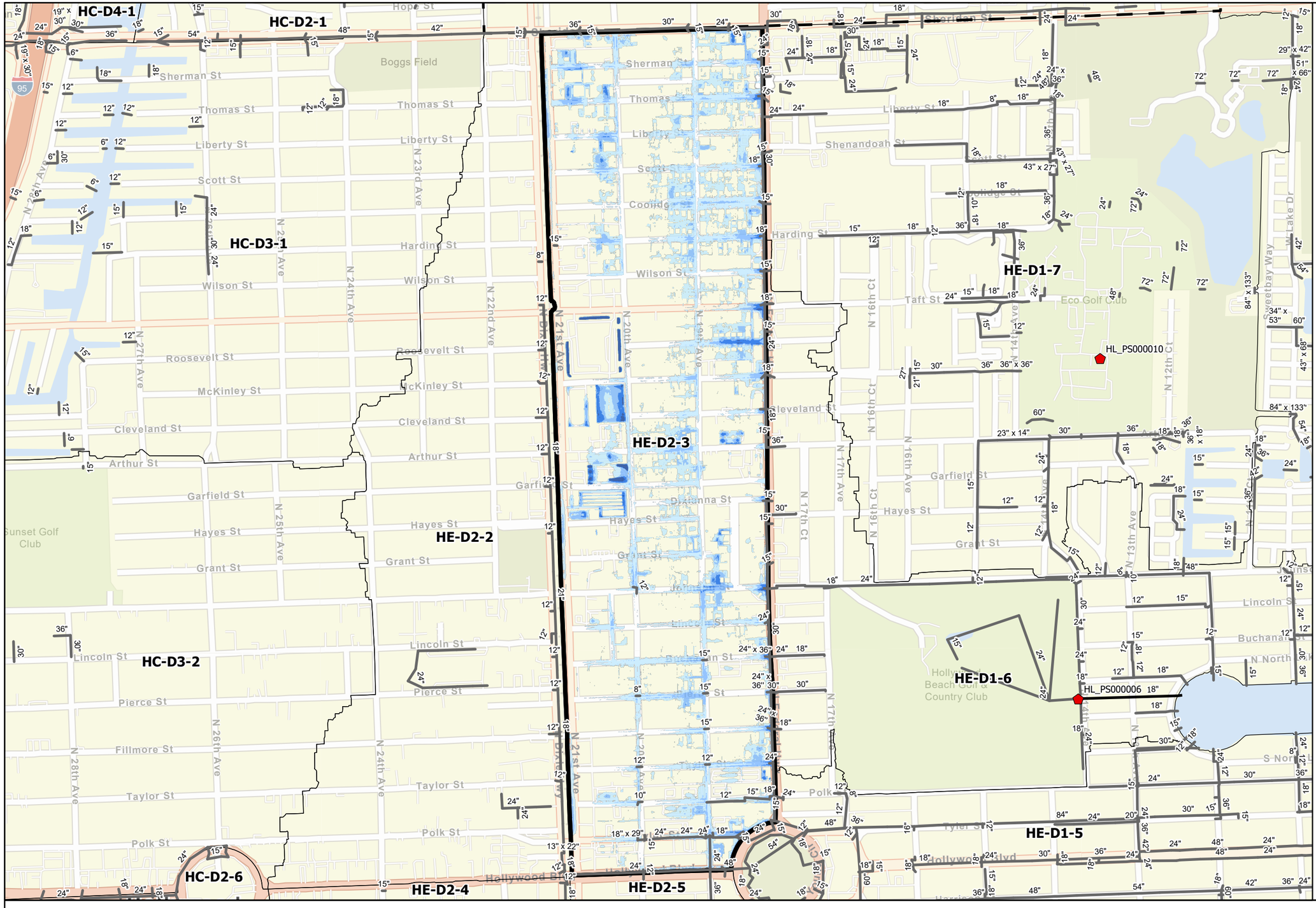


Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Existing Gravity Pipes
- Existing Forcemains

10-Year 72-Hour Storm Flood

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

Current Conditions Flooding in CIP Area
Royal Poinciana
10-year Design Storm

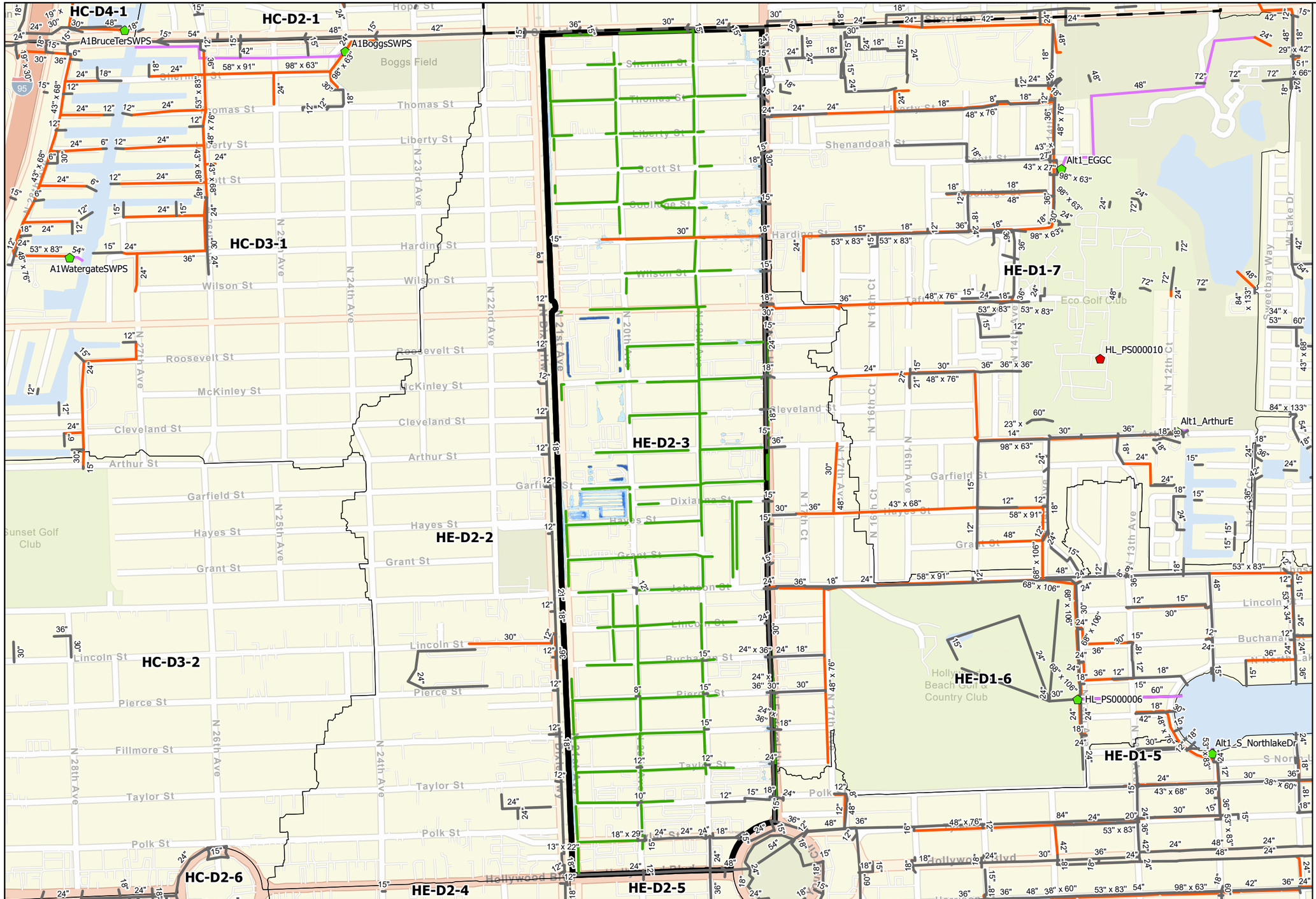
0 465 930 1,860 Feet

1:11,000

City of Hollywood Stormwater Master Plan

HE-D2-3_EC-10

2/28/2023



Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 1 SWPS
- Alt 1 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 1 Exfiltration Pipes
- Alt 1 Gravity Pipes
- Alt 1 Forcemains
- Alt 1 Detention Pond

5-Year ALT 1 Storm Flood Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 1 CIP for 5-year Design Storm in CIP Area Royal Poinciana

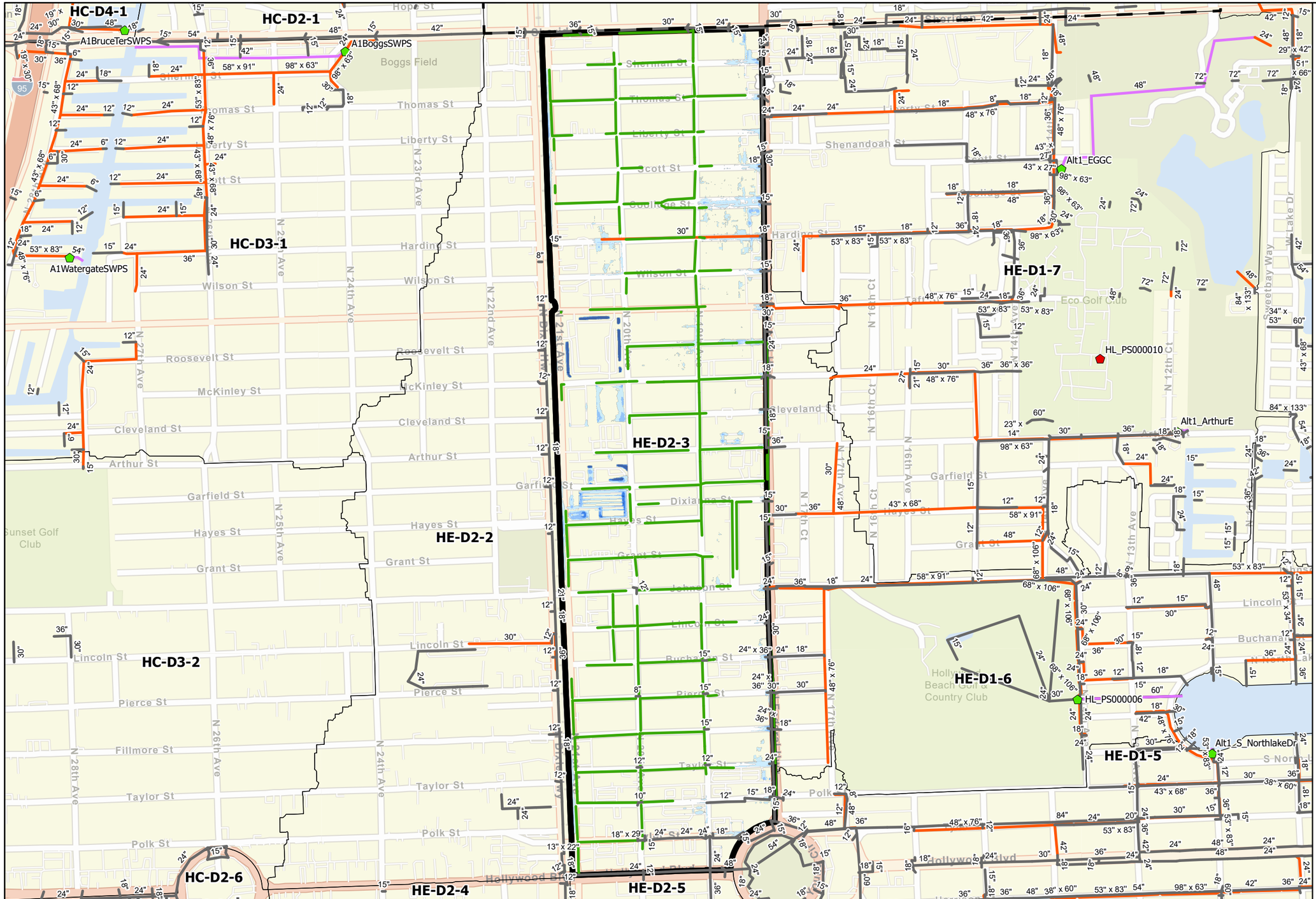
0 465 930 1,860 Feet

1:11,000

City of Hollywood Stormwater Master Plan

HE-D2-3_ALT1-5

2/28/2023



Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 1 SWPS
- Alt 1 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 1 Exfiltration Pipes
- Alt 1 Gravity Pipes
- Alt 1 Forcemains
- Alt 1 Detention Pond

10-Year ALT 1 Storm Flood Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 1 CIP for 10-year Design Storm in CIP Area
Royal Poinciana

0 465 930 1,860 Feet

1:11,000

City of Hollywood Stormwater Master Plan

HE-D2-3_ALT1-10

2/28/2023

HC-D4-1
HC-D2-1
HC-D3-1
HC-D3-2
HC-D2-6
HE-D2-2
HE-D2-3
HE-D2-4
HE-D2-5
HE-D1-7
HE-D1-6
HE-D1-5
A2BoggsSWPS
A2WatergateSWPS
Alt2_EGGC
HL_PS000010
Alt2_ArthurE
HL_PS000006
Alt2_S_NorthlakeDr
Boggs Field
Eco Golf Club
Hollywood Beach Golf & Country Club
Sunset Golf Club
Sherman St
Thomas St
Liberty St
Scott St
Coolidge St
Harding St
Wilson St
Roosevelt St
McKinley St
Cleveland St
Arthur St
Garfield St
Hayes St
Grant St
Johnson St
Lincoln St
Buchanan St
Pierce St
Fillmore St
Taylor St
Polk St
Tyler St
Hollywood Blvd
Sheridan St
Shenandoah St
Taft St
N 28th Ave
N 27th Ave
N 26th Ave
N 25th Ave
N 24th Ave
N 22nd Ave
N 21st Ave
N 20th Ave
N 19th Ave
N 16th Ct
N 16th Ave
N 14th Ave
N 13th Ave
N 12th Ct
N Dixie Hwy
N Lake Dr
Sweetbay Way

Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 2 SWPS
- Alt 2 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 2 Exfiltration Pipe
- Alt 2 Gravity Pipes
- Alt 2 Forcemains
- Alt 2 Detention Pond

5-Year ALT 2 Storm Flood Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 2 CIP for 5-year Design Storm in CIP Area
Royal Poinciana

0 465 930 1,860 Feet

1:11,000

City of Hollywood Stormwater Master Plan

HE-D2-3_ALT2-5

2/28/2023

HC-D4-1
HC-D2-1
HC-D3-1
HC-D3-2
HC-D2-6
HE-D2-1
HE-D2-2
HE-D2-3
HE-D2-4
HE-D2-5
HE-D1-5
HE-D1-6
HE-D1-7
A2BoggsSWPS
A2WatergateSWPS
Alt2_EGGC
Alt2_ArthurE
Alt2_S_NorthlakeDr
HL_PS000010
HL_PS000006
Boggs Field
Eco Golf Club
Hollywood Beach Golf & Country Club
Sunset Golf Club
Sherman St
Thomas St
Liberty St
Scott St
Coolidge St
Harding St
Wilson St
Roosevelt St
McKinley St
Cleveland St
Arthur St
Garfield St
Hayes St
Grant St
Johnson St
Lincoln St
Buchanan St
Pierce St
Fillmore St
Taylor St
Polk St
Tyler St
Hollywood Blvd
Sheridan St
Shenandoah St
Taft St
N 28th Ave
N 27th Ave
N 26th Ave
N 25th Ave
N 24th Ave
N 23rd Ave
N 22nd Ave
N 21st Ave
N 20th Ave
N 19th Ave
N 16th Ct
N 16th Ave
N 14th Ave
N 13th Ave
N 12th Ct
N Dixie Hwy
N Lake Dr
Sweetbay Way

Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 2 SWPS
- Alt 2 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 2 Exfiltration Pipe
- Alt 2 Gravity Pipes
- Alt 2 Forcemains
- Alt 2 Detention Pond

10-Year ALT 2 Storm Flood Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 2 CIP for 10-year Design Storm in CIP Area
Royal Poinciana

0 465 930 1,860 Feet

1:11,000

City of Hollywood Stormwater Master Plan
HE-D2-3_ALT2-10
2/28/2023

SUSINOBM D:\Hollywood SWMP\Final Report Figures\Hollywood Final Report Figures - Map Series\Hollywood Final Report Figures - Map Series.aprx 2/28/2023

		CONCEPTUAL CAPITAL COST ESTIMATE						Royal Poinciana	
								Alternative 1	
PUMP STATIONS WITH FORCE MAINS									
ITEM #	Master Sheet Index	DIAMETER (INCHES)		DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0001	13	24		FM- Force Main Collector	Circular	LF	$ 167.00	0	$ -
0002	14	36		FM- Force Main Collector	Circular	LF	$ 242.00	0	$ -
0003	15	42		FM- Force Main Collector	Circular	LF	$ 336.00	0	$ -
0004	16	48		FM- Force Main Collector	Circular	LF	$ 612.00	0	$ -
0005	17	54		FM- Force Main Collector	Circular	LF	$ 982.00	0	$ -
0006	18	60		FM- Force Main Collector	Circular	LF	$ 1,149.00	0	$ -
0007	19	66		FM- Force Main Collector	Circular	LF	$ 1,329.00	0	$ -
0008	20	72		FM- Force Main Collector	Circular	LF	$ 1,473.00	0	$ -
0009	225	24		FMO- Force Main Offline	Circular	LF	$ 353.00	0	$ -
0010	11			IWI-Injection Wells-Inline		EA	$ 65,000.00	0	$ -
0011	12			IWO-Injection Wells -Offline		EA	$ 75,000.00	0	$ -
0012	6	PS-Storm Drainage Pump Stations < 166 cfs			I	EA	$ 2,400,000.00	0	$ -
0013	7	PS-Storm Drainage Pump Stations < 166-246 cfs			II	EA	$ 3,500,000.00	0	$ -
0014	8	PS-Storm Drainage Pump Stations < 246-328 cfs			III	EA	$ 4,900,000.00	0	$ -
0015	9	PS-Storm Drainage Pump Stations< 328-410 cfs			IV	EA	$ 6,750,000.00	0	$ -
0016	54	PS-CS22 Storm Drainage Pump Stations 600CFS				EA	$ 8,000,000.00	0	$ -
AIN SUBTOTAL									$ -
EXFILTRATION WITH GRAVITY MAINS								Royal Poinciana	
ITEM #	Master Sheet Index	DIAMETER (INCHES)	Width(INCHES)	DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0020	21	15		GM-Gravity Main Collector	Circular	LF	$ 40.00	0	$ -
0021	22	18		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0023	23	24		GM-Gravity Main Collector	Circular	LF	$ 48.00	0	$ -
0024	24	30		GM-Gravity Main Collector	Circular	LF	$ 52.00	1,525	$ 79,300
0026	25	36		GM-Gravity Main Collector	Circular	LF	$ 80.00	0	$ -
0028	26	42		GM-Gravity Main Collector	Circular	LF	$ 115.00	0	$ -
0029	27	48		GM-Gravity Main Collector	Circular	LF	$ 125.00	0	$ -
0030	28	54		GM-Gravity Main Collector	Circular	LF	$ 150.00	0	$ -
0031	29	60		GM-Gravity Main Collector	Circular	LF	$ 220.00	0	$ -
0032	30	66		GM-Gravity Main Collector	Circular	LF	$ 428.00	0	$ -
0033	31	72		GM-Gravity Main Collector	Circular	LF	$ 485.00	0	$ -
0035	32	29	45	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 205.00	0	$ -
0036	33	32	49	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 215.00	0	$ -
0037	34	34	53	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 225.00	0	$ -
0038	35	38	60	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 235.00	0	$ -
0039	36	43	68	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 370.00	0	$ -
0040	37	48	76	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 400.00	0	$ -
0041	38	53	83	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 432.00	0	$ -
0042	39	58	91	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 320.00	0	$ -
0043	40	63	98	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 410.00	0	$ -
0044	41	68	106	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 460.00	0	$ -
0045	42	72	113	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 570.00	0	$ -
0046	43	82	128	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 650.00	0	$ -
0048	44	72	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0072	45	72	72	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0049	46	84	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 750.00	0	$ -
0050	47	96	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 850.00	0	$ -
0051	48			GBP-Gravity Backflow Pipe <36"		Ea	$ 35,000.00	0	$ -
0052	49			GBP-Gravity Backflow Pipe >36"		Ea	$ 70,000.00	0	$ -
0053	5			GW-Gravity Wells		EA	$ 105,000.00	107	$ 11,235,000
0054	4	48		ET-Exfiltration Trench		LF	$ 250.00	43,844	$ 10,961,000
0056	50			Weir Box CS		EA	$ 7,500.00	0	$ -
0057	53			CS-22 Remod		EA	$ 200,000.00	0	$ -
0058	55			SW-04 Remod		EA	$ 150,000.00	0	$ -
0055				Gravity Structures-Inlets		EA	$ 30,000.00	378	$ 11,342,250
0059	56			Ditch Improvement		LF	$ 50.00	0	$ -
0091	57			Swale/Ditch Headwall		Ea	$ 10,000.00	0	$ -
0090	10			Exfil_End Weir		Ea	$ 5,000.00	0	$ -
0092	51			Ret/Det Pond		CUY	$ 355.00	0	$ -
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
GRAVITY MAIN SUBTOTAL							#N/A		$ 33,617,550
0060		Pavement Restoration including Pavement Marking (Full Road)				LF	$ 270.00	45,369	$ 12,249,630
								CONSTRUCTION COST SUBTOTAL	$ 45,867,180
GENERAL CONDITIONS								Royal Poinciana	
0061		Mobilization				LS	4%	$ 45,867,180	$ 1,834,687
0062		Insurance and General Conditions				LS	2%	$ 45,867,180	$ 917,344
0063		Permits/Fees				LS	2%	$ 45,867,180	$ 917,344
0064		Maintenance of Traffic				LS	3%	$ 45,867,180	$ 1,376,015
0065		Engineering Design & CA Oversight Costs				LS	15%	$ 45,867,180	$ 6,880,077
0066		Construction Engineering Inspection Costs				LS	4%	$ 45,867,180	$ 1,834,687
0067		OCI Management Cost				LS	15%	$ 45,867,180	$ 6,880,077
0068		Project Contingency Costs				LS	30%	$ 45,867,180	$ 13,760,154
		Land acquisition							
NS SUBTOTAL									$ 34,400,385
TOTAL									$ 80,267,565

