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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REPORT

relating to the proposed provision of

BUILDINGS AND SERVICES FOR THE INTERNATIONAL TERMINAL COMPLEX AND ASSOCIATED AIRCRAFT PAVEMENTS IN THE NORTH-WEST BUILDING AREA

at

SYDNEY (KINGSFORD-SMITH) AIRPORT

FOR SENATOR PROWSE —

I present the Report of the Parliamentary Standing Committee on Public Works relating to the following proposed work:

Provision of buildings and services for the international terminal complex and associated aircraft pavements in the north-west building area at Sydney (Kingsford-Smith) Airport.

21st October, 1965.

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

BUILDINGS AND SERVICES FOR THE INTERNATIONAL TERMINAL COMPLEX AND ASSOCIATED AIRCRAFT PAVEMENTS IN THE NORTH-WEST BUILDING AREA AT SYDNEY (KINGSFORD-SMITH) AIRPORT

REPORT

By resolution on 18th May, 1965 the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and separate report on each work, the following proposed works at Sydney (Kingsford-Smith) Airport:-

(a) site preparation of the north-west building area; and

(b) provision of buildings and services for the international terminal complex and associated aircraft pavements in the north-west building area.

The Committee have the honour to report as follows on the second of these references.

GENERAL

1. The site works and the construction of the international terminal complex and associated services are two of a number of major works designed to increase the capacity of Sydney airport to handle the growing volume of air traffic. Other phases of the work include:-

(a) the southern extension of the north-south runway;

(b) construction of new operations and control tower buildings; and

(c) provision of an improved instrument landing system on the north-south runway.

2. In a report presented to the House of Representatives on 22nd August, 1963, the Committee recommended that the north-south runway be extended in a southerly direction to a total length of 8,500 feet. This recommendation was accepted and the construction of the extension is now in progress.

3. The Committee's reports on the site works for the north-west building area, on the operations and control tower buildings and on the improved instrument landing system for the north-south runway, were tabled in the House of Representatives on 23rd September, 1965, 31st August, 1965 and 15th September, 1965 respectively.

TERMINAL BUILDING DEVELOPMENT

4. In the report on the site preparation of the north-west area, the Committee agreed with the proposal to carry out the work in that reference. It also recommended that -

(i) there is an urgent need to completely redevelop the passenger terminal facilities at Sydney airport;

(ii) there is a need to commence construction of the new domestic terminals concurrently with the international terminal; and

(iii) the redevelopment of the passenger terminal facilities take place in the north-west area.

5. The north-west building site is bounded by Cooks River and Alexandra Canal on the west and north, and on the other sides by airfield pavements.

6. The present reference relates to the construction in the north-west area of the new international terminal building, a services building, aprons, taxiways, roads, car parks and engineering services.

7. The final phase of the development in this area will be the construction of the domestic terminals. At the time the present proposals were investigated by the Committee, only broad planning had been carried out for these buildings.

COMMITTEE'S INVESTIGATION

8. The Committee received submissions and drawings of the present proposals from the Departments of Works and Civil Aviation. A study model of the project was examined. We inspected the work being carried out on the runway extension, the existing facilities at the

airport and the area generally. Evidence was taken in Sydney from representatives of the Commonwealth and New South Wales State government departments concerned, major airline operators and interested local organizations.

SUBMISSION OF REFERENCES TO THE COMMITTEE

9. Six proposed works were referred to the Committee on 18th May, 1965 for investigation and report - two at Melbourne (Tullamarine) Airport, and four at Sydney (Kingsford-Smith) Airport. At a total value of about £25 million, these works are probably the most important and costly group ever referred to the Public Works Committee or to be constructed for the Department of Civil Aviation in the one period.

10. The Committee's basic function is to investigate and report on proposed works valued over £250,000 in order that Parliament can determine whether it is expedient for the works to be carried out. Submissions to the Committee, therefore, usually take place after basic planning decisions have been made and the project is reaching the preliminary design stage.

11. There were clear signs in several of the projects in the present group, including the present reference, that some fundamental planning decisions had not been taken, basic discussions with State authorities had not been completed, or not enough of the preliminary design had been finished to inform the Committee in the detail we believe we are entitled to receive.

12. The Committee appreciate that in the case of the present airports works, there has been a limited time available for detailed planning between the Government's decision to proceed and the target date for commencement of the work. We consider that if more time had been permitted in the investigation and planning period, a better understanding of the works in the departments concerned would have resulted and we could have been more informative in our reports to Parliament.

13. Because of the character of the projects before the Committee and the amount of public money involved, the Committee are of the opinion that this is a major deficiency. While noting assurances from departmental representatives that acceptable results will be obtained, we feel bound to place on record our concern at these omissions.

SYDNEY AIRPORT

14. Sydney airport has a confined site bounded on the south by Botany Bay, on the north and west by Cooks River and Alexandra Canal, on the north-east and east by a railway line, industrial and residential areas, a highway and the Mill Stream. Development in the last 20 years has involved a number of major works including the diversion of Cooks River and the present installations represent a major public investment. The airport is located close to the city.

15. The aircraft pavements comprise the 16/34 and 07/25 runways and associated taxiways. The 07/25 runway is 8,300 feet long and is orientated roughly east and west. The 16/34 pavement which runs north and south, is at present 5,500 feet long and is being extended to 8,500 feet at the southern end by reclamation in Botany Bay.

16. Most of the present major ground facilities are located in the area north-east of the junction of the runway system. These facilities include the passenger terminals, engineering, maintenance and other installations of airlines operating out of Sydney airport and Commonwealth activities. A large part of the area is occupied by Qantas Empire Airways which operates its overseas services from Sydney.

