standard door height - use the following formula to determine the length, and cut the gauge sticks to this measurement.
  
  Gauge Stick Length: Sill-to-Header Dimension = Opening Height + 7\frac{15}{16}"

1. Move the platform up where the header can be reached.

2. Place the gauge sticks on the sill of the landing below, one at each end of the sill. See Figure 5 on page 16 for all steps on this page.

3. Place the header on the gauge sticks.
   a. At each end of the header, install carriage bolts and flange nuts.
   b. Hand-tighten the hardware into the matching slots of the header and strut.

4. Move the platform up so that the daylight lines and the centerline stamped into the header are even with the car sill.

5. To prevent the door operator equipment from being out-of-plumb:
   a. First tighten the fasteners on the back of the header at both ends.
   b. Then tighten the fasteners on the front of the header at both ends.

6. Repeat this procedure for all landings.

Adjust the Hoistway Sill and Header

1. Level the platform with a landing.

2. Verify that the clearance between the hoistway sill and the car sill is 1\frac{1}{4}".
Adjust the Hoistway Sill and Header
(continued)

GAUGE STICK LENGTH: Sill to Header Dimension = Opening Height + 7\(\frac{15}{16}\)"

Figure 5 - Install and Adjust the Hoistway Header
Assemble the Frame

1. Place the entrance columns and transom face down, and position each column at a slight angle to the transom. See Figure 6.

2. On each end of the transom, remove the flange screw and nut and set them aside.

3. On each end of the transom, roughly align the clips with the rectangular cutouts in the columns.

4. While pushing down on the column, swing the column toward the transom.

5. Ensure that the back side (toward the car) of the transom is flush with the back side of the column.

6. Install the flange screw and nut in the matching holes of transom and column.

7. Repeat steps 3 through 6 for the other column.

8. Verify that the columns are square with the transom.

9. Ensure all fasteners are tight, and repeat this procedure for all landings.

Figure 6 - Assemble the Frame
Attach the Frame to the Sill

1. Attach the frame to the column brackets.
   a. Stand the frame on the column mounting brackets.
   b. Install the hex head flange screws in the bottom of each column.

2. Align the frame columns so that they overlap the hoistway sill $\frac{1}{8}''$ (the depth of the cutout on the top back edge of the hoistway sill). See Figure 7.

3. Tighten the four screws between the columns and the column brackets.

4. Move the platform up high enough to reach the header and transom.

Figure 7 - Attach the Frame (standard sill shown)
Attach the Transom to the Header

1. Attach the transom to the header. See Figure 8.
   
   - For non-clad frames:
     a. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
     b. Tighten the screws.
   
   - For clad frames:
     a. Before the screws are added, install a $\frac{1}{8}$" shim between the transom and the header.
     b. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
     c. Tighten the screws.

2. Install one washer head self-tapping screw into the header.

3. Repeat this procedure for all landings.

Figure 8 - Attach the Transom to the Header
Assemble the Frame

Install the Grout Angles

**NOTE**
Grout angles have a 2\(\frac{1}{2}\)" leg and a 3\(\frac{1}{2}\)" leg. Based on the gap, either leg can be placed against the hoistway wall.

1. Use self-tapping screws to install the grout angle on the bottom of the sill support and also tight against the hoistway wall. See Figure 9.

2. Anchor the grout angle to the wall.

3. Repeat this procedure for each landing.

![Figure 9 - Grout Angle Installation]

Install the Fixture Boxes

Use brackets to install the fixture boxes at each landing.
Install the Hoistway Doors

1. Load the hoistway doors onto the platform.

2. At a landing, place the hoistway doors on the hoistway sill and lean the doors against the hoistway header.

3. Install the door isolation bumpers. See Figure 10.

Figure 10 - Door Isolation Bumpers
Install the Hoistway Doors
(continued)

4. Loosen all upthrust rollers. See Figure 11.

5. Place the door rollers, one roller at a time, onto the door track.

6. Adjust the height of the door to $\frac{3}{8}"$ by turning the eccentric on the door rollers, and then locking the eccentric with the nut.

---

**Figure 11 - Door Rollers**

- Door Roller
- Door Roller Eccentric
- Door Retainer
- Spirator
- Upthrust Roller
- Trailing Edge
- Shown with Door Mounted Interlock Rollers
- Align Fixed Roller With Diamond Mark On Header
- Top Door Retainers
- Centerline of Roller
- Daylight Line
- Shown with Hanger Mounted Interlock Rollers
Install the Hoistway Doors

(continued)

7. Install the door gibs and the door safety retainers. See Figure 12.

Two Gibs and One Safety Retainer per Door

![Door Gib and Safety Retainer Diagram]

Figure 12 - Door Gibs and Safety Retainers
Adjust the Hoistway Door Running Clearance

1. Place a $\frac{5}{16}$" shim (running clearance) underneath the leading edge of the door. See Figure 13.

2. Loosen the upthrust roller, turn it to its lowest adjustment, and then snug it in place.

3. Adjust the eccentric on the door roller so that the door is flush with the shim and the door roller is flush with the track.

4. After the adjustment is made, tighten the door roller eccentric.

5. Remove the shim, and place it under the trailing edge of the door. Repeat steps 2 through 4.

6. Remove the shim, and verify that the doors are flush with the frame columns.

Figure 13 - Adjust Door-to-Sill Running Clearance
Adjust the Upthrust Rollers

1. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.

2. Adjust the eccentric so that a gap of 0.015” is between the upthrust roller and the door track. See Figure 14.

![Figure 14 - Adjust Upthrust Roller Clearance](image-url)
Adjust the Door Gibs

1. Adjust the door gib brackets and the door retainer brackets for a $\frac{1}{8}''$ running clearance between the brackets and the hoistway sill. Tighten the bolts after adjustment. See Figure 15.

2. Place a $\frac{1}{4}''$ shim between the bottom of the entrance frame column and the bottom of the leading edge of the door panel.

3. Use a $\frac{3}{16}''$ hex wrench and turn the eccentric of the door gib to cause the door panel to just touch the $\frac{1}{4}''$ shim, and then tighten the locknut.

4. Repeat Steps 2 and 3 for the trailing edge.

5. Verify that the door rolls freely and also tracks parallel to the hoistway sill groove. Adjust as necessary.

Figure 15 - Running Clearance
Install and Adjust the Spirator

1. Wrap the spirator cable three or four times around the spirator to connect the cable.

2. Use the spirator cable clip to attach the cable to the header. See Figure 16.

3. Adjust the spirator so that the doors close when they are released $1/2"$ from the fully closed position.

4. Verify that the doors close fully with no “double bump” when the doors touch each other.

- The spirator must close the doors from any open position.
- To obtain proper door operation from floor to floor, the spirator tension should be the same at each floor.

Figure 16 - Spirator
Install and Adjust the Top Door Retainers

1. On each side of the door panel, use the provided hardware to install a top door retainer on the hanger. See Figure 17.

2. Verify that there is sufficient running clearance between the retainer and the track, and adjust if needed.

3. On each side of the door panel, use the provided hardware to install a track retainer clip on the hanger.

Figure 17 - Top Door Retainer
Install and Adjust the Interlocks for Door Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 18.

2. Remove the cover from the interlock box.

3. Close the doors, and verify the following. See Figure 19 on page 30.
   a. The interlock hook is centered front-to-back on the contacts.

   **CAUTION**
   - Never remove both washers on the interlock hook shaft.
   - The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.

4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $\frac{1}{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - when the hook is resting on its contacts, the interlock hook has $\frac{1}{32}$" clearance with the top of the locking tab on the box.
   c. Interlock hook - contact compression of $\frac{3}{32}$".
      - The hook touches both contact leafs at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $\frac{1}{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.

Figure 18 - Install the Door Interlock

Figure 19 - Verify Interlock Conditions
Install and Adjust the Interlocks for Door Mounted Interlock Rollers  

(continued)

5. Move the rollers and the interlock hook, and verify that there is $9/32\"$ hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

---

Interlock Wiring

1. Remove the interlock box cover.

2. Ensure that after the hook is in the locked position, the shorting bar has a good wipe on the contacts.

**WARNING**

All door interlock contacts must be wired in series. See the wiring diagrams for details.

3. Repeat Steps 1 and 2 for all other landings.
Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 20.

2. Remove the cover from the interlock box.

3. Close the doors, and verify the following. See Figure 21 on page 32.
   a. The interlock hook is centered front-to-back on the contacts.
   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.

   **CAUTION**

   Never remove both washers on the interlock hook shaft.

4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $\frac{1}{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - when the hook is resting on its contacts, the interlock hook has $\frac{1}{32}$" clearance with the top of the locking tab on the box.
   c. Interlock hook - contact compression of $\frac{3}{32}$".
      - The hook touches both contact leafs at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $\frac{1}{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.
Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers (continued)

5. Move the rollers and the interlock hook, and verify that there is $\frac{9}{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

---

Interlock Wiring

1. Remove the interlock box cover.

2. Ensure that after the hook is in the locked position, the shorting bar has a good wipe on the contacts.

**WARNING**

All door interlock contacts must be wired in series. See the wiring diagrams for details.

3. Repeat Steps 1 and 2 for all other landings.
Install the Fascia Plates and Dust Covers

1. Position the platform near the top landing.

2. Center a top fascia plate in the opening, and hook the fascia plate onto the hoistway sill of the top landing. See Figure 22 on page 34 through Figure 24 on page 36.

3. Use self-tapping screws to anchor the top fascia plate to the top landing hoistway sill support.

4. Install the first intermediate fascia plate by hooking it onto the top fascia plate. If required, install the remaining intermediate fascia plates by hooking each one onto the last one installed.

5. Clip the bottom fascia plate to the top of the header. The bottom fascia plate vertically overlaps the last intermediate fascia plate.

6. Measure the distance between the sill support and the header, and subtract one inch.

7. Cut two fascia plate stiffeners (from the provided fascia stiffener angle) to the length measured in the previous step.

8. Clamp the angles in place behind and also flush with the edge of the fascia plates.

9. Run self-tapping screws through the pilot holes in the fascia plates to anchor the fascia plates to the stiffeners.

10. Repeat Steps 2 through 9 for all intermediate landings. If required, center a top fascia plate in the opening and hook it onto the hoistway sill of the bottom landing. The fascia plate and the toe guard in the pit must extend far enough below the sill so that when the car is on compressed buffers, the platform toe guard will not be below the hoistway toe guard.

11. Use self-tapping screws to anchor the top fascia plate to the bottom landing hoistway sill support.

12. Install the toe guard by hooking it onto the top fascia plate.

13. Use the provided drive pin anchors to fasten the toe guard to the wall.

14. If required, install all dust covers.
Install the Fascia Plates and Dust Covers
(continued)

Figure 22 - Install Fascia Plates, Dust Covers, and Toe Guards (1 of 4)
Install the Fascia Plates and Dust Covers
(continued)

Notes:
1. 5" for single-speed & center-opening
   6½" for two-speed
2. Stiffener to be drilled by contractor for mounting

Figure 23 - Install Fascia Plates, Dust Covers, and Toe Guards (2 of 4)
Install the Fascia Plates and Dust Covers

(continued)

Figure 24 - Install Fascia Plates, Dust Covers, and Toe Guards (3 of 4)
Install the Fascia Plates and Dust Covers

(continued)

19¾" min.

Door Opening

Floor Height

Pit Fascia

6" Toe Guard for Installations with CDI

$\frac{5}{8}"$ Screw, typical at each end

Landing Sill Guards

Figure 25 - Install Fascia Plates, Dust Covers, and Toe Guards (4 of 4)
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Interlock Rollers Mounted to Door Panel

Interlock Rollers Mounted to Door Hanger
Two Speed Installation

Install the Wall Angles

See the job layouts and Figure 26 on page 40 for all steps in this procedure.

