MULLUM CREEK

DESIGN . ENVIRONMENT . DONVALE

Mullum Creek Design Guidelines

Version 8.2 - 4 October 2016

Mullum Pty Ltd

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Note

The following reference documents that support the Mullum Creek Design Guidelines may be downloaded from the Mullum Creek website:

- Lot plans
- Vegetation envelope plans
- Various technical guides (materials, products, services)
- Fencing guidelines
- List of recommended plants and nurseries, gardening guides
- Application forms and checklists
- Incentives information and forms

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These Guidelines have been informed by and draw on materials prepared for similar projects as well as a variety of sources in the public domain. Feel free to use these Guidelines to improve the environmental and aesthetic performance of any project beyond Mullum Creek, however, please acknowledge us if you do so.

1 Introduction

The Mullum Creek estate is located along the western bank of the Mullum Mullum Creek in Donvale, approximately 20 km from the city of Melbourne. The land was formerly comprised of orchard, farm and remnant bush. It has been owned by the Mathews family since 1958 and is now the site of an environmentally sensitive residential development. Homesites are confined to previously cleared land, and the creek frontage and remnant bushland (approximately 45% of the original property) have been donated to Manningham City Council for inclusion in the local reserve system. The Mullum Mullum Linear Park and Bike Trail now extends through the property alongside the creek, and the bush continues to provide habitat for a wide variety of indigenous animals and plants.

1.1 The Mullum Creek vision

Mullum Creek is an environmentally sustainable development in which residents will live in homes that have a light environmental footprint. Homes will be energy efficient, incorporating solar power and water conservation, and will minimise the use of non-renewable resources. Good design principles and environmentally responsible material choices and building practices are central to the vision. The key elements of the Mullum Creek Vision are:

- Respect for the existing environment and topography, reflected in the siting of buildings works and style of landscaping.
- Environmental sensitivity reflected in energy efficiency and conservation of resources to minimise environmental impacts.
- Ecological sensitivity, reflected in the protection and promotion of indigenous habitat, flora and fauna.
- Design excellence reflected in buildings that are of a scale and style compatible with the landscape character and setting of the Mullum Mullum valley.
- Longevity reflected in design that is adaptable to future uses and a changing climate.

Lot plans have been created for each individual homesite. These include site information, as well as specific requirements that apply to each homesite. The three-dimensional (3D) building and vegetation envelopes shown on these plans ensure that constructed dwellings and planted trees are sized to preserve a minimum 5 hours of winter sunlight for neighboring dwellings, thereby protecting the solar rights of all homeowners.

These Guidelines are designed to realise the Mullum Creek vision. They apply to the construction of all dwellings on the estate. This ensures that all residents benefit from a sustainable, well-designed built environment that delivers a high level of amenity, aesthetic appeal, comfort, and energy efficiency, both in the home and estate wide.

1.2 The Mullum Creek Masterplan

The Mullum Creek Masterplan is designed to sit within and enhance the natural features of the site, providing access to bushland reserves, the Linear Park and Bike Trail, and connection to the surrounding neighbourhood.

Figure 1. *Mullum Creek Masterplan.*

The Masterplan provides:

- 56 lots that range from 1,000 to 3,500m^2.
- Connection to the Mullum Mullum Linear Park and Bike Trail and the estate's bushland reserves.
- Wetlands that moderate and filter the estate's stormwater before it enters the Mullum Mullum Creek.
- Significant reserves of remnant bush and mature indigenous trees, with significant trees retained on lots.
- Habitat for native flora and fauna.

1.3 Mullum Creek Design Guidelines

The purpose of these Guidelines is to facilitate the achievement of the Mullum Creek vision by:

- Encouraging innovation and energy efficient design to produce homes that are naturally warmer in winter, cooler in summer, and cheaper to run throughout the year.
- Encouraging the building of homes which minimise use of non-renewable or non-environmentally sustainable resources, both in their construction and their ongoing operation.
- Encouraging the creation of a well-designed and attractive built environment which sits comfortably in its natural setting.
- Assisting homeowners to make choices that will benefit their own lifestyles, the community and the environment, helping to create a better future for everybody.

Compliance with the Guidelines is legally required by an agreement under Section 173 of the Planning and Environment Act 1987, which in turn is registered on the title of all lots at Mullum Creek. This requirement ends only after the Design Review Committee ceases to exist, which at the earliest is three years after the approval of Mullum Creek's final dwelling (see **Section 1.4** below). Thereafter, covenants placed on titles will ensure that core elements of the Mullum Creek vision are upheld into the future.

1.4 Structure of the Guidelines

This first section of the Guidelines provides background information on the Mullum Creek estate, these Guidelines, the Design Review Committee (DRC) and other controls that affect landowners at Mullum Creek. The second section deals with implementation of the Guidelines, including design review and approval processes.

The remainder of the Guidelines cover design objectives, requirements and recommendations. These are divided into six sections:

- Siting.
- Building design.
- Materials, colours and finishes.
- Energy and water.
- Landscaping.
- Miscellaneous items.

Each of these sections contains detailed Guidelines. Each detailed Guideline includes one or more of the following:

- Objectives – what the Detailed Guideline is seeking to achieve.
- Detailed Requirements (R) – specific Requirements directed towards achieving the Objective. Home designs must comply with Detailed Requirements unless the DRC approves a variation.
- Guides (G) – recommendations for other actions that can be taken to assist in achieving the intent of the Objectives or Detailed Requirements. Addressing the Guides is voluntary but highly encouraged. In addition, implementation of Guides may be taken into account by the DRC when considering a proposal for a variation.

1.5 Role of the DRC

The DRC will oversee all development at Mullum Creek until at least three years after construction of the final dwelling on the estate has been completed. After the period of DRC oversight, the Guidelines will cease to apply, but key requirements of the Guidelines will continue to apply via covenants registered on the titles of all homesites within the estate. This will help to maintain the amenity, appeal and environmental performance of your own home as well as the estate more generally, well into the future.

The Mullum Creek Design Review Committee (DRC) has been established for the purposes of:

- Overseeing the implementation of the Guidelines and assisting homeowners and designers to navigate the development process.
- Reviewing and assessing each homeowner's proposed development and providing approvals under the Guidelines.
- Providing support, particularly where it relates to environmentally sensitive design.

You can contact the DRC at: info@mullumcreek.com.au

The DRC may make amendments to the Guidelines from time to time to reflect changes in statutory controls, urban development policies and other requirements of local, state or federal authorities, or to reflect best practice as well as advances in ideas and technology.

1.6 Other controls

The Guidelines do not replace the requirements of the Manningham Planning Scheme, the National Construction Code or other regulatory requirements. Where there is a discrepancy between these requirements, the highest of the standards set must be met. Each homeowner must comply with all relevant regulatory requirements in addition to the Requirements of the Guidelines. Manningham Council will assess your proposed building and landscape designs against **Schedule 11 to the Design and Development Overlay** (DDO11) and **Schedule 8 to the Significant Landscape Overlay** (SL08). These are available on the Mullum Creek website.

Before commencing construction of your home at Mullum Creek, you must obtain the following approvals:

- Step 1, 2 and 3 design approvals from the DRC (see Section 2).
- A planning permit from Council.
- A building permit from Council or private building surveyor.

You must obtain all relevant authority approvals at your own cost. Council's website includes information on planning permits and building permits: http://www.manningham.vic.gov.au

BAL assessment

Homes at Mullum Creek must comply with relevant standards and regulations in relation to bushfire protection. Current building regulations require you to provide a BAL (Bushfire Attack Level) assessment as part of your application for building approval. Terramatrix Wildfire Management Services has prepared a BAL Assessment Report for the Mullum Creek estate (listed on the Mullum Creek website). You may use this report at your own discretion. However, your Building Surveyor should confirm via an independent wildfire management consultant that site conditions upon which the BAL report is based have not changed at the time you commence the detailed design of your home. Refer to the Victorian Building Authority's website for further information.

1.7 Mullum Creek incentives

While compliance with the Guidelines is mandatory and will ensure a high standard of environmentally sensitive development, Mullum Creek encourages you to seek even higher levels of environmental performance for your home. To this end, a number of incentives are offered for Mullum Creek lot owners. Refer to the Mullum Creek website for further information.

Mullum Creek incentive packages

Incentives are offered by Mullum Creek to help you achieve a built outcome that reflects and enhances the Mullum Creek vision. These are outlined in detail on the Mullum Creek website and include architectural design, landscape design and ESD Incentives.

2 Implementation of the Guidelines

2.1 DRC design approval

To ensure a quality-built environment, that reflects the Mullum Creek vision is achieved, all design proposals are reviewed by the DRC according to a 3 step process described in this chapter. This oversight by the DRC will encourage consistency and coherence in the form, character and environmental performance of constructed dwellings and landscapes throughout Mullum Creek.

Detailed Requirements

R1 ***Step 2 Design Approval must be obtained from the DRC before applying to Council for a planning permit, an amendment to an application for a planning permit, an amendment to a planning permit, or secondary consent under a planning permit. A DRC Design Approval stamp on documentation submitted to Council is required as evidence of this.***

R2 ***Step 3 Design Approval must be obtained from the DRC before applying to Council or a private building surveyor for a building permit, an amendment to an application for a building permit, an amendment to a building permit, or secondary consent under a building permit. A DRC Design Approval stamp on documentation submitted for building approval is required as evidence of this.***

R3 ***Any request to the DRC for consent for a variation of a Detailed Requirement contained in these Guidelines must be clearly documented and justified in an application for Design Approval.***

R4 ***Construction of a dwelling must commence within 2 years and be completed within 4 years of settlement on purchase of a Mullum Creek lot.***

R5 ***If the design of a proposed building alters significantly during the 3 step DRC design approvals process, or is refused DRC Design Approval at any of the 3 review steps, each new submission for each Step review must be accompanied by payment of a $900 (exc. GST) fee. At the discretion of the DRC, this fee will not apply to minor variations.***

R6 ***A copy of each of the following documents must be provided to the DRC within 10 business days of their being issued or re-issued:***

- ***Planning permit, including all drawings upon which it is based.***
- ***Building permit, including all construction documentation (drawings, specifications, schedules, etc.) upon which it is based.***

R7 ***The DRC must be notified within 10 business days of the completion of construction, and be permitted access to the property to verify compliance with documentation issued with Step 3 Design Approval (see R2 above).***

2.2 The step-by-step approval process

Who	What	Outcome
Owner	• Carefully read these Mullum Creek Design Guidelines. • Contact the DRC for an early advice meeting. • Choose an architect/designer. If your architect is not a Mullum Creek recommended architect, ensure he/she is aware of and understands these Guidelines.	
Owner **Architect** **Designer**	**Begin designing your home.** • Share your early schematic design with the DRC for informal comment. • Consider a pre-application meeting with Council to elicit helpful feedback. • Download **Step 1 Checklist** from the Mullum Creek website, complete, and submit for Step 1 design approval.	Preliminary design of your home and submission for Step 1 design approval
Owner **Architect** **Designer**	**Continue to develop your design.** • Address any points of concern flaged by the DRC in its Step 1 preliminary design review. • If you have not already chosen a landscape designer, do so now. Landscape design approal is a component of the DRC Step 2 developed design approval. Consider taking advantage of the Mullum Creek landscape design incentive. • Download **Step 2 Checklist** from the Mullum Creek website, complete, and submit for Step 2 design approval.	Developed design of your home and submission for Step 2 design approval
Owner **Architect** **Designer**	**Apply for a planning permit with Manningham City Council.** • The DRC stamped document set received with your Step 2 developed design approval must be submitted to Council along with your permit application. Applications without DRC approval will not be approved by Council.	
Council	Manningham City Council assesses your application for a planning permit.	Planning permit
Owner **Architect** **Designer**	**Complete construction documentation for your design.** • Ensure that the detail contained in documents with DRC Step 2 approval is fully incorporated in drawings and specifictions prepared for building construction. • Download **Step 3 Checklist** from the Mullum Creek website, complete, and submit for Step 3 final design approval with the DRC.	Construction documentation
Owner **Architect** **Designer**	**Choose a builder.** • Ensure that your builder is aware of particular construction detailing, site and waste management practices required by the Mullum Creek Design Guidelines. Arrange a meeting between your builder and the DRC to assist with this.	

2.2.1 Step 1 Preliminary Design

Before purchasing your homesite, you will have inspected the site and become familiar with its features and discussed with the Mullum Creek sales staff whether the lot you have chosen suits the type of home you want to build. You will have been provided with the homesite's lot plan and vegetation envelope plan as well as a copy of these Design Guidelines.

All original lot purchasers will have received a complimentary copy of the book "Your Home". This publication, available also online at www.yourhome.gov.au, contains an extraordinary wealth of information written in plain language, to help you understand the ins and outs of designing, building and living in an environmentally sensitive home and neighbourhood.

Early advice

Before beginning the design process for your dwelling, you are strongly encouraged to make an appointment to meet with the DRC to discuss your vision for your homesite, and to clarify how the DRC can assist you in achieving this through the design process. Clarification of the Guidelines, incentive packages and an explanation of what is required to obtain DRC approval for your proposed development will be covered.

The main purpose of this meeting is to identify the opportunities, constraints and requirements of your homesite. If you haven't already chosen an architect or building designer, you will be encouraged to choose one recommended by Mullum Creek and to take advantage of the Building Design Incentive. If you have already chosen an architect or designer, their presence at this meeting is extremely beneficial. This is particularly the case if you have chosen a designer who is not familiar with the Mullum Creek Design Guidelines, as a great deal of time and expense can be incurred in reworking designs that do not satisfy Guideline Requirements. Make sure to bring any sketches and images that illustrate what you would like to build at Mullum Creek.

Sharing any developed schematics with the DRC before officially submitting for Step 1 preliminary design review will be useful. This feedback will indicate where your design does not meet the key Mullum Creek design requirements, and addressing these at this early stage will save you time and money down the track as your design develops.

Preparing your Preliminary Design

Before applying for Step 1 Preliminary Design approval, it is important that you:

- Ensure that your building design engages sensitively with the existing landform, and rests comfortably within the 3D building envelope prescribed for your lot (consistent with Requirement R9 and R10).
- Take note of any early feedback from the DRC to ensure your design is on track to achieve the minimum 7.5 star energy rating Requirement R34.
- Be aware of the implications that the orientation of your building has on its livability (Requirement R8), and discuss with your designer the impact that the expanse, orientation and quality of glazing has on the thermal performance of your home.
- Take into account the role that effective and appropriate shading can play in your design.
- Bear in mind the compactness of your design form. The smaller the ratio of external surface area to floor area, the better the thermal performance of the dwelling will be in Donvale's climate.
- Provide separate air compartments within otherwise open living zones to allow for more effective containment of mechanically heated and cooled air. Providing air locks to the most regularly accessed external doors to the home will also minimise unwanted heat exchange.

