

IRRIGATION WATER USAGE, CATCHMENT & IRRIGATION STRATEGY

York Street 12.03.26

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 Planting Area – 280m², Catchment Area – 575m²

IRRIGATION WATER USAGE – Method A – BCC requirements

BCC Volume required Lower Range is 30mm per week. – 8,400 Litres per week.

Total Annual Water Usage 436,800 Litres

BCC Volume required Median Range is 35mm per week. – 9,800 Litres per week.

Total Annual Water Usage 509,600 Litres

BCC Volume required Upper Range is 45mm per week. – 12,600 Litres per week.

Total Annual Water Usage 655,200 Litres

IRRIGATION WATER USAGE – Method B – Industry Standards

Application rates based on industry averages x area.

SUMMER 25mm per week = 7,000 Litres – Season requirement 91,000 Litres

AUTUMN 15mm per week = 4,200 Litres – Season requirement 54,600 Litres

WINTER 10mm per week = 2,800 Litres – Season requirement 36,400 Litres

SPRING 20mm per week = 5,600 Litres – Season requirement 72,800 Litres

Total Annual Water Usage 254,800 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.

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 575m² (Adjusted by 80% 460m²)

BRISBANE AVERAGE ANNUAL RAINFALL 1200mm (Adjusted by 24mm annually 1176mm)

1176mm per Year x a Catchment area of 460m² equals a catchment volume of **540,960 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 460m² = Capture of 163,208 Litres

AUTUMN rainfall seasonal average 460m² = Capture of 114,954 Litres

WINTER rainfall seasonal average 460m² = Capture of 50,324 Litres

SPRING rainfall seasonal average 460m² = Capture of 82,984 Litres

Utilising this method Total Annual Catchment from Seasonal figures is **411,470 Litres**.

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 **411,470 Litres**.

Annual Irrigation requirements BCC Lower Range is **436,800 Litres**

Giving us a shortfall of Harvested water of 25,330 Litres.

Annual Irrigation requirements BCC Upper Range is **655,200 Litres**

Giving us an excess of Harvested water of 243,730 Litres.

Annual Irrigation requirements Industry Standard is **254,800 Litres**

Giving us an excess of Harvested water of **156,670 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 **17,296 Litres** in a week.

The following data is for 10,000, 15,000 or 20,000 Litres of storage.

10,000 Litre Storage would hold enough water for:

Approximately 1.19 weekly applications of irrigation at the BCC Lower Range of 30mm

Approximately 1.02 weekly applications of irrigation at the BCC Median Range of 35mm

Approximately 0.79 weekly applications of irrigation at the BCC Upper Range of 45mm

Approximately 2.04 average weekly applications of irrigation at the Industry Standard application rate.

This size tank will require **21.7mm** of Rain over the nominated catchment area to fill the Tank.

15,000 Litre Storage would hold enough water for:

Approximately 1.79 weekly applications of irrigation at the BCC Lower Range of 30mm

Approximately 1.53 weekly applications of irrigation at the BCC Median Range of 35mm

Approximately 1.19 weekly applications of irrigation at the BCC Upper Range of 45mm

Approximately 3.06 average weekly applications of irrigation at the Industry Standard application rate.

This size tank will require **32.6mm** of Rain over the nominated catchment area to fill the Tank.

20,000 Litre Storage would hold enough water for:

Approximately 2.38 weekly applications of irrigation at the BCC Lower Range of 30mm

Approximately 2.04 weekly applications of irrigation at the BCC Median Range of 35mm

Approximately 1.59 weekly applications of irrigation at the BCC Upper Range of 45mm

Approximately 4.08 average weekly applications of irrigation at the Industry Standard application rate.

This size tank will require **43.5mm** of Rain over the nominated catchment area to fill 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, 35mm & 45mm requirements of BCC. Any shortfall 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.

Data Summary

Based on Annual Rainfall data from the BOM. The calculations indicate that the Harvested Water across the 4 seasons will provide the following:

Annual Catchment 411,470 Litres.

Annual Ind. Standard Irrigation requirement – 254,800 Litres Catchment provides 161%.

Annual BCC 30mm requirement 436,800 Litres. Catchment provides 94%.

Annual BCC 35mm requirement 509,600 Litres. Catchment provides 81%.

Annual BCC 45mm requirement 655,200 Litres. Catchment provides 63%.

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

Regards

Rick Freeman