

MAGNET SUPPORTS IN THE TUNNEL

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This note sets forth some thoughts on how the magnets of the SSC might be supported in the tunnel. These thoughts are still exploratory, not yet fully refined and are intended to stimulate discussion.

Figure 1 shows a tunnel arrangement prepared some weeks ago that shows that space is very limited if a tunnel inside diameter of 9'10" is chosen. I understand that the magnet supports shown on this drawing (looks something like Unistrut) were only intended as a rough first cut and not as a viable design. The vertical spacing between rings on this drawing appears to be somewhat more than the 0.700 meter spacing now contemplated. This arrangement raises questions regarding the structural adequacy of the stand as well as the means for removing the lower magnet if servicing should be required.

An alternative arrangement is shown in Figure 2. Here, support feet have been added on the top of each magnet in addition to those that were already on the bottom. A stiffening rib is carried around the circumference to transfer the loads from the tube wall to the feet. This rib might replace the stiffening rings on the cryostat that are now each side of the supports. This arrangement permits the upper ring to be supported directly on top of the lower ring. I would picture the use of shim stacks to provide the final alignment of the lower ring relative to the floor and of the upper ring relative to the lower ring. Shim stacks provided very effective and rapid alignment for the PEP ring. Fixtures can be used to facilitate the positioning and shimming operation. This configuration provides very stiff support (horizontally as well as vertically) for both rings. It is compact and saves space in the tunnel. It also permits stacking of magnets during manufacture to conserve storage space and facilitates picking up of the magnets by an overhead crane. Temporary sheet metal or plastic covers can be placed over the feet to prevent damage to the machined surfaces of the feet during manufacture and handling prior to installation.

A variation is shown in Figure 3. The stiffening rib is of roughly octagonal shape instead of the circular shape of the previous figure. This saves a bit on magnet width.

Figures 4 and 5 show two arrangements for supporting the upper ring temporarily while a lower ring magnet is removed. In Figure 4, tie-rods to the ceiling are used temporarily. This puts concentrated loads onto the ceiling so special strengthening of the tunnel may be required at these locations. In Figure 5, a 3" high beam (could be a 10" or 12" steel channel laid flat) spans the width of the tunnel. Behind the magnet, it might be supported by a niche formed into the tunnel wall or it might be supported by a curved support post slid in behind the magnets and reaching to the floor. Still another approach could be to use arms extended from the magnet transporter to support the upper magnet while the lower magnet is being moved onto or off of the transporter. Further thought might suggest even better ways of doing it.

It appears that this could be a viable way of supporting the magnets of the SSC rings. I would appreciate comments and suggestions.

