PROPOSED
CSIRO ENTOMOLOGY
BIOSCIENCE LABORATORY
AT BLACK MOUNTAIN, CANBERRA, ACT

Statement of Evidence
To the
Parliamentary Standing Committee on Public Works

Commonwealth Scientific Industrial Research Organisation
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1.0 INTRODUCTION

1. The proposal presented in this submission to the Parliamentary Standing Committee on Public Works ("PWC") is for the construction of a new Bioscience Laboratory and refurbishment of two existing buildings for CSIRO Entomology on the CSIRO Black Mountain Campus in Canberra, ACT.

2. The proposed works will provide research laboratory accommodation for up to 55 scientific staff, replacing existing unsuitable and inadequate laboratories.

3. CSIRO Entomology was established in 1928 and is currently the largest single organisation in Australia conducting research into insects, related arthropods and terrestrial invertebrates. The Division is currently located at the CSIRO Black Mountain Campus within the heritage listed Building 101 and other surrounding buildings. Building 101 was constructed in 1929 with additions in 1956 and it is becoming increasingly difficult for this facility to comply with current legislative requirements for contemporary research facilities.

4. CSIRO Entomology's research currently focuses on the evolution and ecology of invasive species, and the molecular biology and physiology of insects. This bioscience base contributes to the national priorities of safeguarding Australia by protecting Australia's agricultural, natural and managed ecosystems from invasive pests and maintaining an environmentally sustainable Australia, together with building and transforming Australian industries based on innovative bioscience technologies.

5. A large and increasing part of CSIRO Entomology research is now dependent on modern integrated biosciences including biochemistry, molecular biology, proteomics, and metabolomics to produce new control strategies and products for pest and weed management in agriculture, environmental bioremediation and monitoring, and industrial bioprocessing.

6. The Division will continue to invest in these integrated biosciences well into the foreseeable future, being an integral part of its growth strategy, attracting significant co-investment by its research partners.

7. The proposed new Bioscience Laboratory will comprise, modern generic laboratories, laboratory support facilities, workstation and staff breakout areas and plant rooms to meet current legislative requirements. The part refurbishment of Building 101 will provide for the conversion of existing laboratories to offices, new registry, reception and exhibition space, disabled access to the main reception, new public accessible seminar and meeting rooms and upgrades to existing toilet facilities. The partial refurbishment of the adjacent Building 135 will provide additional compliant laboratory spaces.

8. The proposed development will also include associated site works, roadworks, engineering and communication services, landscaping and disabled car parking facilities.

9. Substandard temporary and redundant existing buildings located on the site of the new facility will be demolished.

2.0 BACKGROUND

2.1 General

10. CSIRO Entomology is located at the CSIRO Black Mountain Campus, with the existing Building 101 on Clunies Ross Street as its principal public address point. It is intended that this main address point be retained for CSIRO Entomology. Building 101 is a heritage listed building and consequently no alterations or additions to the front of the building are permitted. CSIRO is liaising with the Department of Environment and Heritage to ensure that the characteristics of the building will be maintained.

11. CSIRO proposes to construct a new Bioscience Laboratory for the Entomology Division at the rear of Building 101, which will require the demolition of redundant buildings within an existing courtyard. The project will include partial upgrades of Buildings 101 and 135 to include new office accommodation and laboratory spaces.

12. The new laboratory will comply with the guidelines established by Office of the Gene Technology Regulator (OGTR) and Australian standards for certification for Physical Containment Level 2 (PC2).

13. The existing biotechnology laboratory facilities within Building 101 were constructed before current OGTR requirements were developed. These facilities cannot be economically adapted to meet PC2 requirements, necessitating the provision of new purpose built facilities.

2.2 Need

14. Much of the Division's current scientific research work at the Black Mountain site is conducted in buildings that are over seventy years old. Other buildings in which state-of-the-art science is being performed date from 1957 and 1973. The two research wings of building 101 are the original buildings constructed on the site for the Divisions of Entomology and Plant Industry prior to the Second World War.

15. Although a number of refurbishments have been carried out on various parts of these buildings during their life, inherent structural constraints prevent the buildings from being adapted to meet current and evolving laboratory standards, including full compliance with OGTR requirements, to accommodate anticipated Division growth and to comply with current occupational health and safety guidelines.

16. Any modification to laboratories in Building 101 would require significant alterations to the building's structural support system of load-bearing internal walls. The need to increase fume cupboard exhaust stacks would have a visually unacceptable impact on the heritage qualities of the existing building façade.

17. Building 135, which houses the Stored Grain Research Laboratory (SGRL), has not been refurbished since the building was constructed in 1973. The building is now unsuitable for contemporary research.

18. The proposed new Bioscience Laboratory building will provide international standard accommodation to meet CSIRO Entomology research. It will enable the integration of laboratories, support facilities and equipment in a secure PC2 certified area, consistent with requirements imposed by OGTR for biocontainment work.

19. The proposed works will provide for improved amenities for staff and the public, including a new seminar facility, staff and public accessible canteen and a public exhibition area for research works, publications and displays from the adjacent Australian National Insect Collection.

2.3 Options Considered

20. A number of planning studies have been undertaken in the development of the project, including the re-use of the existing buildings. The existing buildings were found to be unsuitable for open plan research activities. The required floor area could not be accommodated within the existing building envelopes and, in the case of Building 101, uneconomical alterations would be required which would in turn significantly affect its current heritage status.

21. The "do nothing" option is not viable as the required biotechnological research activities cannot be continued to be performed in the current facilities.

22. Various options were considered in developing the proposed solution, giving consideration to the heritage characteristics of the existing Building 101 and to ensure minimal disruption to research activities during construction of the new facility.

3.0 OVERVIEW OF CSIRO

23. CSIRO is one of the world's top scientific institutions and Australia's premier strategic research organisation. It has a staff of approximately 6,500 in 21 research divisions located in 57 sites throughout Australia and in several locations overseas.

24. Since its inception in 1926, CSIRO has played a vital role in shaping Australia and generating the nation's wealth. The organisation 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 technologies, products and techniques for the continuing development of Australia's manufacturing and service-based industries.

25. CSIRO's primary functions under the Science and Industry Research Act are to:

- carry out scientific research for any of the following purposes:
  - assisting Australian industry;
  - furthering the interest of the Australian community;
  - contributing to the achievement of Australian national objectives or the performance of the national and international responsibilities of the Commonwealth; and
  - any other purpose determined by the Minister;
- encourage or facilitate the application or utilisation of the results of any other scientific research; and
- carry out services and make available facilities, in relations to science.

26. In achieving its functions CSIRO collaborates with industry and maintains close and mutually profitable relationships with universities and other research and tertiary education bodies in Australia and overseas.

27. Sixty percent of staff hold university degrees, including more than 1850 doctorates and 420 masters. In collaboration with university colleagues, CSIRO staff supervise or co-supervise more than 550 postgraduate research students annually, over 20 per cent in collaboration with Cooperative Research Centre's (CRCs).

28. Total CSIRO revenue per annum exceeds $900 million. In 2004/05 CSIRO received Parliamentary appropriation funding of $577 million. Over 70 per cent of CSIRO's Parliamentary appropriation funding is directed towards the priority goals associated with the National Research Priorities.

29. CSIRO generated $332 million in 2004/05 in external earnings for research, specialised consultancy and other services. This revenue was derived from the Federal and State governments, Australian Industry and international companies and organisations.

30. In 2003, CSIRO launched the National Research Flagships. These are partnerships of leading Australian scientists, research institutions, commercial companies and selected international partners. Their scale, long timeframes and clear focus on delivery and adoption of research outputs are designed to maximise their impact in key areas of economic and community need.

4.0 CSIRO ORGANISATIONAL STRUCTURE

4.1 General

31. CSIRO has been structured to respond to Australia's needs and to ensure that its research effort and scientific resources are focused in areas of 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.

32. As the basic business units of CSIRO, Divisions are organised largely along discipline lines and each headed by a Chief who plans, guides and evaluates the research efforts of the Division.

33. The 21 Divisions have been strategically grouped together as follows:

Agribusiness & Health
Food Science Australia
Forestry & Forest Products
Health Sciences & Nutrition
Livestock Industries
Plant Industry
Environmental & Natural Resources
Atmospheric Research
Entomology
Land & Water
Marine Research
Sustainable Ecosystems
Information Technology, Manufacturing & Services
Australia Telescope National Facility
ICT Centre
Industrial Physics
Manufacturing & Infrastructure Technology

Mathematical & Information Sciences
Molecular Science
Textile & Fibre Technologies
Sustainable Minerals & Energy Group
Energy Technology
Exploration & Mining
Minerals
Petroleum Resources

4.2 National Research Flagships

34. In April 2003 the Prime Minister, Mr John Howard, launched the Flagship Initiative. The National Research Flagships are multidisciplinary research partnerships that align Divisions across CSIRO and external agencies to tackle specific objectives in areas of major national significance. Their larger scale, longer timeframes and clear focus on adoption of research outputs are designed to provide maximum impact.

35. Flagships are targeted at achieving national goals in fields of health, water, energy, food, light metals and oceans. They have been established to address the following national objectives;

- Strong, sustained economic growth, new industries, competitive enterprises and quality jobs;
- Healthier, more productive lives for Australians;
- Clean, cost-efficient energy;
- More productive and sustainable use of water;
- Sustainable wealth from our oceans; and
- Growth and prosperity for regional Australia.

36. Each Flagship addresses two or more of these national objectives and the initiative as a whole, aligns with the Commonwealth Government's National Research Priorities.

37. The six Flagships and their goals are:

- **Preventative Health** – to improve the health and well being of Australians and save $2 billion in annual direct health costs by 2020 through the prevention and early detection of chronic diseases;
- **Light Metals** – to lead a global revolution in light metals, doubling export income and generating significant new industries for Australia by the 2020s while reducing environmental impact;
- **Food Futures** – to transform the international competitiveness and add $3 billion annually to the Australian agrifood sector by the application of frontier technologies to high-potential industries;
- **Energy Transformed** – to halve greenhouse gas emissions and double the efficiency of the nation's new energy generation, supply and use, and to position Australia for a future hydrogen economy;
- **Water for a Healthy Country** – to achieve a tenfold increase in the social, economic and environmental benefits from water by 2025; and
- **Wealth from Oceans** – to position Australia by 2020 as an international benchmark in the delivery of economic, social and environmental wealth based on leadership in understanding ocean systems and processes.

38. Flagships are large-scale science partnerships in action. They integrate, direct and focus scientific resources on issues of urgent national significance. Research partners in Flagships research include:

- Alcoa
- Australian Bureau of Agricultural and Resource Economics
- Australian Greenhouse Office
- BHP Billiton
- Comalco
- Australian Bureau of Meteorology
- Curtin University
- Flinders University of South Australia
- Fisheries R&D Corporation
- Holden
- Ludwig Institute for Cancer Research
- Murray-Darling Basin Commission
- National Ageing Research Institute
- Neurosciences Australia
- Royal Australian Navy
- The Menzies Centre for Population Health
- The University of Adelaide
- The University of Auckland
- The University of Melbourne
- The University of New South Wales
- The University of Queensland

39. The 2004 Federal Budget included an extra $305 million allocation to CSIRO for the Flagships initiative over the next seven years to which CSIRO will redirect additional funding from its own external resources. This is planned to grow substantially over the next few years, making Flagships one of the largest, focussed scientific undertakings in Australian history.

