Irrigation Design Australia
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IRRIGATION WATER USAGE, CATCHMENT & IRRIGATION STRATEGY

3-9 Byron Street 16.05.2025

Please see below the Irrigation Design / Strategy Information. We have provided the report based on the information provided. The methods of calculating water usage, and irrigation sustainability we have provided are based on this information. Calculations have been carried out based on landscaped areas supplied to IDA. **Irrigation application will be by sub surface Drip.**
We have utilised two methods of calculating water usage. Using a mathematical method of multiplying the landscaped area by the nominated required volumes.
Method A used is as per Brisbane City Council requirements, BCC has recently advised that their preferred allowance is 30-35mm per week for Native Planting & 35-45mm per week for Exotic Planting
Method B used is as per average Industry standard applications these rates are:
Summer 25mm per week, Autumn 15mm per week, Winter 10mm per week, Spring 20mm per week.
Seasonal Calculations have been based on 13 weeks.

PROVIDED DATA

*Containerised **Native Planting*** Area – 483m2, *Catchment Area – 526m2*

IRRIGATION WATER USAGE – Method A – BCC requirements

BCC Volume required Lower Range is 30mm per week. – 14,490 Litres per week.
Total Annual Water Usage 753,480 Litres

IRRIGATION WATER USAGE – Method B – Industry Standards

Application rates based on industry averages x area.
SUMMER 25mm per week = 12,075Litres – Season requirement 156,975Litres
AUTUMN 15mm per week = 7,245Litres – Season requirement 94,185Litres
WINTER 10mm per week = 4,830Litres – Season requirement 62,790Litres
SPRING 20mm per week = 9,660Litres – Season requirement 125,580Litres
Total Annual Water Usage 439,530 Litres

IRRIGATION WATER CAPTURE AND STORAGE:

South-East Queensland's climate is volatile. There are no sureties as to the volume of rainfall that will fall in a season. We have utilised the available historical BOM data to try to forecast potential issues and the figures below depict possible water catchment for comparison to irrigation requirements.

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RAINFALL AND CATCHMENT CALCULATIONS ANNUAL AVERAGE:

Using a mathematical method of multiplying the Average Annual Rainfall provided by the Bureau of Meteorology by the supplied catchment area.
Rainfall minus 24mm per year to cover inefficiencies.
Catchment adjusted to 80% to cover inefficiencies.

CATCHMENT: AREA 526m2 (Adjusted by 80% 421m2)
BRISBANE AVERAGE ANNUAL RAINFALL 1200mm (Adjusted by 24mm annually 1176mm)

1176mm per Year x a Catchment area of 421m2 equals a catchment volume of **494,861 Litres.**

RAINFALL AND CATCHMENT CALCULATIONS SEASONAL:

Using a mathematical method of multiplying the **seasonal** rainfall provided by the Bureau of Meteorology by the supplied catchment area.
SUMMER rainfall seasonal average 421m2 = Capture of 149,300 Litres

AUTUMN rainfall seasonal average 421m2 = Capture of 105,158 Litres

WINTER rainfall seasonal average 421m2 = Capture of 46,036 Litres

SPRING rainfall seasonal average 421m2 = Capture of 75,912 Litres

Utilising this method Total Annual Catchment from Seasonal figures is 376,406 Litres.

Regardless of the calculation method as the catchment area far outweighs the size of the Landscaped area should average rainfall occur then there will be an excess of Harvested water available for irrigation.

CATCHMENT v IRRIGATION REQUIREMENT SUMMARY:

Allowing that average rainfall is received then the annual data is as follows:
Annual catchment figures based on BOM data is **376,406 Litres.**

Annual Irrigation requirements BCC Lower Range is ***753,480 Litres***

Giving us a shortfall of Harvested water of 377,074 Litres

Annual Irrigation requirements Industry Standard is ***439,530 Litres***

Giving us a shortfall of Harvested water of 63,124 Litres

TANK SIZING (WATER STORAGE):

Tank sizing requires consideration of potential harvest volumes as well as irrigation water requirements.

The highest average rainfall in Brisbane is 37.6mm a week, therefore the highest volume of water that can potentially be harvested over the project catchment is **15,822 Litres** in a week.

The suggestion is for 10,000 or 15,000 Litres of storage.

5,000 Litre Storage would hold enough water for:

Approximately 0.35 weekly applications of irrigation at the BCC Lower Range of 30mm

Approximately 0.59 average weekly applications of irrigation at the Industry Standard application rate.

This size tank will require **11.9mm** of Rain over the nominated catchment area to fill the Tank.

10,000 Litre Storage would hold enough water for:

Approximately 0.69 weekly applications of irrigation at the BCC Lower Range of 30mm

Approximately 1.18 average weekly applications of irrigation at the Industry Standard application rate.

