10.0 UTILITIES ELEMENT

PURPOSE

The purpose of this element is to ensure adequate provision of utility services required to meet the future needs of the University including the following:

a) Ensure provision of adequate chilled water supply to meet future University needs;

b) Ensure provision of adequate electric power supply and other fuels to meet Future University needs;

c) Ensure provision of adequate supplies of natural gas or other fuels to meet future University needs; and

d) Ensure provision of adequate supply and distribution facilities for telecommunication systems required to meet future University needs.

Chilled Water Sub-Element

(1) DATA REQUIREMENTS. This sub-element shall be based, at a minimum, on the following data requirements:

The following summary and analysis of the chilled water system is based on existing utility maps, data and workshop meeting with FIU staff.

a) An inventory of the existing chilled water distribution systems on the campus indicating locations and sizes of main distribution lines.

MODESTO A. MAIDIQUE CAMPUS

The campus core is served by a chilled water system consisting of a chiller plant and a substation or secondary chiller plant with their complementary equipment and a common piping distribution loop. The combined plants house seven (7), chillers, five (5) in the main and two (2) in the sub/secondary plant, six (6) cooling towers, four (4) at the main and two (2) at the sub/secondary plant, there are ten (10) condenser pumps, eight (8) at the main and two (2) at the sub/secondary plant, five (5) primary chilled water transport pumps consisting of three (3) at the main, and two (2) at the sub/secondary plant, plus a dedicated chilled water pump for each chiller at both plants central plants consisting of a total of seven (7) dedicated chilled water pumps.

Table 10.1 Existing Chilled Water System – MODESTO A. MAIDIQUE CAMPUS

Building	Conditioned SF	Approximate A/C Tonnage
Viertes Haus (VH)	56,000	233
Engineering & Computer Science	65,200	189
Owa Ehan	140,800	587
Chemistry & Physics	176,800	737
Graham Center – East	96,800	457
Graham Center – West	70,400	426
Ryder Business Building	41,200	167
Deuxiem Maison (DM)	100,000	418
Perry Building (PC)	162,000	675
Health Care Wellness Center	11,600	38
Ziff Education Building	41,200	173
Panther Residence Hall	80,000	350
Wertheim Performing Arts Center –East	48,400	201
Wertheim Performing Arts Center –West	52,000	217
Green Library	208,400	869
Labor Center	17,600	74
College of Health	8,000	28
Conservatory & Greenhouse	5,000	17
University Tower	195,000	561
MARC	75,000	363
Everglades Hall	135,000	403
Health & Life Science I & II	195,000	1210
School of Architecture	48,000	336
Health Care Wellness Center Expansion	23,000	56
Recreation Center I	45,000	170
Law School		467
Lakeview Housing		373
Art Museum		183
Graduate Business I		346
Total		10,324

SOURCE: FIU Central Chilled Water System Engineering Study December, 2009

A set of three primary transport pumps circulates the water through the piping loop and its extensions. Green Library, Owa Ehan, Engineering, Chemistry/ Physics,

and Ryder Business Administration buildings have two (one standby) secondary chilled water pumps. Primera Casa has one secondary pump and University Center has two separate secondary systems, one with an inline pump and the other with 4 through a valved transfer loop. The primary/secondary transfer loop in most buildings is pressure controlled through an automatic mixing valve.
There is a separate 200 ton capacity "Trane" air cooled chiller operating on R-22 refrigerant with its own circulating pump. This chiller is locally connected to the main loop at the Owa Ehan Building. Pharmed Arena has two 200 ton (each) York chillers operating on R-11 refrigerant. These chillers have their own chilled water circulating pumps.

BISCAYNE BAY CAMPUS

A Central Utility Building located in a service yard near the Wolfe University Center produces the chilled water that is circulated throughout Biscayne Bay Campus. The Central Utility Building houses three chillers, cooling towers, condenser, and chilled water transport pumps. Chilled water is conveyed through the campus via underground and exposed supply and return pipes. Table 10.2 shows the buildings, which are served by the chilled water system.

