

BROWN



Estate Development Plan Report

Moncrieff West

March 2014

C11075

Urban Development



Land Development Agency

Smart Consulting

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Brown Consulting (ACT) Pty Ltd
Level 6
121 Marcus Clarke Street
CANBERRA CITY ACT 2601

Ph: (02) 6211 7100

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Moncrieff West Estate Development Plan Report

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Appendix C	Bushfire Report
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1. Introduction

A Concept Plan was prepared for the suburb of Moncrieff in December 2008. In addition a Moncrieff Master Plan Guideline was produced by the LDA. This Estate Development Plan (EDP) incorporates the key planning objectives and principles outlined in the Concept Plan and Guideline.

The Moncrieff West Estate Development Plan provides the important planning requirements as the basis of future detail planning and development of the suburb. The EDP for Moncrieff East has been prepared by Indesco in parallel with this EDP for Moncrieff West to permit coordination of the EDP's for these two projects.

Moncrieff West Residential Estate is being developed by the ACT Government. It is being managed by the Land Development Agency, an agency established to develop land in the ACT on behalf of the Territory in accordance with the principles and policies laid down in the Territory Plan.

This Moncrieff West Estate Development Plan provides for 415 blocks, consisting of 7 multi-unit sites and two Commercial Sites. The estate contains blocks for; one or two storey housing and 2 - 4 storey multi-unit sites. Affordable Housing has been provided up to 20.3%.

Included within this EDP is the extension of Mirrabai Drive which passes through the middle of the suburb of Moncrieff together with provision for a future IPT route to the Moncrieff Group Centre and is to be designed and constructed with the Estate. The extension of Horse Park Drive adjacent to Moncrieff West has recently been designed and is currently under construction as Capital Works.

The Moncrieff EDP is supported by the subject plans listed below:

DRAWING SCHEDULE

Drawing Number	Plan Number	Drawing Title
C11075-CS+	0.1	Cover Sheet
C11075-DS+	1.1	Drawing Schedule
C11075-EDP.1+	2.1	Estate Development Plan Sheet 1 of 4
C11075-EDP.2+	2.2	Estate Development Plan Sheet 2 of 4
C11075-EDP.3+	2.3	Estate Development Plan Sheet 3 of 4
C11075-EDP.4+	2.4	Estate Development Plan Sheet 4 Of 4
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C11075-LP+	4.1	Locality Plan
C11075-CMP+	5.1	Concept Master Plan
C11075-ST+	6.1	Staging Plan
C11075-LUP+	7.1	Land Use Plan
C11075-SAP+	8.1	Slope Analysis Plan
C11075-SWMP.1+	9.1	Stormwater Master Plan Catchment Layout Sheet 1 of 3
C11075-SWMP.2+	9.2	Stormwater Master Plan Catchment Layout Sheet 2 of 3
C11075-SWMP.3+	9.3	Stormwater Master Plan Catchment Layout Sheet 3 of 3
C11075-SWMP.4+	9.4	Stormwater Master Plan Sheet 1 of 4
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C11075-SWMP.6+	9.6	Stormwater Master Plan Sheet 3 of 4

Drawing Number	Plan Number	Drawing Title
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C11075-WSUD+	10.1	Water Sensitive Urban Design Outcomes Plan
C11075-SMP.1+	11.1	Sewer Master Plan Catchment Layout Sheet 1 of 3
C11075-SMP.2+	11.2	Sewer Master Plan Catchment Layout Sheet 2 of 3
C11075-SMP.3+	11.3	Sewer Master Plan Catchment Layout Sheet 3 of 3
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C11075-BCP.3	15.3	Block Compliance Plan Sheet 3 of 4
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C11075-RHP.2	16.2	Road Hierarchy And Traffic Analysis Sheet 2 of 2
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C11075-LS.07	19.7	Longitudinal Sections - Road 04
C11075-LS.08	19.8	Longitudinal Sections - Road 05
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C11075-LS.10	19.10	Longitudinal Sections - Road 06 - Sheet 2 of 3
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C11075-LS.12	19.12	Longitudinal Sections - Road 07 - Sheet 2 of 2
C11075-LS.13	19.13	Longitudinal Sections - Road 08
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C11075-LS.16	19.16	Longitudinal Sections - Road 10 - Sheet 1 of 2
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C11075-LS.20	19.20	Longitudinal Sections - Road 12
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C11075-LS.22	19.22	Longitudinal Sections - Road 14
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C11075-LS.24	19.24	Longitudinal Sections - Road 16
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C11075-LS.28	19.28	Longitudinal Sections - Lane 01
C11075-PTNM.1+	20.1	Public Transport Network Systems
C11075-PTNM.2+	20.2	Off Road Movements Systems Moncrieff And Surrounds
C11075-PTNM.3+	20.3	Off Road Movements Systems Moncrieff West
C11075-PP.1+	21.1	On Street Parking Plan Sheet 1 of 4

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C11075-PP.3+	21.3	On Street Parking Plan Sheet 3 of 4
C11075-PP.4+	21.4	On Street Parking Plan Sheet 4 of 4
C11075-WCP+	22.1	Waste Collection Plan
C11075-BEP.1	23.1	Building Envelope Plan
C11075-DIP.1	24.1	Development Intentions Plan Sheet 1 of 8
C11075-DIP.2	24.2	Development Intentions Plan Sheet 2 of 8
C11075-DIP.3	24.3	Development Intentions Plan Sheet 3 of 8
C11075-DIP.4	24.4	Development Intentions Plan Sheet 4 of 8
C11075-DIP.5	24.5	Development Intentions Plan Sheet 5 of 8
C11075-DIP.6	24.6	Development Intentions Plan Sheet 6 of 8
C11075-DIP.7	24.7	Development Intentions Plan Sheet 7 of 8
C11075-DIP.8	24.8	Development Intentions Plan Sheet 8 of 8
C11075-BTP.1	25.1	Block Typology Plans
C11075-BMP+	26.1	Bush Fire Risk Assessment And Management Plan
C11075-SG.1+	27.1	Fill Plan Sheet 1 of 4
C11075-SG.2+	27.2	Fill Plan Sheet 2 of 4
C11075-SG.3+	27.3	Fill Plan Sheet 3 of 4
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C11075-EMCP.1+	28.1	Environmental Management Concept Plan Sheet 1 of 4
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C11075-ELEC.1	34.1	Electrical Services Masterplan
C11075-IDP.1	35.1	Integrated Development Plans

The drawings listed above meet the requirements of the ACTPLA *Guidelines for the Preparation of Estate Development Plans*, May 2009.

1.1 Background

Moncrieff West forms part of the Moncrieff Concept Plan completed in 2008. LDA intends to commence the release of this land for development in the 2013-2014 financial year. A number of detailed studies have been undertaken including:

- » Flora and Fauna;
- » Aboriginal and Cultural Heritage;
- » Contamination assessment;
- » Infrastructure services.
- » EPBC Referral
- » Environmental Impact Statement

1.2 Site Characteristics

1.2.1 Location

Moncrieff is bounded by Horse Park Drive to the north and west, Amaroo to the east and Ngunnawal to the south. This EDP for Moncrieff West generally includes development to the west of the proposed extension to Mirrabai Drive and incorporates the Group Centre to the north east of the site.

The site is strategically positioned within 3 kilometres from Gungahlin Town Centre. Canberra's highest order commercial centre, Civic is a distance of 18.5 kilometres from the site. Belconnen Town Centre is at a closer distance of approximately 13.0 kilometres.

1.2.2 General Landform, Views and Drainage

The Moncrieff West site is distinctive, characterised by undulating topography. One distinct high point exists in the central portion of Moncrieff West with the majority of the site falling from this point

This outlook from Moncrieff West to the North takes in views of the future subdivision of Taylor while views to the south pickup parts on Ngunnawal.

The site is also characterised by a small water course running north with a major water course running east west in the southern boundary of the site.

Together these features create a memorable landscape and provide an opportunity to deliver a highly desirable landscaped residential community.

The landform consists of relatively flat terrain of 2.5% on the western portion, with slopes of approximately 14% surrounding the main hill.

1.2.3 Existing Vegetation and Habitat

Moncrieff West is characterised by open grasslands with scattered Eucalypts to the south. There is a large stand of Eucalypts of varying species, with a significant number of excellent trees to the north of the main the hill.

There is a large mixed species forward planting group of trees within the centre of the site however there are no significant trees within the plantation.

1.3 Heritage

Navin Officer undertook heritage investigations in 2009, prepared a Conservation Management Plan in 2010 and undertook detailed heritage investigations and collections culminating in a report prepared in 2011. A copy of the Conservation Management Plan and report on investigations and collections are attached in **Appendix G**.

1.4 Planning Context

This EDP has been prepared to respond to the provisions of the Territory Plan, the Moncrieff West Concept Plan and ACT Government "Affordable Housing Action Plan – 2007".

The EDP addresses the following requirements and components which are detailed below:

- » Land-use plans consistent with the Territory Plan
- » Identification of the mandatory Planning Requirements
- » Detailed subdivision design, and where appropriate, development controls
- » A solar audit in accordance with Estate Development Code
- » A tree survey and assessment report
- » A landscape master plan plus a tree retention plan and a tree management report detailing any proposed activity for all tree proposed for retention, pruning or removal
- » Master Plans for sewer, water and stormwater systems including details of sustainable urban stormwater initiatives, road hierarchy plan, drainage plan, longitudinal sections and pathways.

The land is defined as 'Residential, and Commercial'. There are no gazetted or constructed roads on the Moncrieff West site.

The Estate Development Plan has been prepared to satisfy the requirements of the Estate Development Code, October 2013. A table addressing each rule and criteria of this Code is included in **Appendix A**.

1.5 Gungahlin Strategic Assessment

The LDA has received approval from both the Federal and the ACT Government to The Plan to undertake urban and related development in the Gungahlin district of Canberra, (and in particular to the proposed area of Moncrieff) as described in the *Gungahlin Strategic Assessment Biodiversity Plan Final* (ACT Economic Development Directorate and ACT Environment and Sustainable Development Directorate, June, 2023) and this approval has been endorsed under the EPBC Act.

