CIVIL DA REPORT

182-198 Victoria Road and 28-30 Faversham Street, Marrickville
Mixed Use Development

Prepared for Toga Wicks Park Developments Pty Ltd
Submission Date: 19 / 03 / 2019

181392
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1.0 Introduction

Taylor Thomson Whitting (TTW) has been appointed by Toga Wicks Park Developments Pty Ltd to prepare a concept Civil Report to support the Development Application for the proposed works at 182-198 Victoria Road and 28-30 Faversham Street, Marrickville.

1.1 The Site

The site has been divided into “Site A” being 182-198 Victoria Road, and “Site B” Being 28-30 Faversham Street. This report is primarily focussed on Site A.

![Sites A and B](image)

The Site A is bounded by Victoria Road to the west, Wicks Park to the south and industrial development to the north and east. The Local Government Area (LGA) is Inner West Council and was previously part of Marrickville Council. The existing site has an area of approximately 7,262m² and is approximately 98% impermeable.
Figure 2: Aerial Image (SIX maps)

Figure 3: Property Boundary and Map View (SIX maps)
1.2 Relevant Documents

- Marrickville DCP 2011
- Turner Architects Drawings (7/02/2019)
- NSW MUSIC Modelling Guidelines 2015
- Culvert Drawings from Sydney Water (1942 – 1952)
- True North Survey Drawings (01/09/2016)
- Sydney Water email outlining PSD and OSD (27/11/18)
- Marrickville Valley Floodplain Risk Management Study and Plan, Cardno 6/9/2017
2.0 Proposed Development

The existing structures on site will be demolished to make way for the new development. The proposed development is a multi-storey mixed development with underground parking, retail, apartments and communal garden areas. Part of this development includes the construction of a new stormwater system that will capture and convey rainfall into a culvert owned by Sydney Water. Figure 3 shows the ground floor plan floor plan of the proposed development.

![Ground Floor Plan (Turner)](image-url)
3.0 Stormwater

Stormwater from the ground level will be collected on site and conveyed via a gravity fed underground piped system to discharge to the existing box culvert at the south-west corner of the site. The box culvert is owned by Sydney Water. Sydney Water has indicated they will accept a direct connection to the culvert (refer correspondence in Appendix A). Stormwater will be managed to meet Sydney Waters requirements for permissible site discharge and water quality. The site has been modelled as 100% impervious despite the permeable garden areas. This is a conservative assumption.

3.1 On Site Detention

The DCP (section 2.25.3.2 – C5) stipulates that OSD is exempt for this site if stormwater discharges directly into Sydney Water Corporation trunk drainage.

C5 OSD will be required for all developments except for:

i. Extensions where the proposed extended roof or paved area is less than 40m².

ii. Sites that discharge directly to the Cooks River or into a major Sydney Water Corporation controlled trunk drainage system.

However, Jeya Jeyadevan of Sydney Water has advised that the site requires On-Site Detention (OSD) with a volume of at least 108m³ and Permissible Site Discharge (PSD) of 259 L/s (refer to appendix A). The volume of the OSD tank and PSD was based on a 100% impervious site area of 7,262m².

The site was modelled in DRAINS to simulate stormwater flow and design the OSD tank. Due to the site’s constraints, 2 separate OSD tanks are required. OSD 1 will be 85m³ with an orifice of 240mm and discharge into OSD 2. OSD 2 will be 35m³ with an orifice of 350mm and discharge into the existing box culvert on the south-west corner of the site. Figure 5 shows the stormwater concept design. The combination of OSD tanks will meet the PSD requirement set by Sydney Water and the combined OSD volume is greater than required (more conservative).

OSD1 is the receiving point for rainwater from the building roofs and level 1 courtyard. The rainwater from OSD1 discharges via the rainwater tank on level B1 to OSD2. Stormwater from the driveway, through site link and other areas on the ground level discharge directly to OSD2.
Table 1 below shows the discharge rates of the existing site compared to that of the proposed site for a range of storms. The proposed site meets the discharge requirements.