This size tank will require **23.8mm** of Rain over the nominated catchment area to fill the Tank.

15,000 Litre Storage would hold enough water for:

Approximately 1.04 weekly applications of irrigation at the BCC Lower Range of 30mm

Approximately 1.77 average weekly applications of irrigation at the Industry Standard application rate.

This size tank will require **35.6mm** of Rain over the nominated catchment area to fill the Tank.

Should Tank size selection be larger than 15,000 there will be periods where the tank will require top up from an external supply otherwise it will have only small residual water retained as storage this can affect the stability of the Tank.

ALTERNATE WATER SUPPLY

In periods of low rainfall or when tank levels are below requirements an alternative water supply may be required. The discrepancy between potential harvested catchment and water requirements will be met by alternative water when required. To service irrigation requirements the Tank may require multiple top ups, this should be considered when locating the Tanks as refill from Tanker at Ground Level may be an issue if the Water Tanker pumps do not have sufficient pressure to pump to high level Tank storage. Currently water for irrigation is available for approximately $350 for a 13,500-litre tanker delivered. This could be utilised for tank fill if / when rainfall is not available. The locating of the tanks in an accessible location on the property will assist with access for Tanker fill. Alternatively, a fill line could be installed with an external connection point for a tanker to fill from.

Potable back up could be utilized (if required) at a 10-25% Tank level. This would safeguard the system should there be an issue with the alternative supply or nil rainfall in periods of demand.

SUMMARY

Allowing that “Average Rainfall” occurs then 15,000 litres of storage would hold each season’s highest catchment volumes, OR The Irrigation requirements based on industry standards and the 30mm requirements of BCC can be addressed by plant selection and or additional irrigation requiring external Tank fill to cover the shortfall. All planters will require free draining soil and very good drainage, if possible, this should be drained back to the storage Tank. Should plant demand be less than the applied volumes this would ensure water is not wasted.

We trust this information, calculations and stated strategy meets requirements and assists with planning for the required project.

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Regards

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3-9 Byron Street Bulimba

CATCHMENT & IRRIGATION WATER USAGE

Containerised Planting Landscape Area (m2): 483 **Catchment** 526 **Adjusted Catchment** 421

WATER USAGE METHOD - BCC REQUIRED APPLICATIONS (30,35,45mm)

	Weekly Irrigation Application	Weekly Irrigation Requirements	Weeks in Season	Seasonal Irrigation Requirements	Weeks in Season	Annual Irrigation Requirements
483.00	mm	litres	qty	litres	qty	litres
BCC WEEKLY REQUIREMENT Lower Range (Natives)	30	14,490	13	188,370	52	753,480
BCC WEEKLY REQUIREMENT Upper Range (Natives) Lower Range (Exotics)	35	16,905	13	219,765	52	879,060
BCC WEEKLY REQUIREMENT Upper Range (Exotics)	45	21,735	13	282,555	52	1,130,220
				690,690		

WATER USAGE METHOD - INDUSTRY STANDARD APPLICATIONS (25,20,15,10mm)

SUMMER	25	12,075	13	156,975
AUTUMN	15	7,245	13	94,185
WINTER	10	4,830	13	62,790
SPRING	20	9,660	13	125,580
Average	18	8,453	52	439,530

CATCHMENT CALCULATION METHOD - BOM DATA ANNUAL RAINFALL

	AREA	Annual Rainfall	Cunliffe	Adjusted Annual	Catchment
	m2	mm	mm	m2	litres
ROOF CATCHMENT AREA	421	1200	24	1,176	494,861
ANNUAL CATCHMENT					494,861

CATCHMENT CALCULATION - BOM DATA SEASONAL RAINFALL

BOM Data 2024

		Average Monthly Rainfall	Average Weekly Rainfall	Average Weekly Catchment	Average Monthly Catchment	Season Totals
Month	Season	mm	mm	litres	litres	
December	Summer	107.00	24.16	10167	45,026	149,300
January		127.40	28.77	12105	53,610	
February		120.40	27.19	11440	50,664	
March	Autumn	124.40	28.09	11820	52,348	105,158
April		53.20	12.01	5055	22,387	
May		72.30	16.33	6870	30,424	
June	Winter	35.60	8.04	3383	14,980	46,036
July		40.00	9.03	3801	16,832	
August		33.80	7.63	3212	14,223	
September	Spring	33.00	7.45	3136	13,886	75,912
October		73.50	16.60	6984	30,929	
November		73.90	16.69	7022	31,097	
ANNUAL TOTAL						376,406

