

Parliamentary Standing Committee on Public Works

REPORT

relating to the proposed construction of an

AIRCRAFT CORROSION CONTROL FACILITY RAAF Base, Richmond, New South Wales

(Tenth Report of 1980)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
1980

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

R E P O R T

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AIRCRAFT CORROSION

CONTROL FACILITY

RAAF Base, Richmond,
New South Wales

(Tenth Report of 1980)

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS
(Twenty-fifth Committee)

Melville Harold Bungey, Esq., M.P. (Chairman)

Leonard Keith Johnson, Esq., M.P. (Vice-Chairman)

Senate

Senator Bernard Francis
Kilgariff
Senator Jean Isabel Melzer
Senator Harold William Young

House of Representatives

Stephen Edward Calder, Esq.,
D.F.C., M.P.
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M.P.
Albert William James, Esq., M.P.
Murray Evan Sainsbury, Esq., M.P.

PUBLIC WORKS COMMITTEE ACT 1969

ORDER UNDER SUB-SECTION 18(4)

I, SIR ZELMAN COWEN, 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

CONSTRUCTION OF AN AIRCRAFT CORROSION CONTROL FACILITY, RAAF BASE
RICHMOND, NEW SOUTH WALES

L.S.

Given under my Hand and the
Great Seal of Australia
on 30th June 1980

ZELMAN COWEN

Governor-General

By His Excellency's Command,

(Signed) R.J. GROOM
Minister of State for
Housing and Construction

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

AIRCRAFT CORROSION CONTROL FACILITY,

RAAF BASE, RICHMOND,

NEW SOUTH WALES

REPORT

On 30 June 1980, His Excellency the Governor-General in Council referred to the Parliamentary Standing Committee on Public Works for investigation and report to Parliament the proposal to construct an aircraft corrosion control facility at the Royal Australian Air Force Base, Richmond, New South Wales.

The Committee has the honour to report as follows:

THE REFERENCE

1. The proposal is for provision of a modern facility in which aircraft corrosion control procedures can be undertaken under appropriate safety and quality control conditions.
2. The works will consist of:
 - a new hangar;
 - new annexe buildings incorporating store, office, fibreglassing workshop, composite materials workshop and paint rooms;
 - boiler house;
 - air scrubbing plant;
 - flammable liquids store;
 - plant room;
 - pump house;
 - associated site works and engineering services.
3. The estimated cost of the proposal when referred to the Committee was \$7.9 million at May 1980 prices.

THE COMMITTEE'S INVESTIGATION

4. The Committee received written submissions and drawings from the Department of Defence and the Department of Housing and Construction and took evidence from their representatives at a public hearing in Canberra on 25 August 1980.

5. The Committee inspected the existing facilities and the site for the proposed works on 13 May 1980.

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

BACKGROUND

7. Richmond was established in 1925 as Australia's second RAAF Base (after Point Cook, Victoria) when No 3 Squadron was formed and, following the establishment of No 2 Aircraft Depot (No 2AD) on 1 January 1936, continued to grow, particularly during World War II, into a base of major importance. Large scale development has continued at Richmond since World War II and some of the major projects included:

- rebuilding of the runway in 1953;
- concrete taxiways, new hangars, workshops and large aircraft parking areas;
- additional quarters for officers and airmen;
- installation of a hydrant aircraft refuelling system;
- provision of an air-movements terminal building.

With three flying squadrons and No 2AD based at Richmond it has been developed as the home base for the bulk of the RAAF's air transport force. No 2AD has responsibility for the repair, overhaul and modification of maritime and transport aircraft including corrosion control. The Depot provides training for laboratory technicians involved with safety and precision measuring equipment together with continuation training for RAAF

apprentices of all musterings. As part of its technical support role 2 AD provides items from its Central Store for all units at Richmond.

THE NEED

8. The RAAF, for engineering purposes, requires maritime aircraft to be painted to reduce deterioration from corrosion while an operational requirement exists for fighter and bomber aircraft to be camouflaged and others to be painted in high conspicuity colour schemes. The process used in corrosion control entails removal of existing protective paint coatings, detailed examination of the aircraft skin, replacement of any corroded metal and repainting of the whole aircraft. The repainting process can only be carried out in a 15-30 degree Celsius temperature range and must be properly cured by controlled drying.

