

***BROWARD LEADERS WATER ACADEMY***

# URBAN STORMWATER MANAGEMENT

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SOUTH BROWARD DRAINAGE DISTRICT

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# ***BROWARD LEADERS WATER ACADEMY***

## **Outline**

**Definition**

**Regulatory Agencies**

**Regulations**

**Water Quality**

**Flood Protection**

**Design Elements**

**Permitting & Construction**

**Operation and Maintenance**

**Miscellaneous Drainage Facilities**

# ***BROWARD LEADERS WATER ACADEMY***

## **Definition**

### **“URBAN STORMWATER MANAGEMENT”**

**INCLUDES THE DESIGN, PERMITTING, CONSTRUCTION, OPERATION, AND MAINTENANCE OF DRAINAGE AND STORMWATER MANAGEMENT SYSTEMS FOR URBAN AREAS. THIS INCLUDES STREET DRAINAGE; FLOOD PROTECTION FOR HOMES AND BUSINESSES; WATER QUALITY; PRETREATMENT OF STORMWATER RUNOFF; WATER USE; AND CONSERVATION.**

# ***BROWARD LEADERS WATER ACADEMY***

## **Regulatory Agencies**

### **FEDERAL AGENCIES**

**U. S. Army Corps of Engineers**

**Environmental Protection Agency (Clean Water Act ; NPDES)**

### **STATE & REGIONAL AGENCIES**

**South