

PLEASE NOTE: The plan/s that are being provided to you may not reflect what is ultimately approved by Council however they are the most recent version as at the date shown below:

Date Plans Provided: 23/04/2024

MARCON
INFRASTRUCTURE GROUP

**43-47 Meek Street, Werribee VIC
3030**

Response to Clause 53.18 Stormwater Management in Urban Development

REVISION: 0

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March 2024

Plan: 1 of 10

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43-47 Meek Street, Stormwater Management Response to Clause 53.18					
REV	DESCRIPTION	AUTHOR	REVIEWER	APPROVED BY	DATE
0	Client Issue	Anqiancheng Liu	Anning Fang	Matteo Marucci	04/03/2024

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1 Introduction

Marcon Infrastructure Group has been engaged by the developer to prepare a Response to Clause 53.18: Stormwater Management in Urban Development for the proposed residential subdivision at 43-47 Meek Street, Werribee. This response has been written to demonstrate the proposed stormwater management practices and their rationale for satisfying council conditions.

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2 Site Context

2.1 Site Location

The proposed development is located in Werribee within the general residential area of the Wyndham City Council. It is located 33km south-west of Melbourne's Central Business District (CBD).



Figure 1: Site Location Map (Melway 205 J5, 2024)

2.2 Existing Drainage Assets

The below information is obtained from Dial Before You Dig (DBYD) from the Wyndham City Council. As seen below, there are existing drainage lines on the western and northern boundary of the site.

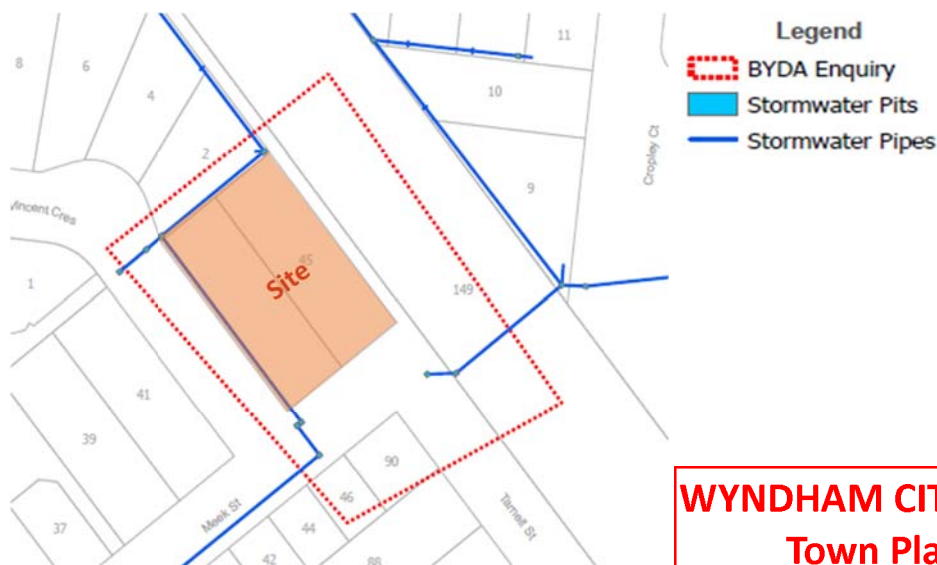


Figure 2: Existing Council Drainage Asset (DBYD, 2023)

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3 Proposed Development

A subdivision plan is proposed where the following summarises the development for the subject site (Figure 3). From the total site area of 1502.08m² (0.15ha)

- The lot will be subdivided into 4 lots for residential purposes.
- Double driveways are proposed. Lot 1 and 2 will share a driveway located on Vincent Crescent, and Lot 3 and 4 will share a driveway on Meek Street.

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Proposed drainage works are also highlighted in response to the drainage requirements of this report.

- Lot 1 and 2 will have drainage property connection directly to the existing drainage pipe by the front of the lot.
- New drainage pipe will need to be connected from the existing drainage pipe at Vincent Crescent to provide property connection to Lot 3 and 4.

