HEADQUARTERS HARBOR DEFENSE OF SANDY HOOK

FORT HANCOCK, NEW JERSEY.

JUNE 10TH, 1941.

PROCEEDINGS OF A LOCAL BOARD OF OFFICERS CONVENED PURSUANT TO PARAGRAPH 1 d ARMY REGULATIONS 100-20 FOR THE PURPOSE OF RECOMMENDING THE DETAILS OF INSTALLATION OF DEFENSIVE ELEMENTS WITHIN THE HARBOR DEFENSE OF SANDY HOOK.

MEMBERS OF THE BOARD

Brigadier General PHILIP S. GAGE - Commanding HDSH, President

Colonel CARL BISCOE - Executive Officer, Second Coast Artillery District

Lt. Colonel L. S. DILLON - U. S. District Engineer, New York District

Lt. Colonel G. S. LAVIN - Ordnance Officer, Second Corps Area

Lt. Col. G. C. SALISBURY - Air Officer, Second Corps Area

Colonel O. S. ALBRIGHT - Signal Officer, Second Corps Area

Major H. E. MILLER - Chemical Warfare Officer, Second Corps Area

1. The Board met March 7, 1941 and on succeeding days thereafter until June 10th, 1941. All of the members were present at scheduled meetings.

2. The Board studied the existing approved Basic Project, the Annexes to the Harbor Defense Projects, Harbor Defense of Sandy Hook, current official manuals pertaining to harbor defense installations and the following listed correspondence:

Letter, Subject, "Modernization of Harbor Defense Projects, Continental United States" sent to the Corps Area Commanders, dated the Office of the Adjutant General, September 27, 1940. (AG 660.2 (9-12-40)M-WPD-M).

Letter, Subject, "Modernization of Harbor Defense Projects, Continental United States" sent to the Corps Area Commanders, dated the Office of the Adjutant General, October 25, 1940. (AG 660.2 (10-18-40)M-OCCA-M).

Letter, Subject, "Revision of Annexes to Harbor Defense Projects," to the same Corps Area Commanders, dated the Office of the Adjutant General, January 18, 1940 (AG 660.2 (1-15-41)M).

Letter, Subject, "Expenditure Program Seacoast Defense Funds, Harbor Defense of Sandy Hook" dated the Office of the Chief of Coast Artillery (February 18, 1941 (111/IB 15A).

3. The Board made a complete and detailed inspection of the existing defensive installations and of the approved sites for the projected installations, and, after consideration of all the factors involved, (unanimously) agrees in recommending that the defensive elements as stated herein be authorized for inclusion in the next revision of the Annexes to the Harbor Defense Project, Harbor Defense of Sandy Hook.

SEACOAST ARTILLERY

4. The following tabulation lists the existing and authorized seacoast batteries which will remain in the project upon completion of the modernization program:

PROJECT BATTERIES PERMANENT

BATTERY TACTICAL NUMBER	NAME OR CONST. NO.	CALIBER IN.	NO. OF GUNS	LOCATION FORT	EXH.	STATUS	PRIORITY FOR TCS OF EXISTING BATTERIES
1	Btry Const. #219	6	2	Highlands of Navesink NJ	3-4	TC	
2	Btry Const. #116	16	2	Highlands of Navesink NJ	3-4	TC	
3	Btry Mills	12	2	Ft Hancock	3-5	EX*	1
4	Btry Kingman	12	2	Ft Hancock	3-5	EX*	1
5	Btry Peck	6	2	Ft Hancock	5	TCS	2
6	Btry Morris	3	4	Ft Hancock	5	TCS	3
7	Btry Urmston	3	2	Ft Hancock	5	TCS	3
8	Btry Kessler	6	2	Ft Tilden	6	TCS	3
9	Btry Harris	16	2	Ft Tilden	6	EX*	1
10	Const. #220	6	2	Ft Tilden	6-7	TC	
11	Btry Const. #117	16	2	Nigger Pt Long Island	6-8	TC	

* To be casemated.

Jamaica Bay Airport
(Occa 662.1/30-C-17
See letter (Occa 667.1/30-C-25) attached to L.B.P. and made a part thereof.

5. There are no batteries under construction in the Harbor Defense of Sandy Hook. Sites for the following batteries to be constructed have been approved by the Secretary of War:

BATTERIES TO BE CONSTRUCTED

PRIORITY	BATTERY TACTICAL NUMBER	NAME OR CONST. NO.	CASEMATE OR SHIELD	EXHIBIT	ACREAGE	ESTIMATED COST OF LAND
1	1	Const. #219	Shield	3-4	12.5)	$225,000
1	2	Const. #116	Casemate	3-4	86.5)	
2	10	Const. #220	Shield	6-7	None	
2	11	Const. #117	Casemate	6-8	84	$275,000

5. a The following listed correspondence shows approval of the site board action:

Site Board report dated March 10, 1941.

Secretary of War's approval, letter.

6. The following tabulation lists the existing seacoast batteries which have been classed as outmoded under the modernization program. Current plans contemplate their exclusion from the project upon completion of all new batteries.

PROJECT BATTERIES (OUTMODED)

TACTICAL NUMBER	NAME	CAL-IBER IN.	NO. OF GUNS	TYPE GUNS	CARRIAGES	LOCATION	EXHIBIT
12	Btry Gunnison	6	2	Model 1903	DC	Ft Hancock	5
13	Btry Richardson	12	2	Model 1895 M-1	DC	Ft Hancock	5
14	Btry Bloomfield	12	2	Model 1895 M-1	DC	Ft Hancock	5
15	Btry Fergusson	6	2	Model 1900	BC	Ft Tilden	6

7. The following tabulation lists those batteries designated in the current Basic Project for the Sandy Hook-Naragansetts Bay Area (Short Title CCA-P-NYNB) as batteries "No Longer Required."

BATTERIES NO LONGER REQUIRED

TACTICAL NUMBER	NAME	CAL. INCHES	NO. OF GUNS	TYPE GUNS	CARRIAGES	LOCATION	EXH.
16	Btry Granger	10	2	Model 1895 M-1	DC	Ft Hancock	5
17	Btry Halleck	10	2	Model 1895 M-1	DC	Ft Hancock	5
18	Btry Alexander	12	2	Model 1888 M-1	DC	Ft Hancock	5

7. a. Battery Granger: This battery is non-project but is being used for training purposes. The guns are in place but the magazines, because of seepage, are not used, except for the storage of the battery target practice ammunition. Magazines need to be reconditioned.

b. Battery Halleck: Battery is non-project and is carried in a caretaker status - authority, basic project and Annex A thereto. The emplacement is designed for three guns, two of which are in place. The magazines are used for the storage of powder for Battery Richardson. The magazines need to be resurfaced and an air circulatory system installed to overcome seepage and condensation.

c. Battery Alexander: Battery is non-project and is carried in a caretaker status - authority, basic project and Annex thereto. The guns are in place and the magazines are used for the storage of powder for Battery Bloomfield. The magazines need to be resurfaced and an air circulatory system installed to overcome seepage and condensation.

8. The tactical organization of the harbor defense pending completion of the modernization program is shown on Exhibit No. 1. The tactical organization of the harbor defense recommended for adoption upon completion of the modernization program is shown on Exhibit No. 2.

9. The following tabulation shows the War Reserve Allowance of Ammunition for all authorized seacoast batteries, including those to be abandoned on completion of the modernization program, together with the Battle Allowances of Ammunition approved for existing batteries and those recommended for new batteries:

NAME OR CONST. NO.	TACTICAL NUMBER	NO. OF GUNS	CALIBER & TYPE	TYPE PROJECTILE	RDS PER W/R	BTRY B/A	PLACE OF STORAGE
Const. #219	1	2	6 (long range)	AP HE	1200 400	*1200 400	Emplacement
Const. #116	2	2	16 (Guns) (BC)	AP	400	* 400	Emplacement plus 2 Bombproof Magazines.
Btry Mills	3	2	12 (BC)	AP	600	600	Emplacement
Btry Kingman	4	2	12 (BC)	AP	600	600	Emplacement
Btry Peck	5	2	6 (BC)	AP HE	1200 400	1200 400	Emplacement plus Magazine ?
				HE	400	* 400	Abandoned Btry Arrowsmith
Btry Morris	6	4	3 (BC)	AP	1600	1600	Emplacement
Btry Urmston	7	2	3 (BC)	AP	800	400	Emplacement
Btry Kessler	8	2	6 (BC)	AP HE	1200 400	*1200 200	Emplacement Emplacement
Btry Harris	9	2	16 (Guns) (BC)	AP	400	400	Emplacement plus existing Magazines
Const. #220	10	2	6 (long range)	AP	1200	*1200	Emplacement
				HE	400	* 400	Emplacement
Const. #117	11	2	16 (Guns) (BC)	AP	400	* 400	Emplacement plus 2 Bombproof Magazines
Btry Gunnison	12	2	6 (DC)	AP	1200	600	Emplacement ?
Btry Richardson	13	2	12 (Medium Range (DC))	AP	400 (480)	400	Halleck & Richardson Emplacement
Btry Bloomfield	14	2	12 (Medium Range (DC))	AP	400 (480)	400	Alexander & Bloomfield Emplacement
Btry Fergusson	15	2	6 (BC)	AP HE	1200 400	*1200	Magazine Btry Harris

* Battle allowance recommended by Local Board.

10. In order to accomodate the Battle Allowances of Ammunition recommended in Paragraph 9 above, and those mentioned in Paragraph 28 below (for anti-aircraft weapons), additional bombproof magazines storage capacity is required as follows:

a. Two magazines (bombproof) for the storage of battle allowance of ammunition over and above that to be located in the casemate of Const. No. 116 (200 rounds). (Exhibits 3 and 4)

b. Three bombproof magazines (one per battery), for the storage of battle allowance of ammunition of anti-aircraft batteries Nos. 1, 2 and 3 (5400 rounds HE @ 1800 rounds per battery). (Exhibits 5 and 6.)

c. Two igloo type magazines (one at Fort Hancock and one at Fort Tilden), to be used for the storage of automatic weapons ammunition (37 MM and .50 caliber). (Exhibits 5 and 6)

d. Bombproof four existing magazines used for the storage of battle allowance of ammunition of Battery Harris. (Exhibit 6)

e. Two bombproof magazines for the storage of battle allowance of ammunition over and above that to be stored in the casemate of Const. No. 117 (200 rounds). (Exhibits 6 and 8)

Recommended locations for the proposed magazines are shown in the Exhibits indicated above. Four of the recommended magazines, those to be used for the storage of ammunition of Const. No. 116 and Const. No. 117, are sited on what is now privately owned property. Sites for these installations are included in the acreage to be procured for the battery sites involved.

11. The ammunition storage plan proposed in the two preceding paragraphs has been checked against the requirements of TR 1370-A as changed by Changes 1 - 7 and complies therewith in all respects.

12. Attached hereto as Exhibit No. 9 is the Cost Estimate and Priority Guide for the construction or procurement of items covered in the preceding eleven paragraphs. The items listed include, by batteries, the fortification construction items, major items of equipment for all services, as listed in Inclosure No. 6 to letter, subject "Modernization of Harbor Defense Projects, Continental United States", dated the office of the Adjutant General, September 27, 1940, (AG 660.2 (9-12-40) M-WPD-M), and land procurement items. Estimated costs of land include cost of survey and transfer. Separate Cost Estimate and Priority Guide forms have been prepared for those items pertaining to the Fire Control, Searchlight, Antiaircraft, Underwater Defense and Gas Defense Annexes as indicated in succeeding paragraphs of these proceedings.

DISTRIBUTION LIST:-

1 - CG, 2d CAD
2 - CG, 1st Army
3 - The A. G. O.
4 - Chief of C. A.
5 - Chief of Engr.
6 - Chief of Ord.
7 - Chief Sig O.
8 - Chief of C.W.S.
9 - HD of Sandy Hook
10 - HD of Sandy Hook

TACTICAL ORGANIZATION HARBOR DEFENSES OF SANDY HOOK BEFORE MODERNIZATION

SUB-SECTOR - - - - - - - - - HD OF SOUTHERN NEW YORK
SUPPORTING AIR
MOBILE FORCES "H" AT FT HANCOCK
NAVAL INSHORE PATROL - - - - - - - - - AIRCRAFT WARNING SERVICE

SUPPORTING TROOPS WHILE IN H. D. 52ND C. A. (RY)

C-1 AT FT HANCOCK

GROUP 1	GROUP 2	GROUP 3
Btry Kingman, two 12" B.C.	Btry Richardson, two 12" D.C.	Mine Command
Btry Mills two 12" B.C.	Btry Bloomfield, two 12" D.C.	Btry Gunnison, two 6" D.C.
		Btry Peck, two 6" Pedestal Mount
		Btry Morris, four 3" Pedestal Mount
		Btry Urmston, two 3" Pedestal Mount

AAD

SEARCHLIGHTS	AAD COMMAND
Searchlight No. 1	AA Battery No. 1 three 3" AA Fixed Guns & five AA Searchlights at Ft Hancock
" 2	
" 3	
" 4	
" 5	
" 6	AA Battery No. 2 three 3" AA Fixed Guns & five AA Searchlights at Ft Hancock
" 7	AA Battery No. 3 Three fixed 3" AA Guns & five AA Searchlights at Ft Tilden

C-2 AT FT TILDEN

GROUP 4	GROUP 5	SEARCHLIGHTS
Btry Kessler, two 6" Pedestal Mount	Btry Harris two 16" B.C.	Searchlight No. 8
Btry Fergusson, two 6" Pedestal Mount		" 9
		" 10
		" 11
		" 12

SECRET

EXHIBIT NO. 1

TACTICAL ORGANIZATION HARBOR DEFENSES OF SANDY HOOK
AFTER MODERNIZATION

SUB-SECTOR — HD OF SOUTHERN NEW YORK
SUPPORTING AIR
MOBILE FORCES — "H" AT FT HANCOCK
NAVAL INSHORE PATROL — AIRCRAFT WARNING SERVICE

SUPPORTING TROOPS WHILE IN H. D.
52ND C. A. (RY)

C-1 AT FT HANCOCK

GROUP 1	GROUP 2	SEARCHLIGHTS
Const. No. 219, two 6" B.C. (shielded)	Mine Command	Searchlight No. 1
Const. No. 116, two 16" B.C. Casemated	Battery Peck, two 6" Pedestal Mount (shielded)	" 2
Battery Mills, two 12" B.C. Casemated	Battery Morris, four 3" Pedestal Mount (shielded)	" 3
Battery Kingman, two 12" B.C. Casemated	Battery Urmston two 3" Pedestal Mount (shielded)	" 4
		" 5
		" 6
		" 7
		" 8
		" 9

AAD

AA FIXED
AA Btry No. 1 three 3" AA Fixed Guns & five AA Searchlights at Ft Hancock
AA Btry No. 2 three 3" AA Fixed Guns & five AA Searchlights at Ft Hancock
AA Btry No. 3 three 3" AA Fixed Guns & five AA Searchlights at Ft Tilden

C-2 AT FT TILDEN

GROUP 3	GROUP 4	SEARCHLIGHTS
Mine Command	Battery Harris two 16" B.C. Casemated	Searchlight No. 10
Battery Kessler Two 6" Pedestal Mount (shielded)	Const. No. 117 two 16" B.C. Casemated	" 11
Const. No. 220 two 6" Pedestal mount (shielded)		" 12
		" 13
		" 14
		" 15

SECRET

EXHIBIT NO. 2

NEW JERSEY

SHREWSBURY RIVER

Scale $\frac{1}{20000}$

SOUNDINGS IN FEET
AT MEAN LOW WATER

PLATES No. 4382-4383

Surveys to 1934
Surveys by U. S. Engineers to 1937

HEIGHTS in feet above high water

ABBREVIATIONS

Lights: F. fixed, Fl. flashing, Occ. occulting, W. white, R. red, G. green, Alt. alternating, Gp. group, Sec. sector, m. miles, min. minutes, sec. seconds, ev. every, vis. visible. Color white unless otherwise indicated. AERO. aeronautical light.

Buoys: C. can, N. nun, S. spar, W. white, REF. reflector.

C.G. Coast Guard Station

M. mud, S. sand, G. gravel, Sh. shells, Rk. rock, Cl. clay; bk. black, hrd. hard, rky. rocky,

P.D. position doubtful. E.D. existence doubtful.

CAUTION

Temporary changes affecting Lights, Buoys and Day Beacons

Aids which have been destroyed or removed, b will be reestablished and are temporarily replace of different characteristics, are indicated in re following abbreviations.

D	Destroyed, to be reestablished.
T R B	Temporarily replaced by a red buoy.
T B B	Temporarily replaced by a black buoy.
T F B	Temporarily replaced by a fixed white l
T F R B	Temporarily replaced by a fixed red ligi
T Fl B	Temporarily replaced by a flashing whi
T Fl R B	Temporarily replaced by a flashing red

02' 01' 74°00' 59'

19
AN

Estimated)
Estimated)

Estimated)
Estimated)

HOOK BAY

VARN 1°00'W IN 1938
ANNUAL INCREASE

Sandy Hook Pier

marsh

Horseshoe

No.1 Gun Kingman

No.1 Gun Kingman

No.1 Gun Mills

No.1 Gun Mills

U.S. Government R.R.

SPERMACETI COVE C.G.

Spermaceti Cove

marsh

Fl. ev 11 sec "I"

(Fl R) 2 BELL

piles

SPIRE

Atlantic Highlands

Navesink Park

12 FEET JUNE 1937

Island Beach

Leonardville

Waterwitch

CUPOLA

C.R.R. of N.J.

Navesink

HIGHLANDS OF NAVESINK

HIGHLANDS
NORTH TOWER
FL ev 5 sec 246 ft vis 22 m
TOWER
NAVESINK

Highland Beach

Navesink Beac

Locust

Cloppit Creek

No.2 Gun Mg
Const. 116

No.1 Gun Mg
Const. 116

No. 2 Gun
No. 1 Gun
Const. 219

Lower Rocky Point

Upper Rocky Point

Locust Pt.

SECRET

TIDES	Sandy Hook Pier	Highlands Bridge	Seabright Bridge
High water interval	7h 38m	8h 04m	9h 14m
High water height	4.6 ft.	3.5 ft.	1.9 ft.
Lowest tide	−4.0 ft.	−4.0 ft.	−3.0 ft.

CAUTION

Improved Channels

The side limits of the improvement are shown by broken lines. The controlling depth through the channel, on the date given, is placed in or alongside the channel; or in a separate note, but no depth greater than the project depth is given. Because of possible shoaling, particularly at the edges, it must not be inferred that the depth stated existed throughout the entire width of the improvement on the date of the examination unless so stated; or that it has not since decreased in places across the entire width.

NEW JERSEY

SHREWSBURY RI

Scale 1/20000

SOUNDINGS IN FEET
AT MEAN LOW WATER

PLATES No. 4362-4383

No. 543 PRICE 50 CENTS

SECRET

LOCATION OF GUNS

CONSTRUCTION BATTERY #116 BATTERY MILLS & CONSTRUCTION BATTERY #219 BATTERY KINGMAN

LAMBERT COORDINATES

		X	Y
CONSTRUCTION BATTERY #116	Gun #1	100,652.00	47,006.00 (Estimated)
	Gun #2	100,719.00	47,160.00 (Estimated)
CONSTRUCTION BATTERY #219	Gun #1	101,553.00	46,800.00 (Estimated)
	Gun #2	101,571.00	46,867.00 (Estimated)
BATTERY MILLS	Gun #1	100,706.24	52,706.51
	Gun #2	100,710.72	52,846.36

Elevation of Gun Trunnion, Gun #1, 11.942'
Elevation of Gun Trunnion, Gun #2, 11.906'

BATTERY KINGMAN	Gun #1	100,718.61	53,096.28
	Gun #2	100,723.03	53,236.27

Elevation of Gun Trunnion, Gun #1, 11.886'
Elevation of Gun Trunnion, Gun #2, 11.870'

USC&GS MAP #543 SCALE 1/20,000

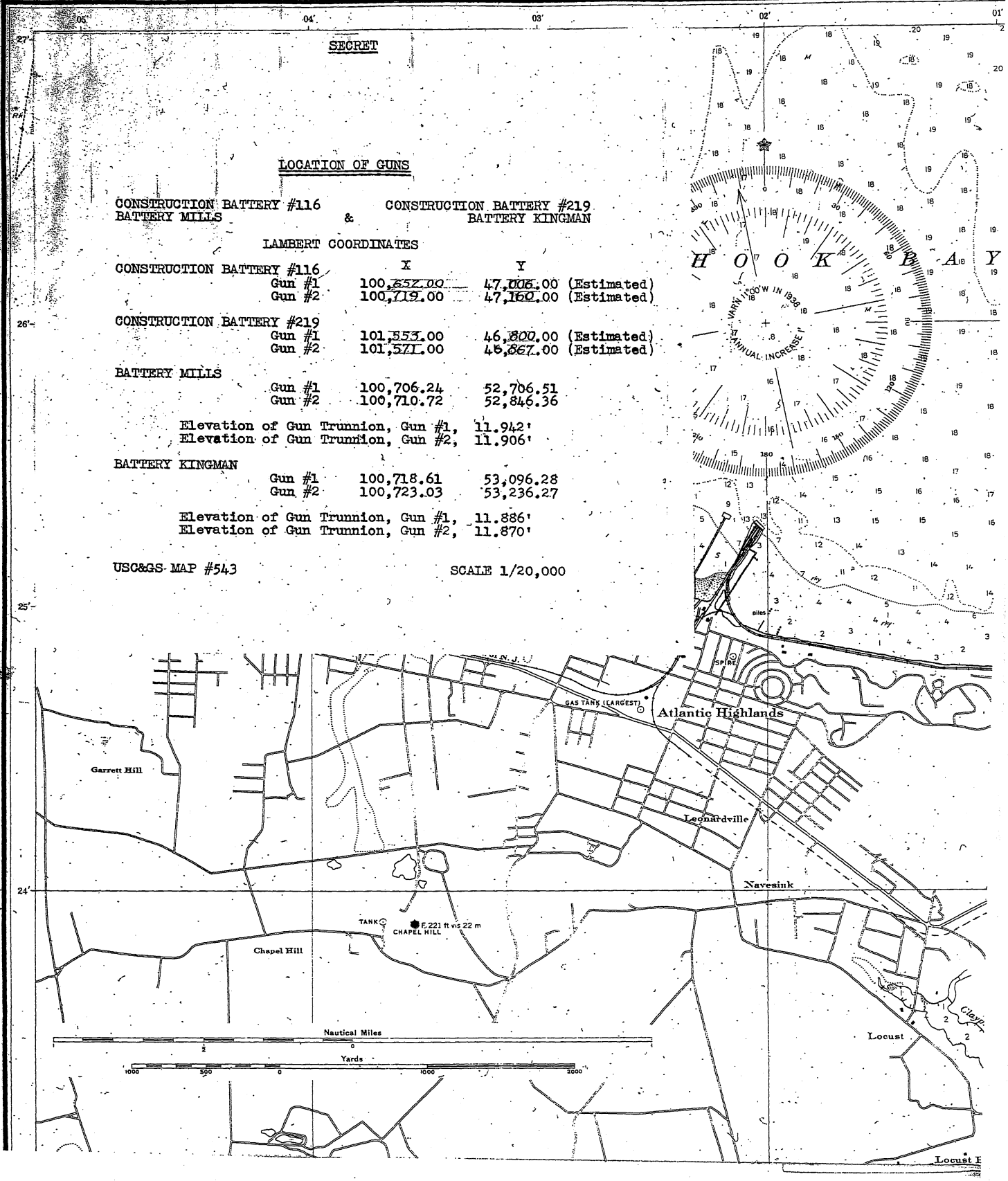
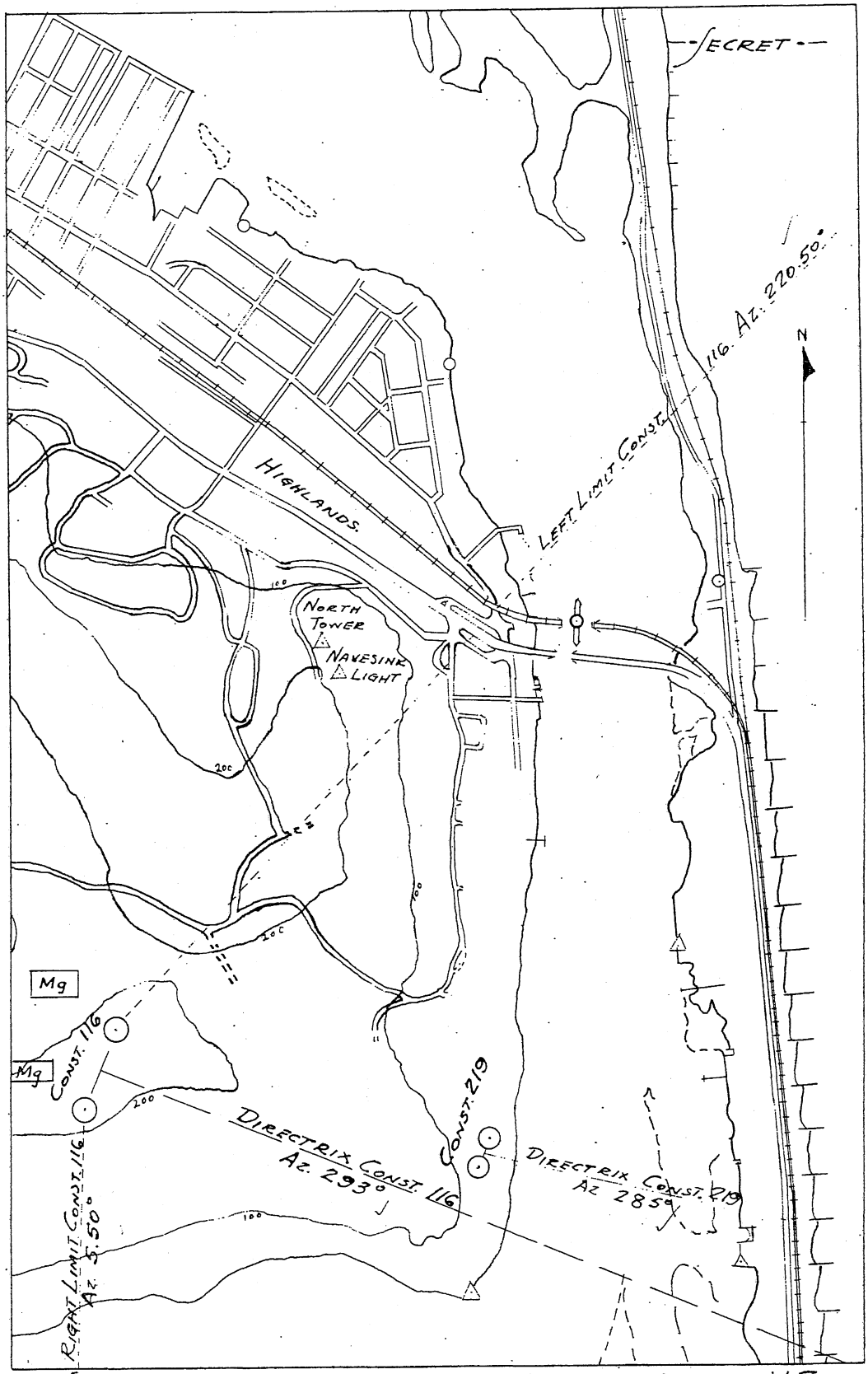


EXHIBIT #4



SKETCH OF SITE FOR CONST. 219 AND CONST. 116.
OVERLAY AIR COMPILATION T-5100

SECRET

SCALE 1/10,000

	Gun #2	32.779'	
BATTERY BLOOMFIELD			
		99,705.64	57,038.27
	2	99,675.60	57,071.81
Elevation			
	Gun #1	32.661'	
	Gun #2	32.667'	
BATTERY HALLECK			
	Gun #1	99,647.26	57,035.94
	Gun #2	99,620.44	57,133.39
	Gun #3	99,592.76	57,164.18
BATTERY ALEXANDER			
	Gun #1	99,557.07	57,201.52
	Gun #2	99,511.49	57,191.54
BATTERY PECK			
	Gun #1	99,447.35	57,227.25
	Gun #2	99,411.70	57,238.96
Elevations			
	Gun #1	25.522'	
	Gun #2	25.617'	
BATTERY MORRIS			
	Gun #1	99,258.88	57,203.61
	Gun #2	99,243.69	57,200.71
	Gun #3	99,227.35	57,197.54
	Gun #4	99,212.06	57,194.59
Elevations			
	Gun #1	22.92'	
	Gun #2	22.430'	
	Gun #3	22.611'	
	Gun #4	22.995'	
BATTERY URMSTON			
	Gun #1	99,160.18	57,180.57
	Gun #2	99,143.41	57,178.92
Elevations			
	Gun #1	22.661'	
	Gun #2	22.700'	

USC&GS
AIR PHOTO COMPILATION
No. T-5100

SCALE 1/10,000

OMIT ALL REFERENCE TO 155 MM. BATTERIES.

GUN N[illegible] MILLS

GUN N[illegible] MILLS

SECRET

SECRET

EXHIBIT #5

O C E A N

SPERMACETI COVE

West Beacon, Spermacetti, 1930 (Lighted)

East Beacon, Spermacetti, 1930 (Lighted)

SHOAL AREA

SHOAL AREA

ROAD OF NEW JERSEY (New York & Highlands Branch)

Center Hiker R.R. Sta. Ho

Flagpole on Ridge, 1936

Mount Mitchell, 1932

N.E. Gable of House

NAVESINK PARK

ISLAND BEACH

WATERWITCH

Highlands School, 1934

Flagpole

Flagpole, N. Gable of Hotel

HIGHLANDS

Navesink North Light, 1877 (New)

Navesink South L.H., 1869 (New)

Bridge House

Spire

HIGHLAND BEACH

JOINS COMPILATION T-5279

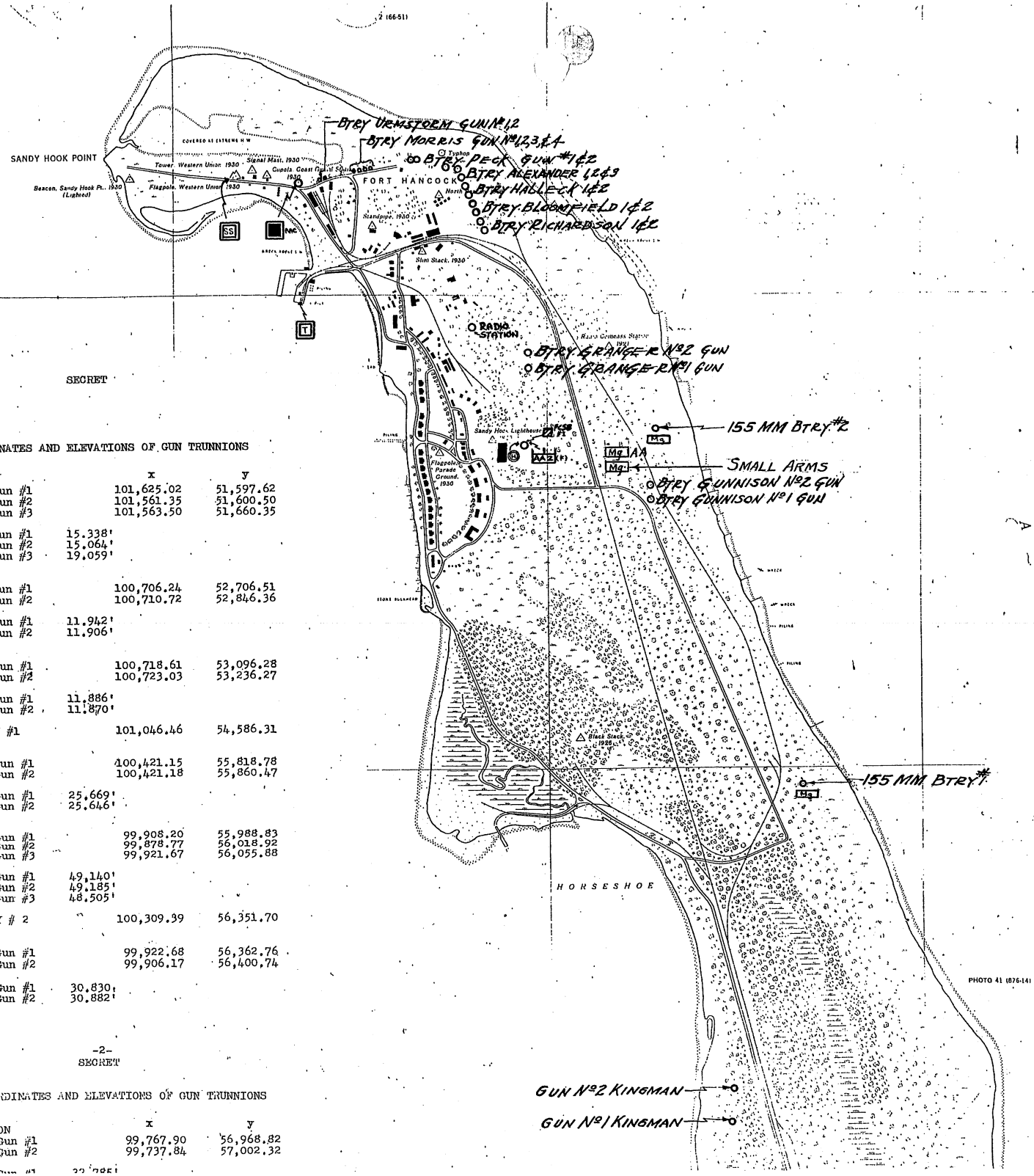
PHOTO 20 (66-51)

74° 00'

PHOTO 9 (66-51)

40

41



SECRET

LAMBERT COORDINATES AND ELEVATIONS OF GUN TRUNNIONS

		x	y
A. A. BATTERY #1			
	Gun #1	101,625.02	51,597.62
	Gun #2	101,561.35	51,600.50
	Gun #3	101,563.50	51,660.35
Elevations			
	Gun #1	15.338'	
	Gun #2	15.064'	
	Gun #3	19.059'	
BATTERY MILLS			
	Gun #1	100,706.24	52,706.51
	Gun #2	100,710.72	52,846.36
Elevations			
	Gun #1	11.942'	
	Gun #2	11.906'	
BATTERY KINGMAN			
	Gun #1	100,718.61	53,096.28
	Gun #2	100,723.03	53,236.27
Elevations			
	Gun #1	11.886'	
	Gun #2	11.870'	
DP 155 MM BATTERY #1		101,046.46	54,586.31
BATTERY GUNNISON			
	Gun #1	100,421.15	55,818.78
	Gun #2	100,421.18	55,860.47
Elevations			
	Gun #1	25.669'	
	Gun #2	25.646'	
A. A. BATTERY #2			
	Gun #1	99,908.20	55,988.83
	Gun #2	99,878.77	56,018.92
	Gun #3	99,921.67	56,055.88
Elevations			
	Gun #1	49.140'	
	Gun #2	49.185'	
	Gun #3	48.505'	
DP 155 MM BATTERY # 2		100,309.39	56,351.70
BATTERY GRANGER			
	Gun #1	99,922.68	56,362.76
	Gun #2	99,906.17	56,400.74
Elevations			
	Gun #1	30.830'	
	Gun #2	30.882'	

