

Parliamentary Standing Committee on Public Works

REPORT

relating to the proposed construction of

RESEARCH LABORATORY COMPLEXES FOR THE C.S.I.R.O. DIVISIONS OF APPLIED ORGANIC CHEMISTRY AND MATERIALS SCIENCE

at

Clayton, Victoria

(Fourth Report of 1980)

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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

R E P O R T

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DIVISIONS OF
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AND MATERIALS SCIENCE

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EXTRACT FROM
THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES,
NO.152 DATED 6 MARCH 1980

- 19 PUBLIC WORKS COMMITTEE - REFERENCE OF WORK - C.S.I.R.O.,
CLAYTON, VIC. - RESEARCH LABORATORY COMPLEXES:
Mr. Groom (Minister for Housing and Construction),
pursuant to notice, moved - That, in accordance
with the provisions of the Public Works Committee
Act 1969, the following proposed work be referred
to the Parliamentary Standing Committee on Public
Works for investigation and report: Construction
of research laboratory complexes for C.S.I.R.O.
Divisions of Applied Organic Chemistry and Materials
Science, Clayton, Vic.

Mr. Groom presented plans in connection with the proposed
work.

Question - put and passed.

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WITNESSES

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

RESEARCH LABORATORY COMPLEXES
FOR THE CSIRO DIVISIONS OF
APPLIED ORGANIC CHEMISTRY
AND MATERIALS SCIENCE,
CLAYTON, VICTORIA

R E P O R T

By resolution on 6 March 1980, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament the construction of research laboratory complexes for the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Divisions of Applied Organic Chemistry and Materials Science at Clayton, Victoria.

The Committee has the honour to report as follows:

THE REFERENCE

1. The proposal referred to the Committee is for the construction of research laboratory complexes, technical, administrative and support facilities on an existing CSIRO site at Clayton, Victoria, adjacent to Monash University.
2. The proposed new facilities will comprise:
 - research laboratories;
 - administrative accommodation;
 - library extensions;
 - stores and workshops;
 - technical testing facilities;
 - a special hazards laboratory; and
 - support facilities, including roads, car parks and landscaping.

3. Library and canteen facilities will be shared with the Divisions already on the site and with the Division of Chemical Technology which is to be constructed in the near future.

4. Laboratory and administration areas for the complexes will be concrete framed and clad with low maintenance materials including concrete, masonry and lightweight cladding. The design of the buildings and landscaping will complement existing site developments.

5. The estimated cost of the proposal at February 1980 prices is \$19.0 million, being \$8.85 million for the Division of Materials Science and \$10.15 million for the Division of Applied Organic Chemistry.

THE COMMITTEE'S INVESTIGATION

6. The Committee received written submissions and drawings from the CSIRO and the Department of Housing and Construction and took evidence from their representatives at a public hearing in Melbourne on 10 and 11 April 1980. The Committee also received written submissions and took evidence from representatives of the CSIRO Laboratory Craftsmen's Association and from Mr. David B. Ellson, CSIRO Technical Staff. In addition, the Committee received letters from a number of organisations supporting the proposal.

7. Prior to the public hearing, the Sectional Committee inspected the existing facilities of the Divisions of Applied Organic Chemistry and Materials Science at Fishermen's Bend and the headquarters of the Division of Materials Science located on the campus of the University of Melbourne at Parkville.

8. The Committee had previously visited the Clayton site during a site inspection for the Division of Chemical Technology complex in 1979.

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

BACKGROUND

10. The research Divisions of the CSIRO are grouped amongst the following five institutes:

- Animal and Food Sciences;
- Biological Resources;
- Earth Sciences;
- Industrial Technology;
- Physical Science.

11. The Division of Applied Organic Chemistry is within the Institute of Industrial Technology; the Division of Materials Science is within the Institute of Physical Sciences.

12. Division of Applied Organic Chemistry The Division traces its origins to 1940 when the Council for Scientific and Industrial Research (CSIR) created the Division of Industrial Chemistry. The CSIR recommended the Division's laboratory to be located on land leased to the Commonwealth at Fishermen's Bend adjacent to the CSIR Aeronautical Research Laboratories, with other accommodation made available at the University of Melbourne and the Melbourne Technical College.

13. Principal elements of the Division came together in 1942 in the first major laboratory complex constructed at Fishermen's Bend. It consisted of small office buildings, four factory-type brick bays for pilot scale work and an array of discarded army huts.

14. As work expanded, the deficiencies of the site became apparent and the CSIR unsuccessfully attempted to persuade the Government to provide a new site for the Division leaving the Fishermen's Bend site for the Division of Aeronautics.

15. The Division of Aeronautics was transferred to the Department of Supply in 1949, the same year that the organisation's name was changed to CSIRO. A security fence separating areas occupied by the Division of Industrial Chemistry and the Division of Aeronautics was subsequently constructed.

