Canal Restoration Work Plan & Lower Matecumbe Culvert(s) Project

PAPOA Meeting September 20, 2021

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Environmental Resources Manager

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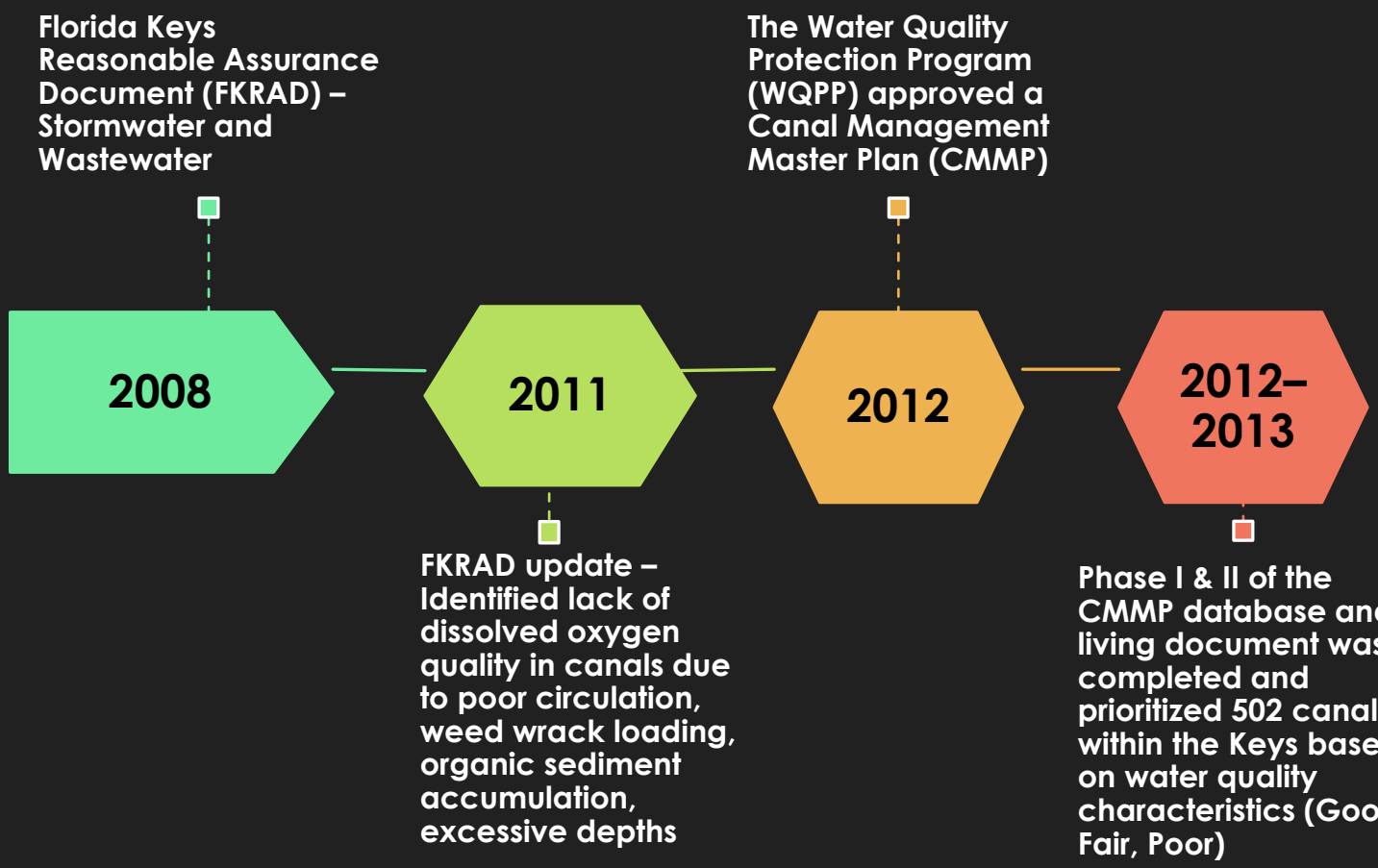
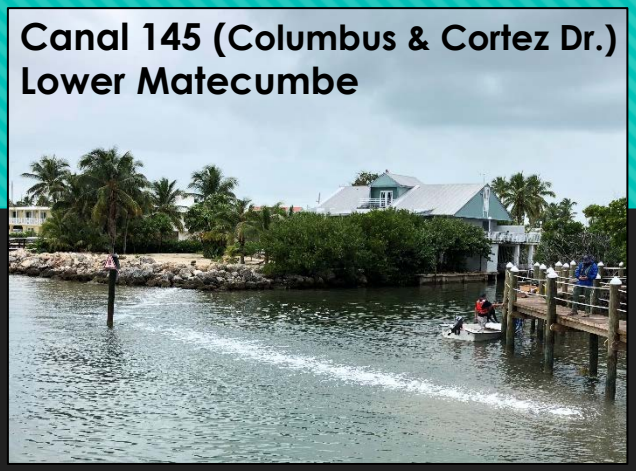
Canal Restoration Program History



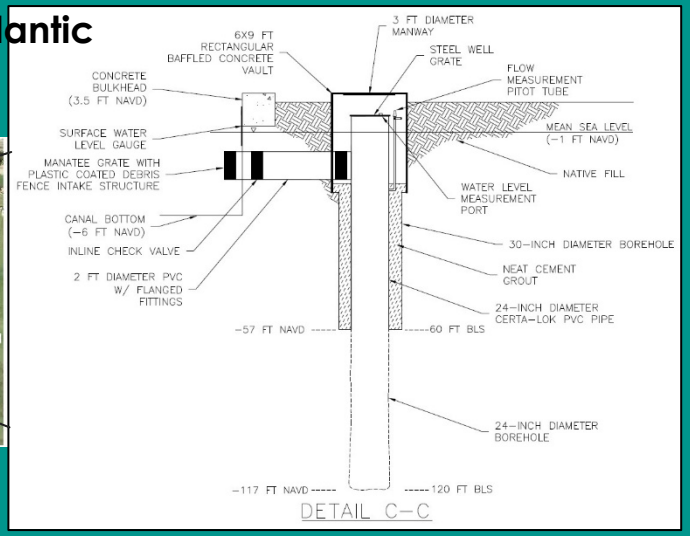
Canal Restoration Program History – Cont.

