

GLEDSDOOD HILLS PUBLIC SCHOOL

Preliminary Engineering Assessment

Hydraulic Services

General

- Based on the authority design documents provided by the client which confirms that sewer, water & gas will become available adjacent to the school grounds which can serve our site subject to authority approval.
- The school domestic cold water, fire services and gas will be fed from the proposed authorities utilities located on the south side of road 7 adjacent to the main entry of the proposed school.
- Sub metering can be installed to monitor gas or water usage in certain areas if required.
- The water main pressure statements from Sydney Water will not be available until the mains have been installed and taken over by Sydney Water.
- A site investigation was carried out with pressure readings taken from the golf club level with the top of the site along with residential properties at the lower end of the site and discovered low domestic cold water pressures of 250kpa which would suggest pumps would be required for both the domestic cold water sand fire hydrant systems.
- The school's sewer drainage will be a gravity system according to the Sydney Water hand sketch depicting the proposed sewer mains located at the bottom of the site (north eastern corner).

Cold Water

- A Dial Before You Dig search has been performed and results indicate there is a 200mm PVC water main on the southern side of the proposed road number 7. This will have an adequate supply for connection to feed the school.
- A preliminary pressure reading obtained from site indicates a minimum available pressure of the existing infrastructure to be approximate 47 metres (470kpa) which would suggest pump assistance may not be required for the domestic cold water and fire hydrant supply to the school, this will be verified during the detail design phase of the hydraulic services.
- The cold water service shall provide the necessary quantity of water to each area or fixture. A system shall be designed with acceptable water velocity and pressure drops to deliver water at the minimum required flows and pressures as mentioned.
- The domestic cold water service will reticulate inground outside the buildings and reticulate within the ceiling space within the buildings to serve each wet area.
- The design shall comply with the latest Australian Standards AS 3500.1 to satisfy local authority requirements.

- Recycled non potable water from the roof plumbing shall be used for toilet flushing along with landscape irrigation as stated within the EFSG.
- A fully automatic filtration system will be installed to treat the roof water for reuse. The filtration system will include automatic back wash filters, bag filters and ultra-violet filters to ensure the children's safety from any contaminated aerosols to comply with the EFSG.
- The non-potable cold water supply from the rainwater filtration system will be pressurised via a pump assembly to deliver the required pressure and flow to the required points.
- Preliminary pressure tests carried out in the local area outside of peak times would suggest a pressure pump assembly would be required for the fire hose reels to comply.

Hot Water

- The hot water system shall be designed to be the most economical energy efficient for its proposed use and peak demand requirements.
- Gas fired central hot water plants are to be installed to serve the main areas of use and reticulate via a copper flow and return system to serve the required wet areas, the more remote areas will be served by individual heavy duty electric units within each required wet area.
- The design shall comply with the latest of Australian Standards AS3500.4.
- Maximum inlet supply pressure to all boilers is to be 500 kPa and maximum temperature supply shall be 65°C.
- Insulation will have a zero flame and smoke index and be 25mm thick with a K value of 0.04 w/m K for all hot water flow and return pipework including all dead legs.
- Dead legs in the hot water system shall be avoided and every hot water outlet shall have full temperature within 20 seconds.
- All hot and cold water pipework in wall chases to be pre lagged, Kemlag type.
- Hot water circulating pumps to be dual in operation with "duty pump" - "stand by" principle with pump run and pump fail. Pump sized to limit heat loss from system to 5°C.
- Control valves to be provided to each group of fixtures located within the same room and level.
- Balancing valves to be installed on all hot water return lines where required.
- Provision for expansion and contraction to be provided on all hot water pipework.
- Air release valves to be provided at highest point of main circuit complete with drain.
- Pressure reduction valves to be provided on any branch line in excess of 500 kPa.
- Approved temperature controlling valves shall be installed throughout the buildings to regulate the temperature of the hot water to illuminate the risk of scalding.