1. Verify that a running platform with the car sill is installed.

2. Obtain the finished floor height dimension from the contractor.

3. Determine the daylight line location for the strike side.

4. Apply tape to the car sill, and mark the line on the tape.

5. Mark the horizontal position of the inside face of the master (first) wall angle relative to the daylight line nearest the strike column. Extra wall angles are provided if the pit is more than 6 feet deep.

6. Install the wall angle.

- Where hoistway space allows, turn the wall angles away from the door opening.
- Wall anchors must be located below the sill support assembly.

7. Drop a plumb line in the front of the hoistway to locate the positions of the remaining master wall angles.

8. Install the remaining master wall angles.

9. Make sure that the master wall angles are square with the platform and plumb with each other. Check the tightness of the wall anchors.

10. Create a gauge stick for the slave wall angle. Cut a piece of light, but stiff material (e.g., \( \frac{3}{4} \)" EMT) for Dimension “A”.

11. Place the gauge stick against the master wall angle and locate, mark, and install the slave wall angles at all floors.
Install the Wall Angles
(continued)

Locate the top of the wall angle a minimum of 2¾" above the finished floor.

### Dimension “A” (distance between wall angles)

<table>
<thead>
<tr>
<th>Door Opening Width (inches)</th>
<th>Dimension “A” (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>82 ¼</td>
</tr>
<tr>
<td>54</td>
<td>91 ¼</td>
</tr>
</tbody>
</table>

Welding Beads
See Welding Detail on page 41.

Figure 26 - Wall Angle Placement
Install the Wall Angles
(continued)

Welding Detail

1. Before welding, make sure the steel is clean. Remove burrs, paint, or coating in weld area.
2. Welding of elevator parts that are specified in *ASME A17.1 Safety Code For Elevators And Escalators*, shall conform to *A17.1, Section 8.8, Welding*.
3. Perform all welding in a well ventilated area, *ANSI Z49.1 Safety In Welding, Cutting And Allied Processes*.
4. Weld entrance wall angles to structural mild steel in two or more locations. Use horizontal fillet welds on square edges of the wall angle (recommended, but not required). The total effective length of fillet welds should equal or exceed 4 inches.
   **Example:** \((L_1 + L_2 + L_3 + L_4 + \ldots + L_n = 4 \text{ inches minimum.}) \text{ The length of each fillet should be a minimum of } 3/4 \text{ inches.}
5. The type of filler metal used will depend on the welding process, but in no case shall the nominal tensile strength of the filler metal be less than 60,000 PSI.
6. For suitable structural mild steel or preheat specifications, refer to *AWS D1.1* or *AWS D1.3* whichever is applicable.

Architectural Hand Identification

**Left Hand - Front/Rear Openings**
Door opens LEFT when standing inside the car, facing the door.

**Right Hand - Front/Rear Openings**
Door opens RIGHT when standing inside the car, facing the door.
Stack the Struts

See Figure 27 on page 43 for all steps in this procedure.

1. Set two struts on the pit floor, and fasten them to the wall angles. A compression splice is required every 32 feet.

2. Adjust the struts so that they are 1 1/4" from the car sill. The strut to car sill adjustment will set the final sill clearance.

3. Clip a strut splice to the top of the two struts. Triangles in splices must match the direction (up or down) of triangles in the struts.

4. Install the second set of struts.
   a. Clip the second set of struts to the splices.
   b. Use a splice bar and a hammer to drive the upper strut onto the splice.
   c. Fasten the struts to the next set of wall angles.
   d. At each landing, verify that the struts are 1 1/4" from the car sill.

5. Repeat this procedure until all of the struts are stacked, spliced, and fastened to wall angles.

6. Check all struts for plumb on two sides, and then securely fasten them.
Stack the Struts
(continued)

To permit slippage, place the flat washer behind the flange nut.

Compression Splice

⅝" to ⅛" Gap Between Struts

⅝" x ⅛" Hex Head Flange Screw with ⅝" Flat Washer and Flange Nut
(3 sets per strut end)

Use the splice bar and a hammer to drive the upper strut onto the splice.

All triangles in a stack must point in the same direction.

Assemble a Compression Splice

Assemble the Strut Splice

Assemble the Strut to the Wall Angle

Figure 27 - Stack and Assemble the Struts
Install the Hoistway Sill

1. Determine the strike side of the hoistway sill.

2. Locate the two slots in the sill support.

3. Remove the hex head cap screws from the column mounting brackets, and slip them into the slot on the back side of the sill. See Figure 28.

4. Loosely attach each mounting bracket, and then adjust the bracket's tab to fit into the slot.

5. Tighten the brackets to the sill.
Install the Sill Support to the Struts

For all steps in this procedure, see Figure 29 on page 46.

1. Hang the sill leveling tool in the slots or oval cutout on the back of each entrance strut.

2. Use the adjustment trigger to set the tool so that the support angle is roughly 2 inches below the finished floor.

3. Lay the sill and/or sill support on the support angles.

4. At each end of the sill and on each side of the strut, install a carriage bolt and a flange nut—the nut goes inside the assembly.

5. Hand-tighten the hardware into the matching slots of the sill support and strut.

6. Raise the sill to the finished floor level.

7. Level the sill side to side and front to back.

8. Move the sill up so that the daylight lines and the centerline stamped into the header are even with the car sill. Make sure that the adjustment is accurate because this determines the accuracy of the entrance frame installation.

9. Verify that the vertical surface of the sill support is even with the angled fascia hanger on the sill.

10. Tighten the fasteners on the hall side and the car side.

11. Repeat this procedure for all landings.
Install the Sill Support to the Struts

(continued)

1. Tighten Hall Side Fasteners (shown)
2. Tighten Car Side Fasteners

Figure 29 - Install the Sill Support to the Struts
Install the Hoistway Header

Gauge sticks are needed for this procedure.

- For standard door height (84") - two gauge sticks are provided for each job.
- For non-standard door height - use the following formula to determine the length, and cut the gauge sticks to this measurement.
  
  \[
  \text{Gauge Stick Length: Sill-to-Header Dimension} = \text{Opening Height} + \frac{105}{16}''.
  \]

1. Move the platform up where the header can be reached.

2. Place the gauge sticks on the sill of the landing below, one at each end of the sill. See Figure 30 on page 48 for all steps on this page.

3. Place the header on the gauge sticks.
   a. At each end of the header, install carriage bolts and flange nuts.
   b. Hand-tighten the hardware into the matching slots of the header and strut.

4. Move the platform up so that the daylight lines and the centerline stamped into the header are even with the car sill.

5. To prevent the door operator equipment from being out-of-plumb:
   a. First tighten the fasteners on the back of the header at both ends.
   b. Then tighten the fasteners on the front of the header at both ends.

6. Repeat this procedure for all landings.

Adjust the Hoistway Sill and Header

1. Level the platform with a landing.

2. Verify that the clearance between the hoistway sill and the car sill is 1\(\frac{1}{4}\)".
Install the Hoistway Header
(continued)

Figure 30 - Install and Adjust the Hoistway Header

**Gauge Stick Length:**
Sill-to-Header Dimension = Opening Height + 10\(\frac{3}{8}\)"
Assemble the Frame

1. Place the entrance columns and transom face down, and position each column at a slight angle to the transom. See Figure 31.

2. On each end of the transom, remove the flange screw and nut and set them aside.

3. On each end of the transom, roughly align the clips with the rectangular cutouts in the columns.

4. While pushing down on the column, swing the column toward the transom.

5. Ensure that the back side (toward the car) of the transom is flush with the back side of the column.

6. Install the flange screw and nut in the matching holes of the transom and column.

7. Repeat steps 3 through 7 for the other column.

8. Verify that the columns are square with the transom.

9. Ensure all fasteners are tight, and repeat this procedure for all landings.

Figure 31 - Assemble the Frame
Attach the Frame to the Sill

1. Attach the frame to the column brackets.
   a. Stand the frame on the column mounting brackets.
   b. Install the hex head flange screws in the bottom of each column.

2. Align the frame columns so that they overlap the hoistway sill \( \frac{1}{8}" \) (the depth of the cutout on the top back edge of the hoistway sill). See Figure 32.

3. Tighten the four screws between the columns and the column brackets.

4. Move the platform up high enough to reach the header and transom.

Figure 32 - Attach the Frame (standard sill shown)
Attach the Transom to the Header

1. Attach the transom to the header. See Figure 33.
   • For non-clad frames:
     a. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
     b. Tighten the screws.
   • For clad frames:
     a. Before screws are added, install a 1/8” shim between the transom and the header.
     b. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
     c. Tighten the screws.

2. Install one washer head self-tapping screw into the header.

3. Repeat this procedure for all landings.

Non-clad frame shown
Optional installation: clad frame
Note: install 1/8” shim before hardware
Install the Grout Angles

Grout angles have a $2\frac{1}{2}$" leg and a $3\frac{1}{2}$" leg. Based on the gap, either leg can be placed against the hoistway wall.

1. Use self-tapping screws to install the grout angle on the bottom of the sill support and also tight against the hoistway wall. See Figure 34.

2. Anchor the grout angle to the wall.

3. Repeat this procedure for each landing.

![Figure 34 - Grout Angle Installation](image)

Install the Fixture Boxes

Use brackets to install the fixture boxes at each landing.
Install Hoistway Doors

1. Load the hoistway doors onto the platform.

2. At a landing, place the hoistway doors on the hoistway sill and lean the doors against the hoistway header.

3. Install the door isolation bumpers. See Figure 35.

![Diagram of door isolation components](image)

**Figure 35 - Door Isolation Bumpers**
Install Hoistway Doors
(continued)

4. Loosen all upthrust rollers. See Figure 36.

5. Place the door rollers, one roller at a time, onto the door track.

6. Adjust the height of the door to $\frac{3}{8}$" by turning the eccentric on the door rollers, and then lock the eccentric with the nut.

Figure 36 - Door Rollers
Install Hoistway Doors
(continued)

7. Install the door gibs and the door safety retainers. See Figure 37.

Figure 37 - Door Gibs and Safety Retainers
Adjust the Hoistway Door Running Clearance

1. Place a \( \frac{5}{16} \)" shim (running clearance) underneath the leading edge of the door. See Figure 38.

2. Loosen the upthrust roller, turn it to its lowest adjustment, and then snug it in place.

3. Adjust the eccentric on the door roller so that the door is flush with the shim and the door roller is flush with the track.

4. After the adjustment is made, tighten the door roller eccentric.

5. Remove the shim, and place it under the trailing edge of the door. Repeat steps 2 through 4.

6. Remove the shim, and verify that the doors are flush with the frame columns.

Figure 38 - Adjust Door to Sill Running Clearance
Adjust the Upthrust Rollers

1. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.
2. Adjust the eccentric so that a gap of 0.015” is between the upthrust roller and the door track. See Figure 39.

Adjust the Door Gibs

1. Adjust the door gib brackets and the door safety guide brackets to obtain a 1/8” running clearance between the brackets and the hoistway sill. After adjustment, tighten the bolts.
2. Place a 1/4” shim between the bottom of the entrance frame column and the bottom of the leading edge of the slow door panel.
   a. Loosen the door gib screws.
   b. Adjust the slow door leading edge to just touch the 1/4” shim.
   c. Adjust the trailing door edge to just touch the 1/4” shim.
   d. Tighten the door gib screws.
3. Place the 1/4” shim between the two door panels.
   a. Adjust door gibbs so that fast door trailing edge just touches the 1/4” shim.
   b. Place 1/4” shim between the fast door leading edge and the strike column.
   c. Adjust door gibbs so that fast door leading edge just touches the 1/4” shim.
4. Verify that the doors roll freely and track parallel to the hoistway sill grooves. Adjust as necessary.
Install and Adjust the Spirator

1. Wrap the spirator cable three or four times around the spirator to connect the cable.

2. Use the spirator cable clip to attach the cable to the header. See Figure 40.

3. Adjust the spirator so that the doors close when they are released $\frac{1}{2}''$ from the fully closed position.

4. Verify that the doors close fully with no “double bump” when the doors touch each other.

- The spirator must close the doors from any open position.
- To obtain proper door operation from floor to floor, the spirator tension should be the same at each floor.