<table>
<thead>
<tr>
<th>Storm Event (AEP)</th>
<th>Event</th>
<th>Existing site</th>
<th>Proposed Site</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>465 l/s</td>
<td>251 l/s</td>
<td>259 l/s</td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td>188 l/s</td>
<td>132 l/s</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

The DCP (section 2.25.3.14 – C35) gives a minimum freeboard of 200mm above the OSD operating level to habitable floor areas.

### 2.25.3.14 Freeboard

C35 Freeboard for floor levels above top water level (TWL) of OSD storages is required for buildings near OSD storages, of at least 0.2 metres above the maximum spillway operating level for habitable areas.

The maximum water level of OSD 2 is at RL2.90m during the 1% AEP storm and the surface level is at RL3.10m. The adjacent area has 200mm freeboard to the OSD. There is an overland flow route from OSD 2 that flows away from buildings and towards Wicks Park. The DRAINS model shows no surcharge from OSD 2 during the 1% AEP storm.

OSD 1 is located within the building envelope and has a maximum water level of RL5.10m during the 1% AEP storm. An overflow pipe is designed to be 0.2m above the maximum water level.
level. The overflow pipe has an invert level of IL5.30m. This pipe discharges to OSD1 which can safely overflow. The DRAINS model shows no surcharge from OSD 1 during the 1% AEP storm

### 3.2 Water Quality

MUSIC was used to model the pollutant loads within the stormwater leaving the proposed site. The site was split into 2 types of catchments, roof and road, both were considered to be 100% impermeable. The treatment train consists of litter baskets placed in pits and 15 x Stormwater360 StormFilter cartridges (or equivalent) placed in the OSD 2.

The water quality requirements for this site have been given by Sydney Water (refer appendix A) and section 2.17.4 of the Marrickville DCP and are compared to the MUSIC model results in Table 2.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Sydney Water Target (% reduction)</th>
<th>Marrickville DCP Target (% reduction)</th>
<th>Proposed Site (% reduction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Pollutants</td>
<td>90</td>
<td>90</td>
<td>99</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>85</td>
<td>85</td>
<td>86</td>
</tr>
<tr>
<td>Total Phosphorous</td>
<td>65</td>
<td>60</td>
<td>69</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>45</td>
<td>45</td>
<td>46</td>
</tr>
</tbody>
</table>

Figure 6 Stormwater treatment train
4.0 Flood Management

The proposed site is located within the Marrickville flood plain as can be seen in Figure 7. The red hatching represents flood liable land. The site is likely to be affected by the 100-year flood associated with local overland flooding. The site is not within the Cooks River Flood Planning Area shown as blue on the MDCP 2011 Flood Planning Area Map.

Figure 7 Extract from Inner West Council MDCP 2011 Flood Planning Area Map

4.1 Flood Modelling

The Marrickville Valley flood model was provided by Council to determine the flood impact of the site. The existing conditions model was modified to better represent the site more accurately. Boundaries representing the buildings were adjusted based on the site survey and aerial photography.

To review the impact of the proposed development on the flood regime, a preliminary site grading was added to the model, along with the proposed building footprints as well as the proposed through site link to Faversham Street.

4.2 Flood Modelling Results

The below figures provide a summary of the flood modelling results
The impact of the development on flood behaviour was determined based on the results of the flood modelling. This is shown in Figure 10.
4.3 Flood Controls

The development involves filling some flood affected land. The DCP (section 2.22.5) outlines the requirements for filling land within the Flood Planning Area:

**Controls for filing of land within the Flood Planning Area**

**C21** Development consent will not be granted to filling of flood ways or high flood hazard areas. Consideration will only be given to granting development consent to the filling of other flood liable land where:

i. Flood levels are not increased by more than 100mm by the proposed filling.

ii. Downstream velocities are not increased by more than 10% by the proposed filling.

iii. Proposed filling does not redistribute flows by more than 15%.

iv. The potential for cumulative effects of possible filling proposals in that area is minimal.

v. The development potential of surrounding properties is not adversely affected by the filling proposal.

vi. The flood liability of buildings on surrounding properties is not increased.

vii. The filling creates no local drainage flow/runoff problems.
The development has the following impact on surrounding flood levels:

- Flood levels on Victoria Road are reduced by a small amount (less than 100mm).
- Limited increase in flood levels of less than 50mm on Faversham street immediately downstream of the proposed through site link.
- There is no negative impact on surrounding properties.
- Flood levels in the eastern corner of the site are reduced by up to 850mm. This is a local impact that does not extend far into the property to the north.

