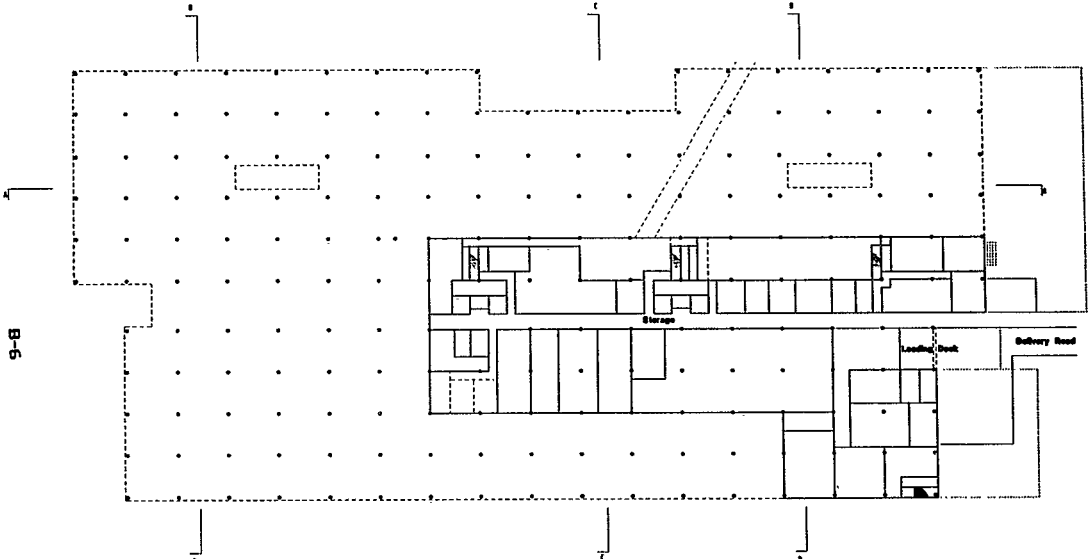

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NEW BUILDING COMPLEX' for AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

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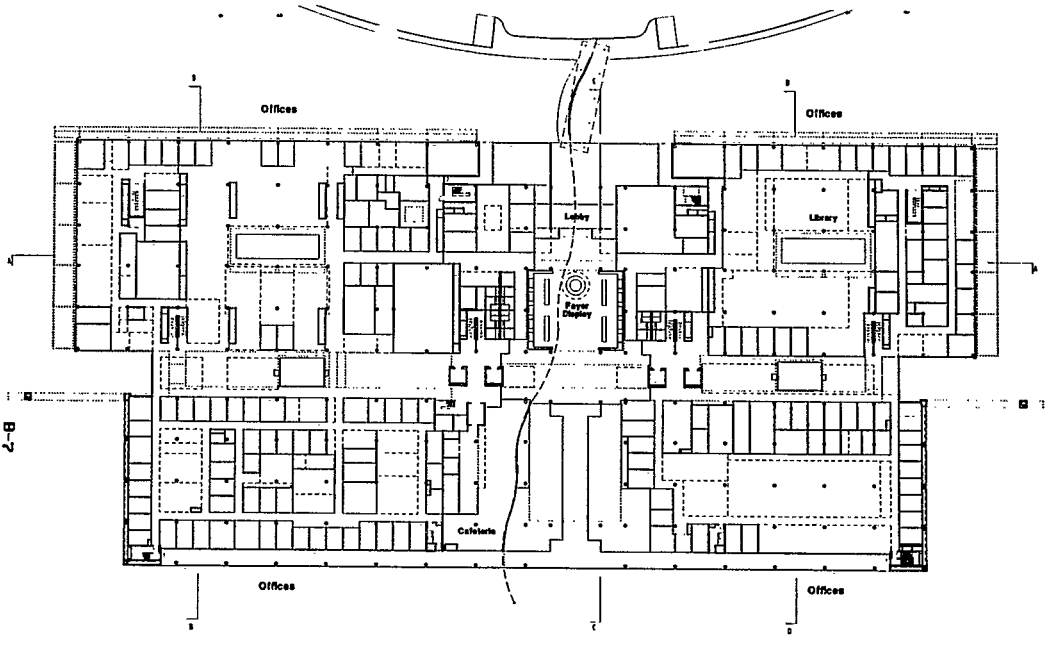

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AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

GROUND FLOOR PLAN
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DWG NO. 94380 - 80 A200

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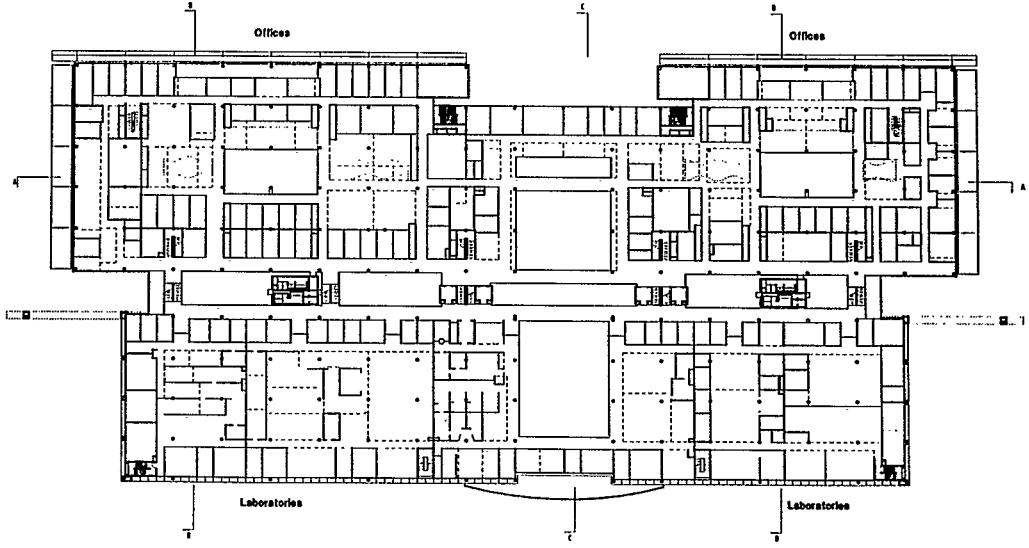

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FIRST FLOOR PLAN

NEW BUILDING COMPLEX for AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

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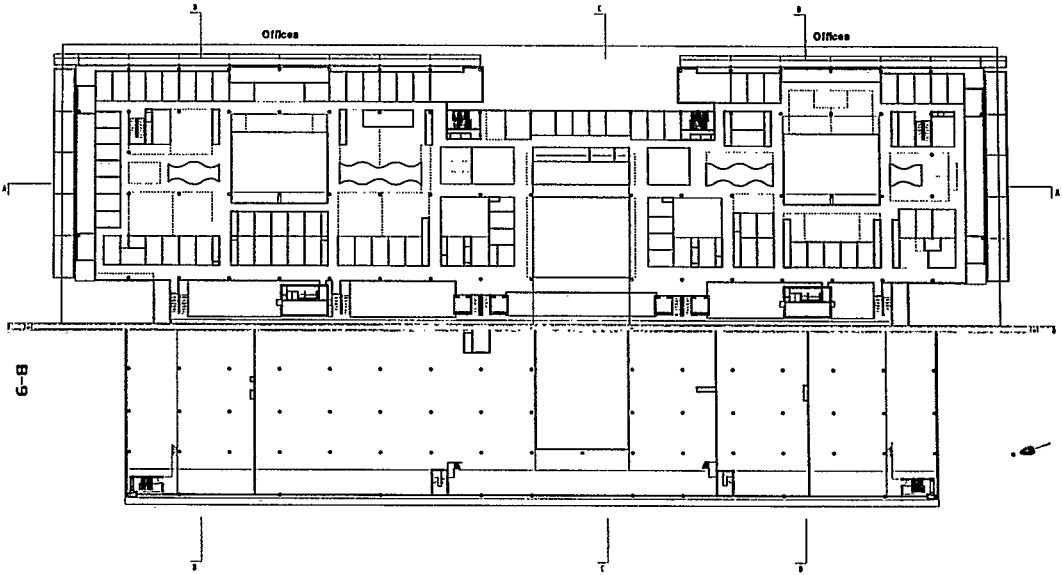

