

CALDERWOOD VALLEY LANDSCAPE MASTER PLAN SHELLHARBOUR CITY COUNCIL

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The Calderwood Valley Master Plan was originally commissioned by Lend Lease in 2014 and was prepared by Taylor Brammer Landscape Architects Pty Ltd. Stockland acquired the project entity Lend Lease Calderwood Pty Ltd in November 2024 via SRCP (Calderwood) Pty Ltd.

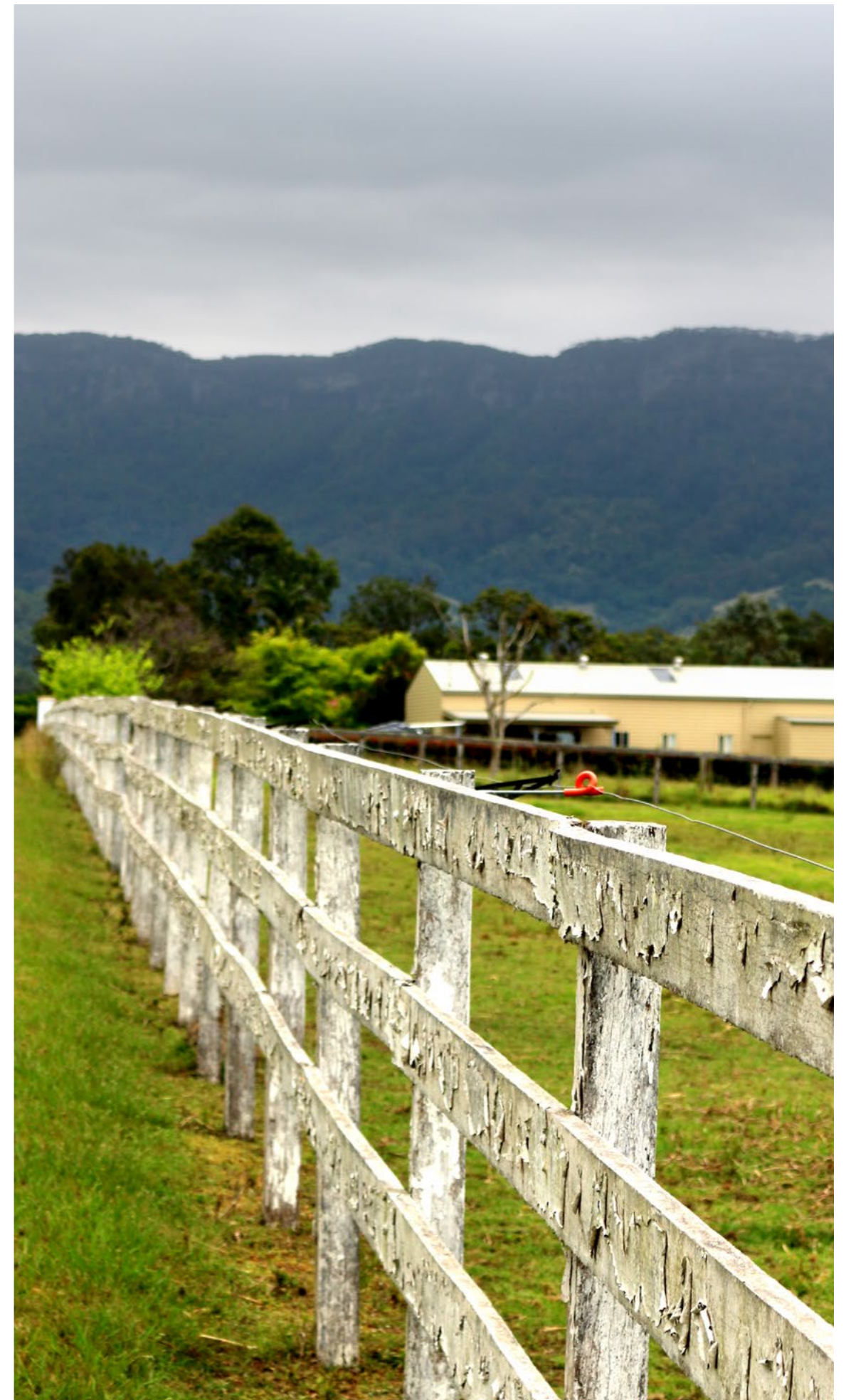


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1.0 INTRODUCTION

View from the Old Marshall Mount School looking south east

1.1 Role of the Master Plan

This Landscape Master Plan provides the landscape vision, design principles and framework that will guide the landscape planning and design of the community of Calderwood Valley. It is a document that has been prepared in collaboration with Shellharbour City Council as the relevant Local Authority. Stockland Calderwood Valley would like to acknowledge the valued contribution of Council staff in the preparation of the Landscape Masterplan and associated Public Art Strategy.

This Landscape Master Plan is to be used as the overall framework which will guide the future character and detail design of the Calderwood Valley vision for landscape development. The document will work as a guide for the final design direction for:-

- Public domain character and presentation
- Key public domain green corridors and open space elements
- Preferred design and material treatments

The Landscape Master Plan is a guide with a degree of flexibility accepted to allow detail design that is site specific and responds to the unique characteristics of each site. For instance the planting palette for a particular site may need to be expanded outside the list provided in the Master Plan due to site conditions or microclimate, however can still adhere to the spirit and direction of the plan.

The Calderwood Valley Master Plan has been developed to align with the requirements outlined in the Calderwood Valley Voluntary Planning Agreement (VPA).

Master Plan Review

The Master Plan will be reviewed within 12 months of being approved and then every 2 years thereafter. This review will take the form of a workshop to include relevant Council officers, Stockland representatives and consultants (Landscape Architects, Engineers, Planners).

Following the workshop, the agreed outcomes will be incorporated into a revised Landscape Master Plan submitted to Council for approval. The Landscape Master Plan provides a framework of design principles to supplement the approved Calderwood Concept Plan, approved Landscape and Open Space Master Plan, approved Development control Strategy and

Calderwood Urban Development Project Development Control Strategy (DCS) dated March 2018. The purpose of the DCS is to:

- Consolidate the planning controls for the Calderwood site approved by the Minister for Planning as part of the Calderwood Part 3A Concept Plan (December 2010) and to communicate the planning, design and environmental objectives and controls against which the relevant consent authority will assess Development Applications; and
- Facilitate the orderly, efficient and environmentally sensitive development of Calderwood as envisaged by Part 28 of Schedule 3 of State Environmental Planning Policy (Major Development) 2005 (the Major Development SEPP); and
- Promote high quality urban design outcomes within the context of environmental, social and economic sustainability for the Calderwood site; and
- Make provision for further planning controls relating to land use, built form and the public domain to be developed for land within the future Town Centre prior to the first application for development (other than subdivision, which is provided for Part 3 of this plan.

The Concept Plan has been modified five times, with the most notable modification being MP_0082 MOD 4. MOD 4 was approved on 21 May 2021 and sought to increase the residential capacity within the Calderwood site by increasing the maximum permitted number of dwellings from 4,800 to 6,000 and by reducing the residential lot sizes in certain areas. Changes to the provision of open space, road infrastructure, community infrastructure, the dedication of lands for schools, water cycle management and ESD measures were also sought under MOD 4, as well as minor amendments to the Development Control Strategy.

MOD4 Determination Documents (162):

The following summarised appendices though not limited to these have informed the assessment and approval of this modification:

1. Appendix A-Secretary's Environmental Assessment Requirements (8 December 2010)
2. Appendix B-Calderwood Concept Plan Notice of Determination (28.5.2019)
3. Appendix B2-Calderwood Consolidated Concept Plan Drawings 21 May 2021
4. Appendix C-Updated Urban Design Report (RPS Group 30.5.2019)
5. Appendix D-Consolidated Development Control Strategy JBA Urban Planning May 2019
6. Appendix E-Urban Design Report (RPS Group 8 August 2018)
7. Appendix F-Updated Water Cycle Management Post Exhibition Report (J.Wyndham Prince, dated April 2019)
8. Appendix G-Comparison of Approved and Modified Concept Plans (2018-08-13)
9. Appendix H-Public Domain Report and Open Space Plan August 2018
10. Appendix I-Response to Secretary's Environmental Assessment Requirements (SEARs)-Traffic & Transport Report (30.5.2019)

11. Appendix I2-Calderwood DCS (Clean) 2018-08-13
12. Appendix I3-DCS Appendix B-Street Typologies 2018-08-13
13. Appendix I4-DCS Appendix C-Dwelling Typologies 2018-08-13
14. Appendix J-Updated Schedule of Local Contributions 2018-08-13
15. Appendix K-Services Report 2018-08-13
16. Appendix L-Revised Statements of Commitments May 2019
17. Appendix M-Consultation Outcomes Report
18. Appendix N-Biodiversity Report (Ecological Australia August 2018)
19. Appendix O-Bushfire Assessment 2018-08-13 Peterson Bushfire
20. Appendix P-Water Management Report (Parts 1-2) (J.Wyndham Prince 2018-08-13)
21. Appendix Q-Environmental, Social, and Infrastructure Assessment (ESIA) 2018-08-13
22. Appendix R-Traffic and Transport Report Cardno now known as Stantec dated 9 August 2018
23. Appendix S-Social Infrastructure Yield Review Elton Consulting 2018-08-13
24. Appendix T-Visual Landscape Assessment 2018-08-13 by Taylor Brammer Landscape Architects
25. Appendix U-Contamination, Geotechnical, and Acid Sulfate Soils Douglas Partners dated 2018-08-13
26. Appendix V-European Heritage Impact Statement Ethos Urban dated Aug 2018
27. Appendix W-Aboriginal Heritage Impact Statement Kelleher Nightingale Consulting dated 2018-08-13
28. Appendix X-Noise and Vibration Assessment Wilkinson Murray dated August 2018
29. Appendix Y-Air Quality Assessment dated August 2018
30. Appendix Z-Urban Design Report (Revised / v10 Final) RPS Group April 2020

For a comprehensive and accurate list of all appendices related to Modification 4, refer to the NSW Planning Portal's dedicated page for the Calderwood Urban Development project: planning.nsw.gov.au (MP09_0082-Mod-4 Mod to Calderwood CA (MP 09_0082 MOD 4)).

1.1.1 Project Area Definition and Local Government Boundaries

The Calderwood Urban Development traverses the local authority boundary of Wollongong City and Shellharbour City Councils, but has jurisdiction in the Shellharbour LGA only at this stage.

This Landscape Master Plan currently applies only to land within the **Shellharbour City Council** Local Government Area, which is managed by Stockland.

This document addresses open spaces within Calderwood Valley to be developed by Stockland and excludes non-core lands and open spaces located within the Wollongong City Council area or areas to be developed by other parties.

Refer to Figures 1.0 and 11.0 for Local Government Area boundaries and the extent of non-core areas.

1.1.2 Community Engagement

Stockland has adopted an open consultation process with Council and the community of Calderwood Valley on the development of the Landscape Master Plan with future plans for community engagement.

The important opportunities to develop strong relationships between government and communities are recognised and consequently a consultation process has run parallel to the development of the Calderwood Valley Landscape Master Plan with the dissemination of information and participation encouraged through a series of workshops involving Council Officers, client and consultants.

This strategy has been adopted to ensure there is a good and open commitment in place that seeks out all the relevant information, views and concerns, and that balanced and informed decisions are taken in developing sustainable outcomes in the Calderwood Valley Landscape Master Plan.

Key Council stakeholders have been engaged in open dialogue to ensure the original vision for Calderwood Valley is maintained throughout the approval process.

Stockland has encouraged stakeholders to attend and be engaged and consulted in the decision making process. In future, plans are in place to continue this engagement process with the community in order to achieve goals in line with community expectations and foster feelings of local ownership for the project.

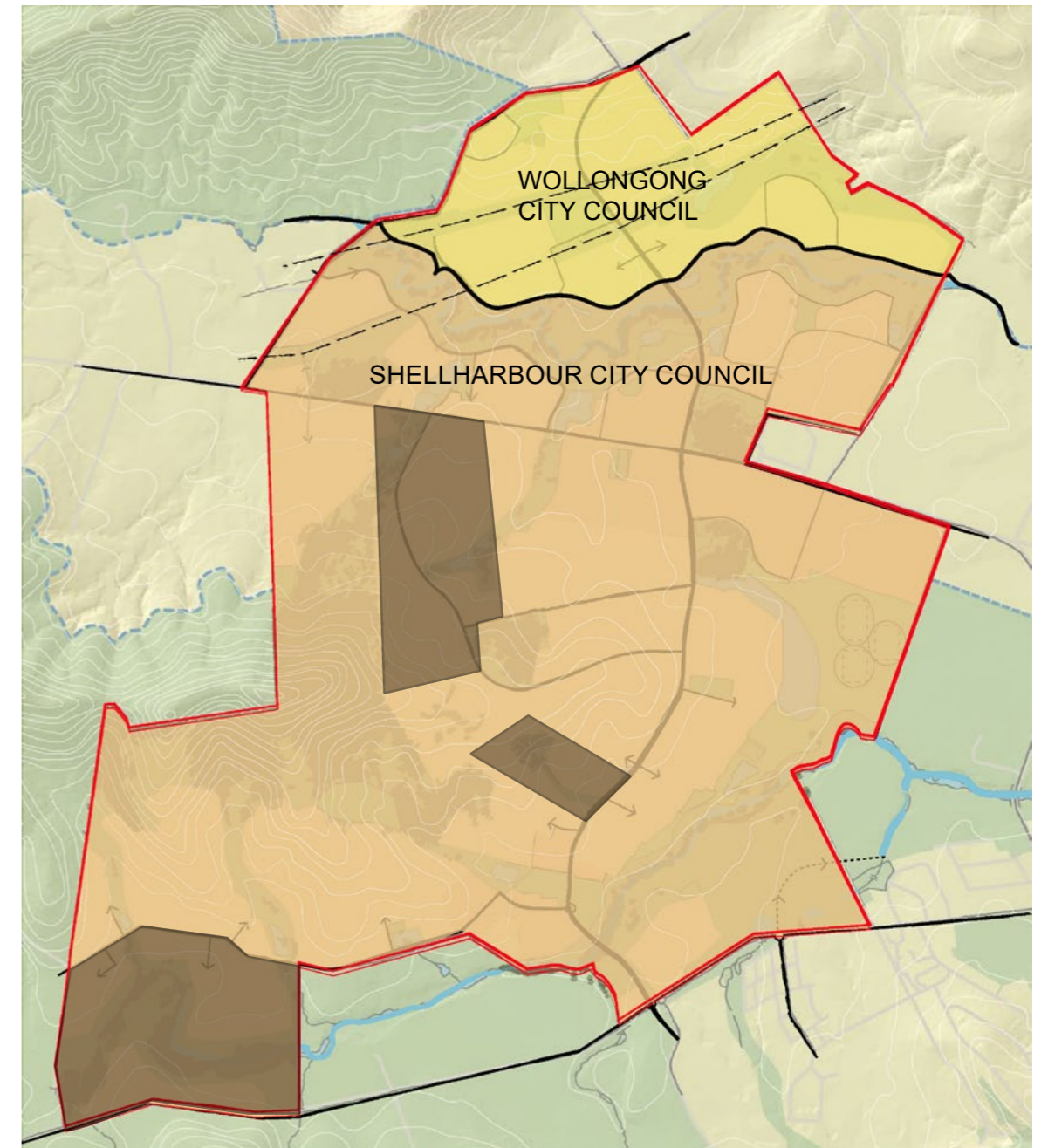


Figure 1.0 Local Government Boundaries

Source: Updated Council Extents (2025)
Taylor Brammer Landscape Architects

LEGEND

- Wollongong City Council
Local Government Boundaries
- Shellharbour City Council
Local Government Boundaries
- Non-Cores development to be developed by other parties

1.2 Background

1.2.1 Approval Process

The Calderwood Urban Development Project (CUDP) is a development of approximately 700 hectares of rural lands in the north west of Albion Park. The site spans both the Wollongong (107 hectares) and Shellharbour (593 hectares) Local Government Areas.

In 2010 the NSW State Government granted the Calderwood Urban Development Project Concept Plan Approval under Part 3A of the Environmental Planning & Assessment Act for the development of approximately 4,800 residential dwellings, 50 hectares of mixed land use, open space, environmental lands, internal roads, service infrastructure and community facilities. The Concept Plan Approval also establishes general principles for the state of local infrastructure.

In January 2011 the NSW State Government declared an area of land at Calderwood, north west of Albion Park, to be a state significant site. The Calderwood Urban Development project was gazetted in the State Environmental Planning Policy after a proposal was made to develop the land for residential, mixed use and environmental uses.

As a result of the State listing, the area was excluded from the Shellharbour Local Environmental Plan (LEP) 2013. Appendix 5 of State Environmental Planning Policy (Regional - Precincts) 2021 (formerly Schedule 3 of State Environmental Planning Policy (Major Projects) 2005) establishes the statutory planning regime for the site. The land is zoned for development and an approved Concept Plan applies to the project site

In 2013 Development consent was granted for 231 residential lots, 9 residue lots and associated works for Stage 1 Project Application.

In September 2014 Shellharbour City Council entered into a whole of project Voluntary Planning Agreement (VPA) with Lend Lease Communities, who were the project developer at the time. The project is now under the management of Stockland (as of November 2024). This VPA includes provision for all Shellharbour City

Council local infrastructure contributions that are generated by the development including a monetary contribution toward both local and citywide infrastructure, and the delivery of on-site infrastructure including a community centre, parks, sports fields and road upgrades.

A new VPA has been drafted between SRCP(Calderwood) Pty Ltd and Shellharbour City Council that carries over the provisions of the original VPA. Stockland has commissioned Taylor Brammer Landscape Architects Pty Ltd to prepare the Calderwood Valley Landscape Master Plan for the development as required in the VPA Schedule 4, Clause 4.

The approved MOD 4 (MP 09_0082 MOD 4) was endorsed by the Department of Planning, Industry and Environment (DPIE) on 21 May 2021. As part of its Revised Statement of Commitments, Stockland has committed to updating the existing Voluntary Planning Agreement (VPA) with the Minister for Planning. The MOD4 approval endorses the increase in residential yield from 4,800 to 6,000 dwellings.

DPIE's endorsement also enabled open space planning to be coordinated in consultation with both Shellharbour and Wollongong Councils, particularly in and around the future Town Centre. This collaboration has informed an updated Landscape Masterplan, incorporating the outcomes of MOD 4 and the revised VPA.

1.2.2 Site Context

Calderwood Valley is bounded by the Illawarra Highway in the south and Marshall Mount Road to the north. The residential development of Tullimbah lies to the south, Illawarra escarpment to the west, Albion Park to the east and the open rural landscape of Marshall Mount to the north. The precinct includes an existing education establishment (Illawarra Christian College) in the northern portion of the site fronting Calderwood Road. Refer to Figure 1.1.

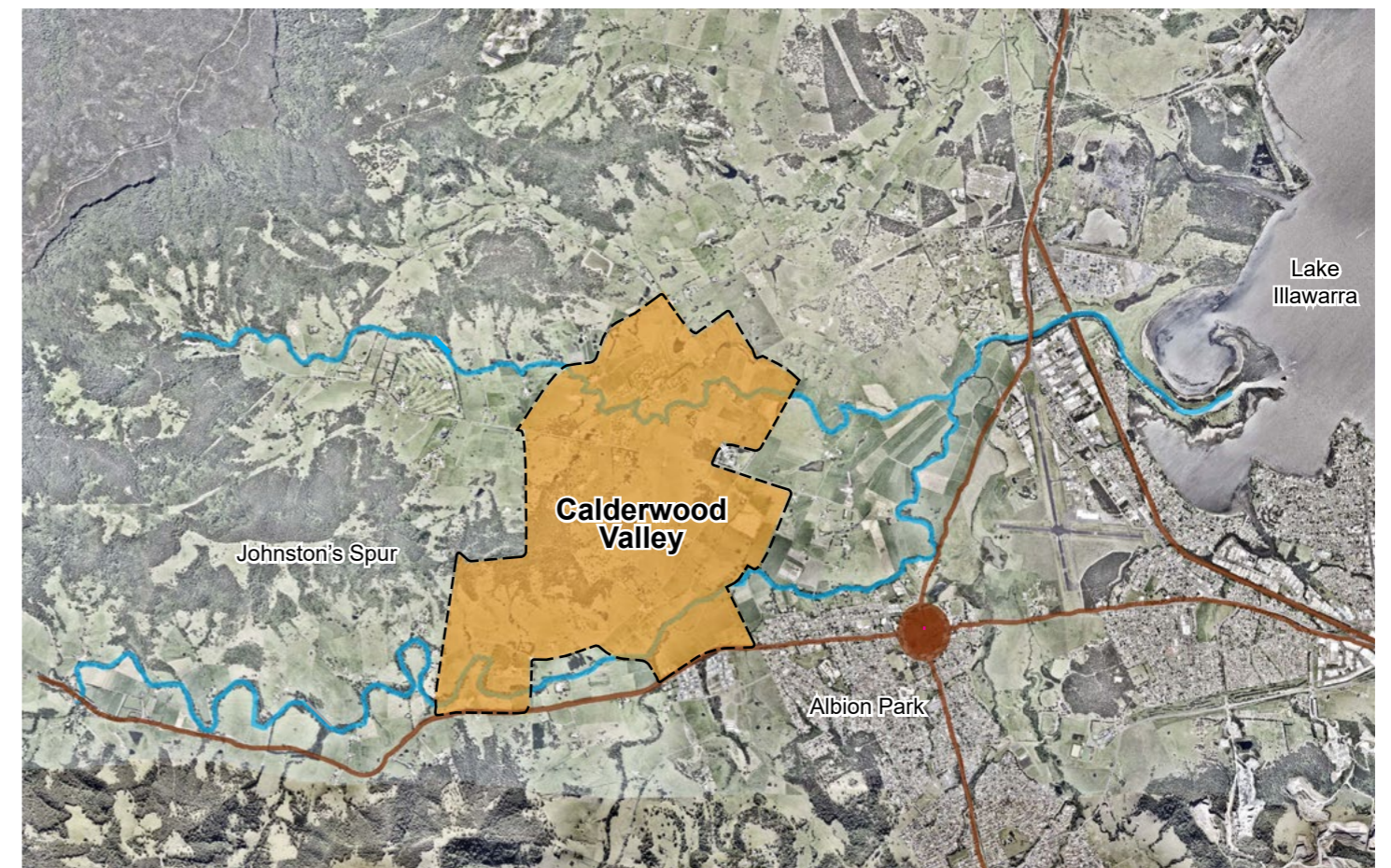


Figure 1.1 Calderwood Valley Location Plan



Marshall Mount Road looking south to Marshall Mount House

1.3 Project Vision, Objectives and Principles

1.3.1 Project Vision

The following Calderwood Valley “project vision” based on detailed site assessment and analysis, and community needs and input.

“The Calderwood Valley Community development will deliver place of natural beauty, a community of villages that reflect the local heritage and character of the region. Each neighbourhood will offer a wide choice of affordable living options with safe, inviting streetscapes and individual home designs that promote a sense of belonging.”

Connecting the escarpment with the coast, it will take advantage of the natural hills, creeks and bushlands, allowing the community to connect via walkways and open space.

Calderwood Valley will become a truly inspirational, connected community that delivers essential facilities to support local social connection, sport and recreation, retail, education and business. Calderwood Valley will be a quality destination that people will be proud to call home.”

1.3.2 Project Objectives

The Calderwood Valley Landscape Master Plan has been prepared as the next phase in the sequence of open space and landscape planning for the precinct. The Master Plan aims to identify a framework of design and materials principles upon which design development will be based.

The public domain will be a major defining component of the Calderwood Valley development with approximately 30% of the site either nominated as open space to be dedicated to council, or environmental lands to be protected by landowners.

The provision of a range of streetscapes, landscape and park elements and village features will create a memorable and unique setting as benefits this extraordinary location. The Master Plan outlines:

1. Public domain character and presentation
2. Design principles for key public domain, green corridor and open space elements.
3. Preferred design and materials treatments for Calderwood.

The design approach of the Master Plan has been to create a framework that responds to:

- The Illawarra Escarpment and Johnston’s Spur
- European and indigenous heritage of the site
- The rolling foothills
- Existing remnant vegetation
- Creek lines and coastal plains
- Proposed urban planning and built form
- Community aspirations
- The rural heritage of the site

The directions outlined in Council’s Open Space, Recreation and Community Facilities Needs Study developed for the Shellharbour LGA in 2010 have also been used to guide the framework for the Calderwood Valley Landscape Master Plan. Although the document does not make specific recommendations for the Calderwood Valley area, the recommendations and general spirit of the Needs Study have been referred to in developing the Master Plan.

LEGEND

- Town and Village Centres
- Residential Neighbourhoods
- Indicative Water Bodies
- Principal Open Space and Drainage
- Citywide Parks
- Local Parks
- District Parks
- Sports Field
- Environmental Reserves
- Open Space Corridors and Citywide Bushland
- Rural Landscape / Lifestyle

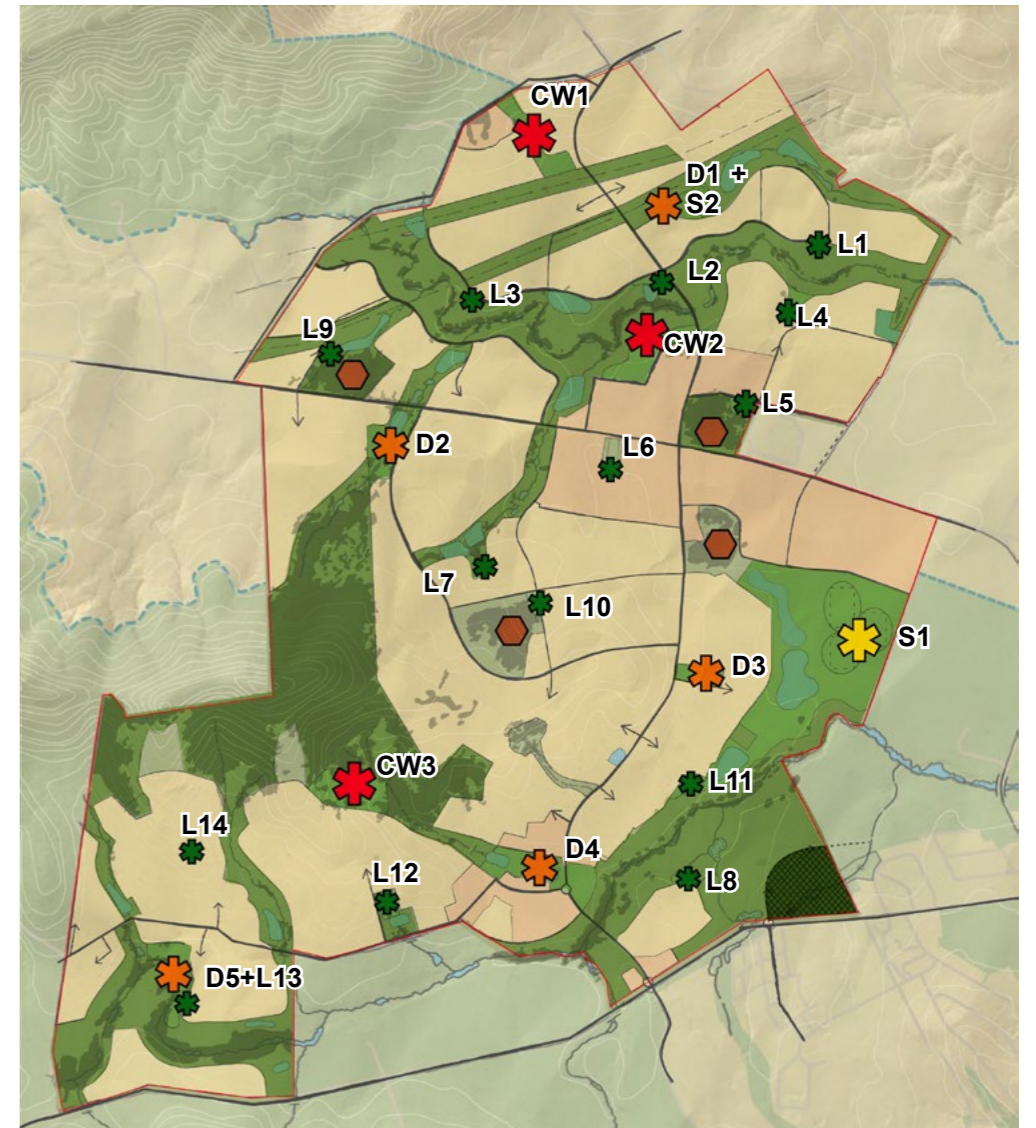


Figure 2.0 Concept Plan (MOD4 approved 2021)

Source: Taylor Brammer Landscape Architects

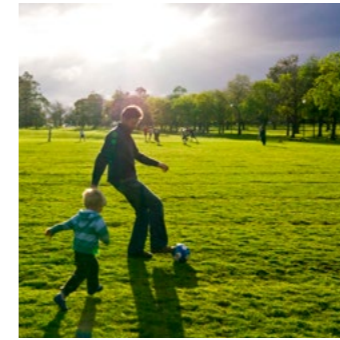
1.3.3 Project Principles

The landscape vision for Calderwood Valley has been defined by five key principles:

- Livability
- Respect for place by interpretation of history, culture and strong landscape elements via a modern aesthetic
- Respect for environment
- Balance between natural, rural and manicured
- Quality materials and finishes

a) Livability

- A living environment that fosters health and community connections
- Walking to local shops and amenities
- Sports fields close at hand and integrated into an open space network
- Open spaces with shady picnic spots to walk and cycle
- Park facilities that encourage children and adults outdoors to play
- A well connected series of landscape experiences with an emphasis on pedestrian and bicycle movement.



b) Respect for place by interpretation of history, culture and strong landscape elements via a modern aesthetic

- Historic form interpreted in contemporary and fresh design with strong simple forms and materials
- Simple material palettes that are long lasting and low maintenance.
- Planting palettes that pay homage to culture and environment
- Vegetation hues that contrast and complement the blue shades of escarpment and coastal vegetation
- Pavements are clean and modern and incorporate texture at significant nodes

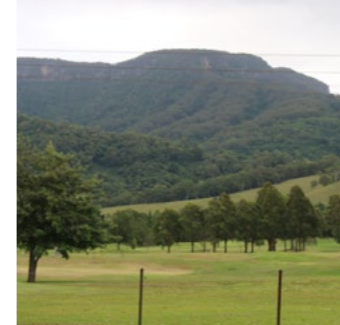
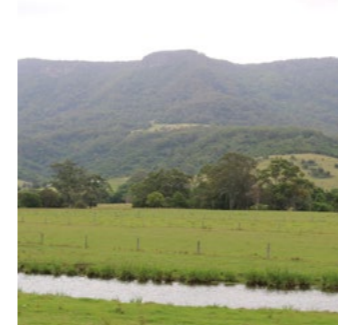


c) Respect for Environment

- Expressing the character through spaces and elements
- Calderwood Valley's connection to the escarpment, its foothills and the coast is valued and respected
- Views to the escarpment and coast are a unique element of the site and this connection will be reinforced through a number of design principles:
- Maintaining and reinforcing views to the coast
- Backdrop of the escarpment and Johnston's Spur
- Outlines of distant trees
- Views to natural rivulets and creek-lines

A number of different landscape characters will be developed including:

- Cultural connections
- Natural areas including riparian zones, open spaces and Johnston's Spur
- Transitional zones between natural and developed areas
- Residential areas
- Urban Village and commercial areas



d) Balance Between Natural, Rural and Managed

i. Utilise existing natural and rural features

- Retain existing major trees
- Retain and enhance existing drainage lines and creeks
- Reuse site soil considering its history as rural land
- Integration of the Vegetation Management Plan into the fabric of the place

ii. Managed

- Clear delineation between the manicured and natural landscape
- Transition zones where nature is less wild
- Define the sense of enclosed and unenclosed open space
- Manicured with natural backdrops



e) Quality Materials & Finishes

The Calderwood Valley Character

To create a character that is reflective of Calderwood with an elegant and modern edge, the style and type of materials will permeate into the core landscape areas. All elements will be made from high quality materials and finished to a high standard, ensuring long term maintenance is kept at a minimum.

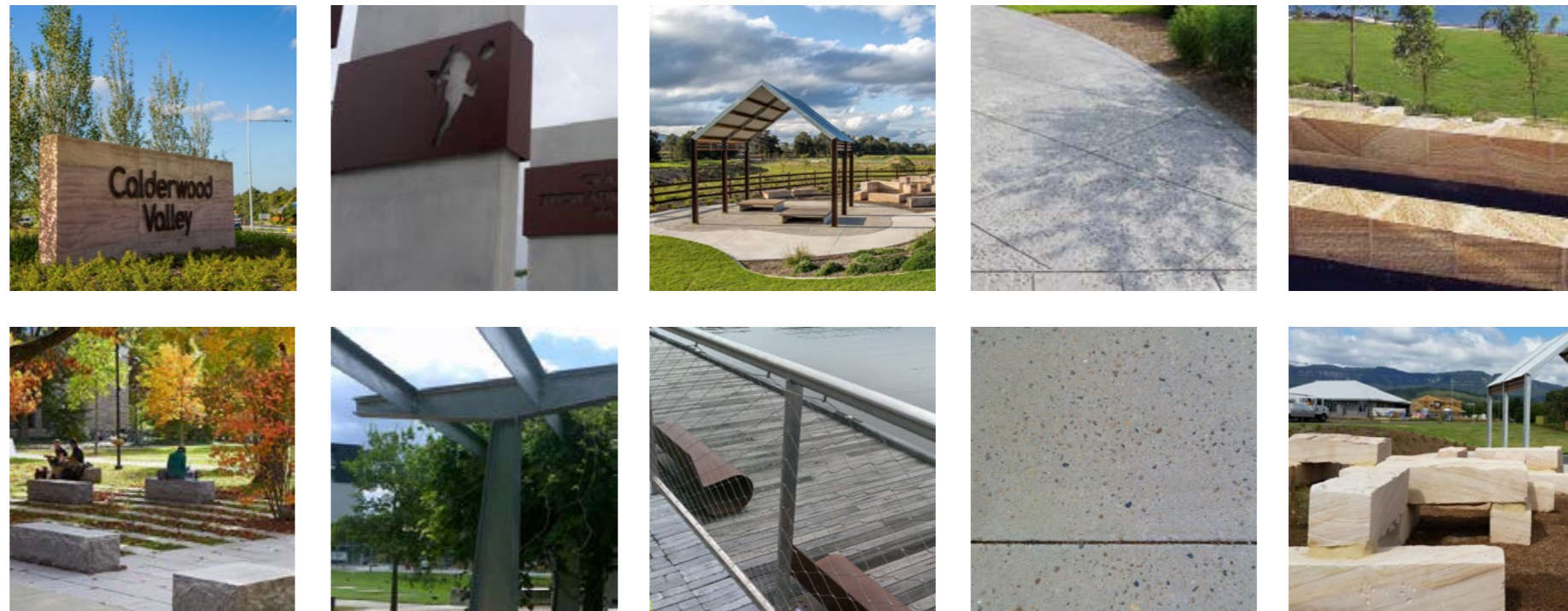
The dominant materials which will form the overall character include:

- Steel-stainless, galvanised and painted
- Concrete with integrated decorative finishes and colours to reflect the escarpment
- Hardwood timber: recycled from local timber where possible
- Stone including use of sandstone and granite
- Rammed earth walling

Valley Differentiation

Differentiation within the landscape will be achieved through applying subtle variations to the Calderwood Valley character. The overall style will remain the same, but the placement of materials, design, colour, detail and finishes can vary from site to site. This is summarised below and expanded on in Section 4.0 Landscape differentiation throughout the project is achieved by:

- Using different metal finishes
- Varying the design of elements
- Different feature pavements
- Different hues and textures and finishes



2.0 THE SITE

2.1 Photographic Assessment

The visual character and landscape of the Calderwood Valley is defined by some key elements, including:

- A landscape of rolling foothills developed on an underlying geology of latite, Illawarra coal measures and the Shoalhaven Group which are comprised of siltstone, sandstone and conglomerates.
- Cleared grass pastures patch-working the landscape with scattered remnant strands of native and exotic vegetation
- The scenic beauty of the Illawarra Escarpment and Johnston's Spur providing a natural backdrop
- Long distant views to the coast. Refer to Figure 3.0
- Macquarie Rivulet and Marshall Mount Creek
- Agricultural land use of the foothills
- Rural and built edges, with close proximity to Albion Park village
- The Illawarra Highway provides a distinct edge on the southern boundary.

These elements have been captured in a photographic assessment that illustrates and represents:

- Forms & patterns
- Hues
- Foliage
- Sounds
- Feeling

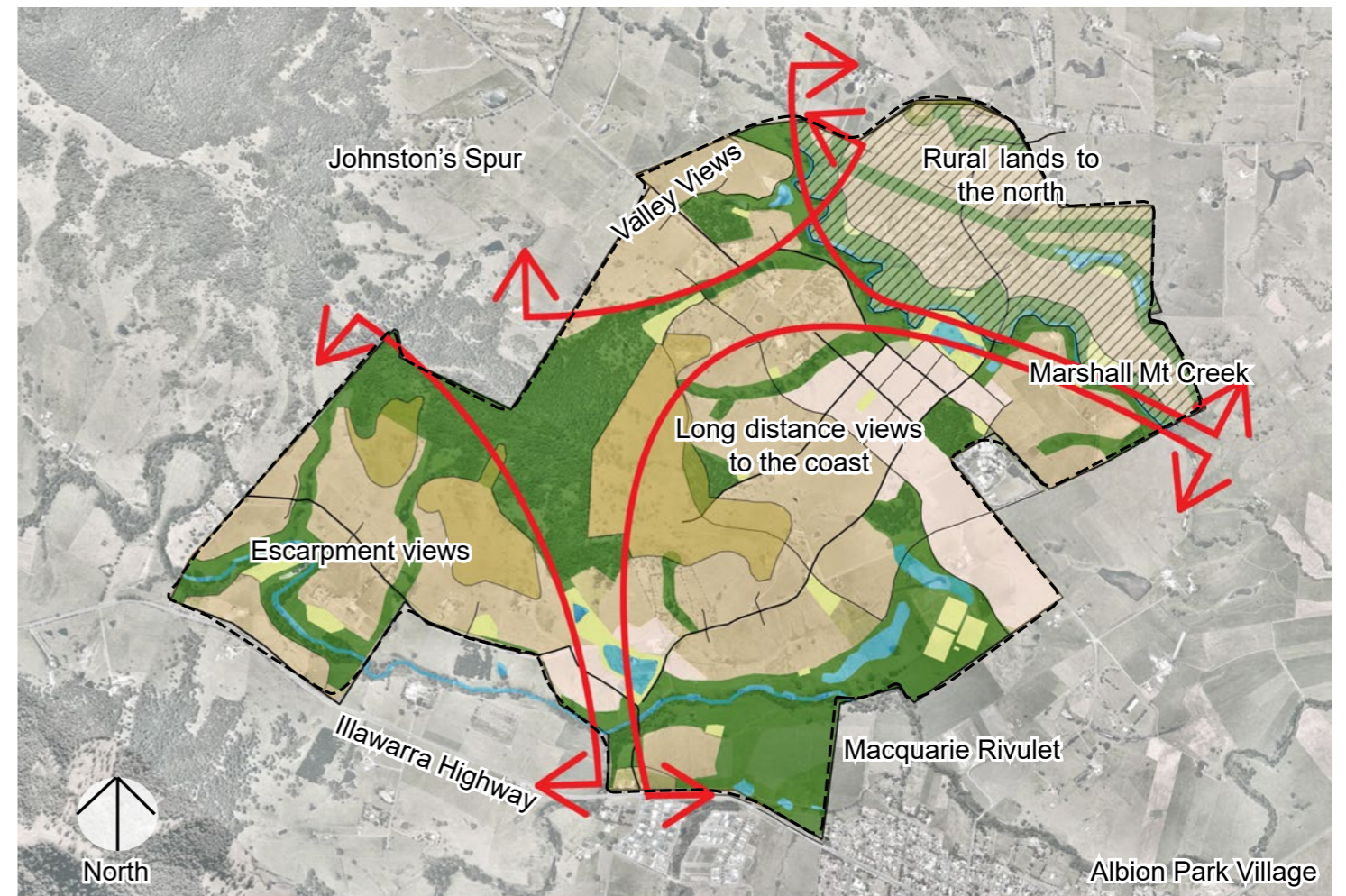


Figure 3.0 Landscape Views

FORMS & PATTERNS

Elements of stone, steel wire, timber and simple built rural forms in the landscape give a sense of age & timelessness. Linear patterns of fencing and cultural plantings contrast to the topography and natural landscape.