Overall, the impact on flooding is minimal.

### 4.4 Flood Planning Levels

The Marrickville DCP 2011 (section 2.22.5) outlines the requirements for Flood Planning Levels:

**Controls for new residential development**

- **C5**  
  Floor levels (Flood Planning Levels) of habitable rooms must be a minimum of 500mm above the standard flood level at that location. For areas of minor overland flow (a depth of 300mm or less or overland flow of 2cm/sec or less) a lower freeboard of 300mm may be considered on its merits.

- **C6**  
  Any portion of buildings below the Flood Planning Level must be constructed from flood compatible materials (See Schedule 1).

- **C7**  
  Flood free access must be provided where practicable.

The flood depth on Victoria Road is greater than 300mm and as such the residential areas fronting Victoria Road have been provided with a 500mm freeboard to the 1% AEP flood level.

The driveway adjoining Victoria Road has been designed with a crest of 3.80m AHD, giving 300mm freeboard to the 1% AEP flood level. In this location the flood depth is limited to 300mm. The driveway crest protects the loading dock and driveway from flooding.

**Controls for underground garages**

- **C25**  
  Freeboard protection of 500mm must be provided above the standard flood within the internal driveway prior to descending into the underground garage.

Entry to the basement has a crest of 3.20m AHD to give 500mm freeboard to the flood level in the north eastern corner of the site (near the through site link) of 2.70m AHD.
The DCP notes: “Flood free access must be provided where practicable”. The streets around the site are flood affected, so there is no flood free access available in this sense. The proposed building and portions of Wicks Park are not flood affected. Site users should remain in place in a flood event and wait for flood waters to recede.

5.0 Construction Phase Stormwater Management

During the construction phase of the project, an erosion and sediment control plan will be implemented to prevent sediment laden stormwater from entering the council drainage network. A conceptual Erosion and Sediment control plan will be included in the civil drawing set and is in accordance with the “Blue Book” - Managing Urban Stormwater: Soils and Construction (Landcom NSW). The controls include

- Sediment fences;
- Vehicle shaker grid and wash down; and
- Sand bags or geotextile filter surrounding pits.
6.0 Conclusion

The proposed Site A development at 182 – 198 Victoria Road and 28-30 Faversham Street, Marrickville consists of a mixed development with underground parking, retail spaces and residential apartments.

- The proposed development is protected from flood by a crest on the driveway and a raised platform along Victoria Road. The Flood Planning level varies from RL3.95m on the northern side of the development to RL3.70m on the southern side of the development. The proposed site is compliant with Flood Planning Levels as per section 2.22 of the Marrickville DCP 2011.
- 2 separate OSD tanks are proposed with an effective volume of 120m$^3$ and an orifice size of 240mm for OSD 1 and 350mm for OSD 2. There will be no increase to current discharge rates for storm events ranging from 50% to 1% AEP and stormwater will discharge to an existing box culvert owned by Sydney Water. Sydney Water have been contacted and will accept this connection on the basis the stormwater detention and quality requirements are met.
- Water quality targets can be meet with Stormwater Enviropods placed in pits and 15x Stormwater360 Storm Filters in the OSD tank 2.
Appendix A

OSD and PSD Requirements

From: Stormwater <Stormwater@sydneywater.com.au>
Sent: Tuesday, 27 November 2018 8:29 AM
To: Jimmy Soo <Jimmy.Soo@jhaengineers.com.au>
Cc: Diego MonteVer <Diego.MonteVer@jhaengineers.com.au>
Subject: RE: Wicks Park Mixed Use Development - OSD requirement or Direct Connection

Jimmy,

With reference to your email dated 26 November 2018 regarding the proposed development at 182 – 198 Victoria Road, Marrickville

Following are the general requirements for any development at this location. These are only general requirements and specific requirements can only be provided, once you lodge the Section 73 application to Sydney Water, upon obtaining the DA approval for your development.

