9.0 GENERAL INFRASTRUCTURE ELEMENT

(1) REQUIREMENTS FOR STORMWATER MANAGEMENT GOALS, OBJECTIVES AND POLICIES

Goal 1.1 **Florida International University shall provide a stormwater management system which incorporates sustainable practices, protects real property, and ensures maintenance of ground water quality.**

Objective 1.1.1 **Adequacy of Campus Drainage:**

Florida International University shall ensure that future development is coordinated with current drainage infrastructure and on-going site improvement projects in order to meet campus drainage system requirements in an efficient manner and protect University property.

Policy 1.1.1.1 Engineering surveys shall be provided to obtain detailed data for implementation of accurate records, and to identify condition of facilities.

Policy 1.1.1.2 Maintain, update, and keep current, accurate as-builts of stormwater facilities.

Policy 1.1.1.3 FIU shall maintain, update and keep current records of any existing swales, dry retention areas, lakes, wetlands, preservation areas, and any other areas within the campus properties that provide stormwater storage and retention capacities, as well as any areas contributing to those retention areas. FIU shall reserve these stormwater storage and retention areas as prohibited from future development unless the area developed is reconstructed elsewhere on site.

Policy 1.1.1.4 FIU shall design and construct or improve stormwater management facilities as identified in Figures 9.1a, 9.2a and 9.3a. To ensure appropriate flood control, the timing and phasing of these improvements should be ahead of the associated developments.

Policy 1.1.1.5 Any development proposing connection to an existing drainage system shall evaluate the impacts of the proposed development on the affected stormwater management system as part of the project's design phase. Otherwise, sufficient stormwater management improvements must be provided to handle all of the runoff from the new developments on a stand-alone basis.

Policy 1.1.1.6 All water bodies shall be interconnected whenever possible to maximize the capacity of sub-basins.

Objective 1.1.2 Flood Protections / Water Quantity:

Florida International University shall ensure that all planned and future developments provide sufficient stormwater management capacity to protect buildings from being flooded during a storm event of at least 100-year capacity.

Policy 1.1.2.1 The following design criteria shall be used in the design and construction of facilities at Florida International University:

	Modesto A. Maidique Campus	**Biscayne Bay Campus**	**Engineering Center**
Min. Building Finished Floor Elevation (F.F.EL.)	10.0 ft NGVD	11.0 ft NGVD (12.0 ft NGVD for buildings along the Southern edge of the campus)	10.0 ft NGVD
Min. Sidewalk Elevation	8.0 ft NGVD	6.0 ft NGVD	8.0 ft NGVD
Min. Crown of Roadway Elevation	7.5 ft NGVD	5.5 ft NGVD	7.5 ft NGVD
Min. Parking Lot Elevation	7.0 ft NGVD	5.0 ft NGVD	7.0 ft NGVD

The minimum elevations shown above are minimum Miami-Dade County Division of Environmental Resources Management (DERM) requirements based on Miami-Dade County Flood Criteria and the FEMA Flood Insurance Rate Maps for the University areas.

Future new buildings serving as emergency shelters are classified as Category IV structures per Table 1-1 of ASCE 24-05. Therefore, these structures shall be protected from the 500 year flood (base flood elevation of 10.0 ft NGVD) with a minimum finished floor elevation (F.F.EL.) of 12.0 ft NGVD, as recommended by FEMA.

Policy 1.1.2.2 New construction and substantial improvements in areas subject to special flood hazards shall be constructed by methods and practices that minimize flood damage.

Residential construction:

Residential buildings (such as University Housing) shall have the lowest floor elevated no lower than 1 foot above the base flood elevation. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate the unimpeded movement of flood waters shall be provided. Structures will be anchored to prevent flotation, collapse, or lateral movement of the structure.

Non-residential construction:
Non-residential buildings shall have the lowest floor elevated no lower than 1 foot above the base flood elevation. Buildings located in a Velocity Zone, will be constructed to adhere to the requirements for this zone. Walls and roof structures will be sufficiently anchored to prevent loss from high winds. FIU will work with the Miami-Dade County Division of Environmental Resources Management (DERM) to determine the proper criteria for construction within this zone.

Elevated buildings:
Elevated buildings that include fully enclosed areas formed by foundation and other exterior walls below the base flood elevation shall be designed to preclude finished living space and designed to allow for the entry and exit of flood waters to automatically equalize hydrostatic flood forces on exterior walls. Structures will be anchored to prevent flotation, collapse, or lateral movement of the structure.

Policy 1.1.2.3 All vehicular paved surfaces and landscaped islands shall utilize curbing or curb and gutter when necessary for stormwater runoff control.

Policy 1.1.2.4 Drainage systems for all new development shall be designed in accordance with the campus master development plan, the Miami-Dade County Public Works and Waste Management Department (PWWMD) - Public Works Manual Section D4 Water Control, Miami-Dade County Division of Environmental Resources Management guidelines, and the South Florida Water Management District Permit Information Manual Volume IV guidelines. In addition, stormwater management facilities at Modesto A. Maidique Campus and the Engineering Center shall also be designed in conformance with Florida Department of Transportation drainage requirements.

Policy 1.1.2.5 Florida International University shall adopt the following water quantity level of service standards for Modesto A. Maidique Campus, the Engineering Center, and Biscayne Bay Campus,

and shall use these standards as the basis for drainage system design.

Road Crown/Ground Surface LOS:
The minimum acceptable flood protection/drainage level of service (LOS) standards for Modesto A. Maidique Campus roadways, parking areas, and ground surfaces shall be protection from the degree of flooding that would result from a storm duration of one day that statistically occurs once in five years. A current elevation required per the Miami-Dade County Flood Criteria Map, as amended is:

- 7.0 ft. NGVD for Modesto A. Maidique Campus and the Engineering Center
- 5.0 ft. NGVD for Biscayne Bay Campus

Future access roadways used by emergency vehicles to access future emergency shelters shall be protected from the degree of flooding that would result from a storm duration of three days that statistically occurs once every 100 years. A current elevation required per the Miami-Dade County Flood Criteria Map, as amended is:

- 8.0 ft. NGVD for emergency access roadways

Minimum Floor Elevations LOS:
The minimum acceptable flood protection/drainage level of service (LOS) standards for minimum floor elevation shall be the elevations as specified in the Federal Flood Insurance Rate Maps for Dade County or the protection from the degree of flooding that would result from a storm duration of three days that statistically occurs once in one hundred years or elevation of:

- 10.0 ft NGVD, whichever is greater, for Modesto A. Maidique Campus and the Engineering Center.
- 11.0 ft. NGVD, whichever is greater, for Biscayne Bay Campus, with the exception of buildings along the southern edge of the campus which should be set at 12.0 ft. NGVD (whichever is greater).