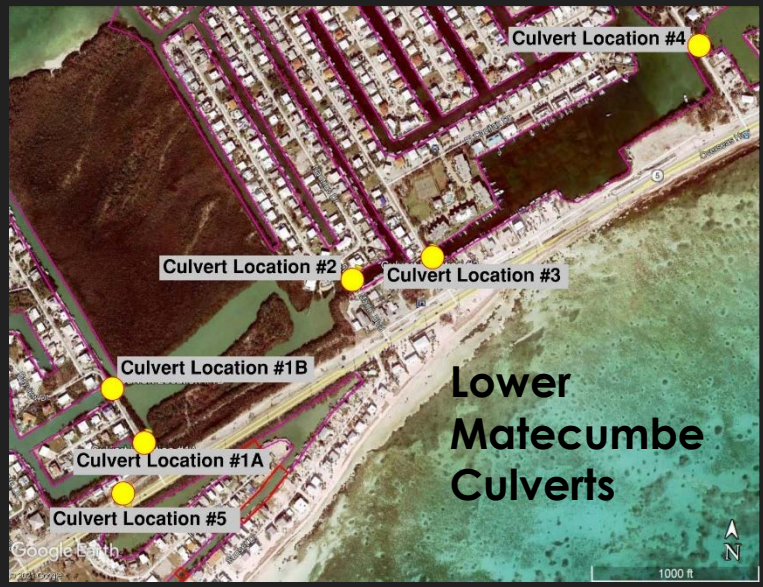
2014	2014–2017	2017	2017–2020	2020
Monroe County, Islamorada and Marathon initiated canal demonstration programs.	FIU measured the water quality and benthic habitat for the demonstration and control canals	Phase III CMMP consisted of obtaining water quality and sediment characteristics for Fair and Poor canals	Hurricane Irma hit the Keys and priority shifted to cleaning marine debris and sediment from the Canals	Monroe County, Islamorada, and Marathon work with Department of Economic Opportunity to revise Administration Commission Rules to implement canal restoration workplan for next decade.

Canal Restoration Program Progress



Canal 114 (Tropical Atlantic Shores) Plantation Key



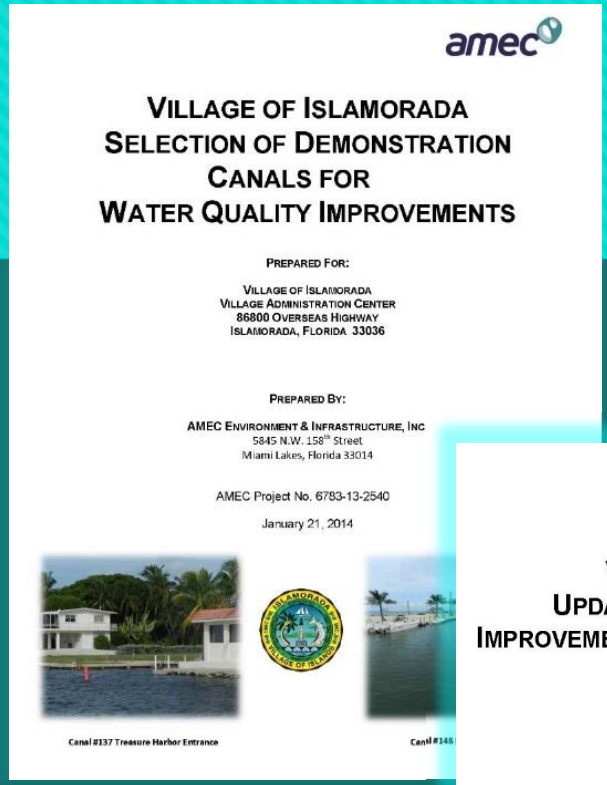


What?
Canal Restoration Work Plan

- Florida Keys Area of Critical State Concern
- The Governor & Cabinet, sitting as the Administration Commission, adopted a new rule (Rule 28-19.310) amending the Islamorada Comprehensive Plan to include a 10-year Canal Restoration Implementation work program.
- Rule 28-19.310 – Islamorada Comprehensive Plan
  - (c) Canal Restoration Implementation
- Provides framework and accountability for implementing canal restoration projects
- The Village is required to annually report to the State each fall on the achievement of the work program tasks, if the Administration Commission determines that progress has not been made, the Village's BPAS allocations shall be reduced by 20 percent for the following BPAS year.

Canal Restoration Guidance Document

- Guiding principles for implementing canal projects
- Structure for establishing a program
- Do's and don'ts (i.e. lessons learned)
- A streamlined process for implementation



amec

VILLAGE OF ISLAMORADA
SELECTION OF DEMONSTRATION
CANALS FOR
WATER QUALITY IMPROVEMENTS

PREPARED FOR:

VILLAGE OF ISLAMORADA
VILLAGE ADMINISTRATION CENTER
86800 OVERSEAS HIGHWAY
ISLAMORADA, FLORIDA 33036

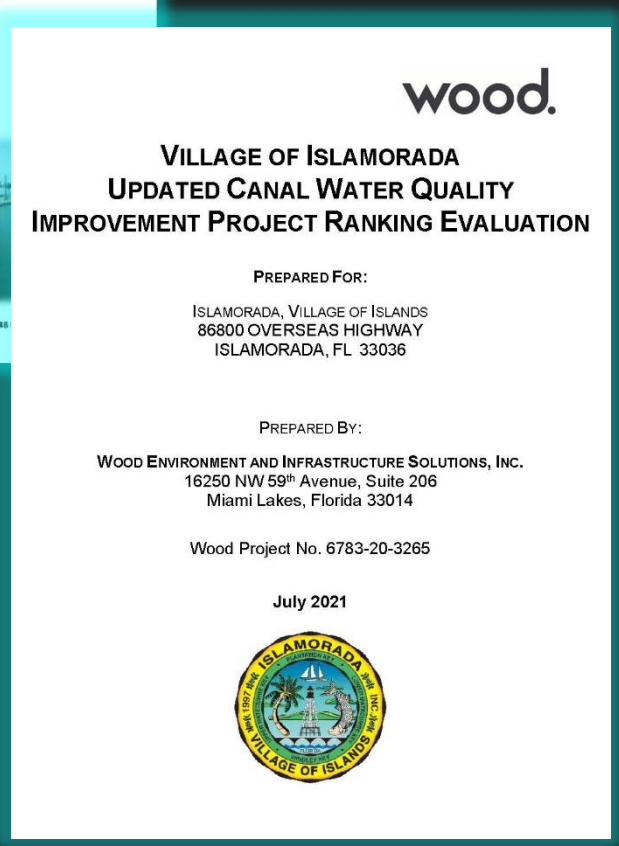
PREPARED BY:

AMEC ENVIRONMENT & INFRASTRUCTURE, INC
5845 N.W. 158th Street
Miami Lakes, Florida 33014

AMEC Project No. 6783-13-2540

January 21, 2014

Canal #137 Treasure Harbor Entrance



wood.

