

ITEM 4 WEST DAPTO PLANNING CONTROLS REVIEW - POST EXHIBITION

The West Dapto Vision 2018 was adopted by Council on 10 December 2018. The Vision includes a number of implementation actions including the need to review the controls in Wollongong Development Control Plan 2009. As a result, staff have reviewed draft Chapter D16: West Dapto Release Area and draft Chapter B2: Residential Subdivisions. Staff also proposed to introduce the draft West Dapto Open Space Design and Technical Manuals to provide more guidance for planners, developers and the community.

On 22 July 2019 Council resolved to exhibit the Draft Chapter D16, Chapter B2 and the draft Open Space Design and Technical Manuals. The draft documents were exhibited from 2 August to 2 September 2019. Council received 12 submissions to the draft DCPs and seven addressing the draft Manuals. This report summarises issues raised in submissions, some of which have resulted in changes and improvements to the draft documents.

It is recommended Council adopt the amended draft Chapter D16: West Dapto Release Area, draft Chapter B2: Residential Subdivisions, draft West Dapto Open Space Design Manual and draft West Dapto Open Space Technical Manual. All three documents will allow for improvements to be made based on 10 years of working knowledge and contribute to achieving the Vision for West Dapto.

Following adoption, it is suggested that further refinement is required to Chapter D16 relating to the precinct planning process. This work should not delay adoption of the substantive amendments made and exhibited to begin guiding development in the release area.

RECOMMENDATION

- 1 Council note the issues raised through submissions during exhibition held 2 August to 2 September 2019.
- 2 Council adopt Draft Chapter B2: Residential Subdivision and Draft Chapter D16: West Dapto Release Area as revised for inclusion in the Wollongong Development Control Plan 2009 and give notice of its adoption.
- 3 Council adopt the Open Space Design and Technical Manuals.
- 4 Staff further review Section 14 and 15 in the Draft DCP Chapter D16: West Dapto Release Area relating to precinct planning and progress to public exhibition for a minimum 28 days. The outcomes of the exhibition process be reported to Council with recommendations for consideration.

REPORT AUTHORISATIONS

Report of: Chris Stewart, Manager City Strategy

Authorised by: Linda Davis, Director Planning + Environment - Future City + Neighbourhoods

ATTACHMENTS

- 1 Draft Development Control Plan Submissions Table
- 2 Draft Open Space Manuals Submission Table
- 3 Draft Chapter D16: West Dapto Release Area
- 4 Draft Chapter B2: Residential Subdivision
- 5 Draft West Dapto Open Space Design Manual
- 6 Draft West Dapto Open Space Technical Manual

BACKGROUND

West Dapto is the region’s largest urban release area. In December of 2010, Part D of the Development Control Plan 2009 – D16 West Dapto Release Area commenced outlining key requirements for planning and guidance for development of the release area.

In December 2018, Council adopted a revised West Dapto Vision. The revised document includes a vision statement and eight (8) key principles relating to transport, water management, conservation, open space, community facilities, town centres, housing and employment. A detailed review of the DCP provisions was identified as part of the next step in implementing the principles in the West Dapto Vision.

The DCP review process has highlighted several issues with the DCP D16 West Dapto Release Area and B2 Residential Subdivisions in terms of its consistency. Based on a working knowledge and stakeholder feedback gained over the past 10 years, several improvement opportunities were identified.

To create a more focused and detailed network of open space in the release area, the Draft West Dapto Open Space Design and Technical Manuals were developed to guide the design process of these important public spaces ensuring quality outcomes for the release area.

At the meeting held 22 July 2019, Council resolved that:

- 1 Council endorse the draft DCP Chapter D16: West Dapto Urban Release Area, draft DCP Chapter B2: Residential Subdivisions, draft Open Space Design Manual and draft Open Space Design Technical Manual for public exhibition for a minimum 28 days.
- 2 A further report outlining the submissions received from the public exhibition process with recommendations regarding progression of the draft DCP amendments be prepared for Council’s consideration.

CONSULTATION AND COMMUNICATION

Council staff held internal workshops in early 2019 to understand challenges experienced during assessment and interpretation of the key West Dapto release area aspects of DCP 2009. The revised draft Chapter D16 and Chapter B2 were reported to Council on 22 July 2019.

Following Council’s resolution at the 22 July 2019 meeting, notice was given in the local newspaper (The Advertiser 31 July 2019) of the exhibition process. There was additional media coverage, an article written in the Mercury on 22 July 2019 with Council’s resolution to exhibit and information of the exhibition included. The endorsed documents were placed on exhibition from 2 August to 2 September 2019. The exhibition was available via two pages set up on haveyoursaywollongong.com.au and hard copies available at Wollongong Central Library, Dapto Library and the Administration building front counter. Submissions were accepted until 16 September 2019. There were several consultation activities conducted during this time, including briefings to Neighbourhood Forum 8 and specific stakeholder groups. A range of stakeholders provided comments and submissions.

Council received 12 submissions to the draft DCPs and seven addressing the draft Manuals. The table below outlines a summary of issues raised in submissions, Council comment and actions or changes made to the draft documents. More detailed table of submissions relating to DCP Chapter B2 and D16 is included in Attachment 1 and for the Open Space Manuals in Attachment 2.

Theme raised	Council comment	Action
Riparian Corridors Corridor buffers and Asset Protection Zones	Riparian corridors are subject to other chapters of the DCP also. Controls included were carried over from current DCP Chapter.	Modified and updated the draft controls regarding riparian corridors to better reflect their strategic functions.
Heat Island Effect	Noted. Important point when planning for sustainable liveable communities.	Principle point added under housing principles.

Theme raised	Council comment	Action
Yallah, Marshall Mount Vision	Precinct planning still to be done for Stage 5 of the release area.	Wording added to reflect the YMM vision in section 4 of DCP.
Facilitating housing density	Noted, there will need to be some areas of high and medium housing densities in the release area. These areas should be near centres and open space and considered in precincts and centre planning. The principles include requirements for master planned centres and housing principles to support planned housing density.	No action required.
Role of built environment and chronic illnesses and disease	Council takes these comments seriously and are attempting to promote a focus on quality outcomes for our open space and community facilities.	Continue supporting involvement and coordination with the Illawarra Shoalhaven Local Health District.
Open space and green infrastructure	A focus on method, planning and guiding principles in the DCP will be used to inform discussions during planning and assessments as well as application decisions.	Promote green and blue infrastructure to be developed in the release area.
Open space - need for indicators to evaluate and monitor delivery	Noted.	Following the adoption of the DCP, the Urban release team propose to develop metrics for a range of different objectives to inform the evaluation, monitoring and reporting on delivery of development in the release areas.
Active transport and planning for community health	A key component of the transport principles is active transport at Section 6.3.	No action required.
Urban form, pedestrian amenity.	Council understands how important it is to create built environments that are safe for pedestrians. That was a key consideration in the new road cross-sections included in the Chapter B2 amendments. Further to this, D16 promotes an active transport network (walking/riding etc) as a key outcome and focus for the release area.	No action required.
Small lot housing	While it is noted that this will be an important component of housing delivered in the release area, small lot housing will need to be located appropriately nearby centres and community hubs. The housing principles are relevant when considering small lot housing in the release area. Small lot housing will also need to be addressed more specifically and while it is important there is small lot housing in the release area, it is not the intent of this chapter to outline the requirements/objectives of this typology	Additional reviews of Chapter B1 and B2 will be needed.

Theme raised	Council comment	Action
	specifically.	
Road design and desired outcomes Strengthen denied access road controls Intersection designs and spacing	Road design guidance from Council staff has varied overtime with various draft and final versions applying. This has been reviewed with extensive input from across council departments to provide a consistent set of cross sections, relevant to the whole LGA but also to establish desired built environments in the release area that respond to land use, are inclusive and accessible street environments.	Slight changes to B2 in response to submissions. Some additional diagrams added to improve communication.
Coal wash reject material reuse	This material is not discussed in either chapters that have been revised and drafted.	No action required.
Cut and fill strategy	All comments are noted. Based on a working knowledge of subdivision works, council has identified an area within policy that has resulted in undesirable built form outcomes and legacy challenges. Changing approach to cut and fill is needed to protect and promote the areas character, heritage, maintain hydrological behaviour (ecological impacts when these are significantly altered) planned housing and quality development outcomes.	Amendments to Chapter B2 in response to a need to connect the key driver to cut and fill considerations, by combining Section 5 Topography, Landform Conservation and Section 8 Cut and Fill land Re-shaping works.
Landform modification	Related to the above response. Landforms of the release area are important to conserve and should be maintained to prompt housing design diversity in response to landscape features.	As above.
D16 transitional arrangements for precinct process	Transitional arrangements were to explain the change from Neighbourhood Planning to precinct plan approach.	Place section 14 and 15 on hold. Staff to review precinct arrangements re-exhibit an approach.
Defining precinct areas	Council understands this is a major challenge and success of precinct planning relies on a useful scale and practical application of an approach.	Place section 14 and 15 on hold. Staff to review precinct arrangements re-exhibit an approach.
Scope of supporting information required in precinct plans	The scope of detail required during precinct planning will vary depending on site features. Initially, the information will need to demonstrate a level of investigation to inform the land uses and urban layout, infrastructure locations (in line with Structure plan, DCP and Section 7.11 plans), centre designs considering walkability and a masterplan, diverse subdivisions to encourage diverse housing products and demonstrate delivery of the West Dapto Vision 2018.	Council is happy to consider providing further advice around analysis and supporting information scoping during precinct/neighbourhood planning and pre-lodgement.
Water management	Submissions raised the need to add some further clarity to the water management principles and update NSW government references.	Amendments made to Section 7 water management of D16 in response.
Application of	Council proposed precinct planning, which added	Place section 14 and 15 on

Theme raised	Council comment	Action
<p>Chapter D16</p> <p>Increase higher order planning layers, require initial development applications be Concept Development applications.</p>	<p>some requirements and increased the rigour around precinct boundary formation but generally, reflected the neighbourhood planning process.</p> <p>It is understood that a Concept DA is required to address the Development Control Plan. Council would still require that a Concept DA delivers the requirements of D16 and specifically demonstrates its planned connections and infrastructure provisions, amongst the other relevant chapters of the Wollongong DCP 2009.</p>	<p>hold. Staff to review precinct arrangements re-exhibit an approach.</p>

PROPOSAL

This report presents the main themes raised in submissions and the elements of the draft DCP and Open Space manuals that address the themes or changes made to improve how the draft documents address the themes. To fully address the concerns raised in submissions staff propose a two-stage approach.

Stage 1 (subject of this report)

Adopt the draft DCP Chapter B2 (Attachment 4) and an interim draft DCP Chapter D16 (Attachment 3) as part of the WDCP 2009 and notify the adoption with an enforcement date.

The interim draft DCP Chapter D16 will be -

- Introducing the use of the new Open Space Manuals.
- Holding off on draft Sections 14 and 15 while staff draft revised provisions.
- Withholding the existing Neighbourhood Planning requirements from current instrument.

Develop a brief explanatory note regarding the precinct process review and re-exhibition.

The final Open Space Design and Technical Manuals are to be adopted during this stage 1.

Stage 2

Review the precinct area boundaries included in the exhibited draft and identify a method most appropriate to form precincts within the release area.

Review and consider how to include additional information that relates to new precinct areas.

Propose an approach to a transitional arrangement to the precinct planning process.

Re-exhibit draft DCP D16 with Section 15 updated following reviews of precinct boundaries and transitional arrangements.

PLANNING AND POLICY IMPACT

This report contributes to the delivery of Our Wollongong 2028 goals “1. We value and protect our environment”, “2. We have an innovative and sustainable economy”, “6. We have affordable and accessible transport.”. It specifically delivers on the following –

Community Strategic Plan		Delivery Program 2018-2021	Operational Plan 2019-20
Strategy		3 Year Action	Operational Plan Actions
1.3	The sustainability of our urban environments is improved	1.3.1.2 Develop planning controls and Town Centre and Neighbourhood Plans with regard to the economic, social and environmental impacts	Continue the review of the West Dapto Land Release area including the Vision, Structure Plans and Local Infrastructure Plans
2.1.5	West Dapto urban growth is effectively managed to balance employment and population growth	2.1.5.2 In collaboration with key agencies, facilitate the West Dapto Taskforce to deliver the first stages of the West Dapto Urban Release Area	Continue to implement the Infrastructure Delivery Program to support the West Dapto Urban Release Area
6.3	Provide connected and accessible places and spaces	6.3.1.1 Plan and implement projects to improve connectivity	Develop a Community focused Active Transport Program

Ecological Sustainability

The Wollongong DCP 2009 already includes Chapter A2 Ecologically Sustainable Development (ESD) which is applicable to the whole LGA and reflective of broader legislative setting. Amendments included in the draft Chapter D16: West Dapto Release Area, comprise principles including environmental conservation, heritage conservation.

RISK ASSESSMENT

The shift towards principles in planning has occurred across NSW planning, in case law and more broadly over the past 10-15 years. The draft DCP D16 aims to reduce the risk of undesirable development and poor-quality outcomes by promoting principles to communicate the outcomes Council would like to achieve for the release area, implementing the West Dapto Vision 2018.

The changes included through Draft Chapter B2 address long standing challenges found reviewing assessment processes as well as changes that mean requirements for subdivisions within the release area are consistent with principles and desired outcomes.

The Open Space Manuals will provide important guidelines and specifications for developers when designing and costing subdivision proposals. Developers will be able to price open space provision more accurately and ensure that the features and infrastructure proposed are appropriate to the relevant park category and reduce the likelihood of unnecessary maintenance burdens being passed on to Council.

CONCLUSION

The Draft DCP Chapter D16 and B2 and the Open Space Design and Technical Manuals were exhibited from 2 August to 2 September 2019. Generally, the documents were well received with praise given regarding the overall intent and direction that has been taken. There were a range of issues raised through submissions. Some submissions have resulted in amendments and improvements to the drafts. These amendments have been relatively minor in nature with one exception. The major amendment action following exhibition has been the removal of Section 14 and 15 from Chapter D16 in relation to precinct planning to allow for further review and future re-exhibition. This work should not delay adoption of the substantive amendments to Chapter 16 which are required as soon as possible to guide development and help to achieve the Vision for West Dapto. The revised Section 14 and 15 will be reported back to Council following re-exhibition in early 2020.

DRAFT DEVELOPMENT CONTROL PLAN SUBMISSIONS TABLE

Subjects/ Submission Themes	Submission Comment	Council Comment	Action
<p>Riparian corridors, corridor buffers and APZs</p>	<p>It's noted and supported how sub section 8.1 Environment conservation aligns with the WD Structure Plan content and Vision Principles. Concern is raised re the content of sub section 8.3 Riparian Corridors 'Controls', '4. The Riparian Land Management Area can include land used for bushfire mitigation activities' as follows: In its current form, this wording particularly 'can' instead of 'may' and 'activities' ie on going actions, in the context the draft revised DCP. Section 8 Conservation Principles does not align with any of the 3 principles that underpin the sub section 8.1 Environment conservation. Further the content and wording does not seem to acknowledge, or consider, the improve biodiversity outcome envisaged for riparian lands through the strategic initiative of Biocertification through the Biodiversity Conservation Strategy for the WDURA noting that the preliminaries of sub section 8.1 discuss 'A BCS provides opportunity for Council to achieve biodiversity certification (bio certification) in a coordinated approach for the whole release area, improving the overall conservation outcomes beyond what would be achievable developing site by site. Council will continue to work closely with the NSW Office of Environment and Heritage and Department of Planning and Environment to achieve this strategic outcome. The principles should also be used to guide site by site considerations.'</p>	<p>Riparian Corridor controls: remove controls 2 and 4 and re-phrase remaining 2 controls to better align with principles language.</p>	<p>Meeting 27/9/19 with Flood/stormwater engineers to discuss 8.3 Riparian Corridors. Action: 8.3 Riparian corridors: remove control 4 and edit control 2 to reflect intent around revegetation works rather than flood risk (secondary issue and not main role for riparian corridors in the release area).</p>

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	<p>In the content of sub section 8.3 Riparian Corridors 'Controls', 'No 4' it doesn't reflect; the attached highlighted content from Councils 'Bushfire Prone Land' and which I understand is a 'general' policy position for Council and with the content drawn from Councils 'Development on Bushfire Land Fact Sheet'. the content of Section 3.4.1 Asset Protection Zones (APZs) in WCC (2018) Vegetation Management Guidelines for Development Applications and Unauthorised Works https://wollongong.nsw.gov.au/_data/assets/pdf_file/0023/30875/Vegetation-Management-Guidelines-for-Development-Applications-and-Unauthorised-Works.pdf</p>		
Heat island effect and roofing materials	<p>See attached article. https://lgfocus.com.au/editions/2019-06/heat-study-reveals-climate-change-impact.php</p> <p>Dark coloured roofing materials increase the urban heat island effect in developments. There is a dual effect to this – ambient air temperatures increase, and roof cavity temperatures also increase.</p> <p>I am not sure if there is anything that can be done with the DCP or planning controls to favour light or bright roof colours.</p>	<p>This concept sits within Housing Principles, "Principle 3: Establish Sustainable, energy efficient, appealing and functional residential living". It is not specifically listed. Council is happy to include this consideration.</p>	<p>Housing principle 3 .3 wording added to encourage light coloured roofing.</p> <p>Consider review of DCP Chapter B1. Comments are relevant to a review of B1 Residential Development.</p>

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<p>Urban form, Pedestrian amenity Yallah, Marshall Mount development Facilitating Housing Density</p>	<p>Concerns the provisions in the document do not adequately facilitate development of small lot housing. Setbacks to large in the plan, no provision for zero lot lines for terrace housing. Concern to road design, YMM vision for town centre promotes walkability and pedestrian friendly environment. Road hierarchy in the plan is predominately focused on cars. Good design outcomes require narrow streets to reduce vehicle speed. Concerns the DCP may not be flexible enough to achieve the vision for YMM.</p>	<p>Small lot housing will be achieved subject to appropriate zones, neighbourhood plans and town centre master planning processes. All Town centres of West Dapto will require further site specific planning prior to development which will need to address the DCP D16 principles such as housing and transport. As for design guidance for small lot housing or 'medium density', while Wollongong DCP 2009 doesn't have detailed guidance for small lot housing at the current time, there is a mechanism in the EP&A regs for the more appropriate design guide to be applied. <i>EP&A Regulations 2000 Part 6, Division 8, Clause 92 (1) For the purposes of section 4.15 (1) (a) (iv) of the Act, the following matters are prescribed as matters to be taken into consideration by a consent authority in determining a development application— (e) in the case of a development application for development for the purposes of a manor house or multi dwelling housing (terraces), the Medium Density Design Guide for Development Applications published by the Department of Planning and Environment on 6 July 2018, but only if the consent authority is</i></p>	<p>Additional wording added to include more of YMM vision content to guide town centre and other precinct planning of the Stage 5 area in Chapter D16.</p>

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		<p><i>satisfied that there is not a development control plan that adequately addresses such development.</i></p> <p>Road cross sections have been developed to encourage slower speeds in local roads, however narrow roads do not always achieve other design objectives (refer Landcom Street Design Guidelines). Minimum width standards also need to be met to allow for garbage & removal truck access, emergency vehicle access (eg fire trucks) and kerbside parking.</p> <p>Problems have arisen in other locations where streets are very narrow (eg Bulli Brickworks site) and the new road cross sections have been developed to avoid these issues. It should be noted that the new road sections incorporate a higher level of footpath and shared path provision than other new release areas (eg Calderwood, Sydney release areas etc). The verge widths for the new local road cross sections are wider than the current road cross section policy, and for the main local road Type 5, the carriageway width is slightly less than the current policy.</p>	

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<p>OS Manuals Role of Built environment and Chronic Diseases Encouraging walking for transport Planning for new community health gains</p>	<p>Promoting healthier liveable West Dapto with good access to public open space as green infrastructure. 1. connectivity of streets (more intersections, fewer blocks, walkway shortcuts etc 2. higher number of local living destinations such as parks, public transport, facilities etc Endorses the objectives of the manuals. recommendations to consider: - key indicators to evaluate and monitor open space requirements - prioritise urban design framework (such as precinct plans??) - mechanism for early acquisition for open space - requirement for developers to consult with health and community services and consumers around open space proposals to help ensure they align with healthy built environment principles. - long-term strategy for timely delivery of open space infrastructure - ensure fresh drinking water in public spaces. - planting edible landscapes (bush tucker and fruits n veg). - best practice of UV protection.</p>	<p>Council considers this very important, particularly to the development of town centres and open space networks. Town centre planning requirements enhanced in draft exhibited to support the creation of healthier liveable communities.</p>	<p>Ongoing project to develop indicators and work with industry and government stakeholders.</p>

Subjects/ Submission Themes	Submission Comment	Council Comment	Action
<p>B2 Subdivision Chapter comments Small lot housing not facilitated Strengthen denied access road controls.</p>	<p>Lot aspect, size and pattern, need for building envelopes for smaller lots - Section 6.5 Road design - clearer around denied access to collector roads (ideally provide a clause and plan/diagram for desired outcome, image example included in submission). DCP (here or in another chapter) needs to provide guidance for studio apartments on rear lanes (fonziflats).</p>	<p>There is need to revisit the DCP to facilitate Small lot housing however the appropriate DCP chapter would be B1. The LEP residential zones through associated controls work to define patterns of density described further in Chapter D16 housing principles (p.43). Subdivision chapter comments have been incorporated where appropriate. The review of B2 Subdivisions was only intended to be minor in view of current practice challenges. Accommodating small lot housing is another issue to be addressed with a Review of DCP Chapter B1 and potentially a future section addition to B2.</p>	<p>Incorporate changes in response to comments made where appropriate. Council will consider next project examining Chapter B1 and update to B2 for small lot housing controls.</p>
<p>B2 pedestrian infrastructure</p>	<p>Chapter B2Section 14 should be corrected to pedestrian blisters or similar, as by definition a threshold (and these treatments) is raised.14.6 - Development Control 9. Safe pedestrian crossing points should be provided at each bus stop by the introduction of non-raised pedestrian thresholds and refuges and in accordance with the requirements of Council.</p>	<p>Comments noted and changes made.</p>	<p>Change incorporated. Retain "blisters and/or refuges".</p>

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D16 and B2 Coal wash rejects reuse Cut and fill strategies Landform modification	Beneficial use of Coal wash Reject for fill. Inclusions that raise concern with potential to impact metallurgical coal operations within the Illawarra and Wollondilly Regions. In discussion, Beneficial use of coal washery reject, " has multiple benefits" etc.	The Draft documents do not mention coal wash reject material. Cut and fill controls were strengthen based on the review of current practice and staff experience, identified weaknesses and gaps in controls and contemporary understandings of the consequences and the accumulative impacts occurring.	
D16 and B2 Coal wash rejects reuse Cut and fill strategies Landform modification	Inclusions raise concern with potential to impact on future development of 464 Bong Bong Road. In discussion the Certainty in the Land Development Process - "ambiguous policy, with the potential prohibition of land form modification presents significant impediment to development".	Landform modification is already discouraged in the DCP. The wording needed further clarification and staff are now more comfortable with how this would be applied to help meet the original intent, to retain the scenic quality and existing landscape values.	
D16 and B2 Coal wash rejects reuse Cut and fill strategies Landform modification	Changes not supported. Recommends adding a statement to the controls that outlines matters to be addressed to justify landform modification, including visual assessment supported by montages illustrating pre and post earthworks landforms, with supporting civil engineering detail. Landform modification controls should state that cut and fill is supported, if it is demonstrated that the earthworks will not have an adverse impact on the broader visual character of the Urban release areas landscape. Noting that strategic intent is to facilitate residential development. Noted concern to proposed changes in	Council is comfortable that the controls as they are written do not prohibit cut and fill but enlist the applicants to be more considered in design responses and prioritise response to existing landforms rather than to modify it first. This is important for many environmental reasons, and in achieving liveable, sustainable future communities. D16 objectives, and specifically b) is in line with state and federal legislation promoting ESD. This is important to achieving resilient sustainable environments for the new communities.	

Subjects/ Submission Themes	Submission Comment	Council Comment	Action
	<p>B2: Section 5 Topography, landform conservation 5.2 controls B2: Section 8 Cut and Fill Land reshaping works, 8.1 objectives and 8.2 controls D16: Objectives b) and e) D16: Section 6 - Transport 6.1 the road network, Principle 3 - design roads to complement environment "ensure roads fit with the landform (topography), complement local character/ land use and minimise visual, ecological and noise impacts.</p>	<p>Objective e) is important to ensure conservation of ecological communities, heritage values and other existing qualities of the landscape. West Dapto, while it may have contemporary vision for and developing denser urban landscape it is also an existing environment with some current rural use, rich aboriginal and European heritage and unique ecology and must be planned with respect to existing environmental values.</p>	
<p>D16 Transitional arrangements between NP and PP Landowner developing draft NP for submission Precinct Areas</p>	<ol style="list-style-type: none"> 1 Transitional arrangements alarming, given their current preparation of a Neighbourhood Plan. Propose a time frame to the transitional arrangements. 2 Precinct Planning areas as mapped in the Draft D16 - do not agree with the boundaries. Propose alternative boundary precincts around their landholdings (potentially two precincts along east west boundaries of proponent's properties, largely aligning with West Dapto Rd and decommissioned rail spur. 3 Council to extend discretion re: precinct boundaries and potential consolidation to also include redefining boundaries more generally including making the areas smaller. 	<p>While the proponents draft NP area appears to be smaller than the precinct outlined in the Draft, the landholder intends to submit the Neighbourhood Plan likely prior to the draft DCP reporting for adoption. Council can amend maps to reflect area of NP or advise the landholder to include indicative details for additional properties, encourage additional landholders participation in the neighbourhood planning.</p>	<p>Meeting was held with proponents to discuss their plans. Transitional arrangements have been removed from draft and boundaries for precincts has been placed on hold for re-exhibition. Retaining neighbourhood planning although additional requirements from precinct planning the draft are instated.</p>

Subjects/ Submission Themes	Submission Comment	Council Comment	Action
<p>D16 precinct areas Scope requirements of investigations and studies Water management B2 cut and fill intersection spacing Riparian corridors</p>	<p>D16 and Precinct Plans Supported.</p> <ol style="list-style-type: none"> 1 Should allow flexibility to boundaries (when not all owners want to develop) to prevent delays and additional costs. 2 Review precincts so no individual owners property is split between precincts. 3 No vehicle to accommodate staging and collaborating between landowners, and costs borne to 'first cab off the rank' and overly burdensome to the keenest developing landowner. 4 Further clarify what is required in studies for precincts. <p>B2</p> <ol style="list-style-type: none"> 1 Further clarification regarding what quantifies and qualifies "excessive earthworks" 2 Request a review of intersection spacing distances, its unclear what is required. 3 Water management includes unnecessary infrastructure (with ESAs), WSUD and road design - not recommended as results in large number of small assets to maintain. 4 Riparian corridors - changes need to be accounted for in analysis of flood plain storage. Enhancements could work to change manning values and hence flood storage in creeks. 	<ol style="list-style-type: none"> 1 Council has identified a need for more leadership in this space following review of previous Plans, the processes followed and the role they played in facilitating development. 2 Council is happy to revisit the precinct boundaries so long as there is similar logic in aligning properties and sub catchment boundaries. 3 Council considers this to be a key challenge and one that needs more leadership. still considering the resources for council to provide more solutions here (councils pilot site etc). 4 These requirements will vary from site to site on the scope for studies depending on constraints and strategic plans (such as West Dapto Vision 2018). 5 The regarding cut and fill has been reviewed and additional objectives have been added to clarify intent. 6 Controls under 14.2 are referring to intersections between LOCAL roads in a subdivision, ie. Road Types 5 to 8. Road junctions within subdivisions are usually simple T -junctions and not controlled with roundabouts or signals. Section 14.8 talks about Roundabouts and road junctions, ie. those that are more significant than local subdivision 	<p>Workshop on 24 oct for precinct response. Respond to "excessive works" by combining section 5 and 8 of Chapter B2 to link the feature (landform) with development action (cut or fill response). Re-exhibition is planned after revisiting precinct boundaries and the defining process. Intersection distances reviewed, an additional graphic to support content included.</p>

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		<p>intersections, and it specifies distances between access (local) roads and COLLECTOR roads, which is different to that in 14.2.</p> <p>7 This is also relevant to the Contributions Planning and the Mullet Creek Flood risk management study and Plan occurring. The water management assets planning in the release area will be subject to the outcomes of the before mentioned review projects.</p> <p>8 Works in riparian corridors subject to E23 not all of which can be engineered to increase water storage performance. Their functions are not for floodplain storage alone.</p>	
D16 Review	<p>Provide 5 key recommendations –</p> <ol style="list-style-type: none"> 1 Council clarify whether the planning principles in the West Dapto DCP must be addressed in development applications. 2 The West Dapto DCP be revised to ensure the objectives reflect an appropriate balance between housing delivery and environmental protection. 3 Delete references to draft/unfinished policies including risk-based framework for stormwater management and biodiversity conservation strategies. 4 Dwelling density controls be minimums only and increased to align more closely with Landcom (2011) 	<ol style="list-style-type: none"> 1 Council to review the chapter with application at DA in front of mind. 2 There is a definite need for balance, and in striving for balance there has been identified a need to strengthen some controls in our known problem areas such as landform modification and cut and fill in B2 amendments. 3 The risk-based framework approach is not draft policy (although the mullet creek plan is not yet complete). The approach is formal and applied state wide. As for the Biodiversity Conservation strategy, Council has 	<ol style="list-style-type: none"> 1 Review D16 in terms of DA application relevance. 2 Double check Conservation principles for BCS language updates if relevant with council application. 3 Internal workshop for potential concept DA solution to challenges with

Subjects/ Submission Themes	Submission Comment	Council Comment	Action
	<p>gross residential densities and Sydneys Growth Areas.</p> <p>5 Replace the requirement for Neighbourhood Plans by including all higher order planning layers in the West Dapto DCP now, and requiring all initial development applications to be Concept Development Approvals.</p>	<p>formally adopted to progress, has been working with OEH and has submitted its application for Biocertification. To omit this information would not be consistently representing Council or NSW Government's formal position.</p> <p>4 Densities are controlled through the LEP minimum lot sizes and FSR. Agree this could be reviewed in context of release area work but not a DCP issue alone.</p> <p>5 This was initially considered in Feb 2019. Internal stakeholders felt this was to risky at that point in time. Through EP & A Act 4.22 Concept DA approach has merit. this will be discussed in a workshop held on 24 October.</p>	<p>Neighbourhood Plans.</p>
<p>Flooding and water quality</p>	<p>Detailed comments relating content for flooding, water quality and general of water principles.</p>	<p>Council reviewed content and made minor changes to align with comments made.</p>	<p>Comments and suggested changes incorporated where required.</p>

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Submission comment	Council comment
<p>1. The street frontage requirements- The street frontage requirements for both the District Park and local park, make the incorporation into contiguous open space areas very difficult. We would recommend flexibility in the wording to require at least one frontage to be a public road, with a desire for more, but not make it a “must” have.</p> <p>2. Fencing off parks and open spaces The need to fence off parklands can be a huge expense / cost burden for limited return. Fencing should be limited to very selected areas and only if deemed absolutely necessary.</p> <p>3. Passive facilities The neighbourhood park description provides a comprehensive range of facilities, including active and passive recreation. It would be helpful to have more clarity around the exact extent of the passive facilities.</p> <p>4. Lighting: There is a considerable difference in cost to training vs competition standard lighting. This would be useful to clarify.</p> <p>5. Field sizes: The field sizes nominated are at the top tier end of the size scale most suitable to A grade / professional grade sport. It also requires very large sites. Any constraints on shape and area could make it difficult meet as it has on our site. Potentially it could possibly have a range of sizes rather than an absolute size provisions.</p> <p>6. Sports field Turf: Guidance should be given on sports field media depth to assist with design and costs. For an active sports field, the turf underlay make up and depth will be quite different to amenity turf depth shown on page 65 of the technical manual. Suggest you add a sports turf section to the technical manual. Flexibility of use is important as is the option to subdivide full size fields to a range of younger age groups. The department of local government, Sport and Cultural industries WA,</p>	<p>1. We disagree with this suggestion. The Manual requires '75%' road frontage – ie. 3 sides minimum for Neighbourhood Parks. This allows connection with contiguous open space (eg Riparian or Natural Areas). Local Parks are required to have 4 frontages for CPTED compliance.</p> <p>2. In the Local Parks reference in the manual there is no requirement for fencing, other than if a playground is too close to a road frontage. In Neighbourhood Parks fencing is only required to define entry points for maintenance and emergency access. In Natural Areas there is an existing and ongoing problem of illegal vehicle entry, which leads to erosion, tipping, weed entry, etc, so there is a definite requirement for vehicle control on the perimeters. The most effective form of vehicle control in these situations is a vehicle barrier as specified in the Technical Manual.</p> <p>3. The examples of passive facilities in the Design Manual are intended to indicate the range of improvements that are required to be considered, not necessarily all provided.</p> <p>4. The requirement to provide competition or training lighting will be an issue to be specified during design development.</p> <p>5. The field sizes specified are drawn from standard sized fields (not professional or A Grade only) as per the Transport Canberra and City Services Design Standards for Urban Infrastructure and are a requirement.</p> <p>6. Agreed, item will be added to Technical Manual.</p> <p>7. It isn't possible to provide a rough guide as each context is different depending on the design of the subdivision and amenities provided. There is a need for the developer to undertake an assessment of future parking demand.</p> <p>8. Agreed. Reference is made to this issue in 'Sports Field Requirements'</p> <p>9. Agreed. Scoreboard reference will be deleted.</p> <p>10. As detailed in the Design Manual, change facilities are required subject to an assessment of potential demand.</p> <p>11. Reference to Wind Shelters in the Manual is referring to the integration of wind break tree planting.</p> <p>12. Agreed, as per Point 6 above.</p>

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<p>also has a good range of sporting amenity sizes. https://www.dsr.wa.gov.au/support-and-advice/facility-management/developing-facilities/dimensions-guide</p> <p>7. Car park spaces: While each facility would need to review the likely car parking demand, is it possible to provide rough guide to assist in space allocations?</p> <p>8. Water Supply - consider opportunities to reduce council's potable water demand by use of on site stormwater and other measures</p> <p>9. Scoreboards - not usually necessary - can it be reconsidered?</p> <p>10. Public Amenities / Change Facilities - may not need to provide change and shower facilities as often not used.</p> <p>11. Wind Shelters - are they mandatory?</p> <p>12. Reference to Sports Field Turf as per point 6 above.</p> <p>13. E2 Bushland Zones - Clarify reason for fencing requirements - is it for pedestrians, vehicles, predators, etc?</p> <p>14. Fencing Query as per point 2 above, and requirement for F2 fencing</p> <p>15. Riparian Corridors - WCC requirements appear to conflict with Water NSW guidelines with regard to issues such as corridor widths and the priority of community and recreational benefits.</p> <p>16. Riparian Zone limited recreation and amenity provision - no permanent works shown within the corridor, no allowance for offsetting, no third order stream catered for, APZ constraints.</p>	<p>13. As per Point 2 above.</p> <p>14. As per Point 2 above.</p> <p>15. WCC adopted DCP E23 lists the requirements applicable.</p> <p>16. Agreed, changes have been made to the Design Manual.</p>
<p>1. Page 6 general principles – creating opportunities for green walls, and green infrastructure as well as blue infrastructure...</p> <p>2. Page 8 reference to S94 is no longer the right legislative reference. Replace with Development Contributions Plan</p> <p>3. Incorporating heat refuges for people and ecology (page 10?)</p> <p>4. Utilising light and natural colours for pavements and surfaces to reduce heat absorption (page 10?).</p> <p>5. P16 Natural areas – planning for its primary ecological functions – animal habitats and breeding supports, fauna crossings, supporting experiential education and restricting access to sensitive receivers etc.</p>	<p>1. This issue is covered in detail in DCP Chapters E13 and E14 and these chapters are referred to in the Design Manual, we feel this is sufficient.</p> <p>2. Noted and changed.</p> <p>3. Urban Greening references and repeated requirements for shade tree planting in the Design Manual address this issue.</p> <p>4. Agreed, in the Design Manual a reference to lighter colours in pavements will be added in Section 5.4. and the Technical Manual already states that WCC would consider other colours.</p> <p>5. Agreed, we will clarify in Section 4.0 that the primary need for application of CPTED principles is adjacent to pathways, and pathways are kept to the perimeters, which will encourage and allow the development and protections</p>

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<p>6. P17 CPTED – this is already its own DCP chapter with higher ranking than a manual. Maybe referencing this here only. Also this concept is at odds with the intent of biocertification and prioritising the structural improvements to ecological functions in much of the release areas E2 and E3 lands. 7. P25 promoting green infrastructure, heat refuges and planting for connected canopies.</p>	<p>of appropriate habitats. 6. Agreed, the Design Manual can reference that chapter. Regarding the comment of CPTED being at odds with ecological needs, see point 5 above. 7. Agreed, this is already addressed in Section 4.3 Urban Greening Strategy Objectives</p>
<p>The overall approach to open space management represented in the Technical Manual and Design Manual falls short of robust protection and enhancement of the area’s ecology. Points of particular concern are: failure to address the acute threats posed by urbanisation to the area’s Ecological Endangered Communities, and to individual threatened faunal and floral species; failure to appreciate the need for some of our more vulnerable natural areas to be protected, short term or long term, from human recreational activities, and vandalism; failure to provide for native groundcover and mid-storey vegetation. - Maximising the use of local native species for our street and open spaces trees has unique benefits, not least the preservation of local biodiversity. Local natives would provide botanic connectivity with our bushland remnants and the Escarpment, thus more strongly augmenting, in quality and quantity, local biodiversity and wildlife habitat.</p>	<p>The Design Manual has been revised with regards to: inclusion of additional local native trees, revision of some of the exotic species included. An email response was sent.</p>
<p>Street Trees 1. The requirement to install trees “after 80%” construction is confusing. Does this mean road and infrastructure or housing construction, as with downturn in housing market, you may not have street trees installed for 5 years? This would then need to be a bond for Council to install them. I have assumed you mean 80% of developer subdivision contract works. I would prefer trees were the very last thing to go in. 2. Tree guards around street trees are not specifically mentioned, though the guards on Paynes Road are illustrated in the design manual. The original requirement of 4 posts was a condition of DA. We found that as the posts would need to be installed without concrete (any future removal due to knocks to posts would damage tree roots), we</p>	<p>1. Design Manual adjusted in Section 4.3 to include “80% of the dwelling construction”. 2. Agreed, Technical Manual will also have a tree guard detail added to cover Village and Town Centres where needed. 3. As tree planting occurs at 80% of construction of subdivision, and the street trees are bonded, there is no need in normal circumstances to install a guard, and therefore the Technical Manual shows a detail without a guard. 4. Agreed, the Technical Manual will include a comment in the tree planting details to allow for staking and tying of trees where approved by the project arborist due to severe site conditions. 5. Agreed. 6. Agreed, comment added to Design Manual Section 4.3.</p>

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<p>needed to cross brace these with a rail.</p> <p>3. Street trees planted in front of areas such as open space reserves, detention basins, natural areas, sports fields, may only need 2 posts to limit car door damage and pedestrians (2 perpendicular to kerb in line with tree) (or 3 in a triangle where planting width is narrower than 1200)</p> <p>whereas street trees planted where there are residential lots and building contractors would need minimum 4 and a cross brace.</p> <p>4. I am not sure what you could recommend if street trees need to be planted in August. Due to winds, staking of trees on windward side with ties at several places along the trunk would limit the snapping of trunks that we experienced, or 200 litre trees totally blowing over.</p> <p>5. I note minimum street tree size is now 100 litre (p26 Design Manual). I applaud this as the 200 litre street trees we have installed at Sheaffes Road have been damaged by house construction. The larger size hasn't made much difference to the percentage of damage to trees. I would only go larger where there is no adjacent residential lot and the developer wants a more significant statement (adjacent parks, drainage reserves, sports fields, etc).</p> <p>6. Street Tree planting in subdivisions is rarely in natural soil as the developers are balancing their cut and fill. Adjacent trenches are often backfilled with clay soils after services so there is often not more than a 100mm site topsoil layer in most of the footpath at all. I am not sure if there is a detail you would draw to show street trees planted in clay fill? On one site that was very rocky I detailed a street tree trench full of topsoil, but with lesser quality topsoil away from the tree pit itself. At least the roots would venture along the strip and hopefully not under the kerbs.</p> <p>7. You have no root barriers shown in the details?</p> <p>8. From my experience, trees are routinely installed over water mains which are 600mm deep. We installed a root barrier along the top of water mains where we had 200 litre trees in 500 deep bags sitting directly over services. I am not sure how effective this will be in the long term.</p> <p>9. In some cases, at Sheaffes Road we had only 725 from back of kerb to</p>	<p>7. Advice from our WCC Urban Greening Team is that root barriers are not normally preferred. The one instance where we will add a shallow root barrier is adjacent to footways, and a note as such will be added to the Technical Manual.</p> <p>8. WCC specifications do not recommend any planting of trees over water mains.</p> <p>9. Road cross sections specified in the latest DCPs allow for a minimum of 1200mm between kerb and footway / shared path, so we don't see the need for a special detail of a longer pit.</p> <p>10. Agreed. Technical Manual section shows 1200 from back of kerb, however, a change can be made to the DCP cross sections to reflect this as well.</p> <p>11. At this time the specification for soils in the Technical Manual is that they must comply with AS4419, and at this stage we are happy to keep it with this reference.</p> <p>12. Agreed, the reference in the Technical Manual will be adjusted to specify 'hardwood chip' due to the windy conditions often present.</p> <p>13. Edges Comment – Design Manual specifies the need for a masonry edge to mass planting beds.</p> <p>14. The need for paths will depend on the individual situation, however, the preference for path placement if needed is to locate them at the top of banks.</p> <p>15. The Design Manual includes requirements for design in general terms - there may be individual cases where these requirements will need to be reconsidered at the time of subdivision / drainage design.</p> <p>16 Reference to an irrigation system in some cases is agreed, but we don't see the need for a policy on this issue as it will be a design consideration for the individual sites.</p> <p>b. Agreed, Sports Field Turf detail has been added to the Technical Manual.</p>
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edge of footpath where we had cycleways. (This is the case in the photo on page 26 of the design manual.) In this instance I increased the tree pit length to 3m and used a smaller tree. This will happen in lots of other instances in West Dapto where there is a shareway, so maybe a detail requiring a longer trench would be helpful.

10. Where the footpath is located 1200mm off the kerb, it is usually assumed by engineers to be the face of kerb as that is the edge of the width of road and start of the "verge". Tree planting grassed strip is often then only 1050mm wide and includes subsoil drains and some compacted road base extending beyond the kerb. So, detail showing 1200 width in reality is likely to be less than 1200mm.

11. It may be useful to reference you topsoil requirements for street trees to the "Soils for Landscape Development" specification by Simon Leake and Elke Haege (CSIRO 2014)?

12. Mulch – I have found the "Eucymulch" style mulch blows away less than the "Hortbark". The contractor topped up an area of mulch with hortbark and it was almost all gone in 24 hours. I'm not sure how that equates to the "hardwood" mulch you have specified on p48 design manual.

13. Edging in Basins

Could you clarify where masonry edging is required? P48 design manual. Where a planted basin bank joins grass, we added some where the banks joined a "park", but then extended it to include all grass areas. Where banks joined grass at base of basin or along grass swale, we used no edge. I assume there will be lots of other basins in West Dapto, and this may crop up.

14. Basins

I didn't find any guidelines on paths in basins? We had to put a path through the SE basin as the volume of the basin extended into the EEC area. We didn't in the northern basin. Is it something you will leave to individual cases?

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<p>15. Drainage swale We have a riparian swale that was fully planted but will need to be retrofitted with a rock base as the planting is washing out. Guidelines in the riparian section may be useful? (This may be an engineering decision rather than landscape?).</p> <p>16. Sports field Construction a. The ACT manual mentioned includes irrigation. We were advised not to include irrigation, but to include subsoil drains. It would have been very little additional cost to include an irrigation system at the time of installation of drains, and some contractors tendered to include it, as it would have been useful to establish the grass. Sports fields in the Inner west of Sydney are being retro-fitted with irrigation and watered with grey water. I'm not sure if that is a possibility in new areas like west Dapto? I note you have "explore options" in the Design Manual. Could there be a policy on this? b. The soil for a sports field is very expensive, but not specified in the ACT guidelines. We have used the C2 "Active High Traffic Turf" Soil Specification from "Soils for Landscape Development" by Simon Leake and Elke Haege (CSIRO2014). A higher use oval would need a C3 specification but I'm not sure you will have these in West Dapto?</p>	
<p>ISLHD strongly endorses the objectives and elements of the West Dapto Open Space Design Manual and Technical Manual, including the requirement for:</p> <ul style="list-style-type: none"> • High priority on open space planning by developers with an interconnected network of open spaces • Ensuring the distribution and type of public open space is within reasonable distances of houses and workplaces • Providing a flexible network of public open spaces to support an increasing diversity of activities ranging from passive enjoyment to formal sport and active recreation • Designing for a series of well-located and accessible parks and public open spaces that provide for the desired range of recreation opportunities and catchment sizes 	<p>All points made are agreed with.</p> <ol style="list-style-type: none"> 1. Agreed, however for this to be possible there is a need for a revision of the 2007 West Dapto Social Cultural and Recreational Needs Study to confirm number and type of sporting and recreational facilities required. Also coordinating Precinct/Neighbourhood Plan for each precinct in the WDURA. 2. Agreed there is a clear need and benefit for Neighbourhood Plans to be formulated by WCC. 3. Agreed, see above comment. 4. Agreed, but unclear how this would be arranged. 5. Agreed, this would be addressed by the revision of the Needs Study and precinct plan creation as noted above. 6. Agreed, this connectivity is already a key requirement in the Design Manual and could be a factor of the Neighbourhood Plans proposed.

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<ul style="list-style-type: none"> • Identifying borders, riparian corridors, lanes and service corridors as supplementary open spaces that provide a range of opportunities for connection to nature • Ensuring that any land proposed for recreation use is fit for purpose, high quality and with good amenity • Ensure sustainable ongoing maintenance costs and achieving long lifecycles. • Prioritising use of natural shade by considering existing mature vegetation and planting advanced stock of suitable trees to provide future shade • Application of Crime Prevention Through Environmental Design (CPTED) principles <p>The following recommendations aim to increase the health gains of the new communities' use of open spaces. Consider:</p> <p>1 - Consider implementing a robust set of key indicators in order to evaluate and monitor the delivery of open space requirements –</p> <p>2 - Prioritise an urban design framework for a strategic overview to ensure the objectives can be achieved. The diversity and number of landowners in West Dapto provides many challenges to connectivity, open space and town centres. Larger scale planning would minimise cross boundary issues.</p> <p>3 - Consider a mechanism to ensure sufficient early acquisition of land areas for efficient provision of open space and ensure investment is targeted where needed.</p> <p>4 - Include a provision requiring developers to consult with Health and community services and consumers to ensure that their open space plans align with healthy built environment principles and offer the greatest opportunity to promote physical activity.</p>	<ol style="list-style-type: none"> 7. Agreed, requirement incorporated into Design Manual and Technical Manual. 8. Agreed with regard to fruit trees and bush tucker plants - reference can be added to the Design Manual. 9. Agreed, already an important consideration in the Design Manual.
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<p>5 - Ensure a long-term strategy to oversee the timely implementation of open space infrastructure.</p> <p>6 - Linking with the Regional Walk Alliance which has been recently formed with the four Councils of the Illawarra and Shoalhaven, ISLHD and the National Heart Foundation. This could support the proposed 'best practice' solutions to the new developments by setting and achieving a 'walkability' target for West Dapto.</p> <p>7 - Ensure fresh drinking water is available in all public spaces. Access to water via refill stations is important in this environment.</p> <p>8 - Plant edible landscapes (e.g. fruit trees and bush tucker plants) on public land, riparian corridors, and parklands to increase exposure to fruit and vegetables.</p> <p>9 - Developing best practice of UV protection for facilities in outdoor areas such as sporting grounds, playgrounds and parks.</p>	
<p>Graham Burgess- National Parks Association (NPA) Open space Manual National Parks Association (NPA) Illawarra Branch take an active interest in urban developments near the Illawarra escarpment and those which may impact on remnant bushland on the coastal plains, particularly those that provide any opportunity for biodiversity corridors linking to the escarpment. The West Dapto development is very much an example of this.</p> <p>1. We note pages 44 and 45 of the draft West Dapto Open Space Design Manual has a section on "Trails" for walking, on-trail cycling and off-road cycling. We support the need for an active community and trails should be provided to encourage this. A mixture of on-trail and off-road cycling may well be able to be incorporated into the area and we note the Design Manual refers to requirements of "The Australian Mountain Bike Trail Guidelines for trail planning, design and construction" but we are concerned there is nothing said about the likely need to prevent, police and reinstate illegally formed trails and the associated costs.</p>	<p>Agreed.</p> <p>WCC intends to manage all mountain bike trails created through the subdivision design process, including the management of illegal trails. Regarding the image that includes a bike with a racing number, this was illustrative only as WCC agrees that bike racing is not appropriate in riparian corridors, and the image will be replaced.</p>

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<p>The creation of illegal trails is a common problem in many places where urban development is close to bushland reserves. This has become a big problem at Helensburgh and Heathcote for example. At first a somewhat blind eye is turned by Council or other landowners, then in time the problem becomes so large it is near impossible to manage with vast areas of bushland destroyed.</p> <p>We also submit that the photograph on the bottom right of page 45 in the Design Manual, which shows a mountain bike rider on a single trail with racing number attached, sends the wrong message in this document. There is no way the riparian corridors of West Dapto should ever be turned over to mountain bike racing events.</p>	
<p>1. Is there possibility to include the easement in active transport infrastructure? There are great examples in Perth.</p> <p>2. I am concerned that the focus on turf over mass plantings in local parks will create a high irrigation and mowing burden and be a lost opportunity for increasing native groundcover like the woody meadow in Melbourne or Harold Park landscaping in Forest Lodge Sydney.</p> <p>3. Could provisions be made for dead or dying trees to be retained and arborists cut hollows in them?</p> <p>Technical manual</p> <p>4. Indicative tree species list - seems that the "with additional species as recommended" proviso negates the tree species list. I support the stated aim of a preference for local native species. Street trees indicative list 5. would like more natives.</p> <p>5. wonder if there should be delineation between the large species are best suited to open spaces and nature strips eg Coachwood or Brushbox suited to the former.</p> <p>6. Will Council's Natural Areas team, experienced Botanic Gardens staff and native vegetation experts be consulted to further develop this list?</p>	<p>1. Yes, the easements across the release area will be utilised for active transport. There may be preference where possible to underground easements, but when not possible, alternative uses such as active/public and generally other transport network connections will be prioritised.</p> <p>2. The Design Manual will include a reference to the use of native grasses in Section 4.0.</p> <p>3. Agreed. The Design Manual includes requirements for habitat trees and associated vegetation communities to be retained and protected in Natural Areas (E2 and E3 Zones)</p> <p>4. The indicative tree species list includes a reference to other species that will be considered as recommended by WCC Parks and Open Space Manager, which seems appropriate as additional species are under consideration by that group.</p> <p>5. Appropriate mature sizes of species used is an important issue. The indicative species list is intended to be a starting point only, and ultimate size of trees specified will need to respond to individual sites.</p> <p>6. Yes, other Council teams have input and were consulted.</p> <p>7. All DA submissions are required to be prepared by Landscape Architects and are reviewed by WCC tree experts within the design team.</p>

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<p>7. How is it ensured that the final planting choices need to be informed by people that know where a particular species is suited to the local conditions?</p> <p>8. Can Council require a bond for landscaping that is refundable once the plantings are established?</p> <p>9. Object to listing of species that are known weed species at local bushcare sites like Acer Negundo 'Sensation' and Ulmus parvifolia 'Todd' Chinese Elm</p> <p>10. Worth including many more natives such as PEGS - Planchonella, Eleodenfron australe, Guioa semiglauca, Streblus - plus Alectryon subcinereus, Toona ciliata, Celtis paniculata, and Pouteria australis.</p> <p>11. How fire safe is fibre reinforced polymer? I have heard that the plastic burnt during the Royal NP bushfires and left lots of fibre debris.</p> <p>12. The recommended turf can become a bushland weed, so should be confined and separated from plantings of native vegetation where possible.</p> <p>13. Bin post mount could be made a double to enable public place recycling bins to be installed.</p> <p>14. Garbage bin enclosures should be specified as recycling and landfill, with the lid shape differentiated.</p> <p>15. Bike rings are currently being installed on parking sign poles throughout suburban centres. Could they be included or would that be dealt with elsewhere in the town centre design?</p> <p>16. Would the same amenity, safety and function be achieved if recycled concrete and brick aggregate was used for pathways?</p> <p>17. Could the tree planting specifications be improved to increase passive irrigation? Such as provided in these examples? https://waterbydesign.com.au/news/water-wise-street-trees</p>	<p>8. Yes, this is currently applied.</p> <p>9. The Dept of Primary Industries Weed wise website does not list these species as weeds, and as they are both developed cultivars, the risk of them becoming weeds is negligible, therefore at this stage, these species can be retained on the list.</p> <p>10. Agreed, these species have been added.</p> <p>11. It is known that the fibre reinforced polymer will melt in fires, wooden structures will burn, and metal will degrade, warp, and discolour, so in a hot fire any structure will need to be repaired or replaced, no matter the material of construction.</p> <p>12. Agreed.</p> <p>13. Agreed.</p> <p>14. Agreed, comment will be added to the Technical Manual.</p> <p>15. Agreed.</p> <p>16. This is possible if the material size meets safety specifications.</p> <p>17. Agreed, this reference will be included in the Technical Manual.</p>
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Part D – Locality Based DCPs / Precinct Plans
Chapter D16: West Dapto Release Area

Document Control

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Rev No	Adoption Date	In force date	Revision Details
1	14/12/10	17/12/12	Adopted
2	27/7/11	3/8/11	Incorporate Shone Ave Neighbourhood Plan
3	26/11/12	8/12/12	Update Wongawilli North Neighbourhood Plan
4	27/5/13	1/6/13	Incorporate Sheaffes Rd Neighbourhood Plan
5	9/12/13	14/12/13	Incorporate Reddalls Rd Industrial Neighbourhood Plan
6	24/3/14	2/4/14	Incorporate Darkes Rd South West Neighbourhood Plan and updated road network diagrams
7	3/8/15	12/8/15	Incorporate Avondale Road North, Huntley Neighbourhood Plan
8	24/8/15	9/9/15	Incorporate Shone Avenue / West Dapto Road Neighbourhood Plan
9	19/10/15	24/10/15	Incorporate West Dapto Rd / Sheaffes Rd (south) Neighbourhood Plan
10			Draft May 2018
11	19/11/18	20/12/2018	Incorporate Bong Bong South Neighbourhood Plan
12	10/12/18	20/12/2018	Incorporate the West Dapto Vision, Structure Plan 2018 and planning principles
13	9/12/2019	XXXX	Whole document review and restructure

1 INTRODUCTION

This chapter of the Wollongong Development Control Plan 2009 (DCP) is intended to provide structure and guidance for the future development of the West Dapto Release Area. It is aimed at achieving the vision for West Dapto which is:

West Dapto will grow and develop as a series of integrated and connected communities. Set against the spectacular Illawarra Escarpment and a landscape of riparian valleys, these communities will integrate the natural and cultural heritage of the area with the new urban form.

The communities will be healthy, sustainable and resilient with active and passive open space accessible by walkways, cycleways and public transport. To support these new communities, local centres will provide shopping services, community services and jobs while employment lands will facilitate further opportunities for the region.

West Dapto will be supported by a long-term strategy to oversee the timely implementation of infrastructure to deliver sustainable and high-quality suburbs with diverse housing choices.

Other parts of this DCP continue to apply to the West Dapto Release Area in conjunction with this chapter. Part A of the DCP contains the Introduction and Part B Land Use Based Planning Controls. Part C provides Specific Land Use Controls and Part E General (City Wide) Controls.

This document is set out around groups of planning principles. The principles are designed to outline expectations around elements for consideration while planning for development of the West Dapto Release Area. The principles, objectives and any applicable controls will guide the growth of new suburbs and neighbourhoods, protect the environment and integrate with existing communities.

2 LAND TO WHICH CHAPTER APPLIES

This chapter applies to all land within the West Dapto Release Area (**Figure 1**).

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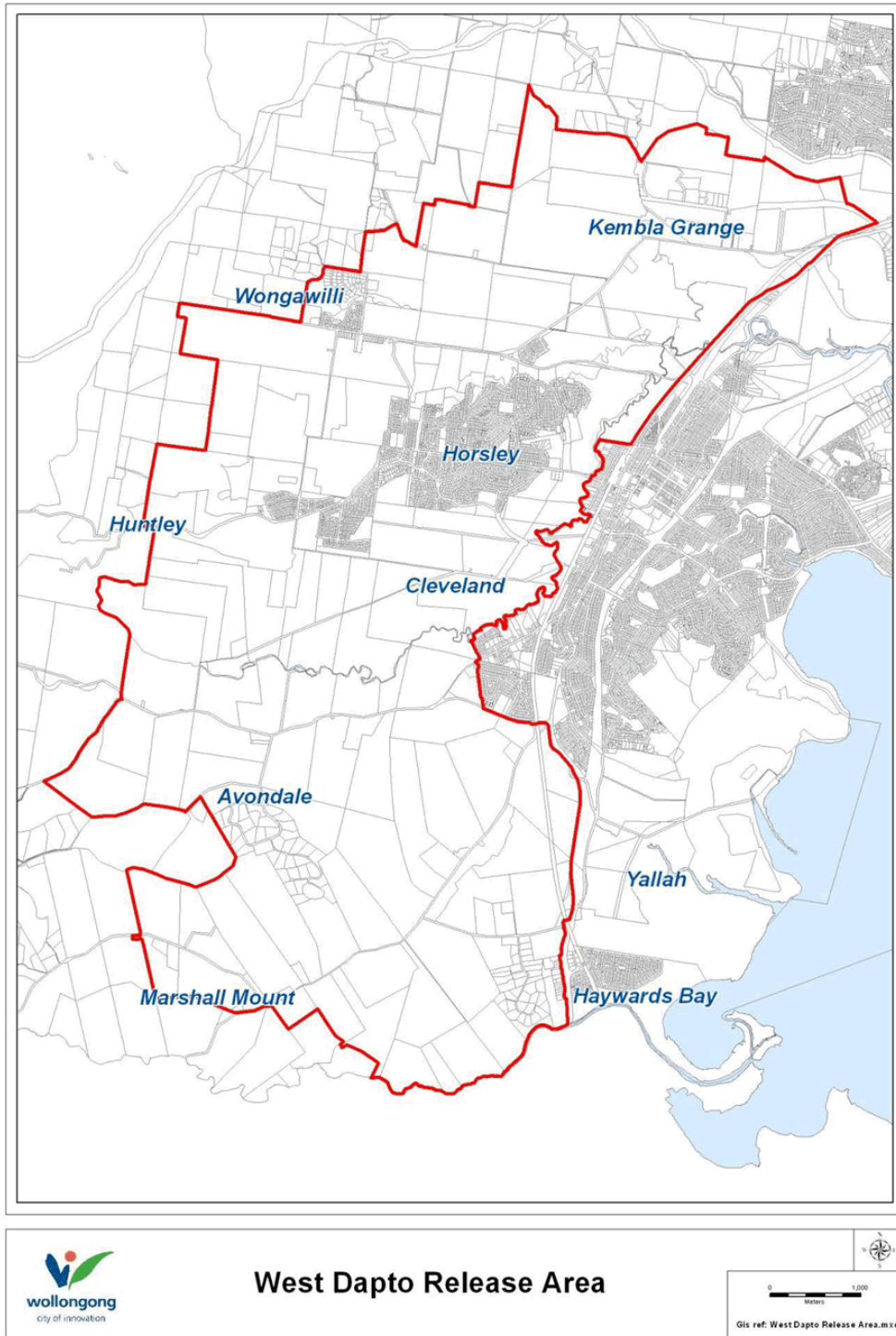


Figure 1. West Dapto Release Area

3 OBJECTIVES

The objectives of this chapter are to:

- (a) enable the development of the West Dapto Release Area for residential, employment, industrial and environmental conservation areas in a manner consistent with the Wollongong LEP 2009 the West Dapto Vision 2018 and the West Dapto Structure Plan (**Figure 2**).
- (b) ensure the development of the West Dapto Release Area is carried out following the principles of Ecologically Sustainable Development, promoting retention and enhancement of the release areas unique environmental features to shape desired future urban setting outcomes.
- (c) support the provision of safe and efficient road networks that promotes long term sustainability and active transport, with public transport services which link the surrounding areas to and throughout the release area.
- (d) implement Water Sensitive Urban Design (WSUD) for effective water management and protect development in the area from flooding.
- (e) recognise existing environmental and landscape qualities and establish future urban characteristics desired for and shaping the ongoing development of the release area.
- (f) protect, conserve and enhance riparian and environmentally sensitive areas and only allow for development compatible with the conservation values of these areas.
- (g) protect areas of high scenic value, notably the Illawarra Escarpment and Lake Illawarra with developments that contribute and promote the areas visual and aesthetic values.
- (h) conserve and enhance the environmental, cultural and built heritage of West Dapto.
- (i) guide the development of open space to meet future community needs and facilitate a network of open space connected by off road cycleways and shared paths throughout the release area.
- (j) ensure that development in the Darkes Road, Bong Bong and Marshall Mount town centres contributes to the creation of retail, business, commercial and community hubs and provides significant local employment and community service opportunities.
- (k) provide village centres with localised businesses and higher density residential opportunities at key places / intersections were bus stops, community facilities and open space come together as local urban focal points.
- (l) ensure the community social and cultural needs are met through the provision of a range of community facilities across the release area (co-located with other facilities in 'hubs', creating urban focal points).
- (m) guide planning and development of well-located schools, childcare centres, and adult education facilities to support the community educational needs.
- (n) stimulate diversity in development types and styles to provide a range of different dwellings to increase housing choice and design quality in the Illawarra region.
- (o) ensure the creation of safe, secure, liveable and resilient urban environments are established considering future climate and other potential environmental vulnerabilities.
- (p) improve employment opportunities and economic growth in the Illawarra region whilst ensuring that commercial and industrial development is of a high design standard, ecologically sustainable and energy efficient.

4 STRUCTURE PLAN

The West Dapto Structure Plan (**Figure 2**) shows the landuse setting which will house the future urban structure and guide the development of the release area.

It is characterised by a series of residential precincts estimated to generate around 19,500 dwellings. The precincts come together to form five distinct stages, separated by riparian corridors connecting through the release area from the Illawarra Escarpment framing the western extent to Lake Illawarra in the east. The release area will also include protection and integration of heritage landscapes and items into the urban structure.

The West Dapto Structure Plan identifies:

- Town and village centres
- Conservation land
- Heritage items and potential curtilages
- Transition land (environmental constraints exist but may be appropriate for some appropriate developments)
- Development land
- Employment land
- Large open space facilities (neighbourhood parks 2-5 ha, and district parks 5-8 ha)
- Structural road network
- Creeklines and flood extents (1% AEP)

The Wollongong LEP 2009 has Stages 1 & 2, a portion of Stage 3 and all of Stage 5 of the release area zoned for existing and potential residential development (see **Figure 3**). There is also 175 hectares of employment land zoned at Kembla Grange (in Stage 1, see **Figure 3**).

Stage 1 and 2

Stages 1 & 2 are located in the northern extent of the release area (**Figure 3**). There are a number of unique features to these stages of the release area including:

- Potential development of around 6700 dwellings.
- Employment land (industrial zones) located within close proximity to Unanderra light industrial area and well connected to Dapto Regional Centre along the Princes Highway, the Port of Port Kembla and the M6 Motorway.
- South of the employment lands will be home to Darkes Town Centre with approximately 7500m² of commercial/retail floor space providing for a range of shops and services as well as community facilities and active open space for community recreation.
- Protection and rehabilitation of riparian corridors and conservation areas (vegetation and heritage conservation depending on site features and opportunities) to improve water quality, recreational opportunities and connectivity of remnant vegetation along these structural spurs through the release area.
- Structural road network that will connect from outside the release area, through Stages 1 and 2 and into the southern reaches of the release area.
- Active transport facilities (cycleways/shared paths) connecting residential areas with open space provisions via riparian corridors and along the structural road network.
- Two village centres (Wongawilli and Jersey Farm) that will provide local convenience shops and urban focal points within the residential areas of Stage 2.
- Two primary schools, one located close to the Darkes Town Centre and one located in the Wongawilli/Jersey Farm Road area to service the future residential families.
- Bong Bong Town Centre, at the southern extent of Stage 2 on the south side of Bong Bong Road will provide retail needs, local services and community facilities with employment opportunities in

the local context. It will be the urban focal point supporting opportunity for denser housing products located convenient to public and active transport links.

Stage 5 or Yallah-Marshall Mount Precinct

The vision for the Yallah-Marshall Mount Precinct is to create a vibrant, compact, environmentally sustainable village atmosphere. The precinct will be centred around a compact, walkable village centre reflecting low carbon footprint principles. The Yallah-Marshall Mount precinct will utilise traditional urban design principles, with relatively high densities around the town centre and concentrated along the main access roads. The precinct will have a diverse range of housing types and densities.

The bulk of higher density development will be focussed around the proposed village centre, with opportunities for small lot housing along the main transport links through the precinct. The fringe areas will contain rural and rural-residential development. The aim is to have the new community focussed on transport links, rather than a 'blanket' of suburbia. The desire is to have a variety of housing types and styles to provide for a wide diversity in population, allow for increased "ageing in place" opportunities and make an interesting urban environment. The biodiversity corridors and Duck Creek will be significant attributes of the new community, with the escarpment as a visual backdrop.

Yallah-Marshall Mount precinct is characterised by:

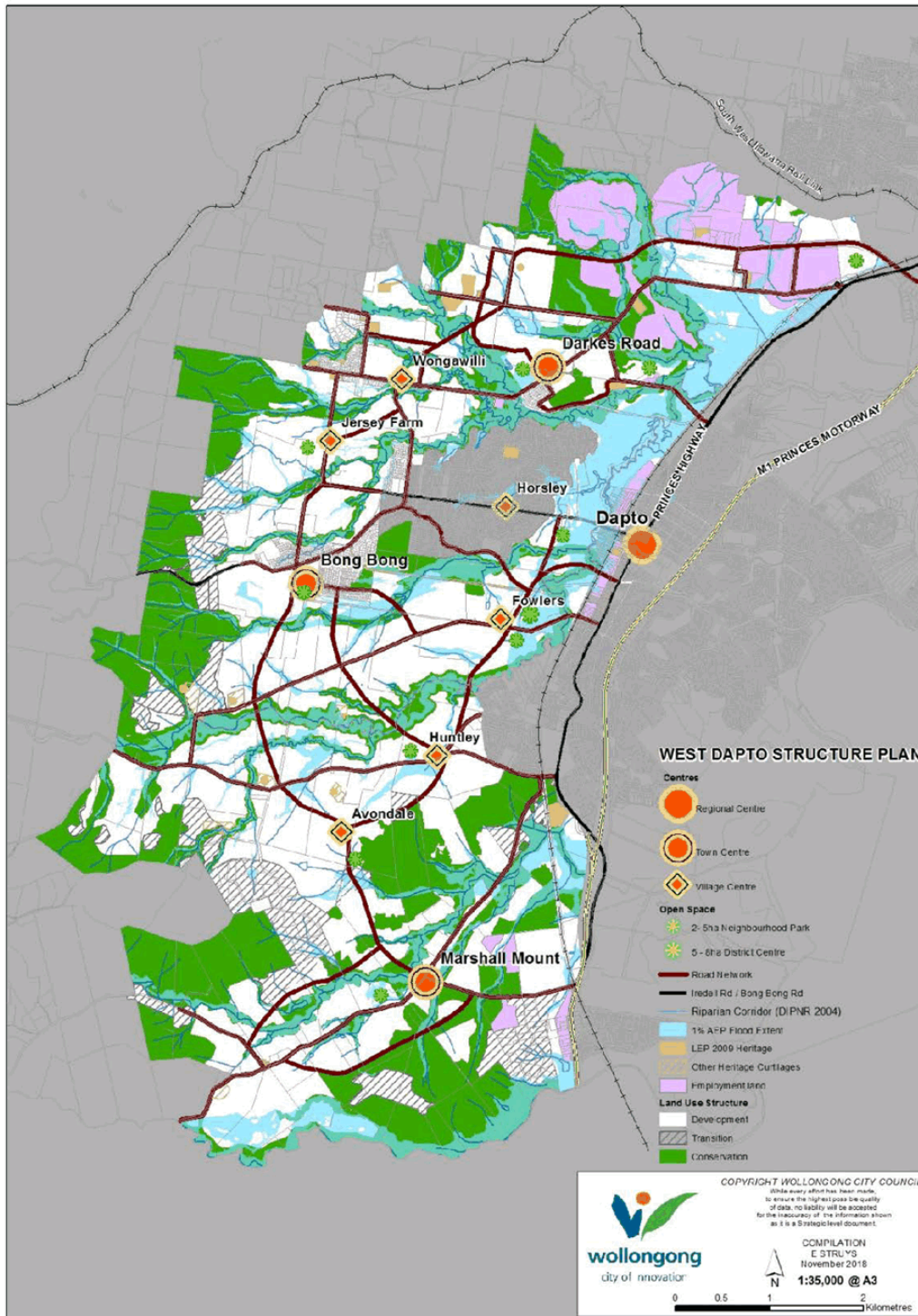
- Potential development of around 4,000 new dwellings.
- Marshall Mount Town Centre comprising approximately 3,500 sqm floor space in a traditional main street format to provide for retail shops, local convenience needs, local services, community facilities and the like.
- Connection of the precinct into Avondale and Cleveland, with access via an extension of Yallah Road (Road No. 8) as part of the overall West Dapto road network.
- Protection of significant vegetation and unique landscape features of the area.
- Utilisation of Duck Creek as a focal feature of the community.
- A primary school located near Marshall Mount Town Centre to meet the educational needs of the future residential families.

Stages 3 & 4

Stages 3 and 4 are located in the existing rural suburbs of Cleveland and Avondale, in the middle of the release area south of Horsley and well connected to Dapto Regional Centre to the East via Fowlers Road into Cleveland Road. Part of Stage 3 has been rezoned and combined with the remainder of Stage 3 and 4 will ultimately include:

- Potential development of approximately 8,800 new dwellings.
- Community facilities including a district level recreational centre and youth services facility.
- Two primary schools meet the educational needs of the future residential families.
- Three well connected village centres (Fowlers, Huntley and Avondale) that will provide local convenience shops and urban focal points within the residential areas.
- Unique Mullet Creek Catchment environmental features providing the riparian corridor spur supporting and defining the surrounding urban form.
- Structural road network that will connect from the southern extent of Stage 2 at Bong Bong Town Centre down to the southern extent of Stage 4 and into Stage 5 of the release area. There will also be road connections spanning from Dapto Regional Centre into the release area along the east, branching into the village centres supporting surrounding residential development.
- Active transport facilities (cycleways/shared paths) connecting residential areas with open space provisions via riparian corridors and along the structural road network.
- High School and primary school facilities for the future population of the stages. Ideally the School will be located near Bong Bong Town Centre (in either Stage 2 or 3) to create a relationship with the town centre and provide education services for the future children and youth population residing between Stage 1, 2 and 3 of the release area.

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Figure 2. West Dapto Structure Plan 2018

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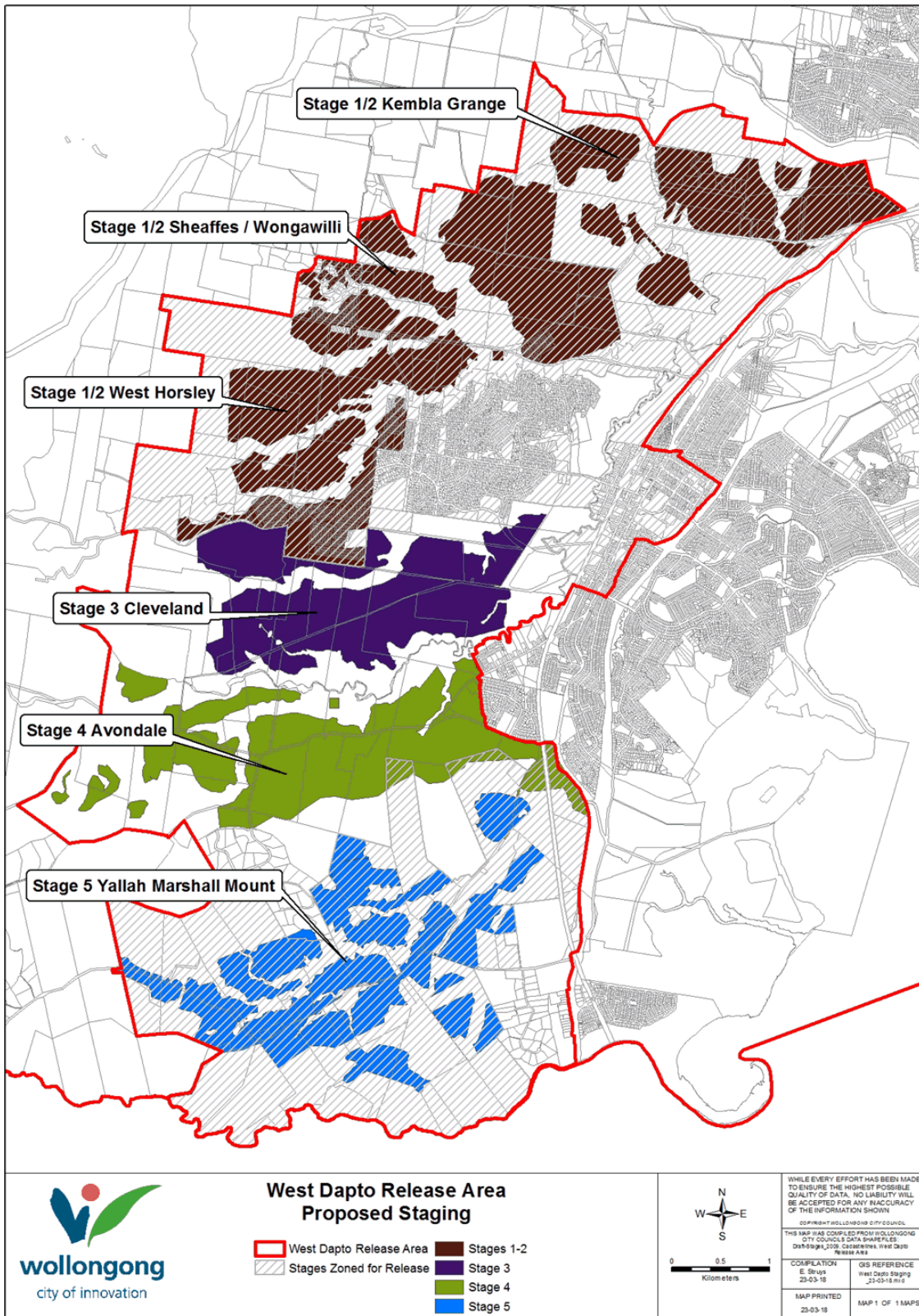


Figure 3. Stages of West Dapto Release Area

5 PLANNING PRINCIPLES

The West Dapto Planning Principles are intended to guide landuse planning decision associated with the release area. They provide a statement of a desirable outcome for the development of the release areas and provide a basis of reasoning to support making planning decisions. Principles are important considerations when there may be more than one interpretation or contradictions between any qualitative requirements or development controls defined in other chapters of the DCP.