The minimum acceptable flood protection/drainage LOS standards for minimum floor elevation of future new buildings serving as emergency shelters, shall be protected from the degree of flooding that would result from a storm that statistically occurs once every 500 years, with an elevation of:

- 12.0 ft. NGVD for emergency shelters

Policy 1.1.2.6 The minimum acceptable Flood Protection Level of Service standards for University stormwater management system facilities shall provide protection for the degree of flooding that would result for a duration of one day from a ten-year storm.

Policy 1.1.2.7 To ensure that the LOS standards are continuously met, all new developments must prepare a pre-post development analysis of the entire development-affected site to evaluate the 100-year flood stages.

Policy 1.1.2.8 All new construction shall adhere to the Disaster Resistant University - FEMA Hazard Mitigation standards.

Objective 1.1.3 Water Quality:

Florida International University shall ensure that all existing and proposed developments have drainage systems that provide water quality enhancement to stormwater runoff.

Policy 1.1.3.1 Best Management Practices shall be incorporated into the drainage system design to minimize the impacts from development to the ground and surface water quality. These practices shall include, but not be limited to:

1. Incorporating stormwater management retention and detention features into the design of parks, trails, commons and open spaces, where such features do not detract from the recreational or aesthetic value of a site.

2. Use of slow release fertilizers and/or carefully managed fertilizer applications timed to ensure maximum root uptake and minimal surface water runoff or leaching to groundwater.

3. Educating maintenance personnel about the need to maintain motor vehicles to prevent the accumulation of oil, grease and other fluids on impervious surfaces, where they might be conveyed to surface and ground waters by runoff, and the need to regularly collect and properly dispose of yard debris.

4. Avoid the widespread application of broad spectrum pesticides by involving only purposeful and minimal

application of pesticides, aimed at identified targeted species.

5. Coordinating pesticide application with irrigation practices to reduce runoff and leaching to groundwater.

6. Use of pervious paving such as turf blocks to minimize impervious surface area.

7. Incorporating features into the design of fertilizer and pesticide storage, mixing and loading areas that are designed to prevent/minimize spillage.

8. Use of downturned elbows in catch basins.

Policy 1.1.3.2 Florida International University shall adopt the following water quality level of service standard and shall use these standards as the basis for drainage system design:

The minimum acceptable water quality/drainage level of service (LOS) standards for FIU shall be the treatment of the first inch of stormwater runoff or 2.5 inches times the percentage of imperviousness of the development-affected site, whichever is greater, in accordance with Miami-Dade County Division of Environmental Resources Management and South Florida Water Management District criteria.

Policy 1.1.3.3 All stormwater runoff shall be contained within a project site utilizing exfiltration trench, with overflow to an on-site water body when available and shall not adversely affect adjacent campus property.

Policy 1.1.3.4 Exfiltration trench systems with overflow into a water body shall be designed to retain on site all the volume of runoff generated by the contributing drainage area.

Policy 1.1.3.5 Design of new facilities as well as retrofitting of existing drainage systems and areas having drainage deficiencies shall be undertaken in accordance with Element 14.0 Capital Improvements.

Policy 1.1.3.6 All drainage inlets receiving runoff directly from potentially contaminated surfaces shall have pollution retardant baffles installed.

Policy 1.1.3.6 All drainage inlets with an outfall to an exfiltration trench or water body shall have pollution retardant baffles installed.

Policy 1.1.3.7 All proposed drainage system plans shall be reviewed and approved by the Florida Department of Transportation (for projects adjacent to an FDOT roadway), South Florida Water Management District, Miami-Dade County Division of Environmental Resources Management or their designees prior to the initiation of any drainage system construction activity.

Policy 1.1.3.8 All future developments constructed after the implementation of Florida Department of Environmental Protection Statewide Stormwater Criteria shall be designed and constructed to comply with the stormwater treatment requirements outlined by the regulation.

Objective 1.1.4 Maintenance of Campus Drainage:

Florida International University shall properly maintain the stormwater management system and ensure that all deficiencies are corrected.

Policy 1.1.4.1 An inspection, cleaning, maintenance and repair program for all facilities shall be developed and implemented. The maintenance program shall be implemented on a continuing, regularly scheduled basis with major repairs prioritized and scheduled based on the availability of funding.

Objective 1.1.5 Maintenance of Campus Drainage:

Florida International University shall consider in all future planning, the protection of natural stormwater management and hydrologic areas, and the protection of the quality of these receiving waters.

Policy 1.1.5.1 Use environmentally friendly designs such as detention systems, ground storage (percolation), littoral treatment in wet detention ponds (including the use of wetland vegetation along the shoreline within the pond's littoral zone), metered-release devices, porous or vegetative liners, and minimize impervious surfaces etc. as appropriate and as called for by state design guidelines, to protect natural stormwater management and hydrological areas from erosion and contamination and to mitigate the impacts of campus generated stormwater.

Policy 1.1.5.2 It shall be the policy of FIU that no stormwater discharges shall cause or contribute to a violation of water quality standards in waters of the State. All discharge of stormwater shall be conducted in accordance with the water quality requirements of

South Florida Water Management District (SFWMD) and Miami-Dade County Division of Environmental Resources Management (DERM).

Policy 1.1.5.3 All new developments shall include sustainable site elements required to meet USGBC standards and LEED Silver certification criteria.

(2) REQUIREMENTS FOR POTABLE WATER GOALS, OBJECTIVES AND POLICIES

Goal 2.1 Florida International University shall ensure that potable water is available for existing and future campus development.

Objective 2.1.1 Adequacy of Potable Water Supply and Distribution:

Florida International University shall ensure that prior to development activities adequate potable water supply, treatment, distribution facilities and adequate fire flow protection are available at the adopted level of service standards in accordance with Element 14.0 Capital Improvements.

Policy 2.1.1.1 Florida International University shall adopt the following potable water level of service standards, in accordance with Section 24-43.1 of the Miami Dade County Code:

12 gallons per day, per 100 square feet of building space

Policy 2.1.1.2 The level of service water pressure standard shall be a minimum of 20 psi. and no greater than 100 psi. A minimum flow of 2,000 gallons per minute should be added to this level of service standard to comply with the required minimum fire flow levels for schools.

Policy 2.1.1.3 The minimum level of service water main size for primary and secondary distribution systems shall be twelve (12) inches in diameter, per M-D WASD, to provide sufficient capacity for potable water and fire protection demands.

