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02/06/04

BIODIVERSITY SCIENCE CENTRE

(INCORPORATING THE WA HERBARIUM)

DRAFT

DESIGN BRIEF

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Herbarium 1-43 - UPDATED 17/6/2005
Kensington 44-79
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DESIGN BRIEF FOR A BIODIVERSITY SCIENCE CENTRE

(INCORPORATING THE WA HERBARIUM)

1. EXECUTIVE SUMMARY

The need for a new facility to house the State collection of plants and fungi has been well established. The construction of a new building to house the research collection of plant specimens offers a unique opportunity to establish a centre of excellence to coordinate biodiversity research in WA, and to fully integrate that research with the delivery of conservation and operational management of the State's biota.

A biodiversity conservation facility of international standard will expand the current services the WA Herbarium provides and synergise these with other Departmental initiatives to further underpin Government and non government conservation effort in accordance with the Department of conservation and Land Management's (CALM) conservation strategies.

CALM proposes to establish a new Herbarium and Flora Conservation Centre as part of the development of a fully integrated WA Biodiversity Science Centre that will enhance five CALM functions:

- Existing Department wide information technology, including corporate databank development and management of an enhanced geographic information system (GIS) capacity:
- The coordination of biological surveys by science staff, regional ecologists, regional flora officers, the Western Australian Threatened Species and Communities Unit (WATSCU) etc;
- The maintenance and expansion of the State plant collection in accordance with the *Conservation and Land Management Act 1984*
- The taxonomic survey of the State's plant diversity; and
- Increasing effective partnerships with community groups.

• plans emphasis on new herbarium
• needs to be revamped to store whole of herbarium
• building to be built as a whole not in phases ie herbarium first

2 CALM'S VISION FOR THE PROJECT

The WA Biodiversity Science Centre (incorporating the WA Herbarium) will undertake world class scientific research to enhance the protection of the Western Australia's outstanding natural terrestrial environment and to guide and facilitate ecologically sustainable development of the State's natural resources for the benefit of current and future generations.

The Centre will bring together people from a broad range of science and technical backgrounds to work effectively in a functional, safe workplace and in an environment that fosters an integrated, holistic approach to biodiversity conservation research. It will provide a focal point and opportunities for national and international partnerships, for attracting and leveraging research grants and for undergraduate and post-graduate training in environmental sciences and natural resource management.

The Centre will greatly facilitate access by policy makers, resource developers, natural resource managers, decision makers, researchers, students and the broader community to scientific and technical information and advice about biodiversity and environmental issues. The Centre will also promote cross-linkage of databases between State and Federal Government agencies, NGOs and universities.

3 PROJECT REQUIREMENTS

3.1 SCOPE AND PARAMETERS

3.2 THE SITE

3.3 PLANNING

HERBARIUM FUNCTIONAL AREAS H 1 - H18

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H.17	Shared Resource: Flora Training Room	63
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	BUILDING TOTAL	$4859m^2$

H.1
RECEPTION, DISPLAY AREA, MANAGEMENT OFFICES

A. Purpose
Entrance area for the Biodiversity Science Centre and the WA Herbarium. Reception staff will be responsible for guiding access to the public access areas, to the Herbarium itself and to the meeting rooms. A display area will be for short-term flora and other science displays.

B. Number of Work Stations
- 2 Receptionists
- 1 Administration Officer
- 2 Herbarium Management staff
- 1 Herbarium Collections Manager

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Design to be compatible with the function as the entrance to the new Herbarium
- Natural lighting (for displays)
- LAN connections for display terminals, projectors, etc
- Fittings for displaying artwork, posters, etc

D. Total Area Required
- 150m^2

E. Essential Proximities
- Entrance to Public Access Reference Herbarium and Herbarium Main Collection
- Meeting Rooms (shared resource)
- Lecture Theatre (shared resource)
- Biodiversity Science Centre foyer (shared resource)

F. Sketch layout (scale 1cm = 1m)
- Depending on design of whole building

G. Notes

H.2
SPECIMEN FREEZING VAULT

A. Purpose
Freezer for specimen fumigation. To cater only for specimens already incorporated and housed in the Specimen Vaults. The new Herbarium will not use Methyl Bromide to fumigate due to toxicity and future bans. To fumigate the collection specimens will be frozen on a rotational basis. Or, if there is an insect outbreak, in a vault, the specimens can be frozen in large numbers and will be wheeled in on specially made trolleys.

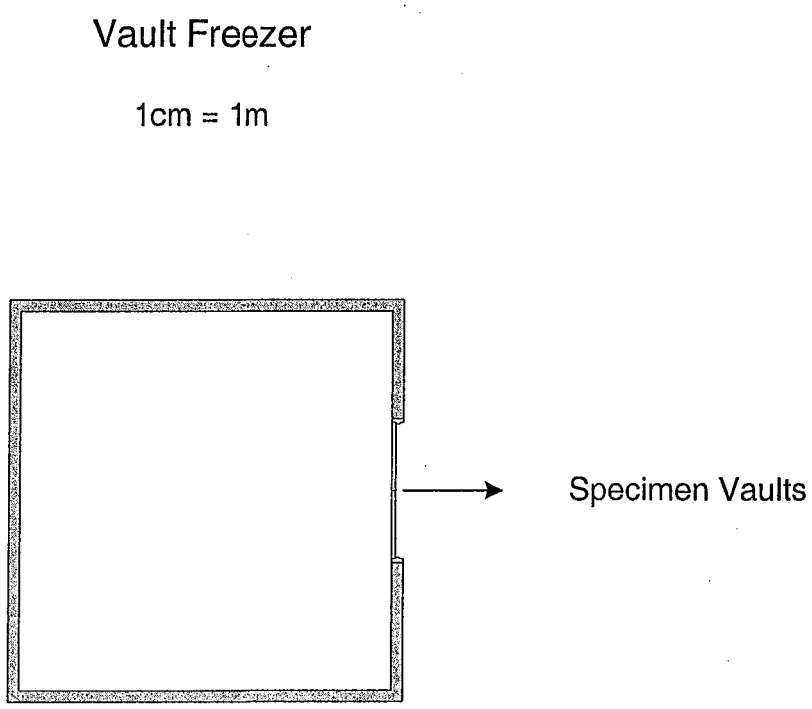
B. Number of Workstations
- None

C. Special Facility Requirements
- Freezer compressor must have access to outside of building
- One large trolley door straight into Vault area

D. Total Area Required
- $25m^2$

E. Essential Proximities
- Collection Vaults

F. Sketch Layout



G. Notes
- Require trolleys to transport and freeze specimens

H 3.1
ACCESSIONS: PREPARATION LABORATORY

A. Purpose
Area where fresh collections are cleaned and prepared prior to drying processes. Different categories of collections have different requirements. Cleaning of the specimens ensures the future archival integrity of the specimens. The following methods are used:

- Vascular plants require sorting and pressing
- Algae require sorting, washing and floating prior to pressing
- Lichens require sorting, cutting down with band or diamond saw, cleaning
- Mosses and Liverworts require sorting, cleaning (with sieves or washing in water) prior to drying
- Fungi require sorting, cutting, photographing, describing prior to drying. Short-term storage in fridge
- Spirit collection, making collections or maintenance of current collection
- Seed store
- DNA capturing
- The dirty room is also required at the time presses are extracted from the dryer and pulled down prior to freezing. The collector does this task. An Herbarium staff member maintains this area

B. Number of workstations
- 3 work benches 3 m x 1 m with end sinks, 1.2 m minimum between benches
- 2 microscopes stored under each bench for identification of fresh material
- Benches on room edge including 2 workstations with LAN connection for FloraBase access and/or personal word document (max), fume hood, double sink, and photographic area

C. Special Facility Requirements
- Fume hood for spirit collection work
- Sink to accommodate disposing of chemicals such as spirit media
- Large double sinks for cleaning and floating algae
- General-purpose sinks for cleaning of moss/liverwort, requires dirt and small rock particles to be disposed of
- Under bench storage area for microscopes/lamps/supplies. Including a few drawers for tags, pens etc
- Box shelving for temporary storage of boxes, 3 m x 450 mm
- Fridge to keep fresh material for short stay
- Pin up board space/White board space
- Photographic area
- Locked cupboard for chemicals
- Hot/cold water
- Reticulated gas
- Heaps of natural light.
- Wide doors.

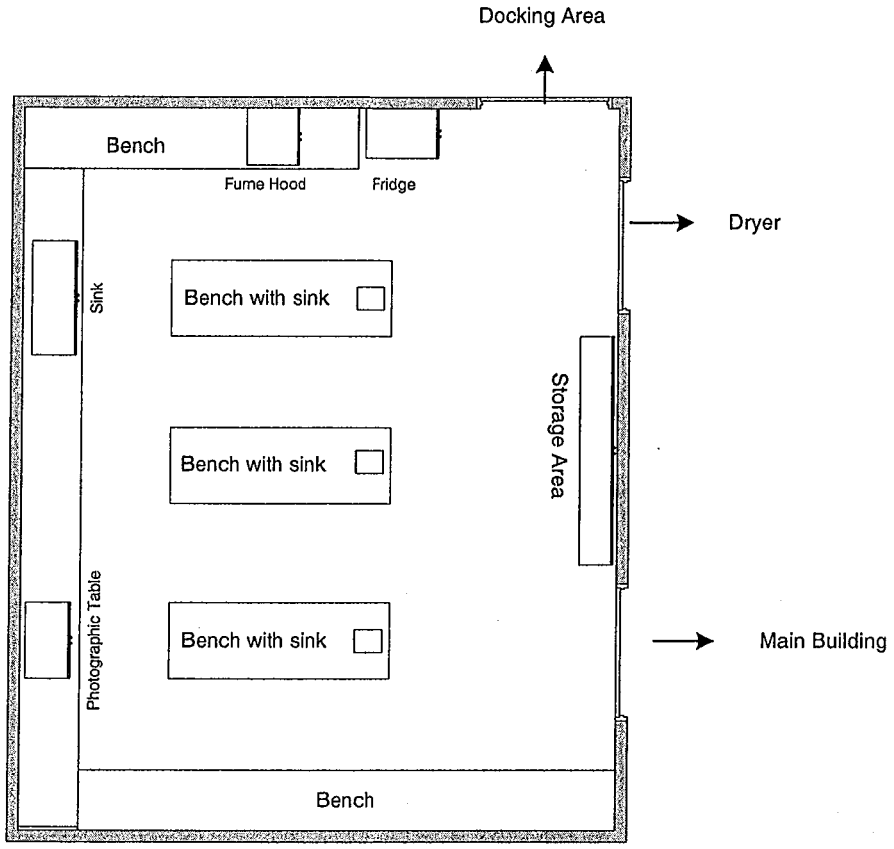
D. Total Area Required.
- 75 m^2.

E. Essential Proximities
- Requires access to outside area with a covered loading dock. With buzzer/phone for deliveries to alert staff to arrivals.
- Require access to inside the building, but not near main vaults or processing areas.
- Needs to be next to dryer/freezer area.

H 3.1 (contd)
F. Sketch Layout

Accession Preparation Area

Scale 1cm = 1m



G. Notes

- The band saw and diamond saw for processing Lichen collections would not be suited to the dirty room. Need a very dirty room annexed to the dirty room, or somewhere on site nearby.
- Threatened seed centre for smoking seeds, soil-sampling activities etc

H 3.2
ACCESSIONS: DRYER ROOM

A. Purpose
Specimens require drying prior to processing into the collection other wise they will be attacked by insects and fungi. Specimens require drying at a certain temperature for a certain length of time to ensure archival preservation. CALM staff are responsible for placing and removing their own collections into the dryer. An Herbarium staff member maintains this area.

B. Number of workstations
- 1 bench-style workstation to sort specimens and write tags prior to drying, and for pulling down specimens after drying, 2 m x 800 mm
- Under bench cupboards for ropes, presses, cardboards, newspapers, some drawers for pens etc
- Bench space for fungi dryers (may require own room to reduce spore contamination), 3 m x 800 mm. Not included in diagram, may require own room

C. Special Facility Requirements
- Dryers, 2 banks of 3
- Good extractor fans to the outside to remove heat and fumes
- Space to store trolleys

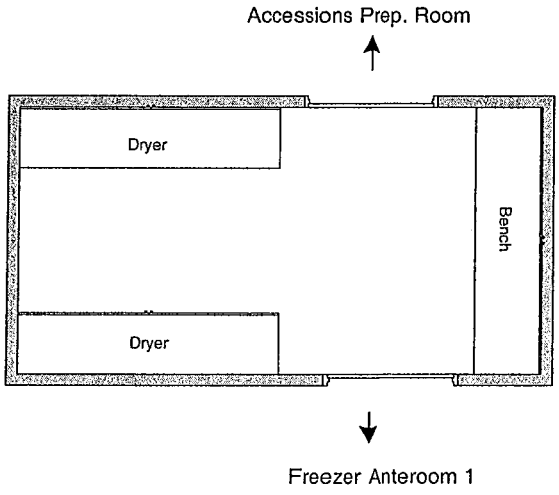
D. Total Area Required
- 25 m^2

E. Essential Proximities
- Next to dirty room and Freezer Anteroom 1

F. Sketch Layout

Dryer Room

Scale 1cm = 1m



G. Notes
- Require access to under cover delivery area so specimens can be delivered to dryer.
- Require access to freezer

H 3.3
ACCESSIONS: FREEZER ROOMS

A. Purpose
All specimens require freezing (fumigation) prior to entry into the building. This kills all insects (including eggs) and ensures insects are not taken into the building, therefore reducing the contamination of the existing collection. Specimens requiring freezing coming from the dryer, specimens requiring specialist quarantine conditions for freezing, inward loans, and annual fumigation of Reference collection.

Ideally the freezer would have an entry and exit point, exiting into the clean part of the building. Therefore going back out through quarantine areas would not contaminate specimens.

An Herbarium staff member carries out this process and maintains this area.

B. Number of workstations
- Anteroom 1 requires large box trolleys, available for collectors to place their dried specimens to be frozen. Bench area required to fill out accession forms 2m x 800mm, with some drawers to place pens etc. 21 m^2
- Anteroom 2 requires space to store unused box trolleys. And an area to sort boxes ready for distribution to staff. 2 m x 800 mm, with some drawers to place pens etc 21 m^2

C. Special Facility Requirements
- Freezers, 2 required. Lockable, walk-in, able to enter one end and exit the other
- Freezer 1: 2 5m^2, no shelving, for weekly freezing run, to hold trolleys
- Freezer 2:10 m^2, AQIS approved quarantine freezer, shelving on one side

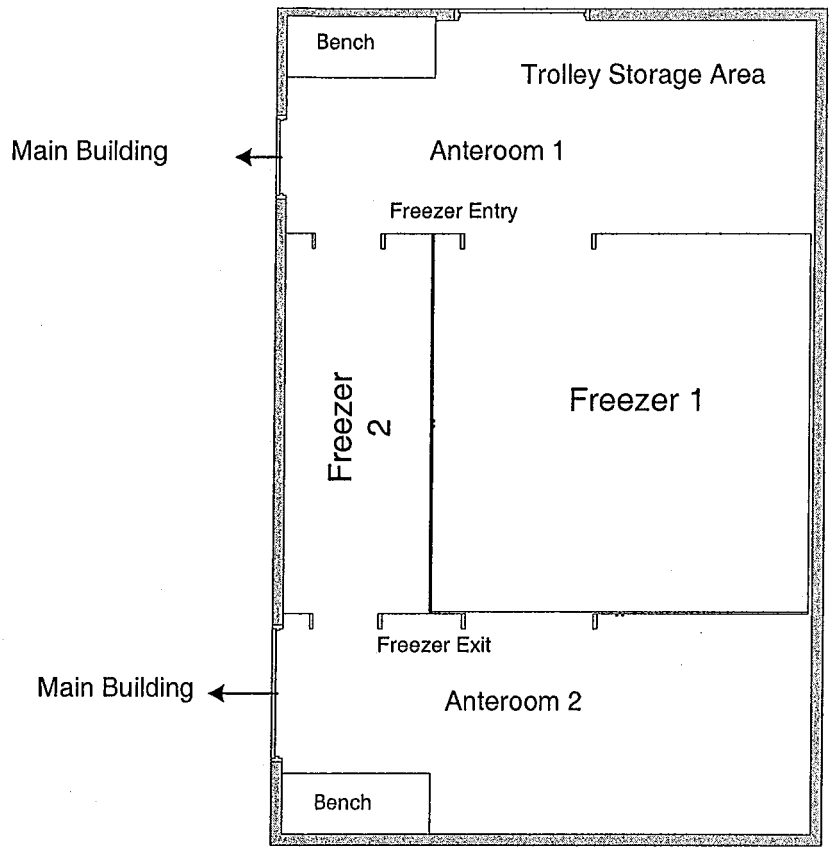
D. Total Area Required
- 77 m^2

E. Essential Proximities
- Dryer room and main herbarium building, secondarily to be close to Herbarium Specimen Storage Area
- Freezers have compressors and these need to be outside the building

H 3.3 (contd)
F. Sketch Layout

Freezer Room

Scale 1cm = 1m



G. Notes

- Loans and exchange are delivered to reception, and ideally these specimens should not be taken through the building to get to a freezer

H 4.1
CURATION: MOUNTING & LABELLING

A. Purpose
An area where specimens (including vascular and cryptogamic) are mounted. Specimen maintenance and labelling functions also occur here. Every specimen in this room is kept in a box.

B. Number of Workstations
- 18 workstations in 3 benches of 6 (for vascular, cryptogamic and labelling functions)
- 2 LAN (Cable or wireless)
- Bench space for guillotining, paperwork, PC's, 4 m x 800 mm
- 18 box shelves for each volunteer to store work they are currently working on day to day
- 40 box shelves for small backlog of work for volunteers to go on with (mounting and labelling)
- Bank of box shelving for repairs
- Box shelves for completed mounting ready to exit the room
- Lockers for volunteer's personal gear
- Large area for white board and pin up boards
- Radio/CD player area
- Stationary cupboard

C. Special Facility Requirements
- Modules to be set in a way that accommodates the social nature of the activity. Require wrap-around desks with shelves and drawer below desk to store supplies to each work station, room to place box of unmounted specimens on one side and finished product on the other, and ample working space in front
- Room for trolleys

D. Total Area Required
- 92 m^2

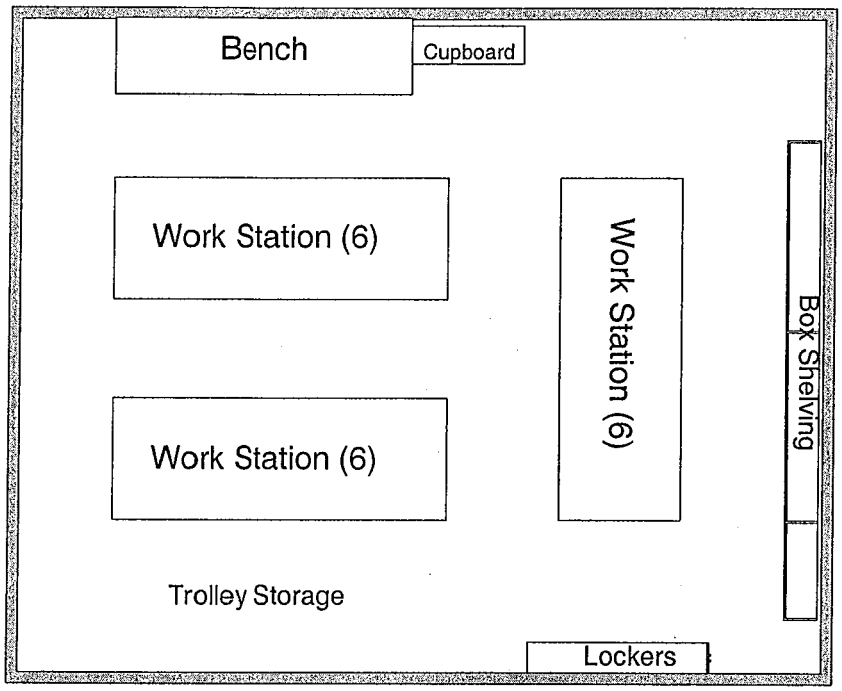
E. Essential Proximities
- Incorporation lab
- Storage area

H 4.1 (contd)

F. Sketch Layout

Specimen Mounting
and Labelling
Laboratory

1cm = 1m



G. Notes

- Require trolleys to transport specimens to incorporation processing room
- Natural light
- Older volunteers working in this area require wider traffic space

H 4.2
CURATION: INCORPORATION

A. Purpose
Specimens require an area for storing and sorting prior to incorporating into the vaults. These specimens are mounted and data based, and must be kept separate from collections not yet mounted, labelled or data based. All specimens on open shelves

B. Number of Workstations
- Incorporation Shelves, standing room only with room for a flat top trolley (160 shelves), wrap around to reduce walking, includes yellow dots, red dots, blue dots
- Sorting Shelves, 4 workstations. (42 shelves/station)
- Shelving area for specialists (48 required)
- Shelving for specimens with duplicates being pulled out prior to incorporation (28 required)
- Bench space for sorting, specialists red dotting, LAN workstation 4m x 1 m

C. Special Facility Requirements
- Trolleys to take specimens to vaults, flat top to use as table space
- Locker with cardigans

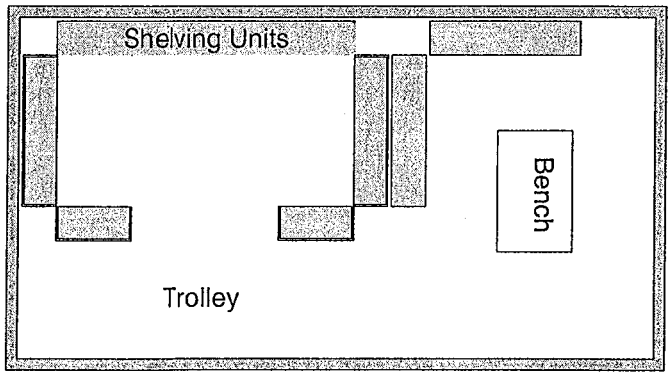
D. Total Area Required
- 40 m^2

E. Essential Proximities
- Database area, where many of the specimens come from
- Secondary proximity, the vaults

F. Sketch Layout

Incorporation Laboratory

1cm = 1m



G. Notes
- Special trolleys required for transporting specimens – to be designed

H 4.3
CURATION: CURATORIAL ASSISTANTS

A. Purpose
This is a specimen working area for specimens already data based. This area caters for short-term or short-stay/irregular curation tasks performed by volunteers and staff. Two rooms are required to accommodate 6 assistants plus volunteer helpers.

