3M™ Cross-Connect Cabinets
4220V/4230V with 3M™ Quick Connect System (QCS) Blocks
2810 pad/pole/stake mount

All Pole Mount/H Frame Mount are Walk Up Application Only

Instructions
1.0 General

1.1 These instructions provide the information necessary for the installation of the 3M™ Cross-Connect Cabinets 4220V and 4230V Series. The 3M 4220V and 4230V series cabinets are 45” tall low profile enclosures to meet the needs of right-of-way. The 3M 4220V and 4230V series cabinets hold frames that accommodate the 3M™ Quick Connect System (QCS) 2810 Blocks. The cabinets are available empty or with loaded/partially loaded frames. Slab preparation, cabinet mounting, cable preparation, splicing, jumper installation and accessories of the cabinet are covered in these instructions.

1.2 To make these instructions easier to read, abbreviated cabinet product numbers will be used throughout the steps. Use the Naming Guide to determine the proper cabinet product numbers needed for your application.

Cabinet with 3M™ Quick Connect System (QCS) 2810 Blocks:

4220V - G - QCSHC  2400 - 1200 / T - A

- Cabinet Color (Almond)
- Connector on the end of stub of the Block
- Cabinet Pair Count Provided
- Cabinet Maximum Pair Capacity
- Type of Terminal Block (QCS-2810 Block, Hi Cat twisted tail)
- Cabinet Size and Style
- Cabinet Series

*See pages 3 - 5 for specific detail.*
1.3 **3M™ Cross-Connect Cabinet 4220V DS, ES, FS and KS** — These cabinets are single-sided with a solid non-removable panel. These cabinets cannot be expanded to a double-sided cabinet due to their solid panel. They can be expanded to a double-sided cabinet by removing the shell and replacing with an appropriate size double-sided cabinet.

1.4 **3M™ Cross-Connect Cabinets 4220V - D, E, F, KF and 4230V F, KF, MF and LF** — These cabinets are single-sided with a removable panel in the back. These cabinets are ideal for expansion to double-sided cabinets.

1.5 **3M™ Cross-Connect Cabinets 4220V - DD, EE, G, K and 4230V G, K, M and L** — These cabinets are double-sided cabinets with doors on front and back.

1.6 Cabinet mounting methods. Choose and procure materials for one of the following mounting methods.

- 3M™ Mounting Ring 4256 for the 3M 4220V and 4230V cabinet (see step 5.2) for pour in place pad
- ½-13 UNC anchor inserts (4) (use with pour-in-place pad, see step 5.1(b))
- Manufactured pre-cast or fabricated pad

1.7 Additional materials needed for cabinet installation:

- Port sealing materials
- Splicing connectors
- 3M™ Scotchlok™ Shield Bond Connectors and bond per approved company practice
- Identification/location labels

1.8 Tools are needed for the cabinet installation:

- ¾” and ½” socket wrench sets
- Module/connector splicing tools
- Standard hand tools
2.0 Cabinet Overall Description

2.1 3M™ Cross-Connect Cabinet 4220V D/DD, E/EE, and ET/EET

Cabinets with 3M™ Quick Connect System (QCS) 2810 Blocks

<table>
<thead>
<tr>
<th>Cabinet Product #</th>
<th>Max. Pair Count QCS 2810</th>
<th>Max. # of Frames QCS 2810</th>
<th>Frame Number</th>
<th>Dimensions Width/Depth/Height (inches)</th>
<th>Single Sided</th>
<th>Double Sided</th>
<th>Low Profile</th>
<th>High Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>4220VDS</td>
<td>900</td>
<td>1-600 &amp; 1-300</td>
<td>QCS6 &amp; QCS3</td>
<td>26 7/8 x 13 7/8 x 44 7/8</td>
<td>X</td>
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<td>4220VDD</td>
<td>1800</td>
<td>2-600 &amp; 2-300</td>
<td>QCS6 &amp; QCS3</td>
<td>26 7/8 x 18 x 44 7/8</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>4220VES</td>
<td>1200</td>
<td>2</td>
<td>QCS6</td>
<td>33 x 13 7/8 x 44 7/8</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4220VE</td>
<td>1200</td>
<td>2</td>
<td>QCS6</td>
<td>33 x 18 x 44 7/8</td>
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<tr>
<td>4220VEE</td>
<td>2400</td>
<td>4</td>
<td>QCS6</td>
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2.2 3M™ Cross-Connect Cabinet 4220V FS/F/G, KS/KF/K 3M™ Cross-Connect Cabinet 4230V G, KF/K

