

## Installing a Model 6020 FM Antenna

Installation of the Shively Labs Model 6020 antenna is straightforward. This instruction sheet contains all the information you will need. If you have any problems, call Shively and talk with your Sales representative.

### Check Shipment.

Before beginning, be sure to check your shipment to be sure all the parts are there. The parts are listed on the installation drawing.

### Installation.

#### **DANGER!**

Whenever personnel are on the tower in the area of the antenna, shut off the signal and lock it off so that it cannot be turned on accidentally. RF emissions at close range are hazardous.

#### **CAUTION**

Do not overtighten hardware and flange connections. Overtightening them may damage components or affect your signal. See Table 1 below.

Do not alter the length of the horizontal member from the mounting pole to the arms (29-13/16 inches shown in Figure 2). Doing so will affect tuning and antenna performance.

- a. Lay the system out on the ground and verify fit of antenna, mounting brackets and feed system components. Inspect connection points for damage.
- b. Mark the tower at the location where the antenna bay will be mounted, in accordance with the installation drawing. Watch for tower components that might interfere with your installation. Verify this location is free of tower paint and that a good ground contact will be made between the mount and the tower.
- c. Assemble the antenna bay (Figure 3).

### NOTES

Your antenna may vary slightly from the illustrations. For example, assembly may require nuts and bolts in bolt holes, or nuts on studs. Also, your antenna may include a pinch plate clamp for mounting, rather than the U-bolts shown.

Arm "A" and arm "B" have different hole patterns to prevent confusion, and are different lengths (see Figure 2 on page 2). Be sure to install them correctly - then be sure to install the antenna with arm "A" pointing upward.

- d. Using the hardware provided, attach the antenna arms to the mounting stubs. Tighten the nuts to the torque specifications shown in Table 1.

Table 1. Torque Specifications

Bolt Size	Torque	Bolt Size	Torque
1/4-20 (7/8" line)	7 ft-lb (9 N-m)	6 mm	5 ft-lb (7.7 N-m)
5/16-18 (1-5/8" line)	12 ft-lb (16 N-m)	10 mm	27 ft-lb (37 N-m)
3/8-16 (3-1/8" line & up)	21 ft-lb (28 N-m)		

Document No. ts-6020\_installation (111123)

A Division of Howell Laboratories, Inc., P. O. Box 389, Bridgton, Maine 04009 USA  
 (207) 647-3327 1-888-SHIVELY Fax: (207)647-8273  
 An Employee-Owned Company

www.shively.com  
 sales@shively.com  
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Figure 1.  
Model 6020 FM antenna bay

