



Karratha Works Depot Office Building Expansion

City of Karratha

Design Development Report



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Design Development Report

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Karratha Works Depot Office Building Expansion

Executive Summary

This report focuses on the findings of the developed design for the Office Building Expansion at the City of Karratha's Depot. This project has been conducted for the City of Karratha and the findings are developed in close consultation with the Depot staff and the Project leaders at the City of Karratha.

The proposed administration building expansion allows for improved functionality for existing staff, with allowance for additional expansion if required for relocation of existing staff from other administration locations.

Current land use at the Depot is not highly developed and there appears, with adequate planning and control, to be sufficient land at the Cowle Road site to meet current and future operational needs.

One of the redevelopment proposals is to expand the office space area to permit for relocation of staff from isolated transportable buildings within the current site, plus cater for depot operational staff growth and improve depot security, parking, customer access, building compliance fire systems, staff training and amenities facilities.

A new facility with Nett Floor Area (NFA) of 346 sqm has been designed to house a reception, the Manager of Infrastructure, Technical Services staff, Building Maintenance staff, Rangers as well as two small meeting rooms, print facility, sick room and staff amenities, with the provision for future expansion to a large meeting and training room of 96sqm.

The existing facility requires some internal modification to better support the functions of Stores, Technical Services and Fleet staff, along with providing a co-joined briefing and office space for the Parks & Gardens and Works staff. The crib room, server room and amenities remain and there is provision for an Archive store, a relocated print room and the addition of lockers for peripatetic staff. This is an area that is not suitable for office accommodation. This facility is 403 sqm (NFA).

Two staff will remain in the Workshop Mezzanine of 30 sqm. This empties a range of outbuildings of staff which equates to 133sqm. The nett gain is 213 sqm of space.

The new facility is deliberately designed to be less than 500 sqm of floor area. This will obviate expensive fire services. The cost to this is there is little room for expansion. A couple of the areas may be altered to house new staff and the meeting rooms can be re-purposed, however planning for a third building may be required if there are staff increases or relocations are envisioned.

The site appears to be adequately serviced for the building as planned and the design can be engineered to meet the wind and climate zone conditions of Karratha as outlined in AS1170.

Karratha Works Depot Office Building Expansion

A range of design considerations has resulted in a thoughtful selection of materials and design strategies. With a focus on sustainability, the new facility's thermal performance and low maintenance requirements are of prime importance.

The design is planned to be procured in a number of ways to suit the city's time line and availability of local suppliers and supplies.

Demolition	\$ 91,169
Existing Administration Refurbishment	\$ 494,665
New Admin Building (excl training room)	\$ 2,471,573
External Works	\$ 656,110
External Services	\$ 66,900
Fit out	\$ 193,355
Fire Wall between existing Admin & Stores	\$ 43,130
TOTAL (Ex GST)	\$ 4,016,901

Options (Ex GST)

Meeting & Training Room to New Admin*	\$ 460,547
Ring Road 1 & Ring Road 2	\$ 252,377
Convert Parks & Gardens to Archives Store	\$ 24,821

Clarifications

* Indicates the costs to build extension at same time as main building

A staged approach to redevelopment is recommended to minimise disruption to Depot operations and allows for facilities to be constructed based on the City's priorities.

Karratha Works Depot

Office Building Expansion

1.0 Background

This report focuses on the expansion of the operational offices at the City of Karratha Works Depot site located on Cowle Road at the Light Industrial Estate in Karratha.

Currently the existing depot is at capacity and staff are located across the site in a range of transportable and outbuildings. This results in staff needing to leave their building and come to the small reception to meet the public.

There are benefits in co-locating staff nearby, including development of working relationships between workforce sectors and collaborative problem solving, information sharing and opportunities for increased cross-team projects.

The site has poor security and access control needs to be considered for site safety and security.

The City of Karratha outlined their design outcomes as:

- Building design to allow for staged building developments
- Controlling site access/Stores deliveries
- New Reception/Visitor area
- Compliant fire system design
- Additional offices for future staff expansions
- Training/meeting rooms needs
- Additional ablutions
- Records storage
- Print room
- Staff and visitor site parking – minimising people vehicle interface conflict



Aerial view of the City of Karratha Works Depot with identified staff accommodation in outbuildings

Karratha Works Depot
Office Building Expansion

2.0 Research and design methodology

Slavin Architects were engaged to undertake the following works as part of this project.

The methodology included:

- A detailed site inspection
- Three visits to Karratha to meet with Depot and other City of Karratha staff to review design
- Presentation to the Depot Working Group outlining the findings, showing detailed initial design and demonstrating buildability
- Email and phone conferences to refine the design details, locations and functionality to suit.

We wish to thank Geoff Shoemark and Lisa Verrall for their conscientious support.

3.0 Existing Depot and Services

3.1 Office Facility

The current depot is 403 sqm of nett floor area and of masonry construction. A variety of outbuildings along with a mezzanine floor in the workshop house over 40 staff.

Other field staff gather here for work briefings and work allocation.

Below is a breakdown of the space allocation in the existing depot office and the outbuildings used for office accommodation.

Existing Accommodation	Function	Net Floor Area (Sqm)	Comments
Main Depot Building	Offices	194	Includes large offices with meeting spaces
	Reception	18	Currently room for one staff member.
	Meeting Room	19	Dedicated- no windows
	Amenities Kitchen (68 sqm) Bathrooms (35 sqm)	103	Includes Circulation, UAT, Right Hand Transfer with shower in transfer area
	Server Room	14	Not to be moved
	Circulation/ Printer	55	Printer in thoroughfare
Sub total		403	
Outbuildings			
Rangers	Offices	43	Housed in an existing transportable building - required to walk to reception to meet with public
Building Maintenance	Offices	72	Rented Transportable building - required to walk to reception to meet with public
Mezzanine	Workshop Mezzanine	30	Currently used by Fleet & Plant Co-ordinator /Support Officer
Workshops 1	Offices	18	Currently occupied by the Fleet & Plant Supervisor and Leading Hand
Sub total		163	
TOTAL		566	

The existing facility has been redesigned internally for better functionality. It includes accommodation for allied groups and provides archival storage, lockers and briefing areas. Please see Drawing 6. Existing Facility-new arrangement.

