

June 2026

Yadira Werley
Lennar
730 NW 107th Avenue, 3rd Floor
Miami, FL 33172

**Re: Conceptual Stormwater Management Master Plan
City Park
SW 136th Street and SW 162nd Avenue, Miami, Florida
Langan Project No.: 330090201**

Dear Yadira:

The purpose of this letter is to describe the anticipated stormwater management system and the anticipated improvements required for the proposed development program for the City Park (Development). The development is generally located south of the SW 136th Street and north of SW 152nd Street between SW 162nd Avenue to the east and Krome Avenue to the west. Refer to **FIG-01** for the Overall Location Plan.

The Development consist of five major development areas known as the Village Core, Central Park, East Village, South Village and West Village.

PROPOSED DEVELOPMENT AREA

The proposed development is located outside the Urban Development Boundary (UDB), therefore the stormwater design shall be capable of retention of the 100-year 3-day storm event. The proposed development stormwater design will conceptually include exfiltration trenches and retention areas. These stormwater best management practices will be designed in accordance with the current Miami-Dade County and South Florida Water Management District requirements at the time they are permitted for construction. The design parameters and standards used for the proposed development can be found in **Appendix B**.

Existing Conditions

The site is relatively flat and as such there is no discernible existing drainage pattern. The rain that falls within the boundaries of the property will seep through the soil until it is saturated. After saturation is complete, the site will flood vertically in proportion to the surrounding areas. There is no information that would indicate that the site in its present condition would experience flooding to a degree different than the surrounding areas. There is currently no perimeter berm or other feature to maintain the stormwater runoff from leaving the site

Background

The current average October water table elevation in the project area is currently +5.0 NGVD29 according to Miami Dade County's "October Water Table and Miami Dade County Flood

Criteria" Map. Based on the projected 2 feet of sea level rise forecast for 2060, the projected groundwater elevation in this area will be approximately 7.0 feet NGVD29.

The 100-year flood elevation based on current FEMA FIRM the site is located within zone AH elevation 9 feet NGVD29.

Proposed Conditions

The proposed retention areas and exfiltration trenches will provide water quality treatment and retain the water quantity design storm per Miami-Dade County requirements prior to discharging into any proposed lakes. The development will include the appropriate amount of exfiltration trench keep to retain the 5 year 1 day storm event so the 3.28-inch rainfall credit can be applied to the larger storm events. Additionally, a perimeter berm will be provided to retain the onsite runoff generated by the 100-year 3-day storm event.

The drainage system for the public rights-of-way will be designed for a 5-year storm event for local roads and the arterial/collector roads will be design for a 10-year storm event with a safety factor of two and four, respectively.

The proposed lake is generally located in the center of overall development and the exfiltration trench will be within all the proposed roadways in the development. The exfiltration trenches will retain the 5 year storm event prior to any overflow into the lake, providing a treatment train to meet the nutrient loading requirements.

	Area
Building	229.49 Acres
Retention Area (Lake)	66.0 Acres
Pervious Area	220.09 Acres
Impervious Area	438.12 Acres
Total	953.70 Acres

Water Quantity

Preliminary stage storage calculations were completed for a conceptual development on the parcel and abutting right-of-way. This will maintain the 100-year 3-day storm event to a peak stage at a max elevation of 10.28-feet NGVD. The perimeter berm will be set at elevation of 10.30-feet NGVD +/- to retain the proposed improved areas. Please refer to **Appendix C** for the stage storage calculations.

Flood Plain Compensation

The proposed development was analyzed utilizing two separate methods for determining potential impacts to the existing floodplain.

In accordance with Miami-Dade County, the 100 year 3 day storm event peak stage shall be below the greater of the following three criteria.

- County Flood Criteria (CFC) plus 8" = 9.2' NGVD + 8" = 9.86' NGVD
- Crown of Road plus 8" (assumes COR one above CFC) = 10.2' NGVD + 8" = 10.86' NGVD
- FEMA Flood Plain Elevation = 9 NGVD

The anticipated peak stage during the 100 year 3 day storm event is 10.28' NGVD which is less than the County's maximum stage of 10.86' NGVD meeting the County criteria.

The proposed development was also analyzed utilizing the SFWMD Floodplain compensation method considering the site as an import/export methodology. The existing site is considered an exporter during 100 year storm event, and the site will retain the 100 year storm event onsite in the proposed condition, therefore, mitigating the floodplain encroachment.

An analysis on the post development nutrient loading analysis was completed for the development. The pre-development condition was analyzed as general agriculture and the post development is analyzed as single family and multi-family areas. There are areas of industrial and commercial land uses, however, the nutrient loading rates from those uses are lower than the loading rates from single family and multi-family uses. To simplify the conceptual model only multi-family and single family land use was applied to the entire development area. Detailed calculations will be submitted during the development of each development phase.

Water Quality

The proposed stormwater management system shall be comprised of a network of exfiltration trench which will provide the required water quality treatment. Refer to the water quality calculations in **Appendix D**.

The exfiltration trench system, consisting of trenches 5-ft wide by 15-ft deep with a minimum 18-inch perforated pipe, has been designed to provide the required water quality treatment for the proposed improvements. The proposed exfiltration trench system will treat the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater. The total length of exfiltration trench required for water quality treatment was calculated in accordance with the SFWMD Environmental Resources Permitting Manual, using a safety factor (SF) of two. The percolation rates utilized were obtained from a nearby existing development and shall be verified upon development of this project. The total anticipated length of exfiltration trench is 260,500 liner feet.

A conceptual BMP Trains analysis was completed to show the nutrient loading reduction is achieved with the proposed stormwater BMPs. Refer to the calculations in Appendix D. Separate catchment areas were included. The catchments were classified as single family areas, multifamily areas, light industrial areas, commercial areas, and open space/park areas. All catchment areas are routed to the overall stormwater BMPs.

Operation and Maintenance Entity

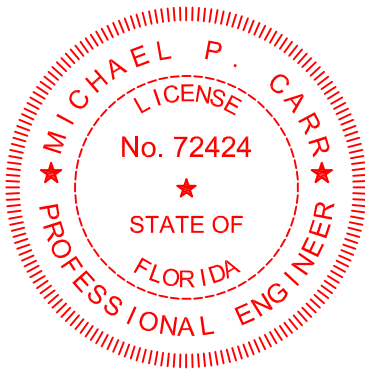
Miami Dade County will own and operate the public roadways throughout the property and the remaining areas served by the overall drainage system will be owned and operated by the Homeowner's Association (HOA) or similar private entity.

Alternative Design Considerations

Understanding this is a redevelopment of an agricultural land area, the project can utilize other traditional stormwater management best management practices to address stormwater quality and quantity requirements such as lined dry ponds and intermediate exfiltration trenches. These are both common BMPs used when shallow groundwater contamination is encountered.

This item has been digitally signed
and sealed by Michael Carr, PE, on
the date adjacent to the seal

Signature must be verified on any
electronic copies.



Sincerely,
Langan Engineering and Environmental Services, LLC.

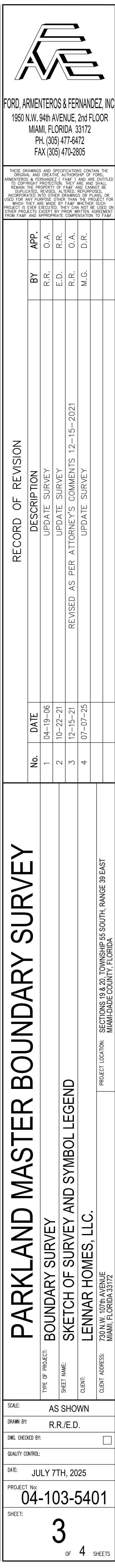
Michael Carr, PE, LEED AP
Associate Principal
Florida Professional Engineer Lic. No. 72424

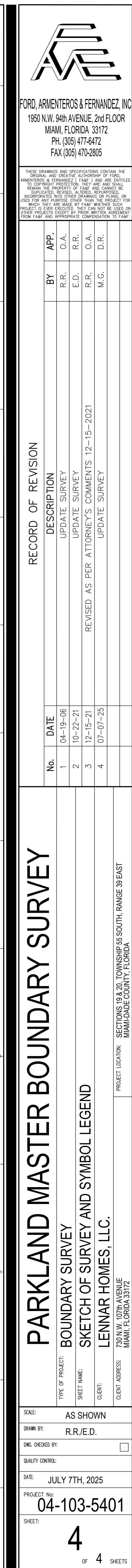
Enclosure(s): Appendix A – Survey
Appendix B – Design Storms, Stormwater Parameters
Appendix C- Proposed and Existing Stage Storage Calculations
Appendix D- Exfiltration Trench Calculations
Appendix E – Flood Plain Compensation
Appendix F – FEMA Flood Maps
Appendix G – Nutrient Loading Analysis

