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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REPORT

relating to the proposed

EXTENSION OF NORTH-SOUTH RUNWAY

and

Associated Pavement Works

at

Sydney (Kingsford-Smith) Airport

BY AUTHORITY
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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

EXTENSION OF NORTH-SOUTH RUNWAY AND ASSOCIATED PAVEMENT WORKS AT SYDNEY (KINGSFORD-SMITH) AIRPORT

REPORT

By resolution on 13 June 1968, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report the proposal to extend the north-south runway to 13,000 ft and to carry out associated pavement works at Sydney (Kingsford-Smith) Airport.

The Committee have the honour to report as follows:

PART I - INTRODUCTION

THE COMMITTEE'S INVESTIGATION

1. The Committee received submissions and drawings from the Department of Civil Aviation and the Department of Works. We took evidence at public hearings in Sydney from witnesses representing these departments, the Maritime Services Board of New South Wales, local government bodies, airline operators, airline pilots associations, the Boeing Company and from interested individuals. A number of written submissions was also received including one from the New South Wales Government.

2. An inspection was carried out of Sydney Airport and of the foreshore of Botany Bay in the Municipality of Rockdale where beach erosion has occurred in recent years.

THE PROPOSAL

3. The major part of the proposal referred to the Committee is concerned with the extension of the north-south (or 16/34) runway at the airport to 13,000 ft. Also included are other airfield pavement works required to meet the operational needs of subsonic aircraft larger than the Boeing 707 or DC8 and supersonic aircraft such as the Concorde.

4. The reference includes

- extension of the 16/34 runway reclamation by 4,600 ft into Botany Bay and a protective seawall;
- extension of the 16/34 runway pavement from 9,100 ft to 13,000 ft and complementary taxiways and other pavements;
- provision of facilities associated with the provision of instrument landing systems;
- minor extensions and modifications to pavements on the existing airfield, particularly at intersections of taxiways and runways, and shoulder widening; and
- restoration of the foreshore along Lady Robinson's Beach.

5. The estimated cost of the work is $23 million.

DEVELOPMENT PROJECTS AT SYDNEY AIRPORT

6. The Committee have investigated six other major works proposals at Sydney Airport since 1963, viz.

- extension of the 16/34 runway to 9,100 ft (1963);
- site preparation of the north-west building area (1965);

- international terminal complex and associated aircraft pavements (1965);
- operations building and control tower (1965);
- an improved instrument landing system at the northern end of the 16/34 runway (1965); and
- site preparations for future domestic terminals and additional roadworks in the north-west building area (1967).

The total estimated cost of these works when referred to the Committee was some $39 million.

7. Operations on the extended 16/34 runway are expected to commence later this year, construction of the operations building and control tower is well advanced and the international terminal is now due for completion late in 1970.

EXISTING AIRFIELD PAVEMENTS

8. The 16/34 or north-south runway has been built in two stages, the initial 5,500 ft being completed in 1954 and the extension into Botany Bay to 9,100 ft on which operations will commence this year. The first stage was constructed with a pavement of 1 in. of bituminous concrete on 10 in. of fine crushed rock over 6 to 12 in. of clinker ash, the pavement being placed on the existing sand subgrade or on a considerable depth of sand fill.

9. The 07/25 or east-west runway was similarly constructed to 7,900 ft in 1954 and extended by 400 ft at the eastern end with a 12 in. concrete pavement in 1959-60.

10. A system of parallel taxiways with connections to the runways was constructed with the runway works completed in 1954. Taxiway shoulders comprising 8 ft of unsealed fine crushed rock were provided and some have subsequently been bitumen sealed.

11. Most of the 1954 runway and taxiway pavements have been, or are being, resurfaced with at least 1 in. of bituminous concrete for shape correction and to maintain a waterproof pavement surface. Simultaneously, the 500 ft of pavement at the northern end of the 16/34 runway is also being reconstructed in concrete.

12. The extension of the 16/34 runway and the parallel taxiway on the western side, have been constructed with a pavement of 2 in. of bituminous concrete on 12 in. of fine crushed rock on sand fill. The extended runway is 150 ft wide with 25-ft wide shoulders on either side, the latter comprising 1 in. of bituminous concrete on 7 in. of fine crushed rock. Taxiway shoulders are 10 ft wide and of similar construction to the runway shoulders.

