

HUGHES NETWORK SYSTEMS

PES FIELD SERVICE BULLETIN

SUBJECT: No-Hole Pole Antenna Mount

FSB NUMBER: 1134A

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SUBMITTED BY: L. Gach/K. Hanson

APPROVED BY: S. d'Adolf

CHANGE TO BE IMPLEMENTED BY:
 AUTHORIZED HUGHES REPRESENTATIVE CUSTOMER

DOCUMENTATION AFFECTED:
 Supercedes FSB1134

CATEGORY:
 HARDWARE FIRMWARE SOFTWARE OTHER

EFFECTIVE DATE: 11/9/93

IMPLEMENT:
 IMMEDIATELY
 NEXT SERVICE CALL
 OTHER

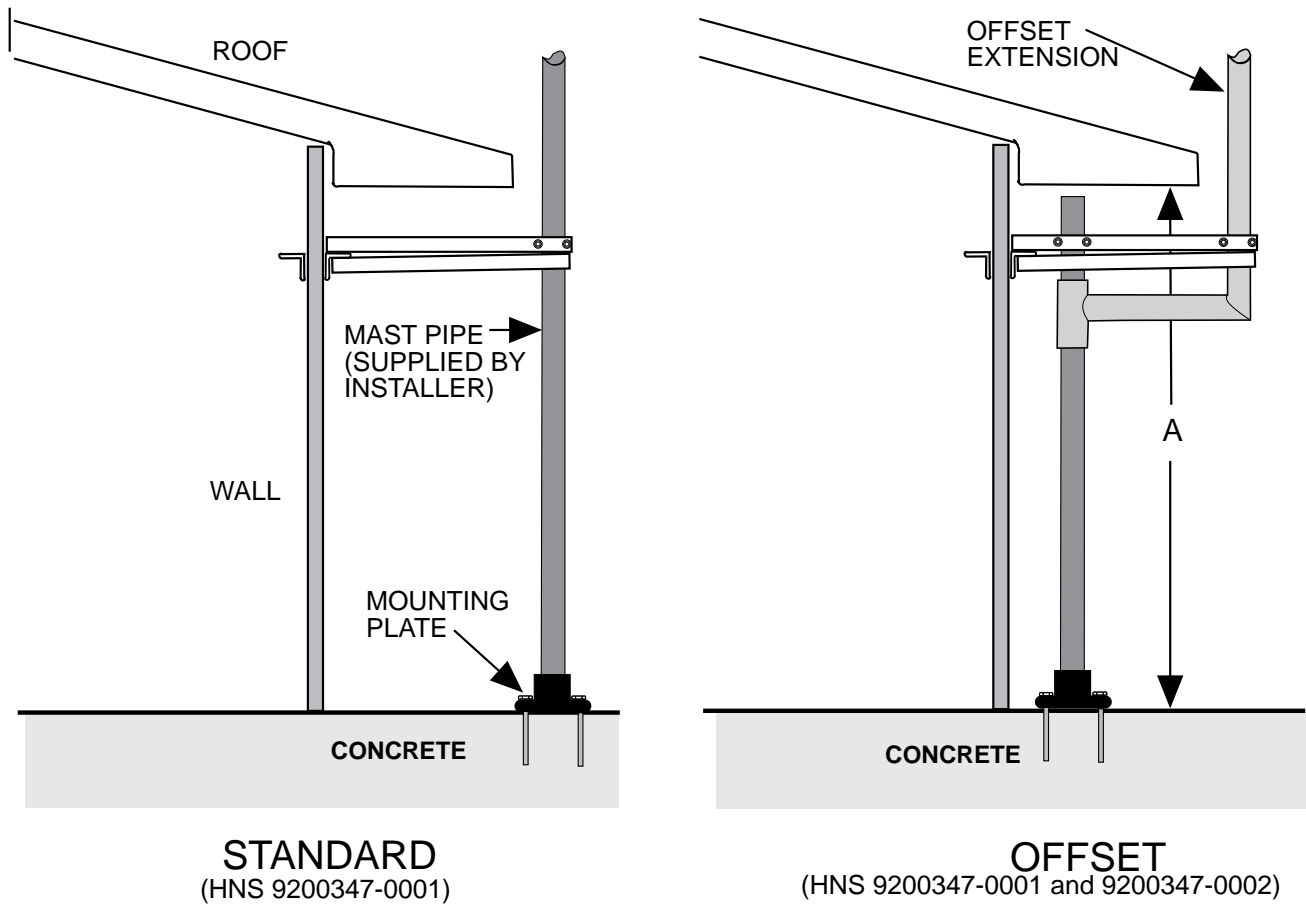
COMMENTS:

REMOVED MATERIAL DISPOSITION

SHIP TO N/A
ATTENTION N/A
COMMENTS N/A

BACKGROUND

HNS now offers a "No-Hole Pole" antenna mount as shown in figure 1. The no-hole pole mount is suitable for the 0.75M, 1.0M and 1.2M antennas only. The no-hole pole mount is intended as an easy-to-install mount that takes advantage of building strength without interfering with the building roof. The no-hole pole includes a bracket assembly which attaches to a building wall and a mounting plate which attaches to a deck, sidewalk, concrete drive, or other suitable surface. The installation subcontractor supplies the mast pipe. The no-hole pole is available in two versions: standard or offset. The standard version has a straight mast which is typically positioned just outside the eaves of the roof (up to 58" away from the building wall). The offset version permits the straight mast to be positioned under the eaves and close to the wall (from 6" to 12") by the addition of an offset mast extension that supports the antenna.



