

Australian National Botanic Gardens

Report for ANBG Seed Bank Scoping Brief and Concept Plan

May 2012



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- the Seed Bank does not require any certification for dealing with genetically modified materials,*
- the Seed Bank does not require certified AQIS facilities for imported materials or disease control,*
- The Seed Bank does not undertake processes requiring ionizing or non ionizing radiation containment design*
- The Seed Bank does not undertake processes requiring microbiological safety and containment procedures*

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1. Background

1.1 Introduction to the collection:

The Australian National Botanic Gardens (ANBG) is home to a large and ever-increasing conservation collection of Australian native seeds, and in particular holds a large collection of Australian alpine seeds and seeds from Southern Highland grasslands. As of mid 2009, the ANBG Seed Bank held around 5360 accessions (individual seed collections, normally stored in a single packet) from more than 2630 different plant taxa.

ANBG's seed related work has been fuelled by the increasing threat of climate change and human impact upon Australian alpine flora. Between 2007 and 2009, more than 290 alpine seed collections were successfully banked at the ANBG, including approximately 150 species from 80+ genera. In 2010-2011, a total of 164 collections from the Australian Alps and local grasslands were made and added to the ANBG Seed Bank. Ongoing collecting activities within local grassland and woodland areas are increasing understanding of the seed biology of local species which will support local conservation activities. During 2011-2012, 99 seed collections from local grassland and woodland areas were added to the conservation seed bank.

1.2 The Role of the ANBG Seed Bank

The key roles of the ANBG Seed Bank are:

1. Providing seed biology and seed conservation services and research to support the development of the living collection.
2. Supporting research at the Centre for Australian National Biodiversity Research (CANBR) and ANBG.
3. Contributing to ANBG's role, as a national institution, in conservation.
4. Maintaining and engaging in new partnerships for collaborative conservation work.
5. Undertaking projects as an active partner of the Australian Seed Bank Partnership.
6. Supporting the conservation and restoration works in Australian Government Commonwealth Parks.

1.3 Key Functions of the Seed Bank:

It carries out these roles through the following key functions:

- ▶ **Long-term storage** of conservation seed collections, with a particularly focus on rare and threatened flora, flora of the Southern Highland grasslands and Alpine flora.
- ▶ **Experimenting** with seed germination and seedling establishment protocols which supports the work on the propagation of native plants at the ANBG's nursery and contributes to national knowledge on the germination requirements of Australian flora.

- ▶ **Researching** seed biology to contribute to knowledge about Australia's flora.
- ▶ **Supplying** seed to conservation and research institutions through ANBG's plant release program.
- ▶ **Undertaking and supporting** research undertaken by ANBG, CANBR and relevant partners and associates.

The role of the ANBG Seed Bank is expanding to support the restoration and conservation work within Park Australia's Commonwealth Parks. This support will primarily consist of training and capacity building in conservation seed banking and seed science. ANBG horticultural staff and CANBR scientists and technicians provide a diverse range of expertise in botany, taxonomy and field identification and collecting in a diverse range of ecosystems that can support the expertise within the DNP's Commonwealth Parks.

1.4 Seed Bank Collection Procedures

ANBG's seed banking protocols are based on international standards which have been developed as part of the Millennium Seed Bank Project in the UK. For each seed collection, a Herbarium specimen is collected and lodged at the Australian National Herbarium and provenance details (location, vegetation information, date, time etc) are comprehensively recorded and entered into the IBIS database (a series of integrated publicly accessible databases).

The viability of seed collections stored in the ANBG Seed Bank is monitored by a program of germination trials. For much of the Australian flora there is very little information available regarding germination requirements and ongoing research is important to bridge the gap in knowledge to inform restoration and rehabilitation works. All seeds, whether for short or long-term storage at the ANBG, have germination trials conducted to determine the:

- ▶ Optimal germination conditions (temperature, light, pre-treatments etc)
- ▶ Germination rate
- ▶ Total percentage germination

1.5 Applicable Codes and Standards

The code and standards that will be applicable to the design of the Seed Bank Facility will be current issues of

The National Construction Code Building Code of Australia ("BCA")

All Australian Standards referenced by the BCA

AS/NZS 1982.1 2010 Laboratory Design and Construction Codes

AS/NZS 2243.1:2005 Safety in Laboratories Planning and Operational aspects

AS/NZS 2243.2:2006 Safety in Laboratories Chemical Aspects

AS/NZS 2243.6:2010 Safety in Laboratories Plant and Equipment Aspects

AS/NZS 2243.8:2006 Safety in Laboratories Fume Cupboards

AS/NZS 2243.9:2009 Safety in Laboratories Recirculating Fume Cabinets

AS/NZS 2243.10:2004 Safety in Laboratories Storage of Chemicals

AS/NZS 3500.1:2003 Plumbing and drainage – Water services (incl. Amdt 1 +2)

AS/NZS 3500.2:2003 Plumbing and drainage – Sanitary plumbing and drainage (incl. Amdt 1 +2)

AS/NZS 3500.3:2003 Plumbing and drainage – Stormwater drainage

AS/NZS 3500.4:2003 Plumbing and drainage – Heated water services AS 2419.1:2005 Fire hydrant installation – System design, installation and commissioning

AS 2441-2005 Installation of fire hose reels (incl. Amdt 1)

AS 2444-2001 Portable fire extinguishers and fire blankets

AS1670.1-2004 Fire detection warning control and intercom system

AS 2118.1-1999 Automatic fire sprinkler systems

In addition to the above the Millennium Seed Bank Project Kew Technical Sheets 11 and 12 are to be used as guide to design of specialist cold room and seed drying room facilities.

2. Introduction

The purpose of this document is to set out the functional requirements, concept plan and cost estimate for the ANBG Seed Bank as established through consultation with the ANBG Seed Bank stakeholders.

The process to establish the brief and concept design to date has included

- ▶ review of preliminary briefing material provided by the ANBG,
- ▶ a site visit to the existing Seed Bank facility
- ▶ a site visit to the proposed site in the nursery undercroft,
- ▶ desktop investigation of existing buildings services and site services supported by Dial Before You Dig enquiry and on site visual inspections at the nursery building
- ▶ site selection review with ANBG stakeholders
- ▶ a meeting with key stakeholders to review the workflows and functional requirements of the facility and comments on the initial draft of the scoping brief
- ▶ preparation of draft concept plan and review with ANBG stakeholders
- ▶ finalisation of the concept plan , servicing principles and costing

The project scope as documented in this report is intended to form the basis for the preparation of business case by the ANBG.

3. Project Objectives

The following objectives underpin the development of the Seed Bank facility scoping brief and concept plan:

- ▶ Provision of a specialist seed research facility focused on seed collection, research related to preservation and long term preservation within a Seed Bank from areas within the ANBG's remit and to increase the national and international research profile of the Seed Bank.
- ▶ Provide increased long term secure Seed Bank storage capability to house expansion of the collection required to reflect the growth of the collection areas to include the alpine areas and key Commonwealth national parks such as Kakadu and Uluru as part of the National Australian Seed Bank Partnership;
- ▶ Functional consolidation of the Seed Bank into a single purpose designed best practise research facility suitable to carry out the research programs proposed
- ▶ Expand the capacity within the existing laboratory to support additional staff and the enhanced collaborative research and collection program proposed. These will include appointment of a Seed Bank scientist and increasing the number of PhD positions offered in the future
- ▶ Locate the Seed Bank facility close to CSIRO to facilitate increased inter organization collaboration on the Centre for Australian National Biodiversity Research and the Australian National Herbarium;
- ▶ Colocation with the ANBG Nursery to streamline operations, sharing of facilities and facilitate collaboration between ANBG Nursery staff and seed bank staff on Seed Bank research and propagation programs and integration with the living collection
- ▶ Colocation with Nursery to utilise the mezzanine capacity built into the existing nursery as and if appropriate to the current needs.

4. Existing Facilities

The Seed Bank consists of a fully equipped laboratory with three germination incubators, a drying room (15°C, 15% relative humidity), cleaning and packaging areas and two freezers (-21°C). Combined with the molecular data analysis facilities and expertise at the CANBR, the Seed Bank is well placed to support the banking of rare and threatened plants and build knowledge to germinate seed of rare and threatened flora and other Australian plants.

These facilities are however housed in a collection of small dispersed buildings including refurbished residential accommodation that do not provide suitable working conditions for the staff currently engaged. The facilities are located near the existing visitors café and facilities rather than collocated with the back of house Production Nursery facilities and adjacent to CSIRO with which there are strong operational and research affinities.

A new facility is required to enhance the capacity of the ANBG Seed Bank to undertake collection and research processes.

5. Seed Bank Organisational Structure

The Seed Bank staffing is structured as shown in the following table.

Table 1 Seed Bank Staff Structure

Position	Category	Number of Staff
Unit Manager	Fulltime	1
Seed Bank Manager	Fulltime managerial and technical role	1
Conservation Seed Biologist	Fulltime contract based research position	1
ANBG Horticultural Staff	ANBG staff in rehabilitation	Variable range up to 6 positions total shared with researchers
Researchers	CSIRO Collaborators & PhD students	Variable range up to 7 including up to 6 positions total in open plan area shared with ANBG Horticultural staff
Volunteer Staff	Part-time volunteers	7 rostered

Other than the Seed Bank Manager the staff numbers are variable. The Conservation Seed Biologist position is a short term contract at this stage. PhD student numbers and level of access required for collaborative research activities will vary over time.

ANBG horticultural staff undergoing rehabilitation work within the laboratory to support the conservation activities.

In addition to the above staff and collaborators the laboratory is used currently by a Cryptogram specialist on part-time basis.

6. Proposed Site for the New Facility

6.1 Investigation of Siting Options

In investigating siting options the materials referenced were the

- ▶ Site survey information obtained pre construction of the ANBG nursery
- ▶ ANBG nursery plans and sections as designed, and
- ▶ Dial Before You Dig site servicing information.

No current site survey or geotechnical information was available or commissioned as part of this study and the location of inground services could not be confirmed.

A visual site inspection of the Nursery and adjoining area was undertaken by the GHD project team.

6.1.1 Option 1: Existing Nursery Undercroft and Adjoining Site

In 2004 the ANBG New Production Nursery facility was completed. Within this facility a lower level space with a height of 5.3m was provided. At the time this project was undertaken the future subdivision of this space by a mezzanine to generate additional area for future use was contemplated.

The initial site proposed for investigation for the new facility was the undercroft of the ANBG Nursery and adjoining area.

Topography

This site area is constrained by the access road to the nursery, the existing nursery building, an adjacent creek and the Botanic Gardens site boundary.

The topography is steep which supports two levels of access but will impact on ease of construction. The adjacent road easement corridor may be accessible to provide temporary construction access and site establishment area.

Figure 1 Proposed Site Option 01: Undercroft and Adjoining Area



Existing Usage

The undercroft area is used for support activities associated with the Nursery including bulk materials storage, vehicle parking and building services. The switchboards and composting toilet linked to the Nursery will need to be retained. The area provides secure parking to ANBG vehicles. The potting mix screw hoist is out of commission and could be removed however the potting medium mixing machine is in active use. The mixing machine could be relocated to increase the available floor area to house Seed Bank functions however this would require provision of an alternate sheltered area adjacent to the potting shed.

Figure 2 Existing Nursery Undercroft Area Media Mixing Machine



Site Advantages and Disadvantages

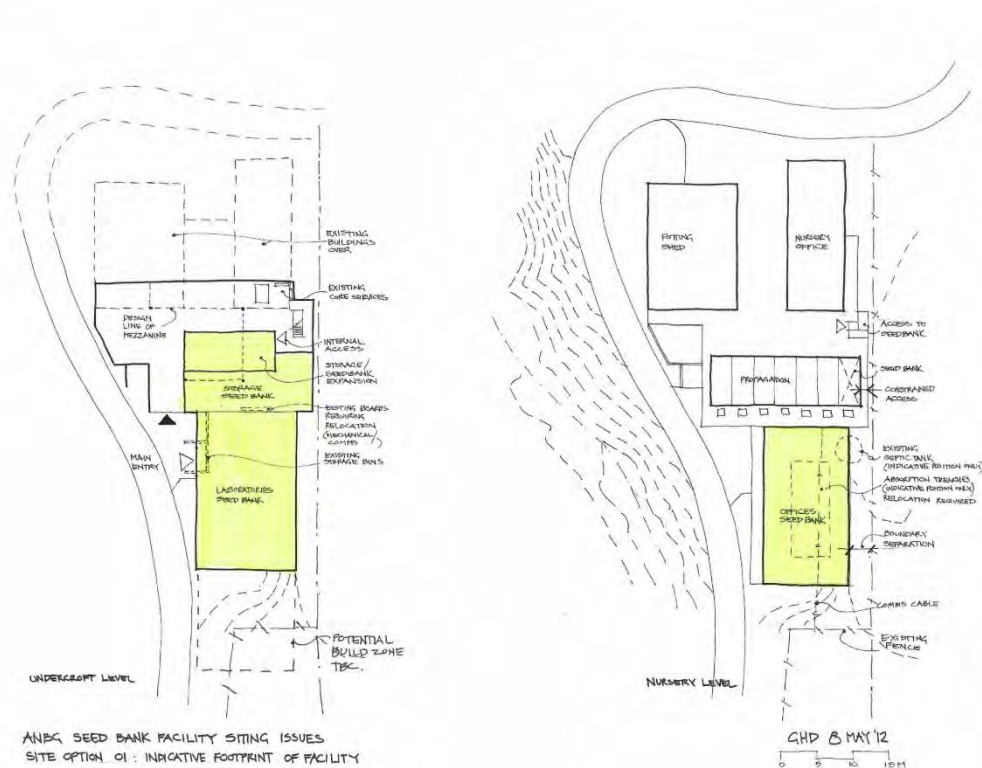


Figure 3 Site Option 1 Initial Planning Study

Following a desktop review of available information and the visual site inspection this site was assessed as having the following advantages and disadvantages:

Advantages

- Close proximity to existing Production Nursery potting sheds and staff offices,
- Connection to existing main switch board and communications,
- Access road provides for two directions of egress and access,
- Access road provides some separation from the gardens to the west,
- A future road, if constructed, in the easement to the east would provide access and protection from this direction.

Disadvantages

- The area of the mezzanine is significantly less than required for the Seed Bank,
- The area adjacent to the building contains a number of in-ground services including the absorption pits for both the composting toilet and septic tank, the septic tank and communications cabling which would be disrupted during any construction on this area requiring temporary works to limit impacts on the Nursery's ability to function,
- The Nursery absorption trenches and septic system will require relocation if building is sited over

them,

- Head heights provided are in the undercroft are consistent with mezzanine storage / plant areas or single level use only for working spaces such as laboratories and offices,
- Relocation of mixer unit to new covered area, removal of screw hoist, reworking of water filtration system from Nursery, removal of stored materials and relocation of the mechanical distribution board would be required to free up usable floor space in the undercroft area,
- Planning for facilities within the undercroft will need to work around existing structural columns and walls or will involve significant structural work,
- Access to the new facility at grade at upper level would be constrained by the existing nursery propagation houses which are well located in for the Nursery workflow and are reported to be fully used,
- Address and access to the site is constrained by the access road. This could change if a road is constructed in the future to the east which could facilitate direct entry on the eastern boundary however it is not unknown if this work is likely to proceed in the short to medium term,
- Reworking the existing retaining walls and slabs to form suitable enclosure will require rectification due to settlement and identified issues with moisture entry and modification due to the original construction for a different class of use,
- There is no sewer service to the site so this building will need to duplicate or substantially modify components of the existing system if acceptable to ACTEW or given the introduction of laboratory waste may need to be pumped to the existing sewers,
- Initial planning studies indicate 2 storey development is required with associated costs for a lift,
- Extension of boundary protection sprinklers is required to protect the new facility,
- The construction site would be extremely due to bounding to east by the site boundary and the west by the access road although access from the adjacent road easement could assist,
- Based on the location of absorption trenches and services to the south it is assumed there has been extensive backfill but the degree of compaction is not known.

6.1.2 Option 2 : Greening Australia Hardening off area (no longer used)/ Fire Assembly Area

During the site inspection of the Option 1 site the abandoned Greening Australia Hardening Off area was identified as an alternate location for the seed bank facility by ANBG representatives. An initial planning study for the site shown below as prepared and the potential advantages and disadvantages identified based on the limited site information available.

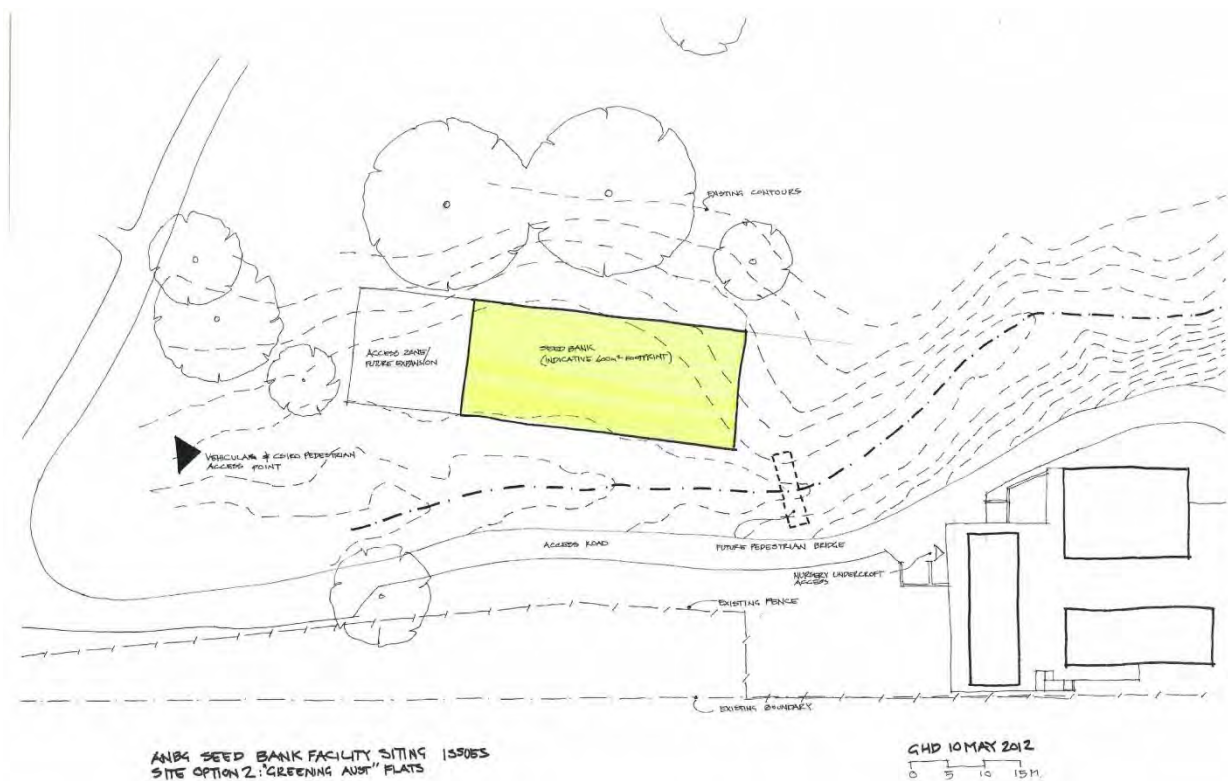


Figure 4 Site Option 2 Initial Planning Study

Advantages and Disadvantages

Advantages

- A larger site constrained by topography to the west but including an open relatively level area would allow single level development with some cut and fill excavation,
- The site is close enough to Nursery to provide pedestrian connection via road to upper level or through the undercroft to enable shared use of facilities,
- The site provides a good opportunity to create a recognisable address and image,
- The site provides a good opportunity to create a facility with outlook to views,
- From the limited topographical information available and the visual inspection on site at grade service & construction access appears possible,
- Land has been identified as not useful for other purposes due to prevalence of disease,
- The site is accessible from the CSIRO access gate.

Disadvantages

- It appears the flat portion of the site has been created from uncontrolled fill in gullies adjacent to the creek so the structural foundation is likely to require deep piers,
- Vehicular access is restricted to one point and one direction requiring bridging of creek for pedestrians with trolleys to improve access to Nursery and provide two exit routes in bushfire or

emergency,

- There is no gravity fed sewer available to the site and as with the undercroft it is anticipated sewerage will need to be pumped off site due to presence of laboratory waste,
- Separation from Nursery building requires either separate POE or connection from existing building across creek for power,
- Bushfire protection through drenching of the facility and extension of the boundary sprinklers will be required,
- Excavation will required to create a large enough site for a 600m² single storey building platform,
- Subject to a detailed site survey confirming their location and the final design removal of trees may be required for creation of a large enough building platform by cut and fill, safety and fire control,
- An alternate fire assembly area will need to be selected.

In conjunction with ANBG representatives it was decide to develop a concept plan for a facility on the Option 2 site. Finalisation of siting would be subject to more detailed site investigation including:

- ▶ A detailed site land survey including identification and location of significant trees,
- ▶ Geotechnical survey and analysis,
- ▶ Review of site servicing options with ACTEWAGL,
- ▶ Review of bushfire protection strategies (which may set additional criteria for building design rather than modify the siting), and,
- ▶ Liaison with the National Capital planning Authority.

7. Area Requirements

The workflows, area and equipment requirements for the proposed seed bank have been developed in consultation with the ANBG Seed Bank Stakeholders and are detailed in Appendices A, B and C. The Room Data Sheets (RDS) included at Appendix C define criteria to guide concept design and a concept design cost estimates only. Additional detail will be developed in later stages of the design process. Based on the concept plan developed in response to the RDS and workflow diagrams located at Appendix B the schedule of areas for the main ANBG Seed Bank Facility is as shown in Table 2.

