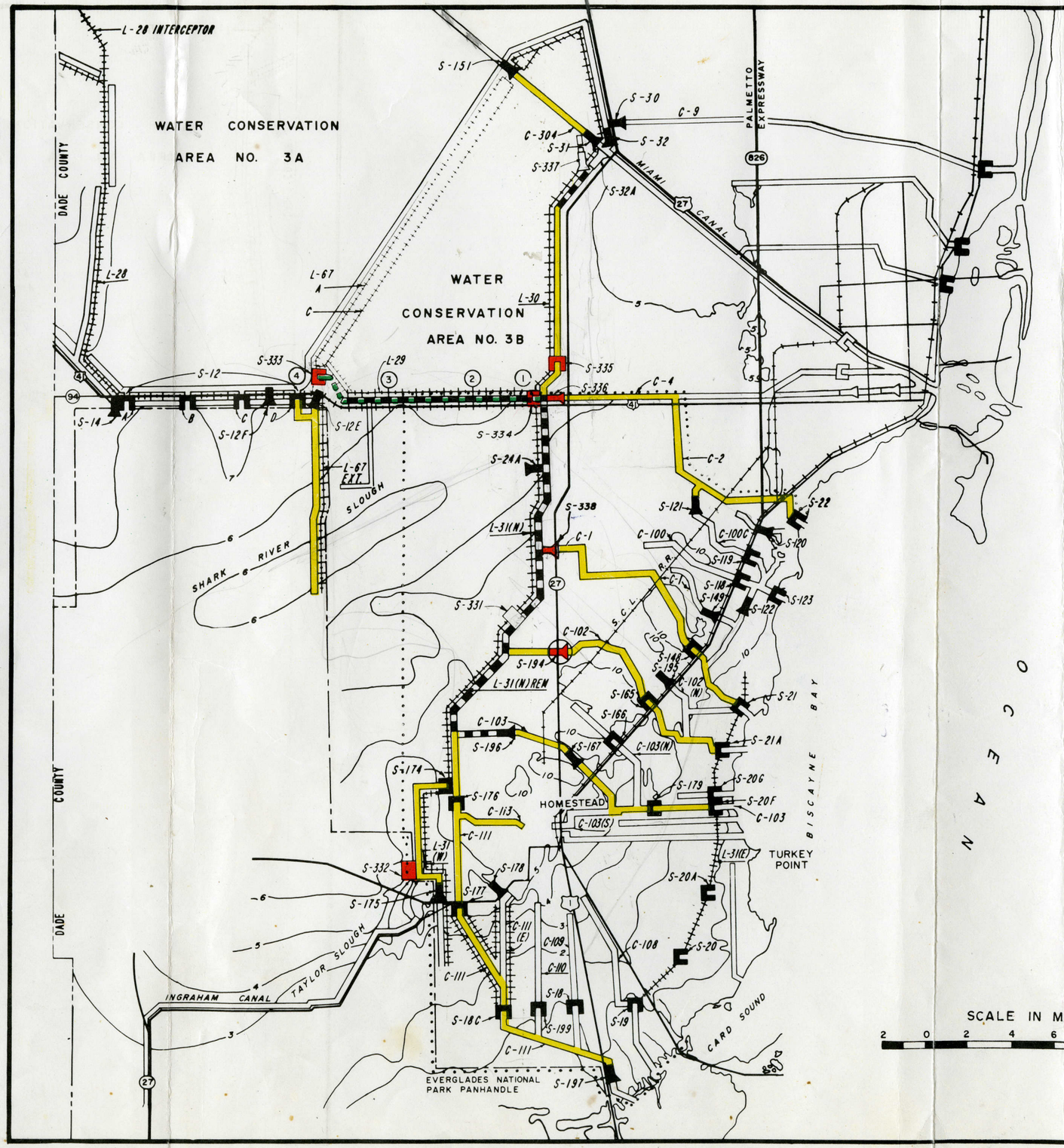


CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

PLAN
CONVEYANCE CANALS TO EVERGLADES NATIONAL PARK AND SOUTH DADE CO.

SCALES AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO., PART V, SUPP. 55, DATED AUGUST, 1974
FILE NO. 400-31,829

Dade Co

PLATE 1

ITEMS TO BE COVERED IN THIS REPORT:

LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT
PUMPING STATION 332
SPILLWAY STRUCTURES 333, 334, AND 335
CULVERTS 194 (MOD), 336, AND 338

CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

LOCATION OF PROPOSED WORK

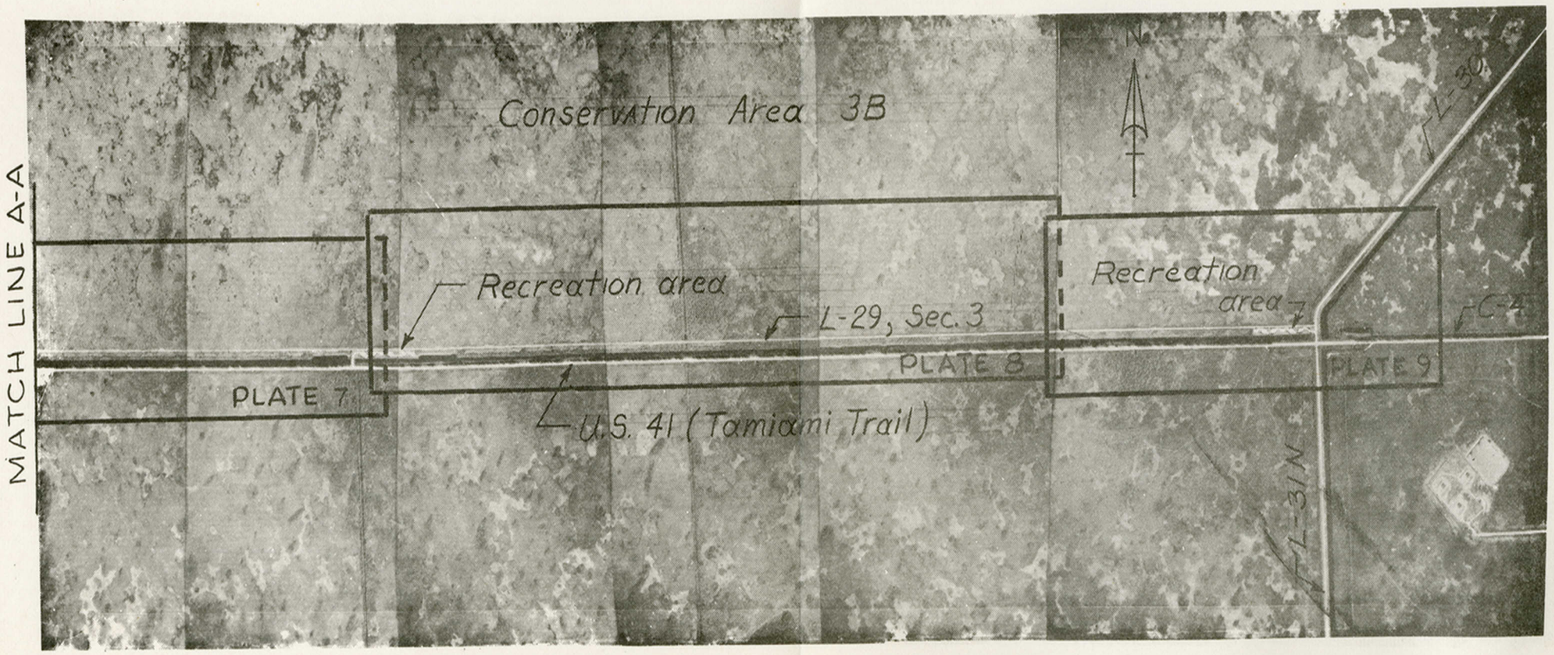
SCALE IN MILES

5 0 5 10 15 20 25 30 35

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

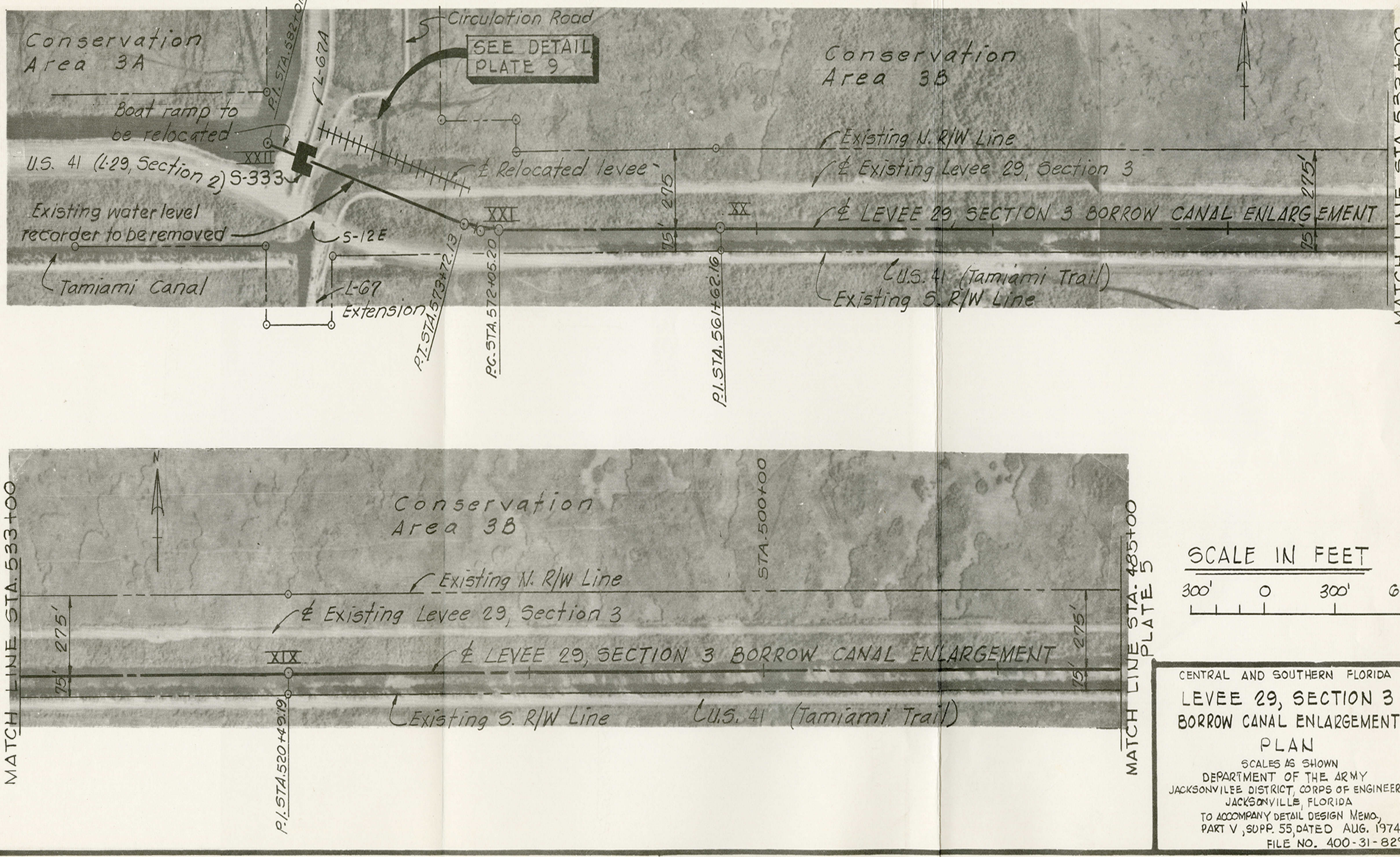
TO ACCOMPANY DETAIL DESIGN MEMO.
PART: V , SUPP. 55 , DATED: AUGUST 1974
, FILE NO. 400-31,829

PLATE 2



CENTRAL AND SOUTHERN FLORIDA
LEVEE 29, SECTION 3
BORROW CANAL ENLARGEMENT
PHOTO PLAN INDEX
SCALE IN FEET
2000 0 2000 4000

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED. AUG. 1974
FILE NO. 400-31-829



SCALE IN FEET

300' 0 300' 600'

CENTRAL AND SOUTHERN FLORIDA

LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

PLAN

SCALES AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO., PART V, SUPP. 55, DATED AUG. 1974
FILE NO. 400-31-829

PLATE 4

MATCH LINE STA. 485+00

STA. 460+00

STA. 440+00

Conservation
Area 3B

Existing N. R/W Line

℄ Existing Levee 29, Section 3

Recreation area

Bridge
STA. 427+50

P.I. STA. 425+15.20

P.I. STA. 424+15.07

MATCH LINE STA. 422+00

75' 275'

XVIII

℄ LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

P.I. STA. 472+79.10

Existing S. R/W Line

U.S. 41 (Tamiami Trail)

XVI

XV

80' 270'

N

MATCH LINE STA. 422+00

STA. 400+00

STA. 380+00

Conservation
Area 3B

Existing N. R/W Line

℄ Existing Levee 29, Section 3

℄ LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

Existing S. R/W Line

80' 270'

MATCH LINE STA. 374+75

PLATE 6

N

SCALE IN FEET

300' 0 300' 600'

CENTRAL AND SOUTHERN FLORIDA

LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT PLAN

SCALES AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO,
PART V, SUPP. 55, DATED AUG. 1974
FILE NO. 400-31-829

PLATE 5

PLATE 5

MATCH LINE STA. 374+50

Existing N. R/W Line

Bridge STA. 351+00

SEE DETAIL PLATE 9

STA. 340+00

Conservation Area 3B

N

STA. 320+00

℄ Existing Levee 29, Section 3

MATCH LINE STA. 314+00

80' 270'

XV

℄ LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

30' 270'

P.I. STA. 367+27.63

Existing S. R/W Line

U.S. 41 (Tamiami Trail)

MATCH LINE STA. 314+00

N

STA. 300+00

Conservation Area 3B

Existing N. R/W Line

STA. 280+00

No excess material placed between P.I. XII and P.I. XIII

Indian Village

℄ Existing Levee 29, Section 3

MATCH LINE STA. 266+50

PLATE 7

80' 270'

℄ LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

XIV

XIII

305'

45'

Existing S. R/W Line

U.S. 41 (Tamiami Trail)

P.I. STA 273+33.61

P.I. STA. 271+33.61

No excavation between P.I. XII and XIII

SCALE IN FEET

300' 0 300' 600'

CENTRAL AND SOUTHERN FLORIDA

LEVEE 29, SECTION 3

BORROW CANAL ENLARGEMENT

PLAN

SCALES AS SHOWN

DEPARTMENT OF THE ARMY

JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO, PART V, SUPP. 55, DATED AUG. 1974

FILE NO. 400-31-829

PLATE 6

PLATE 6

MATCH LINE STA. 266+50

P.I. STA. 266+33.61

P.I. STA. 264+33.61

STA. 260+00

STA. 240+00

STA. 220+00

Conservation Area 3B

SEE DETAIL PLATE 9

Existing N. R/W Line

℄ Existing Levee 29, Section 3

℄ LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

80' 270'

Existing S. R/W Line

U.S. 41 (Tamiami Trail)

Bridge STA. 207+50

MATCH LINE STA. 205+50

MATCH LINE STA. 205+50

STA. 180+00

Conservation Area 3B

Existing N. R/W Line

℄ Existing Levee 29, Section 3

℄ LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

80' 270'

U.S. 41 (Tamiami Trail)

Existing S. R/W Line

P.I. STA. 185+41.91

P.I. STA. 159+80.95

P.I. STA. 157+80.96

Bridge STA. 157+20

MATCH LINE STA. 157+00

PLATE 8

SCALE IN FEET

300' 0 300' 600'

CENTRAL AND SOUTHERN FLORIDA

LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT PLAN

SCALES AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO, PART V, SUPP. 55, DATED AUG. 1974

FILE NO. 400-31-829

PLATE 7

PLATE 7

MATCH LINE STA. 157+00

293'

57'

Recreation area

VII

VI

P.I. STA. 146+80.96

P.I. STA. 144+80.25

U.S. 41 (Tamiami Trail)

STA. 144+00

Conservation Area 3B

STA. 120+00

Existing N. R/W Line

℄ Existing Levee 29, Section 3

℄ LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

Existing S. R/W Line

N

STA. 100+00

270'

30'

MATCH LINE STA. 97+00

MATCH LINE STA. 97+00

80' 270'

Existing N. R/W Line

STA. 80+00

Conservation Area 3B

STA. 60+00

℄ Existing Levee 29, Section 3

℄ LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT

Existing S. R/W Line

U.S. 41 (Tamiami Trail)

80' 270'

MATCH LINE STA. 46+00

PLATE 8

SCALE IN FEET

300' 0 300' 600'

CENTRAL AND SOUTHERN FLORIDA

LEVEE 29, SECTION 3 BORROW CANAL ENLARGEMENT PLAN

SCALES AS SHOWN

DEPARTMENT OF THE ARMY

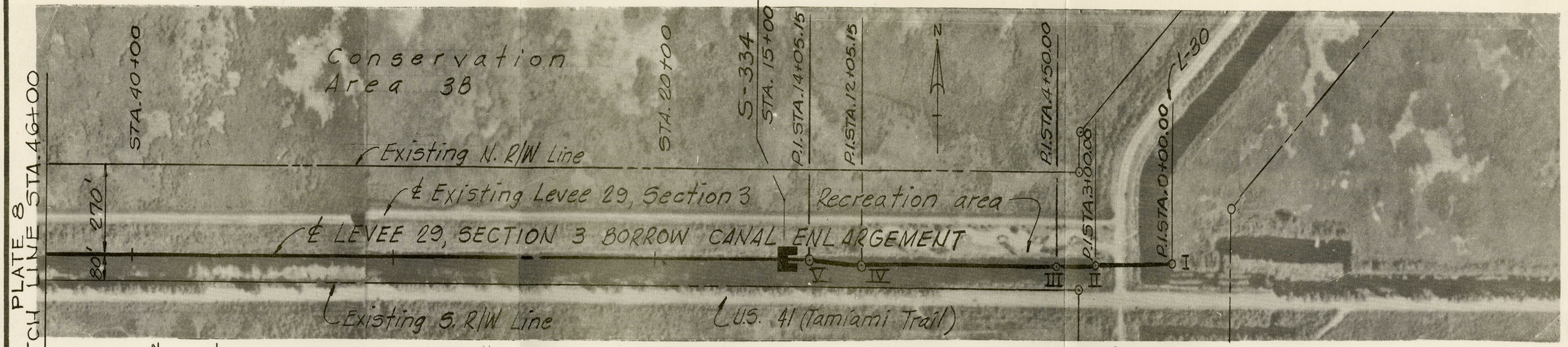
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

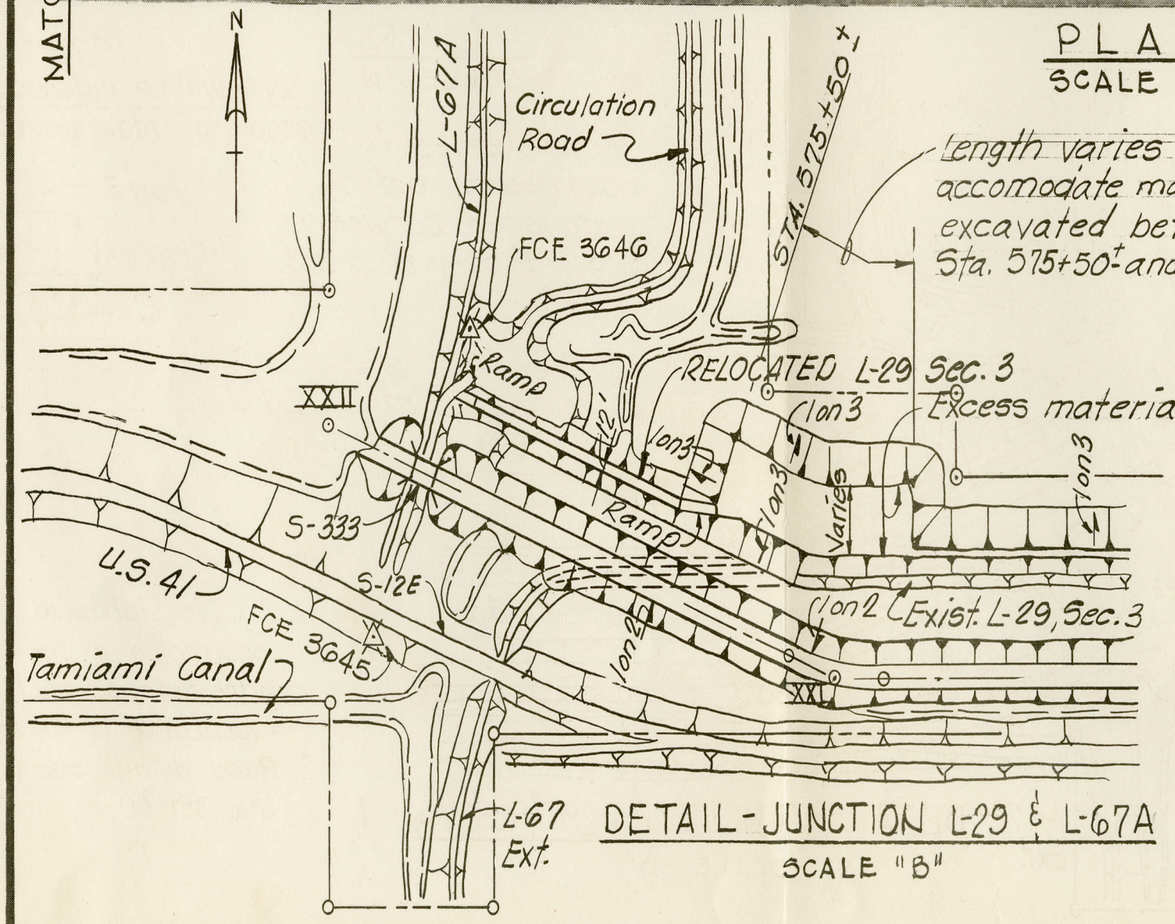
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO, PART V, SUPP. 55, DATED AUG. 1974

FILE NO. 400-31-829

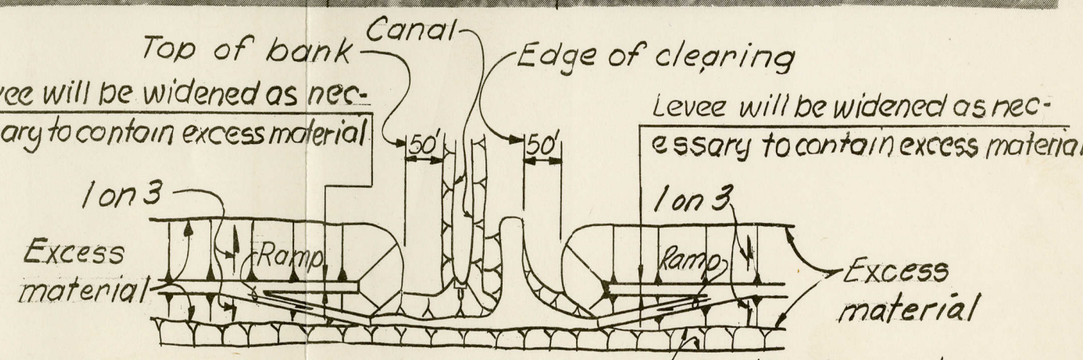
PLATE 8





DETAIL-JUNCTION L-29 & L-67A
SCALE "B"

PLAN
SCALE "A"



DETAIL
VICINITY STATION 208+00
NOT TO SCALE
(See Note 2)

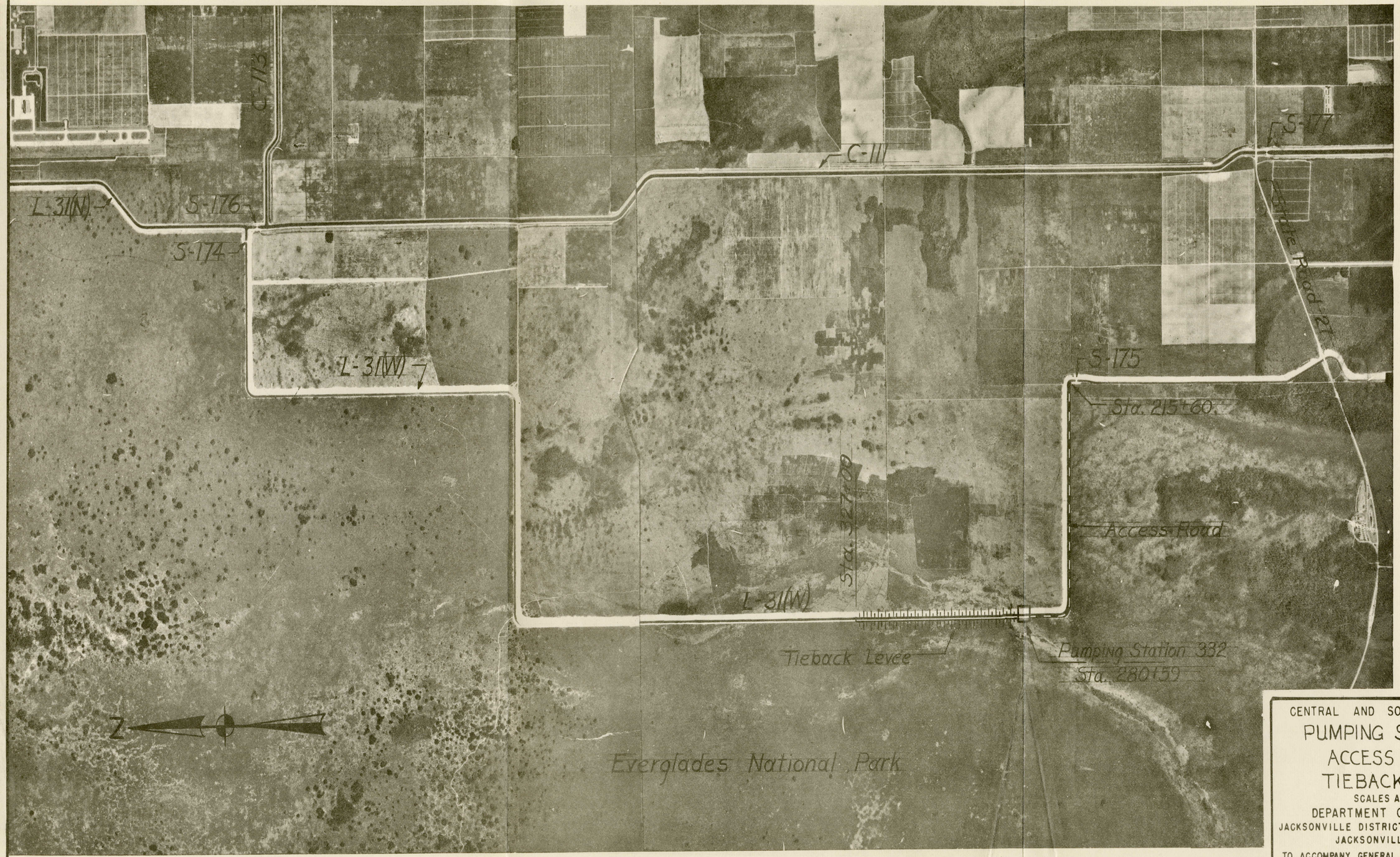
SCALE IN FEET

"A"	300'	0	300'	600'
"B"	200'	0	200'	400'

Note:

1. 12' wide stabilized ramps will be constructed at the locations shown in the details. Each ramp will slope 1 vertical on 12 horizontal.
2. Ramp details also typical for bridge, Sta. 351+00.

CENTRAL AND SOUTHERN FLORIDA
LEVEE 29, SECTION 3
BORROW CANAL ENLARGEMENT
PLAN & DETAILS
SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO., PART V, SUPP. 55, DATED AUG. 1974
FILE NO. 400-31-829



CENTRAL AND SOUTHERN FLORIDA

PUMPING STATION 332, ACCESS ROAD, AND TIEBACK LEVEE

SCALES AS SHOWN

DEPARTMENT OF THE ARMY

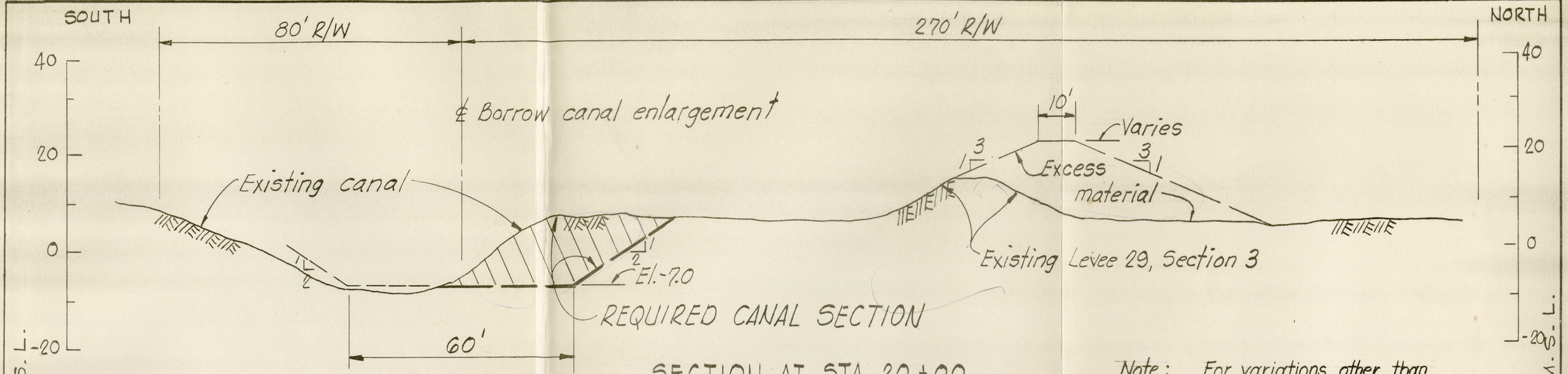
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

JACKSONVILLE, FLORIDA

TO ACCOMPANY GENERAL & DETAIL DESIGN, MEMO., PART V, SUPP. 55, DATED: AUG. 1974

FILE NO. 400-31-829

PLATE 10

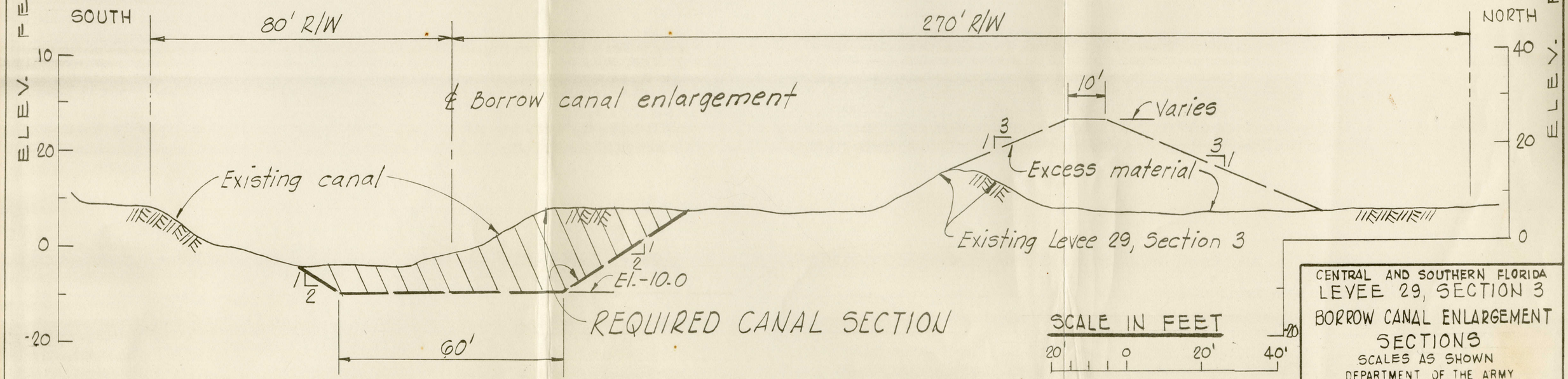


SECTION AT STA. 20+00

(TYPICAL FROM STA. 0+00 TO STA. 294+00)

Note: For variations other than shown on typical sections see Plate 13.

Sta 0 is Levee 30



SECTION AT STA. 410+00

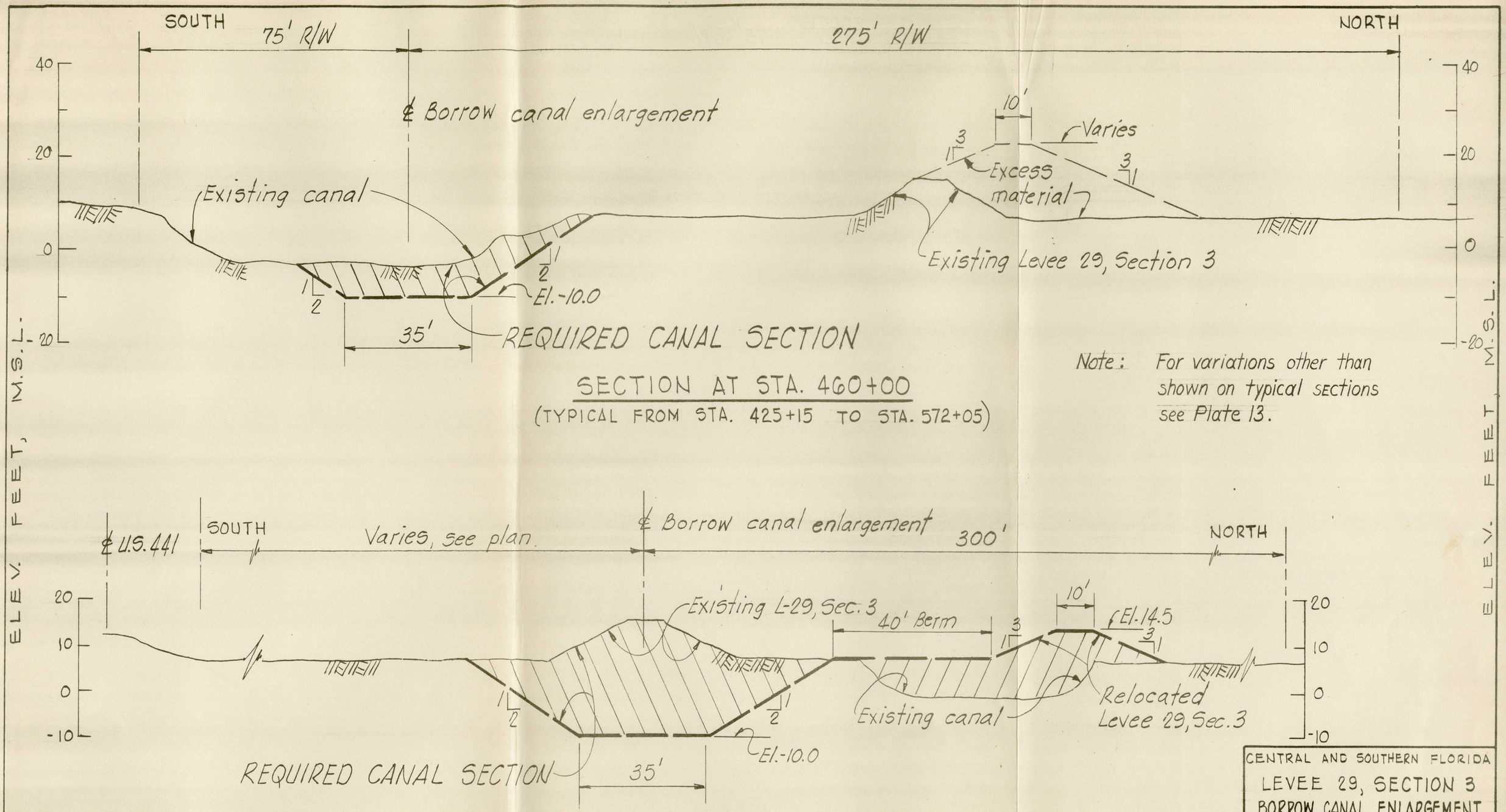
(TYPICAL FROM STA. 294+00 TO STA. 424+15)

SCALE IN FEET

20' 0 20' 40'

CENTRAL AND SOUTHERN FLORIDA
LEVEE 29, SECTION 3
BORROW CANAL ENLARGEMENT
SECTIONS
SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.
PART V, SUPP 55, DATED AUG. 1974
FILE NO 400-31-829

PLATE 11



SECTION AT STA. 460+00

(TYPICAL FROM STA. 425+15 TO STA. 572+05)

Note: For variations other than shown on typical sections see Plate 13.

