

BALANNUP PUMP STATION

JET GROUTING & PERMEATION GROUTING



Owner: Water Corporation
Main Contractor: Georgiou

Specialist Contractor: GFWA

THE PROJECT

Balannup Pump Station has been built to meet the developing requirements of Harrisdale, one of Perth's southern suburbs.

The major structures of the Station were a wet well, a running trap, and a U-box structure that had to be connected to an already existing DN 600 mm corrugated PVC pipe that was buried at an approximate depth of 9 m.

The ground was composed of loose to very dense sand, and groundwater level was reported to be at approximately 2 m below site level.

Connecting the U-box to the existing PVC pipe had to be carried out in the dry and through a shaft that was to be constructed in between the box and the pipe. This task appeared to be very challenging due to the high groundwater level, the high permeability of the sand, the variation in soil strength, the depth of the pipe and excavation, the working space being limited and confined, and the risks associated with water leakage into the shaft and damaging the pipe during shaft construction.

THE ROLE OF GFWA

GFWA was awarded the design and construct contract for building a water tight retaining structure and a base plug to prevent the ingress of water into the work zone.

The retaining structure and plug were both constructed using jet grouting technology. In this technique cement grout is mixed with the in-situ soil at very high pressures to create impermeable columns. The overlapping of the columns prevents water ingress.

Permeation grouting using micro fine cement grout was implemented around the PVC pipe to protect it against the high pressures of jet grouting, and the optimised shape of the retaining structure allowed excavation to proceed to the bottom of the shaft without the application of internal or external supports such as anchors, struts or props.