Figure 40 - Spirator
Install and Adjust the Top Door Retainers

1. On each side of the door panel, use the provided hardware to install a top door retainer on the hanger. See Figure 41.

2. Verify that there is sufficient running clearance between the retainer and the track, and adjust if needed.

3. On each side of the door panel, use the provided hardware to install a track retainer clip on the hanger.

Figure 41 - Top Door Retainer
Install and Adjust the Interlocks for Door Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header.

2. Remove the cover from the interlock box.

3. Close the doors, and verify the following. See Figure 42 on page 61.
   a. The interlock hook is centered front-to-back on the contacts.

   **CAUTION**
   Never remove both washers on the interlock hook shaft.

   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.

4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $\frac{1}{8}"$ between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - when the hook is resting on its contacts, the interlock hook has $\frac{1}{32}"$ clearance with the top of the locking tab on the box. The pickup roller crank should be resting on its stop at this time.
   c. Interlock hook - contact compression of $\frac{3}{32}"$.
      • The hook touches both contact leaves at the same time.
      • When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $\frac{1}{8}"$. If necessary, adjust the interlock hook stop to limit the hook travel.

5. Move the rollers and the interlock hook, and verify that there is $\frac{9}{32}"$ hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

**Interlock Wiring**

1. Remove the interlock box cover.

2. Ensure that after the interlock hook is in the locked position, the shorting bar has a good wipe on the contacts.

   **WARNING**
   All door interlock contacts must be wired in series. See the wiring diagrams for details.

3. Repeat Steps 1 and 2 for all other landings.
Install and Adjust the Interlocks
(continued)

Figure 42 - Two Speed Interlock Adjustment
Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 43.
2. Remove the cover from the interlock box.

3. Close the doors, and verify the following. See Figure 44 on page 63.
   a. The interlock hook is centered front-to-back on the contacts.

   **CAUTION**
   Never remove both washers on the interlock hook shaft.
   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.

4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $\frac{1}{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - when the hook is resting on its contacts, the interlock hook has $\frac{1}{32}$" clearance with the top of the locking tab on the box. The pickup roller crank should be resting on its stop at this time.
   c. Interlock hook - contact compression of $\frac{3}{32}$".
      - The hook touches both contact leaves at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $\frac{1}{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.
Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

(continued)

5. Move the rollers and the interlock hook, and verify that there is $\frac{9}{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

Interlock Wiring

1. Remove the interlock box cover.

2. Ensure that after the interlock hook is in the locked position, the shorting bar has a good wipe on the contacts.

All door interlock contacts must be wired in series. See the wiring diagrams for details.

3. Repeat Steps 1 and 2 for all other landings.

Figure 44 - Two Speed Interlock Adjustment
Install the Fascia Plates and Dust Covers

1. Position the platform near the top landing.

2. Center a top fascia plate in the opening, and hook the fascia plate onto the hoistway sill of the top landing. See Figure 45 on page 65 through Figure 47 on page 67.

3. Use self-tapping screws to anchor the top fascia plate to the top landing hoistway sill support.

4. Install the first intermediate fascia plate by hooking it onto the top fascia plate.

   NOTE
   If required, install the remaining intermediate fascia plates by hooking each one onto the last one installed.

5. Clip the bottom fascia plate to the top of the header. The bottom fascia plate vertically overlaps the last intermediate fascia plate.

6. Measure the distance between the sill support and the header, and subtract one inch.

7. Cut two fascia plate stiffeners (from the provided fascia stiffener angle) to the length measured in the previous step.

8. Clamp the angles in place behind and also flush with the edge of the fascia plates.

9. Run self-tapping screws through the pilot holes in the fascia plates to anchor the fascia plates to the stiffeners.

10. Repeat Steps 2 through 9 for all intermediate landings.

   NOTE
   If required, center a top fascia plate in the opening and hook it onto the hoistway sill of the bottom landing. The fascia plate and the toe guard in the pit must extend far enough below the sill so that when the car is on compressed buffers, the platform toe guard will not be below the hoistway toe guard.

11. Use self-tapping screws to anchor the top fascia plate to the bottom landing hoistway sill support.

12. Install the toe guard by hooking it onto the top fascia plate.

13. Use the provided drive pin anchors to fasten the toe guard to the wall.

14. If required, install all dust covers.
Install the Fascia Plates and Dust Covers

(continued)

Figure 45 - Install Fascia Plates, Dust Covers, and Toe Guards (1 of 4)
Install the Fascia Plates and Dust Covers

(continued)

Notes:
1. 5" for single-speed & center-opening
   6½" for two-speed
2. Stiffener to be drilled by contractor for mounting

Figure 46 - Install Fascia Plates, Dust Covers, and Toe Guards (2 of 4)
Install the Fascia Plates and Dust Cover

(continued)

Figure 47 - Install Fascia Plates, Dust Covers, and Toe Guards (3 of 4)
Install the Fascia Plates and Dust Covers (continued)

Figure 48 - Install Fascia Plates, Dust Covers, and Toe Guards (4 of 4)
Interlock Rollers Mounted to Door Panel

Interlock Rollers Mounted to Door Hanger
Center Opening Installation

Install the Wall Angles

See the job layouts and Figure 49 on page 70 for all steps in this procedure.

1. Verify that a running platform with the car sill is installed.
2. Obtain the finished floor height dimension from the contractor.
3. Determine the daylight line location for the strike side.
4. Apply tape to the car sill, and mark the line on the tape.
5. Mark the horizontal position of the inside face of the master (first) wall angle relative to the daylight line nearest the strike column. Extra wall angles are provided if the pit is more than 6 feet deep.
6. Install the wall angle.
   • Where hoistway space allows, turn the wall angles away from the door opening.
   • Wall anchors must be located below the sill support assembly.
7. Drop a plumb line in the front of the hoistway to locate the positions of the remaining master wall angles.
8. Install the remaining master wall angles.
9. Make sure that the master wall angles are square with the platform and plumb with each other. Check the tightness of the wall anchors.
10. Create a gauge stick for the slave wall angle. Cut a piece of light, but stiff material (e.g., 3/4” EMT) for Dimension “A”.
11. Place the gauge stick against the master wall angle and locate, mark, and install the slave wall angles at all floors.
Install the Wall Angles (continued)

Figure 49 - Wall Angle Placement
Install the Wall Angles
(continued)

**Welding Detail**

1. Before welding, make sure the steel is clean. Remove burrs, paint, or coating in weld area.
2. Welding of elevator parts that are specified in *ASME A17.1 Safety Code For Elevators And Escalators*, shall conform to A17.1, Section 8.8, Welding.
3. Perform all welding in a well ventilated area, ANSI Z49.1 *Safety In Welding, Cutting And Allied Processes*.
4. Weld entrance wall angles to structural mild steel in two or more locations. Use horizontal fillet welds on square edges of the wall angle (recommended, but not required). The total effective length of fillet welds should equal or exceed 4 inches. **Example**: \((L_1 + L_2 + L_3 + L_4 + \ldots + L_n = 4\) inches minimum. The length of each fillet should be a minimum of 3/4 inches.
5. The type of filler metal used will depend on the welding process, but in no case shall the nominal tensile strength of the filler metal be less than 60,000 PSI.
6. For suitable structural mild steel or preheat specifications, refer to *AWS D1.1* or *AWS D1.3* whichever is applicable.

**Architectural Hand Identification**

**Left Hand - Front/Rear Openings**
Door opens LEFT when standing inside the car, facing the door.

**Right Hand - Front/Rear Openings**
Door opens RIGHT when standing inside the car, facing the door.
Stack the Struts

See Figure 50 on page 73 for all steps in this procedure.

1. Set two struts on the pit floor, and fasten them to the wall angles. A compression splice is required every 32 feet.

2. Adjust the struts so that they are $1\frac{1}{4}''$ from the car sill. The strut to car sill adjustment will set the final sill clearance.

3. Clip a strut splice to the top of the two struts. Triangles in splices must match the direction (up or down) of triangles in the struts.

4. Install the second set of struts.
   a. Clip the second set of struts to the splices.
   b. Use a splice bar and a hammer to drive the upper strut onto the splice.
   c. Fasten the struts to the next set of wall angles.
   d. At each landing, verify that the struts are $1\frac{1}{4}''$ from the car sill.

5. Repeat this procedure until all of the struts are stacked, spliced, and fastened to wall angles.

6. Check all struts for plumb on two sides, and then securely fasten them.
Stack the Struts  
(continued)

To permit slippage, place the flat washer behind the flange nut

Compress Splice

3/8" to 7/8" Gap Between Struts

3/8" x 3/4" Hex Head Flange Screw with 3/8" Flat Washer and Flange Nut
(3 sets per strut end)

Assemble a Compression Splice

Use the splice bar and a hammer to drive the upper strut onto the splice

Strut Splice

All triangles in a stack must point in the same direction

Assemble the Strut Splice

Figure 50 - Stack and Assemble the Struts

Assemble the Strut to the Wall Angle

Wall Angle

Carriage Bolt

3/8" x 3/4" Carriage Bolt

3/8" Hex Head Flange Nut

1 1/4"

Face of Strut

Car Sill

Hoistway Wall

Strut
Install the Hoistway Sill

1. Determine the strike side of the hoistway sill.

2. Locate the two slots in the sill support.

3. Remove the hex head cap screws from the column mounting brackets, and slip them into the slot on the back side of the sill. See Figure 51.

4. Loosely attach each mounting bracket, and then adjust the bracket’s tab to fit into the slot.

5. Tighten the brackets to the sill.

![Figure 51 - Column Bracket Installation for Standard Sill](image-url)
Install the Sill Support to the Struts

For all steps in this procedure, see Figure 52 on page 76.

1. Hang the sill leveling tool in the slots or oval cutout on the back of each entrance strut.

2. Use the adjustment trigger to set the tool so that the support angle is roughly 2” inches below the finished floor.

3. Lay the sill and/or sill support on the support angles.

4. At each end of the sill and on each side of the strut, install a carriage bolt outside the assembly and a flange nut inside the assembly into matching slots of the sill support and strut.

5. Hand-tighten the bolt and nut.

6. Raise the sill to the finished floor level.

7. Level the sill side-to-side and front-to-back.

8. Move the sill up so that the daylight lines and the centerline (stamped into the header) are even with the car sill. Ensure that the adjustment is correct because this determines the accuracy of the entrance frame installation.

9. Verify that the vertical surface of the sill support is even with the angled fascia hanger on the sill.

10. Tighten the fasteners on the hall side.

11. Tighten the fasteners on the car side.

12. Repeat this procedure for all landings.
Install the Sill Support to the Struts

(continued)

1. Tighten Hall Side Fasteners (shown)
2. Tighten Car Side Fasteners

Figure 52 - Install the Sill Support to the Struts
Install the Hoistway Header

Gauge sticks are needed for this procedure.

- For standard door height (84") - two gauge sticks are provided for each job.
- For non-standard door height - use the following formula to determine the length, and cut the gauge sticks to this measurement.
  
  \[
  \text{Gauge Stick Length: Sill-to-Header Dimension} = \text{Opening Height} + 7\frac{15}{16}"
  \]

1. Move the platform up where the header can be reached.

2. Place the gauge sticks on the sill of the landing below, one at each end of the sill. See Figure 53 on page 78 for all steps on this page.

3. Place the header on the gauge sticks.
   a. At each end of the header, install carriage bolts and flange nuts.
   b. Hand-tighten the hardware into the matching slots of the header and strut.

4. Move the platform up so that the daylight lines and the centerline stamped into the header are even with the car sill.