- Allow for cross (horizontal) and stack (vertical) ventilation through the interior of the dwelling by the judicious placement of windows and doors.
- Detail floors, walls, roofs and ceilings so that materials of high heat storage capacity, insulation elements and ventilation pathways work together for optimal thermal performance.
- Ensure that the materials proposed in your design address the Objectives of **Section 5** of the Mullum Creek Guidelines and meet Requirements R28 to R33.

AccuRate energy rating

A minimum of 7.5 stars under the **AccuRate** energy rating system must be achieved (Requirement R34). It is essential that you consider this stringent energy rating requirement when designing your home. Each design will undergo a three-step thermal performance assessment with Mullum Creek's nominated energy assessor as part of the DRC Design Approval process.

- Ensure that your building design addresses all of the requirements of Council's DDO11 and SL08 overlays. If your design does not align with these overlays, the DRC recommends that you organise a pre-application meeting with Council before applying for Step 1 approval. Feedback you receive will be invaluable in developing your design and will provide some assurance that your application for planning approval will be viewed favourably down the track.

Submitting for Step 1 Preliminary Design Approval

In its Step 1 review process, the DRC will pay particular attention to the environmental aspects of your preliminary design. The preliminary thermal performance review, undertaken by our nominated energy assessor at this point, will provide you with an interim energy rating. The report will also suggest improvements for your design if it hasn't yet met the minimum 7.5 star energy rating benchmark but is on track to do so.

A checklist of what must be included in your application for Step 1 Preliminary Design Approval is available on the Mullum Creek website. Please note that the DRC is unable to review submissions that are incomplete.

2.2.2 Step 2 Developed Design

Now your architect or building designer will further develop the drawings and specifications of your design. Any requests for greater detail or other outstanding issues of concern, flagged by the DRC, in the Preliminary Design stage must be addressed.

The DRC will offer support to help you select environmentally friendly materials, esd considerations and service systems as your design is developed. Information covering materials selection as well as a wide range of other structural and technical topics is available on the Mullum Creek website.

Landscaping makes a vital contribution to sustainability as well as to the appearance of the Mullum Creek estate and our streetscapes. Given that landscaping is an integral component of any successful home design, we highly recommend that your landscape designer work closely with your architect or building designer. This is an excellent opportunity to take advantage of Mullum Creek's Landscape Design Incentive 2. Review and approval of your landscape design is required as part of the DRC Step 2 Design Approval, which must then be submitted to Council as part of your planning permit submission. Please see **Section 7: Your Landscape** for more information.

DRC Step 2 Developed Design Approval requires a high level of detailed documentation, and a checklist of what must be included is located on the Mullum Creek website. Please note that the DRC is unable to review submissions that are incomplete.

Variations from the Guidelines

Design proposals are generally expected to meet the Detailed Requirements outlined in these Guidelines, but it is recognised that sometimes variations from the Detailed Requirements may be appropriate.

Requirement variations

The DRC may allow a variation from a Requirement. Any proposed variation will be assessed by the extent to which it:

- Accords with the Mullum Creek vision
- Addresses the Guideline Objectives, upon which the relevant Requirement is based.
- Responds to site-specific characteristics such as topography, aspect, drainage, geotechnical characteristics, native vegetation and relationship to the public spaces and viewing points.
- Delivers a better outcome than would otherwise be achieved.

Any variation accepted by the DRC is specific to the homesite and design proposal for which it has been approved and will neither set a precedent nor imply that the variation will be repeated.

2.2.3 Step 3 Construction Documentation

Once Council has issued a planning permit, your architect or designer will complete documentation for the construction of your home. This must be reviewed by the DRC, who will check that the design has not changed since Step 2 Developed Design approval was granted, and that schedules of appliances and materials are in keeping with the Guidelines.

The Mullum Creek nominated energy assessor will perform the third part of the energy rating process and will issue a NatHERS Certificate Energy Rating for your home. Step 3 Construction Documentation will be approved once the DRC determines that the construction documentation is in order and a 7.5 star energy rating has been achieved.

As well as being a core requirement of Mullum Creek's approval process, it will be highly beneficial for you to ensure that the construction of your home implements all the details of excellent environmental performance incorporated in its design documentation. Therefore, before he/she commences construction, your builder must liaise closely with the DRC to ensure he/she is fully aware of those benefits and requirements. This will ensure that materials selected (e.g. concrete and timber), products ordered (e.g. windows and doors) and construction details adopted (e.g. for window and door installation) are faithfully incorporated in the built outcome as approved by the DRC. This is also an ideal time to take advantage of Mullum Creek's Incentive – ESD Building Inspections, as outlined on the Mullum Creek website.

Once the DRC has granted Step 3 Design Approval, evidenced by stamped construction documentation (building and landscape) and a Mullum Creek Design Approval Certificate, you may take your documentation to a building surveyor for a building permit.

Application fees

No application fees apply when submitting your plans for Design Approval with the DRC for any Step for the first time. However, if your design changes significantly during the Step approval process, or your design fails to meet the Requirements and is not granted approval, each additional assessment and review will incur a fee of $900 (exc. GST). For re-submissions, costs associated with re-assessing energy ratings by the nominated Mullum Creek energy assessor must be covered by the purchaser. See also Requirement R5.

Each of the three DRC Step reviews is provided free of charge **once for each lot**.

Bond

A bond is not required by Mullum Creek. However, you must obtain an asset protection permit from Council prior to commencing construction of your home, to ensure the high quality of the public realm is maintained during the construction of homes. Refer to the Manningham Council website for further information.

Construction

Your build commences. If you have signed up for ESD Incentive Part B, the DRC will track your build with site visits. At three key stages during the home's construction, the DRC will check that the environment-friendly features (materials, construction details and service systems) designed into your home are delivered in accordance with construction documentation as approved by Mullum Creek.

Post-construction

As per Requirement R7, following completion of the construction of your home, the DRC will conduct a final inspection to ensure that there has been compliance with the DRC approved design.

Please contact the DRC to arrange a final inspection. If the constructed dwelling has not followed DRC approved design documentation, Mullum Creek may take enforcement action under the *Planning and Environment Act 1987.*

3 Siting and landform response

3.1 Orientation

Careful placement of your home can help reduce energy costs by ensuring it receives warmth from the sun through winter and benefits from breezes that provide cross ventilation in summer. Good orientation allows you to enjoy living spaces that are naturally well-lit and ventilated. It can provide you with views across the estate whilst also maintaining your neighbours' privacy and promoting a positive and appropriate relationship with public spaces.

Your architect/designer will conduct a study of your site to understand its features, including prevailing breezes, sun paths, significant landscape elements, existing and protected vegetation and more.

Objectives

- Support Council's Design and Development Overlay DDO11.
- Maximise benefits from passive solar design and cross ventilation.
- Minimise overlooking and protect the privacy of neighbours.
- Protect significant trees.
- Minimise earthworks and disturbance of the natural vegetation.
- Promote a sympathetic and effective relationship to public spaces.

Detailed Requirement

R8 ***A north-facing private or semi-private open space, which is directly accessible from a habitable room, must be provided.***

Guides

G1 Orientate and design your home to avoid overshadowing your private open space.

G2 Orientate your sitting / living areas towards the north. Note that this will play an important part in achieving a 7.5 star energy rating.

G3 Deal with overlooking at early design stage, rather than relying on retrospective screening, as this is more likely to achieve a high-quality outcome. When locating your primary private open space, seek to position it so that you are not overlooking your neighbours' primary private open space, or are in such close proximity to it that you will affect the privacy of both homes.

G4 If an existing tree is located on your site, take advantage of its shade and shelter and consider its effect on passive solar design. Integrate it with the design of your home and landscape.

3.2 3D building envelopes

The Lot Plan for each site includes a three-dimensional (3D) building envelope, which defines the area in which you may place your house, garage and all other structures. The surfaces of the 3D building envelope define the minimum setback from lot boundaries and the maximum heights within which the built form must be contained. Refer to Figures 2 and 3 on pages 16 and 17.

The purpose of the 3D building envelope is to protect the long-term performance and amenity of your home as well as your neighbours'. Each 3D building envelope is site-specific as each homesite has unique characteristics, with different implications for solar access to neighbouring properties. All homes constructed within envelopes will enjoy at least five hours of direct sunlight per day, even in the depths of winter when the sun's path is low in the northern sky.

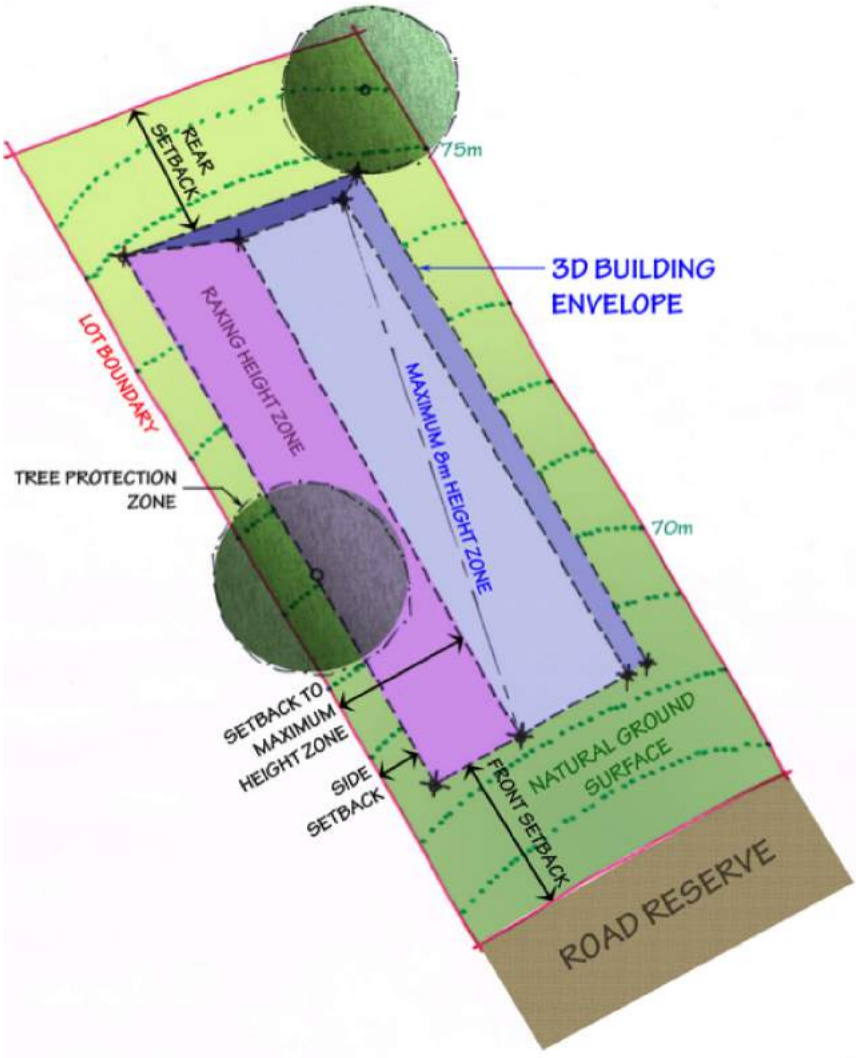

Figure 2. *Lot plan showing 3D building envelope in plan view.*

Objectives

- Preserve solar access and prevent unreasonable inter-lot overshadowing of neighbouring homesites, particularly north-facing windows and private open space, rooftop solar water heaters and photovoltaic arrays.
- Foster visual and acoustic privacy between dwellings.
- Encourage an open streetscape aesthetic throughout the Mullum Creek development.

Detailed Requirements

R9 ***All parts of any dwelling, including the roof and balconies, and all roof services including evaporative coolers and photovoltaic panels, must be located inside the 3D building envelope.***

R10 ***All outbuildings, roofed structures, and semi-enclosed structures positioned on the homesite separate to the main dwelling, must be located inside the 3D building envelope.***

Exceptions

Subject to Council approval, minor encroachments beyond the 3D building envelope will be assessed on merit and at the discretion of the DRC, but only if they are one of the following constructed elements:

- ***A services enclosure or cubby house, of not more than 4m² in floor area or 1.8m in height above natural ground.***
- ***An open deck or terrace of height no greater than 1m above natural ground; balustrades above this 1m limit must not cast significant shadows.***
- ***A chimney, eave, gutter, sunshade, flue or pipe that projects no more than 500mm horizontally beyond the vertical surface of the envelope.***
- ***A water tank located in accordance with Guideline Requirement R39.***

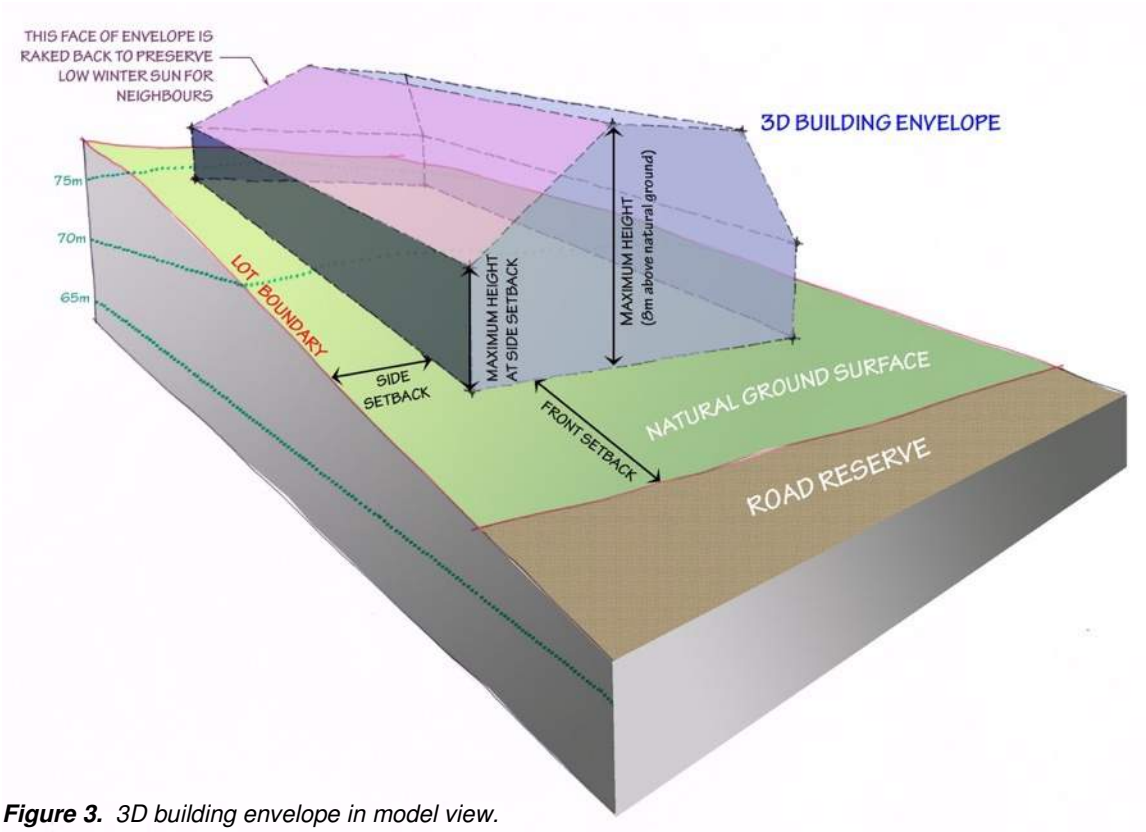

Figure 3. *3D building envelope in model view.*

The surfaces of the prescribed 3D building envelope are set by three parameters:

1. Council's DDO11 setback and height requirements.

2. The protection of each lot's solar access. The 3D building envelopes are shaped to ensure that, for a minimum of 5 hours between 9am and 4pm on May 22 or July 22, no surface of any building envelope will be overshadowed by buildings located within the 3D envelopes on adjacent lots. At the winter solstice (June 22), overshadowing is limited to quite shallow strips around the base of envelopes. The number of hours per day in which surfaces of building envelopes remain clear of shadows increases quite quickly either side of May 22 and July 22.