4.0 Accommodation Schedule

Division	Role	Current Accommod	Notes - Current location
MANAGER	Manager Infrastructure	17	
WORKSHOPS	Fleet Coordinator	30	Located in Mezzanine
	Fleet Support		
	Fleet & Plant Supervisor	18	Located in Transportable shared
	Leading Hand		
	HD Mechanic		
	HD Mechanic		
	Apprentice		
STORES & HEALTH	Depot Coordinator	10	
	Depot Services Officer		
	Depot Services Support Officer		
	Customer Services Officer – Stores	53	Includes circulation
	Courier Driver – Yardperson		
	Pest Control		
PARKS AND GARDENS	Parks & Gardens Coordinator	26	
	Leading Hand		
	Landscaping Design		
TECHNICAL SERVICES	Technical Services Coordinator	14	
	Senior Engineering Technical Officer		
	Engineering Technical Officer	47	
	Engineering Technical Officer		
	Engineering Technical Project Officer		
	Project Officer		
BUILDING MAINTENANCE	Building Mtce Coordinator		
	Building Mtce Planner	72	Currently located in an Outbuilding
	Building Mtce Officer		
	Mtce Handy Person		
	Cleaning Supervisor		
WORKS	Operations Coordinator		
	Works Supervisor	27	
	Administration Officer		
RANGER	Ranger Coordinator		
	Senior Ranger	43	Currently located in an Outbuilding
	Ranger		
	Ranger		
	Ranger		
	Trainee Ranger		
	Emergency Coordinator		
	Community Safety		
	Ranger's admin officer		
SERVER		14	
Main RECEPTION		18	
	Back of house		
INTERVIEW/MEETING		19	
TRAINING			
PRINT	Print Room	55	Includes passage
TOILETS	1 UAT, 2 Toilets	36	
AMENITIES	Crib Area	67	
	Storage		
	Lockers		
	Ice		
PASSAGE & STORAGE			
SPARE OFFICES			
SICK BAY			
		566	

The schedule (left) outlines the current space allocation for the staff located at the depot, including those people located in outbuildings.

This information was used to determine the following:

- The space required for each of the sectors at the Karratha Works Depot
- Status and office requirements
- Requirements for visitors and how staff service a range of depot visitors including general public and deliveries.
- A rough guide to ensuring that there is a equitable allocation of space between staff of similar status and also between the existing and new facility.
- In addition, the process also allowed to place such needs as training and briefing rooms on the agenda.

5.0 New depot facility - design considerations

5.1 Introduction

The design process for a new depot building is presented in the appendix in A3 format.

This includes an overall site plan, car parking, security, demolition and a range of drawings that show the new facility's layouts, along with changes to the existing facility.

The design has been developed over time with extensive consultation with the project team at the City of Karratha and is designed to meet the needs at current staffing levels.

A major design consideration is that the new facility needed to be under 500 sqm in size, to avoid the costly impost of the increased fire services necessary for buildings over 500sqm as mandated by in the National Construction Code.

A site for a third building has been reserved on the Site Plan. There is also reserved space to expand the current store by approximately 130 sqm.

5.2 Structural Material Options

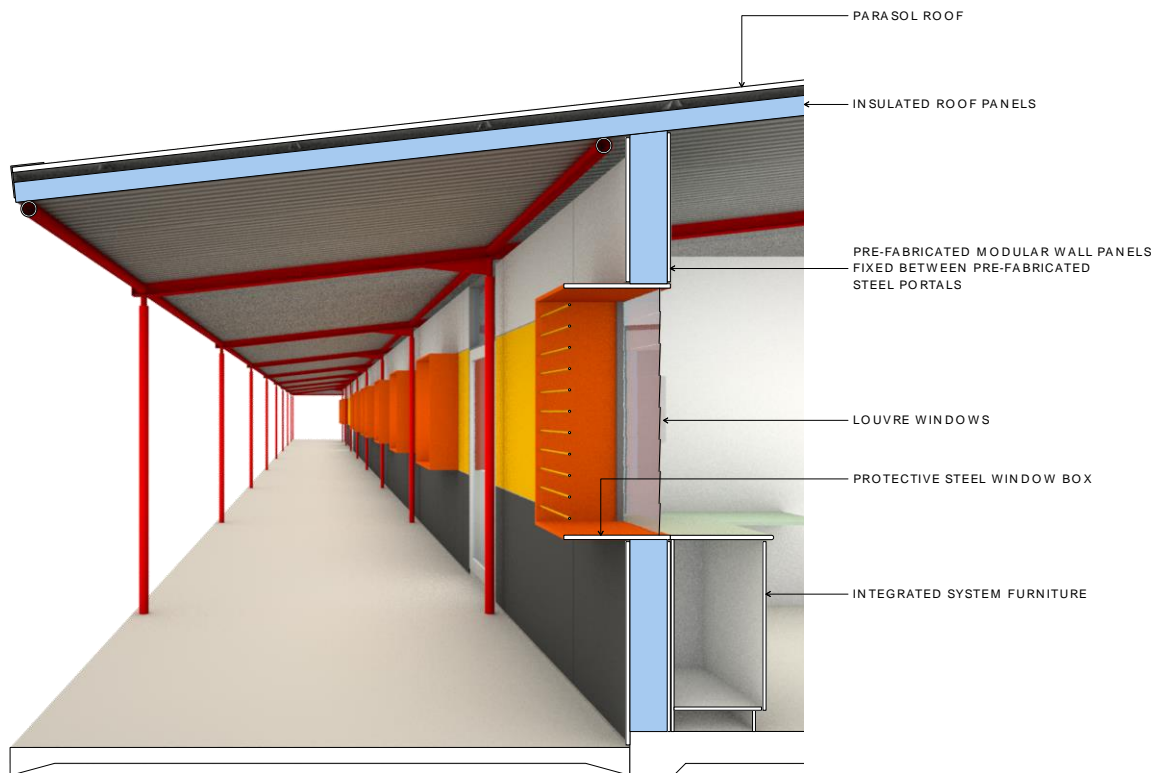
Drawings A903 and A904 in the suite of drawings in appendix of this report provide a range of materials for construction of the new depot facility.

The design is componentised and allows for a range of procurement options. Once procurement is determined, proprietary systems can be identified.

The key principles in materials selection include:

- Climatic and ESD performance
- Selection for minimal maintenance
- Selection for the budget and life cycle costing
- Adaptability of the facility over time-whether it facilitates changes over time.

A cross sectional diagram (over) shows the indicative materiality of the new facility.



NEW ADMINISTRATION BUILDING
section detail

Slavin

5.3 Services Connections

Service connections to the new facility appear to be adequate to service the new facility.

Individual desk connections will be reticulated along wall panels to desks, to provide as a rule of thumb:

- 2 ethernet connections, plus spares for printers. This allows a VOIP system to be retrofitted as site connectivity accommodates this.
- Four GPOs per desk
- a double GPO every three metres

5.4 Fit-Out

Room sizes, desks and storage have been standardised to allow for componentised furniture modules. This allows reconfiguration as staff levels change and provides a sense of uniformity throughout the facility.



