1979

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

Parliamentary Standing Committee on Public Works

REPORT

relating to the proposed construction of a

CROP ADAPTATION LABORATORY

for the

C.S.I.R.O.

at

Black Mountain, Acton, Australian Capital Territory

(EIGHTH REPORT OF 1979)

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COMMONWEALTH GOVERNMENT

Department of Housing and Construction

Departmental
No. 12

Minute Paper for the Executive Council

Subject

Executive Council
Meeting No. 52

ORDER UNDER SUB SECTION 18(4) OF THE PUBLIC WORKS COMMITTEE ACT 1969 IN RELATION TO CONSTRUCTION OF CROP ADAPTATION LABORATORY, COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, BLACK MOUNTAIN, ACTON, AUSTRALIAN CAPITAL TERRITORY.

Approved in Council

ZELMAN COWEN

Governor-General
2 August 1979

Recommended for the approval of His Excellency the Governor-General in Council that, in pursuance of Sub-Section 18 (4) of the Public Works Committee Act 1969, he declare, by executing the attached Order, that the public work proposed in that Order be referred to the Parliamentary Standing Committee on Public Works for consideration and report.

Filed in the Records
of the Council

DAVID N. REID.

Secretary to the
Executive Council.

(Signed) R.J. GROOM

Minister of State for
Housing and Construction.

WITNESSES

Bischoff, F.T., Esq., Project Manager, A.C.T. Region, Department of Housing and Construction, Furzer Street, Phillip, Australian Capital Territory

Dunn, J.V., Esq., Assistant Secretary, Works and Buildings, Commonwealth Scientific and Industrial Research Organisation, P.O. Box 225, Dickson, Australian Capital Territory

Osmond, Professor C.B., Head, Department of Environmental Biology, Research School of Biological Sciences, Australian National University, P.O. Box 475, Canberra City, Australian Capital Territory

Peacock, Dr. W.J., Chief, Division of Plant Industry, Commonwealth Scientific and Industrial Research Organisation, Black Mountain, Acton, Australian Capital Territory

Richards, Dr. A.D., Assistant Secretary, Department of Housing and Construction, 17 Yarra Street, Hawthorn, Victoria

Tracey, M.V., Esq., Director, Institute of Biological Resources, Commonwealth Scientific and Industrial Research Organisation, P.O. Box 225, Dickson, Australian Capital Territory

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

CROP ADAPTATION LABORATORY FOR THE C.S.I.R.O., BLACK MOUNTAIN, ACTON, A.C.T.

R E P O R T

On 2 August 1979, His Excellency the Governor-General in Council referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament the proposed construction of a Crop Adaptation Laboratory for the Commonwealth Scientific and Industrial Research Organisation at Black Mountain, Acton, A.C.T.

The Committee has the honour to report as follows:

THE REFERENCE

1. The proposal referred to the Committee is for the construction of a laboratory building to provide facilities for the crop adaptation program being undertaken by C.S.I.R.O.'s Division of Plant Industry.

2. The building is to be located on a site within the C.S.I.R.O. complex at Black Mountain, Acton, A.C.T. The building will contain laboratories and support areas, and general administrative and service areas. Special facilities will include built-in growth cabinets, constant and controlled temperature rooms and glass houses.

3. The estimated cost of the proposal when referred to the Committee was $2.8 million at June 1979 prices.

THE SECTIONAL COMMITTEE'S INVESTIGATION

4. The Committee appointed a Sectional Committee to investigate and report to it on this reference. The Sectional Committee received written

submissions and drawings from the C.S.I.R.O. and the Department of Housing and Construction and took evidence from their representatives at a public hearing in Canberra on 3 September 1979. The Sectional Committee also received a written submission and took evidence from Professor C.B. Osmond, Head of the Department of Environmental Biology, Australian National University.

5. Written submissions in support of the proposal were also received from a number of State Departments of Agriculture, universities and industry bodies etc.

6. Prior to the public hearing, the Sectional Committee inspected the existing facilities of the Crop Adaptation Section and the site for the proposed laboratory.

