



## Utility Service Co., Inc.

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### Installation Guidelines for Small Antennae Systems on Water Tanks

Utility Service Communications Co., Inc. (USCCI) is part of the Utility Service Group, as is Utility Service Co., Inc. (USCI). While USCI focuses on quality maintenance, inspection, and repair of water tanks, USCCI deals only with antennae installations on water tanks. Both groups have together developed guidelines for the proper installation of coax runs, antenna mounts, tank penetrations, etc. These guidelines were developed around four key goals:

- Assure coating system is accessible for inspection and maintenance (6" minimum clearance)
- Prevent unnecessary corrosion
- Provide safe and efficient access for personnel and equipment
- Protect Structural Integrity

Through our years of experience in maintaining thousands of tanks across the country, and in designing and installing wireless systems on water tanks, it is obvious that the only acceptable method of mounting coax and antennae on a water tank by utilizing attachments which are full seal welded to the structure. Full seal welded attachments require specialized skilled labor, and the welding will damage the coating system both on the exterior and interior of the tank, therefore requiring repair. Because of these factors, full seal weld designs are typically more expensive to install, and are therefore sometimes discouraged by the wireless companies in an effort to save construction costs. However, they are the most cost effective for the wireless companies as they typically don't require removal of the equipment during maintenance. And, this method is best for the tank and the tank owner as it meets the goals listed above.