13. The design loading for the extension of the 16/34 runway to 9,100 ft is for an aircraft with a wheel layout similar to the Boeing 707 but with an all-up-weight of 500,000 lbs. The original pavements with the subsequent resurfacing are considered to be satisfactory for the same loading.

14. The recent runway extension work involved the construction of major structures to carry the runway, taxiway and landing strip over a gravity flow sewer and General Holmes Drive. The design loading for these structures is for an aircraft with a wheel layout similar to the Boeing 707 but with an all-up-weight of 600,000 lbs.

PART II - THE REQUIREMENT

RUNWAY LENGTHS

15. Present Capacity At 8,300 ft the 07/25 runway is regarded as having reached its maximum length because of the physical restrictions imposed by Cooks River and the outfall sewer line which adjoin its western end and General Holmes Drive and a railway line at the eastern end.

16. It has been found more practicable to obtain additional runway capacity by extending the 16/34 runway on a reclamation in Botany Bay. This was the course adopted in the reference considered by the Committee in 1963. The present reference is an extension of this reclamation by 4,600 ft to accommodate an additional 3,900 ft of runway pavement.

17. The Committee were told that at 9,100 ft the 16/34 runway will be able to "handle satisfactorily and efficiently" the types of aircraft now being operated out of Sydney. We noted that hitherto because of the limited length of the 07/25 runway, under some conditions, international aircraft have only been able to operate out of Sydney to Singapore or Manila with a payload or range penalty. This penalty will partly disappear with the availability of the 9,100-ft runway.

18. Future Aircraft The Committee were informed that the work in the present reference is required mainly because of the impending introduction of the supersonic and subsonic aircraft now on order by international airlines. The subsonic Boeing 747 or "jumbo jet" is expected to be flown by the end of this year and to be in commercial service 12 months later. Qantas Airways has approval to purchase four of these aircraft and has options on two others. The first is scheduled to be delivered in August 1971 and to be in service two months later.

19. The supersonic Concorde is expected to have its first flight later this year. Because as a commercial aircraft it will have new operational and technical characteristics, the manufacturers plan to give it a lengthy period of trial operation before it goes into service, probably in 1972. The United States supersonic Boeing 2707 is still in the early stages of design and is not expected to be in commercial service until sometime later.

20. The following table compares the physical features of the 747 and Concorde with some of the larger aircraft now in use. At this stage insufficien is known about the 2707 for it to be included in the table.

	Boeing 707-338C	Douglas DC 8	Douglas DC 8-62	Super VC.10	Boeing 727	Boeing 747	Concorde
Ramp Weight (lbs)	336,000	315,000	338,000	337,000	153,000	736,000	380,000
Length (ft)	153	151	158	172	134	231	193
Span (ft)	146	142	148	146	109	196	84
Height (ft)	42	42	43	40	34	65	37
Tyre Pressure (Main Wheels) (p.s.i.)	160	160	190	150	135	200	180
Engines (lbs of thrust)	4 of 18,000	4 of 18,000	4 of 18,000	4 of 22,500	3 of 14,000	4 of 43,500	4 of 37,400
Distance between Nose Wheel and Main Wheels (ft)	59	58	61	73	53	79) 89)	60
Distance between Main Wheel Assemblies (ft)	27	25	25	25	23	42) 18)	30

21. The Requirement The figures provided to the Committee by the manufacturers, the operators and the Department of Civil Aviation suggest that a runway length of about 13,000 ft should be provided at Sydney for the version of the 747 to be used by Qantas. With this length of runway, we were told that the 747 should be able to operate, virtually without

restriction in take-off weight, to its maximum range. There could be some restrictions on days of high temperature due to the climb limitations of the aircraft but these would operate irrespective of runway length beyond 13,000 ft.

22. The requirement of 13,000 ft submitted to the Committee is based on the manufacturer's figure of 12,050 ft from point of take-off roll plus 250 ft to enable the aircraft to be lined up on the runway before the roll commences. In this connection, it will be noted that the aircraft is 231 ft long and that there is 89 ft between the nose wheel and the furthest part of the main wheel assembly.

23. The Committee noted that a runway of 13,000 ft would be slightly longer than is thought to be necessary for the Concorde, which is expected to operate out of Sydney at a maximum all-up-weight of 376,000 lbs. Less is known of the 2707 but from the information so far available, the runway required for take-off is expected to be less than for the 747 or the Concorde.