9. Existing maintenance policy is for aircraft to be painted as their condition requires and inspections to determine this normally coincide with periods of major overhaul. Thus an indication of usage based on the existing maintenance load at Richmond can be gained. Such a facility would at most times contain at least one and possibly two aircraft as well as having the capacity to treat some aircraft sub-assemblies simultaneously.

10. Existing Facilities Aircraft corrosion control is currently carried out in Hangar 322, a steel framed and clad hangar of World War II vintage. A hangar annexe provides for an office, staff amenities, toilets and equipment storage facilities.

11. Some modifications have been made to the concrete floor of the hangar to facilitate drainage of liquid wastes and the collection of semi-liquid sludge. These wastes are composed of water, paint, paint stripper and other chemicals and are stored in a below-ground tank outside the hangar prior to removal to the Metropolitan Waste Disposal Authority's depot presently at Castlereagh. These arrangements are unsatisfactory and will be replaced with a proper on-base trade waste disposal facility included in the Defence New

Works Program 1980-81. This facility will considerably reduce the amount of material to be disposed of off-base and the balance will be accepted by the Metropolitan Waste Disposal Authority depot (see also paragraphs 23 and 24 Appendix A).

12. The existing facility has no environmental control in terms of temperature, humidity, filtration of airborne contaminants or air movement. Airborne toxic wastes are a danger to the health of personnel working in the facility due to the nature of the chemicals and paint used in the corrosion control process. Most of these compounds are man-made and are not easily broken down by nature or the natural processes of the human body. They present a potential environmental pollution problem and a health hazard to persons who come in contact with them. These hazards are increased by the nature of the existing facility which does not permit the implementation of desirable safety standards. Other disadvantages are caused by:-

- the requirement to dismantle aircraft due to the inadequate size of the hangar;
- an improvised work platform system which does not always allow safe access to the aircraft;
- lack of control over atmospheric conditions in the hangar which results in loss of time and reduces the paint finish;
- the impracticality of always wearing protective clothing as it can impede movement.

As a result of these factors the hangar currently used for corrosion control by the RAAF at Richmond has major shortcomings in respect of health, safety, pollution control and the achievement of acceptable engineering standards for corrosion control. Moreover it is wasteful of manpower and reduces aircraft availability.

13. Future Benefits Through the construction of a modern facility it will be possible to greatly improve the working conditions of personnel involved in the corrosion control process and give them a desirable level of protection. Safer working conditions will significantly reduce the time presently taken

to treat aircraft, resulting in greater aircraft availability (around 35 days per annum for each C130 Hercules), savings in workload content of 2620 manhours for the Hercules and 780 manhours for the Orion. Annual financial savings of \$0.9 million can also be expected. The introduction of a proper waste extraction and treatment system will ensure safer disposal of toxic wastes.

14. Committee's Conclusion The existing aircraft corrosion control facilities at RAAF Richmond are makeshift, inadequate and hazardous. Their replacement with a modern facility incorporating proper safety standards is recommended.

THE PROPOSED WORKS

15. Planning and Design The hangar has been designed as a permanent structure to accommodate RAAF maritime and transport aircraft of all present and potential future sizes. The design of the proposed building has drawn on the experience of overseas commercial and military operators to provide suitable modern facilities in which aircraft corrosion control procedures can be undertaken.

16. It will incorporate pollution control, fire suppression and ventilation systems to provide for health, safety and quality control of appropriate standards. Within the hangar a system of suspended work platforms will permit safe access for personnel to all parts of the aircraft being treated. Closed circuit television will be used in combined fire and safety roles providing a standard of surveillance not presently available. The location of the facility near the flight line and runways makes essential varying degrees of noise reduction depending on functional usage. Where high noise equipment is to be located sound attenuation will be incorporated into the design. Construction details are set out in Appendix A.

17. Committee's Conclusion The design of the proposed building is satisfactory.

SITE

18. The corrosion control facility is proposed to be located at the RAAF Base, Richmond which is situated about 60km by road from Sydney in a north-westerly direction between the townships of Windsor and Richmond and has a total area of approximately 200 hectares. The site for the proposed facility fronts Middleton Avenue between existing hangars No 2 and No 4. Use of this site will involve the demolition of five existing buildings and a concrete blast wall together with removal of underground steel tanks adjacent to hangar No 4. The concrete and bitumen floors of an old hangar, areas of concrete aircraft apron and part of the Middleton Avenue roadway are also marked for removal to clear the site for construction.

