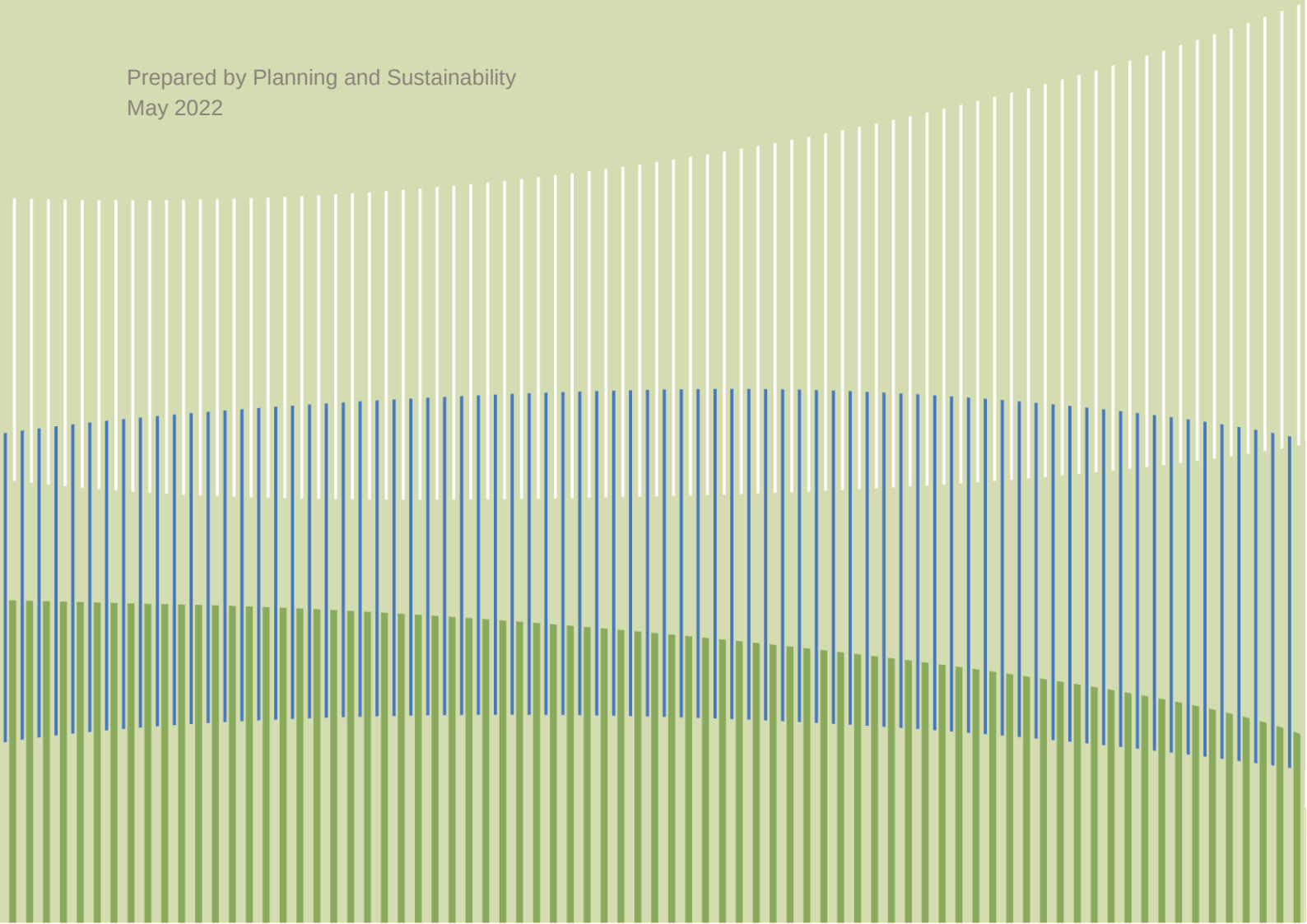
Shire of Murray

Local Planning Policy

Peel Business Park Design Guidelines

Prepared by Planning and Sustainability
May 2022



Shire of Murray

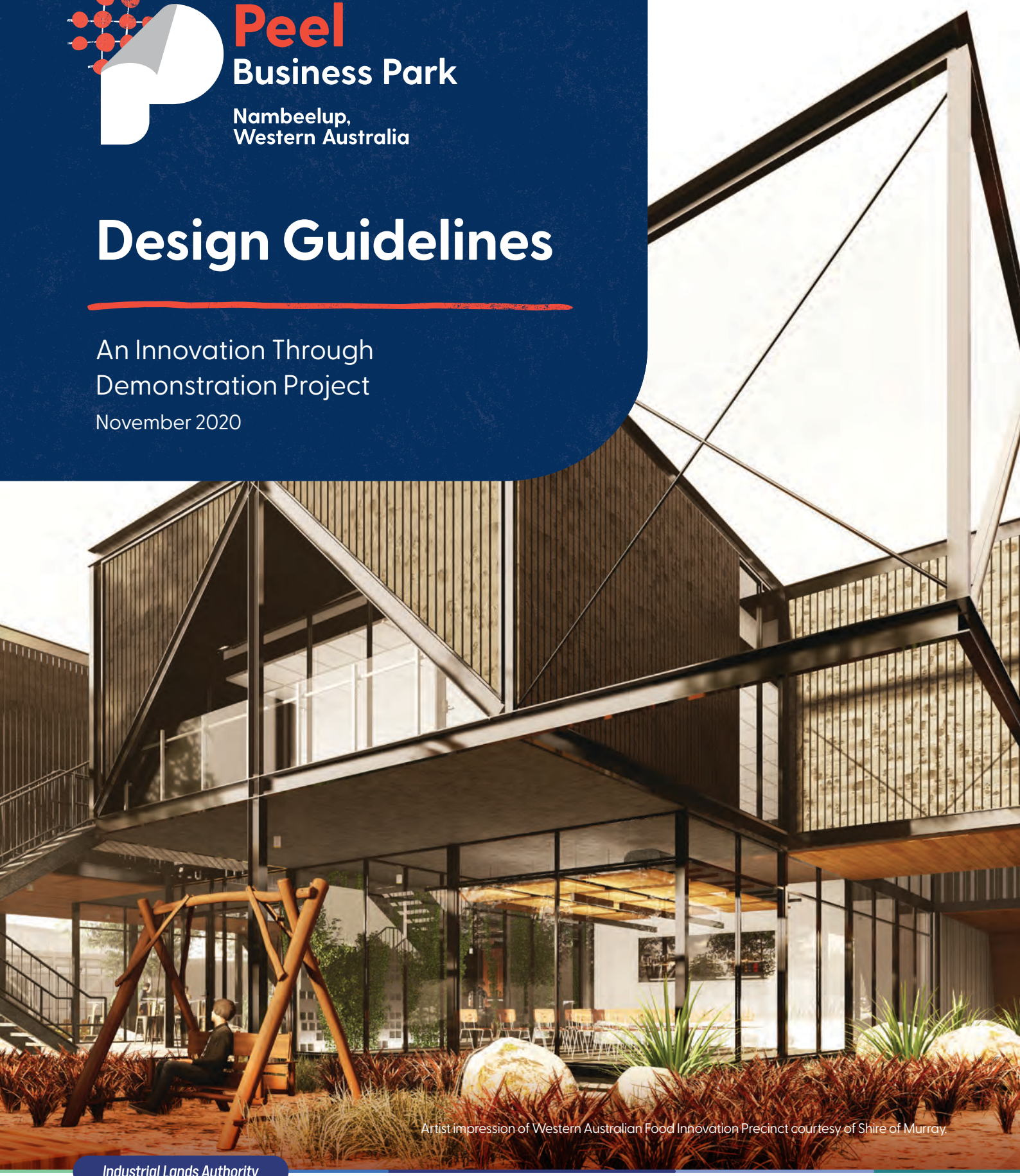
Peel Business Park

Nambeelup,
Western Australia

Design Guidelines

An Innovation Through Demonstration Project

November 2020



Artist impression of Western Australian Food Innovation Precinct courtesy of Shire of Murray.

Industrial Lands Authority

Shaping our State's future

DevelopmentWA

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1. INTRODUCTION

These Design Guidelines relate to the development of the area known as Peel Business Park, Nambeelup Western Australia. The subject area is bound by Lakes Road to the south, Gull Road to the east, Readheads Road to the north (unconstructed) and adjoining a rural lot to the west as shown in Figure 1.

1.10. NAMBEELUP INDUSTRIAL AREA

The subject land forms part of the Peel Business Park which is identified under the Peel Development Commission's Peel Regional Investment Blueprint as a critical element in the delivery of a more sustainable and economically competitive Peel Region.

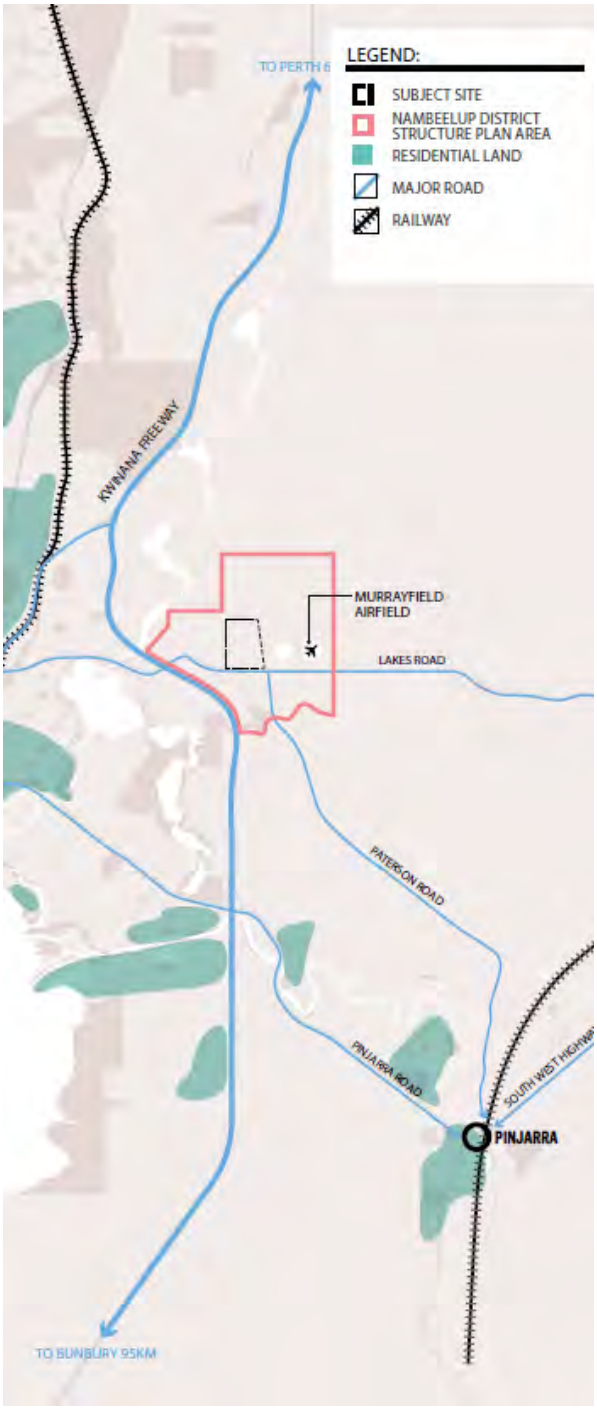
The Peel Business Park represents several strategic imperatives currently driving current state initiatives. They include:

- The diversification of the State's economy away from an overreliance on cyclical commodity exports;
- Increasing local value-add activities;
- More efficiently utilising existing resources;
- Improving Perth and Peel's urban systems to ensure that significant population growth can be supported.

Transform Peel is the overarching name for the development program initiated to deliver the Peel Business Park. The focus of the Peel Business Park (also known as the Nambeelup Industrial Area – 'NIA') will be on food manufacturing and processing industries, logistics enterprises, and supporting rural-related commercial and industrial activities.

The Peel Business Park also focuses on research and development, and training to support primary industries.

Figure 1 – Locality Plan



1.11. PEEL BUSINESS PARK DESIGN GUIDELINES

The development of Peel Business Park, Nambeelup will provide for light industry and agribusiness, pockets of more generalised industry, service commercial and commercial land in line with the visions set for the Nambeelup Industrial Area.

