SITE:	**Zirco Data**
LOCATION:	**WELSHPOOL**
SCOPE OF WORK:	Fire Protection
COMPLETION DATE:	**8th March 2019**
CONTRACT VALUE:	**$1.4M**

CAPSTONE

ZircoDATA
Smarter information management.

Zirco Data is a Records Management & Document storage facility located at 80-92 Sheffield Road in Welshpool. The facility offers a records management and document storage solution that is intergrated and secure by using inventory tracking, document cataloguing, data capture and online access.

Zirco Data is an existing document storage facility and contains high density, high piled document storage. Our installation works were to cover the shortfalls within the current Fire Protection systems to adhere to compliance requirements for this type of facility. A Fire Engineered Solution was adopted to cover the implementations of systems required to bring the systems up to comply with property and life safety standards as set down by the Building Code of Australian and supporting Australian Standards.

Over the years the facility has been expanded with the installation of racked storage to a point where now most of the floor area of the warehouse are covered with racked storage with 3 levels of pedestrain access walkways to the racking. With these additional levels to the premises, the floor area has increased by threefold thus effectively making the existing ESFR roof Sprinkler system inadaquate for compliant building coverage.

SCOPE DETAILS

Within our scope, we were tasked with the design and installation of new and updated Fire Systems in compliance with the Fire Engineering Report.

- An upgrade to the fully compliant Automatic Sprinkler system in accordance with AS2118.1 (1999)
- Additional Fire Detection inclusive of VESDA's and Alarm Systems in accordance with AS1670.1
- Water Mist Systems operated through Deluge Control Valves
- A new Fire Hydrant system internally and externally.
- Additional water storage tank to supply the combined systems.
- Fire Extinguisher installation to Ground, Level 1, 2 & 3

Water Supply:
The existing Fire Service water supply was upgraded to include a back-flow prevention device, and this was mounted inside the existing Allied Pickford Hydrant Booster cabinet. Back flow prevention devices are required with water storage tank installation to stop potential contaminated water flowing back into the potable water supply. Existing hydrants external to the Zirco Data building were capped and removed as part of the upgrade.

Storage Tank:
A second Fire Water storage tank with an effective capacity of 25,000 litres was installed to provide enough firefighting water to the new combined systems installed to the building. The tank is complete with an automatic infill from the fire service connection and refills the tank at the required rate of 10l/sec.

The two Fire Water storage tanks have been linked to a common manifold supplying the existing Fire Pumps with the collective capacity and the tank infill satisfying the demand required to meet the new combined systems hydraulically calculated flow and pressure.

Deluge/Watermist Systems:

Works completed by Firesafe included a Mistex Watermist system split into four (4) zones installed to the racking walkways on the Ground Level, Level 1 and Level 2.

The Watermist systems are a low-pressure system and are activated via a Level 2 VESDA alarm only operating a solenoid on the valve set to release water through to the nozzles.

Pipework has been run down each isle/walkway and the Mistex nozzles have been spaced at 4 metre intervals down these pipe lengths. VESDA sampling pipe also runs the length of these isle/walkways constantly sampling the air for early smoke detection.

A new pipework manifold has been installed and provides the sites water supply through to the Deluge Control Valve sets that control the release of the water to the Mistex nozzles. This manifold also provides the combined link to the new Hydrant systems ring main. This manifold is connected to the existing Pump House and is monitored for low pressure as well as detecting high pressure loss for pump activation.

Sprinkler System:
The existing Sprinkler Control Valve located in the Pump House has been relocated to the new common manifold located inside the Warehouse therefore locating all control valves in a common location.

The existing roof level sprinkler system has been adjusted by the change out of the ESFR sprinklers replacing them with 15mm fast response sprinklers rating the system as Ordinary Hazard Group 1. The sprinkler system to the Office area remains unchanged. The sprinkler system will be monitored for low pressure.

Hydrant System:
A new Hydrant ring main has been installed and runs externally around the entire building. Spur lines run from the ring main into the building providing Hydrant coverage to all levels adjacent to the entry/exit stairways within the building. Spur lines also feed external hydrant providing coverage compliant to the Australian Standards.

Combined Sprinkler/Hydrant Booster:
A new combined Sprinkler/Hydrant booster connection has been provided complete with a 150mm Storz hard suction point that is drawing from the common suction line of the Fire Water storage tanks. Due to the Booster Cabinet not being in view from Sheffield Road, road and gate signage is provided to clearly identify the required path for DFES Fire Appliances to follow.

Fire Detection:

The new Fire Detection works included the expansion and modification of the existing FDCIE Panel to include a cabinet housing the new Aspirating Smoke Detection displays (VESDA) to the same levels and zoning of the Watermist system.

A VESDA panel is located in the field in each zone with all these panels reporting back to the sites existing FIP. New installation works was to also wire the Watermist activation and monitoring from the new control valve locations. Reprogramming of the FIP was required to pick up the new systems and integrate all the existing sites alarms and monitoring.

CHALLENGES & SOLUTIONS

Throughout the project we were faced with various challenges:

- The premises being an existing/operational building, required Firesafe to work closely with the Zirco Data staff to coordinate ours works through the walkways to minimise disruption to both parties.
- Getting pipework feed through into the walkways was challenging and special care had to be taken to avoid damage to the storage rack contents.
- Modifications to the ITP's and Test Packs were required to eliminate hydrostatic testing of Watermist systems pipework. It was considered that having any water in these systems had the potential to damage the stored records within the racks and therefore testing was restricted to pneumatic only.
- The Fire Service main sluice valve required external services to find its location. The valve pit box was not marked and there was no block plan within the Allied Pickford Booster cabinet to
- Relocation of the existing Sprinkler Control Valves identified that routine maintenance may not have been carried out compliant to AS1851 with respect of 5 yearly Control Valve overhaul. The face gasket and seat rubber on this existing valve set was replaced eliminating pressure loss through the valve seat. This systems main stop valve is also passing and may require changing out.
- Interconnection of the new tank to the existing tank was complicated due to the existing tank not having an isolation valve connected directly to the suction outlet. The existing tank does not have a drain valve fitted nor is it fitted with a vortex plate. Existing pipework on the suction lines was found to be in a poor state. All items will need to be addressed in the systems maintenance.
- Various issues existed with the sites main FIP and they have been addressed. Additionally, during commissioning an issue was identified with the EWIS interface and this has been rectified.
- An additional check valve was required to be installed into the old location of the Sprinkler Control Valves. It was found that neither of the pumps check valves are holding pressure in their discharge lines.