19. The site does not present a hazard for aircraft approaching the runway and lies outside the approach and side runway clearances required by the RAAF. Use of this site is in accordance with the Master Plan for the overall development of the Base. Moreover it will provide proper access for aircraft as well as maintaining suitable access for aircraft towing vehicles to the facility. Pedestrian and vehicular access to and past the facility on Middleton Avenue, which is a main road within the Base for traffic circulation, will be maintained.

20. Committee's Conclusion The site selected is suitable.

ESTIMATE OF COST

21. The estimated cost of the work when referred to the Committee was \$7.9 million at May 1980 prices made up as follows:

	\$
Building Work	2 900 000
Mechanical Services	2 700 000
Fire Protection	700 000
Electrical Services	600 000
Civil Works	600 000
Hydraulic Services	400 000
	7 900 000

22. Although the Committee was informed that the suspended work platforms are currently unavailable in Australia, it suggests that local manufacture be further investigated. The Committee notes that the costs associated with these items of equipment may affect the estimated cost.

PROGRAM

23. The Department of Defence has accorded this project a high priority due to the below standard conditions currently prevailing and as a consequence the Department was given permission to proceed to detailed design and documentation concurrently with the hearing of the reference. The project will be executed in two phases:

- (a) demolition, site clearing and relocation of services and some external electrical works with a tender target date of March 1981;
- (b) single lump sum contract for all remaining works including nominated sub-contracts for:
 - electrical services
 - mechanical services
 - work platforms
 - fire protection and detection serviceswith a tender target date of July 1981.

24. Committee's Conclusion The Committee recommends the construction of the work in this reference.

RECOMMENDATIONS AND CONCLUSIONS

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

Paragraph

1. THE EXISTING AIRCRAFT CORROSION CONTROL FACILITIES AT RAAF RICHMOND ARE MAKESHIFT, INADEQUATE AND HAZARDOUS. THEIR REPLACEMENT WITH A MODERN FACILITY INCORPORATING PROPER SAFETY STANDARDS IS RECOMMENDED.

14

Paragraph

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|----|---|----|
| 2. | THE DESIGN OF THE PROPOSED BUILDING IS SATISFACTORY. | 17 |
| 3. | THE SITE SELECTED IS SUITABLE. | 20 |
| 4. | THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS \$7.9 MILLION AT MAY 1980 PRICES. | 21 |
| 5. | THE COMMITTEE RECOMMENDS THE CONSTRUCTION OF THE WORK IN THIS REFERENCE. | 24 |


(M. H. BUNGEY)
Chairman

Parliamentary Standing Committee
on Public Works,
Parliament House,
CANBERRA. ACT

11 September 1980.

CONSTRUCTION

1. Structure The hangar is required to provide covered and enclosed space for a range of aircraft and to accommodate this requirement it will be 55 metres wide (clear) and 57 metres long (clear) with a minimum clear height for aircraft tailplane access, of 15 metres. The structure will have a steel frame with metal cladding to roof and walls and internal insulation to prevent heat gain and avoid condensation. Wall cladding will be of a ribbed profile sheet metal treated for resistance to corrosion and finished with a coloured surface.
2. The main doors will be steel framed and clad with the same material used for the walls. They will be electrically powered but also capable of manual operation in the event of power failure. Other doors will provide normal access and fire escapes except for the central doors facing Middleton Avenue which will give aircraft tug connections and exit from and entrance to the facility during towing operations.
3. The foundations will be concrete pad footings. A concrete floor to accommodate aircraft loadings will be built to required gradients and topped with a non-slip finish. Grated drains will be set in the floor to collect any waste liquid washdown or discharges from the fire suppression system. The grated floor openings and under floor ducts will also be used to remove air from the hangar thus providing a directional flow ventilation system.
4. No natural lighting will be provided as this is considered unacceptable in a facility of this nature due to glare, hot spots in summer, excessive heat loss in winter and difficulties associated with acoustic isolation.
5. Access stairs will be provided as necessary to plant rooms and crane docking bays with walkways provided to service otherwise inaccessible lights and fire safety equipment.