VILLAGE OF ISLAMORADA
UPDATED CANAL WATER QUALITY
IMPROVEMENT PROJECT RANKING EVALUATION

PREPARED FOR:

ISLAMORADA, VILLAGE OF ISLANDS
86800 OVERSEAS HIGHWAY
ISLAMORADA, FL 33036

PREPARED BY:

WOOD ENVIRONMENT AND INFRASTRUCTURE SOLUTIONS, INC.
16250 NW 59th Avenue, Suite 206
Miami Lakes, Florida 33014

Wood Project No. 6783-20-3265

July 2021

Canal Restoration Ranking Summary

- 63 canals throughout Village of Islamorada
- Total restoration price tag Estimated at $319 Million
- Technologies:
  - Organic Removal
  - Backfilling
  - Weed gate
  - Injection Well
  - Culvert
- FL Keys Stewardship Act ($0 - $5 Million per year)

Canal Restoration Ranking List

Canal Ranking	Canal Name	Island Name	2021 Total Score	Recommended Technology	Conceptual Restoration Cost
1	147 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	116	Weedgate, Organic Removal, and Backfilling	$2,268,836
2	132 PLANTATION KEY	PLANTATION KEY	115	Injection Well and Backfilling	$2,000,000
3	114 PLANTATION KEY	PLANTATION KEY	102	Backfill and Injection Well	$879,573
4	115 PLANTATION KEY	PLANTATION KEY	98	Backfill	$1,545,042
5	152 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	95	Culvert	$408,196
6	116 PLANTATION KEY	PLANTATI		Backfill	$652,536
7	151 LOWER MATECUMBE KEY	LOWER MAT KEY		Culvert	$267,377
8	145 LOWER MATECUMBE KEY	LOWER MAT KEY		rganic Removal and Backfill	$4,964,804
9	148 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	84	Organic Removal and Backfill	$3,780,653
10	143 UPPER MATECUMBE	UPPER MATECUMBE	80	Backfill	$1,714,500
11	111 PLANTATION KEY	PLANTATION KEY	78	Weedgate, Organic Removal, Backfill and Culvert	$7,727,180
12	157 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	76	Weedgate, Organic Removal, Backfilling, and Culvert	$26,949,533
13	137 PLANTATION KEY	PLANTATION KEY	72	Organic Removal and Backfill	$4,582,913
14	119 PLANTATION KEY	PLANTATION KEY	71	Backfill	$570,551
15	109 PLANTATION KEY	PLANTATION KEY	69	Weedgate, Organic Removal, Backfill and Culvert	$11,727,408
16	107 PLANTATION KEY	PLANTATION KEY	68	Weedgate, Organic Removal, Backfill and Culvert	$24,945,292
17	121 PLANTATION KEY	PLANTATION KEY	68	Backfill	$2,009,561

$97 Million

Canal Restoration Ranking List – Cont.

Canal Ranking	Canal Name	Island Name	2021 Total Score	Recommended Technology	Conceptual Restoration Cost
18	127 PLANTATION KEY	PLANTATION KEY	68	Culvert* (No elevation data for plugged Canal)	$281,637
19	129 PLANTATION KEY	PLANTATION KEY	67	Culvert* (No elevation data for plugged Canal)	$151,514
20	112 PLANTATION KEY	PLANTATION KEY	66	Backfill and Culvert	$1,502,969
21	110 PLANTATION KEY	PLANTATION KEY	65	Backfill and Culvert	$3,357,794
22	113 PLANTATION KEY	PLANTATION KEY	65	Backfilling	$539,735
23	150 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY		ckfill and Culvert	$41,444,079
24	116 PLANTATION KEY ADDED	PLANTATION KE		Backfill	$772,993
25	139 WINDLEY KEY ADDED 2	WINDLEY KEY		Backfill	$87,120
26	117 PLANTATION KEY	PLANTATION KE		Backfill	$1,756,653
27	155 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	59	Culvert	$356,503
28	153 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	57	Culvert	$178,251
29	120 PLANTATION KEY	PLANTATION KEY	56	Backfill and Culvert	$3,095,811
30	141 UPPER MATECUMBE KEY	UPPER MATECUMBER KEY	56	Backfill	$234,757
31	146 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	56	Weedgate, Organic Removal, and Backfilling	$1,419,953
32	149 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	56	Weedgate, Organic Removal, Backfill and Culvert	$39,474,012
33	123 PLANTATION KEY	PLANTATION KEY	55	Weedgate, Organic Removal and Backfill	$1,830,970
34	123 PLANTATION KEY ADDED	PLANTATION KEY	55	Weedgate, Organic Removal and Backfill	$1,833,541

$98 Million Cumulative $195 Million

Canal Restoration Ranking List – Cont.

Canal Ranking	Canal Name	Island Name	2021 Total Score	Recommended Technology	Conceptual Restoration Cost
35	106 PLANTATION KEY	PLANTATION KEY	49	Backfill	$2,067,489
36	135 PLANTATION KEY	PLANTATION KEY	47	Backfill	$4,106,226
37	136 PLANTATION KEY	PLANTATION KEY	47	Backfill	$4,755,941
38	138 PLANTATION KEY	PLANTATION KEY	47	Backfill	$3,115,707
39	154 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	47	Culvert	$438,498
40	122 PLANTATION KEY	PLANTATION		No Data	No Data
41	134 PLANTATION KEY	PLANTATION		Backfill	$5,106,948
42	151 LOWER MATECUMBE ADDED	LOWER MATEC		nic Removal and Backfill	$496,194
43	137 PLANTATION KEY ADDED	PLANTATION		ate, Organic Removal and Backfill	$8,571,965
44	139 WINDLEY KEY ADDED	WINDLEY KEY	41	Weedgate, Organic Removal and Backfill	$389,212
45	108 PLANTATION KEY	PLANTATION KEY	37	Weedgate, Organic Removal and Backfill	$3,771,172
46	131 PLANTATION KEY	PLANTATION KEY	37	Backfill and Culvert	$4,673,987
47	143 UPPER MATECUMBE ADDED	UPPER MATECUMBE	37	Backfill and Culvert	$560,614
48	158 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	37	Weedgate, Organic Removal and Backfill	$1,806,964
49	125 PLANTATION KEY	PLANTATION KEY	36	Backfill and Culvert	$5,217,771
50	126 PLANTATION KEY	PLANTATION KEY	36	Backfill and Culvert	$5,668,049
51	142 UPPER MATECUMBE KEY	UPPER MATECUMBER KEY	31	Weedgate, Organic Removal, and Backfilling	$1,921,058

$53 Million Cumulative $248 Million

Canal Restoration Ranking List – Cont.