Objectives

The key objectives and principles of the Design Guidelines are:

- To achieve an attractive and unified development suitable for an industrial estate by placing an emphasis on a combination of well designed, functional and efficient buildings.
- To avoid unsightly and poorly planned developments to protect the investment of all developers and owners.
- To allow for outcomes-based development supporting innovative industrial development.
- To promote the environmental and economic benefits of high-quality design

The design principles allow for flexibility in built form design and site layout, to allow for the unique requirements of the emerging specialist industry, light industry and general industry, and each individual user. However, a level of consistency is applied across the estate, in order to provide a high-quality estate which meets the design, environmental and traffic and operational considerations of the locality.

The blend of well-designed buildings and quality landscaping will contribute to the estate being a pleasant working environment and should assist developers and owner occupiers to maintain their investment.

1.12. APPLICATION OF DESIGN GUIDELINES

These Design Guidelines provide “easy to apply” design principles ensuring a consistently high standard of development is maintained from the earliest buildings through to the final stages of development.

The Design Guidelines include a glossary of specialist terms used within the text. These terms are in **blue** through the document and definitions can be found within ***Appendix A - Glossary***.

It is recognised that individual circumstances may require different lot layouts and design standards to satisfy the specific needs of the end user(s).

A departure from the design principles may be considered at the discretion of the DevelopmentWA and the Local Government on a case by case basis, provided it can be sufficiently demonstrated that:

- The proposal will comply with the overall intent of the objectives and principles of the design guidelines.
- The proposal is generally consistent with the objectives and vision of the Lot 600 Local Structure Plan and Nambeelup Industrial Area.

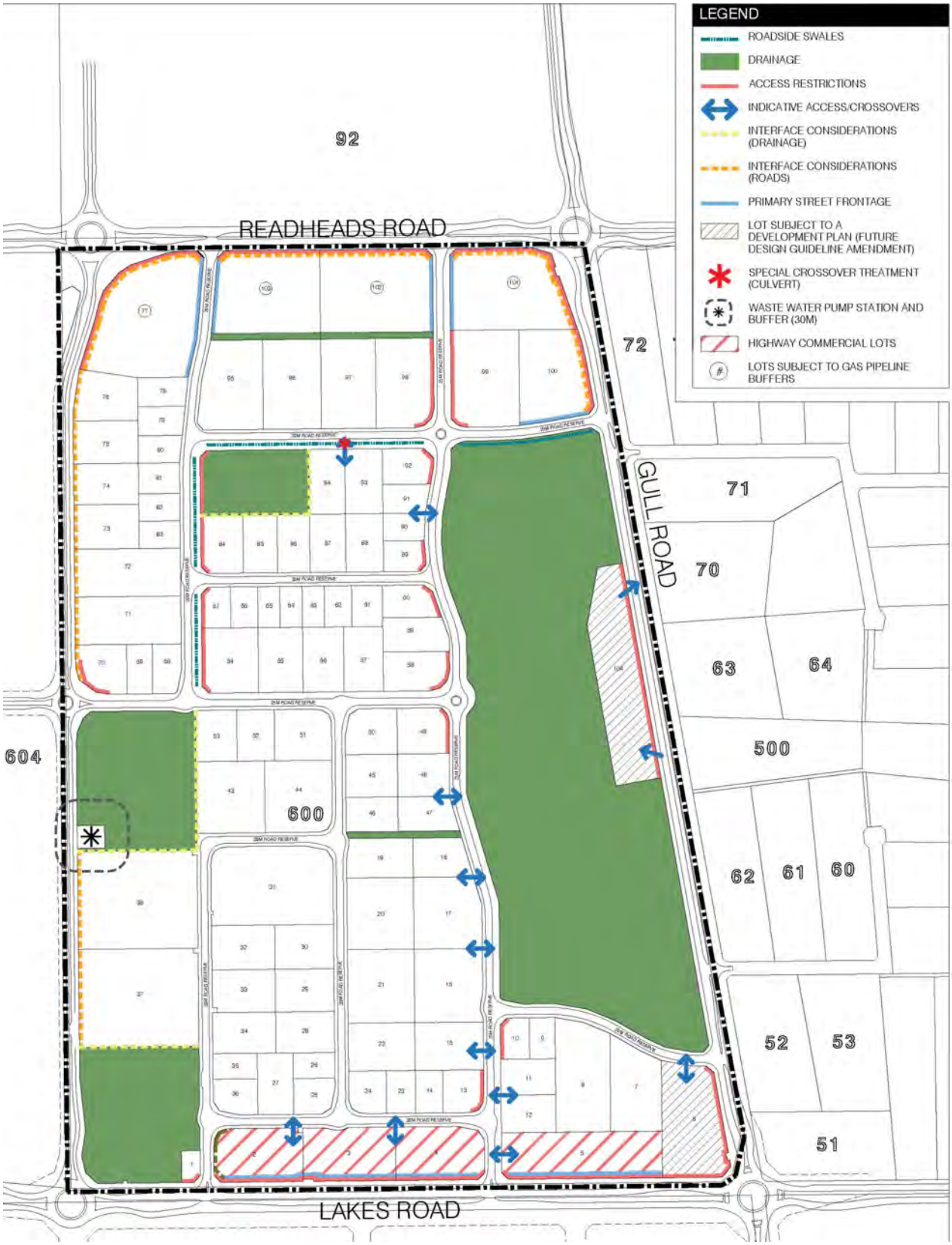
Assessment of proposals

1. Concept plans are submitted to DevelopmentWA for review against design guidelines (by the proponent).
2. DevelopmentWA will complete assessment within 14 days of receipt and will endorse application if the applicable objectives and principles are deemed to have been met.
3. A. DevelopmentWA will request amendments to the concept if applicable objectives and principals are not considered to have been met.
3. B. Proponent amends concept plans and resubmits to DevelopmentWA for approval.
4. DevelopmentWA will send a copy of endorsed plans to the Shire of Murray.
5. The proponent shall apply to the Shire of Murray for Approval to Commence Development (inclusive of DevelopmentWA endorsed plans)
6. The Shire of Murray shall assess and determine the development within the applicable 60-day or 90-day timeframe (advertising dependant).
7. Development of proposal is undertaken in accordance with the approved plans.
8. A post development audit will be undertaken by DevelopmentWA to ensure the development is consistent with the plans endorsed by DevelopmentWA. Any substantial inconsistencies must be rectified prior to DevelopmentWA agreeing to removal of the caveat.

2. DESIGN PRINCIPLES

In addition to the general design principles applicable to all lots within the estate set out in the following sections, the Design Guidelines Plan annotates design principles specific to certain lots within the Peel Business Park, Nambeelup.

Figure 2 – Design Guidelines Plan

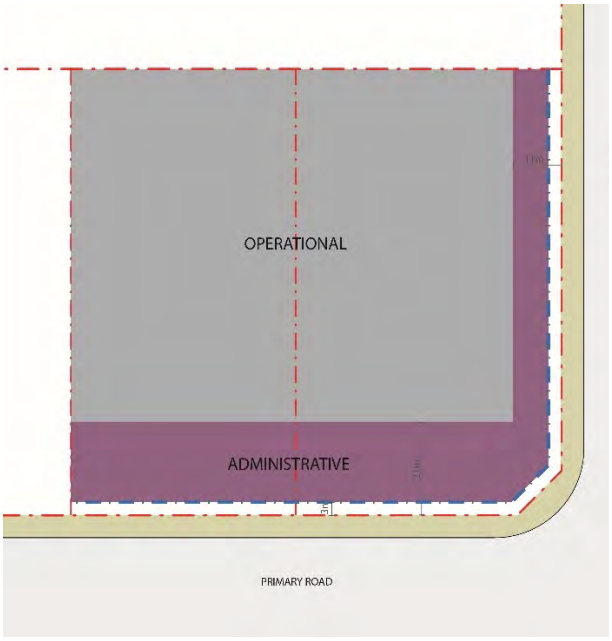


2.1. SITE LAYOUT AND BUILDING ORIENTATION

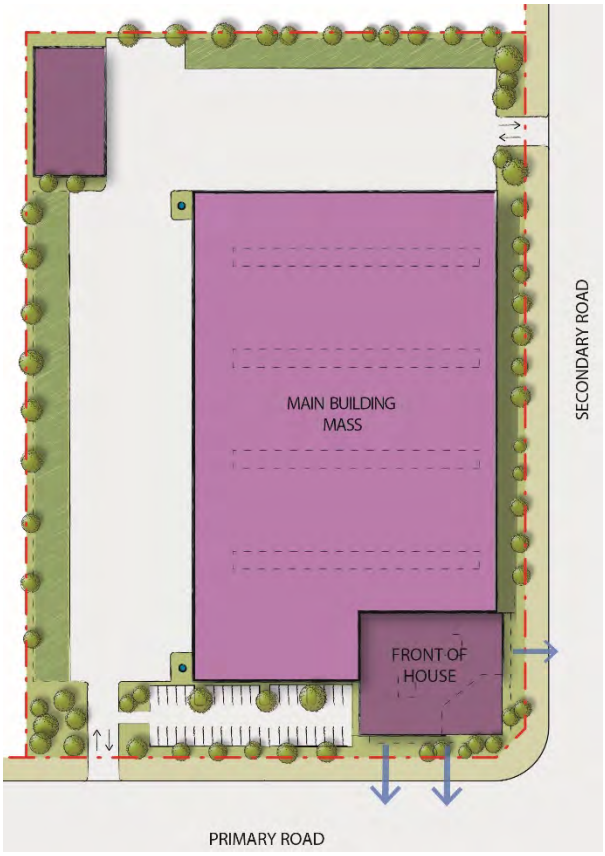
Site layout and building orientation requirements allow for legibility, efficient use and safe operations on site, in addition to providing for a consistent approach to streetscape interfaces across the estate.

- **Office / Front of House areas** including the office/administrative component, must be designed as focal points to the front of the site. This component should be distinct from the main building and clearly identifiable as the entrance to the building.
- **Operational areas** including the warehouse component and external service yards, storage areas, laydown and manoeuvring areas shall be located to the rear or side of the site, behind the Office / Front of House areas.
- All service yards, storage areas, laydown and manoeuvring areas shall be screened from the street.
- Corner lots must ensure buildings address both street frontages, with priority given to the **primary street frontage**.
- Buildings must be oriented and/or designed to respond to passive solar design, optimal generation potential of rooftop solar photovoltaic (PV) panels, prevailing winds and the use of natural light.
- Notwithstanding the lot boundary setbacks in Section 2.2, buildings must be oriented and/or designed so that the shadow cast at midday, 21 June onto any other adjoining property does not exceed 5m.

Figure 3 – Site Layout and Building Orientation Diagrams



Picture 1 – Site layout



Picture 2 – Building Orientation

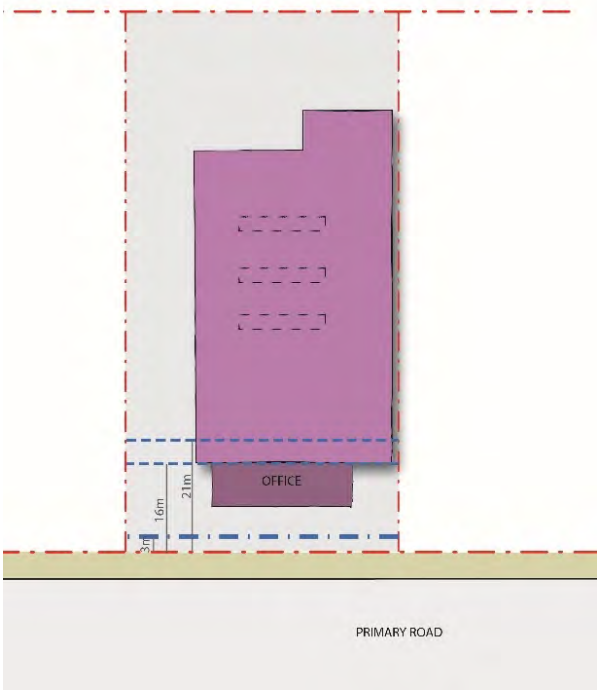
2.2. SETBACKS

Development shall be setback from boundaries in accordance with the requirements of Table 1 in order to ensure an appropriate and consistent **streetscape interface** across the estate:

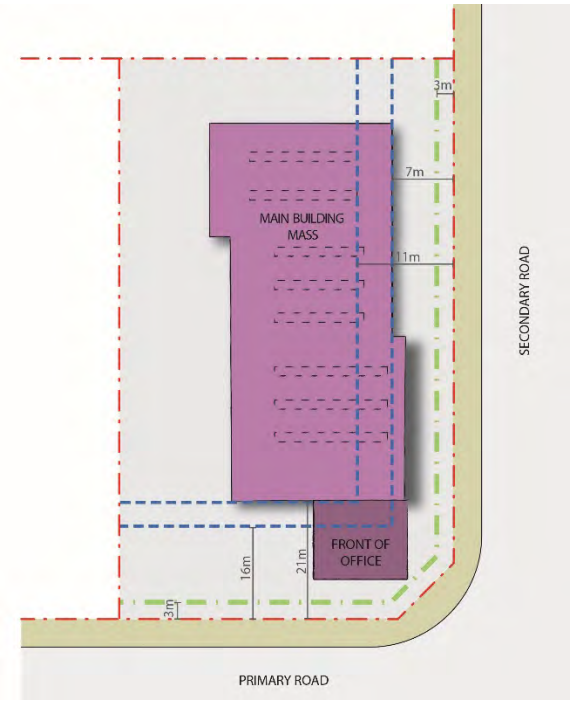
Table 1 – Setbacks

Setback	Office / Front of House areas - minimum	Office / Front of House areas - maximum	Main Building Mass setback - maximum	Conditions
Primary Setback	3m	16m	21m	The main building mass must be attached to the office component. The main building mass is to be setback a minimum of 3m from the front façade of the office component.
Secondary Setback (corner lots)	3m	7m	11m	The main building mass is to be setback a minimum of 1m from the side façade of the office component. Unless mandated within the Design Guidelines Plan the primary and secondary frontage on corner lots shall be determined by the proponent in consultation with the Local Government
Side and Rear setbacks	Nil			On a nil setback, the external finish on the wall must provide a level of detail and interest where visible to adjacent lots or streets as detailed within Building Form and Articulation.

