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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REPORT

relating to the proposed provision of

ADDITIONAL APRONS, VEHICULAR PAVEMENTS, ENGINEERING SERVICES, ROADS AND INSTRUMENT LANDING SYSTEM

at

MELBOURNE (TULLAMARINE) AIRPORT, VICTORIA

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

PROVISION OF ADDITIONAL APRONS, VEHICULAR PAVEMENTS, ENGINEERING SERVICES, ROADS AND INSTRUMENT LANDING SYSTEM AT MELBOURNE (TULLAMARINE) AIRPORT

REPORT

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

(a) provision of additional aprons, vehicular pavements, electricity, sewerage, water supply, roads and instrument landing system.

(b) provision of buildings and services to the terminal complex, control and equipment building, Department of Civil Aviation maintenance area, fire station, etc.

The Committee have the honour to report as follows in respect of the provision of additional aprons, vehicular pavements, electricity, sewerage, water supply, roads and instrument landing system.

STAGING OF DEVELOPMENT OF AIRPORT AT TULLAMARINE

1. In a report tabled in the House of Representatives on 27th August, 1963 the Public Works Committee recorded their views on the proposed construction of airfield pavements at Tullamarine. The scope of that report included the unsuitability of Essendon Airport for further development as the principal airport for Melbourne, the choice of Tullamarine as the site for the new airport and the design and construction of the primary runways and taxiways at Tullamarine as the first stage of development.

2. The two remaining phases of the development required at Tullamarine before it can operate as an airport comprise the works recently referred to the Committee. The present reference, which is the second phase, relates to the following work:-

(a) Aprons and taxiway pavements not included in the first reference.

(b) Instrument Landing System

(c) Roads and Fencing

(d) Engineering Services

- Electricity Supply
- Water Supply
- Sewerage

3. A report expected to be tabled shortly will relate to the work involved in the construction of the terminal complex, the control and equipment building, Department of Civil Aviation maintenance area and fire station.

4. Freight Handling Facilities There was frequent reference in the evidence taken by the Committee to the provision at Tullamarine of facilities for handling freight in facilities separated from the terminal building. The Committee noted that discussions are now taking place between the airline operators and the Department of Civil Aviation on this matter and that a freight terminal building could be the subject of a future reference to the Committee.

COMMITTEE'S INVESTIGATION

5. The Committee received submissions and drawings of the present proposals from the Departments of Civil Aviation and Works. A study model of the proposals was examined. We inspected the work currently being undertaken on the runway and taxiway pavements and the sites of the various works in the current reference. Witnesses who gave evidence to the Committee included representatives of the Departments of Civil Aviation and Works, airline companies and the City Development Association Ltd. of Melbourne. Evidence was taken in Canberra, Sydney and Melbourne.

LAYOUT OF TERMINAL AND OTHER MAJOR AREAS

6. The terminal complex of buildings and the airline maintenance areas at Tullamarine are to be located south-east of the primary runway and taxiway system and west of the Lancefield Road diversion. Vehicular access to the airport will be from the Lancefield Road diversion or from Sharps Road in the south in the case of the airline maintenance area.

7. The site of the terminal building was chosen with the aim of serving the primary runway system to the best advantage. The apron area adjacent to the terminal has been planned for 76 aircraft positions and more can be developed when needed. An area of about 200 acres behind the building line can accommodate cargo and freight handling facilities, ancillary buildings for the airline operators and hotel or motel accommodation, as well as the roads and car parks required for the terminal and associated activities. This area compares with the terminal area of 110 acres at Los Angeles and 100 acres at London, which are proving restrictive in present day conditions. Recently developed airports at New York (Kennedy), Washington (Dulles) and Rome provide 270, 240 and 200 acres respectively. In this light the provision at Tullamarine is considered by the Committee to be most satisfactory for present and future requirements.

8. South of the terminal building and connected to it by a taxiway approximately 7,000 feet long, a large area has been reserved for use by airline companies as aircraft maintenance bases. It is expected that the two domestic airline operators will each have an ultimate space requirement for aircraft maintenance purposes of 100 acres. Half of this area will be made available to each in the first instance and the remaining area will be held on short term agricultural lease so that it can be allotted as required. The area also includes about 55 acres for the maintenance bases of international and other operators who might require these facilities at Tullamarine.