HUES

Blues, greys & subtle ochres of the Illawarra escarpment dominate. Rolling green foothills are punctuated with cultivated colour. The natural greens of the Riparian corridors provide a backdrop and contrast to the bright green of the pastures.



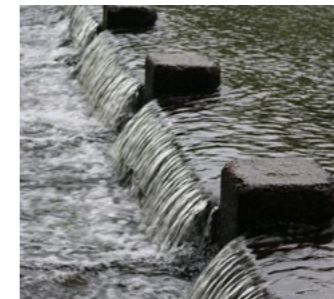
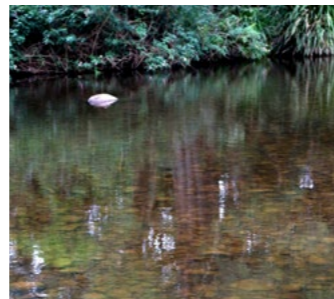
FOLIAGE

Planting palettes pay homage to both cultural and natural environments. Eucalypts, River She Oaks, Cabbage Palms and Fig trees "live with" Poplars, Jacarandas, Illawarra Flame Trees and Bunya Pines. Eucalypts native to the area include Coast Grey Box, Forest Red Gum and Thin leaved Stringybark.



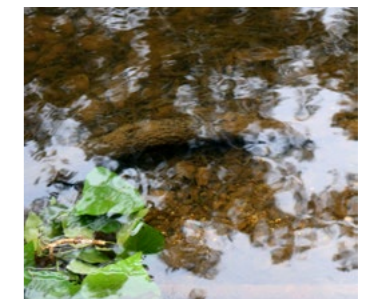
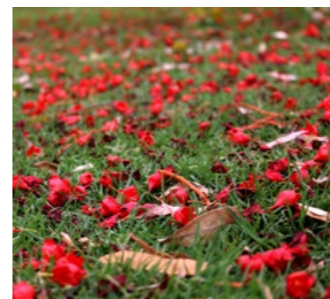
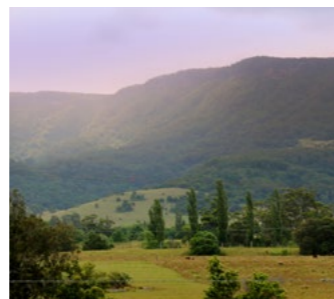
SOUNDS

Cascading water, bird calls, farm animals, the engine of a car on a quiet country road and silence characterises this landscape.



FEELING

Connection through emotional affinity for place, shelter and home. This place evokes strong feelings and feeds the soul of visitors and residents alike.





2.2 Site Assessment

2.2.1 Flora & Fauna

A Flora and Fauna report was prepared by Ecological Australia (2010) and five (5) native vegetation communities were found in the Calderwood Valley site, (four of which are listed as endangered ecological communities (EEC) under the Threatened Species Conservation Act (TSC Act)1995). These being:

- Coastal Grassy Red Gum Forest
- Lowland Dry-Subtropical Rainforest
- Lowland Woollybutt-Melaleuca Forest
- Riparian River Oak Forest
- Moist Box-Red Gum Foothills Forest (not endangered)

No threatened flora or fauna species were found to occur on site, however five threatened flora species are considered to be likely or have the potential to occur on site.

A recent review of bilateral agreements under the Environment Protection and Biodiversity Conservation Act 1999 (the EPBCAct) carried out in 2014 does not affect the listing of any species highlighted in Ecological Australia's report. The species listed as endangered are:

Scientific Name	Common Name
<i>Cynanchum elegans</i>	White-flowered Wax Plant
<i>Daphnandra sp. Illawarra</i> (<i>Daphnandra johnsonii</i>)	Illawarra Socketwood
<i>Pimelea spicata</i>	Spiked Rice-flower
<i>Pterostylis gibbosa</i>	Illawarra Green hood
<i>Zieria granulata</i>	Hill Zieria

In addition the report stated that twenty two fauna species were also considered likely or as having the potential to occur on site, eight of which are listed as migratory or vulnerable under the EPBC Act.

Common Name	Common Name
<i>Fork-tailed Swift</i>	Painted Snipe
<i>Rainbow Bee-eater</i>	Grey-headed Flying fox
<i>Large-eared Pied Bat</i>	Australian Painted Snipe
<i>Cattle Egret</i>	Swift Parrot

Riparian vegetation along Marshall Mount Creek and Macquarie Rivulet comprises approximately 26.75ha of Riparian River Oak Forest (an EEC) which provides habitat for aquatic and riparian species. The forest was identified as highly disturbed and regenerating with varying levels of weed disturbance.

The streams were assessed to determine habitat value and condition. It was found that stream condition is better overall in Macquarie Rivulet (moderate/good) than in Marshall Mount Creek, and that removal of cattle and implementation of water sensitive urban design as part of the proposed Calderwood development should improve the quality of flows to Lake Illawarra. (Ecological Australia 2010)

The Landscape Master Plan ensures that the core ecological values of the site are to be retained. These core ecological values include Johnston's Spur, Marshall Mount Creek and Macquarie Rivulet as well as smaller pockets of better quality remnant native vegetation. With the retention of these key areas of remnant native vegetation it is anticipated, there will be minimal impact to threatened ecological communities, threatened species and their habitat and regional corridors linking the escarpment to the coast will be maintained and enhanced.

The Flora and Fauna report determined that the Concept Plan for Calderwood retains the core biodiversity areas of Johnston's Spur, Marshall Mount Creek and Macquarie Rivulet as well as pockets of better quality remnant native vegetation. The plan incorporates both east-west and north-south connectivity allowing for movement of species between habitat types and across ecotones with access to significant areas of refuge such as the extensive areas of bushland of the escarpment.

Tree removal will be compensated by the extensive revegetation of indigenous species, in riparian and bushland open space areas. Extensive native and exotic tree planting and landscaping will be carried out in open space areas closer to developed areas such as the Village and Town centres and residential precincts. There is also the potential to transplant a number of existing Fig and trees located north of the Macquarie Rivulet to the early stages of open space development.

2.2.2 Water Cycle Management

A Water Cycle Management Study has been prepared by Stantec (Calderwood Urban Development Project. Water Cycle Management Study. February 2010. Previously known as Cardno) with the following text providing a brief commentary on that document.

The study noted that the overall Macquarie Rivulet catchment (approx. 10,500 ha including Marshall Mount Creek) is the largest contributing sub-catchment of Lake Illawarra. The study found that water quality in Macquarie Rivulet is relatively high compared to the more highly urbanised Lake Illawarra catchments further to the north and east that do not have specific water quality control measures in place.

The Study investigated a range of WSUD features that could be suitably incorporated into the project. Existing water quality was investigated and compared to water quality expected once the development is completed.

The Concept Water Cycle Management Plan's objective was to ensure that post development peak stormwater runoff flows do not exceed pre-development peak flows and that water quality objectives remain equal to or better than existing measures.

The report highlighted that the introduction of development within a catchment can lead to a decline in surface water quality and consequently a number of controls are required to maintain and improve water. Strategies and objectives include:

- Flood mitigation
- Retention of existing vegetation where possible
- Incorporation of water quality control ponds/artificial wetlands adjacent to road crossings within the riparian corridor, where permitted. In such locations they are visible to the residents and thus add to the overall amenity of the area.
- Design principles for mosquito control in urban wetland systems to be followed, to minimise opportunities for mosquito breeding. Use of gambusia (mosquito fish) and certain species of macrophyte also to be avoided in this regard.
- Detention storage Dual-use ponds serving detention purposes as well as enhanced water quality functionality are well suited to the Master Plan layout and the morphology of the Calderwood Valley.
- Specification of rainwater tanks adjacent to shelters and park structures to collect roof runoff
- Provide native landscaping with a lower water demand than traditional urban planting regimes.
- The landscape development at Calderwood will be consistent with the principle and recommendations of the Water Cycle Management Study
- Prevention of fine sediment wash-off and associated water quality impacts during the construction phase
- Prevention of accelerated erosion from disturbed areas
- Specification of previous surfaces in order to decrease run off and anthropogenic pollutants such as:
 - plastics, litter, debris
 - sediments
 - nutrients and other bio-stimulants (principally nitrogen and phosphorus compounds)
 - trace metals (lead, cadmium, zinc and copper)

- toxic organic compounds (eg, pesticides)
- oil and grease
- pathogens affecting humans (including pet excreta, sewage overflows)
- propagates of exotic plant species.

Considerations for the delivery of the Calderwood Valley development include:

- Planting specification of Bio-retention swales / bioretention basins
- Use of water found in creek lines of irrigation
- The use of bioretention systems such as roadside bio-swales where slopes have lower grades and soil geology suits.
- Strategic use of bio-retention systems incorporated into parts of the site where there are deep alluvial soils and gentle grades that encourage infiltration eg. wider grassed verges (such as 'feature' streets with high landscape requirements); streets adjoining riparian corridors; and streets that are highly trafficked where increased vehicle usage is likely to generate greater pollutant loadings.

General maintenance for the Calderwood wetlands will require regular inspections and cleaning of inlet structures and gross pollutant traps. This should occur at least every six months, and after heavy rainfall. Inspection of banks and structures after large storm events is also recommended, with any required repairs being completed.

Inspection and maintenance of outlet structures is also essential to the functioning of the wetlands. It should be ensured that outlet structures remain unblocked. Regular cleanout of sediments from ponds or cleaning of macrophyte beds within wetlands is generally not required, apart from the initial phase prior to handover to Council.

This is one of the advantages of adopting a wetland system for stormwater treatment. The ponds and wetlands will however still need management intervention from time to time in the event of invasive species starting to colonise them, or some other ecological disturbance that upsets the desired species balance.

For instance heavy populations of water birds have been observed to build up at a recently constructed wetland system in south-western Sydney, with excess bird numbers leading to damage to vegetation and a decline in water quality because of heavy bird manure loads. Reducing the amount of permanent water during the breeding season, which encourages the birds to migrate elsewhere to breed, can control instances such as this.

Monitoring and management of the macrophyte beds is important in the first twelve months of operation to ensure plant establishment, and should be the responsibility of contractors responsible for the land development and building phase. Handover to Council would occur on a staged basis, once 80% of the houses in each stage are constructed and would also only occur after macrophytes are fully established. Establishment may involve manual manipulation of the water levels to allow different species to establish at the appropriate water depth. Water level control will also be appropriate for controlling any weed species which may establish. Manual weeding of non desirable species during the establishment phase may also be required (Cardno, now known as Stantec February 2010).

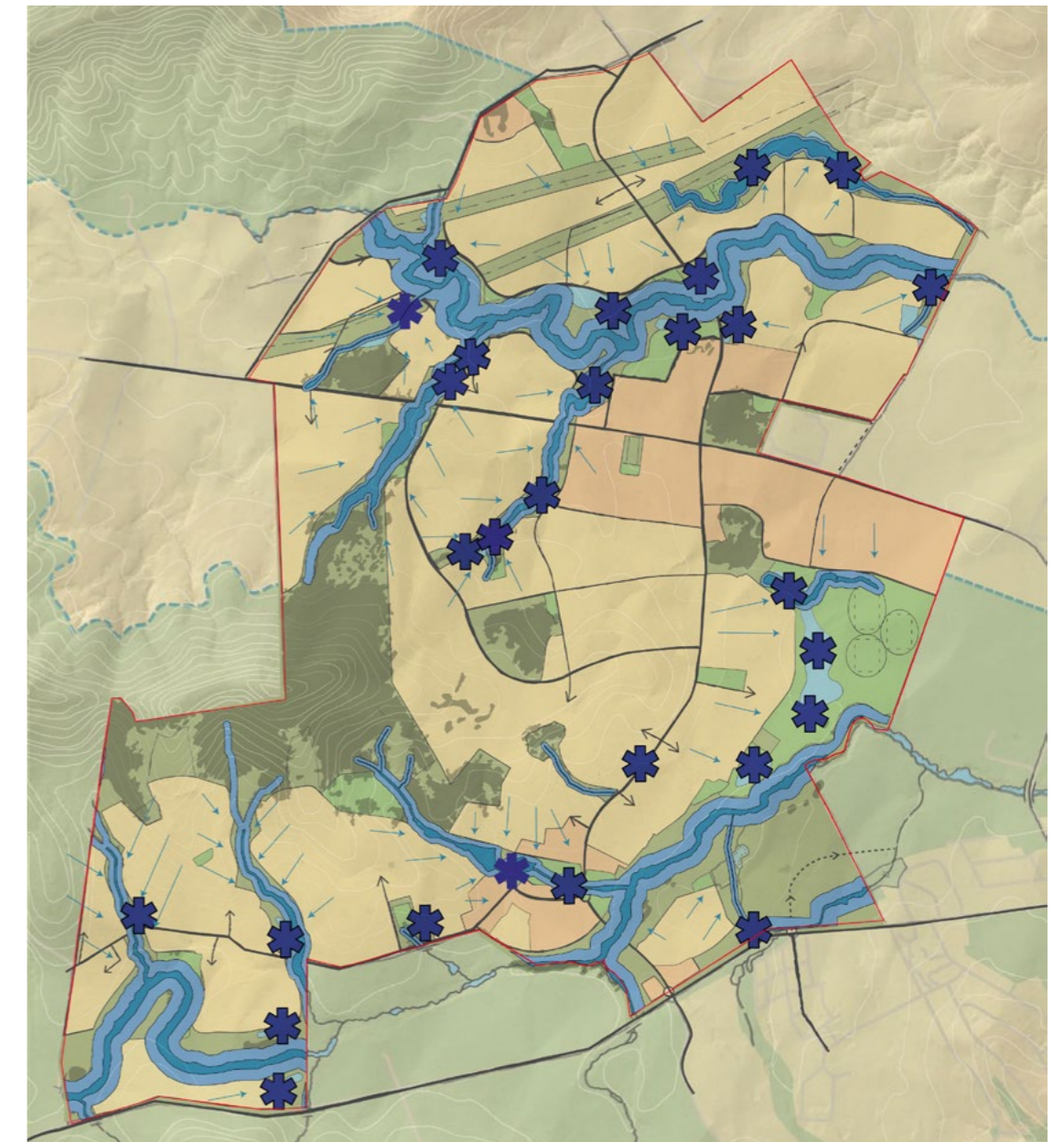





Figure 4.0 Water Cycle Management (MOD4 approved 2021)

Source: Taylor Brammer Landscape Architects

LEGEND

-  **Indicative location of possible water bodies**
Both on-line and off-line ponds serving, water quality and water Detention purposes
-  **Riparian Corridor - Top of Bank**
Based on ground truth and ALS survey data
-  **Core Riparian Zone (CRZ)**
Size based on stream order

Flood Mitigation

The Floodplain Mitigation Strategy and Flood Mitigation Plan (Refer to Figure 5.0) recommended by Stantec (2010) to mitigate and manage potential flood impacts comprises:

- Optimisation of floodplain hydraulics through reshaping areas of the floodplain;
- Construction of bridges throughout the development;
- Measures for dealing with revegetation of riparian corridors.

As a large landholding in single control, the existing flood conditions on the site are able to be managed in an holistic and integrated manner. There are opportunities to undertake strategic re-shaping of the flood plain in a manner that is not readily achieved in release areas involving fragmented land ownership.

The final design and subsequent identification of appropriate flood mitigation measures creates an optimal balance between the extent of works required and the resulting reduction in flood related impacts. The measures proposed mitigate the potential impacts of flooding across the site, ensure no significant off site impacts arise, and also, wherever possible, improve flood affectation external to the site.

The Flood Mitigation Plan identifies areas within the riparian corridor network where vegetation roughness may be increased through the selective planting of select species within Core Riparian Zones (CRZs) where it can be demonstrated that no adverse impact on flood levels will result. The Concept Plan Water Cycle Management Strategy will ensure that peak flows entering the site riparian system will not increase as a result of the development, and this has been included in the flood impact modelling.

Impact assessment

The Floodplain Risk Management Study details the modelling undertaken to test the performance of the identified flood mitigation measures. The modelling work compares the pre-development scenario and the post development scenario with the works identified as being required to offset the flood impacts of the proposed development.

The modelling and adopted Floodplain Risk Management principles and outcomes are strictly in accordance with relevant local and State government guidelines and policies.

The Floodplain Risk Management Study concludes that with implementation of the proposed Flood Mitigation Plan:

- The modelling undertaken to support the proposed development shows that the impacts on adjoining property are acceptable in all events up to and including the 1% AEP flood event.
- There is a significant proportion of the development site, and the surrounding areas, that will experience a decrease in flood levels due to the proposed development. Moreover, the decreases in flood levels occur outside of riparian land and within existing development, which is highly flood prone currently.
- In the PMF event, increases in flood levels can be seen immediately

upstream of the proposed Macquarie Rivulet bridge. This affected area is predominantly rural land. It is not unreasonable to expect that for such a rare flood event, any works on the floodplain would have an impact.

- The cumulative impacts of continued filling on the floodplain are negligible.
- The majority of the site will be located on land above the PMF and as such will not be subject to flood related planning controls or located on flood prone land.
- No occupants will be isolated by any flood event (including the PMF). All new bridge decks will be located above the 1% AEP flood level and will allow uninterrupted road traffic throughout the development (and beyond) during events up to and including the 1% AEP flood. All major spine roads within the development are set at or above the PMF level.
- The requirements of the SES for evacuation are wholly provided for by the Concept Plan proposal. Occupants of the developed site can safely wait out the short duration of flood in site in PMF free dwellings, or they can self evacuate at any time to nearby Calderwood Town Centre via a largely PMF free road network.

(Rienco Flood Study 2009)

The Landscape Master Plan has been developed by recognising the principles and objectives of the Floodplain Mitigation Strategy with the development of appropriate planting and materials palettes in flood corridors and water quality ponds. This process will be further refined through the detail design process.

The April 2019 Post-MOD4 Exhibition Report by J. Wyndham Prince revises the 2018 Water Cycle and Flood Management (WCFM) Strategy for the Calderwood Urban Development Project (CUDP), addressing public and agency feedback on the MOD4 application.

The refined strategy aligns with NSW Government and local council policies and remains consistent with the 2010 Concept Plan. It is considered suitable to support the MOD4 amendments and future development of CUDP. For information refer to the planningportal.nsw.gov.au - MP09_0082-Mod-4 Mod to Calderwood CA (MP 09_0082 MOD 4)

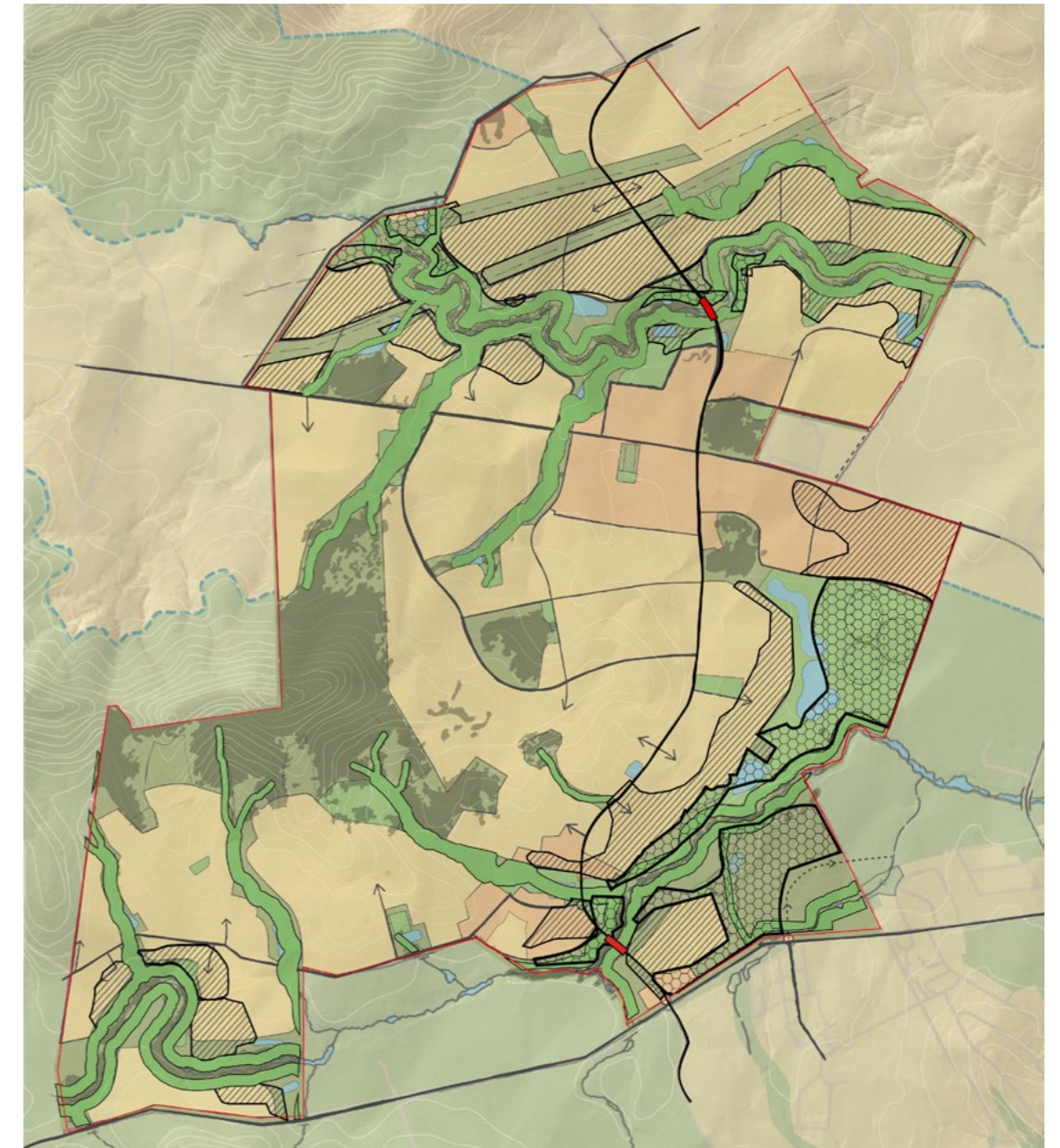






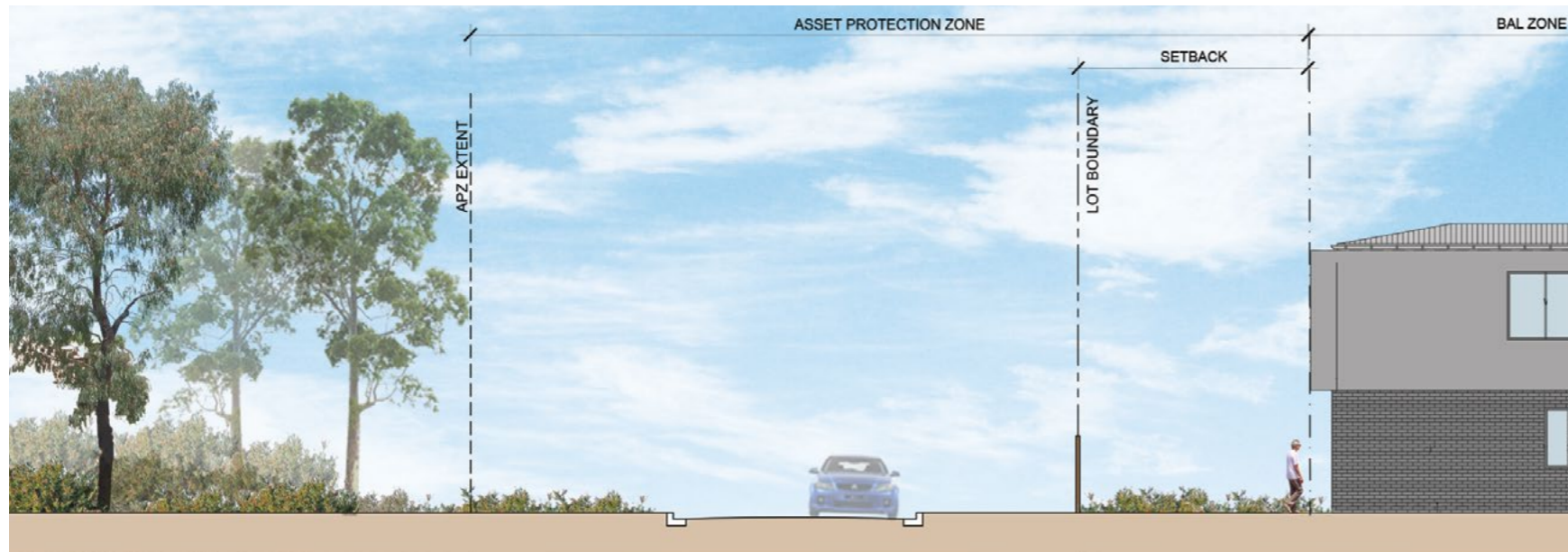
Figure 5.0 Flood Mitigation Plan (MOD4 approved 2021)

Source: Taylor Brammer Landscape Architects

LEGEND

-  Floodplain regrade - increase elevation*
-  Floodplain regrade - decrease elevation
-  Proposed Increased Roughness
-  Proposed Road Bridge

*Works associated with flood mitigation purposes only



Typical APZ Cross Section

2.2.3 Vegetation Management Plan

A Vegetation Management Plan has been prepared by Ecological Australia (2010) and identifies areas of significant vegetation that are to be retained and appropriately enhanced. These comprise the majority of areas of vegetation in good condition that have been identified as Primary, Support for Primary or Other Native Vegetation significance.

The core areas for management include Johnston's Spur, Marshall Mount Creek and Macquarie Rivulet as well as smaller pockets of good quality remnant native vegetation.

The riparian strategy for the Calderwood Valley development is:

- Provision of regional linkages from the ocean to the escarpment via the principal riparian corridors of Marshall Mount Creek and Macquarie Rivulet.
- Identification of a series of secondary corridors from the regional linkages to Johnston's Spur reflecting their relative importance as riparian corridors.
- Secondary corridors will support the primary corridors.
- Provision of a sufficient Core Riparian Zone (CRZ) for remaining riparian corridors to provide for bed and bank stability. The CRZ is the total width of the corridor.

The Vegetation Management Plan proposes:

- Retention of any riparian corridors that have a requisite hydrological function.
- A minimum CRZ of 92 metres to Marshall Mount Creek and Macquarie Rivulet
- A minimum CRZ of 48 metres total width to 2nd Order streams extending from the main valley floor environmental corridors to Johnston's Spur.
- A minimum CRZ of 24 metres total width to first order streams.

An updated Management Plan was prepared by Ecological Australia (May 2015) to expand on this information for Stage 1 of the development.

2.2.4 Bushfire

A Bushfire Report prepared by Ecological Australia (2009) outlines that the requirements for APZ management are detailed in the Bushfire Planning Assessment and vary between Inner Protection Area (IPA) and Outer Protection Area (OPA). Refer to Figure 6.0.

Inner Protection Area (IPA)

- Mature canopy trees providing crowns and canopies do not overlap with overall cover not exceeding 15% of areas
- Understorey saplings can provide sparse cover suitable for ongoing replacement of canopy
- Saplings and shrubs should be limited and not continuous
- Minimal ground fuel to less than 4 tonnes / ha

Outer Protection Area (OPA)

- Mature canopy trees providing crowns and canopies do not overlap with overall cover not exceeding 30% of areas
- Saplings and shrubs should be limited and not continuous
- Minimal ground fuel to less than 4 tonnes / ha

The Stage 1 bushfire statement concluded that:

- Stage 1 is not located within bushfire prone land
- The enhancement of the vegetation along Macquarie Rivulet will require assessment against the Planning for Bushfire Protection Guidelines.
- The proposed Asset Protection Zone along the corridor is consistent with the recommended APZ under the Concept Plan (i.e. a maximum of 25m along each side of the riparian corridor)
- The proposed roads along the riparian corridor are not considered as 'perimeter' roads due to the low hazard nature of the riparian corridor and the large distance of managed open space between these roads and the vegetated corridor. The widths of these roads comply with the Bushfire Protection Guidelines.

As part of future Development Application Submissions for each stage, separate Bushfire Reports will be required to be submitted to Shellharbour City Council for approval.

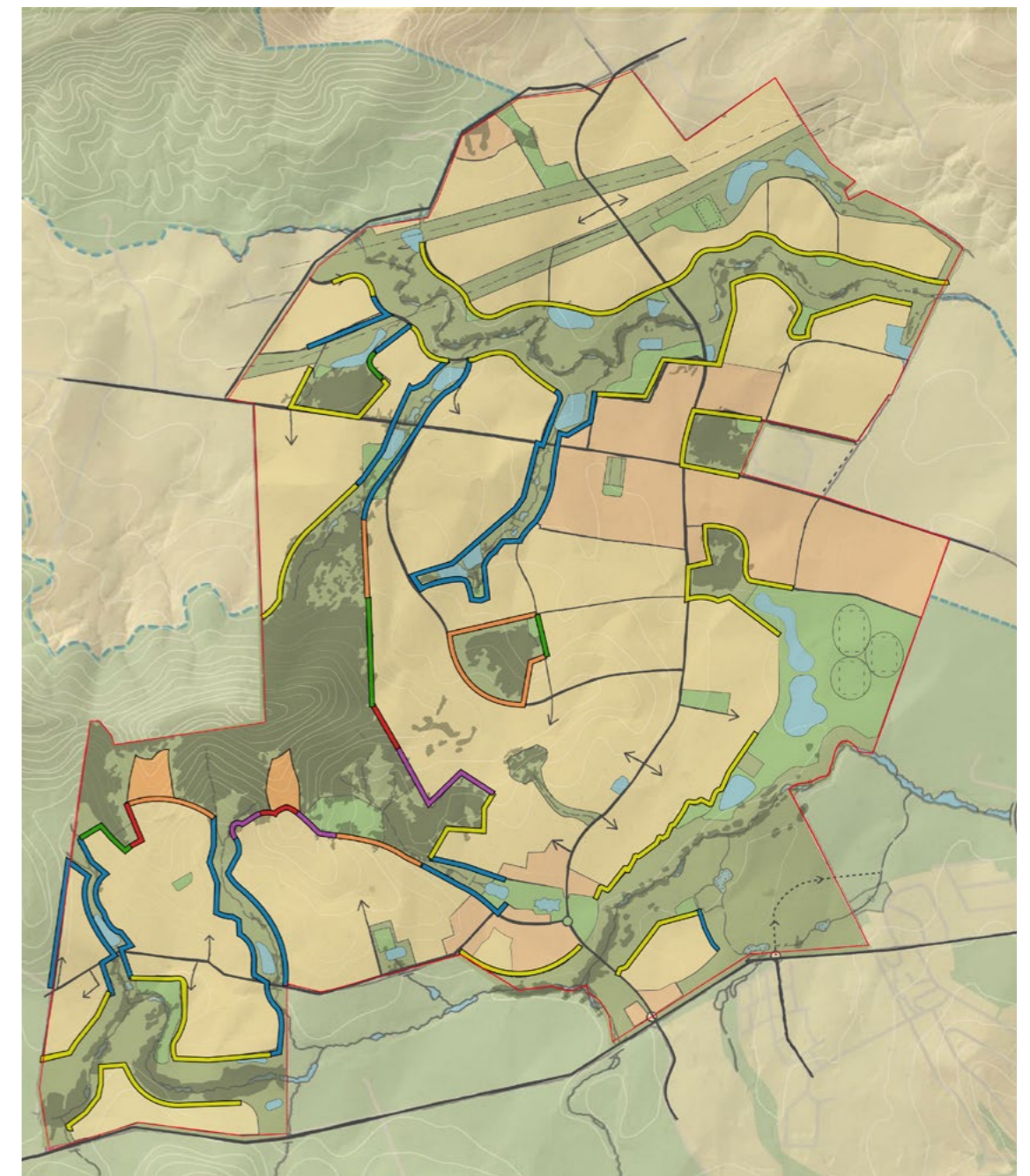
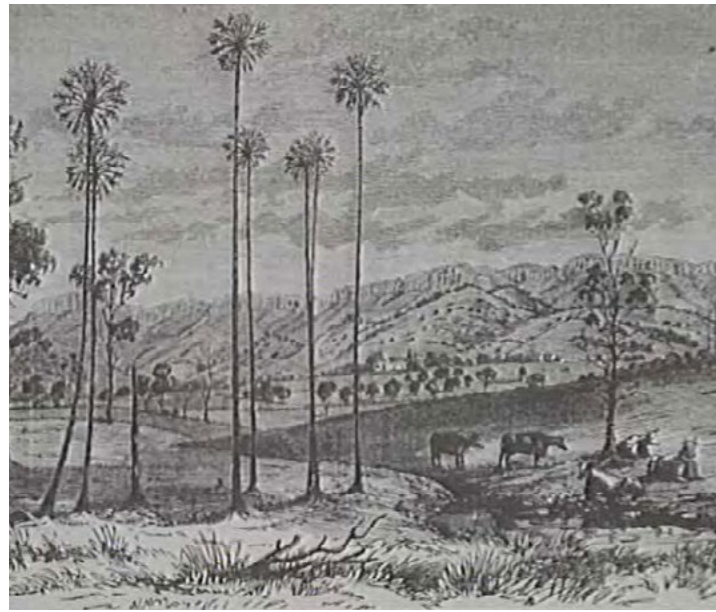


Figure 6.0 Bushfire Asset Protection Zone (APZ) (MOD4 approved 2021)

Source: Taylor Brammer Landscape Architects

LEGEND

- 10m APZ
- 20m APZ
- 25m APZ
- 30m APZ
- 40m APZ
- 60m APZ
- APZ to be determined at point of subdivision



2.2.5 Heritage

The Heritage Impact Assessment prepared by Paul Davies Pty Ltd Architects Heritage Consultants in 2010 highlights that most of the Illawarra coastal plain has been modified first by agriculture and more recent housing developments. Unlike areas north and east in the Illawarra, the Calderwood Valley study area retains its pastoral character and is predominantly rural with some large residential lots.

Land use includes horse paddocks and training tracks, dairy cattle pasture and milking sheds, residential structures and associated road and farm infrastructure. Two main roads run through the development area including North Maquarie and Calderwood Road running through the centre. Marshall Mount Road and the Illawarra Highway are located on the periphery of the area.

Marshall Mount House and the Methodist Cemetery are currently identified as heritage items. Refer to Figure 7.0.

Oak Farm, the former residence of Thomas Armstrong has been identified as a site with the potential for archaeological remains and is located within the Shellharbour City Councils LGA. Oak Farm has not been provided with any statutory protection. Nevertheless the Hynd archaeological report prepared in 2003 for Shellharbour Council indicates that archaeological remains may exist in and around the developed part of the homestead site in the southeast corner of the lot. Paul Davies notes the potential for remains and for future development to be dealt with as part of the detailed design of this area. There is potential for a limited scattered archaeological resource to remain within the Calderwood Valley development area.

The report highlights that the character of the early nineteenth century development was sparse and consisted of mostly simple structures. Outside the two homestead sites and the Cemetery it is likely that archaeological finds on the Calderwood Valley site will consist of the footings or foundations of mostly timber structures including domestic and farm structures, fences, dry stone walls,

dams, formed and unformed pavements, paths and tracks, rubbish pits, possibly privies, wells or cisterns, concrete slabs, redundant services as well as evidence of the modification of the landscape such as drainage, cutting and filling.

The overall significance and research value of the potential archaeological resource of the development area is considered to be low. Any evidence would have some research value at a local level but would not significantly contribute to an understanding of the study area and the southern Illawarra, greater than what is already known with existing written, drawn and photographic evidence.

The Calderwood Valley development will primarily occur outside of the areas identified as having heritage potential. However in those areas adjacent to or identified as significant heritage sites, relevant interpretative art, signage and/or design may be integrated dependent on consultation with relevant stakeholders.

There is also the potential for a heritage trail to be integrated into the Calderwood Valley open space planning.



Figure 7.0 Heritage Sites

Source: Development Control Plan Calderwood Urban Development Project (March 2010) JBA Urban Planning Consultants

Note: Oak Farm has not been provided with statutory protection

2.2.6 Archaeological & Aboriginal

Austral Archaeology Pty Ltd (Archaeological & Cultural Heritage Consultants) was commissioned by Eco Logical Australia Pty Ltd, initially on behalf of Lendlease.

The assessment highlights that before European settlement, many Aboriginal groups lived on the NSW south coast. The area from Bulli and Stanwell Park, in the north, to Shoalhaven and Kangaroo Valley in the south is still called Thurawal by descendants. There were many different Aboriginal groups living in the Illawarra region. The Wadi Wadi people occupied the southern part of the Thurawal area with several camp sites around Lake Illawarra including Berkeley and Hooka Creek. They moved freely throughout the region and shared resources with their near neighbours without fear of trespassing.

Lake Illawarra was a valuable source of food and spirituality for the Wadi Wadi people. Burial sites and middens (shell and camp rubbish heaps) discovered at Windang (meaning "battlefield") and surrounding areas indicate that the Wadi Wadi used the area extensively and performed various corroborees and ceremonies here. Johnston's Spur, which extends into the study area from the west, would provide a route up into the Escarpment from the study area. Some of the same characteristics which made the area of use to past Aboriginal people also would have made it attractive to European settlers, leading to extensive clearing for agricultural, pastoral and rural residential use. These factors have implications for the archaeological potential of the study area.

