

ENGINEERING REPORT

PROPOSED SARASOTA AREA  
FLOOD CONTROL DISTRICT

DECEMBER 1962

*Morgan*  
For the

BOARD OF COUNTY COMMISSIONERS  
County of Sarasota

Warren S. Henderson, Chairman

Boyd R. Gernhard

James A. Spanos

Fred Haigh

G. Johnson

It will be noted that the above scope parallels our overall assignment set out previously. The depth of treatment for this phase is tentative and preliminary, and our engineering has been limited to correspond with the needs at this time.

## II. BACKGROUND AND REFERENCES

The history of floods in recent years is common knowledge and a matter of record in many ways. Severe floods of 1957, 1958, 1959, and 1960 culminated in the disastrous flood of September 21, 1962. It is unnecessary to review here this history in detail, but suitable references will be noted.

Perhaps the most comprehensive summary of this history as it affects Phillippi Creek will be the record of the special hearing on November 30, 1962 called by the U.S. Army Corps of Engineers. In addition to recognition of various engineering reports and technical data, testimony and evidence from many local sources was spread upon the record.

The following list summarizes selected references and information sources which are deemed most pertinent to the matter, although it is by no means exhaustive:

- A. Report on Phillippi Creek Basin Flood Control (June, 1961) prepared by Smally, Wellford & Nalven, including plans referenced therein.
- B. Report on Flood Relief Study of Phillippi Creek at the Tamiami Trail (August, 1961) prepared by J.E. Greiner Company.
- C. Report on Sarasota County Coastal Basin Flood Control Study (September, 1961) prepared by Smally, Wellford & Nalven, including plans referenced therein.
- D. Supplementary plans, letter-reports and documentary material prepared by Smally, Wellford & Nalven, as appearing in the records of the Board of County Commissioners and departments of the County administration. This includes resolutions and statements prepared for federal and state agencies, and for our representatives in Congress.
- E. Report on Flood of 20-21 September 1962, Southwest Florida (November, 1962) prepared by U.S. Army Corps of Engineers.
- F. Newspaper accounts of on-the-scene events, including photographs on the ground and from the air.

- G. Reports of eye-witnesses and other competent sources as to the events that occurred and their direct and long-range impact on the community, summarized most effectively to date during the November 30, 1962 Corps of Engineers hearing.

The first four items above have been utilized by the Board of County Commissioners as the core of the officially adopted "Sarasota County Comprehensive Flood Control Plan". Various elements of this official plan have already been proven effective, such as the control of building elevations in certain flood hazzard areas and the placement of surveying monuments delineating the future right-of-way for Phillippi Creek.

### III. BOUNDARIES OF PROPOSED DISTRICT

Figure 1, on the following page, summarizes on a convenient scale the outer boundaries proposed for the District. Detailed boundaries showing the basins which would compose the District are delineated on the larger maps which supplement the report.

The proposed district boundaries are based on the following criteria:

1. Incorporating the county areas which have been most heavily damaged or threatened by floods.
2. Contiguous geographic areas as an interrelated land grouping, with land uses that are urban or are tending toward urbanization.
3. Physically related to basin hydrology, in the sense of concentration of runoff within basins and channeling through major outlets.

Water does not recognize political boundaries, unless such boundaries are artificially imposed by construction such as dikes. Areas of the City of Sarasota lie within the basins proposed, and consequently the tentative District boundaires extend into parts of the City.

The coastal areas which drain directly to nearby outfalls are excluded, because they are not part of definable basins and can be protected by local storm drainage. This applies to a major portion of the City of Sarasota which drains directly to the bay.

The following basins are included, for which commonly accepted place names consistent with previous reports have been used:

	<u>Area in Square Miles</u>
1. Phillippi Creek	58
2. Whitaker Bayou	8
3. Hudson Bayou	2
4. Matheny Creek	3
5. Elligraw Bayou	2
6. Holiday Bayou	1
7. Clower Creek	<u>1</u>
Total Area	75 Square Miles

#### IV. PROPOSED IMPROVEMENTS

The principles and criteria applied are in accordance with our previous reports to the Board which have been cited above, and will not be repeated here.

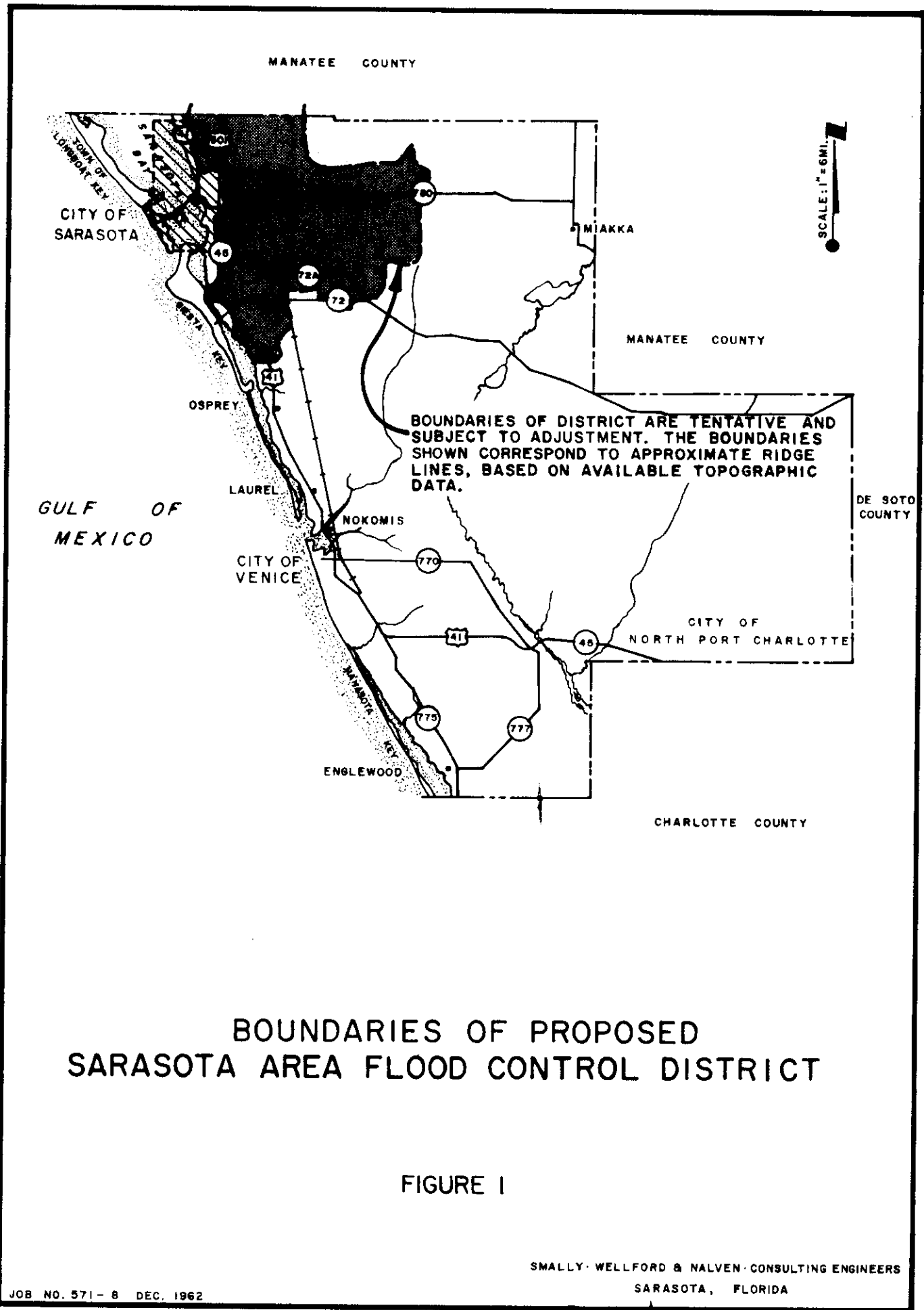
Only those improvements and structures that are required by existing conditions are included in the costs and financing developed later in this report. These apply mainly to downstream channels and built-up areas. Marginal structures would be retained for economy.

