



for buildings exceeding 150 ft in height — the AMP Building is 380 ft high from pavement level — the investigators studied structural requirements in comparable cities overseas.

Representatives of the AMP Society and the architects toured the United States and Canada for three months to confer with the designers and the builders of 40 city structures. They investigated town-planning and construction requirements in 18 cities. They analysed the sums spent on a number of important buildings with the objects of maintaining effective cost control and general economy.

The planners decided on an unusually high degree of natural and artificial light in the building, with future provision for even higher levels because of expected building development in the locality. They finally studied five possible designs — rectangular towers in three arrangements, a circular building, and the eventual structure, which is a double crescent-shaped building with a connecting core.

The architects, the several consultants, and the quantity surveyors separately analysed the costs. This inquiry established that the estimated cost of the eventual structure differed slightly, if at all, from rectangular construction. The detailed estimates proved to be within $\frac{1}{2}$ percent of the final tender cost. Negotiations with the Building Height Committee of the Chief Secretary's Department of NSW occupied many months before final approval of the proposed height of the structure.

The group of consultants met each week to plan and check the drawing schedule. The bill of quantities and the specifications occupied 450 and 600 typewritten foolscap pages respectively. The AMP Society, after advertising for tenders overseas and in Australia, let the main contract to Concrete Constructions Pty Ltd. Throughout the construction, a special committee conferred regularly with the consultants, the contractors, and the sub-contractors

This picture of the AMP Building in Sydney shows the double crescent construction with a connecting core. The Circular Quay ferry wharves and the Cahill Expressway, crossing the top of the Circular Quay Railway Station, are in the foreground.

to ensure a complete flow of information about every phase. The construction involved the use of 140 sub-contractors and major suppliers of materials.

Experimental structure

The planners decided that, with so many new materials and methods available, the simulation of as much of the building as possible would save a considerable sum by proving quality and design. The experimental mock-up building consisted of a full-scale section of the eventual structure.

Complete in itself, and sewered, ventilated, and weatherproofed, the mock-up became an occupiable and useful office or store. At first-floor level, it simulated a bay of the north-east corner of the eventual structure. Internal wall surfaces in the mock-up simulated corresponding walls in the recently completed building. The ground-floor level simulated a section of the main entrance lobby. All those engaged in the project could see in the experimental building what the construction involved.

This experiment led to many changes in methods to achieve the utmost efficiency and the best results. The mock-up saved working time by allowing opportunities to correct work which could, in actual construction, have caused costly waste and delays. The designers used and evaluated many materials. The mock-up provided suppliers and sub-contractors with a means of testing materials before becoming committed to heavy capital expenditure for production.

In the mock-up, the designers tested materials for

ease and speed in erection and fixing, for wear and permanence, for aesthetic merit, and for tolerance, this last factor being particularly important when a 4 ft 2 in modular pattern had to be maintained on accurate centres in finished surfaces throughout the building.

The Commonwealth Experimental Building Station conducted a full-scale test of the fire-resistant qualities of a flooring section under extreme conditions in a furnace at the station. The construction method resulting from this research saved more than £100,000 in the cost of the building, and ensured maximum flexibility for services and lesser dead loads throughout the structure.

Experiments in the prototype building included testing back-up fire walls behind the curtain walls for weight, fixing methods, and ease of erection. Three different curtain walls had been chosen for design and construction. Experimenters used fire hoses to simulate the worst weather conditions in testing the curtain wall eventually chosen.

In extremely hot weather, with the full load of sunlight, they instantaneously cooled window glass and spandrels with jets of cold water to cause rapid contraction, so checking fixing methods against cracking of glass. The designers tried many spandrel materials and colors in the prototype for permanence, stability, and texture. They found that some fixing methods for mosaic tiles failed after a year.

Cellular steel floor

They installed a cellular steel floor — a new development — checked it, redesigned it in various units, and tested it with heavy weights. Its performance proved to be well above the capacity

required for the building. Complete evaluation and testing in the prototype proved that the light fittings eventually chosen gave 15 percent more output than the design figures showed. The lighting test involved checking for wear, working comfort, evenness of distribution, and ease of maintenance and tube replacement.

