

Motus Antenna Mounting and Grounding Guidelines for the Fish and Wildlife Service Tower Locations

Overview

The following guidelines have been provided for mounting the Motus bird tracking antennas at fish and wildlife tower sites. Here are some of the reasons for this guideline:

- Due to the large size of the Motus antennas, and the smaller towers that they are mounted onto.
- Incorrectly mounting antenna's onto other FWS existing antenna's thereby causing irreparable damage to FWS equipment.
- Safety concerns about FWS Personnel installing antennas and cabling without safety harnesses or being tower certified to do this work.
- Not correctly grounding or securing cabling on towers, as per department of the interior specifications for following Motorola R56 standards

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1). Which Personnel are Cleared to do this work

A). If the tower needs to be climbed, then the FWS personnel must be tower climber certified. This training covers the following standards, OSHA, ASME, ANSI Z359, ANSI Z490, ANSI 10.48, TIA regulations-Fall Protection. Understanding the use of Lanyards, Life Lines, Roper Grabs, and Ladder Climbing Systems Knots & Hitches, Rigging, identify, Inspect, and Perform safety administration.

B). If the FWS or other government personnel do not have the necessary certification, and a fiberglass extension ladder that is in good working order is not available, and it is not cost effective or possible to get a boom lift, then the smartest option is to hire a Tower installation contractor who has the personnel that are certified, and has all the necessary insurance.



**Tower Climbing
Harness**

2). Using Ladders and or Boom Lifts

A). Ladders have a rating system that lists the amount of weight you can use going up it, this includes tools, materials and your weight plus clothing.

Here is the OSHA site link that covers ladders

<https://www.osha.gov/laws-regs/standardinterpretations/1998-06-11>

B). To operate a boom lift you have to have a training course to get certified. Here is a video on operating a boom lift.

<https://www.youtube.com/watch?v=OngCj-PbabI>



3). Parts list to Build Mounting Platforms

Parts Needed to be supplied by the Contractor for the Horizontal Motus Antenna Mount

QTY	DESCRIPTION
1	10ft long x 1-5/8" deep 12-gauge half slotted galvanized unistrut channel
2	1" x 10ft. GRC rigid conduit
1	3/8" x 10ft. galvanized allthread rod
4	2" wide with 3/8" hole galvanized Fender washers
2	3/8" x 3" galvanized hex head bolts
12	3/8" galvanized lock washers
12	3/8" galvanized nuts
2	2 hole 90 degree galvanized strut bracket
4	1" universal strut pipe clamps, with bolt and nut
4	U-bolt, 3/8" x 4" for 1.1/4" to 1.5" galvanized/ zinc plated
1	Rohn AS455G Accesory Shelf
3	Cross-pipe brackets for small pipe. U-bolts must handle 1" to 1.5" diameter pipe. 3 Star Inc. has these type C-MT Antenna Mast Pipe Crossover Plate Kit