Cabinets with 3M™ Quick Connect System (QCS) 2810 Blocks

<table>
<thead>
<tr>
<th>Cabinet Product #</th>
<th>Max. Pair Count QCS 2810</th>
<th>Max. # of Frames QCS 2810</th>
<th>Frame Number</th>
<th>Dimensions Width/Depth/Height (inches)</th>
<th>Single Sided</th>
<th>Double Sided</th>
<th>Low Profile</th>
<th>High Profile</th>
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</thead>
<tbody>
<tr>
<td>4220VFS</td>
<td>1800</td>
<td>3</td>
<td>QCS6</td>
<td>44 x 13 7/8 x 44 7/8</td>
<td>X</td>
<td>X</td>
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<td></td>
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<tr>
<td>4220VF</td>
<td>1800</td>
<td>3</td>
<td>QCS6</td>
<td>44 x 18 x 44 7/8</td>
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<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4220VG</td>
<td>3600</td>
<td>6</td>
<td>QCS6</td>
<td>44 x 18 x 44 7/8</td>
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<td></td>
</tr>
<tr>
<td>4220VKS</td>
<td>2700</td>
<td>3</td>
<td>QCS9K</td>
<td>44 x 13 7/8 x 60</td>
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<td>X</td>
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<td>4230VF</td>
<td>1800</td>
<td>3</td>
<td>QCS6</td>
<td>44 x 26 x 44 7/8</td>
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<td></td>
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<tr>
<td>4230VG</td>
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<td>6</td>
<td>QCS6</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>4230VKF</td>
<td>2700</td>
<td>3</td>
<td>QCS9K</td>
<td>44 x 26 x 60</td>
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<td>X</td>
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<tr>
<td>4230VK</td>
<td>5400</td>
<td>6</td>
<td>QCS9K</td>
<td>44 x 26 x 60</td>
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2.3 3M™ Cross-Connect Cabinet 4230V LF/L and MF/M

Cabinets with 3M™ Quick Connect System (QCS) 2810 Blocks
Cabinets with 3M™ Self-Strip Blocks 4320

<table>
<thead>
<tr>
<th>Cabinet Product #</th>
<th>Max. Pair Count SS 4320</th>
<th>Max. # of Frames SS 4320</th>
<th>Frame Number</th>
<th>Dimensions Width/Depth/Height (inches)</th>
<th>Single Sided</th>
<th>Double Sided</th>
<th>Low Profile</th>
<th>High Profile</th>
</tr>
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<tbody>
<tr>
<td>4230VMF</td>
<td>3000</td>
<td>5</td>
<td>SS6</td>
<td>86 x 26 x 44 7/8</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4230VM</td>
<td>6000</td>
<td>10</td>
<td>SS6</td>
<td>86 x 26 x 44 7/8</td>
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<td>X</td>
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2.4 Clearance Requirements of Cabinets

<table>
<thead>
<tr>
<th>4220V</th>
<th>DS</th>
<th>ES</th>
<th>FS/KS</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>27”</td>
<td>36 1/2”</td>
<td>44”</td>
</tr>
<tr>
<td>B</td>
<td>14”</td>
<td>14”</td>
<td>14”</td>
</tr>
<tr>
<td>C</td>
<td>22 3/4”</td>
<td>33 1/2”</td>
<td>21”</td>
</tr>
<tr>
<td>D</td>
<td>37”</td>
<td>48”</td>
<td>41”</td>
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</table>

<table>
<thead>
<tr>
<th>4220V</th>
<th>D/DD</th>
<th>E/EE</th>
<th>F/G, KF/K</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>27”</td>
<td>36 1/2”</td>
<td>44”</td>
</tr>
<tr>
<td>B</td>
<td>18”</td>
<td>18”</td>
<td>18”</td>
</tr>
<tr>
<td>C</td>
<td>22 3/4”</td>
<td>33 1/2”</td>
<td>21”</td>
</tr>
<tr>
<td>D</td>
<td>64”</td>
<td>85”</td>
<td>60”</td>
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<table>
<thead>
<tr>
<th>4230V</th>
<th>KF/K</th>
<th>LF/L</th>
<th>MF/M</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>44”</td>
<td>77”</td>
<td>86”</td>
</tr>
<tr>
<td>B</td>
<td>26”</td>
<td>26”</td>
<td>26”</td>
</tr>
<tr>
<td>C</td>
<td>21”</td>
<td>36 1/2”</td>
<td>34”</td>
</tr>
<tr>
<td>D</td>
<td>68”</td>
<td>99”</td>
<td>94”</td>
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</table>
2.5 3M™ Cross-Connect Cabinets 4220V DS/D/DD Series with 3M™ Quick Connect System (QCS) 2810 Blocks