6. Associated buildings in the complex will be constructed of load bearing brick walls, concrete floors and metal roofing. As necessary the functional requirements of each of the spaces in the buildings will be provided for and internal finishes will be appropriate to their use. Roof drainage will be achieved by use of gutters and downpipes.

7. Electrical Services Light and power will be reticulated as required throughout the facility from the M.V. switchboard. Following consultations with the supply authority, hazardous areas in the vicinity of the aircraft will be fitted with flameproof light fittings and power outlets. These fittings will also be used in the paint rooms, fibreglass workshops and work platforms. The high light fittings in the hangar will not be flameproof but will be fitted with visors while those in plant rooms and offices will be normal fluorescent type. External lighting will be provided to give reasonable vision for pedestrian movement and to generally illuminate the associated aircraft apron.

8. An aircraft earthing system will be installed comprising a number of earth stakes driven under the hangar floor at suitable locations, each point being complete with a surface 'star' connection point. Automatic escape lighting will be provided on work platforms and at strategic locations throughout the hangar to enable evacuation in the event of a mains power failure.

9. Electricity Supply and Reticulation - High Voltage
The proposed facility will increase the maximum demand of the RAAF Base and discussions with Prospect County Council show the need for a 33kV/11kV zone substation which would be installed by the Council. Associated with this it is proposed that a new electrical intake station located close to the zone substation, be included in this project.

10. The corrosion control facility will receive its electrical supply from substations located external to the buildings, with the two substations being interconnected with underground cabling.

11. Electricity Supply and Reticulation - Low Voltage
The medium voltage supplies would emanate from each substation and terminate at the respective medium voltage switchboards located in each plant room. A medium voltage interconnection will be provided between the substations for emergency use.
12. Security Four closed circuit television cameras will be located at strategic points in the hangar to give overall surveillance. Each camera will have its own monitor located in the security/control office. A public address system will be provided for communication between the hangar control room and the main hangar. The system will incorporate an intercom to the work platforms.
13. Mechanical Services A ventilation system is proposed to produce a directional flow throughout the hangar. The supply air pattern will be distributed into independent operating zones each having its own heating coils and fan arrangements. Supply air jets will be adjustable so that the required velocities are obtained.
14. Exhaust air will be drawn out through floor gratings so placed to assist in directing air streams from the supply jets. Exhaust air will be filtered by water spray scrubbers on each side of the hangar prior to discharge above roof level. Air will not be recirculated through the ventilation system.
15. A compressed air service will be provided through a ring main reticulation system to appropriate locations in the facility.
16. Two roof hung travelling crane type bridge and trolley units will be provided, each with hanging telescopic structure and rotating platform. Each work platform will normally operate in its own half of the hangar but can, in the event of a breakdown or during maintenance, be taken out of service by shunting it into a service bay. The remaining work platform can then operate throughout the hangar by a simple switching-rail interlocking system. Control and operational equipment will be provided on the work platforms together with approved safety escape equipment for the personnel in case of fire or power failure.

17. Fire Protection An automatically operated suppression system of floor mounted monitors capable of both vertical and horizontal oscillation and using aqueous film forming foam (AFFF) will be installed. A wet pipe sprinkler system will be incorporated to serve specific areas on parts of the facility used for ancillary activities.

18. A fire detection system will be provided comprising fire indicator boards and manual call points, together with smoke, flame and heat detectors. A dual system based on flame and obscuration detectors will be provided in the hangar area.

19. Civil Engineering The aircraft pavement will be constructed up to the front of the hangar and, as with the hangar floor, will be of concrete capable of supporting the required aircraft weights. Drainage will be provided to prevent water entering the hangar and to collect it from aircraft apron areas.

20. Hydraulic Services The site is adequately serviced by the existing Base water supply system but as this system also provides water for fire sprinkler systems, provision of the foam monitors will necessitate augmentation of the Base pumping and distribution installations. To provide the required flow rates the capacity of the pumps will be enlarged and an additional trunk main constructed.

21. The facility will be connected to the existing sewerage system which has the capacity to cope with the additional load.

22. Stormwater will be piped from the buildings and paved areas to existing stormwater systems. New kerb and guttering will be provided along the Middleton Avenue frontage.