Table 10.2 Existing Chilled Water System – BISCAYNE BAY CAMPUS

Building	Conditioned SF	Approximate A/C Tonnage
Wolfe University Center	87,658	219
Academic One	78,667	197
Academic Two	55,786	140
Hospitality Management	46,222	116
The Library	82,332	206
Student Health & Wellness	15,000	38
Student Health Clinic	1,567	4
Kovens Conference Center	57,604	144
Marine Biology	48,000	191
Total	472,836	1255

SOURCE: Facilities Operations

The chilled water from the Plant is circulated through the pipe network by primary transport pumps. The Library, Wolfe University Center, Academic One building and Kovens Conference Center have in-line single pump secondary systems drawing chilled water from the primary network. These three buildings have the secondary pumps located on a platform which renders them accessible for servicing. Each of the remainder buildings have two pumps for the secondary systems, one of them

being a standby unit (see Figure 10.3: Existing Chilled Water Distribution Map).

The "BRDG-TNDR" brand automatic valving system has been replaced by frequency drives on buster pumps at each building, except the Kovens Conference Center.

OTHER UNIVERSITY SITES

Engineering Center

The Engineering Center has three (3) chillers, one (1) new 1,000.00 ton and two (2) older 600.00 tons that are stated for replacement in the near future. All three circuits are presently stand alone with it's respective cooling towers, condenser pumps and chilled water pumps. There are primary chilled water pumps for the entire loop.

b) The following data shall be included for the chilled water facilities identified in (1) a):

1. The entity having operation responsibility for the facility;

MODESTO A. MAIDIQUE CAMPUS

Florida International University has operation responsibility for the chilled water system.

BISCAYNE BAY CAMPUS

Florida International University has operation responsibility for the chilled water system.

OTHER UNIVERSITY SITES

Engineering Center

Florida International University has operation responsibility for the chilled water system.

2. The geographic service area of the facility and the predominant types of land uses served by the facility;

MODESTO A. MAIDIQUE CAMPUS

The geographic service area is Modesto A. Maidique Campus. The predominant types of land uses served by the facility are; academic, support and recreation.

BISCAYNE BAY CAMPUS

The geographic service area is Biscayne Bay Campus. The predominant types of land uses served by the facility are; academic, support and recreation.

OTHER UNIVERSITY SITES

Engineering Center

The geographic service area is Engineering Center. The predominant types of land uses served by the facility are; academic and support.

3. The design capacity of the facility;

MODESTO A. MAIDIQUE CAMPUS

Cooling capacity of the plant is indicated in Table 10.3.

Table 10.3 Chiller Capacity – MODESTO A. MAIDIQUE CAMPUS

Number	Tons	Manufacturer	Refrigerant	Arrangement
1	1500	Trane	123	Parallel
2	1500	Trane	123	Parallel
3	1500	Carrier	134A	Parallel
4	1500	Trane	123	Parallel
5	1500	Carrier	134A	Parallel
1A	1500	Carrier	134A	Parallel
2A	1500	Carrier	134A	Parallel
Total	10,500*			

Source: Facilities Operations
*Based on the Chilled Water System Engineering Study (July 2000), several older machines have been replaced and total chilled water capacity in the main plant is 7500 tons

BISCAYNE BAY CAMPUS

Cooling capacity of the plant is indicated in Table 10.4.

Table 10.4 Chiller Capacity – BISCAYNE BAY CAMPUS

Number	Tons	Manufacturer	Refrigerant	Arrangement
1	1,250	Carrier	134-a	Parallel
2	1,280	Trane	123	Parallel
3	325	McQuay	134-a	Parallel
Total	2,880*			

Source: Facilities Operations

OTHER UNIVERSITY SITES

Engineering Center

4. The current demand on the capacity of the facility;

MODESTO A. MAIDIQUE CAMPUS

The completion of the Phase II Central Plant Expansion (recommended in the Central Chilled Water System Engineering Study of July, 2000), provided adequate capacity, with minimal redundancy for the inclusion of newly additions of the Research and Development Facility, Museum, and Academic Bldg. Since then, other new facilities have come on line such as New Housing Facilities, and Law School which led to the addition of a satellite chiller plant, which houses two (2) 1500 ton chillers and associated components and equipment interconnected to the existing loop to provide a total plants producing capacity of 10,500 tons of cooling to the main chilled water loop.

BISCAYNE BAY CAMPUS

With the implementation of the 1995 Chilled Water Study recommendations, the system capacity of 2,880 tons is adequate.

OTHER UNIVERSITY SITES

Engineering Center

5. The level of service provided by the facility.

MODESTO A. MAIDIQUE CAMPUS

At the present time, the Chiller Plant has approximately a 14% redundancy in capacity and a multiple distribution of chillers for safe operation. The building has been designed and the piping prepared for an expeditious expansion.