24. The figures available on runway requirements for landings show that for both the 747 and the Concorde much less distance will be needed than for take-off. It is thought that the same will apply to the 2707.

25. Concurrently with the provision of the runway pavements in this reference, it is proposed to provide a sealed blast area 300 ft long at the southern end of the 16/34 runway and to extend the blast area at the northern end from 200 to 300 ft. This work is designed to prevent surface erosion by jet blast at these points.

OTHER PAVEMENT REQUIREMENTS

26. Width of Runway The internationally accepted standard for runway widths is 150 ft with 25 ft shoulders on each side, the runway lights being placed so as to define the central 150 ft. The extension of the 16/34 runway to 9,100 ft is being finished to this standard which is also proposed for the runway work in this reference.

27. In this connection, we noted the views of representatives of the Australian Federation of Air Pilots and the International Federation of Air Line Pilots Associations that 200-ft wide runways are thought to be necessary for the safe operation of large aircraft such as the 747. We also observed that the International Civil Aviation Organization at a meeting late in 1967 gave particular consideration to the width of runways needed for large subsonic and supersonic aircraft and decided to adhere to the standards which are to be adopted in Sydney.

28. We support adherence to the internationally accepted standard and mention that the runway shoulders are to be strong enough to support an aircraft landing without damage to the aircraft, although if this occurred, there may be some minor damage to the shoulder pavements. It is also pertinent in relation to the proposals for Sydney Airport to note that where the runway is extended into Botany Bay it is to be located on a reclamation which itself is 1,235 ft across.

29. Pavement Strengths The design loading for the extension of the 16/34 runway to 9,100 ft is for the operation of aircraft weighing 500,000 lbs on the same wheel layout as the 707 which comprises two main wheel assemblies each of four wheels. The maintenance resurfacing now being carried out will be satisfactory for a similar loading.

30. The 747 to be used by Qantas is expected to weigh 736,000 lbs. Subsequent versions may be up to 800,000 lbs. As this aircraft is, however, to have four wheel assemblies each of four wheels, the existing pavements are expected to be strong enough.

31. The wheel assembly of the Concorde is similar to that of the 707 and as it is of comparable size, it is expected to be handled satisfactorily on the existing pavement.

32. The Committee noted therefore that the pavement strengths proposed are of a similar standard to the existing pavements.

33. Taxiways It is proposed that the runway extension will be served by a parallel taxiway which itself will be an extension of the western taxiway serving the 16/34 runway. There are to be two connections between the extended runway and taxiway and a holding bay at the southern end of the latter to allow an aircraft to bypass another if necessary.

34. The taxiway pavement proposed of 75 ft with 10 ft shoulders accords with the international standard. The pavement will be capable of taking the same loadings as the runways.

35. Runway and Taxiway Intersections It will be noted from the dimensions of the 747 that the distances between the nose wheel and the main wheels and between the main wheel assemblies are markedly greater than for aircraft now in service. Because of the larger turning circle of the new aircraft when taxiing, the existing pavements at the intersections between runways and taxiways and between connecting taxiways will not be wide enough to allow the aircraft to turn and still maintain the standard of 15 ft between

the outside wheels and the edge of the pavement. There is therefore a requirement to widen the pavements or fillets at 15 of these intersections involving 30,000 sq yds of new pavement.

36. The work proposed will cater for the needs of aircraft up to the 747 and Concorde. If additional pavement at intersections is found to be required later for 2707 operations, it can be provided without major interruption to aircraft traffic.

37. Other Improvements Some other minor improvements to existing pavements are proposed. They include sealing to a 10-ft width the unsealed shoulders of a number of the original taxiways. The additional pavement is required because the inner engines of the 747 will overlap both edges of a 75-ft taxiway and without sealed shoulders it would be possible for the inner engines to ingest surface material and erode the shoulders while taxiing.

38. A widening of the main taxiway in the north-eastern part of the airport is also proposed so that the larger aircraft may pass those parked on the apron near the T.A.A. terminal.