The balance of the ultimate improvements is not included. Although conceivably these could be financed by the District in years to come, it is believed that the well-established policy for unimproved lands could be followed of requiring right-of-way and construction by those that improve and subdivide the lands, in accordance with the County Comprehensive Plan. This does not imply, however, that cooperation and adjustments should never be made in keeping with equity and public policy. The powers of the District should permit reasonable flexibility.

The proposed improvements are set out on the plans which supplement the report and the cost estimates which correspond are incorporated below.

#### V. COST OF IMPROVEMENTS

Preliminary cost estimates have been made for the proposed improvements, as defined above. These estimates include both construction and right-of-way. No allowance has been made for possible federal aid, which might reduce the District's share of the total cost.



	<u>Excavation</u>	<u>Structures and Bulkheads</u>	<u>Right-of-Way</u>	<u>Total</u>
Phillippi Creek	\$469,000	\$845,000	\$800,000	\$2,114,000
Whitaker Bayou	58,000	355,000	39,000	452,000
Hudson Bayou	1,000	87,000	12,000	100,000
Matheny Creek	8,000	27,000	12,000	47,000
Elligraw Bayou	6,000	26,000	66,000	98,000
Holiday Bayou	4,000	4,000	5,000	13,000
Clower Creek	<u>23,000</u>	<u>10,000</u>	<u>46,000</u>	<u>79,000</u>
Total	\$569,000	\$1,354,000	\$980,000	\$2,903,000

Although the above estimates are necessarily approximate, they are sufficiently accurate for the purpose of exploring the order of magnitude of a bond issue which could finance the program.

#### VI. FISCAL ANALYSIS

The assumption as to financing of the proposed District which underlies this report is that the costs will be paid by levying annual assessments against all properties, on a non-exempt basis. In order to estimate the millage rate, the valuation of properties must be determined. This has been done by a systematic analysis of the records of the County Tax Assessor covering the specific lands within the District. The following table summarizes our findings, which have been rounded off in keeping with the other estimates:

#### NON-EXEMPT PROPERTY VALUATIONS

<u>Basin</u>	<u>Amount</u>
Phillippi Creek	\$ 88,000,000
Whitaker Bayou	14,000,000
Hudson Bayou	28,000,000
Matheny, Elligraw Holiday, Clower	<u>6,000,000</u>
TOTAL	\$ 136,000,000

Applying the above valuation, each mill levied in 1962 would yield \$136,000 for debt service on a bond issue.

In addition to the costs of the improvements themselves, a complete fiscal analysis must include one-time expenses such as legal and financing fees for a bond issue. Annual income must provide for maintenance and operation expenses, which are assumed to average \$50,000 per year.

Equipment must be utilized for maintenance and operation, which could be either purchased or leased. For the purpose of this analysis \$150,000 worth of equipment is assumed to be purchased, the funds for which are included in the bond issue.

The following table summarizes the elements that are included in a bond issue that could finance the District:

PROPOSED BOND ISSUE

Construction Costs

Excavation	\$	569,000	
Structures		<u>1,354,000</u>	\$1,923,000
Engineering			96,000
Capitalized Maintenance Equipment			150,000
Maintenance and Operation, First Year			50,000
Acquisition of Right-of-Ways			980,000
Legal, Financing & Miscellaneous			150,000
Contingencies			<u>151,000</u>
		TOTAL	\$3,500,000

Although it is not necessary to determine the final features of the proposed bond issue, for which the assistance of a qualified fiscal agent should be enlisted, it is important to demonstrate the general features of suitable financing. Therefore a financial forecast has been developed based on a 20 year bond issue at 4 percent interest, to be secured by general obligation bonds applying to the District.

DEBT SERVICE SCHEDULE

\$3,500,000 - 20 YEAR BOND ISSUE - 4% INTEREST

IN \$1,000'S

<u>Year of District Operation</u>	<u>Income Required</u>	<u>Operation and Maintenance</u>	<u>Debt Service</u>	<u>Bonds Outstanding</u>	<u>Interest</u>	<u>Principal Payments</u>
1	308	50	258	3,500	140	118
2	"	"	"	3,382	135	123
3	"	"	"	3,259	130	128
4	"	"	"	3,131	125	133
5	"	"	"	2,998	120	138
6	"	"	"	2,860	114	144
7	"	"	"	2,716	109	149
8	"	"	"	2,567	103	155
9	"	"	"	2,412	96	162
10	"	"	"	2,250	90	168
11	"	"	"	2,082	83	175
12	"	"	"	1,907	76	182
13	"	"	"	1,725	69	189
14	"	"	"	1,536	61	197
15	"	"	"	1,339	54	204
16	"	"	"	1,135	45	213
17	"	"	"	922	37	221
18	"	"	"	701	28	230
19	"	"	"	471	19	239
20	"	"	"	232	9	232

This debt service schedule indicates that an initial 2½ mill assessment (based on 1962 valuations) would be required to service the \$3,500,000 bond issue. While operation and maintenance costs might rise during the life of the bond issue, future construction will cause a greatly increased valuation base. Even allowing for a possibility of some annual improvement costs not financed by developers, the net effect should result in a long-term annual reduction of millage assessments.