3M™ Cross-Connect Cabinets 4220V DS/D/DD Series with 3M™ Quick Connect System (QCS) 2810 Blocks

2.6 3M™ Cross-Connect Cabinets 4220V ES/E/EE/ET/EET Series with 3M™ Quick Connect System (QCS) 2810 Blocks

3M™ Cross-Connect Cabinets 4220V ES/E/EE Series with 3M™ Quick Connect System (QCS) 2810 Blocks

2.7 3M™ Cross-Connect Cabinets 4220V FS/F/G/KFS/ KF/K and 4230V KF/K Series with 3M™ Quick Connect System (QCS) 2810 Blocks

3M™ Cross-Connect Cabinets 4220V FS/F/G/KFS and 4230V KF/K Series with 3M™ Quick Connect System (QCS) 2810 Blocks

2.8 3M™ Cross-Connect Cabinets 4230V MF/M Series with 3M™ Quick Connect System (QCS) 2810 Blocks

3M™ Frame QCS6 for use in 3M™ Cross-Connect Cabinets DS/D/DD, ES/E/EE, FS/F/G, MF/M Series

3M™ Frame QCS3 for use in 3M™ Cross-Connect Cabinets DS/D/DD Series
2.9 3M™ Quick Connect System (QCS) Frames can be ordered loaded with blocks or empty. Blocks can be terminated with 3M™ MS™ Splicing Modules or 3M™ 710 Connectors.

3.0 3M™ Accessories and Spare Parts

3.1 3M™ Chamber Covers

1. 3M™ Chamber Cover 4246V for 3M™ Quick Connect System (QCS) 2810. Covers empty frame positions in D/DD, F/G cabinets.

2. 3M™ Chamber Cover 4246V-K for 3M™ Quick Connect System (QCS) 2810. Covers empty frame positions in KF/K, LF/L cabinets.

3.2 3M™ Mounting Rings - To anchor cabinets onto the concrete slab.

1. 3M™ Mounting Ring 4256UMR-1-A for the V-DS/D/DD/ES/SVE/E/EE/ET/EET Cabinets

2. 3M™ Mounting Ring 4256UMR-3-A for the V - FS/KS/VF/VG Cabinet

3. 3M™ Mounting Ring 4256UMR-4-A for the V - KF/K/MF/M Cabinet

Note: Dimensions shown on page 10.
3.3 3M™ Port Kits

1. 3M™ Port Kit 4297-2
   4” diameter

2. 3M™ Port Kit 4297-3
   3 1/4” diameter

3. 3M™ Flexible Port Entry Kit 4297-FPE
   
   Note: Expanding foam required.

3.4 3M™ Flex Port Kit 4298 - Provides base isolation with the 3M™ Port Kit 4297

3.5 3M™ Quick Connect System (QCS) 2810

3.6 Caps for 3M™ Quick Connect System (QCS) 2810

3.7 Priority Caps for 3M™ Quick Connect System (QCS) 2810

3.8 3M™ Spacer Block for 3M™ Quick Connect System (QCS) 2810

3.9 3M™ Jumper Wire Spools
   - 4069HT2 - 300' 22 AWG blue/violet jumper wire
   - 4069HT4 - 300' 24 AWG blue/violet jumper wire

3.10 3M™ Split Access Panel Kit
4.0 3M™ Tools and Test Equipment

4.1 3M™ Splice Head 4041. For splicing 3M™ MS™ Modules.

4.2 3M™ 710 Uni-Presser 25-Pair Cutter Presser. For splicing 3M™ 710 Connectors.

4.3 3M™ Single Pair Test Probe 2827

4.4 3M™ Single Pair Test Probe 2827 and Dish

5.0 3M™ Pole Mount Cabinet 4220VDSPM (Walk-up Application Only)

The 3M™ Pole Mount Cabinet 4220VDSPM is used specifically for “Walk Up” pole mount applications. It comes loaded with up to 900 pairs of 3M™ Quick Connect System (QCS) 2810 Blocks. The termination blocks can be provided with either 3M™ MS™ Modules or 3M™ 710 Connectors.

Instructions for Running Jumpers, Priority Cap Installation, and Test Probe Use are on the inside of the cabinet door.