FBPE Registry No. 6601

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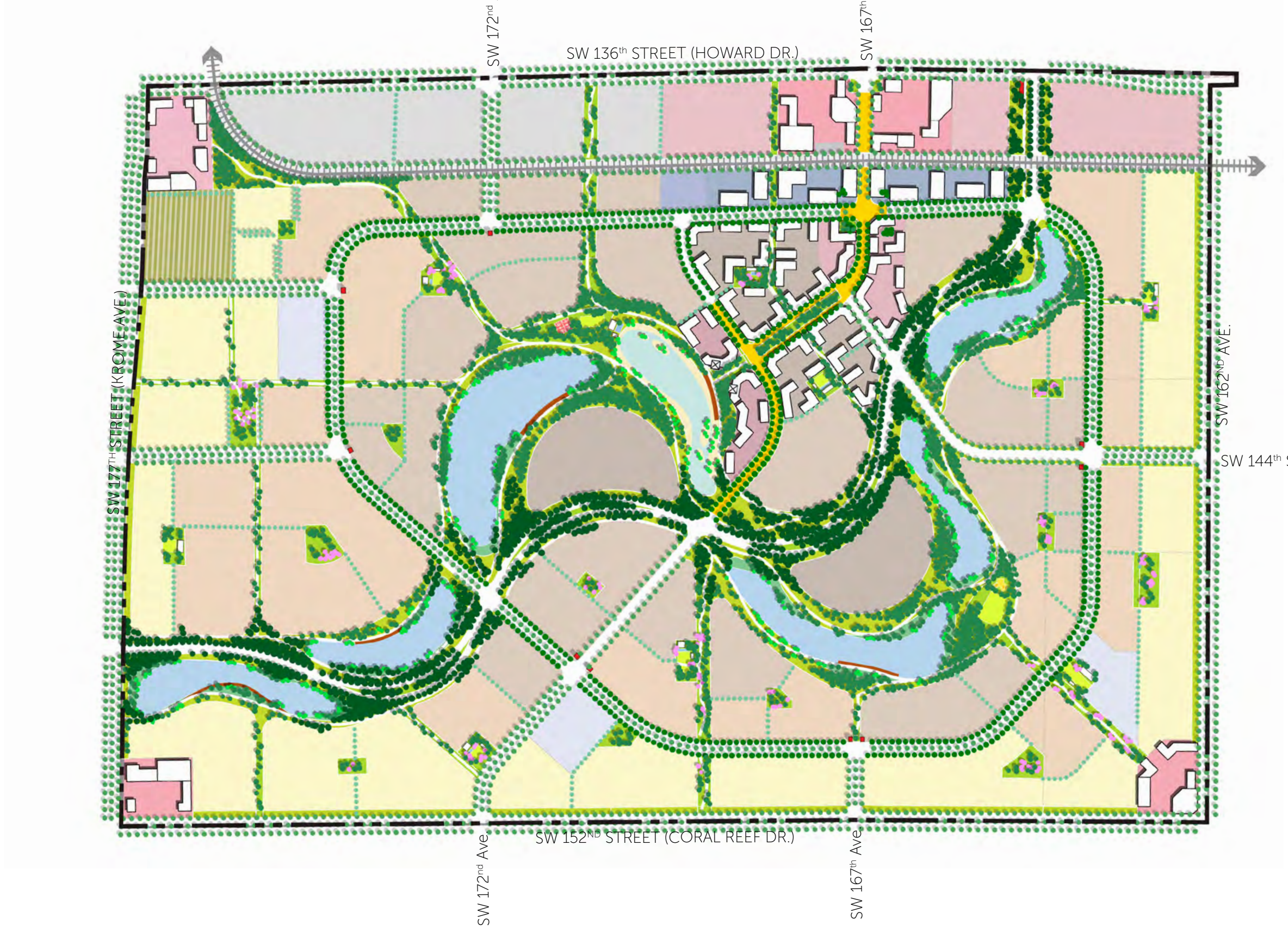
APPENDIX A – SURVEY



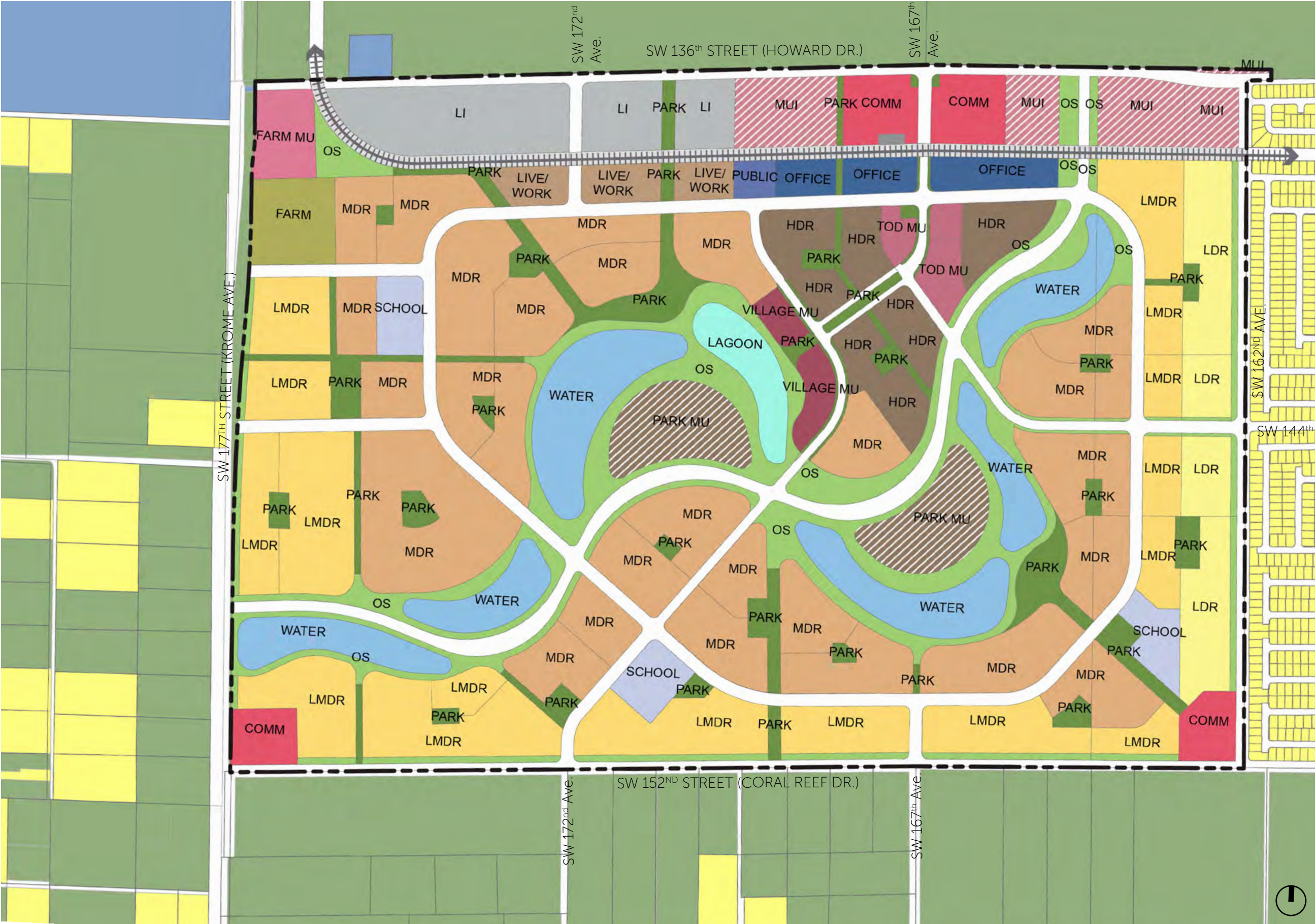


APPENDIX B – DESIGN STORM, STORMWATER PARAMETERS

Concept Illustrative



Revised Concept Land Plan



City Park LU Legend

- Open Space
- Parks
- Farm
- Water
- Lagoon or Community/Water Park
- LDR (6 DU/Ac)
- LMDR (9 DU/Ac)
- MDR (14 DU/Ac)
- HDR (30 DU/Ac)
- Live/Work (12 DU/Ac)
- Commercial
- TOD MU
- Village MU
- Park MU
- Farm MU
- Light Industrial
- Industrial MU
- Office
- Schools
- Public Facility

CDMP LU Legend

- Single-Family Resi
- Agriculture
- Utilities

NOTES TO USERS

is for use in administering the National Flood Insurance Program. It is necessary to identify all areas subject to flooding, particularly from local sources of small size. The community map repository should be updated for possible updated or additional flood hazard information.

In more detailed information in areas where Base Flood Elevations and/or floodways have been determined, users are encouraged to consult profiles and Floodway Data and/or Summary of Stillwater Elevations obtained within the Flood Insurance Study (FIS) report that accompanies the FIS. Users should be aware that BFEs shown on the FIRM represent whole-foot elevations. These BFEs are intended for flood insurance purposes only and should not be used as the sole source of flood information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of flood insurance and/or floodplain management.

Base Flood Elevations shown on this map apply only landward of coastal flood elevations. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Flood Elevations table in the Flood Insurance Study report for this jurisdiction. Users should be aware that BFEs shown on the FIRM represent whole-foot elevations. These BFEs are intended for flood insurance purposes only and should not be used as the sole source of flood information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of flood insurance and/or floodplain management purposes when they are higher than those shown on this FIRM.

es of the floodways were computed at cross sections and interpolated cross sections. The floodways were based on hydraulic considerations and to requirements of the National Flood Insurance Program. Floodway and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Areas not in Special Flood Hazard Areas may be protected by flood structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this area.

ection used in the preparation of this map was Florida State Plane east of 85°30'00" W. The horizontal datum was NAD 83, GRS80 spheroid. Users in datum, spheroid, projection or State Plane zones used in the map or FIRM for adjacent jurisdictions may result in slight positional errors in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure elevations referenced to the same vertical datum. For information on conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

Information Services
NGS 12
Geodetic Survey
#6202
4600 West Highway
Baltimore, Maryland 20910-3282
301-761-3242

In current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at www.ngs.noaa.gov.

Map information shown on this FIRM was provided in digital format by the Miami-Dade County Information Technology Department. These data were at a scale of 1:3,600 from digital orthophotography dated 2001. The base map information was provided by the Cities of Aventura, Coral Gables, and Homestead, the Town of Cutler Bay, and Miami-Dade County.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodway areas that were transferred from the previous FIRM may have been adjusted to these new stream channel configurations. As a result, the Flood Insurance Study and Floodway Data tables in the Flood Insurance Study Report (which contain authoritative hydraulic data) may reflect stream channel distances that are different from what is shown on this map.

