THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

REPORT

RELATING TO PROPOSED

CIVIL ENGINEERING AERODROME WORKS

PERTH AIRPORT, WESTERN AUSTRALIA.

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MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

(SEVENTEENTH COMMITTEE.)

(Senators appointed 19th February, 1959, Members of the House of Representatives appointed 24th February, 1959.)

HON. ALLEN FAIRHALL (Chairman).

Senate.

Senator KENNETH MCCOLL ANDERSON. Senator Edmund Bede Maher. Senator Justin Hilary O'Byrne. House of Representatives. Wilfred John Brimblecombe. Roger Levinge Dean. Charles Edward Griffiths. Hector James McIvor. William Paul O'Connor.

EXTRACT FROM THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES, No. 28, DATED, 1st JUNE, 1960.

5. PUBLIC WORKS COMMITTEE—REFERENCE OF WORKS—WORKS AT PERTH AIRPORT.—Mr. Freeth (Minister for Works) moved, pursuant to notice, That, in accordance with the provisions of the *Public Works Committee Act* 1913-1960, the following proposed works be referred to the Parliamentary Standing Committee on Public Works for investigation and report, namely:—Construction of Apron, Roads, Car Parks and Engineering Services for proposed new Terminal Building at Perth Airport, Western Australia; also extension of North South Runway and widening, strengthening and extension of Associated Taxiways.

Question-put and passed.

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No. 60 [CROEP 17].--F.6399703. -PRET 51-

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THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

CIVIL ENGINEERING AERODROME WORKS, AT PERTH AIRPORT, WESTERN AUSTRALIA.

REPORT.

By resolution on 1st June, 1960, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report, the proposed construction of an apron, roads, car park and engineering services for the proposed new terminal building at Perth Airport, Western Australia, and also extension of the north south runway and the widening, strengthening and extending of associated taxiways. Your Committee have the honour to report as follows:—

SECTION I.-INTRODUCTION.

HISTORICAL.

1. The airport site at Guildford was chosen as the best available near Perth and is approximately 8 miles from the centre of the city. The area, including the land used for transmitting and receiving station aerials and the buffer area, comprises 2,250 acres.

2. Work commenced at the airport in 1941-42 and two runways, the north-east south-west and east west, each 6,000 feet long, together with taxiways and apron were built for the Royal Australian Air Force. The pavements were constructed of gravel about 8 inches thick with a thin bituminous surface about $\frac{1}{2}$ inch thick. Towards the end of the war a concrete apron was built for civil aircraft.

3. Between 1948 and 1950 the north-east south-west runway was re-sheeted with gravel, lengthened and widened, a new north south runway and some new taxiways were built and the R.A.A.F. apron was enlarged. The pavements were of gravel 9 inches thick with a thin bituminous surface of bitumen and sand.

4. More recently a small apron has been built in front of the existing overseas terminal, and the north-east southwest runway has been further extended in concrete 12 inches thick.

5. Services such as the aircraft apron, access road, paved areas, car parks, drainage, sewerage, water supply and power are designed to serve the existing buildings. There are some services which cut through the site for the proposed terminal.

SECTION II.—THE COMMITTEE'S INQUIRIES. General.

6. Your Committee took evidence in Canberra and Perth from witnesses representing the airline companies, air pilots, professional organizations, the State Government and local authorities and the Commonwealth departments concerned with the project.

PROPOSED WORKS ASSOCIATED WITH THE TERMINAL BUILDING.

7. The proposed civil engineering works necessary to make the terminal building function comprise the following:----

					2
Aircraft apron Access road and	 paved area	 around	 new	terminal	150,000
building	·				57,000
Car park	1.01.000				18,000
Drainage works			· ·	1 8 G a.e.	25,000
Sewerage	••	· · · · ·			12,000
Water supply	••				2,000
Power supply					1,000
Diversion of exist	ing services	clear of	buil	ding site	5,000
Duplication of en	ntrance road	e Lulp		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10,000
-					

280,000

8. Apron.—There is no apron which would serve the proposed new terminal. It is proposed to construct one of concrete 12 inches thick on a base of gravel or loam 6 inches thick. This will provide space for eight aircraft and will be of sufficient strength for the parking of large jet aircraft.

