10.0 UTILITIES ELEMENT

The purpose of this element is to ensure coordinated provision of utility services required to meet the future needs of the University, consistent with current efforts to address sustainability on campus such as the development of a Climate Action Plan (a responsibility as a signatory of the American College and University Presidents Climate Commitment) and the university-driven direction that all new facilities meet United States Green Building Council (USGBC) standards and be LEED Silver or higher. This includes the following:

a) Provision of a chilled water supply
b) Provision of electric power supply and other fuels

CHILLED WATER: The requirements imposed by Florida International University Expansion of Facilities on the chilled water generation and distribution are three-fold. First is the upgrade of the Plant's ability to pump the chilled water to all the growth areas, coupled with the energy efficiency optimization of the generating and pumping equipment. Third is the incremental increase in capacity of the plant to satisfy the higher chilled water demands imposed by new buildings.

ELECTRICAL POWER: Electrical energy is furnished to Florida International University by Florida Power and Light (FP&L). They master plan their facilities to satisfy all campus expansion. Close coordination must be maintained with them so the needs of new buildings are provided. Additionally, FP&L offers various incentive programs that may be used by the University to improve the energy consumption of their lighting and chiller systems. FIU should support efforts by FPL to maintain adequate generating capacity and reduce greenhouse gas emissions.

TELECOMMUNICATIONS: The existing telecommunications grid has been heavily used in some areas of Modesto A. Maidique Campus. The planning priorities are to expand the grid to serve new buildings and to reinforce the existing grid by adding new ductbanks. Another area of development is the creation of a second feed at Modesto A. Maidique Campus so the grid has the reliability of two sources of off-Campus communication.

For all updated information pertaining to utilities and infrastructure, a copy of the *Utility Infrastructure Survey Update* is on file in the offices of FIU Facilities Planning and Construction.

10.0 UTILITIES ELEMENT

Chilled Water Sub-Element

MODESTO A. MAIDIQUE CAMPUS

GOAL 1: **Ensure the existing underground chilled water distribution system is not in conflict with future development indicated in the updated master plan.**

Objective 1.1 Coordinate proposed new development with existing and future underground chilled water distribution and locate proposed buildings to avoid existing underground chilled water piping or include chilled water piping relocation in the program requirements for each development.

Policy 1.1.1 Address underground chilled water piping conflicts with proposed buildings established in the 14.0 Capital Improvement Element and as indicated in Figure 10.1 as follows:

A3 Library / Study Expansion
A12 Social Studies / Humanities
S7 Frost Museum Expansion

Policy 1.1.2 In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling for all campus buildings and other applicable improvements. This investment in BIM, 3D Civil and GIS would (ultimately) reduce maintenance costs, reduce design costs, reduce need for utility relocation, serve as an aid for emergency services, provide better electronic wayfinding, etc., etc.

GOAL 2: **Upgrade the chilled water generation and distribution system to efficiently serve Modesto A. Maidique Campus's present and future needs.**

Objective 2.1 Extend the existing chilled water piping loop to maintain the current level of service standard for existing facilities and to serve the new areas of projected growth. Refer to Figure 10.1. The timing and phasing requirements and priorities for the improvements identified in the following policies are established in the 14.0 Capitol Improvement Element.

Policy 2.1.2 Establish defined utility corridors for underground chilled water distribution piping coordinated with future roadway improvements, new buildings and building additions. Refer to Figure 10.1 for

proposed chilled water distribution routing.

Policy 2.1.1 Establish chilled water flow required at each expansion segment so piping sizes may be established. Cumulative flow requirements will be instrumental in determining the parameters for the Chiller Plant capacity upgrade and pumping ability.

Policy 2.1.2 Update the University Building Standards to clearly establish piping loop materials and methods of installation. Similarly establish parameters for the piping, controls, and pumping arrangements for the connection of new buildings to the piping loop.

Objective 2.2 Chilled Water Production and Pumping System Upgrade:
Increase chilled water production capacity and chilled water pumping capacity to accommodate additional demands associated with the capital improvements identified under Element 14.0.

Policy 2.2.1 Increase chilled water production capacity using the available space planned for future chillers within the existing plants to serve new building demands. The timing and phasing requirements and priorities for the improvements identified in the following policies are established in the 14.0 Capital Improvements Element. The estimated chilled water production capacity requirements are indicated below:

Present to 2015		
Building Tag	Building Description	Estimated Tonnage
A14	Mango Building	290 Tons
A15	Solar House	0 Tons
A16	Stocker Astroscience Building	40 Tons
A18	Academic Health Building 5	480 Tons
S5	Student Academic Support Center	520 Tons
N/A	First Floor Support (Not Keyed)	1,400 Tons
F2	Central Utilities	50 Tons
H5	Parkview Housing	1,200 Tons
PG6	Parking Garage 6 / Transit Hub	100 Tons
	Total DesignTonnage (Present to 2015)	**4,080 Tons**
2015 to 2020		
Building Tag	Building Description	Estimated Tonnage
A3	Library / Study Expansion	550Tons
A11	Academic 11	360 Tons
A12	Social Studies / Humanities	310 Tons
A13	SIPA II	240 Tons

A19	Honors College	400 Tons
A20	Academic Health Center Library Addition	400 Tons
S3	Chapel / President's Park Pavilion	20 Tons
S4	Alumni Center	190 Tons
S6	Graham Center	700 Tons
S7	Frost Museum	80 Tons
R1	Expanded Track and Field	0 Tons
R2	Rec Center Expansion	165 Tons
R3	Expanded Training Facility	250 Tons
H1	Parkview Housing 2	1175 Tons
H3	Honors College Housing	500 Tons
	Total Design Tonnage (2015 to 2020)	**5,340 Tons**
	Total Design Tonnage (Present to 2020)	**9,420 Tons**

Please note that projected loads are not taking in consideration the calculated campus diversity factor of 83.5%.

Policy 2.2.2 Upgrade and modify pumping system to operate with the existing and expanded piping loop. The timing and phasing requirements and priorities for the improvements identified in the following policies are established in the 14.0 Capital Improvements Element.

Policy 2.2.3 New developments identified as Partnership buildings shown on Figure 10.1 shall be stand alone facilities. Each building shall have dedicated cooling production equipment. These buildings will not connect to the campus chilled water loop. The new Partnership buildings indicated in the 14.0 Capital Improvement Elements and shown on Figure 10.1 for the Present to 2020 planning period are:

P3 Medical Arts Pavilion 2
P5 Ambulatory Care Center

Policy 2.2.4 Cooling towers are a significant source of water consumption. Consideration shall be given to installation of water meters for make-up water supply and cooling tower blown down to monitor consumption and avoid sewer fees associated with the water that is evaporated from the cooling tower.

GOAL 3: In the process of upgrading the chilled water generation and distribution system, optimize the entire operation to reduce energy costs by increasing operational efficiency.

Objective 3.1 Convert Direct Expansion Systems to Chilled Water:
Convert existing direct expansion systems to chilled water operation.

Policy 3.1.1 Ensure that the chilled water production capacity, pumping capacity and piping distribution can accommodate the additional demand of the existing buildings currently served by direct expansion systems.

Policy 3.1.2 Extend the existing main chilled water loop to serve the existing housing units, Greek Housing at the northeast corner of the Campus.

Objective 3.2 Provide means to measure and verify the efficiency of the HVAC systems serving the campus.

Policy 3.2.1 Install chilled water meters the chilled water plant to monitor overall chilled water consumption and demand.

Policy 3.2.2 Install chilled water meters for each building on campus served by the campus chilled water system to monitor chilled water consumption and demand at the building level.

ENGINEERING CENTER

GOAL 4: Ensure the existing underground chilled water distribution system is not in conflict with future development indicated in the updated master plan.

