CONCEPT REPORT
INTEGRATED WATER MANAGEMENT PLAN

SUTHERLAND HOSPITAL OPERATING THEATRES UPGRADE PROJECT (SHOTUP)

NSW GOVERNMENT Health Infrastructure

JHA

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Title	Concept Report – Hydraulic services
Project	Sutherland Hospital Operating Theatres Upgrade Project
Description	Integrated Water Management Report
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CONTENTS

1. EXECUTIVE SUMMARY

The redevelopment of the Sutherland Hospital has been identified as a State Significant Development. This report has been prepared in accordance with the anticipated requirements to be outlined in the Secretary's Environmental Assessment Requirements (SEARs) from the Department of Planning and Environment.

Prepare an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.

This report has been prepared by JHA & ACOR Consultants (civil) to summarise any proposed alternative water supplies, proposed end uses of potable water and non- potable water and any Water Sensitive Urban Design (WSUD) initiatives.

This document and related work has been prepared following JHA Consulting Engineers Quality and Environmental Management Systems, which are based on AS/NZS ISO 9001 and ISO 14001.

2. PROPOSED ALTERNATIVE WATER SUPPLIES

Given the nature of the proposed development and the need for infection control and avoid potential contaminations, no alternative water supplies are proposed for the Sutherland Hospital Redevelopment.

2.1 POTABLE WATER

Given the nature of the proposed development and the need for infection control and to avoid potential contaminations, potable water systems for human consumption, hygiene purposes, cistern flushing and process equipment for the site to be supplied from the primary water supply from the Sydney Water authority street mains located in Kareena & Kingsway road.

2.2 NON-POTABLE WATER

Alternative non-potable water supply has been assessed in conjunction with recently completed ESD workshops to review water saving initiatives for the site.

JHA has undertaken preliminary investigations regarding the feasibility of implementing rainwater harvesting on the project based on the below anticipated potable water demands:

	Required water rates	**Daily Usage**
Cooling Tower makeup water	~2,500kL p/year	6.86kL
Landscape Irrigation	500m^2 irrigated at 25mm/m^2	6.25kL

Table 2.1 – Anticipated rainwater reuse requirements

The new roof (~1500m^2) & a portion of the existing building's catchment area (620m^2) with an accessible siphonic downpipe have been considered as catchment for a proposed RWT. Based on this, a preliminary matrix has been completed in table 2.2 to outline the size of these tanks to meet potable demands.

Tank size (kL)	**Demand met for Cooling Towers + Landscape Irrigation (%)**	**Demand met for Cooling Towers only (%)**	**Demand met for Landscape irrigation only (%)**
20	21	34	37
30	25	40	43
40	28	44	47

Table 2.2 – Anticipated rainwater reuse requirements

Refer to Appendix A section of this report for graphical analysis of all the above scenarios.

3. PROPOSED END USES

3.1 POTABLE WATER

Potable cold water is proposed to be used for the following applications:

- Sanitary fixtures, with staff and patient areas
- Clinical areas for staff and patient sanitation
- Appliances and equipment, including sanitisers, dishwashers and other specialist equipment
- Fire hydrant services
- Fire sprinkler services
- Fire hose reel services

3.1.1 HIGH EFFICIENCY FIXTURES

To reduce the sites potable water demand, Water efficient fixtures and fittings shall be used for staff and public amenities areas only.

Water efficient fixtures and fittings complying with WELS requirements shall not be used in any clinical areas.

3.2 NON-POTABLE WATER

As stated in section **2.2 proposed alternative water supplies,** no non- potable water end uses are proposed.