LAMBERT COORDINATES AND ELEVATIONS OF GUN TRUNNIONS

		x	y
BATTERY RICHARDSON			
	Gun #1	99,767.90	56,968.82
	Gun #2	99,737.84	57,002.32
Elevations			
	Gun #1	32.785'	

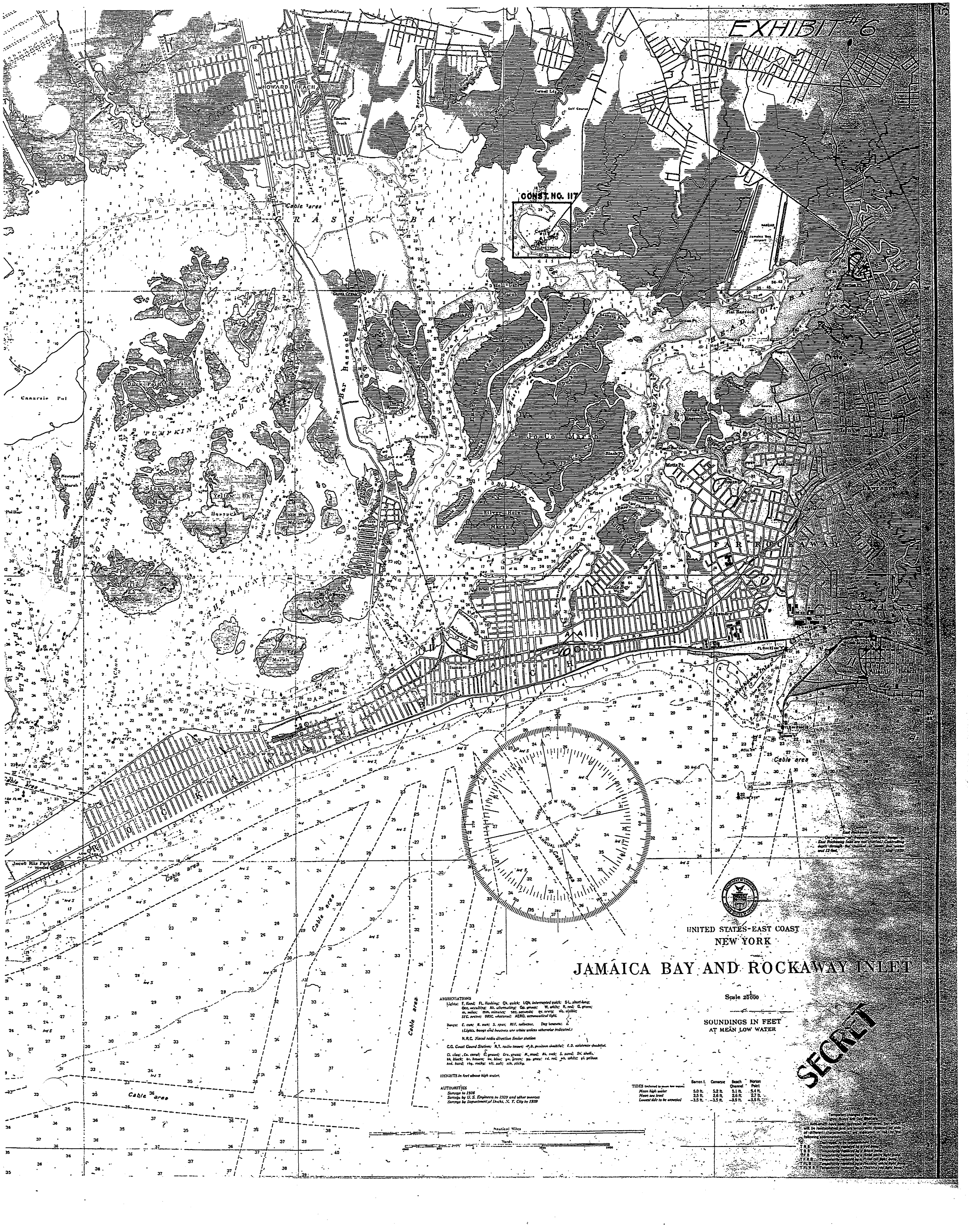


EXHIBIT #6
HOWARD BEACH
CONST. NO. 117
GRASSY BAY
Cable area
Canarsie Pol
PUMPKIN PATCH
Jacob Riis Park
UNITED STATES-EAST COAST
NEW YORK
JAMAICA BAY AND ROCKAWAY INLET
Scale 20000
SOUNDINGS IN FEET
AT MEAN LOW WATER
SECRET

SECRET

LAMBERT COORDINATES AND ELEVATIONS OF GUN TRUNNIONS

		x	y
BATTERY KESSLER			
	Gun #1	109,474.96	67,739.61
	Gun #2	109,564.54	67,746.80
Elevations			
	Gun #1	16.171'	
	Gun #2	18.271'	
BATTERY HARRIS			
	Gun #1	109,601.93	68,028.64
	Gun #2	109,854.76	68,156.48
Elevations			
	Gun #1	14.596'	
	Gun #2	14.580'	
DP 155 MM BATTERY #3		109,736.66	67,804.62
A. A. BATTERY #3			
	Gun #1	110,176.27	68,574.89
	Gun #2	110,146.45	68,534.64
	Gun #3	110,980.98	71,769.19
Elevations			
	Gun #1	10.456'	
	Gun #2	10.410'	
	Gun #3	10.384'	
CONSTRUCTION BATTERY #220			
	Gun #1	110,360.21	68,059.11
	Gun #2	110,415.89	68,061.49
BATTERY FERGUSSON			
	Gun #1	110,913.58	68,269.69
	Gun #2	110,950.30	68,283.60
Elevations			
	Gun #1	15.528'	
	Gun #2	16.886'	
CONSTRUCTION BATTERY #117			
	Gun #1	119,145.77	77,645.01 (Estimated)
	Gun #2	119,289.83	77,700.47 (Estimated)

USC&GS MAP #542 SCALE 1/20,000

OMIT ALL REFERENCE TO 155 MM. BATTERIES.

A. A. BTRY. NO. 3

BTRY. HARRIS

BTRY. KESSLER

155 MM BTRY. NO. 3

CONST. NO. 220

BTRY. FERGUSSON

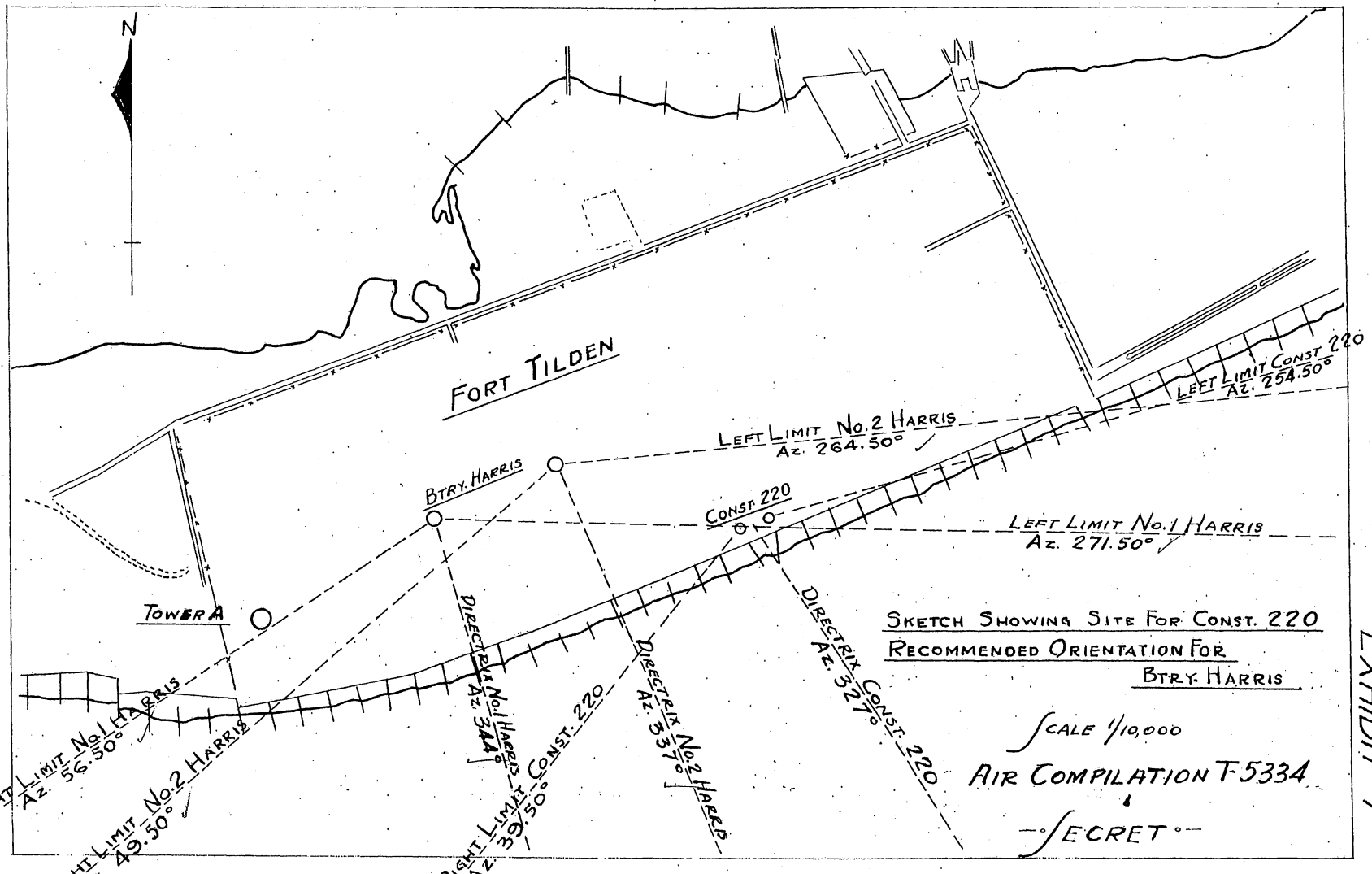
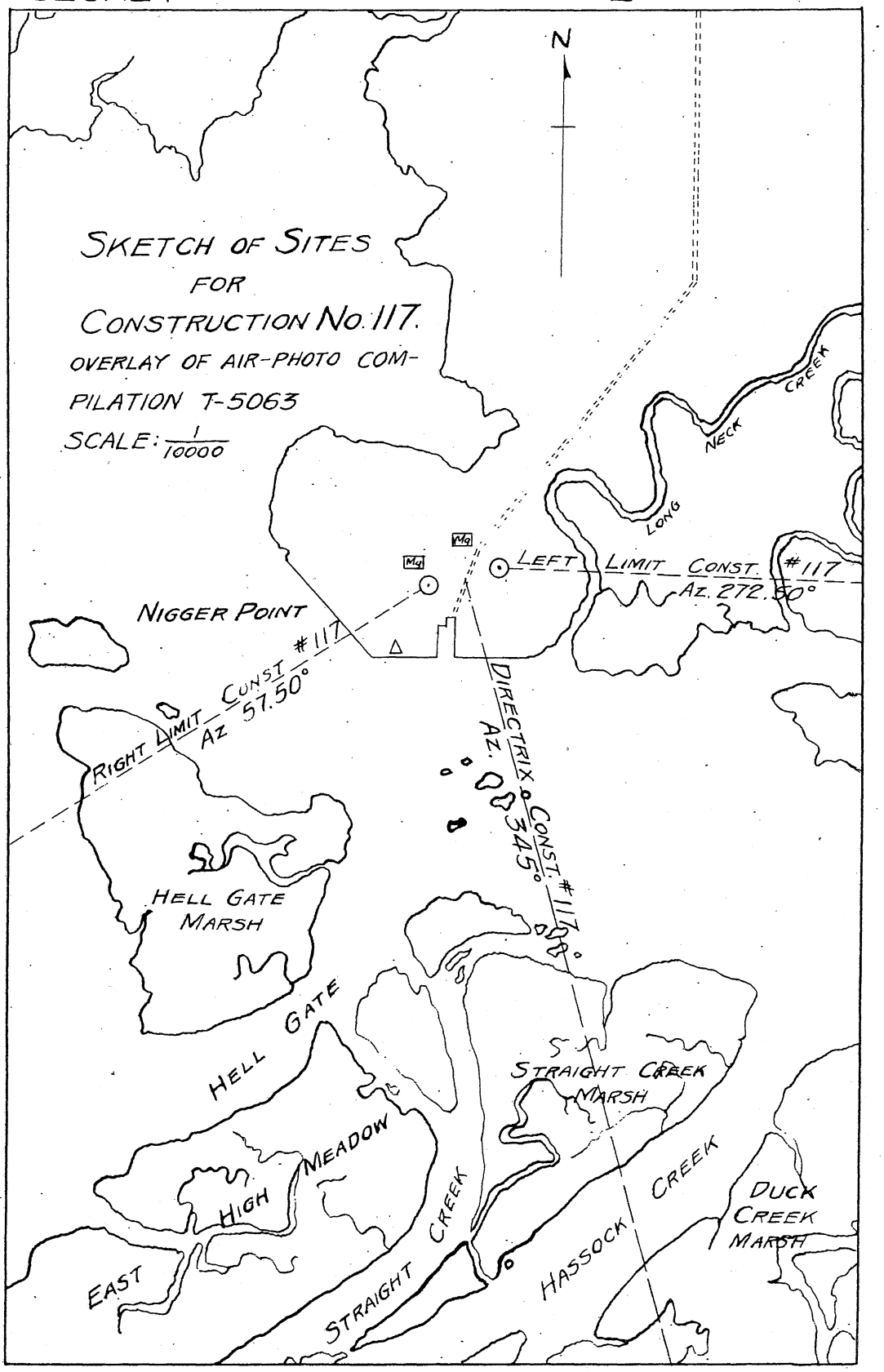

N
FORT TILDEN
LEFT LIMIT CONST 220
Az. 254.50°
LEFT LIMIT No. 2 HARRIS
Az. 264.50°
BTRY. HARRIS
CONST. 220
LEFT LIMIT No. 1 HARRIS
Az. 271.50°
TOWER A
DIRECTRIX No. 1 HARRIS
Az. 344°
DIRECTRIX No. 2 HARRIS
Az. 337°
DIRECTRIX CONST. 220
Az. 327°
RIGHT LIMIT No. 1 HARRIS
Az. 56.50°
RIGHT LIMIT No. 2 HARRIS
Az. 49.50°
RIGHT LIMIT CONST. 220
Az. 39.50°
SKETCH SHOWING SITE FOR CONST. 220
RECOMMENDED ORIENTATION FOR
BTRY. HARRIS
SCALE 1/10,000
AIR COMPILATION T-5334
-SECRET-

EXHIBIT #7

SECRET

EXHIBIT # 8



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COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: MAJOR ITEMS H. D. of Sandy Hook

Exhibit No. 9 OF EQUIPMENT

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	ENGINEER MTL	ENGINEER LAB	ENGINEER LAND	TOTAL
		Battery No. 1					
		Const. No. 219:					
3	1	Engineer:					
		Btry Empl. two 6" guns		$65,000 (Incl.Labor)			
		Land incl. in site for Const. #116					
3	2	Ordnance:					
		Two carriages 6" guns	$150,000				
		TOTAL					$215,000
		Battery No. 2					
		Const. No. 116					
3	3	Engineer:					
		Btry Empl. two 16" guns		$1,250,000 (Incl.Labor)			
3	4	Two Bombproof magazines for ammunition in excess of that stored in gun emplacement		$32,000	$36,000		
		Land				$225,000	
		TOTAL					$2,415,000
		Battery No. 3					
		Battery Mills					
		Casemate two 12" guns		$300,000 (Incl.Labor)			
1	1	Engineer:					
		Ordnance:	$40,000				
		TOTAL					$340,000
		Battery No. 4					
		Battery Kingman					
		Casemate two 12" guns		$300,000 (Incl.Labor)			
1	2	Engineer:					
		Ordnance:	$40,000				
		TOTAL					$340,000
		Battery No. 5					
		Battery Peck					
1	3	Ordnance:					
		Shields for two 6" guns	$10,000				$10,000
		Battery No. 6					
		Battery Morris					
1	4	Ordnance:					
		Shields for four 3" guns	$4,000				$4,000
		SIGNAL COSTS INCLUDED UNDER "LOCATION" AND "BATTERY" FIRE CONTROL EST. (PAR. 20).					

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COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: MAJOR ITEMS H. D. of Sandy Hook

Exhibit No. 9 OF EQUIPMENT

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	ENGINEER MTL	ENGINEER LAB	ENGINEER LAND	TOTAL
		Battery No. 7					
		Battery Urmston:					
1	5	Ordnance:					
		Shields for two 3" guns	$ 2,000	$	$	$	$ 2,000
		Battery No. 8					
		Battery Kessler:					
1	6	Engineer:					
		Btry Empl. (Incl. magazine for storage of ammunition		18,000	22,000		
1	6	Ordnance:					
		Shields for two 6" guns	10,000				
		TOTAL					50,000
		Battery No. 9					
		Battery Harris:					
		Casemate for two 16" guns (dispersed type)					
1	7	Engineer:		600,000			
1	8	Ordnance:	40,000				
	X	#Bombproof four existing magazines and three power plants.					
1	9	Engineer:		52,800	74,800		
		#Covered in Annex A to original project.					
		TOTAL					767,600
		Battery No. 10					
		Const. No. 220:					
		Btry Empl. for two 6" guns					
3	5	Engineer:		65,000 (Incl.Labor)			
3	6	Ordnance:					
		Two carriages 6" guns	150,000				
		TOTAL					215,000
		SIGNAL COSTS INCLUDED UNDER "LOCATION" AND "BATTERY" FIRE CONTROL COST (PAR. 20).					

SECRET

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: MAJOR ITEMS H. D. of Sandy Hook

Exhibit No. 9 OF EQUIPMENT

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	ENGINEER MTL	ENGINEER LAB	ENGINEER LAND	TOTAL
		Battery No. 11 Const. No. 117:					
3	7	Engineer: Btry Empl. two 16" guns		$1,250,000 (Incl.Labor)			
3	8	Two Bombproof magazines for ammunition in excess of that stored in gun emplacement.		$32,000	$38,000		
3	9	Land				$275,000	
3	10	Ordnance: Two carriages 16" guns	$870,000				
		TOTAL					$2,465,000
		AA Battery No. 1					
1	10	Engineer: One bombproof type magazine (Incl. in Annex E to original project)		$3,300	$3,300		$6,600
		AA Battery No. 2					
1	11	Engineer: One bombproof type magazine		$3,300	$3,300		$6,600
		AA Battery No. 3					
1	12	Engineer: One bombproof type magazine (Incl. in Annex E to original project)		$3,300	$3,300		$6,600
		Batteries Nos. 16,17 and 18. Granger, Halleck* and Alexander*:					
2	1	Engineer: Recondition magazines to permit powder storage		$8,000	$3,500		$11,500

*Included in Annex A to original project.

see basic letter

SIGNAL COSTS INCLUDED UNDER "LOCATION" AND "BATTERY" FIRE CONTROL EST. (PAR. 20).

FIRE CONTROL

F I R E C O N T R O L

13. Following are brief paragraphs describing, and in justification of, command and fire control requirements for seacoast artillery, antiaircraft and underwater defense elements pertaining to the Harbor Defense of Sandy Hook. Requirements originating in local defense plans and for which the Coast Artillery is responsible have been included. Detailed location sketches showing these installations are referred to by Exhibit number in each subparagraph. General map location of sketches is shown by blocked out areas on Exhibit No. 11. Land to be acquired is indicated in the subparagraph pertaining to each element.

14. HARBOR DEFENSE, FORT, GROUPMENT AND GROUP FIRE CONTROL REQUIREMENTS:

a. Harbor Defense Command Post - Exhibits 5, 10 and 20. This station is located in the magazines and corridors of Batteries McCook and Reynolds (abandoned mortar batteries). There is also located here Fire Control switchboard No. 1 and the AAD command post. The Harbor Defense and the AAD observation posts are installed in Tower F adjacent to the command post. Command and fire control requirements to complete these installations are shown in the Cost Estimate and Priority Guide.

b. Fort Command Post - none required.

c. (1) Groupment Command Post and OP - Fort Hancock (C-1)(Exhibit 20). At present this station is located in an existing two-level steel tower (G) in rear of the Potter emplacement. It is also the searchlight officer's OP. It is proposed to relocate the Groupment command post in a room in the semi-bombproof Potter emplacement. This will require modification and renovation of a portion of the emplacement and bombproofing of the former gun wells. It will also be necessary to gas proof the entrance to this structure. The observation post will be established in one of the buildings on top of the Potter emplacement. Relocating the groupment station is in line with the doctrine indicated in notes on type Harbor Defense Installations OCCA. Detailed requirements are shown in the Cost Estimate and Priority Guide for this section. There is no present authority for this change.

(2) Groupment Command Post and OP - Fort Tilden (C-2) (Exhibit 23) This command post is to be located in a bombproof to be constructed on the Fort Tilden Reservation near No. 2 power plant. The observation post for this groupment will be installed in the top deck of Tower B which is to be constructed at Fort Tilden. One DPF M-1 Class 1 and two azimuth instruments are required. Height of instrument axis is estimated to be 85 feet. The Searchlight Officer's OP is located in this same structure, on bottom deck. Requirements for construction and equipment for these stations are shown in the Cost Estimate and Priority Guide. Authority - Annex B to original Project. No land is required.

d. Group Command Posts:

(1) GROUP COMMAND POSTS BEFORE COMPLETION OF MODERNIZATION PROGRAM.

Group 1 - Fort Hancock - Batteries Mills and Kingman - Exhibit 18. A combined command and observation post located in an existing 60' steel tower (A) at the southern end of Sandy Hook. Height of instrument axis is 66.312 feet. No land or equipment is required.

14 d. Group Command Posts: (Continued)

(1) GROUP COMMAND POSTS BEFORE COMPLETION OF MODERNIZATION PROGRAM

Group 2 - Fort Hancock - Batteries Granger (non-project), Richardson and Bloomfield - Exhibit 20. This station is located in the former F_2-station, a concrete structure, on top of the Potter emplacement. One DPF Swasey and one azimuth instrument are already installed. Height of instrument axis is 49.287 feet. No land or equipment is required.

Group 3 - Fort Hancock - Mine Command and Batteries Gunnison, Peck Morris and Urmston - Exhibit 20. Located in the mine commander's station at the top of the mine casemate. One DPF (swasey) and one azimuth instrument are already installed. Height of instrument axis is estimated to be 35 feet. The controller for searchlight No. 7 also is located in this station. No land or equipment is required.

Group 4 - Fort Tilden - Batteries Kessler and Fergusson - Exhibit 23. This is an improvised station located in the middle deck of Tower A. One azimuth instrument is installed. Height of instrument axis 87.988 feet. No land is required.

Group 5 - Fort Tilden - Battery Harris. An improvised station in the south tower of the Marine Parkway Bridge. One azimuth instrument is installed. Height of instrument axis is approximately 211 feet. No land is required.

(2) GROUP COMMAND POSTS AFTER COMPLETION OF MODERNIZATION PROGRAM

Group 1 - Fort Hancock - Batteries Const. No. 219, Const. No. 118 and Kingman and Mills - Exhibit 17. It is recommended that this station be a combined command and observation station to be incorporated in a bombproof observing station to be located on the hill about 600 yards south of the twin lights at Navesink. One DPF M-1 Class 3 and one azimuth instrument are required. Height of instrument axis is estimated to be 210 feet. The bombproof station has been authorized but the authorization did not provide for this command post. A plot of land 60' x 90' has been approved for two bombproof stations to be built at this location.

Group 2 - Fort Hancock - Mine Command, Batteries Peck, Morris, Urmston - Exhibit 20. It is recommended that this station be located in the mine commander's station at the top of the mine casemate with the observing station located in Tower I. (Exhibit 20) One azimuth instrument is required for the observing station. No land is required.

Group 3 - Fort Tilden - Mine Command - Kessler and Const. No. 220: Exhibits 22 and 23, C.P. & O.P. recommended to be located in tower B to be constructed on the Fort Tilden Reservation. One azimuth instrument for the observation post is required. Height of instrument axis is estimated to be 89 feet.

Group 4 - Fort Tilden - Batteries Harris and Const. No. 117: Exhibit 24. It is recommended that this station be located in the Middle Deck of the existing Arverne Tower. The group observing station to be located in the top deck of Arverne Tower. One DPF M-1 Class 2 and two azimuth instruments are installed. Height

14. d. (2) (Continued)

of instrument axis is 117.703 feet. No land is required.

e. Harbor Defense Radio Stations:

(1) Station No. 1 - Exhibits 5 and 20. This is an existing station located west of the Potter emplacement at Fort Hancock (Call letters WUB). It is well equipped and functions as a part of the Corps Area net. No land is required (military reservation.)

(2) Station No. 2 - Exhibit 17. This station is covered in Annex B to the original project but not yet provided. It is to be installed at Navesink light in the same bombproof with fire control switchboard No. 2. In view of its excellent location, with little likelihood of disruption, and its importance as related to new construction, it is recommended that this station be supplied with a Collins 32 RA Radio Transmitter (Code Sender) or other similar modern equipment. This set should be supplemented with one SCR 281 A radio telephone set.

(3) Station No. 3 - Exhibits 5, 10 and 20. This station is covered in Annex B to the original project but not yet provided. It is to be installed in the Harbor Defense Command Post located in the abandoned mortar batteries McCook and Reynolds. It is recommended that this station, due to its importance in the tactical chain of command, be equipped with a Collins 32 RA Radio Transmitter (Code Sender) or similar modern equipment. This set should be supplemented with one SCR 281 A radio telephone.

f. Fort Radio Stations: Exhibits 5, 20 and 23.

(1) Fort Hancock - Exhibits 5 and 20. Station (WUB) shown above as Harbor Defense Radio Station No. 1 is also the Fort Hancock Radio Station operating in the Second Corps Area radio net. This station is complete.

(2) Fort Tilden - Exhibit 23. Station (WVEB). This station is located in a small cement finish structure approximately 400 feet northwest of Battery Fergusson. It is equipped with an SCR 136 radio set which is unsatisfactory due to limited range both in distance and frequency coverage. This station being of primary importance in the Harbor Defense net and in the sub-sector net under certain contingencies, it is proposed to relocate it in the proposed C-2 bombproof station (Exhibit 23). Present equipment should be replaced with a Collins 32RA Radio Transmitter or similar modern equipment supplemented with an SCR 281 A radio telephone set. No land is required.

g. Harbor Defense Signal Station: Exhibits 5 and 20.

No signal station as such is operating in the Harbor Defense at this time. As covered in Annex B to the Project, two tall towers located at the point of the Hook, Fort Hancock, one used by the Western Union and another one formerly occupied by the Postal Telegraph are available for use as a principal and an auxiliary station. It is recommended that the "Postal Telegraph" tower be reconditioned and a platform built around the outside at appriximately the 70 feet level and this tower be established as the Harbor Defense Signal Station. No Signal station is recommended for Fort Tilden. Estimated cost of renovating the former Postal Telegraph tower at Fort Hancock is $1,500. No land is required.

14. h. Post Fire Control Switchboard Rooms:

Room No. 1 - Exhibits 5 and 10. This station is already installed in accordance with the Project in the magazines and corridors of Batteries McCook and Reynolds (abandoned Mortar batteries). However, as a result of recommendations made below for the elimination of switchboard room No. 3 and a change in design of switchboard No. 2, this station will require one additional switchboard unit BD 74 to complete the installation.

Room No. 2 - Exhibit 17. Provided for in Annex B to the Project but not constructed, this station is to be located in a common bombproof on the reverse slope of a 250 foot hill on the Navesink Lighthouse (government) Reservation. Its equipment was to be designed to handle the communication load of the existing installations and those to be constructed on the Highlands of Navesink. In view of the excellent location of this station, with little likelihood of disruption during action, the Board recommends that this switchboard be designed to handle the entire Post load in an emergency instead of switchboard No. 3 as provided in the Annex. Requirements as to the result of this proposal are included in the Cost Estimate and Priority Guide. PR structure of 116

Room No. 3 - Exhibit 5. This station is provided for in Annex B to the Project but is not installed. It was to be located in the existing bombproof emplacement of Battery Mills. Its equipment was to be designed primarily to carry the communication load for all stations pertaining to Batteries Kingman and Mills and in addition it was to have a reserve capacity sufficient to carry the entire Post load in an emergency. In view of the fact that switchboard room No. 2 affords a more desirable location for an installation of the required size, the board recommends that this switchboard room and equipment be eliminated from the project. ✓

i. Signal Station - See g. above.

j. Tide Station - Exhibit 5.

Provided for in the Project and already installed, this station located at the Fort Hancock dock is equipped for automatic recording of tide. No separate tide station is required for Fort Tilden.

k. Datum Points:

All datum points are existing fire control towers and the following landmarks: Exhibit 11 -

Romer Shoals Light	Norton Point Light	Allenhurst Tank Tower
West Bank Light	Sandy Hook Light	Long Branch J.C.P. & L. Stack

Coordinates of all datum points were determined by USC & GS.

15. BATTERY FIRE CONTROL REQUIREMENTS - NEW BATTERIES (BY BATTERY):

Following are brief subparagraphs describing, and in justification of, detailed command and fire control construction, equipment and land requirements for each new battery to be constructed.

a. Battery Const. No. 219; Tactical No. 1 (Element of Group 1) - ✓

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Constr. No. 219 - Navesink

15. a (1) This is a two-gun 6" steel shield battery located on the Highlands of Navesink as indicated in Exhibits 3 and 4.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	LOCATION EXHIBIT	SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
BC-I	17	6	101,602.00 47,031.00	Manhole Bombproof	150	$B_1^1 S_1^1$ C.R.F.$_1$	150	None* NAV.
$B_1^1 S_1^1$	17	6	101,602.00 47,031.00	*	150	BC I CRF$_1$	150	None* NAV
$B_1^2 S_1^2$	15	4	102,010.00 38,575.00	Splinter proof steel tank tower	81	$B_2^5 S_2^5$ $B_3^5 S_3^5$ $B_4^5 S_4^5$	12	50' x 50' N LONG (see par. BR 36)
$B_1^3 S_1^3$	19	11f	100,175.00 55,245.00	Splinter proof steel tank tower	89	H.D. OP Aux. Const.218	6	None. Military Reservation. S.H.
$B_1^4 S_1^4$	14	3	100,832.19 31,853.68	Existing Steel Tower a	111.182	$B_2^6 S_2^6$ $B_3^6 S_3^6$ $B_4^6 S_4^6$	16	None ELBERO
$B_1^5 S_1^5$	13	2	99,187.00 23,571.00	Splinter proof steel tank tower	81	$B_2^7 S_2^7$ $B_3^7 S_3^7$ $B_4^7 S_4^7$	12	SHARK 50' x 50' RIVER (See par. 36)
C.R.F.$_1$	17	6	101,602.00 47,031.00	Manhole bombproof	150	BC-I $B_1^1 S_1^1$	150	None* NAV
Plotting Room		6		Concrete.		Btry Structure	120	None* NAV

a. Existing Steel Towers should be splinter proofed.

* Procured as part of Battery site 12½ ± acres, see Paragraph 5).
NOTE: All stations are to be constructed.

(3) Assuming approval of the foregoing stations and sites therefor, base line data for this battery will be approximately as follows (subject to future survey):

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15. a. (3) Continued.

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B_1^1S_1^1$	$B_1^2S_1^2$	357.95	8465 ✓	Map
$B_1^1S_1^1$	$B_1^3S_1^3$	170.15	8337 ✓	Map
$B_1^2S_1^2$	B^4S^4	9.94	6667 ✓	Map
$B_1^4S_1^4$	$B_1^5S_1^5$	11.23	8556 ✓	Map

15. b. Battery Const. No. 116: Tactical No. 2 (Element of Group 1) - NAV.

(1) This is a two-gun 16" casemated battery located on the Highlands of Navesink as indicated in Exhibits 3 and 4.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H.I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
B C-2	17	7		Concrete Bombproof		Plotting & Radio Rms.		None*
BC-1	17	10	99,767.00 48,572.00	Splinter Proof Steel Tank Tower	398'	$B_2^2S_2^2$	276'	-
$B_2^1S_2^1$	19	11g	100,194.20 55,808.65	Existing Steel Tower (a)	115.823	$B_3^1S_3^1$ $B_4^1S_4^1$ M^2S^s	10'	None SM
$B_2^2S_2^2$	17	10	99,767.00 48,572.00	Splinter Proof Steel Tank Tower	398'	$B_3^2S_3^2$ $B_4^2S_4^2$ BC-1	276'	¼ acre NAV (see Par. 36)
$B_2^3S_2^3$	17	8	101,464.00 47,467.00	Manhole Bombproof	214'	$B_3^3S_3^3$ $B_4^3S_4^3$ Group 1 C.P. & O.P.	210	60'x 90' NAV (see Par. 36)
$B_2^4S_2^4$	16	5	102,357.42	Existing Steel Tower (a)	115.095	$B_3^4S_3^4$ $B_4^4S_4^4$	10	None MONMOUTH
$B_2^5S_2^5$	15	4	102,010.00 38,575.00	Splinter Proof Steel Tank Tower	89'	$B_1^2S_1^2$ $B_3^5S_3^5$ $B_4^5S_4^5$	12	50' x 50' N LG DR (see Par. 36)

15. b. (2) Continued.

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
$B_2^6S_2^6$	14	3	100,832.19 31,853.68	Existing Steel Tower (a)	127'	$B_1^4S_1^4$ $B_3^6S_3^6$ $B_4^6S_4^6$	16	None ELBERO
$B_2^7S_2^7$	13	2	99,187.00 23,571.00	Splinter Proof Steel Tank Tower	89'	$B_1^5S_1^5$ $B_3^7S_3^7$ $B_4^7S_4^7$	12	50' x 50' SHARK RIVER (See Par. 36)
$B_2^8S_2^8$	12	1	97,125.00 14,239.00	Splinter Proof Steel Tank Tower	77'		12	None SEA GIRT C. G. Res.

(a) Existing steel towers, should be splinter proofed.

* Procured as part of Battery Site $86\frac{1}{2} \pm$ acres, see Paragraph 5).

(3) Assuming approval of the foregoing stations and sites therefor, base line data will be approximately as follows (subject to further survey).

