EXECUTIVE SUMMARY

The proposed ESD approach for the ASRS project has been developed in conjunction with the UTS Campus ESD Masterplan and the regulatory requirements.

The UTS Campus ESD Masterplan and the ASRS Project Brief call for a 4 Star Green Star rating to be achieved for the ASRS facility. The University has agreed to target an equivalent rating if none of the existing Green Star tools are appropriate.

To support the University's ESD aspirations, a project-specific environmental rating tool has been developed on the basis of available Green Star tools. The recommendations made in the Campus ESD Masterplan have also been consolidated into this tool. It should be noted that this approach will not result in a formal certification of the building's environmental performance.

The design team recognises that UTS has a strong focus on sustainability and that the ASRS project is expected to achieve a sustainable low energy design that demonstrates high environmental performance.

The ASRS development is a sustainable action as it reduces space requirement, typically required for book storage in the order of 50%. This reduced space results in reduced space-conditioning loads, and embodied energy, as compared to typical book storage facilities.

Through integrating energy-efficient systems such as a thermal labyrinth, heat recovery system and high-efficiency fans, we are able to provide an energy-efficient solution to regulate the plant loads of ASRS. These are the key ESD strategies considered for ASRS.

Primarily, ASRS has the opportunity to minimise energy demand by taking advantage of the local characteristics of the site. The underground location of ASRS provides it with benefit of inherent thermal-efficiency, due to the earth temperatures being constant at this depth of 15 metres below ground.

The proposed design approach lays emphasis on utilising the passive heating and cooling strategies to supplement the mechanical services arrangement.

A thermal labyrinth would be incorporated around the ASRS, to take advantage of the constant temperature of the surrounding earth. The labyrinth will be integrated into the service plenum around the ASRS vault.

When outside-air is made to pass through this labyrinth, it exchanges heat with the surrounding walls to precondition. Depending on the season, the outside air will either be cooled in summer or heated in winter, and this approach will reduce the air-conditioning load. Since, the air-conditioning load of the ASRS remains largely unaffected by the outside temperature conditions, the labyrinth would have excess capacity that can be utilised for other adjacent buildings, such as the Thomas Street building.

Another key strategy is to incorporate a 'heat recovery system'. The heat recovery system would capture waste heat from relief air and transfer it to the supply air. This process involves passing the relief air from the ASRS vault to a heat-recovery unit that consists of an enthalpy wheel, which is essentially an air-to-air heat exchanger.

As the supply and relief air flow through the enthalpy wheel, the heat from the relief air is transferred to the incoming supply air. This process can be reversed to provide cooling during hotter periods of the year.

Through detailed analysis it has been determined that the labyrinth has the capacity to serve the ASRS facility and also has spare capacity that can be utilised to serve adjacent buildings, such as the future Thomas Street building.

In addition to the above strategies, the other ESD initiatives that would be incorporated to achieve an environmentally sustainable design include:

- Specification and installation of energy-efficient equipment – mechanical, electrical and lighting
- Incorporate humidity control measures to prevent mould growth.
- Energy metering to facilitate monitoring of energy use.
- Environmentally preferrable materials will be utilised. This includes non-PVC, low VOC, low formaldehdye products and FSC certified timber products.