3. Increased boundary setbacks, to preserve privacy between adjoining residences and private open spaces, and to promote an open landscape aesthetic by generous spacing of dwelling forms.

Your Lot Plan will include your 3D building envelope. The 3D vegetation envelopes also apply to each homesite. If you require clarification in relation to either of these envelopes, contact the DRC. Refer to **Section 7.2** for further information.

3.3 Designing for sloping sites

Sloping sites offer many advantages. They offer opportunities for capturing views and breezes and allow for undercroft storage and car parking. High-quality articulation can naturally result from a design that cascades down a hillside, creating an interesting building comprised of several harmoniously integrated forms.

However, sloping sites can also present challenges. Building placement and cut and fill must be done in a way that is sensitive and minimally disruptive to the natural landform. Bulky buildings must be avoided. Homes on sloping sites at Mullum Creek will require careful and creative architectural design and engineering.

Figure 4. *Building on a slope.*

Figure 5. *A good example of how to build on sloping ground.*

Objectives

- Minimise disruption to the natural landform, soil profile, ground water and surface water.
- Minimise visual bulk.

Guides

G5 Consider stepping floor plates down the slope, to reduce the building's mass and allow your home's interior a more direct engagement with the natural ground level and outdoor spaces.

G6 There is a range of architectural techniques for building on steep sites. Perching over the slope with a raised structure may help avoid excessive earthworks.

G7 You can reduce earthworks by reducing the building footprint or site coverage, and by careful planning that works with rather than against the site contours.

Figure 6. *Example of a raised suspended floor.*

3.4 Site excavation and fill

Site excavation and fill should be minimised, but may be required on steep homesites. Refer to **Section 3.3** for further information on designing to minimise disturbance of the topography.

Objectives

- Support Council's Design and Development Overlay DDO11.
- Minimise impacts on landform, hydrology and natural vegetation.
- Minimise the need to remove or import soil to the site.
- Minimise the ecological impact of construction.
- Minimise impacts on neighbouring properties' amenity.

Detailed Requirements

R11 ***Excavation or fill must not exceed 1.0m in height, measured from the natural ground level to the finished level, such as of a floor slab, car parking space, crossover, turning point or landscaped terrace. The DRC may allow a variation to this Requirement, at its discretion, where it can be shown that the proposed cut and fill minimally impacts on the pre-existing land form, or more effectively advances the Mullum Creek vision and design objectives.***

R12 ***There must be no change to existing landform by way of cut, fill, batters or retaining walls within 1.5m of side or rear boundaries of the homesite.***

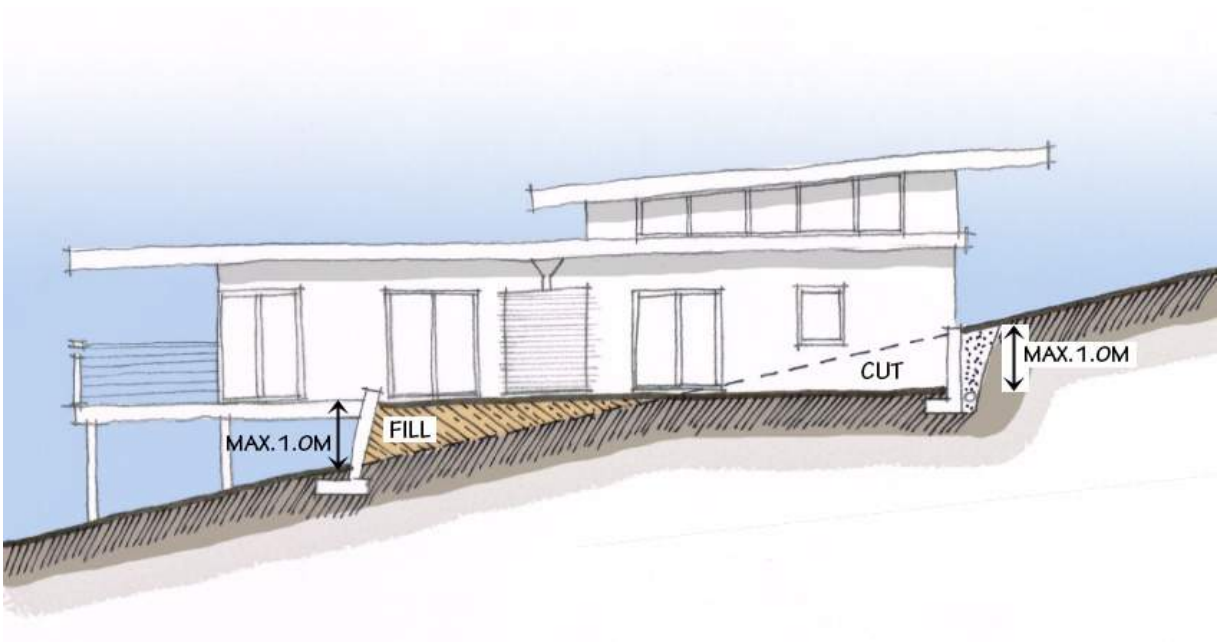

Figure 7. *Cut and fill to maximum 1m height is measured from the natural ground level to the finished floor level.*

Guide

Be mindful of the positioning of your building, and the implications it may have on the need to alter the natural topography when constructing your driveway.

Additional information

Council's DDO11 requires that cut and fill be limited to 1.0m. Should the DRC grant a variation to Requirement R11 or R12, allowing a greater amount of cut or fill, this does not imply Council approval, which must be sought independently.

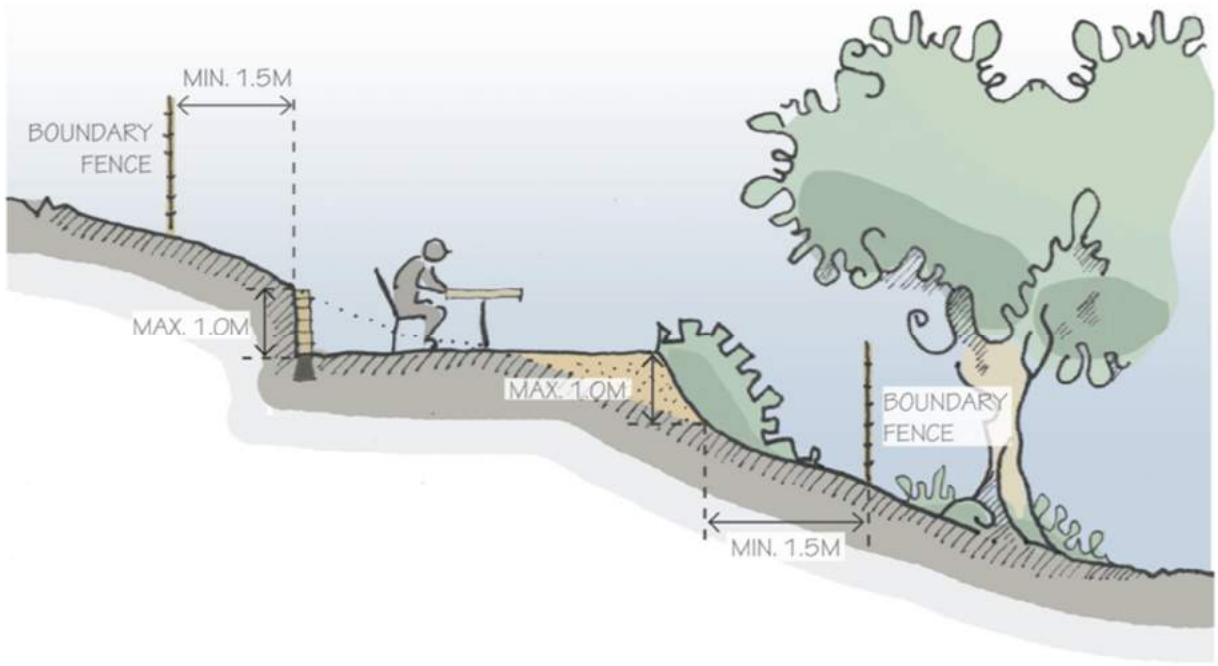

Figure 8. Example of cut and fill with batter to side boundaries.

3.5 Retaining walls and batters

Retaining walls and batters can have a significant impact on the landscape, streetscape and neighbouring property. With careful design, negative impacts can be minimised.

This section deals with retaining walls and batters that form part of the constructed works or provide vehicular and pedestrian access to the home. These retaining walls and batters are structural and must be designed by an engineer to avoid failure. They are separate to those that you might build in your garden for landscaping purposes. Separate Requirements for those retaining walls and batters relating to your garden design are set out in **Section 7.7** of the Guidelines.

Objectives

- Support Council's Design and Development Overlay DDO11.
- Minimise impacts on neighbouring properties and the environment and maintain a safe environment by reducing risk of failure and soil erosion.
- Minimise impacts on the streetscape and the landform of the site.

Detailed Requirement

R13 ***Where a retaining wall or batter is provided to support a building or driveway access, it must not exceed 1.0m in height. The DRC may allow a variation to this Requirement at its discretion where it can be shown that the proposed cut and fill impacts on the pre-existing landform, or more effectively advances the Mullum Creek vision and design objectives.***

Guides

G8 Avoid large benched areas to minimise impact on the existing topography and landscape.

G9 Integrate benched areas with the natural landform by using landscaped batters in preference to expansive retaining walls.

Figure 9. *Examples of suitable retaining walls.*

3.6 Car parking and crossovers

Driveways and car parking may have a significant impact on neighbours and the streetscape. With careful design, any negative impacts can be minimised.

Objectives

- Support Council's Design and Development Overlay DDO11.
- Minimise impacts on the landform and natural vegetation.
- Avoid car parking and driveways becoming dominant features in the streetscape.

Additional information

One crossover per lot is provided by Mullum Creek. If the location of the crossover does not suit your proposed driveway and garage location, please seek advice from the DRC early in your design process regarding the feasibility of any proposed relocation. It is the responsibility of the homeowner to negotiate Council approval and to cover any costs incurred with the relocation. DRC Step 1 preliminary design review can only proceed where there is prior Council approval for a change in crossover location.

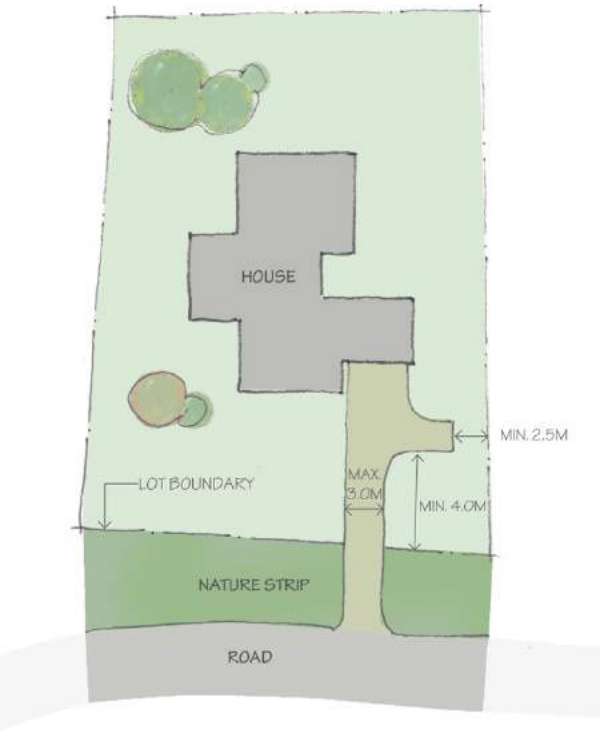

Figure 10. *On-site turning point.*

Figure 11. *Dual access driveways.*

Detailed Requirements

R14 ***Benching required for external car parking within the front setback must satisfy Requirements R11 and R12.***

R15 ***A turning point located inside a homesite must be set back a minimum of 2.5m from any side boundary, and 4.0m from the front boundary, as shown in Figure 10.***

R16 ***All driveways must be located minimum 2.5m from any side boundary, must not exceed 3m in width at the front boundary line, and must align with the crossover.***

R17 ***Each homesite must have no more than one crossover, unless the homesite has a frontage of 30m or more, in which case a dual access drive-through driveway may be constructed.***

A dual access driveway must:

a) be located min. 2.5m from the adjacent side boundary.

b) at its centre across the site frontage be located min. 4.0m from the front boundary.

c) not exceed 3.0m in width.

d) have its access points spaced min. 15.0m apart.

(see Figure 11)

Guides

G10 When providing a car parking or turning space in front of a garage, level only the area you require for vehicular access.

G11 Sensitively integrate driveways into the slope.

G12 External car parking areas should not dominate the front setback.

G13 Large car parking areas in the front setback are strongly discouraged.

G14 Use driveway and hardstand treatments that promote water infiltration.