17. Facilities not located in the north-east sector are the long range radar station in the south-east and the fire station and training school in the north-west.

AIRCRAFT APRONS

18. A basic factor in the design of a terminal building, is the apron and the method of handling aircraft on it. Based on a study of overseas methods and on the experience of operators overseas, it was decided that the most efficient and economical way to handle passengers from large jet aircraft in Sydney would be to follow a method used at a number of recently opened airport terminals overseas.

19. This method makes use of passenger loading concourses or fingers which extend across the apron from the terminal building and which have holding rooms at about the same level as the cabin of the aircraft. Aircraft approach the terminal under their own power to bring the nose to about 25 feet from the loading concourse and the front door to about six feet from the side of the holding room. When the aircraft stops a small covered walkway is extended to the front door from the concourse so that passengers can walk directly into the holding room before passing through the concourse to the terminal. The reverse takes place for departing passengers. By this method passengers are protected from the weather at all times.

20. When an aircraft is ready to depart, a tug pushes it clear of the building to a point from which it is free to move away under its own power.

21. The proposals submitted to the Committee include an apron designed for 12 aircraft positions, each position being for a large aircraft of the type operating, or planned for use, on international flights. Nine positions will be adjacent to holding rooms on the loading concourse and passengers will be able to move directly between the rooms and the aircraft, under cover. The tenth position proposed is adjacent to a holding room but will be a short distance from the concourse. The two remaining positions are slightly more remote and do not have specific holding rooms allotted to them. As holding rooms will generally be used for a shorter time than aircraft parking positions, the rooms for the two standby positions will be

those not in use at the time. When health clearances are not involved, as in the case of flights from New Zealand, passengers can proceed directly to the terminal without passing through a holding room.

22. It has been planned in the full development of the new terminal area to provide 70 parking positions. Traffic forecasts indicate that 20 positions will be needed for international aircraft and 50 for domestic aircraft. The long term development plans are, however, flexible to the extent that if a variation of this ratio is necessary, additional international positions can be provided to give any combination up to 30 international and 40 domestic positions.

23. It was suggested to the Committee by one of the international airline operators that the 12 positions proposed initially may be too conservative considering the international traffic expected when the terminals are completed. Two additional positions were requested. We studied the matter and noted particularly the submission by the Department of Civil Aviation that by careful management of the apron and by minimising the standing time of aircraft at loading positions, greater utilisation of the apron could be obtained. We were also informed that additional loading positions could be constructed easily by an outwards extension of the concourse at a cost of about £175,000 for each position. The Committee considered that the provision of more than 12 loading positions did not seem warranted for the traffic expected when the proposed terminal commences operation but noted that if this provision was insufficient, additional loading positions could be added readily.

INTERNATIONAL TERMINAL COMPLEX

24. Layout The international terminal will be a three storey building with a reinforced concrete frame and ground dimensions of 680 ft. by 260 ft. It will have an enclosed floor area of 300,000 square feet and 33,000 square feet of open observation deck, and will be joined over the service road to the loading concourse.

25. The ground floor of the terminal will accommodate facilities and the Commonwealth departments associated with the clearance of arriving passengers and an Arrivals Hall where passengers and friends will meet. The domestic airlines will have space here to handle passengers arriving on Papua and New Guinea services and those in transit from international services. The remaining areas on the ground floor are principally for baggage sorting, handling of concessionaires' stores and mail handling.

26. The first floor of the terminal will be devoted to departing passengers and space is provided for airline counters, outwards customs and immigration clearance, business concessions and observation decks.

27. The second floor will accommodate the dining room, cocktail lounge, reception rooms, airport administration, pilot briefing, international airline offices, aircraft crew room, plant rooms and an office for the Department of Defence.

28. The loading concourse is an enclosed structure of two floors, raised above the apron on columns so that the lower floor is 10 feet above the apron. The concourse is basically two passage ways, one each at first and second floor levels with holding rooms at the first floor level adjacent to the aircraft parking positions. The first floor of the concourse will be supervised by the Departments of Health, Immigration, and Customs. The area above the holding rooms on the second floor will be used by departing passengers as an assembly and farewelling area. The area beneath the holding rooms will be partly occupied by mechanical plant rooms and by the airline companies' service areas. Operators will be able to enclose these areas to accommodate apron and aircraft servicing units. The areas beneath the passage-ways of the concourse will be used for access purposes by baggage trains, aircraft tugs and other apron vehicles.

29. Expansion The terminal building and loading concourse are both designed so that they can be extended to meet the needs of increasing traffic without interfering significantly with the use of existing facilities.

30. The Committee were shown sketches of the proposed domestic terminal development. Proposals for the domestic terminals have not yet advanced beyond the broad planning phase, although the provision of roads and engineering services in the north-west area takes account of the future needs of the domestic terminals.

31. Capacity The design of the international terminal is based on the need for space generated by passengers and others associated with 16 large international aircraft on the apron at the one time, the average time of occupation of an apron position being assumed as one hour. Based on a traffic peak of this order, it has been estimated that the Departure Lounge and associated areas will need space for 4000 to 5000 passengers, friends and onlookers at one time and that the Arrivals Hall will need capacity for 2000 per hour. More space is required in the Departure Lounge because departing passengers generally arrive at the airport with their friends some time before the aircraft leaves. They may be in the terminal more than an hour and much of this time will be spent in the Departure Lounge. Arriving passengers on the other hand only spend a short time in the Arrivals Hall. They meet their friends there, after being cleared through inwards passenger formalities and usually leave shortly afterwards. Transitting passengers would use the Departure Lounge and not the Arrivals Hall while they are in the terminal.