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SECOND FLOOR PLAN

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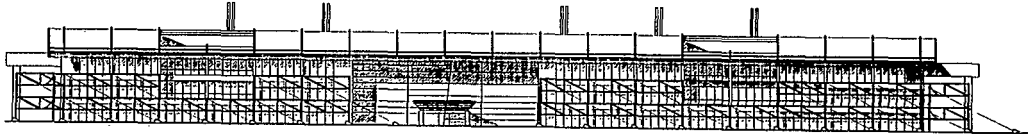
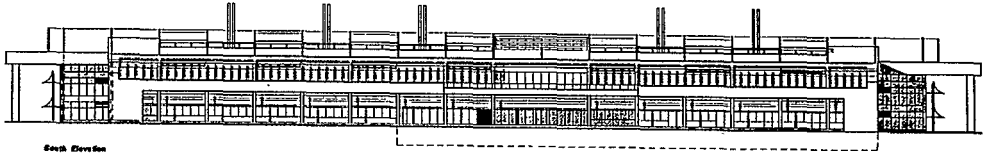


North Elevation



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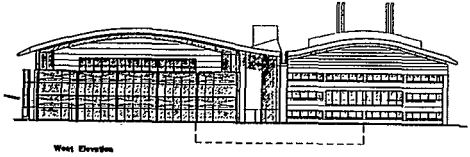

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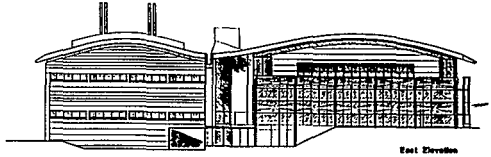

East Elevation

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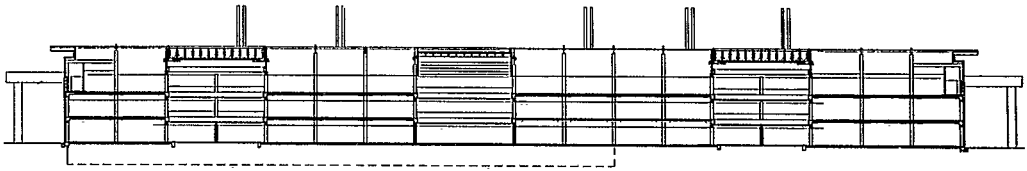
AGSO

ELEVATIONS
NEW BUILDING COMPLEX for AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

10



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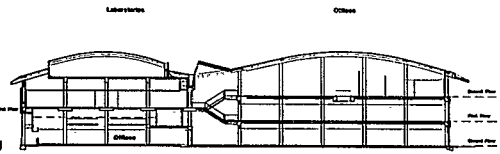

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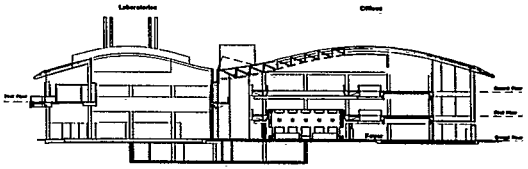

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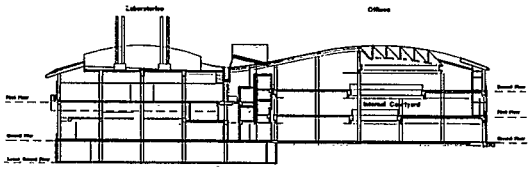

Section DD

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SECTIONS

NEW BUILDING COMPLEX for AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

DWG NO. 04000 - 00 A373

11

Parliamentary Standing Committee on Public Works

REPORT

relating to the

LABORATORY COMPLEX FOR CSIRO DIVISION OF MINERALS, CLAYTON, VIC.

(Fourteenth Report of 1995)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
1995

The Parliament of the Commonwealth of Australia

Parliamentary Standing Committee on Public Works

Report Relating

to the

LABORATORY COMPLEX FOR CSIRO DIVISION OF MINERALS, CLAYTON, VIC.

(Fourteenth Report of 1995)

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MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

(Thirty-First Committee)

Mr Colin Hollis MP (Chairman)
Senator Paul Henry Calvert (Vice-Chairman)

Senate	House of Representatives
Senator Bryant Robert Burns	Mr John Neil Andrew MP
Senator Shayne Michael Murphy*	Mr Raymond Allen Braithwaite MP
	Mr Russell Neville Gorman MP
	Mr Robert George Halverson OBE MP
	Hon. Benjamin Charles Humphreys MP

* replaced Senator John Devereux on 10 February 1995

SECTIONAL COMMITTEE
LABORATORY COMPLEX FOR CSIRO DIVISION OF MINERALS CLAYTON, VIC

Mr Colin Hollis MP (Chair)
Mr Robert George Halverson OBE MP (Vice Chair)
Hon Benjamin Charles Humphreys MP

Committee Secretary:	Peter Roberts
Inquiry Secretary:	Michael Fetter
Secretarial Support:	Mahesh Wijeratne Belynda Zolotto

EXTRACT FROM THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES

No. 129 dated Thursday, 9 March 1995

PUBLIC WORKS–PARLIAMENTARY STANDING COMMITTEE–REFERENCE OF WORK–LABORATORY COMPLEX FOR CSIRO DIVISION OF MINERALS, CLAYTON, VIC.

Mrs Crosio (Parliamentary Secretary to the Minister for Social Security), for Mr Walker (Minister for Administrative Services), 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 consideration and report: Laboratory complex for CSIRO Division of Minerals Clayton, Vic.

Papers: Mrs Crosio presented plans in connection with the proposed work.

Question - put and passed.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

LABORATORY COMPLEX FOR CSIRO DIVISION OF MINERALS, CLAYTON, VIC

By resolution on 9 March 1995, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for consideration and report to Parliament the construction of a laboratory complex for the CSIRO Division of Minerals, Clayton, Victoria.

THE REFERENCE

1. The proposal is for the construction of a laboratory complex at the CSIRO site at Clayton for the Division of Minerals which was formed on 1 January 1995 by the amalgamation of the Division of Mineral and Process Engineering and the Division of Mineral Products.

2. The proposed works will relocate staff of the former Division of Mineral Products from substandard and inadequate accommodation at Port Melbourne into a new complex on the CSIRO site at Clayton.

3. The complex will be designed to accommodate 130 staff including a number of visitors and students. The staff will include 92 research and research support personnel and 32 in management, administration and technical support plus 6 visiting scientists and students.

4. The complex will incorporate research laboratories, analytical laboratories, process bays, offices and meeting rooms.

5. The estimated cost of the proposal is $16.2m at February 1995 prices.

THE COMMITTEE'S INVESTIGATION

6. On 11 May 1995 the Committee appointed a Sectional Committee comprising Mr C Hollis MP (Chair), Mr R Halverson OBE MP (Vice-Chair) and the Hon B Humphreys MP to undertake this inquiry. The Committee received a written submission from CSIRO and the Sectional Committee took evidence from its representatives at a public hearing at Oakleigh on 24 May 1995. The Sectional Committee inspected the existing facilities of the

Division of Minerals at Port Melbourne on 23 May and the proposed site at Clayton prior to the public hearing on 24 May 1995.

7. Written submissions regarding the proposal were received from the following organisations and are incorporated in the Committee's proceedings:

- Intelligent Lighting Controls
- Commonwealth Fire Board
- BHP Steel Research
- Minproc Engineers Pty Ltd
- Western Mining Corporation Ltd
- City of Monash
- Environmental Protection Agency
- Gwalia Consolidated Ltd
- Department of Primary Industries and Energy
- Hamersley Iron Pty Ltd

8. A list of witnesses who gave evidence at the public hearing is at Appendix A. The Committee's proceedings will be printed as Minutes of Evidence.

BACKGROUND

9. CSIRO is one of the largest and most diverse national research institutions in the world. It has a staff of 7400 working in some 150 laboratories and field stations throughout Australia.

10. Since its inception in 1926, CSIRO has played a vital role in shaping Australia and generating the nation's wealth. CSIRO and its scientists have established an international reputation for excellence and achievement in basic and applied research. Its work contributes to the ongoing prosperity of Australia's primary and secondary industries, to the creation of new technology and products and techniques for the continuing development of

Australia's manufacturing and service-based industries.

11. Some 3200 professional staff engaged in scientific research are employed by CSIRO. Collectively they provide expertise in almost every major scientific discipline so that CSIRO can draw on a large and diverse pool of individual skills to meet just about any scientific or technological challenge.

12. CSIRO's major objectives are to:

- carry out strategic research that can be applied by Australian Industry or Government for community benefit
- collaborate with other institutions and industry to strengthen the research effort and ensure its transfer and application
- lead and promote an expanded science and technology effort in Australia.