16. The status of the Division of Industrial Chemistry was changed in 1958. It became the CSIRO Chemical Research Laboratories and its two largest sections became Divisions, the Division of Chemical Physics and the Division of Physical Chemistry. In 1961, the Organic Chemistry section was accorded divisional status, becoming the Division of Organic Chemistry.

17. In 1966, the Divisions of Organic Chemistry and Physical Chemistry were amalgamated to form the Division of Applied Chemistry. The Chemical Research Laboratories complex was dissolved in 1970, all constituent Divisions becoming autonomous entities.

18. Because of the size and diversity of activities embraced by the Division of Applied Chemistry, the CSIRO Executive divided these activities and created two new Divisions. Thus, in February 1974, the Divisions of Applied Organic Chemistry and Chemical Technology came into existence.

19. Current Research Activities The current research activities of the Division of Applied Organic Chemistry are directed towards the fields of energy, biological organic chemistry and polymer science and are summarised as follows:

- energy research related to the production of hydrogen by light-induced reactions and the production of a satisfactory refinery feedstock from coal;
- biological organic chemistry research related directly to a variety of national significant problems including the control of insect pests of stock and crops and the immunisation of sheep and cattle against certain toxins occurring in pastures;
- polymer science programs including the development polymer-drug combinations for use in stock treatment, the application of resins for the control of water pollution and the development of new plastics and formulations for industrial application of polymers.

20. The research programs involve either a joint approach with other CSIRO Divisions or between relevant departments at Monash University or nearby industrial research laboratories.

21. Origins of the Division of Materials Science The Division has its origins in the CSIR Lubricants and Bearing Section established in 1939 in the Chemistry Department of the University of Melbourne. Its name was subsequently changed to the Division of Tribophysics and at the end of World War II, because the university campus was relatively sparsely populated, it remained in the Chemistry Department until 1953 when the building which it presently occupies was completed.

22. The Division then underwent considerable diversification towards general materials research in metal and metallic derivatives.

23. In 1970, the Engineering Ceramics and Refractories Group, located at Fishermen's Bend, was added to the Division following a reorganisation of the Division of Applied Mineralogy.

24. In 1977, the name of the Division was changed to the Division of Materials Science.

25. Current Research Activities The thrust of the Division's present work is related to two broad research programs which are summarised as follows:

- Catalytic Materials and Catalytic Processes.
This program is concerned mainly with processes for the production of transport fuels from conventional and new sources and for the production of petro-chemical feedstocks by novel and improved routes.
- Ceramics as advanced Engineering Materials.
This program involves the development and application of advanced materials for use in vital components in machinery.

Both programs are designed to enhance the viability of Australian industry.

26. Originally, it was proposed to include the staff of the Production Technology Unit, located at Fitzroy, in the proposal. However, organisational changes within CSIRO have caused this arrangement to be no longer appropriate.

THE NEED

27. The need for new facilities has arisen from a combination of deficiencies applying at the Fishermen's Bend site, location of the Division of Applied Organic Chemistry and the Ceramics Group of the Division of Materials Science and at the Parkville site, headquarters and major laboratories of the Division of Materials Science. These deficiencies are set out below:

28. Deficiencies at Fishermen's Bend - Location The laboratories at Fishermen's Bend are 40 years old, having been constructed when the area was relatively undeveloped and free of air-borne particulate matter. Since then, heavy engineering industries, wharves and substantial chemical industries have become established adjacent to the site. The resultant pollution, dust, corrosive fumes, noise and excessive vibration severely limit the extent to which precise electronic instruments can be effectively employed on research.

29. Buildings The design of the three main buildings on the site makes them difficult to adapt to current requirements. The more modern of the three buildings, now used for organic chemistry, was designed in 1947 as a biochemistry laboratory when air ventilation requirements were less stringent. The other two main buildings lack temperature control measures and are unsuited to advanced research. The remainder of the accommodation consists mostly of ex-army timber-framed, iron-clad huts and represent a significant proportion of total usable floor area.

30. Site The Aeronautical Research Laboratories (ARL) now occupy the land and buildings vacated by the Divisions of Chemical Physics and Mineral Engineering which moved to Clayton in 1964 and 1970. The residual site at Fishermen's Bend is now fragmented and difficult to manage and contains a haphazard

arrangement of buildings shared between the Division of Applied Organic Chemistry and the Division of Materials Science ceramics laboratory. The recent erection of a security fence around the ARL tenure, which arbitrarily sub-divides the property, has compounded the problem of site management.

31. Tenure The CSIRO portion of the Fishermen's Bend property is leased from the Victorian Government until 1988 for a current nominal ground rental of \$730. The Department of Administrative Services has indicated it is now the policy of the Victorian State Government to seek fair market rent for all its leased properties and the Department has estimated that a new lease negotiated after 1988 would cost about \$0.25 million per annum for the entire site of which the CSIRO share would be approximately \$0.115 million per annum.