There are eight groups of principles originally outlined in the West Dapto Vision document 2018. This chapter is structured in a similar way building on principles with some additional requirement details. **Figure 4** outlines the key components and how they relate to Council planning policies.

The group of principles include:

- Transport
- Water management
- Conservation
- Open space
- Community and education
- Town centres
- Employment
- Housing

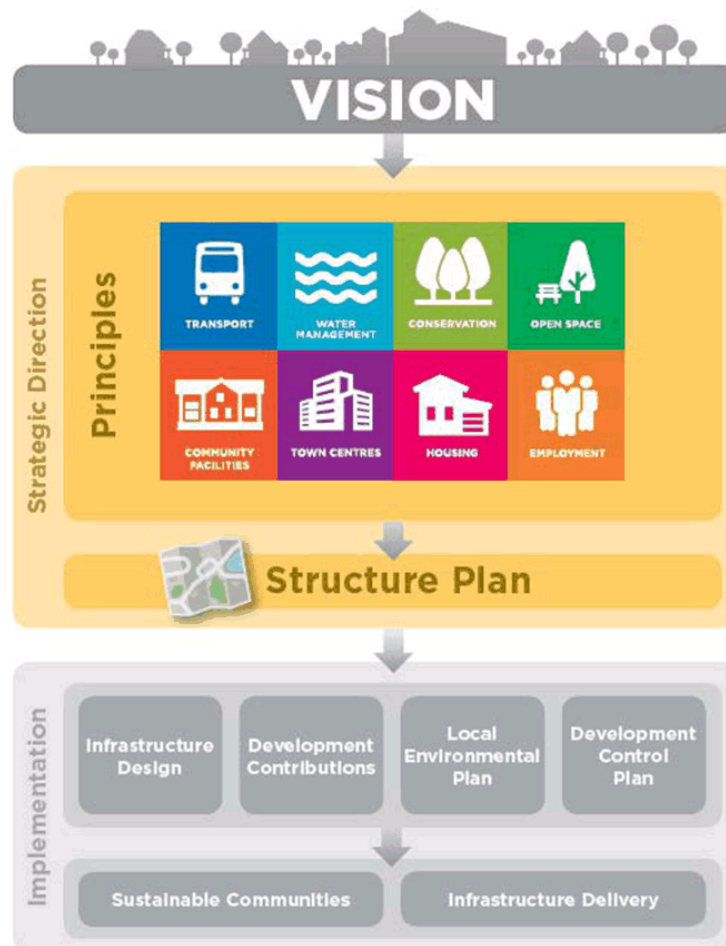


Figure 4. Structure and relationships of principles to planning tools

6 TRANSPORT

6.1 The road network

The future road network for West Dapto will be the 'backbone' of the community, providing for all types of access and movement through the release area. The road network form and provision contribute significantly to achieving the vision of long-term sustainability.

An integrated transport system is proposed that caters for the private car, freight, public transport, pedestrians and cyclists. Road types have been developed based on a functional hierarchy, where the road designs support the transport modes in various ways. The road network has been developed to cater for future urban land uses and deliver a safe, connected and legible transport framework that compliments the natural environment and facilitates sustainable transport outcomes.

The Structure Plan (**Figure 2**) outlines the structural road network through the release area. The Road network structure was modelled in TRACKS to understand the demand and supply requirements to service the release area. The modelling informed road typology requirements for the structural road network as shown in **Figure 5** and **Figure 6**. The road typology for the release area is informed by road hierarchy and cross sections which detail how the roads are configured for designs. Road Hierarchy and cross sections are covered in DCP Chapter B2 Residential Subdivision.

In accordance with the following road network principles (specifically 2 and 3), the release area needs to be accessible in emergency situations. Flooding events present a specific challenge to urban development in a flood plain area and specific design response is needed provide safe and connected residential areas. **Figure 7** illustrates which structural roads or sections of road will be designed and constructed to provide 1% Annual Exceedance Probability (1% AEP) flood immunity.

Principle 1 - Supportive land use patterns

- 1.1 Plan higher residential densities and mixed land use in & adjacent to town and village centres and major public transport nodes, to reduce reliance on the private car and reduce overall road network requirements and costs.
- 1.2 Plan the co-location of compatible land uses to reduce reliance on the private car and reduce overall road network requirements and costs.

Principle 2 - A safe, connected and legible road network for all users

- 2.1 Provide a road network based on the modified grid layout to maximise accessibility and efficiency.
- 2.2 Implement a clear hierarchy of road types (see **DCP Chapter B2 Residential Subdivision**) that responds to relevant transport requirements and road function, creating a highly legible road network for all users (**Figure 5** Road Typology and **Figure 7** Flood access roads of the structural road network).
- 2.3 Implement intersection designs appropriate to the road types (**Figure 5**), surrounding land uses and environments.
- 2.4 Ensure the structural road network supports the town and village centres hierarchy within West Dapto.
- 2.5 Ensure the integrated road system, caters for all road users including private cars, freight, public transport (buses), pedestrians and cyclists.
- 2.6 Implement driveway access restrictions and manage on-road parking on the higher-order roads (access-denied roads) to improve traffic efficiency and pedestrian/cyclist safety and amenity.
- 2.7 Ensure built form controls on adjacent properties to roads deliver active frontages to maximise passive surveillance and personal safety in the road environment. For example, road layouts that include lanes, service roads and so on to ensure houses front the primary road.
- 2.8 Ensure roads and intersections are designed to meet requirements of the DCP Chapter B2: Residential Subdivision, AustRoads and Australian Standards.

Principle 3 - Design roads to compliment the environment

- 3.1 Ensure roads fit with the landform (topography), compliment local character/land use and minimise visual, ecological & noise impacts.

- 3.2 Ensure road alignments take advantage of views and visual stimuli for the motorist to enhance legibility, sense of place & create a positive experience in movement.
- 3.3 Consider the role of road networks in structuring precincts, including both transport and community needs to maximise liveability and quality urban outcomes.
- 3.4 Incorporate Water Sensitive Urban Design (WSUD) into transport infrastructure design and consider options to increase permeability of hard surfaces.

Principle 4 - Quality infrastructure

- 4.1 Use robust and durable materials, quality finishes and ancillary infrastructure, with neat, uncomplicated designs that minimise maintenance requirements and discourage vandalism.
- 4.2 Consider the use of innovative technologies in road & transport infrastructure design, construction and operation.

Principle 5 - Road network to support sustainable transport outcomes

- 5.1 Staging of additional car based infrastructure to encourage public/active transport and maximise use of existing infrastructure.
- 5.2 Use an established 15% transport mode shift target when planning for road network requirements within West Dapto, to encourage a shift towards reduced car dependence.
- 5.3 Ensure that roads are designed to provide a high level of safety, access and amenity for pedestrians, cyclists and public transport (bus services).

6.2 Bridge and culvert design

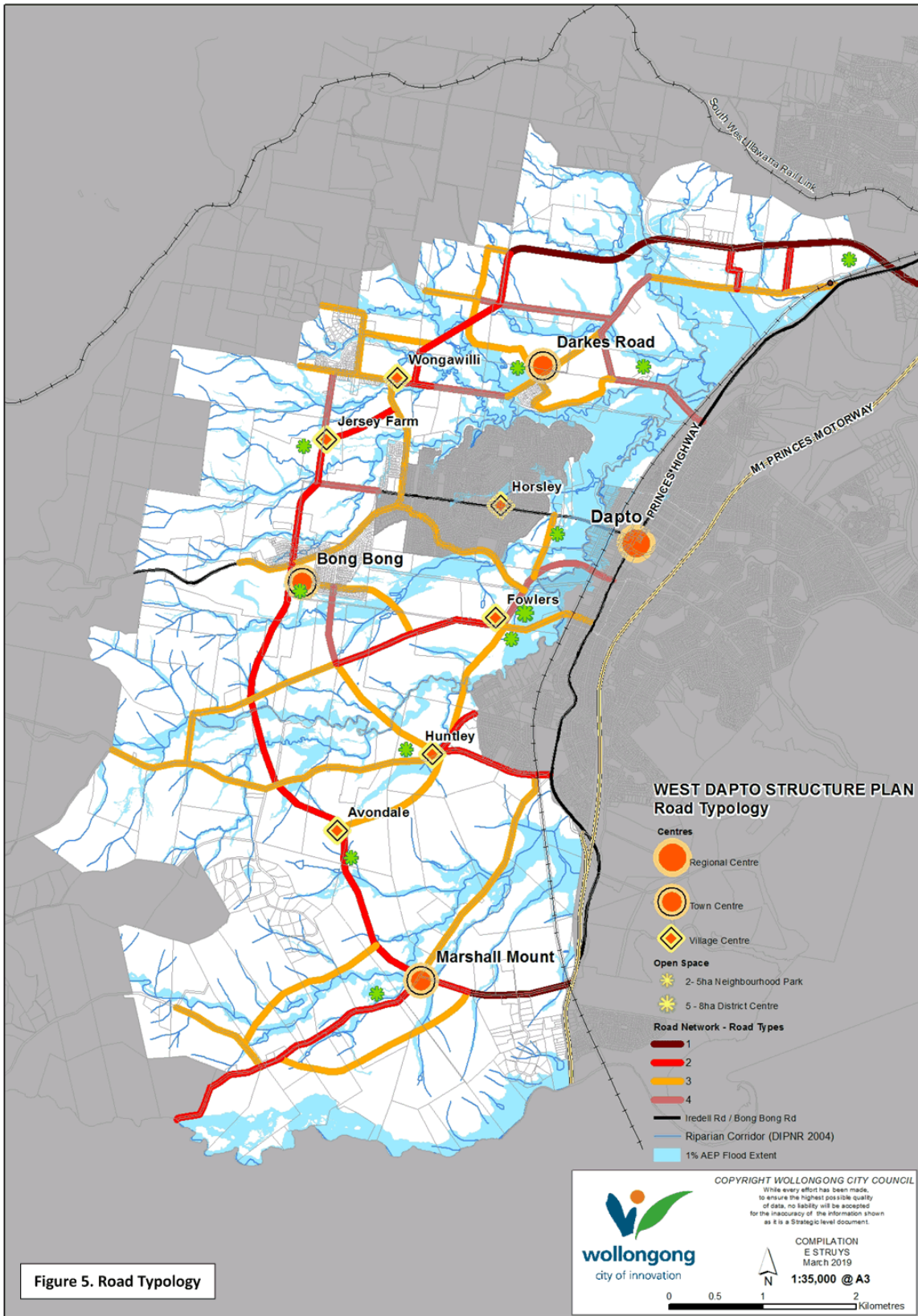
Bridges and culverts form important structural components supporting the road network as it traverses the flood plain landscape. While there are design limits and prefabrication conditions the infrastructure are built to, it is also important that design decisions on materials, placements, modification to standards and any other specifics take into account desired outcomes for the areas they are in and who they will cater to.

Principle 1 – Good design is context sensitive design

Design that is sensitive to context is valued by communities. Bridges/culverts that are functional and fit the landscape are good for community pride and local identity.

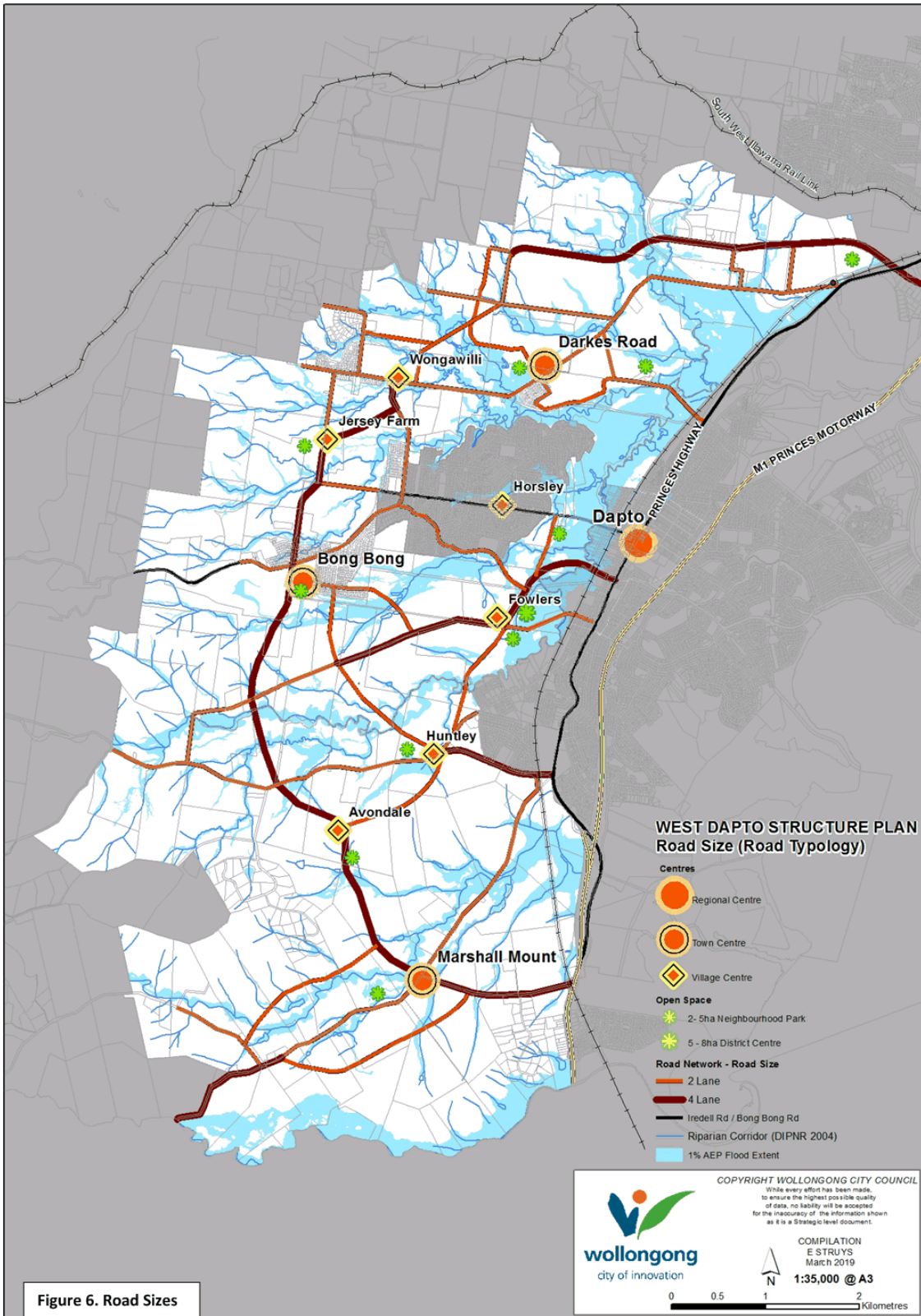
- 1.1 Consider influence of locational context and functional requirements in the design process. For example, if the crossing is traversing land that is zoned E2 or E3 and there are known ecological communities or fauna groups recorded there, fauna crossings should be a component of design and construction must be done sensitive to these outcomes.
- 1.2 Bridge/culvert alignment should integrate with environmental features.
- 1.3 Construction over or within waterways should have regard to the Fish Passage Guidelines developed by NSW Fisheries.
- 1.4 Ensure storm immunity standards are met and design/construction provides longevity and minimises maintenance requirements.
- 1.5 Design and finishes and overall appearance should respond to and incorporate character of the area.

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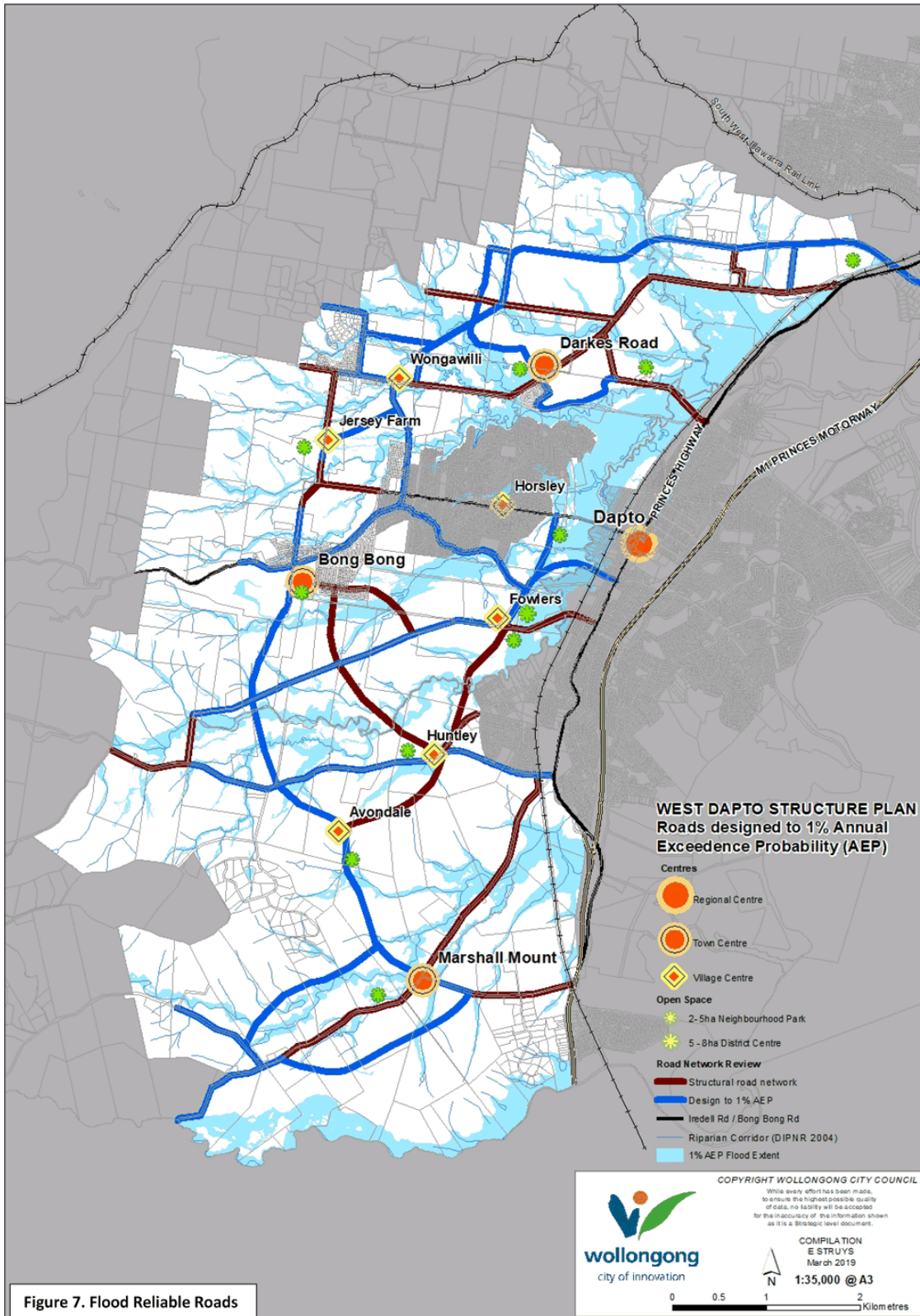
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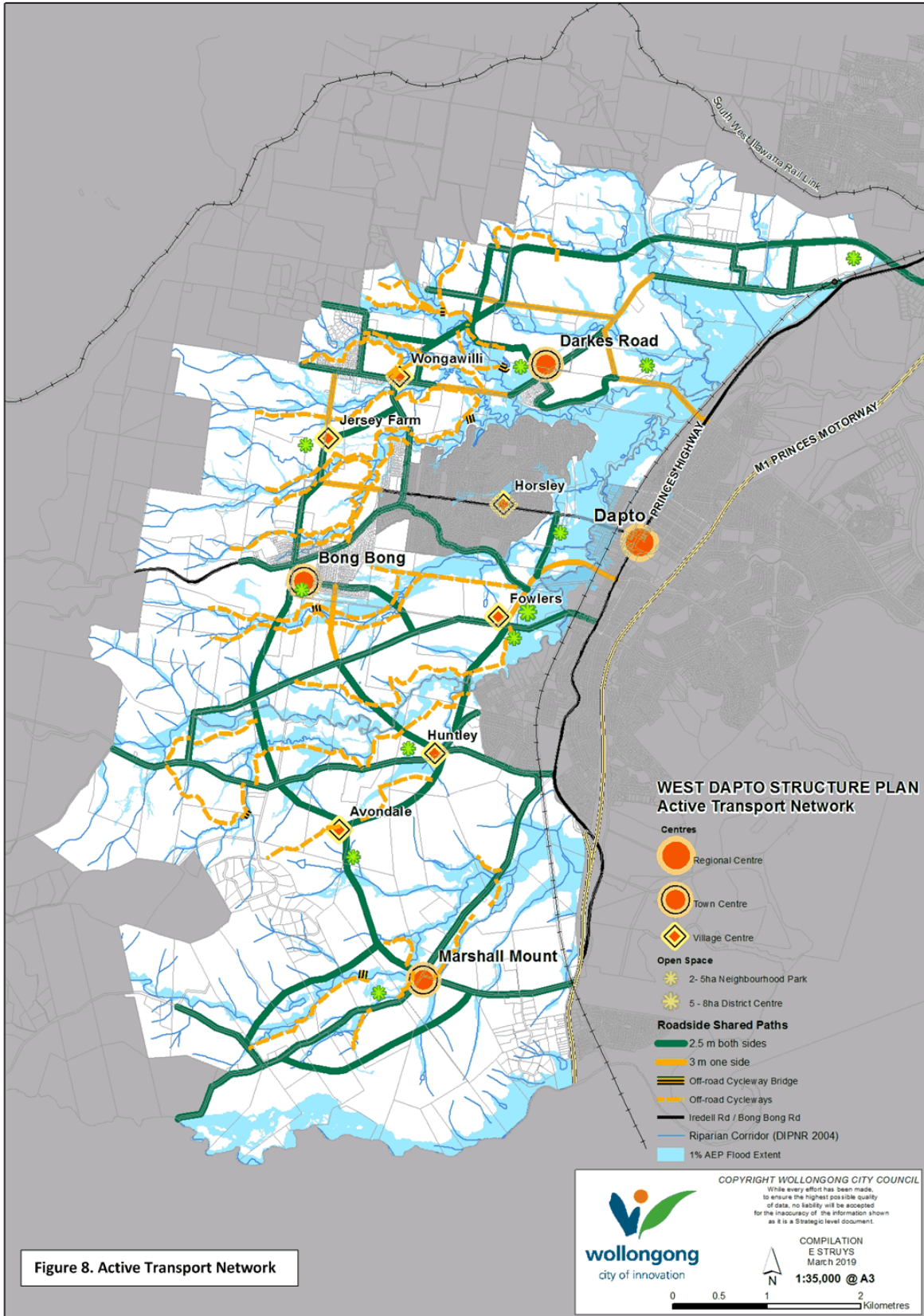
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6.3 Active transport

Walking and cycling (referred to as Active Transport) will be an important component of the future West Dapto transport system, contributing significantly to achieving the vision of a 'sustainable' community. An emphasis on the design and planning for West Dapto has been the notion of walkable communities which enable sustainable living to occur. Walking is also an important factor in the success of public transport.

Active transport at the local level will deliver convenient and attractive travel options especially for short trips, which will not only assist in reducing the reliance on, and impacts of private car use, but will contribute to the health and resilience of the community.

The riparian corridors will be structural open space areas, as a 'spine' to convey water and connect ecology, to promote walking and cycling with a series of pathway systems clearly linking key destinations such as schools from residential areas to promote walkability.

Map shown in **Figure 8** identifies routes for off-road cycleways, as well as links for active travel on shared paths as part of the road network (road cross sections include roads with shared paths outlined in DCP [Chapter B2 Residential Subdivision](#)) connecting neighbourhoods and residential areas to parks and town centres. The shared paths and cycleways should be located outside of the 'core' riparian areas with selected cycleway bridges spanning riparian core land connecting key destinations through an open space network (see active transport map **Figure 8**).

Principle 1 – Supportive land use patterns

- 2.1 Plan residential land use close to town and village centres and major public transport nodes, with higher residential densities adjacent to these locations to maximise walking and cycling catchments
- 2.2 Promote shared parking across uses in town/village centres to encourage walk trips when undertaking multiple activities in these centres. Avoiding fragmented parking will also improve utilisation of spaces and improve walkability through more compact town centre layouts and fewer driveway crossings.

Principle 2 – Connected, functional pedestrian & cycle network

- 2.1 Provide a convenient and legible movement network for pedestrians (including those with disabilities) and cyclists, ensuring excellent connectivity and directness between residences and attractors such as schools, shops, public transport nodes, sports ovals and employment centres.
- 2.2 Include footpaths/shared paths on all roads in the road types hierarchy except laneways and minor access streets (refer to Road Network Principles and DCP Chapter B2: Residential Subdivision)
- 2.3 Take advantage of easements, riparian areas and open space areas to create convenient pedestrian and cycle links (or "short-cuts") that maximise accessibility between different precincts /land uses.
- 2.4 Implement a wayfinding strategy to provide clear and coordinated information for access to facilities and services within the West Dapto Release Area and surrounding areas.
- 2.5 Provide safe and secure bicycle parking or storage facilities at key destinations in town & village centres, sports ovals, community facilities, transport interchanges and key open space areas.
- 2.6 Include bicycle parking and end-of-trip facilities as part of the development of employment sites, business and commercial sites particularly those in town and village centres.
- 2.7 Ensure that the West Dapto cycleway network integrates with the wider surrounding regional cycle routes.

Principle 3 – Attractive and safe environment

- 3.1 Design streets to provide a high level of pedestrian and cyclist amenity and safety, creating public space where people want to be.
- 3.2 Provide convenient and safe road crossing points, traffic calming (where appropriate) and tree planting to enhance the pedestrian and cycle environment.
- 3.3 In high pedestrian demand areas such as town and village centres, further increase pedestrian amenity and safety through path widening, driveway access controls and other site-specific actions to improve pedestrian priority.

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- 3.4 Incorporate Crime Prevention Through Environmental Design (CPTED) principles in the planning of walking and cycling facilities.
- 3.5 Consider innovative technologies for lighting key off-road paths, including solar lighting and luminescent pathway materials etc.
- 3.6 Construct pedestrian and cycle infrastructure according to AustRoads and Australian Standards, with attractive & durable materials and well-designed landscaping treatments.
- 3.7 Incorporate supporting infrastructure such as seats, bike rails, shade structures, bubblers and viewing/rest areas into the active transport network where appropriate.

As part of Council's commitment to the transport principles and active transport outcomes, additional initiatives will be explored that will help promote and encourage the take up of active transport in our community.

6.4 Public transport

The establishment of efficient and attractive public transport options for West Dapto is imperative to achieve sustainable growth outcomes. West Dapto Release Area presents an opportunity to promote 'best practice' in public transport and non-motorised modes, reducing reliance on the private car, contributing to a mode shift target and creating a more resilient, interesting and liveable community.

These high level principles inform & guide public transport planning for the new growth area, to ultimately ensure that the vision for sustainable transport in West Dapto is achieved. This will also require partnerships beyond council, with public transport providers and Transport for NSW.

Neighbourhood Plans and Development applications must demonstrate they have planned to facilitate public transport by responding to these principles at each level of development planning.

Principle 1 – Accessible public transport

- 1.1 Major public transport nodes located in town and village centres where the greater residential densities and employment opportunities are centred.
- 1.2 Ensure that major generators of travel are well serviced by public transport.
- 1.3 Promote co-location of different destination assets around public transport nodes and in centres, to enable multiple trip purposes.

Principle 2 – Effective bus network, service provision & integration

- 2.1 Provide coordinated, frequent & reliable bus services to destinations within and surrounding West Dapto.
- 2.2 Create an efficient, seamless travel experience through integrated ticketing, minimising transfer times, and intuitive and easily accessible service information.
- 2.3 Ensure street networks are interconnected and allow permeability for buses.
- 2.4 Ensure the bus network is highly accessible and services the majority of residences (with bus stops every 400m, see DCP B2 Residential Subdivision), town and village centres, employment areas, sporting facilities and Dapto Station.
- 2.5 Incorporate bus priority measures as necessary to ensure highly efficient, prioritised bus transport.

Principle 3 – Quality infrastructure

- 3.1 Provide comfortable, attractive, safe and secure buses and bus related infrastructure with clear timetable/service information and cater for all users including disabled/elderly.
- 3.2 Ensure pedestrian and cycle links to bus stops are of a high standard (refer also Active Transport Principles).
- 3.3 Encourage the use of innovative and efficient public transport technology.

7 WATER MANAGEMENT

This section outlines the guiding principles, objectives, outcomes and development controls relating to Water Management across the West Dapto Release Area.

The approach behind 'water management' is to consider both floodplain and stormwater principles in an integrated way to achieve a better overall 'water management' strategy for the West Dapto Release Area.

West Dapto is bisected by a series of watercourses that form part of the Mullet Creek and Duck Creek catchments. During heavy rain they can experience intense floods of short duration (rapid rise & fall of the creek levels). The residential areas of West Dapto will be designed to be above the 1% Annual Exceedance Probability (1% AEP) flood level and include provisions to protect future residents against flood risk.

Principle 1 - Integrate floodplain and stormwater management into the urban development process.

Objectives

- Adopt a 'water management' approach by integrating floodplain and stormwater management, which meets the needs for hydraulic capacity, managing floods and maintaining water quality.
- Develop an overall 'water management' strategy for the urban release area by integrating both stormwater and floodplain management strategies, to guide progressive development within West Dapto without causing adverse impacts to downstream areas by way of flooding or reduction in water quality.
- Manage stormwater runoff such that flood damage and adverse effects on both development and the natural environment is minimised.

Outcomes

- The creation of a water management strategy for West Dapto with consideration of but not limited to existing and new urban development, flooding, stormwater runoff, minimising impact of flooding and stormwater, water sensitive urban design, the environment, and water quality in receiving waters including Lake Illawarra.
- The successful implementation of a water management strategy for West Dapto.

Principle 2 - Improve the management of water quantity relating to urban development inclusive of stormwater, wastewater, water supply and recycled water.

Objectives

- Maintain or minimise changes to natural hydrology of catchments which drain to waterways or neighbouring catchments.
- Manage stormwater runoff using a combination of at-source and regional systems rather than a single scale system where possible.
- Minimise stormwater runoff volumes.
- Incorporate Water Sensitive Urban Design principles in managing stormwater quantity.
- Mitigate potential stormwater impacts from future urban development.
- Reduce the probability and impact of downstream flooding to a level acceptable to the community.
- Manage stormwater discharge in a manner that minimises impacts on downstream receiving waters.
- Ensure that stormwater runoff is treated as a valuable resource and that its use for non-potable purposes is encouraged.
- Encourage stormwater reuse and harvesting.
- Reduce potable water consumption.

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Outcomes

- Any retention/detention basins, if required, are strategically located within the neighbourhood, precinct and/or regional scale to attenuate flows to pre-development conditions for events between the 1 year and 100-year storm events.
- Developments which use re-use water, infiltration, retention and/or detention strategies to limit the increase in runoff volume.
- Limiting the increase in stormwater runoff volume from urban development through the use of water sensitive urban design measures.
- Minimised impervious areas to 60% on individual lots to promote infiltration and reduce peak flows downstream.
- Grassed swales incorporated at the subdivision scale to promote infiltration and reduce peak flows downstream.
- Rainwater tanks utilised on a large scale on individual lots for house and garden reuse to reduce runoff volume and reliance on potable water supplies.
- The use of buffers such as landscaping, detention and retention structures between impervious surfaces and receiving waters.
- The use of landscaped features to direct runoff from impervious areas into vegetated areas.

Principle 3 – develop the floodplain and surrounding areas in a sustainable way.

Objectives

- Develop strategies that will cater for progressive urban development within West Dapto without causing adverse impacts to downstream areas by way of flooding, increase in flow rates or reduction in water quality.
- Identify the extent of the floodplain based on post development flooding scenarios to enable key planning for sustainable urban development.
- Prevent the intensification of the use of floodways, watercourses and overland flow paths for residential/commercial/industrial development use.
- Design development layouts with consideration to the existing floodplain and natural landform.
- Promote multifunctional and appropriate land use of the floodplain.
- Address the potential impacts of climate change.
- Increase the public awareness of flooding within the West Dapto Release Area and existing urban catchment of Dapto.
- Ensure that flood fringe areas are sustainably managed.

Outcomes

- Urban developments which are located in the release area and are resilient to flooding in both the short and long term.
- Residential developable areas that are located outside of the 1% AEP flood extents and elevated using a freeboard of 500mm plus a predetermined climate change factor, based on a detailed catchment wide flood investigation for the post development (ultimate) flooding scenario.
- Urban developments which are designed with minimal disturbance to the natural land form.
- Recreational open space areas which are located adjacent to riparian areas and/or within the natural floodplain storage areas.
- Development which has been controlled by specific guidelines to ensure sustainable development in the floodplain.
- Increased public awareness of the hazard and extent of land affected by all potential floods, including floods greater than the 1% AEP event and to ensure essential services and land uses are planned appropriately in recognition of all potential floods.

- No adverse impacts to downstream areas from either flooding or reduction in water quality.

Principle 4 - Preserve the natural function of the floodplain, natural waterways and riparian corridors.

Objectives

- Ensure that the natural function of the floodplain to convey and store floodwaters during flood events is preserved and enhanced where possible along with any associated flood dependant ecosystem.
- Prevent any filling and/or development within high flood risk areas.
- Ensure no net increase in fill within the floodplain.
- Protect key creeks and riparian corridors from degradation and improve their environmental function where possible.
- Ensure that rehabilitation of key riparian corridors is consistent with the adopted 'water management' strategy for West Dapto and the DCP Chapter E23 Riparian Land Management.

Outcomes

- All residential/commercial/industrial development is located outside of the identified flood conveyance and flood storage areas.
- The revegetation of riparian corridors does not increase flood risk to the existing surrounding urban areas.
- Natural drainage paths and infiltration basins utilised as much as possible.
- Revegetation of key riparian areas is undertaken in accordance with the Riparian land management chapter in the Wollongong DCP.
- Waterways are protected by providing a vegetation buffer to urban development.
- Potential increase in developable land within the shallow floodplain (< 0.5m depth in a 1% AEP event and of low hydraulic hazard) by way of implementing a local cut/fill strategy only where compliance with all relevant floodplain management controls can be demonstrated.
- The natural functions of flood dependant ecosystems are preserved where possible.

Principle 5 - Protect people and property from flooding in a strategic way.

Objectives

- Minimise the risk to human life and property damage caused by flooding through appropriately locating urban development.
- Ensure flood risk and flood impacts to both existing and future development within West Dapto and surrounding catchment areas are minimised.
- Minimise the risk to human life by ensuring the provision of safe vehicular access/egress for residents and emergency services in times of flood.
- Develop practical floodplain and stormwater management solutions for future urban development and associated infrastructure within West Dapto.
- Locate residential urban development areas outside of the 1% AEP flood extents and elevate using a freeboard of 500mm plus a predetermined climate change factor, based on the post development (ultimate) flooding scenario.
- Design specific roads within the urban release area to achieve a 1% AEP flood event immunity including a pre-determined climate change factor or greater flood event.
- Ensure new development does not increase the flood risk to existing development areas.

Outcomes

- Specific guidelines which have been created to locate development within West Dapto without putting people and property at flood risk.

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- Residential developable areas that are located outside of the 1% AEP flood extents and elevated using a freeboard of 500mm plus a predetermined climate change factor, based on a detailed catchment wide flood investigation for the post development (ultimate) flooding scenario.
- Floor levels for all residential habitable buildings are set at or above the post development flood planning level corresponding to the 1% AEP flood level plus 0.5 metre freeboard plus a pre-determined climate change factor.
- Specific roads (identified on the map in Figure 7) are designed to connect urban development and provide safe vehicular flood access to higher ground in times of flood up to and including the 1% AEP event plus a pre-determined climate change factor, or where feasible the Probable Maximum Flood (PMF) event;
- Identification of potential flood risks to people and property in West Dapto through the undertaking of a detailed Floodplain Risk Management Study.
- Sheltered refuge areas are incorporated into building designs, with the floor level of the refuge set above the PMF where applicable to protect occupants from extreme floods.

Principle 6 - Protect water quality of surface and groundwater from urban development and avoid any adverse effects on water quality to downstream watercourses and Lake Illawarra.

Objectives

- Enhance the long-term environmental protection of the receiving waters and Lake Illawarra.
- Manage stormwater quality using a combination of at-source and regional systems, rather than single scale systems where possible.
- Incorporate best practice Water Sensitive Urban Design (WSUD) and proven innovative solutions to ensure there is no adverse impact on water quality discharging from the site or to natural streams.
- Utilise higher stormwater quality targets through best practice stormwater treatment systems, as proposed by the stormwater risk management framework being developed for the Lake Illawarra catchment.
- Prioritise stormwater quality management strategies to meet load reduction targets for nitrogen, the limiting nutrient for water quality issues in the receiving waters.
- Manage stormwater in accordance with the Lake Illawarra Coastal Management Program.

Outcomes

- The use of appropriate WSUD measures both at the source of subdivision runoff and at a regional scale to minimise the water quality impacts downstream.
- The use of a treatment train approach including systems such as bio-retention, swales, wetlands and raingardens which exceed current stormwater quality targets.
- No reduction in water quality in Lake Illawarra related to stormwater arriving from the release area.
- A water quality monitoring system that monitors the effectiveness of stormwater treatment systems within the urban release area, the quality of water entering receiving waters and agreed systems and processes for addressing any inadequate water quality issues.
- Stormwater quality reduction targets are verified through focussed monitoring, evaluation and reporting activities.
- The flood risk to existing development is not increased.

Principle 7 - Integrate stormwater management into the natural and urban land form in an unobtrusive way.

Objectives

- Manage the flow of stormwater from the urban release area using both natural and artificial drainage networks to a formal point of discharge.
- Integrate Water Sensitive Urban Design (WSUD) into roads, landscape and open space only

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where practical to collect and treat runoff prior to discharge into receiving waters and Lake Illawarra.

- Identify, manage and enhance the function of existing watercourses and natural trunk drainage paths where possible.
- Make provision in the Neighbourhood Planning phase of the urban release area for adequate proportion of land that serves stormwater management functions.
- Minimise the use of 'hard engineered' stormwater infrastructure. If this type of infrastructure is necessary, avoid locating 'hard engineering' stormwater infrastructure within existing vegetation or riparian corridors where possible.
- Ensure stormwater systems are safely integrated with parks, conservation areas and riparian buffers in a visually appealing way to achieve quality environmental and social outcomes.
- Promote the community acceptance of places which integrate stormwater systems with the environment.

Outcomes

- A network of interconnected multi-functional drainage corridors within West Dapto which act as watercourses, floodways, flora and fauna habitat and water quality treatment areas.
- Stormwater treatment systems which are integrated within public open spaces and streetscapes to enhance visual and public amenity.
- Online stormwater basins only where environmental impacts are minimised, and development benefits maximised.
- Artificial drainage infrastructure which has been designed and landscaped to mimic natural ponds and waterways, and also provides public amenity.
- Places which are safe, visually appealing and encourage active/passive use by the community.
- Places that provide access to and awareness of the total stormwater system for the community.
- Native vegetation used within stormwater management infrastructure.
- Road corridors located above the 1% Annual Exceedance Probability (AEP) which have incorporated WSUD measures.

Principle 8 - Provide efficient and sustainable stormwater infrastructure for the urban release area.

Objectives

- Develop regional stormwater management solutions in combination with at-source based systems where possible.
- Ensure that the stormwater infrastructure is practical, cost effective and maintainable, with preference given to options achieving the maximum benefit-cost ratio over their lifecycle.
- Ensure stormwater infrastructure is designed to remain viable for the long term and under the widest range of probable climate futures.
- Ensure that lifetime maintenance costs are factored into decision making processes and strategies are in place to ensure adequate maintenance over the life of the system.
- Incorporate best practice stormwater management principles and strategies in developments, including monitoring regimes that can demonstrate the effectiveness of the system.
- Discourage interim stormwater management solutions unless it can be replaced with an ultimate strategic solution.
- Ensure that stormwater management systems applied within West Dapto achieve aesthetic, recreational, environmental and economic benefits and avoid introducing social risks;
- Achieve a uniform standard of stormwater drainage design for all urban developments.
- Increase public convenience and public safety as well as protection of property.
- Ensure stormwater infrastructure is designed with consideration to blockage and maintenance

access.

Outcomes

- The overall number of stormwater systems is tailored for the neighbourhood and regional zones to detain or retain as much of the catchment runoff as possible.
- Infrastructure such as swales, basins, wetlands and gross pollutant traps which have been designed with consideration to maximum functionality and longevity, minimal construction and ongoing maintenance costs, infrequent maintenance periods and low potential for attracting mosquitos and algal blooms.
- Stormwater infrastructure such as trunk drainage and basins that are designed to fit within the existing topography, with minimal impact upon the environment.
- Reduced capital costs due to implementation of soft engineering treatments.
- Installation of stormwater infrastructure which has been designed with consideration to climate change in a practical, sustainable and cost-effective manner.
- Stormwater infrastructure designed and constructed with consideration to the ultimate strategic stormwater plan for West Dapto.

Principle 9 - Preserve the natural environment and enhance where possible in keeping with stormwater quantity and quality management objectives and targets.

Objectives

- Protect and enhance the habitat value of the surrounding environment and downstream waterways, by controlling water quality and water quantity.
- Improve key riparian corridors and ensure the ecological values of the creek systems are enhanced without flooding impact on existing development.
- Protect and enhance where possible natural watercourses, riparian corridors and wetlands.
- Minimise the disturbance to the natural landform and existing vegetation.
- Reduce the impacts typically associated with urbanisation on receiving waterways and wetlands, including a reduction in streamflow erosion potential.
- Adopt the treatment of all watercourse corridors including widths according to the Riparian land management chapter in the Wollongong DCP.
- Maintain riparian connectivity of key category 1 watercourses by using piered deck structures where road crossings are proposed.
- Minimise the number of road crossings across category 2 watercourses to preserve riparian connectivity.
- Minimise the edge effects at the riparian corridor / urban interface by the provision of a suitable riparian corridor width and integrated transition at the urban and riparian interface (for example, perimeter roads with houses fronting, gentle batters if needed, otherwise avoid batters and retaining walls).
- Protect and rehabilitate existing waterways into 'living' waterways.
- Enhance urban areas by applying Councils 'Urban Greening Strategy'.
- Enhance the appeal of the natural environment to the community by introducing adjacent open spaces.

Outcomes

- Key watercourses within development neighbourhoods which have been enhanced with natural bed stability and sympathetic re-vegetation to minimise erosion and promote habitat without causing adverse impacts to surrounding urban development in times of flood.
- Watercourses protected by providing a buffer of natural vegetation to urban development.
- Urban development which has minimal disturbance to soils and vegetation by maintaining the natural landform.

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- Waterways that are rehabilitated and provide fish habitat, pools and riffles and adequate riparian buffers in line with best practice.
- Appropriate monitoring systems in place to demonstrate the habitat value of downstream waterways is being protected including agreed systems and processes to manage stormwater quality and/or quantity if the habitat values are shown not to be protected.
- Community open space areas located adjacent to riparian buffers that provide a natural visual backdrop.
- Clear connectivity between riparian corridors and residential areas / roads by avoiding steep batters and retaining walls or opaque fences.
- Community access to selected waterways.

Principle 10 - Promote liveability and amenity for the community by using water in all environments.

Objectives

- Promote the community acceptance of places which integrate stormwater systems with the environment.
- Protect and rehabilitate existing waterways into 'living' waterways.
- Locate communal open space adjacent to natural and artificial waterways.

Outcomes

- Places which are safe, visually appealing and encourage active passive use by the community.
- Places that provide access to and awareness of the total stormwater system for the community.
- Waterways that are rehabilitated and provide fish habitat, pools and riffles and adequate riparian buffers. in line with best practice.
- Safe community access to selected waterways.

Other General requirements

1. A water cycle management report is to be submitted with Development Applications for subdivision in accordance with the currently adopted Water Cycle Management Study and Floodplain Risk Management Study and Plan for the urban release area. The report must address water cycle management, water quality management, watercourse and corridor management, conservation and rehabilitation of aquatic habitat, and floodplain management.
2. Land that remains below the 1% AEP flood level for the post development flooding scenario as approved by the consent authority is not suitable for residential development. The post development flooding scenario refers to the ultimate development scenario inclusive of a fully developed catchment across the urban release area, riparian corridor enhancement and floodplain management works (e.g. basins).
3. Subdivision of land is not to create any additional flood affected residential allotments. A flood affected allotment is defined as being wholly or partly below the Flood Planning Level (FPL) (i.e. the 1% AEP flood level plus a freeboard of 500mm) or the Probable Maximum Flood (PMF) – whichever is the greater.
4. There is to be no net increase in fill within the floodplain.
5. There is to be no filling or development located within the high flood risk areas.
6. Compensatory excavation may be used to offset fill; however, the compensatory excavation must be taken from an adjacent area of similar flood function that is lower in the floodplain (i.e. at a lower AEP inundation extent) than the proposed fill areas. Cut and fill drawings and volume calculations must be supplied to Council.
7. Filling of individual sites within the floodplain in isolation without consideration of the cumulative effects is not permitted unless the floodplain risk management plan (FRMP) for the catchment has been adopted which allows filling to occur. Where no FRMP is applicable, any proposal to fill a site must be accompanied by an analysis of the effect on flood levels of similar filling of developable

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sites in the area.

8. Any development and/or filling proposed within the floodplain shall be commensurate with the land use, flood risk, flood hazard and hydraulic category.
9. Enhanced riparian corridors cannot be used to offset any floodplain storage in the flood modelling.
10. The minimum habitable floor level of buildings to be set at the post development flood planning level (FPL) - (i.e. the 1% AEP flood level based on the post development flooding scenario plus a freeboard of 500mm plus a predetermined climate change factor). *Note: the allowance for climate change is determined from the current and relevant Flood Risk Management Study and Plan.*
11. Subdivisions are to be designed according to Water Sensitive Urban Design principles. Development applications are to include a detailed statement indicating how the proposed design complies with these principles. Refer to Chapter E15: Water Sensitive Urban Design.
12. Detention basins created offline to watercourses are required as necessary where peak flows are predicted to increase. Consideration will be given to proposals for larger basins that serve multiple precincts and sub-catchments or other innovative design. The location of basins needs to be agreed to by adjoining land owners as part the Neighbourhood Plan. Where a basin is on an adjoining property, owner's consent and the creation of an easement is required.
13. Developments shall be demonstrated to have reliable access in a 1% AEP event to Council's designated flood reliable roads within the West Dapto Release Area.
14. Development Proposals shall consider flood events larger than the 1% AEP event.
15. The Lake Illawarra Risk Based Framework water quality targets shall be used as a minimum for all water quality modelling. *Note: This general requirement is subject to the outcome of the Office of Environment and Heritage (now Department of Planning, Industry and Environment) Project: Applying the OEH / EPA Risk Based Framework in the Lake Illawarra Catchment.*
16. Refer to Chapter E13: Floodplain Management and Chapter E14: Stormwater Management and Chapter E15: Water Sensitive Urban Design for additional controls relating to floodplain and stormwater management.

8 CONSERVATION PRINCIPLES

8.1 Environment conservation

In adopting the concept of ecologically sustainable development (ESD, see DCP Chapter A2), regionally significant releases, such as the West Dapto Release Area, present opportunities to preserve remanent vegetation and enhance its ecological connectivity (structural and functional). This section identifies the strategic environmental priorities to guide planning and development of the West Dapto Release Area integrating conservation priorities with opportunity for a future West Dapto Biodiversity Conservation Strategy (BCS) and Biodiversity Conservation Strategy Structure Plan (BCSSP).

A BCS provides opportunity for Council to achieve biodiversity certification (bio certification) in a coordinated approach for the whole release area, improving the overall conservation outcomes beyond what would be achievable developing site by site. Council will continue to work closely with the NSW Office of Environment and Heritage and Department of Planning and Environment to achieve this strategic outcome. The principles should also be used to guide site by site considerations.

Principle 1: Prioritise areas that offer high environmental value for conservation

Consider information that identifies areas of threatened ecological communities or stands of habitat greater than 4 ha (considered to present high environmental value in terms of habitat size and area) and avoid impacts as a result of land use changes to these areas.

Principle 2: Connectivity of habitat areas

Connecting patches of habitat that have high biodiversity value will provide opportunity for ecological migration over time as well as opportunity for improvement to habitat quality and values. These are more commonly known as biodiversity corridors providing strategic connection of larger and better condition patches of vegetation either by re-establishing continuous native vegetation cover in one or more strata over an alignment or designing stepping stones of habitat that traverse local corridors recognised in planning instruments and studies.

Principle 3: Protect Environmental Values

Community values of environmental function in a landscape are aided by planning and providing complimentary land uses alongside conservation sites to assist in improving and protecting the ecological function of the site and enhancing its resilience.

Secure areas that present high environmental value as areas for conservation and long term management (ideally through a bio certification process).

Main development interfaces with the escarpment on the western edge of the release area are considered environmentally sensitive and zones reflect E2 Environment Conservation. Environment Conservation land will form a transitional development edge with lower densities of development adjacent to these areas. Increased opportunity for planting will be accommodated to complement the wooded slopes and riparian corridors.

Development interfaces with the predominantly west-east running riparian corridors which are considered to be where revegetation and ongoing management is required, or will be, zoned E3 Environmental Management.

Environmentally sensitive design and siting will be required for development in the E4 Environmental Living zone.

Refer to Chapter E17: Preservation and Management of Trees and Vegetation, Chapter E18: Threatened Species, Chapter E23: Riparian Land Management.

8.2 Heritage conservation

Understanding and conserving the heritage values of the West Dapto presents an opportunity to enrich the social values of the release area and to promote cultural understanding of our shared heritage.

The Australian Heritage Commission (2000) states the aim of both natural and cultural heritage conservation is to retain the significance of place and in the case of West Dapto the natural and cultural heritage values are deeply entwined and cannot be separated. (Australian Government, Department of Environment and Energy, 2017). Impacts to heritage significance are a key consideration for development of the release area at each planning stage. Land use changes should retain, integrate and enhance heritage values. The principles for West Dapto aim to promote heritage conservation and meaningful

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consideration of the significance of place to ensure future development enhances the heritage values of West Dapto.

Principle 1: Prioritise the Conservation of Heritage Items and sites of Aboriginal Heritage Significance

Local Heritage items listed in Schedule 5 of the Wollongong LEP 2009, sites of Aboriginal Cultural Heritage significance as well as areas of potential archaeological significance should be retained and conserved within new development areas and appropriate curtilages and visual settings established. Development planning should account for the significance of sites and places and their visual relationships to each other or key landforms and key sites that contribute to the historic setting or cultural significance of newly developing neighbourhoods should be retained.

Principle 2: Respect the Cultural Landscape

The West Dapto Release Area has a rich and diverse history of Aboriginal and non-Aboriginal occupation. The area retains a range of key landscape elements, landforms, natural features such as creeks and ridgelines, important views and visual connections, historic road and transport corridors that are important and unique aspects of the local area. The elements contribute to the character and significance of West Dapto through connection to Dreaming stories and by telling the stories of the area. Proposed development should be guided by an understanding of, and respect for significant features of the natural landform and historic setting, and assist new communities in understanding and appreciating the unique visual and physical connections between places and features within and outside of their development areas.

Views and Vistas

Generally, land in the release area around and above the 50-60 metre contours is considered of High Scenic Quality. There are high levels of concern for visual resource based on visual quality assessment of the release area. Development within these areas of high scenic quality must be sympathetic to that visual quality as the ability of the area to absorb change is low.

Principle 3: Embed Local History and Character in New Communities

Developments should strive to feature historic sites and places of significance within development areas to provide a unique sense of identity and character for developing neighbourhoods. The adaptation and re-use of historic buildings in an appropriate manner that provides for their conservation and integration into new developments is encouraged. The retention and integration of significant Aboriginal sites as well as significant trees and landforms into natural area reserves, parks and as conservation areas is also encouraged. The use of historically relevant street names, integration of interpretation and the celebration of aspects of a site's Indigenous and post settlement history, are encouraged to ensure that the rich history of the area is celebrated and recognisable in the identity of developing communities.

Other Requirements

There are additional responsibilities of developers to complete various **heritage studies** to understand the significance of Indigenous and European heritage sites and the potential impacts of the proposed for development in order to determine further conservation management requirements and approval needs.

Neighbourhoods will include visual character and cultural landscapes and will ensure:

1. Design of subdivision patterns and road layouts are to have regard to the retention of view corridors and vistas through, and to, areas of high scenic quality.
2. Primary Street planting is to be undertaken and established prior to the commencement of individual lot development or housing construction to minimise the visual impacts of proposed development.
3. A **visual impact assessment** is to be prepared by the applicant and submitted with any Development Application in areas of high scenic quality (at or above 50-60m contours). The visual impact assessment is to assess any potential impact to the visual quality and how the design will respond to this. The assessment will include recommendations for the development design. The development application will demonstrate how the visual quality of the visual catchment will be protected and incorporated through design responses.
4. An **Aboriginal Cultural Heritage Assessment Report (ACHAR)** is to be prepared for any proposed development where the site has been identified having moderate to high archaeological potential or cultural significance, where an Aboriginal site or object has been recorded in the vicinity, or if an area of potential archaeological deposit (PAD) has been identified through a Due Diligence Assessment or other study undertaken on the site, The recommendations of the ACHAR should

inform the development outcomes.

Wollongong LEP 2009 identifies a number of heritage items within the West Dapto Release Area. In addition to the statutory controls contained under the LEP the Wollongong DCP 2009 contains requirements in relation to these items.

1. Refer to Chapter E10: Aboriginal Heritage and Clause 5.10 of the Wollongong LEP 2009 for specific controls relating to Aboriginal Heritage.
2. Refer to Chapter E11: Heritage Conservation, Clause 5.10 of the Wollongong LEP 2009, The NSW Heritage Act 1977 and The Burra Charter.

8.3 Riparian Corridors

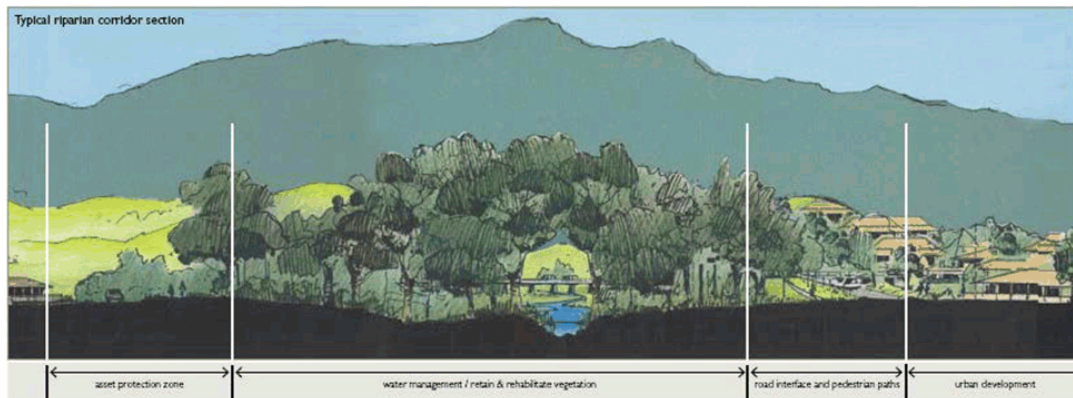


Figure 9. Typical riparian corridor cross section

West Dapto is dissected by fast flowing creeks and extensive areas of flood prone land, and riparian corridors. These areas offer an opportunity for recreation, visual separation and conservation. The corridors will result in significant amounts of open space creating wider landscapes within easy reach of all parts of the new development areas, meaning walking, cycling, recreation and nature will form a part of daily life. These riparian corridors have been, or will be, zoned for Environment Protection with limited development being allowed in these areas.

The riparian corridors will link the escarpment to Lake Illawarra through the release area. They will be vegetated with avenues of intensive planting and water management running through the urban street pattern to create a connected web of open space. This will encourage walking and create a sense of nature interacting with urbanity (see cross section in **Figure 9**).

Land between the watercourse and the 1% Annual Exceedance Probability flood extent can either be:

1. Retained in private ownership and used for grazing, recreational activities or other permissible uses, or
2. Dedicated to Council at no cost to Council, for use as bushland, agricultural purposes or recreational purposes. There are no development contributions off-set for the dedication / transfer of this land.

Controls:

1. Neighbourhood Plans will identify proposed land use and ownership of the riparian land.
2. Revegetation of riparian corridors to ensure healthy ecological structure and function and enhance resilience to flooding and improving water quality.
3. Refer to Chapter E23: Riparian Land Management for controls relating to riparian lands.

9 OPEN SPACE PRINCIPLES

This section establishes the open space principles for the West Dapto Release Area. This section should also be read in conjunction with Community and Education Facilities principles and at a landscape structure level, will contribute to delivering against the Urban Greening Strategy. An overarching framework with four inter-related principles is designed to achieve the open space objective for the West Dapto Urban Release Area. Open spaces need to be considered places that are designed responding to principles to ensure they provide for a resilient community.

There are more details regarding Council's specific requirements for each open space facility and subdivision requirements provided in the **West Dapto Open Space Design Manual and the West Dapto Open Space Technical Manual**.

Principle 1: Functionality

- Open space needs to be of an appropriate size and flexible footprint for multiple functions and uses (Hierarchy of facilities).
- Open space and recreation outcomes are not compromised by other competing functional elements. For example, flooding and water management, traffic and road infrastructure, cultural heritage and biodiversity.

Principle 2: Accessibility

- Walkable distances from residential areas, universal design principles used for facilities with a focus on 'play' and diverse experience (resident catchments).
- There is a well-distributed network of accessible (in both location and design), attractive and useable public open spaces and natural areas within the existing and future neighbourhoods of West Dapto.

Principle 3: Connectivity, movement and flow

- Open space must be connected spaces with shared paths and trails to other facilities or places of interest including centres, heritage sites (if not sensitive), riparian areas, natural areas, employment centres, transport nodes community facilities and the like.
- The open space areas are highly connected to create a network of open space with a range of functions to complement the existing landscape features and provide opportunities for ecological connectivity.

Principle 4: Value and amenity

- Future uses complement and add to existing values for example open space may present opportunities to preserve remanent vegetation or support regrowth of bushland vegetation (avoid conflicting landuse outcomes. For example, an active play facility may jeopardise a threatened ecological community, water management may restrict active use etc.).
- That public open space and natural areas will provide opportunity for interaction filling a variety of recreational, sporting, play, the physical and social needs of the community.

9.1 Hierarchy and catchments

Based on the principles of functionality, accessibility, connectivity and values, there are some guides to the level of open space based on size and characteristics of projected population and its recreational needs. **Table 1** categorises relevant population catchment distances for each level of open space provision (hierarchy) and how it generally relates to size requirements in the future urban and residential areas based on NSW Recreation and Open Space Planning Guidelines for Local Government (2010).

It is important to emphasise that any benchmark standards cannot be used as a 'one size fits all' assessment tool. Through analysis of local context and community needs, these standards can and should be varied if based on sound evidence.

Table 1. Open space provision standards (based on NSW Recreation and Open Space Planning

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Guidelines for Local Government (2010) and the Elton Report (2007) recommendations).

Function and service	Size	Catchment radius (distance)
Local Passive	0.5-2 ha	400-600m
Local Active	1-2 ha	400-600m
Neighbourhood Passive	2-4 ha	2km
Neighbourhood Active	3-5 ha	2km
District Active	5-8 ha	Southern ward of LGA
City wide Active	8 + ha	Facility to serve the whole LGA

Note: If stormwater infrastructure is proposed to be co-located with open space the general size requirements in **Table 1** should be considered with reference to Council’s **West Dapto Open Space Design Manual**.

The relationship can also be understood in catchments for community populations. **Figure 10** shows proposed open space catchments of West Dapto (based on methods established in NSW Recreation and Open Space Planning Guidelines for Local Government, 2010). These catchments are indicative and are shown for illustration purposes only to guide how location of facilities will be planned to be located within a walkable catchment. In the release areas open space network, open space will need to be provided at all hierarchy and catchment levels.

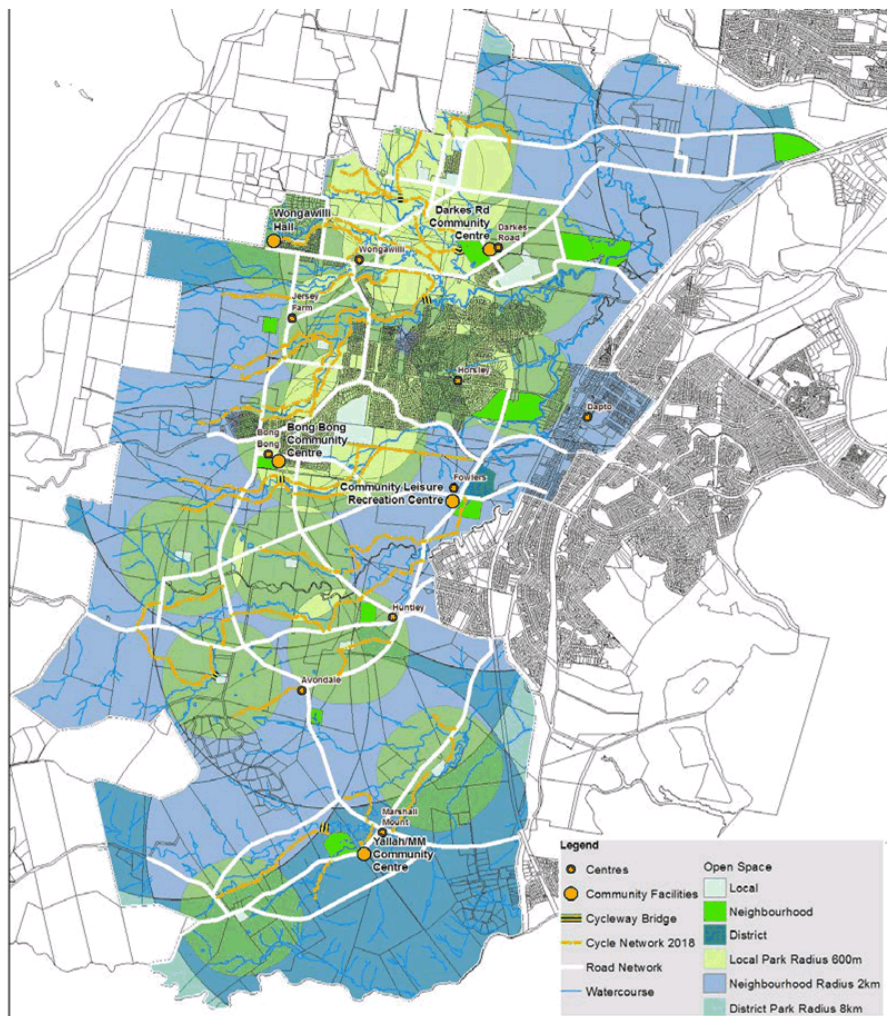


Figure 10. Planning for open space in West Dapto Release Area

10 COMMUNITY AND EDUCATION PRINCIPLES

Community facilities are an increasingly important component of local service provision across a range of areas in the public and private sector. For example, there is a clear trend in public health and alternative education to use local community facilities for regular and specialist community services rather than develop individual facilities. Council understands this increases the importance of flexible design, location and efficiencies to be achieved by these facilities for them to make the best contribution to community outcomes.



Figure 11. Community hub concept – co-location, joint use and multi-purpose centres

Principle 1: Healthy, diverse and resilient

Community facilities contribute to quality of life to support healthy, diverse and resilient community.

Principle 2: Efficient

Making efficient use of resources through shared or co-located facilities and multiple use agreements (multi-purpose community hubs) with flexible design that can respond, expand and adapt as needs change.

Principle 3: Safety, security and adding to civic identity and sense of place

Promote safety, security and provide focal points adding to civic identity and sense of place through clustering community facilities.

Principle 4: Self-sufficient and resilient community

Community facilities provide opportunity for self-sufficiency to build capacity and social capital and to actively contribute to community resilience.

Principle 5: Vibrant and accessible

Placing facilities in convenient, central locations, adjacent to open space. Promotes access and contributes to the vibrancy of the development, and allow for overflow activities such as children's play.

Principle 6: Equitable

Provide equitable access for all sections of the population, through the distribution, design and policies of facilities.

Principle 7: Diversity

Community facilities promote diversity and encourage people from culturally and linguistically diverse backgrounds to participate in the social and economic life of the community.

Principle 8: Viable and sustainable

Developing sustainable funding, ownership, governance, management and maintenance arrangements, including private partnership arrangements where community benefit is achieved.

Principle 9: Coordination

Council will work with the State Government and non-government schools sector to promote best-practice education outcomes for the community of West Dapto. This will include sharing data and integrating asset solutions, such as opportunity for shared and joint-use facilities.

Planning for the provision of education is important for West Dapto's growing community. In NSW, the Department of Education provides funds and regulates education services for NSW students from early childhood to secondary school. The Department of Education provided previous support for the six primary schools and two high schools based on the projected housing provision and related future population estimates.

Figure 12 shows some indicative school locations in developing or future residential areas within the release area.

The distribution pattern for the schools ideally would include two primary schools one being the current Dapto Public School plus two new schools in the vicinities of Darkes Road/West Dapto Road and Wongawilli Village.

In Stage 3 of the release area, a new secondary school in proximity to Bong Bong Town Centre supported by three primary schools potentially Jersey Farm Robins Creeks, Bong Bong/Cleveland and Avondale/Moorland.

A third secondary school potentially located in Calderwood Urban Release Area has been approved and will service a primary school in Marshall Mount area as well as the required primary schools in Calderwood.

A special needs school should be either co-located with or separate to a mainstream school in the release area.

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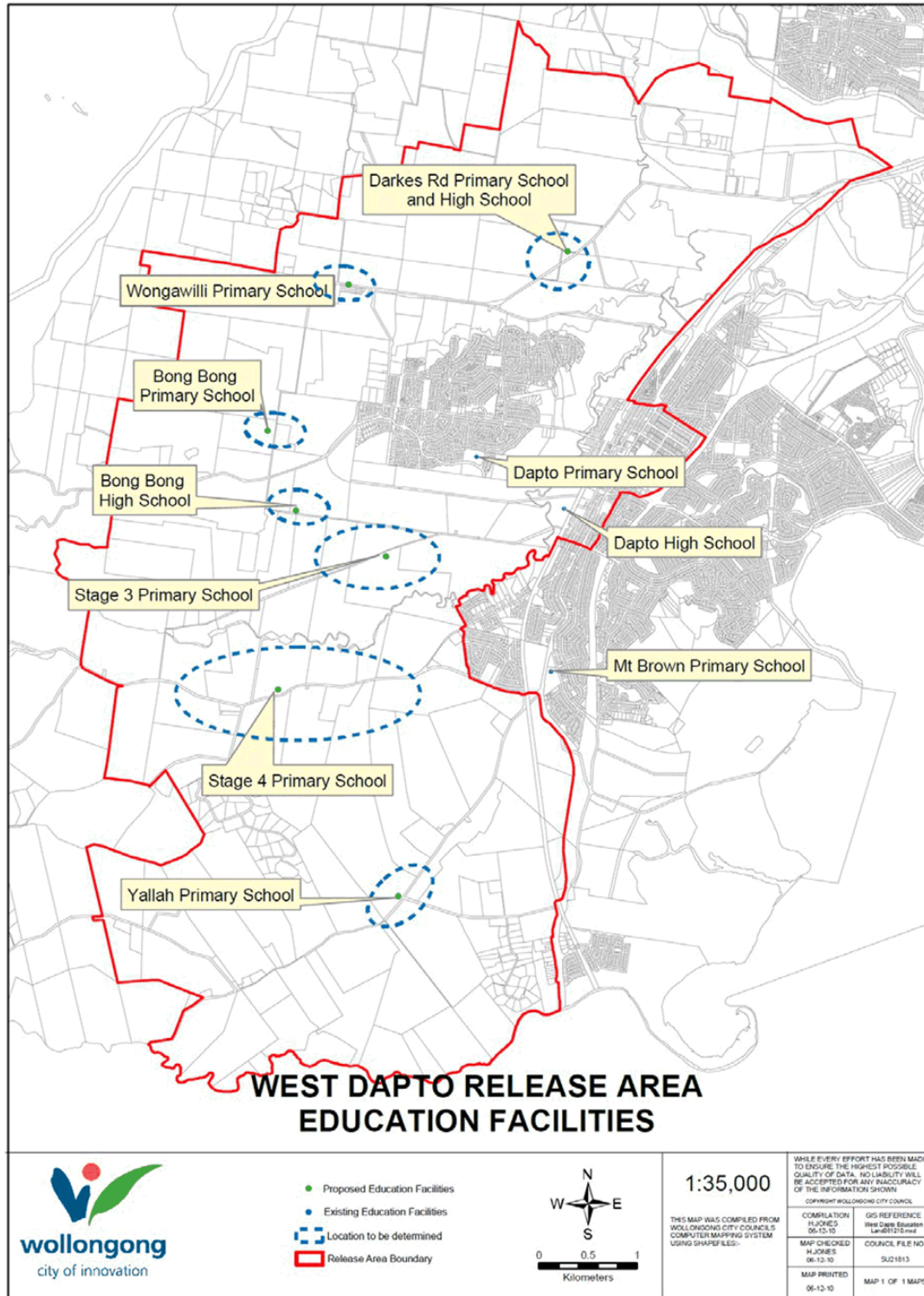


Figure 12. Potential school locations (Council Work with NSW Department of Education)

11 TOWN CENTRE PRINCIPLES

As a new release area, there is an opportunity to ensure that the ideal treatments are made to establish sustainable, appealing and functional residential living as well as commercial and light industrial areas providing employment, social and cultural opportunities with sufficient flexibility to cater for the future populations needs. As with other previous principles the town centre principles should not be considered in isolation.

The town centres of West Dapto will fill diverse roles, functions and mixed uses. The key objective of town centre principles is to help identify centre locations, function and existence. Configurations will reflect the town centre hierarchy with a focus on pedestrian priority. Supported with a decision process (zoning, neighbourhood planning, etc.), appropriate locations will promote the social and economic functions and outcomes sympathetic to character and 'place'.

There are three principles, Hierarchy, Movement sensitive and Identity and diversity, each to be considered in planning of town centres to meet the objectives for West Dapto Release Area.

Council also expects the town and village centres of West Dapto to be:

1. Master planned with the plan responding to the release areas planning principles.
2. Subdivision design modelled for walkability with plans that demonstrate public and employment base have easy access to active and public transport.

Principle 1: Hierarchy

Hierarchy provides a basis for which to establish functions, order, and visions as well as allowing the protection of these. Hierarchy is not the only way to understand or to set direction in planning for centres, we understand that the centres are also a connected network, which can support each other in an interlocking way.

Each level of the hierarchy represents the size and general characteristics of the centres commercial, retail and business roles (see **Figure 13**). The Hierarchy reinforces role and function, supports the Wollongong City Centre and higher order centres and provides certainty for investment decisions. Hierarchy reinforces character and identity as well as provides direction around appropriate residential density sympathetic to community facilities and service locations.

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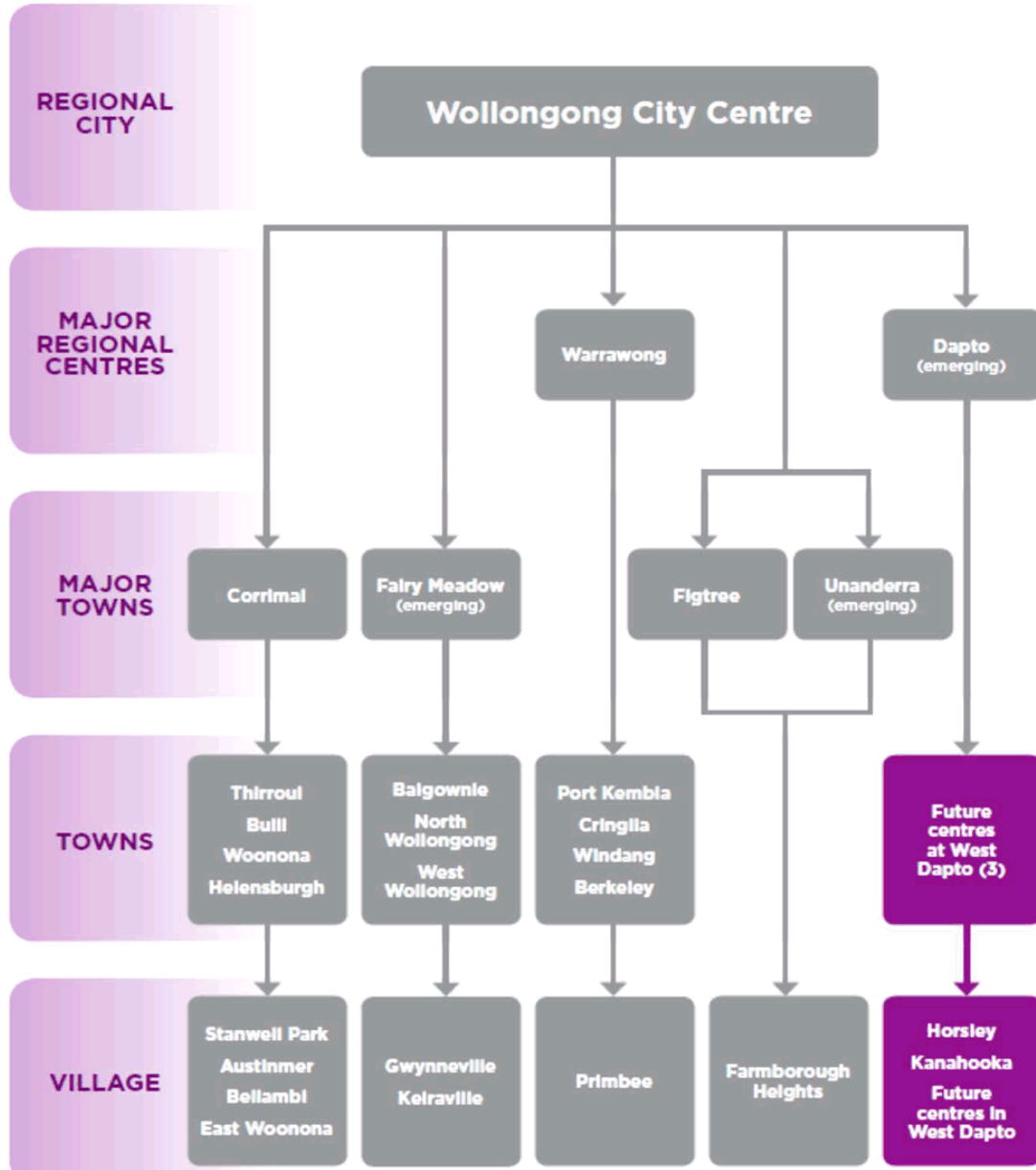


Figure 13. Wollongong Town Centres Hierarchy

Requirements for development in Business zones must comply with contents of the DCP Chapter B4: development in Business Zones. B4 outlines the Hierarchy for the LGA as well as other studies or assessments needed to support development applications.

