

**MIAMI-DADE COUNTY
PARKS, RECREATION, AND OPEN SPACES (MDPROS)**

**LUDLAM TRAIL CORRIDOR
FROM SW 80th STREET TO 400 FEET NORTH OF NW 7th STREET
MIAMI-DADE COUNTY, FLORIDA
P&R CONTRACT NO. 43502-15-001-14470619
P&R PROJECT NO. RFQ 786B
FM NO. 444236-1-22-01
ETDM NO. 14369**

**PRELIMINARY
STORMWATER MANAGEMENT REPORT**

PREPARED BY

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1 INTRODUCTION

The Miami-Dade County Parks, Recreation and Open Spaces (MDPROS) Department is conducting a Project Development and Environment (PD&E) Study for a continuous public bicycle and pedestrian pathway along the Ludlam Trail Corridor in Miami-Dade County. The project is funded under a Local Agency Program (LAP) Agreement with the Florida Department of Transportation (FDOT) which requires compliance under the National Environmental Policy Act (NEPA). This Preliminary Stormwater Management Report documents the existing conditions, design criteria, and proposed conditions from a drainage point of view.

1.1 Purpose and Scope

The purpose of the proposed Ludlam Trail Corridor is to provide a new route/pathway in Miami-Dade County to encourage the use of alternate modes of transportation and enhance overall connectivity and accessibility to schools, parks, transit stations, and bus stops for more than 30,000 people living within two miles of the proposed project corridor. The proposed project would provide a safe, dedicated, and direct means of non-motorized transportation to and from areas of residences, work, schools, parks, and shopping centers, and would serve bicyclists, pedestrians, and other non-motorized vehicle users.

1.2 Project Description

MDPROS is proposing to develop a 5.6-mile multi-use trail within the former Florida East Coast Industries (FECI) railroad corridor (i.e., the Ludlam Trail Corridor, or proposed project). As a future component of the Shared-Use Nonmotorized (SUN) Trail Network, this proposed publicly accessible trail would serve bicyclists, pedestrians, and users of other types of non-motorized vehicles. In addition, the proposed project is expected to provide a safe, dedicated, and direct means of non-motorized transportation to and from areas of residences, work, schools, parks, and shopping centers.

The proposed project limits extend along a segment of the former FECI rail corridor from SW 80th Street to 400 feet north of NW 7th Street, between 69th and 70th Avenues (**See Appendix A**). The project occurs entirely within the former FECI right-of-way (ROW). The ROW for the proposed Ludlam Trail Corridor is approximately 100 feet wide for most of its length, although it narrows to between 75 or 80 feet in some areas. Further, at up to nine (9) roadway crossings, the ROW at the roadway crossing narrows to approximately 40 feet. These roadway crossings include the following: SW 72nd Street/Sunset Drive; SW 56th Street /Miller Drive; SW 40th Street /Bird Road; SW 24th Street/Coral Way; SW 23rd Street; SW 22nd Street; SW 21st Street; SW 8th Street/Calle Ocho; and W Flagler Street.) (**See Appendix B for project Typical Sections**). The proposed project study area extends through sections of the City of Miami, the City of South Miami, and unincorporated Miami-Dade County, and is immediately adjacent to the City of West Miami.

The proposed Ludlam Trail Corridor is located within three (3) South Florida Water management District (SFWMD) Drainage Basins:

- 1) From the Begin Project at SW 80th Street to SW 40th Street – within the C-2 Canal Basin
- 2) From SW 40th Street to SW 8th Street – within the Coral Gables Basin
- 3) From SW 8th Street to the End Project just north of NW 7th Street – within the Tamiami East Basin

This Preliminary Stormwater Management Report presents how the applicable drainage criteria will be addressed as a result of the proposed Ludlam Trail Corridor improvements.

2 DRAINAGE SYSTEM IMPROVEMENTS

There are currently no existing stormwater management systems for the Ludlam Trail Corridor. Stormwater Runoff is permitted to flow directly onto the existing adjacent green areas for storage, where it eventually infiltrates into the ground.

The proposed project improvements, however, will introduce new impervious areas which will increase the stormwater runoff volume. In addition, the new impervious areas will reduce the storage of runoff available from the existing ground surface due to the configuration of the proposed trail. In order to compensate for this increase of runoff and decrease of surface storage, the proposed Ludlam Trail Corridor will include swales (**See Appendix B**) that must be designed to retain the required water quality treatment volume, retain the increase of stormwater runoff due to the increase of impervious area, and also be able to account for any lost ground surface storage of stormwater runoff.

This Preliminary Stormwater Management Report will quantify the required water quality treatment volume and the required stormwater runoff volume needed to be retained onsite due to the increase of impervious area. Due to the scope of this preliminary study phase, however, the required stormwater retention volume due to the decrease of ground surface storage cannot be determined, but must be taken into account during the final design phase of the project. This will ensure that adjacent property owners will not be adversely affected by the proposed Ludlam Trail Corridor improvements.

3 DESIGN CRITERIA AND PARAMETERS

This section outlines the South Florida Water Management District (SFWMD) and Miami-Dade County Department of Regulatory and Economic Resources (DRER) stormwater quantity and quality criteria applicable to the proposed drainage systems. The criteria and parameters outlined in this section are derived from the applicable published regulations, permit design manuals, and design standards.

3.1 Design High Water Elevation

The design high water elevation for most projects within Miami-Dade County is typically derived from the Public Works Department Design Standard W.C. 2.2, which is determined from the average October groundwater level data available from 1960 to 1975. Design Standard W.C. 2.2 shows the wet season groundwater elevation within the 3.0 ft-NGVD (1.44 ft-NAVD) elevation contour (**See Appendix D**).

3.2 Stormwater Quantity Criteria

The stormwater quantity criteria will be based on the most stringent requirement between the SFWMD and DRER criteria.

3.2.1 Design Storms

The DRER's criteria outlined in the Policy for Design of Drainage Structures in Miami-Dade County (December 1980) requires that drainage systems for those other than four lane roads in high density, high traffic areas be designed for a 5-year frequency design storm.

Miami-Dade County DRER also requires that proposed drainage systems meet the offsite discharge requirements per the SFWMD 25 year – 72 hour rainfall event.

Table 3-1: Design Storm Events

Design Storm Event
5 year - 24 hour
25 year - 72 hour

3.2.2 Spread

There are no applicable spread criteria for the subject project.

3.3 Stormwater Quality Criteria

The design high water elevation for most projects within Miami-Dade County is typically derived from the Public Works Department Design Standard W.C. 2.2, which is determined from the average October groundwater level data available from 1960 to 1975. Design Standard W.C. 2.2 shows the wet season groundwater elevation within the 3.0 ft-NGVD (1.44 ft-NAVD) elevation contour.

The SFWMD requires that all projects meet state water quality standards, as set forth in Chapter 17-302, Florida Administrative Code (FAC). To assure that these criteria are met, the Project

must meet the following volumetric retention/detention requirements, as describe in the SFWMD Permit Volume IV:

1. For wet detention systems, the first inch of runoff from the project or the total runoff from 2.5 inches times the percent impervious, whichever is greater, must be detained on-site. A wet detention system is a system that maintains the control elevation below one foot from the seasonal high groundwater elevation and does not bleed-down more than one-half inch of detention volume in 24 hours.
2. Dry detention systems must only provide 75 percent of the required wet detention volume. Dry detention systems must maintain the control elevation at least one foot above the seasonal high groundwater elevation.
3. Retention systems must only provide 50 percent of the wet detention volume.
4. For projects with more than 50 percent of imperviousness, discharge to the receiving water bodies must be made through baffles, skimmers, or other mechanisms suitable of preventing oil and grease from discharging to / or from the retention / detention areas.

DRER also requires that all projects meet the state water quality standards. To assure that this criteria is met, 100 percent of the first inch of runoff must be retained on-site. The volume is equivalent to retaining one inch of runoff from the furthest hydrologic point in the project. The methodology for estimating this volume is outlined in DRER's Policy for Design of Drainage Structures as follows:

$$V = 60 C i A T_t$$

Where:

V = Required stormwater quality volume [cubic feet]

C = Runoff coefficient [dimensionless]

i = Storm intensity [inches per hour]

A = Total tributary area [acres]

T_t = Duration of storm whose runoff is polluted and contaminated [minutes]

$$= T_{1''} + T_c$$

Where:

$$T_{1''} = \frac{2940 F^{-0.11}}{308.5 C - 60.5 (0.5895 + F^{-0.67})}$$

Where:

F = Storm frequency [years]

C = Runoff coefficient

T_c = Time of concentration [minutes]

i = Storm intensity [inches per hour]

$$i = \frac{308.5}{48.6 F^{-0.11} + T_t (0.5895 + F^{-0.67})}$$

Where:

F = Storm frequency [years]

T_t = Duration of storm whose runoff is polluted and contaminated [minutes]

For projects such as the Ludlam Trail Corridor, DRER requires that the one-inch of runoff be retained for a rainfall event with a 5-year frequency.

All Water Quality calculations with adherence to the above criteria are provided in Appendix C of this report.

For the proposed drainage design, the more stringent criteria of either the SFWMD or Miami-Dade County DRER will be used.

4 FLOODPLAIN IMPACTS

In accordance with Part 2, Chapter 13 of the PD&E Manual, the project area is generally located outside of the 100-year floodplain, in flood insurance rate Zone X. However, from SW 43rd Street to SW 40th Street, the project is located within Zone AH with a Base Flood Elevation of 9.00, and from the Tamiami Canal (C-4) to the northern Project Terminus, the project is located within Zone AH with a Base Flood Elevation of 7.00 (See APPENDIX E).

The proposed drainage improvements associated with the project will perform hydraulically in a manner equal to or greater than the existing conditions (no treatment), and backwater surface elevations are not expected to increase. Thus, there will be no significant adverse impacts on natural and beneficial floodplain values. There will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Any localized flooding will not increase as the result of this project. Therefore, it has been determined that any encroachment upon the base floodplain is not significant.

5 DRAINAGE ANALYSIS RESULTS

The results of the drainage analysis have been summarized and presented in Appendix C of this report.