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Figure 1. No-Hole Pole Versions: Standard and Offset

MATERIAL REQUIRED

HNS P/N 9200347-0001, Prodelin P/N 0800-911, No-Hole Pole Mount, Standard

OR

HNS P/N 9200347-0001, Prodelin P/N 0800-911, No-Hole Pole Mount, Standard
with
HNS P/N 9200347-0002, Prodelin P/N 0800-912, No-Hole Pole Mount, Offset

Where required, 4.0" O.D. to 2.88" O.D. mast adapter, HNS P/N 3000356-0001, Prodelin P/N 0800-101

INSTALLATION SUBCONTRACTOR OBTAINS LOCALLY

Mast Pipe - 2.88" outside diameter - must be galvanized or painted
- or where required, 3.5" outside diameter - must be galvanized or painted

Anchor Bolts/Anchoring method for mounting plate

If concrete footing required: rebar #4 and #6, concrete, 1/2" hooked anchor bolts.

ACTION REQUIRED

Figures 3 and 4 provide reference information for the standard and offset no-hole pole mounts. Tables 3 and 4 provide parts identification. If an offset no-hole mount is desired, both the standard and offset kits are required.

PRE-INSTALLATION

Perform the following steps:

STEP 1. Determine the suitability of the site for the no-hole pole mount. The following types of wall construction are appropriate for the no-hole pole:

- a) Concrete block - up to 8" thick with hardware supplied
- b) Sheet metal with vertical ribs
- c) Wooden stud walls with studs on 16" or less centers

Verify that the desired PES location does not interfere with overhead power lines and that the base mounting plate anchoring bolts would not interfere with underground lines (as might be found at a gasoline station). Determine if the drive/sidewalk/deck is adequate for attaching base mounting plate at the desired location. If attaching the mounting plate to a pre-existing concrete surface, the concrete surface must be **at least 3.25 inches thick**. Refer to table 5. If the no-hole pole is to be installed over dirt, gravel, or asphalt, a concrete footing must be installed, figure 2.

STEP 2. Measure the roof overhang and determine the type of no-hole pole for this site: standard or offset. Determine the required height of the mast pipe. Table 1 provides guidelines for maximum mast heights. When the mast passes near the edge of the roof, make sure

that the mast extends far enough above the roof in order to allow sufficient room to install and aim the antenna. If the offset no-hole pole is selected, measure distance from drive/sidewalk/deck to the underside of the roof overhang, dimension A in figure 1. For the offset no-hole pole, the mast pipe should be 4 inches less than dimension A.

