
REPORT 1
(1215/521M)

DELIVERING OUR LIVING CITY: WATER SENSITIVE URBAN DESIGN STORMWATER MANAGEMENT IN WELLINGTON

1. Purpose of report

To introduce Water Sensitive Urban Design (WSUD); it is an integrated solution to flooding, water quality, and sewer overflows which promotes a more resourceful use of water alongside the creation of beautiful and resilient places.

To seek approval to put the new Council guidance document –A WSUD guide for stormwater management in Wellington - document out for consultation.

2. Executive summary

WSUD is an Our Living City initiative to promote natural drainage to help the piped networks cope better with cross connections, under-capacity pipes, and increasing frequency of rain events to reduce incidents of sewer flooding to the sea.

WSUD is an approach to water resource management in urban environments that addresses both water quantity and water quality issues. WSUD integrates natural water systems with built form and landscapes. Key elements include working with nature, avoiding or minimising impervious surfaces, utilising vegetation to assist in trapping sediment and pollutants.

Implementing WSUD will bring together property developers, engineers, urban designers, landscape architects, parks and planning to integrate nature in the creation of spaces that will revitalise and protect Wellington.

The WSUD guide is a practical document; it provides the conditions for the private sector to support economic growth, ensuring Wellington is 'open for business'. By bringing together people and organisations who can work to achieve a common objective is one way to secure a cost effective, future proofed solution.

Formal approval of the WSUD guidance document, which will sit in the District Plan family of documents, with the Code of Practice for Land Development, will be sought from the Council.

This guide represents our first deliverable in support of our Blue Belt concept. As part of the LTP development we will be reporting to you specifically on Blue Belt and its implementation.

3. Recommendations

Officers recommend that the Strategy and Policy Committee:

1. *Receive the information.*
2. *Endorse the key messages.*
3. *Agree the guide for Water Sensitive Urban Design (WSUD) stormwater management in Wellington guide (attached as Appendix 1 to this report) be the standard required for the design WSUD assets.*
4. *Agree that comments and feedback be invited on this draft guide from practitioners and the community.*

4. Background

Conventional stormwater management has traditionally focused on flood risk management. Urban development needs and flood issues have been dealt with by building pipes and burying streams and wetlands underground. However pipes disconnect communities from their natural surroundings, adversely affect biodiversity, and offend cultural values. They are also expensive to build and maintain.

Human activities and urban areas generate contaminants. Traditional piped stormwater networks very efficiently move these contaminants to aquatic receiving environments like Wellington harbour. Contamination of stormwater can result in public health risks; closing beaches and negatively affecting water based recreation, shellfish gathering, and have adverse effects on cultural and tourism values.

It is now being realised that conventional systems for managing our water resources are not viable in the long term and digging up the streets to replace existing drainage pipes with even larger ones is not the answer.

WSUD is a monumental shift in how stormwater is managed in Wellington. The Our Living City team are pushing boundaries beyond conventional drainage management to a multi-disciplinary approach; forming alliances to facilitate and implement a range of WSUD concepts and green infrastructure projects that will deliver multiple benefits.

WSUD will reduce rainwater inundation of the piped system that causes flooding and overflows of sewage in the streams and the sea, dealing with the issues of both quality and quantity. It will also help bring more native flora and fauna into urban areas, whilst providing ecosystem services like water retention and purification, reducing our carbon emission footprint, cultural and aesthetic

services, improving quality of life for Wellingtonian's and attractiveness of the urban environment in addition to realising the 'Blue Belt' vision; making our sea safe to swim in year round.

In Wellington it is not intended to replace the piped network, but to use storage and soakage to the ground to compliment the piped network.

In Wellington the Council has already implemented a number of WSUD solutions. The 80 rain gardens along the quays, the tree pits in lower Cuba Street, the wetlands at Waitangi Park – all provide stormwater treatment and storage for run off from roads, pavements, and other hard surfaces. Similarly the stormwater from the new Westchester Drive flows into swales – shallow, sloping hollows designed to slow the flow of water, trap pollutants and replicate nature. The National War Memorial Park in Buckle Street will be the latest example. The park will incorporate rain gardens to detain stormwater to irrigate the terraced park.

This approach is part of a new philosophy to urban water management, developed in Australia, embraced in America and in the UK, its known as Sustainable Drainage Systems (SuDS).

It should be noted however that WSUD is not a single solution to the stormwater contaminated by sewage currently experienced at Taranaki and Overseas Passenger Terminal outfalls. WSUDD will assist in improving water quality there but monitoring and a programme of works is being implemented by the Chief Asset Officer and Capacity.

5. Discussion

An unstable economy, greenhouse gases, sea level rise and stricter water quality rules challenge traditional ways of working. Water resource management is going to be a major problem for cities in the future.

WSUD is an approach to water resource management that addresses water quantity and water quality issues, ensuring the water entering the harbour is clean. Preserving and enhancing Wellington Harbour as our premier asset.