13. In achieving its objectives CSIRO collaborates with industry and maintains close and mutually profitable relationships with universities and other research and tertiary education bodies. Many joint research projects are undertaken.

14. In 1993/94 the CSIRO budget in 1994/95 dollars was $723.2m. Of this amount $471.6m was provided directly to CSIRO by the Parliament. Another $213.3m came from industry and other sponsors of research. The remaining $38.2m came from revenue earned by CSIRO and from the Department of Primary Industries and Energy for its half-share of the operation of the Australian Animal Health Laboratory at Geelong, Victoria.

15. CSIRO is structured to respond to Australia's needs and to ensure that its research effort is targeted to national priorities. Strong links with industry and the community mean a better understanding of future directions in Australian industry and improved community understanding of new technologies.

16. Currently research is carried out in 6 institutes, each relating to sections of industry. Each institute is headed by a director who develops broad plans, sets priorities and regularly reviews research objectives and progress in consultation with division chiefs.

17. Within each institute there are divisions, each focusing on an area of science and technology. Divisions are headed by a chief who plans, guides and evaluates the research effort.

18. The Committee is aware that a possible reorganisation of CSIRO's administrative structure is currently under consideration. However the Committee was assured by CSIRO at the public hearing that any reorganisation of administrative structures will not impact at the divisional level and will not effect the proposal being considered by the Committee.

Institute of Minerals, Energy and Construction

19. The objective of the Institute of Minerals, Energy and Construction is to benefit Australia by creating technology-based sustainable competitive advantage for the minerals, energy and construction industries.

20. The Institute has 5 constituent divisions. These are: Exploration and Mining, Minerals, Petroleum Resources, Coal and Energy Technology, and Building, Construction and Engineering.

21. The Institute serves industries whose profitability relies on world markets and prevailing economic conditions. As a consequence the Institute directs its research to addressing the major technological needs, both present and emerging, of the industry sectors it serves. The Institute also aims to play a major contributing role in the identification and development of new research and redevelopment based opportunities for industry as well as complementary research on the mitigation of the environmental impact of these industries.

22. The Institute is currently addressing the development of totally integrated mineral exploration mining systems based upon advanced modelling techniques. Significant research efforts are also directed towards improving management and design procedures and systems to reduce construction times and costs, reduce the risks and costs of life and property through fire and improve planning, design and management procedures applicable to housing, infrastructure and urban development.

23. The Institute's total expenditure in 1993/94 was $128m of which $38.4m - 30% - was from external funds. The Institute expects to significantly increase levels of external funding over the next five years through closer identification of customer needs and the development and implementation of research and development strategies to address these needs and requirements.

Division of Minerals

24. The Division of Minerals delivers benefit to Australia through its research and other work for Australian resource companies, the Australian Government and state governments.

25. The Division was formed on 1 January 1995 from the amalgamation of the Division of Mineral and Process Engineering and the Division of Mineral Products. The new Division has a total staff of 356 spread over 6 major sites: Clayton (the headquarters) and Port Melbourne in Victoria, Lucas Heights and North Ryde in NSW, Pinjarra Hills in Queensland, and Waterford in WA.

26. The Division aims to be the minerals research supplier of first choice to the mineral processing and metal production industries and to provide research and development outcomes that will benefit their efficiency, product quality and value-adding prospects.

27. The research activities of the Division are performed in 10 research programs spanning the primary commodities of iron ore, alumina, titania, magnesia and gold together with the technologies of mineral processing, process instrumentation, modelling and control.

National Importance of Mineral Processing Research at CSIRO

28. Australia is well endowed with exploitable mineral wealth and relies heavily on earnings from minerals and value added mineral products. The mineral and basic metal production sectors together contribute over 6% of the nation's GDP and generated $24.5 billion from exports - 44% of Australia's total merchandise exports - in 1993/94. Australia is a leading exporter of many of the world traded mineral commodities and is the largest producer of alumina, lead, titanium minerals and diamonds.

29. All minerals exported are upgraded to some extent, that is value is added by concentrating them or processing them to a different form, such as a refined metal ingot. Concentration may be straight forward but more often than not requires advanced technology to ensure satisfactory metal recovery and concentrate grade. Metal production is highly competitive and requires ever improving technology to remain viable. A major challenge to the industry and CSIRO as a leading research provider, is to find processing routes which will lead to cheaper and therefore more competitive products for existing suppliers and allow for further downstream processing of Australian raw materials both onshore and overseas.

30. The Division of Minerals is one of CSIRO's leading industry-related divisions. It has been consistently undertaking direct contract and consortia funded work for the past 5 years at a level significantly above the 30% budget requirement. Most major mining houses are regular clients of the Division's research and development (R&D) expertise (CRA, BHP, WMC, Comalco, MIM, Hamersley Iron, QMC, Westralian Sands, RGC etc.)

31. In 1993-94 the level of externally funded R&D was approximately $10.2m. The Division is currently engaged in 44 contracts valued at $9.2m.

32. The Division is an active partner in the following Cooperative Research Centres (CRC), established through the Australian Government CRC program:

- A J Parker CRC for Hydrometallurgy
- G K Williams CRC for Extractive Metallurgy
- The Centre for Mining Technology and Equipment
- CRC for New Technologies for Power Generation from Low Rank Coal

33. The CRCs provide strong links between universities, CSIRO and industry through the substantial industrial representation on the boards of management of these CRCs.

THE NEED

Background

34. The proposed relocation of the Division of Minerals from Port Melbourne to the principal Victorian CSIRO site at Clayton, is consistent with the long term CSIRO strategy to integrate and consolidate compatible research resources and facilities on a small number of major regional sites. In effect, this particular proposal is the culmination of a 35 year program to transfer a group of compatible research divisions in Melbourne - the majority from one consolidated site at Fishermens Bend - to Clayton.

35. CSIRO's first major consolidated site for its chemical and industrial oriented activities was at Fishermens Bend, Victoria which was established in 1938 under the terms of a 50 year lease from the State of Victoria.

36. At peak occupancy the CSIRO site at Fishermens Bend housed in excess of 600 staff on a 5.9 hectare site. Progressively Fishermens Bend was to become less attractive as a location for scientific research, predominantly on account of:

- the deterioration of the original facilities, many of which had never been designed specifically for the pursuit of scientific research
- pressure from the independent Aeronautical Research Laboratories for CSIRO to make more land and buildings available for its own expanding production activities
- growth of CSIRO research staff numbers in the residual Divisions
- lack of space to construct more sophisticated laboratories and support infrastructure
- the impact of the deteriorating environmental conditions, particularly air pollution and vibration, generated by the growth of heavy industry on the adjacent sites
- a recognition that when a new lease was negotiated in 1988, the previous "peppercorn rental" would be superseded by commercial rates.

37. In 1959, in anticipation of a long term accommodation strategy, CSIRO acquired a 15.4 hectare site at Clayton, immediately to the north of the campus of the newly established Monash University. This site was to be the ultimate "home" of the activities then conducted at Fishermens Bend and those compatible activities of other Divisions scattered over several smaller sites in the Melbourne region.

38. It was always recognised that with limited capital funds the transfer to Clayton would be slow. Therefore, in 1964, as a temporary measure to relieve the pressures on space at Fishermens Bend, the then Division of Mineral Chemistry moved some 3 km, to Port Melbourne, into a recently vacated paint factory.

39. The first group to relocate to Clayton was the Division of Chemical Physics into a new laboratory complex in 1965. Significantly, the CSIRO submission to the Committee for this project was accompanied by a master

plan for the Clayton site which foreshadowed the relocation of all the other groups still at Fishermens Bend (Second Report of 1961 refers).

40. From 1970 CSIRO relocated by stages the Divisions of Chemical Engineering, Chemical Technology, Applied Organic Chemistry and Material Science into new research facilities at Clayton. By 1989 Fishermens Bend was finally vacated and all activities, other than those of the Division of Mineral Chemistry at Port Melbourne, were accommodated in modern facilities on an ideal research campus.

41. At the public hearing CSIRO indicated that there had been considerable disappointment among the senior staff of the Organisation that the total Clayton development was not undertaken in the mid 1960s. A net present value analysis had indicated that total development in the mid 1960s would have been an extremely worthwhile investment for the Commonwealth. Unfortunately from CSIRO's viewpoint funding levels dictated that development took place in a piecemeal fashion.

