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**SUPPORTING DATA****MASTER PLAN****10 Utilities****Utilities Supporting Data**

The Purpose of the Utilities Element is to ensure adequate provision of utility services required to meet the future needs of the University including the following:

- Ensure provision of adequate steam (or heating water) and chilled water supply;
- Ensure provision of adequate electric power supply and other fuels;
- Ensure provision of adequate supply and distribution facilities of telecommunication systems.

**HOT WATER AND CHILLED WATER SUB-ELEMENT****1. Facilities Data**

**1.a. Chilled Water Source:** The central chilled water plant for the FAU Davie campus includes three centrifugal chillers and 3 primary chilled water circulating pumps. Chillers 1 and 2 were installed in 1992 and each is rated at 400 tons capacity. Chiller 3 is rated at 400 tons and was installed in 1998. The total plant capacity at present is 1200 tons. There are three cooling towers serve these three chillers. The plant has available land for future expansion.

**1.b. Chilled Water Distribution:** Chilled water is distributed through the campus in a direct buried piping system. The existing 12 inches primary chilled water supply and return pipes run from the central plant to the east of campus then split to 10" and 8" pipes. The 10" primary chilled water pipes continue to the east end of the existing campus. The 8" pipes run north then east to the C.B.S. Building. The secondary pumps were installed in each building.

**1.c. Heating Hot Water Source:** There is no hot water heating system in the campus. Heating is provided by electric duct heaters in each occupied space.

**2. Facility Capacity**

**2.a. Chilled Water System Capacity:** The existing chiller plant has enough capacity to support current usage and the proposed Student Center.

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- 2.b. Chilled Water System Expansion:** The chiller plant can be expended to the west side of the existing building. The primary chilled water loop will need to be modified to accommodate additional capacity.
- 3. Accommodating Future Chilled Water Requirements**
- 3.a. Existing and New Chiller Plants:** The Concept Scenarios for future campus expansion includes the addition of buildings whose total cooling requirement will exceed the capacity of the existing central plant. In addition, each scenario includes buildings located in campus areas which are not served by the present system. Adding new chillers to the existing plant is recommended for the existing campus. Adding a new chiller plant at the new site is recommended since extending primary chilled water piping across the College Avenue will be very difficult. A feasibility study will be required for extending primary chilled water pipes to the new site. As a generalization, central plants offer the advantages of lower operating and maintenance cost as chilled water equipment sized to serve a campus operates more efficiently than equipment sized to serve a single building. A few machines in a central plant, even in the larger sizes, require less maintenance effort than multiple small machines serving buildings individually.
- 3.b. Piping Extensions:** Piping from the existing central plant should be extended to the future buildings located at the existing site. This will allow modifications to the existing piping to allow the existing plant to serve new buildings built as in-fill in the existing campus and allow existing buildings to be served from the central plant. It appears to be sufficient land at the west side of existing chiller plant for building expansion to accommodate new chillers to the existing central plant. The expansion of the existing chiller plant should have minimum impact to the adjacent buildings.
- 3.c. Concept Scenarios:** The concept scenario evaluated will require additional cooling capacity at some point in the growth of the campus. An expansion of the existing chilled water system and adding a new chiller plant at the new site is recommended.
- 3.d. Growth to East, North and West:** For schemes involving growth to the East, North or West of the existing campus, the existing central energy plant should be utilized for chilled water service. For Schemes involving the growth in the new site located at the west of College Avenue, a new central utility plant should be added for the future buildings. A feasibility study will be required to size the central plant and the future

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expansion.

- 3.e. Isolated Buildings:** Isolated buildings, buildings are far away from existing chilled water loop, might be served by stand-alone air conditioning (chillers or direct expansion) and heating equipment. Life cycle analysis between the cost and energy consumption of connection to the central plant and stand-alone equipment will be required.

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**SUPPORTING DATA****MASTER PLAN****10 Utilities****ELECTRIC POWER AND OTHER FUELS SUB-ELEMENT****1. Facilities Data**

- 1.a. Distribution:** The existing FAU/BCC campus is fed from multiple FPL primary feeders coming from College Ave. primary lines. The new land to the west of College avenue has minimal FPL lines on it. The major concern would be the primary feeder traversing across the property at the north end which currently feeds the US Dept of Agriculture to the northwest.

**2. Capacity**

- 2.a. FPL Feeders:** The FPL primary feeders that currently feed the east side of College Ave. are nearly loaded to capacity. This may mean the requirement of bringing in a new primary feeder underground from College Ave to expand the existing chiller plant or to place buildings east of College Ave. On the new property west of College Ave there will need to be new primary feeders required to accommodate master plan layout.

**3. Accommodating Future Electrical Power Requirements**

- 3.a. Future Expansion:** All future power expansion will best be achieved via underground primary FPL (owned and operated) distribution in granted easements. This will continue the current trend for this campus which also mimics the distribution at the North Palm Beach Campus.
- 3.b. Concept Scenarios:** Two other possible scenarios of power distribution include: a) Overhead lines (owned and operated by FPL) which are unsightly and subject to wind damage and therefore not recommended; and b) Underground owned and operated by FAU. This scenario is also not recommended as FAU incurs capital costs for installation as well as costs for ongoing maintenance and replacement.

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**SUPPORTING DATA****MASTER PLAN****10 Utilities****TELECOMMUNICATIONS SUB-ELEMENT****1. Facilities Data**

**1.a. Existing Service:** Existing distribution throughout the site is a combination of fiber and copper network owned, operated, and maintained by FAU. The fiber network is the preferred method of delivery on site to be utilized and expanded upon.

**2. Capacity:** The capacity and speed of the existing OC12 (622MBPS) is adequate for the existing campus plus expansion to future for standard internet and phone connections.

**3. Accommodating Future Telecommunications Requirements**

**3.a Future Expansion:** The future expansion throughout the campus will be new fiber optic cables (extension of OC12 network) via underground duct banks and handholes throughout the site. These will run in parallel with all power distribution throughout the site to accommodate ease of locating in the future, and routing to buildings.

**3.b. Concept Scenarios:** Two other possible scenarios of communication distribution include: a) Overhead lines (owned and operated by Bell South) which are unsightly and subject to wind damage and therefore not recommended; b) Underground owned and operated by Bell South tied back into existing OC12 network. This is not recommended as FAU incurs additional service charges for connections and bandwidth that may not be used in the expansion as well as relinquishing control of flexibility for their system.