BISCAYNE BAY CAMPUS

At the present time, the Chiller Plant has approximately a 56% redundancy in capacity and a multiple distribution of chillers to provide safe operation.

OTHER UNIVERSITY SITES

Engineering Center

(2) ANALYSIS DATA REQUIREMENTS. This sub-element shall be based, at a minimum, on the following analyses:

a) A facility capacity analysis, by geographic service area, indicating capacity surpluses and deficiencies for:

1. Existing conditions, based on the facility design capacity and the current demand on facility capacity;

MODESTO A. MAIDIQUE CAMPUS

The existing transport capacity is adequate for the addition of three new buildings (Research & Development Facility, Museum, and Academic Building) with one pump redundant for standby. Beyond that no new major facilities should be added to the campus without serious considerations of expanding the existing central chilled water plant and distribution system which could be interconnected to the existing facilities.

BISCAYNE BAY CAMPUS

With the implementation of the 1995 Chilled Water Study recommendations, the system capacity of 2,880 tons is adequate.

The Central Utility Building houses three chillers, cooling towers, condenser, and chilled water transport pumps. Of the three chillers, the 1,280 ton Trane chiller is used regularly. The 1,280 ton Trane chiller uses the least amount of energy because it operates on low pressure system, whereas the 1,250 Carrier chiller must run at a minimum of 70% to service Biscayne Bay. The 325 ton McQuay

chiller is used only in the winter, and the 1,250 ton Carrier chiller serves as a backup system and remains redundant. With approximately 56% redundancy in capacity, there is a surplus in the capacity of the chilled water system.

OTHER UNIVERSITY SITES

Engineering Center

2. The end of the planning time frame, based in the projected demand at current level of service standards for the facility, projected student populations and land use distributions, and any available existing surplus facility capacity.

MODESTO A. MAIDIQUE CAMPUS

There are several new buildings or expansions to existing ones in the planning stages. These buildings are in the general area of the main core. Therefore, it is planned to serve them from the Central Chiller Plant.

The buildings under design are: FIU Arena, Nursing and Health Sciences and Social Sciences buildings. The total projected square footage of air-conditioned space for this imminent expansion is 85,000 square feet. The air conditioning load increase reflected is of 298 tons. However, after any one of these two new buildings is added there will be no chiller redundancy.

BISCAYNE BAY CAMPUS

The existing primary chilled water pump capabilities presently surpass the existing demand. This system is adequate to guarantee primary flow through the piping network, and with a 56% redundancy it is also capable of meeting the demand of future expansions.

OTHER UNIVERSITY SITES

Engineering Center

b) The general performance of existing chilled water facilities, evaluating the adequacy of the current level of service provided by the facility, the general condition and expected life of the facility, and the impact of the facility upon adjacent natural resources.

MODESTO A. MAIDIQUE CAMPUS

The existing transport capacity is adequate for the additional buildings with one pump redundant for standby. Beyond that no new major facilities should be added to the campus without serious considerations of expanding the existing central

chilled water plant and distribution system which could be interconnected to the existing facilities.

BISCAYNE BAY CAMPUS

With the implementation of the 1995 Chilled Water Study recommendations, the system capacity of 2,880 tons is adequate. The existing primary chilled water pump capabilities presently surpass the existing demand. This system is adequate to guarantee primary flow through the piping network, and with a 56% redundancy it is also capable of meeting the demand of future expansions.

OTHER UNIVERSITY SITES

Engineering Center

Information will need to be obtained to complete this response.

c) An assessment of opportunities or available and practical technologies to reduce University energy consumption. Investigation of emerging technologies to address this issue is encouraged.

MODESTO A. MAIDIQUE CAMPUS

Today and even more in the near and distant future any utility planning, especially the production of chilled water, needs to consider devices to conserve energy and produce/distribute it efficiently.

BISCAYNE BAY CAMPUS

Today and even more in the near and distant future any utility planning, especially the production of chilled water, needs to consider devices to conserve energy and produce/distribute it efficiently.

OTHER UNIVERSITY SITES

Engineering Center

Electrical Power and Other Fuels Sub-Element

(1) DATA REQUIREMENTS. This sub-element shall be based, at a minimum, on the following data requirements:

The following summary and analysis of the electrical power system at FIU is based on workshop meetings with FIU staff.

a) An inventory of the electrical power supply distribution system on the campus indicating locations and sizes of main distribution lines.