5. To prevent the door operator equipment from being out-of-plumb:
   a. First tighten the fasteners on the back of the header at both ends.
   b. Then tighten the fasteners on the front of the header at both ends.

6. Repeat this procedure for all landings.

Adjust the Hoistway Sill and Header

1. Level the platform with a landing.

2. Verify that the clearance between the hoistway sill and the car sill is 1\(\frac{1}{4}\)".
Adjust the Hoistway Sill and Header
*(continued)*

**GAUGE STICK LENGTH:**
Sill to Header Dimension = Opening Height + $7\frac{15}{16}$

---

**Figure 53 - Install and Adjust the Hoistway Header**
Assemble the Frame

1. Place the entrance columns and transom face down, and position each column at a slight angle to the transom. See Figure 54.

2. On each end of the transom, remove the flange screw and nut and set them aside.

3. On each end of the transom, roughly align the clips with the rectangular cutouts in the columns.

4. While pushing down on the column, swing the column toward the transom.

5. Ensure that the back side (toward the car) of the transom is flush with the back side of the column.

6. Install the flange screw and nut in the matching holes of the transom and column.

7. Repeat steps 3 through 7 for the other column.

8. Verify that the columns are square with the transom.

9. Ensure all fasteners are tight, and repeat this procedure for all landings.

Figure 54 - Assemble the Frame
Attach the Frame to the Sill

1. Attach the frame to the column brackets.
   a. Stand the frame on the column mounting brackets.
   b. Install the hex head flange screws in the bottom of each column.

2. Align the frame columns so that they overlap the hoistway sill $\frac{1}{8}''$ (the depth of the cutout on the top back edge of the hoistway sill). See Figure 55.

3. Tighten the four screws between the columns and the column brackets.

4. Move the platform up high enough to reach the header and transom.

---

**Figure 55 - Attach the Frame (standard sill shown)**
Attach the Transom to the Header

1. Attach the transom to the header. See Figure 56.
   - For non-clad frames:
     a. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
     b. Tighten the screws.
   - For clad frames:
     a. Before the screws are added, install a $\frac{1}{8}$" shim between the transom and the header.
     b. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
     c. Tighten the screws.

2. Install one washer head self-tapping screw into the header.

3. Repeat this procedure for all landings.

Non-clad frame shown
Optional installation: clad frame
Note: install $\frac{3}{8}$" shim before hardware

Figure 56 - Attach the Transom to the Header
Install the Grout Angles

Grout angles have a $2\frac{1}{2}$" leg and a $3\frac{1}{2}$" leg. Based on the gap, either leg can be placed against the hoistway wall.

1. Use self-tapping screws to install the grout angle on the bottom of the sill support and also tight against the hoistway wall. See Figure 57.

2. Anchor the grout angle to the wall.

3. Repeat this procedure for each landing.

![Diagram of Grout Angle Installation](image)

Figure 57 - Grout Angle Installation

Install the Fixture Boxes

Use brackets to install the fixture boxes at each landing.
Install the Hoistway Doors

1. Load the hoistway doors onto the platform.

2. At a landing, place the hoistway doors on the hoistway sill and lean the doors against the hoistway header.

3. Install the door isolation bumpers. See Figure 58.

Figure 58 - Door Isolation Bumpers
Install the Hoistway Doors
(continued)

4. Loosen all upthrust rollers. See Figure 59.

5. Place the door rollers, one roller at a time, onto the door track.

6. Adjust the height of the door to $\frac{3}{8}$” by turning the eccentric on the door rollers, and then lock the eccentric with the nut.
Install Hoistway Doors
(continued)

7. Install the door gib and the door safety retainers. See Figure 60.

One Gib and Two Safety Retainers per Door

![Figure 60 - Door Gibs and Safety Retainers](image-url)
Adjust the Hoistway Door Running Clearance

1. Place a $\frac{5}{16}$" shim (running clearance) underneath the leading edge of the door. See Figure 61.

2. Loosen the upthrust roller, turn it to its lowest adjustment, and then snug it in place.

3. Adjust the eccentric on the door roller so that the door is flush with the shim and the door roller is flush with the track.

4. After the adjustment is made, tighten the door roller eccentric.

5. Remove the shim, and place it under the trailing edge of the door. Repeat steps 2 through 4.

6. Remove the shim, and verify that the doors are flush with the frame columns.

Figure 61 - Adjust Door to Sill Running Clearance
Adjust the Upthrust Rollers

1. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.

2. Adjust the eccentric so that a gap of 0.015” is between the upthrust roller and the door track. See Figure 62.

![Figure 62- Adjust Upthrust Roller Clearance](image-url)
Adjust the Door Gibs

1. Adjust the door gib brackets and the door retainer brackets for a $\frac{1}{8}$" running clearance between the brackets and the hoistway sill. Tighten the bolts after adjustment. See Figure 63.

2. Place a $\frac{1}{4}$" shim between the bottom of the entrance frame column and the bottom of the leading edge of the door panel.

3. Use a $\frac{3}{16}$" hex wrench and turn the eccentric of the door gib to cause the door panel to just touch the $\frac{1}{4}$" shim, and then tighten the locknut.

4. Repeat Steps 2 and 3 for the trailing edge.

5. Verify that the door rolls freely and also tracks parallel to the hoistway sill groove. Adjust as necessary.

Figure 63 - Running Clearance
Install and Adjust the Spirator

1. Wrap the spirator cable three or four times around the spirator to connect the cable.

2. Use the spirator cable clip to attach the cable to the header. See Figure 64.

3. Adjust the spirator so that the doors close when they are released 1/2" from the fully closed position.

4. Verify that the doors close fully with no "double bump" when the doors touch each other.

   - The spirator must close the doors from any open position.
   - To obtain proper door operation from floor to floor, the spirator tension should be the same at each floor.

![Figure 64 - Spirator](image)
Install and Adjust the Top Door Retainers

1. On each side of the door panel, use the provided hardware to install a top door retainer on the hanger. See Figure 65.

2. Verify that there is sufficient running clearance between the retainer and the track, and adjust if needed.

3. On each side of the door panel, use the provided hardware to install a track retainer clip on the hanger.

![Figure 65 - Top Door Retainer](image)

Install the Door Relating Cable

1. Install one relating cable pulley assembly in the strut on each end of the hoistway header. See Figure 66 on page 91.

2. Wrap the relating cable around the two pulleys, and install the ends into the relating cable clamp assembly.

3. Place the relating cable (located on back side of the hanger assembly) between the two plates of the relating cable anchor, and tighten the two plates together.

4. Tighten the relating cable tension using the four nuts on the relating cable clamp assembly. The relating cable should be tight, but not enough to cause the doors to bind.

5. Fully close the hoistway doors.
Install the Door Relating Cable

(continued)

6. Move the doors until their meeting point is aligned with the centerline of the sill and the header. Adjust the relating cable tension (if necessary).

7. Fully open the hoistway doors.

8. Verify that the edge of the door is flush with the return column.

9. Verify that the relating cable clears all pulleys and other obstructions. Adjust if necessary.

To tension the cable: Loosen the outside nut, then tighten the inside nut

NOTE: Position cable as shown, then tighten the lower plate to the top.

Figure 66 - Relating Cable Installation

Install and Adjust the Interlocks for Door Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 67 on page 92.

2. Remove the cover from the interlock box.
Install and Adjust the Interlocks for Door Mounted Interlock Rollers
(continued)

3. Close the doors, and verify the following. See Figure 68 on page 93.
   a. The interlock hook is centered front-to-back on the contacts.

   **CAUTION**
   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.

4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $\frac{1}{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - when the hook is resting on its contacts, the interlock hook has $\frac{1}{32}$" clearance with the top of the locking tab on the box.

   **NOTE**
   The pickup roller crank should be resting on its stop at this time.
   c. Interlock hook - contact compression of $\frac{3}{32}$".
      • The hook touches both contact leafs at the same time.
      • When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $\frac{1}{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.
Install and Adjust the Interlocks for Door Mounted Interlock Rollers
(continued)

5. Move the rollers and the interlock hook, and verify that there is $\frac{3}{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

---

Interlock Wiring

1. Remove the interlock box cover.

2. Ensure that after the hook is in the locked position, the shorting bar has a good wipe on the contacts.

**WARNING**

All door interlock contacts must be wired in series. See the wiring diagrams for details.

3. Repeat Steps 1 and 2 for all other landings.
Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 69.

2. Remove the cover from the interlock box.

3. Close the doors, and verify the following. See Figure 70 on page 95.
   a. The interlock hook is centered front-to-back on the contacts.

   **CAUTION** Never remove both washers on the interlock hook shaft.
   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.

4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is \( \frac{1}{8} \)" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - when the hook is resting on its contacts, the interlock hook has \( \frac{1}{32} \)" clearance with the top of the locking tab on the box.

   **NOTE** The pickup roller crank should be resting on its stop at this time.
   c. Interlock hook - contact compression of \( \frac{3}{32} \)".
       - The hook touches both contact leafs at the same time.
       - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of \( \frac{1}{8} \)". If necessary, adjust the interlock hook stop to limit the hook travel.
Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

(continued)

5. Move the rollers and the interlock hook, and verify that there is $\frac{3}{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

---

**Interlock Wiring**

1. Remove the interlock box cover.

2. Ensure that after the hook is in the locked position, the shorting bar has a good wipe on the contacts.

**WARNING**

All door interlock contacts must be wired in series. See the wiring diagrams for details.

3. Repeat Steps 1 and 2 for all other landings.

---

Figure 70 - Interlock Adjustment
Install the Fascia Plates and Dust Covers

1. Position the platform near the top landing.

2. Center a top fascia plate in the opening, and hook the fascia plate onto the hoistway sill of the top landing. See Figure 71 on page 97 through Figure 73 on page 99.

3. Use self-tapping screws to anchor the top fascia plate to the top landing hoistway sill support.

4. Install the first intermediate fascia plate by hooking it onto the top fascia plate. If required, install the remaining intermediate fascia plates by hooking each one onto the last one installed.

5. Clip the bottom fascia plate to the top of the header. The bottom fascia plate vertically overlaps the last intermediate fascia plate.

6. Measure the distance between the sill support and the header, and subtract one inch.

7. Cut two fascia plate stiffeners (from the provided fascia stiffener angle) to the length measured in the previous step.

8. Clamp the angles in place behind and also flush with the edge of the fascia plates.

9. Run self-tapping screws through the pilot holes in the fascia plates to anchor the fascia plates to the stiffeners.

10. Repeat Steps 2 through 9 for all intermediate landings.

NOTE: If required, center a top fascia plate in the opening and hook it onto the hoistway sill of the bottom landing. The fascia plate and the toe guard in the pit must extend far enough below the sill so that when the car is on compressed buffers, the platform toe guard will not be below the hoistway toe guard.

11. Use self-tapping screws to anchor the top fascia plate to the bottom landing hoistway sill support.

12. Install the toe guard by hooking it onto the top fascia plate.

13. Use the provided drive pin anchors to fasten the toe guard to the wall.

14. If required, install all dust covers.
Install the Fascia Plates and Dust Covers
(continued)

Figure 71 - Install Fascia Plates, Dust Covers, and Toe Guards (1 of 4)
Install the Fascia Plates and Dust Covers
(continued)

Notes:
1. 5" for single-speed & center-opening
   6½" for two-speed
2. Stiffener to be drilled by contractor for mounting

---

Figure 72 - Install Fascia Plates, Dust Covers, and Toe Guards (2 of 4)
Install the Fascia Plates and Dust Covers
(continued)

Figure 73 - Install Fascia Plates, Dust Covers, and Toe Guards (3 of 4)
Install the Fascia Plates and Dust Covers

(continued)

Figure 74 - Install Fascia Plates, Dust Covers, and Toe Guards (4 of 4)
Maintenance

Hoistway Doors and Tracks (each floor)

Monthly

1. Slightly move the top of the doors to check the door hangers for looseness.

2. Check that the door tracks are smooth and clean.

3. Unlock the doors, and move the hoistway door by hand to check the door rollers for cracking tires, loose bearings, or unusual noise.