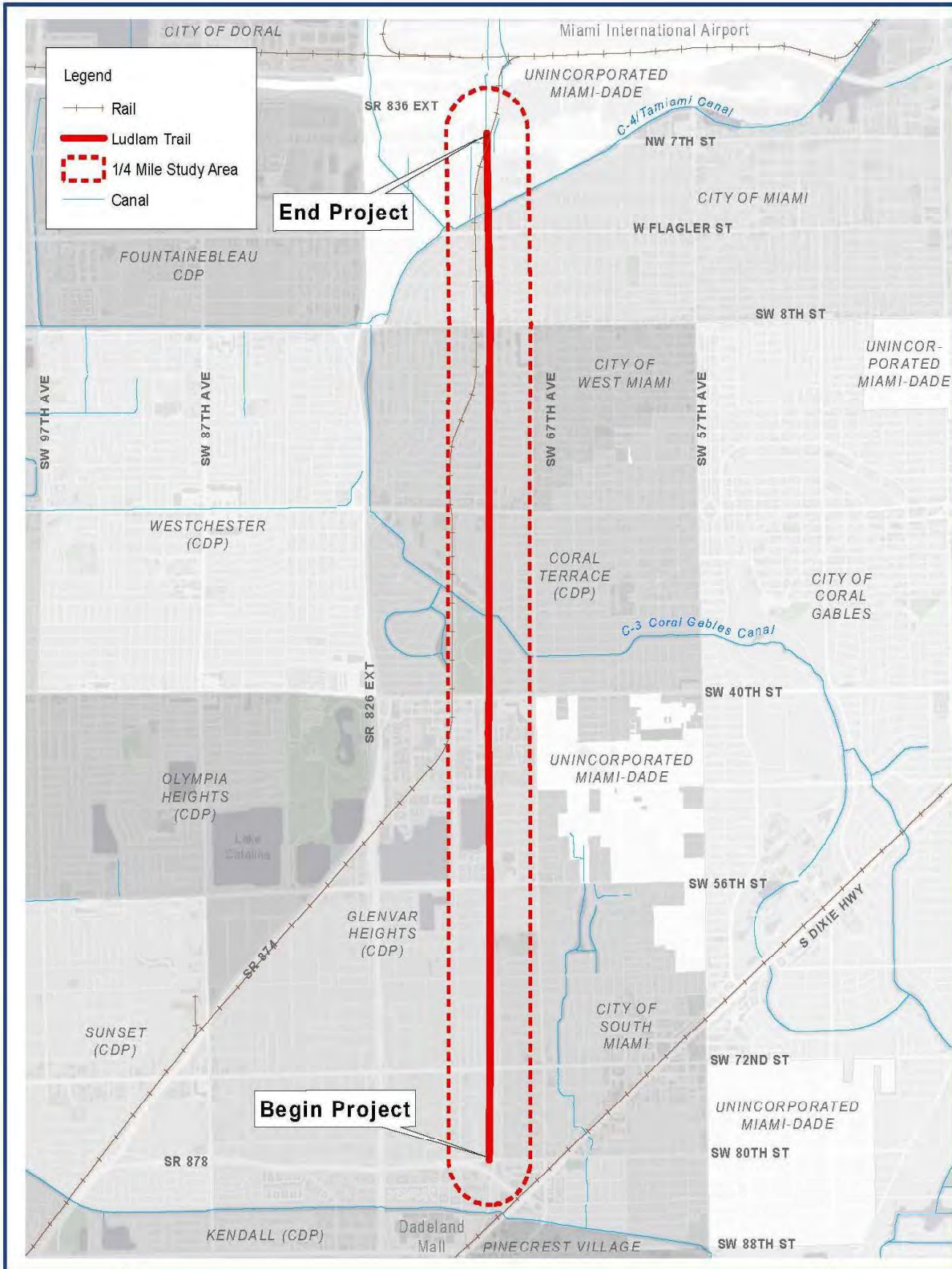
Table C-1 gives a description of the different drainage basins and their boundary limits

Tables C-2A, C-2B, and C-2C provides the required water quality treatment volumes that need to be retained by the proposed dry retention swales. The required water quality retention volumes are categorized by the areas located within each South Florida Water management District (SFWMD) Drainage Basin.

Table C-3 compares the post-development stormwater runoff volume to the pre-development stormwater runoff volume during the SFWMD's 25 year – 72 hour design storm. This is the volume of runoff that needs to be retained by the proposed dry retention swales in order to account for the increase of stormwater runoff due to the increase of impervious area.

APPENDIX A

Location Map



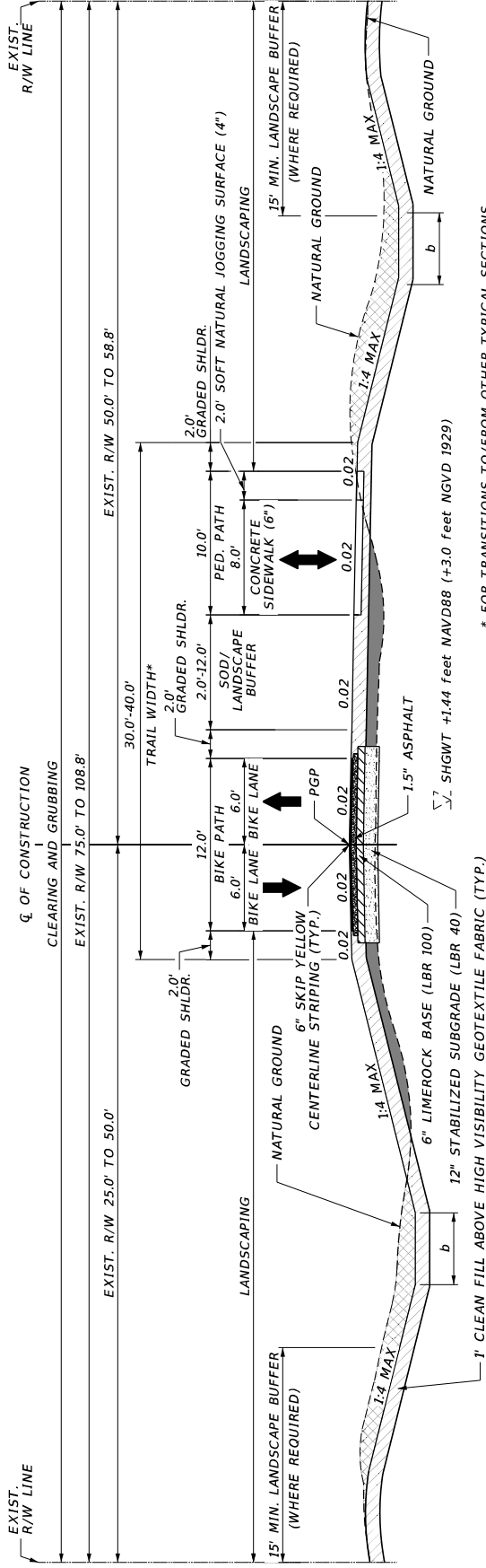
Project Location Map
Ludlam Trail Corridor
PD&E Study



APPENDIX B

Typical Sections

LUDLAM TRAIL BICYCLE AND PEDESTRIAN PATH (BUFFERED SEPARATION)



* FOR TRANSITIONS TO/FROM OTHER TYPICAL SECTIONS, SEE TYPICAL SECTION DETAILS (SHEET 7)

TYPICAL SECTION 1

TRAIL DESIGN SPEED	
18 MPH	FOR LONGITUDINAL GRADES ≤ 4%
30 MPH	FOR DOWNHILL LONGITUDINAL GRADES > 4%

EARTHWORK LEGEND	
	CUT
	RELOCATED FILL
	CLEAN FILL

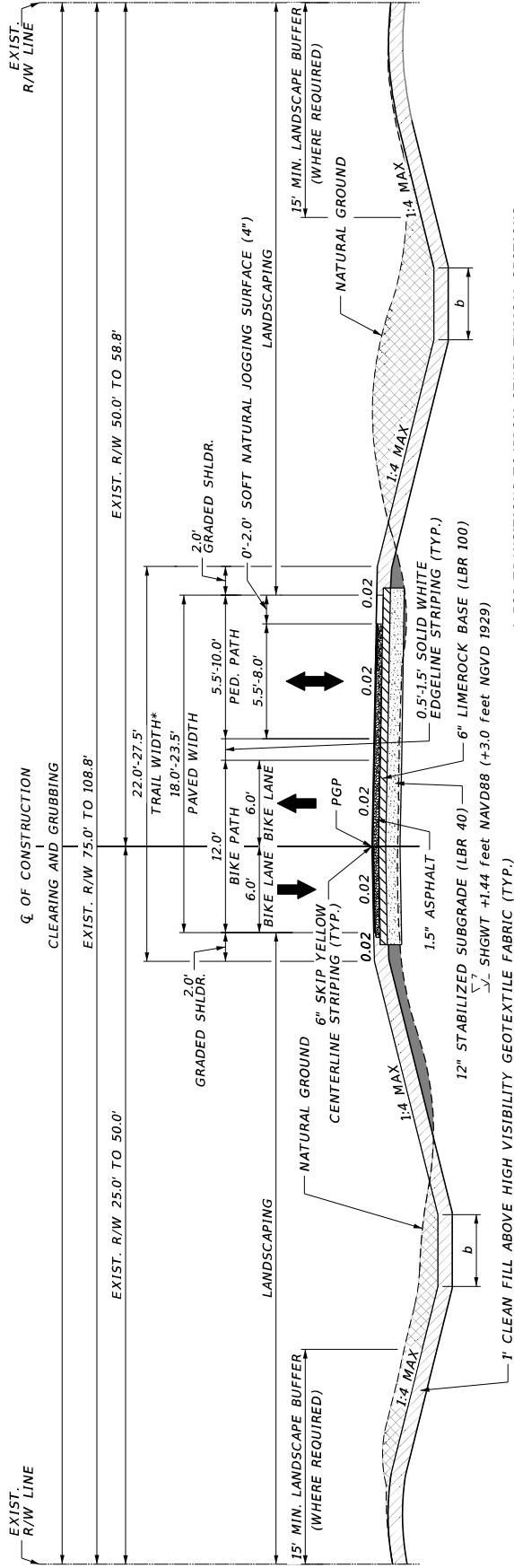
DRAINAGE LEGEND	
b:	Swale Bottom Width
Swale depth and width is to be determined in design.	

- NOTES:
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) EACH YEAR IS IN THE AUGUST-SEPTEMBER PERIOD AT THE END OF THE WET SEASON DURING A YEAR OF AVERAGE (NORMAL) RAINFALL.
 - SHGWT BASED ON NORTH AMERICAN VERTICAL DATUM (NAVD) 1988.
 - PGP: PROFILE GRADE POINT
 - APPLICABLE DRAINAGE IS TO BE EVALUATED/DETERMINED DURING DESIGN.
 - APPLICABLE LIGHTING INCLUDING LOW-LEVEL BOLLARD LIGHTING IS TO BE EVALUATED/DETERMINED DURING DESIGN.
 - ANY EXISTING CHAIN LINK FENCE, ASPHALT PADS OR OTHER ITEMS/ENCROACHMENTS WITHIN THE TRAIL RIGHT OF WAY WILL BE REMOVED AT THE TIME OF CLEARING AND GRUBBING

DATE	REVISIONS DESCRIPTION	 110 EAST BROWARD BOULEVARD, SUITE 700 FORT LAUDERDALE, FL 33301	 MIAMI-DADE County Parks, Recreation, and Open Spaces (INDPROS)	Hickman Building 275 NW 2nd Street Miami, FL 33128 305-255-7800	P&E CONTRACT NO. RPO 288B PCS PROJECT NO. 43502-15-001-047/061B	LUDLAM TRAIL CORRIDOR P&E STUDY	LUDLAM TRAIL TYPICAL SECTIONS	SHEET NO.
								NO.

DRAFT

LUDLAM TRAIL BICYCLE AND PEDESTRIAN PATH (NO SEPARATION)



* FOR TRANSITIONS TO/FROM OTHER TYPICAL SECTIONS, SEE TYPICAL SECTION DETAILS (SHEET 7)

TYPICAL SECTION 2

TRAIL DESIGN SPEED	
18 MPH	FOR LONGITUDINAL GRADES \leq 4%
30 MPH	FOR DOWNHILL LONGITUDINAL GRADES $>$ 4%

DRAINAGE LEGEND	
	Swale Bottom Width
Swale depth and width is to be determined in design.	