Existing Facilities at the Port Melbourne Site

42. The Port Melbourne site is a converted paint factory on a State Government lease which expires in 2005. It has been the subject of numerous studies regarding occupational health and safety deficiencies. The site is inadequate due to the age of the buildings, lack of space and high infrastructure costs.

43. Some 70% of the existing accommodation has already reached the end of its useful life and should be replaced. Termite infestation is also a significant problem. By the end of the current site lease, only the instrument laboratory, the administration wing, the analytical laboratory and the hazardous materials store, will have any residual economic life. These represent only some 27% of the research useable floor area.

44. Were the CSIRO to maintain a research presence at Port Melbourne it would require a substantial investment to upgrade or replace existing buildings to provide a modern standard of accommodation.

45. In addition to the condition of the existing buildings the Port Melbourne site also has some significant general liabilities:

- the site is remote from other major CSIRO sites in Melbourne and in particular from divisions with complementary research interest at Clayton

- it is fully built up, and although the development density is quite low any new building activities would necessitate demolition of existing research activities

- the location of those existing buildings which may be suitable for retention in the longer term, preclude the optimal siting of any major new structures for research activities

- it would be difficult to acquire additional adjacent land for expansion

- the site is occupied under a non-reversionary lease which is unlikely to be renewed at the end of its term as the Victorian Government has indicated that the site is listed for disposal.

Committee's Conclusion

46. There is a need for the CSIRO Division of Minerals to vacate its current site at Port Melbourne as the majority of buildings on the site no longer provide efficient working conditions and do not meet current occupational health and safety standards

THE PROPOSAL

47. The proposed development comprises a two storey laboratory building configured as two separate wings separated by central link space and a further separate process building. Also included is a stand alone hazardous materials store and extensions to the existing workshops and stores building. The development will also include the completion of the internal fit-out of part of the first floor within the recently constructed additions to the Division of Minerals buildings and refurbishment of some existing laboratories and technical bays.

48. The gross floor area of the development including the process building, hazardous materials store and workshops extension is 6 100m^2. The internal fitout of the existing shell space will add a further 800m^2.

49. Works external to the main buildings will involve the extension of the existing car parking and extensions to the existing internal site roadway system to complete the site ring road. Care has been taken in the design for the new development to ensure that the existing urban forest to the south of the site is not disturbed.

50. All buildings will comply with the Building Code of Australia and relevant Australian Standards which include with AS 2982-1987, the Australian Standard for Laboratory Construction and AS 2243-1992, Safety in Laboratories.

51. All new buildings have been designed to permit simple modification to their internal layouts thereby providing for flexible adaptation to changed future uses. The buildings have also been sited to allow for future expansion.

52. The works will also include the fitout of existing shell space for office accommodation and for the extension of the existing library. It will also include minor refurbishment of existing laboratories and technical bays, an extension of the store and workshop building, and a new hazardous materials store.

53. Additional carparking will be provided and existing site services will be upgraded and rationalised.

54. The proposed laboratory complex will finally amalgamate the hitherto dispersed Divisions of Mineral and Process Engineering and Mineral Products research groups at the Clayton site as a further component of a long term strategy to collocate compatible research activities and consolidate research accommodation on the site.

55. By 1998 it is anticipated that practically all of CSIRO's chemical/industrial research in Victoria will be conducted from Clayton. Furthermore, the amalgamation of the Division of Minerals on a combined site will allow improved collaboration and efficiencies between the previously dispersed groups, synergy between other CSIRO Divisions already on the Clayton site and Monash University.

Options Considered for Development

56. Four options were considered by CSIRO for the development of the laboratory complex and are discussed below.

Do Nothing

57. This option would entail no capital expenditure. However the increasing difficulty in meeting Occupational Health and Safety standards in facilities which are generally outmoded for current research requirements and steadily increasing site rental (currently $245 000 pa) would consume a greater total of the outgoings with no appreciable advantage. The

accommodation deficiencies would remain and staff pressure would eventually ensure that redevelopment of the least suitable buildings would have to be undertaken. The disadvantage of remote location and the operational difficulties associated with separate sites - two libraries, workshops, administration - would continue.

Remain at Port Melbourne in upgraded and replacement accommodation

58. CSIRO leases the site from the Victorian Government under the terms of a lease which terminates in June 2005. It is likely that the Victorian Government will sell the land as a part of its policy of rationalising land holdings. Thus the value of any improvements will not ultimately accrue to CSIRO.

59. If a decision was taken to make the site a permanent CSIRO location the site would need to be purchased. However some 70% of the existing accommodation has already reached the end of its useful life. New building activities would necessitate demolition of existing structures and would cause considerable inconvenience to ongoing research activities. Also the location of those existing buildings which are suitable for retention in the longer term, would prevent the optimal siting of such major new structures, as would be required for CSIRO to continue to use the site for research activities.

60. In addition the long term disadvantage of remote location and the operational difficulties associated with separate sites would continue.

Relocate to Clayton

61. A major consideration in the merging of the Division of Mineral Products and the Division of Mineral and Process Engineering was the ability to consolidate shared facilities, enhance the synergistic interactions between researchers and increase the flexibility in creating focused research project teams. In addition, the merger offered productivity improvements through collocation of like research and support activities.

62. There is already considerable synergy between the activities at Port Melbourne and those at Clayton especially in the areas of extractive metallurgy and process development. Further, other CSIRO Divisions on the Clayton site have complementary activities to those at Port Melbourne, namely the Division of Materials, Science and Technology and the Division of Chemicals and Polymers, and joint projects are conducted. The Division also has a working relationship with Monash University particularly the

Department of Chemical Engineering.

63. Productivity improvements will result from merging a number of scientific support services, such as the provision of specialist analytical and instrumentational support and the more effective sharing of major research equipment.

64. It is expected that there will be minimal relocation disruptions to staff brought about by the move to Clayton as many staff already reside in Melbourne's eastern suburbs.

Relocate Interstate

65. CSIRO believes that Clayton is the best location for the Port Melbourne group as their activities fit most appropriately the other groups at Clayton and only a move to Clayton will give the increased flexibility and productivity of resources that will result from the concentration of 250 staff at the one laboratory.

Committee's Conclusion

66. The Committee agrees that the relocation of the Port Melbourne activities of the Division of Minerals to Clayton is the preferred solution as it will consolidate shared facilities and allow greater concentration of the Division's research resources.

Building Planning and Design

67. CSIRO gave consideration to a range of building forms including:

- a single building containing all required areas over a combination of one, two and three levels
- a three storey laboratory building with a single storey separate process building
- a two storey laboratory building with a single storey separate process building.

68. The Committee was advised by CSIRO that the two storey concept design presented in this proposal was arrived at as a result of considering the following issues:

- the existing Division of Minerals building immediately to the west is two storey and the necessary connection and integration with this building will be best achieved by a structure of similar scale

- a two storey structure is easier and quicker to construct than a three storey and will thereby be less expensive

- a high priority has been given to maintaining a close relationship in the laboratory building between the research spaces and office accommodation for research staff

- a number of operations require close proximity to ground level due to a combination of needs:

    - delivery of bulk mineral raw material to the research space

    - large items of equipment requiring special support and servicing at floor level

    - technical research space requiring higher floor loads and high ceiling clearance.

69. These factors indicated that a design which spread the required spaces over two levels would best meet the design requirements, with the technical research and special equipment rooms at ground level and the laboratories and office accommodation at first floor level.

70. A separate process building would reduce the impact of any noise which might be generated by experiments within the process bays. The alternative of a combined building would require expensive sound-rated walling between the process areas and the laboratories and offices.

71. The site area available for this building complex was sufficient to accommodate a two storey laboratory building, a single storey process building, and ancillary external works whilst still providing for future expansion of the proposed buildings without affecting the existing site landscaping elements.

Energy Conservation and Management

72. Passive energy conservation measures have been incorporated into the building and landscape design, and active measures incorporated in the mechanical, electrical and hydraulic design.