39. Other pavement works will include a short length of additional taxiway pavement near the eastern end of the 07/25 runway so that 747s can bypass aircraft in the holding bay in this area and the replacement of 500 ft of bituminous pavement at the western end of the same runway with concrete pavement. The latter work is needed because the existing flexible pavement is requiring heavy maintenance due to the shearing action of aircraft wheels in the early stages of take-off.

40. Lighting The runway extension is to be equipped with side-line, centre-line and threshold lighting and the taxiways with centre-line lighting. These installations will be in accordance with international standards.

41. At this stage, it has not been determined whether approach lighting is required at the southern end of the 16/34 runway. The Committee were informed that these lights can be provided if required on piers located in Botany Bay.

INSTRUMENT LANDING SYSTEMS

42. High winds at Sydney usually have a southerly component. Under these conditions aircraft movements will generally be into the south on the 16/34 runway. Considerable preparatory work has already been carried out to provide a suitable land surface at the northern end of this runway so that a Category 2 instrument landing system can be installed to assist landings in this direction. The reclamation now proposed will permit the localiser unit for this system to be installed beyond the southern end of the runway. A Category 2 system can assist a pilot in conditions of visibility down to a quarter of a mile and with a cloud ceiling of 100 ft. The equipment can be improved subsequently to a Category 3 system for landings in "zero-zero" conditions.

43. A Category 1 instrument landing system for use in visibilities of a half a mile and a cloud ceiling of 200 ft is to be installed on the 16/34 runway when the extension to 13,000 ft is completed, to assist landings into the north. The requirement for assistance for landings in this direction is not as critical as the opposite way because of the more moderate nature of the weather which requires landings into the north. The system will thus

be used mainly as an aid to landings in relatively good weather and to provide precise direction and slope guidance, a particular requirement for aircraft with rear mounted engines. The installation will require grading of the reclamation area and the installation of a radio beacon on piles in Botany Bay 2,400 ft from the end of the reclamation on the extended centre-line of the runway.

44. Although the need for an instrument landing system for landings into the north has been recognised, we noted that it will not be available until the presently proposed runway extension is completed in 1972.

RECLAMATION AND DREDGING

45. Previous Reclamation and Dredging The existing runway reclamation is 1,235 ft wide and extends about 3,000 ft southwards into Botany Bay. It contains about 5 million cubic yards of sand filling, the bulk of which was dredged from a roughly rectangular area in the Bay, known as Area A2, immediately west of the reclamation. The dredging and reclamation were carried out during 1964-65 with the agreement of the Maritime Services Board of New South Wales.

46. Due to the possible effect which the latter work and other development proposals in the Bay could have on wave patterns and adjoining foreshores, the Board had engaged the Hydraulics Research Station, Wallingford, England to examine and advise on the problems involved.

47. Following heavy storms between June and October 1965, severe foreshore erosion and damage occurred along Lady Robinson's Beach which is in the north-western part of Botany Bay west of Area A2. Subsequent storms have continued to aggravate the beach erosion. After a detailed

study of the problem then, Wallingford concluded that the dredging had changed the alignment of waves approaching the beach and this in turn had aggravated the erosion and accentuated foreshore damage during storms. The extent to which the damage has been aggravated by the dredging cannot be determined as the foreshore was subject to storm damage prior to the runway reclamation and dredging.

48. Wallingford also advised that extension and reshaping of Area A2, to the north and south, would result in a restoration of the wave alignment along the beach and would arrest the erosion problem. The corrective dredging recommended involved a further 6 to 7 million cubic yards of sand.

49. In 1966 when 3 million cubic yards of sand were required to fill the north-west building area at the airport, the Board approved of the Commonwealth obtaining sand from the areas immediately north and south of the previously dredged area, but leaving part of the recommended area to the south untouched. It was also agreed that when further sand was required for runway extensions, the dredging would take place in the remaining southern area in order to complete the restoration of the wave alignment.

50. Dredging for the filling for the north-west building area was carried out during 1966-67 and as predicted, it resulted in more stable conditions at the northern end of Lady Robinson's Beach.

51. The location, shape and depth of the dredging for airport development since 1964 have been in accordance with the requirements of the Maritime Services Board. It is accepted, however, that some of the decisions taken about the dredging were made without scientific support and the resulting damage is the price of proceeding without first having obtained this advice.