9. The area at the airport to be used by the Department of Civil Aviation is located on the western boundary adjacent to McNabbs Road. It will contain the control tower, the operations centre and the workshops and stores associated with the maintenance of the airport and its various facilities. The control tower in this site will be ideally placed to command visually all runways and approaches and the visibility of the control staff will not be affected by the setting sun.

10. East of the terminal buildings an area of 12 acres is to be allocated to the oil companies for bulk storage purposes. The present reference includes the provision of engineering services to the boundary of this area.

11. The Committee are agreed that the proposed layout of the terminal, airline maintenance, Department of Civil Aviation and oil companies' areas is satisfactory and believe that the space provided is adequate for present and future needs.

PASSENGER AND AIRCRAFT TRAFFIC

12. Fundamental elements in the planning of airport, passenger, airline and maintenance facilities are passenger and aircraft movements. The following table lists the passenger movements in and out of the Essendon terminal between 1952 and 1964, and the predictions for Tullamarine for 1970 and 1980.

Year	Total	International	Domestic
1952	737,120	4,120	733,000
1953	741,150	4,150	737,000
1954	775,200	4,200	771,000
1955	834,400	4,400	830,000
1956	874,550	4,550	870,000
1957	922,841	4,523	918,318
1958	907,456	13,609	893,847
1959	1,068,576	22,621	1,045,955
1960	1,193,519	22,911	1,170,608
1961	1,168,365	22,661	1,145,704
1962	1,196,911	23,045	1,173,866
1963	1,306,268	28,831	1,277,437
1964	1,534,436	37,929	1,496,507
1970 (Forecast)	2,270,000	370,000	1,900,000
1980 (Forecast)	3,650,000	850,000	2,800,000

13. These figures show the sharp increases in traffic, particularly in the international sphere, since 1962 and the forecasts recognise that when the new airport at Tullamarine is opened to large jet aircraft it will attract some portion of the international traffic now terminating in or passing through Sydney.

14. Passenger traffic forecasts made in 1962 and on which planning of the aprons in the previous reference was developed, were based on an assumption that the rate of expansion of international air traffic up to that time of 17.5% per annum was tending to level off. This did not prove to be the case as the increases in 1963 and 1964 were 21.5% and 23.5% respectively.

15. Need for Additional Aprons and Vehicular Pavements

Included in the proposals on the airfield pavement reference considered by the Committee in 1963, was 240,000 square yards of apron and taxiway pavement. This area was based on the provision of 24 aircraft positions at the terminal building comprising 18 domestic and four international positions, and two positions which might be used by either category. These figures have now been re-assessed in the light of recent experience and the present intention is to provide, at the outset, 32 aircraft positions, including 20 domestic, eight international and four standby positions.

16. With an increase in the provision of aircraft positions, the total area of apron and taxiway pavement has risen to 307,000 square yards. Of this area 262,000 square yards of pavement is of a strength required for aircraft operation. The remaining 45,000 square yards is of lighter construction designed to carry the surface vehicles which service aircraft on the apron.

HANDLING OF AIRCRAFT ON THE APRON

17. A basic consideration in the design of an airport terminal building is the apron and the method of handling aircraft on it. Before deciding how aircraft would be handled at Tullamarine, representatives of the Department of Civil Aviation and Qantas Empire Airways studied the methods of loading, unloading and moving aircraft at overseas airports. Based on these studies and the experience of Qantas as a major international operator, it was decided that the most efficient and economical way to handle large jet aircraft in Melbourne would be to follow a method successfully employed at New York and San Francisco.

This makes use of loading concourses or fingers which extend across the apron from the terminal building and which have holding rooms at about the same level as the aircraft being handled. Aircraft approach the terminal under their own power, following guide lines on the pavement to bring the nose of the aircraft to within 25 feet of the loading concourses. The front door of the aircraft is simultaneously brought to a point about six feet from the side of the holding room. When the aircraft is at rest and the engines stopped, a small covered walkway is extended to the door of the aircraft from the concourse so that passengers can walk directly from the aircraft into the holding room before passing through the concourse to the terminal building. The reverse takes place for departing passengers. Passengers are thus protected from the weather at all times.