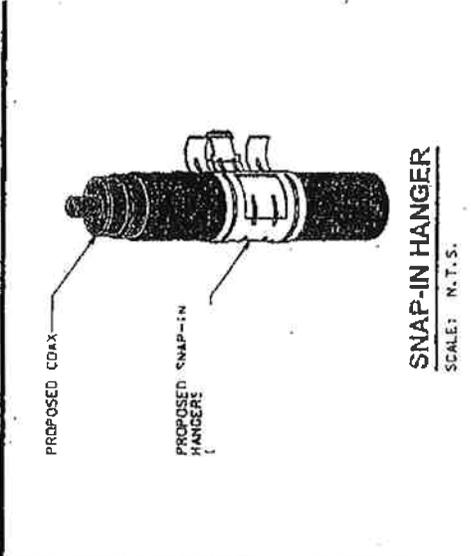
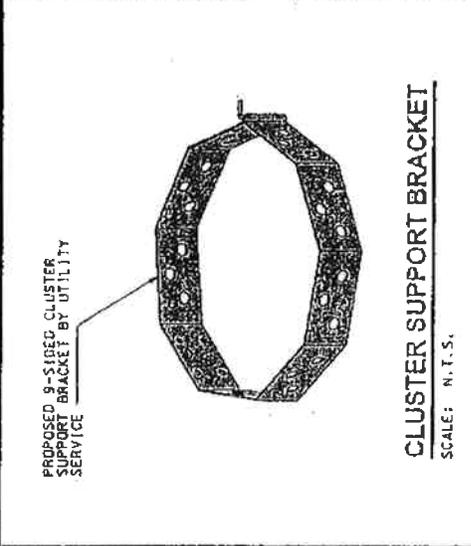
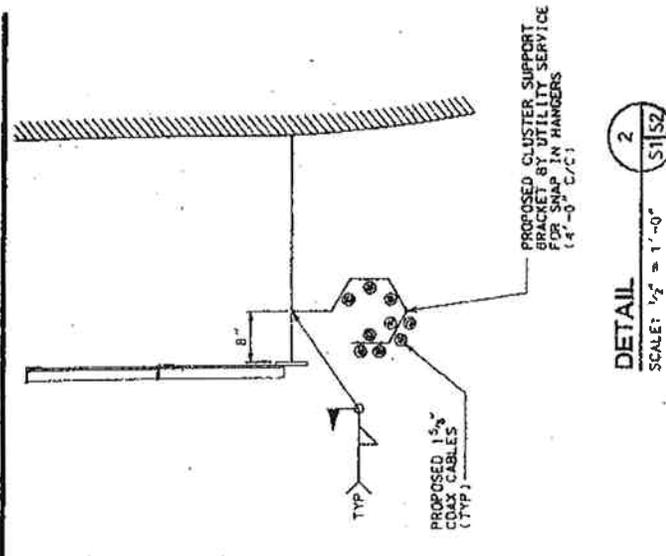
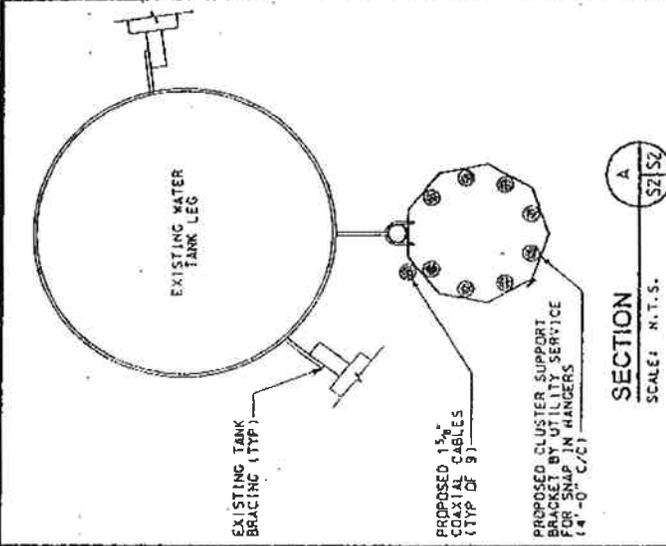
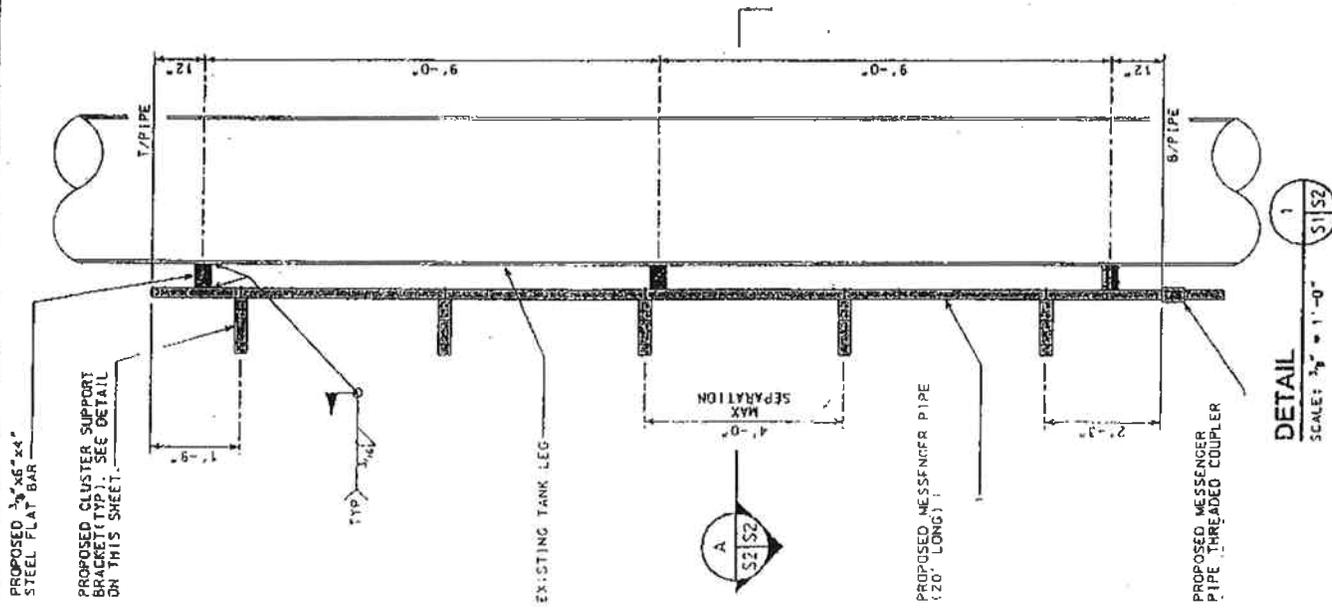
We do not approve other methods of installation, such as stud-welding, stitch welding, epoxy gluing, strapping, clamping, bolting, etc. All of these methods have been proven to present challenges in at least one, and often in more, of the four goals listed above. Feel free to contact us for more explanation.

If any significant wind loads are added on the roof of the tank, it is recommended that a gross structural analysis be performed to assure the structural integrity of the tank with the additional loading.