Figure 4 – Application of Setbacks



Picture 3 – Setback – general lot



Picture 4 – Setbacks – corner lots

2.3. SITE COVER

Table 2 – Site Cover requirements

Site Area	Minimum Enclosed Building Area
Sites up to 1ha	20% of the lot area
Sites 1ha and above	10% of the lot area or 2000sq.m whichever is greater

2.4. BUILT FORM AND ARTICULATION

The design of buildings must incorporate a range of design characteristics to ensure a consistent, high quality standard of built form throughout the estate:

- Front facades must address the primary street frontage, provide a corporate image and clearly identify the main entrance point.
- Front facades must use no less than 2 types of **primary building materials** to create variety and interest.
- **Light coloured roof and wall materials** are generally to be used to reduce heat gain.
- Roofs are to be structurally designed to accommodate solar PV panels and where possible pitched at 10 degrees to facilitate solar generation potential.
- No less than 3 colours shall be incorporated into built form design.
- Solid walls should incorporate no less than 2 horizontal or vertical elements such as **banding or recessed walls** to avoid unbroken expanses of blank wall.
- Where visible from the street, side facades should be integrated into the design of the front façade through use of similar materials and colours.
- Signage must be integrated into the building design.
- Where more than one building is proposed, buildings shall demonstrate an integrated site layout and development using complementary built form, materials and colour.
- Excepting design elements, all plant and equipment, service areas and bin stores shall be screened from the street and public areas.
- Heights shall be in accordance with the requirements of the Murrayfield Aerodrome height limits.

Figure 5 – Built Form and Articulation Examples

2.5. VEHICLE REQUIREMENTS

Crossovers, on-site manoeuvring and car parking must be designed to meet the proponents' operational requirements whilst ensuring safe and efficient vehicle movements:

- All lots require the construction of a crossover. Subject to approval and except as otherwise provided for in this section, additional access points may be constructed to facilitate the effective use of the land for the proposed purposes. Additional access may be approved if it can be demonstrated to the satisfaction of DevelopmentWA and the Local Government that the access points will not impact on the efficiency or safety of the road network.

- No vehicle crossovers shall be provided along the portion of the lots marked as subject to access restrictions on the Design Guidelines Plan.

- 'Indicative access crossovers' are shown on plans in these Design Guidelines in order to minimise the number of crossovers to major roads. This includes lots fronting onto the north-south spine road and those lots fronting onto the drainage swale. No further crossovers are permitted on these lots.

- Design of car parking bays and manoeuvring areas must be in accordance with Australian Standard AS2890 and are to be constructed and sealed, drained and line marked to the satisfaction of the Local Government.

- Parking and access to be designed such that all vehicles enter and exit the site in forward gear.

- Visitor and/or staff parking must be separated from operational areas such as truck manoeuvring areas, loading areas, hard stand and external storage.

- All crossovers shall be designed in accordance with the Shire of Murray crossover specifications (***Appendix C***).

- The number of vehicle parking bays must be provided for on-site and in accordance with the Shire of Murray Local Planning Scheme requirements.

- All vehicle parking shall be provided with pedestrian paths from parking to building entries.

2.6. SIGNAGE

Any signage proposed as part of the development shall be designed in accordance with the following

- Signage must be designed and located in accordance with the relevant local laws or policies of the Local Government to ensure a consistent and orderly approach to signage within the estate.

2.7. FENCING

All fencing proposed as part of the development shall be designed and constructed in accordance with the following:

- Where installed, the required standard for fencing on primary and secondary street frontages is 1800m high black garrison fencing.

- There must be 0.3m separation distance between fencing and underground services to avoid conflict in footings.

- Side and rear fencing is permitted to the standard of 1800mm high black PVC coated link mesh, colourbond or similar fencing styles.

- Barbed wire must not be installed forward of the main building line and shall be in accordance with the Local Government local laws for barbed wire fencing.

2.8. ENERGY MANAGEMENT AND LIGHTING

In addition to the building orientation requirements, the following energy management criteria must be applied to promote energy efficiencies in design:

- The design of buildings must optimise natural lighting and cross-ventilation in accordance with local climatic conditions for heating and cooling of buildings. This can include;
  - Orientation of the buildings to take advantage of prevailing winds and sun
  - minimising extent of glazing of east/west facing facades or providing adequate shading to windows
  - providing clerestory windows, roof vents or skylights to allow for breezes and natural light
- The design of the building must include installation of the following:
  - Efficient water heating, such as solar or heat pump systems;
  - Efficient lighting throughout, (including outdoors) such as LED,
  - Motion sensors fitted to low uses areas such as toilets and storage rooms.

- The design of buildings must facilitate rooftop solar PV and ancillary equipment including mounting hardware, an inverter and associated wiring.

- Energy consumption for developments must be in accordance with the relevant BCA JV3 requirements (certification of compliance required to be provided).

- External lighting must be contained within the site and not directed beyond the lot boundary in order to avoid adverse impacts on adjacent properties, passing motorists and the Murrayfield Aerodrome.

- Where there are individual units or sub-tenancies within a single lot, each unit shall be individually sub-metered.

2.9. WATER MANAGEMENT

- Water management measures must be incorporated into the design as per the Urban Water Management Plan standards in order to ensure effects of rainfall events are managed to avoid adverse impacts on developments and natural areas. These include the installation of WELS (Water Efficiency Labelling and Standards) rated water efficient fixtures and appliances:
  - Showerheads <7.5 litres per minute
  - Taps (bathrooms, kitchen and laundry) <6 litres per minute
  - Toilets 4 stars WELS rated,
  - Waterless Urinals.

- Landowners are encouraged to install rainwater tanks appropriately sized for the development to provide for water reuse in toilet and irrigation systems (if practical).

- Where industrial processes create liquid effluent or require wash down areas, the incorporation of on-site containment, management and appropriate disposal is required. Details regarding these aspects are to be provided in support of the proposal.

- Proponents are encouraged to consider water efficient industrial equipment and seek innovative designs that can be integrated into the built form. This will be dependent upon the processes used within each business but may include automatic shutoff controls, fogging nozzles for cooling or high pressure-low volume nozzles.

- Where there are individual units or sub-tenancies within a single lot, each unit shall be individually sub-metered.

1.10. WASTE MANAGEMENT AND RECYCLING

- All building construction to engage a reputable Waste Management Recycling Company who can capture, recycle or reuse a minimum of 80% (by volume) of construction waste materials and monitor and verify recycling rates.

2.11. ENVIRONMENTALLY RESPONSIBLE MATERIALS

Proponents are encouraged to consider construction materials that a responsibly produced to lower environmental impacts:

Structure

Consider one of the following:

a) concrete with >30% supplementary cementious materials or >30% of recycled aggregate;
b) pre-cast panels with >15% supplementary cement materials;
c) steel with recycled content >15%;
d) structural timber certified to AFS (Australian Forestry Standard) or FSC (Forest Stewardship Council) standard

Envelope/linings:

Consider one of the following:

a) Plasterboard with ≥10% recycled gypsum;
b) Plasterboard which incorporates recycled paper.

Services:

Consider one of the following:

a) 25% of the total cost of PVC content reduced through replacement with alternative materials;
b) PVC content sourced from an ISO 14001 certified supplier;

Fitout:

Consider one of the following:

a) Low emission paints, sealants and adhesives used on 95% of internal and external surfaces.
b) Floor coverings free of formaldehyde and volatile organic compounds.

2.12. LANDSCAPING

Landscaping must be incorporated into the design in order to allow for appropriate levels of amenity within the industrial area, integrating with the form and function of proposed developments to provide visually pleasing interfaces. Landscaping in each lot shall include the following landscaping elements:

- A 3m wide soft landscaping strip must be provided adjacent to the primary and secondary street frontages.
- Landscaping is encouraged around administrative and car parking areas and abutting buildings and boundaries.
- Landscaping of verges is to be undertaken and maintained by the proponent consistent with internal landscaping treatments.
- Soft landscaping is to be consistent with the water-wise species and densities listed within the planting list in ***Appendix D***. The species list is to be a generic guide with formal approval of species to be at the discretion of DevelopmentWA and the Local Government at the time of detailed design.
- Where irrigation is required, watering of soft landscaping areas is to be Waterwise irrigation systems, including:
  - use of sub-surface drip-lines around plants (avoid fine sprayers)
  - weather-based electronic timers (and set irrigation time to early morning before sunrise).
- Soil is to be ameliorated to increase the effectiveness and efficiency of irrigation.
- Mulch is applied to planted areas to 100mm depth.
- Shade trees must be provided within car parking areas at a rate of 1 per every 4 car parking bays on the site. Trees are to have a 1.5m diamond to allow for root protection.
- Dry grass is permitted provided that no irrigation of these areas is required.

Figure 6 – Examples of Landscaping

2.13. INTERFACES

Drainage

The following provisions relate to lots which directly front onto drainage lots:

- All façades facing drainage lots shall be subject to the provisions set out in Building Form and Articulation, having particular regard to those provisions relating to secondary façades. Attractive frontages must be provided to drainage lots.

- The required standard for fencing on boundaries facing drainage lots is 1800m high black garrison fencing.

- All storage and lay down areas fronting onto drainage lots shall be screened through the use of landscaping and/or screening panels. Consideration must be given to the visual outlook from the proposed road abutting the western boundary of the estate.

Western Boundary Road

The following provisions relate to those lots which directly front onto the future road abutting the western boundary of the estate, in particular lots which have dual frontage:

- Lots directly abutting the western boundary road will not have any form of access/from to the road. All access and crossovers must be to the internal local road except where no alternative access can be achieved.

- All façades facing the western boundary road shall be subject to the provisions set out in Building Form and Articulation, having particular regard to those provisions relating to front façades.

- All storage and laydown areas fronting onto the western boundary road shall be screened through the use of landscaping and/or screening panels.

2.14. BUFFERS

Gas Pipelines

Lots adjacent to the ATCO Gas Pipeline along Readheads Road must be designed to ensure:

- All sensitive uses, being commercial or office
- developments are located outside of the applicable buffer (as confirmed with ATCO Gas).
- Activities within the buffer are limited to hardstand, lay down, parking and storage and landscaping.
- Any proposed development within the buffer must provide a Pipeline Risk Management Plan endorsed by the pipeline owner.

Waste Water Pump Station

- Odour sensitive land uses including, but not limited to, commercial and / or offices on sites surrounding waste water pump station sites, must remain outside of the 30m buffer to the wet well, located within waste water pump station facilities.