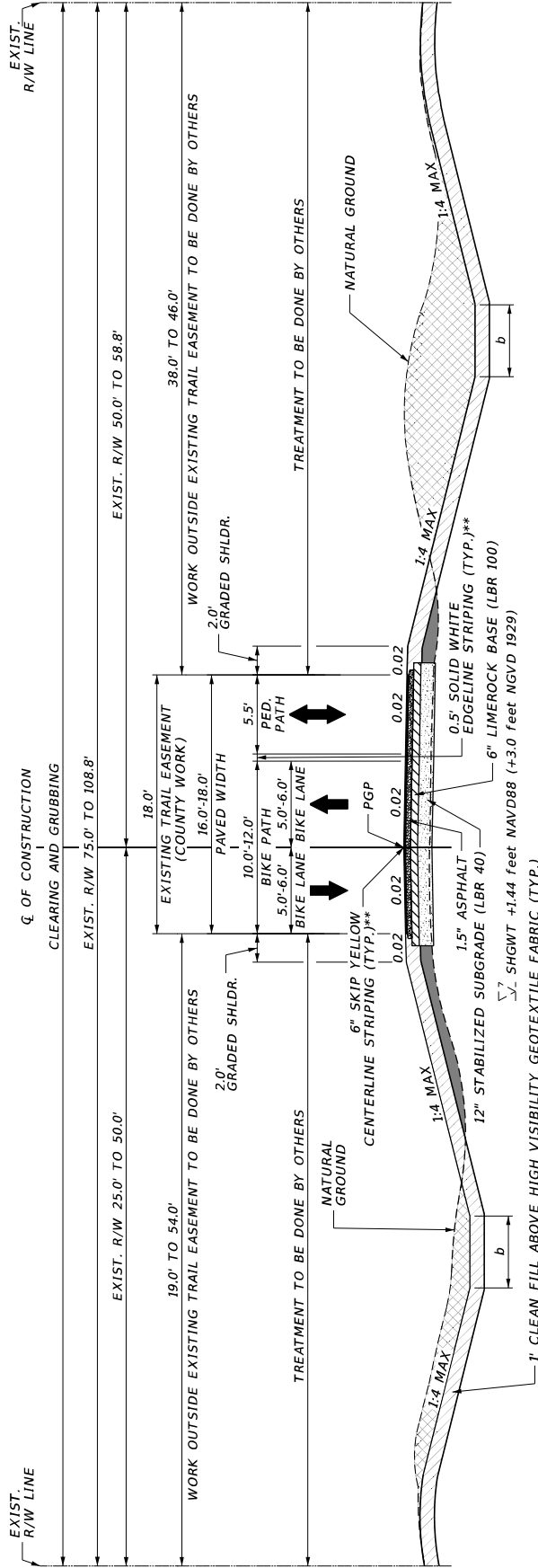
EARTHWORK LEGEND	
	CUT
	RELOCATED FILL
	CLEAN FILL

NOTES:

- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) EACH YEAR IS IN THE AUGUST-SEPTEMBER PERIOD AT THE END OF THE WET SEASON DURING A YEAR OF AVERAGE (NORMAL) RAINFALL.
- SHGWT BASED ON NORTH AMERICAN VERTICAL DATUM (NAVD) 1988.
- PGP: PROFILE GRADE POINT
- APPLICABLE DRAINAGE IS TO BE EVALUATED/DETERMINED DURING DESIGN.
- APPLICABLE LIGHTING INCLUDING LOW-LEVEL BOLLARD LIGHTING IS TO BE EVALUATED/DETERMINED DURING DESIGN.
- ANY EXISTING CHAIN LINK FENCE, ASPHALT PADS OR OTHER ITEMS/ENCROACHMENTS WITHIN THE TRAIL RIGHT OF WILL BE REMOVED AT THE TIME OF CLEARING AND GRUBBING

 110 EAST BROWARD BOULEVARD, SUITE 700 FORT LAUDERDALE, FL 33301		 Miami-Dade County Parks, Recreation, and Open Spaces (INDPROS)		Hickman Building 275 NW 2nd Street Miami, FL 33128 305-255-1800		LUDLAM TRAIL CORRIDOR PDAE STUDY P&E CONTRACT NO. RPO 288B RCR SUBJECT NO. 43502-15-001-047/061B		LUDLAM TRAIL TYPICAL SECTIONS		SHEET NO.
DATE		REVISIONS DESCRIPTION DRAFT								

LUDLAM TRAIL BICYCLE AND PEDESTRIAN PATH (DEVELOPMENT ZONES)



** FOR PAVEMENT MARKING LOCATION DETAIL, SEE TYPICAL SECTION DETAILS (SHEET 7)

TYPICAL SECTION 3

TRAIL DESIGN SPEED	
18 MPH	FOR LONGITUDINAL GRADES ≤ 4%
30 MPH	FOR DOWNHILL LONGITUDINAL GRADES > 4%

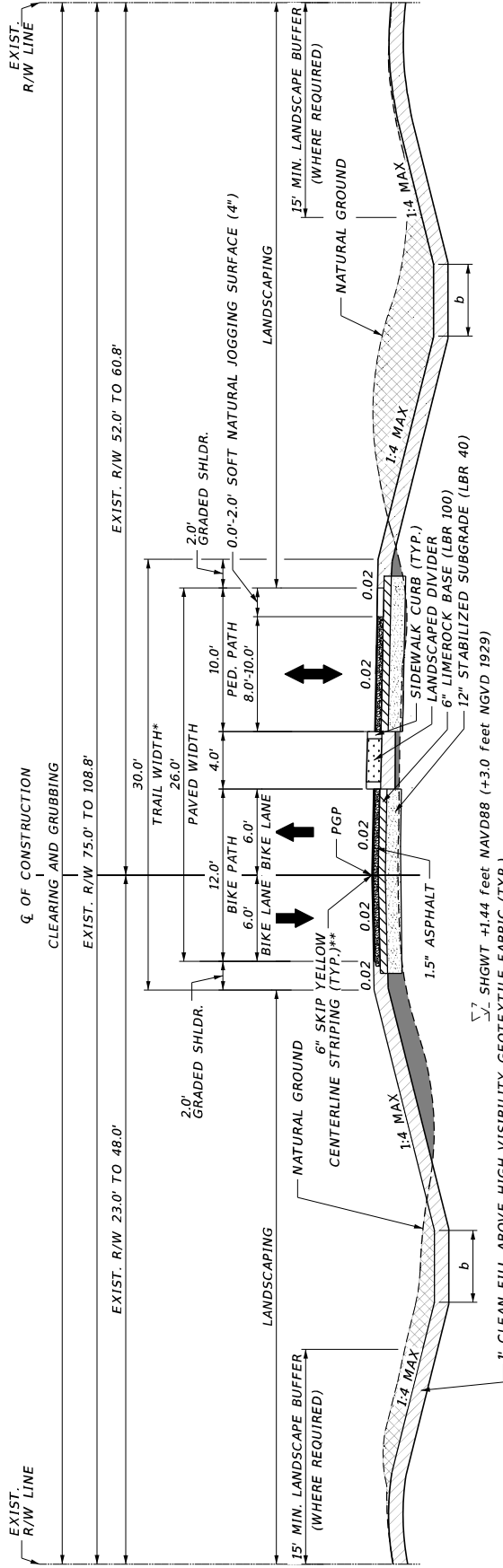
DRAINAGE LEGEND	
b: Swale Bottom Width	Swale depth and width is to be determined in design.

EARTHWORK LEGEND	
CUT	RELOCATED FILL
CLEAN FILL	

- NOTES:**
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) EACH YEAR IS IN THE AUGUST-SEPTEMBER PERIOD AT THE END OF THE WET SEASON DURING A YEAR OF AVERAGE (NORMAL) RAINFALL. (PER PRELIMINARY REPORT OF SURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATIONS, OCTOBER 2018, PREPARED BY: GEOSOL, INC.)
 - SHGWT BASED ON NORTH AMERICAN VERTICAL DATUM (NAVD) 1988.
 - PGP: PROFILE GRADE POINT
 - APPLICABLE DRAINAGE IS TO BE EVALUATED/DETERMINED DURING DESIGN.
 - APPLICABLE LIGHTING INCLUDING LOW-LEVEL BOLLARD LIGHTING IS TO BE EVALUATED/DETERMINED DURING DESIGN.
 - ANY EXISTING CHAIN LINK FENCE, ASPHALT PADS OR OTHER ITEMS/ENCROACHMENTS WITHIN THE TRAIL RIGHT OF WAY MUST BE REMOVED. BOLLARDS TO COINCIDE WITH THE TIME OF CLEARING AND GRUBBING FOR THIS PROJECT

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 110 EAST BROWARD BOULEVARD, SUITE 700 FORT LAUDERDALE, FL 33301		 MIAMI-DADE County Parks, Recreation, and Open Spaces (INDPROS)		LUDLAM TRAIL CORRIDOR PDAE STUDY Hickman Building 275 NW 2nd Street Miami, FL 33128 305-255-1800	
P&E CONTRACT NO. RPO 288B RCS PROJECT NO. 45302-15-001-047/061B		SHEET NO.		LUDLAM TRAIL TYPICAL SECTIONS	

LUDLAM TRAIL BICYCLE AND PEDESTRIAN PATH (WITH LANDSCAPED DIVIDER)



* FOR TRANSITIONS TO/ FROM OTHER TYPICAL SECTIONS, SEE TYPICAL SECTION DETAILS (SHEET 7)

** FOR PAVEMENT MARKING LOCATION DETAIL, SEE TYPICAL SECTION DETAILS (SHEET 7)

TYPICAL SECTION 4

TRAIL DESIGN SPEED	
18 MPH	FOR LONGITUDINAL GRADES \leq 4%
30 MPH	FOR DOWNHILL LONGITUDINAL GRADES $>$ 4%

EARTHWORK LEGEND	
	CUT
	RELOCATED FILL
	CLEAN FILL

DRAINAGE LEGEND	
b:	Swale Bottom Width
Swale depth and width is to be determined in design.	

NOTES:

- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (SHGWT) EACH YEAR IS IN THE AUGUST-SEPTEMBER PERIOD AT THE END OF THE WET SEASON DURING A YEAR OF AVERAGE (NORMAL) RAINFALL.
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- ANY EXISTING CHAIN LINK FENCE, ASPHALT PADS OR OTHER ITEMS/ENCROACHMENTS WITHIN THE TRAIL RIGHT OF WILL BE REMOVED AT THE TIME OF CLEARING AND GRUBBING

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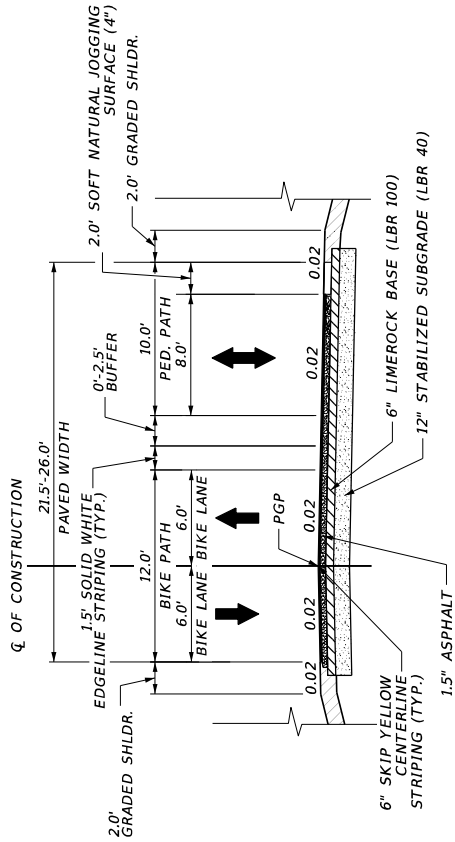
MIAMI-DADE COUNTY
Parks, Recreation, and Open Spaces (INDPROS)

