

2<sup>nd</sup> April 2017



CIR Construction Pty Limited

Suite 2/84 Bathurst Street Liverpool NSW2170

Attention: Tony Zappia

Dear Tony

**RE: 58-72 Redfern Street Wetherill Park**

**Proposed new High Rack Warehouse**

Reference is made to the request for an estimate of the quantity of water used to fight a fire.

The proposed new high rack warehouse building is planned on land currently occupied by existing buildings. The existing buildings are warehouse and factory buildings and will be demolished and modified as required.

The proposed new high rack warehouse building has a ground floor area of 8,921.2 square metres.

In the event of a fire alarm being received Fire and Rescue NSW will attend the premises. If fire has started, FRNSW will utilise the on-site fire-fighting infrastructure as necessary. The fire hydrant site infrastructure will include a fire brigade booster assembly and external fire hydrants and an upgraded fire hydrant pump.

It is not possible to know how much water will be required to contain and extinguish any given fire, so the design fire for fire sprinklers and the design fire for fire hydrants has been adopted as the basis to estimate water requirements.

Because the building will be fire sprinklered throughout (all buildings on the site are fully fire sprinkler protected), it is a reasonable expectation that the fire sprinklers will contain a fire outbreak as designed.

The fire sprinkler system design for the high rack warehouse is not complete yet, but the design criteria (AS2118) driving the water supply demand is likely to be for In-Rack fire sprinklers, a design flow of 2,640 litres per minute and for below roof sprinklers a design flow of 2,500 litres per minute. The fire sprinkler design fire in accordance with AS2118.1 is required to be provided with water for 90 minutes.

With a contingency of over 10%, the fire sprinkler water supply requirement is assumed to be 6,000 litres per minute and for 90 minutes operation, the design fire would require 540,000 litres.

However, in the event that other fire extinguishment is needed, site fire hydrants would be operated by FRNSW fire fighters.

The site fire hydrant system design in accordance with AS2419 (Table 2.1) is to be capable of operating with 3 hydrants running at 10 litres per second each (30 litres per second) for a fire sprinklered building greater than 10,000 square metres.

FRNSW in metropolitan areas have Class 2 and Class 3 pumpers (Fire trucks) available, A Class 2 pumper is able to provide a water pumping capacity of 2,900 litres per minute and a Class 3 pumper is able to provide a water pumping capacity of 3,500 litres per minute. This is more than adequate to cater for a design fire as described in the next paragraph.

The Fire Brigade Booster assembly to serve the site has provision for the connection of two fire pumpers to draw water from the 300mm diameter towns main in Redfern Street and to direct water onto the fire through the site fire hydrant system. If one Class 2 and one Class 3 pumper attend a fire on site, the maximum simultaneous flow they can theoretically achieve is 6,400 litres per minute (or 106 litres per second).

This exceeds the design capability and requirement of the site system. However, it demonstrates that FRNSW has the capability to pump at a flow rate at least equal to the design flow rate.

At the design flow of 30 litres per second, water will be consumed at a rate of 108,000 litres per hour. Design water storage from AS2419.1 is four hours, so a total of 432,000 litres is required.

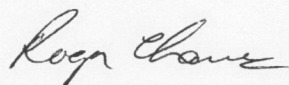
For the design fire, a total of  $540,000 + 432,000 = 972,000$  litres of water is required.

If it is assumed that all of this water is needed in order to contain a fire (ie. no losses), this volume of water needs to be contained to reduce the risk of environmental damage from active water borne fire-fighting operations.

If it is further assumed that this water is contained within the footprint of the building, the lowest floor of the new high rack warehouse could be utilised and banded to contain water to a depth of 108.9mm ( $972,000/8,921.2 = 108.95$ ). Freeboard and construction tolerance needs to also be considered and is proposed as 50%;  $108.9 + (108.9/2) = 163.3$ mm

A bund height of 165 mm around the perimeter of the lowest floor of the new high rack warehouse is therefore proposed in order to contain this water volume of 972,000 litres.

Yours faithfully



Director

Roger Chance Pty Ltd