B. Number of Workstations
- 6 work stations, 1.5 m x 800 mm each
- 2 bench sorting areas, 3 m x1 m each
- 6 LAN (cable and wireless)

C. Special Facility Requirements
- Box shelving
- Specimen shelving
- Supplies shelving
- Book shelving
- Lockers for staff personal gear

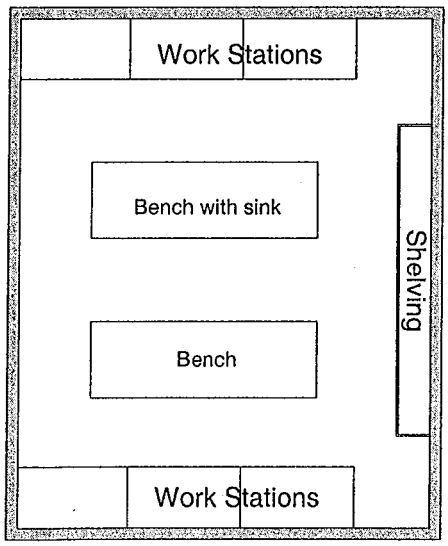
D. Total Area Required
- 72 m^2

E. Essential Proximities
- Near specimen processing areas
- But not too removed from Curators Offices

F. Sketch Layout

Curation Assistant's Laboratory

Scale 1cm = 1m



G. Notes:
- Trolleys required for transporting specimens around with - to be designed
- Two rooms required with natural light

H 4.4

CURATION: SHORT-TERM SPECIMEN STORAGE VAULT

A. Purpose

Area required where short-term backlog specimens can be stored in climate/pest-controlled area. This would ensure the specimens are kept in good condition at all stages of processing. Also a security issue, if specimens are managed in one area rather than distributed around the building, can keep tabs on them. Reduces clutter in the building and thus reducing occurrences of pest outbreaks in the building. It would also reduce the risk of contamination of main vaults when specimens enter to be incorporated.

This area would need to be large, as it would need to accommodate:

- Unprocessed specimens awaiting further information (eg AVH backlog, Ecological Survey)
- Backlogs in mounting, labelling, data basing, incorporating, duplicates, specialists, curation specimens action pending, loans botanists are not currently working on
  ID backlog

B. Number of Workstations

- Bench 2 m x 800 mm
- 1 workstation with LAN connection for tracking bar coded boxes

C. Special Facility Requirements

- Climate controlled same as main vaults, i.e. humidity < 40 %, temp. 16C, no neon lights etc
- Adjustable height box shelving (ca 1000) 1 m between shelving

D. Total Area Required

- 160m^2

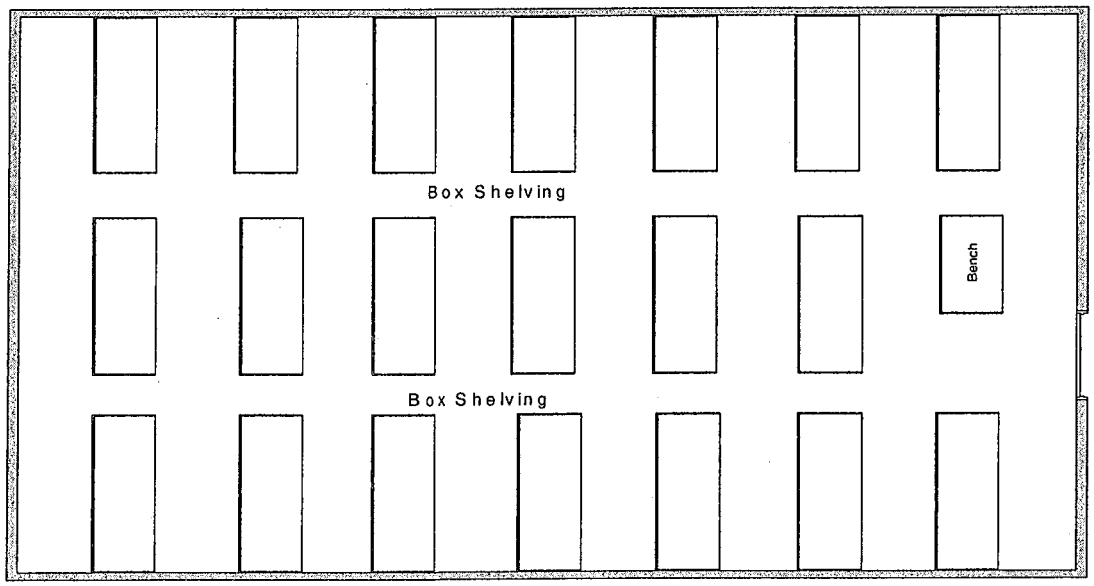
E. Essential Proximities

- Specimen processing area

F. Sketch Layout

Herbarium Specimen
Storage Area

Scale 1cm = 1m



G: Notes

- Trolleys required for transporting specimens - special trolley to be designed

H 4.5
CURATION: CURATION LABORATORY

A. Purpose
Shared facility where curators work on specimens from the vaults. Two or more rooms are required to accommodate 6 curators. These are ideally placed on each floor as "atria" separating the collection vaults from other areas of the building.

B. Number of Workstations
- 3 workstations 800 mm x 2 m LAN (cable or wireless) required per room
- 3 bench per room, 3 m x 1 m each

C. Special Facility Requirements
- Box shelving
- Specimen shelving
- Book shelves
- Supply storage
- Bench with sink
- 3 Microscopes in under bench storage
- Room for visitors
- Trolley storage area

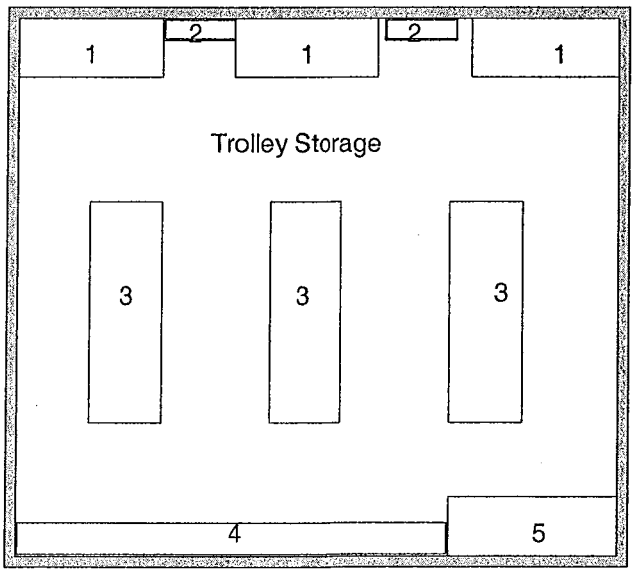
D. Total Area Required
- 60 m^2

E. Essential Proximities
- Curation Offices
- Vaults
- Secondarily the specimen processing area

F. Sketch Layout (these areas could be atria into the specimen vaults)

Curation Laboratory

Scale 1 cm = 1m



1 Work Station
2 Bookshelf
3 Bench
4 Shelving
5 Bench with sink

G. Notes
- Trolleys required for transporting specimens around with; - to be designed
- Natural light

H 4.6
CURATION: CURATORIAL STAFF WORKSTATIONS

A. Purpose
Business space for existing and proposed curators (6)

B. Number of Workstations
- 1 workstation with LAN connection, 3 m x 800 mm
- 1 bench, 2 m x 1 m

C. Special Facility Requirements
- Filing cabinet
- Bookshelf
- Specimen shelves
- Locker
- Floor space for 1-2 visitors
- Printer
- Scanner

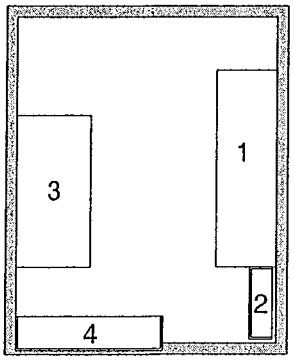
D. Total Area Required
- 90 m^2 (6 offices, ea 15 m^2)

E. Essential Proximities
- Collection Vaults
- Curation Lab

F. Sketch Layout

Curation Office

Scale 1cm = 1m



1 Workstation
2 Bookshelf
3 Bench
4 Shelving

G. Notes
- The plan is the same for 6 separate offices
- Trolleys required for transporting specimens around with - to be designed
- Natural light

H 4.7

CURATION: SPECIALIST CURATION VOLUNTEER WORKSTATIONS

A. Purpose

This area would accommodate curation volunteers/contract staff working on long-term continuous projects.

B. Number of Workstations

- 6 offices
- Each with 1 workstation, 1.5 m x 800 mm
- Each with 1 bench, 3.4 m x 1 m each
- Each with LAN and phone connections

C. Special Facility Requirements

- Filing cabinets
- Bookshelves
- Specimen shelves
- Lockers
- Floor space for visitors
- Scanners
- Printers
- Natural light

D. Total Area Required

- 120 m^2 (8 offices, ea 15 m^2)

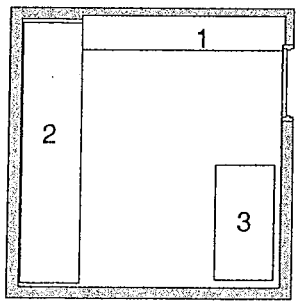
E. Essential Proximities

- Collection Vaults

F. Sketch Layout

Specialist Volunteer Offices

Scale 1 cm = 1m



1 Shelving
2 Bench
3 PC Workstation

G. Notes

- This could be one large room partitioned into 8 offices or open plan, which would allow floor plan flexibility in the future
- Trolleys required for transporting specimens around with - to be designed

H.5
SPECIMEN LOANS

A. Purpose
The main activity in this area is the processing of incoming and outgoing loans and exchange material. Separate area is required to ensure valuable loans are not mixed up with other specimens, and that the specimens are kept in a secure place until distributed.

B. Number of Workstations
- 1 PC workstation, 2 m x 800 mm
- 2 bench style workstations, with under bench storage of supplies 2 m x 800 mm each
- Adjustable box shelves (72)
- Bookshelves
- Open specimen shelves (for small loans)
- LAN (cable or wireless)
- Printer

C. Special Facility Requirements
- Strapping machine
- Paper roll on stand

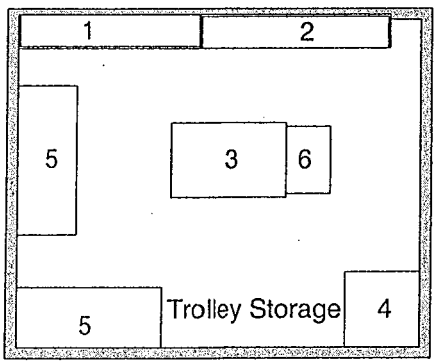
D. Total Area Required
- 25 m^2

E. Essential Proximities
- Vaults

F. Sketch Layout

Loans Laboratory

Scale 1cm = 1m



1,2 Box Shelving
3 Bench
4 Paper Roll
5 Workstation
6 Strapping Machine

G. Notes
- Trolleys required for transporting specimens around with - to be designed
- Wide doors

H.6
SPECIMEN IDENTIFICATION

A. Purpose

Identification area for staff performing critical identification of incoming specimens, specimens of rare and endangered species, and research curation. Currently, two Technical Officers undertake such work, which requires accommodation adjacent to the main collections, and separate from the public or visitors identification areas (Functional Areas 4.1). This is an expected growth area.

B. Number of Work Stations

- 4, for examination of specimens involving comparison and reference to the main collection, each ca 3 m long, with temporary storage shelves, bookcase & filing cabinet; LAN, telephone & pager connections; computer; microscope

C. Special Facility Requirements

- Normal climate control
- Fire control dry pipes or gas
- Natural lighting from windows; supplementary lights not neon (fire hazard)
- Insect-proof
- Passageways wide enough for specimen trolleys
- Sink

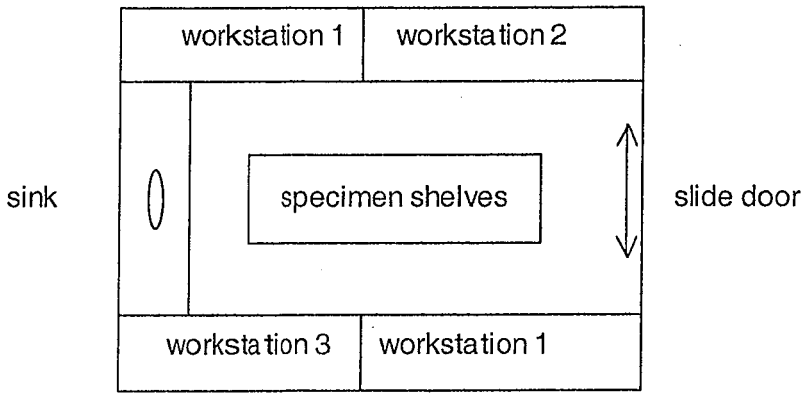
D. Total Area Required

- $25m^2$

E. Essential Proximities

- Collection vaults Library
- Freezer Room, for routine freezing after removal from vault
- Workstations: Scientists, Research Assistants, Visiting Scientists & Students

F. Layout (scale 1 cm = 1 m; shape & size estimate for illustrative purposes only)



G. Notes

- Total area 12 x 5 m
- Shelves with bench top at standing height (for sorting)
- Passage ways ≥ 1.25 m wide

H.7
CURATORIAL SUPPLIES

A. Purpose

- Store all curatorial supplies for up to a year ahead

B. Number of Workstations

- Bench style workstation, 2 m x 800 mm

C. Special Facility Requirements

- Adjustable Box shelving
- LAN (cable or wireless) for stocktaking

D. Total Area Required

- 25 m^2

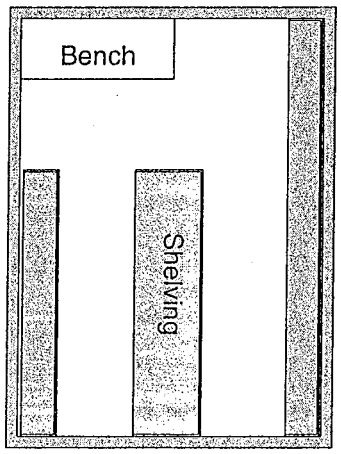
E. Essential Proximities

- Undercover delivery docking area (shared resource)

F. Sketch Layout

Curation Supplies Area

Scale 1 cm = 1m



G. Notes

- Natural light not required

H.8
DATABASE CENTRE

A. Purpose
Validation and data basing of herbarium specimens, and maintenance of Western Australian Census of Plant Names.

B. Number of Workstations
- 13 Computer workstations and 1 office work station

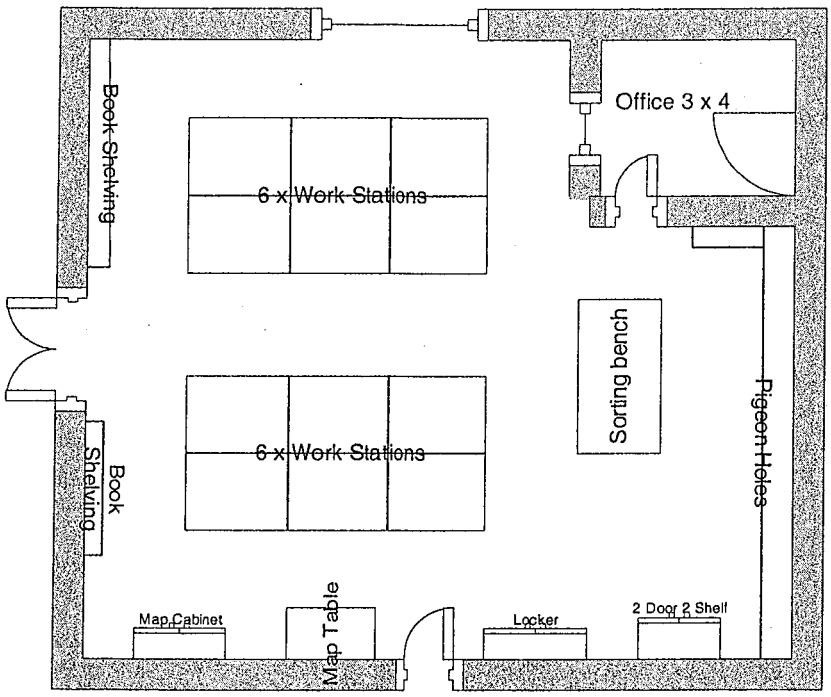
C. Special Facility Requirements
- 13 ergonomic L-shaped workstations (including chairs) with lockable under desk cupboard and filing cabinet in a community activity arrangement
- 13 computers and 1 Printer
- Footstools
- Document holder i.e. typing slope
- Map table and laboratory bench height
- Map cabinet
- Bench at laboratory bench height for sorting specimens
- Bookshelves for Census, FloraBase Waherb, Max files and Reference books
- Specimen shelving (450 pigeon holes)
- Storage cabinet for data basing supplies
- Whiteboard x 1 (No.1 Type 2)
- Pin board x 1 (No.1 Type 2)
- 2 door/2 shelf cupboard at bench height
- Telephones x 3
- Lighting and natural lighting
- Air conditioned and ceiling fans
- Staff Lockers

D. Total Area required
- 168 m^2

E. Essential Proximities
- Herbarium specimen storage area
- Specimen Vaults
- Incorporation area
- Curators' offices
- Secondary – Library

H 8 (contd)
F. Layout

Data Base Center
168 Sq Meters
Scale 1cm = 1m



G. Notes

- The Database centre would only hold specimens that were currently being data based, waiting for editing, validation etc
- The backlog of specimens waiting data basing would need to be housed in the specimen storage area that is climate/pest controlled
- Sufficient floor space between workstations is required to allow access for trolleys

H.9
IMAGE LABORATORY

A. Purpose
A team of dedicated volunteers continue to scan photographic and other images of all WA plant species for inclusion in the WA Herbarium's online plant identification and information retrieval system, FloraBase. They are supervised by the Senior Technical Officer who undertakes support for all Herbarium information systems. Progress on this project is expected to continue steadily of the coming years. A facility for scanning and photographing herbarium specimens should also be located in this area.

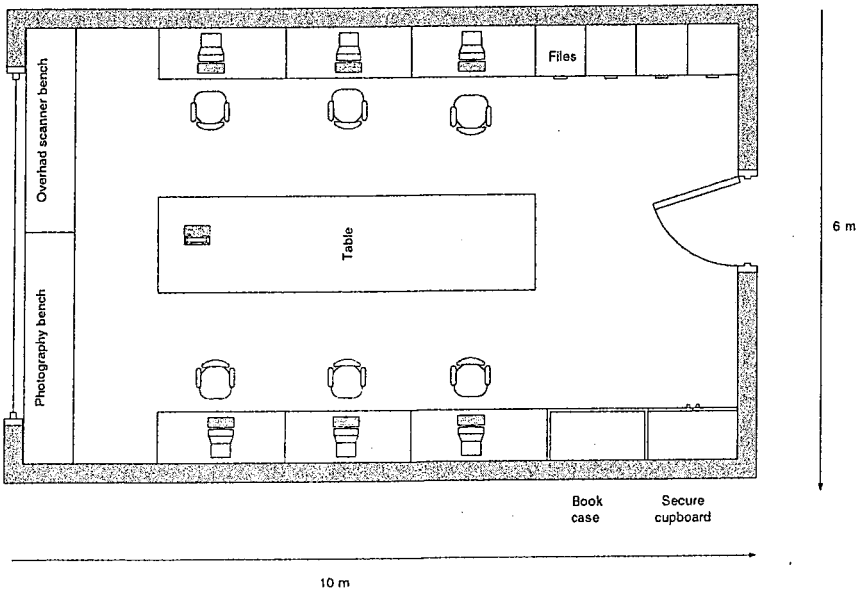
B. Number of Work Stations
- 6, for scanning, processing & data basing of slides, prints, drawings; each 2 m long with temporary storage shelves for books, discs and other materials; LAN & telephone connections; PC

C. Special Facility Requirements
- Normal climate control
- Fire control dry pipes or gas
- Secure fireproof cupboard with racks for archival CDs; shelving for slides, prints, drawings
- Daylight lighting; supplementary lighting not neon (fire hazard)
- Fixed shelving above work stations
- Central bench for slide sorting
- Bench for flatbed scanners (3)
- Bench for slide scanners (3)
- Bench for overhead scanner for herbarium specimen scanning
- Bench for photography of herbarium specimens, eg types
- Filing cabinets (4)

D. Total Area Required
- 60 m^2

E. Essential Proximities
- Senior Technical Officer (Herbarium Information Systems Manager)

F. Layout (1 cm = 1 m)



G. Notes

H 10.1
INFORMATION SYSTEMS: SERVER ROOM

A. Purpose
The server room will house the communications rack and all servers associated with Herbarium information systems. This will be a high noise, high security area and will therefore not be used for regular office or working space.

