

9.0 GENERAL INFRASTRUCTURE ELEMENT

The purpose of this element is to ensure coordinated provision of public facilities and services required to meet the future needs of the University, consistent with current efforts to address sustainability issues on campus include 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 certified. This includes the following:

1. Solid waste handling and disposal capacity
2. Stormwater management capacity to protect the welfare of both the University's and host community's residents.
3. Potable water and water reuse for irrigation purposes.
4. Sanitary sewer and treatment capacity to meet anticipated University needs.

STORMWATER MANAGEMENT: The stormwater management plan for Modesto A. Maidique Campus is a combination of percolation, overland flow, exfiltration systems and positive drainage systems with outfalls into existing onsite lakes. No offsite discharge connections exist, as all stormwater runoff is contained onsite (see Figure 9.1a: Drainage System Map).

The Engineering Center drainage system is designed to handle on-site stormwater runoff with a combination of exfiltration trenches, dry and wet retention areas, drainage swales, lakes, overland flow, and positive drainage pipe systems (see Figure 9.2a: Drainage System Map).

The stormwater management plan for the Biscayne Bay Campus is a combination of percolation, overland flow and exfiltration systems. The Biscayne Bay Campus stormwater management plan also utilizes positive drainage systems with outfalls both to onsite lakes and adjacent off-site water bodies. Currently, there are two outfalls to offsite surface water bodies located on the north and east sides of the site. The north outfall system consists of a 42-inch culvert and the east outfall consists of an 8" x 12" culvert (see Figure 9.3a: Drainage System Map).

WATER: Potable water for Modesto A. Maidique Campus is provided by the Miami-Dade Water and Sewer Department (MDWASD). MDWASD owns and maintains all existing watermains inside the campus. It is important to note that there are no easements over any of the internal mains. If MDWASD requires easements along future mains, there will be restrictions on development within the easements. The internal water distribution system is fed via existing water mains located within the right-of-way of SW 8th Street, SW 107th Ave and SW 117th Avenue (see Figure 9.1b: Water

Distribution System Map).

The Engineering Center is serviced from a MDWASD owned water distribution system with points of connection on SW 107th Avenue and West Flagler Street (see Figure 9.2b: Water Distribution System Map).

Potable water service to the Biscayne Bay Campus is provided by the City of North Miami. Connections are made to the City owned off-site system located along NW 151st Street and NW 135th Street (see Figure 9.3b: Water Distribution System Map.)

SEWER: The Modesto A. Maidique Campus sanitary sewer system consists of gravity sewer lines, force mains, a series of privately owned sanitary sewer lift stations. Sewage flows from the campus are transmitted off-site to the MDWASD owned system via two connection points located within the right-of-way of SW 8th Street and SW 117th Avenue. (see Figure 9.1c: Sanitary Sewer Map.)

The Engineering Center sanitary sewer collection system is comprised of a series of gravity sewer lines which flow into a single privately owned lift station. The sanitary sewer flow generated by the Engineering Campus is transmitted off-site into the MDWASD owned system via a connection point located on West Flagler Street. (see Figure 9.2c: Sanitary Sewer System.)

The Biscayne Bay Campus sanitary sewer system consists of a combination of gravity sewer lines, a force main and a master pump station with connections to multiple on-site secondary pump stations. The sanitary sewer system for the Biscayne Bay Campus is transmitted to the City of North Miami's collection system and ultimately to the MDWASD system for treatment and disposal of the wastewater flows. (see Figure 9.3c: Sanitary Sewer Map).

SOLID WASTE: Solid waste collection and disposal is accomplished at Modesto A. Maidique Campus, Engineering Campus and Biscayne Bay Campus by utilizing a combination of University staff, private contractors and public entities. Upon collection, the solid waste material is either recycled or sent to the landfill for disposal.

GOAL 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 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 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.
Solid Waste Collection and Disposal Requirements:
- Policy 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 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 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 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 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 1.6.7 The University shall establish timing and phasing requirements for solid waste collection and disposal facility improvements to meet future university needs.
- Policy 1.6.7 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 1.1.7 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 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 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 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 1.2.3 FIU shall promote recycling through periodic educational emphases for the student body, faculty, and staff.

Policy 1.2.4 FIU shall implement a mandatory recycling program targeted towards faculty and staff.

Policy 1.2.5 FIU shall evaluate the techniques and benefits of composting of vegetation and landscape refuse for future implementation at the University.

GOAL 2:
Florida International University shall provide a stormwater management system, which protects real property and ensures maintenance of ground water quality.

Objective 2.1 Adequacy of Campus Drainage:
Florida International University shall coordinate future development in accordance with a master campus drainage plan in order to meet drainage systems requirements in an efficient manner and protect University property.

Policy 2.1.1 Engineering surveys shall be provided to obtain detailed data for implementation of accurate records, and to identify condition of facilities.