9. Sewerage.—The work proposed will involve reconstruction and expansion of parts of the existing septic tank system. Proposals to connect to the Metropolitan Water, Sewerage and Drainage Department sewers were examined in 1958.

10. These proposals, which would have involved connexion to mains 3 to 5 miles away, would have cost in the vicinity of $\pounds 60,000$ and your Committee agree with the decision not to proceed with them.

11. Car Parking.—The parking area proposed is planned to handle 350 vehicles. It is to be located close to the new terminal and will be supplemented when necessary, by other areas reserved for future use, which will be equally conveniently located.

12. Your Committee consider that adequate provision has been made for car parking.

13. Access Road.—The new access road to the terminal building will link up, at the airport boundary, with a road, to be constructed by the State authorities, from the Great Eastern Highway. The new road will provide more direct access and keep traffic away from the area which will not have any terminal functions after the new building is completed.

14. Having recommended, in another report, the construction of the new terminal building, it follows that associated engineering work must also be undertaken.

15. Your Committee recommend the expenditure of £280,000 on proposed engineering work associated with the international terminal building.

Condition of Present Runway and Taxiway Facilities.

16. The main cause for concern at the moment is the tendency of the main runway and some taxiways to fail under the loads of the aircraft at present using them.

17. The north-east south-west runway.—Between 1948 and 1950 the north-east south-west runway was extended from 6,000 feet to 6,620 feet and widened from 150 feet to 200 feet. Early in 1960 it was lengthened at the south-west end to 6,900 feet, the extension being in concrete 12 inches thick.

18. At the end of 1957, when it appeared that the airport would eventually have to be raised to a standard adequate for big jet aircraft, an evaluation of the pavements was made. Test rolling was undertaken with a pneumatic-tyred roller loaded to a gross weight of 260,000 lbs. (116 tons) on four tyres with tyre pressures of 150 lbs. per square inch.

19. The tests revealed that the north-east south-west runway contains a number of areas which would fail under jet aircraft such as the Boeing 707 or the Douglas DC8. Some areas, notably a section 400 feet long near the northeast end are sub-standard for Super Constellation and Electra aircraft now using the airport. These areas are not yet, however, showing signs of distress. 20. The north south runway.—In the 1948-1950 period the north south runway, 4,810 feet long and 150° feet wide, was constructed.

21. The tests conducted at the end of 1957 revealed that this runway is adequate in strength for the large jets except for the bituminous surface which should be strengthened by overlaying with bituminous concrete after thorough rolling.

22. The east west runway.—The east west runway is strong enough for Douglas DC3 aircraft only.

23. Taxiways.—The taxiways constructed during the war are variable in quality and would require strengthening to make them suitable for large jets. Those constructed since the war are of adequate strength but would need rolling and surfacing as proposed for the north south runway.

THE EXISTING RUNWAY SYSTEM.

24. The existing runway system, therefore, comprises-

- (a) a north-east south-west runway 6,900 feet long, adequate in length for aircraft at present using the airport but not for large jets, and of such strength that it is likely to fail even under the aircraft now using the airport. There is a runup area approximately 300 feet long at the south-west end, adequate in strength for the large jets. This is the only runway served by the Instrument Landing System.
- (b) a north south runway 4,810 feet long, too short even for the larger aircraft now using the airport. It is strong enough for these aircraft, but for the large jets, may need rolling and overlaying.
- (c) an east west runway 6,000 feet long adequate in strength for Douglas DC3 aircraft only.

ULTIMATE DEVELOPMENT.

25. The prevailing wind blows from a south-westerly direction and, when the proposed development is completed, the traffic pattern at Perth, for the larger aircraft, will be landings from the north-east and take-offs into the south. On the few occasions when the wind has a northerly component, landings would be from the south and take-offs into the north-east.

26. Further development, to permit large jet aircraft to use the airport will, therefore, involve work on the northeast south-west and the north south runways.

27. Residential development.—Residential development in the path of aircraft taking off into the south is approximately 25,000 feet from the point of take-off roll on the proposed extension at the northern end of the north south runway. In the path of aircraft taking off into the northeast there is less distance between the point of take-off roll at the south-western end of the north-east south-west runway, and residential development.

28. Open country exists between the airport and residential development to the south, while there is an industrial area between the airport and residential development to the north-east.

29. Noise.—Because of the distances between residential development and the airport, the noise factor is not expected to present the problem it has done at other airports.