2.15. HIGHWAY COMMERCIAL LOTS (LOTS 2-5)

For lots fronting onto Lakes Road, additional consideration must be given to the site layout and built form in recognising the nature of the land uses, shared infrastructure and the need for consistent built form outcomes to ensure a high amenity precinct / entrance to the estate:

- The layout of the lots shall be generally in accordance with Figure 8.
- Shared parking, access and manoeuvring shall be incorporated into the design across adjoining lots.
- Built form shall provide a **human scale** to the street and reflect the use of the building for highway commercial purposes.
- Buildings shall use architectural features to establish visually distinct pedestrian access points. This includes the provision of legible pedestrian access points from any rear car parking areas to entrance points of the building and distinctive entry doors and canopies to the street elevations.
- A 2m wide pedestrian footpath shall be provided along the Lakes Road frontage of all buildings with the provision of a canopy overhanging the footpath with a minimum height above ground level of 3000mm (maximum 4000mm) and a minimum width of 2000mm to provide shelter for the public.
- Pedestrian footpaths and opportunities for safe crossings are to be provided from the external street footpath system to the buildings.
- Corner elements shall be provided to the buildings fronting Lakes Road and the entrance roads to the estate.
- Secondary frontages shall include materials and articulation which are consistent with the primary façade.
- Back of house and service areas shall be screened from adjacent roads and lots.

Figure 7 – Examples of Highway Commercial Outcomes

Figure 8 – Highway Commercial Lots 2 – 4 Indicative Layout

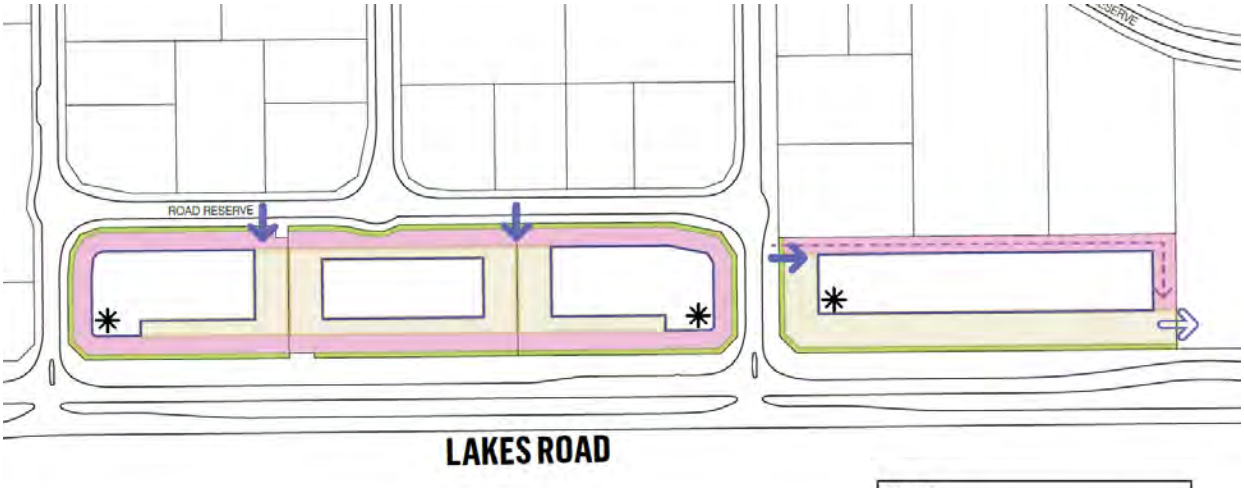
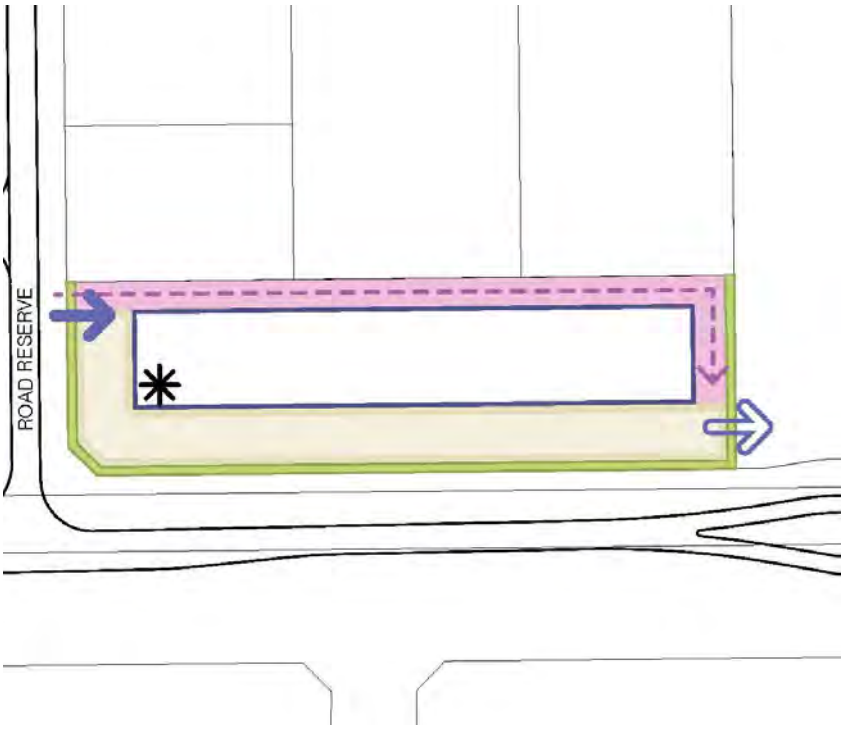


Figure 9 – Highway Commercial Lot 5 Indicative Layout



2.16. LOT 6 DEVELOPMENT PLAN

Lot 6 represents the future Service Hub located at the corner of Lakes Road and Gull Road.

Design considerations for this lot shall be subject to a future amendment to the design guidelines to detail:

- Vehicular Access
- Pedestrian access and amenities
- Building Orientation and design
- Fencing and Landscaping

2.17. LOT 104 DEVELOPMENT PLAN

Lot 98 represents the future lot located along Gull Road and surrounded by the Wetland Buffer.

Design considerations for this lot shall be subject to a future amendment to the design guidelines to detail:

- Vehicular Access
- Building Orientation
- Fencing and Landscaping
- Buffer Considerations

APPENDICES

APPENDIX A GLOSSARY

TERM	DEFINITION
Amenity	means all those factors that combine to form the character of the area and include present and likely future amenity.
Banding or recessed walls	means a change in the direction or depth of materials, either horizontally or vertically in order to provide a high level of visual interest to the facade.
Human Scale	means the inclusion of elements such as glazing, entryways, canopies and lighting that allows opportunity for human interactions with the buildings.
Light coloured roof and wall materials	means colours such as creams, light greys and similar tones which demonstrate low solar absorbency in order to avoid significant heat gain in buildings.
Main Building Mass	Means the warehouse component of the development.
Office / Front of House areas	means the area forward of 22m adjacent to the primary frontage which is to be used for the purposes of the following uses: office, parking, landscaping and approved product display and pedestrian oriented activities.
Operational areas	means the area located to the rear of the site (from 22m, behind the administrative component) utilised for the general operational/ industrial purposes associated with the land use.
Primary building materials	means the predominant building material as observed from the street frontage inclusive of materials such as: • Concrete or rendered panels • Profiled metal cladding • Stone or facebrick • Corrugated iron panelling
Primary street frontage	means the setback to the primary street frontage as depicted on the design principles plan or as agreed with DevelopmentWA.
Streetscape interface	means the relationship between the front facade, landscaping and public areas of a site and the adjacent public realm. The streetscape interface assists in defining spaces and creating positive environments within the industrial estate.

APPENDIX B DESIGN GUIDELINES CHECKLIST

PEEL BUSINESS PARK DESIGN GUIDELINES

LOT #: _____ **STREET ADDRESS:** _____

APPLICANT: _____

APPLICATION DETAILS: _____

REQUIREMENT:	Y/N		Y/N
Site Plan		Electrical Drawings	
Floor plans		Schedule of Fixtures and Fittings	
Roof Plan		Waste Management Letter	
Elevations			
Landscape Plan		Construction Waste Recycler	

DESIGN CRITERIA			APPLICANT CHECKLIST	DWA CHECKLIST	COMMENTS
CATEGORY	REQUIREMENTS	INFORMATION REQUIRED	ACHIEVED	ACHIEVED / NOT ACHIEVED	
SITE LAYOUT AND BUILDING ORIENTATION	- Office/ Front of house areas and operational areas defined - Screening of service / storage areas shown - Orientation of the buildings to take advantage of passive solar design	Show on site plan / floor plans			
SETBACKS	- Setbacks for office / front of hour and operational areas to be within minimum and maximums set out	Show on site plan / floor plans			
SITE COVER	- 20% for sites up to 1ha - 10% for sites over 1ha	Show on site plan / floor plans			
BUILDING FORM AND ARTICULATION	- 2 types of primary building materials - Light coloured roof and wall materials - Roof structures designed at no less than 10 degrees - No less than 3 colours - No blank walls, minimum of 2 horizontal or vertical elements	Show on elevations			
VEHICLE REQUIREMENTS	- Construction of a single crossover as per access restrictions/indicative access crossovers - Car parking in accordance with Shire of Murray Scheme	Show on site plan			

SIGNAGE	- To be integrated into the building	Show on elevations			
FENCING	- 1800mm high garrison fencing to front and secondary streets - 1800m fencing to side and rear boundaries	Show on site plan			
ENERGY MANAGEMENT AND LIGHTING	- Orientation of the buildings to take advantage of prevailing winds and sun - minimising extent of glazing of east/west facing facades or providing adequate shading to windows - Provide clerestory windows, roof vents or skylights to allow for breezes and natural light - Optimal generation potential of rooftop solar photovoltaic (PV) panels - Efficient water heating systems, such as solar or heat pump - Efficient lighting throughout, (including outdoors) such as LED globes. - Motion sensors fitted to low uses areas such as toilets and storage rooms; and outdoors - Individual sub metering where individual units or sub tenancies are proposed on a lot	Show on site plan, floor plan, electrical plan and elevations Show indicative PV panel layout on roof plan and elevations; and indicate potential size (kW) of array Provide a specification schedule for fixtures and fittings			
WATER MANAGEMENT	- Showerheads <7.5 litres per minute - Taps (bathrooms, kitchen, laundry) <6 litres per minute - Efficient dual-flush toilets, - Waterless Urinals. - Rainwater tanks (appropriately sized for the development) connected to toilets and washing machine. - Install water efficient industrial equipment and seek innovative designs that can be integrated into the built form. - Individual sub metering where individual units or sub tenancies are proposed on a lot	Show on site plan and floor plan Nominate on specification schedule for fixtures and fittings Provide size for rainwater tanks on plans or in schedule			
WASTE MANAGEMENT AND RECYCLING	- Engage a reputable Waste Management Recycling Company who can capture and recycle or reuse a minimum of 80% (by volume) of construction waste materials and monitor and verify recycling rates.	Documentation (or letter) showing proof of engagement of the waste management recycling company, including company information stating the types of materials and amounts or percentages to be recycled.			

ENVIRONMENTALLY RESPONSIBLE MATERIALS	- Consider construction materials that a responsibly produced to lower environmental impacts with specific regard to:
	  - Structure
	  - Envelope/Linings
	  - Services
		Show on plans
		
		Provide specification of environmentally responsible materials proposed			

	- Fitout				
LANDSCAPING	- Soft landscaping is to be consistent with the water-wise species and densities listed within the planting list in Appendix D - Install Waterwise irrigation systems, including: - use sub-surface drip-lines around plants - weather-based electronic timers - Soil is ameliorated to increase the effectiveness and efficiency of irrigation. - Mulch is applied to 100mm depth.	Show on landscaping plan			
INTERFACES	- Attractive frontages provided to drainage lots - Attractive frontages to the Western Boundary Road - Screening of storage and service yards	Show on site plan and elevations			
BUFFERS	- Gas Pipelines – setbacks and restrictions to be demonstrated - Waste Water Pump Station – setbacks and restrictions to be demonstrated	Show on site plan			
HIGHWAY COMMERCIAL	- Layout as per figure - Built form at a human scale - Visually distinct access points - 2m wide pedestrian path - Pedestrian crossing opportunities - Corner elements to Lakes Road - Secondary frontage to include consistent treatments and materials - Back of house areas screened	Show on site plan, floor plan and elevations			
DEVELOPMENT PLAN #__					
ASSESSMENT DATE: **SIGNATURE:**				**APPROVED / NOT APPROVED**	
VARIATIONS / COMMENTS					

APPENDIX C SHIRE OF MURRAY CROSSOVER SPECIFICATIONS

Specifications for the Construction of a Standard Vehicle Crossover

General

a) This specification is made pursuant to the provisions of Section 357 and Section 358 of the *Local Government Act 1995* and as may be amended.

b) The construction of vehicle crossovers shall be executed under the supervision of and to the direction of the Director Technical Services or his authorised representative.

c) All materials used in the construction of vehicle crossovers shall be in accordance with the standard specification of Council and any materials used which are inferior to those specified, or as directed by the Director Technical Services, shall be liable to rejection and replacement without any payment of compensation being made to the contractor for the supply, delivery, laying, placing, finishing, removal or disposal of anything rejected, as directed by the Director Technical Services.

