



MULTIPLE MIRROR TELESCOPE OBSERVATORY

Smithsonian Astrophysical Observatory and Steward Observatory, University of Arizona

Reply to: MMT Observatory
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Tucson, Arizona 85721
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MMTO Internal Technical Memorandum 86-4

From: C. Janes

Re: Grounding System for Steward Observatory Building

Date: May 6, 1986

The grounding system for the Steward Observatory building is shown in Figure 1. Per code, earth ground is connected to transformer ground and equipment ground. In addition, ground is bonded to the water pipe. The ground bus is connected to a ground grid system as shown in Figure 2.

Green-colored jacks in the electronics shop labelled "isolated ground" connect via a #8 wire to earth ground consisting of a coil of bare copper #8 wire under the building foundation. This ground does not connect to the grounding system in Figure 1 or 2 other than through the earth. Plugs for the isolated ground system are available in the Steward electronics shop.

From my experience, I would rate the "isolated ground" as seriously compromised for the following reasons:

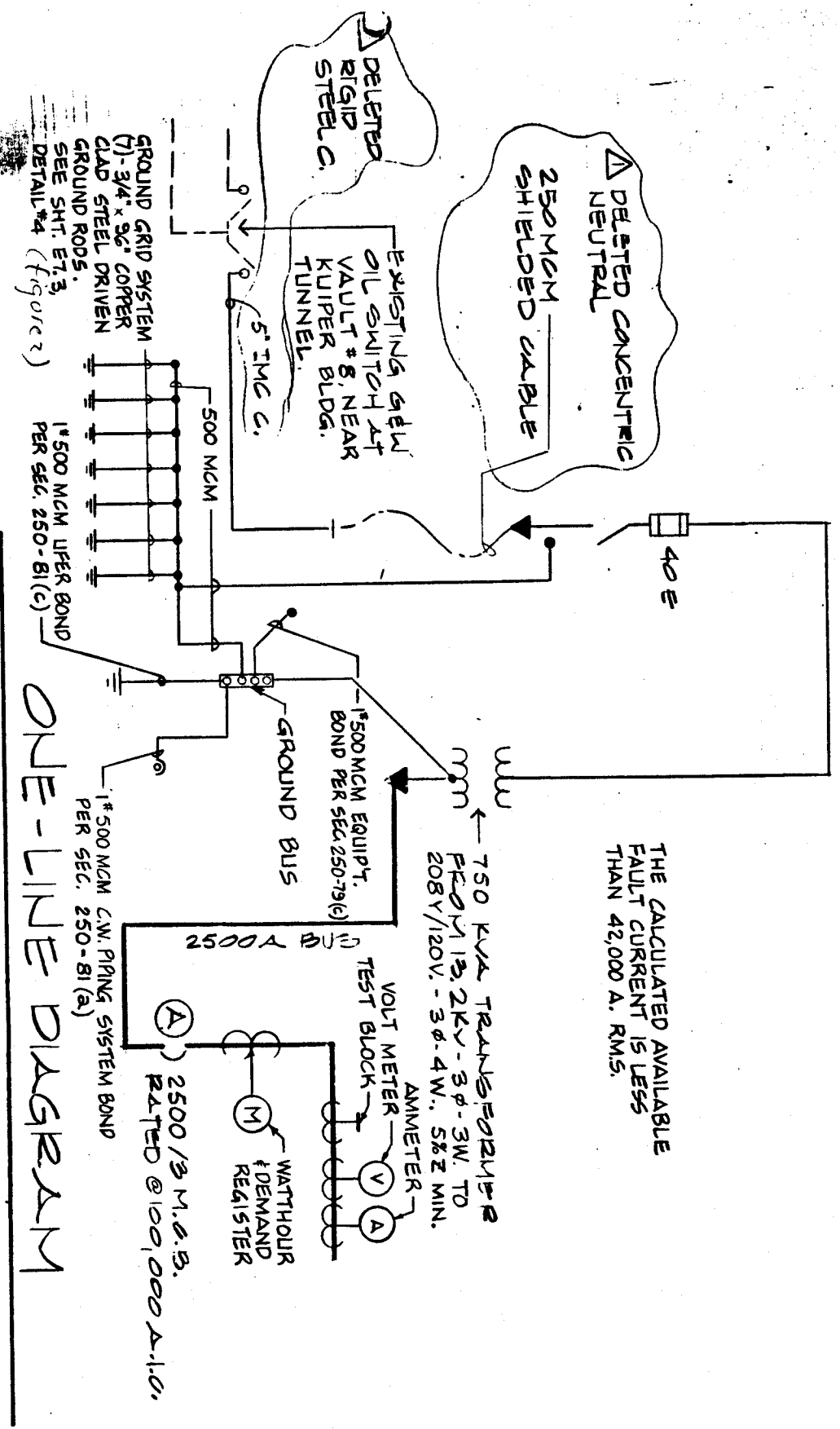
1. I don't think jacks provide a suitable low ohmic contact.
2. The ground wire is too small.
3. The connection to earth ground is inadequate and not serviceable.
4. The connection between wires in the isolated ground are twist locks which I don't think provide a suitable low ohmic connection.
5. This ground should connect to the grid shown in Figure 1.