Map limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may occur after this map was published, map users should contact appropriate officials to verify current corporate limit locations.

Refer to the separately printed Map Index for an overview map of the Miami-Dade County showing the layout of map panels, community map repository addresses, and listing of Communities table containing National Flood Insurance Program information for each community as well as a listing of the panels on which each is located.

The FEMA Map Service Center at 1-800-358-6616 for information on products associated with this FIRM. Available products may include the Flood Insurance Study Report, a Flood Insurance Study report, and/or other products of this map. The FEMA Map Service Center may also be reached at 1-800-358-6620 and its website at <http://msc.fema.gov>.

For questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov>.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard are designated as Zone A, AE, AH, AD, AO, AV, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AD** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); depths determined. For areas of alluvial fan flooding, velocities determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual flood by a flood control system that was subsequently identified as inadequate. Indicates that the former flood control system is being restored to protect from the 1% annual chance or greater flood.
- ZONE AV** Area to be protected from 1% annual chance flood by a flood protection system under construction; no Base Flood Elevation determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevation determined.

FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be maintained so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood, areas of 1% annual chance flood with average depths of less than 1 foot and with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Zone boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area of one community from another
- Boundary dividing Special Flood Hazard Areas of different communities
- Base Flood Elevation line and value; elevation in feet
- Base Flood Elevation value where uniform within zone, in feet
- Reference to the National Geodetic Vertical Datum of 1929
- Cross section line
- Traverse line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 100-meter Universal Transverse Mercator grid values, zone 17
- 500-foot grid ticks: Florida State Plane coordinate system, East zone (FIPS200 0901), Transverse Mercator projection
- Bench mark (see explanation in Notes to Users section of FIS report)
- River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTRYWIDE
FLOOD INSURANCE RATE MAP
January 20, 1993

EFFECTIVE DATES OF REVISIONS TO THIS PANEL
March 2, 1994 - May 16, 1994 - July 17, 1994: See description of revision, see Notice to Users page in the Flood Insurance Study report.

September 11, 2009: To reflect revised shoreline, to incorporate previously issued Letters of Map Revision, to update corporate limits, to add and change Base Flood Elevations, to change zone designations, to add new and delete flood hazard areas, to change Flood Hazard Area boundaries, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000
FEET
150 0 150 300
METERS

PANEL 0439L

FIRM
FLOOD INSURANCE RATE MAP

MIAMI-DADE COUNTY,
FLORIDA
AND INCORPORATED AREAS

PANEL 439 OF 1031
(SEE MAP INDEX FOR FIRM PANEL LIST)

CONTAINS
COMMUNITY NUMBER PANEL
MIAMI-DADE COUNTY 120635 0439

Notice to User: This Map Number shown below is used when placing map orders; the Community Map Number should be used on insurance applications subject community.

MAP NUMBER 120860

MAP REVISION 1

SEPTEMBER 11, 2009

Federal Emergency Management Agency

NOTES TO USERS

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Base Flood Elevations shown on this map apply only to landward of the coastal flood zone. The horizontal datum used in this FIRM is the National Geodetic Vertical Datum of 1929 (NGVD 29). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Elevation table in the Flood Insurance Study report for this jurisdiction. The information shown in the Summary of Elevation table should be used for flood insurance and/or floodplain management purposes when they are higher than those shown on this FIRM.

Floodways were computed at cross sections and interpolated cross sections. The floodways were based on hydraulic considerations and to requirements of the National Flood Insurance Program. Floodway and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Areas not in Special Flood Hazard Areas may be protected by flood structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

This map was prepared in the preparation of this map was Florida State Plane east of the 1983 datum. The horizontal datum was NAD 83, GRS80 spheroid, in datum, projection or State Plane zones used in the FIRM. For adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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Information Services
NGS-12
Geodetic Survey
#5202
14-Weet Highway
Baltimore, Maryland 20910-3282
3-3242

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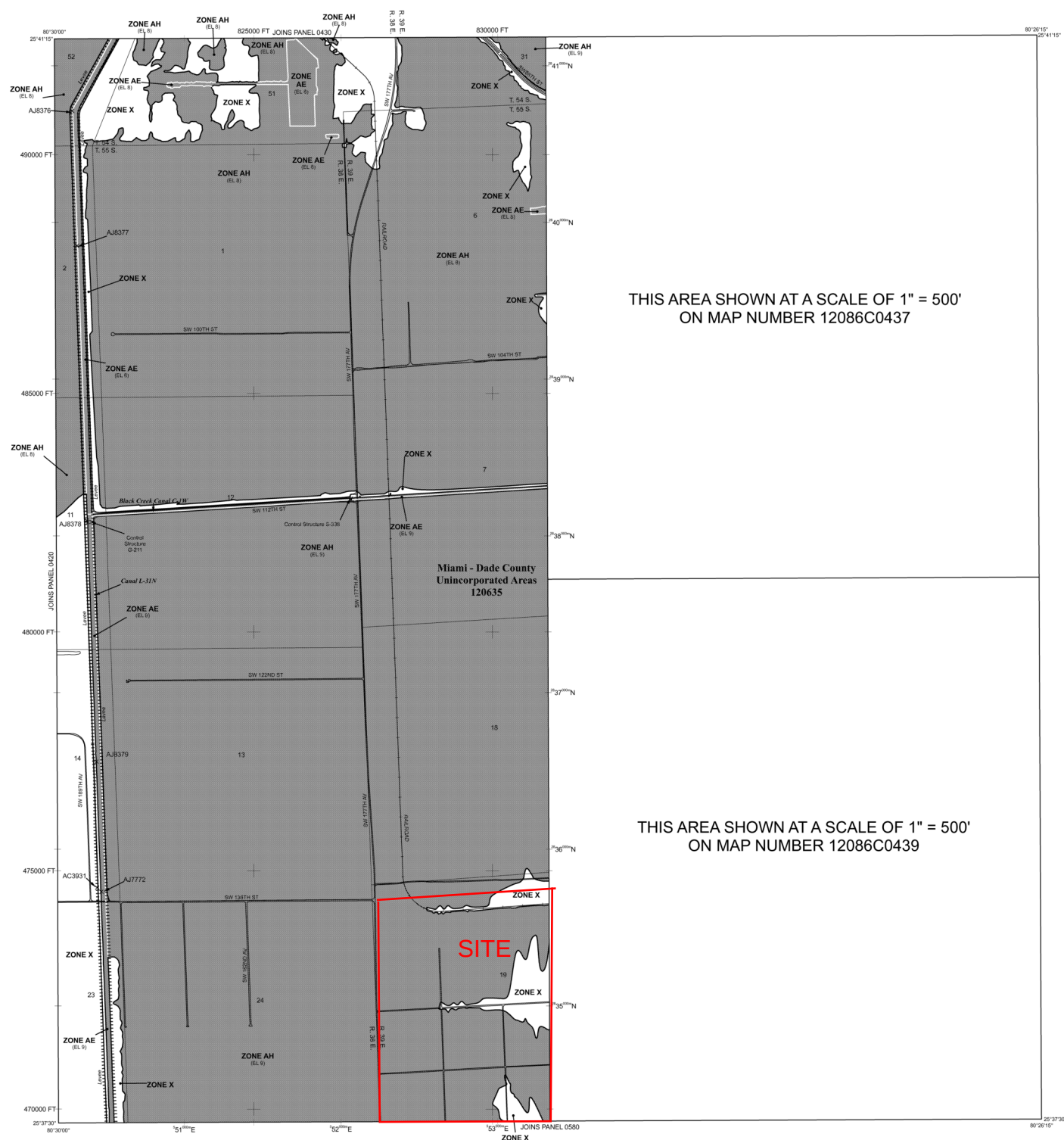
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For the **FEMA Map Service Center** at 1-800-368-0616 for information on products associated with this FIRM. Available products may include issued Letters of Map Change, a Flood Insurance Study report, and/or other products of this map. The FEMA Map Service Center may also be reached at 1-800-368-0620 and its website at <http://msc.fema.gov>.

For **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov>.

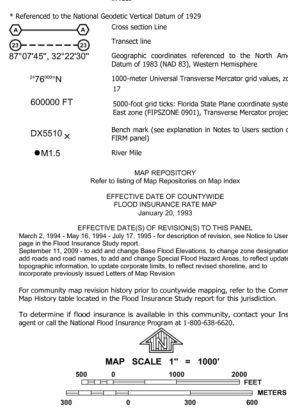


THIS AREA SHOWN AT A SCALE OF 1" = 500'
ON MAP NUMBER 12086C0437

THIS AREA SHOWN AT A SCALE OF 1" = 500'
ON MAP NUMBER 12086C0439

LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard are designated as follows: Zone A, Zone AE, Zone AH, Zone X, Zone AR, Zone V, Zone VE, Zone D, Zone I, Zone O, and Zone P. The Base Flood Elevation is the water elevation of the 1% annual chance flood.
- Zone A**
No Base Flood Elevations determined.
- Zone AE**
Base Flood Elevations determined.
- Zone AH**
Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- Zone AD**
Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); depth determined. For areas of alluvial fan flooding, velocity determined.
- Zone AR**
Special Flood Hazard Area formerly protected from the 1% annual flood by a flood control system that was subsequently determined to be inadequate. The former flood control system is being restored to protect from the 1% annual chance or greater flood.
- Zone AR9**
Area to be protected from 1% annual chance flood by a flood protection system under construction; no Base Flood Elevations determined.
- Zone V**
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- Zone VE**
Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be reserved to ensure that the 1% annual chance flood can be carried without substantial increases in flood heights.
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- Zone X**
Areas of 0.2% annual chance flood; areas of 1% annual chance flood average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
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- Zone X**
Areas determined to be outside the 0.2% annual chance floodplain.
- Zone D**
Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- Floodplain boundary**
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area zone
Boundary dividing Special Flood Hazard Areas of different Flood Elevations, flood depths or flood velocities
Base Flood Elevation line and value; elevation in feet*
Base Flood Elevation value where uniform within zone; elevation in feet*
- * Referenced to the National Geodetic Vertical Datum of 1929
- Transsect line**
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
100-meter Universal Transverse Mercator grid values, zone 17
500-foot grid ticks: Florida State Plane coordinate system, East zone (FIPSZONE 9901), Transverse Mercator projection
Bench mark (see explanation in Notes to Users section of FIS panel)
River Mile
M1.5
- MAP REPOSITORY**
Refer to listing of Map Repositories on Map Index
- EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**
January 25, 1993
- EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL**
Cross section line
March 2, 1994, May 18, 1994, July 17, 1995, for description of revision, see Notice to Users page in the Flood Insurance Study report
September 11, 2009, to add and change Base Flood Elevations, to change zone designations, add and change Special Flood Hazard Areas, to reflect updated geographic information, to update corporate limits, to reflect revised engineering, and to incorporate previously issued Letters of Map Revision
- For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NFIP

