# Stormwater Drainage PA Submission

# Project: 45-47 Macquarie Street and 134-140 Marsden Street, Parramatta

Client:
**CROWN INTERNATIONAL**
LEVEL 11
68 ALFRED STREET
MILSONS POINT NSW 2061

Architects:
**JOSHUA INTERNATIONAL ARCHITECTS**
LEVEL 11
68 ALFRED STREET
MILSONS POINT NSW 2061

**BATES SMART**
243 LIVERPOOL STREET
EAST SYDNEY NSW 2010

Planning Consultant:
**JBA URBAN PLANNING CONSULTANTS**
LEVEL 7
77 BERRY STREET
NORTH SYDNEY NSW 2060

Prepared by:
**HARRIS PAGE & ASSOCIATES PTY LIMITED**
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# 1.0 INTRODUCTION

## 1.1 DESCRIPTION

The site incorporates six (6) levels of basement car parking, retail outlets, commercial offices and residential units.

The site is bounded by Hunter Street, Marsden Street and Macquarie Streets, Parramatta. The Macquarie Street frontage incorporates an area which has archaeological significance (Refer to Section 2.6).

## 1.2 STORMWATER DRAINAGE DESCRIPTION

The project incorporates an internal gravity stormwater drainage system sized in accordance with Parramatta City Council's guidelines for a 1:100 year frequency rainfall event over a 5 minute period (217mm/hr based upon Parramatta City Council's input data).

The system incorporates two (2) detention tanks, rainwater tank / rainwater reuse system all as shown on the stormwater drainage concept plans.

# 2.0 STORMWATER DRAINAGE

## 2.1 FLOOD LEVELS

The site is partly within the 1:100 year flood levels as nominated by Parramatta City Council records and information.

In accordance with Parramatta City Council Stormwater Code, the relative levels of the structure including floor levels, entry areas and access driveways have been established to provide the required freeboard.
Refer to Architectural floor plan of Level 00 for nominated levels.

## 2.2 DESCRIPTION OF STORMWATER DRAINAGE

The stormwater drainage incorporates two (2) separate systems:

- A gravity system collecting roof rainwater extending to the rainwater re-use tank.
- A gravity system collecting all balcony outlets, grated drains, planter beds extending to the detention tank.

Pipework throughout will be generally be UPVC materials and sized for a 1:100 year event in accordance with AS 3500.
The discharge from the site is to the existing kerb entry pit, in Macquarie Street.

## 2.3 STORMWATER DETENTION

The stormwater detention tank will be constructed in accordance with Parramatta City Councils' Stormwater Codes and the Upper Parramatta Catchment Trust requirements, incorporating access, orifice plate, overflow provisions, fall in base of tank and high early discharge pit.

The discharge from the detention tank and overflow will extend to the existing stormwater kerb entry pit located in Macquarie Street.

## 2.4 RAINWATER RE-USE TANK

The rainwater re-use tank (350,000 litre) will collect rainwater from the residential roof areas. An overflow provision will extend to the stormwater detention tank. The rainwater will be used to supply the irrigation system and to nominated water closets in accordance with the BASIX requirements.

A first flush device is incorporated into the inlet side of the rainwater tank, a water filtration system and rainwater pump provide rainwater re-use to water closets and irrigation system with lilac pipework.

## 2.5 BASEMENT DRAINAGE

The lower basement levels of the development (namely P5 and P6) are below the water table. The building structure is tanked to accommodate the water table (refer to structural documentation).

An internal spoon drain is located around the perimeter of the basement levels to collect any seeping through vertical walls. A gravity stormwater drainage system connects to a stormwater pump-out pit. The rising main extends to the discharge side of the detention tank.

## 2.6 MINIMISING THE IMPACT ON THE ARCHAEOLOGICAL ZONE

The frontage to Macquarie Street incorporates a heritage area of the foundation to the original stone buildings.

Given the sensitive nature of the area, services within this area will be minimised where possible.

The stormwater connection in Macquarie Street will be located as far west as possible to reduce the impact on the area.

The archaeological area is moisture controlled by a designated irrigation system and associated sub-soil drainage. This is to be documented by a Heritage Consultant.

## I.1 OSD Stormwater Concept Plan Submission – Short Form

This form is to be completed by the stormwater designer and submitted to Council together with the plan(s), any necessary attachments and a completed OSD Calculation Sheet.