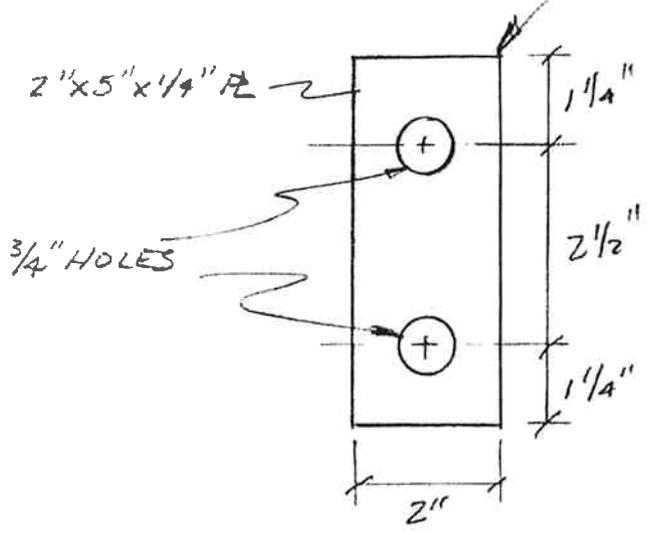
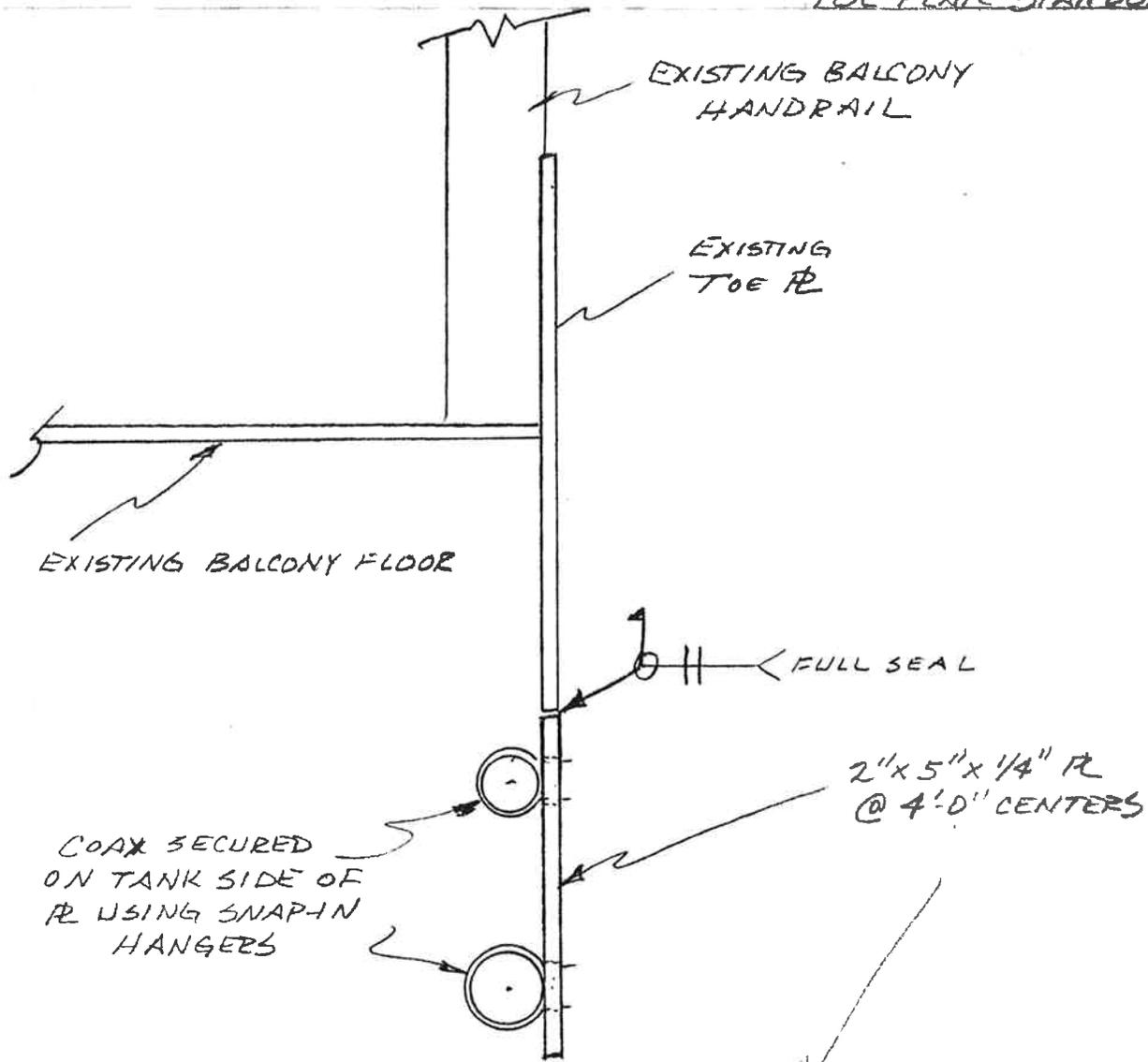
Attached are some details of recommended standoffs and mounts for smaller antenna systems.

