



HEATH CONSULTING ENGINEERS

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2 December 2008

Cambrune Pty Ltd
233 College Road
BATHURST NSW 2795

Attention: Mr Ray Carter

Dear Sir

**RE. ASSESSMENT OF WATER & SEWER FOR 16 VALE ROAD, LOT 2 DP815734,
SOUTH BATHURST**

1.0 INTRODUCTION

As requested Heath Consulting Engineers has carried out an assessment of the above property with regard to the water supply requirements and required water meter size to determine the appropriate water access charge. An assessment has also been made of the sewer disposal for the site in relation sewer access charges.

The existing site is serviced by a DN40 water meter (Meter No. MK71028) located near the north west corner of the site.

This water meter is supplied from Council's water main in Vale Road.

Examination of the 2008/2009 Rates & Charges Notice for the property shows that the property was charged \$943.00 for the Water Availability Charge and \$1338.00 for the Sewer Access Charge which was then reduced by 5%. It is assumed that the 5% reduction is due to the property having a Sewer Discharge Factor (SDF) of 95%. These charges are both based on the water meter size for the property in accordance with Council's Revenue Policy.

2.0 METHODOLOGY

The water supply requirements for the site were determined based on the methodology outlined in *AS 3500.1 – 2003 Water Supply*. Table 3.1 of *AS 3500.1* indicates flow rate requirements.

TABLE 1 - FLOW RATES & LOADING UNITS

| Fixture/Appliance | Flow Rate L/s | Loading Units |
|-------------------------|---------------|---------------|
| Water closet cistern | 0.10 | 2 |
| Bath | 0.30 | 8 |
| Shower | 0.10 | 2 |
| Basin | 0.10 | 1 |
| Sink (Standard Tap) | 0.12 | 3 |
| Laundry tub | 0.12 | 3 |
| Dishwasher | 0.20 | 3 |
| Hose tap (20 nom. size) | 0.30 | 8 |
| Hose tap (15 nom. size) | 0.20 | 4 |

The loading units indicated in **Table 1** allow an assessment to be made of the probable simultaneous flow that may occur to a group of fixtures/appliances. Due to the diversity of use within a building or development, it is a rare occurrence that all fixtures in a development are in use at the one time. For economic reasons it is usual practice to size water pipes to allow flow that is less than the flow that would be required if all fixtures were in use at the same time.

A loading unit is a factor that takes into account the expected flow and probability of usage of a plumbing fixture. By adding up the total number of loading units and referencing an appropriate table, an estimate of the probable simultaneous flow to a group of fixtures can be made.

An assessment must also be made of fixtures that require full flow to be actually available. Full flow requirements must be satisfied for groups of showers, wash fountains, commercial laundry equipment, dishwashing equipment and air conditioning units. Cleaners sinks inside buildings are not counted in the design flow as the fixtures are usually only in use by cleaning staff when all other occupants of the buildings have gone.

For this assessment it has been assumed that there are no full flow requirements for the building.

3.0 WATER SUPPLY REQUIREMENTS

3.1 Potable Water Supply

The number of water supply fixtures was determined from an inspection of the site and building and also discussions with yourself. The assessment of the water requirements for the site is presented in **Table 2**.

TABLE 2 - WATER DEMAND ASSESSMENT

| Fixture/Appliance | Number | Flow Rate L/s | | Loading Units | |
|-----------------------|---------------------------------------|---------------|-------------|---------------|-----------|
| | | Each | Total | Each | Total |
| Sinks (Standard Tap) | 1 | 0.12 | 0.12 | 3 | 3 |
| Basins | 2 | 0.10 | 0.20 | 1 | 2 |
| Water closet cisterns | 1 | 0.10 | 0.10 | 2 | 2 |
| Urinals | 1 | 0.10 | 0.10 | 2 | 2 |
| Shower | 1 | 0.10 | 0.10 | 2 | 2 |
| Hose Taps (20mm) | 2 | 0.30 | 0.60 | 8 | 16 |
| Hot Water System | 1 | 0.20 | 0.20 | 8 | 8 |
| Fire Hose Reels | 1 proposed for future expansion | 0.33 | 0.33 | | |
| Totals | | | 1.75 | | 35 |

The total number of loading units for the building and the respective Probable Simultaneous Flow Rate (PSFR) from Table 3.3 is shown below:

| | | |
|-------------------|----------------------------|-------------------------|
| Existing Building | <u>Loading Units</u> 35 | <u>PSFR</u> 0.51 L/s |
|-------------------|----------------------------|-------------------------|

3.2 Fire Fighting Supply

The site will contain one fire hose reel. AS2441 requires the PSFR for the building to be included with the two most hydraulically disadvantaged fire hose reels (flowrate of 0.33L/s/hose reel) unless only one fire hose reel is installed. Therefore, the design flowrate for the building is 0.51L/s + 0.33L/s = 0.84L/s. AS2441 also requires the fire hose reel to have a minimum residual water pressure of 220kPa.

3.3 Assessment of Water Meter Size

Design information for typical water meters are shown in Table 3.

TABLE 3 - WATER METER DESIGN INFORMATION

| Nominal Diameter | Maximum Continuous Flow Rate L/s | Maximum Flow Rate L/s |
|------------------|----------------------------------|-----------------------|
| DN20 | 0.69 | 1.40 |
| DN25 | 0.97 | 1.94 |
| DN32 | 1.39 | 2.78 |
| DN40 | 3.0 | 5.6 |
| DN50 | 6.1 | 12.6 |

From Table 3, the PSFR for the property of 0.51L/s for the site would suggest the need of a DN20 water meter. Once the building is expanded and a fire hose reel is required the design flowrate would increase to 0.84L/s, thereby necessitating the need for a DN25 water meter.