Objective 4.1 Coordinate proposed new development with existing underground chilled water distribution and locate proposed buildings to avoid existing underground chilled water piping or include chilled water piping relocation in the program requirements for each development.

Policy 4.1.1 The proposed buildings in the updated campus master plan do not conflict with existing underground chilled water distribution. Confirm underground chilled water piping does not conflict with new development of the campus.

Policy 4.1.2 In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling for all campus buildings and other applicable improvements. This investment in BIM, 3D Civil and GIS would (ultimately) reduce maintenance costs, reduce design costs, reduce need for utility relocation, serve as an aid for emergency services, provide better electronic wayfinding, etc., etc.

GOAL 5: Maintain the chilled water generation and distribution system to efficiently serve the Engineering Center present and future needs.

Objective 5.1 Extend the existing chilled water piping loop to maintain the current level of service standard for existing facilities and to serve the new

areas of projected growth. Refer to Figure 10.2. The timing and phasing requirements and priorities for the improvements identified in the following policies are established in the 14.0 Capitol Improvement Element.

Policy 5.1.1 Establish defined utility corridors for underground chilled water distribution piping coordinated with future roadway improvements, new buildings and building additions. Refer to Figure 10.2 for proposed chilled water distribution routing.

Policy 5.1.2 Establish chilled water flow required for the expansion segment so piping sizes may be established. Cumulative flow requirements will be instrumental in determining the parameters for the Chiller Plant capacity upgrade and pumping ability.

Policy 5.1.3 Update the University Building Standards to establish clearly piping loop materials and methods of installation. Similarly establish parameters for the piping, controls, and pumping arrangements for the connection of new buildings to the piping loop.

Objective 5.2 Chilled Water Production and Distribution System Upgrade:
Increase chilled water production capacity to accommodate additional demands associated with the capital improvements identified under Element 14.0.

Policy 5.2.1 The chilled water capacity available at the Engineering Center is sufficient to support the proposed buildings through the 2020 master planning time frame.

Policy 5.2.2 Extend the chilled water piping to serve the Academic 1 Building as shown in Figure 10.2 for the 2015 to 2020 planning period. The estimated chilled water requirements to serve the new Academic 1 Building is 320 GPM.

GOAL 6: Optimize the entire operation to reduce energy costs by increasing operational efficiency.

Objective 6.1 Provide means to measure and verify the efficiency of the HVAC systems serving the campus.

Policy 6.1.1 Install chilled water meters the chilled water plant to monitor overall chilled water consumption and demand.

Policy 6.1.2 Install chilled water meters for each building on campus served by the campus chilled water system to monitor chilled water consumption and demand at the building level.

GOAL 7: **Ensure the existing underground chilled water distribution system is not in conflict with future development indicated in the updated master plan.**

Objective 7.1 Coordinate proposed new development with existing underground chilled water distribution and locate proposed buildings to avoid existing underground chilled water piping or include chilled water piping relocation in the program requirements for each development.

Policy 7.1.1 Address underground chilled water piping conflicts with proposed buildings established in the 14.0 Capital Improvement Element and as indicated in Figure 10.3 as follows:

A2 Media Innovation Center
A4 Environmental Communications
H1 Student Housing

Policy 7.1.2 In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling for all campus buildings and other applicable improvements. This investment in BIM, 3D Civil and GIS would (ultimately) reduce maintenance costs, reduce design costs, reduce need for utility relocation, serve as an aid for emergency services, provide better electronic wayfinding, etc., etc.

GOAL 8: **Upgrade the chilled water generation and distribution system to efficiently serve Biscayne Bay Campus's present and future needs.**

Objective 8.1 Extend the existing chilled water piping loop to maintain the current level of service standard for existing facilities and to serve the new areas of projected growth. Refer to Figure 10.3. The timing and phasing requirements and priorities for the improvements identified in the following policies are established in the 14.0 Capitol Improvement Element.

Policy 8.1.1 Establish chilled water flow required at each expansion segment so piping sizes may be established. Cumulative flow requirements will be instrumental in determining the parameters for the Chiller Plant capacity upgrade and pumping ability.

Policy 8.1.2 Establish defined utility corridors for underground chilled water distribution piping coordinated with future roadway improvements, new buildings and building additions. Refer to Figure 10.3 for proposed chilled water distribution routing.

Policy 8.1.3 Update the University Building Standards to establish clearly piping loop materials and methods of installation. Similarly establish parameters for the piping, controls, and pumping arrangements for the connection of new buildings to the piping loop.

Objective 8.2 Chilled Water Production and Pumping System Upgrade:
Increase chilled water production capacity and chilled water pumping capacity to accommodate additional demands associated with the capital improvements identified under Element 14.0.

Policy 8.2.1 Increase chilled water production capacity to serve new building demands. Additional chiller capacity must be added to the system to maintain the N+1 redundancy for any expansion during the Present to the 2015 planning period. This may be accomplished by the replacement of the existing chiller that is currently out of service. All alternatives will require an upgrade of the condenser water (cooling towers and pumps) system. The timing and phasing requirements and priorities for the improvements identified in the following policies are established in the 14.0 Capital Improvements Element. The estimated chilled water production capacity requirements are indicated below:

Present to 2015		
Building Tag	Building Description	Estimated Tonnage
A3	Seas Expansion	180 Tons
H1	Student Housing	800 Tons
	Total Tonnage (Present to 2015)	**980 Tons**
2015 to 2020		
Building Tag	Building Description	Estimated Tonnage
A1	Graduate Hospitality	45 Tons
A2	Media Innovations Center	300 Tons
	Total Tonnage (2015 to 2020)	**345 Tons**
	Total Tonnage (Present to 2020)	**1,325 Tons**

Policy 8.2.2 Upgrade and modify pumping system to operate with the existing and expanded piping loop. The timing and phasing requirements and priorities for the improvements identified in the following policies are established in the 14.0 Capital Improvements Element.

Policy 8.2.3 New developments identified as Partnership buildings shown on Figure 10.3 shall be served by chilled water production equipment

dedicated for each building. The new Partnership buildings indicated in the 14.0 Capital Improvement Elements and shown on Figure 10.3 are for beyond the 2020 planning period.

Policy 8.2.4 The new Facility Support Building (F1) shown on Figure 10.3 is beyond the 2020 planning period. Due to the distance from the campus chilled water distribution system, the master plan should consider stand-alone cooling system equipment for this building in lieu of connecting to the campus chilled water distribution system.

Policy 8.2.5 Cooling towers are a significant source of water consumption. Consideration shall be given to installation of water meters for make-up water supply and cooling tower blown down to monitor consumption and avoid sewer fees associated with the water that is evaporated from the cooling tower.

GOAL 9: In the process of upgrading the chilled water generation and distribution system, optimize the entire operation to reduce energy costs by increasing operational efficiency.

Objective 9.1 Convert Direct Expansion Systems to Chilled Water:
Convert existing direct expansion systems to chilled water operation.

Policy 9.1.1 Ensure that the chilled water production capacity, pumping capacity and piping distribution can accommodate the additional demand of the existing buildings currently served by direct expansion systems.

Objective 9.2 Provide means to measure and verify the efficiency of the HVAC systems serving the campus.

Policy 9.2.1 Install chilled water meters the chilled water plant to monitor overall chilled water consumption and demand.

Policy 9.2.2 Install chilled water meters for each building on campus served by the campus chilled water system to monitor chilled water consumption and demand at the building level.

<u>Electrical Power and Other Fuels (Energy) Sub-Element</u>

MODESTO A. MAIDIQUE CAMPUS

GOAL 10: Ensure the existing underground electrical distribution system is not in conflict with future development indicated in the updated master plan.