An approval under section 146B of the EPBC Act (strategic assessment provisions) has the same effect as an approval given under Part 9 of the Act. Actions approved under this decision do not require separate referral, assessment or approval under the EPBC Act.

A Section 2.11 EIS exemption under the Planning and Development ACT (2008) is nearing completion and Ministerial sign off is expected to be received by mid November 2013.

2. Moncrieff Concept Plan Planning Principles

The following planning principles were adopted for the Concept Plan and informed this development proposal:

Planning Principles	Development Proposal
The development of the suburb shall be sustainable in terms of economic, social, cultural and economic.	The development has been designed to provide a mix of dwellings that will ensure that the suburb is sustainable.
The development of the suburb shall be sustainable in terms of economic, social, cultural and economic.	The development has been designed to provide a mix of dwellings that will ensure that the suburb is sustainable.
The local neighbourhood is to be based on a walkable radius of 400m and focused on an activated along transport routed node such as shops or community use	A central playground has been provided that allows for pedestrian movement within a 400m radius. A group centre has been provided in accordance with the important planning requirements of the concept plan which is within walking distance of higher density dwellings, bus stops are provided within 400m radius of dwellings.
The road hierarchy should be legible and provide good safe access for all users and encourage high levels of public transport usage	The road network is simple and legible. Bus stops have now been incorporated into the plan to support and encourage public transport usage. Provision is made for future IPT to Moncrieff Group Centre.
Subdivision design should encourage housing diversity and optimism solar orientation. Higher density residential development is to be located around activity nodes	The subdivision design has provided housing diversity in accordance with market advice. Higher density development has been provided adjacent the proposed Group Centre. The estate satisfies the Estate Development Code requirements for solar access.
Aboriginal and historic places are to be recognised and significant sites conserved in public open space, where appropriate	The noted historic fence is unable to be conserved due to OH&S aspects. The design incorporates feature markers to indicate its location within the Hill Top open space. Refer to Landscape Masterplan drawing 13.2 for the location.
A Group Centre to be located at the intersection of Horse Park and Mirrabei Drives. The precinct design shall be based on the urban village. Each of the intersecting roads shall be designed as urban boulevards, with at-grade pedestrian crossings	The group Centre has been located as per the Concept Plan. At grade crossings on the intersecting roads have raised kerbs to address bus movements at intersection. Mirrabei Drive is designed as an urban boulevard rather than an arterial road as agreed with TaMS. The Group Centre, community facilities and CZ5 blocks address the intersection of Mirrabei Drive and Road 05 to create the urban village.
Significant hilltops and ridges to be retained in urban open space	The significant hill top in Moncrieff West has been retained. This hill top has also been linked towards the main open space running between Ngunnawal and Moncrieff
Incorporate Water Sensitive Design Elements such as retention ponds, swales and rainwater gardens for sustainable stormwater management and achieve targets identified in the Waterways – water Sensitive urban design general Code	Water sensitive design elements including swales, retention ponds and wetlands have been included in the design.

3. Moncrieff Concept Plan Planning Requirements

3.1 Dwelling Numbers and Housing Mix

The following section demonstrates how the development proposal for Moncrieff West meets the requirements of the Concept Plan by providing a variety of different housing and block types.

3.1.1 Dwelling Yield

Table 1 Moncrieff West Block Yield

BLOCK TYPE	BLOCK WIDTH	BLOCK DEPTH	DESCRIPTION	TOTAL
SR1 <250 m ²	9m	17m	Attached/Duplex	79
SR3 351-450 m ²	14-20	20-30m	Detached 1 and 2 storey	62
SR4 451-650 m ²	15-22	30m	Detached 1 and 2 storey	204
SR5 >651 m ²	≥22m	30m	Detached 1 and 2 storey	61
Community Use				2
Multi-unit (229 dwellings)			2 -4 storey	4
Mixed Use (245 dwellings)				2
			STAGE TOTAL	414

3.1.2 Housing Mix

The proposed subdivision results in the provision of a total of 414 blocks, which comprise 406 residential blocks and 4 multi-unit blocks, 2 mixed use site and 2 Commercial Block. The housing mix is reflected in the varying block areas and dimensions, with block sizes range from 210 m² to 1110 m². This will provide options to cater to a wide range of markets, provide affordability and choice, and promote housing design and innovation.

Affordable Housing has been provided within Moncrieff West with at least 20% of dwellings meeting the affordable housing obligations set out in the “Affordable Housing Action Plan 2007”.

Consideration has been given to ensure that dwellings can be sighted to enable that their northern facades receive adequate sunshine in winter. A number of specific housing planning controls are proposed to promote high quality housing, improved resident amenity and high quality built form. The controls will ensure that solar access and private open space comply with the Territory Plan requirements.

The small blocks are generally orientated north south to enable compliance with the Block Compliance Tables.

One of the key objectives is to offer a range of housing types to encourage affordability and social mix. The proposal therefore provides a variety of specific housing typologies and corresponding specific block sizes to cater for such a mix throughout the Estate. The mix of housing types has been produced to create attractive and varied streetscapes. The outcome of the built form selection will introduce a strong sense of cohesiveness and contribute to community character and identity.

The dwelling mix consists of dwelling types:

- » Single/two storey detached homes on blocks >500 m² which meet the requirements of the Territory Plan
- » Single/two storey detached homes set on blocks 251-500 m²
- » Attached/duplex homes set on compact blocks up to 250 m²
- » Multi-unit dwellings 2 to 4 storey

3.2 Commercial Site

A site of 1.5Ha has been provided for the Group Centre, which includes a supermarket of approximately 2500m² and a retail component of 1500m².

The expected parking generation from this site has been calculated at 155 car parks, plus disabled parking. This is based on applying 5/100m² GFA for the store area and 2/100m² GFA for the shop area in accordance with the ACT Parking Code.

The Development Intentions Plan 34.4 demonstrates how the supermarket, retail, parking and semi-trailer access can be provided on the nominated 1.5Ha site.

3.3 Community Facility Site(s)

A site of 5Ha has been provided for a potential school, this is located in Moncrieff East EDP. The school site has been quarantined from Moncrieff EDP's in response to DET's ongoing demographic studies, which may move the school to Taylor.

A site of 1.0Ha has been provided adjacent the Group Centre for a community facility. Given the steep nature of the main hill top open space within Moncrieff West, it has not been considered for future small-scale community facilities.

3.4 Subdivision

The development proposal for Moncrieff West has been prepared to include all of the following:

- » Pathways have been provided within the estate that link to existing or proposed future development.
- » All blocks conform to the solar compliance tables.
- » Housing diversity has been provided, with increased density provided along Horse Park Drive and adjacent the Commercial/Community precinct.
- » The majority of road orientation allows for distant views out of the site, with the main central park area maintaining a visual link down the open space between Ngunnawal and Moncrieff West.
- » Mirrabai Drive maintains distant views to both the north and south.

3.5 Roads and Access

The development proposal for Moncrieff West has been prepared to include of the following:

- » Extension of Mirrabai Drive to Horse Park Drive. Mirrabai Drive is a major collector urban boulevard.
- » Access to Moncrieff has been provided from Horse Park and Mirrabai Drive in a way that minimises rat running.
- » Edge roads have been used as buffers between residential areas, open space areas and Horse Park Drive.
- » Proposed street trees strengthen and enhance the different road hierarchy.

3.6 Public Transport and Inter-town Public Transport Route

The development proposal for Moncrieff West has been prepared to include of the following:

- » The Inter-town Public Transport (IPT) corridor has been provided along Mirrabai Drive, with a terminus located at the commercial/community precinct.
- » Bus routes and bus stops have been located to ensure at least 90% of dwellings are within 400m radius.

3.7 Pedestrian / Cycle Network

The development proposal for Moncrieff West has been prepared to include of the following:

- » Pedestrian paths are provided along all streets, both sides of the roads.
- » On road and off road paths connect across the Estate, connect the open space areas and link to existing networks along Horse Park Drive and Ngunnawal

3.8 Equestrian Trails

The development proposal for Moncrieff West does not impact on the existing equestrian trails.

3.9 Open Space

The development proposal for Moncrieff West has been prepared to include of the following:

- » Native plants indigenous to the area have been incorporated where possible, with hills and significant internal ridges protected from development and enhanced with native vegetation.
- » No development is on eastern escarpment.
- » Open space spines retain existing drainage paths and the areas retained as Urban Open Space.
- » Local parks and playgrounds are provided through the suburb.

3.10 Suburb Entry Features

Strong distinctive entry features including signage and formal planting is proposed at Mirrabai Drive roundabout, with formal planting proposed at Horse Park Drive Intersection.

3.11 Trees

Exceptional value trees have been retained in open space and the majority of the high value trees also retained in areas of open space, road reserves and within large blocks.

3.12 Water Sensitive Urban Design

The development proposal for Moncrieff West has been prepared to include of the following:

- » Water quality control ponds and wetlands for catchment in the south west;
- » Swale drains are provide at edge roads along Horse Park Drive and
- » Permeable kerb on edge roads adjacent open space areas.

3.13 Urban Edge Treatment

The development proposal of the open space areas for Moncrieff West have included off-road paths that connect through the Estate and beyond into the adjacent suburbs and a playground located in the Hill Top reserve.

3.14 Staging of Development

The first stage of Moncrieff West is the southern section which can be accessed from the existing Mirrabai Drive. The second and third stages are to follow stage one, however as the Horse Park Drive extension is nearing completion, there is the potential to have stage one and two proceed concurrently.

3.15 Infrastructure/Services

Trunk infrastructure (stormwater, sewerage and water) along Horse Park Drive is nearing completion to allow connections for Moncrieff West to the north.

Trunk infrastructure connections for southern section are proposed as part of the Estate works.

Sewer and electricity are the only services identified that requires a significant extension from Ngunnawal to service Moncrieff.