SECTION AT STA. 574+50

(TYPICAL FROM STA. 572+05 TO STA. 580+00 ±

SCALE IN FEET

20' 0 20' 40'

CENTRAL AND SOUTHERN FLORIDA

LEVEE 29, SECTION 3

BORROW CANAL ENLARGEMENT

SECTIONS

DEPARTMENT OF THE ARMY

JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

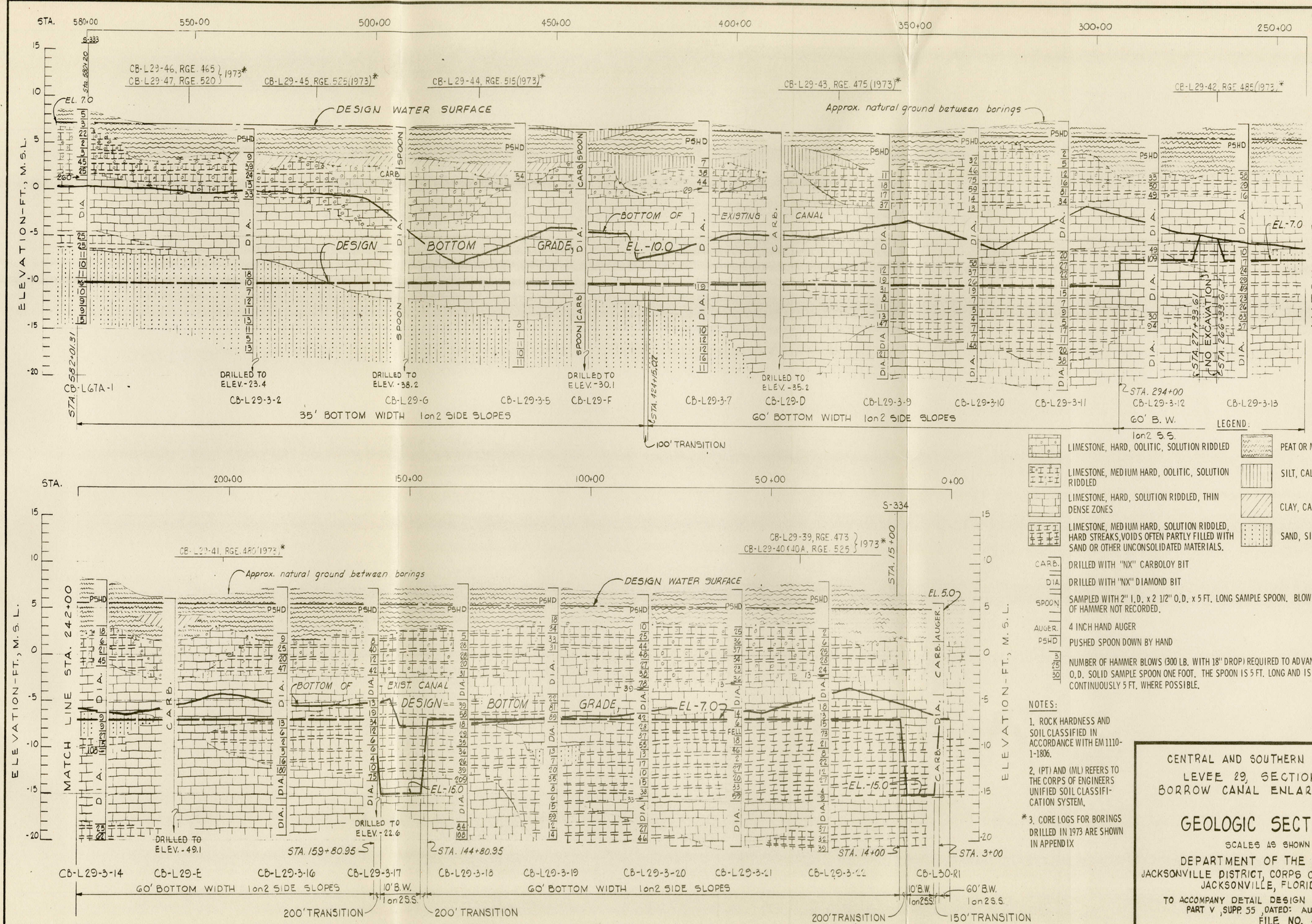
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO.

PART V, SUPP 55, DATED AUG. 1974

FILE NO. 400-31-829

PLATE 12



NOTES:

1. ROCK HARDNESS AND SOIL CLASSIFIED IN ACCORDANCE WITH EM 1110-1-1806.
2. (PT) AND (ML) REFERS TO THE CORPS OF ENGINEERS UNIFIED SOIL CLASSIFICATION SYSTEM.
*3. CORE LOGS FOR BORINGS DRILLED IN 1973 ARE SHOWN IN APPENDIX

CENTRAL AND SOUTHERN FLORIDA
LEVEE 29, SECTION 3
BORROW CANAL ENLARGEMENT

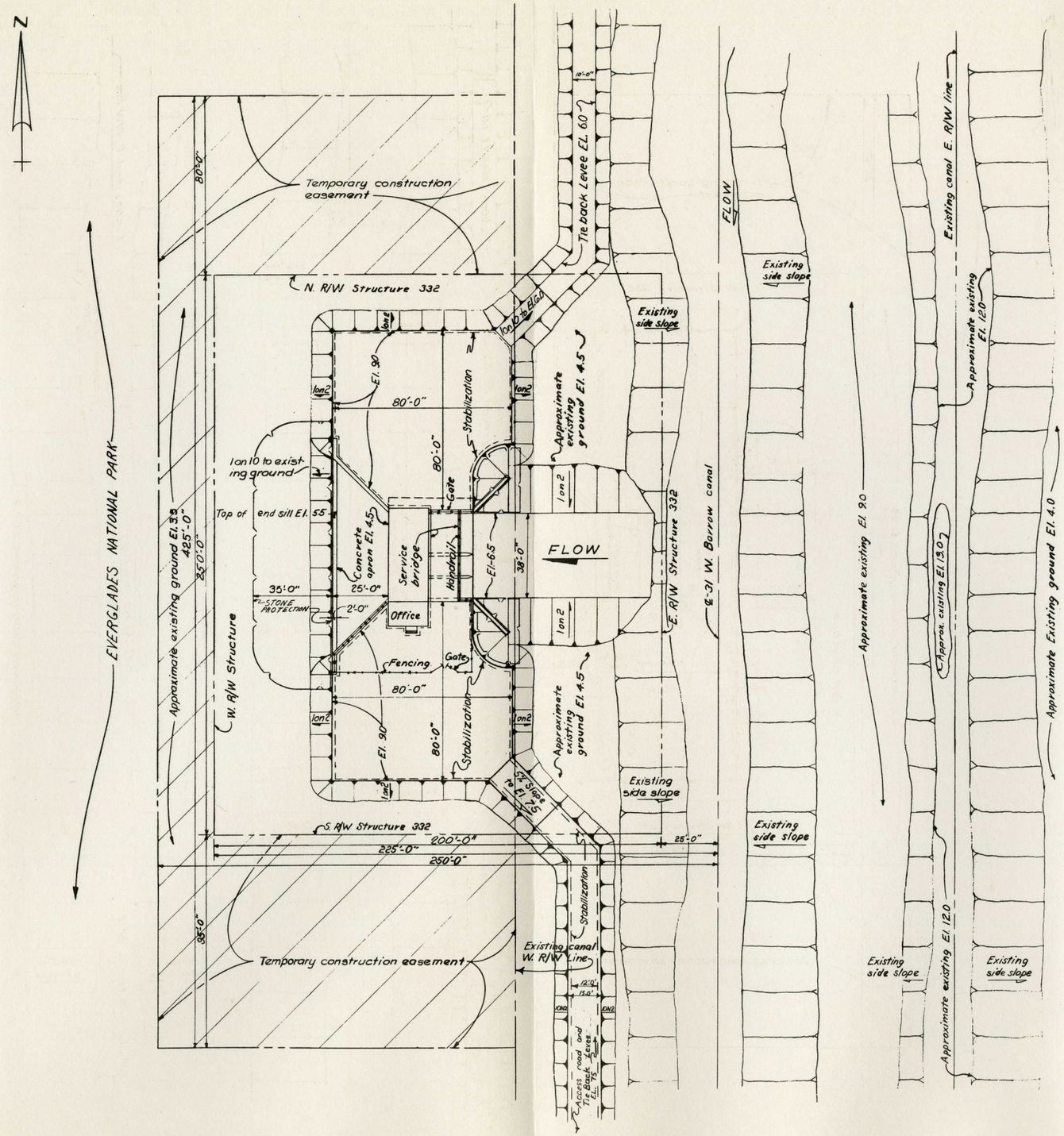
GEOLOGIC SECTION

SCALES AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO. PART V, SUPP. 55, DATED: AUG. 1974
FILE NO. 400-31-829

PLATE 13



CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

PUMPING STATION 332

SITE PLAN

DEPARTMENT OF THE ARMY

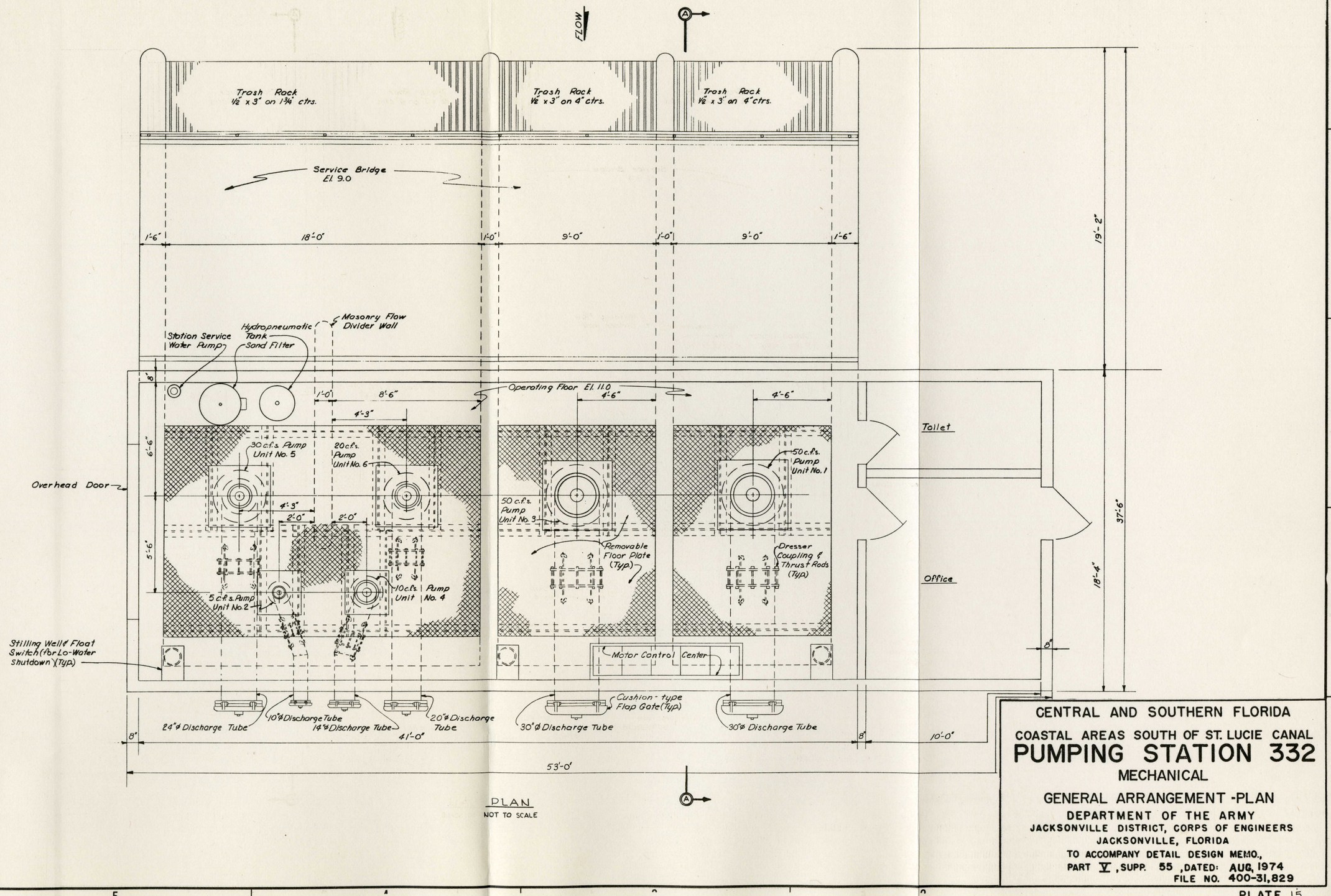
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO.,

PART V, SUPP. 55, DATED: AUG, 1974

FILE NO. 400-31,829



PLAN
NOT TO SCALE

CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

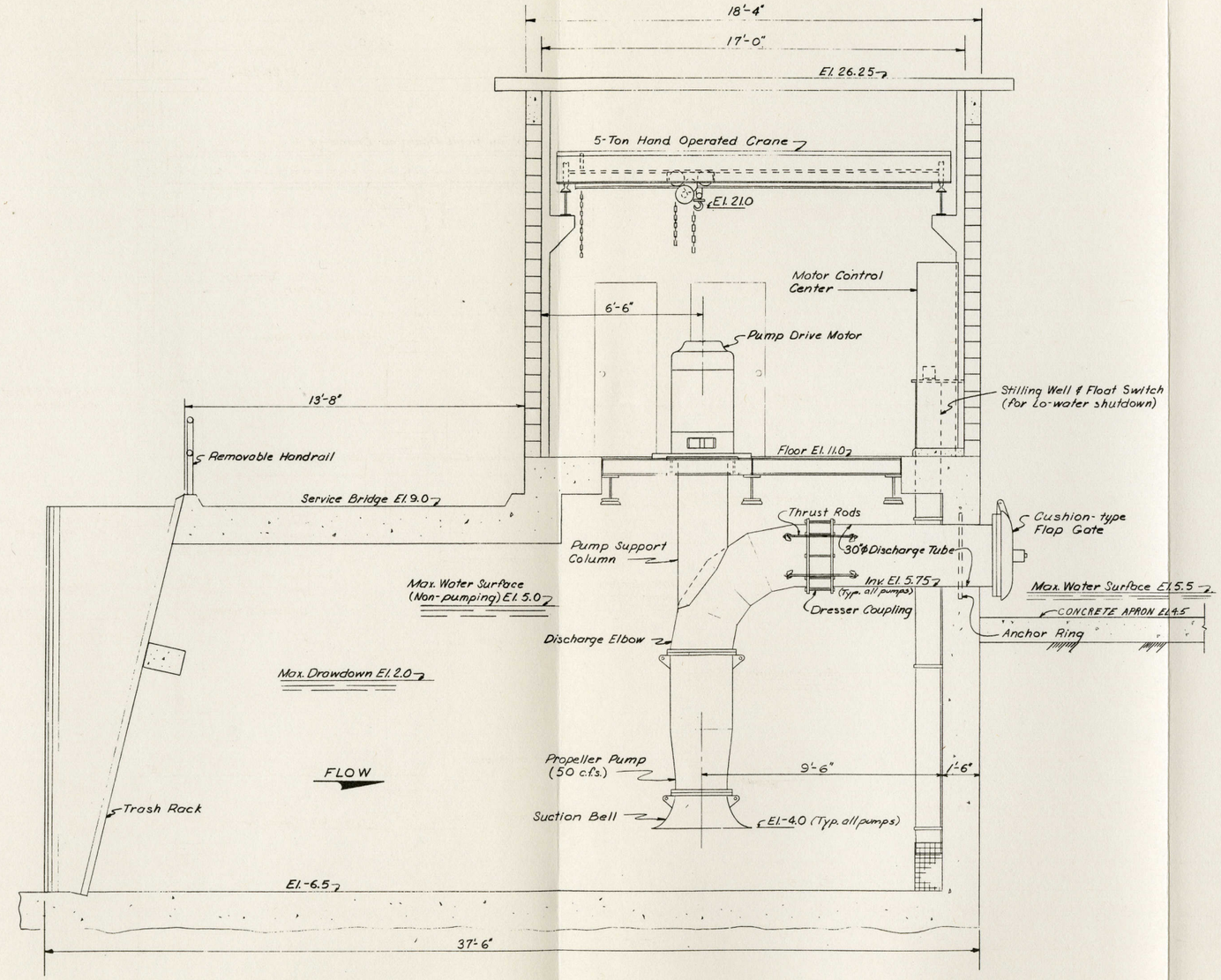
PUMPING STATION 332

MECHANICAL

GENERAL ARRANGEMENT - PLAN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG. 1974
FILE NO. 400-31,829

PLATE 15



SECTION A-A

CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

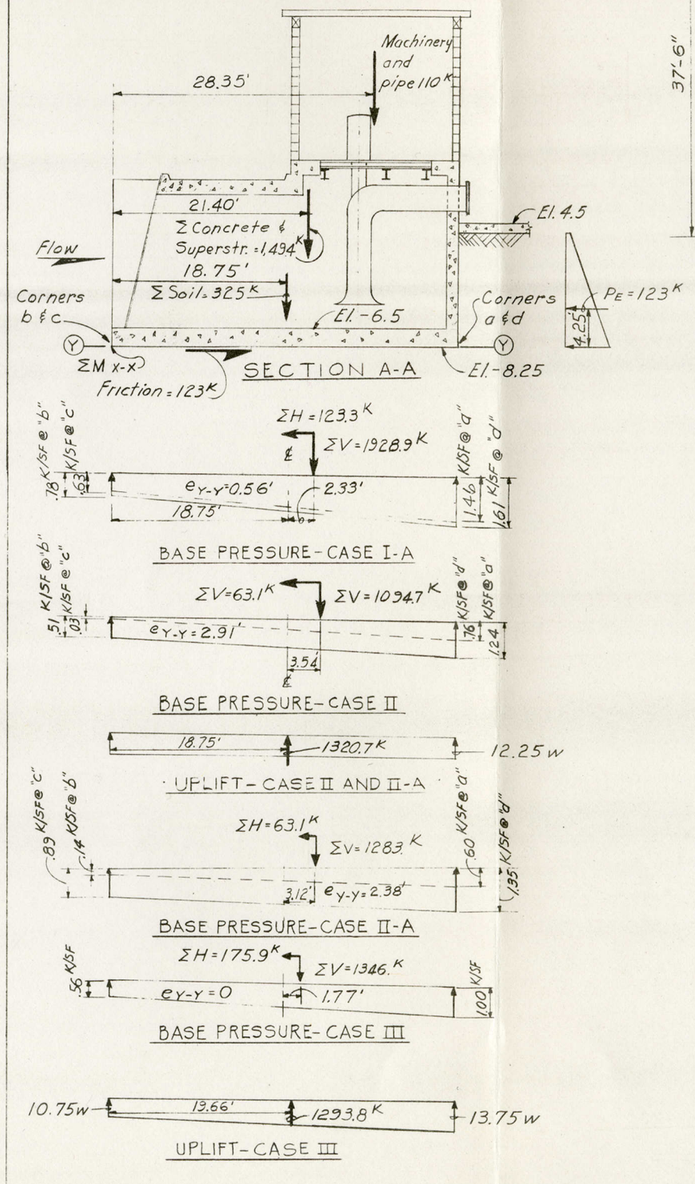
PUMPING STATION 332

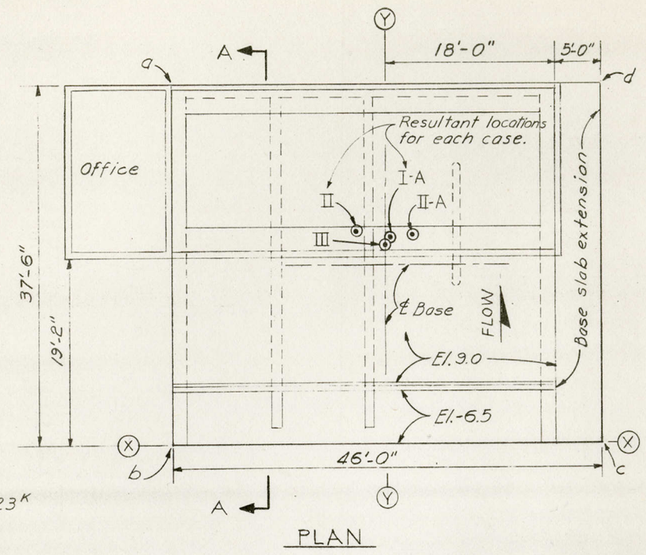
MECHANICAL

GENERAL ARRANGEMENT - SECTION

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829

PLATE 16





CASE ASSUMPTIONS

CASE I	CONSTRUCTION CONDITION-STRUCTURE COMPLETE. NO BACKFILL IN PLACE. NO HYDROSTATIC FORCES ACTING.
CASE I-A	CONSTRUCTION CONDITION- STRUCTURE COMPLETE. BACKFILL IN PLACE. NO HYDROSTATIC FORCES ACTING.
CASE II	DEWATERED CONDITION. WATER SURFACE AND SATURATION EL. 4.0. BAY OPPOSITE OFFICE OVERHANG DEWATERED. FULL UPLIFT ACTING OVER 100 PER CENT OF BASE AREA.
CASE II-A	DEWATERED CONDITION: WATER ELEVATIONS EL. 4.0. BAY NEAR OFFICE OVERHANG DEWATERED. FULL UPLIFT ACTING OVER 100 PER CENT OF BASE AREA.
CASE III	OPERATION CONDITION- DISCHARGE W. S. EL. 5.5, INTAKE W. S. EL. 2.5 FULL UPLIFT ACTING OVER 100 PER CENT OF BASE AREA.

STABILITY SUMMARY

ITEMS	CASE I				CASE I-A				CASE II				CASE II-A				CASE III			
	FORCES (KIPS)		ARM (FT.)		FORCES (KIPS)		ARM (FT.)		FORCES (KIPS)		ARM (FT.)		FORCES (KIPS)		ARM (FT.)		FORCES (KIPS)		ARM (FT.)	
	VERT.	HORIZ.	X-X	Y-Y	VERT.	HORIZ.	X-X	Y-Y	VERT.	HORIZ.	X-X	Y-Y	VERT.	HORIZ.	X-X	Y-Y	VERT.	HORIZ.	X-X	Y-Y
CONC. SUPERSTR., MACH'Y.	1,604 ↓		21.87	3.48	1,604 ↓		21.87	3.48	1,604 ↓		21.87	3.48	1,604 ↓		21.87	3.48	1,604 ↓		21.87	3.48
SOIL					324.9 ↓		18.75	20.50	354.9 ↓		18.75	20.50	354.4 ↓		18.75	20.50	354.4 ↓		18.75	20.50
WATER									457.0 ↓		16.83	12.03	645.2 ↓		17.59	2.83	681.6 ↓		18.00	2.35
UPLIFT									1,320.7 ↑		18.75		1,320.7↑		18.75		1,293.8 ↑		19.66	
HORIZONTAL FORCES FROM UPSTR.																		134.6 →	3.42	—
HORIZONTAL FORCES FROM DWSTR.						123.3 ←	4.25	—		63.1 ←				63.1 ←				310.5 ←	4.51	—
RESULTANTS	1,604 ↓		21.87	3.48	1,928.9↓	123.3 ←	21.08	0.56	1,094.7 ↓	63.1 ←	22.29	2.91	1,283 ↓	63.1 ←	21.87	2.38	1,346 ↓	175.9 ←	20.52	0.06
ΣH/ΣV					0.06				0.06				0.05				0.13			

SOIL PROPERTY VALUES

$\phi = 30°$

UNIT WT. OF MOIST SOIL = 110 PCF

UNIT WT. OF SATURATED SOIL = 125 PCF

ACTIVE PRESSURE (MOIST-LEVEL GRD.) = 37 PSF/F

ACTIVE PRESSURE (SATURATED) = 83 PSF/F

CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

PUMPING STATION 332

STABILITY ANALYSIS

DEPARTMENT OF THE ARMY

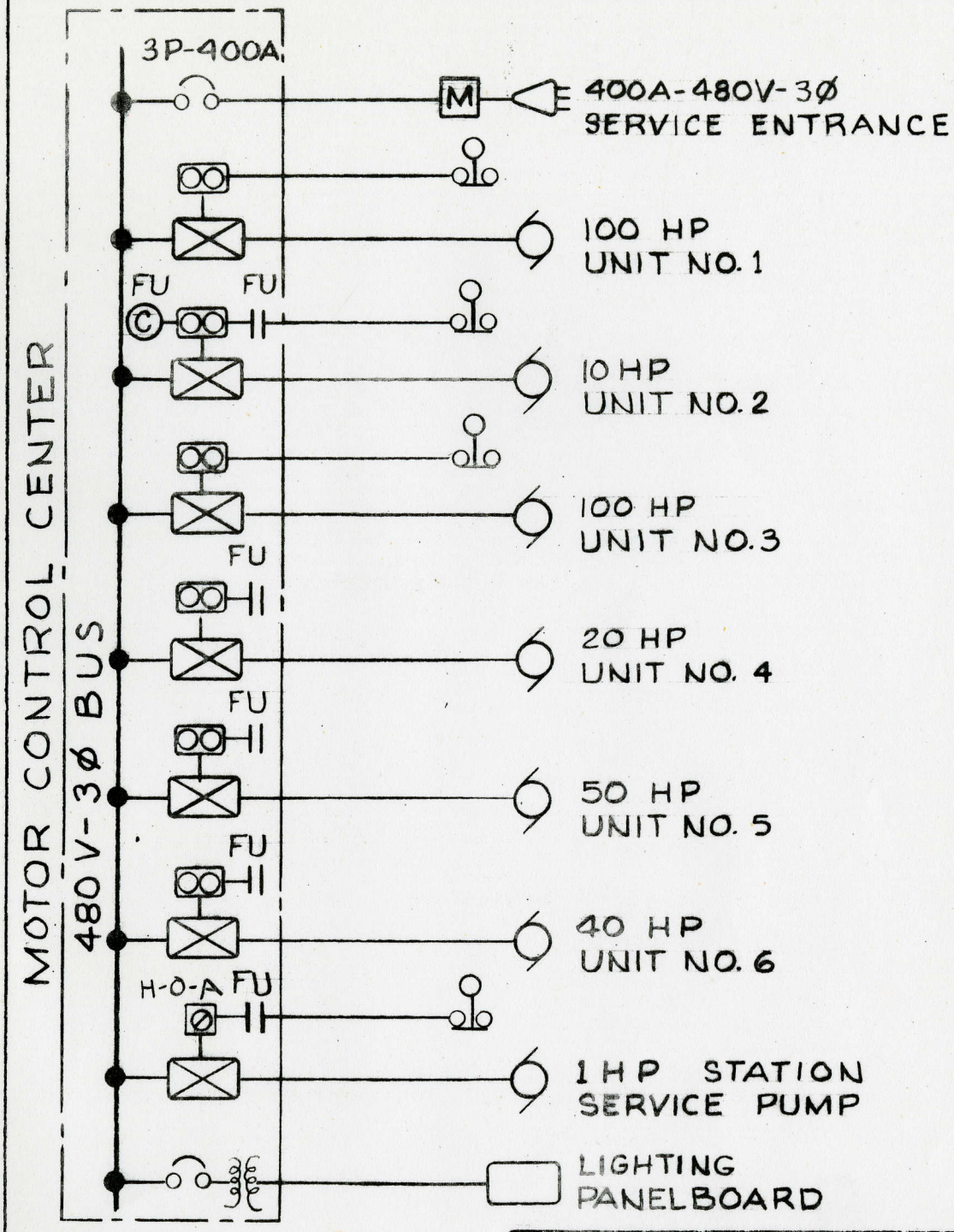
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO.,

PART V, SUPP. 55, DATED: AUG, 1974

FILE NO. 400-31,829



SYMBOLS

P.B. / SEL. SW.

FLOAT SWITCH

CONTROL RELAY/ CONTACT

COMB. STARTER

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

PUMPING STATION 332

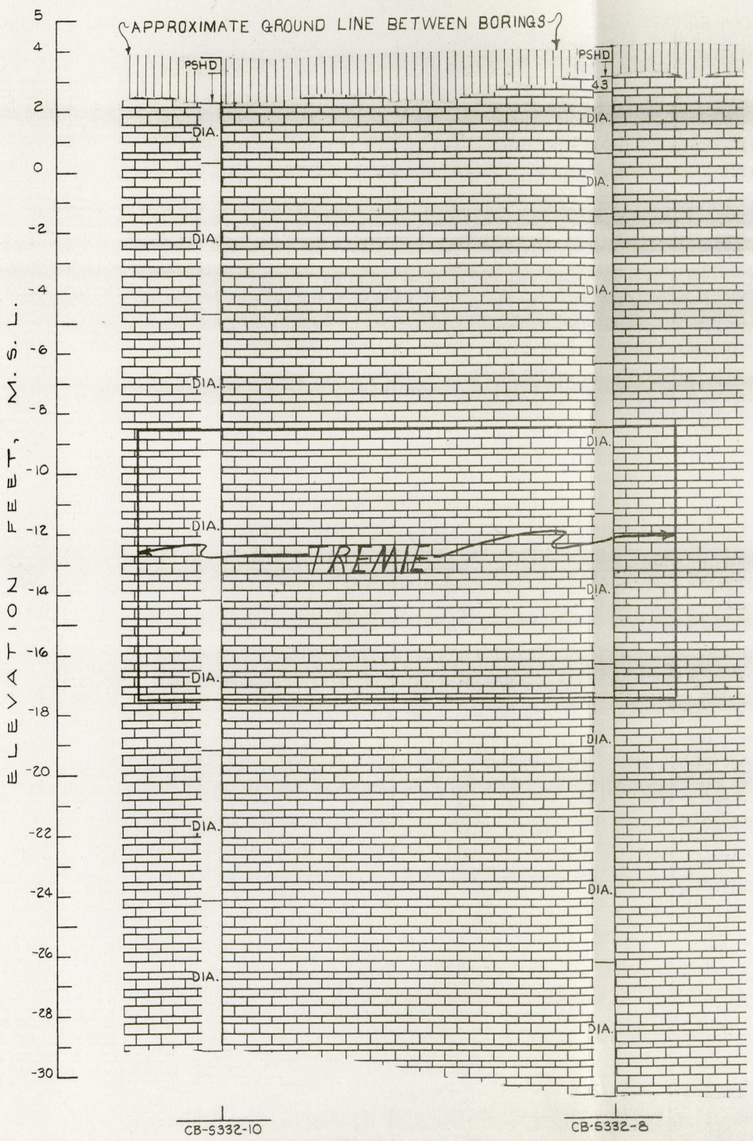
ELECTRICAL SYSTEM ONE-LINE DIAGRAM

SCALES AS SHOWN

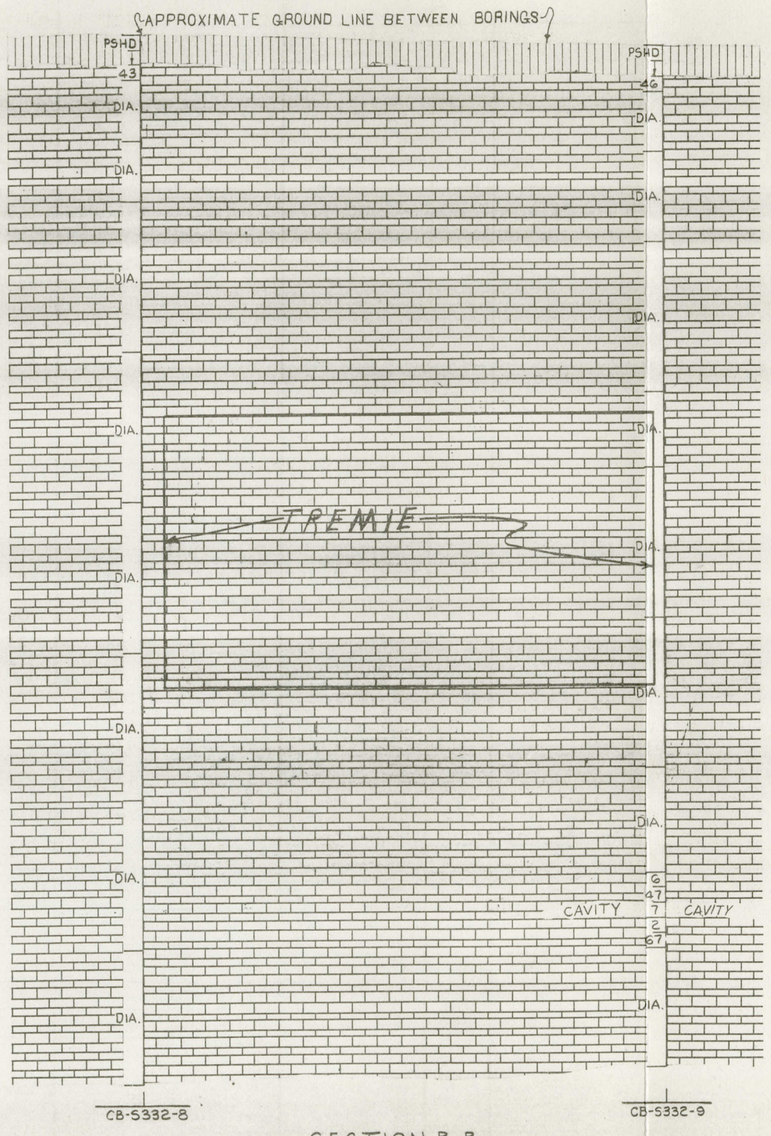
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO.,
PART IV, SUPP. 55, DATED. AUG., 1974
FILE NO. 400-31,829

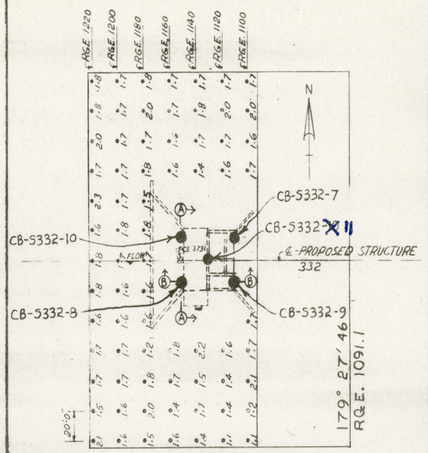
PLATE 18



SECTION A-A



SECTION B-B



LOCATION MAP

NOT TO SCALE

LEGEND

- SILT, CALCAREOUS, SOFT (ML)
- LIMESTONE, HARD WITH MEDIUM HARD ZONES, POROUS, VERY PERMEABLE, SOLUTION HOLES THROUGHOUT.
- 46 — NUMBER OF HAMMER BLOWS REQUIRED TO ADVANCE A SPLIT SAMPLE SPOON (1 3/8" I. D. X 2" O. D.) ONE-HALF FOOT USING A 140 POUND HAMMER WITH A 30-INCH DROP. THE SPOON IS 2 FEET LONG AND IS DRIVEN CONTINUOUSLY 1-1/2 FEET WHERE POSSIBLE.
- PSHD — PUSHED SPOON DOWN BY HAND.
- DIA. — DRILLED WITH 4" X 5 1/2" DIAMETER DIAMOND BIT AND DOUBLE TUBE CORE BARREL.
- CB 5332-10 — LOCATION AND DESIGNATION OF CORE BORING.
- 1.7 — WASH PROBING WITH DEPTH FROM GROUND SURFACE TO TOP OF ROCK.