Objective 10.1 Coordinate proposed new development with existing electrical distribution and locate proposed buildings to avoid existing

underground electrical distribution or include underground electrical distribution relocation in the program requirements for each development.

Policy 10.1.1 Address underground electrical distribution conflicts with proposed buildings established in the 14.0 Capital Improvement Element and as indicated in Figure 10.4 as follows:

A3 Library / Study Expansion
A4 Academic 4
A12 Social Studies / Humanities
A19 Honors College
H3 Main Street Housing
H4 Honors College Housing
S2 Support 2
S6 Graham Center Expansion
P6 MAP 1
P7 Partnership
P8 Sweetwater Pedestrian Bridge

Policy 10.1.2 In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling for all campus buildings and other applicable improvements. This investment in BIM, 3D Civil and GIS would (ultimately) reduce maintenance costs, reduce design costs, reduce need for utility relocation, serve as an aid for emergency services, provide better electronic wayfinding, etc., etc.

GOAL 11: Extend the utility power primary voltage network to efficiently serve the campus in its present and future configurations.

Objective 11.1 Extend the existing electrical power grid coordinated with Florida Power and Light to maintain the current level of service standard to the existing as well as the new buildings

Policy 11.1.1 Extend electrical feeders to planned building expansion at Modesto A. Maidique Campus with increased service capacity. (see Figure 10.4). The planned expansions from Present to 2020 are:

Present to 2015		
Building Tag	Building Description	Estimated Demand
A14	Mango Building	250 KW
A15	Solar House	10 KW
A16	Stocker Astroscience Building	40 KW
A18	Academic Health Building 5	450 KW

S5	Student Academic Support Center	475 KW
N/A	First Floor Support (Not Keyed)	1,225 KW
F2	Central Utilities	50 KW
H5	Parkview Housing	1,120 KW
PG6	Parking Garage 6	250 KW
Total Estimated Demand (Present to 2015)		**3,870 KW**
2015 to 2020		
Building Tag	Building Description	Estimated Demand
A3	Library / Study Expansion	320 KW
A11	Academic 11	320 KW
A12	Social Studies / Humanities	280 KW
A13	SIPA II	210 KW
A19	Honors College	325 KW
A20	Academic Health Center Library Addition	450 KW
S3	Chapel / President's Park Pavilion	20 KW
S4	Alumni Center	175 KW
S6	Graham Center	620 KW
S7	Frost Museum	70 KW
R1	Expanded Track and Field	60 KW
R2	Expanded Recreation Center	300 KW
R3	Expanded Training Facility	225 KW
H1	Parkview Housing 2	1060 KW
H4	Honors College Housing	650 KW
Total Estimated Demand (2015 to 2020)		**5,085 KW**
Total Estimated Demand (Present to 2020)		**8,955 KW**

Policy 11.1.2 The primary service capacity for the partnership buildings shall be coordinated with FP&L and the campus master plan. The partnership buildings may be developed at any time within the campus master planning time period. The planned partnership buildings are:

Partnership Buildings		
Building Tag	Building Description	Estimated Demand
P1	Hotel	825 KW
P2	MAP4	100 KW
P3	MAP2	600 KW
P4	MAP3	900 KW
P5	Ambulatory Care Center	290 KW
P6	MAP1	550 KW
P7	Partnership	600 KW

P8	Sweetwater Pedestrian Bridge	0 KW
	Total Estimated Demand	**3,865 KW**

Policy 11.1.3 Increase primary service capacity at the northeast area of campus to serve future buildings of the Medical Research District. Provide redundant infrastructure necessary for high power reliability required by 24/7 research and healthcare operations. Coordinate with FP&L the service to the area from one of the three underground feeders originating from the International Substation and the replacement of the Tropical Substation feeder to a new feeder from the Flagami Substation that has been proposed by FP&L to be provided as a back-up feeder.

Policy 11.1.4 Establish defined utility corridors for underground chilled water distribution piping coordinated with future roadway improvements, new buildings and building additions. Refer to Figure 10.2 for proposed chilled water distribution routing.

Policy 11.1.5 Maintain close coordination with the local utility, Florida Power & Light (FP&L), so they may tailor their facilities to the projected campus growth. FP&L is responsible for extending their facilities on campus to serve all new buildings. Therefore, Master Plan information must be accessible to FP&L and the University must act as coordinator to guarantee that FP&L planning is in step with Master Plan requirements.

Policy 11.1.6 Establish design guidelines to match FP&L requirements to FIU Building Standards so there is a coordinated design for service entrance to the electrical vaults or pad mounted transformers of new buildings.

GOAL 12: Improve the efficiency of electrically powered equipment aimed at reducing operating costs.

Objective 12.1 Install energy efficient equipment in planned buildings and retrofit existing facilities with energy efficient components.

Policy 12.1.1 Purchase Energy Star rated equipment.

ENGINEERING CENTER

GOAL 13: Ensure the existing underground electricl distribution system is not in conflict with future development indicated in the updated master plan.

Objective 13.1 Coordinate proposed new development with existing underground

electrical distribution and locate proposed buildings to avoid existing underground electrical distribution or include underground electrical distribution relocation in the program requirements for each development.

Policy 13.1.1 The proposed buildings in the updated campus master plan do not conflict with existing underground electrical distribution. Confirm underground electrical distribution does not conflict with new development of the campus.

Policy 13.1.2 In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling for all campus buildings and other applicable improvements. This investment in BIM, 3D Civil and GIS would (ultimately) reduce maintenance costs, reduce design costs, reduce need for utility relocation, serve as an aid for emergency services, provide better electronic wayfinding, etc., etc.

GOAL 14: Extend the utility power primary voltage network to efficiently serve the campus in its present and future configurations.

Objective 14.1 Extend the existing electrical distribution to maintain the current level of service standard for existing facilities and to serve the new areas of projected growth. The timing and phasing requirements and priorities for the improvements identified in the following policies are established in the 14.0 Capitol Improvement Element.

Policy 14.1.1 Establish defined utility corridors for underground electrical distribution coordinated with FP&L, future roadway improvements, new buildings and building additions.

Policy 14.1.2 Extend the FP&L electrical distribution to serve the Academic 1 Building for the 2015 to 2020 planning period. The estimated electrical demand for the new Academic 1 Building is 200 KW.

GOAL 15: Improve the efficiency of electrically powered equipment aimed at reducing operating costs.

Objective 15.1 Install energy efficient equipment in planned buildings and retrofit existing facilities with energy efficient components.

Policy 15.1.1 Purchase Energy Star rated equipment.

BISCAYNE BAY CAMPUS

GOAL 16: Ensure the existing underground electrical distribution system

is not in conflict with future development indicated in the updated master plan.

Objective 16.1 Coordinate proposed new development with existing electrical distribution and locate proposed buildings to avoid existing underground electrical distribution or include underground electrical distribution relocation in the program requirements for each development.

Policy 16.1.1 Address underground electrical distribution conflicts with proposed buildings established in the 14.0 Capital Improvement Element and as indicated in Figure 10.5 as follows:

A1 Graduate Hospitality
A2 Media Innovation Center
A4 Environmental Communications
F1 Facilities Support
H1 Student Housing

The renovation of the existing building labeled P1 (RCCL Housing) indicates the FP&L underground electrical distribution is routed under the existing building based on current campus utility maps. New development is recommended to confirm and verify the actual location of the FP&L underground electrical distribution in this area and assess if relocation of the underground electrical distribution is required.

Policy 16.1.2 In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling for all campus buildings and other applicable improvements. This investment in BIM, 3D Civil and GIS would (ultimately) reduce maintenance costs, reduce design costs, reduce need for utility relocation, serve as an aid for emergency services, provide better electronic wayfinding, etc., etc.