Policy 2.1.1.4 All potable water plans for the Modesto A. Maidique Campus and the Engineering Campus shall be reviewed and approved by the State of Florida Department of Environmental Protection, Miami-Dade County Division of Environmental Resources Management, Miami-Dade County Water and Sewer

Department, Miami-Dade County Health Department, Miami-Dade County Fire Department and the State Fire Marshall. Plans for the Biscayne Bay Campus will require the review and approval of the City of North Miami, as well as the Florida Department of Environmental Protection.

Policy 2.1.1.5 All potable water mains in primary distribution and secondary distribution systems shall be looped.

Policy 2.1.1.6 All existing dead-end potable water primary and secondary distribution systems shall be eliminated by constructing links to complete a loop.

Policy 2.1.1.7 All primary and secondary potable water distribution systems shall incorporate fire system demands.

Policy 2.1.1.8 All fire protection services to new developments shall be in accordance with the National Fire Protection Association (NFPA 24 Private Water Distribution System).

Policy 2.1.1.9 The priorities for potable water improvements shall be:

1. Elimination of dead-end water distribution systems

2. Expansion of potable water infrastructure.

Policy 2.1.1.10 New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system and shall be according to Miami-Dade County Water and Sewer Department standard and specification.

Policy 2.1.1.11 FIU shall design and construct or improve potable water facilities as identified in Figures 9.1b, 9.2b and 9.3b. The timing and phasing requirements for these improvements are established in Element 14.0 Capital Improvements.

Policy 2.1.1.12 All looped water main systems shall be designed with sufficient valving to allow isolation of each building within the loop. Existing water main loops shall be retrofitted to allow for this condition.

Policy 2.1.1.13 Annually review future construction programs and priorities to remediate deficiencies, ensure capacity and provide the capital improvements required to meet the University needs, when needed, based on needs identified in other master plan elements.

Objective 2.1.2 Water Conservation Program:

Florida International University shall develop and implement a comprehensive water conservation program.

Policy 2.1.2.1 Promote an educational program geared toward students, faculty, staff and visitors, which will discourage waste and conserve water.

Policy 2.1.2.2 Enforce requirements, and establish new requirements and procedures as needed, to assure that high efficiency plumbing fixtures are used in all new facilities and in conjunction with renovations to existing facilities.

Policy 2.1.2.3 The use of ”Florida Friendly Landscaping,” including the maintenance and installation of selected vegetative species, low volume irrigation and compact hydrazone concepts, shall be required for all new buildings and ancillary facility construction.

Policy 2.1.2.4 Ensure that all existing and future irrigation systems within the Biscayne Bay Campus tie in to the existing reclaimed water system (where possible).

Policy 2.1.2.5 A leak detection and repair program on building service lines, irrigation lines, and general service lines shall be implemented and maintained.

Policy 2.1.2.6 University-wide development will comply with water use efficiency techniques for indoor water use in accordance with Sections 8-31, 32-84 and 8A-381 of the Code of Miami-Dade County.

Policy 2.1.2.7 Prepare a goal-oriented water conservation plan for Florida International University.

Policy 2.1.2.8 University-wide development shall comply with the landscape standards in Chapter 18A and 18B of the Miami-Dade County Code, in order to conserve the use of potable and non-potable water supplies for irrigation purposes.

Objective 2.1.3 Host Community and Service Provider Coordination:

Florida International University shall coordinate closely with the host local government for each campus on

present and projected future water demands for the University.

Policy 2.1.3.1 The University shall establish a procedure and assign responsibility for regularly scheduled coordination meetings with the appropriate officials relative to the University's water needs.

Policies 2.1.3.2 Periodically revise and/or update the existing water service agreements between the University Board of Trustees and Miami-Dade County.

(3) REQUIREMENTS FOR SANITARY SEWER GOALS, OBJECTIVES AND POLICIES

Goal 3.1: Florida International University shall ensure that sanitary sewer is available for existing and future campus development.

Objective 3.1.1 Florida International University shall ensure prior to development activities adequate sanitary sewer collection, transmission, and treatment facilities are available at adopted levels of service standards in accordance with Element 14.0 Capital Improvements.

Policy 3.1.1.1 Florida International University shall adopt the following sanitary sewer level of service standards, in accordance with Section 24-43.1 of the Miami Dade County Code:

12 gallons per day, per 100 square feet of building space

Policy 3.1.1.2 The minimum level of service gravity sewer pipe size for sewer collection mains shall be eight (8) inches in diameter.

Policy 3.1.1.3 University Wide:

All sanitary sewer plans for connecting off-site shall be reviewed by the Miami-Dade County Division of Environmental Resources Management and any proposed connection to the existing sewer in public right-of-way shall be reviewed by Miami-Dade County Water and Sewer Department. Final approval of any available point connection will only be forthcoming once the proposal successfully passes the rigorous review process in place by the Miami-Dade County Water and Sewer Department.

Policy 3.1.1.4 The priorities for gravity sewer improvement shall be

1. Maintenance of existing sewer system

2. Expansion of sanitary sewer infrastructure.

3. Repair of damaged or broken pipes and other deficiencies in the sanitary sewer system.

Policy 3.1.1.5 Florida International University shall design and construct or improve sanitary sewer facilities as identified in Figures 9.1c, 9.2c and 9.3c. The timing and phasing requirements for these improvements are established in the 14.0 Capital Improvements Element.

Policy 3.1.1.6 Periodically revise and/or update the sewer service agreements between the University Board of Trustees and Miami-Dade County and City of North Miami.

Policy 3.1.1.7 Engineering as-built surveys shall be provided to the University at the completion of every project to obtain detailed data for implementation of accurate records, and to identify condition of facilities. In order to facilitate future maintenance, emergency repairs, facilities upgrades and additions, begin implementation of Building Information Modeling (BIM) for all campus buildings and other applicable improvements. The investment in BIM, 3D Civil and GIS will provide an electronic platform that would facilitate maintenance planning, reduce design costs, avoid utility conflicts and serve as an aid for emergency services

Policy 3.1.1.8 Maintain, update, and keep current, accurate as-builts of sanitary sewer facilities including lift station capacity and manhole/pipe invert elevations.

Objective 3.1.2 Florida International University shall routinely evaluate the condition of the gravity sewer system for each campus.

Policy 3.1.2.1 A maintenance and repair program shall be developed for all facilities to evaluate the condition of the gravity sewer system. The maintenance program shall be implemented on a continuing, regularly scheduled basis with major repairs prioritized and scheduled based on the availability of funding. This includes performing an infiltration and inflow study every five (5) years.