4. Inspect the shorting bar contact of the hoistway door interlock.

5. Manually move the doors on track to check the door relating cables for excessive looseness, fraying, or loose connections; Ensure that the nylon idler pulleys rotate smoothly.

6. Manually move the doors on the track to check for cracked or broken eccentric rollers.

7. Manually check the door closer mounting bracket for looseness, and move the doors the full travel on the track and listen for unusual noises.

8. Manually check the door interlock hook bolt for tightness, and check for clearance on the lock box cover.

9. Ensure the proper rotation on pickup rollers and check for cracking; Pull on the mounting to ensure it is tight.

10. Slightly move the bottom of the doors to check that the door guide mounting brackets are tight.

11. Ensure that the fire tabs are in place, and move the doors the full travel to check for scraping or rubbing noises.

12. Ensure a minimum of 1 1/8" clearance between door panels.

13. While running the car on Inspection Operation the length of the hoistway, randomly stop the car, trip a hoistway door lock, and attempt to run the car (to verify that the car will not run with the door unlocked).

   If car the runs with the doors unlocked, check the controller wiring for jumper of door relays for welded contacts.
Maintenance (continued)

Annually

The car door restrictor may be temporarily deactivated by depressing and blocking the restrictor to allow it to pass the header restrictor angle.

1. Move the car to allow access to the bottom of the doors.

2. Unlock the doors, and move them full travel to check that doors move freely on the sill.

3. Check the following:
   - Gibs for wear (adjust or replace as necessary).
   - Fire tab screws are tight.
   - Door to sill clearance of $1\frac{1}{4}''$ (optimum) to $3\frac{1}{8}''$ (maximum).

4. Remove and store the dust cover.

5. Unlock the doors, and partially open them.

6. Inspect the door hangers, eccentrics, and tracks:
   a. Check that the tracks are smooth and clean, and tighten the mounting bolts.
   b. Manually move doors to check the door rollers for cracks and for smooth bearing operation; check that the mounting bolt is tight.
   c. Use a flashlight to observe the gap between the roller and the track, and check the eccentric setting. Set as close as possible throughout the door travel without causing drag (approximately $\frac{1}{32}''$).
   d. Ensure that the eccentrics and hanger bolts are tight.

7. Inspect the relating cable:
   a. Manually move the doors and check the relating cable for frays or excessive looseness; adjust as necessary, and tighten all fastenings.
   b. Check the condition of nylon pulleys for smooth operation, and tighten the mounting bracket. Adjustment here will affect the interlock settings.

8. Inspect the door closer (spirator).
   a. Fully open the doors, and listen for unusual noises from the closer.
   b. Check that the closer mounting bracket is tight.
   c. Check the cable for fraying, and check the cable fastening.
   d. Stop doors within $1\frac{1}{2}''$ from fully closed, and release them to check the setting of the closer (doors should close from any position).
9. Inspect the door interlocks.
   a. Remove the screws from the interlock cover, and remove the cover.
   b. Verify that the lock is centered in the catch (shim as required).
   c. Unlock the doors, and then allow them to close. Check all clearances below:
      • The pickup of interlock hook = 1/8" from the top of box with the hook up.
      • The drop.
      • The engagement of the hook before the contacts bridge = 9/32"
      • The over-travel on the contacts = 3/32"
      • Equal height of the contacts and the hook-to-locking bar clearance = 1/8" after locked (lateral movement indicates a bushing problem).
   d. Clean the bridging bar, and tighten the mounting bolts.
   e. Turn OFF the mainline disconnect.
   f. Clean the lock contacts, and tighten the screws in the contact assembly base.
   g. Replace the interlock box cover.

10. Inspect the clutch vane and the pick-up rollers:
    a. Position the clutch vane in front of the pick-up rollers by moving the car and checking for proper clearance (1 1/4" maximum) between the face of the vane and the pick-up roller.
    b. Check that the depth of the rollers into the clutch is 3/4 to FULL roller on the vane.
    c. Check the pickup roller assembly mounting bolts.

Cleaning Architectural Finishes

Any cleaning or refinishing, other than routine, should be handled by qualified professionals.

- **Architectural Powder Coating**: Clean all surfaces with a soft cloth or soft natural bristle brush with a non-abrasive, PH neutral solution. Do not use strong solvents such as thinners, or solutions containing chlorinated hydrocarbon, ester, ketone, or any abrasive cleaners.

- **Plastic Laminate**: Routine cleaning with a mild detergent will remove fingerprints, smears, and everyday spills. Do not use abrasives or harsh chemicals.

- **Stainless Steel**: Routine cleaning with a mild detergent will remove fingerprints, smears, and everyday liquid spills. Consumer-type glass cleaners and stainless steel cleaners may also be used. Do not use abrasives or harsh chemicals.

- **Muntz (Bronze)**: These surfaces are coated with a lacquer finish. To prevent scuffing, use a paste wax (for clear coats finishes) every week. Routine cleaning with a damp, soft cloth will remove spills, smears and fingerprints. Do not use abrasives or harsh chemicals.
Replacement Parts

Single Speed Opening, see page 105.
Two Speed Opening, see page 106.
Center Opening, see page 107.

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Single Speed Opening (494AVX)
Two Speed Opening (494AWA)
Center Opening (494AVY)
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Door Mounted Interlock Rollers
Entrance System Installation
Single Speed (494AVX-C)

NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A SINGLE SPEED (LEFT HAND), 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS.
   ALL OTHER SINGLE SPEED ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT.
   FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.
Entrance System Installation - Single Speed
(continued)
Entrance System Installation - Single Speed
(continued)
Two Speed (494AWA-C)

NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A TWO SPEED (LEFT HAND) 48.000 OPENING WITH 7 FT (84.000) DOORS.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT.
5. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.
6. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.
Entrance System Installation - Two Speed

6.500 NOMINAL
6.000 2.000 STANDARD
11.000 11.000
7.438

HALL SIDE
HOISTWAY SIDE

WALL LINE

100.270 OVERALL ENTRANCE HEIGHT
84.000 DOOR OPENING HEIGHT

HOISTWAY WALL TRANSOM
HALL WALL WALL SIZE

.125 .750 DOOR OVERLAP
.125

1.250 SLOW DOOR
2.750 FAST DOOR
.250 CLEARANCE BETWEEN DOORS
.250 DOOR RUNNING CLEARANCE

1.250 CLEARANCE BETWEEN DOORS
.250 DOOR RUNNING CLEARANCE

RETURN COLUMN WIDTH

© Vertical Express
Entrance System Installation - Two Speed
(continued)
Entrance System Installation - Two Speed
(continued)

SECTION A-A
RETURN DETAIL

SECTION A-A
STRIKE RETURN DETAIL
Center Opening (494AVY-C)

ROUGH OPENING

SEE NOTE

91.500 (HEADER / SILL SUPPORT LENGTH = 2 X DOOR OPENING WIDTH + 7.500)

3.125

93.750 (DISTANCE BETWEEN WALL ANGLES = 2 X DOOR OPENING WIDTH + 9.750) (SEE NOTE 5)

3.125

100.000 (HOISTWAY WIDTH = 2 X DOOR OPENING WIDTH + 16.000) (SEE NOTE 1)

VIEW FROM TOP

TRANSOM ASSEMBLY

(DOOR OPENING WIDTH/2) + 4.875

DOOR OPENING WIDTH

2.000 STANDARD

.750

6.000

LH RETURN COLUMN

BACK OF STRUT

HALL SIDE

HOISTWAY SIDE

VIEW FROM BOTTOM

RH RETURN COLUMN

2.000 STANDARD

7.500

5.625 (DOOR OPENING WIDTH/2) + 4.875

NOTES:

1. ENTRANCE FRAME SHOWN IS FOR A CENTER OPENING, 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS.

2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.

3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.

4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT.

5. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.

FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.

5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.
Entrance System Installation - Center Opening
(continued)
Entrance System Installation - Center Opening

(continued)

- 1.250 CAB RUNNING CLEARANCE
- \(\frac{\text{CAB PLATFORM WIDTH}}{2} + 1.500\)
- 28.875 DAYLIGHT LINE
- Column Brackets
- Hoistway Side
- Hall Side
- Wall Angle
- Channel Strut
- Hallway Side
- (Door Opening Width/2) + 1.500
- (Platform Width - Door Opening Width)/2
- 28.875
- 1.250 CAB RUNNING CLEARANCE
Entrance System Installation - Center Opening
(continued)
Entrance System Installation - Center Opening

(continued)
Entrance System Installation - Center Opening
(continued)
Hatch Hanger Assembly Installation
Single Speed (494ACY-E)

NOTES:
1. STANDARD DOOR HEIGHT.
2. DIMENSION CAN VARY TO ACCOMMODATE NON-STANDARD DOOR HEIGHTS.

SEE NOTES 1 & 2

INTERLOCK ASSEMBLY

HEADER LENGTH

TOP DOOR RETAINERS

CL CRANK ASSEMBLY

SAFETY DOOR RETAINER 711ET1

HOISTWAY DOOR ASSEMBLY

HATCH DOOR HEADER

TOP DOOR SAFETY RETAINER, 711GJ001

HOISTWAY DOOR ASSEMBLY, SHOWN IN CLOSED POSITION

DAYLIGHT LINE

VIEW OF LEFT HAND ASSEMBLY FROM INSIDE HOISTWAY

NOTES:
1. STANDARD DOOR HEIGHT.
2. DIMENSION CAN VARY TO ACCOMMODATE NON-STANDARD DOOR HEIGHTS.
Hatch Hanger Assembly Installation - Single Speed
(continued)

- Set torque at 18 ft.-lbs.
- Minimum upthrust roller setting.
- Minimum hatch header typ.
- Typical hatch sill standard.
- Interlock assembly shown with cover removed.

- Interlock stop hook.
- Interlock assembly 297BN.
- Typical hatch sill standard.
- Grooved sill bottom door safety retainer.
- Typical hatch sill standard.
- Interlock assembly 297BNS shown with cover removed.
- Set screw.
- LH crank assembly.
- Set screw.
- Hatch header typ.
- Minimum.
- 0.062 inside edge of cover.
Hatch Hanger Assembly Installation - Center Opening

(continued)
Hanger Mounted Interlock Rollers

Entrance System Installation

Single Speed (494BFE-A)

NOTES:

1. ENTRANCE FRAME SHOWN IS FOR A SINGLE SPEED (LEFT HAND), 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS.

2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.

3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.

4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT.

5. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.

6. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.

