DEPARTMENT OF THE SENATE
953
28 MAY 1987
Clerk of the Senate

THE SENATE
28 MAY 1987
TABLED PAPER

Parliamentary Standing Committee on Public Works

INITIAL REPORT

relating to the

CONSTRUCTION OF DEPARTMENT OF AVIATION CENTRAL TRAINING COLLEGE, A.C.T.

(Third Report of 1987)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
1987

1 9 8 7

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

I N I T I A L R E P O R T

relating to the

CONSTRUCTION OF
DEPARTMENT OF AVIATION
CENTRAL TRAINING
COLLEGE, A.C.T.

(Third Report of 1987)

Canberra 1987

© Commonwealth of Australia

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

(Twenty-Eighth Committee)

Senator Dominic John Foreman (Chairman)

Percival Clarence Millar, M.P. (Vice-Chairman)

Senate	House of Representatives
Senator Gerry Norman Jones	John Neil Andrew, M.P.
Senator Dr Glenister Sheil	Robert George Halverson, O.B.E., M.P.
	Colin Hollis, M.P.
	Leonard Joseph Keogh, M.P.
	Keith Webb Wright, M.P.(1)
	John Saunderson, M.P.(2)

(1) Resigned 13 February 1986

(2) Appointed 18 February 1986

PUBLIC WORKS COMMITTEE ACT 1969
ORDER UNDER SUB-SECTION 18(4)

I, SIR NINIAN MARTIN STEPHEN, the Governor-General of the Commonwealth of Australia, acting with the advice of the Federal Executive Council, in pursuance of sub-section 18(4) of the Public Works Committee Act 1969, hereby, by this order, declare that the public work described in the schedule be referred to the Parliamentary Standing Committee on Public Works for consideration and report.

SCHEDULE

DEPARTMENT OF AVIATION CENTRAL TRAINING COLLEGE, PIALLIGO, A.C.T.

L.S.

Given under my Hand and the
Great Seal of Australia
on 23 January 1987

N.M. STEPHEN

Governor-General

By His Excellency's Command,

Don Grimes

Minister of State for Community Services
on behalf of
Minister of State for Housing and Construction

C O N T E N T S

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

DEPARTMENT OF AVIATION CENTRAL TRAINING COLLEGE

I N I T I A L R E P O R T

On 23 January 1987 His Excellency the Governor-General in Council referred to the Parliamentary Standing Committee on Public Works for consideration and report to Parliament the proposed construction of the Department of Aviation Central Training College, Pialligo, A.C.T.

The Committee is pleased to report as follows:

THE REFERENCE

1. The proposal referred to the Committee was for the construction of a training college for the Department of Aviation at Pialligo, A.C.T. The College would be the department's principal training facility for air traffic services, search and rescue, flight standards, administrative and automatic data processing functions.

2. On 2 April 1987 the Minister for Aviation, on behalf of the Government, requested the Committee to extend the scope of the reference to include an examination of Watson High School as an alternative location for the Central Training College. The Minister advised that preliminary work undertaken by the Department of Aviation in conjunction with the Department of Housing and Construction had indicated that the Watson High School option is feasible and would result in capital cost savings to the Commonwealth of at least $1.0 million.

3. The Limit of Cost of the Pialligo proposal when referred to the Committee was $11.2 million at October 1986 prices. The Indicative Cost of the Watson High School proposal was $9.115 million.

THE COMMITTEE'S INVESTIGATION

4. The Committee received written submissions and plans for the Pialligo proposal and the Watson High School proposal from the Department of Aviation (Aviation) and the Department of Housing and Construction (DHC).

5. On 30 March 1987 the Committee inspected the existing facilities in Melbourne of the Air Traffic Control and Flight Service Schools at Henty House, the Flight Standards School at 607 Swanston Street and, in addition, the control tower and the area approach control centre at Tullamarine Airport.

6. On 2 April 1987 the Committee inspected the site proposed for the college at Pialligo, a number of alternative sites adjacent to Canberra Airport and Watson High School.

7. A public hearing was held in Canberra on 27 April 1987 at which officers from Aviation and DHC presented written submissions and plans and were examined by the Committee. The Committee also received written submissions and took evidence from the following individuals and organisations:

- Department of Territories;
- Victorian Government;
- Professional Radio and Electronics Institute (PREI);
- Civil Air Operations Officers' Association (CAOOA);
- Mr John Langmore, M.P., Member for Fraser;
- Mr Jim Snow, M.P., Member for Eden-Monaro;
- Queanbeyan City Council;
- A.C.T. Trades and Labour Council;

- A.C.T. Teachers' Federation;
- Watson High School Board;
- Watson High School Parents and Citizens Association;
- Mr A. Wilks, Principal, Watson High School;
- Mr J. Timbs, Principal, Canberra College of Technical and Further Education;
- Mr R. Miller; and
- Pialligo Residents Association.

8. The Committee's proceedings will be printed as Minutes of Evidence.

BACKGROUND

9. The Department of Aviation (Aviation) has a requirement to train its personnel in the following disciplines, some of which are required to meet its statutory requirements to provide a safe environment for aircraft operating in Australian airspace:

- air traffic control (ATC);
- flight service (FS);
- search and rescue (SAR);
- flight standards;
- administration; and
- automatic data processing.

10. Training provided by the department for ATC, FS and SAR and flight standards is not available elsewhere in Australia.

11. Air Traffic Control ATC personnel are responsible for the safe, orderly and expeditious flow of air traffic within controlled air space. Controlled air space is normally designated for high density traffic movements where large regular passenger transport aircraft, carrying many passengers, operate. In Australia, controlled air space covers the east coast, to Adelaide and across to Perth and also numerous international air

routes which criss-cross the continent and extend over the oceans. Controlled air space does not necessarily extend to ground level in all parts of Australia. The main base for controlled air space is 10,000 feet, coming down to ground level around high density airports. Within controlled air space ATC personnel are responsible for the maintenance of separation between aircraft under prescribed separation standards laid down by Aviation and guidelines of the International Civil Aviation Organisation (ICAO).

12. Flight Service Flight Service personnel are responsible for providing operational flight information and advisory services to aircraft operating outside controlled air space. This air space has less dense traffic and is used by smaller aircraft carrying fewer passengers.

13. ATC and FS personnel are to be integrated into the one single employment category in the near future.

14. ATC and FS Training At present Aviation employs 1,350 ATC and 870 FS personnel. It also employs 170 aeronautical telecommunications officers who are responsible for passing communications between air traffic services units in Australia and overseas.

15. Aviation advised that a decision was taken about two years ago to integrate ATC and FS personnel. This initiative follows practices adopted in other countries which have single organisational structures employing either ATC or Air Traffic Services officers. In the long term it is aimed to re-train FS personnel to become air traffic controllers. A 12-month conversion course is envisaged.

16. There is a surplus of 150 ATC pesonnel at present; these personnel are performing the functions of flight data officers with responsibilities for providing ATC personnel with relevant

flight data. The emergence of the surplus was attributed by Aviation to a downturn in air traffic services and to delays in the provision of control towers at a number of airports. Through natural wastage of ATC personnel (due to retirement, resignations and illness), which occurs at a rate of approximately 5 per cent per annum, the surplus of 150 ATC personnel will disappear within two years. Additional ATC personnel will then be required.

17. The only training which has been carried out at Henty House during the past 12 months has been an ATC course for Pakistan (12 students) and an aeronautical telecommunications course which is currently in progress. Aviation submitted, however, that training will need to resume during 1988 to cover wastage from 1990 onwards. On the basis of this requirement for training specialist personnel its forecast annual requirement for training is as follows:

- ATC - 2 to 3 courses, each course catering for 20 personnel;

- Aeronautical Telecommunications - one course for 14 personnel;

- Advanced Operational Control - two courses each for 10 personnel;

18. Search and Rescue Aviation is responsible for the overall co-ordination of search and rescue for all civilian aircraft. It also has a role in assisting other organisations such as the Department of Transport for marine rescue, state police services for land rescue and the military for search activities. The SAR school is located in leased premises at Weston, A.C.T. The objectives of SAR courses are to provide training for search mission co-ordinators and assistant mission co-ordinators. Courses are attended by departmental personnel as well as

personnel from the Department of Defence, and members of Federal and State police forces. Students from overseas also undergo training at the school.