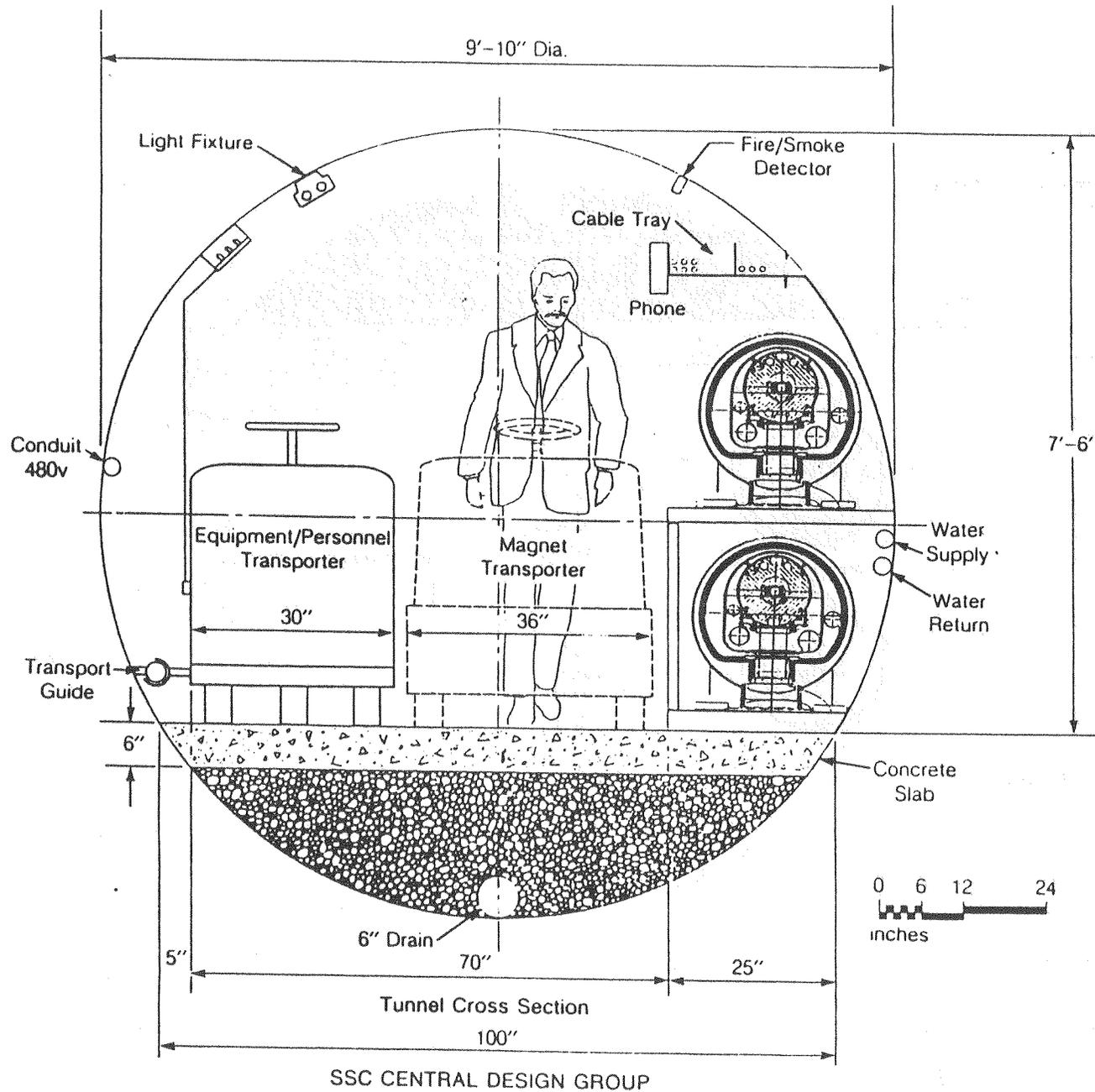


FIGURE 1

XBL 859-9342

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