Table 1. Maximum Mast Dimensions Standard No-Hole Pole

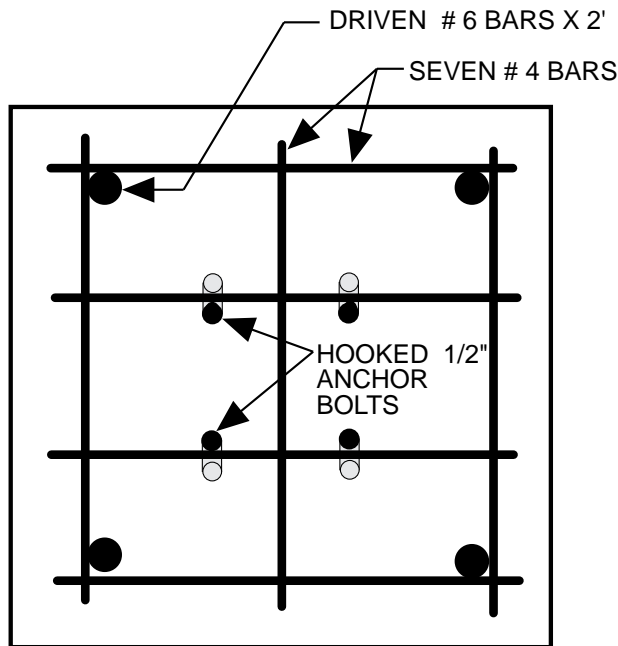
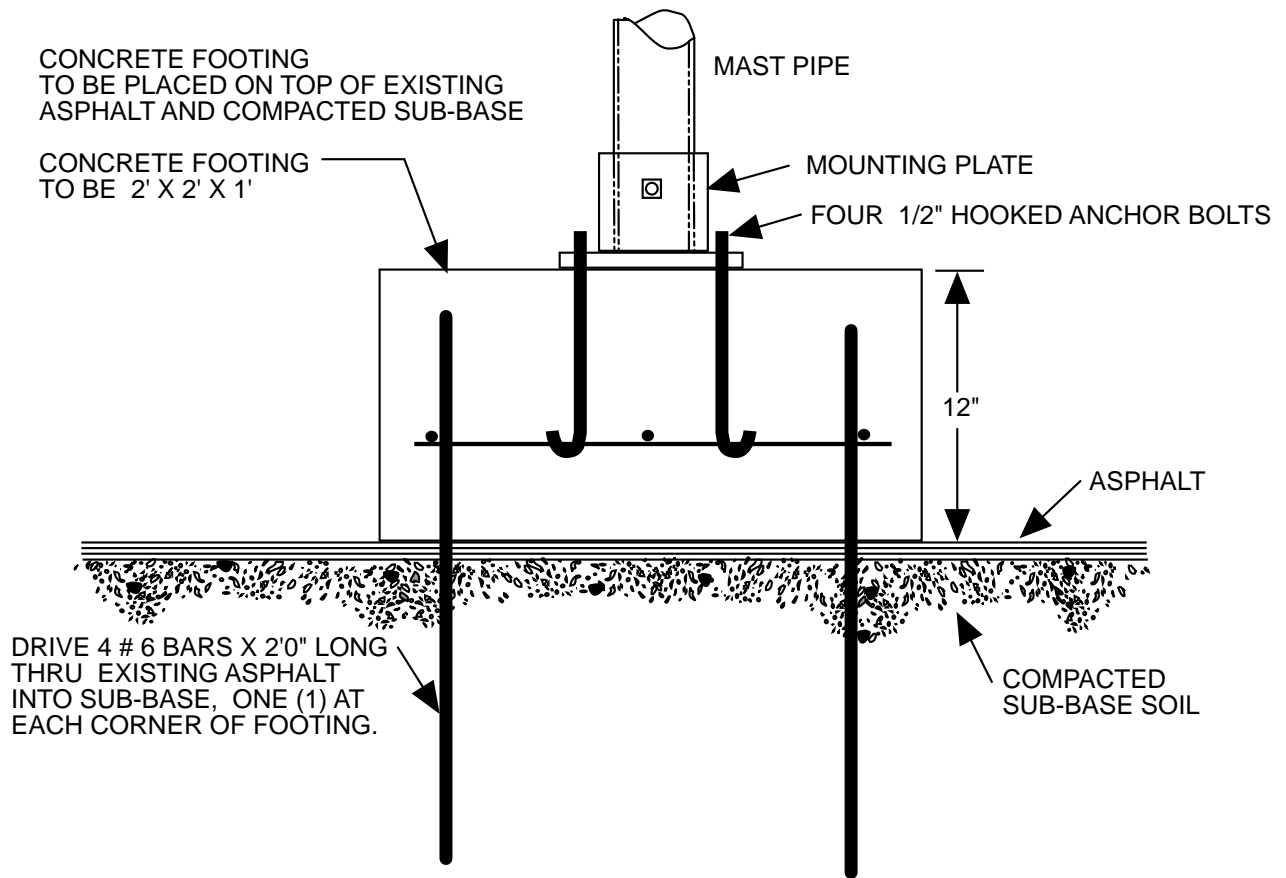
Antenna Size	2.88 in. O.D. Schedule 40	2.88 in. O.D. Schedule 80	3.5 in. O.D. Schedule 40	3.5 in. O.D. Schedule 80
0.75M, 1.0M				
Base to Wall Bracket	12'	16'	16'	20'
Wall Bracket to Top	3'	5'	4'	6'
Total	15'	21'	20'	26'
1.2M				
Base to Wall Bracket	10'	14'	14'	18'
Wall Bracket to Top	2.5'	4'	3.5'	5'
Total	12.5'	18'	17.5'	23'

NOTE: For Offset No-Hole Mount, use base to wall bracket dimension for maximum mast pipe portion dimension. The offset extension portion extends above this level.

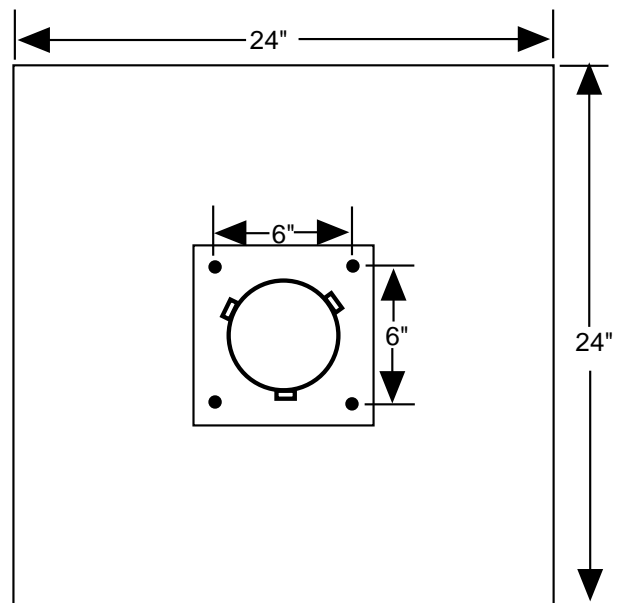
- STEP 3. Obtain the required mast pipe. Table 2 provides reference information regarding pipe sizes. Pipe is commonly identified by nominal pipe size. Note that actual outside diameter differs from nominal pipe size and depends on the pipe schedule/pipe wall thickness. For the standard no-hole pole, nominal pipe size 3" (actual outside diameter 3 1/2") may be selected for added mast height. Select galvanized or nongalvanized according to customer's installation specification, if indicated therein. If you obtain galvanized pipe, it may be used directly. If you obtain nongalvanized pipe, it must be primed and painted before it is installed.
- STEP 4. Obtain the required anchoring hardware for the mounting plate. If attaching the mounting plate to a pre-existing concrete surface, refer to the "Anchoring Bolts for Mounting Plate" section below. If the mounting plate must be installed above an asphalt surface, a 2' x 2' x 1' concrete footing as shown in figure 2 is required. The concrete footing is anchored to the asphalt, and the mounting plate is anchored to the concrete footing.
- STEP 5. For asphalt drive installations, make arrangements to have the concrete footing poured before the installation date so that there is adequate time for the concrete to cure. Accurately position the center of the footing relative to the building within the distant range 52" to 58" for the standard no-hole pole (or 6" to 12" for the offset). The multiple holes for the U-bolt and the mounting plate screws provide the range of adjustment.