5.0 RESEARCH ACTIVITIES OF THE DIVISION

40. CSIRO Entomology is the oldest Division in CSIRO, and has constantly adapted to meet the needs of the Australian community and remains one of the most heavily externally funded Divisions at about 45% of its budget. The Division's science is about more than the single narrow discipline of entomology that its name suggests: the core disciplines lie broadly in **ecology**, **evolutionary biology**, and **biochemistry**. The entomology connection remains because much of the research uses invertebrates as models or test organisms for wider issues, as well as tackling directly the problems caused by insects. In partnership with others, the Division brings together theory and practice to deliver on-the-ground solutions. Rather than simply describing or quantifying problems, the Division provides solutions to them, whether it be the knowledge to develop Integrated Pest Management (IPM) systems, a software package that informs farmers when to treat pasture pests, a novel insect enzyme for use in bio-industries, or a pathogen for controlling one of Australia's worst environmental weeds.

41. The Division has an annual budget of $37 million and a total staff of 250 at Australian sites in Canberra, Brisbane, Perth, and Narrabri, as well as at overseas sites in Montpellier, France and Veracruz, Mexico. The laboratory in Canberra has 200 staff

and it is envisaged to expand by another 40 with the increasing engagement in CSIRO Flagships, Emerging Science initiatives and other priority research areas, such as bio-complexity and synthetic biology.

42. The Division's scientific research is divided into three research themes:

- **Securing agriculture by developing safe methods of managing invasive pests and enhancing product quality.** Targeting of insect pests and weeds of economic impact, especially through significant joint ventures with the grains, cotton, horticultural and wine industries, introducing new technologies to protect and build export markets, maximising quality and profitability;

- **Determining the role of insects and other invertebrates in supporting sustainable natural, rural and urban environments.** The Division supports the rebuilding of damaged ecosystems through community engagement. The Australian National Insect Collection and high level Containment Facilities are essential components of this national network; and

- **Using insects to explore fundamental biological processes and to develop innovative industrial and environmental technologies.** In partnership with the private sector and selected rural industries, the Division develops new products and businesses while contributing to regional development.

43. Under each of these three themes are 13 research streams, set out as follows

Theme 1 – Securing agriculture against biological threats

Stream 1.1 – On farm storage
Stream 1.2 – Product protection
Stream 1.3 – Insect Adaptation to Agriculture
Stream 1.4 – Grain Protection Genes
Stream 1.5 – Food Futures
Stream 1.6 – Biosecurity

Theme 2 – Protecting ecosystem function, biodiversity and water quality

Stream 2.1 – Ecosystem Management
Stream 2.2 – Water for a Healthy Country
Stream 2.3 – Trends in systematics and collection development
Stream 2.4 – Systematics - Identity and Relationships
Stream 2.5 – Systematics evolutionary pattern and process

Theme 3 – Developing Innovative Bio-Industries

Stream 3.1 - Genomics
Stream 3.2 - Biocatalysis

44. In addition to the above research themes and streams there are two major facilities contributing to the Division's research. They are:

- **Australian National Insect Collection**
  The maintenance and curation of the insect collection is of critical importance to the Division's research activities. The core capabilities and knowledge that is held within the collection is utilised across the Streams for Flagship, Emerging Science and other non-aligned areas; and

- **Containment Facilities**
  Entomology currently has three quarantine Containment Facilities in Canberra, Brisbane and Montpellier (France). An additional facility in Perth is due to be operational by late 2005. The goals of these facilities are to enable critical research to be performed particularly in the areas of biosecurity and biological control.

45. The main research hub of Entomology is based in Canberra and enables close interactions with other Divisions in the CSIRO Environment and Natural Resources (ENR) and Agribusiness and Health (ABH) Groups and with key research centres at the Australian National University. To best service research delivery to the rural industry partners and to rural communities the Division will maintain its presence in shared facilities in Perth, Narrabri and Brisbane. Opportunities to maintain and grow a presence in northern Australia are being actively pursued. Overseas commitments will be reviewed in 2004/05 and options for co-location with overseas agencies and institutions will be explored.

46. The Division is concentrating half its efforts in major, long term (typically 5 year) joint ventures that are designed to maximise its operational effectiveness and impact. These ventures are based on the principles of agreed portfolios of strategic research, strong project management with fast failure mechanisms, and joint decision making to deliver agreed outputs.

47. A key to growth will be use of the Division's molecular biology, enzymology and insect biochemistry and physiology base to develop new products in the bio-industrial national priority area that will revitalise existing manufacturing activity and create new biotechnology-based business and jobs. Examples include crop biofactories initiatives that are aimed at transforming Australian agricultural and manufacturing industries, using advanced farming systems to sustainably produce industrial feedstock and fine chemicals. The discovery and development phase of this research will require recruitment of 10-15 staff and place further pressure for access to modern molecular facilities operating at PC2 Containment Level such as the proposed Bioscience Laboratory.

48. In 2002/3 the Grain Protection Gene Joint Venture was established with Grains Research and Development Corporation (GRDC), and the Stored Grain Research Agreement (SGRA) entered a new phase with the bulk handlers and AWB Ltd. (formerly the Australian Wheat Board). The Division will strengthen the existing relationship with Plant Health Australia and are participants in a new Cooperative Research Centre (CRC) for National Plant Biosecurity, and a renewal of the CRC for Cotton Catchment Communities commencing July 2005. All these initiatives contribute to the Division's Securing Agriculture theme.

49. The Division works closely with the Water for a Healthy Country Flagship to grow the impact in this area. The Division will maintain its commitment to the CRC for Weed Management and continue to closely integrate our work with state departments, catchment authorities and community groups.

50. The Division has set an additional challenge in the environmental domain to pursue innovative business models for developing and deploying technologies that are less dependent on traditional models of public sector investment. An analysis of environmental technology market opportunities will be concluded by the CSIRO Environment and Natural Resources Group in 2004.

6.0 SITE

6.1 General Description

51. The proposed CSIRO Entomology Bioscience Laboratory is to be located at the CSIRO Black Mountain Campus within an existing courtyard surrounded by the Division's existing Buildings 101, 135, 137 and 150. The site is bounded by Clunies Ross Street and internal CSIRO access roads.

52. The courtyard is comprised of two zones; the North end of the courtyard is an existing landscape open area with mature trees and grassed areas used as a break out space by staff, whilst the South contains a number of small buildings and storage sheds surrounded by bitumen pavement. It is proposed that these be removed and the proposed new building located within the southern half of the courtyard.

53. The removal of the existing redundant buildings and structures will greatly enhance the presentation of the heritage listed Building 101. Increased plantings of shrubs and trees within the courtyard will create external breakout spaces for the staff.

6.2 Site Development and Planning

54. A master plan was prepared initially by consultants Ancher Mortlock Murray & Wooley in 1975. Since this report there have been varying planning studies and gestations of the original plan, however the intent has remained and the siting of subsequent buildings and infrastructure has been consistent with this plan.

55. In 1997 CSIRO reviewed all previous studies and prepared a Strategic Development Plan outlining the preferred development of the site. A Landscape Master plan was completed in 1999.

56. The proposed works are consistent with the intentions of the Strategic Development Plan.

6.3 Bush Fires

57. As the CSIRO Campus is located adjacent to the Black Mountain Nature Reserve, CSIRO Forestry and Forest Products prepared a report in October 2003, "Measures to minimise bushfire damage to infrastructure at the CSIRO ACT Black Mountain Site".

58. The recommendations of this report are being implemented throughout the site including, the reduction in the level of flammable fuel and the creation of a buffer zone with the adjacent bush land.

6.4 Geotechnical Conditions

59. A preliminary geotechnical review based on previous experience in the area and available geological and topographical data indicates that the subsurface profile is likely to be underlain by shallow fill materials overlying natural colluvial soils comprising fanglomerate (angular and sub-rounded gravels and cobbles of sandstone and quartzite in a weakly cemented silty matrix). Flanglomerate is associated with former colluvial deposits from Black Mountain and can extend to significant depths.

60. The current proposal is to construct the new laboratory building with strip and pad footings founded within the fanglomerate. A detailed site specific geotechnical investigation is currently being carried out in order to complete the design of the footings and pavement systems.

7.0 ENVIRONMENTAL MANAGEMENT

61. Specific environmental management actions to be implemented as part of this proposed development will include:

- Appropriate tree planting and landscaping adjacent to the building;
- The filtering and control of all storm water run-off to contain any potential pollutants onsite;
- Sound attenuation and vibration isolation within the new facilities to maintain acceptable noise and vibration limits on the site;
- The dilution and treatment of non-toxic isotopic and liquid waste prior to discharge to sewer and agreed trade waste approvals;
- Silver recovery units shall be provided for dark room waste;
- Collection of wastes such as flammable liquids, oils and toxic liquids at the point of use in waste containers which will be collected for disposal by a licensed industrial waste collector;
- Storage of hazardous goods in accordance with respective codes and standards; and
- Appropriate filtration and odour management of airborne exhaust discharges to avoid impact on the environment.

62. An Environmental Management Plan consistent with AS/NZS ISO 14001:1996 will be developed for the post-occupancy management of the facility.

63. The construction contractor will be required to implement an Environmental Management Plan during the construction phase to manage waste, noise, airborne pollutants and dust, erosion and stormwater control.

8.0 HERITAGE CONSIDERATIONS

64. The main Entomology Building (Building 101, facing Clunies Ross Street), is listed on the Commonwealth Heritage List. Building 101 is described as a place of considerable heritage value related to its history, aesthetics and social value.

65. The Building's typology, its façade and elements of its interior are deemed of value and will be enhanced.

66. A heritage management plan has been prepared, consistent with the requirements of the Environmental Protection and Biodiversity Conservation Act (EPBC). Heritage assessment of the adjoining buildings has also been undertaken. The heritage reports have been discussed with and submitted to the Commonwealth Department of Environment and Heritage.

67. A formal application under the EPBC Act has been lodged with the Environment Minister.

9.0 CONSULTATION

68. The following authorities and Departments have been contacted and/or consulted by CSIRO and its consultants during the preparation of this submission:

Commonwealth Government
National Capital Authority
Department of the Environment and Heritage
Department of Agriculture, Fisheries and Forestry
Department of Education, Science and Training
Department of Employment and Workplace Relations
Department of Family and Community Services
Department of Finance and Administration
Department of Foreign Affairs and Trade
Department of Health and Ageing
Department of Immigration and Multicultural and Indigenous Affairs
Department of Industry, Tourism and Resources
Department of the Prime Minister and Cabinet
Department of Transport and Regional Services
The Treasury

Territory and Local Government
ACT Roads
ActewAGL
ACT Fire Brigade

Federal and Local Members
ACT Senator - Senator Gary Humphries
ACT Senator - Senator Kate Lundy
Federal Member - Member for Fraser, Mr Robert McMullan
ACT Legislative Assembly – Chief Minister, Mr Jon Stanhope

Unions
CSIRO Division of Community Sector Union (CPSU)

Other Organisations
Australian National University
University of Canberra
University of New South Wales, University College, ADFA
Office of the Gene Technology Regulator
National Botanic Gardens

69. CSIRO has also conducted information and consultation sessions during the planning and schematic design phases with the CSIRO Divisional staff seeking comment and input to the design of the new proposed facilities.