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

19. Initially this arrangement is to be used at four of the aircraft positions at the international section of the terminal at Tullamarine and at two of the positions to be used by each of the domestic operators. All operators wish, for the time being, to preserve the possibility of moving some of their aircraft from the terminal completely under their own power in the departure phase. The use of the covered loading method at all positions would present some problems, particularly to the domestic operators due to the considerable variations in the heights of the doors of their aircraft and to the shape of these aircraft. The dimensions and shape of the Fokker Friendship and the Viscount, for example, will not permit them to be brought close enough to the side of the holding room to allow the walkway to be fitted. The apron at Tullamarine is therefore being designed, except for two aircraft positions in each case, to permit the domestic airlines to operate their aircraft as they do at the present time. The covered loading system can, however, be installed at the remaining positions when new types of aircraft suited to the system are operating.

20. The proposal considered by the Committee provides apron for eight international and 20 domestic aircraft and four standby positions, a total of 32. The layout of the apron is planned to ultimately provide 16 positions for international aircraft and 30 positions for each of the two domestic operators and for other users, a total of 76 positions. Additional positions can be provided if needed. Under cover loading at all 76 positions will be possible.

ADDITIONAL APRONS AND TAXIWAY PAVEMENTS

21. The previous reference to the Committee included 240,000 square yards of 16" thick concrete aircraft pavements for the apron, connecting taxiways and the taxiway to the airline maintenance area. The Committee recommended construction of these pavements although the detailed layout had not been determined, so that this work could be included in the contract for the airfield works.

22. The total areas of the various thicknesses of concrete pavement now proposed, are:

16 inch thick pavement		160,000 square yards
14 inch thick pavement		102,000 square yards
8 inch thick pavement		45,000 square yards
	Total	307,000

All pavements are to be constructed on an 18" base course.

23. The 16 inch pavement is designed for supersonic aircraft and is to be provided on the portion of the apron carrying international aircraft, as well as on the connecting taxiways and the taxiway to the airline maintenance area. The design load is the same as for the aircraft pavements in the previous reference.

24. The 14 inch pavement is proposed for those portions of the apron to be used by the domestic operators. It is designed to carry aircraft such as the Boeing 727 and the types of aircraft now generally used on international services.

25. The 8" concrete pavement is to be provided between the aircraft pavements and the limits of the aprons. It is designed for use by aircraft servicing vehicles and aircraft tugs.

26. The pavements not previously considered by the Committee comprise 22,000 square yards of aircraft pavements and the 45,000 square yards of vehicle pavements already mentioned.

27. The Committee endorses the proposed layout of the aprons, taxiways and vehicular pavements and recommends the construction of the additional aprons and pavements included in this reference.

INSTRUMENT LANDING SYSTEM

28. An instrument landing system (I.L.S.) is a navigational system to assist landing aircraft not only in conditions of low visibility but also, in the case of large high speed aircraft, in conditions of full visibility. The system is of four parts - the localiser, the glide path equipment, the markers and the locators.

29. The localiser directs a radio beam along the centre line of the runway indicating to the pilot the path along which he should fly to touch down on the runway. It indicates whether the aircraft is left or right of this path and enables the pilot to correctly position the aircraft for landing. The localiser is usually 1,000 to 2,000 feet beyond the end of the runway furthest from the approaching aircraft. At Tullamarine they are planned to be 3,500 feet from the runway ends to allow for the future extension of the runways without affecting the localisers.

30. The glide path equipment provides a radio beam on the glide path down which the aircraft should fly to touch down at the ideal place on the runway. It is at a pre-set angle from the horizontal and leads the aircraft over the threshold of the runway at a height of 50 feet to a touch down point 1,000 feet along the runway. The pilot knows where the aircraft is in relation to the correct glide path so that he can take action to position the aircraft for a good landing. The equipment is located clear of the runway adjacent to the touch down point.

31. The localiser and glide path equipment thus give the pilot a path in the air space along which and down which he should fly to land at the ideal point on the runway.

32. The markers are vertical radio beams accurately placed on the extension of the centre line of the runway at points 3,500 feet and 3.9 miles from the threshold. The pilot flying over them knows exactly the distance to the end of the runway. He also knows the ideal height above the runway theshold at these points and can thus check positively on his position.