32. Services Adequate supplies of clean pure water are an important requirement for chemical research. The water supply to the site is unreliable and not of suitable quality for research purposes. Filtration units have been installed requiring considerable expenditure on equipment and running costs for water purification. The Department of Housing and Construction has advised the only solution to the quality and water pressure problems would be to replace the water reticulation system. This would cost the same as providing new facilities elsewhere on a more suitable site.

33. Deficiencies at Parkville - Building The headquarters and major laboratories of the Division of Materials Science are housed in a three-storey steel-framed masonry building located on the campus of the University of Melbourne. The campus is densely occupied and physically congested. Research work being carried out in the building bears little resemblance to which it was originally designed. No horizontal or vertical expansion is possible; there is insufficient floor space for present purposes and the number

of staff accommodated; the sizes of laboratories are inappropriate to modern requirements; floors have an inadequate load-bearing capacity for existing laboratories to be enlarged by removing internal walls.

34. Safety Research currently being undertaken involves the use of potentially hazardous solvents requiring adherence to strict safety and working conditions. Maintenance of a safe working environment is compromised by difficulties of adequately fire isolating and protecting existing laboratories. The local environment and the existing structures make it almost impossible to instal further fume cupboards.

35. Tenure Tenure at the Parkville site is covered by a Permissive Occupancy Agreement under which no rental is paid but a charge of \$4000 is made for services. The Permissive Occupancy Agreement expires in May 1980. The Department of Administrative Services is currently negotiating with the University for a renewed lease of the Parkville laboratory until alternative accommodation can be provided for the Division. It seems certain that the University will agree to no more than a three-year term with the option of a further one year, carrying a minimum rental of about \$100 000 plus service charges.

36. Dispersal From its inception, the work of the Division of Materials Science has been of an inter-disciplinary nature. The fundamental knowledge of surfaces and crystal structure gained by staff at the University site is applied to the development of advanced ceramics by staff at Fishermen's Bend. Conversely, the extensive knowledge of powder technology possessed by Fishermen's Bend scientists is used to formulate new catalysts by the University group. At present, use of equipment not duplicated necessitates travel between sites. Resource management under these conditions is difficult and

inefficient. It involves the continuous redeployment of staff from one project and site to another with consequent interruption to work and the duplication of costly equipment. There are clear benefits to be obtained by laboratory staff being located on the one site.

37. Summary In summary, scientific research of important national significance being carried out by the two Divisions is being adversely limited by the ages and design of existing buildings, by site and tenancy factors, by environmental conditions, by safety and by the condition and unavailability of adequate reticulated services.

38. Committee's Conclusion The Committee accepts that current accommodation for the CSIRO Divisions of Applied Organic Chemistry and Materials Science at Fishermen's Bend and the University of Melbourne are unsatisfactory and should be replaced.

THE PROPOSAL

39. The proposal is the fourth stage of a five stage plan, initially formulated in the late 1950s by the CSIRO Executive, aimed at consolidating CSIRO chemical research related to industry at Clayton, Victoria. Land acquired in 1961 for the consolidation comprises 15.4 hectares adjacent to the Monash University campus.

40. The proposal is for the construction of modern laboratories and associated buildings for the CSIRO Divisions of Applied Organic Chemistry and Materials Science. As mentioned previously, two Divisions - the Division of Mineral Engineering and the Division of Chemical Physics, are already on the site. The works for a third Division, Chemical Technology, which were approved last year, will commence shortly. See Plan A at the end of this report.

41. Master Planning The proposed location of the Applied Organic Chemistry complex reflects the planning of the Division of Chemical Technology with laboratories to the south, central shared facilities and technical bays and workshops and stores to the north.

42. Laboratories for the Division of Materials Science complex are proposed for the west of the site with technical bays and stores to the east. This functional layout is designed to accommodate sharing of a library with the Division of Chemical Physics and to facilitate the use of the site conference room, canteen and amenities located in the Chemical Technology/Applied Organic Chemistry complex.

43. In addition to master planning aimed at achieving cost savings by sharing facilities with related Divisions, the proposed new work will be compatible in form and scale with the proposed Chemical Technology complex and with existing buildings in the immediate environment.

44. Design - Applied Organic Chemistry The research laboratories will be accommodated in two, three-storey blocks, one housing all organic research laboratories, the other housing all general laboratories. The organic research laboratory block has been developed around a system of laboratory modules. The general laboratory block has been designed to ensure minimal interference from vibration, dust, temperature variation and electro-magnetic sources.

45. The administration building will join on to the Division of Chemical Technology complex and will be extended on the ground and first floor. The conference room and canteen on the ground floor will be extended to provide an additional amenities area. The Chemical Technology library on the first floor will be extended to permit amalgamation with the Applied Organic Chemistry library.

46. The process bays, forming part of a combined complex also housing the technical bay, will house the organic process and hydrogenation bays. Each area will have a large, high ceiling open work space with a mezzanine level, monitoring laboratory and beam crane.

47. The technical bay, separated from the process bays by a common plant room, is a basic laboratory designed for activities which for reasons of scale, safety and utility are best not conducted in research laboratories.

