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SYDNEY BRISBANE JAKARTA

PLANS AND DOCUMENTS
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PROPOSED MIXED USE DEVELOPMENT, 29–35 CAMPBELL STREET, BOWEN HILLS

INTEGRATED WATER MANAGEMENT PLAN

Prepared for

METRO PROPERTY DEVELOPMENT

Project No: 10806
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PROPOSED MIXED USE DEVELOPMENT **10806**
29-35 CAMPBELL STREET, BOWEN HILLS

INTEGRATED WATER MANAGEMENT PLAN

This register identifies each issue of and each amendment to this document by Revision No, Page No, the details of each amendment and date of issue.

SPECIFICATION AMENDMENT REGISTER						
Rev. No	**Section & Page No.**	**Issue/ Amendment**	**Author**	**Project Engineer**	**Checked**	**Date**
P1	-	Draft	SE	IO	-	26/11/2010
P2	-	For DA Submission	SE	IO	-	01/12/2010
P3	-	Revised For DA Submission	SE	IO	-	02/12/2010

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1.0 EXECUTIVE SUMMARY

This site based Integrated Water (Resource) Management Plan (IWMP) has been prepared as part of the Development Application for the proposed mixed-use development site is bounded by Campbell St, Mayne Rd and Hazelmount St, Bowen Hills.

When implemented, the IWMP will minimise the impact of the urban development on the water cycle.

This objective will be achieved through the implementation of the following key principles:

- Reduction of the potable water supply to the site.
- Reduction of waste water discharge to the authority sewer infrastructure.
- Improving stormwater quality generated from the site before discharge to the authority infrastructure.

These key principles will be achieved through the application of the following measures:

- High water efficient WELS rated fixtures.
- Providing an alternative water source such as a rainwater harvesting system for:

    - Landscape irrigation.
    - Swimming pool top-up.
    - Toilet flushing to retail
    - Car washing
    - External water use

2.0 INTRODUCTION

The proposed residential development site is bounded by Campbell St, Mayne Rd and Hazelmount St, Bowen Hills as per Figure 2.1 below

Figure 2.1: Site Location

The proposed development consists of:

- 286 residential apartments including an approximately 16m long x 3m wide swimming pool.
- Approximately 180m^2 soft landscape area and
- Approximately 770m^2 retail space at ground level

3.0 INTEGRATED WATER MANAGEMENT PLAN

The site has existing town water supplies on Mayne Road, Campbell Street and Hazelmount Street. It is proposed to have two 100mm water connections from Mayne Road and Campbell Street to provide a grade 1 water supply for the fire sprinkler services and one 150mm connection from Campbell Street to service the domestic and fire hydrant services. There are existing sewer services along Campbell Street and Hazelmount Street. The proposed sewer connection point will be determined during detailed design.

3.1 Potable Water Reduction Measures

Two measures have been identified in order to minimise the potable water consumption. These are:

- Water Efficient Fixtures
- Rainwater harvesting for irrigation, swimming pool top-up and external use.

3.1.1 Water Efficient Fixtures

South East Queensland is currently under "Permanent Water Conservation Level" water restrictions which require residents to have a water consumption of 200 litres or less per person per day including external use.

To achieve this objective, high water efficient fixtures are recommended. As such, the tapwares are proposed to have the following WELS rating:

- Basins taps : 6 Star WELS rating
- Shower taps : 3 Star WELS rating
- WC : 4 Star WELS rating i.e. 4.5/3 litres dual flush

The table in appendix D provides a comparison between the high WELS rated fixtures and a standard WELS rated fixtures.

3.1.2 Non-Potable Water Supply

The non-potable water supply will be sourced from rainwater harvesting and will service:

- Irrigation
- Swimming pool
- WC for the retail space, pool area
- Car washing
- External water use

The site is proposed to contain approximately 180m^2 of soft landscaping and based on 20mm/m^2 weekly ongoing water requirement for established landscaping irrigation, 3,600 litres of water would be required per week. A 20,000 Litre rainwater tank is proposed for servicing the irrigation demand which would equate to approximately 5 weeks storage.

The residential development has a swimming pool with a surface area of 50m^2 on podium level 4. The water loss from the swimming pool has been estimated at 375 litres per day during the summer period, based on a day with a high evaporation rate.

The retail space located on the ground level is relatively small i.e. 770m^2. The water consumption for the toilet can vary significantly depending on level of activities. At this stage the water consumption for toilet flushing has been estimated at 50 litres per day.