32. Onlookers and the public generally are expected to use the first floor of the terminal and the Departure Lounge rather than the ground floor and the Arrivals Hall. Departure areas will be adjacent to the observation decks overlooking the aprons.

33. The Departure Lounge is to be 400 ft. by 136 ft. wide with wings of 140 ft. by 40 ft. on either side. Although some of this area is to be used by airline counters, clearance channels and business concessions, there will be ample space for 1000 people seated and 1500 standing. There will also be space for about 1500 others in the farewelling areas on the loading concourse. The cocktail

lounge, reception rooms and restaurants on the second floor will accommodate another 1400. There is thus under cover, space for over 5000 people, apart from the observation decks which can hold another 3000 people.

34. The Arrivals Hall, measuring 440 ft. by 44 ft. is expected to meet the needs of arriving passengers and welcoming friends, at the rate of 2000 per hour.

35. The Services Building This building will be located about 600 feet to the north of the terminal. The plant to be installed in it will include the generators for standby power and the boilers and chillers for the hot water and air conditioning systems. An underground tunnel passing beneath the access road will carry the engineering services from the services building to the terminal. The building is designed so that it can be readily extended when additional services are required, e.g. when the domestic terminals are erected.

FLOW OF PASSENGER TRAFFIC

36. Inwards Bound Passengers An international aircraft arriving at the terminal will stop with its front door opposite and at about the same level as the aerobridge connected to the loading concourse. When the bridge is extended to the aircraft, passengers will disembark through it, entering a holding room designed for 150 passengers. Adjacent to each holding room will be health clearance facilities and passengers not already cleared medically in Australia or New Zealand, will pass the checking point. Passengers already cleared before reaching Sydney will pass directly through the concourse to the terminal.

37. After health clearance, passengers will proceed to the terminal building, descending by a ramp to the arrivals floor at ground level where they will pass firstly through the barrier of immigration clearance channels. Thirty channels will be provided, three or four being manned for each arriving aircraft.

38. After passing through the immigration clearance, transit passengers will proceed through a transit area and by escalator to the Departure Lounge on the first floor. Other passengers will then submit customs declarations on their baggage. About 30 declaration channels are to be provided. Passengers will then claim their baggage from the nearby revolving baggage platform or carrousel. Whilst passengers are disembarking and passing through the various clearance channels, baggage will have been unloaded from the aircraft and fed on to a conveyor belt originating in the inwards baggage area at ground level for delivery to the carrousels.

39. From the carrousels passengers will take their baggage to baggage inspection counters. Provision will be made for 36 baggage inspection channels, five to six channels being used for each arriving aircraft. Each channel will comprise a 24 ft. bench with a conveyor belt running the full length of the top. Each bench will be long enough to handle three passengers simultaneously - one opening baggage, one being inspected and the other closing baggage after inspection. Inspecting officers would activate the conveyor belt to bring each passenger's baggage in front of him for inspection.

40. Passengers terminating in Sydney would carry their baggage a short distance after clearance, to the Arrivals Hall on their way out of the building. Migrants travelling under assisted passage would be taken, after baggage inspection, to a reception area provided for the Department of Immigration. After baggage inspection, passengers trans-shipping would reconsign their baggage at the appropriate airline counter.

41. The channels for passport inspection and customs declaration and facilities for claiming and inspecting baggage, have been designed to allow passengers to proceed in a direct line through the Customs Hall from the loading concourse to the Arrivals Hall.

42. The Arrivals Hall will be accessible from ground level through automatic doors. The Departure Lounge will be accessible from the Arrivals Hall by lift, escalator or stairway.

43. Offices for hire car, taxi, valet parking and car rental services will be provided in the Arrivals Hall. Space will also be provided for a news stand, a hotel booking bureau, banks and tourist services. Domestic and international airline companies will have traffic offices in the Arrivals Hall for onwards bookings and information purposes.

44. Outwards Bound Passengers Passengers arriving at the terminal for embarkation on an overseas flight would come in one of two ways, viz:-

(i) passengers originating in Sydney would arrive at the terminal either by elevated roadway in front of the Departure Lounge, or through the car park at ground level. In the latter case they would cross the access road at ground level, ascending to the Departure Lounge by escalator, lift or stairway. Until the new domestic terminals are erected, passengers trans-shipping in Sydney from a domestic airline would also arrive at the terminal from the domestic terminal by road transport.

(ii) passengers in transit between international flights would disembark from the first aircraft with other arriving passengers. After clearance through health and immigration formalities, they would by-pass customs inspection and proceed to the transit area and thence by escalator to the Departure Lounge.

45. Originating passengers, and those trans-shipping from a domestic service will check tickets and consign their baggage at the airline counters in the Departure Lounge. Baggage will be sent by conveyor to the baggage sorting area. Passengers will then proceed to the outwards customs and immigration area for clearance. They will then be free to rejoin their friends and either proceed to the farewell areas in the concourse, or wait in the Departure Lounge

until their aircraft is ready. Concessions such as the duty free shop, paper and book kiosk, confectionery shop and gift shop will be in this lounge. The traffic flow will not be interrupted by the concessions but the most frequently patronised concessions will be closest to the route to the loading areas.

46. When the aircraft is ready for loading, passengers will move through the farewelling areas to the holding room on the floor below by stairway.

