THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

R E P O R T

relating to the proposed

ESTABLISHMENT OF AN AIRPORT FOR HOBART

AT LLANHERNE,

TASMANIA.

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

HOBART AIRPORT (LLANHERNE) TASMANIA.

R E P O R T.

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred for investigation and report the question of the establishment of a new airport for Hobart at Llanherne, Tasmania, has the honour to report as follows :-

S E C T I O N I.

INTRODUCTORY.

CAMBRIDGE AERODROME.

1. Access to Hobart by air has been available for a number of years by the use of Cambridge Aerodrome as the air terminal. This aerodrome is situated nine miles North-east of Hobart and consists of four unsealed gravel runways originally constructed during the period 1936-38 and reconstructed in 1941.

EXISTING FACILITIES.

2. Hangars and terminal buildings are in use at Cambridge by the Commercial airlines, and a building belonging to the Department of Civil Aviation is used by the Aero Club as hangar, club room and offices. Control is the responsibility of an officer of the Civil Aviation Department housed in the aeradio room, and operations of Aero Club craft are regulated, at times when commercial planes are in the vicinity, by visual signals from this official.

APPROACHES TO CAMBRIDGE.

3. The nature of the adjacent terrain constitutes a number of serious hazards, and considerable difficulty is experienced, especially when the wind is blowing from the West, in landing and take-off from the runways at this aerodrome. The approaches and surroundings of the runways are such that an instrument landing system, which is used for landing under poor visibility conditions and considered necessary at Hobart, could not be installed in accordance with the accepted international safety standards.

RESTRICTION ON LOADS.

4. Recent progress in aircraft manufacture has made it possible for commercial airlines to operate larger and heavier machines to cope with the increased volume of passenger and freight

traffic, but the conditions obtaining at Cambridge make it essential to apply restrictions on the loads carried by larger aircraft to ensure safe operation. The site precludes extension to the length of the runways and a better site is required to satisfy the present demand for transport by air.

S E C T I O N II.

THE PRESENT PROPOSAL.

THE LLANHERNE SITE.

5. Owing to the fact that Cambridge Aerodrome is not suitable for modern aircraft and cannot be made so, it is proposed to construct a modern airport at Llanherne, about one mile East of the existing Eastern boundary of the Cambridge Aerodrome. The site offers suitable land upon which a new airport may be constructed, completely fulfilling the strictest safety approach requirements for an "A" class establishment.

6. On the site a run of 12,000 feet is possible in the direction of the prevailing wind, and it will also be possible to develop runways in two other directions if required. A suitable area is also available on which to duplicate the main runway if the density of traffic should assume exceptional proportions in time to come. Portion of the land is low-lying, and it is proposed to use approximately 800,000 yards of sand filling as a suitable base to bring the runways to a minimum height of eight feet above normal high water.

THE FIRST STAGE.

7. The runways and taxi-ways are to be constructed of gravel with a bituminous surface, with aprons and ends for 300 feet of concrete. The scheme for the airport as developed at the present is for the construction of a First Stage comprising a runway 5,300 feet long with provision for extension to 6,500 feet to cater for larger aircraft. This runway will be on a bearing of 123 degrees magnetic, and will be 200 feet wide.

8. In addition to the runway in the First Stage a preliminary building area master scheme layout has been designed with associated aprons and taxiways. The buildings envisaged in this stage have not been designed in detail, but one structure to accommodate two or more airline operators will be approximately 150 feet long and sited

to allow for lateral expansion. Provision is also made for maintenance hangers, a compound for fuel Companies and refuelling tenders, and a reserve for the technical needs of the Department of Civil Aviation.

THE FINAL STAGE.

9. The final stage of the planning provides for extensive freight storage and handling facilities together with other buildings and roads likely to be required on the apron frontage. It also envisages the construction of a second 123 degree magnetic runway, parallel to the original one, in case it ever becomes necessary to establish duplicate landing facilities as a result of unforeseen development of passenger and freight traffic.

ESTIMATED COST.