VII. FEDERAL AID

The District Engineer of the U.S. Army Corps of Engineers has been allocated funds by Congress for a study of Phillippi Creek, which is now in process. In order to qualify for construction assistance the project would be recommended by the Corps only if the benefit-to-cost ratio were found to be favorable in accordance with their established formulas and procedures.



It was made apparent at the November 30, 1962 hearing held by the Corps in Sarasota that the earliest possibility of federal funds to assist construction would be in fiscal year 1965. In any event Congress must appropriate funds specifically for such a project. There is no assurance that Congress would approve successive appropriations, nor any way of foretelling how much of the overall project needs in the large basin would be recommended by the Corps of Engineers and approved by Congress.

Whether or not federal aid is ever forthcoming, it is necessary to organize a procedural framework which will be prepared to cooperate with the Corps of Engineers and to furnish the local share of funds that are necessary. Federal assistance at most would apply to a major portion of construction costs. The balance of construction costs and all of the costs of land acquisition would fall upon local interests. The possibility of federal assistance should expedite, not delay, the formation of a District.

No meaningful predictions of the amount of possible federal funds is possible until the extent of involvement in the basin is determined. Moreover, federal aid would automatically call for plans to be prepared by the Corps of Engineers which might differ in some degree from our preliminary plans to date.

The bond issue outlined in this report could be of the "open-end" type, which would permit floating of bonds by increments up to the maximum authorized. The District could thus stage financing and construction in accordance with the course of future actions by the Corps of Engineers and Congress.

#### VIII. CONCLUSIONS AND RECOMMENDATIONS

Formation of a Flood Control District to include 75 square miles of northwest Sarasota County would establish the framework for effective alleviation of floods that continue to inflict hardship and injure the economy. The framework of the District should provide for flexible action, proceeding by stages, and compatibility with both independent action and federal aid.

The proposed improvement within the District could be financed by a bond issue of approximately \$3,500,000, without allowance for federal aid. Based on a 20 year general obligation issue at 4 percent interest and allowing for annual maintenance and operation expenses, an initial assessment of about 2½ mills would apply to properties within the District. This millage rate should drop steadily as new construction, which will be encouraged by the improvements, increases the total valuations. Property values should be protected and enhanced by the removal of economic blight caused by flood hazard within the District.

The bond issue could be of the open-end type, permitting staging of engineering and construction. The timing could allow for the possibility of federal aid as future actions of the Corps of Engineers and Congress may reveal. Any federal aid should reduce the millage required.

There are probably more worthwhile projects which fail to materialize because of differences over methods than outright opposition. The proposed District would permit action to begin now whether or not federal aid might become available some years in the future. The procedures necessary to establish an entity as large and important as the District necessarily require a spirit of compromise among all parties, in the public interest.

If the Board of County Commissioners desire to move forward with this matter, the following steps appear to be in order at this time:

1. Delineate the boundaries of the proposed District in a form suitable for legal descriptions.
2. Engage a fiscal agent to cooperate with the County Attorney and the County's Consulting Engineers in the preparation of a formal presentation to the freeholders within the proposed District, leading to an election. This election could be based on an open-end bond issue equivalent to that outlined in this report or on some form of millage limitation.

#### IX. ATTACHMENTS

The following plans have been prepared specifically for this report.

- E-571-134 Drainage Improvements, Phillippi Creek Basin
- E-571-135 Drainage Improvements, Whitaker & Hudson Bayou Basins
- E-571-136 Drainage Improvements, Holiday Bayou & Matheny Creek, Elligraw Bayou, Clower Creek Basins
- E-571-137 Boundaries of Proposed Flood Control District.