3.7 Site coverage

By reducing the scale of our homes and aspiring to quality over quantity we can substantially reduce our environmental footprint.

The site coverage is the percentage of your site that is covered by buildings. When calculating the site coverage, include all roofed buildings on the site, such as the garden shed, and add any semi-enclosed areas such as verandahs or carports. If an upper level floor area projects beyond the ground floor area, that part of the upper level is also added to the site coverage. Eaves, fascias and gutters (which together do not exceed a total width of 600mm), and unroofed patios, terraces, decks and pergolas are not included in the site coverage calculation.

Objectives

- Support Council's Design and Development Overlay DDO11.
- Minimise the amount of resources used to construct dwellings and associated developments.
- Minimise impacts on natural landform, soil profile, ground water and surface water.
- Minimise the amount of impermeable surface on lots.
- Maintain large areas on lots for landscaping, horticulture and infiltration of water.
- Minimise the visual impact of built form on the landscape, and obstruction of views from lots.
- Maintain an open appearance within the estate.

Detailed Requirement

R18 The total building coverage area must not exceed the maximum site coverage percentage noted on the homesite's Lot Plan.

3.8 Land subject to inundation and overland flows

Parts of a few homesites at Mullum Creek may be subject to rising waters from the Mullum Mullum Creek, or from overland flows in the case of a 1 in 100 year rainfall or flooding event. These areas may have extra authority regulations governing building requirements. Consult your Lot Plan, Melbourne Water and the Manningham Planning Scheme to confirm current information.

4 Building design

4.1 The Mullum Creek architectural vision

Central to the Mullum Creek vision is the encouragement of buildings that demonstrate a high level of excellence in their response to their natural and built surroundings, in their environmental sensitivity, and in their attainment of high quality contemporary design. We look forward to an estate that is highly functional, beautiful to live in, and that has a comparatively minimal impact on the environment.

In review of an application for variation of a Detailed Requirement, included in this section of the Guidelines, the DRC will consider the proposed dwelling's contribution to the Mullum Creek architectural vision, character and objectives as described in this document.

The Mullum Creek architectural and built form vision is embodied in the following Objectives.

Objectives

- Support Council's Design and Development Overlay DDO11.
- Promote a built environment that respects and complements the landscape and the natural features of the site and its environs (landform, soils, water, flora and fauna).
- Promote a harmonious and respectful relationship between neighbouring dwellings, streetscapes and nature reserves across the estate as a whole.
- Create high-quality built form and detailing that is contemporary, innovative and well-articulated.
- Promote buildings that are proportioned to respect the human scale and that minimise visual bulk.
- Promote buildings that emphasise quality of design and craftsmanship over quantity and scale.
- Avoid externally expressed period features.
- Promote buildings that show interest and design resolution from all elevations, not just the façade (especially when viewed from streetscapes and reserves).
- Promote a secure estate and reserve system by ensuring buildings address both the street and reserves, thereby providing passive surveillance of the public realm.
- Facilitate the integration of indoor and outdoor spaces through ensuring architectural design and landscaping are complementary.
- Promote buildings that incorporate design, construction techniques, materials and services systems that demonstrate environmental sensitivity, by encouraging the use of renewable resources and reducing the ecological footprint of dwellings.

***Figure 12**. Diverse examples of building styles that accord with the Mullum Creek architectural vision.*

Detailed Requirements

R19 ***Any roof with a pitch 10 degrees or greater must include eaves of min. 450mm depth.***

R20 ***Period features such as rolled verandahs, finials, applied mouldings and turned posts are not permitted.***

R21 ***Where different external wall treatments meet at the corner of a building, this intersection must be visually engaging and complementary, especially where such corners are visible from a reserve or streetscape.***

R22 ***Sun shading must be designed to complement the building's overall material, colour and form.***

***Figure 13**. Diverse examples of building styles that accord with the Mullum Creek architectural vision*

Guides

G15 The entrance to the dwelling should:

- Include a glazed element to provide visibility for passive surveillance.
- Be provided with cover from weather.
- Include external lighting for night illumination.

G16 The visual bulk of buildings viewed from a streetscape or public reserve should be sympathetic with the surroundings and neighbouring buildings.

G17 Wastewater plumbing pipes and mechanical systems (e.g. hot water services, space heating and cooling plant, etc.) should be concealed externally where they would otherwise be visible from neighbouring homesites, reserves or streets.

4.2 A home for life

Simple design features can help create a liveable home with flexible spaces, that can be adapted to the changing needs of the occupants as the years pass, as households grow and shrink, and as families' needs change through ageing and/or reduced mobility. This reduces the need for upgrading, minimises alteration and renovating costs, and can increase the resale value of the property. A flexibly designed home promotes social, and environmental resilience, as well as asset security.

Homes at Mullum Creek should aim to include the following to ensure they will be suitable for occupancy across the spectrum of life stages. The following seven features enable a home to achieve at least a 'silver level' of compliance under the recognised standards prepared by *Liveable Housing Australia*. Refer to the *Liveable Housing Australia* website for further information, http://www.livablehousingaustralia.org.au/. The seven core design elements are:

1. A safe, continuous and step-free path of travel from the street entrance and/or parking area to a dwelling entrance that is level.
2. At least one level (step-free) entrance into the dwelling.
3. Internal doors and corridors that facilitate comfortable and unimpeded movement between spaces.
4. A toilet on the ground (or entry) level that provides easy access.
5. A bathroom that contains a hobless (step-free) shower recess.
6. Extra wall framing around toilets, showers and bathtubs to support the installation of sturdy grab rails at a later date.
7. A continuous handrail on one side of any stairway and intermediate landing, where there is a rise of more than 1.0m.

4.3 Roofs

On sloping terrain as found at Mullum Creek, roofs can become dominant visual features in the landscape. Please be mindful when designing your roof that its form and expanse are sensitive to the overall development, especially where it can be viewed from an elevated vantage point.

Also, when designing your roof, please be mindful of the extreme rainfall events that impending climate change is expected to bring. It is predicted that more severe and frequent heat waves will be interspersed with increasingly dramatic rainfall events. During heat waves, leaves, bark and small twigs are deposited on roofs due to plants shedding foliage in response to drought and heat stress; this is compounded by the action of hot dry winds. This material accumulates in gutters and rainwater heads, and if not regularly removed through diligent maintenance, will cause blockage and resultant water damage inside the home. As heavy rainfall events are very common after heatwaves, the risk of damage is correspondingly higher at these times. It is therefore vital to ensure that box gutters are adequately sized and appropriately detailed.

Guides

G18 When designing your roof, carefully consider roof falls, flashings, gutters, rainwater heads and downpipes. It is crucial that they be sized and detailed to discharge stormwater from severe rainfall events safely beyond the building perimeter.

G19 Where possible avoid internally draining roofs and box gutters.

4.4 Garages and carports

Care must be taken in the design of garages and carports as they can have a strong visual impact on both front façades and streetscapes. Consider the scale of the garage/carport so that it is in proportion with the rest of the front façade and building design. Consider the position of the garage/carport in relation to the site contours and how the driveway will function. The aim is to minimise the impact of the driveway on the site's topography and the streetscape.

Objectives

- Minimise the visual impact of garages, carports and car parking on the appearance of homes and streetscape, and maximise their integration into the overall building design.
- Promote safe street access for vehicles entering or leaving lots, ensuring adequate ground clearance and good pedestrian visibility.

Detailed Requirements

R23 ***The design of a garage or carport must be integrated with the scale, material and finish of the home and must not be a dominant feature (see Figure 18 on page 37).***

R24 ***A garage must not have an opening width greater than 50% of the width of the front façade of the dwelling.***

R25 ***A garage or carport that is separate from the main building must be consistent with or complementary to the material, finish and style of the home.***

R26 ***A garage or carport located in the street elevation must be set back a minimum of 1.0m behind the front façade of the dwelling. The DRC may grant a variation to this Requirement if it can be demonstrated that the Mullum Creek vision and objectives can be better met through such a variation. However this variation can provide no assurance that Council will approve a design that does not satisfy DDO11 in this regard.***

Figure 14. *Example of an undercroft car parking area.*

Guide

G20 The entry level of the garage or carport should be positioned sympathetically with regard to the site's topography, and the proposed cut and fill must satisfy Requirements R11 and R12.

Additional information

Council's DDO11 requires that a garage be set back min. 1.0m behind the front facade. If you propose to build outside this Requirement, you will need to provide an explanatory rationale to Council in your submission for planning approval. It is highly recommended that you seek a pre-application meeting with Council to obtain feedback before your design progresses beyond early concept stage.

4.5 Sheds and other outbuildings

Sheds and outbuildings, when in harmony with the overall home and lot design, can add interest and variety to a homesite. However, unsympathetic treatments and positioning of these structures can negatively impact on the visual amenity and quality of neighbouring properties and the estate as a whole.

Objectives

- Promote the construction of sheds and other outbuildings that complement and harmonise with the design of the main dwelling, and demonstrate high-quality design, construction and amenity.
- Minimise the negative visual impact of sheds and outbuildings on view lines from streetscapes, public reserves and adjoining properties.

Detailed Requirement

R27 Sheds and outbuildings must be designed according to the following criteria:

- **Sheds and outbuildings must be located out of view from streets and public reserves, except where they have design value and function best served by that position.**
- **Where greater than 4m^2 in floor area or 1.8m in height, sheds and outbuildings must be included in the overall site coverage percentage calculation for the homesite listed on the Lot Plan.**
- **Materials, finishes and colours of sheds and outbuildings must be complementary to the main dwelling.**

5 Materials and finishes

The selection of construction materials and finishes is of great importance at Mullum Creek. A building's material selection has an impact on the ecological footprint of the dwelling, the amenity of the home, and the appearance of the streetscape. The finishes and colours you choose will affect the aesthetic appeal of the estate and its natural setting, and can have implications for the thermal performance of your home.

Figure 15. *Example of timber textures that blend with the natural setting.*

Figure 16. *Example of stone and timber that compliment the natural setting.*

Objectives

- Support Council's Design and Development Overlay DDO11.
- Select materials and finishes that have low environmental impacts and contribute to energy and resource conservation.
- Use recycled and recyclable materials where possible and/or those salvaged/sourced locally.
- Maximise the use of materials that will have a net positive effect on the thermal performance of your home.
- Promote the use of materials and finishes with low greenhouse gas emissions or carbon footprint.
- Minimise the use of materials, colours and finishes that contribute to the 'heat island effect'.
- Minimise negative impacts on neighbouring residents resulting from reflection and glare from external building materials.
- Ensure that the external appearance of the home harmonises with or complements the natural environment and surroundings, and contributes to an estate of high-quality appearance.
- Minimise the introduction of toxic substances to land, buildings and households.
- Apply materials and construction details to the exterior of dwellings, mindful of the bushfire attack level (BAL) assigned to the Mullum Creek estate.

Your application for Step 2 Developed Design Approval must include a detailed schedule of materials, finishes and colours. This section lists materials and finishes that are preferred, those that are not generally acceptable, and those that will not be accepted. The lists are not comprehensive, as the DRC recognises that there are many different ways of achieving the Mullum Creek vision, and that environmentally friendly building materials are constantly being developed. Refer to the Mullum Creek website for Guides to selecting these appropriate materials.

Any proposals to use other materials and finishes will be assessed against:

- the Objectives set out below.
- the Mullum Creek environmental vision.
- the Mullum Creek architectural vision.

5.1 Environmental impacts of building materials

Climate and other impacts of materials we choose

The environmental impacts of a dwelling can be considered as comprising two main types. On the one hand, they include the ongoing greenhouse gases produced in heating, cooling and living in the home and using its appliances, and the climate impacts of those emissions. Increasing the thermal efficiency of the home through passive solar design and achieving a high energy rating can help reduce the production of these greenhouse gases.

Of equal importance, there are significant environmental impacts attached to both the physical construction, maintenance and the end-of-life decommissioning of a dwelling. These impacts are associated with the extraction, processing, manufacture and transport of construction materials and products. They include the greenhouse gas emissions resulting from the burning of fossil fuels to generate energy required for procuring and processing materials, the depletion of finite resources, loss of fresh water, loss of biodiversity and habitat, and pollution of soils, water and air, to name a few. At Mullum Creek we would like the scale of these impacts to be acknowledged and mitigated wherever possible, through sensitive design in line with these Guidelines.

When seeking to reduce the environmental impacts of the materials used in home construction, it is helpful to consider the three phases in the life cycle of a dwelling:

The original construction of the home
The impacts embodied in this phase are most effectively mitigated by smart and elegant architectural design that avoids the need to build large scale homes, and by carefully selecting building materials that don't cost the earth. Simply, as a rough rule, smaller homes use less resources, and some materials have less impacts than others.

Cyclical repairs and maintenance
This refers to the maintenance, repainting and replacement of walls, ceilings, roofs, carpet, service systems and other elements of the building, through the life of the home. Mullum Creek encourages the selection and detailing of materials and products for maximum longevity and minimum maintenance, so that the need to maintain, replace and repair is reduced. For instance, choose timbers for external use that are naturally durable, appropriately treated and detailed in construction to endure without deterioration.

End-of-life building demolition and associated waste processing
The energy and environmental impacts required to demolish a dwelling and safely dispose of the resulting waste is significant. Choosing materials that are non-toxic and easily reused or recycled are ways to reduce these impacts.

Objectives

- Minimise the greenhouse gas emissions and climate change impacts associated with the construction and end-of-life decommissioning of dwellings.
- Minimise the other environmental impacts associated with the construction and end-of-life decommissioning of dwellings.

Refer to the chapter on materials in '*Your Home'* http://www.yourhome.gov.au/materials.

Guides

G21 Consider building a well designed, smaller home that can provide high levels of comfort and flexibility, whilst reducing the environmental impacts attributed to its construction.

G22 Choose an environmentally conscious architect to help you design your home - one who understands the implications and comparative intensity of embodied energy and impacts attached to the range of construction materials and methods available.

G23 Consult the DRC for advice and the Mullum Creek website for information on the various low-impact materials, products and processes available.

5.2 Selecting environmentally sensitive building materials

The materials used in the construction of your home are a vitally important aspect of its environmental performance. Many of the materials conventionally used in house construction have major environmental impacts, and there are often much better options available. The Mullum Creek materials guides list these, giving a range of good products to choose from. To ensure appropriate selections have been made, the DRC will review the materials and finishes specified in documents you submit for Step 2 Developed Design Approval. Please refer to the checklists included on the website for a complete list of what specifications need to be detailed. The following materials have been identified as requiring particular consideration when building an environmentally friendly home.