Water, whether drought or flood, has become a frequent theme the NZ headlines in the past 12months. The drought last summer exposed Wellington's susceptibility; region-wide we experienced hosepipe bans in efforts to limit the stress on water resources. The intense downpour in early May 2013 caused flooding citywide and hundreds of thousands of dollars of water damage claims were filed. Climate science predicts that this kind of extreme weather is set to continue with increasing severity.

We are starting to meet these challenges and to make our city more water sensitive and resilient.

The Council launched the Our Living City programme to strengthen urban nature connections and expand our quality of life. Blue Belt is a Living City showcase project. An important part of our environment, recreation, heritage and economy is the sea surrounding the city. Blue Belt is about enhancing marine life and highlighting the natural advantage the harbour provides for the city. Alas data for Wellington Harbour show contaminants above guidelines for aquatic life. During storms drainage systems are inundated causing flooding and sewage overflows to the harbour –closing beaches and affecting our enjoyment of our natural environment. These issues affect credibility and risk realising our Blue Belt vision.

Digging up the streets and building ever bigger drainage pipes to manage stormwater quality and minimise sewer overflows is extremely disruptive, prohibitively expensive, and would be unlikely to provide a sustainable long-term solution.

We see these challenges as an opportunity to deliver a smarter water environment supporting the needs of society and aquatic ecosystems. A solution lies in using WSUD to reduce the existing impermeable areas of the city, to decrease the amount of water in our drainage networks.

Melbourne, Victoria, is introducing legislation to ensure that it owns all of the rain falling on the city as it sees it as a valuable resource. Maximising the use of run off using WSUD and green infrastructure to manage flooding and water quality at the same time as enjoying the full range of benefits planting brings.

Most traditional 'grey' infrastructure has a single function. Green infrastructure, by contrast is multi-functional. As well as reducing pressure on the sewer network (reducing sewer overflows to the sea) and filtering out pollutants from stormwater, WSUD can also provide ecosystem services such as bringing more of our native flora and fauna into the heart of the city, reducing impervious areas, creating shade, improving the streetscape and storage of carbon in the trees and soil, in addition to realising the Blue Belt vision.

The city of Philadelphia is pursuing a WSUD approach; retrofits on existing rooves and converting roads to make them more permeable. Such an approach is expected to reduce annual sewer overflows by nearly 8 billion gallons per year – at a cost of billions less than the more traditional approach of building underground storage tunnels. Philadelphia has estimated that the cost of a WSUD approach is US\$3billion compared to US\$100billion for a piped solution.

In Seattle, replacing traditional asphalt streets with permeable pavement and green infrastructure has cut paving budgets nearly in half.

Multi-value benefits from investments are now expected and becoming de rigeur.

We need to make decisions at the macro scale, to deliver WSUD on the back of other major investment. Utilisation of WSUD and nature's ecosystem services will yield far greater benefits than single focused projects. For example roading projects can incorporate WSUD elements and bring benefits to other interests-urban design, flood management and biodiversity to name but a few.

In New York a WSUD approach that integrates swales and green roofs, is being used as an alternative approach in managing rain-related pollution. They are directing investments in WSUD to optimise the existing piped system and to reduce flow volumes into its combined sewer system. This project is expected to save about \$1.5 billion in treatment and infrastructure costs over 20 years. For billions of dollars less than the cost of the traditional tanks and pipes, that are useful only when it rains, New York is benefiting from improved water and air quality, reduced greenhouse gas emissions, increase property values, and beautified communities.

A WSUD solution would take shape incrementally over time; just as it will take decades to upgrade all of Wellington's drainage networks. Yet a WSUD approach would see the benefits immediately, unlike the piped solution which will see minimal benefits until completed.

WSUD is not just an option confined to infrastructure projects. When making decisions about any council projects, for example housing or park upgrades, there should be consideration of the opportunities to include WSUD and take into account the possible multi – value benefits.

A water sensitive city may be the future but to deliver them we need understanding and partnerships that ensure WSUD is included in projects and developments throughout Wellington. The guidance document will provide direction for both developers and Council officers for the inclusion, design and implementation of WSUD principles in both the development of urban subdivisions and the retrofitting of assets and neighbourhoods.

The Our Living City team working with others (i.e. City Networks, Urban Development teams and Capacity) will direct WSUD opportunities in joint effort to reduce surface water flows in sewer systems.

In producing the guide we have formed strategic alliances with consultants and developers to facilitate integration of WSUD into Wellington landscapes. In encouraging and promoting the up take of WSUD and providing city specific guidance we open the opportunity to partner with developers, and other stakeholders to deliver an attractive urban environment.

5.1 Consultation and Engagement

The WSUD guide has been produced with considerable discussion and three workshops with stakeholders both internally and external to the Council, including other TA's, land developers and drainage engineers.