## Details

- **Messenger Pipe and J-Cluster:** The preferred method of routing coax from the ground to upper levels of the tank is via a messenger pipe system. This messenger pipe should always be installed on the inside face of the leg to avoid interference with staging during maintenance. If only one or two coax are used, then the cluster brackets can be omitted and the coax secured directly to the outside of the 2" pipe with heavy duty wire ties. This saves costs up front, but still allows future use of cluster brackets if expansion is necessary. The J-Clusters used underneath the balcony are only needed if more than 2 coax are routed along the balcony. If 2 or less coax are used, then the Toe Plate Standoffs can be used instead.
- **Toe Plate Standoffs:** These standoffs are used to support the weight and wind load of 1-2 coax which must be routed around the perimeter of the balcony. The coax should always be secured on the inside face of the standoffs so that the coax will not interfere with rigging for future maintenance activities.
- **Balcony Penetration:** Whenever antennae must be mounted on the roof of the tank, then routing the coax to the roof requires a penetration in the balcony. It is very important that the penetration reinforcement be full seal welded top and bottom, and that the cutout for the penetration does not occur closer than 4" from the tank wall. Also, the penetration should be narrow enough to minimize any impendence with safe access around the balcony.
- **10" coax standoff brackets:** These brackets are to be welded directly to the tank shell from the balcony to the roof antenna location at 4 ft. intervals. Snap-in hangers are used to secure the coax to the brackets. These brackets can handle up to 4 coax if regular snap-ins are used, or up to 8 coax if 'snap-stack' hangers are used.
- **Single antenna roof mount:** This mount is designed for a single antenna to be mounted. The gussets should be positioned as shown to prevent water from pooling around the pipe. The mount should not be installed within 3 feet of the vent so that adequate access is maintained for future vent maintenance activities. If several antennae are planned, then a custom corral type mount should be investigated rather than cluttering the roof of the tank with several single mounts.
- **Handrail/Catwalk Antenna Mount:** The elevation of the midpoint of the antenna should be near the mid-rail of the balcony handrail. This is to avoid offset wind loads which can create structural problems on the balcony. It is important to know that the balcony's primary function is as a reinforcement of the tank itself. If other elevations are needed for a balcony antenna mount, a structural analysis is necessary to determine necessary bracing and supports.



TOE PLATE STANDOFFS ✓



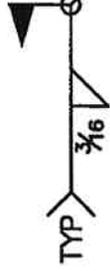
**NOTE:**

1. PRIOR TO PERFORMING THE CUTOUT IN THE CATWALK PLATE, THE CONTRACTOR SHALL VERIFY THE CUTOUT IS A CLEAR DISTANCE FROM ANY SUPPORT BENEATH THE CATWALK.

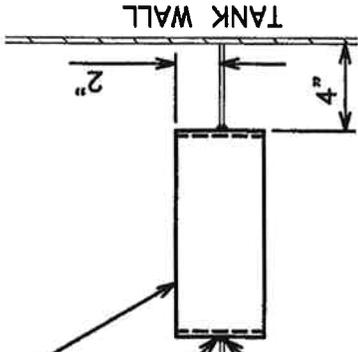
PROPOSED 9" x 16" x 4" x 1/4" TOE BOARD PENETRATION FRAME BY MTS WIRELESS (P/N: WT-PFS) OR APPROVED EQUAL