Furniture modules typology similar to the design for the fit-out of the new Karratha Depot Office Facility

5.5 Finishes to minimise cleaning and maintenance needs

During Contract Documentation the following may be specified to minimise maintenance costs.

- The use of shop finished and shop applied pre-painted finishes such as powder coating to steelwork, provide high resistance and obviate the need for constant painting.
- Durable natural finishes, programmed maintenance budgets are reduced. Use of self-cleaning and graffiti resistant stainless steel in high risk areas further reduces maintenance costs.
- Pre-painted metal external doors withstand vandalism, moisture and wind damage.
- Interiors feature non-flammable materials, use of quality door furniture and keying systems that cannot be copied by unauthorised persons.
- The use of anti-graffiti finishes has reduced the maintenance costs and insurance claims.
- Concrete paving in preference to brick paving to reduce relaying costs due to displacement of individual bricks from tree roots, subsidence and traffic.
- All hardscape is assessed for loadings and potential traffic. Appropriate thicknesses, preparation, compaction and materials are specified and applied to reduce the early failure of pavements.
- Cabinet work and its hardware are specified to ensure durability. Post-formed laminates are preferable to plastic edges that can be pulled off.
- High impact toilet partitions.
- Vinyl floors in offices and circulation space, tiles in ablutions and kitchen areas.
- Highly durable and easily cleaned floor finishes are used in areas of high traffic.
- Limited roof mounted equipment and designing for ground level locations results in easier and safer access for maintenance and reducing the potential for roof damage by foot traffic.
- Service layouts and locations are designed to remove the need for roof penetrations which are potential points of water and vandal ingress and maintenance.
- Similarly roof pitches are sufficient to minimise leakages and water ponding damage as a result of foot traffic. Exposed timber is limited to prevent extra maintenance costs.

5.6 ESD Considerations

The City of Karratha's commitment to the Environment and Sustainability is noted through its various Strategic, Asset and Operational Plans.

The expansion of the Depot Offices offers a great opportunity to demonstrate a lighthouse project. Discussion held during the three visits focusing on this project suggested that there was some reservation by some on the efficacy of solar generated power by City staff. Our research is that it remains an attractive option for the City of Karratha Works depot. The outcomes for the solar project at the Karratha Airport will provide some crucial data on this, and subject to the acceptable cost-benefit, solar power generation is a preferred site option and it is recommended further detailed whole life cycle cost evaluations are prepared as part of the detailed design.

The proposed building materials are all designed with energy efficiency in mind. The roof structure uses insulated sandwich panels under a parasol roof for excellent thermal performance.

Similarly, the walls in the proposed new facility use insulated panels under deep verandas.

In a well-designed building the mechanical services comfort systems can readily be optimised beyond the requirements of the Building Codes energy requirements. The savings in energy cost is usually achieved at reasonable capital cost, and several options are available. The detailed combination needs to be discussed with an experienced designer.

For example, comfort cooling can be achieved from Climate-Wizard style unit. These pre-cool the outside air (fresh air) to the rooms at very low energy cost, and can deliver substantial cooling to the building.

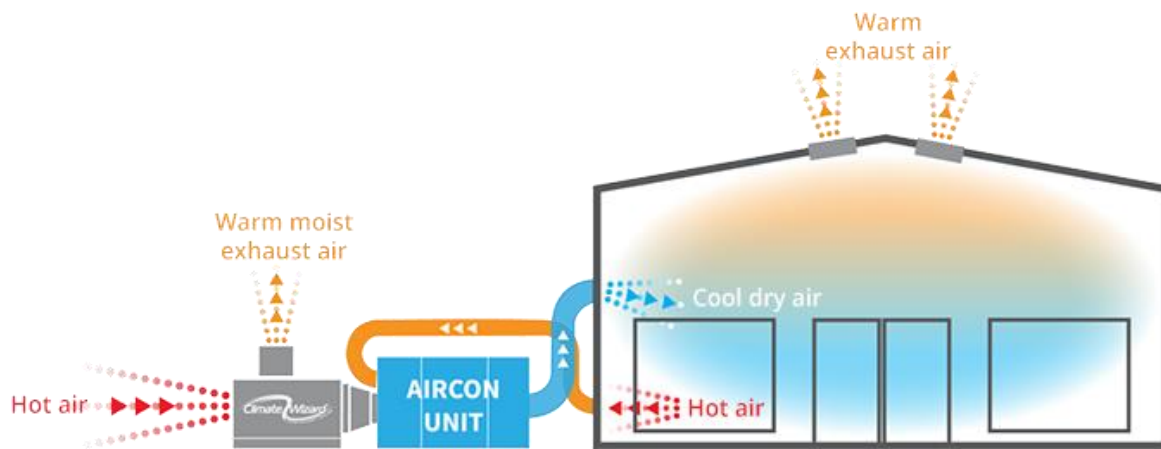
Climate-Wizard style coolers can be coupled with a small installation of conventional air conditioning units to supplement the free-cooling. This system is sometimes referred to as Hybrid Climate Wizard. The Climate Wizard units are the main cooling source for most of the year. The air-conditioning assists the Climate Wizard on very hot or very humid days, and gives winter heating when needed.

An alternative to Climate Wizard is to run air through a radiator system charged with fluid pre-cooled through a pipe loop located below ground at an isothermal level.

This hybrid options will reduce the air conditioning energy and costs, as well as substantially reducing the run-hours of the air conditioners. Savings with Climate Wizard can be even greater for high occupancy areas where the large quantities of outside air (fresh air) are required to the room.

Night-cooling is another form of "free"-cooling at lower capital and energy cost than the Climate Wizard systems. This cools the building overnight taking that stored heat and is effective on most very hot days. For buildings with infrequent occupancy, such as meeting halls, storage areas, these can dramatically improve summer comfort.

A broad cost benefit analysis of HVAC systems is included in Section 7.0- Cost Summary



Location of Climate Wizard in relation to the air conditioning unit.

Life cycle costing is a recommended strategy for asset management and this has influenced the design of the new facility. It is preferred that a facility is adaptable over time to cater for future use. With low-maintenance materials, fixtures and fittings, the facility will last well into the future, but to be usable in an uncertain and unpredictable future, it needs to be able to be modified for new and changing uses.

Fixtures and fittings will contribute to the environmental and economic sustainability with the use of LED lighting and water saving devices.