10.0 TECHNICAL SOLUTION

10.1 General

70. The proposed new CSIRO Entomology Bioscience Laboratory (Building 179) will comprise a two storey building, with plant room on roof, of approximately 2313m2 gross floor area (GFA) consisting of the following:

Ground Floor
Laboratory support facilities
Lift and stair access to all levels
Plant room

First Floor
Main laboratory space
Workstations and staff breakout areas
Lift and stair access to all levels
Laboratory support facilities
Toilet facilities

Second Floor
Lift and stair access to all levels
Plant room

Refurbishment of Existing Building 101
Conversion of existing laboratory spaces into offices
New reception and exhibition space
New seminar and meeting rooms
New registry
New staff canteen
Upgrade of existing toilet facilities
New access for the disabled to main reception

Refurbishment of Existing 135

First Floor
New laboratory spaces to level 1

Ground Floor
Selective refurbishment
New floor finishes and painting
New Services as necessary

71. The proposed new laboratory Building 179 will be linked to the existing Buildings 101 and 135 by enclosed walkways allowing the PC2 barrier to be maintained between laboratory spaces, and to provide access to amenities, offices and seminar spaces.

72. The design of the building provides a facility that will allow leading edge, scientific research within a comfortable work environment, one which is conducive for interaction of all staff and their research visitors and collaborators.

73. The design of the building form will reflect CSIRO's aspirations in a diversity of public and private spaces which:

- provide a public interface for clients and visitors;
- act as a catalyst and attractor for promotion of CSIRO's work;
- assist in creating conditions for product, staff and visitor security and personnel safety;

- provide differentiation between communal areas and work areas;
- provide differentiation between work areas dedicated to particular programmes or groups and shared support zones;
- provide medium and long term flexibility and adaptability; and
- provide quality working facilities for research.

10.2 Design and Construction Standards

74. Design of the facilities will be consistent with the general design philosophy for all CSIRO research accommodation, requiring long-term flexibility (multiple use of space), adaptability (easy conversion of layout/simple re-servicing) and simplicity of maintenance (with fully accessible engineering services).

75. All buildings, services and external infrastructure will comply with all relevant town planning, Commonwealth and State building, health and safety regulations, the Building Code of Australia and all relevant Australian Standards, including the “Safety in Laboratories” and “Laboratory Construction” Codes.

76. All consultant agreements and construction contracts will be in accordance with the National Code of Practice for the Construction Industry 1997.

10.3 Building Design Concept and Planning

77. The proposed Building 101 and Precinct Refurbishment/Upgrade will:

- Maintain the integrity of the heritage value of Building 101 and enable it to be continued in use as part of a research facility, consistent with its original construction intent;
- Provide the ability to “tidy up” the Entomology precinct by removing the dilapidated buildings in the courtyard area and consolidating research support facilities in a dedicated central facility providing better management and infrastructure control;
- Allow the redefinition and control of public access through Building 101;
- Relocate laboratory functions from the ground floor and provide only office space, to prevent the potential hazards of personnel traffic across the central corridors and accidents arising from the movement of dangerous goods or containment material across office access and public interface areas;
- Allow the demolition of the existing fibro annexe at the north end of Building 101 and the reinstatement of the original design intent for Building 101. This will also enable a new controlled exit point to the north end of the building for staff to travel across to the “Discovery Centre” and the broader campus generally.

78. The proposed new Bioscience Laboratory (Building 179) will

- Provide a new fully compliant PC 2 laboratory building;
- Provide a new freestanding laboratory building that offers the opportunity for creating an appropriate workplace environment for research that fosters collaboration, improved safety and hygiene, and will promote the Division as a world-class integrated research facility;
- Provide new laboratory functions located on the first floor of the new building, thereby enabling it to link back to the existing laboratory floor plates of Buildings 101 and 135 with enclosed bridge links;

- Provide on the ground floor essential support functions such as media preparation and wash-up, waste management, dangerous goods storage, and constant temperature rooms;
- Provide a stand-alone facility that will facilitate the construction programme and minimise disruption and enable the discrete management and security of the facility;
- Provide a strong visual identity for the building;
- Provision of controlled service vehicle access; and
- Provide a secure facility compliant with Commonwealth Security Guidelines.

79. The proposed new Bioscience Laboratory Building 179 planning principles include:

- Three principal spatial types: generic laboratories, laboratory support and administration;
- A “laboratory” and structural grid of 3.3 metres in order to provide a higher density of staff and comply with Laboratory Code requirements;
- Location of generic laboratories in the centre of the building with the support facilities to the perimeter;
- A layout that encourages interaction by way of placement of utilities, meeting spaces and tea kitchenettes;
- Movement corridors that allow interactive “opportunities” linking facilities and work spaces;
- A PC 2 barrier that includes media preparation and wash-up;
- “Visual corridors” throughout the entire building for improved safety, visual amenity and management;
- Vehicle movement and access controlled to minimise staff and public crossovers for improved safety and security; and
- Logistics and deliveries at Ground Level from the existing services road.

10.4 Mechanical Services

80. The mechanical services will include:

- Central chilled water plant for the air conditioning systems;
- Central heating hot water plant for the air conditioning systems;
- Air conditioning for comfort conditions to laboratories, laboratory support areas, offices, meeting rooms, registry, canteen, reception and exhibition areas, and all areas which will be occupied by staff for medium to long durations;
- Air conditioning for specific conditions such as constant temperature rooms and cold rooms;
- Make-up air systems to satisfy room pressure requirements;
- Exhaust air ventilation systems for toilets, equipment heat removal and local fume extraction;
- Room pressure regimes and insect barriers to maintain Physical Containment level 2 (PC2) conditions in all nominated PC2 areas;
- Reticulated laboratory gases from a central bottled store; and
- Provision of a Building Management System that will monitor and control the mechanical services.

10.5 Electrical Services

81. The electrical and communications services will include:

- Substation switchboard modification and transformer upgrade;
- Building main switchboard (MSB) for new Building 179;
- Multi-function metering for the new building connected to the Building Management System;
- New mains and submains cabling;
- Facility to connect a stand-by diesel generator via a manual changeover switch;
- Distribution boards;
- Emergency power cut outs of laboratory power;
- Internal lighting systems including emergency and exit lighting;
- External and security lighting systems;
- Electrical power installation including general-purpose and special-purpose power outlets;
- Voice and data communication wiring;
- New local sub-fire panel to be interconnected with the main fire panel, evacuation panel for a new emergency warning system (EWIS) and intercommunication phones;
- Electronic security to the perimeter of the proposed new building; and
- Lightning protection.

10.6 Hydraulic Services

82. The hydraulic services will include:

- Separate domestic and laboratory cold and hot water reticulation;
- Laboratory Grade (Reverse Osmosis) water reticulation;
- Sanitary plumbing and drainage;
- Laboratory trade waste drainage and pre-treatment;
- Rainwater harvesting and collection; and
- Stormwater drainage.

10.7 Fire Services

83. The fire services systems will consist of fire hydrants, hose reels, extinguishers and automatic fire sprinkler systems.

10.8 Lifts

84. Two passenger lifts will be provided to meet the service demands of the proposed new Building 179 and to upgrade the existing 101 and 135 Buildings to meet current barrier free access requirements.

10.9 Acoustics

85. An assessment of the level of noise emission to adjoining properties due to the operation of mechanical plant has been undertaken.

86. Acoustic measures will be incorporated in the proposed works to meet ACT Environmental Protection Regulations. Ventilation grilles to plant rooms will be acoustically treated to prevent noise propagation to buildings on the CSIRO campus and the adjacent Australian National University (ANU) campus. Acoustically designed screens will be installed on the roof line of the eastern blocks facing onto Clunies Ross Street to reduce emitted noise levels from exhaust fans to be located on the roof of the eastern blocks.

10.10 Site Works and Landscaping

87. The proposed landscape design seeks to respect the formality and cultural values of the existing buildings and to respond to the proposed new architectural elements. The overall landscape character will be contemporary Australian with a strong emphasis on Australian plants and semi formal/geometric/massed plantings. Positive landscape elements including established trees will be incorporated into the landscape design where practical.

10.11 Vehicular Access

88. Service vehicular access will be provided from the existing service road to the rear of the building. This provides access for service vehicles to the substation, services plant rooms and bottled gas stores, and enables the refilling of the bulk carbon dioxide and liquid nitrogen storage vessels.

10.12 Car Parking and Bicycle Parking

89. The existing Campus parking facilities are adequate to meet anticipated growth. Disabled parking bays will be located at the front of Building 101 adjacent to a new access ramp.

90. Bicycle accommodation for staff commuting to work will be provided within the perimeter of the enclosed western courtyard, between Building 101 and the new Bioscience Laboratory.

10.13 Pedestrian Access

91. Existing conditions provide for a network of pedestrian footpaths around the site. Vehicle access and movement paths crossing pedestrian paths will be appropriately sign posted. Access ways will be graded and comply with the Code of Practice on Barrier Free Accessibility in Buildings.

92. Public and ANU pedestrian access is from Clunies Ross Street. Internal connections from the front foyer to the exhibition space, the canteen and the seminar facilities have been located directly off this entry to simplify and provide a secure and direct path for visitors.

10.14 Site Security

93. The new and refurbished facility will be provided with access control and monitoring to all external doors. Perimeter lighting will be provided to the proposed new building to improve night security.

94. Access control to doors will be provided between all staff areas and public accessible areas.

10.15 Maintenance and Servicing

95. Access will be provided for vehicles and equipment required for the maintenance and the cleaning of the building and its environs. Access for fire brigade, ambulance and other emergency vehicles will be provided consistent with local regulatory requirements.