19. Aviation advised that the forecast requirement for SAR training is as follows:

- Search and Rescue Mission Co-ordinator - six weeks duration, two courses per year, 6-12 students per course;

- Assistant Search and Rescue Co-ordinator - five weeks duration, three courses per year, 18 students per course; (both courses cater for initial training and refresher training);

- One International SAR course may be conducted during any 12 month period, but not necessarily on an annual basis. Each course is of 14 weeks duration for up to 18 students; and

- Up to two Advanced Operation Control Courses - three weeks duration, 18 students per course.

20. Flight Standards Aviation is responsible for licensing tradespeople who carry out maintenance and repairs to aircraft. The Flight Standards School, housed in leased premises in Melbourne, conducts training in technical, regulatory and management subjects for:

- airworthiness surveyors;
- airworthiness engineers;
- flying unit pilots;
- examiners of airmen;
- airways surveyors;

- Bureau of Air Safety Investigation officers; and
- outside industry.

21. Courses are held at the Flight Standards school or in a particular region when it is considered practical and cost effective. In 1987 the school will conduct 20 courses of 3-17 days duration, each for an average of 13 students.

22. It is planned to relocate the school into temporary leased accommodation in Canberra at the end of 1987.

23. Administrative Training Aviation has approximately 1500 permanent staff employed at its Central Office in Canberra. A training cell has been established in leased premises in Braddon to provide administrative training for all Central Office personnel in management skills and techniques. Courses are also available to selected personnel from the aviation industry. Aviation envisages that on an annual basis 24 courses and 30 one-day modules will be conducted by the school into the foreseeable future. This will involve 634 personnel and 313 course days.

24. ADP Training In 1984/85 Aviation introduced a general computing network to improve productivity and management support throughout the department. The aim of ADP training is to provide training for all Central Office and regional staff in the skills and techniques required to use computing network equipment. Courses are attended by senior management, specialist staff and ADP users. Forecasts provided by Aviation of the annual number of ADP courses and the number of personnel involved are as follows:

- 1064 personnel attending 95 courses - 174 course days;

- 322 personnel attending the computer laboratory involving 1148 student days;

- 477 students attending the ADP training video laboratory involving 960 student days.

THE NEED

25. Aviation submitted that there is a need to provide facilities to house a Central Training College (CTC) to train personnel in ATC, FS, Flight Standards, SAR, administration and ADP. Aviation also submitted that the CTC should be located in Canberra.

26. The following paragraphs describe:

- the new ATC/FS simulator;

- the need for the Central Office of the Department to exercise more control over the college;

- an examination of location options;

- the report of the Location of Australian Government Employment (LAGE) into the need to locate the CTC in Canberra;

- the possible impact of the Civil Aviation Corporation on training and locational requirements; and

- the reactions of the Victorian Government, the Professional Radio and Electronics Institute (PREI), and the Civil Air Operations Association to the need to locate the CTC in Canberra.

27. ATC/FS Simulator Existing ATC and FS simulators in Henty House are old and obselete and no longer represent equipment in use. Aviation is currently providing new ATC automatic radar display systems in a number of centres throughout Australia.

Such equipment is already installed at Adelaide Airport. In Melbourne the new equipment is currently being installed and Aviation hopes to have it operational by the last quarter of 1987. Equipment for Perth is currently in the installation stage and will become operational in late 1987 or early 1988. The types of displays in these major centres are different to those in use at present. Aviation see no advantage in training new ATCs on out-moded equipment. It would be prudent to train new ATCs using the simulator equipment which will simulate more realistically the equipment which is being installed in the major centres.

28. With existing simulators the generation of targets is essentially manual; targets are manipulated by mechanical knobs and buttons. The new simulator will be totally automatic; each aircraft target will move according to a given flight plan taking into account aircraft performance characteristics. The existing simulator is able to handle a single ATC exercise or a single FS exercise. The new simulator will enable six exercises involving both ATC and FS functions to be carried out simultaneously. The old simulator is capable of generating 24 aircraft targets; the new, 300. The number of aircraft which can be generated per target generator position will increase from two in the old to 20 in the new.

29. Contracts for the simulator equipment, costing $8.8 million, were awarded in June 1985. The contract is for the supply and installation of the simulator in suitable premises in Canberra to be available by September 1988 for site acceptance by 12 February 1989. The contractor is required to install and run-up the simulator between September 1988 and 12 February 1989.

30. Central Office Control of Training Schools Aviation stated that historically the training of ATC and FS personnel was carried out in Melbourne because the Central Office of the department was located there. The decision was made when the Central Office moved to Canberra in 1979 to leave the training of

ATC and FS personnel in Melbourne because there were no facilities available in Canberra to house the training schools. The SAR school was established in Canberra because the Central Office is located there.

31. Overall control of the CTC is a responsibility of the Central Office. It was stated by Aviation in evidence that when the CTC and the Central Office were located in Melbourne there were frequent visits by Central Office staff to the College. The number of visits are now less because of the separation of the two, the main reason for this being cost. Aviation conceded that the training of personnel has not suffered as a result of the separation but this has been at a cost associated with the movement of personnel between the two centres. Monitoring of training is carried out by personnel in the standardisation and licensing section of the Central Office. Aviation conceded also that it would be possible to carry out training and monitoring if the CTC and the Central Office were not co-located, but that it would be less expensive and highly desirable to have the Central Office and the CTC located together.

32. Location Options Aviation submitted that the rationale for relocating Melbourne-based training schools to Canberra is not exclusively based on the need for improved central office control which such a move would produce. Capital costs and recurrent expenditure were also considered.

33. A study of location options for ATC, FS and SAR training was carried out by Aviation in 1983. The study examined the suitability, capacity, organisational and administrative and financial implications of a number of location options, including the following:

- Henty House;
- Melbourne Airport;

- Essendon Airport (including use of existing terminal building);
- Leased accommodation in Melbourne, Canberra and Queanbeyan;
- Purpose-built accommodation in Canberra;
- Canberra College of Advanced Education;
- Riverina College of Advanced Education at Goulburn; and
- Surplus A.C.T. Schools Authority buildings in Canberra.

34. The study attributed capital, annual recurrent costs and total costs for the first 20 years of operation for the various options, as follows:

Table 1
Capital, Recurrent and 20-year costs of
Location Options Examined

	Capital	Recurrent	After 20 yrs
	$m	$m	$m
Henty House	3.032	4.264	88.31
Melbourne/Essendon Airport	10.169	5.074	111.649
Essendon Terminal	9.218	4.264	94.498
Melbourne - Leased	2.139	5.169	105.52
Canberra - Leased plus hostel	2.478	3.275	67.98
Queanbeyan - Leased	2.478	3.187	66.22
Canberra - Purpose built plus hostel	10.713	2.404	58.79
Canberra CAE plus hostel	10.153	2.467	59.49
Goulburn CAE	0.845	5.265	87.225
A.C.T. School plus hostel	9.725	2.404	57.81

35. Aviation advised that whilst most of the location options showed some benefits, the study concluded on the basis of functionality and cost effectiveness that the college should be accommodated in purpose-designed facilities in Canberra.

36. Henty House A feasibility study of upgrading this building to house ATC and FS training was also undertaken by DHC in 1984.

37. The building is a concrete-framed, 9-storey structure constructed in 1923/24 and is Commonwealth-owned. The DHC feasibility study concluded that the building is generally in a fair condition, but would need considerable upgrading to meet the requirements of modern office accommodation. Only a small part of the building is air conditioned and openable windows are badly corroded and in need of replacement. The electrical services, whilst meeting present requirements, would need to be upgraded to cater for additional air conditioning and lighting loads.

38. Both the Aviation location options study and the DHC study mention the disruption to training which would occur during any refurbishment. If the building is to be upgraded it would need to be vacated for the duration of the refurbishment period which could take 18 months. Following the upgrading another 6-12 months would be required to install and commission the new simulator. The result would be that no training could be undertaken at Henty House for a period in excess of two years.

39. Examination of Further Options In 1984 the scope of the project was extended with the inclusion of flight standards, administrative and ADP training. Aviation advised that location options were re-examined and the following options were considered in detail:

Option 1 - Consideration of new facilities for the total training requirement in Canberra - i.e., ATC., FS, SAR, Flight Standards, Administrative and ADP;

Option 2 - Construction of new facilities for ATC and FS training in Melbourne (Essendon Airport notionally) with other training functions remaining in leased accommodation in Canberra;

Option 3 - Construction of new facilities for ATC and FS training in Melbourne (Essendon Airport notionally) with other training activities located in Canberra in new facilities.