MODESTO A. MAIDIQUE CAMPUS

The electrical transmission and distribution system serving Modesto A. Maidique Campus presently consists of two primary voltage (13.2 KV) underground feeders which run in a north-south direction up to 107th Avenue and 117th Avenue respectively. Since each feeder originates at a different substation, and each has the rated capacity to energize all campus loads, the campus intrinsically has flexibility and back-up capabilities in the event that any one feeder should fail. See Figure 10.4: Existing Electrical Distribution).

In addition, a new third primary voltage feeder which originates from the new FPL substation built on an easement located at the southwest corner of the campus is completed. This new underground feeder which borders the Modesto A. Maidique Campus/Miami-Dade County Fair and Exposition boundary on the campus side runs in an easterly direction towards 107th Avenue. This new underground ductbank is provided with strategically placed intermediate manholes to allow for taps and extensions to service the campus expansions. This transmission and distribution system provides the campus with unmatched service reliability against possible brownouts.

BISCAYNE BAY CAMPUS

The electrical transmission and distribution system serving Biscayne Bay Campus consists of two primary voltage (13.2 KV) feeders routed through an underground conduit ductbank network. The entry route of these feeders trains the existing entry road to the Central Utilities Building. Each feeder has the rated capacity to individually handle the electrical consumption of the entire campus. However, one feeder is designated as the main service, while the second feeder is designated as a backup circuit, which is interconnected via an automatic throwover mechanism within the transformer vaults to automatically come on line in the event of a main service feeder failure. This design provides the highest level of service reliability to the campus (see Figure 10.6: Existing Electrical Distribution).

In addition to the two primary feeders described above, there is an existing primary voltage overhead feeder which is dead ended near the southeast region of the campus at 135th Street. If required, this feeder could be routed down a riser underground and extended into the campus network to develop a second service loop. However, since only one line is available, it would not provide the reliability of the throw over back-up service.

OTHER UNIVERSITY SITES

Engineering Center

The electrical distribution system serving Engineering Center, consists of two primary voltage (23KV) feeders routed through an underground ductbank network. These feeders enter the OU Building and terminate at the main Switchgear. Each feeder has the rated capacity to individually handle the electrical consumption to the entire campus. Both circuits are available for service. At the main switchgear in the OU Building, one feeder is designated as the main service and the second feeder as a backup, which is interconnected manually via a tie breaker in the event of a main feeder failure. This design provides a high level of reliability.

b) An inventory of any other fuel storage or distributions facilities on the campus indicating their location, size and sizes of main distribution lines (if applicable).

MODESTO A. MAIDIQUE CAMPUS

There are several emergency generators located on campus, that backup the electrical system in the event of a blackout. These generators are located at the following buildings: Engineering and Computer Sciences, Wertheim Conservatory, Owa Ehan, Chemistry and Physics, Tower, Herbert and Nicole Wertheim Performing Arts Center, Management and Advanced Research Center, Deuxiem Maison, Health and Life Sciences, Everglades Hall, Cenral Utilities, Viertes Haus, Charles E. Perry, Parking Garage 3, Parking Garage 4, Ernest R. Graham Center and at various Campus Support buildings.

Fuel storage and distribution facility is located is located at the Campus Support Complex Vechicle Services Facility. The storage facility has a 6000 gallon gasoline tank and a 6000 gallon tank diesel tank. In addition, for distribution, it has a trailer mounted 500 gallon diesel tank.

BISCAYNE BAY CAMPUS

There are two emergency generators located on campus, that backup the electrical system in the event of a blackout. One generator serves the Academic One, part of the Wolfe University Center, and part of the Central Utility building. Another generator is located at the Kovens Conference Center, it backups the lighting, elevators, and computer room outlets.

OTHER UNIVERSITY SITES

Engineering Center

c) The following data shall be included for the electrical power distribution

system facilities identified in (1) a):

1. **The entity having operational responsibility of the facility;**

   MODESTO A. MAIDIQUE CAMPUS

   Florida Power and Light provides services to Modesto A. Maidique Campus.

   BISCAYNE BAY CAMPUS

   Florida Power and Light provides services to Biscayne Bay Campus.

   OTHER UNIVERSITY SITES

   Engineering Center

   Florida Power and Light provides services to Engineering Center.

2. **The geographic service area of the facility and the predominant types of land uses served by the facility;**

   MODESTO A. MAIDIQUE CAMPUS

   The geographic service area is Modesto A. Maidique Campus. The predominant types of land uses served by the facility are; academic, support and recreation.

