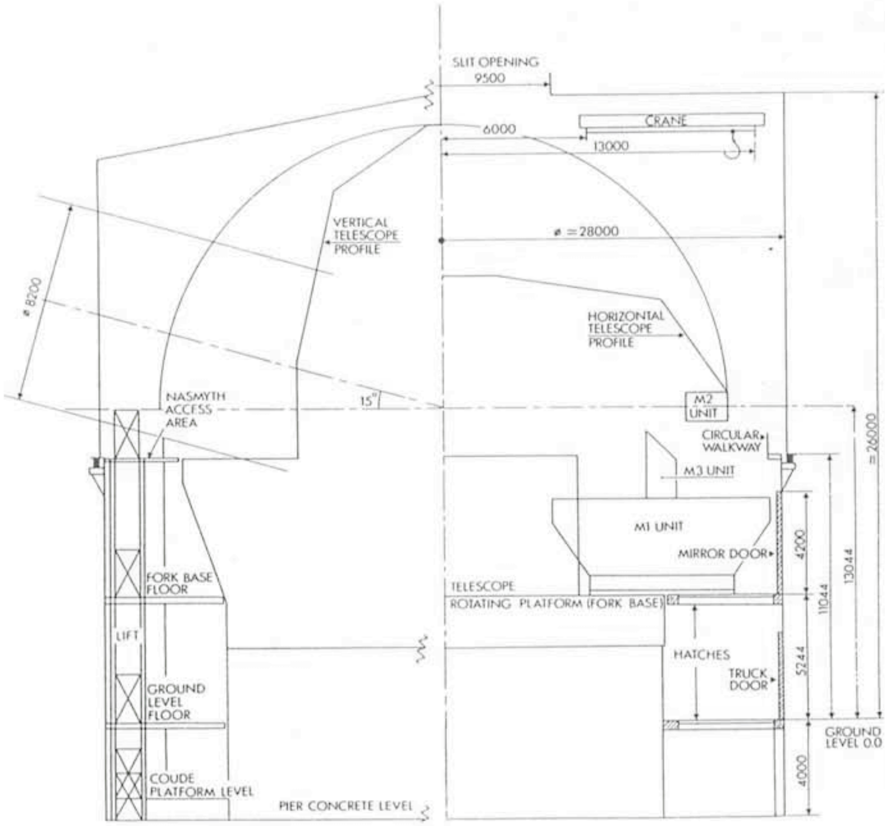
The VLT Enclosure from the User's Standpoint

Here is a brief description of the selected VLT enclosure, emphasizing the aspects which are likely to be of most interest to future users. A schematic cross-section of the enclosure is shown in the figure. Access for personnel to the enclosure will be either via the underground utility tunnels that connect all the buildings of the telescope area or a normal door at the ground-floor level. Staircases and a lift will connect all floors of the enclosure. A large external door at ground level will allow entry of trucks with large instruments and goods in the so-called ground access room, which covers a quadrant of about 90° at ground level. The rest of the ground floor is made of exposed radial walls which support the metal structure surrounding the telescope room.

At the underground floor a 360° ring of rooms will surround the telescope pier and give access to the pier interior where the coudé instruments will be located. Miscellaneous service equipment will be installed in these rooms, such as the oil pumps for the telescope bearings, but ample space will remain for storage of users' items, which may be quite useful particularly during the installation of instruments. Large equipment items will be lowered down to the underground floor by the dome crane, through a hatch in the floor of the ground access room.

The crane, installed radially just under the roof of the dome, will be the main handling tool for all maintenance operations inside the enclosure and, by rotating the dome, will be able to serve the whole telescope volume except the central region. This crane will be used to mount the Nasmyth adapters and instruments, to install and remove the secondary mirror unit (with the telescope in horizontal position), as well as to lift the tertiary mirror unit before the exit of the primary mirror cell on its way to the aluminization plant. Another hatch will allow the crane to pick up loads from the ground access room into the telescope room.

Inside the telescope room there will be two floor levels. The fork base floor, about 5.2 m above the ground level, will constitute a continuous surface with the rotating azimuth platform of the telescope. Cassegrain instruments will be mounted and accessed on this floor. The upper floor level, 11 m from the ground level, will be continuous with the Nasmyth platforms of



Schematic cross-section of the VLT enclosure.

the telescope over a 90° quadrant: this area will be the main access way to the Nasmyth instrument for personnel and small equipment. Only a narrow circular walkway will run all along the inner wall of the enclosure, permitting maintenance access to the dome rotation drives and wheels.

During the day and in general when the enclosure is closed, the thermal control system will keep all internal surfaces inside the telescope room at a set temperature close to the predicted value for the coming night: this will prevent, after opening the dome, the rise of convective flows that may affect the seeing quality. This thermal conditioning will be achieved by air cooling and mixing: in order to achieve the desired heat transfer rates with all surfaces, the mixing rate may be set at up to 10 volumes/hour. Therefore, daytime users of the enclosure should expect to find a somewhat (literally) cool working environment, while the noise of fans and air treatment units should not exceed the level usual for rooms equipped with individual air conditioning equipment.

In addition to the thermal control system, the enclosure will include a variety of mechanisms for dome rotation, opening, louvers, etc. All these systems will be managed by a network of computerized controllers linked both to the Telescope Control System network and to the Building Management System (which monitors and administers all service supplies on the site). Therefore the observer will not only be able to operate from his/her control station all the enclosure mechanisms linked to telescope operation (such as dome rotation and slit opening) but will also be able to inquire at any time about the status of all active components of the enclosure.

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cess in which the lower part of the telescope is contained, topped by a retractable hemispherical dome. Two possibilities for the dome were extensively studied: an inflatable dome made of a pressurized double fabric supported by rigid hoops, or a dome consisting of overlapping shell sections connected along a common axis to the rotating cylindrical part.

Both enclosure versions with the dome in solid shell sections and the inflatable dome were the object of a detailed feasibility study and the inflatable dome design was also thoroughly tested by building a 15-m prototype dome at La Silla (Fig. 3). This dome, erected in 1988, is now planned to be used by Bochum University as the dome for their new Hexapode telescope.

2.2 The NTT-type Enclosure

An alternative enclosure type which was studied in some detail was a scaled-up, simplified version of the NTT building installed at La Silla (Fig. 4). While the other enclosure types limit the observing elevation to 10–15° above the horizon, the NTT-type enclosure would allow observation down to the horizon. It features large, upside down L-shaped doors to cover the observing slit as well as louvers around the periphery of the building, which allow some direct ventilation of the telescope at any azimuth. Like for the NTT, a semi-permeable wind screen can be raised across the slit.