30. When the north-cast south-west and north south runways are available for use by large jet aircraft, the noise they will create in the residential areas will be of less magnitude than has been set as acceptable at New York and London. 31. Acquisition proposals.—Negotiations are in hand to acquire sufficient land to allow foreseeable development of the airport to take place. It is proposed to acquire 1,370 acres, thus increasing the area of the airport to 3,620 acres.

32. Consultation has taken place with officers in State Government departments and the State Government has no objection to the proposals. The acquisition will not involve the displacement of already built-up areas.

33. *Road diversions.*—Development of the north south runway to big jet standards will involve the closing of Maida Vale-road which serves areas to the east of the aerodrome.

34. An alternative route via Hardey-road will come within the area to be acquired. However, it is on the fringe of the airport, acquisition in this area is necessary only to prevent building near the runway approaches, and there is no intention, ever to close the road.

35. Although the local Road Board has expressed some concern about a proposal involving increased travel to and from the city by local residents, it is inevitable that any project of this magnitude will cause inconvenience to some people. However, it appears that the inconvenience will be slight and the number of people affected, small. Such considerations must defer to the general public benefit which will ultimately accrue.

36. Alternative site.—Some reference was made in evidence to an earlier proposal to establish an airport near Lake Gnangara, however this site was rejected because of its distance from the city, its proximity to the R.A.A.F. aerodrome at Pearce and the £5,000,000 estimated development cost.

37. Compared with most major airports in the eastern States, the airport site at Guildford offers greater opportunities for expansion with less effect on surrounding development. We are confident that the airport will not become obsolete due to shortage of space and we cannot see any likelihood of a need for major development elsewhere in the Perth area. Any work undertaken now, will therefore be a contribution towards the requirements for foreseeable development in aviation.

THE PRESENT RUNWAY AND TAXIWAY PROPOSALS.

38. The runway and taxiway works proposed are-

	よ
Southern extension of the north south runway by 1,090 feet	85,000
Northern extension of the north south run- way by 600 feet and widening and	11.542
extending taxiway thereto	140,000
Widening existing taxiways from the north-	
to 75 feet and extensions to join the pro-	
posed new terminal apron	75,000
ous domentes mitar e commune. El bankes	300,000

39. The estimates of cost are preliminary as designs have not yet been prepared.

40. It is intended to construct 300 feet of the northern extension of the runway in concrete 12 inches thick on a base of gravel or loam 6 inches thick. The other new pavements are to be of fine crushed rock 10 inches thick with a surface of bituminous concrete 1 inch thick. The taxiways to be widened will be constructed of fine crushed rock 6 inches thick using the existing gravel as a base course and surfaced with 1 inch of bituminous concrete. The new pavements will have shoulders of gravel 8 feet wide and 6 inches thick with a thin bituminous surface of bitumen and sand.

41. The work proposed will be of adequate strength for use by Boeing 707 and Douglas DC8 aircraft.

42. The more expensive concrete treatment at the northern end of the runway is required to carry the load created by aircraft standing prior to take-off.

BENEFITS ACCRUING FROM THE PROPOSED WORK.

43. As a result of the proposed work on the runway and taxiways, two benefits will accrue.

44. Firstly, the north south runway will become available for the large aircraft at present using the airport, thus enabling reconstruction or maintenance to be carried out on the north-east south-west runway with a minimum of disruption to aircraft traffic.

45. Secondly, aircraft will be able to take off into the south thus avoiding noise disturbace at present experienced by people living in the take-off path of aircraft using the north-east south-west runway.

46. While agreeing that the proposals set out in paragraph 38 are necessary, it seemed to your Committee that, considering expenditure of the order of £1,000,000 on building and engineering work is proposed, and being aware of the progressive introduction of large jet aircraft into service with international airline operators, we should, in the light of the terms of reference, turn our attention also to the need for, and the work involved in providing facilities to enable Perth to share in the jet aircraft traffic.

PERTH AS AN INTERNATIONAL AIRPORT.

47. Prior to the employment of jet aircraft on international air routes, Perth was a fully fledged international airport. The inadequacy of the runways for international jet operation has, in fact, downgraded Perth with serious economic consequences to the State of Western Australia and the operators of international air services.