Policy 3.1.2.2 A program and schedule shall be developed to replace lines that are sub-standard, overloaded or have maintenance/operation problems.

Policy 3.1.2.3 Pipes with excess ground water inflow/infiltration shall be repaired, replaced or lined.

Policy 3.1.2.4 Monitoring of the waste water system shall be consistent with existing Environmental Protection Agency, Florida Department of Environmental Protection, Miami-Dade County Division of Environmental Resources Management, Miami-Dade water and Sewer Department, National, State and local regulatory criteria.

Policy 3.1.2.5 New and replacement sanitary sewer systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharges from the systems into flood waters.

Objective 3.1.3 Florida International University shall provide an efficient and adequate pump station and force main system to convey sewage to offsite mains.

Policy 3.1.3.1 No new developments shall be permitted to connect onto the existing on-site pump stations and force mains unless it can first be shown that sufficient capacity exists within the pump station and associated force main to convey the wastewater generated by the project's proposed use.

Policy 3.1.3.2 Existing pump stations shall be designed to accommodate the following minimum additional flow:

Biscayne Bay Campus - 213,100 GPD
Modesto A. Maidique Campus:
- PSO-428A (LS-1): 5,400 GPD
- PSO-428B (LS-2): 5,500 GPD
- PSO-428C (LS-3): 6,580 GPD
- PSO-428D (LS-4): 4,300 GPD
- PSO-428E (LS-6): 1,400 GPD
- PSO-428F (LS-7): 22,800 GPD
- PSO-428G (LS W-1): 15,200 GPD
- PSO-428H (LS-8): 900 GPD
- PSO-428I (LS-9): 7,400 GPD

Engineering Center:
- 99-00621: 5,800 GPD

Policy 3.1.3.3 In addition to upgrades to existing pump stations, the proposed 2020 build out shall include construction of new pump stations

to collect the following minimum sanitary sewer flow generated by the proposed developments.

Modesto A. Maidique Campus:
Private PS1: 1,472,170 GPD
Private PS2: 50,600 GPD

(4) REQUIREMENTS FOR SOLID WASTE GOALS, OBJECTIVES AND POLICIES

Goal 4.1 **Florida International University shall ensure that adequate solid waste disposal services are available and that these services are provided in an environmentally sound and economically efficient manner.**

Objective 4.1.1 Solid Waste Collection and Disposal:

Florida International University shall ensure that adequate solid waste collection and disposal capacity is available within the University in order to meet the current and future demands generated by the University.

Policy 4.1.1.1 Florida International University shall adopt the following levels of service standards:

Level of Service Standard:
0.60 pounds per full time equivalent (FTE) student per day.

Policy 4.1.1.2 Florida International University Purchasing Services Department shall ensure that the bid solicitation and contractor selection process for campus wide solid waste collection services shall be completed and reviewed on an annual or multi-year basis.

Policy 4.1.1.3 Florida International University Purchasing Services Department shall ensure that the bid solicitation and contractor selection process for campus wide compacting and recycling services shall be completed and reviewed on annual or multi-year basis.

Policy 4.1.1.4 Florida International University Environmental Health and Safety Department shall ensure that any hazardous, bio-hazardous and radioactive waste, generated by the University shall be collected and disposed of by firms licensed and regulated in accordance with Chapter 17-730 Florida Administrative Code.

Policy 4.1.1.5 Florida International University Environmental Health and Safety Department shall solicit bids for the disposal of hazardous wastes by utilizing a single licensed contractor on an annual or multi year basis.

Policy 4.1.1.6 On-campus waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.

Policy 4.1.1.7 The University shall establish timing and phasing requirements for solid waste collection and disposal facility improvements to meet future University needs.

Policy 4.1.1.8 All new developments shall include the provision of a solid waste disposal system capable of handling the solid waste generated by its proposed use. No new development may share solid waste disposal facilities with another structure unless it is shown that the existing solid waste disposal facility has sufficient capacity to serve both uses.

Policy 4.1.1.9 All on-campus dumpsters shall be housed within an enclosed structure with 6-ft high concrete walls and upon a 10 ft deep by 15 ft wide concrete pad. A chain link fence gate shall be provided for access.

Objective 4.1.2 Solid Waste Recycling:

Florida International University shall increase the amount of solid waste recycled above the estimated 5% of total material generated (see 13.0 Conservation Element**).**

Policy 4.1.2.1 Florida International University will determine the University's eligibility for participation in the State of Florida Department of Environmental Protection, Solid Waste Management Trust Fund Program.