5.2.1 Concrete

The production of cement has a particularly high carbon footprint. So where wet mix-concrete is used in the construction of dwellings at Mullum Creek, supplementary cementitious materials (SCMs) must be specified. Concrete mixes incorporating SCMs are similar in price, and use a reduced amount of high greenhouse gas-producing Portland clinker, when compared with standard concrete mixes. SCMs include industrial waste products such as fly ash and slag. Refer to the **Concrete Products Guide** on the Mullum Creek website for more information, including a list of recommended products and suppliers.

Objectives

- Where possible, design your home to minimise the need for concrete, especially structural concrete requiring substantial steel reinforcement.
- Encourage the use of concrete with recycled content in both cement and aggregate to lower its embodied energy and reduce demand on our earth's finite resources.

Detailed Requirement

R28 The binders to wet mix concrete must include minimum 30% supplementary cementitious material (SCM) in on-ground slabs, suspended slabs, columns and hard landscape elements (e.g. swimming pools, paving, retaining walls, etc).

5.2.2 Steel

Steel is high in embodied energy. Its production has a number of environmental impacts, arising from mining, processing, manufacturing, fabrication and transport. Reducing the amount of structural steel used in homes is the best way to reduce these environmental impacts. For example, cold formed steel is commonly used in house construction and is difficult to recycle. But in most applications it can be readily substituted with a more environmentally friendly material such as timber.

Refer to the **Steel Products Guide** on the Mullum Creek website for more information, including a list of recommended products and suppliers.

Objective

- Minimise the requirement for steel in the structure of your home.

Detailed Requirement

R29 Cold formed steel section (for wall framing, roof trusses, purlins or battens) must not be used in construction at Mullum Creek without prior approval of the DRC.

Guides

G24 Avoid demanding structural designs that require large amounts of framing steel and concrete reinforcement.

G25 Where possible, consider using sustainably sourced timber products as effective and economical substitutes for the steel elements.

5.2.3 Timber

Timber, the original renewable resource, can contribute significantly towards creating a truly sustainable home. But there are serious risks to native forests and threatened species both in Australia and overseas from unsustainable timber harvesting. Luckily, there is a wide range of sustainable timber products available, many of which are included on the **Timber Products Guide** on the Mullum Creek website. Consulting this list will make the task of selecting appropriate timbers much easier. If, however, you wish to use a product that is not included on the list, the product must meet the Requirements set out below. Refer to the **Timber Products Guide** on the Mullum Creek website for the current list of approved timber products, the applications to which they are suited, and where you may obtain them.

Objectives

- Promote the use of timber that is fit for its intended purpose, yet not beyond the grade required with regard to strength, exterior durability, dimensional stability, hardness, appearance, etc.
- Promote the use of timber harvested or sourced with minimal adverse impacts on natural ecological systems.
- Minimise the use of timber harvested in ways that cause adverse impacts on forest-dependent traditional communities.
- Maximise use of timber products that contribute to the reduction of greenhouse gas emissions.
- Minimise the use of timber products containing toxic additives.

Detailed Requirement

R30 1) All timber must be at least one of the following:

a) a product included in the Mullum Creek Approved Timber Products List.

b) recycled timber (e.g. from a prior construction use) whose origin can be verified via a chain-of-custody declaration from the supplier, or via obvious physical evidence such as nail holes, etc.

c) certified by the Forest Stewardship Council (FSC) and:

- ***harvested from trees grown in Australia or New Zealand; or***
- ***provided that it is no greater than 6mm thick, a veneer or panel product sourced from forests outside Australia and New Zealand.***

2) Manufactured wood products must meet the requirements in (1) above, and have low formaldehyde emissions to E0 standard (≤0.5mg/L or 0.041ppm) under AS 2098.11 and AS 4266.16.

3) Timber products treated with copper-chrome-arsenate (CCA) must not be used at Mullum Creek.

Manufactured wood products include laminated veneer lumber (LVL), glulam, I-Beam, cross-laminated timber (CLT), plywood, particleboard and fibreboard (MDF and HDF).

The DRC may update its Timber Products Guide from time to time, by listing other timber products that meet the above Objectives and/or Requirements. Please contact the DRC if you know of other timber products that you believe meet the criteria of Requirement R30, and that you wish to put forward for review and inclusion in the Guide. There is a **Timber Selection Form** (*Other Proposed Timber Products)* on the website that you can use to request review of such products. Please provide supporting documentation as requested on the sheet to enable the DRC to assess the product.

5.3 External walls

External wall finishes can contribute significantly to the environmental impact of a home. Specialist finishes such as aluminium, stainless steel, copper or similar materials can be very greenhouse gas intensive in their manufacture, so are generally acceptable only where needed in small quantities. Render finishes on a polystyrene substrate have some thermal benefits, but have poor durability and limited recyclability, so avoid this material and finish where possible.

Suitable materials include:

- locally manufactured face concrete blockwork.
- natural stone (must be locally sourced where practicable).
- bricks (must be locally sourced and/or recycled if practicable).
- rammed, pressed or puddled earth.
- natural or pigmented cement render.
- rough sawn or dressed timbers with high durability.
- plywood cladding.
- timbers finished with clear or pigmented oils, or left to weather naturally.
- in-situ concrete (subject to it satisfying Requirement R28).
- lightweight steel sheet.

Figure 17. *Finish options.*

5.4 Roofing

Unless they have been recycled from a previous use, concrete and terracotta roof tiles are high in embodied energy, and increase a building's environmental footprint. Roofs may absorb or reflect heat and impact on thermal efficiency, depending on the material. Acceptable roofing materials include lightweight sheet roofing, earth or other media for green roofing, and recycled concrete and terracotta tiles. The use of newly manufactured concrete or terracotta tile is not acceptable.

Objective

- Minimise the use of roofing materials with high embodied energy.

Detailed Requirement

R31 All roofs must be steel sheet, or other materials with low environmental impact, as approved by the DRC.

5.5 Garage doors

Garage doors can have significant impact on the appearance of a home and the streetscape. Panel-lift, tilt-up, sliding and swing panel garage doors are suitable where clad with materials such as stained or oiled timber boards or plywood, or Colorbond steel sheet board panelling.

Garage doors should also be consistent with the material of the home's front façade to blend with its overall appearance, or offer a high quality design response that is integrated with and complementary to the overall dwelling design.

Metal roll-up garage doors will not be accepted if they are visible from a street or public reserve, unless it can be shown their use results in a positive visual outcome consistent with the Mullum Creek architectural style.

Figure 18. *Example of an integrated garage door design.*

5.6 Driveways and paving

Driveway colours and tones that complement the natural palette of the Mullum Mullum valley are encouraged. They should not cause excessive glare or create an obtrusive visual appearance.

Objectives

- To reduce the area of homesites covered by hard, impermeable surfaces.
- To ensure that driveways do not dominate the visual landscape, nor contribute significantly to the heat island effect at Mullum Creek (refer also to **Section 6.5**).
- To minimise the use of materials of high embodied energy.
- To maximise the use of renewable and recycled materials.

The following are suitable driveway and paving materials:

- Modular, recycled, porous and permeable paving systems.
- Coloured and/or exposed aggregate concrete.
- Asphalt.
- Salvaged bricks.
- Loose local aggregate (suited only to flat areas).

Other materials may be approved by the DRC at its discretion.

Figure 19. *Suitable driveway and paving material options.*

5.7 Materials and finishes for a healthy home

The design of a healthy home aims to eliminate harmful chemicals. Toxic off-gassing is a risk unless engineered wood products, bulk insulations, floor coverings, adhesives, sealants and paints are carefully selected. To help with specifying low-toxicity materials and products, refer to the Mullum Creek Timber Products Guide as well as the following tables on the Mullum Creek website:

Table 1. Maximum Formaldehyde Levels for Processed Wood Products.
Table 2. Volatile Organic Compounds (VOC) and Formaldehyde.

Detailed Requirements

R32 ***Bulk insulation must have zero formaldehyde emissions or be third-party GreenTag/GECA certified.***

R33 ***At least 95% of paints (including sealers, oils and stains and pigmented finishes) must be low VOC paint in accordance with the VOC levels identified in Volatile Organic Compound and Formaldehyde tables found on the Mullum Creek website.***

5.8 External colours

Colours in the Mullum Creek landscape are varied. When viewed carefully they are not restricted to muted earth tones, but include also brighter ochres and greens found in the soil and the foliage. Colours selected should blend with or complement the landscape.

Bold colours will generally be accepted only where they are restricted to small areas to provide definition and contrast, except where they contribute to a high-quality architectural outcome as assessed by the DRC.

External materials of lighter colour can help to reflect and emit heat back into space on a hot summer day. Light external colours in low-gloss finish are encouraged when carefully applied so as not to create an imposing overall aesthetic or cause glare.

In general, dark-coloured roofs should be avoided to reduce heat gain. The DRC will approve roof colours that are sensitive to the natural palette of the local environs.

Colour should contribute to an integrated high-quality architectural outcome.

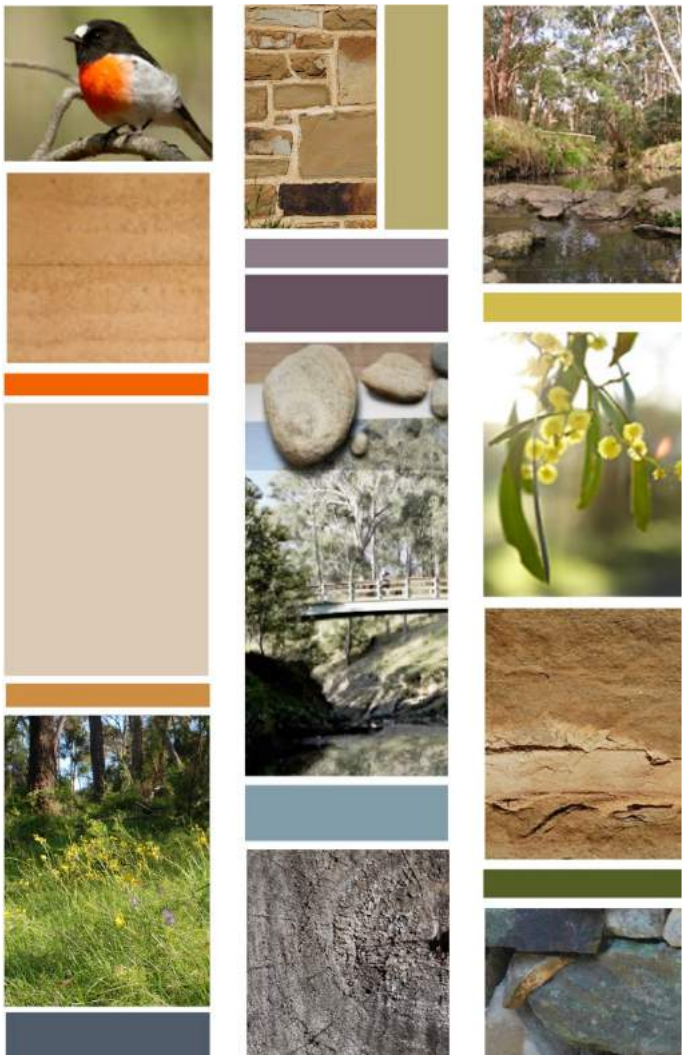

Figure 20. *Colour scheme options.*

6 Energy and water

The Mullum Creek vision is based on a widely accepted set of environmental principles and objectives. The use of natural resources is an integral part of this, and few resources are more precious than energy and water.

Objectives

- Minimise the consumption of potable authority-supplied mains water.
- Promote energy efficient buildings that reduce greenhouse gas emissions due to or arising from their ongoing operation.
- Promote solar access to buildings and private open space.
- Minimise the use of dark coloured building or hard landscaping materials where they will be exposed to sunlight and therefore absorb heat.

6.1 Solar design, thermal mass and ventilation

Applying passive solar design principles will help you create a home that can be effectively heated and cooled at little cost. The aim is to invite the winter sun's warmth into the home and retain it, while in

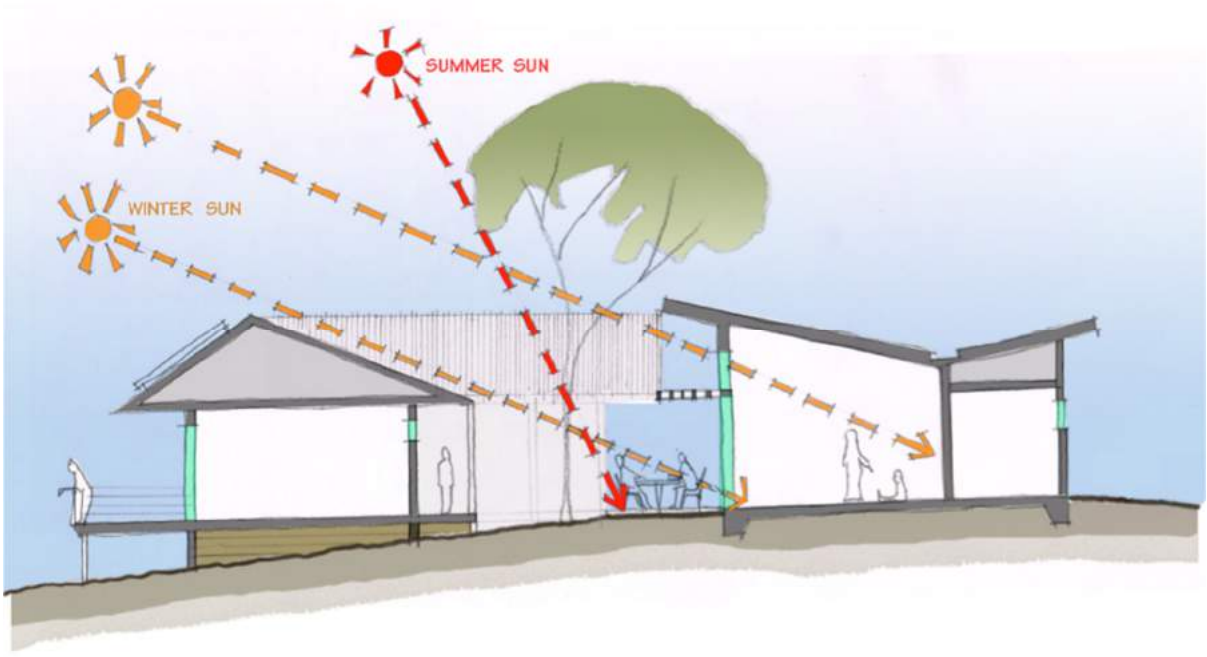

Figure 21. *Clever design of building forms and careful selection and positioning of trees and shrubs can invite low winter sun into courtyards and living spaces, whilst also shading out high summer sun.*

summer the aim is to exclude and purge heat from the building. The key to good passive solar design is understanding how the sun moves across the sky at different times of the year, and to design your home accordingly.