PANEL 0440L

FIRM

FLOOD INSURANCE RATE MAP

MIAMI-DADE COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 440 OF 1031
(SEE MAP INDEX FOR FIRM PANEL LIST)

CONTAINS

COMMUNITY	NUMBER	PANEL
MIAMI-DADE COUNTY	120835	0440

Notice to User: This Map Number shown below is used when placing map orders. The Community shown above should be used on insurance applications subject community.

FEDERAL EMERGENCY MANAGEMENT AGENCY

MAP NUMBER 12086C0439

MAP REVISION HISTORY

SEPTEMBER 11, 2009

APPENDIX C – PROPOSED AND EXISTING STAGE STORAGE CALCULATIONS

Langan Engineering and Environmental Services

15150 NW 79th Court, Suite 200
Miami Lakes, FL 33016
(786) 264-7200

Date: June 16, 2025

Project Name: City Park

Project Number: 330090201

Prepared By: MPC

SURFACE WATER MANAGEMENT CALCULATIONS (S.F.W.M.D. CRITERIA)

I. GIVEN:

A. ACREAGE:

1	Lake Area =	0.00	ac.		
2	Lake Bank Area =	0.00	ac.		
3	Building =	0.00	ac.		
4	Impervious	0.00	ac.		
5	Pervious Area	953.70	ac.		
6	N/A		ac.	Imp	0.00
7	N/A		ac.		
6	Total =	953.70	ac.		

B. OTHER:

1. The current zoning on the property is

II. DESIGN CRITERIA:

A. WATER QUALITY CRITERIA:

Quality standards shall be provided during a 3 year, 1 hour storm event for one of the following three combinations:

1. If a wet detention system, then whichever is the greater of the following:
 - a. The first inch of runoff from the entire project site.
 - b. The amount of 2.5 inches times the percent impervious for the project site.
2. If a dry detention system, then 75% of the volume required for the wet detention system.
3. If a retention system, then 50% of the volume required.

Also, the following shall apply:

4. If the property is zoned "Commercial", at least 0.5 inches of retention or dry detention pre-treatment will be required.
5. Any detention system shall be designed to discharge no more than 0.5 inches of the detained volume per day.

B. WATER QUANTITY CRITERIA:

1. DESIGN EVENTS AND RAINFALL AMOUNTS:

- a. Design Event for Equipment FFE
Frequency: 100 year
Duration: 24 hour
Amount: inches
- b. Design Event for Minimum Road Elevation (if not specified by Local District Criteria):
Frequency: 5 year
Duration: 24 day
Amount: 6.50 inches
- c. Design Event for Minimum Discharge Elevation:
Frequency: 25 year
Duration: 3 day
Amount: 9.22 inches 3.28 credit
- d. Design Event for Finish Floor Elevation
Frequency: 100 year
Duration: 3 day
Amount: 13.72 inches 3.28 credit

2. ADDITIONAL DESIGN INFORMATION:

- a. Design Water / Control Elevation: 7.00 NGVD
(Note: Proposed minimum road elevation must be at least 2 feet above the wet season water table or control elevation.)
- b. Drainage Basin / Canal Number:

STAGE ELEVATION INFORMATION:

Item:	Description:	S type	Length ft.	Area ac.	Low ft.	High ft.	I %	C %	Total Area %
1	Lake Area	V		0.00			100	100	0.00
2	Lake Area	L							0.00
3		V							0.00
4	Impervious	L		0.00			100	100	0.00
5		V							
6	Park	L		953.70	7.40	9.40	0	50	1.00
7	N/A	L							0.00
8		V							
9		L							0.00
10									
11	Building =	V		0.00			100	100	0.00
E	Seepage and Evapotranspiration								
Total:				953.700	7.40	9.40	0.00	50.00	1.0

* Abbreviations: S = Storage; (V = Vertical Storage & L = Linear Storage)
I = Impervious
C = Compaction; (Use the following compaction factors: 0%, 50%, 100%)
T = Exfiltration Trench

D. SCS CURVE NUMBER AND SOIL STORAGE CALCULATIONS:

1. Soil Moisture Storage Table:

Existing Soil Type: **2 FLATWOODS**

Depth to Water Table ft.	Cumulative Water Storage (Pre.-Dev.) in.	Compacted Water Storage (Post 50%) in.	Compacted Water Storage (Post 100%) in.
1	0.76	0.67	0.57
2	2.50	2.19	1.88
3	5.40	4.73	4.05
4	9.00	7.88	6.75

2. Available Soil Storage Calculation:

Item:	Description:	Ave. Elev. ft.	S in.	P Area acres	Volume Stored ac-in
1	Lake Area	0.00	0.00	0.000	0.00
2	Lake Area	0.00	0.00	0.000	0.00
3	0	0.00	0.00	0.000	0.00
4	Impervious	0.00	0.00	0.000	0.00
5	0	0.00	0.00	0.000	0.00
6	Park	8.40	1.27	953.700	1215.01
7	N/A	0.00	0.00	0.000	0.00
8	0	0.00	0.00	0.000	0.00
9	0	0.00	0.00	0.000	0.00
10	0	0.00	0.00	0.000	0.00
11	Building =	0.00	0.00	0.000	0.00
Total:		8.40	1.27	953.700	1215.01

* Abbreviations: S = Soil Storage
P = Pervious

3. Moisture Storage Calculation (S):
 = Available soil storage / Total Site Area
 = 1215.01 ac-in / 953.700 acres
 = **1.27 inches**
4. SCS Curve Number Calculation (CN):
 = $1000 / (S + 10)$
 = $1000 / (1.274 + 10)$
 = **89**

E. SURFACE STORAGE CALCULATIONS:

1. Stage vs. Storage Calculations:

Stage ft.	STORAGE (ac-ft)												
	Item:	1 ac-ft	2 ac-ft	3 ac-ft	4 ac-ft	5 ac-ft	6 ac-ft	7 ac-ft	8 ac-ft	9 ac-ft	10 ac-ft	E ac-ft	Total ac-ft
7.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00		0.00	0.00	0.00	0.00	0.00	85.83	0.00	0.00	0.00	0.00	0.00	85.83
8.50		0.00	0.00	0.00	0.00	0.00	288.49	0.00	0.00	0.00	0.00	0.00	288.49
9.00		0.00	0.00	0.00	0.00	0.00	610.37	0.00	0.00	0.00	0.00	0.00	610.37
9.50		0.00	0.00	0.00	0.00	0.00	1049.07	0.00	0.00	0.00	0.00	0.00	1049.07
10.00		0.00	0.00	0.00	0.00	0.00	1525.92	0.00	0.00	0.00	0.00	0.00	1525.92
10.50		0.00	0.00	0.00	0.00	0.00	2002.77	0.00	0.00	0.00	0.00	0.00	2002.77
11.00		0.00	0.00	0.00	0.00	0.00	2479.62	0.00	0.00	0.00	0.00	0.00	2479.62
11.50		0.00	0.00	0.00	0.00	0.00	2956.47	0.00	0.00	0.00	0.00	0.00	2956.47
12.00		0.00	0.00	0.00	0.00	0.00	3433.32	0.00	0.00	0.00	0.00	0.00	3433.32
12.50		0.00	0.00	0.00	0.00	0.00	3910.17	0.00	0.00	0.00	0.00	0.00	3910.17
13.00		0.00	0.00	0.00	0.00	0.00	4387.02	0.00	0.00	0.00	0.00	0.00	4387.02
13.50		0.00	0.00	0.00	0.00	0.00	4863.87	0.00	0.00	0.00	0.00	0.00	4863.87
14.00		0.00	0.00	0.00	0.00	0.00	5340.72	0.00	0.00	0.00	0.00	0.00	5340.72
14.50		0.00	0.00	0.00	0.00	0.00	5817.57	0.00	0.00	0.00	0.00	0.00	5817.57
15.00		0.00	0.00	0.00	0.00	0.00	6294.42	0.00	0.00	0.00	0.00	0.00	6294.42
15.50		0.00	0.00	0.00	0.00	0.00	6771.27	0.00	0.00	0.00	0.00	0.00	6771.27
16.00		0.00	0.00	0.00	0.00	0.00	7248.12	0.00	0.00	0.00	0.00	0.00	7248.12
16.50		0.00	0.00	0.00	0.00	0.00	7724.97	0.00	0.00	0.00	0.00	0.00	7724.97
17.00		0.00	0.00	0.00	0.00	0.00	8201.82	0.00	0.00	0.00	0.00	0.00	8201.82

* Abbreviations: E = Exfiltration Trench

Langan Engineering and Environmental Services

15150 NW 79th Court, Suite 200
Miami Lakes, FL 33016
(786) 264-7200

Date:June 16, 2025

Project Name:City Park

Project Number:330090201

Prepared By:

SURFACE WATER MANAGEMENT CALCULATIONS (S.F.W.M.D. CRITERIA)

I. GIVEN:

A. ACREAGE:

1	Lake Area =	66.00	ac.
2	Lake Bank Area =	0.00	ac.
3	Building =	229.49	ac.
4	Impervious	438.12	ac.
5	Pervious Area	220.09	ac.
6	N/A		ac.
7	N/A		ac.