Table 2 Area Schedule

Space	Count	Area (sqm)	Sub Total (sqm)
Cool Room	1	4.5	4.5
Incubator Room	1	17.25	17.25
Dark Room	1	8	8
Seed Bank Freezer Room	3	11.25	33.75
Seed Bank Airlock	1	11	11
Store Room	1	8	8
Drying room	2	11.25	22.5
Drying room Lobby	1	16	16
Preparation Laboratory	1	30.5	30.5
Seed Cleaning Machine Room	1	12.25	12.25
Laboratory	1	100.5	100.5
Unit Managers Office	1	20.25	21
Standard Office	3	15.25	45.75
Open Plan Office	1	96.5	96.5
Meeting room	1	32.5	32.5
Utility Area	1	13.5	13.5
Tea Point	1	15.25	15.25
Shared Circulation	1	41	41
Services	1	4	4
Sanitary Facilities	1	20.5	20.5
Total Net Floor Area			554.25

In addition to the above the following are required external to the main building:

- ▶ Sprinkler valve room,
- ▶ Generator,
- ▶ Propagation greenhouse (if there is no capacity to collocate within the existing Nursery greenhouses).

8. Project Risks

Project specific risks identified to be managed through the design process are set out in the table below:

Table 3 Project Risks

Hazard	Risk	Concept Stage Response
Site: Bushfire	Loss of facility Loss of collection	ANBG Bushfire Management Plan External drencher sprinklers to be provided to protect building Seed Bank to be located within a separate fire compartment Building construction to be designed to provide bushfire protection
Site: Bushfire	Emergency Egress / Access constrained	ANBG to revise emergency assembly points in precinct Dual egress points to be provided Design to be reviewed with ACTFB in development stage
Site: Services	Lack of site service capacity leading to costs Disruption costs to existing services	Costs included in concept plan cost plan Site option 02 selected limiting disruption to services to existing nursery
WHS : Chemicals	Exposure of staff	Fume cupboard & laminar flow hood to be incorporated Corrosive and chemical storage cabinets identified and costed Safety shower and eyewash
WHS : -21°C Store	Exposure of staff	ANBG controlled access & safety protocols Brief inclusion and cost allowance for <ul style="list-style-type: none"> ▶ 12 min timer occupancy alarm ▶ Provision of protective suit storage ▶ Provision of duress alarms ▶ Free handle egress and illuminated handle ▶ Swipe card access control

WHS: Drying room	Prolonged exposure of staff	ANBG controlled access and safety protocols Brief inclusion and cost allowance for <ul style="list-style-type: none"> ▶ Swipe Card access controls ▶ Provision of duress alarms ▶ Free handle egress and illuminated handle
WHS: Dust	Inhalation or eye contamination	ANBG safety protocols Brief inclusion and cost allowance preparation lab provision of for <ul style="list-style-type: none"> ▶ Snorkel exhaust to sorting bench ▶ Dwindraught bench ▶ Eyewash at sink
WHS: Glass Breakage	Injury to staff	Bench drying storage for glass Cost & space allowance for disposal bins Shelves at swipe controlled / lockable doors
WHS: Xray Radiation	Exposure of staff	Selection of equipment to contain radiation risk
Security:	Loss of collection or damage to collection or research material	ANBG controlled access protocols Swipe card access briefed and costed
EMS: Contaminated plant material	Contamination of external plant materials	Waste storage space allowance Link to existing nursery disposal process
EMS: Laboratory Waste	Contamination of ground water or creek	Neutralising tank and pumping of sewer to remove it off site

9. Concept Design

9.1 Architectural

9.1.1 General

The Seed Bank is proposed as a standalone facility close enough to the existing Nursery building to allow staff to walk between them.

It is proposed that the building be sited on the western side of the creek bounding the Nursery which provides room for expansion whilst creating the proximity required to enable staff to undertake work in both buildings.

The colocation with the Nursery is to facilitate the shared role on specimen collection and propagation research. A bridge across the creek is proposed to provide ease of access and a second direction of egress in emergencies.

Colocation is also intended to enable shared use of;

- ▶ The potting shed facilities for potting specimens in propagation trials and removal of bulk vegetation from field samples prior to taking them to the Seed Bank drying room,
- ▶ The bulk storage area, potting material storage pits and the potting media mixing equipment located in the Nursery undercroft
- ▶ The joint staff lunchroom and shower facilities, and
- ▶ The propagation houses.

While a tearoom is provided in the Seed Bank building it is proposed larger gatherings of joint staff would occur in the Nursery building to support development of formal and informal connections between the two groups.

The site is also accessible from the perimeter access gate linking the ANBG with CSIRO to enable staff to move easily between the institutions.

9.1.2 Design Principles

The proposed concept design reflects the following design principles:

- ▶ The building is standalone but collocated with the Nursery facilities
- ▶ The building is single storey for ease of access between research and storage areas and cost effective construction.
- ▶ The facility has three key functional zones:
 - Seed Bank drying rooms and cool rooms for storage of specimens
 - Laboratories for specimen preparation, monitoring and propagation research, and
 - Offices for research planning and write up and Seed Bank administration including training of

volunteers & staff and meetings with external stakeholders

- ▶ The preparation laboratory is located with direct access to the office areas to facilitate ease of supervision of volunteers undertaking seed cleaning tasks
- ▶ The Seed Bank -21°C storage rooms are located to enable them to be extended as the collection grows
- ▶ Protection of the Seed Bank collection is the highest priority function, and
- ▶ Facility is designed to provide a safe, flexible, high quality workplace environment that facilitates collaboration across institutions and within ANBG.

9.1.3 Concept Plan Layout

The concept plan for the Seed Bank sets the three key functional zones around a central circulation space that links the northern office area and main entry with the staff entry from the vehicular access.



Figure 5 Seed Bank Facility Concept Plan

Dry room storage & seed bank storage areas have been located to the west where the topography will require the building to be cut into the site. This presents the potential to use the protective barrier of the earth bank and building services zone to the western vegetation area. The drying rooms are located central to the laboratory area as these are a hub for a number of activities including collection, processing of specimens, storage of research materials, Seed Bank quality control and packaging and

dispatch of specimens.

Offices and open plan work areas are located on the northern side to maximise for passive solar design and natural daylighting, with the associated amenity for staff and attractive outlook. The internal glazed partitioning and grouping of offices around the central open plan area maximises openness and light. The central open plan office contains the hot desks for visiting staff, PhD students, CSIRO collaborators and volunteers undertaking data entry activities. The location of the open plan office enables ease of provision of supervision and support by the Seed Bank Manager and allows layered control of security in the facility to control access to the research laboratories and storage areas. Volunteers can undertake work in the northern zone under passive surveillance for safety.



Figure 6 Seed Bank viewed from the access road

Laboratories are located on the eastern side and are skirted by the main entryway veranda which wraps and protects from direct sunlight penetrating into the labs and onto working surfaces. With the exception of the Preparation Laboratory the bench scale laboratory facilities are within a zone secured from unauthorised entry from either the vehicular access area or office space. The Preparation Laboratory is directly accessible from the open plan office area to enable free access to volunteers undertaking cleaning and separation of seed samples.

The location of the meeting room adjacent and the viewing windows is designed to provide an introduction to the activities of the laboratory to those in the meeting room.

9.1.4 Seed Bank -21°C Storage

The proposed siting of the building is such that the Seed Bank -21°C Storage could be extended to the south. The initial provision substantially enhances the capacity of the existing Seed Bank research and storage facilities. The storage required will grow over time as the collection expands.

The Seed Bank storage the core of the facility and protection of the species held within it is fundamental

goal of both the research and collection program.

Key issues to be addressed are;

- ▶ Security from theft or damage
- ▶ Stable storage conditions to maintain viability, and
- ▶ Security of specimens in emergency situation such as a bushfire or power loss.

The measures proposed within the facility design to address these issues include;

- ▶ A highly insulated building envelope to provide thermal stability
- ▶ A high level of building services to insulated cool rooms within the facility to maintain suitable conditions
- ▶ Fire rated construction separating the storage areas from the rest of the building and the external environment
- ▶ Programmable swipe card access to all areas controlling access to the facility and, within that, the collection, and
- ▶ Backup generator power to maintain conditions in the storage areas in the event of power loss for a minimum 12 hours to enable either reinstatement of the power supply or arrangements to move the collection.

These physical provisions will be complemented by ANBG internal procedures, the ANBG emergency management plan and agreements with DisACT and allied institutions. The latter would facilitate temporary relocation and storage of the collection if required. It would also enable any work requiring quarantine conditions to utilise off site facilities such as those within the Herbarium.

9.1.5 Access and Address

The vehicular access and address to the new facility is from the south off the existing ANBG internal road network. This access point will provide both service delivery and a drop off point for visitors to enter the building via walkway overlooking the creek.

The proposed location of the main entry is to provide an address frontage to the internal road next to the nursery and enable creation of a straightforward pedestrian link between the Nursery facility and the Seed Bank.

It is proposed that key services including the backup generator, the sewer pump and tank and sprinkler valve enclosure be located adjacent to the vehicular entry point providing access to the staff entry and delivery receipt areas, and via the covered walkway, the main entry. Final locations of these facilities will be determined once the detailed site investigation has been completed, discussions undertaken with emergency services and access points confirmed.

9.1.6 Construction

Given the location of the facility within the ANBG where there is a potential bush fire risk from surrounding vegetation it is proposed non combustible material selection combined with fire protection

features such as external drenches be used to protect the collection and research. In the detailed design stages the proposed design and construction should be reviewed with fire engineering consultants.

The materials proposed for costing purposes include reinforced concrete, terracotta panels and metal decking.

Subject to final site selection and detailed geotechnical investigations it has been assumed the ground conditions will be similar to those at the Nursery and a foundation system of bored piers and beams to the ground slab has been costed.

A fire rated enclosure around the drying and cool storage rooms has been provided separating them from both rest of the building and external environment.

All openings will need to be fully sealed against ingress of vermin and insects including the use of fine mesh on any louvres for intake of air or openable windows.

To support minimisation of operational costs the external building envelope will be highly insulated and all windows will be double glazed.

At this stage no ESD targets have been established for the project which is a specialised and highly serviced facility, however the construction and servicing systems proposed have been selected with a view to containing operating costs. Sustainability targets beyond this should be investigated and agreed prior to any further design.

9.2 Electrical and Communications Services

9.2.1 Power Supply and Distribution

The proposed siting of the building will require a new electrical supply and connection point. The existing supply at the adjacent nursery is located a significant distance away and does not have sufficient spare capacity to support the new building.

The existing ActewAGL high voltage cable network is located along the northern boundary with the CSIRO. It is proposed to extend this network via aerial cabling to the new site and establish a new transformer. The anticipated load for the new building will be in the order of 100kVA depending on final fitout requirements, equipment selections and heating/cooling solutions.

New service cabling would be run underground from the transformer to a new main switchboard on the building.

The main switchboard would include the following:

- ▶ Metering
- ▶ Automatic transfer switch
- ▶ Circuit breakers supplying building switchboards.
- ▶ Lightning surge diverter

The building will be provided with the following separate distribution boards:

- ▶ Essential (connected to generator supply and mains supply)
- ▶ Non-essential (connected to mains supply only)
- ▶ Non-essential mechanical (connected to mains supply only)

Distribution boards will be located within the building and provided with sufficient access and clearance in accordance with AS3000.

It is not proposed to provide separate metering of lighting, mechanical and general power loads as this is not required by the NCC given the size of the building. However it is proposed to provide a private meter at the main switchboard for energy monitoring purposes.

9.2.2 Stand-by Power

The building requires a permanent stand-by power system to maintain the temperature of the seed bank during periods of prolonged power failure. It is proposed to provide a permanent stand-by power diesel generator as part of the building. Diesel generator will support the cooling and lighting systems serving the seed storage rooms. Other loads within the building will not be connected to generator power.

The stand-by power system will include a diesel generator set (minimum size of 30kVA to be confirmed in detailed design), onsite fuel storage (minimum 12 hours at full load) and automatic transfer switch. The generator and fuel storage would be located such that on demand refuelling via mini-tankers can be provided if necessary for prolonged outages. ANBG has advised that seeds could be relocated off-site using refrigerated transport if necessary.

An automatic transfer switch (ATS) will be provided at the main switchboard.

An uninterruptible power supply (UPS) system was also investigated to provide stand-by power however was not considered a suitable due to the large battery requirements to sustain power for prolonged outages and continuity of supply was not required (short power outages can be tolerated by the cooling system).

9.2.3 General Power

General power will be provided throughout the new building. Refer RDS in Appendix C for quantities to be provided in each room. Outlet types, mounting arrangements and reticulation details will be coordinated with the architectural design in the detailed design stage.

For reticulation to “island” benches, the following options have been considered:

- Switched pendant outlets suspended over benches from the ceiling.
- Switched outlets mounted on the bench itself. Reticulation to outlets would be via in-slab conduit transitioning into the bench. Outlets will need to be coordinated with the bench joinery detail.
- Floor boxes. Reticulation to floor boxes would be via in-slab conduit.

Of these options it is not recommended to install floor boxes due to the nature of the environment (dust ingress etc). The other options will be determined during detailed design.

RCD protection will be provided to all power and lighting circuits as required by AS3000:2007.

Power will be provided to laboratory equipment including fume cupboards. Outlets located in laboratories will be located clear of sinks and wet areas to comply with AS3000.

9.2.4 Lighting

Interior Lighting

Interior lighting will be designed to comply with NCC requirements for energy efficiency (Section J) as well as taking guidance from AS1680 and other codes/standards as applicable. All lighting will be coordinated with the architectural design and will be designed to suit the intended tasks undertaken in each area/room.

Luminaires used in laboratory areas will be fully sealed laboratory type luminaires. Lamps used in laboratory areas will include high colour rendering (>90 Ra) properties.

All luminaires will be selected based on the following criteria:

- ▶ Lamp life
- ▶ Efficiency
- ▶ Maintenance
- ▶ Weather protection

Lighting Controls

Lighting controls will be provided throughout in accordance with NCC requirements for energy efficiency (Section J). Compliance with the requirements will typically dictate the need to incorporate a level of automatic, occupancy based control into the system.

Manual switching will be provided in all areas. Two way switching will be investigated for large areas with multiple entries/exits. Occupancy based lighting control will be achieved via the integration of presence detectors located at suitable positions within each area. These presence detectors will be used to switch lighting off in the event that no presence has been detected within a defined (programmable) time period (typically 30 minutes).

In the detailed development of the project additional requirements such as dimmable lights may be identified for inclusion by ANBG.

Exterior/Security Lighting

It is proposed to provide general building mounted exterior/security lighting on the building to facilitate access during darkness. External lighting will be provided at main building entries.

In addition, new pole mounted lighting will be provided to light the entry driveway and hardstand area adjacent the building.

All exterior and security lighting will operate from dusk till dawn and will be typically controlled via photo electric (PE) cell or time clock.

Emergency Lighting

Emergency lighting and exit signage will be provided in the new facilities in accordance with the NCC (2012) and AS2293.

Depending on the nature of each space within the new facilities, emergency lighting will typically be one of the following:

- ▶ Integrated emergency batten type luminaires, and
- ▶ Recessed (or surface mount as applicable) halogen, non-maintained (Spitfire) type emergency lights.

All exit signs will be new “running man” type in accordance with the NCC (2012) and AS2293.

Each distribution board supplying emergency lighting loads will be fitted with an emergency light test facility.

9.2.5 Communications Cabling

The new Seed Bank building will be provided with data and telephone connectivity to the existing ANBG network and CSIRO network. ANBG ICT representatives have advised that data connectivity to the ANBG network can be provided from the patch panel/data cabinet located in the existing adjacent Nursery building. New cabling would be installed underground in conduit from the Nursery patch panel to a new patch panel/data cabinet located within the new Seed Bank building. New cabling is anticipated to include 12 cores multimode fibre however final configuration of wiring would need to be confirmed during detailed design.

Connectivity to the CSIRO network can be provided by one of the following options:

1. Connection back into CSIRO Black Mountain Campus. This will require discussions with CSIRO IT to nominate a suitable building connection point. Allowance for 200 meters of new underground single mode fibre optic cable in conduit across Frith Road
2. Connection back to CSIRO Computing Centre Building on Clunies Ross Street via existing communications conduits between Computer Centre and the Nursery. This will avoid new trenching but is subject to adequate space in the existing ducts for new 6 core single mode fibre. New fibre will be installed in the same conduit as the ANBG network between the Nursery and the new Seed Bank buildings.

The selection of the preferred option would be undertaken during detailed design phase when capacity of the existing conduit network can be confirmed and suitable connection point within the CSIRO can be identified.

New active equipment will be required (switches) however costs associated are excluded from the estimates provided.

The ANBG Voice Services manager has advised that the existing PABX system is near capacity and there is limited cable infrastructure available at that portion of the site to support new telephone extensions. The existing PABX and site MDF is located in the administration building and there is an existing 30 pair copper telephone cable serving the Nursery Building, Top Depot, Cottage, old nursery and offices. It is anticipated that the new Seed Bank will require approximately 20 telephone extensions, assuming 1 extension per work point. It is anticipated that the existing 30 pair telephone cable will require

upgrading to minimum 50 pair to serve the new facility and the existing PABX modified to provide the required telephone extensions.

ANBG is currently investigating upgrading the existing PABX to a VoIP telephone system which would utilise the fibre optic data network described above instead of a separate copper voice cabling network. Should the existing PABX be upgraded to a new VoIP system, the costs associated with new copper cabling would not be required. Further investigation for providing voice services to the new building will be required.

The new building would be serviced via a new data cabinet containing cable terminations and active equipment. Active equipment (routers, switches etc) would be supplied and installed by ANBG ICT and are excluded from the budget estimates provided.

New communications outlets would be provided throughout the facility. Refer to the RDS for quantities of outlets to be provided in each room.

New cabling would be category 6 minimum solution.

9.2.6 Fire Detection

The proposed building would not require an automatic smoke detection and alarm system to comply with NCC 2012 based on a Class 8 building designation of one storey in height. Notwithstanding this based on the value of the species being stored an automatic smoke detection and alarm system has been costed as a risk mitigation measure.

A fire indicator panel will be located at the main entry to the building and smoke detection and occupant warning speakers provided throughout to meet the requirements of AS1670.

9.3 Mechanical Services

9.3.1 General

It is proposed to provide air conditioning to occupied spaces utilizing reverse cycle air-cooled split systems. Indoor units will be either cassette or ducted type systems.

Each system will provide the necessary outside airflows to meet NCC requirements.

The utility and toilets will be ventilated by separate ducted exhaust systems. It is proposed to reject the heat output of the dehumidifiers (located within the corridor) with the toilet exhaust system. As such, the toilets will be heated by a novel energy reclaim strategy.

A BMS facility will be provided for control and monitoring of the building services systems and alarms.

9.3.2 Drying Rooms

The design conditions of these rooms is 15°C DB and 15% RH. This will be achieved by segregating cooling and dehumidification cycles.

Cooling will be achieved by two air-cooled split systems, sized at 66% of the maximum room load. The units will be controlled in a lead/lag configuration, where the second unit will operate when the other unit

fails or cannot maintain room conditions. The lead unit would be cycled every week to ensure uniform wear.

Dehumidification will be achieved by two desiccant units, sized at 66% of the maximum room load. The units will be controlled in a lead/lag configuration, where the second unit will operate when the other unit fails or cannot maintain room conditions. The lead unit would be cycled every week to ensure uniform wear. The unit will be mounted outside the drying room and airflow ductwork insulated. Each unit will have a digital display for easy monitoring of room conditions. The humidistat will be mounted halfway along the length of the room. Process (supply) air will be provided at high level and extract (return) air will be ducted from the other end of the room at low level.

The amount of outside air will be designed for a single occupant. Each drying room shall be slightly positively pressurized to inhibit the ingress of external contaminants.

Room condition monitoring and alarms will be provided.

9.3.3 Drying Room Lobby

The sorting room will be air conditioned by a single air-cooled split system to control the conditions of air infiltration into the drying rooms.

9.3.4 Freezer Room

The design conditions of these rooms is -21°C DB and low humidity levels to inhibit ice buildup.

Cooling will be achieved by two air-cooled split systems, sized at 66% of the maximum room load. The units will be controlled in a lead/lag configuration, where the second unit will operate when the other unit fails or cannot maintain room conditions. The lead unit would be cycled every week to ensure uniform wear.

The drain pipe from the indoor evaporator will be fitted with a heater to inhibit freezing.

Dedicated dehumidification will not be provided as per the drying rooms. Low humidity levels will be ensured by two desiccant units controlling the RH conditions of the Seed Bank airlock. These units will be similar to the drying room systems.

It is not proposed to provide outside air or pressurized these rooms.

Room condition monitoring and alarms will be provided.

9.3.5 Cool Room

The design conditions of these rooms is 4°C DB and low humidity levels to inhibit ice buildup.

Cooling will be achieved by a single air-cooled split system.

Dedicated dehumidification will not be provided as per the drying rooms. Low humidity levels will be ensured by two desiccant units controlling the RH conditions of the adjacent Seed Bank Airlock. These units will be similar to the drying room systems.

9.3.6 Laboratories

Heating and cooling will be provided from independent air-cooled ducted split systems. Outside air will be ducted from an external louvre to the air conditioning unit. The quantity of air will be calculated based on the amount of exhaust air within the space and occupancy density. Negatively pressuring the laboratories will be preferable. System control will be via wall-mounted controller and time schedule.

9.3.7 Offices

Heating and cooling will be provided from independent air-cooled ducted split systems. Outside air will be ducted from an external louvre to the air conditioning unit based on the occupant density. Smaller independent systems are preferable to larger units for a greater level of flexibility in operation, room conditions and energy usage. System control will be via wall-mounted controller and time schedule. A red light green light system to alert staff to conditions where it is suitable to open the windows for natural ventilation in office areas is proposed.

9.3.8 Utilities and Toilets

These spaces will be mechanically exhausted on a time schedule or via the lighting circuit controls. The exhaust systems could be utilised to remove the heat output from the dehumidifiers, which in turn provides energy reclaim system to heat the toilets.

9.4 Hydraulic Services

9.4.1 General

The Seed Bank facility will be connected to the Authority mains water system via existing connection points on site and extended to the new facility as required.

Sanitary drainage within the facility will also be discharged to an existing sewer connection point on site.

9.4.2 Sanitary Drainage and Trade Waste

It is understood from the topographical situation on site that the sanitary drainage will have to be pumped to the existing sewer connection point. A new sewage pump station, with 3 days emergency storage volume, will be installed adjacent to the new building.

All fixtures and fittings within the facility will discharge via the sewage pump station. Vent pipes for the sanitary system will discharge above the roof line.

Fixtures and tap ware within the laboratory area will discharge to a separate trade waste system and pre-treated to ACTEW requirements prior to discharge to the sewage pump station.

