7.6 Building Services

The 2012 Campus Master Plan retains the previously established strategy of servicing buildings via underground reticulation through designated service routes following the established campus building grid. While the University will continue to manage and minimise its demand for town services, self-sufficiency for the campus is neither feasible nor being contemplated.

Electricity

Presently the University has one main supply route of power supply from the local electricity utility Energex. A secondary supply to the site is provided at the Innovation centre building from Sippy Downs Drive. This connection is a one off situation installed for convenience and cost reasons and will not be extended.

The existing system is a single high voltage (11KV) underground cable system which initially connects to the pad mount transformer at the administration building and then travels in two different locations to supply various pad mount transformers at various buildings on site and one main chamber substation at the central energy plant.

The cabling is located in the allocated electrical conduits that are installed in the services corridor. These conduits were laid as per the original campus master plan and have been extended for each subsequent additional building in accordance with the plan. There remains adequate but not excessive spare capacity in these conduit clusters.

There is presently only one high voltage connection to the University however conduits are in place to allow a redundancy connection to the south west residential area ENERGEX network and the current plan is to connect to a ring network to the north east in Claymore Road. If this occurs then a dramatic improvement in supply continuity should occur.

There are presently no alternative sources of power generation on site other than seven diesel engine based standby power sets. The seven generators are for use in emergency situations to maintain critical systems including Information Technology, laboratory services and refrigeration. They are not used for fire services functions.

For a fledgling campus the pad mounted transformer was an economical solution for providing the power supply to the campus. However, the integration of transformers into future building forms is now considered highly desirable to minimise the disruption to free open space. This also applies for the standby generator units currently based on plinths, external to buildings. All future buildings should be provided with a standby power source unless the nature of the building use is minor or occasional.

Communications

The University has two points of entry to campus for communications services providers. The conduits installed have 100% spare capacity for the future. Communications services have generally followed the original campus services corridors; however there are several minor conduit and cable deviations for specific solutions.

The current standard cluster of communications conduits in the main services trench alignments remains adequate with 100% space capacity for the future.

The current standard of four 100mm conduits in each designated services corridor should be maintained. Each new building should have two points of entry via cast in situ pits from different building frontages whenever practical. With the future development beyond the campus to the north and north-east, the conduit cluster should be advanced to the

boundary of Claymore Road or Old Mountain Creek Road to allow an alternative point of entry to the campus for the communications services.

In the future wireless services should also be considered in order to elevate the campus as close to 100% reliability as can reasonably be achieved.

Water Supply

At present the University has two complete ring mains: a 100mm diameter potable water supply and a 150mm diameter fire main. Pressure in these mains is presently considered adequate towards the top end of the range. Any major high rise building proposed will require sprinkler protection, which will invoke the requirement for a water storage tank due to the potential for future low-pressure flows to the site.

The current supply is adequate for the immediate future but will eventually need duplication to meet continued growth. This is likely to be required beyond 10,000 equivalent full time students.

The original campus master plan should be maintained in its intent; however the water main size should be increased in at least the northern corridor to allow for the future duplication of capacity. The duplication of the connection to the site is a priority for fire fighting purposes and may proceed irrespective of the realisation of the campus building program. The current water storage on site for irrigation should be maintained.

Chilled Water

The existing central energy plant consists of three chillers, one of which is a light load unit. The plant is serviced by a dedicated chamber substation which has capacity for another transformer. The switchboard has been sized to accommodate an additional transformer.

Chilled plant heat rejection is via two water cooled cooling towers. The chilled water reticulation to the various buildings is via an underground network of flow and return chilled water pipes in the allocated services corridor alignment. Both steel and copper piping have been employed in the current network.

The existing central energy plant has been upgraded since the previous review of the Campus Master Plan. This work will continue with the installation of a concrete tank for chilled water storage catering for the University's future growth and further reticulation of chilled water to Building K, enabling provision of chilled water and future air conditioning for this facility.

The University should continue to be proactive in investigating opportunities to supply non-potable water to the cooling towers. If cooling towers are deemed undesirable in the future due to Legionella risk then ground or pond heat rejection should be investigated in preference to air cooled or combined air/water cooled systems. This also follows for heat rejection options should the use of water cooling towers be deemed undesirable.

The current Building Management Strategy is sound and should be maintained. It is essential that all new air conditioning plant should be centrally controlled and monitored unless this is impractical and uneconomical.

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