10. The estimated cost for the first stage is set down as :-

Runway, taxi-way, apron, construction; fire fighting; water supply; sewerage; drainage, fencing, etc.	£650,000
Land acquisition, including compensation to landholders	35,000
Buildings (preliminary estimate)	75,000
	£760,000

TIME FOR COMPLETION.

11. Owing to the existing position regarding labour and construction plant it is not anticipated that full working capacity could be reached until after the completion of airport works at present in hand in Northern Tasmania. In these circumstances it is expected that, if the work at Llanherne is approved, it could be completed in 1951.

SECTION III.

THE COMMITTEE'S INVESTIGATIONS.

GENERAL.

12. The Committee studied the plans and made visits to Melbourne and Hobart for the purpose of informing itself of all the details of the proposal and the problems involved. Evidence was taken from officials of the Departments of Civil Aviation, Works and Housing, and Interior, and also from representatives of commercial airlines and others using the airport at present, as well

as from other persons interested in the proposal and able to impart information which would be likely to assist the Committee in forming its final decisions.

THE PLANS.

13. The plans referred to the Committee by the House of Representatives set out a comprehensive proposal for construction in three stages of an airport consisting of three runways in the form of a triangle. The first stage provided for the first runway on the 121 degree magnetic bearing and certain essential buildings; the second stage allowed for extension in length of the runway and construction of additional taxiways; and the final stage for the more distant future showed additional runways on the 85 degree and 170 degree magnetic bearings, with extensions and suitable additions to the building programme. Before the Committee took evidence, however, these plans were substituted by a revised set which altered the whole scheme and provided for only one runway and essential taxiways and buildings in the first stage, and a second stage comprising a duplicate parallel runway, adjacent to the first, with additional buildings and facilities. In this second stage the duplicate runway was included as a possibility for the distant future in the unlikely event of extraordinary development which is at present entirely unforeseen.

REASONS FOR THE NEW AIRPORT.

14. Details of the reasons which make it necessary to establish the airport in the area selected are :-

(a) Cambridge airport in its present condition will not meet any of the requirements prescribed for the Hobart airport.

(b) Cambridge is not suitable for the operation at maximum permissible all-up weight of DC3 aircraft, and larger machines are not permitted to use the airport.

(c) The airport will not comply with international approach standards because of adjacent hills which badly obstruct the approaches to the West and South-west, and virtually preclude the use of the 96 degree and 60 degree runways, except for light aircraft.

(d) The approach to the 173 degree runway from the North is 1 in 25 and to the South is 1 in 25.
It is not possible satisfactorily to extend this runway and the approaches are below international standards.

(e) The approach to the 144 degree runway from the North is 1 in 45 and the South is 1 in 25 to a hill 18,000 feet away. This runway could be extended to the South but has in its present state steep longitudinal grades up to 2½%. The elimination of these excessive grades would require costly reconstruction of the whole airport and diversion of the main East Coast highway, involving complete disruption of air services to Hobart probably for twelve months. The cost of this work would be of the same order as that proposed for the Llanherne runway, as an entirely new runway would need to be constructed. Even if this extension were carried out the runway would still not comply with the requirements of a standard instrument approach.

(f) The approaches and surroundings of the runways are such that an instrument landing system which is used for landing under poor visibility conditions, and considered necessary for installation in Hobart, could not be installed to satisfy international requirements on the Cambridge site. Hence, scheduled airline traffic to Cambridge airport would always be subject to frequent interruptions due to low cloud and bad visibility conditions which are common on Southern Tasmania during the Winter.

For these reasons Cambridge airport is not suitable for modern aircraft and cannot be made so, but it will remain a serviceable airfield for light aircraft.

THE SITE.

15. The site has been chosen with a view to providing land suitable for the purposes of a modern airport, and of suitable location and adequate area to allow for all possible developments for the future of the terminal airport for Hobart. The area proposed at Llanherne is approximately one mile East of the existing Eastern boundary of Cambridge Aerodrome. It consists of about 1,250 acres, of which 50% is low lying or swampy, the remainder comprising high ground and undulating sand dunes, which can be suitably levelled to form the base for the necessary construction work.

16. Although in close proximity to the present Cambridge Aerodrome it is so situated that approach to it may be made over the water in Barilla Bay or Frederick Henry Bay, and most of the dangers associated with Cambridge are avoided.