48. The isolated hazards laboratory is a small isolated unit for handling particularly noxious and toxic chemicals and small quantities of unstable compounds. It will be a separate structure remote from other buildings and will consist of an organic laboratory and blast room.

49. The workshop and stores building to be constructed as part of the Chemical Technology complex will be extended to provide additional storage. The facilities will be shared between the Divisions of Chemical Technology and Applied Organic Chemistry. Likewise, the separate isolated building to be constructed for the Division of Chemical Technology will also be extended to act as a bulk solvent stores building and serve the needs of Applied Organic Chemistry and Materials Science.

50. A small paved area, surrounded by a security fence will be provided for a solar radiation area.

51. Design - Materials Science The research laboratories will be provided in a three-storey building containing facilities for catalytic chemistry, general chemistry, analytical services and technical services. The laboratories will link to the Division of Chemical Physics through their shared library. Services to the laboratories will be provided from an adjoining plant block.

52. The administrative services building and library extension will be a two-storey building comprising offices and support elements. Its location will allow ready access from the research laboratory and other parts of the complex. The existing library in the Division of Chemical Physics will be extended and redeveloped to link with the new laboratory building.

53. Technical testing bays to house large-scale equipment, associated monitoring laboratories and a catalytic processing bay will be housed in a steel-framed building.

54. The two-storey stores building will be functionally located between the technical testing bays and the machine processing bays with convenient access from the research laboratory.

55. The machine process bays for heavy sheet metal and light machining and related activities will be provided in a high ceiling steel-framed building. Beam cranes will also be provided.

56. Committee's Conclusion The design of the two proposed complexes is satisfactory.

57. Sharing of Facilities The buildings of each Division are to be grouped according to Institute thereby permitting rationalisation of support services.

58. The Divisions of Applied Organic Chemistry and Chemical Technology are affiliated with the Institute of Industrial Technology. Facilities forming part of the Division of Chemical Technology will be extended to allow for joint use with the Division of Applied Organic Chemistry. In addition, facilities such as the canteen, conference room, bulk solvent stores and a hazards laboratory, which are being provided for the Institute of Industrial Technology, will be available to all on-site staff.

59. The Divisions of Materials Science and Chemical Physics are affiliated with the Institute of Physical Science. Existing facilities of the Division of Chemical Physics will be shared by both Divisions. The facilities will include the library, which will be extended, carpentry workshop, glassblowing and liquid nitrogen store.

60. In evidence to the Committee, the Department of Housing and Construction advised that substantial cost savings will result from the sharing of facilities. The workshop and store shared between Chemical Technology and Applied Organic Chemistry

would save about \$450 000; the site cafeteria being provided for the predicted 600 personnel on the site would save about \$80 000 as against providing separate smaller cafeterias in each Division; in the administrative function between Chemical Technology and Applied Organic Chemistry there would be a total saving of about \$290 000, the bulk of which being attributable to the shared library; the site conference room would provide a saving of about \$50 000. In all, the Department of Housing and Construction estimates about \$780 000 has been saved because of the concept of sharing.

61. Committee's Conclusion The Committee commends CSIRO for deciding that a number of facilities should be shared between Divisions, resulting in substantial capital and recurrent savings.

THE SITE

62. The facilities will be constructed on portion of a 15.4 hectare Commonwealth property located immediately north of Monash University in the City of Oakleigh, Victoria.

63. The site is being developed by CSIRO as the major centre for chemical oriented research related to industry in Victoria. The environment at Clayton is eminently suited to scientific research.

64. In deciding to proceed with the proposal to relocate the two Divisions at the Clayton site, CSIRO examined four alternatives but these were discarded for various reasons. Firstly, it was not possible for the headquarters and major laboratories of the Materials Science Division to remain at Parkville beyond 1984 as the University of Melbourne has directed that the building be vacated. Secondly, should another site for the headquarters be found, the inefficiencies of operating on two sites would continue. In addition, the Department of Administrative Services believes there is no suitable laboratory accommodation available for leasing in the Melbourne area. Thirdly, the upgrading of the Fishermen's Bend site to accommodate the Parkville group of Materials Science was also considered but discarded because of the inability to satisfactorily control the adverse environmental conditions even with upgraded services.

In addition, it was deemed inadvisable to make a large capital investment on leased land necessitating high recurrent leasing charges compared to the cost of new facilities on a site owned by the Commonwealth. Fourthly, construction of new facilities on a site other than Clayton was investigated. CSIRO advised that it had a 12 hectare site at Mulgrave, 6 km beyond Clayton, but this was not serviced to the same extent as the Clayton site. If the Divisions were relocated outside Melbourne, staff transfer costs and massive disruptions to ongoing research would be incurred. Construction costs outside the Melbourne metropolitan region would incur cost penalties of up to 20 per cent. For these reasons this option also was discarded in favour of the site at Clayton, which is fully serviced and has adequate room for the relocation of the two Divisions.