52. According to the agreement reached with the Board in 1966, the Commonwealth is currently obligated to

- extend and reshape the dredged area to restore the wave alignment approaching Lady Robinson's Beach and to provide reasonable stability along this section of the foreshore. Further dredging in the area south of that already worked is estimated to yield a further 3.5 million cubic yards of sand;

- carry out certain foreshore restoration work after completing the further dredging. The extent of the work is to be further discussed with representatives of the Board and the Municipality of Rockdale within whose boundaries the eroded areas are located;

- carry out certain remedial work on Lady Robinson's Beach pending completion of the dredging and restoration work in order to rectify damage attributable to previous dredging. The Commonwealth's responsibility in this regard is to cease on completion of the dredging, subject to confirmation by Wallingford that the wave pattern has been substantially restored to the conditions which existed before Area A2 was dredged.

53. Proposed Reclamation The proposed reclamation will extend into Botany Bay a further 4,600 ft and will involve about 8 million cubic yards of sand.

54. The Maritime Services Board has approved the dredging, in principle, subject to it being confined to areas decided by the Board, and the Commonwealth accepting responsibility for any adverse effects on the Bay caused by its dredging. It has been concluded from consultations with the Board and Wallingford that about $3\frac{1}{2}$ million cubic yards of the sand now required should be taken from the hitherto untouched southernmost area. The balance of $4\frac{1}{2}$ million cubic yards is to be obtained by adjusting the shape and depth of the dredging over the same area and slightly deepening the areas dredged between 1964 and 1966. The shape and depth of the dredging is to be designed to produce maximum stability along Lady Robinson's Beach. The design details are to be decided by the Maritime Services Board and Wallingford and checked scientifically by model studies so that any adjustments required can be made before the work is completed.

55. When tenders are being examined, the location, depth and shape of the areas to be dredged for the reclamation will be finalised. Consideration will also then be given to whether the proposed dredging, if carried out in other parts of the Bay, might assist in stabilising the foreshore along Lady Robinson's Beach and at the same time benefit the overall development of the Bay.

56. Foreshore Restoration Work The Commonwealth has undertaken to restore the foreshores of Lady Robinson's Beach after completion of the dredging and reclamation. Due to the difficulty in estimating, at this stage, the full extent of the work and material involved, an allowance has been made in the present estimates on the basis that 600,000 cubic yards of sand will be required. It is planned to obtain this sand as the last

operation in the dredging because by that time it is expected that the wave alignment will have been restored.

57. The Committee were informed that because it is not possible to predict the behaviour of the foreshore after this stage has been reached, it may be necessary for some additional restoration work to be carried out subsequently. We noted that the need for and extent of any such work will be kept under observation and implemented as necessary.

58. Foreshore Remedial and Protective Works Since the storm damage in 1965, the Commonwealth has contributed $477,000 towards remedial and protective works along Lady Robinson's Beach. It also recently agreed to continue to participate in further remedial work that can be shown to be necessary due to the dredging operation or the construction of the runway extension, until such time as the dredging and restoration works now proposed have been carried out. We noted also that additional funds were made available for urgent remedial measures after the heavy storms of last May.

59. Further maintenance and emergency repairs that may be necessary to hold the foreshore in a reasonable condition pending completion of the dredging and the ultimate restoration and stabilisation of the foreshores, will be governed by the frequency and severity of storms which occur in the next four years and determined in consultation with the Maritime Services Board and the local council.

CONCLUSIONS

60. The Committee concluded that there is a need for each of the various works which comprise this reference. For the reasons mentioned later in the report we believe that construction should commence without delay.

PART III - CONSTRUCTION

CONSTRUCTION PROPOSALS

61. Reclamation and Seawall It is planned that the level of the runway centre-line will be 15 ft above mean sea level as will the level of the parallel taxiway. Drainage valleys will extend along the reclamation 320 ft on either side of the runway centre-line at levels ranging between 8 ft and 10 ft above mean sea level. The seabed along the reclamation varies from 17 ft to 20 ft below mean sea level and the average depth of filling required along the runway and taxiway centre-lines will be 34 ft. The unpaved area of the reclamation will be loamed and grassed.

62. The sand filling in the reclamation will be protected around the perimeter by a facing type seawall similar to that on the existing reclamation but strengthened where necessary to withstand the larger waves encountered further out in the Bay. This form of protection is considered to be the most economical and satisfactory solution. The outer facing of the wall will comprise an armouring of large rock boulders or concrete blocks designed to withstand the force of the waves which will vary around the perimeter of the reclamation. The armouring will be heaviest along the southern end and for about 1,500 ft on the eastern side.