47. Facilities for the Physically Handicapped The terminal building is designed so that people in wheel chairs and elderly and physically handicapped people will be able to move to and about the building with freedom. Movement between floors by lift will be possible and changes in floor level will be by easily graded ramps. Ramps will be provided at appropriate points to allow people in wheel chairs to have easy access from the car park to the terminal. The lift in the loading concourse will permit passengers not able to use the stairs from the farewelling areas to the holding rooms to descend by lift to the latter level and then proceed to the holding room and the aircraft. Appropriate toilet facilities will be provided on all floor levels for physically handicapped people.

ACCOMMODATION FOR TERMINAL USERS

48. Commonwealth Department of Health The Department of Health will have facilities for quarantine clearance of passengers at each of the ten holding rooms. They will comprise a counter for the doctor and his assistant to examine the health documents of the passengers, an isolation room and a doctor's room for the examination and vaccination of passengers. Facilities for the disinfection of quarantinable clothing and goods will be adjacent to the baggage inspection counters.

49. Department of Immigration Passport examination desks will be placed at ground floor level in the terminal. These desks will form a barrier between the loading concourse and the Customs Hall

for arriving passengers. Offices and interrogation rooms will be provided adjacent to the passport examination channels.

50. An assembly room of 2,300 sq. ft. will be provided for the reception of assisted migrants. It will hold an aircraft load of migrants and their baggage and will be readily accessible from the Customs Hall.

51. Facilities will be provided in the Departure Lounge for the immigration clearance of departing passengers.

52. Department of Customs and Excise The Customs Hall on the ground floor will be an area of 38,600 square feet providing, in addition to the passport inspection channels, a barrier of 25 to 30 customs declaration channels, six automatically revolving baggage carrousels and 36 baggage inspection channels.

53. Interrogation and search rooms will be provided to assist the Department in its preventive activities. In addition to two positions for duty collection, storage for detained goods, office space and space for dealing with public enquiries will be provided. A room will be provided at ground floor level for the examination, when necessary, of baggage of outwards bound passengers and aircraft crew. Amenities, including locker and change rooms, lunch room and female rest rooms, will be provided for the staff of the Departments of Immigration, and Customs and Excise.

54. Accommodation for outwards customs clearance will be combined in the Departure Lounge at first floor level with that for outwards immigration formalities.

55. The release of goods purchased by departing passengers at the duty free shop will be under the control of the Department of Customs and Excise. A store for this shop will be located on the first floor of the loading concourse to facilitate delivery of goods to passengers at the point of embarkation on the same floor while being kept entirely under customs control.

56. Postmaster-General's Department This department will establish a depot on the ground floor for the receipt, sorting and despatch of mail. The area will open directly to a loading dock and the service road on the apron side of the building.

57. A telephone exchange for the building will be located on the second floor. Telephone, postal and telegraph facilities will be provided in the public areas.

58. Department of Defence An area on the second floor will be used as an office and as waiting space for members of the defence forces and their families. A defence services enquiry counter will be located in the Departure Lounge.

59. Department of Civil Aviation Space will be set aside on the second floor for briefing international pilots prior to departure and for the associated radio equipment. This pilot briefing unit will be ancillary to the main briefing facilities and the rescue co-ordination centre in the present operations building in the north-east area. However, when the operations of the domestic airlines are transferred to the north-west area, all pilot briefing, meteorological and rescue co-ordination facilities will also be transferred.

60. About 2,300 square feet of office space will be provided on the second floor for airport administration. Accommodation for patrol staff and workshops and stores for minor repairs and maintenance of the terminal building will be provided on the ground floor.

61. New South Wales State Government Departments Space will be provided in the Arrivals Hall and the Departure Lounge for the Department of Tourist Activities and Immigration. The reception area of the Commonwealth Department of Immigration will also have some use by this department. An area will be provided for police and for the safe custody of escorted persons.

62. Airline Companies

Ground Floor An area of 14,200 square feet for baggage handling will be provided on the apron side of the terminal building. This will be a communal area for use by all airline operators. The four domestic airlines operating out of Sydney will be provided with space in the Arrivals Hall for the convenience of passengers transshipping to internal routes. International operators will be able to establish information centres in the Arrivals Hall.

First Floor Space will be provided in the Departure Lounge for airline companies for baggage receipt, ticketting and information purposes. Each unit will be served by a conveyor to the baggage handling area.

Second Floor A space of 15,000 square feet will be available to international operators for offices and reception rooms.

Loading Concourse At apron level, space will be available beneath holding rooms for airline companies to establish aircraft servicing units, stores and staff rooms.

63. Accommodation for Press Representatives Provision will be made to accommodate press, television and radio representatives. Rooms adjacent to the Arrivals Hall have been planned for this purpose, including space fitted out for interviews.

64. Business Concessions Space will be provided in the Arrivals Hall for a newspaper kiosk, banks, tourist agencies, offices for ground transportation services and a hotel booking bureau. An area is also being reserved on the ground floor for a medical centre or a professional suite. Store rooms for concessionaires located on the first and second floors will be provided adjacent to the loading docks near the apron.

65. About 7,500 square feet will be available in the Departure Lounge for a duty free shop, newspaper and book kiosk, confectionery shop, gift shop, quick service restaurant, club type bar, chemist shop, milk bar, hairdressers and other specialty shops. On the loading concourse a store is to be provided for the duty free shop.