7. The Committee has endorsed the report of the Sectional Committee and the proceedings of the public hearing will be printed as Minutes of Evidence.

BACKGROUND

8. The Division of Plant Industry is one of eight Divisions comprising the Institute of Biological Resources of the C.S.I.R.O. The research programs of the Institute are aimed at improving the management and productivity of Australia's agricultural, forestry and fisheries resources, and the conservation and management of the Australian flora and fauna.

9. A major concern of the Institute of Biological Resources is to ensure that maximum yield for minimum inputs of money and energy are secured from existing crop varieties and to introduce and adapt new varieties of existing crops with better performance characteristics and new crops of value to both the home and export markets. A large part of the work in this area is undertaken by the Division of Plant Industry. The Division has recently redeployed its manpower and programs in order to give increased emphasis and effect to its research objectives.

10. The objective of the Division of Plant Industry is to conduct research in the plant sciences as a basis for the development and utilisation of crops and pastures better adapted to Australian conditions. The Division is also a major centre for research in the Australian flora and vegetation, its taxonomy, ecology and management.

11. The post-war development of research programs has broadly reflected national needs and the course of research development may be summarised as follows:

- Prior to 1950, research programs concentrated mainly on the improvement of pastures by the introduction of new species, plant breeding and better nutrition. These initiatives were influenced largely by the contemporary world-wide demand for wool.
- In the period 1950 to 1960, there was a major build-up in basic research programs with longer term relevance to agricultural problems, e.g. disease and insect resistance.
- In 1962, the completion of the Phytotron, a facility for growing plants under controlled conditions, enabled the pursuit of research related to the analysis of responses of agricultural and industrial crops to environmental factors, such as temperature and photoperiod, to be undertaken with greater precision than was possible in field experiments.
- During the present decade, research has been directed towards the study of the adaptation of crops to Australian environments for when alternative crops, such as soybeans and sunflower, were introduced crop failures and less than optimum yields were experienced. Plant breeding and agronomic research were undertaken to adapt introduced crops to Australian conditions and to diversify the base of Australian agriculture beyond the traditional dependence on wheat and sheep.

12. The national needs for a wider range of well-adapted crop varieties and for the development of appropriate management practices led to the establishment within the Division of Plant Industry of an inter-disciplinary group, the Crop Adaptation Section, which was formed in 1971 by the redeployment of staff from within Plant Industry and from other C.S.I.R.O. Divisions. The total staff of the section has increased over the period from 55 to its present complement of 73.

13. The crop adaptation programs involve research on the conservation of genetic resources, the adaptation of crops to Australian conditions through breeding, and the development of more efficient management systems aimed at maximising the use of limited resources, particularly rainfall and energy.

14. The present research within the Division of Plant Industry is organised into 15 program areas of which the following are central to the work of the Crop Adaptation Section:

- Crop adaptation, which includes research into the water economy of dryland crops; direct drilling and crop performance; and crops for the temperate high rainfall zone.
- Plant introduction and genetic resources, which includes research into the introduction and conservation of genetic resources; and population biology of crops and pastures.
- Breeding for aphid resistance in lucerne which has resulted in two new varieties which are resistant to attack from both the spotted alfalfa aphid and the blue-green aphid.
- Management of agricultural systems, which includes research into pastures for animal growth; and the integration of grazing and cropping systems.

15. The above programs are collaborative projects involving other C.S.I.R.O. Divisions, State Departments of Agriculture, industry, universities and international institutes or agencies.

THE NEED

16. The premises used by the Crop Adaptation Section for scientific and support activities are situated in the C.S.I.R.O.'s Black Mountain site at Acton, A.C.T.

17. The buildings, of which some are temporary while others have inadequate facilities for research purposes, are scattered over a large area; many of them are overcrowded and a number present a high fire risk.

18. The nature of the Section's work involves multi-disciplinary research and the efficient and effective pursuit of the various programs requires frequent and continuing contact between the staff. The present arrangements, which include the dispersal of staff and facilities over a total of 11 separate buildings, tend to fragment the research groups and as a consequence, the rapid development of interdisciplinary research is impaired.