   BISCAYNE BAY CAMPUS

   The geographic service area is Biscayne Bay Campus. The predominant types of land uses served by the facility are; academic, support and recreation.

   OTHER UNIVERSITY SITES

   Engineering Center

3. **The design capacity of the facility;**

   MODESTO A. MAIDIQUE CAMPUS

   The design capacity of the facility is not available. Electrical design is done on a per building basis, rather than considering the impact on the entire campus. In

order to calculate the electrical design capacity, an in-depth analysis of the electrical design (riser diagrams) for each building must be done. Therefore, further analysis is required to compute the design capacity of Modesto A. Maidique Campus, as well as Engineering Center.

BISCAYNE BAY CAMPUS

The design capacity of the facility is not available. Electrical design is done on a per building basis, rather than considering the impact on the entire campus. In order to calculate the electrical design capacity, an in-depth analysis of the electrical design (riser diagrams) for each building must be done. Therefore, further analysis is required to compute the design capacity of the campus.

OTHER UNIVERSITY SITES

Engineering Center

4. The current demand on the capacity of the facility;

MODESTO A. MAIDIQUE CAMPUS

The current electrical distribution system is adequate for the existing and short-term program improvements. The threat of blackouts for Modesto A. Maidique Campus facilities was minimized by the two incoming electrical power feeds from the substation.

Electrical power distribution system should be extended to all long-term program improvements through the above master electrical feed systems. Specific routing and sizing should be evaluated when more details are known about these long-term program improvements.

BISCAYNE BAY CAMPUS

The current electrical distribution system is adequate for the existing and short-term program improvements. The threat of blackouts for Biscayne Bay Campus facilities was minimized by the two incoming electrical power feeds from the substation.

Electrical power distribution system should be extended to all long-term program improvements through the above master electrical feed systems. Specific routing and sizing should be evaluated when more details are known about these long-term program improvements.

OTHER UNIVERSITY SITES

Engineering Center

5. The level of service provided by the facility.

MODESTO A. MAIDIQUE CAMPUS

The LOS for the energy system (electrical, fuel oil, and L.P. gas combined) will be at the required therms per gross square foot (maximum).

BISCAYNE BAY CAMPUS

The LOS for the energy system (electrical, fuel oil, and L.P. gas combined) will be at the required therms per gross square foot (maximum).

(2) ANALYSIS DATA REQUIREMENTS. This sub-element shall be based, at a minimum, on the following analyses:

a) A facility capacity analysis, by geographic service area, indicating capacity and the current demand on facility capacity;

1. Existing conditions, based on the facility design capacity and the current demand on facility capacity,

MODESTO A. MAIDIQUE CAMPUS

The current electrical distribution system is adequate for the existing and short-term program improvements. The threat of blackouts for Modesto A. Maidique Campus facilities was minimized by the two incoming electrical power feeds from the substation.

Electrical power distribution system should be extended to all long-term program improvements through the above master electrical feed systems. Specific routing and sizing should be evaluated when more details are known about these long-term program improvements.

BISCAYNE BAY CAMPUS

The current electrical distribution system is adequate for the existing and short-term program improvements. The threat of blackouts for Biscayne Bay Campus facilities was minimized by the two incoming electrical power feeds from the substation.

Electrical power distribution system should be extended to all long-term program improvements through the above master electrical feed systems. Specific

routing and sizing should be evaluated when more details are known about these long-term program improvements.

2. The end of the planning time frame, based in the projected demand at current level of service standards for the facility, projected student populations and land use distributions, and any available existing surplus facility capacity.

MODESTO A. MAIDIQUE CAMPUS

The electrical transmission and distribution system serving Modesto A. Maidique Campus presently consists of two primary voltage (13.2 KV) underground feeders. Since each feeder originates at a different substation, and each has the rated capacity to energize all campus loads, the campus intrinsically has flexibility and back-up capabilities in the event that any one feeder should fail.
In addition, a third primary voltage feeder which originates from the new FPL substation built on an easement located at the southwest corner of the campus is completed. This underground ductbank is provided with strategically placed intermediate manholes to allow for taps and extensions to service the campus expansions. This transmission and distribution system provide the campus with unmatched service reliability against possible brownouts.