PROPOSED TOE BOARD PENETRATION FRAME

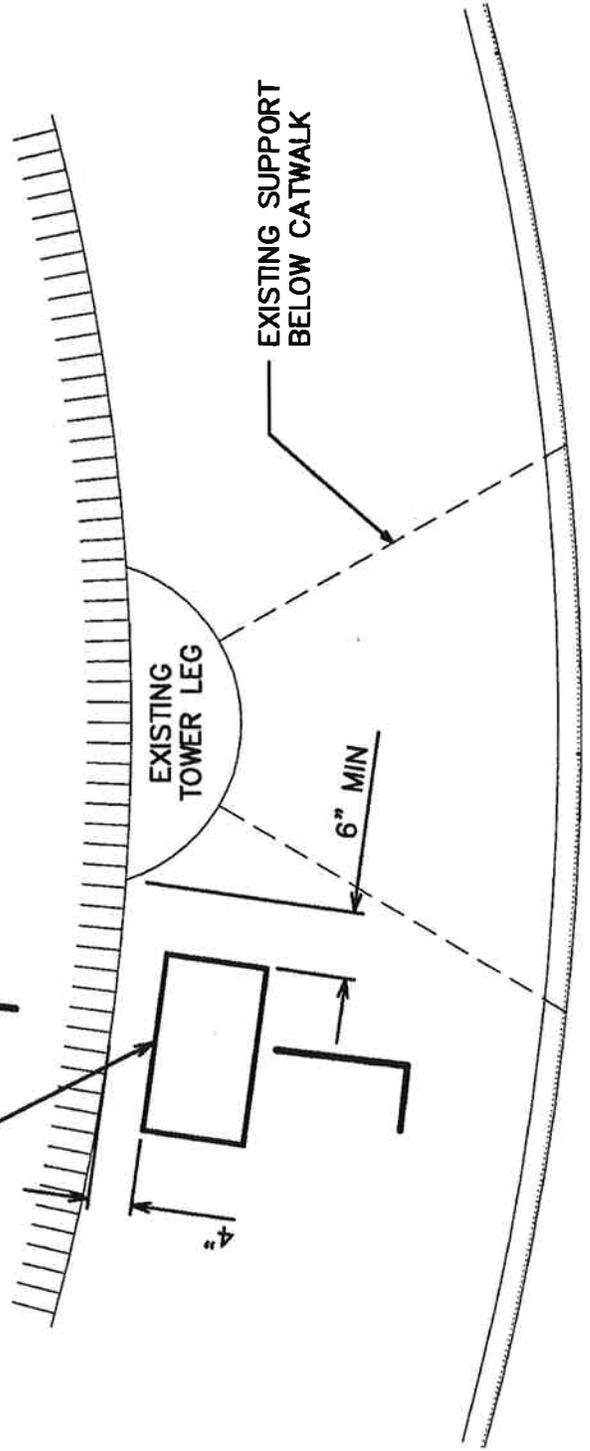


PROPOSED 9 3/4" x 16 