GOAL 17: Extend the utility power primary voltage network to efficiently serve the campus in its present and future configurations.

Objective 17.1 Extend the existing electrical power grid coordinated with Florida Power and Light to maintain the current level of service standard to the existing as well as the new buildings

Policy 17.1.1 Extend electrical feeders to planned building expansion at Biscayne Bay Campus with increased service capacity. (see Figure 10.5). The planned expansions from Present to 2020 are:

Present to 2015		
Building Tag	Building Description	Estimated Demand
A3	Seas Expansion	510 KW
H1	Student Housing	2,000 KW
Total Estimated Demand (Present to 2015)		**2,510 KW**
2015 to 2020		
Building Tag	Building Description	Estimated Demand
A1	Graduate Hospitality	75 KW
A2	Media Innovation Center	300 KW
R2	Multi-Purpose Fields/Tennis & Basketball Courts	750 KW
Total Estimated Demand (2015 to 2020)		**1,125 KW**
Total Estimated Demand (Present to 2020)		**3,635 KW**

Policy 17.1.2 The primary service capacity for the partnership buildings shall be coordinated with FP&L and the campus master plan. The partnership buildings may be developed at any time within the campus master planning time period. The planned partnership buildings are:

Partnership Buildings		
Building Tag	Building Description	Estimated Demand
P1	RCCL Housing	0 KW *
P2	RCCL Training Facility	800 KW
P3	Magnet School	1,350 KW
P4	Academic Health Center	1,000 KW
P5	Wildlife Center	150 KW
P6	Multi-Purpose Academic Building	300 KW
P7	Hotel	1,000 KW
P8	Academic Health Center Housing	550 KW
Total Estimated Demand		**5,150 KW**

Policy 17.1.3 Establish defined utility corridors for underground chilled water distribution piping coordinated with future roadway improvements, new buildings and building additions. Refer to Figure 10.5 for proposed chilled water distribution routing.

Policy 17.1.4 Maintain close coordination with the local utility, Florida Power & Light (FP&L), so they may tailor their facilities to the projected campus growth. FP&L is responsible for extending their facilities on

campus to serve all new buildings. Therefore, Master Plan information must be accessible to FP&L and the University must act as coordinator to guarantee that FP&L planning is in step with Master Plan requirements.

Policy 17.1.5 Establish design guidelines to match FP&L requirements to FIU Building Standards so there is a coordinated design for service entrance to the electrical vaults or pad mounted transformers of new buildings.

GOAL 18: Improve the efficiency of electrically powered equipment aimed at reducing operating costs.

Objective 18.1 Install energy efficient equipment in planned buildings and retrofit existing facilities with energy efficient components.

Policy 18.1.1 Purchase Energy Star rated equipment.

Telecommunications Sub-Element

MODESTO A. MAIDIQUE CAMPUS

GOAL 19: Ensure the existing underground telecommunications system is not in conflict with future development indicated in the updated master plan.

Objective 19.1 Coordinate proposed new development with existing telecommunications distribution and locate proposed buildings to avoid existing underground telecommunications distribution or include underground telecommunications distribution relocation in the program requirements for each development.

Policy 19.1.1 Address underground telecommunication distribution conflicts with proposed buildings established in the 14.0 Capital Improvement Element and as indicated in Figure 10.6. See conflict areas circled on Figure 10.6.

Policy 19.1.2 In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling for all campus buildings and other applicable improvements. This investment in BIM, 3D Civil and GIS would (ultimately) reduce maintenance costs, reduce design costs, reduce need for utility relocation, serve as an aid for emergency services, provide better electronic wayfinding, etc., etc.

GOAL 20: Maintain the level of service for telecommunications and

upgrade it to include multiple communication modes for new and existing buildings.

Objective 20.1 Extend the existing telecommunication underground distribution to maintain the current level of service standard to the existing as well as the new buildings

Policy 20.1.1 Establish defined utility corridors for underground telecommunications distribution coordinated with future roadway improvements, new buildings and building additions. Refer to Figure 10.6 for proposed telecommunications distribution routing.

Policy 20.1.1 Provide annual updates of the design guidelines for duct bank construction, telephone room conditions, sizes and locations, etc. to incorporate advancements in technology.

BISCAYNE BAY CAMPUS

GOAL 21: Ensure the existing underground telecommunications system is not in conflict with future development indicated in the updated master plan.

Objective 21.1 Coordinate proposed new development with existing telecommunications distribution and locate proposed buildings to avoid existing underground telecommunications distribution or include underground telecommunications distribution relocation in the program requirements for each development.

Policy 21.1.1 Address underground telecommunication distribution conflicts with proposed buildings established in the 14.0 Capital Improvement Element and as indicated in Figure 10.7. See conflict areas circled on Figure 10.7.

Policy 21.1.2 In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling for all campus buildings and other applicable improvements. This investment in BIM, 3D Civil and GIS would (ultimately) reduce maintenance costs, reduce design costs, reduce need for utility relocation, serve as an aid for emergency services, provide better electronic wayfinding, etc., etc.

GOAL 22: Maintain the level of service for telecommunications and upgrade it to include multiple communication modes for new and existing buildings.

Objective 22.1 Extend the existing telecommunication underground distribution to maintain the current level of service standard to the existing as well