5.1 Cabinet Size and Pair Count for 3M™ Quick Connect System (QCS) 2810 Blocks

<table>
<thead>
<tr>
<th>Cabinet Size</th>
<th>Pair Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 7/8&quot;</td>
<td>900</td>
</tr>
<tr>
<td>41 3/4&quot;</td>
<td>900</td>
</tr>
<tr>
<td>26 3/4&quot;</td>
<td>900</td>
</tr>
</tbody>
</table>

3M™ Pole Mount Cabinet 4220VDSPM - Top View

3M™ Pole Mount Cabinet 4220VDSPM / 900 Pair

Loaded with 3M™ Quick Connect System (QCS) 2810 Blocks
44220VDSPM cabinet
900/900
5.2 Parts Identification

a. 3M™ Pole Mount Cabinet 4220VDSPM

- Top access cover
- Wire spool
- Test probe with holder
- 3M™ 2810 Block Assembly
- Jumper wireway
- Front access cover
- Cabinet
- Pole
- 3M top pole mount bracket
- 3M™ Bottom Pole Mount Bracket
- Cable ground bar
5.3 Accessories

- 3M™ Jumper Wire Spools
  - 4069HT2 - 300 ft. 22 AWG blue/violet jumper wire
  - 4069HT4 - 300 ft. 24 AWG blue/violet jumper wire
- 3M™ Sealant Boxes 4075-S or 4077 Series
- 3M™ Priority Cap 2810-P

5.4 3M™ Test Probes

- 3M™ Quick Connect System (QCS) 2810 Single-Pair Probe 2827

5.5 Cabinet Mounting

1. Attach the Pole Mounting Brackets
   a. 3M™ Cabinets 4220 VDSPM Top Bracket Mounting
      - Open cabinet door, loosen frame retaining screws and remove the frames. Attach the top pole mount bracket 60" from the ground level to the top of the extension arm. Follow your company’s “pole mounting hardware” practice.
      - When required, adjust this dimension to meet your company practice or local conditions.

2. Mounting the Cabinet
   a. Attach a sling to the lifting brackets on the top of the cabinet and lift it into position with a boom truck. The top bracket supports the cabinet’s hanging weight.

3. Attach the cable to the pole per your company’s practice.
4. Place the 4 gland retaining ¼-20 X 1" bolts in to the holes and slide the bolt retaining clips onto the flange trapping the bolt. Place the split gland inside the cabinet and over the bolts and attach with the flat washer, lock washer and nut.

5.6 Cable Preparation

1. Open cabinet door.

2. See Section 8 for port sealing method. Move the cable into the cabinet.

3. Remove sheath according to the chart and drawing.
   a. Extend cable sheath inside cabinet to the first tie/cable strain relief bar.
   b. Leave free conductor length for splicing.

<table>
<thead>
<tr>
<th>Cabinets</th>
<th>Free Conductor Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M™ Cross-Connect Cabinet 4220VDSPM</td>
<td>60&quot;</td>
</tr>
</tbody>
</table>

3. Install shield bond connector(s) and bond strap(s) per your company practice. Identify cable binder groups. Secure cable(s) to bar.

4. Attach bonding strap(s) to bond plate. Record cable identification on cable bond label.
5.7 Cable Port Sealing

To seal the cable ports of the cabinets use 3M™ Plastic Split Gland Port 4295-3 (4295-2 plastic split gland port and bread pan are also available). Follow your company's procedure for which type to use. Follow the instructions included with each kit for the sealing of a cabinet. The gland and port dimensions are the maximum cable diameter that fit the sealing methods. Unused openings are to have sealed cover plates. After the cable is installed, sealed and secured, attach the bottom cover to the underside of the base with 4 self-tapping screws included with kit.

1. 3M Plastic Split Gland Kits
   a. The opening of the 4295-3 Flanged Gland Kit is 3 3/8”.
   b. The opening of the 4295-2 Flanged Gland Kit is 4”.

Cable not shown
5.8 Splicing

1. 3M™ Pole Mount Cabinets 4220VDSPM

   a. Replace the front access cover, top access cover and bottom frame support. Replace the frames and secure the frames in the open position.

   b. Separate and match the cable(s) groups in 100 pair bundles with the blocks in the hinge column first.

   c. Tie the groups to the frame holes by the blocks. Make sure the groups won’t be pinched when the frame is closed.

   d. Mount a splice rig to a convenient surface and splice the cable and stubs according to your company practice.

   e. Continue tying and splicing the remaining columns of blocks to the cabinet.

   f. After the splicing is complete, close the frame and check for possible wire pinching.