LUDLAM TRAIL CORRIDOR PDAE STUDY

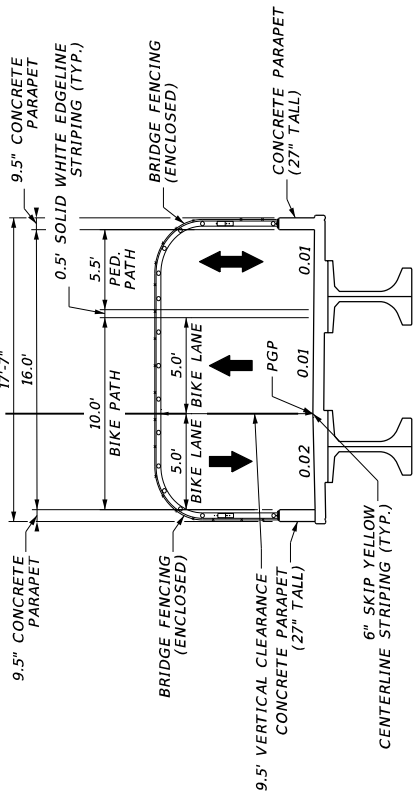
Hickman Building 275 NW 2nd Street Miami, FL 33128 305-255-7800	P&E CONTRACT NO. RPO 788B RCS SUBJECT NO. 43502-15-001-047/061B
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SHEET NO.	LUDLAM TRAIL TYPICAL SECTIONS
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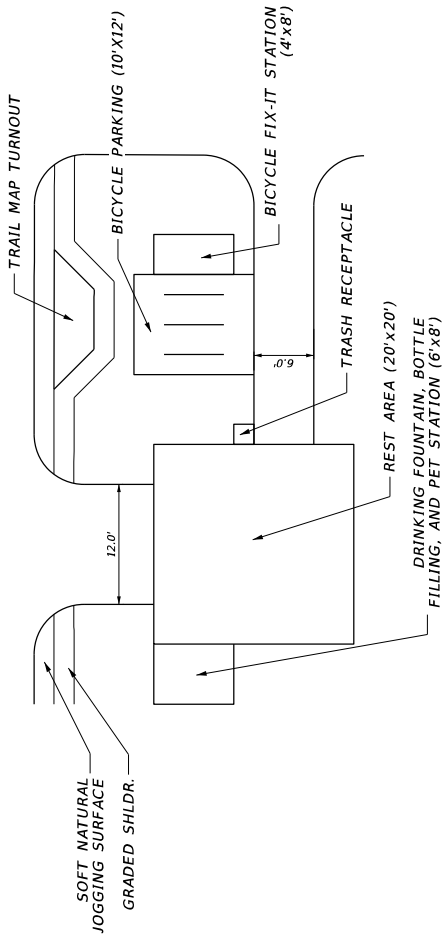
LUDLAM TRAIL BICYCLE AND PEDESTRIAN PATH PAVED BUFFER TRANSITION DETAIL



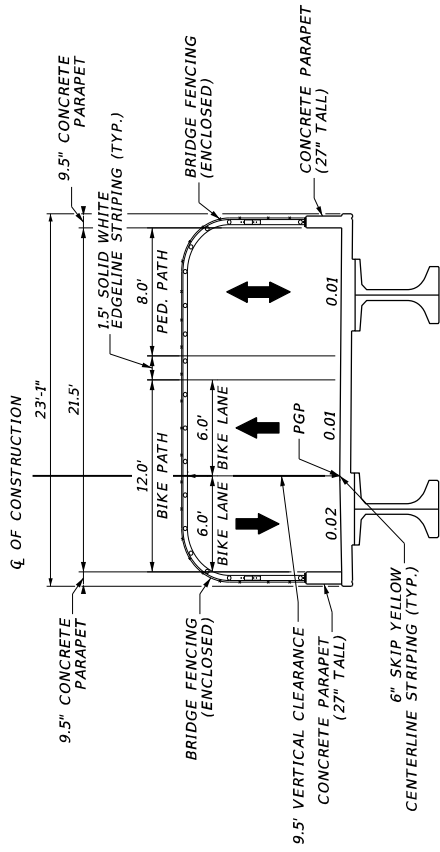
LUDLAM TRAIL PEDESTRIAN BRIDGE TYPICAL SECTION DETAIL (DEVELOPMENT ZONES)



LUDLAM TRAIL TYPICAL REST AREA DETAIL



LUDLAM TRAIL PEDESTRIAN BRIDGE TYPICAL SECTION DETAIL



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MIAMI-DADE COUNTY

LUDLAM TRAIL CORRIDOR PDR STUDY

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RFC 288B

DCS PROJECT NO.

43502-15-001-447/061B

Hickman Building

275 NW 2nd Street

Miami, FL 33128

305-755-7800

Miami-Dade County

Parks, Recreation, and

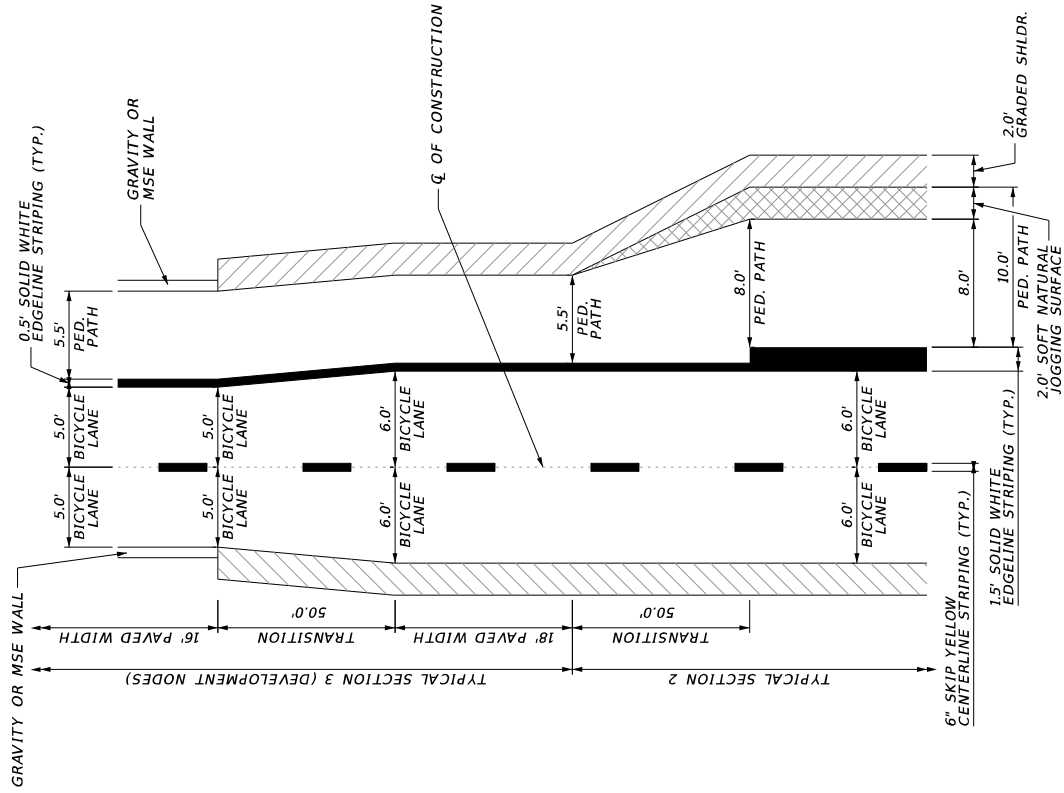
Open Spaces

(INDPROS)

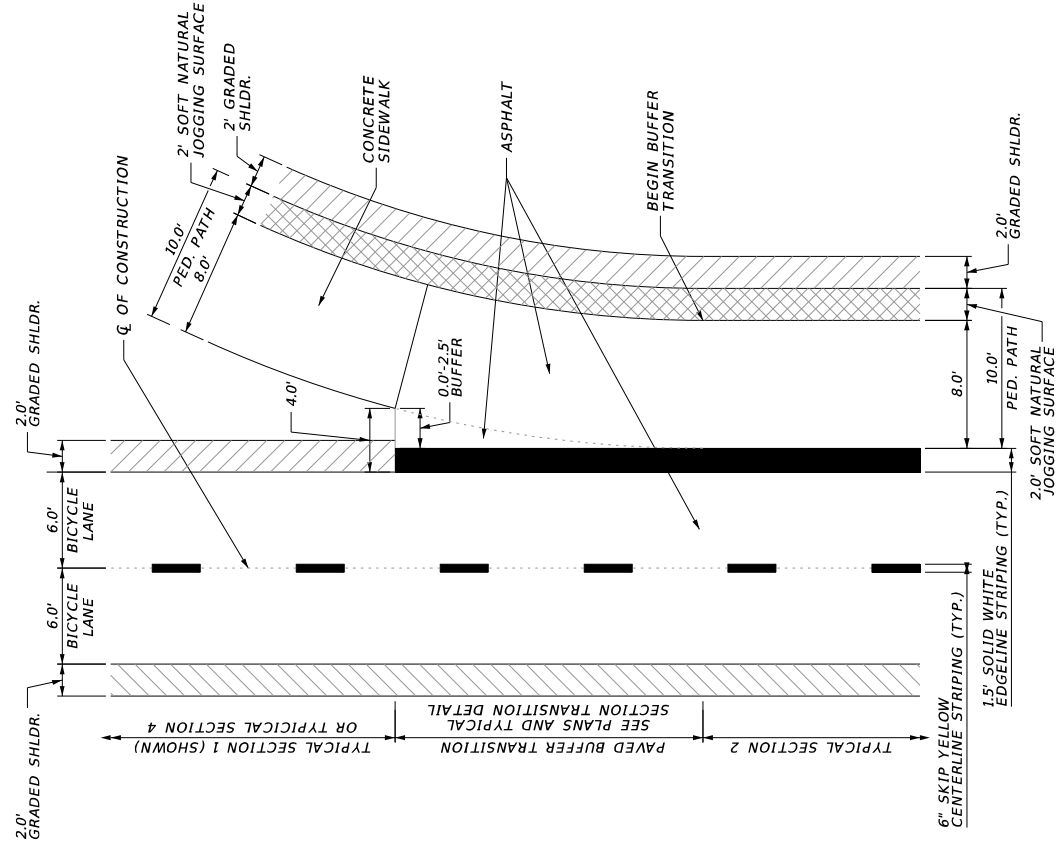
LUDLAM TRAIL
TYPICAL SECTION DETAILS

SHEET NO.

LUDLAM TRAIL BICYCLE AND PEDESTRIAN PATH PAVEMENT MARKING LOCATION DETAIL 1 (N.T.S.)



LUDLAM TRAIL BICYCLE AND PEDESTRIAN PATH PAVEMENT MARKING LOCATION DETAIL 2 (N.T.S.)



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Open Spaces
(INDPROS)

Hickman Building
275 NW 2nd Street
Miami, FL 33128
305-255-1800

P&E CONTRACT NO.
RPO 288B
RCS SUBJECT NO.
43502-15-001-447/661B

LUDLAM TRAIL CORRIDOR P&E STUDY
**LUDLAM TRAIL
TYPICAL SECTION DETAILS**

SHEET
NO.