17. Its principal disadvantage appears to be its distance from the City of Hobart. Inquiries were made by the Committee to ensure that no suitable alternative site had been overlooked, though it is generally recognised that no other suitable site exists within 20 miles of Hobart, and the Committee is satisfied that the proposed area is the best obtainable in the vicinity and is suitable for the establishment of a first class modern airport.

ACQUISITION OF THE LAND.

18. It was stated that the land for the proposed airport had not yet been acquired, but negotiations were proceeding with the various owners. A good deal of the land is of low intrinsic value, but on some of the higher ground there is 300 acres of pine plantation in which the trees are stated to be in a satisfactory condition and of some marketable value. The establishment of the aerodrome, although requiring only a section of approximately one tenth of the pine planted area, will involve severance of portion of the plantation, and the company concerned is said to favour disposal of the whole plantation. As most of the bond holders are resident in England some delay is likely in settlement of their claims, and a number of difficulties are associated with the acquisition.

19. From the evidence submitted to the Committee it would appear that satisfactory negotiations can be arranged, and it is of opinion that the necessary area for the airport should be acquired and suitable arrangements made for realizing the value of the pine trees involved. The possibility of entering into an arrangement with the Company to take over the royalty value of the timber and undertake the felling should also be explored. This would be calculated also to assist the Company in the working of the severed area, not required by the Commonwealth.

STANDARD REQUIREMENTS.

20. The standards adopted for the establishment of aerodromes all over Australia comply with the recognised requirements governing the standardisation of international airports, and drawn up by the International Civil Aviation Organisation (I.C.A.O.). This body is composed of the representatives of 48 States, with headquarters in Montreal, and is part of the United Nations Organisation. The standards laid down recommend practices considered to be consistent with the minimum safety margins required for the operations of aircraft at International airports. Australia has adopted these standards for application to domestic aerodromes as well as to those destined for use by International aircraft.

21. I.C.A.O. standards are graded into classes of aerodromes intended for use by different sizes and types of aircraft. Under these standards the Hobart airport, with provision for landing Douglas DC4 type aircraft, would be classified as "D3". However, there is a possibility that the airport will be developed to a greater extent than can be foreseen at the moment, and it is considered necessary to provide clearances and standards to permit the airport to be developed eventually to an "A" class I.C.A.O. airport. Standards for an "A" class airport include minimum for widths of landing strip and runway; maximum slopes of runway; desirable clearances to buildings from centre line of runway; and clearances in the approaches for a total distance of eight miles from the geographical centre of the airport. Llanherne is so situated that, in spite of the presence of the various hills in the vicinity, their distances from the runway are sufficient to allow safe height to be attained, and a satisfactory margin of clearance observed in accordance with the recognised international standards for safe flying.

OBSTRUCTIONS.

22. Evidence from all the witnesses concerned pointed to the difficulties associated with the use of the Cambridge Aerodrome, and the Committee visited the aerodrome, as well as the site for the proposed new airport, in order to take special note of the whole area and the obstructions existing there. The nearest eminence which would appear to offer danger is Llanherne Hill, but it was stated in evidence that this hill is situated in a location relative to the runway which would obviate danger during take-off and alighting, while it was not of sufficient height to affect aircraft in the circling area. It is only 70 feet high and is 1500 feet from the proposed new runway, while it is intended to establish a control tower on top of the hill.

CLIMATIC CONDITIONS.

23. The climatic conditions, particularly the prevalence of wind, was a deciding factor in changing the plans to the scheme providing duplicate runways in only one direction. Some difference of opinion was expressed by expert witnesses concerned regarding the necessity for the provision of a diagonal runway, for use when

cross winds make landing on the 123 degree runway undesirable.

24. The Civil Aviation Department has made a detailed analysis of wind information, and it has been shown that a usability of almost 100% for Douglas DC4 type aircraft or larger is obtained; but for Douglas DC3 type the usability will fall to 97.4%. This would mean that on approximately eight days each year DC3 aircraft would not be able to use the runway at Llanherne owing to the presence of strong cross winds.