4). Building a Secure Mounting Platform for the Motus Antenna's

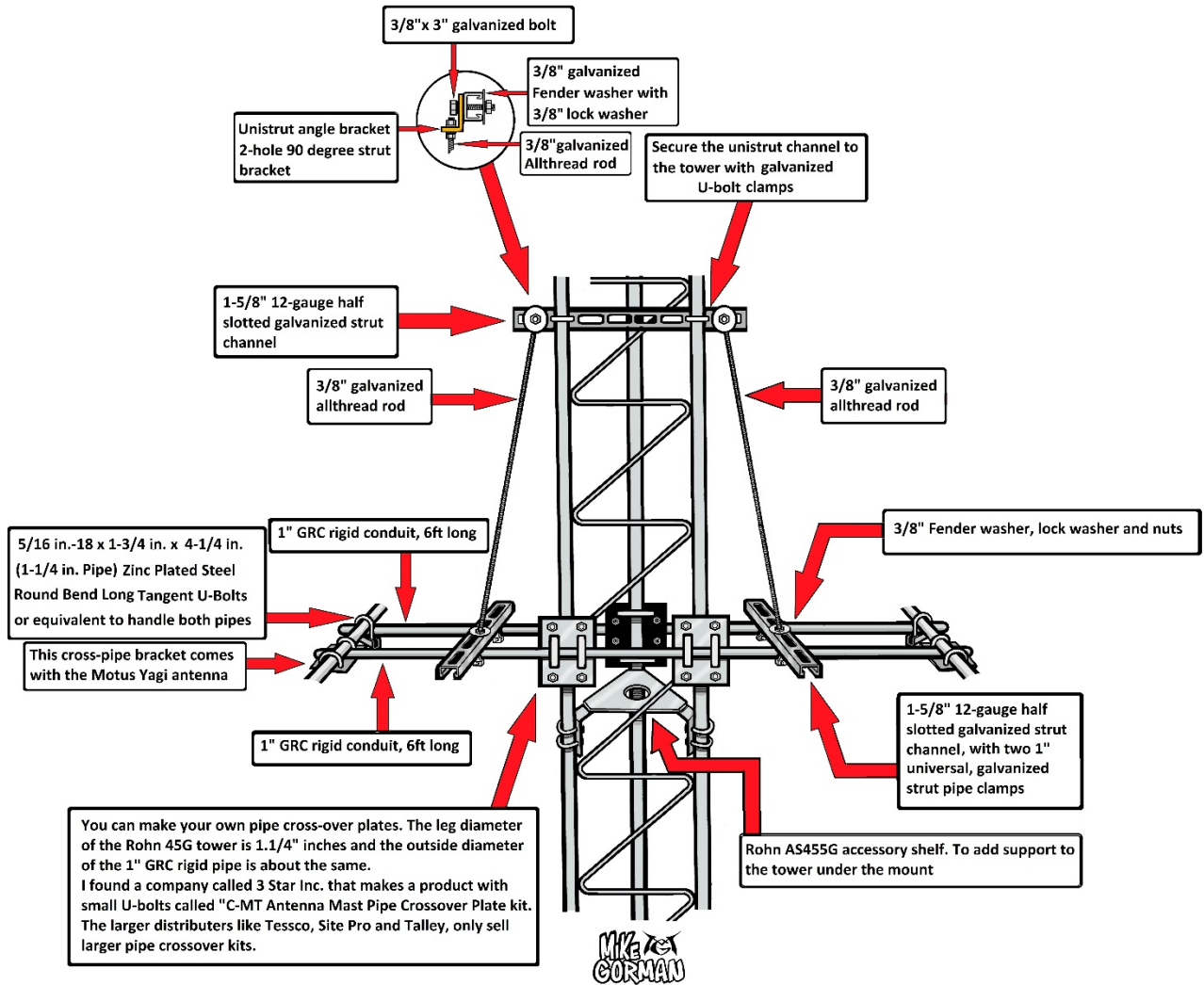


Diagram 1