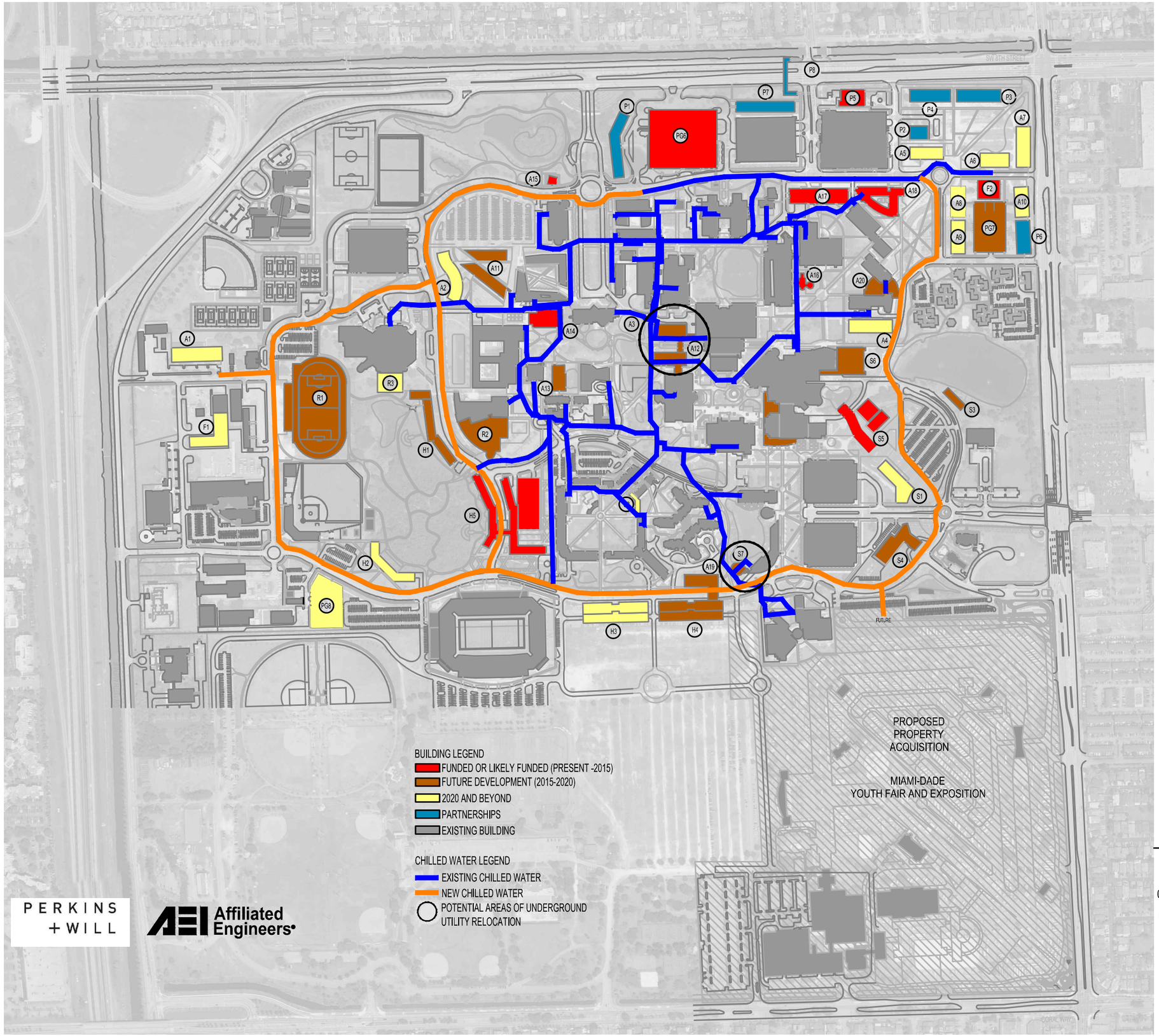
as the new buildings

Policy 22.1.1 Establish defined utility corridors for underground telecommunications distribution coordinated with future roadway improvements, new buildings and building additions. Refer to Figure 10.7 for proposed telecommunications distribution routing.

Policy 22.1.1 Provide annual updates of the design guidelines for duct bank construction, telephone room conditions, sizes and locations, etc. to incorporate advancements in technology.

Objective 22.2 Increase communication service reliability.

Policy 22.2.1 The Biscayne Bay Campus is not provided with redundant telecommunication service. Provide redundant communication service routed along Bay Vista Blvd connecting to NE 135th Street.

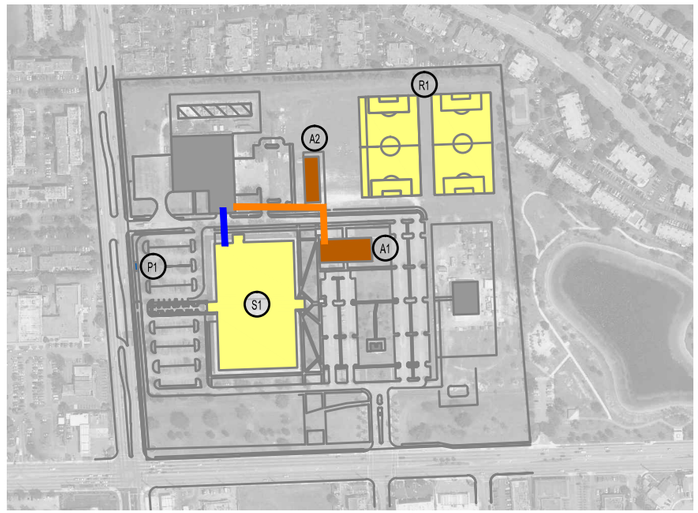


FIU FLORIDA INTERNATIONAL UNIVERSITY

KEY:
A1. ACADEMIC 1
A2. ACADEMIC 2
A3. LIBRARY / STUDY ADDITION
A4. ACADEMIC 4
A5. ACADEMIC 5
A6. ACADEMIC 6
A7. ACADEMIC 7
A8. ACADEMIC 8
A9. ACADEMIC 9
A10. ACADEMIC 10
A11. ACADEMIC 11
A12. SOCIAL STUDIES / HUMANITIES
A13. SIPA II
A14: MANGO
A15: SOLAR HOUSE
A16: STOCKER ASTROSCIENCE
A17: SCIENCE CLASSROOM COMPLEX
A18. ACADEMIC HEALTH CENTER 5
A19. HONORS COLLEGE
A20. ACADEMIC HEALTH CENTER LIBRARY ADDITION
FI. FACILITIES 1
F2: CENTAL UTILITIES
H1. PARKVIEW HOUSING 2
H2. GREEK HOUSING
H3. MAIN STREET HOUSING
H4. HONORS COLLEGE HOUSING
H5. PARKVIEW HOUSING
P1. HOTEL
P2. MEDICAL ARTS PAVILION 4
P3. MEDICAL ARTS PAVILION 2
P4. MEDICAL ARTS PAVILION 3
P5. AMBULATORY CARE CENTER
P6. MEDICAL ARTS PAVILION 1
P7. PARTNERSHIP
P8. SWEETWATER PEDESTRIAN BRIDGE
PG6. PARKING GARAGE 6 / TRANSIT HUB
PG7. FACILITY SUPPORT
PG8. FACILITY SUPPORT
R1. TRACK AND FIELD
R2. REC CENTER EXPANSION
R3. TRAINING FACILITY ADDITION
S1. SUPPORT 1
S2. SUPPORT 2
S3. CHAPEL / PRESIDENT'S PARK PAVILION
S4. ALUMNI CENTER
S5. STUDENT ACADEMIC SUPPORT CENTER
S6. GRAHAM CENTER ADDITION
S7. FROST MUSEUM ADDITION

FIGURE 10.1: CHILLED WATER DISTRIBUTION
MODESTO MAIDIQUE CAMPUS

NORTH
0 125 250 500 1000
Scale: 1:500



KEY
A1. ENGINEERING BUILDING
A2. RESEARCH FIELD
P1. TRANSIT SHELTER
R1. RECREATION FIELDS
S1. FIRST FLOOR INFILL / RENOVATION

BUILDING LEGEND
FUNDED OR LIKELY FUNDED (PRESENT -2015)
FUTURE DEVELOPMENT (2015-2020)
2020 AND BEYOND
PARTNERSHIPS
EXISTING BUILDING