The Aboriginal people at the time of contact are the Illawarra Dharawal speaking people and the Illawarra region, including the Illawarra Coastal Plain wherein the Calderwood Project area is located, has a rich Aboriginal archaeological background.

A search of the AHIMS (Aboriginal Heritage Information Management System) register revealed 66 sites located within 10 km² of the Calderwood Project area. However comparison of the AHIMS mapping with the relevant site cards has revealed that no previously recorded Aboriginal archaeological sites are located within the study area, and that the location of the an open artefact scatter (Macquarie Rivulet 2 AHIMS 52-5-0288) plotted in the northern half of the study area is incorrect. This site most likely lies outside the Calderwood Project area and therefore would not present a specific development constraint.

However an area of moderate archaeological potential is located on Johnston's Spur to the west of the study area, which has potential to extend into the Calderwood Valley area along the crest of the Spur leading toward Mount Johnston. This area may represent a development constraint as the area contained artefacts and the assessment recommends that it will be necessary to ground-truth whether the area of artefacts extend into the Calderwood Project area.

The archaeological assessment estimates that the majority of the Calderwood Project study area has undergone low to moderate impact from clearance, pastoral activities and fluvial action, while a small percentage has undergone severe impacts from infrastructure and dwelling construction.

An area of undisturbed ground surface may be present on top of Johnston's Spur. It is predicted that sites may be found on all landforms within the Calderwood Project area, with ridge crests and creek banks having the highest archaeological potential, followed by the cleared alluvial flats and hill slopes, and then by areas impacted by infrastructure construction. Open artefact scatters are considered to be the most likely site type, followed by grinding grooves in areas with appropriate stone outcrops, and scarred trees in areas with trees of suitable age. Site preservation is tied in with levels of ground surface disturbance, but it is estimated that sites with some spatial integrity may be present in areas of low to moderate impact such as cleared paddocks and potentially along Johnston's Spur. All of these areas will require ground-truthing entailing more detailed assessment.

The Aboriginal archaeological and cultural heritage assessment of the Calderwood Valley was undertaken in December 2009 in two phases entailing desktop and studies. The study highlights that representatives from ILALC (Illawarra Local Aboriginal Lands Council) and WNDAC (Wollongong Northern Districts Aboriginal Community) were registered as Aboriginal stakeholder groups and consulted.

34 new Aboriginal archaeological sites, containing at least 188 surface artefacts, were identified during field assessment. They consisted of 18 isolated finds (52.94%), 11 open artefact scatters deposit (11.76%) and one potential archaeological deposit without surface material (2.94%). The most common artefact type was the flake, followed by cores, flaked pieces, and a single instance each of a hand axe, a milling stone or pestle, and a possible broken hammer stone.

28 of these sites have been assessed as having low archaeological potential and therefore do not warrant further archaeological investigation.

As a result of the Phase 2 Field Assessment of the full Aboriginal archaeological and cultural heritage assessment of the Calderwood Valley a number of recommendations were made dependent on the site, including:

- No further archaeological investigation
- Salvage through collection and relocation of surface artefacts is recommended if identified sites are to be impacted by development
- The development and implementation of a programme of test excavation and reporting is required to clarify the archaeological potential of sites impacted by development
- The development and implementation of a programme of salvage excavation and reporting is recommended if warranted by the results of the test excavation programme.
- The development and implementation of a Care and Control of artefacts strategy, devised through consultation with ILALC and WNDAC, is recommended for all collected and excavated archaeological material retrieved during the above mentioned surface collection, testing and/or salvage excavation works. Such a strategy should be agreed and finalised with the Aboriginal stakeholders prior to any archaeological site works commencing.

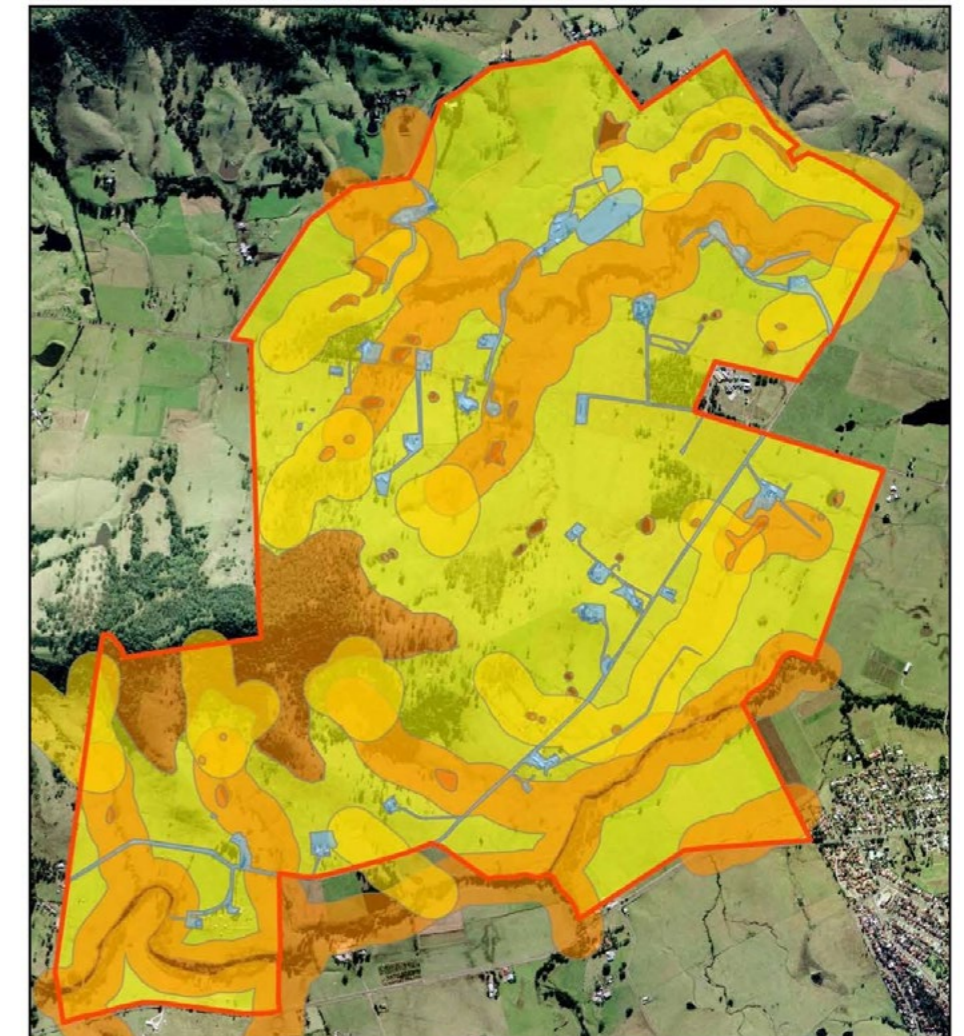
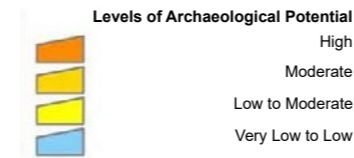


Figure 8.0 Archaeological Potential

Source: Development Control Plan Calderwood Urban Development Project (March 2010) JBA Urban Planning Consultants

- The property at 342 Calderwood Road, were not accessible during the archaeological survey. If it will be impacted by development it is recommended that assessment for their archaeological potential be carried out.
- If additional unrecorded Aboriginal archaeological material is encountered during development, works must cease immediately to allow an archaeologist to make an assessment of the finds, as all Aboriginal artefacts (known and unknown) are protected under Section 90 of the NP&W Act. The archaeologist may need to consult with NSW DECCW and registered stakeholder groups concerning the significance of any such material. DECCW must be notified of any such finds as per Section 91 of the NP&W Act.
- As required by the NSW Heritage Act 1977 (amended), in the event that historic relics are encountered, works must cease immediately to allow an archaeologist to make an assessment of the finds. The archaeologist may need to consult with the Heritage Branch Department of Planning concerning the significance of any historic cultural material encountered. (Austral Archaeology Pty Ltd 2010).

Access to Aboriginal archaeological information was not recommended in the Austral report and consequently the location of all aboriginal archaeological finds remain confidential in the event that this Master Plan is to go on public exhibition.

The Calderwood Valley development will primarily occur outside of the areas identified as having archaeological potential. However if artefacts are discovered the required course of action as outlined by the NSW Heritage Act 1977 (amended) and NP&W Act will be adhered to. Furthermore sites identified as archaeologically significant may be developed with relevant interpretative art, signage and/or design dependent on consultation with relevant stakeholders.

Given the connection of the Calderwood Valley to Aboriginal heritage, Stockland is committed to carrying out consultation with the Aboriginal Advisory Committee established by Shellharbour Council. During the course of the development it is envisaged that consultation will continue to ensure the recognition of Aboriginal history, culture and people in the development of the Calderwood Valley.

3.0 EXISTING LANDSCAPE CHARACTER

3.1 Character Zones

The broad scale landscape character of the development is defined by key elements which determine the principles on which the landscape design for Calderwood Valley is developed.

The landscape character zones of the Calderwood development have been determined as a function of:

- The existing site qualities, landscape approaches
- Cultural influences (European, Indigenous and Natural)
- Urban development fabric and its related density and form

The zones have been developed for Calderwood to guide the character and design aesthetic of the open spaces and urban areas within those areas. Character zones describe the allocation of particular thematic approaches and the key areas can be summarised as:

- Town and Village Centres
- General Residential
- Country Residential
- Bushland Edge

A character zone plan has been developed for the area which nominates the character styles and their application across the site. It determines where to apply the planting palette matrix and the principles of the design typologies to the site. This plan forms the basis on which each of Calderwood Valley's built elements and open space can be further refined.

Special character overlays have been identified in 5 locations (Refer to Figure 9.0) in Calderwood Valley in response to strong landscape or heritage values. The overlays are:

- Marshall Mount House to signify the heritage values of the precinct and highlight an approach which will respect these through integration of planting and materials that reinforce the history of the precinct such as marker trees and use of stone; together with appropriate setbacks and design to provide transition spaces around the property.
- Northern Fringe to signify and respond to the rural nature of the lands located to the north of Calderwood Valley through selection of plants and materials that reinforce this character.
- Southern Fringe to signify and respond to the riparian nature of the lands located to the south of Calderwood Valley which lie adjacent to the Macquarie Rivulet, through selection of plants and materials that reinforce this character.
- Western Fringe to signify and respond to the increasingly sloped and riparian nature of the lands located to the west of Calderwood Valley which lie adjacent to Johnston's Spur and the Macquarie Rivulet, through selection of plants and materials that reinforce this character.
- Illawarra Highway to respond to the rural and riparian nature of the lands lying adjacent to this major road which connects the Southern Highlands to the Illawarra region through selection of plants and materials that reinforce this character.

Site character distinguishes neighbourhoods, aids in way-finding and creates diversity and interest throughout Calderwood Valley. Reference to and incorporation of the existing features, character or vegetation will be promoted wherever possible.

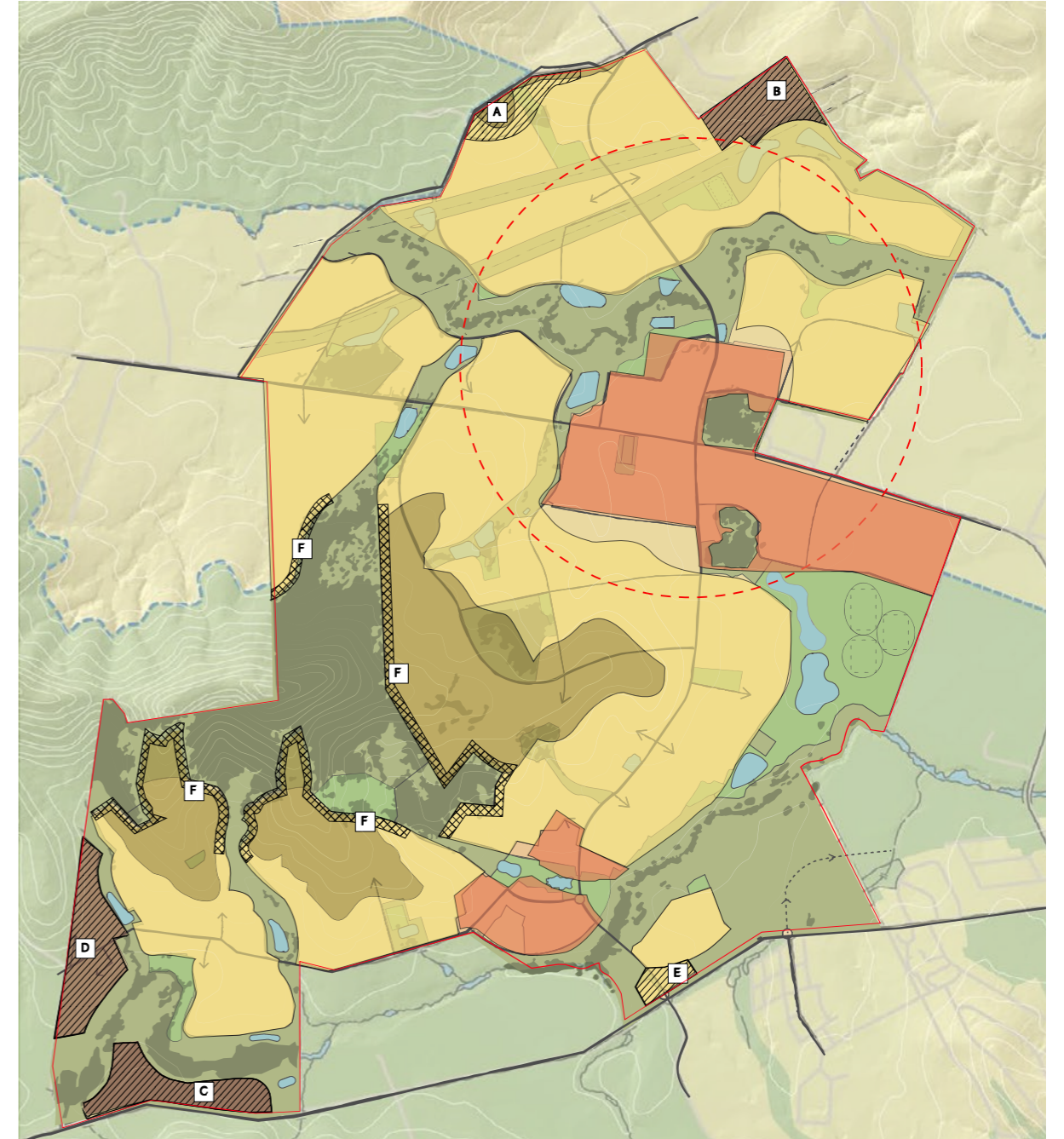






Figure 9.0 Landscape Character Zones (MOD4 approved 2021)

Source: Taylor Brammer Landscape Architects

LEGEND

	Urban scale, higher density and diverse mixed use built form		800m Walkable Catchment Dwellings within 800m/ 10 minute walk of the Town Centre		Special Character Overlay Western fringe
	General Residential Residential scale and character		Special Character Overlay Marshall Mount House		Special Character Overlay B4 Illawarra Highway
	County Residential Residential character with decreased density		Special Character Overlay Northern fringe		Bush Edge Buffer Overlay
	Bushland Edge / RL 50m AHD Responding to bushland interface and indicative elevation		Special Character Overlay Southern Gateway		

3.2 Landscape Character Opportunities

The Calderwood Valley character plan outlines an integrated framework of refined character zones that offer a series of opportunities as outlined on this page. The major character zones that have been identified are:

- Riparian and Transition
- Ponds and Lakes
- Open spaces (Parkland)
- Town and Village Centres

The landscape Master Plan also focuses on the character development of:

- Streetscapes
- Gateways & Entrances
- Neighbourhood precincts

The framework responds to key site planning principles including:

- Provision of local and collector street links (including pedestrian) between neighbourhood nodes and urban centres (town/village).
- Neighbourhoods to be within walking proximity to parks, playing fields and public transport.
- Orientation of street layout to maximise connectivity between residence, open space, connector roads and public transport.
- Use of road subdivision pattern to create distinct and identifiable neighbourhoods.
- Creation of neighbourhood scale and structure.

Landscape opportunities have been identified for each of the key character zones in the following table.



LANDSCAPE CHARACTER ZONE	OPPORTUNITIES
<p>Riparian & Transition Zones</p> <ul style="list-style-type: none"> • Marshall Mount Creek and Macquarie Rivulet • Includes zones such as the APZ 	<ul style="list-style-type: none"> • Retain and enhance cove vegetation habitat. • Off road cycle and/or pedestrian links to connect urban areas to open space. • Retain and reinforce views to the escarpment and Johnston's Spur.
<p>Ponds & Lakes</p> <p>Align to existing drainage in the Calderwood Valley</p> <ul style="list-style-type: none"> - Macquarie Rivulet - Marshall Mount Creek 	<ul style="list-style-type: none"> • Emphasise links to water drainage lines with materials such as rounded stone and use of geometric form (weir castellations). • Incorporate water to reinforce the cultural landscape. • Provide water as a focal point of parklands. • Incorporate setbacks to each side of major creek embankments. • Off road cycle and/or pedestrian links to connect urban areas to open space. • Conserve existing stands of vegetation.
<p>Open Spaces (Parkland)</p> <p>Citywide and District Parks</p> <hr/> <p>Local Parks</p> <hr/> <p>Sportsfields</p>	<ul style="list-style-type: none"> • Community Focal Point. • Close proximity to retail centre, learning or community facilities, bus routes and major access roads. <hr/> <ul style="list-style-type: none"> • Focus of neighbourhood precinct with easy accessibility or residential to open space. • Locale to borrow from surroundings. • Integrate into local street network. • Optimize use of existing views, level grades and/or existing tree canopy. <hr/> <ul style="list-style-type: none"> • Focal element facility in community. • Proximity to retail centre, learning or community facilities, bus routes and major access roads. • Open/rural. • Feature shade trees.
<p>Streetscapes - including gateways and entrances</p>	<ul style="list-style-type: none"> • Reinforce rural character through road design and cultural tree planting in appropriate locations. • Use cultural markers such as planting, significant trees, hedging, natural materials, steel and stone. • Hierarchy of streets to assist wayfinding and creation of identity • Sensitively incorporate the sloped character of the area to aid in the development of the street hierarchy: <ul style="list-style-type: none"> - Collector street - Local street - Access street - Road edge cycleway - Pedestrian pathway • Introduce modified Illawarra coastal plain species to strengthen gateways and entrances.
<p>Gateways & Entrances</p>	<ul style="list-style-type: none"> • Reinforce rural character through road design and cultural tree planting in appropriate locations. • Use cultural markers such as planting, significant trees, hedging and natural materials, steel and stone in a contemporary manner.
<p>Neighbourhood Precincts</p>	<ul style="list-style-type: none"> • Introduce additional modified Illawarra coastal plain species to strengthen natural areas and outline spaces. • Extend ecology into the parklands and streetscape with "green fingers".
<p>Urban Centres (Village/Town)</p>	<ul style="list-style-type: none"> • Reinforce the 'sense of place' by using materials and plants that are characteristic of the area such as timber, steel, Cabbage tree palms, Figs and Illawarra flame trees in order to enhance the unique landscape and develop a sense of identity for the community that will live there. • Maintain the open character of the land in parklands and community spaces. • Emphasise historic and cultural links including indigenous heritage values to the land in the design development.

4.0 DESIGN PRINCIPLES - OPEN SPACE

4.01 General

The design of public open space, parklands and sporting grounds in the Calderwood Valley has been guided by a number of overarching principles as outlined in the Shellharbour Open Space, Recreation & Community Facilities Needs Study (2010). These principles are outlined in Table 1 and can be used to assist in establishing the basis for the provision of sustainable and effective parks and sporting grounds.

In addition to these design principles, life-cycle costing of open space areas, including the materials used, maintenance requirements and replacements costs has been considered.

The hierarchy of parks developed in the Calderwood Valley reflect the system prenoted in the Needs Study and are based on the provision of 3 levels of parkland;

- Citywide
- District
- Local

Stockland is currently consulting with relevant areas of Council to ensure local issues and requirements are integrated into the development of open space in the Calderwood Valley. The aim being to gain the best future community outcomes and address needs for relevant park and sporting facilities.

The Needs Study outlines a number of trends in Leisure, Recreation and Open Space Planning which will be considered when developing detail designs for these spaces. The trends to be considered are:

Broad Trends in Leisure and Recreation Planning

Broad trends experienced across the State which are applicable to the Shellharbour LGA context include:

- Increased participation in formal recreational activities (sports), including a particular increase in female participation rates;
- Changes in housing types, with larger houses on smaller lots, resulting in a general reduction in “backyard” space and recreational opportunities;
- Increased demand on informal recreation, particularly walking and cycling;
- Shifts in the popularity and expectations of various sports, suggesting a need for flexible spaces that can be modified over time;
- Increasing expectations of local government to provide high quality open spaces, including embellishments and maintenance;
- Increased pressure on Councils to provide after hours use of open spaces, particularly for sporting grounds and including car parking and lighting; and
- Increasing expectation for the provision of facilities that are well organised, comfortable, safe, high quality, and well provided for in terms of support/ancillary facilities (such as toilets, car parking and lighting).

Local Trends in Open Space Planning

Within the Shellharbour LGA the above trends can be further focused as follows:

- Defined areas of high growth with new open spaces being required which primarily target families with children;
- Existing established areas with limited growth opportunities, aging resident population and decreasing average household population, where open space areas may need to be reorientated to service an older population;
- An increasing demand for improved embellishments, particularly among sporting groups, including requirements for fencing, shade, toilets, canteens and other embellishments; and
- A tendency to under utilise local open space. Usage has been shown to significantly increase when organised activities are provided by others.

Table 1: Summary of Open Space Principles

The Needs Study outlines a number of principles and their application to the three tiers of parks and these are:-

- Safety
- Access
- Spatial Distribution
- Sustainability
- Place Making
- Physical Attributes
- Clustering
- Integration
- Variety

These principles have been expanded on in each level of open space design relative to park size in sections 4.2.5, 4.2.8, 4.2.13 and 4.2.15.

These trends together with the design principles outlined in the Shellharbour Open Space, Recreation and community Facility Needs Study will be taken into consideration when developing detail designs for open spaces and facilities in Calderwood.

4.02 Safety

The Shellharbour Open Space, recreation and Community Facilities Needs Study (2010) highlights a number of safety considerations that should be addressed in the development of park and open space design at Calderwood Valley. These are summarised in Table 2.

Other safety considerations that must be addressed in the design of open space include:

- Provision of landscape planting that does not compromise visual surveillance. For example the use of trees with high canopies and low shrubs and hedges that allow good sightlines and the monitoring of children’s play;
- The location and design of water bodies that allow a high level of surveillance and provide safe conditions (for example the provision of a gently graded bank and shallow water); and
- Pedestrian and vehicular circulation should be separated where possible to ensure the safety of children and other open space users. All vehicular traffic areas should also be designed as shared spaces, cognisant of use by young children, families, prams and other similar users.

Table 2:

Consideration	Design Response
Car Parking: Providing carparking within an open space area is a significant factor in a park being used for anti-social behaviour.	Provision of car parking should only be considered for district and higher level parks and sports fields. For local parks and most district parks, on street parking is preferred.
Lighting: Lighting of open spaces has the potential to encourage use the space for illegitimate reasons, meaning the lighting is not an answer to discouraging anti-social behaviour	Lighting should only be used where an area is designed to be used for legitimate purposes at night or along essential pedestrian routes that are to be used at night. Controlled use of space at night through the closing of car parking areas should also be utilised to reinforce desired use patterns.
Size: The size of a park is associated with the chances of illegitimate activities occurring, particularly in areas where passive surveillance is poor.	In larger parks, design elements should ensure that gathering spaces have high passive surveillance. The size of parks should reflect its use and need.

Night-time use: Extensive areas of open space that attract nighttime use is problematic for surveillance and law enforcement.

Where open space is designed to be used at night, they should be well defined in terms of their entry and exit points, smaller and on major roads where passive surveillance and easy access can be achieved.

Co-location: Parks co-located within business or town centre precincts are found to be underutilised in non-business times, leading to anti-social behaviour and crime.

Where parks are to be co-located with community or business./retail areas, efforts should be made to ensure that other land uses (for example residential housing) also provide passive surveillance. Retail and businesses should provide a frontage to these open spaces, not “turn their backs” on such spaces.

4.03 Character Zones Design Principles

The aim of the landscape and open design strategy is to provide a recognisable, unified landscape character throughout Calderwood Valley that simultaneously reinforces individual neighbourhood identities.

This will be achieved through a consistent use of appropriate planting species, principles and landscape materials used in site specific and responsive design. The use of individual elements and functions in key zones, and open space features will enable variety and interest to be created.



	CHARACTER ZONE	DESIGN PRINCIPLES
OPEN SPACE	Natural Open Space	<ul style="list-style-type: none"> • Strong linear open space riparian corridors reinforced. • Maintain native tree canopy where possible. • Provides extensive cycle and pedestrian accessibility. • Weed management required. • Reinforce views to Riparian Corridors and ridgelines. • Integrate stormwater ponds, lakes and wetlands to accentuate Riparian character. • Accent and indigenous rainforest trees.
	Open Spaces (Parkland)	<ul style="list-style-type: none"> • May have ephemeral or permanent water bodies that provide drainage function. • May adjoin riparian or APZ buffers. • May adjoin native vegetation and/or conservation areas. • Character may vary from designed urban space combining pavements, planting and furniture elements to natural bushland areas with native vegetation and rustic features. • Open grassland areas reinforcing rolling hills and rural lands
URBAN SPACE	Streetscapes	<ul style="list-style-type: none"> • Provide interconnecting path links and paved areas. • Native or exotic tree canopy in maintained grass or beds of native grass or under-planting. • Maintained grasslands on road verges . • Low to moderate weed management required. • Extend to incorporate front garden management and landscape strategies.
	Gateways & Entrances	<ul style="list-style-type: none"> • Entry marker and wayfinding signage. • Furniture and lighting from consolidated palette. • Major tree avenue. • Median treatment at entries. • Collector and Sub-Arterial tree planting to reinforce rural and village character. • Widened verge to reinforce sense of entry. • Provide access paths and trunk cycle connections. • Establishes a recognisable, unified character across the development.
	Neighbourhood Precincts	<ul style="list-style-type: none"> • Consistent material fabric to reinforce neighbourhood character. • Appropriate scale of street tree planting. • Connection to open space or natural areas is enhanced and integrated into urban design. • Materials respond to the individual sites.
	Urban Centre (Village/Town)	<ul style="list-style-type: none"> • Interface with open space where possible. • Predominantly native canopy with use of exotics for central urban zone amenity. • Provides the focal representation of the overall theme of urban lifestyle in a rural setting ie. country village. • Mix of medium to small scale trees reflecting higher density. • Promote views to water and escarpment where possible. • Provide visual and physical connection to open space including views to the Illawarra escarpment. • Reinforce main street village identity.



4.1 Natural Open Space

4.1.1 Riparian Corridors

Calderwood Valley provides an opportunity to use existing unembellished areas of mature vegetation along existing Riparian Corridors and provide opportunities for improvement through weed management and the provision of informal pathways to create linkages between areas.

The Riparian corridor network for Calderwood Valley is shown in Figure 10.0.

The objectives for the riparian corridors are to:

- Assist in the creation of regional linkages from Lake Illawarra to the escarpment via the principal riparian corridors of Marshall Mount Creek and Macquarie Rivulet.
- Identify a series of secondary corridors from the regional linkages to Johnston's Spur reflecting their relative importance as riparian corridors. Secondary corridors will support the primary corridors.
- Provide a sufficient Core Riparian Zone (CRZ) for remaining riparian corridors to provide for bed and bank stability.

The principles identified in the Vegetation Management Plan for Calderwood Valley outline in broad terms that the riparian corridors are to:

- Relate to existing site drainage lines.
- Retain where possible native tree canopy and existing natural riparian vegetation and suppress weeds and pest species.
- Provide generally an overall width greater than 30m.
- Provide a minimum of 10 metres of vegetation buffer beyond top of embankment to both sides of channel.
- Provide nodal local/pocket recreational spaces adjoining corridor.
- Align off road cycle/pedestrian linkages with corridors.
- Vehicular crossings, and pedestrian and cycle pathways crossing of riparian corridors to be located at appropriate grades. Any disturbance to be stabilised and revegetated.

- Wetlands and ponds are to be located and designed to be sympathetic to the environment. The design and construction of recreation and drainage works to aim to be as 'natural' as possible and provide a stable transition from a constructed system to a natural flow system.
- Utility services infrastructure to cross riparian corridors where dual location within pathways or vehicular crossing is possible

The Landscape Master Plan has been developed by recognising the principles and objectives of the riparian corridor network for Calderwood Valley with the development of appropriate planting and materials palettes in these precincts. This process will be further refined through the detail design process.

These objectives include:

1. Provision of open space that is not specifically embellished and managed
2. Areas that provide an informal landscape setting adjacent to urban areas
3. Manage, conserve and protect natural areas including native bushland and in particular areas that contain habitat for species and/or ecological communities or the existence of cultural heritage items.

4.1.2 Johnston's Spur

The environmentally sensitive lands of Johnston's Spur will be managed to meet the objectives of the E2 zoning. No development is proposed for the upper reaches of the ridge. A citywide park (CW3) is proposed for the lower lying slopes of the spur in an already existing cleared area and will be developed in keeping with the VPA Planning Agreement as outlined in Section 4.2.7 of this Master Plan.

The final location of CW3 will be agreed in consultation/workshops between Stockland and Shellharbour City Council.

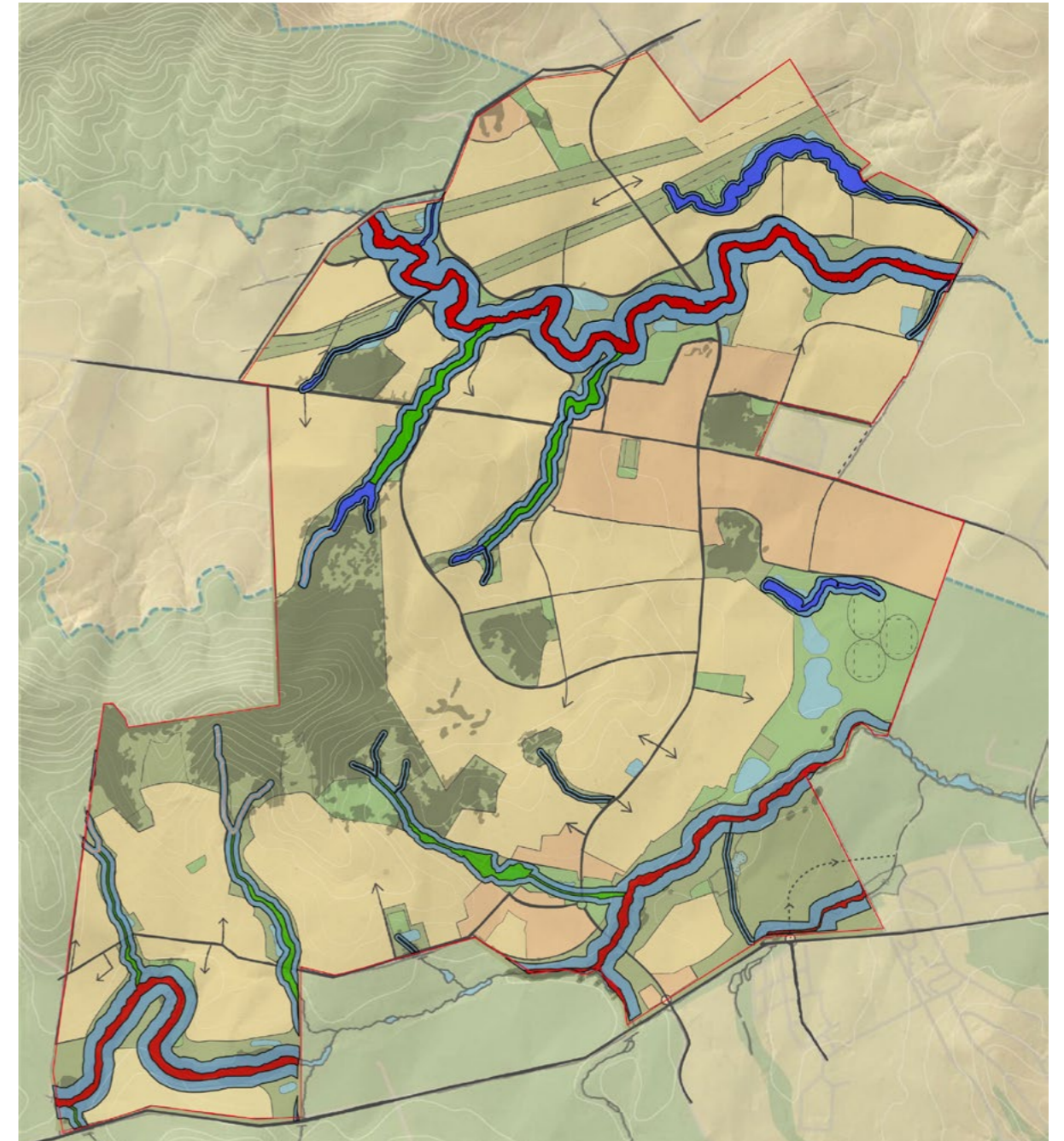


Figure 10.0 Riparian Corridors (MOD4 approved 2021)

Source: Taylor Brammer Landscape Architects

LEGEND

- Top of Bank - Stream Order 3+
Ground truth and ALS survey data
- Top of Bank - Stream Order 2
Ground truth and ALS survey data
- Top of Bank - Stream Order 1
Ground truth and ALS survey data
- Core Riparian Zone (CRZ)
Size based on stream order



4.1.3 Constraints / Opportunities

The objectives and principles for the riparian corridors were applied in the design and developed for the key sites and outlined as follows:

Stormwater

- Existing ephemeral.
- Existing man made drainage systems and dams.

Habitat Corridor

- Drainage corridors (Maquarie Rivulet and Marshall Mount Creek).
- Maintain existing trees where possible.
- Supplement with revegetation and provide canopy links to parks and open spaces.
- Education and interpretation eg. bird hides
- Commuter and recreation opportunities eg. cycling

Recreation

- Recreational walking paths.
- Fitness nodes.
- Informal passive nodes - seating.
- Access/bridge links.

APZ

- Buffer Road or pathway to Citywide parks.
- Supplementary shared access.
- Managed vegetation and local provenance species.
- Green visual / character link to rural residential /streetscapes..
- Local nurseries.
- Local education institutions.

4.1.4 Sustainability

The landscape development process must emphasise sustainability at every appropriate opportunity

Planning and Design

- Site planning to reduce environmental impacts and enhance environmental performance
- Maximise material and furniture longevity through best practise design (including the ability to surpass fashions/trends in design, and enable ease of removal of parts in order to refurbish the item and extend overall life
- Reduce or eliminate reliance on energy required to light, heat and ventilate structures.
- Conserve valuable resources and avoid waste
- Use recovered or recycled content materials where practical
- Minimise or eliminate water usage and reduce reliance on mains supplies (eg. utilise rain or grey water)
- Use low or non-toxic materials to reduce impacts on human health and the environment
- Maximise the recovery of components and materials at end-of-life.

Materials

- Reuse demolition components materials or recycled content materials that meet engineering specifications
- Source materials locally to reduce transport impacts and support the local community
- Use materials adequate for a job and not of an excessive standard (eg don't use stainless steel when galvanised will do)
- use materials that have a lower environmental footprint ie. removed areas to be mulched and re-used on site in open space areas.

Fabrication

- Use prefabricated structures or fabricate components off-site where possible
- Build bulk quantities of structures and components if practical
- Use techniques that maximise recovery at end-of-life (eg bolting not nailing)
- Use contractors with an environmental management system in place to minimise environmental impacts.

4.2 Open Space

4.2.1 Vision

Calderwood's open spaces and connectivity are intrinsic to the success of liveability and enhancement of quality of life in the valley.

Key objectives are to:

- Provide easy access to a variety of open spaces (parks, gardens, plazas and reserves) for relaxation and recreation.
- Create a shared user community integration network that provides a high level of accessibility between open space, roads and amenity.
- Retain areas for environmental purposes and Aboriginal post-contact heritage, providing for conservation, education and recreational needs.
- Reinforce strong visual identity of Calderwood Valley landscape.

4.2.2 Open Space Types

The different types of public and private open space are:

- Public Active Open Space
 - Sportsground (Regional Catchment)
- Public Passive Open Space
 - City Park (Regional Catchment)
 - District Park (District Catchment)
 - Local Parks (Local Catchment)
- Public Drainage Zone: Public Water Bodies and Wetlands
 - Nominated as part of the approved Water Cycle Management Plan as being required for stormwater detention and stormwater quality improvement across the site.
- Private Natural open space
 - Waterways including riparian and wetland corridors with associated open space
 - Green corridors providing linear pedestrian & cycle links
 - Open space on ridgelines

Generally the network of parks and open spaces will be designed to create an integrated environment which provides both a functioning and sustainable drainage system and a range of quality active and/or passive recreational opportunities. Refer to Figure 11.0.

4.2.3 General Principles

- Park and open space area provide an opportunity to apply site specific approaches to tree and garden bed planting which will enhance the relevant character type through species selection.
- Plant densities and selection should be used to highlight entry points, nodal areas, recreational spaces/ routes and provide views to the parks from roads and footpaths.
- Species selected for corridors and areas adjoining regional parkland to be predominantly indigenous to the vegetation communities evident in the Calderwood Valley.
- The site's location adjacent to the rural areas in the north provide opportunities to visually heighten the precincts historic context.
- Species selection to have regard to the soil characteristics, salinity, biodiversity value, potential impact on essential services and public safety issues.
- Species selection and placement should consider existing trees to be retained.
- Feature exotic planting at key entry points and within the Village & Town Centres

Calderwood Valley in Shellharbour City Council (SCC) will provide 2 major city parks and a sports ground facility for the community:

- CW2 -2.55ha in VPA and detail plan as per table in Appendix B
- CW3 - 3.48ha in VPA 'Bushland' City Park as per table in Appendix B
- S1 - 24.18ha Sports ground as per table in Appendix B

Currently there is no agreement in place that determines the final location of the Bushland City Park (CW3). however the VPA stipulates that Citywide park (CW3) will also be handed over and managed by S.C.C in the future, following determination of the CW3 location and embellishment. The final location of CW3 will be agreed in consultation/workshops between Council and Stockland. Park embellishment is required to have infrastructure developed to a standard satisfactory to Council prior to handover.