Canal Ranking	Canal Name	Island Name	2021 Total Score	Recommended Technology	Conceptual Restoration Cost
52	118 PLANTATION KEY	PLANTATION KEY	29	Backfill and Culvert	$6,877,203
53	130 PLANTATION KEY	PLANTATION KEY	28	Backfill	$4,374,278
54	139 PLANTATION KEY	PLANTATION		Backfill	$2,584,133
55	142 UPPER MATECUMBE KEY ADDED	UPPER MATECUMBER		ate, Organic Removal and Backfill	$3,274,523
56	128 PLANTATION KEY	PLANTATION		Backfill and Culvert	$5,565,379
57	133 PLANTATION KEY	PLANTATION KEY	20	Backfill	$5,759,091
58	148 LOWER MATECUMBE KEY ADDED	LOWER MATECUMBE KEY	21	No Data	No Data
59	140 UPPER MATECUMBE KEY	UPPER MATECUMBER KEY	17	Weedgate, Organic Removal and Backfill	$3,631,889
60	144 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	16	Weedgate, Organic Removal, and Backfilling	$8,847,593
61	151 LOWER MATECUMBE ADDED 2	LOWER MATECUMBE KEY	9	No Data	No Data
62	124 PLANTATION KEY	PLANTATION KEY	7	Weedgate, Organic Removal and Backfill	$27,216,843
63	156 LOWER MATECUMBE KEY	LOWER MATECUMBE KEY	2	Weedgate, Organic Removal and Backfill	$2,895,566

$71 Million Cumulative $319 Million

Lower Matecumbe Culvert(s) Project – Canals 150, 151, 152, 153, 155, and 157

Culvert Technology Overview

- Connect two dead end canals with pipes to increase circulation and tidal exchange
- Proven technology with ease of permitting and implementation

- Minimal impacts to residents during construction
- Quick transformation of the water quality after installation with increased dissolved oxygen and fish life

Tasks and Timeline

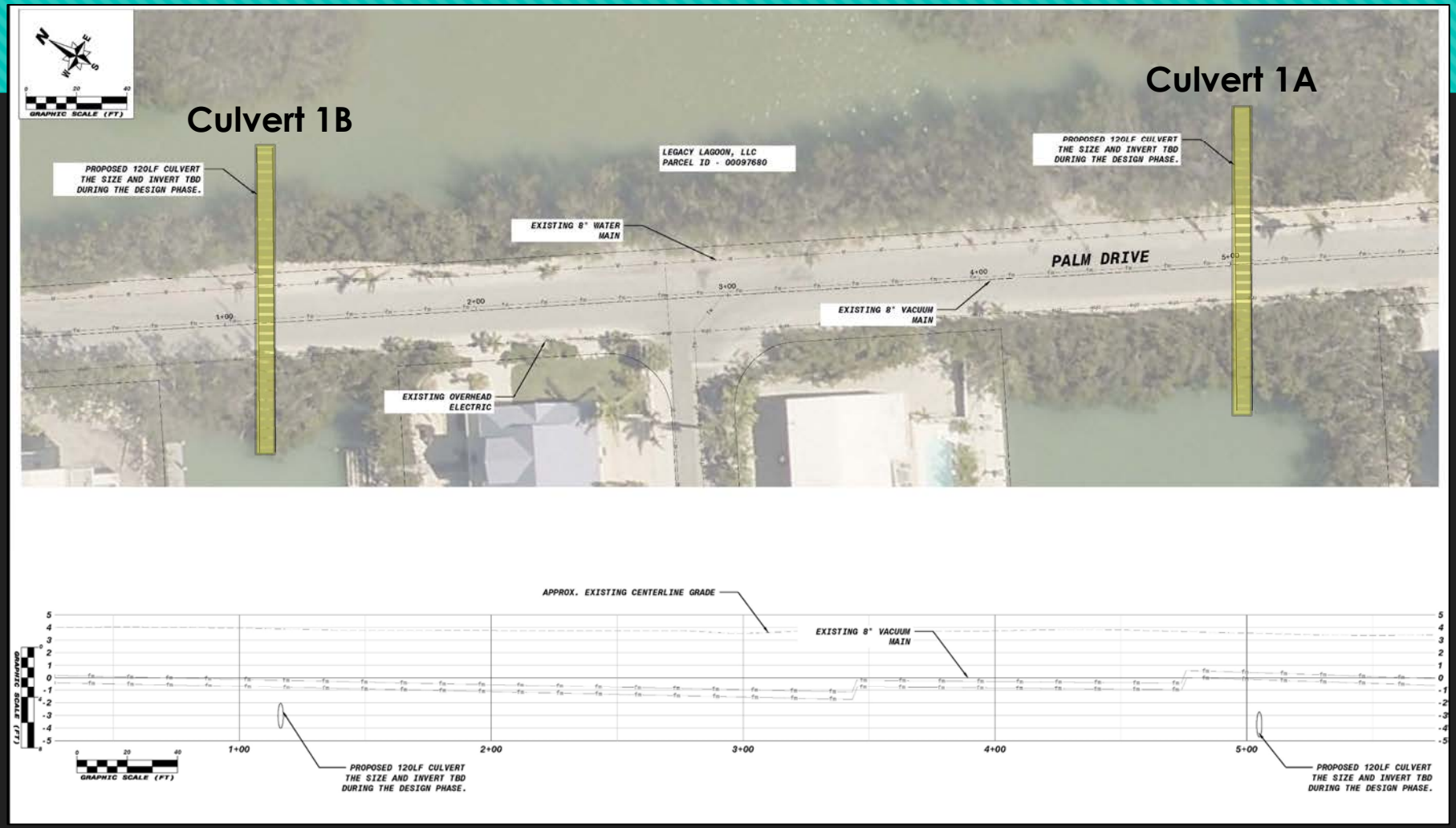
TASK	SERVICE	MONTHS	EST. COST
TASK 1	Feasibility Evaluation and Community Outreach	2 Months	$5,700
TASK 2	Data Collection / Processing	4 Months	$59,000
TASK 3	Design	6 Months	$49,000
TASK 4	Permitting	9 Months	$10,300
TASK 5	Contractor Procurement	11 Months	$4,100

Feasibility

- Determined utility type and providers within the proposed alignment
  - Telephone – AT&T
  - Fiber Optics – FDOT VI ITS
  - Water – FL Keys Aqueduct
  - Electric – FL Keys Electric Cooperative
  - Sewer – Islamorada
- Created conceptual plan and profile for the culvert locations to identify any sensitive environmental resources, utility and private property impacts