3/4" CUTOUT IN THE PLATFORM

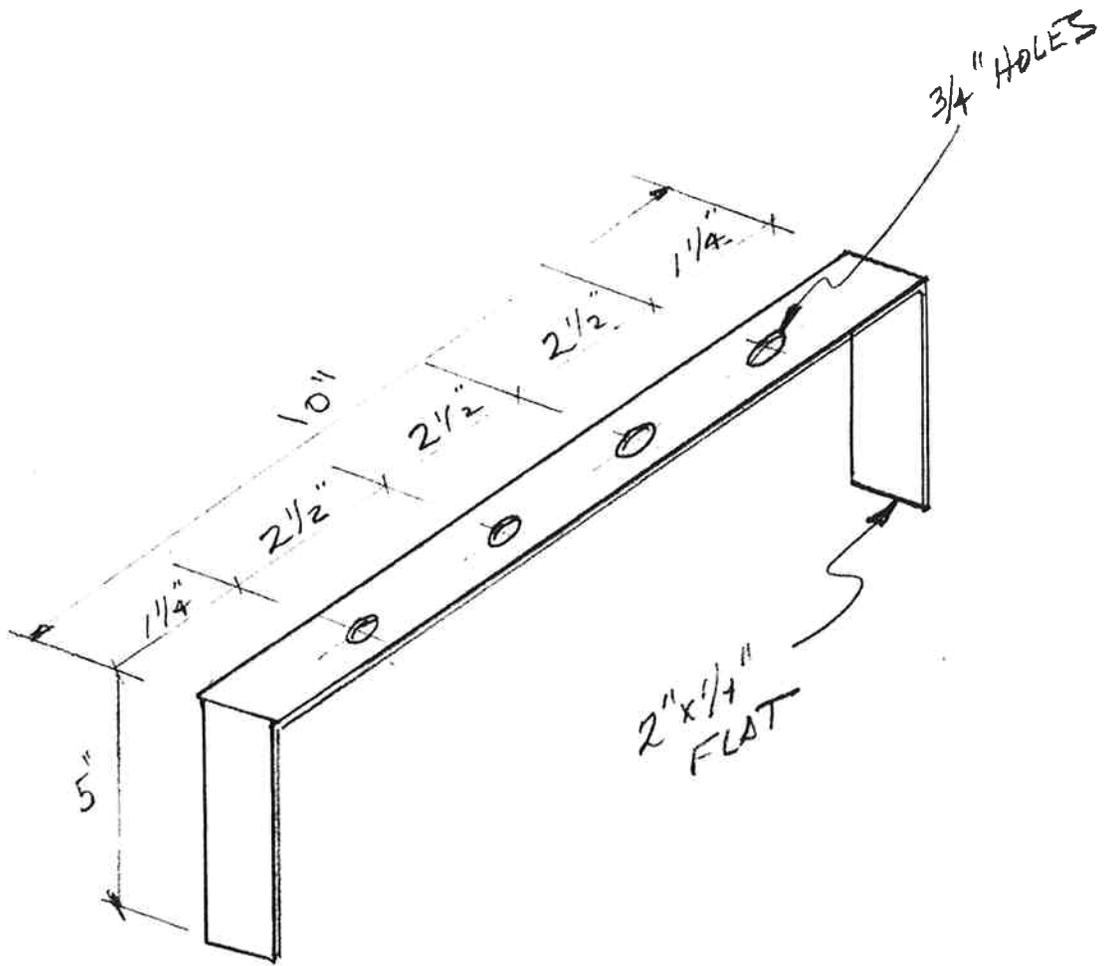


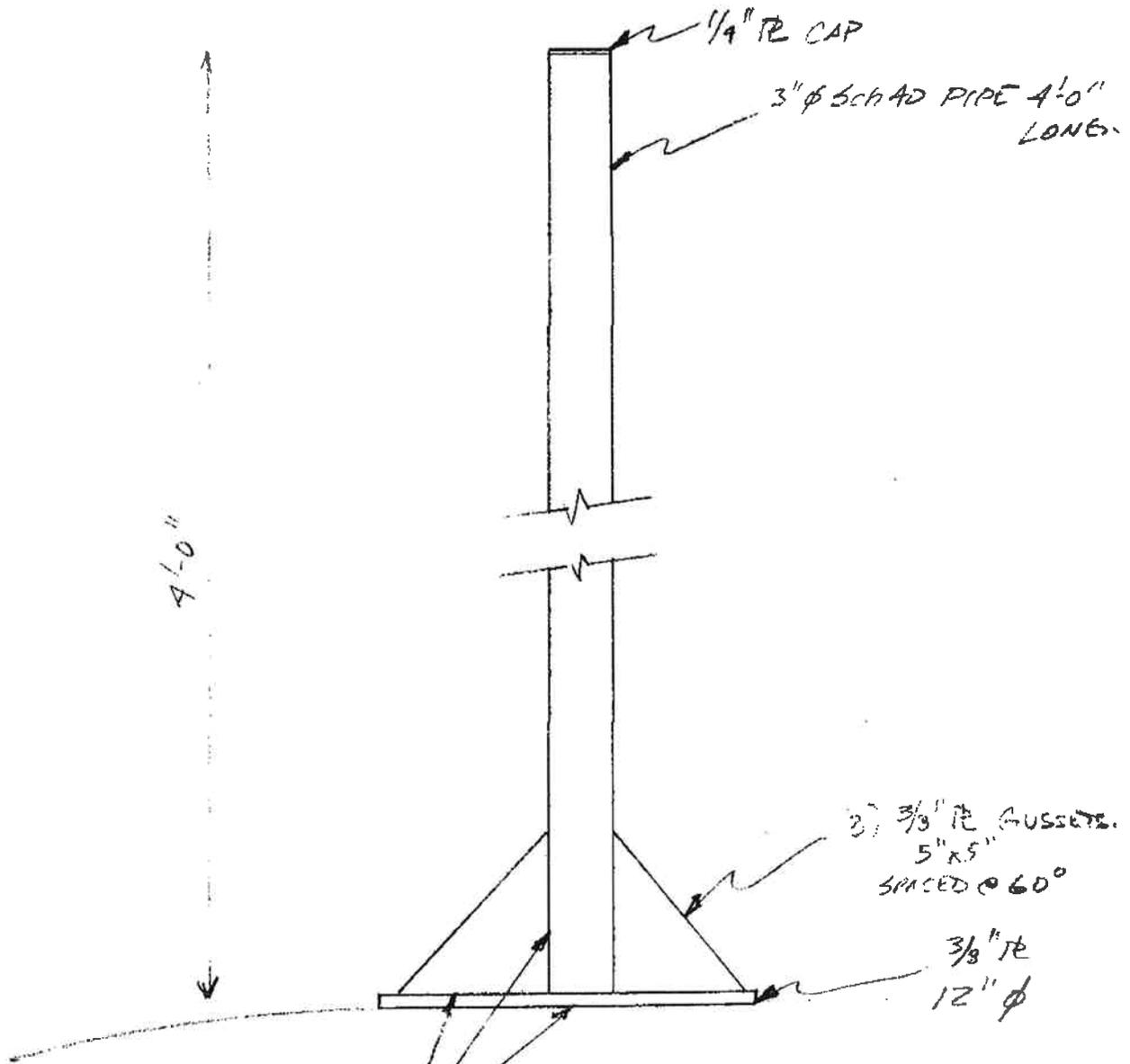