Strategic placement and detailing of doors and windows allows for natural ventilation. And providing floors, walls and ceilings with good thermal mass enables the home to absorb heat or coolth.

Please see **Section 6.2** for more information.

Objective

- Maximise the use of design strategies and measures that optimise thermal performance.

Guides

G26 Orient and size windows so they capture the energy of low winter sun, and use thermal mass (materials with good heat storage capacity) appropriately placed within the home to absorb the resulting heat gain and passively warm your home throughout the night. Well insulated floors, walls, roof/ceilings, windows and doors will then hold this warmth inside your home for extended periods, without the need to resort to mechanical heating.

G27 Selecting highly insulating window frame and glass systems can be particularly important, and the Mullum Creek website contains a **Windows Selection Guide** to help with this.

G28 Place windows and retractable external shading devices to exclude radiant summer heat. Correctly designed eaves also control summer sun and help with roof design, proportion and scale. Consult the 'YourHome' manual or website http://www.yourhome.gov.au/passive-design for more tips on how to provide appropriate sun shading to your home.

G29 Allow for cross (horizontal) and stack (vertical) ventilation to purge any hot air from the home in the cooler nighttime hours. Here again thermal mass within the home can absorb the 'coolth' of the night and passively cool your home well into the day. Well insulated floors, walls, roof/ceilings, windows and doors will then hold this coolth inside your home as long as possible without the need to turn on mechanical air-conditioning.

G30 Building materials that provide good thermal mass include tiled or polished concrete floors, internal brick and rammed earth walls directly exposed to the interior air.

G31 Ceiling fans with dual summer/winter controls improve cooling air movement within the home in summer, whilst in winter they help to gently return to our body level the warm air that would otherwise rise and settle near the ceiling.

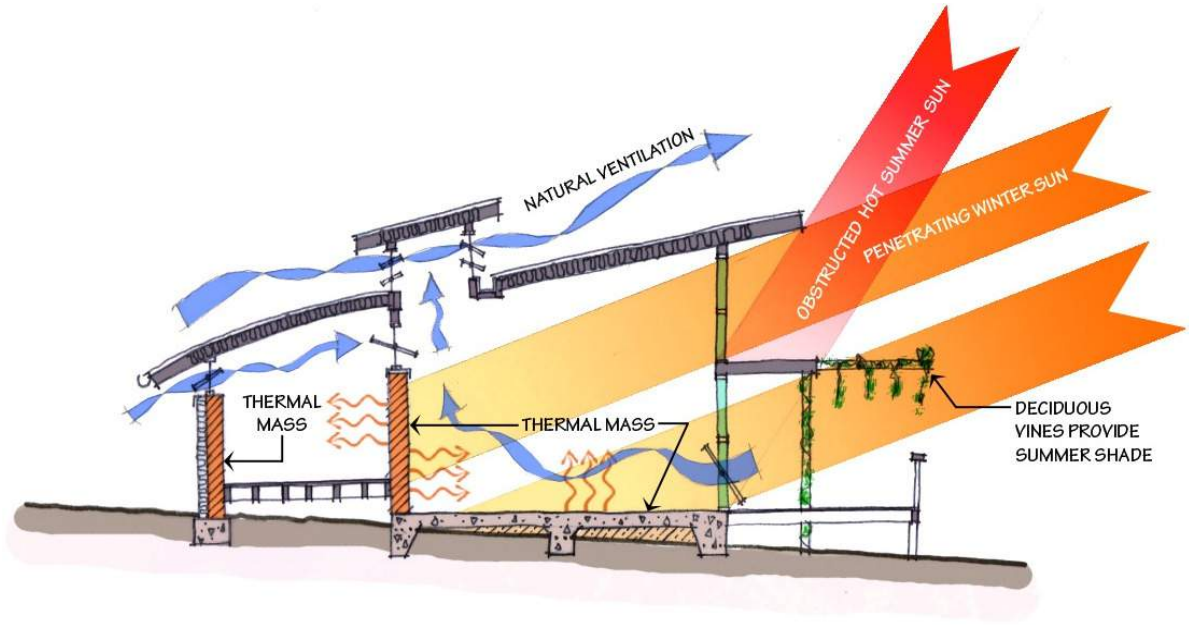

Figure 22. *Carefully proportioned glazing, eaves, and summer sunshade systems. Ample internal mass. Cleverly located openings for cross and stack ventilation. These all contribute to keeping your home warm in winter and cool in summer, reducing your energy consumption and greenhouse gas emissions.*

6.2 Energy rating

Mullum Creek uses the **AccuRate** energy rating program to assess all home designs and ensure they achieve a minimum 7.5 star energy rating. To ensure consistency across the estate, the DRC will commission its nominated energy assessor to undertake assessments at all three stages of the design approvals process. The DRC will provide you with reports and feedback arising from the earlier assessments, as well as a copy of the final NatHERS Certificate. This energy rating will give you an insight into how mechanical heating and cooling of your home will impact on your energy bills and carbon footprint. We recommend that you obtain early advice from the DRC on the energy efficiency of your design prior to submitting for Step 1 Preliminary Design Approval. This will enable you to alter your plans if necessary, before undertaking further costly design work.

Objective

- Reduce the amount of greenhouse gas emissions generated by mechanical heating and cooling, by achieving a high standard of thermal performance (energy efficiency) in the design of homes to be constructed at Mullum Creek.

Detailed Requirement

R34 Each home must achieve a minimum 7.5 star energy rating, as established by Mullum Creek's nominated assessor using AccuRate thermal modelling software.

Guide

G32 To achieve a minimum 7.5 star home energy rating, it is likely that you will need to:

- Orient your home and its layout to maximise northern exposure for living areas.
- Use thermally efficient windows and external doors (frame and glass systems).
- Be frugal with glass area (have it not exceed 20% of floor area where possible) and/or use thermally efficient doors and windows with particularly high thermal efficiency (Uw < 2.5 and SHGC > 0.5) as listed in the Window Energy Rating Scheme (WERS) database http://www.wers.net/werscontent/certified-products-residential.
- Have a more generous expanse of glazing facing solar north (or within 15 degrees thereof) that has clear exposure to low winter sun, but only if the dwelling also has a good amount of internally accessible thermal mass.
- Provide comprehensive and effective external sun shading of all glazing from summer sun.
- Have a reasonably compact plan form, to reduce the building's external surface area to floor area ratio, and hence also reduce unwanted conductive summer heat gains and winter heat losses.
- Incorporate doors, screens and flexible walls (such as large sliding panels) to separate air compartments within otherwise open living zones, thereby allowing more effective containment of mechanically heated and cooled air.
- Ensure that location, size and detailing of door and window openings provide broad and easy pathways for cross (horizontal) and stack (vertical) ventilation through the dwelling interior.
- Use materials with high thermal mass (heat storage capacity and surface conductance i.e. ability to absorb and release heat) and broad surface area in direct contact with interior air.
- Provide substantial insulation for floors, walls, roofs and ceilings.
- Avoid recessed light fittings that require substantial gaps or cut-outs in ceiling insulation.
- Provide airlocks to the home's most regularly accessed entries and exits.

6.3 Solar power

Homeowners can benefit greatly from on-site power generation. There can be significant cost savings and reductions in greenhouse gas emissions from generating and storing your own electricity on site. New technologies such as battery storage and electric cars are expanding the applications for home generated electricity.

Detailed Requirements

R35 Each homesite must have installed an array of photovoltaic panels rated with a minimum 4.0kW generating capacity.

R36 Solar panels must be integrated into the overall design of the home.

Guides

G33 Consider on-site battery storage, so you can use the excess solar power generated during the day to meet your night time power needs. If you're not ready to install batteries yet, consider laying rough-in cabling for it in your initial build. This could save you considerable effort and cost down the track.

G34 Even if you don't own an electric car now, consider installing rough-in electrical cabling between your meter and your proposed car charging point, so as to avoid the cost of expensive retrofit wiring in the future.

6.4 Light pollution

Lighting within the landscape provides ambience and can provide for passive surveillance through the evening hours. However external lighting can also contribute to light pollution. This usually relates to security lighting, street lights and garden lights. The stray light wastes electricity, unnecessarily contributes to greenhouse gas emissions, and can disrupt the normal day-night rhythms of wildlife.

Objectives

- Minimise the amount of light emitted to non-target areas beyond the immediate home environment.
- Reduce the amount of greenhouse gas emissions generated by artificial night lighting.

Guide

G35 To minimise light pollution and greenhouse gas emissions:

- Select light fittings that illuminate only those areas that require lighting.
- Select energy-efficient and solar-powered light fittings.
- Select light fittings that minimise glare and uplight.
- Avoid over-illumination where possible.
- Where possible, install security lights controlled by motion sensors and/or timers.

Figure 23. *Suitable lighting that is directing light downwards to illuminate the target area, keeping spill light to a minimum.*

6.5 Heat island effect and site permeability

Urban development results in buildings, roads and other infrastructure replacing open fields and vegetation. Hard structures and surfaces absorb the sun's heat more intensely than does earth cloaked in greenery. This reduces the amenity of our homes and their surrounds. It also increases summer cooling loads and costs, as well as adding to heat stress on humans, plants and animals occupying our urban environment.

Hard constructed ground surfaces also encourage stormwater to race away to drains and creeks, without first hydrating soils and providing moisture for plants. In heavy downpours this racing stormwater can also cause local flooding, erosion and other environmental and economic damage.

Objectives

- Maximise areas of vegetation on homesites to reduce heat absorption.
- Minimise the use of dark-coloured building or hard landscaping materials where they will be exposed to sunlight and therefore absorb heat.
- Wherever possible maintain porous ground surfaces on your homesite, to capture and absorb surface water run-off.

Detailed Requirement

R37 ***At least 40% of each homesite must comprise vegetation (garden bed, grass) and/or other permeable landscape treatment. This applies equally to front, rear and side yards.***

6.6 Water tanks

The on-site collection and reuse of rainwater helps reduce the demand for potable authority-supplied mains water.

Objectives

- Reduce the demand for potable authority-supplied mains water through on-site capture, storage and use of rainwater.
- Minimise the overshadowing and aesthetic impacts on neighbouring properties of tanks located along a fence line.

Detailed Requirements

R38 ***Each home must provide inter-connected water tanks with a capacity of at least 20,000 litres that collect rainwater from a minimum 80% of the roof area.***

R39 ***A water tank located near a side or rear boundary must be sited a minimum of 1.0m from that boundary, and not extend above a line that rises 30 degrees off and perpendicular to that boundary at 1.8m above natural ground.***

R40 ***Water tanks must be connected to the laundry trough, toilets and swimming pools.***

R41 ***If an irrigation system is used, it must be of a water-efficient type and connected to your water tank.***

Guides

G36 Water tanks may also be connected to washing machines, hot water systems and to kitchen sinks as a third tap, or connected to an appropriate treatment system for drinking water at the sink. Consult Melbourne Water for authority requirements.

G37 There are many different types of water tanks available: above ground and underground, tall and squat, slimline, underfloor (PVC bladders), garden box, etc. They can be fabricated from galvanised (zincalume) and powdercoated (colorbond) steel sheet with or without internal polymer lining, stainless steel sheet, concrete or polyethylene. Choose a tank that minimises visual impacts, and harmonises with your home's materials and colour scheme. Refer to the **Water Tank and Irrigation Guide** on the Mullum Creek website.

G38 If partially or fully burying your water tank into the ground, have regard to Guideline Requirements R11 and R12, as well as possible impacts on nearby dwelling foundations and footing systems. The DRC may give flexibility to the cut and fill requirements where it can be demonstrated that burying a tank results in a better outcome with regard to Mullum Creek's vision and objectives.

6.7 Services and appliances

The selection of services and appliances plays a key role in reducing your water and energy consumption, and therefore also your home's greenhouse gas emissions. Choosing the right appliances can also save you money in the long-term.

Objectives

- Maximise the use of highly water-efficient services and appliances.
- Maximise the use of highly energy-efficient services and appliances.
- Adopt energy efficient lighting techniques and fittings.

Detailed Requirement

R42 Appliances and services must meet the requirements listed in Table 1 below, and must be specified with your application for Step 3 Design Approval.

Service/Appliance	Required for compliance
Hot Water	Solar and/or heat pump hot water service must be provided.
Dishwasher	Must be energy rated to within one star of best available, and must be water rated to within one WELS star of best available.
Space Heating and Cooling	System must be within one star of best available.
Toilet Suites	Minimum 4 Star WELS rating.
Taps and Showerheads	Within one WELS star of best available* ** does not apply to taps serving baths, laundry troughs, toilets or external taps*
PV Panels	Minimum 4 kW system required

Guides

G39 Electric induction cooktops are highly energy efficient and can help reduce energy bills and carbon emissions.

G40 Design and install task-focused lighting, avoid over-illumination, and use the most energy efficient lights available.

G41 Consider not connecting your home to mains gas, instead sourcing your energy only from renewable electricity that you generate on site.

G42 Consider purchasing green power from your electricity retailer.

There are a number of reference sites on the internet that compare and contrast the operational energy costs and greenhouse gas emissions attached to various readily available services and appliances. This includes information on split system air conditioners, space heating systems, domestic water heaters, dishwashers and other appliances. See: http://www.energyrating.gov.au/products.

6.8 Wood-burning stoves and fires

A 7.5 star energy-rated home should require minimal heating or cooling. To reduce urban air pollution and the ecological damage so often caused by the harvesting of firewood, the installation of wood stoves and wood burning fireplaces is strongly discouraged.

Objectives

- Minimise the impacts of firewood collection on the ecological values of native forests.
- Minimise the generation of wood smoke and associated particulate matter arising from the use of wood fires.

Guides

G43 If you insist on installing a wood stove in your home, select the most energy efficient and lowest emissions system available. Please refer to the following website to select the very most energy efficient product you can find. See: http://www.homeheat.com.au/wood-heaters/certified-wood-heaters.

G44 Refer to the **Timber Products Guide** on the Mullum Creek website for a list of firewood suppliers who source their wood in an environmentally sensitive manner.

7 Your landscape

The overall landscape design for Mullum Creek responds to the topography, landform, remnant vegetation, microclimate, solar access and views across the estate, and enriches existing ecological values. Following this approach, landscaping of homesites will promote environmentally sensitive living with productive gardens and a visual character consistent with the natural environment of the Mullum Mullum Valley.