Gas

- A Dial Before You Dig search has been performed and results indicate there is a 210kPa Nylon gas main proposed to be installed on the southern side of road number 7. This will have an adequate supply for connection to serve the school's requirements.
- A natural gas system shall reticulate at 5 kpa to serve all required gas fired appliances.
- The whole of the system shall be designed to comply with AS 5601 and local authorities requirements
- A 100 % flame failure device shall be installed on each appliance connected to the gas supply.
- The gas will reticulate at 5 kpa via a boundary meter and regulator assembly and reticulate to each required appliance via inground trenches and in ceiling reticulation.
- Appropriate ventilation whether it be mechanical or natural to be provided to all required appliances.
- All gas pipe work will reticulate inground external to buildings and within ceiling spaces inside the buildings and extend to all required appliances.
- Gas space heating will be installed where required and comply with all of the relevant standards and school ventilation requirements.

Sewer

- A Dial Before You Dig search has been performed and results indicate there is a proposed sewer main ear marked for the south eastern corner of the site. The sanitary drainage and plumbing system shall connect to the Sydney Water Corporation sewer main in the vicinity.
- A sanitary plumbing and drainage system shall be designed to contain the minimum amount of pipework necessary to carry away waste water from each fixture quickly and quietly, discharging to the authority's sewer main.
- The design shall comply with the latest Australian Standards AS 3500.2 to satisfy local authority requirements.
- A waste water system shall drain all sanitary fixtures, floor wastes, tundishes, mechanical overflows and the like and gravitate to the sewer main.
- The system shall include all waste stacks, soil stacks, vents and horizontal drainage required to complete the system.
- The capacity of the system shall be 25% greater than the design loading that includes all horizontal and vertical pipework.
- All disused sewer connections are to be sealed off to the local authority's requirements.

Trade waste drainage

- An inground grease arrester will be installed to serve the canteen area to meet Sydney Water Trade Waste guideline requirements.
- A HDPE trade waste plumbing and drainage system will be installed to cater for the grease waste expected for the canteen area.
- The grease arrester will be positioned external to the building adjacent to the internal parking area for easy maintenance access.
- All trade waste vents will be terminated to the atmosphere on the roof to minimise any odours.
- The school is required to make application to Sydney Water Trade Waste prior to discharging any grease waste into the authority sewer via a grease arrester.

Stormwater

- All roof water plumbing shall discharge into rainwater holding tanks with overflows designed to discharge into the civil in ground stormwater system via a first flush device.
- All roof water plumbing is to be sized to cater for a 20 year storm intensity as per local and standard requirements.
- Stormwater systems shall be designed to the intensity as outlined in Australian Rainfall and Runoff complying with AS 3500.3 Australian Standard for Stormwater drainage.
- Design Major and Minor stormwater systems to collect rainwater from all roofs, balconies, terraces, and the like.
- Minor system - Piped to drain 20 year ARI.
- Refer to civil report for inground stormwater & water sensitive urban design details.

Fire Hydrant Service

- A new fire hydrant system is required to be installed to provide the required coverage for the buildings.
- The design intent is to have an inground fire hydrant ring main configuration complete with isolation valves to allow maintenance to be carried out on the system in 25% intervals as per the relevant codes and standards.
- The fire hydrant booster valve assembly and block plan will be located within sight of the main school entry to comply with the current standards.
- The fire hydrant service shall be designed to provide all hydrants with a fire flow and pressure to comply with the BCA, AS 2419, NSW Fire Brigade requirements and the local council requirements.

- The fire hydrants will be generally located outside the buildings with a minimum distance of 10 metres unless a fire rated heat shield is provided.
- A fire engineered solution can include the omission of fire hose reels in some areas as they are designed for occupant usage.
- Preliminary pressure tests carried out in the local area outside of peak times would suggest a pressure pump assembly is required to comply with current requirements.

Fire Hose Reel Service

- The fire hose reels will be connected to the metered domestic cold water system which is supplied from the existing 200mm authority water main located in the street.
- Fire hose reels (if required) shall be provided within 4 metres of each required exit to maintain a coverage of 36 metre hose length and 4 metres of spray.
- Each internally located fire hose reel shall be housed in a steel cabinet.
- At this stage the available pressure appears to be adequate for the fire hose reel service.
- Fire hose reels are designed to provide the occupant with a first line of defence during a fire along with fire extinguishers however we believe that most of the fire hose reels can be fire engineered out of the project.
- Preliminary pressure tests carried out in the local area outside of peak times would suggest a pressure pump assembly would be required to comply with current requirements.