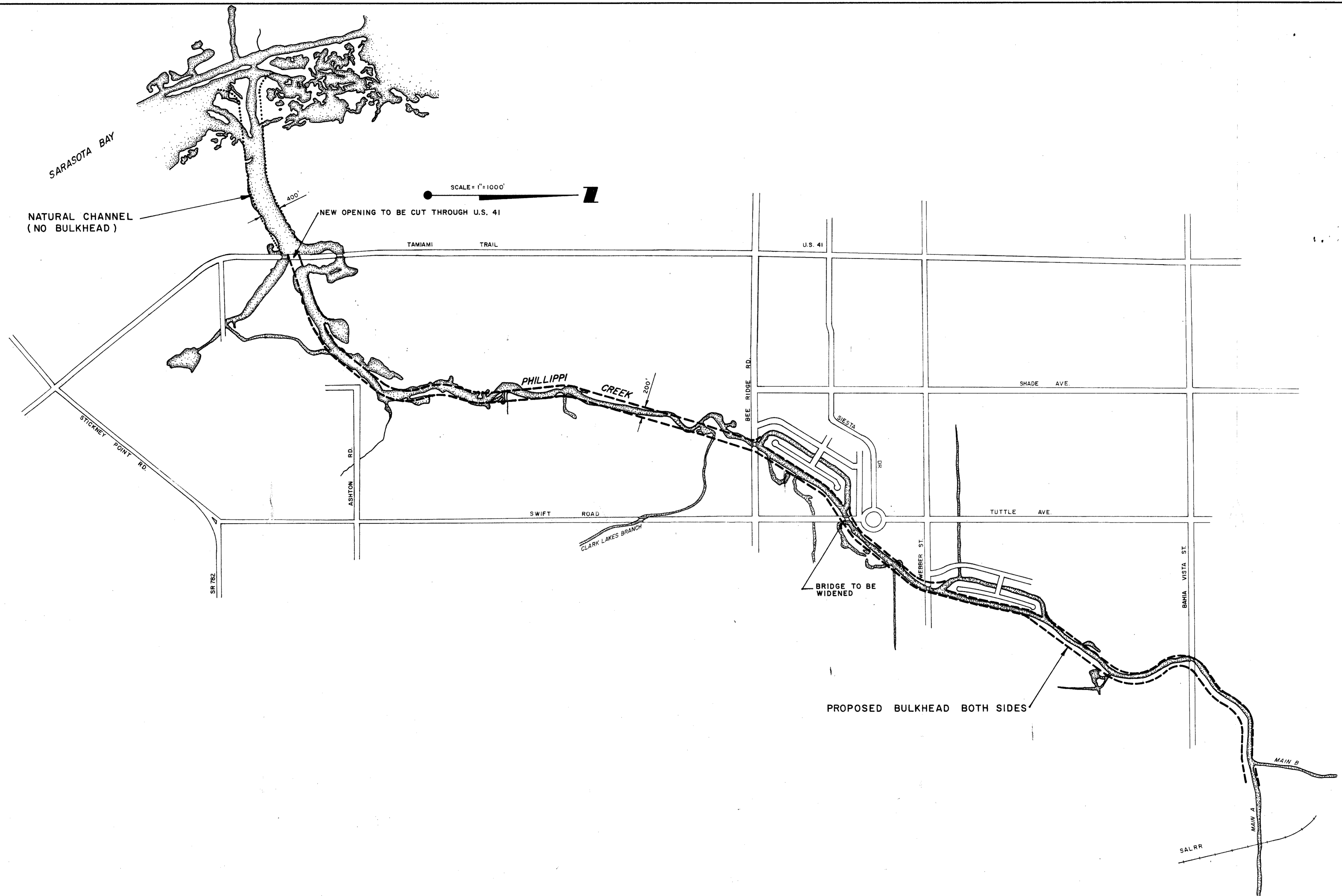
Respectfully submitted,

SMALLY, WELLFORD & NALVEN  
Consulting Engineers



Donald J. Smally, P.E.

DJS/lte



**LEGEND**

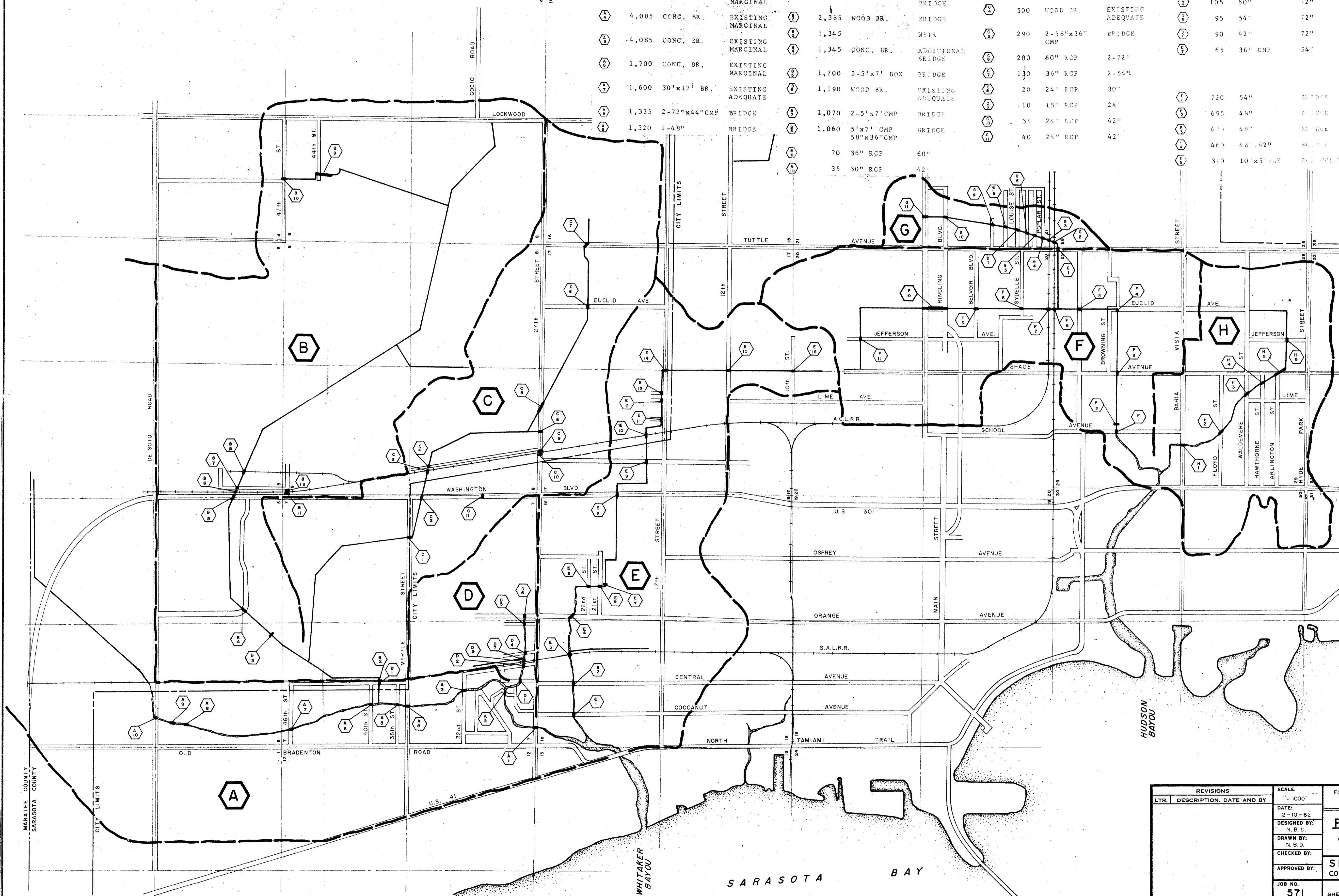
- PROPOSED BULKHEADED CHANNEL
- BRIDGE
- NATURAL CHANNEL (NO BULKHEAD)

<b>REVISIONS</b> LTR. DESCRIPTION, DATE AND BY		SCALE: 1" = 1000' DATE: 12-10-62 DESIGNED BY: N.E.D. DRAWN BY: N.E.D. CHECKED BY: APPROVED BY: JOB NO. 571	FOR: BOARD OF COUNTY COMMISSIONERS SARASOTA COUNTY, FLORIDA  <b>PROPOSED DRAINAGE IMPROVEMENTS</b> PHILLIPPI CREEK BASIN  <b>SMALLY · WELLFORD &amp; NALVEN</b> CONSULTING ENGINEERS — SARASOTA, FLORIDA
		SHEET 1 OF 4	DRAWING NUMBER E-571-134