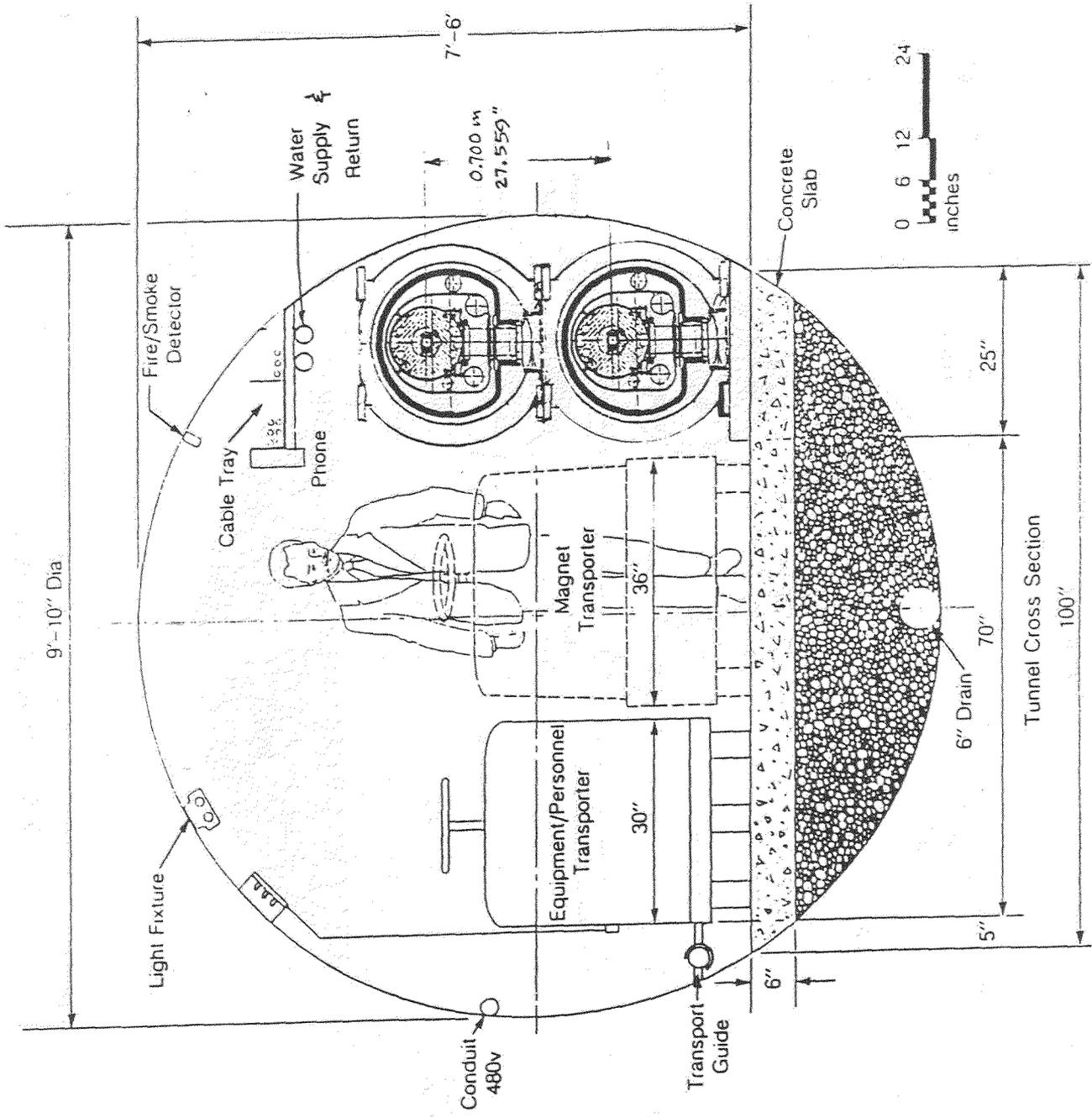
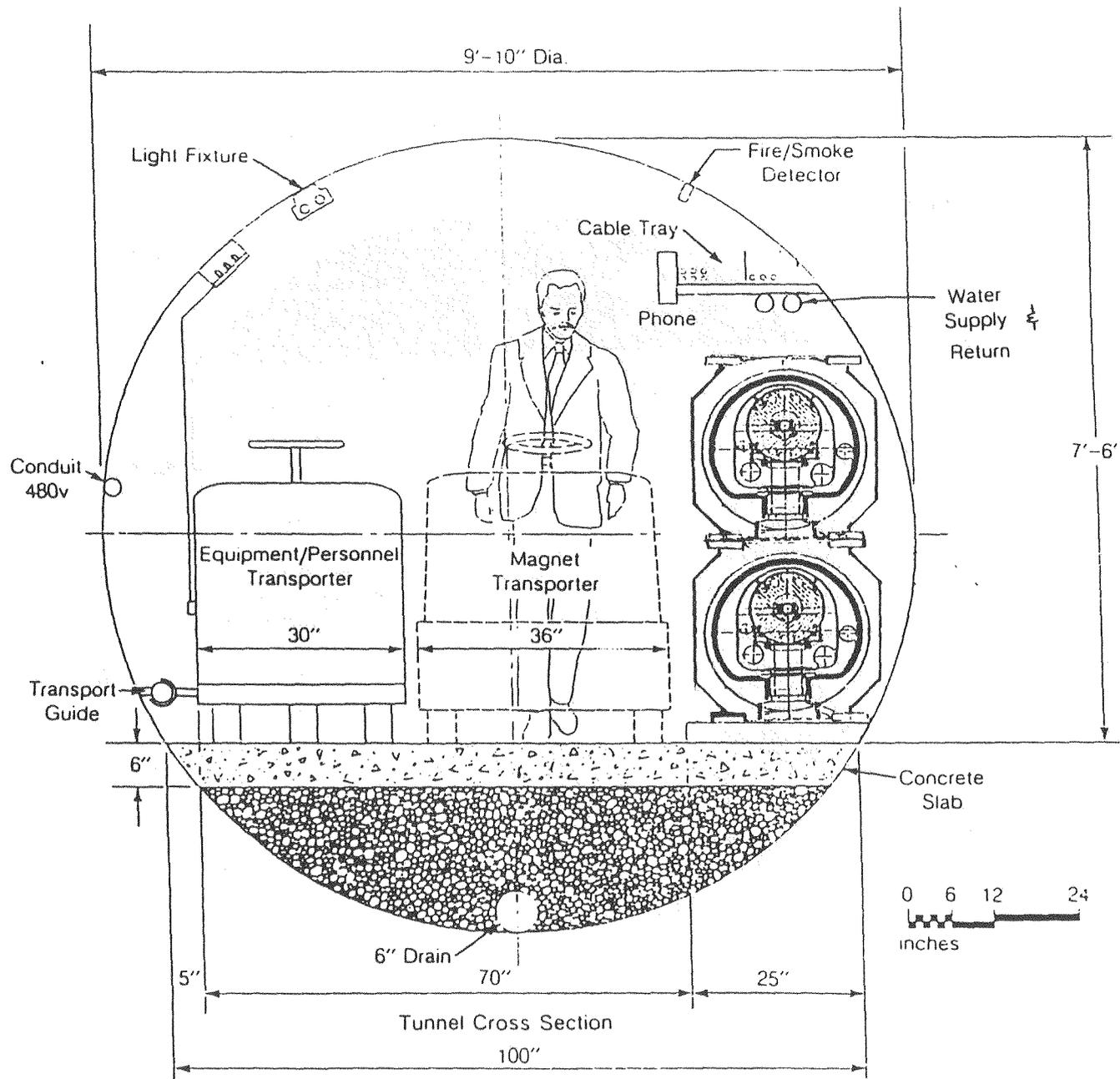