Note: The contractor shall be known as the person responsible for the construction of the vehicle crossover.

d) Protection of the works and the public shall be provided and maintained by the contractor who shall supply and keep supplied as directed all the necessary signs, barricades, rod warning lamps, temporary bridges or any other thing necessary, or as may be directed by the Director Technical Services, to provide for the safety of the public generally and to protect the works from damage for the minimum period of three days following completion of the works. Failure to provide or keep provided shall render the contractor liable under Section 377 of the *Local Government Act 1995* or as amended. All such protective equipment shall comply with the relevant Standards Association of Australia (SAA) code.

e) Any damage which may occur to any Council facilities or private property or the vehicle crossover itself during the course of the works, or which may subsequently become evident from the operation thereof, shall be the sole responsibility of the contractor who shall be held responsible for the repair, replacement, legal claims, liability or any other thing which may arise from the carrying out of any such works.

Location

a) The vehicle crossover shall be positioned as directed by the Director Technical Services. The vehicle crossover shall be located in such a position as to not cause interference with public utilities.

b) All crossovers shall be at right angles (90 degrees) to the carriageway kerb.

c) Crossovers shall be no closer than 1500mm from the side boundary.

d) No crossover shall be constructed closer than 6.5m from the property line intersection point at a corner site, nor shall it infringe upon any part of a truncation corner cut off.

e) Where two residential vehicle crossovers abut one to another, they may be combined, subject to the Director Technical Services' written approval and subject to the combined width not exceeding 8.0m. The two crossovers shall be separated by a pedestrian refuge of 3.0m minimum width unless specifically approved by the Director Technical Services.

f) All commercial vehicle crossovers shall be separated one from another by a pedestrian refuge of 3.0m minimum width except for service stations which shall have a pedestrian refuge of 4.5m minimum width or as designed by the Director Technical Services.

Alignment and Profile

a) The turn-out radii shall be not less than 1500mm and no portion of the radius is to extend beyond the frontage limits of the property it serves.

b) The vehicle crossover finished level at the property line boundary is to be a minimum of 100mm above the crown of the road or 75mm above the top of the kerb. Any variation to these heights to be determined by the Director Technical Services.

c) Where kerbing exists, the level of the vehicle crossover, at a distance of 1500mm behind the kerb, shall be at the same level as the top of the kerb, or 125mm above the road gutter, whichever is greater.

d) Where barrier or semi-barrier kerbing is in place at the vehicle crossover, the length of kerbing equal to the appropriate entrance width of the vehicle crossover shall be removed in all cases. The existing in-situ kerbing shall be cut with a concrete cutting saw or existing pre-cast kerbing should be removed without damage to pavement or remaining kerbing.

e) Where mountable kerbing is in place at the vehicle crossover, the length of kerbing equal to the appropriate entrance width of the vehicle crossover shall be removed only if:

   i. The mountable kerbing is cracked in one or more places.

   ii. The average depth between the road surface and the front of the existing kerbing exceeds 25mm, where the final hot mix surface has been placed.

   iii. It is a commercial crossover.

Brick / Block Construction

a) <u>Preparation</u>

The existing ground shall be boxed out and shaped to the required dimensions and levels. Compaction of the sub-grade shall be carried out using overlapping passes of a vibrating plate compactor. The excavation shall be made to provide a firm base, free from depressions or soft spots or any deleterious material.

b) <u>Edge Restraint</u>

A firm edge restraint preventing lateral movement of paving units at the edges is required. The edge restraint must be in the form of pre-cast or in-situ concrete, or a timber strip.

c) Sand Bedding

The bedding material must be a well graded concreting bricklayer's sand which when compacted will have a uniform thickness of 50mm.

d) Bricks / Blocks Construction - Residential

All paving bricks / blocks used should have a minimum thickness of 65mm and be full depth homogenous units of solid construction or alternatively be of non-solid construction with a minimum characteristic breaking load of 5kn. Bricks / blocks used shall be full depth units of solid construction, ie no block 'splits'.

e) Bricks / Block Construction – Commercial

Commercial vehicle crossovers should have a minimum thickness of 80mm high performance pavers laid in a herringbone pattern on a 150mm compacted bed of gravel, limestone or road base, with a 20mm layer of sand and then the pavers.

f) Laying of Bricks / Blocks

Paving bricks / blocks should be placed with 2 – 4mm gaps between adjacent units, maintaining correct jointing alignment but without pre-compaction of the sand bedding layer. Gaps at the pavement edge adjacent to the edge restraints are to be neatly filled by cutting bricks / blocks to size with a guillotine or bolster for concrete units, or a diamond saw for clay bricks / blocks.

g) Compaction and Joint Filling

After laying, the paving units are to be immediately compacted and brought to level by three passes of a vibrating plate compactor. Prior to compaction the sand for joint filling is to be broomed over the surface and into the joints. Excess sand is to be removed. (Washed single sized sand is required).

h) Kerbing

When in-situ mountable kerbing is provided paving bricks / blocks are to be laid level with the top of such kerb.

Concrete Construction

a) Preparation

The existing ground shall be boxed out and shaped to the required dimensions and levels. Compaction of the sub-grade shall be carried out using overlapping passes of a vibrating plate compactor. The excavation shall be made to provide a firm base, free from depressions or soft spots or any deleterious material.

b) Steel Reinforcement

i. Residential vehicle crossovers – F42 steel mesh

ii. Commercial vehicle crossovers – F62 steel mesh

c) Concrete

All concrete used in works shall develop a minimum compressive strength of 20Mpa at 28 days and shall be composed of a mixture of screenings, sand and cement with a maximum slump of 80mm. Please note: minimum allowable aggregate size for crossovers is 10mm. All concrete shall have an approved high early strength additive to give rapid hardening where directed by the Director Technical Services.

d) Excavation

The excavation for the crossover bed shall be taken out to the lines, levels and grades set by the Director Technical Services and all excavation shall be executed cleanly and efficiently to provide for a consolidated sound base free from depressions and/or any deleterious material to give a minimum 100mm depth of concrete pavement for residential vehicle crossovers or a minimum depth of 150mm for commercial vehicle crossovers.

e) Placing Concrete

The base shall be thoroughly and evenly moistened prior to placing concrete. Concrete shall be evenly placed to a depth specified and shovelled into position continuously and spaded especially at all edges to give maximum density. No break in operations shall be permitted from time of placing to finishing except as authorised by the Director Technical Services.

Note: The contractor shall notify the Director Technical Services 24 hours before pouring of concrete. No concrete is to be poured until the excavation has been inspected and approved.

f) Finishing

The finishing shall be obtained by screeding to the correct levels and broom or wood float finished to match any existing concrete finish and to provide a no-slip dense surface free of any depressions, marks, honeycomb sections or accumulation of fine dust accretions liable to cause excessive wear. The final surface finish shall be to the entire satisfaction of the Director Technical Services who shall reserve the right to require the removal of or the correction of any surface deficiencies or finish.

Note: A street trowel finish is not permitted on any surface of a vehicle crossover.

g) Jointing

Construction joints shall be made in the form of plain dummy joints and finished with an approved jointing tool and in the positions as shown on the plan. The distance whether laterally or longitudinally between contraction joints shall not exceed 2m. Expansion joints shall be full depth joints 14mm wide and shall be filled with bitumen impregnate caneite or similar approved material and located at the property line and at junctions where kerbing has been removed.

h) Tolerances

Thickness	100mm + 25mm
Width	+/- 10mm
Surface	+ 5mm
Alignment	+ 50mm

Construction – Other Materials

Construction of crossovers from other materials shall only be considered for commercial properties.

Opening for Traffic

The crossover can be opened for traffic:

i. Brick paving – as soon as the concrete forming the edge restraints is set.

ii. Concrete – after 24 hours.

General

Reinstatement of Footpaths

Where concrete in-situ paths are removed to permit the construction of a crossover, they shall be cut with a concrete saw and if necessary removed to the contraction or expansion joint nearest to the crossover. The footpath shall be 'tied' into the crossover by filling with concrete to a minimum thickness of 100mm. The reinstated footpath and the vehicle crossover shall be separated by an expansion joint as specified.

Reinstatement of Verge

It shall be the contractor's responsibility to backfill any excavation or depression in the adjacent verge with clean sand free of any stone or other deleterious material.

Contractor's Responsibilities

The contractor shall be responsible for, but not limited to, the following:

i. Removal and disposal of all surplus material from the site of the works and leaving the site in a clean, tidy and safe condition at all times.

ii. Removal of formwork without damage to concrete or pavement or existing kerbing.

iii. The repair to any damage to public utilities, services or any other thing damaged during the course of the works.

iv. Liaison with ratepayers to provide access and notification of intention to commence works.

v. The protection of concrete surface from rain, pedestrian and vehicular traffic etc.

vi. To give at least 23 hours' notice to the Technical Service Department so that a formwork inspection can be undertaken.

Completion

i. On completion the site is to be left in a clean, tidy condition to the satisfaction of the Director Technical Services.

ii. Reinstatement must be made to kerbing, footpaths or bitumous road surfaces damaged during the crossover construction. Any concrete must be removed from the road surface.

iii. The area must be cleared of debris, bitumen and concrete products etc on completion of the works.

iv. Any special requirements placed on the construction or location of a crossover by the Director Technical Services or authorised deputy must be adhered to.

Council Contribution

a) On completion of a crossover, a written application on the appropriate form should be made to the Shire of Murray for a contribution and a final inspection. A delivery docket or supply docket stating strength and quantity of materials used must be attached to the application. The contribution of Council shall be 50% of a standard single vehicle crossover constructed in concrete. The subsidy will only be made to vehicle crossovers that conform to Council's specifications or are previously approved in writing otherwise.

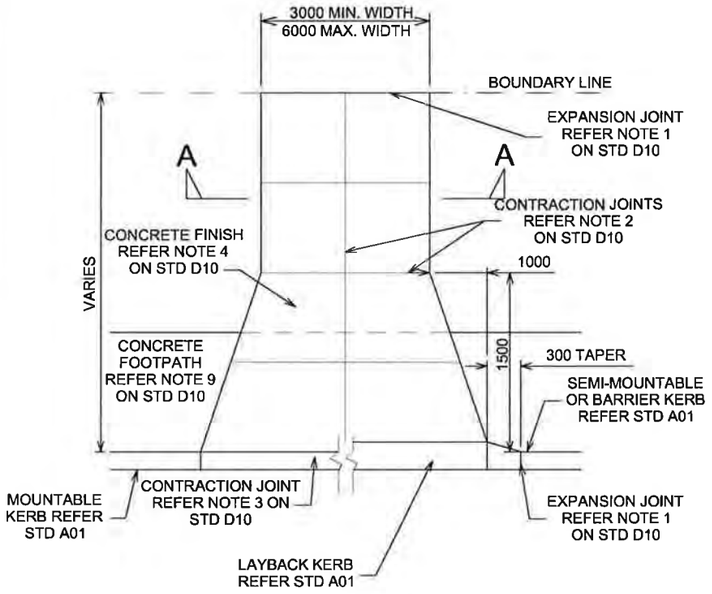
b) This application should be made as soon as possible after construction of the crossover.

c) Only one crossover per lot will be contributed to by Council.

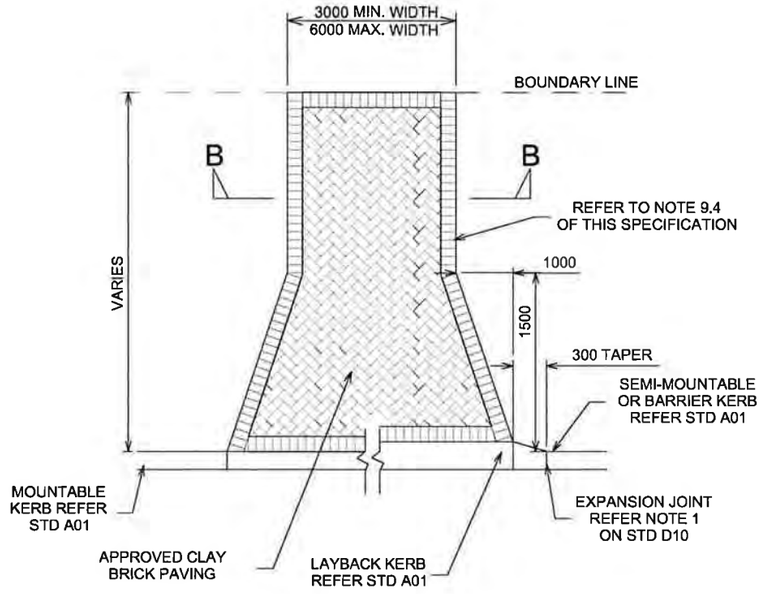
d) Where crossovers are constructed all repairs and maintenance shall be the responsibility of the property owner excluding reinstatement after any road upgrading by Council.