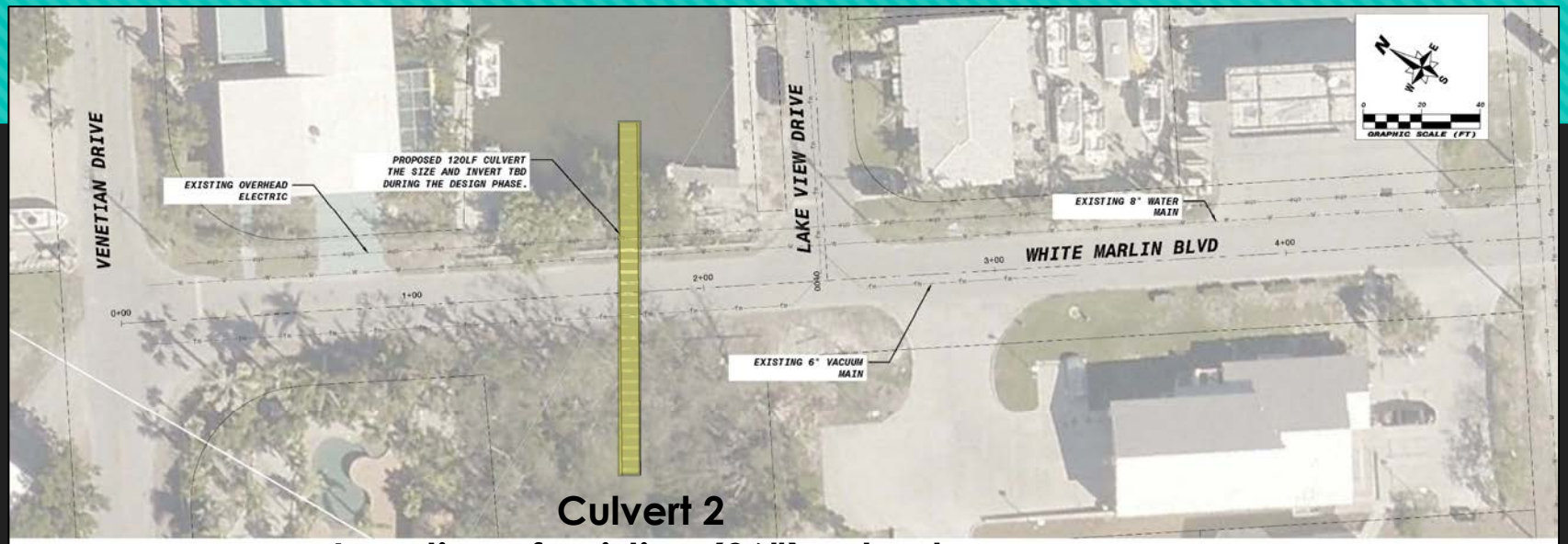
Proposed Culvert
Location #1 – Canal 153 / 155
Palm Drive

Proposed Culvert(s) - **Palm Drive**
Location #1A & 1B – Canal 153 / 155 – cont.

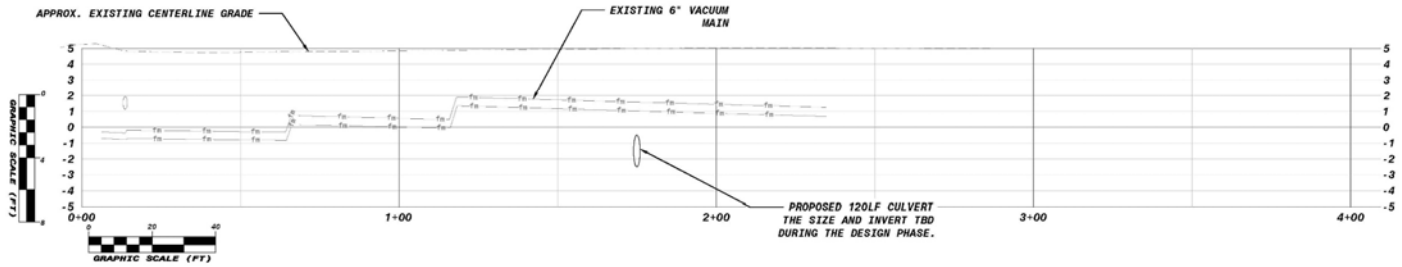


Proposed Culvert
Location #2 – Canal 152 / 153
White Marlin Blvd

Proposed Culvert - White Marlin Blvd. Location #2 – Canal 152 / 153 – cont.