40. Option 1, the construction of new purpose-designed facilities in Canberra, was calculated by Aviation as the least expensive. The nett present value of the cost of the three options over a 15-year life of buildings at discount rates of 7, 10 and 13 per cent, were calculated as follows:

	Option 1	Option 2	Option 3
7 per cent	12.32	15.59	15.55
10 per cent	13.43	15.46	16.15
13 per cent	14.16	15.30	16.50

41. Aviation concluded from this study that savings of the order of $2 million could result by adopting Option 1, i.e., the construction of purpose-designed facilities in Canberra.

42. LAGE Committee The proposal to relocate the Central Training College to Canberra was submitted to the LAGE Committee for consideration in August 1985. In September 1985 the LAGE Committee submitted to Aviation a list of matters requiring further clarification; the Aviation response was received in October 1985. Following several meetings of the LAGE Committee, a report to the Government was prepared in November 1986.

43. In summary, the report concluded that based on the Department of Finance preferred cost analysis approach, which recognises all costs and savings in the years in which they would

be incurred and assessing the net present value of the total costs or savings spread over the first 16 years of the project life, a saving of $170,000 would accrue. The support of management representatives for the proposal to relocate to Canberra was based primarily on significant non-financial advantages advanced by Aviation associated with the relocation.

- Henty House is old and unsuited for modification to house the simulator;

- Co-location of ATC, FS, Flight Standards, SAR, Administrative and ADP training in the one facility would facilitate the effective operation and administration of these schools and also result in on-going financial savings, e.g., relinquishing leased accommodation and the rationalisation of staff members;

- Central Office staff would have more ready access to simulator equipment necessary for the development of ATC and FS operational doctrines. The development of this task, which has not been properly developed in the past due to geographic separation of the College and the Central Office, is being upgraded and expanded by the department. If relocation did not occur Aviation would need to consider the duplication of simulator equipment or more frequent visits by Central Office staff to Melbourne for access to the simulator;

- Central Office staff would have more effective management of college staff and trainees, producing greater flexibility in staffing between Central Office and the college, more effective curriculum determination and a reduction in the volume of Central Office staff travelling to Melbourne; and

- A more satisfactory residential training environment would be provided through the provision of hostel accommodation in Canberra.

44. In December 1986, the LAGE Committee Secretariat formally advised Aviation that the Government had considered the report of the LAGE Committee and the Government supported the proposal to relocate the CTC to Canberra.

45. Civil Aviation Corporation Aviation is undergoing significant organisational changes with responsibilities for the development, maintenance and operation of selected aerodromes and aerodrome facilities being assumed by the Federal Airports Corporation (FAC). The Central Office of the FAC will be in Sydney.

46. Further organisational changes were announced in 1986 when the Minister for Aviation announced in October 1986 an 'in-principle' decision to establish a Civil Aviation Corporation (CAC). The CAC will provide and operate the civil airways system in Australia, covering operational matters such as ATC, flight advisory services, navigational aids, communications systems and rescue and fire-fighting services. The Minister's announcement stated that the cost of developing, providing and operating these facilities and services is about $260 million per annum. A corporation, if operated on a commercial basis similar to those in other leading aviation nations, can provide these services more efficiently than a department of state.

47. The Minister did not indicate a timetable for the implementation of the proposed CAC, nor where the Central Office will be located. The number of personnel to staff the CAC and the extent of the residual functions which will remain with Aviation after the corporation is established were not given in the Minister's announcement. For the purposes of this report responsibilities for ATC, FS and SAR training are unclear. The extent of need for administrative and ADP training at the CTC following the establishment of the CAC is also unclear to the Committee.

48. Reactions to the Need to Relocate to Canberra The Victorian Government, the PREI and the CAOOA indicated a belief that based on the degree of uncertainty about the impact of the CAC on the aviation industry and responsibilities for training personnel, it would be premature to make a decision now on the location of major training schools. In summary, the Victorian Government made the following points:

- since the original proposal for the establishment of a CTC in Canberra was developed, the structure of civil aviation and the Australian economy have changed dramatically; Aviation has recently dealt with other training functions in a way which reflect an altered policy stance;

- the statement by the Minister for Aviation concerning the establishment of the CAC indicated a need for the CAC to be run on commercial lines and for the aviation industry to be consulted to ensure that airways facilities, for which the industry will pay, are the result of appropriate investment and cost recovery decisions. One of the major issues which needs to be considered is whether the CAC will have responsibility for setting policy and standards, and more precisely, whether training will be the responsibility of the CAC or not;

- the development of definitive proposals for the establishment of the CAC will not be completed before May 1987. The Minister for Aviation has undertaken to consult with staff associations before detailed proposals are brought back to the Government for consideration; to proceed now with a relocated CTC, before any resolution would require a high degree of presumption, with attendant risks inherent in any premature decision;

- the proposed integration of ATC and FS personnel will have a profound effect on training and re-training as well as on the administration and organisational arrangements of the CAC. The types of courses to be offered will need to be determined, the nature and number of staff involved and the mechanisms for staff training and selection.

- the proposal for a relocated CTC has been developed since 1979 in isolation, without reference to the consequences and ramifications of initiatives being taken in the re-organisation of civil aviation, especially its administration and technology.

49. In view of the above factors the Victorian Government submitted that Aviation should be requested to review the concept of a centralised training function.

50. The PREI and CAOOA agreed with the broad thrust of the case presented by the Victorian Government. The two organisations submitted also that the concept of using hostel-type accommodation for trainees, has not been the subject of proper consultations with Aviation. The value to trainees of frequent orientation trips to airports and ATC equipment was also emphasised by the two organisations.

51. Financial Penalties Aviation advised there would be financial as well as operational penalties associated with the deferment of any decision on the relocation pending the establishment of the CAC. The contract obliges the contractor to install and run-up the simulator between September 1988 and 12 February 1989. The contract provides no penalty payment to the contractor should the Commonwealth fail to meet its obligation to provide suitable accommodation in Canberra by September 1988. If suitable accommodation is not completed in time the contractor would be unable to achieve the target date for site acceptance (12 February 1989) when a final payment of $1.06 million is due. Aviation believe that whilst there is no provision for penalties to be paid by the Commonwealth, the contractor could seek and expect the Commonwealth to meet interest on the $1.06 million at commercial interest rates of 18 per cent, i.e., approximately $180,000 per annum. Aviation estimate other financial penalties as follows:

- rental of 500 square metres of temperature controlled space for storage of the simulator - $60,000 per annum;

- estimated loss of warranty for full 12 months - $100,000;

- capitalisation of interest on $6.9 million payments already made to the contractor by September 1988 - based on the long-term bond rate of 13 per cent the interest would be $897,000 per annum; and

- the deferment option would require the Commonwealth to install the simulator at a cost of $100,000.

52. In summary, the financial penalties of deferring the installation of the simulator would be $1.237 million for a full year, or $103,000 per month plus installation costs of $100,000.

53. Operational Penalties Aviation advised that based on current planning the CTC training staff would have the simulator handed over to them by the end of March 1989. The training staff would undergo a six month familiarisation period and develop training courses to enable training to commence by September 1989.

54. The surplus of ATC staff will be reduced to zero by late 1989 and courses will need to commence during 1988 to cover natural attrition of staff numbers from 1990 onwards. The Committee believes an anomaly exists in these milestones; training using the simulator cannot commence until September 1989, and natural attrition will require courses to commence during 1988. The Committee sought further clarification of this anomaly from Aviation and was advised that training during 1988 will need to be carried out at Henty House, pending the acceptance, familiarisation and development of courses based on the new simulator.

55. Any longer delays to the acceptance and familiarisation with the simulator would exacerbate problems inherent in continuing training at Henty House, namely:

- the existing simulators in Henty House do not reflect the systems in the field;

- training on the existing simulators is manpower intensive, targets needing to be generated by 12 trainees of staff (the new simulator can generate 20 radar targets per target generator console, compared with two using the old simulator); and

- the possible need to extend the length of training courses to provide more time on the old simulators to improve training levels before trainees enter field training.

56. Summary Although there are surplus ATC personnel at present, the surplus will disappear at the end of two years. Training of replacement personnel will need to resume during 1988 to cover wastage from 1990 onwards. During the next 5-10 years Aviation believe there will be a need to conduct 2-3 ATC courses each for 20 trainees. An ATC/FS simulator, which will reflect equipment in use or which is being installed at most major airports, is being acquired by Aviation. Purpose-designed facilities to house the simulator are required by Aviation to be completed by the contracted delivery date of September 1988.