BISCAYNE BAY CAMPUS

The electrical transmission and distribution system serving Biscayne Bay Campus consists of two primary voltage (13.2 KV) feeders. Each feeder has the rated capacity to individually handle the electrical consumption of the entire campus. However, one feeder is designated as the main service, while the second feeder is designated as a backup circuit, which is interconnected via an automatic throwover mechanism within the transformer vaults to automatically come on line in the event of a main service feeder failure. This design provides the highest level of service reliability to the campus.

In addition to the two primary feeders described above, there is an existing primary voltage overhead feeder which is dead ended near the southeast region of the campus at 135th Street. If required, this feeder could be routed down a riser underground and extended into the campus network to develop a second service loop. However, since only one line is available, it would not provide the reliability of the throwover back-up service.

b) The general performance of existing electrical power and other fuel facilities, evaluating the adequacy of the current level of service provided by the facility, the general condition and expected life of the facility, and the impact of the facility upon adjacent natural resources.

MODESTO A. MAIDIQUE CAMPUS

As previously noted, the existing three primary voltage feeders designed to service Modesto A. Maidique Campus have both the required rating and capacity to accommodate all planned expansions. Existing primary feeders should be intercepted at manhole locations, tapped and extended via underground conduit ductbanks to planned expansion locations. From there, and based upon square footage and projected equipment loads, either pad mounted transformers or transformer vaults can be specified to provide the distribution voltages required by the end user.

In order to maximize the utility kilowatt hour consumption rate as well as providing streamlined electrical equipment, planned building expansions should take advantage of incentive and rebate program offered by Florida Power and Light, designed to help minimize consumption requirements especially at peak demand hours. These incentive programs include thermal energy storage, energy efficient lighting such as T-8 and compact fluorescent lamps, electronic ballast and automated building lighting control systems.

The energy efficient technologies described above will be expanded upon in upcoming sections of this report when alternative plans are discussed.

BISCAYNE BAY CAMPUS

Presently, the existing primary voltage feeders can accommodate sufficient capacity to expand upon and service the projected growth at Biscayne Bay Campus. Therefore, electrical service for planned building expansions would tie into and extend the existing primary feeders to either transformer vaults or padmounted transformers to provide the utilization voltage required.

In order to maximize the existing feeder's capabilities to their fullest potential, all new building designs should incorporate energy conservation programs favored by FPL to both reduce the overall KW consumption and acquire favorable KW per KWH usage rates. These energy conservation programs would include automatic lighting control, energy efficient T-8 lamps, electronic ballasts, LED exit signs, compact fluorescent lighting, and thermal energy storage.

The energy efficient technologies described above will be expanded upon in upcoming sections of this report when alternative plans are discussed.

c) An assessment of opportunities or available and practical technologies to reduce University energy consumption. Investigation of emerging technologies to address this issue is encouraged.

MODESTO A. MAIDIQUE CAMPUS

Electrical power distribution system should be extended to all long-term program improvements through the above master electrical feed systems. Specific routing and sizing should be evaluated when more details are known about these long-term program improvements.

BISCAYNE BAY CAMPUS

Electrical power distribution system should be extended to all long-term program improvements through the above master electrical feed systems. Specific routing and sizing should be evaluated when more details are known about these long-term program improvements.

Telecommunications Systems Sub-Element

(1) DATA REQUIREMENTS. This sub-element shall be based, at a minimum, on the following data requirements:

The following summary and analysis of the telecommunication at FIU will be verified from a response to inquiries made to designated FIU personnel.

a) An inventory of the existing telecommunications system(s) serving the campus, including but not limited to:

1. Telephone;

MODESTO A. MAIDIQUE CAMPUS

Modesto A. Maidique Campus voice communications system is serviced by the Bell South "ESSX" service. The Campus main telephone feeder originates at 107th Avenue and enters into the cable plant located at the PC Building. This cable plant, which provides the voice communications throughout the campus, is owned and maintained by Bell South which provides it as part of the ESSX service rate.

BISCAYNE BAY CAMPUS

The voice communications system at Biscayne Bay Campus is served from a "Rolm CBX 9000" system. This cable plant, located at the Academic Two building, is owned, operated, maintained and managed by the University.

OTHER UNIVERSITY SITES
Engineering Center

Engineering Center voice communications system is serviced by Bell South

"ESSX" service. The site main telephone feeder originates at 107th Avenue and enters in to the cable plant located at the Utilities building. This cable plant, which consists of copper provides voice communication as well as dedicated circuits throughout the site, is owned and maintained by BellSouth, which provides it as part of the ESSX service rate.