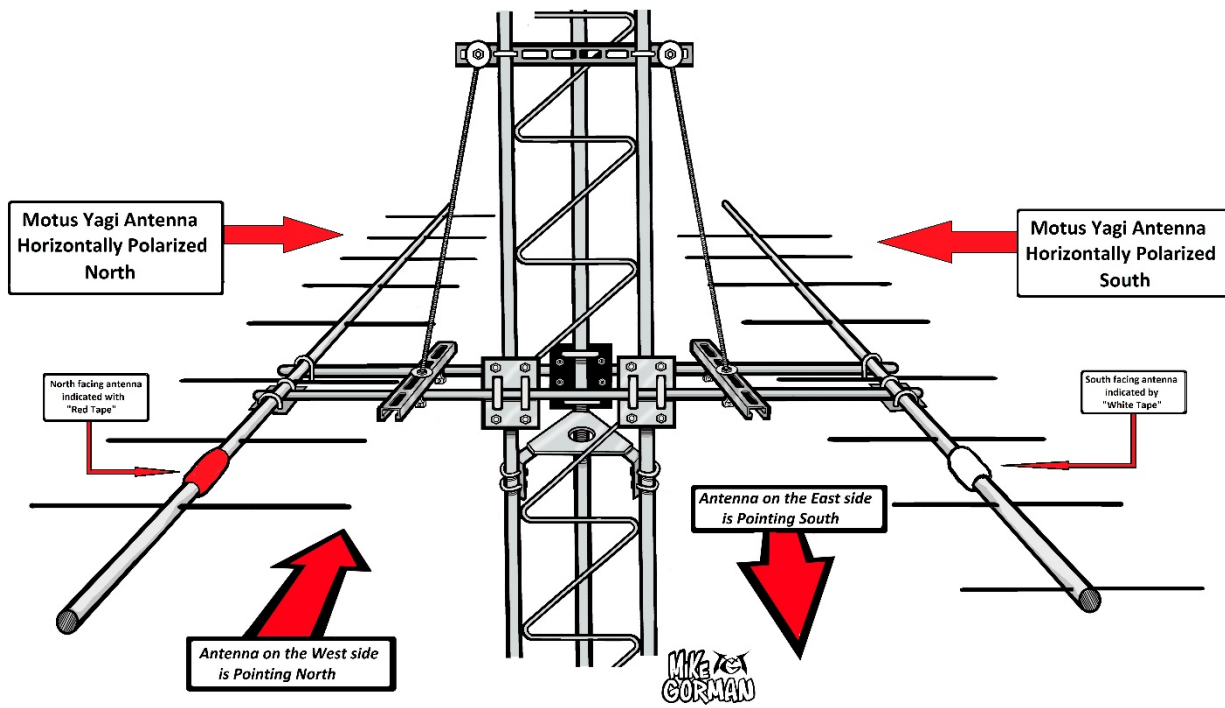


Diagram 2

5). Orientating the Motus antennas on the Mounting Platform