Table 2. Nominal Pipe Size and Actual Outside Diameter - Steel Pipe

Nominal Pipe Size	Actual Outside Diameter	Pipe Schedule	Comment
2-1/2"	2.88"	Schedule 40	Required for offset no-hole pole.
2-1/2"	2.88"	Schedule 80	Preferred over 3.5" O.D. Schedule 40.
3"	3.5"	Schedule 40	Requires mast adapter. Possible tight fit in mounting plate and offset extension collar.
3"	3.5"	Schedule 80	Largest size applicable for no-hole pole. Selected for increased strength, added height. Requires mast adapter. Possible tight fit in mounting plate and offset extension collar.
3-1/2"	4.0"	Schedule 40	Not applicable for no-hole pole. Normally used for 1.8M.



TOP VIEW - REBAR PATTERN



TOP VIEW - COMPLETED FOOTING

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Figure 2. Concrete Footing Required for Asphalt Drive

INSTALLATION

Perform the following steps:

- STEP 1. Identify the wall location for the wall angles, item 2 in figure 3. Make sure that both sides of the wall are free of obstruction and electrical wiring at the location for the wall angles. Use one of the wall angles as a template. Level the wall angle, mark the hole locations, center punch, and drill the three 9/16 in. diameter holes. Install the two wall angles with the flat side on top. Use the three threaded rods (item 11) with 1/2" flatwashers, lockwashers, and nuts (items 7, 8, and 6) to attach the wall angles.
- STEP 2. Temporarily assemble the wall bracket by attaching the wall-to-pipe angle (item 1) with its vertical surface upward, above the wall angle and the support angle (item 3) vertical surface down, below the wall angle. Attach the wall support angle (item 3) underneath the wall-to-pipe angle (item 1). Use 1/2" bolts, nuts, flatwashers and lockwashers (items 5, 7, 8, and 6) only finger tightened.
- STEP 3. Hold the mast pipe vertical at the desired location. Install the U-bolt channel and U-bolt (items 9 and 10) around the mast and at the selected location on the wall-to-pipe angle (item 1). Select a location for the best placement of the mounting plate. The locations closest to the wall are for the offset no-hole pole, figure 4. The center location can be used with the standard no-hole pole mount, figure 4, when the roof overhang is 24" or less. The locations farthest from the wall can be used when the roof overhang is 48" or less.
- STEP 4. Level the wall-to-pipe angle (item 1) adjusting the U-bolt position if necessary. Place the mounting plate underneath the mast pipe.

For sites where a concrete footing (with the proper protruding bolts) is already present, attach the mounting plate to the footing using 1/2" flatwashers, lockwashers and nuts (not supplied with no-hole pole mount). **If necessary, cut the anchor bolts so that they do not extend more than 1/2 inch above the nuts on the mounting plate.** Adjust the mast so that it is vertical by using the adjusting screws of the mounting plate and, if necessary, by changing which holes are used for the U-bolt. Tighten all hardware. Install and aim the antenna.

- STEP 5. For sites where the mounting plate is to be attached to a pre-existing deck or concrete drive/sidewalk, move the mounting plate and mast base until the mast is vertical as measured with an inclinometer. Re-level the wall-to-pipe angle (item 1), adjusting the U-bolt position if necessary. Mark the position of the U-bolt on the mast. Mark the position of the mounting plate on the pavement where the mast is vertical. Mark the hole locations. Remove the mast pipe while attaching the mounting plate. Refer to the "Anchoring Bolts for Mounting Plate" section below. Select or cut the anchor bolts/threaded rods for the proper length before installation. When the mounting plate is bolted to the concrete surface, **HNS requires that the anchor bolts/threaded rods do not extend more than 1/2" above the nuts.** If they do, cut off the excess. After the mounting plate is bolted to the concrete surface and after the adhesive (if used) has had sufficient time to cure, re-install the mast. If installing an offset no-hole pole, place the mast thru the offset extension collar. Adjust the mounting plate clamping screws so that the mast is vertical. Check that the wall-to-pipe angle (item 1) is level. Tighten all

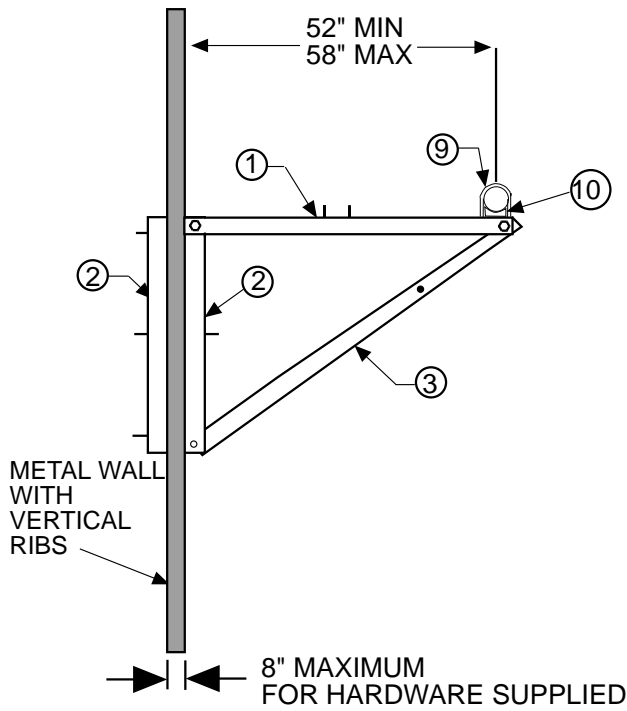
hardware. If installing an offset no-hole pole, lift the offset extension into place, install the U-bolt, and adjust the collar clamping screws so that the mast part of the offset extension is vertical as measured with an inclinometer. Tighten the U-bolt and collar clamping screws. Install and aim the antenna.