**SECTION**

SCALE: 1" = 1'-0"



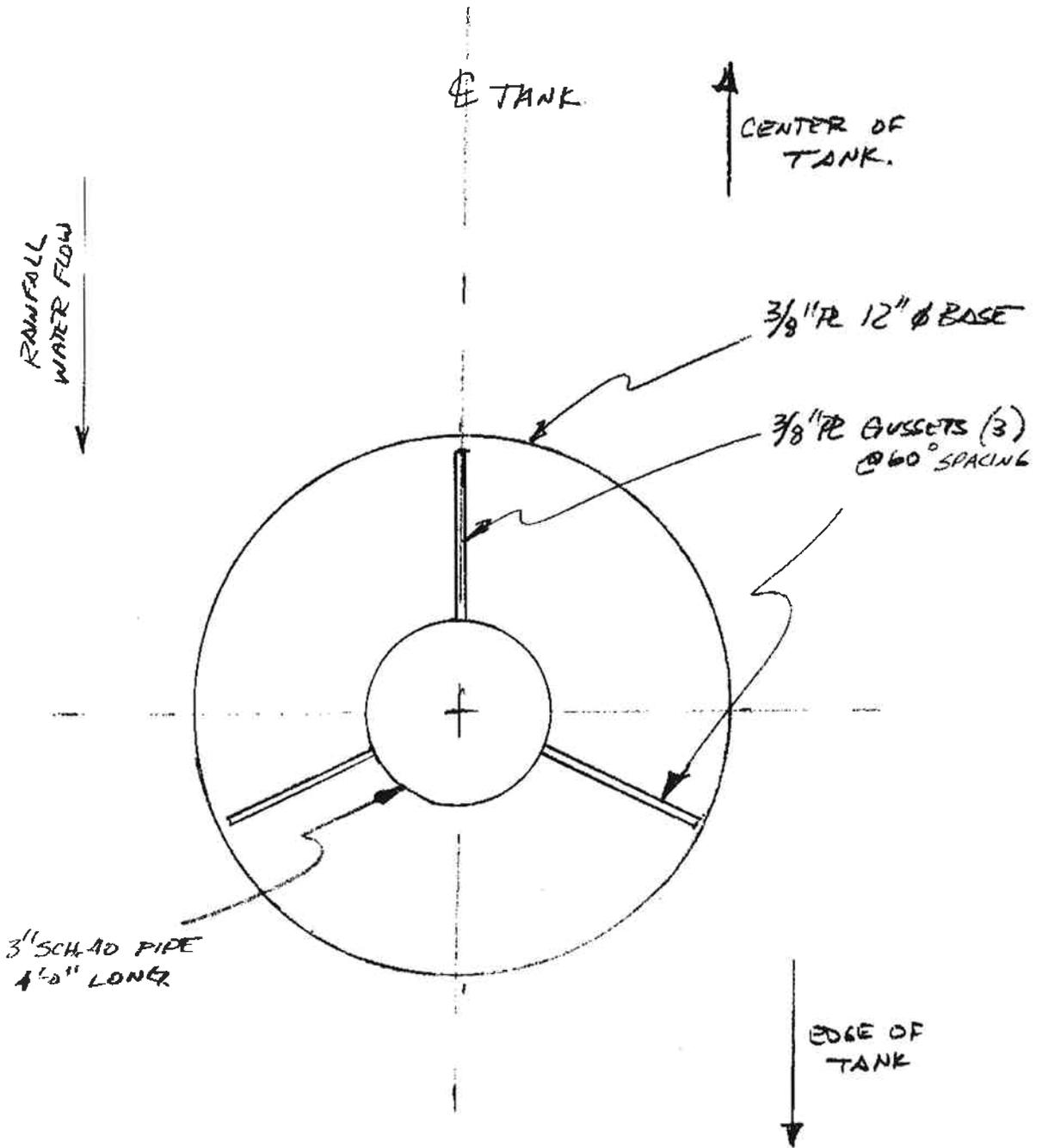
COAX STANDOFF BRACKET - 10"