NOTE: ROCK HARDNESS AND SOIL CLASSIFIED IN ACCORDANCE WITH EM-1110-1-1806.

SCALE IN FEET

VERTICAL 2½ 1 0 1 2 3 4 5

HORIZONTAL 5 0 5 10

CENTRAL AND SOUTHERN FLORIDA

STRUCTURE 332

GEOLOGIC SECTION

SCALES AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO., PART , SUPP. , DATED: AUG. 1974
FILE NO. 400-31,829

PLATE 19

Hole No. CB-S332-7

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	South Atlantic	Jacksonville District	1 OF 2 SHEETS

1. PROJECT	C&SF Structure 332
2. LOCATION (Coordinates or Station)	Sta. 280+74.16, Rge. 1110
3. DRILLING AGENCY	Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	CB-S332-7
5. NAME OF DRILLER	C. Mason & R. Randall
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	34.7'
10. SIZE AND TYPE OF BIT	See Remarks
11. DATUM FOR ELEVATION SHOWN (TDM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	Sprague & Henwood 40-C
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: ; UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	3
15. ELEVATION GROUND WATER	+2.3
16. DATE HOLE	STARTED 6-27-74 ; COMPLETED 6-28-74
17. ELEVATION TOP OF HOLE	+4.1
18. TOTAL CORE RECOVERY FOR BORING	85 %
19. GEOLOGIST:	T. NOVAK

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
+4.1	0.0					BIT OR BARREL +4.1 Bls/0.5 ft
+2.9	1.2		SILT, soft, calcareous, gray (ML)	30	1	SPLIT SPOON Pushed Pushed +2.6 55
			LIMESTONE, hard, porous, open solution holes, fossiliferous, buff to gray with yellow stains	100		DIAMOND 4 x 5-1/2 D.T. 23 min. H.P. 75 psi. +0.4
				96		" " " DIAMOND 4 x 5-1/2 D.T. 15 min. H.P. 75 psi. -1.4
				100		" " " DIAMOND 4 x 5-1/2 D.T. 25 min. H.P. 75 psi. -6.4
				100		DIAMOND 4 x 5-1/2 D.T. 35 min. H.P. 75 psi. -11.4

TYPICAL CONTRACT
CORE BORING LOG

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED. AUG., 1974
FILE NO. 400-31, 829

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PLATE 20

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE +4.1 | Hole No. CB-S332-7

PROJECT: C&SF Structure 332 | INSTALLATION: Jacksonville District | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT OR BARREL
						-11.4 Bls/0.5 ft
				100		DIAMOND 4 x 5-1/2 D.T. 35 min. H.P. 75 psi.
						-16.4
				100		DIAMOND 4 x 5-1/2 D.T. 17 min. H.P. 75 psi.
			Open solution holes from -18.9 to -20.2			
-20.4	24.5		Medium hard from -20.4 to -25.6			-20.4
				53		SPLIT SPOON 3 3 -21.9 9
				82		" " 8 15 -23.4 23
				86		" " 21 33 -24.9 23
-25.6	29.7			74		" " 8 -25.6 50
				100		DIAMOND 4 x 5-1/2 D.T. 45 min. H.P. 75 psi.
-30.6	34.7					-30.6
			NOTES: 1. Set 6" casing to -24.9 2. Hole grouted upon completion with 7 bags of Sakrete.			140# hammer with 30" drop used on 2.0' split spoon (1-3/8" I.D. X 2" O.D.)

TYPICAL CONTRACT CORE BORING LOG

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED AUG., 1974
FILE NO. 400-31,829

ENG FORM 1836-A JUN 67

GPO: 1969 OP—320-243

PLATE 21

Hole No. CB-S332-8

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	South Atlantic	Jacksonville District	1 OF 2 SHEETS

1. PROJECT	C&SF Structure 332
2. LOCATION (Coordinates or Station)	Sta. 280+44.16, Rge. 1150
3. DRILLING AGENCY	Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	CB-S332-8
5. NAME OF DRILLER	C. Mason
6. DIRECTION OF HOLE	[X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	35.0'
10. SIZE AND TYPE OF BIT	See Remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	Sprague & Henwood 40-C
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: ; UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	4
15. ELEVATION GROUND WATER	+3.8
16. DATE HOLE	STARTED 7-1-74; COMPLETED 7-2-74
17. ELEVATION TOP OF HOLE	+4.1
18. TOTAL CORE RECOVERY FOR BORING	92.5 %
19. ~~SIGNATURE AND TITLE OF~~ GEOLOGIST:	T. NOVAK

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
+4.1	0.0					BIT OR BARREL +4.1 Bls/0.5 ft
+2.8	1.3		SILT, soft, calcareous, gray (ML)	40	1	SPLIT SPOON Pushed +2.6 43
			LIMESTONE, hard, porous, solution holes, fossiliferous slightly weathered, buff with yellow stains	100		DIAMOND 4 x 5-1/2 D.T. 13 min. H.P. 75 psi. +0.6
				100		DIAMOND 4 x 5-1/2 D.T. 15 min. H.P. 75 psi. -1.4
				100		DIAMOND 4 x 5-1/2 D.T. 25 min. H.P. 75 psi. -6.4
				100		DIAMOND 4 x 5-1/2 D.T. 35 min. H.P. 75 psi. -11.4

PLATE 22

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT C&SF Structure 332 | HOLE NO. CB-S332-8

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +4.1	Hole No. CB-S332-8
PROJECT C&SF Structure 332	INSTALLATION Jacksonville District	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT OR BARREL
						-11.4 Bls/0.5 ft
				100		DIAMOND 4 x 5-1/2 D.T. 37 min. H.P. 75 psi.
						-16.4
				98		DIAMOND 4 x 5-1/2 D.T. 16 min. H.P. 75 psi.
						-21.3
			zones of open solution holes and badly broken from -21.3 to -26.3	95		DIAMOND 4 x 5-1/2 D.T. 28 min. H.P. 75 psi.
						-26.3
				100		DIAMOND 4 x 5-1/2 D.T. 43 min. H.P. 75 psi.
-30.8	35.0					-30.8
			NOTE: 1. Hole grouted upon completion.			140# hammer with 30" drop used on 2.0' split spoon (1-3/8" I.D. X 2" O.D.)
						PLATE 23

Hole No. CB-S332-9

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Jacksonville District	SHEET 1 OF 2 SHEETS

1. PROJECT: C&SF Structure 332
2. LOCATION (Coordinates or Station): Sta. 280+44.16, Rge. 1110
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number): CB-S332-9
5. NAME OF DRILLER: F. Crawford
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 34.0'
10. SIZE AND TYPE OF BIT: See Remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40-C
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED _____ UNDISTURBED _____
14. TOTAL NUMBER CORE BOXES: 2
15. ELEVATION GROUND WATER: +3.6
16. DATE HOLE: STARTED 7-3-74 COMPLETED 7-8-74
17. ELEVATION TOP OF HOLE: +3.7
18. TOTAL CORE RECOVERY FOR BORING: 51.7 %
19. GEOLOGIST: T. NOVAK

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
+3.7	0.0					BIT OR BARREL +3.7 Bls/0.5 ft
+2.5	1.2		SILT, soft, calcareous, gray (ML)	45	1	SPLIT SPOON Pushed Pushed 46 +2.2
			LIMESTONE, hard, porous, solution holes, fossiliferous buff with yellow stains	30		DIAMOND NX D.T. 13 min. H.P. 75 psi. +0.2
				17		DIAMOND NX D.T. 18 min. H.P. 75 psi. -2.8
				8		DIAMOND NX D.T. 46 min. H.P. 75 psi. -7.8
				40		DIAMOND NX D.T. 16 min. H.P. 75 psi. -10.3
						PLATE 24

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +3.7	Hole No. CB-S332-9
PROJECT C&SF Structure 332	INSTALLATION Jacksonville District	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT OR BARREL
						-10.3 Bls/0.5 ft
			contains broken medium hard zones from -10.3 to -12.0	100		DIAMOND 4x5-1/2 D.T. 46 min. H.P. 75 psi.
						-15.3
				98		DIAMOND 4 x 5-1/2 D.T. 23 min. H.P. 75 psi.
						-20.3
				28		DIAMOND 4 x 5-1/2 D.T. 1 Hr. 2 min. H.P. 75 psi.
						-23.8
				56		SPLIT SPOON 6 47 7
		CAVITY	open void from -25.2 to -25.8			-25.3
				47		" " 2 67
						-26.3
				100		DIAMOND 4 x 5-1/2 D.T. 30 min. H.P. 75 psi.
-30.3	34.0					-30.3
			NOTE: 1. Hole grouted upon completion with 7 bags of Sakrete.			140# hammer with 30" drop used on 2.0' split spoon (1-3/8" ID. X 2" O.D.)

PLATE 25

Hole No. CB-S332-10

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Jacksonville District	SHEET 1 OF 2 SHEETS
1. PROJECT: C&SF Structure 332		10. SIZE AND TYPE OF BIT: See Remarks	
2. LOCATION (Coordinates or Station): Sta. 280+74.16, Rge. 1150.42		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40-C	
4. HOLE NO. (As shown on drawing title and file number): CB-S332-10		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED - UNDISTURBED	
5. NAME OF DRILLER: F. Crawford		14. TOTAL NUMBER CORE BOXES: 4	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: +3.8	
		16. DATE HOLE: STARTED 7-11-74 COMPLETED 7-12-74	
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE: +3.8	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING: 89.2 %	
9. TOTAL DEPTH OF HOLE: 33.0'		19. GEOLOGIST: T. NOVAK	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT OR BARREL
+3.8	0.0					+3.8 Bls/0.5 ft
			SILT, soft, calcareous, gray (ML)	40	1	SPLIT SPOON Pushed Pushed Pushed
+2.3	1.5					+2.3
			LIMESTONE, hard, porous, fossiliferous, solution holes buff to light gray	90		DIAMOND 4 x 5-1/2 D.T. 14 min. H.P. 75 psi.
						+0.3
				100		DIAMOND 4 x 5-1/2 D.T. 43 min. H.P. 75 psi.
						-4.7
				100		DIAMOND 4 x 5-1/2 D.T. 40 min. H.P. 75 psi.
						-9.2
						PLATE 26

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: C&SF Structure 332 HOLE NO.: CB-S332-10

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +3.8	Hole No. CB-S332-10
PROJECT C&SF Structure 332	INSTALLATION Jacksonville District	SHEET 2 OF 2 SHEETS

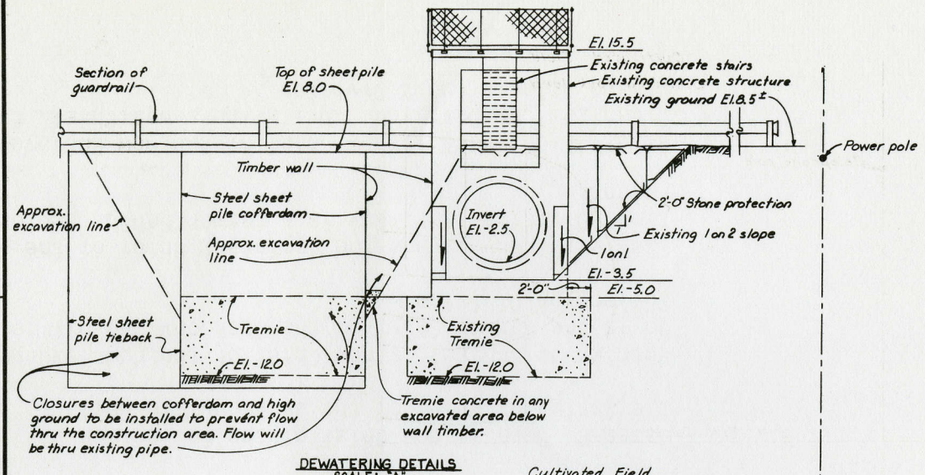
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT OR BARREL -9.2 Bls/0.5 ft
				92		DIAMOND 4 x 5-1/2 D.T. 50 min. H.P. 75 psi. -14.2
				100		DIAMOND 4 x 5-1/2 D.T. 45 min. H.P. 75 psi. -19.2
			Open solution holes with poorly cemented zones from -21.7 to -25.7	98		DIAMOND 4 x 5-1/2 D.T. 55 min. H.P. 75 psi. -24.2
				94		DIAMOND 4 x 5-1/2 D.T. 50 min. H.P. 75 psi.
-29.2	33.0					-29.2
			NOTE: 1. Hole grouted upon completion with 7 bags of Sakrete.			140# hammer with 30" drop used on 2.0' split spoon (1-3/8" I.D. X 2" O.D.)

PLATE 27

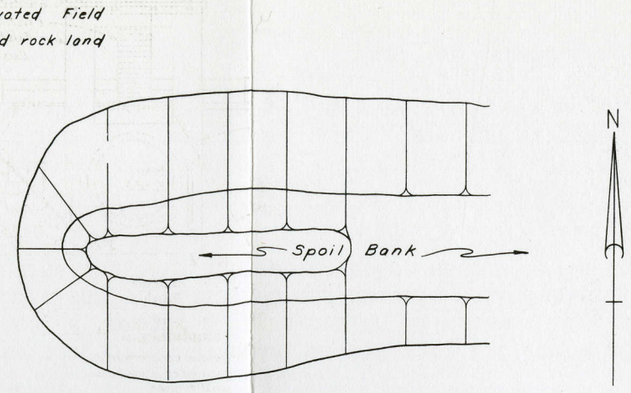
DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE +4.0	Hole No. CB-S332-11
PROJECT C&SF Structure 332	INSTALLATION Jacksonville District	SHEET 2 OF 2 SHEETS

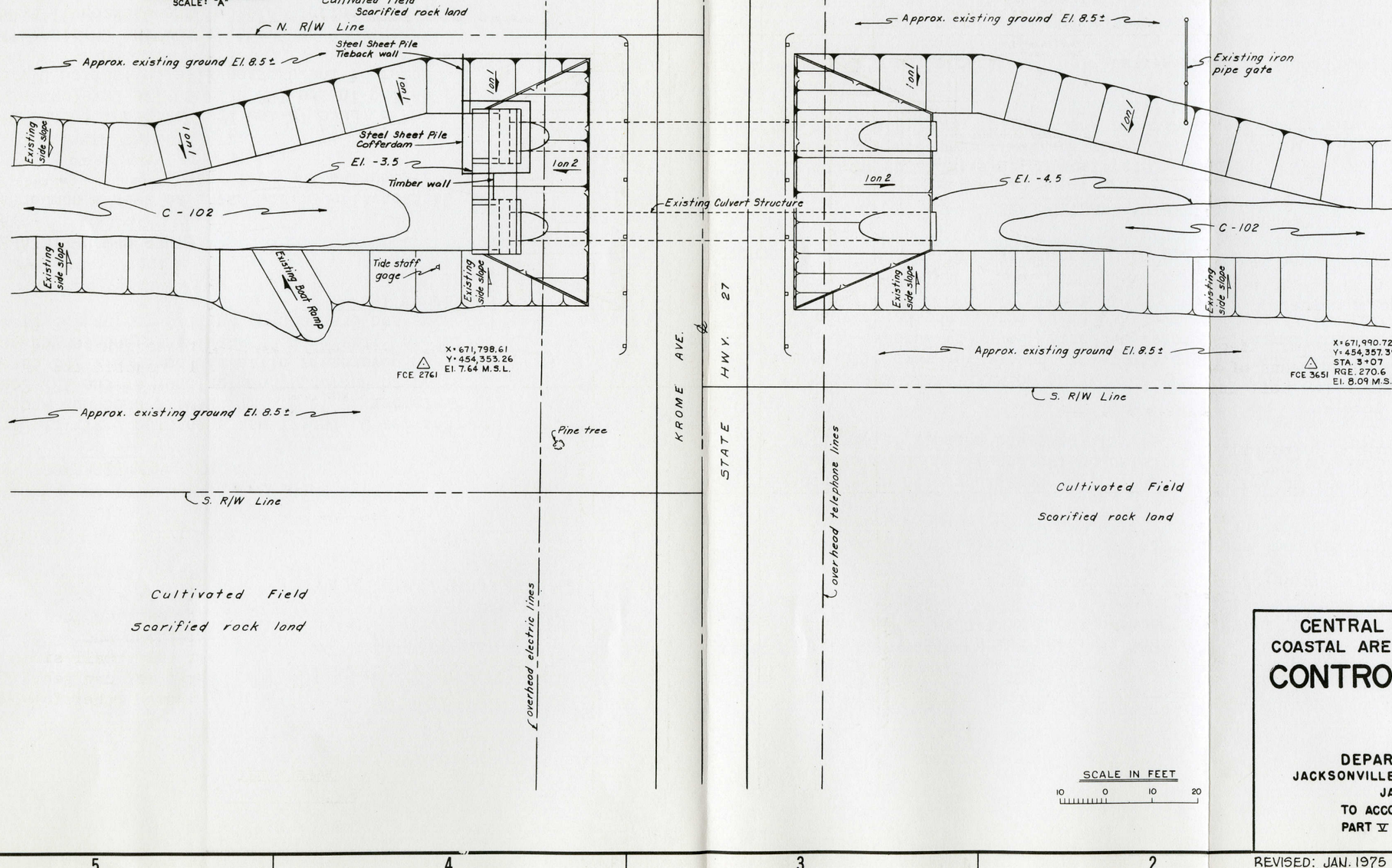
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d			REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT OR BARREL
						-12.5 Bls/0.5 ft
					*	DIAMOND NX D.T. 46 min. H.P. 75 psi.
						-17.5
					*	DIAMOND NX D.T. 40 min. H.P. 75 psi.
						-22.5
					*	DIAMOND NX D.T. 45 min. H.P. 75 psi.
-27.5	31.5					-27.5
			NOTES: 1. No core recovery was attempted. 2. NX casing set to -22.5 3. *No head could be maintained with pump operating at maximum capacity (50 GPM)			140# hammer with 30" drop used on 2.0' split spoon (1-3/8" I.D. X 2" O.D.)

PLATE 29



DEWATERING DETAILS
SCALE: 1" = 4'





SCALE IN FEET
10 0 10 20

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

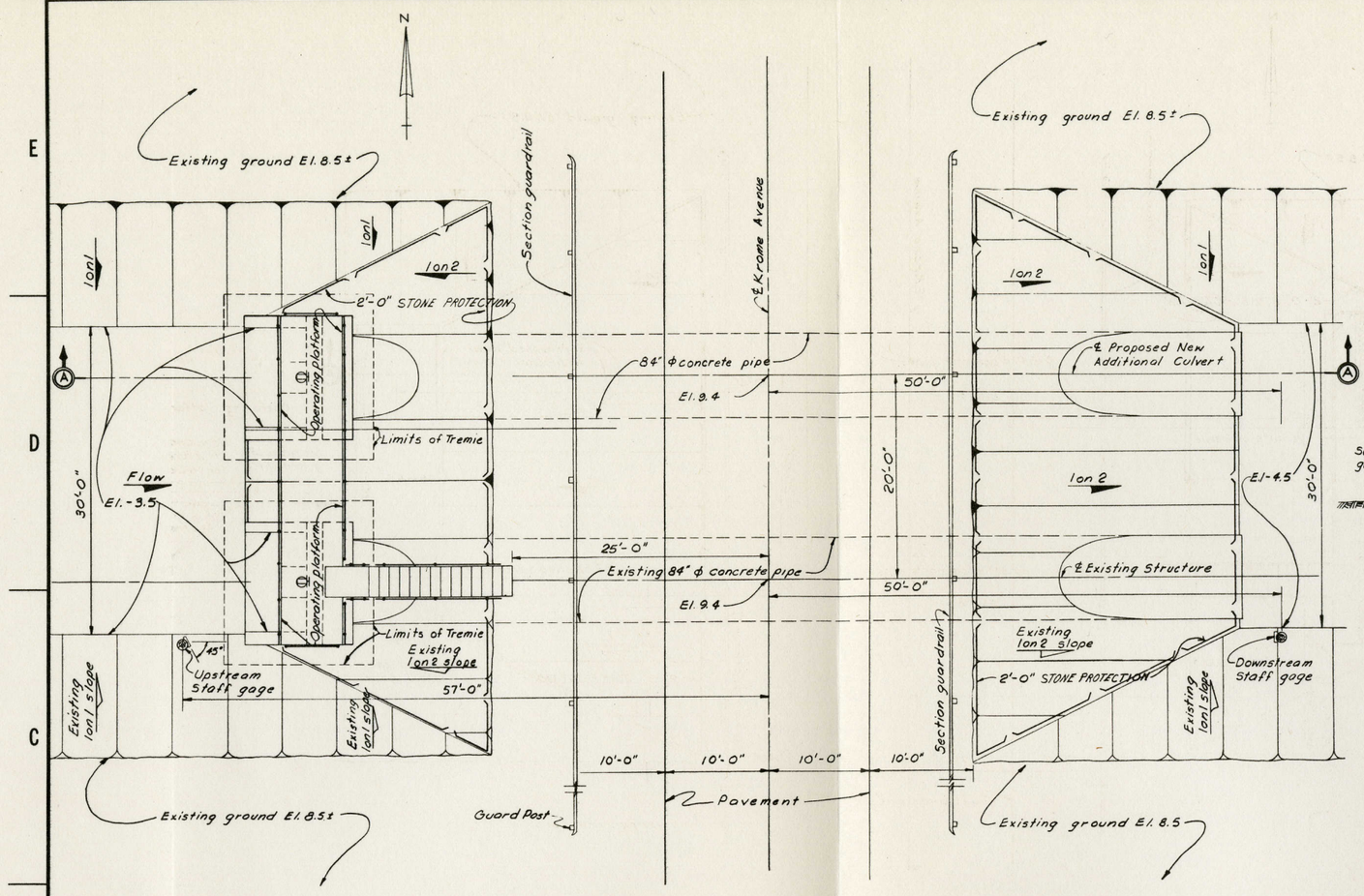
CONTROL STRUCTURE 194 (MOD.)

SITE PLAN

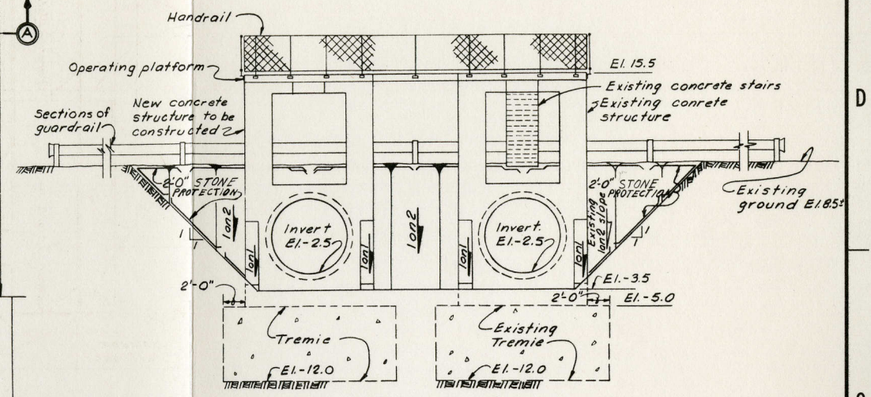
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V , SUPP. 55 , DATED: AUG. 1974
FILE NO. 400-31,829

REVISED: JAN. 1975

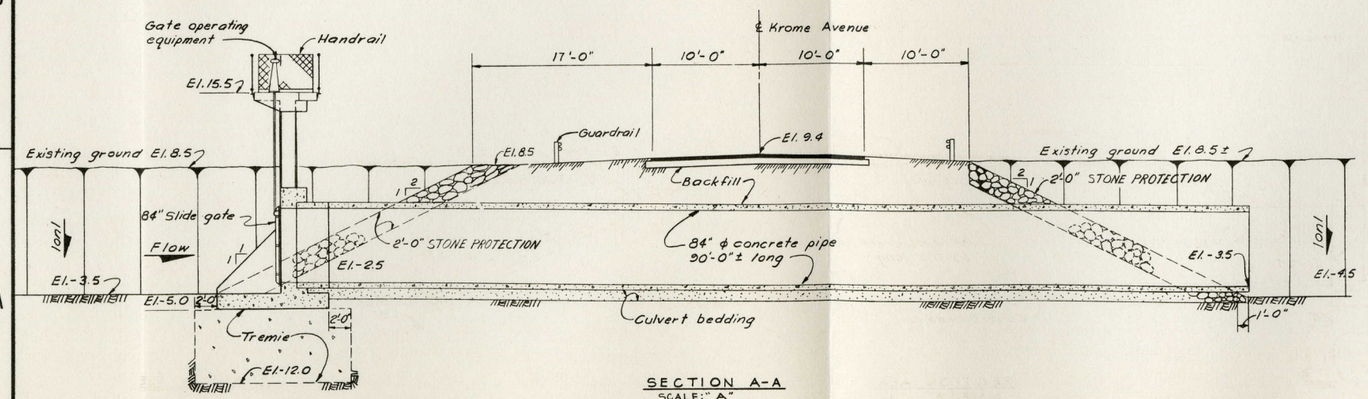
PLATE 30



PLAN
SCALE: "A"



ELEVATION
SCALE: "A"



SECTION A-A
SCALE: "A"

SCALE IN FEET
0 4' 2' 0 4' 8' 12'

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 194 (MOD.)

SECTION AND DETAILS

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829

LEGEND:

LIMESTONE, MEDIUM HARD, OOLITIC

LIMESTONE, HARD

22 / 19 / 44 — NUMBER OF HAMMER BLOWS REQUIRED TO ADVANCE A SPLIT SAMPLE SPOON (1-3/8" I.D. x 2" O.D.) ONE FOOT USING A 140-POUND HAMMER WITH A 30-INCH DROP. THE SPOON IS 2 FEET LONG AND IS DRIVEN CONTINUOUSLY 1 1/2 FEET WHERE POSSIBLE.

DIA — DRILLED WITH 4"x5-1/2" DIAMOND BIT.

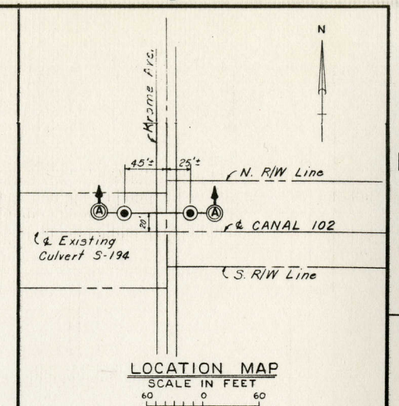
DIA NX — DRILLED WITH "NX" DIAMOND BIT

DROPPED — SAMPLE SPOON DROPPED UNDER WEIGHT OF DRILL RODS

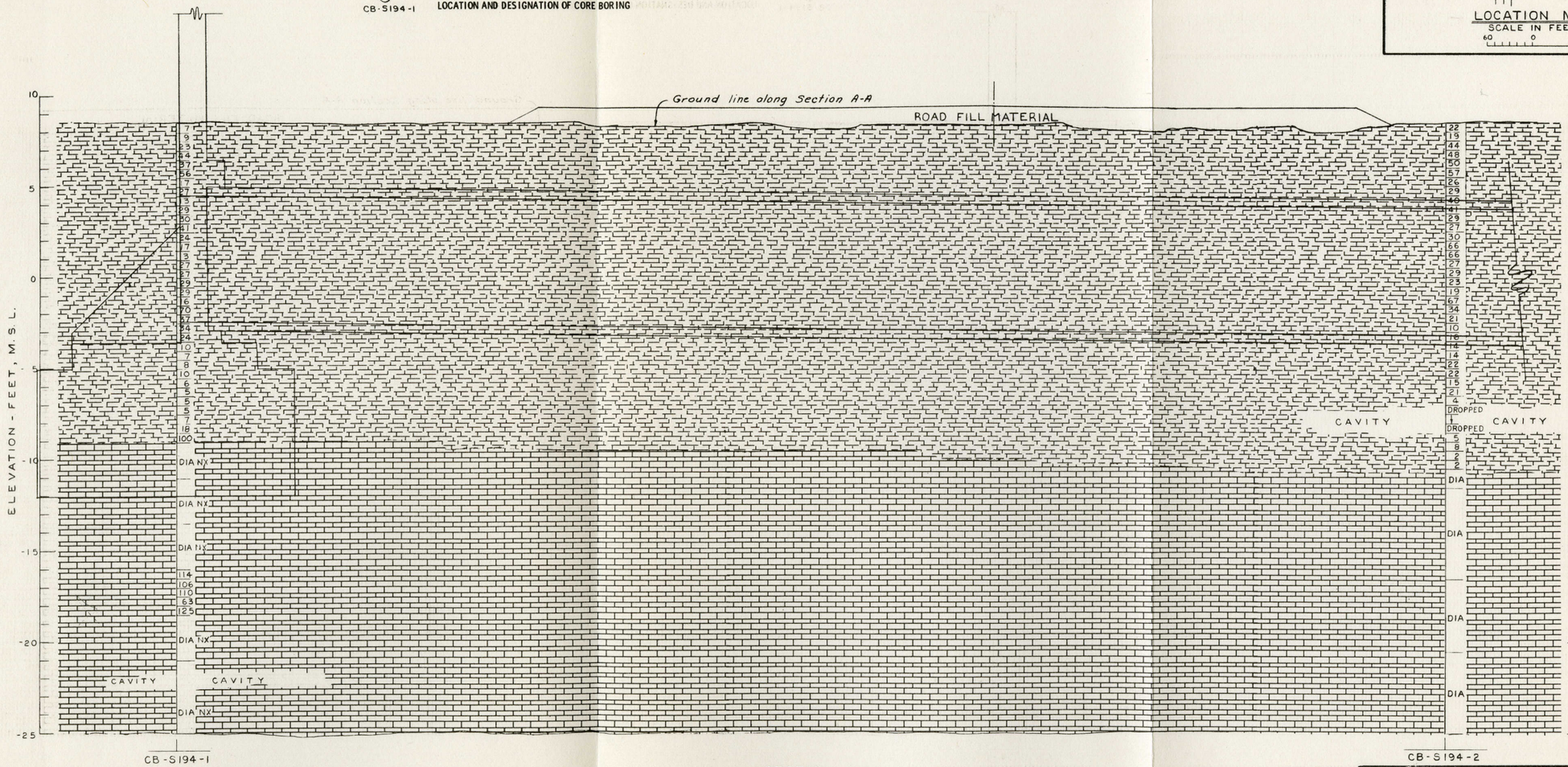
CB-S194-1 — LOCATION AND DESIGNATION OF CORE BORING

NOTES:

1. ROCK HARDNESS CLASSIFIED IN ACCORDANCE WITH EM 1110-1-1806.
2. 100% DRILL WATER LOSS WAS EXPERIENCED DURING DRILLING OPERATIONS.