Building Over and adjacent to Stormwater Assets

- No building or permanent structure is to be proposed over the stormwater channel / pipe or within 1m from the outside wall of the stormwater asset or within Sydney Water easement whichever is larger. Permanent structures include but are not limited to basement car park, hanging balcony, roof eves, hanging stairs, stormwater pits, stormwater pipes, elevated driveway, basement access or similar structures. This clearance requirement would apply for unlimited depth and height.
- The applicant is required to submit the elevation drawings with the stormwater channel / pipe, to ensure that the proposed buildings and permanent structures are 1m away from the outside face of the stormwater channel and away from any Sydney Water easement.

Locating the Exact Position of the Stormwater Channel

Exact position of the stormwater channel / pipe is to be identified using the pot holes or any other acceptable survey method. Location of the easement position should not be used as location of the stormwater channel / Pipe.

On Site Detention Requirements

Sydney Water’s On Site Detention requirements are based on its policy and guidelines as published on our website. According to this policy and guidelines, On Site Detention requirements would apply any development at this location, if you choose to make direct stormwater connection to Sydney Water’s stormwater system.
On Site Detention requirements for the 7,262 square meters site at this location is as follows and would only apply if you make direct stormwater connection to Sydney Water’s stormwater system:

- On Site Detention: 108 cubic meter
- Permissible Site Discharge: 259 L/s

The approval for the On Site Detention would only be given as part of the Section 73 application for this development and part of the stormwater connection approval. The On Site Detention is to be designed according to the above values and submitted to Sydney Water for approval with the stormwater connection details. The following details are to be included in your submission for On Site Detention approval:

- Location of the On Site Detention in relation to the development
- Location of the On Site Detention in relation to overall stormwater network of the property
- Plan and Elevation of the On Site Detention tank with all dimensions
- Orifice plate calculation

Direct Stormwater Connection to Sydney Water’s stormwater system

Sydney Water would not object to any direct stormwater connection to Sydney Water’s stormwater system from this development provided it complies with Sydney Water’s connection requirements which include On Site Detention requirements and Water Quality requirements.

Discharged Stormwater Quality Targets

Stormwater run-off from the site should be of appropriate quality before discharged into a Sydney Water stormwater asset or system. Developments must demonstrate stormwater quality improvement measures that meet the following specified stormwater pollutant reductions:

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Pollutant load reduction objective (%)</th>
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</thead>
<tbody>
<tr>
<td>Gross Pollutants (&gt;5mm)</td>
<td>90</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>85</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>65</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>45</td>
</tr>
</tbody>
</table>

You may use our tool, through the website below, to determine whether your development is Deemed to Comply. In some cases though, we may request an eWater MUSIC model before approving your connection.


Best Regards

Jeya Jeyadivan | Senior Capability Assessor
Liveable City Solutions | Sydney Water
Level 7, 1 Smith St, Parramatta NSW 2150
PO Box 399 Parramatta NSW 2124
T 8849 5118 | Mobile 0409 318 827 | Email jeya.jeyadivan@sydneywater.com.au
sydneywater.com.au

Sydney WATER
Appendix B

MUSIC Model

![MUSIC Model Diagram]

<table>
<thead>
<tr>
<th>Sources</th>
<th>Residual Load</th>
<th>% Reduction</th>
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<tr>
<td>Flow (ML/yr)</td>
<td>6.41</td>
<td>0</td>
</tr>
<tr>
<td>Total Suspended Solids (kg/yr)</td>
<td>1600</td>
<td>230</td>
</tr>
<tr>
<td>Total Phosphorus (kg/yr)</td>
<td>1.46</td>
<td>0.448</td>
</tr>
<tr>
<td>Total Nitrogen (kg/yr)</td>
<td>14.3</td>
<td>7.77</td>
</tr>
<tr>
<td>Gross Pollutants (kg/yr)</td>
<td>157</td>
<td>0</td>
</tr>
</tbody>
</table>
**TAYLOR THOMSON WHITTING (NSW) Pty Ltd**