19. The dispersal of the facilities accentuates the problems associated with the movement of experimental plant material between points of reception, handling, analysis and data processing. Damage and loss of experimental plant material has occurred and the danger of disease escape from quarantine material exists. No facilities exist for analysing plant growth in soil under controlled conditions and attempts to transfer plants raised in Plant Industry glass houses or the Phytotron to intrumanted equipment have failed due to exposure to contrasting temperatures. No facilities for the long term maintenance of viable collections of valuable genetic resource materials exist and the alternative to stable long term storage - frequent regeneration - is costly and genetically unsatisfactory.

20. For many years a large segment of the research of the Division of Plant Industry was field-based, with field stations throughout Australia. In recent years, as a result of the development of effective interactions with the State Departments of Agriculture with their extensive network of field stations and because of recent major advances in biological research, the Division has placed increasing emphasis on laboratory based research. These developments have accentuated the shortage of integrated laboratory areas appropriately serviced and equipped to meet research requirements.

21. The proposed laboratory will bring the interrelated crop adaptation research programs within the one building. This will enhance the opportunity for the rapid development of ideas and their implementation through more effective research programs. Agricultural problems will benefit from a more strongly integrated research attack. Interaction between disciplines will be particularly important in developing more effective crop and stock management systems for the high rainfall zone.

22. Committee's Conclusion There is a need for a purpose-designed laboratory building to accommodate the research activities of the crop adaptation program being undertaken by the C.S.I.R.O.'s Division of Plant Industry.

THE PROPOSAL

23. The proposal is for the construction of a laboratory building which will provide accommodation for research and support staff for the crop adaptation programs of the C.S.I.R.O.'s Division of Plant Industry on the C.S.I.R.O. site at Black Mountain, Acton, A.C.T.

24. The primary requirements of the proposal, which includes the demolition of several small structures existing on the site, are to:

- efficiently group interrelated activities;
- provide safe conditions for staff and equipment;
- ensure control over temperature, humidity, ventilation, cleanliness, noise, vibration and solar penetration;
- allow flexibility in the reorganisation of work spaces to suit future changes in research programs;
- take account of solar requirements for new glass houses and the existing Phytotron building in both building and landscape design;
- develop the design with due regard to energy conservation and economies in planning, building construction, maintenance and running costs; and
- be accessible to the physically handicapped.

25. Planning and Design. The building has been designed to accommodate the functional and service requirements grouped according to their preferred functional relationships and will include laboratories and associated support areas, data and program evaluation areas, plant handling areas, service areas and amenities.

26. The building will consist of two blocks linked together to form a single three-storey building with the main pedestrian entry on the ground floor of the link.

27. In the eastern block, research areas are to be located on the north side of the corridor and serviced laboratories and support facilities on the south. This will achieve economies in reticulated laboratory services.

28. Sun screening has been provided on the northern facade to prevent sun penetration between October and March and on the southern facade to exclude all direct sun penetration.

29. The western block accommodates dirty and noisy service facilities on the lower two floors, both of which are provided with vehicular access. Shared facilities including program evaluation and computer areas are on the top floor.

30. The building will be substantially adaptable with non-structural partitions which can be readily relocated. Services will also be readily accessible and capable of extension.

31. The building has been designed to harmonise with adjacent buildings. The roof will be visible from other areas and has been designed to enclose mechanical equipment.

32. Controlled environment facilities will include long and medium term storage for the genetic resources collection, glass houses, constant temperature rooms, vernalisation room and growth cabinets. Built-in laboratory furniture and fittings will be included. External works will include essential services, access pavements, car parking, landscaping and the replacement of several small structures on the building site.

33. Committee's Conclusion. The proposed laboratory has been designed to meet the requirements of present research programs while providing flexibility to meet the needs of future research.

THE SITE

34. The site for the proposed laboratory is part of the area currently occupied by the Division of Plant Industry on the C.S.I.R.O. site at Black Mountain, Acton, A.C.T. Development on the Black Mountain site is required to conform with the site Master Plan which was approved by the National Capital Development Commission as the Design and Siting Authority.