25. This period of eight days could be divided into three categories :-

(a) Short periods during which DC3 and smaller aircraft are held in the air and on the ground owing to gusty winds of high velocity. These are usually of short duration and normal aircraft movements take place upon abatement of the gusts;

(b) Periods of prolonged high wind velocities precluding flying operations for DC3 and smaller aircraft;

(c) Night time, when no flying takes place.

26. Experience gained at Kasendon, where only one runway was in operation for a considerable period, indicated that in practice the usability of a runway exceeded the theoretical usability as computed from detailed wind records. It was stated that the prevailing wind blows from the South-east down the new runway. It comes over Frederick Henry Bay, across the narrow isthmus, and up to Bridgewater.

27. As a result of a careful study of the information obtained, the Department of Civil Aviation has recommended the construction of only one runway in the first stage of the construction - that on the 123 degree magnetic bearing - and has decided against the construction of the diagonal runways at first proposed on magnetic bearings 85 degrees and 170 degrees. The Committee agrees with this conclusion and recommends that the first stage, including the 123 degree runway and suitable buildings should be constructed.

DIAGONAL RUNWAYS AND TAXIWAYS.

28. Although it was generally recognised that the conditions at Llanherne are particularly favourable, and the prevailing wind is unusually constant, considerable concern was expressed by the representative of one of the commercial airlines in connection with the periods when cross winds would make the runway unusable.

It was explained that, so far as commercial airlines were concerned, the eight days per annum on which the runway would be unusable would constitute a serious disadvantage to commercial traffic. A total of eighty landings and eighty take-offs would be involved, or in other words there would be 160 occasions each year on which aircraft must be either diverted or immobilized with consequent dislocation of the traffic and loss to the Companies.

29. It was pointed out that aircraft would be serviced at night in the Llanherne workshops, and if Cambridge Aerodrome were used on a number of occasions when cross winds made Llanherne unusable, it would not be possible to service the aircraft there. Difficulty would also be experienced with lack of necessary passenger facilities as well as of batteries, water, landing steps and other gear, kept at the normal landing area. In order to make the Llanherne site 100% efficient it would be necessary to construct a diagonal runway, but it was realised that the heavy expenditure involved would be hardly justified in such a locality. The alternative was urged that a taxi-way be constructed to connect Llanherne with Cambridge, so that, on the few occasions when it became necessary, aircraft up to DC3 size would be able to use Cambridge diagonal runway and taxi to Llanherne for servicing.

30. The Committee sought information on the cost of such a taxiway and the relative importance of providing such a facility for use on occasions when landings have to be made on the Cambridge runway. Evidence shows that taxiways are required to be stronger than runways because a greater strain is imposed on taxiways, where aircraft taxi slowly or stand still, while on the runways the landing shocks are brief owing to the high landing speeds. Experience has shown that surface failures are caused by aircraft taxi-ing slowly or standing still for long periods.

31. The cost of constructing a taxiway from Cambridge to the new airport would be approximately £40,000. Provision was considered for such a taxiway when the plans were first considered, but it was ultimately decided that it could be left in abeyance until experience with the new runway showed whether or not such a provision would be essential.

32. Evidence from a representative of the Royal Australian Air Force was to the effect that the service aircraft likely to use the new airport would be large enough to use the one runway without undue difficulty in cross winds, and a diagonal runway as an alternative was not considered necessary.

33. The Committee, after considering the points raised by the various witnesses recommends that construction of a taxiway between Llanherne and Cambridge be deferred until actual tests of operating conditions at Llanherne with one runway can be studied, but that the 60 degree runway at Cambridge be carefully maintained for use in emergency, and for possible future use if the taxiway is deemed necessary from experience of the new airport.

AIRCRAFT DEVELOPMENT.

34. The possibility of outstanding development of aircraft in the near future, with consequent demand for variation in length or strength of runways was investigated by the Committee. Evidence from all witnesses indicates that major developments requiring longer runways in the next few years are not likely in the light of the information at present available, and it was stated that there is nothing on the drawing boards of the world at the moment that will necessitate any alteration in the proposed plans for the new airport.