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B_2^1S_2^1$	$B_2^3S_2^3$	351.34	8437 ✓	Map
$B_2^3S_2^3$	$B_2^5S_2^5$	356.49	9177 ✓	Map
$B_2^2S_2^2$	$B_2^5S_2^5$	347.36	10555 ✓	Map ✗
$B_2^1S_2^1$	$B_2^2S_2^2$	3.25	7380 ✓	Map
$B_2^4S_2^4$	$B_2^6S_2^6$	8.9832	9767.98 ✓	USCGS ✗
$B_2^6S_2^6$	$B_2^7S_2^7$	11.23	8511 ✓	Map
$B_2^7S_2^7$	$B_2^8S_2^8$	12.45	9422 ✓	Map

c. Battery Const. No. 220✓; Tactical No. 10 (Element of Group 3)- TILDEN.

(1) This is a two-gun 6" steel shield battery located on the military reservation of Fort Tilden as indicated in Exhibits 6 and 7.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
BC_{10}	23	14e		Btry Empl.				None
$B_{10}^1S_{10}^1$	23	14b	109,217.58 67,818.52	Existing Steel Tower (a)	76.340'	$B_9^2S_9^2$ $B_{11}^2S_{11}^2$ M^5S^5	12'	None

15. c. (2) Continued.

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H.I.	COMBINED WITH STATIONS	GROUND ELE-VATION	ACREAGE REQUIRED
$B^2_{10}S^2_{10}$	24	15	116,244.00 70,870.00	Splinter Proof Steel Tank Tower	81'	$B^3_9S^3_9$ $B^3_{11}S^3_{11}$ Const. #218	12'	50' x 50' ROCKAWAY (see Par. 36)
$B^3_{10}S^3_{10}$	26	18	123,995.00 72,019.00	Splinter Proof Steel Tank Tower	81'	$B^4_9S^4_9$ $B^4_{11}S^4_{11}$	5'	None C. G. Reservation ATLANTIC BEACH
$B^4_{10}S^4_{10}$	27	19	132,747.91 71,031.63	Existing Steel Tower (a)	96'	$B^5_9S^5_9$ $B^5_{11}S^5_{11}$	5'	None LONG BEACH
$B^5_{10}S^5_{10}$	28	20	140,964.00 71,842.00	Splinter Proof Steel Tank Tower	81'	$B^6_9S^6_9$ $B^6_{11}S^6_{11}$	6'	None C. G. Reservation SHORT BEACH NO

(a) Existing Steel Towers, should be splinter proofed.

15. c. (3) Assuming approval of the foregoing stations and sites therefor, base line data will be approximately as follows (subject to further survey).

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B^1_{10}S^1_{10}$	$B^2_{10}S^2_{10}$	246.53	7722 ✓	Map
$B^2_{10}S^2_{10}$	$B^3_{10}S^3_{10}$	261.55	7835 ✓	Map
$B^3_{10}S^3_{10}$	$B^4_{10}S^4_{10}$	276.43	8808 ✓	Map
$B^4_{10}S^4_{10}$	$B^5_{10}S^5_{10}$	264.3632	8256	Map

15. d. Battery Const. No. 117 ✓ Tactical No. 11 (Element of Group 4) -

(1) This is a two-gun 16" casemated battery located at Nigger Point, Long Island as indicated in Exhibits 6 and 8.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H.I.	COMBINED WITH STATIONS	GROUND ELE-VATION	ACREAGE REQUIRED
$BC_{11}CP$	25	16		Btry Empl.				None*
$BC_{11}OP$	24	15	116,244.00 70,870.00	Splinter Proof Steel Tank Tower	88	$B^3_{11}S^3_{11}$	12'	50' x 50' (see Par. 36)

15. d. (2) Continued.

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
$B^1_{11}S^1_{11}$	21	12	99,694.00 69,480.00	Splinter Proof Steel Tank Tower	88'	$B^1_9S^1_9$ Const.218	5'	50' x 50' (See Par. 36) NORTON PT
$B^2_{11}S^2_{11}$	23	14b	109,217.58 67,818.52	Existing Steel Tower (a)	87.988	$B^2_9S^2_9$ $B^1_{10}S^1_{10}$ M^1S^5	5'	None TILDEN
$B^3_{11}S^3_{11}$	24	15	116,244.00 70,870.00	Splinter Proof Steel Tank Tower	88	$B^3_9S^3_9$ $B^2_{10}S^2_{10}$ Const.218	12'	50' x 50' (See Par. 36) ROCKAWAY
$B^4_{11}S^4_{11}$	26	18	123,995.00 72,019.00	Splinter Proof Steel Tank Tower	88	$B^4_9S^4_9$ $B^3_{10}S^3_{10}$	5'	50' x 50' (See Par. 36) ATLANTIC BEACH
$B^5_{11}S^5_{11}$	27	19	132,747.91 71,031.63	Existing Steel Tower (a)	104.14	$B^4_{10}S^4_{10}$ $B^5_9S^5_9$	5'	None LONG BEACH
$B^6_{11}S^6_{11}$	28	20	140,964.00 71,842.00	Splinter Proof Steel Tank Tower (b)	88'	$B^5_{10}S^5_{10}$ $B^6_9S^6_9$	6'	50' x 50' (See Par. 36) SHORT BEACH
$B^7_{11}S^7_{11}$	29	21	149,494.00 73,479.00	Splinter Proof Steel Tank Tower (b)	88'	$B^7_9S^7_9$	6'	None REACHS BAY C.G. Res.
$B^8_{11}S^8_{11}$	30	22	156,760.00 75,550.00	Splinter Proof Steel Tank Tower	88'	$B^8_9S^8_9$	6'	None JONES C.G. Res. BEACH

* To be procured as part of battery site (85 ± acres. See Par.5)

(a) Existing Steel Towers, should be splinter proofed.

(b) Steel frame towers available but have not been erected. These towers should be replaced by tank towers and the present towers used elsewhere.

(3) Assuming approval of the foregoing stations and sites therefor, base line data will be approximately as follows (subject to further survey).

15. d. (3) Continued.

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B^1_{11}S^1_{11}$	$B^2_{11}S^2_{11}$	279.87	9667	Map
$B^2_{11}S^2_{11}$	$B^3_{11}S^3_{11}$	246.53	7722	Map
$B^3_{11}S^3_{11}$	$B^4_{11}S^4_{11}$	261.55	7835	Map
$B^4_{11}S^4_{11}$	$B^5_{11}S^5_{11}$	276.43	8808	Map
$B^5_{11}S^5_{11}$	$B^6_{11}S^6_{11}$	264.3632	8256	Map
$B^6_{11}S^6_{11}$	$B^7_{11}S^7_{11}$	259.13	8685	Map
$B^7_{11}S^7_{11}$	$B^8_{11}S^8_{11}$	254.10	7556	Map

16. BATTERY FIRE CONTROL REQUIREMENTS-EXISTING PERMANENT BATTERIES (BY BATTERY):

Following are brief subparagraphs describing, and in justification of, detailed command and fire control construction, equipment and land requirements to complete each existing battery designated to remain in the project after completion of the modernization program.

a. Battery Mills: Tactical No. 3 - (Element of Group 1) -

(1) This is a two-gun 12" battery located at Fort Hancock as indicated in Exhibits 3 and 5.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
BC_S	35	Btry Empl		Concrete Structure (Existing)			5'	None
BI B o P	17	8	101,464.00 47,467.00	Manhole Bombproof	214'	$B^3_2S^3_2$ $B^3_4S^3_4$ Group 1 CP & OP	210'	60'x90' (See Par. 36)
$B^1_3S^1_3$	19	11g	100,194.20 55,808.65	Existing Steel Tower (b)	74.977'	$B^1_2S^1_2$ $B^1_4S^1_4$ M^2S^2	10'	None
$B^2_3S^2_3$	17	10	99,767.00 48,572.00	Splinter Proof Steel Tank Tower	382'	$B^2_2S^2_2$ $B^2_4S^2_4$	276'	$\frac{1}{4}$ acre (See Par. 36).

16. a. (2) Continued

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
$B_3^3S_3^3$	17	8	101,464.00 47,467.00	Manhole Bombproof	214'	$B_2^3S_2^3$ $B_4^3S_4^3$ Group 1 CP & OP	210'	60 x 90 (See Par. 36)
$B_3^4S_3^4$	16	5	102,357.42 41,501.85	Existing Steel Tower (b)	74.249	$B_2^4S_2^4$ $B_4^4S_4^4$	10'	None Monmouth
$B_3^5S_3^5$	15	4	102,010.00 38,575.00	Splinter Proof Steel Tank Tower	81'	$B_1^2S_1^2$ $B_2^5S_2^5$ $B_4^5S_4^5$	12'	50'x50' (See Par. 36) LONG BR
$B_3^6S_3^6$	14	3	100,832.19 31,853.68	Existing Steel Tower (b)	111.182	$B_1^4S_1^4$ $B_2^6S_2^6$ $B_4^6S_4^6$	16'	None ELBERON
$B_3^7S_3^7$	13	2	99,187.00 23,571.00	Splinter Proof Steel Tank Tower	81'	$B_1^5S_1^5$ $B_2^7S_2^7$ $B_4^7S_4^7$	12'	50'x50' (See Par. 36) SHARK RIVER

(b) Existing steel towers should be splinter proofed.

(3) Assuming approval of the foregoing stations and sites therefor, base line data for this battery will be approximately as follows (subject to further survey):

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH(DEGREES)	LENGTH(YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B_3^1S_3^1$	$B_3^2S_3^2$	3.25	7380	Map
$B_3^1S_3^1$	$B_3^3S_3^3$	351.34	8437	Map
$B_3^2S_3^2$	$B_3^4S_3^4$	341.25	7550	Map
$B_3^3S_3^3$	$B_3^5S_3^5$	356.49	9177	Map
$B_3^4S_3^4$	$B_3^6S_3^6$	8.9832	9767.98	USC & GS
$B_3^6S_3^6$	$B_3^7S_3^7$	11.23	8511	Map

16. b. Battery Kingman: Tactical No. 4 (Element of Group 1) -

(1) This is a two-gun 12" battery located at Fort Hancock as indicated in Exhibits 3 and 5.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H.I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
BC_4	3 & 5	Btry Empl.		Concrete Structure (existing)			5'	None
BI BOP	17	8	101,464.00 47,467.00	Manhole 214' Bombproof		$B^3_2S^3_2$ $B^3_3S^3_3$ Group 1 CP & OP	210'	60'x 90' (See Par. 36)
$B^1_4S^1_4$	19	11g	100,194.20 55,808.63	Existing Steel Tower (b)	74.977	$B^1_2S^1_2$ $B^1_3S^1_3$ M^2S^2	10'	None E Hancock
$B^2_4S^2_4$	17	10	99,767.00 48,572.00	Splinter Proof Steel Tank Tower	384'	$B^2_2S^2_2$ $B^2_3S^2_3$	276'	¼ acre (See Par. 36)
$B^3_4S^3_4$	17	8	101,464.00 47,467.00	Manhole Bombproof	214'	$B^3_2S^3_2$ $B^3_3S^3_3$ Group 1 CP & OP	210'	60'x 90' (See Par. 36)
$B^4_4S^4_4$	16	5	102,357.42 41,501.85	Existing Steel Tower (b)	74.249	$B^4_2S^4_2$ $B^4_3S^4_3$	10'	None Monmouth
$B^5_4S^5_4$	15	4	102,010.00 38,575.90	Splinter Proof Steel Tank Tower	89'	$B^2_1S^2_1$ $B^5_2S^5_2$ $B^5_3S^5_3$	12'	50'x 50' (See Par. 36)
$B^6_4S^6_4$	14	3	100,832.19 31,853.68	Existing Steel Tower (b)	111.182	$B^4_1S^4_1$ $B^6_2S^6_2$ $B^6_3S^6_3$	16'	None Elberon
$B^7_4S^7_4$	13	2	99,187.00 23,571.00	Splinter Proof Steel Tank Tower	89'	$B^5_1S^5_1$ $B^7_2S^7_2$ $B^7_3S^7_3$	12'	50'x 50' (See Par. 36)

(b) Existing steel towers should be splinter proofed.

16. b. (3) Assuming approval of the foregoing stations and sites therefor, baseline data for this battery will be approximately as follows (subject to further survey):

BASE LINE FROM STATION	TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B^1S^1_4$	$B^2S^2_4$	3.25	7380	Map
$B^1S^1_4$	$B^3S^3_4$	351.34	8437	Map
$B^2S^2_4$	$B^4S^4_4$	341.25	7550	Map
$B^3S^3_4$	$B^5S^5_4$	356.49	9177	Map
$B^4S^4_4$	$B^6S^6_4$	8.9832	9767.98	USC & GS
$B^6S^6_4$	$B^7S^7_4$	11.23	8511	Map

c. Battery Peck: Tactical No. 5 (Element of Group 2) -

(1) This is a two-gun 6" battery located at Fort Hancock as indicated in Exhibit 5. Peck relocated to Gunnison emplacement. See 662 (New York) CM 30362 A for fire cont data.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
BC-5	-	Empl.	99,429.01 47,231.64	Concrete	29.170'	-	10'	None
B^I BOP	-	Empl.	99,429.01 47,231.64	Concrete	29.170'	-	10'	None
$B^1_5S^1_5$	20	11 m	99,616.63 56,958.46	Steel Tower	52'	-	10'	None ✓
$B^2_5S^2_5$	18	11 a	101,801.50 50,270.49	Steel Tower	66.312	-	10'	None ✓
$B^3_5S^3_5$ 3rd floor	20	11 u	98,204.86 57,244.27	Frame Building	38.883	S/L 7	10'	None ✓
(Aux. Station)								
CRF	20	11 p	99,378.70 57,242.78	Concrete	24.373	-	10'	None

NOTE: All stations are existing.

(3) Assuming approval of the foregoing stations and sites therefor, base line data for this battery will be approximately as follows:

BASE LINE FROM STATION	TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B^1_5S^1_5$	$B^2_5S^2_5$	341.9083	7035.81 ✓	USC & GS

16. d. Battery Morris: Tactical No. 6 (Element of Group 2) -

(1) This is a four-gun 3" battery located at Fort Hancock as indicated in Exhibit 5.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H.I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
BC-6	18	Empl	99,288.43 57,209.36	Concrete	20.171	-	7'	None
CRF	18	11q	99,288.43 57,209.36	Concrete	20.171	-	7'	None

NOTE: Both stations are existing.

(3) Assuming approval of the foregoing stations and sites there will be no base line established for this battery.

e. Battery Urmston: Tactical No. 7 (Element of Group 2) -

(1) This is a two-gun 3" battery located at Fort Hancock as indicated in Exhibit 5.

(2) This battery is combined with Battery Morris and both controlled as a single battery. Fire control data are the same as that shown for Battery Morris.

f. Battery Kessler: Tactical No. 8 (Element of Group 3)-

(1) This is a two-gun 6" battery located at Fort Tilden as indicated in Exhibit 6.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATIONS	APPROX. H.I.	COMBINED STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
BC - 8	20 13	14 d	109,515.08 67,764.51	Concrete	35'	CRF Plotting Room UNDER CONST.	10'	None
B^1 30?	20 13	14 j l	110,966.93 68,356.52	Steel Tank Tower	82'	$B^2_8S^2_8$	10'	None
$B^1_8S^1_8$	19 22	13 b	106,761.00 68,130.00	Steel Tank Tower	82'	M-4 Const. #218	10'	50'x 50' (See Par. 36)
$B^2_8S^2_8$	20 23	14 j	110,966.93 68,356.52	Steel Tank Tower	82'	$B^3_{10}S^3_{10}$ Group 3 CP & OP	10'	None
CRF	20 23	14 d	109,515.08 67,764.51	Concrete	35'	BC-10?	10'	None
Plotting	20 23	14 d	109,515.08 67,764.51	Concrete	-	CRF	10'	None

NOTE: All stations are to be constructed.

(3) Assuming approval of the foregoing stations and sites therefor, base line data for this battery will be approximately as follows (subject to future survey):

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B_8^1S_8^1$	$B_8^2S_8^2$	266.919	4211.52	Local Survey

16. g. Battery Harris: Tactical No. 9 (Element of Group 4)-

(1) This is a two-gun 16" battery located at Fort Tilden as indicated in Exhibit 6.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated.

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H.I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
BC_9 CP	23	14 c	110,448.00 68,675.00	Concrete		Plot.Rm Swbd Rm	9'	None
BC_9OP	23	14 b	109,217.58 67,818.52	Existing Steel Tower (a)		$B_9^2S_9^2$	9'	None
$B_9^1S_9^1$	21	12	99,694.00 69,480.00	Splinter Proof Steel Tank Tower	89'	$B_{11}^1S_{11}^1$ Const. #218	5'	50'x 50' (See Par. 36) NORTON PT
$B_9^2S_9^2$	23	14 b	109,217.58 67,818.52	Existing Steel Tower (a)	117.421	$B_{11}^2S_{11}^2$ 117 $B_{10}^1S_{10}^1$ 220 M^5S^5	9'	None TILDEN
$B_9^3S_9^3$	24	15	116,244.00 70,870.00	Splinter Proof Steel Tank Tower	89'	$B_{11}^3S_{11}^3$ $B_{10}^2S_{10}^2$ Const.218	12'	50'x 50' (See Par. 36) ROCKAW
$B_9^4S_9^4$	26	18	123,995.00 72,019.00	Splinter Proof Steel Tank Tower	89'	$B_{10}^3S_{10}^3$ $B_{11}^4S_{11}^4$	5'	50'x 50' (See Par. 36) ATLANTI
$B_9^5S_9^5$	27	19	132,747.91 71,031.63	Existing Steel Tower (a)	111.992	$B_{10}^4S_{10}^4$ $B_{11}^5S_{11}^5$	5'	None LONG BEACH

16. g. (2) Continued:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
$B_9^6S_9^6$	28	20	140,964.00 71,842.00	Splinter proof steel tank tower (b)	89	$B_{10}^5S_{10}^5$ $B_{11}^6S_{11}^6$	6'	50' x 50' (See par 36) SHORT BEACH
$B_9^7S_9^7$	29	21	149,494.00 73,479.00	Splinter proof steel tank tower (b)	89	$B_{11}^7S_{11}^7$	6'	None - ZACH'S BAY C.G. Reservation
$B_9^8S_9^8$ 3 gun battery	30	22	156,760.00 75,550.00	Splinter proof steel tank tower	89	$B_{11}^8S_{11}^8$	6'	None - JONES BEACH C.G. Reservation

(a) Existing steel towers should be splinter proofed.

(b) Steel frame towers are available but not erected. They should be replaced by steel tank type towers, and the frame type towers used elsewhere.

(3) Assuming approval of the foregoing stations and sites, therefor, base line data for this battery will be approximately as follows:

BASE LINE FROM STATION	TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B_9^1S_9^1$	$B_9^2S_9^2$	279.97	9667	Map
$B_9^2S_9^2$	$B_9^3S_9^3$	246.53	7722	Map
$B_9^3S_9^3$	$B_9^4S_9^4$	261.55	7835	Map
$B_9^4S_9^4$	$B_9^5S_9^5$	276.43	8808	Map
$B_9^5S_9^5$	$B_9^6S_9^6$	264.36	8256	Map
$B_9^6S_9^6$	$B_9^7S_9^7$	259.13	8685	Map
$B_9^7S_9^7$	$B_9^8S_9^8$	254.10	7556	Map

h. FIRE CONTROL REQUIREMENTS - Anti-aircraft Gun Defense:

The local anti-aircraft ground defense consists of three 3-gun anti-aircraft batteries (3" fixed). Two batteries are located at Fort Hancock and one battery at Fort Tilden (Exhibits 5 and 6). The AAD Command Post is located in the HDCP in the galleries and corridors of abandoned mortar Batteries McCook-Reynolds (Exhibit 10). Battery command posts and observation posts will be of improvised character. The O.P.s will be served by commercial telephone circuits and field wire. Fire control requirements are covered in the Cost Estimate and Priority Guide. See paragraphs 19 and 31 for communications lay-out.

MINES

SECRET

16. i. FIRE CONTROL REQUIREMENTS - Under Water Defense:

The underwater defense consists of twenty-three groups of controlled mines all of which are controlled at present from Fort Hancock. Current plans covered in Paragraph 25 following provide that ten groups eventually will be controlled from Fort Tilden. The fire control requirements are as follows:

(1) Fire Control Requirements: Fort Hancock.

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATION	GROUND ELEVATION	ACREAGE REQUIRED
MC	20	11	99,008.95 57,167.35	Concrete	31.122	Group 2 C.P.	5'	None
M^1	20	11	98,536.22 57,186.58	3h face Frame Building	36.883	-	10'	None
M^2	19	11	100,194.20 55,808.65	Steel Tower	74.977	$B\frac{1}{3}S\frac{1}{3}$	10'	None
M^3	20	11	99,526.90 57,038.40	Steel Tower	57.467	-	10'	None
Plotting Room	20	11	99,008.95 57,167.35	Concrete	-	-	5'	None

NOTE: All stations are existing.

(a) Assuming approval of the foregoing stations and sites therefor, base line data for the Hancock Underwater Defenses will be approximately as follows:

BASE LINE FROM STATION	TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
M^1	M^2	309.7297	2155.83	USC & GS
M^1	M^3	278.5018	1011.69	USC & GS
M^2	M^3	151.5161	1399.21	USC & GS

(2) Fire Control Requirements - Fort Tilden:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATIONS	GROUND ELEVATION	ACREAGE REQUIRED
MC	23	14 a	-	# Bomb-proof	-	Casemate	10'	None
M^4	22	13 b	106,761.00 68,130.00	# Steel tank tower	81'	$B\frac{1}{8}S\frac{1}{8}$ Const. #218	10'	50' x 50' (See par. 36)
M^5	23	14 b	109,217.58 67,818.52	Steel tower existing	63.340'	$B\frac{1}{10}S\frac{1}{10}$	9'	None
Plotting Room	23	14 a	-	# Bomb-proof	-	Casemate	10'	None

NOTE: Stations marked (#) are to be constructed.

SECRET

Assuming approval of the foregoing stations and sites therefor, base line data for the Tilden Underwater Defenses will be as follows (subject to future survey):

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
M^4	M^5	277.2314	2475.77 ✓	Local Survey

17. BATTERY FIRE CONTROL REQUIREMENTS. EXISTING OUTMODED BATTERIES (BY BATTERY):

Following are brief subparagraphs describing, and in justification of, detailed command and fire control requirements to complete the minimum essential elements of each existing battery designed for abandonment upon completion of the modernization program.

a. Battery Gunnison: Tactical No. 12 ✓ (Element of Present Group 3):

(1) This is a two-gun 6" battery located at Fort Hancock as indicated in Exhibit 5.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated.

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATION	GROUND ELEVATION	ACREAGE REQUIRED
BC-12	5	Btry Empl.	100,407.16 55,839.62	Concrete	28.389'	-	10'	None
B^I	5	Btry Empl.	100,407.16 55,839.62	Concrete	28.389'	-	10'	None
$B^1_{12}S^1_{12}$	20	11 m	99,793.32 56,659.33	Concrete	49.252'	-	10'	None
$B^2_{12}S^2_{12}$	19	11 a	101,801.50 50,270.49	Steel tower	66.312'	-	20'	None
CRF	19	11 h	100,398.71 55,893.80	# Concrete	30'	-	10'	None
Plotting Room	5	Btry Empl.	100,407.16 55,839.62	Concrete	-	-	10'	None

NOTE: Station marked (#) requires housing for CRF. All other stations are existing.

(3) Assuming approval of the foregoing stations and sites therefor, base line data for this battery will be as follows:

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B^1_{12}S^1_{12}$	$B^2_{12}S^2_{12}$	342.4341	6697.04	USC & GS

17. b. Battery Richardson: Tactical No. 13 (Element of Present Group 2) -

(1) This is a two-gun 12" battery (DC) located at Fort Hancock as indicated in Exhibit 5.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATION	GROUND ELEVATION	ACREAGE REQUIRED
BC-13	5	Btry Empl.	99,738.46 56,978.26	Concrete	31.086'	-	10'	None
BC	5	Btry Empl.	99,738.46 56,978.26	Concrete	31.086'	-	10'	None
$B^1_{13}S^1_{13}$	20	11 n	99,638.67 56,926.83	Steel tower	52.025'	$B^1_{14}S^1_{14}$	10'	None
$B^2_{13}S^2_{13}$	19	11 c	100,997.37 54,319.93	Frame Building	37.539'	-	20'	None
$B^3_{13}S^3_{13}$	17-18	9 b	101,313.27 48,074.56	Stone tower	255.288'	-	200'	None
Plotting Room	5	Btry Empl.	99,738.46 56,978.26	Concrete	-	-	10'	None

NOTE: All stations are existing.

(3) Assuming approval of the foregoing stations and sites therefor, base line data for this battery will be as follows:

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B^1_{13}S^1_{13}$	$B^2_{13}S^2_{13}$	332.4883	2939.73	USC&GS & Local Survey
$B^1_{13}S^1_{13}$	$B^3_{13}S^3_{13}$	349.2878	9009.27	USC&GS & Local Survey
$B^2_{13}S^2_{13}$	$B^3_{13}S^3_{13}$	357.1044	6253.35	USC&GS & Local Survey

c. Battery Bloomfield: Tactical No. 14 (Element of Group 2) -

(1) This is a two-gun 12" battery (DC) located at Fort Hancock as indicated in Exhibit 5.

(2) The fire control lay-out recommended is shown in the following tabulation and in the exhibits indicated:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H. I.	COMBINED WITH STATION	GROUND ELEVATION	ACREAGE REQUIRED
BC-14	5	Btry Empl.	99,675.91 57,047.25	Concrete	31.178'	-	10'	None

17. c. (2) Continued:

FIRE CONTROL STATION	EXHIBIT	LOCATION SITE NUMBER	APPROXIMATE COORDINATES	TYPE OF STATION	APPROX. H.I.	COMBINED WITH STATION	GROUND ELEVATION	ACREAGE REQUIRED
BC^1	5	Btry Empl.	99,675.91 57,047.25	Concrete	31.178'	-	10'	None
$B^1_{14}S^1_{14}$	20	11 n	99,638.67 56,926.83	Steel Tower	52.025'	$B^1_{13}S^1_{13}$	8'	None
$B^2_{14}S^2_{14}$	19	11 c	100,989.28 54,335.68	Frame Building	36.709'	-	20'	None
$B^3_{14}S^3_{14}$	17-18	9 a	101,278.70 48,142.52	Stone Tower	255.728'	-	200'	None
Plotting Room	5	Btry Empl.	99,675.91 57,047.25	Concrete	-	-	10'	None

NOTE: All stations are existing.

(3) Assuming approval of the foregoing stations and sites therefor, base line data for this battery will be as follows:

BASE LINE FROM STATION	BASE LINE TO STATION	AZIMUTH (DEGREES)	LENGTH (YDS)	AZIMUTH AND LENGTH WERE DETERMINED BY
$B^1_{14}S^1_{14}$	$B^2_{14}S^2_{14}$	332.4698	2922.03	USC & GS & Local Survey
$B^1_{14}S^1_{14}$	$B^3_{14}S^3_{14}$	349.4248	8936.10	USC & GS & Local Survey
$B^2_{14}S^2_{14}$	$B^3_{14}S^3_{14}$	357.3244	6199.93	USC & GS & Local Survey

18. Radio Requirements: Exhibits 39 and 40.

a. There are at present in the Harbor Defense the following radio sets which are assigned as indicated:

ASSIGNMENT	CALL NUMBER	TYPE	NUMBER OF SETS
Fort Hancock Station	(WUB)	177 a	1
Fort Tilden Station	(WVEB)	136 a	1
HDCP	(QH7)	281 a	1
C-1 Groupment	(9RV)	281 a	1
C-2 Groupment	(JD8)	281 a	1
Group 1	(ZV9)	281 a	1
Group 2	(LJ3)	-	-
Group 3	(GQ7)	281 a	1
Group 4	(7PQ)	281 a	1
Group 5	(8PD)	281 a	1

18. a. Continued

ASSIGNMENT	CALL NUMBER	TYPE	NUMBER OF SETS
Btry Harris	(7KQ)	281 a	1
Battery Kingman	(9GV)	281 a	1
Battery Mills	(H77)	281 a	1
DB Boat	(7YU)	281 a	1
Mine Planter	(A29)	281 a	1
J 129	(WA2)	RCA	1
Leased Vessel	(DU7)	RCA	1

b. The following additional sets are required in order to complete the Harbor Defense radio net in connection with modernization plans:

TO BE ASSIGNED	CALL NUMBER	TYPE	NUMBER OF SETS
HDCP (Radio Station #3)	-	Collins 32 RA Radio Transmitter	1
Fort Tilden Station WVEB	-	Collins 32 RA Radio Transmitter	1
		SCR 281 a ?	1
Fort Hancock Station #2	-	Collins 32 RA Radio Transmitter	1
		SCR 281 a	1
C-1 Groupment	-	Collins 32 RA Radio Transmitter	1
C-2 Groupment	-	Collins 32 RA Radio Transmitter	1
1 additional Mine Planter	-	SCR 281 a	1
2 DB Boats	-	SCR 281 a	2
Battery Const. No. 116	-	SCR 281 a	1
Battery Const. No. 117	-	SCR 281 a	1
Target Tug	-	SCR 281 a	1

The Collins 32 RA Radio Transmitters are necessary in order to work code over wide frequencies required by Naval Liaison and the sector tactical nets. The SCR 281 a sets provide communication for close in work with the Coast Guard, air-ground liaison with the Air Corps and complete the sub-sector and local nets.

19. Attached as Exhibits 36, 37, 38, 39 and 40 are drawings showing the fire control and communications lay-out; the cable route and the radio net diagram.

EXHIBIT #10

ENTIRE UNDERGROUND STRUCTURE TO BE EQUIPPED WITH ADEQUATE AIR CONDITIONING SYSTEM

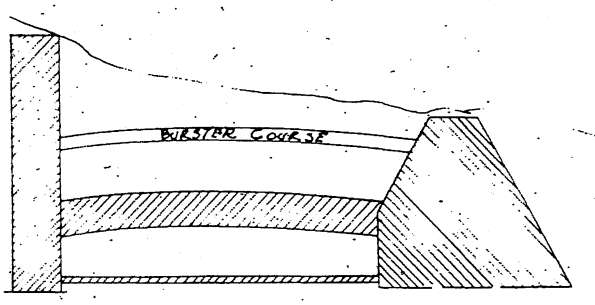
N

POWER PLANT FOR 14A BATTERY

PIT "A"

STORAGE BATTERY ROOM

PIT "B"



SECTION OF PIT FOR BOMB PROOFING

SECRET

BATTERY REYNOLDS

DATE	REV. BY	NATURE

OFFICE OF
ARTILLERY ENGINEER & SIGNAL OFFICER
HARBOR DEFENSE OF SANDY HOOK
FORT HANCOCK, N. J.