6.0 Accommodation schedule for combined facilities

Division	Role	Plans	Existing Buildings (SQM)	Rec.Accommodation - New Building (SQM)	Relocations - Notes	Notes
MANAGER	Manager Infrastructure			19	To New Facility	Office with meeting space
WORKSHOPS	Fleet Coordinator		15		To Depot	
	Fleet Support		15		2 seat office	
	Fleet & Plant Supervisor		15		To Mezzanine	
	Leading Hand		15		To Mezzanine	
	HD Mechanic					
	HD Mechanic					
	Apprentice					
STORES & HEALTH	Depot Coordinator		14		Existing facility new layout	
	Depot Services Officer				Existing facility new layout	
	Depot Services Support Officer				Existing facility new layout	
	Customer Services Officer – Stores		48		Existing facility new layout	
	Courier Driver – Yardperson				Existing facility new layout	
	Pest Control				Existing facility new layout	
PARKS AND GARDENS	Parks & Gardens Coordinator		24		Office and workstations	
	Leading Hand				Request for seating for 2-3	
	Landscaping Design	Y			Email VC 18/4	
					Existing facility new layout	
TECHNICAL SERVICES	Technical Services Coordinator	Y		14	To New Facility	
	Senior Engineering Technical Officer	Y			Request for 1 extra -ie Co-ord + 6 staff	Layout space
	Engineering Technical Officer	Y		38		
	Engineering Technical Officer	Y				
	Engineering Technical Project Officer	Y				
	Project Officer					
BUILDING MAINTENANCE	Building Mtce Coordinator	Y		14	To new Facility- Office	
	Building Mtce Planner	Y			To new Facility	
	Building Mtce Officer			19	To new Facility	
					To new Facility	
	Mtce Handy Person				To new Facility	
	Cleaning Supervisor				To new Facility	
					Reception	
WORKS	Operations Coordinator				Existing Facility	
	Works Supervisor		24		Existing Facility	
	Administration Officer				Existing Facility /	
RANGER	Ranger Coordinator				To new Facility -Open Plan	
	Senior Ranger			14	To new Facility office	
	Ranger				To new Facility -Open Plan	
	Ranger				To new Facility -Open Plan	
	Ranger				To new Facility -Open Plan	
	Trainee Ranger				To new Facility -Open Plan	
	Emergency Coordinator	Y		38	To new Facility -Open Plan	
	Community Safety				To new Facility -Open Plan	
	Ranger's admin officer				?Reception	
SERVER			14		To remain	
Main RECEPTION				12	Public area only -Front of House	
	Back of house			36	Seven work stations	
INTERVIEW/MEETING				27	Two interview rooms in new facility	
TRAINING			52			
PRINT	Print Room		10	9	2 facilities	
TOILETS	1 UAT, 2 Toilets		36	14	1UAT 2 Toilets	2 sets of facilities
AMENITIES	Crib Area		59	8		
	Storage		33			
	Lockers		14			
	Ice					
PASSAGE & STORAGE			45	75		
SPARE OFFICES			0	0		
SICK BAY				9		
			433	346		

Includes 30sqm
Mezzanine

7.0 Cost Summary

7.1 Cost Estimate from Quantity Surveyor

REPORT SUMMARY

PRELIMINARY



Project: Karratha Depot Building: Karratha Depot - Administration Reurbishment		Details: Preliminary Cost Indication REV.1 (VERSION 2)		
Code	Trade Description	Trade %	Cost/ m2	Trade Total
	DEMOLITION	1.92		91,169
	EXISTING ADMINISTRATION BUILDING REFURBISHMENT	10.40		494,665
	NEW ADMINISTRATION BUILDING	51.97		2,471,573
	EXTERNAL WORKS	13.80		656,110
	EXTERNAL SERVICES	1.41		66,900
	FIT OUT	4.07		193,355
	TOTAL (EXCL. OPTIONS BELOW)			3,973,771
	<u>OPTIONS</u>			
	FUTURE BUILDING EXTENSION (MEETING & TRAINING ROOM)	9.69		460,547
	FUTURE ROAD WORK (RING ROAD 1 & RING ROAD 2)	5.31		252,377
	FIRE WALL BETWEEN EXISTING ADMIN AND STORE BUILDING	0.95		45,130
	EXISTING ADMIN. BUILDING - CONVERT 'PARK AND GARDEN' TO 'ARCHIVES'	0.53		24,821
	TOTAL COST FOR OPTIONS			758,054
	NOTE: LOCALITY ALLOWANCE BASED ON CLIENT'S NOTES			
	NOTE: ALL COSTS EXCLUDE GST			

CostX:
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Cost Base Date:
Date of Printing: 21/07/2016

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7.1 Evaluation of the HVAC systems

This is a summary of the cost comparison between three options of HVAC systems for the design of an existing and new administration building for the Karratha Depot Project. Designs are in the concept phase only and are based on the architectural concept design provided by Slavin' Architects. This document is for information only; any quantitative values are estimates and must not be used for any contractual purposes.

7.1.1 Cost comparison

All options are based on the concept design attached to this document and cost comparison will only reflect the cost differences in the each option and must not be assumed to be the total cost for the HVAC system.

Option 1: Cassette (Daikin FFQ35C2 Compact Cassette) System

Option 2: VRV (Daikin Ducted Reverse Cycle Air Condition FDXS6o) System Option 3:

VRV (Daikin Ducted Reverse Cycle Air Condition FDXS6o) System with 2 Climate Wizards

The following assumptions were made for the estimates:

Each building HVAC system will provide a total of 60 kW of cooling

Months per year used for heating = 0 month

Hours per day used for heating = 0 hour

Months per year used for cooling = 10 months Hours

per day used for cooling = 12 hours

Please refer to the table below for a cost comparison: Cost

Estimate:

	Option 1: Cassette system - heads	Option 2: HVAC Indoor Fan Coil Unit system without Climate Wizard	Option 3: HVAC Indoor Fan Coil Unit system with Climate Wizard
Supply	\$ 150,000.00	\$ 134,000.00	\$ 170,000.00
Ductwork		\$120,000.00	\$120,000.00
Operational - KW/h (over 10 years)	\$ 376,000.00	\$ 376,000.00	\$ 270,000.00*
Maintenance	\$32,000.00**	\$21,000.00	\$27,000.00
Total Supply overheads (over 10 years)	\$ 558,000.00	\$ 651,000.00	\$587,000.000

* This is an estimation of the costs when both the HVAC Indoor Fan Coil Unit and the Climate Wizard are running together. In reality, the Climate Wizard alone will result in 80% savings on the monthly running costs for 5 months of the year.

** This assumes that the cassette units will not need to be replaced within 10 years. It is highly likely that the units will need to be replaced in the Karratha environment.

Notes: Supply cost and cost saving for the Climate Wizard is based on consultation with a HVAC engineer

Cost Estimate Exclusions:

- AC condensers
- Ducting costs
- Installation Costs
- Maintenance Cost

Summary

The cost estimates show that a Ducted System pre-cooled by a Climate Wizard represent the best value over a 10 year period. It is recommended that further detailed analysis of the HVAC options be carried out in order to determine the most appropriate solution in terms of health benefits and economy.