33. The locators are radio beams to guide the pilot to the I.L.S. approach path and provide a check on the approach. One locator is usually placed with the marker 3,500 feet from the theshold of the runway and the other at a point six to ten miles from the end of the runway, depending on local circumstances. Both are on the extended runway centre line.

34. The I.L.S. now widely used in Australia and overseas can permit an aircraft to operate safely in conditions down to a cloud ceiling of 200 feet and a visibility of half a mile. However, in some circumstances, such as where the terrain adjacent to the aircraft is unfavourable, higher figures for cloud ceiling and visibility are adopted.

35. The Committee were told that as a result of recent international conferences, it is now intended at major international airports to operate in low visibilities, firstly in conditions with cloud at a ceiling of 100 feet and visibility at quarter of a mile, and later in some circumstances to landings in "zero-zero" conditions. There is also a move to provide better I.L.S. guidance for large high speed aircraft and to reduce the pilot work-load by increasing reliance on automatic systems.

36. It was noted that for an instrument landing the radio guidance must be most accurate and reliable. This accuracy is achieved not only by the quality of the equipment itself but by the quality of the ground areas adjacent to the installations, since the radio beams are reflected off the ground surfaces. In the case of the glide path equipment, for example, a level or almost level area of ground about 800 feet wide and extending for 2,500 to 3,000 feet from the installation in the direction of the approaching aircraft is required.

37. In the case of Tullamarine the plan is to instal an instrument landing system on each of the two runways to allow for landings towards the south and the west. The work involved in this section of the present reference includes -

(a) grading to remove irregularities of the existing surface on the 67 acres of each localiser area. Neither area requires any significant quantity of earth works.

(b) the preparation of large flat grassed areas of 70 acres at the north end of the north-south runway and 50 acres at the east end of the east-west runway for the operation of the glide path equipment. The areas are to be graded to a plane surface with a slope in both the transverse and longitudinal directions not exceeding one per cent. Substantial earthworks are required in each area comprising 130,000 cubic yards of cut and fill on the north-south runway and 170,000 cubic yards of fill on the east-west runway.

(c) a mechanically ventilated building to house electronic equipment at each of the localiser, glide path equipment, marker and locator installations. Each building is to be 100 to 200 square feet in area and except for the middle marker buildings (with which will be associated the approach lighting power houses) which will be in brick, they will be of timber frame construction with a metal external covering. Evaporative cooling units and manual fire extinguishers will be fitted. Artificial lighting will be by fluorescent fittings. General purpose outlets will be provided for portable equipment and fixed equipment will be wired directly. Fire protection will be provided by means of smoke detectors in equipment rooms and thermal detectors elsewhere. Alarm circuits will be connected to the airport fire station by underground cables.

(d) access roads for maintenance vehicles from the perimeter road to each of the buildings in the airport area. Buildings outside the airport will be serviced by access roads from the nearest public roads.

38. The Committee recommends that the earthworks, building construction and roadworks required for the instrument landing system be carried out.

ROADS AND FENCING

39. The road linking the Department of Civil Aviation operations and maintenance area to the airline maintenance area will provide access also to the terminal area and to the public roads south and east of the airport. This link road will form part of the airport perimeter road required for the movement of vehicles and plant used in the maintenance of the airport's facilities. It will be a two lane pavement 24 feet wide.

40. Elsewhere the pavement of the perimeter road will be 12 feet wide. The total length of the perimeter road is 8½ miles, including 2½ miles of 24 ft. pavement. The road will not be sealed initially but the pavement thickness will permit this to be done at minimum cost at a later date if required.

41. An access road between Sharps road south of the airport and the terminal buildings and passing through the airlines maintenance area and service roads in the latter area are also proposed. They are 3½ miles in length and are to be bitumen sealed 24 ft. wide pavements with four feet wide shoulders in the case of the access roads and with kerb and channel in built up areas.

42. A perimeter fence approximately 9½ miles in length will enclose the whole of the operational area of the airport to prevent the entry of stock and unauthorised persons. It will be a manproof chain wire fence eight feet high with gates at appropriate points for use by maintenance vehicles.