65. Since acquisition of the site in 1961, it has always been the intention of CSIRO to locate six laboratory complexes for chemical research related to industry at Clayton. The basic plan has been endorsed by the Committee at previous inquiries, as detailed below:

- New Chemical Physics Laboratory Building, Report presented 20 April 1961;
- Laboratory and Ancillary Buildings for the Division of Chemical Engineering, Report presented 27 September 1966;
- Research Laboratory Complex for CSIRO's Division of Chemical Technology (3rd Report of 1979) presented 23 May 1979 (Parliamentary Paper 147/1979).

66. A draft Environmental Impact Statement was submitted to the then Department of Environment, Housing and Community Development by CSIRO in 1975 for the proposed development of the site. In March 1980, the Department of Science and the Environment, now responsible for the Environment Protection (Impact of Proposals) Act 1974, confirmed that no further action was required on the understanding that continuing consultation would take place with relevant State and local authorities during development of the proposals. The Committee was assured that this would be done.

67. The site is zoned "Public Purposes - Commonwealth" in the Melbourne and Metropolitan Board of Works Planning Scheme 1968 and this proposal conforms with plans for future development.

68. Essential underground services are already available with sufficient capacity for proposed development. The existing water reticulation system will require upgrading.

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

CONSTRUCTION -

DIVISION OF APPLIED ORGANIC CHEMISTRY

70. Structure The research laboratories will consist of two, three-storey reinforced concrete structures with concrete floor slabs. The administration building, being constructed with the Division of Chemical Technology, will be extended on the ground and first floor levels to accommodate the Division of Applied Organic Chemistry. The extensions will comprise a reinforced concrete frame structure. The process and technical bay buildings will be steel framed structures with internal concrete fire separation walls. The isolated hazards laboratory will be of reinforced concrete with an earth bank for extra protection.

71. External Finishes A feature of the design of both laboratory blocks is the external balconies, a concept which was developed for the Division of Chemical Technology. These balconies provide an alternative means of escape from potential fire and toxic hazards within the laboratories. They also give sun protection to windows and facilitate ready access to the full range of reticulated services from outside the laboratories thus providing ease of maintenance and flexibility.

72. Internal fitting out in the research laboratory blocks will be of economical low maintenance fire-resistant materials and finishes. Laboratory ceilings will be painted off-form concrete; office ceilings will be painted plasterboard. Partitions will be plasterboard and floors sheet vinyl and built-in laboratory furniture will be provided. The administration building, an extension of the Chemical Technology complex, will have carpeted floors, acoustic tile ceilings and most walls will be painted plaster.

73. Mechanical Services A plant block located adjacent to the research laboratories will house the central refrigeration system and the necessary plant for air handling and chilled water for laboratory use, compressed air, de-ionised water, low pressure steam, vacuum plant and the main electrical substation and switchboard.

74. Another plant block, located between the process and technical bays, will house the central gas-fired boiler and air handling equipment for the process bays. A separate plant room housing air handling equipment and supplementary services will be provided in the administration building.

75. Fume Cupboards Protection of staff from potentially toxic chemical hazards will be primarily achieved by the provision of fume cupboards or hoods in relevant working areas. Air pressures in laboratories will be lower than in corridors to facilitate the flow of air towards fume cupboards.

76. Air Conditioning All occupied areas of research laboratories will be air conditioned. Air handling plant will be located at each level of the plant block. Air conditioning to the general offices, amenities areas, library extensions of the administration wing will be provided by extending the Chemical Technology system. Offices and laboratories in process bays will also be air conditioned.

77. Heating and Ventilation Heating will be provided by radiant panel heaters in the process bays, technical bay, workshop and occupied stores areas. Radiant heaters will be serviced from the central gas-fired hot water boiler and ventilation to these areas will generally be by natural means.

78. Laboratory Services Services comprising gas, vacuum, compressed air, steam, de-ionised water, domestic hot water and special gases will be provided throughout the laboratories.

79. Fire Protection Overall design of the complex recognises the potential fire hazard by separating buildings and isolating areas within buildings. Each building will be fully sprinklered. Pressure differences between corridors and laboratories will afford some smoke control in the event of fire. Fume cupboards will have self-contained 'Halon' extinguishing units. All buildings will be linked to a fire indicator board, master fire indicator board and the local fire station. External hydrants will be provided and fire brigade connection points will be located at the northern and southern extremities of the complex.

80. Storage of Solvents Storage of solvents for day to day use will be in specially designed and ventilated cabinets in each laboratory module. Back-up supplies will be in discreet solvent stores, one on each floor. Bulk solvents will be stored in the isolated bulk solvent store located in a remote part of the site.

81. Electrical Services Electrical power to the complex will come from a substation in the plant block. The supply of high voltage power to the substation will be by underground cable from the existing main substation at the rear of Chemical Physics. Each laboratory module will be supplied from an individual distribution board. A standby diesel alternator set will be installed to provide emergency power to essential load areas in the event of a mains failure.