The current servers are a combination of rack-mounted and stand-alone servers. In the longer term some of these could be relocated with ISS facilities. However, we have extra requirements for maintaining and controlling these servers which necessitates them remaining on site.

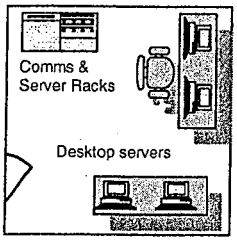
B. Number of Workstations
- 1 x low end PC workstation for communicating with rack servers

C. Special Requirements
- Location of switches for LAN connectivity throughout Herbarium complex
- Entry point for fibre communications with main Kensington communications room
- Network access x 8 (not including incoming fibre, UTP)

D. Total Area
- 9 m^2

E. Essential Proximities
- Database operators
- Senior Technical Officer (Ben Richardson)

F. Layout (1 cm = 1 m)



G. Notes

H 10.2
INFORMATION SYSTEMS: MAP ROOM

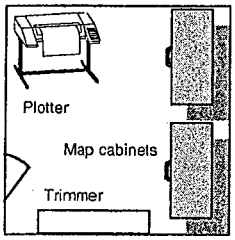
A. Purpose
The Herbarium keeps a number of topographical maps, housed within standard map cabinets. Additionally, it owns a large format plotter, which is regularly used to generate maps and large format posters. A large trimmer is located with the plotter. The map room would house the map cabinets, plus have adequate room for the plotter and trimmer.

B. Number of Workstations
- None

C. Special Requirements
- Network access x 1

D. Total Area
- 9 m^2

E. Essential Proximities
- GIS / Consultants Lab

F. Layout (1 cm = 1 m)


G. Notes

H 10.3
INFORMATION SYSTEMS: GIS/CONSULTANTS/STUDENTS LAB

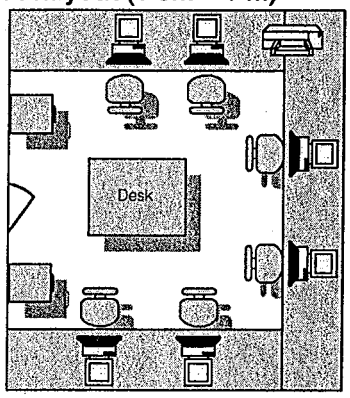
A. Purpose
The Herbarium regularly has a number of university students using on-site facilities. Additionally, consultants undertake software development, or work that requires access to a computer, onsite. The Herbarium has a requirement for undertaking GIS analysis, examination of maps, etc. This room will provide a quiet operating area for students, consultants as well as provide adequate table space for examining maps, etc.

B. Number of Workstations
- 6

C. Special Requirements
- Network access x 8

D. Total Area
- 22 m^2

E. Essential Proximities
- Map room

F. Layout (1 cm = 1 m)


G. Notes
- The functions of a training room for software such as FloraBase, and a plant identification lab (both of which are separate uses and involve a number of PCs) are documented elsewhere

H 10.4

INFORMATION SYSTEMS: SENIOR TECHNICAL OFFICER

A. Purpose

The Senior Technical Officer undertakes support for all Herbarium information systems, particularly FloraBase. His requirements are for a standard office with the addition of capability for bench testing on multiple computers / differing operating systems, and whiteboard for system development.

B. Number of Workstations

- 4

C. Special Requirements

- Whiteboard (LAN-connected)

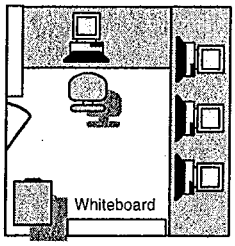
D. Total Area

- 15 m^2

E. Essential Proximities

- Server room

F. Layout (1 cm = 1 m)



H 10.5

INFORMATION SYSTEMS: SENIOR DATABASE/GIS ANALYST

A. Purpose

The Herbarium has a number of corporate database systems that require specialist, in-house knowledge to develop and maintain. Additionally, the Herbarium creates a number of spatial products as part of ongoing research and to service Departmental requests. This room provides office space for a senior analyst. The analyst requires space for a number of high-end workstations used in testing and systems development as well as shelving for a technical library. It is envisaged that members of the new Science Applications program would use this facility.

B. Number of Workstations

- 4

C. Special Requirements

- Shelving for technical library

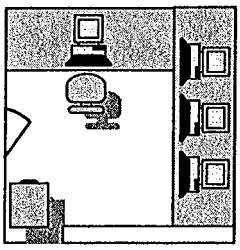
D. Total Area

- $15m^2$

E. Essential Proximities

- None

F. Layout (1 cm = 1 m)



H 10.6
INFORMATION SYSTEMS: DATABASE ANALYST

A. Purpose
The Herbarium has a number of specialised systems involving database development. This room provides office space for a database analyst/developer to assist in maintaining the Herbarium's corporate database applications. It is envisaged that members of the new Science Applications program would use this facility.

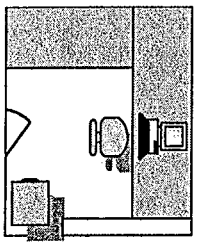
B. No. Of Workstations
- 1

C. Special Requirements
- None

D. Total Area
- 15m^2

E. Essential Proximities
- None

F. Layout (1 cm = 1 m)



H.11
REFERENCE HERBARIUM

A. Purpose
The Reference Herbarium is a public-access facility consisting of a reference set of plant specimens which people use to check identifications of their own specimens. Users include consultants, departmental people, students, community individuals and groups such as the Wildflower Society. It is also used by Herbarium staff and volunteers. It is one of the main public faces of the Herbarium, and is heavily used.

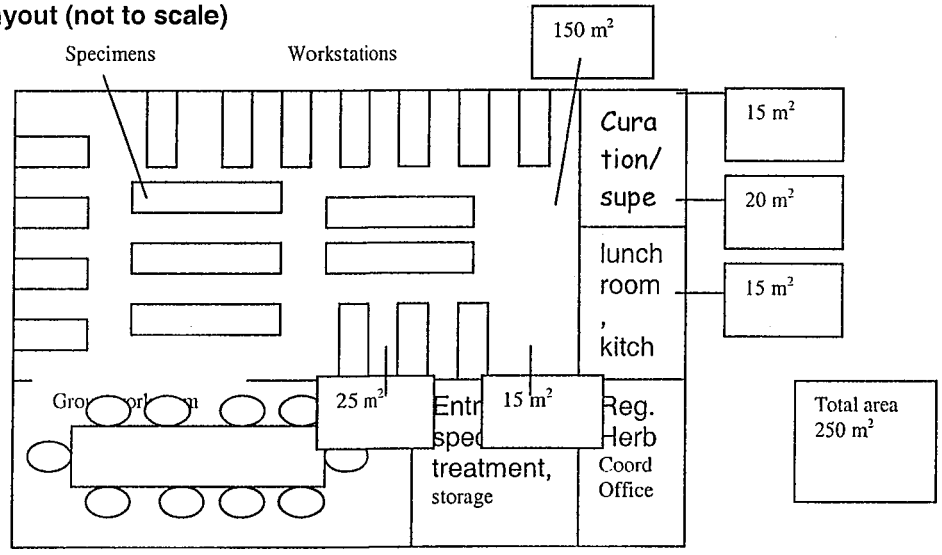
B. Number of Work Stations
- 20 (double the present number)

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc.)
- Shelving for reference specimens
- Shelving for users' specimens during a visit
- Desk/bench space for users
- Shelving for the reference library
- Facilities for pest removal, e.g. self-help freezer
- Computers for FloraBase use
- Microscope for each workstation
- Adjacent office space for staff
- Separate discussion/work/training area for groups to work together separately from general users
- Secure storage for lodgement of users' specimens and equipment between visits
- Kitchen/lunch room/sitting area (Could double for use in functions) (not the staff facility)
- Toilets: convenient access in same security zone, adequate for all users of reference herbarium, regional herbarium project and training facilities
- Acoustic treatment to control noise levels
- Good lighting including for specimen shelves
- Sink, to aid dissecting specimens

D. Total Area required
- 250 m^2

E. Essential Proximities
- Location: in the public access area, near the building entrance so that it is easily found and not within the restricted access area
- Entry past reception, to control access if necessary and for sign-in
- Related functional areas: -
    - Regional Herbarium Network, coordinator and volunteer identification work area
    - Training (flora) - use of reference specimens and books, microscopes, computers
    - Reception

F. Layout (not to scale)



H.12
WEED INFORMATION NETWORK LABORATORY

A. Purpose
The WIN laboratory will house volunteers carrying out the following operations.
- Consulting FloraBase and selected literature (Shelving B and Bench A)
- Selecting from a set of specimens removed from the main collection (at Bench C)
- Examining and measuring specimens and completing DELTA scoresheets (Bench C)
- Coding scores on to DELTA database (Bench A)
- Checking and editing printout (Bench A)

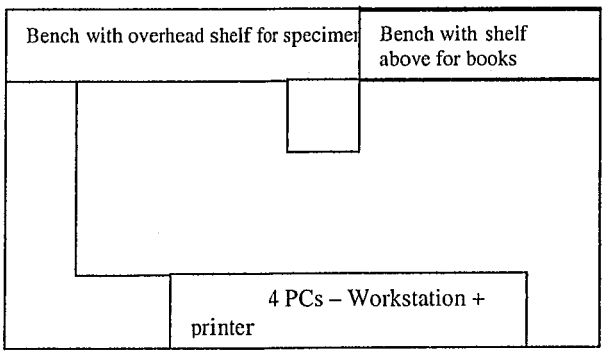
B. Number of Workstations
- Four PC workstations for access to FloraBase and data entry to DELTA system, as well as consulting floras on bench. Bench space per workstation = 1.5 m. Drawers under workstation bench for personal belongings and stationary
- Four specimen examination workstations (90 cm deep x 2.5 m wide and 90 cm tall), for laying out 10 specimens per workstation. Tall adjustable stools for use at this workbench

C. Special Facilities
- Newspaper-size shelving for temporary specimen storage, above benches. 45 cm deep x 1.5 m width total
- Small shelves under the above - as in South Wing Undercroft
- Bookshelves for library books (3 m) and lever arch file storage (3 m)
- General lighting at office standard, but stronger lighting above specimen examination workstations
- Printer linked to PC's
- Pin board and whiteboard for general notices and work progress notices

D. Total Area Required
- 36 m^2

E. Essential Proximities
- Main collection
- Information Systems
- Assigned taxonomist

F. Sketch Layout (1 cm = 1 m)
- Area required = 8 x 4.5 m
- Width of bench tops for specimen examination = 900 mm
- Overhead shelves for specimens = 450 mm depth



G. Notes
- Similar DELTA projects to cover the whole WA flora (not just weeds) could ensure very long term use of this facility
- Future projects may need microscopes. Power points for these will be needed above benches

H.13

SPECIMEN CLEARING HOUSE: WORKROOM

A. Purpose

The Clearing House will provide a mechanism to capture valuable material and records collected during surveys by private and government consultants and CALM staff. After specimens are identified in the Reference Herbarium they can be stored safely (with insect protection) in the Clearing House awaiting selection of specimens that will add value to the collection and those that can be discarded. Specimens will be sorted using experienced officers and volunteers with ready access to WAHERB records through FloraBase.

B. Number of Work Stations

- 6 specimen sorting workstations
- 3 PC workstations for access to FloraBase

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Newspaper size shelving, area for 3 PC's for FloraBase checks

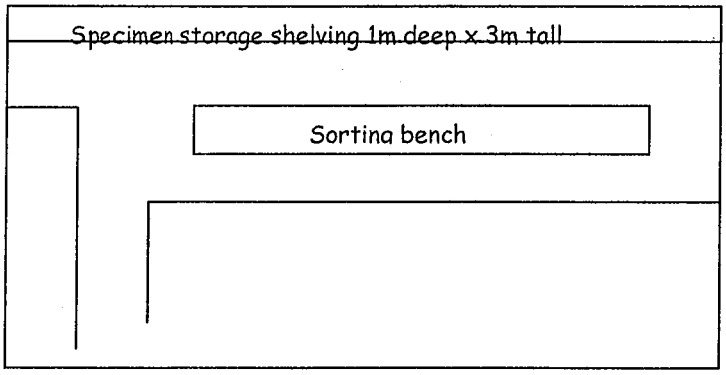
D. Total Area Required

- 50 m^2

E. Essential Proximities

- Needs to be in a public access area adjacent to the Reference Herbarium
- Loading Dock (shared resource)

F. Sketch layout (scale 1 cm = 1 m)



G. Notes

- Funding for Clearing House operations is to be sought from consultants, agencies seeking consultancies, EPA, Wildflower Society and other community groups

H 14.1
COLLECTION VAULT: ALGAL COLLECTION

A. Purpose
Work has intensified on the algal flora, now the subject of several major projects. Current holdings (including those to be transferred to us by Murdoch University, UWA and the CSIRO) currently occupy 1,210 pigeonholes if we are to implement best practice in this regard. Furthermore, current algal holdings are expected to triple in size by 2030 to require 3,630 pigeonholes for 90,750 specimens.

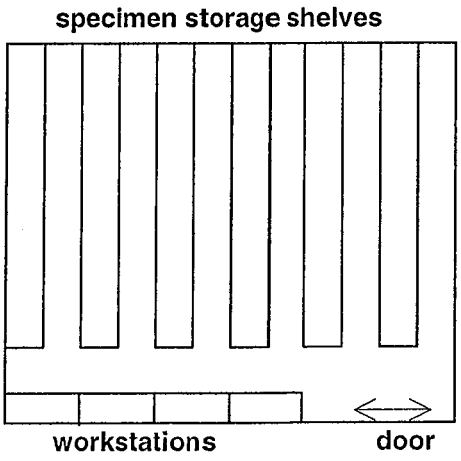
B. Number of Work Stations
- 4, for short-term examination of specimens, each ca 2 m long, with temporary storage shelves; LAN, telephone & pager connections; computer; microscope

C. Special Facility Requirements
- Climate control at all times: humidity $\leq$ 40%, temperature $\leq$ 16° C
- Fire control dry pipes or gas
- Secure entry: automated, sliding doors, opened by card/transponder
- Lighting not neon (fire hazard), minimal UV, i.e. no windows, timed, sensor-operated above collection shelving
- Insect-proof
- Fixed shelving, 3,630 pigeon-holes, some adjustable for larger boxes shelves
- Full (human) height shelves alternating with low shelves with bench top
- Passageways wide enough for specimen trolleys

D. Total Area Required
- 120 m^2

E. Essential Proximities
- Algal Laboratory
- DNA Extract Facility
- Workstations: Curators, Scientists, Research Assistants, Visiting Scientists & Students
- Identification Area

F. Layout (scale 1 cm = 2 m; shape & size estimate for illustrative purposes only)



G. Notes
- Total area 12 m x 10 m
- Passage between shelves $\geq$ 1 m wide
- Main passage $\geq$ 1.5 m wide

H 14.2
COLLECTION VAULT: BRYOPHYTE COLLECTION

A. Purpose
With gathering focus on the cryptogams it is expected that attention will soon turn to the Bryophytes. Current holdings occupy 64 pigeonholes. However, this collection is seriously overcrowded. In order to implement best practice in this regard 85 pigeonholes are required. Furthermore, current bryophyte holdings are expected to triple in size by 2030 to require 255 pigeonholes for 22,500 specimens.

B. Number of Work Stations
- 2, for short-term examination of specimens, each ca 2 m long, with temporary storage shelves; LAN, telephone & pager connections; computer; microscope

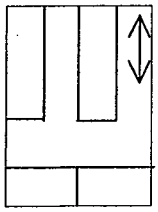
C. Special Facility Requirements
- Climate control at all times: humidity $\leq$ 40%, temperature $\leq$ 16° C
- Fire control dry pipes or gas
- Secure entry: automated, sliding doors, opened by card/transponder
- Lighting not neon (fire hazard), minimal UV, i.e. no windows, timed, sensor-operated above collection shelving
- Insect-proof
- Fixed shelving, 255 pigeonhole.
- Full (human) height shelves alternating with low shelves with bench top
- Passageways wide enough for specimen trolleys

D. Total Area Required
- 20 m^2

E. Essential Proximities
- DNA Extract Facility
- Workstations: Curators, Scientists, and Research Assistants, Visiting Scientists & Students
- Identification Area

F. Layout (scale 1 cm = 2 m; shape & size estimate for illustrative purposes only)

specimen shelves



workstations

G. Notes
- Total area 4 m x 5 m
- Passage between shelves 1 m wide
- Main passage 1.25 m wide
- Sliding door

H 14.3

COLLECTION VAULT: FUNGI, MYXOMYCETE & LICHEN COLLECTION

A. Purpose

Work has intensified on the fungal, slime-mould and lichen flora, the subjects of several major projects. Current holdings (including those soon to be transferred to us by CSIRO) occupy 1,125 pigeonholes. However, these are very inadequately housed and it is estimated that 1,335 pigeonholes would are needed to implement best practice in this regard. Furthermore, current fungal and lichen holdings are expected to triple in size by 2030 to require 4,005 pigeonholes for 87,000 specimens.

B. Number of Work Stations

- 4, for short-term examination of specimens, each ca 2 m long, with temporary storage shelves; LAN, telephone & pager connections; computer; microscope

C. Special Facility Requirements

- Climate control at all times: humidity $\leq$ 40%, temperature $\leq$ 16° C
- Fire control dry pipes or gas
- Secure entry: automated, sliding doors, opened by card/transponder
- Lighting not neon (fire hazard), minimal UV, i.e. no windows, timed, sensor-operated above collection shelving
- Insect-proof
- Fixed shelving, 4,005 pigeon-holes, some adjustable for larger boxes shelves
- Full (human) height shelves alternating with low shelves with bench top
- Passageways wide enough for specimen trolleys

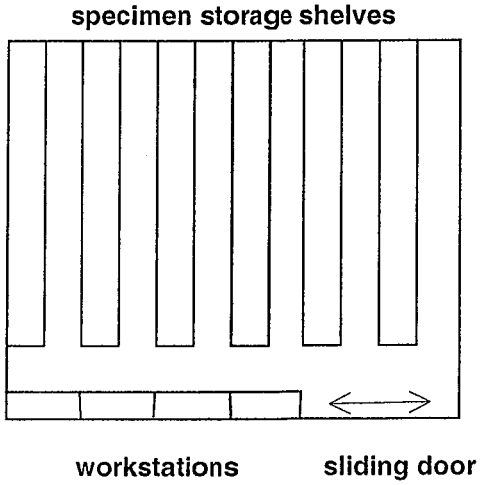
D. Total Area Required

- 120 m^2

E. Essential Proximities

- Refrigerator for routine freezing after removal from vault
- Clean drier to deal with rehydration after removal from vault
- Mycological Laboratory
- DNA Extract Facility
- Workstations: Curators, Scientists, Research Assistants, Visiting Scientists & Students
- Identification Area

F. Layout (scale 1 cm = 2 m; shape & size estimate for illustrative purposes only)



G. Notes

- Total area 12 m x 10 m
- Passage between shelves $\geq$ 1 m wide
- Main passage $\geq$ 1.5 m wide

H 14.4

COLLECTION VAULT: VASCULAR PLANT COLLECTION

A. Purpose

Growth in specimens lodged in our Fern, Gymnosperm and Angiosperm collections over the past century has been exponential. It is expected to continue unabated until it peaks at around 1,500,000 specimens. Current holdings occupy 21,330 pigeonholes. However, these are very inadequately housed and it is estimated that 31,580 pigeonholes would are needed to implement best practice in this regard. Furthermore, current holdings in this area are estimated to triple in size by 2030 to require 90,000 pigeonholes for 1,666,000 specimens.