A 15,000 litre tank including water treatment and pump is proposed for servicing:

- Swimming pool
- WC for the retail space and
- External water use

The location of the tanks will be finalised during detailed design.

3.1.3 Cooling Towers

There is no cooling tower on the project as an air cooled air conditioning system is currently proposed to service the residential apartments, and retail spaces.

3.1.4 Monitoring and Leak Detection

The water requirement for the whole development including the residential and retail components would be in the order of 24 ML per annum which is quite significant. Therefore, it is important to monitor usage patterns and water sub meters will be installed for this purpose to:

- the retail space on ground level.
- each apartment.
- non-potable supply back–up for swimming pool and WC flushing.

All meters will have pulse outputs which will be wired back to a remote monitoring system located on the ground level accessible 24/7. The water usage of individual sub meters will then be added and compared with the master meter consumption to detect any leakage.

3.2 Water Sensitive Urban Design Measures

The objectives of Water Sensitive Urban Design (WSUD) principles are to:

- Reduce demand on the potable water requirement which has been addressed in section 3.1.
- Improve water quality of stormwater runoff from the site via source control.
- Minimise sewerage discharge from the site.

3.2.1 Water Quality of Stormwater Runoff

Urbanisation leads to changes in the quality of stormwater runoff discharged to the receiving waters. As such, the quality of stormwater runoff needs to be addressed prior to leaving the site in order to protect the environment.

To achieve the quality of the stormwater run-off from the site, it is currently proposed to make use of the rainwater harvesting tank, silt traps and litter baskets to reduce the pollutants (Refer to Robert Bird Group SBSMP report). Final location and quantity will be finalised during detailed design.

3.2.2 Quantity of Stormwater Runoff

A stormwater quantity modelling has been undertaken by Robert Bird Group. It has been determined that stormwater flow generated from the post development scenario would actually be lower compared to the pre-development situation. This is due to site reconfiguration and a resulting smaller site. This results in a reduction in peak stormwater runoff.

3.2.3 Reduction in Sewerage Discharges

Reduction in sewerage discharges will be achieved through:

- Water efficient fixtures

While reducing the potable water demand, water efficient fixtures will also reduce sewerage discharge e.g. a standard 11 litres single flush WC would discharge 11 litres per full flush where as 4.5/3 dual flush WC cistern would discharge only 4.5 litres per full flush. This is a reduction of approximately 59% in sewerage discharges.

Similar measures are proposed to be adopted on the project;

- 7.5 l/min shower heads
- 4.5 l/min basin tapware compared to 6 L/min.

4.0 CONCLUSION

Implementation of the measures described in the IWMP which are:

- High Water efficient fixtures.
- Use of non-potable supply for landscaping.
- Use of non-potable supply for toilet flushing in the retail area.
- Best practice stormwater management.

Will provide an Ecologically Sustainable Design for the development.

These measures will achieve the objectives being sought which are:

- Reduce the potable water consumption from the town water supply.
- Reduce the sewer discharge to Council sewer infrastructure.
- Treating the stormwater runoff to maintain healthy waterways.

5.0 BIBLIOGRAPHY

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APPENDIX A
ESTIMATED POPULATION

Table A.1 - Residential - Estimation of Population

Bed type	Qty	Estimated No. of Residents per apartment	Total residents
1 bed Apartment incl. studio	182	1	183
2 beds Apartment	104	2	206
Total Population - Residential			390

Table A.2 - Retail Precinct - Estimation of Population

Building	Net Lettable Area	Estimated No. of person per 10 m^2	Total occupants
Retail	770		10
Total Population – Retail Space			10

APPENDIX B
WATER DEMAND

Water Demand

The water demand for the whole development has been estimated and the chart below represents the percentage consumption for the residential tower retail spaces, and outdoor usage i.e. landscaping irrigation and swimming pool. The figures on top of the percent figure are the estimated water consumptions in megalitres (ML) per annum.