66. On the second floor 6,000 square feet will be available for a high class dining room to seat about 500 people. An additional 5,000 square feet will be provided for food preparation, stores and staff amenities. A cocktail lounge seating 500 persons will be adjacent to the dining room. Between the dining room and cocktail lounge, six reception rooms capable of accommodating a total of 400 people will be provided.

67. All concessions except the island concessions in the Departure Lounge will be provided in an unfinished condition. Concessionaires will be required to finish the floors, walls and ceilings according to their own needs and design and at their own expense. They will also provide their own ventilating systems, lighting and special equipment which will be connected to the services provided. We were assured that although the concessionaires will be required to finish their own areas, control will be exercised over design to ensure that it is integrated with the design of other concessions and the building as a whole.

THE BUILDING PROPOSALS

68. General The Committee have already reported on the urgent need for a new international terminal at Sydney airport. We believe that the proposals in this reference will satisfy the requirements of the Commonwealth and State departments, airline operators and other organizations who are required to operate in the terminal and the adjoining area and provide acceptable standards for the travelling public.

69. Adequate provision has been made to extend the facilities without undue interruption to the existing services when the growth

of passenger traffic makes this necessary. Subject to the qualifications which follow, the Committee therefore recommend the construction of the works included in this reference.

70. Design The Department of Works received the functional layout plans from the Department of Civil Aviation only a short time before the proposed work was referred to the Committee so that at the time the reference was investigated it was still in a formative stage of design. In the time available the efforts of the Department of Works have been concentrated in resolving the design problems related to the functioning of the building. We were, however, told that although the stage in design had not been reached when a work is customarily referred to the Committee, sufficient work had been done to enable an assurance to be given that the final result will produce a building with the qualities of massing, design and decor appropriate to Australia's key international airport terminal.

71. Materials and Finishes Due to the short time available, the schedule of finishes and materials submitted to the Committee had not been completed. However, those materials nominated were indicative of a good, but not extravagant, quality of finish. Their most notable characteristics were of durability and ease of maintenance. They are of a standard comparable with those used in recent times in the Perth and Essendon terminals.

72. Externally, extensive use will be made of selected face bricks in the panels between columns. Glass will be used liberally in the main facades and framed in anodised aluminium.

73. Wall finishes internally will vary with the use of the particular area, from hard plaster to face bricks and tiles in toilet areas, vinyl tiles and fabric. Ceilings also will vary, the main finishes proposed being hard plaster, fibrous plaster and acoustic timber ceiling.

74. There will be considerable variety in flooring material, special attention being paid to the function of the area. Vinyl tiles with carpet will be used in public areas while terrazzo will be used in toilets and on some stairways. Areas such as the plant rooms and concessions will be finished in granolithic. Observation decks will be covered in pre-cast concrete slabs.

75. Roofs will be generally covered in ribbed copper carried on steel purlins and main trusses. The roof will be insulated.

76. The loading concourse will be steel framed with concrete floors and steel roof decking.

77. Engineering Services

Structural The terminal building, concourse and elevated roadway will be supported on piles driven to rock. It has been found that rock occurs at depths between 60 and 120 feet. As sub-soil conditions are corrosive, steel pylons are to be protected by a cathodic protection system. We noted that due to the site conditions the cost of the foundations will be higher than average for a building of this type.

Having regard to economy, speed of erection, the size of the project and the uniformity of layout, it was decided for the terminal building to use pre-stressed pre-cast concrete building frames and floors. Long span, wide flange floor members spanning 50 feet, will be used. They will be supported on main beams or edge beams spanning either 20 or 40 feet. A 2" structural topping which is to be poured over flooring members will also act as a floor membrane to distribute wind forces.

Pre-cast pre-stressed concrete main beams and floor members will be maintained at an overall depth of 3'6" including the topping. Air ducts and other engineering services and suspended ceilings will be supported from floors. Generally, floors will be designed to carry a live load of 100 lbs. per square foot. Columns will be in one length and with projecting haunches for beam support.

The roof will be carried on steel roof trusses supported by the columns.

The suspended floors of the passenger concourse will be framed with steel beams acting compositely with reinforced concrete floor slabs. Supporting columns will be of exposed mild steel and roofs will be framed with steel open web joists supporting steel purlins.

The elevated roadway will run at first floor level past the future northern domestic terminal and the international terminal, access being obtained by a ramp from the north and egress by another ramp at the southern end turning away from the building. When the southern domestic terminal is built, the elevated roadway will be extended to serve this building as well, and an additional egress ramp provided.

At first floor level the road will be 32 ft. wide between kerbs to provide three lanes for traffic. There will be an eight ft. footway at this level adjacent to the building. On the ramps the roadway will be 24 ft. between kerbs and the footway four feet wide.

The superstructure will be pre-stressed concrete girders over concrete piers with joints at change of direction of the roadway. Spans will generally be 80 and 120 ft. to suitably locate piers in relation to the building grid. The girders will be pre-cast concrete units about 10 ft. long placed end to end and pre-stressed. The outer portions of the road and footway slabs will be concrete cast in situ. The piers will be of reinforced concrete cast in situ and supported on piles. Special attention will be given to the surface treatment of concrete in the elevated roadway and piers, the exposed faces of girders and the kerbs, in order that they will be compatible with the materials in the building facade.

78. Mechanical Services

Air Treatment The terminal and passenger loading concourse will be mechanically ventilated and heated and a number of minor areas will be air conditioned by the Commonwealth. Other areas such as the dining room and bars, will be air conditioned by the concessionaires at their own cost. Chilled and hot water will be piped to air conditioning and ventilation plants from the service building. Toilets in public areas and under departmental control will be mechanically ventilated.