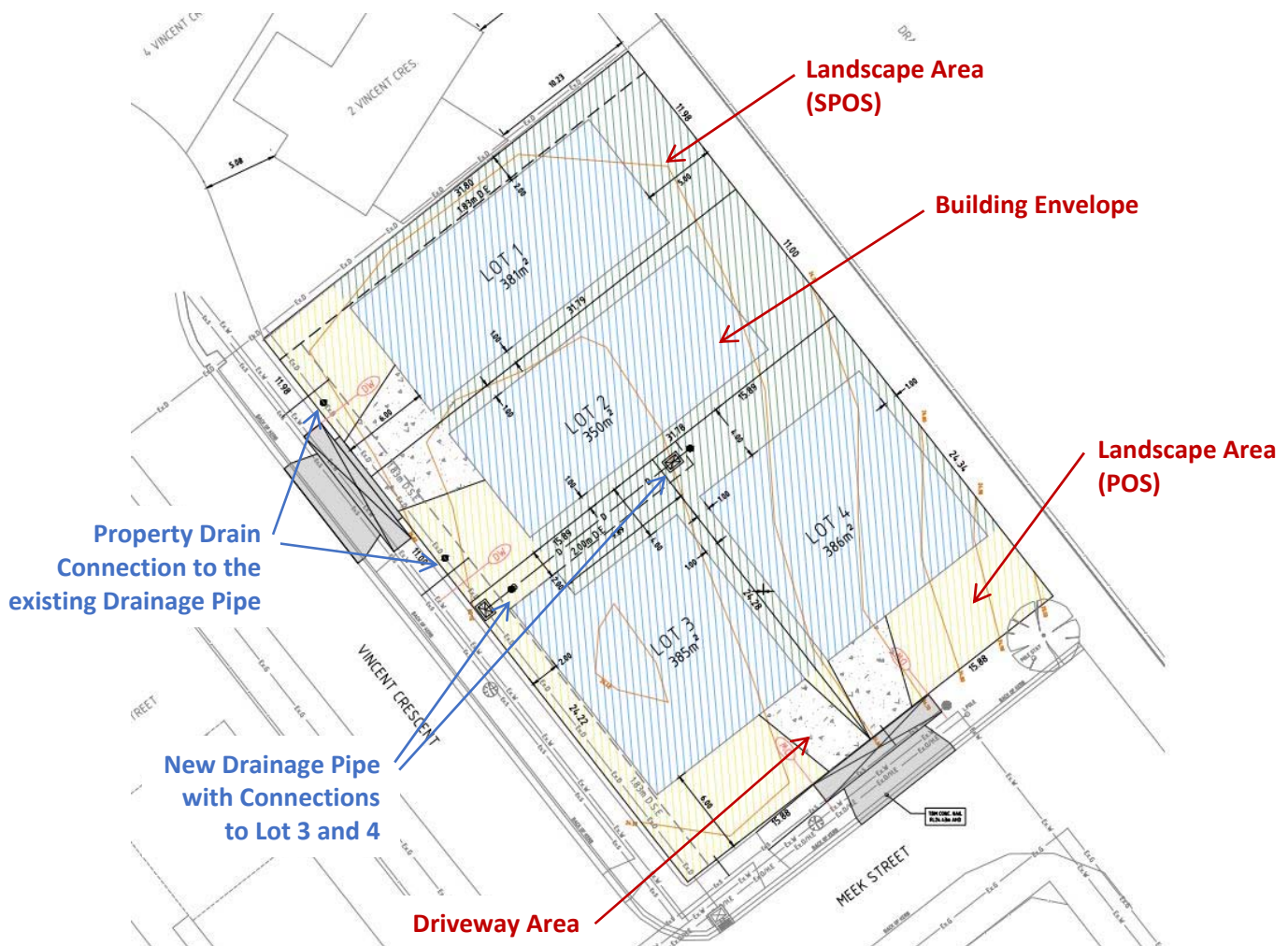


Figure 3: Proposed Subdivision Plan

Catchment	Area m ²	Total Area m ²
Building Envelope	764.2	1502.1
Driveway	96.7	
Landscape Area (POS + SPOS)	641.2	

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4 Clause 53.18

Purpose

To ensure that stormwater in urban development, including retention and reuse, is managed to mitigate the impacts of stormwater on the environment, property and public safety, and to provide cooling, local habitat and amenity benefits

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Requirements - an application to subdivide land:

- Must meet all of the objectives of Clauses 53.18-4 and 53.18-6.
- Should meet all of the standards of Clauses 53.18-4 and 53.18-6.