		CONCEPTUAL CAPITAL COST ESTIMATE						Royal Poinciana	
								Alternative 2	
PUMP STATIONS WITH FORCE MAINS									
ITEM #	Master Sheet Index	DIAMETER (INCHES)		DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0001	13	24		FM- Force Main Collector	Circular	LF	$ 167.00	0	$ -
0002	14	36		FM- Force Main Collector	Circular	LF	$ 242.00	0	$ -
0003	15	42		FM- Force Main Collector	Circular	LF	$ 336.00	0	$ -
0004	16	48		FM- Force Main Collector	Circular	LF	$ 612.00	0	$ -
0005	17	54		FM- Force Main Collector	Circular	LF	$ 982.00	0	$ -
0006	18	60		FM- Force Main Collector	Circular	LF	$ 1,149.00	0	$ -
0007	19	66		FM- Force Main Collector	Circular	LF	$ 1,329.00	0	$ -
0008	20	72		FM- Force Main Collector	Circular	LF	$ 1,473.00	0	$ -
0009	225	24		FMO- Force Main Offline	Circular	LF	$ 353.00	0	$ -
0010	11			IWI-Injection Wells-Inline		EA	$ 65,000.00	0	$ -
0011	12			IWO-Injection Wells -Offline		EA	$ 75,000.00	0	$ -
0012	6	PS-Storm Drainage Pump Stations < 166 cfs			I	EA	$ 2,400,000.00	0	$ -
0013	7	PS-Storm Drainage Pump Stations < 166-246 cfs			II	EA	$ 3,500,000.00	0	$ -
0014	8	PS-Storm Drainage Pump Stations < 246-328 cfs			III	EA	$ 4,900,000.00	0	$ -
0015	9	PS-Storm Drainage Pump Stations< 328-410 cfs			IV	EA	$ 6,750,000.00	0	$ -
0016	54	PS-CS22 Storm Drainage Pump Stations 600CFS				EA	$ 8,000,000.00	0	$ -
IN SUBTOTAL									$ -
EXFILTRATION WITH GRAVITY MAINS								Royal Poinciana	
ITEM #	Master Sheet Index	DIAMETER (INCHES)	Width(INCHES)	DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0022	22	21		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0021	21	18		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0023	23	24		GM-Gravity Main Collector	Circular	LF	$ 48.00	1,525	$ 73,200
0024	24	30		GM-Gravity Main Collector	Circular	LF	$ 52.00	0	$ -
0026	25	36		GM-Gravity Main Collector	Circular	LF	$ 80.00	0	$ -
0028	26	42		GM-Gravity Main Collector	Circular	LF	$ 115.00	0	$ -
0029	27	48		GM-Gravity Main Collector	Circular	LF	$ 125.00	0	$ -
0030	28	54		GM-Gravity Main Collector	Circular	LF	$ 150.00	0	$ -
0031	29	60		GM-Gravity Main Collector	Circular	LF	$ 220.00	0	$ -
0032	30	66		GM-Gravity Main Collector	Circular	LF	$ 428.00	0	$ -
0033	31	72		GM-Gravity Main Collector	Circular	LF	$ 485.00	0	$ -
0035	32	29	45	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 205.00	0	$ -
0036	33	32	49	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 215.00	0	$ -
0037	34	34	53	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 225.00	0	$ -
0038	35	38	60	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 235.00	0	$ -
0039	36	43	68	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 370.00	0	$ -
0040	37	48	76	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 400.00	0	$ -
0041	38	53	83	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 432.00	0	$ -
0042	39	58	91	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 320.00	0	$ -
0043	40	63	98	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 410.00	0	$ -
0044	41	68	106	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 460.00	0	$ -
0045	42	72	113	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 570.00	0	$ -
0046	43	82	128	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 650.00	0	$ -
0048	44	72	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0072	45	72	72	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0049	46	72	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 750.00	0	$ -
0050	47	96	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 850.00	0	$ -
0051	48			GBP-Gravity Backflow Pipe <36"		Ea	$ 35,000.00	0	$ -
0052	49			GBP-Gravity Backflow Pipe >36"		Ea	$ 70,000.00	0	$ -
0053	5			GW-Gravity Wells		EA	$ 105,000.00	49	$ 5,145,000
0054	4	48		ET-Exfiltration Trench		LF	$ 250.00	24,488	$ 6,122,000
0055	50			Weir Box CS		EA	$ 30,000.00	0	$ -
0057	53			CS-22 Remod		EA	$ 525,000.00	0	$ -
0058	55			SW-04 Remod		EA	$ 150,000.00	0	$ -
0056				Gravity Structures-Inlets		EA	$ 7,500.00	217	$ 1,625,813
0059	56			Ditch Improvement		LF	$ 50.00	0	$ -
0091	57			Swale/Ditch Headwall		Ea	$ 10,000.00	0	$ -
0090	10			Exfil_End Weir		Ea	$ 5,000.00	0	$ -
0092	51			Ret/Det Pond		CUY	$ 355.00	0	$ -
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
	GRAVITY MAIN SUBTOTAL								$ 12,966,013
0060		Pavement Restoration including Pavement Marking (Full Road)				LF	$ 270.00	26,013	$ 7,023,510
							CONSTRUCTION COST SUBTOTAL		**$ 19,989,523**
GENERAL CONDITIONS								Royal Poinciana	
0061		Mobilization				LS	**4%**	$ 19,989,523	$ 799,581
0062		Insurance and General Conditions				LS	**2%**	$ 19,989,523	$ 399,790
0063		Permits/Fees				LS	**2%**	$ 19,989,523	$ 399,790
0064		Maintenance of Traffic				LS	**3%**	$ 19,989,523	$ 599,686
0065		Engineering Design & CA Oversight Costs				LS	**15%**	$ 19,989,523	$ 2,998,428
0066		Construction Engineering Inspection Costs				LS	**4%**	$ 19,989,523	$ 799,581
0067		OCI Management Cost				LS	**15%**	$ 19,989,523	$ 2,998,428
0068		Project Contingency Costs				LS	**30%**	$ 19,989,523	$ 5,996,857
NS SUBTOTAL									$ 14,992,142
TOTAL									**$ 34,981,664**

Summary of Locations Not Meeting ALT 2 LOS:

1. Structures Flooded pre-3, post-2

Summary of Offsite Issues Affecting CIP Area:

1. None.

HE-D2-3 Pre-Post CIP Flood Inundation Maps

The following figures provide the predicted existing conditions flooding for the 5- and 10-year storm in the CIP Area and the predicted flood reduction for these storms under the Alternatives 1 and 2 CIP:

- **Figure HE-D2-3-EC_5 - Current Conditions Flooding in CIP Area 5-year Design Storm**
- **Figure HE-D2-3-EC_10 - Current Conditions Flooding in CIP Area 10-year Design Storm**
- **Figure HE-D2-3-CIP_ALT1_5 - Predicted Flooding Reduction and Proposed ALT1 CIP for 5-year Design Storm**
- **Figure HE-D2-3-CIP_ALT1_10 - Predicted Flooding Reduction and Proposed ALT1 CIP for 10-year Design Storm**
- **Figure HE-D2-3-CIP_ALT2_5 - Predicted Flooding Reduction and Proposed ALT2 CIP for 5-year Design Storm**
- **Figure HE-D2-3-CIP_ALT2_10 - Predicted Flooding Reduction and Proposed ALT2 CIP for 10-year Design Storm**
- **Table HE-D2-3_ALT1 – Planning Budget for Alternative 1 Proposed CIP**
- **Table HE-D2-3_ALT2 – Planning Budget for Alternative 2 Proposed CIP**

3.2.4.10 CIP Area HE-D2-4 (Highland Gardens East)

Root Causes of Flooding

This CIP area is characterized industrial and residential land use. The basin has a ridge on the west and south and bounded by higher Dixie Hwy on the east. The area is served by exfiltration systems.

Alternative 1

Proposed CIP:

- New gravity collection systems and inlets in neighborhoods connecting to the north to a new large 6'x10' primary gravity outfall system running east to South Lake. This main gravity transmission pipe is a closed system east of US-1 (i.e., no additional or future new connections are allowed on this portion of the pipe and sealed access MHs) due to the hydraulic head being above grade. No BFP is required due to the elevation to the west.
- 5 gravity wells (assumed 1 cfs per foot head for 24-inch well, 250 ft spacing).

- New 23,600 l.f. of exfiltration systems in neighborhoods.

Summary of Locations Not Meeting ALT 1 LOS:

1. Structures Flooded pre-167, post-0

Summary of Offsite Issues Affecting CIP Area:

1. The City's LOS goal cannot be met along shared South City limits Pembroke Rd in the FDOT system. This may be improved by the CIP in the City of Hallandale Beach SWMP or by FDOT future improvements.

Alternative 2

Proposed CIP:

- New gravity collection systems and inlets in neighborhoods connecting existing pipes and trench systems.
- 4 gravity wells (assumed 1 cfs per foot head for 24-inch well, 250 ft spacing).
- New 7,935 l.f. of exfiltration systems in neighborhoods.

Summary of Locations Not Meeting ALT 2 LOS:

1. Structures Flooded pre-167, post-98

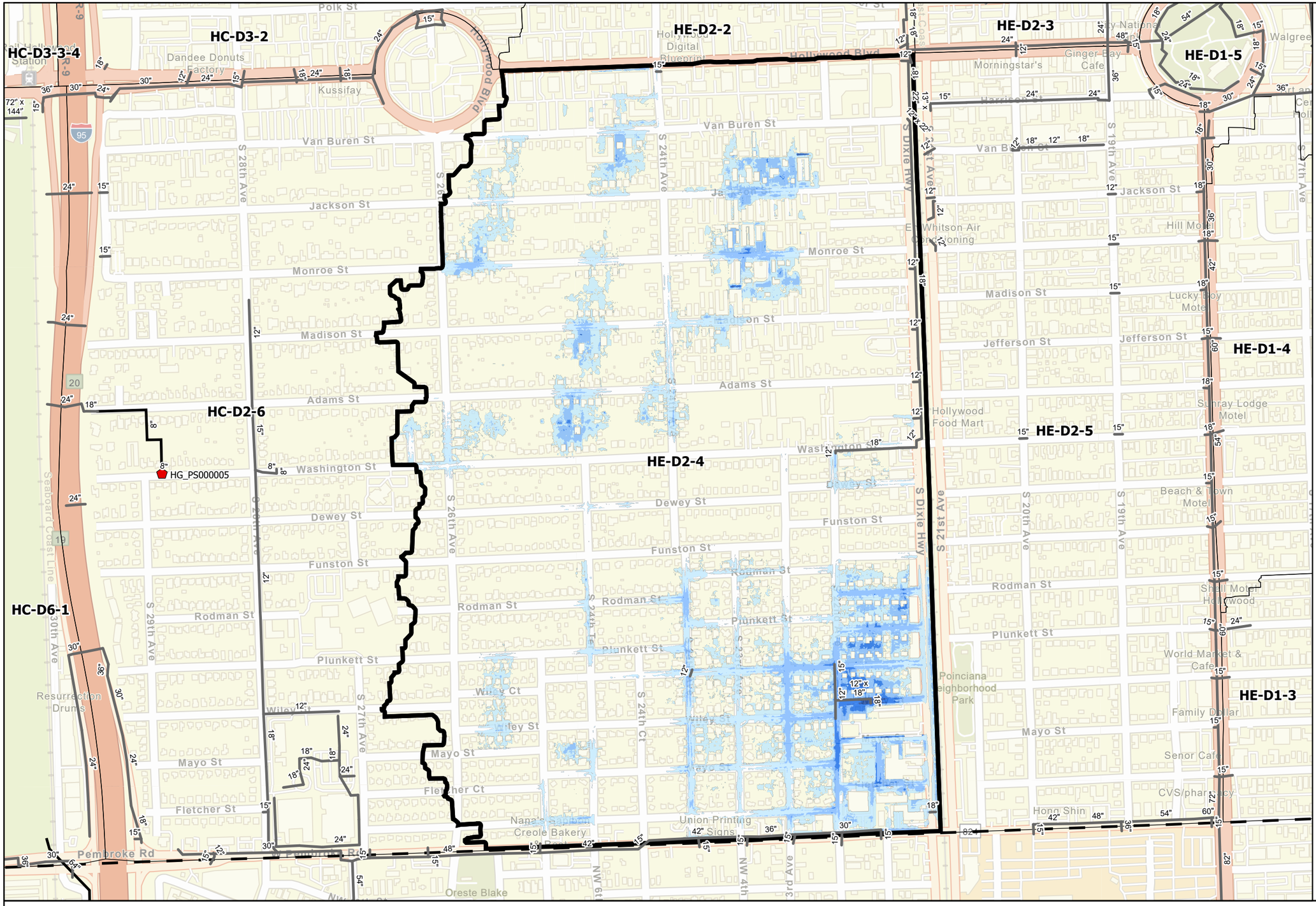
Summary of Offsite Issues Affecting CIP Area:

1. The City's LOS goal cannot be met along shared South City limits Pembroke Rd in the FDOT system. This may be improved by the CIP in the City of Hallandale Beach SWMP or by FDOT future improvements.

HE-D2-4 Pre-Post CIP Flood Inundation Maps

The following figures provide the predicted existing conditions flooding for the 5- and 10-year storm in the CIP Area and the predicted flood reduction for these storms under the Alternatives 1 and 2 CIP:

- **Figure HE-D2-4-EC_5 - Current Conditions Flooding in CIP Area 5-year Design Storm**
- **Figure HE-D2-4-EC_10 - Current Conditions Flooding in CIP Area 10-year Design Storm**
- **Figure HE-D2-4-CIP_ALT1_5 - Predicted Flooding Reduction and Proposed ALT1 CIP for 5-year Design Storm**
- **Figure HE-D2-4-CIP_ALT1_10 - Predicted Flooding Reduction and Proposed ALT1 CIP for 10-year Design Storm**
- **Figure HE-D2-4-CIP_ALT2_5 - Predicted Flooding Reduction and Proposed ALT2 CIP for 5-year Design Storm**
- **Figure HE-D2-4-CIP_ALT2_10 - Predicted Flooding Reduction and Proposed ALT2 CIP for 10-year Design Storm**



Current Conditions Flooding in CIP Area
Highland Gardens East
5-year Design Storm

City of Hollywood Stormwater Master Plan
HE-D2-4_EC-5
2/28/2023

0 337.5 675 1,350 Feet
1:8,000

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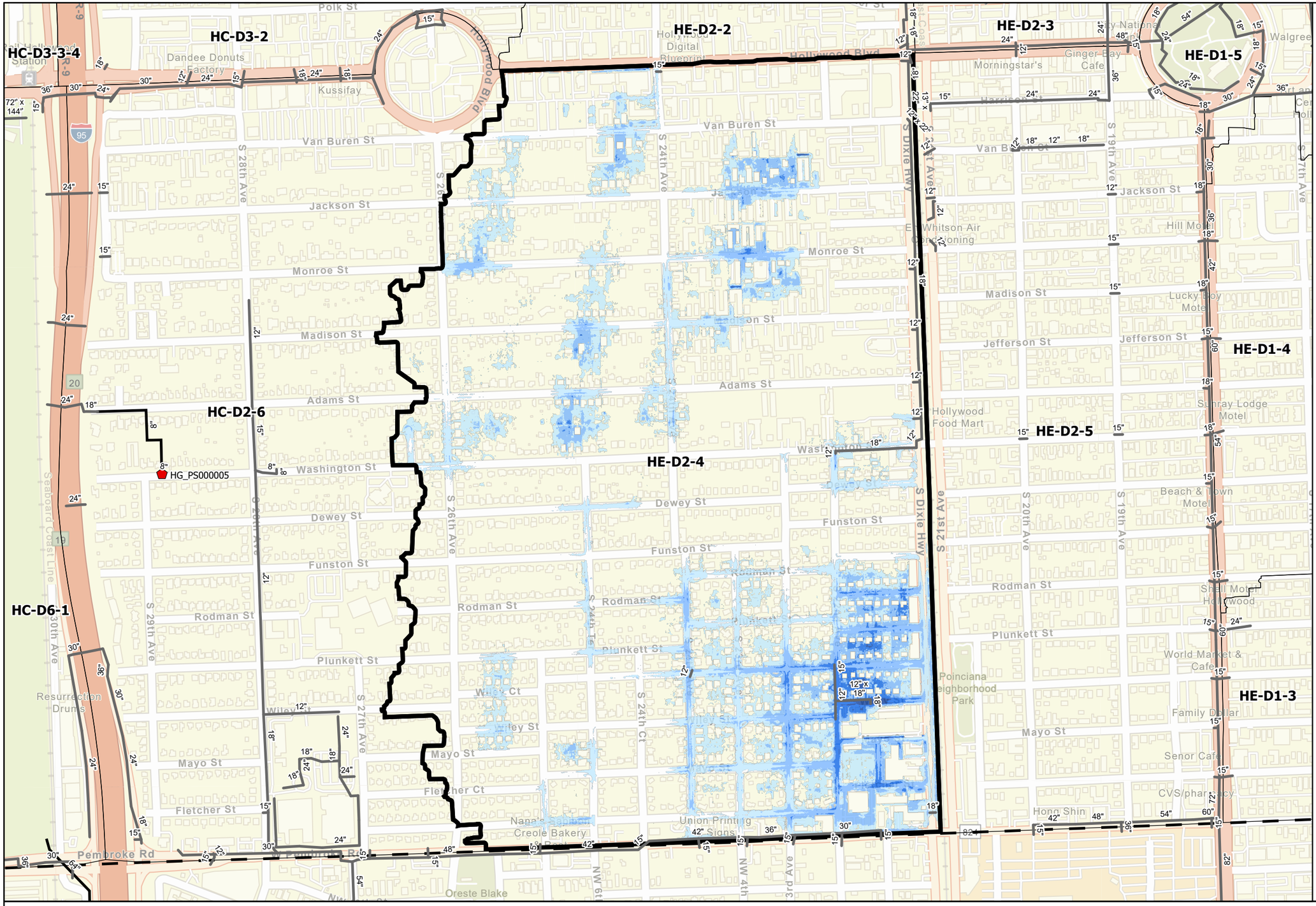

Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Existing Gravity Pipes
- Existing Forcemains

10-Year 72-Hour Storm Flood

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

Current Conditions Flooding in CIP Area
Highland Gardens East
10-year Design Storm

City of Hollywood Stormwater Master Plan
HE-D2-4_EC-10
2/28/2023

0 337.5 675 1,350 Feet

1:8,000

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HC-D3-3-4
HC-D3-2
HE-D2-2
HE-D2-3
HE-D1-5
HE-D1-4
HE-D2-5
HE-D1-3
HE-D2-4
HC-D2-6
HC-D6-1
HG_PS000005
A1FunstonSWPS
Polk St
Van Buren St
Jackson St
Monroe St
Madison St
Jefferson St
Adams St
Washington St
Dewey St
Funston St
Rodman St
Plunkett St
Wiley St
Mayo St
Fletcher St
Pembroke Rd
Hollywood Blvd
S Dixie Hwy
S 28th Ave
S 27th Ave
S 26th Ave
S 24th Ave
S 21st Ave
S 20th Ave
S 19th Ave
S 17th Ave
Dandee Donuts Factory
Kussifay
Ginger Bay Cafe
Morningstar's
Whitson Air Conditioning
Hollywood Mart
Lucky Boy Motel
Sunray Lodge Motel
Beach & Town Motel
Hill Motel Hollywood
World Market & Cafe
Poinciana Neighborhood Park
Family Dollar
Senor Cafe
CVS/pharmacy
Honn Shin
Nana's Saribon Creole Bakery
Union Printing & Signs
Resurrection Drums
Seaboard Coast Line
Oreste Blake

Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 1 SWPS
- Alt 1 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 1 Exfiltration Pipes
- Alt 1 Gravity Pipes
- Alt 1 Forcemains
- Alt 1 Detention Pond

5-Year ALT 1 Storm Flood

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 1 CIP for 5-year Design Storm in CIP Area
Highland Gardens East

0 337.5 675 1,350 Feet

1:8,000

City of Hollywood Stormwater Master Plan

HE-D2-4_ALT1-5

2/28/2023

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HC-D3-3-4
HC-D3-2
HE-D2-2
HE-D2-3
HE-D1-5
HE-D1-4
HE-D2-5
HE-D1-3
HE-D2-4
HC-D2-6
HC-D6-1
HG_PS000005
A1FunstonSWPS
Hollywood Blvd
Van Buren St
Jackson St
Monroe St
Madison St
Adams St
Washington St
Dewey St
Funston St
Rodman St
Plunkett St
Wiley St
Mayo St
Fletcher St
Pembroke Rd
Jefferson St
S Dixie Hwy
S 28th Ave
S 27th Ave
S 26th Ave
S 24th Ave
S 21st Ave
S 20th Ave
S 19th Ave
Dandee Donuts Factory
Kussifay
Hollywood Digital Blueprint
Ginger Bay Cafe
Morningstar's
Whitson Air Conditioning
Hollywood Mart
Lucky Boy Motel
Sunray Lodge Motel
Beach & Town Motel
Hill Motel
Poinciana Neighborhood Park
Family Dollar
Senor Cafe
CVS/pharmacy
World Market & Cafe
Hong Shin
Nana's Saribon Creole Bakery
Union Printing & Signs
Resurrection Drums
Oreste Blake
Seaboard Coast Line
Walgreens

Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 1 SWPS
- Alt 1 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 1 Exfiltration Pipes
- Alt 1 Gravity Pipes
- Alt 1 Forcemains
- Alt 1 Detention Pond

10-Year ALT 1 Storm Flood

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 1 CIP for 10-year Design Storm in CIP Area
Highland Gardens East

0 337.5 675 1,350 Feet

1:8,000

City of Hollywood Stormwater Master Plan

HE-D2-4_ALT1-10

2/28/2023

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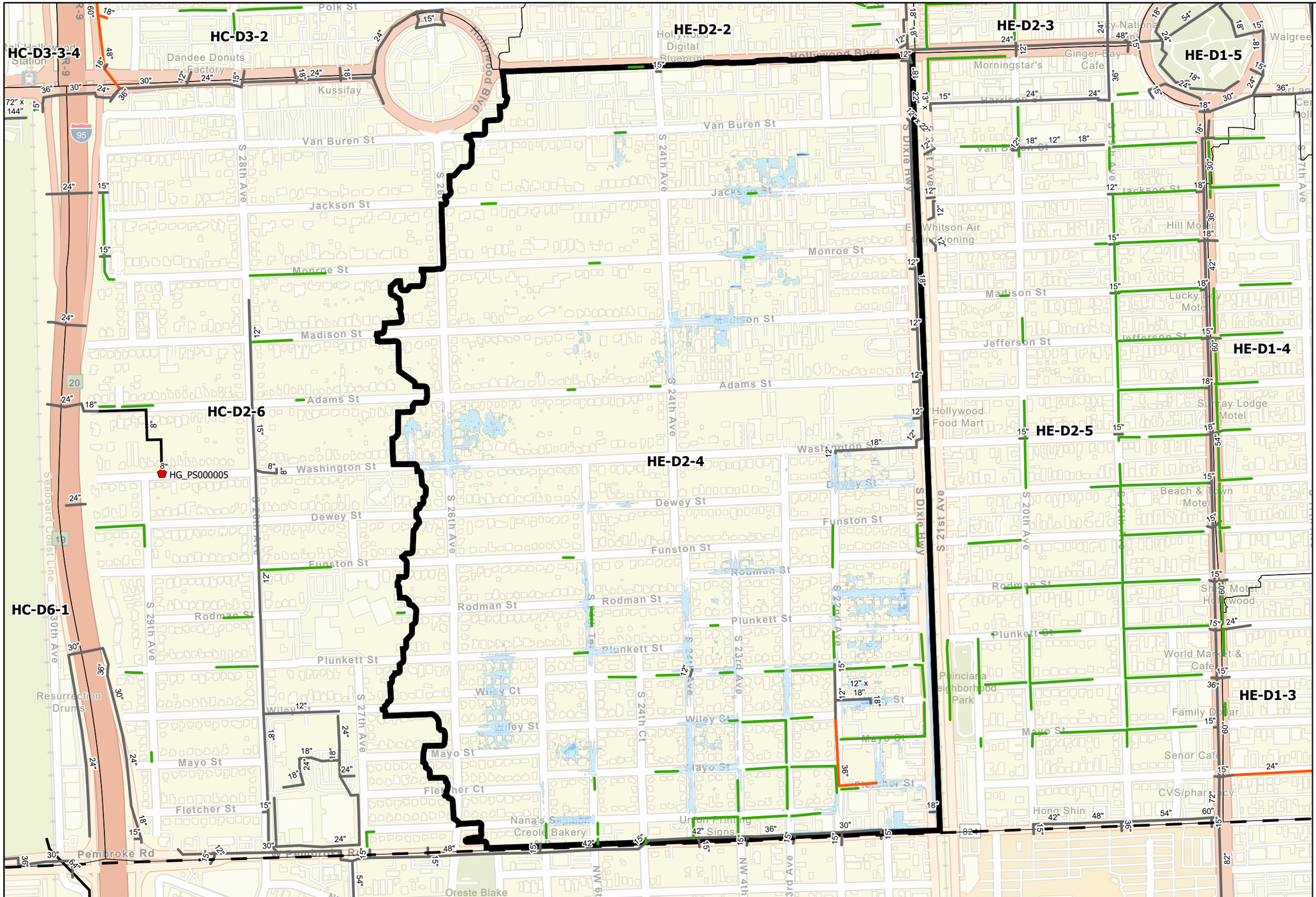

Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 2 SWPS
- Alt 2 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 2 Exfiltration Pipe
- Alt 2 Gravity Pipes
- Alt 2 Forcemains
- Alt 2 Detention Pond

5-Year ALT 2 Storm Flood

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

Predicted Flooding Reduction and Proposed ALT 2 CIP for 5-year Design Storm in CIP Area Highland Gardens East

0 337.5 675 1,350 Feet

1:8,000

City of Hollywood Stormwater Master Plan

HE-D2-4_ALT2-5

2/28/2023

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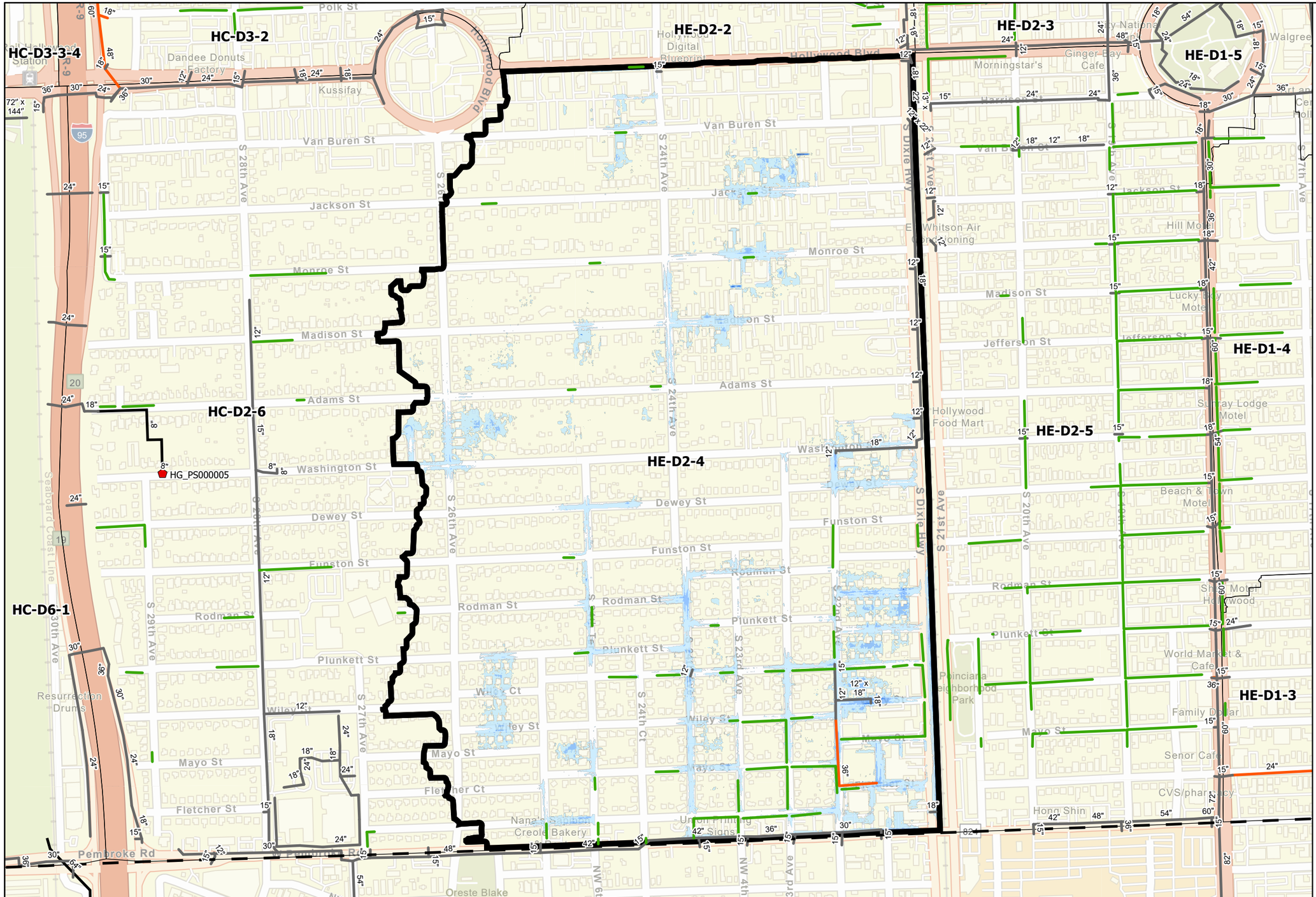

Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 2 SWPS
- Alt 2 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 2 Exfiltration Pipe
- Alt 2 Gravity Pipes
- Alt 2 Forcemains
- Alt 2 Detention Pond

10-Year ALT 2 Storm Flood

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 2 CIP for 10-year Design Storm in CIP Area Highland Gardens East

0 337.5 675 1,350 Feet

1:8,000

City of Hollywood Stormwater Master Plan

HE-D2-4_ALT2-10

2/28/2023

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		CONCEPTUAL CAPITAL COST ESTIMATE					Highland Gardens East	
							Alternative 1	
PUMP STATIONS WITH FORCE MAINS								
ITEM #	Master Sheet Index	DIAMETER (INCHES)	DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0001	13	24	FM- Force Main Collector	Circular	LF	$ 167.00	0	$ -
0002	14	36	FM- Force Main Collector	Circular	LF	$ 242.00	0	$ -
0003	15	42	FM- Force Main Collector	Circular	LF	$ 336.00	0	$ -
0004	16	48	FM- Force Main Collector	Circular	LF	$ 612.00	0	$ -
0005	17	54	FM- Force Main Collector	Circular	LF	$ 982.00	0	$ -
0006	18	60	FM- Force Main Collector	Circular	LF	$ 1,149.00	0	$ -
0007	19	66	FM- Force Main Collector	Circular	LF	$ 1,329.00	0	$ -
0008	20	72	FM- Force Main Collector	Circular	LF	$ 1,473.00	0	$ -
0009	225	24	FMO- Force Main Offline	Circular	LF	$ 353.00	0	$ -
0010	11		IWI-Injection Wells-Inline		EA	$ 65,000.00	0	$ -
0011	12		IWO-Injection Wells -Offline		EA	$ 75,000.00	0	$ -
0012	6	PS-Storm Drainage Pump Stations < 166 cfs		I	EA	$ 2,400,000.00	0	$ -
0013	7	PS-Storm Drainage Pump Stations < 166-246 cfs		II	EA	$ 3,500,000.00	0	$ -
0014	8	PS-Storm Drainage Pump Stations < 246-328 cfs		III	EA	$ 4,900,000.00	0	$ -
0015	9	PS-Storm Drainage Pump Stations< 328-410 cfs		IV	EA	$ 6,750,000.00	0	$ -
0016	54	PS-CS22 Storm Drainage Pump Stations 600CFS			EA	$ 8,000,000.00	0	$ -
AIN SUBTOTAL								$ -
EXFILTRATION WITH GRAVITY MAINS							Highland Gardens East	
ITEM #	Master Sheet Index	DIAMETER (INCHES)	Width(INCHES)	DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0020	21	15		GM-Gravity Main Collector	Circular	LF	$ 40.00	0	$ -
0021	22	18		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0023	23	24		GM-Gravity Main Collector	Circular	LF	$ 48.00	85	$ 4,080
0024	24	30		GM-Gravity Main Collector	Circular	LF	$ 52.00	0	$ -
0026	25	36		GM-Gravity Main Collector	Circular	LF	$ 80.00	0	$ -
0028	26	42		GM-Gravity Main Collector	Circular	LF	$ 115.00	0	$ -
0029	27	48		GM-Gravity Main Collector	Circular	LF	$ 125.00	343	$ 42,875
0030	28	54		GM-Gravity Main Collector	Circular	LF	$ 150.00	0	$ -
0031	29	60		GM-Gravity Main Collector	Circular	LF	$ 220.00	0	$ -
0032	30	66		GM-Gravity Main Collector	Circular	LF	$ 428.00	0	$ -
0033	31	72		GM-Gravity Main Collector	Circular	LF	$ 485.00	0	$ -
0035	32	29	45	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 205.00	0	$ -
0036	33	32	49	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 215.00	0	$ -
0037	34	34	53	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 225.00	0	$ -
0038	35	38	60	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 235.00	0	$ -
0039	36	43	68	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 370.00	0	$ -
0040	37	48	76	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 400.00	0	$ -
0041	38	53	83	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 432.00	914	$ 394,675
0042	39	58	91	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 320.00	0	$ -
0043	40	63	98	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 410.00	3,663	$ 1,501,625
0044	41	68	106	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 460.00	1,199	$ 551,540
0045	42	72	113	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 570.00	0	$ -
0046	43	82	128	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 650.00	0	$ -
0048	44	72	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0072	45	72	72	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0049	46	84	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 750.00	0	$ -
0050	47	96	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 850.00	0	$ -
0051	48			GBP-Gravity Backflow Pipe <36"		Ea	$ 35,000.00	0	$ -
0052	49			GBP-Gravity Backflow Pipe >36"		Ea	$ 70,000.00	0	$ -
0053	5			GW-Gravity Wells		EA	$ 105,000.00	0	$ -
0054	4	48		ET-Exfiltration Trench		LF	$ 250.00	23,601	$ 5,900,250
0056	50			Weir Box CS		EA	$ 7,500.00	0	$ -
0057	53			CS-22 Remod		EA	$ 200,000.00	0	$ -
0058	55			SW-04 Remod		EA	$ 150,000.00	0	$ -
0055				Gravity Structures-Inlets		EA	$ 30,000.00	248	$ 7,451,025
0059	56			Ditch Improvement		LF	$ 50.00	0	$ -
0091	57			Swale/Ditch Headwall		Ea	$ 10,000.00	0	$ -
0090	10			Exfil_End Weir		Ea	$ 5,000.00	0	$ -
0092	51			Ret/Det Pond		CUY	$ 355.00	0	$ -
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
	GRAVITY MAIN SUBTOTAL						#N/A		$ 15,846,070
0060		Pavement Restoration including Pavement Marking (Full Road)				LF	$ 270.00	29,805	$ 8,047,350
								CONSTRUCTION COST SUBTOTAL	**$ 23,893,420**
GENERAL CONDITIONS								Highland Gardens East	
0061		Mobilization				LS	**4%**	$ 23,893,420	$ 955,737
0062		Insurance and General Conditions				LS	**2%**	$ 23,893,420	$ 477,868
0063		Permits/Fees				LS	**2%**	$ 23,893,420	$ 477,868
0064		Maintenance of Traffic				LS	**3%**	$ 23,893,420	$ 716,803
0065		Engineering Design & CA Oversight Costs				LS	**15%**	$ 23,893,420	$ 3,584,013
0066		Construction Engineering Inspection Costs				LS	**4%**	$ 23,893,420	$ 955,737
0067		OCI Management Cost				LS	**15%**	$ 23,893,420	$ 3,584,013
0068		Project Contingency Costs				LS	**30%**	$ 23,893,420	$ 7,168,026
		Land acquisition							
NS SUBTOTAL									$ 17,920,065
TOTAL									**$ 41,813,485**