9.4.3 Domestic Cold and Heated Water

Domestic cold and heated water will be reticulated throughout the building to supply all fixtures and fittings with domestic cold and heated water as required.

Domestic water will be centralized heated and reticulated to all fixtures and fittings requiring heated water. Fixtures for personal hygiene or for disabled access will have temperature limitations in form of TMVs (thermostatic mixing valves) as required under current legislations.

It is currently envisaged to provide a solar boosted electric hot water system due to the lack of natural gas on site and to reduce energy consumption of the hot water generation.

The building will have various back flow prevention devices for zone protection within the building and to Authority requirements.

Safety showers and eyewash stations will be provided within the laboratories in accordance to the current codes and standards.

9.4.4 Rainwater collection and Re-use

An allowance has been made for rainwater to be collected from roof areas to a centralized rainwater tank for the re-use of toilet flushing. Rainwater would be filtered and UV disinfected prior to reticulation within the building. Final assessment of the feasibility of this proposal will require assessment of the best approach to rainwater collection whilst avoiding buildup of leaf litter that could present a fire hazard.

The rainwater re-use system will be supplemented by mains water during prolonged times of dry weather.

The rainwater tank will overflow to the nearby creek system in the event of heavy rain event.

9.5 Fire Services

9.5.1 General

The Seed Bank facility will have various fire protection systems to meet current regulations and address site specific objectives.

9.5.2 Fire Hydrant system

Fire hydrants will be installed external of the Seed Bank building to provide fire hydrant coverage throughout the facility. Additional external fire hydrants may be required to address bush fire protection requirements.

Fire hydrant will be, where possible, located adjacent to the access road to provide easy access by the fire brigade.

9.5.3 Fire Detection

The Seed Bank facility will have fire detectors throughout the building, which will be connected to a FIP (Fire Indicator Panel) for occupant warning systems and connection to the local fire brigade. VESDA has not been included at this stage due to the nature of the materials being protected and will need to be investigated for suitability in the detailed design stages.

9.5.4 Fire Sprinklers

The building will have an external fire sprinkler drencher system for protection of the collection from bushfire. Fire alarm valve and booster valve assembly will be located external of the building as required by current regulations.

9.5.5 Fire Hose Reels

Fire hose reel will be provided within the building and located not more than 4m from the exit.

9.5.6 Fire extinguishers

Fire extinguishers will be provided throughout the facility and according to the fire classification.

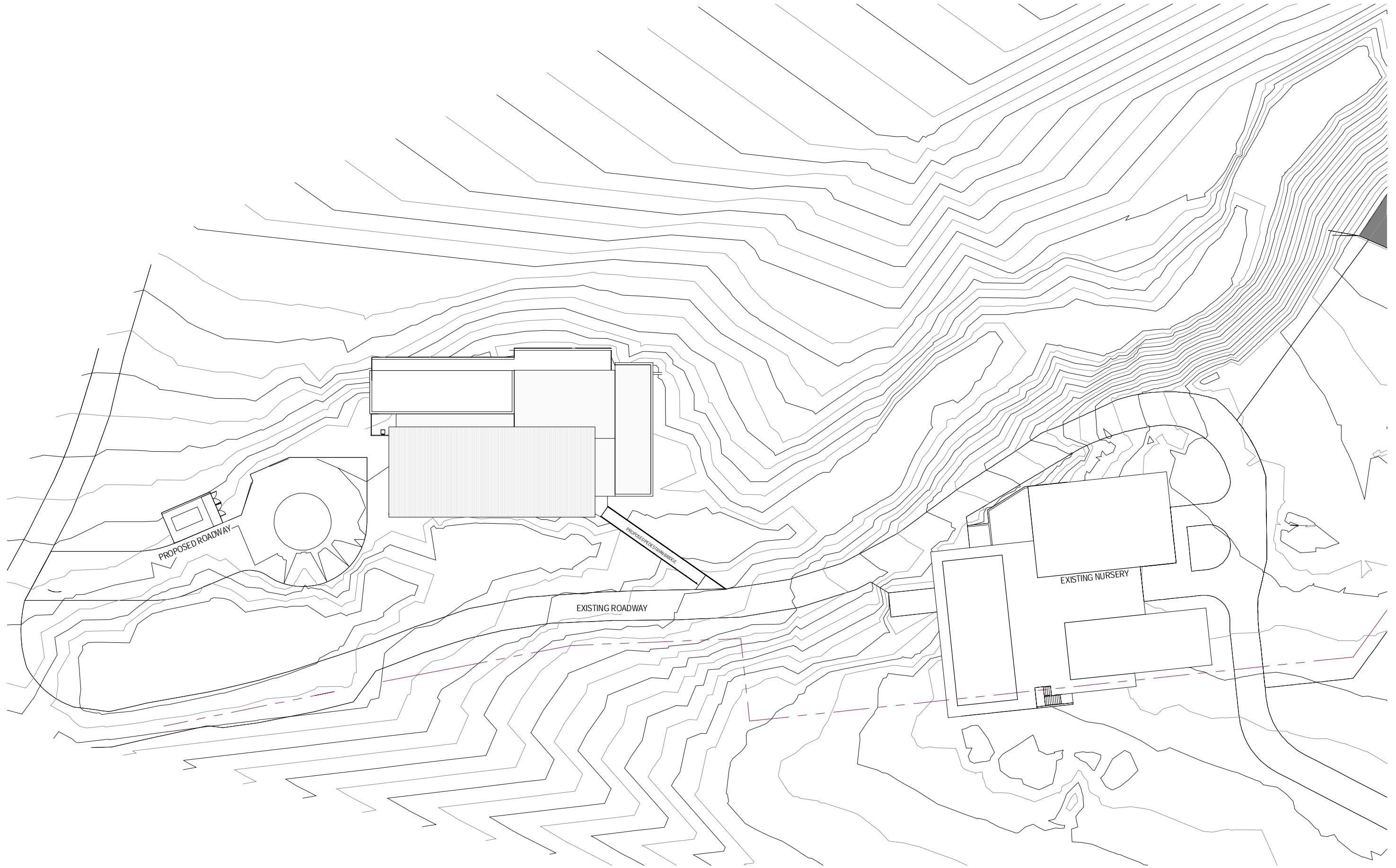
9.5.7 Gas Suppression

Gas suppression system for the -21°C Storage rooms has not been included at this stage. The suitability of usage of this system in the context of insulated cool rooms at this temperature should be investigated in the detailed design stages.

10. Seed Bank Budget

Based on the information in the Scoping Brief, the Concept Plan and indicative Building Services cost estimates prepared by GHD a cost estimate for the Seed Bank facility has been prepared by Wilde and Woollard. This indicates a budget in the order of \$4.6 million will be required to procure the facility. These costs will be subject to review once detailed site investigations have been completed providing additional clarity on site servicing, foundation conditions and extent of excavation and the development of the detailed design. The exclusions from the detailed cost estimate provided at Appendix F should be noted. In particular equipment other than that listed is assumed to be purchase by the ANBG and an assessment of the cost of this equipment will need to be made by the ANBG as part of the development of a detailed business case.

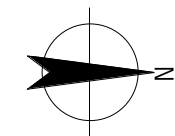
Appendix A
Seed Bank Concept Plans



1 SITE PLAN - SEEDBANK
SCALE 1:250

0 1000 2000 3000 4000 5000mm
SCALE 1:100 AT ORIGINAL SIZE

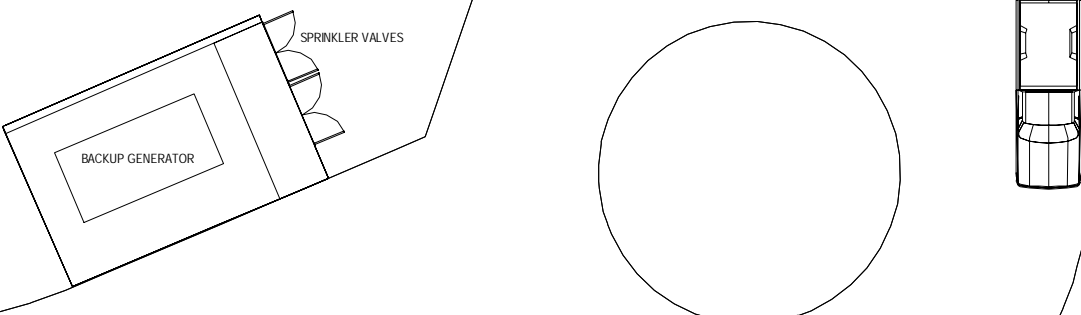
AUSTRALIAN NATIONAL BOTANIC GARDENS SEED BANK



date 01.06.12
job no. 23-14170
drawing A101



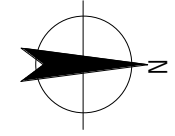
- CIRC Shared Circulation
 - COM Communications Cupboard
 - CR Cool Room (+4 deg)
 - DB Electrical Distribution Board Cupboard
 - DR Dark Room
 - DRL Drying Room Lobby
 - DRY Drying Room (+15 deg, 15% RH)
 - FHR Fire Hose Reel Cupboard
 - FIP Fire Indicator Panel Cupboard
 - INC Incubator Room
 - LAB Laboratory
 - MB Mechanical Switchboard Cupboard
 - MR Meeting Room
 - OFF Office
 - OPO Open Plan Office
 - PRL Preparation Laboratory
 - SBAL Seedbank Airlock
 - SCR Seed Cleaning Machine Room
 - SFR Seedbank Freezer Room (-21 deg)
 - ST Storeroom
 - TEA Tea Point
 - UMO Unit Manager Office
 - UTL Utility & Printing
 - WC Unisex Toilet & Changeroom
 - WCAL Toilet Airlock
- ASP ASPIRATOR
 - AU AUTOCLAVE
 - B BALANCE
 - BN1 GENERAL WASTE, 120LTR
 - BN3 CONTAMINATED WASTE, 120LTR
 - BN6 GENERAL WASTE, 240LTR
 - BN7 RECYCLING, 240LTR
 - BN7 CONTAMINATED WASTE, 240LTR
 - BN8 GLASSWARE DISPOSAL, 240LTR
 - COH CONVECTION OVEN AND HOTPLATE
 - COM COMMUNICATIONS RACK
 - CPD.1 CONSUMABLES STORAGE CUPBOARD
 - CPD.2 GLASSWARE STORAGE CUPBOARD
 - CPD.3 CHEMICAL STORAGE CUPBOARD
 - CPD.4 STATIONARY STORAGE CUPBOARD
 - CPD.5 COAT CUPBOARD
 - DB DISTRIBUTION BOARD
 - DOB DOWNDRAUGHT BENCH
 - DES DESSICATOR
 - DH DEHUMIDIFIER
 - DPO DRYING PRESS OVEN
 - DSEW DELUGE SHOWER AND EYEWASH
 - DW DISHWASHER
 - DWB DIGITAL WATER BATH
 - FC4 FILING CABINET, 4 DRAWER
 - FCPD FUME CUPBOARD
 - FIP FIRE INDICATOR PANEL
 - GEN BACKUP GENERATOR
 - HB BASIN
 - HGP HYGROPALM
- HP HEAT PAD
 - HPS HOT PLATE (STIRRER)
 - INC1 ILLUMINATED INCUBATOR TYPE 1
 - INC2 ILLUMINATED INCUBATOR TYPE 2
 - LFH LAMINAR FLOW HOOD
 - LFR LAB FREEZER (-21C)
 - LK LOCKERS
 - MFD MULTI FUNCTION DEVICE
 - MOU MECHANICAL OUTDOOR UNIT
 - MS MICROSCOPE
 - MS.1 MICROSCOPE (STAGE)
 - MS.2 MICROSCOPE (DISSECTING)
 - MS.3 MICROSCOPE (DISSECTING WITH CAMERA)
 - MS.4 MICROSCOPE, LYMIK STEREO WITH LAPTOP
 - MST MECHANICAL STIRRER
 - MT MOISTURE TESTER
 - MW MICROWAVE OVEN
 - OV OVEN
 - PRC PRESSURE COOKER
 - RF.1 REFRIGERATOR, DOMESTIC COIL
 - RF.2 REFRIGERATOR, DOMESTIC 515L
 - ROS REVERSE OSMOSIS WATER STILL
- SH.1 SHELVING, SINGLE BAY
 - SH.3 DRYING SHELVES
 - SK.1 LABORATORY SINK (INTEGRATED TO BENCHTOP)
 - SPP SEED PACKET PRESS
 - TGP TEMPERATURE GRADIENT PLATE
 - THG THERMO HYDROGRAPH
 - XCAB X-RAY CABINET & COMPUTER