Regional Centres

Wollongong Local Government Area has two major regional centres Warrawong and Dapto. It forms and important commercial and business centre role in Wollongong LGA.

Located in close vicinity of Dapto’s existing urban landscape, will be a series of new centres. Supporting Dapto’s development as a regional centre will be an important consideration in the planning of new town and village centres. These lower order centres must be sensitive to the levels of hierarchy to maintain existing functions and minimising any negative impact on the hierarchy.

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Town Centres

There are three town centres planned for the urban release area. The objective of the town centres is to ensure that development in the Darkes Road (1), Bong Bong (2) and Marshall Mount (3) town centres contribute to the creation of retail, business, commercial, and community hubs that act as public transport nodes and provide significant local employment opportunities.

Major town centres (~15,000m²) are planned within the central western (Bong Bong Road) and the southern (Marshall Mount) parts of the release area. A local town centre is planned in the northern (Darkes Road) area. These are intended to create local retail, business, commercial and community hubs providing significant local employment opportunities. They will need to complement rather than compete with the higher order major regional centre of Dapto.

Council expects the town centres of West Dapto to be master planned demonstrating how the plan responds to these planning principles.

Village Centres

The West Dapto further review of release area centres and controls (Urbacity, 2014) noted the role of Villages, as a lower order centre, is to *“provide convenient alternative to the supermarket based town centres for daily goods and services with a focus on amenity for housing density and improved public transport use”*.

Village and local centres will develop localised business opportunities at key places / intersections where bus stops, community facilities and local open space come together to create an urban focal point for the local community. Small villages are proposed ~2,500m² of floor space and accommodate a 1,000-1,500m² supermarket and variety shops.

Principle 2: Movement sensitive

The town centres of West Dapto are expected to facilitate social contact, employment, and living needs in a sustainable manner. That is, the town centres will be located to promote active transport, public transport and healthy lifestyles. Living within 400-800 metres of a mix of destinations is consistently associated with higher levels of active transport in adults and older adults (Heart Foundation, 2017).

Movement sensitive means movement (accessibility, location etc.) will be a key consideration for co-location of a mix of destinations (or land uses) within a centre. Centres will provide a location for activity, attraction, service for people to walk or cycle to. A focal point and community hub and transport node within the neighbourhood that allows for multiple activities to be undertaken and different daily needs (i.e., live, work, play) to be met in the one location.

Centres must also be supported and surrounded by a network of connected streets, paths and cycle ways, providing and promoting opportunities for active transport, and convenient access to public transport rather than private vehicles. The network will link open space works with Open Space and Recreation principles.

Neighbourhood Plans must consider their interface with adjoining areas and their ability to develop. The Plans must consider how different land use parcels such as centres are linked by the road network and pedestrian / cycle paths within and between different residential neighbourhoods.

Principle 3: Diversity and identity

Centres will be facilitating a diverse range of activities by prioritising places and spaces for people of all ages that become vital to the social fabric of a neighbourhood where people gather, meet friends and family and engage in social activities.

Especially important for new centres are creating a vision that encourages diversity and that shapes and reflects centres character. Centres will be diverse from each other (through hierarchy, features and visions). The vision in some respects can be understood as capitalising on existing features of heritage, environment (vegetation, topography etc.) contributing to a new theme expressing the centres role in the new urban residential landscape. In other words, a vision and purpose for people to create from, understanding that activity, physical setting and meaning come together to create a ‘sense of place’ framed by the built forms that provide a variety of building types.

The Town Centres will have a variety of building typologies with urban characteristics such as increased

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height, minimal or zero street setbacks and street level awnings and verandahs. The public domain is intended to reflect an urban character, with high quality hard and soft landscape and paved footpaths with advanced planting of shade trees. Parking will be at the rear of blocks and underground as well as good on street provision of kerbside parking – building setbacks to accommodate front parking lots will not be permissible, as these detract from the street qualities sought in these centres.

Other Chapters of Wollongong DCP 2009 containing development controls relating to the developments within the town and village centres include:

1. Chapter B3 – Mixed Use Development for specific controls relating mixed use developments.
2. Chapter B4 – Development in Business Zones for specific controls relating to business and town centre developments.

11.1 Town centre development controls

Development in the West Dapto Town Centres is to comply with the following development controls:

1. Establish a strong urban form that clearly distinguishes the centre / local node from surrounding areas.
2. Taller buildings of 4-6 stories are encouraged in the core of the town centre. Lower scale buildings up to 3 stories in height should surround and support the core.
3. The street wall height should have a 2-3 storey building form.
4. Building setbacks on main streets to be nil (zero) while other streets are generally to have a setback of between 0 – 2.5 m.
5. Side and rear building setbacks are as follows:

Setback	Distance
Side	Zero
Rear	Zero where lot adjoins allotment zoned B2 Local Centre or 5-6m where lot adjoins allotment with any residential zone.

6. Civic public spaces designed to encourage social interaction with paved areas, outdoor seating and urban green spaces are encouraged to balance the indoor building provisions.
7. Provision of shared parking facilities is encouraged with access via laneways of minor streets. Parking lots and parking areas are generally not to be visible from the streets, allowing built form to perform a clearly street defining urban function.

11.2 Village centre development controls

Development in the West Dapto Village Centres is to comply with the following development controls:

1. Building setbacks can be either street aligned (zero) or setback up to 5m to create commercial forecourts or residential courts to the street.
2. Variation of setbacks between buildings is encouraged to create an informal organic character.
3. Building height of up to 2 storeys is encouraged to create an urban village character with upper floor uses including small scale commercial and residential developments.
4. Parking to be provided at the rear of buildings in the form of rear laneways and parking areas accessed from the rear laneways / car courts.
5. All shops should address street and be entered by front from the major street where possible or secondary street.
6. Community congregation areas to be north facing and where possible take advantage of escarpment views.
7. Street parking to be maximised around villages.
8. Parking lots and parking areas are generally not to be visible from the main collector roads, allowing built form to perform a clear street defining urban function.

12 EMPLOYMENT PRINCIPLES

Five of the Seven Employment Principles in the West Dapto Vision 2018 intend to guide the development and creation of sustainable employment outcomes for West Dapto Release Area.

The creation of employment opportunities within and near to West Dapto is a key strategy in enabling people to work close to where they live and thereby reduce the overall traffic generated by the development.

The Structure Plan (**Figure 2**) indicates employment land in purple. These areas are zoned mostly light industrial land uses as well as some heavy industrial. The main employment area is in Kembla Grange, in the north of the urban release area. There are some limited areas of light industrial land arranged in an enterprise corridor north and south of the Dapto Regional Centre, and some west of the M1 and along Yallah Road, Yallah to provide additional local employment opportunities.

Other Considerations

1. Wollongong Economic Development Strategy and Implementation Plans, and Advantage Wollongong, Invest Wollongong.
2. Chapter B5 Industrial Development for controls relating to development on industrial lands.

Principle 1: Support local sustainable and accessible employment

- 1.1 Support a variety of employment opportunities accessible to the whole community (and LGA)
- 1.2 Employment containment to reduce commuting out of the release area and region.
- 1.3 Local access to higher order (career generating) employment opportunities.
- 1.4 Encourage high density employment opportunities within walking distance of existing or proposed public transport services.
- 1.5 Encourage employment area developments adjoining the structural road network to take advantage of accessibility and exposure.

Principle 2: Attract, facilitate and support industries, enterprises and business to locate in West Dapto (this principle is supported by Council, Business chambers and other organisations as required).

Principle 3: Ensure Town & Village centre employment outcomes are prioritised

- 3.1 Town and village centres are to ensure planning decisions (such as master plans and spatial arrangements) support and prioritise employment outcomes.
- 3.2 Encourage / promote / emphasise provision of professional service type jobs/roles and beyond, vs the normal retail type jobs that one might normally expect in new urban release areas.

Principle 4: Protect existing employment land

- 4.1 Maintain existing zoned employment land within the release area to ensure a supply is maintained over time and is available to take advantage of employment generating opportunities.
- 4.2 Create a strategy to enable appropriate interim uses of employment areas that also allows for gradual intensification over time.
- 4.3 Support the preservation of large lot parcels and clusters of light and heavy industrial land and ensure business parks are not accommodated in light industrial zones.

Principle 5: Take advantage of and encourage employment innovations

- 5.1 Planning decisions to anticipate, be responsive to and cater for innovative employment solutions.

Principle 6: Improve employment opportunities whilst ensuring development is of a high standard

- 6.1 Ensure developments are considerate of their context and compatibility with residential and sensitive land uses as well as conservation outcomes of the urban release area.
- 6.2 Apply merit-based approach when assessing employment generating activities.
- 6.3 Encourage development for employment which provides a range of goods and services without adversely affecting the amenity, health or safety of any adjoining area.

13 HOUSING PRINCIPLES

Any specific controls for Neighbourhood Plans must consider the ability to develop adjoining areas including linkages to those areas.

The Housing Principles should be read in conjunction with Council's LGA-wide Housing Policy setting, which is updated from time to time to ensure we are addressing the challenges of a changing housing environment.

These principles should be considered in conjunction with all other planning principles as they all contribute to achieving the vision for the West Dapto Release Area and ultimately sustainable housing outcomes.

"The communities will be healthy, sustainable and resilient and will have access to diverse housing choice and active or passive open space accessible by walkways, cycle ways and public transport."

Urban Residential Density Distribution

The intention for the urban structure in West Dapto is to provide for varying housing densities with increased densities around town and village centres and community hubs. Delivering density in housing particularly targeting delivery of the medium residential densities in the release area will help encourage population diversity, make the provision of efficient public transport more viable and support sustainability of the town and village centres. A range of housing types are to be provided to ensure that the housing needs of all household types are met. A diverse demographic profile will help ensure a sustainable and vibrant community in the long term.

The areas of lower residential density (R2 Low Density Residential zone), should provide an average of 13 dwellings per hectare and then in later stages, 15 dwellings per hectare. In the more sensitive areas such as the "transition" areas identified on the structure plan (**Figure 2**) Council proposes densities around 5 to 10 dwellings per hectare to enable protection of environmental values and minimize visual impact. The areas of medium residential density (R3 Medium Density Residential zone) should provide an average of 20 to 25 dwellings per hectare. Density measures such as Gross Density help inform and set targets at a precinct level (based on Landcom, 2011, Residential Density guide and supporting charts, See **Figure 15**). Net density (see **Figure 14**) will be used as an indicator to show over time where the release area development is achieving desired mix and ultimate (finished development) housing densities. These are NOT site by site or zone controls as the aim is for diversity, but they help inform infrastructure planning, understand intensity of built forms and population.

Principle 1: Encourage housing diversity

Diversity can be delivered through different products at different stages of planning by promoting and providing a range of density and lot size and shapes to offer a range of choice to better meet changing community needs.

Mixture of density low to high, single dwellings, dual occupancy, town houses and apartments in appropriate locations should all be considered in neighbourhood planning and subdivision design stages.

Promote increased densities and innovative design types close to town and village centres and transport infrastructure where possible.

A variety of lot sizes and dimensions must be provided to achieve diversity in products to suit a range of household structures and to meet the density targets relating to the residential zones (Refer to **Figure 14**).

Reference chart | Residential density and planning controls

TYPICAL FSR & LOT AREAS FOR HOUSE TYPES



FSR (gross floor area / lot area)

Figure 14. Net Residential Density Chart (Landcom, 2011).

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Reference chart | Gross residential density

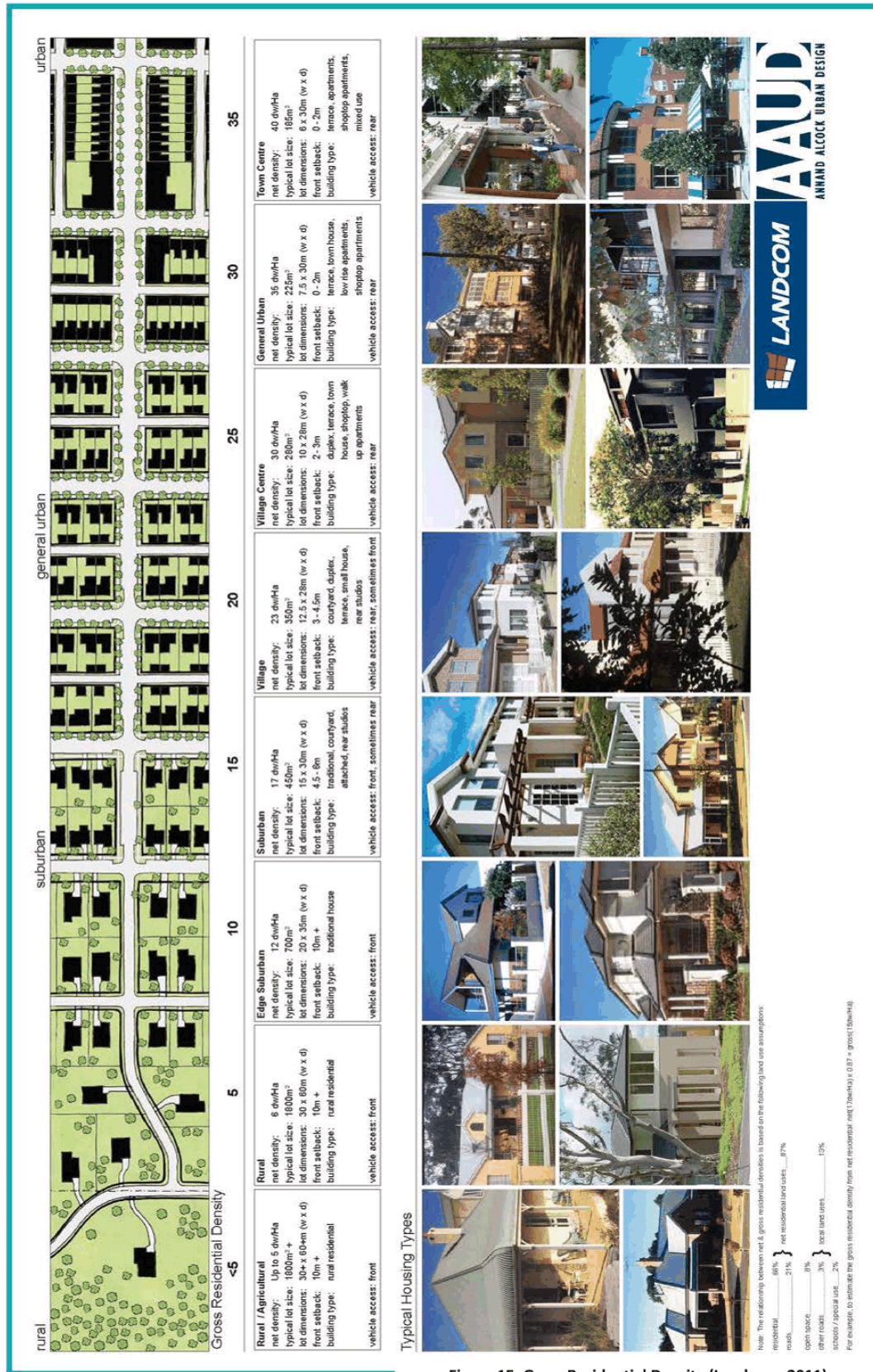


Figure 15. Gross Residential Density (Landcom, 2011)

Principle 2: Promote housing affordability

Residential neighbourhoods cater for a variety of demographic and socio-economic characteristics. Promoting housing mixture is one tool that provides opportunity for more affordable housing options and reduces housing stress.

Principle 3: Establish sustainable, energy efficient, appealing and functional residential living

- 1 Seek to promote design excellence in housing provision and neighbourhood planning.
- 2 Target an increased use and uptake of renewable energy through housing and neighbourhood design.
- 3 Target smart design solutions for housing with passive heating/cooling (housing placement in lots, responsive floor plans), light coloured roofing and light paving or ground covering materials (both reduces ambient air temperatures in the neighbourhoods and roof cavity temperatures).
- 4 Lots must have the appropriate area and dimensions for the siting of dwellings, canopy trees and other vegetation, private outdoor open space, rainwater tank, and vehicular access and on-site parking.

Principle 4: Creating local amenity and a sense of place

Design safe, healthy and active neighbourhoods with interactive interfaces between residences, the streets and surrounds. It is about ensuring there is visual connection between housing and the streets, parks and activity areas they are adjoining or interfacing with.

Encouraging and supporting housing design that responds to place. Creating site responsive built form and lot layouts that consider existing features and landscape context, natural land form and surrounding land uses.

Manage housing growth to protect and promote the conservation values that contribute to concepts of 'place' in West Dapto.

1. Lot size and layout must respond to the physical characteristics of the land, such as slope and existing significant vegetation, and site constraints including bushfire risk.
2. Lot design is to facilitate housing fronting onto creek line corridors and other areas of public open space, to incorporate these spaces into the living environment, facilitate surveillance, and prevent isolation and degradation of these spaces.

Principle 5: Housing transition to the Illawarra Escarpment

Reduce housing density on the fringe of the urban release area to provide delineation to the housed urban areas and a buffer to the Escarpment and important environmental features.

14 NEIGHBOURHOOD PLANS

A Neighbourhood Plan is a step between the West Dapto Structure Plan and a Development Application. It allows issues to be considered on a neighbourhood/precinct/ catchment scale.

The intent for neighbourhood planning is to:

- ensure adjoining land owners jointly (or on behalf of another) consider common constraints and design issues.
- provide a means to work through issues around access and staging of development.
- allow Council and other agencies to better align infrastructure planning and delivery to where development fronts are occurring.
- achieve efficiencies of shared infrastructure requirements (eg. stormwater) at an appropriate scale for the infrastructure to occur.
- at an appropriate scale, set urban density targets and understand tracking against them to support town and village centre development.
- align neighbourhoods between ownership/cadastre and water sub-catchments as an indicator of existing physical environmental setting.

Neighbourhood Plans will be exhibited as an amendment to this Chapter and in place prior to assessment and determination of a development application.

14.1 Neighbourhood Plan Requirements

Neighbourhood Plans are required to:

- Support and reflect the West Dapto Vision, Planning Principles and Structure Plan detailed in the West Dapto Vision 2018.
- Confirm the developable areas within the defined neighbourhood outlined in **Figure 17**. Council will consider any proposals to consolidate neighbourhoods.
- Supplement the information prepared by Council during rezoning of West Dapto. Council did not have sufficient resources to consider every property in detail and Council's consultants were not granted access to all properties. Copies of the studies undertaken by Council are available on request (Note the West Dapto Aboriginal Heritage Study is not a public document).
- Consider all potential constraints, mitigate impacts or propose solutions to managing constraints on a neighbourhood/precinct/catchment scale, rather than property by property.
- Plan the sequence of development for all affected parcels within a neighbourhood to ensure adjoining land owners consider the proposals, concepts and development timeframes of each other (planning through any access issues etc).
- Encourage the integration of development sites, development sequencing and economies of scale and avoid exclusion of adjoining lots that may result in development isolation or disjointed development outcomes (eg. opportunities for efficiencies through shared infrastructure, integrated outcomes with well-considered interfaces between landuses).
- Provide more detailed neighbourhood specific information guided by the West Dapto Structure Plan such as future residential density, open space functions, conservation areas, water management structures.
- Ensure sufficient space is provided in a neighbourhood plan for water management, open space and any other landuses or infrastructure required (considering the vision and Principles in the West Dapto Vision 2018) to support safe and sustainable residential communities.
- Ensure interfaces between land uses and delivery of large infrastructure is well coordinated within and with adjacent neighbourhoods.

The Neighbourhood planning process:

1. Discuss site with Council's Urban Release Team and Land Use Planning Team.

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2. Prepare Concept Neighbourhood Plan, Staging or development Sequencing Plan and supporting technical studies. Council officers will review and provide feedback regarding any change needed before accepting and progressing with a draft Plan.
3. Council officer will report the draft Neighbourhood Plan to Council as an amendment to the Wollongong DCP 2009 – Chapter D16 West Dapto Release Area.
4. Draft Neighbourhood Plan Exhibition.
5. Council officers review submissions, consult with landowners / consultant over any further amendments needed and then report on submissions and the final Neighbourhood Plan to Council.
6. Council adopts Neighbourhood Plan as an amendment to the DCP (including where relevant any updates needed to the Structure Plan **Figure 2** or **Figure 17**).

After the exhibition and adoption of a Neighbourhood Plan, Development Applications for sites within the defined plan can be lodged by individual landowners (or their consultants), for development in their part of the Neighbourhood depending on appropriate sequencing/identified stage of the neighbourhood the site is located in. A Development Application can be submitted on behalf of a number of landowners, provided owners consent is obtained. Note submission of a Development Application within a defined precinct will not be accepted unless the subject Neighbourhood Plan has been adopted by Council.

Any proposed variation to the agreed Neighbourhood Plan area will require justification considered on merit and any variation on or near a property boundary will require agreement of the adjoining owner.

14.2 Matters to be addressed in Neighbourhood Plan applications

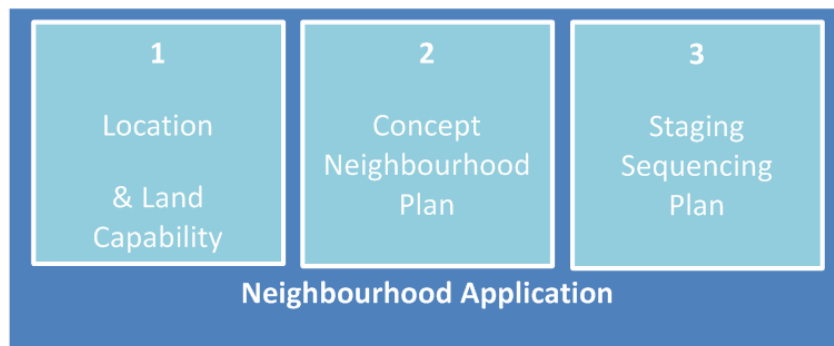


Figure 16. Items of a Neighbourhood Plan application

A Neighbourhood Plan Application should include:

1. Site location and description, and land capability assessment, addressing existing issues such as:
 - Wollongong LEP 2009 provisions (including Zoning, Minimum Lot Size, FSR, Building Height, Flooding, Heritage, Acid Sulfate Soils, riparian corridors etc).
 - Any other relevant legislation.
 - The areas setting within West Dapto, eg proximity to commercial centres, main roads, community services.
 - Flooding and bushfire constraints.
 - Topography, known geotechnical constraints, known contamination constraints.
 - Biodiversity (EECs, bushland, significant trees, habitat).
 - Heritage - historical land use, heritage sites, including Indigenous Heritage cultural issues and visual character.

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- Existing road network.
 - Available utilities & services and existing easements.
 - Need for community and recreation facilities.
 - Noise impacts (e.g. from the main roads, industrial areas or public & private railways).
2. A concept Neighbourhood Plan and supporting documentation, showing proposed:
- All landuse areas including, but not limited to, Residential, retail, employment, recreation and conservation areas.
 - Road layout & hierarchy.
 - Indicative dwelling density (**Figure 15**) & yield.
 - Public transport, bicycle and pedestrian routes demonstrating walkability.
 - Drainage management concept plan based on modelling (water quantity & quality and flood behaviour) inclusive of indicative locations and sizing of infrastructure.
- Note – where a drainage/water quality solution is developed at a catchment or neighbourhood level, Council will consider acquisition where the agreed detention basin site is consistent with the West Dapto Development Contributions Plan.
- Buffers to heritage items or other proposed heritage conservation management measures.
 - Riparian corridors, buffers and proposed future uses.
 - Location of schools, community facilities, recreation facilities and parks, including any proposed public land.
 - Indicative or conceptual Bulk Earthworks Plan linked to demonstrating feasibility of the drainage (stormwater) infrastructure and road layout plans.
3. In collaboration with Council advice, a staging or sequencing plan supporting the concept Neighbourhood Plan showing:
- All existing site boundaries within the neighbourhood, and
 - Proposed development staging within the planned area, taking into consideration delivery of essential infrastructure, access and logical progression as a development front.
4. Submission in electronic and PDF form.
- All the above data layers are required to be presented in electronic form. The electronic Neighbourhood Plan package will include either a set of Shapefiles, a Geodatabase or set of CAD files or be provided in another form as required by Council. The applicant shall also seek advice regarding Council's specific naming conventions, coordinate system and metadata requirements prior to lodgement of the Neighbourhood Plan.
 - Council also requires the Neighbourhood Plan and supporting plans (staging, infrastructure plan etc) to be provided in PDF form.

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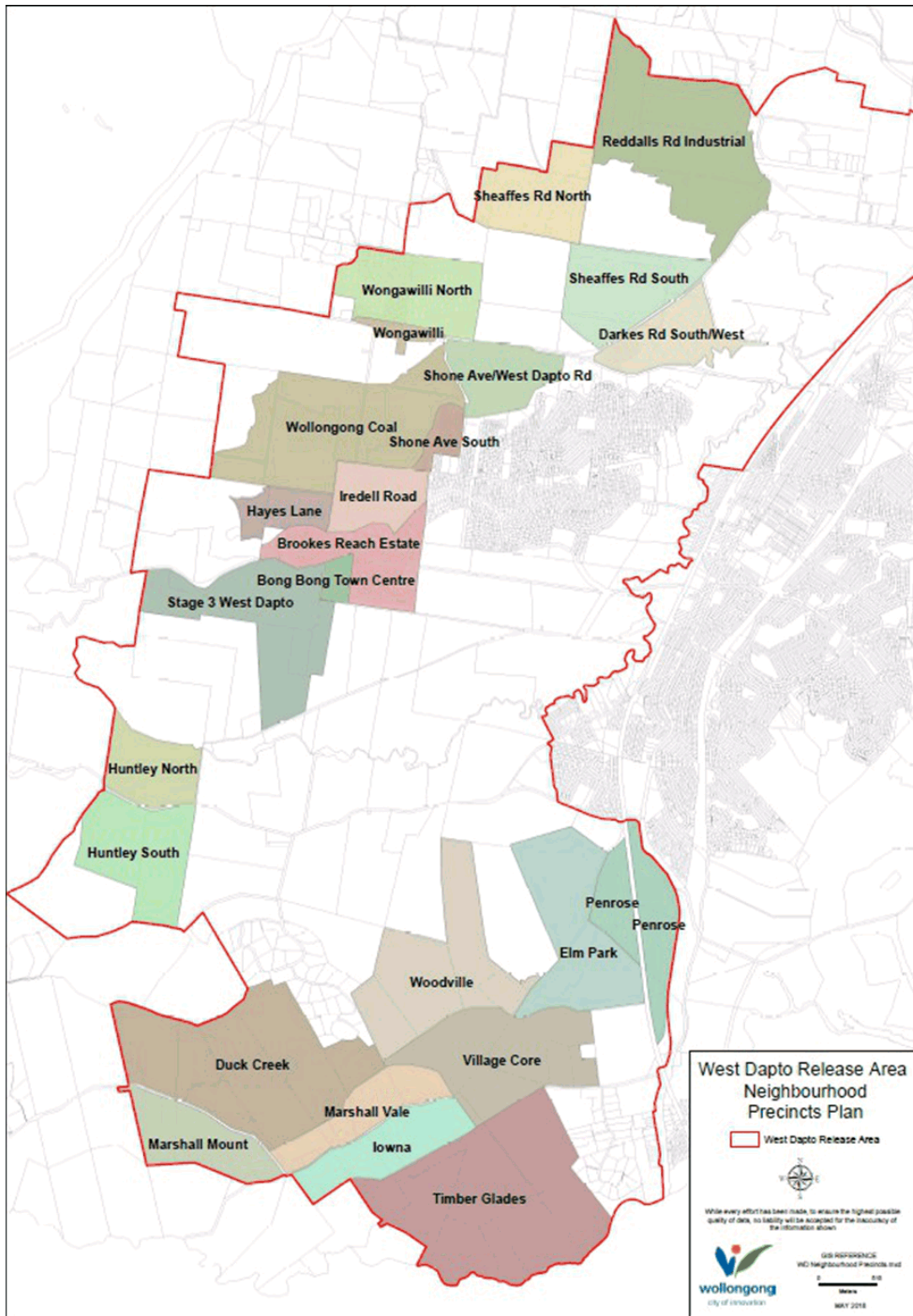


Figure 17. Defined Neighbourhoods in West Dapto Urban Release Area.

14.3 Adopted Neighbourhood Plans

The following Neighbourhood Plans have been adopted for the purposes of this Part:

Neighbourhood Plan	Submitted by	Adoption Date
14.3.1. Bong Bong East and north	Stockland	14 December 2010
14.3.2. Bong Bong Town Centre	Vinta Group / Bong Bong Town Centre	14 December 2010
14.3.3. Wongawilli north	Cardno Forbes Rigby and Jones Flint and Pike.	26 November 2012
14.3.5 Shone Avenue south	KF Williams	26 July 2011
14.3.6 Reddalls Road Industrial	Beadnell	9 December 2013
14.3.7 Sheaffes Road North	SMEC Urban	8 April 2013
14.3.8 Darkes Road South West	Don Fox Planning	24 March 2014
14.3.9 Avondale Road North, Huntley	Urbis	3 August 2015
14.3.10 Shone Avenue / West Dapto Road	KF Williams	24 August 2015
14.3.11 West Dapto Road / Sheaffes Road (south)	Watts Consulting for Wollongong City Council	19 October 2015
14.3.12 Bong Bong South	Stockland	19 November 2018
14.3.13 Stage 5 Yallah, Marshall Mount	Council – supporting the rezone	9 December 2019

14.3.1 Bong Bong East and North



Figure 18. Neighbourhood Plan 1 - Bong Bong East and North

The following variations to development standards have been accepted:

Chapter B1 Residential Development - Section 4.5 Front setbacks – controls 1 and 2 are replaced with:

1. The following setback requirements apply from the primary street frontage to the front façade of the building:
 - (a) Front building line: 4.5 metre minimum setback, except for garages which must be setback at least 5.5 metres from the property boundary on the primary road.
 - (b) Articulation zone: An articulation zone up to a maximum of 1.5 metres measured from the foremost edge of the building line may be incorporated within the front setback zone. The following building elements are permitted in the articulation zone:
 - i) an entry feature or portico,
 - ii) a balcony, deck, patio, pergola, terrace or verandah,
 - iii) a window box treatment,
 - iv) a bay window or similar feature,
 - v) an awning or other feature over a window,
 - vi) a sun shading feature.
 - (c) A building element must not extend above the eave gutter line, other than a pitched roof to an entry feature or portico that has the same pitch as the roof on the dwelling house.
 - (d) The maximum area of all building elements within the articulation zone, other than a building element listed in (v) or (vi) above, must not be more than twenty five percent of the area of the articulation zone, measured through the horizontal plane of the elements.
2. For corner allotments the following setback requirement applies from the secondary street frontage to the façade of the building:
 - (a) Secondary building line: 2 metre minimum setback.

Chapter B1 Residential Development - Section 4.6 Side and rear setbacks – controls 1 to 3 are replaced with:

1. A dwelling house and any carport, garage, balcony, deck, patio, pergola, terrace or verandah that is attached to the dwelling house with a building height at any point up to 3.8 metres on an allotment with an area greater than or equal to 450m² must have a setback from a side boundary of at least 900mm. This control does not apply to a secondary street frontage.
2. Any part of a dwelling house that has a building height in excess of 3.8 metres and any carport, garage, balcony, deck, patio, pergola, terrace or verandah that is attached to a dwelling house on an allotment with an area greater than or equal to 450m² must have a setback from a side boundary of at least the sum of 900mm and an amount that is equal to one quarter of the additional building height above 3.8 metres. This control does not apply to a secondary street frontage.

N.B. A two storey dwelling house may have its ground floor component (up to 3.8 metres in height) setback 900mm from the side boundary with the second storey setback further as required by the formula in (2).

A dwelling house that is part two storey and part single storey may have the single storey portion of the dwelling house (up to 3.8 metres) setback 900mm from the side boundary and the two storey portion of the dwelling house setback further as required by the formula in (2).
3. On an allotment with an area less than 450m² and a lot width 10m or less, where an easement for access and maintenance as well as driveway crossing locations (which are located so as not to adversely impact on-street parking capacity) are provided on title, a zero side setback may be applied to one side for the single storey component of the dwelling. The two storey component of the dwelling is to be setback further as required by the formula in (2). This control does not apply to a secondary street frontage.

The following additional controls to apply:

1. A dwelling house and any carport, garage, balcony, deck, patio, pergola, terrace or verandah that is attached to the dwelling house with a building height at any point up to 3.8 metres must have a setback from the rear boundary of at least 3 metres.
2. A dwelling house with a building height of more than 3.8 metres and any carport, garage, balcony, deck, patio, pergola, terrace or verandah that is attached to the dwelling house must have a setback from the rear boundary of at least 3 metres, plus an amount that is equal to three times the additional building height above 3.8 metres up to a maximum setback of 8 metres.
3. Despite (6) and (7), an allotment that has a rear boundary with a laneway may have a building line that abuts that boundary for up to 50 per cent of the length of that boundary.

Chapter B2 Residential Subdivision – Section 13 Cut and Fill land reshaping works – does not apply to master planning of land and precinct subdivision applications.

14.3.2 Bong Bong Town Centre

In the area where Bong Bong Road adjoins the north-south arterial route a new district town centre is to be established, based on a north-south orientated main street (see **Figure 20** Bong Bong East and North Neighbourhood Plan). The Bong Bong Town Centre is to be the primary town centre in the release area. The Bong Bong Town Centre is to be a supermarket based centre with a range of shops and would accommodate around 15,000m² of retail floor space.

14.3.3 Wongawilli – North

Wongawilli North will provide a mix of housing densities from large lot housing towards the escarpment and becoming denser towards the east and surrounding the village centre. The riparian corridor will create some structural form for passive recreation and active transport links along shared paths between the residential pockets.

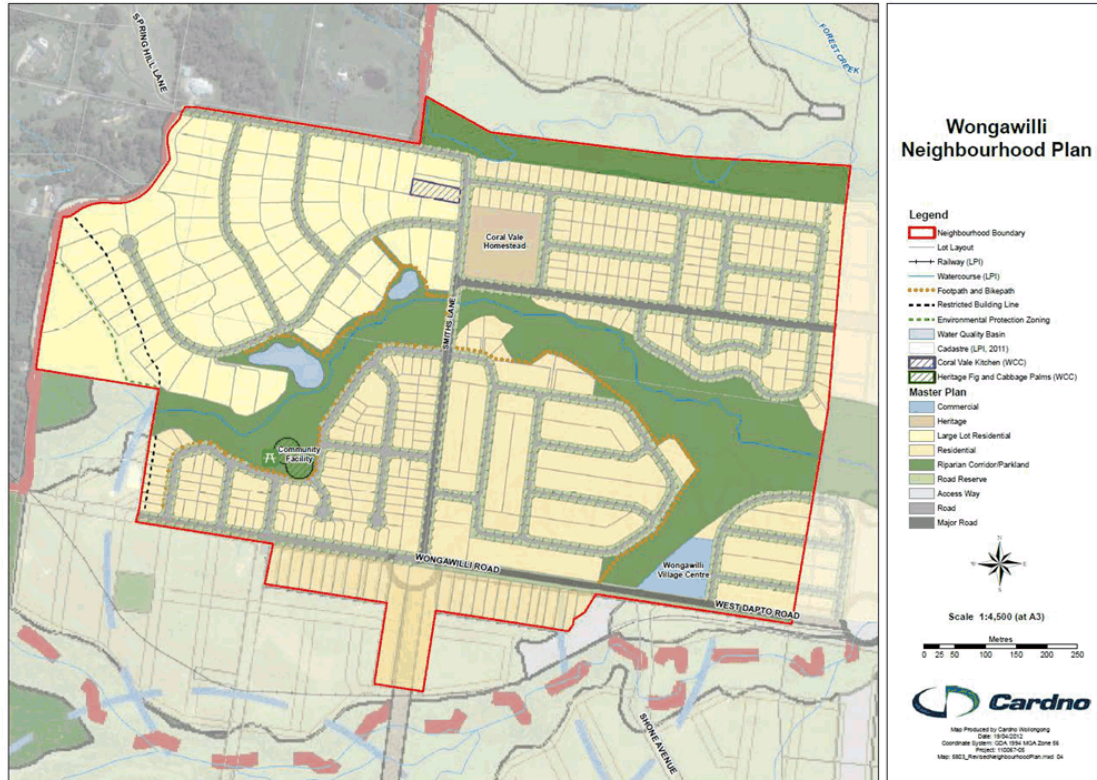


Figure 19. Wongawilli North Neighbourhood Plan

The following modified and additional controls to apply:

1. Minimum Lot width fronting Wongawilli Road and Smiths Lane of 15m;
2. Minimum front building line setback of 4.5m for all lots fronting Wongawilli Road and Smiths Lane;
3. The maximum length of cul-de-sacs that provide access to lots fronting Wongawilli Road Should not exceed 130m;
4. For Lots with a dual road frontage:
 - (a) Wongawilli Road and Smiths Lane is considered to be the primary road frontage and the internal unnamed road is considered to be the secondary road frontage and the rear of the lots;
 - (b) All dwellings must face, address and activate the primary road frontage of Wongawilli Road and Smiths Lane;
 - (c) Car ports or garages must be located and accessed from the secondary road frontage rear of the lots;
 - (d) Minimum rear setbacks are to remain in accordance with Chapter B1, garages and carports are to have a minimum rear setback of 5.5m in accordance with the principles shown in **Figure 22**;
 - (e) Fencing and landscaping treatment of the secondary road frontage is in accordance with the principles shown in **Figure 22**. Examples of Articulated fencing include, but are not limited to:
 - i) Masonry to 1.2m high with open type lattice or slates above with masonry elements no wider than 150mm;
 - ii) Timber Lap and Cap;

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- iii) Colourbond solid to 1.2m with Colourbond lattice style top sections.
- 5. For Lots backing onto or adjoining the Rural Fire Service (RFS) Property:
 - (a) Dwelling house, secondary dwelling and any habitable areas must be setback at least 10m from the rear or common property boundary that adjoins the RFS property;
 - (b) Outbuildings and garages must be setback at least 5m from the rear of common boundary that adjoins the RFS property.

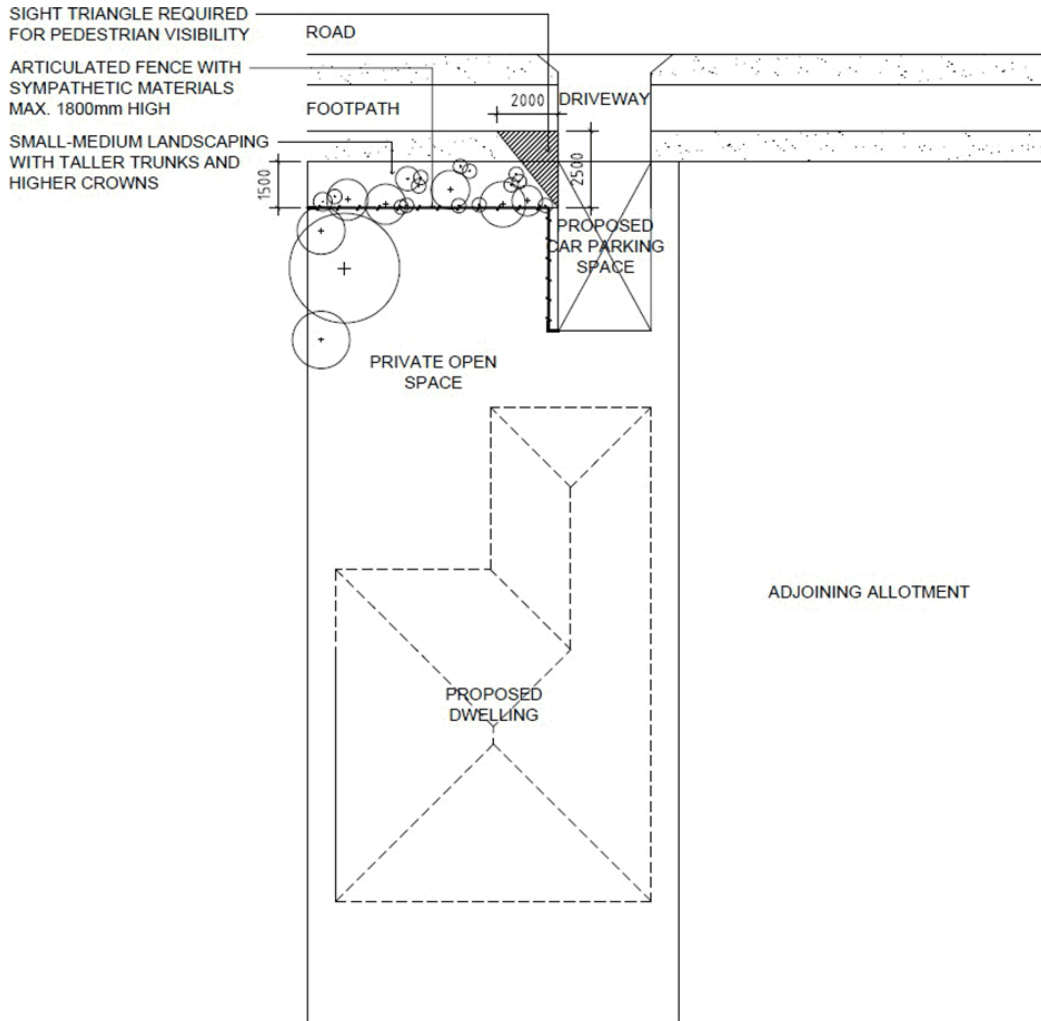


Figure 20. Dual frontage property secondary frontage treatment

PRIMARY ROAD
(No vehicle Access)

Wongawilli Village centre will provide a small convenience centre with a small grocer and some mixed retail shops. The centre will be designed focusing on activating the interface with the riparian boundary and its West Dapto Road frontage. Parking will be included in the village design with street parking along the secondary street and a parking lot area provided along the north, generally not visible from West Dapto Road, allowing built form to perform a clear street defining urban function. The village will take form guided by the concept design presented in **Figure 23**.

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Figure 21. Wongawilli Village Centre – Conceptual design

14.3.4 Wongawilli Mine Spur Rail line

It is anticipated that the Wongawilli Mine will continue to operate for the next 30 years, or longer. Coal is transported from the mine to Port Kembla via the rail network. Future urban development should be designed to recognise the continued use of the rail spur line and include measure to mitigate noise and other potential impacts. Division 15 of SEPP Infrastructure 2007, applies to development near the spur line.

Objectives:

- (a) To facilitate the transport of coal from Wongawilli Mine to Port Kembla by rail transport.
- (b) To minimise rail noise, vibration and other impacts on dwellings near the rail spur line.

Controls:

1. Development Applications for subdivision and dwelling houses within the rail buffer area (Refer to **Figure 24**), are to include sound attenuation measures that achieve a maximum of 35dBA within the dwelling.
2. Development Applications for subdivision and dwelling houses within the rail buffer area, are to include consider vibration impacts and include mitigation measures.
3. The development applications must satisfy the requirements of SEPP Infrastructure Division 15.

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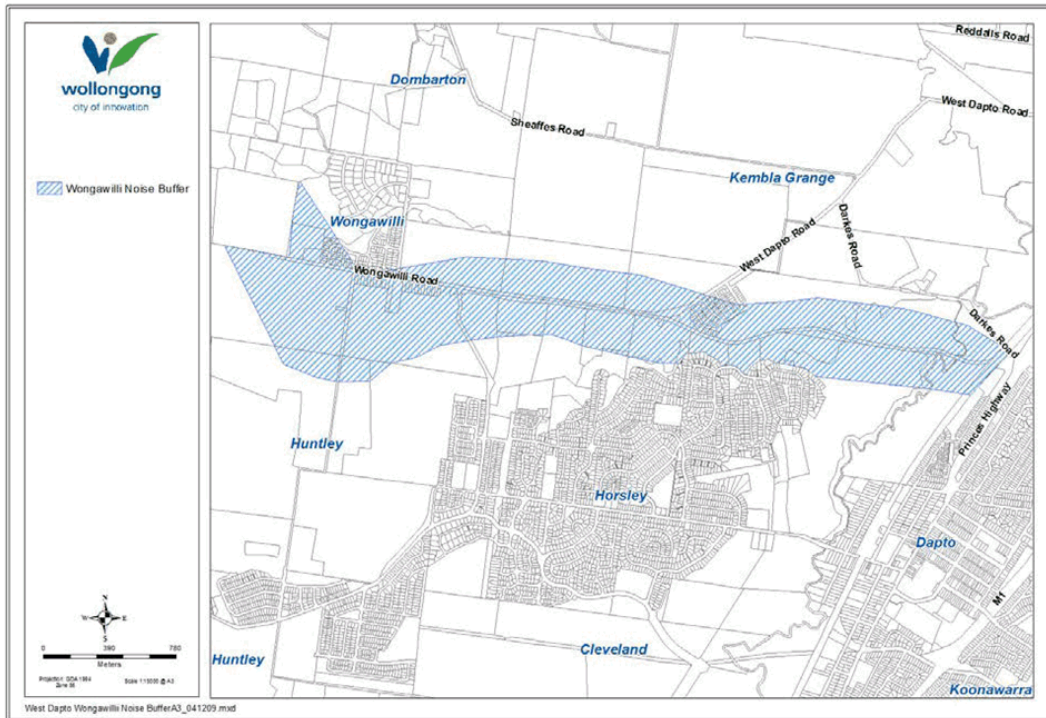


Figure 22. Wongawilli rail noise area

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14.3.5 Shone Avenue - South

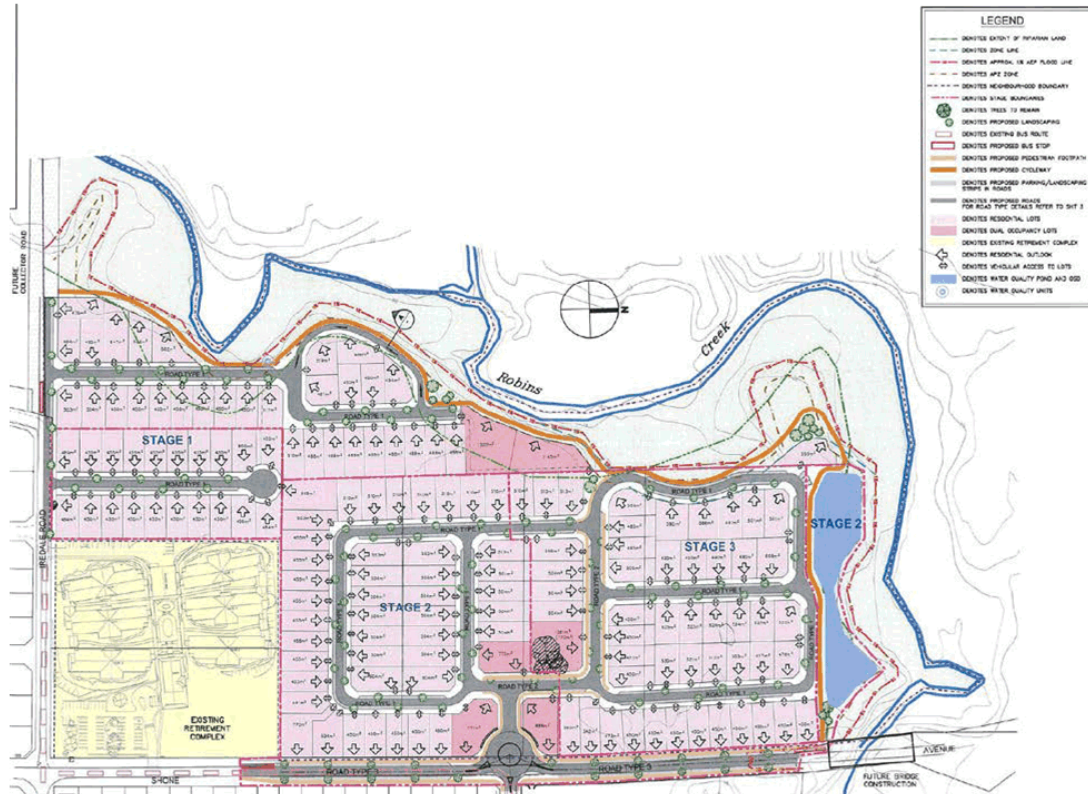


Figure 23. Shone Avenue South Neighbourhood Plan

The following modified and additional controls to apply:

1. For Lots with a dual road frontage:
 - (a) Shone Avenue and Iredell Road are considered to be the primary road frontage and the internal unnamed road is considered to be the secondary road frontage and the rear of the lots;
 - (b) All dwellings must face, address and activate the primary road frontage of Shone Avenue and Iredell Road;
 - (c) Car ports or garages must be located and accessed from the secondary road frontage rear of the lots;
 - (d) Minimum rear setbacks are to remain in accordance with Chapter B1, garages and carports are to have a minimum rear setback of 5.5m in accordance with the principles shown in **Figure 26**;
 - (e) Fencing and landscaping treatment of the secondary road frontage is in accordance with the principles shown in **Figure 26**. Examples of Articulated fencing include, but are not limited to:
 - i) Masonry to 1.2m high with open type lattice or slates above with masonry elements no wider than 150mm;
 - ii) Timber Lap and Cap;
 - iii) Colourbond solid to 1.2m with Colourbond lattice style top sections.

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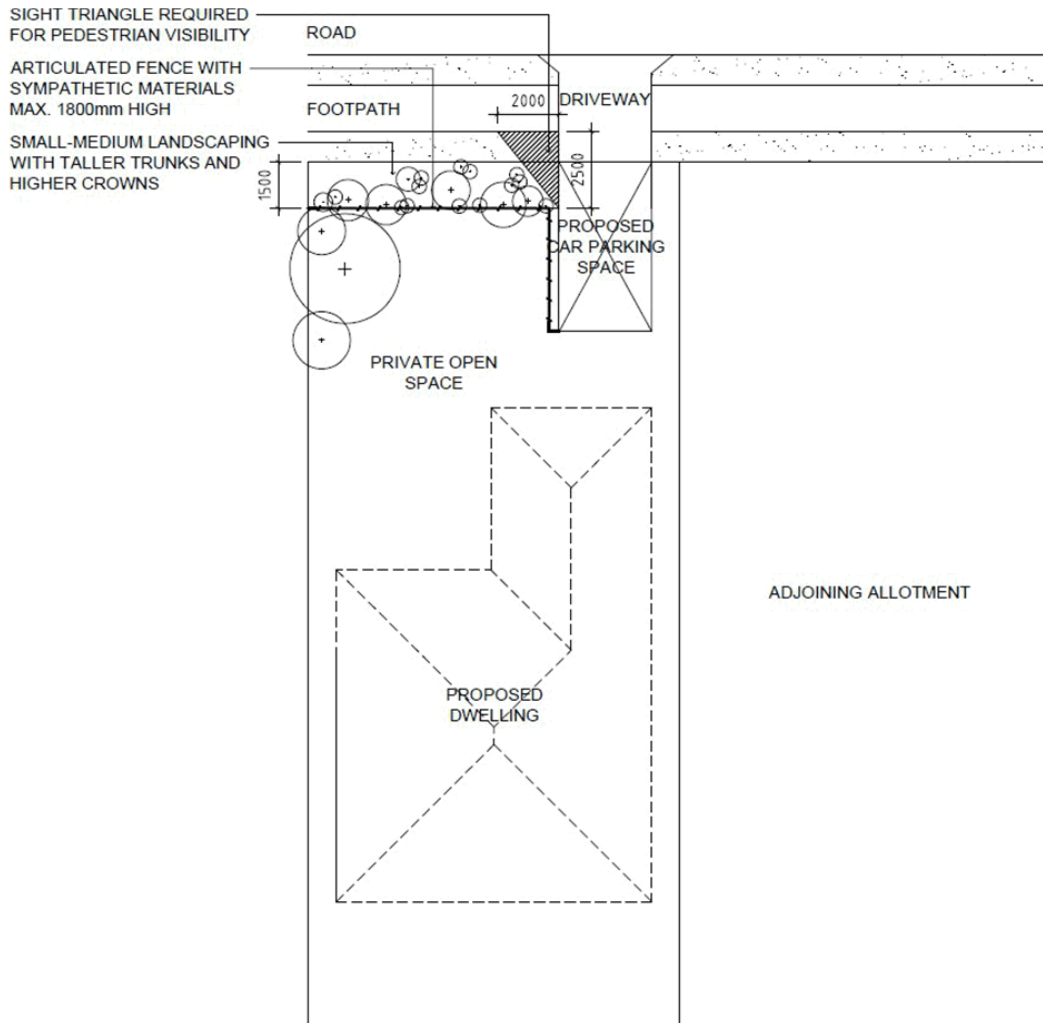


Figure 24. Dual frontage property secondary frontage treatment

(No vehicle Access)

14.3.6 Reddalls Road Industrial



Figure 25. Reddalls Road Industrial Neighbourhood Plan

The following additional controls to apply:

1. The proposed cycleway must have adequate passive surveillance to ensure safety by design.
2. Indicative future bus stop locations should be identified and shown on road types capable of handling bus routes. A minimum number of stops should be located in a manner to ensure that the majority of lots are within 400 metres of a bus stop.
3. Any proposed development of the neighbourhood will require the applicant upgrading the relevant section of Reddalls Road to a standard that is suitable for the normal range of Heavy vehicles at no cost to Council. These upgrade works would also include any required intersection treatment to Reddalls Road and the new proposed Access Road as well as any necessary road safety works.

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14.3.7 Sheaffes Road North

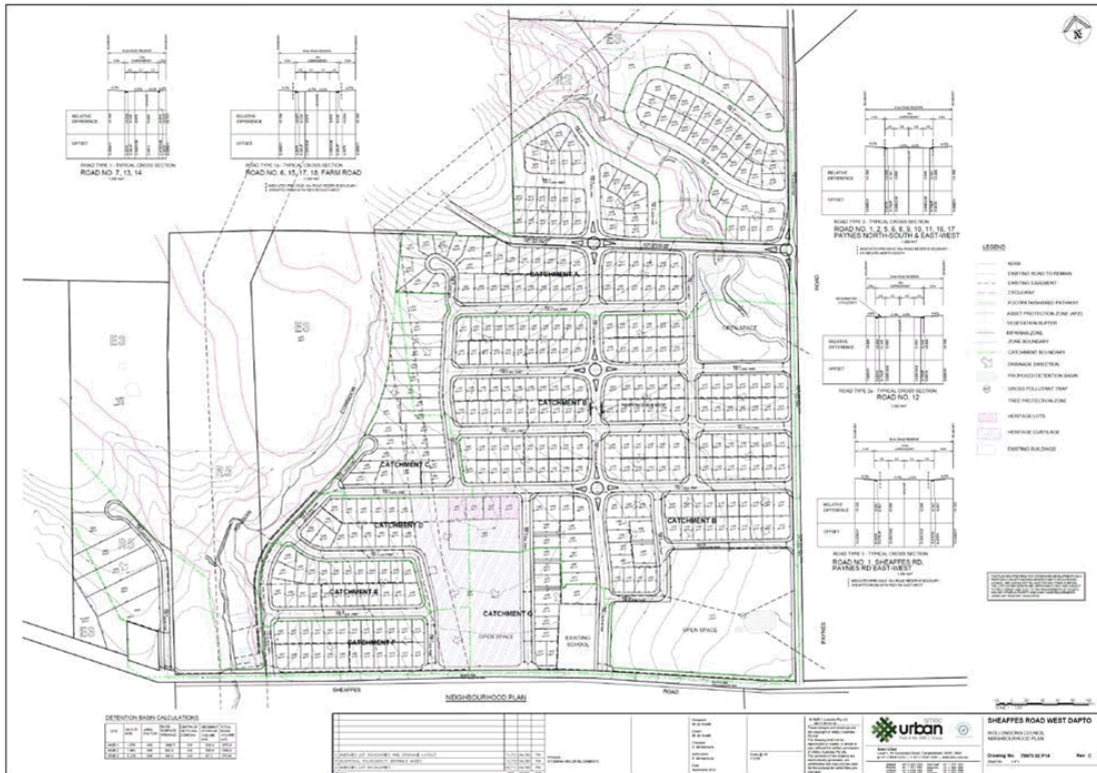


Figure 26. Sheaffes Road North Neighbourhood Plan

The following modified and additional controls to apply:

1. For Lots with a dual road frontage:
 - (a) Sheaffes Road and Paynes Road is considered to be the primary road frontage and the internal unnamed road is considered to be the secondary road frontage and the rear of the lots;
 - (b) All dwellings must face, address and activate the primary road frontage of Sheaffes Road and Paynes Road;
 - (c) Car ports or garages must be located and accessed from the secondary road frontage rear of the lots;
 - (d) Minimum rear setbacks are to remain in accordance with Chapter B1, garages and carports are to have a minimum rear setback of 5.5m in accordance with the principles shown in figure 6.3.6.2;
 - (e) Fencing and landscaping treatment of the secondary road frontage is in accordance with the principles shown in **Figure 29**. Examples of Articulated fencing include, but are not limited to:
 - i) Masonry to 1.2m high with open type lattice or slates above with masonry elements no wider than 150mm;
 - ii) Timber Lap and Cap;
 - iii) Colourbond solid to 1.2m with Colourbond lattice style top sections.

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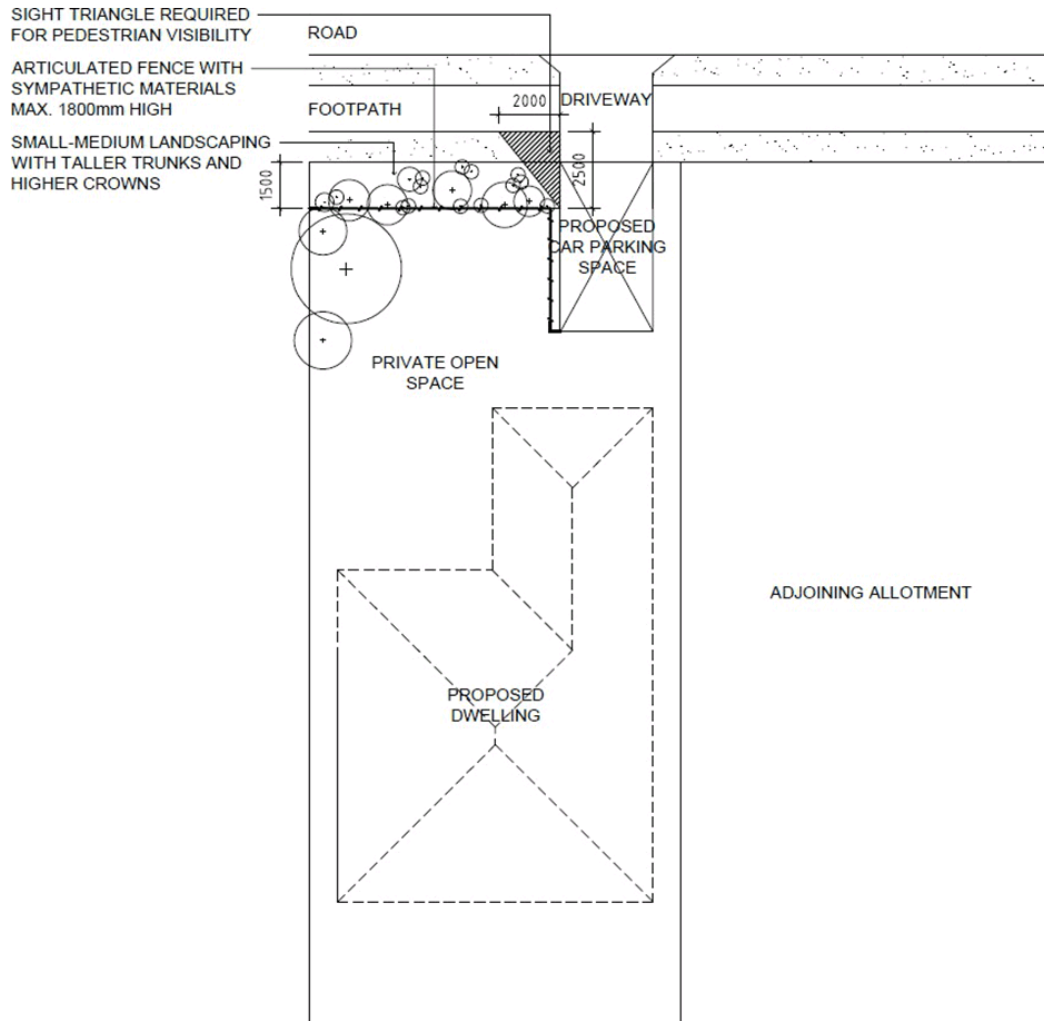


Figure 27. Dual frontage property secondary frontage treatment

PRIMARY ROAD
(No vehicle Access)

14.3.8 Darkes Road South West

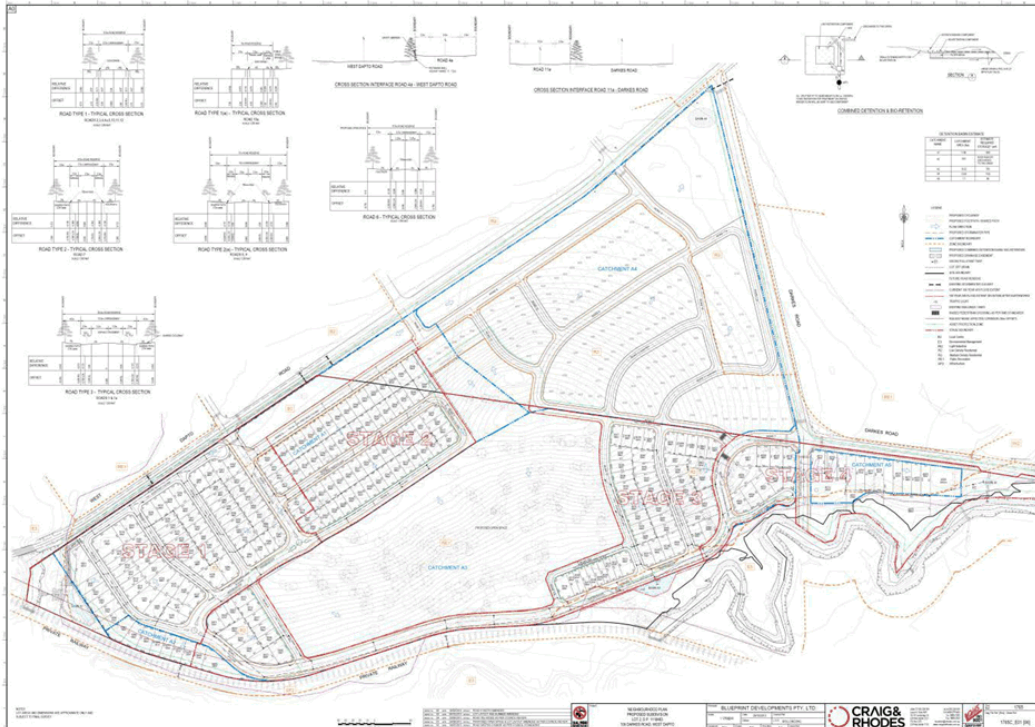


Figure 28. Darkes Road South West Neighbourhood Plan

The following modified and additional controls to apply:

1. Lot Width, Depth and Aspect are to be in accordance with Figure 6.3,7.1 above and are not required to comply with Chapter B2 Section 6 Subdivision Lot Layout – Aspect & Solar Access Orientation as well as Section 8 Lot Width & Depth Requirements. The relevant issues have been considered and the lot layout and details shown are considered acceptable. Should the lot layout depart substantially from that shown then compliance with Chapter B2 is required unless variation is sought in accordance with Chapter A1.
2. On an allotment with an area less than 450m² and a lot width 10m or less, where an easement for access and maintenance as well as driveway crossing locations (which are located so as not to adversely impact on-street parking capacity) are provided on title, a zero side setback may be applied to one side for the single storey component of the dwelling. The two storey component of the dwelling is to be setback further as required by the formula in (2). This control does not apply to a secondary street frontage.
3. For Lots with a dual road frontage:
 - (a) West Dapto Road and Darkes Road is considered to be the primary road frontage and the internal unnamed road is considered to be the secondary road frontage and the rear of the lots;
 - (b) All dwellings must face, address and activate the primary road frontage of West Dapto Road and Darkes Road;
 - (c) Car ports or garages must be located and accessed from the secondary road frontage rear of the lots;
 - (d) Minimum rear setbacks are to remain in accordance with Chapter B1, garages and carports are to have a minimum rear setback of 5.5m in accordance with the principles shown in figure
 - (e) **Figure 31** below;
 - (f) Fencing and landscaping treatment of the secondary road frontage is in accordance with the principles shown in **Figure 31**. Examples of Articulated fencing include, but are not limited to:
 - i. Masonry to 1.2m high with open type lattice or slates above with masonry elements

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- no wider than 150mm;
- ii. Timber Lap and Cap;
- iii. Colourbond solid to 1.2m with Colourbond lattice style top sections.

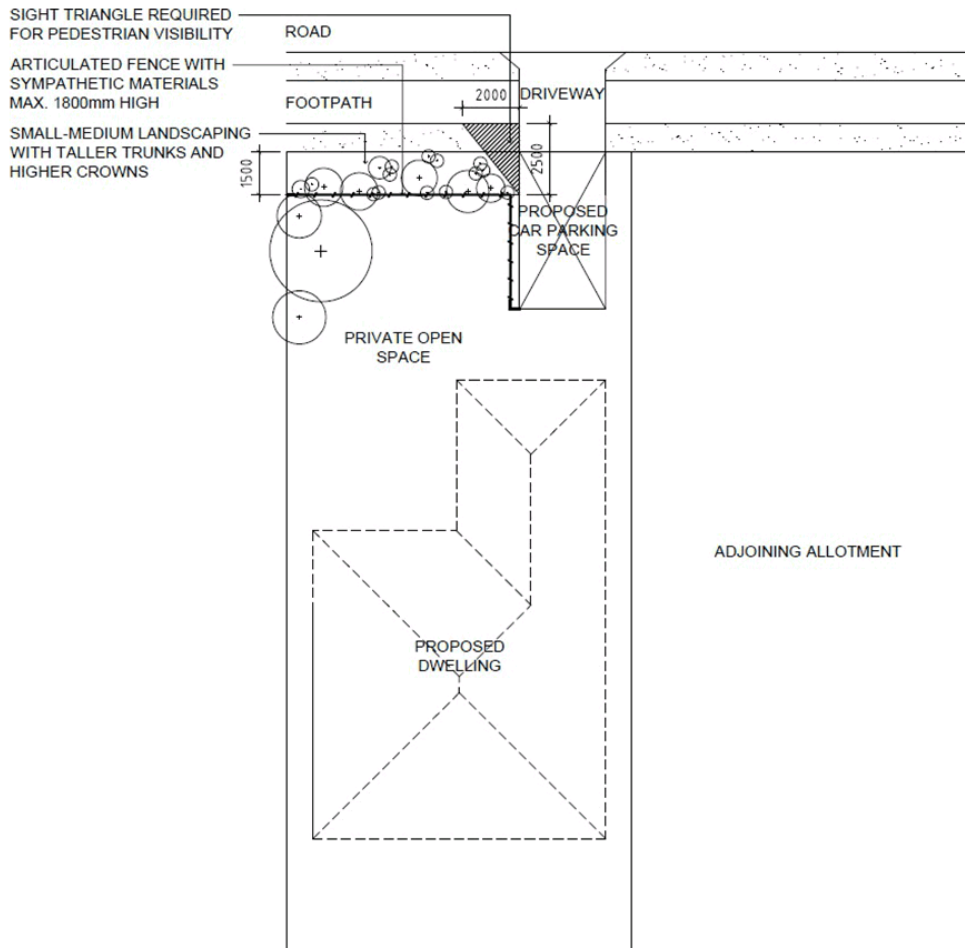


Figure 29. Dual frontage property secondary frontage treatment

PRIMARY ROAD
(No vehicle Access)

1. For all development applications outside of the area denoted as Stage 1:
 - (a) An Aboriginal Heritage Assessment is to be undertaken in accordance with the Wollongong Development Control Plan 2009 Chapter E10.
 - (b) Additional archaeological investigations are required to be undertaken to the previously recorded archaeological sites and three (3) potential archaeological deposits (PADs) identified. This work is required in order to better determine the significance and extents of these areas.
 - (c) In-principle support for the intended mitigation or Aboriginal Heritage Impact Permit (AHIP) proposals is to be gained from the NSW Office of Environment and Heritage (OEH) prior to the determination of the associated development application.
 - (d) Further consultation with Local Aboriginal Groups is to be undertaken within the assessment of any future Development Applications.
 - (e) Consideration of the impacts of the proposal on identified Non-Indigenous Archaeological Deposits located on the site during the preparation of the Heritage reports and which are subject to Section 140 of the NSW Heritage Act 1977.

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- (f) Conservation planning related to any retained structures or features on the site (e.g. The Silo and gardens).
 - (g) Interpretation planning relating to the history and heritage significance of the development area.
2. Bushfire Matters
- (a) Certain construction standards apply for development on Bushfire Prone Land. The applicable Construction Standards for proposed development are to reflect the Bushfire Attack Level (BAL) as identified at **Figure 32** below.
 - (b) Given that the site is identified as Bush Fire Prone Land, when a development application for subdivision is made, the development will require a Bush Fire Safety Authority to be issued by the NSW RFS under Section 100B of the Rural Fires Act 1997. The RFS has indicated that it is likely that by condition of the Bush Fire Safety Authority, restriction on the titles of the lots requiring the provision and maintenance of the necessary APZ's will be required.

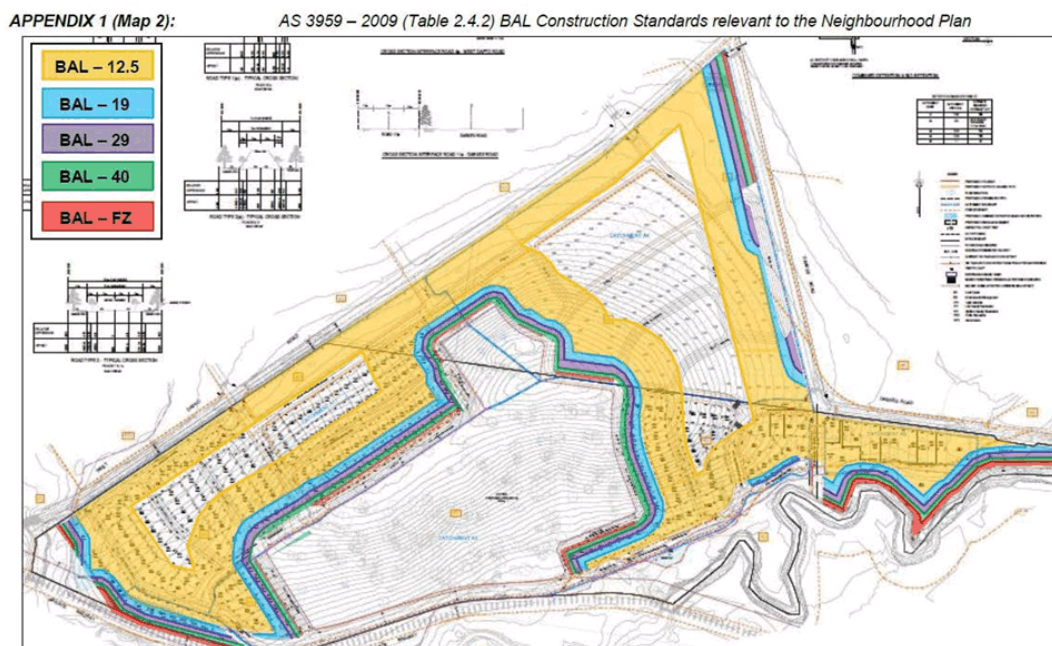


Figure 30. BAL Construction Standards relevant to the Neighbourhood Plan

- 1. Access
 - (a) An appropriate access track is to be provided to the Detention Basin A1 to facilitate sufficient maintenance access for Council.
 - (b) Appropriate access is also to be provided to the Wongawilli Rail Spur Line from the Detention Basin A1 and from Road 01.
 - (c) The final form of the access track is to be determined in conjunction with Council Engineering Officers within the assessment of future Development Applications. Hardstand access will be required.
- 2. There may be scope to amend the current Council Drainage Acquisition Maps to reflect more up to date flood mapping of the area. This is to be further investigated within future Voluntary Planning Agreements (VPAs) and assessment of Development Applications.