11.0 ENVIRONMENTAL SUSTAINABLE DESIGN PRINCIPLES

11.1 Energy Conservation Initiatives

96. The new facilities will incorporate both active and passive energy conservation initiatives. Passive energy conservation measures will be incorporated into both building and landscape design, whilst the design of mechanical, electrical and hydraulic services will incorporate active energy conservation initiatives. Such initiatives will include:

- Optimum building orientation on the site to provide maximum north/south exposure in order to maximise passive solar energy;
- Optimum building layout enabling maximisation of day-lighting conditions for offices, and laboratories;
- Provision of primary or borrowed natural light in all major functional spaces, thus minimising the use of artificial lighting;
- Installation and connection of power factor correction to all transformer supplies from the substation to improve the building power factor and reduce energy usage and cost;
- Utilisation of highly efficient T5 fluorescent lighting with electronic ballasts and triphosphor tubes for energy conservation and extended lamp life;
- Provision of a dedicated automatic lighting control system with features such as:
  - time clock control to turn bulk of lighting off at predetermined times;
  - passive infra-red and ultrasonic detectors to activate/de-activate lighting to intermittently used rooms such as toilets, storerooms and meeting rooms; and
  - photo-electric control of lighting in perimeter rooms with access to natural lighting;
- Separate air handling plant for each laboratory module allowing independent control and operation out of hours;
- The use of variable fresh air supply (to suit the population density) in the new seminar facility;
- Selection of cost effective and energy efficient mechanical plant;
- Variable fresh air will be provided to the laboratories, to maintain a pressure balance when fume cupboards are operating and then isolated;
- Air conditioning to meeting rooms by activation of a 2-hour timer;
- Evaporative pre-cooling to the roof top chiller condensers that will reduce ambient temperatures up to 10°C;
- Chilled glycol buffer tank to prevent frequent start/stop of the chiller under low load situation;

- Dedicated Fan Coil units to the offices to enable isolation of the unit when the room is unoccupied;
- Make-up air systems to the laboratories that operate only when required; and
- Installation of solar collection panels for hot water.

97. The above initiatives and measures are consistent with a continuing commitment by CSIRO to reduce energy use through the adoption of better and more efficient energy management practices in the design and operation of its facilities.

11.2 Environmental Impact Considerations

98. The new facilities will incorporate initiatives to minimise the impact on the environment. Such initiative will include:

- Selection of materials with low volatile organic compound emissions and those of a proven sustainable manufacture;
- Selection of materials with consideration of their embodied energy;
- Module selection of building materials to minimise wastage;
- Provision of sun-screening elements to northern and western facade;
- Incorporation of water saving devices on hydraulic fittings and fixtures to reduce water consumption; and
- Collection of roof rain water and use for flushing toilets and irrigation.

12.0 BARRIER FREE ACCESS

12.1 General

99. An access audit of the existing building has been undertaken to identify all non-conformances within the existing buildings. Barrier free access for people with disabilities will be provided to both the existing and new buildings.

12.2 Access

100. Access for people with disabilities will include:

- Ramped access will be provided from the front carpark to the entry foyer of the main building (Building 101). This will provide an alternative public entrance and whilst respecting the heritage values of the existing building;
- New lift and stair to the central section of the existing building to provide complying access to all floors; and
- New lift to the proposed new Building 179 to provide access to all floors and links into existing Building 135.

13.0 OCCUPATIONAL HEALTH AND SAFETY

101. CSIRO pursues an active Occupational Health and Safety Policy within the workplace and this will be extended to include all facilities. Strict compliance with these requirements will be adhered to in all construction work.

14.0 CHILD CARE PROVISIONS

102. A child care facility currently operates on the CSIRO Black Mountain Campus. The proposed new Entomology Bioscience Laboratory project will not require an increase in capacity to the existing child care facility.

15.0 LOCAL IMPACT

103. The proposed complex will have a positive effect on the local economy as follows:

- During the construction period, construction and associated industries will benefit with up to 50 persons working on the project at one time.
- Enhanced opportunities will be provided for research interaction with the Australian National University.
- The completed facility will be of sufficient size to employ up to an additional 40 persons in the long term. There will be some transfer of persons and their equipment from the CSIRO facilities at Gungahlin.

16.0 COST

104. The indicative cost, exclusive of GST for this proposal is $14.5 million at May 2005 prices, inclusive of escalation costs, contingencies, all professional fees and authorities' charges. The estimate does not include the cost of staff relocation, loose furniture, fittings and equipment.

17.0 PROJECT DELIVERY SYSTEM

105. It is intended to call for expressions of interest from prospective contractors to undertake construction of the proposed works. A short list of tenderers will be selected to tender for the works under a lump sum contract. Tenders will be required to comply with the National Code of Practice.

18.0 CONSTRUCTION PROGRAM

106. It is anticipated that, subject to a favourable report from the Parliamentary Public Works Committee and Parliamentary approval, construction will commence early 2006 with completion in 2007.

107. The project will need to be staged to minimise disruption to staff and CSIRO projects. A detailed staging programme is being developed in conjunction with Division staff.

19.0 CONCLUSION

108. This proposal aims to construct a scientific research complex that ensures that the Bioscience Laboratory will meet PC 2 standards replacing existing unsuitable and inadequate facilities that currently exist in the Black Mountain Campus.

109. CSIRO is satisfied that the proposed works as described in this submission are the most appropriate, timely and cost effective way to achieve the foregoing objectives.

110. The design properly reflects the CSIRO functional brief and will cater for future changes in research activities and priorities.

20.0 ASSOCIATED DRAWINGS

111. Sketch plan drawings:

01 Black Mountain Site Master Plan
02 Campus Plan
03 Precinct Plan
04 Site Plan
05 Demolition
06 Plan basement
07 Plan ground level
08 Plan level 1
09 Plan level 2
10 Elevations
11 Elevations
12 Elevations
13 Sections
14 Sections
15 Perspective

JACKSON ARCHITECTURE

Daryl Jackson Alastair Swayn Pty Ltd
49 Jardine Street, Kingston
Canberra 2604 ACT Australia

CSIRO

PROPOSED ENTOMOLOGY BIOSCIENCE LABORATORY

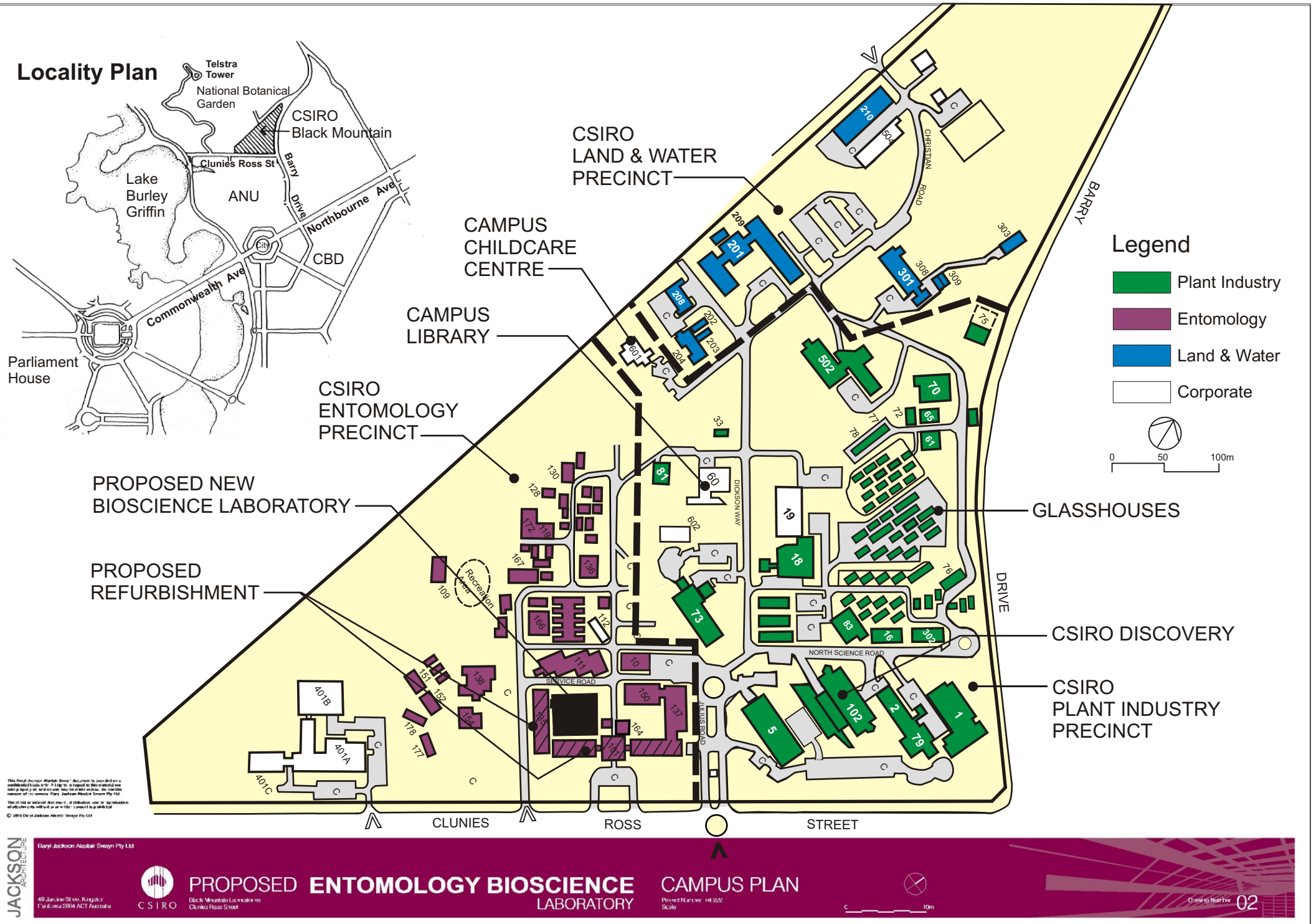
Black Mountain Laboratories
Clunies Ross Street