4. WATER SENSITIVE URBAN DESIGN (INPUT BY CIVIL ENGINEER)

5. APPENDIX A – RAINWATER TANK OPTION: IRRIGATION & COOLING TOWERS

Inputs

Rainfall data (change rainfall data on the "Rainwater data" tab)

Bureau of Meterology Weather Station:	Audley (Royal National Park), 66167
Rainfall Data Range:	01/01/1979 to 31/05/1997
Number of Years Modelled:	18.4 Years

Tank parameters

Tank Size (litres):	30000	Litres
Catchment Area (m^2):	2153	m^2
Runoff Co-efficient:	0.95	
First Flush (mm):	0.15	mm
Daily Rainwater Demand (L/day):	13100	Litres/Day

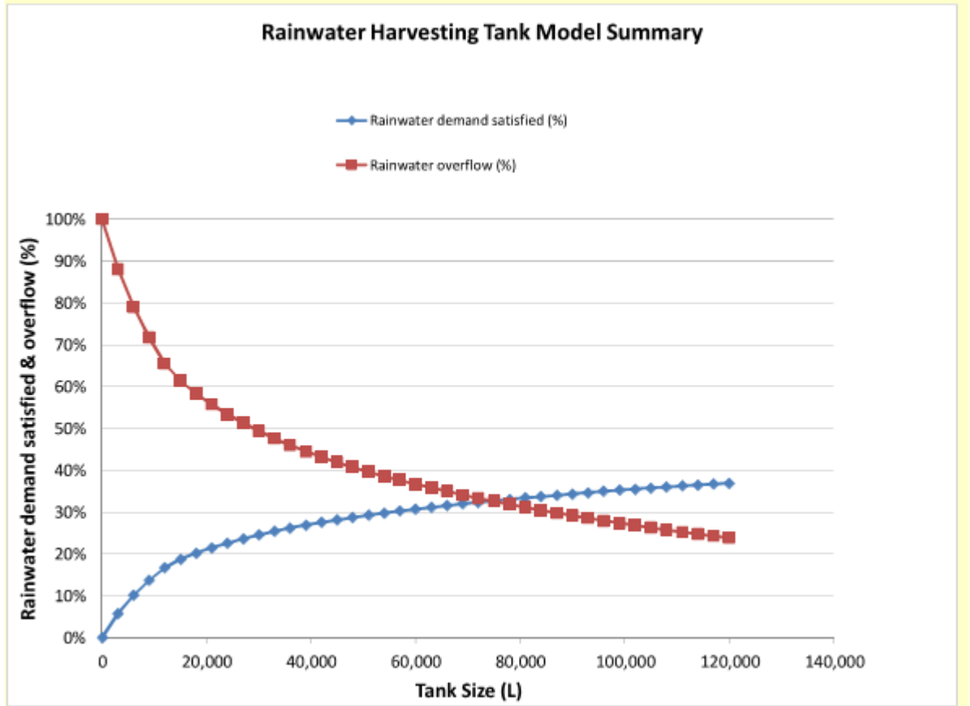
Cost parameters

Cost of Potable Water per kilo litre:	$2.02	per kL

Outputs

Average annual rainfall (mm/yr):	1,135
Average annual demand on rainwater tank (L/yr):	4,784,775
Average annual rainwater harvested (L/yr):	1,175,565
Average annual spill/overflow (L/yr):	1,106,683
Average annual potable top-up (L/yr):	3,609,210
Annual rainwater rainfall (L/yr):	2,321,341
Average Daily harvest Potential (L/day):	6,355
Overall % rainwater demand satisfied with rainwater:	25%
Rainwater overflow (%):	49%
Reduction in Stormwater runoff volume (%):	51%
Annual savings ($/yr):	$2,374.64

Results chart



6. APPENDIX B – RAINWATER TANK OPTION: IRRIGATION

Inputs

Rainfall data (change rainfall data on the "Rainwater data" tab)

Bureau of Meterology Weather Station:	Audley (Royal National Park), 66167
Rainfall Data Range:	01/01/1979 to 31/05/1997
Number of Years Modelled:	18.4 Years

Tank parameters

Tank Size (litres):	30000	Litres
Catchment Area (m^2):	2153	m^2
Runoff Co-efficient:	0.95	
First Flush (mm):	0.15	mm
Daily Rainwater Demand (L/day):	6250	Litres/Day