35. The site slopes to the south-east and has sparse vegetation. Access roads exist and water, stormwater and sewer connections are available adjacent to the site together with power mains. A new central boiler house which will supply the site with reticulated hot water for heating is currently under construction and will be completed this year.

36. The site is in close proximity to existing related research, workshops, library and administrative and canteen facilities.

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

CONSTRUCTION

38. **Structure** The structure will have an in situ reinforced concrete frame supported on concrete footings. The roof will consist of coated steel roofing supported on steel framing.

39. **Finishes** Finishes and materials have been selected with regard to fire resistance, cost, maintenance and dust retention. External concrete and masonry will be unpainted in harmony with adjacent buildings.

40. Internal walls and the underside of those floor slabs forming ceilings will be painted. Welded vinyl floor coverings will be used in laboratories and carpet in the computer and program evaluation areas.

41. Suspended acoustic ceilings will be provided for corridors and quiet research areas, including laboratory offices, computer, and data and program evaluation areas. Stores, mechanical equipment rooms and service areas will have a sealed granolithic concrete floor finish to reduce dust. Toilet and wash rooms will have ceramic wall and floor tiles.

42. **Mechanical Services** Air conditioning will be provided to serve all laboratory and associated areas. Exhaust ventilation will be provided to plant growth areas, fume cupboards and toilet areas.

43. Constant and controlled temperature rooms will be served by their own refrigeration units. Prefabricated growth cabinets will be built in and connected to building services. These facilities, together with the long term seed store, will be provided with emergency power from a 40 kVA standby generator.

44. Laboratory reticulated services will include hot and cold water, compressed air, L.P. gas and demineralised water. An electrically boosted solar hot water service will provide domestic hot water to all laboratories and washrooms. The mechanical plant and equipment will be isolated to avoid the transmission of noise and vibration.

45. **Hydraulic Services** The building will be provided with water, sewerage and stormwater drainage services connected to existing mains. Water will be reticulated for domestic and fire fighting purposes. Wastes discharged to the sewerage system will meet the requirements of the local authorities.

46. **Electrical Services** Electricity supply will be connected by underground cabling to existing site mains. General purpose power outlets will be provided throughout the building together with power supply for mechanical and laboratory equipment.

47. Lighting will be supplied in accordance with Australian Standards. Emergency and exterior lighting for security and car parking will be provided. Block cabling for telephones will be provided.

48. **Lift** A goods/passenger lift of 2 tonnes capacity will be provided primarily for the movement of heavy objects, such as stores, soil bins, plant material etc. It will also be available for physically handicapped persons.

49. **Civil Works** Site works will be compatible with both present and future development in accordance with the Master Plan. Existing roads will provide entry to the service areas and to the car parking area which will provide space for 65 cars.

50. **Landscaping** Landscaping has been designed to blend in with the Black Mountain Reserve and to screen service areas and car parks.

51. **Fire Protection** The building has been designed in accordance with the fire safety and protection requirements of the A.C.T. Building Manual and will be protected generally by automatic fire sprinklers.

52. Portable fire extinguishers, small bore hose reels, break-glass alarms and external fire hydrants will be provided. The fire alarm system will be connected to the local fire brigade.

53. **Environmental Impact** The Department of Science and the Environment has determined that under the Environment Protection (Impact of Proposals) Act 1974, no environmental impact statement will be required for the project.

54. **Committee's Recommendation** The Committee recommends the construction of the work in this reference.

ESTIMATE OF COST

55. The estimated cost of the work when referred to the Committee was $2.8 million made up as follows:

	$
Building works	1 270 000
Mechanical services	560 000
Electrical services	180 000
Lift	70 000
Fire protection	100 000
Specialised equipment	200 000
Civil works and replacement structures	420 000
	2 800 000

PROGRAM

56. The preparation of tender documents will take nine months from the date of approval. Construction will take 18 months.