Part D – Locality Based DCPs / Precinct Plans
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14.3.9 Avondale Road North, Huntley

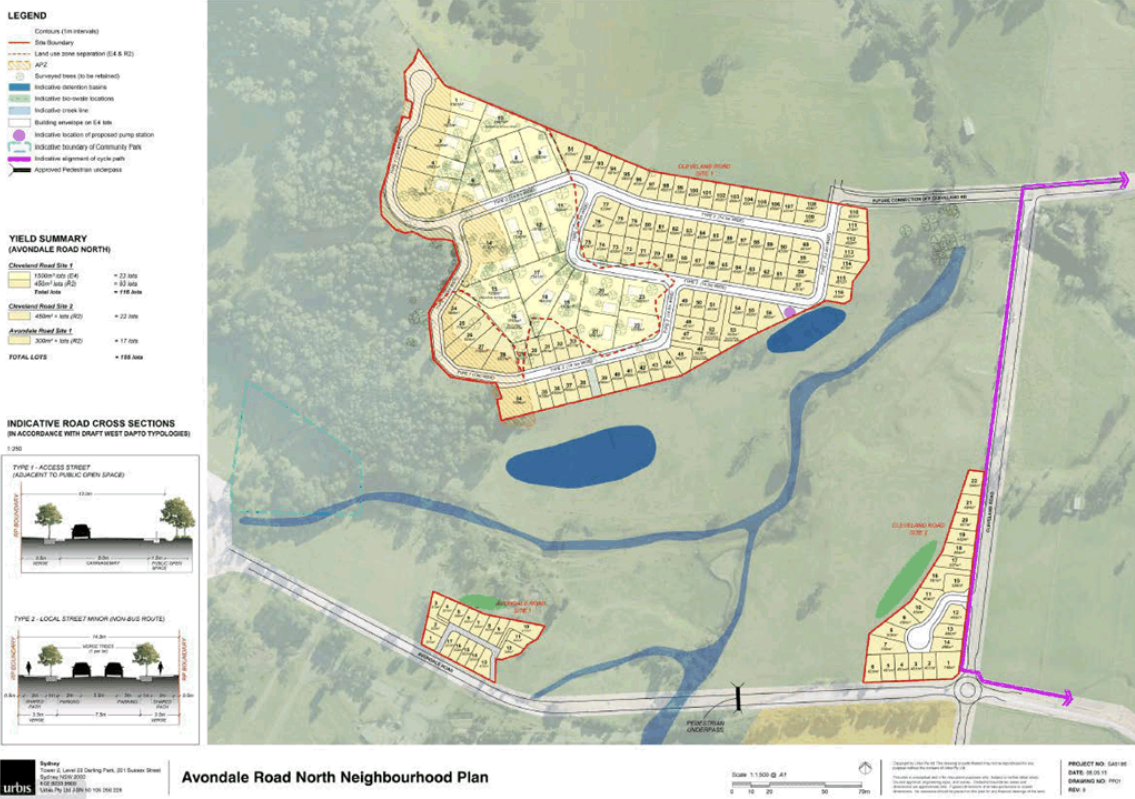


Figure 31. Avondale Road North, Huntley Neighbourhood Plan

Part D – Locality Based DCPs / Precinct Plans
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14.3.10 Shone Avenue / West Dapto Road

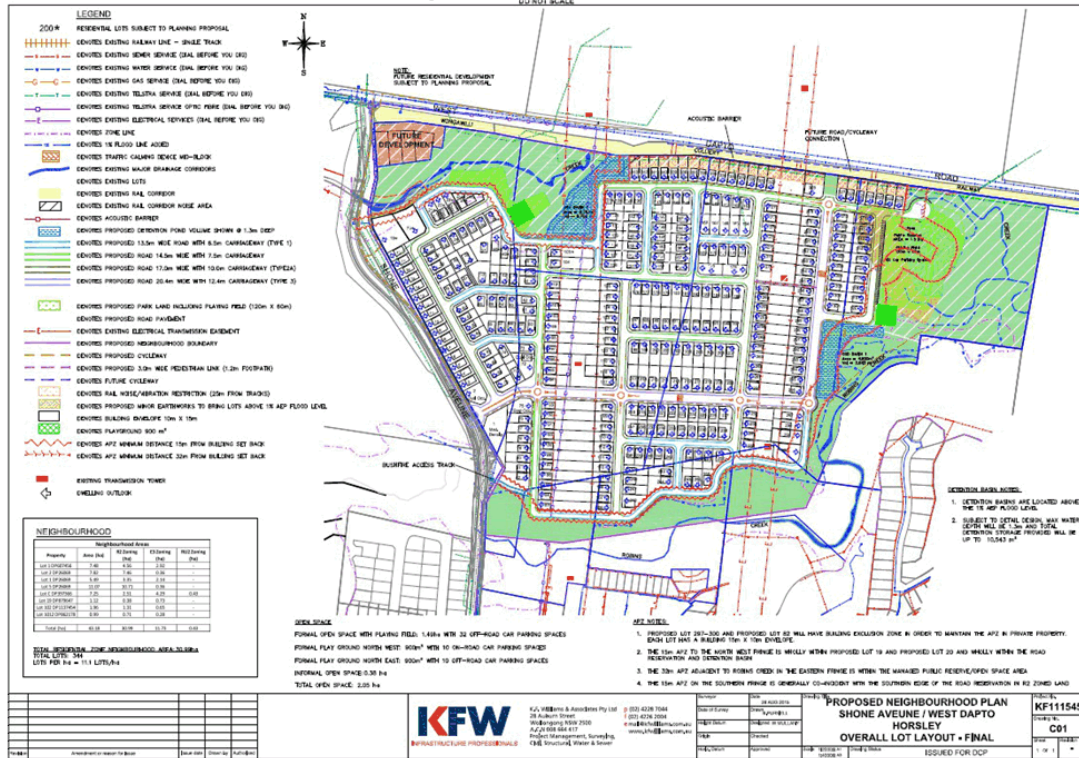


Figure 32. Shone Avenue and West Dapto Road Neighbourhood Plan

The following modified and additional controls apply:

1. For Lots with a dual road frontage:
 - (a) Shone Avenue is considered to be the primary road frontage and the internal unnamed road is considered to be the secondary road frontage and the rear of the lots;
 - (b) All dwellings must face, address and activate the primary street frontage of Shone Avenue – this is the main address of the dwelling;
 - (c) The minimum front setback on Shone Avenue is 4m (being a greenfield site) and the minimum setback from the secondary road is 4m;
 - (d) No car access to residential lots is permitted from Shone Avenue (ie lots are access denied). Carports or garages must be located and accessed from the secondary road frontage rear of the lots;
 - (e) Garages and carports must be setback a minimum of 5.5 metres from the property boundary on the secondary road to enable a vehicle to park or stand in front of the garage or carport (ie allow off street parking that does not impede the footpath) and in order to be a non dominant component of the streetscape;
 - (f) Fencing controls for the primary street frontage of Shone Avenue are outlined in Chapter B1: Residential Development and are designed to complement the objectives of passive surveillance;
 - (g) Fencing and landscaping treatment of the secondary road frontage must ensure that clear lines of sight are maintained for motorists and pedestrians to and from the lot, and ensure the design complements the objectives of passive surveillance. To help soften the visual impact and improve the streetscape appearance of the fence, and allow visual connection between the dwelling and the street, any fence will be required to be well articulated and landscaped with appropriate planting. Articulated fencing should be provided to a maximum height of 1.8 metres. Examples of articulated fencing include, but are not limited to:

Part D – Locality Based DCPs / Precinct Plans
Chapter D16: West Dapto Release Area

- i) Masonry to 1.2m high with open type lattice or slates above with masonry elements no wider than 150mm;
- ii) Timber Lap and Cap;
- iii) Colourbond solid to 1.2m with Colourbond lattice style top sections.

NB. Fences in bush fire prone areas shall be of a metal or masonry construction only.

- (h) Any gates associated with the secondary street fence should open inwards so as to not obstruct the road reserve.
 - (i) Where garage door openings face the secondary road they shall be a maximum of 50% of the width of the dwelling. Refer to Chapter B1: Residential Development for other car parking and access controls.
2. For Lots backing onto West Dapto Road:
- (a) An acoustic building exclusion zone of 25 metres applies along the length of the rail corridor to reflect Noise Report recommendations;
 - (b) A sound wall is to be erected by the developer along the length of the rail corridor, as indicated in the Neighbourhood Plan.

Part D – Locality Based DCPs / Precinct Plans
Chapter D16: West Dapto Release Area

14.3.11 West Dapto Road / Sheaffes Road (south)

Along West Dapto Road a town centre (large local town centre) is to be established to the west. The town centre will interface with large neighbourhood open space provisions that will cater for active organised sporting needs. The Town centre will perform an important role in the provision of public transport, as a node with active transport facilities will meet with the public transport network. The core part will contain the primary retail and commercial functions and be surrounded by some business and medium density housing. It is envisaged that this centre would accommodate around 7,500m² of retail floor space to support the employment land.

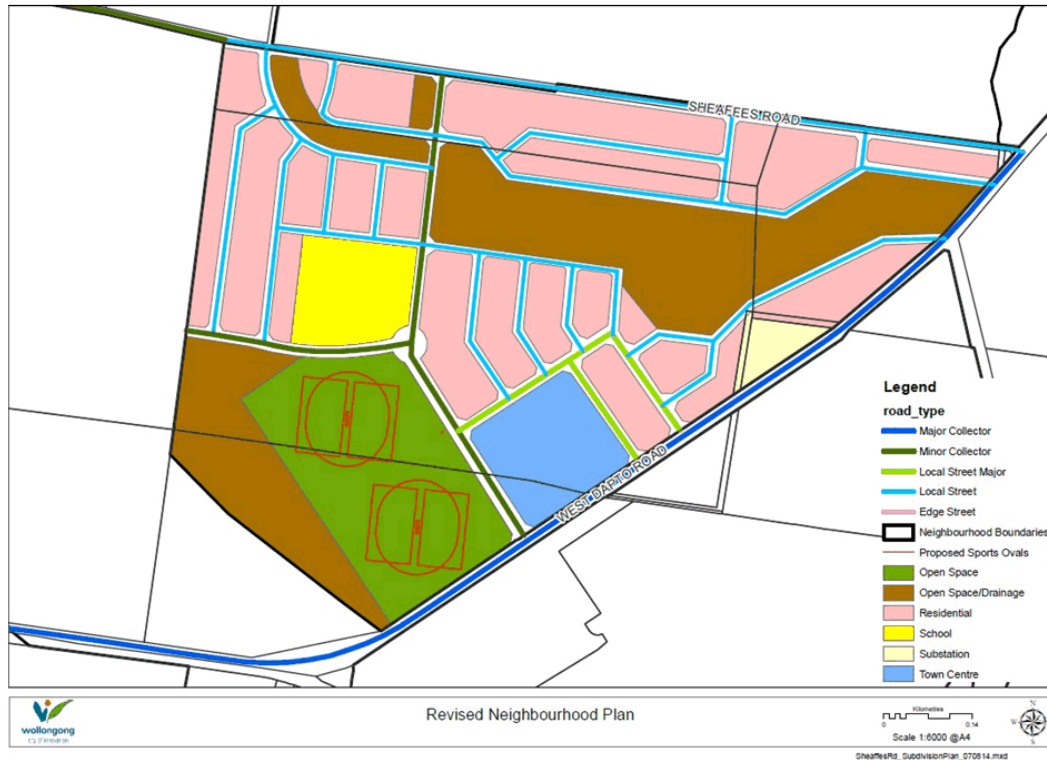


Figure 33. West Dapto Road / Sheaffes Road (south) Neighbourhood Plan

14.3.12 Bong Bong South

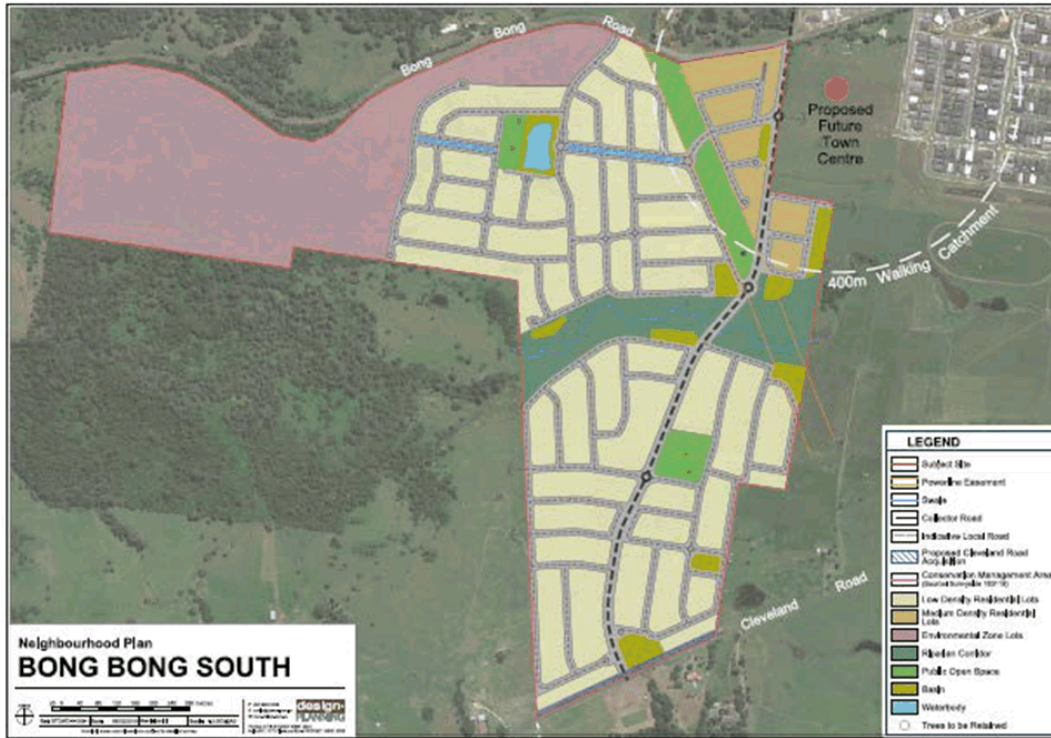
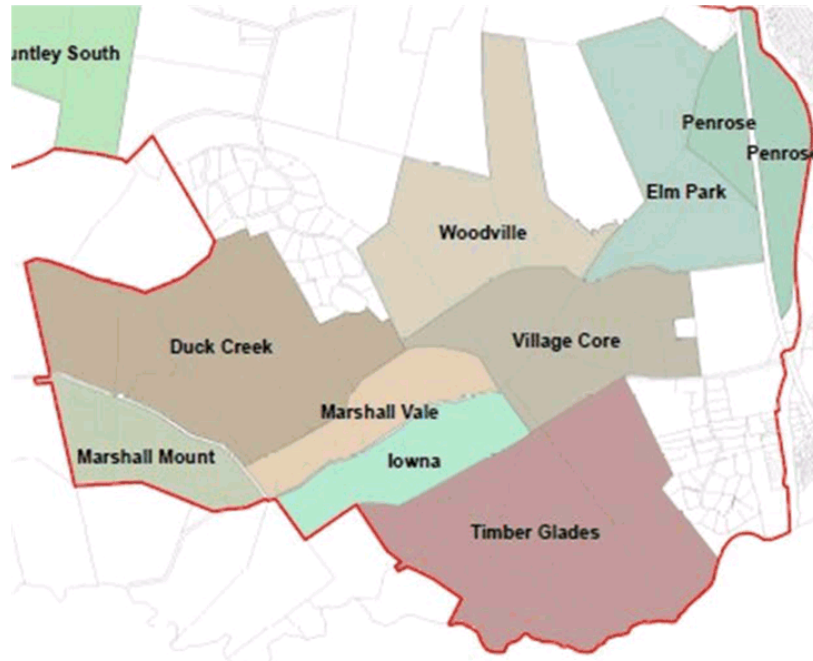


Figure 34. Bong Bong South Neighbourhood Plan

14.3.13 Stage 5 – Yallah / Marshall Mount



There are nine neighbourhood precincts that make up Stage 5 Yallah/Marshall Mount. During the rezoning process, visions and strategic decisions were made to provide strategic level structure to future development in the area (see Page 8 summary of structure). The Neighbourhood plans will all be required to deliver against the strategic intents established during these processes. Applicants planning in Stage 5 can contact Council to obtain a copy of the Yallah-Marshall Mount Vision Statement (Council reference: Z14/418278).

Marshall Mount Town Centre

The new village centre will be focussed around the intersection of Yallah Road and Marshall Mount Road on lower lying land adjacent to Duck Creek. The vision proposes that the focal point of the new community will be in this neighbourhood. Other developable land near this central intersection will be available for development for a mixture of housing types, with densities ranging from 50-75 dwellings per hectare near the village centre, with 20-30 dwellings per hectare further away. The vision needs to achieve these higher densities to create a critical mass of population within a walkable catchment of the proposed village centre to assist in economic viability of the centre and reduced car dependence.

There are opportunities for smaller lot housing and terraces to take advantage of future public transport routes along Marshall Mount Road. Duck Creek provides opportunities for passive open space and walking/cycling tracks, but also presents a significant flood hazard which requires development to be kept clear. The corner of Marshall Mount Road and North Marshall Mount Road contains heritage items, including a community hall, which provides opportunities for a community focus around this point. There is flat land, which may have potential for a school and playing fields adjacent to the proposed Village Centre. Land further from the main public transport routes will be for low density residential and rural-residential development.

The steeper slopes and more timbered areas provide a scenic green backdrop to the Duck Creek valley and provide a bushland link along the ridgelines from the escarpment to Lake Illawarra.

15 Matters to be addressed in Development Applications

This chapter applies to development applications in the West Dapto Urban Release Area.

Documentation accompanying the Development Application for subdivision will also have to provide more detailed site specific information and specialist reports, addressing issues such as:

- Detailed site survey by a registered surveyor.
- Development plans – lot layout, detailed road designs, landscape plans, subdivision stages (if any) (Chapters B2, B3 and B4).
- Flora and fauna assessment and future management (Chapters E18).
- Riparian land management (Chapter E23).
- Drainage/flooding/water quality modelling, WSUD (Chapters E13, E14, E15 and E22).
- Land contamination assessment (Chapter E20).
- Bushfire management (Chapter E16).
- Traffic assessment (Chapter E3).
- Aboriginal heritage assessment (Chapter E10 and E11).
- Noise assessment (where relevant) (Chapter E4).
- Pedestrian and bicycle routes, including accessibility for persons with a disability (Chapter E1).
- Crime Prevention through Urban Design (Chapter E2) etc.

The documentation accompanying a Development Application for a Dwelling House on a newly subdivided lot should have regard to Part A and B1 (Dwelling Houses) of this DCP and any variations to the generic controls under this chapter (e.g. the standard setbacks in individual neighbourhoods may have been varied).

An application for a Dwelling House can also be undertaken in accordance with the requirements of SEPP Exempt and Complying Development, which can be assessed by Council or a Private Certifier.



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1 INTRODUCTION

1. This Chapter of the DCP outlines the objectives and detailed controls for residential subdivision in addition to the planning controls contained in the relevant Local Environmental Plan.
2. The purpose of this chapter of the DCP is to provide Council's detailed requirements for residential subdivision development upon land zoned either: R1 General Residential, R2 Low Density Residential, R3 Medium Density Residential, R4 High Density Residential, R5 Large Lot Residential, B1 Neighbourhood Centre and B4 Mixed Use.
3. This part of the DCP should be read in conjunction with:
 - (a) The relevant Local Environmental Plan which prescribes the zoning and minimum subdivision lot size requirements.
 - (b) Part A (Introduction and General Requirements) of the DCP which provides advice on the lodgment requirements for a Development Application.
 - (c) Part D (Locality based DCPs / Precinct Plans) of the DCP which provides specific locality based or precinct based planning controls which may affect a proposed residential subdivision in a specific locality.
 - (d) Part E (General Planning Controls City Wide) of the DCP which outlines Council's general planning requirements for all developments.
 - (e) Council's Subdivision Policy which outlines Council's minimum design and construction specifications for all components of a subdivision including but not limited to earthworks, drainage and road works etc.

2 OBJECTIVES

The objectives of this Part of the DCP are:

- (a) To facilitate a range of lot sizes to permit a range of housing styles and housing mix, in order to meet the changing demographic profiles and housing requirements for residents in the City of Wollongong Local Government Area;
- (b) To ensure the subdivision of land is responsive to inherent site conditions and constraints;
- (c) To ensure that all subdivisions are designed to take into account the principles of ecologically sustainable development and solar energy efficiency, to assist in ensuring that subsequent development is significantly more energy efficient;
- (d) To ensure subdivisions achieve high quality urban design outcomes through maximising the number of new lots with principal street frontage and to restrict the number of battle-axe lots;
- (e) To ensure that lot sizes, dimensions and layout are consistent with best practice in terms of urban design, solar access orientation and energy efficiency;
- (f) To establish a clear hierarchy of different road types which cater for different types of traffic movement through residential subdivisions; and
- (g) To ensure that the majority of residential allotments are within a 400 metre walking distance from an existing or proposed new bus stop.

Part B – Land Use Based Planning Controls
Chapter B2: Residential Subdivision

3 DEFINITIONS

Corner Allotment Is a lot which has frontage to two roads on adjacent boundaries.

Irregular shaped allotment means an allotment which is not regular in shape.

Regular shaped allotment means either:

- (a) Allotment which is either square or rectangular in shape; or
- (b) Allotment of another shape where a square or rectangular shape equivalent in area to the minimum lot size area for the allotment type could be contained within the boundaries of the allotment and includes a battle-axe shaped allotment and a corner allotment where the only deviation from the above requirements is the access handle (ie battle axe lot) or the splay corner (ie corner lot).

4 TYPES OF RESIDENTIAL SUBDIVISION

In NSW, there are three (3) main forms of residential subdivision, namely:

1. Torrens Title subdivision;
2. Strata Title subdivision; and
3. Community Title subdivision.

4.1 Torrens Title Subdivision

Torrens Title subdivision is the main form of subdivision of a parcel of land.

Torrens Title is a system of title, based on registration. The property owner is referred to as the 'registered proprietor' who holds the land subject to interests and other rights recorded in the register but is free from all other interests. The registered proprietor is issued with a Certificate of Title (CT) that is a duplicate copy of the folio entry in the central Torrens Lands Title register, held by the NSW Department of Lands (Land & Property Information).

Any Development Application for a proposed Torrens Title subdivision must be supported by the following documentation:

- (a) A registered survey plan of the subject site;
- (b) A draft subdivision plan which shows all existing and proposed easements or covenants over relevant lots in the proposed subdivision;;
- (c) A draft written instrument outlining the creation of any easements / restrictions under Section 88B or 88E of the Conveyancing Act 1919; and
- (d) A Statement of Environmental Effects which addresses the proposal's relationship with relevant environmental planning instruments (including any relevant State Environmental Planning Policy, State Code, Wollongong Local Environmental Plan 2009 etc) and this DCP.

4.2 Strata Title Subdivision

The application of the Strata Titles Act applies principally to the subdivision of residential flat buildings, townhouses, villas or dual occupancies into separate parts / units.

Strata title subdivision is essentially the subdivision of space in three dimensions defined by or with

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reference to walls, floors and ceilings as well as courtyards. It allows for the horizontal subdivision of land and / or airspace into separate titles for separate “strata” lots or units. Each lot or unit represents a separate apartment. An owner of a strata title unit has title to the air bounded by the inner skin of the boundary walls of the unit and by the ceiling height above and the floor level below horizontally.

The legal title to the land and building structure is owned by the “Owners Corporation” being a corporate body comprising and representing the owners of all the units in the building. The common property in the strata title includes the building itself, common open space, waste and recycling storage bin areas, visitor car parking and driveways on the land. Generally, car parking spaces (except visitor car parking spaces) are marked on the strata plan and form part of the unit title for the unit owner’s exclusive rights.

Any Strata Title subdivision application must be accompanied by:

- (a) A survey plan of the site and the building;
- (b) A strata subdivision plan showing individual entitlements, common property (including common open space and visitor car parking) and any easements or other restrictions;
- (c) A Statement of Environmental Effects which addresses the proposal’s relationship with any previous development consents granted upon the site and consistency with relevant environmental planning instruments such as State Environmental Planning Policies (including SEPP 10 – Retention of Low Cost Rental Accommodation where relevant) and Wollongong LEP 2009, any State Codes and this DCP;
- (d) A written 88B Instrument applying to any existing or proposed easements / restrictions (where relevant); and
- (e) A copy of any previous Development Consents and Construction Certificates applying to the site, including any buildings upon the site.

4.3 Community Title Subdivision

Community Title subdivision is a form of subdivision which lies between conventional Torrens Title subdivision and Strata Title subdivision. Community Title enables common (shared) property to be created within an otherwise conventional subdivision.

Community title subdivision is primarily governed by the Community Land Development Act 1989 and Community Land Management Act 1989.

The Community Land Development Act 1989 permits community title subdivisions to be staged or non-staged developments. The main advantage of staging of larger Community Title subdivisions is that the initial development costs will be lower because the first stage(s) of the development can be used to finance the construction of later stages. It also enables the development of planned communities of any residential type where the use of some land is shared.

Council encourages urban consolidation / housing density initiatives involving Community Title subdivisions, particularly in areas within proximity to railway stations. In certain cases, Council may generally agree to the road carriageway widths for private roads servicing up to 12 dwellings within the subdivision being reduced in width, except where in the opinion of Council there is a potential adverse traffic management issue.

Management Structure

The Community Titles legislation allows for a multi-tiered management structure incorporating either two (2) or three (3) main levels or types of schemes, namely:

- (a) Community;
- (b) Precinct; and
- (c) Neighbourhood.

The multi-tiered management structure applies only to Community Title schemes which are developed in

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stages. The multi-tiered management structure includes all three (3) levels in a scheme.

The Community Plan shows the development of the total area broken up into at least two (2) development lots plus common property.

The Precinct Plan is the subdivision of a development into at least two (2) precincts plus common property and is managed by a Precinct Association which comes under the control of the Community Association.

The Neighbourhood Plan is the further re-subdivision of a precinct within the Precinct Plan. Lots within the Neighbourhood Plan are managed by a Neighbourhood Association which comes under the control of both the Precinct Association and the broader Community Association.

It also allows a further level as a strata scheme integrated into the overall scheme.

In a proposed two tier management structure, the second tier of management is created by the registration of a neighbourhood plan subdividing a community development lot in a community plan into lots for separate use or disposition known as neighbourhood lots. The neighbourhood scheme is administered by a neighbourhood association which will automatically become a member of the community association.

The by-laws for each community scheme are set out in the Management Statement which is registered with the relevant plan of subdivision. Each community scheme is bound by the rules set out in its own Management Statement. The Management Statement is required to cover a range of matters including:

- (a) The management, use and maintenance of community property such as roads and special facilities such as constructed wetlands, recreational facilities and open space areas;
- (b) Waste and recycling storage and collection areas etc;
- (c) Insurance of common property; and
- (d) The proceedings of the Executive Committee.

The Development Contract is the construction agreement between the developer and the members of the scheme regarding the type and timing of facilities proposed to be constructed within the common property.

Any Development Application for a proposed Community Title subdivision must be accompanied by the following documents:

- (a) A subdivision plan which shows the proposed individual lots and proposed "Association Property" lots (including any private roads, common open space, recreational facilities etc) as well as any necessary easements / restrictions;
- (b) A draft Management Statement and a draft Development Contract which comply with the provisions of the Community Land Development Act 1989 and Community Land Management Act 1989;

Note: If development consent is ultimately granted to the Community Title subdivision, the final Management Statement and final Development Contract will be required to be lodged with the final plan of subdivision as part of the Subdivision Certificate application.

- (a) A survey plan of the subject site;
- (b) A written 88B Instrument for any necessary easements / restrictions; and
- (c) A Statement of Environmental Effects which addresses the proposal's relationship with relevant environmental planning instruments (including any relevant State Environmental Planning Policy, State Code, Wollongong Local Environmental Plan 2009 etc), any State Code and this DCP.

5 TOPOGRAPHY, LANDFORM CONSERVATION, CUT AND FILL

Objectives

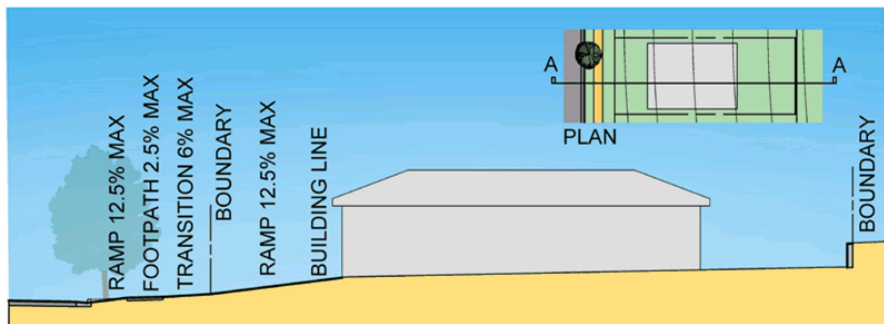
- a) Ensure the design of any subdivision takes into account inherent site constraints, and natural landform features.

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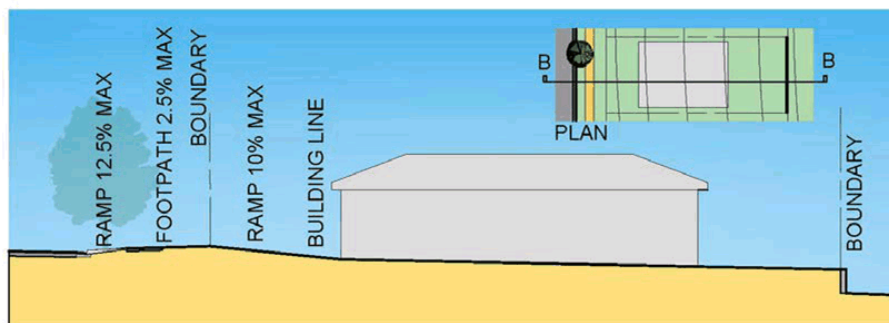
- b) Ensure the design of the subdivision responds to the natural topography and landform feature and minimise, as far as practicable, significant cut / fill and unnecessary reshaping of the site.
- c) Retain key characteristics of landforms and encourage individual housing and lot design solutions to contribute to future street and residential character diversity.
- d) Ensure that the design of any residential subdivision takes into account any significant trees or other vegetation upon the subject site, including any endangered ecological community or threatened species.

Development Controls

1. The topography and landform of the site must be taken into consideration as part of the design of the subdivision layout, to optimise solar access opportunities and maximise views to key natural features.
2. The topography and landform of a locality are important place-making elements. Roads should be designed to respond to such features and work to minimise cut and fill.
3. The subdivision lot layout should be designed to improve views from public points of interest (such as parks and hill tops, public facilities, centres) and residential areas to special features such as the escarpment backdrop, remnant stand of significant trees (ie Spotted Gum forest or stand of Norfolk Island pine trees) or the coastline.
4. Where the land slopes at a grade of 6% or greater, the predominant road alignment should be perpendicular to the contours of the site, wherever practicable.
5. Roads must be constructed at the natural ground level of the site wherever practical, taking into account the constraints of the site and road design requirements.
6. Where natural landform is sloping prior to subdivision works, lots shall be designed to reflect inherited slopes. Housing products to suit sloping lots, with building envelope platforms, landscaped sloping solutions and split-level house designs are encouraged (see diagrams below).
7. All finished lots shall have a minimum 2% fall towards the proposed stormwater drainage system, in order to allow for suitable stormwater run-off from the site and to help minimise any potential water ponding.



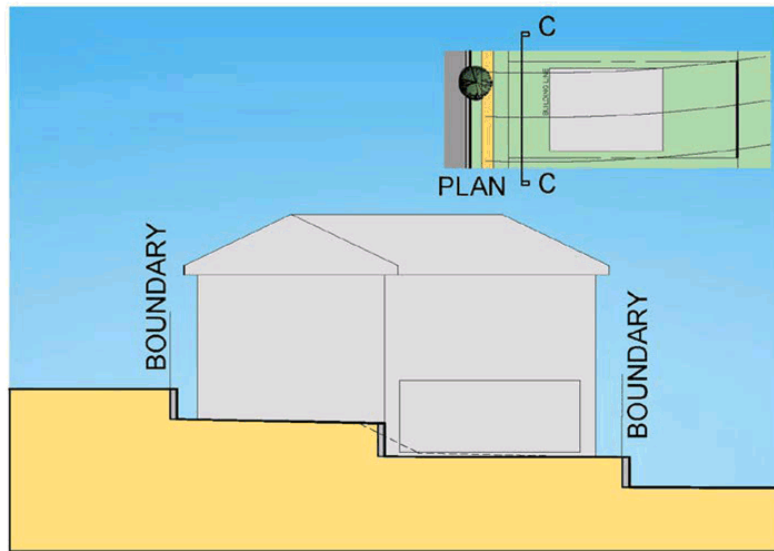
SECTION AA



SECTION BB

Examples of incorporating sloping in lots from front to rear into lot design and related housing designs.

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SECTION CC

Examples of accommodating sloping blocks into lot design and related housing designs.

6 SUBDIVISION DESIGN

Subdivision layouts are to incorporate adequate pedestrian, bicycle and vehicle links to the road network, public transport nodes, pedestrian/cyclist network, and public open space areas. The street and subdivision layout should minimise fuel use by reducing travel distances and maximising public transport effectiveness. Connectivity within neighbourhoods is essential to ensure the majority of dwellings are within 400 metres walking distance to bus stops.

1. The design of any residential subdivision must include a land suitability assessment, addressing the following issues where relevant:
 - Existing land use.
 - Flooding.
 - Bushfire.
 - Topography, geotechnical constraints, contamination constraints.
 - Biodiversity (Ecologically Endangered Communities, bushland, significant trees, habitat).
 - Known or likely heritage sites, including Indigenous heritage cultural issues.
 - Existing road network.
 - Street frontage and access.
 - Available utilities & services and existing easements.
 - Need for community and recreation facilities.
 - Visual character.
 - Noise impacts (e.g. from the main roads, industrial areas or public and private railways).
2. Subdivisions comprising 4 lots or more must demonstrate the following where applicable:
 - Proposed road layout and hierarchy.
 - Proposed public transport, bicycle and pedestrian routes.
 - Proposed drainage management concepts.

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- Proposed buffers to heritage items.
 - Riparian corridors, buffers and proposed future use and ownership.
 - Proposed Asset Protection Zone requirements.
3. Refer to Council's Subdivision Policy for general subdivision design and the construction requirements for roads, stormwater drainage, utility services etc.

6.1 Lot layout – Aspect and solar access

Objectives

- (a) To ensure residential lots are well designed to take into account major factors in creating desirable landuse outcomes for the built environment through aspect, orientation, slope issues and optimal solar access.
- (b) To provide residential lots which maximises solar access and energy efficiency opportunities for future dwellings and private open space areas.

Development Controls

1. Roads running generally east – west are preferred since they provide for lots with a north-south axis which caters for optimum solar access to dwellings and private open space. Lots with a main north-south axis (20°W to 30°E) provide the best flexibility for the siting of future dwellings and reduce potential overshadowing problems.
2. Lots with a main east-west axis (ie roads running north-south) should be widened, in order to ensure satisfactory solar access opportunities into living rooms of future dwellings and rear private open space areas and to help prevent overshadowing of dwellings and private open space on adjoining lots.
3. Lots with a NW – SE or NE – SW axis are less favourable and may need to be specifically designed or larger than normal to allow for the siting of a dwelling which is not directly parallel to the boundaries.
4. Lots should be rectangular shaped rather than irregular shaped, wherever practicable, in order to maximise solar access opportunities. Lots on the southern side of any road should have a greater frontage to the road, to allow improved solar orientation for the future dwelling.
5. Wherever possible, an access way to a rear battle-axe lot should be located on the southern side of an allotment, to minimise any potential overshadowing of future adjoining dwellings.
6. Any subdivision proposal adjoining a rear lane shall be designed so as to provide clear building frontage and pedestrian / visitor access between future building and the front road.

6.2 Lot size

1. The minimum subdivision allotment size requirement for a particular parcel of land shall be in accordance with the provisions of Wollongong LEP 2009 and the accompany Lot Size Map, relevant to the land.
2. Irregular shaped lots shall have a minimum allotment size of 485m².
3. Regular shaped corner lots shall have a minimum allotment size of 500m² as per Table 1 below and as illustrated in Figure 1 below.
4. Regular shaped battle axe allotments within residential zones shall have a minimum allotment size of 550m², excluding the battle axe access handle. Irregular shaped battle – axe lots shall have a minimum allotment size of 600m² (excluding the access handle). Refer to Figure 1 and Table 1 below.

Table 1. Minimum allotment sizes

Allotment Type	Minimum Lot Size Requirement for Regular Shaped Lots	Minimum Lot Size Requirement for Irregular Shaped Lots
Standard Lot	Subject to Wollongong Local Environmental Plan 2009	485m ²

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(relevant Lot Size Map)

Corner Lot	500m2	NA
Battle-axe Lot (excluding access handle)	550m2	600m2

However, larger allotments may be required in certain circumstances such as lots containing steeply sloping land or land containing a watercourse or land fronting an arterial road.

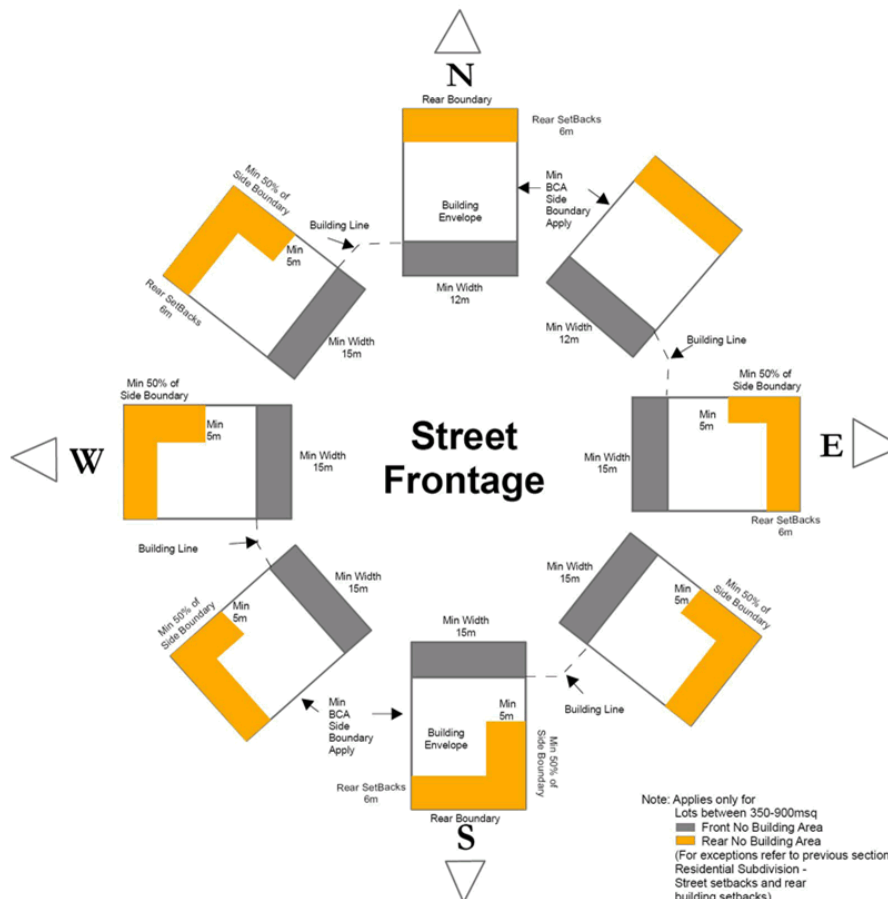


Figure 1. Solar Access Orientation – Minimum Building Envelopes and Lot Widths

6.3 Lot width and depth

Objectives

- e) To ensure residential lots are designed to provide sufficient lot width and depth, to cater for a suitable range of dwelling styles having regard to any site constraints or environmental qualities of that land.
- f) To ensure residential lots in low density residential areas provide sufficient site area to cater for detached dwelling-houses with sufficient rear private open space which gains appropriate sunlight access during mid-winter.

Development Controls

- 1) A minimum 12 metre lot width is required for residential allotments with N to NE rear boundary alignment.
- 2) Lots with a NW, W, SW, S, SE or E alignment should be 15 metres wide at the front building alignment, in order to ensure satisfactory solar access opportunities into living rooms of future dwellings and rear private open space areas and to help prevent overshadowing of dwellings and

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private open space on adjoining lots.

- 3) A minimum 15 metre lot width may be required where Council determines on-street parking is required.
- 4) The minimum depth for a residential allotment should be at least 25 metres.

6.4 Battle-axe lots

Objectives

- (a) To encourage conventional residential subdivisions with direct public road access, rather than a series of battle axe allotments one behind each other, in order to maintain the residential amenity and character of the locality.
- (b) To minimise the potential adverse streetscape and amenity impacts upon the locality arising from a number of battle axe lots sharing common access corridors.
- (c) To ensure each battle axe lot has a sufficient site area with a suitable building envelope to accommodate a range of different dwelling styles, in order to minimise any potential amenity or privacy impacts upon adjoining residential properties.
- (d) To ensure each battle axe lot has a sufficient site area to provide satisfactory on-site parking with suitable vehicular access and maneuvering areas.

Development Controls

1. The minimum allotment size requirement for battle-axe lots shall be in accordance with the relevant LEP and accompanying Lot Size Map, excluding the site area required for the battle-axe lot access handle.
2. The minimum lot width for a battle-axe allotment shall be 15 metres as measured at the front building line (ie exclusive the access handle). The 15 metre minimum lot width requirement for battle axe lots is set at 6 metres from the end of the battle axe handle (ie within the main building portion of the site).
3. A maximum of two (2) battle-axe allotments will be permitted behind an allotment which has direct frontage to a dedicated public road in the proposed subdivision. This allows for inherent site constraints such as slope or topography which may otherwise prevent a conventional residential subdivision providing direct public road access to all lots. Under no circumstances will Council favourably consider any subdivision proposal involving a series of battle-axe lots, one behind each other.
4. All battle-axe allotments must have direct access to a dedicated public road, through the provision of an access handle attached to each battle-axe lot or via a shared access corridor (ie maximum of two (2) lots may share a common access corridor).
5. The minimum access corridor width for a battle axe allotment shall be 5 metres with a minimum road pavement width of 3 metres for the entire length of the access handle.
6. A 1 metre wide landscaping strip shall be provided along each side of the required 3 metre wide road pavement. The landscaping strip shall be planted with suitable small trees, shrubs and groundcovers.
7. A shared access corridor may be permitted for a maximum of two (2) battle axe allotments where, in the opinion of Council, the proposed access arrangement will satisfactorily cater for safe vehicular and pedestrian access to each of the lots and that satisfactory sight line distances are available between the subject lots and the public road.
8. Any access corridor shared between two (2) battle axe allotments must be created through reciprocal rights of carriageway under Section 88B of the Conveyancing Act 1919. The minimum shared access handle width shall be 5 metres with a minimum road pavement width of 3 metres for the entire length of the access handle. However, the shared access handle must be designed wide enough to satisfactorily cater for the placement of garbage and recycling bins (ie associated with the dwellings on the two battle axe lots) adjacent to the access handle road pavement
9. A minimum 1 metre wide landscaping strip must be provided along each side of the required 3

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metre wide road pavement of any shared access handle. The landscaping strip shall be planted with suitable small trees, shrubs and groundcovers. A hard stand area on one side of the access handles for garbage and recycling bins (ie directly abutting the public road reserve). The opposite 1 metre wide landscaping strip in the shared access handle shall include letterboxes for the two lots (ie. directly abutting the public road reserve).

10. All battle-axe lot access corridors must be provided with all-weather road pavement. All access handle driveway crossings must be of a full concrete or asphalt construction and must be designed having regard to current fire regulations for fire hydrants. Driveways must be sited to allow for visibility of vehicles entering and leaving the site.
11. Driveway construction must give consideration to driveway drainage, utility servicing and retaining structures.
12. Within bush fire hazard areas, access to allotments shall be in accordance with the requirements of the NSW Rural Fire Service Planning for Bush Fire Protection 2006 guidelines. In the event of any inconsistency between the access requirements to lots between this part of the DCP and the Planning for Bush Fire Protection 2006 guidelines, the Planning and Bush Fire Protection guidelines.
13. Each battle axe access corridor must have capacity for vehicular turning facilities and two (2) on-site parking spaces must be provided for each battle axe lot.
14. Access corridors within bush fire prone areas must provide a suitable turning area, in order to enable the satisfactory maneuvering of fire fighting vehicles in accordance with the requirements of the NSW Rural Fire Service Planning for Bush Fire Protection 2006 guidelines will prevail.
15. The maximum gradient for any access way required for a battle axe lot subdivision should be 25%.
16. The gradients for access handles for allotments within bush fire prone areas shall be in accordance with the requirements of the NSW Rural Fire Service Planning for Bush Fire Protection 2006 guidelines.
17. Stormwater drainage on driveways must be contained in kerbs or a central dish and conveyed to the Council stormwater drainage system via the public road.

6.5 Building envelopes

Objectives

- (a) To ensure each residential lot has a suitable building envelope to accommodate a range of different dwelling styles, in order to minimise any potential amenity or privacy impacts upon adjoining residential properties.
- (b) To ensure the building envelope for each residential lot, takes into account all relevant constraints of the site and / or any easement or other restrictions pertaining to the land.
- (c) To ensure the building envelope for each residential lot takes into account any area of the subject land which contains significant remnant trees or other significant vegetation (including riparian vegetation).
- (d) To ensure building envelopes are appropriately positioned to maximise solar access opportunities and energy efficiency for future dwellings and rear private courtyards for each residential lot.

Development Controls

1. Council may require residential lots to provide a specific rectangular building envelope with minimum dimensions of 15 metres (depth) x 10 metres (width), where the subject site contains any inherent site constraint(s) (eg flooding, geotechnical constraints etc) or contains significant remnant vegetation, any threatened flora species, endangered ecological community etc. Any such building envelope shall be exclusive of the required setback requirements for a dwelling - house as per Chapter B1: Residential Development.
2. A 15 metre (depth) x 10 metre (width) building envelope will be required for any proposed battle axe allotment upon land zoned R2 Low Density Residential, since the erection of a two storey dwelling on a battle axe allotment is not permitted for land zoned Residential R2, under Chapter B1: Residential Development. Therefore, a building envelope is required to provide a sufficient building platform, to cater for a single storey dwelling.

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3. Any proposed building envelope shall be shown on the required subdivision concept layout plan accompanying the Development Application. Additionally, any existing easements or other restrictions on the use of the land should be shown on the required subdivision layout plan.

Note: In the event that Council ultimately supports the proposed subdivision, a condition of consent may be imposed requiring the imposition of a restriction on the use of land pursuant to the provisions of Section 88B of the Conveyancing Act 1919 which shows the building envelope for each lot within the subdivision. This requirement may apply to certain subdivisions where sites are subject to inherent site constraints (eg geotechnical /slope instability issues etc) or contain significant vegetation, threatened flora or fauna, flood prone / riparian land or other constraints which may require the building envelope to be specifically identified on the lot(s).

6.6 Superlots in residential subdivisions for integrated housing or medium density housing

Objectives

- (a) To ensure large residue lots or super lots for future dual occupancy or medium density housing are well planned and are strategically placed to reflect future traffic management conditions and other environmental conditions.
- (b) To encourage large residue lots to be earmarked for medium density housing early in the residential subdivision process.

Development Controls

1. The configuration and lot size of residue or super lots shall be designed to meet the future planning requirements for either dual occupancy, multi dwelling development or residential apartment building developments contained in this DCP. Accordingly, the subdivision plan accompanying the Development Application shall indicate the intended future residential use of the residue lot.
2. In the event that the residue lots are not designed to comply with the future planning requirements for the intended future residential development, then a reduced dwelling yield may occur when the Development Application for the development of the residue lot is assessed.
3. Large residue lots should be located in strategically placed locations in subdivisions and generally not at the end of cul-de-sacs. However, in certain circumstances, the positioning of a residue lot at the end of a cul-de-sac may be supported where individual site circumstances such as traffic management and other environmental conditions, support this arrangement.

6.7 Existing easements

Objectives

- (a) Guide the use of land under electrical easements for appropriate urban purposes.
- (b) Guide the use of land over gas easements for appropriate land uses.

Development Controls

1. A Development Application shall include the proposed use of all land under easements.
2. Water management can be carried out in electrical easements
3. Landscape planting (low rise) can be established in electrical easements while allowing for necessary service access.
4. More significant planting can happen on the edge of electrical easements to create a visual buffer to electrical infrastructure
5. Recreational uses and open space can be established within easements.
6. Easements can be used for roads, pedestrian and bicycle routes subject to approval by the easement authority.

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7. Consultation with the asset owner (eg. TransGrid, Endeavour or Jemena) is required to ensure that buffers, road levels and access are adequate.

7 MAJOR RESIDENTIAL SUBDIVISIONS

A major subdivision is considered to be a subdivision of lots creating more than 15 lots and/or applies to an area greater than 3600m² and creating an increase to the number of dwellings in the site.

If the subdivision is within an urban release area the development may have additional staging and sequencing requirements relating to development Concept, Precinct Plan or Neighbourhood Plans (eg. DCP Chapter D16: West Dapto Urban Release Area).

Objectives

- (a) To ensure the staging of a major residential subdivision is well planned and that all relevant roads, drainage and other infrastructure services are provided for each stage in the subdivision.
- (b) To ensure the staging of the development minimises any potential adverse noise or amenity conflicts, arising from construction equipment and plant operating on later subdivision stages upon residents in early release stages.

Development Controls

1. In cases of a major residential subdivision, a staging plan will be required which shows the proposed staging program. Additionally, the Statement of Environmental Effects shall provide a detailed outline of the proposed staging program, including the proposed total number of lots within each relevant stage.
2. The subdivision staging should be designed to minimise conflicts arising from construction plant and equipment operating during the construction of later subdivision stages impacting upon the amenity of residents living in dwellings within the earlier subdivision stages. This may also require the provision of temporary access arrangements for heavy vehicles associated with the stages under construction separate from the first stage(s) of the subdivision. The provision of suitable landscaping treatment and / or acoustic walls may also be necessary to minimise potential privacy, amenity or noise impacts upon first stage residents.
3. In the event that the staging of the subdivision is approved, all necessary subdivision works (including road works, drainage works, water and sewerage infrastructure, telecommunications, electricity supplies etc) must be completed for each relevant stage, prior to the release of any Subdivision Certificate.

8 PUBLIC RESERVES AND OPEN SPACE

Objectives

- a) To ensure the provision and embellishment of public open space is consistent with Council's planned requirements, to meet the recreational needs of the community.
- b) To provide public open space (ie both active and passive) within reasonable proximity for all residential lots within existing urban areas and new release areas.
- c) To preserve remnant native bushland including endangered ecological communities within public open space buffers, where possible.
- d) To limit the amount of land proposed to be dedicated to Council for public open space, to only lands zoned RE1 Public Recreation, under the relevant LEP or other lands previously identified by Council as being required for public open space.
- e) To minimise costs of on-going maintenance of public open space.

Development Controls

1. The size and location requirements for public open space shall fall within a hierarchy of provisions in accordance with Council infrastructure planning and generally as indicated in Table 2. Exact

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location and the level of equipment or other embellishment required for the open space must be discussed with Council upfront, prior to the lodgment of the Development Application, where such open space is proposed to be dedicated to Council for a public reserve or other purposes.

Table 2. Size and Location Criteria for Public Open Space

Open space type	Minimum Area	Maximum walking catchment
Local open space	1-2 hectares	400-600 metres
Neighbourhood open space	2-4 hectares	2km via road or pedestrian/ bicycle networks
District open space	5-8 hectares	Ward based catchments (3 wards of Wollongong LGA)

Note: Whilst Council may have had preliminary discussions with an applicant upfront over the possible future dedication and embellishment of land for public reserve(s), there is no guarantee that the proposed subdivision will be ultimately approved until such time as the application is properly assessed and determined on its merits, based on the "Matters for Consideration" as listed under Section 79C of the Environmental Planning and Assessment Act 1979.

2. Council will not accept the dedication of land for the purposes of public reserve where in the opinion of Council, there is already sufficient public open space in the locality and / or the land is not zoned RE1 Public Recreation.
3. Any approved public reserve lot shall be fully embellished in accordance with Council's requirements, prior to the release of the Subdivision Certificate.
4. Private open space may be provided as community lots in a Community Title subdivision. Any small open space area in a Community Title subdivision should be at least 500m² - 1,000m² in area and should make provision for seating as well as provision for an integrated children's playground equipment.
5. Wherever possible, riparian corridors should form the 'spine' for public open space within a subdivision.

9 PEDESTRIAN AND BICYCLE NETWORKS

Objectives

- (a) To ensure residential subdivisions provide safe and convenient pedestrian and bicycle linkages to facilities and services within the surrounding locality.
- (b) To ensure the road network adequately caters for the safety of pedestrians, cyclists and motorists through the provision of adequate sight lines at critical locations such as intersections, driveway crossings, bus stops and crossing points.
- (c) To ensure all pedestrian footpaths, and shared paths are designed in accordance with relevant Australian Standards and AUSTRROADS.
- (d) To ensure all pedestrian footpaths and shared paths are designed to incorporate Crime Prevention Through Environmental Design (CPTED) principles.

Development Controls

1. Any residential subdivision should identify the overall layout of dedicated pedestrian footpaths and shared paths within the subdivision. The constructed pedestrian footpath shall be a minimum width of 1.5 metres. For any shared path, a minimum 2.5 metre width is required and widened to 3 metres if the shared path is on a Minor Collector (Type 4) road.
2. Pedestrian and shared paths should be provided to link roads including cul-de-sacs and to directly access public transport routes/bus stops, public reserves, sporting / community facilities, schools, business precincts and adjacent residential subdivisions.

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3. All pedestrian footpaths or shared paths should be designed in accordance with the requirements of relevant Australian Standards, AUSTRROADS Guides and Council's Subdivision Policy as appropriate. All paths should be constructed of concrete, except where varied by Council.
4. Safe pedestrian crossings are to be created with the use of pedestrian refuges, slow points, kerb extensions or other appropriate measures, designed in accordance with relevant Australian Standards and AUSTRROADS Guides.
5. All footpaths and shared paths are to be provided with appropriate lighting and designed to incorporate Crime Prevention Through Environmental Design (CPTED) principles by minimising any potential hiding places and maximising passive surveillance.
6. The full design details of any footpaths, shared paths, pedestrian crossings or any other associated infrastructure shall be clearly shown on the subdivision plans submitted with the Development Application.

(Note: "shared path" refers to a path that is shared by both pedestrians and cyclists)

10 ACOUSTIC ASSESSMENT

Objective

- (a) Ensure appropriate acoustic measures are planned for and provided for subdivisions which are subject to potential adverse noise impacts, in order to provide a pleasant acoustic environment for all residential lots within the subdivision.

Development Controls

1. Council will refer to NSW Roads and Maritime Services (RMS) and Department of Planning to determine if an acoustic assessment is required as outlined in "Development near Rail Corridors and Busy Roads – Interim Guidelines" (Department of Planning).
2. When required, full details of the proposed acoustic mediation shall be submitted with the Development Application.

11 STREET TREE PLANTING

Objectives

- (a) To provide suitable street trees within residential subdivisions, in order to improve the streetscape character of the locality.
- (b) To improve the general residential amenity of the subdivision.
- (c) To ensure the planting of street trees in new subdivisions is appropriate and compatible with existing street tree planting within certain suburbs in the city.

Development Controls

1. The planting of street trees shall be integrated with driveway crossings, utility services, street lighting and shall be undertaken in accordance with the general requirements contained in the Chapter E6: Landscaping in this DCP.
2. Council may require the planting of a specific tree species for certain roads in a subdivision, especially if there is already an existing street tree scheme in the suburb. This requirement will be determined by Council as part of the assessment of the Development Application.

12 ENTRY STATEMENTS

Objectives

- (a) Ensure entry statements are appropriately designed and constructed to enhance the streetscape character of the residential estate.

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- (b) Ensure all entry statements and supporting structures (including night lighting) are contained wholly within the private realm of the subdivision, rather than within any existing or proposed future public road reserve.
- (c) Ensure all entry statements minimise any potential obstructions to motorists, pedestrians and cyclists and to prevent any potential adverse traffic visibility impact and / or visual distraction to motorists.

Development Controls

1. Entry statements mark and define the entry to a residential estate and are designed to enhance the streetscape character of the estate.
2. All entry statements (including associated special effects and night lighting) at the entry to residential subdivisions must be contained wholly within the private property and not within any land proposed to be dedicated as public road reserve.
3. The location and form of the entry statement must not unduly impede or restrict pedestrian, cyclist or public and private vehicular movement to or from the site. The siting and design of an entry statement must not reduce traffic visibility on adjacent roads and should not cause an unsafe visual distraction to vehicle drivers.
4. The entry statement should also be designed to incorporate Crime Prevention through Environmental Design (CPTED) principles by minimising any potential hiding places.
5. The full design details of the proposed entry statement(s) shall be shown on the required Landscape Plans to be submitted with the Development Application.

13 TRAFFIC FACILITIES

13.1 Road connectivity, permeability and legibility

Objectives

- (a) To establish a legible and well connected road network that promotes safe pedestrian and bicycle movement as well as convenient vehicular access.
- (b) To provide improved road, pedestrian and bicycle connections linking residential areas with public reserves, business centres, public services and facilities.

Development Controls

1. New subdivision roads should be designed to be integrated and connected with the existing local road network of the surrounding neighbourhood, wherever possible. In new subdivisions, cul-de-sacs should be minimised, wherever possible, in order to ensure connectivity within an estate.
2. Road design taking into account the surrounding local road network in the locality, especially the existing road hierarchy.
3. The subdivision design must achieve a high level of vehicular permeability and legibility in the location and layout of the road pattern.
4. The integration of new subdivision roads with existing roads will help to:
 - (a) Improve interconnections and minimise travel distances to / from facilities and services;
 - (b) Provide a choice of routes; and
 - (c) Spread traffic loads throughout the local road network, rather than intensifying traffic volumes to a restricted number of roads.
5. Connected grid networks are preferred as they provide more walkability and improve safety when dwellings are sited to address block edges, to enable passive surveillance.
6. The road network should provide internal connectivity to allow for a distributed traffic flow as well as encourage walking and cycling within the subdivision and wider area.

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7. Pedestrian footways and shared paths should be safe and convenient to encourage alternative transport options to motor vehicles.
8. A larger subdivision involving 50 or more residential lots should be designed to minimise any excessive “backtracking”. Therefore, the creation of multiple cul-de-sacs and “no through” roads within a larger subdivision is discouraged.
9. Developments that include commercial /retail or business that will generate employment for more than 50 people should develop and submit a Workplace Travel Plan that demonstrate there will be facilities provided to encourage positive active transport and public transport outcomes.

13.2 Road hierarchy and design requirements

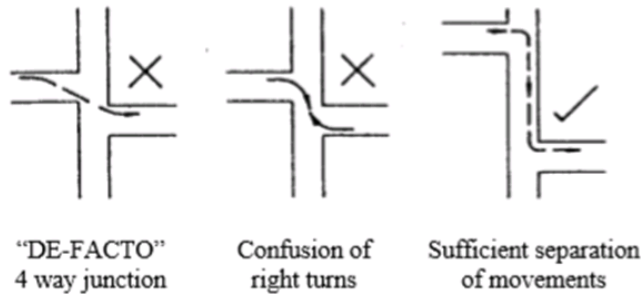
Objectives

- (a) To provide a defined hierarchy of roads, in order to provide an acceptable level of access, safety and convenience for all road users.
- (b) To ensure that the design features of each residential road within a subdivision reflects the role of the road within the overall road network.
- (c) To provide an acceptable level of access, safety and convenience for all road users within existing urban areas and new release areas, whilst ensuring acceptable levels of amenity and minimising traffic management issues in the particular locality.
- (d) To provide appropriate road access for larger and special purpose vehicles including garbage and recycling trucks, fire trucks, delivery trucks etc.
- (e) Ensure sufficient road carriageway and verge widths are provided for each road type, in order to enable all roads to perform their designated function within the road network.
- (f) Ensure that the road reserve adequately caters for all required functions including safe and efficient vehicular and pedestrian movement throughout the road network, provision of on-street parking and the provision of street tree planting and other landscaping, where appropriate.
- (g) Ensure road verges are of sufficient width to physically accommodate all necessary infrastructure assets and utilities.
- (h) Provide road geometry that is consistent with the designated function of the specific road as well as the physical characteristics of the locality.
- (i) Ensure the road network is simple and safe for all road users, including motor vehicles, pedestrians and cyclists.
- (j) Ensure that appropriate vehicle speed limits are incorporated into the road design to enhance the safety of pedestrians and cyclists, the young and people with a disability.
- (k) Ensure new release areas are designed to provide for safe, convenient and efficient bus routes.

Development Controls

- 1 The design of any road as part of a subdivision shall be in accordance with the following Table 3, Table 4 and Table 5, the Road Type Cross-Sections accompanying this section 14.2 and in accordance with Council's Subdivision Policy.
- 2 Roads should be designed to provide visual interest in the streetscape through kerbs (where appropriate), landscaping and paving treatments. The road design should be compatible with the existing road pattern in the locality.
- 3 The minimum spacing of staggered intersections in a local subdivision road network (Road Types 5 to 8) should be 20 metres.

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- 4 Street layout and curve radii must make provision for service vehicles to manoeuvre.
- 5 The provisions of the NSW Rural Fire Service publication "Planning for Bushfire Protection" and the State Government Publication "Fire Safety Guideline – Access for Emergency Vehicles and Emergency Service Personnel" must be met and will take precedence.
- 6 The maximum length of cul-de-sacs should not exceed 80 metres.
- 7 For all roads that permit direct driveway access, a minimum 15 metre lot width may be required at the street frontage, where Council determines that on-street parking is required.
- 8 Angled parking may be utilised adjacent to active open space and in town and village centres, particularly for lower volume roads, provided it does not unduly impact traffic flow or public transport services. Angled parking must comply with Australian Standards and will be assessed by Council as to its merits on a case-by-case basis.

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Table 3. Road network environment

Street Types		Road Environment				
		Access (driveway)	Indicative Daily Traffic Volume (vpd)	Target Speed (km/h)	Street Pavement Type	Parking
Sub-Arterial Road	Type 1 <i>(entry road with WSUD median strip (4.2m) & bus services)</i>	No Access	20,000 - 40,000+	70	Asphalt	No
	Type 2 <i>(with bus services)</i>	No Access	15,000 - 20,000+	60	Asphalt	No
	Type 2A <i>(with parking & bus services)</i>	No Access	10,000 - 15,000	60	Asphalt	Yes
Major Collector Road	Type 3 <i>(with parking & bus services)</i>	No Access	3,000 - 15,000	60	Asphalt	Yes
Minor Collector Road	Type 4 <i>(with parking & limited bus access)</i>	Access	3,000 - 9,000	50	Asphalt	Yes
Town & Village Centre Road	Type TC	Limited Access	(varies)	40	Asphalt	Yes
Local Road	Type 5 <i>(with parking)</i>	Access	1,000 - 3,000	40	Asphalt	Yes
Access Street	Type 6 <i>(with residential on both sides, and parking)</i>	Access	300 - 1,000	25	Asphalt	Yes
Access Place	Type 7 <i>(with parking)</i>	Access	< 300	25	Asphalt	Yes
	Type 7A <i>(1-Way, adjacent open space on one side)</i>	Access	< 300	25	Asphalt	Yes
	Type 7B <i>(2-Way, adjacent open space on one side)</i>	Access	< 300	25	Asphalt	Yes
Laneway	Type 8 <i>(no parking)</i>	Access	< 150	10	Asphalt	No

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Table 4. Carriageways and verges

Street Types		Carriageway			Verge			
		Kerb Lane (m)	Centre Lane (m)	Total (m)	Verge (m)	Total Reserve (m)	Footpath (m)	Shared Path (m)
Sub-Arterial Road	Type 1 (entry road with WSUD median strip (4.2m) & bus services)	3.6	3.4	18.2	10.5 (5.25 each side)	28.7	n/a	5m (2.5m each side)
	Type 2 (with bus services)	3.5	3.2	13.4	9.5 (4.75 each side)	22.9	n/a	5m (2.5m each side)
	Type 2A (with parking & bus services)	3.5	3.2	13.4	9.5 (4.75 each side)	22.9	n/a	5m (2.5m each side)
Major Collector Road	Type 3 (with parking & bus services)	3.0	3.2	12.4	9.5 (4.75 each side)	21.9	n/a	5m (2.5m each side)
Minor Collector Road	Type 4 (with parking & limited bus access)	2.6	3.0	11.2	9.75m (5.25m one side, 4.5m other side)	20.95	1.5	3m
Town & Village Centre Road	Type TC	(varies)	(varies)	(varies)	9m (4.5m each side) or 9.75m (5.25m residential side, 4.5m centre side)	(varies)	4.5m full width town centre side	3m provided on one side if residential
Local Road	Type 5 (with parking)	2.1	2.8	9.8	9m (4.5m each side)	18.8	3m (1.5m each side)	n/a
Access Street	Type 6 (with residential on both sides, and parking)	2.3	3.5	8.1	9m (4.5m each side)	17.1	3m (1.5m each side)	n/a
Access Place	Type 7 (with parking)	3.5	n/a	7.0	8m (4m each side)	15	n/a	n/a
	Type 7A (1-Way, adjacent open space on one side)	2.0 (parking lane) or 3.5 (travel lane)	n/a	5.5	6.45m (2.45m open space side, 4m other side)	11.95	n/a	n/a
	Type 7B (2-Way, adjacent open space on one side)	3.5	n/a	7.0	6.45m (2.45m open space side, 4m other side)	13.45	n/a	n/a
Laneway	Type 8 (no parking)	n/a	n/a	5.5	2.9m (1.45m each side to property boundary)	8.4	n/a	n/a

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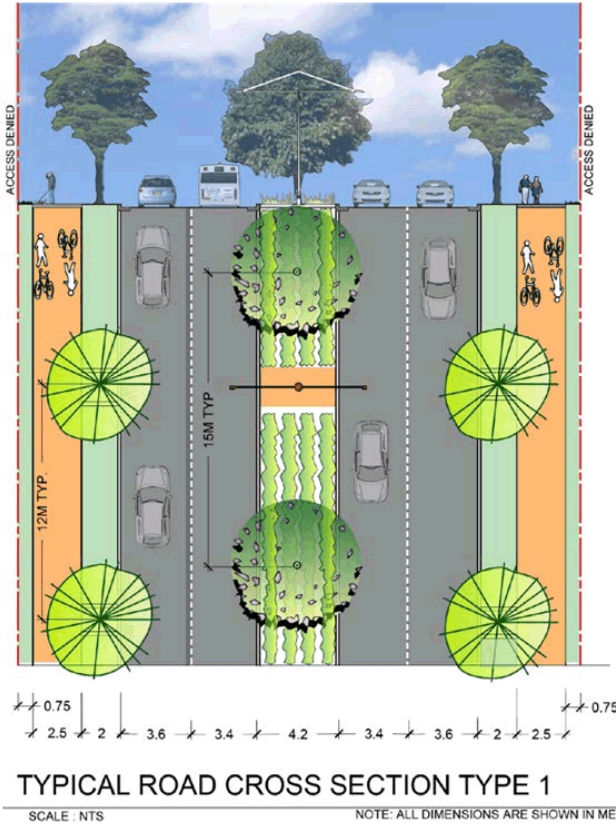
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Table 5. Street vegetation

Street Types	Verge Trees	Street Tree Planting	
Sub-Arterial Road	Type 1 <i>(entry road with WSUD median strip (4.2m) & bus services)</i>	1 every 12m	n/a
	Type 2 <i>(with bus services)</i>	1 every 12m	n/a
	Type 2A <i>(with parking & bus services)</i>	1 every 12m	1 every 30-60m via kerb bulges
Major Collector Road	Type 3 <i>(with parking & bus services)</i>	1 every 12m	1 every 30-60m via kerb bulges
Minor Collector Road	Type 4 <i>(with parking & limited bus access)</i>	1 per lot or every 15-20m	None – use kerb extensions at intersection
Town & Village Centre Road	Type TC	Landscape design or 1 per lot or every 15-20m (residential side)	Kerb extensions can be used mid-block (eg at pedestrian crossings) and intersections
Local Road	Type 5 <i>(with parking)</i>	1 per lot or every 15-20m	None – use kerb extensions at intersection
Access Street	Type 6 <i>(with residential on both sides, and parking)</i>	1 per lot or every 15-20m	None – use kerb extensions at intersection
Access Place	Type 7 <i>(with parking)</i>	1 per lot or every 15-20m	n/a
	Type 7A <i>(1-Way, adjacent open space on one side)</i>	1 per lot or every 15-20m (residential side)	n/a
	Type 7B <i>(2-Way, adjacent open space on one side)</i>	1 per lot or every 15-20m (residential side)	n/a
Laneway	Type 8 <i>(no parking)</i>	1 per lot depending on lane design	n/a

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TYPE 1 – Major Sub-arterial road



Objectives

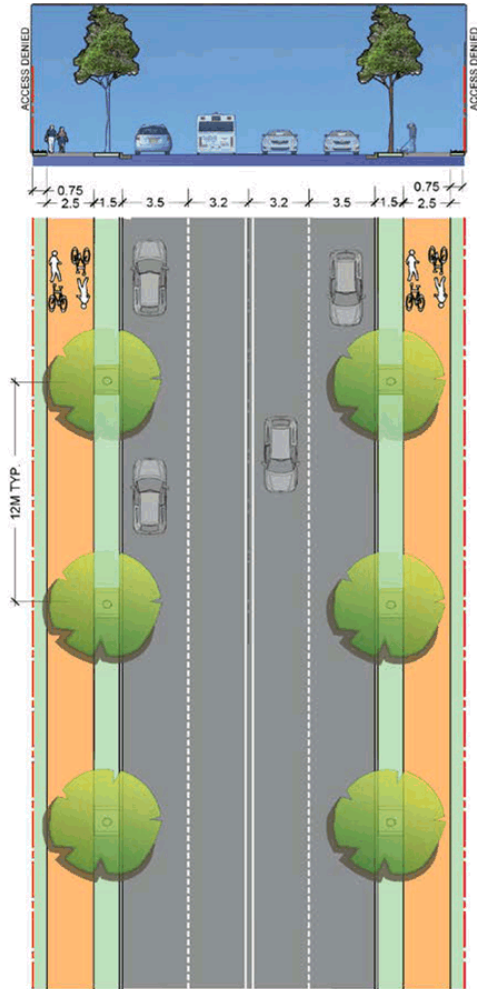
1. Provide for high general traffic and heavy vehicle volumes with 4 travel lanes.
2. Provide connectivity between neighbourhoods and local centres/arterial road network.
3. Direct access is not permitted (access denied).
4. Provide for bus routes and bus stops (generally indented stops).
5. Design speed 80km/h, posted speed 70km/h.
6. Provide legible pedestrian and cycle network via shared paths on both sides of road.
7. Provide improved safety and amenity through provision of planted median.
8. Allows for development of right turn lanes at intersections via the central median provision.

Notes

1. The median will include low planting and incorporate WSUD where appropriate.
2. The road capacity is considered to generally cater for greater than 15,000vpd.
3. Lighting can be provided in the median as well as within the verge.
4. A kerbside verge width of 2m has been provided for an improved buffer for pedestrians/cyclists to higher speed road traffic.
5. Barrier kerb used for kerbside lanes.
6. Travel lanes wider than other road types reflective of higher speed limit and proportion of heavy vehicles.
7. Bus stops shall be via indented bus bays where practicable.
8. Intersections are to be controlled (signals, roundabouts) and provide appropriate pedestrian crossing facilities.
9. Priority controlled intersections will only be considered for left turns (eg Left-in/Left-out).
10. Controlled intersections (signals, roundabouts) are to be generally spaced a minimum of 400 metres apart.
11. Mid-block pedestrian crossings not permitted (eg refuges, marked crossings, kerb extensions etc).

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TYPE 2 - Sub-arterial road with bus service



TYPICAL ROAD CROSS SECTION TYPE 2

SCALE: NTS NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

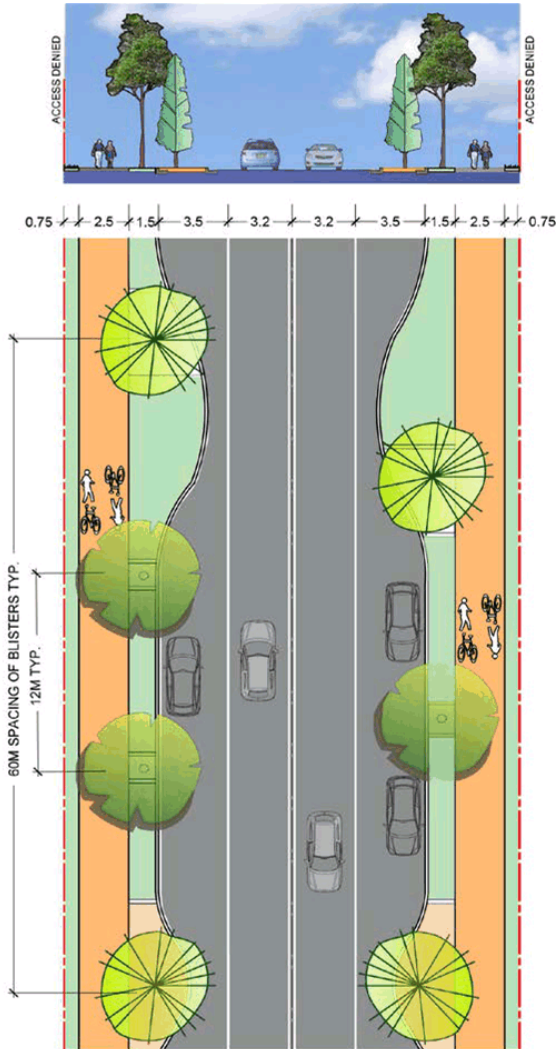
Objectives

1. Provide for high traffic volumes with 4 travel lanes.
2. Provide connectivity between neighbourhoods and local centres/higher order roads.
3. Direct access is not permitted (access denied).
4. Provide for bus routes and bus stops.
5. Design speed 70km/h, posted speed 60km/h.
6. Provide legible pedestrian and cycle network via shared paths on both sides of road.
7. All adjoining lots must provide an active frontage to the Type 2 road (can be direct frontage or via secondary parallel internal road).

Notes

1. The road capacity is considered to generally cater for greater than 15,000vpd.
2. Lighting can be provided within the verge.
3. A kerbside verge width of 1.5m has been provided to allow for space for trees.
4. Barrier kerb to be provided.
5. Bus stops shall be provided in the kerbside lane.
6. Intersections are to be controlled (signals, roundabouts) and provide appropriate pedestrian crossing facilities.
7. Priority controlled intersections will only be considered for left turns (eg Left-in/Left-out).
8. Controlled intersections (signals, roundabouts) are to be generally spaced a minimum of 400 metres apart.
9. Mid-block pedestrian crossings not permitted (eg refuges, marked crossings, kerb extensions etc).
10. Road reserve may need to be locally widened at intersections to allow for turn lane requirements.