Operational units, including pilot briefing, radio equipment and space for the Departments of Civil Aviation, Customs and Excise, and Immigration and V.I.P. and rest rooms, will be air conditioned.

The provision of mechanical ventilation and heating to most areas and the air conditioning of only selected functional areas follows, the Committee were told, the practice adopted in recently constructed major terminals overseas where climatic conditions are similar to those experienced in Sydney. Having regard to the relatively short time the public are in a terminal and the very few occasions when conditions of discomfort are likely to prevail, the proposal seems reasonable. We noted that the capital cost of fully airconditioning the building would exceed the cost of the proposals in this reference by about £450,000. Additional running costs would be of the order of £22,000 per annum.

Central Plant The services building will house chiller, boiler and emergency generating plant to serve the essential areas of the terminal with chilled and hot water and with electricity in the case of mains supply failure.

Chilled and hot water will be supplied to a series of air handling plants serving public and departmental areas

in the terminal. Piping will terminate in suitable positions to enable the use of chilled and hot water by airline companies and the concessionaires.

Other Mechanical Equipment Provision is made for baggage conveying equipment in the terminal and for telescopic passenger loading bridges at each of the holding rooms in the concourse.

Domestic hot water will be available at sinks, basins, etc. in public toilets and those under departmental control. In the terminal, supply will come through calorifiers connected to the main hot water lines. In the concourse, electric storage systems are proposed. Airline companies will be able to connect their domestic hot water supply calorifiers to the main hot water lines. Cooled drinking water will be provided in public areas.

79. Electricity Supply and Services Electricity for present airport requirements is purchased in bulk from the Sydney County Council at a sub-station in the existing terminal area. The proposal submitted to the Committee was to use the same source of supply for the north-west terminal area through an 11,000 volt underground cable from the same sub-station for distribution through sub-stations at major load points in the terminal area.

80. The boundary between the franchise areas of the Sydney County Council and the St. George County Council which adjoin each other in the vicinity of the airport, divides the airport along the original course of the Cooks River. The north-west terminal area is thus in each franchise area. It was therefore submitted to the Committee by the St. George County Council that there was good reason for some of the airport's power needs to be purchased from it.

81. A similar case arose recently regarding the electricity supply to the proposed operations and control tower buildings, although in this case the St. George County Council had cables running right

past the site which was entirely in the St. George area. Legal opinion is that the Commonwealth may purchase power from any supply authority for reticulation in its own area irrespective of franchise boundaries. The Committee took the view in the case of the operations and control tower buildings, that the Commonwealth is entitled to take electricity from the most economical source and recommended in these circumstances that the supply should be taken from St. George County Council providing the cost to the Commonwealth was no greater than from the alternative source.

82. In the present reference, an effective electricity supply could be taken from either source, although there seem to be cost advantages because of the pattern of the airport's demand, in using Sydney County Council power. It was also clear that there were operational advantages in using Sydney County Council's supply and that certain precautions would need to be taken to ensure the safety of operating staff if supply for the airport is taken from the St. George County Council.

83. The Committee consider, in these circumstances, that electricity supply should be taken from the Sydney County Council unless the supply from the alternative source is equally economic and the safety of operating staff by reasonable means can be assured.

84. Emergency generating plant installed in the services building will be connected to the high voltage switch board to provide standby power for essential loads in the terminal. A control system will disconnect non-essential loads in the event of a normal supply failure.

85. Lighting will generally be fluorescent with incandescent units where required for functional or architectural reasons. Special lighting will be provided in public areas to suit the needs of the particular area. General purpose power outlets will be provided for portable equipment and direct wiring will be arranged for fixed equipment. Public address and electrically operated clock systems are to be installed.

86. The proposals submitted to the Committee provide for the installation of five lifts, including a lift to accommodate wheel chairs and stretcher cases in the loading concourse, and three escalators. Space is provided for two additional passenger and three further goods/passenger lifts in the future when required. The location of the wheel chair lift was considered by the Committee and the conclusion reached was that it would be appropriate to locate it in the concourse near the loading position closest to the building.

87. Street lighting will be installed for the approach road from the eastern side of the airport, for the spur road connection from the existing terminal area and for the subsidiary roads in the new terminal complex. Area lighting will be provided in the terminal car park.

88. Aircraft aprons will be illuminated by flood lights mounted on tubular steel pylons. Apron power outlets will be provided adjacent to aircraft parking positions.

89. Water Supply and Sewerage A water supply system has been designed to meet the needs of the first stage of the terminal complex. It will be capable of extension when further demand occurs. Water will be supplied by a 10" main from the Sydney metropolitan system at Tempe. It will be piped to an elevated 50,000 gallon service reservoir, of which 10,000 gallons will be reserved as a secondary supply for the fire sprinkler system. The service reservoir will ensure continuity of supply should supply direct from the Board's main be inadequate or lack pressure.

90. The sewerage system will comprise a pumping station and rising main which will discharge into the outfall sewer which runs around the south-western boundary of the airport. Reticulation from the terminal will be a gravity system but ejectors may be necessary from the end of the concourse.

91. Fire Protection The water supply system is designed to meet the domestic and fire fighting requirements of the terminal and

concourse, the services building, the car parks and the aircraft aprons. Hydrants will be provided for the external protection of buildings and for fire protection purposes on the apron.

92. A system of thermal detectors is to be installed in most areas of the building. However, automatic sprinklers will protect catering and concession areas and smoke detectors will be installed in areas where electronic and similar equipment is being used. Portable extinguishers will be available at strategic points.