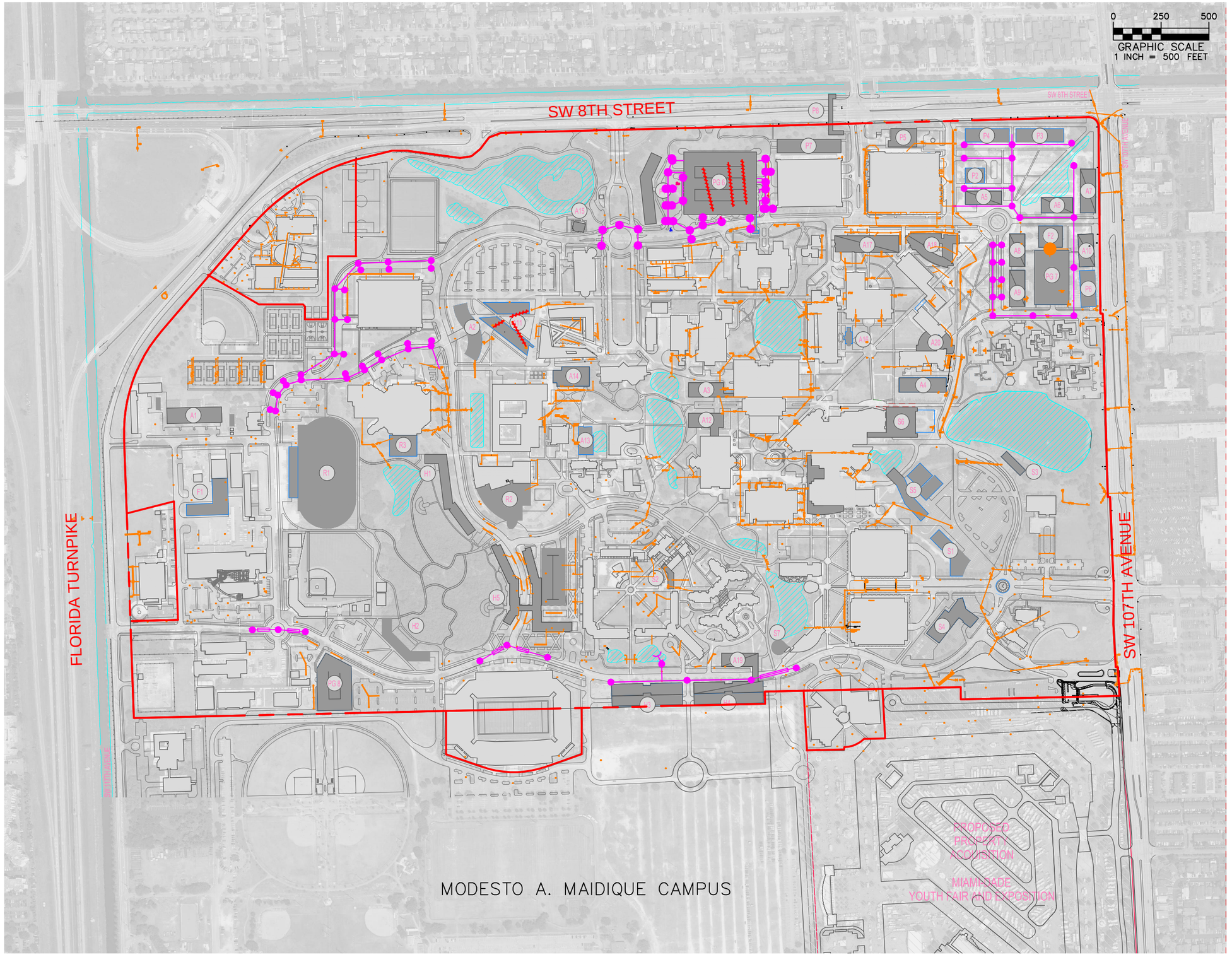
Policy 4.1.2.2 Recycling containers shall be located at numerous convenient locations across the Modesto A. Maidique Campus, Engineering Center and Biscayne Bay Campus.

Policy 4.1.2.3 Florida International University shall promote recycling through periodic educational campaigns for the student body, faculty, and staff.

Policy 4.1.2.4 Florida International University shall implement a mandatory recycling program targeted towards faculty and staff. This includes mandatory recycling at all student housing buildings, to

include (but not limited to) recycling of items such as newspaper, glass, aluminum cans, steel cans and plastics, in accordance with Section 15-2.2b of the Code of Miami-Dade County.

Policy 4.1.2.5 FIU shall evaluate the techniques and benefits of composting of vegetation and landscape refuse for future implementation at the University.



LEGEND

- Proposed Building
- Existing Building
- Existing Storm Line
- Existing Catch Basin
- Existing Trench Drain
- Proposed Trench Drain
- Proposed Storm Line
- Proposed Manhole / Inlet
- Existing - To Be Removed
- Surface Water

KEY MAP

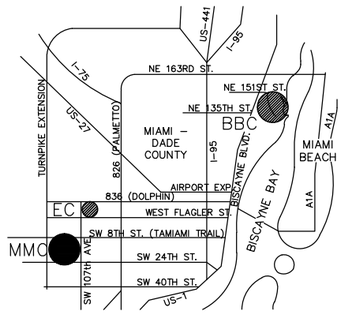
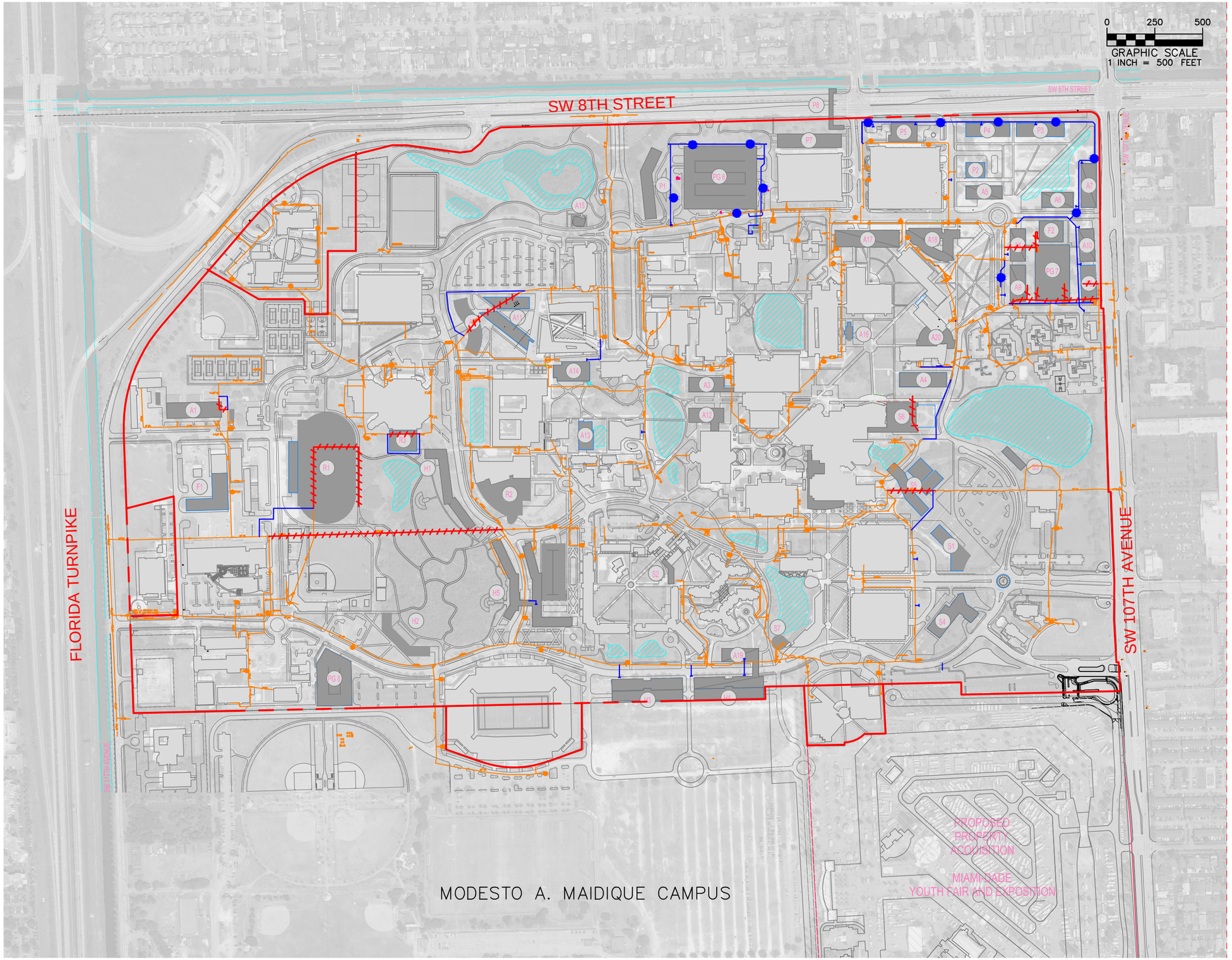