35. The present trend in connection with the development of commercial operations is to use Convair machines which, while being able to carry as many passengers as a DC4, require less space for landing and take off than the smaller DC3 type of aircraft at present in use.

WHEEL LOADS.

36. Considerable detail was studied in reference to the size and weight of the various aircraft in operation and likely to use the proposed new airport immediately or in the near future. It appears probable that, with the present heavy passenger traffic to Hobart in the Summer time, the airline companies will desire to use the heaviest types of commercial aircraft available, that is Douglas DC4, Convair, and possibly Constellation aircraft.

The runways and taxiways must therefore be designed to withstand continuous operation of 60,000 lb. wheel loads and occasionally 75,000 lb. wheel loads in order to accommodate heavy Constellation aircraft with an all-up weight of 102,000 lbs., giving a wheel load of 51,000 lbs.

37. Information gained from a representative of the Royal Australian Air Force indicates that none of the present service aircraft will exceed the wheel loads for which the runway is to be designed. However, some of the large American bombers are considerably heavier and would require longer runways than those planned for Llanherne in the first stage. Heavily laden B17 or B29 aircraft could not use a runway of 5,800 feet as proposed, and if such machines were to be included in those operating in this locality in future years the length of the runway, and possibly the strength of the pavement would have to be increased. The site allows for a run of 12,000 feet in the direction of the prevailing wind if required at any time, but for heavy aircraft the runway would have to be strengthened.

RUNWAY CONSTRUCTION.

38. Much of the area on which the runways, taxiways, aprons and buildings are to be constructed consists of low-lying country, being about four feet above normal high water, and the surface is a heavy black clay. A swampy area about 900 feet wide traverses the area, but at both ends of the runway site the ground is higher and the soil sandy. Based on the preliminary contour survey and field inspections, the tentative design of the airfield provides for drainage of the pavements and landing strips, and also for sufficient cover over the clay soil to carry heavy traffic.
It is estimated that it will be necessary to build the runways, taxiways and aprons at a minimum height of eight feet above normal high water level, and approximately 800,000 cubic yards of filling, obtained from the high sandy country at either end of the runway, will be required in the construction operations. The sand available on the site is considered as almost ideal for the filling required.

39. On top of the sand fill gravel pavements ten inches thick for runways and twelve inches thick for taxiways will be necessary. The ends of the runways and the aprons are designed to be of concrete owing to its better resistance to petrol, kerosene and oil and to its minimum maintenance requirements.

Materials and Labour.

40. In addition to the 300,000 cubic yards of sand filling which will be moved from some parts of the site to level the lower areas as required, it will be necessary to provide approximately 24,000 cubic yards of crushed stone and 12,000 cubic yards of sand for the concrete pavements. Suitable sand deposits have been located, and it is anticipated that the requirements of crushed stone can be met by local suppliers. It is contemplated that the majority of the work will be carried out by day labour which will be available as construction of other aerodromes in Tasmania approach completion. The Department of Works and Housing is at present engaged in the construction by day labour of a runway at Western Junction and two runways at Wynyard, both of which projects are nearing completion. It is also commencing construction of an airport at Devonport, and with the release of labour from these works it is considered that the clearing and the commencement of the earthworks at Llanherne will be possible before next Winter.

Machinery.

41. It was stated in evidence that the amount of plant owned by the Department in Tasmania will permit the commencement of earthworks at Llanherne by about February, 1949, subject to the land being acquired by that date. The machinery at Western Junction will be taken to Hobart, and, if necessary, a certain amount of dirt-moving plant may be brought from Victoria if it is found that the total available is not quite sufficient to cope with all the Tasmanian commitments.

Runway Paving.

42. The proposal referred to the Committee provides for a gravel runway sealed with bitumen but with concrete ends. The decision to construct the runway with bitumen surface instead of concrete was made because it is more resilient and flexible, and the cost is very much less. It was also represented that

unevenness in the gravel runway can be more simply remedied than is the case with subsidences in the concrete slabs.

43. Evidence taken by the Committee recorded varying points of view in regard to the best surface for paving the runways. Some witnesses with very considerable experience in Australia and overseas favoured concrete runways, while others were satisfied that bitumen provided a surface which was equally suitable for landing and take-off.