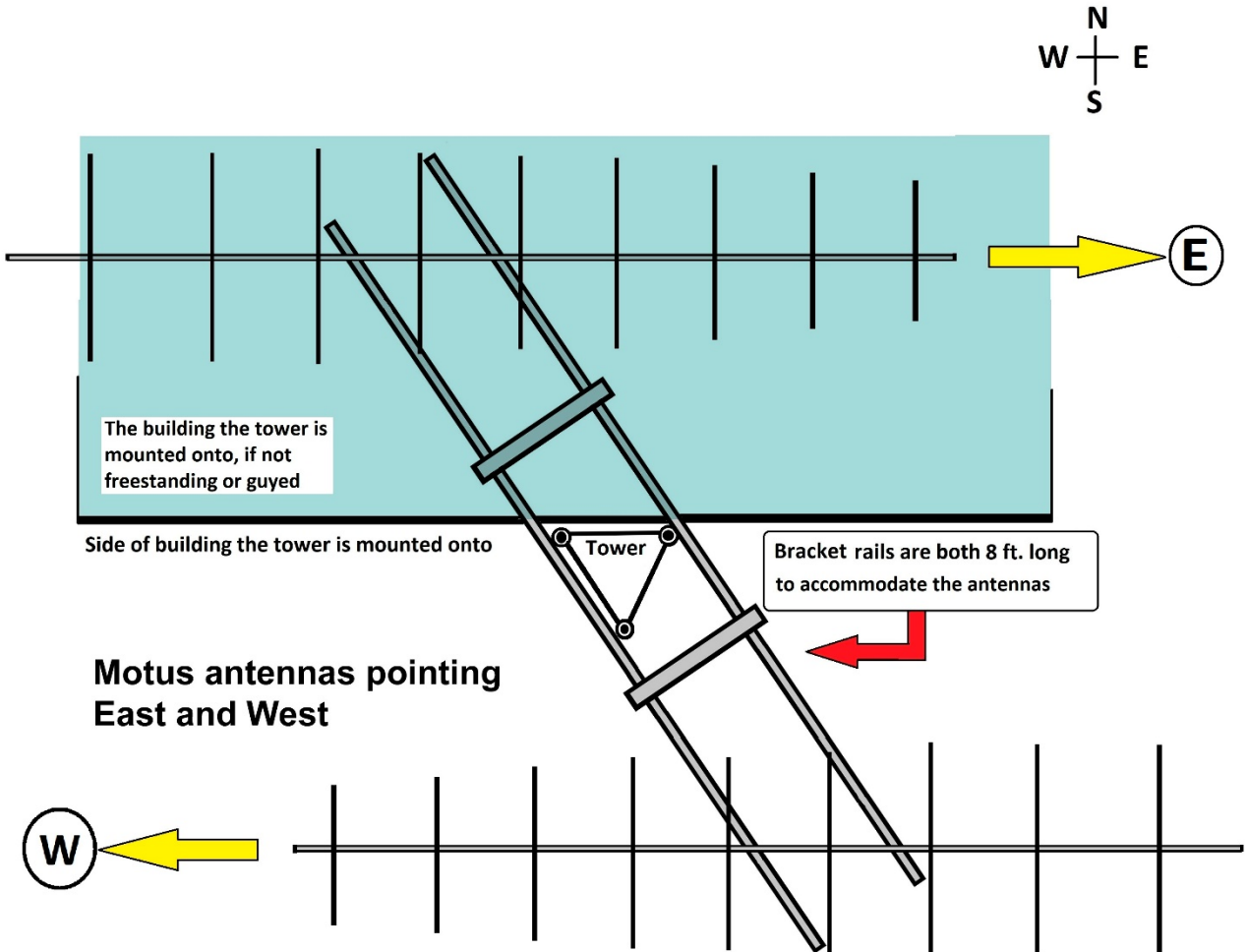


Diagram 3

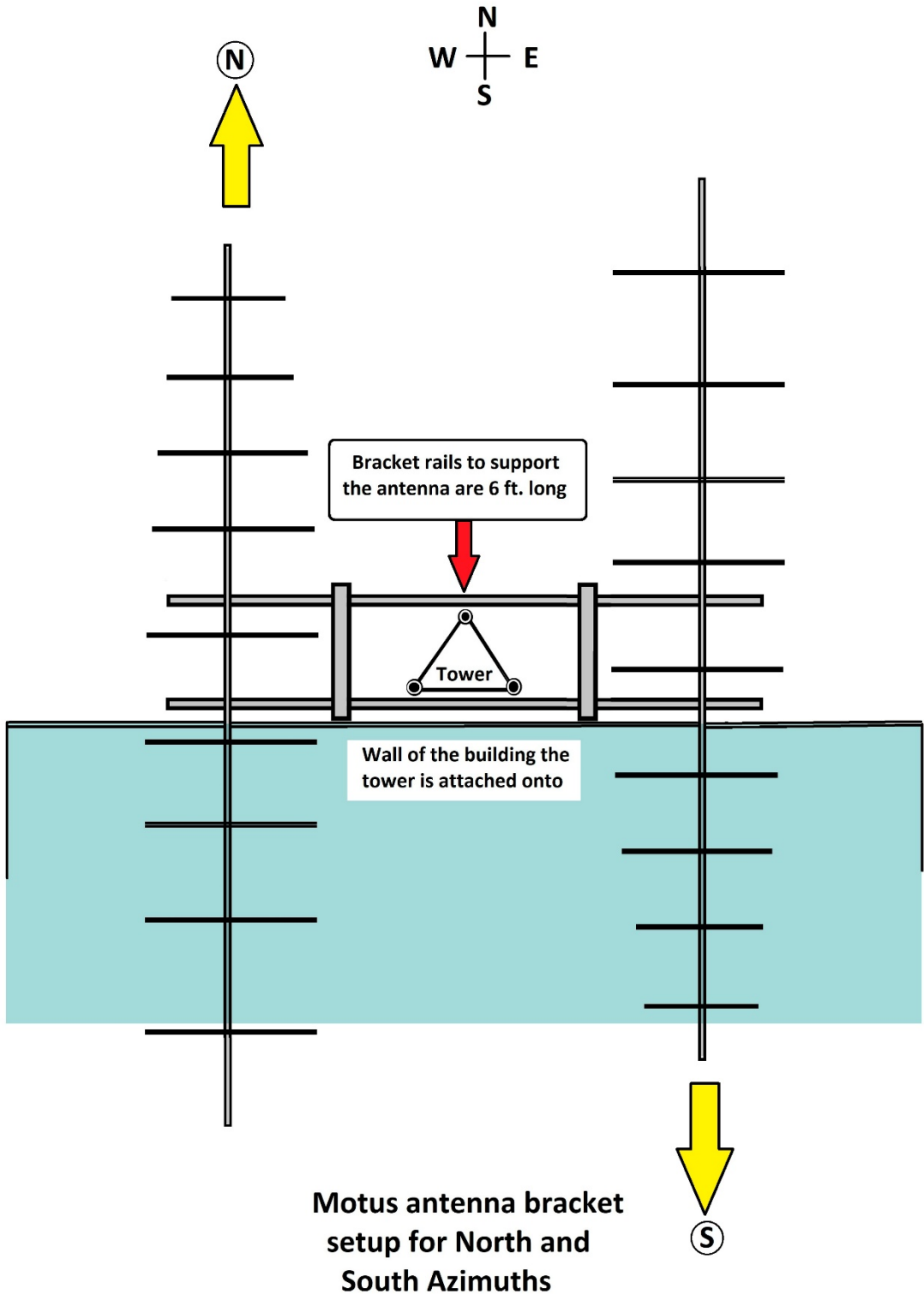


Diagram 4

6). Installing, Securing and Grounding