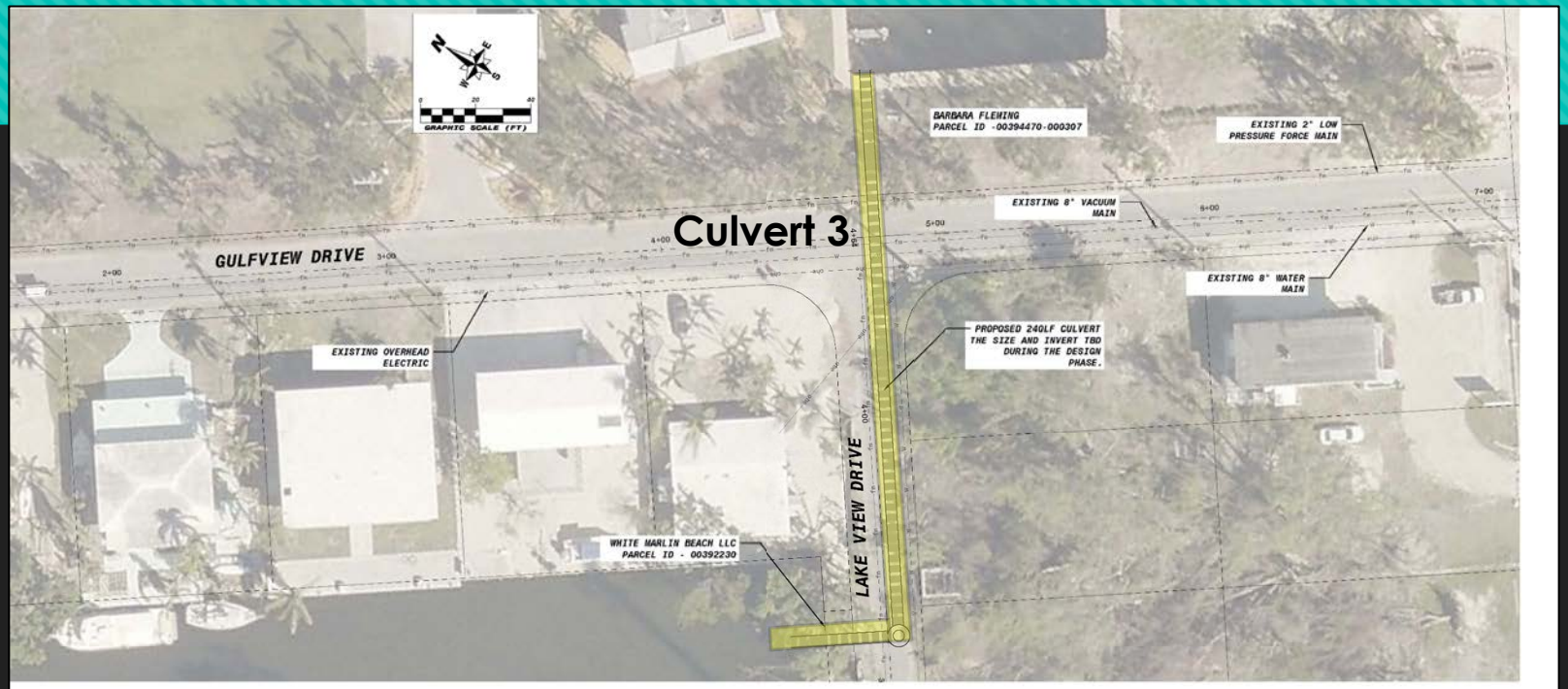


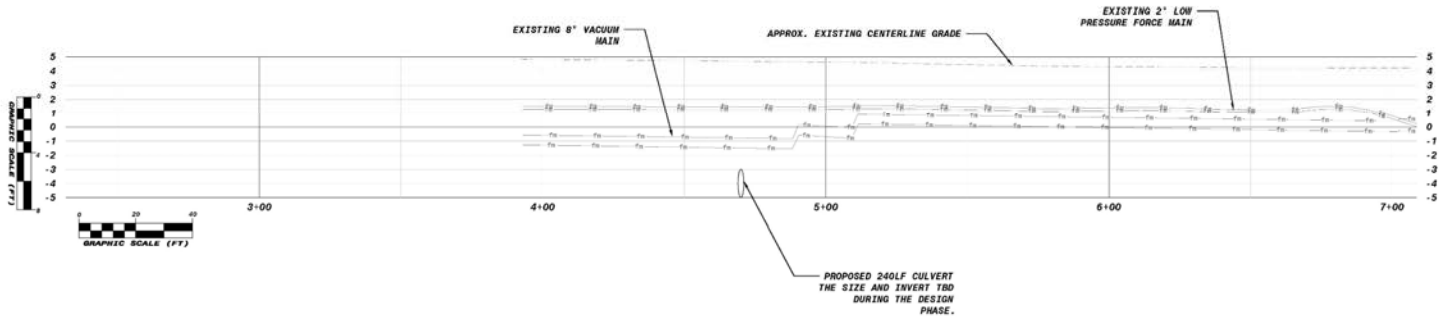
Culvert 2
Location of existing (36") culvert



Proposed Culvert – Gulfview Dr. Location #3 – Canal 150 / 152

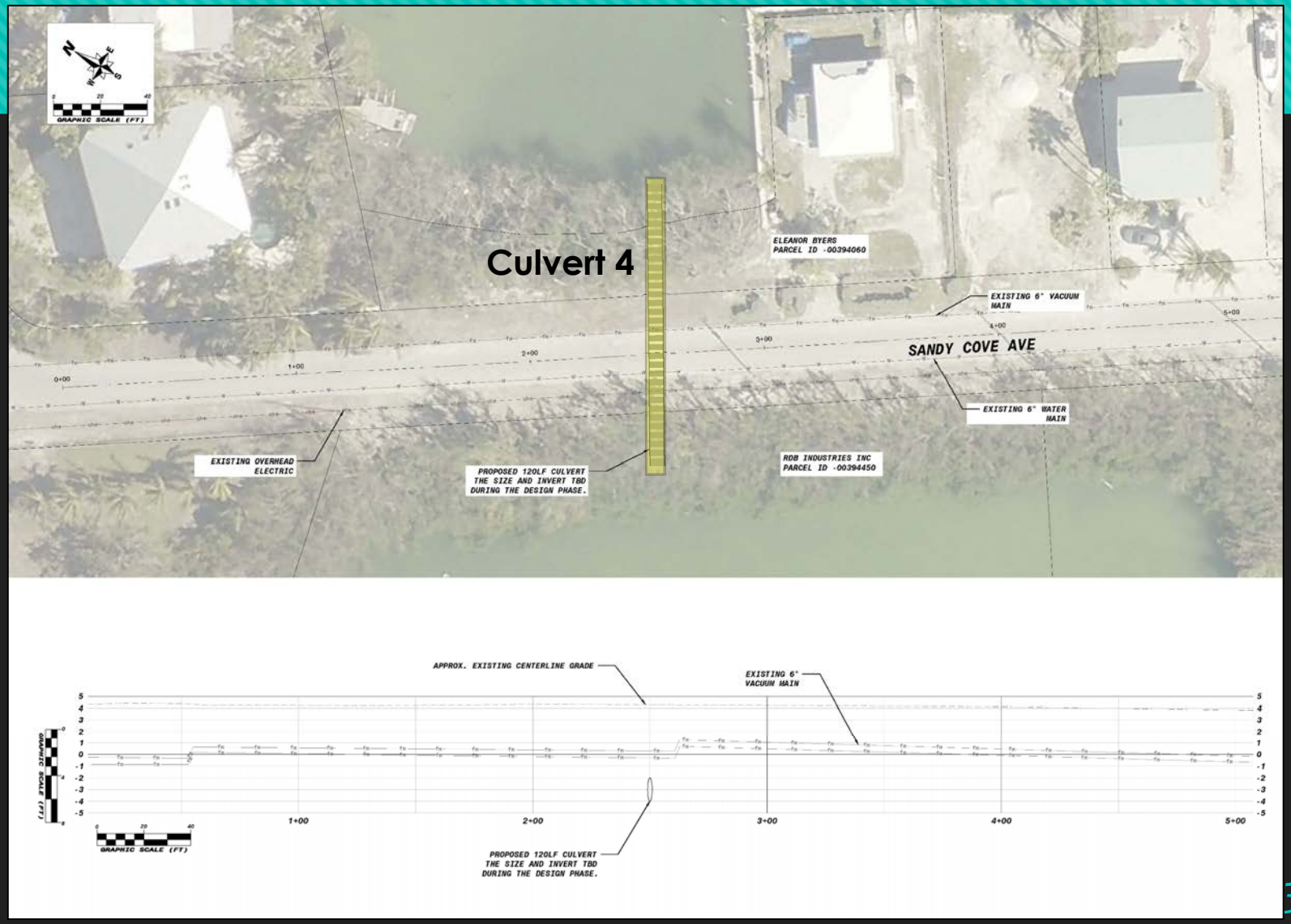
Proposed Culvert – Gulfview Dr. Location #3 – Canal 150 / 152 – cont.