Commercial Off	129.2
industrial	90.5
SF	180.6
MF	304
Park Open Space	183.4

Assumed
Assumed

total

887.7
66.00

Imp

667.61

6	Total =	953.70	ac.
---	---------	--------	-----

B. OTHER:

1. The current zoning on the property is

II. DESIGN CRITERIA:

A. WATER QUALITY CRITERIA:

Quality standards shall be provided during a 3 year, 1 hour storm event for one of the following three combinations:

1. If a wet detention system, then whichever is the greater of the following:
 - a. The first inch of runoff from the entire project site.
 - b. The amount of 2.5 inches times the percent impervious for the project site.
2. If a dry detention system, then 75% of the volume required for the wet detention system.
3. If a retention system, then 50% of the volume required.

Also, the following shall apply:

4. If the property is zoned "Commercial", at least 0.5 inches of retention or dry detention pre-treatment will be required.
5. Any detention system shall be designed to discharge no more than 0.5 inches of the detained volume per day.

B. WATER QUANTITY CRITERIA:

1. DESIGN EVENTS AND RAINFALL AMOUNTS:

- a. Design Event for Equipment FFE
Frequency: 100 year
Duration: 24 hour
Amount: inches
- b. Design Event for Minimum Road Elevation (if not specified by Local District Criteria):
Frequency: 5 year
Duration: 24 day
Amount: 6.50 inches
- c. Design Event for Minimum Discharge Elevation:
Frequency: 25 year
Duration: 3 day
Amount: 9.22 inches 3.28 credit
- d. Design Event for Finish Floor Elevation
Frequency: 100 year
Duration: 3 day
Amount: 13.72 inches 3.28 credit

2. ADDITIONAL DESIGN INFORMATION:

- a. Design Water / Control Elevation: 7.00 NGVD
(Note: Proposed minimum road elevation must be at least 2 feet above the wet season water table or control elevation.)
- b. Drainage Basin / Canal Number:

STAGE ELEVATION INFORMATION:

Item:	Description:	S type	Length ft.	Area ac.	Low ft.	High ft.	I %	C %	Total Area %
1	Lake Area	V		66.00	7.00	7.00	100	100	6.92
2	Lake Area	L							0.00
3		V							0.00
4	Impervious	L		438.12	8.50	10.00	100	100	45.94
5		V							
6	Park	L		220.09	8.00	9.00	0	50	23.08
7	N/A	L							0.00
8	Building =	V		229.49	10.50	10.50	100	100	24.06
9		L							0.00
10									
11									
E	Seepage and Evapotranspiration								
Total:				953.700	7.00	10.50	76.92	88.46	100.0

* Abbreviations: S = Storage; (V = Vertical Storage & L = Linear Storage)
 I = Impervious
 C = Compaction; (Use the following compaction factors: 0%, 50%, 100%)
 T = Exfiltration Trench

D. SCS CURVE NUMBER AND SOIL STORAGE CALCULATIONS:

1. Soil Moisture Storage Table:

Existing Soil Type: 2 FLATWOODS

Depth to Water Table ft.	Cumulative Water Storage (Pre.-Dev.) in.	Compacted Water Storage (Post 50%) in.	Compacted Water Storage (Post 100%) in.
1	0.76	0.67	0.57
2	2.50	2.19	1.88
3	5.40	4.73	4.05
4	9.00	7.88	6.75

2. Available Soil Storage Calculation:

Item:	Description:	Ave. Elev. ft.	S in.	P Area acres	Volume Stored ac-in
1	Lake Area	7.00	0.00	0.000	0.00
2	Lake Area	0.00	0.00	0.000	0.00
3	0	0.00	0.00	0.000	0.00
4	Impervious	9.25	2.42	0.000	0.00
5	0	0.00	0.00	0.000	0.00
6	Park	8.50	1.43	220.090	313.90
7	N/A	0.00	0.00	0.000	0.00
8	Building =	10.50	5.40	0.000	0.00
9	0	0.00	0.00	0.000	0.00
10	0	0.00	0.00	0.000	0.00
11	0	0.00	0.00	0.000	0.00
Total:		8.50	9.25	220.090	313.90

* Abbreviations: S = Soil Storage
 P = Pervious

3. Moisture Storage Calculation (S):
 = Available soil storage / Total Site Area
 = 313.90 ac-in / 953.700 acres
 = **0.33 inches**
4. SCS Curve Number Calculation (CN):
 = 1000 / (S + 10)
 = 1000 / (0.329 + 10)
 = **97**

E. SURFACE STORAGE CALCULATIONS:

1. Stage vs. Storage Calculations:

Stage ft.	STORAGE (ac-ft)												
	Item:	1 ac-ft	2 ac-ft	3 ac-ft	4 ac-ft	5 ac-ft	6 ac-ft	7 ac-ft	8 ac-ft	9 ac-ft	10 ac-ft	E ac-ft	Total ac-ft
7.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00		66.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.00
8.50		99.00	0.00	0.00	0.00	0.00	27.51	0.00	0.00	0.00	0.00	0.00	126.51
9.00		132.00	0.00	0.00	36.51	0.00	110.05	0.00	0.00	0.00	0.00	0.00	278.56
9.50		165.00	0.00	0.00	146.04	0.00	220.09	0.00	0.00	0.00	0.00	0.00	531.13
10.00		198.00	0.00	0.00	328.59	0.00	330.14	0.00	0.00	0.00	0.00	0.00	856.73
10.50		231.00	0.00	0.00	547.65	0.00	440.18	0.00	0.00	0.00	0.00	0.00	1218.83
11.00		264.00	0.00	0.00	766.71	0.00	550.23	0.00	0.00	0.00	0.00	0.00	1580.94
11.50		297.00	0.00	0.00	985.77	0.00	660.27	0.00	0.00	0.00	0.00	0.00	1943.04
12.00		330.00	0.00	0.00	1204.83	0.00	770.32	0.00	0.00	0.00	0.00	0.00	2305.15
12.50		363.00	0.00	0.00	1423.89	0.00	880.36	0.00	0.00	0.00	0.00	0.00	2667.25
13.00		396.00	0.00	0.00	1642.95	0.00	990.41	0.00	0.00	0.00	0.00	0.00	3029.36
13.50		429.00	0.00	0.00	1862.01	0.00	1100.45	0.00	0.00	0.00	0.00	0.00	3391.46
14.00		462.00	0.00	0.00	2081.07	0.00	1210.50	0.00	0.00	0.00	0.00	0.00	3753.57
14.50		495.00	0.00	0.00	2300.13	0.00	1320.54	0.00	0.00	0.00	0.00	0.00	4115.67
15.00		528.00	0.00	0.00	2519.19	0.00	1430.59	0.00	0.00	0.00	0.00	0.00	4477.78
15.50		561.00	0.00	0.00	2738.25	0.00	1540.63	0.00	0.00	0.00	0.00	0.00	4839.88
16.00		594.00	0.00	0.00	2957.31	0.00	1650.68	0.00	0.00	0.00	0.00	0.00	5201.99
16.50		627.00	0.00	0.00	3176.37	0.00	1760.72	0.00	0.00	0.00	0.00	0.00	5564.09
17.00		660.00	0.00	0.00	3395.43	0.00	1870.77	0.00	0.00	0.00	0.00	0.00	5926.20

* Abbreviations: E = Exfiltration Trench

F. MINIMUM ELEVATION CALCULATIONS TO VERIFY FLOOD PLAIN ENCROACHMENT (ZERO DISCHARGE):

1. The rainfall amount for the 100-Year, 3-Day storm event:
= **13.72 in.**
2. Compute inches of runoff, Q:
= $(P - (0.2 S))^2 / (P + (0.8 X S))$
= $(13.72 \text{ in.} - (0.2 X 0.33 \text{ in.}))^2 / (13.72 \text{ in.} + (0.8 X 0.33 \text{ in.}))$
= **13.33 inches of runoff**
3. Compute volume of runoff:
= (Inches of Runoff) X (Project Area)
= 13.33 inches X 953.700 acres X (1 foot / 12 inches)
= **1059.62 ac-ft of storage required (zero discharge)**
4. From the stage vs storage curve, **1059.62** ac-ft corresponds to elevation **10.28** NGVD

G. MINIMUM DISCHARGE ELEVATION CALCULATIONS (ZERO DISCHARGE):

1. The rainfall amount for the 25-Year, 3-Day storm event:
= **9.22 in.**
2. Compute inches of runoff, Q:
= $(P - (0.2 S))^2 / (P + (0.8 X S))$
= $(9.22 \text{ in.} - (0.2 X 0.33 \text{ in.}))^2 / (9.22 \text{ in.} + (0.8 X 0.33 \text{ in.}))$
= **8.84 inches of runoff**
3. Compute volume of runoff:
= (Inches of Runoff) X (Project Area)
= 8.84 inches X 953.700 acres X (1 foot / 12 inches)
= **702.28 ac-ft of storage required (zero discharge)**
4. From the stage vs storage curve, **702.28** ac-ft corresponds to elevation **9.76** NGVD