Policy 2.1.2 Maintain, update, and keep current, accurate as-builts of stormwater facilities

Policy 2.1.3 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 2.1.3

FIU shall design and construct or improve stormwater management facilities as identified in Figures 9.1 a, 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 2.1.4

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 2.1.5

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

Objective 2.2

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 2.2.1

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

Modesto	A. Maidique Campus	Biscayne Bay	Engineering Center
Min Building Finished Floor Elevation	9.0 ft NGVD	9.0 ft NGVD (10.0 ft NGVD for buildings along the Southern edge of the campus)	9.0 ft NGVD
Min. Sidewalk Elevation	8.0 ft NGVD	6.0 ft NGVD	8.0 ft NGVD
Min. Crown of Roadway Elevations	7.5 ft NGVD	5.5 ft NGVD	7.5 ft NGVD
Min. Parking Lot Elevations	7.0 ft NGVD	5.0 ft NGVD	7.0 ft NGVD

The minimum elevations shown above are minimum Miami-Dade County DERM requirements based on Miami-Dade County Flood Criteria and the FEMA Flood Insurance Rate Maps for the University areas.

Policy 2.2.2

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 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 Department 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 2.2.3

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

Policy 2.2.4

Drainage systems for all new development shall be designed in accordance with the campus master development plan, the Miami-Dade County Public Works Department Public Works Manual Section D4 Water Control and Miami-Dade County Department of Environmental Resource Management guidelines. The South Florida Water Management District Permit Information Manual Volume IV guidelines shall also be implemented as part of any proposed

development at the Biscayne Bay Campus. 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 2.2.5

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

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:

-9.0 ft NGVD, whichever is greater, for Modesto A. Maidique Campus and the Engineering Center.

-9.0 ft. NGVD, whichever is greater, for Biscayne Bay Campus

Policy 2.2.6

The minimum acceptable Flood Protection Level of Service standards for University facilities shall be protected from the degree of flooding that would result for a duration of one day from a ten-year storm.

Policy 2.2.7

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

Policy 2.2.8

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

Objective 2.3

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 2.3.1

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 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 2.3.2

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, whichever is greater, in accordance with Miami-Dade County Department of Environmental Resources Management and South Florida Water Management District criteria.

Policy 2.3.3 All stormwater runoff shall be contained within the project site utilizing exfiltration trench, with overflow to an on-site water body when available and shall not adversely affect adjacent property.

Policy 2.3.4 Exfiltration trench systems with overflow in to a water body shall be designed to retain on site all the volume of runoff generated by the contributing drainage area.

Policy 2.3.5 Design of new facilities as well as retrofitting of existing drainage systems and areas having drainage deficiencies identified in the Master Drainage Study shall be undertaken in accordance with the Capital Improvements Element and Master Drainage Study.

Policy 2.3.6 All drainage inlets receiving runoff directly from paved surfaces shall have oil pollution baffles installed.

Policy 2.3.7 All proposed drainage system plans shall be reviewed and approved by FDOT, SFWMD, DERM or their designees prior to the initiation of any drainage system construction activity.

Policy 2.3.9 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 2.4 Maintenance of Campus Drainage:
Florida International University shall properly maintain the stormwater management system and ensure that all deficiencies are corrected.

Policy 2.4.1 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 2.5 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 2.5.1 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 2.5.2 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 Department of Environmental Resources Management (DERM).

Policy 2.5.3 All new developments shall include sustainable elements required to meet USGBC standards and LEED Silver certification criteria.

GOAL 3: Florida International University shall ensure that potable water is available for existing and future campus development.

Objective 3.1 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 the capital improvements element.

Policy 3.1.1 Florida International University shall adopt the following potable water level of service standards:

10 gallons per capita per day*

*Level of service standard is consistent with local government comprehensive plan for schools.

Policy 3.1.2 The level of service water pressure standard shall be a minimum of 20 p.s.i. and no greater than 100 p.s.i. 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 3.1.3 The minimum level of service water main size for primary and secondary distribution systems shall be 12 inches in diameter.

Policy 3.1.4 All potable water plans for Modesto A. Maidique Campus and Engineering Campus shall be reviewed and approved by the State of

Florida Department of Environmental Protection, Miami-Dade County Department of Environmental Resources Management, Miami-Dade County Water and Sewer Authority Department, Miami-Dade County Health Department, Miami-Dade County Fire Department and the state fire Marshall. Plans for Biscayne Bay will require the review and approval of the City of North Miami, as well as the Florida Department of Environmental Protection.

- Policy 3.1.5 All potable water mains in primary distribution and secondary distribution systems shall be looped.
- Policy 3.1.6 All existing dead-end potable water primary and secondary distribution systems shall be eliminated by constructing links to complete a loop.
- Policy 3.1.7 All primary and secondary potable water distribution systems shall incorporate fire system demands.
- Policy 3.1.8 All fire protection services to new developments shall be in accordance with the National Fire Protection Association (NFPA 24 Private Water Distribution System).
- Policy 3.1.9 The priorities for potable water improvements shall be:
- 1) Elimination of dead-end water distribution systems
 - 2) Expansion of potable water infrastructure.
- Policy 3.1.10 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 WASD standard and specification.
- Policy 3.1.11 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 the 14.0 Capital Improvements element.
- Policy 3.1.12 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 3.1.13 Annually review future construction programs and priorities for deficiency remediation as part of the capital improvements procedures to ensure capacity and capital improvements required to meet the University needs are provided when required, based on needs identified in other master plan elements.

Objective 3.2 **Water Conservation Program:**
Florida International University shall develop and implement a comprehensive water conservation program that is consistent with Florida's Water Conservation Act.