7. 100.000 = 2 x DOOR OPENING WIDTH + 16.000

8. 93.750 = 2 x DOOR OPENING WIDTH + 9.750

9. 11.000 = 2 x DOOR OPENING WIDTH + 1.500

10. 6.000 = DOOR OPENING WIDTH
Entrance System Installation - Single Speed (494BFE-A)

(continued)
Entrance System Installation - Single Speed (494BFE-A)

(continued)
Entrance System Installation - Single Speed (494BFE-A)

(continued)
Two Speed (494BFH-B)

NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A SINGLE SPEED (LEFT HAND), 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS. ALL OTHER SINGLE SPEED ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT.
   FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.
Entrance System Installation - Two Speed

(continued)
Entrance System Installation - Two Speed
(continued)
Entrance System Installation - Two Speed (continued)
NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A CENTER OPENING, 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS.
   ALL OTHER CENTER OPENING ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494J1.
   FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494J3V.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.
Entrance System Installation - Center Opening

(continued)
Entrance System Installation - Center Opening (continued)

- **97.902 OVERALL ENTRANCE HEIGHT**
- **84.000 DOOR OPENING HEIGHT**
- **DOOR ASSEMBLY**
- **TRANSOM**
- **WALL**
- **SILL SUPPORT ASSEMBLY**
- **CW**
- **RETURN COLUMN WIDTH**
- **.125**
- **.750**
- **WALL SIZE**
- **9.827**
- **7.952**
- **.750 DOOR OVERLAP**
- **4.726**
- **1.234**
- **DOOR PANEL**
- **COLUMN**
- **HOLE IN DOOR HANGER**
- **HATCH HEADER**
- **STRUT CHANNEL**
- **.250 DOOR RUNNING CLEARANCE**
- **2.50 DOOR RUNNING CLEARANCE**
- **CV**
- **RETURN COLUMN WIDTH**
- **9.7902 OVERALL ENTRANCE HEIGHT**
- **84.000 DOOR OPENING HEIGHT**
- **HALL**
- **HALLWAY**
- **HOISTWAY**
- **DOOR ASSEMBLY**
- **SILL SUPPORT ASSEMBLY**
Entrance System Installation - Center Opening (continued)

84.000 DOOR OPENING HEIGHT

97.902 OVERALL ENTRANCE HEIGHT

SILL SUPPORT ASSEMBLY

DOOR ASSEMBLY

RETURN COLUMN WIDTH

WALL SIZE

1.500

3.500 EXPOSED SILL

SILL SUPPORT ASSEMBLY

FLOOR SLAB

WALL ASSEMBLY

WALL LINE

RETURN COLUMN WIDTH

WALL ASSEMBLY

HOISTWAY

HALL
Hatch Hanger Assembly Installation
Single Speed (494BFD-D)

NOTES:
1. STANDARD DOOR HEIGHT.
2. DIMENSION CAN VARY TO ACCOMMODATE NON-STANDARD DOOR HEIGHTS.
Hatch Hanger Assembly Installation - Single Speed

(continued)
Two Speed (494BKD-A)
Hatch Hanger Assembly Installation - Two Speed
(continued)

-0.250 UNDER DOOR

-0.250 HATCH SILL TO BACK OF DOOR

SET ECCENTRIC FOR ROLLERS TO BE OFFSET BY 0.030 TO 0.060 IN THE UNLOCKED POSITION
Center Opening (494BFF-D)

NOTES:
1. STANDARD DOOR HEIGHT.
2. DIMENSION CAN VARY TO ACCOMMODATE NON-STANDARD DOOR HEIGHTS.

ALIGN FIXED ROLLER WITH DIAMOND MARKS ON HEADER

VIEW OF CENTER OPENING DOOR ASSEMBLY WITH LH SIDE CLUTCH

1. STANDARD DOOR HEIGHT.
2. DIMENSION CAN VARY TO ACCOMMODATE NON-STANDARD DOOR HEIGHTS.
NOTES:

1. **SILL LOAD RATING** - MAXIMUM OF 5000 POUNDS, ANSI/ASME A17.1, CLASS A (1250 LBF AXLE LOAD).
   REINFORCED SILL LOAD RATING - MAXIMUM OF 20,000 POUNDS, ANSI/ASME A17.1, CLASS A (5000 LBF AXLE LOAD).

2. **4.000 X 8.000 MINIMUM AREA AT THE WALL LINE (AT EACH FLOOR) FOR ANCHORING WALL ANGLES.**
   MOUNTING SURFACE CAN BE CONCRETE, FILLED BLOCK, SUITABLE WOOD BEAMS, STEEL BEAMS OR STEEL DECKING.

3. **ATTACH TO WALL USING .375 DIAMETER BOLT CONCRETE ANCHORS, .375 LAG SCREWS OR WELDING.**
   SEE 494ATJ FOR WELDING DETAIL. CONSULT ANCHOR MANUFACTURER FOR QUANTITY, SPACING AND EDGE DISTANCE RECOMMENDED FOR TYPE OF ANCHOR USED AND TYPE OF WALL CONSTRUCTION.

4. **SEE DATA SHEET 1104AF FOR CALCULATIONS.**
Sill Support Assembly
(continued)

APPROXIMATE HORIZONTAL LOADS AND LOCATIONS APPLIED TO BUILDING SHOWN PER ASME A17.1, PART II, RULE 2.28.1(I).

THE SPECIFIED LOADS HAVE CONSIDERED IMPACT.

"FHF" = FLOOR HEIGHT FACTOR = FLOOR HEIGHT - (DOOR OPENING HEIGHT)/2.000

FLOOR HEIGHT

1.500(X)

(2.000(X) + 4.500)

X = CLEAR OPENING

ELEVATOR SILL

DAYLIGHT LINE

FACE OF FLOOR SLAB

1.500(X)

500(X) + 4.500

X = CLEAR OPENING

SILL SUPPORT ASSEMBLY

SINGLE SPEED REACTIONS (LBS.) DUE TO LOADS ON DOOR PIAVES

R1 = (1.500(X))

FLOOR HEIGHT - (DOOR OPENING HEIGHT)/2.000

R2 = (2.000(X) + 4.500)

X 1125 (FHF)

500(X) + 4.500

X 1125 (FHF)
Sill Support Assembly
(continued)

APPROXIMATE HORIZONTAL LOADS AND LOCATIONS APPLIED TO BUILDING SHOWN PER ASME A17.1, PART II, RULE 2.28.1(I).

THE SPECIFIED LOADS HAVE CONSIDERED IMPACT. THE LOAD CAN ONLY BE ON ONE PANEL AT A TIME; THEREFORE, ONE SET OF LOADS IS SHOWN AS CASE 1, THE OTHER AS CASE 2. THESE SETS OF LOADS DO NOT OCCUR AT THE SAME TIME.

**FHF** = FLOOR HEIGHT FACTOR = FLOOR HEIGHT - (DOOR OPENING HEIGHT)/2.000

CASE 1:R1 = \[2.000(X) + 4.000\] X 1.250 (FHF) - 0.750(X) + 2.000

CASE 2:R1 = \[2.000(X) + 4.000\] X 1.125 (FHF)

CASE 1:R2 = \[2.000(X) + 4.000\] X 1.125 (FHF) - 1.250(X) + 2.000

CASE 2:R2 = \[2.000(X) + 4.000\] X 1.125 (FHF)

X = CLEAR OPENING

X = FACE OF FLOOR SLAB

X = ELEVATOR SILL

X = ELEVATOR SILL SUPPORT ASSEMBLY

X = DAYLIGHT LINE

X = FACE OF FLOOR SLAB

X = FACE OF FLOOR SLAB

X = G OF OPENING
3. Reinforcement and brace are only supplied when capacity is > 5000 lbs.

2. Wall anchors must be located below sill support assembly or wall angles.

1. Using both wall angle and strut angle, blocking may be required for gout.

Notes:

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<tr>
<th>NOTE</th>
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<tr>
<td>1.</td>
<td>USING BOTH WALL ANGLE AND STRUT ANGLE, BLOCKING MAY BE REQUIRED FOR GROUT.</td>
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<td>2.</td>
<td>WALL ANCHORS MUST BE LOCATED BELOW SILL SUPPORT ASSEMBLY OR WALL ANGLES.</td>
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<td>3.</td>
<td>USING BOTH WALL ANGLE AND STRUT ANGLE, BLOCKING MAY BE REQUIRED FOR GROUT.</td>
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<td>4.</td>
<td>MINIMUM</td>
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Wall anchors must be located below sill support assembly or wall angles.
TWO SPEED REACTIONS (LBS.) DUE TO LOADS ON DOOR PANELS

APPROXIMATE HORIZONTAL LOADS AND LOCATIONS APPLIED TO BUILDING SHOWN PER ASME A17.1, PART II, RULE 2.28.1(I). THE SPECIFIED LOADS HAVE CONSIDERED IMPACT. THE LOAD CAN ONLY BE ON ONE PANEL AT A TIME; THEREFORE, ONE SET OF LOADS IS SHOWN AS CASE 1, THE OTHER AS CASE 2. THESE SETS OF LOADS DO NOT OCCUR AT THE SAME TIME.

"FHF" = FLOOR HEIGHT FACTOR = FLOOR HEIGHT - (DOOR OPENING HEIGHT) / 2.000

CASE 1: \[ R_1 = \frac{1.250(X)}{1.500(X) + 4.625} \times 1125 \text{ (FHF)} \]

CASE 2: \[ R_2 = \frac{1.500(X) + 4.625}{1.500(X) + 4.625} \times 1125 \text{ (FHF)} \]
NOTES:

1. USING BOTH WALL ANGLE AND STRUT ANGLE, BLOCKING MAY BE REQUIRED FOR GROUT ANGLE WITH "S" GREATER THAN 8.000.
2. WALL ANCHORS MUST BE LOCATED BELOW SILL SUPPORT ASSEMBLY OR WALL ANGLES TURNED OUT AWAY FROM DOOR OPENING.
3. REINFORCEMENT AND BRACE ARE ONLY SUPPLIED WHEN CAPACITY IS > 5000 LBS.

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<td>2</td>
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<td>3</td>
<td>0.625</td>
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DIM. "S" STANDARD ADJUSTMENT

6.500 +2.000 -0.625

SECTION B-B

REINFORCED SILL SUPPORT ASSEMBLY, SILL MOUNTING DETAILS
ANSI/ASME A17.1 CLASS A LOADING
MAXIMUM 20000 POUND
SUPPORT ASSEMBLY, SILL MOUNTING DETAILS
TWO SPEED

CONCRETE, GROUT FILLED BLOCK, OR WOOD BEAM IN THE AREAS LOCATED WHERE THE LOAD REACTIONS ARE DEFINED.

WALL ANCHORS SUPPLIED BY TKF (SHOWN FOR 20000 POUND REFERENCE)
STANDARD GROOVED SILL INSTALLED FLUSH WITH FINISH FLOOR LEVEL, SUPPLIED BY TKF (SILL PROFILE SHOWN FOR REFERENCE ONLY)
STRUT REINFORCEMENT BRACE (SEE NOTE 3) (SHOWN FOR 20000 POUND REFERENCE)

SUPPORT ASSEMBLY, SILL MOUNTING DETAILS
ANSI/ASME A17.1 CLASS A LOADING
TWO SPEED
Sill Support Assembly
(continued)

**Single Speed Reactions (LBS.) Due to Live Loads on Sills**

- Maximum Axle Load = 1250 LBS. or 5000 LBS. when reinforced as defined by ASME A17.1.
- Half of live load is supported by anchors at the floor above or below.
- Live loads can occur only at one floor at a time.
- Max capacity = 5000 LBS. Max capacity = 20000 LBS.

**Face of Strike Column**

**Elevator Sill**

**Hoistway Door Assembly Shown in Open Position**

**Sill Support Assembly**

**FINISHED FLOOR LEVEL**

**LSR**

**LSS**

\[ \text{LSR} = \frac{2.000(\times) + 4.500}{2.000} \times 5000 / 2000 \]

\[ \text{LSS} = \frac{2.000(\times) + 4.500}{2.000} \times 1250 / 2000 \]

\[ \text{LSR} = \frac{500(\times) + 4.500}{2.000} \times 5000 / 2000 \]

\[ \text{LSS} = \frac{500(\times) + 4.500}{2.000} \times 1250 / 2000 \]
MAXIMUM ALLOWABLE AXLE LOAD IS 1250 LBS. OR 5000 LBS. IF REINFORCED AS DEFINED BY ASME A17.1.