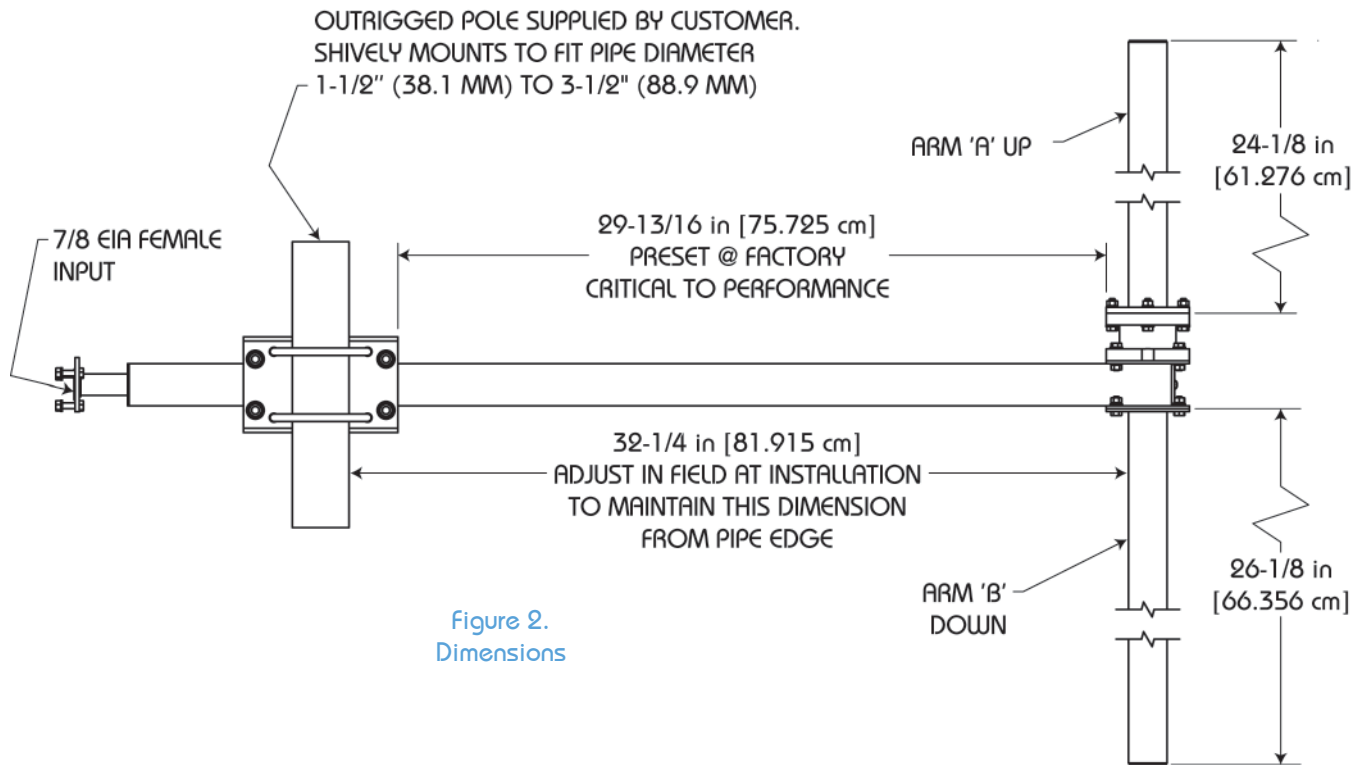


Figure 2.  
Dimensions

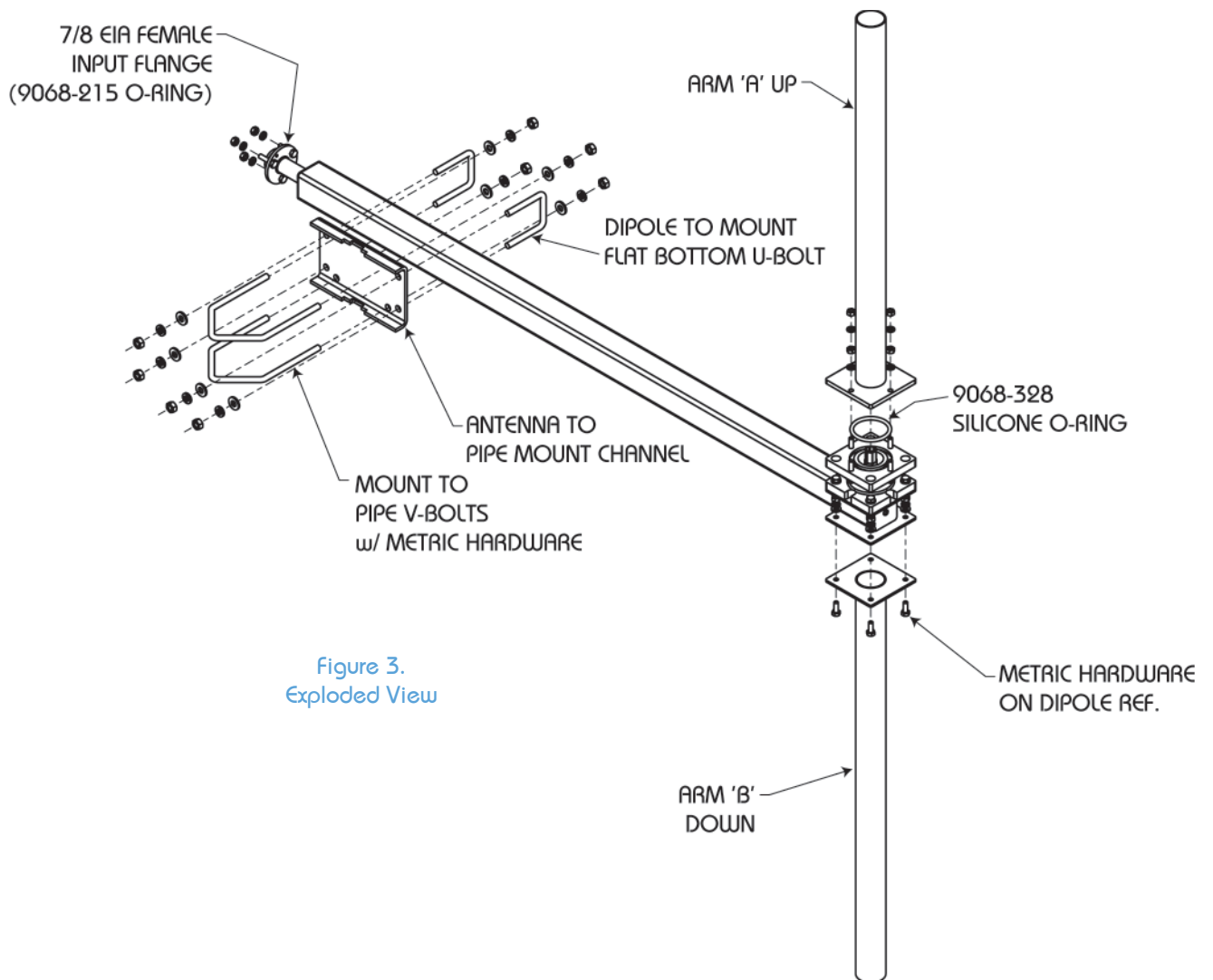


Figure 3.  
Exploded View

## CAUTION

Before attaching the mounts to the tower, ensure good electrical contact in accordance with (b) above. If you do not, the antenna may generate unwanted electrical signals.

- e. Mount the antenna bay on the tower at the location you marked (step a).  
Semiflex cable has a minimum bending radius, specified by the manufacturer. Bending it too sharply will damage the cable. See Shively Labs technical bulletin "tb-coax installation" for installation guidelines.
- f. Be sure the tower transmission cable flange contains an inner conductor connector. Install a -215 O-ring in the flange. Carefully insert the inner conductor connector into the inner conductor in the antenna, then attach the cable flange to the flange at the rear of the antenna bay as shown in the installation drawing. Tighten the flange bolts to the torque specifications shown in Table 1.  
Improperly installed feedlines can be damaged from wind, ice, arcing or inadvertently damaged by climbers.
- g. DO NOT COIL any excess cable. Dress up any excess cable and tie-wrap it to the tower leg, as shown in Figure 4, to prevent wind damage to the cable or the antenna. When feasible, route the cables to take advantage of shielding from tower members to minimize added windload.

## NOTE

The Model 6020-1 does not require pressurization or purging. The gore vent plug may be replaced to allow the unit to hold pressure.