HDCP

SCALE 1"=20'

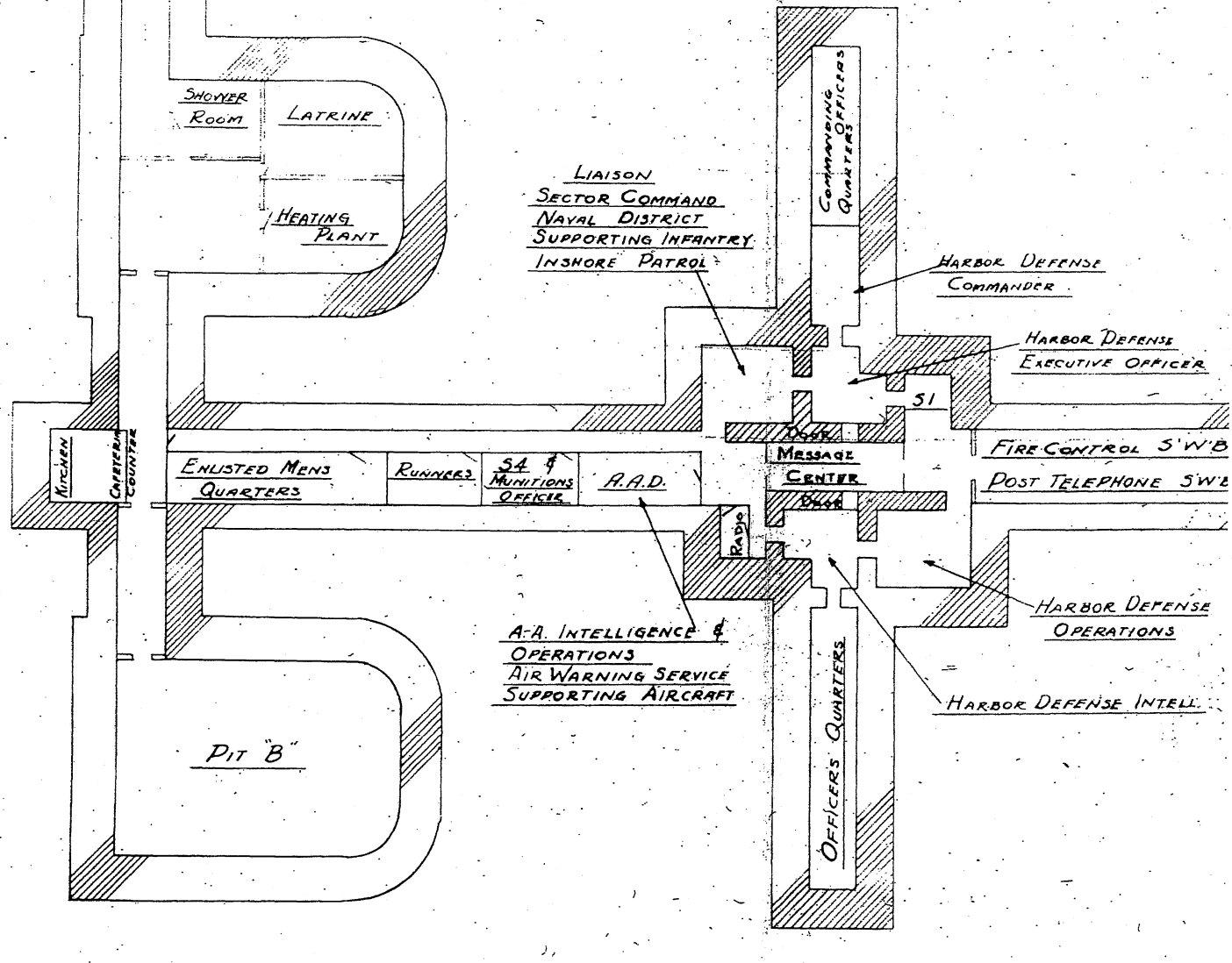
DATE ____ APPROVED BY ____

RD. BY Cpl. RICE

CHKD. BY ____ A. E. FILE NO. ____

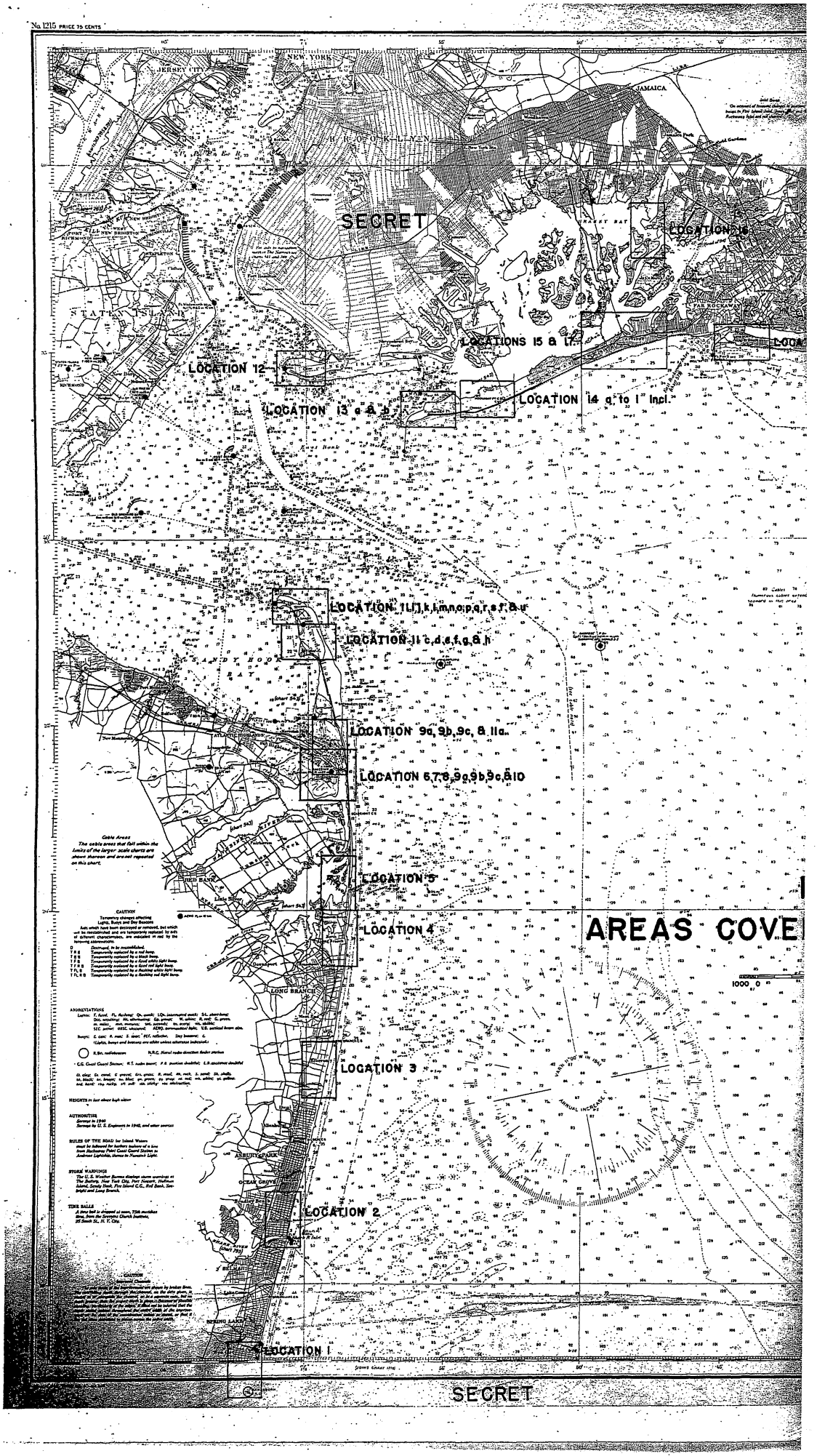
EXHIBIT #10

SECRET



BATTERY Mc COOK

B


SECRET
LOCATION 16
LOCATIONS 15 & 17
LOCATION 12
LOCATION 13 a & b
LOCATION 14 a to l incl.
LOCATION 11 j, k, l, m, n, o, p, q, r, s, t, & u
LOCATION 11 c, d, e, f, g, & h
LOCATION 9a, 9b, 9c, & 11a
LOCATION 6, 7, 8, 9a, 9b, 9c, & 10
LOCATION 5
LOCATION 4
LOCATION 3
LOCATION 2
LOCATION 1
AREAS COVE
SECRET

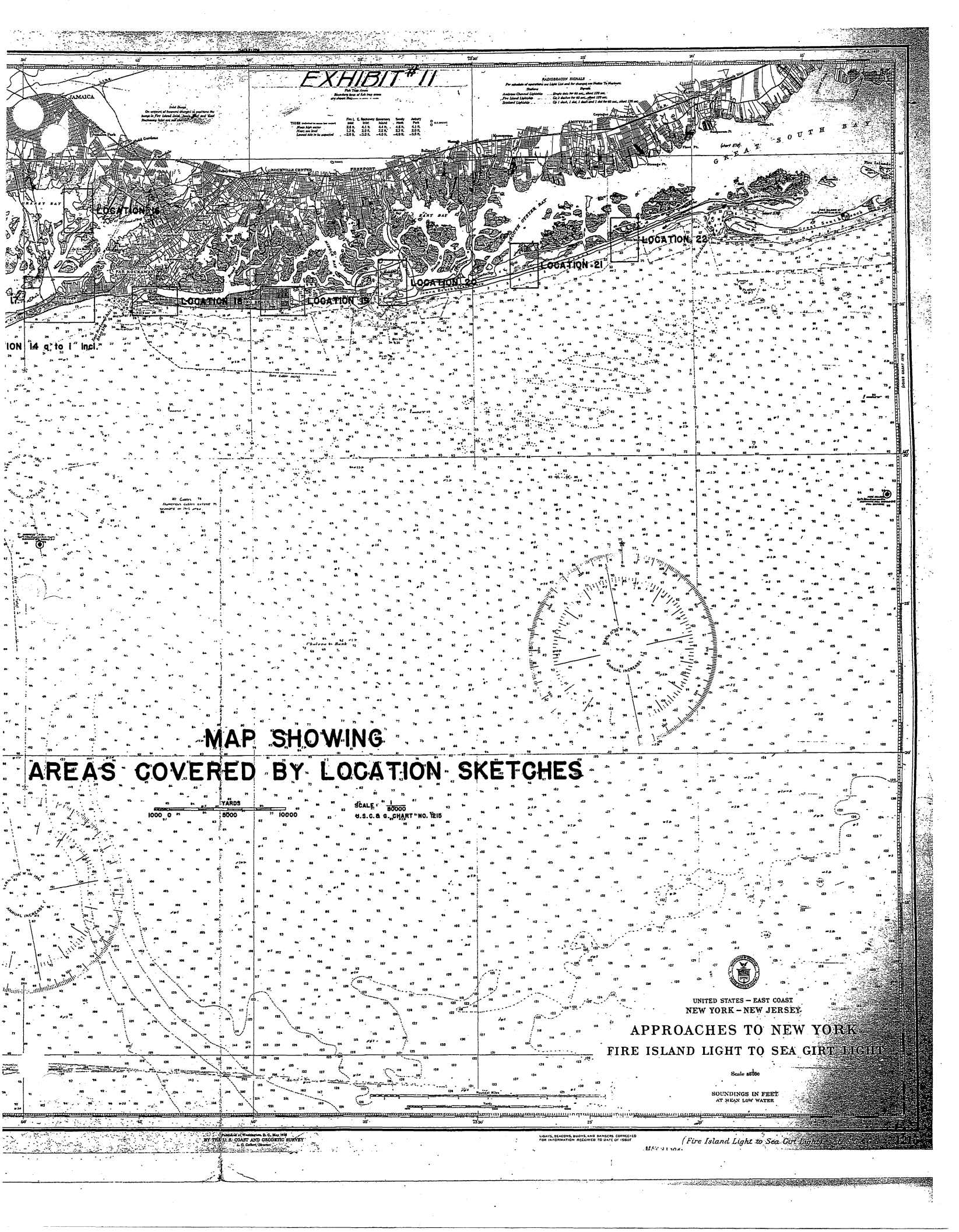


EXHIBIT #11
JAMAICA
GREAT SOUTH BAY
LOCATION 16
LOCATION 15
LOCATION 15
LOCATION 20
LOCATION 21
LOCATION 22
ION 14 a to 1" incl.
MAP SHOWING
AREAS COVERED BY LOCATION SKETCHES
SCALE 1/80000
U.S.C.& G. CHART NO. 1215
UNITED STATES – EAST COAST
NEW YORK – NEW JERSEY
APPROACHES TO NEW YORK
FIRE ISLAND LIGHT TO SEA GIRT LIGHT
Scale as above
SOUNDINGS IN FEET
AT MEAN LOW WATER
(Fire Island Light to Sea Girt Light)

Exhibit 11 A

FIRE CONTROL

LOCATION SITE NUMBERS

1. Manasquan
2. Shark River
3. Elberon
4. Long Branch
5. Monmouth
6. Construction 219
7. Construction 116
8. Manhole Bombproof Stations
9. Lighthouse Reservation
   - a. South Tower
   - b. North Tower
   - c. F.C. Swbd No. 2 & Radio Station No. 2
10. Waterwich
11. Fort Hancock Reservation
    - a. A Tower
    - b. F.C. Swbd No. 3
    - c. Secondary Stations
    - d. C Tower
    - e. D Tower
    - f. B Tower
    - g. E Tower
    - h. Gunnison CRF
    - i. H Station
    - j. F Tower
    - k. Radio Station
    - l. G Tower
    - m. Potter Emplacement
    - n. H Tower
    - o. I Tower
    - p. Peck CRF
    - q. Morris-Urmston CRF
    - r. Mine Casemate
    - s. Signal Station
    - t. M^1 Tower
    - u. Peck Tower
12. Sea Gate
13. Point of Rockaway
    - a. Cable Hut
    - b. M^4 Tower
14. Fort Tilden Reservation
    - a. Mine Casemate
    - b. A Tower
    - c. FC Swbd
    - d. Kessler CRF
    - e. Construction 220
    - f. C-2 Station
    - g. Fergusson CRF
    - h. Radio Station
    - i. B Tower
15. Seaside
16. Construction 117
17. Arverne
18. Atlantic Beach
19. Long Beach
20. Short Beach
21. Zachs Bay
22. Jones Beach

S E C R E T

LIST OF BASE END AND GROUP STATIONS BY BATTERIES SHOWING

TOWERS ASSIGNMENTS

BTRY NO.	BATTERY	GROUP	BASE END STATION	TOWER	DECK	TOWER SITE NO.	EXHIBIT
1	Const. No. 219	1 After Mod.	$B_1^1S_1^1$	Btry Site		6	17
			$B_1^2S_1^2$	Long Branch	Bot	4	15
			$B_1^3S_1^3$	B Tower, Hancock	Top	11-f	19
			$B_1^4S_1^4$	Elberon	Bot	3	14
			$B_1^5S_1^5$	Shark River	Bot	2	13
			BC_1 CP	Btry Site		6	17
			BC_1 OP	Btry Site		6	17
			CRF_1	Btry Site		6	17
2	Const. No. 116	1 After Mod.	$B_2^1S_2^1$	E Tower, Hancock	Top	11-g	19
			$B_2^2S_2^2$	Waterwich	Top	10	17
			$B_2^3S_2^3$	Manhole Bombproof Station	Top Sta So Bldg	8	17
			$B_2^4S_2^4$	Monmouth	Top	5	16
			$B_2^5S_2^5$	Long Branch	Top	4	15
			$B_2^6S_2^6$	Elberon	Top	3	14
			$B_2^7S_2^7$	Shark River	Top	2	13
			$B_2^8S_2^8$	Manasquan	Single	1	12
			BC_2 CP	Btry Site		7	17
			BC_2 OP	Waterwich	Top	10	17
3	Mills	1 Before & After Mod.	$B_3^1S_3^1$	E Tower, Hancock	Bot	11-g	19
			$B_3^2S_3^2$	Waterwich	Bot	10	17
			$B_3^3S_3^3$	Manhole Bomb-proof Station	Bot Sta So Bldg	8	17
			$B_3^4S_3^4$	Monmouth	Bot	5	16
			$B_3^5S_3^5$	Long Branch	Bot	4	15
			$B_3^6S_3^6$	Elberon	Bot	3	14
			$B_3^7S_3^7$	Shark River	Bot	2	13
			BC_3 CP	Btry Site			
			BC_3 OP	Manhole Bomb-proof Station	Bot Sta So Bldg	8	17

SECRET

BTRY NO.	BATTERY	GROUP	BASE END STATION	TOWER	DECK	TOWER SITE NO.	EXHIBIT
4	Kingman	1 Before & After Mod.	$B_4^1S_4^1$	E Tower, Hancock	Center	11-g	19
			$B_4^2S_4^2$	Waterwich	Bot	10	17
			$B_4^3S_4^3$	Manhole Bomb-proof Station	Bot Sta No Bldg	8	17
			$B_4^4S_4^4$	Monmouth	Center	5	16
			$B_4^5S_4^5$	Long Branch	Top	4	15
			$B_4^6S_4^6$	Elberon	Center	3	14
			$B_4^7S_4^7$	Shark River	Top	2	13
			BC_4 CP	Btry Site			
			BC OP	Manhole Bomb-proof Station	Bot Sta No Bldg	8	17
5	Peck	3 Before Mod.	$B_5^1S_5^1$	Before Modernization Potter Emplacement	Single	11-m	20
		2 After Mod.		After Modernization H Tower, Hancock	Single	11-n	20
			$B_5^2S_5^2$	A Tower, Hancock	Single	11-a	18
			$B_5^3S_5^3$	SL 7 and Peck Tower	Single	11-u	20
			BC_5 CP	Btry Site			
			BC_5 OP	Btry Site			
			CRF_5	Peck CRF	Single	11-p	20
6 7	Morris-Urmston	3 Before Mod.	$CRF_{6\&7}$	Morris-Urmston	Single	11-q	20
		2 After Mod.	$BC_{6\&7}$CP	Btry Site			
			$BC_{6\&7}$OP	Btry Site			
8	Kessler	5 Before Mod.	$B_8^1S_8^1$	M^4 Tower, Tilden	Top	13-b	22
		3 After Mod.	$B_8^2S_8^2$	B Tower, Tilden	Bot	14-i	23
			BC_8 CP	Btry Site			
			BC_8 OP	B Tower, Tilden	Bot	14-i	23
			CRF_8	Kessler CRF	Single	14-d	23

SECRET

SECRET

BTRY NO.	BATTERY	GROUP	BASE END STATION	TOWER	DECK	TOWER SITE NO.	EXHIBIT
9	Harris	6 Before Mod. 4 After Mod.	$B^1_9S^1_9$	Seagate	Top	12	21
			$B^2_9S^2_9$	A Tower, Tilden	Top	14-b	23
			$B^3_9S^3_9$	Seaside	Top	15	24
			$B^4_9S^4_9$	Atlantic Beach	Top	18	26
			$B^5_9S^5_9$	Long Beach	Top	19	27
			$B^6_9S^6_9$	Short Beach	Top	20	28
			$B^7_9S^7_9$	Zachs Bay	Top	21	29
			$B^8_9S^8_9$	Jones Beach	Single	22	30
			BC_9 CP	Btry Site			
			BC_9 OP	A Tower, Tilden	Top	14-b	23
10	Construction No. 220	4 After Mod.	$B^1_{10}S^1_{10}$	A Tower, Tilden	Bot	14-b	23
			$B^2_{10}S^2_{10}$	Seaside	Bot	15	24
			$B^3_{10}S^3_{10}$	Atlantic Beach	Bot	18	26
			$B^4_{10}S^4_{10}$	Long Beach	Bot	19	27
			$B^5_{10}S^5_{10}$	Short Beach	Bot	20	28
			BC_{10}CP	Const. No. 220		14-e	23
			BC_{10}OP	Const. No. 220		14-e	23
			CRF_{10}	Const. No. 220		14-e	23
11	Construction No. 117	4 After Mod.	$B^1_{11}S^1_{11}$	Seagate	Top	12	21
			$B^2_{11}S^2_{11}$	A Tower, Tilden	Center	14-b	23
			$B^3_{11}S^3_{11}$	Seaside	Top	15	24
			$B^4_{11}S^4_{11}$	Atlantic Beach	Top	18	26
			$B^5_{11}S^5_{11}$	Long Beach	Center	19	27
			$B^6_{11}S^6_{11}$	Short Beach	Top	20	28
			$B^7_{11}S^7_{11}$	Zachs Bay	Bot	21	29
			$B^8_{11}S^8_{11}$	Jones Beach	Single	22	30
			BC_{11} CP	Btry Site		16	25
			BC_{11} OP	Seaside	Top	15	24

BTRY NO.	BATTERY	GROUP	BASE END STATION	TOWER	DECK	TOWER SITE NO.	EXHIBIT
12	Gunnison	3 Before Mod.	$B^1_{12}S^1_{12}$	Potter Emplacement	Single	11-m	20
			$B^2_{12}S^2_{12}$	A Tower, Hancock	Single	11-a	18
			BC_{12} CP	Btry Site			
			BC_{12} OP	Btry Site			
			CRF_{12}	Gunnison CRF	Single	11-h	19
13	Richardson	2 Before Mod.	$B^1_{13}S^1_{13}$	H Tower, Hancock	Single	11-n	20
			$B^2_{13}S^2_{13}$	Secondary Stations	Single	11-c	19
			$B^3_{13}S^3_{13}$	South Tower	Single	9-a	17-18
			BC_{13} CP	Btry Site			
			BC_{13} OP	Btry Site			
14	Bloomfield	2 Before Mod.	$B^1_{14}S^1_{14}$	H Tower, Hancock	Single	11-n	20
			$B^2_{14}S^2_{14}$	Secondary Stations	Single	11-c	19
			$B^3_{14}S^3_{14}$	North Tower	Single	9-b	17-18
			BC_{14} CP	Btry Site	Single		
			BC_{14} OP	Btry Site	Single		
15	Fergusson	5 Before Mod.	BC_{15} CP	Btry Site			
			BC_{15} OP	Btry Site			
			CRF_{15}	Fergusson CRF	Single	14-g	23
16	Granger	2 & 3 Before Mod.	$B^1_{16}S^1_{16}$	Potter Emplacement	Single	11-m	20
			$B^2_{16}S^2_{16}$	Secondary Stations	Single	11-c	19
			BC_{16} CP	Btry Site			
			BC_{16} OP	Btry Site			
	Mines, Ft Hancock	3 Before Mod.	M^1S^1	M^1 Tower, Hancock	Single	11-t	20
			M^2S^2	E Tower, Hancock	Bottom	11-g	19
		2 After Mod.	M^3S^3	I Tower, Hancock	Single	11-o	20
			MC	Mine Casemate, Hancock		11-r	20
	Mines, Ft Tilden	3 After Mod.	M^4S^4	M^4 Tower, Tilden	Bot	13-b	22
			M^5S^5	A Tower, Tilden	Bot	14-b	23
			MC	Mine Casemate, Tilden		14-a	23

S E C R E T

LIST OF COMMAND STATIONS & GROUP OBSERVING STATIONS SHOWING TOWER ASSIGNMENTS BEFORE MODERNIZATION

GROUP NO.	ELEMENTS OF GROUP	STATION	TOWER	DECK	TOWER SITE NO	EXHIBIT
HDSH H Sta	Hancock Groupment Tilden Groupment	CP OP	H Station Tower F, Hancock	Single	11-i 11-j	20 20
Hancock Group-ment. C1	Group 1 Group 2 Group 3 Searchlights	CP OP	At present in G Tower, Hancock Relocate in Potter.	Single	11-l 11-m	20 20
Tilden Group-ment C-2	Group 4 Group 5 Searchlights	CP OP	Post Swbd. Bldg. A Tower Tilden	Top	14-b	23
AAD Com-mand	AA Btry 1 AA Btry 2 AA Btry 3	CP OP	H Station F Tower	Single	11-i 11-j	20 19
Group 1	Kingman Mills	CP OP	A Tower, Hancock	Single	11-a	18
Group 2	Richardson Bloomfield	CP OP	Potter	Single	11-m	20
Group 3	Mine Command Gunnison Morris Urmston Peck	CP OP	Mine Casemate	Single	11-r	20
Search-light	Searchlight 1 Searchlight 2 Searchlight 3 Searchlight 4 Searchlight 5 Searchlight 6 Searchlight 7	CP	G Tower, Hancock	Single	11-l	20
Group 4	Kessler Fergusson	CP OP	A Tower, Tilden A Tower, Tilden	Center Center	14-b 14-b	23
Group 5	Harris	CP OP	Marine Parkway Bridge	Single		
Search-light	Searchlight 8 Searchlight 9 Searchlight 10 Searchlight 11 Searchlight 12	CP	A Tower, Tilden	Bottom	14-b	23

S E C R E T

S E C R E T

LIST OF COMMAND STATIONS & GROUP OBSERVING STATIONS

SHOWING TOWER ASSIGNMENTS AFTER MODERNIZATION

GROUP NO.	ELEMENTS OF GROUP	STATION	TOWER	DECK	TOWER SITE NO.	EXHIBIT
HDSH H Sta.	Hancock Groupment Tilden Groupment	CP OP Aux.OP	H Station F Tower,Hancock B Tower,Hancock	 Single Top	11-i 11-j 11-f	20 20 19
Hancock Group-ment C1	Group 1 Group 2 Searchlights	CP OP	Potter Emplacement Potter Emplacement	Single Single	11-m 11-m	20 20
Tilden Group-ment C2	Group 3 Group 4 Searchlights	CP OP	No. 2 Power Plant B Tower, Tilden	 Top	14-f 14-i	23 23
AAD Com-mand	AA Btry 1 AA Btry 2 AA Btry 3	CP OP	H Station F Tower, Hancock	 Single	11-i 11-j	20 20
Group 1	Const. 116 Const. 219 Mills Kingman	CP OP	Manhole Bombproof Top Sta.No.Bldg.		8	17
Group 2	Mine Command Peck Morris Urmston	CP OP	Mine Casemate I Tower,Hancock	 Single	11-r 11-o	20 20
Search-lights	Searchlight 1 Searchlight 2 Searchlight 3 Searchlight 4 Searchlight 5 Searchlight 6 Searchlight 7 Searchlight 8 Searchlight 9	CP	G Tower,Hancock	Single	11-l	20
Group 3	Mine Command Kessler Const. 220	CP OP	B Tower,Tilden	Top	14-i	23
Group 4	Harris Const 117	CP OP	Arverne	Top	17	24
Search-lights	Searchlight 10 Searchlight 11 Searchlight 12 Searchlight 13 Searchlight 14 Searchlight 15	CP	B Tower,Tilden	Bottom	14-i	23

S E C R E T

S E C R E T

LIST OF FIRE CONTROL TOWERS SHOWING STATIONS ASSIGNED EACH TOWER TOGETHER WITH TYPE OF OBSERVING INSTRUMENTS REQUIRED

Key to Observing Instruments: A -- Installed or on Hand in H.D.
B -- Under Procurement
C -- Required - Not under Procurement
(For classification see last column)

FORT HANCOCK

TOWER AND EXHIBIT	LOCATION SITE NO.	BASE END STATION	BATTERY	DECK	INSTRUMENTS	
A Tower, Ex. 18	11-a	$B_5^2S_5^2$	Peck	Single	1 DPF,Lewis,1907 1-AZ	A A
EXISTING		$B_{12}^2S_{12}^2$	Gunnison	Single	1 DPF,Lewis,1907 1 AZ	A A
		Group 1 CP & OP	Before Modernization	Single		
B Tower Ex. 19 7	11-f	$B_1^3S_1^3$	Const. #219	Top	1 DPF,M-1,Cl.2 1 AZ	C C
		Aux. HD OP	After Modernization	Top	1 AZ 1 AZ	C A
		Base End Station reserved for Const. No. 218 Ft Wadsworth, HD of Southern N.Y.				
C Tower, Ex. 19	11-d				1 DPF Swasey	A
Const #116 Ex. 17	7	BC_2 CP	Const. #116			
Const.#219 Ex. 17	6	$B_1^1S_1^1$	Const. #219		1 DPF,M-1,Cl 2 1 AZ	C C
		BC_1CP & OP	Const. #219		1 AZ	A
		CRF_1	Const. #219		1 CRF,T2	C
D Tower, Ex. 19	11-e				1 DPF,Swasey AII	A
E Tower, Ex. 19	11-g	$B_2^1S_2^1$	Const #116	Top	1 DPF,M-1,Cl 1 1 Az	A A
		$B_3^1S_3^1$	Mills	Bot	1 DPF,M-1,Cl 1 1 Az	A A
		$B_4^1S_4^1$	Kingman	Center	1 DPF,M-1,Cl 1 1 Az	A A
		M^2S^2	Mines	Bot	1 Az	A
		AAOP #8	AAD			

SECRET

TOWER AND EXHIBIT	LOCATION SITE NO.	BASE END STATION	BATTERY	DECK	INSTRUMENTS	
Elberon, Ex. 14	3	$B_1^4S_1^4$	Const. #219	Bot	2 Az	C
		$B_2^6S_2^6$	Const #116	Top	1 DPF M-1 Cl 1 1 Az	A A
		$B_3^6S_3^6$	Mills	Bot	1 DPF M-1 Cl 1 1 Az	A A
		$B_4^6S_4^6$	Kingman	Center	1 DPF M-1 Cl 1 1 Az	A A
		AAOP #1	AAD			
F Tower Ex. 20	11-j	HD OP	HDSH	Single	1 DPF 1 Az 1 Az	A C A
		OP	AAD		1 AA BC 1 AA BC	A C
G Tower, Ex. 20	11-l	C-1 CP & OP	Before Modernization	Single		
		CP	Searchlights	Single	1 Az	A
Gunnison CRF Ex. 19	11-h	CRF_{12}	Gunnison	Single	1 CRF, 15'	A
H Station Ex. 20	11-i	CP	HDSH			
		CP	AAD			
H Tower Ex. 20	11-n	$B_5^1S_5^1$	Peck, after modernization	Single		
		$B_{13}^1S_{13}^1$	Richardson	Single	1 DPF,Lewis,1907 1 Az	A A
		$B_{14}^1S_{14}^1$	Bloomfield	Single	1 DPF,Lewis,1907 1 Az	A A
I Tower, Ex. 20	11-o	M^3S^3	Mines	Single	1 DPF,Swasey AII 1 Az	A A
		OP	Group 2 after modernization	Single	1 Az	C
Long Branch Ex. 15	4	$B_1^2S_1^2$	Const. #219	Bot	1 DPF M-1 Cl 1 1 Az	C C
		$B_2^5S_2^5$	Const. #116	Top	1 DPF M-1 Cl 1 1 Az	C C
		$B_3^5S_3^5$	Mills	Bot	1 DPF M-1 Cl 1 1 Az	C C
		$B_4^5S_4^5$	Kingman	Top	1 DPF M-1 Cl 1 1 Az	C C
M'Tower Ex. 20	11-t	M^1S^1	Mines	Single	1 DPF,Swasey AII 1 Az	A A
Manasquan Ex. 12	1	$B_2^8S_2^8$	Const. 116	Single	1 DPF M-1 Cl 1 1 Az	C C

SECRET

S E C R E T

TOWER AND EXHIBIT	LOCATION SITE NO.	BASE END STATION	BATTERY	DECK	INSTRUMENTS	
Manhole Bombproof Station, Ex. 17	8	$B^3_2S^3_2$	Const. #116	Top Sta So Bldg	1 DPF M-1 Cl. 3 1 Az	C C
		$B^3_3S^3_3$ BC_3 OP	Mills Mills	Bot Sta So Bldg	1 DPF M-1 Cl. 3 2 Az	C A
		$B^3_4S^3_4$ BC_4 OP	Kingman Kingman	Bot Sta No Bldg	1 DPF M-1 Cl. 3 2 Az	C A
		Group 1 CP & OP	After Modernization	Top Sta So Bldg	1 DPF M-1 Cl. 3 2 Az	C B
Mine Casemate Ex. 20	11-r	MC	Mines	Single	1 Az	A
		Group 4 CP & OP	Before Modernization	Single		
		Group 2 CP	After Modernization	Single		
Monmouth Ex. 16	5	$B^4_2S^4_2$	Const. #116	Top	1 DPF M-1 Cl. 1 1 Az	A A
		$B^4_3S^4_3$	Mills	Bot	1 DPF M-1 Cl. 1 1 Az	A A
		$B^4_4S^4_4$	Kingman	Center	1 DPF M-1 Cl. 1 1 Az	A A
		AAOP #2	AAD			
Morris-Urmston CRF, Ex.20	11-q	$CRF_{6\&7}$	Morris-Urmston	Single	1 CRF	A
North Tower, Ex.17 &18	9-b	$B^3_{14}S^3_{14}$	Bloomfield	Single	1 DPF M-1 Cl. 3 1 Az	C A
Peck CRF Ex. 20	11-p	CRF_5	Peck	Single	1 CRF	A
Peck Tower Ex. 20	11-u	$B^3_5S^3_5$	Peck	Single	1 Az	A
Potter Emplacement Ex. 20	11-m	$B^1_5S^1_5$	Peck, Before Modernization	Single	1 DPF,Lewis, 1907 1 Az	A A
		$B^1_{12}S^1_{12}$	Gunnison	Single	1 DPF,Lewis,1907 1 Az	A A
		$B^1_{16}S^1_{16}$	Granger	Single	1 DPF Swasey AII 1 Az	A
		Met	Met	Single		
		Group 2 CP & OP	Before Modernization	Single	2 Az	C
		C-1 CP & OP	After Modernization	Single	1 DPF Swasey 2 Az	A
Secondary Stations Ex. 19	11-c	$B^2_{13}S^2_{13}$	Richardson	Single	1 DPF Swasey AII 1 Az	A A
		$B^2_{14}S^2_{14}$	Bloomfield	Single	1 DPF 1 Az	A A
		$B^2_{16}S^2_{16}$	Granger	Single	1 DPF Swasey 1 Az	A A

SECRET

TOWER AND EXHIBIT	LOCATION SITE NO.	BASE END STATION	BATTERY	DECK	INSTRUMENTS	
Shark River Ex. 13	2	$B_1^5S_1^5$	Const. #219	Bot	2 Az	C
		$B_2^7S_2^7$	Const. #116	Top	1 DPF M-1 Cl. 1 1 Az	C C
		$B_3^7S_3^7$	Mills	Bot	1 DPF M-1 Cl. 1 1 Az	C C
		$B_4^7S_4^7$	Kingman	Top	1 DPF M-1 Cl. 1 1 Az	C C
South Tower Ex. 17 & 18	9-a	$B_{13}^3S_{13}^3$	Richardson	Single	1 DPF M-1 Cl. 3 1 Az	A A
Water-witch Ex. 17	10	$B_2^2S_2^2$ BC_2 OP	Const. #116 Const. #116	Top	1 DPF M-1 Cl. 5 2 Az	C C
		$B_3^2S_3^2$	Mills	Bot	1 DPF M-1 Cl. 5 1 Az	C A
		$B_4^2S_4^2$	Kingman	Bot	1 DPF M-1 Cl. 5 1 Az	C A
			FORT TILDEN			
A Tower Ex. ~~24~~ 23	14-b	$B_9^2S_9^2$ BC_9 OP	Harris Harris	Top Top	1 DPF M-1 Cl. 1 2 Az	A A
		$B_{10}^1S_{10}^1$	Const. #220	Bot	1 DPF M-1 Cl. 1 1 Az	A A
		$B_{11}^2S_{11}^2$	Const. #117	Center	1 DPF M-1 Cl. 1 1 Az	A A
		M^5S^5	Mines	Bot	1 DPF M-1 Cl. 1 1 Az	C C
after mod.	×	C-2 OP	Before Modernization			
		Group 5 CP & OP	Before Modernization			
		Search-light CP	Before Modernization			
Arverne Ex. 24	17	Group 4 CP & OP	After Modernization	Top	1 DPF M-1 Cl. 1 1 Az	A A
		AAOP #11	AAD			
Atlantic Beach, Ex. 26	18	$B_9^4S_9^4$	Harris	Top	1 DPF M-1 Cl. 1 1 Az	C C
		$B_{10}^3S_{10}^3$	Const. #220	Bot	1 DPF M-1 Cl. 1 1 Az	C C
		$B_{11}^4S_{11}^4$	Const. #117	Bot	1 DPF M-1 Cl. 1 1 Az	C C
		AAOP #12	AAD			
B Tower Ex. 23	14-i	$B_8^2S_8^2$ BC_8 OP	Kessler Kessler	Top	1 DPF M-1 Cl. 1 2 Az	C A
		C-2 OP	After Modernization	Top	1 DPF M-1 Cl. 1 2 Az	C C
		Group 3 CP & OP	After Modernization	Bot	2 Az	C
		Search-light CP	After Modernization	Bot	1 Az	C

SECRET

TOWER AND EXHIBIT	LOCATION SITE NO.	BASE END STATION	BATTERY	DECK	INSTRUMENTS	
C-2 Station Ex.23	14-f	C-2 CP	After Modernization			
Const. 117 Ex. 25	16	BC_{11} CP	Const. #117			
		AAOP #10	AAD			
Const. 220 Ex. 23	14-e	BC_{10} CP & OP	Const. #220		1 Az	C
		CRF_{10}	Const. #220		1 CRF, 22'	C
Fergusson CRF Ex. 23	14-g	CRF_{15}	Fergusson	Single	1 CRF, 15' 1 Az	A A
Jones Beach, Ex. 30	22	$B^8_9S^8_9$	Harris	Single	1 DPF M-1 Cl. 1 1 Az	C C
		$B^8_{11}S^8_{11}$	Const. #117	Single	1 DPF M-1 Cl. 1 1 Az	C C
Kessler CRF Ex. 23	14-d	CRF_8	Kessler	Single	1 CRF	A
Long Beach Ex. 27	19	$B^5_9S^5_9$	Harris	Top	1 DPF M-1 Cl. 2 1 Az	A A
		$B^4_{10}S^4_{10}$	Const #220	Bot	1 DPF M-1 Cl. 1 1 Az	C C
		$B^5_{11}S^5_{11}$	Const. #117	Center	1 DPF M-1 Cl. 2 1 Az	C C
		AAOP #13				
M^4 Tower Ex. 22	13-b	$B^1_8S^1_8$	Kessler	Top	1 Az	A
		M^4S^4	Mines	Bot	1 DPF M-1 Cl. 1 1 Az	C C
		Base End Station reserved for Const. #218, Ft. Wadsworth, HD of Southern N.Y. Bottom Deck				
Marine Parkway Bridge		Group 6 CP & OP	Before Modernization	Single		
		AAOP #9	AAD			
Seagate Ex. 21	12	$B^1_9S^1_9$	Harris	Top	1 DPF M-1 Cl. 1 1 Az	C C
		$B^1_{11}S^1_{11}$	Const. #117	Top	1 DPF M-1 Cl. 1 1 Az	C C
		Base End Station reserved for Const. #218, Ft. Wadsworth, HD of Southern N.Y. Bottom Deck				
Seaside Ex. 24	15	$B^3_9S^3_9$	Harris	Top	1 DPF M-1 Cl. 1 1 Az	C C
		$B^2_{10}S^2_{10}$	Const. #220	Bot	1 DPF M-1 Cl. 1 1 Az	C A
		$B^3_{11}S^3_{11}$	Const. #117	Top	1 DPF M-1 Cl. 1 1 Az	C C
		BC_{11} OP	Const. #117		1 Az	A
		Base End Station reserved for Const. #218, Ft. Wadsworth, HD of Southern N.Y. Bottom Deck				