Where an equipment ground is required, I suggest a connection to a water pipe or in extreme cases, running a 2" or larger braid to the ground shown in Figure 1.

The NRAO screen room is bonded to the 4" fire protection water pipe that goes to the roof. The microwave tower is grounded to this same pipe. The building has no lightning protection and none should be connected to the water pipe or other part of the building ground. If a lightning system is ever added, aerials and down conductors must be added to the building per NFPA code 78-1980, under the supervision of a licensed professional.

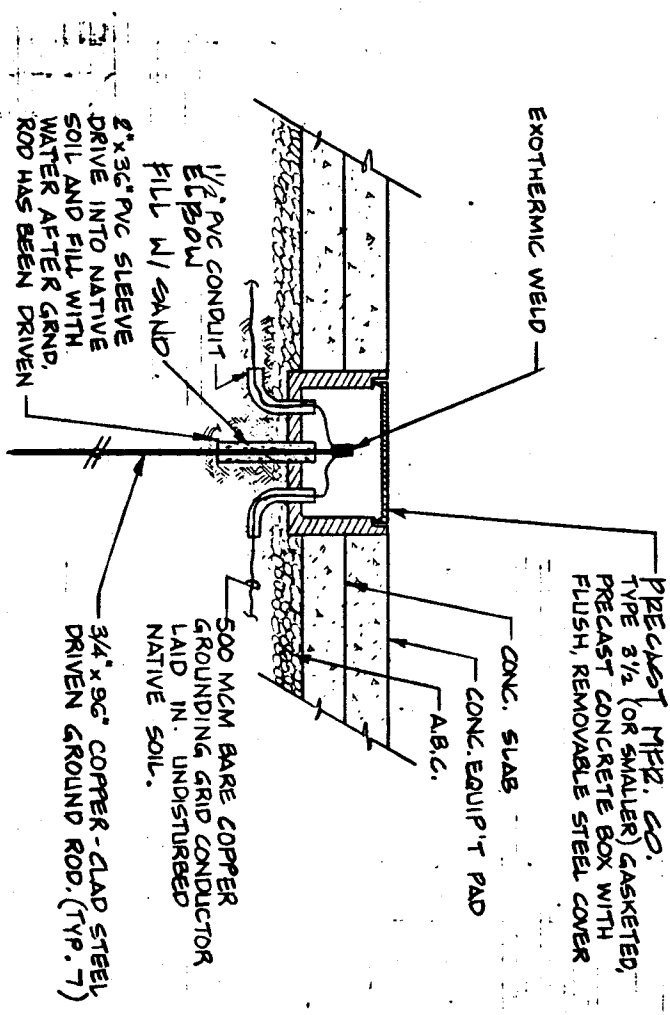
SERVICE ENTRANCE EQUIPMENT SHALL BE 2500 A - 208Y/120V-3Φ-4W-NEMAT-EQUAL TO SQUARE 'D' U.L. LISTED & FREE STANDING. PROVIDE LOAD SIDE ACCESS DOOR & FULL HEIGHT COPPER BUS. BRACE BUS FOR 7500 RMS SYM. PROVIDE REJECTION TYPE SWITCH & FUSE UNITS AS INDICATED

THE CALCULATED AVAILABLE FAULT CURRENT IS LESS THAN 42,000 A. RMS.