B. Number of Work Stations

- 15, for short-term examination of specimens, each ca 2 m long, with temporary storage shelves; LAN, telephone & pager connections; computer; microscope

C. Special Facility Requirements

- Climate control at all times: humidity $\leq$ 40%, temperature $\leq$ 16° C
- Fire control dry pipes or gas
- Secure entry: automated, sliding doors, opened by card/transponder
- Lighting not neon (fire hazard), minimal UV, i.e. no windows, timed, sensor-operated above collection shelving
- Insect-proof
- Fixed shelving, 90,000 pigeon-holes, some adjustable for larger boxes shelves
- Full (human) height shelves alternating with low shelves with bench top
- Passageways wide enough for specimen trolleys

D. Total Area Required

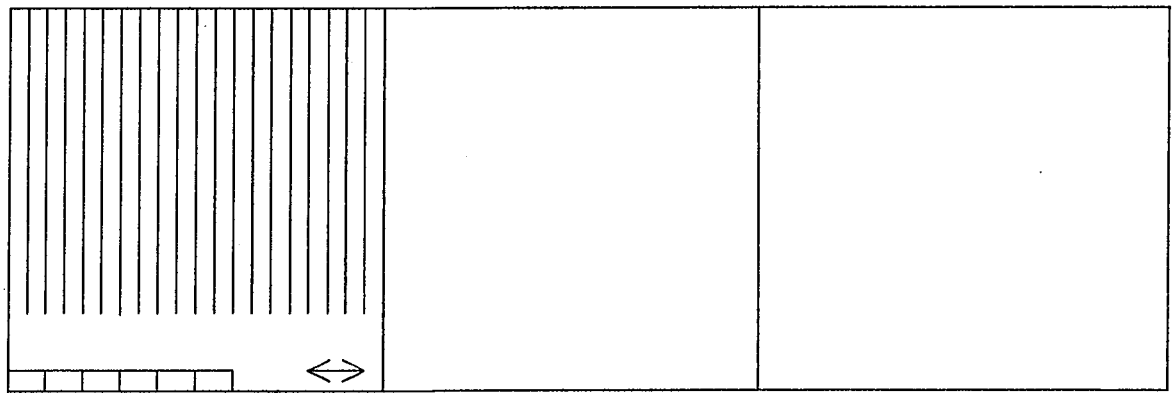
- 2400 m^2

E. Essential Proximities

- Refrigerator for routine freezing after removal from vault
- DNA Extract Facility
- Workstations: Curators, Scientists, Research Assistants, Visiting Scientists & Students
- Identification Area

F. Layout (scale 1 cm = 8 m; shape & size estimate for illustrative purposes only)

Vault 1: specimen shelves **Vault 2: ditto** **Vault 3: ditto**



workstations **slide door**

G. Notes

- Total area 120 m x 20 m – compartmentalised, multiple entry points
- Passage between shelves $\geq$ 1 m wide
- Main passage $\geq$ 1.5 m wide

H 14.5
COLLECTION VAULT: TYPE SPECIMENS

A. Purpose
Type specimens serve as critical reference points for fixing the application of scientific names. They are sequestered from the main collection, primarily for security reasons, but also in order to provide maximum protection against fire and insect damage. Current holdings occupy 540 pigeonholes. However, these are not ideally housed and it is estimated that 675 pigeonholes are needed to implement best practice in this regard. Furthermore, with the increasing intensity of collection and the discovery and description of more species current holdings are expected to increase by a factor of 1.5 by the year 2030 to require 1,010 pigeonholes for 11,500 specimens.

B. Number of Work Stations
- 2, for short-term examination of specimens, each ca 2 m long, with temporary storage shelves; LAN, telephone & pager connections; computer; microscope

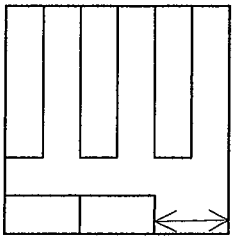
C. Special Facility Requirements
- Climate control at all times: humidity $\leq$ 40%, temperature $\leq$ 16° C
- Fire control dry pipes or gas
- High security, monitored entry: automated, sliding doors, opened by card/transponder
- Lighting not neon (fire hazard), minimal UV, i.e. no windows, timed, sensor-operated above collection shelving
- Insect-proof
- Fixed shelving, 1,010 pigeon-holes, some adjustable for larger boxes shelves
- Full (human) height shelves alternating with low shelves with bench top
- Passageways wide enough for specimen trolleys

D. Total Area Required
- 36 m^2

E. Essential Proximities
- Refrigerator for routine freezing after removal from vault
- Workstations: Curators, Scientists, Research Assistants, Visiting Scientists & Students

F. Layout (scale 1 cm = 2 m; shape & size estimate for illustrative purposes only)

specimen storage shelves



workstations sliding door

G. Notes
- Total area 6 m x 6 m
- Passage between shelves $\geq$ 1 m wide
- Main passage $\geq$ 1.5 m wide

H 15

BIOSYSTEMATICS: SCIENTIST OFFICES

A. Purpose

Office and laboratory for scientist working with herbarium specimens, books, microscopes and computer.

Each workstation designed for one full-time scientist with two bench workstation spaces, for the primary researcher and for a technical officer, colleague or volunteer to work part-time in the same area, or for seating at additional microscopy or computer equipment.

B. Number of Work Stations

- 12. Caters for existing permanent scientists, proposed new positions, and long-term contract staff

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc.)

- Adequate workbench area (length and width) with appropriate height, to allow for: laying out specimens, 2 deep (90 cm deep)
- Seating position for microscope with space around it (1800 cm X 90 cm).
- Design to allow a second microscope (e.g. high power) or seated workspace for visitor/assistant
- Writing desk (built-in or free-standing)
- Specimen shelves for storage of working material including loans and own collections (size of pigeonholes or shelves needs to take standard cardboard boxes and the new herbarium boxes if these are to be used). Suggested vertical sections 38 cm wide inside, with adjustable metal shelving
- Desk space for computer and accessories such as printer; ergonomic height for keyboard
- Filing cabinets (possibly under benches to provide more bench space)
- Bookshelves (including above furniture)
- Laboratory sink with hot and cold water
- Lighting – good general lighting; Special lighting for work areas
- Access to daylight, preferably over workbench
- Lockable cupboard for valuables and coat cupboard for clothing, coat etc
- Floor space adequate to seat 1-2 visitors
- Power points adequate in number and distribution; computer network outlets adequately distributed; phone outlet/s strategically placed
- Pin-up board

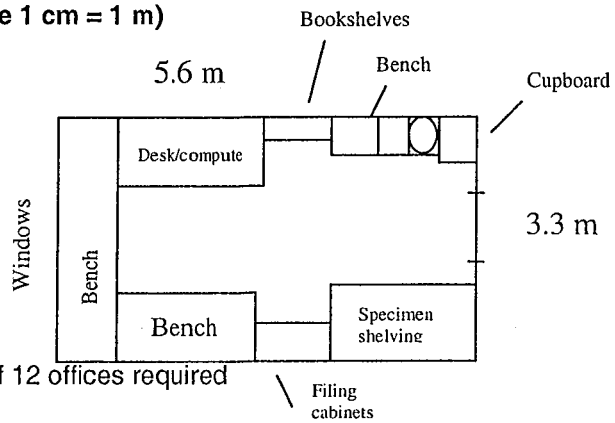
D. Total Area Required

- 240 m^2 (20 m^2 x 12 rooms)

E. Essential Proximities

- Herbarium collections
- Meeting rooms
- Resource Information Centre (Library)

F. Layout (scale 1 cm = 1 m)



N.B. Total of 12 offices required

G. Notes

- Offices be within the clean zone and secure area

H 16
BIOSYSTEMATICS: VISITING SCIENTISTS & STUDENTS

A. Purpose

The Herbarium will have many visitors wishing to work with the specimen collections or collaborate with staff. These may be short or long term, in solid periods or regular day-visits. It is considered that some workstations will be individual and others in open-plan rooms, to cater for privacy and for interaction respectively.

B. Number of Work Stations

- Visiting Scientist workstations (rooms): 4
- Student workstations (benches or carrels): 8

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc.)

- Adequate workbench area (length and width) with appropriate height, to allow for:
  - laying out specimens (90 cm deep)
  - seating position for microscope with bench space around it
  - desk space for computer; ergonomic height for keyboard
- Specimen shelves for storage of working material during visit (each stack of specimens 40 cm x 50 cm)
- Specimen storage where material can be left between visits
- Lighting – good general lighting, and special lighting for work areas
- Lockable cupboard for valuables, e.g. laptop, camera
- Power points adequate in number and distribution
- Computer network outlets adequately distributed
- Phone outlets
- Student area: Shared sink with hot and cold water
- Student area: Shared long bench (for specimen sorting), 4m X 0.9 m plus standing/sitting space = 9.6 sq m

D. Total Area required

- 110 m^2 (50 m^2 for 4 visiting scientist rooms plus 60 m^2 for student benches etc)

E. Essential Proximities

- Herbarium collections
- Molecular Lab
- Within secure and clean area

F. Layout

Not available yet. Preferably a flexible scheme where the number of workstations varies according to the number of people present without having unused space in fixed stations

G. Notes

H 17

SHARED RESOURCE: FLORA TRAINING ROOM

A. Purpose

The training room will be used to conduct Plant Identification and/or FloraBase workshops. These will mainly be attended by volunteers or client groups such as the regional herbarium project, consultants, students or 'friends' groups.

B. Number of Workstations

- 15 ID workstations consisting of a dissecting microscope, a computer and space to place specimens and reference books.

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air-conditioning requirements, lighting, etc)

- 15 computers with LAN network connection
- 15 microscopes with electric power to each
- Podium or lectern, microphone, telephone point
- Computer screen projection system, white board
- Lighting: dim lights switched from podium area, special lighting for PC's, natural light, blackout blinds. Soundproofing from outside noise
- Floor covering – vinyl
- 2 doors, lockable
- Sink
- Shelving - newspaper size shelving, book shelves
- Lockable storage cupboard for dissecting equipment, miscellaneous stationary items, manuals, personal belongings

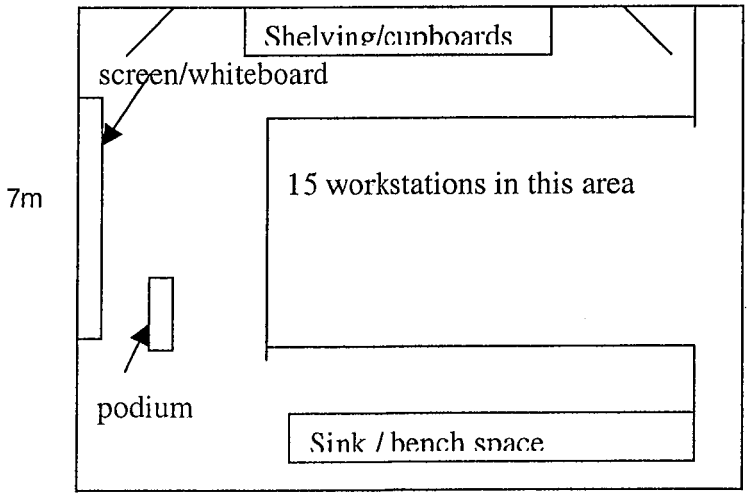
D. Total Area Required

- 63 m^2

E. Essential Proximities

- This area will be in the Public area and should be close to amenities such as tea-making facilities & toilets

F. Layout (scale 1 cm =1 m) (*room size estimate for illustrative purposes only)



G. Notes

- This room will be a dedicated training room with the maximum number of students at 30, if each workstation is shared. This room will need to be secured

H 18

SHARED RESOURCE: COMPUTER TRAINING ROOM

A. Purpose

The training room will be used to conduct training on biodiversity-related computer systems eg FloraBase, GIS, DELTA, MAX. It will be for training CALM staff, volunteers, consultants and clients .

B. Number of Workstations

- 10 ergonomically designed PC workstations with room to place and read a manual and to write notes if necessary.

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air-conditioning requirements, lighting, etc)

- Ergonomically designed PC areas with LAN network connection
- Podium or lectern, microphone, telephone point
- Computer screen projection system, white board
- Lighting: dim lights switched from podium area, special non-reflective lighting for PC's
- Soundproofing from outside noise
- 1 door, lockable
- Book shelves for manuals
- Lockable storage cupboard miscellaneous stationary items, manuals, personal belongings

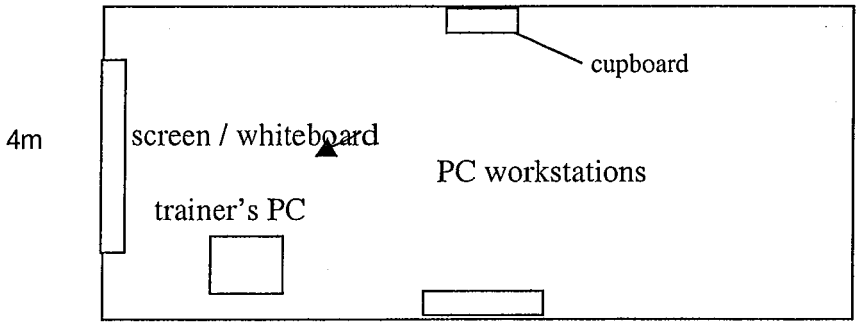
D. Total Area required

- 40m^2

E. Essential Proximities

- This area should be in the public area for ease of access to outsiders so they don't have to enter the secure area
- It would share facilities such as tea room and toilets with ref herb, ID training etc

F. Layout (scale 1 cm = 1 m) (*room size estimate for illustrative purposes only)



bookshelves

10 m

G. Notes

- This will be a dedicated training room

5. KENSINGTON FUNCTIONAL AREAS INCLUDING DIRECTORATE

	Functional Area	Area M^2
5.1	Science Directorate and Administration	212
5.2	Administration, Radio Communication and Firearm Store	160
5.3	Genetics Laboratories - DNA Bank	244
5.4	Plant Ecology	120
5.5	Plant Pathology	139
5.6	Biometrics	32
5.7	Entomology	251
5.8	Soils - Plant Nutrition	157
5.9	Threatened Flora Seed Centre	154
5.10	Vegetation Health Service	198
2.11	Dark Room (Shared Rsources)	18
2.12	Workstations: Scientists	195
2.13	Workstations: Technical Officers	198
2.14	Workstations: Visiting Scientists and Students	120
2.15	Flammable Liquid Store (Shared Resources)	18
	BUILDING TOTAL	2216 ($105m^2$ short) (2321 on sheet)
2.16	Vehicle Storage – Secure Compound (Shared Resources)	2500
2.17	Glass Houses and Shade Houses (details to be provided)	

5.1 SCIENCE DIRECTORATE AND ADMINISTRATION

A. Purpose

Accommodation for Directorate staff on top floor of building.

B. Number of Work Stations

- 3 offices and one open area to accommodate 5 staff
- 1 service room to house photocopier, facsimile, network printer, shredder, archives (Compactus), stationery cupboards

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Central air-conditioning

D. Total Area Required

- Director's office – 12 x 4 m^2
- Director's Personal Assistant – 5 x 4 m^2
- Policy Adviser's office – 8 x 4 m^2
- Divisional Admin Assistant – 4 x 4 m^2
- Divisional Financial Officer – 4 x 4 m^2
- Service Room – 12 x 4 m^2
  Total area 212 m^2

E. Essential Proximities

- Directors Personal Assistant and Divisional Admin Assistant share an open plan area. This together with a waiting area are to be in front of the Director's office.

F. Sketch layout (scale 1cm = 1m)

G. Notes

We assume that on this floor there will be

- a small kitchenette, with cupboard, refrigerator, sink, hot and cold water and filtered drinking water
- shower and toilet facilities
- several meeting rooms of different sizes (one room to include video conferencing facilities and a large screen for presentations)

5.2 ADMINISTRATION, RADIO COMMUNICATION AND FIREARM STORE

A. Purpose
Management of Divisional accounts and finances.

B. Number of Work Stations
- 13 Admin and support staff

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Central air-conditioning

D. Total Area Required –
- $160m^2$

E. Essential Proximities
- Directorate

F. Sketch layout (scale 1cm = 1m)

5.3 GENETICS LABORATORIES - DNA BANK

A. Purpose

Genetics and molecular systematics research to support the conservation and management of flora and fauna particularly rare and threatened species, carry out DNA forensics for wildlife management and assist in taxonomic identification

B. Number of Work Stations

- 2 scientists (+3 new positions)
- 5 technical positions (+ 3 new positions)

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- See modules 203/1 and 203/2 below

D. Total Area Required

- 244m^2

E. Essential Proximities

- Plant ecology
- Herbarium systematics research
- Threatened Flora Seed Centre
- Fauna ecology

F. Sketch layout (scale 1cm = 1m)

- See modules 5.3.1 and 5.3.2 below

MODULE 5.3.1 PLANT GENETICS

A. Purpose

The plant genetics laboratory is a facility where the full range of plant genetic research can be carried out. It consists of a main laboratory with associated DNA extraction room, radioactivity room and dark room.

B. Number of Work Stations

- 12 work stations in the main lab
- offices for 2 scientists (+2 new positions)
- offices for 5 technical officers (+2 new positions)

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- needs to meet specifications for Australian Laboratory Standards and Physical Containment 2 (PC2) standards
- requires fume hoods, sealed floors, sealed bench tops with lip and splashback, non-porous floor, wall and ceiling, plumbing for water purifier, non-recycling airconditioning
- radioactivity room needs to meet specifications for Radiation Safety Standards and have a flushing sink
- dark room must be light proof and have an extraction fan

D. Total Area Required

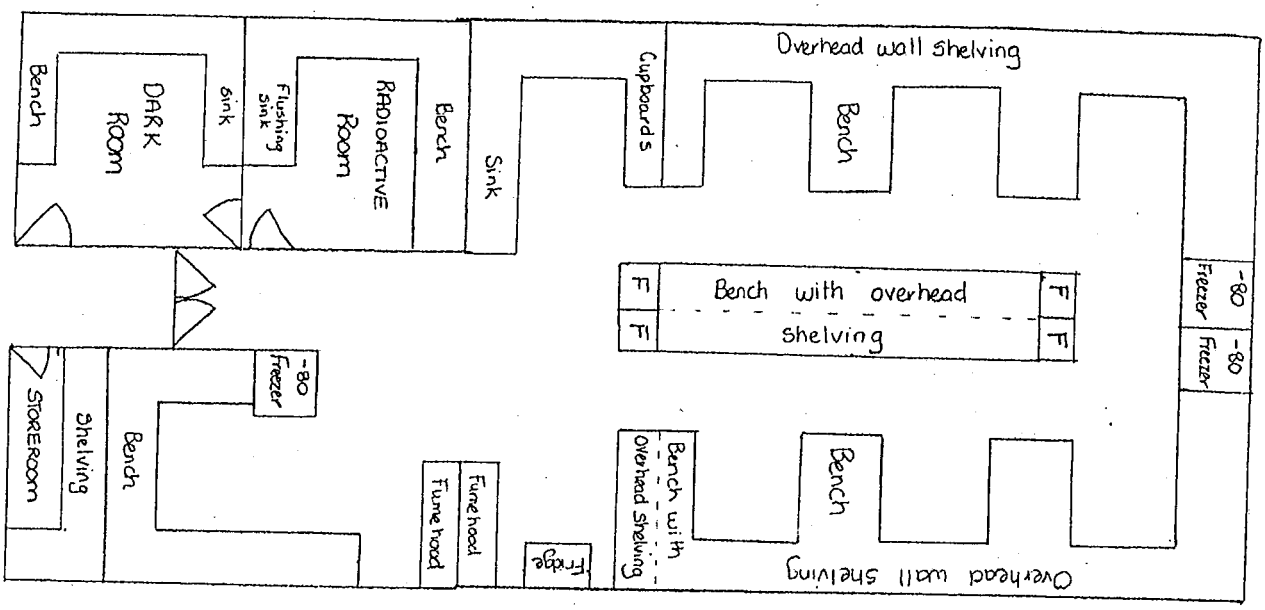
- main laboratory – 100m2
- radioactivity room – 12m2
- DNA extraction room – 32m2

  Total 144 m^2

E. Essential Proximities

- main lab, radioactivity room, dark room and extraction room need to be together
- close to animal genetics laboratory (share radioactivity room and dark room)
- close to offices
- reasonable access to germination room
- access for external suppliers eg. Medicollect bin, liquid nitrogen

F. Sketch layout (scale 1cm = 1m)



G. Notes

- Access to radioactivity room and dark room should be provided from outside main laboratory.

MODULE 5.3.2. ANIMAL GENETICS

A. Purpose

The animal genetics laboratory is a facility where the full range of animal genetic research can be carried out.