73. Energy conservation measures include:

- orientation of the buildings towards the north to maximise passive solar energy
- use of adequate and efficient insulation in the roof and to the walls to reduce ambient internal heat gain or loss. Wall panels to the first floor spandrels of the laboratory buildings will comprise metal sheeting both inside and out with high density polyurethane foam insulation sandwiched between. The roof to the laboratory buildings will be provided with double sided aluminium foil backed with fibreglass blanket insulation
- the use of light colours on the facade to minimise heat absorption through the facade
- careful detailing of the facade and all openings to ensure that the buildings are sealed against air and heat gain or 'oss
- maximising natural light through the use of roof lights and carefully placed and shaded windows
- tinted solar control glass will be used in all windows to reduce the direct transmission of solar heat load to the building interior and thereby reduce cooling loads on the mechanical systems
- the first floor windows to the laboratory buildings will be provided with metal sunscreening devices to further reduce solar heat load to the building interior
- the windows to the laboratory buildings at ground floor level and first floor level will be shaded by wide overhangs
- establishment of energy targets beyond the 1994 BOMA energy guidelines

- outside air economy cycles to selected air handling plants to make full use of the free cooling effect of outside air when appropriate

- separate air handling plants for laboratories and office spaces to allow independent running out of hours

- multiple staged air cooled refrigeration systems for chilled water generation. This allows matching of part loads without major losses in system efficiency

- selection of cost effective and energy efficient mechanical plant

- central direct digital controls systems will allow monitoring, trending and reporting of systems installed, maximising the overall system efficiency

- use of long life, low energy light fittings together with having lighting controlled to only required usage in occupied areas

- selection of equipment and appliances rated as highly energy efficient.

Access for people with disabilities

74. The buildings have been designed to permit access for the disabled. A combined goods and passenger lift will provide first floor access within the laboratory building and this will connect via a covered walkway to the first floor of the existing buildings to the west. Disabled toilets will be provided at ground level in accordance with regulatory requirements.

SITE

75. The new development has been designed to integrate with the existing Division of Minerals buildings and the other CSIRO buildings on the site. The new buildings occupy a site located between two existing building complexes and have been planned to reinforce the existing masterplan. The masterplan provides for offices and standard laboratories to be located towards the southern side of the campus with the more industrial style buildings housing technical and process laboratories to be located towards the northern boundary.

76. The CSIRO site at Clayton is a 15.37 hectare site located within the Monash University precinct, with Gardners Road to the west and Normanby Road to the north.

77. CSIRO has title to the site in its own name. The site is zoned Reserve Public Purpose under the Melbourne Metropolitan Planning Scheme.

78. The site adjoins Monash University to the south and Waverley light industrial zone to the north. It is well serviced by several minor roads and major arterial roads are close by.

79. Gas and water supplies are adequate for the proposed expansion. Electrical high voltage supply is also adequate but some upgrading of switchgear will be performed prior to completion of the project.

80. Geotechnical investigations have indicated that foundation material on the site is moderately reactive clay soil. CSIRO indicated that the footings will be designed to allow for the movements that can occur in moderatively reactive clay material.

Committee's Conclusion

81. The site for the proposed laboratory complex for the CSIRO Division of Minerals on the CSIRO campus at Clayton is suitable and allows for future expansion should this be required.

ENVIRONMENTAL CONSIDERATIONS

General

82. CSIRO has discussed the proposal with the Commonwealth Environmental Protection Agency (EPA). EPA has advised CSIRO that an Environmental Impact Statement is not considered necessary for this project.

83. All gaseous discharges, which are currently covered by the *Victorian Environmental Protection Act of 1970* will comply with all requirements of the Victorian Environmental Protection Authority. The boilers serving the laboratory complex will be operated under emission conditions and with a fuel approved by the Victorian Environmental Protection Authority.

84. Discharges from fume cupboards, have been assessed against safety standards and criteria of both Australian and overseas authorities and the ventilation systems designed accordingly. All such discharges will be

periodically checked and maintained at a sufficiently low level and high rate of dilution to be harmless to humans and to ensure no detrimental effects to the environment.

85. There are four types of liquid effluent from the laboratory complex - human sewage and sullage - liquid chemicals - solvents - and trade wastes. All will be disposed of in a manner acceptable to the Victorian Environmental Protection Authority and other relevant bodies such as the Melbourne Water.

Contamination at Port Melbourne Site

86. CSIRO has initiated a survey to determine the existence of any site contamination at Port Melbourne from its activities. Prior to occupation by CSIRO the site was occupied by a paint manufacturer. Following completion of this survey measures will be implemented to remove any form of contamination caused by CSIRO occupancy of the site. At the public hearing CSIRO advised the Committee that contamination by CSIRO activities has been assessed by its consultants as minimal.

87. While the Committee recognises that CSIRO is confident that its contamination of the site is minimal it is possible that decontamination of the site could be a much more costly exercise than provided for by CSIRO. The Committee believes that the issue of responsibility for decontamination of the site should be clarified by CSIRO as a matter of urgency.

Committee's Recommendations

88. **CSIRO should clarify its responsibility for decontamination of the Port Melbourne site as a matter of urgency.**

Clayton Site

89. There are no known items of historic value within the confines of the CSIRO Clayton site. This site, which is currently 60% occupied by other CSIRO laboratories is not regarded as being environmentally significant. There will be no effect on native flora or fauna by the construction work.

FUTURE DEVELOPMENT

90. The proposed works will consolidate buildings on the site and rationalise services and establish an infrastructure for common access and servicing. These activities will allow CSIRO opportunities to locate future

research facilities on the Clayton site should the need arise.

91. The proposed buildings have been sited to allow for future expansion if required. However no further expansion is currently planned for the Division of Minerals at Clayton. Future expansion in metal production and process modelling may see growth in down-stream processing (e.g. metal coating and forming). It is anticipated that any Divisional expansion will be in activities and infrastructure in Perth and Brisbane.

92. CSIRO advised the Committee that the design criteria allows for flexibility and adaptability in meeting changing needs for research programs. All internal walls are non-load bearing. This allows the internal space to be adapted to meet changing requirements. Similarly services while being able to meet the long term servicing requirements for the building will be able to meet the evolving needs of research.

CONSULTATIONS

93. The following authorities and departments have been contacted and/or consulted during the preparation of the submission:

Commonwealth Government

- Department of Finance
- Department of the Environment, Sport and Territories
- Department of Industrial Relations
- Department of the Prime Minister and Cabinet
- Department of the Treasury
- Attorney-General's Department
- Department of Industry, Science and Technology
- Department of Housing and Regional Development
- Department of Human Services and Health
- Department of Primary Industries and Energy

- Department of Employment, Education and Training
- Department of Communications and the Arts

Victorian Government

- State Department of Labour
- Environmental Protection Authority
- Melbourne Fire Brigade
- Melbourne Water

Local Government

- City of Monash (formerly the City of Waverley)

Unions

- *CSIRO Chapter of the Public Service Union*

Other Authorities and Organisations

- Monash University
- Telecom
- ACROD Ltd
- United Energy
- Gas and Fuel Corporation

94. The City of Monash in its submission raised a number of matters of concern with CSIRO:

- the location of the proposed hazardous materials store close to Normanby Road - the Council requires a minimum setback of 10.6m for buildings and works along Normanby Road
- the closeness of the proposed car spaces along Normanby Road - Council's minimum expectation for the setback of car spaces

would be no closer than the existing car spaces - about 4.5m.

95. At the public hearing CSIRO advised the Committee that following discussions with the City of Monash, CSIRO has been able to meet its requirements. The hazardous materials store will be pushed slightly further to the west while the car parking will be set back the same distance from Normanby Road as the existing car parking. In relation to landscaping the final design will be discussed with Council.

COST ESTIMATE

96. The cost estimate for this proposal is $16.2m at February 1995 prices, inclusive of all professional fees and authorities charges. The estimate does not include the cost of relocating staff and equipment from the existing facility at Port Melbourne.

