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Onsite Treatment

Considerations for onsite treatment

Introduction

This fact sheet is designed to provide advice and recommendations for applicants and councils when applying Clause 56.07-4 at the lot scale, subdivision and precinct scale. This fact sheet should not be read in isolation and is designed to supplement existing guidelines (refer to the Related Resources section of the C56 Tool).

Clause 56.07-4

The revised Sustainable Neighbourhood's Clause 56 – Residential Subdivisions of the Victoria Planning Provisions came into effect on 6 October 2006. The Clause 56 provisions are designed to deliver more sustainable built environments. The objectives contained support and promote walking, cycling, public transport, the neighbourhood street network, integrated water management and subdivision construction site management.

The integrated water management provisions (Clause 56.07 – Integrated Water Management) provide a more sustainable basis for managing water in residential subdivisions by conserving potable (drinking) water, providing opportunities for reusing and recycling water for non-drinking purposes and managing the quality as well as quantity of urban run-off.

In particular, the urban run-off management objectives (Clause 56.07-4) address urban stormwater, and will contribute to improved stormwater water quality and assist in achieving the objectives of the State Environment Protection Policy (SEPP) - Waters of Victoria. The standards to be met include performance objectives as set out in the *Urban Stormwater Best Practice Environmental Management Guidelines* (BPEMG) (see BPEMG section). These standards can be met by incorporating water sensitive urban design (WSUD) elements as part of the drainage system.

WSUD is a sustainable urban water management approach which regards stormwater as a resource. It integrates sustainable water initiatives such as recycled water (wastewater and stormwater), while at the same time protecting and enhancing natural urban waterways. The main goals are water sustainability and environment protection.

What targets need to be achieved?

The onsite stormwater treatment system proposed within the subdivision, which *should* incorporate Water Sensitive Urban Design (WSUD), *must* be designed to meet the following BPEMG targets:

- 80% Total Suspending Solids reduction
- 45% Total Phosphorus reduction
- 45% Total Nitrogen reduction

Stormwater quality performance (targets) is assessed by using specialist software. Usually the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) is used for large developments and a web-based calculator (STORM) is used for small developments. Please refer to the Related Resources section of the C56 Tool for links.

Greenfield and infill development and redevelopment

Clause 56.07-4 applies to all new development, infill development in existing urban areas and redevelopment of existing urban areas. For further information on Clause 56.07-4 click on the 'Related Documents' section of the tool from the homepage.

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Planning zones and overlays

It is useful to consult the planning scheme in which your development is located to determine the regulations around the types of treatment that may or may not be able to be used. For further details on Planning Schemes click here - http://www.dpcd.vic.gov.au/planning/planningschemes

Style of development

Clause 56.07-4 was introduced to direct the creation of distributed water quality treatments as part of all new development, infill development and redevelopment. There are a range of treatment options available, therefore distributed treatments can be constructed as part of new developments in a variety of ways. Choosing the right treatment or combination of treatments for your development is the key to achieving the water quality treatment performance objectives.

Typical styles of development to which on-site treatment apply are as follows:

- Small developments of less than 10 lots with individual private ownership
- Unit or townhouse developments with a body corporate over shared assets
- Staged subdivisions of 10 or more lots in large Greenfield estates in urban growth corridors

The first two styles of development are typical of infill and redevelopment. The third is typical of Greenfield areas. The style of development will primarily dictate the size of the contributing area of runoff that will require treatment and the amount of space available for water quality treatment.

For example, the first two styles of development lend themselves to the installation of rainwater tanks and planter box or small in-ground raingardens whereas larger subdivisions in Greenfield areas can incorporate these treatments on individual lots if desired, plus they allow for the incorporation of swales in the streetscape and larger raingardens in neighbourhood parks.

Potential location of water quality treatments on site

How do I define the 'site'?

Defining the site depends on the scale of the development. The site can be individual lots or it can be a particular location or locations within a stage of subdivision consisting of multiple lots.

Typical locations

Lot-scale treatments are located in the front or back garden, either in-ground or in planter boxes, fed by flow from downpipes. Swales are typically located in the streetscape and fed by flows from multiple property outlets. Larger raingardens in neighbourhood parks are typically fed by multiple lots from a whole stage of subdivision.

Water quality treatment options available

There are a range of options available that can be used individually or in combination depending on the amount of runoff that requires treatment, the space available for siting treatments and the performance objectives that are to be met. Some examples of the different types of treatment are:

- Permeable paving
- Rainwater tanks
- Small raingardens
- Bioretention systems
- Vegetated swales
- Bioretention swales
- Large raingardens
- Wetlands

For further details on these different treatments types refer to the *Related Documents* and *C56 Resources* sections.

Planning considerations

It is useful to plan your water quality treatment as part of your development. This requires the thinking to be done early on and discussions at pre-application stage between council and applicants. Some key considerations during the planning phase are highlighted below.