8.0 Fire Compliance

General

All buildings that are in excess of 500m² are required to be service by Fire Hydrants and Fire Hose Reels in accordance with the National Construction Codes.

New Administration Building

The design of the new building has been deliberately kept below 500 sqm to ensure it does not require fire hydrant and fire hose reel coverage. The distance between the existing building and the proposed new depot facility (minimum 3m) is sufficient for fire separation. In order for the respective fire compartments of the new and existing Administration Buildings to be assessed as separate, the verandah between the two buildings will require design with an open portion to satisfy NCC requirements. This is noted and will be managed during Detailed Design.

Existing Administration Building

Currently, the combined fire compartment of the Existing Administration Building and Stores Building exceeds 500m² and the site does not have adequate water supply for fire fighting purposes. In order to achieve compliance with AS2419 and Clause E1.3 and E1.4 of the National Construction Codes the existing buildings must either be serviced by fire hydrants and fire hose reels or have fire separation that reduces the fire compartments below 500m². Both options were assessed and a summary of the costs are below:

Option 1:

Upgrade water supply to allow Hydrant and FHR Coverage

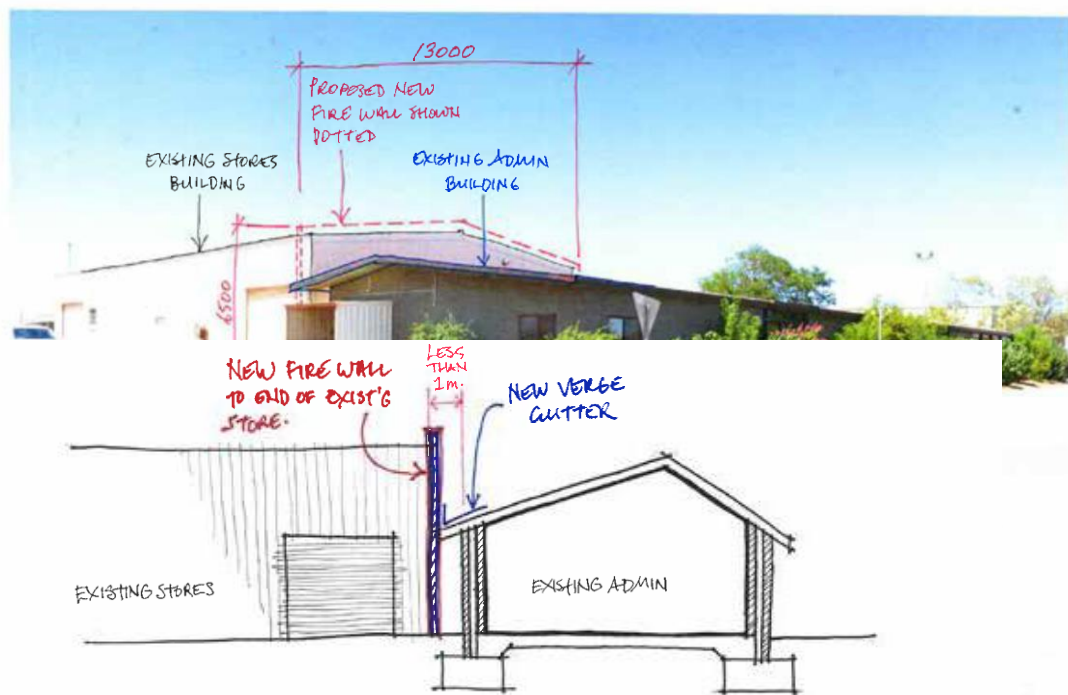
The site's current water supply provides inadequate pressure and should be upgraded to protect the Administration Building and Stores. Based on the pressures recorded and rates of flow, an upgraded hydrant and hose reel system would require on-site water storage and a pumpset. The costs to supply & install this configuration would be in the order of \$90,000.

Option 2:

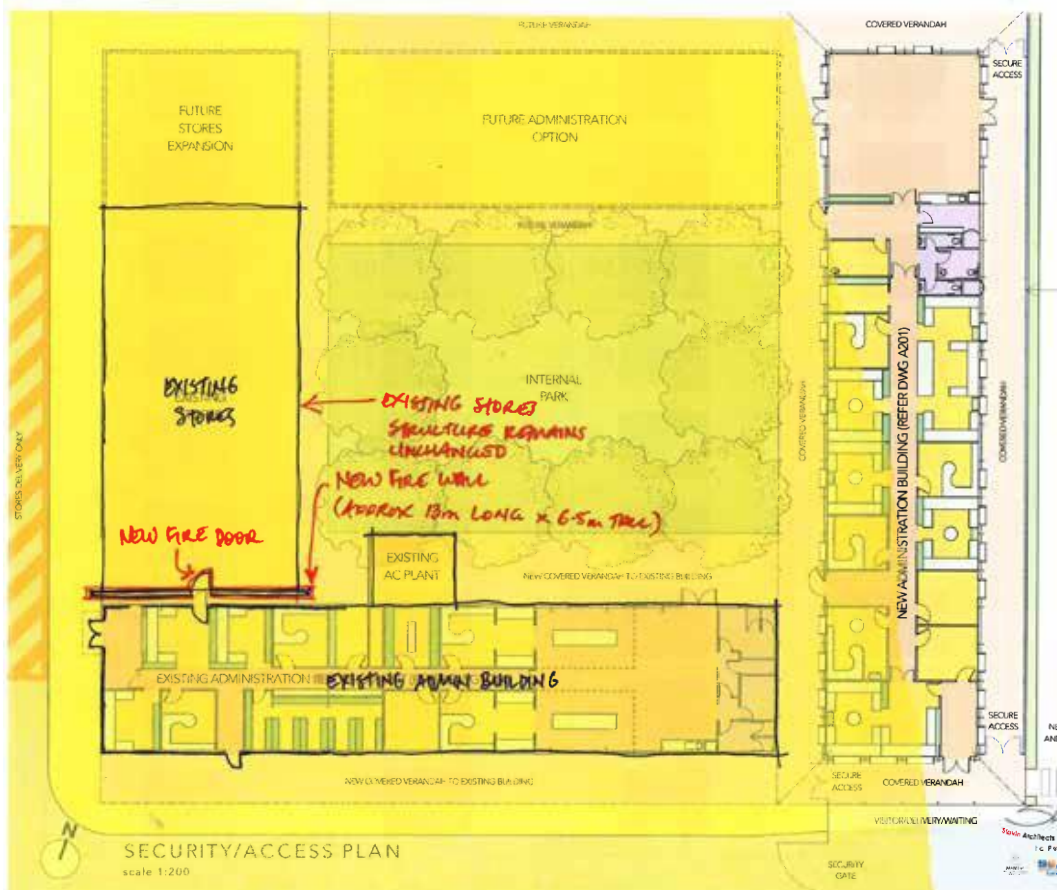
Create fire separation between Existing Admin & Stores Buildings

In order to bring the combined fire compartment of the Existing Administration and Stores Building below 500m², a fire wall could be constructed between the two buildings to create fire separation and bring their respective fire compartments below 500m². The costs of a 2 hour fire wall are estimated to be \$43,130.