3.16 Further Studies

The following investigations have been undertaken to support the development of Moncrieff:

- » a tree survey and assessment, available on request;
- » a contamination assessment report, Appendix H;
- » an environmental assessment as part of the Gungahlin Strategic Assessment;
- » a heritage assessment report, Appendix G;
- » a bushfire risk assessment, Appendix C;
- » an engineering/infrastructure/services assessment, included in the Estate Development Plan Documentation;
- » a traffic and noise assessment, Appendix B and F;
- » a geotechnical assessment, currently underway by Douglas and Partners;
- » water sensitive urban design measures, included in the Estate Development Plan Documentation;
- » an assessment to determine if aged person facilities are required, Appendix J.

4. Specific Planning Objectives and Principles

A set of objectives and specific planning principles were developed for the Estate as part of the planning process. They incorporate best practice design and planning principles of “Liveability” and “Sustainability” as well as embrace the overarching planning objectives, principles, and policies identified in the Territory Plan for development of residential areas. The EDP conforms to the requirements of the Estate Development Code.

4.1 Objectives

The Estate design meets all the following objectives:

- » Maximises lifestyle opportunities.
- » Provides a subdivision that is attractive, safe, convenient, easily walkable and accessible to public transport.
- » A responsive and memorable planned place.
- » Creating a community heart.
- » Creating a connective network of green streets.
- » Provides a distinctive urban character precinct with good building diversity.
- » Provides a suburban character precinct with efficiency in block subdivision.
- » Creating series of open spaces including a central hilltop park with children's playground, wetland ponds, sloping grasslands, woodlands, path linkages, seating with varied views and an urban hub plaza environment at the Group Centre.
- » Offers a range of housing types to encourage social mix.

4.2 Principles

This section summarises key planning considerations used as a basis for developing the Estate Development Plan for Moncrieff West.

- » The introduction of a collector road / bus route through Moncrieff West. Deviation of this route around the central hill to ensure maximum road grades are not exceeded.
- » The introduction of a number of visual corridors through the site to capture the view of the central hill spine.
- » Retention of a number of significant trees in the main open space park which provide habitat to the superb parrot and other fauna.
- » Retention of grassland and open woodland in the open space to retain and enhance biodiversity.
- » Enhancement of the creek corridor and its ecosystem to the south.
- » Achieving optimum number of dwellings units on site consistent with identified constraints.
- » Enhance verge width to emphasize entry into the estate.
- » Provision of entry feature for wayfinding and landmarking.
- » Provide dual carriageway road entry to further reinforce the entry into the estate from Horse Park Drive.
- » Creation of a connective pedestrian network to serve the needs of the local community and surrounding neighbourhoods.
- » Ensure that bushfire protection measures are integrated into the estate.
- » Satisfy solar access requirements of the Estate Development Code.
- » Extension of Mirrabei Drive through the estate to Horse Park Drive.
- » Provision of an IPT corridor through the estate to the Moncrieff Group Centre and community facility.
- » Provision of Moncrieff Group Centre and community facility.
- » Higher density development in close proximity to the collector roads, Group Centre and IPT terminus.

5. Site Planning Potentials and Constraints

5.1 Potentials

Develop the EDP within the framework of the LDA master plan.

Ensure that the planning and design principles of the Moncrieff Concept Plan are incorporated into the EDP.

Capitalize on views to natural features within and beyond the site to Canberra landmarks.

Ensure that road hierarchy and open space pedestrian linkages interfaces with Moncrieff East.

5.2 Constraints

A number of constraints have been addressed in the development of the EDP, these are:

- » A number of drainage easements will be required to pass through the site. These would ideally be contained within the road corridors.
- » Steep terrain, particularly towards the central portion of the development.
- » Upstream catchments from the adjoining future suburb of Taylor.
- » Noise from the adjoining Horse Park Drive and Mirrabai Drive.
- » Existing high value trees.
- » Existing exceptional trees
- » South facing slopes
- » Grassland and open woodland
- » Incorporating a future light rail , inter town public transport corridor and terminus

Refer to Appendix O – which outlines the subdivision planning concept which aimed to maximise the retention of trees for the proposed estate layout.

5.3 Planning Assumptions

The Estate Development Plan includes the following key elements:

A simple, legible and permeable road and pedestrian network which responds to identified design generators. These include natural drainage patterns, aspect and prospect. The block and section layout ensures that the maximum number of blocks obtain optimal solar access.

One playground site has been proposed within the site adjacent to a number of large significant trees.

Open space pedestrian linkages are wheel chair accessible where this can be accommodated with the existing topography.

- » 406 residential blocks and 4 multi-unit blocks, 2 mixed use site and 2 Commercial Blocks (Local Centre) in Moncrieff West will allow for a diverse housing choice. The estate provides for 1 or 2 storey detached and attached dwellings to suit various block sizes.

6. Planning Proposal

The EDP responds to the requirements expressed in the Territory Plan – Estate Development Code (2013) and the Moncrieff Concept Plan (2008).

6.1 Urban Design Objectives

The urban design responds to the objectives outlined below:

- » Maximise life style opportunities;
- » Develop an integrated, diverse community with a strong identity and sense of place;
- » Provide a high level of permeability and connectivity with adjoining estates;
- » Provide ease of pedestrian movement both from within Moncrieff West to Moncrieff East
- » Maximise Investment opportunity through ensuring quality design and delivery;
- » Provide safe, compact and walkable residential precincts with easy access to recreational, retail-commercial and community facilities;
- » Provide high quality, affordable, commercially viable, ecologically sustainable development;
- » Ensure flexibility to meet the changing needs of the market through diverse house designs;
- » Provide a variety of living options and affordable housing
- » Design for efficiency of land use and increased amenities;
- » Maximise the opportunity for visual and physical linkages throughout the site;
- » Allow good pedestrian permeability while respecting the need to create safe and secure living environments;
- » Optimise the opportunities for active and passive recreation within the precinct;
- » Provide for a range of dwelling designs which address contemporary lifestyle, economic constraints and current market styles;
- » Create a unique landscape setting providing an attractive public realm and opportunities for communal/social participation and reinforcement by the future residents.
- » Provide a group centre with direct linkages to pedestrian street

6.1.1 Urban Design Principles

General

- » Planning and development of Moncrieff West should incorporate environmental, social, cultural and economic sustainability principles;
- » Detailed planning is to take advantage of the natural, cultural and heritage characteristics of the area to support and strengthen the community's identity;
- » Deliver high quality, commercially viable, ecologically sustainable development;

Vehicular and Pedestrian Networks

- » Provide a legible and connected road layout and pedestrian / cycle network;
- » The local neighbourhood is based on easy walkable distances, and focus on an activity node such as a neighbourhood park;
- » The road hierarchy should be legible, connected to the wider network and provide good and safe access for all users and support high levels of public transport usage;

- » Roads include adequate on street parking, wide verges, street trees and pedestrian friendly walkways.
- » Provide quiet leafy streets;
- » Mirrabai Drive extension connecting to Horse Park Drive and Moncrieff Group Centre

6.2 Compliance with Planning Codes

The Territory Plan Estate Development Code guided the planning and design of the Master plan and Estate Development Plan including neighbourhood planning - street networks, block layout, and open space, physical infrastructure - construction and design of streets and on street parking, utilities, waste management, as well as storm water and integrated catchments management.

6.2.1 Estate Development Code – 4 October Issue

The development of Moncrieff West was prepared two years prior the introduction of the updated Estate Development Code. The project was then subsequently lodged for an EPBC, Section 146B approval in relation to the Gungahlin Strategic Assessment Plan and approval provided in 2013.

The proposed estate layout was assessed against the requirements of the new Estate Development Code. It was identified that the proposed layout was generally compliant to the new code, with the exception of shared path widths. In consultation with TaMS the proposed shared path network layout and nominated width of paths was developed and endorsed by TaMS. The noted exemptions to path widths have been identified in the table shown on drawing C11075-RHP.1 Plan 16.2 and associated typical cross section drawings.

6.2.2 Neighbourhood Design

The proposal meets the general intent and performance criteria of the Territory Plan in that the Estate is designed to provide a safe, convenient, accessible and attractive neighbourhood which meets the diverse and changing needs of the community. Refer also to the Section 4.1, which outlines the objectives of the design

6.2.3 Street Networks

The proposal meets the general intent and performance criteria of the Territory Plan in that the street network of the Estate is designed to have a clear and legible layout that is accessible, safe and convenient for all users. Refer also to Section 4.1.

6.2.4 Pedestrian and Cyclist Facilities

The proposal meets the general intent and performance criteria of the Territory Plan in that the street layout and associated paths encourage walking and cycling and that the network is safe and accessible for cyclists and pedestrians.

Paths are to be provided to both sides of the street in association with paths on the extremities of the estate that link to other suburbs.

6.2.5 Public Transport

The proposal meets the general intent of the rules and criteria outlined in the Territory Plan and the Moncrieff Concept Plan.

6.2.6 Public Open Space

The proposal meets the general intent and performance criteria of the Territory Plan. The design of the Moncrieff West Estate provides for attractive and accessible public open space that considers community requirements and

which incorporates landscaping and place-making elements that contribute to the character and identity of the Estate and relates to Moncrieff East.

Refer also to the Landscape Master Plan (LMP.1-4, 13.1-13.4) for information on the provision of facilities and play structures.

6.2.7 Block Layout and Building Envelope Plans

The EDP drawing, meets the general intent and performance criteria of the Territory Plan. The layout of the sections and blocks in Moncrieff West correlates to the road layout. The layout of blocks attempts to maximize internal and external solar access for housing, maximize street address, increase housing mix and provides diversity in response to site features. Dwellings allocated as meeting the “Affordable Housing Plan” objectives have been strategically located close to open parkland and are accessible to other nearby community amenities.

The layout of sections and blocks allows for a wide range of block size, block layout and therefore housing mix, in response to market analysis and consumer demands. The variation in block size and typology and resultant mix of housing will allow attractive and varied streetscapes.

Where possible, houses address open space areas to increase surveillance opportunities and to maximize the interface with the public realm.

Where appropriate, blocks have been orientated to take advantage and maximise the external views and to capture the views to open space areas within the site.

Building Envelope Plans have been prepared for those blocks that do not comply with Appendix A – Block Compliance Table, but do comply with the Test Block requirements.