B. Number of Work Stations

- 12 work stations in the main lab
- offices for 1 scientists (+1 new position)
- offices for 1 technical officers (+1 new position)

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- needs to meet specifications for Australian Laboratory Standards and Physical Containment 2 (PC2) standards
- requires fume hoods, sealed floors, sealed bench tops with lip and splashback, non-porous floor, wall and ceiling, plumbing for water purifier, non-recycling airconditioning

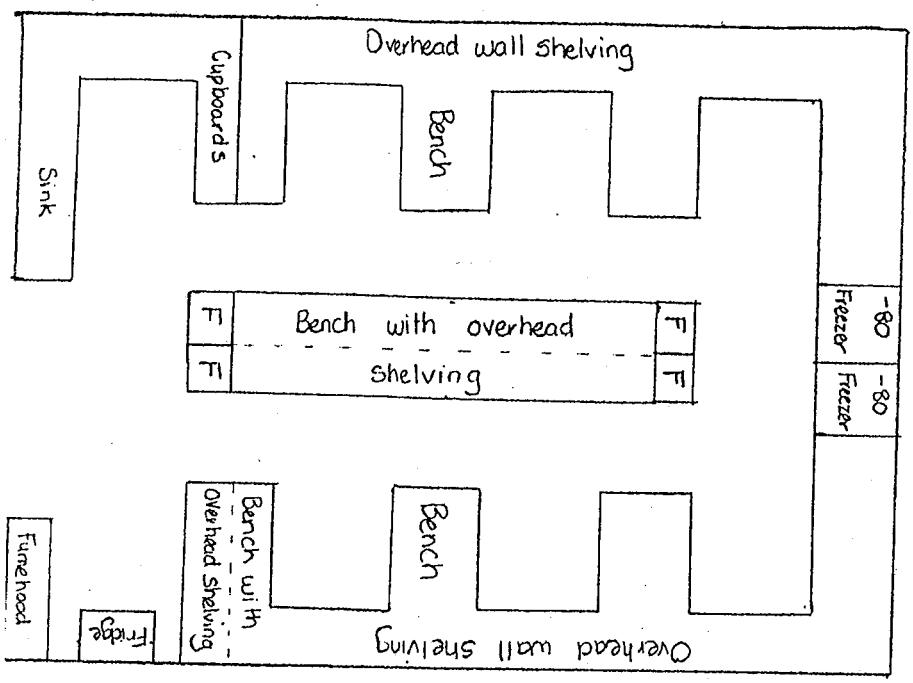
D. Total Area Required –

- laboratory – 100m^2

E. Essential Proximities

- close to plant genetics laboratory (share radioactivity room and dark room)
- close to offices

F. Sketch layout (scale 1cm = 1m)



G. Notes

5.4 PLANT ECOLOGY

A. Purpose
Plant ecological research to underpin conservation and restoration of Western Australia's flora including threatened species and threatened ecological communities.

B. Number of Work Stations
- 3 scientists (+4? new positions)
- 2 technical positions (+ 4? new positions)
- 4 students

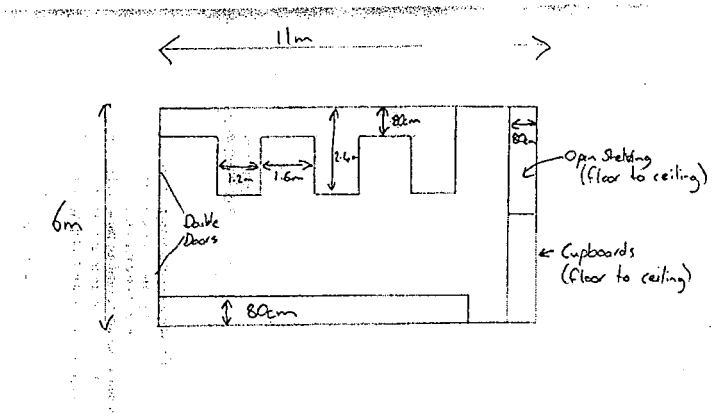
C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Suitable open bench space (See floor plan)
- Double sink
- Vibration free platform for digital sales
- Bench for microscopes
- Storage shelving and cupboards
- Network access

D. Total Area Required –
- Dirty lab 24 m^2
- Clean lab 96 m^2

  Total 120m^2

E. Essential Proximities
- Genetics
- Threatened Flora Seed Centre

F. Sketch layout (scale 1cm = 1m)



5.5 PLANT PATHOLOGY

A. Purpose
Plant pathology research to inform the management and control of plant pathogens particularly *Phytophthora cinnamomi* the cause of dieback root rot disease.

B. Number of Work Stations
- 1 Scientist (+1 new position),
- 1 Technical (+1 new position) staff

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- See modules 205/1 to 205/4 below

D. Total Area Required

• Pathology Lab	$35m^2$
• Dirty Lab	$49m^2$
• Culture room	$20m^2$
• Workshop	$35m^2$
Total	**$139m^2$**

E. Essential Proximities
- Vegetation health service

G. Notes

MODULE 5.5.1 - PATHOLOGY LAB

A. Purpose
Identification and culturing of pathogens

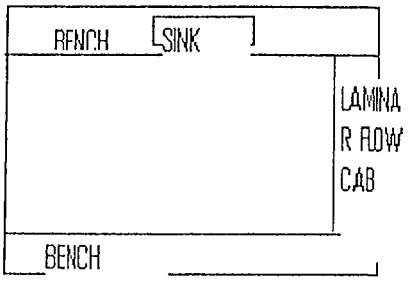
B. Number of Work Stations
- Two

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Gas
- Vacuum
- Compressed air
- D I water
- Sink
- 15 and 10 amp power
- Air cond.
- Solid benches suitable for microscopy
- Lan connections

D. Total Area Required
- $35m^2$

E. Essential Proximities
- Autoclave room both clean and dirty
- Balance room
- Chemical store

F. Sketch layout (scale 1cm = 1m)



G. Notes

- Could be a shared facility with VHS

MODULE 5.5.2 - DIRTY LAB

A. Purpose

Receives variety of materials for initial processing from tree stumps and poles to soil samples

B. Number of Work Stations

- Up to six

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Dust extraction hood
- Large fan forced drying ovens capable of below ambient temp. drying
- Sinks
- Solid benches
- Gas, vacuum and compressed air outlets
- 15 amp and 10 amp power supplies

D. Total Area Required –

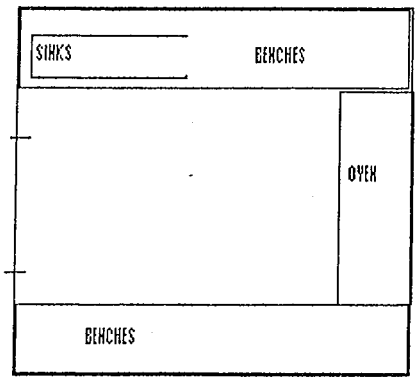
- $49m^2$

E. Essential Proximities

- Loading bay or ramp

F. Sketch layout (scale 1cm = 1m)

7 by 7 m



G. Notes

- Can be a shared facility
- Large access doors required
- Band saws required here

MODULE 5.5.3 - CULTURE ROOM

A. Purpose
Growing on and storage of live fungal cultures

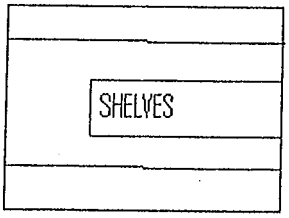
B. Number of Work Stations
- N/A

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Temperature controlled
- Many banks of shelves

D. Total Area Required – m2
- 20m2

E. Essential Proximities
- Pathology lab

F. Sketch layout (scale 1cm = 1m)



G. Notes
- Can be shared with VHS

MODULE 5.5.4 - PATHOLOGY WORKSHOP

A. Purpose
Construction and modification of equipment

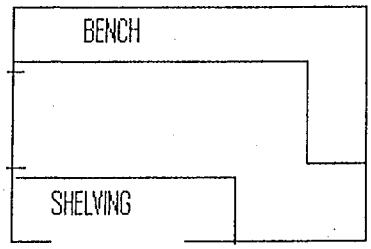
B. Number of Work Stations
- Two

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- 15 and 10 amp outlets
- Heavy duty bench for welding grinding drilling etc
- Strong shelves for materials storage
- Wide access through doors

D. Total Area Required –
- $35m^2$

E. Essential Proximities
- Loading bay or ramp
- Away from offices due to noise and obnoxious odours etc

F. Sketch layout (scale 1cm = 1m)



G. Notes
- Shared

5.6 BIOMETRICS

A. Purpose

The biometrics unit provides a statistical consulting service to all scientific staff within the Science Division, to other staff within CALM conducting research or monitoring (such as Regional ecologists), and to external agencies on a fee-for-service basis.

B. Number of Work Stations

- 2 PC-based workstations, each with sufficient space to conduct consultation meetings with 2-3 staff.

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- None

D. Total Area Required –

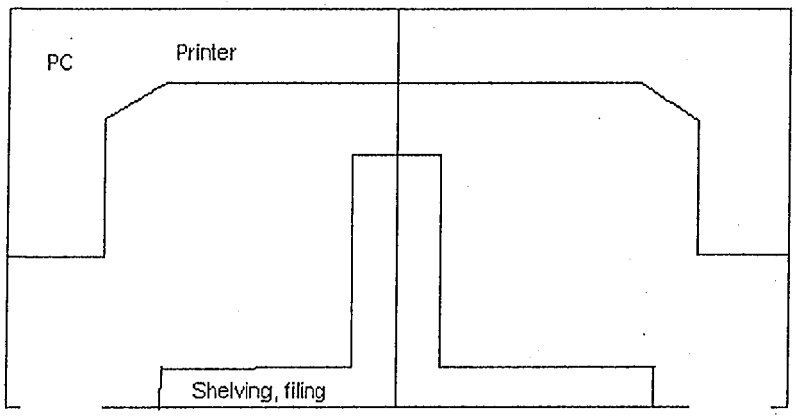
- 2 offices @ 4m x 4m approx = $32m^2$

E. Essential Proximities

- The 2 offices should be adjacent, to facilitate communication. Otherwise, no essential proximities.

F. Sketch layout (scale 1cm = 1m)

- Similar to existing layout, ie:



G. Notes

- N/a

5.7 ENTOMOLOGY

A. Purpose
Entomological research

B. Number of Work Stations
- 1 Scientist,
- 3 Technical staff,
- 3 students

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- See modules 207/1 to 207/5 below

D. Total Area Required – m2

• Specimen processing and analysis	70m^2
• Specimen drying	9m^2
• Specimen pre processing	18 m^2
• Specimen preparation	36 m^2
• Insect collection	70 m^2
• Wet collection	20m
• Wood collection	9m
Total	**234m^2**

E. Essential Proximities
- Herbarium collections
-

F. Sketch layout (scale 1cm = 1m)

G. Notes

MODULE 5.7.1 - SPECIMEN PROCESSING AND ANALYSIS

A. Purpose
4. Specimen processing and analysis
Preparation, examination and analysis of specimens.

B. Number of Work Stations
- 4 work stations with microscopes

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- benches, work stations with microscopes (ducted exhaust required for microscopes when alcohol preserved specimens used) , cupboards, drawers, shelving, bookcases

D. Total Area Required
- 70 m^2

E. Essential Proximities

F. Sketch layout (scale 1cm = 1m)

MODULE 5.7.2 - SPECIMEN DRYING

A. Purpose
7. Specimen drying room
Area to dry pinned specimens prior to curation

B. Number of Work Stations
- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Bench, cupboards, shelving

D. Total Area Required
- $9m^2$

E. Essential Proximities
- proximity to specimen processing and analysis

F. Sketch layout (scale 1cm = 1m)

MODULE 5.7.3- SPECIMEN PRE-PROCESSING

A. Purpose
2. Specimen pre-processing and temporary storage

B. Number of Work Stations
- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Shelving, Bench with cupboards, Sink

D. Total Area Required
- $18\ m^2$

E. Essential Proximities
- Ground floor access

F. Sketch layout (scale 1cm = 1m)

MODULE 5.7.4 - SPECIMEN PREPARATION

A. Purpose
Preparation and fixing of specimens prior to detailed examination and analysis

B. Number of Work Stations
- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- bench top drying oven, freezer, bench, sink

D. Total Area Required
- $36m^2$

E. Essential Proximities
- Specimen collection

F. Sketch layout (scale 1cm = 1m)

MODULE 5.7.5 - INSECT COLLECTION

A. Purpose
Repository for pinned insect collection and area to house and protect pinned insect collection.

B. Number of Work Stations
- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- sealablenon fluoro lighting., climate control, accommodation for 20 or more insect storage cabinets
- Separate fumigation re use of napthalene

D. Total Area Required –
- $70m^2$

E. Essential Proximities
- Specimen preparation

F. Sketch layout (scale 1cm = 1m)

G. Notes
- Naphthalene currently used in insect cabinets as an insect deterrent

MODULE 5.7.6 - WET COLLECTION

A. Purpose
Wet collection area to house and protect the part of the collection stored in alcohol.

B. Number of Work Stations
- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- needs to be of a standard suitable for storage of alcohol, shelving, ventilation, bench

D. Total Area Required
- $20m^2$

E. Essential Proximities

F. Sketch layout (scale 1cm = 1m)

MODULE 5.7.7 - WOOD COLLECTION

A. Purpose
Wood and pressed collection area to house and protect wood and other materials collection

B. Number of Work Stations
- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Sealable, fumigable

D. Total Area Required
- $9\ m^2$

E. Essential Proximities

F. Sketch layout (scale 1cm = 1m)

G. Notes
- Specimens have similar requirements to main herbarium collection
- Naphthalene has been used as an insect deterrent.

5.8 SOILS - PLANT NUTRITION

A. Purpose
To carry out compositional analysis of soils and foliar material

B. Number of Work Stations
- See modules 208/1 to 208/5

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- See modules 208/1 to 208/5

D. Total Area Required –

• Soil Science Lab	$25m^2$
• Soil and Foliar pre area	$30m^2$
• Plant Nutrition Lab	$38m^2$
• Instrument Lab	$25m^2$
• Balance room	$12\ m^2$
Total	**$130m^2$**

E. Essential Proximities

MODULE 5.8.1 - SOIL SCIENCE LABORATORY

A. Purpose
Chemical and physical analysis of soil samples

B. Number of Work Stations
- 2 computer workstations

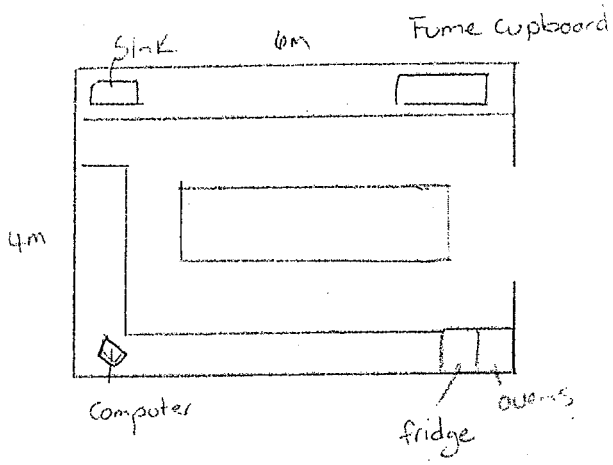
C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Benches impervious to chemicals and acid resistant and should have a lip on the edge to prevent liquid spills form flowing onto the floor
- Flooring impervious too chemicals and in one piece with covings to the walls and benches
- Under bench drawers and cupboards
- Lots of bench space for specialized analysis
- Shelving not above head height with liquid spill trays for storage of chemical solutions
- Main sink area and glassware drying racks
- Small sinks and taps on benches
- Distilled water for chemical solution making and general lab work and storage and pumping of DI water for washing glassware
- LPG outlets for Bunsen burner
- Power points at bench level
- Fume Cupboard suitable for use with perchloric/hot acid digestion, should contain sink and water spray system and have a transparent movable sash shield
- Storage for acids under the fume cupboard. Needs to be stored in a acid resistant tray for safety
- Good ventilation and ability to control room temperature

D. Total Area Required
- $25m^2$

E. Essential Proximities

- Balance room
- Plant nutrition lab
- Instrument lab
- Safety shower and eyewash

F. Sketch layout (scale 1cm = 1m)



G. Notes

- Needs to be a safety shower and eye wash station within accessible reach of the soil, plant and instrument laboratories

MODULE 5.8.2 - SOIL AND FOLIAR PREPARATION AREA

A. Purpose

A dirty lab area to prepare both soil and foliar samples for analysis. This includes the drying of bulk material in ovens, area for sample sorting and then sieving and grinding of samples ready for analysis

B. Number of Work Stations

- 2 computers with network access for data entry

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Industrial size ovens for bulk sample drying
- Smaller ovens
- Dust and particle extraction system for removal of dust created in soil sieving and foliar grinding
- Sink
- Cupboards and drawers for storage of equipment
- Air-conditioning

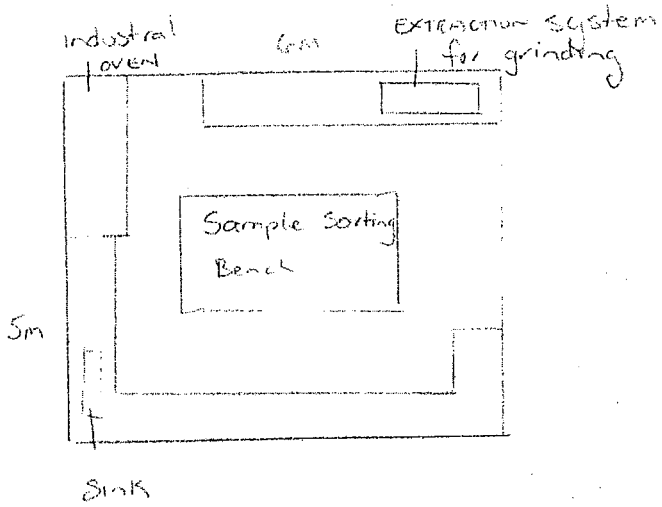
D. Total Area Required

- $30m^2$

E. Essential Proximities

- Ground Floor with vehicle access

F. Sketch layout (scale 1cm = 1m)



G. Notes

- This would be used as a communal area for sorting incoming samples. If the extraction system for soil and foliar grinding is not adequate for dust removal then contamination of others samples could occur.
- Required regardless of the fate of the Soil/Plant Labs

MODULE 5.8.3 PLANT NUTRITION LABORATORY

A. Purpose

Chemical analysis of plant material.

B. Number of Work Stations

- 1 computer workstation

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Benches impervious to chemicals and acid resistant and should have a lip on the edge to prevent liquid spills form flowing onto the floor
- Flooring impervious too chemicals and in one piece with covings to the walls and benches
- Under bench drawers and cupboards
- Shelving not above head height with liquid spill trays for storage of chemical solutions
- Main sink area and glassware drying racks
- Small sinks and taps on benches
- Distilled water for chemical solution making and general lab work and storage and pumping of DI water for washing glassware
- LPG outlets for Bunsen burner
- Power points at bench level
- Fume Cupboard suitable for use with perchloric/hot acid digestion, should contain sink and water spray system and have a transparent movable sash shield
- Storage for acids under the fume cupboard. Needs to be stored in a acid resistant tray for safety
- Good ventilation and ability to control room temperature

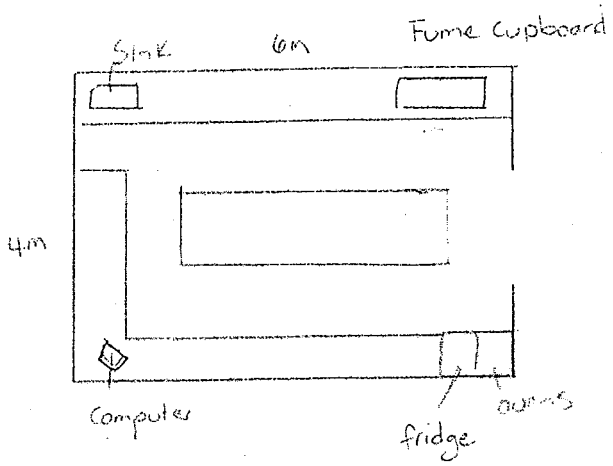
D. Total Area Required –

- 38m^2

E. Essential Proximities

- Balance room
- Soil lab
- Instrument lab

F. Sketch layout (scale 1cm = 1m)



G. Notes

- Needs to be a safety shower and eye wash station within accessible reach of the soil, plant and instrument laboratories

MODULE 5.8.4 - INSTRUMENT LABORATORY

A. Purpose

Special Lab for the analytical instruments used to analyse soil and plant material
Instruments to be included

- Atomic Absorption Spectrophotometer
- Flame Photometer
- UV/Vis spectrophotometer
- Electrical conductivity meter
- PH meter
- Chloride meter
- Variable dilutors
- Keljahal Nitrogen distillation unit

B. Number of Work Stations

- 1 computer workstation as AA can be run using a computer;
- 2 network points for laptop computers

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Benches impervious to chemicals and acid resistant and should have a lip on the edge to prevent liquid spills form flowing onto the floor
- Flooring impervious too chemicals and in one piece with covings to the walls and benches
- Under bench drawers and cupboards
- Shelving not above head height with liquid spill trays for storage of chemical solutions
- Main sink area and glassware drying racks
- AA requires compressed Air and Acetylene to operate and an extraction unit over the flame, Flame photometer requires LPG and compressed air so specialized gas pipes and regulators will be required from compressed gas cylinder stored outdoors
- Nitrogen unit requires water and would need a special tap and bench sink for cooling and for waste disposal

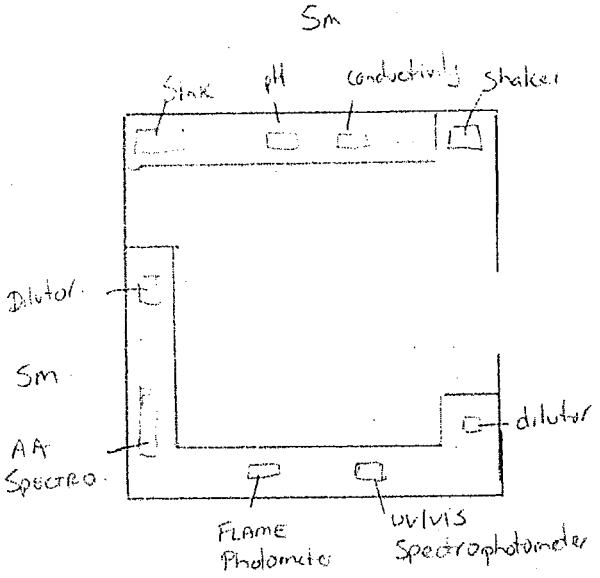
D. Total Area Required –

- $25m^2$

E. Essential Proximities

- Same level and close to laboratories and Balance room

F. Sketch layout (scale 1cm = 1m)



G. Notes

- Instruments could be placed into the laboratories if a dedicated lab was not available however the requirements such as compressed gas piping and extraction systems for the AA and Flame photometer would then need to be added into the Plant/Soil nutrition Labs and the size of the labs increased as more bench space would be required to sit the instruments

- Needs to be a safety shower and eye wash station within accessible reach of the soil, plant and instrument laboratories

MODULE 5.8.5 - BALANCE ROOM

A. Purpose

To provide an area to house balances for Soil science and Plant nutrition labs giving us a contamination free area to weight soil and plant material. Also can provide storage for samples that are currently being analyzed. This area can also be a communal facility as long as it is restricted to lab use. eg weighing of fertilizer would not be encouraged because of possible trace element contamination.