LOCATION MAP
SCALE IN FEET
60 0 60



SECTION A-A
HORIZ SCALE: "A"

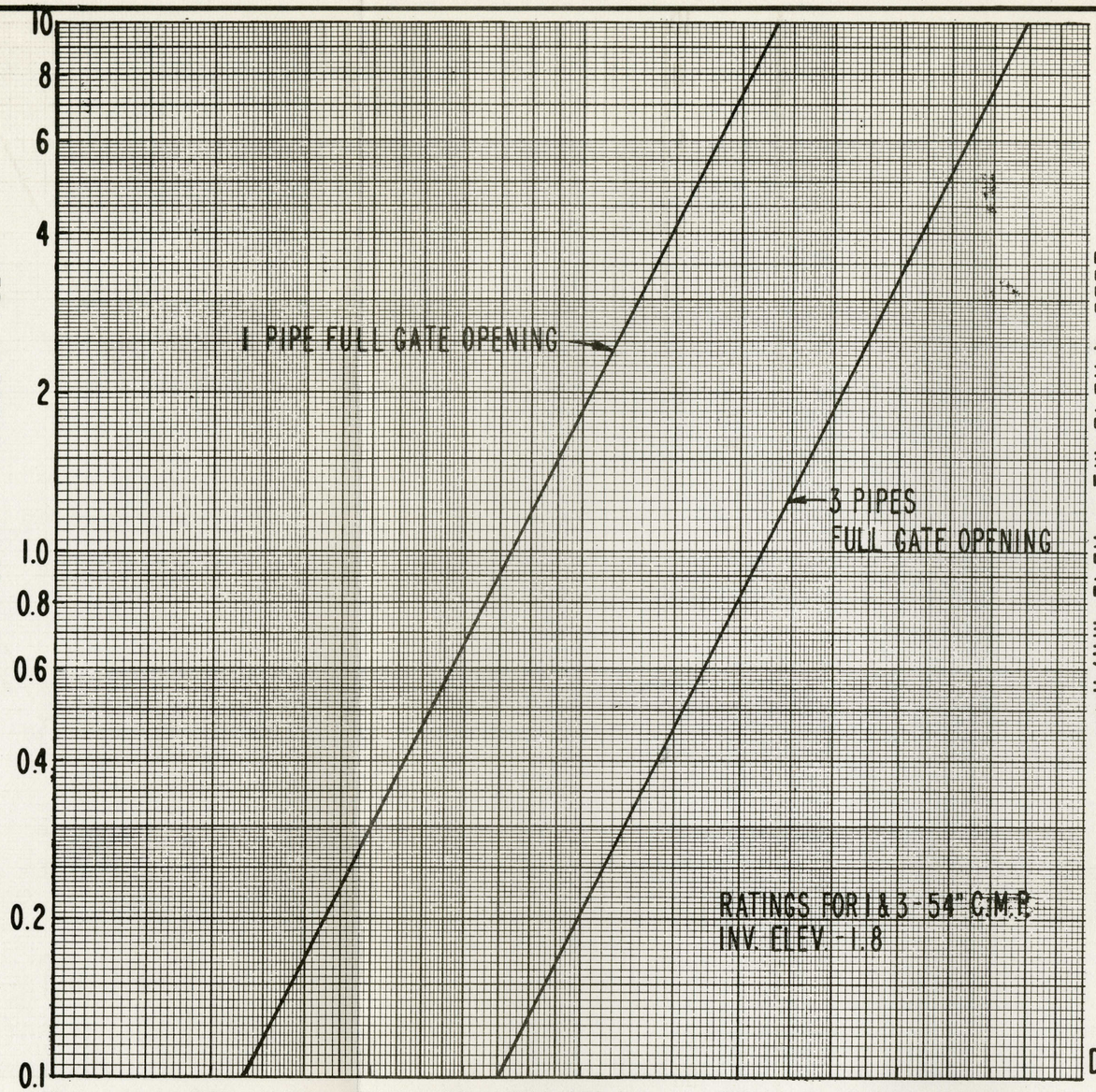
SCALE IN FEET
"A" 2.5 0 2.5 5.0 7.5

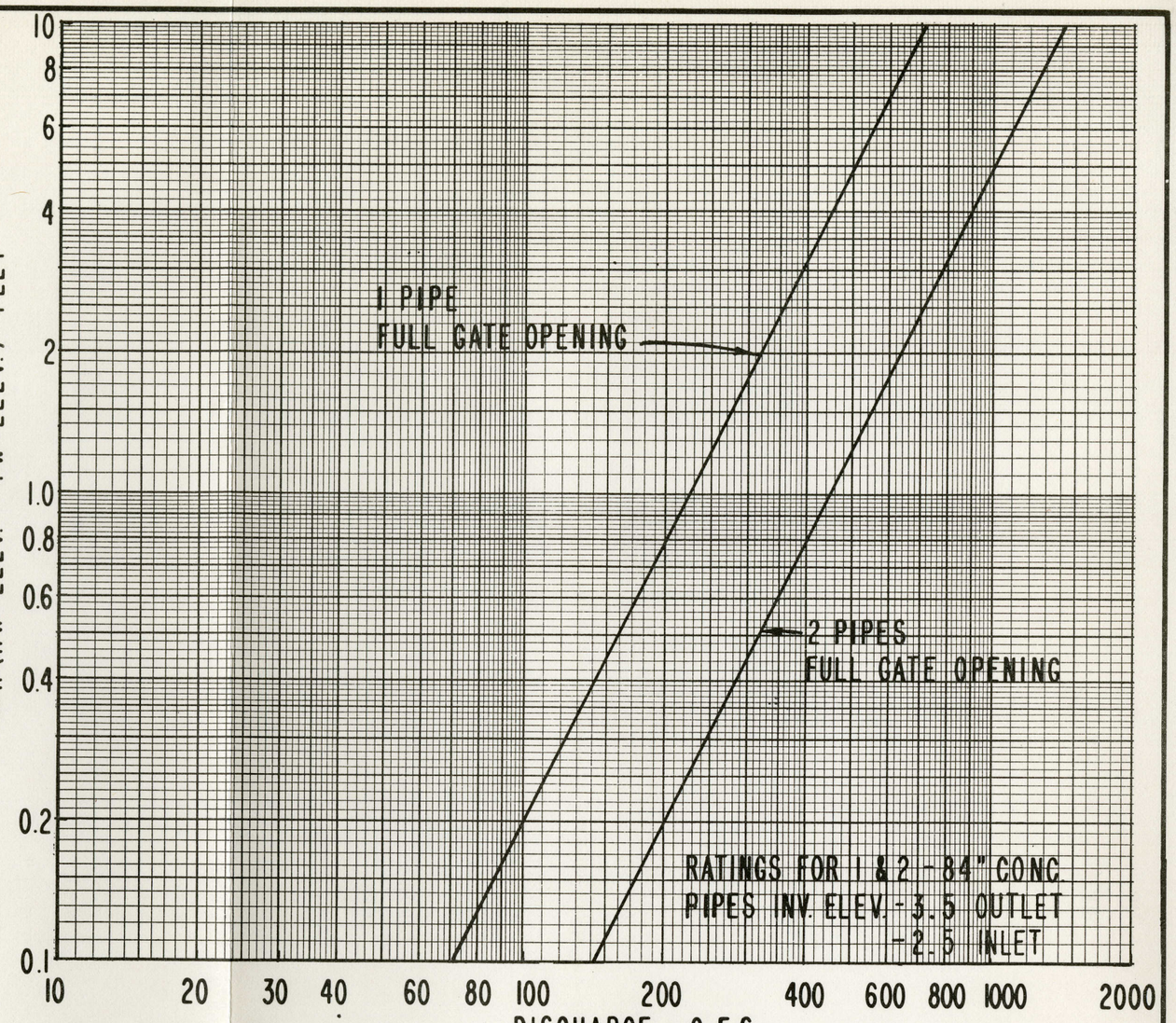
CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL
CONTROL STRUCTURE 194 (MOD)

GEOLOGIC SECTION

SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO, PART V, SUPP 55, DATED: AUG. 1974
FILE NO. 400-31,829

PLATE 32





NOTE:

Kent & "n" VALUES FROM
TM5-820-4 DATED JULY 1965

DISCHARGE RATINGS BASED ON:

$$Q = A\sqrt{\frac{2G\Delta H}{Kent + Kfr + Kexit}}$$

Kent = 0.50

$$Kfr = \frac{29.1n^2}{R^{4/3}} \times \text{LENGTH}$$

Kexit = 1.0

n = 0.012 (CONCRETE), n = 0.024 (CMP)

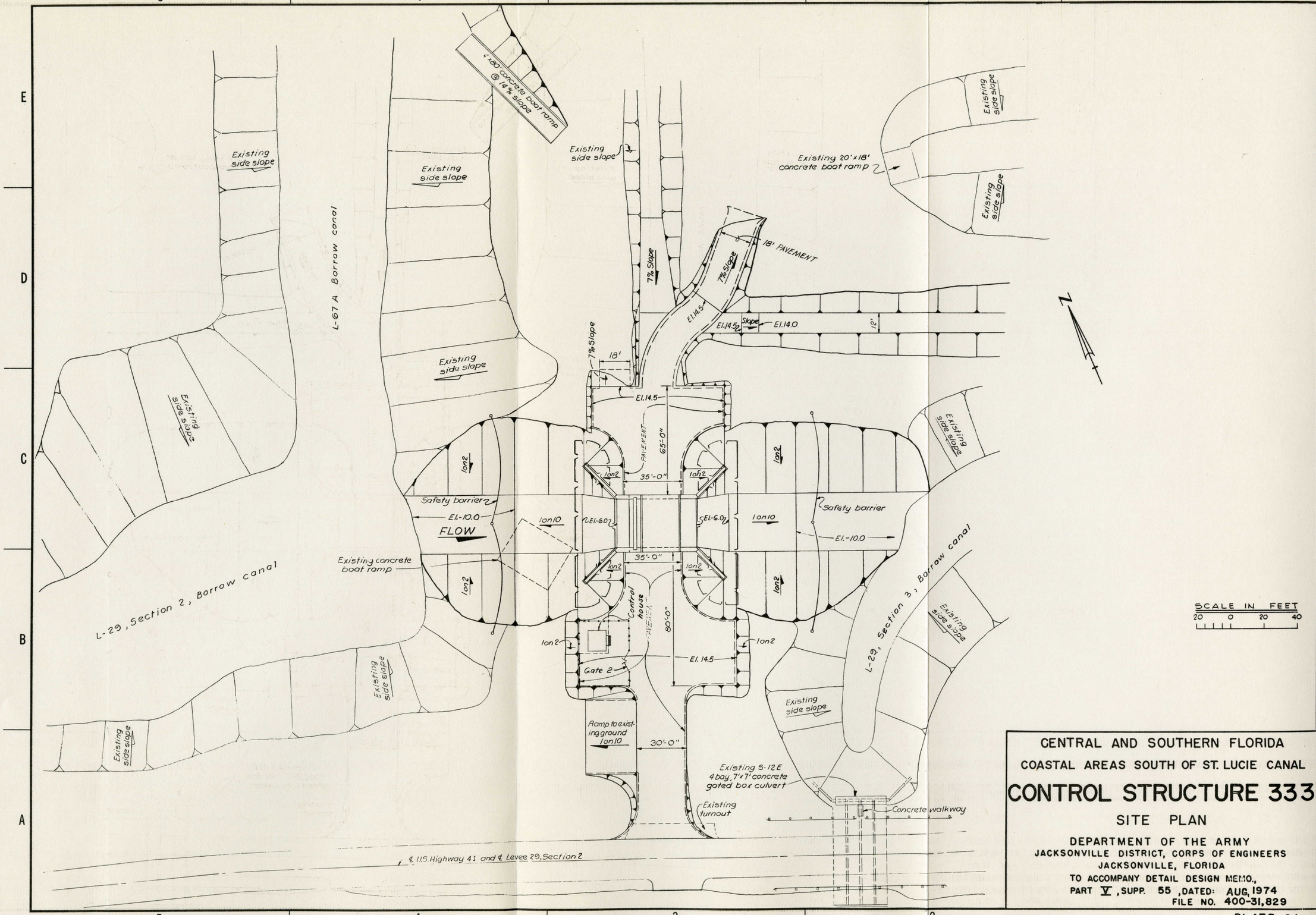
A = AREA OF PIPE (SQUARE FEET)

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CULVERTS 336 AND 194
DISCHARGE RATING CURVE

SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO., PART X, SUPP. 55, DATED AUGUST, 1974
FILE NO. 400-31,829

PLATE 33



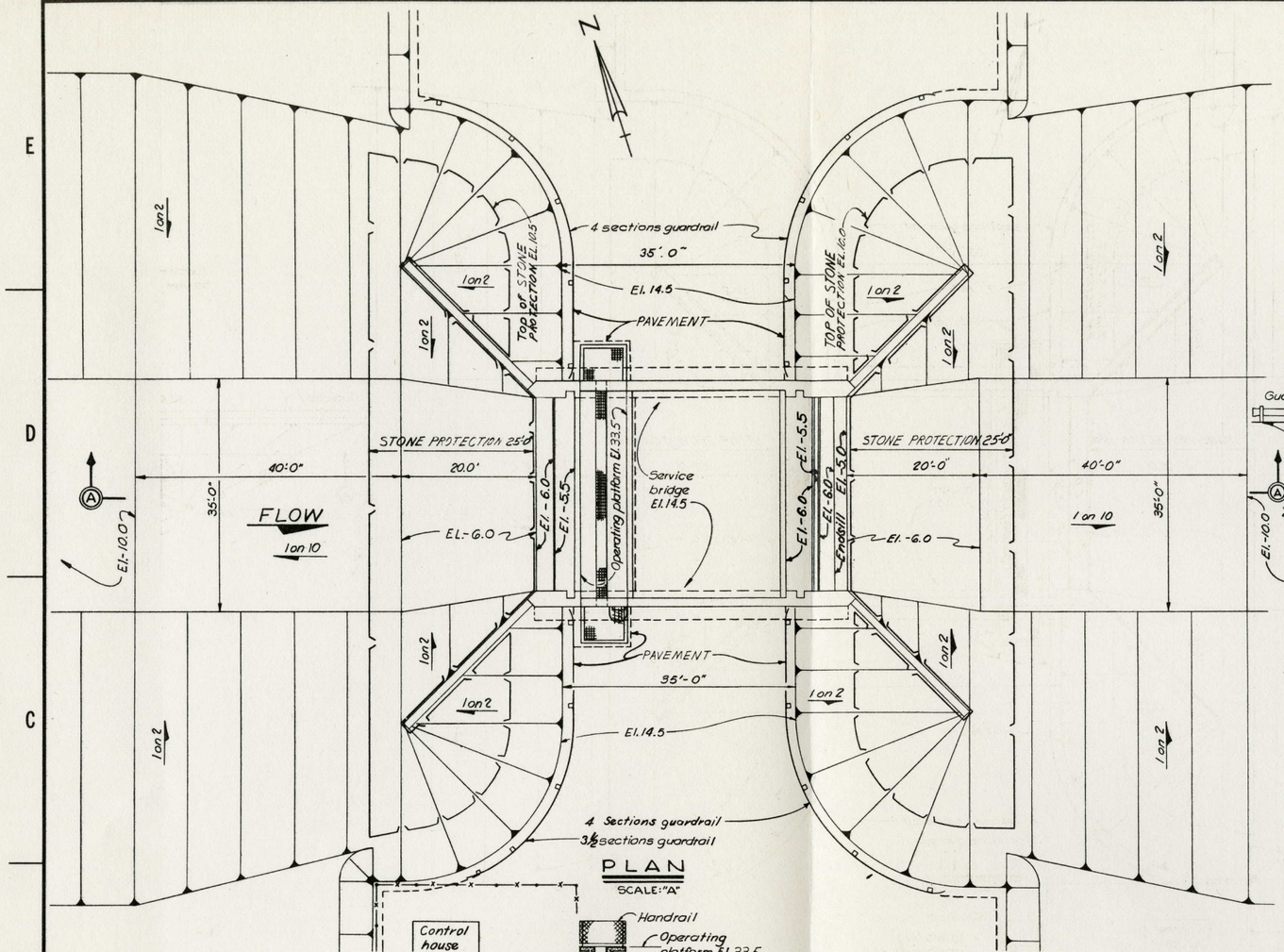
CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 333

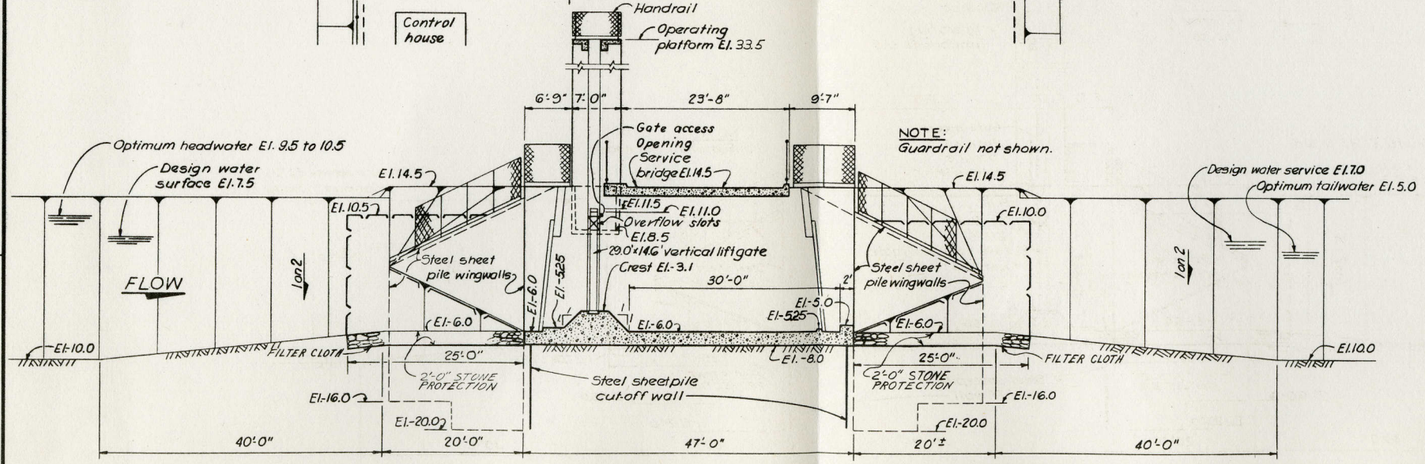
SITE PLAN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG. 1974
FILE NO. 400-31,829



PLAN

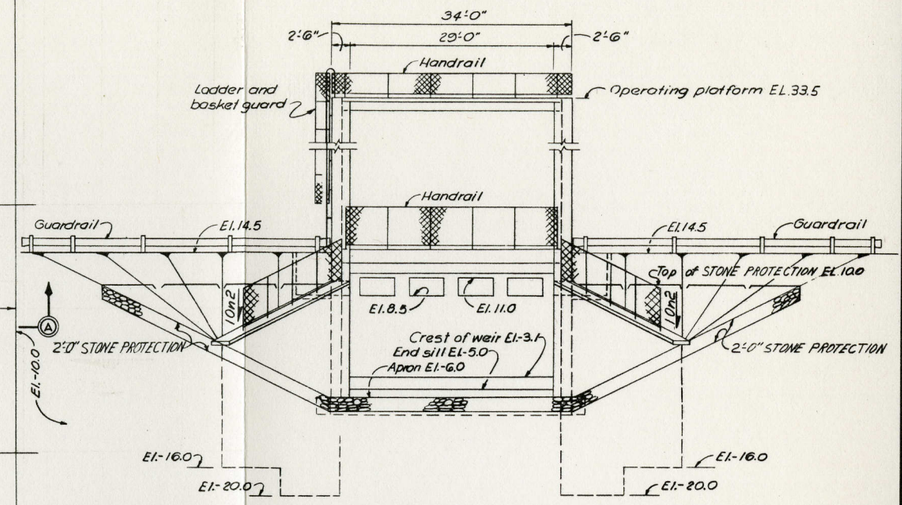
SCALE: "A"



SECTION A-A

SCALE: "A"

NOTE:
Guardrail not shown.



DOWNSTREAM ELEVATION

SCALE: "A"

SCALE IN FEET

"A" 8 0 8 16

CENTRAL AND SOUTHERN FLORIDA

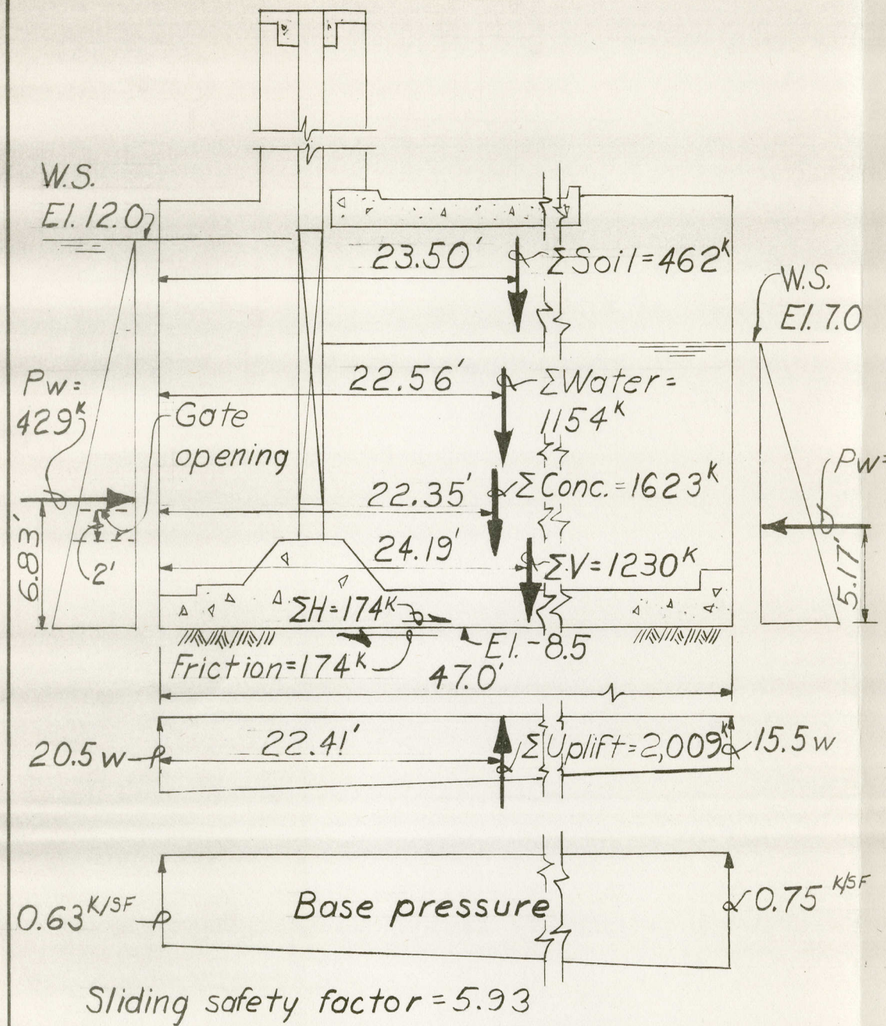
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 333

SECTION AND DETAILS

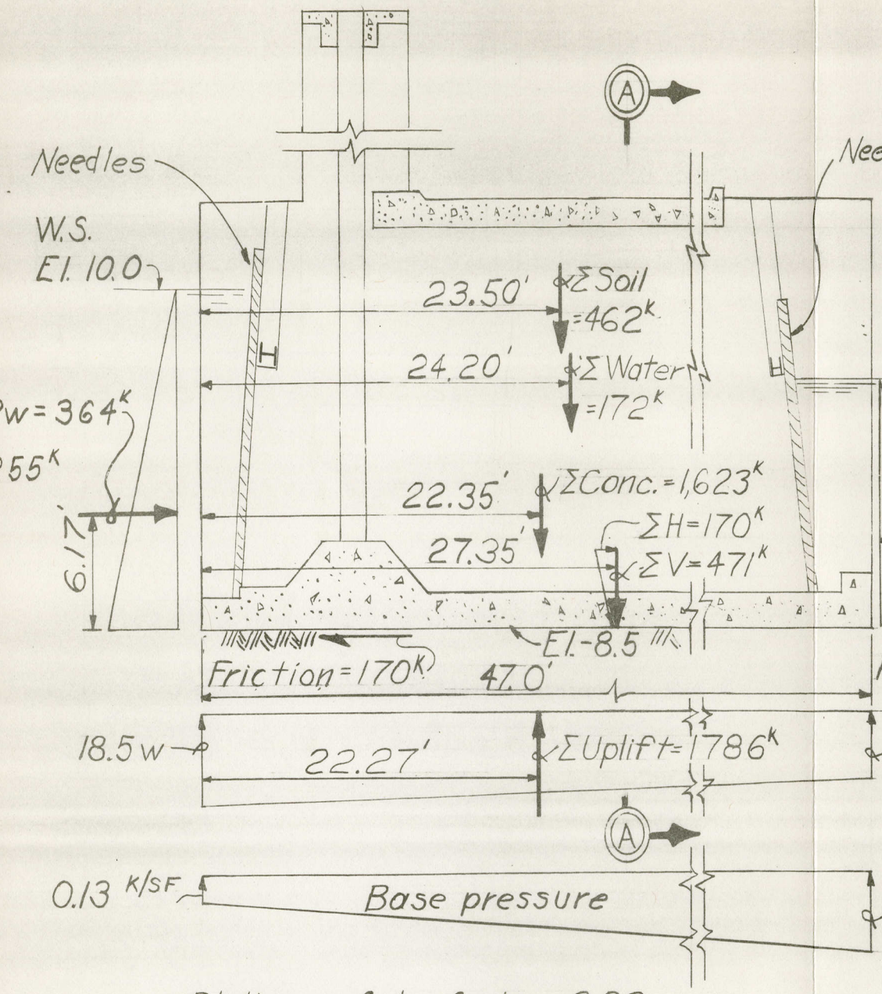
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829

PLATE 35



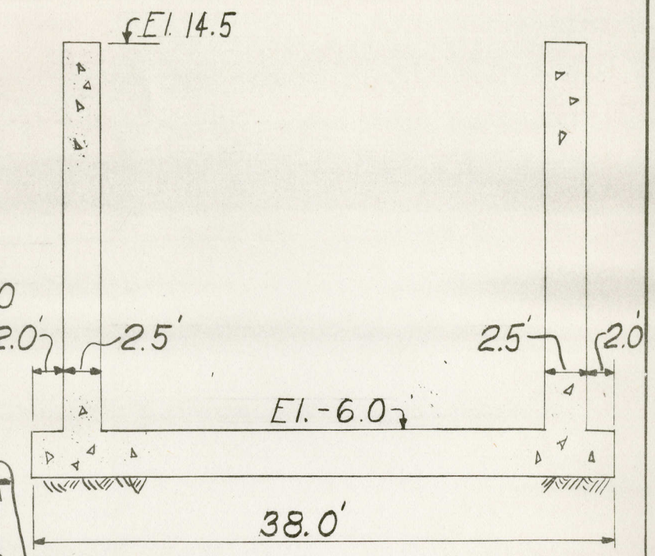
Sliding safety factor = 5.93

Case III: Operating condition, H.W. El. 12.0, T.W. El. 7.0. Full uplift acting over 100% of base area.



Sliding safety factor = 2.32

Case II: Structure dewatered, H.W. El. 10.0 T.W. El. 5.0. Full uplift acting over 100% of base area.



SECTION A-A

Base pressures

Upstream edge = 1.05 k/sf
Downstream edge = .77 k/sf

Case I: Construction condition, structure complete, no backfill or hydrostatic forces acting.

Note: Sliding safety factors based on ØL of 40° for calcareous sand, no cohesion.

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 333

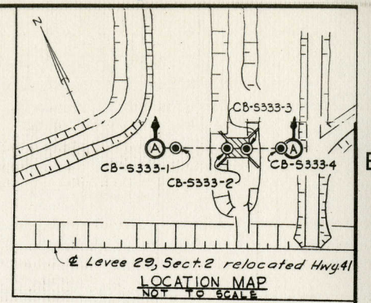
STABILITY ANALYSIS

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO., PART V, SUPP. 55, DATED. AUG. 1974
FILE NO. 400-31,829

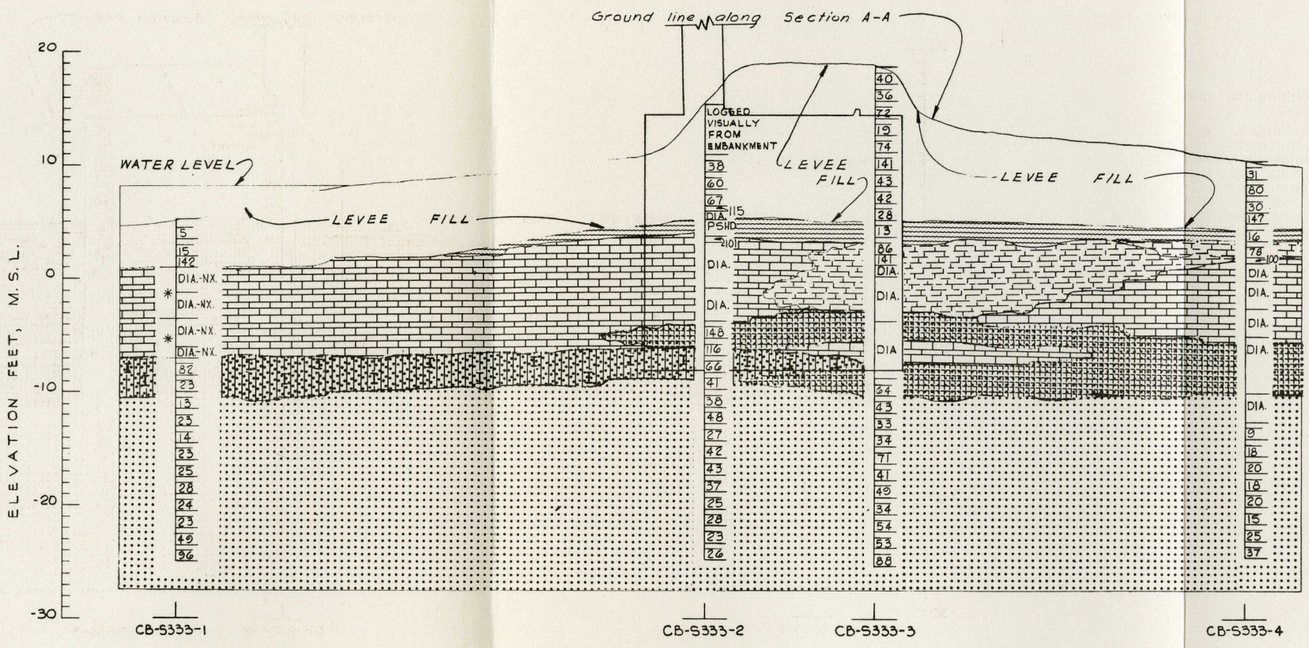
LEGEND:

- PEAT (PT)
- SAND (SP)
- SAND, SILTY, WITH LIMESTONE LAYERS (SM)
- SANDSTONE, MEDIUM HARD
- LIMESTONE, HARD, OOLITIC
- LIMESTONE, MEDIUM HARD OR SOFT, OOLITIC

- 5 / 15 / 142 — NUMBER OF HAMMER BLOWS REQUIRED TO ADVANCE A SPLIT SAMPLE SPOON (1-3/8" I.D. x 2" O.D.) ONE FOOT USING A 140-POUND HAMMER WITH A 30-INCH DROP. THE SPOON IS 2 FEET LONG AND IS DRIVEN CONTINUOUSLY 1 1/2 FEET WHERE POSSIBLE.
- 4 / PSHD — PUSHED SAMPLER DOWN BY HAND
- DIA — DRILLED WITH 4" x 5-1/2" DIAMOND BIT
- DIA NX — DRILLED WITH "NX" DIAMOND BIT
- * — NO HEAD COULD BE MAINTAINED DURING RECHARGE TEST WITH PUMP RUNNING AT FULL CAPACITY OF 29 G.P.M.
- CB-S333-1 — LOCATION AND DESIGNATION OF CORE BORING



LOCATION MAP
NOT TO SCALE



SECTION A-A
HORIZ. SCALE: "A"

NOTES:

1. ROCK HARDNESS AND SOIL CLASSIFIED IN ACCORDANCE WITH EM 1110-1-1806.
2. RECHARGE TESTS MADE IN THE FOLLOWING MANNER: CASING IS INSTALLED IN THE HOLE TO THE UPPER LIMIT OF THE ZONE TO BE TESTED. THE HOLE IS THEN DRILLED TO THE LOWER LIMIT OF THE SECTION TO BE TESTED. WATER IS PUMPED INTO THE CASING AT A RATE SUFFICIENT TO MAINTAIN A CONSTANT HEAD ABOVE THE NORMAL WATER TABLE, IF POSSIBLE, AND THIS RATE OF FLOW IS DETERMINED. THE RATE OF FLOW DIVIDED BY THE HEAD MAINTAINED GIVES GALLONS PER MINUTE PER FOOT OF HEAD.