6.2.8 Utilities, Waste Management and Sediment and Erosion Control

For information relating to provision of utilities, refer to Section 14 of this document.

For information relating to Waste Management arrangements, refer to Section 22 of this document.

For information relating to Sediment and Erosion control, refer to Drawing C11075-EMCP1-29.1 TO 29.3.

6.2.9 Traffic Generation Numbers

Trip generation rates in Table 1A of the Estate Development Code have been adopted to calculate traffic generation for the development of Moncrieff West.

7. Traffic Analysis and Road Hierarchy

As part of an overall assessment of the development of Moncrieff West, an assessment of internal traffic generation and road hierarchy has been undertaken by Brown Consulting (refer to drawings C11075-RHP1 and RHP2). A traffic study for Mirrabai Drive was also undertaken by Brown Consulting to inform the design of this road, refer to **Appendix B** for a copy of this traffic study. Indesco are undertaking the EDP for Moncrieff East concurrently with the Moncrieff West EDP and the traffic study undertaken by Indesco was also referenced to inform the Moncrieff West traffic study.

Horse Park Drive extension from Mirrabai Drive to Burrumurra Avenue has recently been designed by Brown Consulting and is currently under construction. These works provide a stub road into the estate at Mirrabai Drive and Road 04.

7.1 Road Hierarchy

A summary of the traffic assessment for Horse Park Drive, Mirrabai Drive and the Moncrieff West internal estate is provided below:

Horse Park Drive

Traffic volumes on Horse Park Drive adjacent Moncrieff were obtained from the Roads ACT EMME2 model with a 2031 traffic volume of 12,600vpd adopted as the design traffic volume. This traffic volume makes this section of Horse Park Drive an arterial road with a single carriageway. This EMME2 model assumed that Moncrieff, Taylor and Jacka were completed and fully occupied by 2031.

Two intersections are proposed from Horse Park Drive into Moncrieff West, one being at Mirrabai Drive, the second being approximately 500m west of Mirrabai Drive at the location indicated on the Territory Plan and the Moncrieff Concept Plan. In accordance with the Territory Plan and Moncrieff Concept Plan, the adjacent Taylor road network is to connect to both of these intersections. The EMME2 model showed that traffic volumes from the Taylor legs would be 12,500vpd at the Mirrabai Drive intersection and 6,230vpd onto the second intersection with Moncrieff. It is noted that these are large traffic volumes which require additional lanes on the Moncrieff legs of these intersections in order to reduce traffic queue lengths within Moncrieff.

A SIDRA analysis was undertaken for both intersections onto Horse Park Drive to determine their configuration. Both intersections are proposed to be traffic signals. The Mirrabai Drive intersection is to be constructed initially as a four way intersection with traffic signals. The western intersection is to be constructed initially as an unsignalised tee and upgraded to a signalised four way intersection when Taylor is constructed.

The Mirrabai Drive intersection is required to have two straight through lanes in all directions to reduce queue lengths. Double right turn lanes are required from Horse Park Drive in both east and west direction to reduce queue lengths which therefore requires two lanes on the southbound carriageway of Mirrabai Drive.

The western intersection only requires single lane in each direction on Horse Park Drive with dedicated right turn lanes in both directions. Due to the traffic volumes from Taylor, a dedicated through lane and right turn lane are required on the Moncrieff West leg (Road 04) of this intersection to reduce queue lengths within Moncrieff West. A central island is also required to create this right turn lane which in turn restricts the access to blocks fronting Road 04.

The Horse Park Drive road reserve boundary is proposed to be 45m wide adjacent Moncrieff West. This accommodates all works required for Horse Park Drive within the road reserve.

Mirrabai Drive Extension

A brief statement of results of traffic modelling for Mirrabai Drive is included in **Appendix B**.

Traffic volumes on Mirrabai Drive through Moncrieff were obtained from the Roads ACT EMME2 model with a 2031 traffic volume of 11,900vpd adopted as the design traffic volume. This traffic volume means Mirrabai Drive requires a minimum single carriageway. This EMME2 model assumed that Moncrieff, Taylor and Jacka were completed and fully occupied by 2031. It is noted that a micro-simulation model of Mirrabai Drive was not conducted, hence the adoption of the EMME2 model traffic volumes along this section of Mirrabai Drive.

The developable area of Taylor and Jacka used in the EMME2 model has subsequently been reduced as a result of the Gungahlin Strategic Assessment. It would be desirable to have ESDD update the ACT Government EMME model to reflect this change in population. However, it is considered that the outcome of the design of Mirrabai Drive would not change, albeit the traffic midblock and intersection performance would be improved.

Based on the nature, function and character of this section of Mirrabai Drive through Moncrieff, Roads ACT has agreed to classify Mirrabai Drive as a Major Collector road in keeping with the intent of the Concept Plan for an Urban Boulevard. This results in a 60km/hr speed limit, parallel parking, on street bus stops, 7.5m verges with large trees and housing front the road.

Two intersections are proposed onto Mirrabai Drive. One intersection, with Road 05, is approximately 150m south of Horse Park Drive and provides access to the proposed Moncrieff Group Centre, the community facility and the Moncrieff East estate including school. The traffic volume on this road is approximately 4,676vpd making it a collector road which is appropriate order for road hierarchy. The second intersection is approximately 420m south of Horse Park Drive with collector roads (Roads 01 and 02) running east and west into Moncrieff East and West in accordance with the Territory Plan and Moncrieff Concept Plan.

Due to the location of the potential Moncrieff School and Group Centre, a safe pedestrian crossing of Mirrabai Drive including for school children from Moncrieff West is considered essential to be provided. The landform does not permit a pedestrian underpass to be located along Mirrabai Drive within Moncrieff West, hence it is proposed to signalise both intersections along Mirrabai Drive to provide safe pedestrian crossings of Mirrabai Drive to the school and Group Centre. A SIDRA analysis of these signalised intersections has been provided in **Appendix B**. Dual carriageway is provided between Horse Park Drive and Road 01/02 to reduce queuing and improve intersection performance.

The Moncrieff Concept Plan requires provision for a future IPT along Mirrabai Drive to the Moncrieff Group Centre. A corridor reserved for the IPT has been provided on the eastern verge of Mirrabai Drive within the road reserve. Draft TCD drawings have been included in the EDP submission to detail the configuration of Mirrabai Drive; refer to drawings C11075-MIR4 to MIR8.

The intersection with Road 01 and 02 is also signalised to allow for the future light rail. This intersection and adjacent property boundaries have been designed to allow an intersection upgrade to occur in the future for the IPT crossing of Road 01. The current and ultimate intersection arrangement is shown on drawing 17.1.

The section of Mirrabai Drive south of Roads 01 and 02 merges to a single carriageway with a connection onto the existing roundabout on Mirrabai Drive. Dual carriageway is not required on this road due to traffic volumes.

Moncrieff West

The proposed development at Moncrieff West will generate 4,782vpd from the main estate area between Horse Park Drive and Mirrabai Drive with 2,828vpd along Road 02 onto Mirrabai Drive and 1,954vpd along Road 04 onto Horse Park Drive. These two roads are therefore Minor Collector Roads which are appropriate hierarchy to connect to the main roads. The Moncrieff West development has been included in the Roads ACT EMME2 model and are therefore inclusive in the Horse Park Drive and Mirrabai Drive traffic volumes.

A collector road link is provided through the Moncrieff West estate between Horse Park Drive and Mirrabai Drive in accordance with the Territory Plan and Moncrieff Concept Plan. A road link directly between Horse Park Drive and Mirrabai Drive was not provided as it considered that this would lead to rat-running through the estate from high traffic volumes in Taylor. Also, a direct road link would traverse over the crest of the hill requiring a 5m deep road cutting through open space area where exceptional value trees are to be retained. The collector road route provided is therefore a slower route with two intersections and a 90 degree bend to slow traffic down along this road link to make the collector network more attractive and deter rat-running. The alignment of this collector road and bus route is also aligned for gradient requirements for a bus route of no greater than 8% longitudinal grade.

Due to the terrain and location of Group Centre, the estate is broken up into three distinct areas being the south eastern area of single dwelling residential development (Sections AA, AB, AC and AD), the south western area of single dwelling residential (Sections AE, AF, AG, AH, AI, AJ, AK and AL) and the northern area of multi-unit high density development focused around the Group Centre and proposed bus routes and future IPT terminal. A higher order road (Road 03) is provided through the estate to suit the land form and to provide a logical road hierarchy, access through the estate and two separate entry/exit routes from anywhere in the estate. The southern section of Road 03 also traverses the open space ridge to provide a second road access to each of the single dwelling residential areas.

A logical road hierarchy is achieved with intersecting roads being no more than 2 categories lower than the higher classification road. Refer Section 5.1 below. All roads from Moncrieff West onto arterial roads are collector roads, therefore complying with this road hierarchy requirement.

A bus route is provided along the northern section of Road 03. Road 02 has 8.0% longitudinal grade while the northern section of Road 03 has less than 8% longitudinal grade. The southern half of Road 3 has grades in excess of 8% and is therefore not suitable for a bus route through this southern area of the estate. The entire estate can be serviced from the proposed bus route along Mirrabai Drive and the northern part of Road 03.

Road 05 has traffic volumes of 4,626vpd and is a bus route, hence has been classified as a Major Collector road. Parallel parking is provided on both sides of this road. Safe pedestrian crossing is provided at the Mirrabai Drive traffic signal signals and a median pedestrian island at the Road 15 intersection.

The location of parallel parking bays on Road 05 and the Road 15 intersection provide room for the Group Centre developer to construct a driveway into the site for shoppers and a separate driveway for commercial vehicles for deliveries.

Parking demand generated by the development will be accommodated within the development site and no overflow parking will spread into the neighbouring suburbs. On block parking requirements can be fully provided on the Group Centre and Community Centre sites.