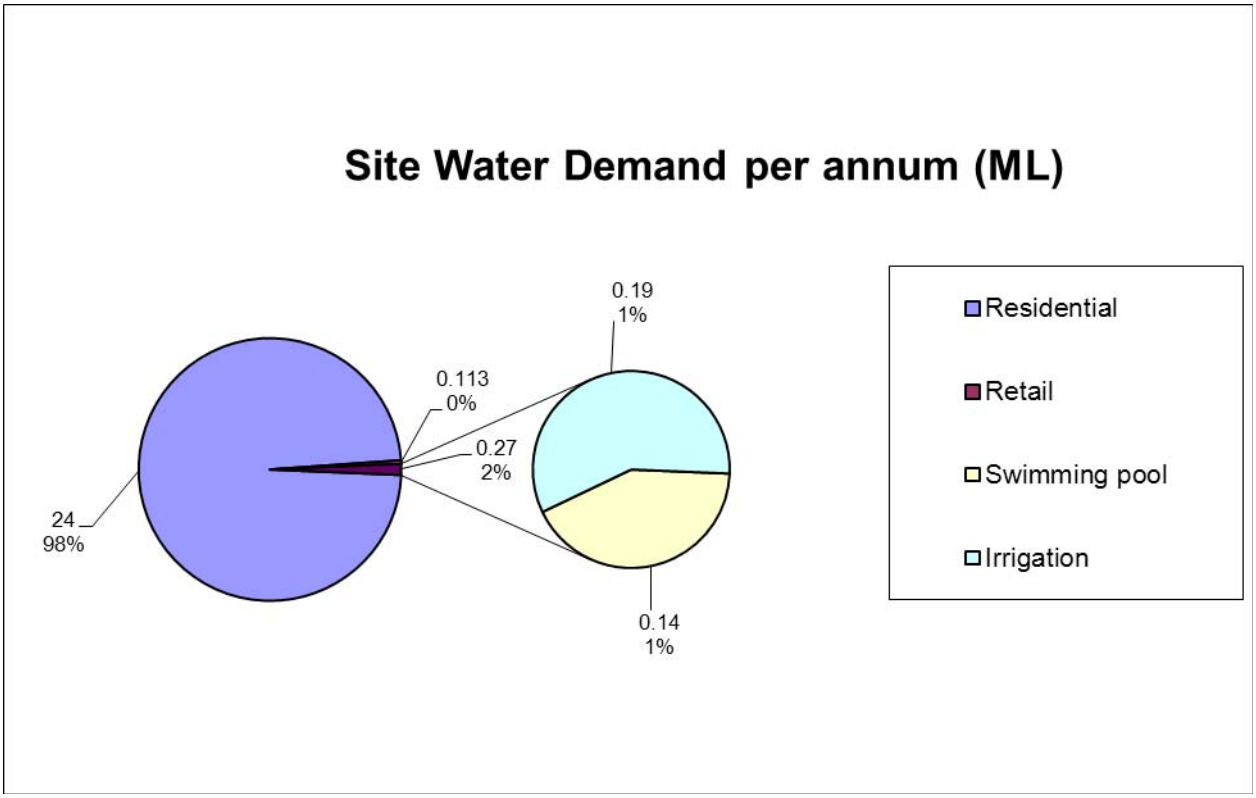

Chart 1- Yearly Site Water Demand in ML

The usage within the mixed used development has been estimated. The usage within the residential buildings has been subdivided into:

- Shower (average shower is 8 minutes)
- Bathroom tap
- Toilet Flushing
- Washing machine
- Dishwasher
- Other (cooking, drinking…)

APPENDIX C
COMPARISON BETWEEN WATER EFFICIENT FIXTURES AND STANDARD FIXTURES

Table C.1 - Residential Apartments: Average Domestic Water Usage

Fixtures	Type		Average flow rate (l/min) OR average consumption		Average total water used per day per person	
	Water Efficient	Normal fixtures	Water Efficient	Normal fixtures	Water Efficient	Standard fixtures
Shower (8 mins)	WELS rated 3 Star	Standard	7.5	15	60	120
Water Closet(WC)	WELS rated 4 Star	Standard(single flush)	4.5/3 dual flush	11	15	44
Washing Machine (per week)	Top Loading	Top Loading	150	150	11	21
Dishwasher	N/A	N/A	50	50	50	50
Bathroom basin's tap	WELS rated 5 Star	Standard	4	10	5	15
Other(Cooking, Drinking, ...)	N/A	N/A	20	20	15	15
Total average water consumption *with* and *without* water efficient fixtures					166	265

Table C.2 –Retail: Average Domestic Water Usage

Fixtures	Type		Average flow rate (l/min) OR average consumption per flush	
	Water Efficient	Normal fixtures	Water Efficient	Normal fixtures
Water Closet(WC)	WELS rated 4 Star	Standard(single flush)	3.75	11
Urinals	WELS rated 4 Star	Standard	1.5	2.5
Shower	WELS rated 3 Star	Standard	7.5	15
Wash hand basin	WELS rated 6 Star	Standard	7	9