Calderwood Valley will provide 2 district parks in the Calderwood Valley:

- District Park D3 - 1Ha "Residential" Park as per table in Appendix B
- District Park D4 - 3.14Ha "Village Centre" Park as per table in Appendix B

Calderwood Valley will provide 13 local parks of minimum 1-2Ha each refer to Appendix B and figure 11.0 adjacent.

The VPA stipulates that all district and local parks within SCC will be taken over and managed by Shellharbour Council in the future. Park embellishment is required to have infrastructure developed to a standard satisfactory to Council prior to handover.

The following open spaces are proposed to be managed by Shellharbour City Council (SCC) and Wollongong City Council (WCC) in the future. Please refer to Appendix B for further detail. The following list includes open spaces that will be the responsibility each respective Council.

	SCC	WCC
Citywide Park (CW1)		2.00ha
Citywide Park (CW2)	2.55ha	
Citywide Park (CW3)	3.48ha	
District Parks	4.14ha (D3 and D4)	1.00ha (D1)
Local Parks	5.09ha	0.6ha (L1 & L3)
Main Sports Complex	24.18ha	1.6ha (S2)
Total	39.44ha	5.2ha

Currently Stockland is responsible for the future management of the following;

Open Space Corridor	104.68Ha
Environment Reserves	16.58ha
Citywide Bushland	61.11ha
Total	182.37ha

Open Space to be delivered by Non-Core Landowners within Shellharbour City Council and not the responsibility of Stockland.

District Park 2 (D2)	1.0ha
District Park 5 (D5)	1.0ha
Local Park 7 (L7)	0.2ha
Local Park 13 (L13)	0.2ha
Total	2.4ha

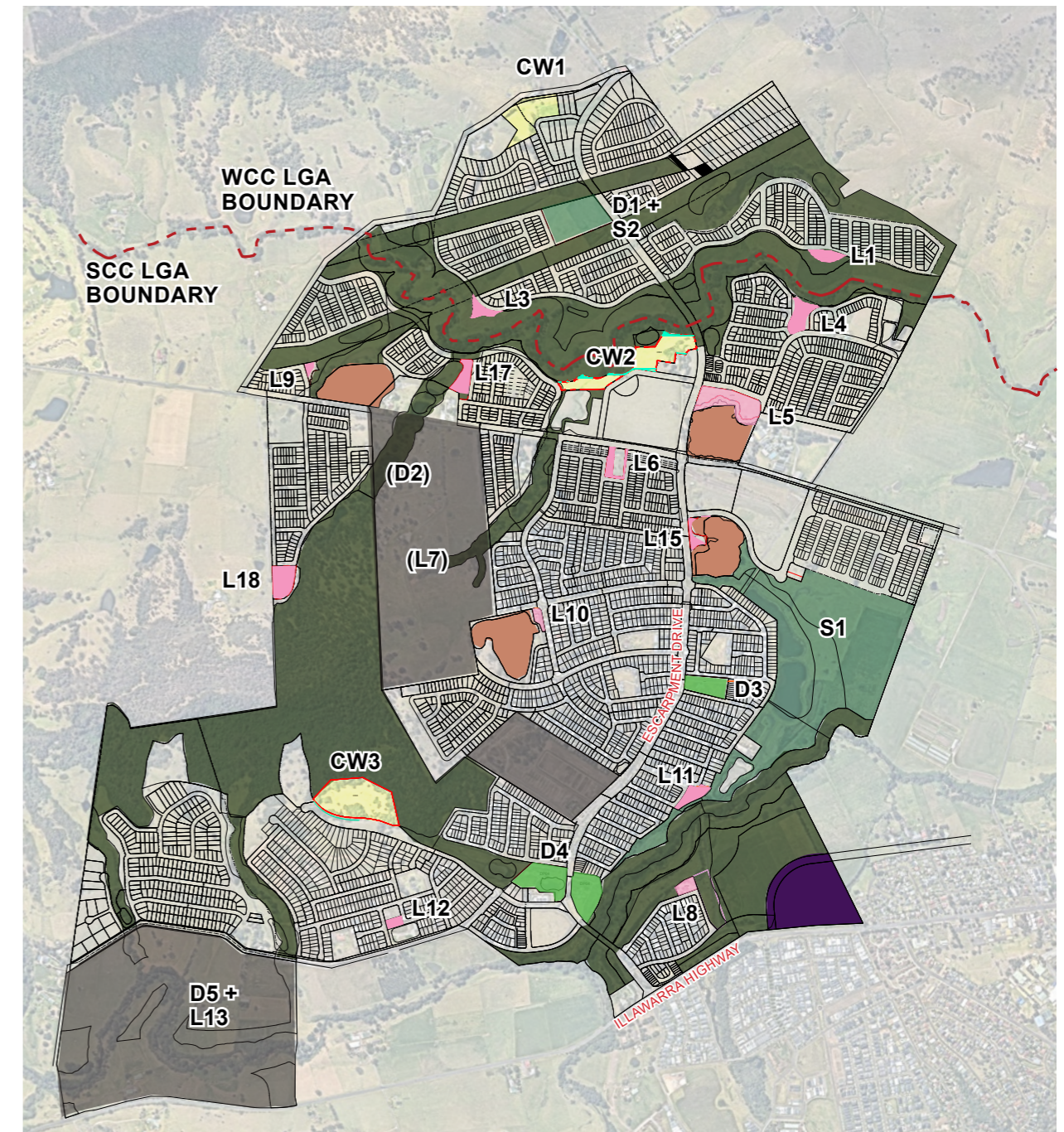


Figure 11.0 Open Space Analysis Plan

Source: Taylor Brammer Landscape Architects

LEGEND

- Sportsfield Proposed
- City Wide Parks Proposed
- District Parks
- Local Parks
- Environment Reserves
- Openspace Corridors /Citywide Bushland
- Rural Landscape/lifestyle
- Non-Core Land

4.2.4 Target Groups

The Shellharbour Open Space, Recreation, and Community Facilities Needs Study (2010) highlights the importance of recognising the special needs of the targeted user groups in the development of open space design. The following trends and principles have been identified in the Needs Study and will be considered in the development of the design of open space at Calderwood Valley:

Design for Younger Children (0-4 years)

The Needs Study identifies the provision of safe, challenging and appropriate play spaces and playgrounds for children must recognise the importance of play as an informal mechanism for the development of a child's physical, cognitive, emotional and intellectual skills.

Some basic principles to be considered when developing parks and open spaces for younger children include:

- **Sensory richness:** Initial contact with a park or playground is a sensory experience for younger children. Design should introduce different textures to feel and touch, with dappled light, colour, external outlooks, smells, shapes and wall displays can all contribute to extend the sensory experience. Inclusion of a vantage point (0.5 - 1.5m above ground) will provide an over viewing place;
- **Variety and diversity:** Younger children can move quickly from one activity to another as they explore a public space. Activity areas should be flexible to accommodate a range of activities and to challenge them to acquire additional skills. Open-ended activities not specifically linked to standard playground offerings can be made more (or even less) complicated to hold the children's interest.

These concepts can be translated into design features such as:

- Innovative play and appropriated sized climbing structures and motion apparatus which provide for sensory experiences such as reflective materials, climb through spaces and oversized games or activities; and
- Ground manipulation to provide for grassed mounds, logs, water, sand and other natural materials and structures to allow creative play opportunities.

Design details should also ensure that play areas are fenced where necessary and shade structures are provided to protect younger children and their carers, particularly in summer.

Design for Older Children (4-12)

The development of park spaces for older children should allow for a variety of experiences and challenges that suit the interests of this group. These needs include the provision of areas for sports related informal leisure activities such as ball games. These types of designs are also often family orientated, and may include sub-activities for adults or younger children.

Considerations for the design of open space for older children could include:

- Provision of linear pathways for riding bikes and skateboards;
- Informal tracks and mounds for BMX riding and active games;
- Adventure opportunities such as climbing structures; and
- Observation places and structures (children like to perch on top of play equipment and mounds).

Design for Teenagers

Design of park spaces for teenagers is generally similar to those for older children, but should include areas for social interactions (hanging out) and to allow for provision of more formal recreation activities such as purpose designed BMX tracks and skateboard parks. Provision of hard-standing areas and structures for games such as tennis rebound walls, basketball/netball half courts or ring areas provide for increased informal active recreational opportunities.

Design for Adults

Parks for adults should provide convenient comfortable spaces and adequate shelter from sun and wind, picnic facilities and comfortable seating. Quality landscape embellishments and use of adjoining natural area and views can contribute to the provision of contemplative public spaces.

Convenient seating and weather protection for parents and carers adjacent to children's play areas will result in increased usage of the park by young children. Options for recreation, such as fitness courses and exercise routes, could be used to provide alternatives to indoor fitness. The provision of larger spaces for the gathering of larger groups for picnics and other social activities will also attract adult users.

Design for Older People

Spaces for older people should provide for convenient and safe access and movement with a high level of safety and security. Historical or traditional design elements such as arbours or rotundas and more formalised gardens should be considered, particularly where such gardens can be associated with groups such as community service clubs and organisations. Spaces suitable for older people should be implemented within and co located with other passive open space areas to ensure sites are suitable for multiple ages, for example, shaded seating areas are provided around playground facilities.

Design issues should generally be similar to those for adults with ease of walking, gentle slopes and the provision of shaded and protected areas for rest, relaxation and contemplation being very important.

Design for People with a Disability

It is desirable that the design of public open space take into account the needs of people with a disability both in regard to access to the park and movement within the space and the use of the equipment and facilities.

Design should address issues such as the adequacy of accessible parking, the provision of even walkway surfaces and gradients, and the detailing of kerbs, ramps, handrails, signage and facilities such as toilets.

Spaces suitable for people with a disability will be considered for implementation within and co-located with other passive open space areas to ensure dignified access to all areas; for example - playground facilities to include equipment and play opportunities for people of all abilities.



4.2.5 Citywide Park General Principles

The Shellharbour Open Space, Recreation, and Community Facilities Needs Study (2010) highlights that citywide parks typically have a number of characteristics that make them significant recreational destinations for the entire local government area and surrounding regional areas. These characteristics include high visitation levels, significance for local and visitor perceptions of Shellharbour, high tourism values, proximity to surrounding tourist attractions and potential for flow on commercial benefits. In Calderwood Valley these areas also have high environmental values.

The Needs Study specifies that the objective of a citywide park is to:

- Provide a large strategically located park which due to its unique setting and/or physical attributes provides a unique recreational resource for the entire LGA and potentially the surrounding region. Citywide parks typically have high levels of visitation and offer significant tourism opportunities.

In Calderwood Valley the two (2) citywide parks (refer to Figure 11.0) have been proposed in unique settings:

- a 2Ha lakeside park adjacent to Marshall Mount Creek
- a 3.48Ha park located on the lower slopes of Johnston's Spur at the toe of the Illawarra escarpment.

The needs study identifies the overarching design principles can be applied to citywide parks in Table 3.

Table 3: Citywide Park Design Principles

Principle	Application to Citywide Parks
Safety	<p>Ensure high level of visibility with frontages and access from main roads and located in locations where high visibility is maintained.</p> <p>Buildings with active frontages to be orientated for passive surveillance of active park areas.</p> <p>Avoid rear fences backing onto parks or provide for a consistent fencing type that is appropriate for the location and environmental conditions.</p> <p>Internal fencing should only be introduced where necessary to protect the safety of children's play areas. In all instances such fencing should be see-through style fencing of 1.0m in height.</p> <p>Lighting of key public walkway areas (where designed be used at night).</p> <p>Landscaping should be provided for weather protection and scenic amenity. Species selection and maintenance should ensure clear vision through landscaping between 0.6m and 1.8m in height above ground level.</p>

Principle	Application to Citywide Parks
Access	<p>Access to the park would be via private vehicle as well as pedestrian access by nearby local residents-car parking should therefore be provided.</p> <p>Access roads and parking areas should be provided from higher level roads, avoiding suburban streets and access through residential suburbs.</p> <p>Wherever possible, access by public transport should be encouraged, through appropriately located bus stops or other infrastructure.</p>
Spatial Distribution	<p>90% of all residential lots should be within 400m safe walking distance to any open space area. Reference should be made to Council to ensure this accessibility standard is achieved whilst ensuring a mix of park types is provided.</p> <p>The breakdown of the 2.83 ha standard can be applied to assist with determining an appropriate hierarchy.</p> <p>Citywide parks are spatially distributed according to need and setting requirements, and no standard can be applied to their distribution.</p>
Sustainability	<p>Environmental attributes, such as drainage lines, stands of significant vegetation, foreshore dunes and the like should be integrated into the park design.</p> <p>Environmental education and cultural interpretive opportunities should be developed with an appropriate signage strategy.</p>

Principle	Application to Citywide Parks
Place Making	<p>A citywide park is typically located in a prominent area with the park capitalising on site attributes to maximise future recreation, environmental and tourism values.</p> <p>Areas should be well defined to develop character and sense of place for the space.</p> <p>Public art could be utilised to reinforce the unique character and attributes of the park.</p> <p>These attributes could include cultural, indigenous, historical and physical characteristics.</p>
Physical Attributes	<p>The shape of a citywide park is typically a consequence of its location or physical attributes. Where linkages or narrow areas are proposed, these should not be less than 50m wide.</p>
Clustering	<p>Integration of local or district style parks adjacent to the citywide park is desirable, particularly where such areas can provide increased use and safety around the greater park area.</p> <p>Other regional sporting, public and retail type facilities may also be located with the citywide park to capitalise on shared facilities such as parking.</p>
Integration	<p>Citywide parks are typically the centrepieces of the integrated park system, with linear parks, footpaths and cycleways leading to these areas.</p>
Variety	<p>A range of infrastructure should be included in citywide parks to suit the environmental attributes recreational uses and expected.</p>



4.2.6 City Park - (CW2)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:
2.55ha

Total APZ affected Land:
13205 m²

Approximate Gradient / Slope of Park:
0-5% slope

Site Characteristics

CW2 - The "Lakeside" Urban City Park lies to the north of the development in the Marshall Mount Creek corridor. The park will focus on natural waterfront experiences and will be developed on low lying lands with minimal falls.

Opportunities and Constraints

- Promote views and links with water
- Develop space to transition between urban edge to Marshall Mount Creek corridor
- Design should optimise any natural drainage line as a site feature
- Links and relationships to retail precinct

Provision

- Parking for approximately 20 cars
- Public amenities
- All Abilities playground
- Performance space for music and outdoor cinema
- Board-walks and decking to provide view to waters edge (adjacent basin)
- Retention of existing vegetation. New tree planting that respects the natural place but reflects the new community - marker trees, deciduous and flowering trees.
- Shared pedestrian / cycleway (2.5m wide)
- Interpretive and way-finding signage
- Open grassed area suitable for informal games and recreation
- Integration of a fitness trail along Marshall Mount Creek
- Structured and natural playgrounds that provide a range of experiences for all ages
- Picnic shelters with barbecues, picnic tables and seats
- Soft landscaping works including broad-scale low maintenance plantings
- WiFi
- Fencing as required
- Drinking Fountains where appropriate

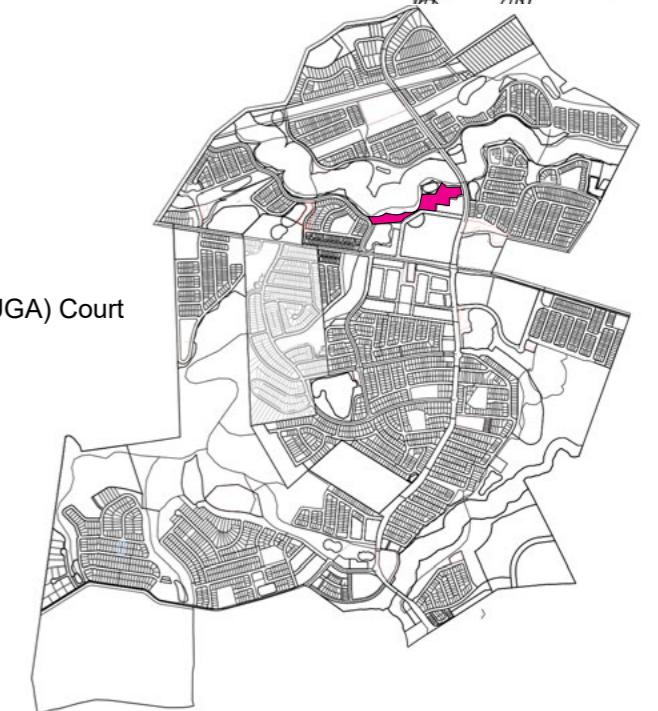


LEGEND

--- Park boundary

--- Asset protection Zone(APZ)

- | | |
|----------------------|--------------------------------------|
| 1 Performance Lawn | 9 Turf Kickabout |
| 2 Performance | 10 Forecourt |
| 3 Basin | 11 Paved Threshold to Road |
| 4 Boardwalk to Basin | 12 Multi Use Games Area (MUGA) Court |
| 5 Playground | 13 Terrace Stairs |
| 6 Exercise | 14 Picnic Lawn |
| 7 Picnic Shelter | |
| 8 Amenities Facility | |



KEY PLAN

SCALE 1:2000 @ A3
0 20 40 80 120m

4.2.7 City Park - (CW3)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:

3.48ha

Total APZ affected Land:

16731.2 m²

Approximate Gradient / Slope of Park:

>20% slope

Site Characteristics

CW3 - The Bushland City Park is proposed on the lower slopes of Johnston's Spur adjacent to the residential development in areas that are already partially cleared. The park will take advantage of the existing setting of trees and backdrop of ridgeline, and will focus on promoting education, interpretation of the natural environment and incorporation of indigenous plantings throughout.

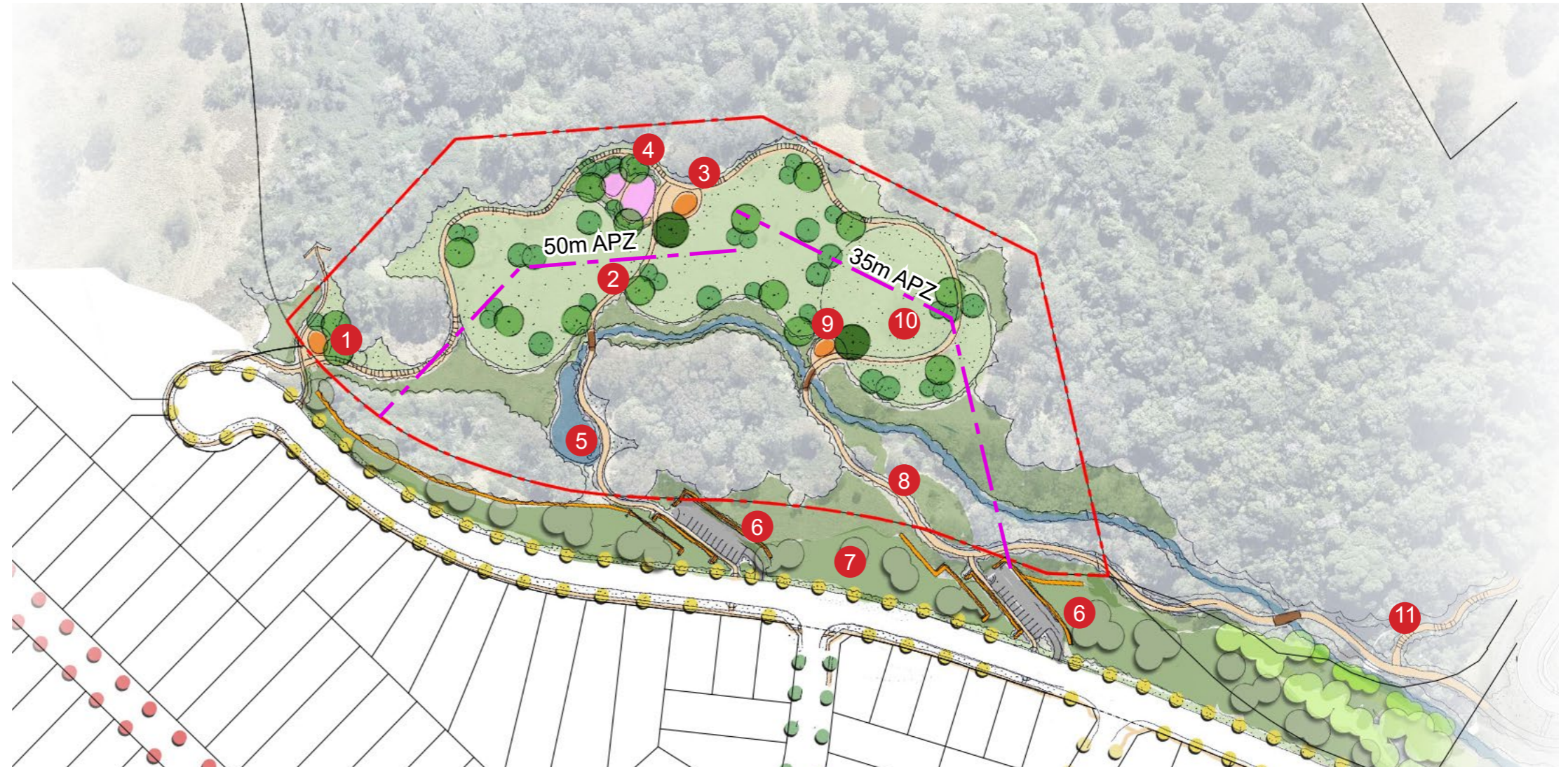
Funding from CW3 has been transferred to District Park (D4) for an Amenities Building and Lighting. Funds have also been transferred to City Wide Park 2 (CW2) for an All Abilities Playground and Public Amenities.

Opportunities and Constraints

- Take advantage of the existing cleared land and existing tree canopy to create a natural park area
- Promote views to the hill and ridge areas the escarpment and Johnston's Spur
- Locate seating to take advantage of any tree canopy for shelter and views
- Provide natural access links and bushwalk trails
- Provide interpretation of the natural environment

Provision

- Informal parking for approximately 20 cars with groups of vehicles spaced amongst existing trees
- Links to district park and informal pathways across to stage 3B residential area
- All Abilities playground
- Interpretive signage and map of bike/walking track
- Bicycle racks and start of track to the top of Johnston's Spur
- Open grassed area suitable for informal games and recreation
- Natural playground with provision for shade
- Outdoor classrooms
- Adventure bushwalks
- Picnic shelters, seating associated with education opportunities
- Fencing as required
- Soft Landscape works to include native grass establishment and native tree planting
- All plantings to be of a local provenance

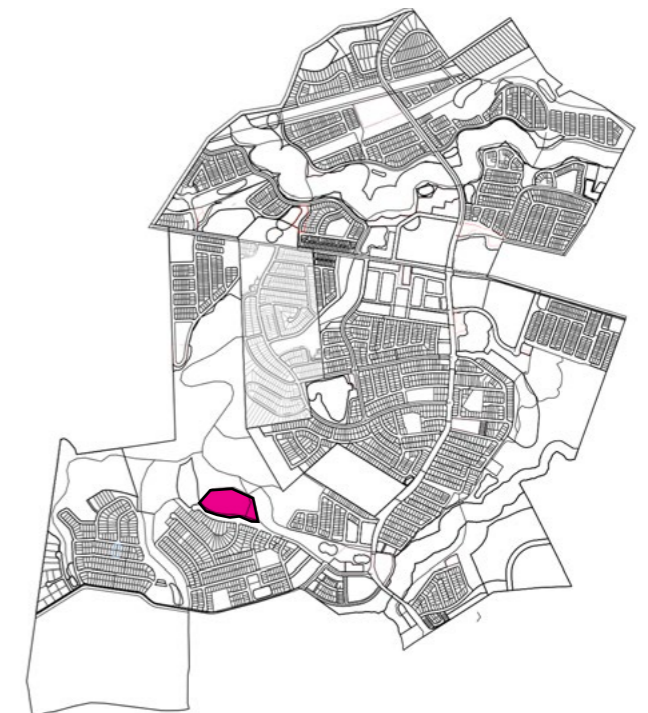


LEGEND

--- Park boundary

--- Asset protection Zone(APZ)

- | | |
|-------------------------|--|
| 1 Pedestrian connection | 7 Planted edge |
| 2 Staired walkway | 8 Shared walkway |
| 3 Picnic Shelter | 9 Meeting area |
| 4 Playground | 10 Open grass kickabout |
| 5 Existing pond | 11 Pedestrian connection to open space of 3B south |
| 6 Carpark | |



KEY PLAN

SCALE 1:2000 @ A3
0 20 40 80 120m

4.2.8 District Park General Principles

The Shellharbour Open Space, Recreation, and Community Facilities Needs Study (2010) that district parks are generally parks of substantial size which are well developed to cater for a broad range of recreational opportunities and have a district rather than a local user catchment. Embellishments are provided to cater for the more complex and varied recreational activities and for multiple user groups.

The objective of a district park is to:

- Provide a larger public open space with more advanced embellishments to provide for wide range of recreational activities on a district user catchment basis.

In Calderwood valley four district parks will be provided in the Shellharbour LGA and the designs of these guided by the principles outlined in the Needs Study. Refer to Figure 11.0

Design Principles

The overarching design principles for the development of district parks outlined in the Needs study as described in Table 4:

Table 4: District Park Design Principles

Principle	Application to District Parks
Safety	<p>Ensure that at least two of the park boundaries have public street frontages or back onto other public open space.</p> <p>Buildings with active frontages to be orientated for passive surveillance of active park areas.</p> <p>Avoid rear fences backing onto parks. Where avoidance is not possible, open form fencing is preferred.</p> <p>Ensure all park areas can be readily viewed from public streets and active building frontages</p> <p>Fencing should only be introduced where necessary to protect the safety of children's play areas. In all instances such fencing should be see-through style fencing of no more than 1.2m in height</p> <p>Lighting of essential public circulation paths that are designed to be used at night.</p> <p>Landscaping should be provided for weather protection and scenic amenity. Species selection and maintenance should ensure clear vision through landscaping between 0.6m and 1.8m in height above ground level.</p>

Principle	Application to District Parks
Access	<p>Access to the park would be via pedestrian access and private vehicle. Car parking space should therefore be available. Kerb-side parking will be considered, although performance criteria should be applied to determine the need for designated car parking space.</p> <p>District parks are to have convenient vehicular and pedestrian access from the surrounding residential areas-access points should reflect such desired movement patterns.</p>
Spatial Distribution	<p>90% of all residential lots should be within 400m safe walking distance to any open space area. Reference should be made to Council to ensure this accessibility standard is achieved whilst ensuring a mix of park types is provided. The breakdown of the 2.83 ha standard can be applied to assist with determining an appropriate hierarchy (see 6. Provision Standards).</p> <p>District parks should be located to cover the whole local government area with reasonable access to surrounding groupings of residential areas.</p> <p>Distribution of district parks should generally be around 800m from other similar parks to create an even distribution.</p>
Sustainability	<p>Sustainability Environmental attributes, such as landscape features, drainage lines or significant trees, should be integrated into the park design.</p> <p>Environmental education and interpretive opportunities should be developed with an appropriate signage strategy.</p>
Place Making	<p>A district park should be located where possible in a physically prominent space or local landmark area in order to capitalise on special site attributes to maximise recreation opportunities and environmental values.</p> <p>District park sites should be physically well defined to develop special character and sense of place for the space.</p>

Principle	Application to District Parks
Physical Attributes	<p>The park area should be a minimum area of 1.0 ha of usable space, free from environmental reserves.</p> <p>District parks should generally be regular in shape and not less than 50m wide.</p> <p>Linear parks such as foreshore reserves may be elongated subject to the minimum width indicated above.</p> <p>Some variation in landform and landscape setting is desirable, however sufficient level land must be provided for informal recreation activities.</p>
Clustering	<p>Integration with other district or higher level facilities should be incorporated where possible, for example community centres, district retail shops or sports grounds.</p>
Integration	<p>District parks should form part of a linear series of parks or recreation corridor, enabling a start/end point for walking and cycling pathways.</p>
Variety	<p>A range of infrastructure should be included in district parks to cater for a variety of use and recreational activities.</p> <p>In certain instances district parks may provide specialised recreational opportunities to suit their natural attributes and setting</p>



4.2.9 District Park (D3)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Size: 1 Ha

Site Characteristics

Park D3 is a 'residential' District Park located to the east of the Calderwood Valley and is bounded by the main Arterial Road to the west with the site falling at a 5% gradient to the east. Residential housing faces the park to the north, south and east. The site has no existing vegetation.

Opportunities and Constraints

- Potential pedestrian landscape to the nearby Riparian zone
- Relationship to the houses bordering the space on the eastern edge
- Constant fall of 5% enables space creation and accessibility
- Primary trail requirement

Provision

- Parking for approximately 10 cars
- Multi use games court
- Open grassed area suitable for informal games and recreation.
- Structured playgrounds that provide a range of experiences for all ages with provision for shade
- All Abilities playground
- Spaces separated by grassed and planted embankments
- Picnic shelters and table/seats
- Fitness nodes
- Fencing as required
- Barbecues where appropriate

Drinking Fountains where appropriate

Presentation Standard

- Residential / Parkland (High)

Public Art

- Public artwork in accordance with the Public Art Strategy

Status

- Constructed and under maintenance until 15 November 2024
- Practical Completion achieved 19 November 2021 (OC)
- Maintenance has been handed over to Council however the formal letter is yet to be issued.



4.2.10 District Park (D4)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Size: 3.14 ha

Site Characteristics

Park D4 is a 'Village Centre' District Park situated in close proximity to the Village Centre at the southern end of Calderwood Valley. The park will combine both a formal urban water edge and natural experience of Macquarie Rivulet. The topography of the park falls from west to east with the Sub Arterial Road dividing the space into an upper and lower park. There is no existing vegetation on the site but the topography serves as a slight drainage depression. Views up to Johnston's Spur to the west dominate the space visually. The densely vegetated Macquarie Rivulet forms the eastern edge of the space.

Opportunities and Constraints

- Park design should optimise the change in levels and natural drainage as site landscape features
- Design should link the northern and southern portions of the park which are dissected by the north-south sub arterial road - consider pedestrian safety
- Promote visual access to the village entry and maintain visual links to the escarpment from throughout the park
- Promote links to the adjoining Macquarie Rivulet and retain and strengthen existing riparian vegetation
- Promote the vegetation communities from riparian to escarpment - horticulture interpretation and education

Provide

- Primary trail provide links to the north and west
- Structured and natural playgrounds that provide a range of experiences for all ages
- Water play
- WiFi
- Picnic shelters
- Performance space with opportunities for music, theatre and outdoor cinema
- All Abilities playground
- Open grassed area suitable for informal games and recreation
- Vegetation that is influenced by the Riparian vegetation in lower parts to the Johnston's Spur woodlands in the higher areas.
- Interpretive signage of vegetation communities
- Multi use games area for informal court games
- Parking for approximately 20 cars
- Permanent water body to act as a visual focus with water quality function
- Boardwalks and pedestrian bridges to pond edges
- Shared pedestrian / cycleway (2.5m wide)
- Fencing as required
- Barbecues where appropriate
- Drinking Fountains where appropriate
- Public Amenities Building and Lighting using Better Outcomes and funding transferred from CW3

Presentation Standard

Combination of:

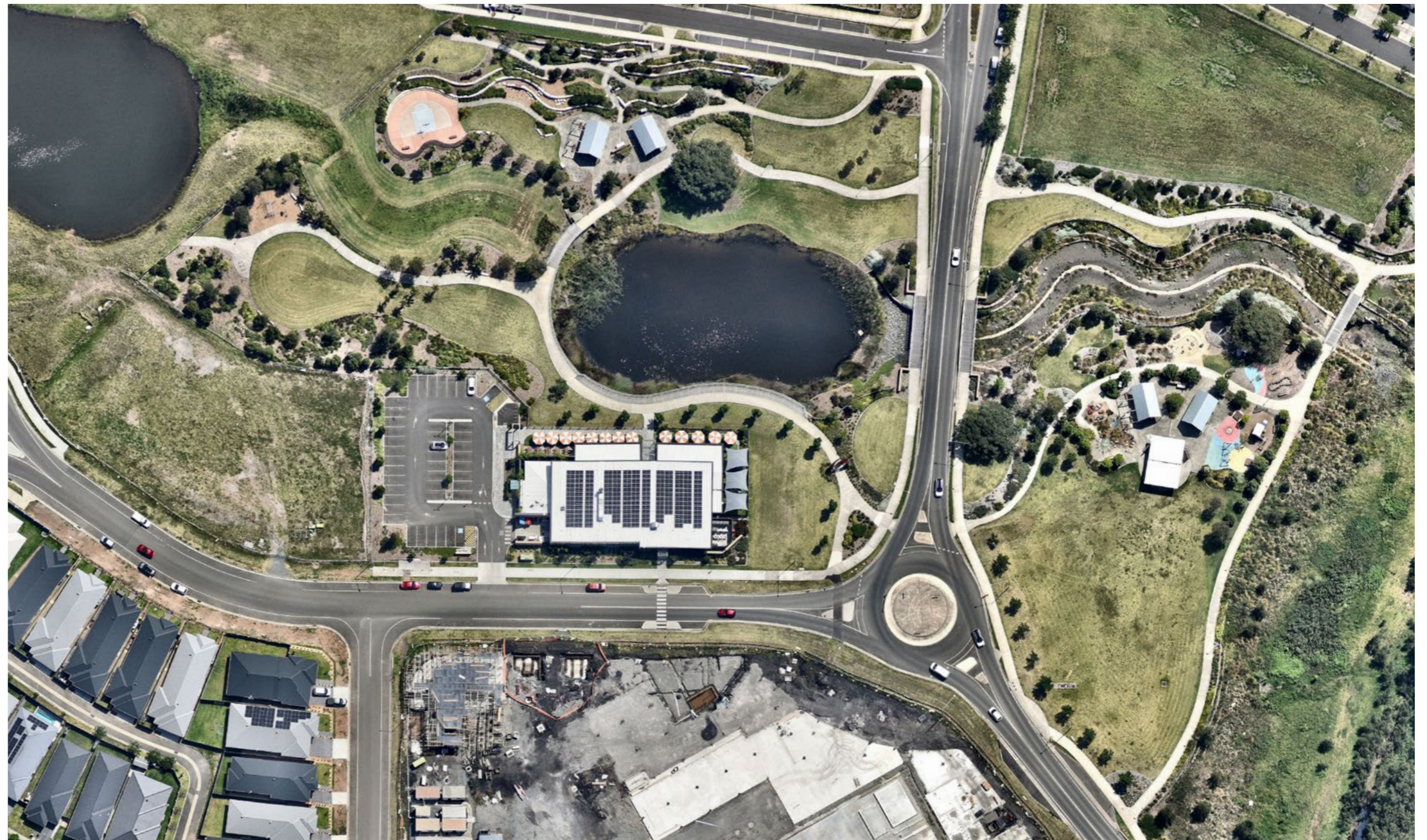
- Residential parkland (High)
- Urban / commercial (High)

Public Art

- Public artwork in accordance with the Public Art Strategy

Status

- Constructed and under maintenance until 16 December 2021
- Practical Completion achieved :20 December 2018
- Western side handed over to Council 02/10/24. Eastern side anticipated handed over to Council end of 2025.



4.2.11 Sporting Ground General Principles

The Shellharbour Open Space, Recreation, and Community Facilities Needs Study (2010) outlines the objectives and principles for the sporting Grounds. These will be considered together with the result development of community consultation to develop the final design of the sports ground at Calderwood Valley.

The Needs Study highlights that the objective of district level sporting grounds is to:

Provide sporting grounds that primarily serve a district catchment (group of suburbs) with an appropriate level of embellishment suited to regular use by a number of sporting groups. District sporting grounds are predominantly used for local level competitions defined by local sport associations and for visiting organisations for competition. They also provide local use benefits as well as venues for multiple-club training.

As the overarching design principles outlined in the Needs study that applied to the Calderwood Valley sporting ground is described in Table 5:

Table 5: District Sporting Ground Design Principles

Principle	Application to District Parks
Safety	<p>Ensure that the sporting ground has a complete frontage to a public road to facilitate passive surveillance.</p> <p>Sporting fields and ancillary buildings are to be orientated for passive surveillance from surrounding streets, but being cognisant of sport requirements outside of fields (for example space behind goals for ball over-run and light spill).</p> <p>Fencing should also be introduced where necessary to protect fields and grounds from illegitimate access (eg. vehicle barriers) or to protect users or spectators from balls leaving the grounds into other areas.</p> <p>Ensure the provision of lighting of playing areas and facilities, as well as circulation paths to provide for safe usage if proposed to be used at night.</p>
Access	<p>Access to sporting grounds would typically be via private vehicle - car parking should therefore be provided.</p> <p>Wherever possible, access by public transport should be encouraged, through appropriately located bus stops or other infrastructure.</p> <p>Access should be from non-residential roads where possible to avoid traffic impacts on residential areas.</p>

Principle	Application to District Parks
Spatial Distribution	Distribution of district sporting grounds will be subject to sporting and community requirements of the LGA, but in new development areas should be conveniently accessible for residential areas while providing physical separation from dwellings.
Sustainability	<p>Design, development and management of sporting grounds should respond to environmental values and conditions, community needs and economic considerations and must remain viable in the long term.</p> <p>In certain locations and as part of an integrated design, sporting grounds should provide for and assist in the detaining and cleansing of stormwater runoff.</p> <p>Turf and landscape planting species should be of low maintenance and have low water requirements.</p>
Place Making	Locate sporting grounds to ensure that special attributes of an area are protected and enhanced. Due to the extensive flat area often required for sporting grounds, initial site planning should avoid sensitive areas.
Physical Attributes	<p>Land for district sportsgrounds should have the following attributes:</p> <ul style="list-style-type: none"> Land should be regular in shape to maximise the number and layout of the playing fields. Land should be relatively level, with individual fields having a slope no greater than 1V:66H, with Council preferring 1V:100H. The slope required will be determined by Council and will be based on the existing contours of the land and the proposed sport. Playing fields should have a north-south orientation of the long axis. Land should be fully serviced, with adequate drainage systems to ensure player safety and appropriate field conditions during rain events. Adequate space should be made available for the provision of ancillary facilities and landscape buffers to minimise impacts of noise, floodlighting and traffic impacts on neighbouring properties.

Principle	Application to District Parks
Clustering	<p>Cluster/group sports fields and facilities in order to maximise flexibility of use and to minimise disruption to residential areas (noise, light spill and parking/ traffic issues and impacts).</p> <p>While aimed at a target audience based on LGA and regional demographics, use of additional embellishments (for example pathways and seating) to facilitate broad use should be considered.</p>
Integration	Where possible, make connections between open space areas and sporting grounds within the local open space network.
Variety	<p>Designs should provide for a variety of seasonal sports uses, which will assist in providing year round use and allow flexibility as trends change.</p> <p>Use of clubhouses and ancillary facilities for other community uses should also be considered where these can be used around sporting use times.</p>

4.2.12 Sportsground (S1)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Size: 24.18ha

Site Characteristics

Former cleared agricultural land lying within the Macquarie Rivulet floodplain. Slopes are gently undulating with minimal existing tree canopy.