43. The provision of roads and fencing included in this reference is recommended.

OTHER ENGINEERING SERVICES

44. As a basis for the design of engineering services to the various areas at the airport, the following estimates of the working population in each area in the years 1980 and 2000, have been used -

	1980	2000
Terminal Area	3,000	6,600
Airline Maintenance Area	4,000	7,000
An Industrial Area to be developed adjacent to the Airline Maintenance Area	7,500	15,000
D.C.A. Operations and Maintenance Area	300	500

45. These figures compare with 1500 now working in the terminal area and 2,400 in the airline maintenance area at Essendon.

46. Electricity Supply The electricity supply in this reference includes service mains to the terminal building area and reticulation throughout that area (except for street and car parking lighting), the main supply to the oil companies' area and to the Department of Civil Aviation operations and maintenance area and the flood lighting and supply to the aprons.

47. The supply for the airport will be taken at high voltage from the State Electricity Commission at a bulk metering supply point on the eastern boundary of the airport. From here a 22,000 volt feeder will run to a high voltage switchboard in the services building near the terminal building, thence to 15 stepdown sub-stations at various points in the airport. The Commission will augment the high voltage system in the locality to meet the airport load and has been asked to arrange separate routes for supply mains, preferably with separate feeds from two different directions.

48. The existing electricity supply to the operations building and the terminal radar building on the western side of the airport will be terminated when the permanent supply is available. These, and the buildings which are to be built west of the north-south runway, will be fed by a high voltage line from the services building. Initially the high voltage feeders will radiate from the services building but the high voltage switch gear installation in the sub-stations will permit feeders to be joined later to form a ring main.

49. Emergency generating plant to be installed in the services building will be connected to the high voltage switch board to provide stand-by power to essential loads in the terminal area. In the event of normal supply failure, unessential loads will be disconnected.

50. The outer markers and the outer locators associated with the I.L.S. systems will receive power from the State Electricity Commission as individual consumers.

51. Underground reticulation for both high and low voltage is proposed adjacent to major buildings and in areas where required for operating clearances for aircraft or radio operation. In other areas, overhead lines are proposed.

52. Aircraft aprons will be illuminated by flood lights mounted on tubular steel pylons located along the building front and the loading concourse. Power outlets will be provided on the apron adjacent to aircraft parking positions.

53. Water Supply The previous reference investigated by the Committee included reticulation of the main water supply to a ground storage tank in the terminal area. The present reference includes the extension of the supply to various areas in the airport.

54. Since the Melbourne & Metropolitan Board of Works has been unable to guarantee complete continuity of supply, a 100,000 gallon elevated storage tank is to be constructed about 100 feet above the ground level tank. The height of the tank will ensure adequate pressure for distribution, at the same time complying with the restrictions imposed by flying safety requirements.

55. The combined capacity of the ground and elevated storages of 200,000 gallons will balance the fluctuating rate of water consumption and provide a 24 hour supply should there be an interruption to the external supply. There is space adjacent to the proposed storage tanks for additional storages when required.

56. Reticulation mains will be laid from the elevated storage to buildings in the terminal complex, the airline maintenance area, the oil companies' area, the operations buildings and the departmental maintenance

area on the western side of the airport. The present temporary supply to the operations building is to be discontinued. A stand-by supply for this area will be provided by an existing ground level storage.

57. Pumps will be provided to raise water from the ground level storage to the elevated storage when the pressure in the supply main is insufficient or when the supply is interrupted and for providing the quantity and pressure of water required for fire fighting. The pumps will be located in the structure formed by the elevated and ground level tanks.

58. Sewerage Generally the airport will be served by a gravity flow extension from the Melbourne & Metropolitan Board of Works system. A main to be constructed from the existing service about two miles south of the airport boundary will be laid through the airline maintenance area to the terminal area.

59. Sewage from the oil companies' area cannot gravitate to the main system and it will therefore be necessary to pump it to the main near the terminal area. The departmental building complex on the western side of the airport will not be connected to the sewerage system as it is not economic to extend the main to include this area. Provision will be made for treatment of sewage from these buildings in the septic system now serving the operations building.