   **Note:** If using dry 3M™ MS™ Modules, install 3M™ Sealant Boxes 4075-S and 4077 Series.

   **Note:** When using 3M™ MS™ Modules, 3M Sealant Boxes 4075-S, 4077 or 3M™ 710 Connectors containing sealants, carefully follow safety, health and environmental information on appropriate Safety Data Sheet.

   g. Skip to section 12.0 - Identification of 3M™ Quick Connect System (QCS) 2810 Blocks Using Number Labels

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6.0 3M™ Cross-Connect Cabinet 4220VDS Mounting with Stakes

**Note:** Mounting on a pad is recommended as it provides the greatest stability for the cabinet. If you are stake mounting the cabinet extra care should be taken when leveling the cabinet.

6.1 Carefully remove dirt from around the cables per Table.

<table>
<thead>
<tr>
<th>Cabinet</th>
<th>Length</th>
<th>Width</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M™ Cross-Connect Cabinet 4220 VDS</td>
<td>45”</td>
<td>45”</td>
<td>16”</td>
</tr>
</tbody>
</table>

6.2 Fill excavation with coarse gravel and tamp to within 2” of ground level.

6.3 Open the front doors and remove the front access cover.

6.4 Place the cabinet over the cables and center on the excavation.

6.5 The stakes will be located on the outside of the cabinet. Mark the stake location directly in line with the two knock outs in the end walls. Position the stakes so the smooth face is adjacent to the cabinet wall.

6.6 Move the cabinet away from the stakes and drive the stakes into the ground until the top ends are 5” above the ground and level with each other. Protect the top of the stake with a wood block while driving.

6.7 Position the cabinet next to the stakes and attach with four 5/8” carriage bolts, flat washers, lock washers and nuts. The head of the carriage bolt must be to the outside. Hold cabinet in a vertical position and tighten nuts.

6.8 Route the cables to the inside of the cabinet. Replace the front access cover.

6.9 Fill the excavation with coarse gravel to ground level and tamp.

6.10 Skip to section 10.0 - Shield Bonding.
7.0 Pour in Place Concrete Mounting Pads for Cabinets

7.1 3M™ Mounting Rings are recommended for the pour in place concrete mounting pad. This gives the cabinet support and properly locates the anchor bolts.

<table>
<thead>
<tr>
<th>Figure</th>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>Used With Cabinets</th>
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<tbody>
<tr>
<td>1</td>
<td>4256UMR-1</td>
<td>40</td>
<td>20</td>
<td>VD/VDD, VDS, VE/VEE, VES/SVE</td>
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<td>4256UMR-3</td>
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<td>21</td>
<td>VF/VG, VFS, VKS</td>
</tr>
<tr>
<td>2</td>
<td>4256UMR-4</td>
<td>61</td>
<td>27 1/2</td>
<td>VK/VKF, VM/VMF</td>
</tr>
</tbody>
</table>

Figure 1

Figure 2
7.2 Pad Preparation

**Note:** Follow your company’s recommended procedures or these pad dimensions and guidelines:

1. Larger pads are for the convenience of the craftsmen and to control vegetation around the cabinet.
2. Smaller pads should extend six (6) inches around the mounting ring. Smaller pads (front to back) will require increased thickness to support cabinet.
3. Reinforcing concrete is recommended.

1. **3M™ Mounting Ring**
   a. Prepare ground surface at cabinet location and build concrete form to the dimensions of the drawing.
   b. Keep the cable entry area(s) of pad clear of concrete.
   c. Place cable duct(s) aligned with cable duct location markers on the mounting ring.
   d. Place leveling stakes per drawing dimensions. Tops of stakes must be level with each other and with the form.
   e. Attach the anchors to the bottom of the mounting ring with bolts (anchors and bolts provided with ring).

   **Note:** Anchors can be located for either internal or external attachment to the cabinet.

   **Note:** Side of mounting ring can be cut open for placement around cable for rehab applications.

   f. Set mounting ring on leveling stakes and make sure ring is level with concrete form. Secure to leveling stakes with four nails.
   g. Pour concrete around mounting ring until concrete is level with top of ring. Inspect for good concrete flow around anchors.

   **Note:** Optional procedure is to pour and level concrete. Then press mounting ring into soft concrete until it is flush with top surface.

   h. Recommended pad dimensions:

   **3M™ Mounting Ring**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Overall Pad W x D</th>
<th>Locations of Leveling Stakes</th>
<th>Cable Ducts/Sweeps Entry Location</th>
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<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>4256UMR-1</td>
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<td>75&quot;</td>
<td>29&quot;</td>
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<tr>
<td>4256UMR-4</td>
<td>74&quot;</td>
<td>75&quot;</td>
<td>50&quot;</td>
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</table>

3M™ Mounting Ring 4256 F/G/K/M/L shown
2. Using 3M™ Anchor Inserts

a. Prepare ground surface at cabinet location and build concrete form to the dimensions of the drawing.
b. Keep the cable entry area of pad clear of concrete.
c. Pour concrete, making sure surface is level.
d. Place anchor inserts at dimensions of drawings. Select internal or external attachment to cabinet.