Remnant protected woodland provides a natural feature at the parks north western end.

A major sports facility will be located on the eastern edge within the Calderwood Valley development

It will be the focal recreational space of the Calderwood Valley for organised sports and for larger scale community gatherings and activities.

The development of the final design for the Sportsground provides opportunities to work closely with Shellharbour City Council, local schools and the community to define the final recreational use and sporting / community groups for the facility. This will enable a stronger sense of ownership and accurate and appropriate design briefing, Preliminary works will involve the initial earthworks coordinated with residential stages and stormwater works. These preliminary works will not be considered as a Stage for the purposes of satisfying the timing requirements of the VPA. Following that the remainder of works (such as sports fields, amenities, DOLA, play, picnic areas and the like) will be constructed consecutively. All works will be constructed in total and may be considered as being "Stage 1 Works" in accordance with the VPA.

Preliminary works will involve the initial earthworks coordinated with residential stages and stormwater works. These preliminary works will not be considered as a Stage for the purposes of satisfying the timing requirements of the VPA. Following that the remainder of works (such as sports fields, amenities, DOLA, play, picnic areas and the like) will be constructed consecutively. All works will be constructed in total and may be considered as being "Stage 1 Works" in accordance with the VPA.

Opportunities and Constraints

- Integration of the E3 woodland at the western end
- Interface with the Riparian zone at eastern edge
- Consideration of residential development to the north and west
- Sewer pumping station forms a southern edge to the Sports field with embankment
- Electricity easement consideration along eastern boundary
- Stormwater/water quality pond integration
- Linkage to D3, D4, L11 and L15 parks to the immediate surrounds
- Integration of primary and secondary trails

Provision

- Vehicular access and parking for approximately 300 cars
- 3 x sporting ovals/fields and training facilities as agreed
- 1x central amenities building including change rooms, central kiosk facility, communal storage, clubhouse/meeting room, publicly accessible toilets
- Playing field lighting to Australian Standard
- Irrigation system for playing fields
- Fenced dog off leash area
- Hard courts (approximately 3 in number)
- Fitness nodes
- Integration of primary and secondary trails
- Structured and natural playgrounds with provision for shade
- Picnic shelters and table/seats
- Vegetation to pond edges with native tree planting to the remainder of the area
- Informal grassed overflow parking

- Way-finding and interpretive signage to pathways - particular emphasis on Riparian, wetland and woodland plant communities
- Potential BMX bike track
- Barbecues where appropriate
- Drinking fountains where appropriate

Presentation Standard

- Residential parkland (Medium)

Public Art

- Public artwork in accordance with the Public Art Strategy

Dog Off Leash Area

The Calderwood Valley Voluntary Planning Agreement highlights the sportsground precinct as the preferred location of a Dog Off Leash Area (DOLA).

Status

- Bulk earthworks Development Application to be submitted Council.

LEGEND

- Site boundary
- Sporting Fields
- Disc Golf Area
- Open Lawn Areas
- Play Spaces
- Dog Park
- Natural Areas
- Carpark

Open Space

	Measures
Active Open Space	22.20 Ha
Passive Open Space	1.98 Ha
Total	24.18Ha

Refer to Appendix A and Appendix B: Calderwood Sportfield open spaces layout plan (S1) for areas shown as passive and active.

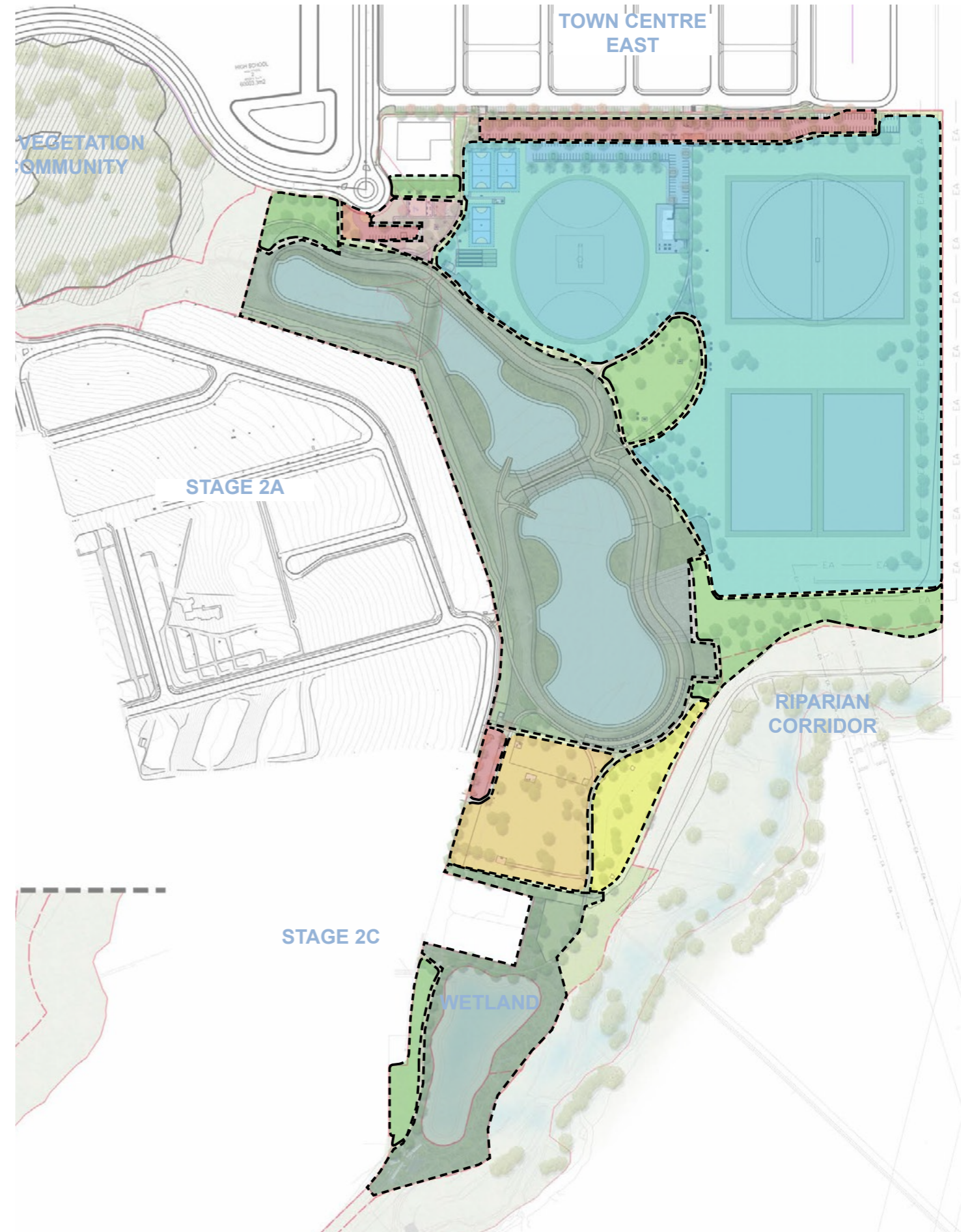


Figure 12.0 Calderwood Valley Sports Fields (S1)

4.2.13 Local Parks General Principles

The Shellharbour Open Space, Recreation, and Community Facilities Needs Study (2010) highlights that local parks are generally located within residential areas and are designed to be easily accessible to local residents and workers by foot.

The objective of a local park is to:

- Provide public open space which primarily serves a local neighbourhood, being highly accessible for pedestrians within a local catchment with an appropriate level of embellishment suited to the local population.

Design Principles

The overarching design principles outlined in the Needs Study that applied to local parks are described in Table 6:

Table 6: District Park Design Principles

Principle	Application to Local Parks
Principle	Application to District Parks
Safety	<p>Ensure a minimum of 50% of the frontage is orientated to a public street.</p> <p>Buildings and structures to be orientated for passive surveillance of active park areas.</p> <p>Avoid rear fences backing onto parks. Where avoidance is not possible, open form fencing is preferred.</p> <p>Ensure all park areas can be readily viewed from public streets and from surrounding active building frontages.</p> <p>Fencing should only be introduced where necessary to protect the safety of children's play areas. In all instances such fencing should be see-through style fencing of no more than 1.2m in height.</p> <p>Landscaping should be provided for weather protection and scenic amenity. Species selection and maintenance should ensure clear vision through landscaping between 0.6m and 1.8m in height above ground level.</p>
Access	<p>Access pathways should follow natural desire lines and provide passive surveillance of active park areas.</p>

Principle	Application to District Parks
Spatial Distribution	<p>90% of all residential lots should be within 400m safe walking distance to any open space area.</p> <p>Reference should be made to Council to ensure this accessibility standard is achieved whilst ensuring a mix of park types is provided. The breakdown of the 2.83 ha standard can be applied to assist with determining an appropriate hierarchy. In areas with significant levels of medium density residential development, additional local parks may be required to cater for increased use.</p>
Sustainability	<p>Environmental attributes, such as drainage lines or significant trees, should be integrated into the park design.</p>
Place Making	<p>Attributes of the site should be highlighted to provide character and place making for the park.</p>
Physical Attributes	<p>The park area should be a minimum of 0.2 ha of usable space, free from environmental reserves.</p> <p>Parks should be regular in shape with a minimum area of 200m² with a minimum width of 25m.</p> <p>Grassed open activity areas with a slope less than 1V:20H and greater than 1V:150H.</p> <p>Maintained parkland with gradients no steeper than 1V:4H if grassed and 1V:3H where planted with vegetation (1V:6H preferred).</p>
Clustering	<p>Cluster local parks with other open space linkages or localised community facilities where possible.</p>
Integration	<p>Local parks should form part of a linear park system or recreation corridor where possible with linked cycle and pedestrian paths.</p>

Principle	Application to District Parks
Variety	<p>Local parks should be designed to target the predicted demographic users for the area.</p> <p>Embellishments should also include consideration of sub-groups who are also likely to use the park-for example seating and shade for elderly people in conjunction with younger children's play areas.</p>
Calderwood Valley will provide 10 local parks (Local Parks L4 - L13) for the development in the locations shown on Figure 12.0 Open Space	<p>The network of Local Parks of minimum 0.2Ha each in size will provide passive recreation for the local community in both bushland and residential settings.</p>



4.2.14 Local Park (L4) - Riparian Park

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:
0.82ha

Total APZ affected Land:
1515.7 m²

Approximate Gradient / Slope of Park:
0-5% Slope

Site Characteristics

Local Park L4 is the northern most park in the SCC Calderwood Valley development and is located within the Marshall Mount Creek corridor. The area has formerly been cleared for grazing and the site for the park has been denuded of vegetation and is highly disturbed. The area is relatively flat with only slight falls from south to north. The park is bounded by residential development on 3 sides and is open to the north and creek area.

Opportunities and Constraints

- The site is characterised by gentle slopes and represents a good opportunity to restore indigenous riparian vegetation to an area largely grazed to bare earth
- Link park to primary trail access along east west Marshall Mount Creek corridor
- Reinforce linkages and provide views through the Marshall Mount Creek Corridor to parklands proposed in the north
- Integrate park with surrounding residential areas. The park presents an opportunity to transition between these and the creek corridor
- Promote additional Dog Park area to service the residents of Stage 4,9 and Town Centre North

Provision

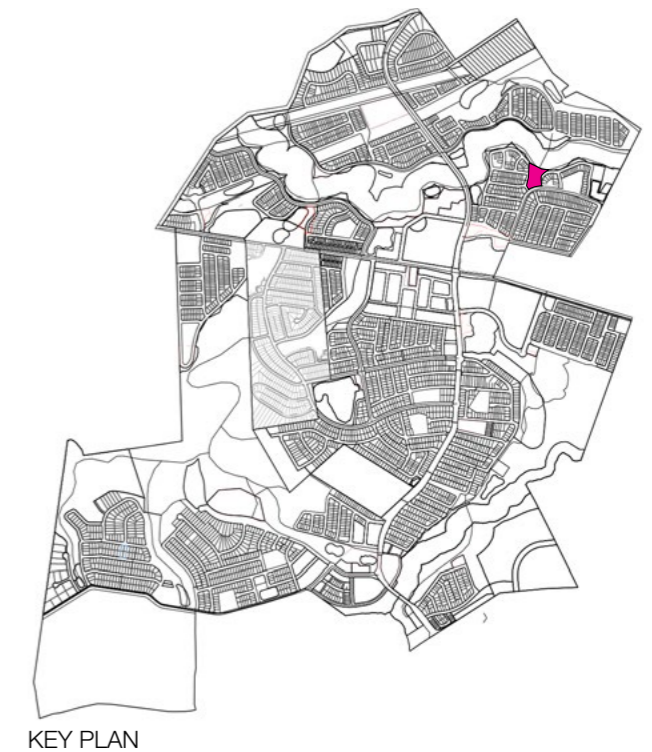
- Combination of structural and natural playground relating to the creekline
- Picnic shelters and table/seats
- Rubbish bin enclosure
- Drinking fountains with dog bowl
- Native planting
- Pedestrian path that connect to the street path network
- Fitness Station with a range of fitness opportunities
- Open grassed area suitable for informal games and recreation
- Dog Park with Fencing
- Interpretive and wayfinding signage



LEGEND

- - - Park boundary
- - - Asset protection Zone (APZ)

- 1 Open grass kickabout
- 2 Picnic Shelter
- 3 Planted edge
- 4 Fitness station
- 5 Playground
- 6 Picnic shelter
- 7 Dog park
- 8 Interface planting
- 9 Pedestrian connection



4.2.15 Local Parks (L5) - Community Park Plan

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:

1.17ha

Total APZ affected Land:

3587.69 m²

Approximate Gradient / Slope of Park:

0-5% slope

Site Characteristics

The park is located to the east of the town centre and is dominated by the remnant conservation bushland area that is to be retained to the south

Opportunities and Constraints

- Recognise the relationship with the adjoining environmental reserve
- Reinforce access linkages to the town centre along northern edge and school to the east
- Integrate additional play opportunities that provide an extension to the CW2 Park and adjacent School

Provision

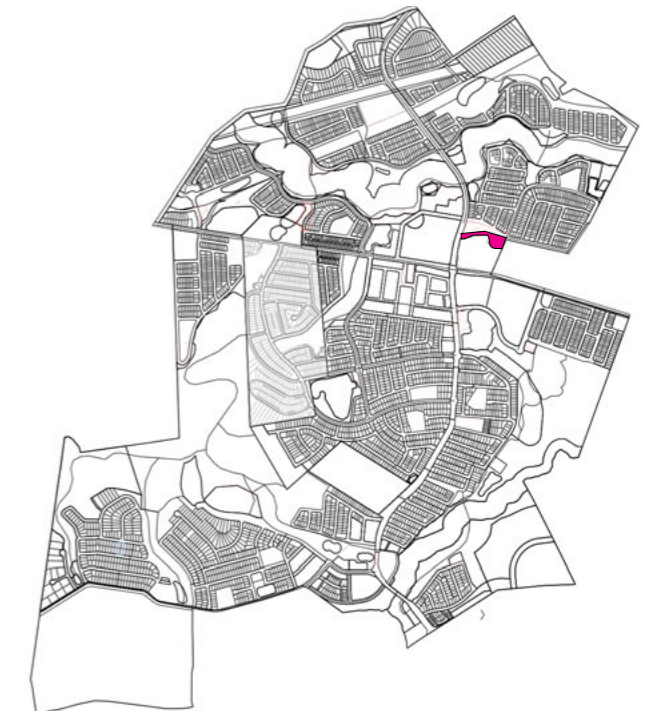
- Structured and natural playgrounds with provision for shade
- Picnic shelters with table/seating
- Learn to ride bike track
- Multi Use Games Area (MUGA) Court
- Retain open character with limited planting
- Native grassland buffer to the first 15m offset within the Ecological buffer
- Pedestrian path that connects to the streetscape network
- Open grassed area with feature shade trees
- Fencing as required
- Interpretive and Wayfinding Signage



LEGEND

- Park boundary
- Asset protection Zone(APZ)

- | | |
|------------------------|---------------------------|
| 1 Open grass (passive) | 6 Open grass kickabout |
| 2 Exercise | 7 Picnic shelter |
| 3 Picnic Shelter | 8 MUGA court |
| 4 Playground | 9 Native buffer |
| 5 Learn to ride track | 10 Pedestrian connections |



KEY PLAN

4.2.16 Local Park (L6)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:

0.25ha

Approximate Gradient / Slope of Park:

0-2.7% slope

Site Characteristics

The Calderwood area is rich in Aboriginal history, with significant artefacts discovered that are culturally important to the Wodi Wodi people of the Dharawal nation, the traditional custodians of the land. The site holds deep cultural and historical value as it served as a critical intersection of travel paths between the escarpment, Johnston's Spur, and the coast. The discovery of these artefacts enhances the narrative of the site as a place of connection, not only for its historical role in the community but also for its ongoing relationship with Country. This local park presents an opportunity to honor and integrate this heritage through sensitive landscape design that acknowledges the deep cultural roots of the Wodi Wodi people.

Connect with Country

Important Aboriginal artefacts were found near this site that hold an important cultural significance to the Wodi Wodi people of the Dharawal nation that occupied the area. The site represents a significant archaeological find in the area.

The artefacts include:

- Arrow heads and knapping stones for carving
- Earth ovens
- Ochre balls,
- Precious stones
- A burnt tree that was used as a focal point for stories, gathering around and cooking

Opportunities and Constraints

- The design of the park should respect the importance of the past of the site
- To incorporate storytelling and knowledge of the past so it can enrich the design of places.
- Retain visual connectivity to the country
- Reinforce access linkages to the town centre

Provision

- Hedge planting to park perimeter to define edge
- Pedestrian pathways to perimeter
- Interpretive signage regarding the history of the place
- Quiet reflective spaces for residents to sit and enjoy the place
- Shade provision that provide a quiet space for informal gatherings
- Open lawn areas with formal structure planting of exotic tree types to reinforce the space and its relevance
- Reinforce view corridors to the Johnston's spur



LEGEND

--- Park boundary

DIALOGUE

- 1 Shared path to calderwood road. No street trees are nominated to the north of the cemetery and existing lawn areas, which retains the existing curtilage to the cemetery
- 2 Existing cemetery entrance is retained with potential for interpretive signage
- 3 Retain existing trees with additional hedge planting to reinforce the cemetery boundary
- 4 Post and rail fence replaces the existing chain mesh fence to help define the boundary of the cemetery, whilst still allowing views within
- 5 Strong views maintained from within the cemetery towards Johnston's spur
- 7 Shaded tree planting to provide a softened edge to the perimeter of the local park
- 8 Picnic lawn with deciduous tree planting to provide a quiet space for informal gatherings
- 9 Concrete path to edge of lawn area provides a circuitous connection with seating opportunities set to the edge of the garden beds. A row of evergreen trees set amongst the post and rail fencing provide shade
- 10 Open lawn area to the centre of the park encourages informal activities for user groups
- 11 Hedge planting with low groundcovers will soften the visual impact from the adjacent residential lot
- 12 Pedestrian link provides connection from the park to riparian corridor in the west



KEY PLAN

4.2.17 Local Park (L8)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Size: Minimum 0.2 ha

Site Characteristics

Located within Stage 1 of the Calderwood Valley development the site is located on the south side of the Macquarie Rivulet corridor. The area has been cleared and forms part of a parcel of land formerly used for grazing and dairy cattle. Topography is flat with a 1m fall across the site. It is located on the northern edge of the stage 1A residential community. The north side at the park bounds the Macquarie Rivulet riparian areas providing planting influences.

Opportunities and Constraints

- Proximity to creek area and potential safety issues
- Access for maintenance to creek
- Backdrop of creek vegetation
- Views to escarpment
- Connection to main pedestrian/cycleway into Calderwood

Provided

- Open grassed area suitable for informal games and recreation
- Picnic shelters with table/seating
- Natural play utilising sandstone and ground modelling - Escarpment influence with provision for shade
- Shade tree planting to establish Calderwood character
- Fencing as required

Presentation Standard

- Residential / parkland (Medium)

Public Art

- Public artwork in accordance with the Public Art Strategy

Status

- Constructed and currently under maintenance until 6 March 2019.
- Practical completion achieved 6th December 2016.
- Handed over to Council 27 March 2024



4.2.18 Local Park (L9) - Agricultural Park

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:

0.2ha

Total APZ affected Land:

1279.4 m²

Approximate Gradient / Slope of Park:

0-5% slope

Site Characteristics

Located to the north west within the Calderwood Valley the park will lie in an area of undulating cleared land that falls south to north. The site is characterised by a large adjacent stand of native tree canopy to the south, with a cleared area to the north that has been cleared for agriculture and has been impacted by grazing. The site provides a strong relationship to the adjoining Electrical Easement that connects to the northern boundary of the park

Opportunities and Constraints

- Recognise the relationship with the adjoining environmental reserve
- Include educational trails and signage adjoining Electrical Easement
- Incorporate Food production gardens within the park that extend into the Electrical Easement "Calderwood Farm"
- Connection to school in the South-West for educational opportunities

Provision

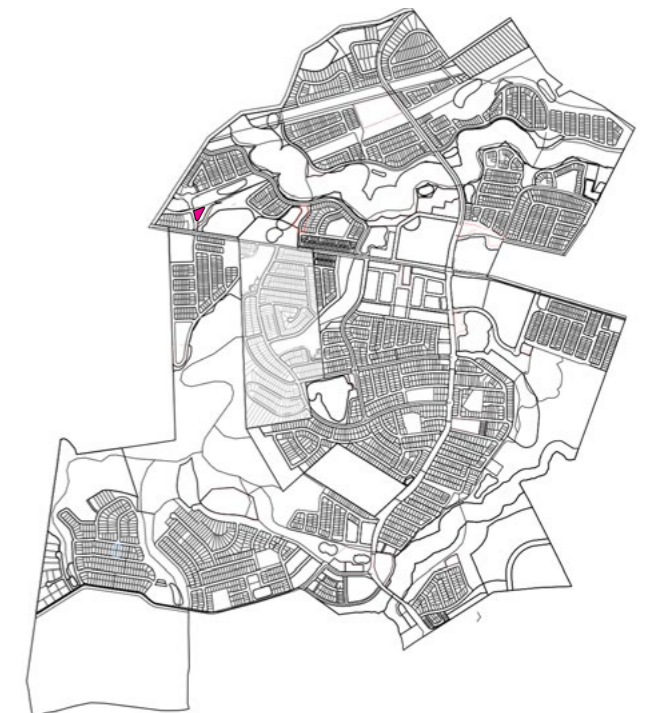
- Structured and natural playgrounds with provisions for shade
- Picnic shelters with table/seating
- Pedestrian path that forms an edge to the environmental reserve
- Fencing as required
- Interpretive and Wayfinding Signage
- Open grassed area suitable for informal games and recreation
- Fitness nodes that connect to the fitness trail along Marshall Mount Creek corridor
- A mixture of open turf and native grass revegetation to the edge of the environmental reserve



LEGEND

- - - Park boundary
- - - Asset protection Zone (APZ)

- 1 Food production
- 2 Open grass kickabout
- 3 Picnic Shelter
- 4 Planted edge
- 5 Fitness station
- 6 Playground
- 7 Interface planting
- 8 Pedestrian connection



KEY PLAN

4.2.19 Local Park (L10)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Size: Minimum 0.2 ha

Site Characteristics

Located centrally within the Calderwood Valley, the park is sited in an area of rising ridgeline up to Johnston's spur. The site is characterised by a large stand of remnant native vegetation adjoining to the south west. Potential visual links to Johnston's spur and north of the escarpment.

The site itself is a corner park with minimal cross fall and no vegetation in the area designated for the park.

Opportunities and Constraints

- Bounded by two roads
- Adjoining native woodland
- Small area relatively isolated
- No direct link to pedestrian network
- Exposed to north, south and east
- Potential views to the north and east
- Existing native woodland

Provided

- Retention of native woodland
- New tree planting to 'extend' the woodland character
- The linear space provides opportunity for smaller space to be developed
- Picnic shelters and table/seats
- Quiet smaller grassed space for informal gatherings
- Native regeneration planting to interface with existing woodland
- Open grassed area suitable for informal games and recreation
- Structured playground with provision for shade
- Drinking Fountain
- Fencing as required

Presentation Standard

- Natural / residential parkland (Medium)

Public Art

- Public artwork in accordance with the Public Art Strategy

Status

- Constructed and under maintenance until 23rd June 2022.
- Practical Completion achieved 27 June 2019.
- Handed over to Council 24 May 2024



4.2.22 Local Park (L11)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Size: Minimum 0.2 ha

Site Characteristics

Located within the Macquarie Rivulet corridor on the western edge, the park has limited existing tree canopy. The area has previously been cleared for grazing. The site has gently to undulating slopes adjacent to the riparian corridor.

Opportunities and Constraints

- Drainage and GPT requirements
- Link to primary trail
- Association with Riparian zone
- Proximity to District park to the south
- Links to Sportsfield precinct to the north
- Small linear space
- Adjoining residential to the park

Provided

- Footpath design to integrate with primary trail and tie in with road footpaths
- Picnic shelters with table/seats
- Potential fitness node to form part of the Macquarie Rivulet fitness trail
- Planting consistent with riparian zone
- Open grassed area suitable for informal games and recreation
- Structured playground with provision for shade
- Fencing as required

Presentation Standard

- Residential / parkland (Medium)

Public Art

- Public artwork in accordance with the Public Art Strategy

Status

- Constructed and under maintenance until 30 January 2019.
- Practical Completion as at 31 January 2018.
- Council Handover Date 15 May 2025



4.2.23 Local Park (L12)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Size: Minimum 0.2 ha

Site Characteristics

Located on the southern edge of the Calderwood Valley the park will lie adjacent to a major east-west collector road and 2.5 metre sealed primary commuter path. The site is gently undulating and has a dam and drainage line running through it and linking into Macquarie Rivulet in the south. Some scattered remnant trees exist. The area has previously been cleared for agriculture and impacted by grazing.

Opportunities and Constraints

- Maximise tree retention to provide shade for the park
- Promote links to the east west primary commuter path
- Promote visual links to the escarpment and relationship to Macquarie Rivulet
- Integrate the existing drainage line into the design for diversity and interest

Provision

- Pedestrian crossing to 'watercourse'
- Potential for small boardwalk/viewing deck to any retained water elements
- Footpath system to link the footpaths into park
- Planting designed to maximise resident overview of park
- Retain existing shade trees and integrate into park
- Open grassed area suitable for informal games and recreation
- Natural playground with small structural play items and provision for shade
- Fencing as required

Presentation Standard

- Residential / parkland (Medium)

Public Art

- Public artwork in accordance with the Public Art Strategy

Status

- Constructed and under maintenance until 16th December 2025
- Practical Completion achieved 11 March 2025 (OC)
- 12-month notification to be issued to council-March 2027
- 3C1 Local Park handed over to council (pending final walkover)- March 2028



4.2.24 Local Park (L15) - Conservation Park

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:

0.33ha

Total APZ affected Land:

2706.6 m²

Approximate Gradient / Slope of Park:

0-5% slope

Site Characteristics

The park is located adjacent to Escarpment Drive to the west and remnant conservation bushland to the east and south.

The park will focus on the conservation that highlights the natural attributes of the adjacent lands, as well as promotes a place for the extension of learning.

Opportunities and Constraints

- Recognise the relationship with the adjoining environmental reserve
- The design of the park should integrate with the remnant nature vegetation to the south west.
- Reinforce access linkages to the adjacent sportfield and schools
- Include educational trails and signage to the environmental reserve

Provision

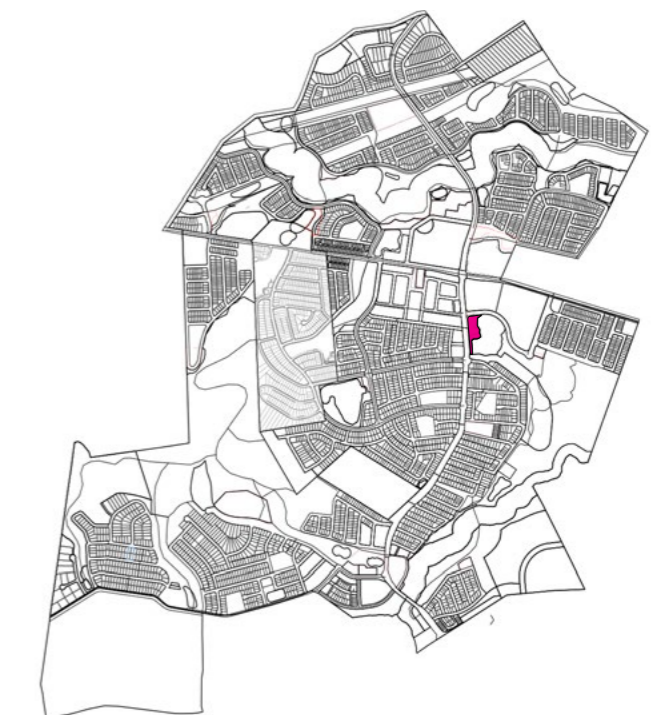
- Entry Shade Structure
- Interpretive signage
- Provision of planting to provide a buffer to the edge of the park that front Escarpment Drive
- Open grassed area suitable for a meeting space or pick up/ drop off
- Fencing as required
- Pump Track



LEGEND

- - - Park boundary
- - - Asset protection Zone (APZ)

- 1 Planted Edge
- 2 Native Buffer
- 3 Pump Track
- 4 Picnic Shelter
- 5 Conservation Area



KEY PLAN

4.2.25 Local Park (L17) - Fitness Park

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:

0.65ha

Total APZ affected Land:

2019m²

Approximate Gradient / Slope of Park:

0-5% slope

Site Characteristics

The park is located adjacent to Marshall Mount Creek to the north and detention basin to the west. The linear form of the park provides an extended frontage to the eastern streetscape whilst taking advantage of the backdrop of revegetation that surrounds the detention basin to the west.

Opportunities and Constraints

- Take advantage of pedestrian connection that fronts Marshall Mount Creek and provide a take-off point to extend to Johnston's Spur in the south
- Promote the open space as a 'fitness Hub' with a wide range of exercise options for all age groups
- Build on the native plant types to attract bird life

Provision

- Natural play relating to the creekline
- Picnic shelter and table/seats
- Wide range of exercise options for all ages and abilities
- Open grassed area suitable for group fitness classes or recreation
- Fencing as required
- Pedestrian pathway connections
- Bird hide

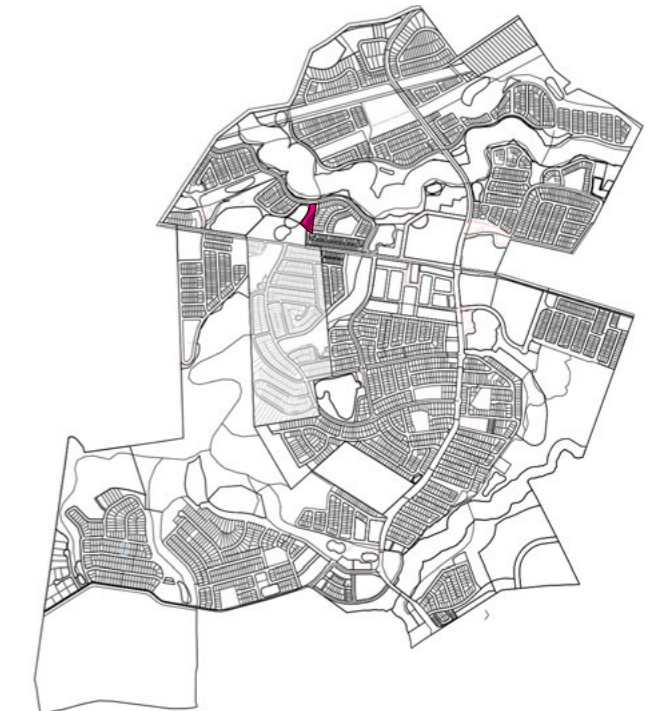


LEGEND

- - - Park boundary
- - - Asset protection Zone (APZ)

DIALOGUE

- 1 Open grassed areas provide space for picnics and informal games, with gentle slopes from the road to the riparian zone, allowing passive surveillance of play areas.
- 2 Play has been designed for junior play with a variety of options that promote movement. Shade trees will provide natural cover for the playground.
- 3 The Calderwood Shelter, used throughout Calderwood Valley, will offer shaded picnic areas. It is located between the fitness node and junior playground.
- 4 The fitness node is equipped with a range of fixed exercise equipment for public use. Central stairs will connect the fitness area to the grassed space for additional informal exercise activities.
- 5 Bird hide is designed to offer elevated views of the native fauna and flora. Interpretive signage will be installed to raise awareness and enhance the experience.
- 6 Senior play area is designed to promote movement through parkour and bouldering activities. It is separated from the junior playground and fitness node by a picnic shelter and seating areas, allowing for interaction and passive surveillance.



KEY PLAN

4.2.27 Local Park (L18)

(Refer Figure 11.0 Open Space Analysis Plan for locations)

Total Park Size:

0.87 ha

Total APZ affected Land:

3789.7m²

Approximate Gradient / Slope of Park:

15-20% slope

Site Characteristics

This Bushland Park is proposed on the northern slopes of Johnston's Spur adjacent to the residential development in areas that are already partially cleared. The park will take advantage of the views to the north and will focus on promoting education, interpretation of the natural environment and incorporation of indigenous plantings throughout.

Opportunities and Constraints

- Take advantage of the existing cleared land and existing tree canopy to create a natural park area
- Promote views to the north and take advantage of the sun
- Locate seating to take advantage of any tree canopy for shelter and views
- Provide natural access links and bushwalk trails
- Provide interpretation of the natural environment

Provision

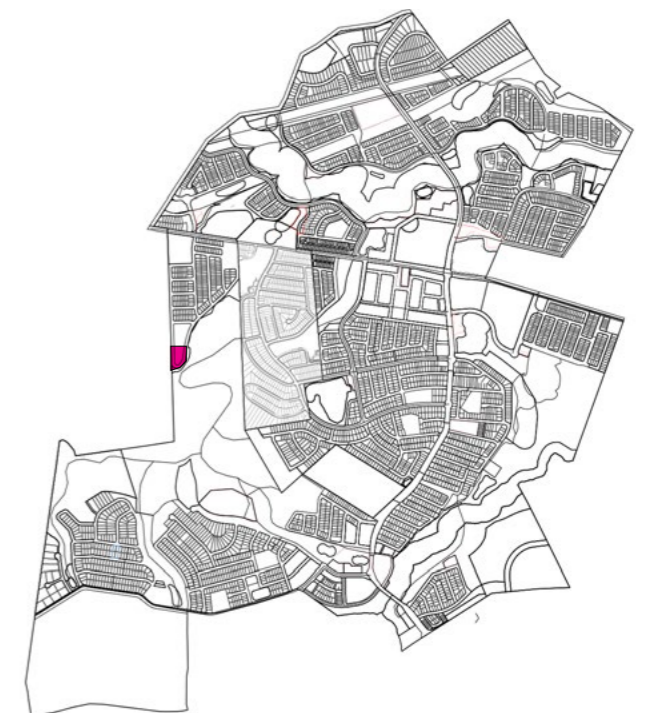
- Informal parking for approximately 15 cars
- Interpretive signage and map of bike/walking track
- Bicycle racks and start of track to the top of Johnston's Spur
- Open grassed area suitable for informal games and recreation
- Natural playground with provision for shade
- Outdoor classrooms (informal)
- Picnic shelters, seating associated with education opportunities
- Fencing as required
- Soft Landscape works to include native grass establishment and native tree planting
- All plantings to be of a local provenance



LEGEND

- - - - - Park boundary
- - - - - Asset protection Zone (APZ)

- 1 Carpark
- 2 Open grass kickabout
- 3 Picnic Shelter
- 4 Open grass kickabout
- 5 Picnic Shelter
- 6 Pedestrian connection
- 7 Interface planting



KEY PLAN

4.3 Access and Circulation

4.3.1 Pedestrian and Cycle Network

A pedestrian and cycling network has been planned in the Calderwood Valley to maximise connectivity and enable easy cycling and walking between residential areas, schools, villages, town centres and open space area.

A network of pedestrian and cycle paths is to be provided within open space / riparian corridors and through bushland as well as along the street network providing a high level of connectivity within and between the future residential neighbourhoods, and linking the Town Centre and Village Centre.

The provision of mostly off road paths creates a safer and more comfortable environment for cyclists and pedestrians while the location of a large proportion of the network through open space provides an attractive environment for users.

The final number and location of pathways and corridor crossings with the Riparian Corridor Network is subject to refinement at the detailed design stages, however is to be generally in accordance with the principles illustrated at Figure 13.0.

Where pedestrian and cycle paths are not provided within the street reservation, the width, finishes and lighting details are to be detailed in the relevant Construction Certificate.

4.3.2 Connectivity

The network of pedestrian and cycle access linkages will enhance the connectivity between built precincts and parkland and open space areas. Access within parks, green corridors and natural bushland areas will vary in the degree of formality and finish in keeping with the character of each space.

The access network is planned and designed to maximise safety and passive surveillance and will meet all requirements for width, signage and sight lines for each particular location.

In addition, design of access paths in all public areas and around community facilities will meet all requirements for width, signage and sight lines for each particular location.

In addition, design of access paths in all public areas and around community facilities will meet the requirements for disabled and equitable access. Tactile indicators, design grades, signage and edge treatments will be employed where appropriate.