BLACKMOUNTAIN SITE MASTERPLAN

Project Number 04 222
Scale

0 10m

Drawing Number 01



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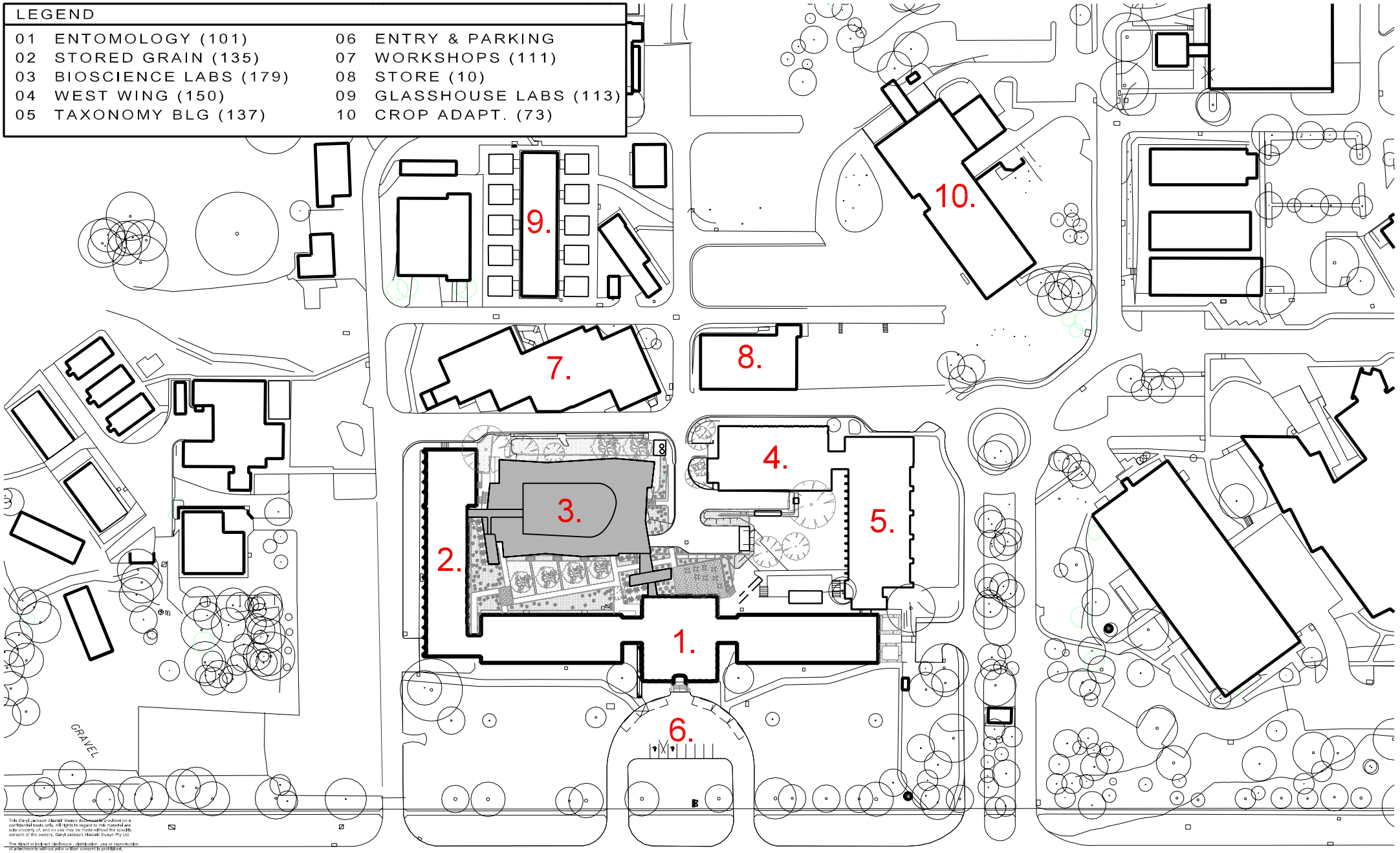
CAMPUS PLAN

Black Mountain Laboratories
Clunies Ross Street

Project Number 04 222
Scale
0
10m

Drawing Number 02



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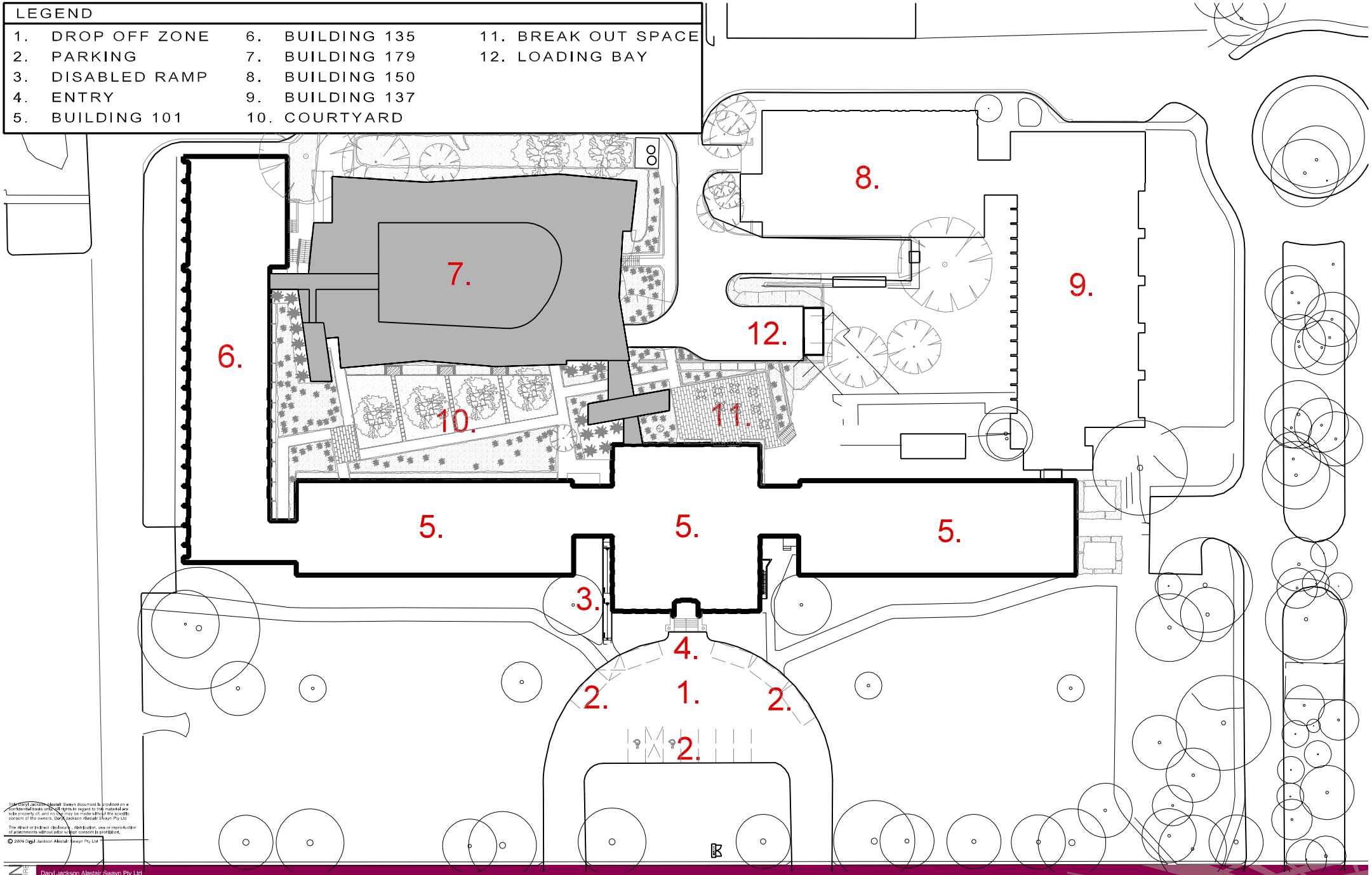
PRECINCT PLAN

Project Number 04.222
Scale 0 10m

Drawing Number 03



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Black Mountain Laboratories
Clunies Ross Street

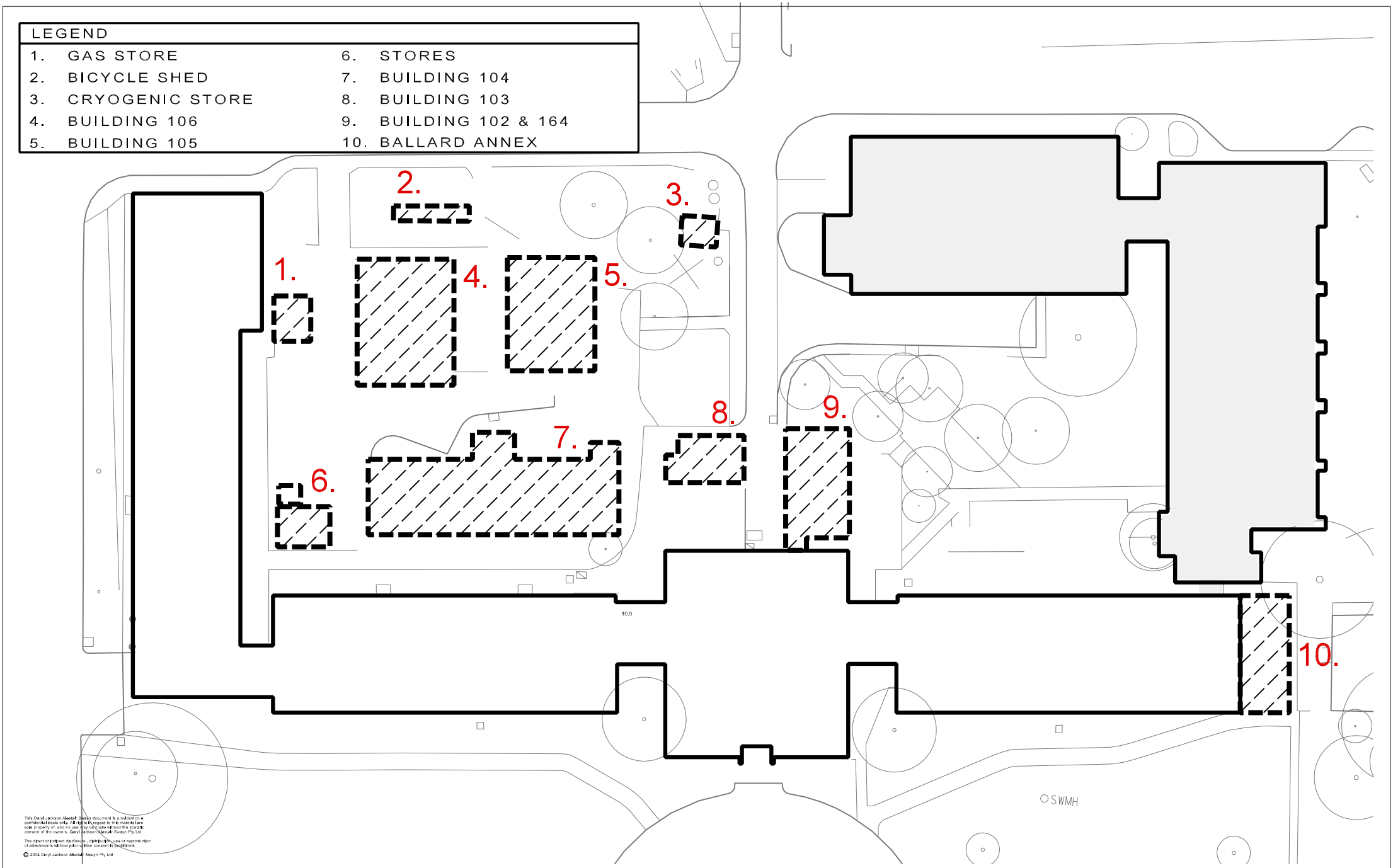
SITE PLAN

Project Number 04.222
Scale

0 10m

Drawing Number 04

LEGEND	
1. GAS STORE	6. STORES
2. BICYCLE SHED	7. BUILDING 104
3. CRYOGENIC STORE	8. BUILDING 103
4. BUILDING 106	9. BUILDING 102 & 164
5. BUILDING 105	10. BALLARD ANNEX