The aim was to create a concise document that had credibility and buy in from the different areas of professional expertise and end users, including Council officers and developers. The WSUD guide for Wellington provides direction for the inclusion and implementation of WSUD principles in both the development of new subdivisions and the retrofitting of city infrastructure assets and neighbourhoods.

As the WSUD guidance is basically a technical document, it is not considered appropriate to follow Councils normal “engagement” policy nor is consultation under the LGA is not required.

It is intended that the guide is placed on the Council’s website and feedback and comment invited from users. These suggestions will be considered prior to the document being finalised.

In the interim it is proposed that the WSUD guide is and be used to guide works instigated by the Council and also as a guide for the assessments of resource consents that are undertaken.

The final document will be considered a voluntary reference document as opposed to having legal status under the District Plan.

5.2 Financial considerations

It is envisaged that some WSUD measures will be constructed by developers and be vested as public assets when approved by the Council. After being vested, responsibility for ongoing maintenance and renewals of the constructed assets resides with the Council. Therefore it is important these assets are constructed to the Council’s standard to ensure economically efficient, practical solutions that consider total lifecycle cost and represent value to the community.

It is also important that the maintenance and whole of life requirements of all devices are understood, budgeted for and responsibility allocated to a business unit. As such, simultaneously to the development of the guide, clear maintenance and management requirements outlining WSUD ownership, operation requirements and responsibility are being drafted. The maintenance plans will outline vegetation and drainage component requirements to allow successful and consistent management.

5.3 Climate change impacts and considerations

The Council is committed to increase the resilience of the city to natural hazards, including adapting to climate change. To maintain and enhance the city’s resilience, it is important all infrastructure and other assets are designed and constructed in a way that considers the predicted elements of climate change.

Wellington’s stormwater systems are at risk from increases in intensity and frequency of rainfall events and sea level rise and storm surge effects.

WSUD can be seen as mitigation to the risks posed by increased rainfall. By increasing permeable urban surfaces and capturing rain where it falls reduces the potential for the drainage networks to become overwhelmed reducing flooding risk.

In addition to managing rain-related pollution and enhancing urban biodiversity and habitat, WSUD creates potential for carbon sequestration and emissions reductions.

Similarly stormwater entering the sewers increases the amount of energy needed to pump it to the treatment plants and to treat it, causing further environmental impact through higher carbon emissions. Tackling the issue of surface water run off will therefore produce a dual environmental benefit, by protecting local environments and reducing carbon emissions.

5.4 Long-term plan considerations

All public WSUD assets will be included in the Councils asset management planning processes. WSUD will have lifecycle cost benefits well beyond the timeframe of the current LTP.

The guide pre-empts increasing regulatory attention around water resources. The National Policy Statement on Freshwater (2011), the Land and Water Forum third report (2012) and resulting Freshwater Reform (2013) policy document, the review of NZS4404 Land development and subdivision infrastructure (2010) the Regional Policy Statement (2013) and current Regional Plan review all make reference to water quality and the way urban run off is managed. Multiple disciplines now recognise the need for stormwater quality considerations.

6. Conclusion

WSUD is about valuing, growing and protecting Wellington's natural capital- including our marine environment.

The objective of the guidance is to inform and guide the requirements for stormwater management practices that will provide both water quantity and water quality benefits, as well as other wider social and environmental benefits. In implementing the WSUD guide we will be increasing the potential for diverting rainfall instead of it overwhelming the drainage networks and polluting our beaches.

The WSUD guide for Wellington provides direction for both developers and Council officers for the inclusion and implementation of WSUD principles in both the development of new subdivisions and the retrofitting of city infrastructure assets and neighbourhoods.

It will encourage and guide the take up of WSUD in Wellington identifying opportunities across the city, taking into account Wellington's unique

characteristics and constraints to ensure consistency in design standard across the city

Using WSUD will help position Wellington as a smart, vibrant, globally competitive city.

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SUPPORTING INFORMATION

1) Strategic fit / Strategic outcome

WSUD crosses the Transport, Urban Development and Environmental portfolios. WSUD will achieve the Towards Wellington 2040 Strategy goals through working smarter, protecting the natural environment through developing and maintaining ecological networks, and by managing resources prudently to ensure resilient and sustainable use.

2) LTP/Annual Plan reference and long term financial impact

The impact of the WSUD on Councils Opex and Capex projects will be included in LTP projects.

3) Treaty of Waitangi considerations

There are no Treaty of Waitangi implications however all District Plan work is required to take into account the principles of the Treaty of Waitangi (refer to section 8 of the Resource Management Act 1991).

4) Decision-making

This is not a significant decision. WSUD supports existing Council decisions.

5) Consultation

a) General consultation

There has been considerable discussion with stakeholders both internally and externally

b) Consultation with Maori

Consultation is not required with Maori.

6) Legal implications

There are no legal implications

7) Consistency with existing policy

This report is consistent with existing Wellington City Council policy.