93. The warning and sprinkler systems will be connected to the existing central fire alarm control panel at the airport fire station.

94. Aprons and Taxiways The apron and taxiway pavements to be provided include:-

(a) a 75 ft. wide taxiway, 3,600 ft. long, parallel and with connections to the northern part of the north-south runway. The 39,000 square yards of pavement required will comprise a 10" thickness of fine crushed rock on a crushed stone sub-base and surfaced with 2" of bituminous concrete on a sand sub-grade;

(b) some 115,000 square yards of apron pavement adjacent to the international terminal and loading concourse and including 75 ft. wide taxiway outlets in 14" thick concrete on a 6" thick base of fine crushed rock.

(c) about 15,000 square yards of 8" thick concrete vehicular pavement immediately adjacent to the terminal and concourse.

95. The aircraft pavements will carry international aircraft weighing up to 500,000 lbs. with tyre pressures of 200 lbs. per square inch. The 8" concrete pavement is for use by aircraft servicing vehicles and aircraft tugs.

96. Surface drainage from the aprons will be by grated drains connected to the underground drainage system which will discharge into the Cooks River. Stormwater from the outer portions of the

apron area and the taxiways will flow across the grassed flanks for collection and discharge by the drainage system.

97. Ducts will be installed beneath aircraft pavements for light and power cables and other services. A tunnel is proposed beneath the loading concourse to accommodate the services located there. Blast fences are proposed on the apron to protect the building from damage by blast and to deflect exhaust gases upwards.

98. Roads and Car Parks The means of public surface access to the new terminal area was dealt with in detail in the Committee's report on the site preparation of the north-west building area. Initially access will be from the north-east following the route of the existing road on the northern boundary of the area occupied by Qantas Empire Airways, and the southern side of the diverted Alexandra Canal. It is proposed that this road will have dual carriageways each 24 ft. wide with a fine crushed rock pavement surfaced in bituminous concrete. The carriageways will be separated by a six ft. median.

99. The departmental view is that this road will become of secondary importance as a means of public access when the county road connecting General Holmes Drive and the Princes Highway (known as the Kyeemagh/Arncliffe access) is developed and a spur road and bridge over the Cooks River are built to facilitate a direct access to the terminal area from the west. We were not sure that this will be the case, particularly because when the Kyeemagh/Arncliffe access is constructed, the road inside the airport boundary will provide a ready means of public access from areas east of the airport to Tempe, Arncliffe and Marrickville. The Committee thus consider that the northern access road should be capable of expansion to three carriageways in each direction if pressure of traffic requires.

100. It is proposed that the connection between O'Riordan Street and the northern access road within the airport will be via Amelia Street and the railway underpass at the end of that street. It is also proposed to construct a short spur road from the southern side

of the underpass to Ross Smith Avenue in the existing terminal area for direct access between the original and new terminal areas. It was drawn to our attention that the junction of the northern access road, the spur road from Ross Smith Avenue and the Amelia Street extension immediately adjacent to the underpass, could develop into a dangerous intersection because of Amelia Street and the proximity and nature of the underpass and railway embankment. Alternative sites for an intersection were not investigated by the Committee but it seems that more satisfactory connections from O'Riordan Street could be designed either at Joyce Drive or further north in the vicinity of King Street. We therefore recommend that further investigation of the connection between O'Riordan Street and the northern access road inside the airport boundary be undertaken.

101. Within the terminal area the access road will pass the services building and then divide, one section rising on the elevated roadway to serve the first floor of the international terminal building. The elevated portion will also serve the first floor of the future domestic terminal to be sited north of the international terminal. The road will then descend to ground level returning by a loop around the car parking area. At the point the access road divides, the other section will continue at ground level to serve the ground floor of the terminal.

102. A bitumen surfaced perimeter and service road for use by official and airlines traffic will link the existing and new terminal areas. It will be 22 ft. wide except adjacent to the terminal where it will be 32 ft. wide. The section of road adjacent to the terminal will also serve as the apron service roadway.

103. Included in the proposals submitted to the Committee is a bitumen surfaced car park with an initial capacity for 1000 vehicles at ground level. The ultimate capacity of 5000 vehicles can be readily achieved by lateral extension as required.

104. The Committee believe that the initial provision of 1000 car parking spaces will be insufficient when the building is first occupied. We therefore recommend that adequate car parking space be provided.

105. An eight ft. security fence is to be erected in the grassed area between the access and perimeter roads and along the western side of the perimeter road where it leads to the apron area. Gates will be provided where necessary.

106. The proposals include landscaping within the terminal area and car parks.

ESTIMATES OF COST

107. The estimated cost of the proposals referred to the Committee is £8,950,000 made up as follows:

Terminal Building:		
Foundations and Superstructure	£3,509,000	
Mechanical Services	£694,000	
Electrical Services	£201,000	£4,404,000
Loading Concourse:		
Building Work	£811,000	
Mechanical Services	£357,500	
Electrical	£55,000	£1,223,500
Services Building:		
Building Work	£230,000	
Mechanical Services	£388,500	
Electrical Services	£3,000	£621,500
Fire Services		£32,000
Elevated Road		£580,000
Electricity Supply		£150,000
Water Supply		£102,000
Sewerage		£100,000
Fencing		£9,000
Landscaping		£50,000
Roads and Car Parks		£350,000
Taxiways and Aprons		£1,243,000
Materials Control and Survey		£85,000
		£8,950,000

108. The Committee noted that of these estimates, some £250,000 is attributable to the future domestic terminal buildings, principally for piling and the elevated roadway. The piling work is to be undertaken at this stage to minimise interference with the international terminal when the domestic terminals are being constructed.