82. Lighting will generally be by fluorescent fittings and illumination levels will be designed to comply with the Australian Lighting Code recommendations. An emergency warning and evacuation system will be provided throughout the complex and will be an extension of the system provided for Chemical Technology.

83. Disposal of Laboratory Wastes All laboratory sinks will be connected to a neutraliser pit prior to discharge to the Melbourne and Metropolitan Board of Works sewer. All such wastes will be the subject of a trade waste agreement between CSIRO and the Melbourne and Metropolitan Board of Works. Most laboratory solvent wastes will be separated, stored and collected for treatment and recycling by a licensed industrial waste collector. Those few solvents that cannot be separated will be stored for collection and disposal by a contractor registered and approved in accordance with Victorian State Regulations. Radio-active wastes from the Division of Applied Organic Chemistry will be relatively small in quantity and of very low potency. Storage and disposal of these wastes will comply with the provisions of the Irradiating Apparatus and Radio-Active Substances Regulations included in the Victorian Health Act.

CONSTRUCTION -
DIVISION OF MATERIALS SCIENCE

84. Structure The research laboratory building will consist of a three-storey structure of reinforced concrete with concrete floor slabs. The administrative services building will be of two storeys also of reinforced concrete frame. The technical testing bays and machine processing bays will be steel frame buildings and the stores building will have a reinforced concrete frame structure with internal fire isolating concrete block walls.

85. Internal Finishes Internal finishes in the research laboratory building and administrative building will be similar to those provided in comparable buildings for Applied Organic Chemistry. Floor finishes in the machine process bays will be industrial parquetry for machining, grinding and other work areas, while granolithic quarry tiles and vinyl sheets will be provided to other areas as required.

86. Mechanical Plant A plant block adjoining the research laboratory building will house the central refrigeration system, all air handling plant including the chilled water to be reticulated to serve the various air handling plants throughout the complex. It will also house the primary plant for compressed air, de-ionised water and chilled water for laboratory use, as well as the vacuum plant and the main electrical substation and switchboard.

87. A plant room within the stores building will house the central gas-fired boiler and air handling plant for the machine process and technical bays. A small separate plant room will house air handling equipment for the administrative services building.

88. Fume Cupboards These will be similar to those for Applied Organic Chemistry.

89. Air Conditioning Air conditioning will be provided to all occupied areas in the research laboratory and administration areas and the electronics suite in the administrative building. Office and laboratory areas in the machine process and technical

testing bays will be provided with air conditioning from separate package units located in the plant room in the adjacent stores building.

90. Heating and Ventilation This will be the same as for the Applied Organic Chemistry complex.

91. Laboratory Services As with Applied Organic Chemistry services comprising gas, vacuum, compressed air and de-ionised water, domestic hot water and special gases will be provided throughout the laboratory building.

92. Fire Protection The same fire protection measures proposed for Applied Organic Chemistry will be provided, i.e. fully sprinklered, fire hazard separation, pressure differences, and a fire indicator board.

93. Storage of Solvents Similar arrangements to those proposed for Applied Organic Chemistry will apply.

94. Electrical Services Electrical power to the Materials Science complex will be supplied from a substation to be located adjacent to the research laboratory building. High voltage power to the substation will be supplied from the underground reticulation system proposed for the Division of Organic Chemistry. Each laboratory module will be supplied from an individual distribution board. Areas housing sensitive equipment will be electrically isolated. Low voltage alternating current will be reticulated to areas housing equipment associated with Ceramics Engineering. As with Applied Organic Chemistry a standby diesel generator set will be installed to provide emergency power to essential load areas in the event of mains failure.

95. Disposal of Laboratory Waste Arrangements similar to those for Applied Organic Chemistry will apply. Materials Science does not expect to produce any radio-active waste.

96. Roads and Car Parking The central area of the site will be maintained as an exclusive pedestrian zone. The main requirements for road works embrace road work extensions, paved areas and connections between complexes.

97. Public transport services to this site are poor necessitating adequate provision for private transport. Accordingly, car parking spaces, 90 for staff and visitors of Applied Organic Chemistry and 80 for Materials Science, will be provided.

98. Consultations with Local Authorities Officers of the City of Waverley, City of Oakleigh and Monash University indicated their general acceptance of the proposal.

99. Staff Consultations The two Divisions conducted surveys of their staff and representatives of staff associations. The results indicate substantial acceptance of the move to Clayton.

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

OCCUPATIONAL HEALTH CENTRE

101. In evidence, the CSIRO included in their design brief to the Department of Housing and Construction the provision for a site first aid station similar to one operating at Fishermen's Bend. The Department of Housing and Construction accordingly allowed space of 15m² for this in their design.

102. The facility at Fishermen's Bend is staffed by a full time sister, attached to the staff of the Aeronautical Research Laboratories, and a CSIRO safety officer. It provides treatment for on-site accident victims, twice-yearly general preventative health surveys and safety training. It is also serviced by a visiting doctor from the Health Department.

