



Vincentia Market Place

MEMORANDUM

Shopping Centre,

From : Stuart Johnstone
Date : 1st July 2011
Re : Fire Services Tank Sizing

Job No.: 7188F
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Sent	Copy	Company	Attention	Fax No
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Compass Projects	Ian Goodman	Via Email

Ian,

In response to item 7.3

The Fire tank sizing is based on the requirement AS2118.1-1999 and is for the sprinkler systems with in the site.

Summary

Fire sprinklers are to be fed from an onsite storage tank with dual pumps, one diesel and one electric. The required tank size is 255,984 litres. This is based on the use of a Grade two water supply for the in rack storage systems. The design calculations are as indicated below.

The stored water in the tank needs to be accessible to NSW Fire and Rescue at the booster assemblies. This is achieved from a suction point with in the booster assemblies. The maximum suction lift available from the NSW Fire and Rescue appliances is 3m. As the tank is located lower than the booster assemblies to remain with in the 3m requirement the tanks need to be located immediately adjacent to the booster assemblies.

Design Calculations Sprinklers

Water Supply

Specification 1.5, clause 7 of the BCA requires the sprinkler system, to be not less than grade 3 as defined by AS2118.1, as the building is not greater than 25 m in effective height. However due to the design requirements of Big W a grade 2 water supply will be required for the project.

Requirements for a grade two supply based on AS2118.1

In general for a grade two supply the water is connected to the site via one water main fed from two water sources with two independent connections to the one water main. These two connections are controlled by a series of isolation valves with one located between the two points of connection to enable the water main to maintain supply to the site in the event of maintenance of a break in the main.

As we are unable to obtain a Grade two supply from the councils main then the use an automatic pumps & suction tank (storage tank) is required. The automatic pump supply



must consist of two automatic pumps, one of which shall be a compression ignition engine drive. Each pump must be sized to independently supply the required pressure and flows.

As the pump draws directly from a tank, providing the tank has a capacity of not less than two thirds of the full holding capacity required, it need not meet the requirements for connection to the water main as indicated for the grade two above.

Sizing

Design classification for the shopping centre is OH3 for the retail area and in rack sprinklers to High piled storage risk Category 3

The density for OH3 in accordance with Big W is 10mm min x 260m² plus 3 in rack sprinkler to operate simultaneously

$$\begin{aligned} 10/1000 \times 260 &= 2.6\text{m}^3/\text{min} \\ &= 2600 \text{ l/min} \\ &= 2600 \times 90\text{min} = 234000 \text{ litres capacity} \end{aligned}$$

$$\begin{aligned} \text{Plus } 3 \times 1.357\text{l/s} \\ &= 4.071\text{l/s} \\ &= 244\text{l/m} \\ &= 244 \times 90\text{min} = 21983 \text{ litres} \end{aligned}$$

Therefore the total demand requires a capacity of 255,983.4 litres, this volume equates to a tank 12mx2.4m high. The final size is indicated on the structural design drawings. Tank levels are IL15.750, Top of tank RL18.400. Booster suction point 18.750

Regards,
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