RECOMMENDATIONS AND CONCLUSIONS

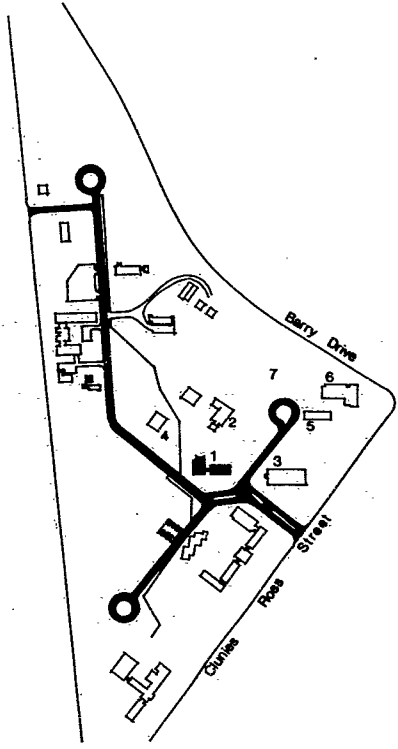
57. The summary of recommendations and conclusions of the Committee is set out below. Alongside each is shown the paragraph in the report to which it refers.

		Paragraph
1.	THERE IS A NEED FOR A PURPOSE-DESIGNED LABORATORY BUILDING TO ACCOMMODATE THE RESEARCH ACTIVITIES OF THE CROP ADAPTATION PROGRAM BEING UNDERTAKEN BY THE C.S.I.R.O.'S DIVISION OF PLANT INDUSTRY.	22
2.	THE PROPOSED LABORATORY HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF PRESENT RESEARCH PROGRAMS WHILE PROVIDING FLEXIBILITY TO MEET THE NEEDS OF FUTURE RESEARCH.	33
3.	THE SITE SELECTED IS SUITABLE.	37
4.	THE COMMITTEE RECOMMENDS THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	54
5.	THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS $2.8 MILLION.	55

(M.H. Bungey)
Chairman

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

27 September 1979.

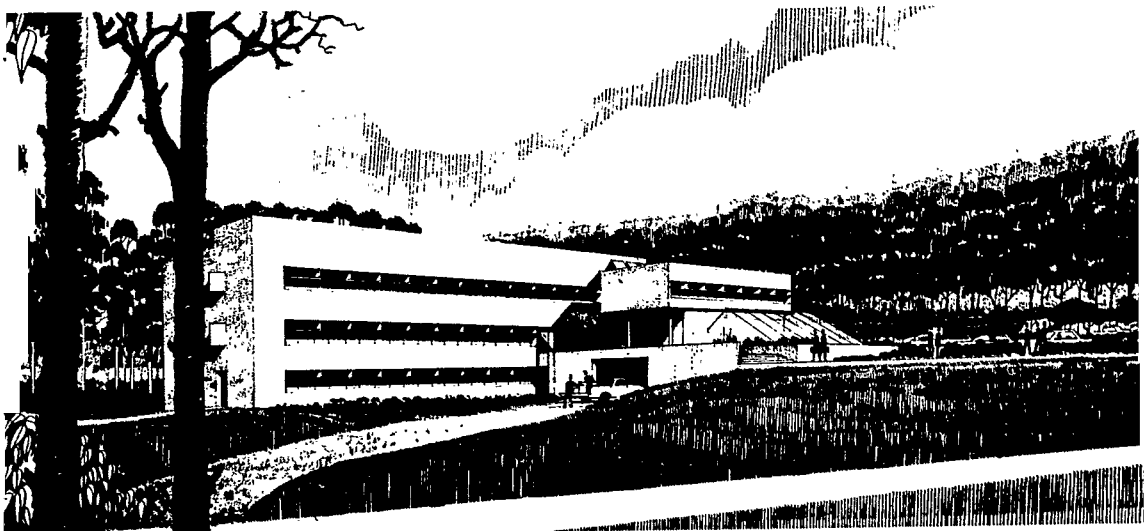


Legend

1. Crop Adaptation.
2. Workshop.
3. Phytotron.
4. Library.
5. Bio chem.
6. Agronomy.
7. Glasshouses.

Master Plan

0 100 200m



Perspective of Crop Adaptation Laboratory