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PROPOSED **ENTOMOLOGY BIOSCIENCE** LABORATORY

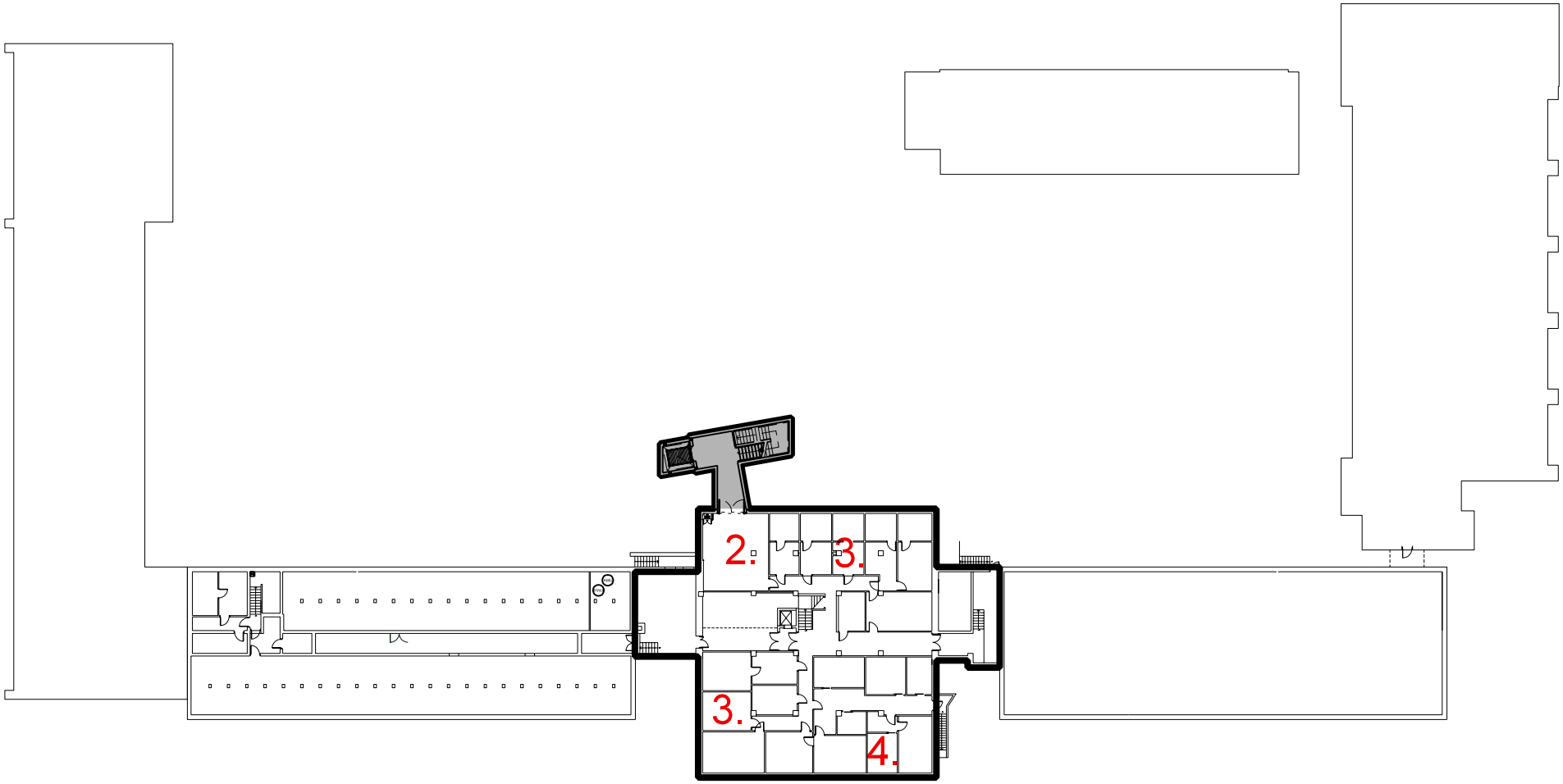
Black Mountain Laboratories
Clunies Ross Street

DEMOLITION PLAN

Project Number 04.222
Scale 0 10m

Drawing Number 05

LEGEND
01 LIFT & STAIR
02 FOYER
03 C/T ROOMS
04 OFFICES



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PROPOSED **ENTOMOLOGY BIOSCIENCE LABORATORY**

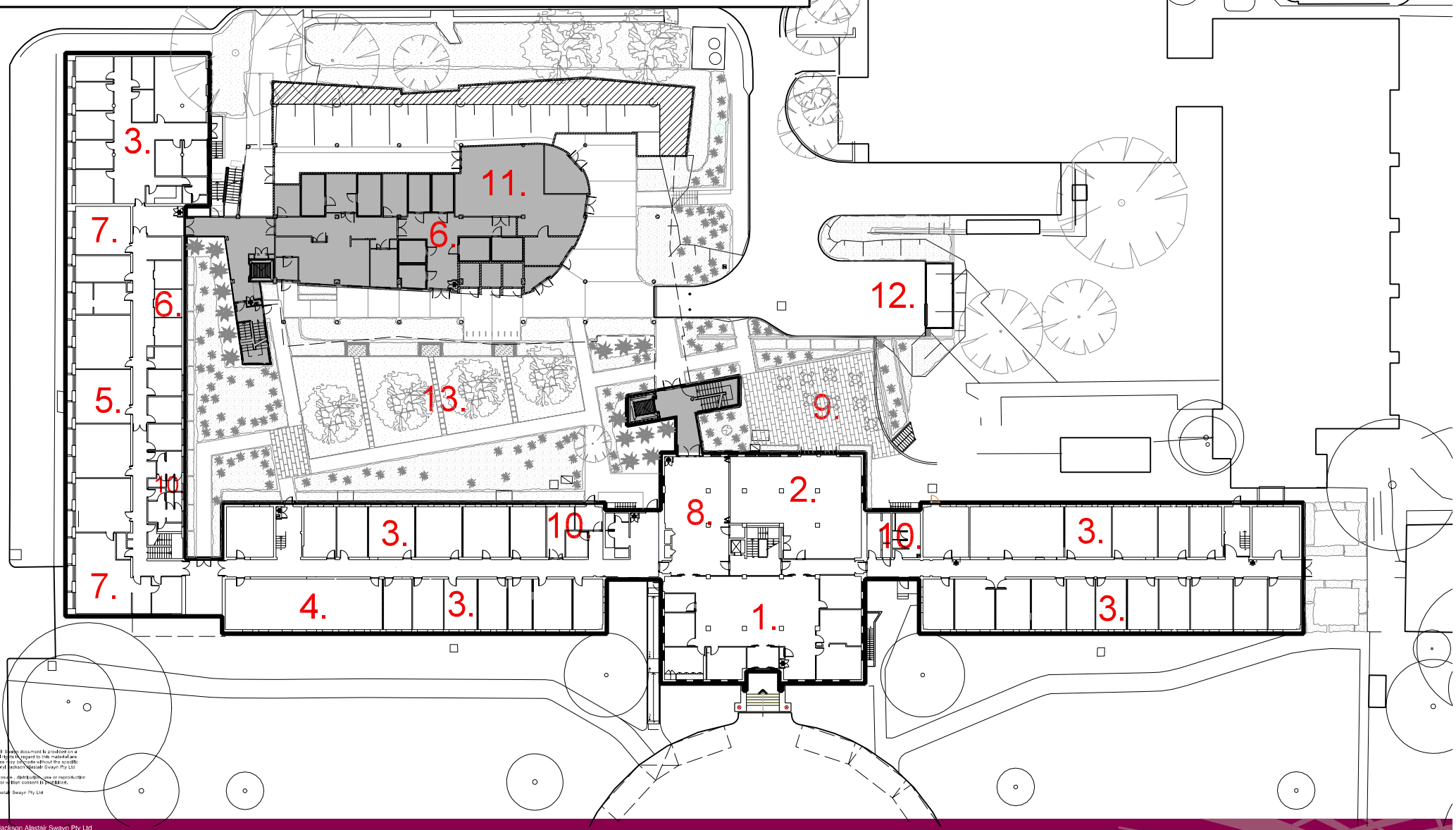
Black Mountain Laboratories
Clunies Ross Street

BASEMENT LEVEL

Project Number 04.222
Scale 0 10m

Drawing Number 06

LEGEND		
1. FOYER	6. LAB SUPPORT	11. PLANT ROOM
2. COMMON ROOM	7. ADMIN. SUPPORT	12. GARBAGE ENCLOSURE
3. OFFICES	8. EXHIBITION SPACE	13. COURTYARD
4. REGISTRY	9. BREAK OUT SPACE	
5. LABORATORIES	10. AMENITIES	



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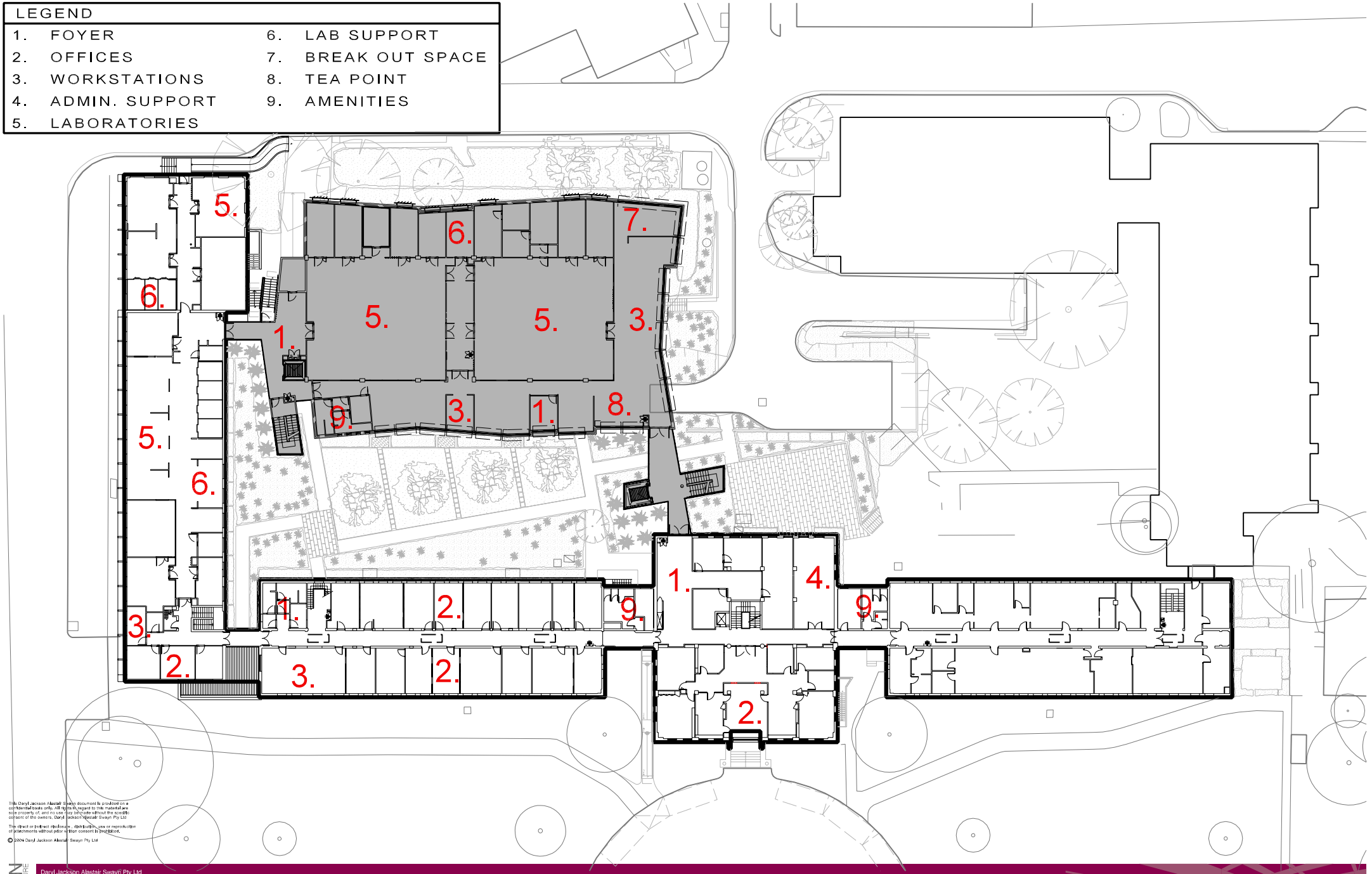
Clunies Ross Street

