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4. Microwave Tower, Kimberley (Rep. of South Africa)

Owner: Department of Posts & Telecommunications
Architect: Joubert Owens Van Niekerk & Watt
Engineer: Ove Arup Incorporated
Contractor: Ovcon (Pty) Limited
Works duration: 21 months
Service date: 1985

The Microwave Tower currently under construction at Kimberley is the largest capacity microwave tower to be built for the South African Department of Posts & Telecommunications. It is an important link in the national network of towers for automatic telephone exchanges and has to accommodate 48 antennae dishes as well as equipment rooms. The tower is 129 m high and has four technical and equipment floors as well as four antenna platforms.



The shaft of the tower is a basic 9 m square shape with chamfered corners providing a seven-cell structure to accommodate a lift shaft and lobby, stairwell and four service ducts at each corner. At the 75 m level is the base of the major cantilever structure which supports the technical floors. Above that are the four cantilevered octagonal antennae platforms and the VHF room.

The tower, though not very tall, presents an interesting sculptural form of high quality concrete elements which efficiently accommodate the functional requirements.

The main shaft was constructed by slipforming. The main slide to 75 m was completed in 14 days. At that level the outer wall thickness changes from 700 mm to 300 mm and details for connecting in the eight main cantilever beams on the corners are incorporated. Openings had to be left at the corners to allow for the heavy reinforcement.

The second 50 m slide was completed in nine days. A good quality finish was achieved throughout. An important feature which facilitated efficient construction was the internal steel staircase which was fixed as the slide progressed to provide safe and efficient access for workmen and cut down on travelling time.

The eight tapering cantilever beams at the corners are 800 mm wide x 4,6 m deep at the shaft. The beams cantilever 8 m and carry the columns supporting the three floors above. To avoid excessive supporting structure underneath the beams which would have had to be removed subsequently under difficult access conditions and which could have damaged the finish of the tower, the beams were supported during construction from above by inclined Dywidag bars tied back into the tower. These bars supported steel joists under the soffit. A carefully designed steel bracket at the corners enabled the two temporary joists meeting at the corner to be supported on the recess in the shaft at that level and readily removed after construction.

Between the corner, beams are precast panels laid at a slope to form the finished underside of the cruciform-shaped supporting brackets.

The walls of the equipment floors are clad with plain off-shutter precast concrete panels which were manufactured on site.

(C. M. McMillan)

