



# Shand Road, Reservoir: 2024 Update

Location:  
**Melbourne,  
VIC**



Case Study — Prepared by Water Sensitive Cities  
Australia, April 2024

## Insight

Water sensitive urban design (WSUD) has evolved over the past decade, but these advances have yet to be reflected in the technical guidance used in development. As a result, councils are restricted in what they can and will approve. These restrictions relate to: (i) their understanding of WSUD; (ii) risk appetite, which may be lower for drainage that interfaces with council infrastructure, and (iii) the need to justify approval decisions with reference to approved standards, regardless of the currency of these standards.

To accelerate the implementation of WSUD in small scale development current best practices could be standardised and documented.

## Project description

The Shand Road affordable housing development proposed an innovative approach to WSUD as a part of a broader strategy to achieve long-term sustainability.

The innovations included WSUD features to provide flood mitigation as a sustainable alternative to on-site 'grey infrastructure' like concrete pits, tanks and pipes. Other benefits included managing water quality, providing amenity and supporting biodiversity.

In addition to meeting flood management requirements, the original design exceeded EPA Victoria's Urban Stormwater Guidance for stormwater quality and flow volumes for infill sites and aligned with the stormwater management objectives in Melbourne Water's Healthy Waterways Strategy. If approved, it would have provided an exemplar of best practice.

The design is a collaboration between the developer, engineering consultant, WSUD consultant and landscape architect. Darebin Council also came on board early by encouraging further investigation of flood assessment methodologies to assess how WSUD can contribute to flood management.

The project is currently in the construction phase – design has been completed and the planning permit has been issued. Progress will be tracked throughout the development.

↓ Image 1: Architectural render for 45 Shand Road.



### What does this case study demonstrate?

Each case study has been selected to demonstrate specific solutions, benefits or enabling structures that support the creation of water sensitive cities. This case study focuses on:

**Flood mitigation**

**Rainwater and stormwater harvesting**

**Water sensitive homes and buildings**

## Current status

A planning permit has been approved by Darebin Council, supporting many of the sustainability features for the development, but requiring changes to the drainage design to meet council flood mitigation requirements. These changes impact some WSUD features:

- A WSUD approach was not approved as a flood mitigation solution.
- The raingarden was not approved as part of the site drainage plan and was removed. An on-site stormwater detention (OSD) pit was introduced.
- The rainwater tanks and swale were approved, with modifications to the sizes of inlets and outlets. This required balancing 2 competing objectives: the tanks acting as a reservoir (to support reuse of rainwater) and as a drainage conduit (to slowly discharge rainwater).

Other agency approvals have also been granted, such as Yarra Valley Water service connections.

Construction for the development started in December 2023 and is planned to finish by November 2024.

## Understanding the approval process

The case study provides an insight into the way WSUD is considered in council approval processes. This is best explained with reference to the steps in a planning application:

- 1. Design team initial proposal** – In this case study, the WSUD innovation was jointly developed by the developer and their design consultants. A specialist WSUD consultant was also engaged. This provided advocacy for the innovation, backed by a strong conceptual and technical basis for the proposal.
- 2. Council pre-application** – The 'pre-app' meeting is a formal part of the planning approval process and provides non-binding guidance to the developer. The development's sustainability features were considered and supported by Council teams who attended this meeting. The WSUD concept gained in-principle support from Council's sustainability team. Council's engineering team was not part of this meeting.
- 3. Planning permit approval** – Council provides a conditional planning permit. Assuming the developer accepts the conditions, the design team update the proposal for final endorsement by Council and issuance of a town planning permit. Importantly, the Council engineering team will, as a matter of policy, not consider a drainage design until the plans have been fully endorsed.
- 4. Drainage design approval** – Council's engineering team review the drainage design and connection to Council's drainage assets as the 'last' step in the approval process, after the planning permit has been issued and plans are endorsed. The design must meet their technical guideline(s). The engineering team raised concerns with the proposal at this stage and would not approve the development plans unless the development complied with Darebin Council's technical guidelines around drainage design.

## Concerns with WSUD for flood mitigation

Darebin Council's engineering team raised several issues with the original WSUD design:

- **Compliance with standards.** In the absence of technical guidance on WSUD for flood mitigation, the proposal could not be evaluated against these outcomes. Because the proposed design was outside Darebin's own set of technical guidelines, it could not be approved.
- **The appropriateness of using WSUD for flood mitigation.** A raingarden was deemed impractical for detaining rainwater in the development's drainage system, notwithstanding the role of WSUD in managing water quality.
- **Concern about long-term maintenance and permanence of the asset.** Specific concerns were raised about the long-term performance and maintenance of blue-green assets (like raingardens). These concerns related to uncertainty about ongoing raingarden maintenance, and potential lack of owner knowledge which may result in permanent removal of the raingarden in the future.

As a result of these concerns, preference was given to conventional 'grey' drainage designs that are well understood.