60. The proposed sewerage system is designed to meet the needs of the airport population expected in the year 2000.

61. The Committee recommends the provision of the engineering services proposed in this reference.

CONSTRUCTION PROGRAMME

62. The completion of the various works included in the reference is part of the overall programme for the whole Tullamarine complex. The construction period of the various parts is:-

1.	Aprons and taxiway pavement	12 months
2.	Earthworks for I.L.S.	18 months
3.	Roads	
	- Sharps Road to the airline maintenance area	12 months
	- Service roads in the airline maintenance area	12 months
	- Link road to the Department of Civil Aviation area	12 months
	- Access road from the airline maintenance area to the terminal area	15 months
4.	Electricity Supply	21 months
5.	Water Supply	18 months
6.	Sewerage	24 months
7.	Vehicular pavements adjacent to the terminal building	To be completed concurrently with the terminal building.

63. It was noted that negotiations are to be entered into with the contractor for the runway work to carry out some of the work in this reference as an extension of the original contract.

ESTIMATES OF COST

64. The estimated cost of the proposals referred to the Committee is £1,977,000 made up as follows:

Additional Apron and Vehicular Pavements (including earthworks, drainage and ducts)	£368,000
Perimeter Road and Fencing	£198,000
Instrument Landing System	£365,000
Roads and Engineering Services to Airline Maintenance Area	£328,000
External Engineering Services to Terminal and other Buildings:	
(a) Electrical work	£164,000
(b) Water supply	£194,000
(c) Sewerage	£360,000

65. These figures have been based on estimates calculated in 1964. The Committee were told that due to increases in building and engineering works since that time the cost of the proposed work is now expected to be about £2,150,000 or an increase of ten per cent over the 1964 estimates.

COMPLETION OF FACILITIES

66. Some significant points relating to the present work on the primary runway and taxiway system and the operation of Tullamarine as Melbourne's airport, were made in the evidence taken by the Committee. Although the Committee recommended in its report on the runways that the construction be phased so that the airport would be ready for use by the end of 1966, it is now quite clear that this hope will not be realised. The work on the runways, even if completed at that time - and this seems doubtful - will not be matched by the provision of the other facilities essential to the operation of an airport. It was also submitted to the Committee that at least one of the domestic airline operators expects conditions at the Essendon terminal to become "severe" before the Tullamarine facilities become fully operational.

67. The Committee therefore strongly urges that every step be taken to hasten the completion of the terminal and other functional buildings and facilities.

68. The Committee noted that the runways at Tullamarine will not be completely idle between their completion in 1967 and the completion of the other facilities as it is likely that they will be made available to the airline operators for training purposes.

RECOMMENDATIONS AND CONCLUSIONS

69. The summary of recommendations and conclusions is set out below. Alongside each is shown the paragraph in the report to which it refers. Recommendations appear in bold type.

	Paragraph
1. THE COMMITTEE ARE AGREED THAT THE PROPOSED LAYOUT OF THE TERMINAL, AIRLINE MAINTENANCE, DEPARTMENT OF CIVIL AVIATION AND OIL COMPANIES' AREAS IS SATISFACTORY AND BELIEVE THAT THE SPACE PROVIDED IS ADEQUATE FOR PRESENT AND FUTURE NEEDS.	11
2. THE COMMITTEE ENDORSES THE PROPOSED LAYOUT OF APRONS, TAXIWAYS AND VEHICULAR PAVEMENTS AND RECOMMENDS THE CONSTRUCTION OF ADDITIONAL APRONS AND PAVEMENTS INCLUDED IN THIS REFERENCE.	27
3. THE COMMITTEE RECOMMENDS THAT THE EARTHWORKS, BUILDING CONSTRUCTION AND ROADWORKS REQUIRED FOR THE INSTRUMENT LANDING SYSTEM BE CARRIED OUT.	38
4. THE PROVISION OF ROADS AND FENCING INCLUDED IN THIS REFERENCE IS RECOMMENDED.	43
5. THE COMMITTEE RECOMMENDS THE PROVISION OF THE ENGINEERING SERVICES PROPOSED IN THIS REFERENCE.	61
6. The cost of the proposed work is expected to be about £2,150,000.	65
7. THE COMMITTEE STRONGLY URGES THAT STEPS BE TAKEN TO HASTEN THE COMPLETION OF THE TERMINAL AND OTHER FUNCTIONAL BUILDINGS AND FACILITIES.	67

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