SECRET

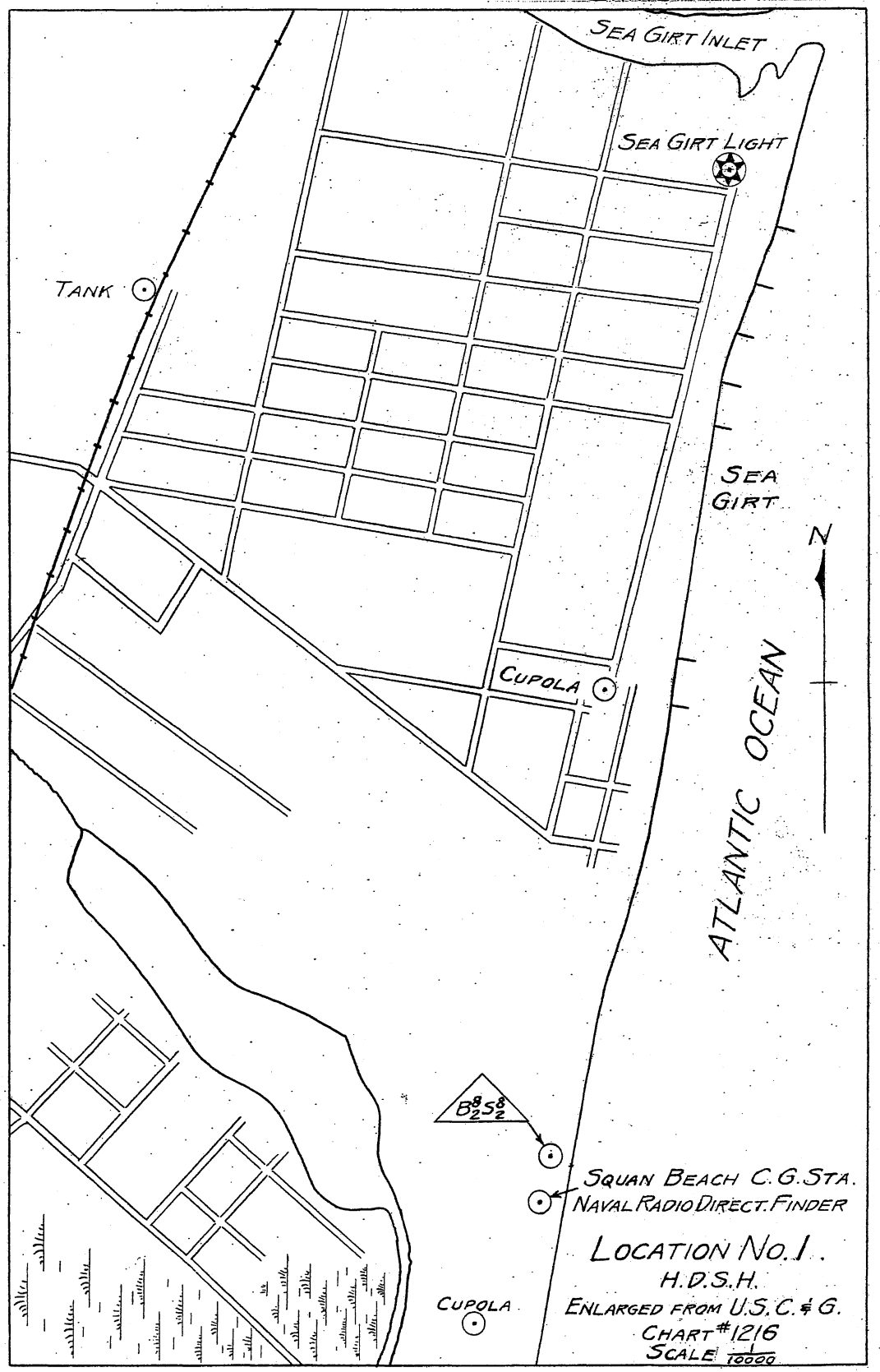
SECRET

TOWER AND EXHIBIT	LOCATION SITE NO.	BASE END STATION	BATTERY	DECK	INSTRUMENTS	
Short Beach Ex. 28	20	$B_9^6 S_9^6$	Harris	Top	1 DPF M-1 Cl. 1 1 Az	C A
		$B_{10}^5 S_{10}^5$	Const. #220	Bot	1 DPF M-1 Cl. 1 1 Az	C C
		$B_{11}^6 S_{11}^6$	Const. #117	Top	1 DPF M-1 Cl. 1 1 Az	C C
		AAOP #14	AAD			
Zachs Bay Ex. 29	21	$B_9^7 S_9^7$	Harris	Top	1 DPF M-1 Cl. 1 1 Az	B A
		$B_{11}^7 S_{11}^7$	Const. #117	Bot	1 DPF M-1 Cl. 1 1 Az	C C

SECRET

SECRET

EXHIBIT #12

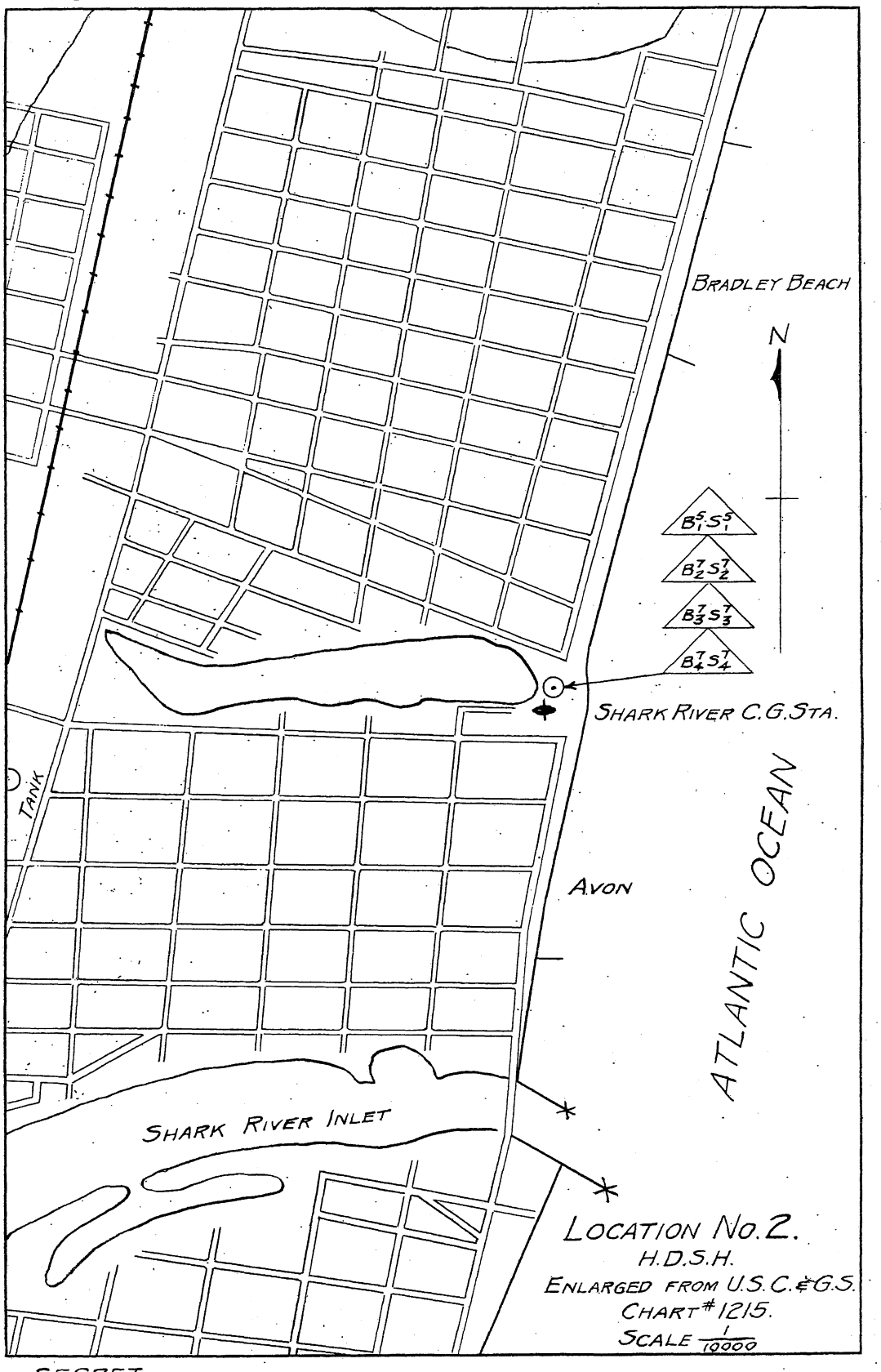


LOCATION NO. 1.
H.D.S.H.
ENLARGED FROM U.S.C. & G.
CHART #1216
SCALE 1/10000

SECRET

SECRET

EXHIBIT #13

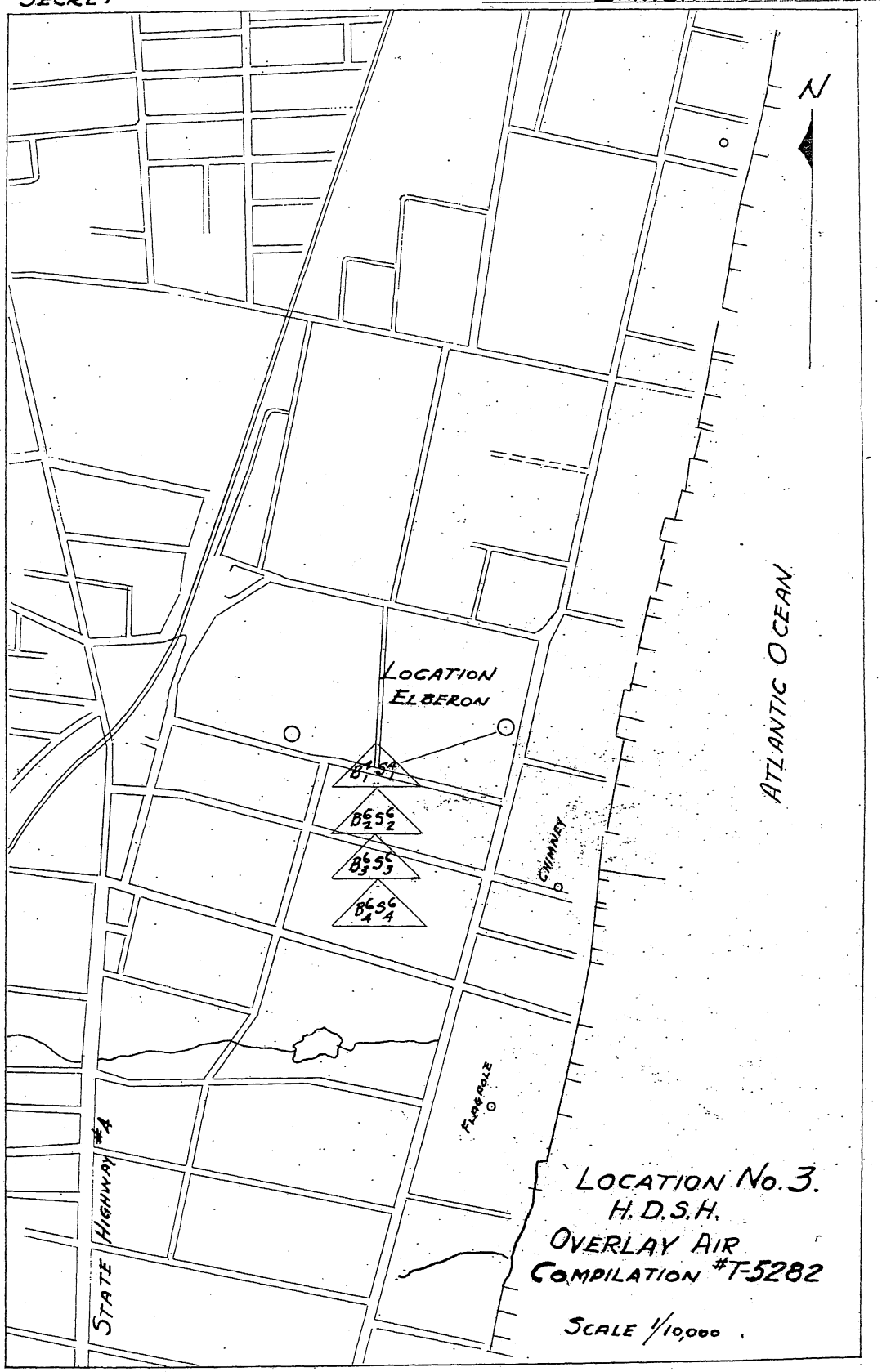


LOCATION NO. 2.
H.D.S.H.
ENLARGED FROM U.S.C.&G.S.
CHART # 1215.
SCALE $\frac{1}{10000}$

SECRET

SECRET

EXHIBIT #14



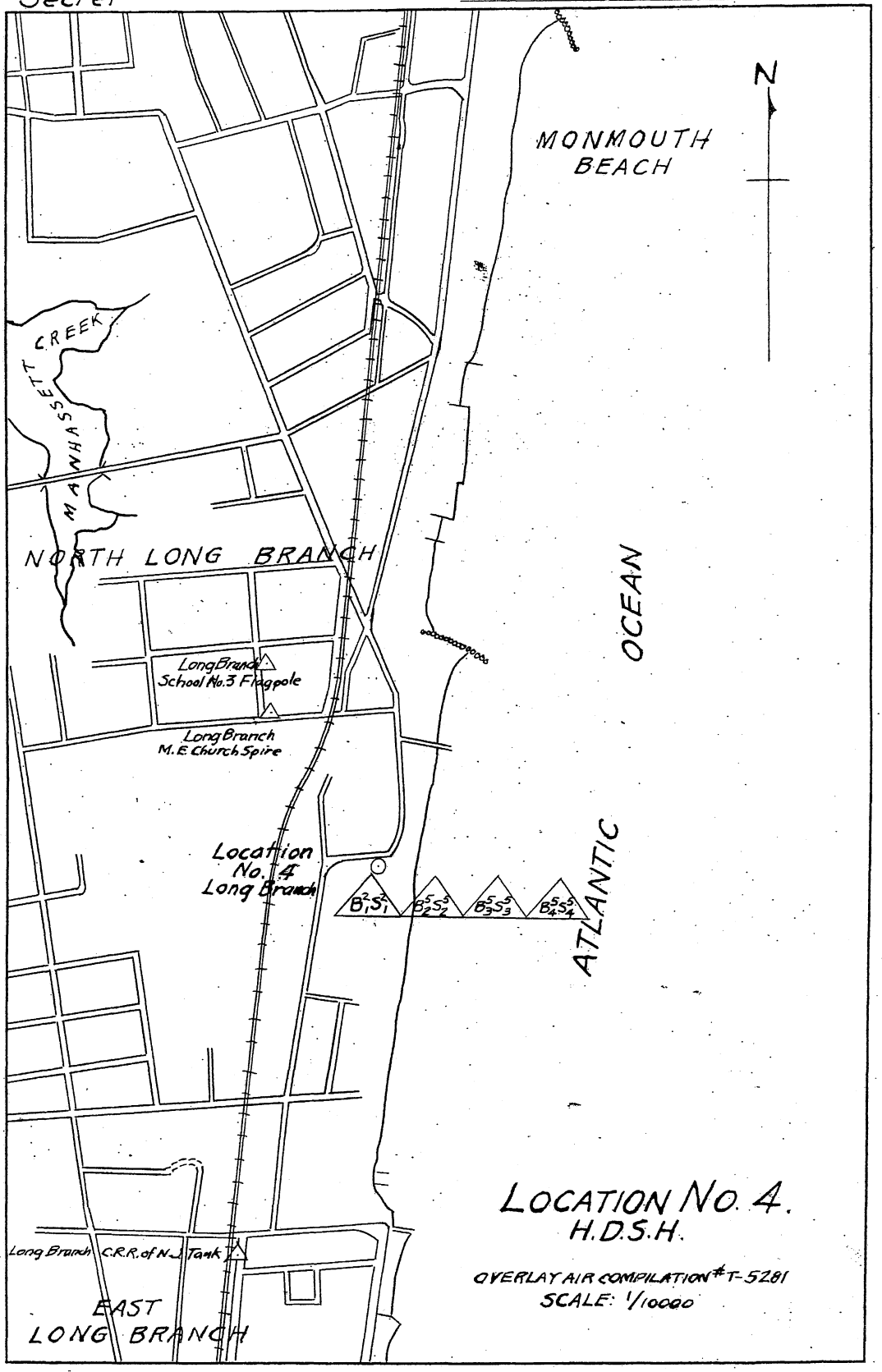
LOCATION No. 3.
H.D.S.H.
OVERLAY AIR
COMPILATION #T-5282

SCALE 1/10,000.

SECRET

Secret

EXHIBIT #15



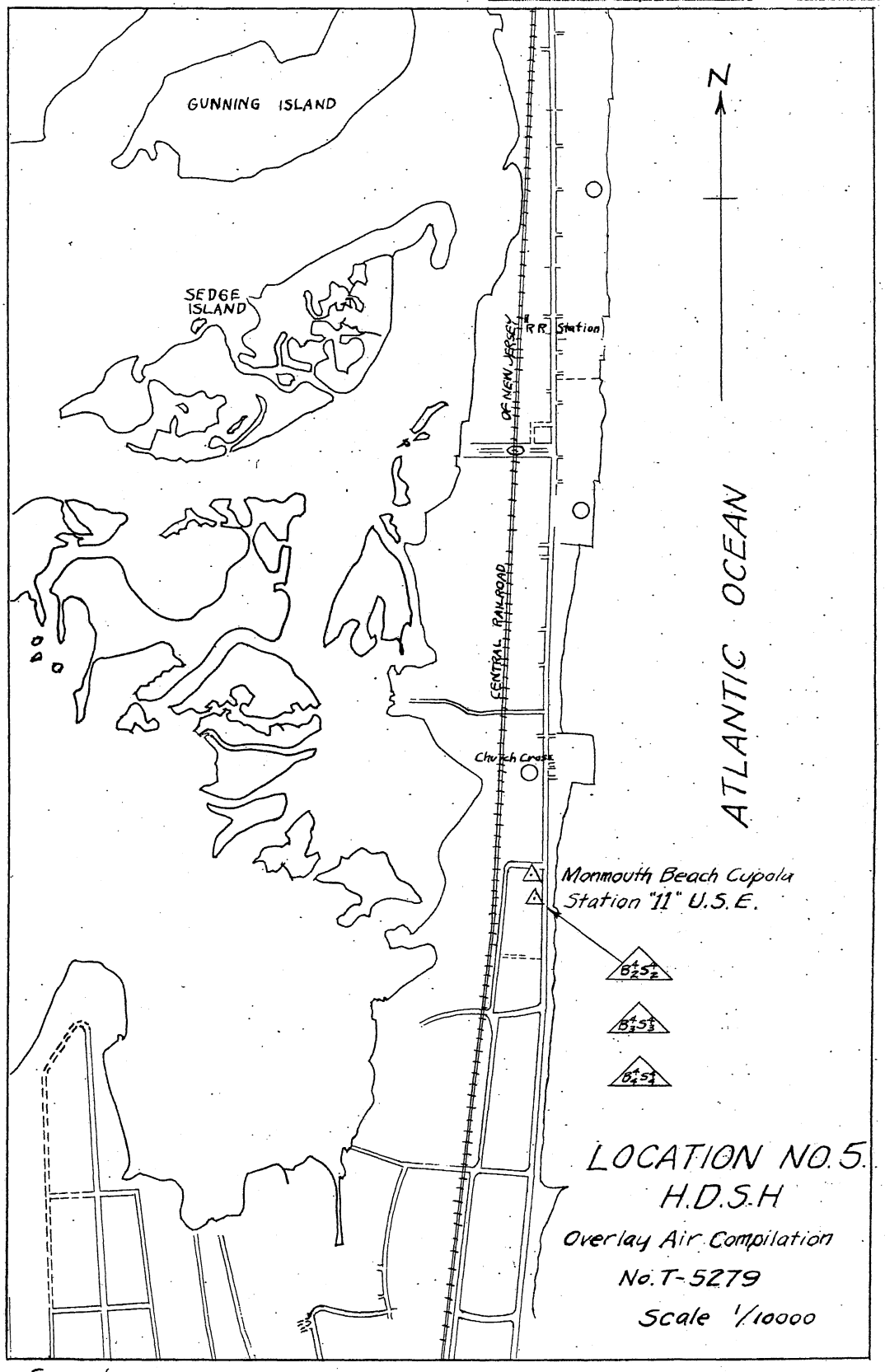
LOCATION NO. 4.
H.D.S.H.

OVERLAY AIR COMPILATION #T-5281
SCALE: 1/10000

Secret

Secret

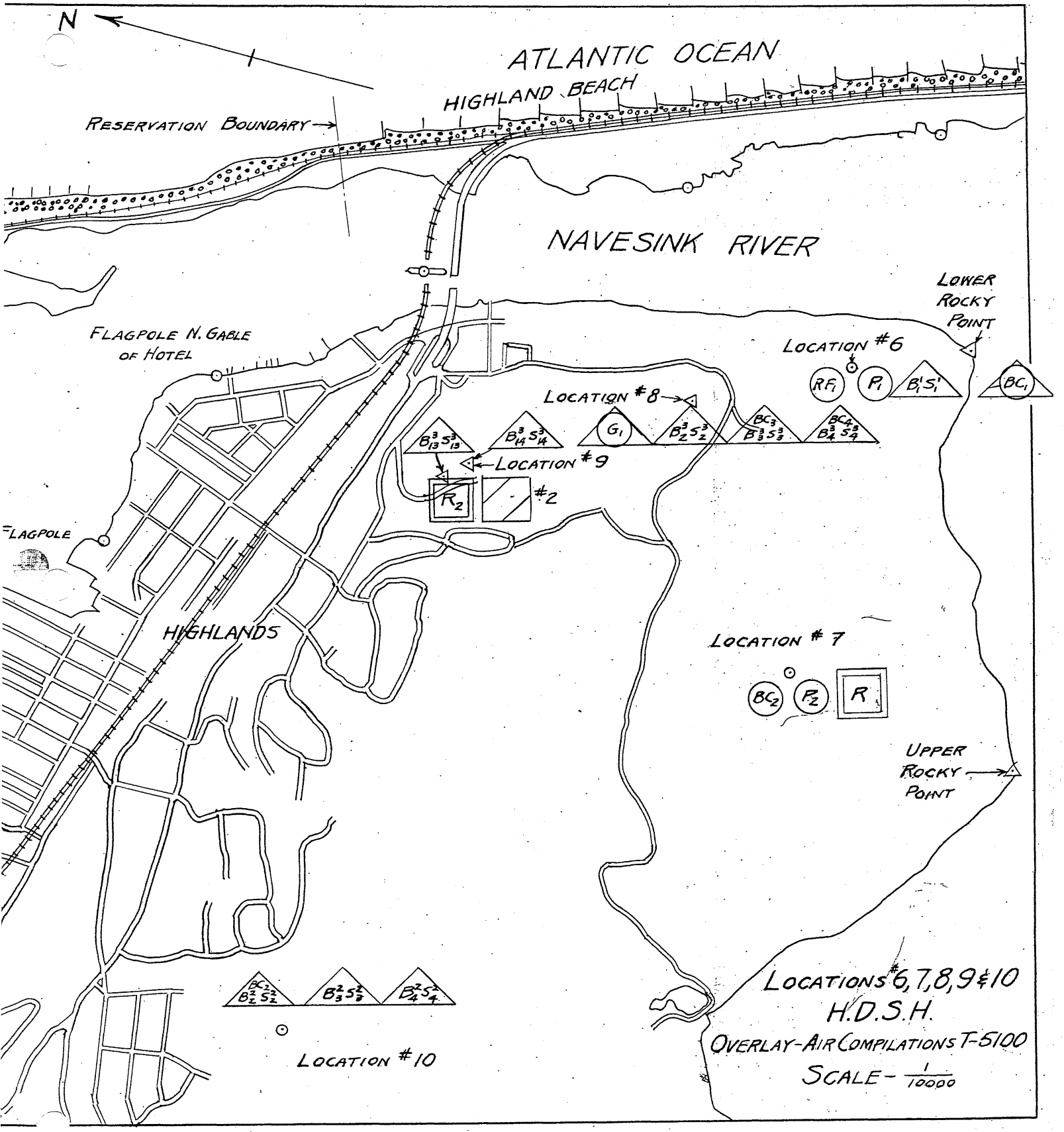
EXHIBIT #16



Secret

SECRET

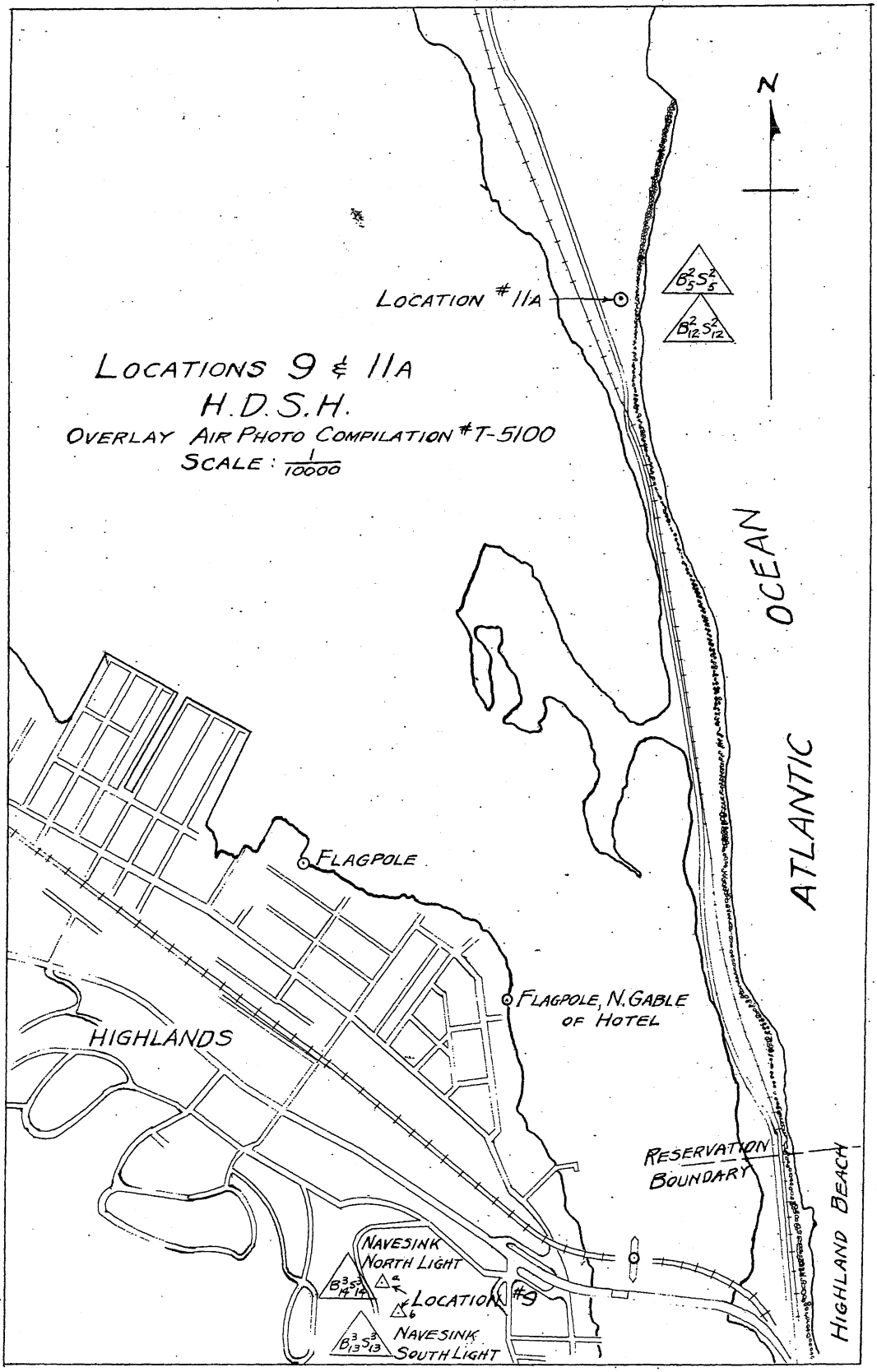
EXHIBIT #17



SECRET

SECRET

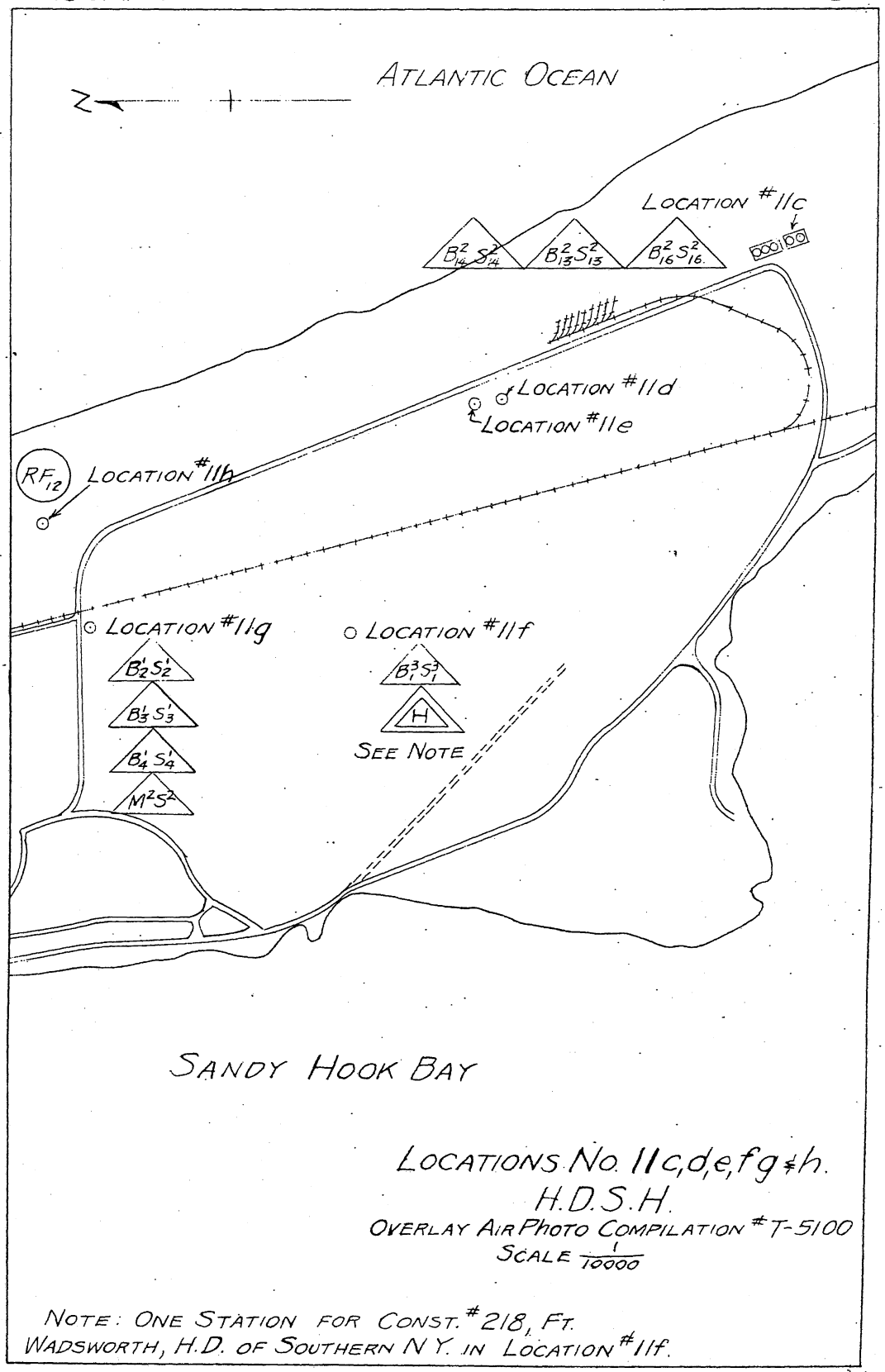
EXHIBIT #18



SECRET

SECRET

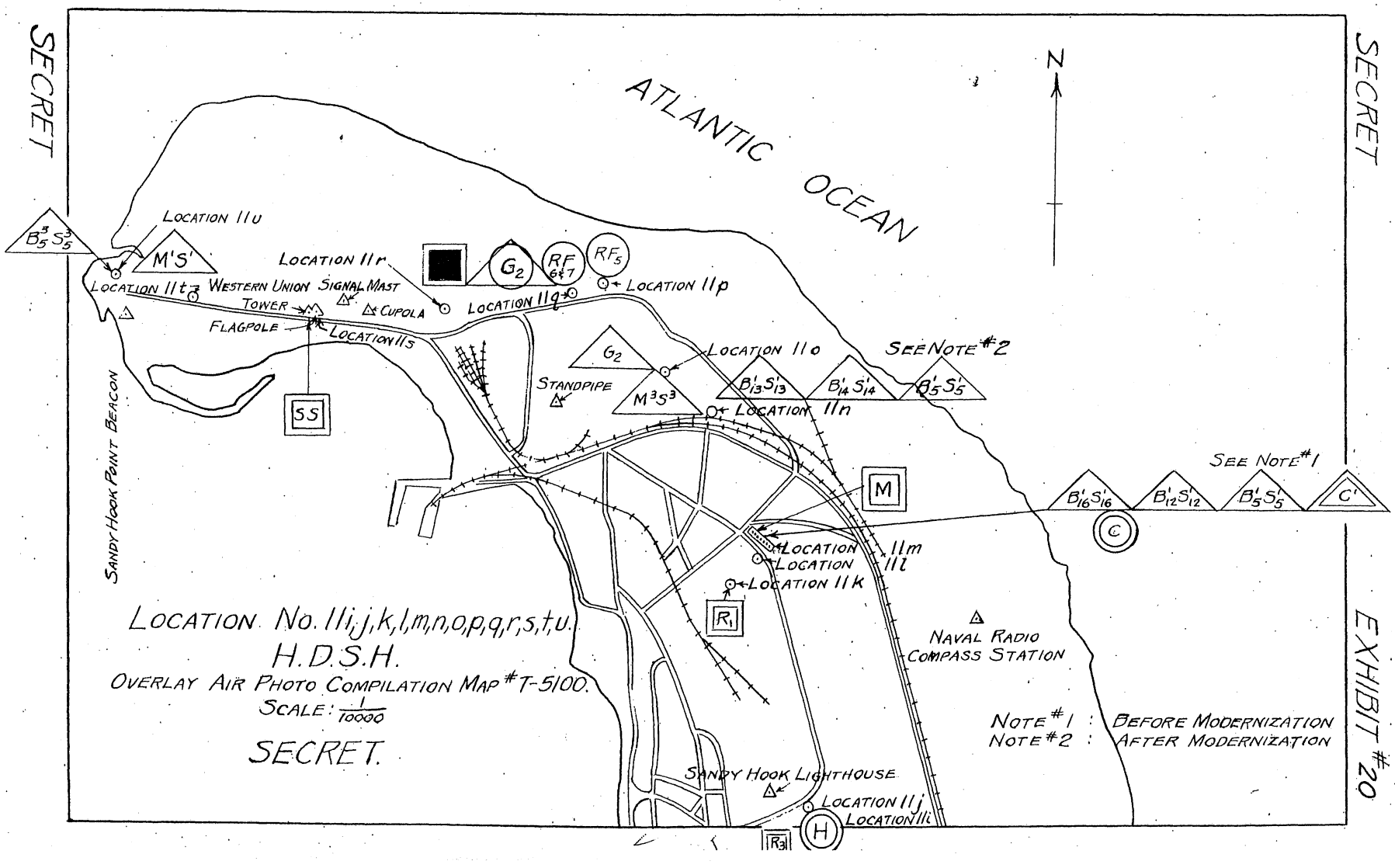
EXHIBIT # 19



LOCATIONS No. 11c, d, e, f g & h.
H.D.S.H.
OVERLAY AIR PHOTO COMPILATION # T-5100
SCALE 1/10000

NOTE: ONE STATION FOR CONST. # 218, FT. WADSWORTH, H.D. OF SOUTHERN N.Y. IN LOCATION # 11f.