SCALE: 1" = 1000'

STRUCTURE SCHEDULE

REFERENCE KEY NUMBER	AREA DRAINED ACRES	EXISTING STRUCTURE	PROPOSED STRUCTURE	REFERENCE KEY NUMBER	AREA DRAINED ACRES	EXISTING STRUCTURE	PROPOSED STRUCTURE	REFERENCE KEY NUMBER	AREA DRAINED ACRES	EXISTING STRUCTURE	PROPOSED STRUCTURE	REFERENCE KEY NUMBER	AREA DRAINED ACRES	EXISTING STRUCTURE	PROPOSED STRUCTURE
1	4,785	30'x12' BR	EXISTING MARGINAL	1	1,300	18'x9' BR.	BRIDGE	2	680	17'x10.5' BR.	ADDITIONAL BRIDGE	3	175	60" CMP	2-72"
2	4,335	CONC. BR.	EXISTING MARGINAL	3	2,385	30'x8' BR.	ADDITIONAL BRIDGE	4	555	7'x7' RCP	BRIDGE	5	170	60" RCP	2-72"
3	4,085	CONC. BR.	EXISTING MARGINAL	4	2,385	WOOD BR.	BRIDGE	6	500	WOOD BR.	EXISTING ADEQUATE	7	170	WOOD BR.	EXISTING ADEQUATE
4	4,085	CONC. BR.	EXISTING MARGINAL	5	1,345	WEIR	WEIR	8	500	WOOD BR.	EXISTING ADEQUATE	9	105	60"	72"
5	4,085	CONC. BR.	EXISTING MARGINAL	6	1,345	CONC. BR.	ADDITIONAL BRIDGE	10	290	2-58"x36" CMP	BRIDGE	11	95	54"	72"
6	1,700	CONC. BR.	EXISTING MARGINAL	7	1,200	2-5'x7' BOX	BRIDGE	12	200	60" RCP	2-72"	13	90	42"	72"
7	1,600	30'x12' BR.	EXISTING ADEQUATE	8	1,190	WOOD BR.	EXISTING ADEQUATE	14	130	36" RCP	2-54"	15	65	36" CMP	54"
8	1,335	2-72"x44" CMP	BRIDGE	9	1,070	2-5'x7' CMP	BRIDGE	16	20	24" RCP	30"	17	720	54"	BRIDGE
9	1,320	2-48"	BRIDGE	10	1,060	5'x7' CMP 58"x36" CMP	BRIDGE	18	10	15" RCP	24"	19	695	48"	BRIDGE
				11	70	36" RCP	60"	19	35	24" RCP	42"	20	670	48"	BRIDGE
				12	35	30" RCP	42"	20	40	24" RCP	42"	21	470	48", 42"	BRIDGE
								21				22	390	10'x5' BOX	BRIDGE