44. The main disadvantage experienced with bitumen appears to be tendency for the seal coat to screw off at the ends of the runways where the larger aircraft apply the brakes heavily to one wheel in turning. This disability is being overcome by the provision of concrete ends to the runways. The Committee is satisfied that the saving in expense by the use of bitumen paving is desirable, and recommends that a bitumen surfaced runway with concrete ends and aprons should be constructed.

Length of Runways.

45. Much information was obtained in regard to the necessity for runways of sufficient length to ensure safe conditions in operations of all kinds. The proposal submitted is for a runway of 5,800 feet on the 123 degree magnetic bearing, and this length is sufficient to allow for the criterion run of the largest aircraft likely to use the airport. It was explained that the criterion run is the distance in which an aircraft, when taking off, attains the critical speed, and if engine failure occurs, can be settled down on the runway again and stopped. This is the standard adopted by the Civil Aviation Department in runways for commercial use. The Royal Australian Air Force adopts a somewhat different basis for determining the necessary length of runway, but it is satisfied that the length proposed will be sufficient for all the service aircraft requiring to use the airport. The only additional requirement regarded as essential for service operations is an overshoot area of 500 yards for an aircraft that might not attain the critical speed.

46. The detailed information presented to the Committee showed that the proposed runway of 5,800 feet would be sufficient to accommodate the Constellation type of aircraft, the largest commercial machine likely to operate in this locality, and this length of runway will therefore be sufficient for all normal operations in the area. However, the Committee made further inquiries concerning the possibility of using the airport in the future for emergency searches towards the Antarctic and for defence purposes, and evidence shows that machines of the Superfortress type, when heavily laden would require a much longer runway. It was also suggested that an air service between Tasmania and New Zealand might be demanded in the near future. The distance to the South Island of New Zealand is much shorter from Tasmania than from the mainland, and an application has already been lodged by one airline company for a permit to operate such a service.

47. When all these factors are considered it appears desirable to construct the first stage of the runway of sufficient strength to allow of its use when extended to carry the heavier types of aircraft. The Committee therefore recommends that the filling and strength of the paving be designed with the object of allowing for major extensions in the future and to carry the necessary wheel loads. It is also recommended that in the first stage the overshoot area desired by the Royal Australian Air Force should be cleared of any obstructions in case of use by service aircraft.

Stages of Construction.

48. The first stage of the construction is to include the preliminary earthworks and filling to the required level; the construction of the 123 degree runway base; paving the runway with bitumen and construction of concrete ends; aprons and taxiways to provide for movement of aircraft from runways to appropriate buildings; and erection of buildings required to cope with the passenger and freight traffic involved.

49. The second stage is planned for the distant future, when considerable increase in traffic will demand extensions to the buildings, additional taxiways, and possibly an additional 123 degree runway parallel to the first one. Although the present

indications do not point to the necessity for such a second runway it has been deemed a wise precaution to select a site and develop a major plan which will allow of expansion to meet all possible demands in the future.

THE BUILDING PROGRAMME.

50. It was stated in evidence that, up to the present, the airline operators have provided their own buildings and facilities at airports throughout Australia, and the airline companies favour the procedure by which the Department makes areas of land available to the companies, and exercises a certain degree of control of the type of buildings to be erected.

51. So far as the present reference to the Committee is concerned the building programme envisaged provides only for the general principles and layout of the airport so that the placing of buildings will conform to the standards of safety in relation to the movement of aircraft as laid down by international civil aviation requirements. The two major factors upon which the plan has been based are, firstly the necessity to plan for the possible incorporation of the future parallel runway, and, secondly the visibility of the entire apron movement area for aircraft from a control point situated between the two runways.

52. As yet it has not been possible to give detailed consideration to accommodation requirements of individual buildings for either stage of the building programme, but an amount of £75,000 has been estimated as necessary to cover building requirements of the initial stage of the project. This figure is merely approximate as no detail drawings have yet been made.

53. Space has been allowed for the equivalent of passenger terminals, each operator having its own terminal building. The spacing of the operators' terminal buildings would be dependent upon the density of traffic and the size of the aircraft under their control.