103. The CSIRO was not aware that its first aid station at Fishermen's Bend was more in the nature of an occupational health centre. The Committee was advised that an allowance of 56m² would need to be made for an occupational health centre, being the minimum requirement under the National Health and Medical Research Council's Guide to Occupational Health Services.

104. CSIRO believed that a site occupational health centre at Clayton is required in view of the expected 600 personnel to be employed and the sometimes hazardous nature of activities performed.

105. Committee's Conclusion Consideration should be given to the inclusion of a site occupational health centre, rather than a first aid station.

ESTIMATE OF COST

106. The estimated cost of the work for both Divisions when referred to the Committee was \$19 million at February 1980 prices made up as follows:

	Applied Organic Chemistry	Materials Science
	\$	\$
Building works, including structural	5 960 000	5 450 000
Engineering services and buildings	3 470 000	2 780 000
External services	720 000	620 000
	<u>10 150 000</u>	<u>8 850 000</u>

PROGRAM

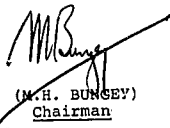
107. The preparation of documentation ready for calling tenders for the Division of Applied Organic Chemistry will take ten months from the date of approval by the Committee. Construction of the complex will take approximately 2½ years.

108. Preparation of documentation for calling tenders for the Division of Materials Science will take nine months from the date of approval by the Committee. Construction of the complex will take approximately 2 years.

RECOMMENDATIONS AND CONCLUSIONS

109. 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.

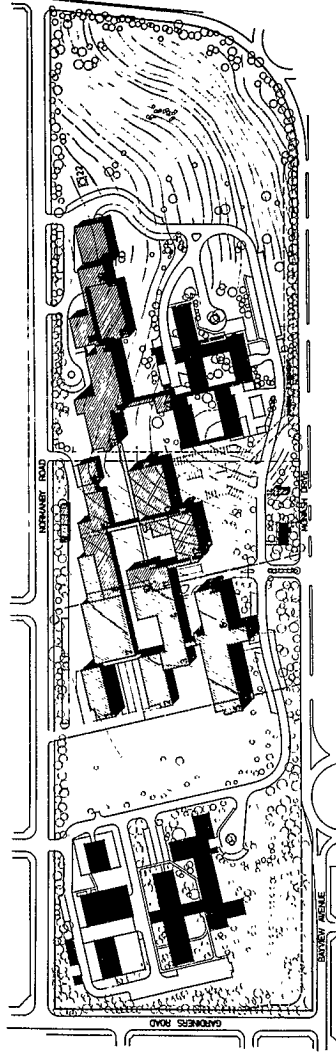
	<u>Paragraph</u>
1. THE COMMITTEE ACCEPTS THAT CURRENT ACCOMMODATION FOR THE CSIRO DIVISIONS OF APPLIED ORGANIC CHEMISTRY AND MATERIALS SCIENCE AT FISHERMEN'S BEND AND THE UNIVERSITY OF MELBOURNE ARE UNSATISFACTORY AND SHOULD BE REPLACED.	38
2. THE DESIGN OF THE TWO PROPOSED COMPLEXES IS SATISFACTORY.	56
3. THE COMMITTEE COMMENDS CSIRO FOR DECIDING THAT A NUMBER OF FACILITIES SHOULD BE SHARED BETWEEN DIVISIONS, RESULTING IN SUBSTANTIAL CAPITAL AND RECURRENT SAVINGS.	61
4. THE SITE SELECTED IS SUITABLE.	69
5. THE COMMITTEE RECOMMENDS THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	100
6. CONSIDERATION SHOULD BE GIVEN TO THE INCLUSION OF A SITE OCCUPATIONAL HEALTH CENTRE, RATHER THAN A FIRST AID STATION.	105
7. THE ESTIMATED COST OF THE WORK FOR BOTH DIVISIONS WHEN REFERRED TO THE COMMITTEE WAS \$19 MILLION AT FEBRUARY 1980 PRICES.	106


(M.H. BUNSEY)
Chairman

Parliamentary Standing Committee on Public Works,
Parliament House,
CANBERRA, A.C.T.

1 May 1980.

DIVISION OF MATERIALS SCIENCE



A.