<table>
<thead>
<tr>
<th>3M™ Cabinet Model Number</th>
<th>Overall Pad W x D</th>
<th>Cable Ducts/Sweeps Entry Location</th>
<th>Concrete Anchor Location</th>
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<tbody>
<tr>
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<td>G     H     J  K</td>
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<td>19.78&quot; 34.44&quot; 24.87&quot; 25.26&quot;</td>
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Note: Depth equals 4".
8.0 3M™ Cross-Connect Cabinet Installation

8.1 Install feeder and distribution cables. Provide cable length:

1. 4220V D/DD, E/EE, - 12’ above pad
2. 4220V ET/EET - 14’ above pad
3. 4220V/4230V F/G, MF/M - 16’ above pad
4. 4220V/4230V KF/K/KT - 18’ above pad
5. 4230V LF/L - 22’ above pad

8.2 Position cabinet on mounting pad.

1. Single-sided cabinet: loosen the screws and remove back panel.
2. Double-sided cabinet: open rear doors and remove frames, if factory installed.

*Note: Remove all frames to minimize weight.*

3. Remove the top and front access panels, front cable port plate and lower frame support.

*Note: If a lift boom truck is used, reposition the two side lifting straps for attachment of a sling. Attach lift device (slings) to cabinet lift straps.*

4. Position the cabinet onto the mounting points of the ring or anchors. Align the cables with cable ports.

8.3 Secure the cabinet to the pad. The cabinets have two sets of mounting holes, external and internal. Refer to your company practice for which one to use.

1. **External mounting** uses the mounting lugs provided with the cabinet. Mounting lugs, ½” bolts and shims are in the parts bag included with the cabinet.

![Shim and Mounting Lug](image1)

2. **Internal mounting** uses the ½” bolts provided with the cabinet. The internal mounting holes are located on the inside flanged portion of the base.

![Internal Mount Position](image2)

3. For proper door clearance and operation, the cabinet doors must be square. Shims are provided for this purpose.

8.4 When the cabinet is in place, remove the lifting straps bolted to the sides of the cabinet. Replace the bolts with the carriage bolt heads to the outside of the cabinet.

8.5 Identify the cabinet (street address) on street side door according to your company procedure.
8.6 Reverse the doors and removable back panel to install a 3M™ Cross-Connect Cabinet 4220 D, E, F, KF, KT or 4230 MF or LF against a wall or obstruction.

*Note: Mounting pad requirements are the same.*

1. Remove the doors with the hinges and the door latching system from the front of the cabinet.
2. Remove the back panel and its supports and attach them to the front of the cabinet using the same hardware.
3. Attach the door latching system and doors with the hinges to the back of the cabinet. The base access panel should be on the door side.
4. Mount the cabinet and do all work through the doors and base access panel.

*Note: These cabinets are intended for OSP (Outside Plant) applications only. The cabinets shall not contact the exterior wall of any building.*

9.0 Cable Port Sealing

Six methods are available to seal the cabinet cable ports:

- Method 1 - Sealing Tape collar
- Method 2 - Foam collar
- Method 3 - 3M™ Flexible Port Entry FPE Kit 4297
- Method 4 - Sleeve/Compound
- Method 5 - Sleeve/Compound/Moisture Block
- Method 6 - 3M™ Flex Port Kit 4298 (wrap around)

9.1 Method 1 – Sealing Tape Collar

**Materials required:**

- 1 ½ x ⅛–inch sealant tape

1. Remove cable sheath.
2. Clean and scuff cable in location of cable ports.
3. Install shield connectors and attach bond straps, making sure that the straps will reach the bond plate.
4. Wrap sealing tape around the cable. Build diameter to ¼” larger than inner diameter of cable port.
5. Replace top access panel using supplied fasteners and self-tapping screws.
6. Install cable ports around the cable with sealing tape.
7. Replace front access panel using supplied fasteners.
8. Attach foam seal across front of cabinet.
9.2 Method 2 – Foam Collar

**Materials required:**
- 3M™ Foam Tape 4430
- 3M™ Scotchcast™ Pedestal Base Sealant Kit 4411-B

1. Install the base cover plate(s).
2. Replace top access panel using supplied fasteners and self-tapping screws.
3. Replace the front access panel using supplied fasteners.
4. Attach foam seal across the front of the cabinet.
5. Wrap 3M foam tape 4430 around the cables at the top of the ports. Make it larger than the inside diameter of the ports.
6. Slide the tape bundle down into the port openings. Leave ½” of space between the tape and the top of the ports for foam expansion. Tighten all bolts.
7. Mix the 3M Scotchcast Pedestal Base Sealant Kit 4411-B according to instructions provided.