54. It is proposed to build in permanent form only the exterior walls, columns and floors of the buildings, leaving the internal walls capable of being removed to facilitate any modifications that may be required. By this means it is hoped to achieve a measure of flexibility, and, at the same time to save

materials needed for housing. Preparation of the drawings is being delayed until it is possible to decide upon the permanent form of the structures, and until labour and materials are more readily available. Consideration is also being given to the adoption of a uniform colour scheme for all airport buildings.

55. The Committee is satisfied that the master plan for the airport buildings as shown on the plans will provide satisfactorily for future development of the proposal, but it is recommended that any major buildings of extensive proportions and considerable cost should be referred to the Committee when plans have been developed to the appropriate stage.

56. As construction of the new airport is to be expedited, and its facilities should be available within a reasonable time, it is considered that any major expenditure on new buildings at Cambridge in the meantime should be avoided. If certain temporary accommodation is essential it might be possible to provide it by enclosing the verandah.

TRAFFIC DEVELOPMENT.

57. The Committee was interested to learn of the phenomenal development of aerial traffic, particularly in the freight section, and evidence showed that the planning for large building areas, to provide for rapid extension of traffic requirements in the future, was amply justified. It was stated that, so far as passengers were concerned, the increase was likely to be steady but sure. At present one seventh of the Australian population travels by air every year, and there seems no reason why it should not increase in the future.

58. The possibilities of transport of freight by air have not yet been fully explored, but the view was expressed that freight traffic will increase to astronomical figures. In the last few months development of freight handling has been staggering, and one witness informed the Committee that two years ago his company carried 7,000,000 lbs. of freight per annum, while at the present time freight is being carried at the rate of 40,000,000 lbs. per annum. The DC3 freighters carry approximately four tons, but the freight carried is often limited by capacity rather than by

weight, and a very steep increase in freight business is expected in the future. At present passenger carrying is the more profitable, but, as the freight business grows mechanical handling equipment will be installed and the expense of handling will be cut down.

CONTROL OF TRAFFIC.

59. Direction of the traffic at present is made from the control room in the aeradio building adjacent to the runways at Cambridge Aerodrome. Radio communication with the larger types of machines assists in making the operations at Cambridge reasonably safe, but concern was expressed on behalf of private fliers at the risks entailed in the use of the visual control operating at this airport now.

60. It was stated in evidence that, under the present control system at Cambridge, the control officer on duty has to dash out through the door of the aeradio building and observe from ground level any aircraft approaching to land or taking off. The opinion was also expressed that the lamps in use for visual signalling are not nearly strong enough, and the yellow wind sleeve, used to warn Aero Club members of the approach or take-off of aircraft, is difficult to see.

61. The Committee recommends that immediate steps should be taken to ensure safe flying at the aerodrome, and, until the new airport is established, some form of control tower should be provided in a position affording efficient visual control of aircraft operations.

Llanherne Control Tower.

62. The proximity of Cambridge to the new Llanherne site was envisaged as a possible source of danger on occasions when Aero Club operations were taking place at Cambridge simultaneously with the arrival or departure of commercial aircraft at Llanherne. Evidence on this point was obtained from several witnesses amongst whom there was some divergence of opinion.

63. Evidence was tendered indicating that a control tower was to be erected on Llanherne Hill, the eminence being situated near the site of the proposed new airport buildings, and between

the new airport and Cambridge. The presence of a control tower on this point of vantage was generally regarded with satisfaction. However, it was stated that small private aircraft operating from Cambridge were frequently affected by topographical turbulence, and, in approaching from the North might slip in unseen. It was therefore suggested that the operations at Cambridge aerodrome should be controlled by a separate control officer in that locality.

64. The Committee is of opinion that it is essential for safety that the control officer in the tower on Llanherne Hill should regulate the traffic on both airfields, but it is also considered necessary to maintain local control of the private flying activities by an officer at Cambridge who would be under general direction from the Llanherne tower.

FLYING BOAT BASE.