63. The armouring will rest on a 8 to 9 ft thick base of smaller rocks the size of which will be progressively reduced to act as a filter to prevent the loss of sand fill. The top of the seawall will be 17 ft above sea level at the southern end and will slope down to a general level 3 ft lower at the sides. The seawall will be 10,300 ft long and will contain 500,000 tons of rock and concrete blocks.

64. Pavements The runway and taxiway pavements and shoulders on the proposed extension will be similar in construction to those in the present extension. Apart from the 500 ft of concrete pavement to be provided at the western end of the 07/25 runway, all new pavement in this reference will be surfaced in bituminous concrete.

65. Other Works The 20-ft wide bituminous surfaced perimeter road on the existing extension will be extended adjacent to the seawall around the proposed reclamation. New brick buildings and services for the localiser and glide path equipment will be constructed on the proposed extension and a piled frame will be provided in Botany Bay for the erection of the middle marker beacon.

66. Committee's Recommendation The Committee recommend the construction of the work in this reference.

PROGRAMME AND ESTIMATES

67. The estimated cost of the work when referred to the Committee was $23 million.

68. The Committee were told that after an approval to proceed is given by Parliament, tender documents are expected to require three months to complete and tenders three to four months to invite and consider. The work is expected to take three years to complete after a contract is let, providing normal weather conditions are experienced. Completion is therefore not expected before March/April 1972.

PART IV - CONCLUSION

OTHER OBSERVATIONS

69. The Committee generally endorse the work in this reference and agree that it should be put in hand as quickly as possible. There are, however, a number of important matters about the proposed work or other development work being carried out at Sydney Airport which, whilst not affecting whether the proposed work should proceed, require comment in this report to the Parliament. These matters are now discussed.

70. Programme The basic requirement for the extension of the 16/34 runway to 13,000 ft is to meet, initially, the operational requirements of the Boeing 747 aircraft to be delivered to Qantas in August 1971. It is also a fact that the programme for the work envisages a three year construction period after a contract is let. This latter stage is not expected to be reached before March 1969. And it should be noted that construction is only expected to be completed in three years if normal weather conditions are experienced. It is obvious then that the project is behind schedule even before it is out of the planning phase and the position will be aggravated if abnormal weather occurs.

71. It was explained to the Committee that the decision to extend the runway to 13,000 ft was made only after fairly precise details became known about the performance of the aircraft for which the longer runway is required, particularly the 747. There is no doubt that a 13,000 ft runway, when available, will meet the needs of 747 operations but it is equally evident that because of the "wait and see" policy, there will be a period when these aircraft will not be able to operate out of Sydney without a

range or weight penalty. The Committee do not suggest that the Government should make speculative decisions on projects of this nature, but in this instance there was clearly scope for a considered judgment to be made much earlier on the information then available.

72. From the evidence given to the Committee, there seems no possibility of improving on the target date for completion of the work. Firstly, achievement of the target date now set relies on normal weather and experience with the present reclamation and runway extension contract, which is over 12 months behind schedule, suggests that the programme may be optimistic.

73. We draw the attention of the Parliament to the report of the Committee in 1965 on the international terminal at Sydney Airport which was critical of the limited time taken to plan that and a number of other major airports works dealt with at the time. Unfortunately, the same thing has occurred in this instance. The Committee believe that if the Government intends to provide facilities commensurate with the needs of modern civil aviation, then clearly it has a responsibility to plan with more energy and imagination than has been shown in this instance.

74. Noise We noted that the Committee, when reporting in 1963 on the initial extension of the 16/34 runway, recognised and drew attention to the noise problem generally and commented that until the proposed extension was completed, the basic problem would remain and be accentuated with the introduction of jet aircraft on domestic flights. This has proved to be the case.

75. The Committee heard a considerable amount of evidence about the noise nuisance now being suffered by residents in the vicinity of Sydney Airport and particularly by those who live under the approach paths of the 07/25 runway. Among other things, the evidence suggested that the existing flight patterns over these areas are not arranged in the best interests of noise abatement.