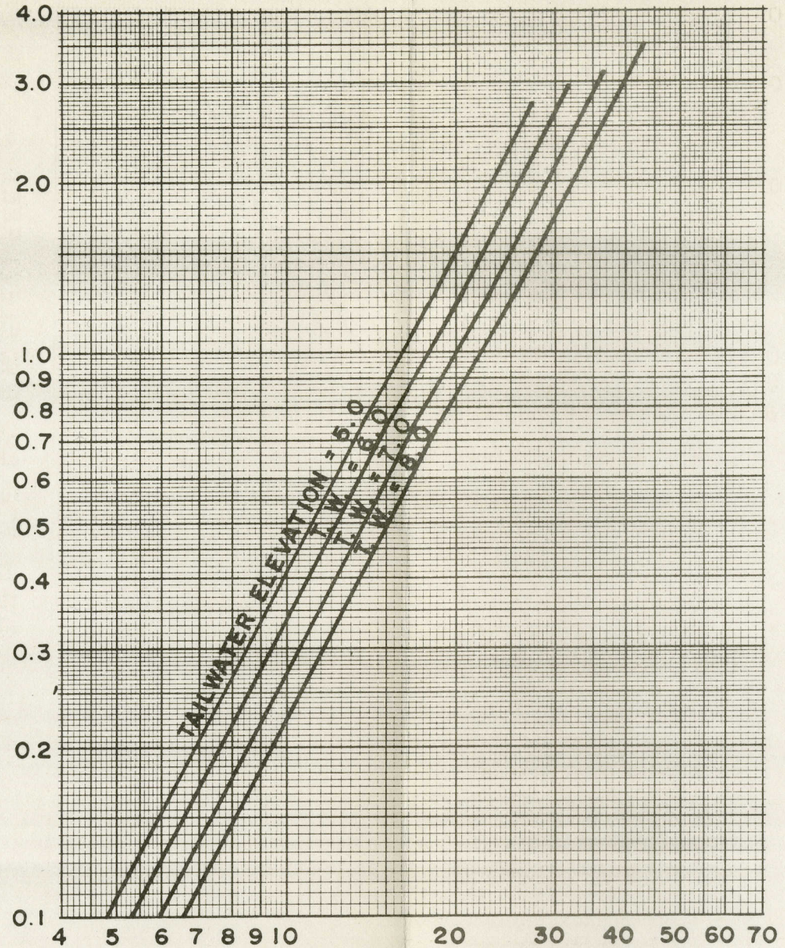
SCALE IN FEET
"A" 10' 0 10' 20'

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

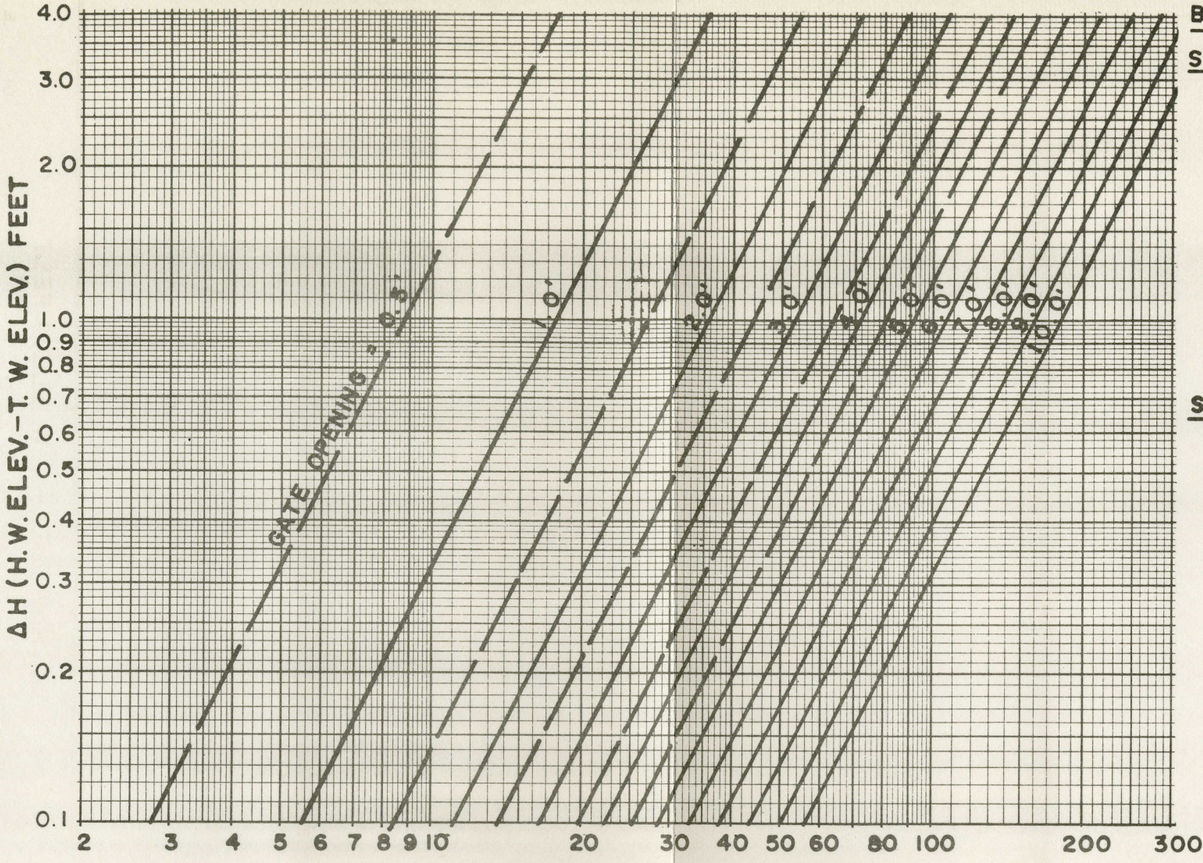
CONTROL STRUCTURE 333

GEOLOGIC SECTION

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG. 1974
FILE NO. 400-31,829



SUBMERGED UNCONTROLLED FLOW



SUBMERGED CONTROLLED FLOW

BASIS FOR DISCHARGE RATING CURVES

SUBMERGED UNCONTROLLED FLOW

BASED ON DAUBUISSON'S FORMULA

$Q = KA\sqrt{2g\Delta H + V_1^2}$

$K = 0.85$ WHEN $\Delta H \geq 1.0'$

$K = 0.80$ WHEN $\Delta H < 1.0'$

$A = (\text{TW ELEV.} - \text{CREST ELEV.}) \times 29.0'$

V = APPROACH VELOCITY

SUBMERGED CONTROLLED FLOW

BASED ON ORIFICE FORMULA

$Q = CA\sqrt{2g\Delta H}$

$C = 0.75$

A = GATE OPENING X 29.0'

S-333

ONE 29.0' WIDE X 14.6' HIGH GATE
CREST ELEVATION = – 3.1

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

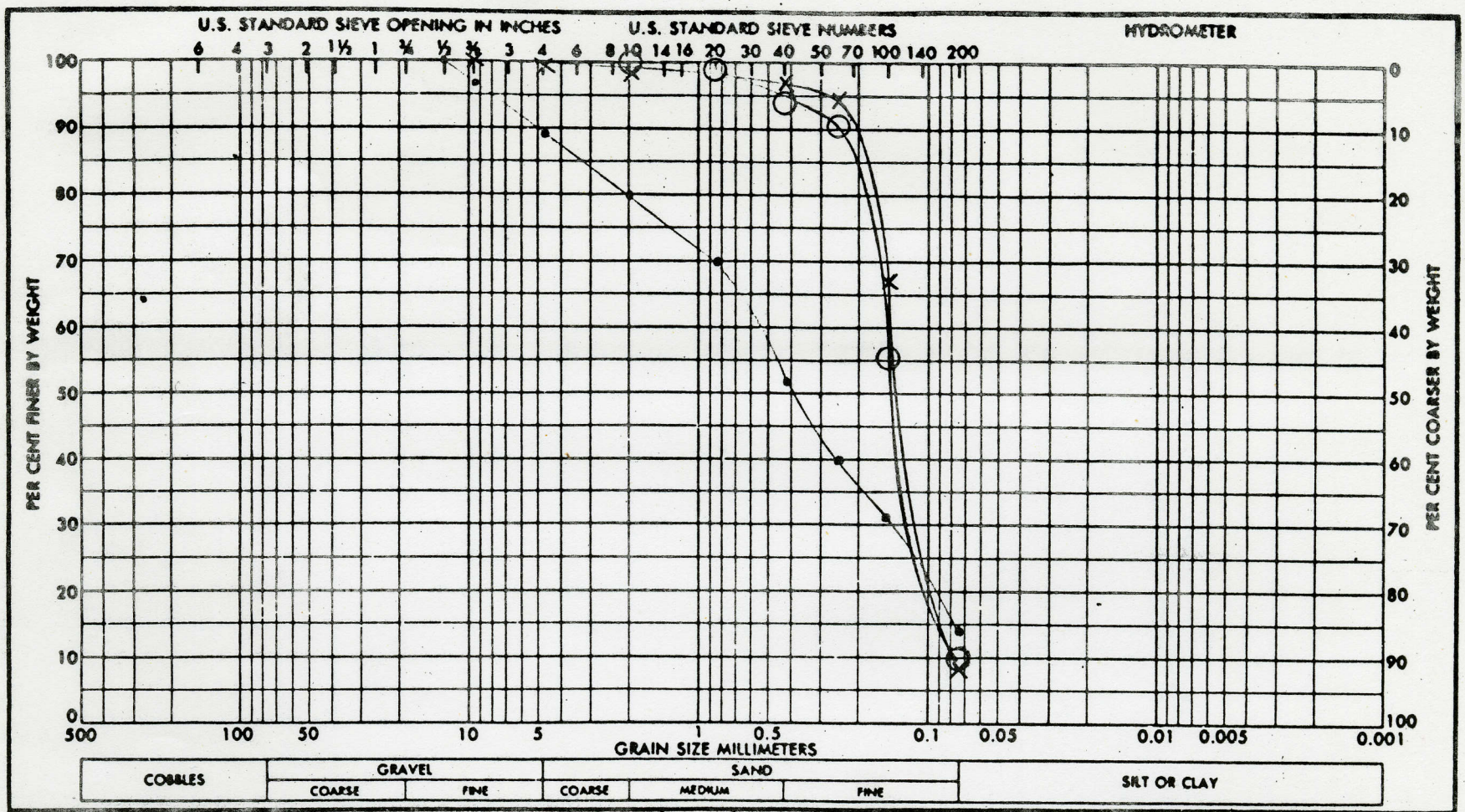
CONTROL STRUCTURE 333
DISCHARGE RATING CURVE

SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED AUGUST, 1974
FILE NO. 400-31,829

PLATE 36

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY,
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GEORGIA 30061

REQ. NO. 08-123-ENG-166-73
WORK ORDER NO. 8045



SAMPLE NO.	ELEV ID/DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
•	-8.2 to -10.2	White silty sand (SM) w/ trace of mica & w/shell	-	NP	NP	NP
X	-10.2 to -17.2	White poorly graded silty sand(SP-SM) w/trace of mica	-	NP	NP	NP
○	-17.2 to -24.2	White poorly graded silty	-	NP	NP	NP

& trace of shell

GRADATION CURVES sand (SP-SM)

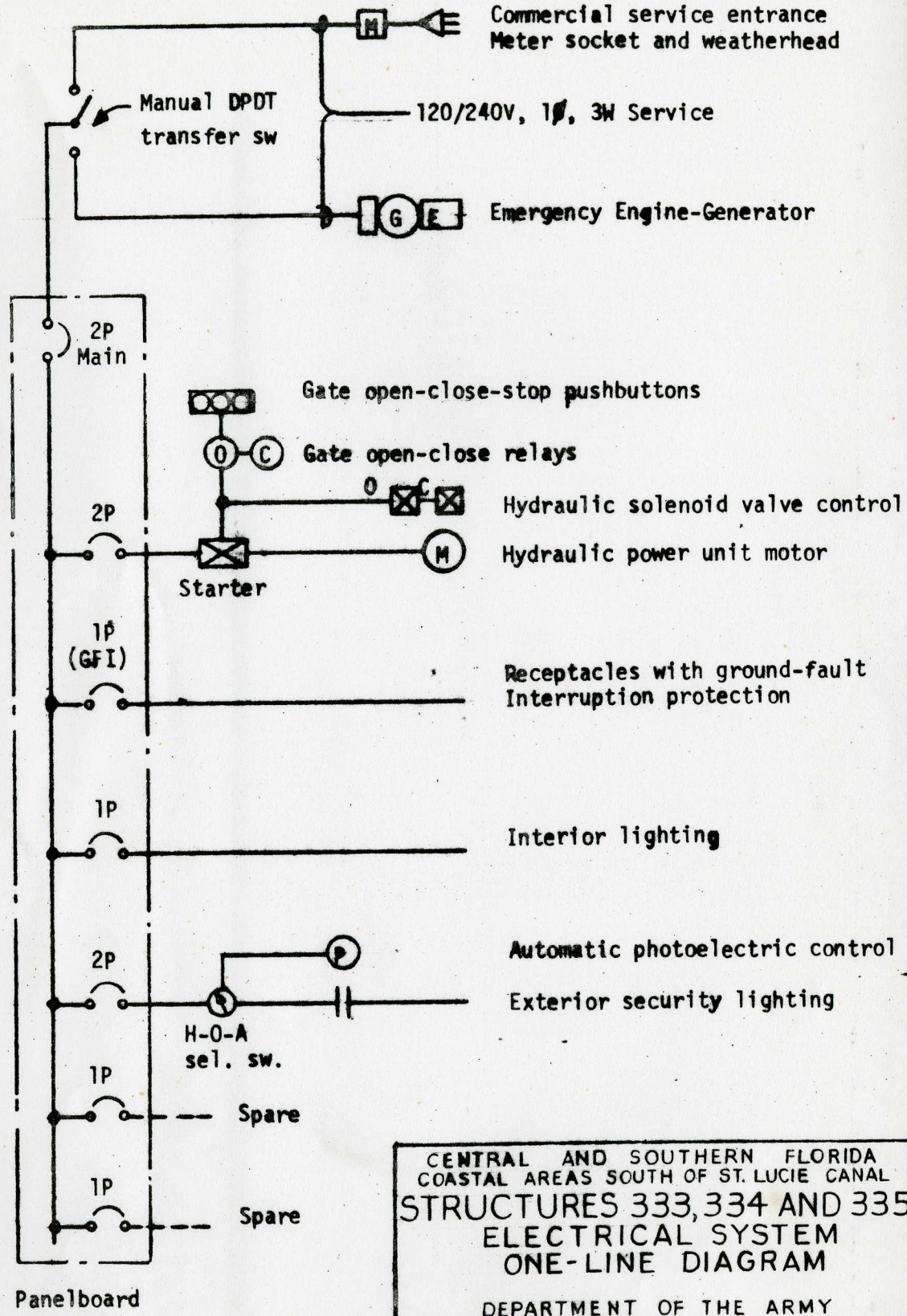
PROJECT C & S Florida, Jacksonville District
Lab. No. 4/2749, 2750 & 2751
AREA Structure 333
BORING NO. CB-S333-1
DATE 23 March 1973

PLATE 37

ENG FORM 2087
1 MAY 63

REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.

U.S. GOVERNMENT PRINTING OFFICE : 1965 O-790-126

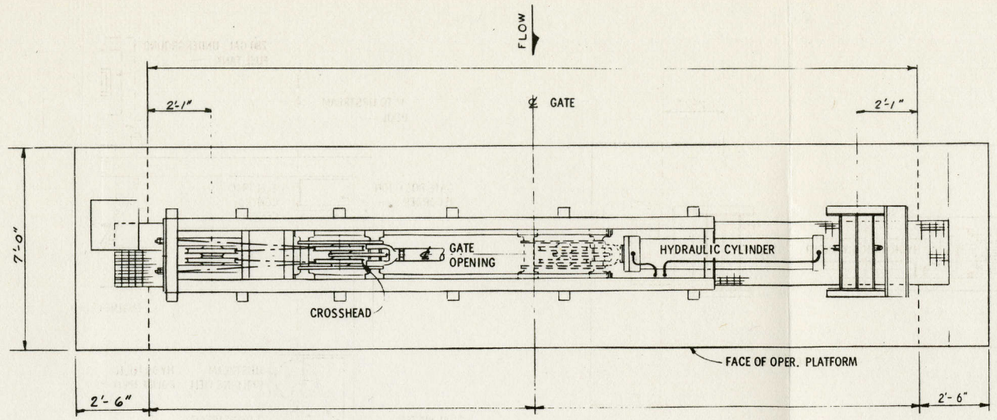


CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

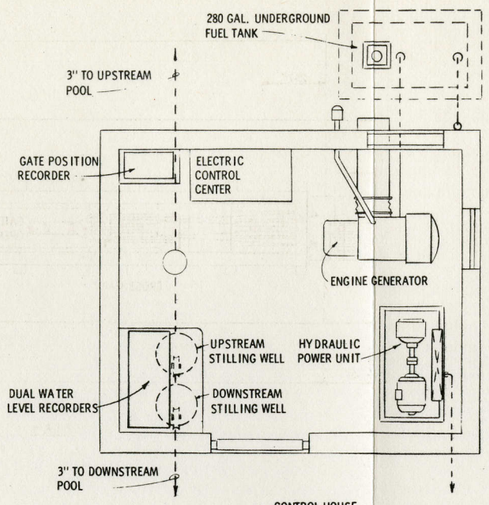
STRUCTURES 333, 334 AND 335
ELECTRICAL SYSTEM
ONE-LINE DIAGRAM

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED. AUG., 1974
FILE NO. 400-31,829

PLATE 40



PLAN AT OPERATING PLATFORM

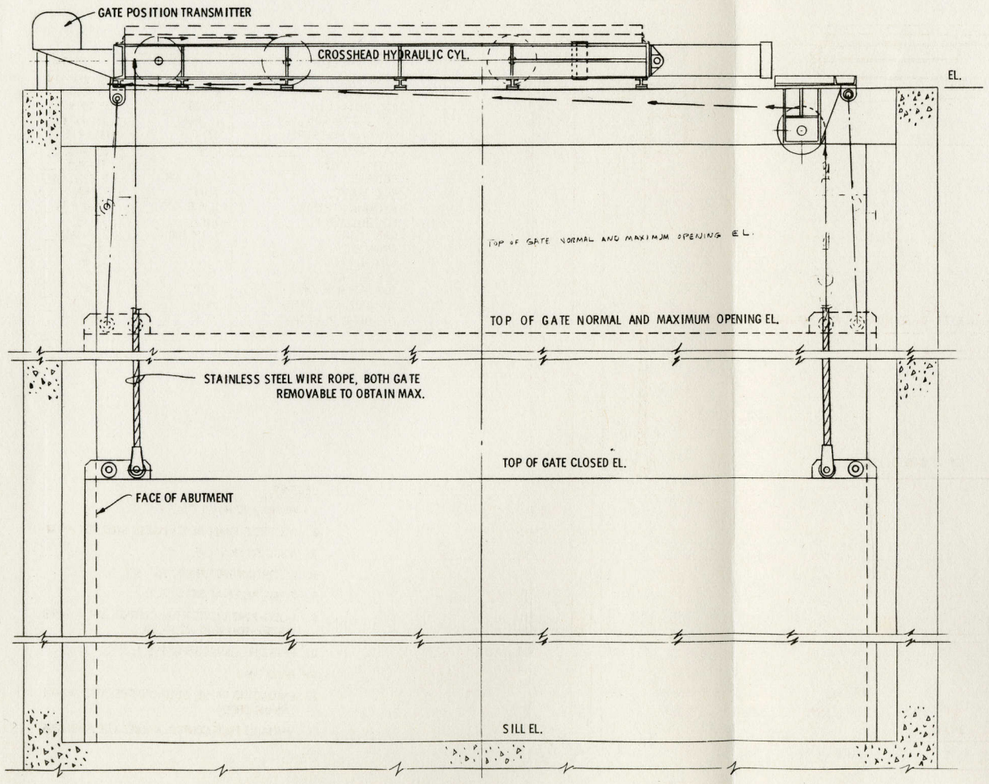


CONTROL HOUSE

HOIST HYDRAULIC SYSTEM

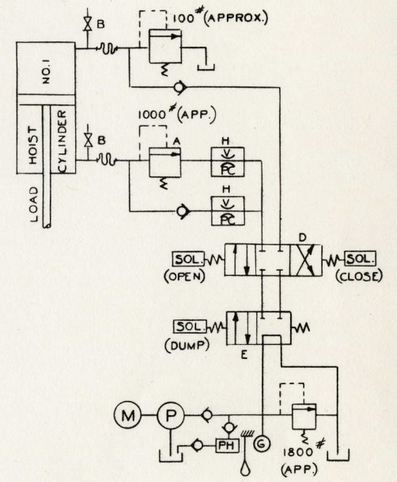
NOTES:

1. WITH THIS SYSTEM OIL IS PUMPED TO THE CYLINDER WHEN GATE IS EITHER RAISED OR LOWERED.
2. RELIEF VALVE "A" SHALL BE OF A TYPE THAT SEALS LEAKPROOF WHEN CLOSED.
3. RELIEF VALVE "A" SHALL BE SET (1) TO CLOSE AT THE MINIMUM PRESSURE REQUIRED TO HOLD GATE OPEN AT ANY POSITION, AND (2) TO OPEN WHEN THIS PRESSURE IS EXCEEDED IN ORDER TO LOWER THE GATE.
4. DRAIN LINES TO COMPONENTS REQUIRING SAME SHALL BE PROVIDED ALTHOUGH NOT SHOWN.
5. AIR BLEEDING VALVES SHALL BE PROVIDED AT HIGH POINTS OF SYSTEM.
6. ALL COMPONENTS EXCEPT HOIST CYLINDER AND ADJACENT AIR VENT VALVES SHALL BE MOUNTED ON OR BE PART OF THE HYDRAULIC POWER UNIT LOCATED IN THE CONTROL HOUSE.



SECTION ELEVATION

ITEM	S-333	S-334	S-335
GATE SIZE	29'W x 14.6'H	29' W x 14.4 H	20'W x 11.2'H
EST. GATE WT.	31,755#	31,320 #	16,800 #
EST. HOIST LOAD	58,000 #	48,700 #	25,200#
EST. PISTON ROD LOAD	145,000#	121,750 #	63,000 #
WORKING PRESSURE	1625 P.S.I.	1365 P.S.I.	1150 P.S.I.
GATE SPEED u/D	6"/MIN.	6"/MIN.	6"/MIN.
CYLINDER SIZE	12 INCH	12 INCH	10 INCH
ROD SIZE	5 1/2 INCH	5 1/2 INCH	5 1/2 INCH
ROD TRAVEL	6.0 FT.	6.5 FT.	5.0 FT.
HYDRAULIC PUMP	1.16 G.P.M.	1.16 G.P.M.	0.71 G.P.M.
ELECTRIC MOTOR	3 H.P.	3 H.P.	3 H.P.
CABLE SIZE	1 1/4 INCH	1 1/4 INCH	1 INCH
EMERGENCY GEN.	10 KW	10 KW	10 KW
SILL ELEVATION	-3.1'	-6.9'	-4.2'
TOP GATE CLOSED	11.5'	7.5'	7.0'
TOP GATE NOR. OPEN	23.1'	20.4'	17.2'
TOP GATE MAX. OPEN	23.1'	20.4'	17.2'
TOP OPER. PLATFORM	33.5'	36.0'	30.5'



LEGEND

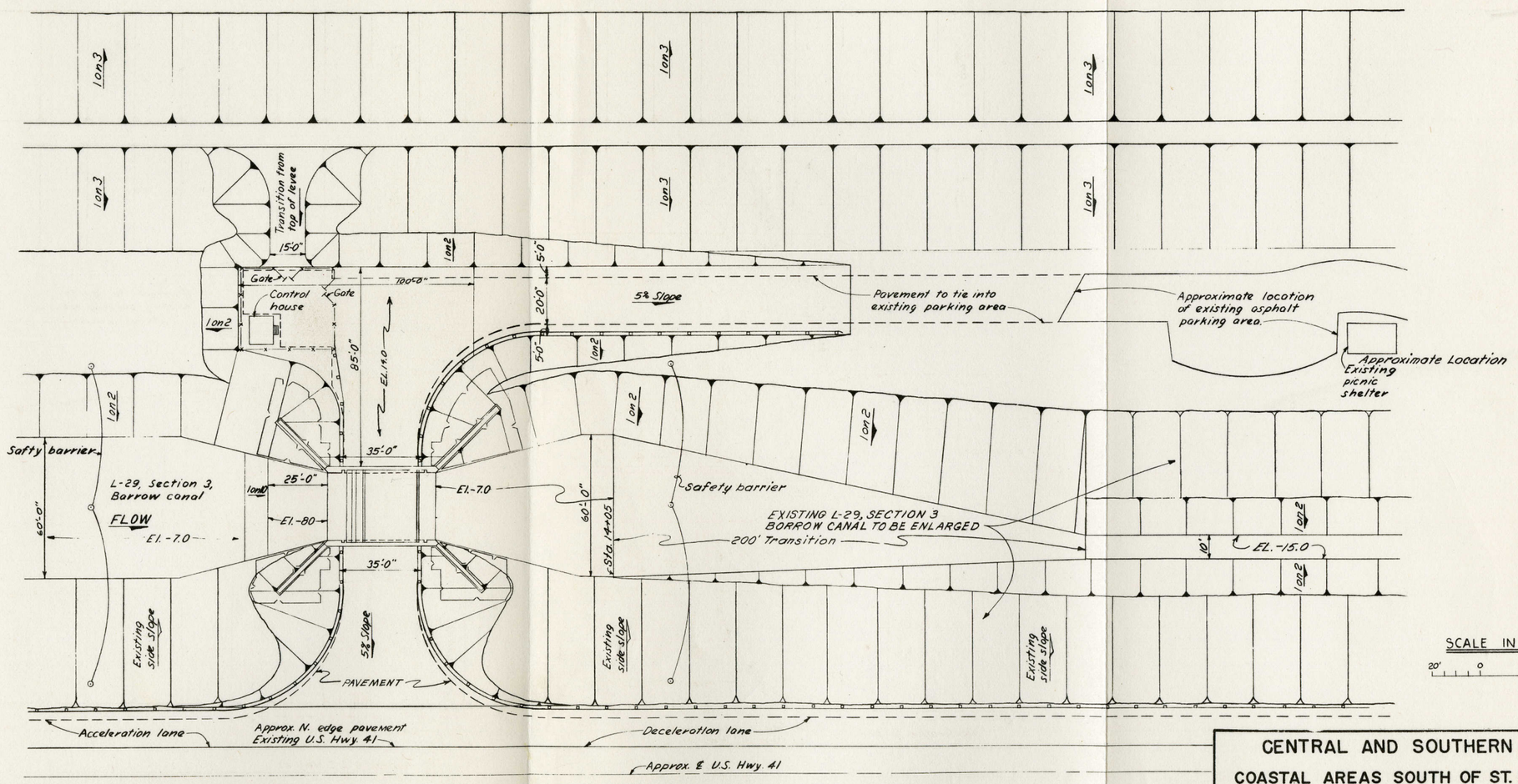
1. HYDRAULIC HOIST CYL.
2. ALL PIPES SHALL BE STAINLESS STEEL TUBING WITH 0.035" WALL.
- B. AIR BLEEDER VALVE.
- M. ELECTRIC MOTOR 230V, 1ϕ, 3H.P.
- P. PUMP, RATED AT 2000 P.S.I.
- D. MULTI-PORT DIRECTIONAL CONTROL VALVE SPRING CENTERED DOUBLE-SOLENOID ACTUATED.
- G. PRESSURE GAUGE 0-3000 P.S.I.
- PH. HAND PUMP
- E. UNLOADING VALVE, SOLENOID OPERATED, TIME DELAYED, SPRING OFFSET.
- H. VARIABLE FLOW CONTROL VALVES PRESSURE COMPENSATED.

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURES 333, 334 AND 335

GATE HOIST

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829



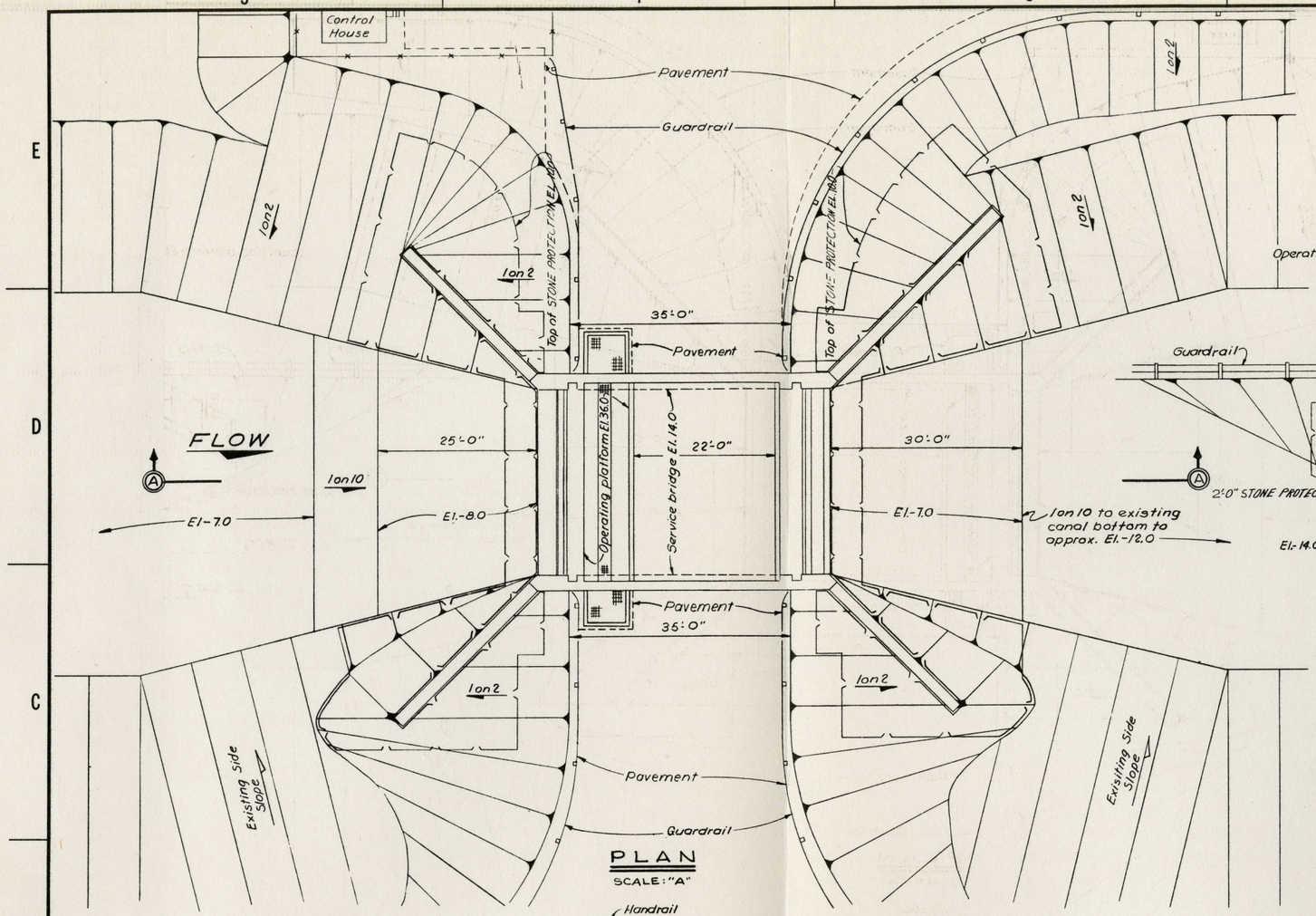
CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 334

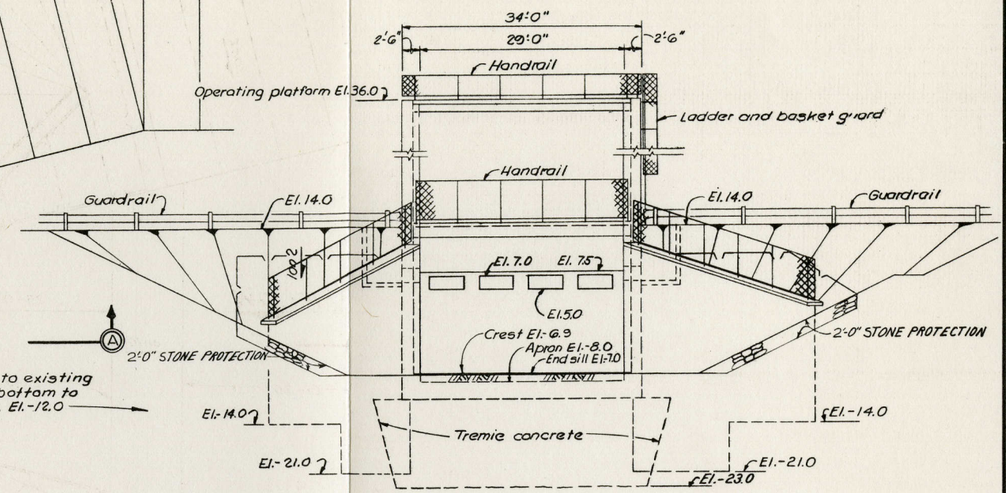
SITE PLAN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829



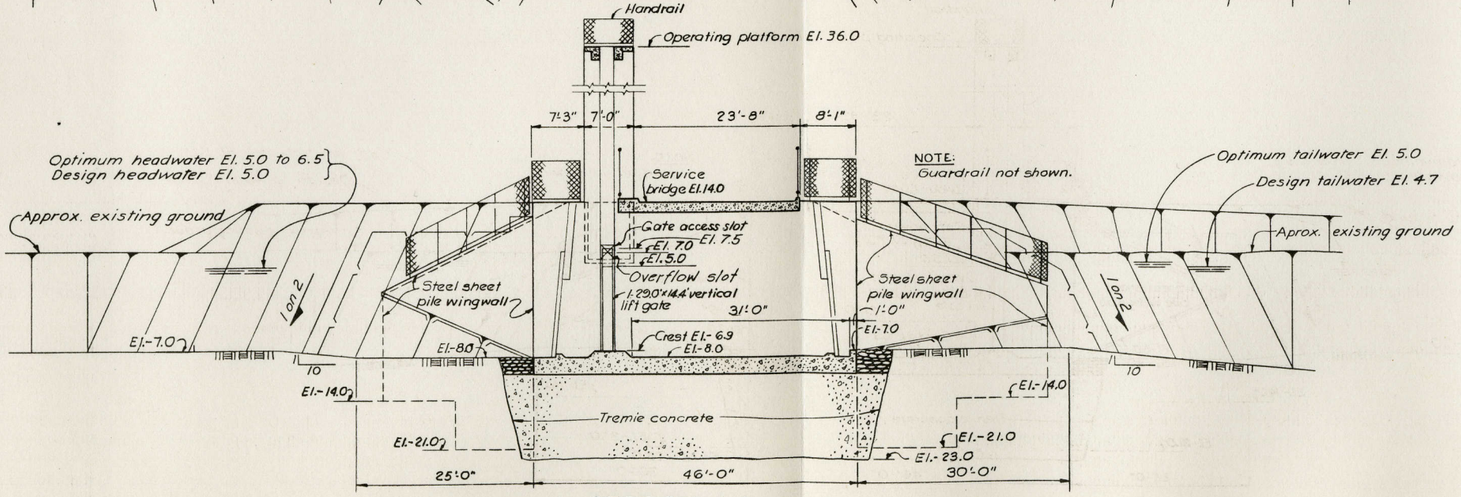
PLAN

SCALE: "A"



DOWNSTREAM ELEVATION

SCALE: "A"



SECTION A-A

SCALE: "A"

SCALE IN FEET

"A" 8 0 8 16

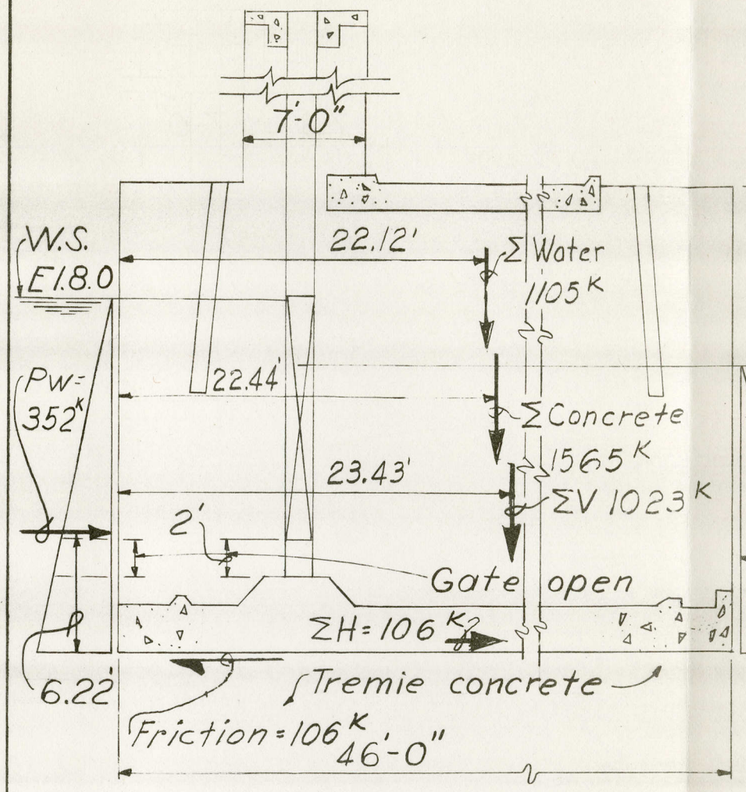
CENTRAL AND SOUTHERN FLORIDA

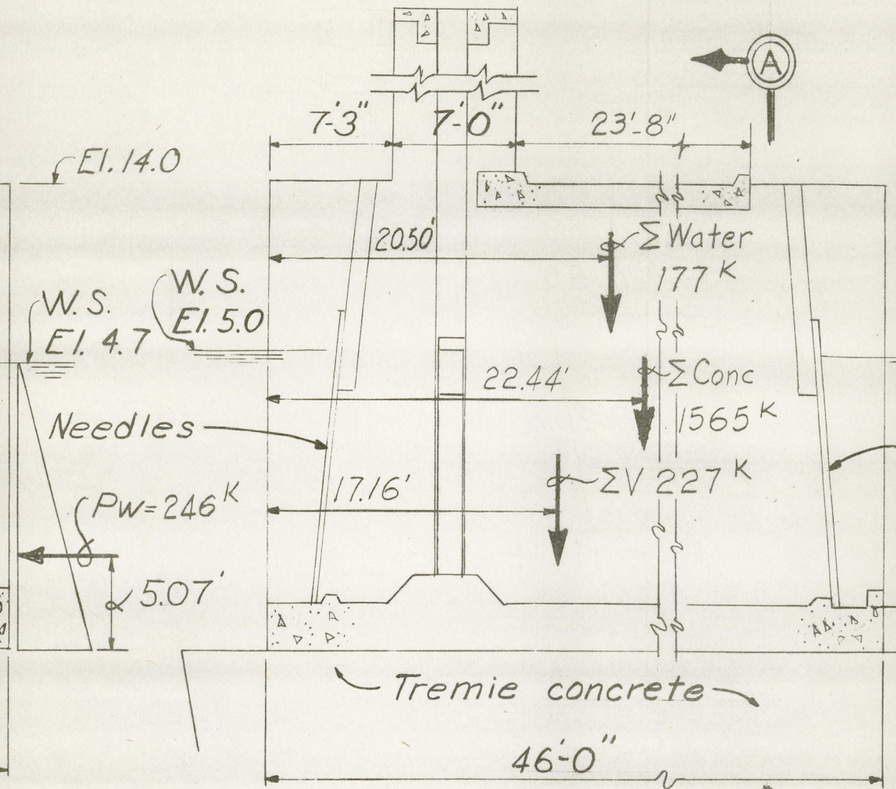
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

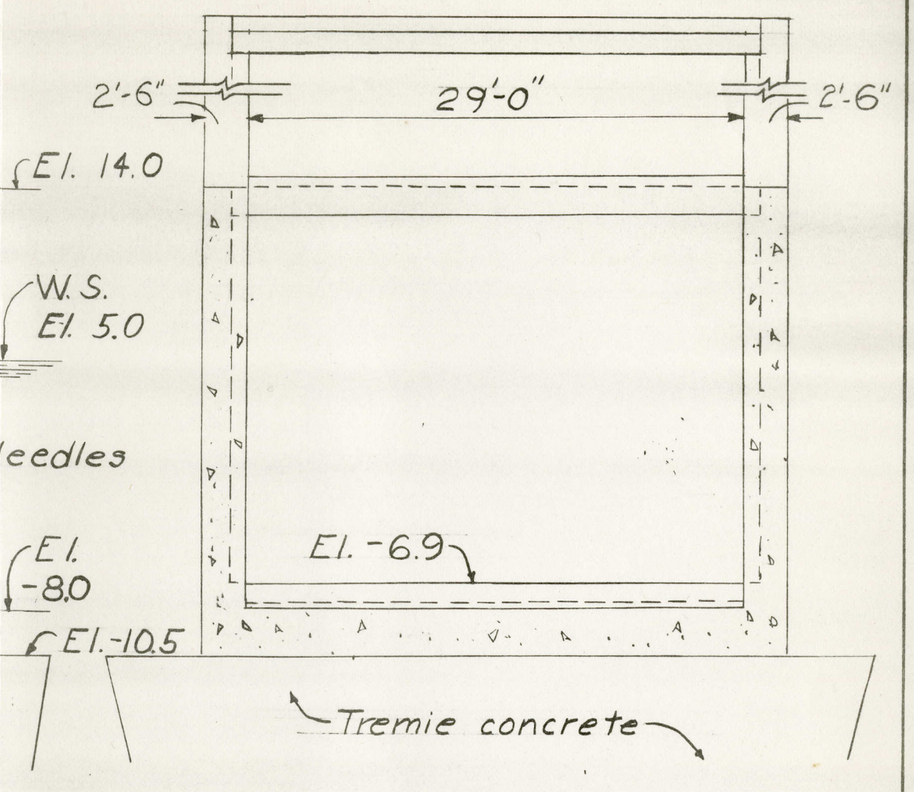
CONTROL STRUCTURE 334

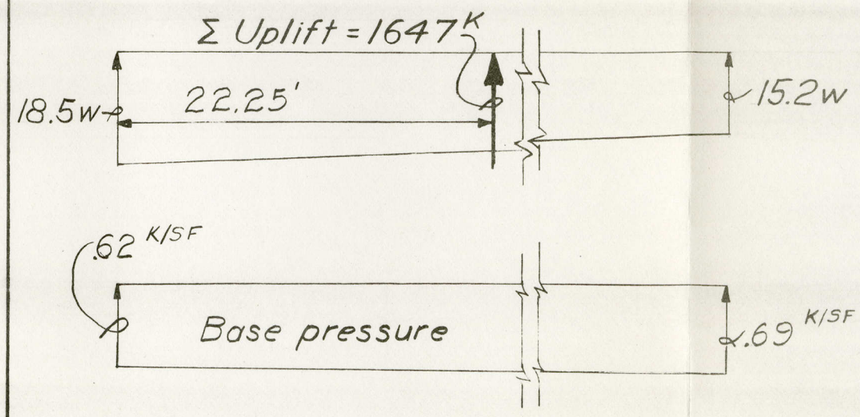
SECTION AND DETAILS

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG. 1974
FILE NO. 400-31,829

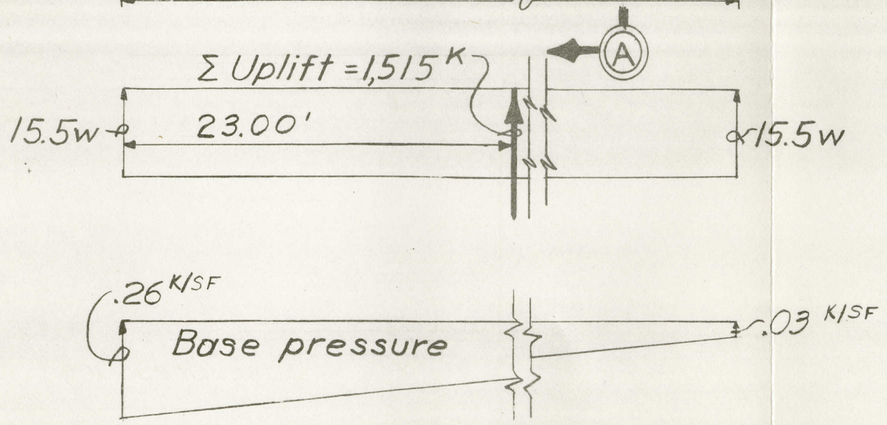








Case III Operating condition H.W. El. 8.0, T.W. El. 4.7, Full uplift acting over 100% of base area



Case II Structure dewatered, H.W. El. 5.0, T.W. El. 5.0. Full uplift acting over 100% of base area.