1 FLOORPLAN - SEEDBANK
SCALE 1:100

0 1000 2000 3000 4000 5000mm
SCALE 1:100 AT ORIGINAL SIZE

AUSTRALIAN NATIONAL BOTANIC GARDENS SEED BANK



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drawing A102



PRELIMINARY



AUSTRALIAN NATIONAL BOTANIC GARDENS SEED BANK

date 01.06.12
job no. 23-14170
drawing A103



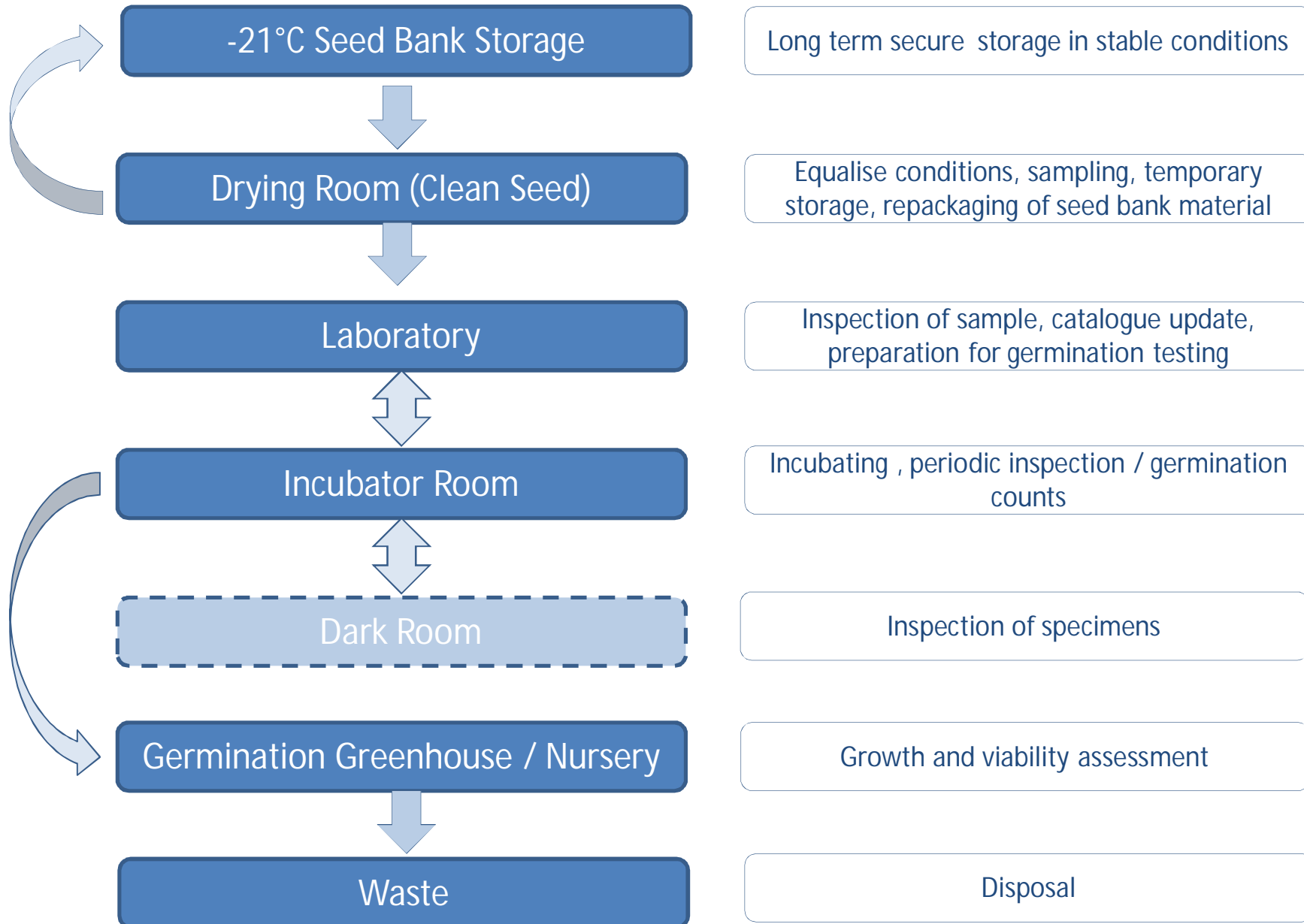
PRELIMINARY

Appendix B
Seed Bank Workflows

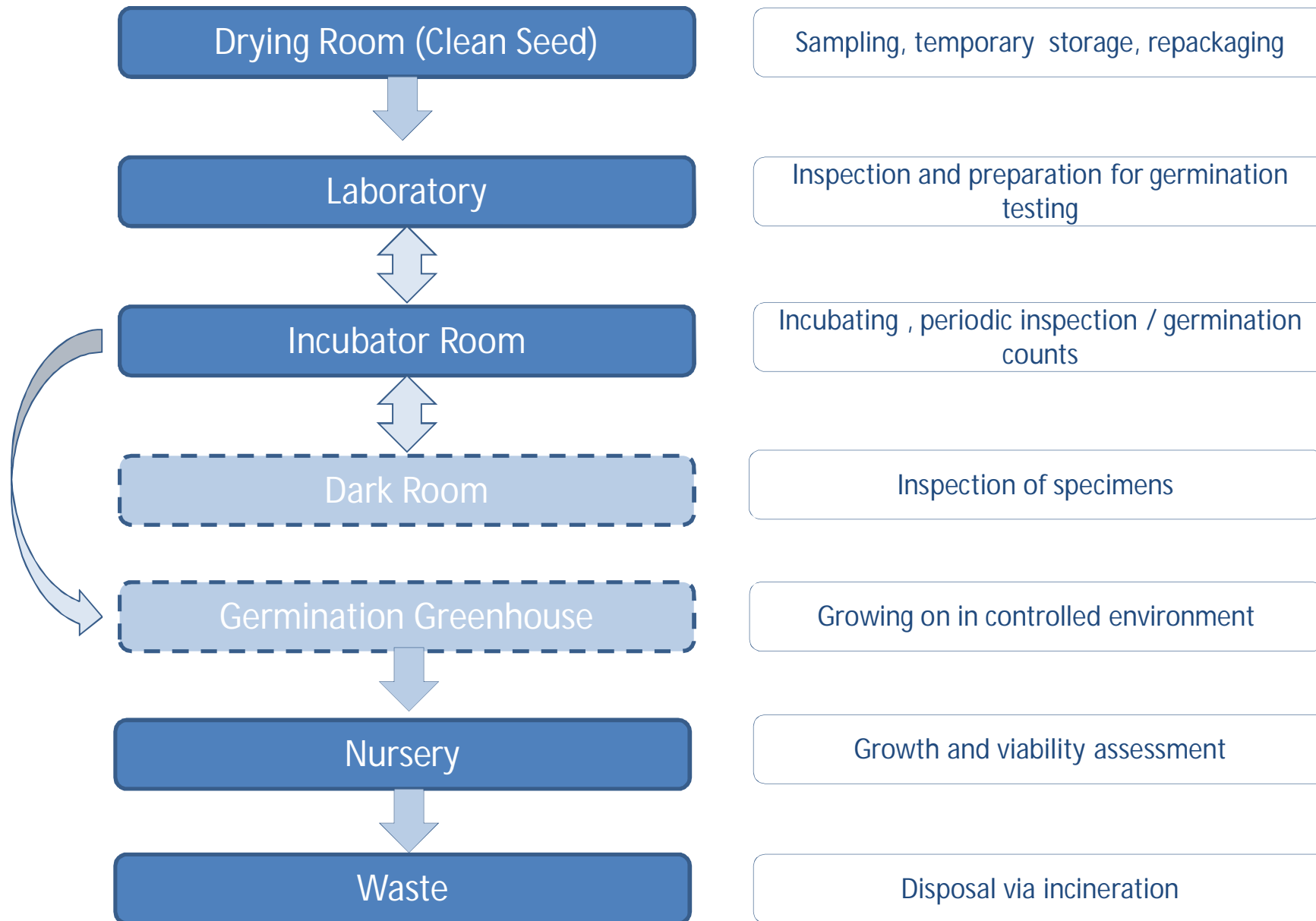
ANBG SEED BANK FIELD COLLECTION



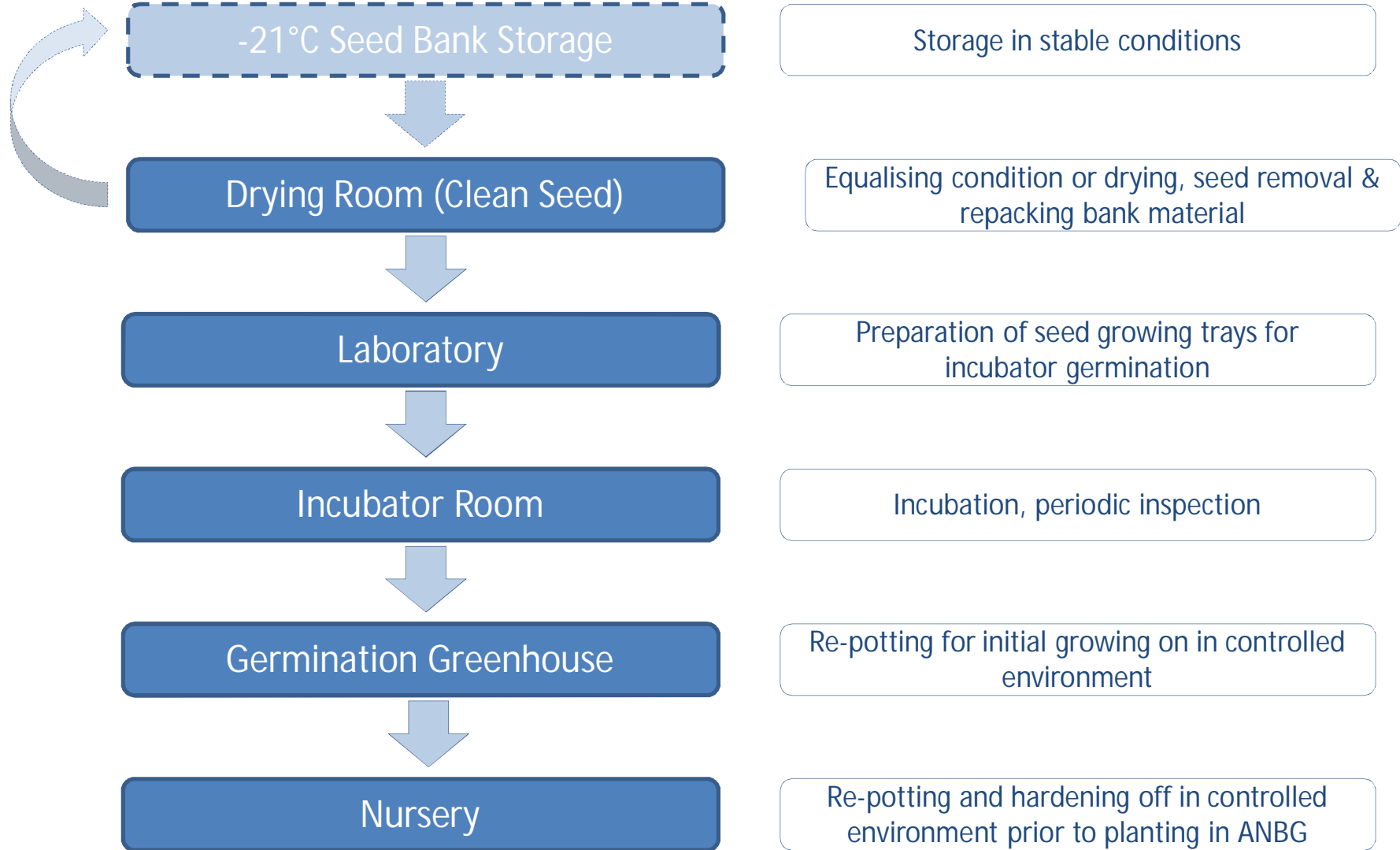
ANBG SEED BANK QUALITY CONTROL



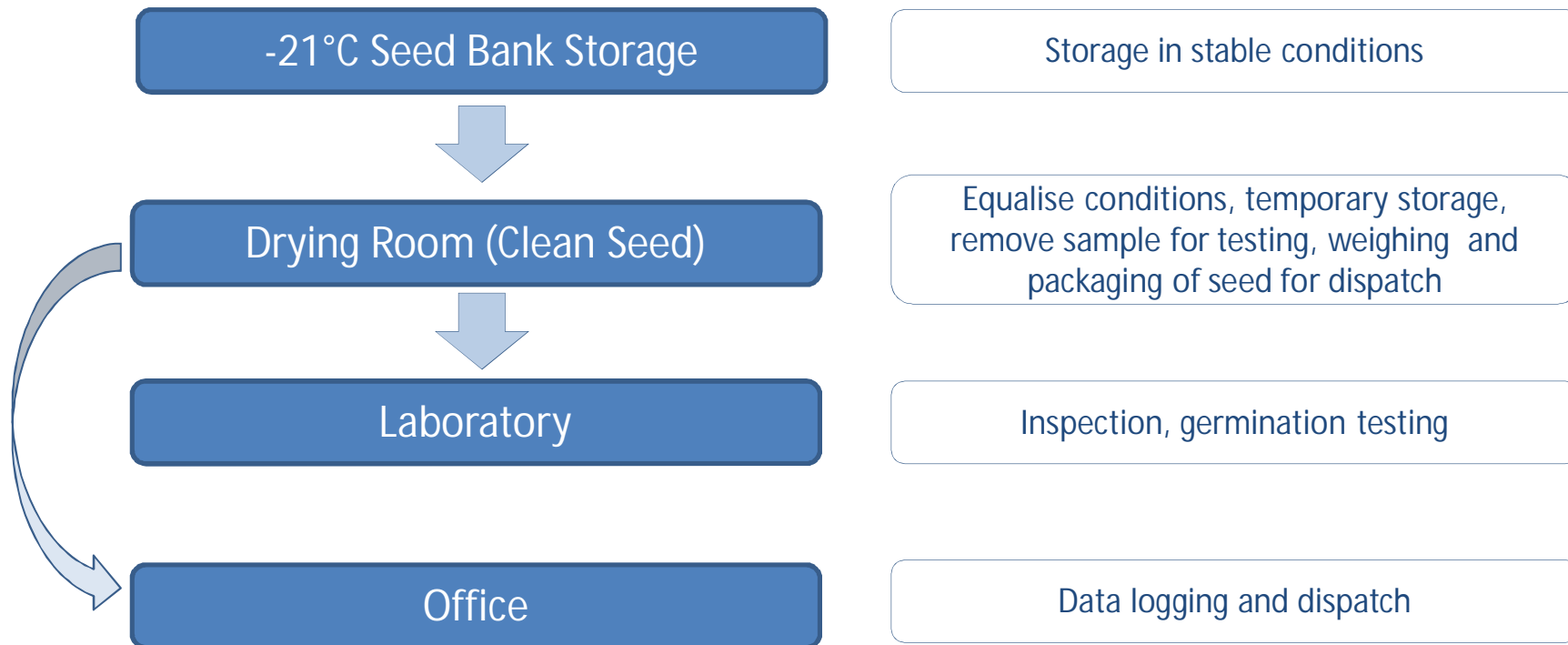
ANBG SEED BANK GERMINATION RESEARCH



ANBG SEED BANK LIVE COLLECTION GERMINATION



ANBG SEED BANK DISPATCH PROCESS



Appendix C
Seed Bank Room Data Sheets



Room Data Sheet
ANBG SEED BANK

2314170

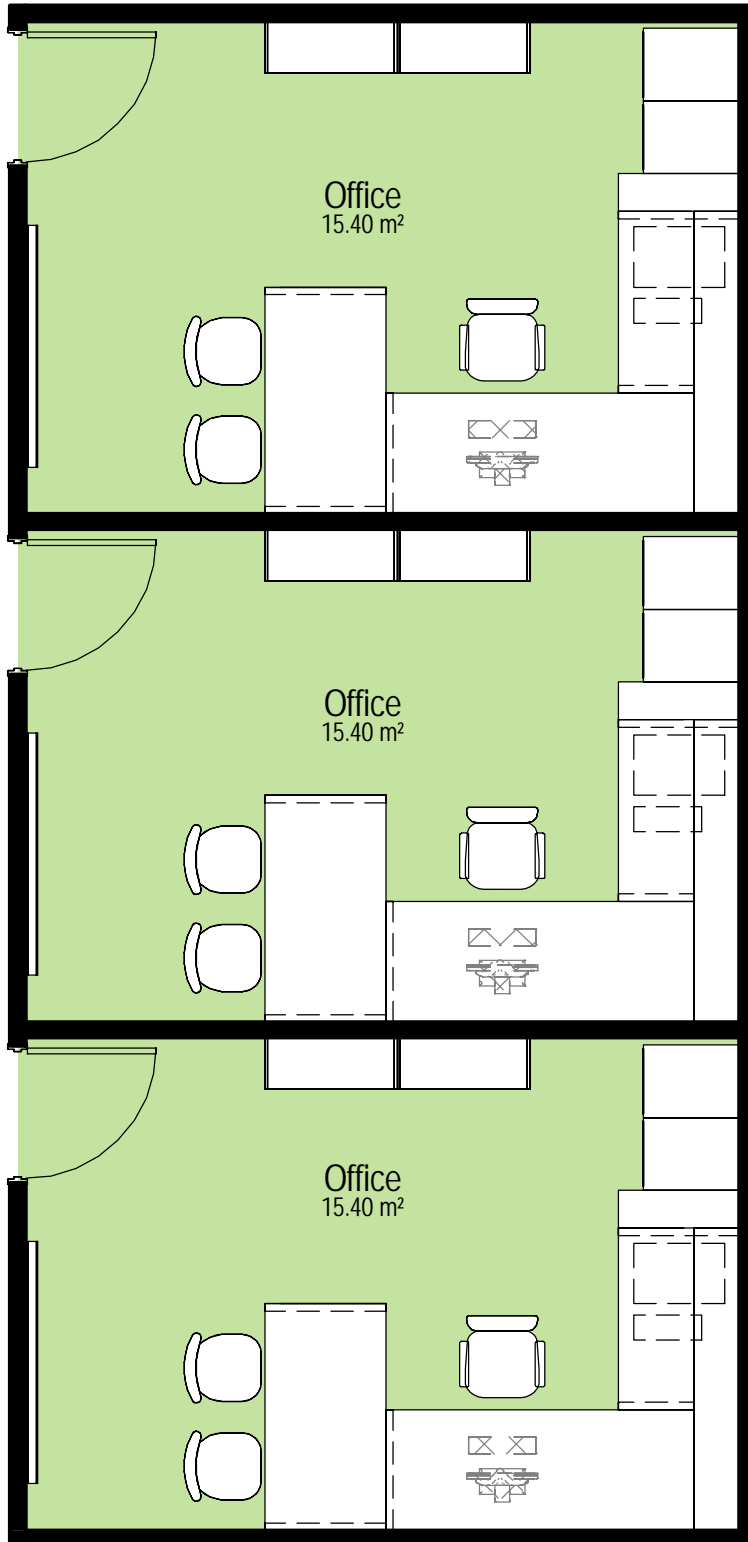
Room Name	Office - Standard
Room Number	3 off
General Design Criteria	
Function	Administration & desk based research activities, data entry
Minimum Area / Minimum Dimensions	15m ² min
Occupants	1 each for <ul style="list-style-type: none">Seed Conservation BiologistSeed Bank ManagerVisiting Researcher
Hour of Operation	Office hours with limited afterhours access
Affinities	Laboratory, entry, open plan office
Fire / Smoke Rating	To code
Acoustic Requirements	45 dB(A) partition rating
Access	Authorized staff, visitors and volunteers
Security Performance Requirements	Security of records
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Glazed link to circulation and laboratory areas
Enclosure	Full
Floor Loading	To code
Materials and Finishes Project Specific Performance Requirements	
Walls	Painted plasterboard or equal
Ceilings	Acoustic treatment as needed
Floors	Carpet
Glazing	External windows and internal glazed partitions
Doors	Solid core with acoustic seals
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitoring and control
Mechanical	AC supplemented by natural ventilation
Lighting	To code for offices



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Office - Standard
Room Number	3 off
Power	3 no. 10A DGPO
ICT / Communications	CSIRO and ANBG networks
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	Private lockable- Prox card or key, PIR intruder detection
Other	Nil
Furniture	
Fixed	Nil
Loose	1 no. U shaped adjustable workstation with meeting point, shelving, pinboard, mobile pedestal, CPU cradle and coat storage. 1 no. adjustable task chair 2 no. 4 drawer filing cabinets Bookshelves 2 x 900w full height units 2 no. Visitors chairs
Fixtures and Fittings	
ICT	1 no. CSIRO & 1 no. ANBG Data plus 1 no. phone
Hydraulic	Nil
Window Covering	To control glare
Signage	Room signage
Other	Wall mounted whiteboard
Equipment: refer attached equipment schedule	
Waste Disposal and Treatment	General waste only
Commentary	Occasional meetings with colleagues only



AUSTRALIAN NATIONAL
 BOTANIC GARDENS
 SEED BANK
 ROOM DATA SHEET DIAGRAM
 OFFICES

Job Number | 23-14170

Revision | UR

Date | 03/30/12

RDS-001



Room Data Sheet
ANBG SEED BANK

2314170

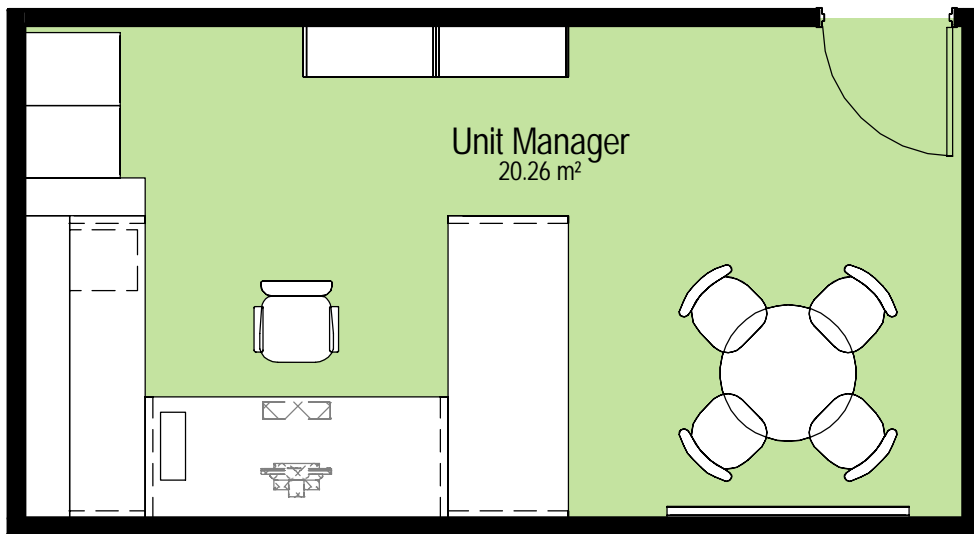
Room Name	Office - Unit Manager
Room Number	1 off
General Design Criteria	
Function	Administration & desk based research activities, data entry
Minimum Area / Minimum Dimensions	20m ²
Occupants	Unit manager
Hour of Operation	Office hours with limited afterhours access
Affinities	Laboratory, entry, open plan office
Fire / Smoke Rating	To code
Acoustic Requirements	45 dB(A) partition rating
Access	Authorised staff, visitors
Security Performance Requirements	Security of records
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Glazed link to internal areas preferred
Enclosure	Full
Floor Loading	To code
Materials and Finishes Project Specific Performance Requirements	
Walls	Painted plasterboard or equal
Ceilings	Acoustic treatment as needed
Floors	Carpet
Glazing	External windows and internal glazed partitions
Doors	Solid core with acoustic seals
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitoring and control
Mechanical	AC supplemented by natural ventilation
Lighting	To code for offices
Power	3 no. 10A DGPO



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Office - Unit Manager
Room Number	1 off
ICT / Communications	CSIRO and ANBG networks
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	Private lockable- Prox card or key, PIR intruder detection
Other	Nil
Furniture	
Fixed	
Loose	1 no. U shaped adjustable workstation with meeting point, shelving, pinboard, mobile pedestal, CPU cradle and coat storage. 1 no. adjustable task chair 2 no. 4 drawer filing cabinets Bookshelves 2 x 900w full height units 4 no. Visitors chairs 1 no. Small Meeting Table
Fixtures and Fittings	
ICT	1 No. CSIRO and 1 No. ANBG Data outlets plus 1
Hydraulic	Nil
Window Covering	To control glare
Signage	Room signage
Other	Wall mounted whiteboard
Equipment: refer attached equipment schedule	
Waste Disposal and Treatment	
Commentary	Occasional meetings with colleagues or external client



AUSTRALIAN NATIONAL
BOTANIC GARDENS
SEED BANK
ROOM DATA SHEET DIAGRAM
UNIT MANAGERS OFFICE

Job Number | 23-14170

Revision | UR

Date | 03/30/12

RDS-002



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Open Plan Office
Room Number	1 off
General Design Criteria	
Function	Administration & desk based research activities, data entry
Minimum Area / Minimum Dimensions	45 sqm
Occupants	Up to 6 staff on a hot desk basis
Hour of Operation	Office hours with limited afterhours access
Affinities	Laboratory, entry, offices
Fire / Smoke Rating	To code
Acoustic Requirements	35 dB(A) partition rating
Access	Authorised staff, PhD students, visitors and volunteers
Security Performance Requirements	Security of records and research
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Passive oversight of building and laboratories
Enclosure	Full, partial subdivision for tea point
Floor Loading	To code
Materials and Finishes Project Specific Performance Requirements	
Walls	Painted plasterboard or equal
Ceilings	Acoustic treatment as required
Floors	Carpet
Glazing	External windows and internal glazed partitions
Doors	Solid core or glazed aluminum
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code for offices
BMS	Monitoring and control
Mechanical	AC supplemented by natural ventilation
Lighting	To code for office
Power	2 no. DGPO per workstation

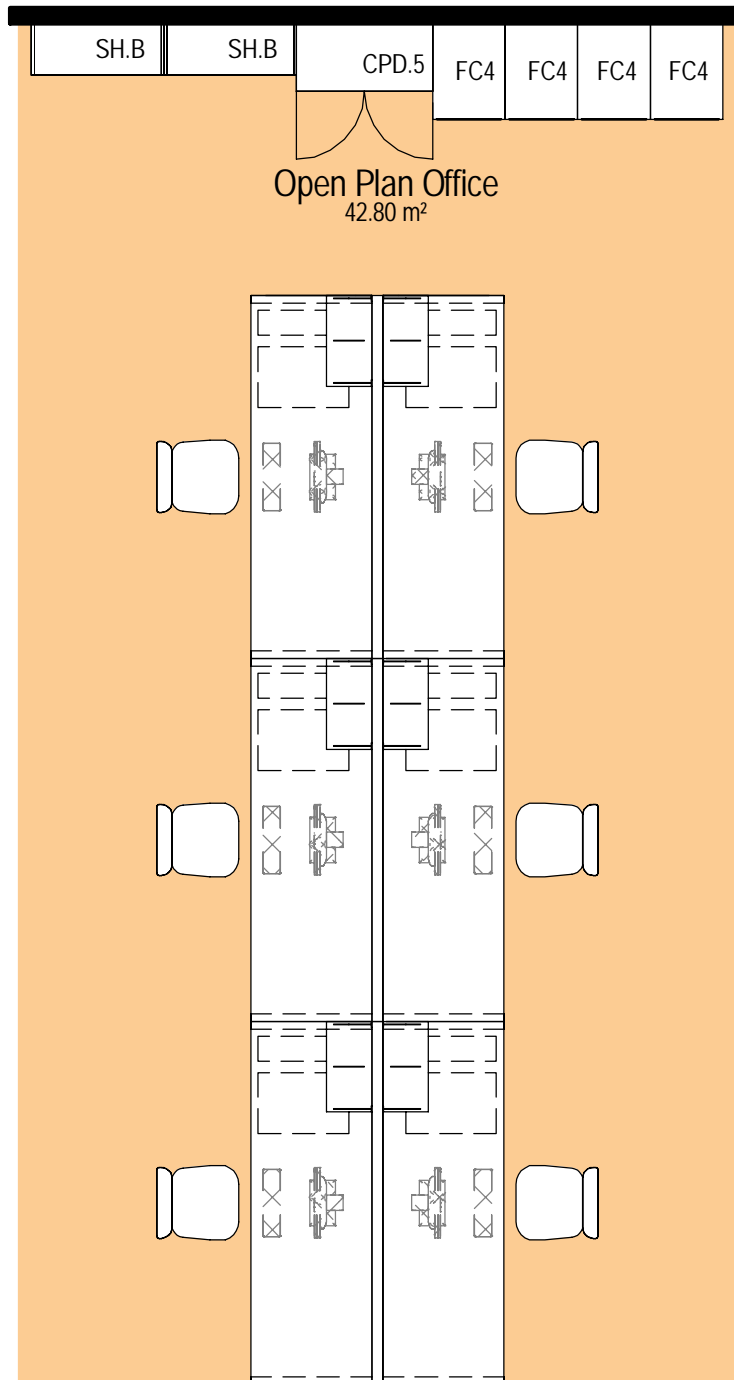


Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Open Plan Office
Room Number	1 off
ICT / Communications	CSIRO and ANBG networks
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	Prox Card Access or secure perimeter with associated office spaces, PIR intruder detection
Other	Nil
Furniture	
Fixed	Nil
Loose	6 no. 2400w x 800d height adjustable workstation with mobile pedestal, screen hung shelf and CPU cradle. 6 no. adjustable task chairs. 4 no. 4 drawer filing cabinets. Shared coat cupboard. Bookshelves 2 x 900w full height units.
Fixtures and Fittings	
ICT	1 No. CSIRO and 1 no. ANBG Data plus phone point
Hydraulic	Nil
Window Covering	To control glare
Signage	Room signage
Other	Wall mounted whiteboard
Equipment: refer to attached equipment schedule	
Waste Disposal and Treatment	3 bin recycling
Commentary	