TYPE 2A – Sub-arterial with bus service and parking



TYPICAL ROAD CROSS SECTION TYPE 2A

SCALE : NTS

NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

Objectives

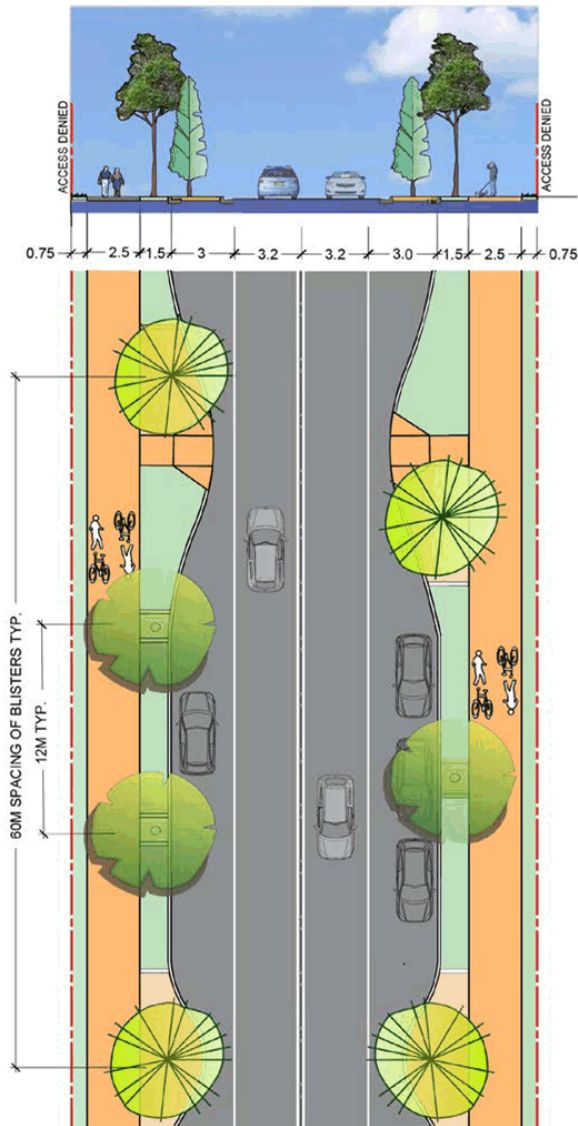
1. Provide for moderate traffic volumes with 2 travel lanes and 2 parking lanes, with potential to provide 4-lane capacity when required.
2. Provide kerbside parking.
3. Allow for traffic calming and greening opportunity through provision of regular kerb extensions in parking lane.
4. Provide connectivity between neighbourhoods and local centres/higher order roads.
5. Direct access is not permitted (access denied).
6. Provide for bus routes and bus stops.
7. Design speed 70km/h, posted speed 60km/h.
8. Provide legible pedestrian and cycle network via shared paths on both sides of road.
9. All adjoining lots must provide an active frontage to the Type 2A road (can be direct frontage or via secondary parallel internal road).

Notes

1. The road capacity is considered to generally cater for 10,000 - 15,000vpd.
2. Lighting can be provided within the verge.
3. A kerbside verge width of 1.5m has been provided to allow for space for trees.
4. Barrier kerb to be provided.
5. Bus stops shall be provided in the kerbside (parking) lane.
6. Intersections are to be controlled (signals, roundabouts) and provide appropriate pedestrian crossing facilities.
7. Priority controlled intersections will only be considered for left turns (eg Left-in/Left-out).
8. Controlled intersections (signals, roundabouts) are to be generally spaced a minimum of 400 metres apart.
9. Mid-block pedestrian crossings generally not permitted (eg refuges, marked crossings, kerb extensions etc).
10. Road reserve may need to be locally widened at intersections to allow for turn lane requirements.

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TYPE 3 - Major collector with bus service and parking



TYPICAL ROAD CROSS SECTION TYPE 3

SCALE: NTS

NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

Objectives

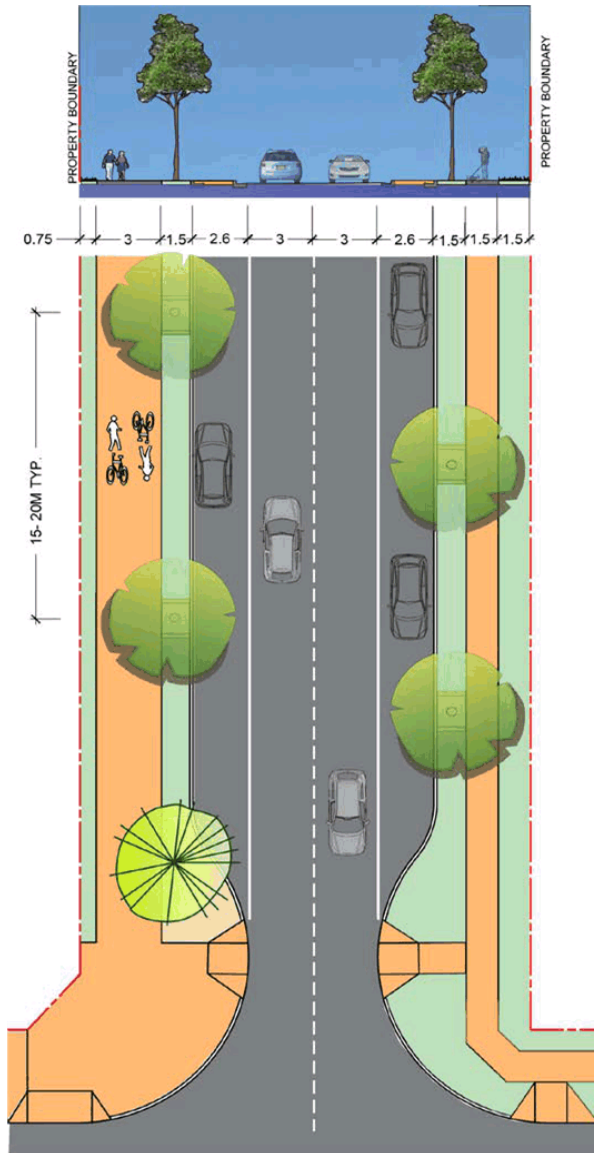
1. Provide for moderate traffic volumes with 2 travel lanes and 2 parking lanes.
2. Provide kerbside parking.
3. Allow for traffic calming and greening opportunity through provision of regular kerb extensions in parking lane.
4. Provide connectivity between neighbourhoods and local centres/higher order roads.
5. Direct access is generally not permitted (access denied) but may be considered dependent on traffic demand.
6. Provide for bus routes and bus stops.
7. Design speed 70km/h, posted speed 60km/h.
8. Provide legible pedestrian and cycle network via shared paths on both sides of road.
9. All adjoining lots must provide an active frontage to the Type 3 road (can be direct frontage or via secondary parallel internal road).

Notes

1. The road capacity is considered to generally cater for 3,000 - 15,000vpd.
2. Lighting can be provided within the verge.
3. A kerbside verge width of 1.5m has been provided to allow for space for trees.
4. Barrier kerb to be provided.
5. Bus stops shall be provided in the kerbside (parking) lane.
6. Intersections are to be generally controlled (signals, roundabouts) and provide appropriate pedestrian crossing facilities.
7. Priority controlled intersections may be considered dependant on traffic demand.
8. Controlled intersections (signals, roundabouts) are to be generally spaced a minimum of 400 metres apart.
9. Mid-block pedestrian crossings may be considered based on traffic demand and location (eg refuges, marked crossings, kerb extensions etc).
10. Road reserve may need to be locally widened at intersections to allow for turn lane requirements.

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Road Type 4 – Minor collector with parking and limited bus access



TYPICAL ROAD CROSS SECTION TYPE 4

SCALE : NTS NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

Objectives

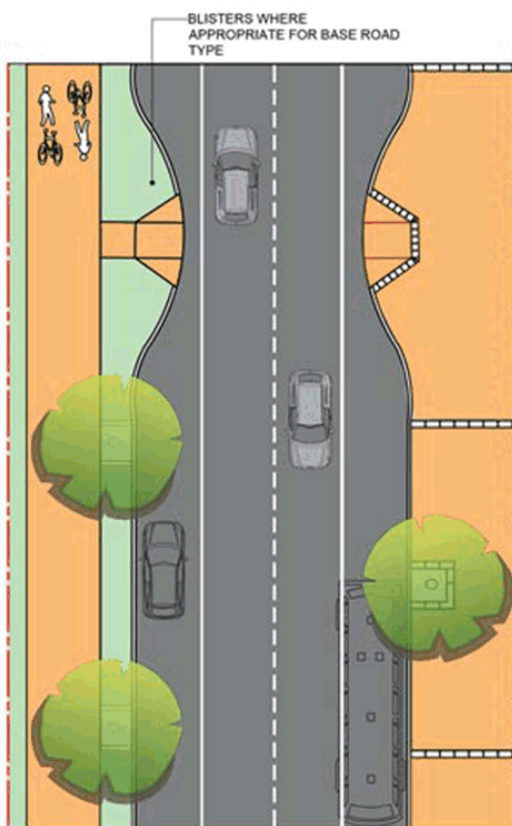
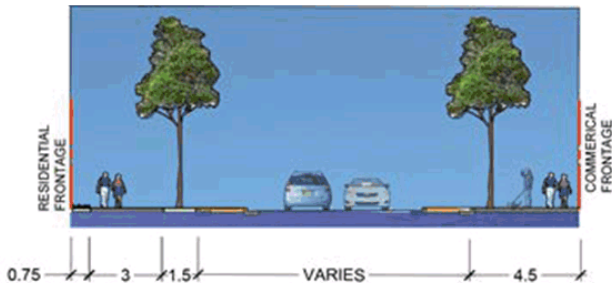
1. Provide for low to moderate traffic volumes with 2 travel lanes and 2 parking lanes.
2. Provide kerbside parking.
3. Allow for traffic calming, greening opportunity and improved pedestrian safety through provision of kerb extensions at intersections.
4. Provide connectivity between and within neighbourhoods and to local centres/higher order roads.
5. Direct access is permitted.
6. Limited provision for bus route services in certain circumstances.
7. Design speed 60km/h, posted speed 50km/h.
8. Provide legible pedestrian and cycle network via shared path on one side and footpath on other.

Notes

1. The road capacity is considered to generally cater for 3,000 - 9,000vpd.
2. Lighting can be provided within the verge.
3. A kerbside verge width of 1.5m has been provided to allow for space for trees.
4. Barrier kerb to be provided.
5. Where a bus service exists, bus stops shall be provided in the kerbside (parking) lane.
6. Intersections with higher order roads to generally be controlled (signals, roundabouts) and provide appropriate pedestrian crossing facilities.
7. Priority controlled intersections may be considered where not intersecting the same or higher order road.
8. Road segment length shall be a maximum of 200m between intersections/bends.
9. Mid-block pedestrian crossings are generally acceptable (eg refuges, marked crossings, kerb extensions etc).
10. Verge trees are to be provided at one per lot, located to avoid impacts on utilities, driveways and drainage infrastructure.
11. Road reserve may need to be locally widened at intersections to allow for turn lane requirements.

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Road Type TC – Town & Village Centre Road



TYPICAL ROAD CROSS SECTION TYPE TC

SCALE : NTS

NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

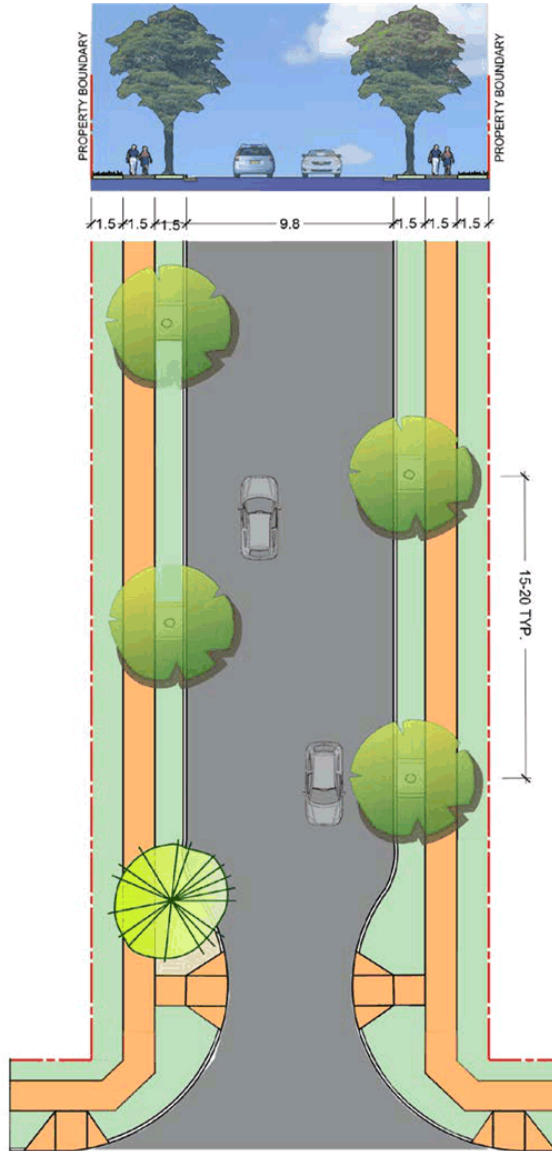
Objectives

1. Provide a variation on Road Types 2-4 specifically for town and village centre environments.
2. Provide for low to moderate traffic volumes.
3. Provide kerbside parking and bus stops.
4. Allow for traffic calming, greening opportunity and improved pedestrian safety through provision of kerb extensions mid-block &/or at intersections.
5. Provide connectivity to local centres/higher order roads.
6. Direct access may be considered on residential side (where relevant) depending on base road type and traffic demands.
7. Consolidation of access points to commercial development to maintain high level of pedestrian amenity and safety.
8. Allows for bus services.
9. Design speed generally 50km/h however road design should seek to encourage lower speeds in these high pedestrian activity areas.
10. Provide improved pedestrian/cyclist amenity through provision of full width sealed paths on commercial frontages and shared path on any residential frontage.

Notes

1. The road capacity varies depending on base road type.
2. Lighting can be provided within the verge (or median if provided).
3. A kerbside verge width of 1.5m has been provided to allow for space for trees on residential frontage.
4. Barrier kerb to be provided.
5. Verge trees to be provided within paved area on commercial frontage with tree grates and one tree per lot on residential side.
6. Planter boxes, bus shelters and street furniture will be considered for paved verge adjacent commercial development.
7. Bus stops shall be provided in the kerbside (parking) lane.
8. Intersections with higher order roads to generally be controlled (signals, roundabouts) and provide appropriate pedestrian crossing facilities.
9. Priority controlled intersections can be considered depending on base road type and traffic demands.
10. Mid-block pedestrian crossings are generally acceptable (eg refuges, marked crossings, kerb extensions etc).
11. Median treatments can be considered however base road type lane widths must still be provided.
12. Road reserve may need to be locally widened at intersections to allow for turn lane requirements.

Road Type 5 – Local Road with parking



Objectives

1. Provide for low traffic volumes, access to properties and amenity in residential areas.
2. Provide kerbside parking.
3. Allow for traffic calming, greening opportunity and improved pedestrian safety through provision of kerb extensions at intersections.
4. Provide connectivity between and within neighbourhoods.
5. Direct access is permitted.
6. Not intended to cater for bus routes.
7. Design speed 60km/h, posted speed 50km/h.
8. Provide legible pedestrian access via footpaths on both sides of road.

Notes

1. The road capacity is considered to generally cater for less than 3,000vpd.
2. Lighting can be provided within the verge.
3. A kerbside verge width of 1.5m has been provided to allow for space for trees.
4. Road segment length shall be a maximum of 200m between intersections/bends.
5. Barrier kerb to be provided.
6. Intersections will generally be priority control however small roundabouts may be used for traffic calming (eg to break up long sections of road) &/or at 4-way intersections.
7. Traffic calming measures can be used to reduce the likelihood of through-traffic use (rat running).
8. Mid-block pedestrian crossings are generally acceptable (eg refuges, marked crossings, kerb extensions etc).
9. Verge trees are to be provided at one per lot, located to avoid impacts on utilities, driveways and drainage infrastructure.
10. Shared path is required (2.5m width) if the street forms part of a dedicated off-road cycle route (eg riparian shared path route).

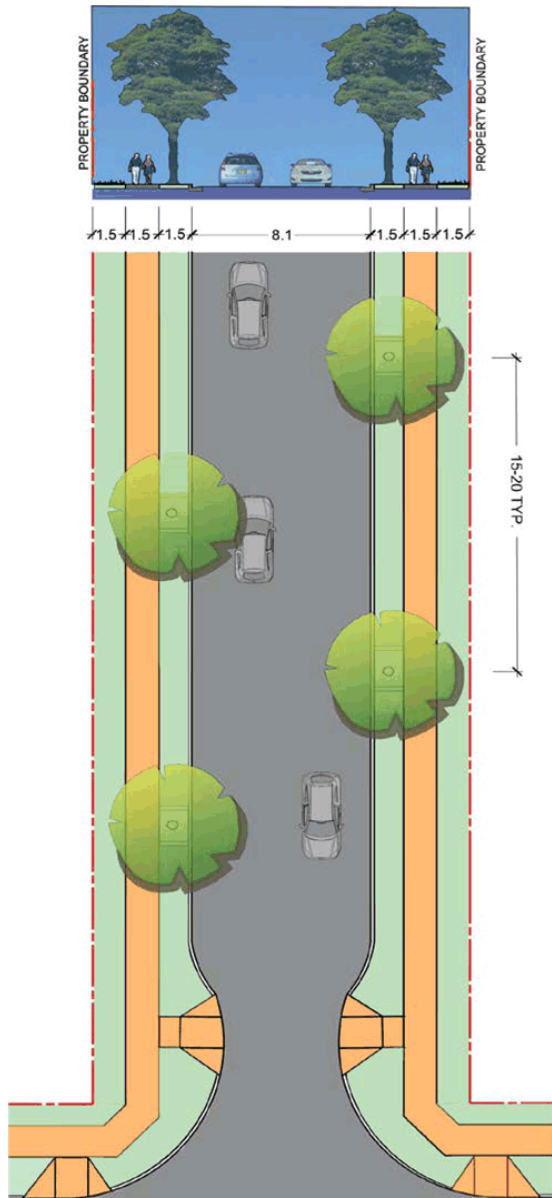
TYPICAL ROAD CROSS SECTION TYPE 5

SCALE : NTS

NOTE: ALL DIMENSIONS ARE SHOWN IN MET

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Road Type 6 – Access Street



Objectives

1. To provide access to properties and amenity in residential areas.
2. Allows for some casual on-street parking.
3. Allow for traffic calming, greening opportunity and improved pedestrian safety through provision of kerb extensions at intersections.
4. Provide connectivity within neighbourhoods/subdivisions.
5. Direct access is permitted.
6. Does not cater for buses.
7. Design speed 60km/h, posted speed 50km/h.
8. Provide legible pedestrian access via footpaths on both sides of road.

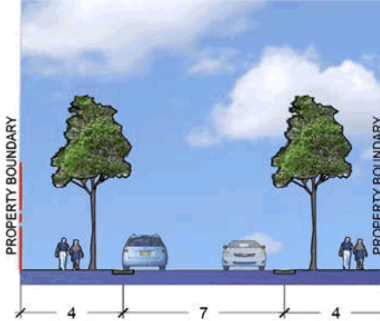
Notes

1. The road capacity is considered to generally cater for less than 1,000vpd.
2. Lighting can be provided within the verge.
3. A kerbside verge width of 1.5m has been provided to allow for space for trees.
4. Road segment length shall be a maximum of 200m between intersections/bends.
5. Barrier kerb to be provided.
6. Intersections will generally be priority control.
7. Verge trees are to be provided at one per lot, located to avoid impacts on utilities, driveways and drainage infrastructure.
8. Shared path is required (2.5m width) if the street forms part of a dedicated off-road cycle route (eg riparian shared path route).

TYPICAL ROAD CROSS SECTION TYPE 6

SCALE : NTS NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

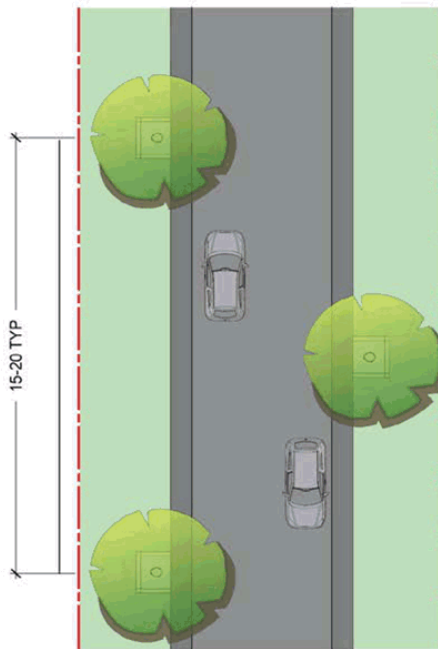
Road Type 7 – Access Place



Objectives

1. Provide for access to small sections of properties & high pedestrian/cyclist amenity in residential areas – no through traffic.
2. Allows for some casual on-street parking.
3. Direct access is permitted.
4. Does not cater for buses.
5. Urban default speed limit of 50km/h applies, however lower speeds maintained through geometry/design.

Notes



1. The road capacity is considered to generally cater for up to 300vpd (ie approx. 30 properties).
2. Lot layout shall be designed to ensure staggered on-street parking in order to present a clear travel lane with passing opportunities.
3. Provides dish drains rather than barrier kerb to increase pedestrian amenity.
4. Road segment length shall be a maximum of 100 metres.
5. Lighting can be provided within the verge.
6. Verge trees are to be provided at one per lot, located to avoid impacts on utilities, driveways and drainage infrastructure.
7. This road type does not provide kerb and gutter for builders to connect stormwater into. The applicant will need to provide a piped stormwater connection point within each lot (eg stub, or pit) draining to the receiving stormwater system.
8. The final method of stormwater collection (ie dish drain, swale, etc) is subject to Council approval.
9. Concrete footpath (1.5m width) is required if the street forms part of a dedicated pedestrian route.
10. Shared path is required (2.5m width) if the street forms part of a dedicated off-road cycle route (eg riparian shared path route).

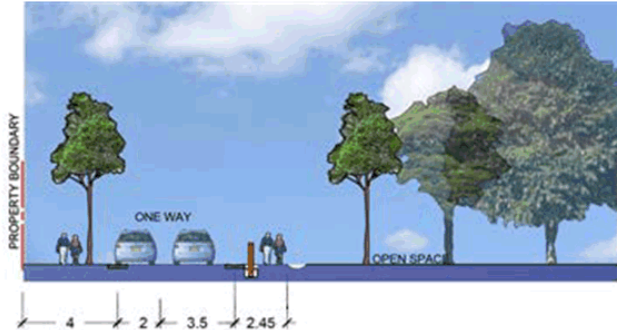
TYPICAL ROAD CROSS SECTION TYPE 7

SCALE : NTS

NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

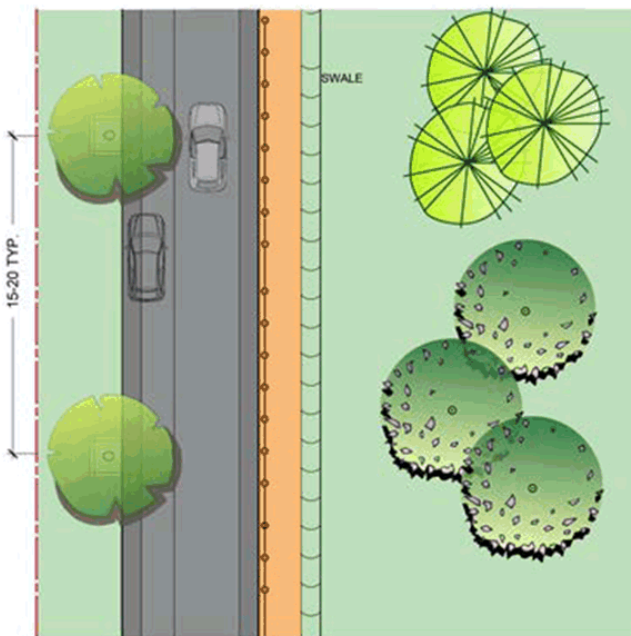
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Road Type 7A – Access Place adjacent to open space (one-way traffic)



Objectives

1. Provide for access to small sections of properties & high pedestrian/cyclist amenity in residential areas – no through traffic.
2. Provide for informal access to open space, whilst not generating any more than 300vpd.
3. Allows for some casual on-street parking.
4. Direct access is permitted.
5. Does not cater for buses.
6. Urban default speed limit of 50km/h applies, however lower speeds maintained through geometry/design.



Notes

1. This road is one-way and only permitted adjacent to open space and excludes sporting fields.
2. The road capacity is considered to generally cater for up to 300vpd (ie up to approx. 30 properties) and must include any anticipated traffic from open space component.
3. Provides dish drains rather than barrier kerb to increase pedestrian amenity.
4. Road segment length shall be a maximum of 100 metres.
5. Lighting can be provided within the verge.
6. Verge trees are to be provided at one per lot, located to avoid impacts on utilities, driveways and drainage infrastructure.
7. This road type does not provide kerb and gutter for builders to connect stormwater into. The applicant will need to provide a piped stormwater connection point within each lot (eg stub, or pit) draining to the receiving stormwater system.
8. The final method of stormwater collection (ie dish drain, swale, etc) is subject to Council approval.
9. Verge tree planting on open space side is not required – these requirements will be dealt with separately to the road section.
10. Shared path is required (2.5m width) if the street forms part of a dedicated off-road cycle route (eg riparian shared path route).

TYPICAL ROAD CROSS SECTION TYPE 7A

SCALE : NTS

NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

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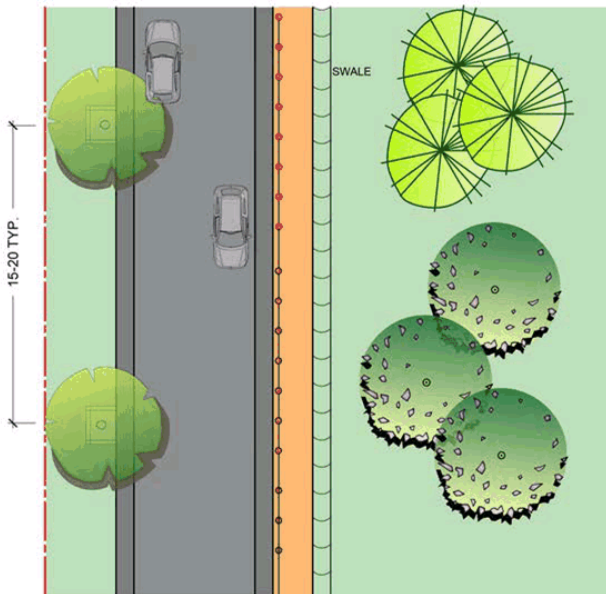
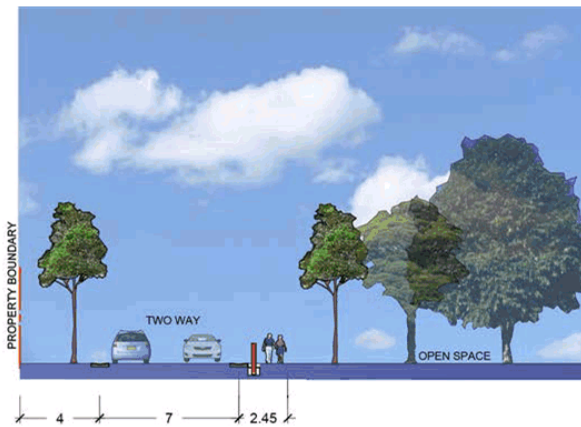
Road Type 7B – Access Place adjacent to open space (two-way traffic)

Objectives

1. Provide for access to small sections of properties & high pedestrian/cyclist amenity in residential areas – no through traffic.
2. Provide for informal access to open space with improved parking opportunity, whilst not generating any more than 300vpd.
3. Allows for some casual on-street parking.
4. Direct access is permitted.
5. Does not cater for buses.
6. Urban default speed limit of 50km/h applies, however lower speeds maintained through geometry/design.

Notes

1. This road is two-way and only permitted adjacent to open space and excludes sporting fields.
2. The road capacity is considered to generally cater for up to 300vpd (ie up to approx. 30 properties) and must include any anticipated traffic from open space component.
3. Road segment length shall be a maximum of 100 metres.
4. Provides dish drains rather than barrier kerb to increase pedestrian amenity.
5. Lighting can be provided within the verge.
6. Verge trees are to be provided at one per lot, located to avoid impacts on utilities, driveways and drainage infrastructure.
7. This road type does not provide kerb and gutter for builders to connect stormwater into. The applicant will need to provide a piped stormwater connection point within each lot (eg stub, or pit) draining to the receiving stormwater system.
8. The final method of stormwater collection (ie dish drain, swale, etc) is subject to Council approval.
9. Verge tree planting on open space side is not required – these requirements will be dealt with separately to the road section.
10. Shared path is required (2.5m width) if the street forms part of a dedicated off-road cycle route (eg riparian shared path route).



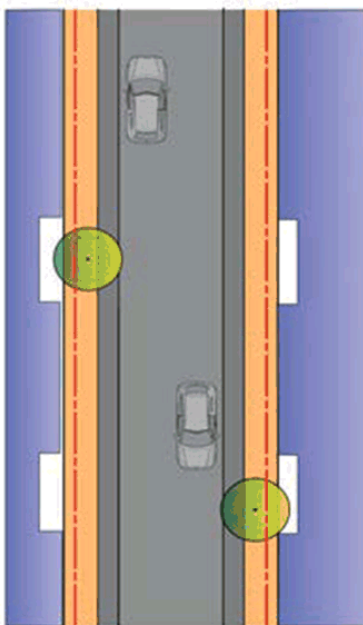
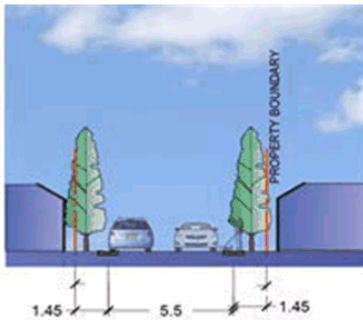
TYPICAL ROAD CROSS SECTION TYPE 7B

SCALE : NTS

NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

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Road Type 8 – Laneway



TYPICAL ROAD CROSS SECTION TYPE 8

SCALE: NTS
NOTE: ALL DIMENSIONS ARE SHOWN IN METRES

Objectives

1. Provide vehicular access to the rear or side of lots where front access is restricted or not possible.
2. To maximise on-street parking and landscaping in residential street frontages.
3. Provide housing density, diversity and affordable housing options.
4. Reduce vehicular conflict through reduced driveway cross overs on the main road frontage.
5. To create a slow speed zone that is distinctly different in character and materials to residential streets.
6. Urban default speed limit of 50km/h applies, however lower speeds maintained through geometry/design.
7. Does not cater for buses.
8. Verge design allows space for pedestrians, garbage bins, planting and lighting, whilst not encouraging casual parking, storage of boats/trailers etc.
9. All lots adjoining a laneway are to utilise the laneway for vehicular/garage access.

Notes

1. The lane capacity is considered to generally cater for up to 300vpd (ie up to approx. 30 properties).
2. "C" shaped laneways are to be avoided as they do not provide good sightlines for passive surveillance.
3. Lighting can be provided within the verge.
4. No raised kerb is to be provided in laneways to increase pedestrian amenity.
5. Verge trees of appropriate species are to be provided within the verge area (tree grates may be utilised).
6. This road type does not provide kerb and gutter for builders to connect stormwater into. The applicant will need to provide a piped stormwater connection point within each lot (eg stub, or pit) draining to the receiving stormwater system.
7. Any bends or intersections in the laneway must be designed to permit garbage truck movements.
8. Passive surveillance along the laneway from upper storey rooms or balconies of secondary dwellings, studios, lofts over garages &/or principle dwelling is encouraged.
9. The intersection of laneways with other roads should not be designed as a typical street intersection with kerb returns, but instead as a driveway entrance (ie vehicle crossover). Any footpath or shared path along the main road frontage is to be continued across the laneway intersection.

13.3 Road and drainage construction

Objective

- (a) To ensure all residential lots have suitable, safe and efficient access to and from public roads and that all road and stormwater drainage infrastructure works are properly constructed.

Development Controls

1. All allotments in a subdivision must gain direct access to / from a properly formed public road.
2. The full cost of the construction of new roads (including the construction of the road carriageway, footpaths and / or shared paths, full kerb and gutter, street tree planting etc), stormwater drainage and the provision of infrastructure services to a subdivision will be borne by the subdivider / developer.
3. The required road, stormwater drainage and infrastructure works shall be constructed in accordance with Council's Subdivision Policy and any necessary requirements by the infrastructure service authority. The roadworks, drainage works and infrastructure services shall be completed, prior to the issuing of a Subdivision Certificate. For approved staged subdivisions, all required road, drainage and infrastructure works must be completed for each stage prior to the issue of the Subdivision Certificate for each respective stage.

13.4 Upgrading poorly constructed or unformed roads

Objective

- (a) To ensure all residential lots have suitable, safe and efficient access to and from public roads and that all road and stormwater drainage infrastructure works are properly constructed.

Development Controls

1. All allotments in a subdivision must gain direct access to / from a properly formed public road.
2. In areas where the subdivision fronts a poorly constructed or unformed public road, the subdivision will be subject to the construction of full kerb and gutter, stormwater drainage, full or half road construction and sealing in addition to the provision of nature strips with a 3% cross fall to the roadway. The final decision as to the level of construction required will be at the discretion of Council.

13.5 Half-road construction

Objective

- (a) To ensure half road construction is undertaken to effectively and safely meet the needs of road users both in the interim (half road) and final (full road) scenario.

Development Controls

1. Where a subdivision fronts an existing road and requires a road upgrade, it is the developer's responsibility to design and construct the half-road with the associated pedestrian / shared path facilities, adjacent to the subject property. The road and path widths are determined by the road type.
2. Roads with an existing frontage that require half-road construction require a minimum 3m existing travelling lane from the new crown of the road.
3. The construction of the half road requires overlapping of longitudinal joints and may require additional pavement construction of an existing road.

13.6 Bus Routes and public transport

Objectives

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- (a) Encourage bus services to link existing urban areas (especially business centres) with new residential subdivisions within new release areas.
- (b) Ensure residential subdivisions within new release areas are designed to ensure safe, convenient and efficient bus routes within reasonable walking distance to the majority of residential lots in a subdivision.
- (c) Provide safe and convenient bus stops along the planned bus route.

Development Controls

1. Large residential subdivisions should be designed to make provision for a bus service to link existing urban areas with the new residential subdivisions. The bus route should be designed to provide adequate servicing by bus companies. Therefore, consultation should take place with the local bus companies and Transport for NSW to determine whether a bus service can be provided within or connecting to the new residential subdivision.
2. The design of roads and infrastructure to support bus servicing should be in accordance with relevant Australian Standards, AUSTRROADS guidelines and *'Guidelines for Public Transport Capable Infrastructure in Greenfield Sites'* (Transport for NSW).
3. The bus route should be generally designed along collector roads and linked up to sub-arterial or arterial roads, due to the requirement for wider road carriageways.
4. Bus stops should be generally located within 400 metres walking distance for 90% of the lots in the immediate locality.
5. Bus stop locations should be located to maximize active transport accessibility via footpath and shared path networks.
6. Any proposed roundabout on a bus route must be designed to satisfactorily accommodate bus maneuvering through and around the roundabout.
7. Bus shelters are to be provided at all bus stops. Bus shelters are to be located in positions that will service the maximum number of dwellings. The approved bus shelters are to be installed during the subdivision construction stage by the property developer involved in the subdivision.
8. Bus stops should be easily accessible for all people (including people with a disability), well defined and within casual observation from nearby dwellings, whilst minimising any interference with the streetscape amenity of the locality. All pedestrian pathways leading to and from bus stops should be designed to have a maximum gradient of 1 in 14 and be in compliance with relevant AUSTRROADS guidelines and Australian Standards.
9. Safe pedestrian crossing points should be provided at each bus stop by the introduction of non-raised pedestrian thresholds and refuges and in accordance with the requirements of Council. For collector/arterial roads safe pedestrian crossing should be provided by locating stops near controlled crossing points (traffic signals, roundabouts).

13.7 Cul-de-sacs and turning heads

Objectives

- (a) Restrict the length of cul-de-sacs within a residential subdivision to improve accessibility to public transport facilities such as bus stops and provide more direct vehicular access arrangements for emergency vehicles.
- (b) Ensure cul-de-sacs and turning heads are designed to provide safe and efficient vehicular access for cars, waste collection and recycling trucks, removalist trucks, emergency vehicles etc.
- (c) Ensure all new residential lots are capable of being either accessed or serviced by emergency vehicles and other non-passenger vehicles such as waste and recycling collection trucks and removalist trucks, without adversely affecting the performance or safety of the surrounding road network.
- (d) Restrict "T" or "Y" turning heads to smaller cul-de-sacs which serve a limited number of residential lots within a subdivision.

Development Controls

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1. The maximum length of any cul-de-sac should be 80 metres, in order to ensure adequate accessibility to public transport facilities such as bus stops as well as suitable access arrangements for emergency service vehicles and waste disposal vehicles.
2. The minimum kerb radius for the turning head of any small residential cul-de-sac (ie serving a maximum 30 dwellings / allotments) shall be 10.5 metres.
3. “T” or “Y” turning heads will only be permitted within small cul-de-sacs / access roads which serve up to a maximum of 10 lots / dwellings. In most cases, a “Y” turning head configuration is preferred, in order to discourage potential parking in the turning space. Turning heads must provide sufficient space for larger vehicles such as waste, emergency services and recycling collection trucks to make a three point turn.
4. Where a “T” or “Y” turning head is proposed, a suitable waste and recycling bin storage area(s) must be carefully positioned on the left hand side (forward direction of the truck). The bin storage area(s) must not be located any closer than 5 metres from the forward end and 8 metres from the reverse end of the “T” or “Y” turning head. This is to ensure that waste and recycling collection trucks are able to satisfactorily service the bin storage areas.

13.8 Roundabouts and road junctions

Objective

- (a) Ensure all roundabouts and road junctions are safe, designed in accordance with traffic engineering best practice and appropriately spaced to help define residential areas.

Development Controls

1. Roundabouts and other road junctions are to be designed in accordance with the requirements of the relevant AUSTRROADS and RMS guidelines and Australian Standards. Roundabouts must also be designed to provide for safe passage of pedestrians and cyclists.
2. The design and construction of a roundabout upon an existing or proposed public road will be subject to the separate approval of Council’s Infrastructure Division. As part of this consideration, Council’s Infrastructure Division will also consider the whole of life assets cost of the roundabout and determine whether landscaping or hard finishings to the centre island of the roundabout is required.
3. The minimum distance between an access road and a collector road shall be 60 metres where the junction is on the same side of the road or 40 metres where the junction is located on the opposite side of the road.
4. The minimum distance between collector roads shall be 120 metres if the junction is on the same side or 100 metres where the junction is staggered on the opposite side of the road.
5. All intersections are to be T-junctions or roundabouts (ie subject to Council’s agreement as to the location and design of any proposed roundabout).

13.9 Traffic control measures

Objectives

- (a) Provide appropriate traffic calming devices, in order to improve traffic management flow within large residential subdivisions.
- (b) Provide appropriate traffic control devices and signs within residential subdivisions, in order to ensure traffic safety.

Development Controls

1. Traffic calming devices such as thresholds, slow points, speed humps, chicanes and splitter islands are to be designed in accordance with the requirements of relevant AUSTRROADS and RMS guidelines and Australian Standards. Any proposed traffic calming devices will require the approval by Council’s Local Traffic Committee.

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2. Traffic control signs, pavement markings and guideposts are to be provided for roads, intersections, pedestrian / cycle paths in accordance with the relevant AUSTRROADS and RMS guidelines and Australian Standards.

Location of Traffic Calming Devices

1. The location of traffic calming devices must be consistent with the streetscape requirements of the locality and must also be based upon the location of existing and / or proposed street lighting, drainage pits, driveway crossings, on-street car parking requirements and the location of utility services.

Traffic Calming Devices – Design Vehicles

1. Any proposed traffic calming device must be designed to enable emergency vehicles and garbage trucks to reach all properties from the road.
2. Traffic calming devices upon local roads with a feeding function between arterial or sub-arterial roads and access streets are to be designed in accordance with a 14.5 metre long rigid truck / bus as per AUSTRROADS Guide to Traffic Engineering Practice (Drawing No.SD037).
3. Raised platform threshold treatments are not permitted where such treatments may be used as pedestrian crossings by pedestrians.

Design Speed Controls

1. Roads are to be designed to assist manage vehicular speed. This can be achieved by:
 - creating a visual environment conducive to lower speeds through using landscaping treatments and other traffic calming devices to segment streets into relatively short road lengths (ie generally less than 300 metres long).
 - Using traffic calming devices which shift vehicle travel paths laterally (eg slow points, roundabouts, corner treatments) or vertically through humps, platform intersections etc).

Sight Distance Requirements

1. Any proposed traffic calming device must be designed to cater for critical sight distances for the design operating speed of the subject road.
2. Speed control devices (such as narrowed threshold treatments) should be located in close proximity to existing or proposed street lighting. Any such traffic calming measures must incorporate appropriate reflective treatments to delineate the vehicular travel path.

Streetscape Requirements for Traffic Calming Devices

1. The new road features to be considered in the design of traffic calming devices include the following:
 - (a) Improve the landscape character of the locality;
 - (b) Reduce the linearity of roads by segmentation;
 - (c) Avoid continuous long straight lines (kerb lines) for local roads; and
 - (d) Maximise the continuity between existing and new landscape areas.

13.10 Splay corners

Objective

- (a) Provide appropriate splay corners at intersections within residential subdivisions, to ensure adequate sight line distances.

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Development Controls

1. All intersections in a subdivision shall be provided with a minimum 4.25 metre splay or as required by Council's Infrastructure Division.

13.11 Street lighting and fire hydrants

Objectives

- (a) Provide effective street lighting along all roads within the subdivision, to maximise vehicular and pedestrian safety.
- (b) Provide appropriate street lighting at key intersections and pedestrian crossings as well as traffic calming device locations to maximise vehicular and pedestrian safety.
- (c) Provide appropriate lighting along all pedestrian pathways and / or shared pathways / cycle ways, in order to maximise pedestrian and cyclist safety.
- (d) Provide fire hydrants within close proximity to all residential lots in a subdivision in accordance with the relevant Australian Standard and the requirements of Sydney Water Corporation and Fire and Rescue NSW.

Development Controls

1. Electric street lighting systems are to be provided for roads and intersections as well as pedestrian crossing and traffic calming device locations in accordance with AS / NZS 1158 Road Lighting as indicated in the following Table 3.
2. All allotments created must be within 60 metres to a fire hydrant in accordance with Australian Standard AS 2419. The proposed location of fire hydrants shall be shown on the subdivision plan.

Table 3: Road type - street lighting requirements

Road Type	Street Lighting Category (AS 1158)
Arterial Roads	V4
Collector Road (>7000 vehicles / day)	P3
Collector Road (<7000 vehicles / day)	P4
Access Road in Business Areas	P3
Access Road	P4
Laneway	P5
Public Pathways & Cycleways	P4
Car parks	P11
Traffic Calming Device (including roundabout)	Horizontal illuminance min. of 3.5 lux
Pedestrian Refuge	Horizontal illuminance min. of 3.5 lux

Note: Category of illumination is defined in AS 1158 Part 1.1 and Part 3.1. All lighting designs are to be prepared in accordance with AS / NZS 1158 for the above specified categories.

13.12 Restricted access to collector or arterial roads

Objectives

- (a) Restrict access to any arterial or sub-arterial road to maintain satisfactory traffic flows and safety along such roads. Design for alternative public road access for lots in subdivisions (see diagrams below for examples).

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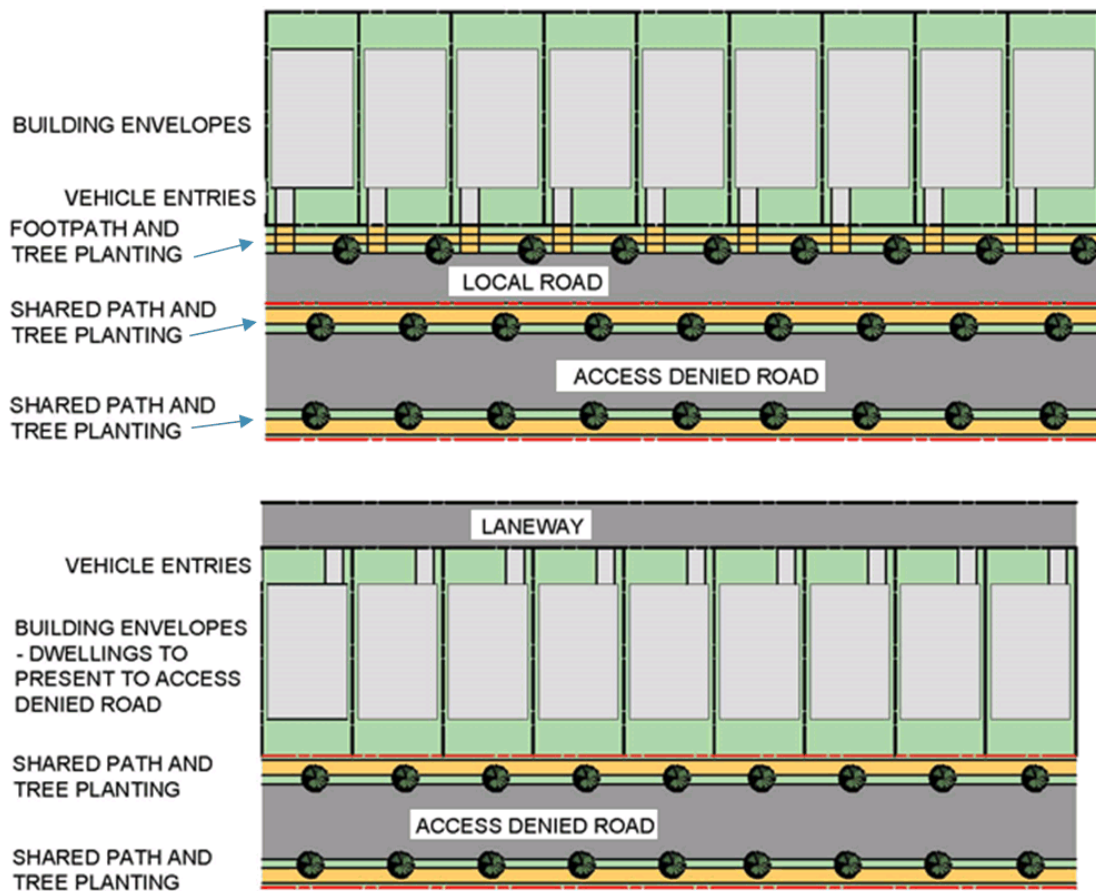
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- (b) When deemed necessary, create legal restrictions prohibiting direct access to designated roads (Collector or Arterial Roads).
- (c) Create temporary access agreements for designated roads (Collector or Arterial Roads).

Development Controls

1. Direct access to any arterial or sub-arterial road will not be permitted where alternate public road access is available. However, direct property access to / from an arterial or sub-arterial road will not be restricted until such time as alternate public road access is available.
2. Subdivision shall be designed to provide alternative public road access in cases where lot access to the arterial or sub-arterial roads is restricted.
3. Council may require as a condition of consent as part of any subdivision or development that a suitable restriction on the use of land be created pursuant to the provisions of Section 88B of the Conveyancing Act 1919, in order to legally prohibit direct access to / from any adjoining Arterial or Sub-Arterial Road where alternative direct public road access is available to / from the subject site.
4. Temporary access may be granted to a designated road (arterial or sub-arterial road) where alternate public access has not yet been completed. However, this temporary access arrangement will be dependent upon the nature of the access arrangement in relation to the arterial or sub-arterial road. Additionally, the formal concurrence of the NSW Roads and Maritime Services may be required.

Examples of alternative solutions to lot layouts around restricted access roads.



14 BUSHFIRE PROTECTION

Objectives

- (a) Proposed residential subdivisions designed to minimise the potential bush fire hazard risk to prevent future loss of, and damage to life, property and the environment due to bushfires.
- (b) Residential subdivision designed to minimise the siting of future dwellings away from ridge tops and other steeply sloping land, especially upslope lands, within saddles or narrow ridge crests.
- (c) Proposed residential subdivisions designed to provide an efficient and safe road network which minimises potential bottle-necks.
- (d) Minimise the impact of fire protection measures on vegetation, fauna, views, watercourses and soil erosion, amenity and safe access.
- (e) Ensure each residential subdivision upon bush fire prone land is designed to provide satisfactory asset protection zones (APZ) between areas of potential hazard and development.

Development Controls

1. New residential subdivisions in bush fire hazard prone lands will generally require a perimeter road system to assist in providing space and access to fire fighting vehicles. Council will refer to NSW Rural Fire Service regarding compliance with specifications and requirements.
2. Any proposed residential subdivision upon land classified as bush fire prone land is an Integrated Development Application under the *Environmental Planning and Assessment Act 1979*. As such, formal concurrence is required from the NSW Rural Fire Service, pursuant to section 100B of the *Rural Fires Act 1997*.
3. Any Integrated Development Application for residential subdivision upon bush fire prone land will be subject to compliance with the requirements of NSW Rural Fire Service publication "*Planning for Bush Fire Protection*". The application must be accompanied by a bush fire assessment report. The bush fire assessment report must be prepared by a suitably qualified and experienced bush fire consultant and must provide a comprehensive assessment as to how the proposed development complies with the relevant specifications and requirements.

The Statement of Environmental Effects (SEE) should specifically address the findings and conclusions of the bush fire assessment report to ensure compliance with the "*Planning for Bush Fire Protection*". The findings and conclusions of the bush fire assessment report should also be reflected in the design of the proposed subdivision. Council will refer this information to NSW Rural Fire Service for assessment advice.

15 STORMWATER DRAINAGE

Objectives

- (a) Minimise stormwater drainage run-off impacts upon downstream properties.
- (b) Limit post development discharges to pre-development levels.
- (c) Provide a sustainable stormwater drainage and water quality environment incorporating both natural and man-made landscape features and which is aesthetically pleasing.
- (d) To encourage water sensitive urban design initiatives for larger residential subdivisions, in order to maintain or enhance the water quality in watercourses.

Development Controls

1. A detailed stormwater drainage concept plan together with calculations is required to be submitted with the Development Application.
2. The proposed stormwater drainage system for the subdivision shall be designed in accordance with the requirements of the Stormwater Management & Water Sensitive Urban Design chapters in Part E of the DCP.
3. For subdivisions involving 20 or more allotments, the proposed stormwater drainage system must

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incorporate water sensitive urban design techniques, wherever possible, in order to minimise runoff and restrict discharge from the site. This may be achieved by using grass swale drains, bio-filtration, bio-retention basins, detention ponds, reuse systems and retention of natural watercourses including wetlands and pool and riffle zones etc. Other stormwater quality improvement measures such as artificial wetlands, sedimentation basins and gross pollutant traps or trash racks may also be provided to facilitate the removal of sediment and other pollutants.

4. Where water sensitive urban design features (eg grass swales, bio-filtration measures, water quality detention ponds or basins etc) are proposed to be ultimately handed over to Council, upfront consultation is required to be held with Council prior to the lodgment of any subdivision application. This will ensure that appropriate design parameters, minimum performance requirements, monitoring and maintenance regimes are agreed upon between Council and the subdivider for each relevant WSUD treatment measure upfront. In the event that no agreement is reached upfront, Council is unlikely to accept the handover of any such assets.
5. All stormwater drainage systems are to be designed considering 'living waterways' as places for people. Some protections may be needed to prevent access to any highly hazardous features of drainage and water quality facilities.
6. The discharge of stormwater runoff must be restricted into a lawful point of discharge such as a natural watercourse or waterway to which the development site naturally drains or existing stormwater drainage systems as agreed to by Council.
7. Where there is no existing lawful point of discharge, the applicant must:
 - (a) Dedicate the discharge point to Council's connecting reserves or easements that provide legal continuity from the site to an off-site legal point of discharge into a natural watercourse or waterway or suitable public stormwater drainage system and
 - (b) Construct the necessary connecting drainage works.
8. For sites sloping away from public roads or watercourses, written documentary evidence must be provided from downstream property owners which confirms their agreement for stormwater drainage pipes and associated creation of necessary easements through their properties, in order to guarantee that satisfactory arrangements have been made for stormwater drainage from the site.
9. The provision of inter-allotment drainage is required where drainage pipelines convey stormwater from private residential lots across other adjoining residential lots (ie not draining directly to a public road). The creation of 1.5 metre wide inter-allotment drainage easements will be required as part of the subdivision. The inter-allotment drainage easements shall not be vested in Council.
10. Where it is necessary to connect into Council's existing stormwater drainage system, the capacity of the existing stormwater drainage system is to be checked to ensure its capacity of accepting the additional developed run-off from this development. Costs associated with any necessary upgrading or drainage is to be borne by the developer and work is to be undertaken in accordance with Council's Subdivision Policy and Part E Stormwater Management chapter to this DCP.

16 RIPARIAN LAND MANAGEMENT

Objectives

- (a) Protect urban creeks and riparian corridors and their native ecology from further degradation and improve their environmental function.
- (b) Maintain or enhance the stability of the bed and banks of a watercourse.
- (c) Minimize 'edge effects' at the riparian corridor / urban interface by the provision of a suitable riparian corridor width and create borders with perimeter road systems and pedestrian/cycle paths.
- (d) To ensure riparian land management measures are compatible with floodplain risk management objectives.

Development Controls

1. Any proposed residential subdivision involving waterfront land on, in or within 40 metres of the top of bank of a river, creek or intermittent watercourse, lake or estuary will be subject to compliance

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with the requirements of Chapter E23 Riparian Corridor Management in this DCP.

2. Any riparian land within a subdivision will be subject to a Vegetation Management Plan (VMP) to assist in establishing an ongoing management process. This VMP will include ownership, maintenance and management arrangements.

17 SERVICING ARRANGEMENTS

Objectives

- (a) To ensure the provision of infrastructure servicing / utilities is carried out in accordance with the requirements of Council and the relevant infrastructure servicing authority.
- (b) To maximise the opportunities for shared (common) trenching and to reduce constraints on landscaping within road reserve verges.

Development Controls

1. It is recommended applicants consult with servicing authorities at an early stage in the planning process to ensure that all allotments can be appropriately serviced by reticulated water and sewerage and electricity supplies as different servicing needs may require subdivision lot/layout design responses.
2. Shared common trenches for service infrastructure to be underground are preferred in order to also enable the planting of trees and other landscaping within the road verges.
3. In the event that the subdivision cannot be adequately serviced by reticulated water and sewerage supplies, then Council is unlikely to support any such application.
4. Where a subdivision is approved, a condition of consent will be imposed requiring the submission of a Notice of Requirements from Sydney Water Corporation to Council prior to the release of the Construction Certificate for the proposed subdivision. Additionally, a separate condition of consent will be imposed requiring the submission of a Section 73 certificate from Sydney Water Corporation which confirms that satisfactory arrangements have been made for reticulated water and sewerage infrastructure to the subdivision and the original Section 73 Certificate lodged with the Subdivision Certificate application.
5. Electricity distribution must be underground in all new residential subdivisions. Accordingly, the subdivision plan should provide details of the location of any required electricity sub-stations.
6. Telecommunication services are to be provided to all proposed lots. The submission of documentary evidence from a telecommunications carrier will be required for any approved subdivision, prior to the release of the Subdivision Certificate.
7. All allotments must be designed to enable the suitable provision for waste facilities. In cul-de-sacs, the head of the cul-de-sac must be designed to provide sufficient road reserve width (footpath area), in order to enable the storage of garbage and recycling bins without hindering access to adjacent properties.
8. Battle axe allotments shall be designed to include sufficient area within the existing public road reserve verge to cater for the provision of garbage and recycling bins. Alternatively, a garbage and recycling bin storage area may be provided within close proximity to the adjoining public road, but will be subject to private waste servicing arrangements being made by the property owner in the event that Council's waste contractor is not able to service the bin storage area.
9. Applicants are encouraged to liaise with Council's Waste Services Section of the City Works Division, in order to guarantee satisfactory waste service arrangements and to minimise potential future problems arising from poorly designed waste and recycling storage facilities.

18 ROAD ADDRESSING

Objectives

- (a) To ensure that addressing of property is undertaken in a consistent approach across NSW.
- (b) To ensure logical and unique identification of property.

Part B – Land Use Based Planning Controls

Chapter B2: Residential Subdivision

- (c) Provide improved clarity and direction for emergency services and the community.
- (d) Addressing to reflect longstanding address identification to minimise confusion and reduce disruption to the local community.

Development Controls

1. Lot numbering (assignment of address numbers) and road naming is to be undertaken in accordance with the Geographical Names Board - NSW Addressing User Manual.
2. Council has a responsibility to clearly identify public roads in accordance with the Roads Act 1993, and in the interests of public information and safety.
3. Where new roads exist the developer is to apply for a road naming application for the names of new road(s), together with the reasons for the names proposed, should be submitted in accordance with Council's Road Naming Policy for Council's consideration.
4. Where no suggestions are received for the naming of roads, Council will determine the street names.
5. New street name signs are to be paid for and installed by developers.
6. As part of the road naming procedures under the Roads Act 1993, Council will forward the proposed road names in a subdivision to the Geographical Names Board for the Board's appropriate comment. In cases where the Geographic Names Board does not support the proposed road naming, Council will request alternative road names and in certain cases will liaise with the applicant.
7. For any classified roads, the NSW Roads and Maritime Services will determine the road name in consultation with the Geographic Names Board.
8. Upon receipt of development consent Council can assign address numbers. Addressing for lots will be provided from Council according to Councils Property addressing policy, prior to the issue of a construction certificate.
9. Poor or inadequate house numbering (or even no numbering at all) can seriously hamper emergency services in the performance of their duties. Street / property numbering shall be clearly and permanently displayed at the primary frontage of each lot.

19 SUBDIVISION HANDOVER

Objectives

- (a) Ensure that local Council assets are handed over to Council in a satisfactory condition and reflecting the assets intended design purpose.
- (b) To ensure the community can suitably utilise the asset to be handed over in a safe and practical manner.
- (c) To provide clear requirements, procedures and guidelines relating to the handover process.
- (d) Provide information and documentation that ensure the longevity and design life of any Council asset.

Development Controls

1. Records are to be kept of the dimensions, length, square meterage and associated costs of constructed roadworks, landscaping and other civil assets intended to be dedicated as public infrastructure. CCTV is required of all pipelines to be dedicated to Council at practical completion of the development and again prior to handover of the asset.
2. Road pavement details, including survey of each layer, material used, during road construction, is to be documented. Additional geotechnical engineering testing results including pavement density and Benkelman beam results must be provided.
3. Operations and maintenance manuals for assets are to be prepared and handed over to Council. These manuals must include but not be limited to proposed type and frequency of establishment and maintenance intervention requirements. Maintenance requirements must cover civil assets

Part B – Land Use Based Planning Controls

Chapter B2: Residential Subdivision

(including and not limited to gross pollutant traps, detention basins, water sensitive urban design assets), landscape assets (including and not limited to street trees, reserves, parks, playgrounds), and riparian areas (such as creeks, bushland), and areas covered by vegetation management plans.

4. Risk assessment of carrying out maintenance of constructed roadworks, landscaping and other civil assets to be dedicated as public infrastructure is to be undertaken. Appropriate traffic control plans (prepared in accordance with RMS Guidelines) will need to be submitted for approval where maintenance work takes place in a proposed road reserve.
5. All relevant reports / documentation (e.g. surveillance reports, emergency management plans etc.) associated with any detention storage basin/s, as required by the NSW Dam Safety Committee (DSC) are to be provided, including documentary evidence confirming approval of this reporting/documentation by the DSC.
6. A final inspection is required at the conclusion of the defects liability period outlined in the development consent, for each component/asset to be handed over to Council. This meeting will be undertaken with relevant Council staff to ensure that the assets are in a satisfactory condition for handover to Council. The inspection is a review of works that have received practical completion against the approved drawings/development consent after the defects liability period has ended.

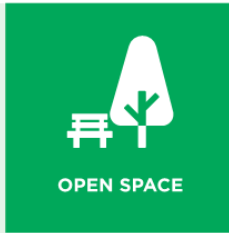
WEST DAPTO OPEN SPACE DESIGN MANUAL



Document Revision Status

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1.0 Project Description

1.1 Introduction

The manual provides design guidance to promote design innovation, excellence as well as to ensure that proposed developments adhere to and facilitate the delivery of the West Dapto Vision, and Council's open space requirements.

This manual outlines the open space requirements and Design Standards to be achieved in the lodgement of all plans for subdivision applications in The West Dapto Urban Release Area and surrounding suburbs.

1.2 Objectives of Design Manual

- To set design objectives and requirements for open space in the West Dapto Urban Release Area.
- To be utilised by both external and internal stakeholders as well as professionals involved with the development, planning and design of open space within the West Dapto Urban Release Area and surrounding suburbs.

1.3 Policy Location

The manual should be read in conjunction with (but not limited to) the following development controls and Strategic Plans:

- Wollongong City Council West Dapto Vision 2018;
- Wollongong City Council DCP 2009 -
 - Chapter D16: *West Dapto Urban Release Area*;
 - Chapter B2: *Residential Subdivisions*;
 - Chapter E2: *Crime Prevention Through Environmental Design*;
 - Chapter E6: *Landscaping*;
 - Chapter E10: *Aboriginal Heritage*;
 - Chapter E11: *Heritage Conservation*;
 - Chapter E13: *Floodplain Management*;
 - Chapter E14: *Stormwater Management*;

- Chapter E15: *Water Sensitive Urban Design*;
- Chapter E17: *Preservation and Management of Trees and Vegetation*;
- Chapter E23: *Riparian Land Management*;
- West Dapto Development Contribution Plan 2017;
- Wollongong City Council Urban Greening Strategy 2017-2037;
- Wollongong City Council, Wollongong Social Infrastructure Planning Framework 2018-2028;
- Wollongong City Council Civil Specifications 2019;
- Recreational and Open Space Planning Guidelines for Local Government 2010 Department of Planning;
- West Dapto Social, Cultural and Recreational Needs Study – Facility and Open Space Recommendations – Final Report (Elton Consulting, 2007);
- Play Wollongong Strategy 2014 – 2024 – in particular the Background Research Report 2014;
- Wollongong City Council's Public Art Policy 2016, and Animating Wollongong: Public Art Strategy and Guidelines 2016-2021;
- Wollongong City Council - *Vegetation Management Guidelines for Development Applications*;
- West Dapto Open Space Technical Manual;
- Transport Canberra and City Services (TCCS) publication – '*Design Standards for Urban Infrastructure, 24 - Sportsground Design*.'

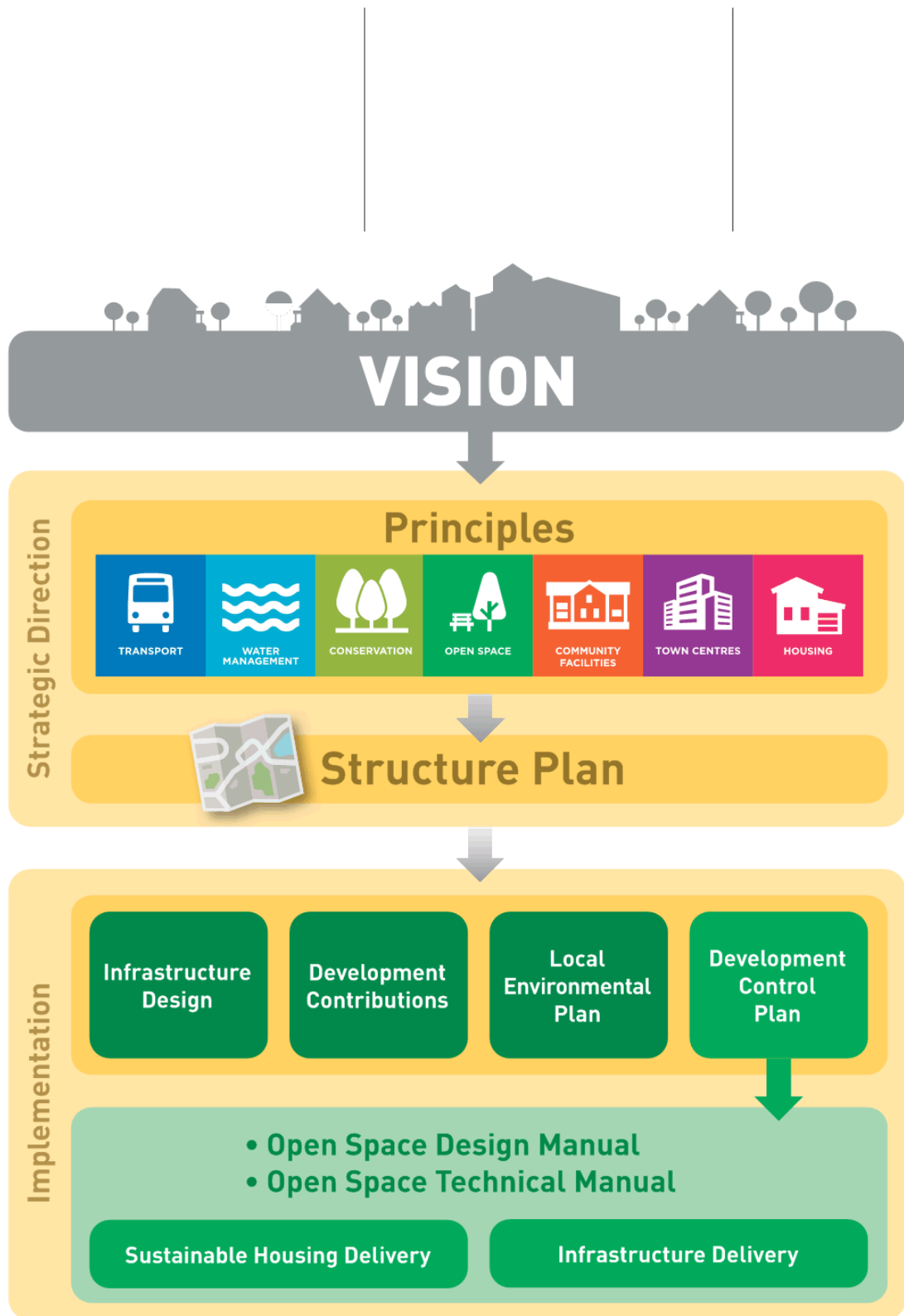


Figure 1
Structure and relationships of principles to planning tools

2.0 West Dapto Open Space Hierarchy

2.1 General Design Principles

Objectives

Open space should be planned and designed to achieve the following key objectives:

Well distributed network of open space – the design of neighbourhoods must provide a connected network of accessible, attractive, and usable public open spaces and natural areas.

Flexibility of design – open space and natural areas must provide for a variety of recreational, sporting, play, and social needs of the community. Sufficient size and flexibility of design must be incorporated to accommodate the needs of the community as they change over time.

Competing functions – flooding and water management, traffic and road infrastructure, cultural heritage and biodiversity must be accommodated without compromising the open space and recreation functions.

Open space embellishment – open space should not contain an excessive amount of embellishments that results in an unsustainable maintenance cost to the community. Embellishments should be appropriate to the intended catchment of users and to the type of park and associated service level of maintenance.

Active (formal) and Passive (informal) functional split – the West Dapto Urban Release Area open space provision must provide for an equal split between active (formal) and passive (informal) recreation.

Crime Prevention Through Environmental Design (CPTED) – CPTED principles are applied in the planning and development of open space, community facilities, and town and village centres.

Connectivity – open spaces must be connected with shared paths, pathways, and trails to other facilities and places of interest. These include: heritage sites, riparian areas, schools, shops, community facilities, public transport nodes, employment centres, and natural areas.

Urban Greening – the West Dapto Urban Release Area presents unique opportunities to increase the quality and quantity of vegetation with the provision of street tree planting, enhancement of existing remnant vegetation, revegetation of riparian areas, and the provision of significant tree planting within open space.

Conservation – the West Dapto Urban Release Area presents opportunities to preserve remnant and regrowth bushland vegetation, and enhance ecological connectivity.

Amenity – open space and natural areas will provide for a variety of recreational and social needs of the community and contribute to the local landscape character.

Value – open space design must deliver quality infrastructure that is robust and made from durable materials and finishes, and neat, uncomplicated designs that minimises maintenance requirements and discourages vandalism.

2.2 Open Space Hierarchy - Function and Catchment Distance

'Catchment' refers to the area and resident (or future resident) population intended to be serviced by the open space facility. The catchment area for an open space facility also relates to the size and function of the facilities to be provided. As illustrated in table 1 below, open space facilities are intended to

service city wide, district, neighbourhood or a local catchment.

It is important to note that land parcel size is not the only criteria defining a catchment level to be provided. The proposed function of the open space incorporating the future needs of the community is equally as significant in determining likely catchment.

As part of the open space network for West Dapto, open space is required at all hierarchy and catchment levels. This relationship is illustrated in table 1 below.

Open Space Hierarchy Table

Function and service	Size	Catchment radius (distance)
Local Passive (Informal)	0.5-2 ha	400-600m
Local Active (Formal)	1-2 ha	400-600m
Neighbourhood Passive (Informal)	2-4 ha	2km
Neighbourhood Active (Formal)	3-5 ha	2km
District Active (Formal)	5-8 ha	Southern ward of LGA
City wide Active (Formal)	8 + ha	Facility to serve the whole LGA

Table 1

Open space provision standards (based on NSW Recreation and Open Space Planning Guidelines for Local Government (2010) and the Elton Report (2007) recommendations).

Open Space Hierarchy and Function

The section 94 Development Contribution Plan provides for open space and recreational facilities including neighbourhood and local parks within each stage of the West Dapto Urban Release Area.

Figure 2
Open space hierarchy and functions

City Wide

Sports Park

Darkes Town Centre Sports Park
Cleveland Road Sports Precinct.

These facilities will provide a range of sporting fields and recreational opportunities designed to align with the West Dapto Open Space Design Manual.

District - South Wollongong

Community Leisure Centre

West Dapto Community Recreation and Leisure Centre.

Neighbourhood (min 2 - 4ha size)

Active (Formal) Recreation

Large scale open space designed to facilitate organised outdoor sports and training eg AFL, soccer, rugby league, rugby union, netball, basketball hockey, cricket, baseball and softball, etc.

Passive (Informal) Recreation

Unorganised or structured outdoor sport eg walking, running, cycling, fitness stations, youth spaces, play spaces such as playgrounds, kick about areas and children learn to ride facilities.

Local (min 0.5 - 2ha)

Active (Formal) Recreation

Small scale open space designed to facilitate organised outdoor sports with the provision of modified sportsfields or multi purposed courts to provide active recreational opportunities eg basketball and netball.

Passive (Informal) Recreation

Open space for unorganised activities promoting outdoor movement for all age, eg walking, running, cycling, youth spaces, playgrounds, kick-about areas as well as spaces for picnicking and family gatherings.

3.0 Open Space Categories

3.1 Neighbourhood Parks

Principles

Catchment

Neighbourhood parks are larger scale spaces for residents and visitors providing both active (formal) and passive (informal) recreational opportunities. Neighbourhood parks are intended to service a neighbourhood of residential areas with a catchment radius of 2km depending on the functions of the open space.

Activation and Flexibility

Neighbourhood parks should aim to have five sources of activation to provide a diversity of active and passive recreational opportunities. Neighbourhood parks should have the flexibility to cater for a wide variety of recreational experiences, activities, and formal sports to cater for all age groups and future community needs.

Neighbourhood park example, Rockley Oval 'Googong' Queanbeyan



Active (Formal) and Passive (Informal) Split

Active open space is defined by the Greater Sydney Commission as land set aside for the primary purpose of formal outdoor sports for the community. Active open space supports team sports, training and competition.

Neighbourhood parks across West Dapto must provide a range of recreational opportunities that must be evenly split between active (formal) and passive (informal). The location of a park will influence the design, function and the range of outdoor recreation, sport and exercise opportunities in response to the size, shape, topography, landscape setting and adjacent land uses.

Passive (informal) open space is land set aside for parks, gardens, linear corridors, conservation bushland and nature reserves. These areas are made available for informal recreation, play and physical activity. Examples of passive (informal) recreation are cycling, exercise stations, running, walking, play spaces, sitting and picnicking.

Neighbourhood Parks adjacent to Natural Areas

Neighbourhood parks, which are near to natural areas zoned as E2 Environmental Conservation, and E3 Environmental Management zones such as bushland or riparian areas, can accommodate self-directed recreational activities such as walking, running and cycling within these areas. This will increase access to these areas and create activity nodes for passive surveillance, and encourage social interaction in a natural setting.

Multi-purpose Sportsfield

Neighbourhood parks must be capable of accommodating multi-purpose sports fields for training and competition in addition to providing attractive green environments for hosting community events.

Site Interpretation

Neighbourhood parks should respond to the local setting and characteristics, and where possible incorporate references to local Indigenous and historical features in the form of interpretive signage and or public art.

General Requirements

- **Utilities** - Where land is to be dedicated to Council for future open space the land must include appropriate utility mains including but not limited to water, sewer, stormwater and power, that can be connected when the embellishment design is carried out.
- **Size** - Neighbourhood parks require a minimum provision for open space of two (2) to five (5) hectares with a particular emphasis on the provision of active (formal) recreational opportunities. The size of the park should respond to the specific requirements of the sport code.
- **Riparian corridors** - Neighbourhood parks cannot incorporate riparian corridors in open space area calculations.
- **Frontage requirements** - Neighbourhood parks should be located along a minor collector road with an additional smaller order road leading to car parking. Seventy-five percent (75%) of the neighbourhood park must have road frontage with no boundary less than thirty (30) metres.
- **Connectivity** - to achieve active transport outcomes in the West Dapto Urban Release Area it is essential that community facilities and neighbourhood parks are connected with shared paths and linked to public transport nodes to ensure pedestrians and cyclists can safely access open space.
- **Equal Access paths** - entry points and internal pathway networks must achieve equitable access. At least one continuous pedestrian path providing access to the major features of the park must be designed to AS1428.1:2009 'Design for Access and Mobility-general requirements for access'.
- **Passive Surveillance** - residential dwellings must be orientated to overlook neighbourhood parks to allow passive surveillance and deter anti-social activities. This includes incorporating **Crime Prevention Through Environmental Design (CPTED)** principles, such as the facilitation of casual community surveillance through layout and design.
- **Inclusive Playgrounds** - play spaces planned for open space should be inclusive with the provision of accessible play features. Supporting infrastructure such as accessible parking and paths of travel are required to help meet the needs of carers and children accessing the space.
- **Amenities** - public toilets are required. The number of cubicles required is subject to an objective assessment of potential demand through a needs analysis.
Public toilet buildings in parks should be designed, located and constructed in accordance with **Crime Prevention through Environmental Design (CPTED)** principles, relevant Australian Standards and Building Codes. The amenities must:
 - use infrastructure that is readily maintainable
 - be sited to avoid nuisance to neighbours;
 - be within reasonable proximity to a car park or other demand source;
 - be in close proximity to a road, gate or internal maintenance access for servicing;
 - be sited where casual surveillance is possible from surrounding streets.
- **Co-location of social infrastructure** - Neighbourhood parks could include the co-location of leisure and recreational facilities. This could be achieved by co-locating facilities within a multi-purpose community facility as recommended in the Wollongong Social Infrastructure Planning Framework.
- **Car parking** - Neighbourhood park design must include off street parking within the park to facilitate parking for visitors. Car parking within the park should not visually dominate and always incorporate substantial shade tree planting.
- **Park lighting** - Lighting should facilitate evening sports activities on fields and pathways that link to car parking areas. The lighting must be in accordance with AS2560.1:2018 Sports Lighting Part 1: General Principles, AS 2560.2.3 - 2002 Specific Application for football (all codes). Final determination of an appropriate lighting standard, for any particular pathway location, shall be subject to Council approval. Lighting design must consider illumination and spill requirements for functions.