The types of access connections to be provided for the various spaces throughout Calderwood Valley may include but are not limited to:

- Off road shared path-2.5m link
- Off road pedestrian path-1.5m link
- Verge shared path - 1.8-3m link in pedestrian/cycle priority locations
- On road route located where corridors or parks connect to roadside links
- Pedestrian path supplementing the road network
- Track/trail within natural areas
- Boardwalks adjacent to water bodies

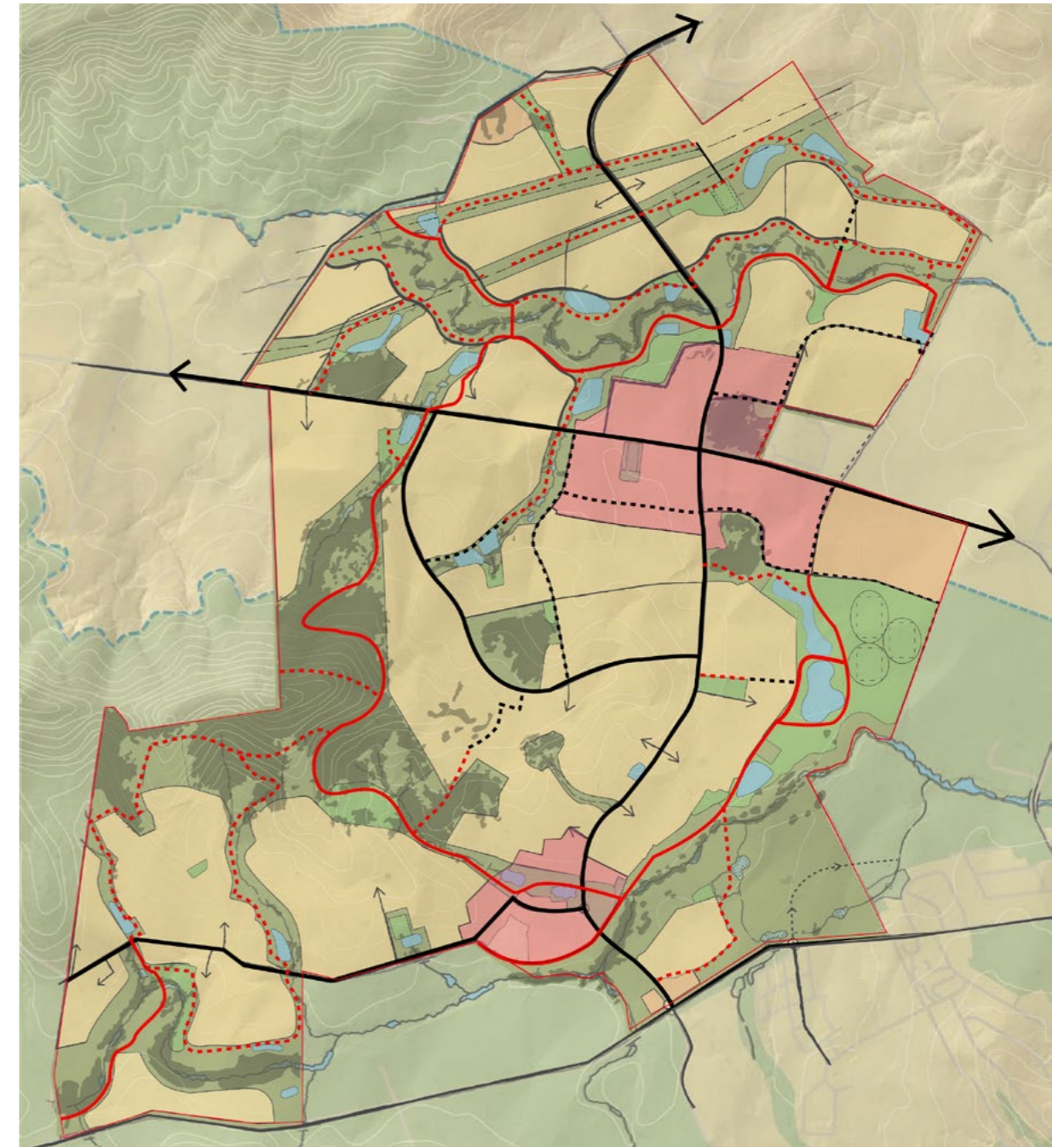


Figure 13.0 Proposed Pedestrian and Cycle Network (MOD4 approved 2021)

Source: Taylor Brammer Landscape Architects

LEGEND

	Pedestrian/Bicycle Friendly Zones 2-4 lanes, Bus Route		Indicative Crossing Points
	Primary/Commuter Path in Road Corridors 2.5m sealed		
	Secondary Path in Road Corridors 1.5m-2.5m sealed		
	Primary Trail in Open Space Corridors 2.5m sealed*		
	Secondary Trail in Open Space Corridors 1.5m gravel		

* Trail through the Johnstons Spur will be 1.5m and of a material sensitive to the environment (eg gravel, decomposed granite, etc)



Street 'island' in road tree planting on stratacells



5.0 DESIGN PRINCIPLES - URBAN SPACE

5.1 Streetscape Hierarchy

Streets provide connectivity, character and environmental values to Calderwood Valley.

Street trees are proposed for each of the street types in the Calderwood Valley. The various street types have different conditions and requirements for tree planting and an overlay of an identifiable theme is proposed to enhance their character.

A number of guiding principles have been identified to guide detailed species selection and tree planting design to individual streets.

5.1.1 Streetscape Planting Principles

- Minimise maintenance issues through careful species selection and provision of required soil volumes as outlined in table 1 for healthy tree growth.
- Provide ecological links to key nodes, corridors and parks.
- Reinforce landscape setting and character of precinct.
- Select species and use formal and informal planting design to reinforce street hierarchy.
- Provide root barrier protection to street trees where required.
- Provide canopy to create shade and amenity.
- Maximise solar access and gain in residential dwellings.
- Reduce urban heat island effect.
- Provide shade and protection from hot westerly sun.
- Minimise impact of driveways and soil volumes by
 - Careful positioning of dwellings
 - Permeable surfaces where possible
 - Planting into 'street islands' where possible.

5.1.2 Key Species Principles

- Strengthen the sites relation to the Illawarra coastal plain through street tree planting focussing on exotic and native plantings where suitable soils volumes are achievable, (signature trees endemic to the site).
- Achieve soil volumes as outlined in Table 1 to maximise tree growing conditions and reduce impacts on surrounding infrastructure.
- Street hierarchy and character themes of larger signature species will be further strengthened through supplementary plantings of medium native evergreen species such as *Tristanopsis laurina*, *Elaeocarpus eumundi* & *Waterhousia floribunda*
- Remnant iconic rural species including Hoop Pine (*Araucaria cunninghamii*), Bunya Pine (*Araucaria bidwillii*) and Moreton Bay Fig (*Ficus macrophylla*) provide an opportunity to visually heighten the precinct's historic context.
- Have regard for site soil characteristics, salinity management, biodiversity value, potential impact on essential services and public safety issues,
- Consider existing trees to be retained in verges and open space.
- Landscape treatments at ground level to be hardy groundcover plantings, turf or paved/ mulch treatments to provide a clear definition of the extended public domain.
- Undertaken pre- construction plant procurement programme to ensure availability of plant material to meet requirements for:
 - local provenance of plant stock in site / locally indigenous species.
 - plant stock to meet NATSPEC (a Guide to Assessment of Tree Quality) Tree Supply requirements.

TREE SIZE	RECOMMENDED SPACING	RECOMMENDED SOIL VOLUME	M ² AREA REQUIRED AT 1M DEEP
6 - 8M HIGH SMALL TREE	5m	5 - 15m ³	2.5 - 7.5m x 2.0m
10 - 12M HIGH MEDIUM TREE	7 - 10m	20 - 40m ³	10 - 20m x 2.0m
16 - 20M HIGH LARGE TREE	10 - 20 m	50 - 80m ³	25 - 40m x 2.0m

Table 1: Recommended Soil Volumes for Street Tree Planting

5.1.3 Street Tree Strategy

GATEWAYS AND ENTRANCES - MAJOR

In response to the Connecting with Country Framework NSW Guidelines, there is an opportunity to celebrate the Indigenous seasonal plantings on Calderwood Road. The tree plantings selected should be derived from the Coastal Valley Grassy Woodlands and the Illawarra Lowland Red Gum Grassy Forest Trees communities that were dominant pre-clearing.

Tree planting locations will be designed to reflect the verge widths, with the inclusion of tree planting bays set amongst car parking bays to the edges of Calderwood Road.

The design intent for this Major Gateway is to :

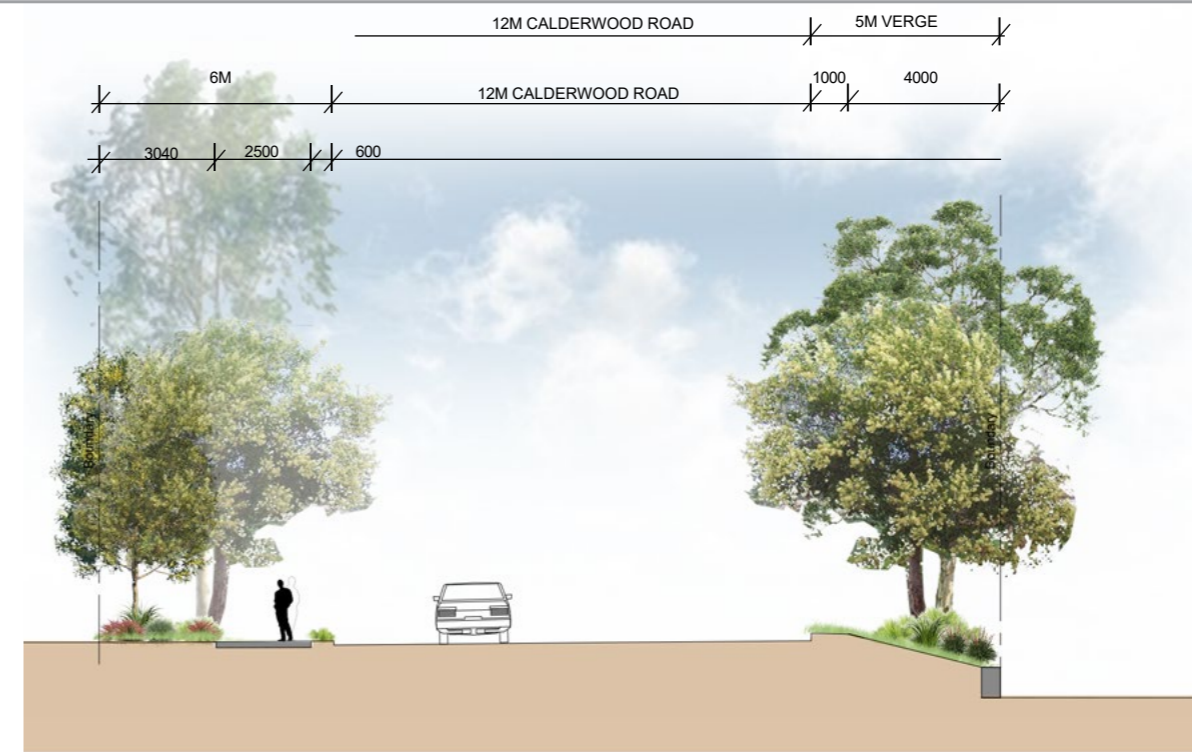
- Celebrate the Indigenous seasonal plantings along the length of Calderwood Road that connect to the broader landscape setting
- Integrate entry walls and signage to the Town Centre that dissects the Sub- Arterial that runs in the north- south direction
- Maximise shade for carparking to the edges of Calderwood Road

The below indicative planting list is reflective of the tree species that should be considered for use:

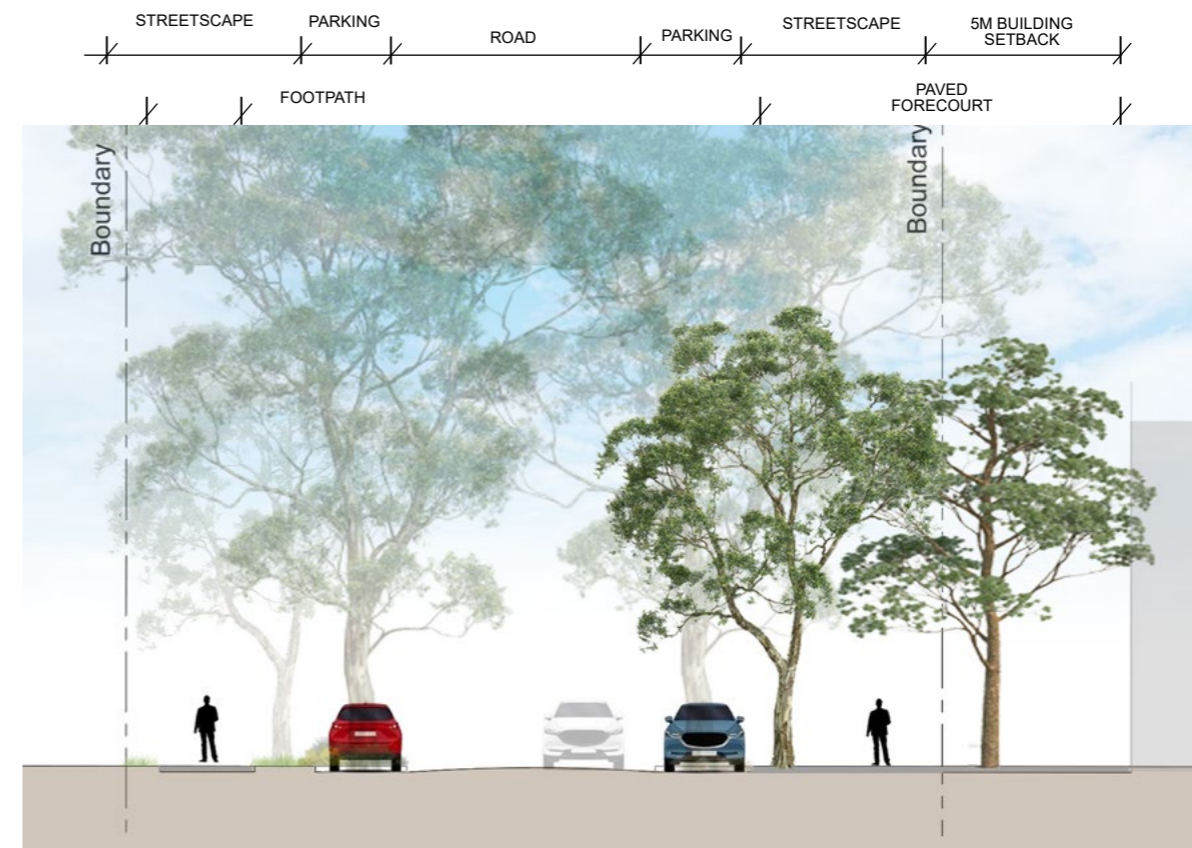
BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	SPREAD
<i>Acacia binervia</i>	Coast Myall	15m - 18m	3m - 4m
<i>Acacia implexa</i>	Hickory Wattle	6m - 8m	3m - 5m"
<i>Acacia maidenii</i>	Maidens Wattle	6m - 8m	2m - 3m
<i>Acacia melanoxylon</i>	Blackwood	8m - 10m	2m - 3m
<i>Angophora floribunda</i>	Rough-barked Apple	18m - 20m	9m - 10m
<i>Banksia integrifolia</i>	Coast Banksia	8m - 10m	5m - 6m
<i>Brachychiton acerifolius</i>	Illawarra Flame Tree	15m - 18m	4m - 5m
<i>Brachychiton populneus</i>	Kurrajong	8m - 10m	5m - 6m
<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum	8m - 10m	0.1m - 0.3m
<i>Corymbia maculata</i>	Spotted Gum	20m - 25m	10m - 12m
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	8m - 10m	3m - 4m
<i>Eucalyptus amplifolia</i>	Cabbage Gum	18m - 20m	7m - 8m
<i>Eucalyptus camaldulensis</i>	Murray red gum	40m - 45m	3m-11m
<i>Eucalyptus microcorys</i>	Tallow wood	40m - 45m	12m - 15m
<i>Eucalyptus paniculata</i>	Grey Ironbark	20m - 25m	
<i>Eucalyptus raecmosa</i>	narrow-leaved scribbly gum	15-20 m	6m
<i>Eucalyptus robusta</i>	Swamp Mahogany	"10m - 13m	12m - 15m
<i>Eucalyptus longifolia</i>	Woollybutt	"13m - 15m	15m - 18m"
<i>Flindersia australis</i>	Australian Teak	10m - 13m	6m - 7m
<i>Geijera salicifolia</i>	Brush Wilga	25m - 30m	
<i>Guioa semiglauca</i>	Wild Quince	6m - 8m	"2m - 4m
<i>Lophostemon conferta</i>	Brush Box	15m - 18m	9m - 10m
<i>Melia azedarac</i>	White Cedar	20m - 25m	7m - 8m
<i>Notelaea longifolia</i>	Large Mock-olive	8m - 10m	3m - 4m
<i>Syzygium smithii</i>	Lilly Pilly	15-20m	6m
<i>Telopea speciosissima</i>	Waratah	1m - 1.5m	1m - 1.5m"



Indicative Location Plan



Typical Section



Typical Section

GATEWAYS AND ENTRANCES - SECONDARY

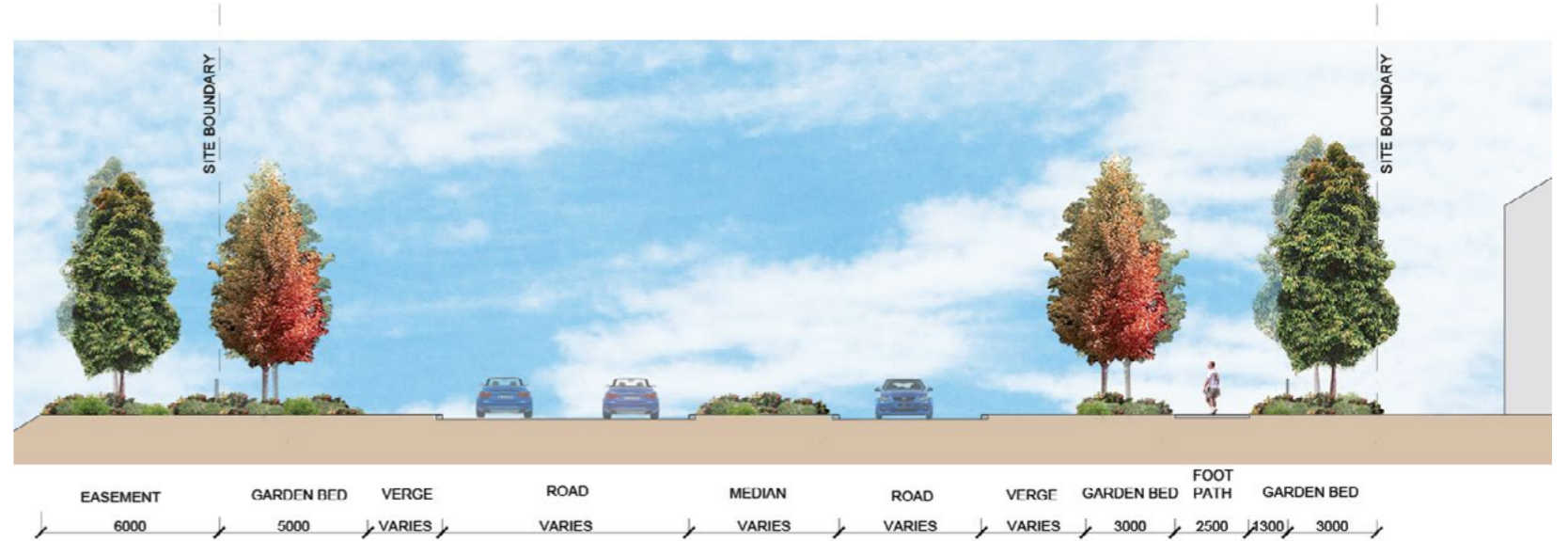
Trees for secondary entry streetscapes will be selected to provide a strong visual identity at a suitable scale to reinforce the road/entry hierarchy. As such a selection of iconic rural trees will be used at secondary entries in conjunction with exotic and native species. Plantings will be selected and designed to meet constraints of soil volumes determined by verge widths.

- Entry zone of collector roads
- Possible threshold treatment
- Feature street tree planting - possibly integrated to adjoining open space
- With or without median
- Extended verge width
- With or without entry signage
- More formal treatment
- Bus routes in some areas

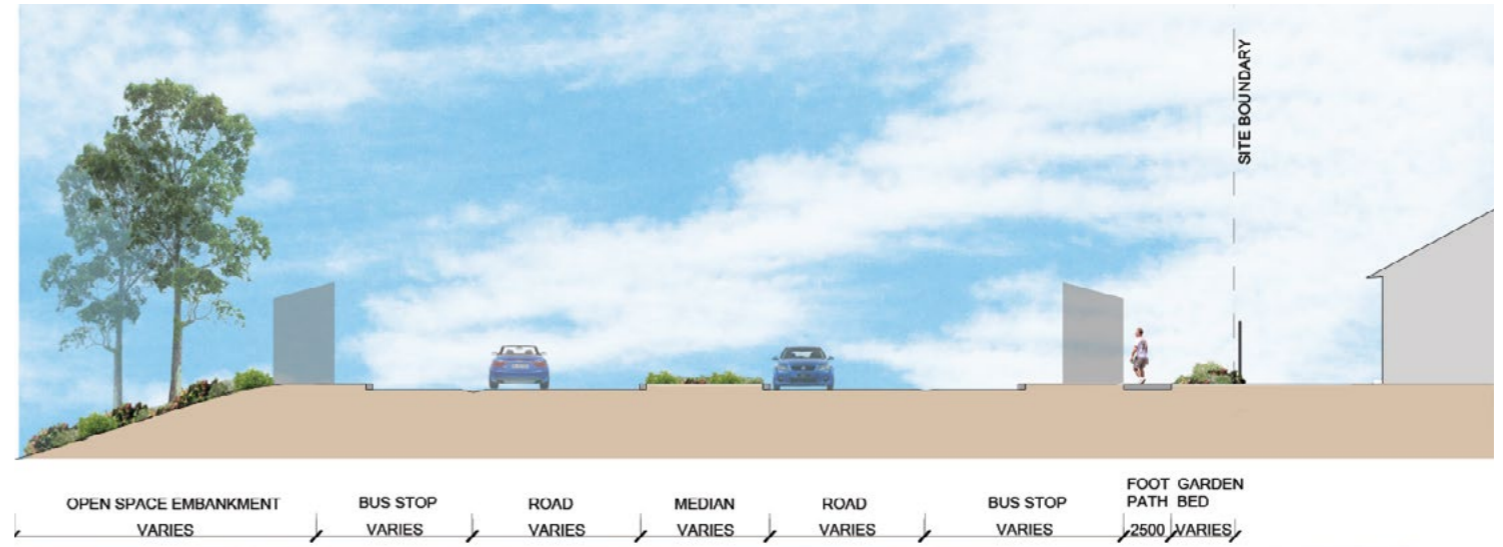


Indicative Location Plan

BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	SPREAD	NOM SPACING & (REQ SOIL AREA)	SPECIFIC USES
<i>Acer 'Crimson sentry'</i>	'Crimson sentry' Maple	10-12	6-8	10m & (20m2)	verges of 3.5m
<i>Acer freemanii 'Autumn blaze'</i>	Autumn Blaze Maple	10-12	6-8	10m & (20m2)	verges of 3.5m
<i>Acmena smithii</i>	Lilly Pilly	10-12	8-9	10m & (30m2)	verges of 3.8 min.
<i>Agathis robusta</i>	Queensland Kauri Pine	15-20	8-10	12m & (40m2)	verges of 4m
<i>Brachychiton acerifolius</i>	Illawarra Flame Tree	15	6-8	10m & (30m2)	verges of 3.5m
<i>Eucalyptus bosistoana</i>	Coastal Grey Box	10-25	8-12	12m & (40m2)	verges of 3.5m
<i>Fraxinus 'Cimmaron'</i>	Cimmaron Ash	10	5-6	10m & (20m2)	verges of 3.5m min.
<i>Fraxinus 'Urbanite'</i>	Urbanite Green Ash	10	5-6	10m & (20m2)	verges of 3.5m min.
<i>Lagerstroemia indica</i>	Crepe Myrtle	6-8	4-8	7m & (12m2)	verges of 2.5m
<i>Magnolia grandiflora</i>	Southern Magnolia	15-20	10-12	10m & (20m2)	verges of 4m
<i>Magnolia 'Exmouth'</i>	Magnolia Exmouth	10-12	6	10m & (20m2)	verges of 3.5m min.
<i>Populus Simonii 'Fastigiata'</i>	Simon's Poplar	8-12	2-3	8m & (20m2)	verges of 2.5m
<i>Pyrus 'Chanticleer'</i>	Pear	10-12	3-4	10m & (20m2)	verges of 3.5 min.
<i>Pyrus nivalis</i>	Snow Pear	8-10	8-9	12m & (30m2)	verges of 2.5m
<i>Ulmus parvifolia</i>	Chinese Elm	10-12	8-9	10m & (20m2)	verges of 3m
<i>Waterhousea floribunda</i>	Weeping Lilly Pilly	5-10	3.5-6	8m & (10m2)	verges of 3m
<i>Zelkova serrata</i>	Japanese Zelkova	10-15	10	10m & (30m2)	verges of 3.5m



Typical Section



Typical Section

ILLAWARRA HIGHWAY

Spaced stands of tree plantings along the Illawarra Highway which lead to entries to create themes indigenous planting. These may be broken by intermittent informal stands of *Livistona australis* and any existing stands of native species. A secondary zone of smaller trees will be used to residential properties.



Indicative Location Plan

BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	SPREAD	NOM SPACING & (REQ SOIL AREA)	SPECIFIC USES
<i>Acmena smithii</i>	Lilly Pilly	10-12	8-9	10m & (30m2)	verges of 3.8m
<i>Casuarina cunninghamiana</i>	River Oak	8-12	4-5	6m & (15m2)	verges of 3.5m
<i>Eucalyptus bosistoana</i>	Coastal Grey Box	10-25	8-12	12m & (40m2)	verges of 3.5m
<i>Eucalyptus tereticornis</i>	Forest Red Gum	15-35	6-10	12m & (50m2)	verges of 5m
<i>Livistona australis</i>	Cabbage Palm	15-20	2-3	8m & (20m2)	verges of 2.5m
<i>Melaleuca styphelioides</i>	Prickly Leaf Paperbark	18-20	8-10	12m & (40m2)	verges of 3.5m
<i>Populus simonii</i>	Chinese Poplar	10-12	2-3	8m & (20m2)	verges of 3.5m



Illawarra Highway Major Entry Perspective

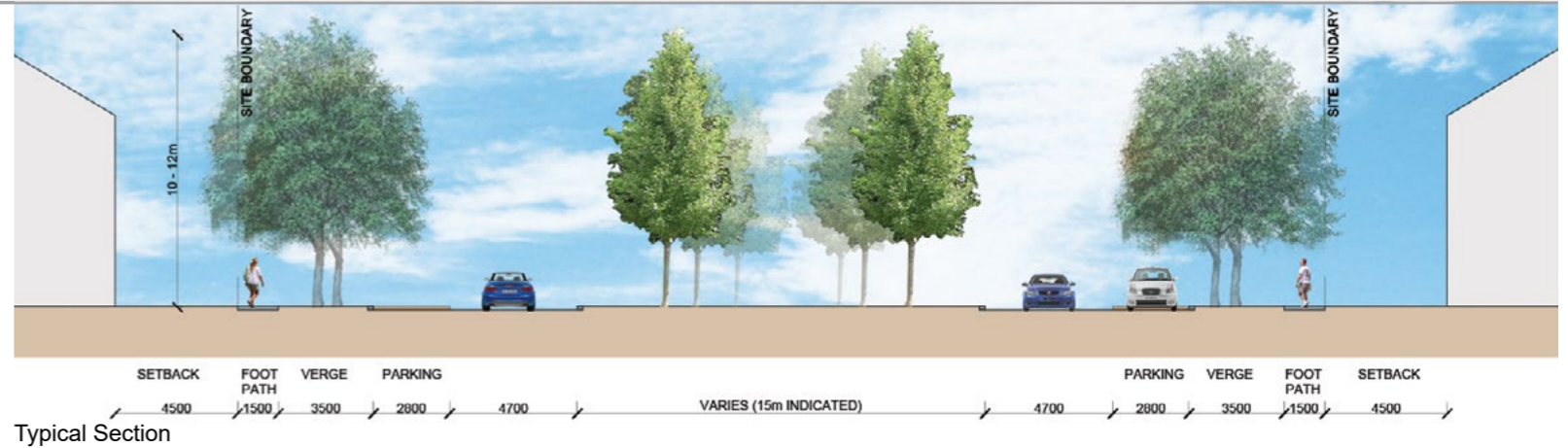
SUB-ARTERIAL ROAD

The collector roads are to incorporate formal avenue plantings of native evergreen and exotic deciduous tree species to strengthen visual continuity and provide links to the previously rural nature of the setting.

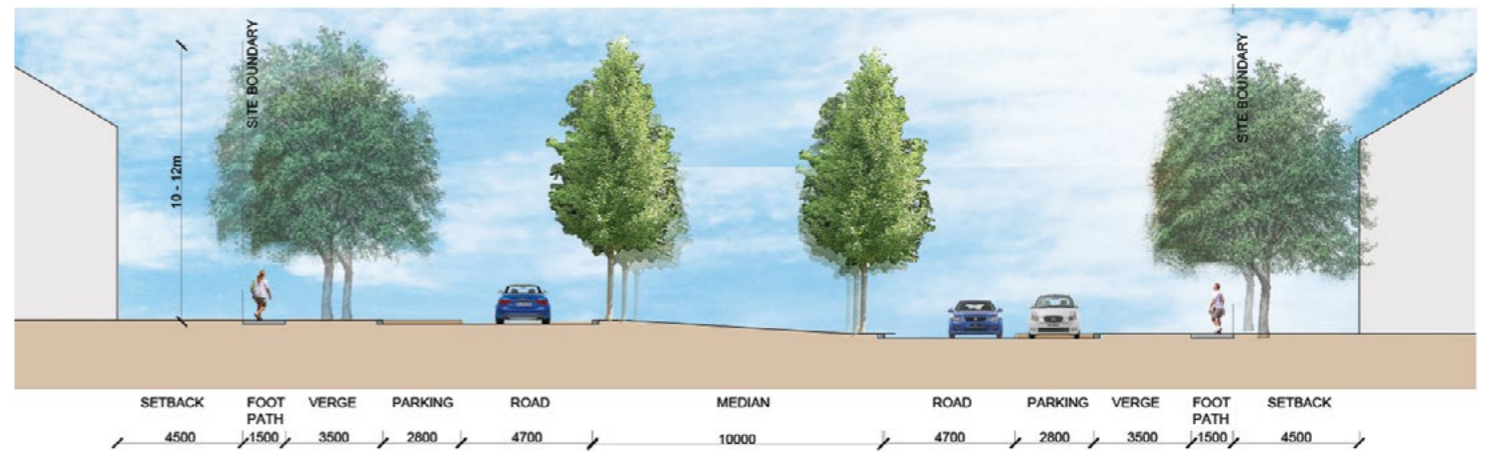
- Leads to or transects urban centre
- Street tree planting
- With or without median
- Angle or parallel parking
- Extended footpath zone width for main street pedestrian movement and trading
- Bus routes in some areas



Indicative Location Plan



BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	SPREAD	NOM SPACING & (REQ SOIL AREA)	SPECIFIC USES
<i>Acmena smithii</i>	Lilly Pilly	10-12	8-9	10m & (30m ²)	verges of 3.8m
<i>Araucaria cookii</i>	Cook Pine	10-20	8-10	10m & (30m ²)	verges of 4m
<i>Eucalyptus tereticornis</i>	Forest Red Gum	15-35	6-10	12m & (50m ²)	verges of 5m
<i>Lophostemon confertus</i>	Brush Box	12-20	6-10	10m & (30m ²)	verges of 3.5m
<i>Populus simonii 'Fastigiata'</i>	Simon's Poplar	8-12	2-3	8m & (20m ²)	verges of 2.5m
<i>Pyrus 'Chanticleer'</i>	Peat	10-12	3-4	10m & (20m ²)	verges of 3.5m min.



Escarpment Drive planting images

MAJOR COLLECTOR STREET

- Street tree planting
- Parallel parking
- Bus routes in some areas
- With or without median

BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	SPREAD	NOM SPACING & (REQ SOIL AREA)	SPECIFIC USES
<i>Acer platanoides 'Columnare'</i>	Norway Maple	8-10	4	6m & (12m ²)	verges of 2.5m
<i>Acer freemanii 'Autumn blaze'</i>	Autumn Blaze Maple	10-12	6-8	10m & (20m ²)	verges of 3.5m
<i>Acmena smithii</i>	Lilly Pilly	10-12	8-9	10m & (30m ²)	verges of 3.8m
<i>Araucaria cookii</i>	Cook's Pine	10-20	8-10	10m & (30m ²)	verges of 4m
<i>Araucaria heterophylla</i>	Norfolk Island Pine	15-25	8-10	10m & (30m ²)	verges of 3.5m
<i>Livistona australis</i>	Cabbage Tree Palm	15-20	2-3	8m & (20m ²)	verges of 2.5m
<i>Lophostemon confertus</i>	Brush Box	12-20	6-10	10m & (30m ²)	verges of 3.5m
<i>Magnolia grandiflora</i>	Southern Magnolia	15-20	10-12	10m & (20m ²)	verges of 4m
<i>Magnolia 'Exmouth'</i>	Magnolia Exmouth	10-12	6	10m & (20m ²)	verges of 3.5m min.
<i>Magnolia 'Little Gem'</i>	Little Gem Southern Magnolia	10-12	6	10m & (20m ²)	verges of 3.5m min.
<i>Populus simonii 'Fastigiata'</i>	Simon's Poplar	8-12	2-3	8m & (20m ²)	verges of 2.5m
<i>Populus euramericana 'veronese'</i>	Veronese Poplar	15-20	5-6	6m & (20m ²)	verges of 2.5m
<i>Quercus virginiana</i>	Virginia Live Oak	10-15	10-15	15m & (30m ²)	verges of 4m
<i>Ulmus parvifolia</i>	Chinese Elm	10-12	8-9	10m & (20m ²)	verges of 3m
<i>Zelkova serrata</i>	Japanese Zelkova	10-15	10	10m & (30m ²)	verges of 3.5m



Indicative Location Plan



Typical Section Without Median



Typical Section With Median



Major Collector Rd planting images

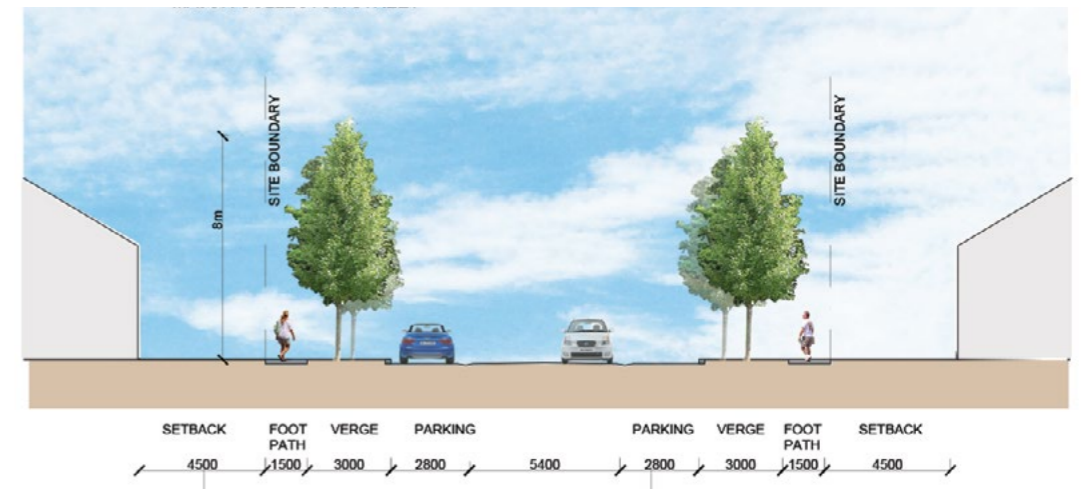
MINOR COLLECTOR STREETS

- Street tree planting
- Parallel parking
- Bus routes in some areas

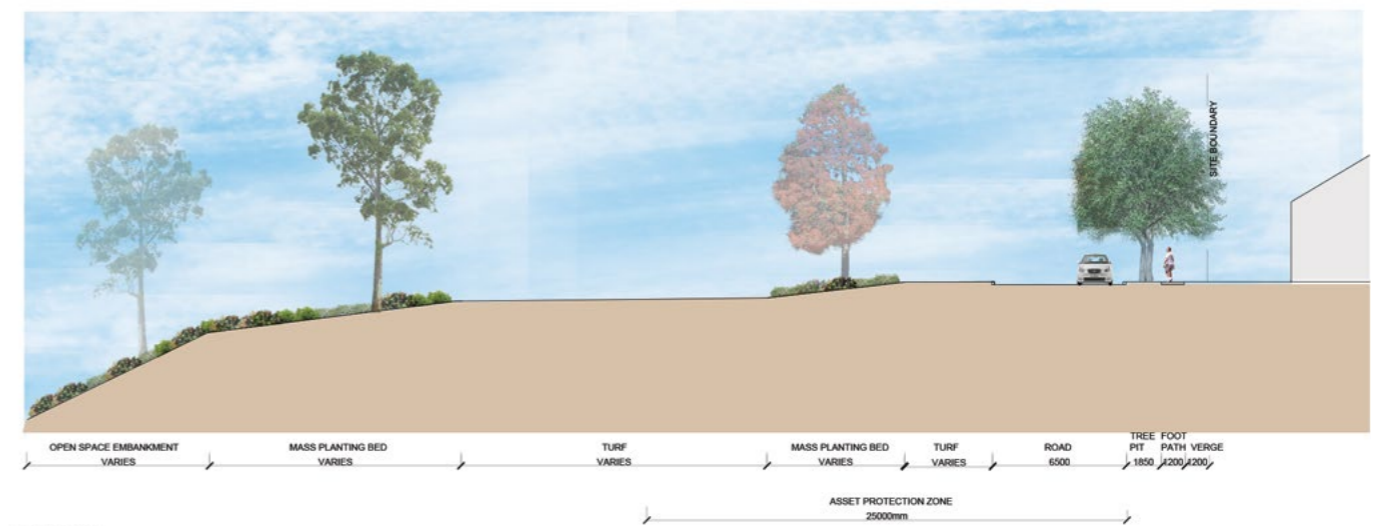


Indicative Location Plan

BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	SPREAD	NOM SPACING & (REQ SOIL AREA)	SPECIFIC USES
<i>Acer freemanii</i> 'Autumn blaze'	Autumn Blaze Maple	10-12	6-8	10m & (20m ²)	verges of 3.5m min.
<i>Acmena smithii</i>	Lilly Pilly	10-12	8-9	10m & (30m ²)	verges of 3.8m min.
<i>Backhousia citriodora</i>	Lemon Myrtle	10-12	8-9	10m & (30m ²)	verges of 2.5m min.
<i>Elaeocarpus eumundi</i>	Eumundi Quondong	10-12	6-8	10m & (30m ²)	verges of 2.5m min.
<i>Fraxinus</i> 'Urbanite'	Green Ash	10	5-6	10m & (20m ²)	verges of 3.5m min.
<i>Gleditsia</i> 'Sunburst'	Sunburst Honey Locust	10-12	4-5	10m & (20m ²)	verges of 2.5m
<i>Hymenosporum flavum</i>	Native Frangipani	6-8	3-4	10m & (20m ²)	verges of 3.5m min.
<i>Magnolia</i> 'Exmouth'	Magnolia Exmouth	10-12	6	10m & (20m ²)	verges of 3.5m min.
<i>Pyrus</i> 'Chanticleer'	Chanticleer Pear	10-12	3-4	10m & (20m ²)	verges of 3.5m min.
<i>Pyrus ussuriensis</i>	Manchurian Pear	10-12	5-6	10m & (20m ²)	verges of 3.5 min.
<i>Tilia cordata</i>	Small Leaved Lime	10-12	6-7	10m & (20m ²)	verges of 4m min.
<i>Tristaniopsis</i> 'Luscious'	Water Gum	8-12	6-8	15m & (50m ²)	verges of 2.5m min.
<i>Ulmus parvifolia</i>	Lacebark Elm	10-12	8-9	10m & (20m ²)	verges of 3.0m
<i>Ulmus parvifolia</i> 'Todd'	Chinese Elm 'Todd'	10-12	8-9	10m & (20m ²)	verges of 3.0m
<i>Waterhousia floribunda</i>	Weeping Lilly Pilly	5-10	3.5-6	8m & (10m ²)	verges of 3.0m



Typical Section



APZ SECTION

Typical Section APZ Local Park 8



Minor Collector Rd planting images



5.2 Gateways & Entrances

A hierarchy of gateways and entrances leading into Calderwood Valley and their potential character have been identified. The identified gateways range from major to tertiary is outlined in Figure 14.