Table 3. Standard No-Hole Pole Mount Parts List (Ref. Figure 3)

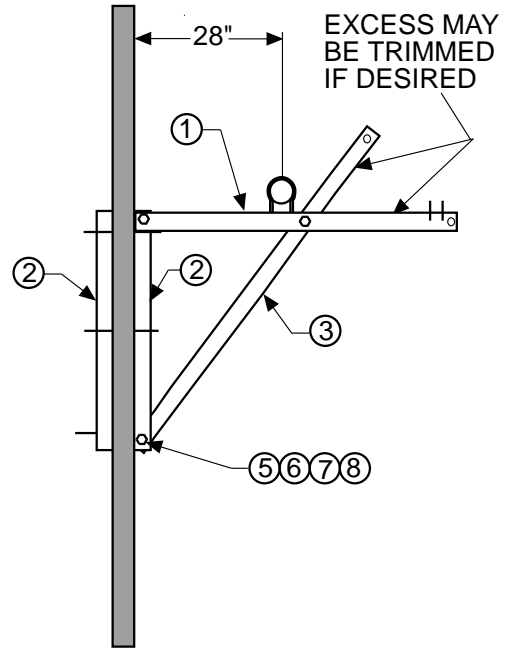
Item No.	Description	Quantity	Prodelin Part No.
1	Angle, Wall to Pipe	1	0225-515
2	Angle, Wall	2	0225-517
3	Angle, Support	1	0225-518
4	Weldment, Mounting Plate	1	0490-446
5	Bolt, 1/2-13 x 1.75	3	8033-010
6	Nut, 1/2-13	11	8104-007
7	Flatwasher, 1/2	14	8201-043
8	Lockwasher, 1/2	11	8202-043
9	U-Bolt, 3 1/2	1	8403-010
10	Channel, U-Bolt	1	0247-150
11	Threaded Rod, 1/2 x 10	3	0180-276
12	Screw, 1/2-13 x 1.75	3	8317-103

NOTE REGARDING OFFSET NO-HOLE POLE MOUNT

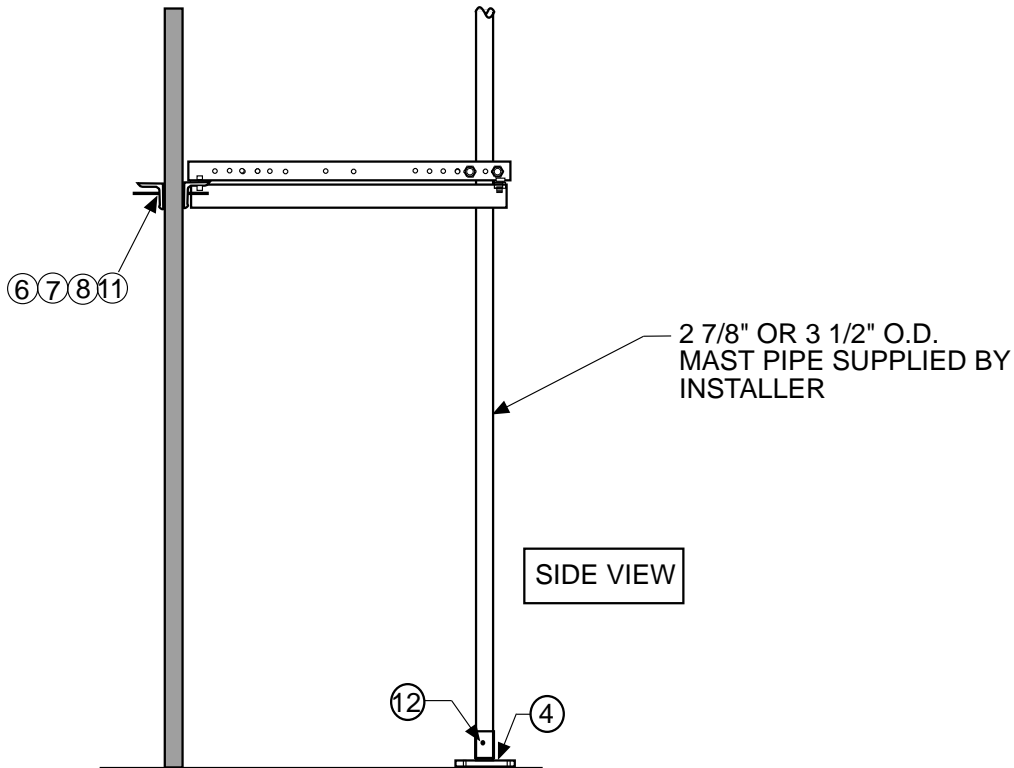
Standing on the offset extension or wall bracket while installing the antenna can cause the collar clamping screws to form indentations in the mast. These indentations can cause the antenna to be slightly wobbly. If someone has stood on the offset extension or wall bracket, re-tighten the collar clamping screws after the person is off of the mount in order to restore the required rigidity to the antenna.