SECTION A-A

Base pressure:
Upstream 1.07 K/SF
Downstream 0.93 K/SF

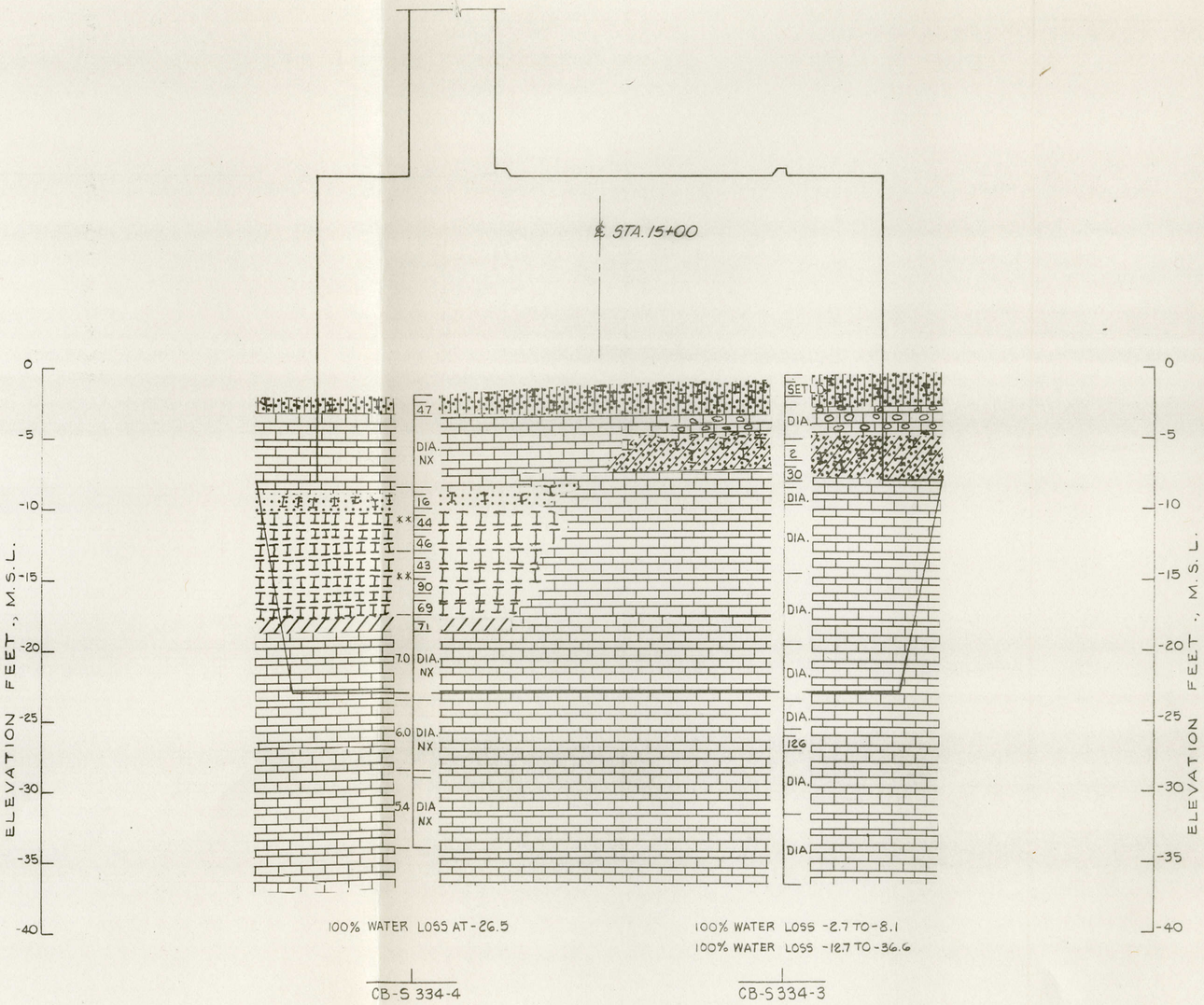
Case I: Construction condition, no backfill or hydrostatic forces acting

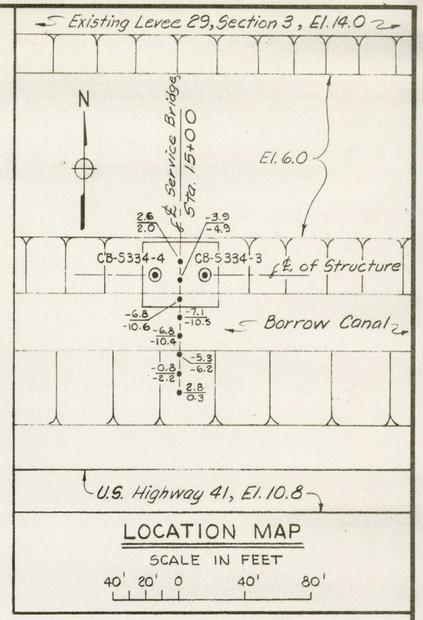
CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 334

STABILITY ANALYSIS

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO., PART V, SUPP. 55, DATED. AUG, 1974
FILE NO. 400-31,829





LOCATION MAP

SCALE IN FEET

40' 20' 0 40' 80'

LEGEND

- MUCK - SILT & SAND, SOFT
- SAND, CLAYEY (SC) WITH LIMESTONE FRAGMENTS
- SAND, (SP) WITH LIMESTONE FRAGMENTS
- CLAY, PLASTIC, (CH)
- LIMESTONE, HARD
- LIMESTONE, CONGLOMERATIC
- LIMESTONE, MEDIUM HARD TO SOFT.

DIA. — DRILLED WITH 4 X 5 1/2 DIAMOND BIT

DIA. NX — DRILLED WITH NX DIAMOND BIT

SET LD. 16 44 46 43 90 — SAMPLE SPOON SETTLED UNDER WEIGHT OF DRILL RODS
BLOWS REQUIRED TO DRIVE A 2' SPLIT SPOON SAMPLER (1 3/8" I.D. X 2" O.D.) ONE FOOT USING A 140 POUND HAMMER WITH A 30" DROP. THE SPOON IS DRIVEN CONTINUOUSLY 1 1/2' WHERE POSSIBLE. FOR CONVENIENCE THE BLOWS ARE NOT SHOWN FOR THE TOP 1/2' OF THE DRIVE.

5.4 — RECHARGE TEST SHOWING GALLONS PER MINUTE PER FOOT OF HEAD.

** — RECHARGE TEST - UNABLE TO MAINTAIN HEAD WITH PUMP OPERATING AT FULL CAPACITY OF 35 GPM.

CB-S334-4 — CORE BORING LOCATION & DESIGNATION.

-0.8 / -2.2 — PROBING SHOWING ELEV. OF GROUND AND TOP OF ROCK.

NOTES

1. ROCK HARDNESS AND SOIL CLASSIFIED IN ACCORDANCE WITH EM 1110-1-1806.
2. RECHARGE TESTS WERE MADE IN THE FOLLOWING MANNER: CASING IS INSTALLED TO THE UPPER LIMIT OF THE ZONE TO BE TESTED. THE HOLE IS THEN DRILLED TO THE LOWER LIMIT OF THE SECTION TO BE TESTED. WATER IS PUMPED INTO THE HOLE AT A RATE SUFFICIENT TO MAINTAIN A CONSTANT HEAD ABOVE THE NORMAL WATER TABLE AND THE RATE OF FLOW IS DETERMINED. THE RATE OF FLOW DIVIDED BY THE HEAD MAINTAINED GIVES GALLONS PER MINUTE PER FOOT OF HEAD.

SCALE IN FEET

5' 0 5' 10'

CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

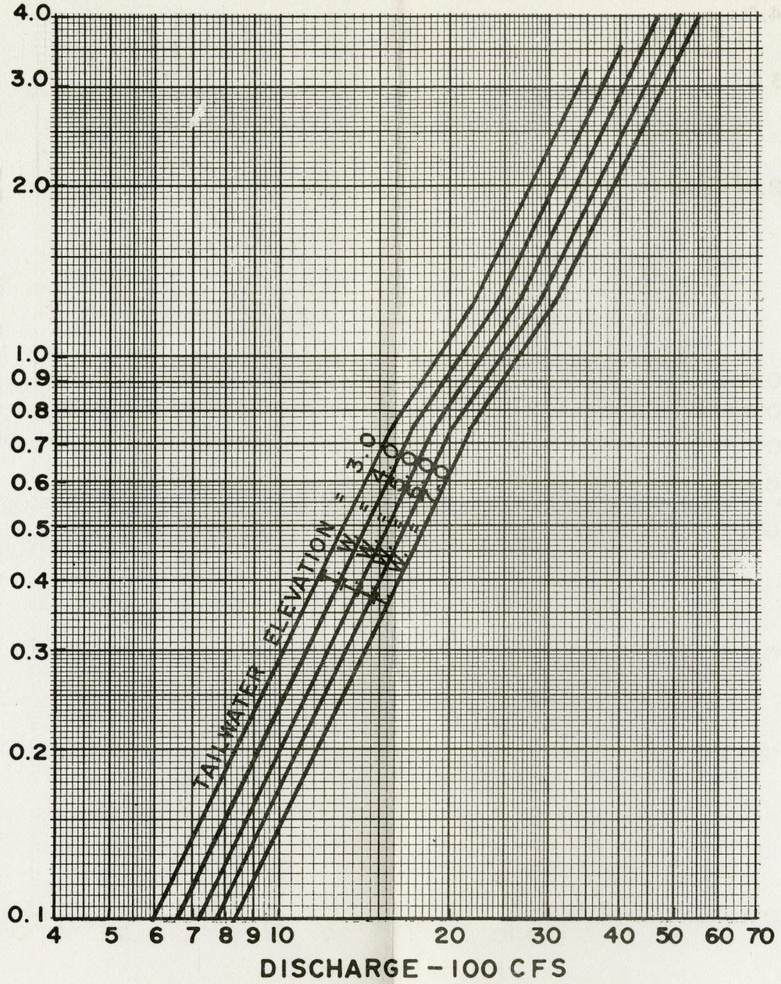
CONTROL STRUCTURE 334

GEOLOGIC SECTION

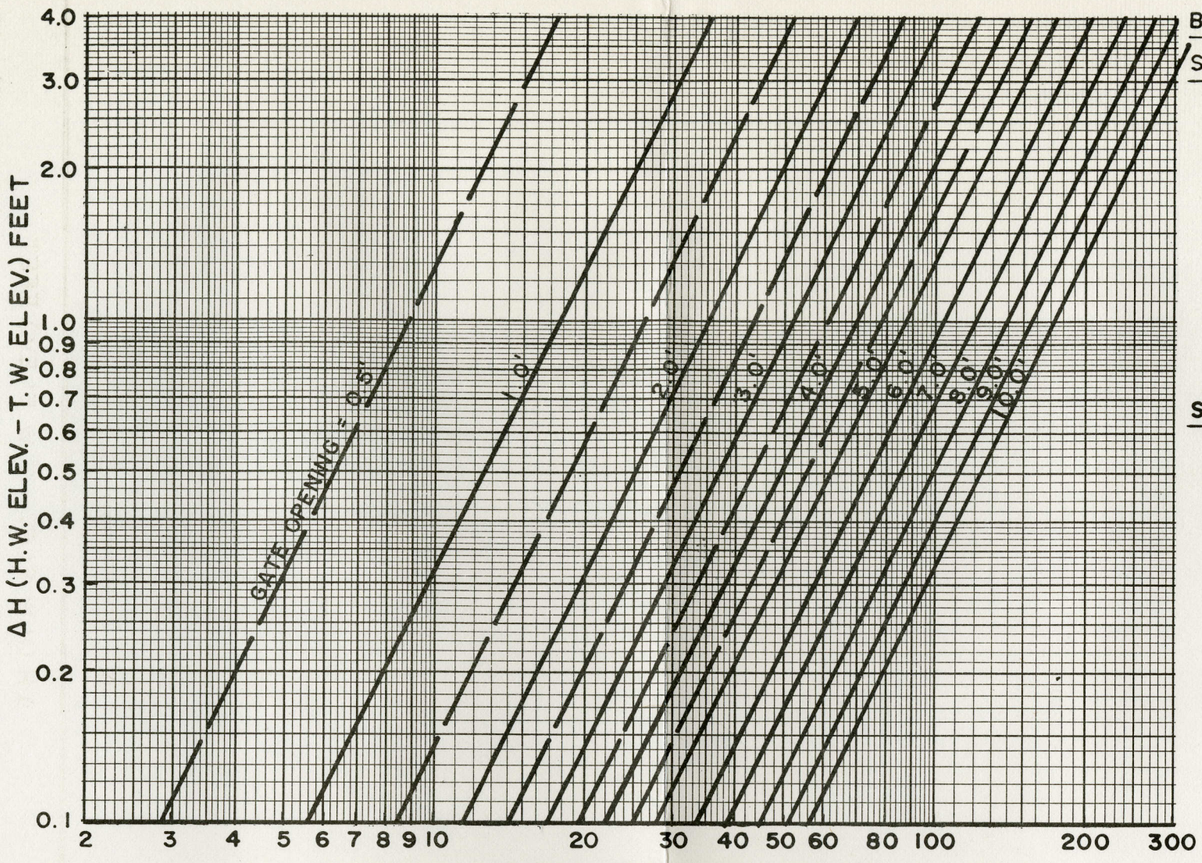
SCALES AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO., PART V, SUPP 55, DATED: AUGUST, 1974
FILE NO. 400-31,829



SUBMERGED UNCONTROLLED FLOW



SUBMERGED CONTROLLED FLOW

BASIS FOR DISCHARGE RATING CURVES

SUBMERGED UNCONTROLLED FLOW

BASED ON DAUBUISSON'S FORMULA

$Q = KA\sqrt{2g\Delta H + V_1 2}$

$K = 0.85$ WHEN $\Delta H \geq 1.0'$

$K = 0.80$ WHEN $\Delta H < 1.0'$

$A = (\text{TW ELEV.} - \text{CREST ELEV.}) \times 29.0'$

$V_1 =$ APPROACH VELOCITY

SUBMERGED CONTROLLED FLOW

BASED ON ORIFICE FORMULA

$Q = CA\sqrt{2g\Delta H}$

$C = 0.75$

$A =$ GATE OPENING X 29.0'

S-334

ONE 29.0' WIDE X 12.9' HIGH GATE

CREST ELEVATION = – 6.9

CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 334

DISCHARGE RATING CURVE

SCALES AS SHOWN

DEPARTMENT OF THE ARMY

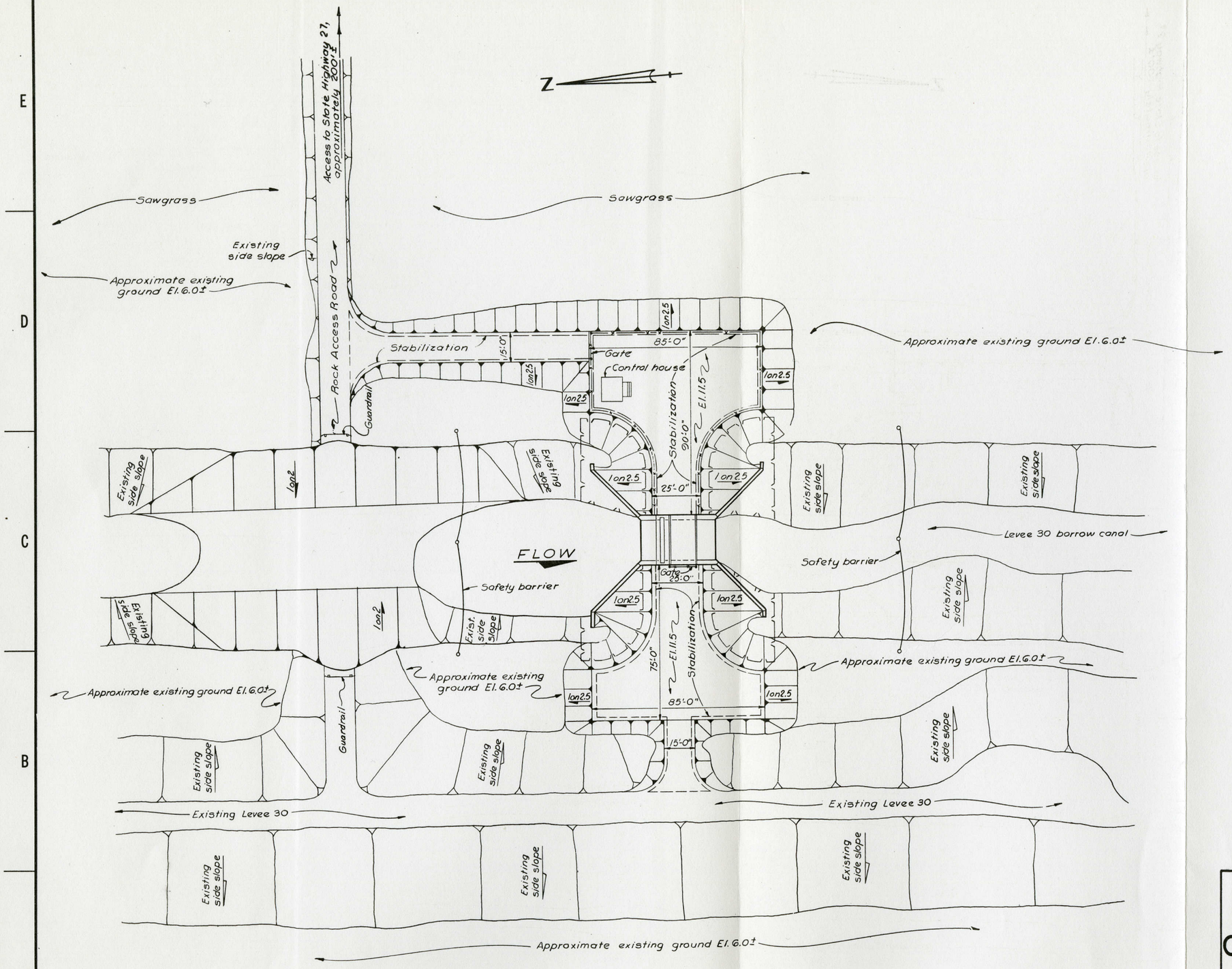
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO., PART IX, SUPP. 55, DATED AUGUST, 1974

FILE NO. 400-31,829

PLATE 46



SITE PLAN

SCALE: "A"

SCALE IN FEET

20' 0 20' 40'

"A"

CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

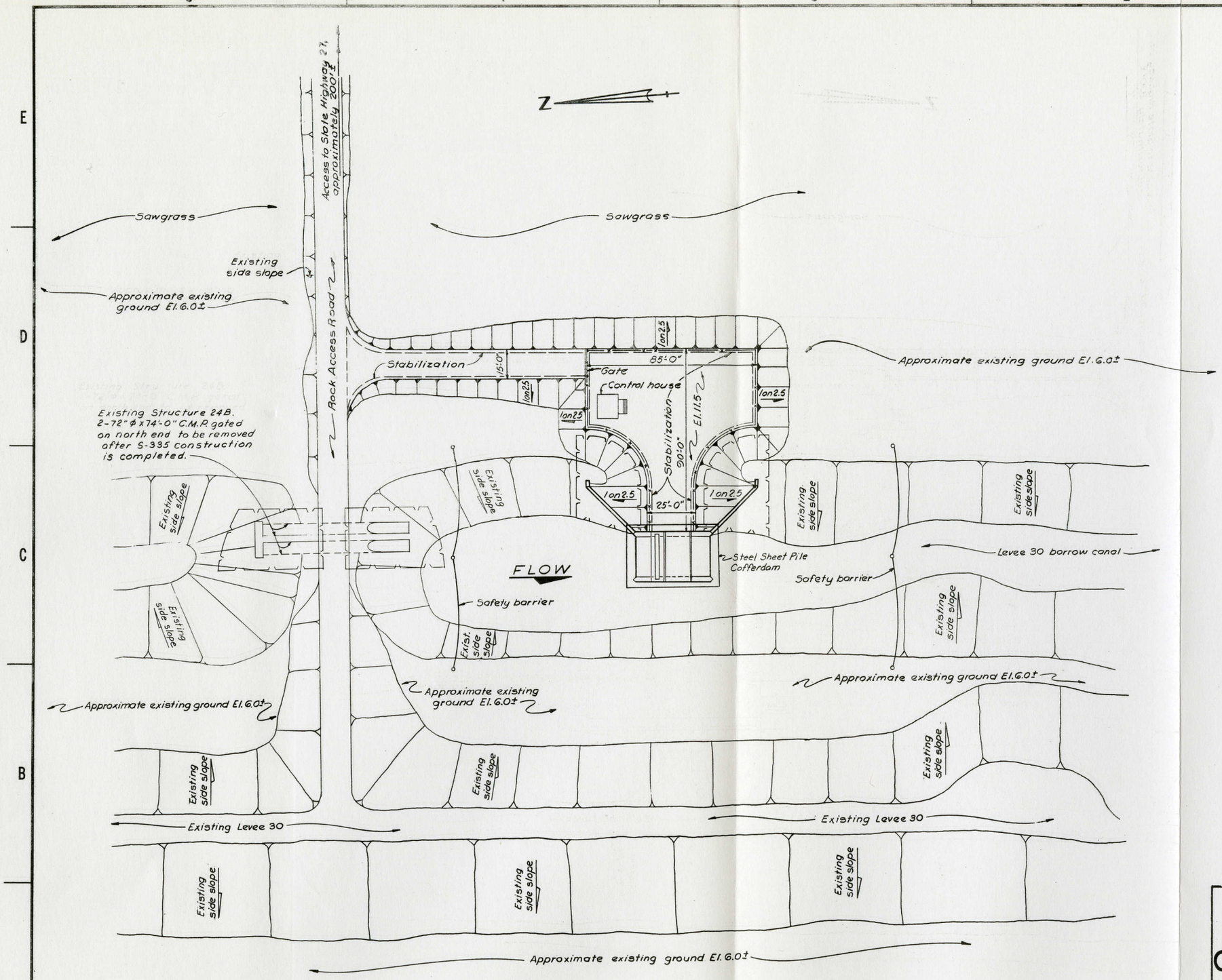
CONTROL STRUCTURE 335

SITE PLAN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829

REVISED: JAN. 1975

PLATE 47



SITE PLAN

SCALE: "A"

SCALE IN FEET

20' 0 20' 40'

"A"

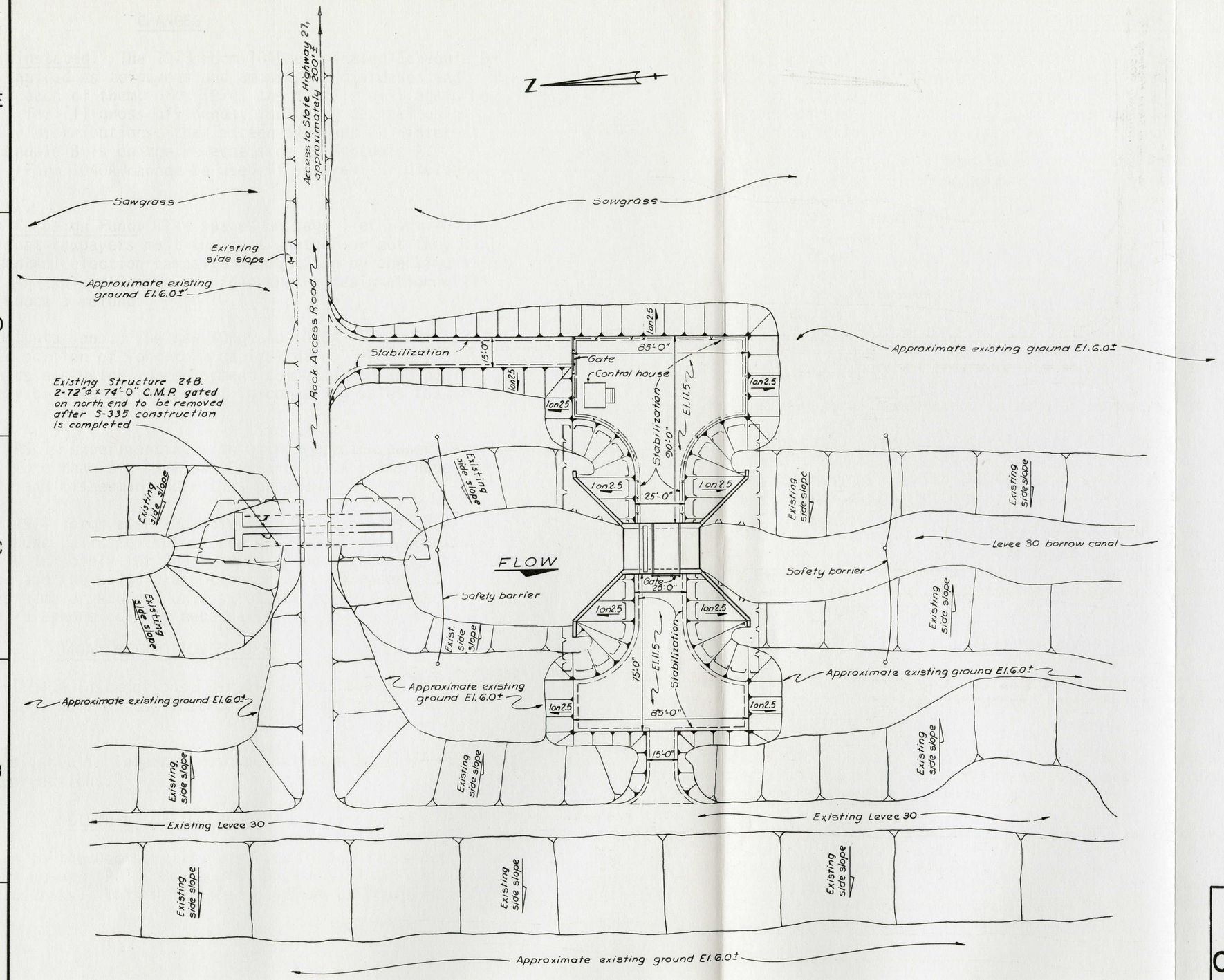
CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 335

CONSTRUCTION STAGE I

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: JAN. 1975
FILE NO. 400-31,829



SITE PLAN

SCALE: "A"

SCALE IN FEET

"A" 20' 0 20' 40'

CENTRAL AND SOUTHERN FLORIDA

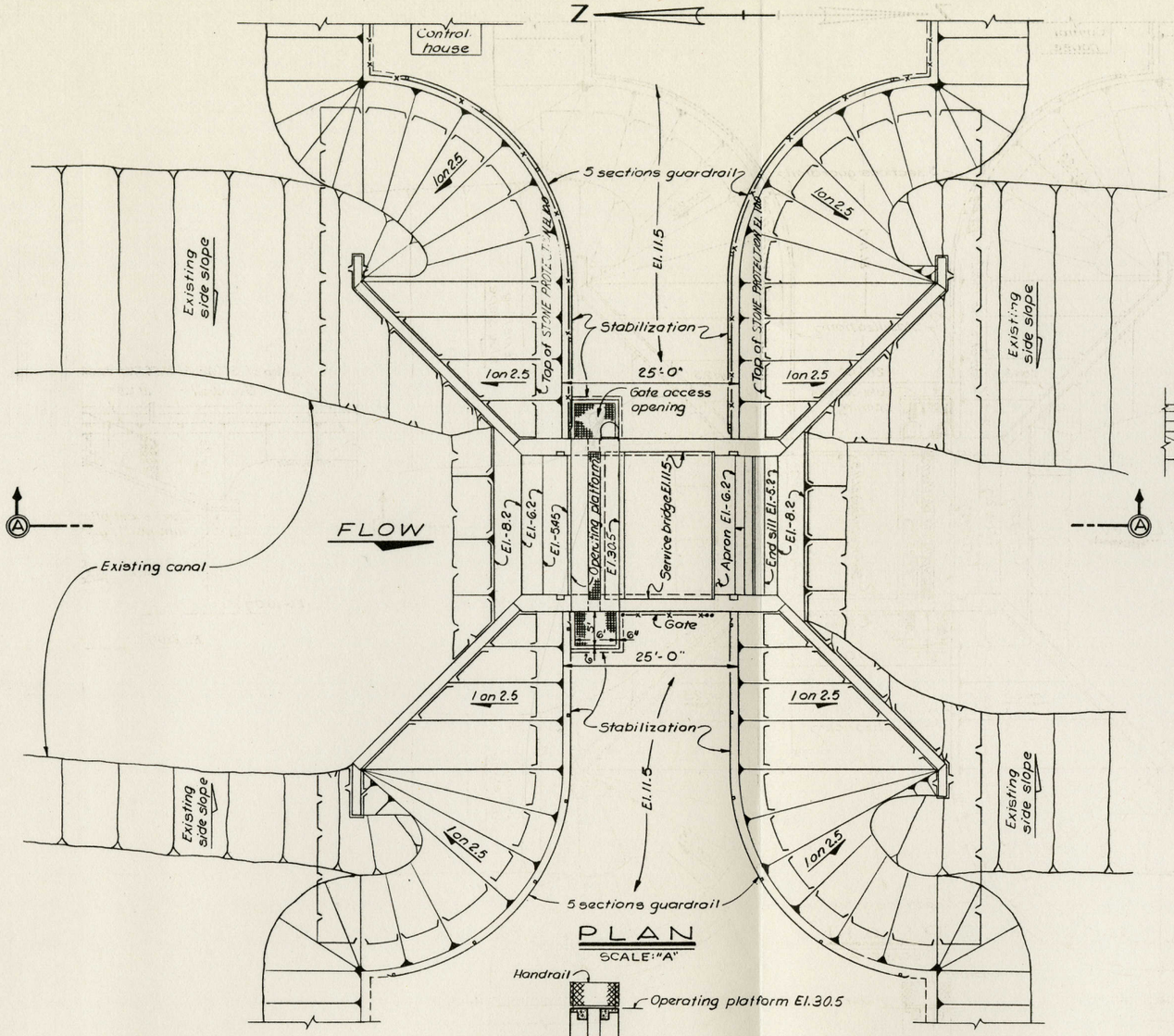
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 335