FIGURE 2

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FIGURE 3

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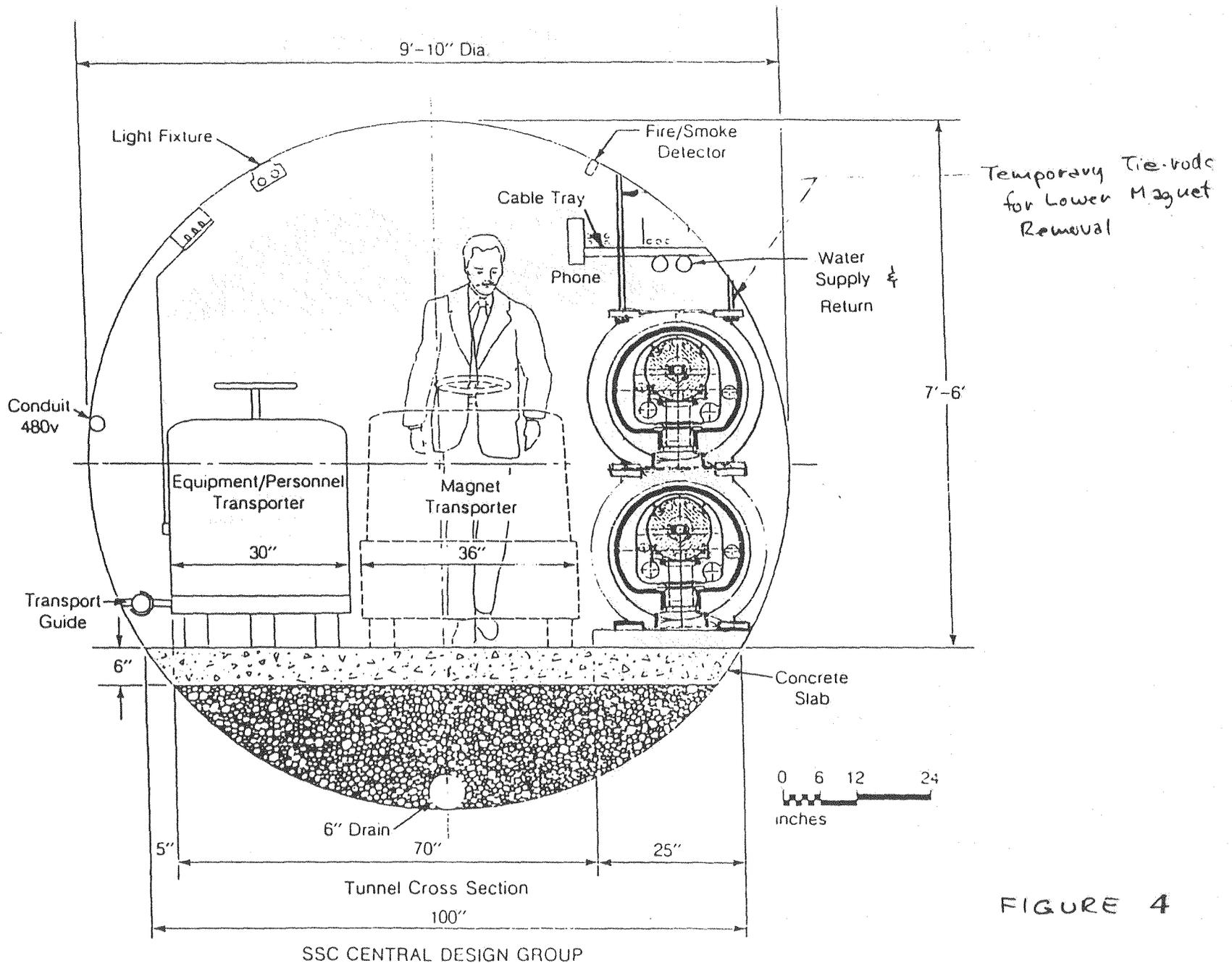
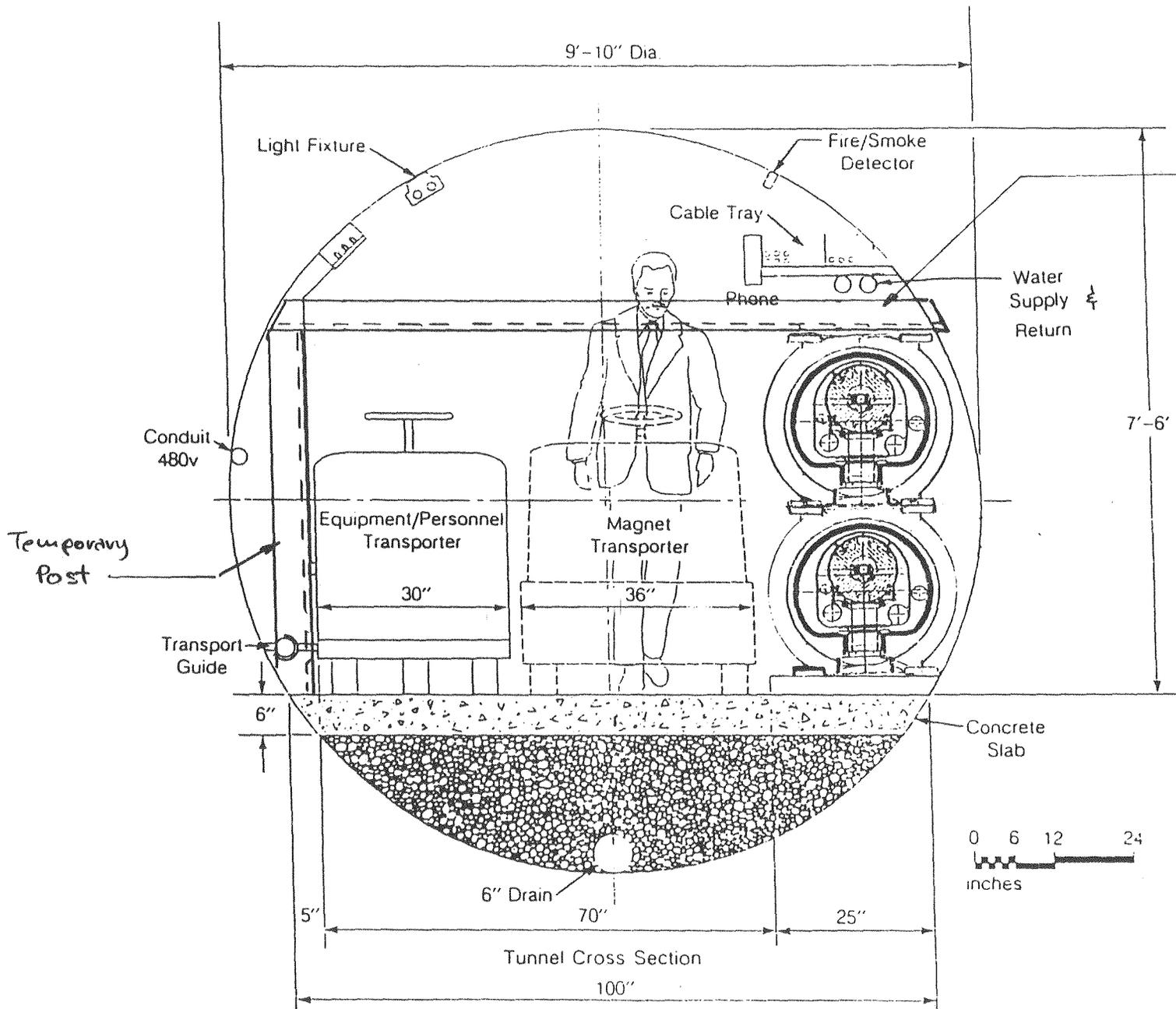


FIGURE 4



Temporary Support Brim (12" channel) Inserted into niche in wall (or use curved support post behind magnets instead of the niche)

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FIGURE 5