B. Number of Work Stations

- Benches along walls for balances, pedestal drawers and metal shelving for sample storage

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Benches need to be solid so that sensitive balances are not subject to vibration etc
- Shelving for current samples, metal cabinets with adjustable shelves
- Gentle Air-conditioning as balances are sensitive to air flow
- Flooring impervious too chemicals and in one piece with covings to the walls and benches

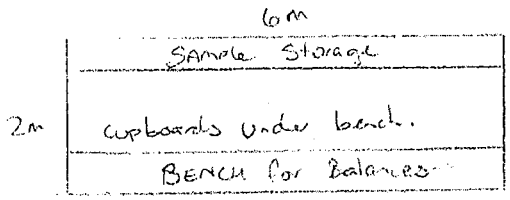
D. Total Area Required –

- $12m^2$

E. Essential Proximities

- Next to soil and plant laboratories

F. Sketch layout (scale 1cm = 1m)



G. Notes

- This is a communal facility and would be required even if Soil and Plant Science Labs were not retained

5.9 THREATENED FLORA SEED CENTRE

A. Purpose

Collection and storage (long and short term) of seed from rare and threatened species and key species in threatened ecological communites

B. Number of Work Stations

- 1 Scientist
- 3 Technical staff

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- See modules 209/1 to 209/7

D. Total Area Required – m2

• Dirty Lab	$18m^2$
• Clean lab	$61m^2$
• Dehumdification	$32m^2$
• Cool room	$8m^2$
• Freezer room	$25m^2$
• Control Temperature rooms	$8m^2$
• Equipment room	$18m^2$
Total	**170 m^2**

E. Essential Proximities

- Plant Ecology,
- Genetics

F. Sketch layout (scale 1cm = 1m)

G. Notes

MODULE 5.9.1 - SEED STORE DIRTY LAB

A. Purpose

The seed store dirty laboratory is used to receive seed from the field and to conduct seed cleaning work which would house seed cleaning equipment and would have a dust extraction system. Collections direct from the field will be processed and any insect infestations and excess plant material removed from around fruits and seed. The cleaning work generates dust and dirt and must not contaminate the clean lab. There is an occupational health and safety requirement for adequate ventilation in this area.

B. Number of Work Stations

- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- 2 x Clean air cabinets (as per Millennium Seed Bank Design) for seed cleaning
- bench (~4m long) with above bench shelving
- sink for hygiene
- emergency eyewash station

D. Total Area Required –

- approx 5.8 x 3 m ($17.4m^2$)

E. Essential Proximities

- external entry with easy vehicular access and adjacent to seed store functional area drying room and clean laboratory

F. Sketch layout (scale 1cm = 1m)

G. Notes

- Door to Area 2 with glass vision panel.

5.29 MODULE 209/2 FUNCTIONAL AREA CLEAN LAB

A. Purpose

The seed store clean laboratory will be used to conduct seed experimental work (eg seed quantification, germination and dormancy testing, seed ageing etc).

B. Number of Work Stations

- approx. 5-6m of low benches for computers
- 1 PC workstation (computer imaging/microscopy)
- 1 PC workstation (collection database management)
- 1 PC workstation (data logging of temperature and humidity conditions in facility)

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- laminar flow cabinet (x2)
- double deep sink for cleaning laboratory glassware
- emergency eyewash station
- storage cupboard for laboratory glassware and chemicals
- vibration-free platform (eg cement/granite) for digital scales
- approx. 8 m of waist high benches (4m back to back) for conducting laboratory work – with above bench shelving

D. Total Area Required

- 10.2 x 6m (61.2m^2)

E. Essential Proximities

- access adjacent to all other seed store functional areas and seed store offices.

F. Sketch layout (scale 1cm = 1m)

G. Notes

- All internal doors with glass vision panels.
- Natural lighting along at least one wall.

MODULE 5.9.3 - SEED STORE DEHUMIDIFICATION ROOM

A. Purpose

The seed store dehumidification room plays a crucial role in the operation of the seed store. This is a highly controlled environment that is used for drying seed prior to low temperature storage. This room must be maintained at a constant temperature of 15°C and relative humidity of 15% for seed drying.

B. Number of Work Stations

- 1 PC workstation (monitoring seed moisture levels and data entry)
- workbench for packaging seed (~3m long x 0.8m wide)

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Air flow in to be across entire width of room at top of room and air flow out to be across entire width of room at ground level at opposite end of room.

- emergency power supply backup system
- air conditioning and dehumidification requirements are stringent (see above)
- at least 9.5m shelving for drying seed - shelving from floor level, but easy access underneath for cleaning

D. Total Area Required –
- 9.5 x 3m (28.5m^2)
- Air lock approx 1.5 x 2m (3m^2)

E. Essential Proximities
- adjacent to seed store clean laboratory and walk-in freezer. For cost-effectiveness this functional area should be adjacent other areas requiring controlled temperature conditions and in particular needs to be adjacent to the freezer functional area 5.

F. Sketch layout (scale 1cm = 1m)

G. Notes
- This area requires and air lock to minimize any fluctuations in relative humidity.
- All doors leading off from this room should have glass vision panels.
- Areas 3, 4, 5 & 7 would require a maintenance access walkway around them and also above.

MODULE 5.9.4 - SEED STORE WALK-IN COOL ROOM

A. Purpose
The seed store cool room is used to store seed as well as material used for germination work. It is a short term controlled temperature storage area held at 4-5°C. This room could also be used as expansion space in the future if the freezer area became full.

B. Number of Work Stations
- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- controlled temperature ca. 4°C by refrigeration
- approx. 6m shelving from floor to ceiling

D. Total Area Required
- 4 x 2m (8m^2)

E. Essential Proximities
- adjacent to seed store dehumidifying room and clean laboratory

F. Sketch layout (scale 1cm = 1m)

G. Notes
- Doors to Area 2 & 3 should have glass vision panels.
- Areas 3, 4, 5 & 7 would require a maintenance access walkway around them and also above.

MODULE 5.9.5 - SEED STORE WALK-IN FREEZER ROOM

A. Purpose
The seed store freezer room plays a crucial role in the operation of the seed store and is used for the long term storage of seed. It is a controlled temperature storage area and should have immediate access to the dehumidifying functional area 3.

B. Number of Work Stations
- nil

C. **Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)**
- controlled temperature ca. -20°C by refrigeration.
- Compactor shelving to take full advantage of limited space.
- Fixed shelving ~8m.
- backup emergency power supply.

D. Total Area Required
- 5 x 5 ($25m^2$)

E. Essential Proximities
- adjacent to seed store walk-in cool room, dehumidification room and clean laboratory

F. Sketch layout (scale 1cm = 1m)

G. Notes
- Door to area 3 with glass vision panel.
- Emergency exit to Area 6 (if required)
- Areas 3, 4, 5 & 7 would require a maintenance access walkway around them and also above.

MODULE 5.9.6 - SEED STORE EQUIPMENT ROOM

A. Purpose

The seed store equipment room is used for the storage of seed germination cabinets and ovens. This equipment requires separate housing to ensure heat loads are not added to the laboratory areas. This room would house at least 5 incubators and 2 ovens for germination and dormancy research work.

B. Number of Work Stations
- nil

C. **Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)**
- air conditioning to maintain constant +/- 20°C

D. Total Area Required
- approx 5.8 x 3 m ($17.4m^2$)

E. Essential Proximities
- adjacent to seed store clean laboratory

F. Sketch layout (scale 1cm = 1m)

G. Notes
- Double doors access to enable movement of large equipment.
- Door to Area 2 with glass vision panel.

MODULE 5.9.7 - SEED STORE CONTROLLED TEMPERATURE ROOMS (X 2)

A. Purpose
The seed store controlled temperature rooms are walk-in controlled temperature and light programmed incubation rooms for seed germination experiments.

B. Number of Work Stations
- nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- fully insulated with cool white fluorescent lights and fully programmable for temperature and photoperiod
- shelving

D. Total Area Required
- 2 x 2 m ($4m^2$) x 2 = $8m^2$

E. Essential Proximities
- adjacent to seed store clean laboratory

F. Sketch layout (scale 1cm = 1m)

G. Notes
- Doors with glass vision panels

5.10 VEGETATION HEALTH SERVICE

A. Purpose
Identification of fungal pathogens, particularly *Phytophthora cinnamomi*, that are major concerns for biodiversity conservation in Western Australia

B. Number of Work Stations
- 1 Scientists
- 2 x 0.5 technical staff

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- See modules 5.10.1 to 5.10.5

D. Total Area Required

• Vegetation Health Service lab	82m2
• Dirty lab	32m2
• Culture collection	35m2
• Bait room	28m2
• Sterile culture lab	21m2
Total	**198m^2**

E. Essential Proximities
- Plant pathology

MODULE 5.10.1 – MAIN LABORATORY/OFFICE AND STORE ROOM

A. Purpose
Lab – microscopy and semi-clean culturing (from baits, etc); incubators for growing-on cultures.
Office - for Technical Officers.
Store – for VHS consumables and glassware.

B. Number of Work Stations
- Four

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Air cond
- Shelving, cupboards
- Benches
- Solid benches for microscopes
- Laminar flow cabinet
- Space for incubators for growing-on cultures
- Gas outlets
- 10 & 15 Amp power
- Sink with DI water outlet plus hot/cold
- Desks
- Network connection x2
- Natural light (windows)

D. Total Area Required
Lab/office = 70; Store = 12; Total = 82m^2

E. Essential Proximities
- Clean culturing lab, bait room and dirty lab, sterile culture collection room.
- VHS Manager's office.

F. Sketch layout (scale 1cm = 1m)

- Attached

G. Notes

- It is advantageous to locate the VHS Tech Officers' office within this area, rather than in a separate room.
- VHS provides an ongoing service which requires priority, continuous access to its labs, office and facilities.
- Other research functions are unlikely to be compatible (generally) with VHS areas. This applies especially to main office/lab, and the sterile culturing lab.

MODULE 5.10.2 - DIRTY LAB AND AUTOCLAVE ROOM.

A. Purpose

Dirty lab - Processing of dirty soil & root samples from the field; setting up baits; temporary storage of dirty soil samples. Dirty autoclave room – sterilising contaminated materials for disposal.

B. Number of Work Stations

- Two

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Air cond
- Natural light (windows) in dirty lab
- Sink (DI water plus hot & cold)
- Benches (central, wider)
- Gas outlets
- 10 & 15 Amp power outlets; 3-phase for autoclaves (2)
- Ventilation (fumes, odours) in both areas
- Autoclaves (2)

D. Total Area Required

- 16 + 16 = 32m^2

E. Essential Proximities

- Access direct to VHS bait room.
- Access direct to loading bay/rubbish disposal

F. Sketch layout (scale 1cm = 1m)

- Attached

G. Notes

- Possible to share some aspects, but VHS makes heavy, continuous use of these facilities.
- Dirty lab must be a separate room from the dirty autoclave area due to fumes & odours from autoclaves.

MODULE 5.10.3 - STERILE CULTURE COLLECTION STORAGE ROOM

A. Purpose
Storage of collection of sterile cultures only.

B. Number of Work Stations
- N/a

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Air cond. (temperature controlled)
- Shelving along walls & central
- Room for at least 5 secure incubators
- No windows
- Pest proof

D. Total Area Required
- $35m^2$

E. Essential Proximities
- Access direct to sterile culturing lab

F. Sketch layout (scale 1cm = 1m)
- Attached

G. Notes
- Must be located away from all areas where non-sterile materials are handled.
- Can be shared (Pathology); need for separate secure storage incubators, etc.

MODULE 5.10.4 - VHS - BAIT ROOM

A. Purpose
Incubate soil and root baits.

B. Number of Work Stations
- N/a

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- Air cond.(temperature controlled) 26C
- Shelving
- Gas outlet
- Lighting along all shelves
- No windows

D. Total Area Required
$28m^2$

E. Essential Proximities
- Dirty lab, dirty autoclave room
- Main lab/office

F. Sketch layout (scale 1cm = 1m)
- Attached

MODULE 5.10.5 - STERILE CULTURING LAB

A. Purpose

Sterile work – preparing culture media, pouring agar plates, sub-culturing sterile cultures and preparing cultures for storage in Culture Collection.

B. Number of Work Stations

- One

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Air cond
- Sink
- Benches (wide)
- Laminar flow cabinet
- Autoclave (clean)
- 10 & 15 Amp power outlets, and 3-phase for Autoclave
- Gas outlets
- Still (distilled water, not DI water, is required for baiting)
- Space for fridges, incubators.

D. Total Area Required

- 21 m^2

E. Essential Proximities

- Culture collection room
- Main lab/office

F. Sketch layout (scale 1cm = 1m)

- Attached

G. Notes

- Must be separate from all areas where non-sterile materials are handled.
- No windows

5.11 DARK ROOM (SHARED RESOURCE)

A. Purpose
Dark room facilities for genetics laboratories and other occasional divisional needs

B. Number of Work Stations
- 3

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas,air conditioning requirements, lighting etc)

D. Total Area Required
- 18 m^2

E. Essential Proximities
- Genetics labs

F. Sketch layout (scale 1cm = 1m)
- See genetics lab sketches

G. Notes)
- Shares facility.

5.12 . WORK STATIONS SCIENTISTS

A. Purpose
Office space

B. Number of Work Stations

- 13 Scientists (+ 7 new positions?)

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

D. Total Area Required

• 20 x Standard Office	15 m^2
Total	**300m^2**

E. Essential Proximities

5.1.3. WORK STATIONS - TECHNICAL OFFICERS

A. Purpose
Office space

B. Number of Work Stations

- 14 Technical officers (+ 7 new positions)

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

D. Total Area Required – m^2

• 11 x Shared offices	18 m^2
Total	**198m^2**

E. Essential Proximities

5.14 WORK STATIONS - STUDENTS AND VISITING SCIENTISTS

A. Purpose
Office space

B. Number of Work Stations

- 15 students
- 5 visiting scientists

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

D. Total Area Required – m^2

• Open planned	5 x 24m^2?
Total	120m^2

E. Essential Proximities

5.15 FLAMMABLE LIQUID STORE (SHARED RESOURCES)

A. Purpose
To provide the appropriate and safe storage of Flammable liquids and combustible liquids

B. Number of Work Stations
- Nil

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)
- As per Australian Standards AS1940-1993
- Not next to an ignition source
- Smaller Flammable liquids cabinet inside the store for safe storage of small amounts of volatile liquids

D. Total Area Required
- $18m^2$

E. Essential Proximities
- Ground floor with vehicle access

F. Sketch layout (scale 1cm = 1m)

G. Notes
- Shared facility

5.16 VEHICLE STORAGE/COMPOUND (SHARED RESOURCES)

A. Purpose

To provide secure and safe storage for vehicles. This should also include boat, canoe and trailer storage.

B. Number of Work Stations

- 35 vehicles

C. Special Facility Requirements (plumbing, shelving or other storage, PC areas, air conditioning requirements, lighting etc)

- Security
- Boats and Canoes should be housed under cover.
- Telephone

D. Total Area Required

- 2500 m^2

E. Essential Proximities

- Field equipment storage
- Workshop?

6 WOODVALE COMPONENT

		Functional Area	Area M^2
6.1	Laboratory:	Terrestrial Zoology	60
6.2	Laboratory:	Botany	60
6.3	Laboratory:	Biodiversity Aquatic	60
6.4	Laboratory	:Native Fauna Conservation	60
6.5	Laboratory:	Introduced Species Control	60
6.6	Laboratory:	Terrestrial Invertebrates	60
6.7	Laboratory:	Cyanide	60
6.8	Meeting Room (Shared Resource)		48
6.9	Meeting Room (Shared Resource)		96
6.10	Specimen Storage -Bulk		50
6.11	Work Stations -scientist (420), WATSCU (225), students (35) Research Fellows (60)		740
6.12	Work Stations - Technical Officers (284) Consultants (68		352
6.13	Equipment Storage –**External** (Shared Resource)		1000
6.14	Firearm Safe Lockup (Shared Resource)		10
6.15	Chemical Transfer Lift (Shared Resource)		0
6.16	Controlled Temperature Room (small facility at Kensington)		50
6.17	Animal Housing (small facility at Kensington) – **External**		100
6.18	Freezer (animals)		15
6.19	Seminar Room 150 seats (Shared Resource)		300
6.20	Library –Whole of Division (Shared Resource)		993
6.21	Workshop (Shared Resource) – **External**		64
6.22	Washdown – vehicle and Equipment (Shared Resource) – **External**		20
		BUILDING TOTAL	3074
		EXTERNAL TO BUILDING	1184

6.1 LABORATORY - TERRESTRIAL ZOOLOGY

A. Purpose

Laboratory will provide a facility that accommodates wet areas, microscope benches, dissection facilities, chemical storage and decanting and data entry.

- Air management systems including 3 downdraft benches for dissection and open bench work, 1 fume cabinet for decanting liquids and 4 effective vacuum snorkels for microscopes
- Under-bench, ventilated storage of chemicals.
- Overhead shelving for the storage of vials and equipment
- Refrigeration and freezing is required but can be treated as a shared facility
- Two sinks, adequate power connections along benches and network connections

B. Number of workstations

- A variable number of microscope workstations with a maximum of 6.
- 6 pc workstations for access to electronic keys.

C. Special facility requirements

- Downdraft benches, fume cabinets, snorkels, freezer, refrigeration

D. Total area

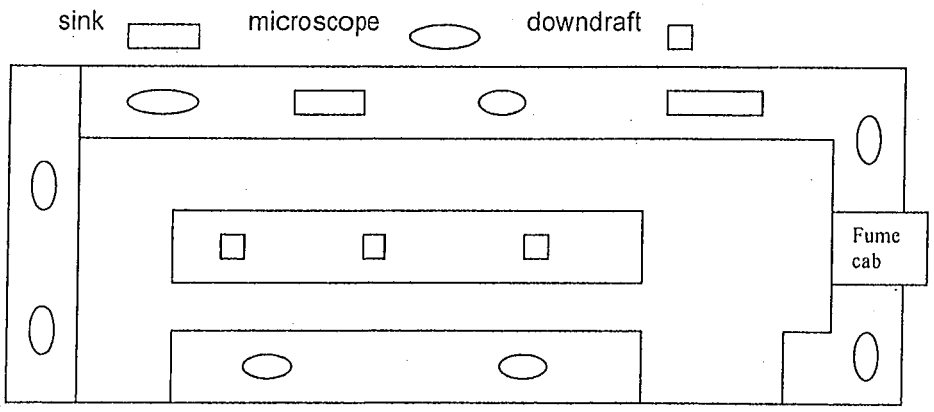
- 12x5m =60m^2

E. Essential Proximities

- Adjacent to scientist's office and relevant technical officers. Close proximity to personal decontamination facility. Close to 6.2, 6.3, 6.4, 6.5

F. Notes

G. Sketch Layout



6.2. LABORATORY - BOTANY

A. Purpose

Laboratory will provide a facility that accommodates plant sorting benches, microscope benches, curation and identification facilities and data entry.

- Air management system that includes 1 downdraft bench for dissection and open bench work, chemical storage in ventilated under bench cupboard, chemical decanting in a fume cabinet, double bowl sink.
- Overhead shelving for the storage of equipment.
- Under bench storage cabinets.
- Shared use of a drying room and plant freezer
- Adequate power connections along benches and network connections
- Adequate lighting

B. Number of workstations

- A variable number of microscope workstations with a maximum of 6.
- 6 pc workstations for access to electronic keys.