2. Computer network(s);

MODESTO A. MAIDIQUE CAMPUS

The data communications system at Modesto A. Maidique Campus is comprised of two networks: the FIUnet and the Administration Network. The FIUnet system is a fiber-optic cable based transmission system which links Primera Casa, Deuxieme Maison, Owa Ehan, Engineering & Computer Science, Viertes Haus, Graham Center, Green Library, Health Wellness Center, and Physical Science. The operation, maintenance and management of this fiber network is the responsibility of the University. The Administrative Network which services the end users is a twisted pair, copper cable based, dedicated data circuit system. The data circuits required to run or expand the system are leased from Bell South via the cable plant located at the Primera Casa building (see Figure 10.7: Existing Telecommunications Network).

The data communications system at the Engineering site is comprised of two networks: FIUnet and EICnet. The FIUnet system is a fiber-optic cable based transmission system, which links both the CEAS and Utility buildings. The operation, maintenance and management of this network are the responsibility of the University. The EICnet system is a fiber-optic cable as well as twisted copper pair cabling based transmission system, which links all users within the EICnet system. The operation, maintenance and management of this network are the responsibility of the College of Engineering (see Figure 10.8: Existing Telecommunications Network).

BISCAYNE BAY CAMPUS

The data communications system is divided into two networks: FIUnet and the Administration Network. FIUnet is a fiber-optic cable based distribution system which expands to the following buildings: Academic One, Hospitality Management, The Library, and Wolfe University Center. This fiber network is owned, operated, maintained and managed by the University.

The Administrative Network is a twisted pair copper cable based, dedicated data circuit system to service the end users. Although the University owns the cable plant, the required number of lines are leased from Bell South (see Figure 10.9: Existing Telecommunications Network).

3. **Radio;**
4. **Microwave;**
5. **Satellite transmission/reception.**

Information was not available to complete the required response.

b) An inventory of electromagnetic fields (if any) emanating from any telecommunications transmitter that pose a hazard to persons or equipment.

Information was not available to complete the required response.

(2) ANALYSIS DATA REQUIREMENTS. This sub-element shall be based, at a minimum, on the following analyses:

a) A facility capacity analysis, by geographic service area, indicating capacity and the current demand on facility capacity;

1. Existing conditions, based on the facility design capacity and the current demand on facility capacity,

Information was not available to complete the required response.

2. The end of the planning time frame, based in the projected demand at current level of service standards for the facility, projected student populations and land use distributions, and any available existing surplus facility capacity.

MODESTO A. MAIDIQUE CAMPUS

In order to increase telecommunications reliability, a second main telephone feeder should be extended into the campus from 117th Avenue. This second feeder should be strategically located in such a fashion with the existing telecommunications network to form a loop around the campus.

BISCAYNE BAY CAMPUS

Telecommunication extensions for planned building expansions will follow the established path of transmitting via fiber optic cables and distributing to end users via a copper based twisted pair network. Four inch communication conduit ductbanks should be extended from the existing cable plant at Academic Two via intermediate manholes to service the building expansions.

b) The general performance of existing telecommunications systems and facilities, evaluating the adequacy of the current level of service provided by the facility, the general condition and expected life of the facility, and the

impact of the facility upon adjacent natural resources.

MODESTO A. MAIDIQUE CAMPUS

Network technology has undergone a rapid evolutionary process over the course of the last decade. Today, organizations still rely on separate network infrastructures to transmit data and voice traffic. The challenge of integrating voice and data networks is becoming a rising priority for many organizations. Modesto A. Maidique Campus plans to take advantage of the synergies gained by converging data and voice onto a single multiservice IP network. An IP-based network that integrates data and voice introduces the opportunity to a new world of technologies that increases productivity and provides a more efficient allocation of resources. This multiservice network will serve Modesto A. Maidique Campus's communication needs well into the future.

In order to achieve the multiservice network, the communication conduit infrastructure needs to be reevaluated. A proposed conduit layout of four-inch communication conduit duct-banks will provide redundancy among core buildings on the campus and a single conduit path for the boundary buildings on the campus. The conduit layout could be made more robust by providing redundancy to every building on campus.

BISCAYNE BAY CAMPUS

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c) An assessment of potential electromagnetic hazards resulting from facilities required to meet future telecommunications needs of the University, and an analysis of practical ways to mitigate such hazards.

Information was not available to complete the required response.