SECRET


SECRET
SECRET
ATLANTIC OCEAN
N
LOCATION 11u
M'S'
LOCATION 11t
WESTERN UNION SIGNAL MAST
TOWER
CUPOLA
FLAGPOLE
LOCATION 11s
LOCATION 11r
LOCATION 11q
LOCATION 11p
RF 6&7
RF5
G2
SS
SANDY HOOK POINT BEACON
STANDPIPE
M3S3
LOCATION 11o
SEE NOTE #2
B'13S'13
B'14S'14
B'5S'5
LOCATION 11n
SEE NOTE #1
B'16S'16
B'12S'12
B'5S'5
C'
M
C
LOCATION 11m
LOCATION 11l
LOCATION 11k
R1
NAVAL RADIO COMPASS STATION
LOCATION No. 11i,j,k,l,m,n,o,p,q,r,s,t,u.
H.D.S.H.
OVERLAY AIR PHOTO COMPILATION MAP #T-5100.
SCALE: 1/10000
SECRET.
NOTE #1 : BEFORE MODERNIZATION
NOTE #2 : AFTER MODERNIZATION
SANDY HOOK LIGHTHOUSE
LOCATION 11j
LOCATION 11i
H
R3
EXHIBIT #20

SECRET

LOCATION #12
H.D.S.H.
ENLARGEMENT U.S.C. & G.S.
CHART #369
SCALE: 1/10000

N

GRAVESEND BAY

SECRET

NORTON PT.

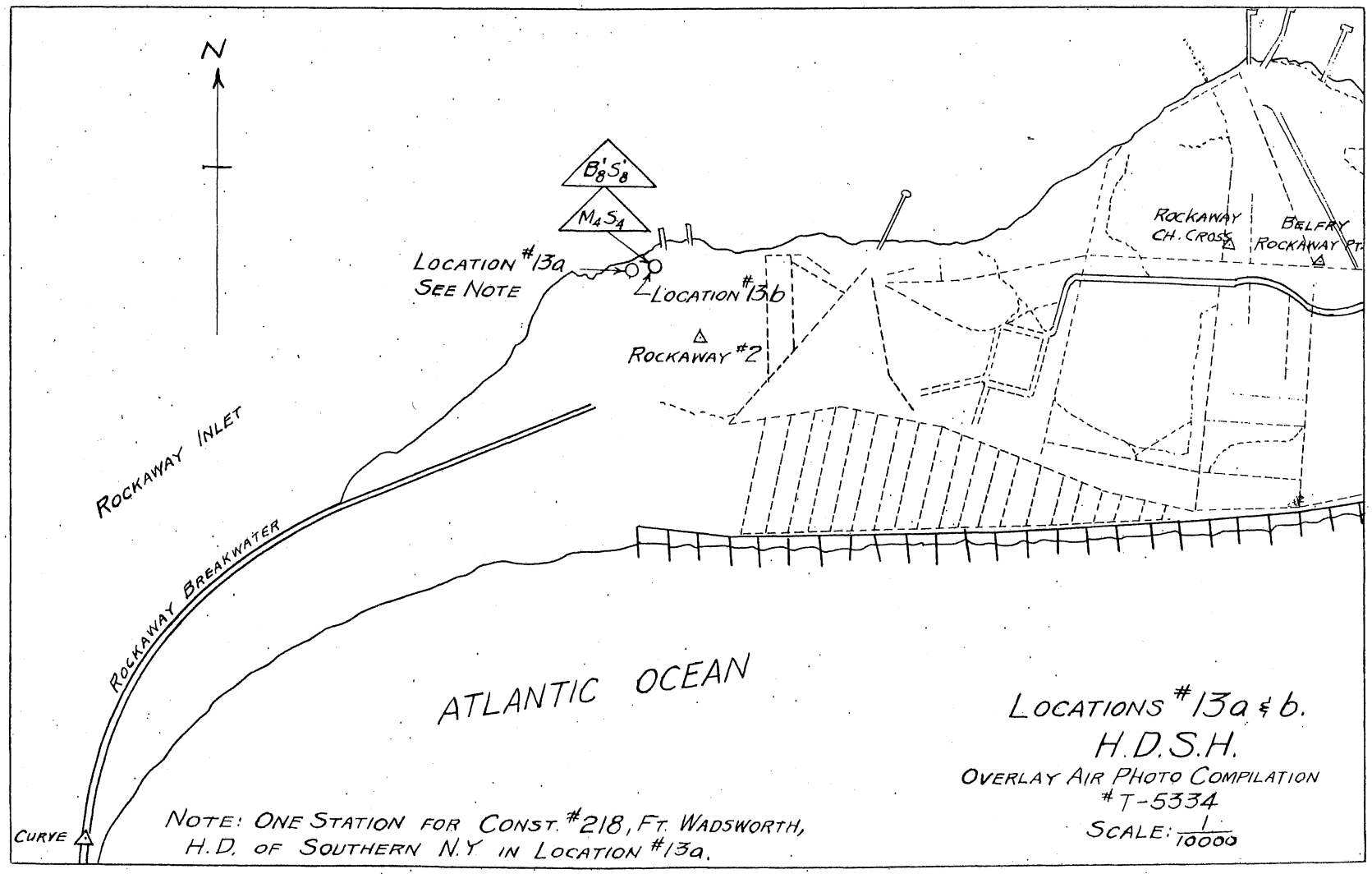
LOWER BAY

$B'_9 S'_9$ $B'_{11} S'_{11}$

NOTE: ONE STATION FOR CONST. #218,
FT. WADSWORTH, H.D., SOUTHERN N.Y.
IN LOCATION #12.

EXHIBIT #21

SECRET



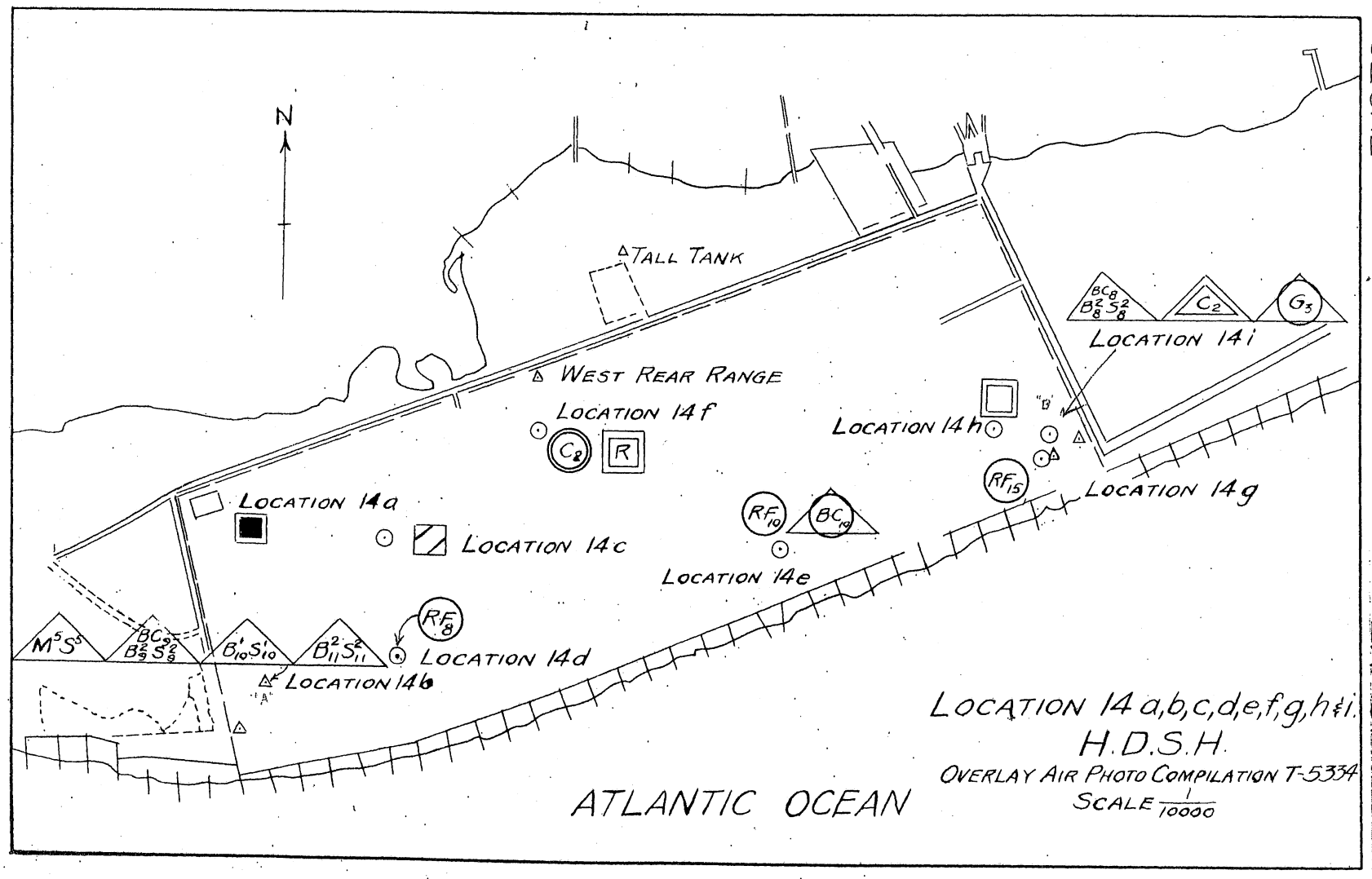
NOTE: ONE STATION FOR CONST. #218, FT. WADSWORTH, H.D. OF SOUTHERN N.Y. IN LOCATION #13a.

LOCATIONS #13a & b.
H.D.S.H.
OVERLAY AIR PHOTO COMPILATION
#T-5334
SCALE: 1/10000

SECRET

EXHIBIT #22

SECRET

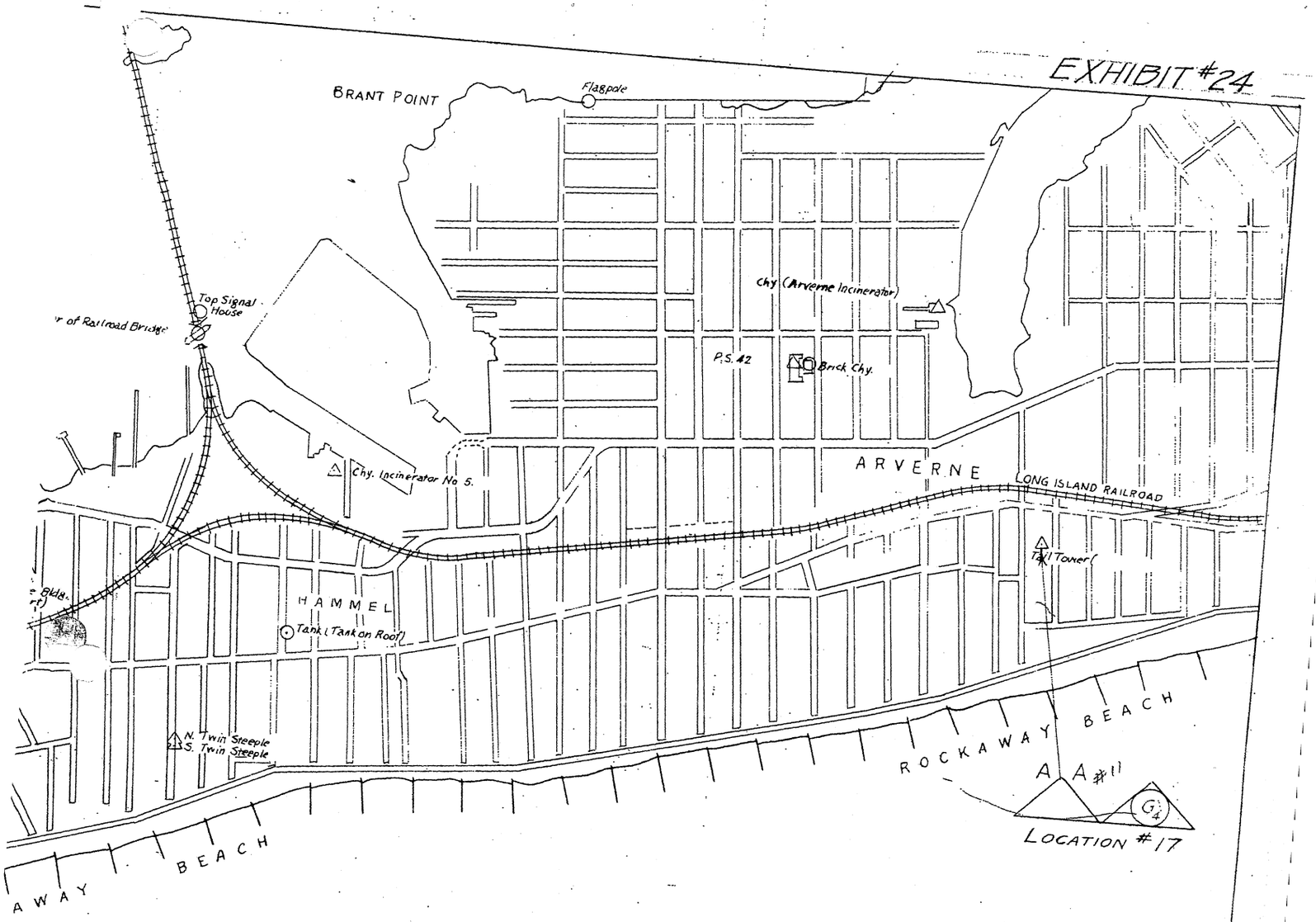


LOCATION 14 a,b,c,d,e,f,g,h&i.
H.D.S.H.
OVERLAY AIR PHOTO COMPILATION T-5334
SCALE 1/10000

SECRET

EXHIBIT #23

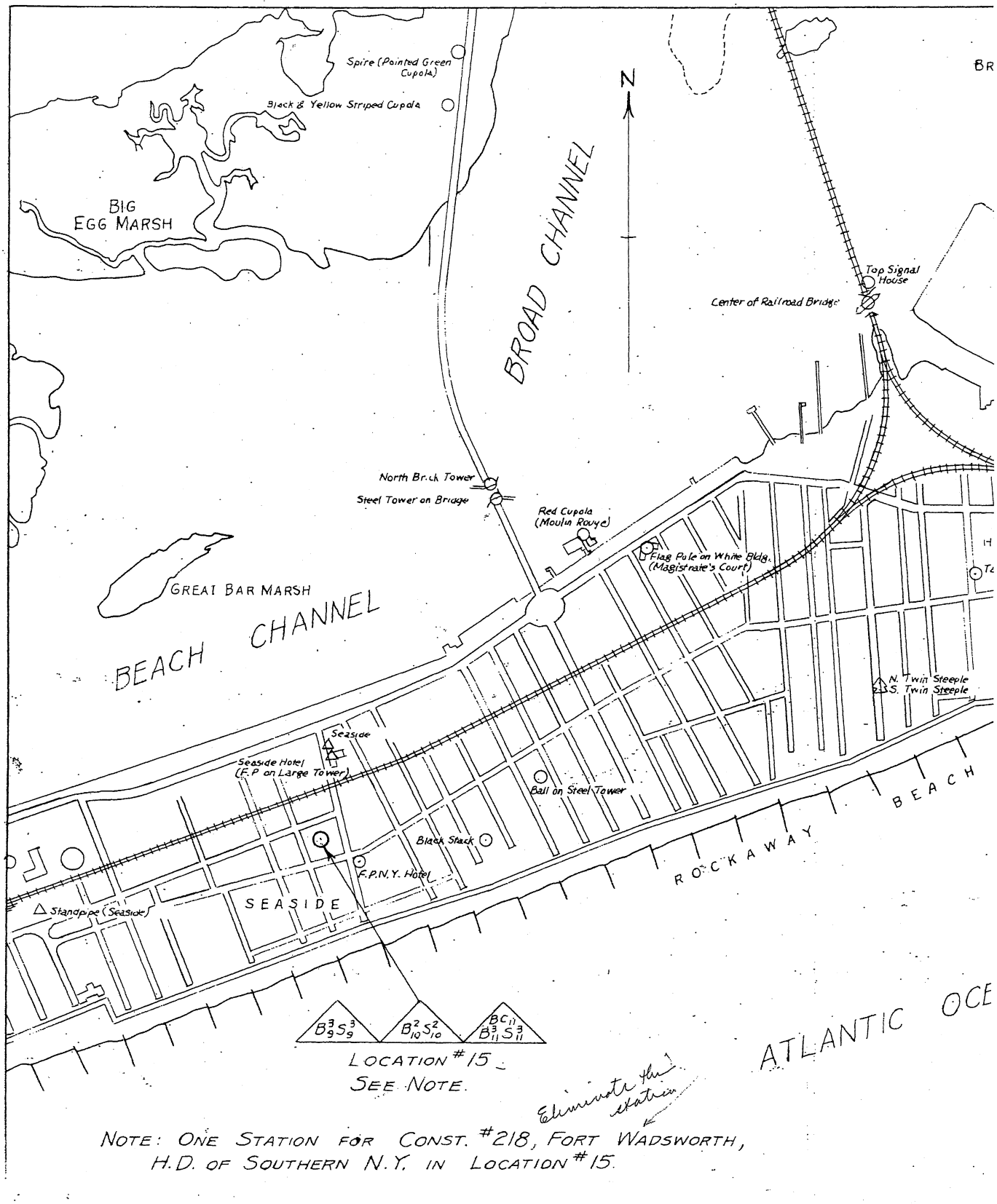
EXHIBIT #24



ATLANTIC OCEAN

LOCATIONS #15 & #17
H.D.S.H.
OVERLAY AIR PHOTO COMPILATION No. T-5093.
SCALE: 1/10000

SECRET



LOCATION #15
SEE NOTE.

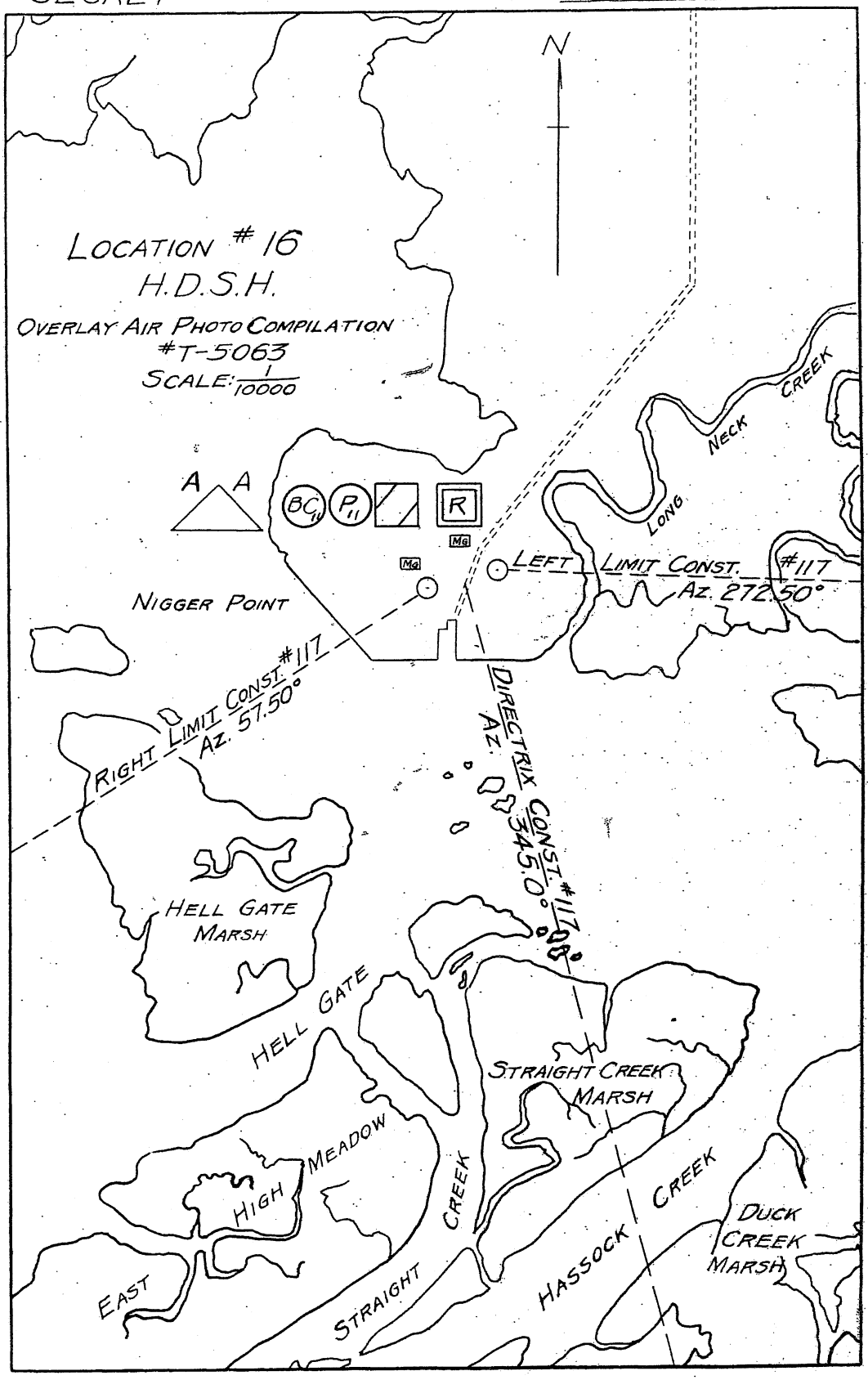
Eliminate this station

NOTE: ONE STATION FOR CONST. #218, FORT WADSWORTH, H.D. OF SOUTHERN N.Y. IN LOCATION #15.

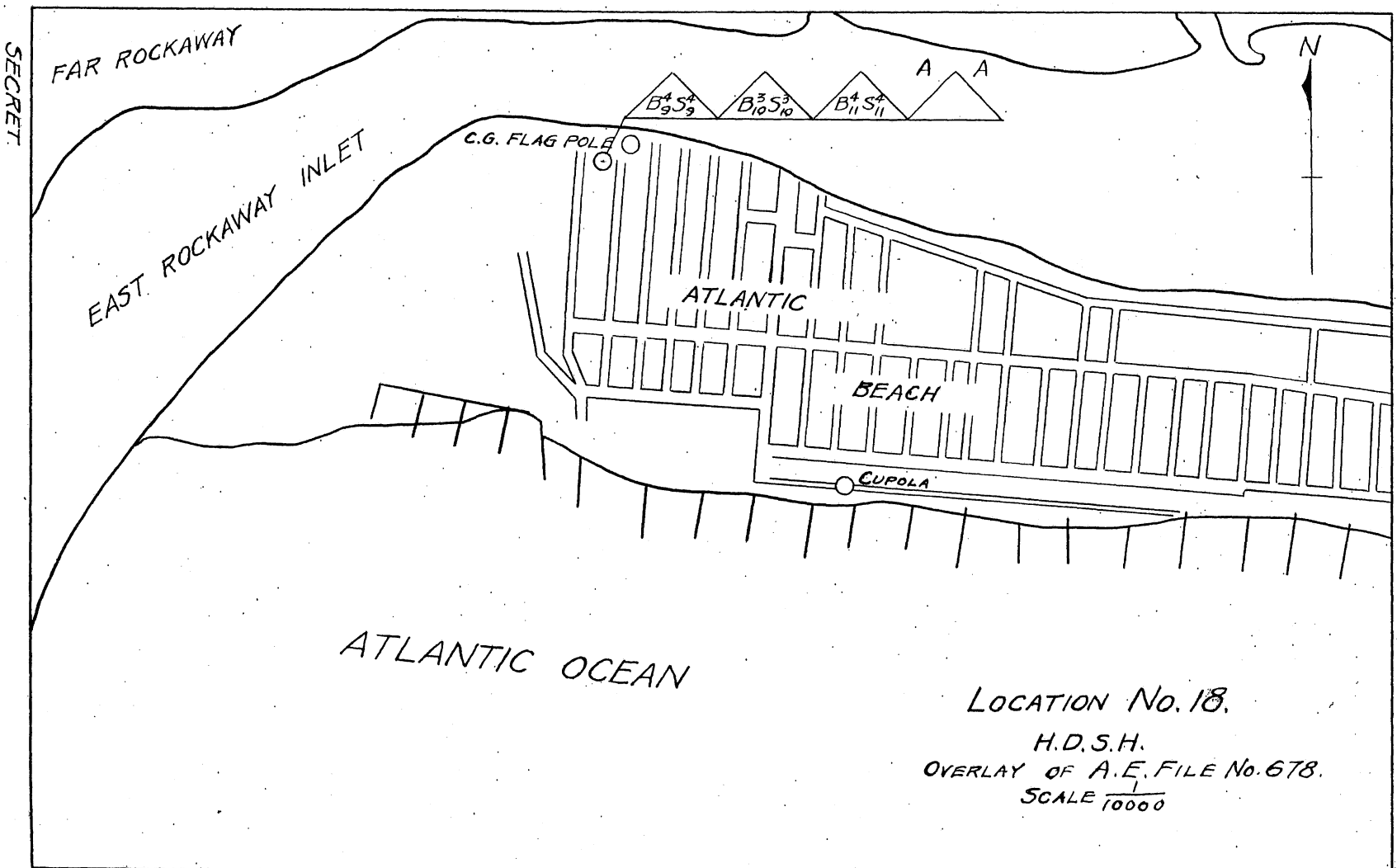
SECRET

SECRET

EXHIBIT #25



SECRET



LOCATION No. 18.

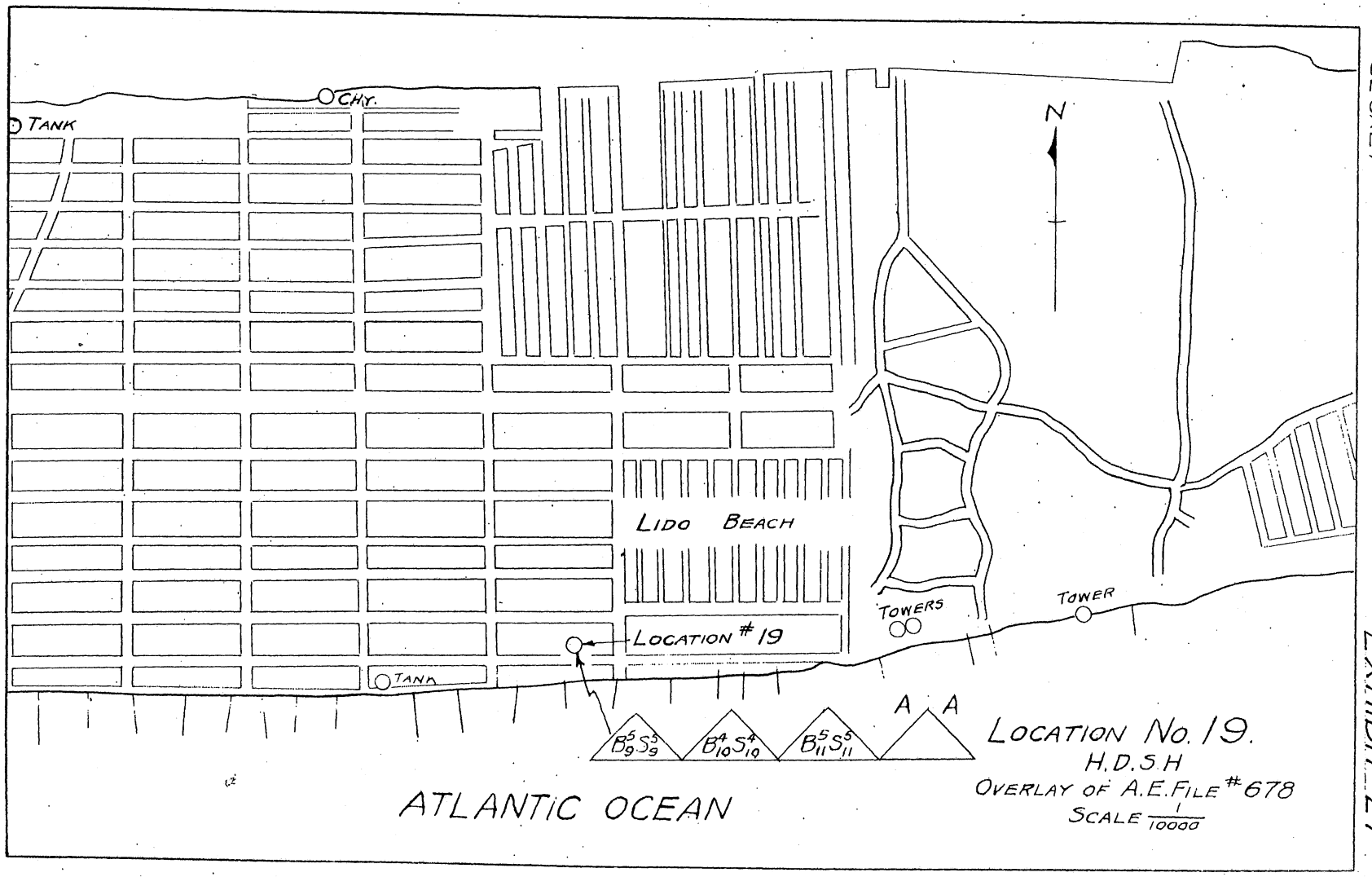
H.D.S.H.

OVERLAY OF A.E. FILE No. 678.