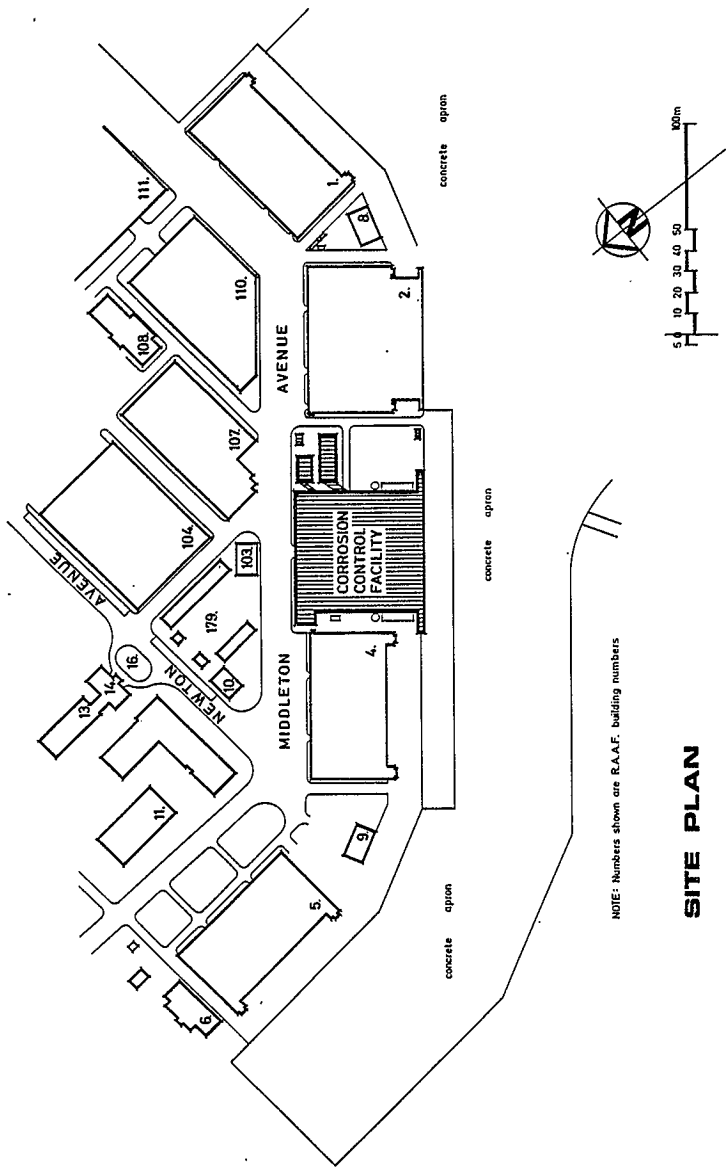
23. Pollution Control Polluted liquid from the aircraft washdown, corrosion control activities and fire suppression discharges will be collected by the underfloor trench system, isolated from the stormwater system and fed to below ground holding tanks on each side of the hangar