57. A study of location options for ATC/FS training revealed a number of advantages in relocating the two schools from Melbourne to Canberra and co-locating them with other departmental training schools already located there (SAR, Administrative, ADP) or planned to be located there (Flight Standards). These advantages include:

- more effective control, at less cost, by Central Office in administering the College;

- more ready access by Central Office staff to the simulator equipment;

- rationalisation of training at a single location providing operational and manpower savings; and

- marginally less capital investment and recurrent expenditure due to the use of hostels for accommodating trainees.

58. The effect of the impending creation of the CAC on facilities required for training, the location of training establishments and the nature of training which the corporation will assume responsibility for is imprecise. It is nevertheless clear that in order to continue Australia's internationally

recognised high standards of civil aviation safety, there will remain a need for personnel to be trained in specialist fields such as ATC, SAR and Flight Standards.

59. Any delays pending the establishment of the CAC will incur cost penalties associated with contractural obligations for the provision of the new simulator.

60. Committee's Conclusion Air Traffic Control and Flight Service Schools should be relocated to Canberra. There would be operational and financial benefits in co-locating the SAR, Flight Standards, Administrative and ADP training schools with the Air Traffic Control and Flight Standards Schools.

THE PROPOSALS

61. The proposal originally referred to the Committee was for the construction of a purpose-designed Aviation College at Pialligo, A.C.T. (see Site Plan - Illustration B-1).

62. The Committee was subsequently requested by the Minister for Aviation, to extend its inquiry to include an examination of converting Watson High School for the College.

63. The following paragraphs describe the background which led to the original proposal to locate the College at Pialligo, the design of the College complex there and consideration of the suitability of the site.

64. Selection of Pialligo Site The option of using surplus A.C.T. Schools Authority buildings to house the College in Canberra was considered during the 1983 location options study, but was not proceeded with because of the unavailability of surplus school buildings at the time. Instead, the option of providing purpose-designed facilities was developed further. The National Capital Development Commission (NCDC) was requested to

identify suitable sites to accommodate the College buildings and associated infrastructure. One of the key siting criteria was proximity to Canberra Airport. It was felt that proximity to an airport would give trainees a focus for identification and enable them to achieve a better perspective of the aviation industry. Other site selection criteria included:

- expected building area of 12,000 square metres;
- parking for 180 cars;
- outdoor recreation areas;
- room for expansion; and
- a site of up to five hectares.

65. Four sites adjacent to the airport were identified by the NCDC:

- Pialligo;
- Molongo River;
- Woolshed Creek; and
- Duntroon Hill.

66. The location of the four sites are shown in Illustrations B-2.

67. The Pialligo site was considered preferable because it would allow the development of the CTC to be contiguous to and to be identified with the existing civil buildings area of the airport. The study concluded that this would enhance the immediate identification by new recruits with airport operations and the aviation industry. It would require less cost to provide services to the site than the other three options, would be least affected by aircraft noise and could be well serviced by public transport.

68. The site comprises portions of Commonwealth leasehold land used for private commercial rural-type activites.

69. Proposed Complex The College complex, which was originally proposed (see Site Plan - Illustration B-1) comprised two wings, the larger of 2-storeys intended to house training accommodation, administrative support and amenities. The smaller, single storey wing would contain the ATC simulator. The buildings were to be joined by a fully enclosed link. The floor area for the complex was about 7,500 square metres and the entire site about 4.48 hectares.

70. Site Problems The leaseholders who would be affected by the resumption of portions of their leases and the Pialligo Residents Association were unanimous in opposing any resumption of land. The leases had recently been extended to 40 years and the leaseholders believed that continued tenure would be reasonably certain unless the land was required for airport related activities. The Pialligo Residents Association claimed that the Pialligo site is prone to occasional flooding and to water-logging. DHC confirmed the risk of periodic low level inundation but stated that diversionary drains had been designed to cater for 100-year flood events. The floors of the buildings would be raised above any flooding which may occur. Floodwater would be impeded by contouring and would not enter adjacent properties.

71. A key criterion in the site selection process was that any site for the college must be in close proximity to Canberra Airport. The justification for this being somewhat nebulous, especially since the ATC, FS, and Flight Standards Schools have been operating in Melbourne some distance from the nearest airport without any apparent or evident diminution in the quality of training. At the public hearing Aviation admitted that whilst it was desirable that the college be located adjacent to Canberra Airport, it was not an essential requirement. Nevertheless, the Committee makes the observation that based on what can only be regarded at the time to have been an essential criterion, four sites, the majority remote from services, were identified and

considered. No other sites in Canberra were identified or considered. Following the public hearing the NCDC advised that the site at Pialligo was identified following strict requirements stipulated by Aviation for proximity to Canberra Airport. Had this not been so, other sites, for example, at Technology Park in Bruce or the Canberra College of Advanced Education, could have been identified.

72. Watson High School In October 1986 the Minister for Territories, in consultation with the A.C.T. Schools Authority, announced that Watson High School would close at the end of 1987 due to declining enrolments and high recurrent operational costs.

73. A working party was convened by Department of Territories to recommend possible uses for the school. The advice of the NCDC about land use planning for the site was sought. At the public hearing representatives of the Department of Territories stated that the NCDC saw a range of other uses which it could support but these would need to go through a policy plan review stage before they could be adopted. The Commission's preferred options for use of the site were:

- educational;
- social and community;
- leisure and/or recreational;
- health or welfare;
- residential; and
- special institutional (undefined).

74. Based on these options the working party sought the advice of the NCDC if use of the school for the Aviation Training College would fit within existing land use planning for the area occupied by the school. The NCDC advised the working party that the Aviation Training College was considered to be an educational use and therefore fitted well within the existing land use policy for the area.

75. In February 1987 Aviation was subsequently requested by the working party to assess the feasibility of establishing the college within the existing buildings of the school. Initial inspections and preliminary studies indicated that the school is suitable.

76. Subsequent to the public hearing the Committee sought clarification from the NCDC of the status of the use of Watson High School for the CTC. The NCDC advised that the designated land use for the Watson High School site is educational. Accordingly the NCDC would be agreeable to the siting of a facility corresponding to this use on the site - the CTC is an educational use and is acceptable at Watson.

77. Description of Watson High School The School is located on Phillip Avenue, Watson, was opened in March 1965 and was constructed in four stages, as follows:

- Stage 1 - comprising blocks A, B, C and D, were completed in 1966 at a cost of $836,925 and consists of three 2-storey classroom blocks, a central amenities hall and change rooms;

- Stage 2 - comprising block E was completed in December 1966 at a cost of $200,259 and consists of classrooms, laboratories, library and other facilities;

- Stage 3 - the Assembly Hall was completed in March 1969 at a cost of $173,900; and

- Stage 4 - blocks F and G and the library were completed in May 1972 at a cost of $496,481.

78. Two major maintenance works were undertaken at the school in the past three years. The heating system has been upgraded at a cost of $0.4 million to provide adequate heating for the entire complex. Asbestos was removed from the complex at a cost of $1.5 million in 1985/86.

79. Proposed Use of Space Aviation advised that the net area requirement for the training college is about 3,900 square metres. The net floor area available at the school is about 6,700 square metres. A number of options utilising different combinations of blocks were evaluated and it is proposed that about 4,270 square metres of the school would be required by Aviation. The balance could be made available for other uses such as the Canberra College of Technical and Further Education.

80. A development scheme using blocks A, B, C and G, the library and the assembly hall was adopted (see Illustrations B-3 to B-9). Aviation believes the configuration proposed will meet functional needs and security requirements.

81. It will be necessary to provide a new building for the simulator, identical to that proposed for Pialligo, as none of the existing buildings at the school are considered suitable for adaptation for that purpose. New construction is considered by DHC to be the only feasible solution to meet Aviation's critical delivery schedule for simulator equipment. The proposed location of the simulator building is adjacent to the assembly hall (see Illustration B-3).

82. Services DHC advised that the school is naturally ventilated and heated by hot water radiators fed from a central boiler. The library is mechanically heated and cooled. The existing lighting was assessed by DHC as minimal and in poor condition. Fire protection comprises a recently upgraded thermal alarm system, hose reels and extinguishers.