		CONCEPTUAL CAPITAL COST ESTIMATE						Highland Gardens East	
								Alternative 2	
PUMP STATIONS WITH FORCE MAINS									
ITEM #	Master Sheet Index	DIAMETER (INCHES)		DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0001	13	24		FM- Force Main Collector	Circular	LF	$ 167.00	0	$ -
0002	14	36		FM- Force Main Collector	Circular	LF	$ 242.00	0	$ -
0003	15	42		FM- Force Main Collector	Circular	LF	$ 336.00	0	$ -
0004	16	48		FM- Force Main Collector	Circular	LF	$ 612.00	0	$ -
0005	17	54		FM- Force Main Collector	Circular	LF	$ 982.00	0	$ -
0006	18	60		FM- Force Main Collector	Circular	LF	$ 1,149.00	0	$ -
0007	19	66		FM- Force Main Collector	Circular	LF	$ 1,329.00	0	$ -
0008	20	72		FM- Force Main Collector	Circular	LF	$ 1,473.00	0	$ -
0009	225	24		FMO- Force Main Offline	Circular	LF	$ 353.00	0	$ -
0010	11			IWI-Injection Wells-Inline		EA	$ 65,000.00	0	$ -
0011	12			IWO-Injection Wells -Offline		EA	$ 75,000.00	0	$ -
0012	6	PS-Storm Drainage Pump Stations < 166 cfs			I	EA	$ 2,400,000.00	0	$ -
0013	7	PS-Storm Drainage Pump Stations < 166-246 cfs			II	EA	$ 3,500,000.00	0	$ -
0014	8	PS-Storm Drainage Pump Stations < 246-328 cfs			III	EA	$ 4,900,000.00	0	$ -
0015	9	PS-Storm Drainage Pump Stations< 328-410 cfs			IV	EA	$ 6,750,000.00	0	$ -
0016	54	PS-CS22 Storm Drainage Pump Stations 600CFS				EA	$ 8,000,000.00	0	$ -
IN SUBTOTAL									$ -
EXFILTRATION WITH GRAVITY MAINS								Highland Gardens East	
ITEM #	Master Sheet Index	DIAMETER (INCHES)	Width(INCHES)	DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0022	22	21		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0021	21	18		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0023	23	24		GM-Gravity Main Collector	Circular	LF	$ 48.00	0	$ -
0024	24	30		GM-Gravity Main Collector	Circular	LF	$ 52.00	0	$ -
0026	25	36		GM-Gravity Main Collector	Circular	LF	$ 80.00	725	$ 58,000
0028	26	42		GM-Gravity Main Collector	Circular	LF	$ 115.00	0	$ -
0029	27	48		GM-Gravity Main Collector	Circular	LF	$ 125.00	0	$ -
0030	28	54		GM-Gravity Main Collector	Circular	LF	$ 150.00	0	$ -
0031	29	60		GM-Gravity Main Collector	Circular	LF	$ 220.00	0	$ -
0032	30	66		GM-Gravity Main Collector	Circular	LF	$ 428.00	0	$ -
0033	31	72		GM-Gravity Main Collector	Circular	LF	$ 485.00	0	$ -
0035	32	29	45	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 205.00	0	$ -
0036	33	32	49	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 215.00	0	$ -
0037	34	34	53	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 225.00	0	$ -
0038	35	38	60	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 235.00	0	$ -
0039	36	43	68	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 370.00	0	$ -
0040	37	48	76	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 400.00	0	$ -
0041	38	53	83	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 432.00	0	$ -
0042	39	58	91	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 320.00	0	$ -
0043	40	63	98	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 410.00	0	$ -
0044	41	68	106	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 460.00	0	$ -
0045	42	72	113	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 570.00	0	$ -
0046	43	82	128	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 650.00	0	$ -
0048	44	72	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0072	45	72	72	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0049	46	72	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 750.00	0	$ -
0050	47	96	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 850.00	0	$ -
0051	48			GBP-Gravity Backflow Pipe <36"		Ea	$ 35,000.00	0	$ -
0052	49			GBP-Gravity Backflow Pipe >36"		Ea	$ 70,000.00	0	$ -
0053	5			GW-Gravity Wells		EA	$ 105,000.00	4	$ 420,000
0054	4	48		ET-Exfiltration Trench		LF	$ 250.00	7,935	$ 1,983,750
0055	50			Weir Box CS		EA	$ 30,000.00	0	$ -
0057	53			CS-22 Remod		EA	$ 525,000.00	0	$ -
0058	55			SW-04 Remod		EA	$ 150,000.00	0	$ -
0056				Gravity Structures-Inlets		EA	$ 7,500.00	72	$ 541,250
0059	56			Ditch Improvement		LF	$ 50.00	0	$ -
0091	57			Swale/Ditch Headwall		Ea	$ 10,000.00	0	$ -
0090	10			Exfil_End Weir		Ea	$ 5,000.00	0	$ -
0092	51			Ret/Det Pond		CUY	$ 355.00	0	$ -
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
	GRAVITY MAIN SUBTOTAL								$ 3,003,000
0060		Pavement Restoration including Pavement Marking (Full Road)				LF	$ 270.00	8,660	$ 2,338,200
							CONSTRUCTION COST SUBTOTAL		$ 5,341,200
GENERAL CONDITIONS								Highland Gardens East	
0061		Mobilization				LS	4%	$ 5,341,200	$ 213,648
0062		Insurance and General Conditions				LS	2%	$ 5,341,200	$ 106,824
0063		Permits/Fees				LS	2%	$ 5,341,200	$ 106,824
0064		Maintenance of Traffic				LS	3%	$ 5,341,200	$ 160,236
0065		Engineering Design & CA Oversight Costs				LS	15%	$ 5,341,200	$ 801,180
0066		Construction Engineering Inspection Costs				LS	4%	$ 5,341,200	$ 213,648
0067		OCI Management Cost				LS	15%	$ 5,341,200	$ 801,180
0068		Project Contingency Costs				LS	30%	$ 5,341,200	$ 1,602,360
NS SUBTOTAL									$ 4,005,900
TOTAL									$ 9,347,100

- **Table HE-D2-4_ALT1 – Planning Budget for Alternative 1 Proposed CIP**
- **Table HE-D2-4_ALT2 – Planning Budget for Alternative 2 Proposed CIP**

3.2.4.11 CIP Area HE-D2-5 (Parkside)

Root Causes of Flooding

This CIP area is characterized commercial and residential land use. The basin is on a higher ridge and area is served by exfiltration systems. There is minor flooding in the area, however, the extensive CIP proposed is to prevent the runoff from this area sheet flowing east into other areas and exacerbating the flooding in those areas.

Alternative 1

Proposed CIP:

- New gravity collection systems and inlets in neighborhoods connecting to the new 6'x10' South Lake primary gravity outfall system and multiple connections to the US-1 system. Note: This is feasible because the SWMP is removing flows at Monroe St from the US-1 system in CIP Area D2-4 into Southlake and adding significant amounts of exfiltration capturing water before flowing toward US-1 in other areas so as not to adversely affect stages or flows.
- New 23,320 l.f. of exfiltration systems in neighborhoods.
- Low roadway dip road raising improvements are required when collection systems are installed.

Summary of Locations Not Meeting ALT 1 LOS:

1. Structures Flooded pre-1, post-0

Summary of Offsite Issues Affecting CIP Area:

1. The City's LOS goal cannot be met along shared South City limits Pembroke Rd in the FDOT system. This may be improved by the CIP in the City of Hallandale Beach SWMP or by FDOT future improvements.

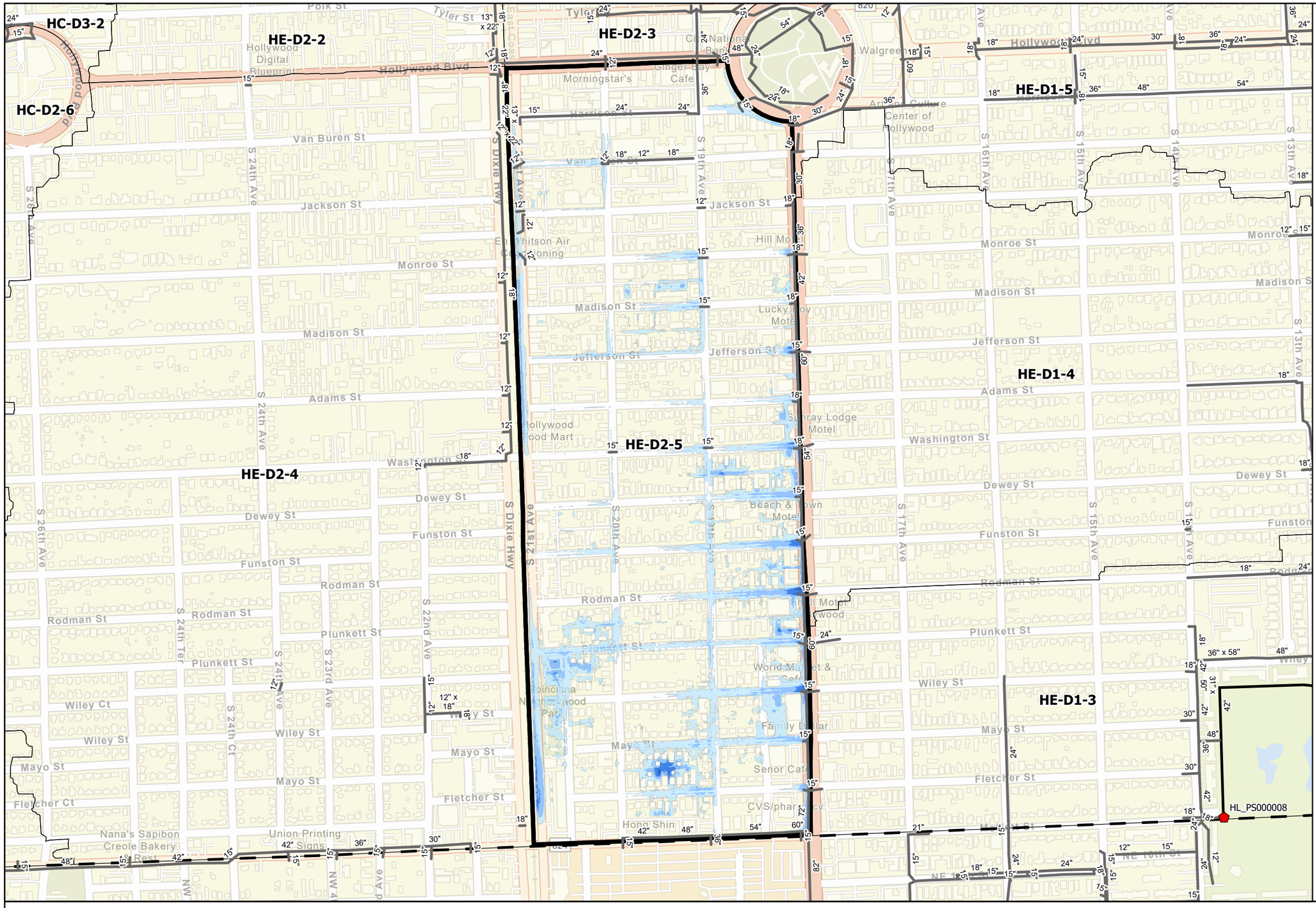
Alternative 2

Proposed CIP:

- New gravity pipe in neighborhoods connecting to existing system on US-1.
- New 17,950 l.f. of exfiltration systems in neighborhoods.
- Low roadway dip road raising improvements are required when collection systems installed.

Summary of Locations Not Meeting ALT 2 LOS:

1. Structures Flooded pre-1, post-1



Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Existing Gravity Pipes
- Existing Forcemains

5-Year 24-Hour Storm Flood

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

Current Conditions Flooding in CIP Area
Parkside
5-year Design Storm

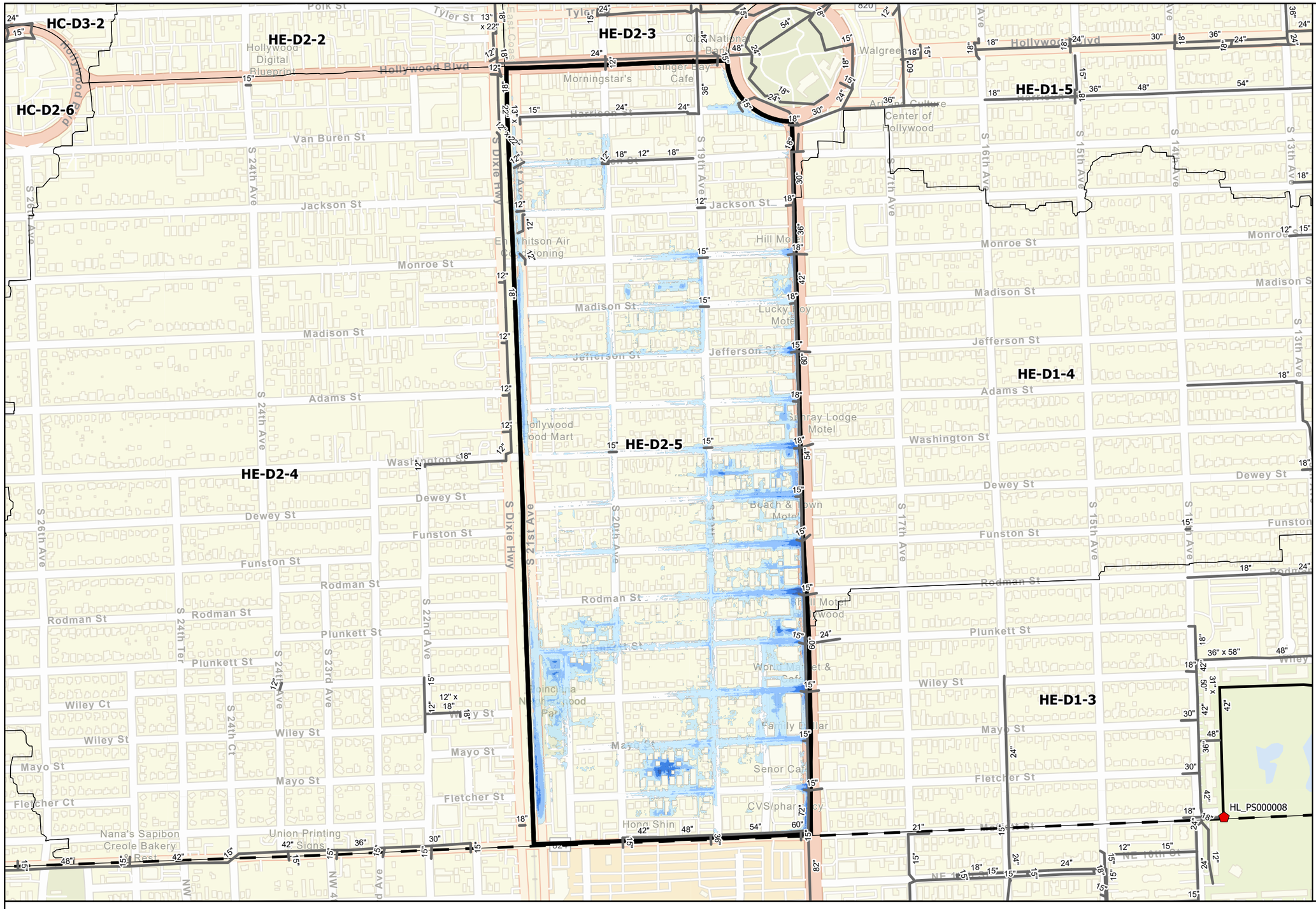
0 337.5 675 1,350 Feet

1:8,000

City of Hollywood Stormwater Master Plan

HE-D2-5_EC-5

2/28/2023



Current Conditions Flooding in CIP Area
Parkside
10-year Design Storm

City of Hollywood Stormwater Master Plan
HE-D2-5_EC-10
2/28/2023

0 337.5 675 1,350 Feet
1:8,000

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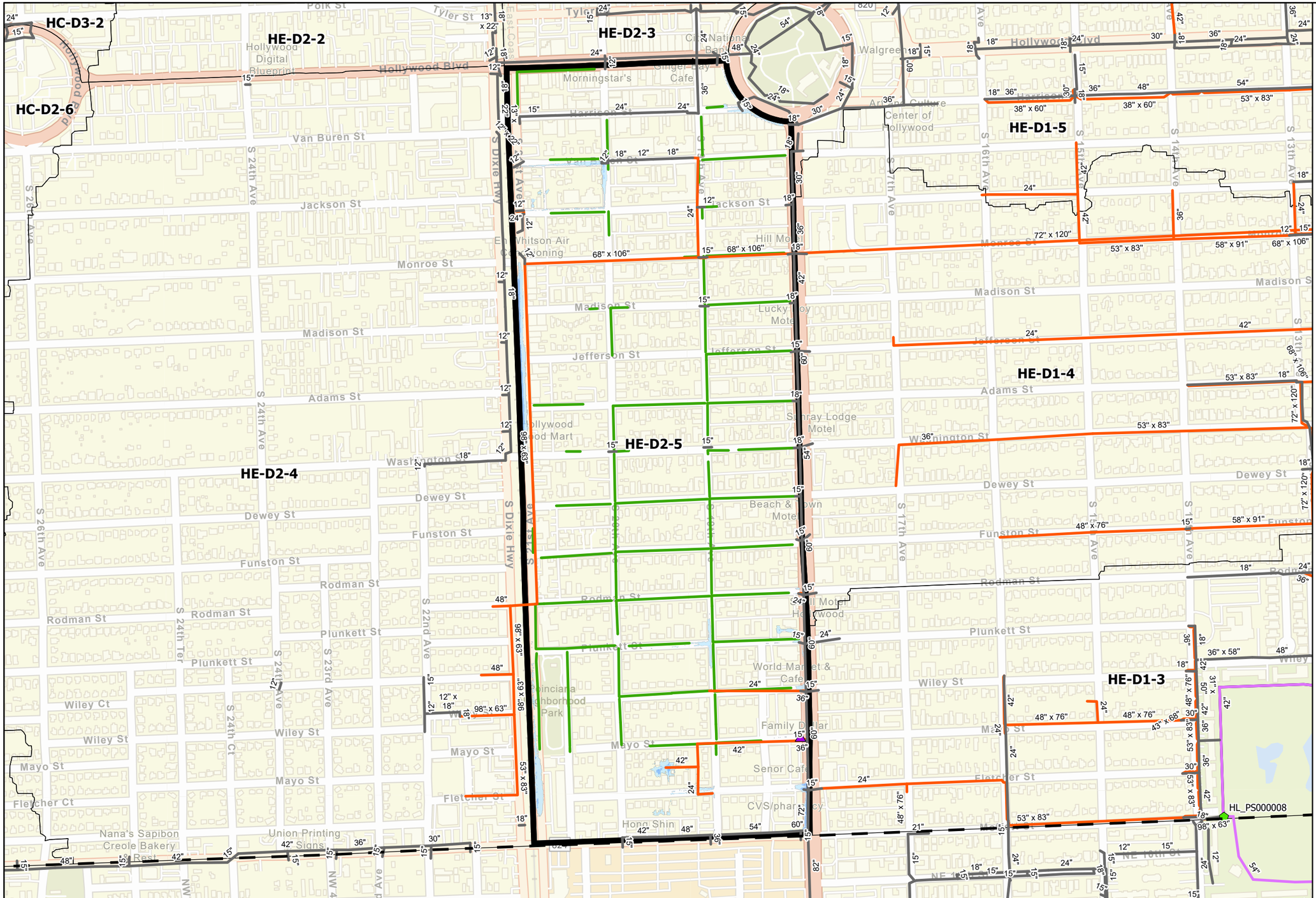

Predicted Flooding Reduction and Proposed ALT 1 CIP for 5-year Design Storm in CIP Area Parkside

City of Hollywood Stormwater Master Plan

HE-D2-5_ALT1-5

2/28/2023

0 337.5 675 1,350 Feet

1:8,000

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HC-D3-2
HE-D2-2
HE-D2-3
HC-D2-6
HE-D1-5
HE-D1-4
HE-D2-5
HE-D2-4
HE-D1-3
HL_PS000008

Legend

- Hollywood City Limits
- Focused CIP Area
- Existing SWPS
- Near Term SWPS
- Alt 1 SWPS
- Alt 1 Injection Wells
- Existing Gravity Pipes
- Existing Forcemains
- Alt 1 Exfiltration Pipes
- Alt 1 Gravity Pipes
- Alt 1 Forcemains
- Alt 1 Detention Pond

10-Year ALT 1 Storm Flood Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 1 CIP for 10-year Design Storm in CIP Area Parkside