**Level 7**

One Oxford Street
Darlinghurst NSW 2010

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**STORMWATER DRAINAGE NOTES**

- Kerb and channel drainages
- Inlet and outlet structures
- Stormwater pipe sections

**SITEWORKS LEGEND**

- Geographical locations
- Materials and construction
- Site details

**SITEWORKS NOTES**

- Contours and elevations
- Grading and drainage
- Excavation and backfilling

**CONCRETE FINISHING NOTES**

- Surface finishes
- Jointing and stitching
- Cure and protection

**JOINTING NOTES**

- Vehicular pavement jointing
- Pedestrian footpath jointing
- Jointing materials

**SIGNs AND LINE MARKING NOTES**

- Road markings
- Pedestrian crossings
- Traffic signs

**SAFETY IN DESIGN**

- Hazard identification
- Safety in work design
- Personal protective equipment

**BOUNDARY AND EASEMENT NOTE**

- Property boundaries
- Easements and restrictions
- Survey and services information

**SURVEY AND SERVICES INFORMATION**

- Survey control points
- Underground services
- Service connection points

**SAFETY IN DESIGN**

- Health and safety
- Workplace safety
- Hazardous materials handling

**EXISTING SERVICES**

- Water supply
- Sewerage
- Gas

**EXISTING STRUCTURES**

- Buildings
- Property fences
- Property gates

**EXISTING TREES**

- Trees on site
- Tree protection
- Tree removal

**GROUNDWATER**

- Groundwater levels
- Groundwater control

**HAZARDOUS MATERIALS**

- Flammable materials
- Explosives
- Radioactive materials

**CONFINED SPACES**

- Ventilation
- Respiratory protection
- Safety equipment

**MANUAL HANDLING**

- Lifting and handling
- Manual handling equipment
- Safe working practices

**WATER POLLUTION**

- Water treatment
- Water discharge
- Water pollution prevention

**SITE ACCESS/EGRESS**

- Access roads
- Parking areas
- Egress routes

**VEHICLE MOVEMENT**

- Traffic control
- Vehicular congestion
- Roadway designs

**EXCAVATIONS**

- Excavation depths
- Support systems
- Earth retention

**GROUND CONDITIONS**

- Soils and subsoils
- Geotechnical investigations
- Foundation designs

**BULK EARTHWORKS NOTES**

- Earthworks design
- Earthwork construction
- Earthwork protection

**SURVEY**

- Surveying methods
- Surveying equipment
- Surveying accuracy

**REFERENCE DRAWINGS**

- Related drawings
- Coordination drawings
- Site plans

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**CIVIL DRAWING LIST**

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<td>NOTES &amp; LEGENDS/COVER SHEET</td>
<td>General notes</td>
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<td>EROSION AND SEDIMENT CONTROL PLAN</td>
<td>Erosion control</td>
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<td>SITEWORKS/STORMWATER PLAN</td>
<td>Siteworks and stormwater management</td>
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**NOTES & LEGEND SHEET**

- Legend symbols
- Note numbers
- Revision information

---

**DEVELOPMENT APPLICATION**

- Application type
- Applicant details
- Application number

---

**AUTHORISED**

- Architect
- Draftsman
- Surveyor

---

**Drawn**

- Drawing number
- Sheet number
- Scale

---

**Description**

- Drawing purpose
- Description details
- Notes

---

**Draft**

- Drawing status
- Date

---

**Date**

- Revision date
- Submission date
- Approval date
PROVIDE TEMPORARY CONSTRUCTION ENTRY/EXIT
REFER TO DETAIL ON THIS DRAWING (TYP).
LOCATION TO BE CONFIRMED ON SITE

PROVIDE SILTATION FENCE. REFER TO DETAIL ON THIS DRAWING (TYP)

PROVIDE GEOTEXTILE PIT FILTER SURROUND. REFER TO DETAIL ON THIS DRAWING (TYP)

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