65. As the site of the proposed new airport is on the narrow isthmus between Barilla Bay and Frederick Henry Bay it appeared to be an ideal position for the establishment of a flying boat base, and the Committee made inquiries regarding such a possibility. It was stated that no considerable attention had been given to the necessity for establishing a flying boat base in this locality because, so far as commercial flying is concerned, the future of flying boats is regarded as very uncertain. They are to be taken off the England-Australia service from 1st January next and replaced by Constellations. However, Hobart is said to be particularly suitable for flying boats, and a base could be established at Barilla Bay with facilities for use by commercial or service flying boats if developments made them necessary.

WATER SUPPLY.

66. Some concern was felt at the absence of a water supply at Cambridge at the present time, and the Committee investigated the possibility of providing a constant supply when the new airport is established. Up to the present stage only very preliminary investigations have been made on the subject of water supply for the airport. It was stated that several alternatives presented themselves for future development and all would have to be fully studied.

67. A small catchment area could probably be constructed in the hills to the South-west of the airport, with a small storage reservoir on the flat area near the aerodrome, providing water suitable for fire fighting and sewerage. The alternatives for the supply of drinking water are to conserve water from the roofs of the Hangars or to lay a small main to the airport from Bellerive. There is a scheme to provide towns to the East of the River Derwent with an improved water supply, and it might be possible to connect the airport to that supply with a 1½ inch or 2 inch main. Berrell also has a water supply, but it is not considered satisfactory for extension to the airport.

68. It appears to the Committee that the most satisfactory system would be to connect the airport with the supply at Bellerive and it recommends that the necessary investigations should be made at an early stage to ensure that, in the interests of safety as well as comfort, the airport is not established without a permanent and satisfactory water supply.

ESTIMATED COST.

69. Of the total estimated cost of £760,000 for the first stage, the major portion relates to the construction of the runways and associated facilities, together with the preliminary earthworks necessary to bring the area to the required levels. The estimate for this part of the proposal is £650,000 and details of the works involved were presented under fifteen headings, showing the amount calculated for each section of the construction. The evidence indicates that the estimates have been carefully prepared from data obtained in experience of similar works in course of construction, and the figures presented should be reliable.

70. The remainder of the total estimated expenditure consists of £35,000 estimated for land acquisition and £75,000 for buildings. Both these amounts are provided without any very reliable basis for calculation and are included as an indication of what may be required for these items. The Committee therefore recommends that revision of these amounts be made at a later date with the object of determining the reasonable cost of the project when details are available upon which to base the costs.

SECTION XV.

SUMMARY OF CONCLUSIONS.

71. The following is a summary of the conclusions reached by the Committee after consideration of the information gained by study of the plans and evidence, and the inspection of the site :-

		Paragraph in Report.
1.	The Llanherne site is the most suitable for the airport.	17
2.	The land necessary for the airport should be acquired and suitable arrangements made for realising the value of the pine trees involved.	19
3.	The first stage, including the 123 degree runway and suitable building should be proceeded with.	27
4.	As building plans have not been developed, any extensive buildings should be referred to the Committee at a later date.	55
5.	It is not advisable to erect any further new buildings at Cambridge but if temporary accommodation is required it could be provided by enclosing the verandah.	56
6.	A bitumen surfaced runway with concrete ends and aprons is advisable.	44
7.	The construction of a taxiway from Llanherne to Cambridge should be deferred till actual tests of operating conditions with one runway are studied, but the 60 degree runway at Cambridge should be well maintained for emergency use.	33
8.	Special provision should be made to ensure that the runway will be constructed with a view to its future extension and use by heavy air force machines.	47
9.	In the interests of safety the control officer on Llanherne Hill should regulate the traffic on both airfields but an officer under the general direction of the control officer at the Llanherne tower should direct local movements at Cambridge.	64
10.	Pending erection of the control tower at the new airport some steps should be taken to improve the conditions under which the control officer at Cambridge directs the movements of civil and private aircraft.	61
11.	Early action should be taken to ensure an adequate water supply by the time the airport is established.	68

	Paragraph in Report.
12. Estimate should be reviewed when details of buildings are available.	70
13. In the first stage an overwheet area should be cleared.	47

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10th November, 1948.