CPD.5 COAT CUPBOARD
 FC4 FILING CABINET, 4 DRAWER
 SH.B BOOK SHELVES



AUSTRALIAN NATIONAL
 BOTANIC GARDENS
 SEED BANK
 ROOM DATA SHEET DIAGRAM
 OPEN PLAN OFFICE

Job Number | 23-14170
 Revision | UR
 Date | 03/30/12

RDS-003



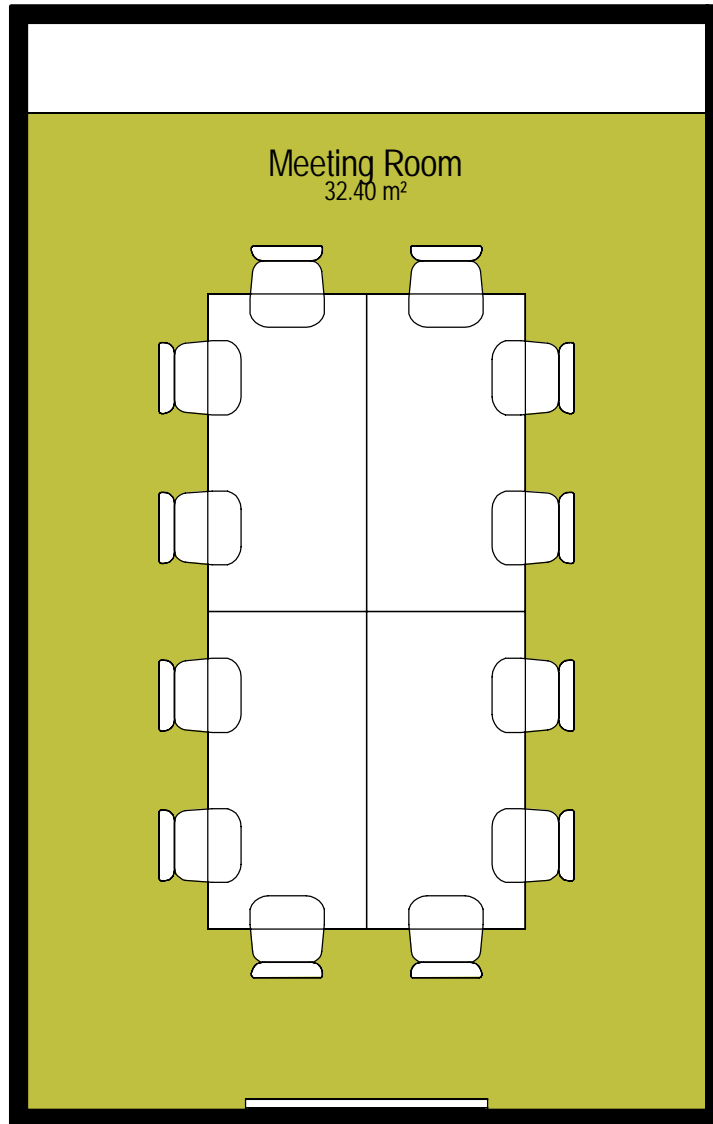
Room Name	Meeting Room
Room Number	1 off
General Design Criteria	
Function	Staff and volunteer meeting and training
Minimum Area / Minimum Dimensions	
Occupants	12 no participants
Hour of Operation	Business hours and limited after hours
Affinities	Offices and laboratory
Fire / Smoke Rating	To code
Acoustic Requirements	45 db(A) partition rating
Access	Authorized staff visitors students and volunteers
Security Performance Requirements	Access control
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Visual link to laboratory desirable
Enclosure	Full
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	
Ceilings	
Floors	
Glazing	External windows and internal partition glazing
Doors	Solid core with acoustic seals
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitoring and management
Mechanical	AC with supplementary natural ventilation
Lighting	To code
Power	2 no. DGPO



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Meeting Room
Room Number	1 off
ICT / Communications	2 no data points
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	PIR intruder detection, secure perimeter with associated office areas.
Other	Nil
Furniture	
Fixed	Joinery unit with below bench storage cupboards
Loose	12 person meeting table 12 chairs
Fixtures and Fittings	
ICT	Refer attached equipment schedule
Hydraulic	nil
Window Covering	Light exclusion
Signage	Room signage
Other	Nil
Equipment: refer to attached equipment schedule	
Waste Disposal and Treatment	
Commentary	



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BOTANIC GARDENS
SEED BANK
ROOM DATA SHEET DIAGRAM
MEETING ROOM

Job Number | 23-14170
Revision | UR
Date | 03/30/12
RDS-004



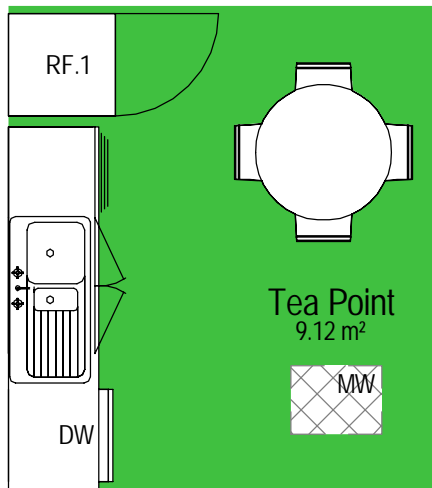
Room Name	Tea point area
Room Number	1 no.
General Design Criteria	
Function	Small tea point for general use
Minimum Area / Minimum Dimensions	
Occupants	Occasional use
Hour of Operation	Business hours with limited after hours use
Affinities	Offices and laboratories
Fire / Smoke Rating	To code
Acoustic Requirements	Noise containment
Access	Authorised staff, students, visitors and volunteers
Security Performance Requirements	-
Applicable Licences and Certification	Nil
Visual Privacy /Connection	-
Enclosure	Partial or full
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	
Ceilings	
Floors	
Glazing	
Doors	
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitoring and management
Mechanical	AC supplemented with natural ventilation
Lighting	To code
Power	3 no 10A DGPO



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Tea point area
Room Number	1 no.
ICT / Communications	Nil
Fire Detection	To code
Fire Suppression	To code
Hydraulic	H&C water and drainage
Specialist Gases	Nil
Security	Secure perimeter with associated office spaces, PIR intruder detection
Other	Nil
Furniture	
Fixed	2400w x 750d bench with cupboards under bench and overhead
Loose	1000 dia café table 4 no. lunchroom chairs
Fixtures and Fittings	
ICT	Nil
Hydraulic	1.5 bowl sink with single drainer, under bench boiling & chilled water unit, dishwasher
Window Covering	Nil
Signage	Room signage
Other	
Equipment: refer to attached equipment schedule	
Waste Disposal and Treatment	3 bin recycling
Commentary	



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 BOTANIC GARDENS
 SEED BANK
 ROOM DATA SHEET DIAGRAM
 TEA POINT

Job Number | 23-14170
 Revision | UR
 Date | 03/30/12

RDS-005



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Utility Area
Room Number	1 off
General Design Criteria	
Function	Printing and stationary and large consumables storage
Minimum Area / Minimum Dimensions	
Occupants	Nil
Hour of Operation	Business hours and limited afterhours access
Affinities	Offices and lab
Fire / Smoke Rating	To code
Acoustic Requirements	Noise separation from office areas
Access	Authorized staff students volunteers and visitors
Security Performance Requirements	Equipment protection
Applicable Licences and Certification	Nil
Visual Privacy /Connection	-
Enclosure	Partial or full
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	Painted plasterboard or equal
Ceilings	
Floors	
Glazing	-
Doors	-
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitoring and control
Mechanical	Exhaust
Lighting	To code
Power	2 no. DGPO above layout bench, 1 no. DGPO to MFD

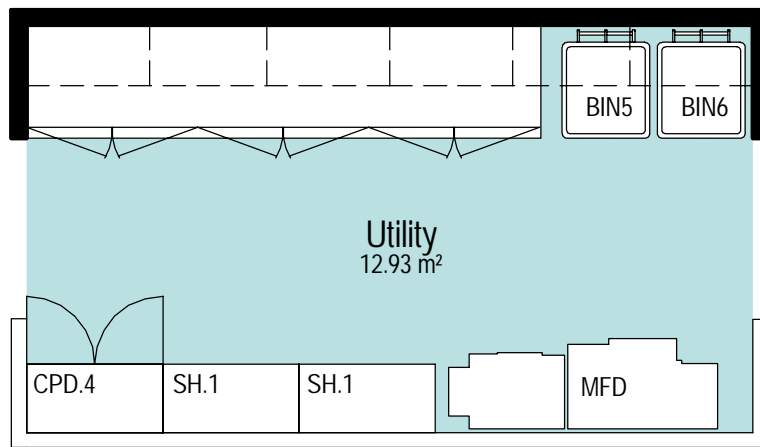


Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Utility Area
Room Number	1 off
ICT / Communications	Data to MFD (multi-function device), Data above layout bench
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	Perimeter security with associated office spaces, PIR intruder detection
Other	Nil
Furniture	
Fixed	3400w x 750d layout bench with under bench storage and shelves over
Loose	Stationary cupboard 900w x 450d full height, 2no. 900w x 450d powdercoated metal shelving
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	-
Signage	Room signage, safety signage
Other	
Equipment: Refer to attached equipment schedule	
Waste Disposal and Treatment	2 x 240lt bins - Paper recycling, toner etc
Commentary	

- BIN5 GENERAL WASTE, 240LTR
- BIN6 RECYCLING, 240LTR
- CPD.4 STATIONARY STORAGE CUPBOARD
- MFD MULTI FUNCTION DEVICE
- SH.1 SHELVING, SINGLE BAY



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 BOTANIC GARDENS
 SEED BANK
 ROOM DATA SHEET DIAGRAM
 UTILITY

Job Number | 23-14170

Revision | UR

Date | 03/30/12

RDS-006



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Laboratory
Room Number	1 no.
General Design Criteria	
Function	Specimen quality checks and recording, preparation of specimens for storage, preparation and packaging or specimens for dispatch, experimental work
Minimum Area / Minimum Dimensions	100sqm
Occupants	Up to 10 people
Hour of Operation	Business hours with limited afterhours access
Affinities	Drying room, cool room, freezer room, incubator room, offices
Fire / Smoke Rating	To code
Acoustic Requirements	To code
Access	Authorised staff, PhD students, visiting researchers and volunteers, escorted visitors, trolley access
Security Performance Requirements	Protection of specimens, records and equipment
Applicable Licences and Certification	Nil beyond periodic equipment testing and tagging
Visual Privacy /Connection	Glass link to office or circulation desirable for passive oversight
Enclosure	Fully enclosed, glazed wall to provide visibility of activity
Floor Loading	Dependent on equipment
Materials and Finishes Project Specific Performance Requirements	
Walls	
Ceilings	Cleanable acoustic ceiling tiles
Floors	Sheet vinyl, coved skirting
Glazing	External windows and internal glazed partitions
Doors	Double solid core with acoustic seals & vision panels or glazed aluminium
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitored
Mechanical	AC to meet required parameters and operational efficiency
Lighting	To code
Power	10 no DGPO

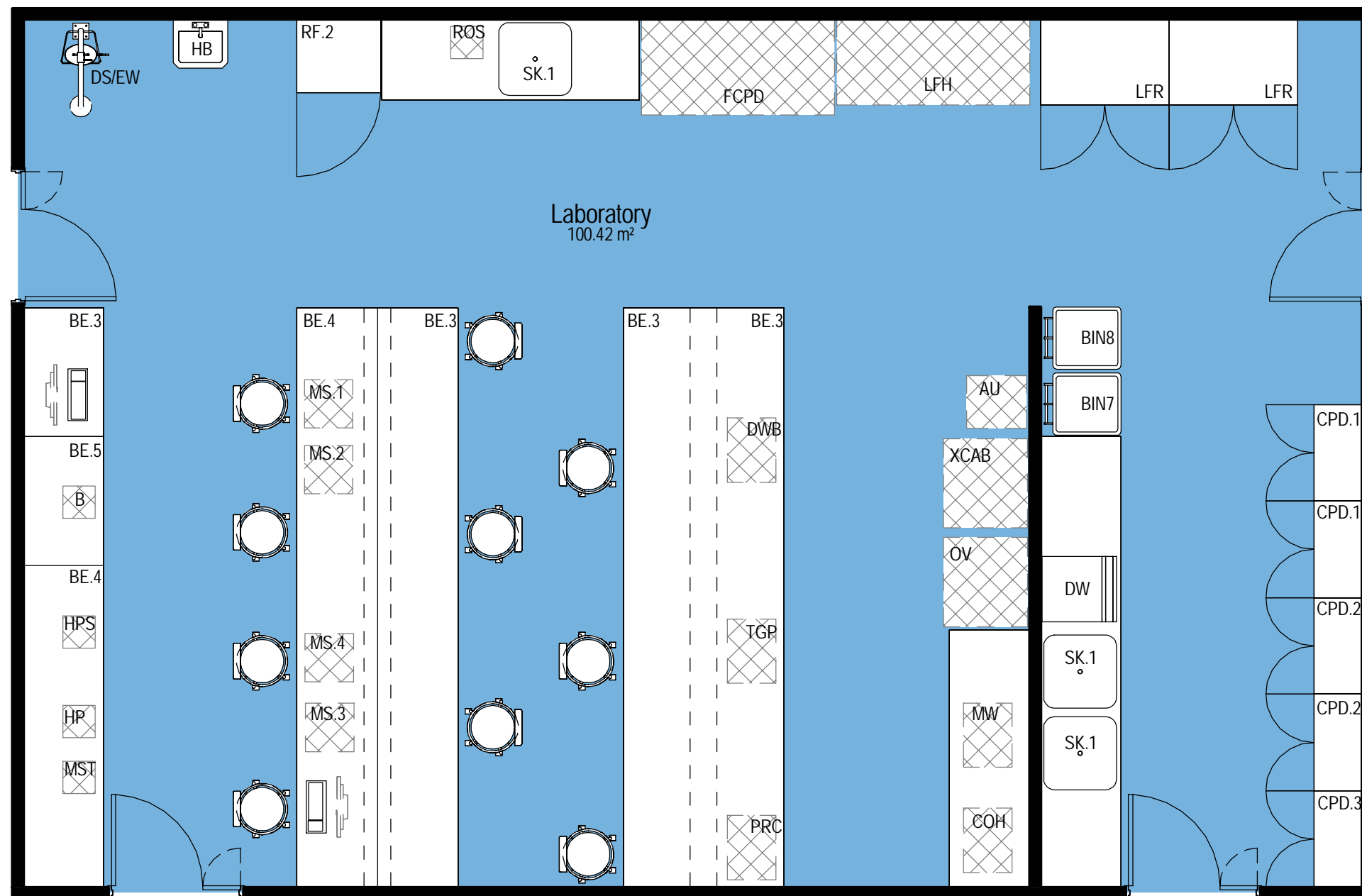


Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Laboratory
Room Number	1 no.
ICT / Communications	12 no. data points
Fire Detection	To Code
Fire Suppression	To code
Hydraulic	H&C water supply and drainage,
Specialist Gases	Propane
Security	PIR intruder detection, prox card access or secure perimeter with associated laboratory areas
Furniture	
Fixed	Laboratory benches with 9no. 1800w x 750d task areas for bench work and equipment as listed. Microscope bench with space for 4no. 1200w x 750d and 2 no. 1800w x 750d microscope stations and equipment as listed. Balance bench 1200w x 750d. Computer bench 1200w x 750d. 2400w x 750d bench with integrated laboratory sink. 4200w x 750d bench with 2 integrated laboratory sinks. Chemical storage cupboard 900w x 450d. 2 no. 900w x 450d consumables storage cupboards (large petri dishes etc). 2 no. 900w x 450d glassware storage cupboards. Glass ware drying rack over sink
Loose	10no. Stools for lab staff, trolley for material movement 1no. Flammables cabinet 30lt under bench 1no. Corrosives cabinet 30 lt under bench
Fixtures and Fittings	
ICT	Nil
Hydraulic	Handwash basin, Double Laboratory sink with double drainer (large deep bowls) Single sink with single drainer (large deep bowl) Safety shower and eyewash
Window Covering	Exclude direct sunlight and control glare
Signage	Room identification, safety signage
Other	Whiteboard 1800l x 900 h
Equipment: refer to attached equipment schedule	
Waste Disposal and Treatment	Laboratory waste from sinks or equipment to be neutralised 3 x 240lt bins Bulk material disposal through nursery waste disposal Glass disposal bin
Commentary	

- AU AUTOCLAVE
- B BALANCE
- BE.3 LABORATORY WORKBENCH
- BE.4 MICROSCOPE WORKBENCH
- BE.5 BALANCE BENCH
- BIN7 CONTAMINATED WASTE, 240LTR
- BIN8 GLASSWARE DISPOSAL, 240LTR
- COH CONVECTION OVEN AND HOTPLATE
- CPD.1 CONSUMABLES STORAGE CUPBOARD
- CPD.2 GLASSWARE STORAGE CUPBOARD
- CPD.3 CHEMICAL STORAGE CUPBOARD
- DS/EW DELUGE SHOWER AND EYEWASH
- DW DISHWASHER
- DWB DIGITAL WATER BATH
- FCPD FUME CUPBOARD
- HB BASIN
- HP HEAT PAD
- HPS HOT PLATE (STIRRER)
- LFH LAMINAR FLOW HOOD
- LFR LAB FREEZER (-21C)
- MS.1 MICROSCOPE (STAGE)
- MS.2 MICROSCOPE (DISSENTING)
- MS.3 MICROSCOPE (DISSECTING WITH CAMERA)
- MS.4 MICROSCOPE, LYNX STEREO WITH LAPTOP
- MST MECHANICAL STIRRER
- MW MICROWAVE OVEN
- OV OVEN
- PRC PRESSURE COOKER
- RF.2 REFRIGERATOR, DOMESTIC 515L
- ROS REVERSE OSMOSIS WATER STILL
- SK.1 LABORATORY SINK (INTEGRATED TO BENCHTOP)
- TGP TEMPERATURE GRADIENT PLATE
- XCAB X-RAY CABINET & COMPUTER



AUSTRALIAN NATIONAL BOTANIC GARDENS SEED BANK



Date 03/30/12
Job No. 23-14170
Drawing RDS-007



PRELIMINARY



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Preparation Laboratory
Room Number	1 off
General Design Criteria	
Function	Processing material from field to extract seeds , seed cleaning
Minimum Area / Minimum Dimensions	30 sqm
Occupants	Up to 4 no ANBG volunteers and staff on occasional access basis
Hour of Operation	Business hours
Affinities	Close to drying room, entry, offices and laboratory
Fire / Smoke Rating	To code
Acoustic Requirements	Enclosed office equivalence (radio used by volunteers doing work)
Access	Authorised volunteers and staff, trolley access
Security Performance Requirements	Lockable
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Glass link to office or circulation desirable for passive oversight
Enclosure	Fully enclosed, glazed wall to provide visibility of activity
Floor Loading	Dependent on equipment
Materials and Finishes Project Specific Performance Requirements	
Walls	
Ceilings	Cleanable acoustic ceiling tiles
Floors	Sheet vinyl, coved skirting
Glazing	External windows and internal glazed partitions
Doors	Solid core with acoustic seals or glazed aluminium
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitored
Mechanical	Containment pressure AC
Lighting	To code
Power	4 No. 10A DGPO



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Preparation Laboratory
Room Number	1 off
ICT / Communications	1 data
Fire Detection	To Code
Fire Suppression	To code
Hydraulic	Laboratory sink
Specialist Gases	Nil
Security	Prox card access or secure perimeter with associated laboratory areas, PIR intruder detection
Other	Nil
Furniture	
Fixed	1800w x 750d microscope& equipment bench 1800w x 750d bench with integrated laboratory sink Over bench shelving for sieve storage
Loose	1no. full height 900w x 450d x 5 shelves 2 no. 2400w x 750d workstations 1no. 900w x 450d storage cupboard
Fixtures and Fittings	
ICT	Nil
Hydraulic	Cold water, single bowl sink with drainer, drainage
Window Covering	Exclude direct sunlight and control glare
Signage	Room identification
Other	1800w x 900h wall mounted whiteboard
Equipment : Refer to Attached Schedule	
Waste Disposal and Treatment	
Commentary	



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Seed Cleaning Machine Room
Room Number	1 off
General Design Criteria	
Function	Processing material from field to extract seeds , seed cleaning
Minimum Area / Minimum Dimensions	12 sqm
Occupants	ANBG volunteers and staff on occasional access basis
Hour of Operation	Business hours
Affinities	Attached to Preparation Laboratory
Fire / Smoke Rating	To code
Acoustic Requirements	Enclosed office equivalence
Access	Authorised volunteers and staff, trolley access
Security Performance Requirements	Lockable
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Glass link to preparation laboratory desirable for passive oversight
Enclosure	Fully enclosed, glazed wall to provide visibility of activity
Floor Loading	Dependent on equipment
Materials and Finishes Project Specific Performance Requirements	
Walls	
Ceilings	Cleanable acoustic ceiling tiles
Floors	Sheet vinyl, coved skirting
Glazing	External windows and internal glazed partitions
Doors	Solid core with acoustic seals or glazed aluminium
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitored
Mechanical	Containment pressure AC
Lighting	To code
Power	4 No. 10A DGPO

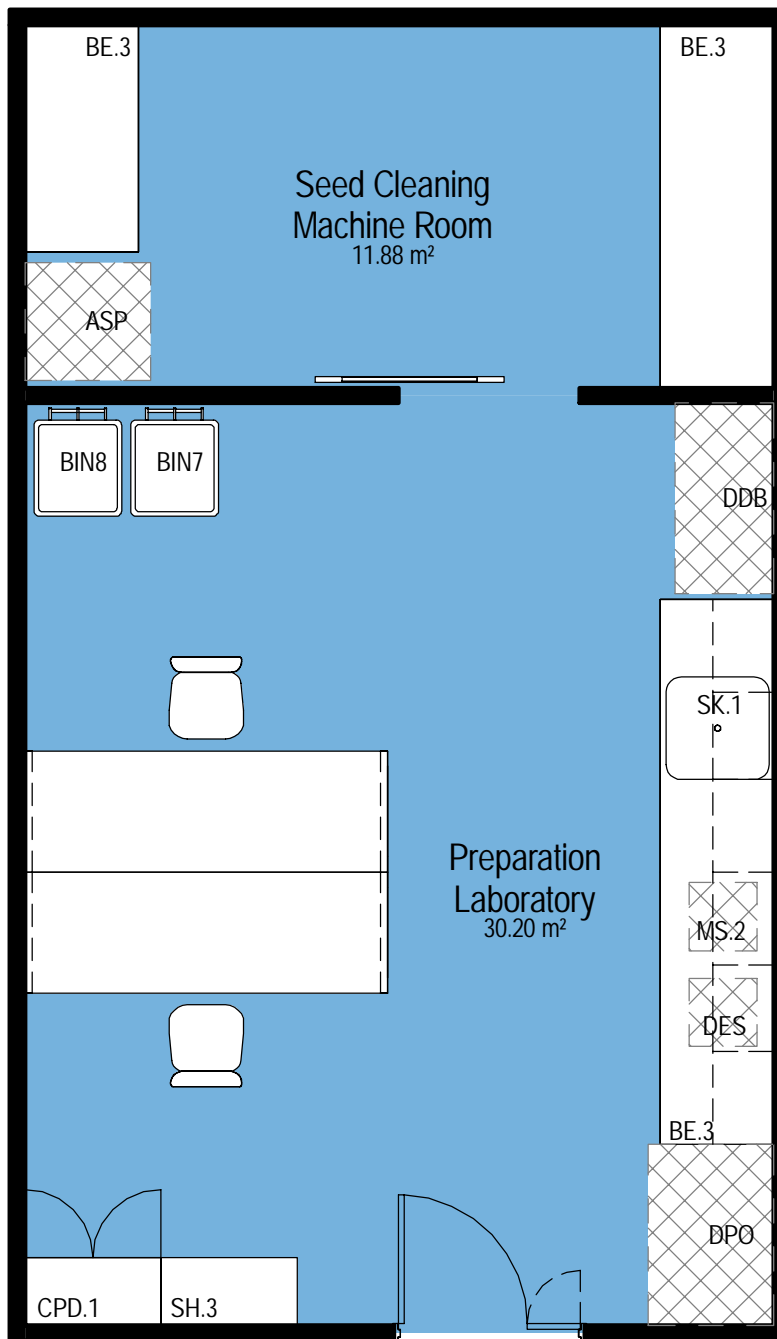


Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Seed Cleaning Machine Room
Room Number	1 off
ICT / Communications	1 data
Fire Detection	To Code
Fire Suppression	To code
Hydraulic	
Specialist Gases	Nil
Security	PIR intruder detection, secure perimeter with associated laboratory areas
Other	Nil
Furniture	
Fixed	2400w x 750d bench 1500w x 750d bench
Loose	Nil
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	Exclude direct sunlight and control glare
Signage	Room identification
Other	
Equipment : Refer to Attached Schedule	
Waste Disposal and Treatment	
Commentary	