ONE-LINE DIAGRAM

Figure 1



GROUND ROD CONNECTION DETAIL # 4

Figure 2

NOTE:

1 # 8 $\frac{3}{4}$ " C TO GRD. IN BASE OF COLUMN.
 STATIC BLEED GRD. JACK. (TYP. 9 PLACES)
 @ +40" - PROVIDE (3) POST-GLOVER 499-412-001
 GRD. PLUG & CABLE ASSEMBLIES. 20" # 8 B.C.
 COILED IN BASE OF COLUMN. DO NOT CONNECT
 TO BLDG. STEEL OR GRDNG. SYSTEM.

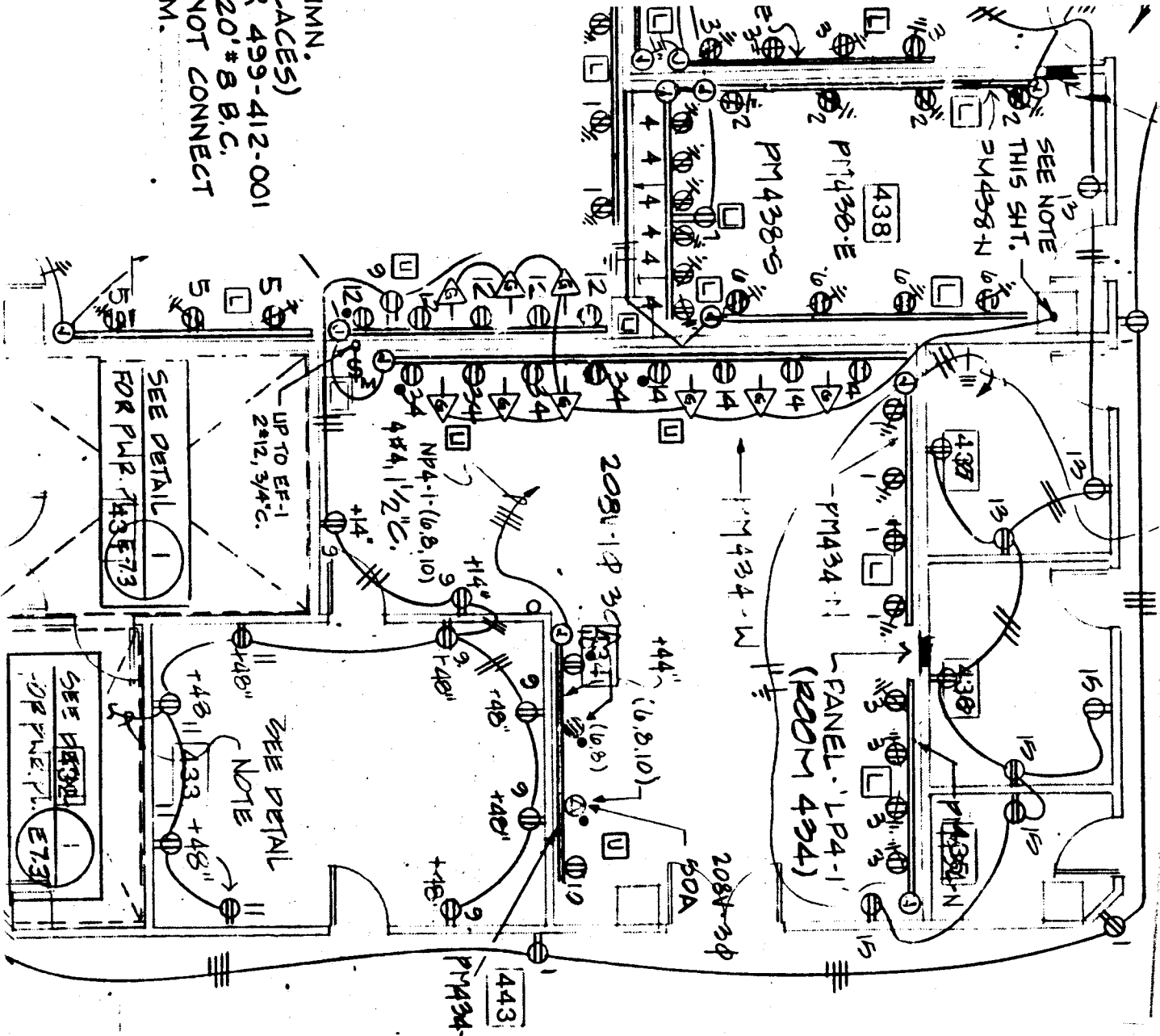


Figure 3