CONSTRUCTION STAGE II

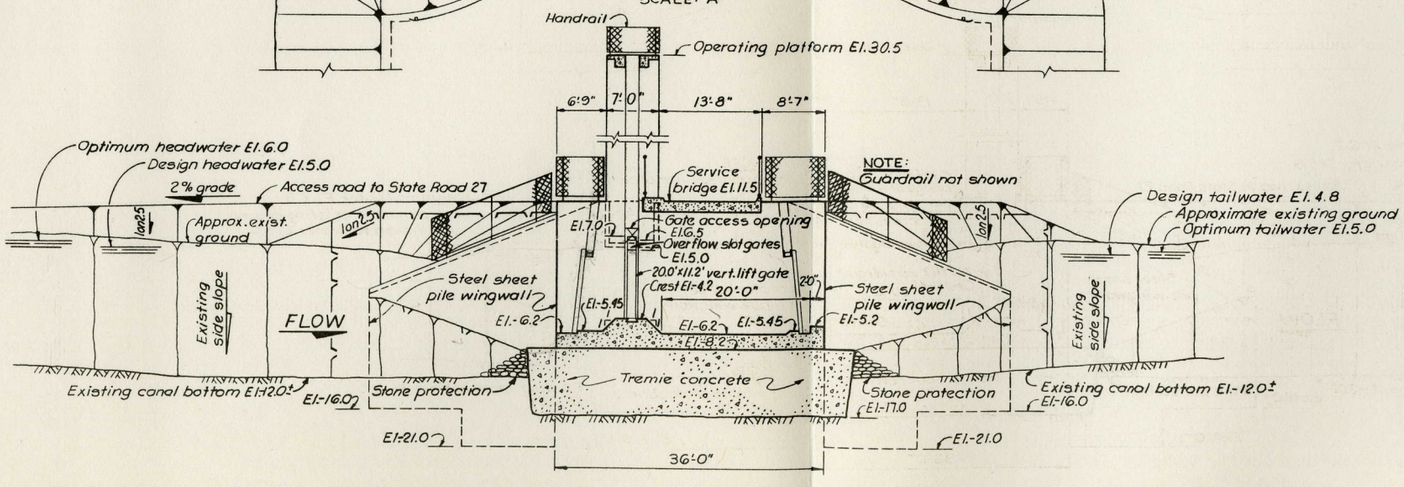
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: JAN. 1975
FILE NO. 400-31,829

PLATE 47B



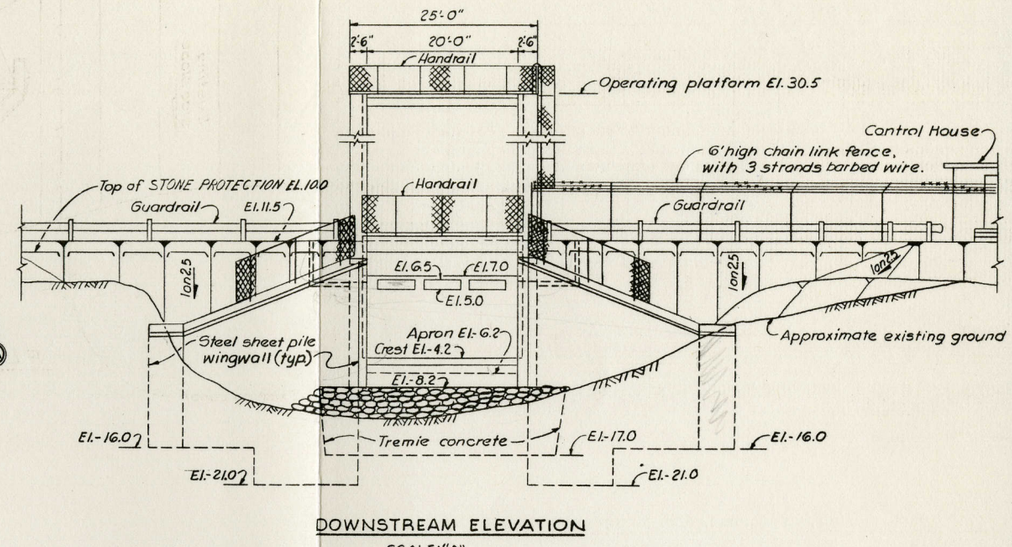
PLAN

SCALE: "A"



SECTION A-A

SCALE: "A"



DOWNSTREAM ELEVATION

SCALE: "A"

SCALE IN FEET

"A" 8 0 8 16

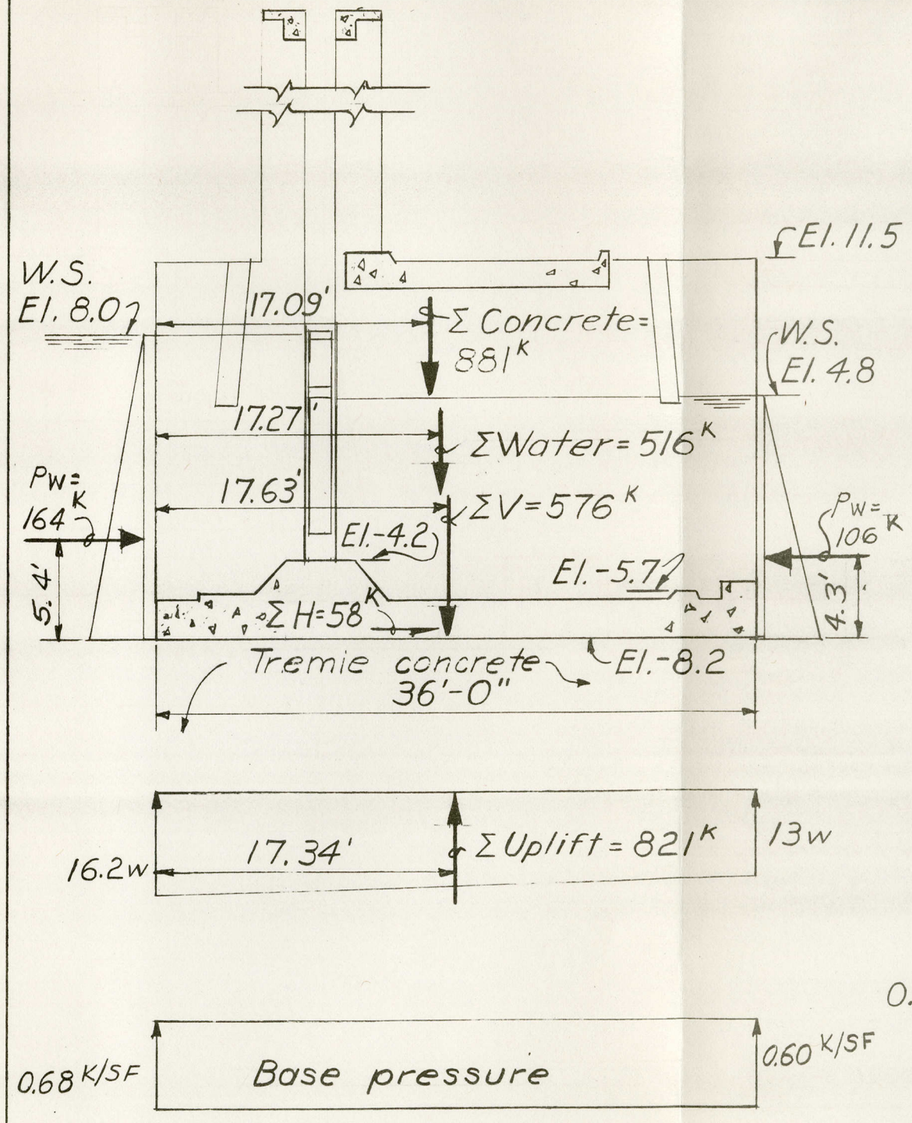
CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

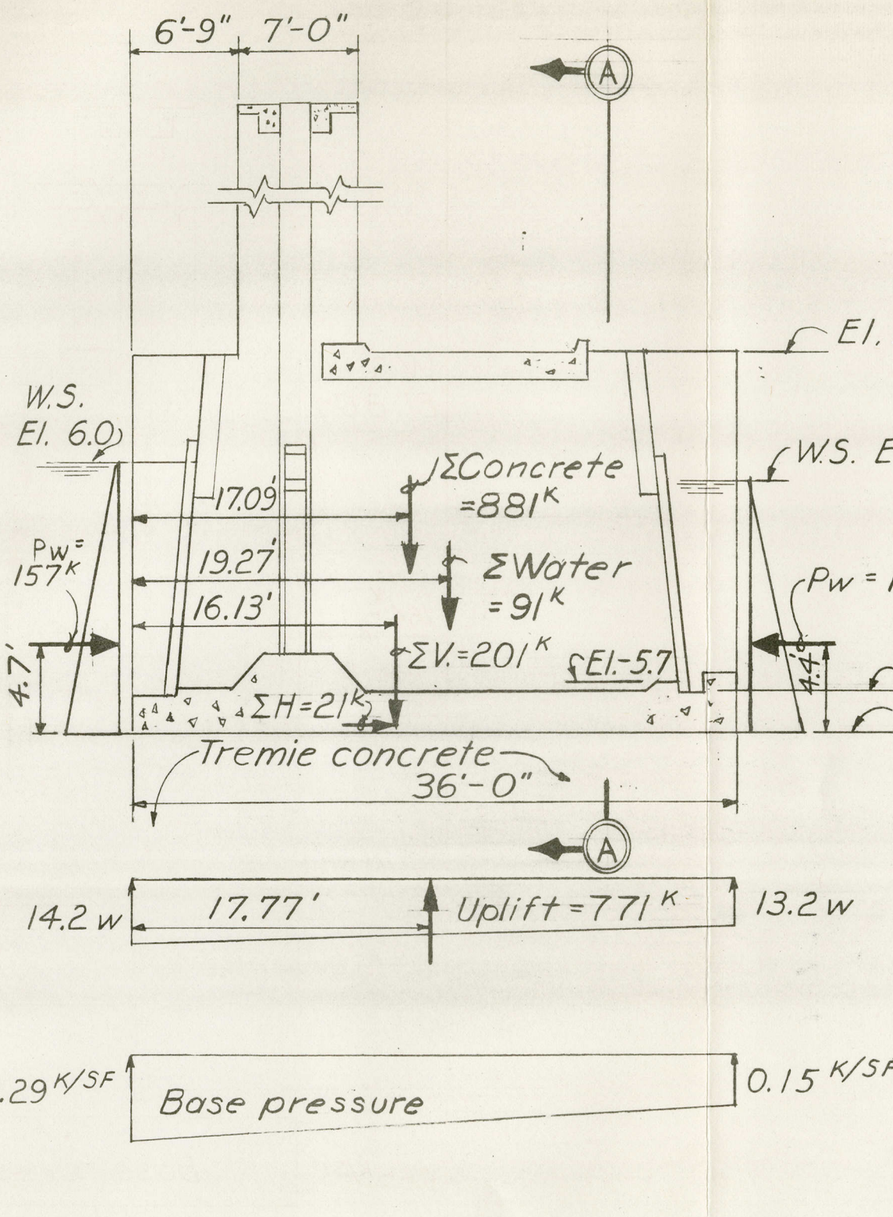
CONTROL STRUCTURE 335

SECTION AND DETAILS

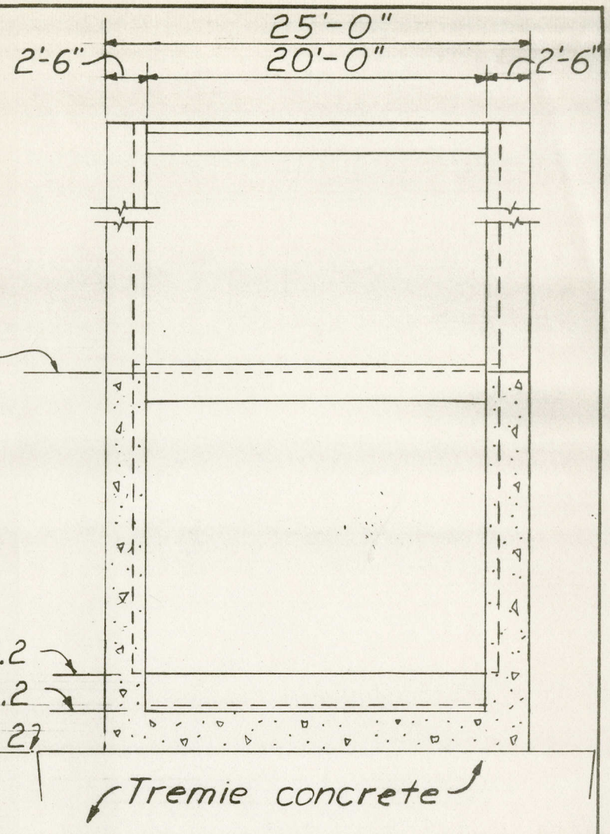
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG. 1974
FILE NO. 400-31,829



Case III:
Operating condition: H.W. El. 8.0, T.W. El. 4.8. Full uplift acting over 100% of base area.



Case II:
Structure dewatered: H.W. El. 6.0, T.W. El. 5.0. Full uplift acting over 100% of base area.



SECTION A-A

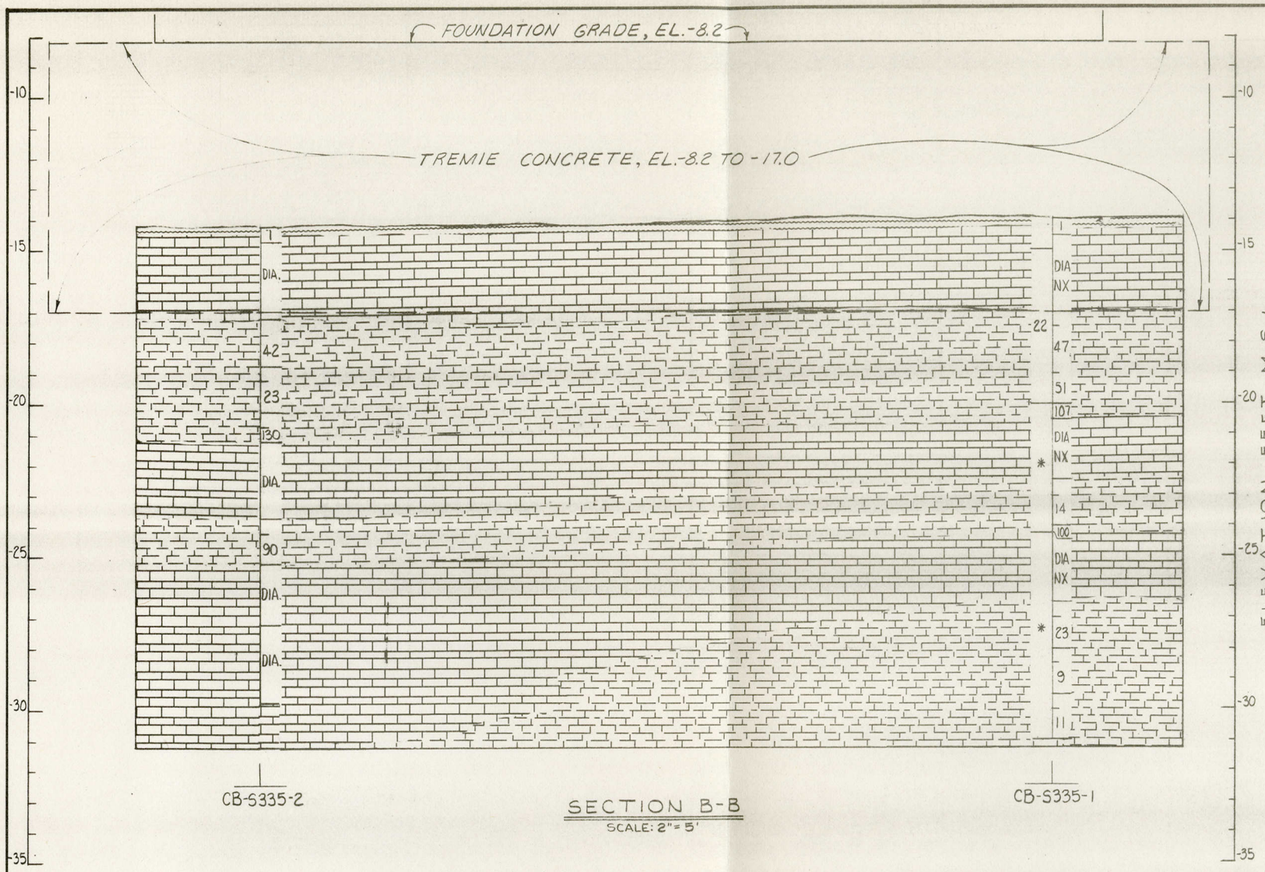
Case I:
Construction condition: Structure complete, no back-fill or hydrostatic forces acting.
Base pressure: Upstream 1.13 K/SF
Downstream 0.84 K/SF

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

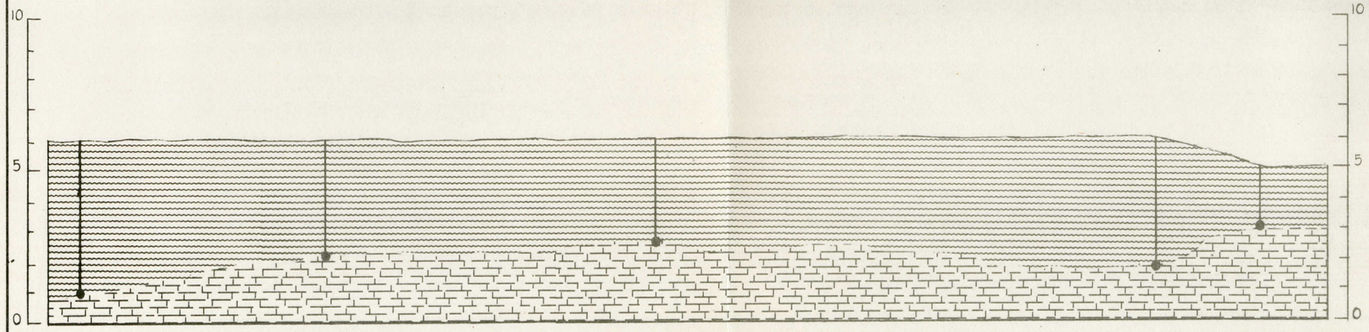
CONTROL STRUCTURE 335

STABILITY ANALYSIS

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO., PART V, SUPP. 55, DATED. MAY, 1974
FILE NO. 400-31,829



SECTION B-B
SCALE: 2"= 5'



SECTION B-B
SCALE: 1"=10' HOR.
2"=5' VERT.

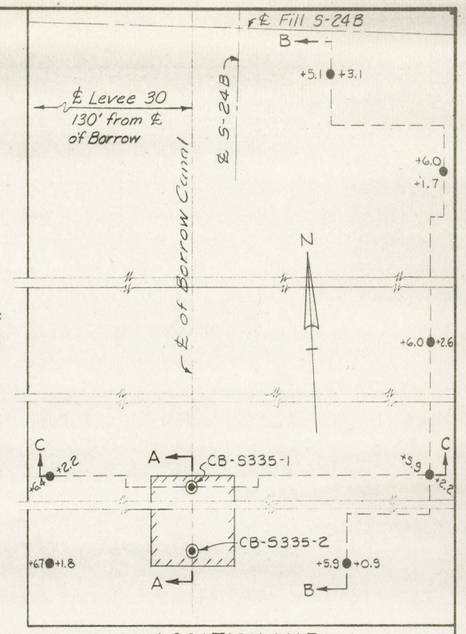
ELEVATION FEET M.S.L.

LEGEND:

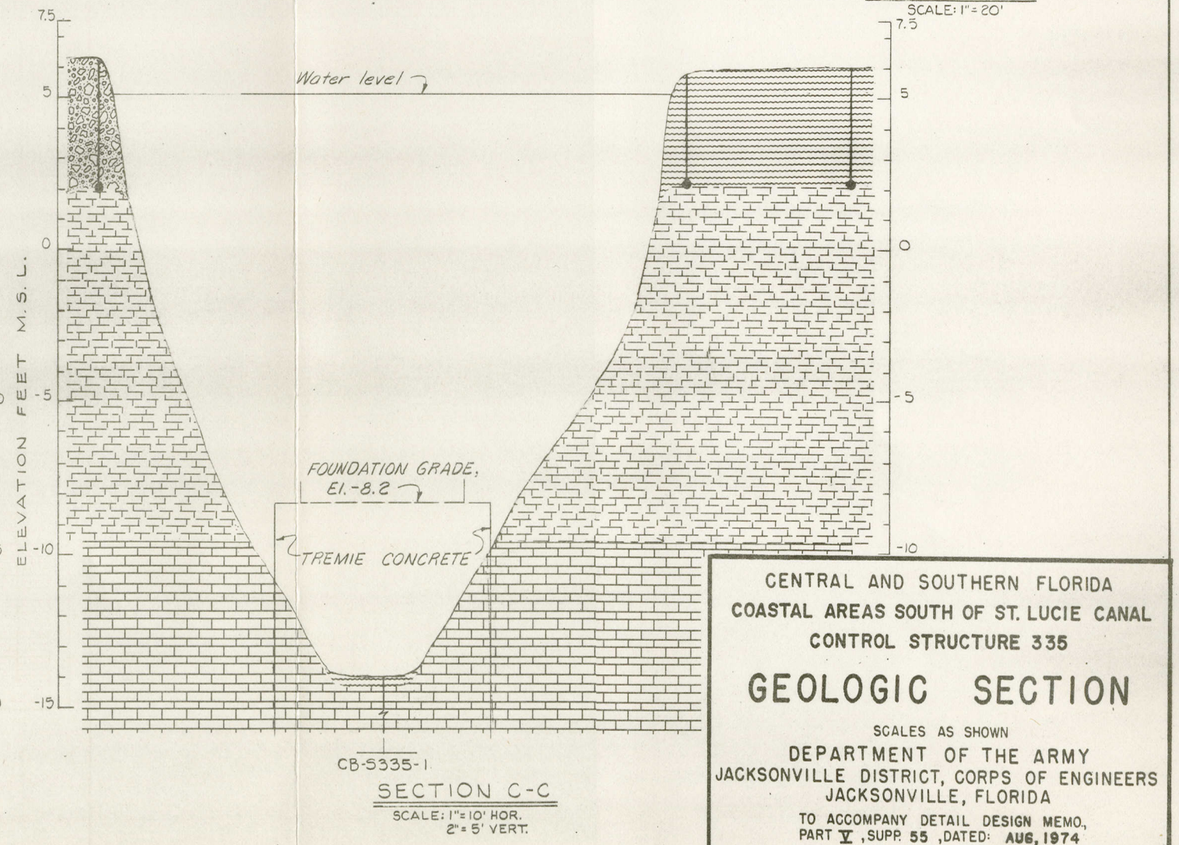
- PEAT AND OTHER HIGHLY ORGANIC SOILS
- HARD LIMESTONE
- SOFT OR MEDIUM HARD LIMESTONE
- 7 / 32 / 64 — NUMBER OF HAMMER BLOWS REQUIRED TO ADVANCE A SPLIT SPOON (1 3/8" I.D. X 2" O.D.) ONE FOOT USING A 140 POUND HAMMER WITH A 30" DROP. THE SPOON IS DRIVEN CONTINUOUSLY 1 1/2 FEET WHERE POSSIBLE.
- DIA — DRILLED WITH 4" X 5 1/2" DIAMOND BIT.
- DIA NX — DRILLED WITH "NX" DIAMOND BIT.
- 22 — RECHARGE TEST IN G.P.M. PER FOOT OF HEAD
- * — NO HEAD COULD BE MAINTAINED DURING RECHARGE TESTS, WITH PUMP RUNNING AT FULL CAPACITY OF 22 GPM.
- CB-S335-1 — CORE BORING LOCATION
- +6.7 ● +1.8 — PROBING LOCATION, SURFACE ELEVATION AND TOP OF ROCK ELEVATION SHOWN.
- SAND AND GRAVEL

NOTES:

1. ROCK HARDNESS AND SOIL CLASSIFIED IN ACCORDANCE WITH EM 1110-1-1806.
2. RECHARGE TESTS MADE IN THE FOLLOWING MANNER: CASING IS INSTALLED IN THE HOLE TO THE UPPER LIMIT OF THE ZONE TO BE TESTED. THE HOLE IS THEN DRILLED TO THE LOWER LIMIT OF THE SECTION TO BE TESTED. WATER IS PUMPED INTO THE CASING AT A RATE SUFFICIENT TO MAINTAIN A CONSTANT HEAD ABOVE THE NORMAL WATER TABLE, IF POSSIBLE, AND THIS RATE OF FLOW IS DETERMINED. THE RATE OF FLOW DIVIDED BY THE HEAD MAINTAINED GIVES GALLONS PER MINUTE PER FOOT OF HEAD.



LOCATION MAP
SCALE: 1"= 20'

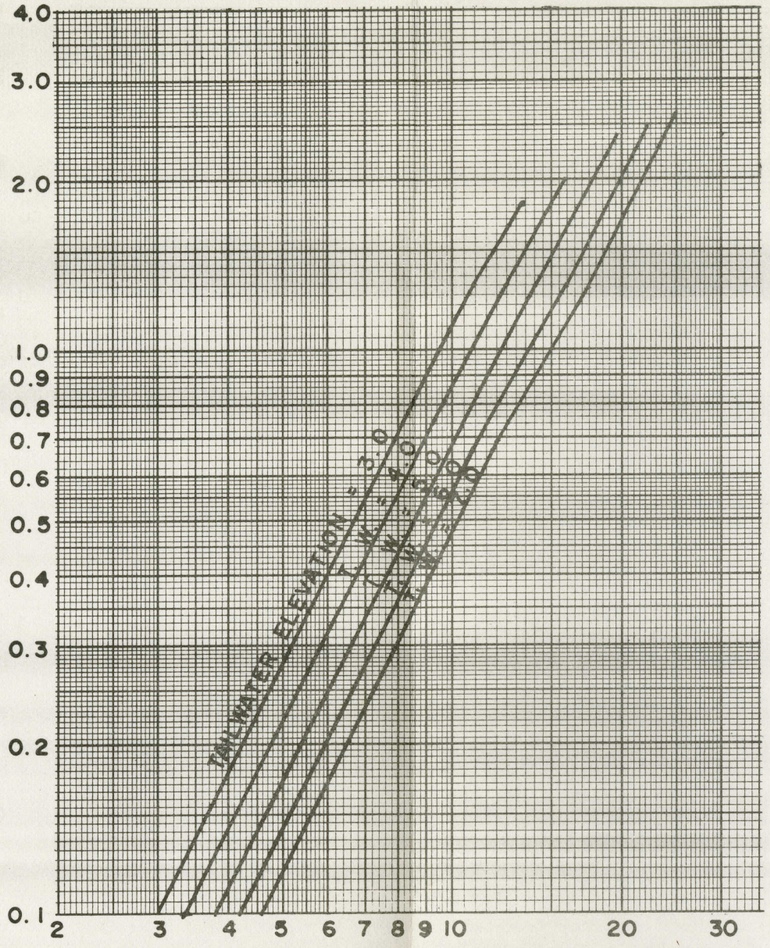


SECTION C-C
SCALE: 1"=10' HOR.
2"= 5' VERT.

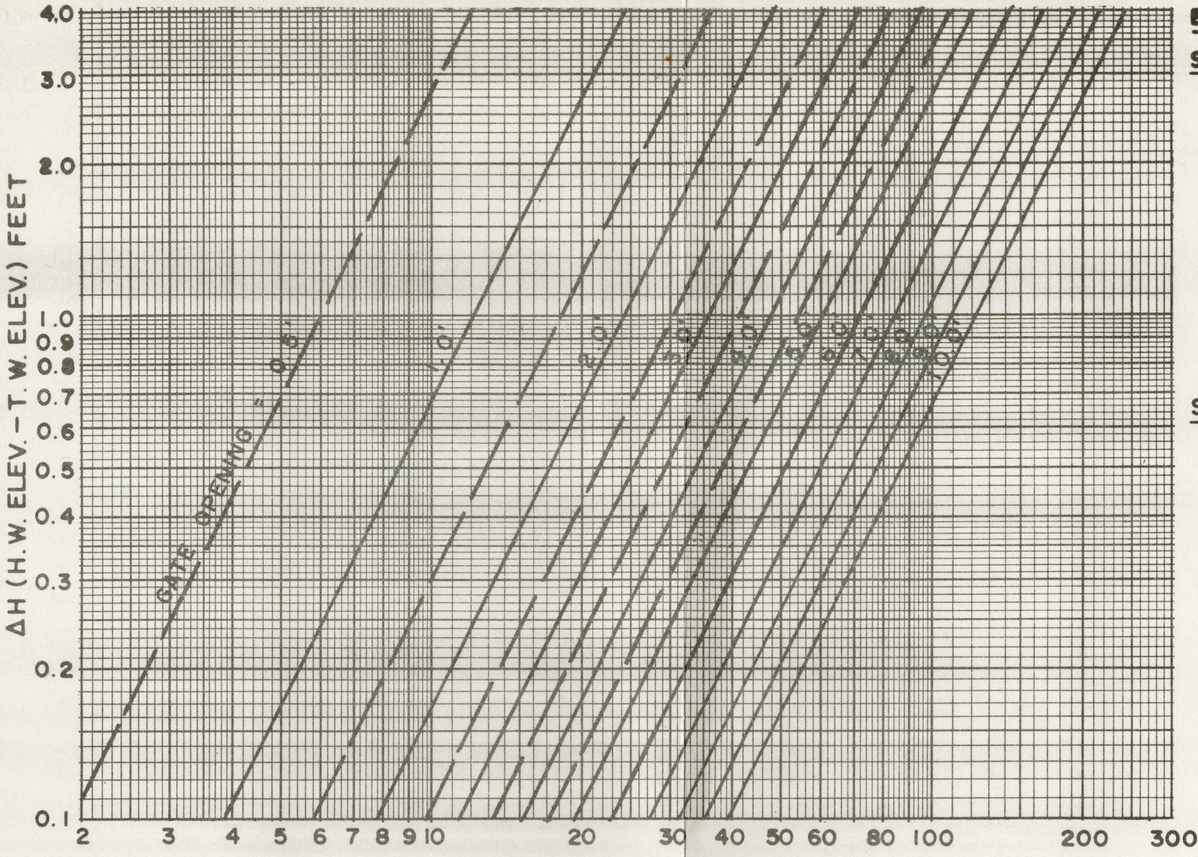
CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL
CONTROL STRUCTURE 335

GEOLOGIC SECTION

SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO, PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829



SUBMERGED UNCONTROLLED FLOW



SUBMERGED CONTROLLED FLOW

BASIS FOR DISCHARGE RATING CURVES

SUBMERGED UNCONTROLLED FLOW

BASED ON DAUBUISSON'S FORMULA

$Q = KA\sqrt{2g\Delta H + V_1^2}$

$K = 0.85$ WHEN $\Delta H \geq 1.0'$

$K = 0.80$ WHEN $\Delta H < 1.0'$

$A = (\text{TW ELEV.} - \text{CREST ELEV.}) \times 20.0'$

$V_1 =$ APPROACH VELOCITY

SUBMERGED CONTROLLED FLOW

BASED ON ORIFICE FORMULA

$Q = CA\sqrt{2g\Delta H}$

$C = 0.75$

$A =$ GATE OPENING X 20.0'

S-335

ONE 20.0' WIDE X 11.2' HIGH GATE
CREST ELEVATION = -4.2

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 335
DISCHARGE RATING CURVE

SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED. AUGUST, 1974
FILE NO. 400-31,829

PLATE 51

Approximate existing ground El. 7.0±

Existing side slope

Existing side slope

Existing side slope

Existing borrow pit

Existing side slope

Fill material to be placed in any opening in this area.

Approximate existing ground El. 7.0±

5% Slope to exist. ground

Existing side slope

Approximate existing ground El. 7.0±

Existing side slope

1on 3

Stabilization

1on 3

Existing Canal 4

FLOW

Existing Canal 4

1on 3

El. 11.0

1on 3

15'-0"

Existing side slope

Existing side slope

Approximate existing ground El. 12.0±

Approximate existing ground El. 10.0±

Edge of pavement

℄ U.S. Highway NO. 1

S-24 to be removed

SITE PLAN

SCALE: "A"

SCALE IN FEET

"A" 20 0 20 40

CENTRAL AND SOUTHERN FLORIDA

COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 336

SITE PLAN

SCALES AS SHOWN

DEPARTMENT OF THE ARMY

JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

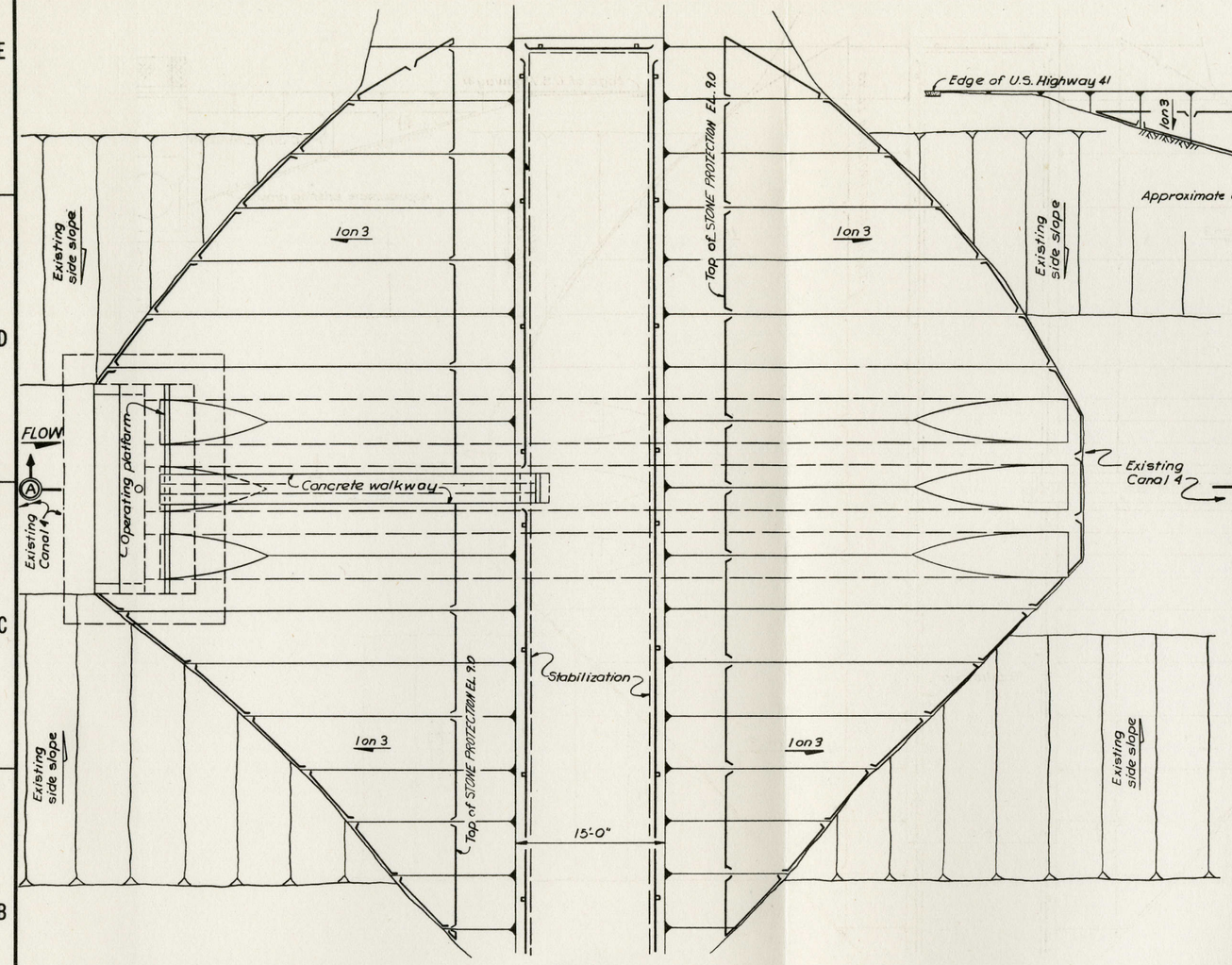
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO.