DIVISION OF METALS
 CHEMISTRY BUILDINGS

RESOURCES FOR
 EARTH RESOURCES

DIVISION OF CHEMICAL
 TECHNOLOGY

DIVISION OF APPLIED
 ORGANIC CHEMISTRY

DIVISION OF GENERAL
 PHYSICS BUILDINGS

Legend

- existing buildings
- proposed Chemical Technology buildings
- proposed buildings

chemical technology

- 1 process bays
- 2 light technical bays
- 3 technical bays
- 4 administration
- 5 general laboratories
- 6 organic laboratories

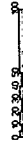
- 7 shared workshops (cl & oac)
- 8 shared stores (cl & oac)
- 9 shared stores (oac & ms)
- 10 shared library (cl & oac)
- 11 conference (cl, oac & ms)
- 12 common
- 13 amenities

applied organic chemistry

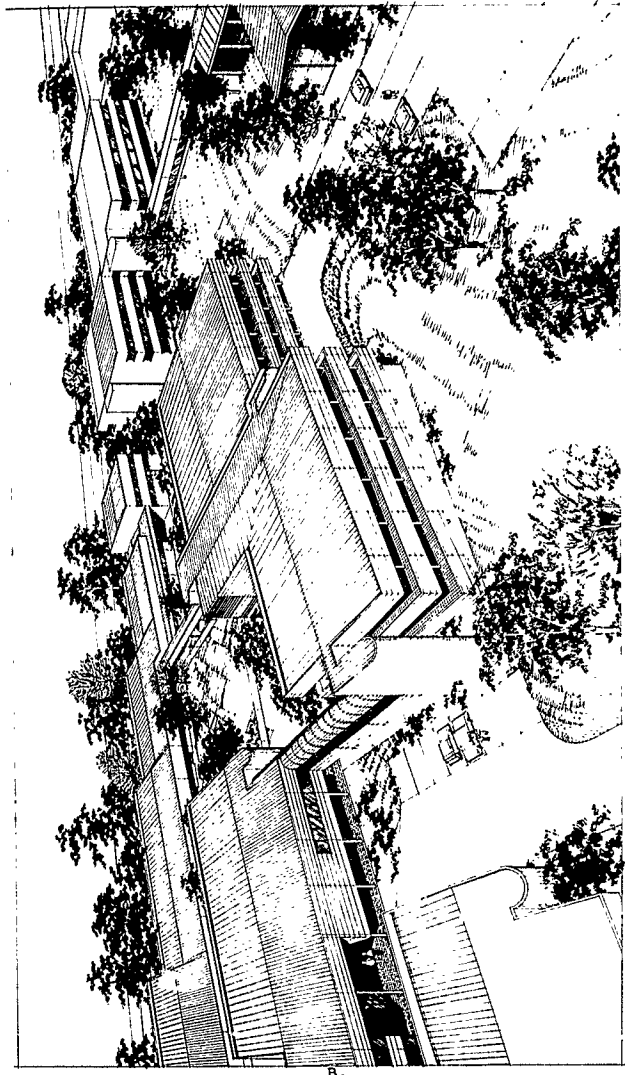
- 11 administration
- 12 general laboratories
- 13 general laboratories
- 14 remote laboratory
- 15 technical bay
- 16 process bays

materials science

- 17 laboratories
- 18 administration
- 19 general laboratories
- 20 stores
- 21 machine processing
- 22 shared library

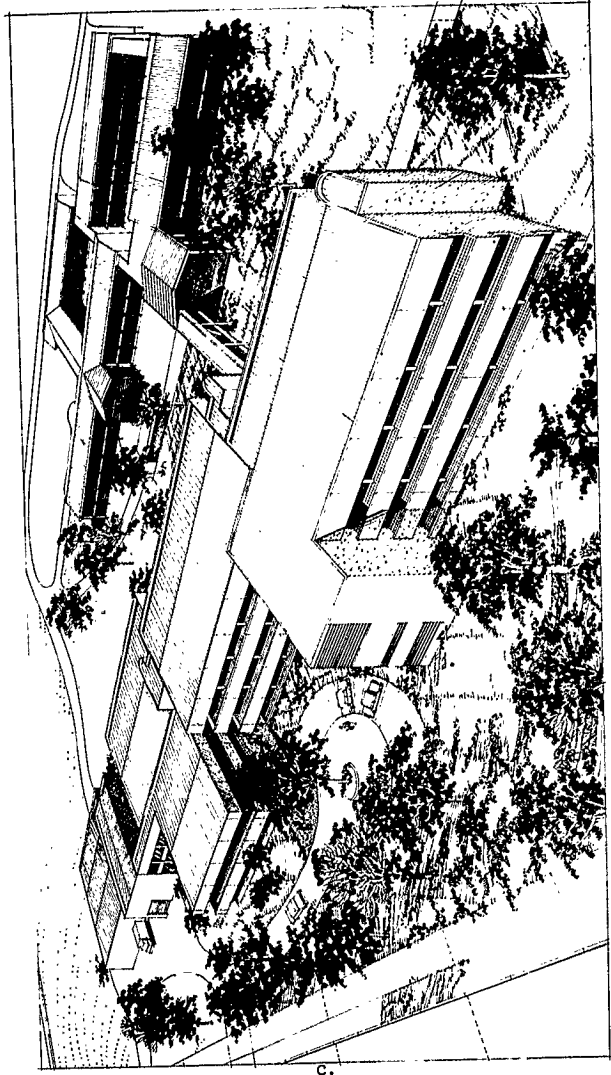


master site plan



B.

AOC view looking north-east



MS view looking south-east