48. The need for adequate airport facilities in the development of trade with South-East Asia, the desirability of an alternative air route to the United Kingdom through Cocos Island and for an alternative airport to Darwin, and the reasonable demand that Western Australia should not be handicapped in its commercial development by restriction to a second-class international airport, impressed your Committee.

49. Commercially the need to maintain piston-engined aircraft on a feeder service to Singapore is wasteful of aircraft time, necessitates the retention of these aircraft in service longer than would otherwise be necessary and is estimated to cost one operator, Qantas, £200,000 more per annum than if two Boeing services per week were routed through Perth instead of Darwin.

50. All the indications are that jet travel has so captured the imagination of the overseas traveller, that operators of international air services have no alternative but to convert to jet aircraft.

51. For these reasons your Committee agree that there is a sound case for the development of Perth airport to international jet standards.

THE RUNWAY REQUIREMENTS FOR LARGE JET AIRCRAFT.

52. The Boeing 707.138A (fully loaded) at present in use by Qantas would need a runway 10,850 feet long in order to operate on the long stage from Perth to Singapore.

53. Three new Boeing 707 aircraft, the 138B, with ducted fan engines, on order by Qantas, will require considerably less runway length. A modification programme is to be carried out on seven existing Boeing 707.138A to equip them also with ducted fan engines. Representatives of both Qantas and the Department of Civil

Aviation believe that based on nominal specification performance, the new and modified aircraft will be able to operate out of Perth to Singapore with 25,000 lbs. payload (full load 30,000 lbs.) with a runway 7,450 feet long.

54. They have pointed out, however, that the new engine has not been flight tested in a Boeing 707 and they have therefore made the reservation that, when the Boeing 707.138B undergoes airworthiness trials early in 1961, it may be found that 7,950 feet of runway will be needed. This additional 500 feet was mentioned as a possibility but not as a probability.

55. The smaller payload of 25,000 lbs. would give an acceptable and profitable commercial operation to Qantas. In any case, this figure is the maximum the company can carry betwen Perth and Singapore under the tripartite pool arrangement between Qantas, B.O.A.C. and Air India International.

56. Until recently it was believed that 8,500 feet of runway would be needed to enable the Boeing 707.138B to operate through Perth. The factors which contributed to a reduced requirement are a smaller payload, more knowledge of the expected performance of the new aircraft and a changed fuel reserve policy resulting from experience acquired in operating jet aircraft to Singapore.

57. It has been estimated that the additional cost involved in extending the north south runway from 6,500 feet to 7,450 feet would be £120,000. A further £40,000 is estimated to be required to extend it to 7,950 feet.

58. Your Committee is aware that when the interdepartmental committee, set up to report to the Government on major civil aerodrome works, was studying the proposals for the Perth Airport, the cost, additional to the $\pm 300,000$ for the work suggested under the reference before your Committee, was estimated to be approximately $\pm 750,000$. The main components to make up this figure were—

				£	£
Extension of nort 6,500 feet to	h south 8,500 fe	runway t et	from	185,000	
1-in. bituminous	concret	e coat	with	50,000	
south runway		ith 2 inche	ortin-	50,000 °	
bituminous cond	crete	···		105,000	
Overlay north-east	south-we	st runway	with		390,000
bituminous con	crete		••••		170,000
Road deviations	5.5.6	••	••		160,000
Navigational aids	••	••			10,000
					730,000

59. Minimum standards for large jets can, it has been submitted, be provided with less elaborate development than was proposed earlier. Shoulders to the north south runway and the holding bay can be omitted and less runway length is required.

60. Experience since large jets have been using the runways at Sydney Airport leads to the belief that although some damage may occur, the runways at Perth would, in their existing state, stand up to the amount of jet aircraft traffic likely during the next few years.

61. It would not be proposed, therefore, to overlay the existing runways although this work will have to be carried out, possibly within the next five years, even if large jets do not use the airport.

62. The estimated cost of overlaying the existing surfaces of both the north-east south-west and north south runways is now £260,000. This would be regarded as capital expenditure because the standard of the pavements would be improved, however, it would it would be capital expenditure to save maintenance, 64. The estimate of $\pounds 160,000$ for road diversion was based on previous experience and was given before there had been any consultation with authorities in Western Australia. Now that discussions have taken place the estimate is $\pounds 35,000$.