Some initial sketches of the fire wall are shown over the page to guide the documentation of the fire separation.



KARRATHA WORKS DEPOT. 11-7-16

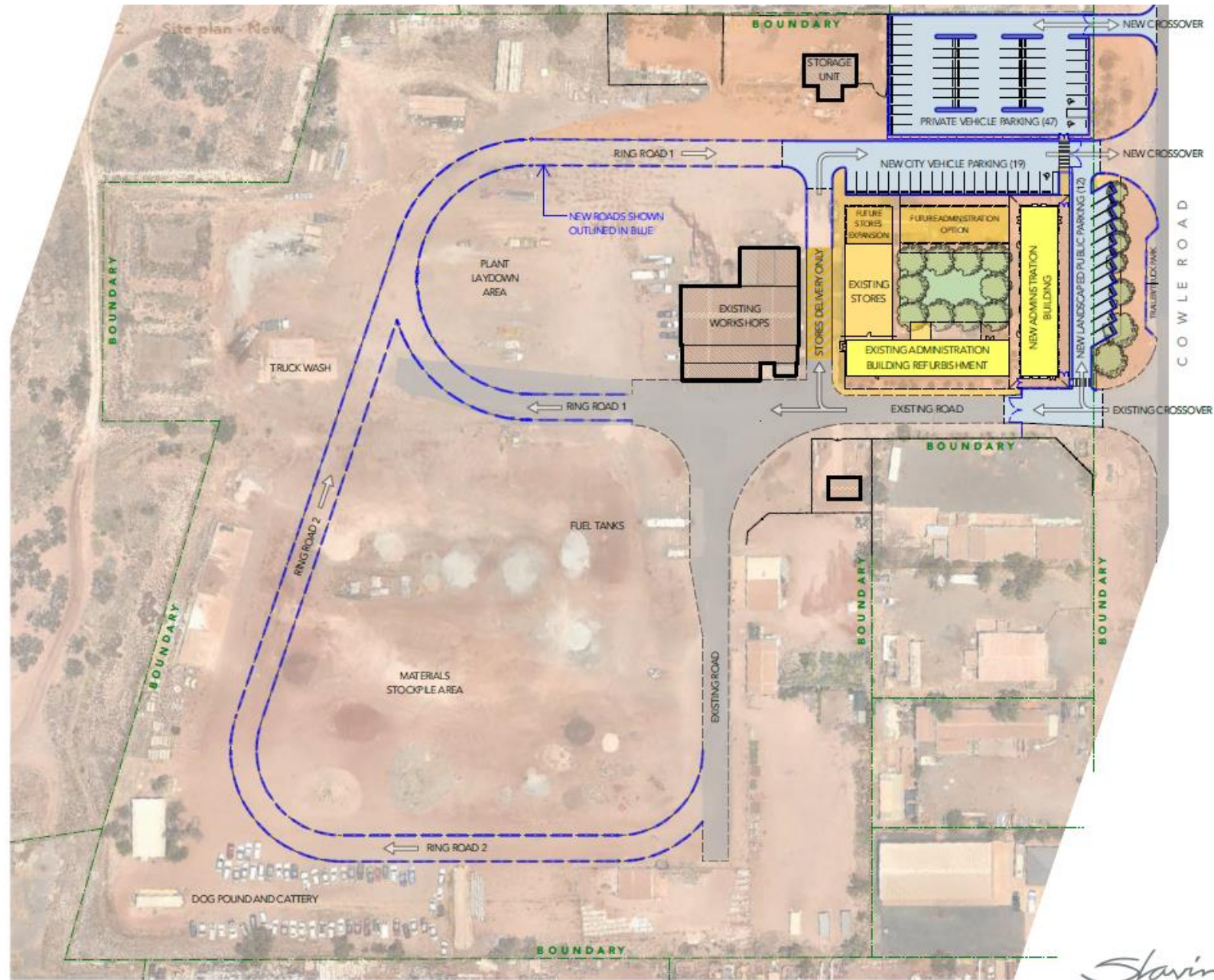