- ASP ASPIRATOR
- BE.3 LABORATORY WORKBENCH
- BIN7 CONTAMINATED WASTE, 240LTR
- BIN8 GLASSWARE DISPOSAL, 240LTR
- CPD.1 CONSUMABLES STORAGE CUPBOARD
- DDB DOWNDRAUGHT BENCH
- DES DESSICATOR
- DPO DRYING PRESS OVEN
- MS.2 MICROSCOPE (DISSENTING)
- SH.3 DRYING SHELVES
- SK.1 LABORATORY SINK (INTEGRATED TO BENCHTOP)



0 500 1000 1500 2000 2500mm



SCALE 1:50 AT ORIGINAL SIZE



AUSTRALIAN NATIONAL
 BOTANIC GARDENS
 SEED BANK
 ROOM DATA SHEET DIAGRAM
 PREP LABORATORY

Job Number | 23-14170
 Revision | UR
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RDS-008



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Seed Bank Freezer Room
Room Number	3 off
General Design Criteria	
Function	Freezer rooms providing controlled storage for seeds within the seed bank collection
Minimum Area / Minimum Dimensions	11 sqm
Occupants	Nil - Occasional authorized staff access
Hour of Operation	24/7
Affinities	Laboratory, suit store and change room
Fire / Smoke Rating	240/240/240
Acoustic Requirements	Nil
Access	Authorized staff only seed bank unit manager, see d conservation scientist, seed bank manager)
Security Performance Requirements	Extremely high value specimens - access control, pest entry control, specimen security,
Applicable Licences and Certification	TBC
Visual Privacy /Connection	Nil
Enclosure	Fully enclosed
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	Fully insulated , washable
Ceilings	Fully insulated washable
Floors	Fully insulated, Slip resistant sheet vinyl with coved skirting
Glazing	Nil
Doors	Insulated door with seals, airlock
Indoor Environment Quality & Building Services Requirements	
Service Parameters	-21°C, low humidity to avoid ice build up
BMS	Monitored and alarmed
Mechanical	AC, operation must be maintained to protect equipment during maintenance
Lighting	To code for storage in walk in, to code for laboratory for room , supplementary filtered light for light sensitive bench work
Power	Due to value of specimens the power to support AC and security to be maintained for period sufficient to allow for



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Seed Bank Freezer Room
Room Number	3 off
	protection of collection for period to be confirmed.
ICT / Communications	Alarm to advise power failure or failure of equipment back to base and key staff
Fire Detection	VESDA
Fire Suppression	Gas suppression to be considered
Hydraulic	Nil
Specialist Gases	Nil
Security	Prox card access, PIR intruder detection
Other	Nil
Furniture	
Fixed	Fixed metal shelves 10 no. 900w x 400d x 5 no. shelves high
Loose	Nil
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	Nil
Signage	Room identification, safety signage
Other	Duress alarm to base and open plan office, duty ranger, & seed bank manager, 12 minute occupant warning alarm
Equipment : Refer to attached equipment schedule.	
Waste Disposal and Treatment	Nil
Commentary	The seed bank storage rooms are critical to the core function of the seed bank to preserve the specimens. As the collection grows the storage component will need to be scalable so that it can expand.



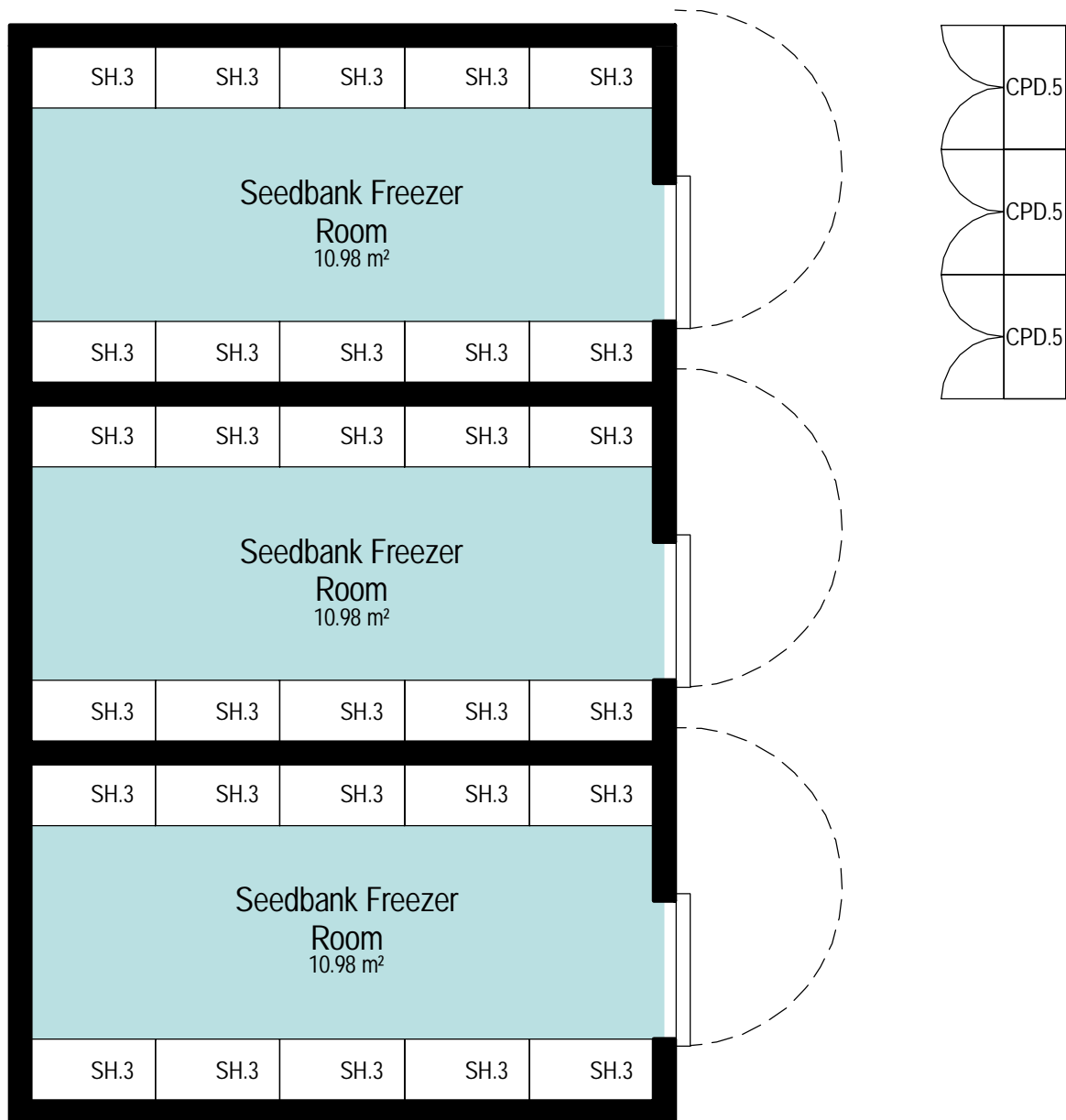
Room Name	Seed Bank Airlock
Room Number	
General Design Criteria	
Function	Airlock to -21°C Storage rooms including storage of thermal suits to be worn in the seed bank freezer rooms and changing
Minimum Area / Minimum Dimensions	
Occupants	Nil – occasional use only
Hour of Operation	24/7
Affinities	Freezer Rooms
Fire / Smoke Rating	Nil
Acoustic Requirements	Nil
Access	Authorised staff only
Security Performance Requirements	Swipe card access
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Nil
Enclosure	Full or partial
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	
Ceilings	
Floors	
Glazing	
Doors	
Indoor Environment Quality & Building Services Requirements	
Service Parameters	Conditions to protect suits
BMS	
Mechanical	
Lighting	
Power	



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Seed Bank Airlock
Room Number	
ICT / Communications	Nil
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	PIR intruder detection, secure perimeter with associated seed bank freezer rooms
Other	Nil
Furniture	
Fixed	Lockable storage cupboards if not secure room
Loose	
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	Nil
Signage	Room name and number
Other	
Equipment: Refer attached schedule	
Waste Disposal and Treatment	
Commentary	



AUSTRALIAN NATIONAL
 BOTANIC GARDENS
 SEED BANK
 ROOM DATA SHEET DIAGRAM
 SEEDBANK FREEZER ROOMS

Job Number | 23-14170
 Revision | UR
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RDS-009



Room Data Sheet
ANBG SEED BANK

2314170

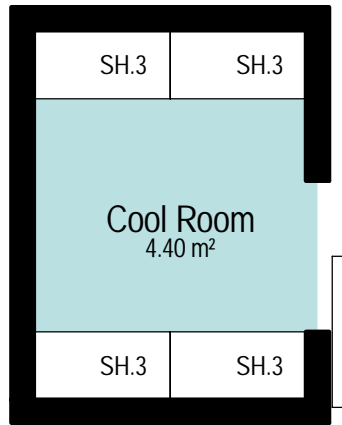
Room Name	Cool Room
Room Number	1 off
General Design Criteria	
Function	Cool room providing controlled storage
Minimum Area / Minimum Dimensions	5 sqm
Occupants	Nil - Occasional authorized staff access
Hour of Operation	24/7
Affinities	Laboratory
Fire / Smoke Rating	
Acoustic Requirements	Nil
Access	Authorized staff only seed bank unit manager, seed conservation scientist, seed bank manager
Security Performance Requirements	access control, pest entry control, specimen security,
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Nil
Enclosure	Fully enclosed
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	Fully insulated , washable
Ceilings	Fully insulated washable
Floors	Fully insulated, Slip resistant sheet vinyl with coved skirting
Glazing	Nil
Doors	Insulated door with seals, airlock
Indoor Environment Quality & Building Services Requirements	
Service Parameters	+4°C, low humidity
BMS	Monitored and alarmed
Mechanical	AC, operation must be maintained to protect equipment during maintenance
Lighting	To code for storage walk in
Power	Power to support AC and security to be maintained for period sufficient to allow for protection of collection for period to be confirmed.



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Cool Room
Room Number	1 off
ICT / Communications	Alarm to advise power failure or failure of equipment back to base and key staff
Fire Detection	VESDA
Fire Suppression	Gas suppression to be considered
Hydraulic	Nil
Specialist Gases	Nil
Security	Prox card access or secure perimeter with associated laboratory or storage areas
Other	Nil
Furniture	
Fixed	Fixed metal shelves 4 no. 900w x 400d x 5 no. shelves high
Loose	Nil
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	Nil
Signage	Room identification, safety signage
Other	Duress alarm to base and open plan office, duty ranger, & seed bank manager, 12 minute occupant warning alarm
Equipment: Refer to attached equipment schedule.	
Waste Disposal and Treatment	Nil
Commentary	The seed bank storage rooms are critical to the core function of the seed bank to preserve the specimens.



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BOTANIC GARDENS
SEED BANK
ROOM DATA SHEET DIAGRAM
COOL ROOM

Job Number | 23-14170

Revision | UR

Date | 03/30/12

RDS-010



Room Name	Germination Glasshouse
Room Number	
General Design Criteria	
Function	Potting on and growth of germinants in vermiculite prior to transfer to nursery
Minimum Area / Minimum Dimensions	3 x 5m
Occupants	Nil
Hour of Operation	24/7
Affinities	Laboratories
Fire / Smoke Rating	To code
Acoustic Requirements	Nil
Access	Authorised staff, students and volunteers only
Security Performance Requirements	Security of seedlings
Applicable Licences and Certification	
Visual Privacy /Connection	Nil
Enclosure	Full
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	Glass with shading and operable panels
Roof	Glass with shading and operable panels
Floors	Sealed concrete
Glazing	As above
Doors	Sliding glass door
Indoor Environment Quality & Building Services Requirements	
Service Parameters	
BMS	
Mechanical	
Lighting	
Power	



Room Name Germination Glasshouse

Room Number

ICT / Communications

Fire Detection

Fire Suppression

Hydraulic

Specialist Gases

Security

Other

Furniture

Fixed 5000l x 750 d galvanized wire from benching with single shelf under both sides

Loose

Fixtures and Fittings

ICT

Hydraulic

Window Covering

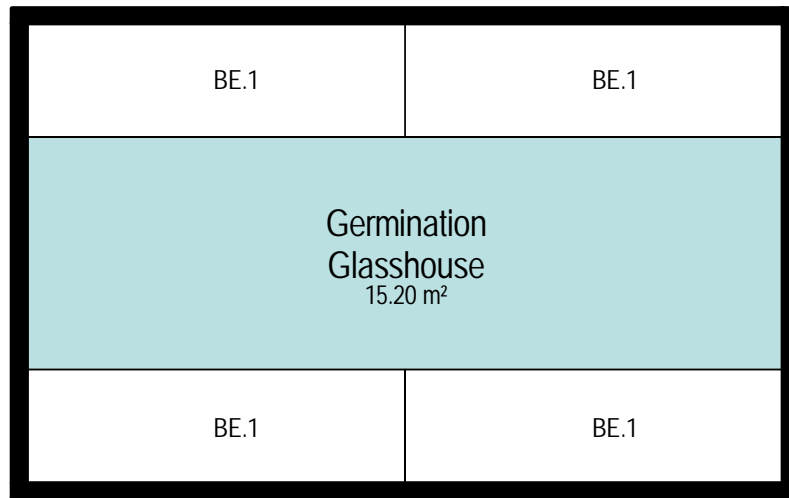
Signage

Other

Equipment: refer attached equipment schedule

Waste Disposal and Treatment

Commentary



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BOTANIC GARDENS
SEED BANK
ROOM DATA SHEET DIAGRAM
GERMINATION GREENHOUSE

Job Number | 23-14170
Revision | UR
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RDS-011



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Incubator Room
Room Number	1 off
General Design Criteria	
Function	Incubator room for experimental studies and other seed germination work
Minimum Area / Minimum Dimensions	15.5 sqm
Occupants	Occasional use by staff
Hour of Operation	24/7
Affinities	Direct access to laboratory
Fire / Smoke Rating	To code
Acoustic Requirements	Noise containment of sound from incubators
Access	Authorised staff only, trolley access
Security Performance Requirements	Access control at ,
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Visual links for supervision
Enclosure	Full
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	
Ceilings	
Floors	Slip resistant sheet vinyl within coved skirting or equivalent
Glazing	Vision panels or internal or external windows
Doors	Solid core acoustic seals vision panel or glazed aluminium
Indoor Environment Quality & Building Services Requirements	
Service Parameters	
BMS	Monitoring room conditions and equipment
Mechanical	A/C
Lighting	To office standard for bench top fine work
Power	4 no. 10A DGPO



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Incubator Room
Room Number	1 off
ICT / Communications	2 no. data points
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	Prox card access or secure perimeter with associated laboratory spaces, PIR intruder detection
Furniture	
Fixed	4no. 2.4 Im Laboratory Bench
Loose	Stool
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	Direct sun / glare exclusion
Signage	Room signage, safety signage
Other	Nil
Equipment: refer attached equipment schedule	
Waste Disposal and Treatment	Nil
Commentary	Bench space for scoring germination and handling



Room Name	Dark Room
Room Number	
General Design Criteria	
Function	Inspection and testing of specimens under controlled light conditions
Minimum Area / Minimum Dimensions	7.7 sqm
Occupants	Nil - occasional use only
Hour of Operation	
Affinities	Incubator Room , laboratory
Fire / Smoke Rating	
Acoustic Requirements	
Access	
Security Performance Requirements	Specimen protection
Applicable Licences and Certification	Nil
Visual Privacy /Connection	Nil
Enclosure	Full
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	
Ceilings	
Floors	
Glazing	Nil
Doors	Light lock at door
Indoor Environment Quality & Building Services Requirements	
Service Parameters	
BMS	
Mechanical	AC
Lighting	Office task lighting, specialised lighting
Power	

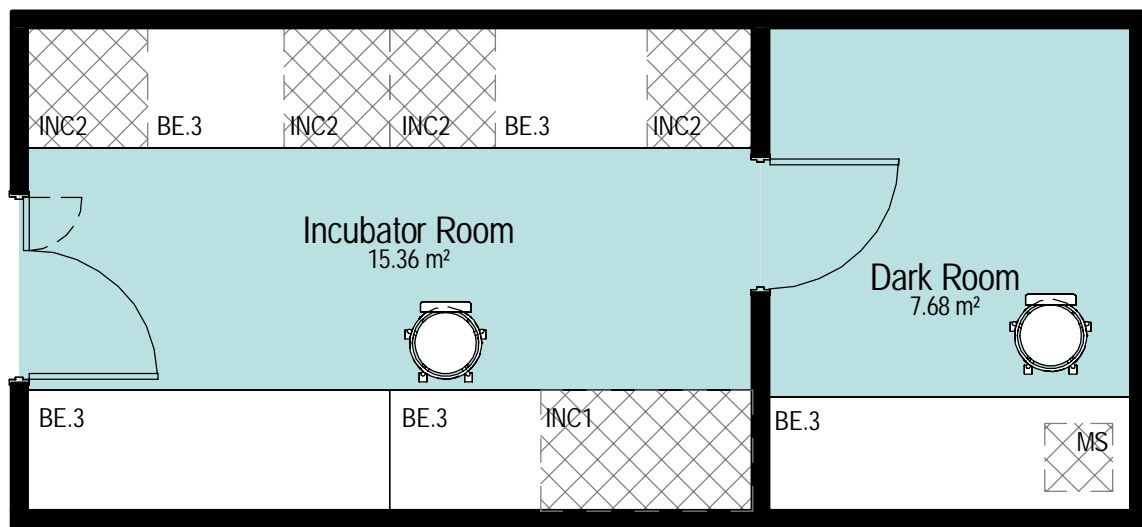


Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Dark Room
Room Number	
ICT / Communications	
Fire Detection	
Fire Suppression	
Hydraulic	
Specialist Gases	
Security	Prox card access or secure perimeter with associated laboratory spaces, PIR intruder detection, in-use signage activated with classroom latch.
Other	Nil
Furniture	
Fixed	2400w x 750d Laboratory Bench
Loose	stool
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	Nil
Signage	Room name and number, illuminated signage to indicate when in use connected to light switching
Other	Nil
Equipment: Refer to Equipment schedule	
Waste Disposal and Treatment	
Commentary	

BE.3 LABORATORY WORKBENCH
 INC1 ILLUMINATED INCUBATOR TYPE 1
 INC2 ILLUMINATED INCUBATOR TYPE 2
 MS MICROSCOPE



AUSTRALIAN NATIONAL
 BOTANIC GARDENS
 SEED BANK
 ROOM DATA SHEET DIAGRAM
 INCUBATOR ROOM

Job Number | 23-14170
 Revision | UR
 Date | 03/30/12

RDS-012



Room Name	Drying Room
Room Number	2 off
General Design Criteria	
Function	Drying of field collection seed samples prior to processing and at various stages of processing including repackaging for distribution
Minimum Area / Minimum Dimensions	11.25 sqm
Occupants	Nil
Hour of Operation	24/7
Affinities	Entry, dirty preparation & laboratory
Fire / Smoke Rating	To code or ANBG policy
Acoustic Requirements	Nil
Access	Authorized staff only, trolley access
Security Performance Requirements	Entry control, pest exclusion critical to protect seeds
Applicable Licenses and Certification	Nil
Visual Privacy /Connection	N/A
Enclosure	Full, insulated
Floor Loading	To code
Materials and Finishes Project Specific Performance Requirements	
Walls	Insulated metal panel or equal
Ceilings	Insulated metal panel or equal
Floors	Insulated sealed concrete or slip resistant sheet vinyl with coved skirting
Glazing	Nil
Doors	Insulated metal doors with full seals
Indoor Environment Quality & Building Services Requirements	
Service Parameters	15C and 15-18% RH
BMS	Required, Temperature and RH monitoring
Mechanical	A/C
Lighting	To code sufficient to read labeling
Power	UPS



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Drying Room
Room Number	2 off
ICT / Communications	Alarm in event of equipment failure, duress alarm
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	Prox card access or secure perimeter with associated spaces, PIR intruder detection
Other	Nil
Furniture	
Fixed	Nil
Loose	10 no. 900w x 400d x 5no. shelves high fixed wire shelves
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	Nil
Signage	Room signage, safety signage
Other	Nil
Equipment: Refer to Equipment Schedule	
Waste Disposal and Treatment	Nil
Commentary	Materials in small packages or open boxes (see photographs)



Room Name	Drying Room Lobby
Room Number	1 off
General Design Criteria	
Function	Airlock and work area for sampling and preparing packaging for dispatch to other institutions
Minimum Area / Minimum Dimensions	16 sqm
Occupants	Nil – occasional use only
Hour of Operation	24/7
Affinities	Entry, dirty preparation & laboratory
Fire / Smoke Rating	To code or ANBG policy
Acoustic Requirements	Nil
Access	Authorized staff only, trolley access
Security Performance Requirements	Entry control, pest exclusion critical to protect seeds
Applicable Licenses and Certification	Nil
Visual Privacy /Connection	N/A
Enclosure	Full, insulated
Floor Loading	To code
Materials and Finishes Project Specific Performance Requirements	
Walls	Insulated metal panel or equal
Ceilings	Insulated metal panel or equal
Floors	Insulated sealed concrete or slip resistant sheet vinyl with coved skirting
Glazing	Nil
Doors	Insulated metal doors with full seals – automated operation
Indoor Environment Quality & Building Services Requirements	
Service Parameters	15C and 15-18% RH
BMS	Required, Temperature and RH monitoring
Mechanical	A/C
Lighting	To code sufficient to read labeling
Power	UPS