TOP VIEW
UP TO 48" ROOF OVERHANG



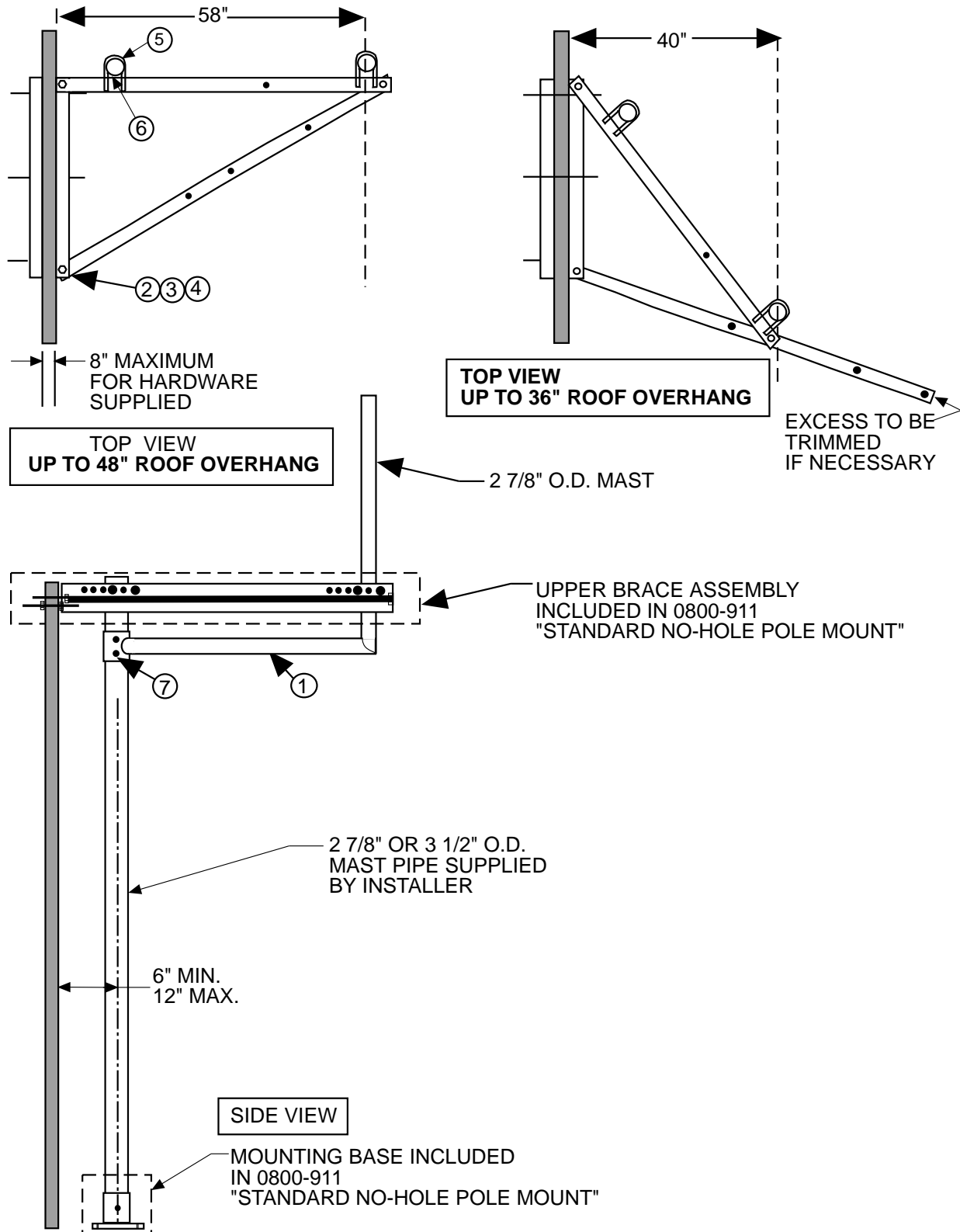
TOP VIEW
UP TO 24" ROOF OVERHANG



SIDE VIEW

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Figure 3. Standard No-Hole Pole Mount