## Startup

When all personnel are clear of the tower, apply a low-power signal to the antenna and read the VSWR. The VSWR should be below 1.3: 1. If it is not, call Shively and speak with a designer or Sales.

## Operation

Once the antenna has been installed and VSWR has been confirmed, simply apply the transmitter signal. Don't exceed the rated power of the antenna.

## Troubleshooting

**Broad Spectrum RF Noise:** This indicates that some component is not in good electrical contact with the tower. Make sure mounts are tight, that tower paint has been removed from under the mounts, and that components of other systems are likewise in good contact with the tower.

**High VSWR:** This is caused by any factor that changes the impedance match between the antenna and the transmitter. Look for:

- Defective RF connector. Make sure connectors are in good shape, and that center pins are not bent over.
- Damage to any antenna components, especially the feed strap on each antenna.
- Incorrect assembly. Is a radiator upside-down, or the bay spacing not as shown in the installation drawing?
- Paint on radiators.
- Interference from other tower components, especially components broken by wind or ice.

**Change in Coverage:** This may be caused by the same factors that can cause high VSWR. Look for VSWR changes as well.

Do recognize, however, that apparent changes in coverage may be due to subjective factors or faults of the receiving equipment. Before doing more than checking the VSWR, be sure that an actual coverage change has occurred.