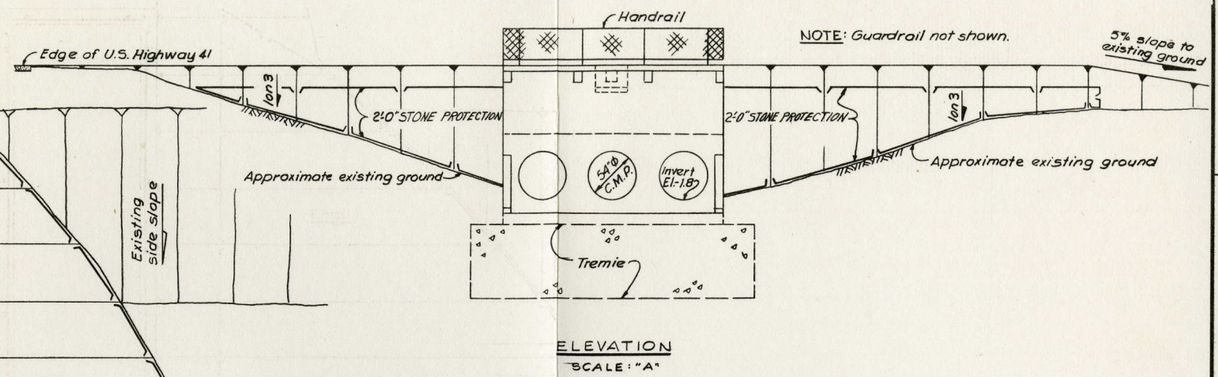
PART V, SUPP 55, DATED: AUG. 1974

FILE NO. 400-31, 829

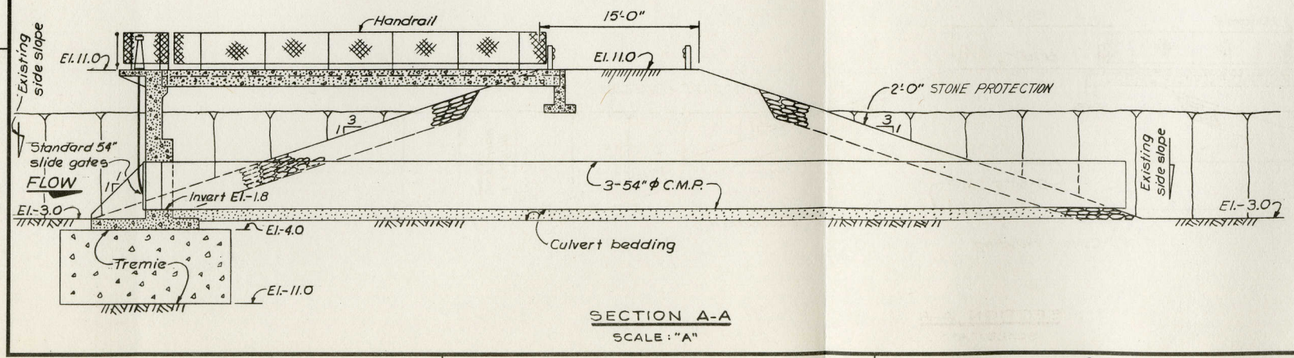
PLATE 52



PLAN
SCALE: "A"



ELEVATION
SCALE: "A"



SECTION A-A
SCALE: "A"

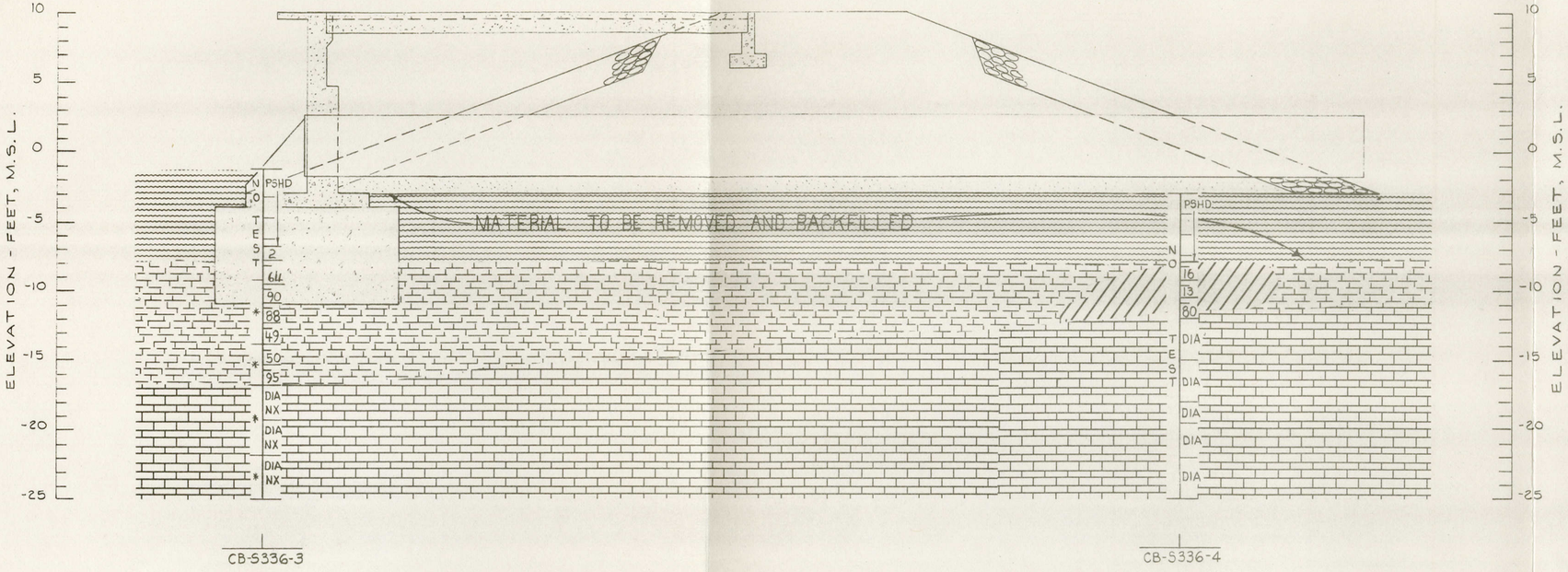
SCALE IN FEET
5' 0 5' 10'

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 336

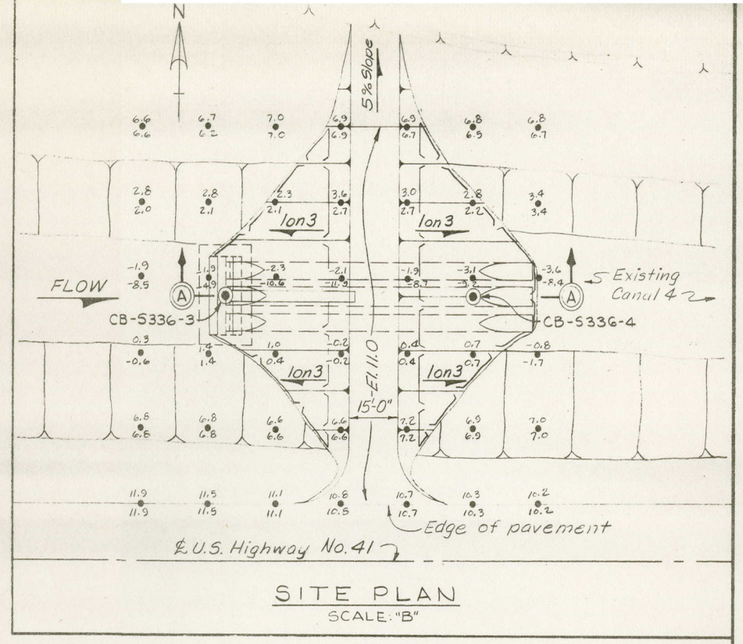
SECTION AND DETAILS

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829



GEOLOGIC SECTION A-A

SCALE: "A"



SITE PLAN

SCALE: "B"

LEGEND

PEAT (PT)

CLAY, FAT (CH), CAVITY FILLING

LIMESTONE, MEDIUM HARD

LIMESTONE, HARD

6 / 13 / 80 — NUMBER OF HAMMER BLOWS REQUIRED TO ADVANCE A SPLIT SAMPLE SPOON (1-3/8" I.D. X2" O.D.) ONE FOOT USING A 140 POUND HAMMER WITH A 30-INCH DROP. THE SPOON IS 2 FEET LONG AND IS DRIVEN CONTINUOUSLY 1-1/2 FEET WHERE POSSIBLE. THE FIRST ONE-HALF FOOT OF EACH DRIVE IS OMITTED FOR CONVENIENCE OF PRESENTATION.

PSHD — PUSHED SAMPLER DOWN BY HAND

DIA — DRILLED WITH 4"X5-1/2" DIAMOND BIT

DIA NX — DRILLED WITH "NX" DIAMOND BIT

* — NO HEAD COULD BE MAINTAINED DURING RECHARGE TEST WITH PUMP RUNNING AT FULL CAPACITY OF 20 G. P. M.

CB-5336-3 — LOCATION AND DESIGNATION OF CORE BORING

-1.9 / -8.7 — PROBING LOCATION, GROUND ELEVATION AND REFUSAL (ROCK) ELEVATION SHOWN

NOTES:

1. ROCK HARDNESS AND SOIL CLASSIFIED IN ACCORDANCE WITH EM 1110-1-1806.
2. RECHARGE TESTS MADE IN THE FOLLOWING MANNER: CASING IS INSTALLED IN THE HOLE TO THE UPPER LIMIT OF THE ZONE TO BE TESTED. THE HOLE IS THEN DRILLED TO THE LOWER LIMIT OF THE SECTION TO BE TESTED. WATER IS PUMPED INTO THE CASING AT A RATE SUFFICIENT TO MAINTAIN A CONSTANT HEAD ABOVE THE NORMAL WATER TABLE, IF POSSIBLE, AND THIS RATE OF FLOW IS DETERMINED. THE RATE OF FLOW DIVIDED BY THE HEAD MAINTAINED GIVES GALLONS PER MINUTE PER FOOT OF HEAD.

SCALE IN FEET

"A" 5' 0 5' 10'

"B" 20' 0 20' 40'

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

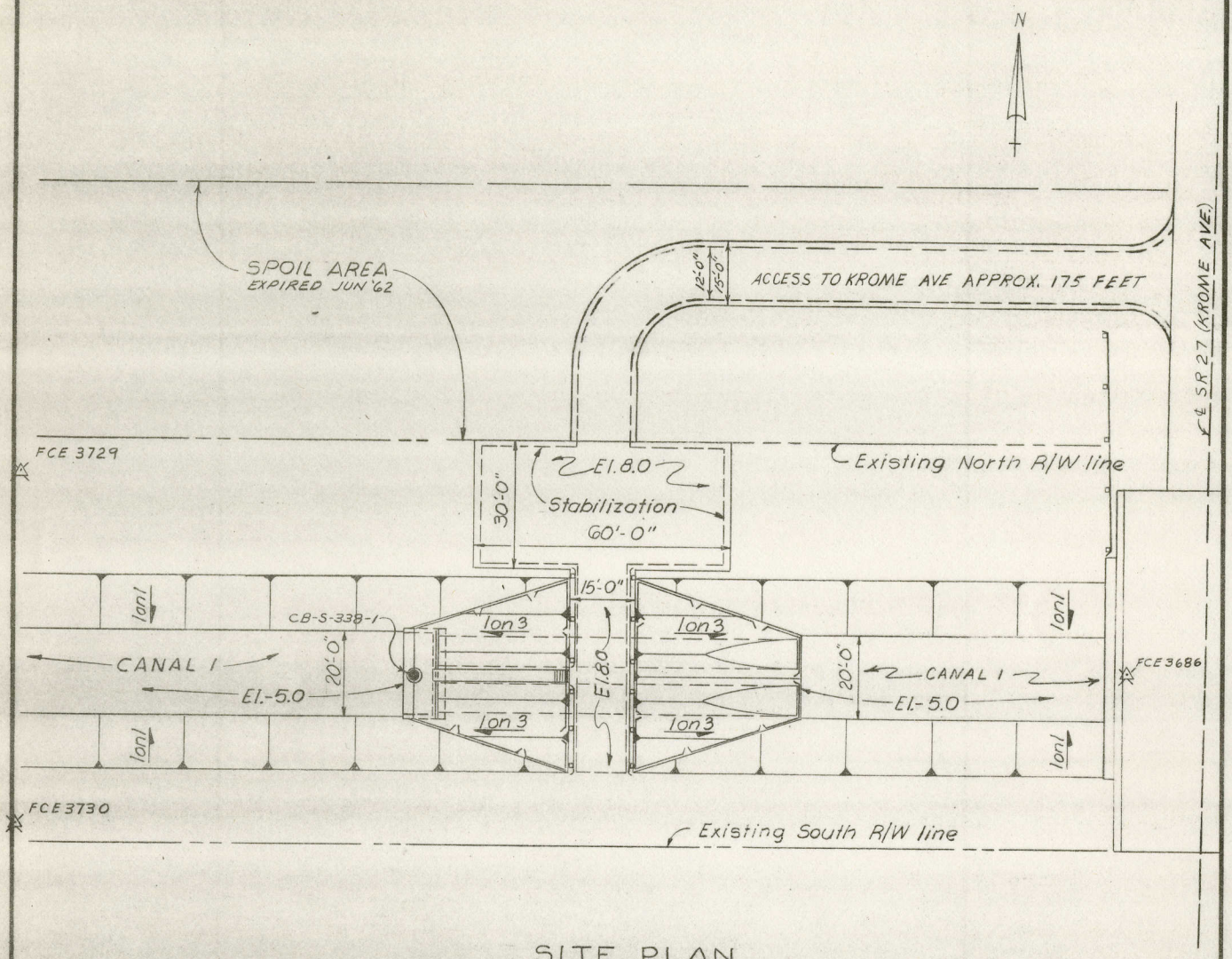
CONTROL STRUCTURE 336

GEOLOGIC SECTION

SCALES AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO., PART V, SUPP. 55, DATED: AUG., 1974
FILE NO. 400-31,829



SITE PLAN

SCALE : "A"

SCALE IN FEET

"A" 20 0 20 40

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 338

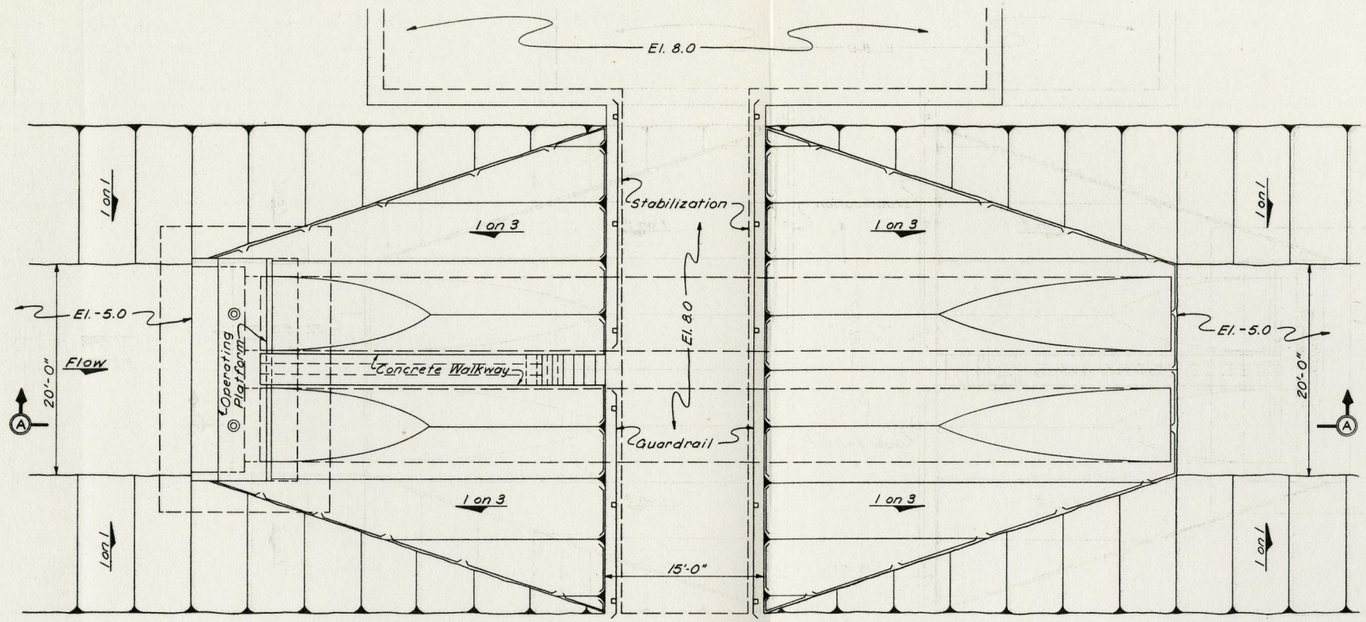
SITE PLAN

SCALES AS SHOWN

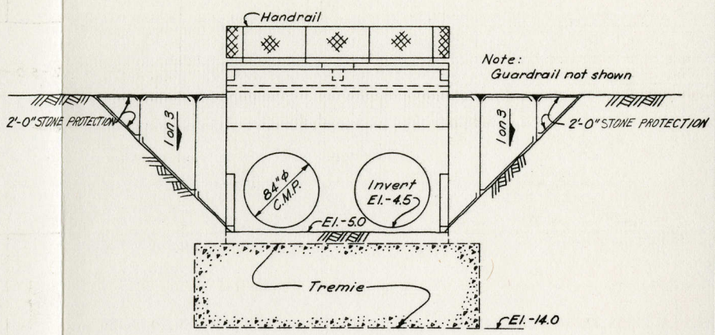
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55 ,DATED: AUG, 1974
FILE NO. 400-31,829

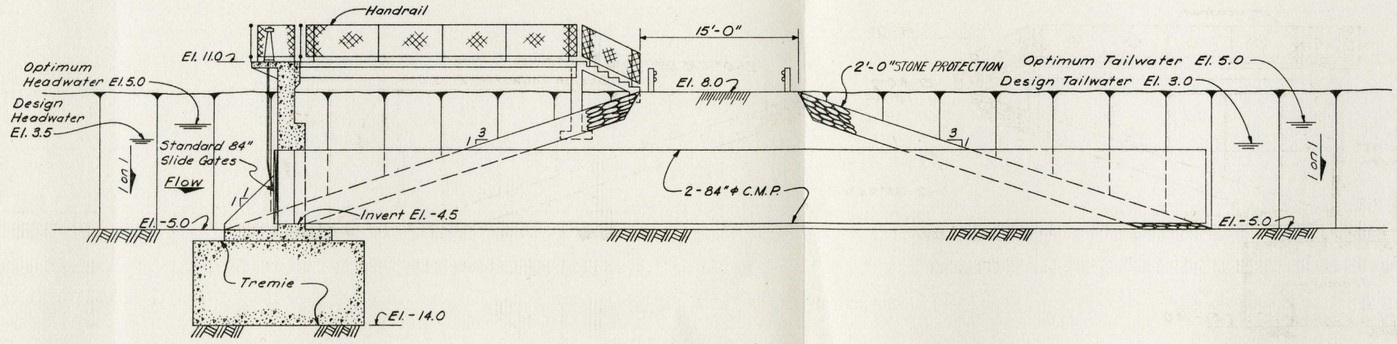
PLATE 55



PLAN
SCALE "A"



ELEVATION
SCALE "A"



SECTION A-A
SCALE "A"

SCALE IN FEET

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

CONTROL STRUCTURE 338

SECTION AND DETAILS

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V, SUPP. 55, DATED: AUG, 1974
FILE NO. 400-31,829

PLATE 56

Hole No. CB-S338-1

DRILLING LOG	DIVISION: South Atlantic	INSTALLATION: Jacksonville District	SHEET 1 OF 1 SHEETS

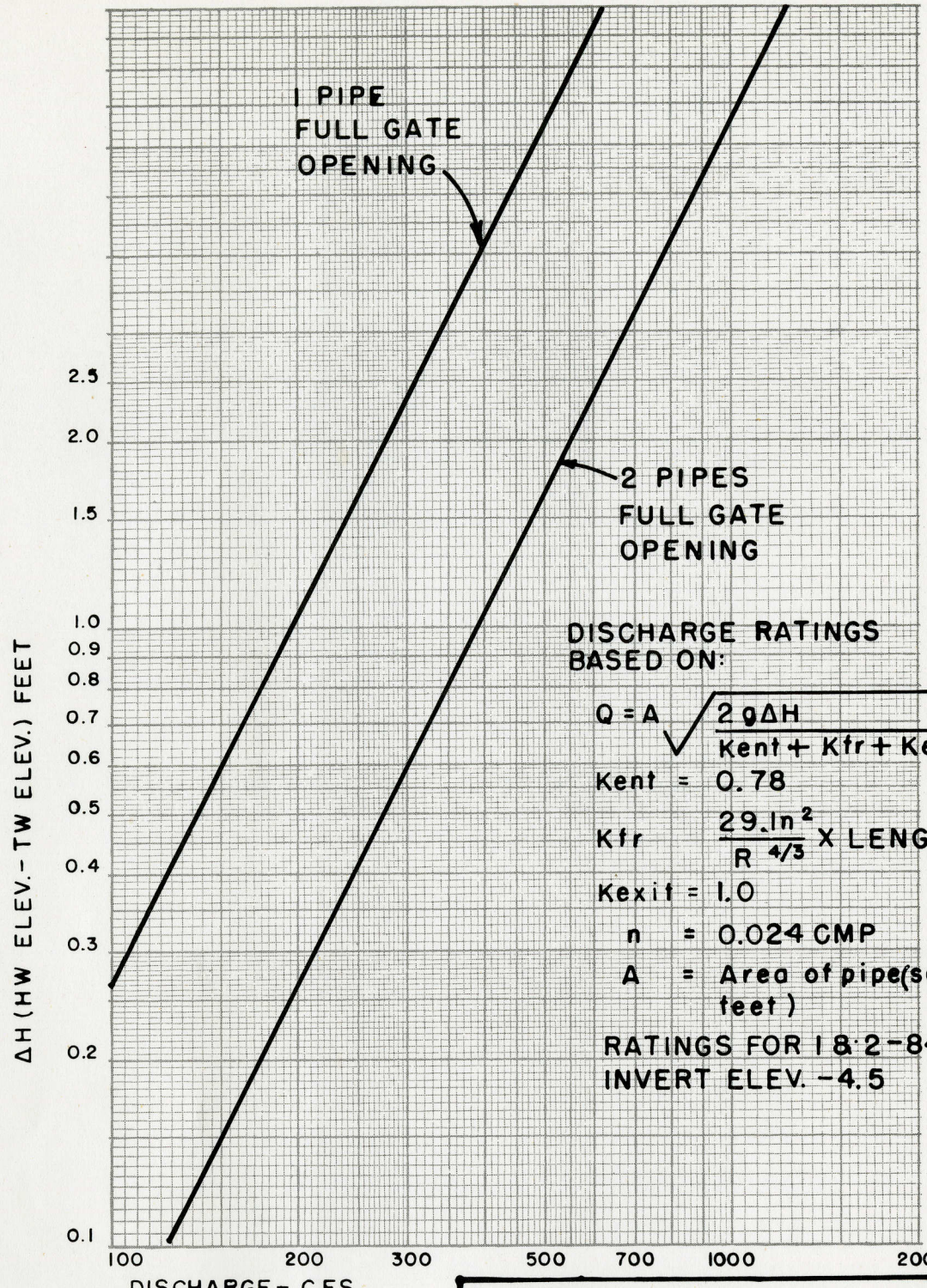
1. PROJECT: C&SF Structure 338
2. LOCATION (Coordinates or Station): SEE PLATE
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number): CB-S338-1
5. NAME OF DRILLER: J. Detloff
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 11.0'
10. SIZE AND TYPE OF BIT: See Remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40-C
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED:
14. TOTAL NUMBER CORE BOXES: 1
15. ELEVATION GROUND WATER: +2.0
16. DATE HOLE: STARTED 4-2-74; COMPLETED 4-2-74
17. ELEVATION TOP OF HOLE: -5.7
18. TOTAL CORE RECOVERY FOR BORING: 68 %
19. ~~MEMBER OF CREW~~
GEOLOGIST: R. KRETCHMAN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e		REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Recharge Tests, GPM/FT. HEAD			BIT OR BARREL
-5.7	0.0					-5.7 Bls/0.5 ft
			LIMESTONE, hard, gray, fossiliferous, porous, permeable, oolitic with medium hard zones from -5.7 to -11.0	60	*	DIAMOND NX D.T. 70 min. H.P. 100 psi.
						-10.7
				40		DIAMOND NX D.T. 20 min. H.P. 100 psi.
					*	-13.2
				40		DIAMOND NX D.T. 15 min. H.P. 100 psi.
						-15.7
-16.7	11.0			50		-16.7 D.T. 5 min. ~~H.P. 100 psi.~~

NOTES:

1. NX casing set to elevation -13.5
2. On recharge test no head could be maintained with pump operating at full capacity of 20 GPM.
3. Hole grouted upon completion with 3 bags of Sakrete.

PLATE 57



DISCHARGE RATINGS
BASED ON:

$$Q = A\sqrt{\frac{2g\Delta H}{Kent + Kfr + Kexit}}$$

Kent = 0.78

$Kfr = \frac{29.1n^2}{R^{4/3}} \times LENGTH$

Kexit = 1.0

n = 0.024 CMP

A = Area of pipe(square feet)

RATINGS FOR 1 & 2-84" CMP'S
INVERT ELEV. -4.5

S-338
2-84" CMP'S

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST LUCIE

CULVERT 338
DISCHARGE RATING CURVES

SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL DESIGN MEMO.,
PART V .SUPP. 55 ,DATED. AUG. 1974
FILE NO. 400-31,829

PLATE 58

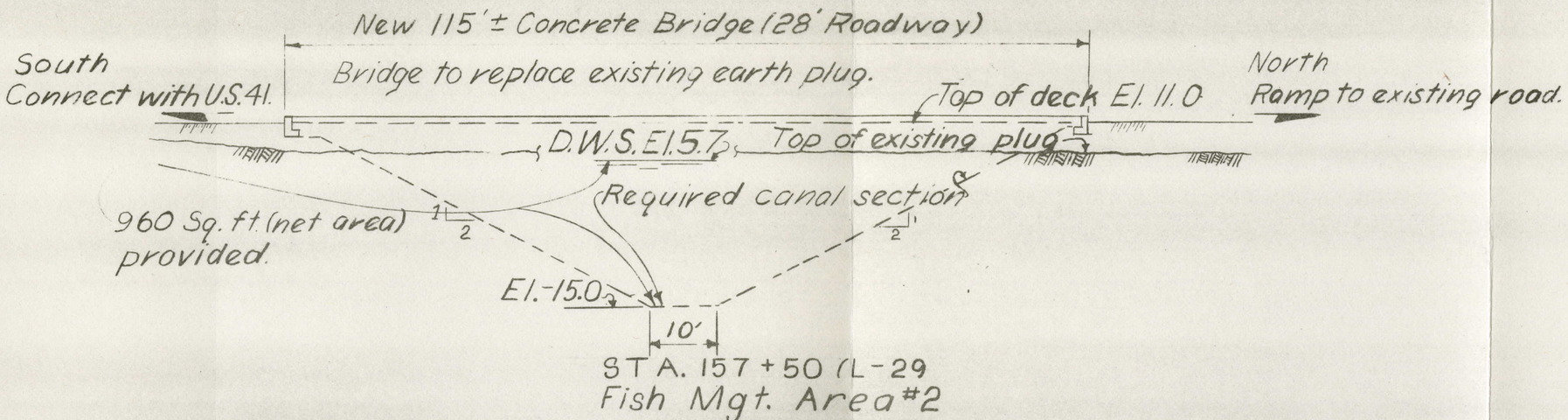
CORE BORING NOTES

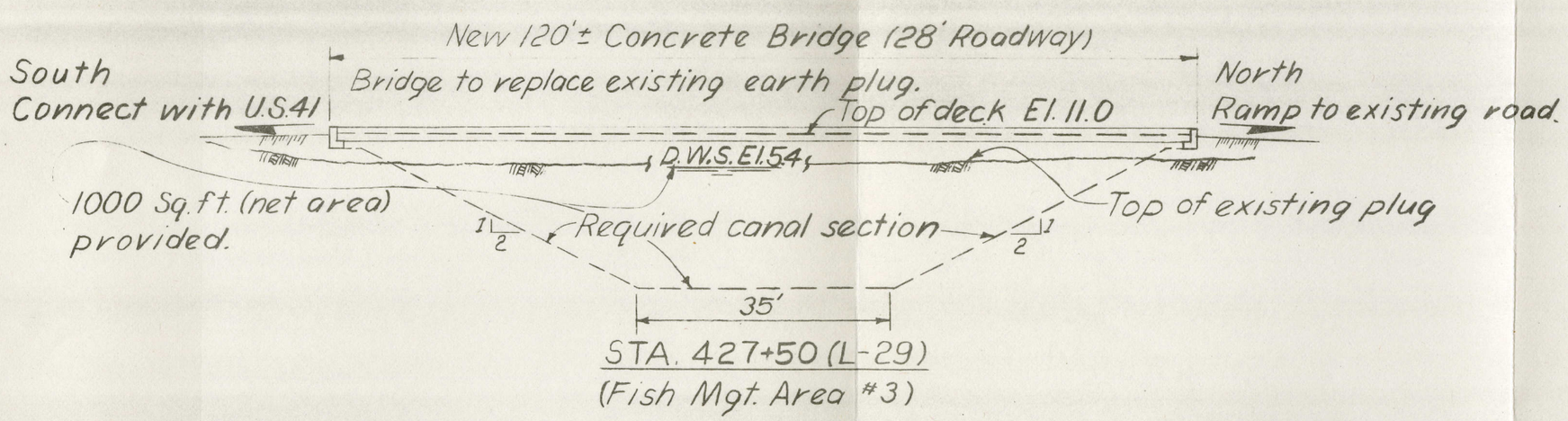
1. BORING LOCATIONS ARE SHOWN ON
2. BLS/0.5 FT. REFERS TO THE NUMBER OF HAMMER BLOWS REQUIRED TO ADVANCE A SPLIT-SPOON (1 3/8" I.D. x 2" O.D.) ONE-HALF FOOT. THE SPOON IS 2.0 FEET LONG AND DRIVEN CONTINUOUSLY ONE AND ONE-HALF FEET WHERE POSSIBLE.
3. BLS/FT. REFERS TO THE NUMBER OF HAMMER BLOWS REQUIRED TO ADVANCE A SOLID SPOON (2" I.D. x 2 1/2" O.D.) ONE FOOT. THE SPOON IS 5 FT. LONG AND DRIVEN CONTINUOUSLY 5 FT., WHERE POSSIBLE.
4. (SP) AND (PT) ETC., REFERS TO THE CORPS OF ENGINEERS UNIFIED SOILS CLASSIFICATION SYSTEM. CLASSIFICATION OF MATERIALS IS BASED ON VISUAL EXAMINATION.
5. CORE SAMPLES TAKEN DURING THE BORING OPERATIONS ARE AVAILABLE FOR INSPECTION AT THE CORPS OF ENGINEERS DREDGE DEPOT IN JACKSONVILLE, FLORIDA, (EXCEPT BORINGS DRILLED IN 1950, 1951, AND 1960.)
6. ORIGINAL BORING NOTES ARE AVAILABLE FOR INSPECTION AT THE JACKSONVILLE DISTRICT OFFICE, (EXCEPT BORINGS DRILLED IN 1950, 1951, AND 1960.)
7. GROUND WATER ELEVATIONS WERE OBSERVED ON THE COMPLETION DATES OF THE BORINGS AND ARE SUBJECT TO FLUCTUATIONS. WHERE GROUND WATER ELEVATIONS WERE NOT OBSERVED OR NOT RECORDED, IT DOES NOT NECESSARILY INDICATE THAT GROUND WATER WILL NOT BE ENCOUNTERED AT THE LOCATION AND THROUGHOUT THE DEPTH OF THE HOLE.
8. ROCK HARDNESS IS DEFINED BY THE FOLLOWING:
   SOFT- CAN BE SCRATCHED WITH FINGERNAIL.
   MEDIUM HARD- CAN BE SCRATCHED EASILY WITH KNIFE; CANNOT BE SCRATCHED WITH FINGERNAIL.
   HARD-DIFFICULT TO SCRATCH WITH KNIFE.
   VERY HARD- CANNOT BE SCRATCHED WITH KNIFE.
9. D.T. 30 MIN. ETC., REFERS TO THE TIME IN MINUTES, REQUIRED TO DRILL THROUGH THE VERTICAL REACH SHOWN.
10. H. P. 75 P.S.I. ETC., REFERS TO THE HYDRAULIC PRESSURE, IN POUNDS PER SQUARE INCH, APPLIED TO THE DRILL BIT WHILE DRILLING THROUGH THE VERTICAL REACH SHOWN.
11. RECHARGE TESTS MADE IN THE FOLLOWING MANNER: CASING IS INSTALLED IN THE HOLE TO THE UPPER LIMIT OF THE ZONE TO BE TESTED. THE HOLE IS THEN DRILLED TO THE LOWER LIMIT OF THE SECTION TO BE TESTED. WATER IS PUMPED INTO THE CASING AT A RATE SUFFICIENT TO MAINTAIN A CONSTANT HEAD ABOVE THE NORMAL WATER TABLE, IF POSSIBLE, AND THIS RATE OF FLOW IS DETERMINED. THE RATE OF FLOW, DIVIDED BY THE HEAD MAINTAINED, GIVES GALLONS PER MINUTE PER FOOT OF HEAD.

TYPICAL CONTRACT PLAN BORING NOTES

SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY
PART V, SUPP. 55 DATED: AUG. 1974
FILE NO. 900-31,829

PLATE 59





NOTE:

1. ALL BRIDGES ARE NORMAL TO FLOW.
2. ALL ELEVATIONS REFER TO M.S.L. DATUM.
3. PRIVATE BRIDGES NOT SHOWN.

SCALE IN FEET

20' 0 20' 40'

CENTRAL AND SOUTHERN FLORIDA
COASTAL AREAS SOUTH OF ST. LUCIE CANAL

LEVEE 29
BRIDGES

SCALES AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY DETAIL REPORT DTD.,
PART IV, SUPP. 55, DATED AUG. 1974
FILE NO. 400-61-229