FIGURE 09.1a
Drainage System Map

FIU FLORIDA INTERNATIONAL UNIVERSITY

PERKINS +WILL

MILLER LEGG



LEGEND

- Proposed Building
- Existing Building
- Existing Fire Hydrant
- Existing Water Main
- Proposed Fire Hydrant
- Proposed Water Main
- Existing To Be Removed
- Surface Water

KEY MAP

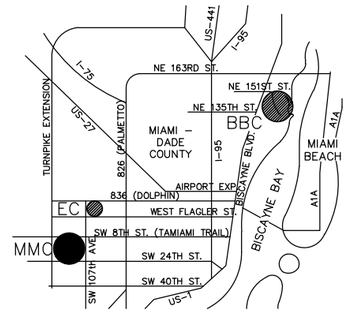
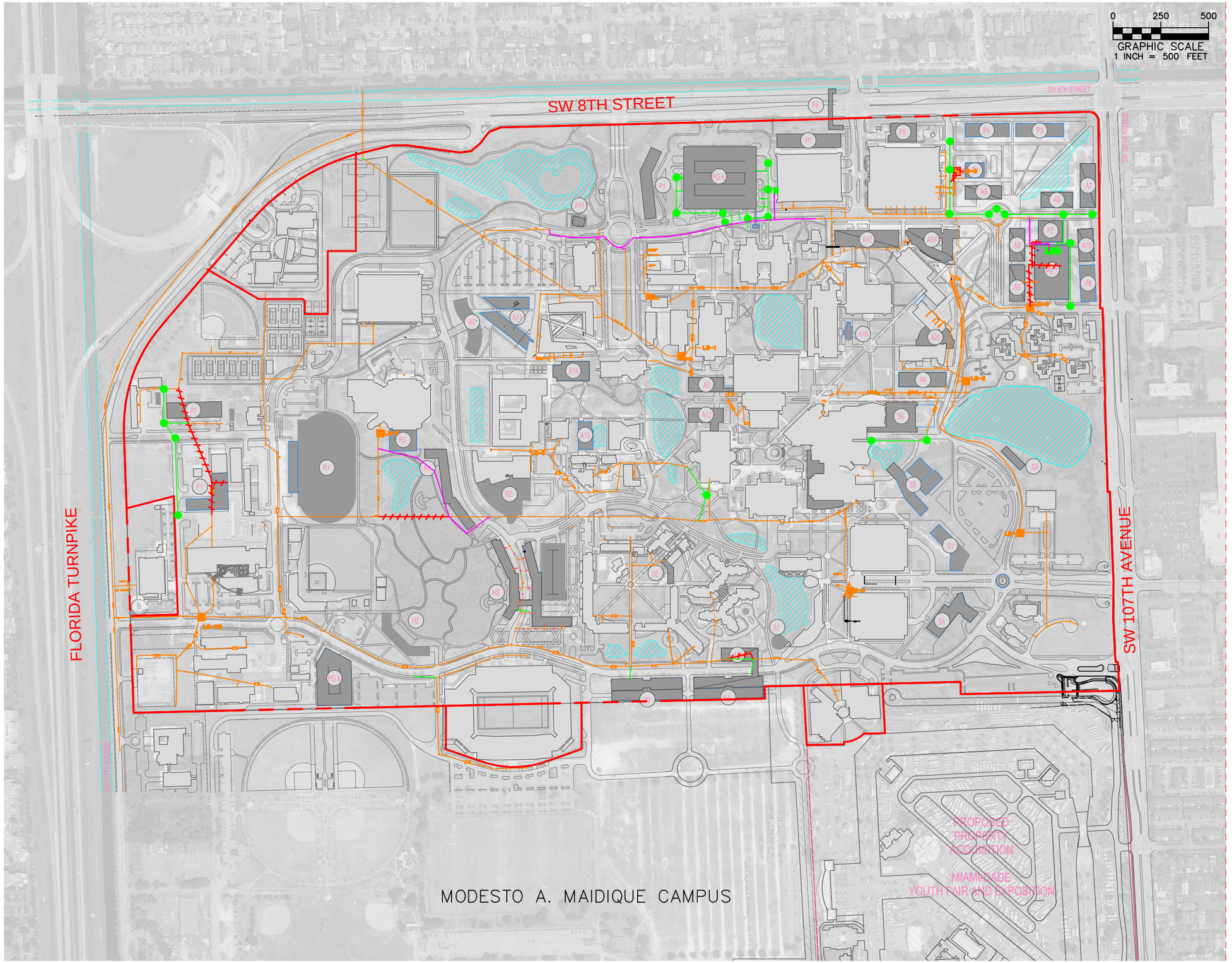


FIGURE 09.1b
Water Distribution Map

FIU FLORIDA INTERNATIONAL UNIVERSITY

PERKINS + WILL

MILLER LEGG



LEGEND

- Proposed Building
- Existing Building
- Existing Sanitary Manhole
- Existing Sanitary Main
- Existing Sanitary Lift Station
- Proposed Sanitary Manhole
- Proposed Sanitary Main
- Proposed Form Main
- Proposed Lift Station
- Existing - To Be Removed
- Surface Water