APPENDIX C

Drainage Calculations

TABLE C-1: DRAINAGE BASIN DESCRIPTIONS

BASIN ID	BASIN LIMITS		TOTAL DRAINAGE AREA (ACRES)	IMPERVIOUS DRAINAGE AREA (ACRES)	PERVIOUS DRAINAGE AREA (ACRES)
	FROM	TO			
SOUTHBOUND SIDE					
S1	BEGIN	SW 76th STREET	1.45	0.38	1.07
S2	SW 76th STREET	SW 74th STREET	0.60	0.17	0.43
S3	SW 74th STREET	SW 72nd STREET	0.73	0.14	0.59
S4	SW 72nd STREET	SW 66th STREET	1.94	0.27	1.67
S5	SW 66th STREET	SW 64th STREET	0.65	0.09	0.56
S6	SW 64th STREET	SW 62nd STREET	0.54	0.08	0.46
S7	SW 62nd STREET	SW 60th STREET	0.62	0.11	0.51
S8	SW 60th STREET	SW 56th STREET	1.26	0.18	1.08
S9	SW 56th STREET	SW 53rd STREET	1.16	0.22	0.94
S10	SW 53rd STREET	SW 48th LANE	1.80	0.29	1.51
S11	SW 48th LANE	SW 40th STREET	2.95	0.55	2.40
S12	SW 40th STREET	A.D. BARNES PARK	1.82	0.34	1.48
S13	A.D. BARNES PARK	C-3 CANAL	0.15	0.04	0.11
S14	C-3 CANAL	NORTH WATERWAY DRIVE	0.09	0.01	0.08
S15	NORTH WATERWAY DRIVE	SW 24th STREET	2.42	0.58	1.84
S16	SW 24th STREET	SW 22nd STREET	0.81	0.21	0.60
S17	SW 22nd STREET	SW 21st STREET	0.33	0.04	0.29
S18	SW 21st STREET	SW 16th STREET	1.65	0.23	1.42
S19	SW 16th STREET	SW 12th STREET	1.26	0.15	1.11
S20	SW 12th STREET	SW 8th STREET	1.46	0.19	1.27
S21	SW 8th STREET	SW 4th STREET	1.40	0.36	1.04
S22	SW 4th STREET	W FLAGLER STREET	1.34	0.20	1.14
S23	W FLAGLER STREET	ROBERT KING HIGH PARK (S)	0.21	0.08	0.13
S24	ROBERT KING HIGH PARK (S)	C-4 CANAL	0.44	0.16	0.28
S25	C-4 CANAL	ROBERT KING HIGH PARK (N)	0.24	0.06	0.18
S26	ROBERT KING HIGH PARK (N)	PARKING LOT ENTRANCE	1.25	0.16	1.09
S27	PARKING LOT ENTRANCE	END	0.88	0.10	0.78
NORTHBOUND SIDE					
N1	BEGIN	SW 69th COURT	1.54	0.36	1.18
N2	SW 69th COURT	SW 72nd STREET	1.67	0.37	1.30
N3	SW 72nd STREET	SW 64th STREET	3.30	0.95	2.35
N4	SW 64th STREET	SW 60th STREET	1.82	0.51	1.31
N5	SW 60th STREET	SW 56th STREET	1.63	0.47	1.16
N6	SW 56th STREET	SW 53rd STREET	1.08	0.39	0.69
N7	SW 53rd STREET	SW 48th STREET	2.11	0.64	1.47
N8	SW 48th STREET	SW 40th STREET	3.30	0.77	2.53
N9	SW 40th STREET	SOUTH WATERWAY DRIVE	2.66	0.89	1.77
N10	SOUTH WATERWAY DRIVE	C-3 CANAL	0.17	0.08	0.09
N11	C-3 CANAL	NORTH WATERWAY DRIVE	0.09	0.03	0.06
N12	NORTH WATERWAY DRIVE	SW 24th STREET	3.73	0.97	2.76
N13	SW 24th STREET	SW 22nd STREET	0.88	0.38	0.50
N14	SW 22nd STREET	SW 21st STREET	0.34	0.12	0.22
N15	SW 21st STREET	SW 19th STREET	0.63	0.21	0.42
N16	SW 19th STREET	SW 16th STREET	1.24	0.36	0.88
N17	SW 16th STREET	SW 12th STREET	1.52	0.53	0.99
N18	SW 12th STREET	SW 8th STREET	1.45	0.51	0.94
N19	SW 8th STREET	SW 6th STREET	0.79	0.18	0.61
N20	SW 6th STREET	SW 4th STREET	0.77	0.27	0.50
N21	SW 4th STREET	W FLAGLER STREET	1.61	0.64	0.97
N22	W FLAGLER STREET	C-4 CANAL	0.74	0.27	0.47
N23	C-4 CANAL	END	2.53	0.71	1.82

TABLE C-2A: WATER QUALITY SUMMARY (SFWMD C-2 CANAL BASIN)

BASIN ID	TOTAL AREA (AC)	TOTAL IMPER. AREA (AC)	TOTAL PERVIOUS AREA (AC)	WATER MANAGEMENT AREA (AC)	% IMPER.	SFWMD CRITERIA			DRR CRITERIA			WEIR ELEV. (FT.NAVD)	TREATMENT VOL. REQD. (AC-FT)	TYPE OF TREATMENT PROVIDED
						TREATMENT VOL. REQD. WET DET. (AC-FT)	TREATMENT VOL. REQD. DRY DET. (AC-FT)	TREATMENT VOL. REQD. RETENTION (AC-FT)	TREATMENT VOL. REQD. (AC-FT)	TREATMENT VOL. REQD. (AC-FT)				
S1	1.45	0.38	1.07	1.27	26.21	0.1208	0.0906	0.0604	0.1403	0.1403	N/A	0.1403	DRY RETENTION SWALE	
S2	0.60	0.17	0.43	0.50	28.33	0.0500	0.0375	0.0250	0.0587	0.0587	N/A	0.0587	DRY RETENTION SWALE	
S3	0.73	0.14	0.59	0.84	19.18	0.0608	0.0456	0.0304	0.0680	0.0680	N/A	0.0680	DRY RETENTION SWALE	
S4	1.94	0.27	1.67	1.67	13.92	0.1617	0.1213	0.0808	0.1760	0.1760	N/A	0.1760	DRY RETENTION SWALE	
S5	0.65	0.09	0.56	0.56	13.85	0.0542	0.0406	0.0271	0.0589	0.0589	N/A	0.0589	DRY RETENTION SWALE	
S6	0.54	0.08	0.46	0.45	14.81	0.0450	0.0338	0.0225	0.0492	0.0492	N/A	0.0492	DRY RETENTION SWALE	
S7	0.62	0.11	0.51	0.53	17.74	0.0517	0.0388	0.0258	0.0574	0.0574	N/A	0.0574	DRY RETENTION SWALE	
S8	1.26	0.18	1.08	1.09	14.29	0.1050	0.0788	0.0525	0.1145	0.1145	N/A	0.1145	DRY RETENTION SWALE	
S9	1.16	0.22	0.94	0.97	18.97	0.0967	0.0725	0.0483	0.1080	0.1080	N/A	0.1080	DRY RETENTION SWALE	
S10	1.80	0.29	1.51	1.47	16.11	0.1500	0.1125	0.0750	0.1651	0.1651	N/A	0.1651	DRY RETENTION SWALE	
S11	2.95	0.55	2.40	2.65	18.64	0.2458	0.1844	0.1229	0.2742	0.2742	N/A	0.2742	DRY RETENTION SWALE	
N1	1.54	0.36	1.18	1.03	23.38	0.1283	0.0963	0.0642	0.1468	0.1468	N/A	0.1468	DRY RETENTION SWALE	
N2	1.67	0.37	1.30	1.31	22.16	0.1392	0.1044	0.0696	0.1581	0.1581	N/A	0.1581	DRY RETENTION SWALE	
N3	3.30	0.95	2.35	2.22	28.79	0.2750	0.2063	0.1375	0.3236	0.3236	N/A	0.3236	DRY RETENTION SWALE	
N4	1.82	0.51	1.31	1.45	28.02	0.1517	0.1138	0.0758	0.1778	0.1778	N/A	0.1778	DRY RETENTION SWALE	
N5	1.63	0.47	1.16	1.12	28.83	0.1358	0.1019	0.0679	0.1599	0.1599	N/A	0.1599	DRY RETENTION SWALE	
N6	1.08	0.39	0.69	0.78	36.11	0.0900	0.0675	0.0450	0.1101	0.1101	N/A	0.1101	DRY RETENTION SWALE	
N7	2.11	0.64	1.47	1.44	30.33	0.1758	0.1319	0.0879	0.2086	0.2086	N/A	0.2086	DRY RETENTION SWALE	
N8	3.30	0.77	2.53	2.33	23.33	0.2750	0.2063	0.1375	0.3144	0.3144	N/A	0.3144	DRY RETENTION SWALE	
TOTALS:	30.15	6.94	23.21	23.48	23.02	2.6126	1.8844	1.2863	2.8698	2.8698		2.8698		

TABLE C-2B: WATER QUALITY SUMMARY (SFWMD CORAL GABLES BASIN)

BASIN ID	TOTAL AREA (AC)	TOTAL IMPER. AREA (AC)	TOTAL PERVIOUS AREA (AC)	WATER MANAGEMENT AREA (AC)	% IMPER.	SFWMD CRITERIA			DRR CRITERIA			WEIR ELEV. (FT.NAVD)	TREATMENT VOL. REQD. (AC-FT)	TYPE OF TREATMENT PROVIDED
						TREATMENT VOL. REQD. WET DET. (AC-FT)	TREATMENT VOL. REQD. DRY DET. (AC-FT)	TREATMENT VOL. REQD. RETENTION (AC-FT)	TREATMENT VOL. REQD. (AC-FT)	TREATMENT VOL. REQD. (AC-FT)				
S12	1.82	0.34	1.48	1.32	18.68	0.1517	0.1138	0.0758	0.1692	0.1692	N/A	0.1692	DRY RETENTION SWALE	
S13	0.15	0.04	0.11	0.09	26.67	0.0125	0.0094	0.0063	0.0145	0.0145	N/A	0.0145	DRY RETENTION SWALE	
S14	0.09	0.01	0.08	0.08	11.11	0.0075	0.0056	0.0038	0.0081	0.0081	N/A	0.0081	DRY RETENTION SWALE	
S15	2.42	0.58	1.84	2.02	23.97	0.2017	0.1513	0.1008	0.2314	0.2314	N/A	0.2314	DRY RETENTION SWALE	
S16	0.81	0.21	0.60	0.51	25.93	0.0675	0.0506	0.0338	0.0782	0.0782	N/A	0.0782	DRY RETENTION SWALE	
S17	0.33	0.04	0.29	0.29	12.12	0.0275	0.0206	0.0138	0.0297	0.0297	N/A	0.0297	DRY RETENTION SWALE	
S18	1.65	0.23	1.42	1.44	13.94	0.1375	0.1031	0.0688	0.1497	0.1497	N/A	0.1497	DRY RETENTION SWALE	
S19	1.26	0.15	1.11	1.07	11.90	0.1050	0.0788	0.0525	0.1131	0.1131	N/A	0.1131	DRY RETENTION SWALE	
S20	1.46	0.19	1.27	1.27	13.01	0.1217	0.0913	0.0608	0.1318	0.1318	N/A	0.1318	DRY RETENTION SWALE	
N9	2.66	0.89	1.77	2.07	33.46	0.2217	0.1663	0.1108	0.2674	0.2674	N/A	0.2674	DRY RETENTION SWALE	
N10	0.17	0.08	0.09	0.10	47.06	0.0167	0.0125	0.0083	0.0183	0.0183	N/A	0.0183	DRY RETENTION SWALE	
N11	0.09	0.03	0.06	0.07	33.33	0.0075	0.0056	0.0038	0.0090	0.0090	N/A	0.0090	DRY RETENTION SWALE	
N12	3.73	0.97	2.76	2.35	26.01	0.3108	0.2331	0.1554	0.3605	0.3605	N/A	0.3605	DRY RETENTION SWALE	
N13	0.88	0.38	0.50	0.41	43.18	0.0792	0.0594	0.0396	0.0931	0.0931	N/A	0.0931	DRY RETENTION SWALE	
N14	0.34	0.12	0.22	0.26	35.29	0.0283	0.0213	0.0142	0.0345	0.0345	N/A	0.0345	DRY RETENTION SWALE	
N15	0.63	0.21	0.42	0.45	33.33	0.0525	0.0394	0.0263	0.0633	0.0633	N/A	0.0633	DRY RETENTION SWALE	
N16	1.24	0.36	0.88	0.84	29.03	0.1033	0.0775	0.0517	0.1218	0.1218	N/A	0.1218	DRY RETENTION SWALE	
N17	1.52	0.53	0.99	0.99	34.87	0.1267	0.0950	0.0633	0.1539	0.1539	N/A	0.1539	DRY RETENTION SWALE	
N18	1.45	0.51	0.94	0.80	35.17	0.1208	0.0906	0.0604	0.1471	0.1471	N/A	0.1471	DRY RETENTION SWALE	
TOTALS:	22.70	5.87	16.83	16.43	25.86	1.9000	1.4250	0.9500	2.1947	2.1947		2.1947		

TABLE C-2C: WATER QUALITY SUMMARY (SFWM D TAMIAMI EAST BASIN)