Policy 3.2.1 Promote an educational program which will discourage waste and conserve water.

Policy 3.2.2 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 3.2.3 The use of xeric landscaping techniques, 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 3.2.4 A leak detection and repair program on building service lines shall be implemented and maintained.

Policy 3.2.5 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 3.2.6 Encourage the preparation of a goal oriented water conservation plan for FIU.

Objective 3.3 **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 3.3.1 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 3.3.2 Periodically revise and/or update the existing water service agreements between the University Board of Trustees and Miami-Dade County.

GOAL 4: **Florida International University shall ensure that sanitary sewer is available for existing and future campus development.**

Objective 4.1 **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 the capital improvements element.

- Policy 4.1.1 Florida International University shall adopt the following sanitary sewer level of service standards:
- 2015**
Modesto A. Maidique Campus and Engineering Center:
26 gallons per capita per day
Biscayne Bay Campus:
11 gallons per capita per day
- Policy 4.1.2 The minimum level of service gravity sewer pipe size for sewer collection mains shall be eight inches in diameter.
- Policy 4.1.3
All UNIVERSITY WIDE:
sanitary sewer plans for connecting off-site shall be reviewed by the Miami-Dade County Department of Environmental Resources Management and any proposed connection to the existing sewer in public right-of-way shall be reviewed by WASD. Final approval of any available point connection will only be forthcoming once the proposal successfully passes the rigorous review process in place by the WASD.
- Policy 4.1.4 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 4.1.5 FIU 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.
- Policies 4.1.6 Periodically revise and/or update the sewer service agreements between the University Board of Trustees and Miami-Dade County.
- Policy 4.1.7 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.
- Policy 4.1.8 Maintain, update, and keep current, accurate as-builts of sanitary sewer facilities including lift station capacity and manhole/pipe invert

elevations.

Objective 4.2 Florida International University shall implement the recommendations of the infiltration and inflow study performed for the gravity sewer system for each campus.

Policy 4.2.1 A program and schedule shall be developed to replace lines that are sub-standard, overloaded or have maintenance/operation problems.

Policy 4.2.2 Pipes with excess ground water r inflow/infiltration shall be repaired, replaced or lined.

Policy 4.2.3 Monitoring of the waste water r system shall be consistent with existing EPA, FDEP, Miami-Dade County DE RM, National, State and local regulatory criteria.

Policy 4.2.4 New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharges from the systems into flood waters

Objective 4.3 Florida International University shall provide an efficient and adequate pump station and force main system to convey sewage to off-site mains.

Policy 4.3.1 No new developments shall be permitted to connect onto the existing on-site pump stations and forcemains 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 4.3.2 Existing pump stations shall be designed to accommodate the following minimum additional flow:

Biscayne Bay Campus - 116,850 GPD

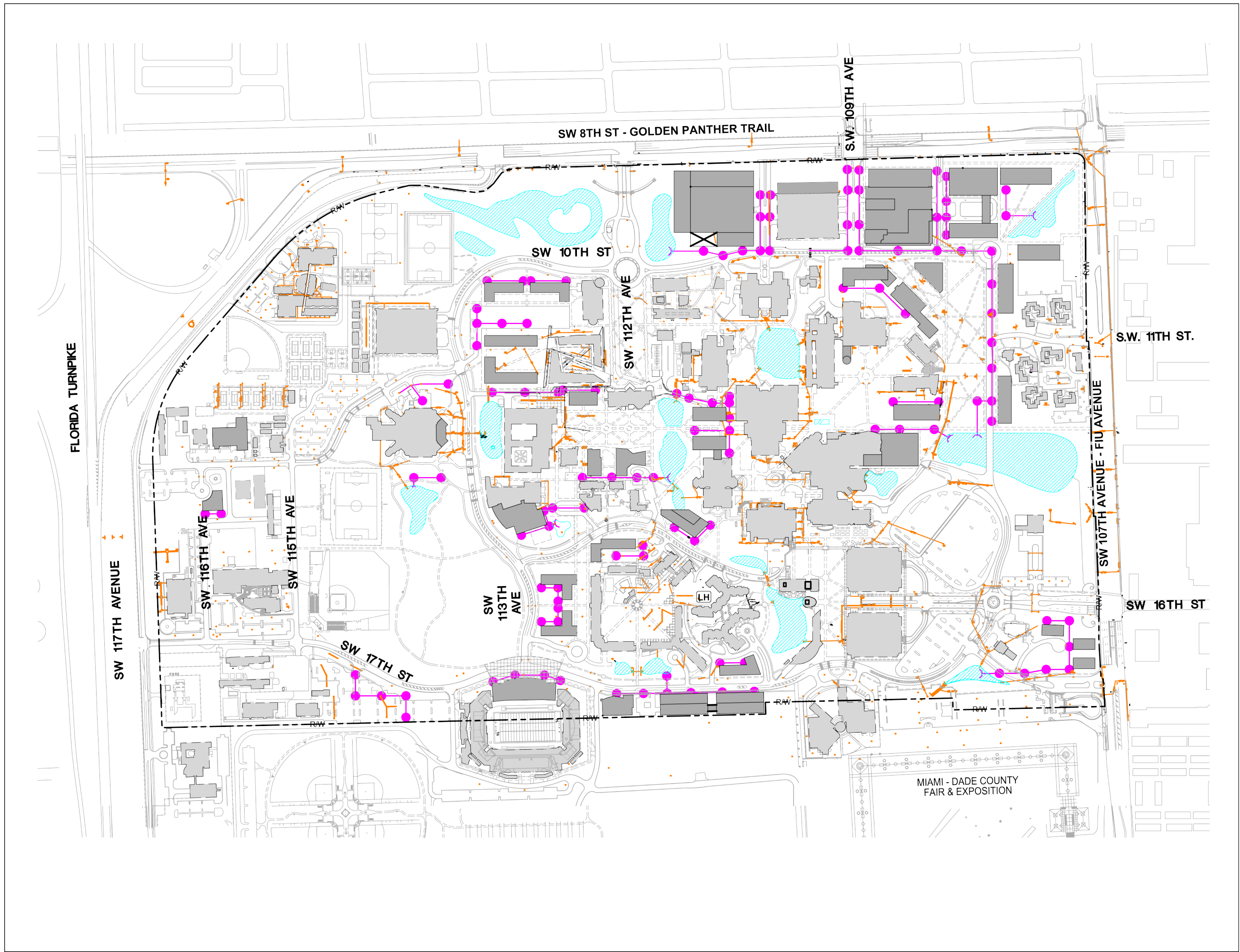
University	Park:
PSO-428B:	244, 250 GPD
PSO-428C:	285, 350 GPD
PSO-428D:	296, 408 GPD
PSO-428E:	12,000 GPD
PSO-428F:	20,000 GPD