**PROJECT ADDRESS:** _____

**OSD DESIGNER DETAILS:**

**Company Name:** HARRIS PAGE & ASSOCIATES / HENRY & HYMAS

**Address:** _____

**Telephone No.:** 9262-1600 / 9417 8400 **Fax No:** —

**Accreditation Organisation:** _____ **Accreditation Reference:** _____

**Name of designer:** DARREN RITCHIE **Date:** 18·02·10
(Print Name)

**Council Reviewer's Name:** _____ **Date:** _____

| CHECKLIST | Complies to Handbook Yes | Complies to Handbook No | Council Agrees Yes | Council Agrees No |
|---|---|---|---|---|
| **1. Flooding:** | | | | |
| Is the site (whole or partly) below the 100 year ARI flood level? | ☑ | ☐ | ☐ | ☐ |
| If yes, does the OSD system reflect the flood affectation? | ☑ | ☐ | ☐ | ☐ |
| Have floodplain issues been addressed (eg storage, obstructed flow etc)? | ☑ | ☐ | ☐ | ☐ |
| **2. External catchment:** (refer Section 4.1.3) | | | | |
| Is there an external catchment draining into the site? | ✓ | | | |
| If Yes, have calculations of 100 year ARI flow been submitted & full area of catchment shown? | ☐ | ☐ | ☐ | ☐ |
| **3. OSD Storage:** (refer Sections 4.1.4, 4.1.5 & 6.5) | | | | |
| Was the storage volume calculated using the UPRCT Calculation Sheet? | ☑ | ☐ | ☐ | ☐ |
| Is the area bypassing the OSD storage less than 30% of the residual area? | ☑ | ☐ | | |
| Is there free discharge at the outlet or provision made for a drowned outlet? | ☑ | ☐ | ☐ | ☐ |
| Has the storage been located at the lowest point of the site to collect surface and roof gutter overflow | ☑ | ☐ | ☐ | ☐ |
| **4. Site Information:** | | | | |
| Has the following information has been shown on the plans: | ☑ | ☐ | ☐ | ☐ |
| - scaled site layout showing all buildings, roadways and landscaped areas | | | | |
| - spot levels and contours (including adjoining properties) | | | | |
| - location, dimensions and extent of detention storages | ☑ | ☐ | ☐ | ☐ |
| - location of any floodways or flowpaths through the site | N/A | ☐ | ☐ | ☐ |
| - location of any other constraints, e.g. easements, sewer and other services or Water Sensitive Urban Design (WSUD) features | ☑ | ☐ | ☐ | ☐ |
| **5. OSD Calculation Sheet is attached** | | | | |

# On-Site Detention Calculation Sheet for Upper Parramatta River Catchment
## HED Secondary Outlet

| | |
|---|---|
| Project: | UPRCT Handbook Demonstration Example |
| Site Address | 140 Marsden Street, Parramatta |
| Job No: | a09477 |
| Designer: | TR |
| Telephone: | (02) 9417 8400 |

## Site Data

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| OSD Area: | Upper Parramatta River Catchment | | | | | | |
| L.G.A | Parramatta City Council | | | | | | |
| Site Area | 0.0258 | ha | 258 | $m^2$ | | | |
| Total Roof Area | 0 | ha | 0 | $m^2$ | | | |
| Area of Site draining to OSD Storage | 0.0258 | ha | 258 | $m^2$ | Satisfactory | | |
| Residual Site Area (Lot Area - Roof Area) | 0.026 | ha | | | | | |
| Area Bypassing Storage | 0 | ha | | | | | |
| Area Bypassing / Residual Site Area | 0.0% | | | | Satisfactory | | 30% Max |
| No. of Dwellings on Site | 1 | | | | Satisfactory | | |
| Site Area per Dwelling | 0.026 | ha | | | | | |
| Roof Area per Dwelling | 0.000 | ha | | | | | |

## Basic OSD Parameters

| | | Extended Detention | | | Detention | |
|---|---|---|---|---|---|---|
| Basic SSR Vols | Ext Detention Storage | 300 | $m^3$/ha | Total Storage | 455 | $m^3$/ha |
| Basic SRDs | Primary Outlet | 40 | L/s/ha | Secondary Outlet | 150 | L/s/ha |

## OSD Tank Bypass

| | | | | | |
|---|---|---|---|---|---|
| Residual Lot Capture in OSD Tank | 100% | | | | |
| Adjusted SRDs | 40 | L/s/ha | | 150 | L/s/ha |

## OSD Calculations

| | | Extended Detention | | | Detention | |
|---|---|---|---|---|---|---|
| Basic SSR Volume | Ext Detention Storage | 7.74 | $m^3$ | Total Storage | 11.74 | $m^3$ |
| Total Rainwater Tank Credits | | 0.00 | $m^3$ | | 0.00 | $m^3$ |
| Storage Volume | | | | Total | 11.74 | $m^3$ |
| Storage Volume | Ext Detention Storage | 7.74 | $m^3$ | Flood Detention Storage | 4.00 | $m^3$ |
| OSD Discharges | Primary Outlet | 1.03 | L/s | Secondary Outlet | 3.87 | L/s |
| RL of Top Water Level of Storage | | 9.720 | m | | 9.720 | m |
| RL of Orifice Centre-line | | 7.950 | m | | 9.220 | m |
| Number of Orifices | | 1 | | | 1 | |
| Estimated Downstream Flood Level | | 7.95 | 1.5 yr ARI | | 9.22 | 100 yr ARI |
| Downstream FL - RL of Orifice Cente-line | | 0.00 | Satisfactory | Satisfactory | 0.00 | m |
| Design Head to Orifice Centre | | 1.770 | m | TWL Ext Detn Storage - RL Orifice | 0.500 | m |
| Calculated Orifice Diameter | | 19 | mm Satisfactory | Min Diam 25 mm | 51 | mm |