**Note:** Carefully follow safety, health and environmental information given on product label or the Safety Data Sheet for the compound being used.

8. Pour the 3M Scotchcast Pedestal Base Sealant 4411-B (expanding foam) ⅛” thick on top of the foam tape. Ensure that the material surrounds the cables and creates a seal. Allow 10 minutes for the foam to harden before moving cables.

9.3 Method 3 – 3M™ Flexible Port Entry Kit 4297-FPE

**Materials required:**
- 3M™ Flexible Port Entry Kit 4297-FPE
- 3M™ Scotchcast™ Pedestal Base Sealant Kit 4411-B

**Note:** This option is used when several cables enter into the cabinet. It uses a large, open cable port and is sealed with 3M™ Foam Tape 4430 and 3M Scotchcast Pedestal Base Sealant 4411-B (expanding foam).

1. Replace the top access panel using supplied fasteners and self-tapping screws.
2. Replace the front access panel using supplied fasteners.
3. Attach foam seal across front of cabinet.
4. Remove factory-installed black ports from the cabinet.
5. Remove the front plate from the flexible port entry kit. Install the port body onto the threaded studs.
6. Place cables into the port and install the front plate. Wrap each cable with at least one layer of foam tape. Leave ½” of space between the top of the tape and top of the port. Install base cover plate. Tighten all bolts.

7. Mix the 3M™ Scotchcast™ Pedestal Base Sealant 4411-B (expanding foam) according to manufacturer’s instructions.

**Note:** Carefully follow safety, health and environmental information given on product label or the Safety Data Sheet for the compound being used.

8. Pour the 3M Scotchcast Pedestal Base Sealant 4411-B (expanding foam) ½” thick on top of the foam tape and ensure that the material surrounds the cables and creates a seal. Allow space for foam to expand.

9. Allow 3M Scotchcast Pedestal Base Sealant 4411-B to harden, usually 10 minutes, then continue with splicing.

9.4 Method 4 – Sleeve/Compound

1. Slide the sleeve(s) included with cabinet over new end of cables.

2. Install the sleeve to the cable and black cable port as shown.

3. Fill sleeve with 3M™ High Gel Re-enterable Encapsulant 8882 or 3M™ Scotchcast™ Encapsulating and Blocking Compound 4407.

**Note:** Carefully follow safety, health and environmental information on the product label or Material Data Sheet for the compound being used.

4. Replace the top access panel using the supplied fasteners.

5. Replace the front access panel using the supplied fasteners.

6. Attach foam seal across front of the cabinet.

9.5 Method 5 – Sleeve/Compound/Moisture Block

1. Slide the sleeve(s) included with the cabinet over new end of cables.

2. Install the sleeve to the cable and black cable port as shown.
3. 3M™ High Gel Re-enterable Encapsulant 8882 or 3M™ Scotchcast™ Encapsulating and Blocking Compound 4407.

**Note:** Carefully follow safety, health and environmental information on the product label or Safety Data Sheet for the compound being used.

4. Replace the top access panel using the supplied fasteners.

5. Replace the front access panel using the supplied fasteners.

6. Attach foam seal across front of cabinet.

9.6 Method 6 – 3M™ Flex Port Kit 4298 (wrap around)

1. Wrap the 3M Flex Port 4298 sleeve around the cable and press side seam together.

2. Fold over black cable port and secure with a cable tie.

3. Secure to cable with a cable tie.

**Note:** This method provides a simple moisture barrier between the ground and the cabinet interior.

**Note:** The 3M Flex Port Kit 4298 can also be used for Method 4 and Method 5.

4. Replace the top access panel using supplied fasteners and self-tapping screws.

5. Replace the front access panel using supplied fasteners.

6. Attach foam seal across front of the cabinet.

10.0 Shield Bonding

10.1 Install 3M™ Scotchlok™ Shield Bond Connectors according to your company’s practice. Attach bond straps between the shield bond connector(s) and the cabinet bond plate.

10.2 Identify cable bond straps on bond log label in the cabinet.

11.0 Cable Termination to the 3M™ Quick Connect System 2810 Blocks

11.1 Break feeder and distribution field cables into 100-pair groups. Route the groups up to the tie bar and across to the appropriate frame location according to the cross-connect block counts in Section 9.2.
11.2 Determine feeder/distribution layout per illustrations below and on the next page.