A notice of DRC Design Approval, together with a set of stamped building and landscape drawings, are required as part of your submission to Manningham City Council for a planning permit.

Objectives

- Support Council's Design and Development Overlay DDO11.
- Design landscaping in front yards to complement the public reserve areas, to promote a cohesive streetscape consistent with the natural environment.
- Where homesites adjoin public reserve areas, design home landscaping to complement these reserves.
- Minimise the impact of landscaping on natural landforms and soil profiles.
- Minimise erosion and soil loss.
- Promote the use of landscaping materials such as soil, rock and timber occurring naturally on or as close as possible to the site.
- Utilise landscaping materials of low toxicity and with low environmental impacts in their production and use.
- Promote the use of locally indigenous plant species on private allotments, consistent with vegetation communities occurring naturally in the vicinity.
- Support the thermal efficiency and passive solar design of homes at Mullum Creek, by careful selection and placement of trees and shrubs, to preserve good solar access for dwellings across the estate.
- Encourage the use of productive food gardens and plants on allotments.
- Promote on-site infiltration and use of rainfall.
- Use the opportunities provided by judicious planting to afford privacy and avoid potential overlooking across neighbouring lots.
- Reduce fire hazard from the planting of fire-prone vegetation on homesites.

Detailed Requirements

R43 ***Landscape Design Approval must be obtained from the DRC as part of the Step 2 Developed Design Review.***

R44 ***All landscaping works must be executed in accordance with the Landscape Design Approval.***

R45 ***Landscaping works for the front garden and must be completed within 6 months from occupation of the dwelling, or other timeframe as agreed to by the DRC.***

R46 ***Landscaping works for the remainder of a homesite must be completed within 12 months from occupation of the dwelling, or other timeframe as agreed to by the DRC.***

7.1 Landscape design approval

Landscape designs for homesites that are in line with these Guidelines will provide a consistent aesthetic and environmental character throughout Mullum Creek. The DRC will review your landscape plans as part of the Step 2 Developed Design Review process.

Mullum Creek offers an Incentive to engage a recommended landscape architect or designer to prepare a conceptual landscape design for your site. Close consultation between your building and landscape designers will provide the best possible outcome for your site.

Your landscape plan should take into account the character of your homesite with regard to its landform, solar access, drainage, views and existing trees. It is very important to integrate landscape design with the design of your home and lot from the outset, to ensure a highly functional and aesthetic outcome.

The **'Step 2 Developed Design Checklist'** available on the Mullum Creek website details the landscape design detail you must submit for review.

Consider seasonal conditions when constructing and planting out your landscape. The DRC may consider seasonal limitations in assessing proposals for extending completion dates.

7.2 3D vegetation envelope plans

Plantings of tall trees and shrubs can have a significant overshadowing impact on neighbouring properties. Each lot at Mullum Creek has a prescribed 3D vegetation envelope which is shown on its 3D vegetation envelope plan. The surfaces of the 3D vegetation envelope shape the zone within which trees and shrubs (when at their mature height and form) must be located so as to minimise their overshadowing of homes on adjoining lots.

The 3D vegetation envelope plan for your lot, together with an explanatory note, are available on the Mullum Creek website. Also ensure that your plantings do not obscure winter sunlight to your own home and private open spaces.

Objective

- Ensure that planted vegetation does not obscure sunlight to adjacent homesites [1].

Detailed Requirement

R47 Shrubs and trees must be planted in accordance with the 3D vegetation envelope plan relating to your lot.

7.3 Protected trees and tree protection zones (TPZ)

The Mullum Creek landscape contains a number of existing indigenous trees with high aesthetic and biological value that must be retained and protected. These trees provide a high level of amenity not only to the local area, but also to your home, as well as providing faunal habitat. Trees that are considered especially important to the Mullum Creek landscape have been designated as 'Mullum Creek Protected Trees' and are shown on your Lot Plan. In addition, Council requires the retention of a number of other trees; these are also shown on the Lot Plan.

Each Lot Plan will show a tree protection zone (TPZ) for all protected trees. The TPZ is the area around the trunk required to be protected to ensure the health and survival of the tree. Careful consideration should be applied when siting a building or structure, or undertaking works near an existing tree that is to be retained. Refer to the "Tree Protection Zone Guide" on the Mullum Creek website for further information.

Detailed Requirements

R48 Trees marked on lot plans as 'Mullum Creek protected' (MCP) must not be removed. Lot plans also show other trees pre-existing on lots; the DRC may also require the retention of these trees. All trees require Council permit to remove.

R49 The TPZs of all retained trees must be protected during any works, developments or activities, for example through fencing out the entire TPZ.

R50 Trees marked on lot plans as Mullum Creek Protected must not be pruned or lopped except where necessary for safety or tree health reasons, as supported by an arborist's report made available to the DRC before commencing work. All trees retained on lots require Council approval to prune or lop for reasons other than ornamental or regeneration purposes.

[1] The 3D vegetation envelopes ensure that for a minimum of 5 hours between 9am and 4pm on May 22 or July 22, no surface of any building envelope will be overshadowed by vegetation located within the 3D envelopes on adjacent lots. At the winter solstice (June 22), overshadowing is limited to quite shallow strips around the base of envelopes. The number of hours per day in which surfaces of building envelopes remain clear of shadows increases quite quickly either side of May 22 and July 22.

R51 ***Any application to the DRC for a variation of the TPZ protection clause of Requirement R48 must be accompanied by:***

- ***An explanation of why encroachment on the TPZ is considered necessary or desirable; and***
- ***Advice from a qualified arborist that details the type and extent of encroachment, and proposed construction and protection methods.***

Where the DRC has approved a variation of Requirement R48, the conditions on that approval, which may include a requirement for hand excavation, must be complied with.

R52 ***All equipment, materials and debris must be kept clear of protected trees and their TPZs during construction.***

Guide

G45 At early design stage, minimise potential conflict between existing trees and new buildings, earthworks, external structures, driveways and pavings.

Application requirement

Protected trees and associated TPZs must be clearly indicated on any documentation submitted to the DRC for Design Approval. If the TPZ of a tree is to be encroached upon, an arborist's report outlining measures to protect the tree must accompany your submission. Applications for Council planning permits that involve any encroachment on TPZs will also require this information.

Additional information

The removal of protected trees other than Mullum Creek Protected Trees may be agreed to by the DRC. However, DRC agreement does not assure Council approval and Council permission must be independently sought. The Planning Scheme's Significant Landscape Overlay SLO8 requires that a planning permit be obtained to remove, destroy or lop native and exotic vegetation. Refer to the Manningham Planning Scheme and contact Council for advice. A report from a qualified arborist may be required to support requests for removal.

7.4 Fencing

Mullum Creek promotes an open, spacious and visually permeable landscape character, in keeping with the natural environment and the nearby rural bushland setting. Therefore fencing will be open and rural in nature but of a high quality. In accordance with Council's Design and Development Overlay (DDO11), fencing is not allowed within front boundary setbacks. Where agreement can be reached between adjoining lot owners, Mullum Creek encourages them to dispense with inter-lot fencing altogether, as this will afford a further openness and communal feeling for the estate. Fencing is to be constructed using timbers that are harvested in an environmentally sensitive manner (see Requirement R30).

Boundaries adjoining reserves are fenced by the developer in the basic post and wire format approved by Council.

Objectives

- Support Council's Design and Development Overlay DDO11.
- Ensure a consistent suite of fencing types are adopted to provide a coherent visual appearance throughout the estate.
- Adopt fencing types and layouts that maintain an open, spacious and visually permeable rural-style landscape throughout the estate.
- Maximise the use of environmentally sensitive fencing materials.

Detailed Requirement

R53 The following must apply to all fencing built on a homesite:

1) Fencing must be installed as per the Fencing Guide which can be downloaded from the Mullum Creek website, and will be of a simple post and wire type.

2) The selection of wooden fencing materials must satisfy Requirement R30.

3) Fence timbers, steel wire and mesh must be left unpainted.

4) No fencing or screens are permitted within the front boundary setback and must be set back a minimum of 1.0m behind the front façade.

5) All screens, whether installed to provide visual privacy, or to hide service areas, or applied to boundary fencing, must be minimum 50% permeable, and of a maximum 1.8m height.

6) Any screening applied in addition to the basic post and wire (BPW) fencing installed on side and rear boundaries must not exceed 50% of the total length of fencing allowable on that boundary, must be negotiated and agreed between adjoining lot owners, and must be approved by the DRC.

7) A wing fence (fence between side boundary and house) will be approved at the discretion of the DRC on a case-by-case basis. It may be decorative and should complement the design of the home.

8) Any screen not on a boundary or wing fence must be limited in extent and located at least 3m from the boundary to allow for adequate landscaping. They require DRC approval, and will be assessed on a case-by-case basis.

9) Dense formal cypress, box or similar hedging must not be used as fencing along a boundary.

Figure 24. *Example of fencing in accordance with Requirement R52.*

Alternative screen styles with artistic merit will also be approved at the discretion of the DRC on a case-by-case basis. Any screening along a lot boundary that is taller than 1.8m will require both DRC approval and a planning permit from Council.

7.5 Treatment of homesites facing reserves

If you have purchased a homesite that addresses a public reserve, we strongly encourage you to take advantage of the Mullum Creek landscape design incentive.

Objectives

- Ensure that high-quality landscape appearance is achieved on lots where they front reserves.
- Maintain passive surveillance of reserves from homes.
- Ensure that all fencing and screening demonstrates a high-quality design response, and does not unreasonably impede the open visual character of the estate when viewed from a reserve.

Detailed Requirements

R54 ***External services and equipment (water tanks excepted) must be located in a designated services area that is located away from public view.***

R55 ***The developer will install Council approved basic post and wire fencing along boundaries that adjoin the reserve. Modifications to these must be approved by the DRC.***

R56 ***Privacy screening for private open spaces adjoining a reserve must be submitted to the DRC and Council for review. They will be assessed on how well they integrate with the surrounding landscape at this public-private interface.***

Figure 25. *Decorative gates and screens, to be at least 50% permeable.*

7.6 Driveways and paving surfaces

New landscape works at Mullum Creek strive to rest gently within the existing natural environment. Driveways are no exception. They must not be visually dominant when viewed from the street. Therefore, the extent of driveway surface area is to be minimised, and permeable pavements are preferred.

Driveway surface materials and paving should remain visually consistent with the natural bush setting with regard to texture and colour. Refer to **Section 5.7** for a description of suitable driveway materials and finishes.

Objectives

- Minimise the impact of driveways and paving on the natural landform, soil profile and drainage, by minimising the impermeable area covered by driveways and paving on lots.
- Maximise the use of permeable and environmentally friendly driveway and paving materials that also facilitate the infiltration of rainwater (see Figure 19).
- Adopt textures and colours of the natural bush setting, to reduce potential glare and the heat island effect.

7.7 Batters, terracing and retaining walls

Much of the land at Mullum Creek slopes steeply and care must be taken when designing for usable outdoor spaces. Requirements regarding grade changes are addressed in **Section 3** and **Section 7** of these Guidelines. We strongly advise you to discuss your options with a Mullum Creek recommended landscape designer before drawing up plans for approval by the DRC. Mullum Creek has an approved range of retaining wall materials to select from. Other materials may be approved by the DRC based on merit

Figure 26. *Well designed batters/embankments can add depth to your landscape design.*

Objectives

- Adopt form and scale for these works that harmonise with and enhance the existing landform.
- Use landscaping materials for batters, terracing and retaining walls that reflect the colours, textures and materials of the Mullum Mullum valley.

Detailed Requirement

R57 Garden retaining walls must not exceed 1.0m in height.

Guides

G46 Where possible use local stone varieties that express the geology and character of the site.

G47 Preferred form, materials and detailing for batters, terracing and retaining walls are shown in Figure 26 above. See also Figure 9 on page 22.

7.8 Hard landscaping materials

To maintain Mullum Creek's naturalistic landscape character, it is important to select landscaping materials consistent with the local natural environment and visual palette. This includes loose laid rock, materials for retaining walls, soil and gravel. For example, basalt or granite boulders do not reflect the geology or appearance of the local environment, and are likely to incur higher energy costs in transportation than local stone, increasing the environmental impact of their use. Nonetheless, as the use of basalt boulders in landscaping is well-established in this vicinity (for example, through the work of landscaper Gordon Ford), their use may be allowed if supported by a strong design rationale.

A range of sustainably sourced materials consistent with the natural environs of the Mullum Mullum valley are listed in a **Hard Landscaping Materials Guide** on the Mullum Creek website.

Objectives

- Promote landscaping materials with relatively low environmental impact, that are durable and readily reused or recycled.
- Promote the use of local materials consistent with the natural landscape of the Mullum Mullum valley.

Guide

G48 Where possible use topsoil already present on your site, rather than importing large quantities from elsewhere. Conserve your site's topsoil by removing it from within the proposed footprints of dwellings and pavements, stockpiling it, and using it for garden beds and soft landscape works elsewhere. Maintain site hygiene during construction to prevent contamination of soil and soil stockpiles.

7.9 Design of home gardens

Gardens should complement the natural bushland of the Mullum Creek environment. The planting of local indigenous vegetation is encouraged within homesites at Mullum Creek, to promote a consistent visual appearance across the estate, to integrate gardens with public reserve areas, and to support the local flora and fauna. Productive food gardens are also encouraged as part of the Mullum Creek vision, to foster household self-sufficiency.

Objectives

- Promote Mullum Creek's environmental and aesthetic objectives in the design of home gardens.
- Encourage the use of locally indigenous plants.
- Ensure variety and richness in front garden landscape treatments, by including non-lawn garden elements such as plantings of varied densities, garden beds, rocks, etc.
- Incorporate bushfire hazard reduction measures in garden design and plant selection where necessary.
- Promote the production of fruit, vegetables and other foods on homesites.

Detailed Requirement

R58 Lawn must not exceed 60% of the area of the front garden, excluding driveways and hardstand areas.

Guides

G49 Lots at Mullum Creek that have gardens addressing a public reserve should where possible include locally indigenous plants. Plant selection should take into account the BAL (Bushfire Attack Level) for the lot, to minimise bushfire risk. In some cases deciduous fruit trees may be a more appropriate choice. The following document may also be helpful: http://www.cfa.vic.gov.au/fm_files/attachments/plan_and_prepare/landscaping/landscaping_for_bushfire.pdf

G50 Front gardens should predominantly adopt a natural bushland aesthetic with a locally indigenous theme in landscaping materials and plant selection, with a limited component of exotics to provide variation along the streetscape.