H. MINIMUM ROAD CROWN ELEVATION CALCULATIONS (ZERO DISCHARGE):

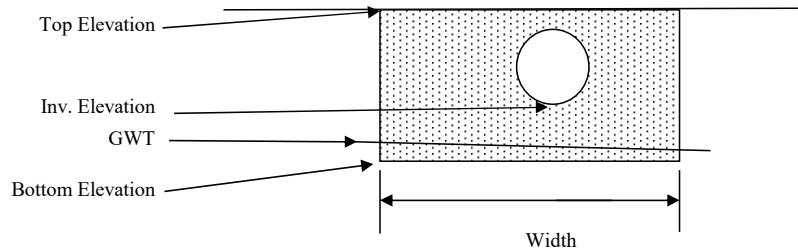
1. The rainfall amount for the 100-Year, 1-Day storm event:
= **0.00 in.**
2. Compute inches of runoff, Q:
= $(P - (0.2 S))^2 / (P + (0.8 X S))$
= $(0.00 \text{ in.} - (0.2 X 0.33 \text{ in.}))^2 / (0.00 \text{ in.} + (0.8 X 0.33 \text{ in.}))$
= **0.02 inches of runoff**
3. Compute volume of runoff:
= (Inches of Runoff) X (Project Area)
= 0.02 inches X 953.700 acres X (1 foot / 12 inches)
= **1.31 ac-ft of storage required (zero discharge)**
4. From the stage vs storage curve, **1.31** ac-ft corresponds to elevation **7.02** NGVD

APPENDIX D – EXFILTRATION TRENCH CALCULATIONS

Preliminary Exfiltration Trench Calculations

WATER QUALITY CALCULATIONS

Total Drainage Area =	887.70	acres.	Total Drainage Area Less Lake	
Impervious Area =	667.61	acres.	(C = 0.90)	
Pervious Area =	220.09	acres.	(C = 0.30)	
Lowest Grnd. Elev. for Prop. Exfil. Trench =	8.50	ft. NGVD		
Lowest Exist. Grate Elevation =	8.50	ft. NGVD		



Proposed Exfiltration Trench:

Top Elevation =	7.00	ft. NGVD
GWT =	7.000	ft. NGVD
Pipe Diameter =	18	inches
Inv. Elevation =	7.00	ft. NGVD
Bottom Elevation =	-8.00	ft. NGVD
Width =	5.00	feet.
Weir Elevation =	n/a	ft. NGVD

Existing Exfiltration Trench:

Top Elevation =	n/a	ft. NGVD
GWT =	n/a	ft. NGVD
Pipe Diameter =	n/a	inches
Inv. Elevation =	n/a	ft. NGVD
Bottom Elevation =	n/a	ft. NGVD
Width =	n/a	feet.
Length =	n/a	feet.
Assumed Usage =	0	percent

Weighted k =	9.79E-04	cfs/sf-ft of head.
Safety Factor =	2	
DESIGN STORM FREQUENCY (YEARS):	5	
MINIMUM TIME OF CONCENTRATION (MINUTES):	10.00	

BASIN DESIGN INFORMATION per DERM

TOTAL DRAINAGE AREA =	359.247	hectares or	887.700	acres.
TOTAL IMPERVIOUS DRAINAGE AREA =	270.178	hectares or	667.610	acres.
IMPERVIOUS RUNOFF COEFFICIENT =	0.90			
TOTAL PERVIOUS DRAINAGE AREA =	89.069	hectares or	220.090	acres.
PERVIOUS RUNOFF COEFFICIENT =	0.30			
SUB-BASIN DRAINAGE AREA =	359.247	hectares or	887.700	acres.
SUB-BASIN IMPERVIOUS DRAINAGE AREA =	270.178	hectares or	667.610	acres.
IMPERVIOUS RUNOFF COEFFICIENT =	0.90			
SUB-BASIN PERVIOUS DRAINAGE AREA =	89.069	hectares or	220.090	acres.
PERVIOUS RUNOFF COEFFICIENT =	0.30			
SUB-BASIN TIME OF CONCENTRATION =	10.00	minutes		
DESIGN STORM FREQUENCY =	5	years		
SUB-BASIN TIME OF CONCENTRATION =	10.00	minutes		
SUB-BASIN TIME FOR FIRST INCH OF RUNOFF =	14.03	minutes		
REQUIRED WATER QUALITY TREATMENT TIME =	24.03	minutes		
V1" =	1.94	ac.-ft.		

WATER QUALITY CALCULATIONS

Water Qaulity Based on 1" Over the Entire Drainage Area =	73.98	ac-ft
Water Qaulity Based on 2.5" Over the Impervious Area =	139.09	ac-ft

TREATMENT VOLUME REQUIRED (Greater of the two above):

Vtrmt =	6,058,561	cu. ft.
Vtrmt =	139.09	ac.-ft.

TYPICAL EXFILTRATION TRENCH DESIGN by SFWMD

$$L = SF \times (\text{Volume WQ} + \text{Volume Additional}) / [k \times (2 \times H2 \times Du - Du^2 + 2 \times H2 \times Ds) + (1.39 \times 10^{-4}) \times (W \times Du + PS)]$$

Volume = Treatment Vol. - Capacity of Exist. Trench (ac-in)

k = Weighted Hyd. Conductivity (cfs/sf - ft)

H2 = Depth to the Water Table (ft)

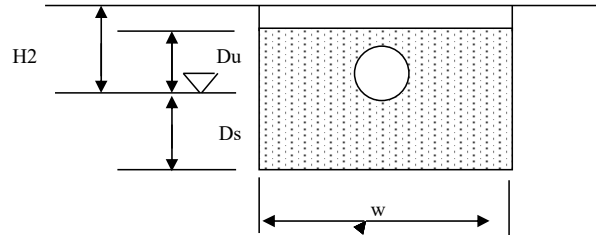
W = Trench width (ft)

Du = Non-Saturated Trench Depth (ft)

Ds = Saturated Trench Depth (ft)

0 SF = Safety Factor

PS = Pipe Storage (ft.^3)



Capacity of Exist. Exfil. Trench =	0.000	ha-m or	0.000	ac.-ft.
Treatment Volume =	59.336	ha-m or	480.84	ac.-ft.
Volume =	5770.050	ac-in.		
k =	9.79E-04	cfs/sf-ft		
H2 =	1.50	ft.		
W =	5.00	ft.		
Du =	0.00	ft.		
Ds =	15.00	ft.		
SF =	2.00			

L Required = 260,495 feet

PROVIDED LENGTH = 260,500 feet

APPENDIX E – FLOOD PLAIN COMPENSATION

City Park

FLOODPLAIN COMPENSATIONS CALCULATIONS

SURFACE WATERMANAGEMENT CALCULATIONS

I. Design Criteria:

1) SHWT: 7.00 ft. NGVD

2) Rainfall Amounts:

Design Events	SFWMD Rainfall Amounts*	
	24 Hour	72 Hour
100 Year Storm Event	12.00 inches	17.00 inches

*Rainfall data was obtained from the SFWMD rainfall maps Handbook Volume II

II. Pre-Development Runoff and Volume Calculations

1) Pre-Development Area Breakdown:

Description	Area (Ac.)	% of Area	From Elevation (ft.)	To Elevation (ft.)	C % (0%, 50%, 100%)
Building	0.00	0.00%			
Pervious	953.70	100.00%	7.40	9.30	0%
Impervious	0.00	0.00%			
Total Site Area:		953.70 Ac.*			

*Area excludes the existing stadium building coverage which has a separate drainage system from the rest of the site

2) SCS Curve Number and Soil Storage Calculations:

A) Soil Moisture Storage table for Flatwoods (2) Soil Type:

Depth to Water Table (ft.)	Cumulative Moisture Storage (in.) C 0%	Cumulative Moisture Storage (in.) C 50%	Cumulative Moisture Storage (in.) C 100%
1	0.60	0.53	0.45
2	2.50	2.19	1.88
3	5.40	4.73	4.05
4	9.00	7.88	6.75

C=Compaction

Note: Moisture Storage based on SFWMD Part III Section F. Water Storage, A. Ground Storage

B) Available Soil Storage Calculations:

Soil Storage Calculations:

Description	Area (Ac.) (A)	Avg. Elevation (ft.)	Depth to SHWT (ft.)	Moisture Storage (S)	Volume Stored (Ac-in) (V)*
Building	0.00	0.00			0.00
Pervious	953.70	8.35	1.35	7.88	7510.39
Impervious	0.00	0.00			0.00

*V=A x S

Total Volume Stored: 7510.39

Moisture Storage Calculation (S):

$$\begin{aligned}
 &= \text{Available Storage} \quad / \quad \text{Total Site Area} \\
 &= \quad 7510.39 \text{ ac-in} \quad / \quad 953.70 \quad \text{acres} \\
 &= \quad \underline{\underline{7.88 \text{ inches}}}
 \end{aligned}$$

SCS Curve Number Calculation (CN):

$$\begin{aligned}
 &= 1000 / (S + 10) \\
 &= \quad 1000 / \quad (7.88 + 10) \\
 &= \quad \underline{\underline{56}}
 \end{aligned}$$

4) Site Pre-Development Runoff Volume and Sotrage Volume Calculations

A) SCS Runoff Volume Calculation:

$$\begin{aligned}
 &= \frac{(P - 0.2 S)^2}{(P + 0.8 S)} \\
 &= \frac{(17 - 0.2 (2.29))^2}{(17 + 0.8(2.29))} \\
 &= \quad \underline{\underline{10.21 \text{ inches}}}
 \end{aligned}$$

$$\begin{aligned}
 Q &= 10.21 \text{ in} \times 129.40 \text{ ac} \\
 &= \quad 9738.82 \text{ ac-in} \\
 &\quad \underline{\underline{811.57 \text{ ac-ft}}}
 \end{aligned}$$

B) Available Site Pre-development Storage:

$$\text{Available Volume} = \quad \underline{\underline{610.37 \text{ ac-ft}^*}}$$

This volume was calculated at elevation 9 ft-NGVD, which is the FEMA Base Flood Elevation at the site

C) Difference Between the Runoff Storage and Available Storage Volume

$$= \quad \underline{\underline{201.20 \text{ ac-ft}}}$$

The runoff volume is larger than the available storage, therefore the site is an exporter site.