83. Existing cold water supply, sanitary drainage and stormwater drainage systems appeared to DHC to be adequate for future needs. DHC pointed out that the complex has no lifts and many changes of level occur throughout the complex making access for the disabled difficult.

84. Cost DHC advised that the Indicative Cost for the Watson High School proposal is $9.115 million at February 1987 prices. The cost estimate is based on the provision of an equivalent standard of facility to that briefed at Pialligo. The cost does not include design costs (including abortive costs at Pialligo) and the cost of acquiring the land and buildings. DHC advised that about $1.0 million has been spent on design charges for developing the proposal to the 'tender readiness' stage. DHC does not charge for the cost of services provided to other departments and there is no basis for seeking recovery of these costs from Aviation.

85. The transfer price for the buildings was assessed by the Department of Territories in consultation with the Minister for Finance at $1.147 million. There was no value placed on the land as it was being provided free of charge at either location.

86. Basis of Cost DHC advised that some upgrading of the building fabric has been included in the cost. It believes a high proportion of non-load bearing internal partitions will require demolition and replacement to provide briefed spaces. This in turn would require substantial replacement of ceilings and floor finishes.

87. Allowance has been made in the cost for mechanical and building works to provide air conditioning to the building. Existing timber and suspended concrete floors do not meet floor load requirements and replacement of window walls would be necessary to achieve air-tight conditions.

88. Given that the cost of providing the simulator building is constant to both sites, i.e., $2.45 million, the Committee questioned the relatively high cost of upgrading an existing educational institution to make it suitable for Aviation's requirements. The costs given, whilst at differing levels of precision, are as follows:

	$m
Pialligo new building, excluding simulator	8.750
Watson High refurbished, excluding simulator	6.665
Difference	2.085
Cost of school buildings	1.147
Total saving	0.938

89. At the public hearing and subsequent to it DHC confirmed that its investigations into cost aspects for the refurbishment of Watson High was limited to the provision of indicative costs. The limited time available did not allow DHC to prepare schematic designs on which more precise figures, resulting in Preliminary Estimates, are based. The estimated cost of $6.665 million is thus based upon an attempt to achieve as closely as practicable the stated requirements of Aviation on which the Pialligo design was based. Reductions in the $6.665 million indicative cost could be achieved if Aviation alters its brief.

90. Timing Subequent to the public hearing DHC has advised that documentation of the Pialligo proposal has reached the stage where tenders could be called within a few weeks, subject to a favourable report by the Committee. A contract for the entire project could be awarded by the end of July 1987. Even if this were to occur DHC have advised that it would be unlikely to complete the simulator building at the Pialligo site before the end of September 1988.

91. In relation to the Watson High School proposal DHC advised that based on approval to proceed with this option in late May or early June 1987, necessary investigation, re-documentation and tendering requirements would not enable the award of a contract before the end of September 1987. If construction commenced immediately following approval, it is unlikely that the simulator building could be completed before the end of November 1988, three months after the simulator is scheduled to arrive for installation. Deferment of construction of the simulator building until the end of 1987 school year would give an estimated completion date of mid-March 1989, a minimum of seven months late.

92. Reactions to the Proposal Representatives of the A.C.T. Trades and Labour Council, the A.C.T. Teachers' Federation and the Watson High School Board and Parents and Citizens Association, Mr A. Wilks, the Principal of Watson High School, presented arguments which favoured the retention of the school either in its present form, or as a public boarding school or a local community resource.

93. The following points were made:

- the Aviation Training College should be constructed in Queanbeyan advanced by the A.C.T. Trades and Labour Council;

- there may be a requirement for a high school to serve new areas of North Canberra which are planned for development within the next five years;

- the cost of providing such a high school would be in the order of $15-20 million;

- there is therefore a future value far in excess of the agreed transfer price of $1.147 million; and

- there has not been a proper evaluation of why the school should not continue to be used.

94. Queanbeyan Sites In evidence, a representative of Queanbeyan City Council identified three possible sites in or adjacent to Queanbeyan which could be suitable for locating the college. The case put forward by the Council was strongly supported by Mr Jim Snow, M.P., Federal Member for Eden-Monaro. The sites and an Aviation assessment of their suitability are as follows:

Site 1 - is a triangular site facing Mowatt Street of 1.6 hectares. Aviation assessed that the site would be too small to accommodate the design proposed for Pialligo and it would require a complete redefinition and design of the proposed complex. The land is owned by the New South Wales Lands Department and is adjacent to residential development;

Site 2 - is owned by Queanbeyan City Council and is adjacent to the brickworks and the golf club. Aviation estimate to make it suitable for development would cost about $1.5 million in site works due to the nature of the topography;

Site 3 - on the Tharwa Road, is owned by the New South Wales Housing Commission. Aviation advised that this site is under the flight path of the main runway at Canberra Airport and as such is an area which it would not recommend construction because of the high level of aircraft noise.

95. On the basis of this assessment Aviation believe sites 2 and 3 are definitely unsuitable for construction of the college. Site 1 has possibilities but it would require protracted negotiations with the Lands Department to acquire it and would need a complete redefinition and design of the complex proposed for Pialligo. Any proposed use of the site for a CTC could raise objections from neighbouring residents.

96. Future Use of Watson High The Committee questioned representatives of the Department of Territories about the basis of the decision to close the high school. The Committee was advised that the closure is due to declining high school enrolments in the northern part of Canberra. A decision to close the school was taken by the Schools Authority in 1982 but was reversed in 1983.

97. Advice provided by Aviation following the public hearing indicates the historic trend of enrolments at Campbell, Lyneham and Watson High Schools, which serve the northern suburbs of Canberra, during the period 1978 to 1987, is as follows:

Table 2

Enrolments of Watson, Lyneham and Campbell High Schools 1978-1987

Year	Watson High	Lyneham High	Campbell High
1978	884	735	717
1979	754	640	687
1980	661	600	654
1981	577	606	675
1982	490	570	683
1983	318	677	763
1984	360	677	763
1985	294	773	732
1986	264	912	687
1987	203	941	664

(NOTE: Enrolments are taken from the annual *February census of School enrolments* of the A.C.T. Schools Authority)

98. The A.C.T. Schools Authority is currently reviewing building need throughout Canberra in the light of declining enrolments in older areas and at the same time the need to build new schools in developing areas such as South Tuggeranong and Gungahlin. In view of declining numbers the Authority does not see a requirement for three high schools in North Canberra. Students from North Canberra could be accommodated in two of the high schools, Campbell and Lyneham. To keep three high schools open involves a penalty in recurrent expenditure.

99. It is not intended to detail here the factors which other witnesses advanced as resulting in declining enrolments at Watson High School which led to the decision to close it at the end of 1987. Threats of closure, the discovery and removal of asbestos, disruption to school activities may have been contributing factors.

100. It is clear, nevertheless, that school buildings, which have a design capacity for 1000 pupils have been significantly under-utilised. In these circumstances and in the context of the availability of adequate capacity at Lyneham and Campbell High Schools it would be financially imprudent for Watson High School to remain open awaiting a possible influx of pupils from areas such as Gungahlin which have yet too be developed. Similarly, whilst the alternative uses for the school advanced by a number of organisations may have some merit, it could take considerable time and funds for them to be developed and for their resource implications to be considered by the Government.

101. Consideration by Committee The Committee has already concluded that there would be advantages in co-locating ATC, FS, SAR, Flight Standards, Administrative and ADP Training in Canberra.

102. It now remains to decide between the merits of the two proposals - Pialligo and Watson High School.

103. The Pialligo proposal has a number of advantages; it is purpose-designed, close to the airport and construction of the building to house the simulator could be completed one month after the contracted delivery date of simulator equipment. The main advantages of locating the CTC at Watson High School is that there is considerable scope for cost reductions. The Committee recognises that direct comparisons of costs between the two proposals is largely invalid due to the imprecise nature of Indicative Costs. It is also recognised that Indicative Costs for Watson High School are based on an adaptation of the Pialligo brief to building envelopes, room configurations and services available at the school. Within this framework, the Committee believes there is considerable scope for Aviation to re-brief DHC on their requirements. Bearing in mind that the school complex is essentially sound, the re-briefing should be carried out to minimise costs and should include the following:

- minimal internal alterations;
- minimal upgrading of internal services;
- provision of no new services unless justifiable on operational grounds; and
- review of space requirements in order to match requirements with internal room configurations.

104. The Committee also recognises that some delay to the completion of the simulator building will occur if it were constructed at Watson High School. Delays to completion range from to the end of November 1988 (if construction commenced at the end of September 1987) to mid-March 1989 (if construction were delayed to avoid disruption to school activities).