Florida Water Management District (SFWMD)**

**Florida Department of Environmental Protection (FDEP)**

**Florida Fish & Wildlife Conservation Commission**

**Florida Statutes (Everglades Forever Act)**

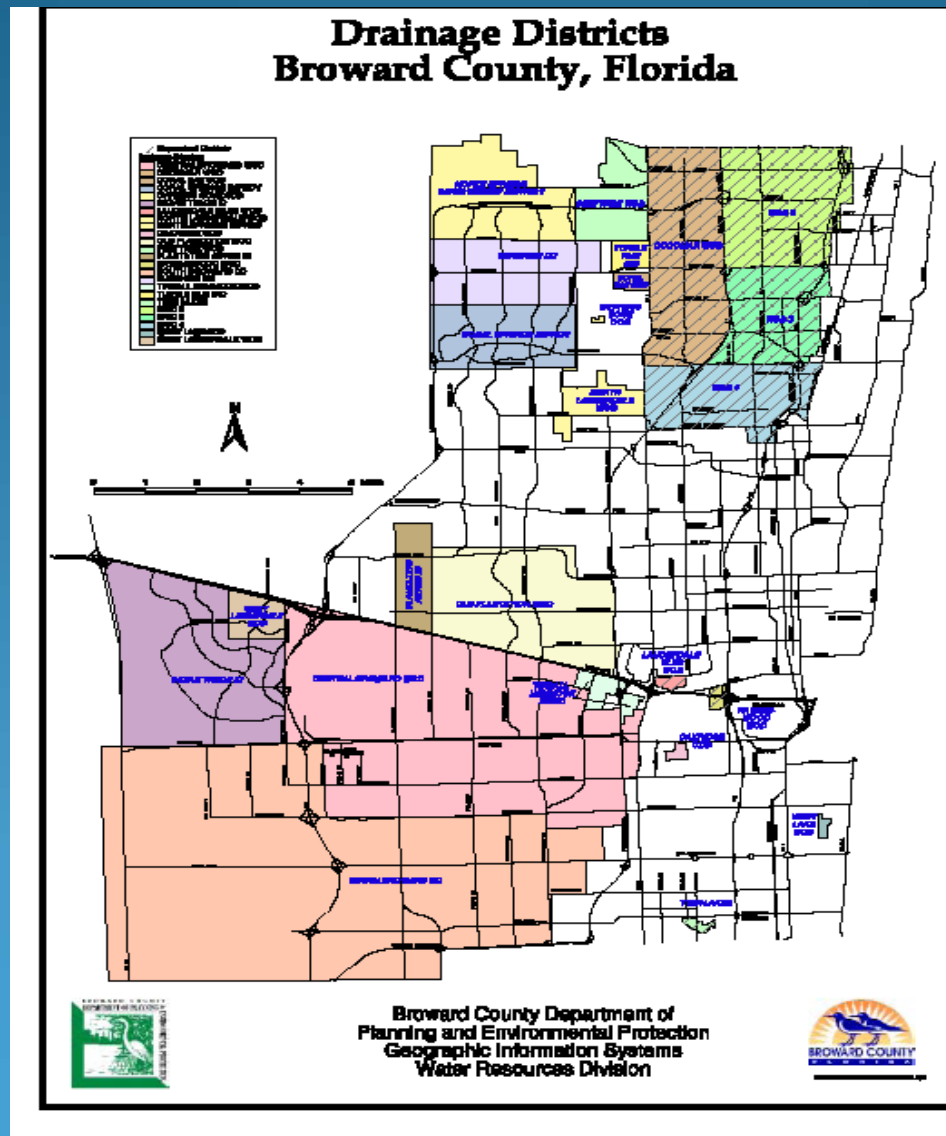
### **LOCAL AGENCIES**

**Broward County**

**Independent, Local Drainage Districts**

**Local Municipalities**

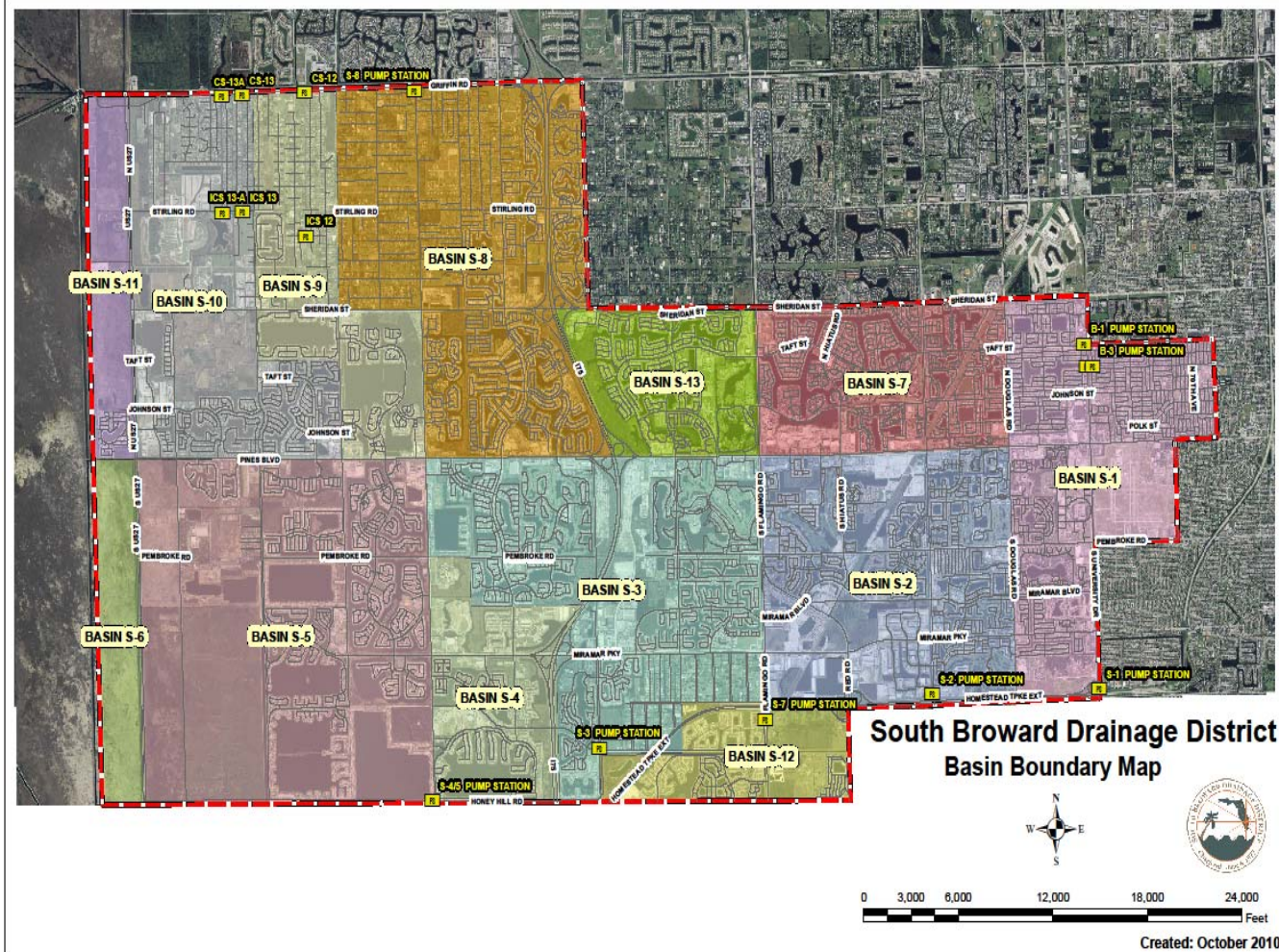
# ***BROWARD LEADERS WATER ACADEMY***





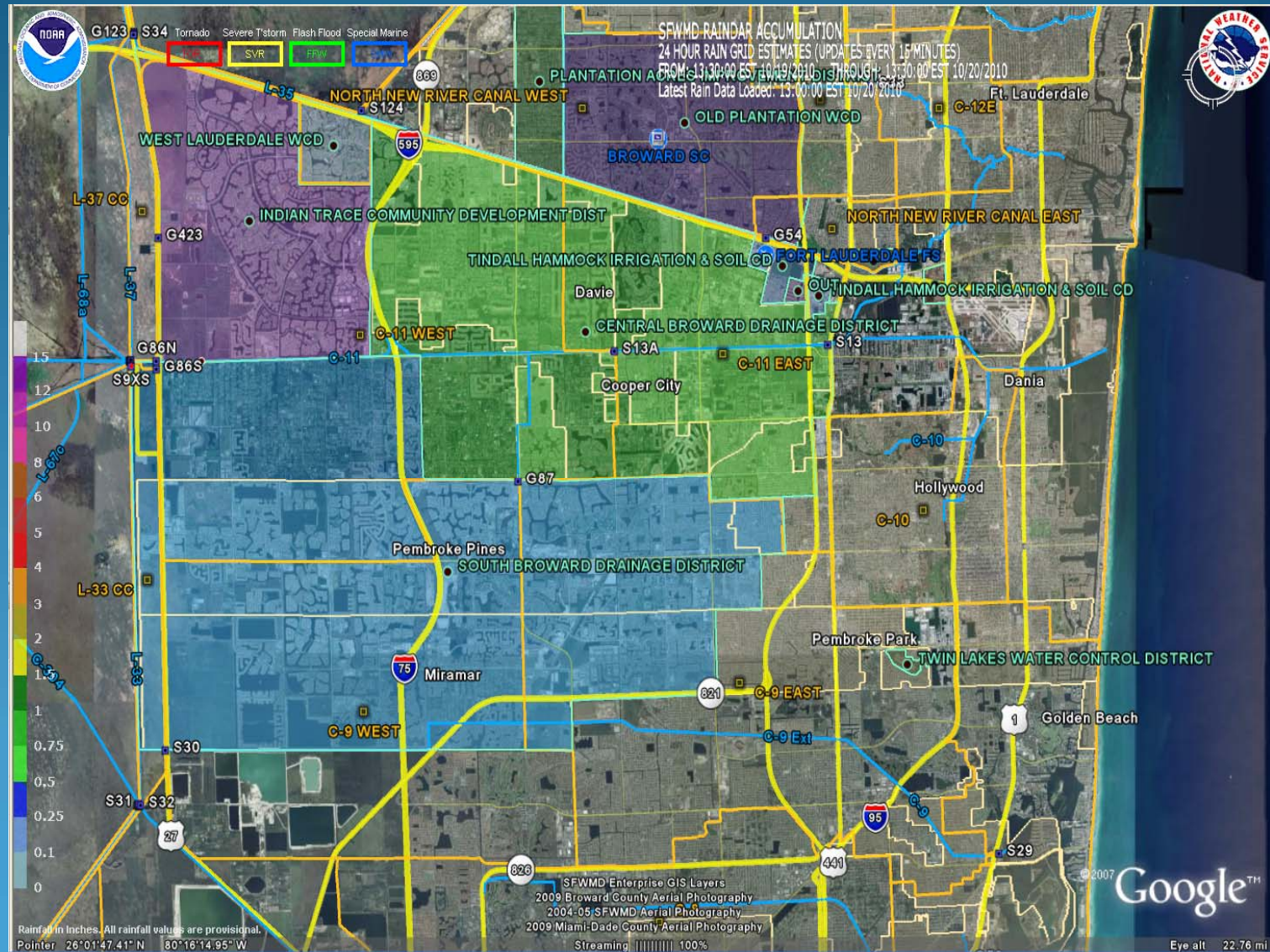