BASIN ID	TOTAL AREA (AC)	TOTAL IMPER. AREA (AC)	TOTAL PVIOUS AREA (AC)	WATER MANAGEMENT AREA (AC)	% IMPER.	SFWM D CRITERIA			DRR CRITERIA			WEIR ELEV. (FT.NAVD)	TREATMENT VOL. REQD. (AC-FT)	TYPE OF TREATMENT PROVIDED
						TREATMENT VOL. REQD. WET DET. (AC-FT)	TREATMENT VOL. REQD. DRY DET. (AC-FT)	TREATMENT VOL. REQD. RETENTION (AC-FT)	TREATMENT VOL. REQD. (AC-FT)	TREATMENT VOL. REQD. (AC-FT)				
S21	1.40	0.36	1.04	0.83	25.71	0.1167	0.0875	0.0583	0.1351	0.1351	N/A	0.1351	DRY RETENTION SWALE	
S22	1.34	0.20	1.14	1.12	14.93	0.1117	0.0838	0.0558	0.1222	0.1222	N/A	0.1222	DRY RETENTION SWALE	
S23	0.21	0.08	0.13	0.12	38.10	0.0175	0.0131	0.0088	0.0216	0.0216	N/A	0.0216	DRY RETENTION SWALE	
S24	0.44	0.16	0.28	0.25	36.36	0.0367	0.0275	0.0183	0.0449	0.0449	N/A	0.0449	DRY RETENTION SWALE	
S25	0.24	0.06	0.18	0.21	25.00	0.0200	0.0150	0.0100	0.0231	0.0231	N/A	0.0231	DRY RETENTION SWALE	
S26	1.25	0.16	1.09	1.08	12.80	0.1042	0.0781	0.0521	0.1128	0.1128	N/A	0.1128	DRY RETENTION SWALE	
S27	0.88	0.10	0.78	0.75	11.36	0.0733	0.0550	0.0367	0.0788	0.0788	N/A	0.0788	DRY RETENTION SWALE	
N19	0.79	0.18	0.61	0.56	22.78	0.0658	0.0494	0.0329	0.0751	0.0751	N/A	0.0751	DRY RETENTION SWALE	
N20	0.77	0.27	0.50	0.59	35.06	0.0642	0.0481	0.0321	0.0781	0.0781	N/A	0.0781	DRY RETENTION SWALE	
N21	1.61	0.64	0.97	0.93	39.75	0.1342	0.1006	0.0671	0.1673	0.1673	N/A	0.1673	DRY RETENTION SWALE	
N22	0.74	0.27	0.47	0.52	36.49	0.0617	0.0463	0.0308	0.0756	0.0756	N/A	0.0756	DRY RETENTION SWALE	
N23	2.53	0.71	1.82	C-2 Canal Basin	28.06	0.2108	0.1581	0.1054	0.2472	0.2472	N/A	0.2472	DRY RETENTION SWALE	
TOTALS:	12.20	3.19	9.01	6.96	26.15	1.0167	0.7625	0.5083	1.1816	1.1816		1.1816		

**TABLE C-3: REQUIRED PRE VERSUS POST DEVELOPMENT SWALE STORAGE VOLUME
(SFWMD 25 YEAR - 72 HOUR DESIGN STORM RAINFALL = 14")**

BASIN ID	PRE-DEVELOPMENT CONDITIONS						POST-DEVELOPMENT CONDITIONS						REQUIRED PRE-POST STORAGE VOLUME (CU.FT.)	REQUIRED PRE-POST STORAGE VOLUME (AC.FT.)		
	TOTAL DRAINAGE AREA (ACRES)	(CN=96) IMPERVIOUS DRAINAGE AREA (ACRES)	(CN=61) PERVIOUS DRAINAGE AREA (ACRES)	WATERSHED CURVE NUMBER	MAXIMUM SOIL STORAGE (INCHES)	RAINFALL EXCESS (INCHES)	TOTAL RUNOFF VOLUME (CU.FT.)	TOTAL DRAINAGE AREA (ACRES)	(CN=96) IMPERVIOUS DRAINAGE AREA (ACRES)	(CN=61) PERVIOUS DRAINAGE AREA (ACRES)	WATERSHED CURVE NUMBER	MAXIMUM SOIL STORAGE (INCHES)			RAINFALL EXCESS (INCHES)	TOTAL RUNOFF VOLUME (CU.FT.)
S1	1.45	0.00	1.45	61.00	6.39	8.47	44562.51	1.45	0.38	1.07	70.17	4.25	9.94	52306.60	7744.09	0.1778
S2	0.60	0.00	0.60	61.00	6.39	8.47	18439.66	0.60	0.17	0.43	70.92	4.10	10.05	21893.23	3453.56	0.0793
S3	0.73	0.00	0.73	61.00	6.39	8.47	22434.92	0.73	0.14	0.59	67.71	4.77	9.55	25317.91	2882.99	0.0662
S4	1.94	0.00	1.94	61.00	6.39	8.47	59621.57	1.94	0.27	1.67	65.87	5.18	9.26	65225.24	5603.67	0.1286
S5	0.65	0.00	0.65	61.00	6.39	8.47	19976.30	0.65	0.09	0.56	65.85	5.19	9.26	21844.39	1868.09	0.0429
S6	0.54	0.00	0.54	61.00	6.39	8.47	16595.69	0.54	0.08	0.46	66.19	5.11	9.31	18253.83	1658.14	0.0381
S7	0.62	0.00	0.62	61.00	6.39	8.47	19054.32	0.62	0.11	0.51	67.21	4.88	9.47	21324.36	2270.04	0.0521
S8	1.26	0.00	1.26	61.00	6.39	8.47	38723.29	1.26	0.18	1.08	66.00	5.15	9.28	42457.03	3733.74	0.0857
S9	1.16	0.00	1.16	61.00	6.39	8.47	35650.01	1.16	0.22	0.94	67.64	4.78	9.54	40181.85	4531.84	0.1040
S10	1.80	0.00	1.80	61.00	6.39	8.47	55318.98	1.80	0.29	1.51	66.64	5.01	9.38	61318.16	5999.18	0.1377
S11	2.95	0.00	2.95	61.00	6.39	8.47	90661.67	2.95	0.55	2.40	67.53	4.81	9.52	101996.69	11335.02	0.2602
S12	1.82	0.00	1.82	61.00	6.39	8.47	55933.64	1.82	0.34	1.48	67.54	4.81	9.53	62940.35	7006.71	0.1609
S13	0.15	0.00	0.15	61.00	6.39	8.47	4609.92	0.15	0.04	0.11	70.33	4.22	9.96	5424.59	814.61	0.0187
S14	0.09	0.00	0.09	61.00	6.39	8.47	2765.95	0.09	0.01	0.08	64.89	5.41	9.10	2974.36	208.41	0.0048
S15	2.42	0.00	2.42	61.00	6.39	8.47	74373.30	2.42	0.58	1.84	69.39	4.41	9.82	86232.54	11859.24	0.2723
S16	0.81	0.00	0.81	61.00	6.39	8.47	24893.54	0.81	0.21	0.60	70.07	4.27	9.92	29174.95	4281.41	0.0983
S17	0.33	0.00	0.33	61.00	6.39	8.47	10141.81	0.33	0.04	0.29	65.24	5.33	9.16	10974.21	832.39	0.0191
S18	1.65	0.00	1.65	61.00	6.39	8.47	50709.07	1.65	0.23	1.42	65.88	5.18	9.26	55482.41	4773.35	0.1096
S19	1.26	0.00	1.26	61.00	6.39	8.47	38723.29	1.26	0.15	1.11	65.17	5.35	9.15	41845.77	3122.48	0.0717
S20	1.46	0.00	1.46	61.00	6.39	8.47	44869.84	1.46	0.19	1.27	65.55	5.25	9.21	48818.47	3948.63	0.0906
S21	1.40	0.00	1.40	61.00	6.39	8.47	43025.88	1.40	0.36	1.04	70.00	4.29	9.91	50367.74	7341.86	0.1685
S22	1.34	0.00	1.34	61.00	6.39	8.47	41181.91	1.34	0.20	1.14	66.22	5.10	9.32	45326.57	4144.66	0.0951
S23	0.21	0.00	0.21	61.00	6.39	8.47	6453.88	0.21	0.08	0.13	74.33	3.45	10.57	8055.82	1601.93	0.0368
S24	0.44	0.00	0.44	61.00	6.39	8.47	13522.42	0.44	0.16	0.28	73.73	3.56	10.48	16734.48	3212.06	0.0737
S25	0.24	0.00	0.24	61.00	6.39	8.47	7375.86	0.24	0.06	0.18	69.75	4.34	9.87	8600.80	1224.94	0.0281
S26	1.25	0.00	1.25	61.00	6.39	8.47	38415.96	1.25	0.16	1.09	65.48	5.27	9.20	41742.18	3326.22	0.0764
S27	0.88	0.00	0.88	61.00	6.39	8.47	27044.84	0.88	0.10	0.78	64.98	5.39	9.12	29128.16	2083.33	0.0478
N1	1.54	0.00	1.54	61.00	6.39	8.47	47328.46	1.54	0.36	1.18	69.18	4.45	9.78	54695.82	7367.35	0.1691
N2	1.67	0.00	1.67	61.00	6.39	8.47	51323.72	1.67	0.37	1.30	68.75	4.54	9.72	58909.45	7585.73	0.1741
N3	3.30	0.00	3.30	61.00	6.39	8.47	101418.14	3.30	0.95	2.35	71.08	4.07	10.08	120704.48	19286.35	0.4428
N4	1.82	0.00	1.82	61.00	6.39	8.47	55933.64	1.82	0.51	1.31	70.81	4.12	10.04	66299.11	10365.47	0.2380
N5	1.63	0.00	1.63	61.00	6.39	8.47	50094.41	1.63	0.47	1.16	71.09	4.07	10.08	59635.42	9541.01	0.2190
N6	1.08	0.00	1.08	61.00	6.39	8.47	33191.39	1.08	0.39	0.69	73.64	3.58	10.46	41023.71	7832.32	0.1798
N7	2.11	0.00	2.11	61.00	6.39	8.47	64846.14	2.11	0.64	1.47	71.62	3.96	10.16	77809.40	12963.26	0.2976
N8	3.30	0.00	3.30	61.00	6.39	8.47	101418.14	3.30	0.77	2.53	69.17	4.46	9.78	117177.10	15758.96	0.3618
N9	2.66	0.00	2.66	61.00	6.39	8.47	81749.16	2.66	0.74	1.92	70.74	4.14	10.02	96793.77	15044.61	0.3454
N10	0.17	0.00	0.17	61.00	6.39	8.47	5224.57	0.17	0.08	0.09	77.47	2.91	11.03	6805.54	1580.97	0.0363
N11	0.09	0.00	0.09	61.00	6.39	8.47	2765.95	0.09	0.03	0.06	72.67	3.76	10.32	3370.91	604.96	0.0139
N12	3.73	0.00	3.73	61.00	6.39	8.47	114633.23	3.73	0.97	2.76	70.10	4.26	9.93	134406.93	19773.71	0.4539
N13	0.88	0.00	0.88	61.00	6.39	8.47	27044.84	0.88	0.38	0.50	76.11	3.14	10.83	34597.28	7552.44	0.1734
N14	0.34	0.00	0.34	61.00	6.39	8.47	10449.14	0.34	0.12	0.22	73.35	3.63	10.42	12861.99	2412.85	0.0554
N15	0.63	0.00	0.63	61.00	6.39	8.47	19361.64	0.63	0.21	0.42	72.67	3.76	10.32	23596.38	4234.73	0.0972
N16	1.24	0.00	1.24	61.00	6.39	8.47	38108.63	1.24	0.36	0.88	71.16	4.05	10.09	45414.50	7305.87	0.1677

**TABLE C-3: REQUIRED PRE VERSUS POST DEVELOPMENT SWALE STORAGE VOLUME
(SFWMID 25 YEAR - 72 HOUR DESIGN STORM RAINFALL = 14")**