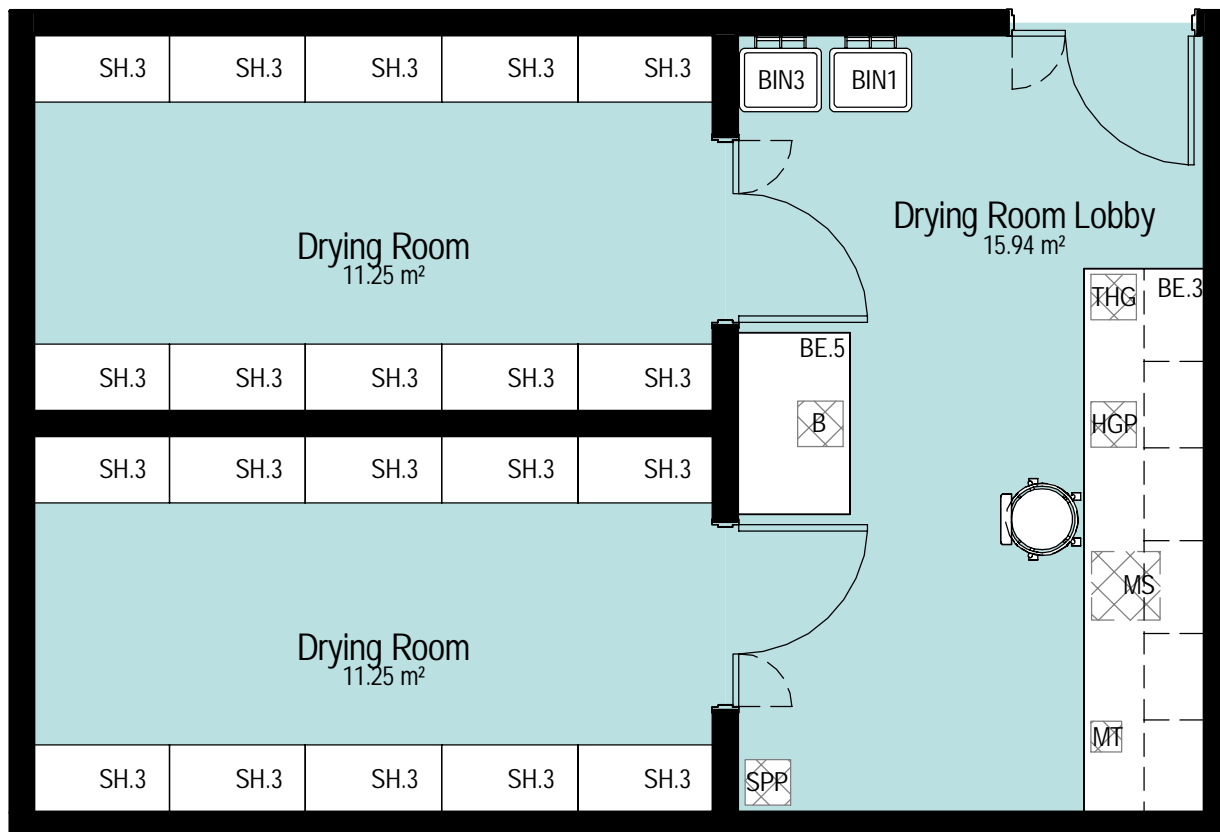


Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Drying Room Lobby
Room Number	1 off
ICT / Communications	1no. ANBG Network data, phone, duress alarm
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	Prox card access or secure perimeter with associated spaces, PIR intruder detection
Other	Nil
Furniture	
Fixed	3600w x 750d lab bench 3600w x 400d over bench shelving for packing materials 1200w x 750d balance bench
Loose	Stool
Fixtures and Fittings	
ICT	Computer terminal - TBC
Hydraulic	Nil
Window Covering	Nil
Signage	Room signage, safety signage
Other	Nil
Equipment: Refer to Equipment Schedule	
Waste Disposal and Treatment	2 x 120lt packaging waste bins
Commentary	Materials in small packages or open boxes (see photographs)

- B BALANCE
- BE.3 LABORATORY WORKBENCH
- BE.5 BALANCE BENCH
- BIN1 GENERAL WASTE, 120LTR
- BIN3 CONTAMINATED WASTE, 120LTR
- HGP HYGROPALM
- MS MICROSCOPE
- MT MOISTURE TESTER
- SH.3 DRYING SHELVES
- SPP SEED PACKET PRESS
- THG THERMO HYDROGRAPH



AUSTRALIAN NATIONAL
 BOTANIC GARDENS
 SEED BANK
 ROOM DATA SHEET DIAGRAM
 DRYING ROOM

Job Number | 23-14170
 Revision | UR
 Date | 03/30/12

RDS-013



Room Name	Shared Storeroom
Room Number	1 off
General Design Criteria	
Function	Large consumables storage shared between Production Nursery and
Minimum Area / Minimum Dimensions	
Occupants	Nil
Hour of Operation	Business hours
Affinities	Nursery and Seed Bank
Fire / Smoke Rating	To code
Acoustic Requirements	Noise separation from office areas
Access	Authorised staff , trolleys
Security Performance Requirements	Equipment and materials protection
Applicable Licences and Certification	Nil
Visual Privacy /Connection	-
Enclosure	Full
Floor Loading	
Materials and Finishes Project Specific Performance Requirements	
Walls	Painted blockwork/ plasterboard or equal
Ceilings	Not required
Floors	Sealed concrete
Glazing	-
Doors	Double door to allow trolley access
Indoor Environment Quality & Building Services Requirements	
Service Parameters	To code
BMS	Monitoring and control
Mechanical	Exhaust
Lighting	To code
Power	2 no. DGPO



Room Data Sheet
ANBG SEED BANK

2314170

Room Name	Shared Storeroom
Room Number	1 off
ICT / Communications	Nil
Fire Detection	To code
Fire Suppression	To code
Hydraulic	Nil
Specialist Gases	Nil
Security	Prox card access, PIR intruder detection
Other	Nil
Furniture	
Fixed	Medium duty metal shelving accessible without lifting equipment
Loose	Nil
Fixtures and Fittings	
ICT	Nil
Hydraulic	Nil
Window Covering	-
Signage	Room signage, safety signage
Other	Nil
Equipment : Nil	
Waste Disposal and Treatment	Nil
Commentary	Shared access external to secure area of Seed Bank preferable Potentially suitable for location in undercroft

Appendix D
Seed Bank Equipment Schedule

Appendix E
Seed Bank Chemicals Schedule

Chemicals Register Seed Bank October 2010			
Name	Quantity	Number	Danger goods - Hazard rating
Acetone	200ml	1	3 Flammable
Acid fuchsin	10g	1	6
Agar	1kg	1	
Agar Difco	454g	1	
Ammonium dihydrogen orthophosphate	500g	1	
Ammonium nitrate	500g	1	5.1
Ammonium sulphate	500g	1	
Benzylaminopurine (6-)	500g	2	
Benzylaminopurine (6-)	5g	1	
Boric Acid	100g	1	Harmful
Calcium chloride, dihydrate	500g	1	Irritating to eyes
Calcium nitrate	500g	1	5.1 No contact with combustibles
Chlorazole black E	25g	1	Toxic
Cineole 99%	100ml	1	
Cobalt chloride hexahydrate	25g	1	Toxic (US), Harmful (Europe)
Copper sulphate			
Dimethyl sulfoxide	100ml	1	
di-Potassium hydrogen orthophosphate	500g	2	
di-Sodium hydrogen orthophosphate, anhyd	500g	1	
di-Sodium hydrogen orthophosphate, hydrated EDTA disodium salt	500g	1	
Gibberellic acid	10g	1	Irritant
Ethanol	2.5L	2	3 Flammable
Glycerin	100ml	1	
Glycerol	100ml	1	
Glycerol	2.5L	1	
Hydrogen peroxide 6% 20 vol	100ml	1	
Iron (II) sulphate	500g	2	
Kerosene	1L	1	3 Flammable
Lactic acid 85%	2.5L	1	
Lithium chloride reagent plus 99%	2kg	1	Harmful
Mancozeb fungicide	125g	1	
Manganese (II) chloride	500g	1	
Manganese sulphate	500g	1	
Manganese sulphate	500g	1	
Manganese sulphate monohydrate	500g	1	
Molybdic acid, NA, dihydrate	100g	1	Irritant
Myo-Inositol			
Naphthylacetic acid (1-)	25g	2	Harmful,irritant, don't inhale, avoid skin & eyes
Nicotinic acid	25g	1	Irritant
N,N-Dimethylformamide	100g	1	
Paraffin, liquid BP 73	500ml	1	
Phenol crystals	500g	1	Poison S6 not to be taken
Pectinase	10g	1	
Plant preservative mixture	500ml	1	Don't drink, inhale no contact eyes & skin.
Potassium chloride	500g	1	
Potassium dihydrogen orthophosphate	500g	1	
Potassium hydroxide, flake	500g	1	8 corrosive Poison
Potassium metabisulphite	500g	1	
Potassium nitrate	500g	1	5.1 Oxidising
Potassium permanganate	500g	2	5 Oxidising
Pyridoxine hydrochloride	25g	1	Harmful by ingestion, irritant
Silver nitrate			
Smoke Master	2 kg	2	Non hazardous
Sodium chloride	500g	1	
Sodium dihydrogen orthophosphate	500g	1	
Sodium hydroxide, 20-40 mesh	500g	1	8 corrosive, harmful
Sodium molybdate	100g	1	Irritant
Sucrose	500g	1	
Terpinen-4-ol 97%	25g	1	3 Flammable, Irritant
Triphenyltetrazolium chloride	25g	1	Irritant
Zinc sulphate	100g	1	

Appendix F
Seed Bank Cost Estimate

Full Estimate Summary

Job Name : 3912 ANBG SEED CON
Client's Name:

Job Description

Australian National Botanic Gardens
 Seed Bank- Concept Design Cost Plan
 3912 - 13 June 2012

Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	AREAS					
	Substructure	5.05	360.68	233,000		233,000
	Columns	0.93	66.56	43,000		43,000
	Roof	10.94	781.73	505,000		505,000
	External Walls	6.95	496.90	321,000		321,000
	Windows	2.38	170.28	110,000		110,000
	External Doors	0.24	17.03	11,000		11,000
	Internal Walls and Screens	4.94	352.94	228,000		228,000
	Internal Doors	1.06	75.85	49,000		49,000
	Wall Finishes	0.61	43.34	28,000		28,000
	Floor Finishes	1.62	116.10	75,000		75,000
	Ceiling Finishes	1.36	97.52	63,000		63,000
	Fitments	2.49	178.02	115,000		115,000
	Hydraulics	1.95	139.32	90,000		90,000
	Mechanical Services	8.49	606.81	392,000		392,000
	Electrical, Communications, Security and Fire Detection	8.23	588.24	380,000		380,000
	Builders work in connection with services	0.56	40.25	26,000		26,000
	SUBTOTAL BUILDING COSTS FOR CONCEPT ESTIMATE					<u>2,669,000</u>
	Earthworks	1.73	123.84	80,000		80,000
	Retaining walls	0.97	69.66	45,000		45,000
	Roadworks	1.52	108.36	70,000		70,000
	Paving, Bridge and Sprinkler Valve Enclosure	1.47	105.26	68,000		68,000
	Landscaping	0.97	69.66	45,000		45,000
	External Hydraulics	6.22	444.27	287,000		287,000
	External Communication	0.43	30.96	20,000		20,000
	SUBTOTAL EXTERNAL WORKS AND SERVICES FOR CONCEPT ESTIMATE					<u>615,000</u>
	Preliminaries and Profit (14%)	9.97	712.07	460,000		460,000
	SUBTOTAL CONSTRUCTION COSTS FOR CONCEPT ESTIMATE					<u>3,744,000</u>
	Loose Furniture	1.52	108.36	70,000		70,000

Full Estimate Summary

Job Name : <u>3912 ANBG SEED CON</u> Client's Name:	<u>Job Description</u> Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012
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Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	Design and Construction Contingency (10%)	8.28	591.33	382,000		382,000
	Consultant Fees and Statutory Fees (10%)	9.10	650.15	420,000		420,000
	TOTAL CONCEPT STAGE COST PLAN AT JUNE 2012 PRICES (EXCLUDING GST)					<u>4,616,000</u>
	OPTIONS					
	Option costs are outturn costs at June 2012 prices including Contingency, Consultant fees (but excluding GST and escalation beyond June 2012)					
	RAINWATER HARVESTING OPTION			86,000	-100.00	
	ESTIMATE REPORT					
	The Estimate is based upon the following:-					
	- GHD DRAWINGS A102, A103 dated 01.06.12					
	- GHD Scoping Brief Revision B dated April 2012					
	- Hydraulic, mechanical, electrical, communications, security and fire detection services estimates provided by GHD					
	AREA SCHEDULE					
	FECA - 581m2					
	UCA - 65m2					
	GFA - 646m2					
	INCLUSIONS					

Full Estimate Summary

Job Name : <u>3912 ANBG SEED CON</u> Client's Name:	<u>Job Description</u> Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012
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Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	The Estimate includes the following equipment shown on drawing A102 as indicated in the room data sheets:					
	- CPD.1 CONSUMABLES STORAGE CUPBOARD					
	- CPD.2 GLASSWARE STORAGE CUPBOARD					
	- CPD.3 CHEMICAL STORAGE CUPBOARD					
	- CPD.4 STATIONARY STORAGE CUPBOARD					
	- CPD.5 COAT CUPBOARD					
	- FC4 FILING CABINET, 4 DRAWER					
	- SH.1 SHELVING, SINGLE BA					
	- SH.3 DRYING SHELVES					
	EXCLUSIONS					
	The Estimate excludes the following:					
	- GST					
	- Escalation beyond JUNE 2012					
	- Seed bank expansion zone					
	- Fire Hydrants					
	- AV Equipment					
	- Rainwater harvesting (included as an option)					
	- Greywater reuse					
	- Equipment (other than indicated above all as scheduled on drawing A102)					

GFA: 646 m2.	100.00	7,145.51	4,702,000	4,616,000
			Final Total : \$	4,616,000

Trade Breakup

Job Name : 3912 ANBG SEED CON

Job Description

Client's Name:

Australian National Botanic Gardens
Seed Bank- Concept Design Cost Plan
3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 1 <u>AREAS</u></i>						
1	FECA	581.00	m2			
2						
3	UCA	65.00	m2			
4						
5	GFA	646.00	m2			
<u>AREAS</u>						Total :
<i>Trade : 2 <u>Substructure</u></i>						
<u>Substructure</u>						
1	Ground slab including beams and bored piers	610.05	m2	380.00		231,819.00
2	Sundries.	1.00	item	1,181.00		1,181.00
<u>Substructure</u>						Total : 233,000.00
<i>Trade : 3 <u>Columns</u></i>						
<u>Columns</u>						
1	Concrete columns	701.00	m2	60.00		42,060.00
2	Sundries.	1.00	item	940.00		940.00
<u>Columns</u>						Total : 43,000.00
<i>Trade : 4 <u>Roof</u></i>						
<u>Roof</u>						
1	Concrete roof slab to seed bank drying rooms, drying room lobby, seed bank freezer rooms, storeroom, cool room and seed bank airlock	123.00	m2	400.00		49,200.00
2	Steel roof framing over concrete roof slab	123.00	m2	90.00		11,070.00
3	Steel roof framing to other roof areas	578.00	m2	180.00		104,040.00
4	Metal roof decking including insulation, sarking, flashings, cappings and roof safety system	701.00	m2	140.00		98,140.00
5	Extra for turning roof down over columns including framing	139.00	m2	350.00		48,650.00
6	Extra for horizontal reveal to edge of roof	66.00	m	180.00		11,880.00
7	Prefinished metal eaves lining	151.00	m2	90.00		13,590.00
8	High level double glazing including sunscreen	20.00	m2	950.00		19,000.00

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 4 <u>Roof</u></i> <i>(Continued)</i>						
9	Vertical metal cladding to high level roof including framing, insulation, sarking and internal linings	364.00	m2	400.00		145,600.00
10	Sundries.	1.00	item	3,830.00		3,830.00
<u>Roof</u>						Total : 505,000.00
<i>Trade : 5 <u>External Walls</u></i>						
<u>Steel Framing</u>						
1	Allow for steel framing to walls	393.00	m2	100.00		39,300.00
<u>External Walls</u>						
2	Cavity insulated precast wall	220.00	m2	800.00		176,000.00
3	Terracade cladding including insulation and impact resistant plasterboard internal linings	173.00	m2	580.00		100,340.00
4	Metal screen to bins	11.00	m2	320.00		3,520.00
5	Sundries.	1.00	item	1,840.00		1,840.00
<u>External Walls</u>						Total : 321,000.00
<i>Trade : 6 <u>Windows</u></i>						
<u>Windows</u>						
1	Double glazed eco thermally broken aluminium windows	118.00	m2	750.00		88,500.00
2	Extra for 50% openable (office areas)	84.00	m2	150.00		12,600.00
3	Extra for opaque glass (top and bottom panes)	76.00	m2	100.00		7,600.00
4	Sundries.	1.00	item	1,300.00		1,300.00
<u>Windows</u>						Total : 110,000.00
<i>Trade : 7 <u>External Doors</u></i>						
1	Pair of entry glazed doors	1.00	no	3,500.00		3,500.00
2	Single leaf glazed door	1.00	no	2,250.00		2,250.00
3	Single leaf solid door	1.00	no	1,500.00		1,500.00
4	4 Hour fire rated single door	1.00	no	3,000.00		3,000.00
5	Sundries	1.00	no	750.00		750.00
<u>External Doors</u>						Total : 11,000.00

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	<u>Job Description</u>
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
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Trade : **8 Internal Walls and Screens**

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<u>Internal Walls and Screens</u>						
1	Allow for steel framing to walls	81.00	m2	100.00		8,100.00
2	Cavity insulated precast wall	81.00	m2	800.00		64,800.00
3	Internal stud wall comprising 13 impact plasterboard to both sides; acoustic insulation 92 steel stud framing to office areas	43.00	m	420.00		18,060.00
4	Internal stud wall comprising 13 impact plasterboard to both sides; acoustic insulation 92 steel stud framing to labs	44.00	m	910.00		40,040.00
<u>Internal Screens</u>						
5	Single glazed screen to office	50.00	m2	350.00		17,500.00
6	Double glazed screen to meeting room	29.00	m2	450.00		13,050.00
<u>Cool Room/ Freezer Room Panelling</u>						
7	Insulated wall drying room panelling	124.00	m2	150.00		18,600.00
8	Insulated wall coolroom panelling	28.00	m2	150.00		4,200.00
9	Insulated wall freezer panelling	176.00	m2	160.00		28,160.00
10	Vapour membrane to stud framing	328.00	m2	7.00		2,296.00
11	Studframing	328.00	m2	40.00		13,120.00
12	Sundries.	1.00	item	74.00		74.00
13						
14						
<u>Internal Walls and Screens</u>						Total : 228,000.00

Trade : **9 Internal Doors**

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<u>Internal Doors</u>						
1	Insulated door with seals	4.00	no	2,500.00		10,000.00
2	Insulated metal door with seals	2.00	no	2,300.00		4,600.00
3	Insulated automated metal door with seals	1.00	no	7,000.00		7,000.00
4	Single service cupboard door	4.00	no	800.00		3,200.00
5	Pair of service cupboard doors	1.00	no	1,250.00		1,250.00
6	Single leaf solid core door	8.00	no	1,150.00		9,200.00
7	Single leaf door with light lock	1.00	no	2,200.00		2,200.00

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 9 <u>Internal Doors</u></i>						<i>(Continued)</i>
8	Single leaf sliding door	1.00	no	1,350.00		1,350.00
9	Pair of doors with unequal leaves including vision panels	3.00	no	2,900.00		8,700.00
10	Sundries.	1.00	item	1,500.00		1,500.00
<u>Internal Doors</u>						Total : 49,000.00
<i>Trade : 10 <u>Wall Finishes</u></i>						
1	Ceramic wall tiles	73.00	m2	125.00		9,125.00
2	Painting to wall linings.	1,137.00	m2	13.00		14,781.00
3	Painting to single doors.	11.00	no	160.00		1,760.00
4	Painting to double doors.	6.00	no	230.00		1,380.00
5	Sundries.	1.00	item	954.00		954.00
<u>Wall Finishes</u>						Total : 28,000.00
<i>Trade : 11 <u>Floor Finishes</u></i>						
1	Carpet tiles.	202.00	m2	65.00		13,130.00
2	Sheet vinyl.	223.00	m2	95.00		21,185.00
3	Slip resistant sheet vinyl including screed and insulation to drying rooms, cool rooms and freezer rooms	86.00	m2	185.00		15,910.00
4	Ceramic floor tiles	20.00	m2	180.00		3,600.00
5	Skirting	519.00	m	35.00		18,165.00
6	Entry mat	2.00	no	900.00		1,800.00
7	Sundries.	1.00	item	1,210.00		1,210.00
<u>Floor Finishes</u>						Total : 75,000.00
<i>Trade : 12 <u>Ceiling Finishes</u></i>						
1	Ceiling insulation.	531.00	m2	20.00		10,620.00
2	Cleanable acoustic ceiling tiles	243.00	m2	95.00		23,085.00
3	Acoustic ceiling tiles	202.00	m2	65.00		13,130.00
4	Insulated panelling	86.00	m2	150.00		12,900.00
5	Allow for bulkheads	1.00	item	3,000.00		3,000.00

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 12 <u>Ceiling Finishes</u></i>						<i>(Continued)</i>
6	Sundries.	1.00	item	265.00		265.00
<u>Ceiling Finishes</u>					Total :	63,000.00