SCALE 1/10000

EXHIBIT #26

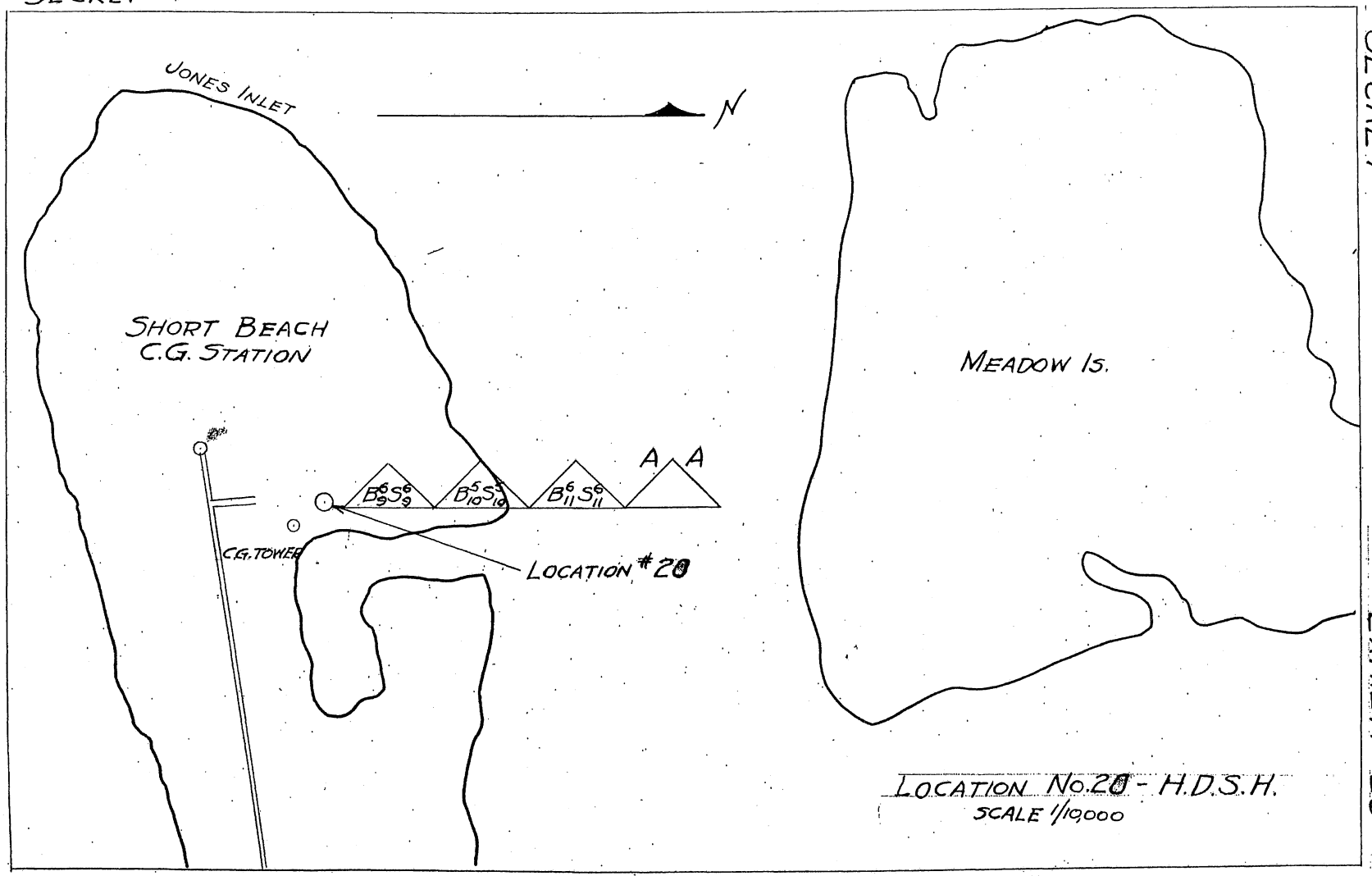
SECRET



SECRET

EXHIBIT #27

SECRET



LOCATION No. 20 - H.D.S.H.
SCALE 1/19,000

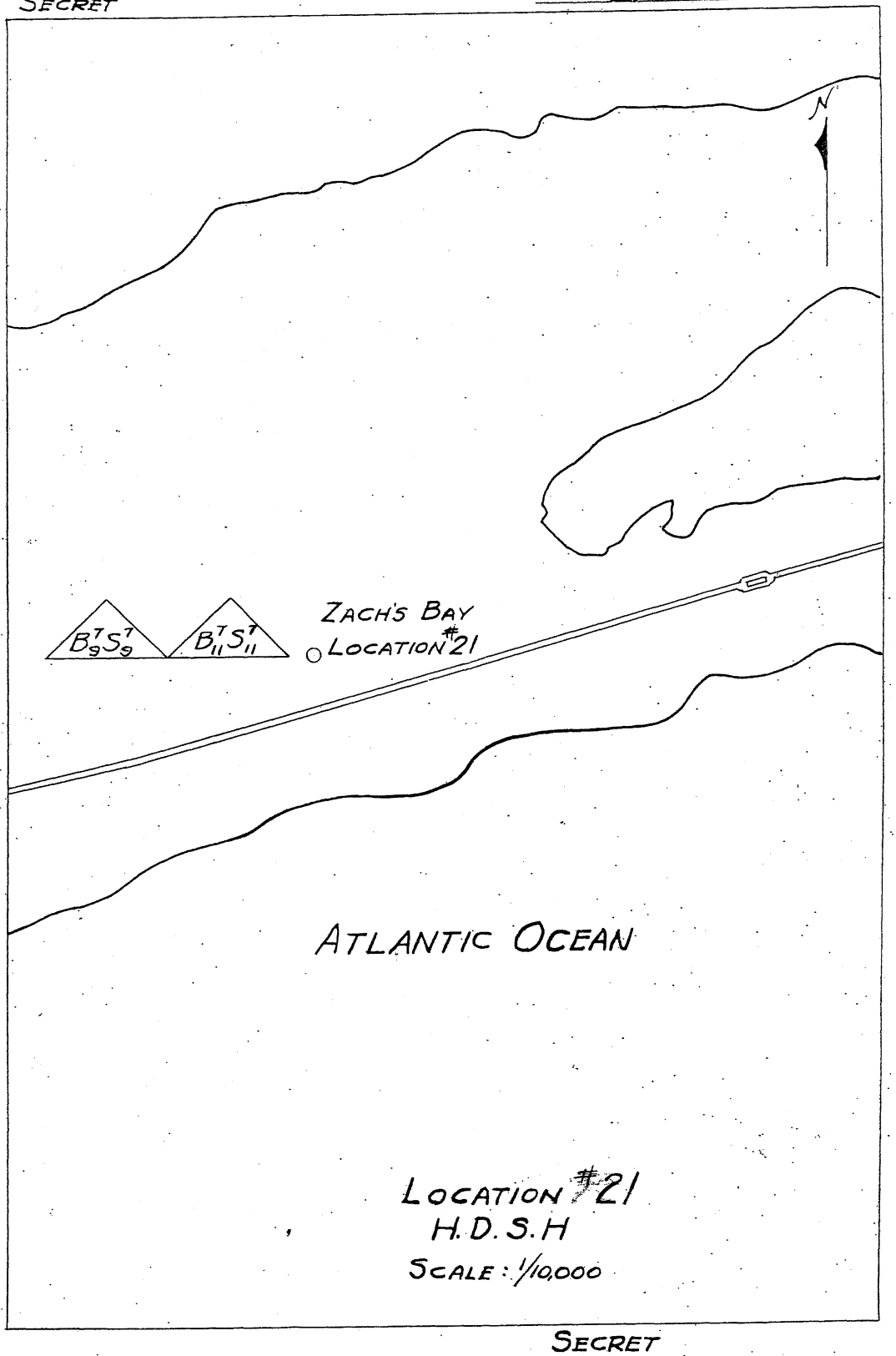
SECRET

EXHIBIT #28

SECRET

SECRET

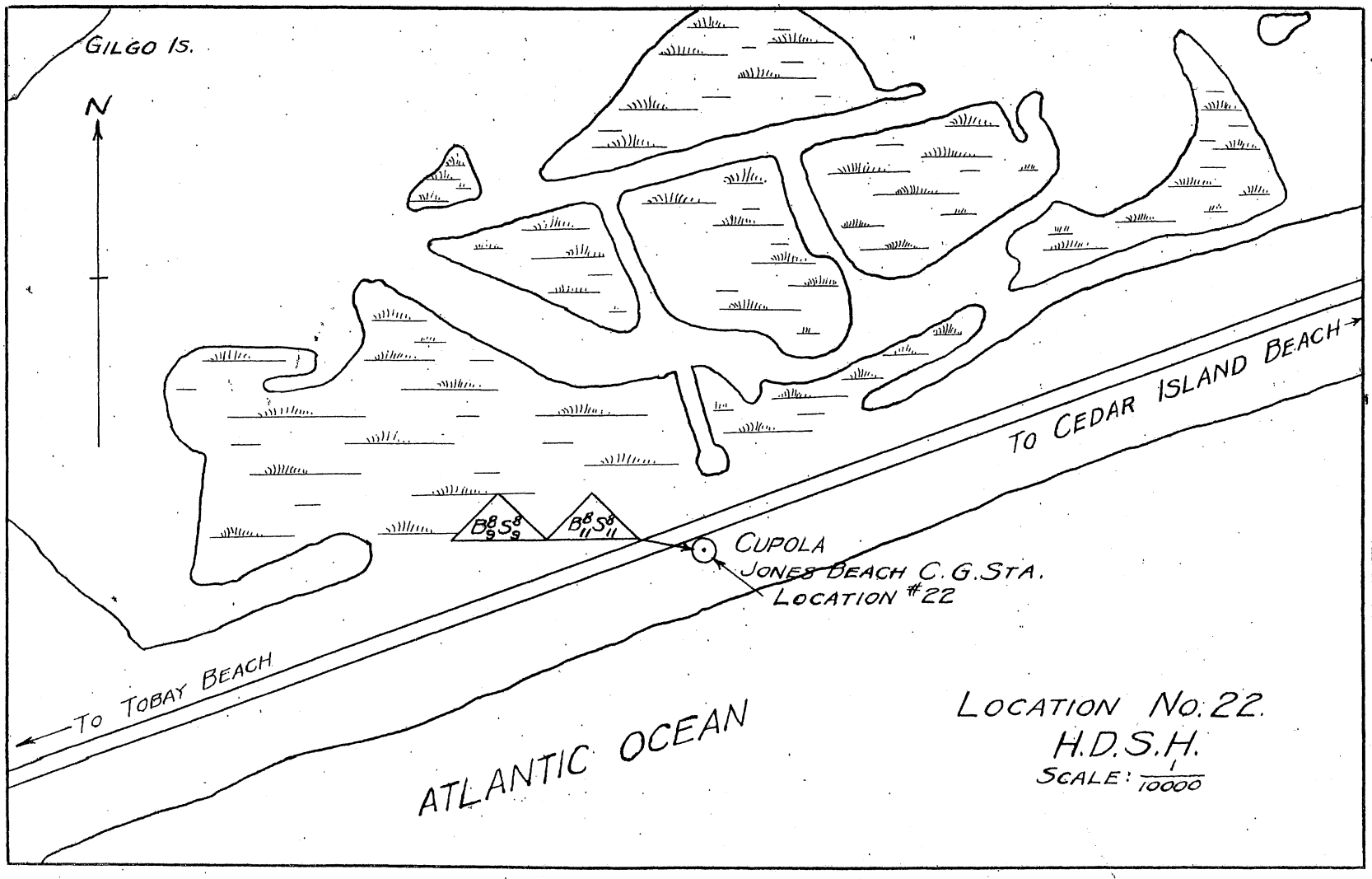
EXHIBIT #29



LOCATION #21
H.D.S.H
SCALE: 1/10,000

SECRET

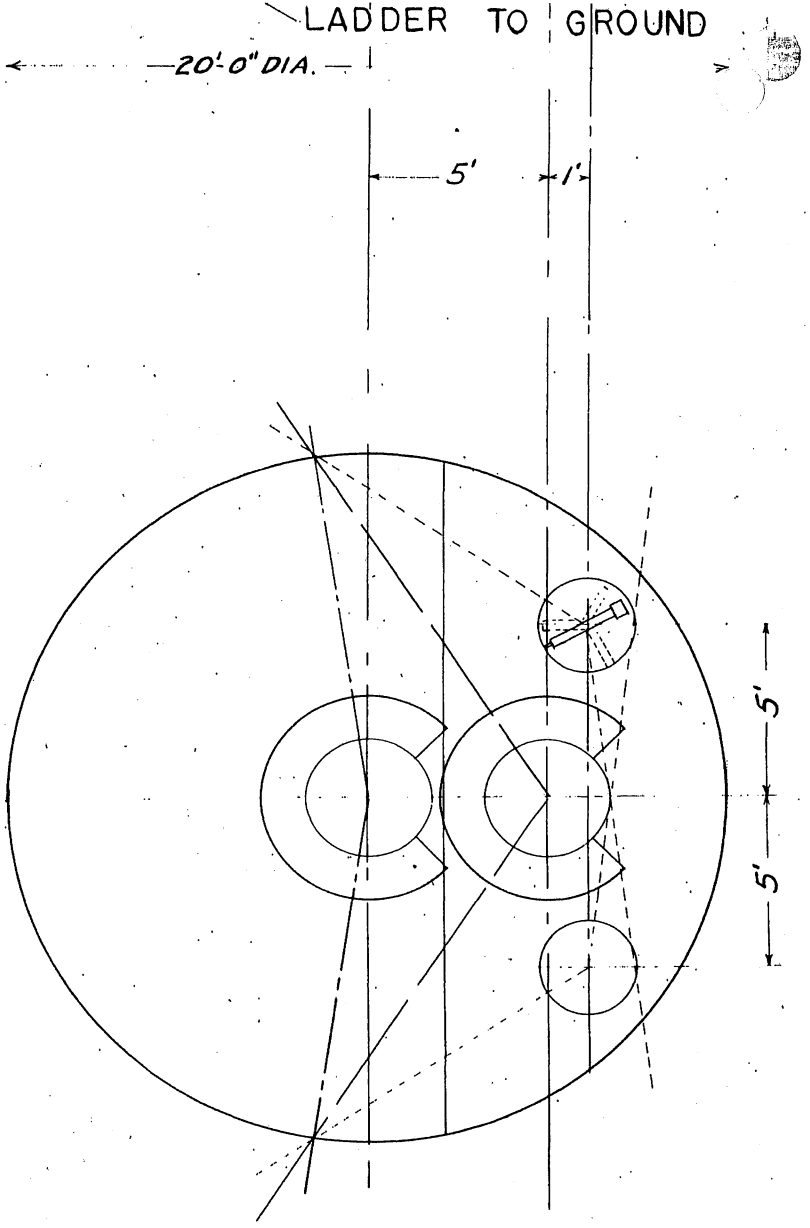
SECRET



LOCATION NO. 22.
H.D.S.H.
SCALE: 1/10000

SECRET

EXHIBIT #30



CATWALK PLATFORM- 24" wide

OPENING FORMED BY REMOVING DUMMY PLATES

ALL CABLES CONCEALED IN PIPE

EXHIBIT #31

SUGGESTED DESIGN FOR SPLINTER-PROOF TANK-TYPE OBSERVATION TOWERS

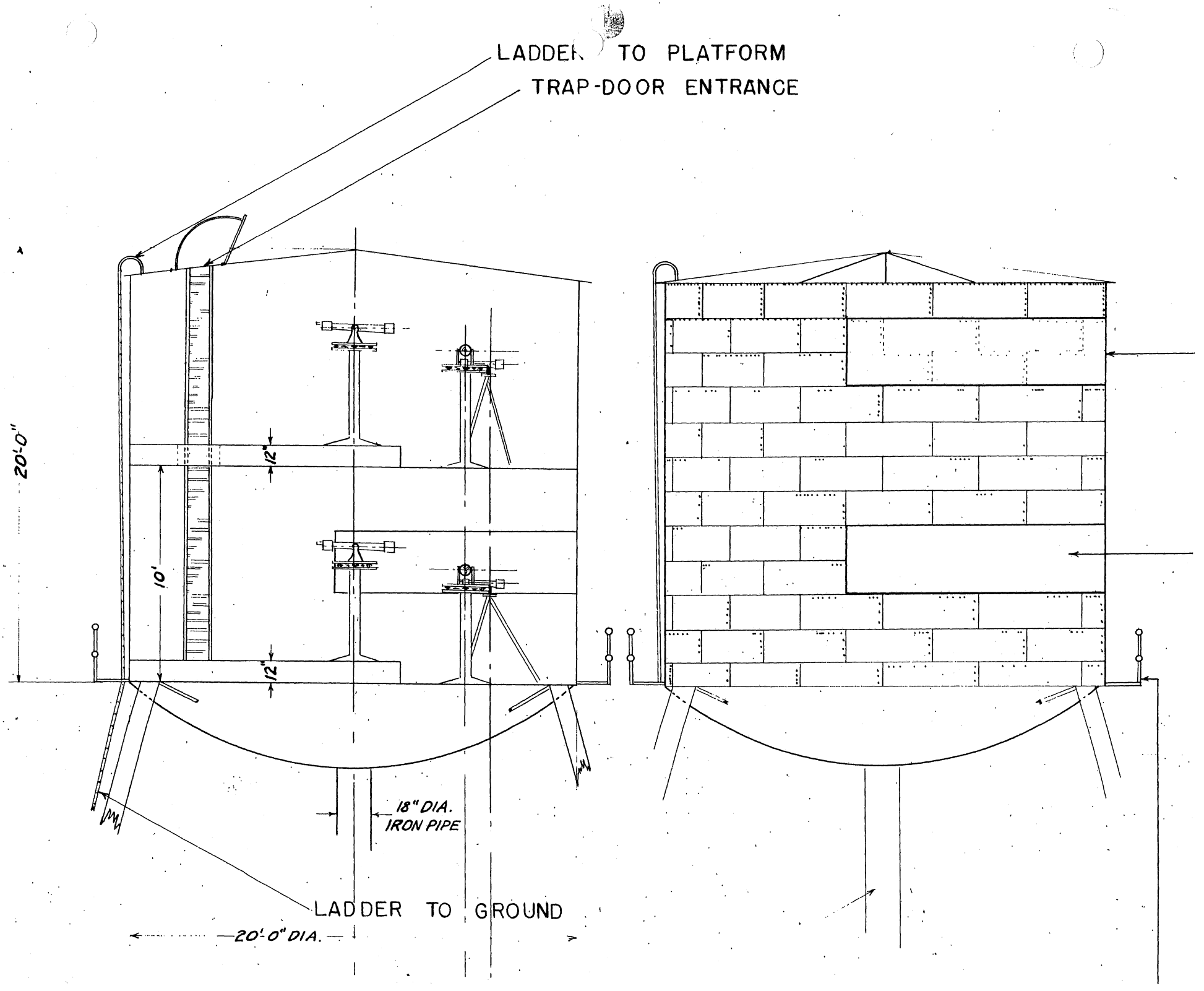
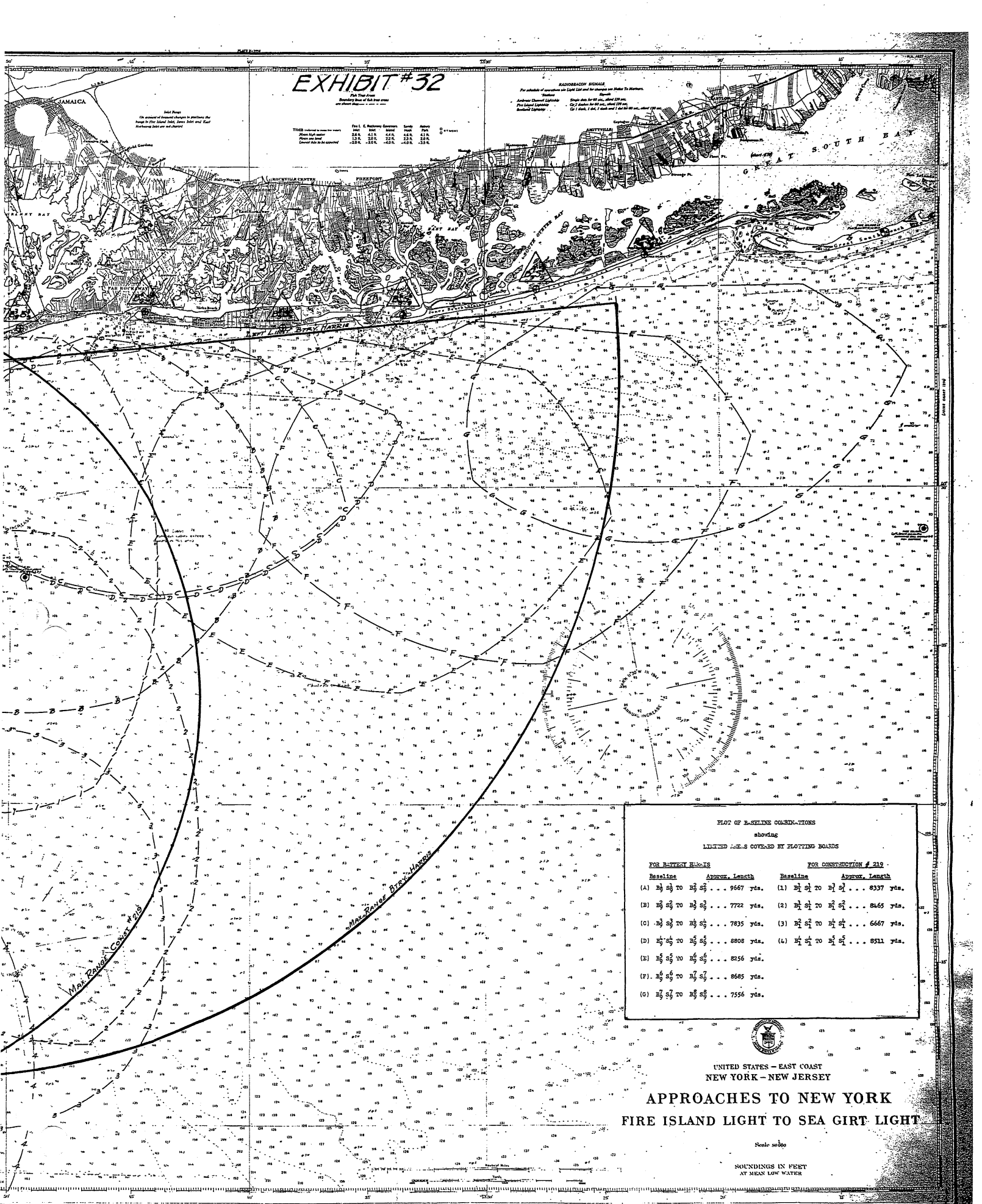

LADDER TO PLATFORM
TRAP-DOOR ENTRANCE
20'-0"
12"
10'
12"
18" DIA.
IRON PIPE
LADDER TO GROUND
20'-0" DIA.

EXHIBIT #32



PLOT OF BASELINE COMBINATIONS

showing

LIMITED AREAS COVERED BY PLOTTING BOARDS

FOR BATTERY HARRIS		FOR CONSTRUCTION # 219	
Baseline	Approx. Length	Baseline	Approx. Length
(A) B_3^3 S_3^3 TO B_2^3 S_2^3 . . .	9667 yds.	(1) B_1^1 S_1^1 TO B_1^1 S_1^1 . . .	8337 yds.
(B) B_3^3 S_2^3 TO B_3^3 S_3^3 . . .	7722 yds.	(2) B_1^1 S_1^1 TO B_1^1 S_1^1 . . .	8465 yds.
(C) B_3^3 S_3^3 TO B_3^3 S_2^3 . . .	7835 yds.	(3) B_1^1 S_1^1 TO B_1^1 S_1^1 . . .	6667 yds.
(D) B_2^3 S_2^3 TO B_2^3 S_3^3 . . .	8808 yds.	(4) B_1^1 S_1^1 TO B_1^1 S_1^1 . . .	8511 yds.
(E) B_2^3 S_3^3 TO B_3^3 S_3^3 . . .	8256 yds.		
(F) B_3^3 S_3^3 TO B_3^3 S_2^3 . . .	8685 yds.		
(G) B_3^3 S_3^3 TO B_3^3 S_3^3 . . .	7556 yds.		

UNITED STATES – EAST COAST

NEW YORK – NEW JERSEY

APPROACHES TO NEW YORK

FIRE ISLAND LIGHT TO SEA GIRT LIGHT

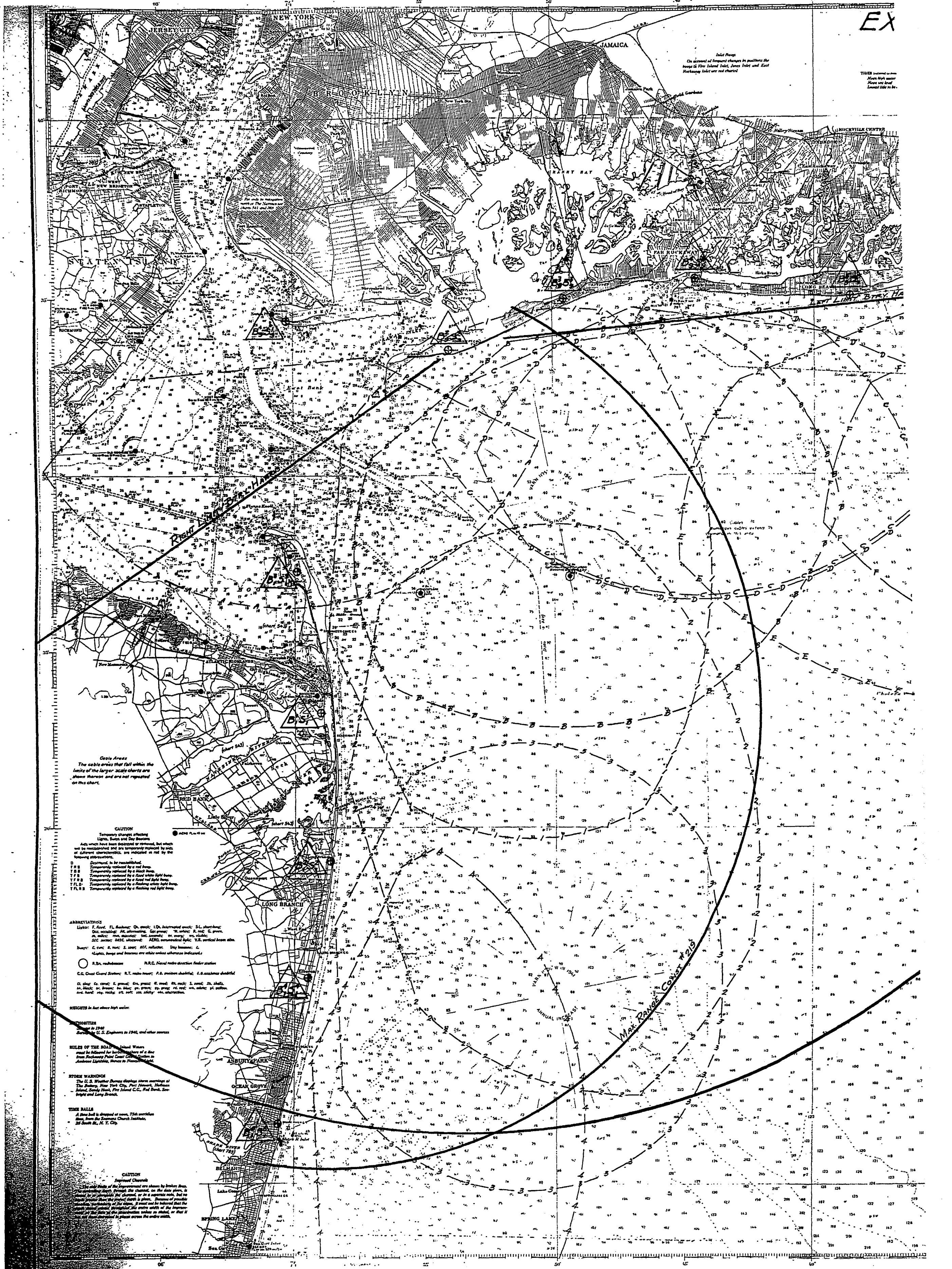
Scale 50000

SOUNDINGS IN FEET
AT MEAN LOW WATER

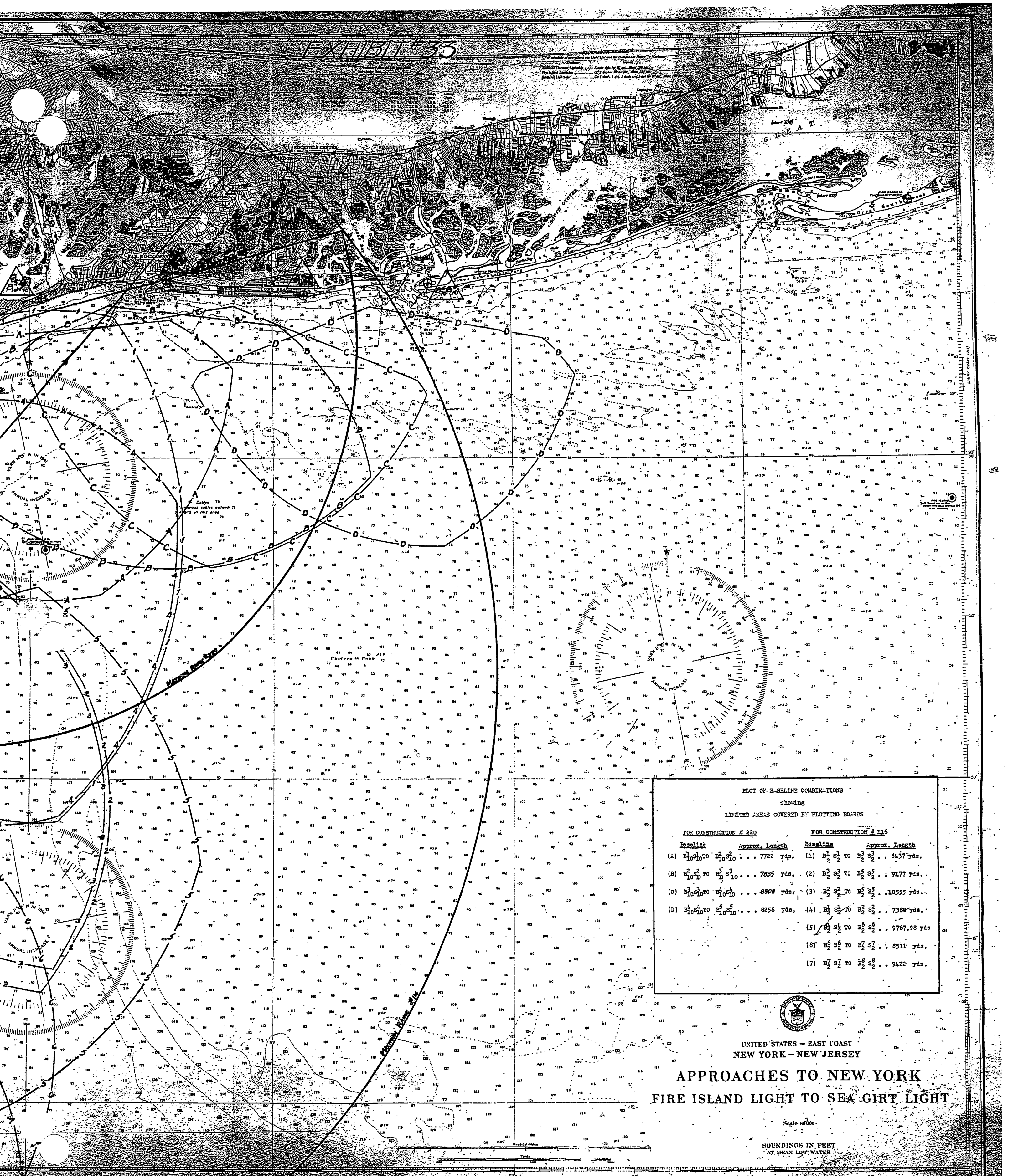
Published at Washington, D. C., May 1928
BY THE U. S. COAST AND GEODETIC SURVEY
L. O. Colbert, Director.

LIGHTS, BEACONS, BUOYS, AND SOUNDING COMPLETED
FOR INFORMATION RECEIVED TO DATE OF ISSUE

(Fire Island Light to Sea Girt Light)



Published at Washington, D. C., May 1936
BY THE U. S. COAST AND GEODETIC SURVEY
L. O. Colbert, Director.

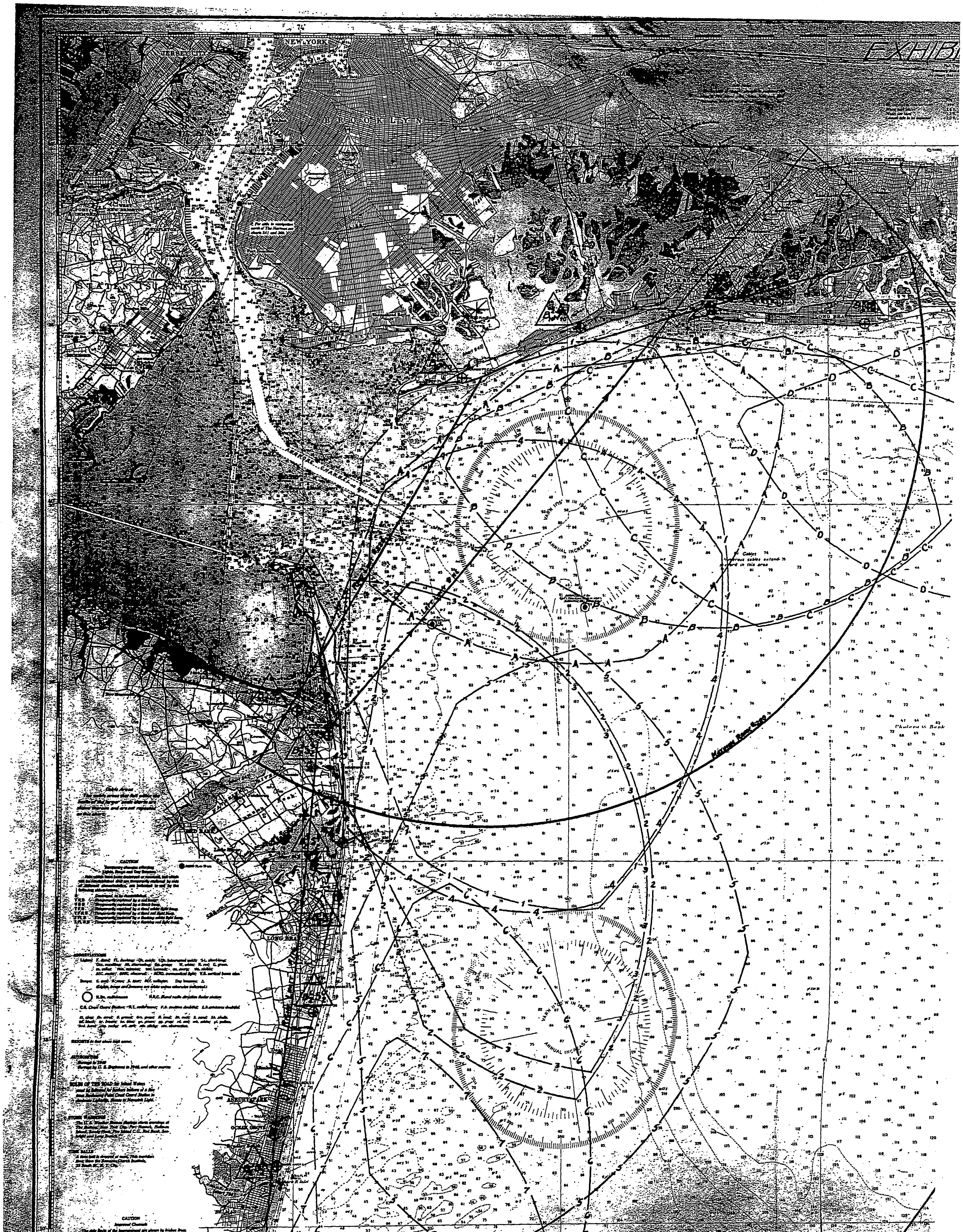


PLOT OF BASELINE COMBINATIONS

showing

LIMITED AREAS COVERED BY PLOTTING BOARDS

FOR CONSTRUCTION # 220 Baseline	Approx. Length	FOR CONSTRUCTION # 116 Baseline	Approx. Length
(A) $B^1_{10}S^1_{10}$ TO $B^2_{10}S^2_{10}$	7722 yds.	(1) $B^1_2 S^1_2$ TO $B^3_2 S^3_2$	8437 yds.
(B) $B^2_{10}S^2_{10}$ TO $B^3_{10}S^3_{10}$	7835 yds.	(2) $B^3_2 S^3_2$ TO $B^5_2 S^5_2$	9177 yds.
(C) $B^3_{10}S^3_{10}$ TO $B^4_{10}S^4_{10}$	8808 yds.	(3) $B^2_2 S^2_2$ TO $B^5_2 S^5_2$	10555 yds.
(D) $B^4_{10}S^4_{10}$ TO $B^5_{10}S^5_{10}$	8256 yds.	(4) $B^1_2 S^1_2$ TO $B^2_2 S^2_2$	7388 yds.
		(5) $B^4_2 S^4_2$ TO $B^6_2 S^6_2$	9767.98 yds
		(6) $B^6_2 S^6_2$ TO $B^7_2 S^7_2$	8511 yds.
		(7) $B^7_2 S^7_2$ TO $B^8_2 S^8_2$	9422 yds.