		Weeks Harvest
Highest Average Rainfall (BOM Data)	37.60	15,822

AVERAGES	Annually	Summer	Autumn	Winter	Spring
IRRIGATION REQUIREMENT 30mm	753,480	188,370	188,370	188,370	188,370
CATCHMENT	376,406	10,167	11,820	3,383	3,136
% provide by Rainfall	50%	5%	6%	2%	2%
DIFFERENCE	-377,074	-178,203	-176,550	-184,987	-185,234
IRRIGATION REQUIREMENT 35mm	879,060	219,765	219,765	219,765	219,765
CATCHMENT SEASONAL	376,406	10,167	11,820	3,383	3,136
% provide by Rainfall	43%	5%	5%	2%	1%
DIFFERENCE	-502,654	-209,598	-207,945	-216,382	-216,629
IRRIGATION REQUIREMENT 45mm	1,130,220	282,555	282,555	282,555	282,555
CATCHMENT SEASONAL	376,406	10,167	11,820	3,383	3,136
% provide by Rainfall	33%	4%	4%	1%	1%
DIFFERENCE	-753,814	-272,388	-270,735	-279,172	-279,419
METHOD B					
IRRIGATION REQUIREMENT (Industry Standards)	439,530.0	156,975	94,185	62,790	125,580
CATCHMENT SEASONAL	376,406	10,167	11,820	3,383	3,136
% provide by Rainfall	86%	6%	13%	5%	2%
DIFFERENCE	-63,124	-146,808	-82,365	-59,407	-122,444

Tank Sizing	Average Weekly Application	TANK SIZE	TANK SIZE	TANK SIZE	TANK SIZE
STORAGE		5,000	10,000	15,000	20,000
APPLICATIONS OF IRRIGATION BCC Lower Range	14,490	0.35	0.69	1.04	1.38
APPLICATIONS OF IRRIGATION BCC 35mm	16,905	0.30	0.59	0.89	1.18
APPLICATIONS OF IRRIGATION BCC Upper Range	21,735	0.23	0.46	0.69	0.92
Applications of Industry Standard - Summer	12,075	0.41	0.83	1.24	1.66
Applications of Industry Standard - Autumn	7,245	0.69	1.38	2.07	2.76
Applications of Industry Standard - Winter	4,830	1.04	2.07	3.11	4.14
Applications of Industry Standard - Spring	9,660	0.52	1.04	1.55	2.07
Applications of Industry Standard - Average 18mm	8,453	0.59	1.18	1.77	2.37
Tank holds mm over total area of 1514m2	mm	10.4	20.7	31.1	41.4
mm OF RAIN TO FILL TANK	mm	11.9	23.8	35.6	47.5

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RAINFALL/ E.TR./ IRRIGATION SUMMARY BASED ON MEDIAN RAINFALL DATA FROM BOM.

3-9 Byron Street Bulimba

REGIONAL AREA: Brisbane

INDUSTRY STANDARDS FOR APPLICATION

Landscape Area (m2): **483** Total Catchment Area: (m2) **526** Adjusted Catchment Area: (m2-80%) **421**

Irrigation Application Rates for	SUMMER	AUTUMN	WINTER	SPRING
Irrigation Application Rates for Seasons after estab. (mm) **Industry Standards**	**25.0**	**15.0**	**10.0**	**20.0**

Statistic Element	December	January	February	March	April	May	June	July	August	September	October	November
Rainfall (Median 1994-2022)												
Monthly (mm) [Data from BOM]	121.30	123.80	161.60	120.20	71.20	100.90	64.20	31.20	34.40	32.20	82.40	94.10
Weekly (mm)	30.33	30.95	40.40	30.05	17.80	25.23	16.05	7.80	8.60	8.05	20.60	23.53
Seasonal Average (mm)		33.89			24.36			10.82			17.39	
Potential Catchment for defined roof area, less other usages i.e. Toilet flushing												
Monthly Rainfall Catchment (L)	51,043	52,095	68,001	50,580	29,961	42,459	27,015	13,129	14,476	13,550	34,674	39,597
Weekly Rainfall Catchment (L)	12,761	13,024	17,000	12,645	7,490	10,615	6,754	3,282	3,619	3,387	8,668	9,899
Season Average (L)		14261.61			10249.99			4551.65			7318.41	
Average Weekly Rainfall Catchment (L)		9,095										
Evapotranspiration (Median 2000-2019)												
Monthly (mm)	204.40	201.60	193.20	162.40	128.80	98.00	81.20	89.60	114.80	151.20	179.20	196.00
Weekly (mm)	51.10	50.40	48.30	40.60	32.20	24.50	20.30	22.40	28.70	37.80	44.80	49.00
Daily (mm) [Data from BOM]	7.30	7.20	6.90	5.80	4.60	3.50	2.90	3.20	4.10	5.40	6.40	7.00
Seasonal Average (mm)		7.13			4.63			3.40			6.27	
Adjusted Irrigation Appl. Rate comparing ETvsRainfall - VE indicates irrigation IS required + VE indicates irigation NOT required												
Adjusted Monthly ETvsRain (mm)	-83.10	-77.80	-31.60	-42.20	-57.60	2.90	-17.00	-58.40	-80.40	-119.00	-96.80	-101.90
Adjusted Weekly ETvsRain (mm)	-20.78	-19.45	-7.90	-10.55	-14.40	0.73	-4.25	-14.60	-20.10	-29.75	-24.20	-25.48
Irrigation Required 1=Yes 0=No	1	1	1	1	1	0	1	1	1	1	1	1
Irrigation Supplement												
Weekly Irrigation Required (L)	-10,034	-9,394	-3,816	-5,096	-6,955	0	-2,053	-7,052	-9,708	-14,369	-11,689	-12,304