Major Gateway 1 - Connection to Country

Located in the Town Centre that fronts Calderwood Road. This gateway is connected on both the eastern and western edges of the site via Calderwood Road and promotes the entry experience as a journey as you travel towards the Town Centre. Appropriate landscape treatment to the Town Centre will include:

- Major Entry signage with the potential to be integrated into the built form of the Town Centre
- Native planting
- Design with materials to reflect the urban nature of the Town Centre

Secondary Gateway 2 - Native and Rainforest Riparian

Lies to the south of the site and links directly to the Illawarra Highway adjacent to the Macquarie Rivulet corridor. The gateway is linked to the northern level 2 Gateway via the proposed connector road. It provides the major entry into the development for those travelling from the Southern Highlands through Macquarie Pass.

The landscape precinct surrounding the gateway has been identified as native riparian with a potential rural overlay to emphasise connections to the previous and adjacent rural land use of the area. It is located within the Macquarie Rivulet corridor and appropriate landscape treatment has been identified as:

- Utilize major entry signage
- Exotic evergreen and deciduous Avenue planting
- Introduce native rainforest and riparian vegetation into the entry planting where possible
- Design with materials to reflect rural / riparian nature of entry
- Use of Rammed Earth Walling to reflect the Illawarra Escarpment.

Secondary Gateway 2 - Rural

The northernmost level 2 Gateway is located within the Wollongong CC Area. The elevated reaches of the site to the north of this area is strongly rural and open. The gateway is linked to the Southern level 2 gateway via the proposed connector link road. Landscape treatment for the gateway is:

- Major entry signage

- Emphasis on the rural nature of the precinct
- Exotic evergreen or deciduous avenue planting

Gateway 3 - Riparian Rainforest

This gateway has also been identified in 4 locations of the site lying on the north-western and south-western boundaries. The south-western level 3 gateway is located on the Illawarra Highway adjacent to the Macquarie Rivulet corridor. The gateway has been identified as riparian rainforest and recommended treatment is:

- Utilize entry signage to reflect the character of the area
- Riparian and rainforest species as avenue planting
- Design to reflect riparian nature of the area.

The remaining level 3 gateways have been identified on the north-western boundary of Calderwood Valley. Located on the ridgeline which follows Marshall Mount Road and descends into the valley to meet Calderwood Road, the gateways have been identified as riparian rainforest. Appropriate landscape treatment has been identified as:

- Riparian and native rainforest species as avenue planting
- Design to reflect natural setting and views.



Figure 14.0 Gateways & Entrances

LEGEND

- ① Major - Suburban
- ② Secondary - Rural
- ② Secondary - Rural Riparian
- ③ Tertiary - Riparian Rainforest



5.3 Neighbourhood Precincts

Neighbourhood Identities

Identity is a function of the fundamental qualities or physical characteristics that makes a locality or space unique. It is aimed to provide a recognisable, unified character across the Calderwood Valley while still reinforcing individual neighbourhood identities.

This is proposed to be achieved through a consistency of material fabric used in site specific design responses, and the use of individual design elements / functions to individual parks. Built form of housing will remain a strong influence in promoting the identity of individual villages as will the shape and nature of its public spaces.

Housing type / Architectural style

Accommodation of mixed residential densities incorporating varied building types with typical building heights of 2-3 storeys at neighbourhood nodes is envisaged. A continuity of architectural styles for each neighbourhood is achieved through a range of colours, materials and roof types selected for each neighbourhood that provides opportunity for diversity of choices within a coordinated framework. Calderwood Valley Building and Siting guidelines outline these strategies.

Setbacks

Street frontage setbacks will allow the scale of tree planting feasible to street environments. Every home will have a tree planted in their front setback. Large scale plantings to open spaces can also play a major role but to engender a sense of space and scale - generous setbacks are preferred.

Street Planting

Street tree planting provides an important element in promoting long term individual village identity to all areas of the Calderwood Valley. This is particularly important at gateway and entry nodal points as way finding cues.

Open Space

Parkland areas can develop space specific designs that support individual neighbourhood identities. This will be a function of site specific characteristics of slope and existing tree canopy and the overlay of recreational roles and built elements.

Public Art

Entry markers and sculptural elements may be incorporated to reflect overall themes to further strengthen identity.

Elements

Furniture and lighting elements will be from a consolidated palette to provide continuity across the development.

5.4 Urban Centres (Village/Town)

Calderwood Valley will be served by two Urban Centres which will act as the heart of the new community integrating retail, commercial, and civic / public domain functions within a cohesive environment that responds to the character and identity of the landscape. The Village Centre incorporates three key elements:

- Main Street
- Waterbody
- Plaza/Square
- Incidental community spaces

Community Role

The three elements work together to create the community heart where residents and visitors can gather and have access to services.

The main street provides a retail "strip" environment activated by vehicular access and parking but with high pedestrian amenity through generous pavements and boulevard tree planting.

The development will provide major permanent water bodies which act as a focus for the centre and strongly shape adjoining urban planning. The water periphery will provide a variety of experiences ranging from promenades and cafés, through to natural water edges with informal walking and cycle path access linking to the riparian corridor.

The Plaza/Square will provide a flexible and adaptable public domain, and the major public space in the Urban Centre. The Plaza/Square will visually and spatially extend the public domain of the water edge promenade, and provide for day to day use as a place for cafés, seating, and gathering. In addition it will provide for organised events such as markets and displays.

Plaza/Square design principles

Key principles for the Plaza/Square as the focal space of the Village Centre include:

- Incorporate into design development key contextual considerations:
 - integration of character of adjoining streetscape corridors into design theme (alignment, materials, urban built forms, vistas and views);
 - urban role of square or plaza as visual focus and landmark
 - emphasise relationship to water body
 - heritage, character, and social fabric of adjoining neighbourhoods
- the relationship of the plaza or square to an active street frontage to enhance public accessibility and security the provision of equitable access for all members of the community,
- recognise / influence where possible spatial definition and character of adjoining architectural form;
- reinforce pedestrian linkages to main street corridor and lake promenade through use of in road pavements and widened footpaths
- public art as fundamental component of design scheme with artworks provided as both functional and visual elements of the designs.
- opportunity to incorporate richer palettes of materials including paving and plant material into design,
- Provision of seating, tables, bins etc. as appropriate to location and adjoining uses.
- Decorative street lighting poles and banners
- Decorative pedestrian pole top lights or under awning / colonnade lighting to reinforce the Illawarra village centre characteristics.
- Free wifi to be incorporated to increase connectivity where possible
- Shade to be provided by tree planting and as structures

6.0 PALETTES

The use and design of hard and soft material treatments aims to reinforce the character of Calderwood Valley in the Illawarra within the context of adjoining suburbs and as a community.

The development also needs to provide an identifiable and marketable image to prospective residents to promote Calderwood as a desirable and attractive place to live and work. The design of plants and materials will be integral to this image.

The selection of materials for Calderwood will define and strengthen each landscape character zone. The materials palette for Calderwood will support the following design principles:

- Longevity - low maintenance
- Quality and consistency
- Contemporary - clean simple lines
- Heritage links - rural and indigenous
- Robust and simple structures
- Rural influences
- Natural environment and materials

Detail of materials will be confirmed with the details documentation that is submitted to Council for Construction Certificate (CC).

6.1 Hard Landscape

Colour

- Warm tones and natural or subdued colours. Bright colours only used as highlights in distinctive and select locations. Use in landscape 90% natural, 10% bright colour.
- Bright colour swatches to be sources from locally significant elements such as prominent tree, flower or heritage building.

Materials Principles

- Naturally and locally sourced.
- Variations in aesthetic created by using the same material with a different finish.
- Good quality craftsmanship.
- Timber sourced from sustainable suppliers
- Stone sourced from local suppliers.
- Clean lines and crisp finishes.

Pavement Principles

Footpath paving for the Calderwood Valley will provide a hard wearing, cost effective and practically maintainable surface that enhances the character and identity of the public domain and provides an aesthetically pleasing visual experience.

A hierarchy of pavement treatments reflects the varied pedestrian and vehicular access roles of streetscapes and open space areas, from urban to natural landscape character contexts.

Park and open space areas will have a less structured approach to application of pavement materials as parks tend to be destinations for users, and as such do not need to provide strong visual continuity between different sites.

This is with the exception of:

- cycle linkages connecting to systems beyond the park.
- pedestrian linkages connecting to systems beyond the individual park; and

Paving materials incorporated in the public domain (including parks and open space) will be limited in range to make maintenance, renewal and extension works more cost effective and practical for Council.

Key Materials and Finishes

The following table outlines the materials being proposed with photographic images demonstrating design intent including:

- Footpaths and paving
- Informal mown tracks
- Cycleway
- Walls
- Fencing
- Picnic Shelters
- Signage
- Lighting
- Furniture
 - Seating
 - Custom furniture
 - Bollards
 - Bike racks
 - Rubbish bins
 - Drinking fountains

Footpaths and Paving

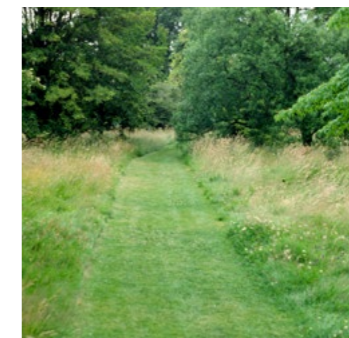
Paving will be selected for individual area depending on the site and its priority. Materials will include:

- Broom finished concrete
- Exposed aggregate concrete
- Sawn sandstone or basalt to high profile town centre areas.



Informal Mown Tracks

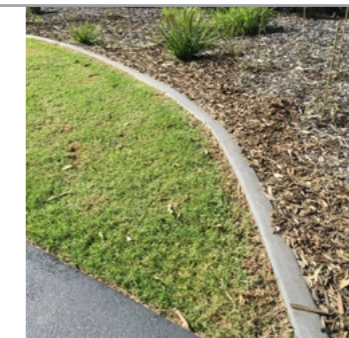
Mown tracks formed and maintained by regular use will occur as a tertiary level of walking track access for access provision in riparian and transition zones, and some maintenance access routes.



Edging

Edging will be used to separate soft landscape surface finishes (eg. turf and mass planting) and will include:

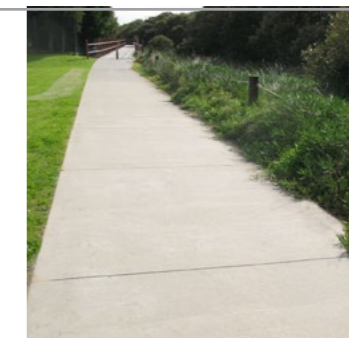
- Concrete
- Spade (natural Areas)



Cycleway

The development of the pedestrian and cycle network through the Calderwood Valley development is an important component of the ongoing planning for the site.

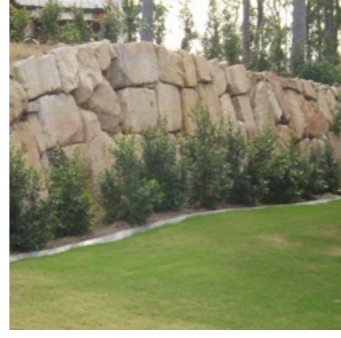
Cycleways will be 2.5 metres wide as per the DCP. Where possible a unified colour surfacing and line marking system is followed as a long term objective for ongoing implementation that identifies cycle routes in their various forms. Major road crossing points will be treated differently to highlight their location.



Walls

Walls will be designed to relate to the Calderwood Valley environment and will include:

- Rammed earth (feature entry only)
- Sandstone logs
- Dimensioned sandstone
- Concrete sleeper retaining walls
- 1 - 2 man sandstone boulders
- Reinforced concrete blockwork.



Fencing

Feature landscape fencing relates to the rural heritage of the site.

A timber (or suitable alternative product) post and rail fence treatment is proposed in the Calderwood Valley landscape. In specific areas timber (or suitable alternative product) post and rail fence which will incorporate 2, 3 or 4 horizontal timber rails depending on the location.



Picnic Shelters

Shelters will be designed to reflect the rural heritage of the area. Generally, structures will incorporate a mix of building materials including galvanised steel, steel and timber.

The scale will be directly informed by the hierarchy of the park type ie. local, district or city wide parks.

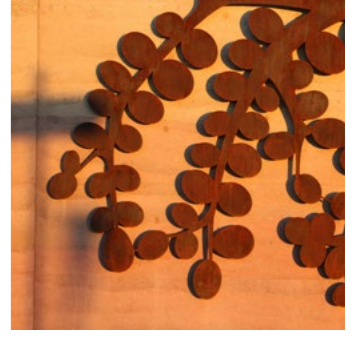


Signage

Signage will be subject to ongoing site specific design and related development approval. Materials are used to reinforce a cohesive theme across the Calderwood environment and will be contemporary in appearance and built of low maintenance materials.

Typically signage will be made of a metal and fixed to an element such as steel, timber or concrete.

All signage will be developed in consultation with Council prior to lodging construction certificate documentation.

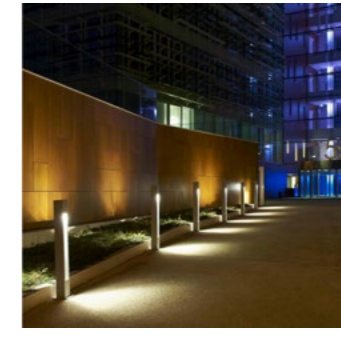


Lighting

Street Lighting

Street lighting will be provided within the Calderwood Valley to contribute to a coordinated street environment. Selection will be subject to electricity authority approval.

An effective lighting schedule will be included in the design of residential areas and open spaces to ensure that street footpaths are adequately lit.

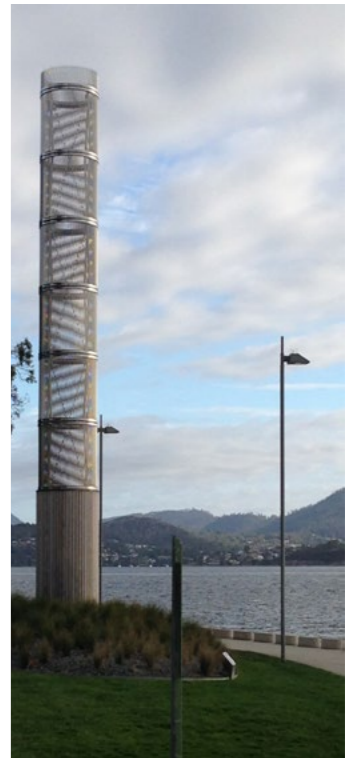


Open Space lighting

There are a range of issues that must be considered in determining the level of lighting to be provided to open space areas. The situations to which lighting may apply are:

- Lighting of major cycle routes and pedestrian access paths for night time usage
- Feature lighting of elements as visual displays (eg. sculpture/artwork elements, uplighting trees, feature bridges or structures)
- Sports field lighting to Council requirements having regard for relationship to adjoining residential areas.

Pedestrian lighting of pathways through parks will be evaluated for each specific site based on linkage value, impacts on pedestrian amenity, and safety/security considerations. In general lighting will not be provided in open space.



Furniture

Generally, furniture items will be selected to consider a functional and aesthetic contribution to the quality of the public domain as well as achieving a low maintenance outcome for council. It will form a recognisable theme particular to Calderwood Valley.

For both maintenance, cost, and replacement purposes it is preferable that a simple palette of furniture be incorporated into open space design.

Furniture will be accessible to allow wheel chair access.

All furniture to be specified at Calderwood Valley will be discussed and approved by Shellharbour City Council prior to construction certificate documentation being lodged with council.

Seating

Seating will be developed that is bespoke in significant open space areas and will include materials such as recycled large section timber, and galvanized steel.

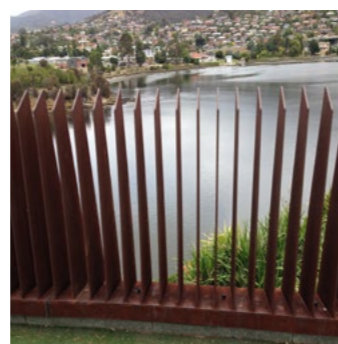
Where "off the shelf" seating and furniture is to be used then it will meet all relevant Australian Standards and be constructed from durable timber and steel/aluminium.

Materials to be utilised include precast concrete, galvanised and weathered steel, large section recycled hardwood.



Custom Furniture

In specific areas there may be the opportunity for 'one off' designed furniture that responds to a particular theme (eg. The Escarpment or a Watercourse).



Bollards

Design:

- robust
- simple form
- low maintenance
- removable where required

Bollards will be constructed of recycled timber, or steel depending upon the location and function required.

Consideration will be given to them having a multi functional purpose such as bicycle parking.



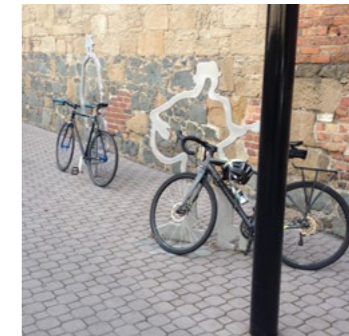
Bike Racks

Design:

- consider as sculpture
- ability to 'stand alone'
- durability

Generally stainless steel construction.

Consider use of public artist to develop a suite of racks and integrated art into the landscape.



Rubbish Bins

Design:

- consider recycling needs
- discrete location that is practical
- ease of council access for maintenance

Generally of steel construction with lockable door and with a cover to keep out weather.

Appropriate signage on bins for general rubbish, recycling and other waste. 240L and 120L sizing to be determined at CC stage in conjunction with Council.



Drinking Fountains

Drinking fountains will be of stainless steel and aluminium construction and be located in the higher profile open space areas. Consideration to be given to dog drinking bowls.



6.2 Hard Landscape Materials Matrix
(Figure 15.0)

Hard landscape matrix identifies materials and finishes recommended for the major precincts of the Calderwood Valley

MATERIALS / FINISH	STREETSCAPE					OPEN SPACE		
	Entry Road Major	Entry Road Minor	Sub- arterial & Major Collector Road	Minor Collector Road Residential Street	Urban Centre (Village/ Town)	Parkland: Sportsground, Citywide & District Park	Parkland: Local Park	Riparian/ Natural
Feature Paving - Sawn Sandstone					X			
Pathway & Cycleway Paving - Plain concrete with broom finish		X	X	X		X	X	
Feature Paving - Exposed aggregate concrete					X	X		
Pathway - mown grass								X
Concrete causeway/weir bridge crossing								X
Feature Wall - Rammed earth	X	X			X	X		
Feature Wall - Sandstone log						X	X	X
Feature Wall - Dimensioned sandstone						X	X	
Feature Wall - 1-2 man sandstone rock						X	X	X
Timber (or suitable alternative product) post and rail fence with 4 horizontal timber sections. Painted, oiled, powder coated or pre-coloured finish (dark colour).	X							
Timber (or suitable alternative product) post and rail fence with 3 horizontal timber sections. Painted, oiled, powder coated or pre-coloured finish (dark colour).		X						
Timber (or suitable alternative product) post and rail fence with 2 horizontal timber sections. Painted, oiled, powder coated or pre-coloured finish (dark colour).						X	X	X
Seating - Aluminium with timber slats	X							
Seating - Large section timber or steel base					X	X	X	
Seating - Sandstone log								X
Bollards - Steel						X	X	
Bollards - Timber								X
Steel Signage - Galvanised or weather finish	X				X	X	X	X
Picnic Shelter - Galvanised steel, Colorbond roof, Rural theme	X					X	X	
Pergolas - Galvanised steel with steel / timber or composite timber battens						X	X	
Bridge - Galvanised steel balustrade with stainless steel handrail	X							
Deck Balustrade - Galvanised steel to match bridge			X					
Playground-Structured					X	X	X	
Playground - Natural						X	X	
BBQ - Push-button electric, Stainless steel and aluminium construction						X		
Bins					X	X		
Doggy Bins					X	X	X	
Fitness stations						X	X	
Drinking Fountain - Stainless steel or pre-cast aluminium					X	X		

6.3 Planting Palette

The planting styles (refer to matrix opposite) for Calderwood include:

- Urban / Commercial - Strong lines with manicured planting in the Entry, Village Centre and District Park precincts.
- Residential / Parkland - Flowing design with strategic use of formal lines of planting at key locations in the Sales Pod, Residential, District and Local Park precincts.
- Natural - Organic style planting in the riparian and transitional zones

Planting Principles

Trees should be planted in groves or linear configurations as these are more successful at creating meaningful and comfortable spaces within parks and open spaces.

Individually scattered trees should only be used where there are large areas of open space and when planted between larger clumps or avenues.

Planting trees together with associated mulch bed, increases wind protection and shelter for younger plants and provides protection from mowing and human damage.

Understorey and Garden Bed Design Guidelines

- Select species to perform in the long term for their climatic location and site conditions.
- Choose species that have acceptable Council maintenance requirements
- Choose a range of species and reduce monoculture, to reduce the potential loss of trees through disease and climate
- Choose species that will create a strong identity and character for the space
- Generally choose a small mixture of plant species in one garden bed to ensure if one species dies there is still good coverage of garden bed
- Only utilise single species mass planting in locations where vegetation growth will provide full coverage of the soil
- Utilise single species planting in garden beds of a small size, as too many species can appear cluttered in character

PLANTING STYLES MATRIX

URBAN / COMMERCIAL					
	Grove	Row	Avenue	Single species grouped	
	RESIDENTIAL / PARKLAND				
		Grove	Row	Avenue	Single species grouped
NATURAL					
		Grove	Row	Avenue	Mix species, organic shapes



Acer 'Autumn Blaze'



Acer platanoides 'Columnare'



Araucaria cookii



Brachychiton acerifolius



Casuarina cunninghamiana



Elaeocarpus eumundi



Eucalyptus bosistoana



Eucalyptus microcorys



Eucalyptus tereticornis



Ficus macrophylla



Fraxinus 'Cimmaron'



Fraxinus 'Urbanite'



Ginkgo biloba



Hymenosporum flavum



Lagerstroemia indica

6.4 Tree Planting Matrix (Figure 16.0)

The species reflect the diversity of the rural, rainforest, riparian and community character of the Calderwood Valley. The tree planting matrix identifies species recommended for the major precincts of the Calderwood Valley

SPECIES	LOCATION													
	Major Entrance	Minor Entrance	Urban Public Place (Plaza)	Urban Residential Street	Major Road: Heritage	Major Road: Avenue	Residential Street	Parks & Open Space: Marker	Parks & Open Space: Space Definition	Parks & Open Space: Shade	Parks & Open Space: Display	Transition Open Space	Transition Rainforest	Riparian
<i>Abarema sapindoides</i>												X	X	
<i>Acer 'Crimson Sentry'</i>	X	X				X						X	X	
<i>Acer freemanii 'Autumn blaze'</i>	X	X				X	X							
<i>Acmena smithii</i>	X		X			X	X			X				
<i>Araucaria heterophylla</i>					X			X						
<i>Araucaria cookii</i>					X			X						
<i>Backhousia citriodora</i>							X		X			X		
<i>Brachychiton acerifolius</i>		X							X		X			
<i>Casuarina cunninghamiana</i>												X		X
<i>Ceratopetalum apetalum</i>												X	X	
<i>Cryptocarya glaucescens</i>												X	X	
<i>Dendrocnide excelsa</i>												X	X	
<i>Doryphora sassafras</i>												X	X	
<i>Elaeocarpus eumundi</i>				X			X		X			X		
<i>Eucalyptus amplifolia</i>												X		
<i>Eucalyptus bosistoana</i>		X												
<i>Eucalyptus eugenioides</i>														X
<i>Eucalyptus microcorys</i>						X			X					
<i>Eucalyptus tereticornis</i>									X			X		X
<i>Eucryphia moorei</i>												X	X	
<i>Ficus macrophylla</i>								X		X				
<i>Ficus rubiginosa</i>	X							X		X				
<i>Fraxinus 'Cimmaron'</i>	X						X							
<i>Fraxinus 'Urbanite'</i>	X		X	X			X							
<i>Ginkgo biloba</i>							X							
<i>Hymenosporum flavum</i>							X							
<i>Lagerstroemia indica</i>	X	X	X	X							X			



Livistona australis



Lophostemon confertus



Magnolia 'Exmouth'



Melaleuca styphelioides



Populus simonii 'Fastigiata'



Populus 'Veronese'



Pyrus 'Chanticleer'



Pyrus 'Aristocrat'



Quercus virginiana



Syzygium australe



Tilia cordata



Toona ciliata var australis



Tristaniopsis laurina



Ulmus parvifolia



Waterhousea floribunda



Zelkova serrata

6.4 Tree Planting Matrix (continued)

SPECIES	LOCATION													
	Major Entry	Minor Entry	Urban Public Place (Plaza)	Urban Residential Street	Major Road: Heritage	Major Road: Avenue	Residential Street	Parks & Open Space: Marker	Parks & Open Space: Space Definition	Parks & Open Space: Shade	Parks & Open Space: Display	Transition Open Space	Transition Rainforest	Riparian
<i>Livistona australis</i>								X	X		X	X	X	
<i>Lophostemon confertus</i>		X			X					X		X		
<i>Magnolia 'Exmouth'</i>	X		X	X	X		X				X			
<i>Magnolia grandiflora</i>	X							X		X				
<i>Magnolia 'Little Gem'</i>	X			X		X					X			
<i>Melaleuca decora</i>												X		X
<i>Melaleuca styphelioides</i>												X		
<i>Melaleuca quinquenervia</i>												X		
<i>Pennania cunninghamii</i>												X	X	
<i>Polyosma cunninghamii</i>												X	X	
<i>Populus simonii 'Fastigiata'</i>	X				X									
<i>Populuseuramericana 'Veronese'</i>					X									
<i>Pyrus 'Aristocrat'</i>	X													
<i>Prunus erasifera 'Nigra'</i>	X			X			X				X			
<i>Pyrus 'Chanticleer'</i>	X			X			X							
<i>Pyrus nivalis</i>	X			X			X				X			
<i>Quercus virginiana</i>	X					X								
<i>Rapanea howittiana</i>												X	X	
<i>Syncarpia glomulifera</i>												X	X	
<i>Syzygium australe</i>							X							
<i>Tilia cordata</i>							X							
<i>Toona ciliata var. australis</i>									X			X	X	
<i>Tristania albens</i>												X	X	
<i>Tristaniopsis laurina 'Luscious'</i>							X					X		
<i>Ulmus parvifolia</i>	X					X	X							
<i>Ulmus parvifolia 'Todd'</i>			X	X			X							
<i>Waterhousea floribunda</i>	X			X			X			X		X		
<i>Zelkova serrata</i>			X			X	X			X				



Acacia cognata



Bauera rubioides



Berberis thunbergii



Callistemon citrinus



Callistemon viminalis



Camellia sasanqua



Choisya ternata



Cordyline stricta



Convolvulus cneorum



Cordyline australis



Cyathea australis



Dicksonia antarctica



Doryanthes excelsa



Grevillea 'Superb'



Leucadendron 'Safari Sunset'



Loropetalum chinensis

6.5 Shrub and Understory Planting Matrix

Provide form and texture to add more contrast and scale in urban and entry areas while reinforcing character in open space and rainforest areas. Passive surveillance principles need to be considered in design. A diversity of leaf form, shape, texture, colour and scale are vital in providing an innovating, uplifting and illuminating residential community.

SPECIES	LOCATION					
	Town Centre	Entries	Park/Open Space	Riparian	Rainforest	Wetland
<i>Abelia x grandiflora</i>	X		X			
<i>Acacia cognata</i>			X			
<i>Acacia falcata</i>			X			
<i>Acacia floribunda</i>			X			
<i>Baeckea virgata</i>			X			
<i>Bauera rubioides</i>			X			
<i>Berberis thunbergii</i>		X				
<i>Callistemon citrinus</i>			X			
<i>Callistemon linearis</i>			X			
<i>Callistemon ridigis</i>			X			
<i>Callistemon salignus</i>			X			
<i>Callistemon viminalis</i>			X			
<i>Camellia sasanqua</i>	X					
<i>Casuarina glauca 'Cousin It'</i>	X		X			
<i>Choisya ternata</i>			X			
<i>Citriobatus pauciflorus</i>					X	
<i>Clerodendron tomentosum</i>			X			
<i>Convolvulus cneorum</i>		X	X			
<i>Cordyline australis</i>	X	X				
<i>Cordyline stricta</i>	X					
<i>Cordyline terminalis</i>	X					
<i>Correa alba</i>	X					
<i>Cyathea australis</i>	X		X		X	
<i>Daviesia ulicifolia</i>			X			
<i>Dicksonia antarctica</i>	X		X		X	
<i>Dodonaea viscosa</i>	X					
<i>Dodonaea triquetra</i>	X					

SPECIES	LOCATION					
	Town Centre	Entries	Park/Open Space	Riparian	Rainforest	Wetland
<i>Doryanthes excelsa</i>	X	X				
<i>Echium fastuosum</i>			X			
<i>Escallonia macrantha</i>	X					
<i>Eupomatia laurina</i>			X			
<i>Gardenia augusta</i>	X	X				
<i>Grevillea 'Superb'</i>			X			
<i>Hakea dactyloides</i>			X			
<i>Hebe elliptica</i>			X			
<i>Hymenanthera dentata</i>			X		X	
<i>Indigophera australis</i>	X					
<i>Kunzea ambigua</i>			X			
<i>Laurus nobilis</i>			X			
<i>Lavandula stoechas</i>	X	X				
<i>Leptospermum petersonii</i>			X			
<i>Leucadendron 'Safari Sunset'</i>			X			
<i>Loropetalum chinensis</i>			X			
<i>Melaleuca nodosa</i>			X			
<i>Melaleuca thymifolia</i>			X			
<i>Michelia figo</i>	X		X			
<i>Murraya paniculata</i>	X		X			
<i>Nandina domestica</i>	X		X			
<i>Notelaea venosa</i>			X		X	
<i>Olearia viscidula</i>			X			
<i>Pholitheca myoporoides</i>	X		X			
<i>Photinia glabra</i>			X			
<i>Photinia x fraseri</i>			X			
<i>Pittosporum tobira</i>			X			



Austrodranthonia racemosa



Carex appressa



Commelina cyanea



Dichelachne micrantha



Echinopogon ovatus



Eragrostis brownie



Imperata cylindrica



Juncus usitatus



Poa labillardieri



Microlaena stipoides



Rosa 'Pierre de Ronsard'



Rosmarinus officinalis



Russelia equisetiformis



Strelitzia reginae



Teucrium fruticans



Trachelospermum jasminoides

6.5 Shrub and Understory Planting Matrix (continued)

SPECIES	LOCATION					
	Town Centre	Entries	Park/Open Space	Riparian	Rainforest	Wetland
<i>Pultenea villosa</i>			X			
<i>Rosmarinus officinalis</i>	X	X				
<i>Russelia equisetiformis</i>	X					
<i>Strelitzia juncea</i>	X					
<i>Strelitzia reginae</i>	X					
<i>Tasmannia insipida</i>			X		X	
<i>Teucrium fruticans</i>			X			
<i>Tibouchina 'Groovy Baby'</i>	X					
<i>Viburnum odoratissimum</i>	X					
<i>Viburnum tinus</i>			X			
<i>Westringia fruticosa</i>	X		X			
<i>Westringia 'Wynyabbie Gem'</i>	X					
<i>Yucca elephantipes</i>	X					

6.6 Climbers Planting Matrix

Species used to introduce an element of colour and texture at height.

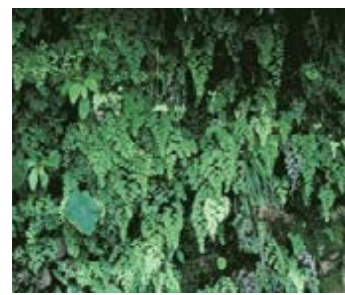
SPECIES	LOCATION					
	Town Centre	Entries	Park/Open Space	Riparian	Rainforest	Wetland
<i>Bougainvillea glabra</i>		X				
<i>Hardenbergia violacea</i>			X			
<i>Hibbertia scandens</i>			X	X		
<i>Kennedia rubicunda</i>				X		
<i>Pandorea pandorana 'Snowbells'</i>		X				
<i>Parthenocissus tricuspidata</i>	X	X				
<i>Rosa species</i>	X	X				
<i>Trachelospermum jasminoides</i>	X					

6.7 Grasses Planting Matrix

Grasses act as transitional elements embracing both the more manicured spaces and the vital riparian zones.

SPECIES	LOCATION					
	Town Centre	Entries	Park/Open Space	Riparian	Rainforest	Wetland
<i>Aristida ramosa</i>			X	X		
<i>Austrodranthonia racemosa var. racemosa</i>				X		
<i>Bothriochloa decipiens</i>				X		
<i>Carex appressa</i>			X			
<i>Chloris divaricata var. divaricata</i>				X		
<i>Commelina cyanea</i>			X	X		
<i>Danthonia longifolia</i>			X			
<i>Danthonia tenuior</i>			X			
<i>Dianella species</i>		X	X	X	X	X
<i>Dichelachne micrantha</i>			X			
<i>Dichopogon strictus</i>				X		
<i>Dietes bicolor</i>	X					
<i>Dietes grandiflora</i>	X	X				
<i>Dietes iridioides</i>	X					
<i>Echinopogon ovatus</i>				X		
<i>Entolasia stricta</i>				X		
<i>Eragrostis brownie</i>				X		
<i>Juncus usitatus</i>			X			
<i>Lomandra species</i>	X	X	X			X
<i>Microlaena stipoides var. stipoides</i>			X	X		
<i>Poa labillardieri var. labillardieri</i>				X		
<i>Themeda australis</i>			X	X		

Note: The species outlined in the planting matrix are a guide to the approach to planting taken at Calderwood Valley. The species list may need to be extended as site specific requirements become apparent with the detailed design development.



Adiatum affine



Ajuga reptans



Banksia 'Birthday Candles'



Baumea articulata



Convolvulus mauritanicus



Cyperus exaltatus



Dampiera diversifolia



Echinacea purpurea



Ficinia nodosa



Grevillea 'Bronze Rambler'



Juniperus sabina



Liriope muscari



Myoporum parvifolium



Rosa 'Amber Sun'



Scaevola aemula



Schoenoplectus validus

6.8 Ground Covers Planting Matrix

Reinforce the character of each zone on the ground plane

SPECIES	LOCATION					
	Town Centre	Entries	Park/Open Space	Riparian	Rainforest Entry	Wetland
<i>Adiatum affine</i>			X			
<i>Ajuga reptans</i>	X		X			
<i>Alternanthera dentata 'Little Ruby'</i>	X	X	X			
<i>Arthropodium cirratum 'Matapouri Bay'</i>		X	X			
<i>Australie pusilla</i>			X			
<i>Banksia spinulosa 'Birthday Candles'</i>	X		X			
<i>Brachyscome multifida</i>	X		X			
<i>Convolvulus mauritanicus</i>			X			
<i>Dampiera diversifolia</i>	X		X			
<i>Desmodium varians</i>				X		
<i>Dichondra repens</i>	X		X	X		
<i>Doodia aspera</i>	X		X			
<i>Echinacea purpurea</i>			X			
<i>Euphorbia species</i>		X	X	X		
<i>Geitonoplesium cymosum</i>				X		
<i>Glycine species</i>				X		
<i>Grevillea 'Bronze Rambler'</i>	X		X			
<i>Helichrysum petiolare</i>			X			
<i>Iris germanica</i>			X			
<i>Juniperus conferta</i>	X	X				
<i>Juniperus horizontalis</i>	X					
<i>Juniperus Sabina</i>	X					
<i>Lastreopsis microsora</i>			X			
<i>Laxmannia gracilis</i>			X			
<i>Liriope muscari</i>	X	X	X			

SPECIES	LOCATION					
	Town Centre	Entries	Park/Open Space	Riparian	Rainforest Entry	Wetland
<i>Marsdenia rostrata</i>				X		
<i>Myoporum parvifolium</i>	X		X			
<i>Nandina domestica 'Nana'</i>	X	X	X			
<i>Pratia purpurascens</i>	X			X		
<i>Rosa 'Flower Carpet'</i>	X	X	X			
<i>Scaevola aemula</i>	X		X			
<i>Sigesbeckia orientalis subsp. orientalis</i>				X		
<i>Stachys byzantina</i>			X			
<i>Tulbaghia violacea</i>		X	X	X		
<i>Viola hederacea</i>	X		X			
<i>Zephyranthes candida</i>	X		X			

6.9 Wetland Planting Matrix

Species selected to stabilise constructed wetlands and reinforce the natural and ecosystems of these areas.

SPECIES	LOCATION					
	Town Centre	Entries	Park/Open Space	Riparian	Rainforest Entry	Wetland
<i>Baumea articulate</i>						X
<i>Bolboschoenus caldwelli</i>						X
<i>Bolboschoenus fluviatilis</i>						X
<i>Cyperus exaltatus</i>						X
<i>Elaeocharis sphacelata</i>						X
<i>Entolasia marginata</i>						X
<i>Ficinia nodosa</i>						X
<i>Juncus usitatus</i>						X
<i>Potamogeton tricarinatus (aquatic)</i>						X
<i>Schoenoplectus mucronatus</i>						X
<i>Schoenoplectus validus</i>						X
<i>Triglochin procerus (aquatic)</i>						X

Note: The species outlined in the planting matrix are a guide to the approach to planting taken at Calderwood Valley. The species list may need to be extended as site specific requirements become apparent with the detailed design development.

7.0 RECREATIONAL PRINCIPLES

7.1 District Context

The Shellharbour City Councils Open Space, Recreation & Community Facilities Needs Study (2010) identifies that the Calderwood Valley is part of the Illawarra Highway North precinct. The Needs Study highlights that any development of open spaces in the area should be based on the key principles for the design of Park & Sporting Grounds as outlined in the table 5.1.1.