Cabling on a Tower

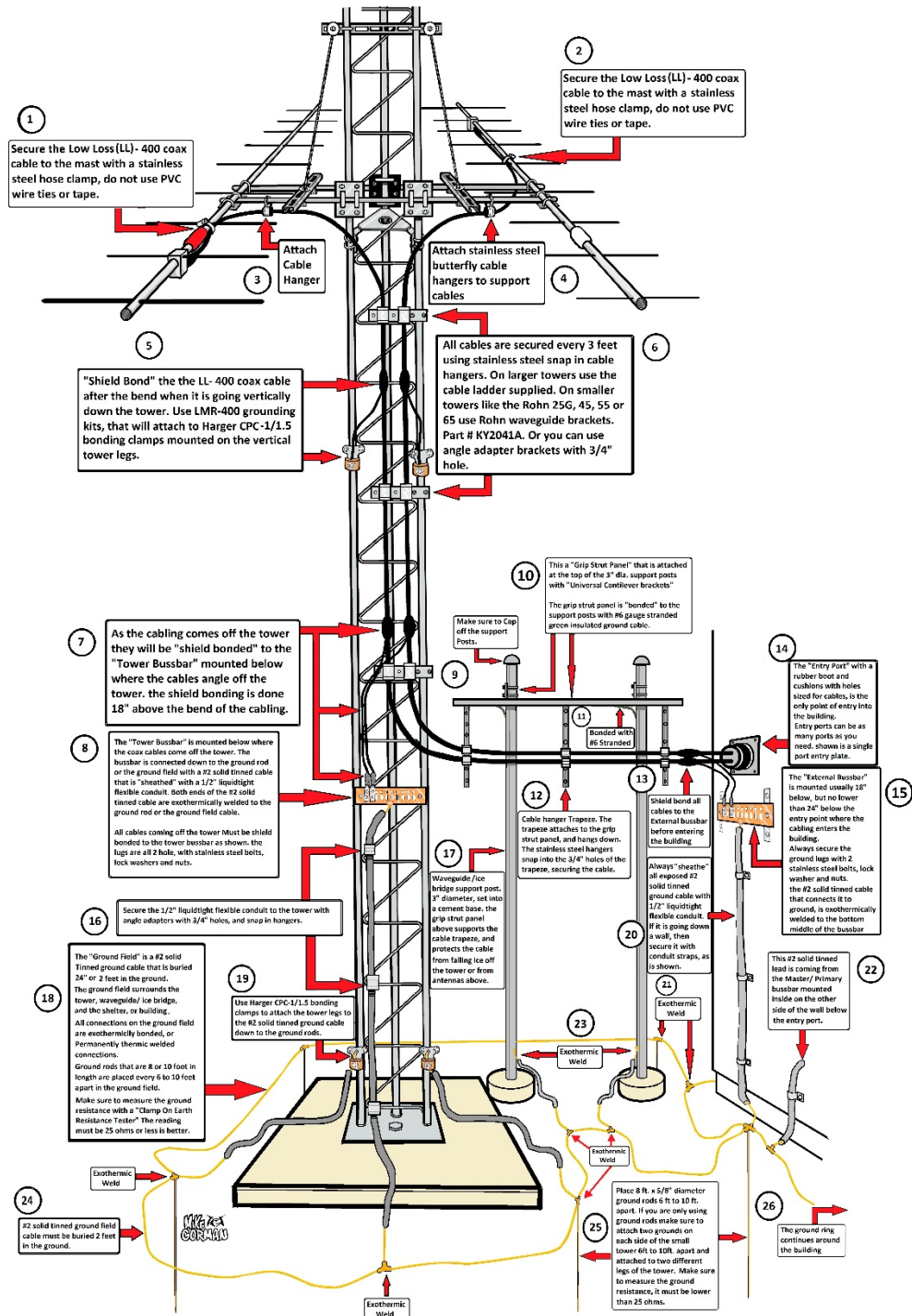


Diagram 5

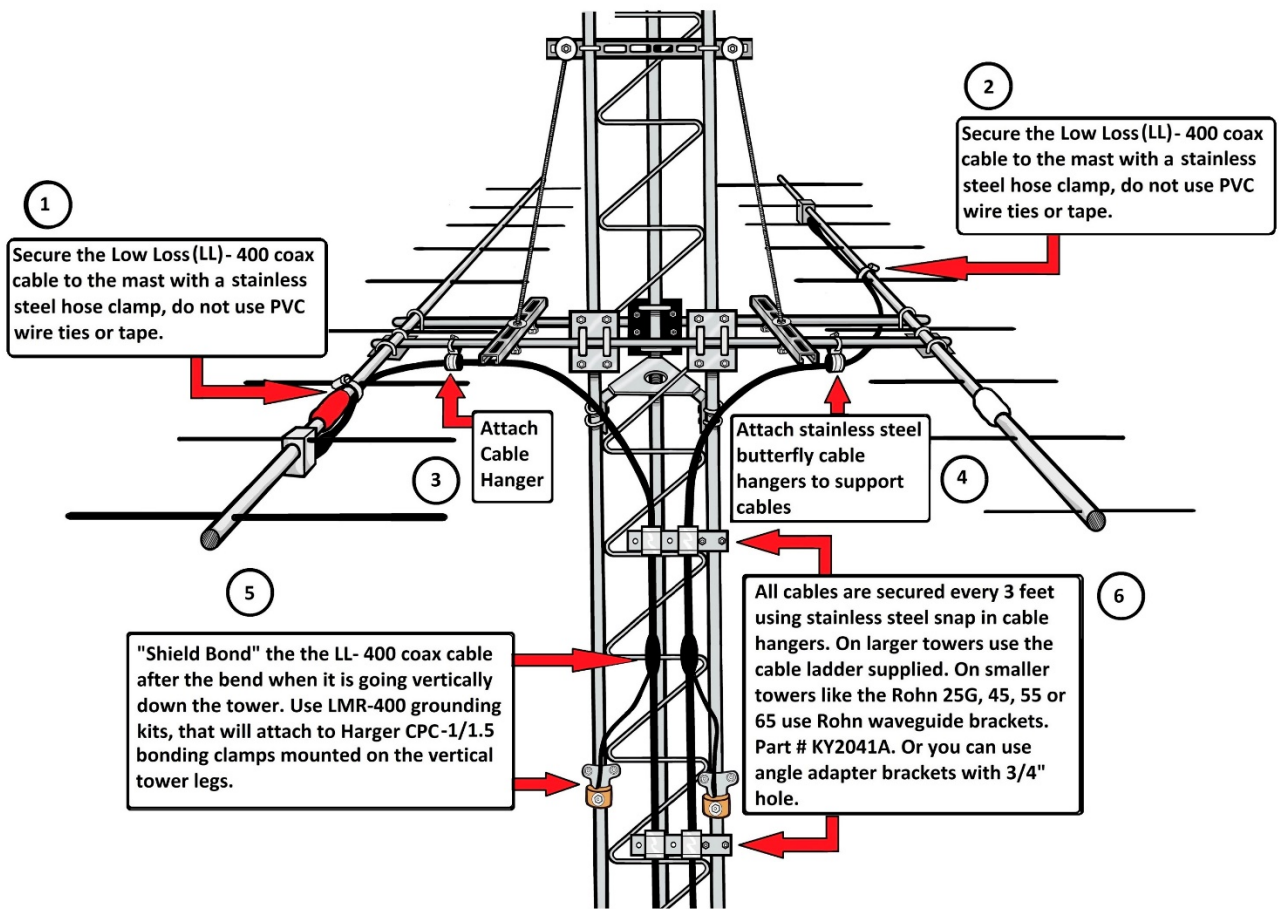


Diagram 6