<i>Trade : 13 <u>Fitments</u></i>						
	<u>Fitments</u>					
	<u>Fitments as per Room Data Sheets</u>					
	<u>Meeting Room</u>					
1	Joinery Unit with Below Bench Storage Cupboards	1.00	no	4,050.00		4,050.00
	<u>Tea Room</u>					
2	2400w x 750d bench with cupboards under bench and overhead including splashback	1.00	no	3,720.00		3,720.00
	<u>Utility Room</u>					
3	4100w x 750d bench with under bench storage and shelves over to Utility Room	1.00	no	4,510.00		4,510.00
4	900 w shelving	2.00	no	405.00		810.00
	<u>Laboratory</u>					
5	Benches with 9no. 1800w x 750d task areas - 5400 long	2.00	no	7,300.00		14,600.00
6	Microscope bench with space for 4no 1200w x 750d and 2 no 1800w x 750d microscope stations (included above)	1.00	item			INCL
7	Balance bench 1200w x 750d	1.00	no	1,200.00		1,200.00
8	Computer bench 1200w x 750d	1.00	no	1,200.00		1,200.00
9	2400w x 750d bench with integrated laboratory sink (sink included in hydraulics)	1.00	no	3,600.00		3,600.00
10	4200w x 750d bench with 2 integrated laboratory sinks (sink included in hydraulics)	1.00	no	6,300.00		6,300.00
11	Other benching	6.00	m	1,000.00		6,000.00
12	Chemical Storage Cupboard 900w x 450d	1.00	no	1,200.00		1,200.00
13	Consumables Storage Cupboard 900w x 450d	2.00	no	900.00		1,800.00
14	Glassware Storage Cupboard 900w x 450d	2.00	no	1,400.00		2,800.00
15	Glassware drying rack over sink	1.00	no	1,200.00		1,200.00
	<u>Freezer Room</u>					
16	Fixed metal shelves 900w x x400d x 5no shelves high	30.00	no	405.00		12,150.00
17	Lockable Storage cupboards to store themal suits	3.00	no	450.00		1,350.00

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	<u>Job Description</u>
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 13 <u>Fitments</u></i>						<i>(Continued)</i>
	<u>Cool Room</u>					
18	Fixed metal shelves 900w x x400d x 5no shelves high	4.00	no	405.00		1,620.00
	<u>Incubator Room</u>					
19	Laboratory Bench 2.4lm	4.00	no	2,880.00		11,520.00
	<u>Dark Room</u>					
20	Laboratory bench 2400w x 750d	1.00	no	2,880.00		2,880.00
	<u>Drying Room Lobby</u>					
21	Lab Bench 3600w x 750d	1.00	no	3,240.00		3,240.00
22	Over Bench Shelving 3600w x 400d	1.00	no	1,620.00		1,620.00
23	Balance Bench 1200w x 750d	1.00	no	1,200.00		1,200.00
	<u>Shared Storeroom</u>					
24	Medium duty metal shelving accessible without lifting equipment	1.00	no	2,000.00		2,000.00
	<u>Seed Cleaning Machine Room</u>					
25	Bench 2400w x 750d	1.00	no	2,160.00		2,160.00
26	Bench 1500w x 750d	1.00	no	1,350.00		1,350.00
	<u>Preparation Lab</u>					
27	Microscope and Equipment Bench 1800w x 750d	1.00	no	1,620.00		1,620.00
28	Bench with integrated laboratory sink 1800w x 750d (sink included in hydraulics)	1.00	no	2,160.00		2,160.00
29	Over bench shelving for sieve storage	1.00	no	1,000.00		1,000.00
	<u>Drying Room</u>					
30	900w x400dx 5 shelves high fixed wire shelves	20.00	no	405.00		8,100.00
	<u>Sundries</u>					
31	Allow for signage	1.00	item	4,000.00		4,000.00
32	Allow for fire extinguishers	1.00	item	1,000.00		1,000.00
33	Allow for WC fitments	1.00	item	1,000.00		1,000.00
34	Sundry items	1.00	item	2,040.00		2,040.00
<u>Fitments</u>					Total :	115,000.00
<i>Trade : 14 <u>Hydraulics</u></i>						
	<u>Hydraulics</u>					

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 14 <u>Hydraulics</u></i>						<i>(Continued)</i>
	<u>GHD estimate (dated 29/05/12)</u>					
1	Site Establishment	1.00	item	1,000.00		1,000.00
2	Workshop Drawings	1.00	item	7,500.00		7,500.00
3	Fixtures	12.00	no	2,400.00		28,800.00
4	Sewer Pump Station	1.00	m3	12,500.00		12,500.00
5	Neutralisation Pit	1.50	m3	4,500.00		6,750.00
6	Cold Water Boost Pumps	1.00	no	10,000.00		10,000.00
7	Solar Hot Water Plant	1.00	no	10,000.00		10,000.00
8	Hot Water Circulating Pump	1.00	no	3,000.00		3,000.00
9	RPZ Valve Assembly in Wall Box	3.00	no	1,500.00		4,500.00
10	Eye Wash and Safety Shower Unit	1.00	no	2,000.00		2,000.00
11	Allow for operation and maintenance manuals	1.00	item	2,000.00		2,000.00
12	Additional water meters to major water use areas	1.00	no	1,000.00		1,000.00
13						950.00
<u>Hydraulics</u>					Total :	90,000.00
<i>Trade : 15 <u>Mechanical Services</u></i>						
	<u>Mechanical Services</u>					
	<u>GHD estimate (dated 07/06/12)</u>					
1	Office Air Conditioning	1.00	item	70,000.00		70,000.00
2	Utility Exhaust	1.00	item	2,000.00		2,000.00
3	Toilet Exhaust	1.00	item	4,000.00		4,000.00
4	Dry Room Air Lock AC	1.00	item	5,000.00		5,000.00
5	Dry Room AC	1.00	item	35,000.00		35,000.00
6	Dry Room Dehum	1.00	item	60,000.00		60,000.00
7	Cool Room AC	1.00	item	50,000.00		50,000.00
8	Cool Rom Airlock Dehum	1.00	item	30,000.00		30,000.00
9	Cool Room Airlock AC	1.00	item	8,000.00		8,000.00
10	Cool Room AC (4degC)	1.00	item	8,000.00		8,000.00
11	Electrical and Controls	1.00	item	40,000.00		40,000.00

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
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Trade : 15 <u>Mechanical Services</u>						<i>(Continued)</i>
12	Overheads	1.00	item	40,000.00		40,000.00
13	BMS	1.00	item	40,000.00		40,000.00
<u>Mechanical Services</u>						Total : 392,000.00

Trade : 16 <u>Electrical, Communications, Security and Fire Detection</u>						
<u>Electrical, Communications, Security and Fire Detection</u>						
<u>GHD estimate (dated 07/06/12)</u>						
1	Power Supply and Distribution	1.00	item	237,000.00		237,000.00
2	Lighting	1.00	item	88,600.00		88,600.00
3	Communications	1.00	item	15,800.00		15,800.00
4	Dry Fire Systems	1.00	item	18,500.00		18,500.00
5	Security	1.00	item	20,000.00		20,000.00
6						100.00
<u>Electrical, Communications, Security and Fire Detection</u>						Total : 380,000.00

Trade : 17 <u>Builders work in connection with services</u>						
<u>Builders work in connection with services</u>						
						Total :

Trade : 18 <u>SUBTOTAL BUILDING COSTS FOR CONCEPT ESTIMATE</u>						
1						
<u>SUBTOTAL BUILDING COSTS FOR CONCEPT ESTIMATE</u>						Total :

Trade : 19 <u>Earthworks</u>						
<u>Earthworks</u>						
1	Allow for clearing site	2,500.00	m2	3.00		7,500.00
2	Allow for cut and filling with excavated material	2,500.00	m2	25.00		62,500.00
3	Allow for erosion control measures	1.00	item	5,000.00		5,000.00
4	Sundries.	1.00	item	5,000.00		5,000.00
<u>Earthworks</u>						Total : 80,000.00

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 20 <u>Retaining walls</u></i>						
<u>Retaining walls</u>						
1	Retaining wall footing	41.00	m	150.00		6,150.00
2	Subsoil drainage	41.00	m	50.00		2,050.00
3	Concrete retaining wall	91.00	m2	395.00		35,945.00
4						855.00
<u>Retaining walls</u>						Total : 45,000.00
<i>Trade : 21 <u>Roadworks</u></i>						
<u>Roadworks</u>						
1	Asphalt road pavement including kerbing	450.00	m2	95.00		42,750.00
2	Linemarking and signage	1.00	item	1,000.00		1,000.00
3	Allowance for culverts and drainage	1.00	item	25,000.00		25,000.00
4						1,250.00
<u>Roadworks</u>						Total : 70,000.00
<i>Trade : 22 <u>Paving, Bridge and Sprinkler Valve Enclosure</u></i>						
<u>Paving, Bridge and Sprinkler Valve Enclosure</u>						
1	Concrete walkway	54.00	m2	110.00		5,940.00
2	Concrete bridge including metal handrails	33.00	m2	1,100.00		36,300.00
3	Paving to generator slab	35.00	m2	130.00		4,550.00
4	Sprinkler valve enclosure including doors	1.00	item	10,000.00		10,000.00
5	Metal screening to perimeter of backup generator	23.00	m	450.00		10,350.00
6						860.00
<u>Paving, Bridge and Sprinkler Valve Enclosure</u>						Total : 68,000.00
<i>Trade : 23 <u>Landscaping</u></i>						
1	Landscaping to Site area excl. Buildings, paths and roads.	1,246.00	m2	35.00		43,610.00
2						1,390.00
<u>Landscaping</u>						Total : 45,000.00

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 24 <u>External Hydraulics</u></i>						
	<u>External Hydraulics</u>					
	<u>Based on estimate provided by GHD (29/05/12)</u>					
1	Applications	3.00	no	1,000.00		3,000.00
2	Fire Hydrant Connection	1.00	no	7,500.00		7,500.00
3	Inground Pipework (Domestic Cold Water)	200.00	m	300.00		60,000.00
4	Inground Pipework (Rising Main)	200.00	m	300.00		60,000.00
5	Stormwater Drainage	90.00	m	200.00		18,000.00
6	Sub Soil	1.00	no	5,000.00		5,000.00
7	Head Wall Discharge	1.00	no	5,000.00		5,000.00
8	Inground Pipework (Hydrant Supply)	200.00	m	450.00		90,000.00
9	Fire Hydrant Booster Assembly	1.00	no	10,000.00		10,000.00
10	Fire Hydrant Valves	3.00	no	2,000.00		6,000.00
11	Fire Hose Reels	1.00	no	5,000.00		5,000.00
12	Fire Drenchers	10.00	no	350.00		3,500.00
13	Sprinkler Alarm Valve	1.00	no	5,000.00		5,000.00
14	Sprinkler Pipe Work	60.00	m	150.00		9,000.00
	<u>External Hydraulics</u>				Total :	287,000.00
<i>Trade : 25 <u>External Communication</u></i>						
	<u>External Communication</u>					
	<u>Estimate as provided by GHD (13/06/2012)</u>					
1	Allowance for cabling to CSIRO	1.00	item	20,000.00		20,000.00
	<u>External Communication</u>				Total :	20,000.00
<i>Trade : 26 <u>SUBTOTAL EXTERNAL WORKS AND SERVICES FOR CONCEPT ESTIMATE</u></i>						
	<u>SUBTOTAL EXTERNAL WORKS AND SERVICES FOR CONCEPT ESTIMATE</u>				Total :	
<i>Trade : 27 <u>Preliminaries and Profit (14%)</u></i>						
1						

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<u>Preliminaries and Profit (14%)</u>						Total :
<i>Trade : 28 <u>SUBTOTAL CONSTRUCTION COSTS FOR CONCEPT ESTIMATE</u></i>						
1						
<u>SUBTOTAL CONSTRUCTION COSTS FOR CONCEPT ESTIMATE</u>						Total :
<i>Trade : 29 <u>Loose Furniture</u></i>						
	<u>Loose Furniture</u>					
	<u>Office - Standard</u>					
1	U Shaped office workstation including meeting point, shelving, pinboard, pedestal and coat storage	3.00	no	2,600.00		7,800.00
2	Bookshelf - 900 wide	6.00	no	650.00		3,900.00
3	4 drawer filing cabinet	6.00	no	350.00		2,100.00
4	Task chair	3.00	no	500.00		1,500.00
5	Visitors chair	6.00	no	350.00		2,100.00
	<u>Office - Unit Manager</u>					
6	U Shaped office workstation including meeting point, shelving, pinboard, pedestal and coat storage	1.00	no	2,800.00		2,800.00
7	Bookshelf - 900 wide	2.00	no	650.00		1,300.00
8	4 drawer filing cabinet	2.00	no	350.00		700.00
9	Task chair	1.00	no	500.00		500.00
10	Visitors chair	4.00	no	350.00		1,400.00
11	Meeting table	1.00	no	500.00		500.00
	<u>Office Plan Office</u>					
12	2400 Wide x 800 deep open plan office workstation including pedestal and shelving	6.00	no	1,400.00		8,400.00
13	Bookshelf - 900 wide	2.00	no	650.00		1,300.00
14	4 drawer filing cabinet	4.00	no	350.00		1,400.00
15	Task chair	6.00	no	500.00		3,000.00
16	Shared coat cupboard	1.00	no	350.00		350.00
	<u>Meeting Room</u>					
17	Meeting room table for 12 people - 4200 x 2100	1.00	no	4,000.00		4,000.00
18	Meeting room chair	12.00	no	450.00		5,400.00
	<u>Tea Point Area</u>					

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012
Client's Name:	

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 29 <u>Loose Furniture</u></i>						<i>(Continued)</i>
19	Cafe table	1.00	no	450.00		450.00
20	Lunchroom chair	4.00	no	150.00		600.00
	<u>Utility</u>					
21	Stationary cupboard 900 wide	1.00	no	600.00		600.00
	<u>Labs</u>					
22	Stool	10.00	no	650.00		6,500.00
23	Flammable cabinet 30 litre - under bench	1.00	no	1,100.00		1,100.00
24	Corrosive cabinet 30 litre - under bench	1.00	no	1,250.00		1,250.00
	<u>Incubator Room</u>					
25	Stool	1.00	no	650.00		650.00
	<u>Dark Room</u>					
26	Stool	1.00	no	650.00		650.00
	<u>Drying Room Lobby</u>					
27	Stool	1.00	no	650.00		650.00
	<u>Preparation laboratory</u>					
28	2400 Wide x 750 deep workstation	2.00	no	900.00		1,800.00
29	Storage cupboard 900 wide	1.00	no	600.00		600.00
30	Full height shelving 900 wide	1.00	no	410.00		410.00
31	Task chair	2.00	no	500.00		1,000.00
	<u>Sundries</u>					
32	Sundry items	1.00	item	5,290.00		5,290.00
<u>Loose Furniture</u>						Total : 70,000.00
<i>Trade : 30 <u>Design and Construction Contingency (10%)</u></i>						
<u>Design and Construction Contingency (10%)</u>						Total :
<i>Trade : 31 <u>Consultant Fees and Statutory Fees (10%)</u></i>						
1						
<u>Consultant Fees and Statutory Fees (10%)</u>						Total :

Trade Breakup

Job Name :	<u>3912 ANBG SEED CON</u>	<u>Job Description</u>
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012	

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 32 <u>TOTAL CONCEPT STAGE COST PLAN AT JUNE 2012 PRICES (EXCLUDING GST)</u></i>						
1						
<u>TOTAL CONCEPT STAGE COST PLAN AT JUNE 2012 PRICES (EXCLUDING GST)</u>						Total :
<i>Trade : 33</i>						
1						
						Total :
<i>Trade : 34 <u>OPTIONS</u></i>						
1						
<u>OPTIONS</u>						Total :
<i>Trade : 35</i>						
1						
						Total :
<i>Trade : 36 <u>Option costs are outturn costs at June 2012 prices including Contingency, Consultant fees (but excluding GST and escalation beyond June 2012)</u></i>						
1						
<u>Option costs are outturn costs at June 2012 prices including Contingency, Consultant fees (but excluding GST and escalation beyond June 2012)</u>						Total :
<i>Trade : 37</i>						
1						
						Total :
<i>Trade : 38 <u>RAINWATER HARVESTING OPTION</u></i>						
	<u>Rainwater Harvesting Option</u>					
	<u>Based on estimate provided by GHD (29/05/12)</u>					
1	Rainwater Harvesting Tank	22.00	m3	3,000.00		66,000.00
2	Filtration and Treatment	1.00	no	7,500.00		7,500.00
3	Non Potable Cold Water Booster Pumps	1.00	no	8,500.00		8,500.00
4	Preliminaries and profit	0.14	item	11,480.00		1,607.20

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 38 <u>RAINWATER HARVESTING OPTION</u></i> <i>(Continued)</i>						
5	Design and Construction Contingency	0.10	item	8,360.72		836.07
6	Consultant Fees and Statutory Fees (10%)	0.10	item	8,444.33		844.43
7						712.30
<u>RAINWATER HARVESTING OPTION</u>						Total : 86,000.00
<i>Trade : 39</i>						
						Total :
<i>Trade : 40 <u>ESTIMATE REPORT</u></i>						
1						
<u>ESTIMATE REPORT</u>						Total :
<i>Trade : 41 <u>The Estimate is based upon the following:-</u></i>						
1						
<u>The Estimate is based upon the following:-</u>						Total :
<i>Trade : 42 - <u>GHD DRAWINGS A102, A103 dated 01.06.12</u></i>						
1						
<u>- GHD DRAWINGS A102, A103 dated 01.06.12</u>						Total :
<i>Trade : 43 - <u>GHD Scoping Brief Revision B dated April 2012</u></i>						
1						
<u>- GHD Scoping Brief Revision B dated April 2012</u>						Total :
<i>Trade : 44 - <u>Hydraulic, mechanical, electrical, communications, security and fire detection services estimates provided by GHD</u></i>						
1						
<u>- Hydraulic, mechanical, electrical, communications, security and fire detection services estimates provided by GHD</u>						Total :
<i>Trade : 45</i>						
1						

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012
Client's Name:	

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 45</i>						
					Total :	
<i>1</i>	<u>AREA SCHEDULE</u>					
<u>AREA SCHEDULE</u>						Total :
<i>Trade : 47 FECA - 581m2</i>						
<i>1</i>						
<u>FECA - 581m2</u>						Total :
<i>Trade : 48 UCA - 65m2</i>						
<i>1</i>						
<u>UCA - 65m2</u>						Total :
<i>Trade : 49 GFA - 646m2</i>						
<i>1</i>						
<u>GFA - 646m2</u>						Total :
<i>Trade : 50</i>						
<i>1</i>						
						Total :
<i>Trade : 51 INCLUSIONS</i>						
<i>1</i>						
<u>INCLUSIONS</u>						Total :
<i>Trade : 52 <u>The Estimate includes the following equipment shown on drawing A102 as indicated in the room data sheets:</u></i>						
<i>1</i>						
<u>The Estimate includes the following equipment shown on drawing A102 as indicated in the room data sheets:</u>						Total :

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 53 - <u>CPD.1 CONSUMABLES STORAGE CUPBOARD</u></i>						
1						
<u>- CPD.1 CONSUMABLES STORAGE CUPBOARD</u>						Total :
<i>Trade : 54 - <u>CPD.2 GLASSWARE STORAGE CUPBOARD</u></i>						
1						
<u>- CPD.2 GLASSWARE STORAGE CUPBOARD</u>						Total :
<i>Trade : 55 - <u>CPD.3 CHEMICALSTORAGE CUPBOARD</u></i>						
1						
<u>- CPD.3 CHEMICALSTORAGE CUPBOARD</u>						Total :
<i>Trade : 56 - <u>CPD.4 STATIONARY STORAGE CUPBOARD</u></i>						
1						
<u>- CPD.4 STATIONARY STORAGE CUPBOARD</u>						Total :
<i>Trade : 57 - <u>CPD.5 COAT CUPBOARD</u></i>						
1						
<u>- CPD.5 COAT CUPBOARD</u>						Total :
<i>Trade : 58 - <u>FC4 FILING CABINET, 4 DRAWER</u></i>						
1						
<u>- FC4 FILING CABINET, 4 DRAWER</u>						Total :
<i>Trade : 59 - <u>SH.1 SHELVING, SINGLE BA</u></i>						
1						
<u>- SH.1 SHELVING, SINGLE BA</u>						Total :
<i>Trade : 60 - <u>SH.3 DRYING SHELVES</u></i>						
1						
<u>- SH.3 DRYING SHELVES</u>						Total :

Trade Breakup

Job Name : <u>3912 ANBG SEED CON</u>	Job Description Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012
Client's Name:	

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 61</i>						
1						
						Total :
<i>Trade : 62 <u>EXCLUSIONS</u></i>						
1						
<u>EXCLUSIONS</u>						Total :
<i>Trade : 63 <u>The Estimate excludes the following:</u></i>						
1						
<u>The Estimate excludes the following:</u>						Total :
<i>Trade : 64 <u>- GST</u></i>						
1						
<u>- GST</u>						Total :
<i>Trade : 65 <u>- Escalation beyond JUNE 2012</u></i>						
1						
<u>- Escalation beyond JUNE 2012</u>						Total :
<i>Trade : 66 <u>- Seed bank expansion zone</u></i>						
1						
<u>- Seed bank expansion zone</u>						Total :
<i>Trade : 67 <u>- Fire Hydrants</u></i>						
1						
<u>- Fire Hydrants</u>						Total :
<i>Trade : 68 <u>- AV Equipment</u></i>						
1						
<u>- AV Equipment</u>						Total :

Trade Breakup

Job Name :	<u>3912 ANBG SEED CON</u>	<u>Job Description</u>
Client's Name:	Australian National Botanic Gardens Seed Bank- Concept Design Cost Plan 3912 - 13 June 2012	

Item No.	Item Description	Quantity	Unit	Rate	Mark Up %	Amount
<i>Trade : 69 - <u>Rainwater harvesting (included as an option)</u></i>						
1						
<u>- Rainwater harvesting (included as an option)</u>						Total :
<i>Trade : 70 - <u>Greywater reuse</u></i>						
1						
<u>- Greywater reuse</u>						Total :
<i>Trade : 71 - <u>Equipment (other than indicated above all as scheduled on drawing A102)</u></i>						
1						
<u>- Equipment (other than indicated above all as scheduled on drawing A102)</u>						Total :

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		Name	Signature	Name	Signature	Date
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