The proposed development will retain the 100 year 3 day storm event, therefore, there will be no negative impact to the surrounding area.

APPENDIX F– NUTRIENT LOADING ANALYSIS

Complete Report (not including cost)

Project: City Park

Date: 5/28/2026 11:15:36 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Mult-Family	Single Family	Commercial	Industrial	Community Uses
Rainfall Zone	Florida Zone 5	Florida Zone 5	Florida Zone 5	Florida Zone 5	Florida Zone 5
Annual Mean Rainfall	55.00	55.00	55.00	55.00	55.00

Pre-Condition Landuse Information

Landuse	Agricultural - General: TN=2.800 TP=0.487	Agricultural - General: TN=2.800 TP=0.487	Agricultural - General: TN=2.800 TP=0.487	Agricultural - General: TN=2.800 TP=0.487	Agricultural - General: TN=2.800 TP=0.487
Area (acres)	389.40	108.60	149.00	94.00	250.00
Rational Coefficient (0-1)	0.11	0.11	0.11	0.11	0.11
Non DCIA Curve Number	74.00	74.00	74.00	74.00	74.00
DCIA Percent (0-100)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	2.800	2.800	2.800	2.800	2.800
Phosphorus EMC (mg/l)	0.487	0.487	0.487	0.487	0.487
Runoff Volume (ac-ft/yr)	204.532	57.042	78.262	49.374	131.313
Nitrogen Loading (kg/yr)	706.127	196.932	270.193	170.457	453.343
Phosphorus Loading	122.816	34.252	46.994	29.647	78.849

(kg/yr)

Post-Condition Landuse Information

Landuse	Multi-Family: TN=2.320 TP=0.520	Single-Family: TN=2.070 TP=0.327	Low-Intensity Commercial: TN=1.13 TP=0.188	Light Industrial: TN=1.200 TP=0.260	Rangeland/Parkland: TN=1.150 TP=0.055
Area (acres)	389.40	108.60	149.00	94.00	250.00
Rational Coefficient (0-1)	0.41	0.41	0.41	0.41	0.41
Non DCIA Curve Number	29.90	29.90	29.90	29.90	29.90
DCIA Percent (0- 100)	50.00	50.00	50.00	50.00	50.00
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	66.00
Nitrogen EMC (mg/l)	2.320	2.070	1.130	1.200	1.150
Phosphorus EMC (mg/l)	0.520	0.327	0.188	0.260	0.055
Runoff Volume (ac- ft/yr)	728.107	203.062	278.603	175.763	344.046
Nitrogen Loading (kg/yr)	2,082.793	518.277	388.174	260.059	487.840
Phosphorus Loading (kg/yr)	466.833	81.873	64.581	56.346	23.331

Catchment Number: 1 Name: Mult-Family

Project: City Park

Date: 5/28/2026

None Design

Watershed Characteristics

Catchment Area (acres) 389.40

Contributing Area (acres) 389.400

Non-DCIA Curve Number 29.90

DCIA Percent	50.00
Rainfall Zone	Florida Zone 5
Rainfall (in)	55.00

Surface Water Discharge

Required TN Treatment Efficiency (%) 66
 Provided TN Treatment Efficiency (%)
 Required TP Treatment Efficiency (%) 74
 Provided TP Treatment Efficiency (%)

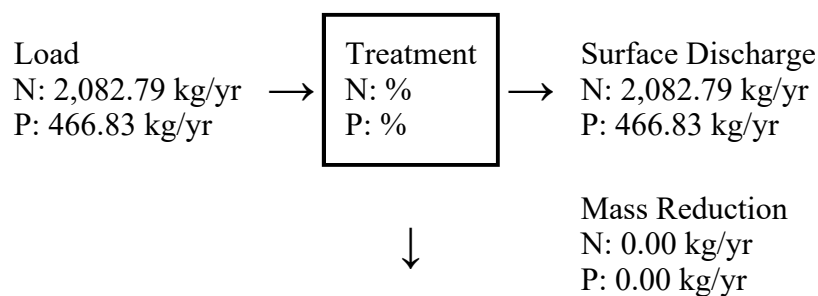
Media Mix Information

Type of Media Mix
 Media N Reduction (%) 0.000
 Media P Reduction (%) 0.000

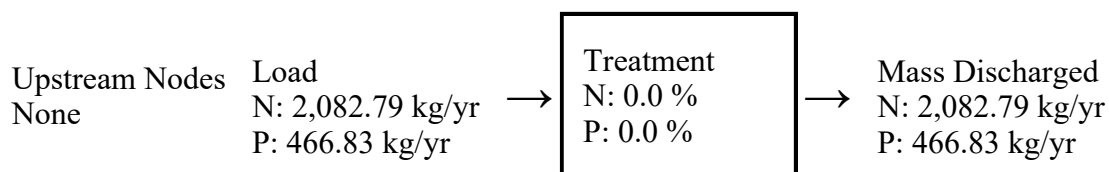
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 0.000
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.000
 TP Concentration (mg/L) 0.000

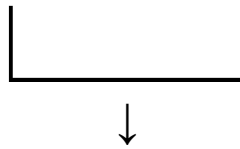
Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)



Q: 728.11 ac-ft



Q: 728.11 ac-ft

Mass Removed
 N: 0.00 kg/yr
 P: 0.00 kg/yr

Catchment Number: 2 Name: Single Family

Project: City Park

Date: 5/28/2026

None Design

Watershed Characteristics

Catchment Area (acres) 108.60
 Contributing Area (acres) 108.600
 Non-DCIA Curve Number 29.90
 DCIA Percent 50.00
 Rainfall Zone Florida Zone 5
 Rainfall (in) 55.00

Surface Water Discharge

Required TN Treatment Efficiency (%) 62
 Provided TN Treatment Efficiency (%)
 Required TP Treatment Efficiency (%) 58
 Provided TP Treatment Efficiency (%)

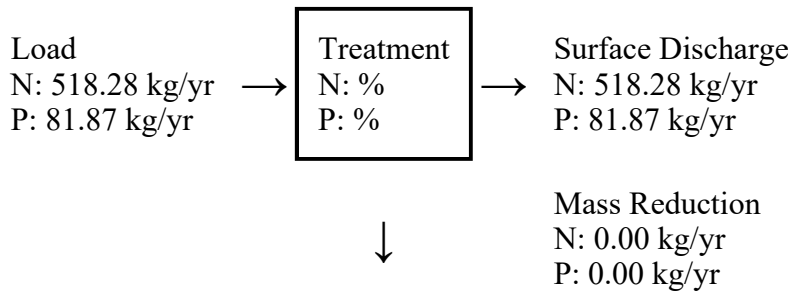
Media Mix Information

Type of Media Mix
 Media N Reduction (%) 0.000
 Media P Reduction (%) 0.000

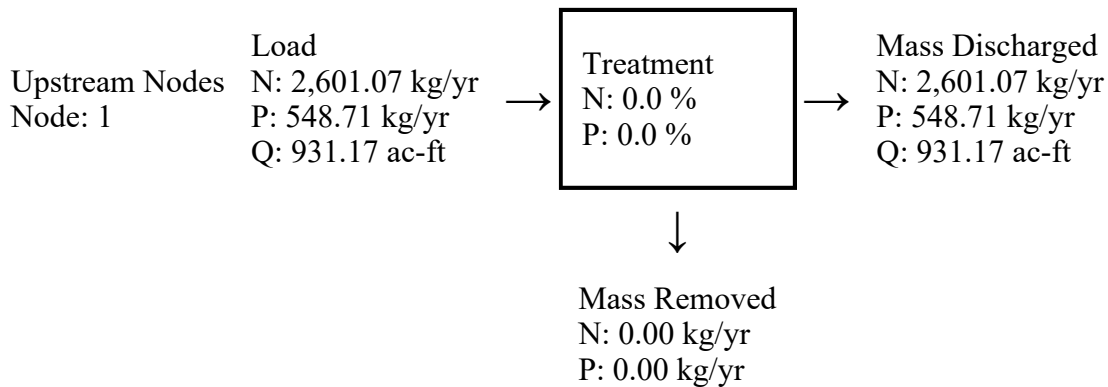
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 0.000
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.000
 TP Concentration (mg/L) 0.000

Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)



Catchment Number: 3 Name: Commercial

Project: City Park

Date: 5/28/2026

None Design

Watershed Characteristics

Catchment Area (acres) 149.00
 Contributing Area (acres) 149.000
 Non-DCIA Curve Number 29.90
 DCIA Percent 50.00
 Rainfall Zone Florida Zone 5
 Rainfall (in) 55.00

Surface Water Discharge

Required TN Treatment Efficiency (%) 30
 Provided TN Treatment Efficiency (%)

Required TP Treatment Efficiency (%) 27

Provided TP Treatment Efficiency (%)