Engineering	Center:
99-00621:	5,832

Policy 4.3.3 In addition to upgrades to existing pump stations, the proposed 2015

build out shall include construction of new pump stations to collect the following minimum sanitary sewer flow generated by the proposed developments.

University	Park:
Private	PS1: 50,600 GPD
Private	PS2: 1,472,170 GPD



LEGEND

- Proposed Building
- Existing Building
- Existing Storm Line
- Existing Catch Basin
- Existing Trench Drain
- Proposed Exfiltration Trench
- Proposed Manhole / Inlet
- Proposed Outfall
- Surface Water

KEY MAP

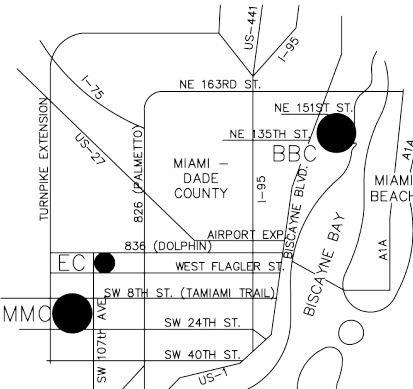


FIGURE 9.1a
Drainage System Map

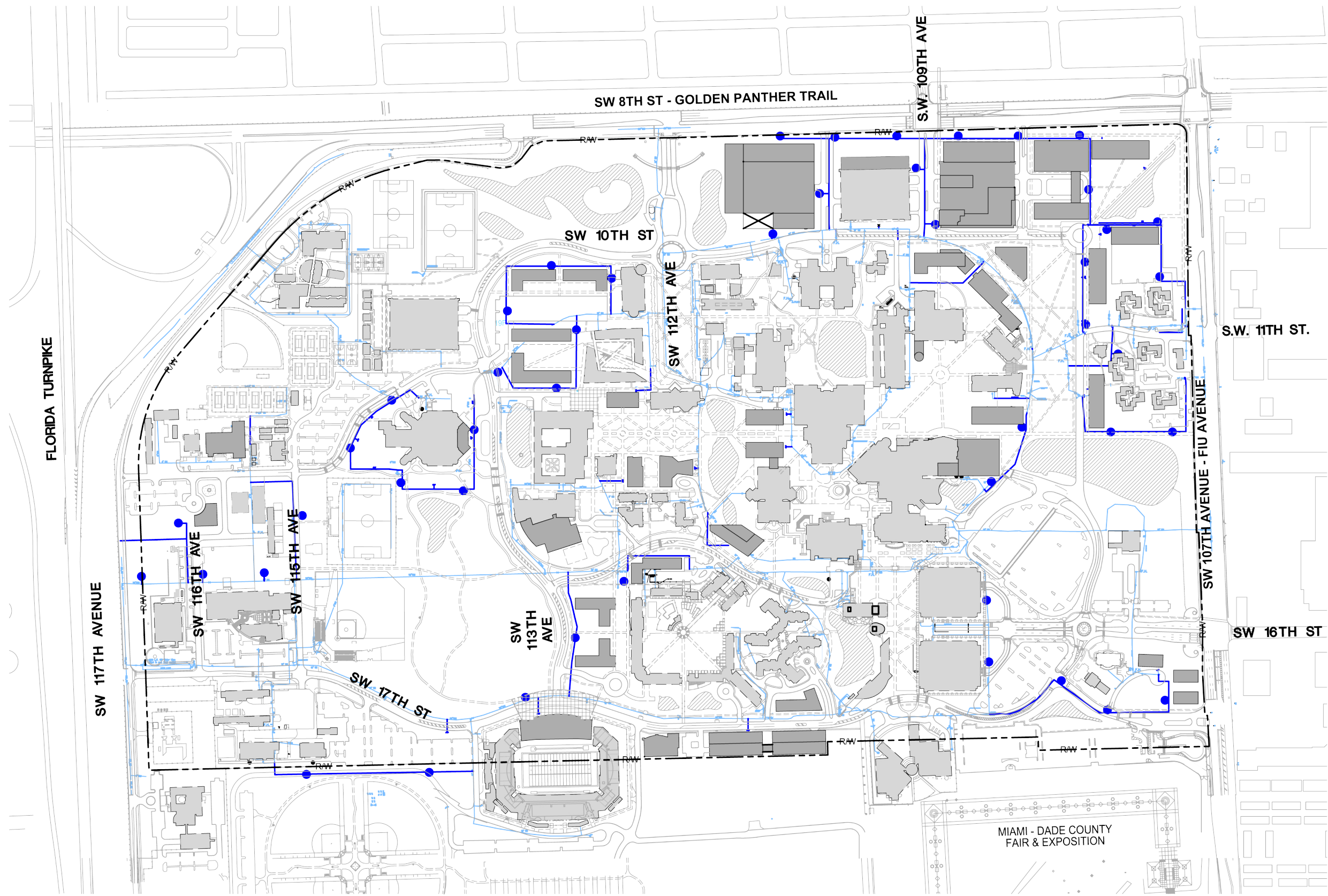
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Campus Master Plan - June 2010