If your vehicle crossover cannot meet these specifications please contact the Technical Services Department on 9531 7762 to discuss alternatives **before construction.**

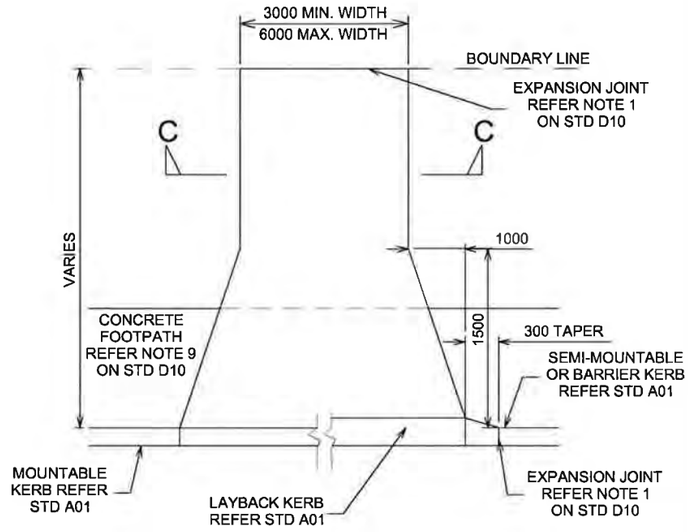
Updated 23 July 2014



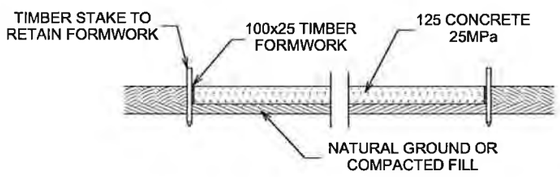
RESIDENTIAL CONCRETE CROSSOVER PLAN



RESIDENTIAL BRICK PAVED CROSSOVER PLAN

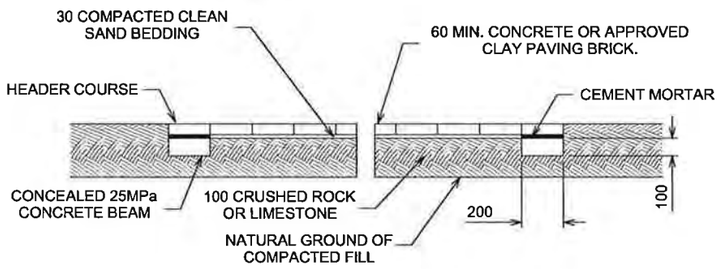


RESIDENTIAL BITUMEN CROSSOVER PLAN

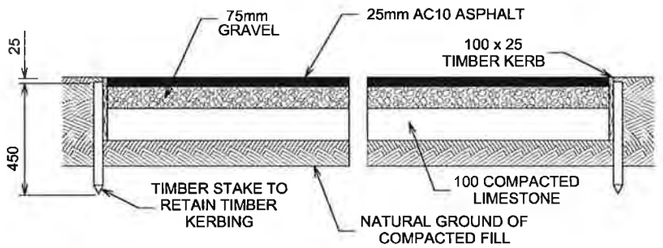


RESIDENTIAL CONCRETE CROSSOVER SECTION A-A

NOTE: IN CLAY SOILS 50mm COMPACTED SAND BEDDING IS REQUIRED.



RESIDENTIAL BRICK PAVED CROSSOVER SECTION B-B



RESIDENTIAL BITUMEN CROSSOVER SECTION C-C

NOTE:
WHERE FUTURE PATH CONSTRUCTION IS UNDERTAKEN BY THE SHIRE, IT IS COUNCIL POLICY TO REMOVE ALTERNATIVE PAVING MATERIALS OTHER THAN PLAIN GREY CONCRETE ACROSS THE CROSS OVER AT THE WIDTH OF THE PATH, TO ENSURE UNIFORMITY OF THE PATH. ie BRICKPAVING, ASPHALT & COLOURED CONCRETE FOR EXAMPLE WILL BE REMOVED.

No.	DATE	REVISION	BY	CHKD	APPR'D	DATE

C.A.D.D. File Nos.

MICROSTATION	CIVILCAD
SURVEYED BY DATE	DATUM

NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED APPROVED.

APPROVED .....
POSITION .....
DATE .....

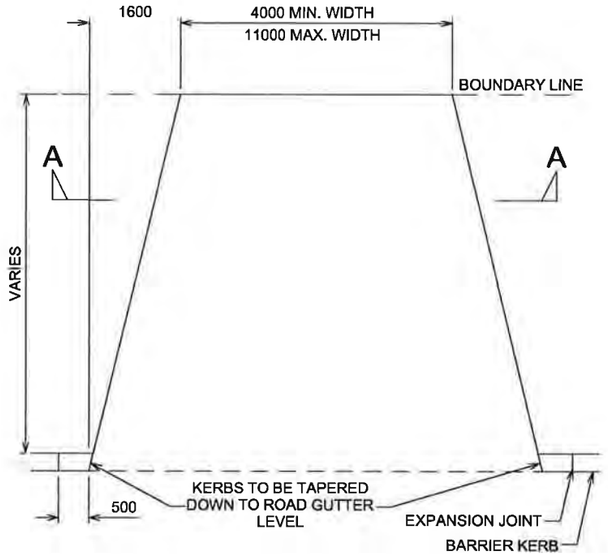
DESIGNER TO COMPLETE Date

DESIGNED	
DRAWN	
DRAFT CHECK	
DESIGN CHECK	

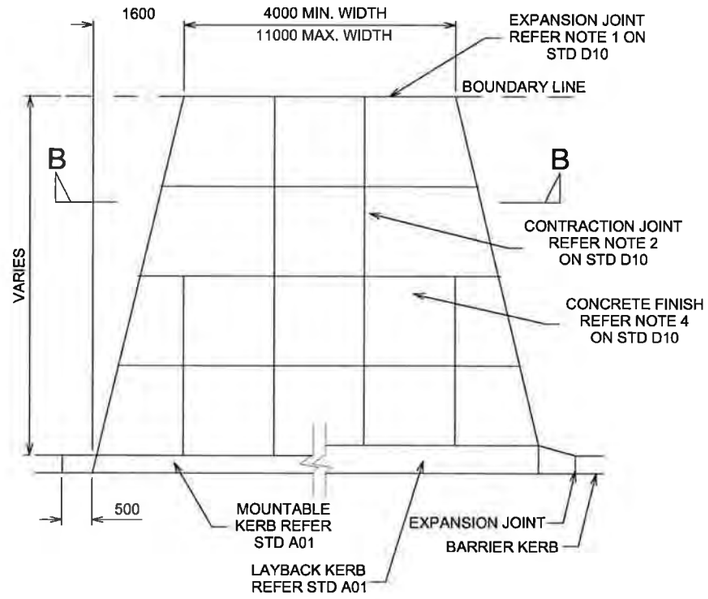
Shire of Murray

STANDARD DETAILS RESIDENTIAL CROSSOVERS

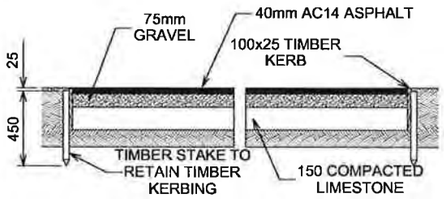
JOB No.	SCALE		DWG No.
	N.T.S.	A3	STD D08



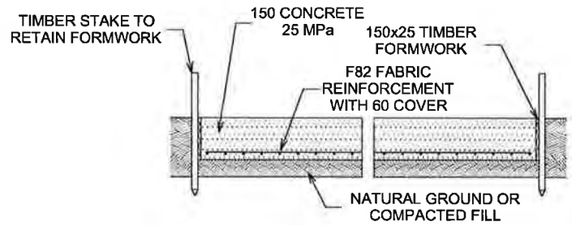
INDUSTRIAL BITUMEN CROSSOVER PLAN



COMMERCIAL OR LIGHT INDUSTRIAL CONCRETE CROSSOVER PLAN



INDUSTRIAL BITUMEN CROSSOVER SECTION A-A



COMMERCIAL OR LIGHT INDUSTRIAL CONCRETE CROSSOVER SECTION B-B

No.	DATE	REVISION	BY	CHKD	APPR'D	DATE

C.A.D.D. File Nos.	
MICROSTATION	CIVILCAD
SURVEYED BY DATE	DATUM

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APPROVED .....

POSITION .....

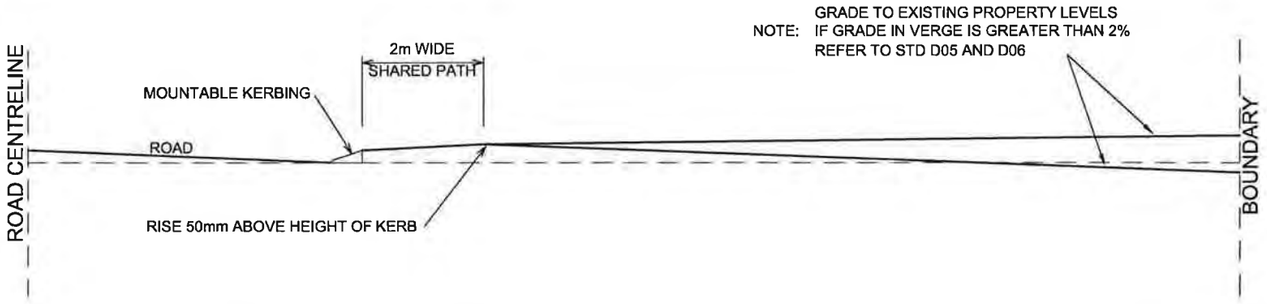
DATE .....

DESIGNER TO COMPLETE	Date
DESIGNED	
DRAWN	
DRAFT CHECK	
DESIGN CHECK	

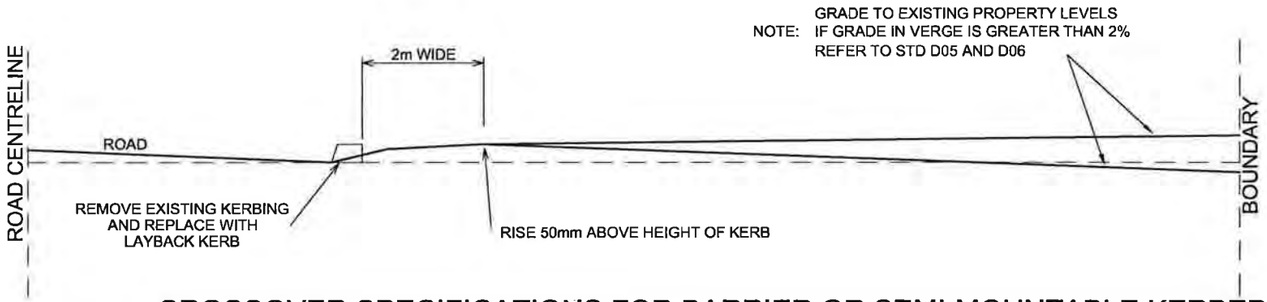
Shire of Murray

STANDARD DETAILS INDUSTRIAL BITUMEN AND CONCRETE CROSSOVER

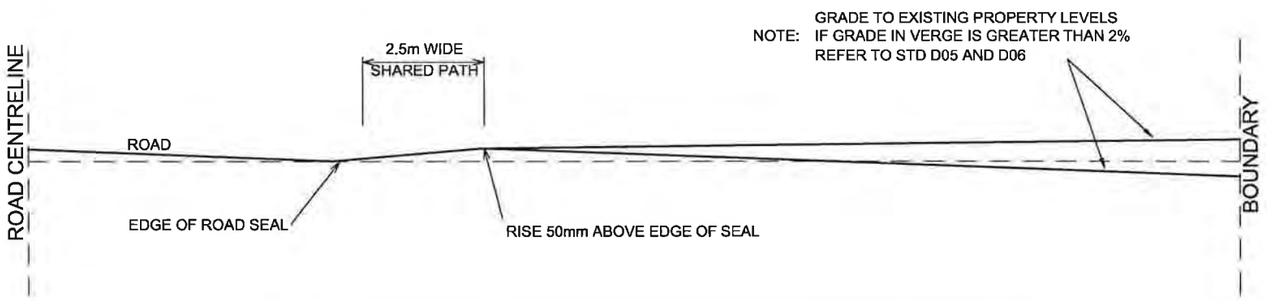
JOB No.	SCALE		DWG No.
	N.T.S.	A3	STD D09