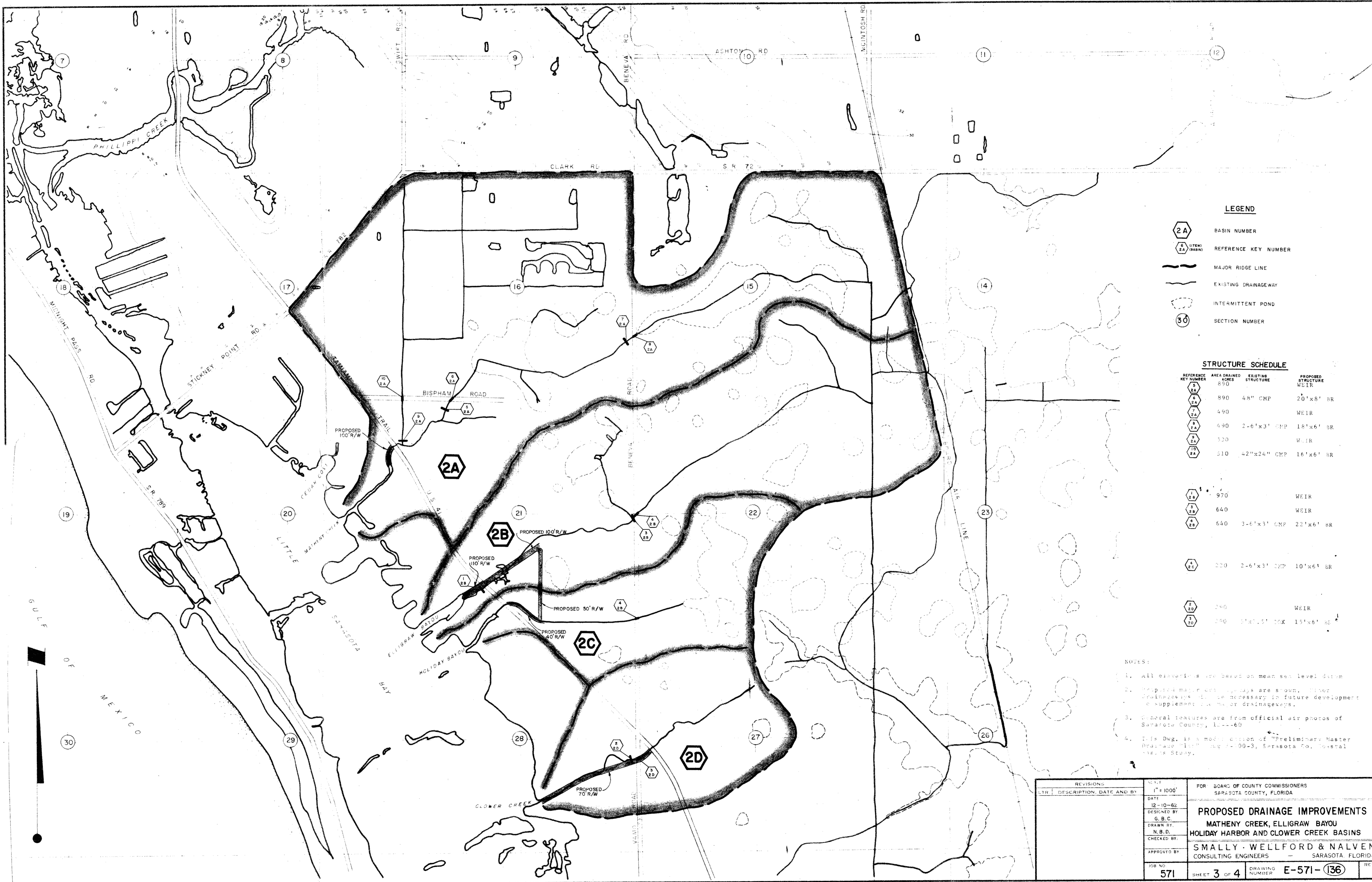


23	380	10'x5' BOX	BOX CULV.
24	380		WEIR
25	300	7'x7' BOX	BOX CULV.
26	230	60" RCP	BRIDGE
27	215	36" RCP	2-72"
28	200	48"	2-72"
29	190	36"	2-72"
30	185	42"	2-72"
31	145	42"	72"
32	80	30" RCP	60"
33	30	48" RCP	EXISTING ADEQUATE
34	780	10'x7' BOX	BRIDGE
35	780		WEIR
36	725	40'x12' BR.	EXISTING ADEQUATE
37	685	3-30"	BRIDGE
38	565	CONC. BR.	EXISTING ADEQUATE
39	420	54"	BRIDGE
40	415	2-36"	BRIDGE
41	385	2-36"	BRIDGE
42	290	2-36"	BRIDGE
43	245	2-30"	2-72"
44	80	30"	60"
45	115	58"x36" CMP	72"
46	100	36"	72"
47	95	36"	12"
48	90	36"	72"
49	85	36"	72"
50	80	36"	60"
51	75	30"	60"
52	70	30"	60"
53	65	24"	54"
54	40	36"	48"
55	30	30"	42"
56	320	10'x7' BOX	EXISTING ADEQUATE
57	285	10'x5' BOX	EXISTING ADEQUATE
58	245	72" RCP	2-72"
59	230	72" CMP	2-72"
60	155	72" CMP	2-60"
61	85	42"	72"

**LEGEND**  
 E BASIN LETTER  
 1 (BASIN) REFERENCE KEY NUMBER  
 --- MAJOR RIDGE LINE  
 --- EXISTING DRAINAGEWAY

<b>REVISIONS</b>		SCALE: 1" = 1000'	FOR: BOARD OF COUNTY COMMISSIONERS SARASOTA COUNTY, FLORIDA
LTR.	DESCRIPTION, DATE AND BY	DATE: 12-10-62	<b>PROPOSED DRAINAGE IMPROVEMENTS</b> WHITEAKER BAYOU AND HUDSON BAYOU BASINS <b>SMALLY, WELLFORD &amp; NALVEN</b> CONSULTING ENGINEERS - SARASOTA, FLORIDA
		DESIGNED BY: N. B.L.	
		DRAWN BY: N. B.D.	
		CHECKED BY:	
		APPROVED BY:	
JOB NO. 571	SHEET 2 OF 4	DRAWING NUMBER E-571 - 135	REV.





**LEGEND**

- 2A BASIN NUMBER
- 8  
2A REFERENCE KEY NUMBER
- MAJOR RIDGE LINE
- EXISTING DRAINAGEWAY
- INTERMITTENT POND
- 30 SECTION NUMBER

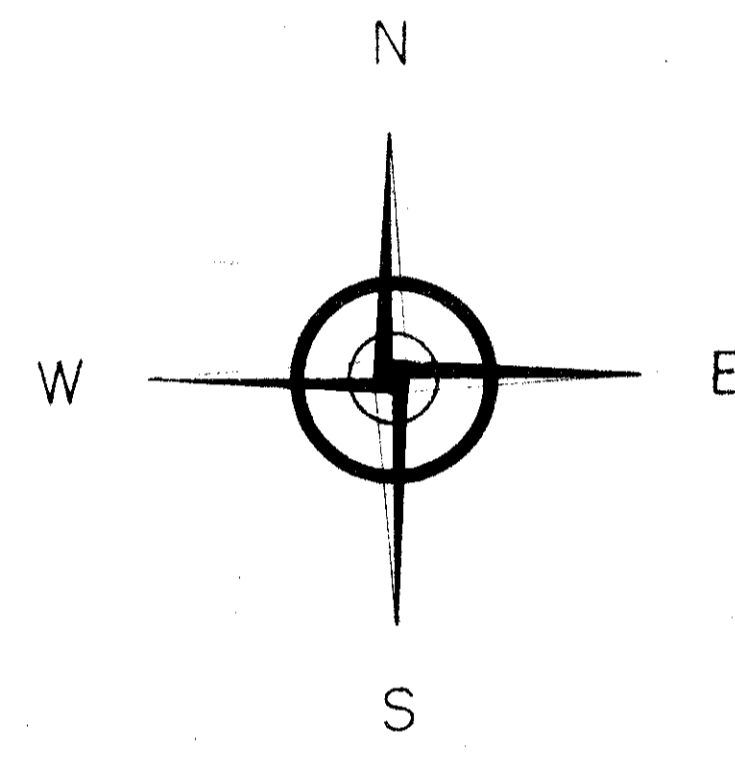
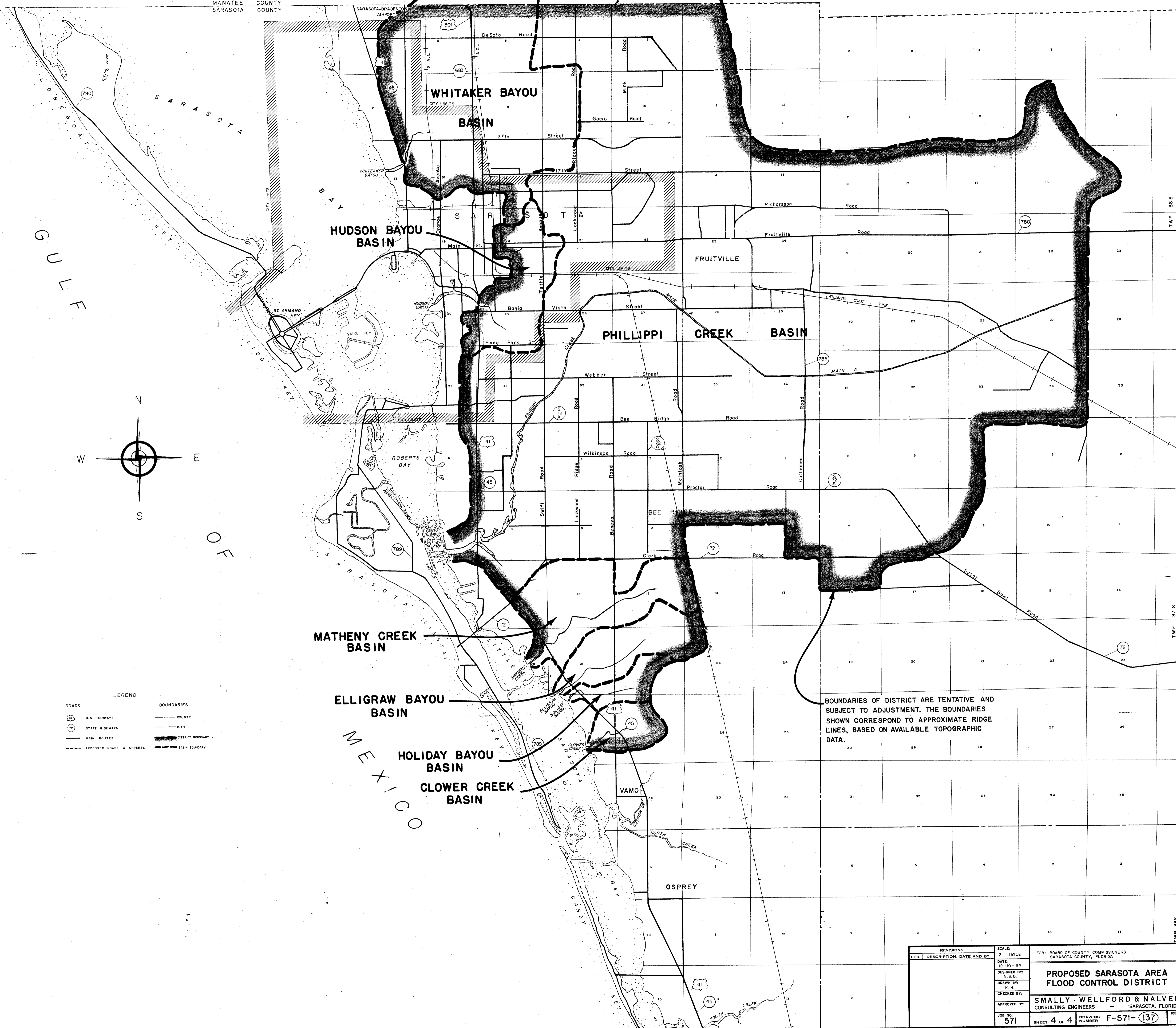
**STRUCTURE SCHEDULE**