CONSTRUCTION PROGRAM

97. It is expected that construction will be staged over a 24 month period. Subject to Parliamentary approval, it is planned to commence construction in early 1996 with completion and occupation by early 1998

Committee's Recommendation

98. **The Committee recommends the construction of a laboratory complex for the CSIRO Division of Minerals at Clayton, Victoria at an estimated cost of $16.2 million at February 1995 prices.**

CONCLUSIONS AND RECOMMENDATIONS

99. The conclusions and recommendations of the Committee and the paragraph numbers in the report are set out below:

		Paragraph
1.	There is a need for the CSIRO Division of Minerals to vacate its current site at Port Melbourne as the majority of buildings on the site no longer provide efficient working conditions and do not meet current occupational health and safety standards.	46
2.	The Committee agrees that the relocation of the Port Melbourne activities of the Division of Minerals to Clayton is the preferred solution as it will consolidate shared facilities and allow greater concentration of the Division's research resources.	66
3.	The site for the proposed laboratory complex for the CSIRO Division of Minerals on the CSIRO campus at Clayton is suitable and allows for future expansion should this be required.	81
4.	CSIRO should clarify its responsibility for decontamination of the Port Melbourne site as a matter of urgency.	88

5. The Committee recommends the construction of a laboratory complex for the CSIRO Division of Minerals at Clayton, Victoria at an estimated cost of $16.2 million at February 1995 prices. 98

Colin Hollis MP
Chair

22 June 1995

LIST OF WITNESSES

BOSCI, Mr Peter John Resources Manager, Institute of Minerals, Energy and Construction, Commonwealth Scientific and Industrial Research Organisation, 105 Delhi Road, North Ryde, New South Wales 2113

BOOTH, Mr Richard Alec Senior Associate/Project Director, Woods Bagot Pty Ltd, Level 10, No. 1 Spring Street, Melbourne, Victoria 3000

HARLEY, Mr George Johnston General Manager, Corporate Property, Commonwealth Scientific and Industrial Research Organisation, Limestone Avenue, Campbell, Australian Capital Territory 2601

HICKS, Mr Allan Russell Project Manager, Corporate Property, Commonwealth Scientific and Industrial Research Organisation, 314 Albert Street, East Melbourne, Victoria 3002

HILL, Dr Roderick Jeffrey Manager, Research and Development, Division of Minerals, Commonwealth Scientific and Industrial Research Organisation, Bayview Avenue, Clayton, Victoria 3168

KELLY, Mr Mark Edward Partner/Design Leader, Woods Bagot Pty Ltd, Level 10, No. 1 Spring Street, Melbourne, Victoria 3000

KENNEDY-COOKE, Mr William Quantity Surveyor, WT Partnership, 390 St Kilda Road, Melbourne, Victoria 3004

KENNEDY, Mr John Francis Director, Simpson Koteman Pty Ltd, 123 Lonsdale Street, Melbourne, Victoria 3000

KINGS, Mr Andrew Newman Principal, Andrew Kings Architects, 55 Claremont Street, South Yarra, Victoria 3141

LA NAUZE, Dr Robert David Chief, Division of Minerals, Commonwealth Scientific and Industrial Research Organisation, Bayview Avenue, Clayton, Victoria 3168

MATTESSI, Mr Aldo Associate, Andrew Kings Architects, 55 Claremont Street, South Yarra, Victoria 3141

McCAULEY, Mr Geoff Director, WT Partnership, 390 St Kilda Road, Melbourne, Victoria 3004

MOODY, Mr Trevor Laurence Assistant General Manager, Corporate Property, Commonwealth Scientific and Industrial Research Organisation, Limestone Avenue, Campbell, Australian Capital Territory 2601

MOORE, Mr Donald William Senior Design Engineer, Clive Steel Partners Pty Ltd, 740 Glenferrie Road, Hawthorn, Victoria 3122

REID, Mr Alan Forrest Director, Institute of Minerals, Energy and Construction, Commonwealth Scientific and Industrial Research Organisation, 105 Delhi Road, North Ryde, New South Wales 2113

CONSTRUCTION DETAILS

Laboratory Buildings

1. The Laboratory Buildings will have a gross floor area of 4 700m^2 and will comprise ground floor technical bays and specialist equipment rooms together with ancillary spaces and office accommodation. The first floor will provide laboratories and ancillary spaces to the centre of the plan with office accommodation for research staff to the perimeter. The two wings of the Laboratory Buildings will be linked by an entry space with common informal meeting areas to enhance interaction of the research staff. The building is designed on a north-west to south-east axis in a staggered plan form to relate to the eastern face of the existing building and to provide the opportunity for incorporating landscaped courtyards between the two structures. The new and existing buildings are to be linked via a two storey enclosed and glazed covered way.

2. The building is design.ed to be constructed with a structural steel frame on a reinforced concrete raft ground floor with a reinforced concrete suspended first floor. The roof is to be pre-finished steel deck on steel structure. A feature of the roof will be the provision of clerestory roof-lights to allow maximum use of natural light to the laboratory spaces. The external walls at ground level are proposed to be tilt-up pre-cast reinforced concrete wall panels with tinted glazed windows. The external walls at first floor are to be insulated light-weight pre-finished metal panels with extensive tinted glazing to provide for pleasant internal conditions for the perimeter offices and to match the finish on the adjacent existing buildings. Sunscreening will be provided to the perimeter windows.

3. Internal walls generally will be painted plasterboard lined metal stud partitions but will be painted concrete blockwork to the technical bays and certain specialist equipment rooms where the walls may be required to resist mechanical damage. The partition walls will have extensive areas of glazing to the internal circulation spaces and in particular to the first floor laboratories where they will look out onto the perimeter office space and through the perimeter windows to the exterior.

4. Construction of laboratory benching and fittings, as well as reticulation of services will allow for the maximum degree of flexibility of operation.

5. Floor finishes will generally be welded sheet vinyl to laboratories and

support areas, carpet to office areas and ceramic tiles in wet areas. Ceilings to the office areas will be mineral acoustic tile, to the first floor laboratories and circulation spaces will be painted plasterboard and to the ground floor special equipment rooms will be vinyl coated plasterboard tile. The ground floor technical bays, ancillary spaces and circulation spaces will not be provided with ceilings and the soffit of the concrete slab over will be left exposed.

Process Building

6. The Process Building with a gross floor area of 885m^2, is located to the north of the Laboratory Building and will be as a single storey industrial style space with high internal clearance for large scale research. Attached to the Process Building will be the mechanical plant spaces and an electrical switchroom for the new development.

7. The Process Building is designed to be constructed with a structural steel portal frame on a reinforced concrete raft floor slab. The building will be provided with a 2 tonnes overhead travelling crane. The external walls are to be pre-cast reinforced concrete panels up to 3 metres above floor level with unlined pre-finished profiled steel sheet siding and roofing above. The roof will also be provided with profiled polycarbonate roof-lights inserts.

Hazardous Materials

8. The storage of the bulk supplies of hazardous materials to be used in the new laboratory complex, such as strong acids and alkalis, solvents, flammable materials, gases, radioactive substances and the like, will be contained within a new building to be constructed adjacent to existing facilities on the northern side of the existing Division of Minerals buildings.

9. The building will be single storey and will comprise a concrete raft floor slab with precast reinforced concrete wall panels supporting a steel deck roof. Racking will be provided internally for the storage of containers and the floor slab will be bunded at all openings to contain any spillage of hazardous materials. The facility will be constructed to meet the requirements of the Victorian Department of Labour, the Victorian Environment Protection Agency and the Standards Association of Australia standards AS 2243, AS3780 and AS 2714.

Workshops and Stores Extension

10. The existing Division of Minerals buildings within the Clayton campus include a workshops and stores facility which is used in the preparation of test rigs and specialist equipment for laboratory experiments. This facility is not considered large enough to provide for the additional requirements resulting from the construction of the new laboratory complex, and, as a consequence, it is proposed to extend the floor space within the existing facility by 300m^2. The extension will be a single storey industrial space matching, in terms of both construction and finishes, the existing building to which it is to be attached.

Internal Fitout

11. The existing Division of Minerals buildings were extended during 1993 and 1994 to provide for additional office space, increased library space, a staff cafeteria and additional meeting rooms. As part of these extensions, an area at first floor level was left as an unfitted building shell in anticipation that this space could be finished and fitted out as part of an amalgamation of the two Divisions related to minerals.

12. The proposed works will involve internal lining to the walls and the suspended ceilings for a total of 800m^2 of floor space comprising partly administrative offices and partly an extension to the existing library.

Mechanical Services

13. The mechanical services will include:

- Air conditioning for comfort conditions in laboratories, offices, general administration areas, microscopic rooms and X-Ray Diffraction areas.
- Heating and mechanical ventilation in the Technical Bays and heating with natural ventilation in Process Bays.
- Exhaust ventilation systems for toilets, fume cupboards, hoods and specific equipment.
- Reticulated piped services within laboratories for fluids such as compressed air, vacuum, natural gas, nitrogen, argon, oxygen, etc.

- Automatic controls for heating, ventilation and air conditioning systems.