65. By contrast with the estimates submitted to the interdepartmental committee therefore, it is now considered that, to provide minimum standards for large jets, but maintaining maximum safety, additional expenditure of approximately £85,000 to extend the north-south runway from 6,500 feet to 7,450 feet, and approximately £35,000

for road deviation work, is all that will be required.

66. Having taken considerable evidence on the runway and taxiway works proposed and on the question of possible development of the airport to permit use of it by large jet aircraft, your Committee have no hesitation in recomending the expenditure of £300,000 as proposed to increase the length of the north south runway to 6,500 feet and to carry out associated taxiway work.

67. We believe, however, that the airport should be developed to large jet standards and therefore recommend the expenditure of an additional $\pm 120,000$ to increase the length of the north south runway to 7,450 feet.

68. We realize that if this recommendation is accepted and work commences, there may be a commitment to spend a further $\pounds40,000$ if airworthiness tests early in 1961 reveal that the Boeing 707.138B needs 7,950 feet of runway to operate to Singapore with 25,000 lbs. payload.

69. In these circumstances the need to spend a further $\pounds 40,000$ would be well justified.

ESTIMATES OF COST.

70. The following estimates of cost have been given for the work proposed:—

	£	£	£
Southern extension of the north south runway by 1,090 feet	85,000		
Northern extension of the north south runway by 600 feet and the widen-			
ing and extending of taxiway			
thereto	140.000		
Widening existing taxiways from	,		
north-east south-west and north			
south runways to 75 feet: exten-			
sions to join the proposed new			
terminal aprop	75 000		
terminal apron	15,000	200.000	
2011/107	150.000	300,000	
Apron	150,000		
Access road and paved areas around	57 000		
new terminal building	57,000		
Car park	18,000		
Drainage works	25,000		
Sewerage	12,000		
Water supply	2,000		
Power supply	1,000		
Diversion of existing services clear of			
the building site	5,000		
Duplication of entrance road	10,000	280,000	
the success of Perth formed in	· · · · · · · · · · · · · · · · · · ·		580.000
Further extension of north south run-			
way to 7.450 feet as recommended.			
to bring airport to jet standard	- Min Lyin	네네 이 [상 학]	120 000
it in provide the second of th			
			700 000
			,

(Extension to 7,950 feet if required, would cost a further £40,000.) The estimates of cost are preliminary as designs have not yet been prepared.

CONSTRUCTION TIME.

71. Having regard to the facilities available in the Perth area, the whole of the civil engineering works proposed could be completed within a period of fifteen months from commencement of construction.

72. Your Committee wish to record their appreciation and thanks to those witnesses who so obviously devoted a considerable amount of time to the study of the proposals.

SECTION III.-THE COMMITTEE'S CONCLUSIONS.

SUMMARY OF RECOMMENDATIONS AND CONCLUSIONS.

73. The recomendations and conclusions, arrived at after studying all the evidence and material submitted, are set out below. The paragraphs quoted alongside each conclusion or recommendation refer to the relevant portions of the report:—

Paragraph in report.

- (1) The expenditure of £280,000 on proposed engineering work associated with the international terminal building is recommended 15 (2) The cost involved does not justify the connexion of sewerage to the metropolitan 10 system (3) Adequate provision has been made for car 12 parking (4) The site at Guildford should be capable of meeting the needs of foreseeable develop-37 ment in aviation (5) There is a sound case for the development of Perth Airport to international jet standards 51 (6) The cost of work necessary to develop the airport to large jet standards, additional to that proposed under reference, is estimated 57.65 to be £120,000 (7) An additional £40,000 may be needed, depending on the results of airworthiness tests on the Boeing 707.138B ... 57 . . (8) Expenditure of £300,000 as proposed to increase the length of the north south runway to 6,500 feet and to carry out associated taxiway work is recommended ... 66 (9) The Perth Airport should be developed to large jet standards. To achieve this, expenditure of an additional £120,000 to increase the length of the north south runway to 7,450 feet is recommended 67 (10) If airworthiness tests on the Boeing 707.138B reveal the need for further extension of the runway to 7,950 feet, the expenditure of a further £40,000 would be justified 68, 69 . .
- (11) The estimated cost of all the work recommended is £700,000 70

ALLEN FAIRHALL, Chairman.

Office of the Parliamentary Standing Committee on Public Works,

> Parliament House, Canberra, A.C.T.

> > 24th August, 1960.

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