- **Emergency and maintenance vehicles** – Neighbourhood park designs are required to provide appropriate entry points and route alignments for emergency and maintenance access. Emergency access to sporting fields must be carefully planned to allow vehicles to treat injured players.
- **Public art** – park designs should accommodate appropriate public art. Public art can enhance and enrich our experience of a public space by representing and interpreting the local heritage and culture of the area.
- **Signage** – park signage is to be provided at all entries. Refer to West Dapto Open Space Technical Manual.
- **Waste** – litter bins should be located near a road so that trucks are not required to enter the park to service them.
- **Urban Greening** – Significant feature tree planting is required with the aim of establishing canopy and shaded pathway networks, recreational spaces, car parks, and play spaces with 30 percent of the park provided with natural shade.

Active (Formal) Recreation Requirements

- The active (formal) recreational component provided would be in the

form of multi-sport fields to accommodate demand for local sports training and competition, including soccer, rugby union, rugby league, cricket, and AFL. Refer to section 5.2 for sports field requirements.

- Gradients of fields are to be no greater than 2 percent. Correct preparation of the subgrade and playing surface, and final grading is the most important design component affecting the performance of a sportsfield.
- Orientation of fields must be between north, and 15 degrees east of north depending on specific sporting requirements of the sporting code to be accommodated.
- The active (formal) recreational spaces are to be designed with appropriate drainage to ensure they are not significantly damaged by flooding, are self draining (ie no entrapped low points) to ensure that they are available for play within three (3) days of a rain/flood event.
- Tennis, netball, and basketball courts are examples appropriate active recreational components in neighbourhood parks.

Passive (Informal) Recreation Requirements

- The remnant bushland which may form part of the neighbourhood park, can cater for passive recreational uses

Examples of play space and fitness station



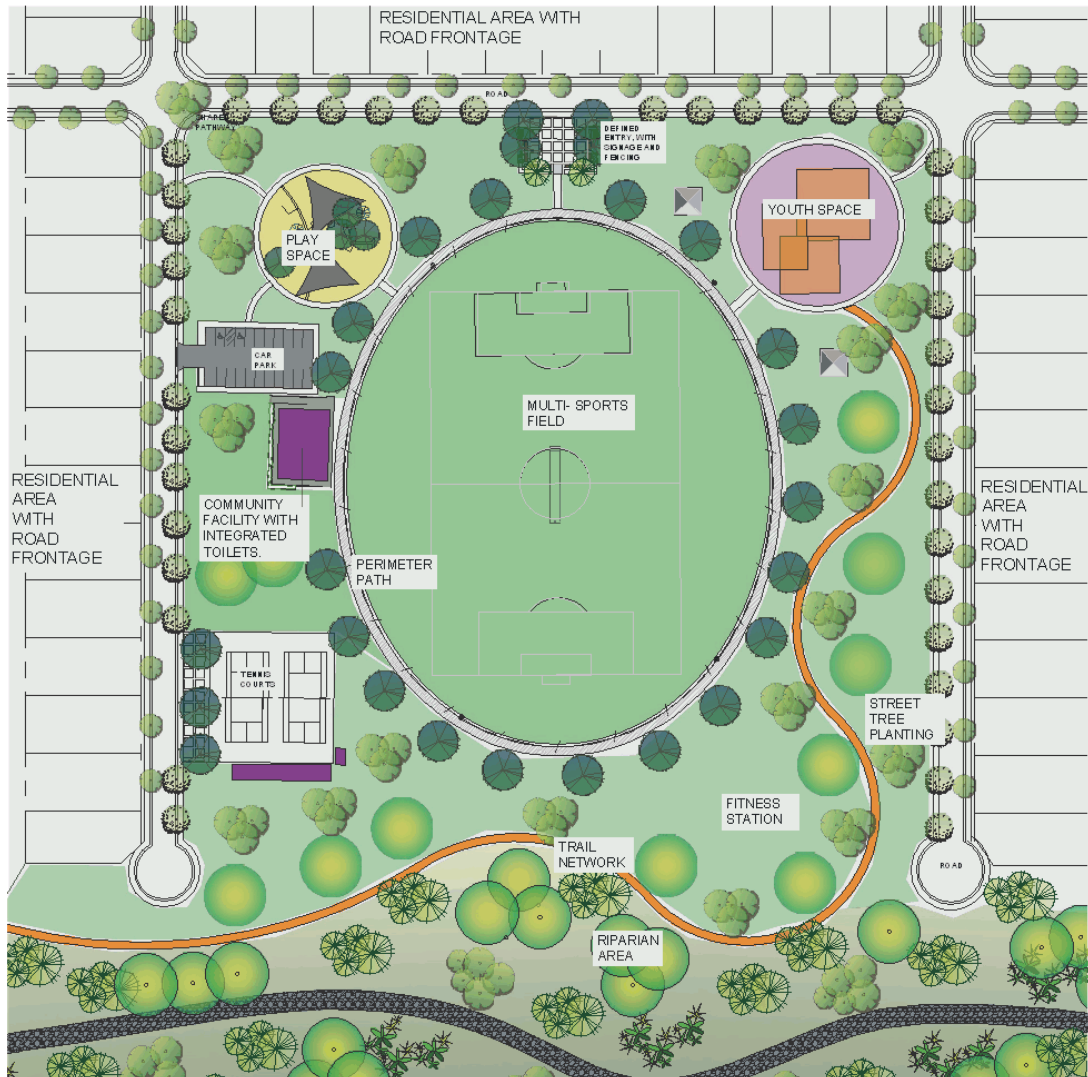
as well as achieving the West Dapto Vision conservation principles with acceptable impacts on biodiversity values. Activities such as walking, running and cycling can be integrated, creating experiences enhanced by the site features.

- Neighbourhood parks can offer opportunities for community gardens and conservation themes such as bird watching and nature walks.
- Fitness and exercise stations can be used by all ages to create opportunities for self-directed recreational exercise.
- Youth spaces are required to be incorporated into neighbourhood parks. Youth recreational spaces should aim to cater for a range of activities such as Parkour, ping pong tables, re-bound

walls, skate features, BMX, and pump tracks. Seating areas for hanging out spaces should also be incorporated.

- Play spaces within the neighbourhood park should provide play equipment and experiences that provide a range of opportunities for play. Play spaces should be planned to be inclusive. The provision of a children's learn to ride area is an example of a desire play feature.
- Park design must incorporate picnic areas of different sizes with shelters and tables, water, barbecues, and waste stations located offline from the pathway networks.
- Neighbourhood parks should be capable of hosting community events such as market days.

Figure 3
Typical features of a of good neighbourhood park design



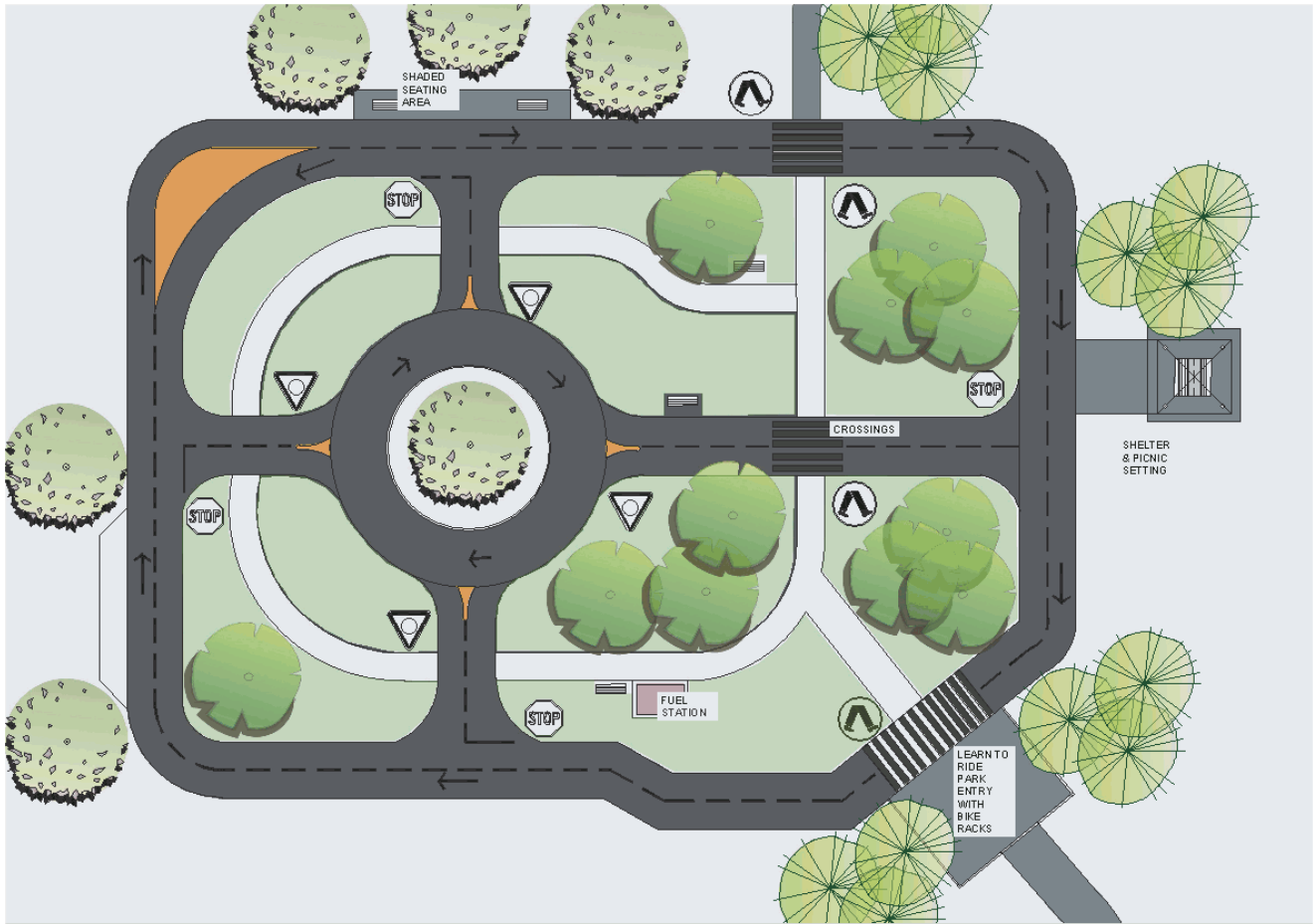


Figure 4 Typical Learn to Ride facility layout plan

Learn to Ride facility feature, Stuart Park Wollongong



Learn to Ride facility feature, Mt Stromlo Canberra



3.2 Local Parks

Principles

Access

Local parks should be accessible and be a safe walking distance within 400m-600m of the surrounding residential area.

Passive Surveillance

Local parks must be located in a highly visible location to allow for passive surveillance. The park should have direct residential frontage with four road frontages. This includes incorporating **Crime Prevention Through Environmental Design (CPTED)** principles, such as the facilitation of casual community surveillance through layout and design.

Recreation opportunities

Local park features and activations must service the immediately adjacent residential population. Local parks should provide a range of recreation spaces with a flexible design.

Level of Embellishment

Local parks should not contain an excessive amount of embellishments that results in an unsustainable maintenance cost to the community. Features such as an integrated path network with variable seating options complemented by significant tree planting must be primary features of park designs. Embellishments should be appropriate to the type of park and associated service level, and to the intended catchment of users.

Shade

Significant shade planting must be incorporated into the park design with at least 40 percent of the park provided with natural shade. Tree species should be selected from a minimum of three genus types.

Requirements

- **Size and Gradient** - Local parks require a minimum area of zero point five (0.5) to two (2) hectares with a particular emphasis on the provision of a range of recreational opportunities. The minimum provisions for informal ball sports (kick-about areas) should be 40m wide x 60m long with a maximum gradient of 5 percent and minimum of 2 percent.



- **Frontage requirements** - Local parks must be located on residential streets and not adjacent to major roads. The park should have direct residential frontage with four road frontages.
- **Passive Surveillance** - residential dwellings must be orientated to overlook neighbourhood parks to allow passive surveillance and deter anti-social activities.
- **Connectivity** - to achieve active transport outcomes in the West Dapto Urban Release Area it is essential that local parks are connected with pathways and shared paths to ensure pedestrians and cyclists can safely access open space.

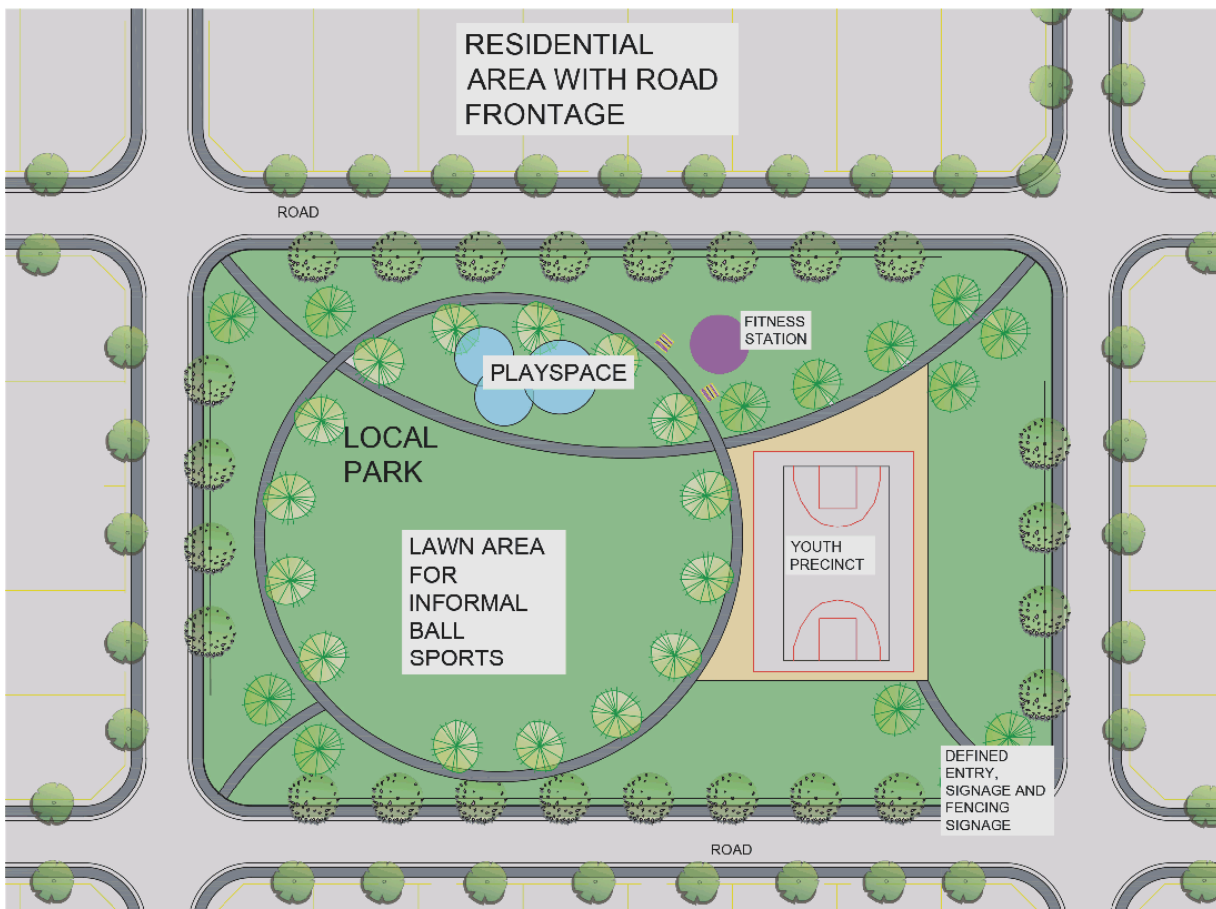
Top: Play feature, Emu Park West Dapto

Middle: Half basketball court, Emu Park West Dapto

Bottom: Skate features West Epping Park, source City of Parramatta

- **Equal Access paths** - Entry points and at least one route within the internal pathway network linking key park features must achieve equitable access as per AS 1428.
- **Play spaces** - within the local park play spaces should provide play equipment and experiences that provide a range of opportunities for play. Play spaces should be planned to be inclusive.
- **Youth spaces** - park designs are required to respond to the progression of children to youth and include facilities such as ball courts and skate elements.
- **Amenities** - Provision of infrastructure such as toilets is not required as most visitors are able to return to their homes if necessary.
- **Park Lighting** - none required. Street lighting only.
- **Emergency and Maintenance Vehicles** - Maintenance and emergency access must be provided.
- **Signage** - park signage is to be provided at all entries. Refer to West Dapto Technical Manual.
- **Waste** - Litter bins should be located as close as possible to entrances and or road frontages for servicing, and near high activity areas such as play spaces.
- **Urban Greening** - Tree planting is a major focus of local parks with mass planting bed provision confined to focal areas only or where slopes exceed 25 percent. Significant feature tree planting is required with the aim of establishing canopy and shaded pathway networks, recreational spaces, and play spaces with 40 percent of the park provided with natural shade. A variety of genus of tree planting to be selected to provide diversity.
- **Picnic nodes** - picnic areas with tables and a variety of seating areas are to be provided through the park. Facilities such as shelters with furniture to accommodate family gatherings such as birthday parties, must be included.

Figure 4
Local Park
typical features



4.0 OPEN SPACE DESIGN GUIDELINES

4.1 Natural Areas

Objectives

The West Dapto Urban Release Area presents opportunities to preserve and enhance remnant and regrowth vegetation and other biodiversity values. Natural areas such as riparian environments and remnant and regrowth bushland zoned as E2 (Environmental Conservation) and E3 (Environmental Management) are an important community asset. They provide opportunities to learn about flora and fauna and appreciate and enjoy the environment. The primary purpose of natural areas is conservation however balanced passive (informal) recreation is a key secondary function of natural areas in urban settings.

Requirements

Trails and Rest Areas

Activities such as walking, running and cycling can be integrated, creating varied

experiences enhanced by the diversity of landforms and site features. The creation of appropriate trail networks and rest areas in natural areas will increase access and create activity nodes for passive surveillance, encouraging social interaction in a natural setting.

By allowing controlled access for the public it can also deter damaging activities such as rubbish dumping and other anti-social activities. Designing a trail network within natural areas may also prevent the proliferation of informal trails and reduce impacts on biodiversity values. Trailheads or trail access points should be visible and defined by signage and/or fencing.

Conservation

The primary objective for natural areas is to ensure their ongoing conservation. Conservation can include rehabilitation of areas which have suffered misuse or have been impacted by previous land uses. Areas of thriving natural habitat are to be preserved to ensure they are not adversely impacted by development and human activity. Natural areas or parts of natural areas with biodiversity values of high conservation significance are to be protected and managed to minimise the potential for adverse impacts. As part of this protection there is a requirement for native grasses and groundcovers to be utilised adjacent to natural areas in place of Kikuyu.

Vegetation Management Plans

Vegetation Management Plans must

Good example of walking trail within a conservation area (Tasmania)



be developed for all natural areas such as riparian environments and remnant bushland. All works recommended in the Vegetation Management Plans must be undertaken by a licenced bush regeneration company. Embellishments such as trails proposed within a natural area must be integrated and considered as part of the Vegetation Management Plan. Monitoring and ongoing maintenance is required to ensure the effectiveness of the Vegetation Management Plan. Refer to Wollongong City Council Vegetation Management Guidelines for Development Applications.

Recreation and Conservation

Any embellishment works need to be targeted at providing recreation opportunities that minimise the impact to vegetation and wildlife. Low impact recreation such as walking, track running, cycling (on track only), observation points, and rest areas are suitable activities.

Trails and seats should be located away from high conservation areas.

Works within natural areas must make appropriate provisions to accommodate suitable activities and inhibit degrading ones such as vegetation vandalism, firewood collection, four wheeled driving, and motorbike riding.

Access and Frontages

Subdivision design must provide good connectivity to streets and pathway networks, with the majority of the natural area having road frontages to

allow for passive surveillance. Road frontages also provide an offset as a fire protection measure to residential dwellings. Vehicle barriers should be incorporated into the design where perimeter access control is required consistent with the open space fencing requirements listed in the technical manual.

CPTED Principles in Trail design

Trails for walking and running should be designed in consideration of Crime Prevention Through Environmental Design (CPTED) in order to facilitate casual community surveillance.

CPTED elements can guide trail design to reduce the likelihood of crime and enhance community safety. For example, routing walking trails around the perimeter of natural areas and the creation of active edges will encourage casual surveillance into these areas.

Routing walking trails on the perimeter will also allow for a clear line of sight for users enabling them to see what is ahead. This is an essential element of people’s perception of safety and will therefore encourage use of the trail.

As part of the trail route design the applicant will be required to include a comprehensive risk assessment following CPTED principles within the Development Application documentation. Refer to DCP2009 Chapter E2 Crime Prevention through environmental design.

Good example of walking trail within a conservation area Wisemans Park, Gwynneville



Figure 5
Natural Area within
Subdivision typical layout



Riparian Corridors

Refer to Chapter E23: Riparian Land Management for riparian corridor objectives.

Classification of Watercourses

All watercourses within the Wollongong Local Government Area have been classified into one or more of the following three (3) categories, depending upon the nature and function of each watercourse:

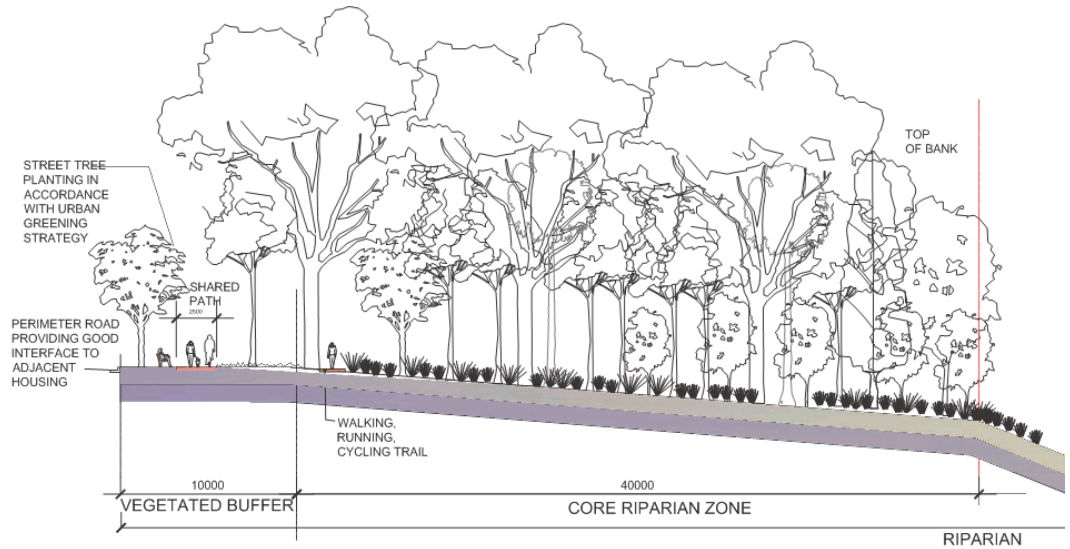
- **Category 1: Environmental Corridor** – This category aims to provide extensive habitats for terrestrial and aquatic fauna and to maintain and restore the viability of riparian vegetation as well as protect water quality and provide bank stability.
- **Category 2: Terrestrial and Aquatic Habitat** – This category aims to maintain or restore the natural functions of a stream in order to maintain the viability of riparian vegetation and provide suitable habitat for terrestrial and aquatic fauna as well as improve water quality and provide bank stability.
- **Category 3: Bank Stability and Water Quality** – This category aims to minimise sedimentation and nutrient transfer.

Requirements

- **Frontage requirements** – subdivision layouts should provide a road frontage to all riparian areas.
- **Services** - services must be located on the outer edge of the riparian corridor.
- **Pathways** - locate shared pathways and walking trails sensitively so they do not compromise the integrity of the riparian corridor and facilitate passive (informal) recreation.
- **Passive (Informal) Recreation** - integrate infrastructure such as picnic facilities and exercise equipment sensitively to facilitate passive (informal) recreation. Riparian areas accommodate self-directed recreational activities such as walking, running and cycling. This will increase access to these areas and create activity nodes for passive surveillance, and encourage social interaction in a natural setting.
- **Riparian Vegetation Communities** – subdivision design must retain existing communities and revegetate where necessary riparian vegetation communities to achieve creek bank stability.
- **Access** - the ecological integrity of existing riparian vegetation must be protected by limiting access to the watercourse to strategic locations where the stream bed and bank stability will not be compromised.

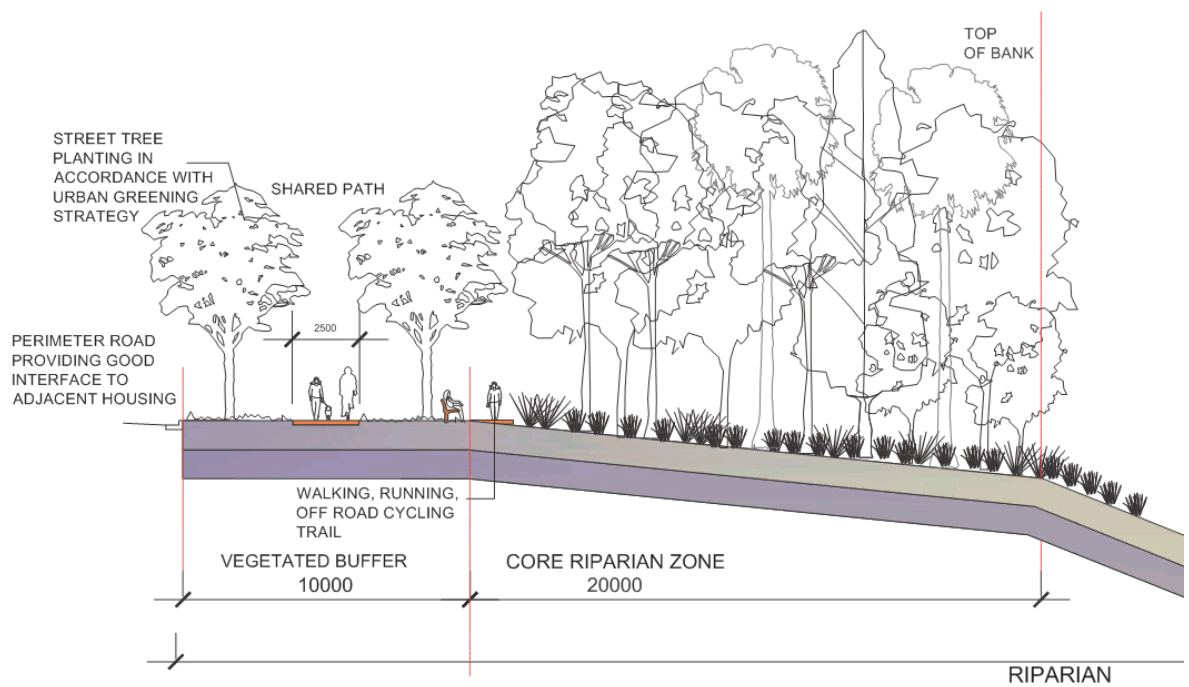
Riparian Corridor - Category One

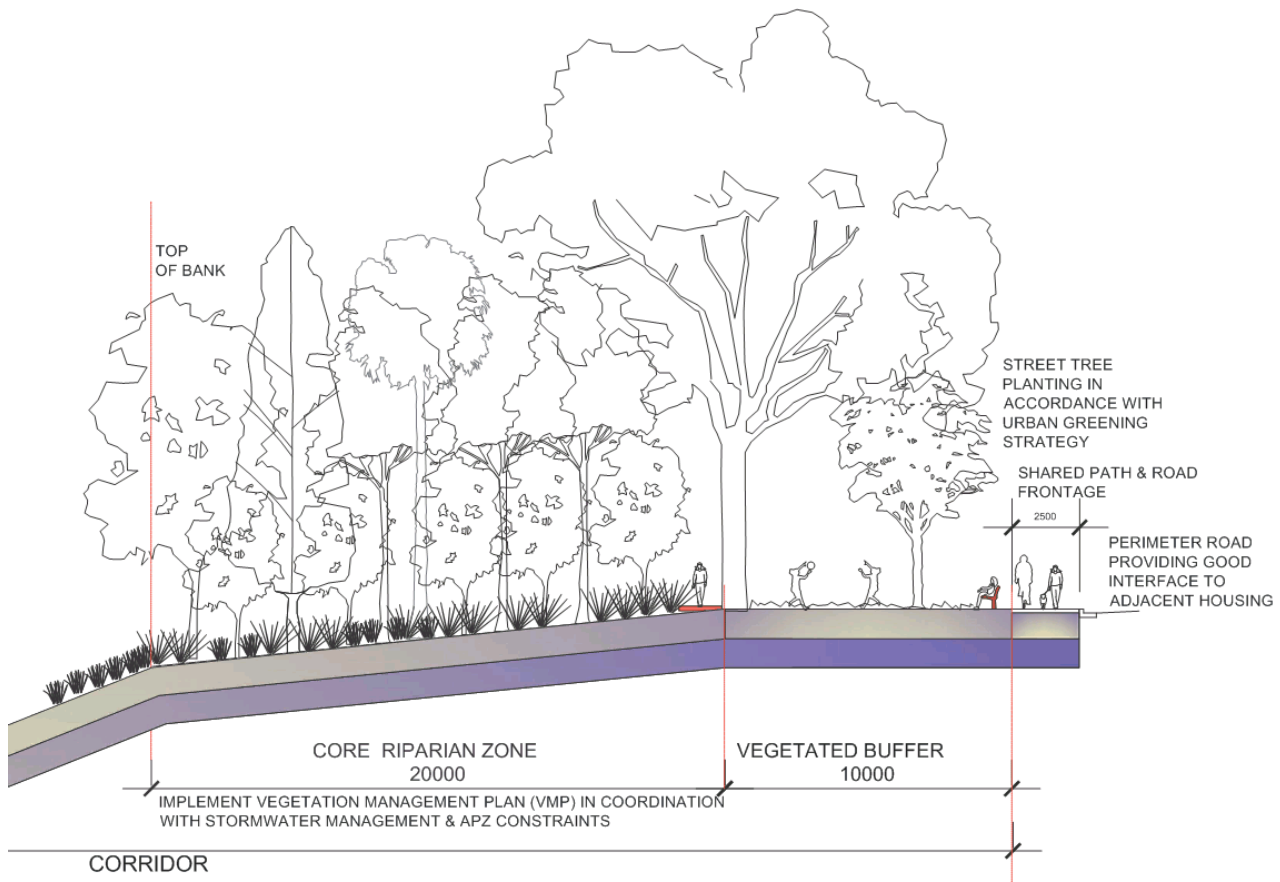
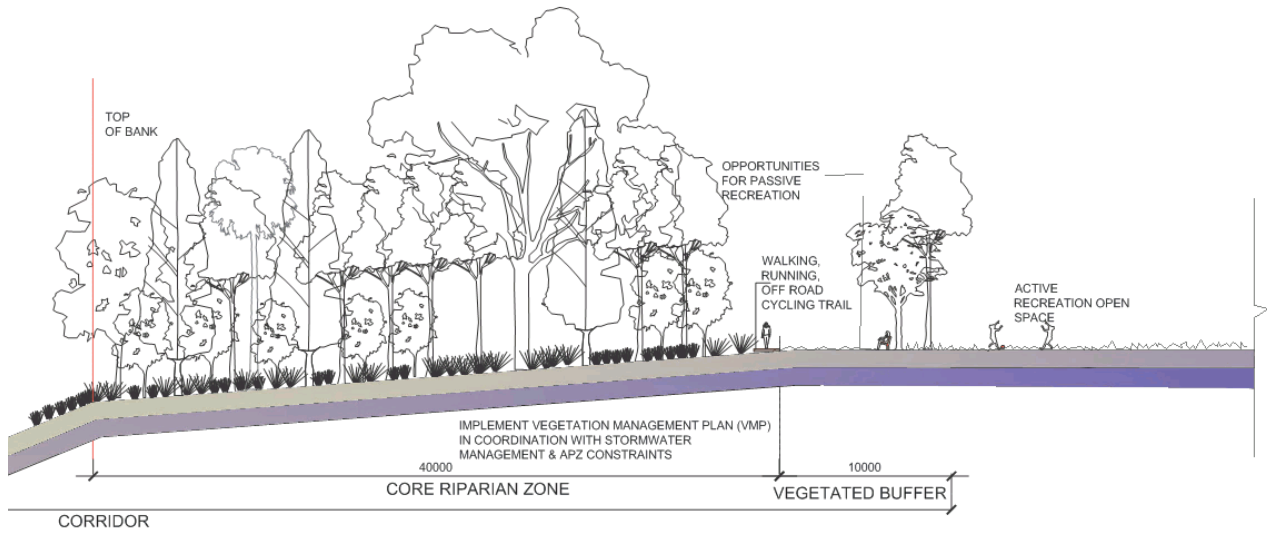
Figure 6 Typical Riparian Corridor Frontage Category One



Riparian Corridor - Category Two

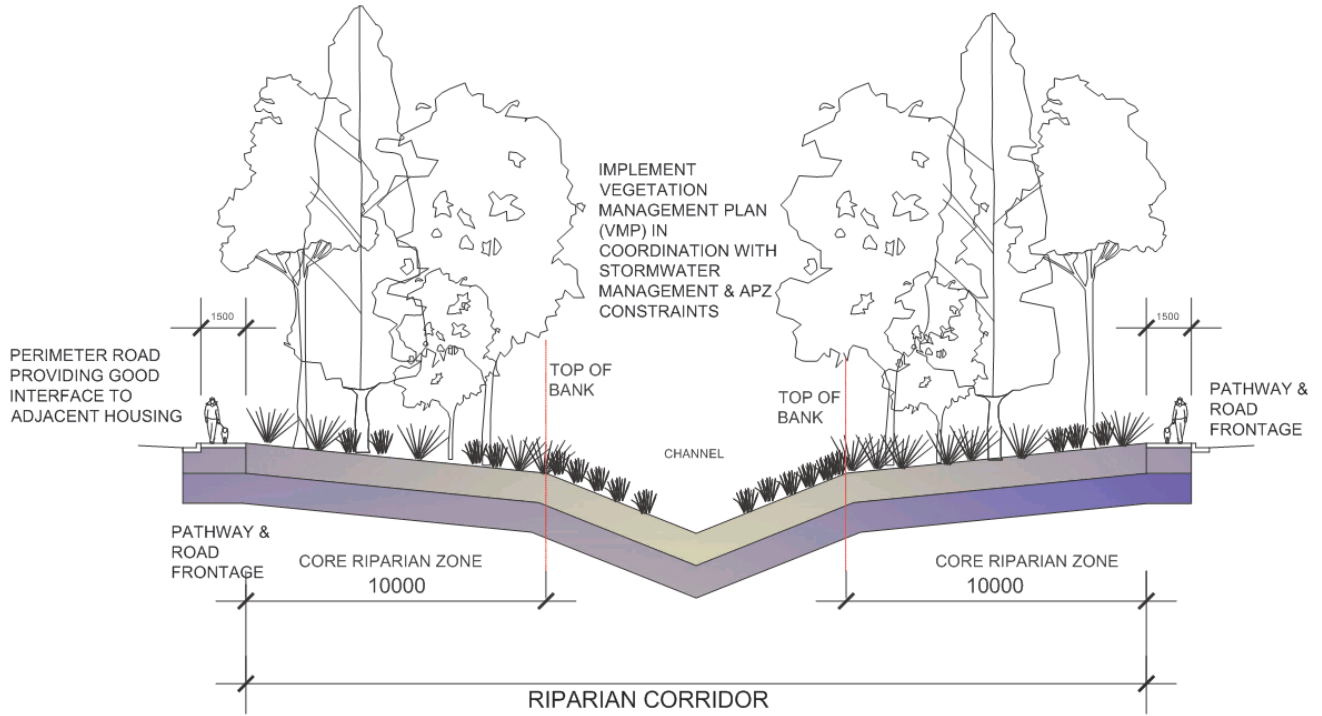
Figure 7 Typical Riparian Corridor Frontage Category Two





Riparian Corridor - Category Three

Figure 8 Typical Riparian Corridor Frontage Category Three



4.2 Open Space Water Management

Objectives

The design of stormwater management at times has a significant impact on open spaces as it is often integrated. The required facilities should not impede the recreational function of an open space and where possible it should be designed to complement and enhance recreational opportunities.

Permanent detention basins and panels can not be included in open space calculations. Dual use of open space and detention areas must be carefully considered, as there are safety hazards associated with pairing of stormwater management in open space, which may not be obvious to users. Stormwater facilities should be located in consideration of the activity areas function.

The key criteria for the design of stormwater and flood management infrastructure in open space should be aesthetics, safety, maintenance, and public access risk analyses.

Stormwater engineers and landscape architects have a key role in shaping open space and contributing to community benefits that go beyond flood mitigation.

Requirements

Safety

If stormwater and flood plain management infrastructure are integrated into open space it must be demonstrated that all aspects of public access risk analysis, safety and aesthetics have been achieved in the design. The design of stormwater must be in accordance with 'Queensland Urban Drainage Manual Third Edition 2013 - provisional, Department of Energy and Water Supply'. This requires that water management functions are assessed and graded for their ability to safely accommodate public interaction. Where possible the design should offer opportunities for the public to interact with components of the water cycle management system and provide environmental education. Fencing to prevent public access should only be used where all other safety in design measures are not feasible.

Safety in Design Report

A Safety in Design Report is required for the investigation of proposed stormwater infrastructure in open space design, considering the location, type and size of infrastructure necessary, as well as public access requirements and proposed recreational use. Types of stormwater structures may include pipe inlets / outlets, basins, grates and surface flow paths. The associated risks arising from the proposal must be detailed, and how those risks are to be mitigated. This report is required to identify and rectify any potential design safety issues such that future risks can be mitigated during the operational phase of the proposal.

Slope Gradients

The side slopes of detention basins should be a maximum gradient of 16 percent or flatter to allow easy egress up the likely wet surface. Areas with slopes steeper than 25 percent cannot be turfed and will require steps and a handrail to assist egress at regular intervals. Drainage swales and pits and pipes should not impede maintenance operations and the recreational function of a park.

Stormwater Management and Active (Formal) Sports

It is essential that the active (formal) sportsfield component of open space is designed to ensure that it is not significantly affected by flooding and is available year round for competition play except during the flooding event. Sportsfields should be located outside the 10 percent Annual Exceedance Probability (AEP) flood extent. Sportsfields incorporated into open space designs should be available for play with good diversion and subsurface drainage around any active playing areas. Designs of sportsfields should minimise the frequency of maintenance as a result of stormwater run-off.

Stormwater Management and Passive (Informal) Sports

The preservation of the natural waterways and riparian corridors also provides an important community asset that could provide passive recreational opportunities. Low impact recreation such as walking, track running, cycling (on track only) can be integrated into riparian corridors providing an opportunity for off road pedestrian linkages.

If the proposed subdivision water management infrastructure is intended to be dual purposed with open space activities (eg an informal ball sports area within a detention basin) there are specific requirements that must be provided:

- Side slope gradients cannot exceed 16 percent
- Informal ball sports area gradient cannot exceed 5 percent
- Informal ball sports minimum available area to be 40m x 60m. Any stormwater infrastructure such as outlets, weirs, and swales must be located outside this proposed area so as not to impede usage.
- Informal ball sport area to be provided with adequate subsurface drainage.

Urban Greening and Stormwater Management

Tree planting for shade and amenity wherever possible should be integrated in the floodplain. For example, basin floors and some bank designs offer scope for planting when compatible with the required open space provision. Where trees are proposed to be planted in a floodplain, flood modelling and flood impact mapping must be undertaken to identify the impact on flood behaviour and flood levels resulting from the change in vegetation densities and hydraulic roughness. The flood modelling and impact mapping should be undertaken as part of a flood study prepared by a suitably qualified civil engineer in accordance with Chapters E13 and E14 of the Wollongong DCP2009. This information will need to demonstrate compliance with Clause 7.3 of the Wollongong LEP and Chapter E13 of the Wollongong DCP2009, with respect to flood impacts.



Urban greening and stormwater management, Nyrang Park, Keiraville. A good example of pathways located at top of bank in open space

4.3 WCC Urban Greening Strategy

Objectives

The Wollongong Urban Greening Strategy 2017-2037 aims to strategically increase the quality and quantity of all vegetation in an urban setting, particularly tree canopy cover on all land types.

The West Dapto Urban Release Area presents unique opportunities to increase the quality and quantity of vegetation with the provision of street tree planting, enhancing existing remnant vegetation and riparian areas, and the provision of significant feature tree planting within open space.

Open space should integrate natural areas such as riparian environments and remnant and regrowth bushland and the active recreational areas with provision of significant tree planting. Open spaces, which are greener and well shaded, will attract people and encourage them to stay longer.

Tree planting is a form of place making as it creates a pleasant place for users. Tree planting provides environmental benefits such as; shade and cooling, protection from prevailing winds, storing carbon, an increased sense of local identity, encouragement of outdoor activity, provision of habitat for local wildlife, and increased property values.

Tree planting can frame view corridors and provide privacy.

Tree planting is an essential part of shade provision for open space and associated facilities such as play spaces, seating areas and pathways. Provision of appropriate tree planting around play spaces is considered essential to provide shade for children and carers. Natural shade of play spaces by the provision of evergreen or deciduous trees is preferred to built shade structures.

Street Tree Planting Requirements

- Street tree planting provides a great opportunity to create streetscapes which deliver amenity and environmental performance. Street tree species selected should aim to create avenues of trees which provide shade and visual amenity. A variety of genus and species should be utilised to create diversity. Street tree species selected can be drawn from the West Dapto Open Space Technical Manual Tree Species List or as recommended by Parks and Open Space Manager.
- The equivalent of one (1) street tree for each lot on residential road frontages (ie with locations adjusted for driveway crossings, lighting, sightlines, utility services and the like) will generally be required to enhance the appearance of the locality.



Significant tree canopies contribute to urban amenity



*New street tree planting,
Paynes road Kembla
Grange*

- The location of street trees should take into account overhead and underground services.
- Where street trees are to be installed in areas with hard surfaces such as town and village Centres, suitable grates are to be laid around the tree to protect the roots and enable water infiltration.
- Minimum plant requirements for street trees is 100 litre container size, in accordance with AS 2303: 2018 Tree Stock for Landscape Use.
- Trees to be planted in accordance with the standard detail. Refer to West Dapto Open Space Technical Manual for detail.
- The planting of the street trees should occur, after at least 80 percent of the dwelling construction and infrastructure work has been completed for the subdivision.
- Where coal wash or heavy clay forms the subgrade of proposed street tree and verge planting a minimum depth of natural soil must be provided to allow healthy root growth. Refer to West Dapto Open Space Technical Manual for details and typical sections.
- A minimum of 52 weeks establishment period should be applied to all new tree plantings. Longer establishment periods may apply under DA conditions.

Tree Planting in Open Space Requirements

Tree planting is required in open space to provide shade and amenity. Canopy trees should be planted to provide shade to active recreational nodes such as sporting fields, basketball and netball courts, exercise stations, play spaces as well as seating areas.

A planting plan must be prepared as part of all open space submissions. Tree planting should be utilised to define spaces and functions in open space.

- Tree planting must be integrated with pathway networks. Tree planting must be offset from pathways in consideration of the tree's mature height and spread.
- Significant feature tree planting should be integrated into open space with the aim of establishing canopy and shade to amenities, parking and play spaces.
- Minimum plant requirements for amenity trees within open space are 75-200 litre container size.
- Tree planting must be spaced adequately to allow deck mowers to access all turfed areas or grouped together in mulch beds.
- Where coal wash or heavy clay forms the subgrade of proposed open space areas a minimum depth 600mm of

natural soil must be provided to allow healthy root growth.

- In lawns, tree pits are required to be backfilled with site soil if good quality or with good quality soil, mixed with a suitable soil conditioner. Trees in lawn areas are to be installed with a mulch ring of minimum 1500mm radius and 75 mm thickness.
- Tree planting locations must be compliant with service authority offset requirements.
- As per the WCC Urban Greening Strategy, provision of canopy cover is of the highest priority. Tree species should be selected to provide the maximum canopy size that fits within the context of the selected location.
- Further guidance on tree planting as required to be advised by Parks and Open Space Manager.
- Fruit trees and bush tucker tree species are permitted in open space.

Planting in Natural Areas Requirements

Where remnants of existing vegetation will be retained, environmental weeds should be selectively controlled prior to enhancement planting. Weed-free mulch should be laid evenly to a nominal thickness of 75 mm over the prepared subsoil, except along waterways subject to flooding where erosion control matting or similar materials resistant to water movement are to be used.

- Select plants that are indigenous to the local area and appropriate to the existing vegetative community, and include a range of shrub, groundcovers and grass species. Species selection in natural areas is to be consistent with the recommendations in the Vegetation Management Plan. Plant a mixture of tube stock and plants in pots up to 140 mm, to achieve the maximum survival potential.
- Pioneer species should be used in conjunction with slower more permanent species, as to provide shade and protection during the establishment period.
- Plant at sufficient density (recommended average density of 6 native grasses per m²) with the tree

component spaced at about 4 to 6 m centres to achieve substantial cover of the ground surface at the time of the Maintenance Inspection.

- Water and weed the rehabilitation area to ensure the site is well established at the time of the inspection, with plants conditioned to survive dry periods without supplementary watering. An approved temporary fence may be required around rehabilitation areas to deter deer and other pests.
- Further guidance on planting for Natural Areas is provided in Council's Vegetation Management Plan Guidelines or as otherwise advised by Council officers.

Protection of Existing Vegetation

Objectives

West Dapto presents opportunities to preserve remnant vegetation and enhance ecological connectivity.

The planning, design and location of open space should aim to preserve and enhance remnant native bushland and riparian areas. Existing trees are considered a valuable asset in the community.

A subdivision application must incorporate the following requirements:

Requirements

- Tree survey of existing trees on the site and trees on adjacent properties, accurately located by a registered surveyor, indicating the trunk location and level to Australian Height Datum (AHD) and an accurate portrayal of the canopy spread,
- The applicant must engage an Australian Qualifications Framework (AQF) Level 5 consulting arborist to prepare an Arboricultural Impact Assessment (AIA) in the initial stages of planning the development to determine which trees are suitable to be retained and integrated into the open space. The suitability of vegetation for incorporation should be based on the tree's health, amenity value and significance of the tree.
- The arborist must assess trees from a public safety risk, where they are located in close proximity to proposed

active recreation spaces, pathways and play spaces. In assessing existing remnant/regrowth vegetation the arborist should carry out an AIA to make recommendations for pruning, dead wooding or removal of hazardous trees. This AIA must address the health, amenity value and Useful Life Expectancy (ULE) rating of each tree.

- Where appropriate an AIA Level 3 assessment may be required;
- Should the land be bushfire prone the landscape plan must be coordinated with the Arborist Report and in accordance with the Planning for Bushfire Protection Guidelines.
- The arborist must provide a Tree Protection Plan (TPP) outlining the specifications for tree protection to be in place during the construction

phase including any pruning requirements. All development activity must be in accordance with the Australian Standard 4970 – Protection of Trees on Development Sites.

- Tree protection fencing for retained trees must be installed as per the arborist recommendations prior to the commencement of any excavation or land clearing works.
- The applicant may also be required to have an arborist inspect and report on the tree/s at monthly intervals during construction. This report must be submitted to the Principal Certifying Authority.
- Tree protection details to be as per the Wollongong City Council Civil Specification 2019.

Significant stand of existing vegetation West Dapto Road



4.4 Equal Access

Objectives

Open space should be designed by applying Universal Design principles to promote equal access and connectivity for everyone from the very young to youths and the elderly, families, carers, and people of all abilities.

The design of open spaces should provide equitable access to allow people to access the park in accordance with the Disability Discrimination Act as specified in AS 1428. This will ensure that the design of the open space will eliminate obstacles and barriers that prevent access by people of all ages and abilities and create an inclusive open space that considers as many people's needs as possible.

Open spaces should be easy to navigate, interesting and attractive. They should offer a variety of landscape settings to explore, and provide opportunities to connect with others. Pathways and paved areas must be provided for all weather pedestrian access to key areas and facilities such as lookouts, amenities and play spaces.

Equal Access Requirements

- Points of entry to the park must be compliant with Australian Standard AS1428.1.2009 'Design for Access and Mobility general requirements for access'.
- At least one compliant path of travel must be designed linking to key features or facilities contained within the park such as play spaces, picnic areas and toilets.
- A pathway must link to the park from the Equal Access Parking spaces.

4.5 Material Selection

Objectives

The West Dapto Planning principle for infrastructure is to utilise robust and durable materials with high quality finishes that minimise maintenance requirements and discourage vandalism.

Materials and furniture items within an open space that are difficult to maintain and difficult or costly to replace can have a significant impact on both the aesthetics, function of a park, and the long-term maintenance costs.



Requirements

Open Space infrastructure materials must be:

- vandalism and graffiti resistant
- constructed with low maintenance high quality, durable materials.
- robust and fire resistant
- non-corroding and non-corrosive
- sustainable, with low whole of life costs
- sourced locally where possible (such as site rock)
- comply with relevant Australian standards

Typical materials suitable for use are galvanised steel, stainless steel, aluminium, stone (sourced locally), concrete, recycled hardwood and non-toxic paint.

Refer to West Dapto Open Space Technical Manual for specifications.

*Top: Equal access pathway.
City of Parramatta*

Above: Equal access pathway



High quality, durable seats, East Corrimal

4.6 Open Space Maintenance Objectives

Open space and park infrastructure must be easy to maintain and financially sustainable. Parks shall not be over-embellished with multiple pieces of bespoke infrastructure. Often the most important elements in parks such as paths, trees, grass, and seats are the simple and long lasting features of parks that appeal to the community. Careful design and planning is required

to ensure sustainable ongoing maintenance costs and achieve long lifecycles.

Requirements

- Maintenance access must be provided into open space. Access must be unobtrusive and be separated from pedestrian access points.
- Mass planting in centre medians within roads are not supported unless safe maintenance zones can be provided.
- A minimum of one maintenance access point should be provided at strategic locations along road frontages to provide for maintenance and emergency access.
- A driveway should be formed to create the maintenance access point. A controlled access device such as a removable bollard, gate or lock rail to be installed at each driveway. A 3.5m wide reinforced concrete driveway should be provided as per WCC Civil Specification 2019.
- Where a maintenance access route crosses an internal path, the path must be reinforced to withstand maintenance equipment traversing it.
- Provide for vehicular access to park facilities and areas requiring regular cleaning and ongoing maintenance (toilets, playgrounds, refuse bins, barbecues, mown areas, firebreaks, etc.). Wherever possible all weather access should be provided to these facilities and areas.
- Provide access to stormwater infrastructure such as stormwater detention basins, drainage swales/channels, stormwater pits, manholes, water quality treatment facilities (eg wetlands, bio retention basins, etc.), and stormwater quality improvement devices (eg GPT's, CDS units, etc.).
- Feature garden beds in open space should be minimal and be relative to the size, function and service of the public open space. For example, a local park would have minimal to no feature garden beds whereas a neighbourhood park with a civic space may include them.
- A maintenance schedule is required for all open spaces detailing soft and hard landscape features such as areas of turf, mass planting beds, edging, fencing and furniture.

5.0 OPEN SPACE INFRASTRUCTURE DESIGN

5.1 Play Spaces

Objectives

People of all ages and abilities engage in play. Play helps to enhance mental and physical wellbeing. Play happens at our parks, natural areas, beaches, public swimming pools, playgrounds, outdoor exercise stations, skate facilities, youth precincts, public art installations, ball courts, bicycle tracks and many other locations.

The West Dapto Urban Release Area is in a unique position to enable, enhance and promote play opportunities by providing a broad range of quality facilities and infrastructure.

Wollongong City Council has developed a strategy - 'Play Wollongong' which has been developed to guide the future direction of play across the Wollongong Local Government Area (LGA). This strategy focuses specifically

on toddlers to 12 year olds. Youth spaces are also required to respond to the natural progression of children to teenagers as outlined in the 'Social Cultural and Recreational Needs Study for the West Dapto New Release Area' Elton, 2007.

Design Principles

Distribution - quality play opportunities must be equitably distributed across the city, including large regional play spaces and smaller local play spaces. Ensure play spaces meet the function, service, size and catchment distance requirements of the park type.

Access - play spaces must be easily accessed by walking and cycling and encourage healthy living and independent access by children.

Engagement - ensure meaningful engagement is undertaken with the surrounding community including children, in relation to play space planning. Work with the local community and engage school children and young people when planning and designing play spaces. Involve children and the broader community in the design of public art features and in accordance with Council's Public Art Policy.

*Below left:
Play equipment,
Bankbook Park
Wongawilli*

*Below right: Inclusive
equipment, Bankbook
Park Wongawilli*



Inclusive and age appropriate design -

play spaces are to be inclusive of all ages and abilities and encourage participation in play. Well-designed play spaces provide a range of age-appropriate experiences that can help to foster independence, support social interaction, develop learning and encourage creativity.

Informal play spaces - informal play spaces and the provision of natural play elements are to be given priority, recognising the benefits of connecting with nature. Children who are able to access natural play environments regularly are more active and resistant to stress, and play in more imaginative, diverse and creative ways. Natural elements that feature in good play space design include wet/dry creek beds, bridges and tunnels, mounds and slopes, plants and where possible existing trees.

Appropriate risk and challenge - play spaces must provide children with an appropriate level of risk and challenge while complying with relevant safety standards. Play spaces that encourage children to take manageable risks allow them to test their limits.

General Requirements

Playgrounds in parks should be designed, located and constructed in accordance with the following requirements:

- Certification is required that the impact attenuation surfacing and associated landscaping comply with the relevant Australian Standards *AS/NZS 4442:1996 Playground Surfacing Specification Requirements and Test Method*.
- Certification is required that the play spaces and play equipment comply with the relevant Australian Standards *AS/NZS 4486.1:1997 Playgrounds and Play Equipment. Part 1: Development, Installation, Inspection, Maintenance and Operation, Standards Australia*.
- Certification is required that the play equipment comply with the relevant Australian Standards *series AS 4685.1, AS4685.2, AS4685.3, AS4685.4, AS4685.5, AS4685.6, AS85.11*.
- Ensure play elements complement and enhance other recreation opportunities in a park. Where possible playgrounds

should be linked to other areas of play including open activity areas, natural areas and recreation facilities such as shared paths and basketball courts.

- Ensure play equipment is readily maintainable and approved by WCC. A list of preferred Council suppliers can be provided to assist with the selection of suitable equipment.
- A minimum of five-year manufacturer's warranty is required for any off the shelf equipment.
- Custom playground equipment is permitted in neighbourhood playgrounds only unless approved by WCC.
- Playground design should achieve a balance between carer supervision and independent play. Carer involvement in the play of young children is essential to reduce the risk and severity of accidents. However, older children need to be able to play without constant adult supervision, to maximise opportunities for social development.
- Fencing of play spaces is not encouraged. The location of play spaces should be carefully considered to design out the need for fencing. Where there is no alternative for the location of a playground, a safety fence is permitted between playgrounds and a main road, a water body with standing water, a shared pathway, when play elements are less than 20m from the road frontage, bikeway or water body.
- CCA treated timber must not be used in the construction of play equipment, fencing and furniture within playgrounds.
- The installation of water play elements requires specific involvement and approval of Council during the concept development stage to undertake risk analysis and to plan for sustainable water use.
- Incorporate natural shade and seating and other park furniture.

Playground Surfacing

Surfacing of playgrounds should comply with the following Council requirements.

- Grade the site to produce a gentle fall (maximum 2 percent) towards the perimeter of the playground to



enhance drainage, particularly away from fall zones and areas of high traffic or activity. A shallow swale or low bund may be required at strategic locations around the playground to divert overland flow.

- Typical drainage treatment will include the installation of a robust plastic agricultural drain fitted with a filter sock around the outer edge and below the under surfacing area, with disposal to the stormwater system.
- Construct an extruded 200 x 200mm reinforced concrete edge around the perimeter of the playground under surfacing and fill the entire area with an appropriate impact attenuation material, in accordance with AS/NZS 4422. The edge must be set back at least 2.5 m from any item of play equipment to provide adequate circulation and maintenance space.
- All features within 1.0 m of the proposed playground such as seats should be incorporated within the boundary of the surfacing by at least 0.5 m, to enhance the aesthetics of the playground and for ease of maintenance of the park.
- Impact attenuation should be provided over the entire fall zone and circulation space around play equipment, as specified in the AS 4685 series, and/or by the equipment manufacturer.
- WCC does not support the use of sand as soft fall due to poor performance, hygiene and high maintenance requirements.

- Solid impact attenuation surfacing such as wet pour synthetic surfacing should be installed under swings, basket swings, slippery dip exits, fireman's poles, and at the entrance and exits of flying foxes. Coverage should extend the length and width of a flying fox unit.
- All finished grass and impact attenuation surfaces should be flush with the concrete edge and internal solid surfacing if applicable, to avoid trip hazards.

Left: Wet pour surface treatment under swings. 'Brickworks' Bulli

Above: Inclusive play features, Beltana Park Googong Queanbeyan

Shade

The siting of playgrounds and infrastructure such as seating should take into account the relationship to existing mature vegetation. Advanced stock of suitable tree species should also be planted to provide future shade around playgrounds. More permanent shade structures such as shade sails are often required over larger play elements in neighbourhood playgrounds.

Shade structures are not desirable within local playgrounds with a preference for shade from existing vegetation or supplementary advanced planting of shade trees.

*Natural shade to play spaces,
'Melaleuca Park' Jordan Springs Sydney*



5.2 Sportsfields

Objectives

The location and design of sportsfields is intended to encourage, promote and facilitate recreational pursuits in the community involving organised competitive sporting activities and games as well as informal recreation. Sportsfields of the West Dapto Urban Release Area must provide for the active (formal) sporting needs of the new population with the provision of sporting facilities such as AFL, soccer, rugby and cricket.

Sportsfield design and location must accommodate flooding and water management without compromising the open space and recreation functions. Sportsfields should be located outside the 10% Annual Exceedance Probability (AEP) flood extent. The fields should be available for play within 3 days after the rain event.

An internal and external pathway network for pedestrians and cyclists must be provided ensuring connectivity within the park and externally to residences and public transport.

The adjacent proposed residential housing must encourage passive surveillance by orientating the dwellings to overlook the open space and deter anti-social behaviour.

Requirements

Standard of Construction - sportsfield construction and layout must be in accordance with the Transport Canberra and City Services (TCCS) publication - 'Design Standards for Urban Infrastructure, 24 - Sportsground Design.'

Sportsfield design principles - the sporting fields are to be planned in consideration of the specific requirements of the relevant sport code such as field size, posts, nets, line markings and safety, in addition to the following points:

- Gradient of fields to be no greater than 2 percent slope.
- Orientation of the fields are to be between north and 15 degrees east of north depending on the particular code to be catered for.
- Provide supporting facilities appropriate to the standard of sportsfield.

*Neighbourhood Park
- West Epping Park,
City of Parramatta.
Image sourced from
City of Parramatta*



Fencing - Sportsfields should be fenced in accordance with the West Dapto Technical Manual, typically with a barrier fence separating road easement and active fields.

Goal Posts - Galvanised steel construction, with in ground sleeves.

Tree planting - sportsfield design must include significant shade tree planting with at least 30 percent of the off field areas of the park provided with natural shade.

Shelter - protection from dominant winds to improve spectator amenity must be provided wherever possible e.g. integrated tree planting to form wind breaks.

Utilities - sportsfields must be provided with all required utilities such as sewer, drainage and water and power connections.

Public amenities - an amenity block is required for Sports Field provision. Toilets with disabled access, showers and change facility must be provided as it is expected people will visit and stay in the park for extended periods. The

number of cubicles and size of change rooms is subject to an objective assessment of potential demand.

Passive surveillance - the majority of the park should be road frontage with activated edges to encourage passive surveillance on the frontages. In addition, the park design must include the provision of pathways and shared pathways within the park boundaries to improve passive surveillance within the park.

Signage - park signage must be as per the West Dapto Urban Release Area Open Space Technical Manual to define entries.

Emergency Access - sports park design must include provision for compliant emergency access.

Car parking - provide car parking within the park to facilitate off street parking for visitors.

Any new sportsfield application needs to be accompanied by an assessment of future visitor parking demand (prepared by a suitably qualified transport consultant), and must include the provision of public car parking to facilitate off

Integrated perimeter control and tree planting, Towradgi



Standard Dimensions for Sportsfields

(Note: spectator area excluded).

SPORT	PITCH DIMENSION	RUN OFF AREA	ROTATION AREA/ SUBSTITUTION BENCH
AFL	177x 155m	6m from pitch perimeter	5 x 5m
CRICKET	138 x 119m	6m from pitch perimeter	6 x 2m
FOOTBALL	110 x 68m	6m from pitch perimeter	5 x 5m
RUGBY UNION	144x 69m	6m from pitch perimeter	5 x 5m
RUGBY LEAGUE	122x 69m	6m from pitch perimeter	5 x 5m
TOUCH FOOTBALL	76x 50m	6m from pitch perimeter	5 x 5m

Table 2

Sourced from Gold Coast Planning Policy II:
Land Development Guidelines Section 6 - Open Space Requirements

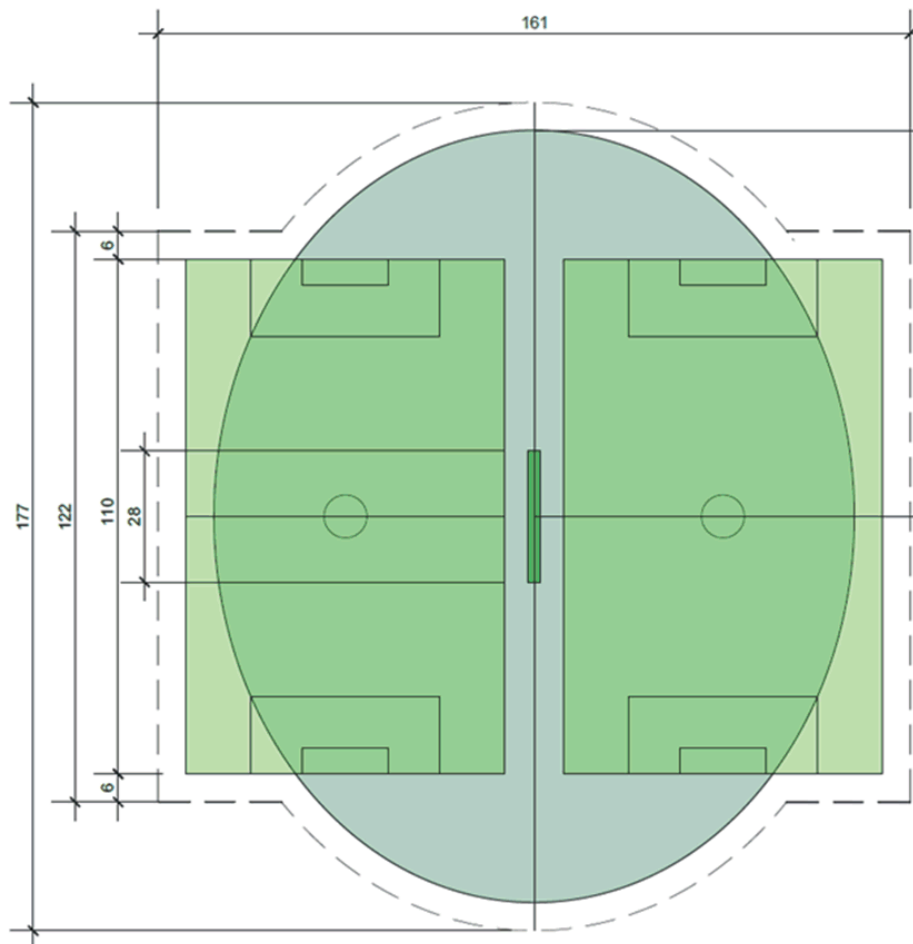


Figure 9
Typical layout
multi-sportsfield layout
for Cricket, AFL, and
Soccer: sourced from
Transport Canberra and
City Services (TCCS)
publication - 'Design
Standards for Urban
Infrastructure, 24 -
Sportsground Design

street parking for visitors.

As part of the visitor demand assessment the applicant needs to:

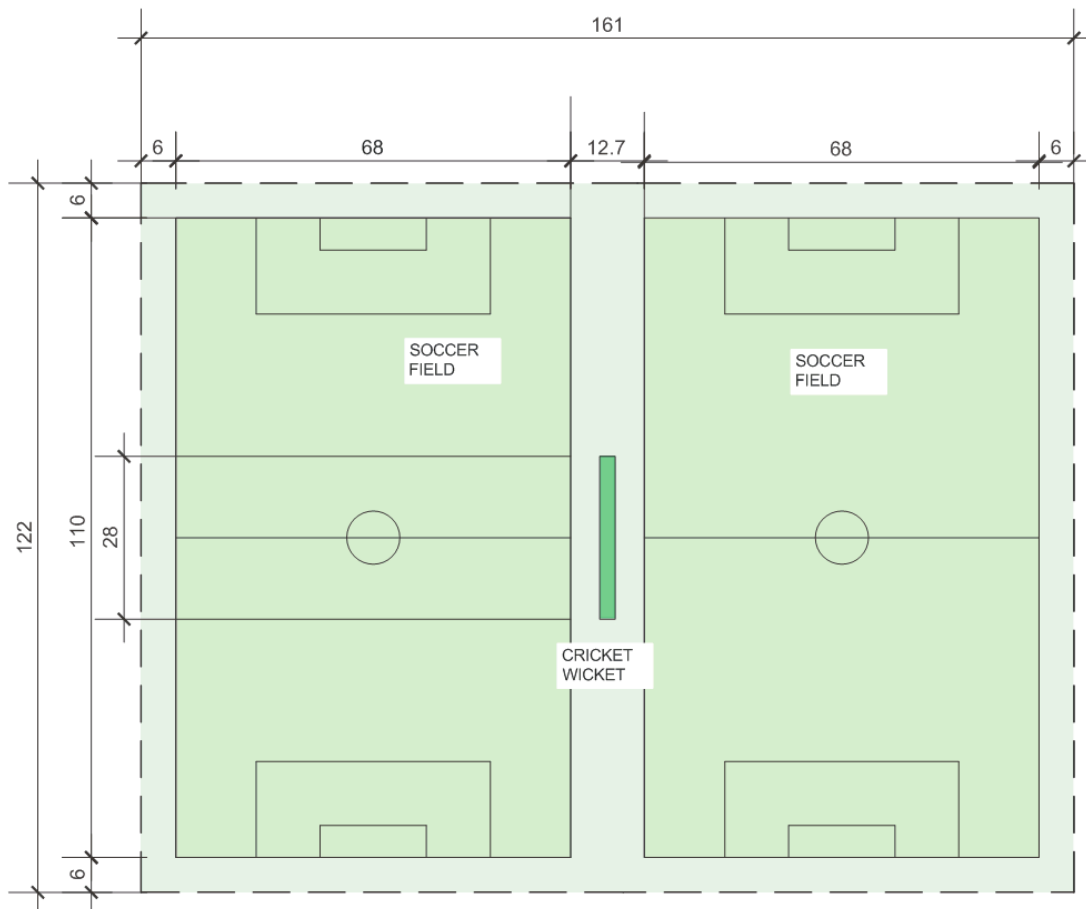
- Undertake a site-specific on-street car parking capacity survey to establish the number of available on-street and off-street 'public' car parking spaces within a 250 metre radius of the facility.
- Establish the projected weekend sportsfield car parking demand based on surveys of similar existing facilities during peak weekend operation (Saturday and Sunday during winter sport season).
- Provide details of public transport links (proximity of bus and rail stations).
- Provide details of pedestrian and cycling routes.
- Car park design must be in accordance with relevant civil design standards - AS2890 series.
- Disabled car parking must accord with AS2890.6 with the number of spaces

provided in accordance with BCA rates. These spaces must be located as close to the entrance of facilities as possible and be linked by an accessible path of travel as per AS1428.1.

- Car park design must include provision for buses.
- Car parking should not visually dominate the landscape and always incorporate substantial shade tree planting.
- Car parking must be linked to the pedestrian path networks within the park.
- A suitable number of bicycle racks to further encourage cycling must be provided. Bicycle racks must be located in areas with good passive surveillance.

Pathway networks - entry points and paths to internal key destinations such as sports fields and amenities must provide equitable access in accordance

Figure 10
Typical layout for dual use - Soccer and Junior Cricket Transport Canberra and City Services (TCCS) publication - 'Design Standards for Urban Infrastructure, 24 - Sportsground Design



with the Disability Discrimination Act. The pathway network should use different widths, path finishes and detailing to establish a clear hierarchy

Perimeter control - the park perimeter is to be furnished with a suitable barrier to define vehicle entry points, including maintenance and emergency access points.

Water supply - Sportsfields are to be provided with a compliant water supply to allow the provision of water for visitors and maintenance of sportsfields. In particular:

- Field irrigation water supply and irrigation system is required for sports grounds for maintenance. Explore opportunities for recycled water for sportsfield irrigation.
- Bubblers and water filling stations are required near play spaces and sportsfields where visitor use is high.

Lighting - sportsfields should comply with the appropriate Australian Lighting Standards, in particular:

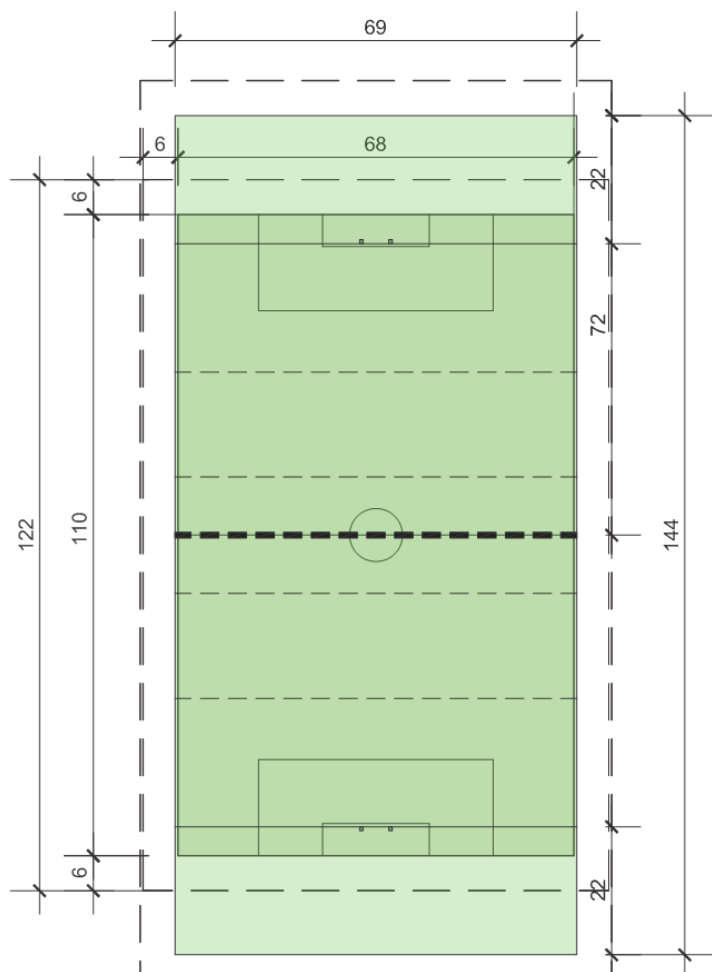
- Lighting to be provided to facilitate evening sports training and competition on sporting fields and pathway networks linked to car parking areas.
- Lighting design should consider illumination and spill requirements for functions, and the siting of light standards to enable free movement of specified mowing equipment.

Waste Requirements - consideration must always be given to the location of bins so that emptying can be undertaken as efficiently as possible, in particular:

- Bins should be located as close as possible to entrances and or road frontages of parks or high activity areas such as BBQ or picnic facilities.
- Bins should be located near a road or the perimeter of the open space to allow the bins to be serviced without the need to drive the collection trucks into the park.

Turf specification for fields - Kikuyu (*Pennisetum clandestinum*) installed as per West Dapto Open Spaces Technical Manual. Refer to sports turf detail.

Figure 11
Typical dual use layout for Rugby and Soccer



5.3 Open Space Frontages

Objectives

Good design of park perimeters is essential to activate the park and enable passive surveillance. The majority of the park should be road frontage to allow for passive surveillance.

Parks should have active edges with the provision of pathways or shared pathways to enable passive surveillance.

Requirements

- The majority of park perimeters must be surrounded by a road network with footpath or shared pathways with defined entry points.
- Neighbourhood parks must be located along a minor collector road with additional smaller order roads leading to car parking. Seventy-five percent (75%) of the neighbourhood park must have road frontage. No boundary to be less than thirty (30) metres.
- Local parks should have direct residential frontage with four road frontages.
- Residential dwellings should be oriented to allow passive surveillance.
- All park perimeters should be provided with a suitable barrier to define vehicle entry points including emergency and maintenance access.

Below left: Open space frontage treatment, Penrith NSW

Below: Internal pathway networks, Stuart Park Wollongong

- Street trees should be provided to the perimeter of all parks.
- Signage across Council's parks must be consistent and of a high standard. Messages should be consolidated to reduce visual clutter. Refer to West Dapto Urban Release Area Open Space Technical Manual.

5.4 Pathways

Objectives

All neighbourhood and local parks must be linked to the shared pathway network. Walking and cycling is a very important component of active transport in the West Dapto transport system to achieve a sustainable, healthy and active community. Creating attractive walking routes will contribute greatly to the health and vitality of communities.

A hierarchy of internal pathways should be developed to connect the park perimeter pathways to key features and facilities within the open space. At least one internal path should be Equal Access connecting to the main entry point and linking to key facilities in the park such as sportsfields, picnic areas, toilets and play areas.