CHILLED WATER LEGEND
EXISTING CHILLED WATER
NEW CHILLED WATER

FIGURE 10.2: CHILLED WATER DISTRIBUTION
ENGINEERING CENTER

PERKINS + WILL

Affiliated Engineers

NORTH

0 125 250 500 1000

Scale: 1:500

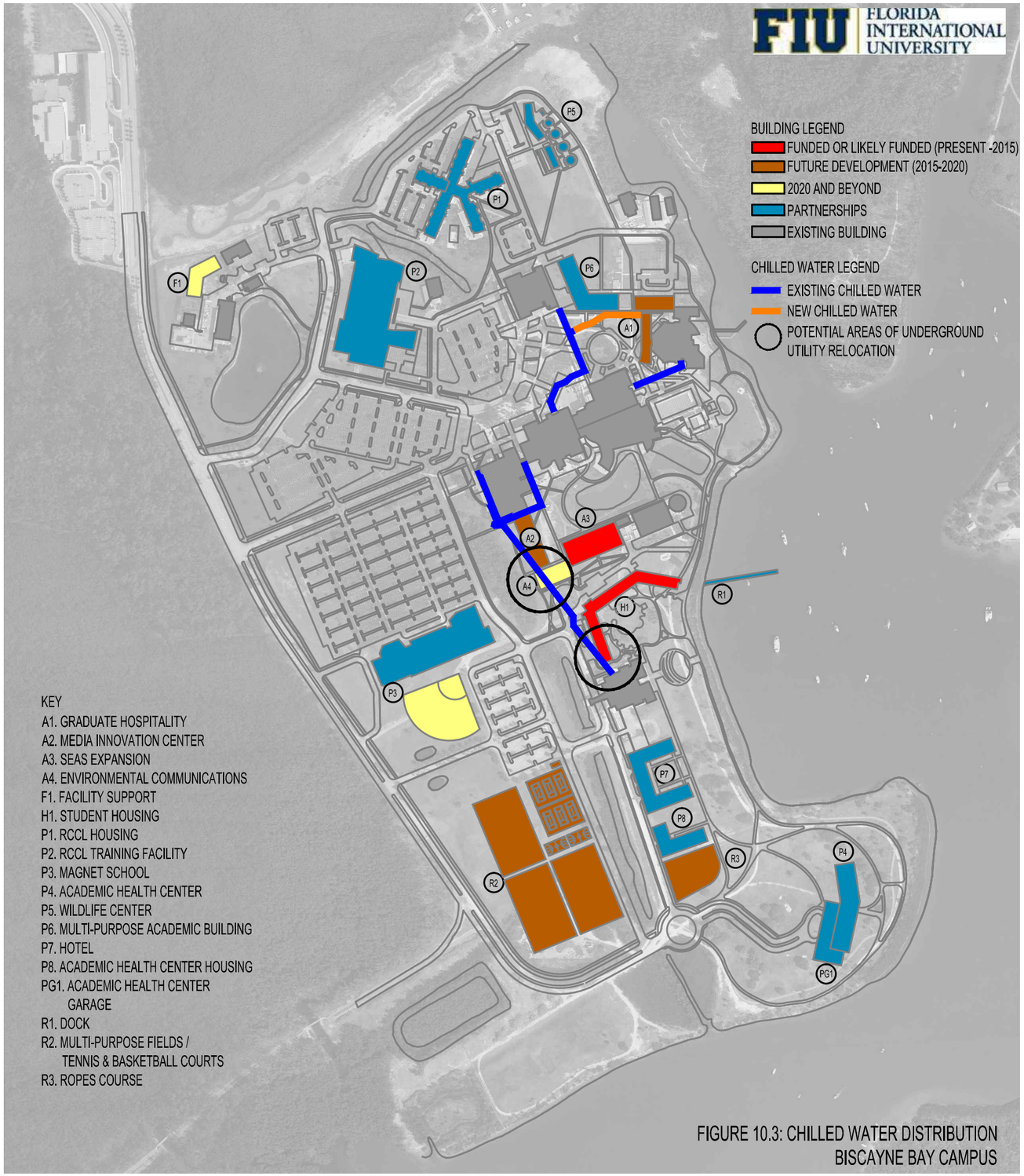


FIGURE 10.3: CHILLED WATER DISTRIBUTION
BISCAYNE BAY CAMPUS

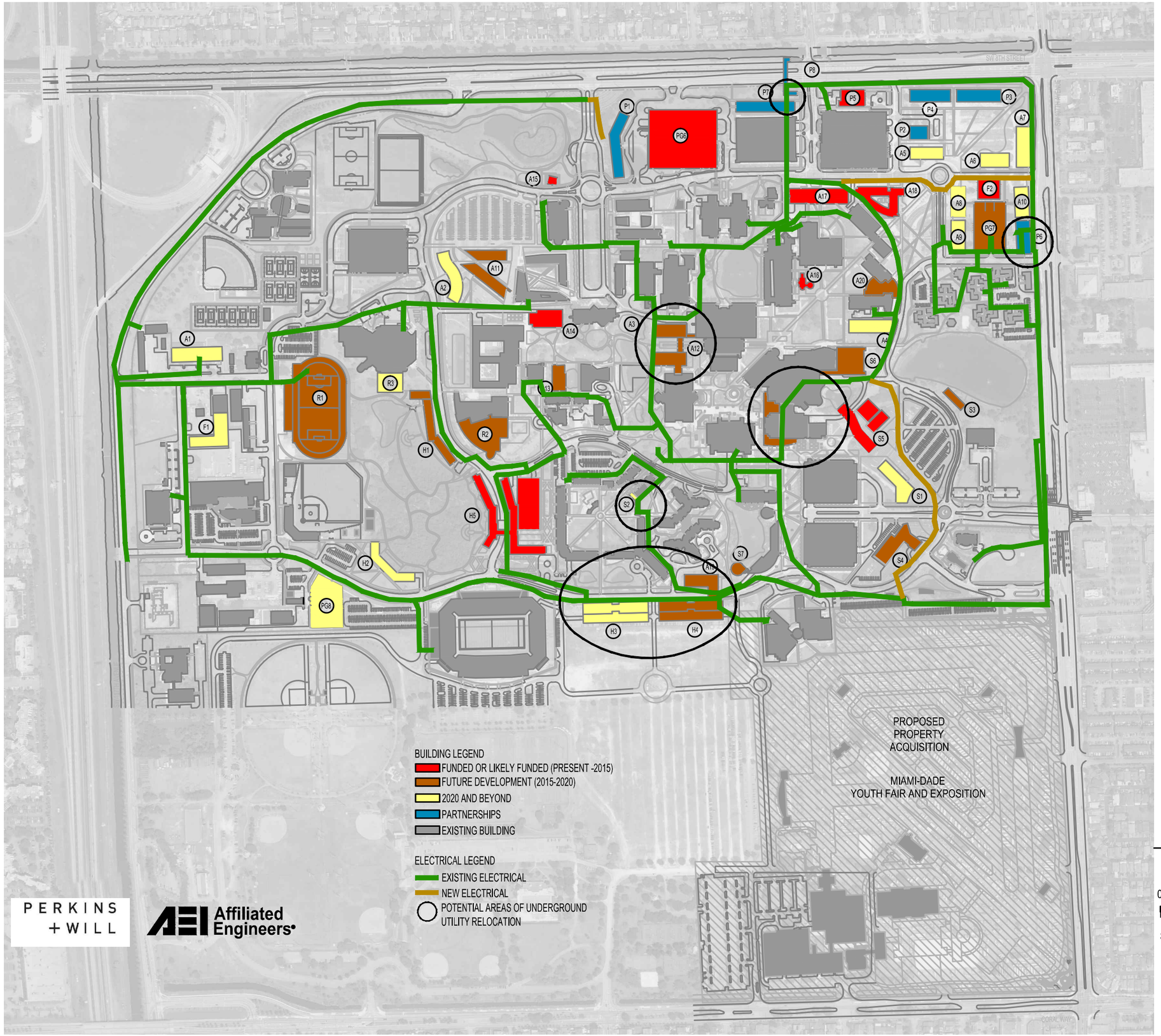
PERKINS + WILL

Affiliated Engineers

NORTH

0 125 250 500 1000

Scale: 1:500



FIU FLORIDA INTERNATIONAL UNIVERSITY

KEY:
A1. ACADEMIC 1
A2. ACADEMIC 2
A3. LIBRARY / STUDY ADDITION
A4. ACADEMIC 4
A5. ACADEMIC 5
A6. ACADEMIC 6
A7. ACADEMIC 7
A8. ACADEMIC 8
A9. ACADEMIC 9
A10. ACADEMIC 10
A11. ACADEMIC 11
A12. SOCIAL STUDIES / HUMANITIES
A13. SIPA II
A14: MANGO
A15: SOLAR HOUSE
A16: STOCKER ASTROSCIENCE
A17: SCIENCE CLASSROOM COMPLEX
A18. ACADEMIC HEALTH CENTER 5
A19. HONORS COLLEGE
A20. ACADEMIC HEALTH CENTER LIBRARY ADDITION
FI. FACILITIES 1
F2: CENTAL UTILITIES
H1. PARKVIEW HOUSING 2
H2. GREEK HOUSING
H3. MAIN STREET HOUSING
H4. HONORS COLLEGE HOUSING
H5. PARKVIEW HOUSING
P1. HOTEL
P2. MEDICAL ARTS PAVILION 4
P3. MEDICAL ARTS PAVILION 2
P4. MEDICAL ARTS PAVILION 3
P5. AMBULATORY CARE CENTER
P6. MEDICAL ARTS PAVILION 1
P7. PARTNERSHIP
P8. SWEETWATER PEDESTRIAN BRIDGE
PG6. PARKING GARAGE 6 / TRANSIT HUB
PG7. FACILITY SUPPORT
PG8. FACILITY SUPPORT
R1. TRACK AND FIELD
R2. REC CENTER EXPANSION
R3. TRAINING FACILITY ADDITION
S1. SUPPORT 1
S2. SUPPORT 2
S3. CHAPEL / PRESIDENT'S PARK PAVILION
S4. ALUMNI CENTER
S5. STUDENT ACADEMIC SUPPORT CENTER
S6. GRAHAM CENTER ADDITION
S7. FROST MUSEUM ADDITION