C. Special facility requirements

- Downdraft bench, fume cabinet, sink, ventilated chemical storage cabinet

D. Total area

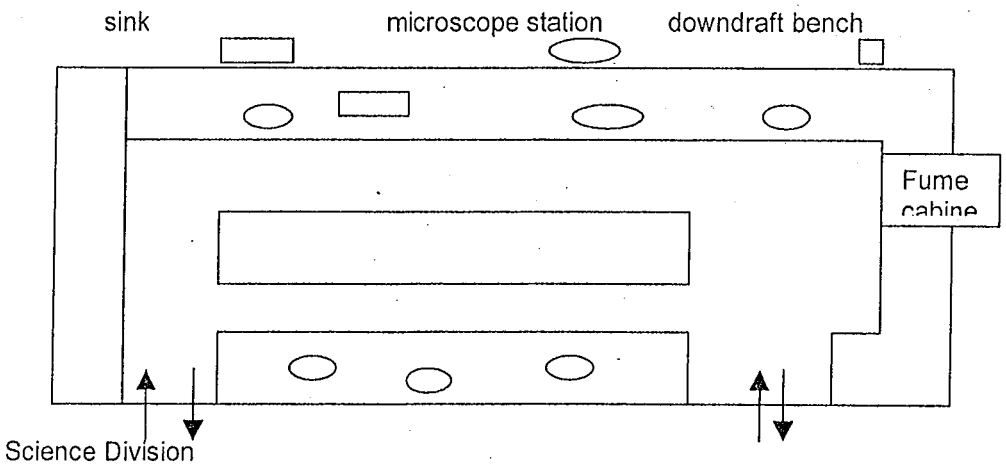
- Lab is 12 x 5 =60m^2

E. Essential Proximities

- Adjacent to scientist's office and relevant technical officers.
- Shared botanical drying and freezing areas. Close to 6.1,6.3 and 6.4

F. Notes

G. Sketch Layout



6.3 LABORATORY - AQUATIC -

A. Purpose

Laboratory will provide a facility that accommodates microscope benches, specimen preparation and sorting, down draft benches and electronic key identification facilities, chemical storage and decanting and data entry.

- Air management system that includes 1 downdraft bench for dissection and open bench work and a fume cabinet.
- Provision of under-bench, ventilated storage of chemicals beneath a double bowl sink. Additional double bowl sink
- Overhead shelving for the storage of equipment.
- Under bench storage cabinets
- Adequate power connections along benches and network connections.
- Workstation that enables drawing of invertebrate specimens for publication.

B. Number of workstations

- A variable number of microscope workstations with a maximum of 6.
- 6 pc workstations for access to electronic keys.

C. Special facility requirements

- Downdraft bench, fume cabinet, refrigeration, chemical and specimen storage

D. Total area

- 12 x 5 =60m^2

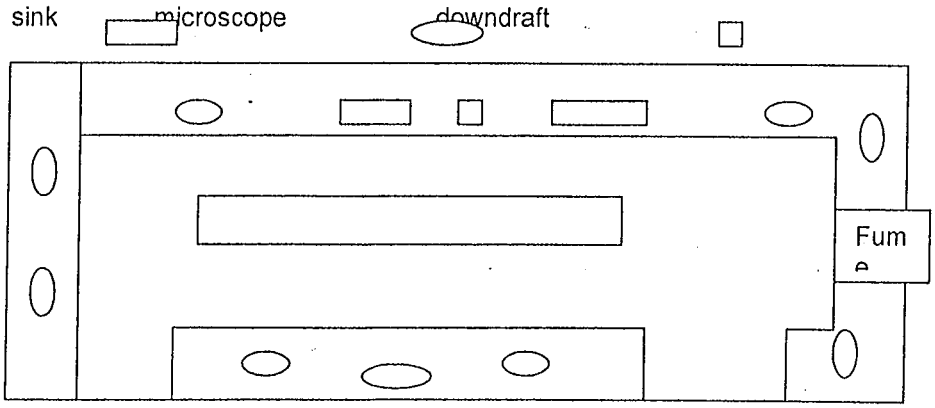
E. Essential Proximities

- Adjacent to scientist's office and relevant technical officers.
- Close proximity to personal decontamination facility.

F. Notes

- The design is dependant upon provision of separate workstations of adequate dimensions for scientists and consultants outside the laboratory.

G. Sketch Layout



6.4 LABORATORY - NATIVE FAUNA CONSERVATION

A. Purpose

Laboratory will provide a facility that accommodates wet areas, microscope benches, dissection facilities, chemical storage and decanting and data entry.

- Air management systems including 2 downdraft benches for dissection and open bench work, 1 fume cabinet for decanting liquids and 6 vacuum snorkels for microscopes.
- Under-bench, ventilated storage of chemicals.
- Overhead shelving for the storage of vials and equipment.
- Refrigeration and freezing is required as a shared facility.
- Two sinks, adequate power connections along benches and network connections.

B. Number of workstations

- A variable number of microscope workstations with a maximum of 6.
- 6 pc workstations for access to electronic keys.

C. Special facility requirements

- Downdraft benches, fume cabinets, snorkels, freezer, refrigeration

D. Total area

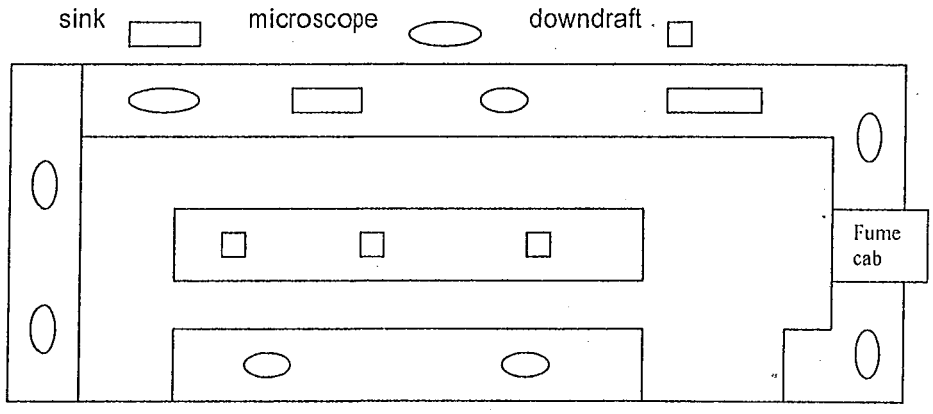
- 12x5m =60m^2

E. Essential Proximities

- Adjacent to is scientist's office and relevant technical officers -. Close proximity to personal decontamination facility. Close proximity to controlled temperature room. Close to 6.1, 6.2, 6.3 and 6.5

F. Notes

G. Sketch Layout



6.5 LABORATORY - INTRODUCED SPECIES CONTROL

A. Purpose

Laboratory will provide a facility that accommodates wet areas, microscope benches, dissection facilities, chemical storage and decanting and data entry.

- Air management systems including 2 downdraft benches for dissection and open bench work, 1 fume cabinet for decanting liquids and 6 vacuum snorkels for microscopes.
- Under-bench, ventilated storage of chemicals.
- Overhead shelving for the storage of vials and equipment.
- Refrigeration and freezing is required as a shared facility.
- Two sinks, adequate power connections along benches and network connections.

B. Number of workstations

- A variable number of microscope workstations with a maximum of 6.
- 6 pc workstations for access to electronic keys.

C. Special facility requirements

- Downdraft benches, fume cabinets, snorkels, freezer, refrigeration

D. Total area

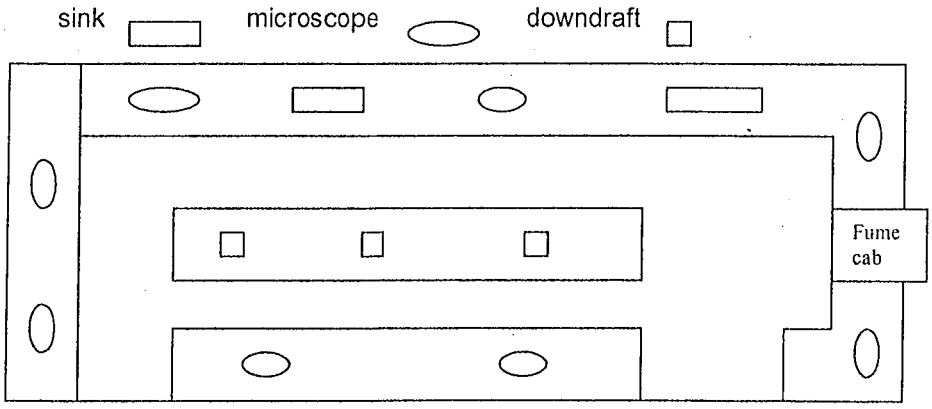
- 12x5m = 60m^2

E. Essential Proximities

- Adjacent to scientist's office and relevant technical officers.
- Close proximity to personal decontamination facility.
- Close proximity to controlled temperature room is desirable.
- Close proximity to Cyanide lab if located at Kensington.
- Close to 6.1, 6.2, 6.3 and 6.4

F. Notes

G. Sketch Layout



6.6 LABORATORY - TERRESTRIAL INVERTEBRATES

A. Purpose

Laboratory will provide a facility that accommodates wet areas, microscope benches, dissection facilities, chemical storage and decanting and data entry.

- Air management systems including 1 downdraft bench for dissection and open bench work, 1 fume cabinet for decanting liquids and 4 effective vacuum snorkels for microscopes.
- Under-bench, ventilated storage of chemicals.
- Overhead shelving for the storage of vials and equipment.
- Refrigeration and freezing is required as a shared facility.
- One double sink, adequate power connections along benches and network connections.

B. Number of workstations

- A variable number of microscope workstations with a maximum of 6.
- 6 pc workstations for access to electronic keys.

C. Special facility requirements

- Downdraft bench, fume cabinet, snorkels, freezer, refrigeration

D. Total area

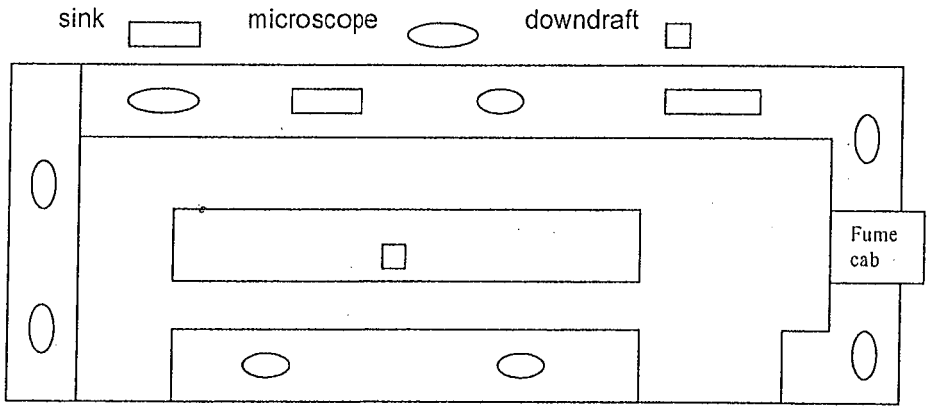
- 12x5m = 60m^2

E. Essential Proximities

- Adjacent to scientist's office and relevant technical officers.
- Close proximity to personal decontamination facility.

F. Notes

G. Sketch Layout



6.7 LABORATORY - CYANIDE

A. Purpose

The Cyanide Laboratory will provide a highly specialised facility that accommodates wet areas for the production or handling of cyanide, 1080 poison baits and other toxic chemicals.

- Air management features independent airconditioning, fume cabinet, downdraft benches, dissection facilities, chemical storage and decanting facility.
- Under-bench, ventilated storage of chemicals.
- Overhead shelving for the storage of vials and equipment. Secure locked refrigeration for the storage of cyanide separate to all other storage.

The lab should be separated into two compartments –one for cyanide production, the other as a work room for cyanide related activities and data entry. Safety requirements include Oxy-viva equipment and electronic monitoring of production activities.

B. Number of workstations

- The lab should be large enough to accommodate up to 4 persons involved in the production process and up to 4 workstations for data entry

C. Special facility requirements

- Independent air conditioning,
- Downdraft bench
- Fume cabinet,
- Snorkel
- Freezer,
- Locked refrigeration,
- Electronic surveillance of activities,
- Resuscitation equipment,
- Security system

D. Total Area

- 12x5m = 60m^2

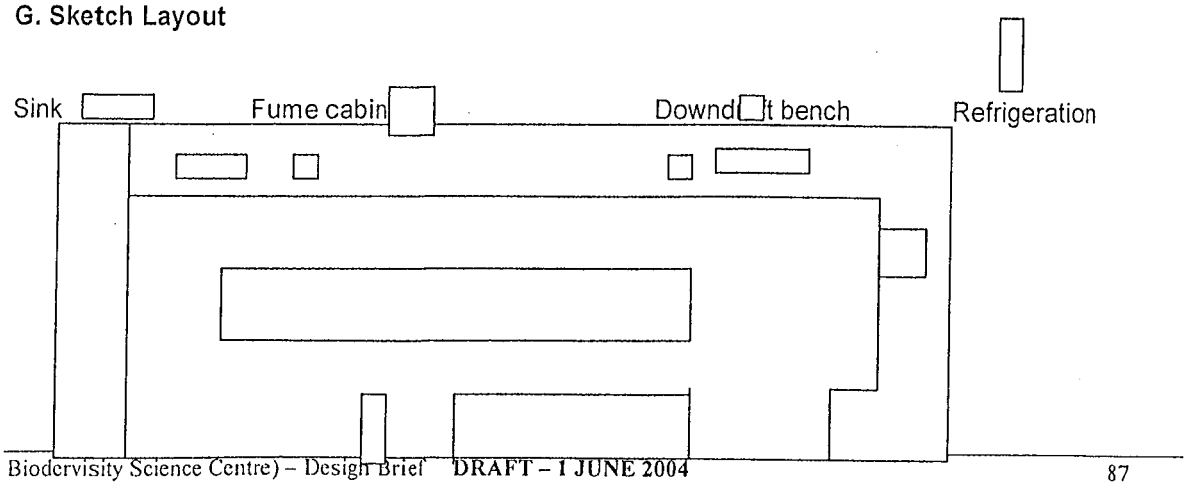
E. Essential Proximities

- If at Kensington located with the specimen storage house away from the main building on the ground floor to minimise plumbing for the evacuation of fumes.
- If not on the ground floor chemicals delivered to and from the laboratory should be transported by a lift.
- Close proximity to personal decontamination facility and emergency resuscitation equipment.

F. Notes

- A small but functional cyanide lab exists at Woodvale and could be maintained for the purpose of future cyanide and 1080 production.
- Ongoing professional experienced management and regular maintenance of this facility would be a requirement.

G. Sketch Layout



6.8 MEETING ROOMS (SHARED RESOURCE)

A. Purpose

There is a requirement for adequate conferencing facilities in the new building. Out of 97 working days since January 5 2004 the Woodvale meeting room has been occupied on 57 occasions (58%) for a staff of around 60. With the increasing number of staff in a new building it is possible that three small meeting rooms will be required accommodating 14 to 20 persons each. One of the rooms should be located near the biodiversity module and fitted with up to date electronic projection equipment.

The other 2 rooms could be shared facilities used to accommodate recreational activities such as yoga and students or visitor workstation requirements when not in use for conferencing.

B. Number of Workstations

- The biodiversity room should have provision for multiple LAN connections for training sessions and workstations.

C. Special facility Requirements

- Data projectors,
- Video conferencing.
- Small tearoom
- adjoining primary meeting room.

D. Total area

- 1 room 8mx6m =48 m^2

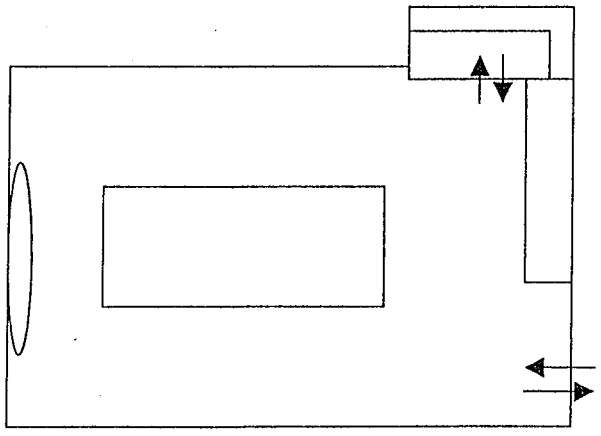
E. Essential Proximities

- Central to Biodiversity laboratories.

F. Notes

- The meeting room could be used for student office accommodation or visitor use when required.

G. Sketch Layout



6.9 MEETINGS ROOMS (2) – (SHARED RESOURCE)

A. Purpose

There is a requirement for adequate conferencing facilities in the new building.
In addition to the Biodiversity meeting room two other rooms could be shared facilities used to accommodate the requirements of other Divisional groups.

B. Number of workstations

- The rooms should have provision for multiple LAN connections for training sessions and workstations.

C. Special Facility Requirements

- Data projectors,
- Video conferencing.
- Small tearoom
- Adjoining primary meeting room.

D Total Area

- 2 rooms 8mx6m = 96 m^2

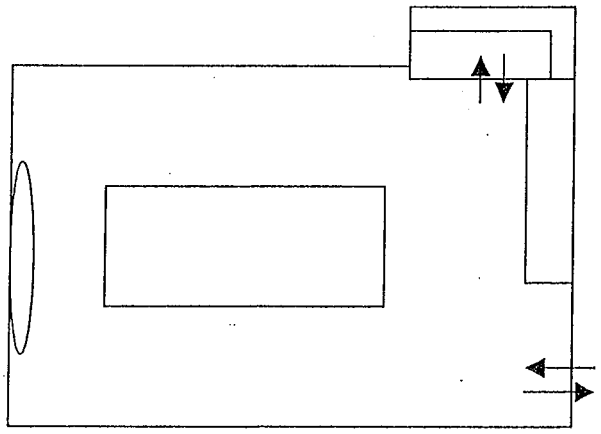
E. Essential Proximities

- Central to laboratories.

F. Notes

- The meeting rooms could be used for student office accommodation, visitor use and recreational activities such as yoga when required.

G. Sketch Layout



6.10 SPECIMEN STORAGE - BULK

A. Purpose

The bulk specimen storage should be located in properly ventilated housing away from the main building to avoid occupational health and safety issues for workers in the main building. The storage should comprise an area for holding bulk new and used preservatives and large numbers of specimens in preservative. Climate control is essential. Specimens in preservative will be taken to the store and catalogued for long term storage.

B. Number of Workstations

- One for data entry and catalogue management

C. Special Facility Requirements

- Adequate ventilation and lighting.
- Climate control.
- Adequate access for safe handling of chemicals.
- Pc facility for management of data.
- Downdraft bench for decanting liquids safely
- Fume cabinet
- Sink
- Personal wash down, toilet and shower facility.

D. Total area

- 50 m^2
- 1x 11 x 4 x 4x1.5m =176 lineal m. storage
- 1x 4x5 =20 m^2 bulk storage
- 1x 4x5=20 washdown

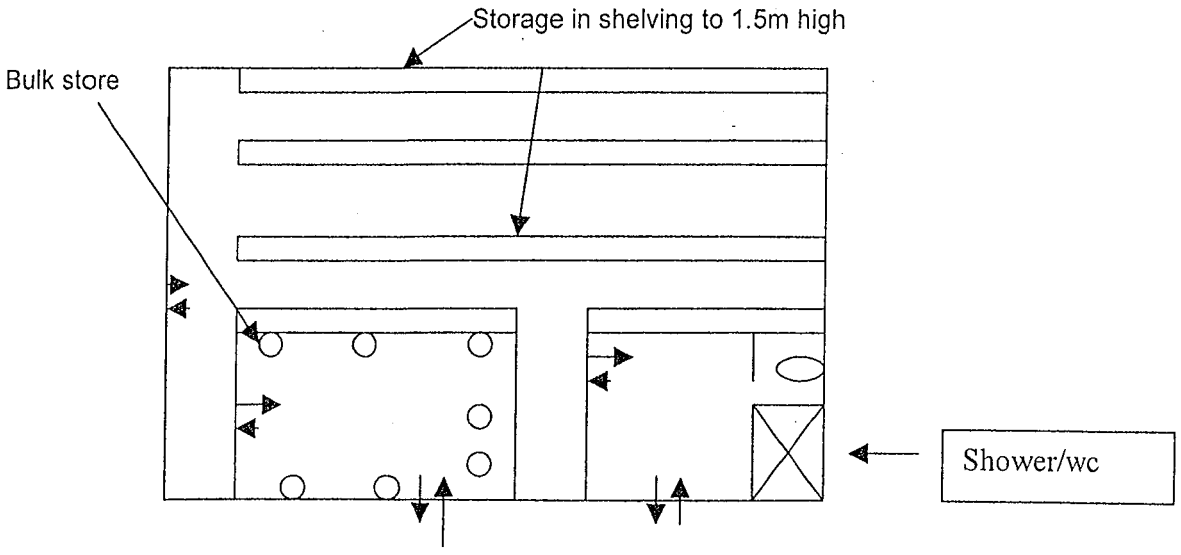
E. Essential Proximities

- The store should be accessible for frequent access by staff from the Biodiversity labs.
- Personal washdown facility

F Notes

- This facility should be located away from the main building and possibly located next to or within the Cyanide lab facility.