Pathways should link to shared pathways in riparian areas and to the street network. Walking and running trails are permitted in natural areas subject to careful route mapping in consideration of high conservation areas, natural



landform, existing gradients, and points of interest. Trails should minimise impacts on existing landform and vegetation and other biodiversity values.

Tree planting should be integrated with pathway networks to provide shade and amenity.

Requirements

- All paths to be designed in accordance with WCC Civil Specification 2019.
- All concrete pathways shall have a minimum of 1500mm width.
- Utilise light and natural colours for pavement and surfaces to reduce heat absorption.
- The selection of planting adjacent to paths should be in consideration of Safety in Design Principles and not provide places of concealment.
- Trees should be offset from pathways to allow sufficient area for the root zone in consideration of the species and mature size.

Shared Pathways

Objectives

Active transport is achieved with the provision of convenient, connected, direct and attractive shared pathway networks between residences, schools, town and village centres, community facilities, parks and public transport nodes. The aim is to increase participation in all forms of cycling and walking by the development of safe, connected networks of shared pathways.

Site analysis of open spaces should map existing shared pathway and footpath networks. The parks need to connect to shared pathway networks to create safe and easy access to the park by bike, scooter or walking.

Neighbourhood parks should integrate the shared pathway network. The shared pathway network could be integrated into transmission easements, riparian areas and open space to create convenient pedestrian and cycle links that are safe, scenic and direct.

Shared path bridges are planned as part of the West Dapto Section Development contributions plans on major riparian corridors to allow direct linkages and maximise accessibility between precincts and land uses.

Requirements

Shared pathway networks must provide both connectivity within the proposed subdivision, and form part of the wider context of the West Dapto Urban Release Area active transport network.

- A site analysis should be undertaken mapping any existing or proposed shared path networks within the park's catchment area prior to commencement of shared pathway route planning.
- Shared pathway networks can be integrated into the riparian corridors to provide an off road cycle network.

Below: Shared pathway, Squires Way Wollongong

Bottom: Shared pathway adjacent to riparian area, Cordeaux Road Mt Kembla



- Utilisation of the riparian corridors can create pedestrian and cycle links that maximise accessibility between open spaces. Shared pathways should be located where possible outside the 10 percent Annual Exceedance Probability (AEP) flood extent.
- For any shared pedestrian footpath/ cycleway, a minimum 2.5 metre width is required and widened to 3 metres if the shared footpath/cycleway is adjacent to any embankment or structure.
- Fencing must be provided where required with safety fencing ie cycle rails.
- Where possible incorporate a level 0.6m shoulder (maximum cross fall of 2.5%) along both sides of a pathway. No planting should occur in this shoulder to create a safe and level run off area.
- All pedestrian footpaths or shared pathways / cycle ways should be designed in accordance with the requirements of Australian Standard AS 1428-2001. The maximum gradient for such pathways should be one in 14 with handrails, or 1 in 20 without, wherever practicable. The pathway should be constructed of concrete, except where varied by Council.
- Shared pathways should be designed in accordance with RMS NSW Bicycle Guidelines. These comprehensive guidelines assist in the planning and construction of high quality bicycle transport facilities in NSW including on-road and off-road facilities, intersection treatments, parking, line marking and signage. This document is to be read in conjunction with

Austrroads Guides part 6A: Pedestrian and Cyclist Paths, which prevails where there are differences between these two sets of guidelines.

- Provide end of trip facilities such as bubblers, water bottle filling station, seating and picnic facilities within parks.
- Provide bicycle parking at all parks.

Trails

Objectives

A trail is a component of the active transport network that is compatible with natural areas. Trail networks can facilitate activities such as walking, jogging and on trail cycling. The trail networks within a natural area should be planned around the high conservation areas, natural landform, existing gradients, and points of interest. Trails should minimise impacts on existing landform and vegetation and other biodiversity values.

Trails can also provide access to undertake maintenance in a natural area.

Requirements

- Trail construction materials can vary dependent on site conditions and anticipated uses.
- All walking trails should be in accordance with Australian Standard 2156.2:2001 - Walking Tracks Infrastructure Design. This standard specifies requirements for the structural design of walking track structures, to protect natural and cultural assets.



Concrete pathway adjacent to riparian area, Wongawilli

- Trail heads or trail access points must be visible. Trails should have good lines of sight.
- As part of the trail route design the applicant will be required to undertake a comprehensive risk assessment following CPTED principles.
- A hierarchy of trails should be determined with variable pathway widths dependent on function (with a minimum of 1.5m width). The width of a trail should respond to not only the hierarchy but also respond to natural features and vegetation.
- Trails should be designed to ensure that they are not significantly damaged in a storm event with a hard wearing surface preferred unless there is significant existing vegetation which may be impacted.
- Trails in natural areas, should incorporate long sweeping bends and meanders, with crests and gentle rises and falls, to create interest and assist drainage.
- Raised walkways and minor footbridges are permitted in natural areas in low-lying areas and areas of high environmental sensitivity. Materials for raised walkways and bridges must be durable, hardwearing and slip resistant. Structural components should be corrosion resistant such as galvanised steel and Fibre Reinforced Plastic (FRP). All boardwalks and pedestrian bridges to be designed in accordance with Australian Standard 2156.2:2001 - Walking Tracks Infrastructure Design.

Off Road Cycling Objectives

Open space designs should provide a safe and fun environment to allow for cycling. Mountain biking is a rapidly growing recreational activity in NSW and the riparian corridors of West Dapto provide a unique opportunity for both a formal shared pathway network and for on trail off road cycle network.

Trail networks for off road cycling within a natural area should be planned in consideration of high conservation areas, natural landform, existing gradients and points of interest. Trails should minimise impacts on existing landform, vegetation and other biodiversity.

Planning, design and management of off road cycling trails can minimise environmental impacts, provide a quality experience for riders to enjoy and appreciate open space, and minimise conflict between park users.

Requirements

- The Australian Mountain Bike Trail Guidelines for trail planning, design and construction should be utilised to create a sustainable mountain bike network. Off road bike tracks must be designed and constructed so that water flows are managed and riders and other users are contained on the tracks. This is crucial to reduce erosion, sediment travel, track widening and proliferation, vegetation damage, and associated maintenance requirements.

Left: Off road cycling trails, Mt Kosciuszko

Below: Off road cycling trails Wollongong



5.5 Car Parking

Objectives

Car parks should be located in areas which have natural surveillance from adjoining residential areas. Car parking within the park should not visually dominate and always incorporate substantial shade tree planting.

Car parking should be separated from dedicated play spaces so there is no conflict between vehicles and pedestrians.

Requirements

- Car park design within open space must comply with relevant civil design Australian Standards.
- Car parking within the park should not dominate the development and provide shade to a minimum of 50 percent of parked vehicles. This should be achieved by the provision of medians and planting beds within the car parks to allow for shade tree planting. Appropriate soil volumes must be provided in consideration of proposed stocking rate.

- Planting beds must have sufficient deep soil area for the trees to grow. The minimum dimension of the planting bed is 2.4 metres by 5.5 metres (one car space). If an elongated bed design is required, the minimum width of available soil is 1.5m.
- Pedestrian and vehicular movement is to be clearly separated by use of design devices such as kerbs, bollards and or fencing.
- Car parking must be linked to the pedestrian path networks of the park.
- Trees in car parks should be long-lived large canopy species that do not excessively drop branches or soft fruit that may damage vehicles.
- Car parking should incorporate water sensitive urban design principles.



Car Park and integrated shade planting. Stewart Street Wollongong

5.6 Public Art

Objectives

Public art as defined in the WCC Public Art Strategy & Guidelines is 'a broad term that refers to a range of sculptural installations in the public realm. Public art can be enduring in the form of iconic, stand-alone work and integrated artistic elements. Ultimately, public art embraces its environment, and helps create places that inspire investigation and interaction, and are enjoyable and meaningful in their own right'.

Public art can enhance open spaces by:

- creating a sense of place,
- enhancing and enriching our experience in a public space by representing the local history of the area,
- increasing amenity and activating the open space,
- providing a medium to educate on the culture and heritage of an area.

Public art is permitted in neighbourhood and district parks only, due to the long term maintenance costs of the work.

Requirements

Public artwork and design proposals must be submitted to be assessed by the Public Art Advisory Panel and comply with the following requirements to be considered for approval:

- The artwork should not portray or depict material in a way which discriminates against or vilifies a person or section of the community on account of race, ethnicity, nationality, gender, age, sexual preference, religion, disability, mental illness or political belief.
- The artwork must principally include the work of artists and art-forms or designers and should not contain advertising or promotional material for any other product or service.
- The artwork must be the original work of the submitter and must have obtained all necessary clearances and approvals for subjects or materials featured in the work.
- The artwork should not employ sexual appeal in a manner which is exploitative and degrading of any individual or group of people.



Public art Bald Hill
Stanwell Park

- The artwork should not present or portray violence unless it is justifiable in the context.
- The artwork should not use language which is inappropriate in the circumstances.
- Public art should be located offline from pathways to ensure they do not create a hazard.
- Items should not have any sharp edges that could be a hazard to people.
- Artworks should be designed to prevent finger and head entrapment.
- A maintenance report is required to be prepared by the artist at the end of the project addressing the following:
 - a description of the artwork (including digital images and the date of completion);
 - artist/artist team contact details;
 - completed list of construction drawings;
 - a maintenance schedule
 - an agreement relating to decommissioning of an artwork once it has reached its intended lifespan, has been damaged or destroyed, and is no longer safe;
 - the method of construction, the types of materials used and details of the fabrication company (if relevant);
 - any specific instructions or products to be used when cleaning and maintaining the artwork.

*BMX Pump track
(Barden Ridge). Image
sourced from Sutherland
Shire Council*



5.7 Skateboarding, Scooting & BMX

Objectives

Parks need to cater to the needs of both young and older children with the provision of facilities for skateboarding, scooting, roller blading, and BMX riding.

This section does not relate to the provision of formal skate facilities but to features and elements where skating, scooting and roller blading can occur without conflict with other open space users. BMX riding activities can be accommodated in separate BMX and pump tracks.

Requirements

All concrete pathways can be used for skateboarding, scooting and roller blading.

- Hard landscape elements such as concrete steps, ramps, retaining walls, and steps that are not intended as skate facilities should integrate skate deterrent devices.
- Skating, scooting and roller blading provisions should be located offline from where young children are playing. Surface treatment changes such as unit pavers can be integrated to define skate area.
- Skate specific forms and typical furniture such as wedge boxes and fun boxes can be integrated adjacent to pathway networks to address the needs.
- For design guidelines for BMX facilities refer to BMX (Sports Dimension Guide) - Department of Local Government, Sport and Cultural Industries (Gov of WA).

*Right: Skate feature,
Holborn Park Berkeley*



5.8 Park Furniture

Objectives

Open space furniture selection should be appropriate to the size, function and service of the open space. Parks should not contain an excessive amount of park furniture that results in an unsustainable maintenance cost to the community. For example, a local park would have minimal furniture whereas a neighbourhood park with a greater intensity of use may have a variety of park furniture such as multiple seating options, barbecues, and picnic tables with shelters, drinking fountains and bike racks.

The required provision of furniture and amenities within the park hierarchy is detailed in the West Dapto Open Space Technical Manual – Furniture.

Requirements

- All specifications for park furniture are detailed in the West Dapto Urban Release Area Open Space Technical Manual. Below are some examples of requirements needed.
- Seats should be provided at regular intervals and at points of interest such as play spaces and sporting fields. Seats should be offset from the trail so as not to affect the path of travel. Refer to Open Space Technical Manual for seat specification.
- Seats are to be constructed on an extended concrete pad to allow for wheelchairs, prams, walkers etc. Seats are to be positioned with a continuous accessible path of travel where possible.
- Tree planting should be positioned to complement seat positions to maximise shade.
- Picnic nodes (picnic table with shelter) should be located adjacent to places of special interest, and to complement, and enhance other recreational opportunities in the park. The picnic node must have accessible pedestrian paths from adjoining car parks and roads.
- Within a neighbourhood park, electric barbecues are generally provided as part of a picnic node and must be covered by a shelter.



Picnic shelter, Sheaffes Road Kembla Grange

5.9 Lawn Areas

Objectives

Grass areas provide opportunities for formal and informal recreation in open space. Grass areas should be as large as possible to create functional and flexible spaces to suit a large array of recreational activities.

Requirements

- Informal grass areas for ball sports or unorganised sport should be a minimum dimension of 60m long x 40m wide.
- Lawns should generally be kept clear of furniture elements such as signs, seats, lights, bins.

- Trees in lawns should be spaced to allow ease of mowing and be planted with a maintained 1.5m radius mulch ring where no edge is specified.
- The gradient of lawn areas proposed for informal kick about areas should have a slope of less than 6 percent and greater than 2 percent to allow for surface drainage and safe ball play.
- The maximum slope of turfed areas in public open spaces is to be to be 25 percent to ensure the safety of individuals carrying out maintenance. Areas with slopes steeper than 25 percent must be treated as a mass planting bed and may need stabilisation with a geo fabric.
- Stones, sticks and roots should be removed from all soil profiles.
- Turf areas should have a minimum of 100mm depth of top soil.
- For lawn species and construction details refer to West Dapto Open Space Technical Manual.

5.10 Mass Planting Beds

Objectives

Mass planting beds are defined as a mulched area that is densely planted. Mass planting beds in open space should be minimal and be relative to the size, function and service of the public open space. For example, a local park would have minimal to no mass planting beds whereas focal areas of a neighbourhood park with a civic space may benefit from appropriately sized mass planting beds.

In riparian zones mass planting beds will form part of the re-establishment of the original riparian vegetation community and therefore may be of considerable size dependent on the order of the stream being revegetated.

Although mass planting beds can be an important amenity improvement in the right location, the priority for open space upgrades should always be the establishment of canopy trees, groups of trees and feature trees.

All vegetation established in or around any open space shall be located to maximise passive surveillance opportunities, maintain clear lines of sight and avoid the creation of concealment areas.

Requirements

- Areas with slopes steeper than 25 percent must be planted as a mass planting bed or constructed with materials specifically designed to stabilise the slope.
- All planting areas are to be prepared to a minimum depth of 300mm and free of weed species. This may require the importation of planting mix or a mixture of weed free site soil and soil conditioner.
- If planting areas are required, the garden beds should not be narrower than 750mm for grasses only, and 1500mm for a mix of trees and grasses.
- Planting beds should have hard and robust masonry construction edges installed. The edging should be straight, or with long sweeping curves with no acute angles, which would require hand mowing.
- Planting beds should comprise a mix of native canopy trees, groundcovers and grasses.
- Plants shall comply with AS 2303:2018 be healthy, of good form and be true to species and size. They must be free from pests and disease, and shall not be root bound.
- Advanced trees and grasses are to be planted in good quality soil and humus. The planting hole shall be twice the width and the same depth as the plant container.
- Any sites adjoining any natural areas or creek lines with native vegetation must use locally indigenous species (no cultivars) in the landscape plan and must have regard to any impacts of water flows and flooding.
- Planting selection should be based on a weeds risk assessment to prevent the dispersal of inappropriate species into natural areas.
- Mulch for all planting areas shall be hardwood chip mulch. Mulch is to be free of weed material and seed, debris and foreign matter. The contractor shall spread a 75mm thickness of approved mulch on all mass planting beds and 75mm thick mulch ring around all trees in lawn areas. The stems of all plants shall be kept free of mulch to protect the stem from possible rot.

5.11 Water Supply

Objectives

Open spaces must be provided with a water supply to allow the provision of water for maintenance of landscape areas as well as provision of water for bubblers. Taps should be provided in a park to allow the cleaning of infrastructure and the maintenance of turf and planting areas.

Bubblers and water filling stations are also required near play spaces and active recreation nodes where it is expected that people stay longer.

Water supply for irrigation of sportsfields should be obtained from sustainable sources such as recycled or harvested water supplies.

Requirements

- A minimum size of 25mm water service connection is required at the park boundary with a water meter and at least one vandal proof water tap.
- Taps should be located near the edge of the landscaping and turf to be maintained. The tap should not interfere with maintenance activities such as grass mowing.
- Taps to be placed in fifty (50) metre intervals.
- Water supply connections should be located within twenty five (25) metres of a maintenance vehicle access point.
- All water provided from Council's reticulated water supply system shall be metered and all irrigation systems shall comply with the back-flow prevention requirements of AS3500 Plumbing and Drainage - Part 1. Locate water supply connections and back-flow prevention devices away from public access points adjacent to other park infrastructure or within landscape beds where possible.
- Bubblers should be provided in parks in key locations, on shared pathway networks and near play spaces and active recreation nodes where visitor use is high.
- A dog drinking bowl must be added to bubblers in proposed dog parks.

5.12 Fencing And Barriers

Objectives

Wherever possible, the need for fencing should be designed out of open space proposals. However, there may be special circumstances where fencing or barriers may be required, such as along road frontages of a park to prevent illegal vehicle access to open space or natural areas, or to provide protection from potential hazards such as permanent water bodies.

As detailed above, play space design should avoid the need for fencing by careful planning and placement of the play environment wherever possible.

The type of fence or barrier to be provided in open space should be consistent with the park type and existing site characteristics. Fencing must be robustly constructed and made from durable materials with high quality finishes that minimise maintenance requirements.

Requirements

- Fence rails and the tops of bollards should be generally installed following the overall slope of the land, without minor dips and bumps.
- Vehicle barriers are to be installed along the perimeter of natural areas, along road frontages and near public entrances and facilities. Refer to the West Dapto Technical Manual for a range of appropriate fence types.
- Barrier materials to control and define the entry points into natural areas should be as simple and robust as possible, such as quarry sawn sandstone 'logs', timber railing fences, bollards, or galvanised pipe and timber posts as detailed in the Open Space Technical Manual.
- Designated access gates to be provided for emergency and maintenance vehicles as detailed in the Open Space Technical Manual.
- Ensure that fencing adjacent to riparian areas does not result in the undesirable obstruction of the free flow of floodwaters, or obstruct the connectivity and movement of fauna along riparian corridors.

- Fencing is required where there is a danger of children gaining access to high risk areas (eg around stormwater drain head walls, outlets and stormwater quality improvement devices) or where the drop height exceeds 1.0m. Fencing to be installed in accordance with stormwater design best practice and relevant standards. Refer to the West Dapto Urban Release Area Open Space Technical Manual for a range of appropriate fence types.
- A safety fence is permitted when play elements are less than 20m from the road frontage, shared pathway or water body.

only be permitted in special circumstances such as to achieve accessible paths of travel or to retain the natural ground levels around significant vegetation.

Requirements

- Retaining walls over 1000mm high are to be designed and certified by an experienced chartered structural engineer and will require safety fencing.
- Retaining walls must be constructed with low maintenance high quality, durable materials. In this regard, masonry and stone walls are preferred as retaining structures.
- Boulder walls may only be constructed where natural stone is a feature of the site and the retaining walls are less than one metre in height.
- Timber retaining walls are not acceptable.

5.13 Retaining Walls

Objectives

Wherever possible, the need for retaining walls should be designed out of open space proposals. Retaining walls will



Retaining Wall, Bulli

5.14 Dog Parks

Objectives

The term 'dog park' is generally given to designated fenced dog off leash areas that contain a variety of landscape features and/or equipment that offer different activities and experiences for dog owners and their dogs. They are defined areas which offer a safe and controlled environment for dogs to play, socialise, interact and exercise with other dogs and their owners. Dog parks can contribute to enhancing social connectivity and improving community health. The provision of dog parks may also reduce impact on sensitive natural habitats by the creation of purpose built facilities.

The Companion Animal's Act 1998 states that dogs under effective control of a companion person are allowed in open space. Under the Act, dogs are not allowed within 10m of children's play equipment and in areas specifically prohibited by Council.

Dog parks must be located where people want to go, where people will feel safe, where natural surveillance is achieved through passing cars and/or foot traffic, and a site that is not within 50 metres of residential houses.

The design and detailing of dog exercise embellishments should blend in and complement the landscape quality of the space.

Requirements

- Minimum area required for a fenced dog park is 0.25 to 1.0 hectares.
- Dog parks must not be placed in close proximity to children's playgrounds.
- Dog parks cannot be co-located with formal sportsfields.
- The site must have car parking options.

Dog exercise areas should have the following features as a minimum:

- The installation of double gate systems to allow people to enter/exit the facility easily with their dogs not being able to run away. The entry point must be treated with a hard surface such as concrete;



Dog exercise equipment

- The installation of two entrance points to allow people to enter/exit without conflict if encountered;
- provision of a 1.2m high perimeter fence with tree planting to create natural shade around the perimeter;
- seating for visitors;
- waste bins at each entry point;
- a maintenance access gateway;
- a water service to allow for the provision of water for dogs and owners with water fountains and dog bowls;
- regulatory signage;
- open ball play area;
- dog agility equipment.

5.15 Waste Collection

Objectives

Bins should be located as close as possible to entrances and or road front-ages of parks, or high activity areas such as BBQ or picnic facilities. Bins should be located near a road or the perimeter of the open space to allow the bins to be serviced without the need to drive the collection trucks into the park.

Bins shall not be provided in natural areas.

Requirements

- Consideration must always be given to the location of bins so that emptying can be undertaken as efficiently as possible.
- Provide a dispenser for dog waste bags on all bins at neighbourhood parks.
- Bins generally should be positioned offset from a pathway network on a concrete base with a minimum dimension of 1.2 x 1.2m in close proximity to either an entry point or an area of high activity.
- 240 litre size wheelie bins to be used with or without enclosure, depending on type of park.
- Refer to the West Dapto Open Space Technical Manual for specifications for waste bins.

5.16 Transmission Easements

Objectives

Transmission easements primary function is the distribution of power, however they can provide important links between the open space networks. Transmission easement areas should be accessible to the public where possible with the integration of pedestrian/cycle linkages.

Site analysis of open spaces should map existing shared pathway and foot-path networks and plan to integrate a safe and easy access to the park by bike, scooter or walking through the transmission easement where possible.

Permitted uses and requirements for treatment of transmission easements vary. Professionals involved with the development, planning, design and integration of transmission easement in

open space must consult with electricity service providers.

A general guide of permitted activities is as follows:

- grazing;
- water storage dams, subject to sufficient clearances from conductors and towers;
- non-metallic fences up to three metres in height. Metallic fences, or fences incorporating metallic materials, must be suitably earthed and sectionalised, and are subject to approval by electricity service providers;
- dog exercise could be considered in transmission easement areas where there is good access and parking.

Requirements

The following guidelines apply:

- Pedestrian paths should connect to adjacent open space pathways and shared pathway networks;
- At least one key path must be provided for each transmission easement area;
- When a more complex path network is proposed the design should use different widths to establish a clear hierarchy. Minimum clear footpath width of 1500mm.

5.17 Signage

Wollongong City Council follows the guidelines of the NSW Geographical Names Board (GNB) for the assignment of names to parks, sportsgrounds, and natural areas within the Wollongong Local Government Area. Council will consider the naming of parks, sports-grounds, natural areas and general community use lands (including features within those) based on the following:

- names of Aboriginal origin and Indigenous significance to the local area;
- botanical reference native to the area;
- historical or cultural significance to the local area;
- geographical relevance of the immediate area;
- a person's name or
- a group – charitable, social/cultural community.

Below: Large interpretive signage 'Purrungully' West Dapto



It is acknowledged that the GNB's primary directive is to give precedence to the use of names of Aboriginal origin associated with the feature or a name with an historical background in the area of the feature. Council will utilise these long standing practices wherever possible.

Signage across Council's parks needs to be consistent and of a high standard. Messages should be consolidated to reduce visual clutter. Refer to the West Dapto Open Space Technical Manual for specifications.

Below and bottom: Small interpretive signage examples, Endeavour Drive, Wollongong



6.0 SUBMISSION REQUIREMENTS

Requirements for submission of Landscape Concept plans to Wollongong City Council when seeking approval for a subdivision development application, which contains open space:

- **Site Analysis plan** - shows relationship of the open space to the development as well as its relationship to the surrounding open space network and original neighbourhood or precinct plan. Connectivity must be shown to shared pathway networks and linkages to key destinations such as town and village centres, community facilities, schools and public transport.
- **Open Space inventory** - assessment of the existing and planned recreational facilities in the surrounding neighbourhood precinct.
- **Landscape Plan** - Refer to Chapter E6: Landscape for Lodgement of a Landscape Plan. A statement from both a registered landscape architect and civil engineer that the proposed open space design complies with the West Dapto Open Space Design Manual.
- **Arboricultural Impact Assessment (AIA) report** - to cover existing vegetation. Arborist report must correlate the cut and fill plans with proposed trees to be retained and removed.
- **Flooding impacts on proposed open space** - mapping of flood impacts on proposed open space. For example sportsfields are to be located outside the 10 percent AEP flood extents and are available year around for competition play except during the flooding event.
- **Formal and Informal recreation** - concept designs must demonstrate the achievement of an equal split of active (formal) and passive (informal) play.
- **Vegetation Management Plan** - a VMP must be provided to cover riparian areas and areas of remnant / regrowth vegetation.

7.0 DEFINITIONS

Active (formal) open space

As defined by Greater Sydney Commission 'Active open space is land set aside for the primary purpose of formal outdoor sports for the community. Active open space supports team sports, training and competition'.

Passive (informal) open space

Is land set aside for parks, gardens, linear corridors, conservation bushland and nature reserves. These areas are made available for informal recreation, play and physical activity. Examples of passive (informal) recreation are cycling, exercise stations, running, walking, play spaces, sitting and picnicking.

Consulting Arborist

An arborist qualified to be consulted in the preparation of subdivision documentation must have achieved an AQF Level 5 (or equivalent) qualification.

Dog park

The term 'dog park' is generally given to designated fenced dog off leash areas that contain a variety of landscape features and/or equipment that offer different activities and experiences for dog owners and their dogs.

Landscaped area

A landscape area is a part of a site used for growing plants, grasses and trees which does not include any building, or hard paved area.

Natural areas

Natural areas are reserves created to protect the ecological biodiversity and habitat values of the land, the flora and fauna of the land, and other ecological values of the land. Natural areas include riparian environments and remnant, regrowth and restored bushland. Natural areas protect the aesthetic, heritage, recreational, educational and scientific values of the land. The management of the natural area protects and enhances the values and quality of the land and facilitates public enjoyment of the land with measures directed to minimising or mitigating any disturbance caused by human intrusion.

Public Art

Is defined in the WCC Public Art Strategy & Guidelines 'Public art is a broad term that refers to a range of sculptural installations in the public realm. Public art can be enduring in the form of iconic, stand-alone works and integrated artistic elements. Ultimately, public art embraces its environment and helps create places that inspire investigation and interaction, and are enjoyable and meaningful in their own right'.

Remnant vegetation

Any patch of native vegetation around which most or all of the native vegetation has been removed.

Shared pathway

A concrete or paved path, which is a shared pedestrian/cycleway with a minimum width of 2.5 metres designed in accordance with the requirements of Australian Standard AS 1428-2001 and WCC Civil Specification 2019.

Trail

A trail is usually a path or track to facilitate activities such as walking, jogging and on trail cycling. Trail construction materials can vary from compacted natural ground or compacted gravel to asphalt and concrete.

Tree Protection Zone

The Tree Protection Zone (TPZ) is defined as the optimal distance from the trunk of a tree that should be maintained free of development and construction activity in accordance with AS4970-2009 in order to protect the tree and keep the tree viable.

Urban Greening

Is strategically increasing the quality and quantity of all vegetation in open green spaces and on all land types in an urban setting with a particular emphasis on the increase of canopy cover.

Universal Design is the process of designing for everyone. It is the "design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation and specialised design", Ron Mace, 1997.

Vegetation Management Plan (VMP)

A VMP is a map-based report to assist the landowner to manage a site to ensure that biodiversity on the site is protected, maintained and enhanced.

Amendments

The following table summarises the changes in the document since the last version on exhibition August 2019.

Amendment Sequenced No.	Key Topic Addressed in Amendment	Amendment Location	Author Initials	Amendment Date
1	A change to text to update name of Contribution Plan	Page 4	DP	October 2019
2	Change to text in park frontage requirements	Page 10	DP	October 2019
3	Change to text in local park frontage requirements	Page 14	DP	October 2019
4	Change to text to refine requirements in conservation areas	Page 16- 17	DP	October 2019
5	Change to note in cross sections referencing APZ constraints	Page 20-22	DP	October 2019
6	Change to text to clarify timing of street tree planting and subgrade preparation	Page 26	DP	October 2019
7	Change to Tree planting in open space to include reference to fruit trees and bush tucker	Page 27	DP	October 2019
8	Change to requirement for Sportsfields for scoreboards	Page 35	DP	October 2019
9	Change to car requirements	Page 36	DP	October 2019
10	Change to text to clarify location of bicycle racks	Page 38	DP	October 2019
11	Change to text to clarify requirement for irrigation system for Sportsfield	Page 38	DP	October 2019
12	Reference added for Sport Turf Detail	Page 39	DP	October 2019
13	Addition of text in pathway requirements to clarify pavement colours	Page 41	DP	October 2019
14	Change to reference to Development Contributions	Page 41	DP	October 2019
15	Change to image of Off Road cycling	Page 43	DP	October 2019
16	Change image of tree planting in car parking	Page 44	DP	October 2019
17	Change to description of type of mulch in mass planting beds	Page 48	DP	October 2019
18	Change to text to locations of dog parks	Page 51	DP	October 2019

NOTES

WEST DAPTO OPEN SPACE DESIGN MANUAL



WEST DAPTO OPEN SPACE TECHNICAL MANUAL



Document Revision Status

Author	Revision No.	Review	Date Issued
D. Pollock	Draft A	A. Goldie	2/4/19
D. Pollock	EMC Draft	A. Goldie	7/6/19
D. Pollock	Draft for Council	A. Goldie	20/6/19
D. Pollock	Final- Post exhibition	A. Goldie	25/10/19

OPEN SPACE TECHNICAL MANUAL

INTRODUCTION

This manual will be a controlled document that will be updated regularly in line with the changes in maintenance requirements, construction technology, and advances in environmentally sustainable design as experienced by the managing authorities.

Professionals involved with the development, planning and design of open space within the West Dapto Urban Release Area (WDURA) should in all cases also consider the specific qualities, technical requirements and existing site features of each design. The Open Space Technical Manual establishes a series of generic design materials, finishes, and performance standards to be used in open space design. Site specific character and constraints will also influence the design to give each individual space a particular character.

This manual provides technical specifications to ensure that all elements proposed in developments integrate quality design and apply consistent standards of infrastructure within open space that are required to adhere to and facilitate the delivery of, the West Dapto Vision and in line with Council's open space requirements.

Enquiries regarding this document may be directed to the Council's Landscape Architecture Section on telephone number (02) 4227 1111.

The following tables provide a list of the various infrastructure required to be provided in open space to achieve a consistent level of treatment to the type of park and associated service level of maintenance.

OBJECTIVES

Maintenance Costs

Open space and park infrastructure must be easy to maintain and financially sustainable. The level and nature of infrastructure required or considered appropriate will depend on Council's determination of the open space hierarchy, function and service (refer to tables below). Careful design and planning is required to ensure sustainable ongoing maintenance costs and achieve long lifecycles.

Materials and furniture items within an open space that are difficult to maintain and difficult or costly to replace can have a significant impact on the aesthetics, function, and the long term maintenance costs of a park. Materials should be hard wearing, and vandalism and graffiti resistant.

Durability

The West Dapto Planning principle for infrastructure is to utilise robust and durable materials with high quality finishes that minimise maintenance requirements and discourage vandalism.

Tree planting

The tree planting specifications detailed in Table 5 below recognises the importance of establishing street trees as part of the Urban Greening of the West Dapto Urban Release Area. Street trees improve the amenity and quality of city streets in measurable ways such as reduction of dust, glare and temperature extremes. In addition, trees improve streetscapes in more subtle ways that improve the visual quality of the street which is frequently reflected in higher property values.

Due to the importance of the streetscape, it is vital that correct stock is selected and correct methods of planting are applied, as per the details and specifications contained within this document.

Amenity and Security

Streets and open spaces must be safe, convenient and comfortable pedestrian spaces that cater to the needs of all users. The design of the open space should provide equal access for all users, such as pedestrian crossovers, and the choice of paving and street furniture should meet slip resistance and access codes. Design for pedestrian amenity should maximise the actual and perceived sense of safety in open space. Active use of all spaces and passive surveillance of streets and open space should be encouraged, particularly at night, in line with Safer by Design principles and in accordance with Crime Prevention Through Environmental Design (CPTED).

Codes and Standards

All infrastructure construction works, including hard and soft landscape material and workmanship must be in accordance with the relevant Australian Standards and Building Codes of Australia, and Wollongong City Council Standard Engineering drawings where applicable.

The Open Space Technical Manual outlines the soft and hard landscape treatments for inclusion in the Landscape Plans and other information in support of a Development Application for a subdivision in The West Dapto Land Release Area (WDURA).

HOW TO USE THIS MANUAL

The following tables provide a list of the various infrastructure to be provided in the park hierarchy to achieve a consistent level of amenity provision and associated service level of maintenance.

OPEN SPACE HIERARCHY PARK TYPE & INFRASTRUCTURE							
TABLE 1 – PARK FURNITURE							
PAGE	ITEM	LOCAL PARK	NEIGHBOURHOOD PARK	NATURAL AREA	TRANSMISSION EASEMENT	DOG PARK	TOWN CENTRES
11	S1 Seat	X	X	X	X	X	
12	S2 Bench	X	X	X	X	X	
13	S3 Seat						X
14	S4 Bench						X
15	S5 Picnic Setting		X				X
16	PS1 Picnic Shelter	X	X				
17	PS2 Picnic Shelter	X	X				
19	PS3 Large Picnic Shelter		X				
21	PS4- BBQ Shelter		X (optional)				
22	BBQ		X (optional)				
23	GB1 – Bin Post Mount	X				X	
24	GB2 – Bin Enclosure		X				X
25	TAP	X	X			X	X
26	BU1 - Bubbler	X				X	
27	BU2/BU3 Equal Access Bubbler		X				X
28	BR – Bike Rack	X	X				X
28	BR2 – Post mounted Bike Rack						X
29	B1 – Timber Bollard		X	X	X		
30	B2 – Stainless Steel Bollard		X				X
31	B3 – Removable Bollard	X	X				X
32	B4 – Sandstone Log	X	X	X			

OPEN SPACE HIERARCHY PARK TYPE & INFRASTRUCTURE							
		TABLE 2 - OPEN SPACE FENCING REQUIREMENTS					
PAGE	ITEM	LOCAL PARK	NEIGHBOURHOOD PARK	NATURAL AREA	TRANSMISSION EASEMENT	DOG PARK	TOWN CENTRES
33	F1 - Single rail timber barrier.	X	X	X			
34	F2 - Vehicle access control			X			
35	F3 - Sports Field Fencing		X				
40	F4 - Play Space fencing						
41	F5 - Safety Fencing		X				
42	F6 - Dog Park Fence					X	
44	G1 - Boom Gate	X	X	X			

OPEN SPACE HIERARCHY PARK TYPE & INFRASTRUCTURE							
TABLE 3 – PATHWAY & PAVEMENT REQUIREMENTS							
PAGE	ITEM	LOCAL PARK	NEIGHBOURHOOD PARK	NATURAL AREA	TRANSMISSION EASEMENT	DOG PARK	TOWN CENTRES
45	Decomposed Granite Path			X			
46	Raised Walkways		X	X			
47	Asphalt Pathway			X			
48	Broom Finished Concrete Pavement	X	X	X	X	X	X
49	Coloured Honed Concrete Pavement		X				X
50	Unit Paving		X				X
51	Softfall	X	X			X	X

OPEN SPACE HIERARCHY PARK TYPE & INFRASTRUCTURE							
TABLE 4 – PARK SIGNAGE							
PAGE	ITEM	LOCAL PARK	NEIGHBOURHOOD PARK	NATURAL AREA	TRANSMISSION EASEMENT	DOG PARK	TOWN CENTRES
53	PS1 – Park Name/ Ordinance	X	X	X		X	X
54	PS2 – Trail Marker	X	X	X		X	X
55	PS3 – Small Interpretive Sign	X	X	X			X
56	PS4 – large Interpretive Sign		X	X			X

OPEN SPACE HIERARCHY PARK TYPE & INFRASTRUCTURE						
TABLE 5 – LANDSCAPE DETAILS						
PAGE	ITEM	LOCAL PARK	NEIGHBOURHOOD PARK	NATURAL AREA	DOG PARK	TOWN CENTRES
58-59	Tree Species List	X	X		X	X
61	Street Tree Planting Detail	X	X		X	
62	Street Tree with guard Detail					X
63	Tree Planting with Mulch Ring	X	X		X	
64	Street Tree Planting in coal/clay	X	X	X	X	
65	Tree Planting With Edging	X	X		X	
66	Mass Planting Detail	X	X	X		X
67	Turf Detail	X	X		X	X
67	Sports Turf Detail		X			

PARK FURNITURE

S1 - Seat

LOCATION:

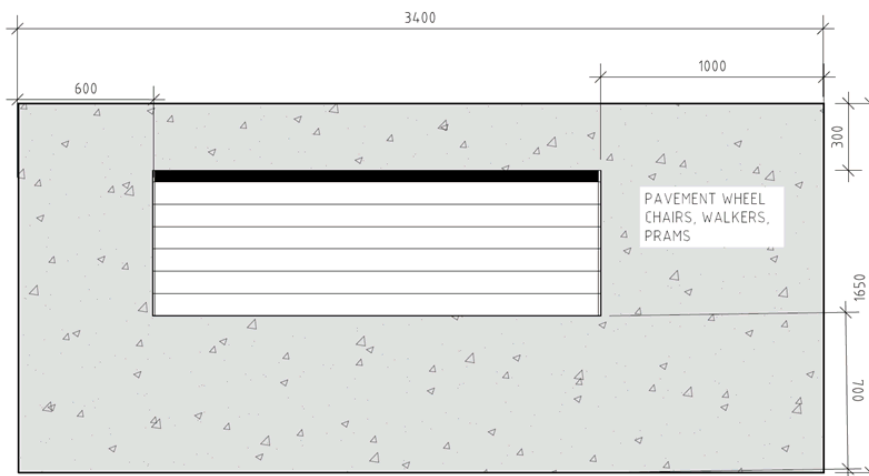
- Natural Areas, Dog Park, Transmission Easements, Local Parks, Neighbourhood Parks.

INSTALLATION:

- Concrete base slab. 3.4m x 1.65m

SPECIFICATION:

- Model: Gossi Park 'Parkway Seat' © or approved equal with armrests with skate guards.
- Frame: Die Cast legs: Powder Coated in standard Dulux colour range (Citi Pearl)
- Batten: Clear anodised aluminium planks, cast aluminium frame.
- Leg type: flange leg surface mounted
- Size: 1800mm long



S1 SEAT

PLAN NTS

PARK FURNITURE

S2 – Bench

LOCATION:

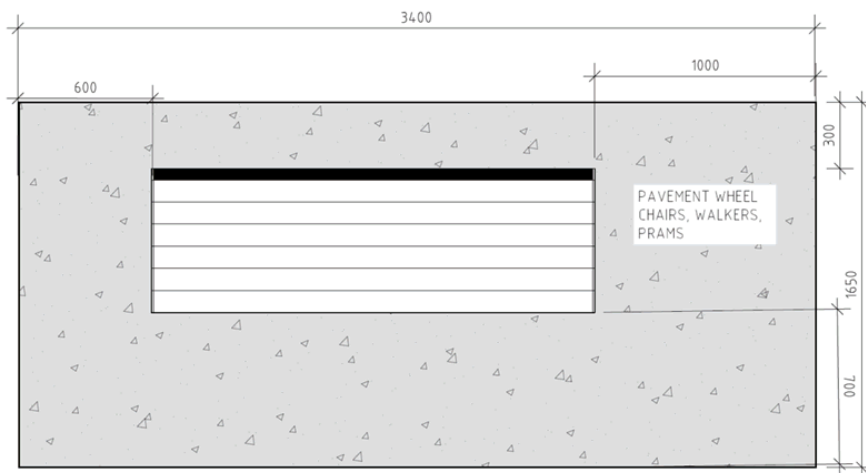
- Natural Areas, Local Parks, Neighbourhood Parks.

INSTALLATION:

- Concrete base slab. 3.4m x 1.65m.

SPECIFICATION:

- Model: Gossi Park 'Boulevard Bench' © or approved equal fitted with skate guards.
- Frame: Die Cast legs, Powder Coated in standard Dulux colour range (Citi Pearl).
- Batten: Clear anodised aluminium planks, cast aluminium frame, cast aluminium frame.
- Leg type: flange leg surface mounted.
- Size: 1800mm length.



S2 BENCH

PLAN NTS

PARK FURNITURE

S3 Seat

LOCATION:

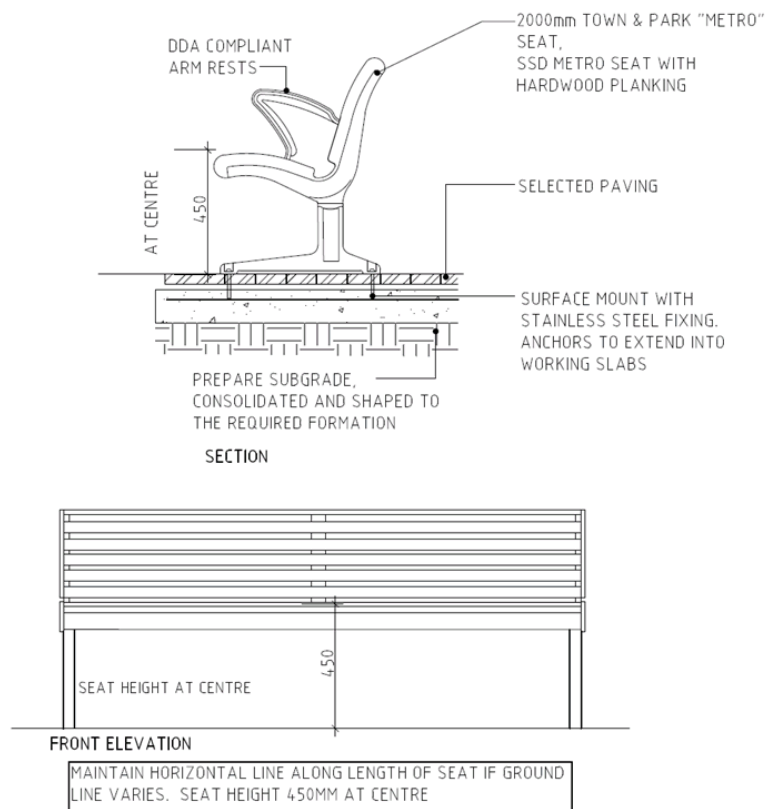
- Town, Village Centres.

INSTALLATION:

- Surface mounted on unit pavers on concrete base slab.

SPECIFICATION:

- Model: Town and Park Metro Seat with armrests and skate guards by Stoddart © or approved equal.
- Frame: Cast aluminium.
- Battens: oiled Forest Stewardship Council (FCR) certified hardwood timber planks or approved equal.
- Size: 2000mm length.
- Leg type: leg foot surface mounted.



S3 SEAT

SECTION & ELEVATION

NTS

PARK FURNITURE

S4 Bench

LOCATION:

- Town Centres, Village Centres.

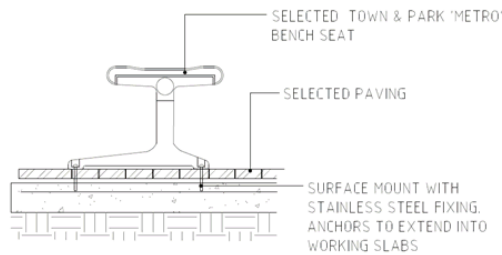
INSTALLATION:

- Surface mounted on unit pavers on concrete base slab



SPECIFICATION:

- Model: Town and Park Metro Bench by Stoddart © or approved equal with and skate guards.
- Frame: Cast aluminium frame.
- Batten: oiled Forest Stewardship Council (FCR) certified hardwood timber planks or approved equal.
- Leg type: leg foot surface mounted.
- Size: 2000mm long.



S4 BENCH SEAT

SECTION

NTS

PARK FURNITURE

S5 Picnic Setting

LOCATION:

- Town Centres, Neighbourhood Parks

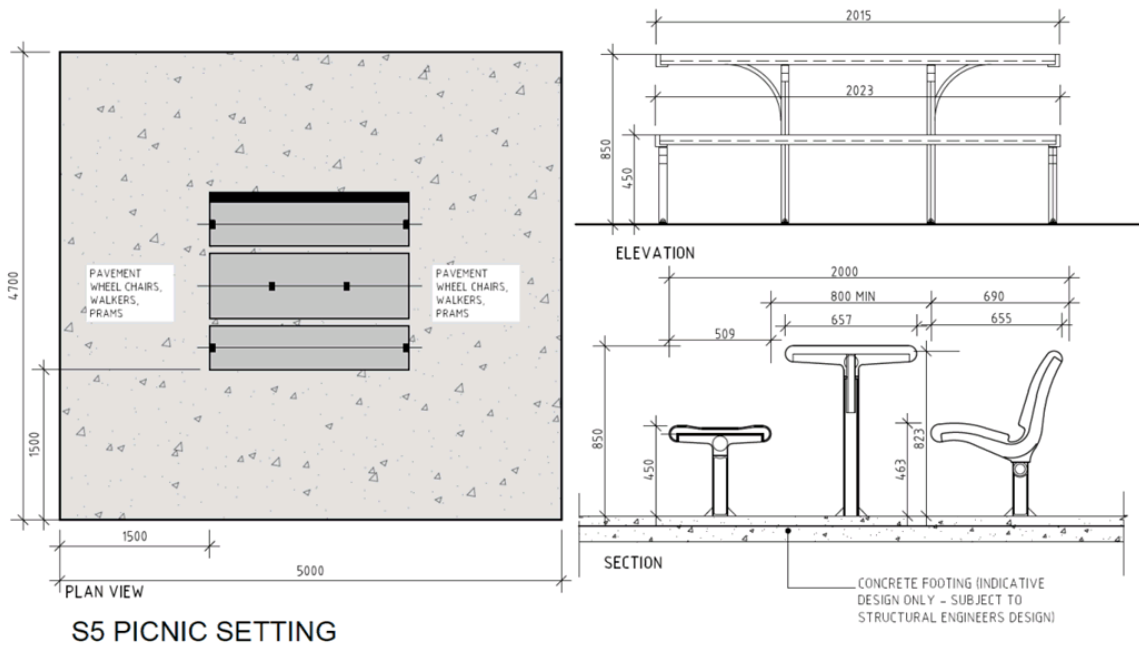
INSTALLATION:

- Unit pavers or coloured concrete base slab. 4.7m X 5m



SPECIFICATION:

- Model: wheelchair accessible Town and Park 'Metro' picnic setting by Stoddart © or approved equal. One (1) 'Metro' Seat and one (1) 'Metro' bench.
- Frame: Cast aluminium frame.
- Table Battens: Clear anodised aluminium planks.
- Seat Battens: oiled Forest Stewardship Council (FCR) certified hardwood timber planks or approved equal.
- Leg type: surface post.
- Size: 2000mm long.



S5 PICNIC SETTING

PLAN, ELEVATION, SECTION

NTS

PARK FURNITURE

PS1 Picnic Shelter

LOCATION:

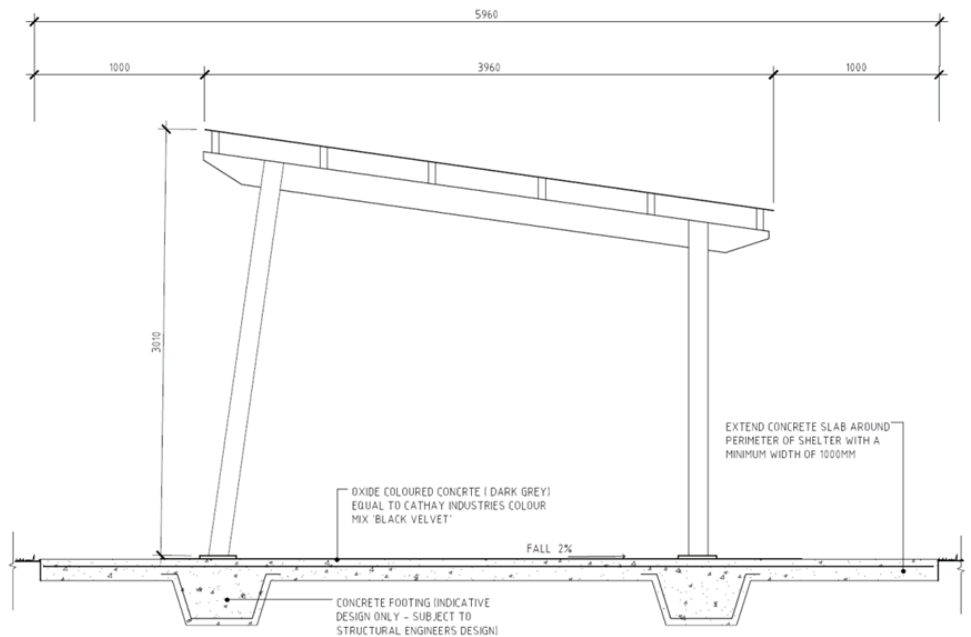
- Local Parks, Neighbourhood Parks

INSTALLATION:

- Surface mounted on oxide coloured concrete (dark grey) 5.96m x 5.8m

SPECIFICATION:

- Tathra Shelter by Precinct © or approved equal.
- Size: 3800mm X 3960mm
- Posts: Extruded aluminium posts 125 x 125 x 5mm powder coated
- Frame: Class 2 F27-Hardwood roof frame with exterior grade stained coating
- Roofing: Pre-cut Colorbond, custom orb roof sheeting - Ultra grade (Surfmist)
- No guttering or downpipes.
- Fixing: Stainless steel brackets and fixings.
- Picnic setting: Wheelchair accessible 'Bridgewater' table setting with cast aluminium legs by Precinct © or approved equal. Picnic setting: cast aluminium frame with aluminium battens.



PARK FURNITURE

PS2 Picnic Shelter

LOCATION:

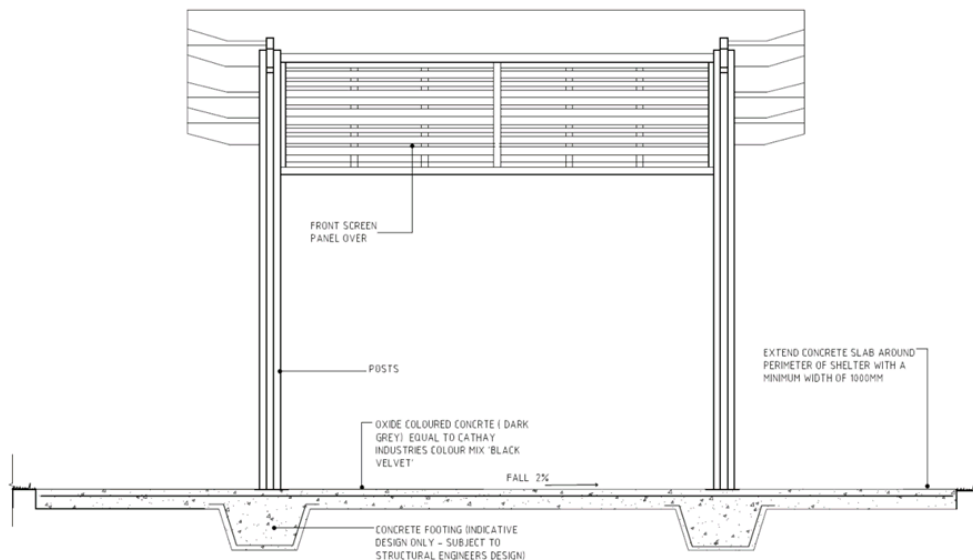
- Local Parks, Neighbourhood Parks

INSTALLATION:

- On oxide coloured concrete (dark grey) 6.m X 6m

SPECIFICATION

- Skillion roof shelter Peninsula Series (K302) by Landmark © or approved equal
- Size: 4000mm x 4000mm
- Posts: Class 2 F27-Hardwood, factory exterior grade stained coating triple leaf posts.
- Roof frame: ACQ treated, factory exterior grade stained F27 hardwood timber roof frame
- Roofing: Pre-cut Colorbond, custom orb roof sheeting - Ultra grade (Surfmist)
- No guttering or downpipes.
- Fixing: All remaining brackets and fixings are stainless steel **G316** including Stainless steel anti vandal fastenings.
- Picnic setting: Wheelchair accessible 'San Remo' by Landmark © or approved equal.

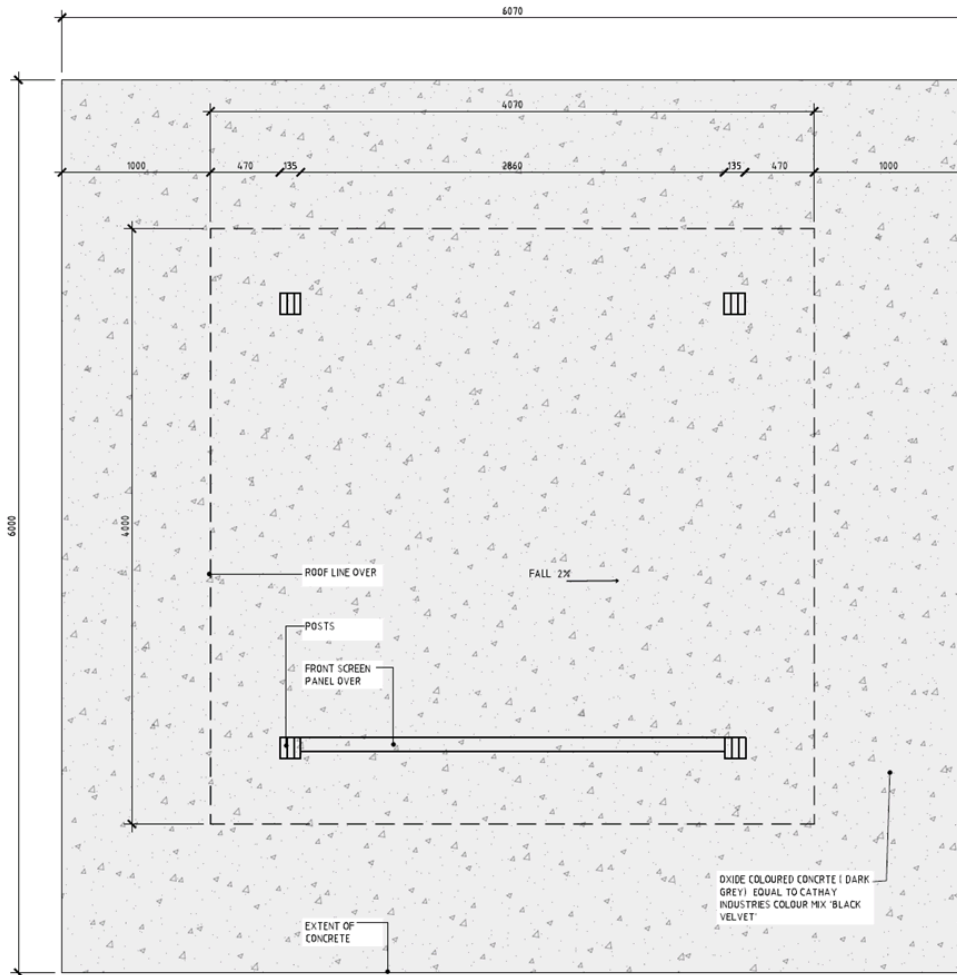


PS2 PICNIC SHELTER

ELEVATION

NTS

PARK FURNITURE



PS2 PICNIC SHELTER

PLAN

NTS

PARK FURNITURE

PS3 Large Picnic Shelter

LOCATION:

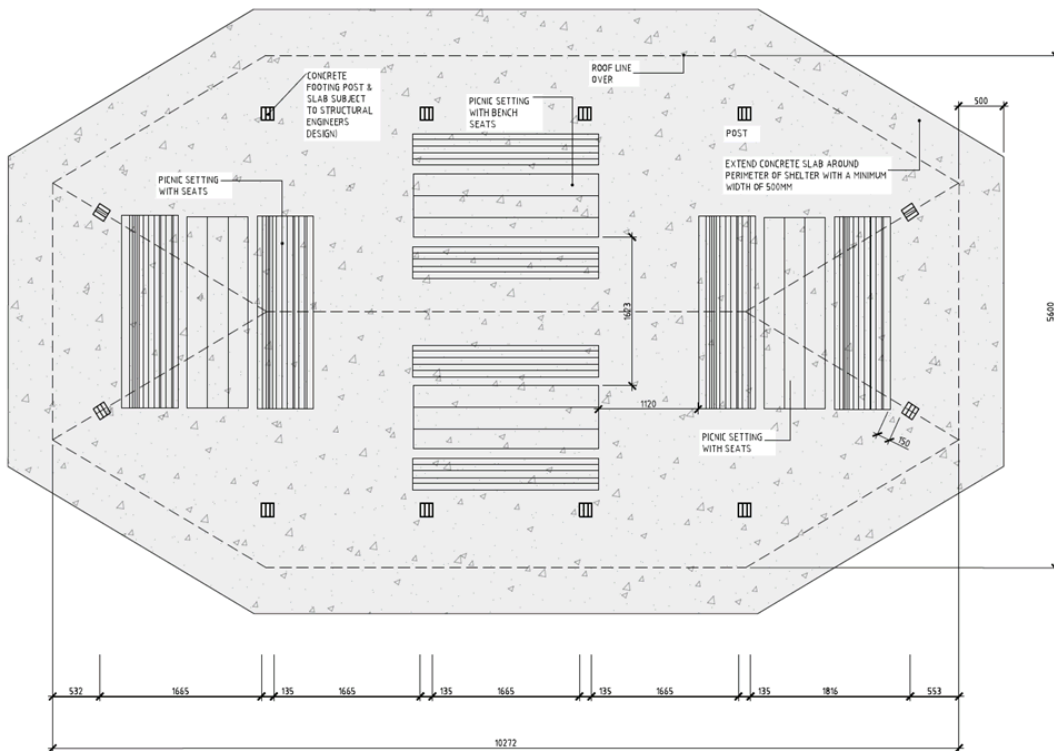
- Neighbourhood Parks.

INSTALLATION:

- Oxide coloured concrete (dark grey)

SPECIFICATION:

- Large picnic shelter with gable roof 'Mulgrave' by Landmark © or approved equal. Product Code K504 10m x 5m
- Posts: Class 2 F27-Hardwood timber dual leaf posts with factory exterior grade stain.
- Roof Frame: ACQ treated, hardwood timber roof frame with factory exterior grade stain.
- Roofing: Pre-cut Colorbond, custom orb roof sheeting - Ultra grade (Surfmist).
- No guttering or downpipes
- Fixing: All remaining brackets and fixings are stainless steel G316 including Stainless steel anti vandal fastenings.



PS 3 PICNIC SHELTER

PLAN

NTS

PARK FURNITURE

PS3 Picnic Setting

LOCATION:

- In PS3 Large Picnic Shelter

INSTALLATION:

- Surface mounted.

SPECIFICATION:

- Wheelchair accessible x 4 San Remo' by Landmark or approved equal.
- Frame: aluminium powder coated table and seat frames (Powdercoat: APO Grey).
- Table battens: Aluminium anodised table boards (Clear Finish).
- Bench seat Batten: ACQ treated hardwood timber bench boards with exterior grade stain.
- Leg type: surface post



PARK FURNITURE

PS4 Barbecue Shelter

LOCATION:

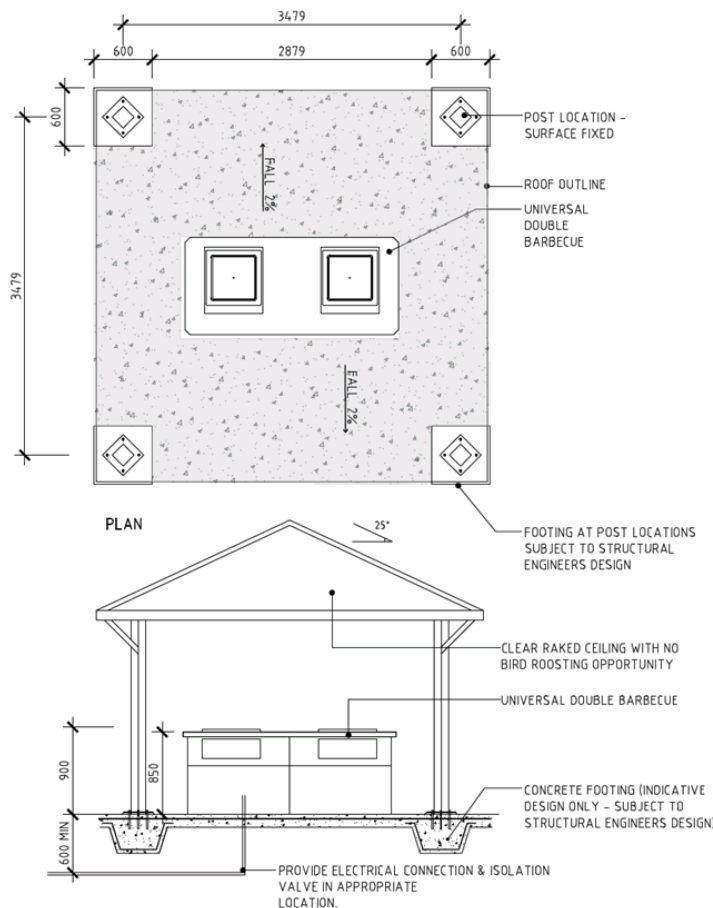
- Neighbourhood parks

INSTALLATION:

- Oxide coloured concrete (dark grey)

SPECIFICATION:

- Barbecue shelter with gable roof 'Tilba' by Precinct © or approved equal
- Size: 4000x 4000mm
- Posts: Class 2 F27-Hardwood timber posts with exterior grade stain.
- Roof Frame: ACQ treated hardwood timber roof frame with exterior grade stain.
- Roofing: Pre-cut Colorbond, custom orb roof sheeting - Ultra grade (Surfmist).
- No guttering or downpipes
- Fixing: All remaining brackets and fixings are stainless steel.



BARBECUE SHELTER
ELEVATION & SECTION NTS

PARK FURNITURE

Barbecue

LOCATION:

- Neighbourhood parks where need has been demonstrated.

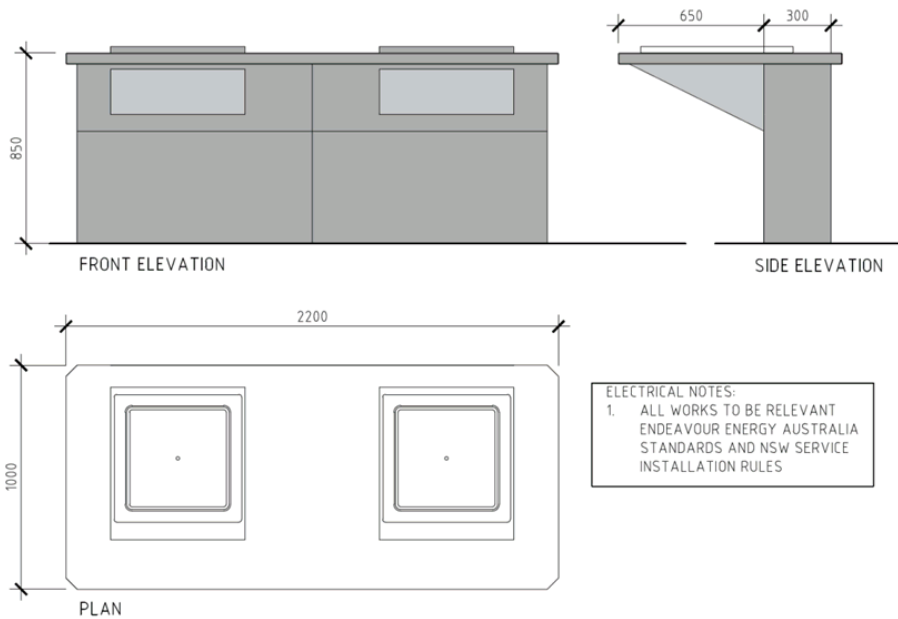
INSTALLATION:

- within Barbecue shelter on oxide coloured concrete (dark grey)



SPECIFICATION:

- Stoddart Town and Park Metro Double Barbeque © or approved equal. CODE: SPTP.BBQ.W.S.SM.DBL.800.D01
- Note: All service locations to be conducted prior and supplies to be continuous with no underground (hidden) connections points. All work to be relevant Endeavour Energy and Australian Standards and NSW Services installation rules.



UNIVERSAL BARBECUE

ELEVATION & PLAN

NTS

PARK FURNITURE

GB1 Garbage Bin Post Mount

LOCATION:

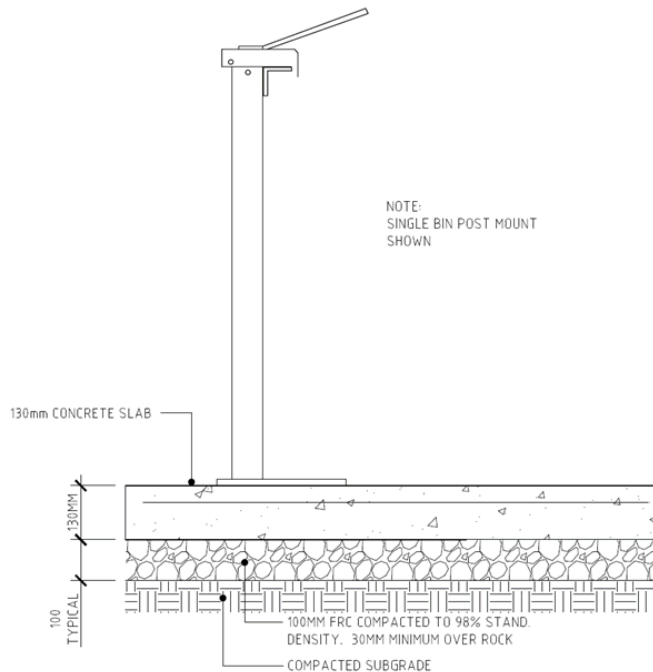
- Local Park, Neighbourhood and Dog Park

INSTALLATION:

- Surface mount on oxide colour concrete pad (dark grey) 1.2m x 1.2m offset from a path in close proximity to either an entry point or an area of high activity.
- Double Wheelie Bin Post to be utilised in Neighbourhood Parks

SPECIFICATION:

- 240 Litre Modular post lock system. Product code: 383 or 394 by Draffin Street Furniture© or approved equal.
- Finish: Hot dip Galvanised Finish. 2.5mm TK RHS Upright, 5.0mm TK Mild Steel Angle and Channel, 8.0mm TK Mild Steel Top Arm.



GARBAGE BIN POST MOUNT

SECTION

NTS

PARK FURNITURE

GB2 Garbage Bin Enclosure

LOCATION:

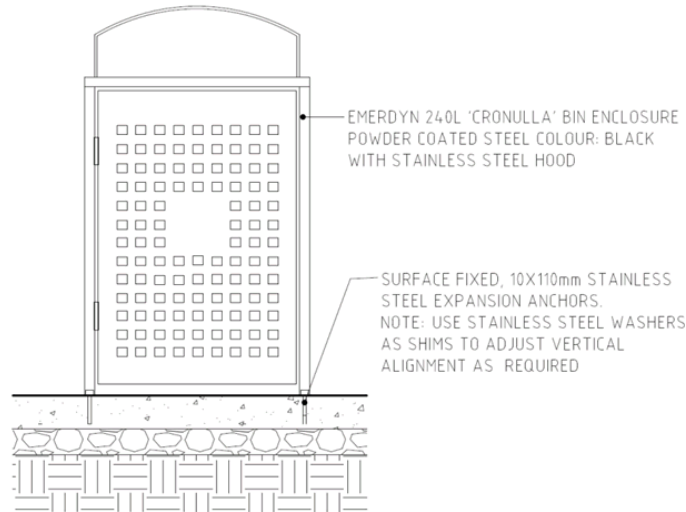
- Town Centres and Neighbourhood Parks

INSTALLATION:

- Surface mount on oxide colour (dark grey) concrete pad minimum 1.2m x 1.2m offset from a path in close proximity to either an entry point or an area of high activity. Ensure that enclosure is installed plumb with bin opening facing pathway.
- Note WCC may require a double bin arrangement for recycling.

SPECIFICATION:

- Emerdyn© 'Cronulla' EM 224 240 litre bin enclosure with hood or approved equal.
- Materials: galvanised steel body, stainless steel chute and hood, custom perforation, powder coated black.
- Signage panel may be required to indicate recycling.



240L BIN ENCLOSURE

SECTION NTS

PARK FURNITURE

TAP

LOCATION:

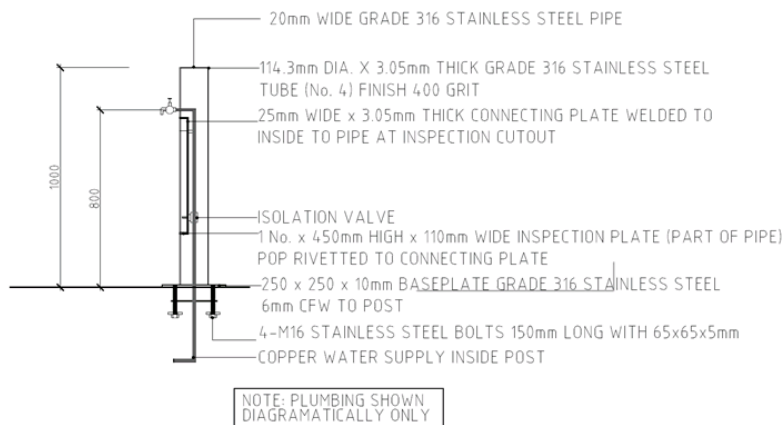
- Dog Park, Local and Neighbourhood Parks.

INSTALLATION:

- Installed in close proximity to Barbecue and picnic shelters.

SPECIFICATION:

- Vandal proof hose cock fitted on 316 stainless steel pipe finish 400 GRIT with inspection plate.
- Fixed on a stainless steel base plate.



TAP IN STAINLESS STEEL PIPE

SECTION

NTS

PARK FURNITURE

BU1 BUBBLER

LOCATION:

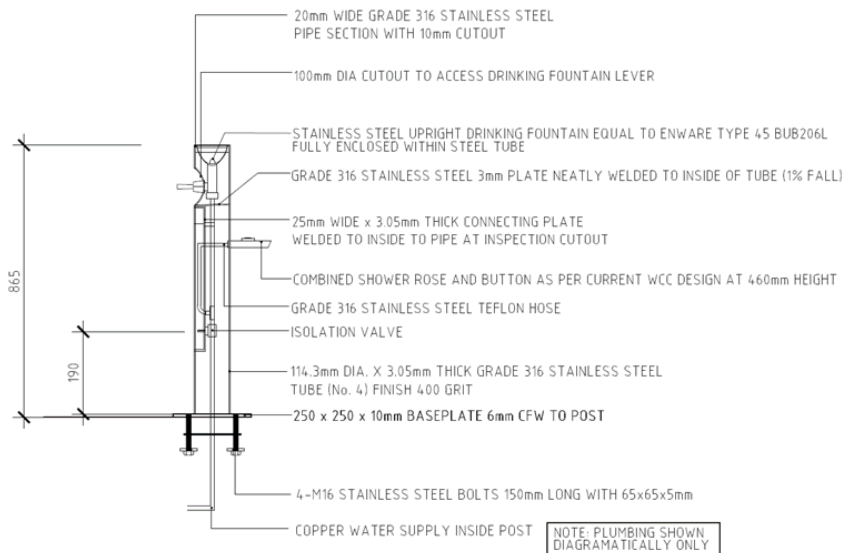
- Dog Park and Local Parks.

INSTALLATION:

- Located in area of high activity in association with picnic shelter and or nodes of park furniture of play features

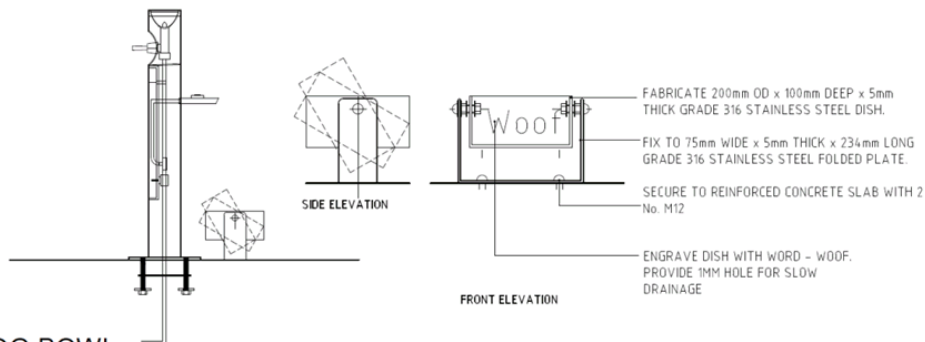
SPECIFICATION

- Encat © pipe style or approved equal.
- Materials - Marine grade 316 stainless steel frame, electro polished mirror finish.
- Features - bottle filling tap and dog bowl.



WATER FOUNTAIN & DOG BOWL

SECTION NTS



DOG BOWL

SECTION NTS

PARK FURNITURE

BU2 - Equal Access Bubbler

LOCATION:

- Town Centres

INSTALLATION:

- In area of high activity.

SPECIFICATION:

- 'Prospect' drinking fountain by Botton & Gardner © or approved equal. Conforms to the Australian disabled access standard. Product code PDF.316.DB.BT.WC
- **Materials:** marine grade 316 stainless steel frame, electro polished mirror finish.
- **Features:** bottle filling tap. Self-draining and levelling dog bowl. Perforated grate covering the drainage sump.



BU3 - Equal Access Bubbler

LOCATION:

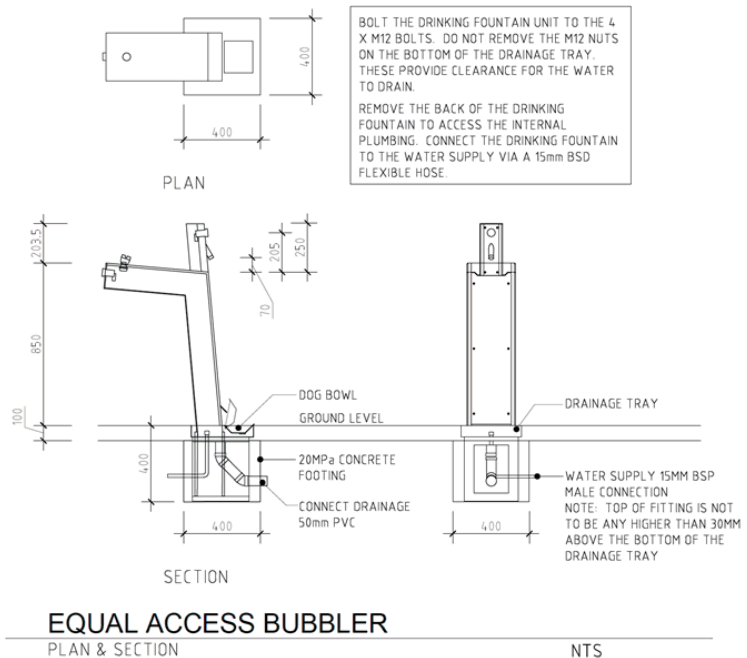
- Neighbourhood Parks

INSTALLATION:

- In area of high activity in association with picnic shelter and nodes of park furniture.