## Overflow Weir & Freeboard Calculation

| | | | |
|---|---|---|---|
| RL of Minimum Habitable Floor Level | | 19.100 | m |
| RL of Minimum Garage Floor Level | | 19.100 | m |
| Length of Overflow Weir | | 1.80 | m |
| Site Runoff Coefficient | Parramatta City Council | 0.75 | |
| Storm Intensity (5 min 100 yr ARI) | | 227 | mm/h |
| Peak Flow over Weir | | 12.2 | L/s |
| Depth of Flow over Weir | | 26 | mm |
| Freeboard to Habitable Floor | Satisfactory | 9354 | mm |
| Freeboard to Garage Floor | Satisfactory | 9354 | mm |

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# On-Site Detention Calculation Sheet for Upper Parramatta River Catchment
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| Site Address | 140 Marsden Street, Parramatta |
| Job No: | a09477 |
| Designer: | TR |
| Telephone: | (02) 9417 8400 |

### Site Data

| | | | | | | |
|---|---|---|---|---|---|---|
| OSD Area: | Upper Parramatta River Catchment | | | | | |
| L.G.A | Parramatta City Council | | | | | |
| Site Area | 0.4642 | ha | 4,642 | $m^2$ | | |
| Total Roof Area | 0.4558 | ha | 4,558 | $m^2$ | | |
| Area of Site draining to OSD Storage | 0.4642 | ha | 4,642 | $m^2$ | Satisfactory | |
| Residual Site Area (Lot Area - Roof Area) | 0.008 | ha | | | | |
| Area Bypassing Storage | 0 | ha | | | | |
| Area Bypassing / Residual Site Area | 0.0% | | | | Satisfactory | 30% Max |
| No. of Dwellings on Site | 1 | | | | Satisfactory | |
| Site Area per Dwelling | 0.464 | ha | | | | |
| Roof Area per Dwelling | 0.456 | ha | | | | |

### Basic OSD Parameters

| | | Extended Detention | | | Detention | |
|---|---|---|---|---|---|---|
| Basic SSR Vols | Ext Detention Storage | 300 | $m^3$/ha | Total Storage | 455 | $m^3$/ha |
| Basic SRDs | Primary Outlet | 40 | L/s/ha | Secondary Outlet | 150 | L/s/ha |

### OSD Tank Bypass

| | | | | | |
|---|---|---|---|---|---|
| Residual Lot Capture in OSD Tank | 100% | | | | |
| Adjusted SRDs | 40 | L/s/ha | | 150 | L/s/ha |

### OSD Calculations

| | | Extended Detention | | | Detention | |
|---|---|---|---|---|---|---|
| Basic SSR Volume | Ext Detention Storage | 139.26 | $m^3$ | Total Storage | 211.21 | $m^3$ |
| Total Rainwater Tank Credits | | 0.00 | $m^3$ | | 0.00 | $m^3$ |
| Storage Volume | | | | Total | 211.21 | $m^3$ |
| Storage Volume | Ext Detention Storage | 139.26 | $m^3$ | Flood Detention Storage | 71.95 | $m^3$ |
| OSD Discharges | Primary Outlet | 18.57 | L/s | Secondary Outlet | 69.63 | L/s |
| RL of Top Water Level of Storage | | 16.870 | m | | 17.300 | m |
| RL of Orifice Centre-line | | 15.900 | m | | 15.900 | m |
| Number of Orifices | | 1 | | | 1 | |
| Estimated Downstream Flood Level | | 7.95 | 1.5 yr ARI | | 9.22 | 100 yr ARI |
| Downstream FL - RL of Orifice Cente-line | | -7.95 | Satisfactory | Satisfactory | -6.68 | m |
| Design Head to Orifice Centre | | 0.970 | m | TWL Ext Detn Storage - RL Orifice | 0.970 | m |
| Calculated Orifice Diameter | | 95 | mm Satisfactory | Satisfactory | 184 | mm |

### Overflow Weir & Freeboard Calculation

| | | | |
|---|---|---|---|
| RL of Minimum Habitable Floor Level | | 19.100 | m |
| RL of Minimum Garage Floor Level | | 19.100 | m |
| Length of Overflow Weir | | 1.80 | m |
| Site Runoff Coefficient | Parramatta City Council | 0.75 | |
| Storm Intensity (5 min 100 yr ARI) | | 227 | mm/h |
| Peak Flow over Weir | | 219.5 | L/s |
| Depth of Flow over Weir | | 177 | mm |
| Freeboard to Habitable Floor | Satisfactory | 1623 | mm |
| Freeboard to Garage Floor | Satisfactory | 1623 | mm |

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