Who will be the owner of the treatment?

Given the typical locations of water quality treatments, ownership of the ultimate 'assets' will either be by individual private landowners or by the local government authority. Typically, any treatment situated on individual lots will be in private ownership, whilst anything in the streetscape or neighbourhood parks, for example, will become Council assets.

How much will it cost to construct and maintain?

Determining the estimated cost of the treatment is important during the planning phase. Cost is informed by the type of treatment, its location, its size, the materials required, site constraints, construction methods and so on.

Who is funding construction and maintenance costs?

In estate developments that have included distributed water quality treatment; the developer has constructed these assets at their own cost as part of their obligations under Clause 56. This is the typical process that occurs in Greenfield areas and where a developer is undertaking a large infill development or large redevelopment project.

In existing urban areas, installing water quality treatments will require retrofitting the existing infrastructure and in this case, it is typically, the asset owner who will pay for the construction and maintenance costs. For example, a private landowner who wishes to install a raingarden on their lot will pay for its construction and maintenance, and often undertake the work themselves. Any works in the streetscape or local/neighbourhood parks to install swales or raingardens will still be paid for by applicant but construction may be undertaken by the council.

Design considerations

There are a number of guidelines, engineering design manuals, software modeling packages (STORM, MUSIC) and training courses available to assist the development industry, local government and private landowners to design and construct appropriate WSUD technology and meet the BPEMG objectives for urban stormwater.

Concept design

The first stage in the design process is to prepare a concept which typically shows the location, size and type of treatment being proposed. The concept design phase is a useful tool when consulting with various interested parties and seeking in-principle approvals and where required, funding assistance.

Functional and detailed design

Once the concept design has been prepared and revised as a result of the consultation process, functional/detailed designs are prepared which will be used to guide the ultimate construction of the treatment.

Construction considerations

There are a number of considerations during the construction phase. Key considerations are highlighted below. A number of councils are now building in 'hold points' to construction of WSUD assets that are within the road reserve or local parks. By having points in the construction period where the method and materials can be checked will help to ensure a quality outcome.

Materials and method

The materials required will depend on the design of the treatment. For example, smaller lot-scale raingardens can simply involve some excavation in the garden and planting, or the construction of a planter box filled with soil, with flows from one or more downpipes being directed into them. More complex raingardens may have filters of sand and gravel with collector pipes at the base as well as being planted. Swales in the streetscape and larger

raingardens in parks can also be simple earthen excavations with plants or more complex with sand and gravel filters. The construction method will be determined by the design of the treatment.

Using a contractor

Local government authorities engage contractors to undertake works on their behalf, if they do not have their own roads and drainage or parks and gardens works crews. Private landowners may choose to do the same and hire a builder or landscape gardener to construct their water quality treatment for them.

Constructing yourself

Private landowners have the option of undertaking works themselves, such as building a planter box raingarden to capture water from their down pipes, or constructing a raingarden in their front or back garden. Others may choose to contract a landscape gardener or builder to undertake the work for them. The only difference is cost and the decision will depend on how confident the private landowner is in undertaking the work themselves. DIY enthusiasts may well enjoy having a go! Refer to the specific fact sheets on different WSUD systems within the C56 Tool to understand how you can construct systems yourself.

Occupational health and safety

If you are a private landowner undertaking works yourself, please ensure that you have your health and safety front of mind and that you adhere to the directions of the design plans you are using and any Material Safety Data Sheets for any construction materials you are using. As well as be mindful of lifting and carrying heavy materials. It is always a good idea to work with a helper.

Maintenance considerations

Regular maintenance

WSUD elements require regular maintenance; the frequency of maintenance will depend on a number of factors including location (e.g. proximity to high pedestrian and vehicle traffic). Regular maintenance activities may include:

- Checking and recording that plants are alive and growing well
- Prune plants when necessary
- Sediment removal and/or leveling of rock mulch
- Removing weeds, picking up litter that may get blown in
- Record of any physical damage

If the WSUD system is located within the road reserve or park, council will usually adopt the asset and list on their asset register for maintenance. This will usually occur at the end of the initial 12 month period where the asset is maintained by the applicant/developers. If the WSUD system is located on private property it is up to the individual property owner or body corporate to maintain the system. Section 173 (legal agreements) can be used to register the asset on the property title.

Engineering checklist

In addition to the regular maintenance activities listed above, an engineering check of more complex systems, may need to be undertaken every 3-6 months (or otherwise agreed frequency). Depending on the system, this may involve the checking of detention depth, any ponding or blockages and water quality testing. If the WSUD system such as a raingarden is constructed correctly, it will be many years before the system will require re-setting i.e. replacement of the loamy-sand filter media, plants and gravel mulch.

Costs

Maintaining the treatments will involve some degree of cost over the lifetime of the WSUD system, whether it is time or a financial cost for replacement materials or plants. Local government authorities typically factor maintenance costs into their operating budgets.