SPECIFICATION:

- 'Aquafil drinking fountain, bottle refill station with dog drinking bowl' by Civiq © or approved equal. Conforms to the Australian disabled access standard.
- **Materials:** marine grade 316 stainless steel
- **Features:** bottle filling tap and dog bowl.



PARK FURNITURE

BR - BIKE RACK

LOCATION:

- Local, Neighbourhood, and Civic Parks.

INSTALLATION:

- Surface mount on concrete base slab.
- Three grouped together.

SPECIFICATION:

- Single Hoop Bike Rail AS Urban © or approved equal.
- Material: 50mm dia polished 316 stainless steel
- Fixing: 316 Stainless steel M8 chemical Anchor. Surface mounted spaced at 1200mm centres in accordance with AS2890.3 Part 3 Bicycle Parking Facilities unless otherwise directed by WCC.



BR2 – POST MOUNTED BIKE RACK

LOCATION:

- Town Centres.

INSTALLATION:

- Post Mounted bicycle rail to street sign posts

SPECIFICATION:

- Circular bike rack CORA © or approved equal.
- Material: 316 stainless steel
- Fixing: M10 Hex bolt G304 S/S with washer and M10 shear nut.



BIKE RACK MOUNTED TO STREET SIGNS

ISO VIEW NTS

PARK FURNITURE

B1 –Timber Bollard

LOCATION:

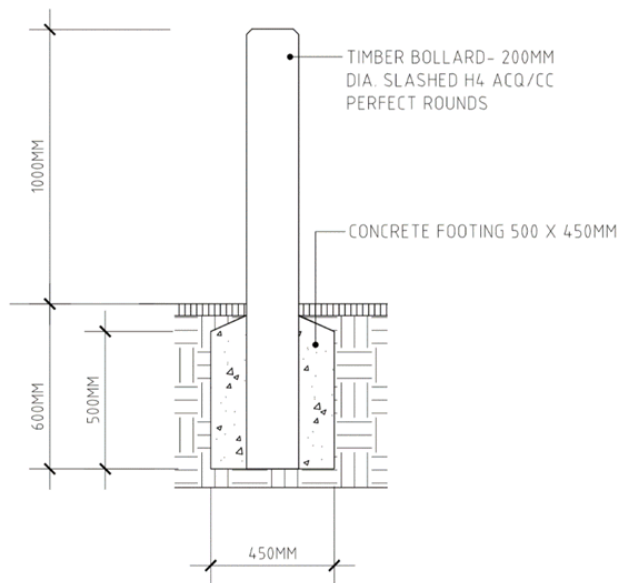
- Natural Areas, Local and Neighbourhood Parks.

INSTALLATION:

- Within mulched areas adjacent to natural areas. If located in grass install in concrete strip.

SPECIFICATION:

- Dome topped timber 200mm dia. Bollard. H4 ACQ treated Slash Pine timber.
- Height: 1000mm spaced at 1500mm centres
- Finish: Two coats of exterior grade stain that protects against staining, sun deterioration and damage, water and fungal damage and provides stabilisation of the timber.



TIMBER BOLLARDS

SECTION

NTS

PARK FURNITURE

B2 – Stainless Steel Bollard

LOCATION:

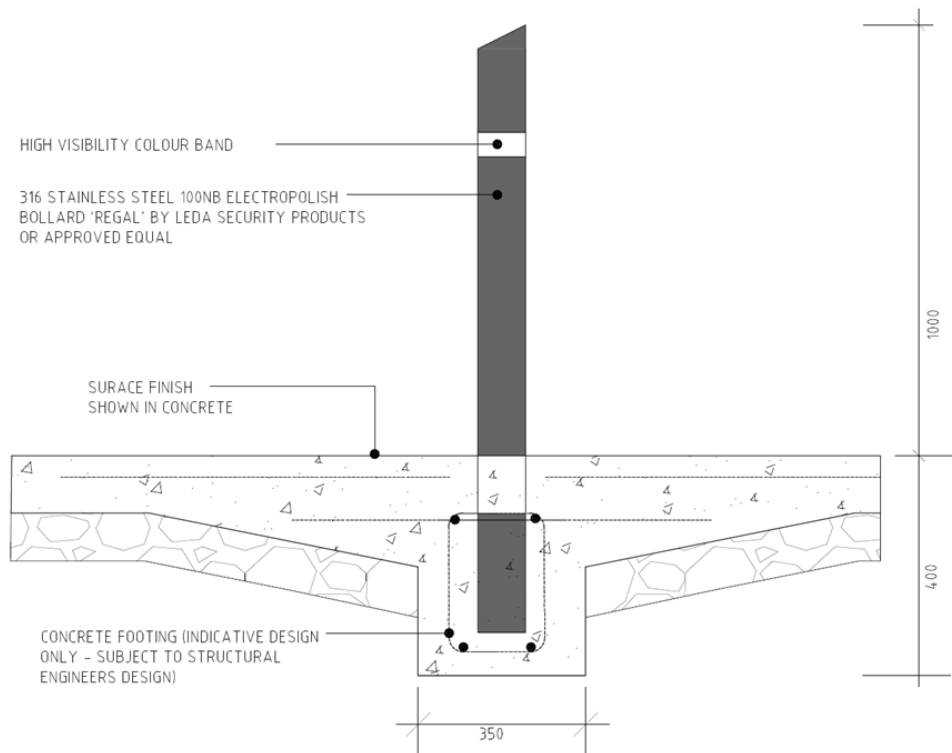
- Neighbourhood Parks and Town Centres.

INSTALLATION:

- Within pavement.

SPECIFICATION:

- 316 Stainless steel mitre top 100mm dia with 5mm wall thickness by Leda Security Products © or approved equal.
- Height: 1000mm x 140mm dia. spaced at 1500mm centres
- Finish: Milled with high visibility reflective band.



STAINLESS STEEL BOLLARD

SECTION

NTS

PARK FURNITURE

B3 – Removable Bollard

LOCATION:

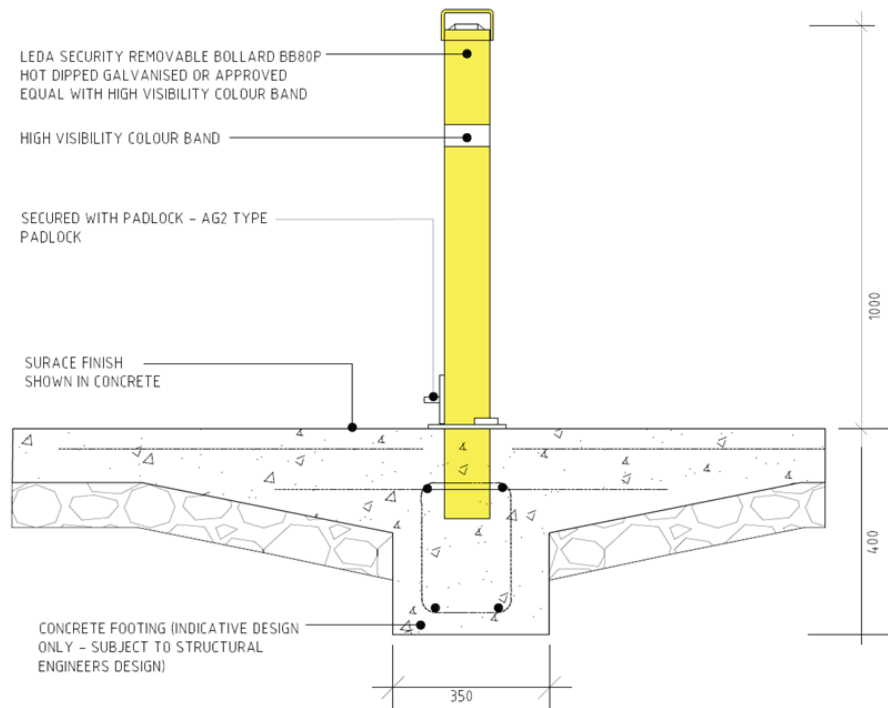
- Local, Neighbourhood and Town Centres.

INSTALLATION:

- Installed within pavement of vehicle access points

SPECIFICATION:

- Hot dipped galvanised electrostatically powder coated in industrial yellow with reflective tape. Removable bollard BB80P by Leda © or approved equal.
- Materials: 80NB (88.9) x 10.4mm extra heavy duty galvanised pipe.
- Height: 1000mm x 80mm dia. spaced at 1500mm centres



HOT DIPPED GALVANISED REMOVABLE BOLLARD

SECTION

NTS

PARK FURNITURE

B4 – Sandstone Log

LOCATION:

- Natural Areas, Local and Neighbourhood Parks.

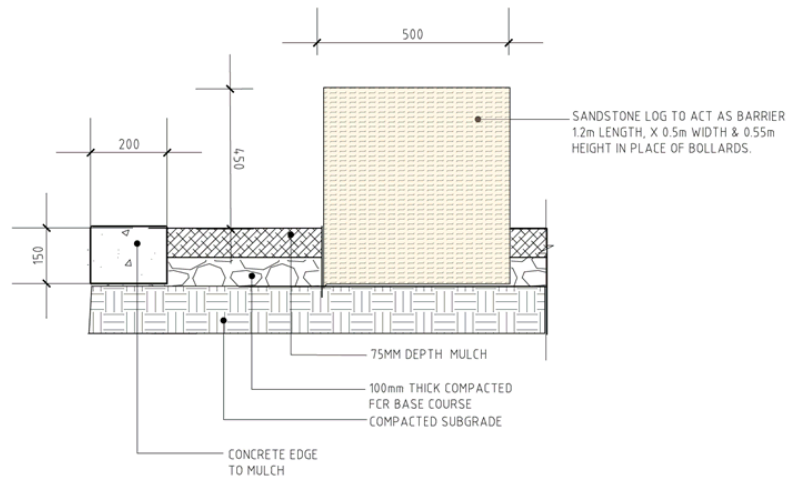
APPLICATION:

- Restriction of vehicle access to natural areas within mulched zones. Informal seating in play spaces.



SPECIFICATION:

- Quarry sawn sandstone 'log' shapes.
- Dimensions: approximately 550mm high and 1200mm long
- Material: sandstone 'logs' by Bundanoon Sandstone © or approved equal.
- Finish: 2 sides diamond sawn, 4 sides quarry sawn, grey in colour. 500mm x 550mm x 1200m



SANDSTONE LOG

TYPICAL SECTION

NTS

OPEN SPACE FENCING REQUIREMENTS

F0 – General Fencing Requirements:

DESIGN

- The contractor shall be responsible for the design compliance, strength and durability of the finished fence and the fence elements.

DESIGN COMPLIANCE

All fencing shall be designed and constructed in accordance with all relevant regulations and standards, including but not limited to:

- National Construction Code NCC (formerly Building Code of Australia)
- AS1170.0 Structural design Actions – General Principles
- AS1170.1 Structural design Actions – Permanent, Imposed and other actions
- AS1170.2 Structural design Actions – Wind Actions
- AS1428.1 Design for access and mobility – General requirements for access
- AS1725.1 Chain link fabric fencing – Security fencing and gates – General requirements
- AS1725.4 Chain link fabric fencing - Cricket net fencing enclosures
- AS1725.5 Chain link fabric fencing – Sports ground fencing - General requirements

DESIGN LOADING

All fencing shall be designed to accommodate all relevant design loadings as set out in the following:

- AS1170.1 Permanent, Imposed and other actions –
- In particular, Table 3.3, Minimum Imposed Actions for Barriers. Categories C3 and C5 are typically most used by Council. Refer below.
- AS1170.2 Wind Actions
- Other reasonably expected loadings due to climbing, vandalism etc. – i.e. must be fit for purpose.

TABLE 3.3
MINIMUM IMPOSED ACTIONS FOR BARRIERS

A2	Type of occupancy for part of the building or structure	Specific uses	Top edge			Infill	
			Horizontal kN/m	Vertical kN/m	Inwards, outwards or downwards kN	Horizontal kPa	Any direction (see Note 2) kN
A	Domestic and residential activities	All areas within or serving exclusively one dwelling including stairs, landings, etc. but excluding external balconies and edges of roofs (see C3)	0.35	0.35	0.6	0.5	0.25
		Other residential, (see also C)	0.75	0.75	0.6	1.0	0.5
A2	B, E Offices and work areas not included elsewhere including storage areas	Light access stairs and gangways not more than 600 mm wide	0.22	0.22	0.6	N/A	N/A
		Fixed platforms, walkways, stairways and ladders for access (see Note 1)	0.35	0.35	0.6	N/A	N/A
		Areas not susceptible to overcrowding in office and institutional buildings also industrial and storage buildings	0.75	0.75	0.6	1.0	0.5
C Areas where people may congregate							
C1/C2	Areas with tables or fixed seating	Areas with fixed seating adjacent to a balustrade, restaurants, bars, etc.	1.5	0.75	0.6	1.5	1.5
C3	Areas without obstacles for moving people and not susceptible to over-crowding	Stairs, landings, external balconies, edges of roofs, etc.	0.75	0.75	0.6	1.0	0.5
C5	Areas susceptible to over-crowding	Theatres, cinemas, grandstands, discotheques, bars, auditoria, shopping malls (see also D), assembly areas, studios, etc.	3.0	0.75	0.6	1.5	1.5
D	Retail areas	All retail areas including public areas of banks/building societies, (see C5 for areas where overcrowding may occur)	1.5	0.75	0.6	1.5	1.5

Extract from AS1170.1

DESIGN LIFE

- All fencing is to be designed with due consideration to the site exposure classification (refer appendix A) and other site conditions for a service life of 20 years, with little to no maintenance.

WARRANTIES

- The Contractor shall provide with their quotation the warranties offered for their work. This shall include warranties offered with regard to protective coating systems for materials and workmanship.
- Minimum Warranty shall be 10 years on all protective coatings and workmanship

INSTALLATION

SITE WELDING

- On-site welding shall not be undertaken.
- Site cutting and drilling is to be avoided to maintain protective coating.
- Repairs to cut or damaged material which compromise the protective coating are to be repaired in accordance with protective coating manufacturer specification.

VANDALISM

- The fencing shall be designed and installed such that opportunities for vandalism are minimised. This may include the burring or bending of bolt threads after installation to prevent the unauthorised removal of nuts, use of anti-tamper screws etc.

POST HOLES

- The top surface of footings is to be a trowelled concrete finish 10mm above the level of the existing surface and shaped to fall away from the post.

MATERIAL SPECIFICATION

- All materials and workmanship shall be in accordance with the following:
 - AS1450-2007 Steel tubes for mechanical purposes
 - AS1397-2011 Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
 - AS/NZS 1163-2009 Cold-formed structural steel hollow sections
 - AS4680-2006 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
 - AS1111.1-2015 ISO metric hexagon bolts and screws – Product grade C –Bolts

- AS1111.2 ISO-2015 metric hexagon bolts and screws – Product grade C –Screws
- AS1604.1-2012 Specification for preservative treatment – Sawn and round timber
- AS1725.1-2010 Chain link fabric fencing – Security fencing and gates – General requirements

FITTINGS, FIXTURES AND BRACKETS

- All fittings, fixtures, brackets etc. shall be constructed of the same material as the fence proper wherever possible, with consistent protective coating system (including colour).
- Dissimilar metals shall be electrically isolated via neoprene washers, bushes etc.
- All fittings such as hinges, locks, latches etc. are to be Heavy Duty and suitable for the site exposure and require nil maintenance.

PROTECTIVE COATING SYSTEM

- Refer to fence types for specific requirements of protective coating systems.
- Generally, the Contractor is to provide details of the proposed system at the time of quotation and a 10 year warranty on materials and workmanship.
- Cut or damaged materials which compromise the protective coating are to be repaired in accordance with protective coating manufacturer specification.
- Any damage to the galvanised elements including where the thickness of the galvanising has locally been reduced to less than the relevant requirement of AS/NZS 4680 shall be repaired in accordance with Section 8.2(a) of AS/NZS 4680, using an approved two-pack epoxy zinc rich primer meeting the requirements of a Type 2 product of AS 3750.9.

OPEN SPACE FENCING REQUIREMENTS

F1 – Single Rail Timber Barrier



LOCATION:

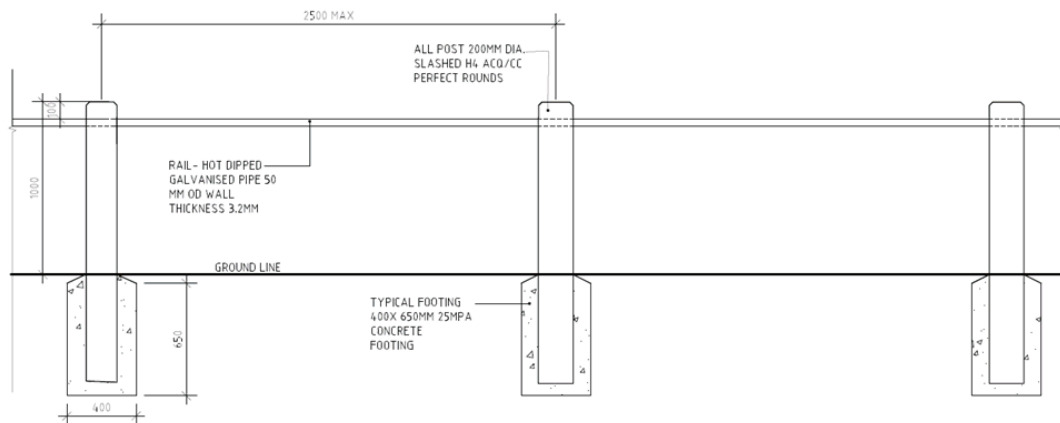
- Natural, Local, and Neighbourhood Parks where vehicle access control is required.

APPLICATION:

- Restriction of vehicle access in open space.

SPECIFICATION:

- ACQ treated Slash Pine timber post with hot dipped galvanised pipe rail.
- Height: 1000mm
- Material: H4 ACQ treated Slash Pine post with galvanised pipe top rail.
- Finish: Two coats of exterior grade stain that protects against staining, sun deterioration and damage, water and fungal damage and provides stabilisation of the timber.



F1 FENCE

SECTION & ELEVATION NTS

OPEN SPACE FENCING REQUIREMENTS

F2 – Vehicle Access Control

LOCATION:

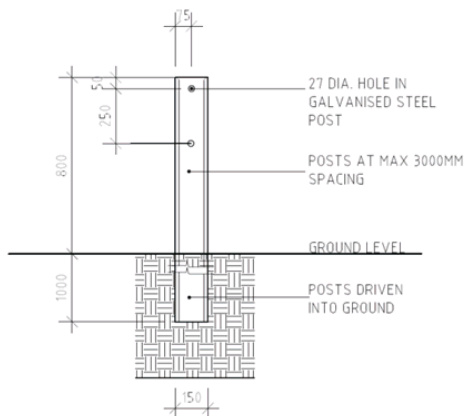
- Natural, Local, Neighbourhood Parks.

APPLICATION:

- Restriction of vehicle and motor bike access to natural areas in open space.

SPECIFICATION:

- Galvanised steel post and steel cable by Ingal © or approved equal. The distance from the ground to the bottom steel cable is 500mm.
- Height 800mm
- Twin 19mm diameter cables pass through pre-punched holes in each post Hot dipped galvanized (HDG500) for improved durability
- Rigid C posts driven into the ground. Posts are at 3m centres



F2 FENCE

SECTION & ELEVATION NTS

OPEN SPACE FENCING REQUIREMENTS

F3 – Sports Field Fencing

LOCATION:

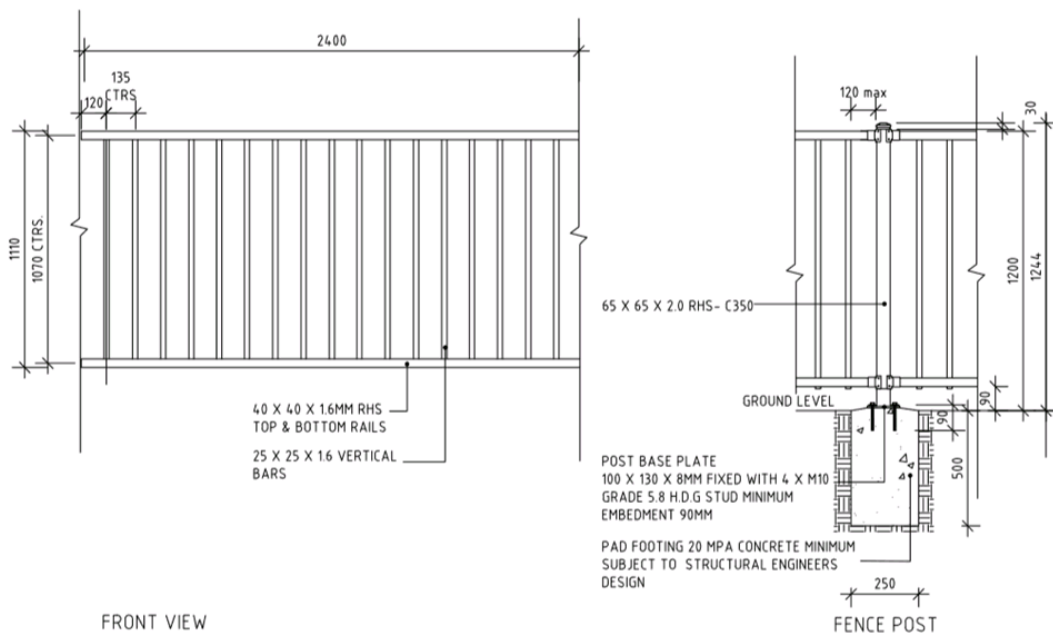
- Neighbourhood Parks.

APPLICATION:

- Installation of fencing to sports fields

SPECIFICATION:

- Incorporate one or more self-closing single pedestrian access gates, and lockable maintenance/emergency vehicle access gates
- HDG500 in accordance with AS4680
- Height 1244mm
- Consideration for drain holes required during the hot-dip galvanising process
- All fixing screws to be Class 3 (or better)
- Expansion joints are to be provided in the fence rails at maximum spacing of 9m.
- All Brackets etc. shall have protective coating to match fence
- Expansion joints shall accommodate longitudinal movement whilst maintaining structural integrity, e.g. provide internal spigots at joints.



FRONT VIEW
F3 FENCE

SECTION & ELEVATION NTS

OPEN SPACE FENCING REQUIREMENTS

F4 – Play Space Fencing

LOCATION:

- Local and Neighbourhood Parks

APPLICATION:

- Installation of fencing to play spaces where identification of risk to children such as proximity to a road or water body.



SPECIFICATION:

- Height: 1100mm
- All elements are to be manufactured from pre-galvanised steel tube, zinc coated inside and outside to AS 1450-2007 and AS 1397-2011, 100g/m² minimum average coating thickness.
- All powder coating to comply with AS5405 – A minimum warranty of 10 years shall be provided
- All welding to be silicone bronze
- All fixing screws to be Class 3 (or better)
- All Brackets etc. shall have protective coating to match fence
- Expansion joints are to be provided in the fence rails at maximum spacing of 9m.
- Expansion joints shall accommodate longitudinal movement whilst maintaining structural integrity, e.g. provide internal spigots at joints.
- Unless otherwise specified the fence must be raked to follow the ground contour.
- The bottom of picket to ground level clearance is to be 100mm minimum and 150mm maximum
- Where ground clearance exceeds 150mm, the panels are to be stepped or raked to achieve the foregoing level of clearance. Stepped panels must be a minimum length of 1200mm. After stepping or raking, in-fills are to be fitted rigidly beneath panels where the ground clearance still exceeds 150mm. This practice should not be utilised in covering designated waterways where such installation would obstruct the natural flow of water.

OPEN SPACE FENCING REQUIREMENTS

F5 – Safety Fencing

LOCATION:

- Natural Areas, stormwater infrastructure, Local and Neighbourhood Parks

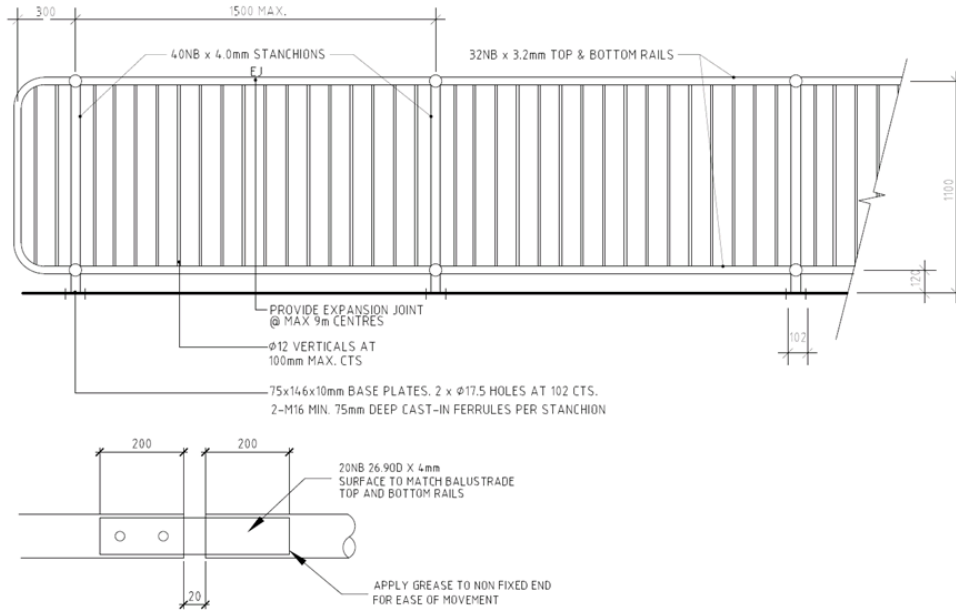


APPLICATION:

- To restrict access to high risk areas (eg around stormwater drain head walls, outlets and stormwater quality improvement devices), or where the drop height exceeds 1.0 m.

SPECIFICATION:

- All materials to be Grade C250L0 in accordance with AS/NZS 1163.
- Minimum thickness of pipe to be 3.2mm.
- Height: 1100mm.
- HDG500 in accordance with AS4680.
- Consideration for drain holes required during the hot-dip galvanising process.
- All nuts, bolts and washers to be hot dip galvanised in accordance with AS4680.
- Bolts to be Grade 4.6 to AS1111, installed snug tight, minimum size M12.
- Expansion joints are to be provided in the fence rails at maximum spacing of 9m.
- Expansion joints shall accommodate longitudinal movement whilst maintaining structural integrity, e.g. provide internal spigots at joints.



TYPICAL EXPANSION JOINT DETAIL

F5 FENCE

SECTION & ELEVATION NTS

OPEN SPACE FENCING REQUIREMENTS

F6 – Dog Park Fence

LOCATION:

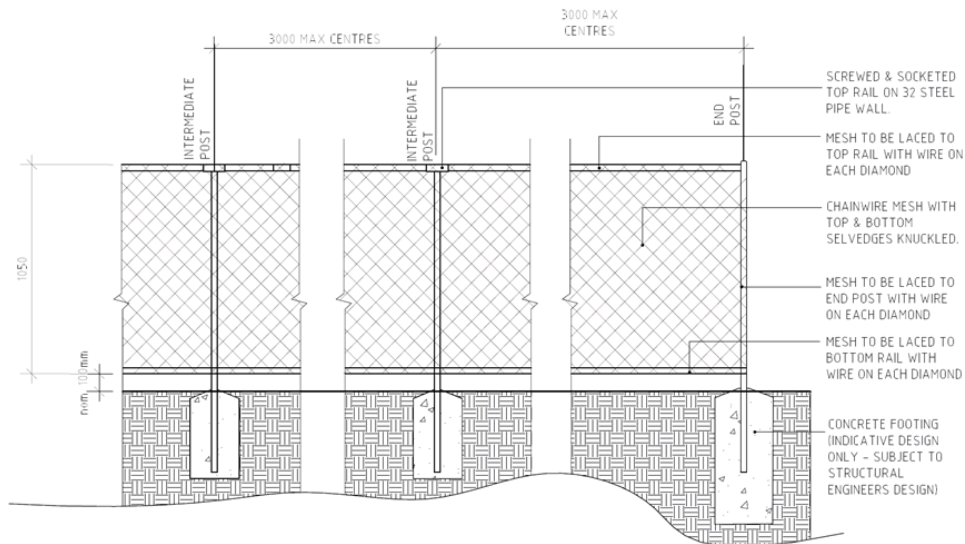
- Dog Park boundaries

SPECIFICATION:

- Height: 1150mm
- Incorporate one or more self-closing single pedestrian and dog access gates, and lockable maintenance vehicle access gates. Provision of concrete threshold pavement at all gate entries due to high pedestrian activity.
- Black PVC coated chain mesh fence with galvanised pipe top and bottom rails.
- Min thickness of pipe to be 3.6mm in accordance with AS1725.1
- Chain link and fencing construction to comply with AS1725 – 2003 and AS1163 grade (C250LO)
- Galvanising:
 - Wire: Heavy galvanised coating W10Z/HG (240g/m²)
 - Pipe: HDG500 in accordance with AS4680
- All nuts, bolts and washers to be hot dip galvanised in accordance with AS4680
- All powder coating to comply with AS5405 – A minimum warranty of 10 years shall be provided
- All items welded or cut on site must be primed followed by galvanising or black paint.
- Panel dimensions to be 1050mm height by 3000mm length maximum.
- Chain link fabric is to be 3.15mm PVC coated galvanised 50 pitch. Chain link fabric is to be finished with knuckled top and bottom selvedge.
- Post footings shall be in accordance with AS1725.1

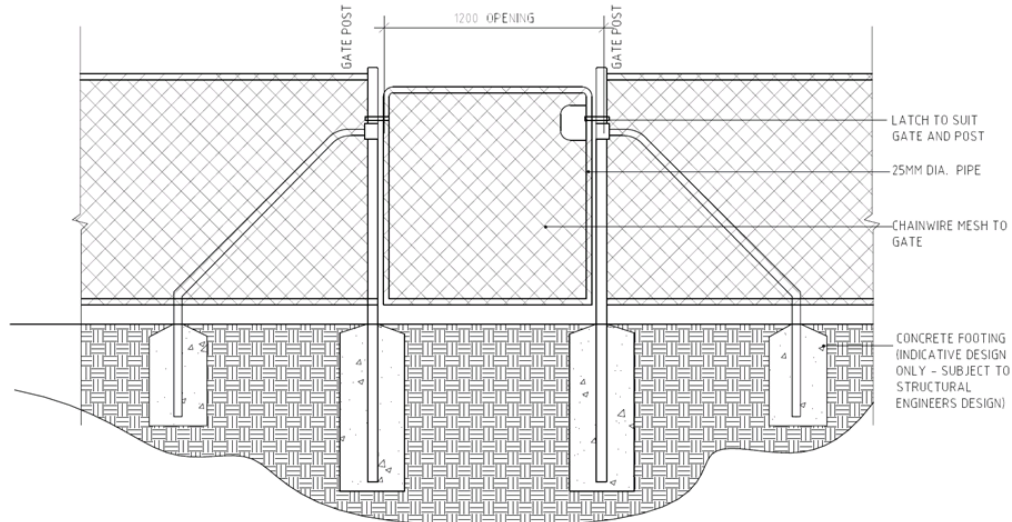


- Above ground concrete finish is to be domed with steel trowel finish to eliminate water lying at base of posts and is to be completed at time of original concrete pour. Ends of the support cable wire are to be firmly secured to all terminal posts.



F6 FENCE

SECTION & ELEVATION NTS



F6 FENCE- ENTRY GATE

SECTION & ELEVATION NTS

OPEN SPACE FENCING REQUIREMENTS

G1 – Boom Gate

LOCATION:

- Local parks, Neighbourhood Parks, natural areas, transmission easements.

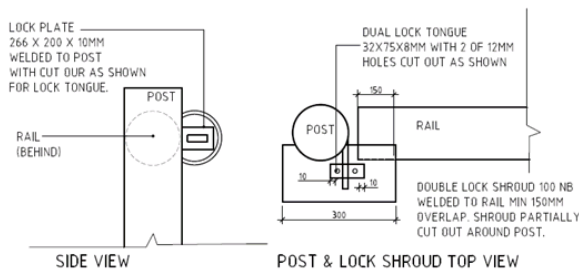
APPLICATION:

- Boom gate to be used for maintenance access. Minimum distance of eight (8) metres is required as a threshold to the gate for service vehicles.



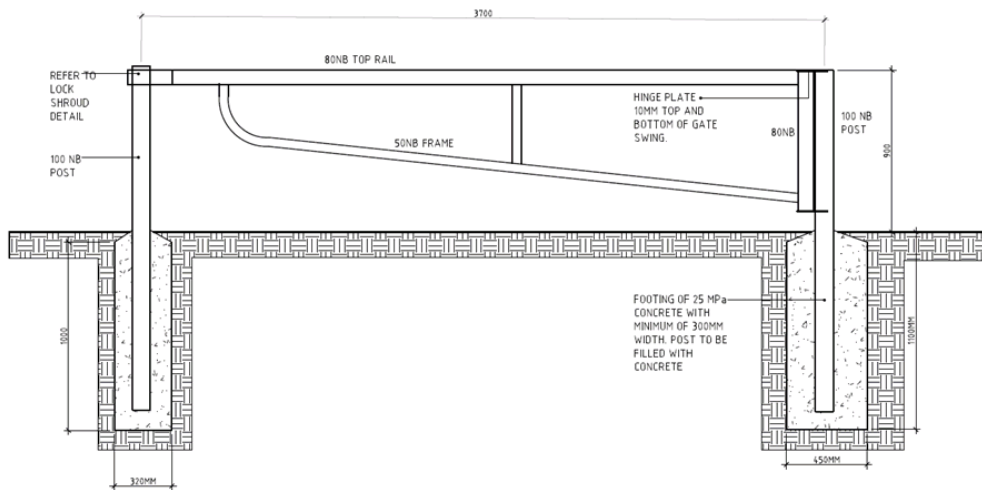
SPECIFICATION:

- 5mm gauge hot dipped galvanised steel.



MAINTENANCE ACCESS GATE- POST & LOCK SHROUD

SIDE & TOP VIEW NTS



MAINTENANCE ACCESS GATE

TYPICAL ELEVATION NTS

- Construction and installation as shown below

PATHWAY & PAVEMENT REQUIREMENTS

Decomposed Granite Path



LOCATION:

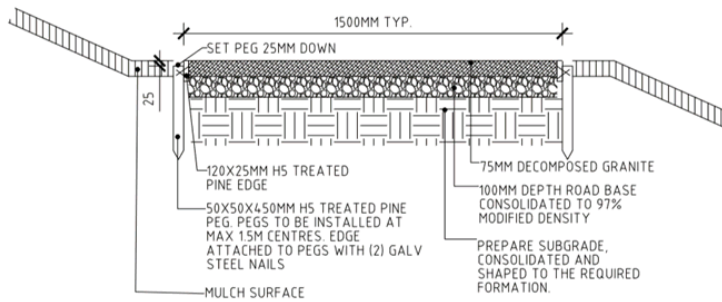
- Natural Areas, Local and Neighbourhood Parks.

APPLICATION:

- Walking trails within natural areas only.

SPECIFICATION:

- 75mm stabilised compacted decomposed granite pathways with timber edges refer to detail.



DECOMPOSED GRANITE PATH

TYPICAL DETAIL NTS

PATHWAY & PAVEMENT REQUIREMENTS

Raised Walkways

LOCATION:

- Natural Areas, Local and Neighbourhood Parks.

APPLICATION:

- High use walking trails within natural areas that are low lying or boggy.



SPECIFICATION:

- Fibre reinforced polymer (FRP) walkway decking with FRP or galvanised steel support structure.

PATHWAY & PAVEMENT REQUIREMENTS

Asphalt Pathway

LOCATION:

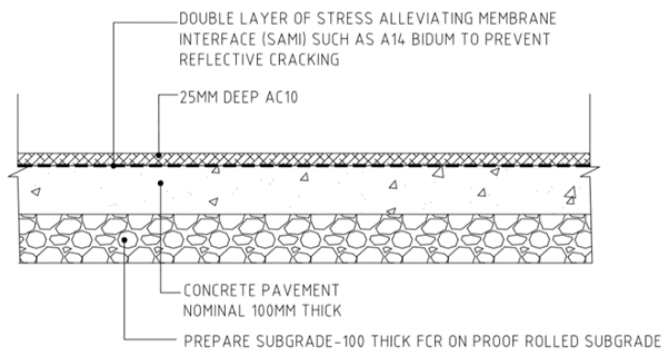
- Natural Areas, Local and Neighbourhood Parks.

APPLICATION:

- High use walking trails requiring unobtrusive, flexible, and semi permeable surfaces adjacent to existing vegetation.

SPECIFICATION:

- Asphalt AC10 as shown below



ASPHALT

TYPICAL SECTION NTS

PATHWAY & PAVEMENT REQUIREMENTS

Broom Finished Concrete Pavement

LOCATION:

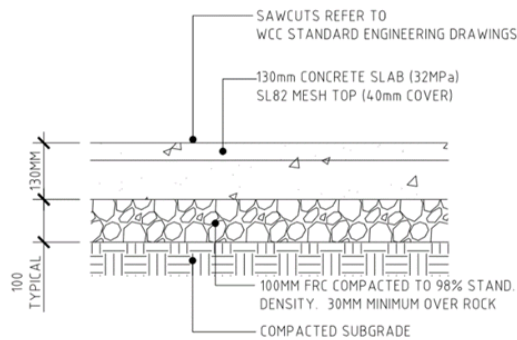
- Natural Areas, Local and Neighbourhood Parks.

APPLICATION:

- Paths and high use walking trails within natural areas.

SPECIFICATION:

- Slip resistance: P4.
- Approved oxide colour can be considered. Utilise light and natural colours for pavement and surfaces to reduce heat absorption.
- Refer to Wollongong City Council Standard Engineers Drawings 2019 for further details on jointing.



BROOM FINISH CONCRETE

TYPICAL DETAIL NTS

PATHWAY & PAVEMENT REQUIREMENTS

Coloured Honed Concrete Pavement

LOCATION:

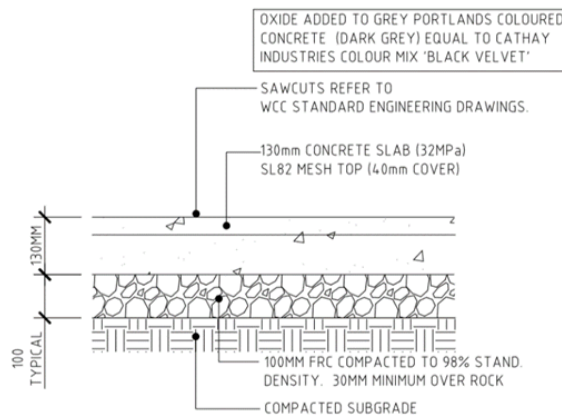
- Neighbourhood Parks, Town Centres

APPLICATION:

- Paving within open space that require a high finish or coloured to reduce surface staining.

SPECIFICATION:

- Slip resistance: P4.
- Refer to Wollongong City Council Standard Engineers Drawings 2019 for further details on jointing.
- Refer to detail below.



OXIDE CONCRETE

TYPICAL DETAIL NTS

PATHWAY & PAVEMENT REQUIREMENTS

Unit Paving

LOCATION:

- Neighbourhood Parks, Town and Village Centres

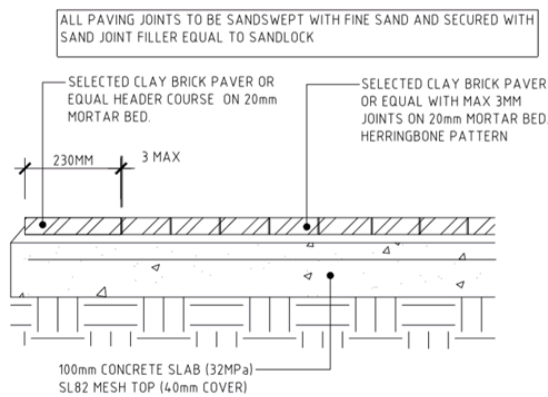
APPLICATION:

- Paving within open space that require a high finish. Town and village centres treatment to footpaths.



SPECIFICATION:

- As shown below



BRICK PAVING ON CONCRETE SUBGRADE

TYPICAL DETAIL NTS

PATHWAY & PAVEMENT REQUIREMENTS

Softfall to play spaces/ fitness stations

LOCATION:

- Local, Neighbourhood Parks.

APPLICATION:

- Softfall to play spaces and fitness equipment

SPECIFICATION:

- As per AS 4685 series.
- Colour: CBSR Rubber with a 50/50mix of Mid Blue and Mid Green
- Construct an extruded 200 x 200mm reinforced concrete edge around the perimeter of the playground under surfacing and fill the entire area with an appropriate impact attenuation material, in accordance with *AS/NZS 4422*. The edge must be set back at least 2.5 m from any item of play equipment to provide adequate circulation and maintenance space.



PARK SIGNAGE

Park Signage Guidelines

The Landscape Plan should incorporate a signage strategy to provide locations for park naming signage, walking trail markers and interpretive signage. A standard Blank Council PS1 Park name sign shall be provided at the park's primary public access point(s). Any sites of special interest in the park, such as heritage sites should have interpretive signage (PS3 or PS4).

Park naming signage infrastructure can be installed at completion of the park construction. The final naming of the park and associated graphics can be determined when the Park naming has been approved in accordance with the WCC Management Policy '*Naming of Community Facilities and Parks (including sports grounds and natural areas)*' May 2017 and the name is gazetted.

Interpretive Signage

Interpretive signage should be developed as part of the Heritage Interpretation Plan for the development site. The interpretive signage should use both text and images to reference the European and Aboriginal history of the site and its significance to the history of West Dapto.

The location and proposed type of all signage should be indicated on the submitted Landscape Plan.

The details of images and text proposed for any interpretive signage must be provided to Councils Heritage Officer for written approval. We would recommend the text to be limited between 200- 300 words.

PARK SIGNAGE

PS1 – Park Name Sign

LOCATION:

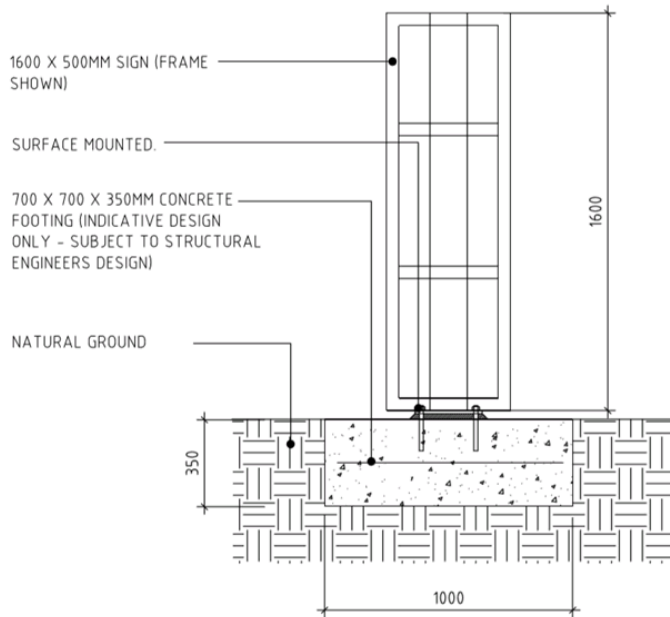
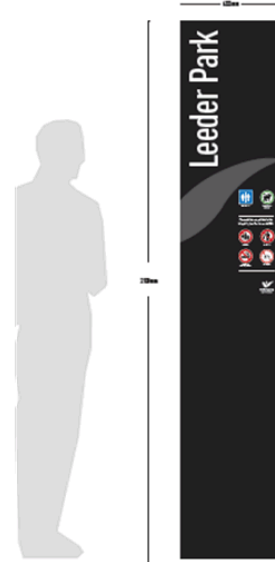
- Local and Neighbourhood Parks

APPLICATION:

- Installed at major entry points to park to maximise pedestrian exposure to information.

SPECIFICATION:

- Galvanised steel frame fixed with aluminium composite panel top sheets. Steel frame painted in black.
- Vinyl graphics prepared by WCC. Rear panel of the sign can also be utilised for the display of interpretive information.



PARK SIGNAGE

SECTIONAL ELEVATION NTS

PARK SIGNAGE

PS2 – Trail Marker

LOCATION:

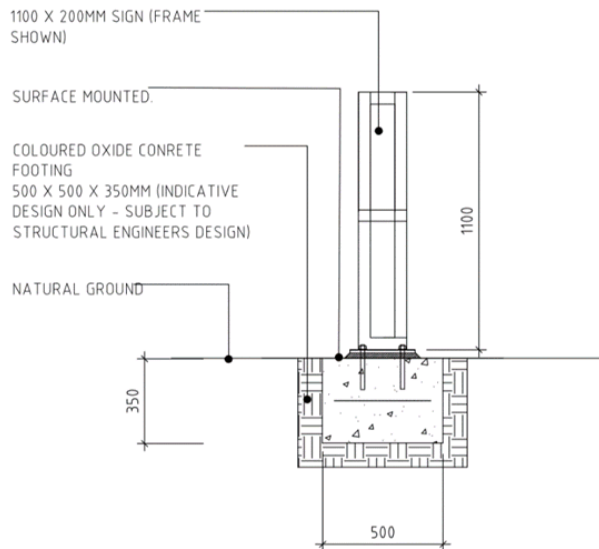
- Local, Natural Areas and Neighbourhood Parks

APPLICATION:

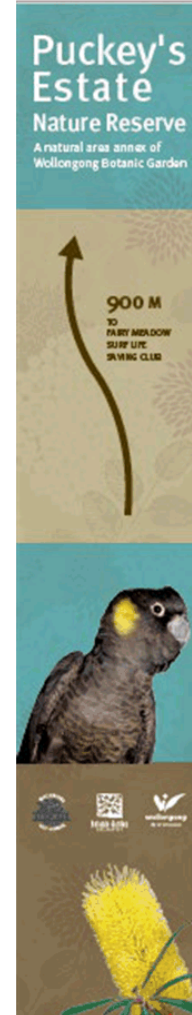
- Track marker installed at track junctions and secondary entry points and along tracks at strategic locations.

SPECIFICATION:

- Galvanised steel frame fixed with aluminium composite panel top sheets. Steel frame painted in black.
- Vinyl graphics prepared by WCC.



TRACK MARKER
SECTIONAL ELEVATION NTS



PARK SIGNAGE

PS3 –Small Interpretive Sign

LOCATION:

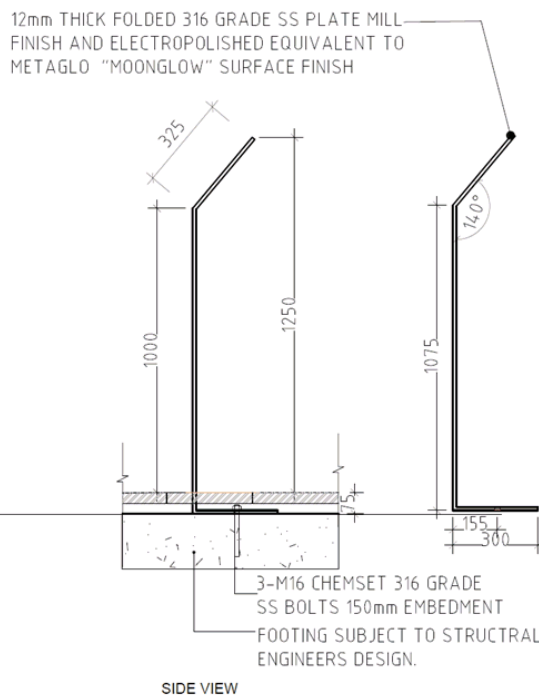
- Local and Neighbourhood Parks

APPLICATION:

- Small format signage to display interpretative information.

SPECIFICATION:

- Stainless steel plate with milled finish.
- The details of images and text proposed for any interpretive signage must be provided to Councils Heritage Officer for written approval. Vinyl graphics prepared by applicant.
- Recommend maximum word count for text (200-300)



SMALL INTERPRETATIVE SIGN

SECTIONAL NTS

PARK SIGNAGE

PS4- Large Interpretive Sign

LOCATION:

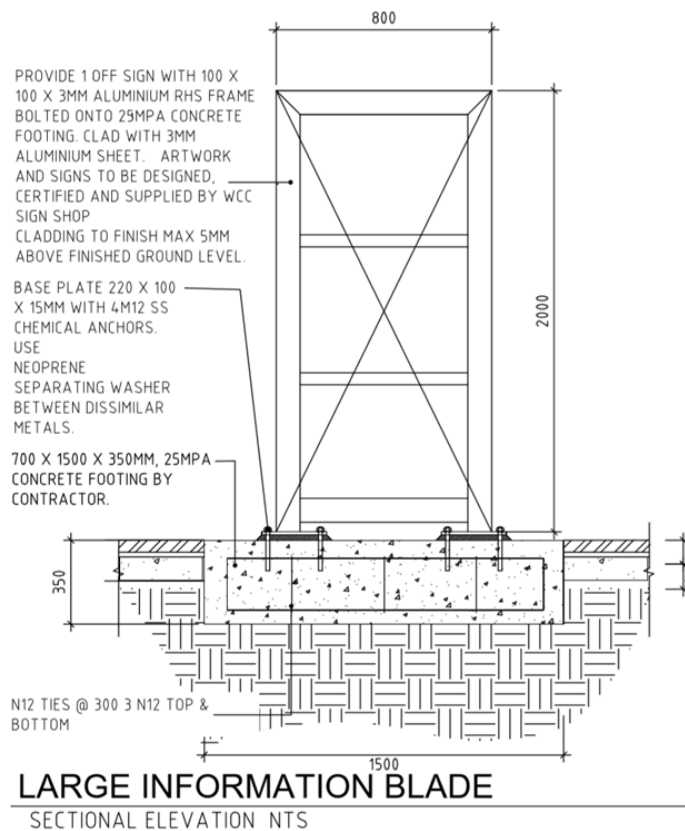
- Local and Neighbourhood Parks

APPLICATION:

- Large format signage to display interpretative signage.

SPECIFICATION:

- Galvanised steel frame fixed with aluminium composite panel top sheets. Steel frame painted in black.
- The details of images and text proposed for any interpretive signage must be provided to Councils Heritage Officer for written approval. Vinyl graphics prepared by the applicant.



LANDSCAPE DETAILS

Tree planting Guidelines

TREE SELECTION CRITERIA

Trees are to be selected in accordance with AS2303:2018. Tree Stock for Landscape Use. All stock is to be inspected for Myrtle rust (*Uredo rangeli*) prior to delivery to site. No transactions should be conducted if the nursery is not compliant with the Nursery Industry Myrtle Rust Management Plan.

STREET TREE LAYOUT

The limitations to the positioning of street trees on footways immediately behind the kerb line are listed below:

CLEARANCE NEEDED

- Street intersection 10m from intersection kerb line
- Telegraph pole 5m from centre of pole.
- Storm water inlet 2m from edge of inlet
- Major underground service junction 3m from edge of junction box
- Bus stops - no trees planted along length of stop.
- Traffic lights - 10m from pole of traffic lights.
- Driveways - 4m from vehicle crossing

TREE PLANTING SPECIFICATION

SOIL TYPES

Soil mixes to be used as the growing medium in tree pits as minimum all soils must comply with AS4419 – Soils for Landscaping and Garden Use.

MAINTENANCE

Newly planted street trees require deep watering once a week for a minimum of 52 weeks from Practical Completion. At each watering the guards should be checked and repaired or tightened as necessary.

LANDSCAPE DETAILS

Indicative Tree Species List

Indicative species list only with additional species as recommended by Park and Open Space Manager.

STREET TREES

Exotic

- Pyrus ussuriensis* - Manchurian pear.
- Zelkova serrata* 'Green Vase'
- Fraxinus pennsylvanica* 'Urbanite'
- Pistacia chinensis* - Pistachio
- Ulmus parvifolia* - 'Todd' Chinese Elm
- Lagerstroemia indica* x *L. fauriei* - 'Sioux' Crepe Myrtle
- Lagerstroemia indica*
- Geijera parvifolia*
- Hibiscus tiliaceus* 'Rubra'

Native

- Tristaniaopsis laurina* - Water Gum
- Melaleuca linariifolia* - Snow in Summer
- Waterhousia floribunda* - Waterhousia
- Waterhousia floribunda* 'Amaroo'
- Lophostemon confertus* - Brushbox
- Elaeocarpus reticulatus* - Blueberry Ash
- Elaeocarpus eumundii* - Quandong
- Brachychiton acerifolium* - FlameTree
- Backhousia myrtifolia* - Grey myrtle
- Ceratopetalum apetalum* - Coachwood
- Syzygium leuhmanii* - Weeping Lily Pily
- Acmena smithii* var. - Minor Lily Pily
- Alphitonia exclesa* - Red Ash
- Callistemon 'Kings Park'* - Kings Park Bottlebrush
- Glochidion ferdinandi* - Cheese Tree
- Polycias elegans* - Celery Wood
- Planchonella australis* - Black Apple
- Elaeodendron australis* - Red Fruited Olive Plum

Guioa semiglauca- Guioa

Streblus brunonianus- Whalebone Tree

Celtis paniculata- Native Celtis

Toona ciliata- Red Cedar

TREE PLANTING IN OPEN SPACE

Ficus macrophylla - Moreton Bay Fig

Ficus obliqua - Small leaf fig

Ficus rubiginosa - Port Jackson Fig

Ficus coronata - Sand Paper Fig

Araucaria cookii - Column Pine

Fraxinus pennsylvanica 'Urbanite'

Zelkova serrata 'Green Vase'

Podocarpus elatus - Illawarra Plum

Waterhousia floribunda - Waterhousia

Melaleuca decora - Feather Honeymyrtle

Melaleuca styphelioides - Prickly Leaf Paperbark

Livistona australis - Cabbage Tree Palm

Ulmus parvifolia 'Todd' - Chinese Elm

Lophostemon confertus - Brushbox

Lagerstroemia indica - Crepe Myrtle

Syzygium leuhmanii - Weeping Lily Pily

Alphitonia exclesa - Red Ash

Backhousia citriodora - Lemon Ironwood

Callistemon 'Kings Park' - Kings Park Bottlebrush

Glochidion ferdinandi - Cheese Tree

Polycias elegans - Celery Wood

Planchonella australis- Black Apple

Elaeodendron austral- Red Fruited Olive Plum

Guioa semiglauca- Guioa

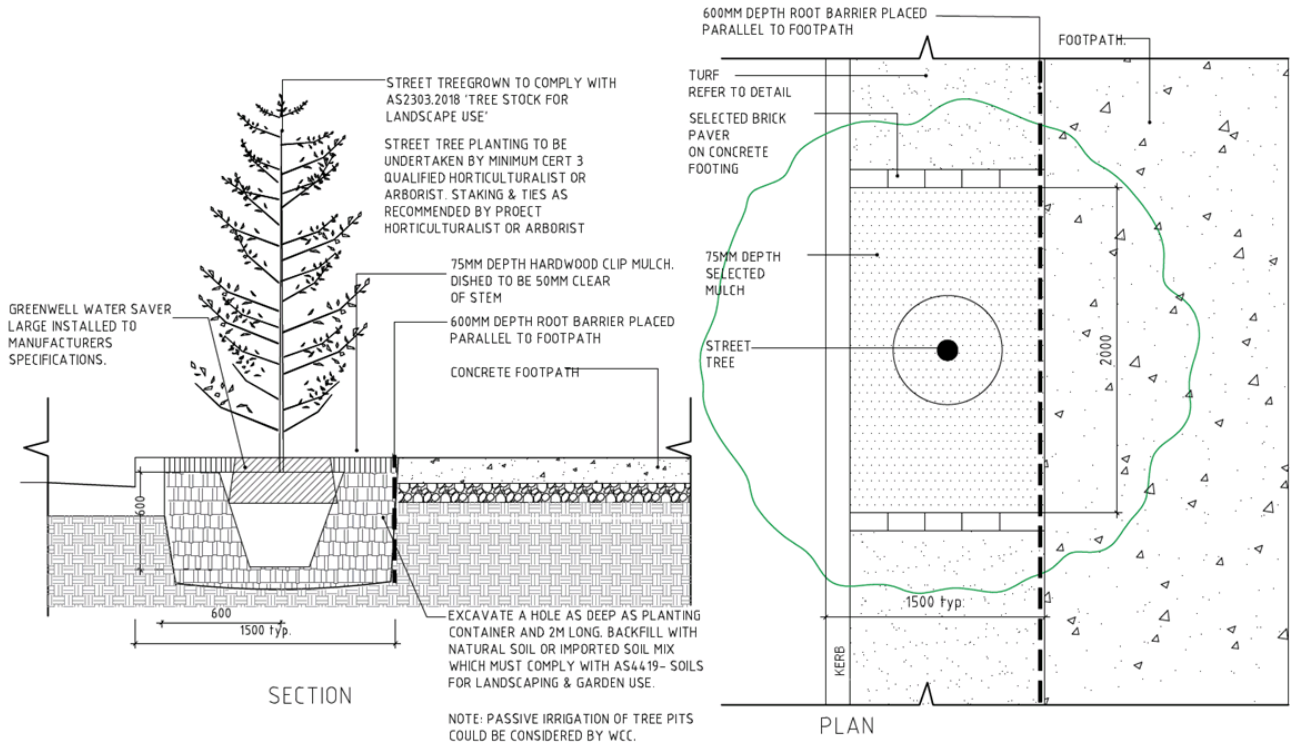
Streblus brunonianus- Whalebone Tree

Celtis paniculata- Native Celtis

Toona ciliata- Red Cedar

LANDSCAPE DETAILS

Street Tree Planting Detail



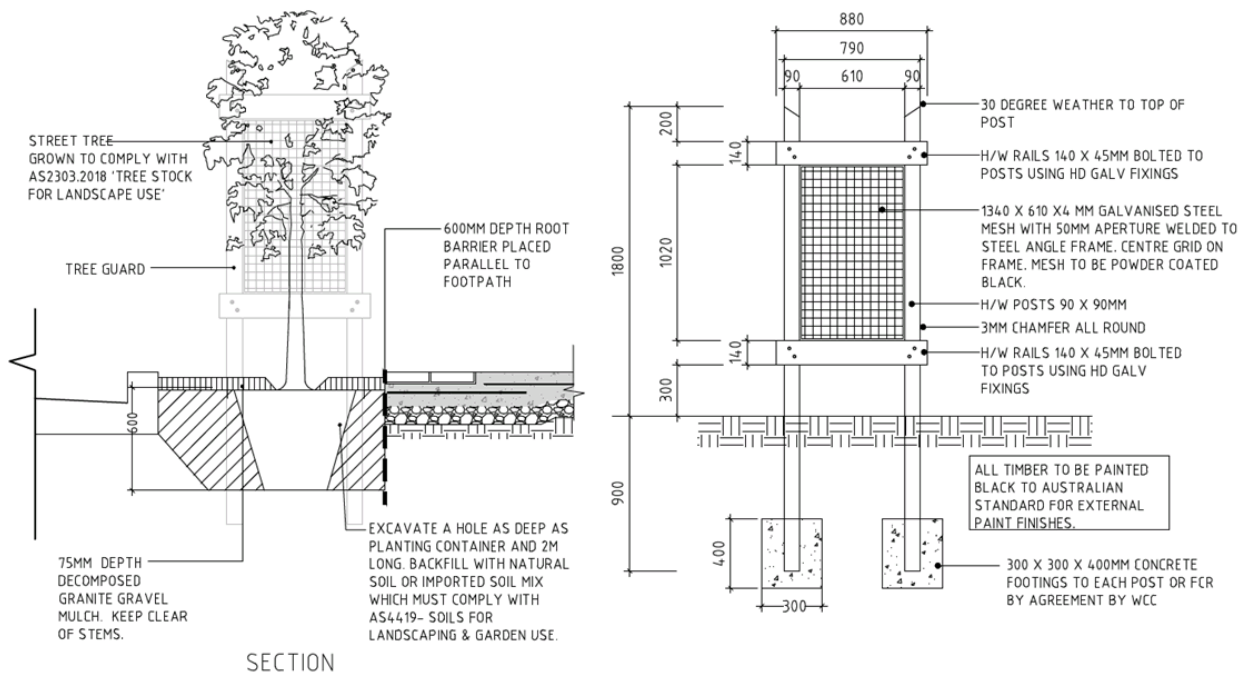
STREET TREE IN NATURAL GROUND

PLAN & SECTION

NTS

LANDSCAPE DETAILS

Street Tree Planting in Village and Town Centre Detail



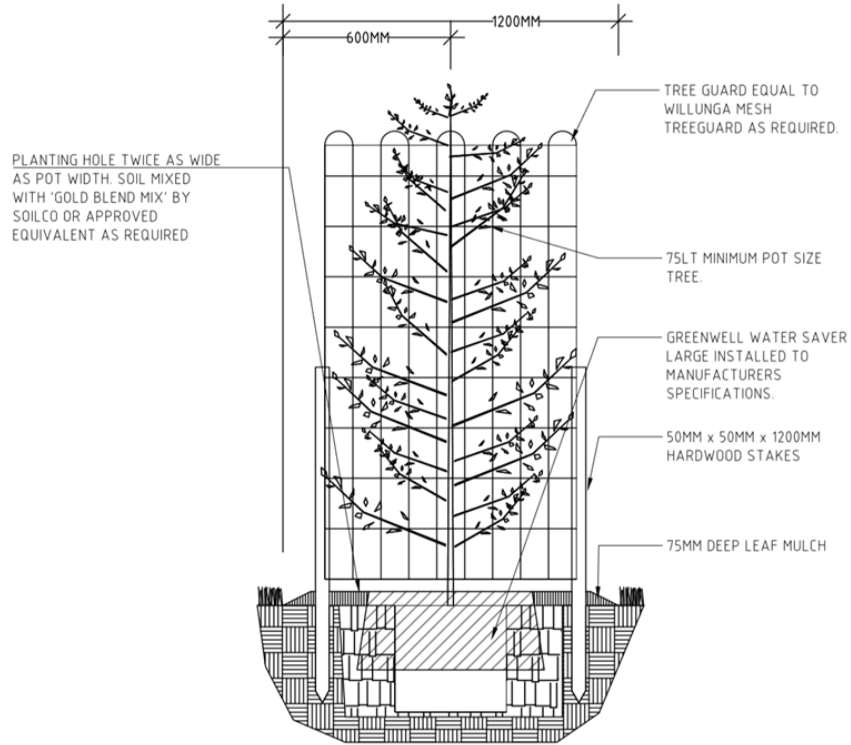
STREET TREE IN TOWN & VILLAGE CENTRE WITH GUARD

PLAN & SECTION

NTS

LANDSCAPE DETAILS

Tree Planting in Lawn Areas with Mulch Ring



TREE PLANTING IN MULCH RING

SECTION

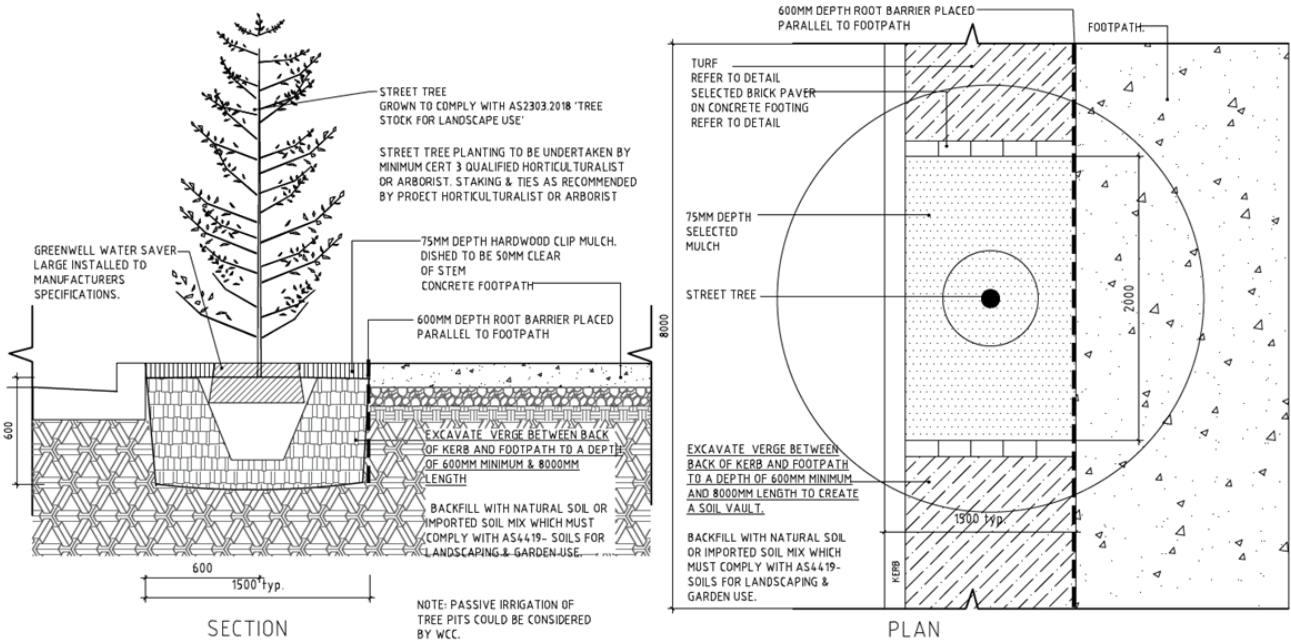
NTS

LANDSCAPE DETAILS

Street Tree Planting in Coal Wash / Clay soils

To ensure the establishment of trees and ensure their long term health and life expectancy it is required that a minimum top soil depth be established in streetscapes and open space. A minimum depth of 600mm of top soil must be installed in all open spaces to establish street trees, mass planting beds and turf areas.

Refer to the following details for street tree planting.



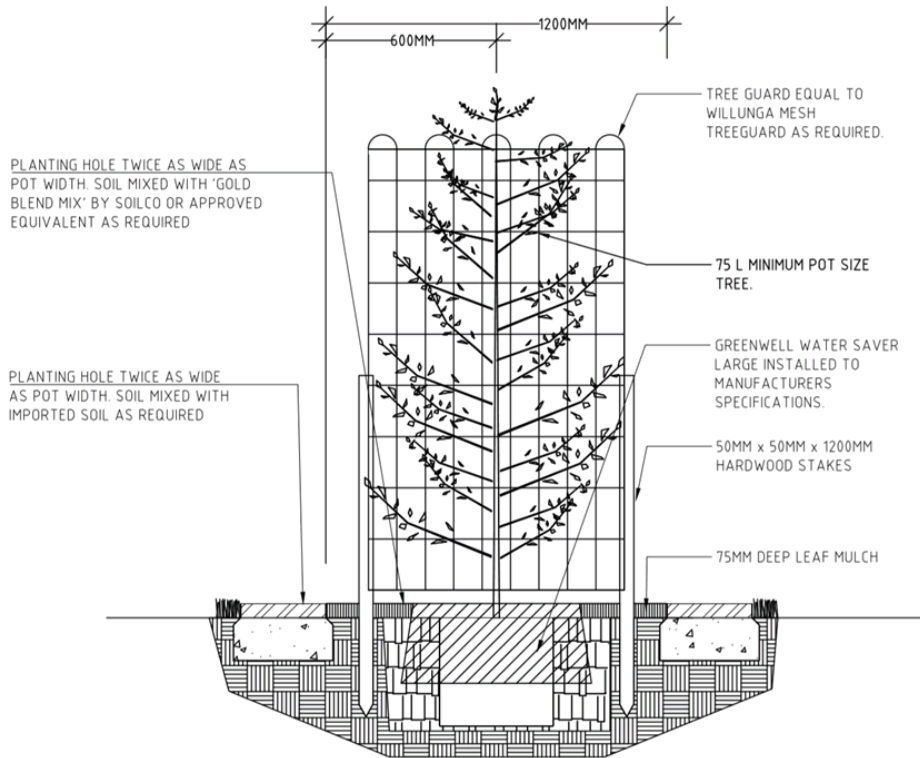
STREET TREE IN COAL WASH/ CLAY SOILS

PLAN & SECTION

NTS

LANDSCAPE DETAILS

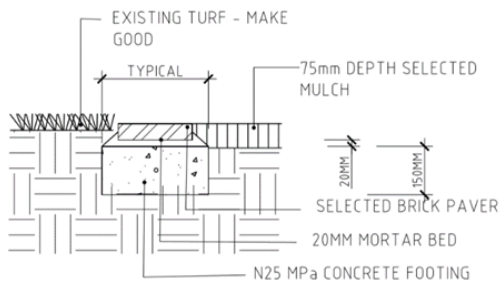
Tree Planting with Edge Detail



TREE PLANTING IN EDGING

SECTION

NTS



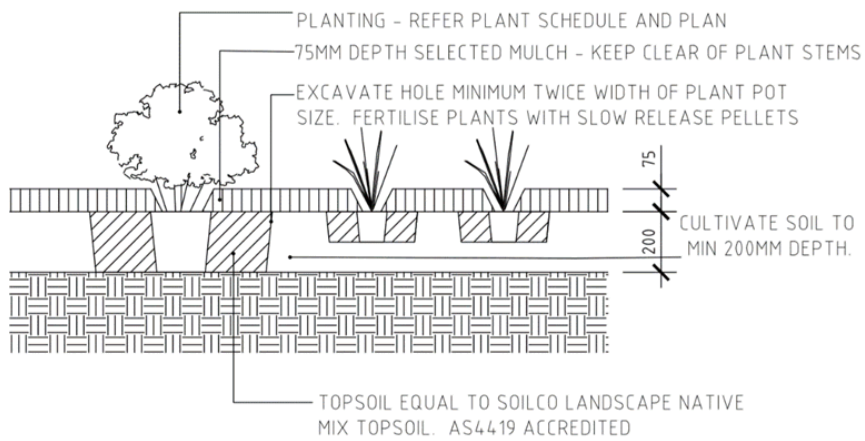
BRICK PAVER - TREE PIT EDGE

TYPICAL DETAIL

NTS

LANDSCAPE DETAILS

Mass Planting Detail



MASS PLANTING

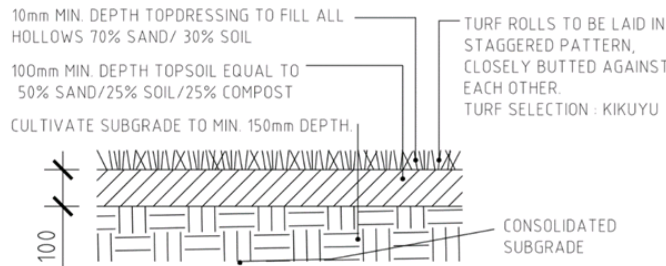
TYPICAL DETAIL

NTS

LANDSCAPE DETAILS

Turf Detail

Turf Species to be Kikuyu for Open Space areas, and Buffalo adjacent to Natural Areas



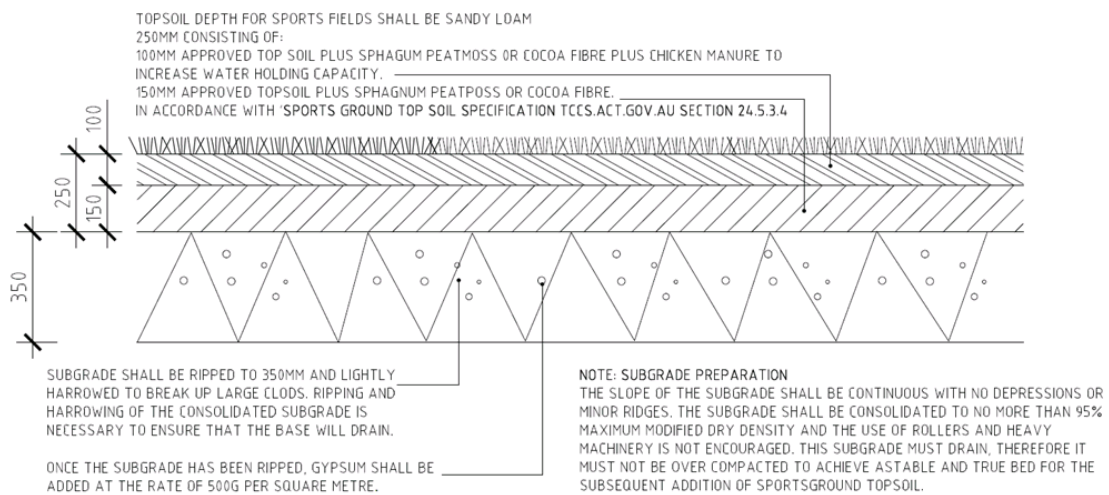
TURF

TYPICAL SECTION

NTS

Sports Turf Detail

Turf Species to be Kikuyu for Sports Fields



SPORTS FIELD TURF

TYPICAL SECTION

NTS

AMENDMENTS

The following table summarises the changes in the document since the last version on

Amendment Sequenced No.	Key Topic Addressed in Amendment	Amendment Location	Author Initials	Amendment Date
1	Change to Table 1- Park furniture- additional post mounted bike rack added	Page 6	DP	October 2019
2	Change to Table 5- Landscape details- additional Sports Turf Detail added	Page 10	DP	October 2019
3	Change to include reference for Double wheelie bin post for Neighbourhood Parks to allow for inclusion of recycling bin	Page 23	DP	October 2019
4	Change to detail to include bike rail mounted to post	Page 28	DP	October 2019
5	Change to text to clarify requirements for vehicle access control	Page 37	DP	October 2019
6	Add reference to the use of light colours in surfaces to reduce heat absorption	Page 49	DP	October 2019
7	Additional species added to indicative tree species list	Page 58-59	DP	October 2019
8	Street tree detail amended	Page 61	DP	October 2019
9	Street tree detail with tree guard	Page 62	DP	October 2019
10	Street tree detail amended	Page 64	DP	October 2019
11	Additional Sports Turf Detail	Page 67	DP	October 2019

exhibition August 2019

WEST DAPTO OPEN SPACE TECHNICAL MANUAL