CROSSOVER SPECIFICATIONS FOR MOUNTABLE KERBED ROADS



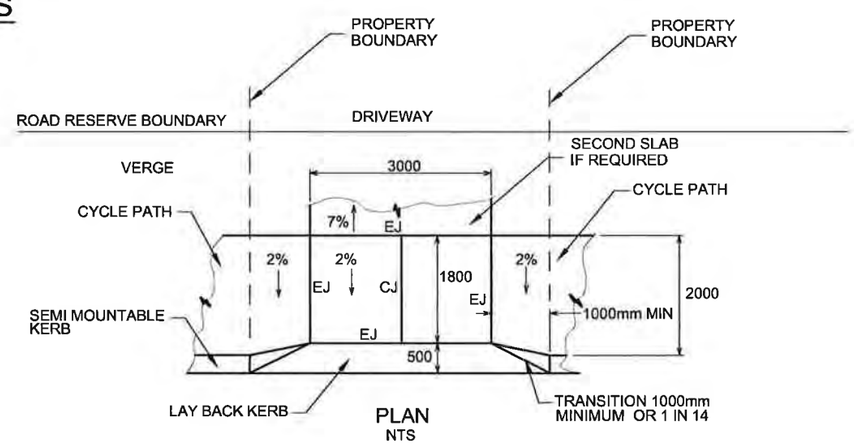
CROSSOVER SPECIFICATIONS FOR BARRIER OR SEMI-MOUNTABLE KERBED ROADS



CROSSOVER SPECIFICATIONS FOR UNKERBED ROADS

NOTES

1. 12mm EXPANSION JOINTS TO BE PROVIDED AS SHOWN. A 12mm THICK POLYETHYLENE FOAM PACKER SHALL BE POSITIONED IN EACH EXPANSION JOINT.
2. 5mm CONTRACTION JOINTS TO BE PROVIDED AT A MAXIMUM SPACING OF 1.50m.
3. WHERE MOUNTABLE KERB EXISTS A 12mm EXPANSION JOINT IS TO BE PROVIDED BETWEEN THE BACK OF KERB AND THE CROSSOVER.
4. CONCRETE CROSSOVER TO HAVE A BROOM FINISH WITH JOINTS AND EDGES HIGHLIGHTED. KERB TO HAVE SMOOTH FINISH.
5. i) PRIVATELY CONSTRUCTED CONCRETE CROSSOVERS MUST BE INSPECTED PRIOR TO POURING CONCRETE.
   ii) BRICK PAVED CROSSOVERS MUST BE INSPECTED AFTER LIMESTONE BUT PRIOR TO LAYING BRICKS.
6. ALL MEASUREMENTS IN MILLIMETRES.
7. SHOULD ANY TREE, POWER POLE, STREETLIGHT POLE, SIGN, PIT, MANHOLE OR ANY OTHER OBSTRUCTION BE LOCATED ON THE PROPOSED ALIGNMENT OF THE CROSSING THE APPLICANT SHALL BE LIABLE FOR THE COSTS ASSOCIATED WITH THE REMOVAL OR ALTERATION OF SAME.
8. TRENCH GRATING SHALL BE CONSTRUCTED BY THE APPLICANT IF CONSIDERED NECESSARY TO CUT OFF WATER ENTERING THE PROPERTY, OR ENTERING THE ROAD FROM INTERNAL DRIVEWAYS.
9. WHERE THE EXISTING CONCRETE FOOTPATH/SHARED PATH IS ONLY 75mmTHICK IT MUST BE REMOVED AND REINSTATED AT MINIMUM 100mm THICK CONCRETE. AN EXPANSION JOINT IS TO BE PLACED AT EACH INTERFACE BETWEEN THE FOOTPATH AND CROSSOVER.



PLAN
NTS

No.	DATE	REVISION	BY	CHKD	APPR'D	DATE

C.A.D.D. File Nos.

MICROSTATION	CIVILCAD
SURVEYED BY DATE	DATUM

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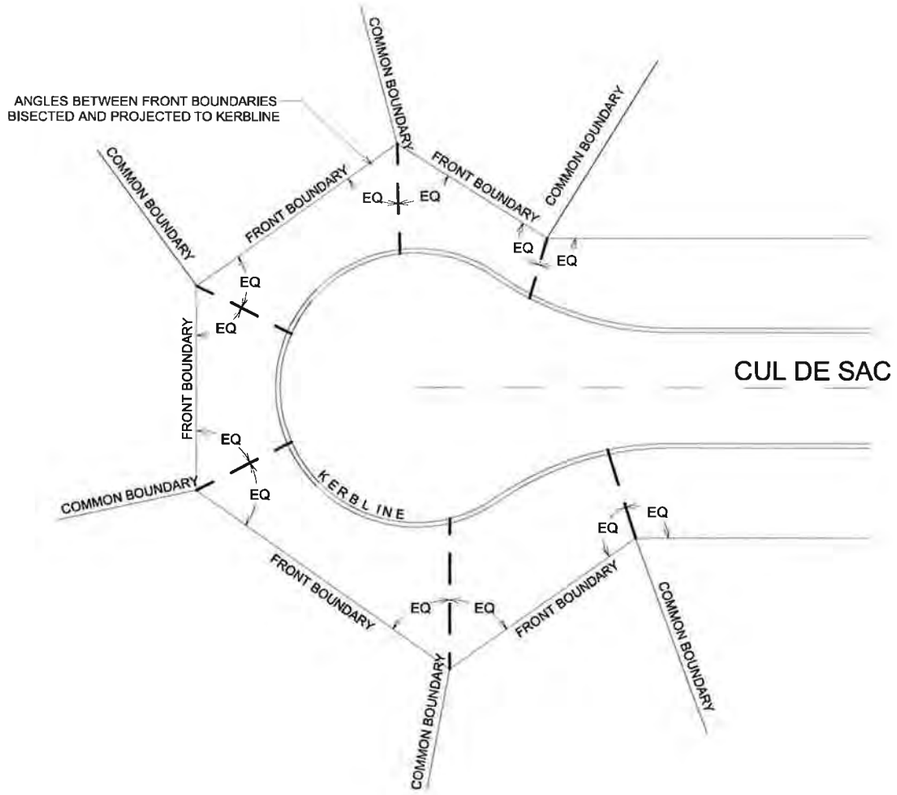
DESIGNER TO COMPLETE

	Date
DESIGNED	
DRAWN	
DRAFT CHECK	
DESIGN CHECK	

Shire of Murray

STANDARD DETAILS CROSSOVER SPECIFICATIONS

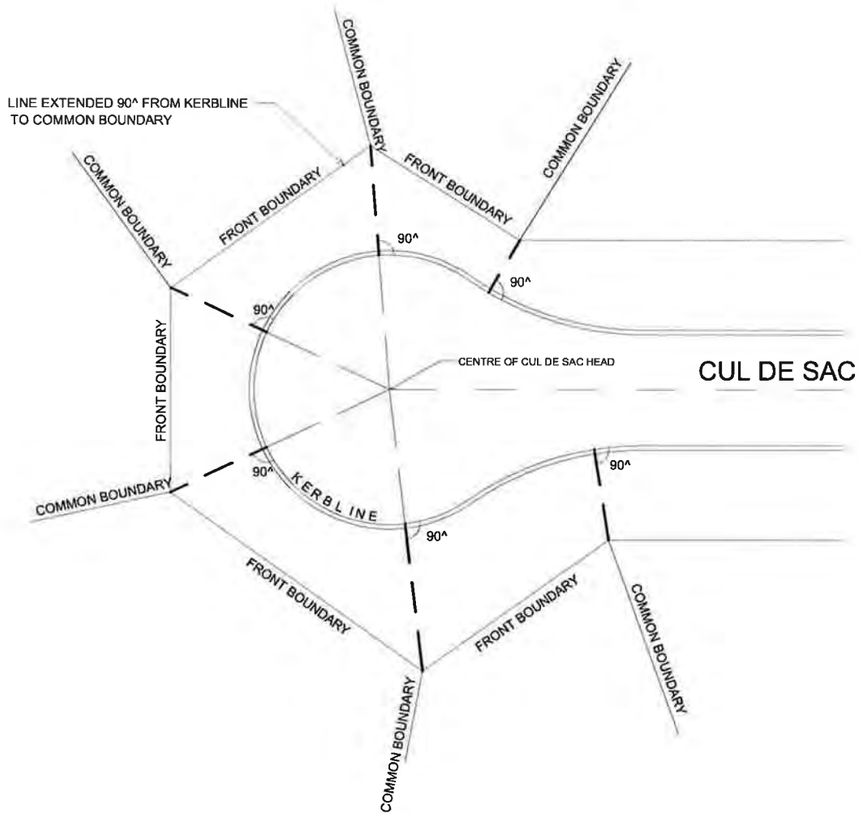
JOB No.	SCALE		DWG No.
	N.T.S.	A3	STD D10



METHOD 1 - BISECTING ANGLE

METHOD 1 TO BE USED IN CONSULTATION WITH THE ADJOINING NEIGHBOURS

N.T.S.



METHOD 2 - PERPENDICULAR (90^) FROM KERBLINE

METHOD 2 TO BE USED WHERE METHOD 1 WILL NOT ACCOMMODATE CROSSOVERS
AND IS TO BE USED ONLY IN CONSULTATION WITH THE ADJOINING NEIGHBOURS AND COUNCIL.

N.T.S.

No.	DATE	REVISION	BY	CHKD	APPR'D	DATE

C.A.D.D. File Nos.	
MICROSTATION	CIVILCAD
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DRAWN	
DRAFT CHECK	
DESIGN CHECK	

Shire of Murray

STANDARD DETAIL CUL-DE-SAC HEADS AND EYEBROWS

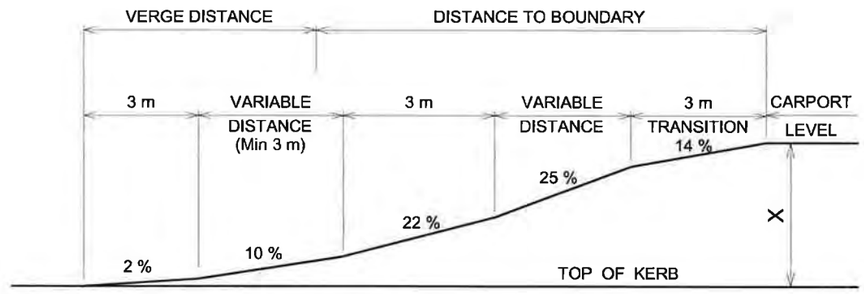
JOB No.

SCALE N.T.S.