## Maintenance Recommendations

### DANGER!

Whenever personnel are on the tower in the area of the antenna, shut off the signal and lock it off so that it cannot be turned on accidentally. RF emissions at close range are hazardous.

**Log:** We recommend that you keep a log of VSWR readings and any other performance notes and maintenance history for your antenna. Such a log can be invaluable for troubleshooting.

**Inspection:** Whenever a rigger is on the tower for any reason, it is a good idea to have him check your antenna for general condition, looseness of connectors and mounts, and electrical damage.

**Paint:** The radiator should never be painted; this will affect the VSWR.

**Return Policy:** When returning any material to the factory, be sure to call your salesperson and obtain an returned material authorization (RMA) number first. Your material may not be recognized and may be refused if you don't do this.

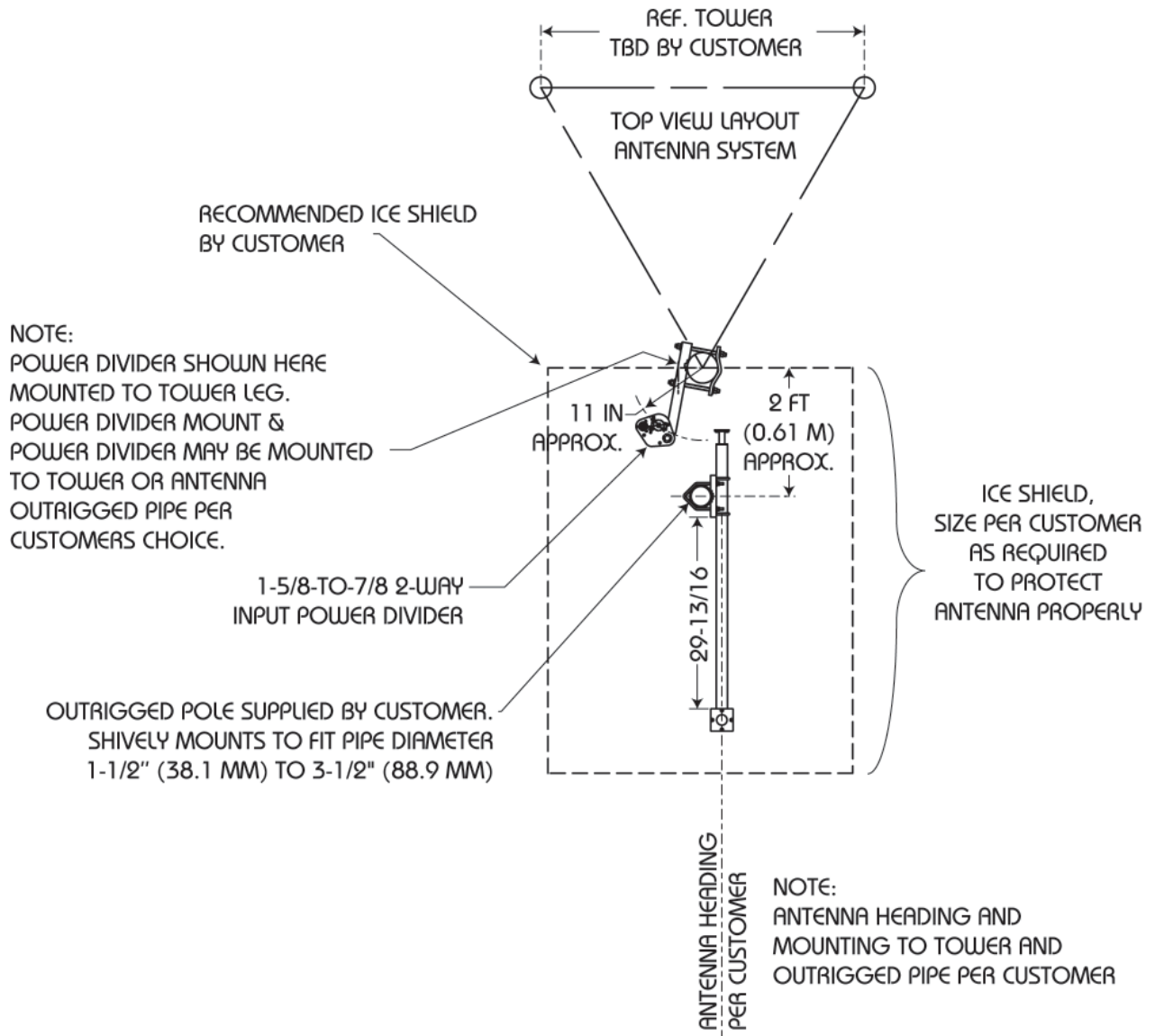


Figure 4. Top view

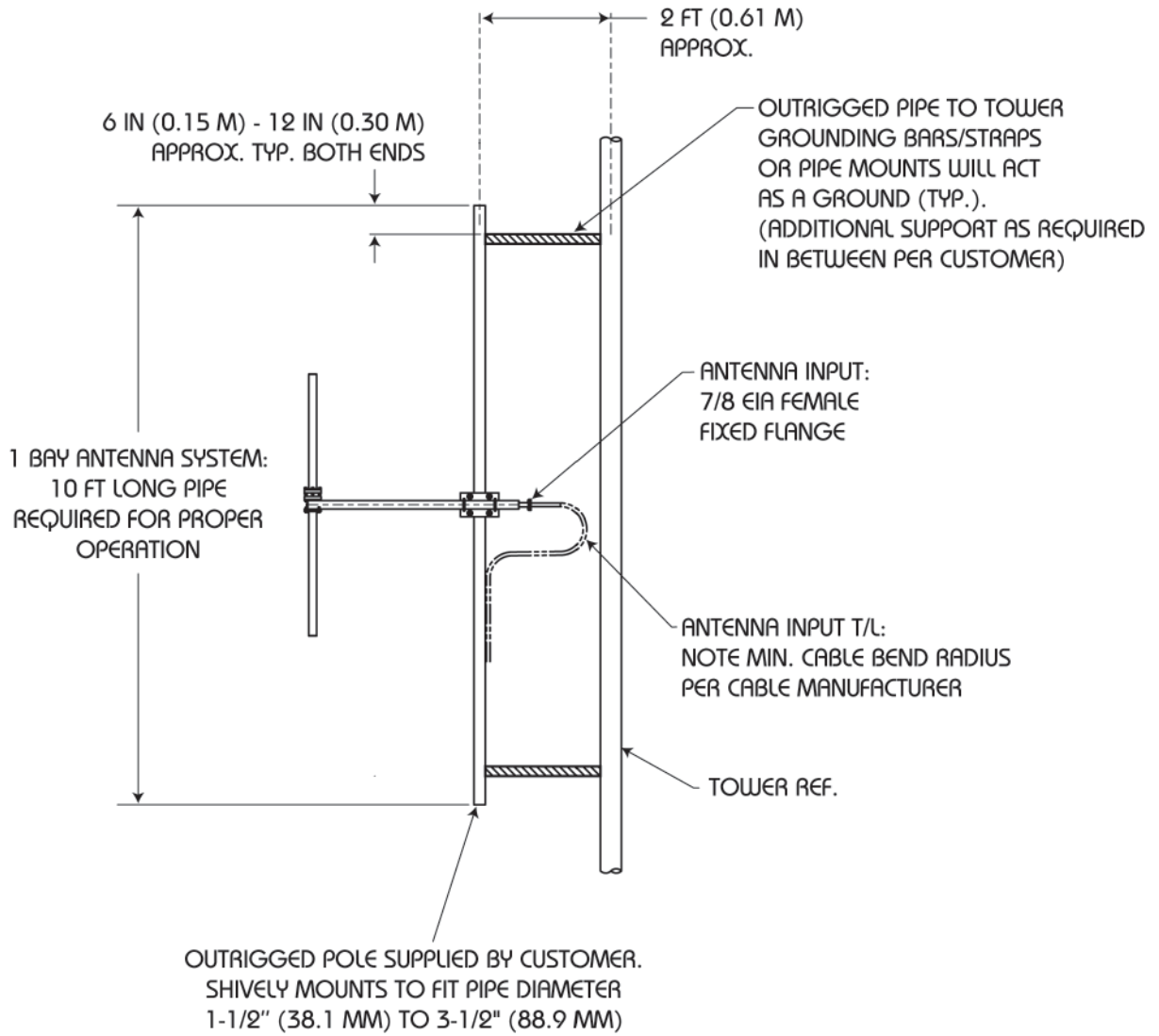


Figure 5. Single-Bay Installation

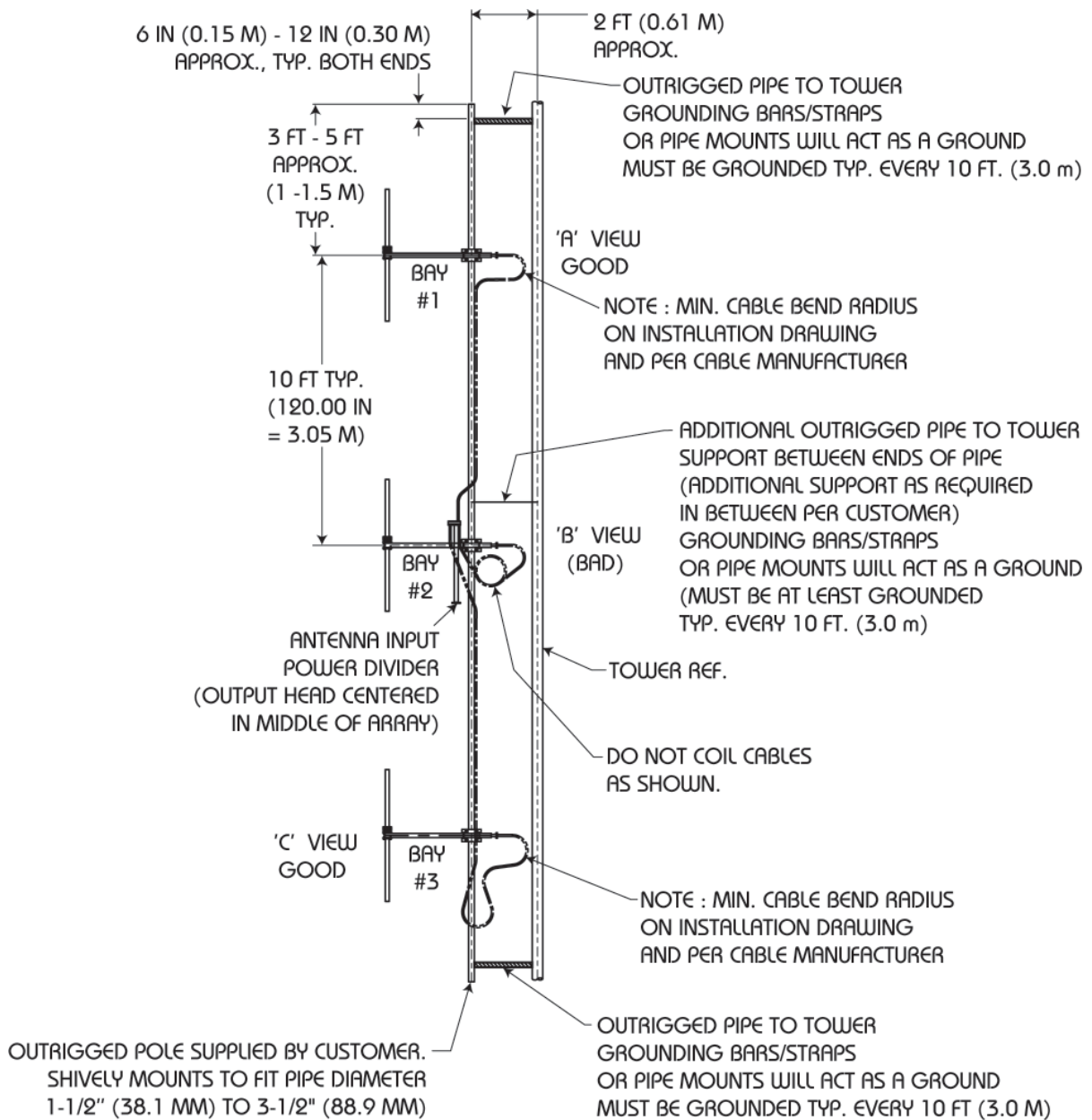


Figure 6. Multi-Bay Installation