5 Clause 53.18-4 & Response

Stormwater management objectives for subdivision

- To minimise damage to properties and inconvenience to the public from stormwater.
- To ensure that the street operates adequately during major storm events and provides for public safety.
- To minimise increases in stormwater and protect the environmental values and physical characteristics of receiving waters from degradation by stormwater.
- To encourage stormwater management that maximises the retention and reuse of stormwater.
- To encourage stormwater management that contributes to cooling, local habitat improvements and provision of attractive and enjoyable spaces.

Standard W1

The stormwater management system should be:

- Designed and managed in accordance with the requirements and to the satisfaction of the relevant drainage authority.

Response:

Stormwater will be designed as per Wyndham City Council Drainage Design Guidelines

- Designed and managed in accordance with the requirements and to the satisfaction of the water authority where reuse of stormwater is proposed.

Response:

The reuse of water in the subdivision will be designed to the satisfaction of the water authority.

- Designed to meet the current best practice performance objectives for stormwater quality as contained in the *Urban Stormwater - Best Practice Environmental Management Guidelines* (Victorian Stormwater Committee, 1999)

Response:

The Best Practice Environmental Guidelines (BPEG) states stormwater quality treatment standards require mean annual removal rates from the typical urban loads generated from the development area.

The development stormwater systems must incorporate measures to satisfy the objectives of "Best Practice Environmental Guidelines" to reduce peak runoff to:

- 80% reduction in Suspended Solids (SS)
- 45% reduction in Total Phosphorus (TP)
- 45% reduction in Total Nitrogen (TN)
- 70% reduction in Urban Annual Litter Load

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Melbourne Water Stormwater Treatment Objective – Relative Measure (STORM) calculator can be used to assess whether the best practice water quality objectives will be achieved for the site.



STORM Rating Report

TransactionID: 0
Municipality: WYNDHAM (North/East of Skeleton Ck)
Rainfall Station: WYNDHAM (North/East of Skeleton Ck)
Address: 43-47 Meek Street

Werribee
VIC 3030

Assessor:
Development Type: Residential - Subdivision
Allotment Site (m2): 1,502.00
STORM Rating %: 102

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof Area (4 Lots)	764.20	Rainwater Tank	18,000.00	15	115.40	98.00
Driveway Area	96.70	None	0.00	0	0.00	0.00

Melbourne Water STORM analysis shows that in total, there would need to 18,000L of rainwater tank installed to achieve a STORM rating above 100%.

Each lot will need a minimum of 4,500L rainwater tank installed and the rainwater tank must be plumbed in, where re-use capacity will be used for toilet flushing and laundry purposes. Regular maintenance of rainwater tanks is critical to ensure that there are no damages, contamination and is working as intended.

- Designed to ensure that flows downstream of the subdivision site are restricted to pre-development levels unless increased flows are approved by the relevant drainage authority and there are no detrimental downstream impacts.

Response:

Stormwater discharged from the site will be limited to pre-development levels.

EDCM Design Manual states that an impervious fraction of 60% is designated for this site located at General Residential Zone. The proposed development only has site coverage of 57%, which is less than what is designated for the site. The development will not increase the flow of the pipe designed for.

Looking at the peak flows for the proposed development, below analysed the flow rate during 20% AEP event.

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	Area (ha)	Runoff Coefficient C	Time of Concentration (min)	Rainfall Intensity (mm/hr)	Peak Flow Rate (20% AEP Event)
Roof Area	0.076	1	5	84.0	0.018 m ³ /s
Driveway Area	0.010	1	5	84.0	0.002 m ³ /s
Landscape Area	0.064	0.3	5	84.0	0.004 m ³ /s
Total Area	0.150				0.024 m ³ /s

- Designed to contribute to cooling, improving local habitat and providing attractive and enjoyable spaces.

Response:

The development does not introduce elements that will negatively impact the area. The development enables the site to be a future residential dwelling.

