Introduction

This Practice Note has been prepared by Water Resources to assist Development Assessment staff and applicants in assessing and applying Water Sensitive Urban Design (WSUD) at the subdivision scale. It is one in a series on WSUD. It should be used in conjunction with the *WSUD Engineering Guidelines: Stormwater* and other relevant Practices Notes within the series.

Applicants and Development Assessment staff should be familiar with the contents of both the Practice Notes and *WSUD Engineering Guidelines: Stormwater* prior to making their assessment.

How to Implement Water Sensitive Urban Design at Subdivision Scale

When designing for WSUD at subdivision scale, priority should be given to ‘source’ controls placed at the top of the catchment, and extend throughout the rest of the catchment. This is in keeping with Brisbane’s Water Management Strategy of achieving smart and responsible water cycle solutions. It is important to work with the existing landform and topography when developing lot layouts and selecting and using treatment measures.

Subdivision Scale WSUD Treatment Measures

WSUD treatment elements related to subdivision scale developments are listed below. The list is not exhaustive and a combination of elements should be a design consideration, leading to a wider range of possible solutions. Elements include:

- source controls such as rainwater tanks, porous pavements and rain gardens
- swales and buffer strips
- bioretention swales
- bioretention basins
- sand filters
- on-site infiltration measures
- sediments basins
- constructed wetlands
- other elements such as litter baskets, trash racks, gross pollutant traps, oil/grease separators and green roofs.
The treatment elements should be implemented in a series (i.e. a ‘Treatment Train’). Collectively, the treatment measures will need to typically remove coarse to fine sediments, nutrients and metals to achieve water quality objectives.

**Selection of Appropriate WSUD Measures**

Council and the developer must consider certain factors prior to the selection of WSUD elements for subdivision scale developments. Such considerations are covered within the Introductory, Lot and Street Scale Practice Notes and the *WSUD Engineering Guidelines: Stormwater* document.

**Design Considerations**

The aims of WSUD are to protect waterway health by minimising rainwater runoff; reducing water demand through reuse; and maximising recycling opportunities while enhancing aesthetics and livability.

Considerations of possible treatment measures at subdivision scale are given in Table 1 and provided visually in Figure 1, which illustrates the incorporation of WSUD in an urban subdivision. The Practice Note detailing WSUD at Commercial or Industrial Scale should be used for reference where these land uses are being proposed.

**Table 1: Subdivision Scale Treatment Measures**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Possible Treatment Measures</th>
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<tbody>
<tr>
<td>Roof runoff, canopies</td>
<td>• rainwater tanks&lt;br&gt;• swales and buffer strips&lt;br&gt;• bioretention swales&lt;br&gt;• small bioretention systems e.g. rain gardens&lt;br&gt;• on-site infiltration measures&lt;br&gt;• other elements such as landscaping with pervious materials and rooftop gardens</td>
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<tr>
<td>Impervious surfaces, e.g. car parks, driveways, paths and courtyards</td>
<td>• replace impervious materials with porous materials&lt;br&gt;Where the use of impervious materials is unavoidable, channel runoff to:&lt;br&gt;• swales and buffer strips&lt;br&gt;• bioretention swales&lt;br&gt;• bioretention systems (e.g. rain gardens)&lt;br&gt;• on-site infiltration measures</td>
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<td>Road runoff</td>
<td>• bioretention swales can be located in the median strip or footpath&lt;br&gt;• swales and buffer strips can be located in the median strip or footpath&lt;br&gt;• on-site infiltration measures</td>
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<tr>
<td>Public open space such as parks, lunch areas and playgrounds</td>
<td>• bioretention swales&lt;br&gt;• swales and buffer strips&lt;br&gt;• bioretention basins&lt;br&gt;• on-site infiltration measures&lt;br&gt;• sediment basins&lt;br&gt;• constructed wetlands&lt;br&gt;• ponds/ lakes&lt;br&gt;• other devices i.e. rooftop gardens, rainwater tanks, landscaping and rain gardens</td>
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Figure 1 depicts several on-ground solutions for WSUD incorporation into urban development at various scales.
## Construction and Maintenance Considerations

Maintenance of WSUD systems needs to be considered carefully during the design, construction, establishment and operational phases. Key considerations are given in Table 2.

### Table 2: Construction, Establishment and Maintenance Considerations

<table>
<thead>
<tr>
<th>Development Stage</th>
<th>Considerations</th>
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| **Design Phase**                   | • configure elements to achieve water treatment requirements  
• provide appropriate access for continued maintenance  
• select plant species to suit water treatment objectives  
• establish ultimate land ownership and asset ownership  
• establish who is responsible for maintenance |
| **Construction/Establishment Phase** | • establish frequency of maintenance inspections  
• ensure erosion and sediment control is enforced to protect soil and vegetation systems  
• control traffic and deliveries to prevent damage to treatment systems  
• time vegetation planting to ensure maximum survival rates (dependent on seasons, irrigation requirements, and timing of development) |
| **Operational Phase**              | • written maintenance plans are required prior to asset transfer to Council  
• establish frequency of maintenance inspections  
• maintain water flow through the system  
• maintain flow inlet points  
• remove accumulated sediments and litter  
• inspect and remove debris  
• undertake scour checks following large storm events  
• maintain vegetation (especially during first two years to allow for optimal plant establishment)  
• prevent undesired vegetation from taking over the desirable vegetation  
• prune to remove dead or diseased vegetation material and to stimulate new growth  
• remove noxious plants or weeds, pests and diseases  
• re-establish plants that die  
• ensure turfed areas are mowed to the designed height |