FIGURE 10.4: ELECTRICAL DISTRIBUTION
MODESTO MAIDIQUE CAMPUS

NORTH
0 125 250 500 1000
Scale: 1:500

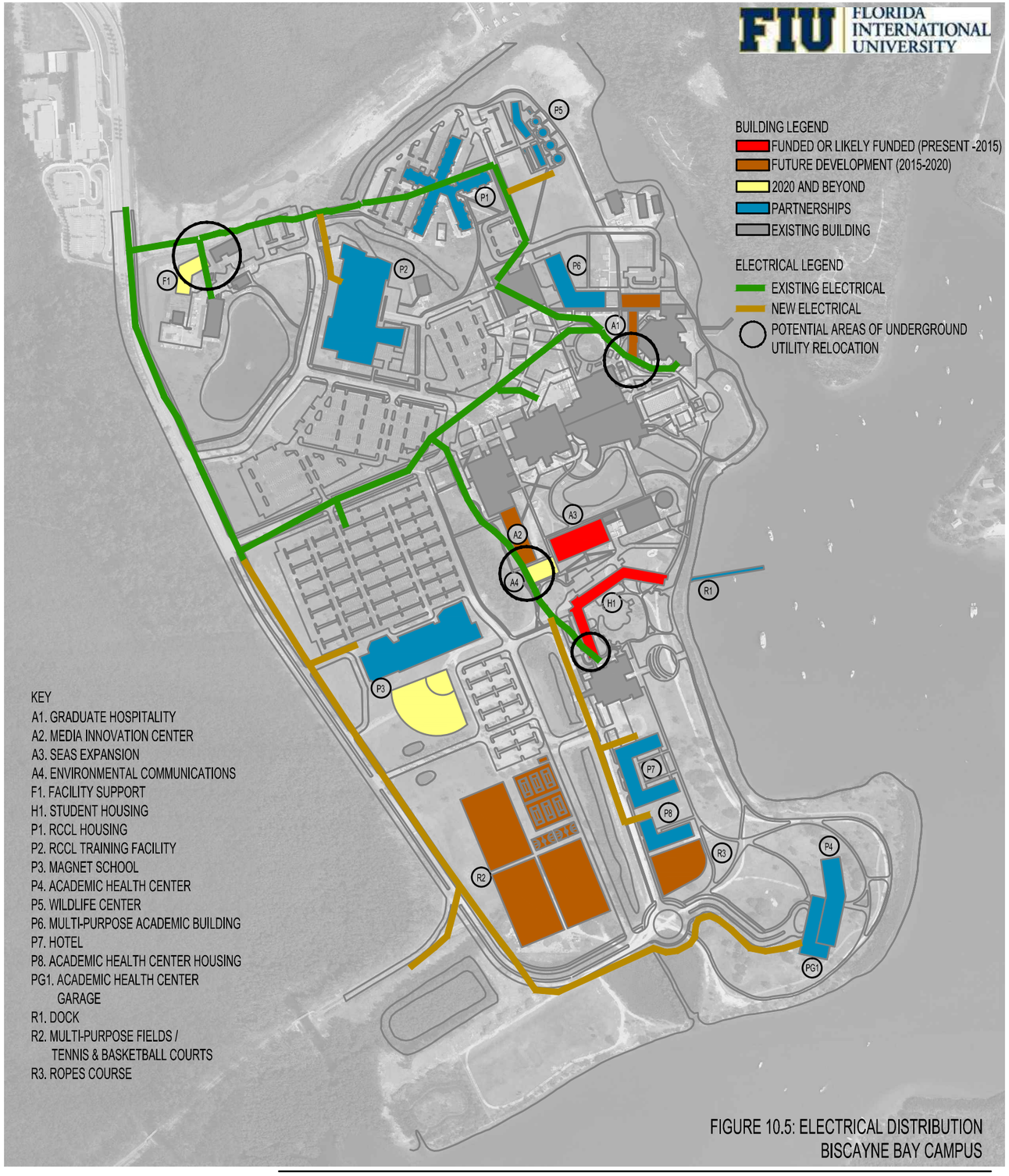


FIGURE 10.5: ELECTRICAL DISTRIBUTION
BISCAYNE BAY CAMPUS

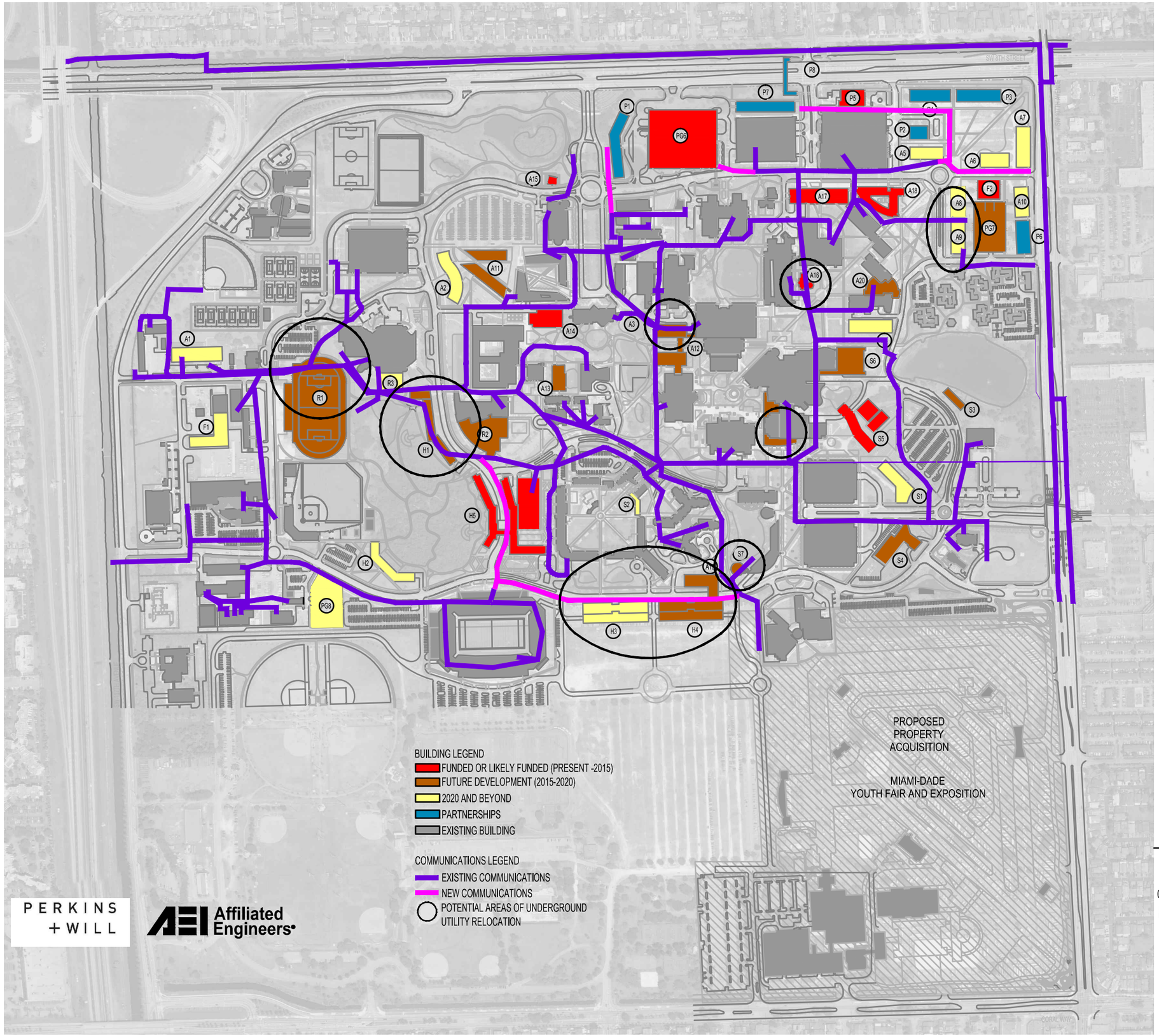
PERKINS + WILL

Affiliated Engineers

NORTH

0 125 250 500 1000

Scale: 1:500



FIU FLORIDA INTERNATIONAL UNIVERSITY

KEY:
A1. ACADEMIC 1
A2. ACADEMIC 2
A3. LIBRARY / STUDY ADDITION
A4. ACADEMIC 4
A5. ACADEMIC 5
A6. ACADEMIC 6
A7. ACADEMIC 7
A8. ACADEMIC 8
A9. ACADEMIC 9
A10. ACADEMIC 10
A11. ACADEMIC 11
A12. SOCIAL STUDIES / HUMANITIES
A13. SIPA II
A14: MANGO
A15: SOLAR HOUSE
A16: STOCKER ASTROSCIENCE
A17: SCIENCE CLASSROOM COMPLEX
A18. ACADEMIC HEALTH CENTER 5
A19. HONORS COLLEGE
A20. ACADEMIC HEALTH CENTER LIBRARY ADDITION
FI. FACILITIES 1
F2: CENTAL UTILITIES
H1. PARKVIEW HOUSING 2
H2. GREEK HOUSING
H3. MAIN STREET HOUSING