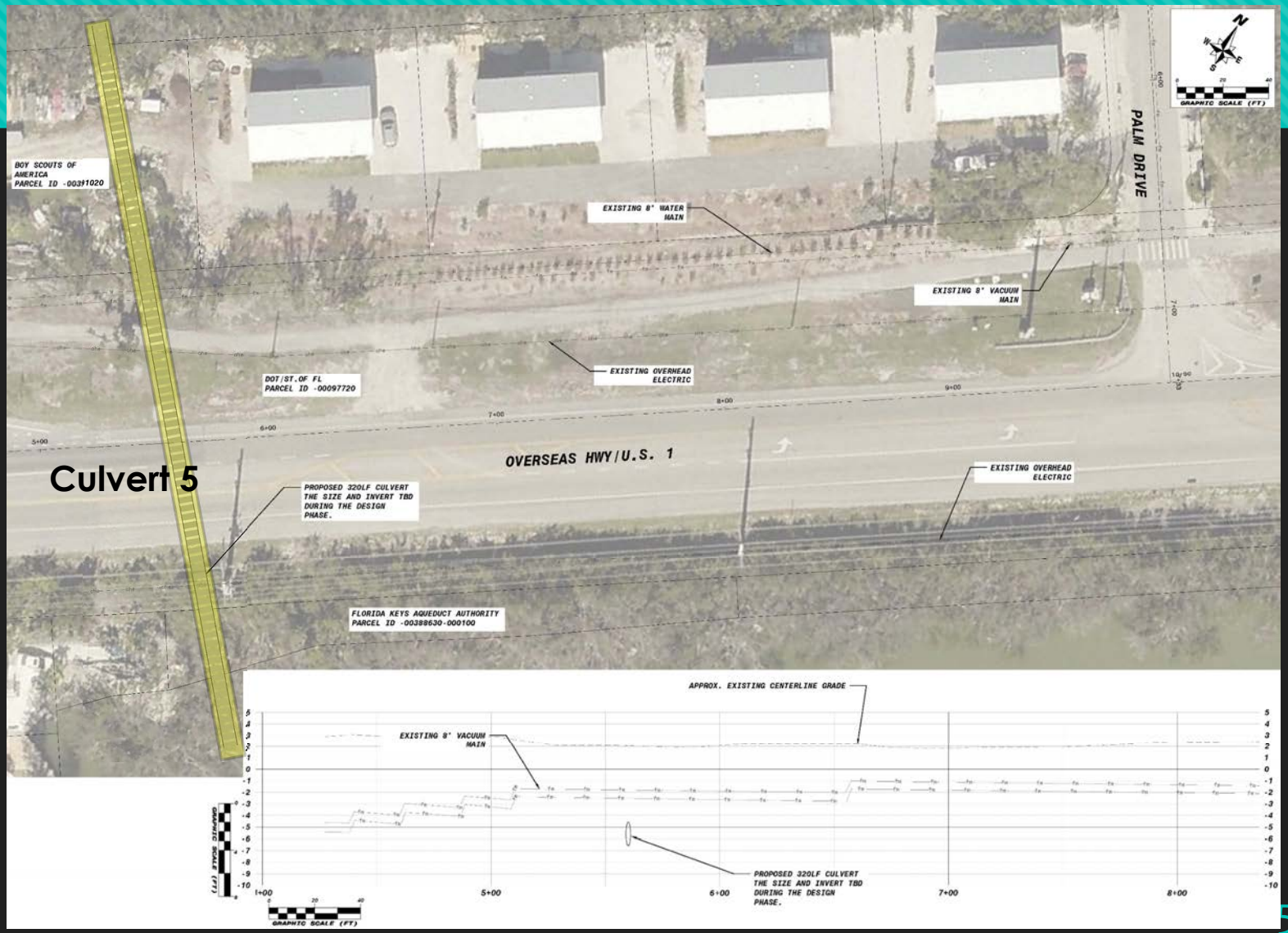
Proposed Culvert – Sandy Cove Ave. Location #4 – Canal 150 / 151

Proposed Culvert - Sandy Cove Ave. Location #4 – Canal 150 / 151 – cont.



Proposed Culvert – Under US1
Location #5 – Canal 155 / 157

Proposed Culvert - Under US1
Location #5 – Canal 155 / 157 – cont.

