Short Drilled Braced Monument Installation Tutorial

664 Beth Bartel August 16, 2010 Shallow Braced (drilled and non-drilled) 2009

1. Locate site. Fresh, unweathered bedrock is best.

2. Clear a pad approximately 5 ft square. [Figure 1]

3. Mark center point for vertical leg with chalk. [Figure 2]

4. Drill vertical hole approximately 36” deep using 36”x1.5” drill bit (or 6 ft if using 72” drill bit); use post level to insure hole is vertical; use vacuum to remove rock powder during drilling to prevent drill bit from getting stuck; conduct frequent drill bit purges to prevent drill bit from getting stuck. Try and keep the hole dry and free of debris. [Figure 3]

5. Temporarily set vertical steel pole in center hole, level it and keep it plumb with rags or pieces of cardboard.

6. Lay out line from center point due north (true) and set a marker or stake ~50 feet away from center point on line. [Figure 4]. Note that the leg directions can be altered based on site characteristics.

7. The intersection point between the slanted legs and the vertical leg should be between 40-50 inches high. Place a mark or tape on vertical pole at this height.

8. Hold ground rod at the mark (step 7) and place the other end out along north line until the ground rod makes a 55-degree angle. Mark this point on the ground with a dot of chalk and cross hair. An observer should sight down the north line and make sure the ground rod is in line with the vertical leg and the azimuth. Cover the point. [Figure 5] and [Figure 2]

9. Repeat this process for the other 2 legs and insure they are spaced at 120 degrees off the north leg. [Figure 6]

10. Remove the center leg and drill leg holes at 55 degree angle. Make sure and check the angle often with a Brunton (especially at the beginning) and have someone stand along the azimuth marks making sure the hole is in line with the center point. [Figure 7]

11. Use the vacuum to make sure all dust is removed from the hole and cover the holes with cardboard to make sure no rocks fall in. [Figure 8]

12. Replace the center pole and fit all slated legs in proper holes. Make sure the rods cross in tepee fashion.

13. Hold one leg up to the piercing point (40-50 inch mark placed in step 7) and place a mark along

the top of the rod ~2 inches down from the intersection point. This will provide a little play in the rod when it is epoxied into the hole. Continue the mark along the vertical (~35 degrees) such that when cut the slanting rod will mate with the vertical rod. Repeate this for each leg.

14. Mark each leg with tape (or marker) indicating which leg is north, south west, and south east. Remove all legs.

15. Clean the vertical leg with denatured alcohol. Place 4 tubes of epoxy in center hole, insert, and plumb center leg. Make sure leg stays vertical while epoxy cures. Hilti epoxy and Pour Stone cures in ~20 min.

16. Using a grinder with a cutting wheel cut the slanted legs along marks.

17. Using grinder with grinding wheel scallop off the cut ends of the legs for ease of welding to the center leg. [Figure 9]

18. Place 4 tubes of epoxy in one of the slant leg holes and insert leg. Mate the slated leg to the vertical leg and tack weld. [Figure 10]

19. Repeat for other 2 legs.

20. Tack weld fillet triangles between vertical leg and slanted legs. [Figure 11]

21. Finish weld the legs and fillets. [Figure 12]

22. Cut the end off the vertical leg ~2 inches above the intersection point and grind the cut surface flat and slightly round the edges. [Figure 13]

23. Place the screw thread end of the of the SCIGN adaptor (note there is a thin edge on the inside that goes up) on the center leg and tap flush. [Figure 14]

24. Weld the screw thread end of the of the SCIGN adaptor to the center leg.

25. Disassemble the SCIGN adaptor and remove the security screw and washers and center bolt and put them in a safe place. If using a Trimble antenna back off the alignment screw from the base plate (for Ashtech antenna this will seat in the horizontal groove in the bottom of the antenna. [Figure 15]

26. If using a tall SCIGN radome place the bottom portion of the dome over the mount. Skip this step if using a short dome.

27. Thread the bottom portion of the SCIGN adaptor and align it to North. Once it is aligned tack weld the adaptor to the screw threads on the center post. [Figure 16]

28. Place the top portion of the SCIGN adaptor onto the bottom portion of the adaptor. Use a Brunton compass to level the mount. To do this remove the set screws from beneath the bottom

plate and adjust with an Allen wrench. When adjusted replace the setscrews. [Figure 17a] and [Figure 17b]

29. Thread the antenna bolt up through the top plate and finger tighten with a wrench. If using a Trimble legs using wire ties or hose clamps. [Figure 19] [Note: foam insulation used to isolate mount legs from soil

30. Connect dome base and dome using SCIGN hex screws. [Figure 20a] and [Figure 20b]

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