9.0 Appendices

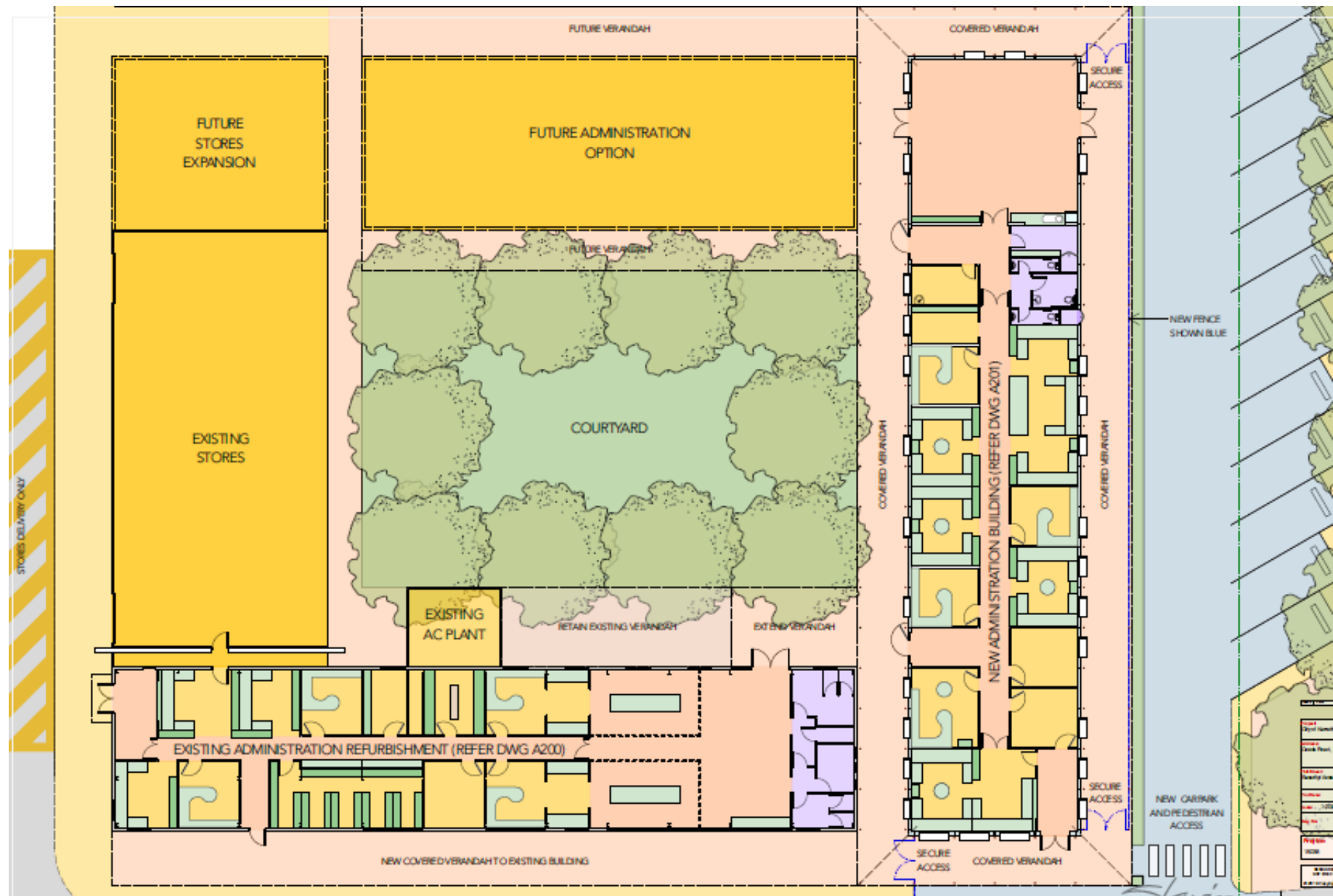
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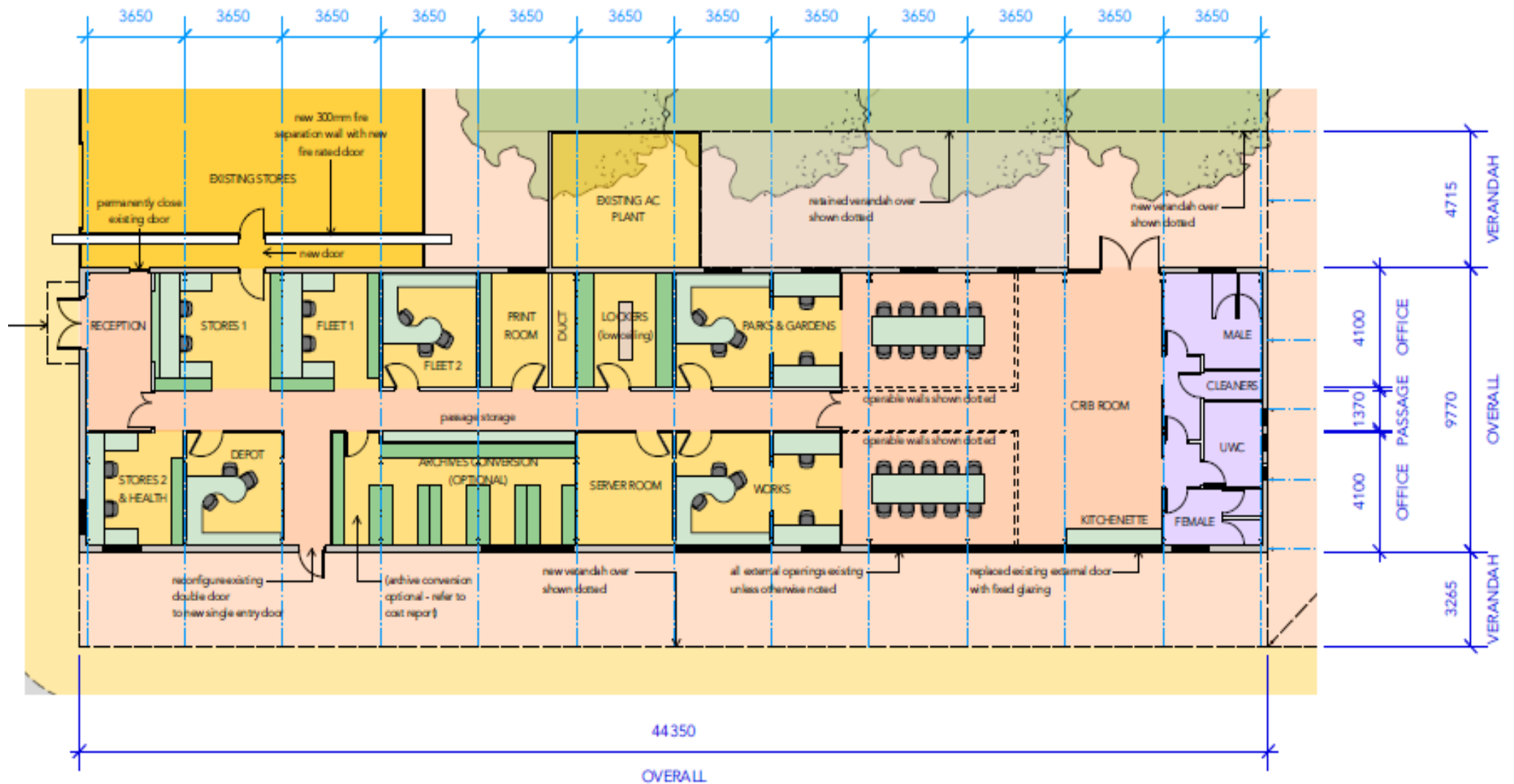
1. Site Plan of Proposed New Developments