The stormwater management system should be integrated with the overall development plan including the street and public open space networks and landscape design. For all storm events up to and including the 20% Average Exceedance Probability (AEP) standard:

- Stormwater flows should be contained within the drainage system to the requirements of the relevant authority.

Response:

Minor Stormwater System will all be managed within drainage pipes and pits. Major Stormwater System, catering for the 1% AEP will be directed towards the council road. Stormwater will be designed to comply with Wyndham City Council Drainage Design Guidelines.

- Ponding on roads should not occur for longer than 1 hour after the cessation of rainfall.

Response:

No roads are proposed within the development.

- For storm events greater than 20% AEP and up to and including 1% AEP standard: Provision must be made for the safe and effective passage of stormwater flows.

Response:

Stormwater greater than 20% AEP will be directed as overland flow, flowing towards Meek Street & Vincent Crescent.

- All new lots should be free from inundation or to a lesser standard of flood protection where agreed by the relevant floodplain management authority.

Response:

The site is not located in Land Subject to Inundation overlay. Lots will meet the minimum freeboard of 150mm for 1% AEP.

- Ensure that streets, footpaths and cycle paths that are subject to flooding meet the safety criteria $da \text{ Vave} < 0.35 \text{ m}^2/\text{s}$ (where, da = average depth in metres and $Vave$ = average velocity in metres per second)

Response:

There are no proposed roads/footpaths for the development. The development will not increase the flow compared to what the existing road is designed for.

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The design of the local drainage network should:

- Ensure stormwater is retarded to a standard required by the responsible drainage authority.

Response:

Wyndham City Council is to confirm if on-site detention system will be required, since the proposed subdivision does not increase the flow that is originally designed for the lot.

- Ensure every lot is provided with drainage to a standard acceptable to the relevant drainage authority. Wherever possible, stormwater should be directed to the front of the lot and discharged into the street drainage system or legal point of discharge.

Response:

Each lot within the subdivision will have drainage property connections connected to the existing drainage system.

Lot 1 and 2 will have drainage connected to the front of the lot, while Lot 3 and 4 will need to extend a new drainage pipe through the rear and connecting to the existing drainage along Vincent Crescent.

- Ensure that inlet and outlet structures take into account the effects of obstructions and debris build up. Any surcharge drainage pit should discharge into an overland flow in a safe and predetermined manner.

Response:

Lots will be graded to ensure that overland flow will be directed towards existing roads at Meek Street and Vincent Crescent.

Effects of obstructions and debris build up will be considered.

- Include water sensitive urban design features to manage stormwater in streets and public open space. Where such features are provided, an application must describe maintenance responsibilities, requirements and costs.

Response:

No road / public open space is proposed. WSUD features will still be designed to satisfy The Best Practice Environmental Guidelines.

- Any flood mitigation works must be designed and constructed in accordance with the requirements of the relevant floodplain management authority.

Response:

The site is not located in Land Subject to Inundation overlay and is not subject to flooding.

6 Clause 53.18-6 & Response

Site management objectives

- To protect drainage infrastructure and receiving waters from sedimentation and contamination.
- To protect the site and surrounding area from environmental degradation prior to and during construction of subdivision works.

Standard W3

An application should describe how the site will be managed prior to and during the construction period and may set out requirements for managing:

- Erosion and sediment.
- Stormwater.
- Litter, concrete and other construction wastes.
- Chemical contamination.

Response

Before the construction, a construction environmental management plan will be provided. This covers the location of concrete washout areas, rubbish disposals, washdown bays, fencing, and others.

Furthermore, sediment traps will be installed to protect existing and proposed pits. Silt fences will be installed and placed downstream. Site runoff shall be diverted away from exposed surfaces, batters, or stockpiles. Litter and waste must be contained on site, before disposal in a responsible manner. Waste generation will be minimised. Storage and spill management practices will be implemented to ensure no environmental damage can result from the escape or spillage of chemicals or fuels.

7 Conclusion

Marcon Infrastructure Group has completed the review and provided responses to Clause 53.18: Stormwater Management in Urban Development for the proposed subdivision at 43-47 Meek Street, Werribee.

We trust that the above provides sufficient information to meet the requirements of Wyndham City Council; should there be any further enquiries, please do not hesitate to contact Marcon Infrastructure Group's engineering team to discuss.