# BROWARD LEADERS WATER ACADEMY

## Interface Between Local and Regional Facilities





## Interface Between Local and Regional Facilities



# ***BROWARD LEADERS WATER ACADEMY***

## Regulations



**Regulations Are Aimed at Finding a Balance  
Between Water Quality, Flood Protection and  
Conservation**



# ***BROWARD LEADERS WATER ACADEMY***

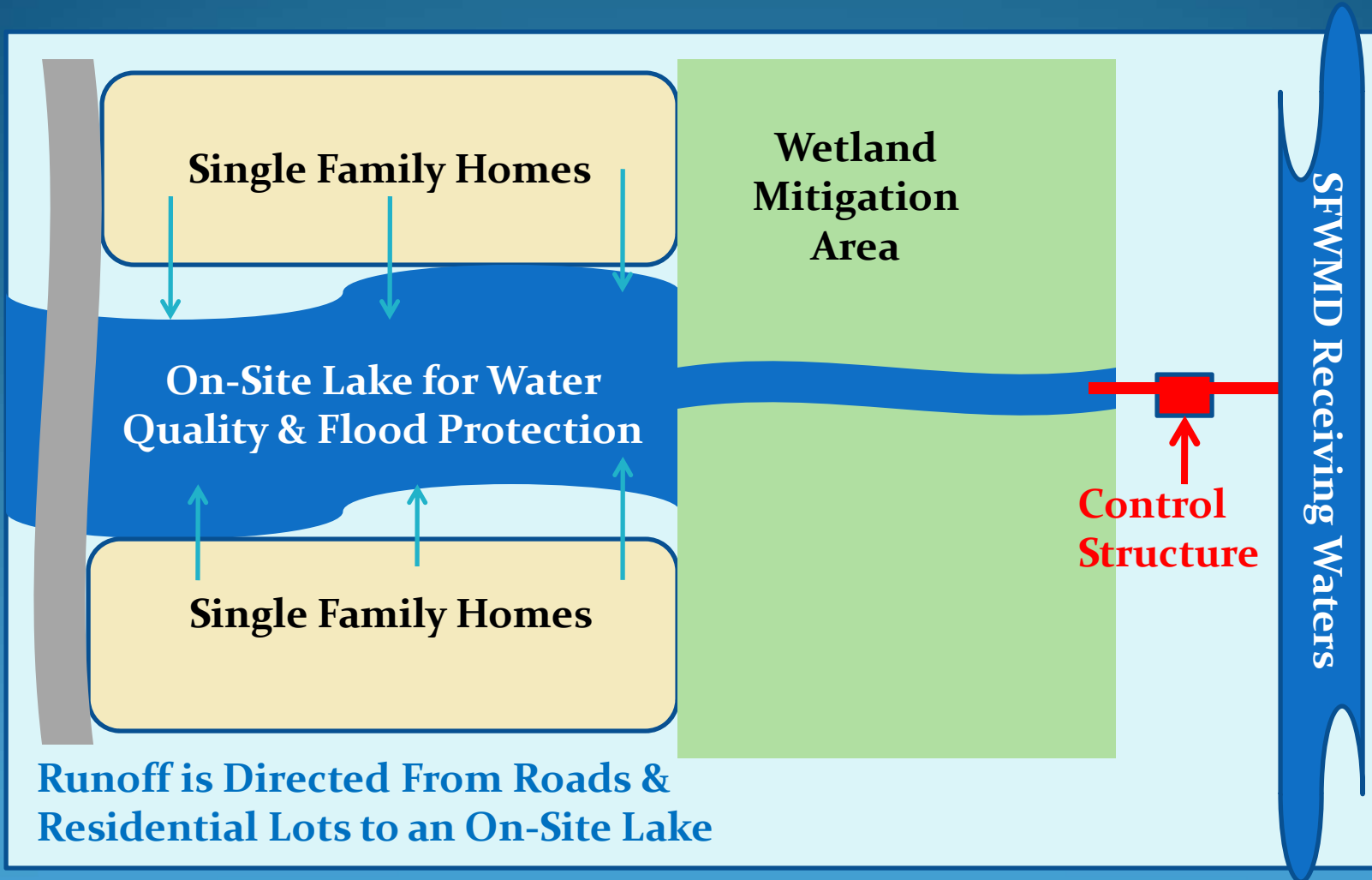
## Regulations

**All Urban Stormwater Management Systems Must Meet Minimum Requirements For:**

- **Water Quality**
- **Dry Pretreatment- Commercial & Industrial Sites**
- **Flood Protection**
- **Limited Off-Site Discharge**