At a Council meeting on the 21 July 2004 Council resolved that a number of items with regard to the user pays best practice sewer charges. Of particular interest is Item (d) of that resolution which is shown below:

(d) That the cost of downsizing or removing meters be met by Council.

It is recommended that Council be asked to change the water meter size to 25mm diameter in order to reduce the water availability charge for the property.

3.4 Water usage

The actual water usage for the property over the last three financial years is shown in Table 4.

TABLE 4 - ACTUAL WATER USAGE

| Financial Year | Water Usage (kL) |
|----------------|---------------------|
| 2005/2006 | 0 (property vacant) |
| 2006/2007 | 313 |
| 2007/2008 | 11 |

4.0 SEWER CHARGES

Council's management plan allows for non-residential properties to be levied sewer charges. These charges consist of two parts: an access charge (based on the size of the water meter connected to the property) and a usage charge (based on the amount of water used by the property). Each of these charges is then multiplied by the SDF determined by Council for the property.

In February 2004 the Department of Energy, Utilities and Sustainability (DUES) now known as the Department of Water & Energy (DWE) provided strategies as to how Council deal with the implementation of best practice pricing for water and sewer. It appears from minutes of Council meetings that not all of these strategies were adopted by Council, namely only charging for the actual water meter size required rather than charging for the actual meter size where the larger size is required for fire fighting purposes.

However, it appears that the Council have allowed for an expert report to be provided to establish the peak load (in equivalent tenements (ETs)) that is actually placed on the sewerage system. In the absence of such a report, the Council can determine the access charge on the basis of the square of the service connection size times the discharge factor.

4.1 Assessment of Peak Load

An assessment of the peak load in ETs was carried out. This assessment is outlined below.

The Department of Water & Energy's *Best-Practice Management of Water Supply & Sewerage Guidelines* August 2007 defines an ET as:

A measure of the demand a development will place on the infrastructure in terms of the water consumption or sewage discharge for an average residential dwelling.

These same guidelines also suggest that to encourage water conservation, high water consuming residential customers should be subjected to a step price increase of at least 50% for incremental usage above a specified threshold with the threshold not to exceed 450kL/annum for Tablelands areas. Bathurst Regional Council have adopted 250kL as their threshold limit.

Bathurst Regional Council staff advised they generally use a figure of 220 to 240L/person/day for their sewage load with an average of 2.3persons/ET. This equates to an annual sewage load of 185kL to 202kL.

The Australian Standard for On-Site Domestic Wastewater Management, AS1547, sets out wastewater demands for residential houses. These demands are used when designing effluent disposal systems where no reticulated sewer is available. The standard suggests values of 1080 L/day for older houses and 880L/d for new houses built in accordance with Basix requirements. The annual peak load per house is therefore 394.2kL and 321.2kL respectively, with an average of 357.7kL.

For the purposes of this report a figure of 200kL/annum was adopted as the peak load that an ET would place on a sewage system.

The water usage for the property shown in Table 4 is very irregular. Using the highest value of 313kL and the SDF of 95% a total of 297.4kL would be the peak load placed on the sewage system by this property. When expressed in terms of ETs it equates to 1.49 ETs.

If we average the water usage over two years (excluding the year the property was vacant) the peak load (expressed in ETs) would be 0.77 ETs.

If we use the lesser water usage over two years the peak load (expressed in ETs) would be 0.05 ETs.

With such a range of water usage it would be fair to adopt the average value as the the peak sewage load.

Council's revenue policy sets out that there is a minimum sewer access charge for any non-residential property, which is equivalent to the charge for a 20mm diameter water service.

This minimum access charge correlates with the actual water meter size that would be required for the property as outlined in Section 3.3.

The user pays best practice sewer charges allow for a second set of charges to be applied which is based on the actual amount of water used. Non-residential properties are levied for all water used which is multiplied by the SDF. Bathurst Regional Council have set their charge at \$0.85/kL. This is the truest form of user pays.

5.0 CONCLUSION

The water meter size and the peak sewage load of the property was assessed to determine the appropriateness of the current water and sewer access charges currently being levied for the property. Based on our assessment we conclude that the existing property only requires a DN20 water meter. When the existing building is extended and requires a fire hose reel the water meter would need to be DN25.

As a comparison, the current annual water availability charge for a DN40 water meter is \$943.00, a DN25 water meter is \$367.00 and a DN20 water meter is \$235.00.

It is recommended that Council be asked to change the water meter size to 25mm diameter in order to reduce the water availability charge for the property. This change in meter size would be at Council's cost in accordance with the Council resolution.

The peak sewage load placed on the existing sewage system, based on actual water usage, was assessed to be range between 0.05 ETs and 1.49 ETs.


Council's revenue policy allows for a minimum sewer access charge equivalent to a DN20 water meter size (this is the normal size meter provided for a single residential property).

Based on the peak sewage load determined we conclude that this property should only be charged the minimum sewer access charge. As a comparison, the current annual sewer access charge for the property is 95% of \$1339.00, whilst the minimum charge would be \$334.00.

We trust that this information satisfies your requirements, however, if you require further information do not hesitate to contact the undersigned.

Yours faithfully

Heath Consulting Engineers



Per:

ROGER HEATH