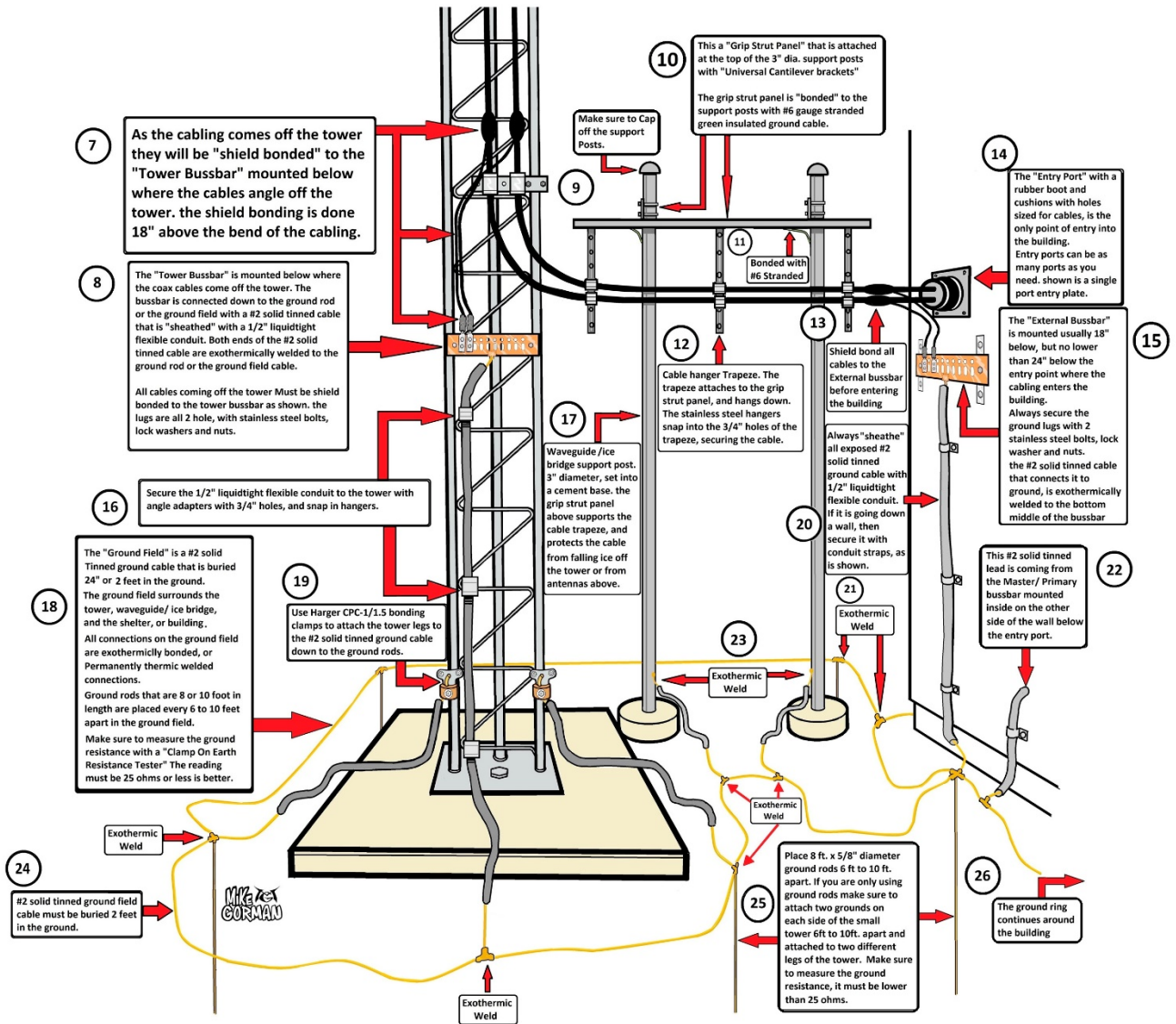


Diagram 7

For towers that are wall mounted to the building, you would not need the Waveguide/ Ice bridge. But every other detail would apply.

Grounding for all Cabling Entering A Building from a Tower.