The Calderwood Urban Development Control Plan (2013) outlines a number of objectives for conservation and open space areas catering to recreation. The Landscape Master Plan has been developed in response to guidelines outlined in both the Needs Study and Development Control Plan. Relevant objectives for the Natural and Park Open Space areas are as follows.

Natural Open Space

Objectives:

- To ensure that open space corridors, including land for public open space, drainage and environmental conservation are appropriately provided for within the site.
- To provide for the retention of areas of land comprising Primary Conservation Significance.
- To provide for the retention of bushland areas of Johnston's Spur.
- To provide for the dual use of land for open space, conservation and critical drainage function.

Park Open Space

Objectives:

- To ensure that land is provided within the site to meet the reasonable demand of the future population of the site for public open space (local parks, district and city wide parks and sporting grounds).
- To ensure that land for public open space is appropriately located and distributed within the site having regard to the location of future residential neighbourhoods, and that the location of public open space responds to the particular environmental features of the site.
- To investigate opportunities for sharing facilities ie. schools, clubs, amenity blocks etc..

The broad principles for the provision of recreational areas include:

- that a community's health and well-being is important
- the head of the community for recreational facilities be considered
- recreational facilities be developed to allow equitable access
- participation by the community is encouraged by providing vibrant, easily accessible and safe recreational facilities
- a diverse range of recreational facilities are considered for people of all ages and abilities

Design principles to guide the development of recreational facilities should include:

- provision of linkages to the broader network of open space and allow access in the Calderwood Valley
- provision of linkages to other community facilities
- design of open spaces to provide for a variety of recreational activities including passive, family use, personal fitness and 'new' active recreational uses such as adventure playgrounds if required
- flexibly designed spaces that can be adapted to changing community needs

The key recreational opportunities for the Calderwood Valley have been identified and summarized in Figure 14 with consideration given to the open space type most appropriate for each opportunity.

Figure 16 Recreational Opportunity Matrix

RECREATIONAL OPPORTUNITIES	OPEN SPACE TYPE						
	Urban Centre (Village/ Town)	City Wide Park	Parkland: District Park	Parkland: Local Park	Sportsfield	Riparian/ Natural	Open Space Corridor
Open grassed area suitable for informal games and recreation		X	X	X	X		
Good links to all open space areas	X	X	X	X	X	X	X
Barbecue areas		X	X		X		
Picnic Shelters		X	X	X	X		
Picnic Tables and seats		X	X	X	X		
Focal event space for community gatherings	X	X	X		X		
Playground-Structured	X	X	X	X	X		
Playground - Natural		X	X	X	X		
Shaded seating areas	X	X	X	X	X	X	
Winter solar access seating areas	X	X	X	X	X		
Viewing areas		X	X	X	X	X	
Productive Parklands (Community Gardens)			X		X		X
Pedestrian paths	X	X	X	X	X	X	
Dog Off Leash area					X		
Youth recreation	X	X	X	X	X		
Shared pedestrian / cycleway (2.5m wide)	X	X	X	X	X	X	
Multi use games court			X		X		
Fields for Organised Sport					X		
Technology focussed recreation / WiFi	X	X	X		X		
Pathway - mown grass						X	X
Equestrian		X			X		X
Mountain Bike / BMX / Trail Head		X		X	X		X
Parkour		X			X		X
Fitness Node		X	X	X	X		



7.2 Key Recreational Usage Opportunities

7.2.1 Active recreation

Active or facilitated recreation is provided across the site, however main sporting fields and facilities lie east of the site in the vicinity of Calderwood Road and North Macquarie Road. This provides a clustering of recreation facilities that responds to both the access network and landform, as well as the physical remnant fabric of green corridors which influence the overall network of the proposed recreation location.

This includes consideration of the following factors:

- The sporting zone provides the highest carrying capacity for more intensive use
- The Macquarie Rivulet Drainage corridor interface is adaptable for recreation use
- Close relationship to existing and proposed educational precinct including potential co-use of facilities.
- Core relationship to the town centre and main access collector roads
- Better surveillance and security to the centre of site

Stockland will enter a community engagement process in conjunction with Shellharbour City Council to ensure input of youth, community groups and sporting codes to determine the needs of the community for open and recreational space at Calderwood Valley.

7.2.2 Park Recreation

Park recreation is provided across the site and will include district and local parks, which will cater for a range of scales and nature of activities and facilities ranging from passive to active landscape settings found across the site such as open space adjacent water bodies provide for varied recreational activities for Calderwood. This includes consideration of the following factors:

- Drainage corridor interface adaptable to recreation use
- Close relationship to neighbourhood centres
- District / local parks

7.2.3 Playgrounds - Exploration & Interpretation Play

Playscapes will be an integral aspect of open space development in the Calderwood Valley. The play role to be developed in each open space will vary from an informal to more structured playground.

The approach to informal playground design will emphasize the use of natural design themes. "Natural playgrounds" are play environments that blend natural materials, features, and indigenous vegetation with creative landforms to create purposely complex interplays of natural, environmental objects in ways that challenge and fascinate children and teach them about the wonders and intricacies of the natural world while they play within it.

Child play areas will be designed to have good sight lines and opportunities for natural surveillance, especially after hours, in order to reduce opportunities for malicious behaviour.

Play components may include earth shapes (sculptures), environmental art, indigenous vegetation (trees, shrubs, grasses, flowers, lichens, mosses), boulders or other rock structures, dirt and sand, natural fences (stone, willow, wooden), textured pathways, and natural water features. Consideration will be made in regard to the selection of play equipment ensuring it is made of robust materials with minimum plastic in order to reduce opportunities for malicious damage and allow easy repair.

The incorporation of an all abilities playground may be considered in the Calderwood Valley development however is not a requirement of the current Calderwood Valley Voluntary Planning Agreement (VPA). Should the design of an all abilities playground be incorporated the focus will be on designing:

- custom-made, accessible and intergenerational play equipment and amenities
- incorporating accessible pathways, passive areas, sensory and tactile play and graduated challenges
- points of recognition and visual cues,
- fencing, accessible parking and bus drop off zones.

City park (CW2) is currently proposed as the best location for an all abilities playground. It is thought to be ideal with its links to the town centre, retail area, and community parkland.

7.2.4 Community Events

Community events are an important aspect of community building and sustaining community pride and involvement. Open space will play an important role in providing for a range of events to be undertaken across the Calderwood Valley.

Events may be a part of Council programmes but also may have a community basis when attractive and functional venues are provided. Spaces that are to cater for event usage should consider event mode requirements such as:

- A potential area that can be used as a stage for events - maybe a platform that functions as a stage, or space for the setup of temporary stage
- At least single and ideally 3 phase power
- Possible night lighting for events
- Effective balance of hard paved areas to grass that cater for event volumes of usage but are appropriate in scale in non-event times

Potential Community events / activities include:

- family fun days / carnivals
- outdoor theatre
- community markets
- sporting events (fun runs etc.)
- awards / presentation days
- community gardens

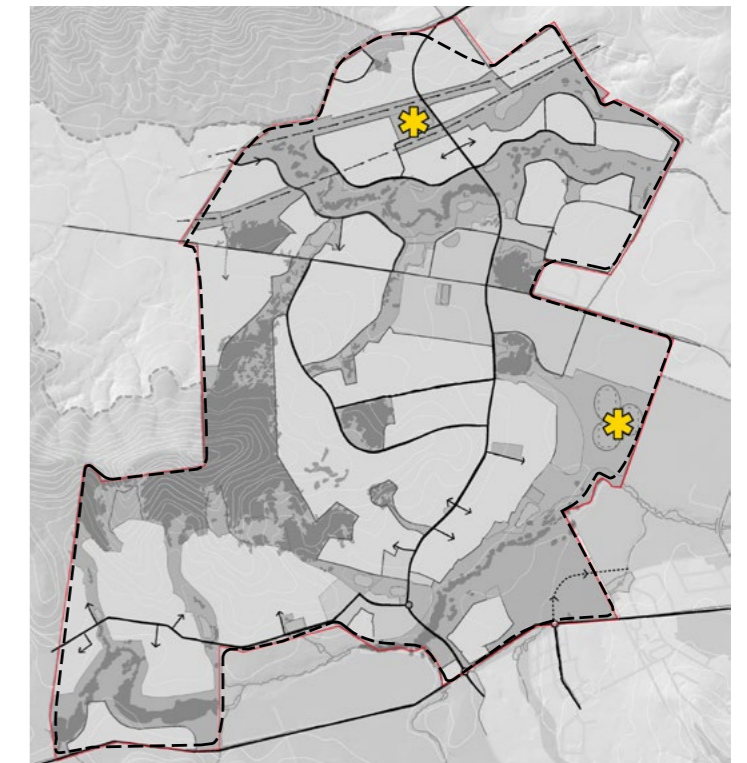


Figure 17 Location of proposed sportsfield



7.2.5 Dedicated Youth Recreation

Catering for youth (aged 12-18) needs through open space and recreation facilities is a challenging area. However there are some consistencies that may form an overall approach to ensuring youth needs are considered.

Some principles for the provision of places to meet, interact and interface (with other sections of the community):

- Gathering and meeting spaces that provide both a sense of ownership to youth in addition to sustainable levels of interaction with the broader community
- An appropriate level of activity (exercise, games) that can coexist with adjoining uses
- Ability for the space and facilities to evolve with changing needs and the influence of its youth constituents / users

7.2.6 Technology Focused Recreation

The open space development of the Calderwood Valley will investigate possible new and developing technologies that may integrate in to its spaces and facilities. These should be as robust as possible, and minimise recurrent maintenance requirements.

Examples of technology that may be used are:

- Empower Play Pump**
Integration of active hydraulic pumping mechanism to play equipment - activated by the equipment day to day motion and use. This can expose children to the principles of hydraulics and mechanics especially if a water-raising mechanism is visible.
- Play power - Play Generators**
Which have the ability to generate power that may activate play elements / lighting / displays / charge ipods and mobile phones etc. and can be customised. Available as "off the shelf" items.
- Interactive technology**
Can include digital displays / terminals to public domain, motion activated audio and video.
- Free WiFi**
Available in urban centres, some nominated public parks and spaces to increase connectivity where possible and where appropriate

7.2.7 Interpretation

Interpretation in the Calderwood Valley will aim to integrate core themes relating to the site in park and open space design.

The core themes are:

- Rural character
- Aboriginal and European history
- Vegetation, water and the environment

These themes will be woven into open space design and the design and fabric of public art in the public domain should this be considered.

7.2.8 Productive Parklands

Community gardens provide an opportunity for local and wider residents to be involved within the site at a hands on level. The potential management of this area may include 'ownership' of individual plots whereby individuals or groups may rent the plot for a small annual fee. Alternatively the garden may be managed overall by a committee or group.

7.2.9 Dog Parks

The Companion Animals Act aims to ensure that the role of pets in our society is supported through public domain and open space design and management. As a primarily detached housing community a large proportion of Calderwood Valley residents are expected to have pets.

Dogs will probably be the greatest in number (of types of pets) and are the most significant in determining how open spaces may contribute to their role in the family group. Walking the dog is a key recreational activity.

A strategic approach to distribution of off leash areas is desirable, so that these are equitably located, and maximise "walk up" use rather than needing to be accessed by vehicle. Designated off leash dog use areas are currently located at:

- Flinders
- Barrack Heights
- Oak Flats
- Mount Warrigal
- Shellharbour
- Albion Park Rail (Croom Regional Sporting Complex)

There are 6 off leash dog exercise areas in the Shellharbour LGA with the area at Albion Park Rail presently being the closest in distance to Calderwood Valley.

The provision of an additional off leash space is to be confirmed, however the Calderwood Valley Planning Agreement currently highlights that a fenced dog off leash area be considered for the proposed sporting ground facility. Refer to Section 4.2.14 of the Master Plan which outlines a design strategy for the DOLA in that area.

The design of a dog agility park and the location of the park can be subject of workshops between Stockland and Shellharbour City Council.

8.0 PUBLIC ART PRINCIPLES

At the time of updating this Landscape master plan, a public art strategy is in the final stages of development as a separate document to support the Calderwood Valley Landscape Master Plan. The following documentation provides a framework for how this strategy is to be approached. The strategy is being developed in collaboration with Shellharbour City Council.

8.1 Public Art & Landscape

8.1.1 General Approach & Consultation

Opportunities to incorporate public art into the public domain can occur in a range of situations.

Public art can be incorporated as formative design input not just as overlay elements to a design. Opportunities may include:

- Using technology such as smartphone Apps to enhance the experience
- Development of a Calderwood Valley art trail
- Focal precinct entries
-
- Town centre squares and plazas
- Focal intersections and locations to street corridors
- Local open space
- Major street corridors
- Walking / cycle trails where applicable
- Promotion of natural features such as water, elevation, open space, views and vistas

The potential for integration of public art into these spaces should be identified at the initial stages of a project to enable complete integration into the design process, and incorporation of the artwork as a functional and integral component of the scheme rather than an overlaid installation.

A public art component can provide a reference to physical or cultural characteristics of a site or neighbourhood, or alternatively may provide a purely visual element, enhancing the appreciation and diversity of the public domain.

In all cases public art should contribute to the identity and character of open space and landscape and engage users of open space in an ongoing way. Public spaces should be designed to be flexible in order to accommodate a mixture of permanent and temporary activation such as events, public art, busking and street performance.

Future consultation will be carried out with the community and Council by Stockland in order to develop directions and strategies for the incorporation of public art at Calderwood Valley. The Public Art Strategy and associated consultation will be carried out as a separate process to the Landscape Master Plan, however will be based on the principles outlined in this section of the document.

8.1.2 Design Principles

- Incorporate public art treatments to reinforce town centre character and identity
- Art elements may include ephemeral works which involve community input over time
- Integrate public art elements that interpret everyday elements
- Public spaces designed to be welcoming and accessible even when not 'activated' by events and activities.

8.1.3 Materials Principles

- Art components to be of durable materials and resistant to potential vandalism.
- Art components should use materials that are low in maintenance durable and have longevity.

8.1.4 Conceptual Framework for Public Art

The framework for the Public Art is outlined in further detail in the Public Art Strategy document that is in the final stages of being approved. Following feedback from community consultations as part of this strategy, the curatorial vision was developed, with the following themes to be explored:

- Valley and Rural Character (pasture, rivulet, undulating slopes, cloud, mist)
- Escarpment (mist, edge, natural rock formation)
- Flora and Fauna (sounds, tracks, colour palette, scent)
- Water- Macquarie Rivulet (water sound qualities, fluvial movement, water rhythms)
- Wind and Air (effects of wind on grasses and water, patterns and textures)
- Heritage- Aboriginal and European (discovery, exploration, culture, rural forms, traditional land use)

The guiding principles that should be reflected in each piece of public art throughout Calderwood Valley are

- Artistic excellence
- Quality
- Innovative design
- Site specificity
- Community
- Sustainability

Further detail is provided in the Public Art Strategy in regards to the vision and guiding principles (refer to Appendix A).



9.0 DELIVERY & MAINTENANCE PRINCIPLES

9.1 Delivery & Process

A streamlined design, construction and maintenance process is critical for successful, efficient and high quality delivery of the Calderwood Valley landscape. The flow chart below summarises the journey in designing, documenting, constructing and maintaining the landscape at Calderwood Valley.

The Master Plan document will also be reviewed within 12 months of acceptance and every 2 years thereafter in order to update the document in line with current community and Council expectations.

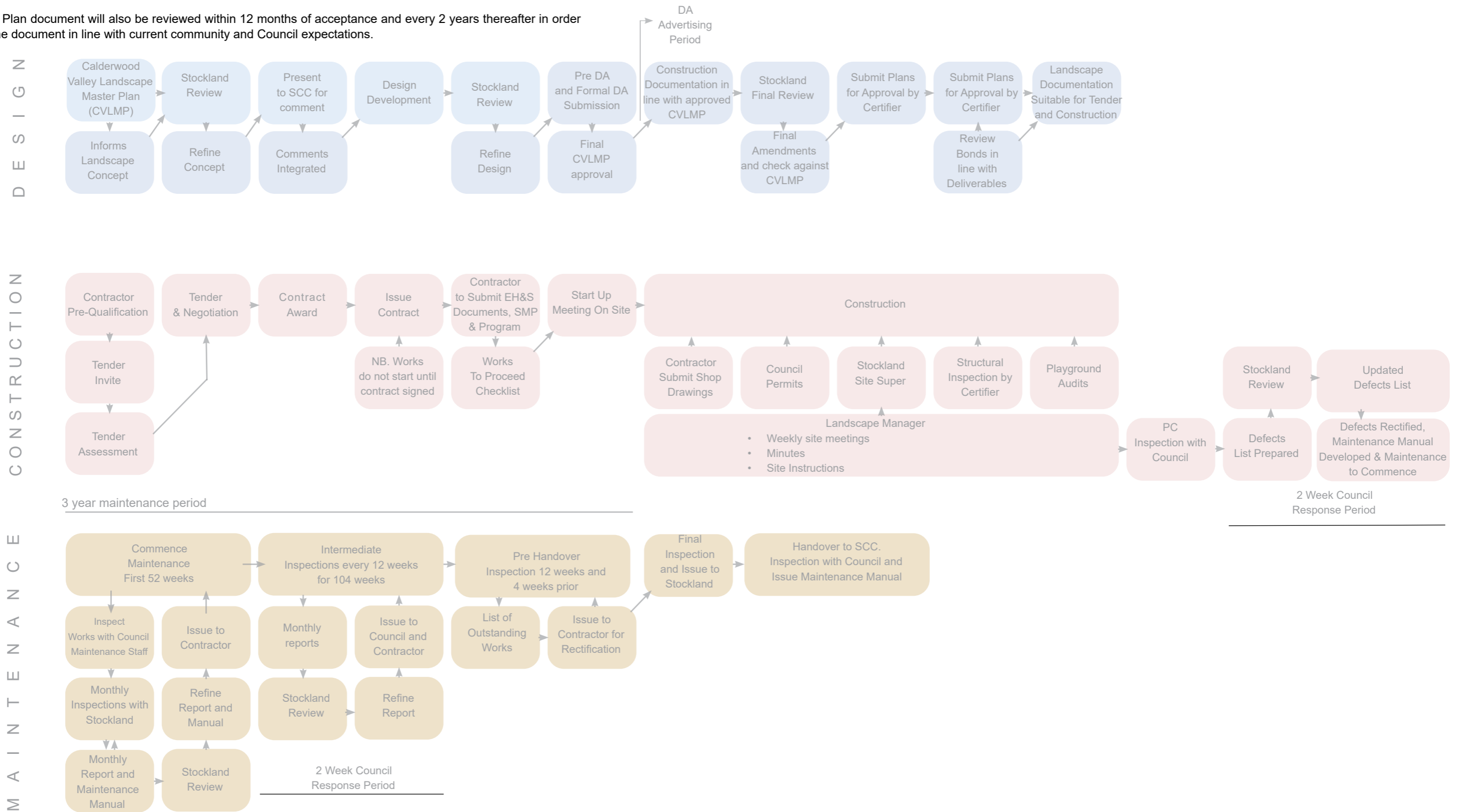


Figure 18.0 Delivery and Process Flow Chart

Note: Under the provisions of the VPA the developer will maintain the open space areas comprised of entry parks, district parks, local parks and sports fields for 3 years following the agreed point of Practical Completion.

9.2 Maintenance Principles

The following outlines the maintenance strategy and principles for the Calderwood Valley. The indicative strategy is to be agreed by all parties concerned.

9.2.1 Design

The design process will take long-term maintenance requirement into consideration as follows:

- Selection and specification of materials and planting
- Design of grades of turfed and/or grassed areas requiring mowing
- Mowed areas to be designed to openly flow with minimum tight corners
- Quality furniture elements to be specified for longevity at price points that will enable future replacement by Council
- Irrigation to be considered in areas as outlined in the VPA. These being
 - District Park D2-5
 - City Park CW2
 - Sportsfield S1
- Mulched garden beds
- Location of garden beds and bins in high use and easily accessible areas
- Minimised location and extent of garden beds
- Retain open views within parks to deter dumping
- Minimize use of native gardens within parks
- Avoid the need for traffic control where possible

The following design guidance should be considered for all design and construction phases:

- Australian Standards
- Stockland Corporation's Global Minimum Requirements
- Building Code of Australia

Maintenance and frequency is critical to achieving a high quality landscape. Table 2 below outlines the typical maintenance requirements for the landscapes and public open spaces of Calderwood Valley. This overview will be expanded on following design documentation when a detailed maintenance manual will be produced for subsequent stages of the development.

Area	Frequency	
Village Centre	twice weekly	
Town Centres	daily	
Sales Office	daily	
Major Entries	twice weekly	
Calderwood Valley parks		
- Local	weekly	
- District	twice weekly	
- City	weekly	
Major Streets	weekly	
Item	Frequency	When
BBQ's & bins	SCC from PC	Weekly
Graffiti and vandalism	immediately	
Plant replacement	annually	Autumn
Mulch	annually	Spring
Prune & fertilise	annually	Spring
Prune	annually	Autumn
remove tree stakes and remulch bowls	after 12 months	
Lawn renovation in open space:		
warm season grass	annually	Spring
cold season grass	annually	autumn

Table 2 Maintenance frequency

9.2.2 Irrigation

Opportunities to incorporate irrigation into the public domain will be investigated by Stockland in order to achieve cost effective levels of maintenance using sustainable water management practices.

The primary areas to be considered for irrigation systems will include:

- Sport grounds

Water will primarily be sourced through existing water licences and irrigation designs will be developed to consider:

- Water supply characteristics, amount flow water and quality
- Estimated water requirements based on horticultural assessment
- Water restrictions and strategies to cope with drought ed. sprinklers set to early morning
- Soil types and root zone depths
- System performance targets
- Costs
- Maintenance procedures
- Documentation of repairs
- Installation of automatic controllers with water conserving functions
- Installation of central control systems for complete system automation

9.2.3 36 month Maintenance Period

Refers to the contract maintenance period that is included in the implementation of open spaces and embellishment works by the developer and will be a minimum 36 month period depending on the park type.

The maintenance period incorporates a Defects Liability Period for hard landscape works and a plant establishment period for soft landscape works. During this time defects including plant losses will be monitored and addressed prior to final inspection (by Council) and handover to Council.



Copies of As Constructed Drawings of the embellishment works will be provided to Council along with any warranties etc.

Establishment of landscape quality setting:

- Hard landscape finishes to be "settled in" and stable without deflections or drainage ponding
- Furniture elements maintained with firm fixings and any vandalism repaired, or damaged items replaced.
- Soft landscape surfaces fully established and any non-established areas replaced.
- Turfed/grassed areas subject to weed control
- Turfed areas mown and watered to a regular regime for establishment
- Plantings fully established and site hardened. Any non-establishment/failed items replaced.
- Tree and garden bed plantings watered to a regular regime for establishment
- Garden bed areas subject to weed control
- Garden plantings pruned/shaped as required
- All plantings fertilised as applicable
- Litter removal from open space
- Dumping removed

9.2.4 Supplementary Maintenance by Developer

The developer may determine in agreement with Council that it is desirable to continue maintaining areas of open space for an extended period after handover.

This supplementary maintenance could include, but is not limited to:

- Turfed/grassed areas subject to weed control, mowing edging
- Garden bed areas subject to weed control and regular re-mulching
- Garden plantings pruned/shaped as required
- All plantings fertilised as applicable
- Litter removal from open space
- Dumping removed

9.2.5 Handover and Ongoing Maintenance

Following the completion of the 36 months 'on maintenance' period, the developer will invite Council to inspect the works to be handed over. Council will advise of any maintenance issues that need to be addressed with an inspection 3 months prior to Handover and then another 1 month prior to Handover. The developer will notify Council one year prior Handover date of an Item of Contribution works to Council.

At least 6 months prior to Handover, the developer will submit an appropriate Plan of Management for works to be handed over. Maintenance issues identified will be noted by Council and forwarded to the developer within 5 working days. Any defects identified will be rectified by the developer within 20 working days of receiving Council's notification.

The Final Handover Inspection with Council, client, contractor and Landscape Architect is effectively a "rubber stamp" or confirmation of the completed landscape being suitable for Council to accept.

Certain maintenance objectives that are deemed to fall outside the current scope of Councils capabilities and resources are identified as such with appropriate strategies for implementation identified.

Maintenance of quality landscape setting:

- Hard landscape finishes subject to weed management
- Any failure of hard landscape finishes to be identified and actioned
- Furniture elements monitored with firm fixings and any vandalism repaired, or damaged items replaced.
- Turfed areas mown and irrigated to regular regime
- Garden bed areas subject to weed control
- Tree and garden bed vandalism actioned and replaced
- Litter removal from open space
- Dumping removed

9.2.6 Presentation and Maintenance of Parks

The term landscape presentation is used to indicate the level of landscape detail that is proposed to be applied to embellishment of open space areas.

Presentation is typically linked to landscape character. As such open spaces of plaza / square type character may be generally associated with an urban / commercial (or higher) presentation / maintenance standard, whilst bushland character is sustainable with a natural (or lower) presentation / maintenance standard.

Figure 17 identifies the maintenance presentation standard applicable to each landscape character zone. Landscape presentation are identified for open spaces and will inform the landscape design process

Urban/Commercial presentation

This landscape presentation style will apply to those open spaces which lie within the denser development zones of the Calderwood Valley, and which serve a higher intensity and recurrence of community use. Levels of presentation are higher than other spaces to meet these usage demands and to complement the urban character of their locations.

Residential / Parkland presentation

Residential / parkland landscape presentation will apply to active and passive recreational use spaces catering for moderate levels of usage including family use, social gatherings, fitness and exercise activities, and playgrounds.

This presentation type will typically encompass a combination of landscape character types which will dictate variations in the level of presentation across the open space dependent on the character and type / level of usage it receives.

Residential / parkland presentation will generally be located in a landscape setting that is of woodland, parkland, or open space water character or a combination of each.

Residential / parkland will also apply to Bushfire Protection Zones where recurrent maintenance is required to address fuel management requirements.

Natural presentation

Natural landscape presentation will apply to low level and intensity of use spaces areas that incorporate and adjoin natural systems.

Typically green corridors and the interface areas of adjoining parks will fall into this category. Retention of existing vegetation and revegetation (if applicable) with indigenous species will provide a generally self sustaining landscape with low recurrent maintenance demands.

PRESENTATION STANDARDS			
	Urban/ Commercial	Residential Parkland	Natural Parkland
City Wide Parks	H	M	M/L
Urban (Town and Village Centre)	H	H	M
District Park	H	H	M
Local Park	H	M	M
Sportsground	H	M	-
Riparian	-	-	L

LEGEND

- H High Landscape Maintenance Standards
- M Medium Landscape Maintenance Standards
- L Low Landscape Maintenance Standards

Figure 18.0 Maintenance Presentation Standards

10.0 APPENDIX A: CALDERWOOD URBAN DEVELOPMENT PROJECT OPEN SPACE ANALYSIS PLAN

(Shellharbour and Wollongong City Council LGAs)

Parks Schedule	"2010 Concept Plan OS (Ha)"	"TOTAL OS in SCC VPA (Ha)"	Proposed SHCC (Ha)(1)	Proposed SHCC (Ha) (2)	Proposed WCC (Ha)	Proposed Total (Ha)	Vari from 2010 Concept Plan (3)	"TC Proximity additional OS"	Comment
D1	1.00					1.00	0.00	0.00	OS increase within Town Centre proximity. Combined with S2
D2	1.00	1.00				1.00	0.00		No change - OS included in Non Core Lands.
D3	1.00	1.00	1.00	1.00		1.00	0.00		Land Dedicated and construction completed
D4	3.80	3.80	3.14	3.14		3.14	-0.66		Land Dedicated and Agreed with SHCC
D5	1.00	1.00				1.00	0.00		No change - OS included in Non Core Lands
L1	0.30				0.30	0.30	0.00	0.00	OS increase within Town Centre proximity to min 0.3ha for WCC
L2	0.30					0.00	-0.30	-0.30	Consolidated with D1 and SP2 in WCC LGA based on feedback from WCC
L3	0.30				0.30	0.30	0.00	0.00	OS increase within Town Centre proximity to min 0.3ha for WCC
L4	0.20	0.20	0.67	0.82		0.82	0.62	0.62	OS increase within Town Centre proximity
L5	0.20	0.20	1.52	1.17		1.17	0.97	0.97	OS increase within Town Centre proximity
L6	0.20	0.20	0.32	0.25		0.25	0.05	0.05	Small OS increase to integrate with TCS Urban Design
L7	0.20	0.20				0.20	0.00		No change - OS included in Non Core Lands
L8	0.20	0.20	0.20	0.20		0.20	0.00		Land Dedicated and Agreed with SHCC
L9	0.20	0.20	0.51	0.20		0.20	0.00		Park decreased to meet requirements of MOD 4 EPBC approval
L10	0.20	0.20	0.20	0.20		0.20	0.00		Land Dedicated and Agreed with SHCC
L11	0.20	0.20	0.20	0.20		0.20	0.00		Land Dedicated and Agreed with SHCC
L12	0.20	0.20	0.20	0.20		0.20	0.00		No change proposed
L13	0.20	0.20				0.20	0.00		No change - OS included in Non Core Lands
L14			0.00	0.00		0.00	0.00		Proposed MOD4 park deleted in Stage 5 as requested by SHCC
L15			0.89	0.33		0.33	0.33	0.33	Proposed new park along Escarpment Drive within Town Centre proximity
L16						0.00	0.00	0.00	Proposed new Town Square within Town Centre proximity
L17			0.38	0.65		0.65	0.65	0.65	Proposed new park in Stage 7A within Town Centre proximity
L18				0.87		0.87	0.87	0.87	Proposed new park in Stage 7C to enhance connection to Johnsons Spur
CW1	1.31				2.00	2.00	0.69		MOD 4 OS increase
CW2	2.00	2.00	2.00	2.55		2.55	0.55		No change proposed - OS included in TC proximity
CW3	3.35	3.43	3.43	3.48		3.48	0.13		Embellishment reallocated in agreement with SHCC and embellishment reduced
S1	15.84	15.84	20.74	24.18		24.18	8.34	8.34	OS increase within Town Centre proximity Sportsfield Open Space 22.2ha Passive Open Space 1.98ha
S1 Active				22.20 Ha					
S1 Passive				1.98 Ha					
S2					1.60	1.60	1.60	1.60	OS increase within Town Centre proximity
TOTAL	33.20	30.07	35.40	39.44	4.20	47.04	13.84	13.13	

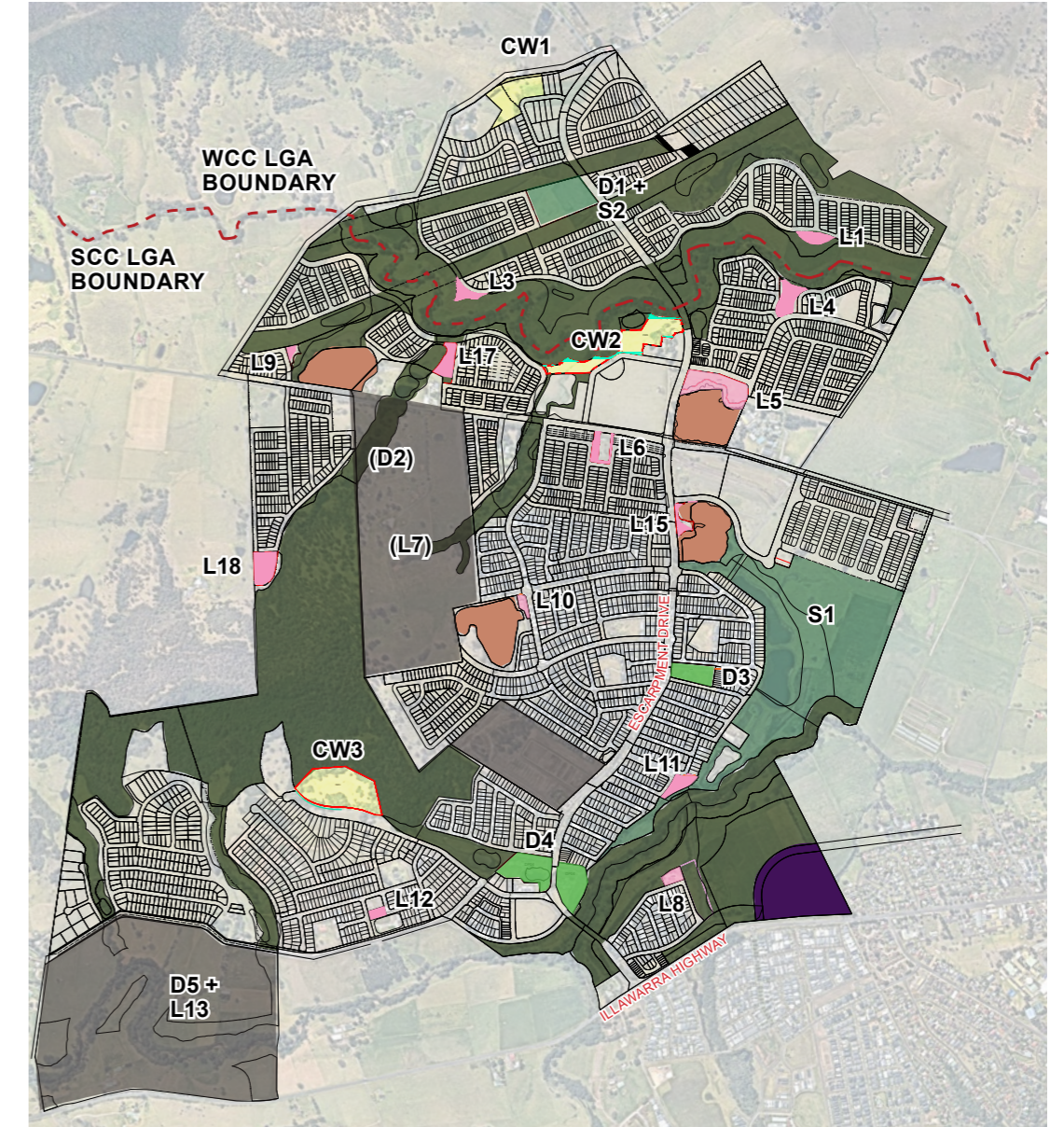


Figure 11.0 Open Space Analysis Plan

Source: Taylor Brammer Landscape Architects

LEGEND

■ Sportsfield Proposed	■ Environment Reserves
■ City Wide Parks Proposed	■ Openspace Corridors / Citywide Bushland
■ District Parks	■ Rural Landscape/lifestyle
■ Local Parks	■ Non-Core Land

Notes

- Nov 2022 Landscape Masterplan Open Space Allocations
- Nov 2023 Landscape Masterplan Open Space Allocations
- MOD 4 approval required 43.81ha of Open Space SCC and WCC

10.1 APPENDIX B: CALDERWOOD SPORTFIELD OPEN SPACES LAYOUT PLAN (S1)

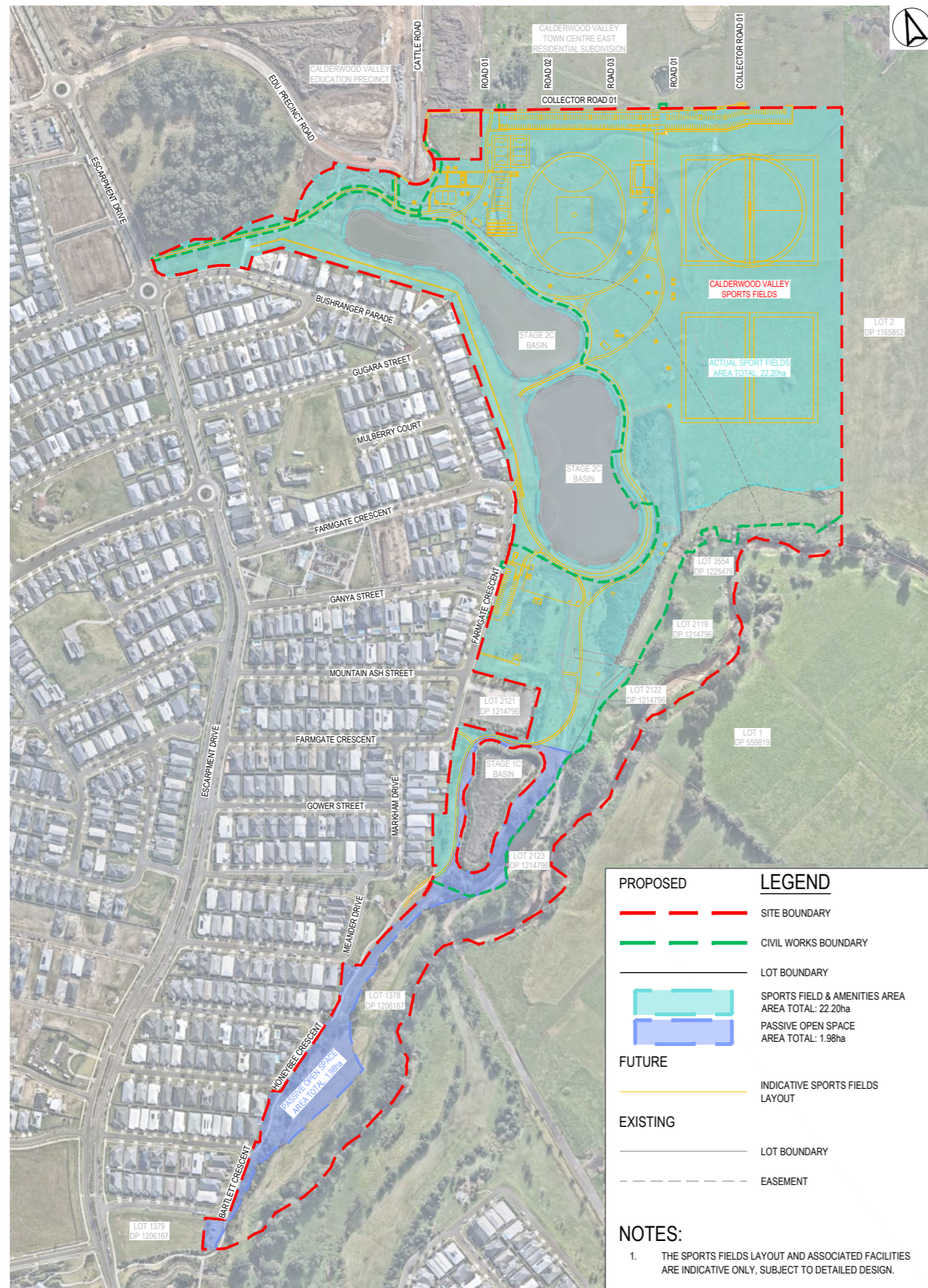


Figure 19 Prepared by Maker Eng dated 25th september 2025
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