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LEGEND

- Proposed Building
- Existing Building
- Proposed Fire Hydrant
- Proposed Water Main
- Existing Fire Hydrant
- Existing Water Main
- Surface Water

KEY MAP

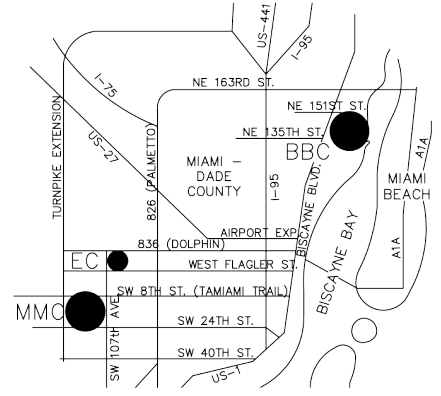


FIGURE 9.1b
Water Distribution Map

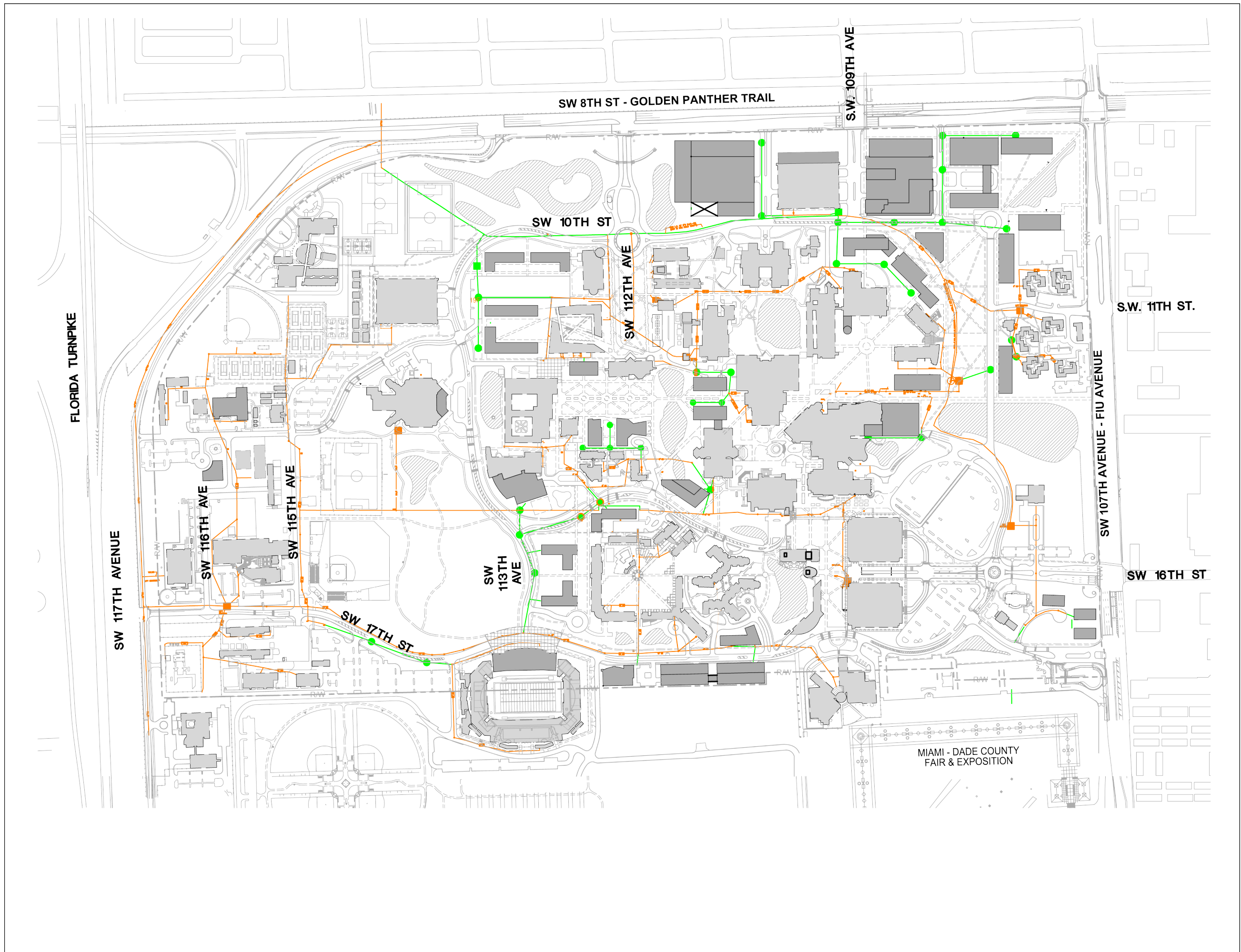
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LEGEND