CONSTRUCTION PROGRAMME

109. On the basis that an approval to proceed is given shortly after the tabling of this report, it has been estimated that the work in this reference would be completed in the latter part of 1969.

STAFF AMENITIES

110. The scale and nature of amenities for staff working in the building have not yet been clearly defined because at this stage the proposals have not yet been developed in this detail. We were assured however, that the requirements of amenities codes and awards of staff employed in the building would be satisfied.

111. Consideration had not been given to the provision of space or to the operation of a cafeteria and light refreshment service for staff working in the area. We believe that in view of the considerable numbers involved and the irregular hours worked, staff employed at the terminal should be able to purchase simple hot meals and light refreshments at low cost in a facility operated separately from the public dining room on the second floor. The Committee therefore recommend that the Department of Civil Aviation confer with other employers of staff in the terminal area with a view to the provision of hot meal and refreshment services for employees.

PROVISION OF AIRPORT FACILITIES

112. The present pattern of international and domestic airlines operations in Australia is characterised by a number of peaks during the day. In the case of international flights, the basic reason for this is the keen competition between a relatively large number of airlines and the desire of each to provide a service which meets the needs of passengers in relation to times of departure and arrival,

not only at points of origin and destination, but also en route. It was suggested to the Committee that the same wish to satisfy passengers' needs was the fundamental cause of traffic peaks at various points in the interstate airline network where only two airlines operate in competition. We doubt whether this is entirely true and are inclined to think that some of the congestion at airports caused by peaks in traffic could be avoided. But whatever is the cause of the peaks, the fact is that not only in the present proposals but in the case of other passenger terminals provided by the Commonwealth, large sums of public money are being spent on facilities which lay partly idle for considerable periods during the day. The provision of terminal, navigational and other airport facilities assist the operators but do not represent an economic investment to the Commonwealth.

113. In the case of the present proposals we agree that it is proper to build to the scale proposed because to provide lesser facilities would be short sighted and future expansion could be prejudiced. The Committee consider, however, that by spreading the use of terminals more evenly, the time when extensions are required would be deferred.

114. Furthermore, we believe that there is strong evidence of the need for a searching enquiry into the possibility of planning commercial airline operations in Australia to reduce the peak loading of airport facilities and to produce a more economic utilisation of installations and staff.

PUBLIC ACCESS TO THE TERMINAL BUILDINGS

115. The Committee were concerned at the possiblity of the new terminal facilities being inhibited by lack of adequate developed public access from the west of the airport by the time the international terminal is opened and stresses the importance of the negotiations with the State authorities to ensure completion of the planned external means of access by the opening date.

RECOMMENDATIONS AND CONCLUSIONS

116. The summary of recommendations and conclusions of the Committee is set out below. Alongside each is the paragraph in the report to which it refers.

	Paragraph
1. THE COMMITTEE CONSIDERED THAT THE PROVISION OF MORE THAN 12 LOADING POSITIONS DID NOT SEEM WARRANTED FOR TRAFFIC EXPECTED WHEN THE PROPOSED TERMINAL COMMENCES OPERATION.	23
2. SUBJECT TO THE QUALIFICATIONS WHICH FOLLOW, THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORKS INCLUDED IN THIS REFERENCE.	69
3. ELECTRICITY SUPPLY SHOULD BE TAKEN FROM THE SYDNEY COUNTY COUNCIL UNLESS THE SUPPLY FROM THE ALTERNATIVE SOURCE IS EQUALLY ECONOMIC AND THE SAFETY OF OPERATING STAFF BY REASONABLE MEANS CAN BE ASSURED.	83
4. IT WOULD BE APPROPRIATE TO LOCATE THE WHEEL CHAIR LIFT IN THE LOADING CONCOURSE NEAR THE LOADING POSITION CLOSEST TO THE BUILDING.	86
5. THE NORTHERN ACCESS ROAD SHOULD BE CAPABLE OF EXPANSION TO THREE CARRIAGEWAYS IN EACH DIRECTION.	99
6. FURTHER INVESTIGATION OF THE CONNECTION BETWEEN O'RIORDAN STREET AND THE NORTHERN ACCESS ROAD INSIDE THE AIRPORT BOUNDARY SHOULD BE UNDERTAKEN.	100
7. ADEQUATE CAR PARKING SPACE SHOULD BE PROVIDED.	104
8. THE ESTIMATED COST OF THE PROPOSALS REFERRED TO THE COMMITTEE IS £8,950,000.	107

		Paragraph
9.	THE DEPARTMENT OF CIVIL AVIATION SHOULD CONFER WITH OTHER EMPLOYERS OF STAFF IN THE TERMINAL AREA WITH A VIEW TO THE PROVISION OF HOT MEALS AND REFRESHMENT SERVICES FOR EMPLOYEES.	111
10.	THERE IS NEED FOR A SEARCHING ENQUIRY INTO THE POSSIBILITY OF PLANNING COMMERCIAL AIRLINE OPERATIONS IN AUSTRALIA TO REDUCE THE PEAK LOADING OF AIRPORT FACILITIES AND TO PRODUCE A MORE ECONOMIC UTILISATION OF INSTALLATIONS AND STAFF.	114

W. J. Brimblecombe
Chairman

Parliamentary Standing Committee
on Public Works,
Parliament House,
Canberra, A.C.T.

19th October, 1965.