3M™ Cross-Connect Cabinets 4220V DS/D/DD Series with 3M™ Quick Connect System (QCS) 2810 Blocks

3M™ Cross-Connect Cabinets 4220V ES/EE/ET/EET Series with 3M™ Quick Connect System (QCS) 2810 Blocks

3M™ Cross-Connect Cabinets 4220V FS/F/G/KFS/KF/K and 4230V KF/K Series with 3M™ Quick Connect System (QCS) 2810 Blocks

*Note: Drawings are not to scale.*
3M™ Cross-Connect Cabinets 4230V MF/M Series with 3M™ Quick Connect System (QCS) 2810 Blocks

Note: Drawings are not to scale.
11.3 Installing the frames into the cabinet.

1. Double-sided cabinets: Install the frames on one side and splice them. Install the other side and splice. See Section 9.6.
2. Rest the frames on bottom pivots.
3. Attach the safety cable to frame.

Note: 3M™ Cable Frame Support Kit 4320 available in 28” and 38” lengths. Contact a 3M sales representative for more information. 3M ID 80-6113-2605-1

11.4 Splice frame modules to the field cable.

1. Set up a splicing head and supporting system.
2. Position the splice head so that connections are made in staggered groups for maximum cable length.
3. Splice frames to the field cable per your company procedure.
4. Cable tie groups, creating adequate slack to lower frames.

11.5 Cable slack storage in the frame (optional)

1. Dress field cable to complete an up and down loop of conductors plus length to splice to the frame tails. Fold and bundle these groups so that they will tuck into the space behind the frames/blocks. Splice the field conductors to the block tails.
2. Use the holes in the back of the frame to secure the groups in place. Make sure to maintain the slack so the frame can be lowered from the cabinet. Secure the group to the bottom of the frame.

Note: If you are using non-sealed 3M™ MS™ Modules, install 3M™ Sealant Boxes 4075 or 4077 Series to them.

Note: Carefully follow safety, health and environmental information on sealant box label or Safety Data Sheet.
11.6 Splicing the frames on the second side of a double-sided cabinet.

1. After the first side of the cabinet is completely spliced, install one frame in the other side of the cabinet. Rest the frame on the pivots and attach the safety cable to the frame.

2. Mount the splice head alongside the frame. Splice the field conductors and block tails with the same method as the other frame splices.

3. Complete the splices and bundle and store them following your company procedures.

4. Repeat this procedure with the middle frame.

5. Support the frame close to the last frame position. Do not install it into the cabinet. Keep it off the ground to prevent damage.

6. Untie the block tails from the frame. Lay it on the metal side. Bring the tails to the cabinet.

7. Mount the splice head in the cabinet so the splices can be bundled and stored in the same method as the frames.

8. Splice the field conductors and block tails following your company practice.

9. Complete the splicing and install the frame. Attach the safety cable to the frame.

10. Bundle the splices in the frame the same as the other frames.

11. Secure all frames in the upright position.

12.3 Align the proper number, such as 1-11-21, etc., with the block pads on left and press into place. Align numbers, such as 10-20-30, etc. with right side block pads and press into place. Remove the top liner of the numbers.

12.4 Fill in Binding Post Log on the cabinet door with the cable pair count information.

13.0 Jumper Wire Installation and Routing of the 3M™ Quick Connect System (QCS) 2810 Blocks

13.1 Open feeder pair jumper cap by pushing up on latch and rotating up. Insert jumper wire ends A (tip) left and B (ring) right into wire openings in cap, making sure they are inserted all the way to the back of the cap.

13.2 While holding the jumper wires in place, close the cap and press to snap the latch firmly into place.
13.3 Route the jumper wires to distribution pair through wire loops on block ends and through vertical and horizontal wireways. Cut jumper wires to appropriate length, leaving at least 5 cm (2 in.) of slack.

13.4 Terminate the jumper wires to the distribution pair by repeating the procedure described in steps 15.1 and 15.2.

13.5 Terminate additional jumper wires by repeating the above procedure. To remove jumper wires, open the cap and pull wires straight out from block.

14.0 Accessories Installation of the 3M™ Quick Connect System (QCS) 2810 Blocks

14.1 Plug the 3M™ Single Pair Test Probe 2827 into the cap of the pair being tested, with the black lead to the left and the red lead to the right.

14.2 To install 3M™ Priority Caps, place over the jumper cap of the pair to be marked and push it into place. Latching is indicated by an audible snap.
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