G. Sketch Layout



6.11 WORK STATIONS - SCIENTIST

A. Purpose

The workstations will provide a base from which the scientist is able to perform high-level research including process of data, writing reports and managing operations. Workstations for scientists should be individual offices designed to enhance productivity and excellence in research outputs. Adequate shelving space for a reference library, good lighting is essential. Ventilation in addition to air-conditioning is desirable. A suitable desk with pc will be essential.

B. Number of workstations

- For Biodiversity there are 23 scientists.
- Allowance for 20%growth takes the figure to 28.
- For WATSCU there are 12 staff requiring similar workstations.

C. Special Facility Requirements

- Lighting,
- Opening window,
- Desk,
- Pc and network connections

D. Total area

- Per person requirement 15 m^2
- Biodiversity = 420 m^2
- WATSCU = 225m^2
- Research Fellows and students = 95 m^2

  Total area 740m^2

E. Essential Proximities

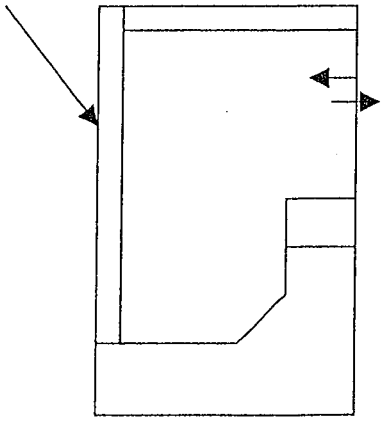
- Close to laboratory and technical support offices.

F. Notes

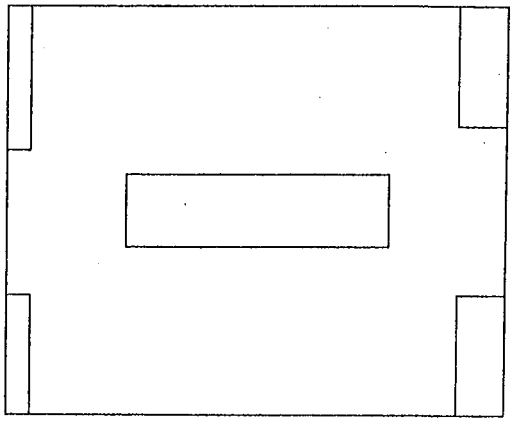
- A separate office for scientists is essential.

G. Sketch Layout

Individual office layout for scientists/Fellows



Layout for students



6.12 112 WORK STATION –TECHNICAL OFFICER

A. Purpose

The workstations could be located in a separate shared workroom that provides a base from which the technical officer is able to process data, write reports, manage operations and carry out basic technical work on equipment. Workrooms are envisaged as about 6m x 4.5m that can house 2 technical officers but not be suitable for work on materials that might compromise health and safety issues. The latter activities must take place within dedicated laboratories. Adequate shelving space for a reference library is essential. Good lighting and ventilation in addition to air-conditioning is desirable. A suitable desk with pc for each technical officer will be essential.

B. Number Of Workstations

- For Biodiversity there are 17 technical officers.
- Allowance for 20%growth takes the figure to 21.
- Space for 5 consultants is estimated at 68 m^2

C. Special Facility Requirements

- Lighting,
- Opening window,
- Desk,
- Pc and network connections

D. Total area

- Per person area for technical officers and consultants is calculated at 13.5 m^2
- Technical staff 284 m^2
- Consultants =68 m^2
  Total area – 352m^2

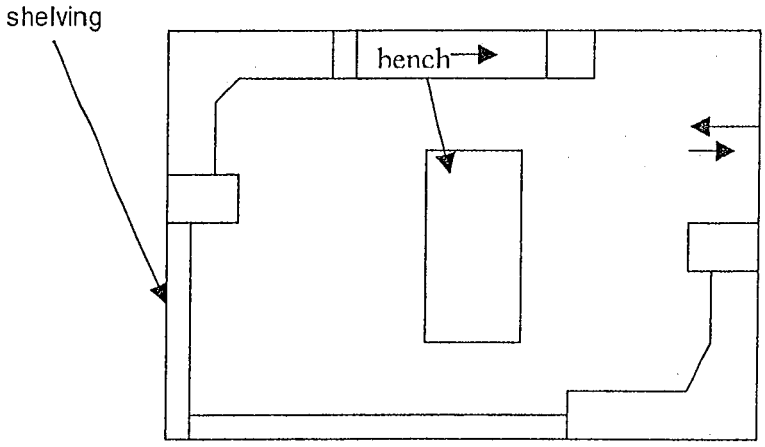
E. Essential Proximities

- Close to laboratory and scientists offices.

F. Notes

- Consultants and technical officer workrooms can be identical providing maximum flexibility for future expansion

G. Sketch Layout



6.13 EQUIPMENT STORAGE – EXTERNAL (SHARED RESOURCE)

A. Purpose

Research performed by Biodiversity Group includes specialised equipment for mammal, invertebrate, reptile, and waterbird trapping. A very effective system of storing this variety of equipment to preserve its life and ensure maximum efficiency of use and access has been developed and should be replicated at the new facility.
The equipment can be housed externally or within the main building in a basement location.
Current project equipment can be housed in shelving in lockable compartments managed by individual programs. Separation from other programs is essential. Security is necessary. Adequate lighting and space is essential.

B. Number of Workstations

- None

C. Special Facility Requirements

- Lighting,
- shelving,
- outboard motor supports,
- outboard motor flushing area,
- cage drying racks,
- cage cleaning area,
- equipment,
- power supply ,
- battery charging facility,
- machinery storage,
- telephone, PA system,
- high pressure wash down facility.

D. Total area

- 1000 m^2

E. Essential Proximities

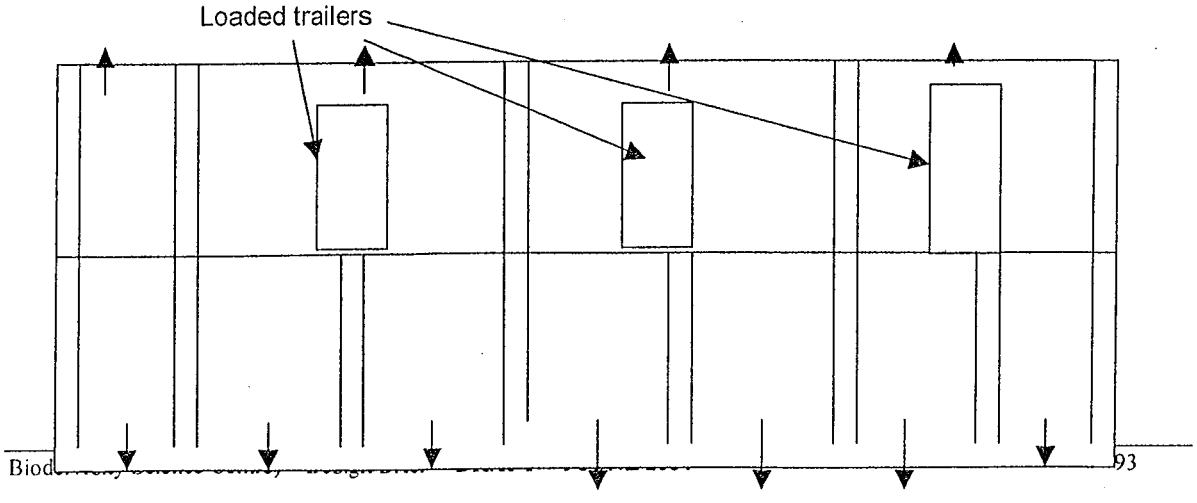
- Close to chemical store and vehicle compound.
- Provision of lockable secure parking for loaded vehicles or trailers

F. Notes

- Some older equipment can be archived in current storage at Woodvale.
- There are very significant savings in time and cost if vehicles and/or trailers can be stored loaded in a secure lockup in preparation for extended field trips. This would require a small number of equipment storage bays large enough for the task or two dedicated undercover lockable storerooms. These can be multiuse areas.
- All storage bays to have similar layout of bench, shelf and lockable doors.
- Security alarms and reed switches on all doors.
- Bench width to be 0.8 m.

G. Sketch Layout

- The sketch below is not meant to represent actual size requirements or numbers of bays.



6.14 FIREARM SAFE LOCKUP (SHARED RESOURCE)

A. Purpose

Firearms are an essential part of the Biodiversity operations. A range of types are stored in two locked safes at Woodvale. These provide adequate security when housed in a modern electronically secured facility. The storage of the armoury should be in a separate space that has a very high level of security.

B. Number of workstations

- One

C. Special Facility Requirements

- Very high level security.
- Electronic security.
- Workbench.
- Provision for PC for recording firearm movements.

D. Total area

- 6 m^2

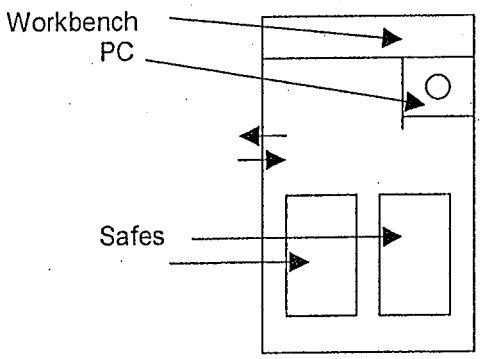
E. Essential Proximities

- Close to the Administration area where a permanent officer can issue firearms to researchers.

F. Notes

- The firearms at Woodvale are managed by a technical officer under the supervision of the Centre Manager. A budget is provided for the regular maintenance of each firearm. Two signatures are required for firearm issue.

G. Sketch Layout



6.15. CHEMICAL TRANSFER LIFT (SHARED RESOURCE)

A. Purpose

This item is necessary where laboratories are located above ground floor. Noxious chemicals such as formaldehyde should not be carried up or down stairs in a public facility. A lift is a preferred mechanism for transporting noxious agents and heavy loads to and from laboratories.

B. Number of workstations

- none

C. Special Facility Requirements

- Load capacity is likely to be less than 1000 kg.

D. Total Area

- $4m^2$

E. Essential Proximities

- Central to all laboratories.
- Close to Cyanide lab if it is located in the main module.

F. Notes

G. Sketch Layout

6.16 CONTROLLED TEMPERATURE ROOMS- KENSINGTON AND WOODVALE

A. Purpose

Fauna Conservation programs require the handling and management of native and feral fauna. It can be necessary to keep these animals for long or short-term periods. It will be preferable from time to time to house these animals in purpose built housing at Kensington near the main building. There are significant savings of time and greater work efficiency in having a facility located at Kensington.

Animal yards at Woodvale will require a second controlled temperature house in the existing facility.

B. Number Of Workstations

- One each

C. Special Facility Requirements

- Controlled temperature facility.
- A PC workstation is necessary.
- Moderate to high level security may be required.

D. Total Area

- 50 m^2

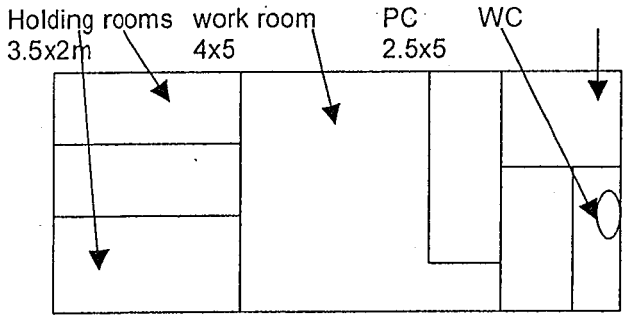
E. Essential Proximities

- Close to main building or at Woodvale

F. Notes

- The animal house should be self-contained and provide a workstation for an officer who may be required to remain in the facility monitoring captive fauna.
- The facility could be built at Woodvale to complement the existing animal yards, however there is a need to provide adequate short-term housing at Kensington.

G. Sketch Layout



6.17. ANIMAL HOUSING

A. Purpose

Fauna Conservation programs require the handling and management of native and feral fauna. It can be necessary to keep these animals for long or short-term periods. It will be preferable from time to time to house these animals in purpose built animal yards at Kensington near the main building although it is recognised that there are concerns relating to the suitability of such facilities in built up areas. However, there are significant savings of time and greater work efficiency in having the facility located at Kensington.

B. Number of Workstations

- none

C. Special Facility Requirements

- Fences impervious to predators such as cats and foxes are essential.
- Monitoring of security.
- Management of waste and impact on neighbours.
- Impact of external lighting and neighbours on captive animals.

D. Total Area

- 100 m^2

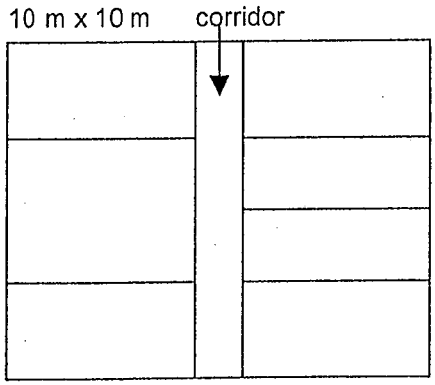
E. Essential Proximities

- Controlled temperature house.
- Close to laboratories or other work base.

F. Notes

- It is preferable for the main animal yards to remain within the 40 Ha of bushland at Woodvale.
- The loss of the existing facility at Woodvale in the future would require consideration for replacement at Kensington or elsewhere.

G. Sketch Layout



6.18 FREEZER FACILITY

A. Purpose

Biodiversity groups have an ongoing requirement for adequate freezer facilities. Chest freezers can provide adequate storage however a new facility might be better served by a communal walk in type providing a more cost efficient and safer method of preserving specimens.

B. Number of workstations

- none

C. Special Facility Requirements

- Adequate space to accommodate current and future requirements.

D. Total Area

- 5x3 m 15 m^2

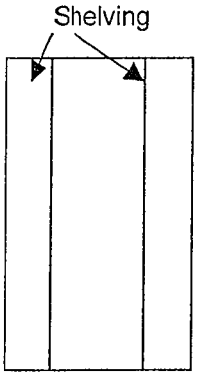
E. Essential Proximities

- Botanical laboratory may be a frequent user.
- Close to plant drying room.

F. Notes

- Freezer space has been identified for the Biodiversity –botanical group. This could be combined with that facility.

G. Sketch Layout



6.19 SEMINAR ROOM (SHARED RESOURCE)

A. Purpose

A shared resource seminar room with seating for about 150 is proposed. The facility should have a sloping floor to accommodate better viewing of IT applications during seminars. Up to date projection and recording facilities. Provision for video conferencing.

B. Number of Workstations

- none

C. Special facility requirements

- Provision for network connections and IT facilities.

D. Total area

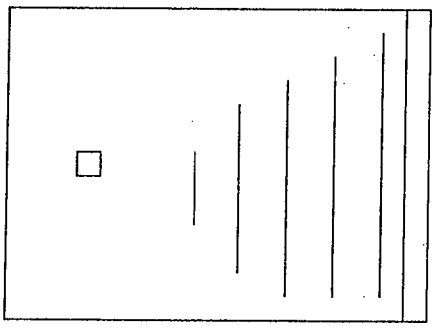
- 15m x 20m - 300 m^2

E. Essential Proximities

- Central position

F. Notes

G. Sketch Layout



6.20 LIBRARY – WHOLE OF DIVISION (SHARED RESOURCE)

A. Purpose

The Library acquires, organizes, maintains, utilizes and disseminates informational material germane to the Department's activities. It is a major source of information for Departmental staff, students, public and other research personnel. The information sources come in a variety of formats and need to be organized and maintained by experienced staff who have an in depth knowledge of the contents of the Library collection.

B. Number Of Work Stations

- 5 workstations for staff (3 professional, 2 assistants)
- 3 PC workstations for Public Access/Volunteers/Library students
- 1 PC workstation for Loans

C. Special Facilities

- Illumination, heating, cooling, ventilation & acoustics should be constant - minimum 400 lux, 18.5°-21°, 50%-60% RH never to exceed 65% RH (closed room storage 300 lux, 18-20°, 45-55 % RH)
- Flooring - 7.2 kN/m2 for fixed shelving, 13.5 kN/m2 for mobile shelving
- Compactus (mobile shelving) and/or fixed shelving
- No stairs or steps
- Security - Minimum separate door keys from rest of Centre
- Network connections for laptops, including wireless connectivity
- Locked storage for Archives/Rare Books/Restricted access - Mobile shelving
- Sufficient shelving for special collections eg microfiche/film, aerial photos
- Sufficient shelving for data archives
- Large store room
- Mailing area - high volume of mail sent and received
- Display area/boards for staff posters, botanical art, items of interest
- Video/TV viewing area - Cassette listening area
- Wet area
- Accessibility for wheelchair access etc.,

D. Total area required –

- **993 m^2**
- Space allowed should be considered in relation to the 3 major activities in a library:
- Space for the library's service functions - eg. reference, reading, study, loans
- Space for storage - A high space requirement is necessary because of the greater use of older material and higher retention rate of material. The collections contain historical material that will not be weeded and so space must allow for this. Storage space is essential for duplicate Departmental materials and unsorted donated material. Large collections of non-book materials also require specific housing requirements. - eg. maps, photographs, slides, microfiche
- Space for technical processes - eg. acquisitions, cataloguing
- The space required for the above functions will fall into the following 4 areas:
  - **User Space**
  - seating for 20% of potential users - assume 24 users at one time
  - 12 x 3 m^2 table seating - 36 m^2
  - 12 x 4 m^2 informal reading- 48 m^2
  - reference & loans desk 4 x 3.5 - 14 m^2
  - display area 5 x 4 - 20 m^2
  - Public access catalogues2 x 4 - 8 m^2
  - **Total 126 m^2**

  - **Staff Space**
  - staff workroom 25 m^2
  - staff offices 3 x 12 m^2 - 36 m^2
  - **Total 61 m^2**

- **Collection Space**
- Currently the collections occupy approx. 220 m^2 and acquisition averages 600 items/year at existing budget. At current level of acquisition, space required to allow for growth in next 20 years is approx. 30 m of shelving/year. More vertical filing cabinets will also be required for housing reprints/pamphlets/vertical file materials, approx. 1 cabinet per year.
- Current size 220 m^2
- 20 yr growth 540 m^2
- 20 cabinets 6 m^2
- Total **766 m^2**

- **Equipment Space**
- TV & Video area 4 m^2
- Binding Equipment 3 m^2
- Photocopier (+sorting table) 6 m^2
- Computer terminals 20 m^2
- Microform reader/printer 3 m^2
- Light table 1 m^2
- Fax .5 m^2
- Trollies 2 m^2
- Total **39.5 m^2**

E. Essential proximities

- Toilets (for visitors) nearby

F. Sketch Layout

G. Notes

- The current shelving does not meet OHS standards
- More mobile book shelves will reduce the space required, but the floors need to be almost double the strength of ordinary flooring

6.21. WORKSHOP (SHARED RESOURCE)

A. Purpose

A small, suitably equipped workshop is essential to provide technical staff with the capacity to repair and maintain field equipment and vehicles efficiently and effectively. It should be located in the vehicle compound or adjacent to the equipment storage module. Small tasks that can be dealt with in-house in properly set-up workshop will avoid expensive outsourcing or time consuming trips to the Woodvale workshop.
The workshop should be located away from quiet areas such as workstations.

B. Number of Workstations

- none

C. Special Facility Requirements

- Benches,
- Vices,
- Oxy welder,
- Grinder ,
- Bench saw,
- Drill press,
- Hand tools.
- A workshop manager should be appointed to control use of equipment.
- Telephone,
- Sink

D. Total Area

- 64 m^2

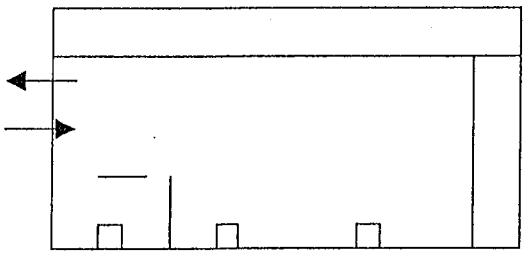
E. Essential Proximities

- Close to the equipment storage module.
- Away from the main building

F. Notes

- The design of this facility will be influenced by Occupational Health and Safety regulations.

G. Sketch Layout



6.22 WASHDOWN –VEHICLE AND EQUIPMENT (SHARED RESOURCE)

A. Purpose

There is a requirement to ensure vehicles travelling into the field are free of soil pathogens. Biodiversity policy has been to ensure washdown of vehicles at the completion of fieldwork. This takes place immediately after leaving a known dieback area or at Woodvale if washdown facilities cannot be located.

All vehicles must leave the base clean and free of soil pathogens.

Some field equipment requires high pressure cleaning as a maintenance issue.

B. Number of Workstations

- None

C. Special facility requirements

- Washdown pad and drainage sump tolerant of decontamination chemicals such as sodium hypochlorite.

D. Total Area

- 20 m^2

E. Essential Proximities

- Close to vehicle compound and equipment storage
- Close to chemical store.

F. Notes

- It may be possible to access commercial washdown facilities. However these can be unreliable and unavailable at times.
- The importance of ensuring 100% disease free practice demands a dedicated facility near the vehicle storage compound.

G. Sketch Layout