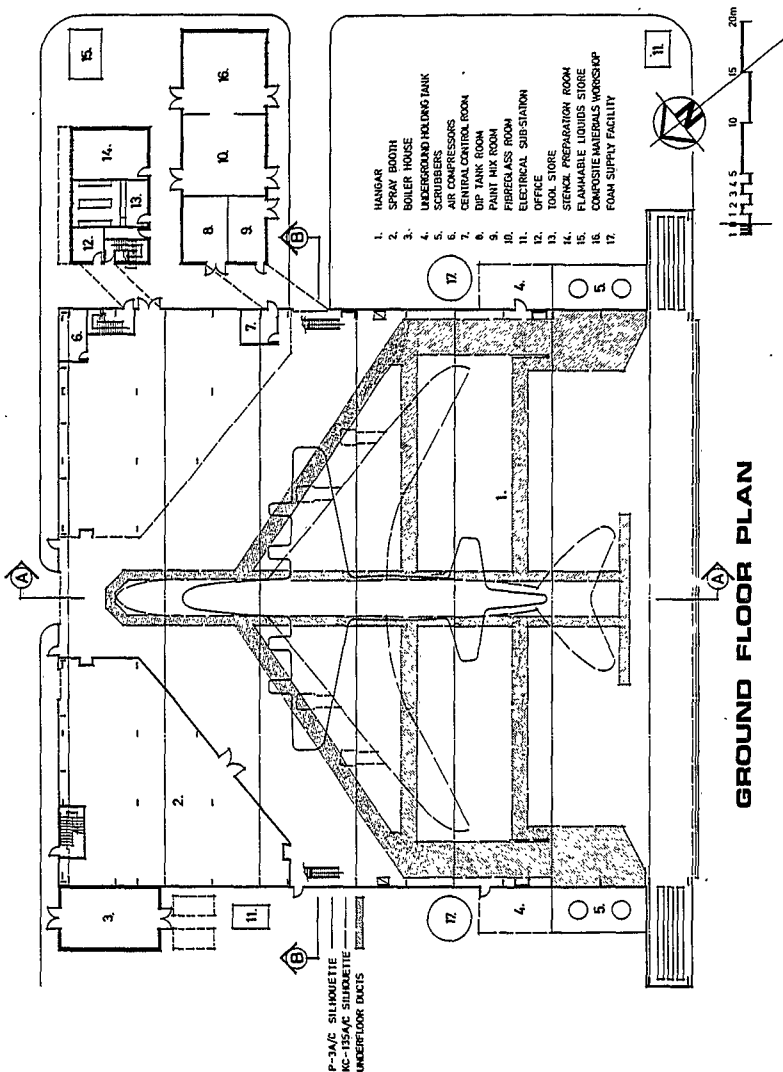
24. The contents of the holding tanks and trenches will be pumped to a proposed pollution - trade waste treatment facility designed for handling and treating currently used products prior to discharge to the sewerage system. The new treatment facility is not part of this reference, but is included in the Defence New Works Program 1980-81. Sludge residual waste from this plant will be transported to an industrial waste disposal area and will be of an acceptable nature for such disposal as determined by the Metropolitan Waste Disposal Authority.

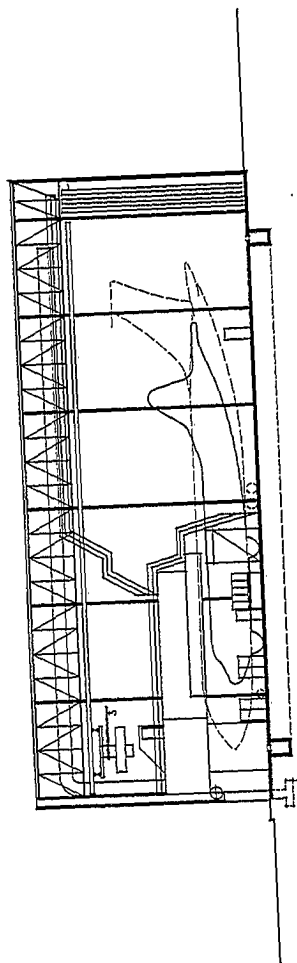
25. Car Parking While vehicular access will be provided to the complex, no specific parking areas are included in this proposal as it is considered by the RAAF that sufficient space is available along Middleton Avenue.

26. Liaison with Authorities The plan has been developed by the Department of Housing and Construction in consultation with the Department of Defence. The Department of Science and the Environment has issued an environmental Certificate of Compliance in respect of the Environment Protection (Impact of Proposals) Act 1974-75.

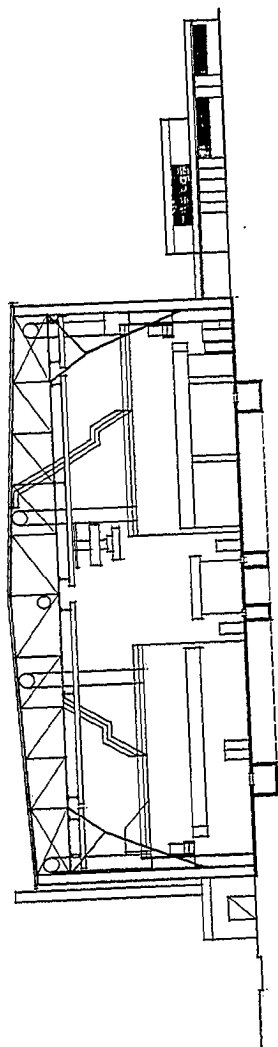
27. Appropriate portions of the plan have been discussed with and agreed to by the Prospect County Council, the Windsor Municipal Council, the Metropolitan Water, Sewerage and Drainage Board and the Metropolitan Waste Disposal Authority.







SECTION A-A



SECTION B-B