76. We could not fail to be impressed, on the one hand, by the apprehension in the community generally about the effects of noise resulting from present and future airport development, and on the other, by the almost complete lack of action by the Commonwealth to attempt to alleviate the immediate problem and the admission of a departmental witness that "we have not done any significant work in this field".

77. The Committee were told of the manufacturers claim that in theory the 747 and Concorde are not expected to create any more noise than 707 and DC8 aircraft, except that the side-line noise of the Concorde could be higher in places. We also noted that some relief is expected when operations take place over Botany Bay on the extended 16/34 runway.

78. We do not necessarily accept that the noise levels created by the operations of 707, DC8 and other jets are acceptable. And it remains to be seen whether the manufacturers' claims for the 747 and Concorde are realised. It is abundantly clear, however, that the Government should tackle the noise problem with positive action and without further delay. The problem exists now and should be confronted immediately. The necessary staff

should be appointed quickly to investigate local problems and solutions without necessarily awaiting the establishment of internationally accepted standards or the development of noise abatement techniques overseas.

79. At Sydney Airport considerable thought needs to be given to the means of using the 16/34 runway to the best possible effect and of minimising noise nuisance when operations take place over built-up areas. We emphasise that until the runway extension to 13,000 ft is completed in 1972, only visual aids will be available to assist landings from the south over Botany Bay, whilst a sophisticated Category 2 instrument landing system will be available for landings in the opposite direction, for which the approach is over densely populated Marrickville and areas to the north.

80. The Committee believe that the noise problem is of such a magnitude that subject to safety considerations a decision should be made to adopt the 16/34 runway with access over Botany Bay as the preferred runway at Sydney Airport.

81. Future Airport Development In 1965, the Committee recommended that steps be taken to identify as soon as possible the site for the development of Sydney's second major airport. The background to that recommendation was the forecast that the present airport will be functioning at its maximum capacity some time after 1980 and by that time parallel runways will be completed and operating.

82. During our current investigation, we were informed in general terms of the efforts being made to find an area for a second major airport

and of the difficulties associated with each of the sites contemplated. We noted also the opposition being voiced publicly against the Towra Point site at both State and local government levels.

83. We strongly support the recommendation of the 1965 Committee but stress that the problem is now at least that much more urgent because of the time that has since elapsed. We are particularly mindful of the long period of time required for airport development and instance the case of Melbourne (Tullamarine) Airport, where ten years have already elapsed since the Melbourne Airport Panel was set up and point out that it will be at least another two years before domestic airline operations commence there.

84. Domestic Terminal Development The Committee draws the notice of the Parliament to the reports of the Committee in 1965 on the site preparation of the north-west building area, and in 1967 on the site preparation for future domestic terminals. In these reports we focused attention on the need, for operational reasons, for the construction of new domestic terminal buildings and aprons. The basis for this conclusion was that Sydney Airport will require a system of parallel runways by about 1975. The decision which has already been taken to eventually relocate both the international and domestic passenger terminals in the north-western area of the airport means that the runway parallel to the 16/34 runway will need to be about 1,000 ft east of it, requiring the demolition of the present T.A.A. terminal. As the parallel runways will require up to two years to construct, it means that T.A.A. and probably Ansett-A.N.A. should both be operating from the new terminal area by 1973.

85. On that basis, and allowing four years for design and construction, Parliament should be approached for an approval to proceed with the terminal buildings no later than next year. So far as the Committee could ascertain, the Government has not heeded the previous recommendations and a proposal for the construction of the domestic terminals has not yet been considered.

86. We are firmly convinced that failure to push on quickly with the domestic terminals will produce chaotic conditions at Sydney Airport in the next five to ten years. If the traffic forecasts eventuate, the absence of parallel runways might well produce conditions of aircraft traffic congestion reminiscent of some United States airports today and the existing domestic terminals will be totally inadequate for their purpose.

87. The Committee are unable to understand why these projects should be deferred further and strongly recommend that construction of the domestic passenger terminals at Sydney Airport should be commenced without further delay.

88. Decentralised International Airport The Committee received an interesting submission which suggested that an international transit airport specifically for large subsonic and supersonic aircraft operations might be an appropriate development in a country area and a substitute for the extension of the 16/34 runway at Sydney Airport to 13,000 ft. Dubbo, New South Wales was cited as the type of centre the witnesses had in mind, it being fairly conveniently located in relation to major centres of population

having a nucleus of an aircraft maintenance industry and being relatively free from expansion and noise problems.