105. At the public hearing representatives of the Watson High School community pointed out that significant disruptions to school activities had occurred during the removal of asbestos. If the Committee agreed to the location of the CTC at the school, they requested the Committee to recommend that construction work not commence before it closes at the end of the 1987 school year.

106. The Committee notes advice from DHC that it will not be possible to commence construction of the simulator building until the end of September 1987. The Committee also notes that the simulator building site is not in an area of intensive use for school-related activities. The Committee therefore does not believe that there will be significant disruption if construction of the simulator building commences at the end of September 1987.

107. Committee's Conclusion The conversion of Watson High School for the Aviation Training College and the construction on a site adjacent to the assembly hall of a new building to house the Air Traffic Control and Flight Service Simulator are agreed, provided that significant reductions in costs resulting from the Department of Aviation re-examining the scope of its briefing requirements are achieved.

108. Committee's Recommendation It is therefore recommended that:

(a) construction of the building to house the Air Traffic Control and Flight Service simulator proceed at Watson High School at a Limit of Cost estimate of $2.45 million;

(b) the Department of Aviation should review its functional and briefing requirements in order to enable the Department of Housing and Construction to significantly reduce the cost of converting the school, giving particular regard to the following:

(i) review of space requirements in order to match them with existing room configurations;

(ii) minimal internal alterations having regard to essential operational requirements; and

(iii) minimal upgrading of internal services unless justifiable on health or operational grounds.

(c) upon completion of the review mentioned in paragraph 108(b), the Department of Aviation and the Department of Housing and Construction forward to the Committee for consideration the following:

(i) detailed schematic designs of functional areas including justification of dimensions and their location;

(ii) details of the scope of changes to briefed requirements aimed at reducing the overall cost; and

(iii) limit of cost estimates for the conversion of the college to meet revised briefed requirements.

109. Upon receipt of this information, the Committee will conduct a further public hearing.

RECOMMENDATIONS AND CONCLUSIONS

110. The recommendations and conclusions of the Committee and the paragraph in the report to which each refers are set out below:

		Paragraph
1.	Air Traffic Control and Flight Service Schools should be relocated to Canberra. There would be operational and financial benefits in co-locating the SAR, Flight Standards, Administrative and ADP training schools with the Air Traffic Control and Flight Standards Schools.	60
2.	The conversion of Watson High School for the Aviation Training College and the construction on a site adjacent to the assembly hall of a new building to house the Air Traffic Control and Flight Service Simulator are agreed, provided that significant reductions in costs resulting from the Department of Aviation re-examining the scope of its briefing requirements are achieved.	107

Paragraph

3. It is therefore recommended that: 108

(a) construction of the building to house the Air Traffic Control and Flight Service simulator proceed at Watson High School at a Limit of Cost estimate of $2.45 million;

(b) the Department of Aviation should review its functional and briefing requirements in order to enable the Department of Housing and Construction to significantly reduce the cost of converting the school, giving particular regard to the following:

(i) review of space requirements in order to match them with existing room configurations;

(ii) minimal internal alterations having regard to essential operational requirements; and

(iii) minimal upgrading of internal services unless justifiable on health or operational grounds.

(c) upon completion of the review mentioned in paragraph 108(b), the Department of Aviation and the Department of Housing and Construction forward to the Committee for consideration the following:

(i) detailed schematic designs of functional areas including justification of dimensions and their location;

(ii) details of the scope of changes to briefed requirements aimed at reducing the overall cost; and

(iii) limit of cost estimates for the conversion of the college to meet revised briefed requirements.

D.J. Foreman.

(D.J. FOREMAN)
Chairman

Parliamentary Standing Committee
on Public Works
Parliament House
CANBERRA

27 May 1987

LIST OF WITNESSES

Barwick, Mr N.J., Executive Consultant, Ministry of Transport, 16th Floor, 589 Collins Street, Melbourne, Victoria

Curtis, Mr P.J., Federal Secretary, Civil Air Operations Officers Association of Australia, 202 Berkeley Street, Carlton, Victoria

Darbyshire, Mrs A.K.E., Convenor, Working Group, Pialligo Residents Association, 7 Beltana Road, Pialligo, A.C.T.

Davies, Mr A.W., Assistant General Secretary, Professional Radio and Electronics Institute, 123 Clarence Street, Sydney, New South Wales

Duke, Ms A., Vice President, A.C.T. Teachers Federation, P.O. Box 21, Weston, A.C.T.

Gallagher, Mr R.G., First Assistant Secretary, Development Division, Department of Territories, Canberra, A.C.T.

Hayter, Mr H.W., Supervising Engineer and Project Director, CTC Project, Department of Aviation, Allara Street, Canberra City, A.C.T.

Hincksman, Mr C.C., 13 Beltana Road, Pialligo, A.C.T.

Huggett, Mr J.W.E., Principal Adviser, Airports Division, Department of Aviation, Allara Street, Canberra City, A.C.T.

Jago, Mr A.W., Chairman of the School Board, Watson High School, Phillip Avenue, Watson, A.C.T.

Kearns, Mr P.B., Assistant Secretary, Education and Special Studies Branch, Department of Territories, Canberra, A.C.T.

Kelly, Mr A.J., 9 Beltana Road, Pialligo, A.C.T.

Knox, Mr D.J., Assistant Secretary, Airways Systems Branch, Airways Division, Department of Aviation, Allara Street, Canberra City, A.C.T.

Langmore, Mr J.V., M.P., Member for Fraser, House of Representatives, Parliament House, Canberra, A.C.T.

Marriott, Wing Cdr B.J., President, Parents and Citizens Association, Watson High School, Phillip Avenue, Watson, A.C.T.

McDonald, Mr C.W., Secretary/Treasurer, Trades and Labour Council of the A.C.T., P.O. Box 279, Dickson, A.C.T.

McGuane, Mr P.G., Industrial Officer, Civil Air Operations Officers Association of Australia, 202 Berkerley Street, Carlton, Victoria

Miller, Mr R.R., 13 Richards Street, Hackett, A.C.T.

Morse, Mr C.M., Director of Personnel, Management Services Division and CTC Project, Planning Co-ordinator, Department of Aviation, Allara Street, Canberra City, A.C.T.

Ogilvie, Mr R.C., Town Planner, Queanbeyan City Council, Queanbeyan, N.S.W.

Pottenger, Mr D., Architect, Department of Housing and Construction, Sirius Building, Furzer Street, Phillip, A.C.T.

Richards, Ms R., General Secretary, A.C.T. Teachers Federation, P.O. Box 21, Weston, A.C.T.

Richardson, Mr J.E., Assistant Secretary, Air Traffic Services, Airways Division, Department of Aviation, Allara Street, Canberra City, A.C.T.