LIVE LOADS CAN OCCUR ONLY AT ONE FLOOR AT A TIME.
HALF OF LIVE LOAD IS SUPPORTED BY ANCHORS AT THE FLOOR ABOVE OR BELOW.
MAXIMUM ALLOWABLE AXLE LOAD IS 1250 LBS. OR 5000 LBS. IF REINFORCED AS DEFINED BY ASME A17.1.

\[ \begin{align*}
\text{LCL} &= \frac{2.000 \times x + 4.000 \times 1250}{2.000} + 2.000 \\
\text{LCR} &= \frac{2.000 \times x + 4.000 \times 5000}{2.000} + 2.000
\end{align*} \]
Sill Support Assembly
(continued)

TWO SPEED
REACTIONS (LBS.) DUE TO LIVE LOADS ON SILLS

X = CLEAR OPENING

MAXIMUM AXLE LOAD = 1250 LBS. OR 5000 LBS. WHEN REINFORCED

FINISHED FLOOR LEVEL

ELEVATOR SILL

FACE OF STRIKE COLUMN

SILL SUPPORT ASSEMBLY

500(X) - 4.625

LCL = 1.500(X) + 4.625

X 1250 / 2.000

L2S = (1.500(X) + 4.625) X 5000 / 2.000

L2R = (500(X) + 4.625) X 5000 / 2.000

MAXIMUM ALLOWABLE AXLE LOAD IS 1250 LBS. OR 5000 LBS. IF REINFORCED AS DEFINED BY ASME A17.1.

MAXIMUM CAPACITY = 5000 LBS.

HALF OF LIVE LOAD IS SUPPORTED BY ANCHORS AT THE FLOOR ABOVE OR BELOW.

LIVE LOADS CAN OCCUR ONLY AT ONE FLOOR AT A TIME.

Max Capacity = 20000 LBS.
There are two load conditions for the reactions at floor connections. One condition includes tension loads due to door panel impact and with only dead loads as shear. The other condition includes tension loads due to door panel impact and with only dead loads as shear. These two conditions cannot occur at the same time. Door panel impact loads occur with the doors closed and only at one floor at a time.

Reactions including door panel impact:

- Strike side of single speed or two speed
- Left side of center opening
- Return side of single speed or two speed

Wall angle supplied by the floor slab
Wall anchor
Finished floor
General contractor
Clear hoistway line
Strut channel
Grounding bar
Clear hoistway line
Supplied by the general contractor

Appendix
Sill Support Assembly (494ACX-D)
THERE ARE TWO LOAD CONDITIONS FOR DETERMINING THE REACTIONS AT THE FLOOR.
ONE CONDITION INCLUDES TENSION LOADS DUE TO DOOR PANEL IMPACT AND WITH ONLY DEAD LOADS AS SHEAR.
THE OTHER CONDITION INCLUDES ONLY SHEAR LOADS DUE TO LIVE SILL LOADS PLUS THE WEIGHT OF THE ENTRANCE.
THESE TWO CONDITIONS CANNOT OCCUR AT THE SAME TIME.
LIVE SILL LOADS OCCUR WITH THE DOORS OPEN AND ONLY AT ONE FLOOR AT A TIME.

REATIONS INCLUDING LIVE SILL LOADS

STRIKE SIDE OF SINGLE SPEED OR TWO SPEED
LEFT SIDE OF CENTER OPENING

RETURN SIDE OF SINGLE SPEED OR TWO SPEED
RIGHT SIDE OF CENTER OPENING

WALL ANGLE
SUPPLIED BY tke

WALL ANCHOR

FLOOR SLAB

FINISHED FLOOR

CLEAR HOISTWAY LINE
GROUTING BY
GENERAL CONTRACTOR

STRUT CHANNEL
SUPPLIED BY tke
### M721 Entrance Wall Anchor Loads

### Values Shown Are for 84.000 Opening Height

#### Tension Loads for All 1.1

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<th>Door Width (INCHES)</th>
<th>LSS</th>
<th>LSR</th>
<th>L2S</th>
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#### Shear Loads for Maximum Axle Loads of 1250 LBS.

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#### Shear Loads for Maximum Axle Loads of 5000 LBS.

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### Single Speed Door Width (INCHES)

<table>
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### Two Speed Door Width (INCHES)

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### Case 1 and Case 2

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<th>Return Side</th>
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### M721 Entrance Wall Anchor Loads (continued)
### Sill Support Assembly

#### Appendix Hanger Mounted Interlock Rollers

**Sill Support Assembly (continued)**

**SHEAR LOADS FROM DEAD WEIGHT**

<table>
<thead>
<tr>
<th>DOOR WIDTH (INCHES)</th>
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<th>R3</th>
<th>R4</th>
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<td>DEAD LOAD CLOSED STRIKE SIDE</td>
<td>DEAD LOAD CLOSED RETURN SIDE</td>
<td>DEAD LOAD DOORS OPEN STRIKE SIDE</td>
<td>DEAD LOAD DOORS OPEN RETURN SIDE</td>
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<tr>
<td>32.000</td>
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**TOTAL SHEAR LOADS (LIVE LOAD + DEAD WEIGHT)**

**SINGLE SPEED WITH DOORS OPEN**

<table>
<thead>
<tr>
<th>DOOR WIDTH (INCHES)</th>
<th>STRIKE SIDE (R3 + LSS)</th>
<th>RETURN SIDE (R4 + LSR)</th>
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<tbody>
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<td>32.000</td>
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**CENTER OPENING WITH DOORS OPEN**

<table>
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<th>STRIKE SIDE (R3 + LCL)</th>
<th>RETURN SIDE (R4 + LCR)</th>
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**TWO SPEED WITH DOORS OPEN**

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<th>DOOR WIDTH (INCHES)</th>
<th>STRIKE SIDE (R3 + L2S)</th>
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### Painted, 2,000 Face, 84,000 Doors

**Shear Loads from Dead Weight**

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**Total Shear Loads (Live Load + Dead Weight)**

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**Center Opening with Doors Open**

<table>
<thead>
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<th>R5</th>
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</tr>
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<td>36.000</td>
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**Two Speed with Doors Open**

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NOTES:
1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN. FOR HOISTWAY WALL DESIGN AND MATERIALS SUCH AS CMU, CONCRETE, GROUT OR OTHER, REFER TO SPECIFIED UL CONSTRUCTION DETAILS.

2. ENTRANCE FRAMES DO NOT REQUIRE BACK FILLING WITH GROUT, BUT IT IS PERMISSIBLE. IF FRAMES ARE BACK FILLED, THEN WIRE ANCHORS ARE NOT MANDATORY.

3. 30.000 MAXIMUM SPACING (TYPICAL)

SECTION A-A
THRU STRIKE (TYPICAL)
MASONRY WIRE ANCHOR

SECTION B-B
THRU RETURN (TYPICAL)
MASONRY WIRE ANCHOR
Appendix Hanger Mounted Interlock Rollers Drywall Installation (494JV-J)

August 2018 - 89121 v.2.0 A-51

Drywall Installation (494JV-J)

2 HOUR FIRE RATED SHAFTWALL SHOWN, SEE NOTE 9 FOR 1 HOUR OPTION
(3.500 THRU 8.375 WALL THICKNESS)

COLUMN
ASSEMBLY

0.190(#10) x 0.500 SELF TAPPING PAN HEAD SCREWS (TYP. EACH COLUMN CLIP)

STRIKE JAMB
(SIMILAR CONSTRUCTION AS RETURN)

NOTE 10
J-RUNNER

GYPSUM SHAFTWALL LINER ATTACHED TO GALVANIZED STEEL J-RUNNER (20 GA. MIN.)
WITH TYPE “S” SCREWS, 12,000 O.C.

RETURN JAMB

GYPSUM SHAFTWALL LINER ATTACHED TO GALVANIZED STEEL J-RUNNER (20 GA. MIN.)
WITH TYPE “S” SCREWS, 12,000 O.C.

1.000 x 12.000 LINER FILLER
.500 OR .625 x 6.000 WALLBOARD

1.000 x 12.000 WALLBOARD

.500 OR .625 WALLBOARD OR 1.000 FILLER LINER (FRICITION FIT AS REQUIRED TO FILL)

COLUMN ASSEMBLY

BASE LAYER

FACE LAYER

HEAD JAMB

TYPICAL NOTES FOR ALL WALL OPTIONS:

1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN FOR WALL RATING UP TO 2 HOURS.

2. FOR ELEVATOR DOOR FRAMING WALL DESIGN AND MATERIAL, REFER TO SPECIFIED UL CONSTRUCTION DETAILS.

3. ENTRANCE LABEL UP TO 2 HOURS MAXIMUM.

4. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND LABOR RELATING TO HOISTWAY WALL AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE ELEVATOR SUPPLIER. THIS INCLUDES, BUT IS NOT LIMITED TO, STEEL OR WOOD STUDS, J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS AND FASTENERS.

5. THE DOOR AND FRAME WILL CARRY A 1 1/2 OR 2 HOUR FIRE LABEL FROM AN APPROVED TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL BUILDING CODE.

6. FOR CLEAR DOOR OPENING HEIGHTS 7 FEET OR LESS; FILLERS AND STRIPS / SHIMS ARE NOT REQUIRED PER SPECIFIED UL CONSTRUCTION.

7. FOR CLEAR DOOR OPENING HEIGHTS OVER 7 FEET (SHAFTWALL CONSTRUCTION ONLY): LINER FILLER - ATTACH 1.000 X 12.000 wide WALLBOARD TO SHAFTWALL LINER WITH 1.625 TYPE S STEEL SCREWS STAGGERED 12,000 O.C.

FILLER STRIPS - ATTACH .500 OR .625 X 6.000 wide WALLBOARD LINER FILLER TO SHAFTWALL LINER WITH TYPE W STEEL SCREWS STAGGERED 12,000 O.C.

8. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND STUD WITH THE FASTENER TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN). SEE CHART BELOW FOR WALL SYSTEM CONFIGURATION OPTIONS.

9. FOR WALLS WITH LESS THAN 2 HOURS RATING; ELIMINATE THE BASE LAYER OPTION.

10. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS, FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12,000 O.C.

GYPSUM WALL OPTION CHART

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<tr>
<th>OPTION</th>
<th>SHAFTWALL LINER</th>
<th>FACE LAYER</th>
<th>BASE LAYER</th>
<th>MAX FIRE RATING</th>
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<td>1</td>
<td>1.000 TYPE X</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>2</td>
<td>750 TYPE X</td>
<td>.625 TYPE X OR C</td>
<td>.625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>3</td>
<td>.500 OR .625 TYPE X OR C (2 LAYERS)</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>4</td>
<td>.625 TYPE X (2 LAYERS)</td>
<td>.625 TYPE X OR C</td>
<td>.625 TYPE X OR C</td>
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<td>5</td>
<td>1.000 TYPE X</td>
<td>.750 TYPE X OR C</td>
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<td>2 HOUR</td>
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</table>

NOTE 10
J-RUNNER

GYPSUM SHAFTWALL LINER

1.000 x 12.000 LINER FILLER
.500 OR .625 x 6.000 WALLBOARD

1.000 x 12.000 WALLBOARD

.500 OR .625 WALLBOARD OR 1.000 FILLER LINER (FRICITION FIT AS REQUIRED TO FILL)

COLUMN ASSEMBLY

BASE LAYER

FACE LAYER
Drywall Installation (494JV-J) Hanger Mounted Interlock Rollers Appendix

2 HOUR FIRE RATED SHAFTWALL SHOWN, SEE NOTE 9 FOR 1 HOUR OPTION

COLUMN ASSEMBLY

STRIKE JAMB

(SIMILAR CONSTRUCTION AS RETURN)

NOTE 10

J-RUNNER

GYPSUM SHAFTWALL LINER

GYPSUM SHAFTWALL LINER ATTACHED TO GALVANIZED STEEL J-RUNNER (20 GA. MIN.) WITH TYPE “S” SCREWS, 12.000 O.C.