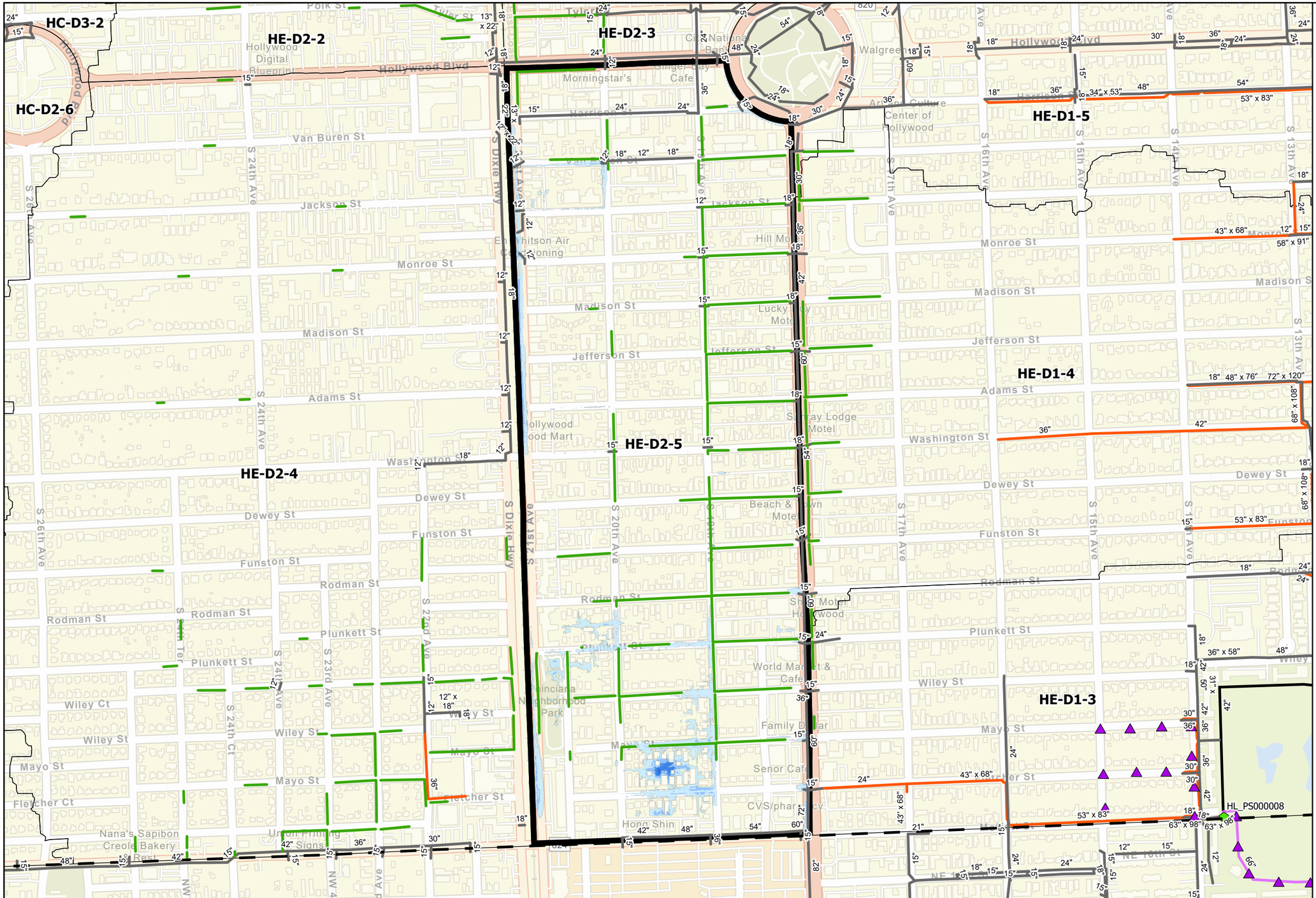
City of Hollywood Stormwater Master Plan

HE-D2-5_ALT1-10

2/28/2023

0 337.5 675 1,350 Feet

1:8,000



Predicted Flooding Reduction and Proposed ALT 2 CIP for 5-year Design Storm in CIP Area Parkside

City of Hollywood Stormwater Master Plan

HE-D2-5_ALT2-5

2/28/2023

0 337.5 675 1,350 Feet

1:8,000

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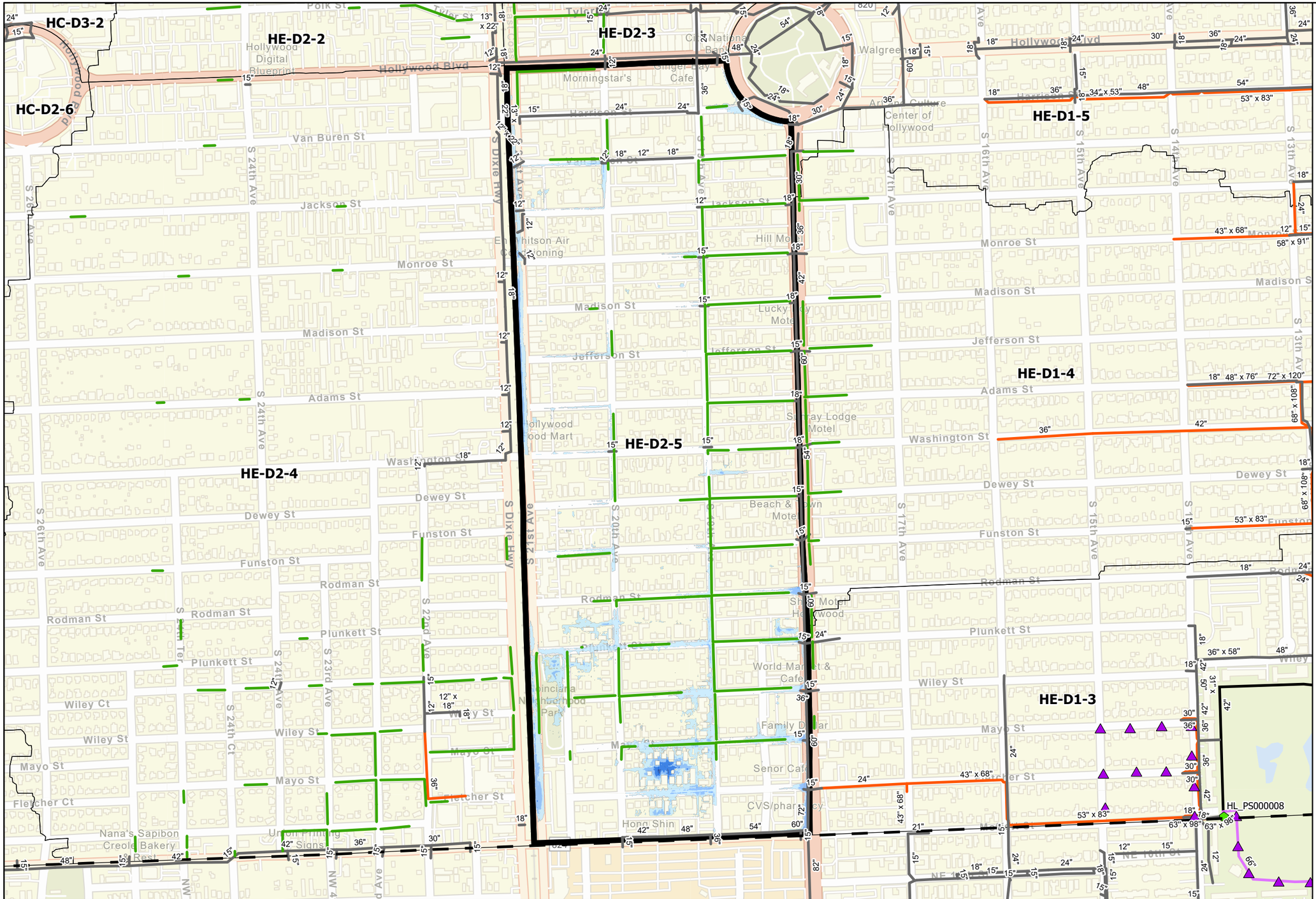

CDM Smith

CITY OF Hollywood FLORIDA

Predicted Flooding Reduction and Proposed ALT 2 CIP for 10-year Design Storm in CIP Area Parkside

0 337.5 675 1,350 Feet

1:8,000

City of Hollywood Stormwater Master Plan

HE-D2-5_ALT2-10

2/28/2023

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		CONCEPTUAL CAPITAL COST ESTIMATE						Parkside	
								Alternative 1	
PUMP STATIONS WITH FORCE MAINS									
ITEM #	Master Sheet Index	DIAMETER (INCHES)		DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0001	13	24		FM- Force Main Collector	Circular	LF	$ 167.00	0	$ -
0002	14	36		FM- Force Main Collector	Circular	LF	$ 242.00	0	$ -
0003	15	42		FM- Force Main Collector	Circular	LF	$ 336.00	0	$ -
0004	16	48		FM- Force Main Collector	Circular	LF	$ 612.00	0	$ -
0005	17	54		FM- Force Main Collector	Circular	LF	$ 982.00	0	$ -
0006	18	60		FM- Force Main Collector	Circular	LF	$ 1,149.00	0	$ -
0007	19	66		FM- Force Main Collector	Circular	LF	$ 1,329.00	0	$ -
0008	20	72		FM- Force Main Collector	Circular	LF	$ 1,473.00	0	$ -
0009	225	24		FMO- Force Main Offline	Circular	LF	$ 353.00	0	$ -
0010	11			IWI-Injection Wells-Inline		EA	$ 65,000.00	0	$ -
0011	12			IWO-Injection Wells -Offline		EA	$ 75,000.00	0	$ -
0012	6	PS-Storm Drainage Pump Stations < 166 cfs			I	EA	$ 2,400,000.00	0	$ -
0013	7	PS-Storm Drainage Pump Stations < 166-246 cfs			II	EA	$ 3,500,000.00	0	$ -
0014	8	PS-Storm Drainage Pump Stations < 246-328 cfs			III	EA	$ 4,900,000.00	0	$ -
0015	9	PS-Storm Drainage Pump Stations< 328-410 cfs			IV	EA	$ 6,750,000.00	0	$ -
0016	54	PS-CS22 Storm Drainage Pump Stations 600CFS				EA	$ 8,000,000.00	0	$ -
AIN SUBTOTAL									$ -
EXFILTRATION WITH GRAVITY MAINS								Parkside	
ITEM #	Master Sheet Index	DIAMETER (INCHES)	Width(INCHES)	DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0020	21	15		GM-Gravity Main Collector	Circular	LF	$ 40.00	0	$ -
0021	22	18		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0023	23	24		GM-Gravity Main Collector	Circular	LF	$ 48.00	1,694	$ 81,317
0024	24	30		GM-Gravity Main Collector	Circular	LF	$ 52.00	0	$ -
0026	25	36		GM-Gravity Main Collector	Circular	LF	$ 80.00	67	$ 5,376
0028	26	42		GM-Gravity Main Collector	Circular	LF	$ 115.00	1,299	$ 149,362
0029	27	48		GM-Gravity Main Collector	Circular	LF	$ 125.00	0	$ -
0030	28	54		GM-Gravity Main Collector	Circular	LF	$ 150.00	0	$ -
0031	29	60		GM-Gravity Main Collector	Circular	LF	$ 220.00	0	$ -
0032	30	66		GM-Gravity Main Collector	Circular	LF	$ 428.00	0	$ -
0033	31	72		GM-Gravity Main Collector	Circular	LF	$ 485.00	0	$ -
0035	32	29	45	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 205.00	0	$ -
0036	33	32	49	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 215.00	0	$ -
0037	34	34	53	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 225.00	0	$ -
0038	35	38	60	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 235.00	0	$ -
0039	36	43	68	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 370.00	0	$ -
0040	37	48	76	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 400.00	0	$ -
0041	38	53	83	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 432.00	0	$ -
0042	39	58	91	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 320.00	0	$ -
0043	40	63	98	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 410.00	0	$ -
0044	41	68	106	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 460.00	660	$ 303,416
0045	42	72	113	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 570.00	0	$ -
0046	43	82	128	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 650.00	0	$ -
0048	44	72	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0072	45	72	72	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0049	46	84	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 750.00	0	$ -
0050	47	96	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 850.00	0	$ -
0051	48			GBP-Gravity Backflow Pipe <36"		Ea	$ 35,000.00	0	$ -
0052	49			GBP-Gravity Backflow Pipe >36"		Ea	$ 70,000.00	0	$ -
0053	5			GW-Gravity Wells		EA	$ 105,000.00	0	$ -
0054	4	48		ET-Exfiltration Trench		LF	$ 250.00	23,320	$ 5,830,000
0056	50			Weir Box CS		EA	$ 7,500.00	0	$ -
0057	53			CS-22 Remod		EA	$ 200,000.00	0	$ -
0058	55			SW-04 Remod		EA	$ 150,000.00	0	$ -
0055				Gravity Structures-Inlets		EA	$ 30,000.00	225	$ 6,759,925
0059	56			Ditch Improvement		LF	$ 50.00	0	$ -
0091	57			Swale/Ditch Headwall		Ea	$ 10,000.00	0	$ -
0090	10			Exfil_End Weir		Ea	$ 5,000.00	0	$ -
0092	51			Ret/Det Pond		CUY	$ 355.00	0	$ -
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
GRAVITY MAIN SUBTOTAL							#N/A		$ 13,129,396
0060		Pavement Restoration including Pavement Marking (Full Road)				LF	$ 270.00	27,040	$ 7,300,800
								CONSTRUCTION COST SUBTOTAL	$ 20,430,196
GENERAL CONDITIONS								Parkside	
0061		Mobilization				LS	4%	$ 20,430,196	$ 817,208
0062		Insurance and General Conditions				LS	2%	$ 20,430,196	$ 408,604
0063		Permits/Fees				LS	2%	$ 20,430,196	$ 408,604
0064		Maintenance of Traffic				LS	3%	$ 20,430,196	$ 612,906
0065		Engineering Design & CA Oversight Costs				LS	15%	$ 20,430,196	$ 3,064,529
0066		Construction Engineering Inspection Costs				LS	4%	$ 20,430,196	$ 817,208
0067		OCI Management Cost				LS	15%	$ 20,430,196	$ 3,064,529
0068		Project Contingency Costs				LS	30%	$ 20,430,196	$ 6,129,059
		Land acquisition							
NS SUBTOTAL									$ 15,322,647
TOTAL									$ 35,752,843

		CONCEPTUAL CAPITAL COST ESTIMATE						Parkside	
								Alternative 2	
PUMP STATIONS WITH FORCE MAINS									
ITEM #	Master Sheet Index	DIAMETER (INCHES)		DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0001	13	24		FM- Force Main Collector	Circular	LF	$ 167.00	0	$ -
0002	14	36		FM- Force Main Collector	Circular	LF	$ 242.00	0	$ -
0003	15	42		FM- Force Main Collector	Circular	LF	$ 336.00	0	$ -
0004	16	48		FM- Force Main Collector	Circular	LF	$ 612.00	0	$ -
0005	17	54		FM- Force Main Collector	Circular	LF	$ 982.00	0	$ -
0006	18	60		FM- Force Main Collector	Circular	LF	$ 1,149.00	0	$ -
0007	19	66		FM- Force Main Collector	Circular	LF	$ 1,329.00	0	$ -
0008	20	72		FM- Force Main Collector	Circular	LF	$ 1,473.00	0	$ -
0009	225	24		FMO- Force Main Offline	Circular	LF	$ 353.00	0	$ -
0010	11			IWI-Injection Wells-Inline		EA	$ 65,000.00	0	$ -
0011	12			IWO-Injection Wells -Offline		EA	$ 75,000.00	0	$ -
0012	6	PS-Storm Drainage Pump Stations < 166 cfs			I	EA	$ 2,400,000.00	0	$ -
0013	7	PS-Storm Drainage Pump Stations < 166-246 cfs			II	EA	$ 3,500,000.00	0	$ -
0014	8	PS-Storm Drainage Pump Stations < 246-328 cfs			III	EA	$ 4,900,000.00	0	$ -
0015	9	PS-Storm Drainage Pump Stations< 328-410 cfs			IV	EA	$ 6,750,000.00	0	$ -
0016	54	PS-CS22 Storm Drainage Pump Stations 600CFS				EA	$ 8,000,000.00	0	$ -
IN SUBTOTAL									$ -
EXFILTRATION WITH GRAVITY MAINS								Parkside	
ITEM #	Master Sheet Index	DIAMETER (INCHES)	Width(INCHES)	DESCRIPTION	TYPE	UNIT	UNIT COST	QUANTITIES	SUBTOTAL
0022	22	21		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0021	21	18		GM-Gravity Main Collector	Circular	LF	$ 45.00	0	$ -
0023	23	24		GM-Gravity Main Collector	Circular	LF	$ 48.00	0	$ -
0024	24	30		GM-Gravity Main Collector	Circular	LF	$ 52.00	0	$ -
0026	25	36		GM-Gravity Main Collector	Circular	LF	$ 80.00	38	$ 3,040
0028	26	42		GM-Gravity Main Collector	Circular	LF	$ 115.00	0	$ -
0029	27	48		GM-Gravity Main Collector	Circular	LF	$ 125.00	0	$ -
0030	28	54		GM-Gravity Main Collector	Circular	LF	$ 150.00	0	$ -
0031	29	60		GM-Gravity Main Collector	Circular	LF	$ 220.00	0	$ -
0032	30	66		GM-Gravity Main Collector	Circular	LF	$ 428.00	0	$ -
0033	31	72		GM-Gravity Main Collector	Circular	LF	$ 485.00	0	$ -
0035	32	29	45	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 205.00	0	$ -
0036	33	32	49	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 215.00	0	$ -
0037	34	34	53	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 225.00	0	$ -
0038	35	38	60	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 235.00	0	$ -
0039	36	43	68	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 370.00	0	$ -
0040	37	48	76	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 400.00	0	$ -
0041	38	53	83	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 432.00	0	$ -
0042	39	58	91	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 320.00	0	$ -
0043	40	63	98	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 410.00	0	$ -
0044	41	68	106	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 460.00	0	$ -
0045	42	72	113	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 570.00	0	$ -
0046	43	82	128	GM-Gravity Main Collector	Horizontal Ellipse	LF	$ 650.00	0	$ -
0048	44	72	120	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0072	45	72	72	GM-Gravity Main Collector	Rectangle Closed	LF	$ 570.00	0	$ -
0049	46	72	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 750.00	0	$ -
0050	47	96	96	GM-Gravity Main Collector	Rectangle Closed	LF	$ 850.00	0	$ -
0051	48			GBP-Gravity Backflow Pipe <36"		Ea	$ 35,000.00	0	$ -
0052	49			GBP-Gravity Backflow Pipe >36"		Ea	$ 70,000.00	0	$ -
0053	5			GW-Gravity Wells		EA	$ 105,000.00	0	$ -
0054	4	48		ET-Exfiltration Trench		LF	$ 250.00	17,947	$ 4,486,750
0055	50			Weir Box CS		EA	$ 30,000.00	0	$ -
0057	53			CS-22 Remod		EA	$ 525,000.00	0	$ -
0058	55			SW-04 Remod		EA	$ 150,000.00	0	$ -
0056				Gravity Structures-Inlets		EA	$ 7,500.00	150	$ 1,124,063
0059	56			Ditch Improvement		LF	$ 50.00	0	$ -
0091	57			Swale/Ditch Headwall		Ea	$ 10,000.00	0	$ -
0090	10			Exfil_End Weir		Ea	$ 5,000.00	0	$ -
0092	51			Ret/Det Pond		CUY	$ 355.00	0	$ -
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
							#N/A	#VALUE!	#VALUE!
	GRAVITY MAIN SUBTOTAL								$ 5,613,853
0060		Pavement Restoration including Pavement Marking (Full Road)				LF	$ 270.00	17,985	$ 4,855,950
							CONSTRUCTION COST SUBTOTAL		$ 10,469,803
GENERAL CONDITIONS								Parkside	
0061		Mobilization				LS	4%	$ 10,469,803	$ 418,792
0062		Insurance and General Conditions				LS	2%	$ 10,469,803	$ 209,396
0063		Permits/Fees				LS	2%	$ 10,469,803	$ 209,396
0064		Maintenance of Traffic				LS	3%	$ 10,469,803	$ 314,094
0065		Engineering Design & CA Oversight Costs				LS	15%	$ 10,469,803	$ 1,570,470
0066		Construction Engineering Inspection Costs				LS	4%	$ 10,469,803	$ 418,792
0067		OCI Management Cost				LS	15%	$ 10,469,803	$ 1,570,470
0068		Project Contingency Costs				LS	30%	$ 10,469,803	$ 3,140,941
NS SUBTOTAL									$ 7,852,352
TOTAL									$ 18,322,154

Summary of Offsite Issues Affecting CIP Area:

1. The City's LOS goal cannot be met along shared South City limits Pembroke Rd in the FDOT system. This may be improved by the CIP in the City of Hallandale Beach SWMP or by FDOT future improvements.