7.2 Traffic Generation

The following trip rates were used for this assessment:

- » Peak hour traffic generation rate = **0.8 trips per dwelling** (0.6 trips for Multi-unit dwellings)
- » Daily traffic generation = **8 trips per dwelling** (6 trips for Multi-unit dwellings)

7.3 Traffic Distribution

The traffic in Moncrieff West is directed towards either Hose Park Drive or Mirrabai Drive, both of which provide easy access to Gungahlin Town Centre, Belconnen Town Centre, Civic and to Moncrieff Group Centre and Moncrieff School. Based on the estate layout, key external attractors for motorists and linkages of Horse Park Drive and Mirrabai Drive to the broader road network, a roughly even split has been assigned towards each road. The internal road network provides ready access to each road and therefore to the Group Centre and School from anywhere in the estate.

7.4 Key Internal Intersections

The majority of internal intersections in Moncrieff West are on Local Access streets for which intersection performance is not a problem due to low traffic volumes. The key internal intersections within Moncrieff West are on the Minor Collector Road 03 intersections with Road 02, 04 and 13. Other key intersections are those of Road 01 and 15 and Road 05 and 15. The traffic volumes at these intersections have been modelled in SIDRA and will operate at a satisfactory Level of Service A. Refer to SIDRA analysis in **Appendix B**.

Several four way intersections are proposed in Moncrieff West. The key four way intersection on Road 03 has a roundabout to control traffic flows due to the higher traffic volumes at this intersection. The other four way intersections on Road 11 have lower traffic volumes and are therefore considered to be an acceptable arrangement.

Pavement thresholds are proposed on several intersections to delineate road hierarchy and priority movements at these intersections, refer Road Hierarchy Plan C11075-RHP1 for details.

8. Roads

8.1 Major Collector Roads

Road 01 is a major collector road which conveys traffic from the Moncrieff East onto Mirrabai Drive. The section of this road within Moncrieff West project is of variable width due to it being within the Mirrabai Drive intersection extent where a dedicated left turn lane onto Mirrabai Drive is required to reduce traffic queuing at this intersection. Road 01 narrows down to an 11m wide pavement at the Estate boundary with Moncrieff East to allow for on-road cycling on this road in both estates. This road is suitable for a bus route. A 2.5m wide path is proposed on the northern verge for major path linkage to the school and a 2.0m wide path on the southern verge.

Road 05 is a major collector road which provides access directly off Mirrabai Drive to the Group Centre, community facility, Moncrieff School and Moncrieff East. The Group Centre and Community facility are co-located on both sides of this road in order to provide an urban village environment. The pavement width is 10m wide with parallel parking on both sides and fully paved verges.

8.2 Minor Collector Roads

Road 02 is a minor collector road which conveys traffic from Moncrieff West onto Mirrabai Drive. This section of road has 10m wide pavement. Driveway access is permitted onto this road. This road forms part of the bus route through Moncrieff West. 2.0m wide paths are proposed on both verges of this road.

Road 03 is a minor collector road with 10m wide pavement and 7.5m wide verges. The wider pavement and verges will signify to motorists the role of this road in the road hierarchy compared to all other Access Street connections of narrower pavement and verge. A 2.0m wide path is proposed on one verge and a 1.5m wide path on the other side of this road. This road forms part of the bus route through the estate. Parallel parking bays are provided adjacent to the open space and playground. This road connects to Road 02 and 04 which are collector roads and an appropriate road hierarchy.

Road 04 is a minor collector road from Moncrieff West onto Horse Park Drive. The road pavement width is nominally 10m wide. This road forms part of the bus route through the estate. A 2.0m wide path is proposed on one verge and a 1.5m wide path on the other side of this road. A median island is required on the approach to Horse Park Drive to allow a right turn lane to be added in the future when the intersection is upgraded to a four way signalised intersection when Taylor is developed.

Road 15 is a minor collector road which provides vehicular access to the blocks in Section AQ which include the community facility/group centre block, future IPT terminus and a large multi-unit site. The road pavement is 10m wide permitting on street parking along this road. This road links onto two major collector roads which is appropriate hierarchy for this road.

8.3 Access Streets

The standard reserve for Access streets within Moncrieff West is 20m which is formed from 6.25m wide verges and a 7.5m wide road pavement. Access streets have 1.5m wide paths on both sides. Access streets that form an edge road have verge widths of 6.25m and 3.25m.

Road 03 forms a continuous loop within the Moncrieff West project, therefore the same road reserve width of 25m with 10m wide pavements has been provided, even though the road hierarchy of this road varies. This wider pavement and verges will clearly identify the road within the road hierarchy of the estate as a continuous circulating road through the estate.

Part of Road 11, 13, 14 and 16 have 20.8m wide road reserves to allow a 2.0m wide path on one verge and 1.5m path on the other verge in order to comply with Access Street B requirements and/or path hierarchy.

8.4 Parking

Visitor parking is sufficiently provided along the kerbside edge of all Access Street roads. A parking plan is provided which indicates available parking opportunities on garbage collection day where block frontages are less than 12.5m. Refer to drawings C11075-PP1 to PP4.

While the full requirement for visitor parking for the multi-unit sites is to be provided on site, parallel parking is proposed on Mirrabai Drive adjacent to multi-unit sites. Parallel parking bays are also provided on Road 03 to provide visitor parking to the adjacent open space and playground. The parallel parking bays on Road 05 and Mirrabai Drive will be short stay parking for the purpose of access to the Group Centre blocks and ground floor commercial/retail use permitted on Section AV. The parking bays on Mirrabai Drive are proposed to have 45 degree kerb entrance/exit to facilitate parking on the road. Parking bays on Road 05 have longer parking bays to allow the tree pits at each end of parking bays to be square to the road.

The Parking plans show where No Parking is to be signposted including Roads 01, part Road 04 and sections of Mirrabai Drive.

8.5 Street Lighting

ActewAGL will undertake the underground electricity reticulation and streetlighting design in accordance with the current Design Standards for Urban Infrastructure Part 12.

The following streetlighting design criteria will be adopted in the design (to be confirmed with TaMS at detailed design) of the streetlighting for Moncrieff West:

- » Mirrabai Drive, streetlighting will be Category V3 with streetlight pole offset of at minimum 2.0m from the lane kerb line.
- » Major Collector and Minor Collector roads. Streetlighting will be Category P3 due to the higher traffic volumes and higher pedestrian traffic anticipated on these roads and each of these being a bus route. The pole type will be the Forde style column as adopted on other recent LDA estates in Gungahlin. The minimum offset of light poles will be 1.85m behind the kerb line.
- » Access Streets will be designed to Category P4. The Forde style light columns will be used with a minimum offset behind the kerb of 1.85m.

8.6 Traffic Noise

Moncrieff West is bounded by Horse Park Drive to the north and west and has Mirrabai Drive extension running through the estate. Horse Park Drive will be constructed as capital works while Mirrabai Drive will be designed and constructed with the Moncrieff West estate.

In undertaking the noise assessment the relevant road traffic noise criteria is defined in ACTPLA's Noise Management Guidelines (Draft), March 1996. The guidelines stipulate that for new developments, the maximum noise levels from traffic at a point one metre in front of the façade of the nearest affected residential dwelling should be 63 dB(A)L10 (18 hour). Within a recreational courtyard of private open space not facing the road source, the noise levels should be 58 dB (A) L10 (18 hour).

A noise assessment report for Horse Park Drive was prepared by UNSW at ADFA in December 2011 for the Horse Park Drive project. A copy of this report has been included in **Appendix F**. The following summarises the findings of this report:

The compact blocks on the northern end of Sections AH, AI, AJ, AK, AL, AM, AN, AO and AT will have noise levels below 63dBA at ground level while a second storey, if provided, would be subject to noise levels in excess of 63dBA. A second storey on these blocks would therefore require noise abatement measures to be incorporated into the building façade of the second floor.

A 1.8m high lapped and capped fence or a noise mound will be required adjacent Blocks a and b Section AL, Blocks a and b Section AM and Blocks a and b Section AO to reduce noise levels to the ground floor private open space areas of these blocks to below 58dBA. The noise levels of any second storey on these houses would exceed 63dBA and would therefore require noise abatement measures to be incorporated into the building façade of the second floor. Noise levels to the multi-unit developments fronting Horse Park Drive may require noise abatement measures to be incorporated into the buildings or open space areas depending on the development type that occurs on each of these blocks, its proximity to Horse Park Drive and its height. This should be assessed by the developer of each multi-unit site.

A noise assessment report for Mirrabai Drive was prepared by UNSW at ADFA in October 2013 to inform the Moncrieff West EDP. A copy of this report has been included in **Appendix F**. The following summarises the findings of this report:

All blocks on the western side of Mirrabai Drive in Section AA are sufficiently close to the road to require noise abatement measures to be incorporated into the building facades fronting Mirrabai Drive.

Noise levels to the multi-unit developments fronting Mirrabai Drive may require noise abatement measures to be incorporated into the buildings or open space areas depending on the development type that occurs on each of these blocks, its proximity to Mirrabai Drive and its height. This should be assessed by the developer of each multi-unit site.

It is noted that the noise levels determined in the ADFA report for both Horse Park Drive and Mirrabai Drive are less than the maximum permissible for a commercial area; therefore the Group Centre will not require any specific noise abatement measures.

Where the predicted external traffic noise levels do not comply with the criterion additional treatments to the dwellings are available to control the traffic noise intrusion into the building. Treatments are only required for the appropriate level of the dwelling for the affected facade/s. These treatments would take the form of upgraded glazing to habitable rooms and external doors opening onto habitable rooms. Habitable rooms are defined as living, dining, and bedrooms. They exclude bathrooms, laundries and corridors. They may apply to open plan kitchens. These treatments may need to be supplemented with mechanical ventilation and air-conditioning to enable windows to be kept closed during high traffic noise periods.

Blocks affected by noise are highlighted on the Planning Controls Plans included in the EDP drawings.

9. Cycle and Pedestrian Systems

9.1 On Road Cycling

On road cycling is provided along Mirrabai Drive as it is a Major Collector. This road will have a speed limit of 60km/hr, hence 1.5m wide on-road cycle lanes are allowed for in each direction. Mirrabai Drive has a maximum longitudinal grade of 2.5% which is suitable for a cycling route and has good links to the broader off-road trunk path network.

Road 01 is a major collector road and has 1.5m wide on road cycle lanes on both sides of the road.

