

# La Banque Apartments, High Rise Building Hot Water System Comparison

Microheat  
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## Revision

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REVISION	DATE	COMMENT	APPROVED BY
0	23/12/2011	For Client Review and Comment	JAL
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# Contents

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<b>1.</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
1.1	HIGH RISE BUILDING (36 STORIES – 257 APARTMENTS) .....	1
<b>2.</b>	<b>DESCRIPTION OF PLANT ARRANGEMENT OPTIONS .....</b>	<b>2</b>
2.1	GENERAL OVERVIEW .....	2
2.2	CENTRALISED GAS BOOSTED HOT WATER PLANT (HIGH RISE) .....	2
<b>3.</b>	<b>COSTS ASSOCIATED WITH HOT WATER SYSTEMS .....</b>	<b>3</b>
3.1	INITIAL CAPITAL COSTS (HIGH RISE BUILDING) .....	3
	<b>APPENDIX A – TYPICAL HOT WATER SCHEMATIC (HIGH RISE BUILDING) .....</b>	<b>4</b>

# 1. Executive Summary

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This Hot water comparison report for the Hydraulic Services has been prepared at the request of Microheat.

This report sets out the conceptual layout of the hot water comparisons between a centralised gas boosted hot water plant Vs. individual continuous flow electric hot water units for an apartment building of high rise construction.

The two options under consideration are:

## 1.1 High Rise Building (36 Stories – 257 Apartments)

- Hot water via individual continuous flow electric hot water heaters in each apartment
- Hot water via a centralised gas boosted plant.

The main considerations that must be considered when weighing the two options are:

- Initial capital cost expenditure
- Ongoing operating costs (To be prepared by RMIT)

## 2. Description of Plant Arrangement Options

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### 2.1 General Overview

There are 2 options provided for hot water services comparisons for a high rise building.

- Hot water via individual continuous flow electric hot water heaters in each apartment
- Hot water via a centralised gas boosted plant.

Installation of individual continuous flow electric hot water heaters will typically entail providing space within the apartment to house the individual hot water unit. Metering can be provided on an apartment by apartment basis as electricity and cold water consumption to each apartment is already metered. Hot water temperature would be set to 50C outlet, hence eliminating the need for tempering valves.<sup>1</sup>

Installation of a central plant will consist of gas boosters, hot water storage tanks and hotwater flow and return pumps. Note, due to the plant located at rooftop (ie 100 metres above ground) a cold water booster pumpset is required for the supply of water to plant as town main supply pressure is insufficient. A spatial allocation on the roof for housing all equipment is required. Individual apartment metering would be achieved through the use of a proprietary Origin energy remote hot water metering solution that would meter the hot water consumption of each apartment and accordingly apportion the associated gas costs.

#### Centralised Gas Boosted Hot Water Plant (High Rise)

A centralised gas boosted hot water plant that would be adequate to serve a high rise building containing 257 apartments consists of:

- Bosch Hotwater System consisting of:
  - Free standing continuous flow gas heater manifold (10 x heaters)
  - 1 x Hot water flow and return pump
  - 2 No X 315L Storage Tanks
- Flow and return hot water pumps
- Gas pipework and bulk meter
- Hot water meters

A centralised hot water system relies on a main hot water flow and return loop being constantly circulated throughout the building from which each individual apartment will draw from. A plant spatial is required at roof level with an approximate area of 20m<sup>2</sup>.

A plant spatial will be required at ground floor of 4m<sup>2</sup> to accomodate the constant pressure domestic cold water pumpset. .

Note, hot water plant outlet temperature would be set at 70C. Pipework will be a combination of copper tube and wethatherm. All pipework will be lagged with 25mm Armaflex insulation or equivalent.

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<sup>1</sup> It is assumed that the Microheat continuous flow water heater will comply with AS3498 and be clearly marked "THIS APPLIANCE DELIVERS WATER NOT EXCEEDING 50°C IN ACCORDANCE WITH AS 3498" As required by AS3500.4, Clause 1.9.3.(b).(iii)

### 3. Costs Associated With Hot Water Systems

#### 3.1 Initial Capital Costs (High Rise Building)

We estimate the initial capital cost estimate of the individual electric water heater option to be approximately \$719,600

Item	Quantity	Cost	Total
Microheat CFEWH SERIES 2-27 (Supply and Installation) <sup>1</sup>	257	\$1800	\$462,600
Electrical Costs Per apartment			
-Additional apartment electrical Infrastructure <sup>2</sup>	257	\$1000	\$257,000
<b>Total</b>			<b>\$719,600</b>

We estimate the initial capital cost estimate for the central gas boosted solar plant option to be approximately \$710,050.