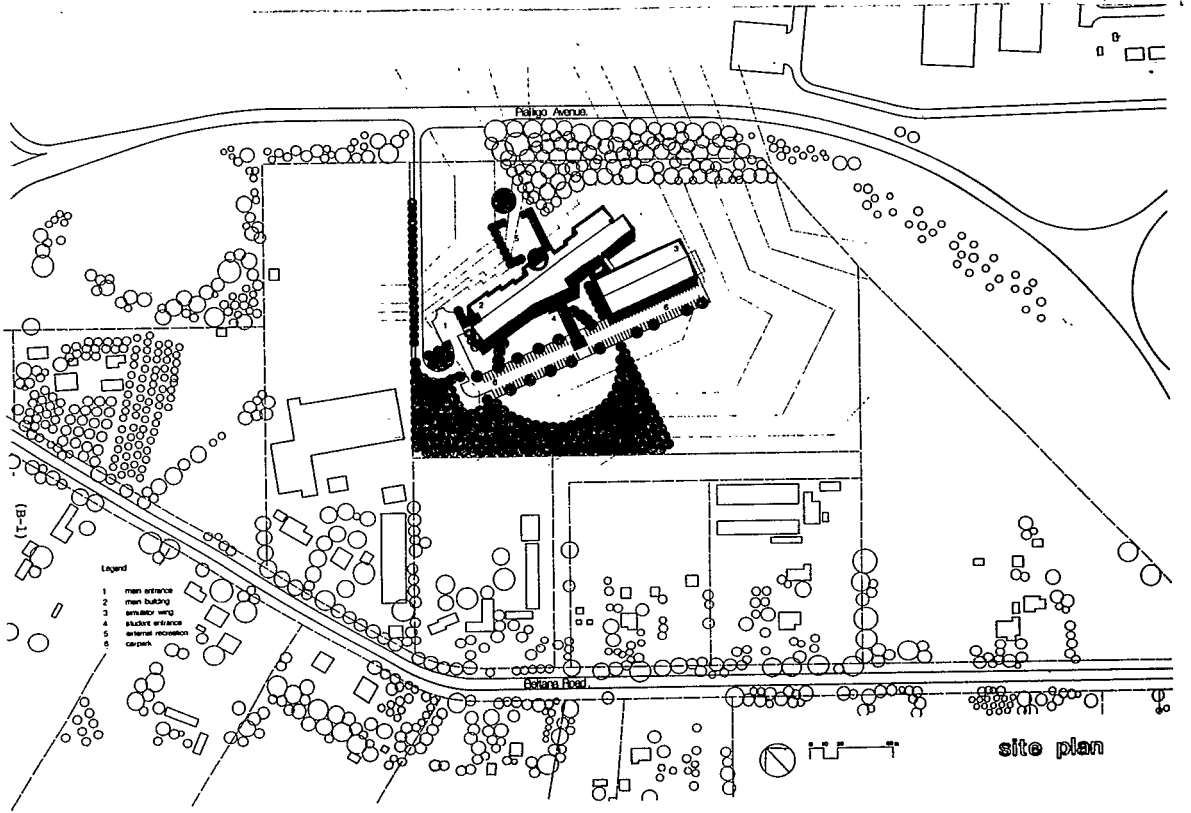
Setchell, Mr G.H., Assistant Secretary (Client Programs 1), Department of Housing and Construction, P.O. Box 111, Dickson, A.C.T.

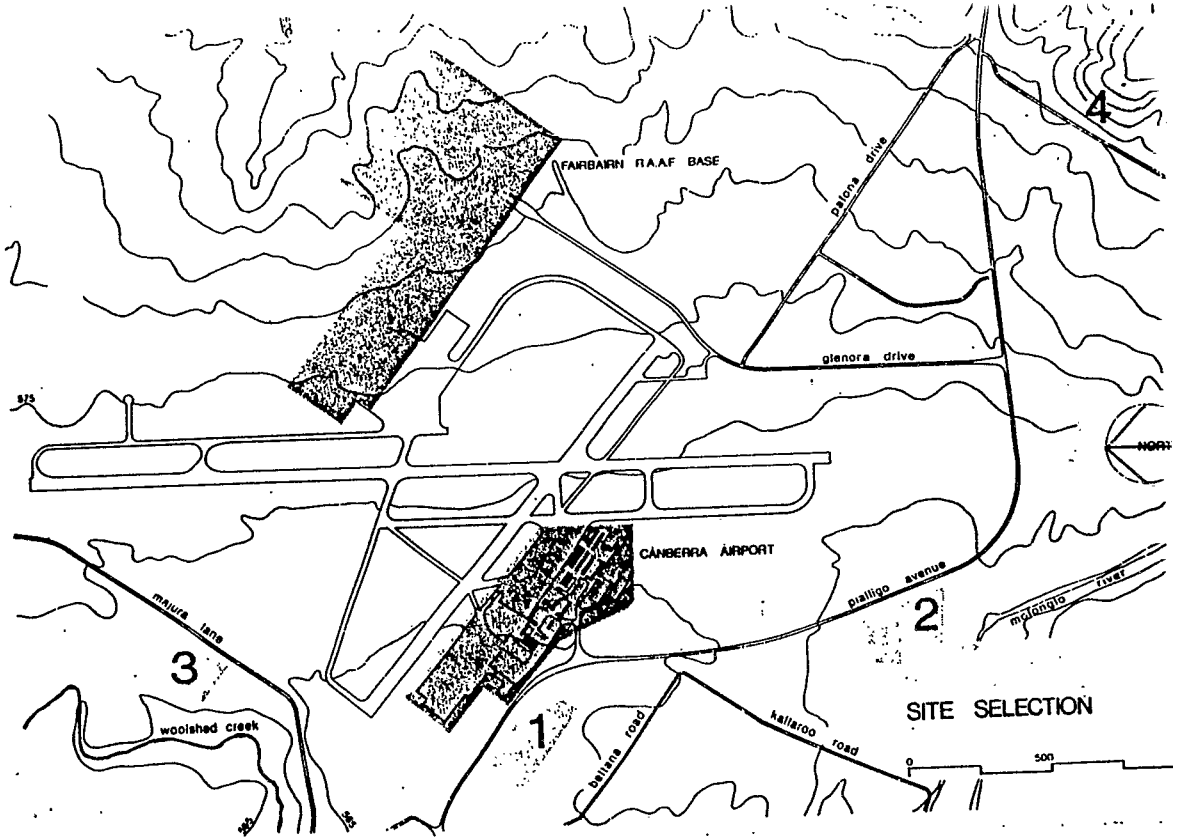
Skurka, Mr P., Project Manager, Department of Housing and Construction, A.C.T. Region, Sirius Building, Furzer Street, Phillip, A.C.T.

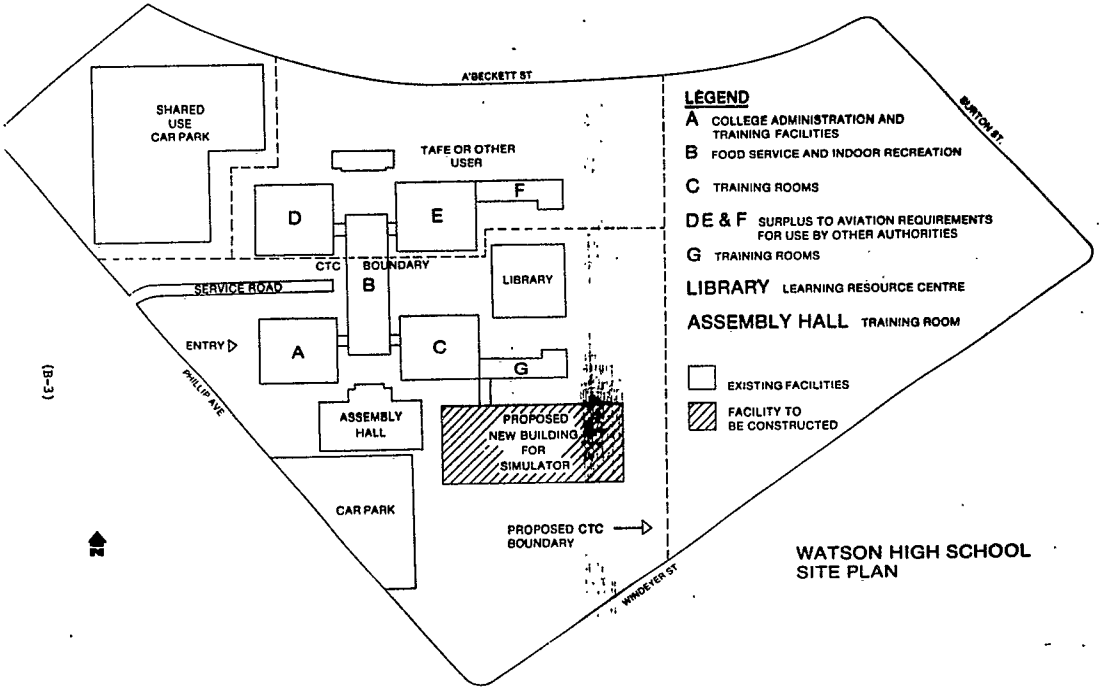
Smith, Mr R.J., 11 Beltana Road, Pialligo, A.C.T.

Snow, Mr J.H., M.P., Member for Eden-Monaro, House of Representatives, Parliament House, Canberra, A.C.T.

Wilks, Mr A.F., Principal, Watson High School, Phillip Avenue, Watson, A.C.T.