Road 05, while nominated as a major collector road, does not have provision for on-road cycling as the Group Centre is a destination location and does not link to any on road cycle lanes within Moncrieff East. Both verges to be fully paved permitting a shared use of this wide path in lieu of on-road cycling.

On road cycling is provided along Horse Park Drive to the north and west of Moncrieff West. The Mirrabai Drive on road cycle lanes will match up to the Horse Park Drive on road cycling.

On road cycling is not provided on existing Mirrabai Drive, hence the on road cycling commences north of the existing roundabout with Len Waters Street. Off road cycle paths are to be located at this roundabout with concrete cycle ramps provided onto the on road cycle lanes north of the roundabout to allow connection to the existing off road cycle path along the northern verge of existing Mirrabai Drive. This off road path continues along Mirrabai Drive to the Gungahlin Town Centre.

9.2 Trunk Paths

A 2.5m wide trunk path is proposed on the eastern side of Mirrabai Drive for its entire length from Len Waters Street roundabout to Horse Park Drive. This trunk path connects to an existing 2.5m wide major path which currently ends at the Len Waters Street roundabout and to the 3.0m wide major trunk path proposed along the Horse Park Drive southern verge providing connectivity to the broader network.

A 2.5m wide trunk path is proposed along the northern side of the creek to the south of Moncrieff West and links Horse Park Drive to Mirrabai Drive. A pedestrian, cycle and equestrian underpass is located on Horse Park Drive at this creek crossing to the immediate west of Moncrieff West Section AH which connects to this 2.5m wide path along the creek corridor to Casey and Taylor. This path at the underpass also has a link to the 3.0m trunk path along the southern verge of Horse Park Drive.

An at grade trunk path crossing of Mirrabai Drive is provided as there is insufficient clearance for a grade separated underpass under Mirrabai Drive extension.

A 2.5m wide trunk path is proposed on the northern verge of Road 01 and southern verge of Road 05 as these paths are a key path link to the proposed Moncrieff School.

The verges of Mirrabai Drive and Road 05 adjacent to the Group Centre are proposed to be fully paved due to the urban village and commercial environment with higher pedestrian usage.

9.3 Intermediate Paths

A 2.0m wide shared path is proposed along the western verge of Mirrabai Drive from Len waters Street to Horse Park Drive.

A 2.0m wide path is proposed along key pedestrian desire routes through the estate to create a logical path hierarchy. This includes 2.0m wide intermediate shared paths along Road 01, 02, 03, 04, 11, 13, 14 and 16. The Offroad Movements System plan, C11075-PTNM.3, Plan 20.3 shows the proposed estate path network highlighting the main pedestrian desire paths to the school, Group Centre and adjacent Trunk Paths surrounding the estate. 2.0m paths are provided on these key pedestrian corridors. This path network and path widths has been endorsed by TAMS.

9.4 Minor Paths

Minor paths are provided on both verges of all Access Street A and on one side of all Access Street B and Minor Collector roads. These paths are all 1.5m wide and are located 1.2m offset from the block boundary in accordance with the typical cross-sections for Moncrieff West. These minor path network has been endorsed by TAMS.

A Minor path network is proposed across the hill top open space area to link road and path networks to activate this open space area and provide access to the proposed playground.

A path network is provided across the entire estate linking all roads directly with open space areas, nature reserves and shops.

10. Land Contamination

A site audit of Block 588 was undertaken by JBS Environmental in 2006. The investigations of the site assessed the contamination status of the site as low and the site as suitable for residential land use. The Environmental Protection Authority (EPA) reviewed the Site Audit in 2006 and endorsed the recommendation of the audit. Clearance from ACTPLA and the EPA was provided through the Concept Plan for Block 588.

As the development has received approval from both the Federal and ACT government as part of the Gungahlin Strategic Assessment this report has been omitted from the EDP Report.

11. Public Transport

The existing and proposed local bus network is shown on the Public Transport Network Systems plan, drawing C11075-PTNM.1, Plan 20.1. The proposed local bus capable route through Moncrieff West and Moncrieff East including indicative bus stop locations has been nominated, demonstrating that 90% of all dwellings in the estate are less than 400m from a proposed bus stop. Brown Consulting and Indesco met with ACTION during the development of these two EDP's to coordinate the bus routes.

The Moncrieff Concept Plan and the ACT Strategic Transport Plan require an IPT route along Mirrabai Drive to the Moncrieff Group Centre with a terminus to be located at the Group Centre. This IPT is a long term network providing rapid public transport (light rail) between the major centres in the ACT. As the IPT will not occur for many years, a corridor reservation for the future IPT has been provided within the Mirrabai Drive road reserve as shown on drawing C11075-PTNM.1, Plan 20.1 and typical road cross-sections. This reservation is reflected on all the EDP drawings. This reservation complies with minimum requirements for horizontal geometry and vertical grading for a light rail system to be provided in the future within the corridor nominated.

A future IPT light rail terminus is proposed on the southern side of the Moncrieff Group Centre permitting the Group Centre to have direct frontage onto Mirrabai Drive while allowing the IPT terminus to be located at the Group Centre.

The road network for Moncrieff West and the IPT corridor and terminus location has been designed to minimise the number of road crossings of the IPT to reduce delays in the service and minimise intersection upgrades in the future. As such, the IPT corridor only crosses one road within Moncrieff West. The design of the intersection of Mirrabai Drive with Road 01 and 02 has been prepared to accommodate the ultimate arrangement with the IPT with adjacent block boundaries set to this ultimate IPT arrangement so as to not restrict the future IPT system. The EDP drawings show the design of this intersection without the IPT as this is what will be constructed with this project and will be sufficient for the short to medium term until the IPT is installed. Drawing C11075-RDP.1 shows the short to medium term intersection without the IPT and the long term intersection design with the IPT to demonstrate that this ultimate arrangement can be incorporated into the intersection and road reserve with minor upgrade works. The IPT corridor alignment deviates away from the intersection to permit splitter islands, paths and signals to be located at this intersection with the IPT.

The earthworks for Mirrabai Drive will be inclusive of the final alignment and level of the IPT corridor so that the adjacent multi-unit developments will be constructed to suit the ultimate IPT road reserve grading so as to not create any constraints to the IPT. No pedestrian access will be permitted from these multi-unit sites directly onto Mirrabai Drive.

12. Agency Liaison and Consultation

During the planning process and preliminary engineering design, there has been ongoing liaison and consultation with agency representatives from Actew Water, ActewAGL, ESDD, TAMS, ACTION and Rural Fire Services. Other Agencies and Authorities will be liaised with during the EDP approval process.

13. Stormwater Concept Plan

13.1 Existing Stormwater Infrastructure

There are currently no existing stormwater services within Moncrieff West estate except at the existing roundabout on Mirrabai Drive. The following summarises the major stormwater catchments for Moncrieff.

Western Catchment: the western catchment of Moncrieff drains a small catchment of Taylor and part of Horse Park Drive and flows into an existing creek along the southern boundary of Moncrieff.

Southern Central Catchment: the south eastern catchment of Moncrieff West flows south into the existing creek and floodway adjacent the existing Mirrabai Drive. Mirrabai Drive extension will become the main drainage path for this catchment.

Northern Catchment: the northern catchment drains north through proposed culverts under Horse Park Drive into Taylor.

An existing creek runs along the southern boundary of Moncrieff adjacent to Ngunnawal and drains part of Casey and Taylor. This creek discharges into an existing floodway that has been constructed on the northern side of existing Mirrabai Drive and which currently ends at the roundabout with Len Waters Street.

Horse Park Drive will be constructed prior to Moncrieff West estate, therefore, the Horse Park Drive stormwater culverts and pipes are shown as existing on the Moncrieff West stormwater master plans.

13.2 Proposed Stormwater Infrastructure

A stormwater master plan has been prepared for Moncrieff West. The stormwater master plan illustrates the schematic stormwater pipe layout for the development, catchment areas, 5 and 100 year ARI flows, velocity depth safety criteria and 100 year ARI flood extents.

The detailed stormwater design will be in accordance with the TAMS Design Standards. Flows up to and including the 5 year ARI event are generally to be piped whilst the major system comprising roads conveys the 100 year ARI flows. Flows up to and including the 10 year ARI will be piped through to the Group Centre.

Major features of the proposed stormwater network for the Moncrieff West estate include:

- » Two water quality control ponds with detention capacity that will reduce peak developed flows to pre-developed levels prior to discharge downstream. Both of these ponds are off-line only treating the Moncrieff urban runoff before discharge to the creek.
- » A trunk stormwater pipe through Road 08 and Road 11 to Pond 2. This pipe will convey stormwater flows from the upstream Taylor catchment through the Moncrieff West estate. This pipe has been sized to convey in excess of the 5 year ARI flows to limit overland (Q_{gap}) flows to comply with velocity depth criteria as outlined in the Design Standards for Urban Infrastructure. It is assumed that a pond with detention capability will be provided in Taylor to reduce post-developed runoff from that catchment to pre-developed flow-rates.
- » A 750mm diameter pipe is proposed along Road 05 to convey the 1 in 10 year ARI flow to provide appropriate flood protection to the Group Centre blocks.
- » Grassed swales adjacent Horse Park Drive to convey overland flows to culverts under Horse Park Drive.
- » Grassed swale on the eastern verge of Mirrabai Drive to provide water quality treatment of road runoff and convey 100 year ARI overland flows along this road.
- » Culverts under Horse Park Drive. These are to be constructed with the Horse Park Drive project and have been sized to discharge all flows up to and including the 1 in 100 year ARI from the upstream catchment including Moncrieff West. The position and size of these culverts have been coordinated with the Horse Park Drive design.

Extension of the existing Mirrabai Drive grassed floodway under Mirrabai Drive extension running west adjacent to the proposed Pond 1. This floodway diverts creek runoff around Pond 1 and lowers the existing 100 year ARI flood extents in this area to protect the proposed development. The alignment of this floodway extension is through an existing large stockpile which will be removed. The floodway will be the same shape and size as the existing floodway which is grass lined with an open concrete invert. A number of drop structures will be required along this floodway extension to minimise earthworks adjacent the floodway and to maintain flow velocities less than 2.0m/s. Large culverts under Mirrabai Drive at the floodway crossing. These are notionally 4x1800mm dia culverts to convey the 100 year ARI flows but may be designed as box culverts at detailed design. Cutoff drains are proposed at the back of blocks where required in the hill top open space area to provide protection to the blocks from runoff off the open space.