HE-D2-5 Pre-Post CIP Flood Inundation Maps

The following figures provide the predicted existing conditions flooding for the 5- and 10-year storm in the CIP Area and the predicted flood reduction for these storms under the Alternatives 1 and 2 CIP:

- **Figure HE-D2-5-EC_5 - Current Conditions Flooding in CIP Area 5-year Design Storm**
- **Figure HE-D2-5-EC_10 - Current Conditions Flooding in CIP Area 10-year Design Storm**
- **Figure HE-D2-5-CIP_ALT1_5 - Predicted Flooding Reduction and Proposed ALT1 CIP for 5-year Design Storm**
- **Figure HE-D2-5-CIP_ALT1_10 - Predicted Flooding Reduction and Proposed ALT1 CIP for 10-year Design Storm**
- **Figure HE-D2-5-CIP_ALT2_5 - Predicted Flooding Reduction and Proposed ALT2 CIP for 5-year Design Storm**
- **Figure HE-D2-5-CIP_ALT2_10 - Predicted Flooding Reduction and Proposed ALT2 CIP for 10-year Design Storm**
- **Table HE-D2-5_ALT1 – Planning Budget for Alternative 1 Proposed CIP**
- **Table HE-D2-5_ALT2 – Planning Budget for Alternative 2 Proposed CIP**

Appendix B provides a summary of easements or land acquisition areas for the new SWPSs, pipeline utility corridors, and wet detention/pond areas at SWMP suggested locations with the 2021 BCPA parcel information for each Alternative, the approximate station capacity required, the tributary service area, and a calculation of flow per unit area served (to compare to the BC Surface Water Management regulated restriction of 1 cfs/acre if applicable).

3.3 CIP Implementation Strategies

The following section describes methods of implementation of the proposed CIP required to meet the two alternate LOSs.

3.3.1 Summary of Analysis of LOS Alternatives

Table 3-1 provides a summary of the basic CIP elements required for the two alternate LOSs Citywide for a relative magnitude of CIP comparison. As shown, most of the element quantities are significantly less for Alternative 2 and the ones that are similar quantities (such as the number of new SWPSs) have lesser capacity requirements.

Table 3-1 Citywide CIP Summary for Two Alternatives LOS[1]

ALTERNATIVE	PROPOSED CIP ELEMENT								
	EXFILTRATION (MI)	GRAVITY RECHARGE WELLS	STORMWATER GRAVITY COLLECTION PIPE (MI)	NEW STORMWATER PUMP STATIONS	FORCEMAIN (MI)	NEW OUTFALLS	AQUIFER RECHARGE WELLS	NEW DETENTION AREA (AC-FT)	BACKFLOW PREVENTERS
1	112	109	63	37	27	45	135	51.5	26
2	61	55	46	32	19	43	56	18.7	27

(1) Values are approximated from GIS data.

- The proposed Alternative 1 CIP provides a plan for meeting an LOS goal of limiting flooding to no more than 3 inches above the road crowns in the 10-year, 24-hour recurrence interval design storm for the major roadways and evacuation routes; and no more than 3-inches above secondary and arterial residential streets for a 5-year, 24-hour storm; and flooding maintained below building finished-floor elevations in the 100-year recurrence interval design storm wherever practicable.

- The proposed Alternative 2 CIP provides a plan for meeting an LOS goal of limiting short duration flooding to no more than 6 inches above the road crowns in the 10-year, 24-hour recurrence interval design storm for major evacuation routes; no more than 6-inches of flooding for a short duration above residential streets for a 5-year, 24-hour storm event; and flooding maintained below building finished-floor elevations in the 100-year recurrence interval design storm wherever practicable.

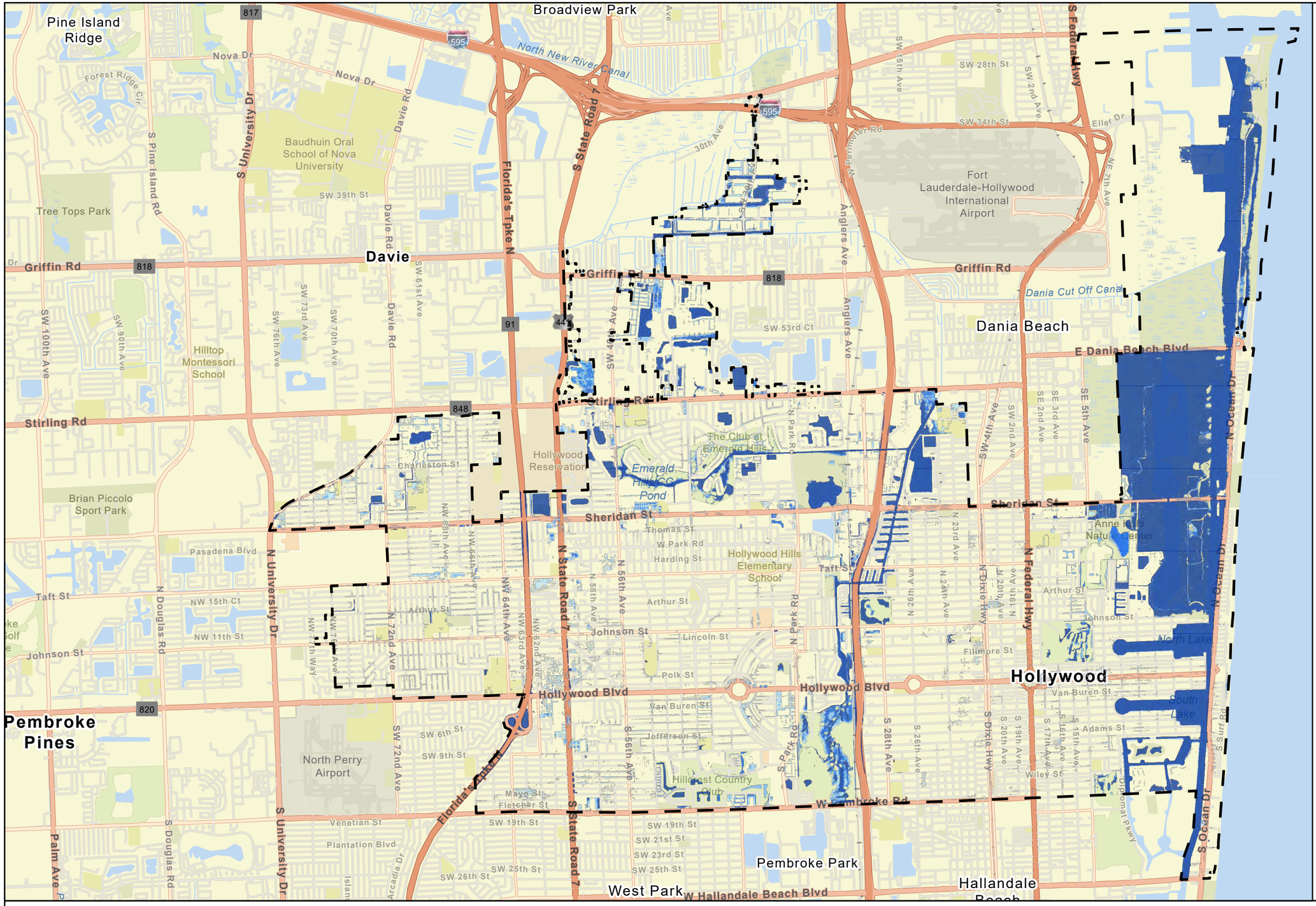
Alternative 2 developed a less extensive and much less costly CIP, using a more frequent, smaller volume, 5-year recurrence interval design storm. It should be noted that the Alternative 2 LOS is still a robust program because the peak intensity of the 5-year design storm is concentrated over a shorter period of time (24 hrs), and as a result, resolving the 5-year storm LOS flooding issues most times inherently resolves the majority of the 10-year LOS flooding areas as well. The trade-off for the potentially significant savings over Alternative 1 is that, in the less costly Alternative 2 CIP, the City accepts that short-duration, shallow ponding over the road crowns will occur during the 10-year storm event, and a greater percentage of the lowest-lying homes in the City's flood plain are predicted to continue to flood in the 100-yr event.

A visual comparison of predicted flood reduction post CIP improvement as compared to existing conditions citywide (provided previously on Figure 3-2) is provided which shows the Citywide inundation map for each design storm with Alternative 1 CIP and Alternative 2 CIP in place, respectively:

- **Figures 3-6.1 & 3-6.2** - Post CIP Citywide flood inundation map for 5-yr, 24-hr design storm, for ALT 1 and ALT 2.

- **Figures 3-7.1 & 3-7.2** - Post CIP Citywide flood inundation map for 10-yr, 24-hr design storm, for ALT 1 and ALT 2.

- **Figures 3-8.1 & 3-8.2** - Post CIP Citywide flood inundation map for 100-yr, 72-hr design storm, for ALT 1 and ALT 2.



Hollywood City Limits

Alt 1 Post CIP 5-Yr 24-Hr Design Storm

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

Post CIP Citywide Flood Inundation Map for 5-Year 24-Hour Design Storm, for Alternative 1

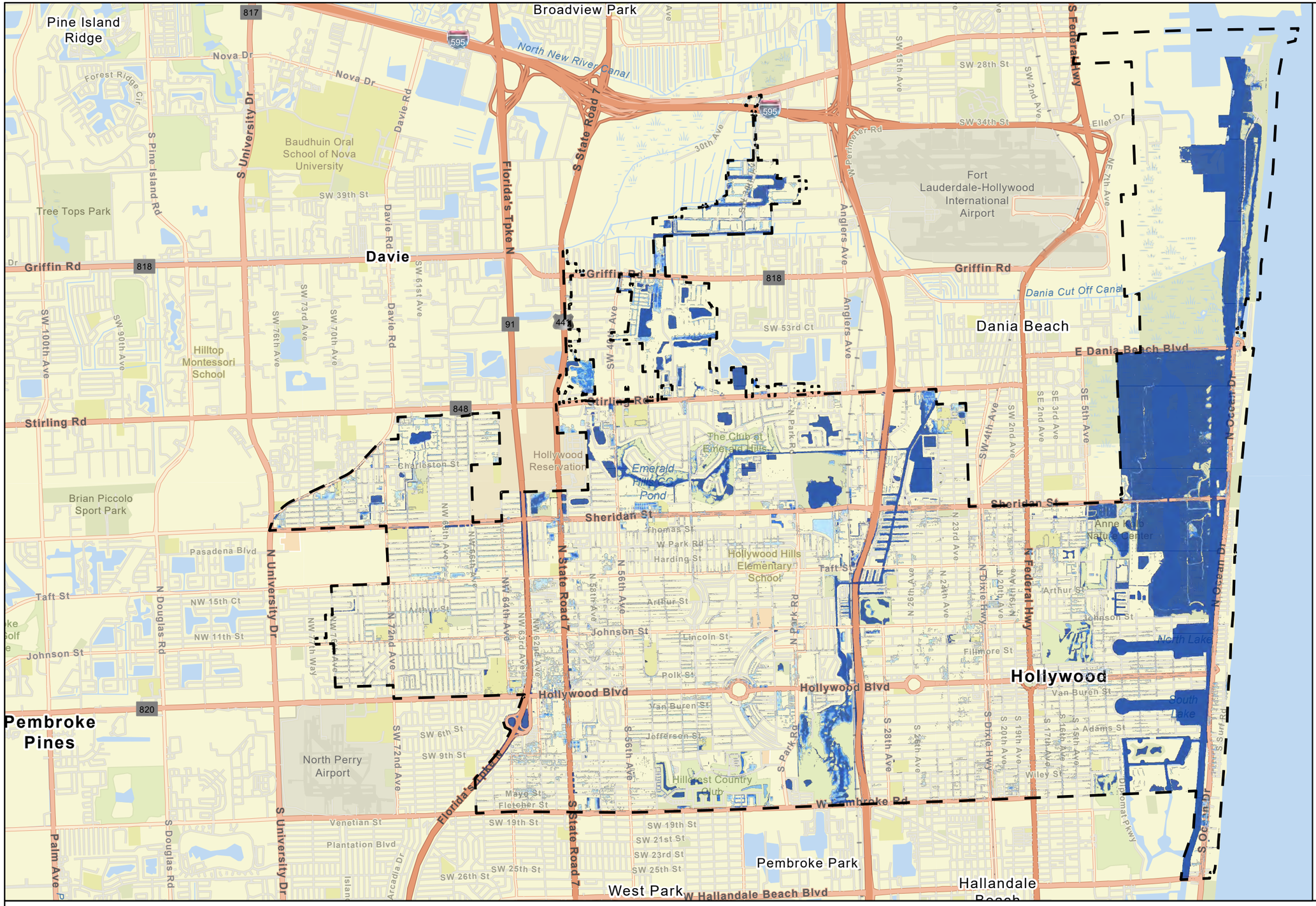
0 2,000 4,000 8,000 Feet

1:53,000

City of Hollywood Stormwater Master Plan

Figure 3-6.1

2/20/2024



Post CIP Citywide Flood Inundation Map for 5-Year 24-Hour Design Storm, for Alternative 2

0 2,000 4,000 8,000 Feet

1:53,000

City of Hollywood Stormwater Master Plan

Figure 3-6.2

2/20/2024

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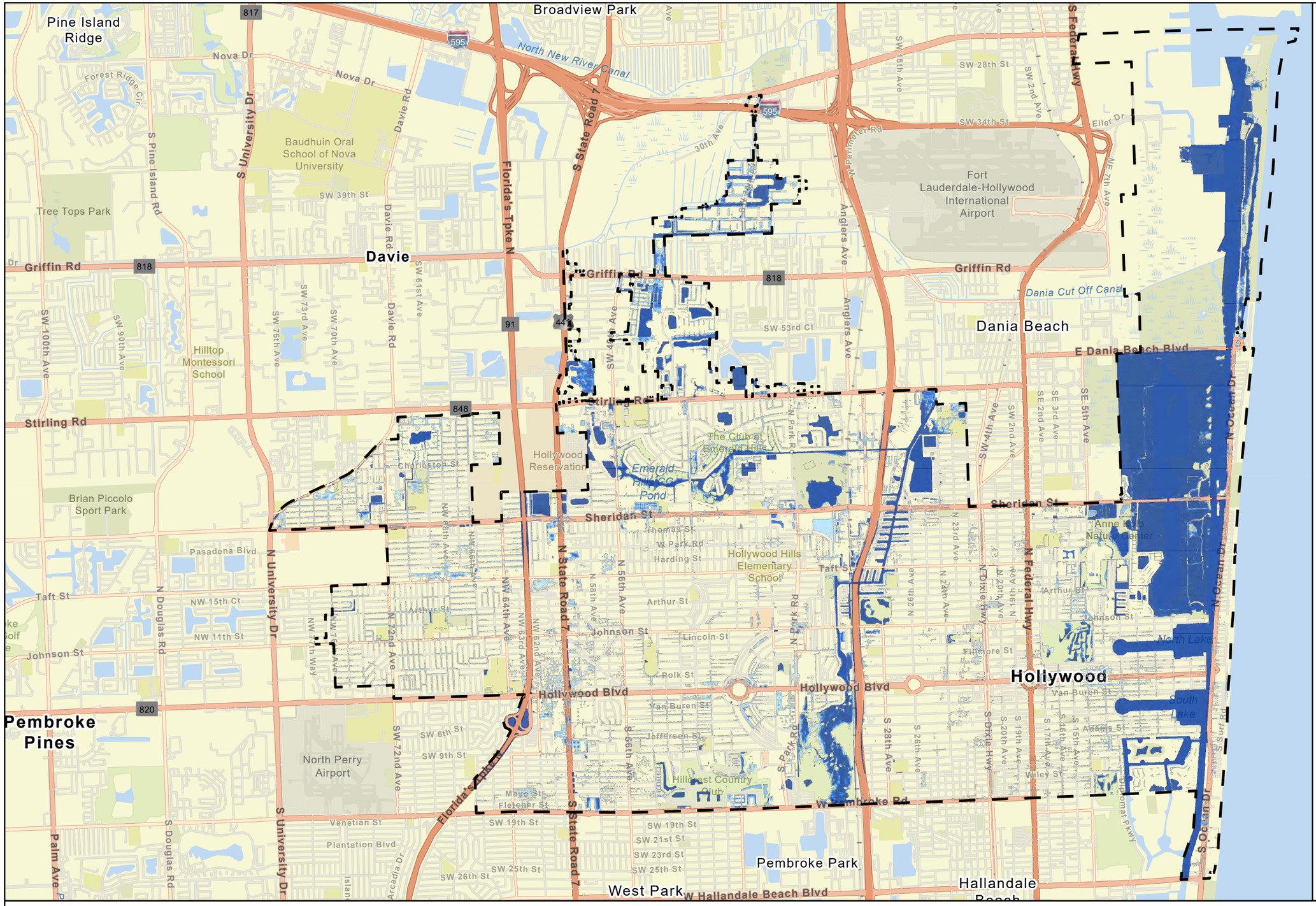

Post CIP Citywide Flood Inundation Map for 10-Year 24-Hour Design Storm, for Alternative 1

0 2,000 4,000 8,000 Feet

1:53,000

City of Hollywood Stormwater Master Plan
Figure 3-7.1
2/20/2024

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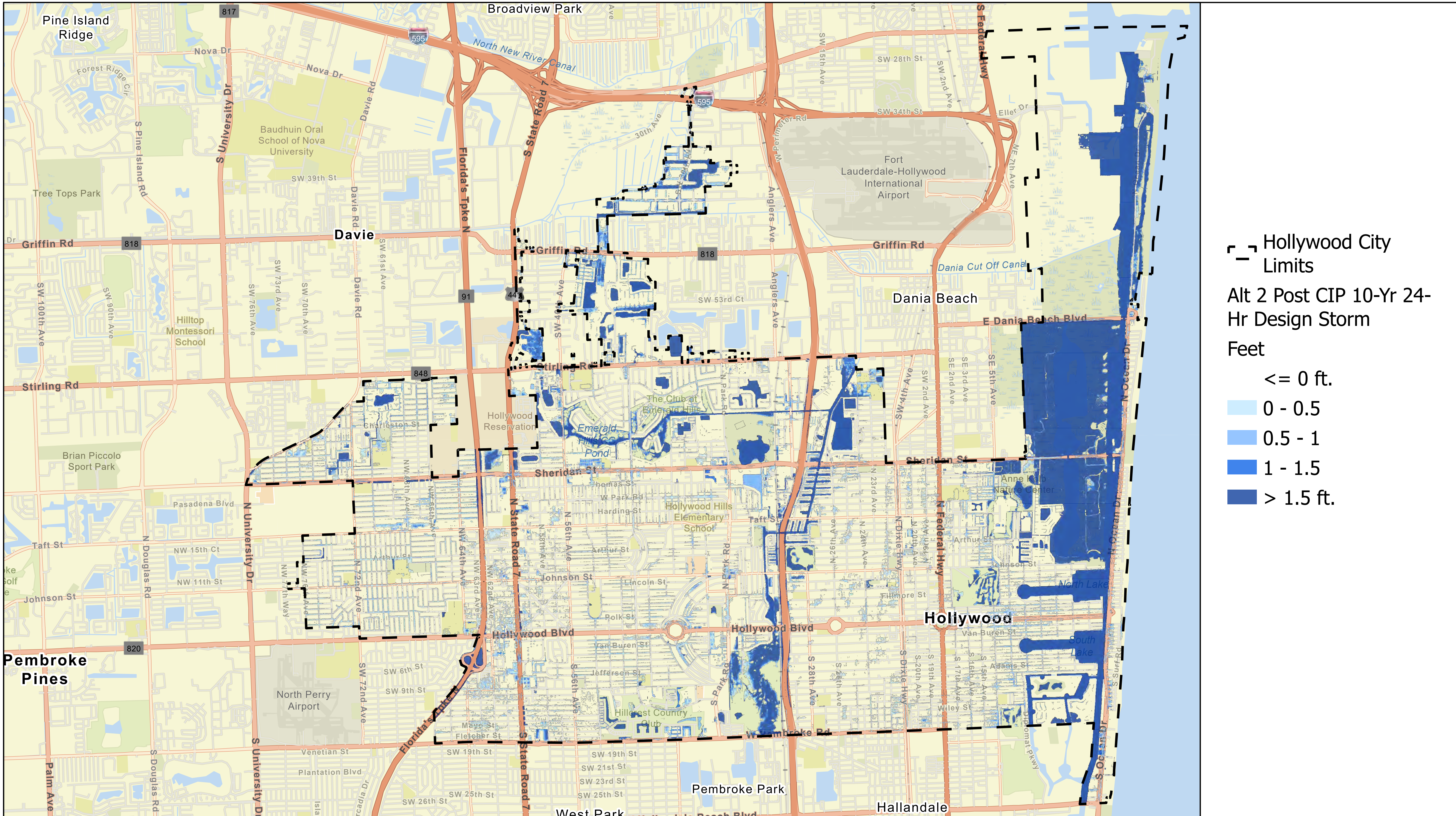