G51 Planted trees and garden beds should be located to provide appropriate screening and shade, having regard to the thermal performance (or energy efficiency) of the home, as well as potential overlooking and privacy issues.

G52 Level changes should as far as possible be addressed through use of planted batters. Large stone boulders may be interspersed within plantings. The treatment of embankments and batters should appear natural and informal.

G53 Use of indigenous grasses for lawn is encouraged.

G54 Gardens should provide an area for composting and/or compost bins that are not in public view.

Productive food gardens

Food gardens are encouraged at Mullum Creek, and hopefully fruit trees and vegetable plots will become a feature of each homesite. Food planting is encouraged in both the front and back gardens at Mullum Creek.

Objectives

- Promote the growing of fruit, vegetables and other edible produce in home gardens at Mullum Creek.
- Minimise the impact of vegetable garden beds on natural landforms.

Guides

G55 If you wish to create a flat area for a vegetable garden, sensitively terrace the natural landform in accordance with the Requirements in **Section 3** of these Guidelines.

G56 Use raised garden beds filled with sustainably sourced clean soil to grow vegetables.

G57 Consult the 3D vegetation envelope plan for your lot (available on the Mullum Creek website) to ensure that fruit and nut trees in your garden are planted in an area that doesn't impact adversely on solar access for your neighbour's home. Check that you are not planting tall trees in an area designated for shorter species.

G58 Use rainwater collected and stored on site to irrigate your food garden, and adopt water conserving irrigation technology.

Figure 27. *Growing fruits and vegetables.*

7.10 Recommended plant selection and prohibited species

To help enrich the landscape and promote food self-sufficiency, Mullum Creek encourages owners to plant indigenous species and plants in character with the area, as well as fruit trees and other productive species.

Objectives

- To achieve an overall landscape theme for the estate consistent with the natural environment and landscape character of the Mullum Mullum valley.
- To promote the planting of productive gardens.
- To exclude environmental weeds and prohibited invasive species.

Detailed Requirement

R59 ***Locally indigenous 'signature' trees must be planted on all homesites consistent with the Mullum Creek Recommended Plant List and 3D vegetation envelope, and to at least the densities listed in the table below.***

Area of homesite	Minimum number of signature trees or shrubs (in brackets)
Less than 1500m^2	1 (5)
1500m^2 to 2,000m^2	2 (10)
Over 2,000m^2	3 (15)

A signature tree may be replaced with signature shrubs at the rate of 5 shrubs per tree. This requirement may be relaxed if existing protected signature trees are already present on your homesite. Please contact the DRC if you have any queries about signature trees on your homesite.

Guides

G59 Indigenous trees and grasses should generally be used in preference to exotic species, although food producing species are strongly encouraged. Please only purchase indigenous plants grown from local stock. These are generally available from the indigenous plant nurseries listed in the Planting and Gardening Guide on the Mullum Creek website.

G60 Please consult the Mullum Creek Recommended Plant List on the Mullum Creek website for guidance on suitable plants for your garden and for information on weedy species.

G61 Consider the Bushfire Attack Level for your homesite and consider planting less-flammable species such as fruit trees where necessary.

7.11 Environmental weeds

Plants that act as environmental weeds have the capacity to invade natural bushland, displacing locally indigenous species and reducing native faunal habitat. Consult Manningham Council's Weed Identification Booklet which you can find on the Mullum Creek website. Council's website also includes links to other relevant noxious weed and invasive plants lists.

Objective

- Minimise the use of plants with the capacity to invade and negatively impact on natural vegetation and habitat within and adjoining the estate.

Detailed Requirement

R60 ***Environmental weeds, as listed in the references on the Mullum Creek website and in particular the Mullum Creek Planting Guide, must not be planted.***

7.12 Water-efficient garden design

Water conservation is an important environmental objective at Mullum Creek. Appropriate choice of drought tolerant species and a responsible approach to irrigation will ensure that your home garden uses a great deal less water than would a more traditional European style garden.

Raingardens, designed to promote water infiltration and sediment reduction, can assist in managing stormwater run-off. Information on how to build a raingarden can be found on the Melbourne Water website. See: http://www.melbournewater.com.au/raingardens.

Figure 28. *Raingarden examples.*

Objective

- Minimise the use of mains supplied drinking water for garden irrigation.

Guides

G62 The following strategies are recommended in order to make your garden water-efficient:

- Select drought tolerant plant species.
- Select plants that are appropriate to the moisture and exposure conditions of the lot.
- Install a water-efficient irrigation system connected to your water tank(s).
- Collect and re-use ground surface stormwater, for example through the use of swales, ponds and raingardens.
- Apply mulch.

7.13 Bushfire attack level (BAL)

Consider the bushfire risk associated with your lot when designing your garden and selecting plants. A BAL assessment and report prepared by Terramatrix for the estate as a whole is available on the Mullum Creek website. Your building surveyor will determine whether this report is relevant to your site. Refer to information on the Victorian Building Authority website to understand what landscaping requirements may apply.

Guides

G63 Address the BAL rating and other bushfire considerations when selecting plants for areas directly adjoining reserves.

G64 Fruit trees can assist in shielding homes from radiant heat and tend to be less flammable.

8 Miscellaneous

8.1 Swimming pools and spas

While swimming pools can contribute to a home's amenity, their construction on sloping sites may involve considerable excavation and benching, and they may be unsuitable for some homesites. Substantial embodied energy is involved in the construction of a swimming pool. Filling and maintaining them also requires extraordinary amounts of potable water, electricity and chemicals.

Objectives

- Minimise the impact of pools on the natural landform and soil profile.
- Reduce reliance on potable mains water, by encouraging the use of tank water when filling and maintaining pools, and by undertaking pool water conservation measures.
- Minimise unreasonable impacts of pools and pool use on neighbouring properties.
- Promote environmentally sensitive water conservation and water heating techniques.
- Encourage pools of modest scale, consistent with the Mullum Creek vision and environmental objectives.
- Minimise the amount of non-renewable energy used in heating pools.

Figure 29. *Examples of pool fencing and a natural pool that are in keeping with Requirement R60.*

Detailed Requirement

R61 Pools must be sited to minimise disruption to the site's topography, and to avoid disturbance to neighbours with respect to noise and privacy.

Guides

G65 Swimming pools should be fitted with an insulating cover to minimise evaporation and heat losses.

G66 Pools should be filled and topped up with rainwater, rather than mains water, whenever possible.

G67 Ensure that pool fencing accords with current regulations.

G68 Consider installing a fiberglass pool rather than a concrete pool as fibreglass has much less embodied energy.

Additional information

The City of Manningham requires that a planning permit be obtained to construct an outdoor pool. Pool fencing must comply with the Victorian Building Regulations and satisfy Sections 3, 6 and 8 of these Guidelines.

8.2 Clothes lines

Objective

- Reduce reliance on non-renewable energy for drying clothes.

Detailed Requirement

R62 An outdoor clothes drying area must be provided on each homesite.

8.3 Tennis courts

A tennis court is permitted only where noted on the Lot Plan.

Objectives

- Minimise the impact of tennis courts on natural landform and soil profiles.
- Maximise the integration of tennis courts with the landscaping of lots.
- Promote the use of environmentally friendly materials in the construction of tennis courts.
- Minimise the impact of tennis courts (lighting, noise, overlooking and appearance) on the amenity of neighbouring lots.

Detailed Requirements

R63 ***A tennis court must not be constructed on a homesite where the Lot Plan for the homesite indicates that it is not suitable for a tennis court, except with the consent of the DRC.***

R64 ***The surface of any tennis court must be permeable. Tennis court lighting must be directed downward, shielded against stray light projection, of energy efficiency no less than 80 lumens per watt, and with colour temperature not exceeding 4000ºK.***

R65 ***Tennis court fencing must be demountable.***

8.4 Letterboxes

Letterboxes that complement the design of homes and provide creative interest are encouraged. They can stand alone or be designed into a garden feature wall. If you prefer to buy something off the shelf, keep to simple contemporary forms.

Objective

- Promote letterbox treatments that are creative, contemporary and contribute to a high-quality environment.

Figure 30. *Letterbox examples.*

8.5 Construction waste management

Mullum Creek promotes the reduction of waste and discourages its disposal to landfill. Your builder must be aware of best practice waste management systems to ensure that the development is not polluted with construction waste. Especially on sloping sites, silt management systems must be employed to minimise potential run off to neighbouring sites, roads and stormwater drains. Refer to the **Construction Waste Management Guide** on the Mullum Creek website for more information.

Objectives

- Reduce the amount of construction waste that ends up as landfill.
- Maximise the amount of construction material that can be reused or recycled.
- Minimise contamination of homesites with construction material, including small items that are so difficult to remove from soil, like discarded fasteners and insulation foam shavings.
- Minimise run-off, soil erosion and movement of silt.

Detailed Requirements

R66 Owners must ensure that builders:

- ***provide general waste and recycling facilities.***
- ***empty stockpiles and skips on a regular basis.***
- ***do not place non-recyclable materials in the recycling bins.***
- ***place waste directly into skips to avoid litter, broken glass and rubble spreading through soil.***
- ***close bin lids at the end of every work shift.***
- ***engage a waste-recycling contractor who can fulfill the specifications detailed in the Construction Waste Management Guide on the Mullum Creek website.***
- ***Install silt barriers, absorptive bales or similar measures to prevent sediments in run-off entering the stormwater and creek systems.***

R67 A site waste management plan must be submitted to the DRC for approval prior to the commencement of construction.

8.6 Building site and maintenance

Mullum Creek homeowners are required to maintain their property in good order. Property maintenance for bushfire safety is also necessary. For example, all roof gutters and downpipes must be kept clean of leaves and twigs. Refer to Bushfire Attack Level maintenance requirements on the Building Authority's website to ensure you are maintaining a fire-safe home environment.

Objective

- Undertake adequate maintenance across your homesite to sustain a high quality appearance and protect against the threat of wildfire.

8.7 Pets

Cats and other domestic animals provide companionship and enjoyment for many Australian households, but can also pose a serious threat to indigenous wildlife. Pet owners at Mullum Creek are encouraged to help provide a secure habitat for our indigenous fauna by responsibly securing their pets.

Objective

- Minimise the impact of domestic animals on native fauna.

Detailed Requirements

R68 ***Cats must be kept indoors or in a secured cat enclosure at all times. Proposed cat enclosures must be documented for Step 2 Developed Design Review.***

R69 ***Dogs may only be kept in accordance with Council by-laws.***

Guide

G69 Consider limiting your dog's access to certain areas of your homesite to avoid impacts on wildlife, with particular attention to protecting areas which adjoin reserves.

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Prepared by Paul Haar Architect with acknowledgment to Taylor Cullity Lethlean

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Prepared by Paul Haar Architect with acknowledgment to Taylor Cullity Lethlean

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2. 'Hawthorn Tan' Bricks, Daniel Robertson Bricks, viewed 26 February 2016, <http://danielrobertson.com.au/bricks-overview/>
3. Timber Wall Detail, Image courtesy of Breathe Architecture
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6. Cellar de Can Roca, Retail Design Blog, viewed 26 February 2016, <http://retaildesignblog.net/2012/03/12/wine-stores-celler-de-can-roca-restaurant-by-sandra-tarruella-isabel-lopez-vilalta-girona-spain/Image>

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3. Wood sliced walkway, Katt Elliott, viewed 26 February 2016, < http://www.katyelliott.com/blog/2009/03/wood-slice-walkway-inspiration.html>
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Prepared by Paul Haar Architect

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3. Terraced Garden, Landscape Design, viewed 17 March 2016, <http://stvlandscape.com/retaining-wall-ideas-stylish-way-to-conquer-slopes/retaining-wall-ideas-cheap/>
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Addendum for Version 8.1

1.6 Other controls

Page 7: Sentence added to first paragraph

The Guidelines do not replace the requirements of the Manningham Planning Scheme, the National Construction Code or other regulatory requirements. Where there is a discrepancy between these requirements, the highest of the standards set must be met. Each homeowner must comply with all relevant regulatory requirements in addition to the Requirements of the Guidelines. Manningham Council will assess your proposed building and landscape designs against **Schedule 11 to the Design and Development Overlay** (DDO11) and **Schedule 8 to the Significant Landscape Overlay** (SL08). These are available on the Mullum Creek website.

2.2.1 Step 1 Preliminary Design

Page 12: Paragraph replaced by bullet point

Once you are happy that your preliminary design incorporates the above principles and is consistent with the Mullum Creek Design Guidelines, a pre-application meeting with Council's planning office is highly recommended. Feedback from this meeting should indicate whether your design is on track to gain Council planning approval.

Replaced with:

- Ensure that your building design addresses all of the requirements of Council's DDO11 and SL08 overlays. If your design does not align with these overlays, the DRC recommends that you organise a pre-application meeting with Council before applying for Step 1 approval. Feedback you receive will be invaluable in developing your design and will provide some assurance that your application for planning approval will be viewed favourably down the track.

4.4 Garages and carports

Page 29: Requirements clarified

R 24 A garage must not exceed 50% of the width of the façade.

Replaced with:

R24 A garage must not have an opening width greater than 50% of the width of the front façade of the dwelling

Also,

R26 A garage door must be set back 1.0m behind the front façade, unless it can be demonstrated that the Mullum Creek vision and objectives can be better met through a variation to this Requirement.

Replaced with:

R26 A garage or carport located in the street elevation must be set back a minimum of 1.0m behind the front façade of the dwelling. The DRC may grant a variation to this Requirement if it can be demonstrated that the Mullum Creek vision and objectives can be better met through such a variation. However this variation can provide no assurance that Council will approve a design that does not satisfy DDO11 in this regard.

Addendum for Version 8.2

1.6 Step 3 Construction Documentation

Page 14: Application fees clarified

Application fees

No application fees apply when submitting your plans for Design Approval with the DRC for any Step for the first time. However if your design changes significantly during the Step approval process, or your design fails to meet the Requirements and is not granted approval, each additional assessment and review will incur a fee of $900 (exc. GST). See Requirement R5.

Replaced with:

Application fees

No application fees apply when submitting your plans for Design Approval with the DRC for any Step for the first time. However if your design changes significantly during the Step approval process, or your design fails to meet the Requirements and is not granted approval, each additional assessment and review will incur a fee of $900 (exc. GST). For re-submissions, costs associated with re-assessing energy ratings by the nominated Mullum Creek energy assessor must be covered by the purchaser. See also Requirement R5.

Each of the three DRC Step reviews is provided free of charge **once for each lot**.