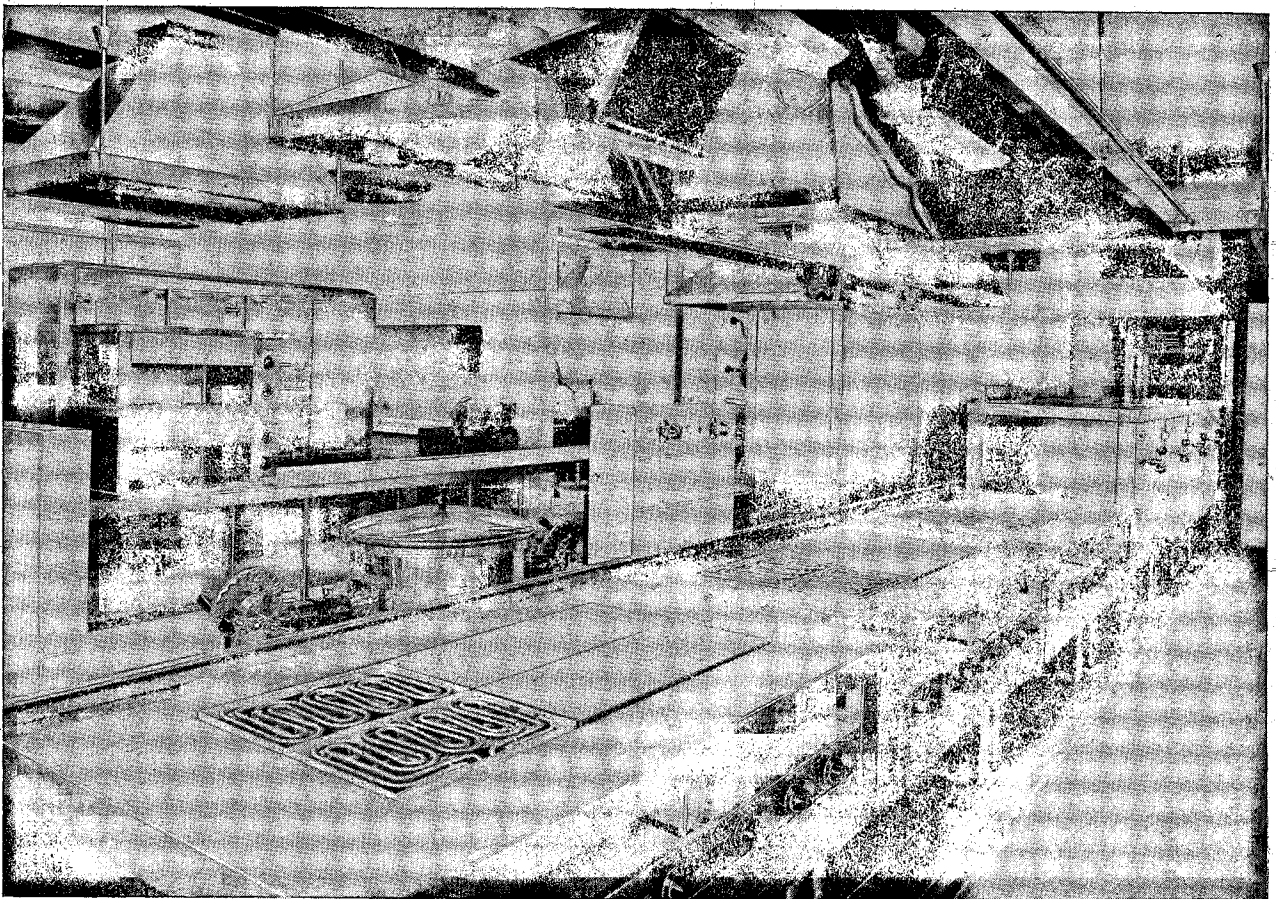
The tests of the sill units — a difficult selection because the unusual periphery of the building presented a problem in air circulation and distribution from the sill — occupied two years. Other tests included floor covering for wear, texture, color, maintenance, and joint tolerance, and ceiling materials for noise seal, texture, and flexibility of pattern.

The architects consider that the experiments in the mock-up structure became an essential research resulting in a better finish to the building and in faster, cheaper construction.

The planning required close attention to the mechanical services, the cost of which in a modern block of offices may be 25 to 35 percent of the total. The preliminary investigations showed that the western face of the building should be "blanked off" for air-conditioning purposes and that sufficient light should be gained from the northern and southern windows.

Long investigation resulted in the choice, for the large area of solid walling on the western face, of glass mosaic tiles just under 2 in square, giving a light pattern in 1 ft squares to alleviate monotony, as well as a light variation within each 1 ft square to maintain interest at close range. The designers decided that the solid walling should be as light and reflective in color as possible and that the material should be permanent and self-cleaning, not requiring maintenance.

Because of the dominating, horizontal lines of the Cahill Expressway, running above Circular



Stainless steel is used extensively in the impressive and very large kitchen for the staff cafeteria in the AMP Building.