- Proposed Building
- Existing Building
- Proposed Sanitary Manhole
- Proposed Sanitary Lift Station
- Proposed Sanitary Sewer Main
- Existing Sanitary Manhole
- Existing Sanitary Sewer Main
- Existing Sanitary Lift Station
- Surface Water

KEY MAP

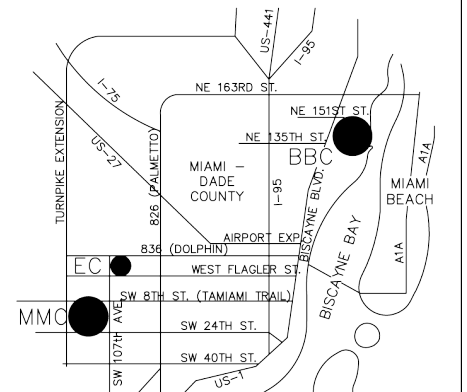


FIGURE 9.1c
Sanitary Sewer Map

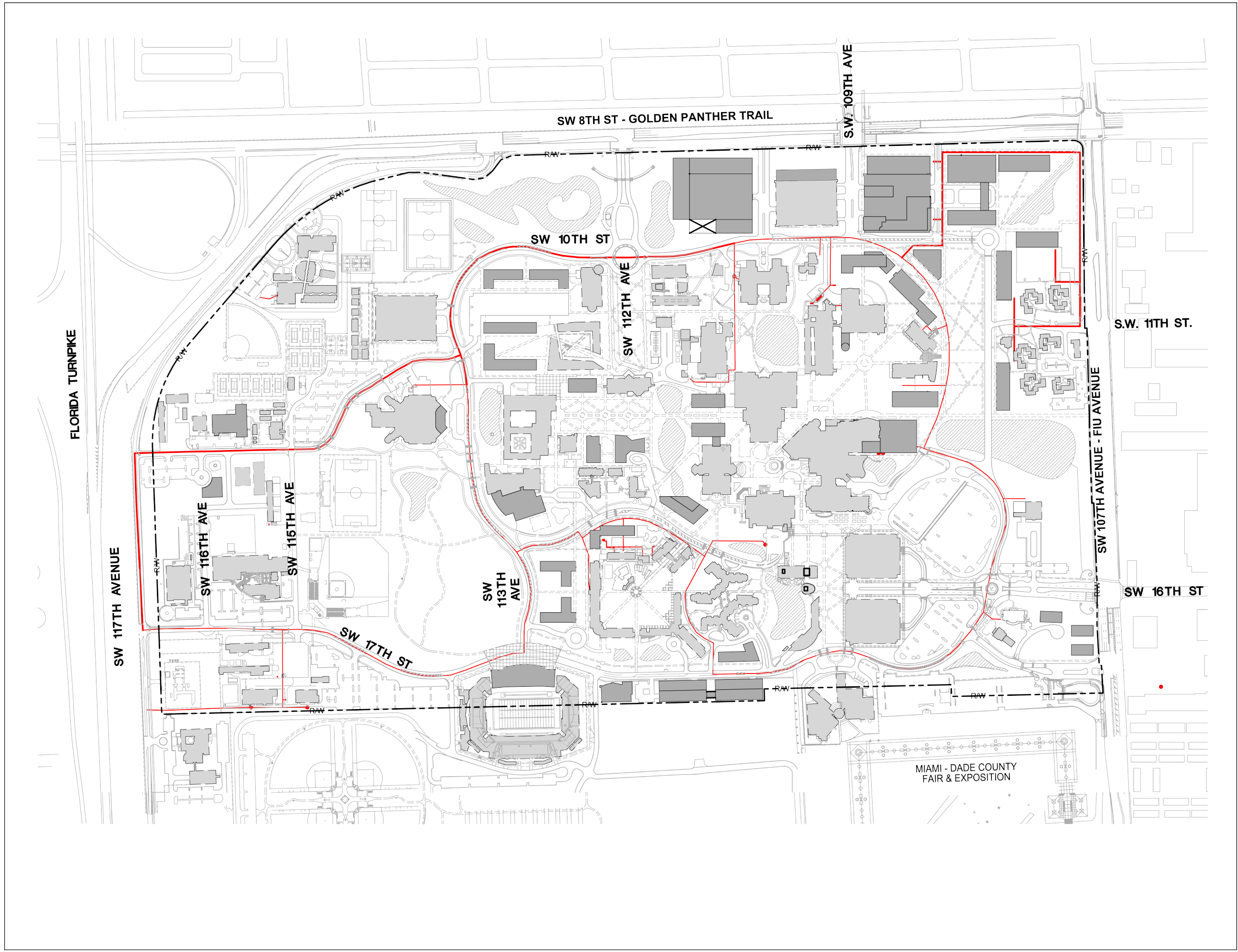
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LEGEND

