COMPLETED PROJECTS

SITE:	Perth Children's Hospital
LOCATION:	Nedlands
SCOPE OF WORK:	Fire Sprinkler, Gas Suppression, Deluge systems
COMPLETION DATE:	September 2016

The new hospital is located on the QEII Medical site in Nedlands and will provide tertiary-level health services including inpatient and outpatient care. The hospital has 298 patient beds, 12 operting theatres, an integrated research and education facility and WA's only paediatric trauma centre. The project is approximately 120,000 sqm, spread over 8 storeys (4 towers/3 podium levels) and an extensive basement under the entire footprint of the structure. The double skinned façade incorporates a mechanism to filter the sun's rays, which is designed to assist in cooling the building and contributing to energy efficiency.

SCOPE DETAIL:

Within our scope for this project we were tasked with the design and construct contract for all the Wet Fire services (Combined fire sprinkler/fire hydrant system), Hose Reels, Fire Extinguishers, Fire Booster Pumps, Fire Water Storage tanks, Pre Action Fire Sprinkler systems, Helipad Fire Suppression/Deluge system and Gaseous Suppression systems in accordance with:

- A fully compliant combined fire sprinkler/fire hydrant system designed and installed to AS2118.6
- A fully compliant Fire Hose Reel system to AS2441 installed throughout the basement and car parking levels.

- Compliant portable extinguishers to AS2444 installed throughout the whole complex.
- One Duty Electric Fire Pump and one Diesel Standby Fire Pump to AS2941 fed wholly from 2 below ground storage fire water tanks of full capacity of approximately 1 million litres.

Note: All the wet fire systems are interfaced with the Fire Detection and EWIS systems installed by others.

Upon completion of the project, Firesafe continue to be on site to maintain all the wet fire systems for the 2 year defects liability period and as required by the current Australian Standard.

To satisfy this requirement, we were tasked to co-operate and co-ordinate this service with the hospital staff in a working hospital.

CHALLENGES & SOLUTIONS

Throughout the project there were various challenges which we had to overcome:

Wall Wetting Sprinklers
With the requirement for this project to have wall wetting sprinklers to the glazed Atrium façade for the East and West buildings to prevent fire from breaking out of a floor level into the Atrium, a design had to be engineered to allow for 3 separate criteria to compliment the architectural ascetic appeal of the project.

Firstly the design had to conform to the Fire Engineered criteria providing the correct flow and pressure of water onto the glazed panels. This was achieved by the use of a software program called Hyena which is used to carry out full hydraulic calculations and will provide the correct amount of water as dictated by the consultant's specification.

Secondly the layout had to meet the current Australian Standard for compliance.

Thirdly it had to satisfy the architectural appeal of the project.

Operating Theatre Complex & MRI Scan Theatre
This area was a major challenge and is protected by a series of Pre Action Sprinkler systems.

We installed 7 separate pre-action sprinkler systems monitoring the Operating Theatres and MRI complex. The Pre-action control vales are housed in a purpose built cabinet and located in the operating theatre plant room on level 4, one level above the operating theatres.

All the sprinkler piping was co-ordinated with the other services in such a manner to allow the pipework to be drained through a drainage pipe system interconnected for the 7 theatres in case of a false activation.

The interface with the other services and the specialised ceiling panels was achieved through close consultation with the specialised contractors, consultants and architects associated with the operating theatre complex.

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Wet Fire Systems Fire Pumping Units

The criteria for the fire pumps was to not only satisfy the requirements of the current Australian standards but to also provide an excess pressure of 20% over and above the calculated system requirements.

To achieve this we selected a single stage pump and with the aid of 2 reduction valve stations located in the fire pump room. By doing this, we were able to reduce the pressure to 1200 kPa for the low rise system and 1700 kPa for the high rise system while still maintaining the 20% requirement at the pumps.

Helipad Wet Fire Protection System

The helipad wet fire system was designed in Singapore however we were tasked with the supply and installation of the deluge valve set and all the pipework suspended below the helipad, which is mounted on huge springs, with the deluge valve located on level 8 in stair 4 one level below the helipad. This pipework is connected to 20 surface mounted nozzles which sit flat on the helipad deck and when under water pressure they all rise up to discharge approximately 4000 litres of water per minute at 800 kPa onto the helicopter when on fire.

This system is so impressive when in operation, as the helicopter deck is not visible through the water spray and mist created. We had to co-ordinate works with the dry fire contractor for system activation as part of this installation.

Floor Control Rooms (FCR)

As there are numerous FCR rooms throughout the project of which 10 are protected with a Proinert Gas System, Firesafe had to co-ordinate works to ensure these where completed effectively. For example the largest FCR room and the most important to run the complex is located in the basement and required 33 Proinert gas cylinders to accommodate its huge volume of space. We achieved this installation by utilising our high specialised technicians.