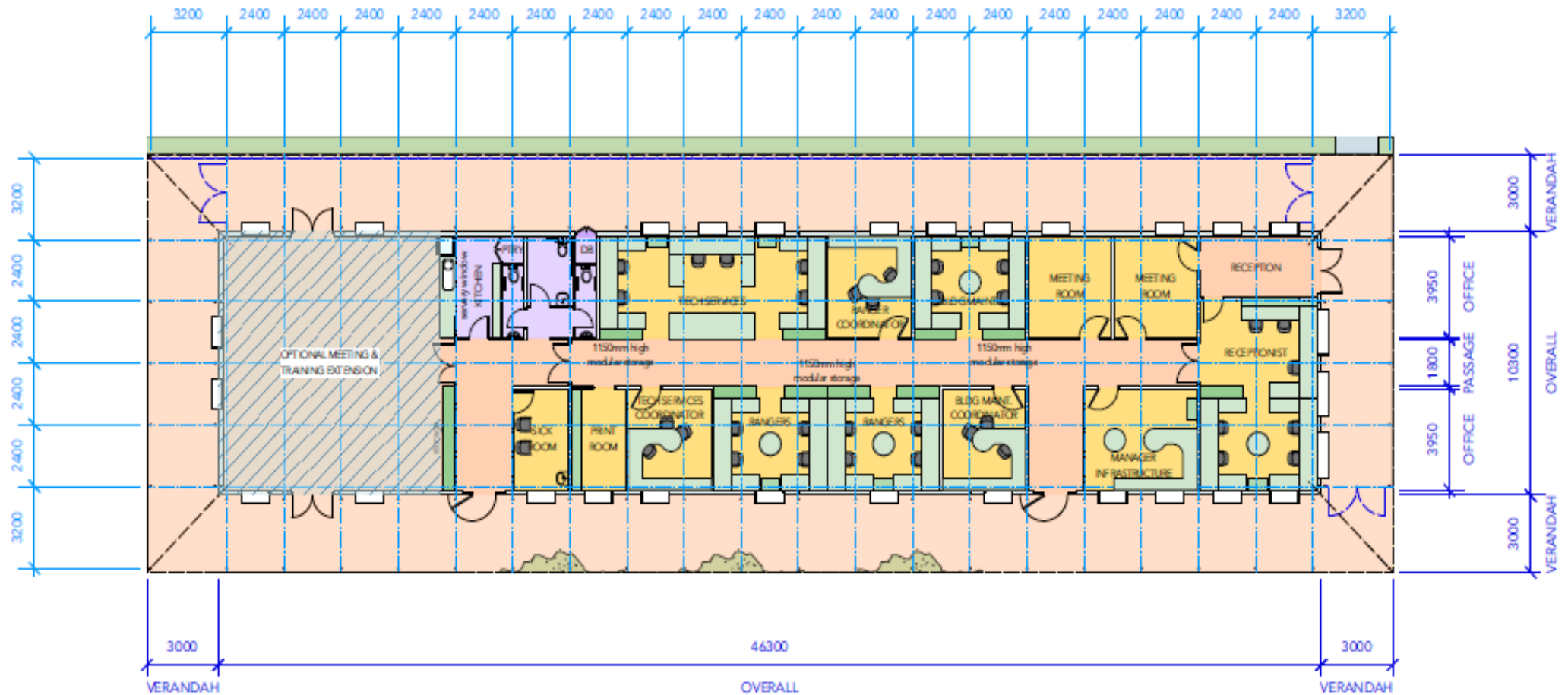
2. Proposed Building Configuration and Access Control



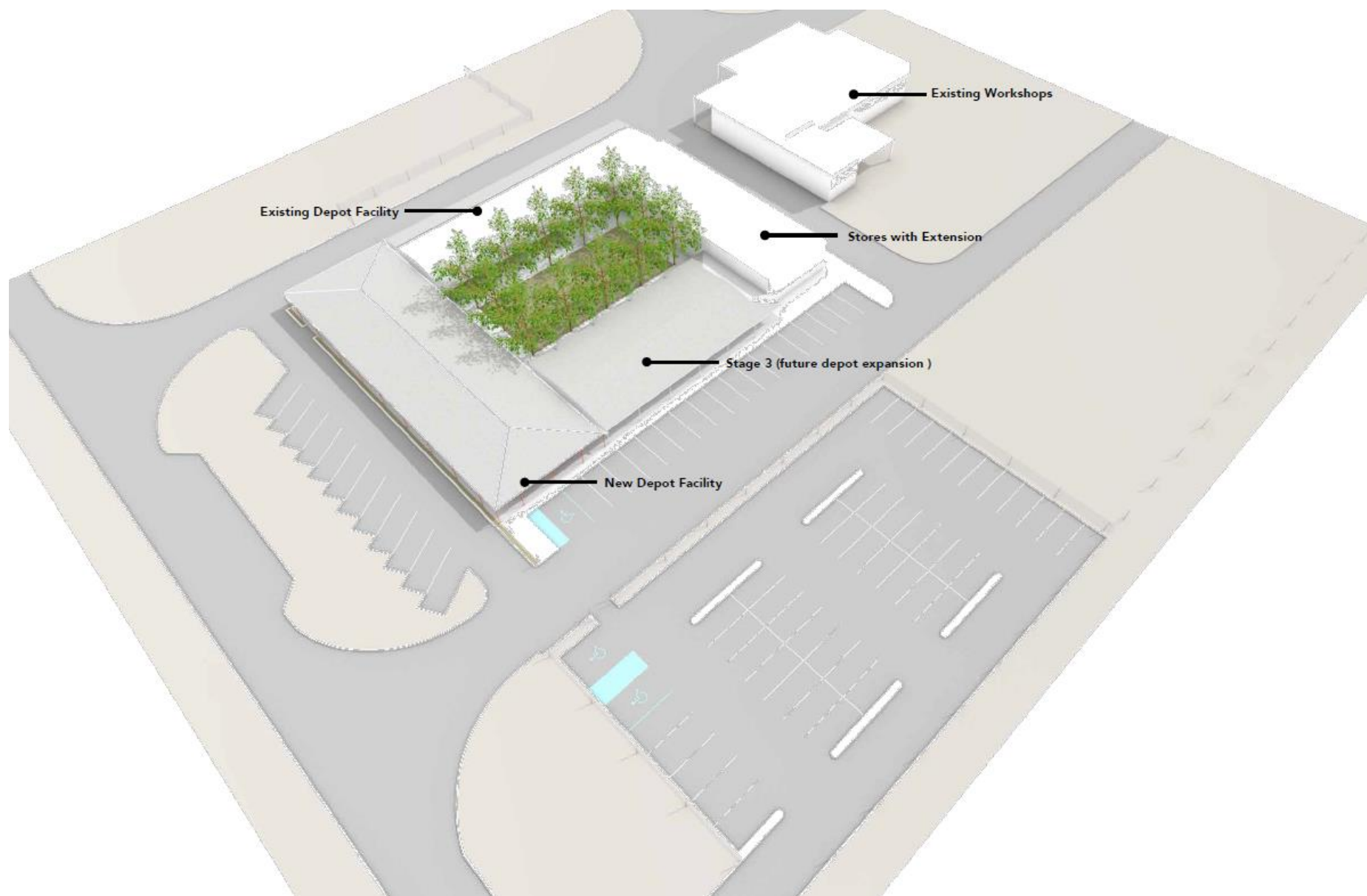
3. Existing Administration Building Refurbishment



4. Proposed new Administration Building



5. Perspective view of proposed buildings



6. Front view of proposed new Administration Building