- Proposed Building
- Existing Building
- Proposed Natural Gas Main
- Existing Natural Gas Main
- Surface Water

KEY MAP

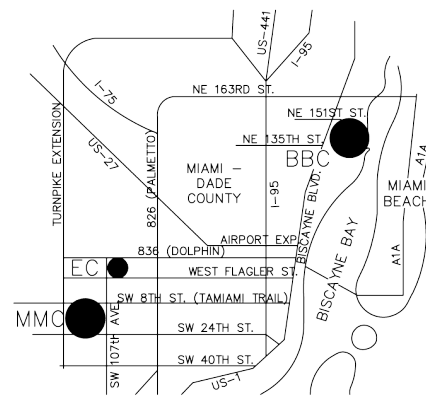


FIGURE 9.1d
Natural Gas Map

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LEGEND

- Proposed Building
- Existing Building
- Existing Storm Line
- Existing Catch Basin
- Existing Trench Drain
- Proposed Storm Line
- Proposed Manhole / Inlet

KEY MAP

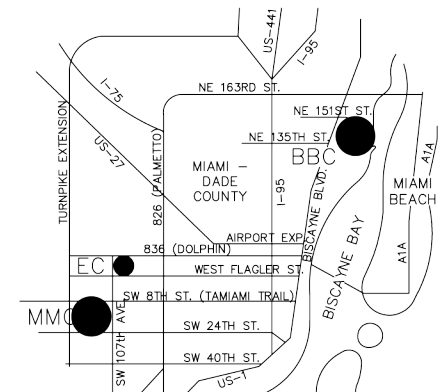


FIGURE 9.2a
Drainage Map

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LEGEND

- Proposed Building
- Existing Building
- Proposed Fire Hydrant
- Proposed Water Main
- Existing Fire Hydrant
- Existing Water Main

KEY MAP

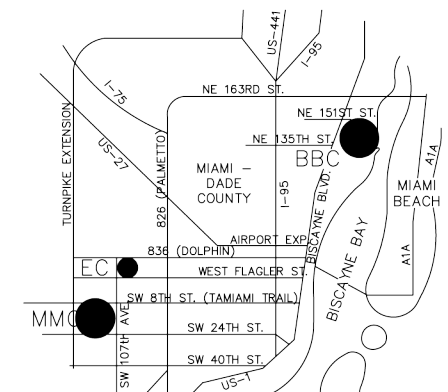


FIGURE 9.2b
Water Distribution Map

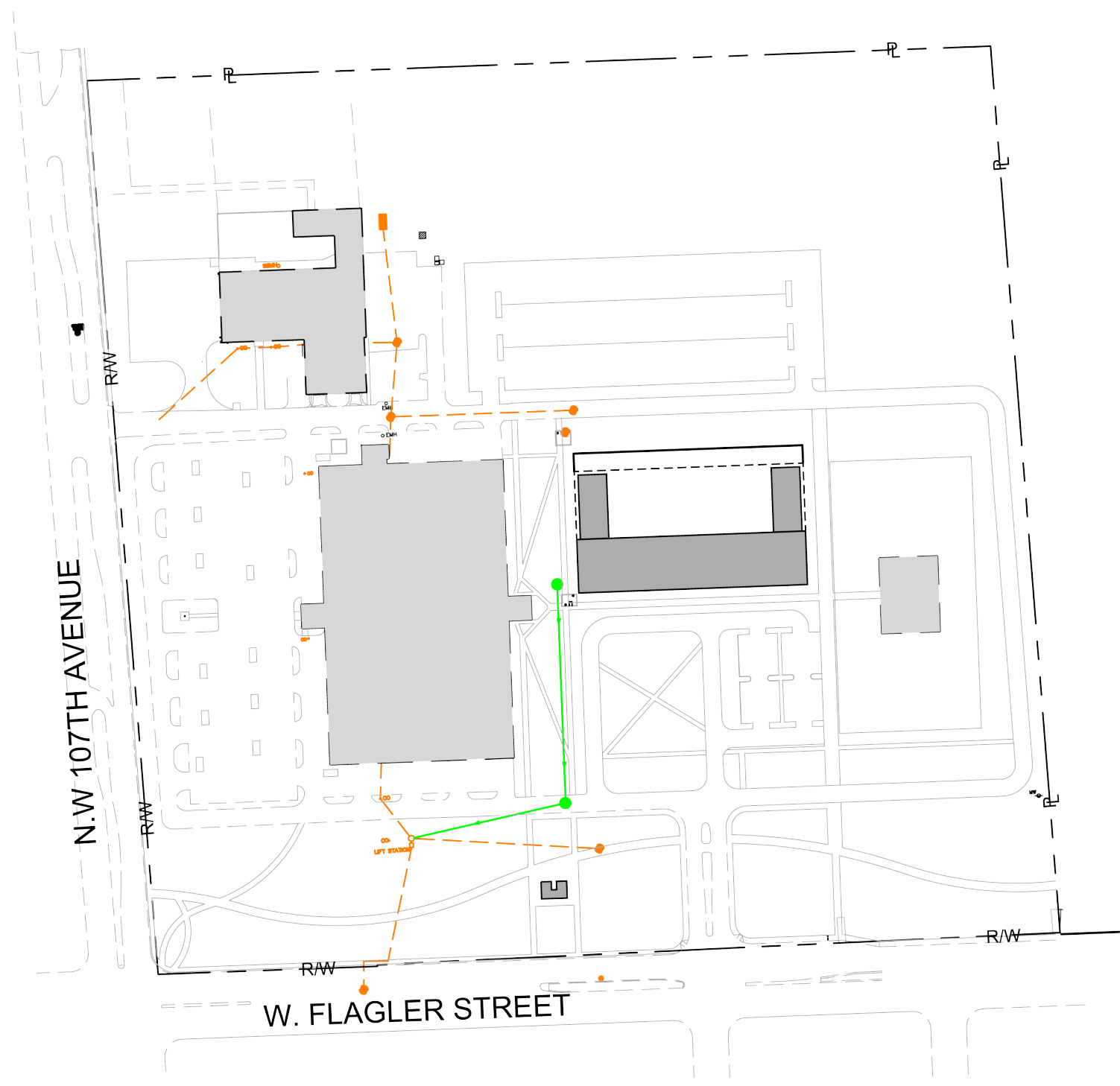
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LEGEND