14. The mechanical services will generally comply with the following relevant codes, regulations and standards:

- Building Code of Australia - 1990 and amendments.
- AS 2243 Parts 1 - 8 (1982 - 1987) Safety in Laboratories.
- AS 2982 - 1987 Laboratory Construction Code.
- AS 1668 Part 1 - 1991 Fire and Smoke Control.
- AS 1668 Part 2 - 1991 Mechanical Ventilation for Acceptable Indoor Air Quality.
- AS 3666 - 1989 Air Handling and Water Systems for Buildings - Microbial Control.

Laboratory Building

15. The laboratories and work station areas will be air conditioned for comfort conditions and equipment requirements. Generally separate air handling plant will be provided and air provided to laboratories will not be recirculated to other areas.

16. Separate air handling plant will be provided according to thermal zoning characteristics, nature of occupancy and spatial limitations. This will allow optimal plant selection and will permit energy efficient day to day operation.

17. A building management system (BMS) will be provided for automatic control and monitoring of specific faults.

Ventilation

18. General exhaust ventilation systems will be provided to toilet areas, darkrooms and selected store rooms where required.

19. Specific exhaust systems will be provided to the Autoclave area, Battery Support area and within laboratories where required for specific equipment.

20. Fume cupboards will be provided in laboratories and research areas as scheduled. Exhaust fans are generally located at roof plant walkway level.

21. Smoke exhaust systems are not required as all buildings are to be fully sprinkler protected. Air handling plant will shut down in the event of a fire to limit the spread of smoke.

Reticulated Piped Services

22. Reticulated piped services will be provided to specific laboratory benches and fume cupboards. Specific gases will be reticulated to laboratories and when other gases are required, stand alone systems reticulated to that area only will be provided.

23. The two general process bays will be provided with space heating and natural ventilation.

24. Exhaust systems will be provided to remove localised odours, heat, vapours and dust where requirements are known.

25. Specific gases will be reticulated for future use.

26. The Central Plant area within this building will serve the three new buildings. It will house plant including:

- Natural gas fired heating hot water and pumps
- Air cooled chillers and chilled water pumps
- Compressed air plant.
- Vacuum plant.
- Condenser water plant and cooling tower.

27. The reverse osmosis plant for purified water, domestic hot water systems and steam generators will be based in areas adjacent to their point of use. A central steam plant for general use is not required.

Electrical Services

28. The electrical services will comprise:

- High Voltage (HV) supply and Low Voltage (LV) reticulation systems.
- Power reticulation throughout.
- General lighting throughout.
- Emergency and exit lighting where required.
- Voice and data communication cabling.
- External security and car park lighting.
- Access control and intruder detection.

29. All electrical works will be undertaken generally in accordance with:

- Building Code of Australia
- AS 3000 - 1991 SAA Wiring Rules
- Victorian Supply Authorities requirements

30. A new HV substation and switchroom will be located in the Process Building for supply to the new buildings. A new 22kV supply will be run to the substation from the existing underground HV line.

31. Submains at 415 volts will run from the main switchboard to local distribution boards adjacent load areas. Separate distribution boards will be provided to each laboratory, technical bay and process bay greater than 50m^2. Separate supplies for the passenger goods lift and mechanical services plant will also be provided

General Office Areas

32. Lighting will comprise recessed fluorescent luminaries with ultra low brightness louvres to provide an average illumination level of 400 Lux maintained.

Laboratory Areas

33. Lighting will comprise suspended or surface mounted fluorescent luminaries with prismatic diffusers to give an average illumination level of

500 lux maintained.

Technical Bays

34. Lighting will comprise suspended or surface mounted fluorescent luminaries with prismatic diffusers to give an average illumination level of 500 lux maintained.

Process Bays

35. Lighting will comprise high intensity discharge lamps for general lighting, and supplementary fluorescent luminaries at specific bench locations where required. All luminaries will be sealed water resistant type.

Reception and Tea Areas

36. Lighting systems will generally comprise a combination of wall mounted incandescent fittings, Extra Low Voltage recessed units and task luminaries at reception desks.

External Areas

37. Car parking areas and walkways will be provided with luminaries comprising high intensity discharge lamps, mounted on the building structure or pole mounted where necessary.

Communications Systems

38. An integrated communications cabling system will provide voice and data services.

Fire Protection

39. Fire hydrants, hose reels and extinguishers will be provided in accordance with the Building Code of Australia. Fire sprinklers, complying with AS 2118 - 1982 will be provided to serve the whole of the new development. Smoke detectors will be provided for early warning within the air handling systems and at exits. As with the remainder of the Clayton campus, the fire detection systems will be taken to a fire indicator panel which will be connected to the Metropolitan Fire Brigade.

40. Fire hydrants, hosereels will be provided in accordance with the requirements of the Building Code of Australia.

41. Automatic fire sprinklers in accordance with Australian Standard AS 2118 -1982 and amendments will be provided to all areas of the proposed buildings.

42. A system of automatic smoke detectors will be provided throughout the laboratory buildings in accordance with the Building Code of Australia. A separate fire indicator panel will be provided for the new buildings, connected to the site's central system for alerting the local fire authority.

43. Fire extinguishers will be supplied to areas with specific hazards warranting the provision of additional, portable fire suppression equipment.

Security

44. A Security Risk Analysis has been initiated for the physical and intellectual security of the site and its recommendations, including control of access to the site, perimeter security of buildings and detection within critical areas, will be considered and incorporated where necessary in the design and construction of the complex.

Hydraulic Services

45. The hydraulic services will include:

- Sanitary Plumbing and Sewerage Drainage.
- Laboratory Plumbing and Trade Waste Treatment.
- External Water Supply.
- Internal hot and cold water reticulation.

46. All hydraulic services will be designed and constructed in accordance with the Australian Codes of Practice, the applicable Australian Standards and the requirements of the local authority.

47. Sewer drainage from amenities areas will be separately connected to the site sewerage reticulation system.

48. Drainage from the laboratories, technical and process bays will be connected to appropriate interceptors and neutralisers prior to connection to the site sewerage reticulation.

49. The existing water mains supplying the adjacent buildings will be diverted and extended to supply the fire sprinkler system, fire hydrant/hose reels and domestic water services.

50. Internal cold water supply will be reticulated to all sanitary plumbing fixtures, laboratory equipment, domestic hot water units and mechanical services equipment as required.

51. Internal hot water supply will be reticulated from localised domestic hot water units to sanitary plumbing fixtures and laboratory equipment areas.

52. Safety showers and eyewash units will be provided to specific laboratories.

Lift Services

53. One passenger goods lift of nominal 2000kg capacity will be provided for the unsupervised movement of equipment between ground level and level one.

54. The lift will be a side acting hydraulic type with a single door car. The lift motor room will be located adjacent the lift shaft.

55. Lift car finishes will generally be hard wearing vinyl and stainless steel.

Siteworks and Landscaping

56. The existing access road system within the Clayton Campus will be amended by closing the road to the east of the existing Division of Minerals buildings whilst constructing a link road to the south to the existing buildings as part of a ring road that will extend around the entire Clayton Campus. This ring road will be completed by constructing a further linking roadway north of the proposed Process Building between Entrance 1 and Entrance 2 off Normanby Road.

57. On site parking will be increased to accommodate an additional 112 spaces for staff and visitors together with secure parking for 4 other Division cars and a 1.5 tonne truck.

58. Landscaping will be provided to the courtyard areas formed between the new and existing buildings and will be compatible with the rest of the site. Care has been taken to retain existing landscape elements within the

site wherever possible.

Electromagnetic Radiation

59. The design will employ the principle of prudent avoidance to minimise exposure of staff to very low frequency electromagnetic radiation. The substation will be located in a position that will minimise the extent of electromagnetic radiation fields for both the Division of Minerals and other surrounding Divisions. Major cable runs on the site are routed to avoid research laboratory and staff amenity locations.

Local Impact

60. The proposed development will have a positive effect on the local economy including employment in the construction and support industries during the construction period. Various local support industries will continue to benefit from servicing the increased number of staff on the site.