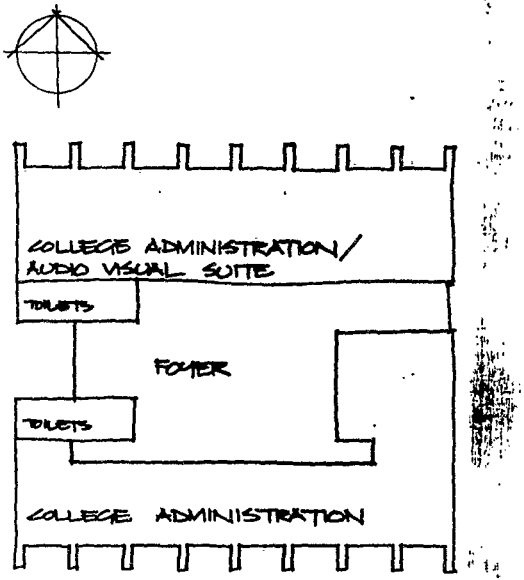

Pablgo Avenue
Bellana Road
Legend
1 main entrance
2 main building
3 simulator wing
4 student entrance
5 external recreation
6 carpark
site plan


FAIRBAIRN R.A.A.F BASE
patons drive
4
glenora drive
NORT
CANBERRA AIRPORT
pialligo avenue
2
molonglo river
maiura lane
3
woolshed creek
1
SITE SELECTION
bellana road
kallaroo road
0
500



WATSON HIGH SCHOOL
SITE PLAN

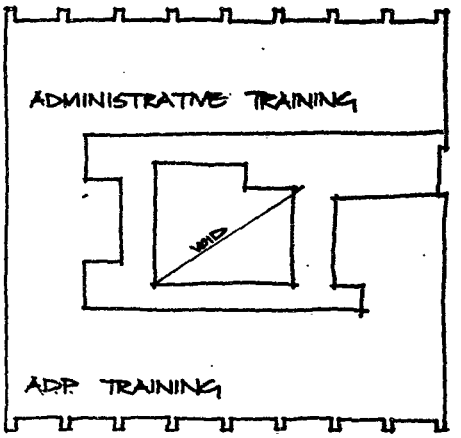
(B-3)



MAIN ENTRY

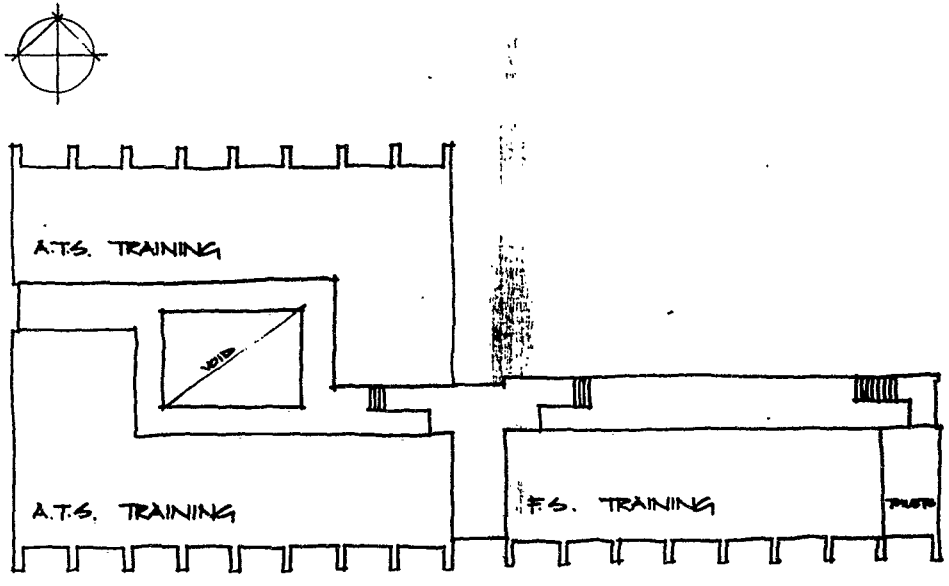
(B-4)

BLOCK A LEVEL 1



BLOCK A LEVEL 2

N.T.S

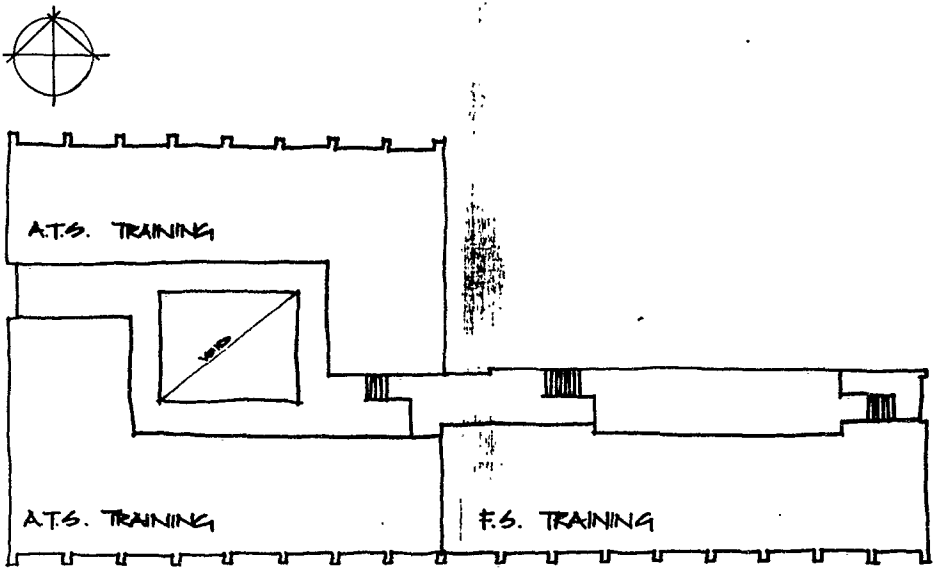


BLOCK C LEVEL 1

BLOCK G LEVEL 1

(B-5)

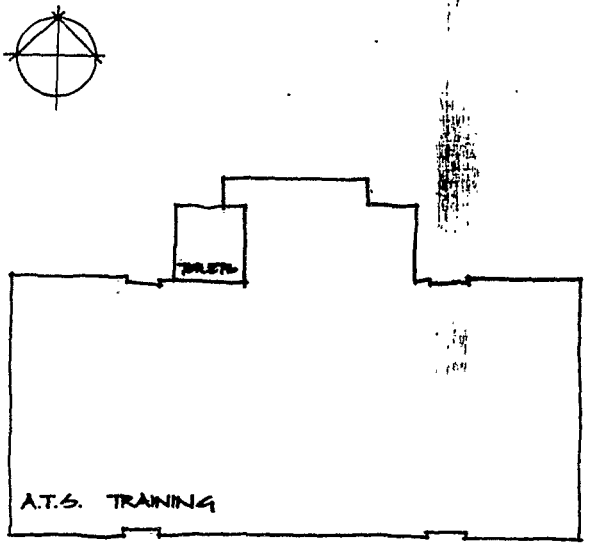
NTS.



BLOCK C LEVEL 2

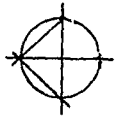
BLOCK G LEVEL 2

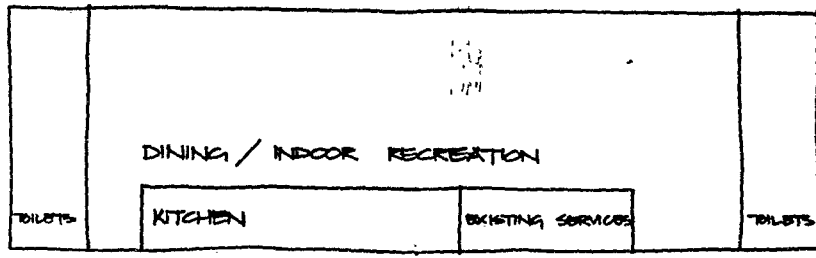
N.T.S



HALL LEVEL 1

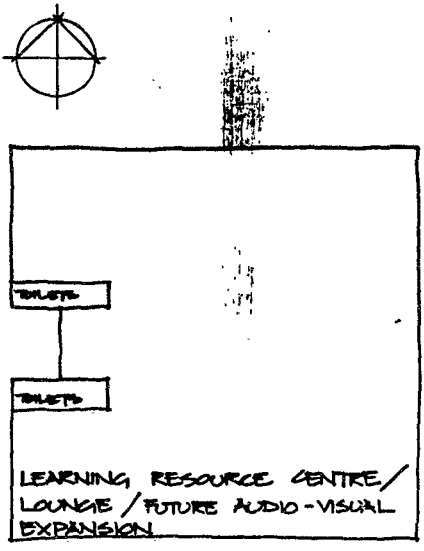
N.T.S.





BLOCK B LEVEL 1

N.T.S.



LIBRARY LEVEL 1

(6-8)

WT4