H4. HONORS COLLEGE HOUSING
H5. PARKVIEW HOUSING
P1. HOTEL
P2. MEDICAL ARTS PAVILION 4
P3. MEDICAL ARTS PAVILION 2
P4. MEDICAL ARTS PAVILION 3
P5. AMBULATORY CARE CENTER
P6. MEDICAL ARTS PAVILION 1
P7. PARTNERSHIP
P8. SWEETWATER PEDESTRIAN BRIDGE
PG6. PARKING GARAGE 6 / TRANSIT HUB
PG7. FACILITY SUPPORT
PG8. FACILITY SUPPORT
R1. TRACK AND FIELD
R2. REC CENTER EXPANSION
R3. TRAINING FACILITY ADDITION
S1. SUPPORT 1
S2. SUPPORT 2
S3. CHAPEL / PRESIDENT'S PARK PAVILION
S4. ALUMNI CENTER
S5. STUDENT ACADEMIC SUPPORT CENTER
S6. GRAHAM CENTER ADDITION
S7. FROST MUSEUM ADDITION

FIGURE 10.6: TELECOMMUNICATION DISTRIBUTION
MODESTO MAIDIQUE CAMPUS

NORTH

0 125 250 500 1000

Scale: 1:500

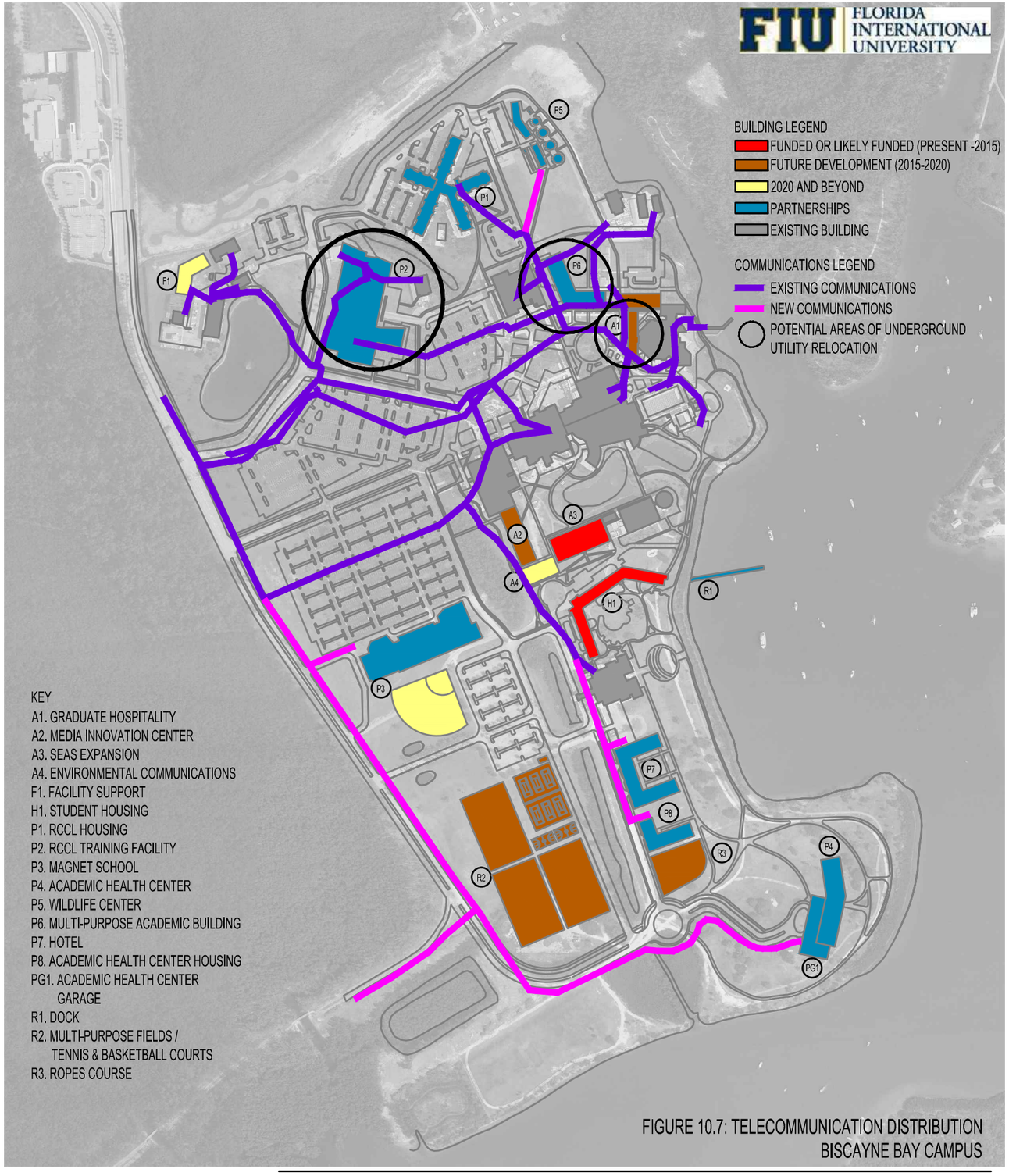


FIGURE 10.7: TELECOMMUNICATION DISTRIBUTION
BISCAYNE BAY CAMPUS

PERKINS + WILL

Affiliated Engineers

NORTH

0 125 250 500 1000

Scale: 1:500