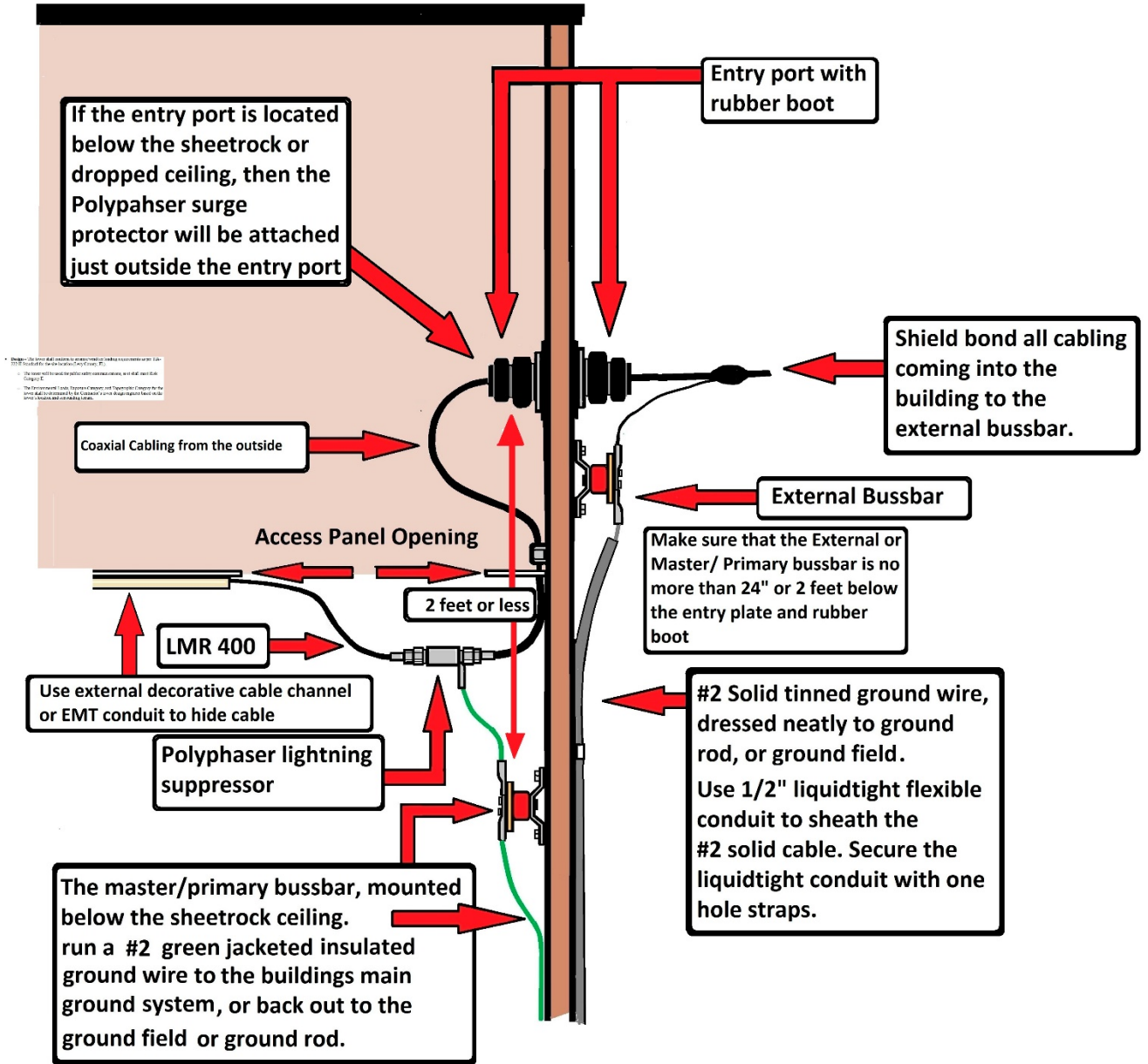


Diagram 8

Points to Remember:

- 1). There is an entry port plate on the inside and outside of the wall and both have rubber boots and cushions.
- 2). The Polyphasers should be located just after the cable comes into the building and is bonded to the Master / Primary bussbar.
- 3). There are always 3 bussbars, Tower, External and Master/ Primary with 3/8" holes and all ground lugs are attached with stainless steel bolts, lock washers and nuts.
- 4). All "exposed" #2 solid tinned ground wire must be sheathed with ½" liquidtight flexible conduit.
- 5). Please follow the diagrams closely.

If you, or your contractor have any questions, please don't hesitate to contact me at Michael_gorman@fws.gov

Thank you for your help in getting the Motus antennas installed and grounded correctly!