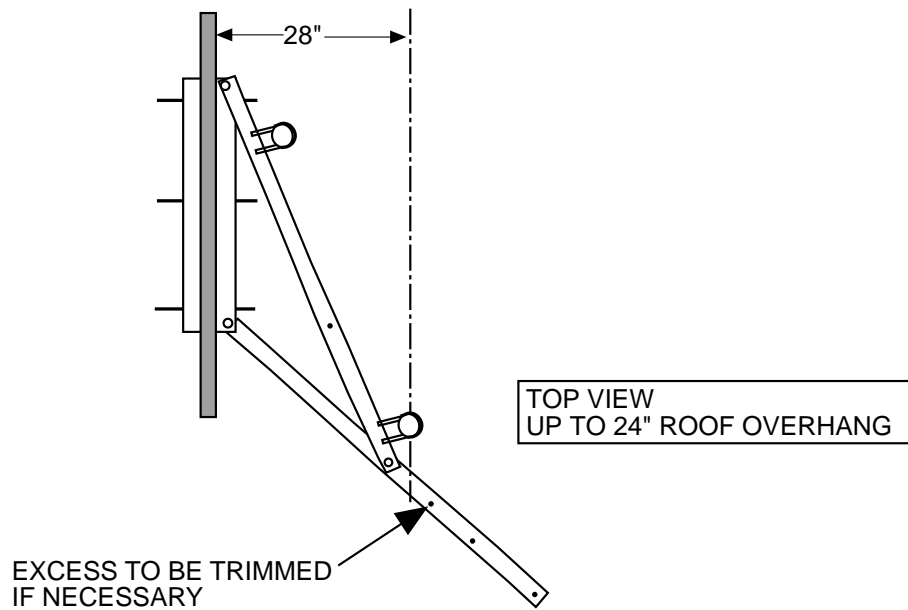
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Figure 4. Offset No-Hole Pole Mount

Table 4. Offset No-Hole Pole Mount Parts List (Ref. Figure 4)

Item No.	Description	Quantity	Prodelin Part No.
1	Weldment, Offset Pipe	1	0490-447
2	Nut, 1/2-13	2	8104-007
3	Flatwasher, 1/2	2	8201-043
4	Lockwasher, 1/2	2	8202-043
5	U-Bolt, 3 1/2	1	8403-010
6	Channel, U-Bolt	1	0247-150
7	Screw, 1/2-13 x 1.75	4	8317-103

NOTE: Offset no-hole pole also requires standard no-hole pole.



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Figure 5. Additional Configuration Offset No-Hole Pole Mount

ANCHORING BOLTS FOR MOUNTING PLATE

The selection/purchase of anchoring bolts for the mounting plate is the responsibility of the installation subcontractor.

For sites where the mounting plate is to be attached to a pre-existing concrete drive/sidewalk, the selection of anchoring bolt type can depend on the thickness of concrete. See table 5. For concrete that is 4 inches thick or thicker, an adhesive anchoring method is suggested. For concrete thicknesses between 3 1/4 inches and 4 inches and for thru holes, a mechanical expansion anchor bolt is suggested. The example part numbers given in table 5 are Hilti Company part numbers. You may reach the Hilti Company at phone number (800) 879-8000.

Table 5. Suggested Anchor for Pre-existing Concrete

Minimum Concrete Thickness	Anchoring Method	Suggested Fastener	Anchor Size	Drill bit Diameter	Hole Depth	Comment
6 1/4"	Chemical Adhesive Hilti C-100 System	Threaded Rod Assembly Hilti Anchor Rod Assembly HAS 12-612 Item No. 000686675	1/2"	9/16"	4 1/4" for full strength	Preferred method if concrete is at least 6 1/4" thick. No thru hole.
4"	Chemical Adhesive Hilti C-100 System	Threaded Rod Assembly Hilti Anchor Rod Assembly HAS 12-612 Item No. 000686675	1/2"	9/16"	3" for sufficient strength	No thru hole. Exercise care when drilling. Do not use hammer drill for last 1/2" of hole.
3 1/4"	Mechanical Expansion Bolt	Hilti Carbon Steel KWIK BOLT II KB II 12-334 Item No. 000453670	1/2"	1/2"	2 3/4"	Thru hole OK.

ADHESIVE ANCHOR

In general, an adhesive anchor is preferred because of its superior long-term resistance to loosening from mechanical vibration (wind on antenna). An adhesive anchor requires that the bolt hole is not a thru hole. If you drill thru the concrete when drilling the mounting plate bolt hole, you must reposition the mounting plate and drill another hole. Exercise care when drilling the last portion of hole; do not use a hammer drill on the last portion if you are likely to break thru the concrete.¹ Follow the manufacturer's instructions for the adhesive anchor system. The hole must be clean of debris. The adhesive must mix properly or it will not set. Be aware that adhesive curing time increases as temperature decreases (typically from 25 minutes at 86°F to 6 hours at 23°F: concrete temperature, not air temperature). If you leave the site during a long curing time, place an obstruction such as a sawhorse with a "Do Not Disturb" sign over the mounting plate holes/anchors.

It is the responsibility of the installer to ensure the anchor/adhesive is set prior to attaching to the mast pipe.

¹If you repeatedly drill thru the concrete, consider the mechanical expansion bolt anchor below. Note that the mechanical anchor requires a smaller diameter hole/drill bit.