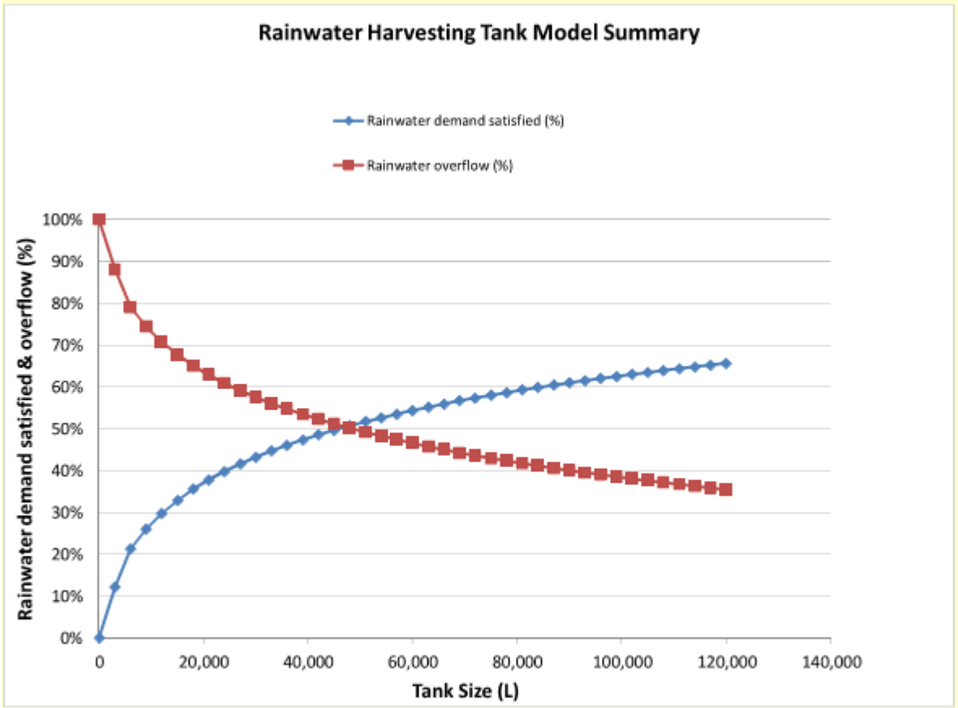
Cost parameters

Cost of Potable Water per kilo litre:	$2.02	per kL

Outputs

Average annual rainfall (mm/yr):	1,135
Average annual demand on rainwater tank (L/yr):	2,282,813
Average annual rainwater harvested (L/yr):	987,637
Average annual spill/overflow (L/yr):	1,295,215
Average annual potable top-up (L/yr):	1,295,175
Annual rainwater rainfall (L/yr):	2,321,341
Average Daily harvest Potential (L/day):	6,355
Overall % rainwater demand satisfied with rainwater:	43%
Rainwater overflow (%):	57%
Reduction in Stormwater runoff volume (%):	43%
Annual savings ($/yr):	$1,995.03

Results chart



7. APPENDIX C – RAINWATER TANK OPTION: COOLING TOWERS

Inputs

Rainfall data (change rainfall data on the "Rainwater data" tab)

Bureau of Meterology Weather Station:	Audley (Royal National Park), 66167
Rainfall Data Range:	01/01/1979 to 31/05/1997
Number of Years Modelled:	18.4 Years

Tank parameters

Tank Size (litres):	30000	Litres
Catchment Area (m^2):	2153	m^2
Runoff Co-efficient:	0.95	
First Flush (mm):	0.15	mm
Daily Rainwater Demand (L/day):	6860	Litres/Day

Cost parameters

Cost of Potable Water per kilo litre:	$2.02	per kL

Outputs

Average annual rainfall (mm/yr):	1,135
Average annual demand on rainwater tank (L/yr):	2,505,615
Average annual rainwater harvested (L/yr):	1,011,740
Average annual spill/overflow (L/yr):	1,271,004
Average annual potable top-up (L/yr):	1,493,875
Annual rainwater rainfall (L/yr):	2,321,341
Average Daily harvest Potential (L/day):	6,355
Overall % rainwater demand satisfied with rainwater:	40%
Rainwater overflow (%):	56%
Reduction in Stormwater runoff volume (%):	44%
Annual savings ($/yr):	$2,043.72

Results chart