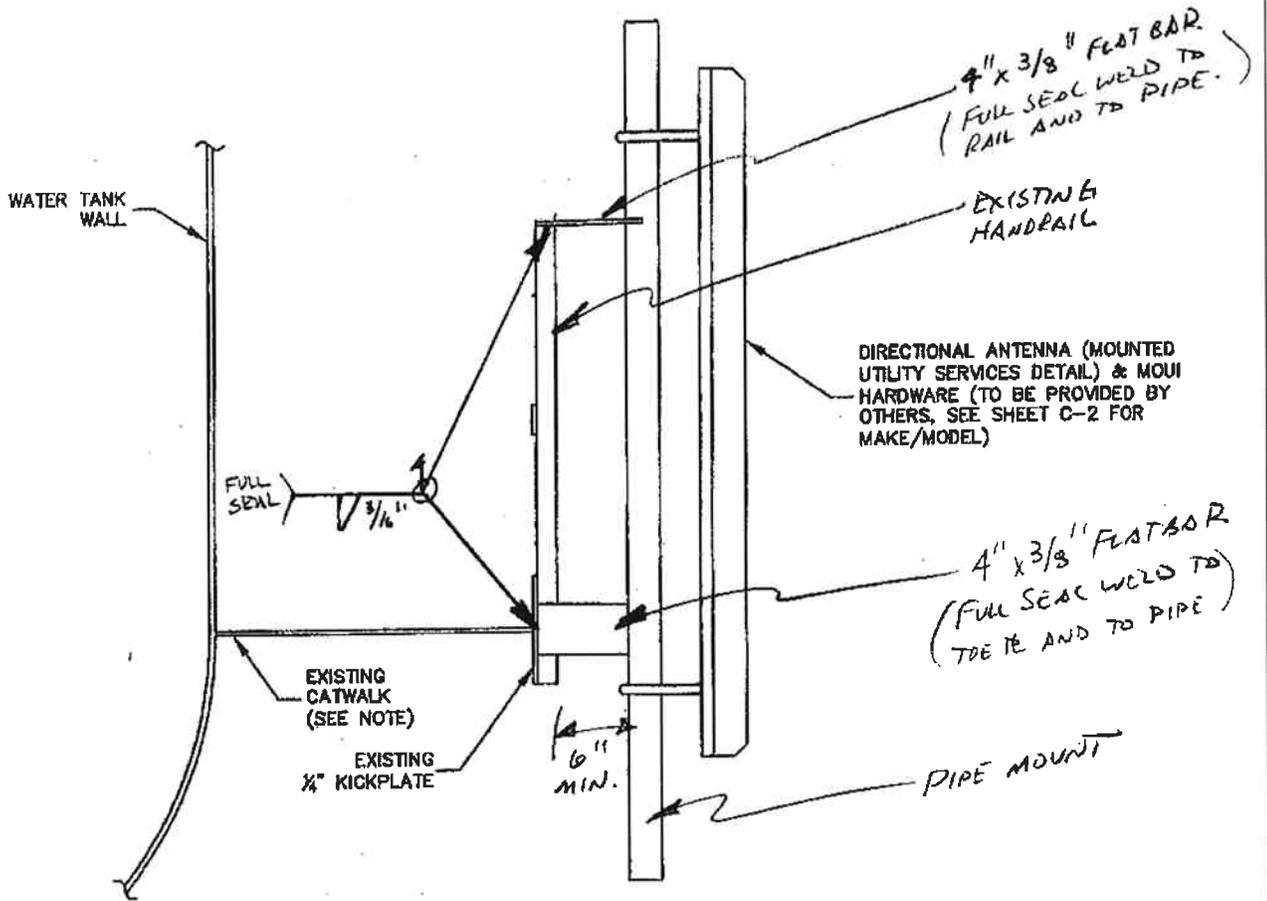


FULL SEAL  
TID.  
3/16  
3/16

\* FIELD TRIM BOTTOM OF PIPE AND BOTTOM EDGE OF GUSSETS TO ALLOW FOR SLOPE OF ROOF. PIPE MUST BE PLUMB.  
\* SEE PAGE 2 FOR GUSSET PLACEMENT.



GUSSET ORIENTATION



**CATWALK ANTENNA MOUNT DETAIL**