13.3 Overland Flow Management

When stormwater flows exceed the capacity of the piped system (including an allowance for blockages), stormwater runoff will travel overland along the road network into swales and ponds.

Overland flows have been designed to meet the following criteria:

- » Prevent flow up to the 100 year ARI from entering leased blocks.
- » In road reserves to ensure velocity depth safety criteria is less than 0.4m²/s.
- » In road reserves to ensure flow does not exceed a depth of 50mm above top of kerb.
- » To ensure velocity of flows in swales is less than 2m/s to prevent scour.
- » To ensure a minimum freeboard of 300mm to leased blocks in basins.
- » Overland flows in Mirrabai Drive will also need to be carefully managed at detailed design to ensure that the appropriate number of lanes are not inundated during storm events in accordance with Section 1.3 of the TAMS Design Standards.

13.4 Water Sensitive Urban Design

Water quality ponds provide the main WSUD treatment for the Moncrieff West estate with ponds provided as follows:

Northern catchment. This catchment drains under Horse Park Drive and on to a large regional pond which is to be constructed on the northern side of Horse Park Drive to the east of this project as capital works by others. This regional pond will provide water quality and quantity treatment for this catchment of Moncrieff without the need for local measures on this estate.

South eastern catchment. This catchment will drain south to Pond 1 which will provide stormwater quantity and quality treatment for this Moncrieff West catchment only. This pond is an off-line pond separate to the adjacent creek and floodway allowing these large upstream flows to bypass the pond.

Western catchment. This catchment will drain to Pond 2 which will provide stormwater quantity and quality treatment for this Moncrieff West catchment only. This pond is an off-line pond separate to the adjacent creek allowing these large upstream flows to bypass the pond.

Other treatment train WSUD measures within Moncrieff include the following:

- » Grassed swale in the eastern verge of Mirrabai Drive.
- » Edge roads with one way crossfall and permeable kerb discharging overland flows to grassed open space areas.
- » Tree pits along Road 05. These will provide water quality treatment to low flows from this fully paved road as well as being a landscaped feature along this road fronting the Group Centre.

A large proportion of the Moncrieff West site is too steep for grassed swales and tree pits and rain gardens, hence focusing the WSUD measures at the water quality ponds. The proposed ponds in combination with the other measures listed above provide a treatment train that ensures that the suburb meets the requirements of the ACTPLA Waterways Code. These measures provide extended detention and water quality treatment required for the estate. The Waterways Checklist for Pond 1 and Pond 2 is provided in **Appendix D**.

40% reduction in potable water usage will be met by the provision of rainwater tanks to all blocks exceeding 300m². These rainwater tanks will also provide some of the extended detention volume for the estate.

13.5 Water Quantity and Quality

The proposed Pond 1 and 2 and the regional pond to the north of Horse Park Drive by others will provide all stormwater quality and quantity treatment required for the Moncrieff West estate to meet the objectives of the ACTPLA Waterways Code.

14. Sewer Concept Plan

14.1 Existing Sewer Infrastructure

The existing sewer infrastructure adjacent Moncrieff includes the following:

- » An existing DN375 sewer main stub adjacent to the Mirrabai Drive and Wanganeen Ave roundabout connects a DN 600mm trunk sewer main which follows the floodway downstream beside Mirrabai Drive.
- » A 375mm dia sewer main has recently been constructed along the northern verge of Horse Park Drive up to Mirrabai Drive with ties under Horse Park Drive to service Moncrieff.

14.2 Proposed Sewer Infrastructure

All sewer flows from Moncrieff West estate will discharge to the existing trunk sewer mains in either Horse Park Drive to the north or Mirrabai Drive to the south. The Sewer Master Plan indicates the extent of catchments, taking into account the future development of Taylor, and shows the alignment of the sewer mains throughout the Moncrieff West estate. The Master Plans have been prepared in accordance with the requirements of Appendix D of the ACTEW Corporation 'Water Supply and Sewerage Standards.' The detailed design will also be undertaken in accordance with Part 3 of the 'Water Supply and Sewerage Standards.'

The following summarises the key design components of the sewer master plan:

- » The northern catchment of Moncrieff West drains to Horse Park Drive with connection to a 375mm dia sewer main. Sewer main stubs have been constructed under Horse Park Drive with these road works in order to service the Moncrieff northern catchment.
- » Block c Section AQ multi-unit site will drain east through Moncrieff East estate.
- » The Moncrieff West project includes the construction of a trunk 300/375mm dia sewer main along Mirrabai Drive from Wanganeen Avenue roundabout to Mirrabai Drive extension and then adjacent the existing creek to Horse Park Drive. While this sewer outfall is adjacent the Moncrieff East estate, it will be constructed with the Moncrieff West estate due to the timing of Moncrieff West Stage 1 requiring this sewer outfall before the construction of Moncrieff east in this catchment.
- » The south eastern catchment will connect to the proposed trunk sewer outfall at existing Mirrabai Drive.
- » The western catchment will drain a future catchment of Taylor and will connect to the trunk sewer main adjacent to Pond 2. A sewer main has been constructed under Horse Park Drive with these road works that will be connected into the Moncrieff West estate sewer network when Taylor is developed.

- » A 225mm dia sewer main has been constructed under Horse Park Drive at the underpass. The trunk sewer along the creek will connect to and drain this sewer main under Horse Park Drive.
- » Inter-allotment sewers have been minimised to reduce the service easements on the blocks. Where back of blocks sewers are proposed, sewer maintenance access routes are provided and shown on the EDP drawings.

15. Water Concept Plan

15.1 Existing Water Infrastructure

There are no existing water supply mains within the estate. The following summarises the existing water mains adjacent the estate:

- » 300mm dia water main at the roundabout of Len Waters Street and Mirrabai Drive. This is an intermediate zone main and has an existing stub to allow it to be extended through Moncrieff.
- » A 300mm dia water main constructed along Horse Park Drive from Amaroo to the Moncrieff East Road 16 with the Horse Park Drive capital works. This water main is an intermediate zone main.
- » A 300mm dia water main constructed along the northern verge of Horse Park Drive from Burrumurra Avenue to Mirrabai Drive. This water main will be in the high zone. Three 150mm dia water main stubs will be constructed under Horse Park Drive for connection to Moncrieff West at Roads 04, 11 and Mirrabai Drive.

Moncrieff falls within two water pressure zones, being the intermediate zone which will service all blocks below about RL653 and the high zone serving blocks above RL653. The zone boundary is shown on the water masterplan.

15.2 Proposed Water Infrastructure

The Water Supply Master Plan indicates the alignment and size of the water mains for Moncrieff West. The Master Plan has been prepared in accordance with the requirements of Appendix D of the ACTEW Corporation 'Water Supply and Sewerage Standards.' The detailed design will also be undertaken in accordance with Part 2 of the 'Water Supply and Sewerage Standards.'

The proposed water design for Moncrieff West has the following features:

- » A zone boundary is located through Moncrieff West and Moncrieff East.
- » A 300mm dia water main is proposed by ActewAGL along the western verge of Mirrabai Drive and then through Moncrieff East to link the intermediate water mains at Len Waters Street and Horse Park Drive. No water ties are proposed to be connected to this main. 150mm dia water mains will run along Road 01 and 05 to service Moncrieff East and will connect to this 300mm dia main.
- » 150mm dia water mains will be provided adjacent to all edge roads where a higher F5 fire category is required for bush fire requirements.
- » F4 fire category is applicable to the Group Centre in accordance with the ACTEW Corporation 'Water Supply and Sewerage Standards.'
- » F5 fire category is applicable to all multi-unit sites in Moncrieff West due to the proposed density of these developments.

The high zone water supply network has been modelled by Brown Consulting under peak flow and fire demand flow for the Moncrieff West high zone. The analysis indicates that sufficient pressures can be obtained throughout the estate area nominated within the high zone. A summary of the results can be seen on C11075-WMP.

The intermediate water zone has been modelled by Indesco and pressures documented as part of the Moncrieff East estate by Indesco.

16. Utilities

The following existing utility services are located at the roundabout of Len Waters Street with Mirrabai Drive:

- » An existing 160mm dia gas main already has live ties under the roundabout for the extension of Mirrabai Drive.
- » Telstra also has existing conduits under this roundabout for the extension of Mirrabai Drive.
- » Existing 11kV cables are located along Maynard Street within Ngunnawal.
- » Existing streetlighting is located at this roundabout.
- » A Telstra mobile phone tower is located in the centre of the roundabout with an associated building on the eastern side of the roundabout.
- » A trunk shared trench consisting of electricity, gas and communications constructed along the southern verge of Horse Park Drive from Burrumurra Avenue to Amaroo with the two separate Horse Park Drive works.
- » A trunk shared trench including three electricity conduits, two Telstra conduits, one TransACT conduit and a live 160mm dia gas main is proposed by the Service Authorities to be installed along Mirrabai Drive extension through Moncrieff West. This trunk shared trench will be utilised to extend existing services at Len Waters Street roundabout into the Moncrieff West estate to permit site servicing. This trunk shared trench will also permit connection to services in Horse Park Drive. Direct service connections to this trunk shared trench from blocks will not be permitted. Estate shared trenches will connect to this trunk shared trench to permit the estate to be serviced.

A typical cross-section of the trunk shared trench is shown on drawing C11075-US.2. This typical section is the same as that utilised on Horse Park Drive.

The utilities services layout for Moncrieff West is shown on drawing C11075-US.1. Services connections to existing mains at Mirrabai Drive are shown on drawing C11075-MIR.1.

17. Staging

It is proposed to construct the works in three (3) stages which will enable the progressive release of blocks to the market. Each stage has been broken into substages to permit handovers to Authorities progressively.