REFERENCE KEY NUMBER	AREA DRAINED ACRES	EXISTING STRUCTURE	PROPOSED STRUCTURE
<span style="border: 1px solid black; padding: 2px;">5 2A</span>	890		WEIR
<span style="border: 1px solid black; padding: 2px;">6 2A</span>	490	48" CMP	20'x8' BR
<span style="border: 1px solid black; padding: 2px;">7 2A</span>	490		WEIR
<span style="border: 1px solid black; padding: 2px;">8 2A</span>	490	2-6'x3' CMP	18'x6' BR
<span style="border: 1px solid black; padding: 2px;">9 2A</span>	520		WEIR
<span style="border: 1px solid black; padding: 2px;">10 2A</span>	510	42"x24" CMP	16'x6' BR
<span style="border: 1px solid black; padding: 2px;">11 2B</span>	970		WEIR
<span style="border: 1px solid black; padding: 2px;">12 2B</span>	640		WEIR
<span style="border: 1px solid black; padding: 2px;">13 2B</span>	640	3-6'x3' CMP	22'x6' BR
<span style="border: 1px solid black; padding: 2px;">14 2C</span>	200	2-6'x3' CMP	10'x6' BR
<span style="border: 1px solid black; padding: 2px;">15 2D</span>	240		WEIR
<span style="border: 1px solid black; padding: 2px;">16 2D</span>	240	3'x1.5' BOX	15'x6' BR

- NOTES:**
- All elevations are based on mean sea level datum.
  - Proposed major drainageways are shown. Other drainageways, where necessary in future development, to supplement the major drainageways.
  - General features are from official air photos of Sarasota County, 1955-60.
  - This Dwg. is a modification of "Preliminary Master Drainage Plan" Map 1-100-3, Sarasota Co., Coastal Drainage Study.

REVISIONS:	SCALE:	FOR BOARD OF COUNTY COMMISSIONERS SARASOTA COUNTY, FLORIDA
DATE	1" = 1000'	
DESIGNED BY	DATE	<b>PROPOSED DRAINAGE IMPROVEMENTS</b> MATHENY CREEK, ELLIGRAW BAYOU HOLIDAY HARBOR AND CLOWER CREEK BASINS
DESIGNED BY	DATE	
DRAWN BY	DATE	SMALLY · WELLFORD & NALVEN CONSULTING ENGINEERS SARASOTA, FLORIDA
DRAWN BY	DATE	
CHECKED BY	DATE	JOB NO. 571 SHEET 3 OF 4 DRAWING NUMBER E-571-(136) REV.
CHECKED BY	DATE	
APPROVED BY	DATE	
APPROVED BY	DATE	