1.000 LINER FILLER .500 OR .625 x 6.000 WALLBOARD FACE LAYER

BASE LAYER

1.000 LINER FILLER

J-RUNNER

1.000 x 12.000 LINER FILLER

.500 OR .625 x 6.000 WALLBOARD

HEAD JAMB

.500 OR .625 WALLBOARD OR 1.000 FILLER LINER (FRICTION FIT AS REQUIRED TO FILL)

COLUMN ASSEMBLY

1.000 LINER FILLER (SHIM)

J-RUNNER

9. FOR WALLS WITH LESS THAN 2 HOURS RATING, ELIMINATE THE BASE LAYER OPTION.

10. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS, FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12.000 O.C.

8. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND STUD WITH THE FASTENER TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN). SEE CHART BELOW FOR WALL SYSTEM CONFIGURATION OPTIONS:

TYPICAL NOTES FOR ALL WALL OPTIONS:

1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN FOR WALL RATING UP TO 2 HOURS.
2. FOR ELEVATOR DOOR FRAMING WALL DESIGN AND MATERIAL, REFER TO SPECIFIED UL CONSTRUCTION DETAILS.
3. ENTRANCE LABEL UP TO 2 HOURS MAXIMUM.
4. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND LABOR RELATING TO HOISTWAY WALL AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE ELEVATOR SUPPLIER. THIS INCLUDES, BUT IS NOT LIMITED TO, STEEL OR WOOD STUDS, J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS AND FASTENERS.
5. THE DOOR AND FRAME WILL CARRY A 1 1/2 OR 2 HOUR FIRE LABEL FROM AN APPROVED TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL BUILDING CODE.
6. FOR CLEAR DOOR OPENING HEIGHTS 7 FEET OR LESS: FILLERS AND STRIPS / SHIMS ARE NOT REQUIRED PER SPECIFIED UL CONSTRUCTION.
7. FOR CLEAR DOOR OPENING HEIGHTS OVER 7 FEET (SHAFTWALL CONSTRUCTION ONLY): LINER FILLER - ATTACH 1.000 X 12.000 WIDE WALLBOARD TO SHAFTWALL LINER WITH 1.625 TYPE S STEEL SCREWS STAGGERED 12.000 O.C.
8. FILLER STRIPS - ATTACH .500 OR .625 X 6.000 WIDE WALLBOARD LINER FILLER TO SHAFTWALL LINER WITH TYPE W STEEL SCREWS STAGGERED 12.000 O.C.
9. FILL JAMB STRUT WITH HEADER COMPLETELY (WITHIN .188) WITH LAYERS AND THICKNESSES AS REQUIRED TO MEET UL DESIGN.

GYPSUM WALL OPTION CHART

<table>
<thead>
<tr>
<th>OPTION</th>
<th>SHAFTWALL LINER</th>
<th>FACE LAYER</th>
<th>BASE LAYER</th>
<th>MAX FIRE RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.500 TYPE X</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>2</td>
<td>.750 TYPE X</td>
<td>.625 TYPE X OR C</td>
<td>.625 TYPE X OR C</td>
<td>2 HOUR</td>
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<tr>
<td>3</td>
<td>3.500 OR .625 TYPE X OR C (2 LAYERS)</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>2 HOUR</td>
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<tr>
<td>4</td>
<td>.625 TYPE X (2 LAYERS)</td>
<td>.625 TYPE X OR C</td>
<td>.625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>5</td>
<td>1.000 TYPE X</td>
<td>.750 TYPE X OR C</td>
<td>N/A</td>
<td>2 HOUR</td>
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</tbody>
</table>

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Drywall Installation (continued)

2 HOUR FIRE RATED SHAFTWALL SHOWN, SEE NOTE 9 FOR 1 HOUR OPTION
(FOR WOOD STUD CONSTRUCTION)

NOTE 10
SHAFTWALL LINER
NOTE 10
TYPE W SCREW, 12,000 O.C.

TYPE W SCREW, 12.000 O.C.
TYPE S SCREW, 12.000 O.C.

RETURN JAMB
RETURN JAMB

BASE LAYER
FACE LAYER
FACE LAYER

TYPE W SCREW, 12.000 O.C.

HEAD JAMB

TYPICAL NOTES FOR ALL WALL OPTIONS:
1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN FOR WALL RATING UP TO 2 HOURS.
2. FOR ELEVATOR DOOR FRAMING WALL DESIGN AND MATERIAL, REFER TO SPECIFIED UL
   CONSTRUCTION DETAILS.
3. ENTRANCE LABEL UP TO 2 HOURS MAXIMUM.
4. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND LABOR RELATING TO HOISTWAY WALL
   AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE
   ELEVATOR SUPPLIER, THIS INCLUDES, BUT IS NOT LIMITED TO, STEEL OR WOOD STUDS,
   J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS
   AND FASTENERS.
5. THE DOOR AND FRAME WILL CARRY A 1 1/2 OR 2 HOUR FIRE LABEL FROM AN APPROVED
   TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL
   BUILDING CODE.
6. FOR CLEAR DOOR OPENING HEIGHTS 7 FEET OR LESS: FILLERS AND STRIPS / SHIMS
   ARE NOT REQUIRED PER SPECIFIED UL CONSTRUCTION.
7. FOR CLEAR DOOR OPENING HEIGHTS OVER 7 FEET (SHAFTWALL CONSTRUCTION ONLY):
   LINER FILLER - ATTACH 1.000 X 12,000 WIDE WALLBOARD TO SHAFTWALL LINER WITH
   1.625 TYPE S STEEL SCREWS STAGGERED 12,000 O.C.
   FILLER STRIPS - ATTACH .500 OR .625 X 6,000 WIDE WALLBOARD LINER FILLER TO
   SHAFTWALL LINER WITH TYPE W STEEL SCREWS STAGGERED 12,000 O.C.
   FILL JAMB STRUT WITH HEADER COMPLETELY (WITHIN 1/8") WITH LAYERS
   AND THICKNESSES AS REQUIRED TO MEET UL DESIGN.
8. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND STUD WITH THE FASTENER
   TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN
   (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN). SEE CHART BELOW FOR WALL SYSTEM
   CONFIGURATION OPTIONS:

<table>
<thead>
<tr>
<th>OPTION</th>
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<th>BASE LAYER</th>
<th>MAX FIRE RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.000 TYPE X</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>2</td>
<td>.750 TYPE X</td>
<td>.625 TYPE X OR C</td>
<td>.625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>3</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>.500 OR .625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>4</td>
<td>.625 TYPE X (2 LAYERS)</td>
<td>.625 TYPE X OR C</td>
<td>.625 TYPE X OR C</td>
<td>2 HOUR</td>
</tr>
<tr>
<td>5</td>
<td>1.000 TYPE X</td>
<td>.750 TYPE X OR C</td>
<td>N/A</td>
<td>2 HOUR</td>
</tr>
</tbody>
</table>

9. FOR WALLS WITH LESS THAN 2 HOURS RATING, ELIMINATE THE BASE LAYER OPTION.
10. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS,
     FILL GAP WITH ADDITIONAL WALLBOARD X 6,000 WIDE. ATTACH ADDITIONAL LAYERS TO
     J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12,000 O.C.
Drywall Installation (494JV-J) Hanger Mounted Interlock Rollers Appendix

Drywall Installation (continued)

2 HOUR FIRE RATED SHAFTWALL STEEL STUD, SEE NOTE 9 FOR 1 HOUR OPTION

COLUMN

ASSEMBLY

STRIKE JAMB

(SIMILAR CONSTRUCTION AS RETURN)

NOTE 10

SHAFTWALL LINER

FACE LAYER

RETURN JAMB

TYPE S SCREWS, 12.000 O.C.

.190(#10) x 0.500 SELF TAPPING PAN HEAD SCREWS

(TYPICAL EACH COLUMN CLIP)

BASE LAYER

FACE LAYER

SHAFTWALL LINER

TYPE S SCREW, 12.000 O.C.

.500 OR .625 WALLBOARD OR 1.000 FILLER LINER

(FRICTION FIT AS REQUIRED TO FILL)

COLUMN ASSEMBLY

STEEL HEADER

TRANSOM

ASSEMBLY

BASE LAYER

9.       FOR WALLS WITH LESS THAN 2 HOURS RATING, ELIMINATE THE BASE LAYER OPTION.

10.     THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS,

FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO

J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12.000 O.C.

8.       WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND STUD WITH THE FASTENER

TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN

(WALL BOARD THICKNESS PER SPECIFIED UL DESIGN). SEE CHART BELOW FOR WALL SYSTEM

CONFIGURATION OPTIONS:

TYPICAL NOTES FOR ALL WALL OPTIONS:

1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN FOR WALL RATING UP TO 2 HOURS

2. FOR ELEVATOR DOOR FRAMING WALL DESIGN AND MATERIAL, REFER TO SPECIFIED UL

CONSTRUCTION DETAILS.

3. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND LABOR RELATING TO HOISTWAY WALL

AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE

ELEVATOR SUPPLIER. THIS INCLUDES, BUT IS NOT LIMITED TO, STEEL OR WOOD STUDS,

J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS

AND FASTENERS.

THE DOOR AND FRAME WILL CARRY A 1 1/2 OR 2 HOUR FIRE LABEL FROM AN APPROVED

TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL

BUILDING CODE.

FOR CLEAR DOOR OPENING HEIGHTS 7 FEET OR LESS: FILLERS AND STRIPS / SHIMS

ARE NOT REQUIRED PER SPECIFIED UL CONSTRUCTION.

6.   FOR CLEAR DOOR OPENING HEIGHTS OVER 7 FEET (SHAFTWALL CONSTRUCTION ONLY): LINER FILLER - ATTACH 1.000 X 12.000 WIDE WALLBOARD TO SHAFTWALL LINER WITH

1.625 TYPE S STEEL SCREWS STAGGERED 12.000 O.C.

FILLER STRIPS - ATTACH .500 OR .625 X 6.000 WIDE WALLBOARD LINER FILLER TO

SHAFTWALL LINER WITH TYPE W STEEL SCREWS STAGGERED 12.000 O.C.

FILL JAMB STRUT WITH HEADER COMPLETELY (WITHIN .188) WITH LAYERS

AND THICKNESSES AS REQUIRED TO MEET UL DESIGN.
Drywall Installation

(continued)

NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND LABOR RELATING TO HOISTWAY WALL AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE ELEVATOR SUPPLIER. THIS INCLUDES, BUT IS NOT LIMITED TO, STEEL OR WOOD STUDS, J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS AND FASTENERS.
2. SEE SHEET 1 OR 2 OF 5 FOR WALL OPTIONS.
Drywall Installation
(continued)

2 HOUR OR LESS FIRE RATED SHAFTWALL WITH FRAMES FOR CONTROL CABINET
(8.000 THROUGH 24.000 WALL THICKNESS)

1. THE MINIMUM TYPE X WALL BOARD THICKNESS SHALL BE .500 OR .625
   TYPE X OR C.
2. THE WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND J-RUNNER
   WITH THE FASTENER TYPE, LENGTHS, LOCATION AND SPACING IN
   ACCORDANCE WITH THE SPECIFIED UL DESIGN (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN).
3. FOR WALLS WITH LESS THAN 2 HOURS RATING, THE BASE LAYER MAY BE ELIMINATED.
4. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS,
   FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO
   J-RUNNER OR STUD USING A SPECIFIED STEEL SCREWS 12.000 O.C.
5. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND J-RUNNER WITH THE FASTENER
   TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN.

CHANNELS PROVIDED WITH CABINET

FACE LAYERS, .500 OR .625 TYPE X OR C
BASE LAYERS, .500 OR .625 TYPE X OR C
WALL SIZE
8.000 MINIMUM
ADJACENT TO
CONTROL CABINET

J-RUNNERS
ABOVE CABINET

CHANNEL PROVIDED WITH CONTROLLER FOR SHAFT LINER

0.190(#10) X .500 SELF
TAPPING PAN HEAD SCREWS (TYP. EACH COLUMN CLIP ABOVE 7' 0" CABINET)
Drywall Installation

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