Item	Quantity	Cost	Total
Hot Water Plant	1	\$40000	\$40,000
Tempering Valves	257	\$700	\$179,900
Remote Read Hot Water Meters	257	\$250/meter	\$51,400
Hot water Flow & Return Pump	1	\$8000	\$8,000
Bulk Cold Water Meter Assembly & BFPD	1	\$3000	\$3,000
Gas pipework to Hot water plant, 150 dia	200m	\$330 per meter	\$66,000
Gas Meter for Bulk Hot water plant <sup>3</sup>	1	\$0	\$0
75 dia Hotwater flow – lagged (Wefatherm)	150m	\$210 per meter	\$31,500
40 dia Hotwater flow – lagged (wefatherm)	1,400m	\$150 per meter	\$210,000
40 dia Hotwater flow – lagged (copper)	50m	\$100 per meter	\$5,000
20 dia Hotwater flow – lagged (copper)	75m	\$70 per meter	\$5250
Isolation valves, balancing valves, check valves	-	\$50,000	\$50,000
Fire Collars	-	\$15,000	\$15,000
DCW Booster Pumpset	1	\$45,000	\$45,000
<b>Total</b>			<b>\$710,050</b>

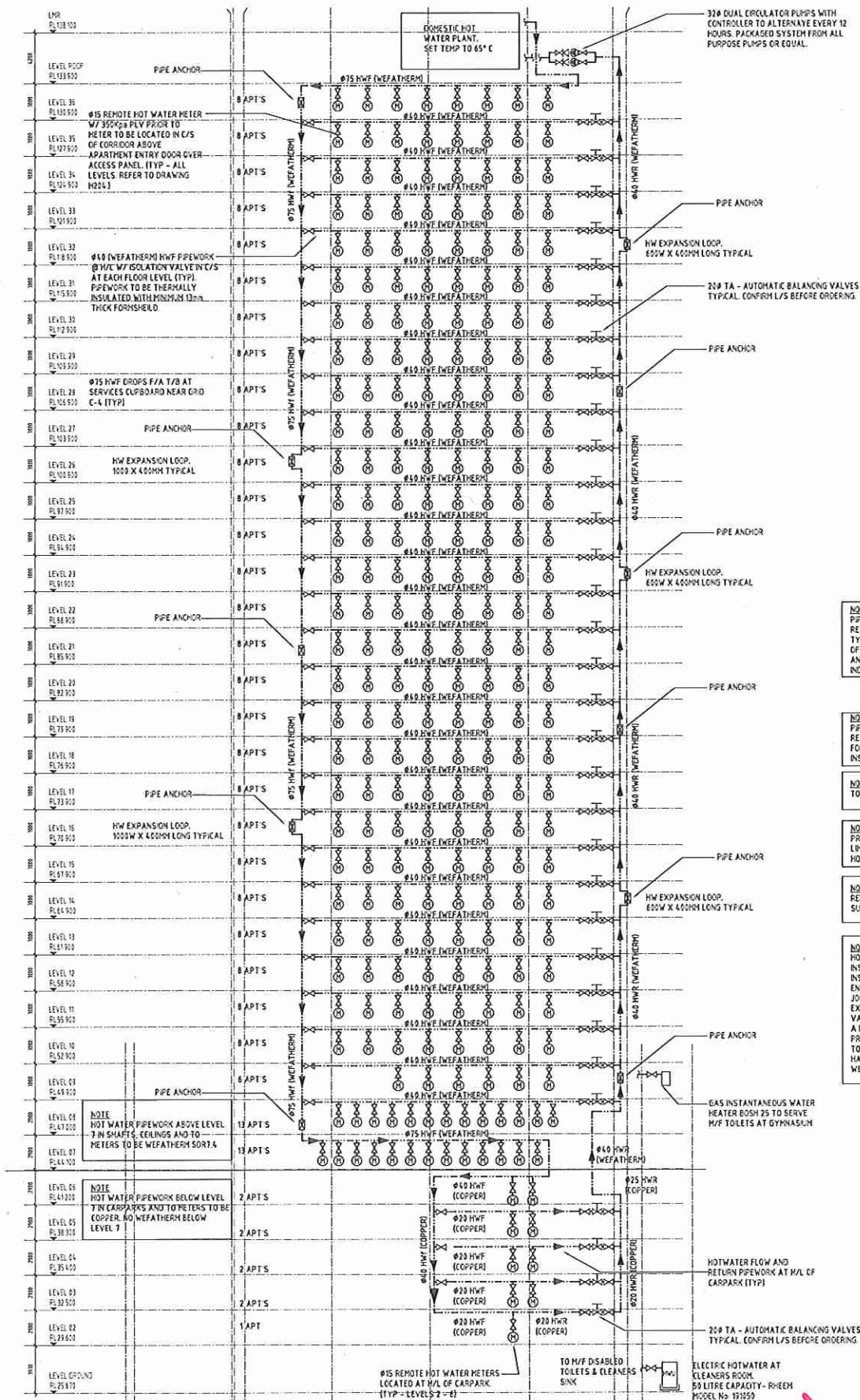
***It should be noted that neither of the above cost estimates allow for hot water pipework, insulation and valving within the apartments as this will be similar for both systems. It is noted that tempering valves and thermostatic mixing valves are included in the comparison as they are not required to be installed as part of the continuous flow electric solution.***

**Notes:**

- Hot Water equipment cost based upon supply cost quotation (budget allowance \$900/unit), with an allowance of 2 x supply cost for installed cost of plant
- Extra over cost of running three phase power to each apartment to suit the hot water system based on past project experience, exact costs may vary on a project by project basis depending on the Electrical Authorities requirements.
- Based on a typical tapping arrangement the gas authority will not normally charge for supply and installation of a gas meter.
- Price allowance for tempering valve includes tempering valve and access panel to be provided

## Appendix A – Typical Hot Water Schematic (High Rise Building)

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**HOTWATER SCHEMATIC (TYP)**