Post CIP Citywide Flood Inundation Map for 10-Year 24-Hour Design Storm, for Alternative 2

0 2,000 4,000 8,000 Feet

1:53,000

City of Hollywood Stormwater Master Plan

Figure 3-7.2

2/20/2024

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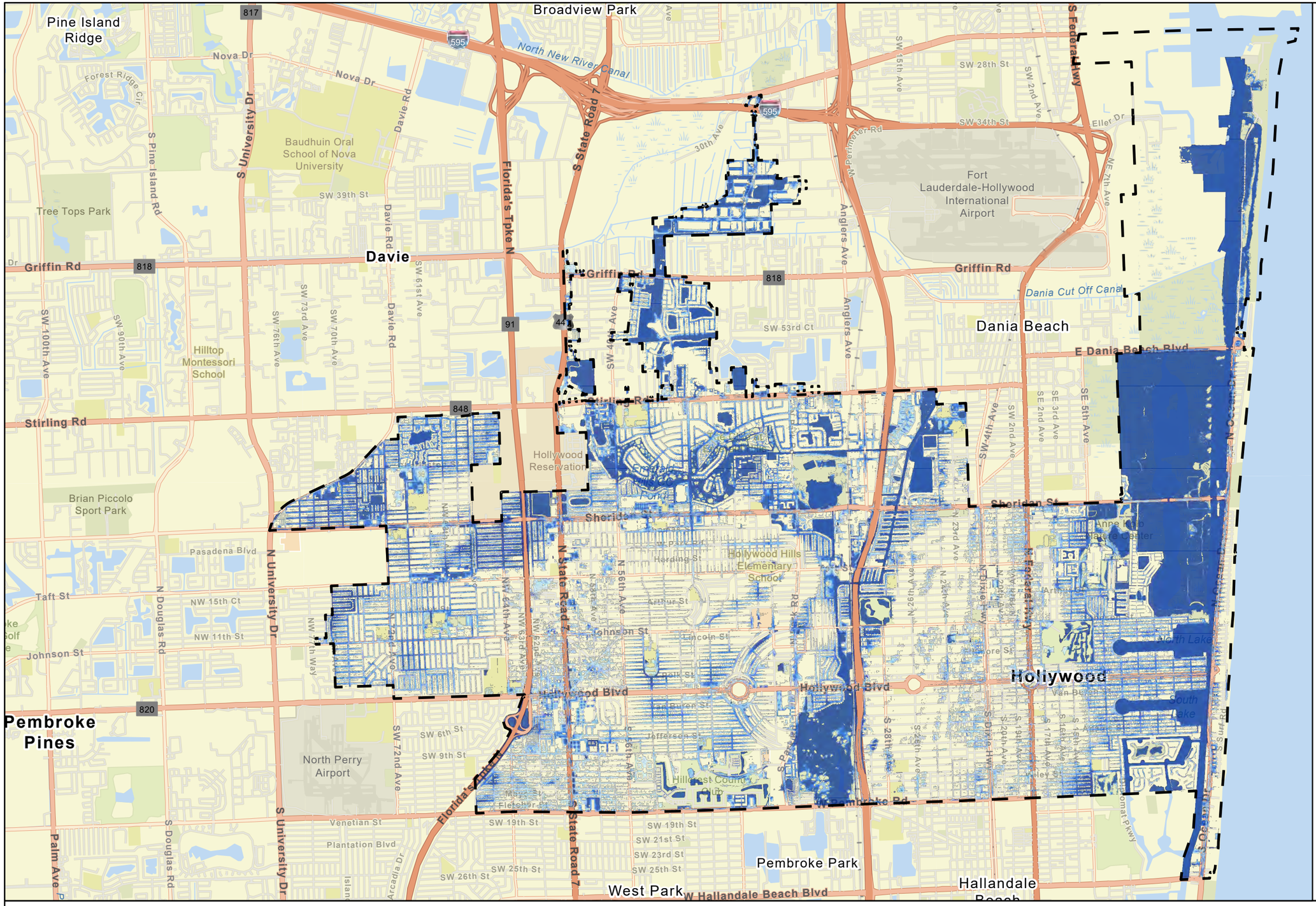


Hollywood City Limits

Alt 1 Post CIP 100-Yr 72-Hr Design Storm

Feet

- <= 0 ft.
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5 ft.

Post CIP Citywide Flood Inundation Map for 100-Year 72-Hour Design Storm, for Alternative 1

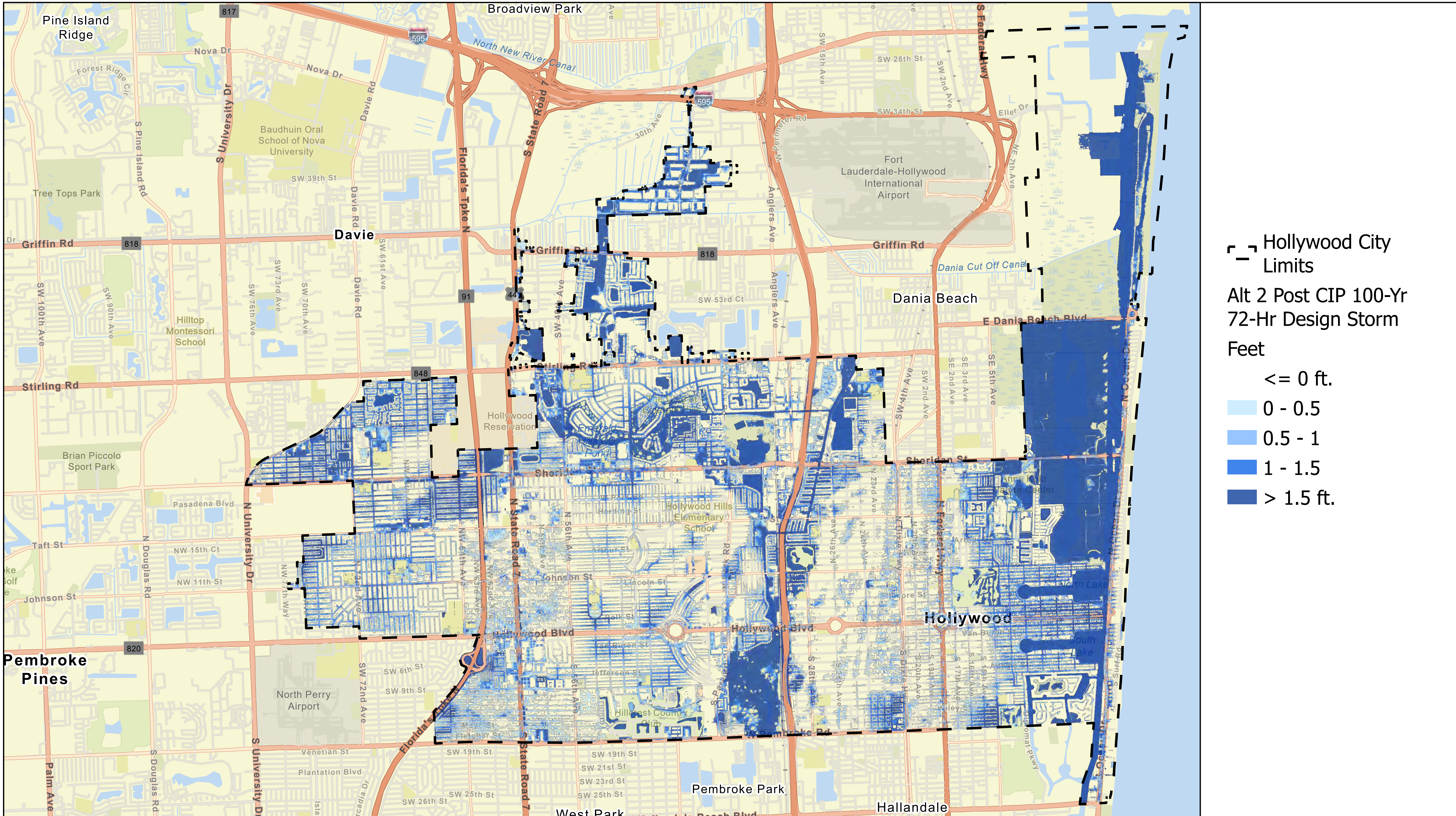
0 2,000 4,000 8,000 Feet

1:53,000

City of Hollywood Stormwater Master Plan

Figure 3-8.1

2/20/2024



Post CIP Citywide Flood Inundation Map for 100-Year 72-Hour Design Storm, for Alternative 2

0 2,000 4,000 8,000 Feet

1:53,000

City of Hollywood Stormwater Master Plan

Figure 3-8.2

2/20/2024

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The Alternative 1 flood map indicates that nearly all the flooding from the 10-year design storm (except in the few remaining areas where the diminishing point of return was reached and additional CIP capacity increases were ceased as they did not impact the flood reduction further) is mitigated by this plan.

The Alternative 2 flood map shows more predicted flooding in isolated areas than Alternative 1, but a significant reduction from the existing conditions flooding, and the depth and duration of the remaining flood area inundation has been significantly reduced to approximately less than one hour only at the peak of the storm, and it dissipates rapidly through the new drainage system infrastructure.

From the analysis, it is shown that implementing the less costly Alternative 2 LOS CIP can still provide a vast and noticeable improvement over the existing conditions LOS Citywide and significantly reduce the number of structures currently flooding if financing is an issue. **Table 3-2** provides a summary of the reduction in total length of flooded streets and inundated structures for each alternative.

Table 3-2 Roadway and Structure Inundation Reduction Summary

Condition	Length of Streets Not Meeting LOS[1] (mi)	Percent Reduction	No. of Structures Inundated[2] (100 yr event)	Percent Reduction
Existing Conditions	233		1,611	
Alt 1 CIP	2	99%	270	84%
Alt 2 CIP	26	90%	767	53%

[1]Approximately 492 total miles of streets within the Hollywood City limits
[2]Approximately 38,000 structures exist with the Hollywood City limits

3.3.2 CIP Implementation Alternatives

The balance of implementing stormwater management flood control solutions that will simultaneously address flooding to the desired LOS, meet regulatory requirements for pre-post impacts, meet the imposed water quality treatment considered in the development of the CIP, meet applicability for implementation considering available budget, equity, and coordination with other CIP programs, is discussed further below.

3.3.2.1 CIP Implementation General Sequencing

It is important to make the distinction between “priority” and “sequence of implementation”. All flooding problems in the City which affect property, health, and welfare of the City’s residents are a “priority”. The actual sequence of implementation of stormwater project construction may not match the priority list due to many influencing factors – funding and other competing capital and social projects being the most influential, followed by coordination with other projects. However, it is the intent of the City to address all of the priority areas over the life of the program.

It is also important to realize that due to the magnitude of the widespread flooding to be resolved in the study area and the interaction and interconnectivity of the proposed CIP elements working in concert, it is not possible in many of the flooded areas to assign a single, local, CIP project to fully resolve a particular flooding area issue. As a result, a direct one-to-one project to flooding

problem relationship for any particular flooded area may sometimes not be applicable and will need to be further analyzed on a case-by-case basis for benefit if smaller local projects are required to be created due to budget constraints. Analysis shows that typically the CIP in several areas implemented together may be required to resolve the flooding collectively for several areas, improving the LOS in discrete steps:

- Capturing stormwater "uphill" in surrounding areas to limit inflow into a lower neighboring area where the flooding occurs,
- Lowering canal stages by implementing exfiltration or wells in an area first to provide the required future capacity for additional flow from proposed new connected areas, and
- Increasing capacity and lowering hydraulic head in existing pipes so they are able to accept new flow from flooding areas by implementing exfiltration, diversion, and recharge wells in other areas.

It also may not be practical nor affordable for the City to immediately implement the CIP program in the worst flooding areas, as many of these projects tend to be much larger, have costly, complex solutions that may rely on other areas parallel CIP implementation to be put in place, may require extensive engineering, easement acquisition, time consuming resolution of regulatory and permitting issues, and longer construction periods. This results in expending the majority of available funding (and potentially future funding) to be applied to only one or two areas of the City, and potentially not realizing the tangible results in actual flood mitigation in those areas for many more years as the project progresses. This situation must be weighed against applying the same funding to address multiple smaller projects in multiple areas throughout the City first, referred to as the Initial Action Plan (IAP).

The IAP is comprised of both policy and engineering projects and is used to kickstart progress of the stormwater improvements program throughout the City and targets smaller projects which are installed as the "Phase I" of the future planned systems. The IAPs need to be selected carefully with further analysis and engineering so that they do provide some immediate relief to the areas where they are installed and are not perceived as spent capital with no results as most of these projects' scope of work are planned backward from a set, allotted budget to determine the extent of CIP that can be installed.

The project sequencing will most likely be to design and construct phased portions of the ultimate full CIP in several areas simultaneously to provide some immediate partial relief to locations Citywide (although not resolving the flooding fully to the desired LOS in all locations immediately), and then over time, returning to implement additional subsequent phases of the work, and continue to reduce the flooding in phases as funding dictates. The analysis and engineering for the worst flooding areas which required the most capital budget and longest time to implement and permit can be started in parallel with the only the construction deferred until funding is available.

The overall sequence of implementation for the Stormwater CIP would be as follows:

1. Stormwater Capital Program Initialization and Immediate Action Plan (IAP). (Note, these initial actions should occur simultaneously):

a. Execute a high-priority and accelerated, Citywide maintenance and cleaning program of the entire existing stormwater system, ditches and channels to remove silt, trash, and debris and overgrowth in areas that have been shown to be constricting and blocking the existing infrastructure pipes, and conveyance ditches, etc. from obtaining its intended installed designed performance, including those operated by other entities such as FDOT, BC, SBDD, and CBWCD. Based on the root cause analyses of a few publicized flooding events during this analysis, this proactive initial action alone, if done thoroughly, will likely reduce the flooding complaints in some areas immediately for many of the frequent heavy thunderstorms currently being experienced during the summer months. This is especially important near construction areas where construction debris frequently ends up in the storm sewers. The City has stated it is currently on a 2-year cleaning cycle for the entire storm system however it appears to not be sufficient or fully covering all of the assets. If not currently, this effort should be audited and analyzed for potential shortfalls in efficiency, process, equipment, and coverage to avoid repeating the current situation in the future after the full system cleaning.

b. Apply for and obtain a conceptual Citywide SFWMD Environmental Resource Permit ERP for construction of the CIP elements in the SWMP. Regulators will need reasonable assurance that the City is fully committed to the overall stormwater master plan, its funding plan, phasing and schedule, and environmental protection concepts. The CIP recommendations in the SWMP are based on achieving 2022 regulatory requirements. Additional regulatory requirements may be imposed on the City due to recent renewed interest by the State FDEP regarding the protection and cleanup of Broward County waterways that may change the cost and timing of the CIP implementation or require additional modeling or analyses before project can be approved for construction.

c. Revisit the Stormwater Utility (SWU) for rate sufficiency to fund the operations management, CIP, and debt service of the program. Use the existing funding generated by the Stormwater Utility and the allotment of the general capital program to implement interim “quick fix” solutions in areas where a short lengths of pipe connections, exfiltration systems, or new culverts or ditches may provide relief. If funding is available, stormwater pump station improvements and additions should commence under this funding.

d. Revisit the SWU billing files and impervious area by parcel (ERUs) to ensure the SWU is collecting the proper fees and including all parcels in the City in its revenue collection.

e. Begin the long-lead time preliminary engineering and permitting for the “worst flooding areas” priority projects so that when funding is available for the capital construction, the project has a head start on schedule.

f. Continue to repair, maintain, and install new backflow prevention devices in the stormwater system. Sea-level rise “sunny day flooding” issues, although not

generated by rainfall or its runoff, are perceived as stormwater issues due to the resultant street flooding and the interaction with the stormwater systems and the detrimental effect on the stormwater system's capacity when tidal events occur concurrently with a rainfall event, so they are inherently part of the required CIP as the outfalls for the stormwater systems are directly connected to the tidal fluctuations of the receiving waters. Backflow issues are currently being addressed by the City under the in-progress tidal valve back flow prevention program at the outfalls, in conjunction with the pending minimum seawall height or shoreline elevation and armoring requirements discussed below. Certain areas may have cracked or leaking pipes on the upstream side of the BPF which may be allowing infiltration into the system also resulting in street flooding.

g. Continue the process of fortifying the City's public and private shorelines, whether by new or raised seawalls, or other green or grey coastal armoring methods. As the model analyses show, the new CIP is designed to handle stormwater runoff cannot keep up with the additional capacity that would be required to simultaneously pump out the sea.
    i. The current City of Hollywood Code of Ordinances Section 150.30 - Resiliency Standards For Tidal Flood Barriers adapts the Broward County requirements for shoreline protection. The City's Department of Development Services Code Compliance Division should add tidal flooding of the rights of way and adjacent property to its currently published list of Code Violations, and it should be added to the public awareness agenda.
    ii. The seawall height ordinance adapted by the City provides the City a means to enforce raising of low or non-existent seawalls for:
        1. new or substantial refurbishment construction
        2. where a seawall section results in flooding of rights of way or other property, or
        3. and to an EL 4 ft NAVD by 2035 with provision for adding height, and EL 5 ft-NAVD by 2050.

h. New seawall projects areas should always require the stormwater CIP improvements to be implemented in conjunction with the shoreline protection so as not to create or worsen stormwater flooding in these areas. Although intended to keep the seawater out, new seawalls raised above the flood elevation will also trap historic overland sheet flows of stormwater runoff and worsen flooding in many neighborhoods during rain events if the associated collection systems, pump stations, and backflow preventers are not installed simultaneously.

i. Develop a plan for funding the cost of the future O&M of the system and that earmarked increased funding over time set aside in the SWU budget.

j. Grant funding applications should be pursued for many of these projects as addressing flooding issues is directly related to resiliency, vulnerability reduction, and hazard mitigation and may allow the City to implement a project that has been lowered in the implementation sequence due to other factors.

k. Acquire the CS-22 structure from Broward County and install the weir/backflow prevention improvement.

l. Begin negotiations with Hallandale Beach, SBDD, CBWCD, Pembroke Pines, and FDOT for joint project agreements and cost sharing of mutually beneficial capital improvements in their shared service areas.

2. Near-Term CIP Implementation:

a. As funding methods are being formulated for the 20+ year program, several methods for implementation are plausible:

i. Implementation by combining common water, sewer, road, and stormwater improvement projects in individual neighborhoods where the CIPs overlap.