The proposed staging is shown in Drawing C11075-ST-6.1 - Staging Plan. This plan shows the nominated Stages 1 to 3.

The staging of Moncrieff West has been coordinated with the staging of Moncrieff East to ensure that active services are provided as each stage of the estate is developed.

18. Geotechnical Structure and Site Grading

18.1 Geotechnical Investigation

A geotechnical investigation and report is currently underway and will be provided prior to design approvals and construction.

18.2 Site Grading

Moncrieff West is an undulating site characterised by the main hill central within the estate with grades ranging from 10 and 20% and a drainage gully to the west and east of this hill both with grades of around 5%. The Slope Analysis Plan, C11075-SAP-8.1 - Slope Analysis Plan shows the grades across the site.

The Site Fill Plans (drawings C11075 – SG1 to SG4) provide a preliminary estimate of the earthworks required to construct the roads and grade blocks.

The site grading has been based on:

- » Protection of high and exceptional value trees to be retained.
- » Minimising back of block sewer easements by grading the sections to allow the sewer to drain to the road where possible.
- » Minimising the slope of proposed blocks to aid house construction.
- » Provide path grading that is less than 12.5% maximum permissible grade allowable under the TAMS Design Standards.
- » Achieving maximum 8% grade along proposed bus routes.
- » Generally allow roads to be minimum 1% longitudinal grade. It is noted that Road 07 is proposed to be graded at 0.8% grade due to the existing undulating terrain, to minimise extensive earthworks in this area while providing an overland flowpath. Road 06 is graded at 0.6% to reduce significant earthworks and provide optimal grading on the steep blocks adjacent this road. Road 05 has been graded at 0.9% to enable the low point location on this road to match the open space overland flow path to Horse Park Drive.

The earthworks will be undertaken in a staged manner with progressive stabilisation and will be undertaken in accordance with EPA Guidelines requiring approved sediment and erosion control measures. This will limit the risk of soil erosion from cut and fill operations.

Earthworks are provided for all roads, then on blocks where required to provide a satisfactory block grading. The road layout generally follows the contour around the steep hill of the site which reduced earthworks. The lack of east west roads between Mirrabai Drive and Road 3 is due to topography to allow roads to follow contours better for earthworks. The remainder of the side is fairly flat and only requires earthworks to satisfy Authority back of blocks servicing and for prevention of overland flow flooding. In some locations earthworks on blocks are undertaken to minimise earthworks required by builders which is considered an advantage as the developer has appropriate sediment and erosion controls in place while the builders typically do not.

19. Off Site Works

The following offsite works outside the estate boundary are as follows:

- » Trunk sewer outfall from Mirrabai Drive extension to Wanganeen Avenue roundabout.
- » 11kV electrical connection to existing at Maynard Street in Ngunnawal.
- » Works at existing Mirrabai Drive roundabout.
- » Path crossing at creek to Ngunnawal.

20. Landscape Master Plan

20.1 Character

The landscape design philosophy for Moncrieff West is based on the following key principles:

- » To develop a landscape which is sympathetic to the intrinsic cultural and environmental values of the area.
- » To provide a new landscape which will flourish in urban conditions and will be environmentally effective; now and into the future.
- » To provide streetscapes and public domain to the Group Centre commercial hub that reflects the community focus of these areas providing attractive comfortable urban amenity

- » To provide a public domain that shapes the character of the place. A public domain framework that is flexible and can accommodate development and redevelopment well into the future.
- » To design a landscape that maximises the opportunity for people to identify with their home patch, their block, their immediate neighbourhood and to link with their hinterland, adjacent neighbourhoods and the district networks. Clarity of perception, address, connections, movement, and visual identity underpin the design.
- » To provide open space areas that draw upon and work in harmony with on the existing topography and landscape character.
- » Effective streetscapes and large scale urban landscapes require space, soils, water to flourish; the design for the commercial hub provides enhanced verge growing conditions for large scale trees (space, improved soils, WSUD throughout).
- » To provide perimeter and open space landscapes for recreation, habitat, and visual aesthetics.

Open Space Elements

The following key open space elements are identified in the landscape master plan and are to be read in conjunction with viewing landscape plans LMP.1-4, 13.1 - 13.4.

Hilltop Park

The plan provides a distinctive open space embedded within the core of the proposed estate. The existing mature tree hilltop landscape provides the foundation for the landscape character of this open space.

The scheme celebrates the hilltop and ridge, and makes the most of the existing landform and existing trees which provide habitat for the fauna. The design ensures passive security and access to all parts of the park. This hill top is the focus of the main entry streets to Moncrieff West, and is highly visible to, and accessible from, all parts of the neighbourhood. The hilltop affords panoramic views beyond Moncrieff West, and equally importantly, it provides a landscape landmark when viewed from neighbouring suburbs and transport corridors. The open space includes paths, plantations, open grass areas, playground and bushland areas within its boundary. The scale of this space enables meaningful retention of key trees and natural features that can be sustained within such an urban setting. The retention of trees also provides important habitat for fauna.

A recreation path meanders through the parkland with a maximum 1 in 20 gradient, an accessible grade for wheelchair access. Wheelchair access is also provided to the lookout at the top of the hill.

Playground

A Central Neighbourhood Park is located at a lower knoll of the parkland surrounded by mature eucalypt trees. The paths to the playground are aligned with maximum 1 in 20 gradients for wheelchair accessibility and the picnic tables, to be detailed at a later stage, are to be wheelchair accessible.

The playground is to be detail designed to meet the Design Standards for Urban Infrastructure. Fixed play equipment over softfall and surrounding landscape for natural play is envisaged.

Existing trees will provide some shade; however, additional shade to the playground is to be provided by shade structure/s.

Local Parks

Each of the local parks are designed to retain high value or significant trees, integrated with its surrounding streets, footpaths and landscapes. Each of these parks defines the local home patch for the residents – these become places to visit and socialise, and to be proud of. Each path has seating to provide a focal element and from which local residents can take a rest and enjoy the neighbourhood.

20.2 Development Interface

The edge landscape is informal tree groupings, grassland, and recreation paths that link all parts of Moncrieff West to perimeter open spaces and to regional trails and bike routes.

20.3 Tree Survey and Retention

A detailed tree survey and assessment of Moncrieff was undertaken by DSB in 2008, Trees within the Mirraabei Drive corridor were reassessed as part of the North Gungahlin Roads and Ponds Review of Tree Assessment by JEA in October 2009. In 2010 LDA commissioned Scenic Landscape Architecture to provide a tree assessment report for additional trees and tree groups within Moncrieff.

The Tree Management Plans for Moncrieff West identify the status of the trees on site and nominates those trees to be retained and those recommended for removal.

Forward Planting Plantation

The forward planting was undertaken by NDC more than 20 years ago and the trees were planted close together with the intention that they be thinned at a later date. The thinning did not occur and the intense competition from the dense planting on the rocky ridge with thin soils has resulted in the trees not thriving, but instead being of poor to fair condition trees. The trees should be thinned and the poorest condition trees removed to improve the growing environment for the remaining trees. The trees have not been individually assessed. The following is to be undertaken in the detail design and implementation:

- » Carry out a detailed assessment of the trees and identify trees to be removed
- » Remove trees identified for removal.
- » Carry out tree surgery to remove dead branches and improve the structure of the remaining trees
- » Remove stumps
- » Chip the removed trees and prunings for recycling as mulch within the area

21. Block Compliance Plan

The Block Compliance Plan was prepared using the Estate Development Plan – Appendix A – Block Compliance Table. All blocks that comply have been noted as a direct comparison to the Block Compliance Table.

The results of the Block Compliance assessment indicate that 97% of the blocks in the Estate complied with the Block Compliance Table. Refer Dwg C11075 – BCP, drawings 1-4

The BCP also indicates two types of blocks, ones that do not comply with the Building Compliance Tables but do comply with the Test Block requirements and ones that comply with the Building Compliance Table but do not comply with the Test Block requirements. Both types of blocks are deemed as “limited development potential blocks.”

22. Capital Works

No further capital works are required in association with the Moncrieff West project. Horse Park Drive is currently under construction as Capital Works and is expected to be completed prior to commencement of construction of Moncrieff West.

23. Bushfire Protection Measures

A Bushfire Risk Assessment Review was prepared by Australian Bushfire Protection Planners Pty Ltd for Moncrieff West. The report is attached at **Appendix C**. A bushfire plan C11075-BMP presents the proposed bushfire protection measures for this estate.

24. Waste Collection Plan

A waste collection plan is provided which shows on street garbage collection will be provided for all blocks without direct frontage to the main street. Refer drawing C11075-WCP-22.1

25. Landuse Plan

A Landuse Plan (C11075-LUP-7.1) has been prepared to indicate the land use policy applicable to the site – refer also to Section 1.2 ‘Planning Context’.

26. Development Intentions Plan

Typical Development Intentions Plan has been prepared to show the building intent for the all Multi Unit sites. Refer drawings C11075-DIP-24.1 to 24.8.

27. Planning Controls Plan

Planning Controls Plans have been prepared to show additional information on block requirements to the Territory Plan – Single Dwelling Housing Code. Refer drawings C11075-PCP-31.1 to 31.4.

28. Building Envelope Plan

Building Envelope Plans have been prepared to show the building intent for all multi-unit sites. In addition building envelopes have been prepared for all blocks that do not comply with the Block compliance Table. Refer drawings C11075-BDP-23.1 to 23.4.

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Appendices

Appendix A Subdivision Code Response Table

Appendix B Traffic Report

Appendix C Bushfire Report

Appendix D Water Sensitive Urban Design Checklist

Appendix E Bird Hollows Report

Appendix F Traffic Noise Assessment

Appendix G Heritage

Appendix H Contamination

Appendix I CPTED Risk Assessment

Appendix J Retirement Housing and Facilities Needs Analysis Moncrieff

**Appendix K Response to EDP Review Comments Circulation
18 November**

Appendix L Endorsement Forms and Correspondence

Appendix M Bushfire Risk Assessment Correspondence

Appendix N Roads ACT and ACTION Correspondence

Appendix O **A subdivision planning concept aiming to maximise the retention of trees**