**LEGEND**

	U.S. HIGHWAYS		COUNTY
	STATE HIGHWAYS		CITY
	MAIN ROUTES		DISTRICT BOUNDARY
	PROPOSED ROADS & STREETS		BASIN BOUNDARY

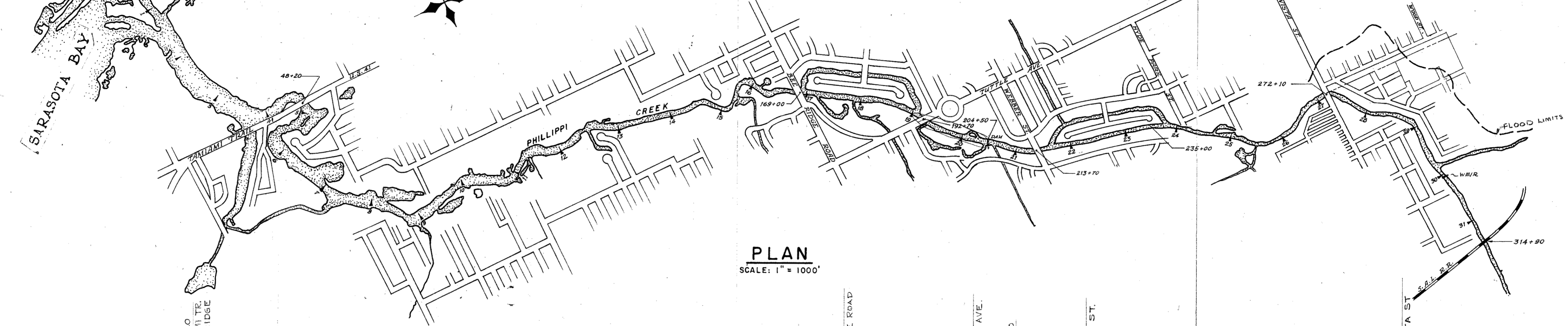
BOUNDARIES OF DISTRICT ARE TENTATIVE AND SUBJECT TO ADJUSTMENT. THE BOUNDARIES SHOWN CORRESPOND TO APPROXIMATE RIDGE LINES, BASED ON AVAILABLE TOPOGRAPHIC DATA.

REVISIONS		SCALE: 2" = 1 MILE	FOR: BOARD OF COUNTY COMMISSIONERS SARASOTA COUNTY, FLORIDA
LTR.	DESCRIPTION, DATE AND BY	DATE: 12-10-62	
		DESIGNED BY: N.S.C.	<b>PROPOSED SARASOTA AREA FLOOD CONTROL DISTRICT</b>
		DRAWN BY: K.H.	
		CHECKED BY:	SMALLY, WELLFORD & NALVEN CONSULTING ENGINEERS - SARASOTA, FLORIDA
		APPROVED BY:	
		JOB NO. 571	REV.
		SHEET 4 OF 4	DRAWING NUMBER F-571-(137)

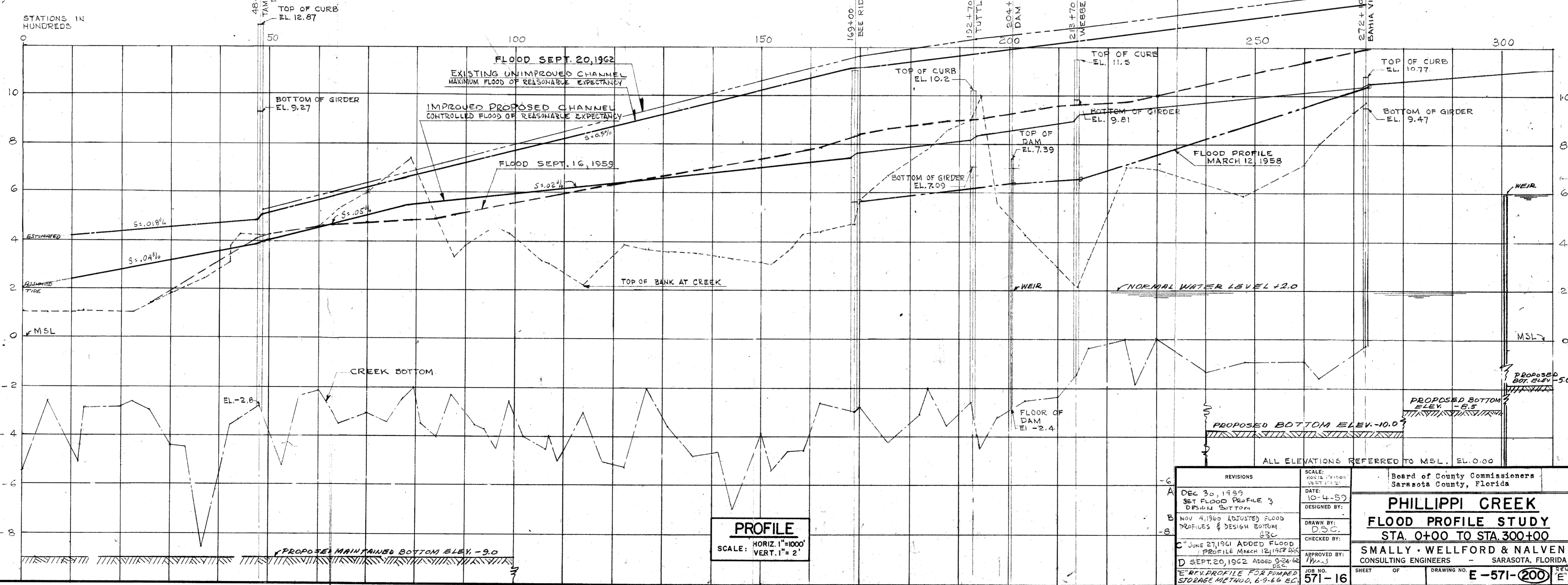


0+00  $\frac{1}{2}$  of INTRACOASTAL WATERWAY

REFERENCE  
PHILLIPPI CREEK FLOOD CONTROL STUDY  
DWGS. E-571-1 THRU 11



**PLAN**  
SCALE: 1" = 1000'



**PROFILE**  
SCALE: HORIZ. 1" = 1000'  
VERT. 1" = 2'

REVISIONS		SCALE:	Board of County Commissioners Sarasota County, Florida	
A	DEC 30, 1959 SET FLOOD PROFILE 3 DESIGN BOTTOM	HORIZ. 1" = 1000' VERT. 1" = 2'	DATE:	10-4-59
B	NOV 4, 1960 (ADJUSTED FLOOD PROFILES & DESIGN BOTTOM	DESIGNED BY:	D.S.C.	
C	JUNE 27, 1961 ADDED FLOOD PROFILE MARCH 12, 1958	DRAWN BY:	D.S.C.	
D	SEPT 20, 1962 ADDED FLOOD PROFILE FOR PUMPED STORAGE METHOD, 6-9-66 EC.	CHECKED BY:		
		APPROVED BY:	SMALLY - WELLFORD & NALVEN CONSULTING ENGINEERS - SARASOTA, FLORIDA	
		JOB NO.	571-16	SHEET OF DRAWING NO. E-571-(200)

EXHIBIT "F"