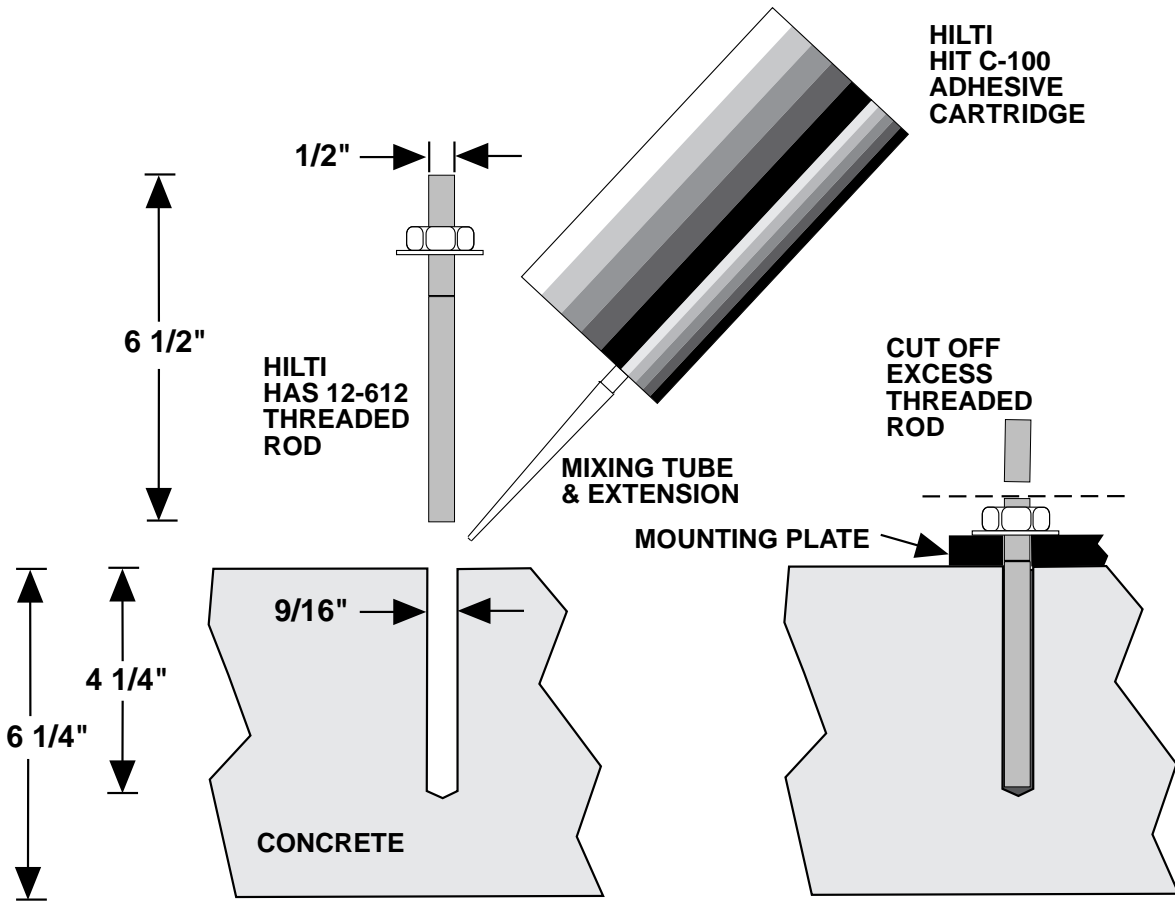
NOTE

HNS requires that the threaded rods of a completed mounting plate installation not extend more than 1/2" above the nuts. After drilling the holes in the concrete but before applying the adhesive, place the rods in the holes as a preliminary measurement. Allow for thickness of the mounting plate (1/2 inch), the washer, and the nut (approx. another 1/2 inch). Remove the rods and cut them to the proper length. By cutting the rods before installing them, you will avoid stressing them while the adhesive is curing.

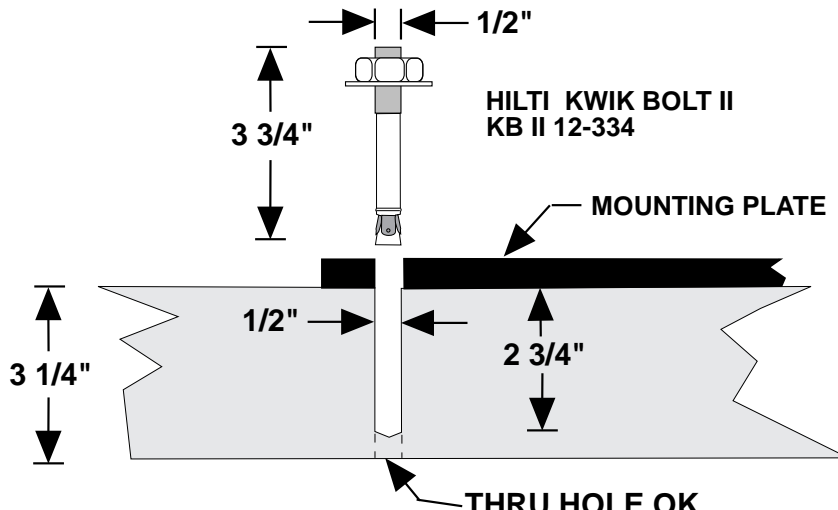
A suggested adhesive anchor is the Hilti HIT C-100 system (or equivalent) as listed in table 5 and shown in the upper portion of figure 6. The four components of the HIT C-100 system are: HIT C-100 adhesive, HIT dispenser, Fastener, Drill and Bit. Follow the Hilti instructions. Use a fresh mixing tube for each site. The old mixing tube serves as a cap between sites.

MECHANICAL EXPANSION BOLT ANCHOR

The mechanical expansion bolt offers the advantages being applicable to concrete between 3 1/4" and 4" and to being applicable if the hole is drilled all the way thru the concrete. Note that the mechanical expansion bolt suggested in table 5 requires a smaller diameter hole than the adhesive anchor (1/2" instead of 9/16"). Follow the manufacturer's instructions.



ADHESIVE ANCHOR



MECHANICAL ANCHOR

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Figure 6. Pre-Existing Concrete, Sample Anchoring Methods