Irrigation for 1 wk during Summer (during no rain) (L)	12,075
Irrigation for 1 wk during Autumn (during no rain) (L)	7,245
Irrigation for 1 wk during Winter (during no rain) (L)	4,830
Irrigation for 1 wk during Spring (during no rain) (L)	9,660

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RAINFALL/ E.TR./ IRRIGATION SUMMARY BASED ON MEDIAN RAINFALL DATA FROM BOM.

3-9 Byron Street Bulimba **REGIONAL AREA: Brisbane** **BCC 30mm WEEKLY APPLICATION**

Landscape Area (m2): **486** Total Catchment Area: (m2) **526** Adjusted Catchment Area: (m2-80%) **421**

Irrigation Application Rates for	SUMMER	AUTUMN	WINTER	SPRING
Irrigation Application Rates for Seasons after estab. (mm) **BCC Lower Range**	**30.0**	**30.0**	**30.0**	**30.0**

Statistic Element	December	January	February	March	April	May	June	July	August	September	October	November
Rainfall (Median 1994-2022)												
Monthly (mm) [Data from BOM]	121.30	123.80	161.60	120.20	71.20	100.90	64.20	31.20	34.40	32.20	82.40	94.10
Weekly (mm)	30.33	30.95	40.40	30.05	17.80	25.23	16.05	7.80	8.60	8.05	20.60	23.53
Seasonal Average (mm)		33.89			24.36			10.82			17.39	
Potential Catchment for defined roof area, less other usages i.e. Toilet flushing												
Monthly Rainfall Catchment (L)	51,043	52,095	68,001	50,580	29,961	42,459	27,015	13,129	14,476	13,550	34,674	39,597
Weekly Rainfall Catchment (L)	12,761	13,024	17,000	12,645	7,490	10,615	6,754	3,282	3,619	3,387	8,668	9,899
Season Average (L)		14261.61			10249.99			4551.65			7318.41	
Average Weekly Rainfall Catchment (L)					9,095							
Evapotranspiration (Median 2000-2019)												
Monthly (mm)	204.40	201.60	193.20	162.40	128.80	98.00	81.20	89.60	114.80	151.20	179.20	196.00
Weekly (mm)	51.10	50.40	48.30	40.60	32.20	24.50	20.30	22.40	28.70	37.80	44.80	49.00
Daily (mm) [Data from BOM]	7.30	7.20	6.90	5.80	4.60	3.50	2.90	3.20	4.10	5.40	6.40	7.00
Seasonal Average (mm)		7.13			4.63			3.40			6.27	
Adjusted Irrigation Appl. Rate comparing ETvsRainfall - VE indicates irrigation IS required + VE indicates irigation NOT required												
Adjusted Monthly ETvsRain (mm)	-83.10	-77.80	-31.60	-42.20	-57.60	2.90	-17.00	-58.40	-80.40	-119.00	-96.80	-101.90
Adjusted Weekly ETvsRain (mm)	-20.78	-19.45	-7.90	-10.55	-14.40	0.73	-4.25	-14.60	-20.10	-29.75	-24.20	-25.48
Irrigation Required 1=Yes 0=No	1	1	1	1	1	0	1	1	1	1	1	1
Irrigation Supplement												
Weekly Irrigation Required (L)	-10,097	-9,453	-3,839	-5,127	-6,998	0	-2,066	-7,096	-9,769	-14,459	-11,761	-12,381

Irrigation for 1 wk during Summer (during no rain) (L)	14,580
Irrigation for 1 wk during Autumn (during no rain) (L)	14,580
Irrigation for 1 wk during Winter (during no rain) (L)	14,580
Irrigation for 1 wk during Spring (during no rain) (L)	14,580

Proposed Tank Size 0,000 Litres