GROUND LEVEL

Project Number 04.222
Scale

0 10m

Drawing Number 07



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Clunies Ross Street

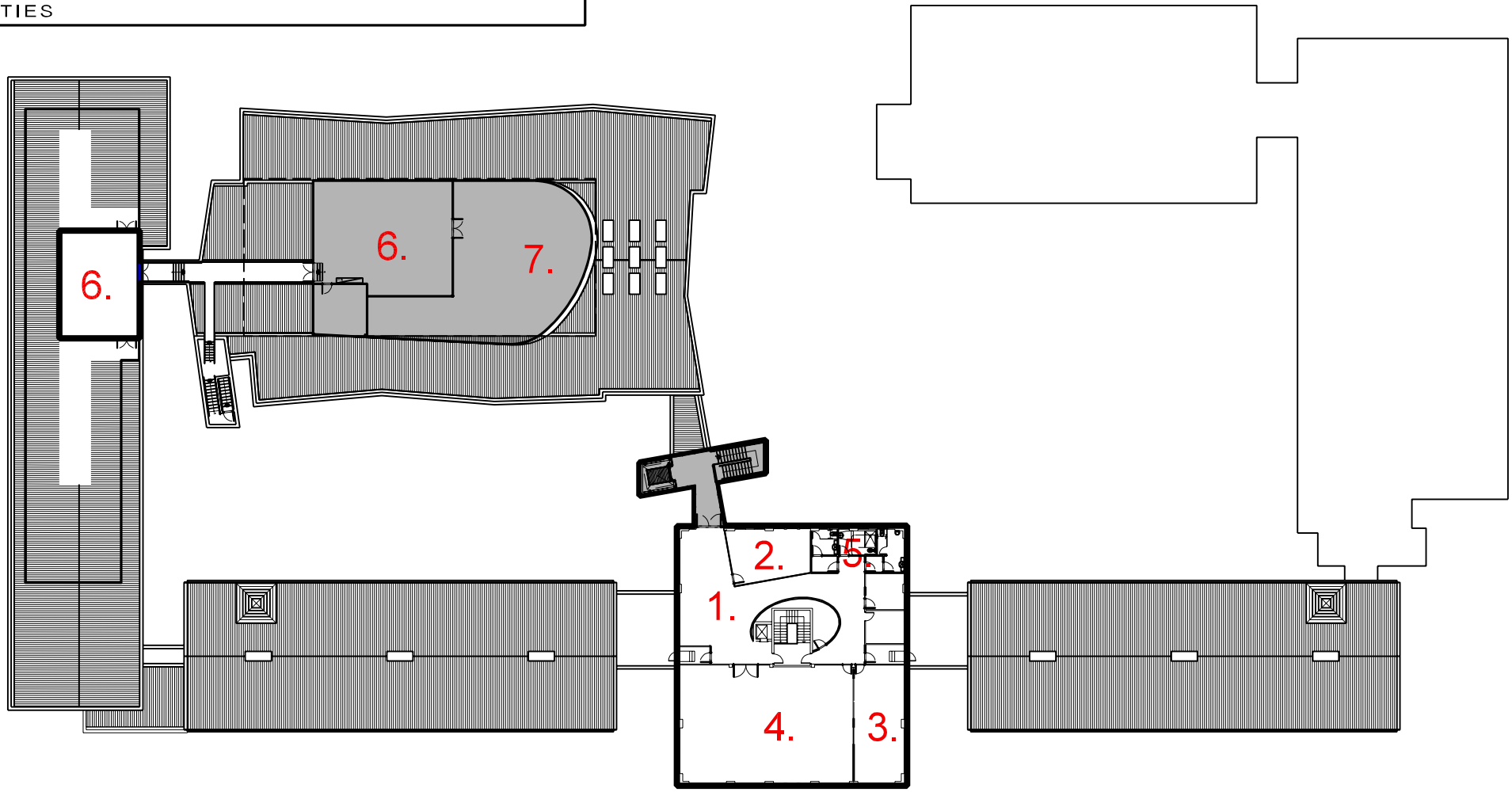
LEVEL 01 PLAN

Project Number 04.222
Scale

0 10m

Drawing Number 08

LEGEND	
1. FOYER	6. ENCLOSED PLANT ROOM
2. MEETING ROOM	7. OPEN PLANT ROOM
3. CONFERENCE ROOM	
4. SEMINAR ROOM	
5. AMENITIES	



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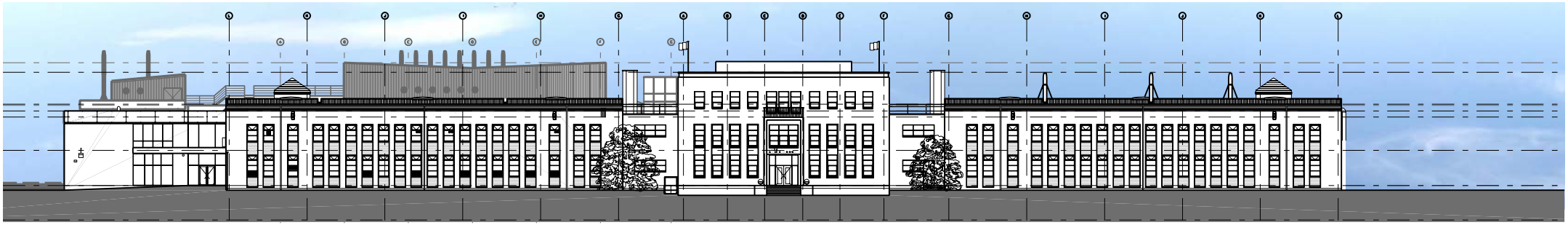
LEVEL 02 PLAN

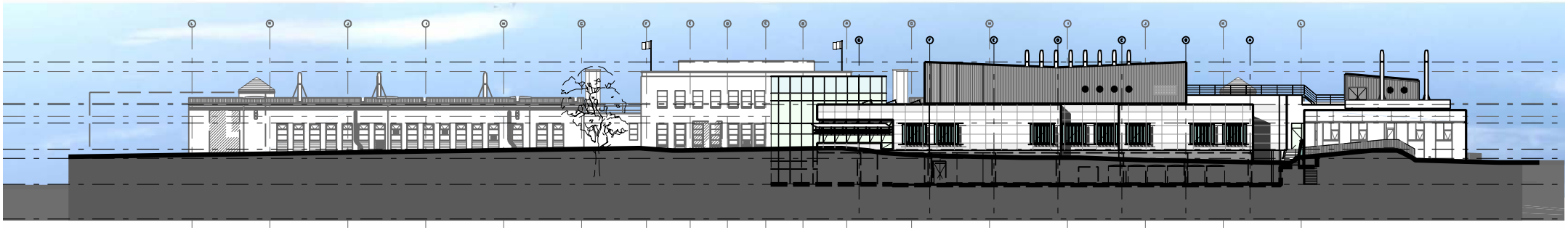
Project Number 04.222
Scale

0 10m

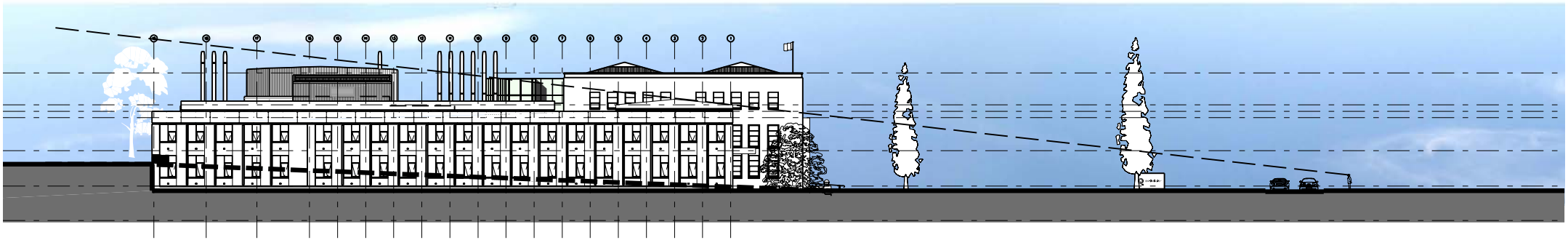
Drawing Number 09



EAST ELEVATION



WEST ELEVATION



SOUTH ELEVATION

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PROPOSED **ENTOMOLOGY BIOSCIENCE LABORATORY**

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Clunies Ross Street

ELEVATIONS

Project Number 04.222
Scale

0 10m

Drawing Number 10

EAST ELEVATION

NORTH ELEVATION

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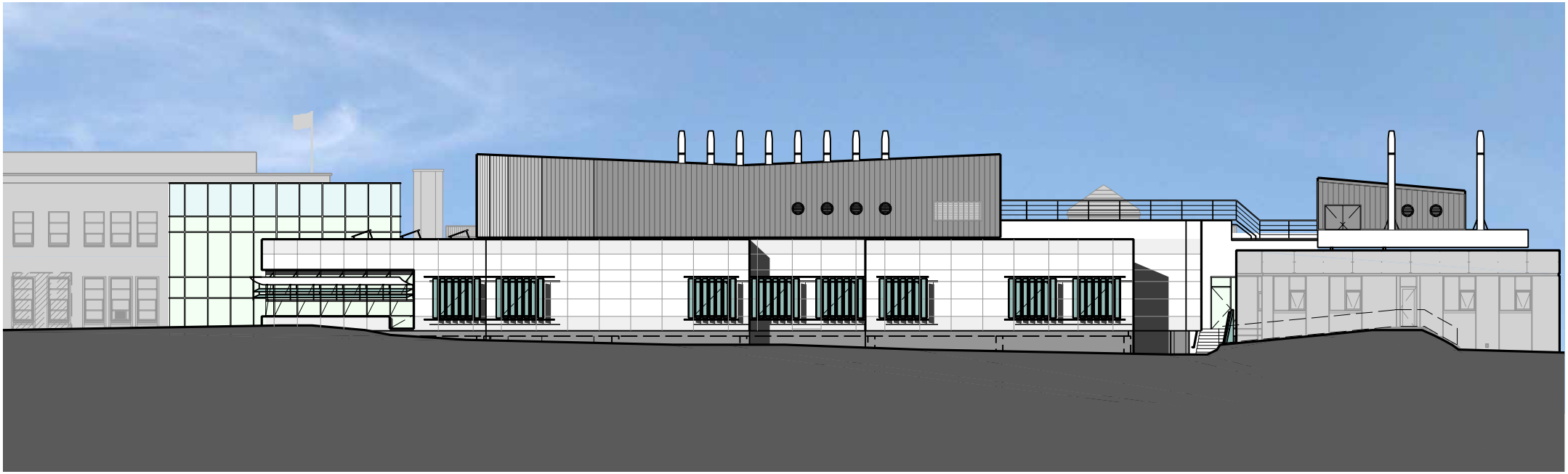
ELEVATIONS