BASIN ID	PRE-DEVELOPMENT CONDITIONS						POST-DEVELOPMENT CONDITIONS						REQUIRED PRE-POST STORAGE VOLUME (AC-FT)	REQUIRED PRE-POST STORAGE VOLUME (CU.FT.)		
	TOTAL DRAINAGE AREA (ACRES)	(CN=96) IMPERVIOUS DRAINAGE AREA (ACRES)	(CN=61) PERVIOUS DRAINAGE AREA (ACRES)	WATERSHED CURVE NUMBER	MAXIMUM SOIL STORAGE (INCHES)	RAINFALL EXCESS (INCHES)	TOTAL RUNOFF VOLUME (CU.FT.)	TOTAL DRAINAGE AREA (ACRES)	(CN=96) IMPERVIOUS DRAINAGE AREA (ACRES)	(CN=61) PERVIOUS DRAINAGE AREA (ACRES)	WATERSHED CURVE NUMBER	MAXIMUM SOIL STORAGE (INCHES)			RAINFALL EXCESS (INCHES)	TOTAL RUNOFF VOLUME (CU.FT.)
N17	1.52	0.00	1.52	61.00	6.39	8.47	46713.81	1.52	0.53	0.99	73.20	3.66	10.40	57377.26	10663.46	0.2448
N18	1.45	0.00	1.45	61.00	6.39	8.47	44562.51	1.45	0.51	0.94	73.31	3.64	10.41	54818.97	10256.46	0.2355
N19	0.79	0.00	0.79	61.00	6.39	8.47	24278.89	0.79	0.18	0.61	68.97	4.50	9.75	27965.80	3686.91	0.0846
N20	0.77	0.00	0.77	61.00	6.39	8.47	23664.23	0.77	0.27	0.50	73.27	3.65	10.41	29094.98	5430.75	0.1247
N21	1.61	0.00	1.61	61.00	6.39	8.47	49479.76	1.61	0.64	0.97	74.91	3.35	10.65	62264.00	12784.25	0.2935
N22	0.74	0.00	0.74	61.00	6.39	8.47	22742.25	0.74	0.27	0.47	73.77	3.56	10.48	28161.62	5419.37	0.1244
N23	2.53	0.00	2.53	61.00	6.39	8.47	77753.90	2.53	0.71	1.82	70.82	4.12	10.04	92183.39	14429.48	0.3313

APPENDIX D

Design Aids

Table T-6
Definitions of Four SCS Hydrologic Soil Groups

<u>Hydrologic Soil Group</u>	<u>Definition</u>
A	<u>Low Runoff Potential</u> Soils having high infiltration rates even when thoroughly wetted, consisting chiefly of deep, well-to-excessively-drained sands or gravels. These soils have a high rate of water transmission.
B	<u>Moderately Low Runoff Potential</u> Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep, to deep, moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.
C	<u>Moderately High Runoff Potential</u> Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, soils with moderate fine to fine texture, or soils with moderate water tables. These soils have a slow rate of water transmission.
D	<u>High Runoff Potential</u> Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

Reference: USDA, SCS, NEH-4 (1972).

Table T-7
SCS Runoff Curve Numbers for Selected Agricultural, Suburban, and Urban Land Use

Land Use Description	Hydrologic Soil Group			
	A	B	C	D
Cultivated Land ^a :				
Without conservation treatment	72	81	88	91
With conservation treatment	62	71	78	81
Pasture or range land:				
Poor condition	68	79	86	89
Good condition	39	61	74	80
Meadow: good condition	30	58	71	78
Wood or Forest Land:				
Thin stand, poor cover, no mulch	45	66	77	83
Good cover ^b	25	55	70	77
Open Spaces, Lawns, Parks, Golf Courses, Cemeteries:				
Good condition: grass cover on 75% or more of the area	39	61	74	80
Fair condition: grass cover on 50% to 75% of the area	49	69	79	84
Poor condition: grass cover on 50% or less of the area	68	79	86	89
Commercial and Business Areas (85% impervious)	89	92	94	95
Industrial Districts (72% impervious)	81	88	91	93
Residential ^c				
Average lot size				
Average % Impervious ^d				
1/8 acre or less	65	77	85	90
1/4 acre	38	61	75	83
1/3 acre	30	57	72	81
1/2 acre	25	54	70	80
1 acre	20	51	68	79
Paved Parking Lots, Roofs, Driveways ^e :	98	98	98	98
Streets and Roads:				
Paved with curbs and storm sewers ^e	98	98	98	98
Gravel	76	85	89	91
Dirt	72	82	87	89
Paved with open ditches	83	89	92	93
Newly graded area (no vegetation established) ^f	77	86	91	94

^a For a more detailed description of agricultural land use curve numbers, refer to Table T-8.

^b Good cover is protected from grazing and litter and brush cover soil.

^c Curve numbers are computed assuming the runoff from the house and driveway is directed toward the street with a minimum of roof water directed to lawns where additional infiltration could occur, which depends on the depth and degree of the permeability of the underlying strata.

^d The remaining pervious areas (lawn) are considered to be in good pasture condition for these curve numbers.

^e In some warmer climates of the country, a curve number of 96 may be used.

^f Use for temporary conditions during grading and construction.

Note: These values are for Antecedent Moisture Condition II, and $I_a = 0.2S$.

Reference: USDA, SCS, TR-55 (1984).

RUNOFF COEFFICIENTS ^a					
Slope	Land Use	Sandy Soils		Clay Soils	
		Min.	Max.	Min.	Max.
Flat (0-2%)	Woodlands	0.10	0.15	0.15	0.20
	Pasture, grass, and farmland ^b	0.15	0.20	0.20	0.25
	Bare Earth	0.30	0.50	0.50	0.60
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements ^c	0.75	0.95	0.90	0.95
	SFR: 1/2-acre lots and larger	0.30	0.35	0.35	0.45
	Smaller lots	0.35	0.45	0.40	0.50
	Duplexes	0.35	0.45	0.40	0.50
	MFR: Apartments, townhouses, and condominiums	0.45	0.60	0.50	0.70
	Commercial and Industrial	0.50	0.95	0.50	0.95
Rolling (2-7%)	Woodlands	0.15	0.20	0.20	0.25
	Pasture, grass, and farmland ^b	0.20	0.25	0.25	0.30
	Bare Earth	0.40	0.60	0.60	0.70
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements ^c	0.80	0.95	0.90	0.95
	SFR: 1/2-acre lots and larger	0.35	0.50	0.40	0.55
	Smaller lots	0.40	0.55	0.45	0.60
	Duplexes	0.40	0.55	0.45	0.60
	MFR: Apartments, townhouses, and condominiums	0.50	0.70	0.60	0.80
	Commercial and Industrial	0.50	0.95	0.50	0.95
Steep (7%+)	Woodlands	0.20	0.25	0.25	0.30
	Pasture, grass, and farmland ^b	0.25	0.35	0.30	0.40
	Bare Earth	0.50	0.70	0.70	0.80
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements ^c	0.85	0.95	0.90	0.95
	SFR: 1/2-acre lots and larger	0.40	0.55	0.50	0.65
	Smaller lots	0.45	0.60	0.55	0.70
	Duplexes	0.45	0.60	0.55	0.70
	MFR: Apartments, townhouses, and condominiums	0.60	0.75	0.65	0.85
	Commercial and Industrial	0.60	0.95	0.65	0.95

a. Weighted coefficient based on percentage of impervious surfaces and green areas must be selected for each site.

b. Coefficients assume good ground cover and conservation treatment.

c. Depends on depth and degree of permeability of underlying strata.

Note: SFR = Single Family Residential, MFR = Multi-Family Residential

Table 2-2

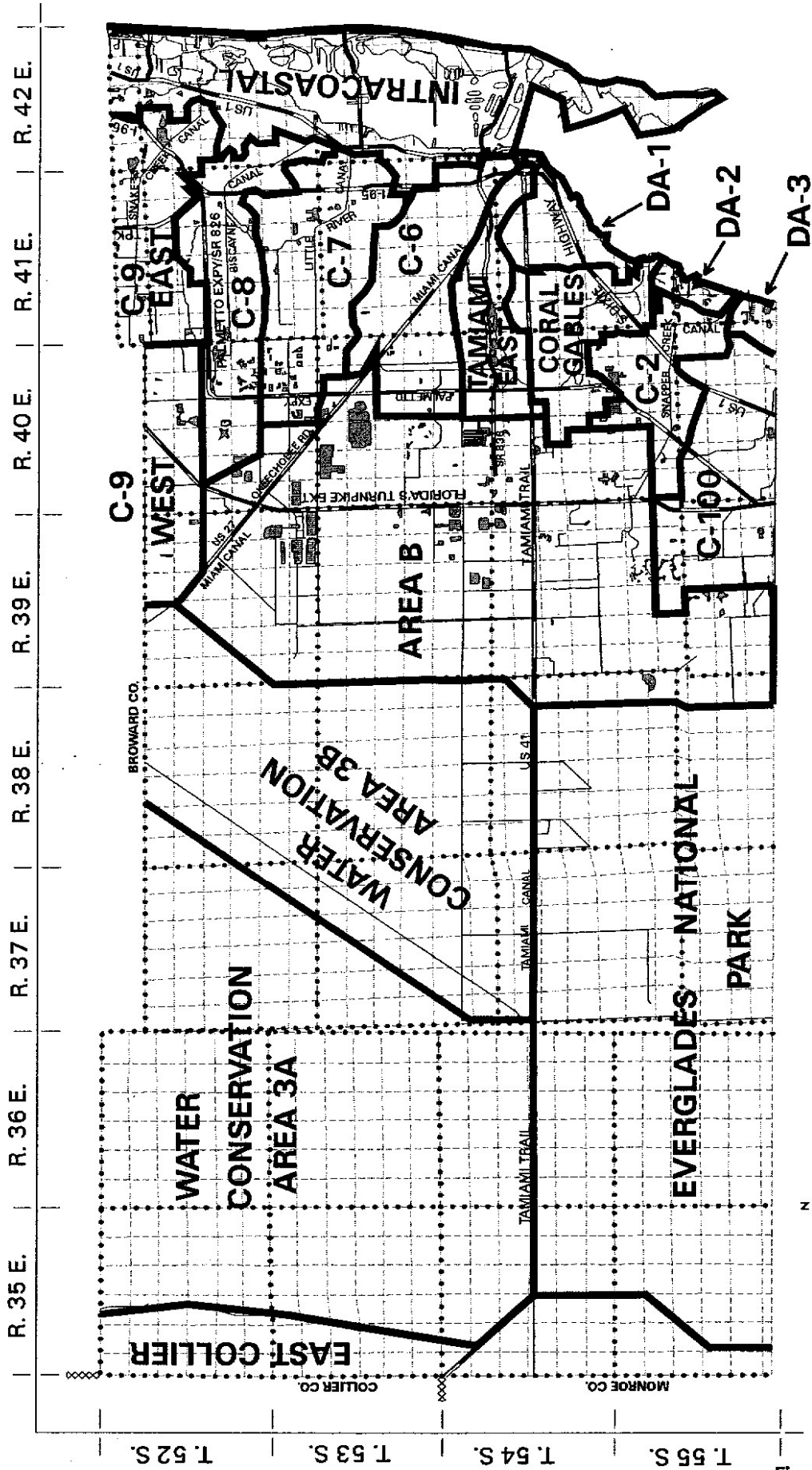
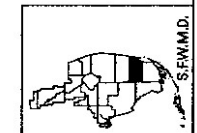
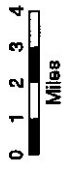


Figure B-11



S.F.W.M.D.