KEY MAP

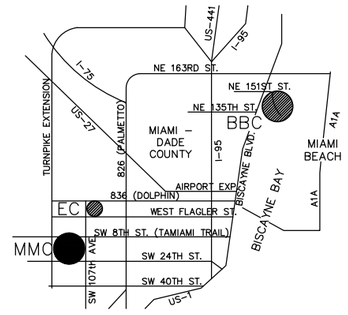
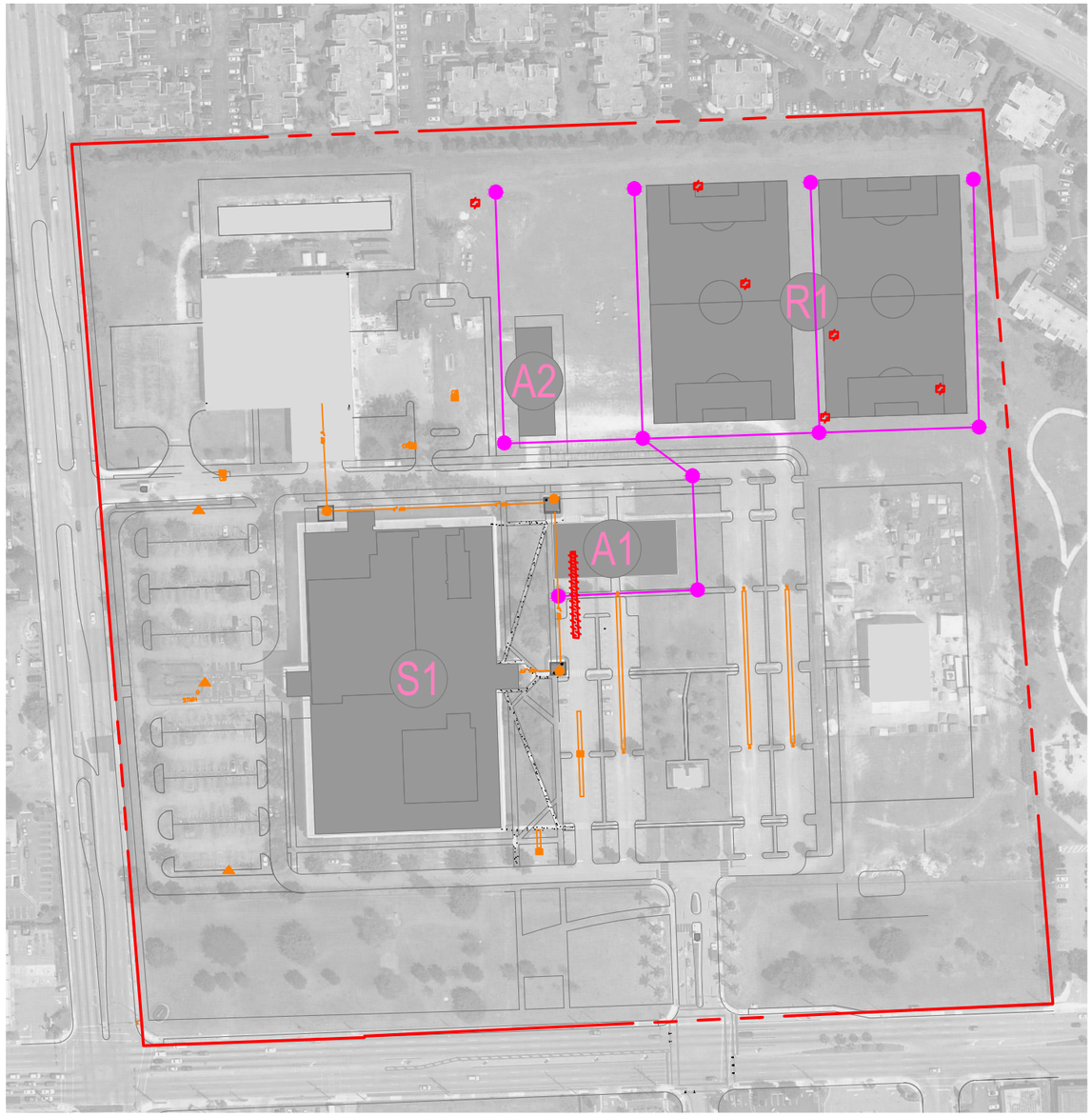


FIGURE 09.1c
Sanitary Sewer Map

FIU FLORIDA INTERNATIONAL UNIVERSITY

PERKINS + WILL

MILLER LEGG



ENGINEERING CENTER

0 100 200
GRAPHIC SCALE
1 INCH = 200 FEET

LEGEND

- Proposed Building
- Existing Building
- Existing Storm Line (ST)
- Existing Catch Basin
- Existing Trench Drain
- Proposed Storm Line
- Proposed Manhole / Inlet
- Existing -To Be Removed
- Surface Water

KEY MAP

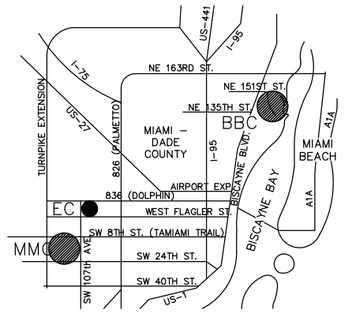
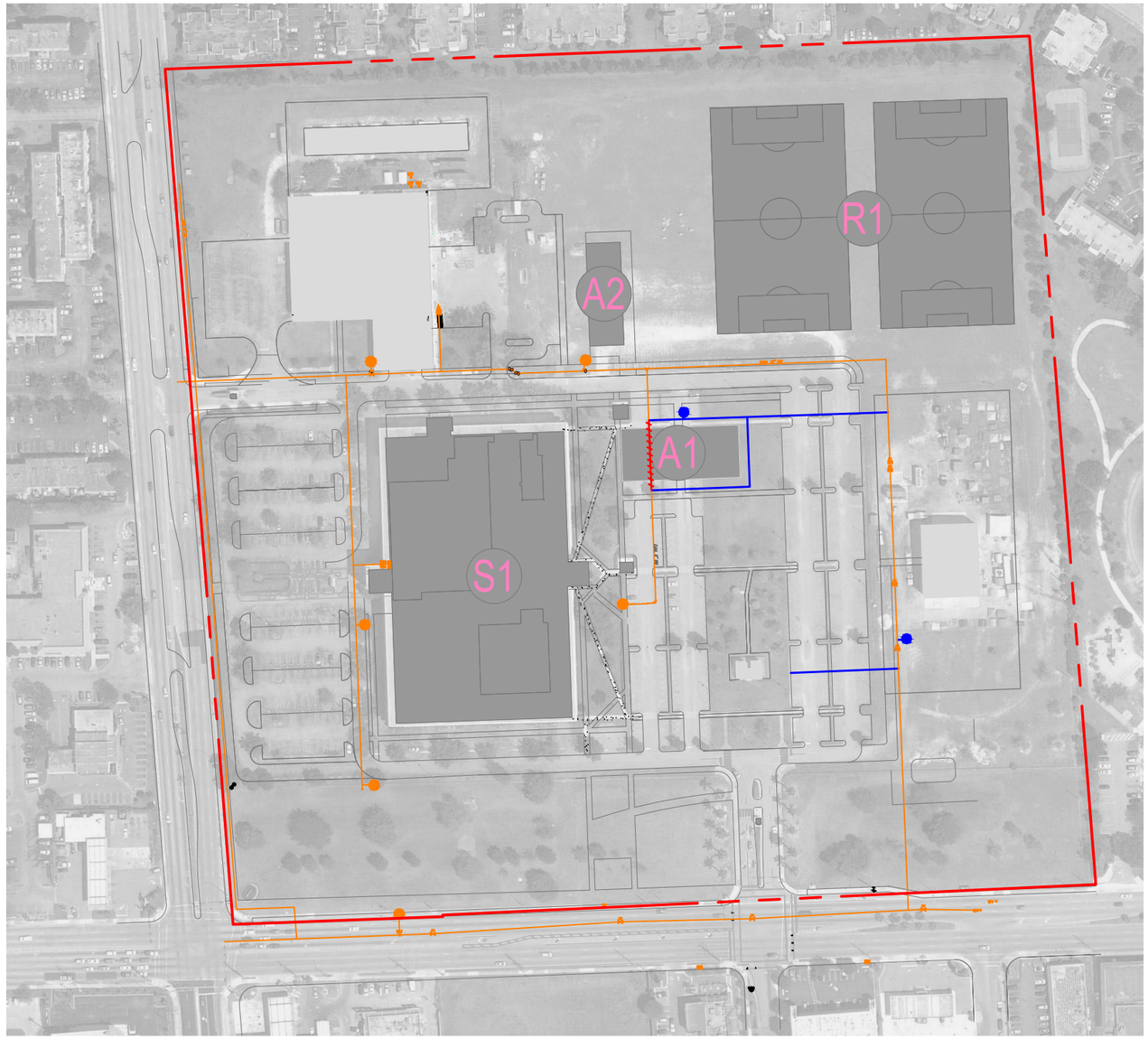