Media Mix Information

Type of Media Mix

Media N Reduction (%) 0.000

Media P Reduction (%) 0.000

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000

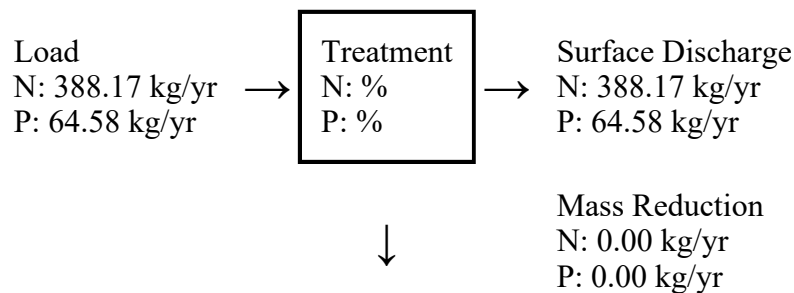
TN Mass Load (kg/yr) 0.000

TN Concentration (mg/L) 0.000

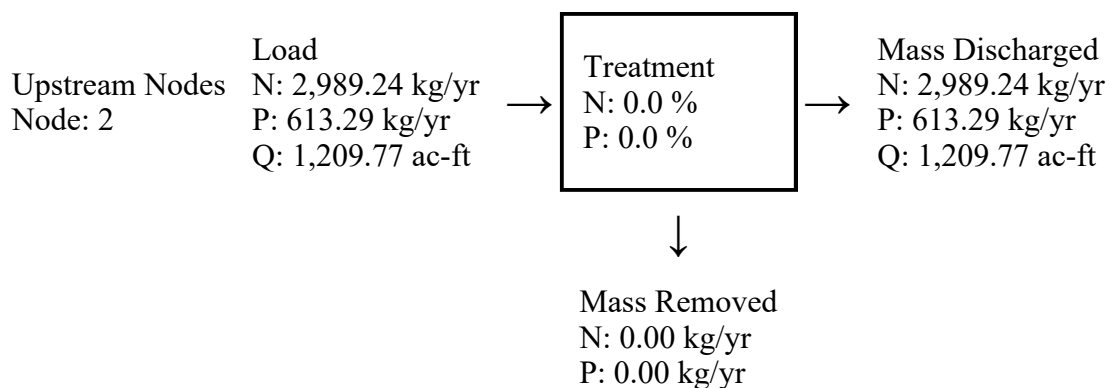
TP Mass Load (kg/yr) 0.000

TP Concentration (mg/L) 0.000

Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)



Catchment Number: 4 Name: Industrial

Project: City Park

Date: 5/28/2026

None Design

Watershed Characteristics

Catchment Area (acres) 94.00
 Contributing Area (acres) 94.000
 Non-DCIA Curve Number 29.90
 DCIA Percent 50.00
 Rainfall Zone Florida Zone 5
 Rainfall (in) 55.00

Surface Water Discharge

Required TN Treatment Efficiency (%) 34
 Provided TN Treatment Efficiency (%)
 Required TP Treatment Efficiency (%) 47
 Provided TP Treatment Efficiency (%)

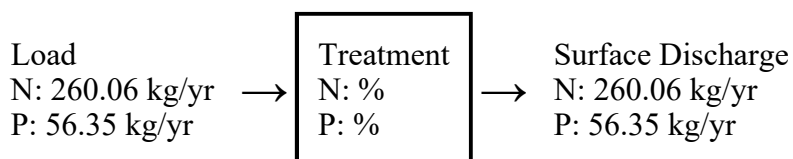
Media Mix Information

Type of Media Mix
 Media N Reduction (%) 0.000
 Media P Reduction (%) 0.000

Groundwater Discharge (Stand-Alone)

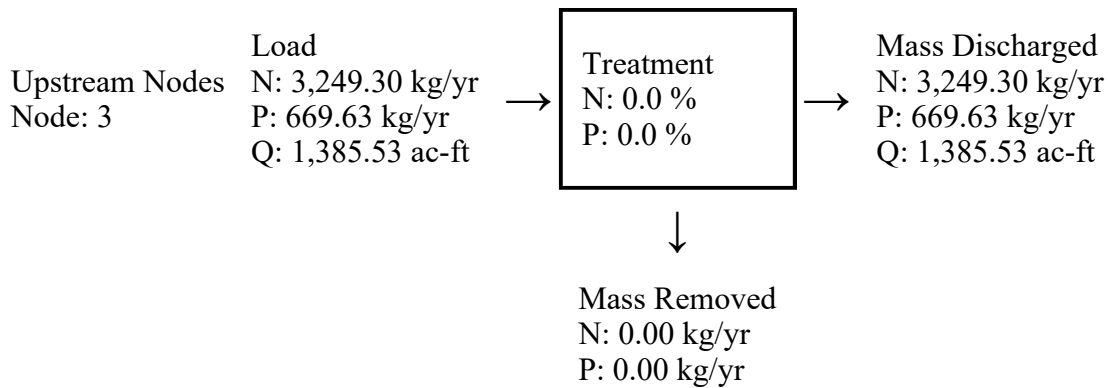
Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 0.000
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 0.000
 TP Concentration (mg/L) 0.000

Load Diagram for None (stand-alone)



↓
 Mass Reduction
 N: 0.00 kg/yr
 P: 0.00 kg/yr

Load Diagram for None (As Used In Routing)



Catchment Number: 5 Name: Community Uses

Project: City Park
Date: 5/28/2026

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Exfiltration

Pipe Span (in)	18.0
Pipe Rise (in)	18.0
Pipe Length (ft)	180,000.0
Trench Width (ft)	5.0
Trench Depth (ft)	15.0
Trench Length (ft)	180,000.0
Aggregate Void Ratio (fraction)	0.40
Storage Volume (Ac-ft)	128.35
Retention Depth (in over CA)	8.371

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	792.000
Permanent Pool Volume (ac-ft) for 31 days residence	29.220
Annual Residence Time (days)	840
Littoral Zone Efficiency Credit	

Wetland Efficiency Credit

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

Catchment Area (acres) 250.00
 Contributing Area (acres) 184.000
 Non-DCIA Curve Number 29.90
 DCIA Percent 50.00
 Rainfall Zone Florida Zone 5
 Rainfall (in) 55.00

Surface Water Discharge

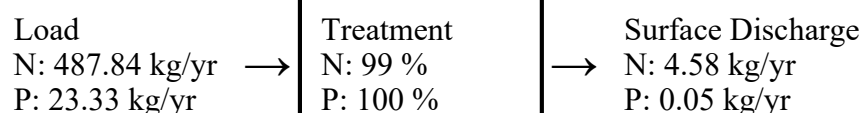
Required TN Treatment Efficiency (%) 7
 Provided TN Treatment Efficiency (%) 99
 Required TP Treatment Efficiency (%)
 Provided TP Treatment Efficiency (%) 100

Media Mix Information

Type of Media Mix Not Specified
 Media N Reduction (%)
 Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

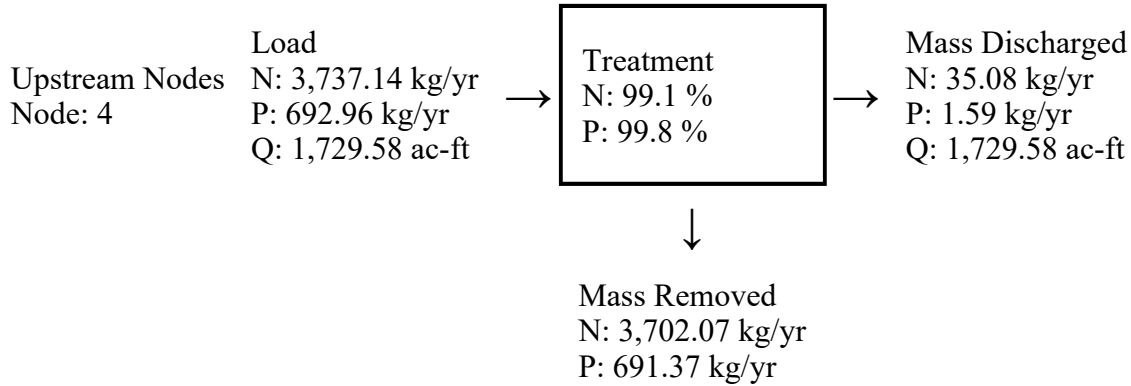
Treatment Rate (MG/yr) 0.000
 TN Mass Load (kg/yr) 482.006
 TN Concentration (mg/L) 0.000
 TP Mass Load (kg/yr) 23.052
 TP Concentration (mg/L) 0.000

Load for Multiple BMP in Series



Mass Reduction
N: 483.26 kg/yr
P: 23.28 kg/yr

Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 2.0.1

Project: City Park

Date: 5/28/2026

Analysis Type: Net Improvement

BMP Types:

- Catchment 1 - None
- Catchment 2 - None
- Catchment 3 - None
- Catchment 4 - None
- Catchment 5 - Multiple BMP

Routing Summary

- Catchment 1 Routed to Catchment 2
- Catchment 2 Routed to Catchment 3
- Catchment 3 Routed to Catchment 4
- Catchment 4 Routed to Catchment 5
- Catchment 5 Routed to Outlet

Total nitrogen target removal met? YES

Total phosphorus target removal met? YES

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	1797.05 kg/yr
Total N post load	3737.14 kg/yr
Target N load reduction	52 %
Target N discharge load	1797.05 kg/yr
Percent N load reduction	99 %

Provided N discharge load	35.08 kg/yr	77.34 lb/yr
Provided N load removed	3702.07 kg/yr	8163.06 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	312.56 kg/yr	
Total P post load	692.96 kg/yr	
Target P load reduction	55 %	
Target P discharge load	312.56 kg/yr	
Percent P load reduction	100 %	
Provided P discharge load	1.59 kg/yr	3.51 lb/yr
Provided P load removed	691.37 kg/yr	1524.48 lb/yr

From Pre-Condition Loads

Existing N Discharge	1797.05 (kg/yr)
Existing P Discharge	312.559 (kg/yr)

Table 10-2 Break Down of LandUse

BMP LandUse Breakdown

Residential	498		389.4	Mutli-Family
			108.6	Singel Family
		Subtotal	498	Residential Sub-Total
Retail	29		149	Low-Intensity Commercial
Office	15			
Mixed Use	85			
Schools	20			
	149	Subtotal	149	
Community Uses	250		250	Rangeland/Parking Land
Industrial	40		94	Light Industrial
Roadway	37			
Rail	17			
	94	Subtotal	94	
Total	991		991	