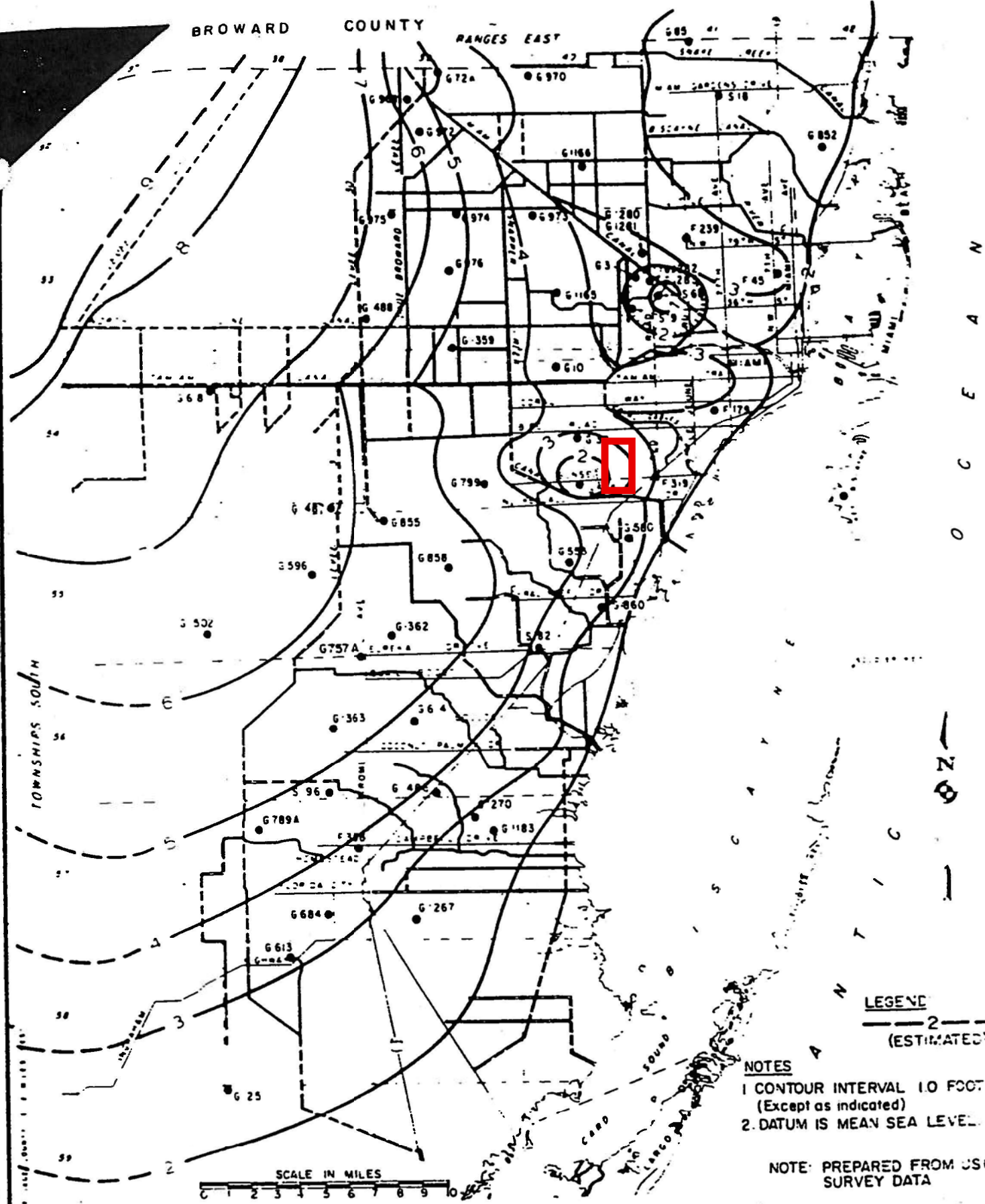


DRAINAGE BASINS for NORTHERN MIAMI-DADE COUNTY, FL.



PORTION OF
MIAMI-DADE COUNTY
REPRESENTED ON MAP.

BROWARD COUNTY RANGES EAST



LEGEND
 --- 2 ---
 (ESTIMATED)

NOTES
 1. CONTOUR INTERVAL 10 FEET
 (Except as indicated)
 2. DATUM IS MEAN SEA LEVEL

NOTE: PREPARED FROM USGS SURVEY DATA

SCALE IN MILES
 0 1 2 3 4 5 6 7 8 9 10

METROPOLITAN
 BROWARD COUNTY
 PUBLIC WORKS
 DEPARTMENT

APPROVED	REVISED
4/1/72	2/3/77
	4/14/77

DESIGN STANDARDS
 AVERAGE OCTOBER
 GROUND WATER LEVEL
 1960-75

W.C.
 2.2
 SHEET 1 OF 1

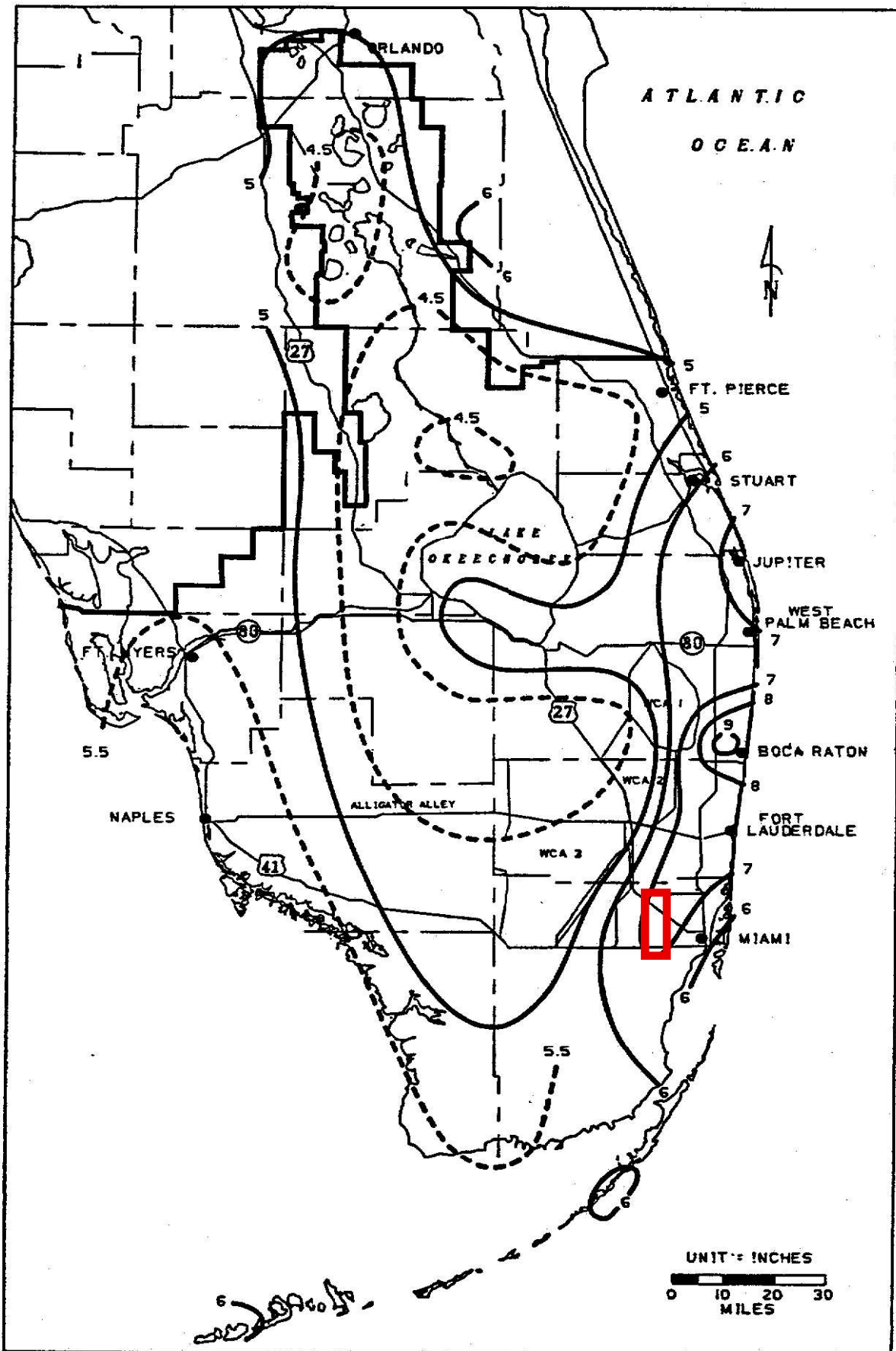


FIGURE C-3. 1-DAY RAINFALL: 5-YEAR RETURN PERIOD

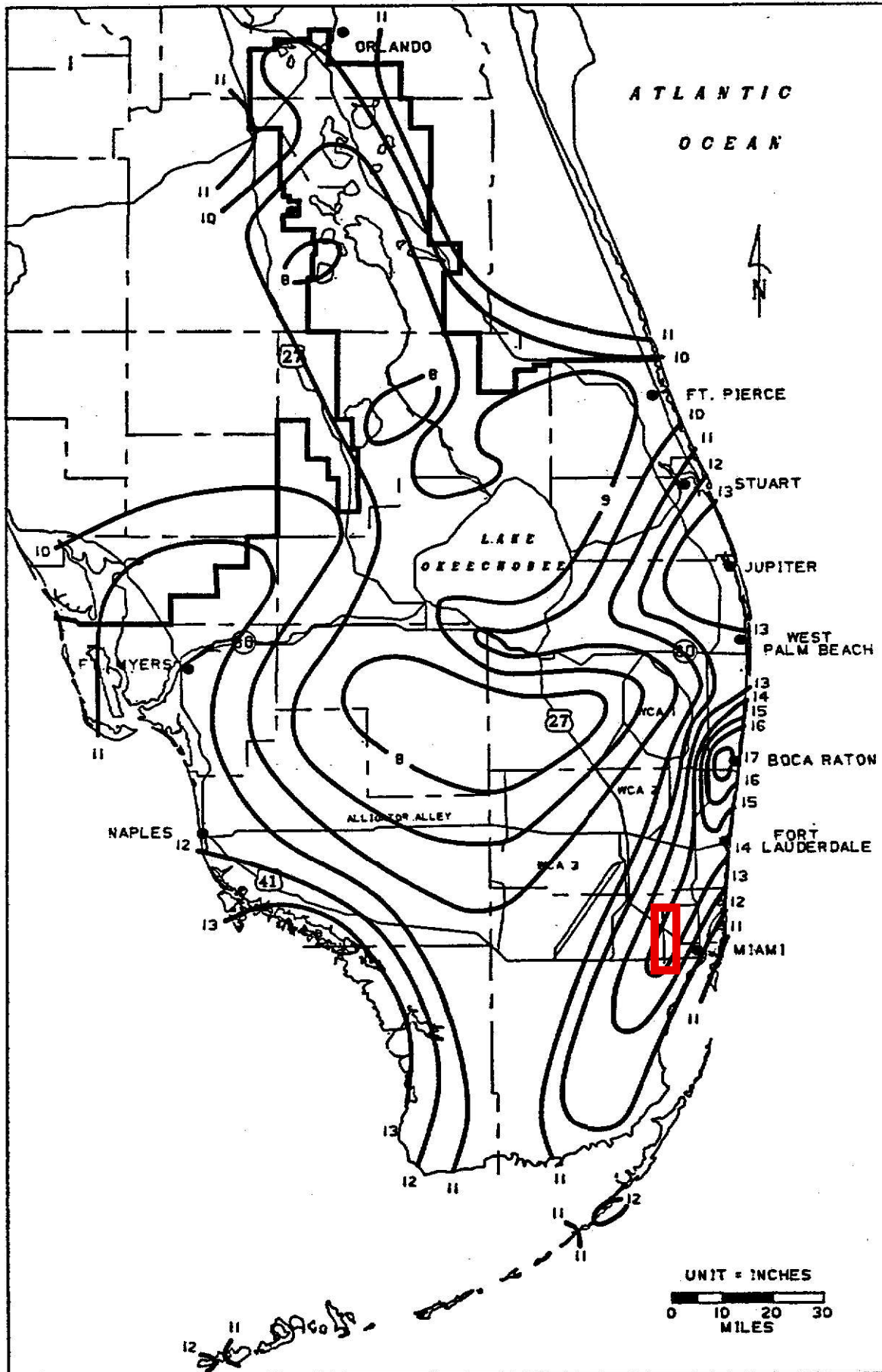


FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

APPENDIX E

FEMA Flood Insurance Rate Maps