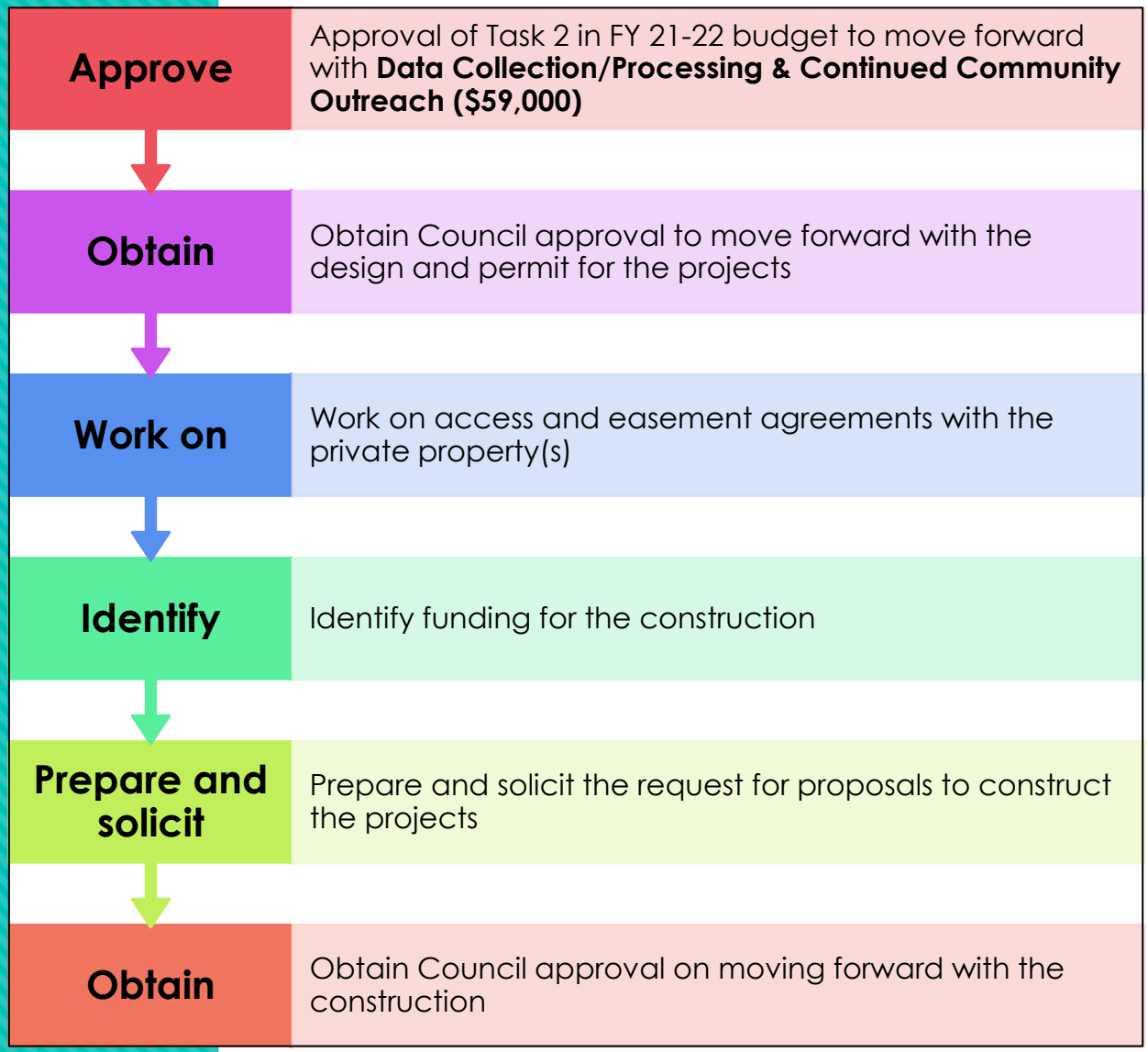


Public Outreach

- Identified the 6 private property owners for each of the culvert locations
- Sent emails and called to discuss the project and obtain feedback on the proposed projects
- *Most* property owners were amenable to the project and working with the Village on establishing access agreements for the culverts.

Culvert Location	Property Ownership (Private, Public or Both)	Access and Easement Interest (Yes or No)
#1	Both	Yes
#2	Public	Yes
#3	Both	Yes & Probable
#4	Both	Yes
#5	Both	Yes

Next Steps


Approve
Approval of Task 2 in FY 21-22 budget to move forward with **Data Collection/Processing & Continued Community Outreach ($59,000)**
Obtain
Obtain Council approval to move forward with the design and permit for the projects
Work on
Work on access and easement agreements with the private property(s)
Identify
Identify funding for the construction
Prepare and solicit
Prepare and solicit the request for proposals to construct the projects
Obtain
Obtain Council approval on moving forward with the construction

Thank You

Revised Canal Restoration Ranking Criteria

Scoring Criteria for Potential Canal Restoration Sites		Canal Name: Score	Weighting Factor	Total Score	Comments
Severity of Problem					
1A) Water Quality (scored from 0 to + 5) Scoring is based on observed water quality degradation.	If no monitoring data is available, or greater than 50 percent of the monitoring data exhibits DO saturation greater than 70 percent; the score is 0.	0	10	0	
	If less than 10 monitoring events have been completed, and 50 percent of the monitoring data exhibits a DO saturation between 42 and 70 percent; the score is 1.				
	If less than 10 monitoring events have been completed, and 50 percent of the monitoring data exhibits a DO saturation below 42 percent; the score is 2.				
	If between 2 and 10 monitoring events have been completed, and greater than 50 percent of the monitoring data exhibits a DO saturation below 42 percent; the score is 3.				
	If greater than 10 monitoring events have been completed, and greater than or equal to 3 monitoring events (or the allowable number pursuant to Table 1 of 62-303) exhibit a DO saturation less than 42 percent; the score is 5.				
	If greater than 10 monitoring events have been completed, and less than 3 monitoring events (or the allowable number pursuant to Table 1 of 62-303) exhibit a DO saturation less than 42 percent; the score is 0.				
1B) Evidence of Nutrient Accumulation (scored from 0 to +5) Scoring is based on the potential discharge of nutrient rich waters from the canals.	For canals that do not receive seaweed loads or do not exhibit elevated nutrient concentrations (evident through slime growth and reduced water clarity); the score is 0.	0	3	0	
	For canals with moderate seaweed loading, moderate slime growth, moderate water clarity, or moderate reduction in fish habitat; the score is 3.				
	For canals with heavy seaweed loading, significant visual degradation, and lack of fish habitat; the score is 5.				
1C) Likelihood of toxicity (scored from 0 to +5) Scoring is based on the likelihood of hydrogen sulfide production based on canal bathymetry.	For canals with an average depth less than 10 feet; the score is 0.	0	3	0	
	For canals with an average depth between 10 feet and 20 feet; the score is 3.				
	For canals with an average depth greater then 20 feet; the score is 5.				
Environmental Setting					
2) Connectivity to Nearshore Waters (scored from 0 to +5) Scoring is based on the potential of the canal to degrade the water quality in nearshore waters.	For canals that are connected to semi-enclosed waters such as harbors and inlets; the score is 0.	0	2	0	
	For canals that are connected to open water, but are a sufficient distance away from high flow areas such as tidal channels; the score is 3.				
	For canals that are connected to open water, and are close to high flow areas such as tidal channels; the score is 5.				

Revised Canal Restoration Ranking Criteria Cont.

Scoring Criteria for Potential Canal Restoration Sites		Canal Name: Score	Weighting Factor	Total Score	Comments
Severity of Problem					
Project Success					
3) Restoration Technology (scored from 0 to +5) Scoring is based on the potential to implement a proven technology that is capable of complete canal restoration. A technology should not be considered valid if the estimated implementation cost exceeds $2M. However, it is reasonable to assume that the implementation of multiple technologies are valid even if the project total exceeds $2M.	For canals that are only amenable to technologies that provide partial restoration; the score is 0 to 2. For canals that are only amenable to an alternative technology, such as capping or an injection well, but it is expected that a complete restoration can be achieved; the score is 3 to 4. For canals that are amenable to proven technologies, such as backfilling with or without organic sediment removal and culverts, that are expected to provide a complete restoration; the score is 5.	0	5	0	
4) Implementation Costs (scored from 0 to +5) A scoring value of 0 to 2 is associated with restoration projects that are between $2M to $25M, a scoring value of 3 to 4 is associated with restoration project between $500K and $2M and a scoring value of 5 is associated with restoration projects that can be completed for $500K or less.		0	2	0	
5) Homeowner Interest (scored from 0 to +5) A scoring value of 0 is associated with communities that have not participated in the canal meetings, or have expressed negative opinions of the canal restoration program. A scoring value of 1 to 5 is associated with very active communities that have expressed interest in participating in the canal restoration program and potentially providing financial support.		0	3	0	
6) Project "implementability" (scored from -5 to 5) This criterion accounts for factors such as staging areas, complexity of permitting issues, mitigation requirements, and potential complications with existing utilities or difficulty of access. Scoring ranges from -5 to +5, with -5 indicating very difficult to implement, 0 indicating significant difficulties in implementation, and 5 indicating relative ease of implementation.		0	3	0	
7) Public benefit (scored from 0 to +5) The public benefit criterion is related to the number of users affected by the proposed project. A value of 0 means 0-9 users (parcels) would be positively affected by the project, a value of 1 means 10-44 users would be positively affected by the project, a value of 3 means 45-79 users would be positively affected by the project, +5 indicates that 80 or more users would be positively affected.		0	1	0	
Overall Score					