Project Number 04.222
Scale

0 10m

Drawing Number 11



WEST ELEVATION

SOUTH ELEVATION

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PROPOSED **ENTOMOLOGY BIOSCIENCE** LABORATORY

Black Mountain Laboratories
Clunies Ross Street

ELEVATIONS

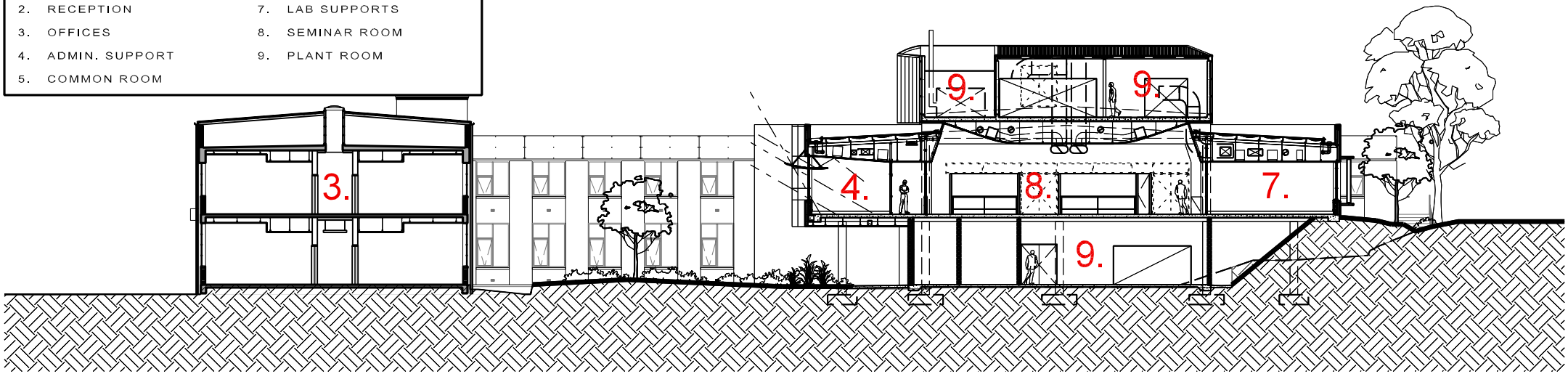
Project Number 04.222
Scale

0 10m

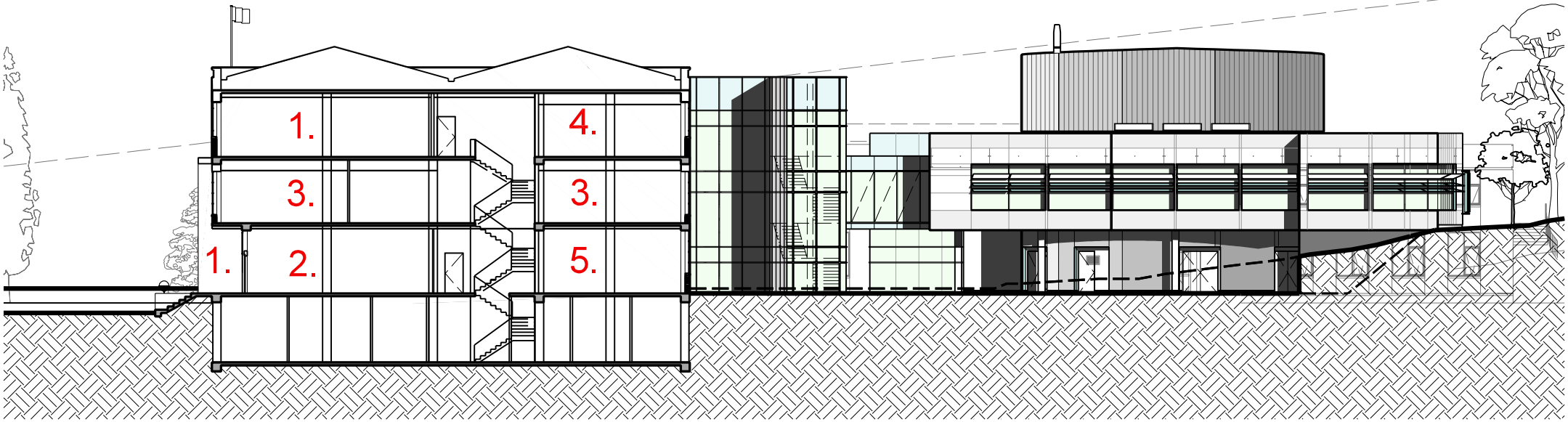
Drawing Number 12

LEGEND

1. ENTRY
2. RECEPTION
3. OFFICES
4. ADMIN. SUPPORT
5. COMMON ROOM
6. LABORATORY
7. LAB SUPPORTS
8. SEMINAR ROOM
9. PLANT ROOM



CROSS SECTION THROUGH BUILDING 101 AND 179



CROSS SECTION THROUGH BUILDING 101

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PROPOSED **ENTOMOLOGY BIOSCIENCE LABORATORY**

Black Mountain Laboratories
Clunies Ross Street

SECTIONS

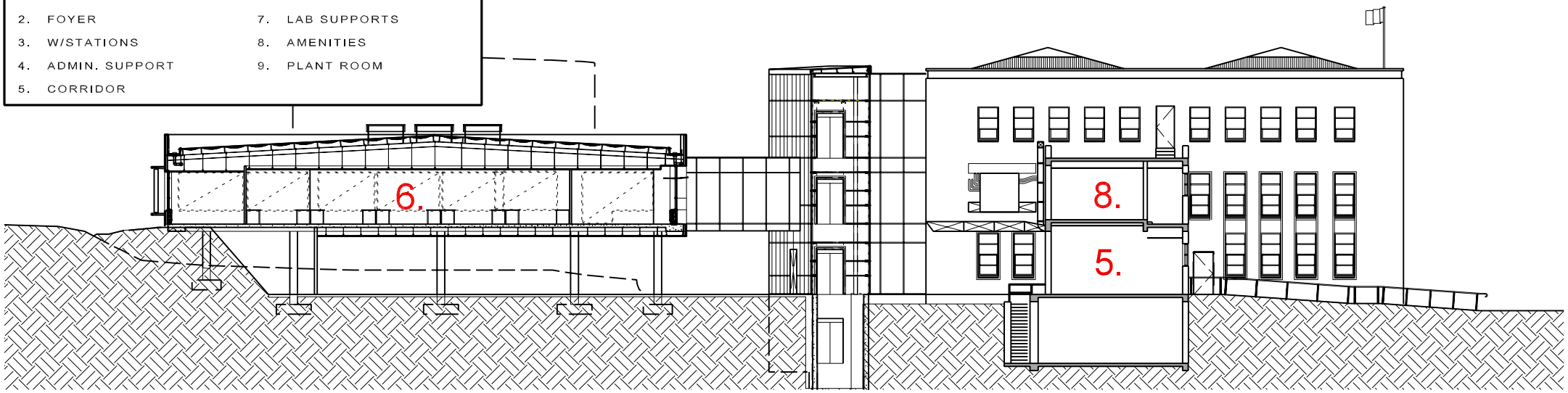
Project Number 04.222
Scale

0 10m

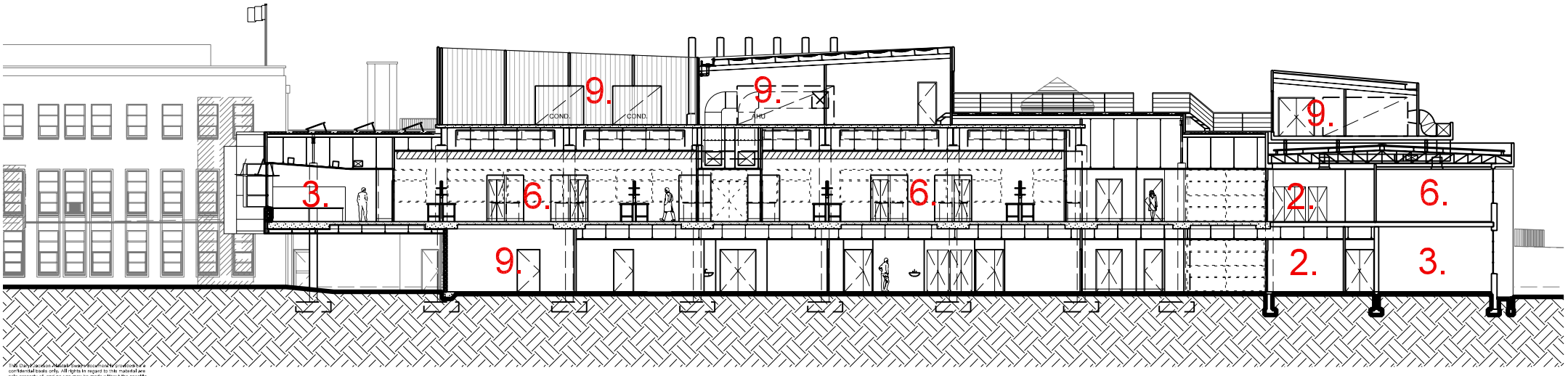
Drawing Number 13

LEGEND

1. ENTRY
2. FOYER
3. W/STATIONS
4. ADMIN. SUPPORT
5. CORRIDOR
6. LABORATORY
7. LAB SUPPORTS
8. AMENITIES
9. PLANT ROOM



SECTION THROUGH BUILDING 179 AND LINK OF BUILDING 101



LONGITUDINAL SECTION THROUGH BUILDING 179

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PROPOSED **ENTOMOLOGY BIOSCIENCE LABORATORY**

Black Mountain Laboratories
Clunies Ross Street

SECTIONS

Project Number 04.222
Scale

0 10m

Drawing Number 14

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PROPOSED **ENTOMOLOGY BIOSCIENCE** LABORATORY

Black Mountain Laboratories
Clunies Ross Street

PERSPECTIVE

Project Number 04.222
Scale

0 10m

Drawing Number 15