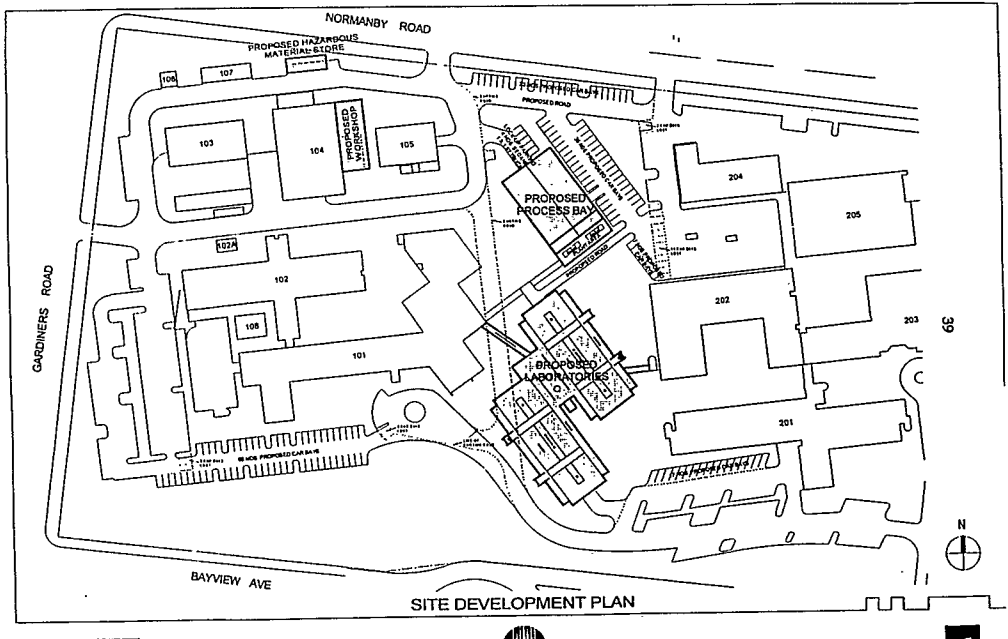
Quality Management

61. Quality management principles will be applied to all stages of the project delivery process. Value management analysis has been applied in developing the initial design concepts and quality reviews will be maintained throughout the design and construction phases of the project.

APPENDIX C

PROJECT DRAWINGS

Location Plan	C-1
Site Plan - Clayton	C-2
Site Development Plan	C-3
Ground Floor Plan - Laboratories	C-4
First Floor Plan - Laboratories	C-5
West Elevation/South Elevation - Laboratories	C-6
Cross Section/Longitudinal Section/ Section-Bridging Link - Laboratories	C-7

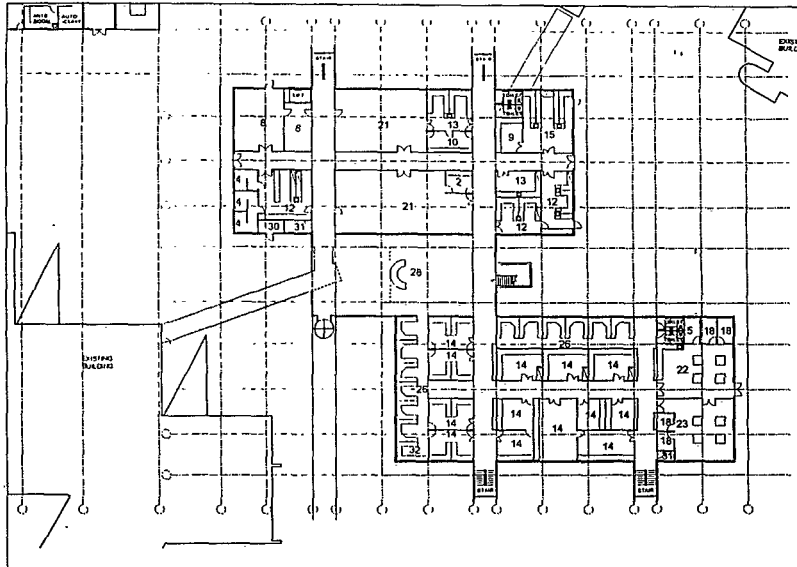


WOODS BAGOT

CSIRO

ARMENIENGS ARCHITECTS

DIVISION OF MINERALS • CLAYTON



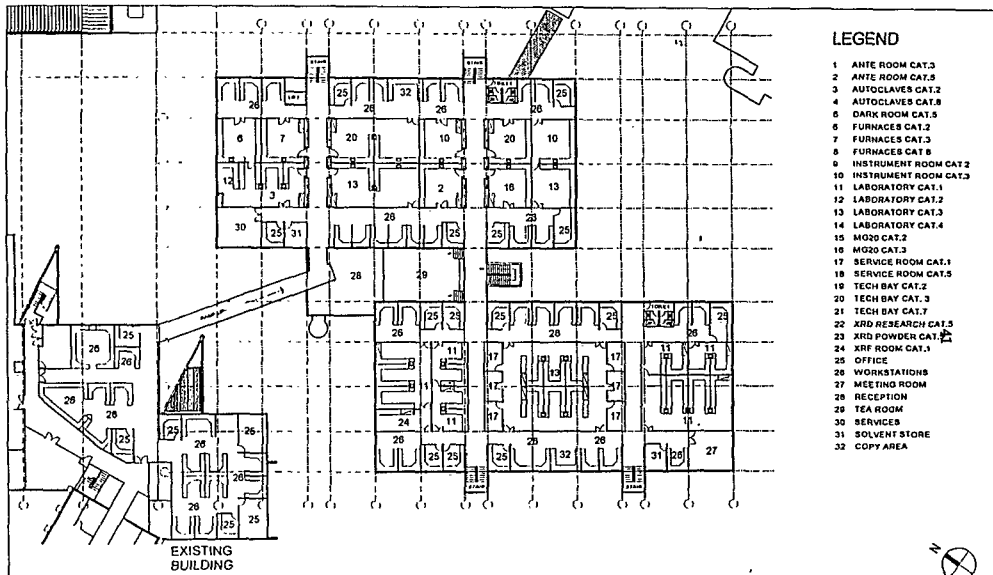
GROUND FLOOR PLAN - LABORATORIES

WOODS BAGOT

CSIRO

DIVISION OF MINERALS • CLAYTON

ASHTON RAGGATT MCDOUGALL ARCHITECTS



FIRST FLOOR PLAN - LABORATORIES

WOODS BAGOT

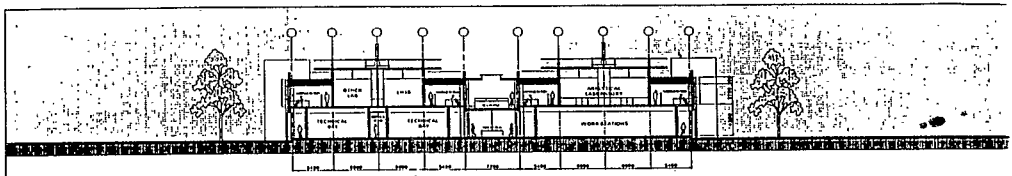
CSIRO AUSTRALIA

ARDILL WILKES ARCHITECTS

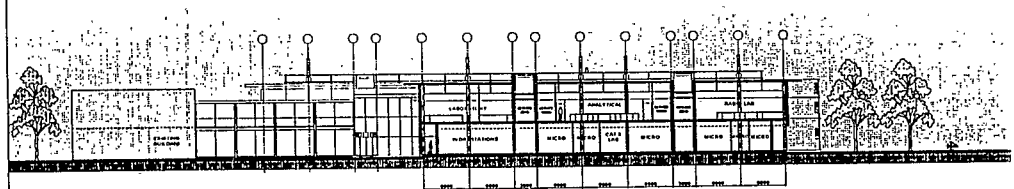
DIVISION OF MINERALS • CLAYTON

C-3

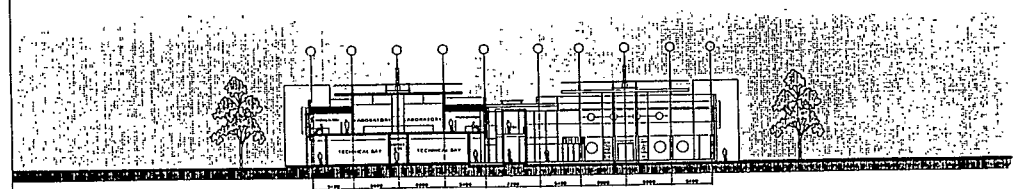
44
WEST ELEVATION - LABORATORIES
SOUTH ELEVATION - LABORATORIES
WOODS BAGOT
CSIRO
DIVISION OF MINERALS • CLAYTON
ARKLEY JONES ARCHITECTS



CROSS SECTION - LABORATORIES



LONGITUDINAL SECTION - LABORATORIES



SECTION - BRIDGING LINK - LABORATORIES

WOODS BAGOT

CSIRO

DIVISION OF MINERALS • CLAYTON

ANDREW RIRES ARCHITECTS