FIGURE 09.2a
Drainage Map

FLORIDA INTERNATIONAL UNIVERSITY

PERKINS + WILL

MILLER LEGG



ENGINEERING CENTER

0 100 200
GRAPHIC SCALE
1 INCH = 200 FEET

LEGEND

- Proposed Building
- Existing Building
- Existing Fire Hydrant
- Existing Water Main
- Proposed Fire Hydrant
- Proposed Water Main
- Existing - To Be Removed
- Surface Water

KEY MAP

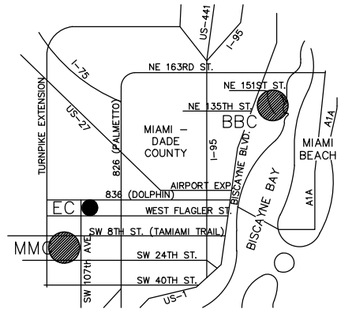


FIGURE 09.2b
Water Distribution Map

FIU FLORIDA INTERNATIONAL UNIVERSITY

PERKINS + WILL
MILLER LEGG

ENGINEERING CENTER

0 100 200
GRAPHIC SCALE
1 INCH = 200 FEET

LEGEND

- Proposed Building
- Existing Building
- Existing Sanitary Manhole
- Existing Sanitary Main
- Existing Sanitary Lift Station
- Proposed Sanitary Manhole
- Proposed Sanitary Main
- Existing - To Be Removed
- Surface Water

KEY MAP

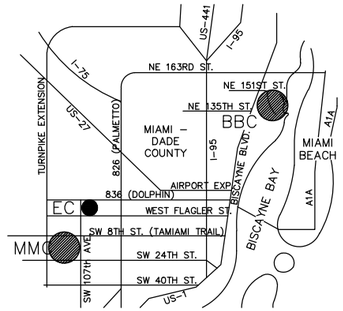


FIGURE 09.2c
Sanitary Sewer Map

FIU FLORIDA INTERNATIONAL UNIVERSITY

PERKINS + WILL
MILLER LEGG

0 250 500
GRAPHIC SCALE
1 INCH = 500 FEET

LEGEND

- Proposed Building
- Existing Building
- Existing Storm Line (ST)
- Existing Catch Basin
- Existing Trench Drain
- Proposed Storm Line
- Proposed Manhole / Inlet
- Existing -To Be Removed
- Surface Water

KEY MAP

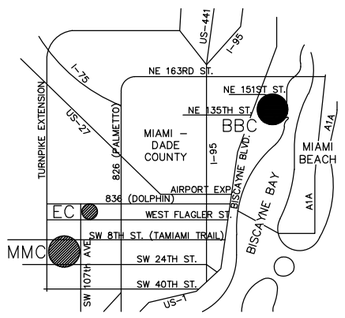


FIGURE 09.3a
Drainage System Map

FIU | FLORIDA INTERNATIONAL UNIVERSITY

PERKINS + WILL
MILLER LEGG

LEGEND

- Proposed Building
- Existing Building
- Existing Fire Hydrant
- Existing Water Main
- Proposed Fire Hydrant
- Proposed Water Main
- Existing - To Be Removed
- Surface Water

KEY MAP

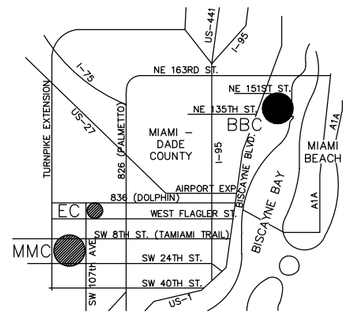


FIGURE 09.3b
Water Distribution Map

FLORIDA INTERNATIONAL UNIVERSITY

PERKINS + WILL

MILLER LEGG

LEGEND

- Proposed Building
- Existing Building
- Existing Sanitary Manhole
- Existing Sanitary Main/ Existing Force Main
- Existing Sanitary Lift Station
- Proposed Sanitary Manhole
- Proposed Sanitary Main
- Proposed Force Main
- Proposed Lift Station
- Existing - To Be Removed
- Surface Water

KEY MAP

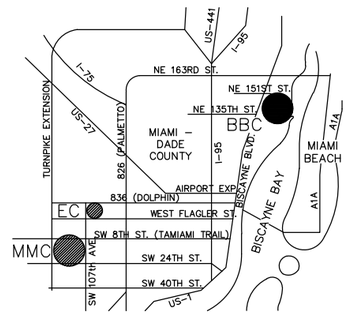


FIGURE 09.3c
Sanitary Sewer Map

FIU | FLORIDA INTERNATIONAL UNIVERSITY

PERKINS + WILL
MILLER LEGG