A3

DWG No. STD D03

SETBACK FROM BOUNDARY	VERGE LENGTH										
	3	4	5	6	7	8	9	10	11	12	13
3.2	.52	.62	.72	.82	.92	1.02	1.12	1.22	1.32	1.42	1.52
3.6	.61	.71	.81	.91	1.01	1.11	1.21	1.31	1.41	1.51	1.61
4.0	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70
4.4	.79	.89	.99	1.09	1.19	1.29	1.39	1.49	1.59	1.69	1.79
4.8	.88	.98	1.08	1.18	1.28	1.38	1.48	1.58	1.68	1.78	1.88
5.2	.96	1.06	1.16	1.26	1.36	1.46	1.56	1.66	1.76	1.86	1.96
5.6	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	1.95	2.05
6.0	1.14	1.24	1.34	1.44	1.54	1.64	1.74	1.84	1.94	2.04	2.14
6.4	1.24	1.34	1.44	1.54	1.64	1.74	1.84	1.94	2.04	2.14	2.24
6.8	1.34	1.44	1.54	1.64	1.74	1.84	1.94	2.04	2.14	2.24	2.34
7.2	1.44	1.54	1.64	1.74	1.84	1.94	2.04	2.14	2.24	2.34	2.44
7.6	1.54	1.64	1.74	1.84	1.94	2.04	2.14	2.24	2.34	2.44	2.54
8.0	1.64	1.74	1.84	1.94	2.04	2.14	2.24	2.34	2.44	2.54	2.64
8.4	1.74	1.84	1.94	2.04	2.14	2.24	2.34	2.44	2.54	2.64	2.74
8.8	1.84	1.94	2.04	2.14	2.24	2.34	2.44	2.54	2.64	2.74	2.84
9.2	1.94	2.04	2.14	2.24	2.34	2.44	2.54	2.64	2.74	2.84	2.94
9.6	2.04	2.14	2.24	2.34	2.44	2.54	2.64	2.74	2.84	2.94	3.04
10.0	2.14	2.24	2.34	2.44	2.54	2.64	2.74	2.84	2.94	3.04	3.14
10.4	2.24	2.34	2.44	2.54	2.64	2.74	2.84	2.94	3.04	3.14	3.24
10.8	2.34	2.44	2.54	2.64	2.74	2.84	2.94	3.04	3.14	3.24	3.34
11.2	2.44	2.54	2.64	2.74	2.84	2.94	3.04	3.14	3.24	3.34	3.44
11.6	2.54	2.64	2.74	2.84	2.94	3.04	3.14	3.24	3.34	3.44	3.54
12.0	2.64	2.74	2.84	2.94	3.04	3.14	3.24	3.34	3.44	3.54	3.64
12.4	2.74	2.84	2.94	3.04	3.14	3.24	3.34	3.44	3.54	3.64	3.74
12.8	2.84	2.94	3.04	3.14	3.24	3.34	3.44	3.54	3.64	3.74	3.84
13.2	2.94	3.04	3.14	3.24	3.34	3.44	3.54	3.64	3.74	3.84	3.94
13.6	3.04	3.14	3.24	3.34	3.44	3.54	3.64	3.74	3.84	3.94	4.04



FIGURES INSIDE THE CHART ARE THE MAXIMUM HEIGHT DIFFERENCE (X) BETWEEN THE TOP OF KERB AND CARPORT FLOOR LEVEL

No.	DATE	REVISION	BY	CHKD	APPR'D	DATE

C.A.D.D. File Nos.	
MICROSTATION	CIVILCAD
SURVEYED BY DATE	DATUM

NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED APPROVED.

APPROVED .....

POSITION .....

DATE .....

DESIGNER TO COMPLETE	Date
DESIGNED	
DRAWN	
DRAFT CHECK	
DESIGN CHECK	

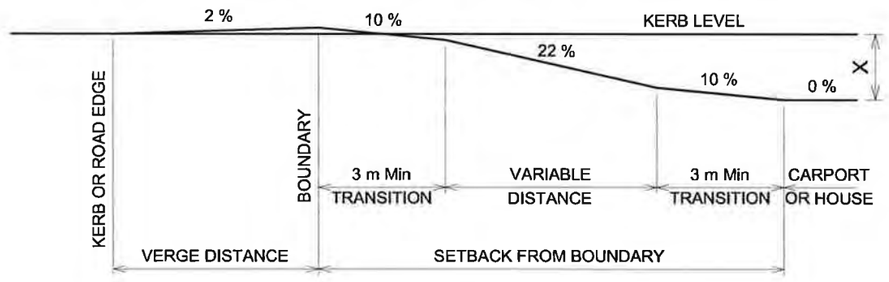
Shire of Murray

STANDARD DETAIL
ABOVE CARPORT LEVEL AND DRIVEWAY VERGES EXCEEDING 2% GRADIENT

JOB No.	SCALE		DWG No.
	N.T.S.	A3	STD D05

VERGE LENGTH

SETBACK FROM BOUNDARY	3	4	5	6	7	8	9	10	11	12	13
3.2	.26	.24	.22	.20	.18	.16	.14	.12	.10	.08	.06
3.6	.30	.28	.26	.24	.22	.20	.18	.16	.14	.12	.10
4.0	.34	.32	.30	.28	.26	.24	.22	.20	.18	.16	.14
4.4	.38	.36	.34	.32	.30	.28	.26	.24	.22	.20	.18
4.8	.42	.40	.38	.36	.34	.32	.30	.28	.26	.24	.22
5.2	.46	.44	.42	.40	.38	.36	.34	.32	.30	.28	.26
5.6	.50	.48	.46	.44	.42	.40	.38	.36	.34	.32	.30
6.0	.54	.52	.50	.48	.46	.44	.42	.40	.38	.36	.34
6.4	.63	.61	.59	.57	.55	.53	.51	.49	.47	.45	.43
6.8	.72	.70	.68	.66	.64	.62	.60	.58	.56	.54	.52
7.2	.80	.78	.76	.74	.72	.70	.68	.66	.64	.62	.60
7.6	.89	.87	.85	.83	.81	.79	.77	.75	.73	.71	.69
8.0	.98	.96	.94	.92	.90	.88	.86	.84	.82	.80	.78
8.4	1.07	1.05	1.03	1.01	.99	.97	.95	.93	.91	.89	.87
8.8	1.16	1.14	1.12	1.10	1.08	1.06	1.04	1.02	1.00	.98	.96
9.2	1.24	1.22	1.20	1.18	1.16	1.14	1.12	1.10	1.08	1.06	1.04
9.6	1.33	1.31	1.29	1.27	1.25	1.23	1.21	1.19	1.17	1.15	1.13
10.0	1.42	1.40	1.38	1.36	1.34	1.32	1.30	1.28	1.26	1.24	1.22
10.4	1.51	1.49	1.47	1.45	1.43	1.41	1.39	1.37	1.35	1.33	1.31
10.8	1.60	1.58	1.56	1.54	1.52	1.50	1.48	1.46	1.44	1.42	1.40
11.2	1.68	1.66	1.64	1.62	1.60	1.58	1.56	1.54	1.52	1.50	1.48
11.6	1.77	1.75	1.73	1.71	1.69	1.67	1.65	1.63	1.61	1.59	1.57
12.0	1.86	1.84	1.82	1.80	1.78	1.76	1.74	1.72	1.70	1.68	1.66
12.4	1.95	1.93	1.91	1.89	1.87	1.85	1.83	1.81	1.79	1.77	1.75
12.8	2.04	2.02	2.00	1.98	1.96	1.94	1.92	1.90	1.88	1.86	1.84
13.2	2.12	2.10	2.08	2.06	2.04	2.02	2.00	1.98	1.96	1.94	1.92
13.6	2.21	2.19	2.17	2.15	2.13	2.11	2.09	2.07	2.05	2.03	2.01



FIGURES INSIDE THE CHART ARE THE MAXIMUM HEIGHT DIFFERENCE (X) BETWEEN THE TOP OF KERB AND CARPORT FLOOR LEVEL

No.	DATE	REVISION	BY	CHKD	APPR'D	DATE

C.A.D.D. File Nos.
MICROSTATION | CIVILCAD
SURVEYED BY | DATUM
DATE

NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED APPROVED.
APPROVED .....
POSITION .....
DATE .....

DESIGNER TO COMPLETE
Date
DESIGNED
DRAWN
DRAFT CHECK
DESIGN CHECK

Shire of Murray

STANDARD DETAIL BELOW CARPORT LEVEL AND DRIVEWAY VERGES EXCEEDING 2% GRADIENT

JOB No.
SCALE N.T.S.
A3
DWG No. STD D06

APPENDIX D LANDSCAPING SPECIES LIST

SHRUBS


Anigozanthos flavidus


Beaufortia elegens


Dianella revoluta


Eremophila nivea

BOTANICAL NAME	COMMON NAME
Anigozanthos flavidus	Tall Kangaroo Paw
Anigozanthos manglesii	Mangles Kangaroo Paw
Anigozanthos viridis	Green Kangaroo Paw
Banksia nivea	Honeypot Dryandra
Beaufortia elegens	Elegant beaufortia
Beaufortia squarrosa	Sand Beaufortia
Boronia crenulata	Aniseed Boronia
Dianella revoluta	Bluberry Lilly
Eremophila nivea	“Spring Mist” or Emu Bush
Grevillea thelemanniana	Spider Net Grevillea
Hovea trisperma	Common Hovea
Hypocalymma angustifolium	White Myrtle
Lechenaultia floribunda	Free-flowering Leschenaultia
Pimelea ferruginea	“Bonne Petite”
Patersonia occidentalis	Purple flag
Regelia ciliata	Regelia
Templetonia retusa	Cockies Tongues
Verticordia chrysantha	Yellow featherflower
Verticordia plumosa	Plumed featherflower

TREES


Hakea laurina


Eucalyptus rudis


Melaleuca viridiflora


Zelkova serrata

BOTANICAL NAME	COMMON NAME
Agonis flexuousa	Native Peppermint
Banksia littoralis	Swamp Banksia
Banksia menziesii	Firewood Banksia
Banksia prionotes	Acorn Banksia
Sapium sebiferum	Chinese Tallow
Corymbia calophylla	Marri
Corymbia ficifolia	Red flowering gum
Erythrina sykesii	Coral Tree
Eucalyptus erythrocorys	Illyarrie (Straight Stem Form)
Eucalyptus gomphocephala	Tuart
Eucalyptus marginata	Jarrah
Eucalyptus rudis	Flooded gum
Eucalyptus torquata	Coral Gum
Eucalyptus vitrix	“Little Ghost Gum”
Hakea laurina	Pincushion Hakea
Macrozamia reidli	Zamia Palm
Melaleuca leucadendra	Weeping Paperbark
Melaleuca preissiana	Moonah
Melaleuca rhaphiophylla	Swamp paper bark,
Melaleuca viridiflora	Red Flowering Paperbark
Xanthorrhoea preissii	Grass Tree
Zelkova serrata ‘Green Vase’	Japanese Elm

SWALE


Baumea juncea


Ficinia nodosa


Juncus pallidus


Viminaria juncea

BOTANICAL NAME	COMMON NAME
Baumea articulata	Jointed Rush
Baumea juncea	Bare twigrush
Baumea vaginalis	Sheath Twigrush
Ficinia nodosa	Knotted Club Rush
Gahnia trifida	Coast Saw Sedge
Juncus kraussii	Sea Rush
Juncus pallidus	Pale Rush
Juncus pauciflorus	Loose Flower Rush
Lepidosperma longitudinale	Pithy Sword-sedge
Lepidosperma squamatum	
Lepidosperma tenue	
Viminaria juncea	Swishbush

GROUND COVERS


Chrysocephalum apiculatum


Conostylis aculeata

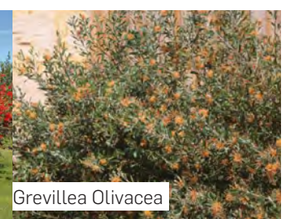

Grevillea crithmifolia


Dampiera linearis

BOTANICAL NAME	COMMON NAME
Adenanthos Cuneatus	Coral Carpet
Adenanthos meisneri	Prostrate Woollybush
Carpobrotus virescens	Coastal Pigface
Chrysocephalum apiculatum	Desert Flame
Conostylis aculeata	Prickly Conostylis
Conostylis candicans	Grey Cotton Heads
Dampiera linearis “True Blue”	Common Dampiera
Eremophila glabra “kalbarri carpet”	Tar bush
Grevillea crithmifolia prostrate	Green carpet
Grevillea obtusifolia	Gin Gin Gem
Grevillea preissii	Mini Marvel
Hemiandra pungens	Snake bush
Hibbertia racemosa	Stalked Guinea Flower
Hibbertia scandens	Guinea Flower
Kennedia prostrata	“Running Postman”
Leucophyta brownii	Cushion Bush
Olearia axillaris	Little Smokie
Scaevola canescens	Grey Scaevola

SCREENING


Callistemon citrinus


Grevillea Olivacea


Hibbertia scandens


Ricinocarpus Tuberculatus

BOTANICAL NAME	COMMON NAME
Adenanthos cygnorum	Common Woollybush
Astartea scoparia	Common Astartea
Callistemon citrinus	Bottlebrush
Callistemon phoeniceus	Lesser Bottlebrush
Calothamnus quadrifidus	One-sided Bottlebrush
Grevillea Olivacea	Olive Grevillea
Hardenbergia violaceae	Happy Wanderer
Hibbertia scandens	Guinea Flower
Ricinocarpus Tuberculatus	Wedding Bush

URBIS

PEEL BUSINESS PARK
DESIGN GUIDELINES PLANT SPECIES PALETTE

DATE: 30.05.2019
JOB NO: P0006347
DWG NO: SK-P-01
REV: A

Administration

Directorate	Officer Title
Planning and Sustainability	Director Planning and Sustainability

Version	Decision to Advertise	Decision to Adopt/Amend	Current Status
1	Delegated authority	OCM19/108 – 27/6/2019	
2	Not applicable	OCM21/083 – 24/6/2021	

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