- Proposed Building
- Existing Building
- Proposed Sanitary Sewer Manhole
- Proposed Sanitary Sewer Main
- Existing Sanitary Sewer Manhole
- Existing Sanitary Sewer Main
- Existing Sanitary Sewer Lift Station

KEY MAP

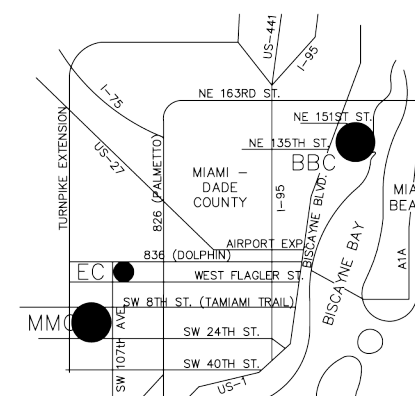


FIGURE 9.2c
Sanitary Sewer Map

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Oleta River State Park

City of North Miami

LEGEND

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

KEY MAP

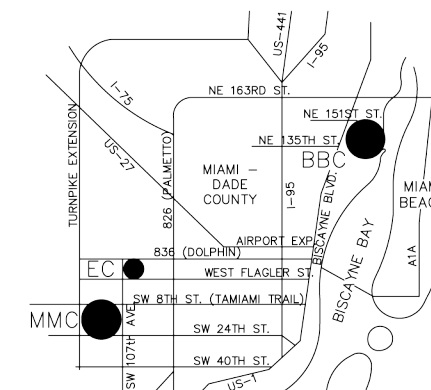


FIGURE 9.3a
Drainage System Map

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City of North Miami

LEGEND

-  Proposed Building
-  Existing Building
-  Proposed Fire Hydrant
-  Proposed Water Main
-  Existing Fire Hydrant
-  Existing Water Main
-  Existing Chilled Water Main
-  Surface Water

KEY MAP

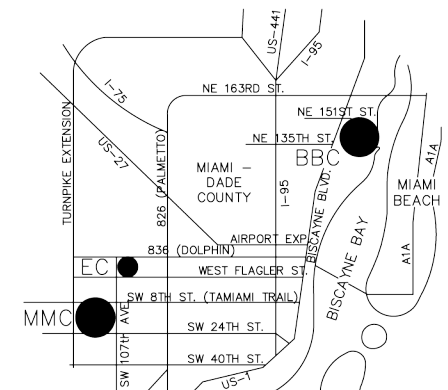


FIGURE 9.3b
Water Distribution Map

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LEGEND

- Proposed Building
- Existing Building
- Proposed Sanitary Sewer Manhole
- Proposed Sanitary Sewer Main
- Existing Sanitary Sewer Manhole
- Existing Sanitary Sewer Main
- Existing Sanitary Sewer Lift Station
- Surface Water

KEY MAP

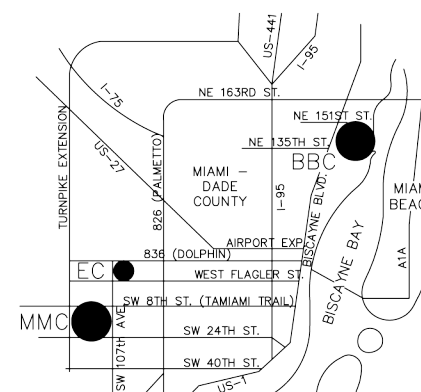


FIGURE 9.3c
Sanitary Sewer Map

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