## What this means for implementing WSUD in small scale development

- **Openness to consider WSUD.** Councils' engineering team was not comfortable approving WSUD as a substitute for OSD, possibly because there was no standard or guideline they could rely on and they had limited experience with the robustness of such a solution.
- **Technical guidelines don't reflect the multiple functions of WSUD.** Council must refer to approved standards when assessing proposals. Existing WSUD guidelines focus on the stormwater quality aspects and have less guidance on using WSUD to manage flows on site (either for ecological or flooding objectives). In this case study, the developer and WSUD consultant sourced examples of guidance used in other councils (outside Victoria). This evidence was not suitable for Council to approve the drainage design.
- **The role of advocacy.** Both the developer and the WSUD consultant engaged proactively with the engineering team to try to resolve concerns, and were given the opportunity to do so by Council. The planning approval became a procedural process, in which the development was assessed against Darebin Council's existing technical guidelines. Despite the outcome, it shows the importance of having a 'champion' involved.
- **Approving WSUD is the last step and occurs after a planning permit is approved.** Council engineers did not review the drainage design until the end of the process, and it is not clear to what extent the engineering review considers earlier advice or

broader council objectives for WSUD. This approach increases risk for the developer to propose something innovative, even if considered best practice in another jurisdiction. The developer has limited options to re-work the design, having completed consultation with neighbours and obtained other Council and service approvals.

- **The cost to revise plans.** Developers of small scale, infill projects have limited budgets for consultants. When innovative WSUD solutions are proposed, there is often a requirement to iterate the design in discussion with Council. This approach exhausts budgets quickly and increases the likelihood that the final design will be 'conventional' to secure approval.

- **Uncertainty regarding operation and maintenance (O&M) of private realm WSUD.** Council raised concerns about the reliance on the site owner for O&M. This created uncertainty about the ongoing hydraulic performance of the site's drainage system. Council bears the flood risk if the system fails. While this risk is not unique to WSUD, the nature of WSUD makes this risk more probable. The developer proposed solutions such as putting the raingarden on title as an asset (so it can't be built over) or adding it to body corporate requirements (so it must be maintained). These solutions were not supported by Council.

↓ Image 2: Architectural render for 45 Shand Road.



## Support for innovative solutions

### Capacity and capability

- *Create awareness of WSUD:* Council engineers' level of awareness of WSUD influences how innovative designs are evaluated. If councils value WSUD outcomes, they need to invest in internal capacity, capability and guidance. And importantly, councils need to maintain this investment in capacity and capability over time, from relying on individual champions (who will likely move on over time) to becoming institutional champions.
- *Foster champions:* Building the capacity of drainage consultants (or sustainability consultants) to identify and advocate for opportunities is a key pathway. In this case study, the developer advocated for innovation. In other cases, this advocacy role may be played by the developer's drainage consultants; the developer is likely to go ahead with the designs that are proposed by their expert advisors. Similarly, sustainability teams could find more effective ways to influence planning processes and engineering review to support developments that meet council WSUD objectives as the developer will often accept what is proposed.

### Technical guidance

- *Ensure technical guidance supports multiple WSUD objectives:* The absence of a guideline or standard on the use of WSUD to manage flow was a barrier, as was a lack of examples in different housing typologies in Victoria. Guidance should be issued by an authoritative source and include standard drawings, designs and assessment checklists.

### Process

- *Manage interface with council assets:* Site drainage is a service that directly interfaces with Council's own assets (i.e. street drainage). Council engineers likely have a lower risk appetite for novel drainage design, compared with services managed by others (e.g. energy systems).
- *Engage early:* Bring engineering consideration of WSUD forward in the approval process so that issues and opportunities can be considered from a whole-of-council perspective. Leaving the review of WSUD until the final step in the process (in isolation of other reviews of the development against council objectives) discourages innovation.
- *Bridge cultural and capacity gaps between council teams:* Council strategy/sustainability teams need more effective ways to influence land planning approval processes and outcomes, to support strategic Council objectives.

### Support for innovative solutions

- *Consider 'performance solutions' as a pathway to implement novel WSUD.* The Building Code provides a mechanism for non-standard approaches called 'performance solutions'. This allows a developer to work with an engineering expert to put forward non-Deemed-to-Satisfy solutions that meet the requirements of the Building Code (NCC 2019). These solutions are used when the development industry has identified a better way to do something but the Building Code (which is updated every 3 years) has not yet incorporated that new approach. Compliance with the Building Code is assessed by the building surveyor. The performance solution process provides a pathway to put forward novel solutions that meet Building Code objectives, although it can be complex, expensive and often redundant. It could be adapted for WSUD, with the role of the building surveyor (who makes the assessment with respect to the building code) replaced by council engineers. These technical decision makers could consider performance solutions that meet the stated WSUD objectives but are not within council's existing engineering guidelines. Although most proponents would not bother with this process, some may, leading to pilot solutions that provide further experience and evidence of WSUD implementation.

## Project collaborators

- Ys Housing
- E2DesignLab
- Ipsum Structures
- Watkin McLennan
- Bank Australia
- City of Darebin

## Additional information

More information on the 45 Shand Road project can be found at:

[Open space contribution exemption for charitable affordable housing providers](#)



↑ Image 3: Rendered image of one of the front gardens.

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