# ***BROWARD LEADERS WATER ACADEMY***

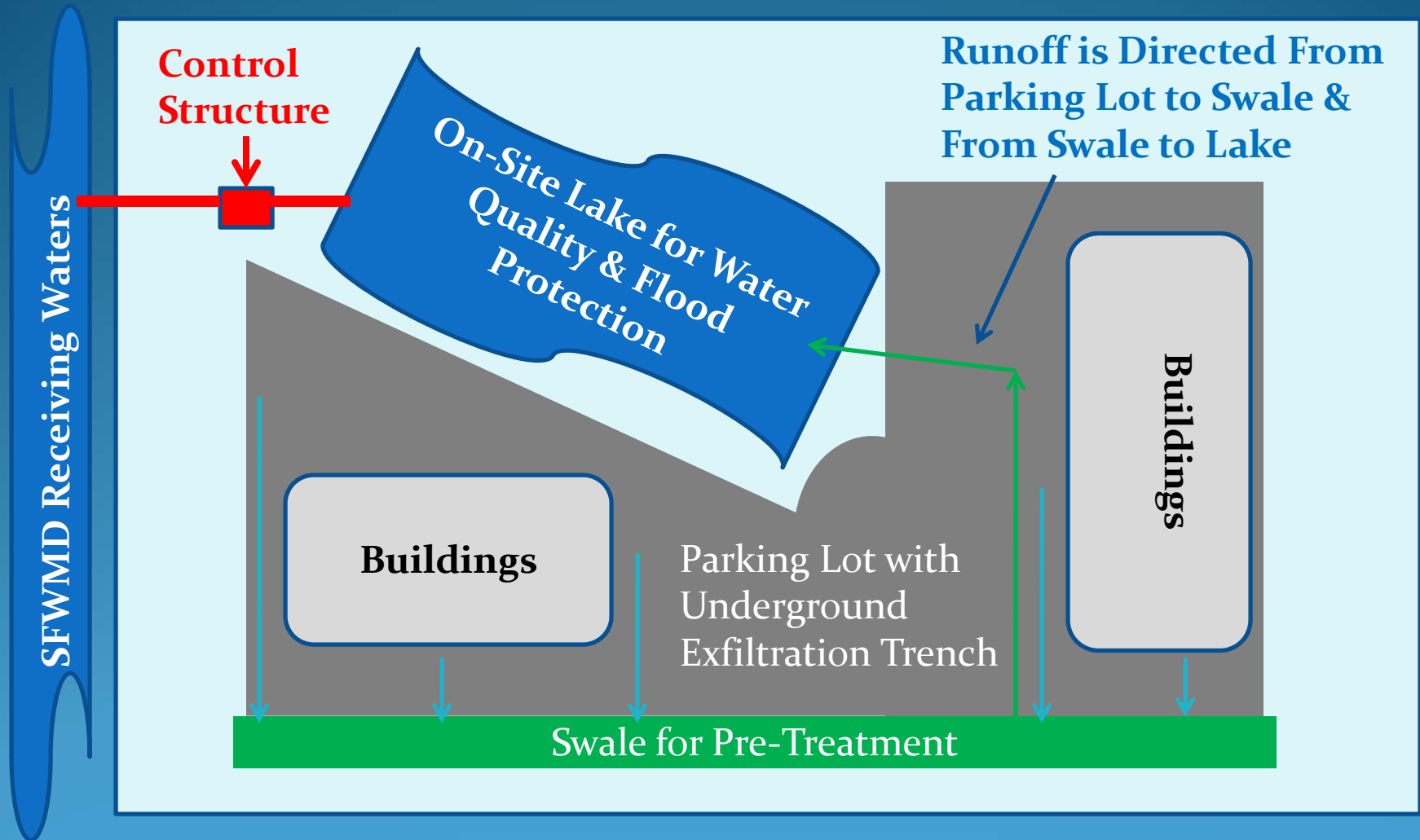


**TYPICAL RESIDENTIAL DRAINAGE SYSTEM**

# ***BROWARD LEADERS WATER ACADEMY***



# BROWARD LEADERS WATER ACADEMY



**TYPICAL COMMERCIAL DRAINAGE SYSTEM**



# ***BROWARD LEADERS WATER ACADEMY***





# ***BROWARD LEADERS WATER ACADEMY***

## Permitting & Construction



**All Work Should be Performed in Accordance with the  
Approved Permit Plans**

# ***BROWARD LEADERS WATER ACADEMY***

## **Operations & Maintenance**

**Annual Inspections of Drainage Facilities**

**Year Round Maintenance & Upgrades**

**5-Year Re-Certifications**

**Water Quality Testing as Required**

**Coordination with SFWMD on Pre-Storm Drawdowns**

**Outreach Programs on BMPs and Other Water Issues**





# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Roadside Swales with Pre-Treatment**





# ***BROWARD LEADERS WATER ACADEMY***

## **Drainage Facilities**



**Swales and Retention Areas**

# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Swales and Retention  
Areas**





# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Perimeter Berms**



# ***BROWARD LEADERS WATER ACADEMY***

## **Drainage Facilities**



**On-Site Lakes for Water  
Quality**





# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Wetland Mitigation  
Areas**





# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Curb & Gutter with Inlets**



# ***BROWARD LEADERS WATER ACADEMY***

## **Drainage Facilities**



**Water Level Recorder**



**Fish Guard**



# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Control Structures**



# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Primary Drainage  
Canals and Boat Ramp**



# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Primary Drainage  
Canals**



# ***BROWARD LEADERS WATER ACADEMY***

## **Drainage Facilities**



**Adjustable Gates & Weirs**



# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Adjustable Gates & Weirs**



# ***BROWARD LEADERS WATER ACADEMY***

## Drainage Facilities



**Stormwater Pump Stations**



# ***BROWARD LEADERS WATER ACADEMY***

## **Drainage Facilities**

**Regional Facility -  
SFWMD S-381 Gated  
Spillway Structure  
on the C-11 Canal**