89. The proposal envisaged international aircraft currently in service continuing to use existing airports and the transit centre served, for the transport of passengers within the country, by domestic airlines.

90. The Committee were informed that a similar proposal has been considered by the Government a number of times and rejected for good reasons on each occasion. We concluded that the creation of a complex such as that proposed is not the most appropriate way to provide operational and terminal facilities for aircraft such as the 747 in the next five to ten years, but agreed the idea has considerable merit. The Committee believe that the growth of aircraft traffic in this period may well precipitate the development of a decentralised international airport because of noise, airport expansion and aircraft traffic congestion reasons.

91. Municipality of Botany A representative of the Council of the Municipality of Botany pointed out to the Committee that one of the secondary effects of the Commonwealth's reclamation and dredging in Botany Bay appears to be an accretion of sand in the north-eastern corner of the Bay in an area where the Council's drainage lines enter the Bay. The effect of the accretion is that the drain outlets are becoming choked with sand.

92. We noted from the evidence that the Commonwealth has undertaken to investigate this problem and to take appropriate action if the accretion is found to be caused by its dredging or reclamation.

93. Runway Width The views of the Committee on the width of the proposed runway extension are set out in paragraph 28 above. Although in this instance we endorse adherence to the international standard of 150 ft plus 25 ft shoulders for runways, we considered that the point of view expressed by the pilots' associations was not without merit. We therefore think that there should be a review of the standard when there has been operational experience with Boeing 747 and similar aircraft.

RECOMMENDATIONS AND CONCLUSIONS

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

		Paragraph
1.	SUBJECT TO RECOMMENDATION 17, WE SUPPORT ADHERENCE TO THE INTERNATIONALLY ACCEPTED STANDARD ON RUNWAY WIDTHS.	28
2.	ALTHOUGH THE NEED FOR AN INSTRUMENT LANDING SYSTEM FOR LANDINGS INTO THE NORTH HAS BEEN RECOGNISED, IT WILL NOT BE AVAILABLE UNTIL THE PROPOSED RUNWAY EXTENSION IS COMPLETED IN 1972.	44
3.	THE COMMONWEALTH HAS UNDERTAKEN TO RESTORE THE FORESHORES OF LADY ROBINSON'S BEACH AFTER COMPLETION OF THE DREDGING AND RECLAMATION.	56
4.	THERE IS A NEED FOR EACH OF THE VARIOUS WORKS WHICH COMPRISE THIS REFERENCE.	60
5.	CONSTRUCTION SHOULD BE COMMENCED WITHOUT DELAY.	60

Paragraph

6. THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE. 66

7. THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS $23 MILLION. 67

8. THE RUNWAY EXTENSION PROJECT IS BEHIND SCHEDULE EVEN BEFORE IT IS OUT OF THE PLANNING PHASE. 70

9. IF THE GOVERNMENT INTENDS TO PROVIDE FACILITIES COMMENSURATE WITH THE NEEDS OF MODERN CIVIL AVIATION IT HAS A RESPONSIBILITY TO PLAN WITH MORE ENERGY AND IMAGINATION THAN HAS BEEN SHOWN IN THIS INSTANCE. 73

10. THE GOVERNMENT SHOULD TACKLE THE NOISE PROBLEM WITH POSITIVE ACTION AND WITHOUT FURTHER DELAY. 78

11. THE NECESSARY STAFF SHOULD BE APPOINTED QUICKLY TO INVESTIGATE LOCAL NOISE PROBLEMS AND SOLUTIONS. 78

12. SUBJECT TO SAFETY CONSIDERATIONS A DECISION SHOULD BE MADE TO ADOPT THE 16/34 RUNWAY WITH ACCESS OVER BOTANY BAY AS THE PREFERRED RUNWAY AT SYDNEY AIRPORT. 80

13. THE COMMITTEE STRONGLY SUPPORT THE RECOMMENDATION OF THE 1965 COMMITTEE THAT STEPS BE TAKEN TO IDENTIFY WITHOUT DELAY THE SITE FOR THE DEVELOPMENT OF SYDNEY'S SECOND MAJOR AIRPORT. 81