- PROS:
  - This method allows the roadways to be torn up only once for all utilities in any particular neighborhood limiting disruption.
  - Accomplishes the work within discrete geographically defined areas.
  - Takes advantage of economy of scale as a single utility contract and contractor will likely be selected and mobilized.
  - Potential cost sharing from three sources of funding for common elements such as roadway restoration
- CONS:
  - Some of the elements of the CIP required to fully complete the project(s) may be located in other areas of the City or rely on other areas' CIP installation (i.e., remote pump stations, retention areas, connections to other pipes or areas not yet constructed) resulting in delayed startup/dry permit or project scope expansion beyond the neighborhood. Additional engineering will need to be performed as a simple extraction of the SWMP CIP in any defined area may not be viable or effective without parallel improvements in other areas (i.e., collection pipes that lead to a remote proposed detention area or pump station in another area would also require that improvement to be installed as part of the project).
  - The Contractor must be skilled and bonded for all three disciplines of the utility work.
  - The common project work areas, although overlapping, may not contain the priority projects for each of the master plans.

3. Implementation by installation of the proposed exfiltration systems and gravity wells that connect to existing infrastructure Citywide as a separate parallel program.

    - PROS:
        - Exfiltration systems are rapidly designed, permitted, and constructed and would allow certain areas in the City to meet or approach their LOS goal immediately and reduce the depth and duration of flooding in other areas as well. The reduction in runoff captured in the exfiltration and drainage well systems will in-turn reduce the flow loading on the existing system pipes thus increasing their capacity and their ability to relieve other tributary areas and will catch runoff uphill of the lower-lying areas, in-turn reducing the depth of flooding in those areas and add needed water quality treatment to the overall stormwater system and reduce discharge impacts on the receiving waters.
        - Areas where roadway improvements are pending or where other development or utility construction is concurrently scheduled to occur can be coordinated to be installed first, and then possibly in a Citywide rotation of several high-profile flooding areas in each major basin until all of the exfiltration and gravity recharge wells are installed. A time frame of 10-15 years of the 20+year CIP program could be set as a goal to complete the installation of exfiltration systems and gravity wells Citywide, accelerating the areas where remaining CIP is pending due to available budget. The City will need to coordinate the SWMP CIP with the designers of roadways, parks, golf courses, water, and sewer CIP to expedite any area with these rapidly implementable and effective stormwater CIP elements and for CIP coordination with other utility or roadway improvements planned or in progress, so that the streets are excavated only once. Designers can use this information to rapidly layout the systems with flexibility for unforeseen utility conflicts on alternate streets in the neighborhoods to achieve the required length of trench.
        - Capturing runoff and recharging the aquifer removes a portion of the existing runoff from the canals and ditches and adds the needed capacity for future projects which pump or outfall into the canals. Demonstration of this will be required for permitting large flows discharging into the canals. At some point a project may be delayed by regulators until offsetting flow is removed from reaching the waterways.
        - Stormwater recharge into the surficial aquifer retards the advancement of saltwater intrusion.

- Exfiltration is an approved method of water quality treatment credits and achieving water quality citywide. Providing these systems early in the program may offset another future project area which is short on water quality volume due to constraints of its retrofit, and allow permitability.

- CONS:
  - Exfiltration systems alone do not meet the LOS by themselves everywhere in the City where they are viable for installation, and if flooding occurs post-construction in a storm that exceeds the capacity of the installed trench, the City runs the risk of perception that the improvements are not working, and capital dollars were spent erroneously.
  - Exfiltration does not work in all areas of the City. The CIP Area figures provide the required length and approximate locations in the City where exfiltration will work hydraulically (above EL 6 ft NAVD), other exfiltration systems are not currently installed, and is not in an exclusion zone for well fields or known contamination, and the text description provides the optimized total length of trench to be installed in each CIP area for each Alternative LOS.

4. Long-term Implementation.

   As funding becomes available, install the gravity storm sewer collection pipes, secondary systems, and pump stations with discharge force mains and pumped recharge wells in the CIP Areas in phases addressing the many low-elevation, trapped bowl areas of the City and areas where new seawall is replacing historic overland flow and will cause new flooding. This work can be phased spread out over the 20+ year CIP. These designs involve installation of secondary systems to connect the tributary areas to the PSMS pipes, pavement re-grading to route water to the new catch basins, installation of new MHs, weir structures, pump stations, force mains, outfalls, and pumped recharge wells to meet the chosen LOS goal for the remaining flooding areas, arranged in a sequence that meets the projected expenditure budget over time.

3.2.2.2 Alternate Implementation Sequencing Strategies and Considerations

Due to budgetary considerations and the timing or ability of the City for generating the required continued funding or potentially obtaining the required environmental permits in a timely manner for this large of a capital program, the full ideal implementation sequence of the CIP described above will most likely be selectively reduced to smaller individual phases and sub-phases, and some areas may even be ultimately decided by the City to be left unresolved due to cost-benefit considerations. The City will need to decide between the primary goal of Alternative 1 or secondary goal or Alternative 2 LOS for any particular area, or possibly even a less restrictive, more affordable LOS for some areas based on what is determined to be feasible and practical under the existing budget constraints, and to accept short duration, shallow, safe ponding up to a predicted level of flooding above the LOS for a given recurrence interval storm.

Alternate sequences of CIP project implementation that consider depth and extent of flooding, repetitive loss areas mitigated, characteristics of projects that may be able to be fully implemented under the available funding were also discussed with City officials. The flooding issues being resolved in most project areas are considered relatively equal in severity, so the order of priority can be changed within the phases based on budget, City preferences, or other influencing factors. Note, the IAP items including the thorough cleaning of the existing system will still need to occur first regardless of the LOS chosen or the order of project implementation or phasing.

Two alternate potential prioritization options are presented below:

Prioritization by FEMA Flood Zone Designations

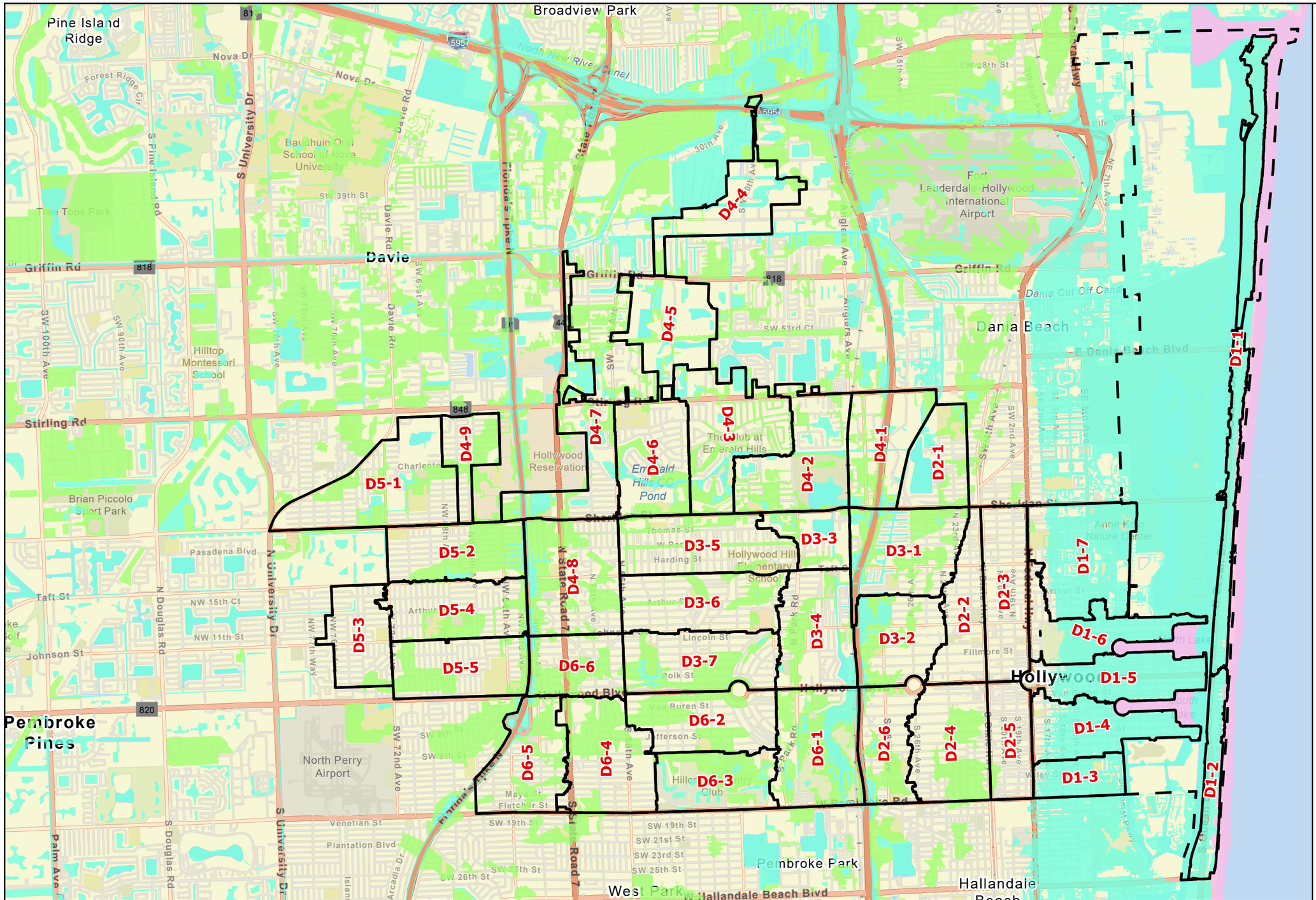
A prioritization strategy that considers areas in FEMA flood zones as the priority areas is shown on **Figure 3-9** which superimposes the same contiguous flooding area delineations on to the current 2022 FEMA FIRM Map. Flood LOS improvements in these areas may directly impact reductions in the residents' flood insurance rates from FEMA and thus provide the residents in these zones with a measurable benefit for the cost of the installed CIPs. Prioritization can be guided toward targeting areas of recurrent-loss flooding that will lower flood insurance rates or reduce economic hardship, where there is recurrent interference with commerce or tourism and repetitive media coverage or resolve areas where access to homes are most frequently blocked. In either case, implementation must still be permittable and sequenced for downstream implementation first where cascading infrastructure is proposed, and for balancing the flows and levels of the canals and minimizing the impact on the waterways. This variant sequencing verification is accomplished by modeling what-if scenarios of combinations of smaller desired CIPs, and interpreting the resultant reduction in flooding, canal stages, and water quality treatment, and the effect on surrounding neighborhoods.

The figure shows that areas of Hollywood are designated as FEMA flood zones AE, AH, and VE. As defined by FEMA:

- AE flood zones are areas that have base flood elevations (BFEs) established and present a 1% annual chance of flooding, and a 26% chance over the life of a 30-year mortgage, during the 100-year flood at that elevation. Since these areas are prone to flooding, homeowners with mortgages from federally regulated lenders are required to purchase flood insurance through the NFIP. The designation AE indicates areas at high risk for flooding and provides the base flood elevations (BFEs) for them.

- AH flood zones are areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet also with a 26% chance of flooding over the life of a 30-year mortgage.

- VE Zones, also known as the coastal high hazard areas, are areas subject to high velocity water including waves and defined by the 1% annual chance of the BFE 100-year flood and include wave effects 3 feet or greater. The regions are further defined in Flood Insurance Rate Maps and are paired with detailed information about associated base flood elevations by location.



Legend

- Hollywood City Limits
- CIP Areas

FEMA Flood Zones

Class

- AE
- AH
- VE

CIP Areas within the FEMA Flood Zones

0 2,000 4,000 8,000 Feet

1:53,000

City of Hollywood Stormwater Master Plan

Figure 3-9

2/20/2024

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If affordable under the budgeted funding, the City may desire to include these areas in the initial prioritizations to demonstrate an accountable monetary benefit post CIP. For example, Zone AE is generally east of Federal Hwy. As shown in the Figure, trying to address all the FEMA flood Areas such as AH would then being to include most of the areas in the City with only a few neighborhood not affected.

It should be noted that the current FEMA zones are derived from coastal and riverine based models and as shown on the figure, do not extend into all areas of the City. Updated FEMA flood maps are expected to be published in the near future will likely address the other non-tidal/surge related flooding areas. The flooded areas further to the west are the costliest to improve as they

require large pump stations, long force mains, and pumped recharge wells to meet regulatory requirements. Portions of these areas can be noticeably improved from their current flooding condition with exfiltration systems if the pumps and force mains systems are cost prohibitive at this time.

Prioritization by Chronic High-Impact Flood Areas

The prioritization strategy to address flooding by resolving solvable, impactful and chronic flood areas is based on several factors important to the City residents and City leaders. These factors are:

1. High number of flooding complaints
2. Disruption to business and residential access
3. Highly visible and repetitive problems even in smaller storms
4. Repetitive loss (to the extent practicable)
5. Addressing areas of known capacity shortfalls already on the City's priority list for action
6. Spreading of the CIP projects throughout the City areas
7. Taking advantage of opportunities for coordination with private development and other City projects
8. Attaining some immediately implementable LOS improvements with measurable results for readily solvable flooding issues
9. Flexibility so that the projects can be readily sub-phased to remain within the limiting parameters of available funding capacity
10. Selection of some projects of less complex design and permitting to take advantage of potential stimulus/resiliency funds for shovel ready projects
11. City shoreline armoring areas

Areas where flow is directed toward one or more new SWPSs will need the pump station constructed and on-line by the time the collections systems are installed. Large pump stations can

be designed and constructed to accommodate the future full station capacity, and the components for additional pumps installed as funding allows. In this manner, a new SWPS at a reduced capacity, while not meeting the LOS goal, may allow an area to drain more rapidly following the storm, if that is what is affordable at the time, compared to installing no SWPS at all.

If funding is not sufficient for all projects in their entirety as desired, projects will be completed in smaller sub-phases for each CIP area and be completed over time. The model should be applied and kept up to date to predict the impact of partial CIP infrastructure construction. As the permitability of many projects may rely on projects in other areas to lower stages or flows in the receiving waters, engineering planning using the model as a tool should be implemented before selecting projects to test the ability to meet regulatory and flooding requirements.

Grant and Loan Funding

Certain projects may qualify for various grant monies and economic stimulus funding due to their type, location, or economic zone, including resiliency and hardening, green infrastructure, and infrastructure renewal. These project candidates may be required to be tailored in size to meet funding requirements and potentially accelerated to meet the deadlines imposed for submission of "shovel-ready" contract documents to qualify for the funding. Types of grants that can be considered include:

Grant Funding Resources:

- FEMA Hazard Mitigation Grant Program (HGMP) opportunities - Hazard mitigation is any sustainable action that reduces or eliminates long-term risk to people and property from future disasters. Mitigation planning breaks the cycle of disaster damage, reconstruction and repeated damage. Hazard mitigation includes long-term solutions that reduce the impact of disasters in the future, such as the CIP in the SWMP. These federal funds are available for projects following disaster declarations.

- The Flood Mitigation Assistance (FMA) Grant Program - This is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project. FEMA requires state, local, tribal and territorial governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects.

- FEMA Pre-Disaster Mitigation (PDM) Grant Program – This program is authorized by Section 203 of the Stafford Act. As a result of amendments by the Disaster Relief and Recovery Act of 2018, the Pre-Disaster Mitigation program is in the process of being replaced with the new Building Resilient Infrastructure and Communities (BRIC) program.

- FEMA Building Resilient Infrastructure and Community (BRIC) grants – These funds support states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster

Mitigation (PDM) program. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.

- Federal Stimulus Programs – In times of national economic hardship, the federal government may inject funding into sectors of the economy where goods and services can provide a jump start toward the road to recovery. Infrastructure construction projects require labor and materials and are prioritized for stimulus funds. "Shovel-Ready" projects, where the planning, engineering, and permitting is advanced and construction can begin within a very short time are usually specifically prioritized. Past programs such as ARRA funds were funneled through existing funding programs such as the State Revolving Funds, FEMA Hazard Mitigation, BUILD Grants (formerly known as TIGER Grants), and many more. Projects already earmarked and/or on priority lists received unprecedented grants and/or principal forgiveness. Having projects positioned for existing funding programs is recommended.

- United States Department of Housing and Urban Development (HUD) Community Block Development Grant (CBDG) program - To support community development and to address needs such as infrastructure, economic development projects, public facilities installation, community centers, housing rehabilitation, public services, clearance/acquisition, microenterprise assistance, code enforcement, disaster assistance, and homeowner assistance, federally supported block grants are made available.

- State of Florida Resilience Grant program (FDEP/SFWMD) – This funding provides financial assistance aimed at preparing coastal communities for current and future effects of rising sea levels, including coastal flooding, erosion and ecosystem changes. Resilience Planning Grants (RPG) and Resilience Implementation Grants (RIGs) are available to Florida communities that are required to have a coastal management element in their comprehensive plan. The purpose of RPGs is to promote community resilience-planning, including complying with the "Peril of Flood" statute (Sec. 163.3178(2)(f) F.S.), analyzing vulnerabilities and risks, developing plans and policies that allow communities to better handle changing coastal conditions so they can recover and move forward faster after disasters. The purpose of RPGs is to assist coastal communities in implementing their adaptation/resilience plans by supporting nature-based options for erosion and flood control, elevating public structures, and projects specifically included in existing adaptation/resilience plans.

- SFWMD Cooperative Funding Program for Alternative Water Supply and Water Conservation Projects - The objective of the Cooperative Funding Program is to assist local governments, public and private water providers, and other entities with construction and/or implementation of alternative water supply (AWS) and water conservation (WC) projects that support or complement the District's mission. The aquifer recharge elements of the CIP can be considered under the AWS project umbrella.

- USEPA/FDEP Water Quality Grants
  - Section 319(h) Non-Point Source Grants - The program administers both the Federal Clean Water Act Section 319(h) Grants (also known as "319 Grants") and the State Water-quality Assistance Grants (also known as "SWAG"). The goal of these grants is to reduce nonpoint source pollution from land use activities and includes funding for projects including BMP efficiencies, green infrastructure, low impact development, groundwater protection, and septic to sewer.
  - State Water Quality Assistance Grants - Annually, the state Legislature provides approximately $5 million in Water Quality Assistance Grant funding for the implementation of best management practices designed to reduce pollutant loads to waters not meeting water quality standards from urban stormwater discharges. Matching funds are not required but local contributions are encouraged.
  - Local Government Funding for Beach and Inlet Management - Grants for the planning and implementation of beach and inlet management projects to protect upland structures and infrastructure, to provide critical habitat for threatened and endangered species, to provide recreational opportunities and to support local economies through tourism.
  - Natural Resource Damage Assessment (NRDA) – Funding for stormwater improvements, pier construction, kayak launch, dune restoration, living shorelines, land acquisition, hydrologic restoration, shorebird predation control.
  - The Division of Water Restoration Assistance is responsible for providing financial assistance to fund projects that improve the quality and quantity of the water resources of the state. The division was formed in 2015 when several significant water project funding programs collected from around the agency and brought together under one leadership. Formal adoption of the division was completed by the Legislature in 2016.
  - The Division of Water Restoration Assistance provides loans and grants to local governments, utilities for projects that improve the quality and quantity of the state's water resources and provide a significant benefit to the environment and local communities. These projects improve stormwater quality, reduce pollutants entering surface water and ground water, conserve energy or water, protect springs, collect and treat wastewater, produce and distribute drinking water, provide alternative water supply, restore potable water for homeowners in areas affected by declining source water quality, and restore habitat/enhance recreation.
- Loan Funding Resources:
  - Federal USEPA Water Infrastructure Finance and Innovation Act (WIFIA) loans - The WIFIA program accelerates investment in our nation’s water infrastructure by providing long-term, low-cost supplemental loans for regionally and nationally significant projects. Projects eligible for these loans include Enhanced energy efficiency projects at drinking water and wastewater facilities, brackish or seawater desalination,