NEW YORK
BROOKLYN
LONG BRANCH
ASBURY PARK
OCEAN GROVE
SPRING LAKE
CAUTION
ANNUAL INCREASE

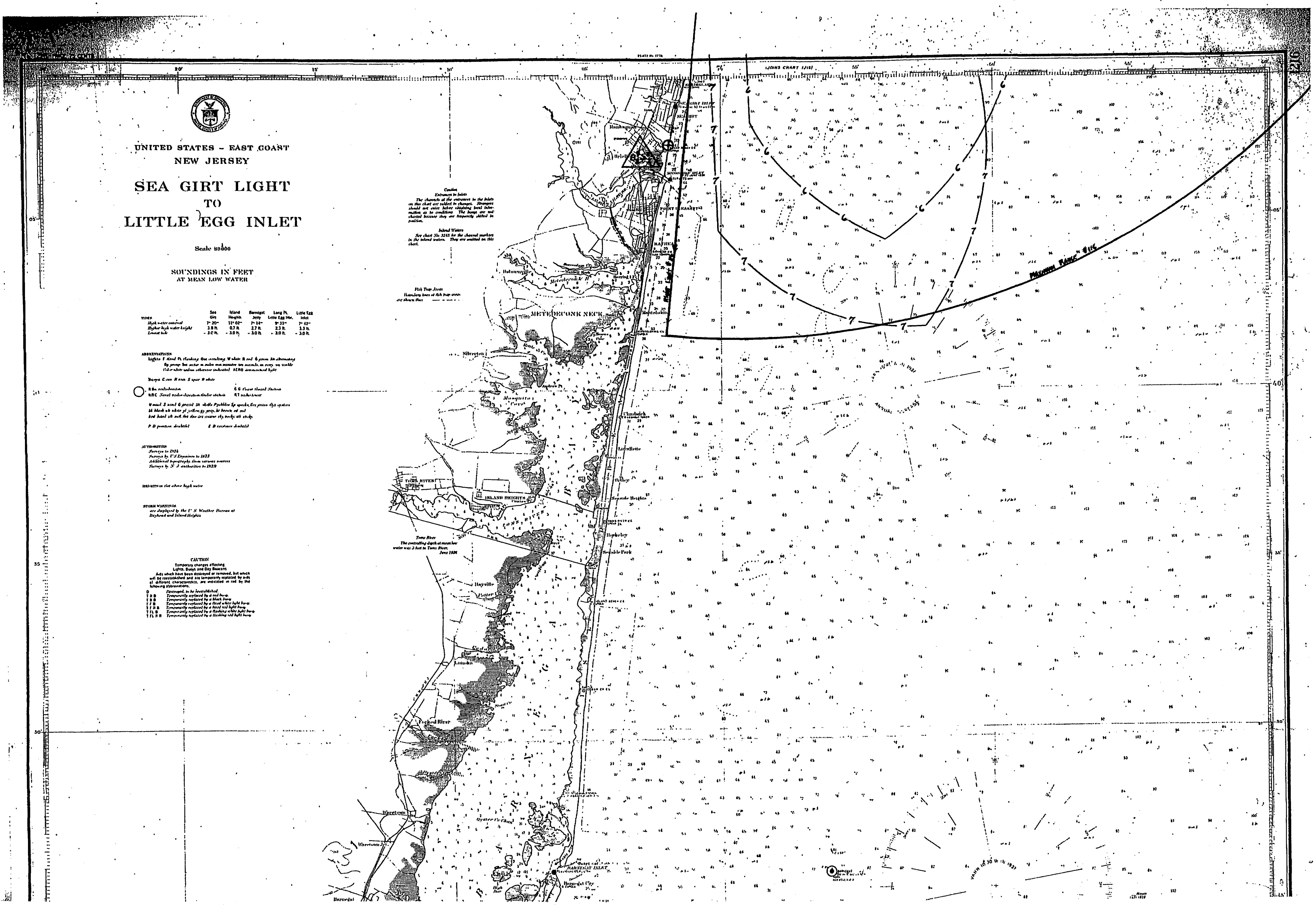
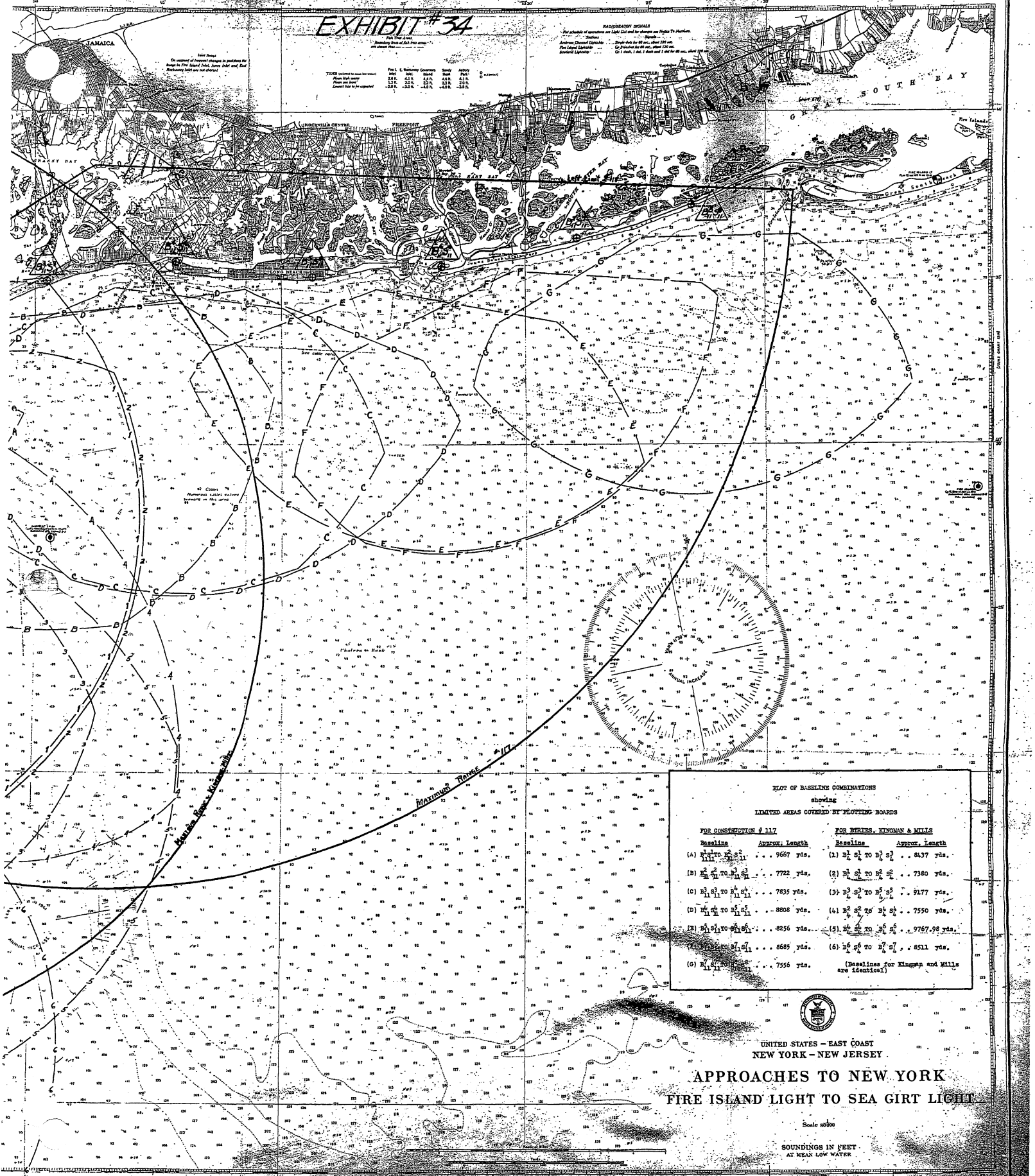

1216
UNITED STATES - EAST COAST
NEW JERSEY
SEA GIRT LIGHT
TO
LITTLE EGG INLET
SOUNDINGS IN FEET
AT MEAN LOW WATER
METEDECONK NECK
ISLAND HEIGHTS
CAUTION

EXHIBIT #34



PLOT OF BASELINE COMBINATIONS

showing

LIMITED AREAS COVERED BY PLOTTING BOARDS

FOR CONSTRUCTION # 117		FOR BYRIES, KINGMAN & MILLS	
Baseline	Approx. Length	Baseline	Approx. Length
(A) B^1_{11} to B^2_{11}	. . . 9667 yds.	(1) B^1_4 S^1_4 to B^3_4 S^3_4	. . 8437 yds.
(B) B^2_{11} S^1_{11} to B^3_{11} S^2_{11}	. . . 7722 yds.	(2) B^1_4 S^1_4 to B^2_4 S^2_4	. . 7380 yds.
(C) B^3_{11} S^2_{11} to B^4_{11} S^3_{11}	. . . 7835 yds.	(3) B^3_4 S^3_4 to B^5_4 S^5_4	. . 9177 yds.
(D) B^4_{11} S^3_{11} to B^5_{11} S^4_{11}	. . . 8808 yds.	(4) B^2_4 S^2_4 to B^4_4 S^4_4	. . 7550 yds.
(E) B^5_{11} S^4_{11} to B^6_{11} S^5_{11}	. . . 8256 yds.	(5) B^4_4 S^4_4 to B^6_4 S^6_4	. . 9767.98 yds.
(F) B^6_{11} S^5_{11} to B^7_{11} S^6_{11}	. . . 8685 yds.	(6) B^6_4 S^6_4 to B^7_4 S^7_4	. . 8511 yds.
(G) B^7_{11} S^6_{11} to B^8_{11} S^7_{11}	. . . 7556 yds.	(Baselines for Kingman and Mills are identical)	

UNITED STATES – EAST COAST

NEW YORK – NEW JERSEY

APPROACHES TO NEW YORK

FIRE ISLAND LIGHT TO SEA GIRT LIGHT

Scale 80000

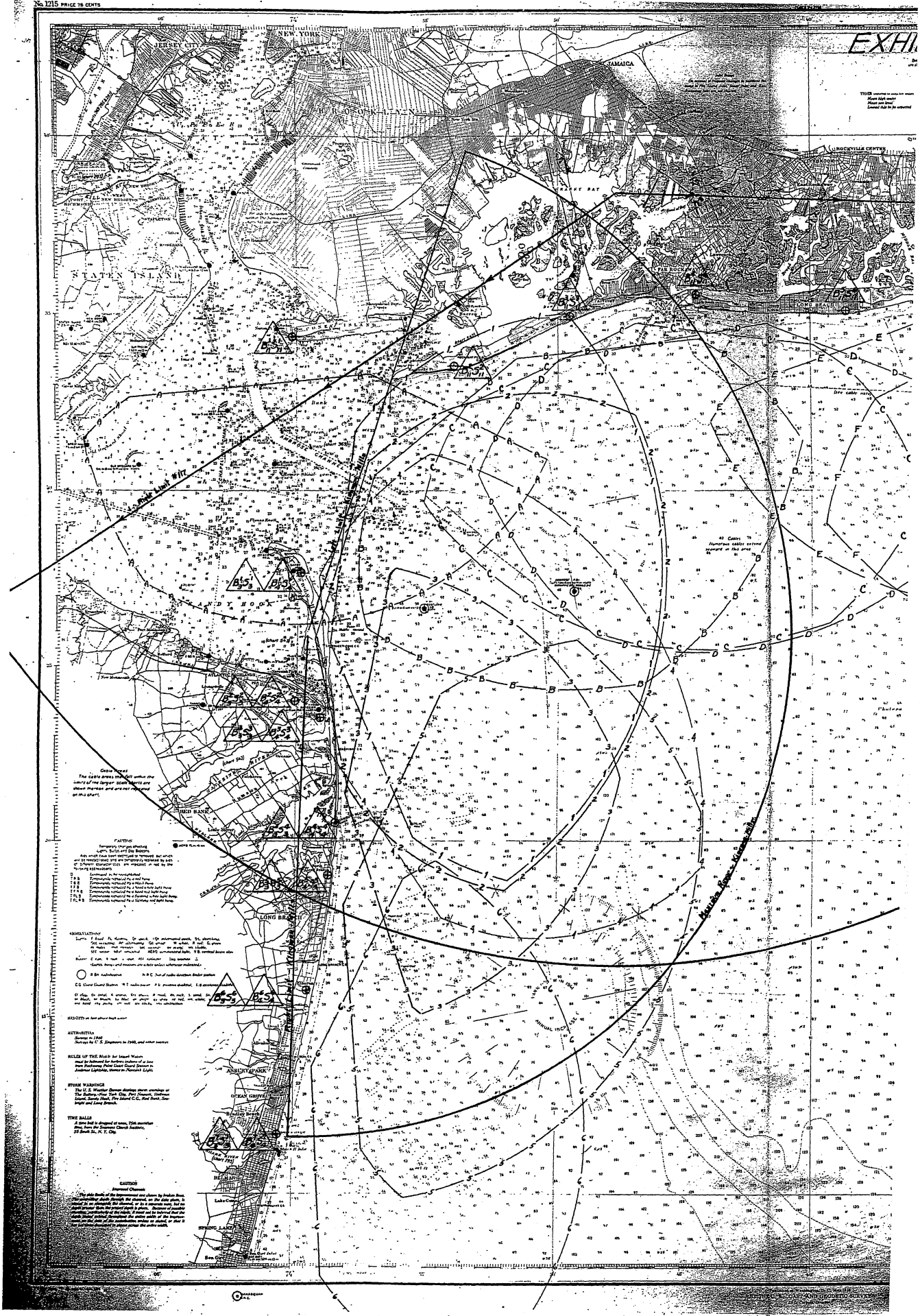
SOUNDINGS IN FEET

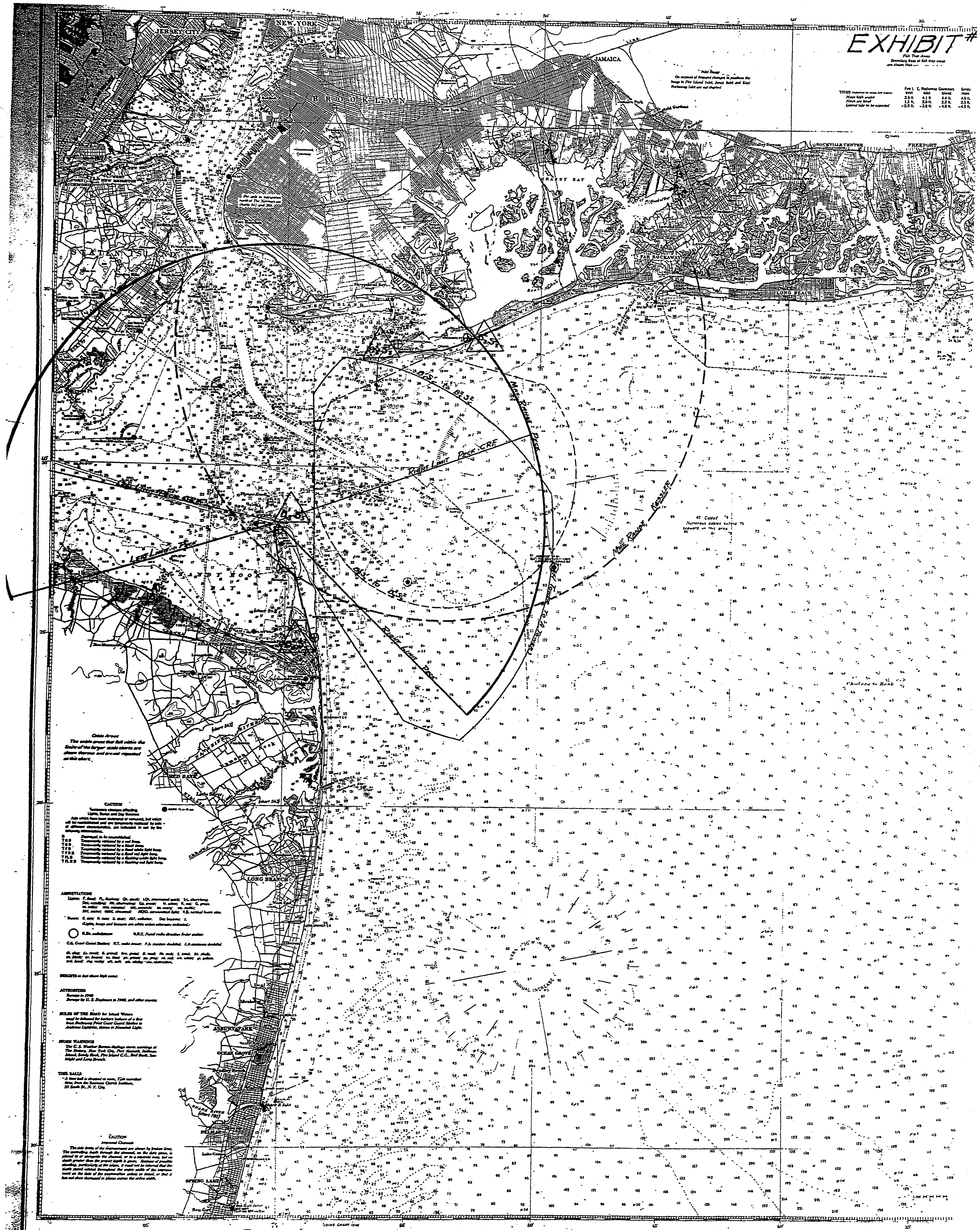
AT MEAN LOW WATER

MAY 31 1941

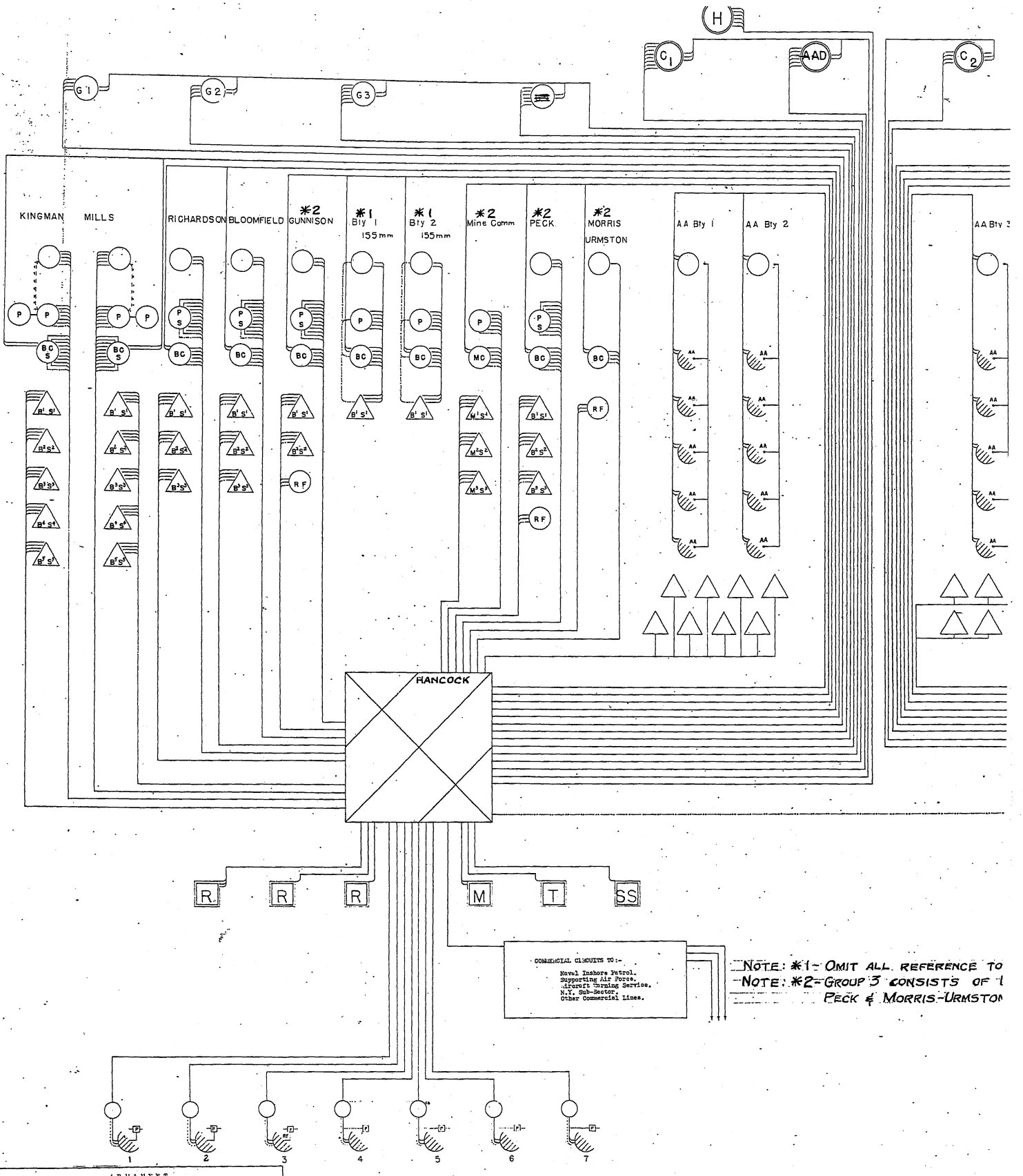
(Fire Island Light to Sea Girt Light) — U.S.C. & G.S. 1215

No. 1215 PRICE 75 CENTS





Published at Washington, D.C., May 1938
BY THE U. S. COAST AND GEODETIC SURVEY
L. O. Colbert, Director.



NOTE: *1- OMIT ALL REFERENCE TO
NOTE: *2- GROUP 3 CONSISTS OF
PECK & MORRIS-URMSTON

ARMAMENT

HARBOR DEFENSES OF SANDY HOOK

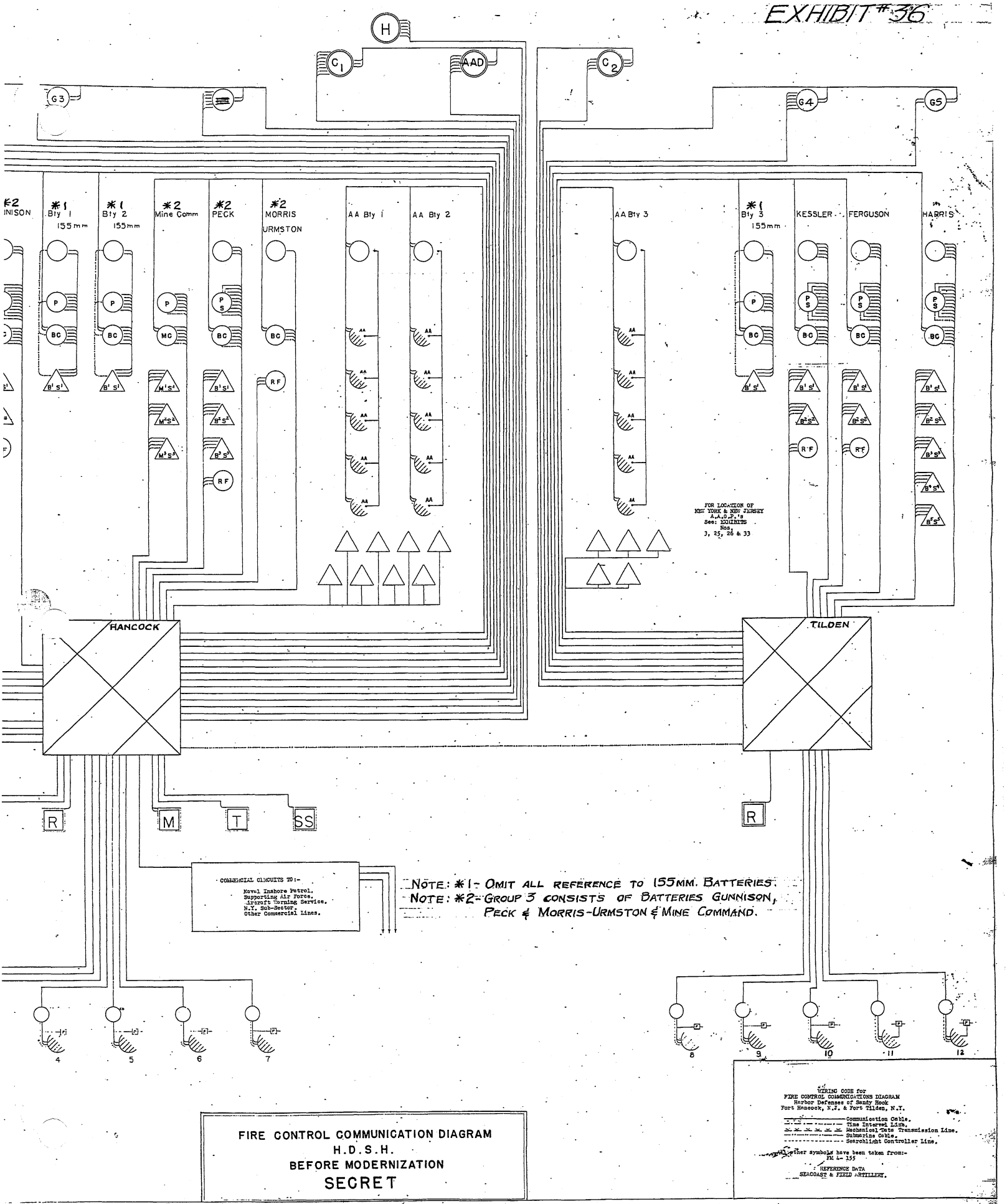
Fort Hancock, N.J. & Fort Tilden, N.Y.

Battery	No. of Guns	Carriage
Kingman	2-12"	B.C.
Mills	2-12"	B.C.
Richardson	2-12"	D.C.
Bloomfield	2-12"	D.C.
Gunnison	2- 6"	D.C.
Peck	2- 6"	Pedestal
Morris & Urmston	4- 3"	Pedestal
155Bty #1	2- 3"	Pedestal
	4-155mm	Mobile

Battery	No. of Guns	Carriage
155Bty #2	4-155mm	Mobile
AA Bty #1	3- 3"	Fixed
AA Bty #2	3- 3"	Fixed
Tilden		
AA Bty #3	3- 3"	Fixed
155Bty #3	4-155mm	Mobile
Kessler	2- 6"	Pedestal
Fergusson	2- 6"	Pedestal
Morris	2-16"	R.C.

FIRE CONTROL COMMUNICATION DIAGRAM
H.D.S.H.
BEFORE MODERNIZATION
SECRET

EXHIBIT #36



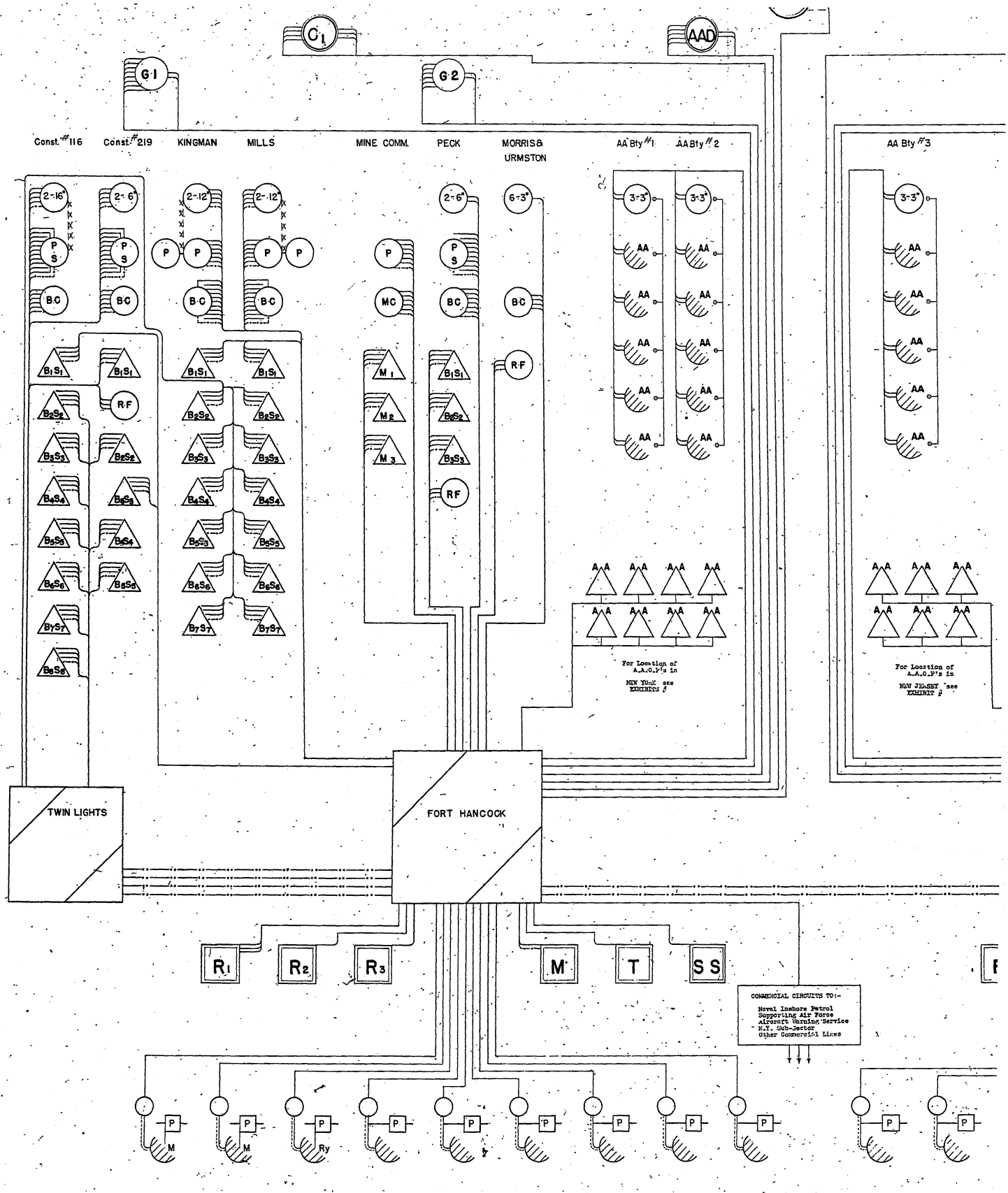
NOTE: #1- OMIT ALL REFERENCE TO 155MM. BATTERIES.
NOTE: #2- GROUP 3 CONSISTS OF BATTERIES GUNNISON, PECK & MORRIS-URMSTON & MINE COMMAND.

WIRING CODE for
FIRE CONTROL COMMUNICATIONS DIAGRAM
Harbor Defenses of Sandy Hook
Fort Hancock, N.J. & Fort Tilden, N.Y.

- Communication Cable.
- Time Interval Light.
- Mechanical Data Transmission Line.
- Submarine Cable.
- Searchlight Controller Line.

Other symbols have been taken from:-
FM 4-155
REFERENCE DATA
SEACOAST & FIELD ARTILLERY.

FIRE CONTROL COMMUNICATION DIAGRAM
H.D.S.H.
BEFORE MODERNIZATION
SECRET



ARMAMENT
HARBOR DEFENSES OF SANDY HOOK

FORT HANCOCK, N.Y.

BATTERY	NO. OF GUNS	CARRIAGE
Const.116	2-16"	B.C.
Const.219	2- 6"	B.C.
Kingman	2-12"	B.C.
Mills	2-12"	B.C.
Peck	2- 6"	Pedestal
Morris & Urmston	4- 3"	Pedestal
	2- 3"	Pedestal
AA Bty #1	3- 3"	Fixed
AA Bty #2	3- 3"	Fixed

FORT TILDEN, N.Y.

BATTERY	NO. OF GUNS	CARRIAGE
AA Bty #3	3- 3"	Fixed
Kessler	2- 6"	Pedestal
Const.220	2- 6"	B.C.
Harris	2-16"	B.C.
Const.117	2-16"	B.C.

FIRE CONTROL COMMUNICATIONS DIAGRAM
FORT HANCOCK & FORT TILDEN
AFTER MODERNIZATION

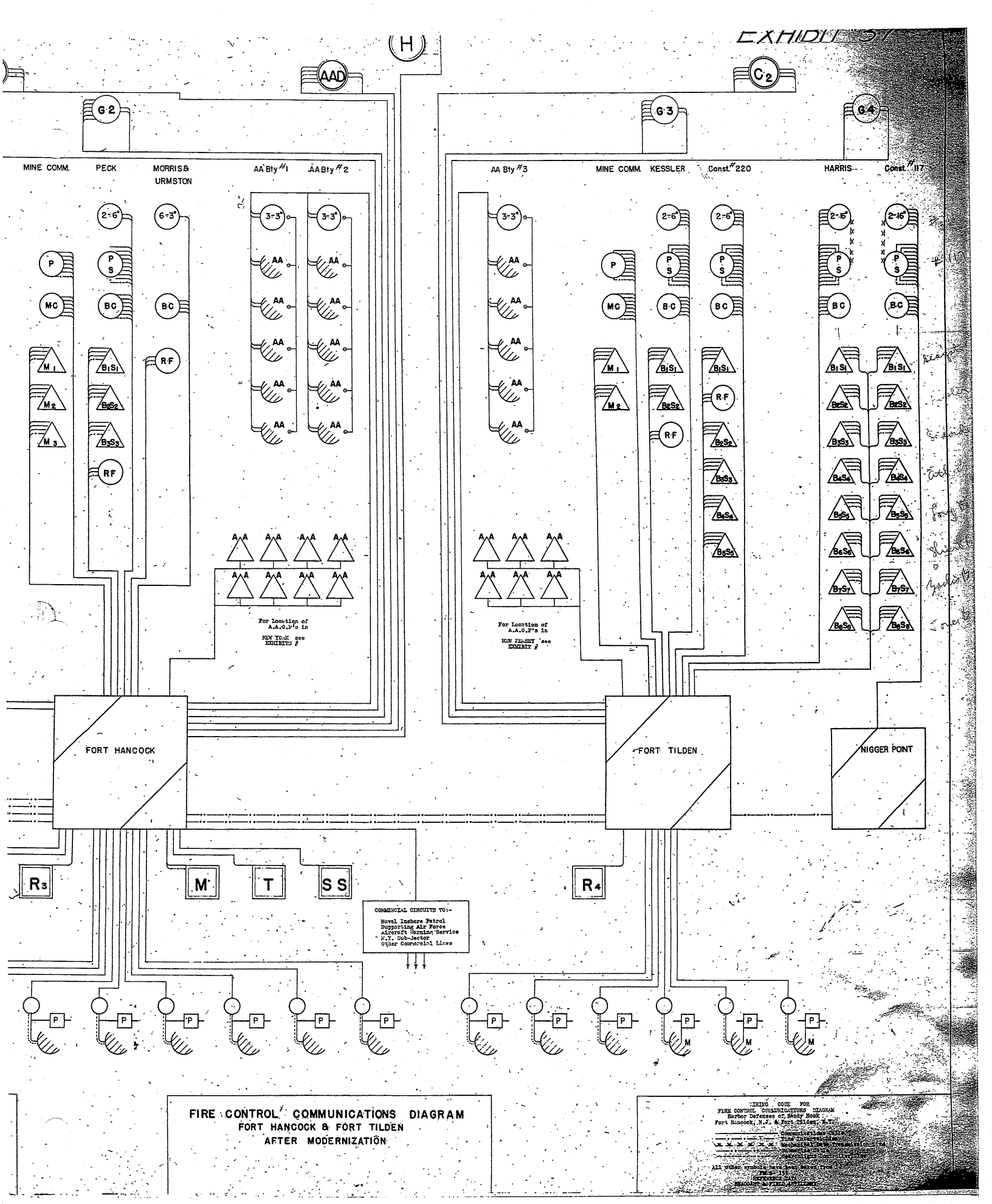
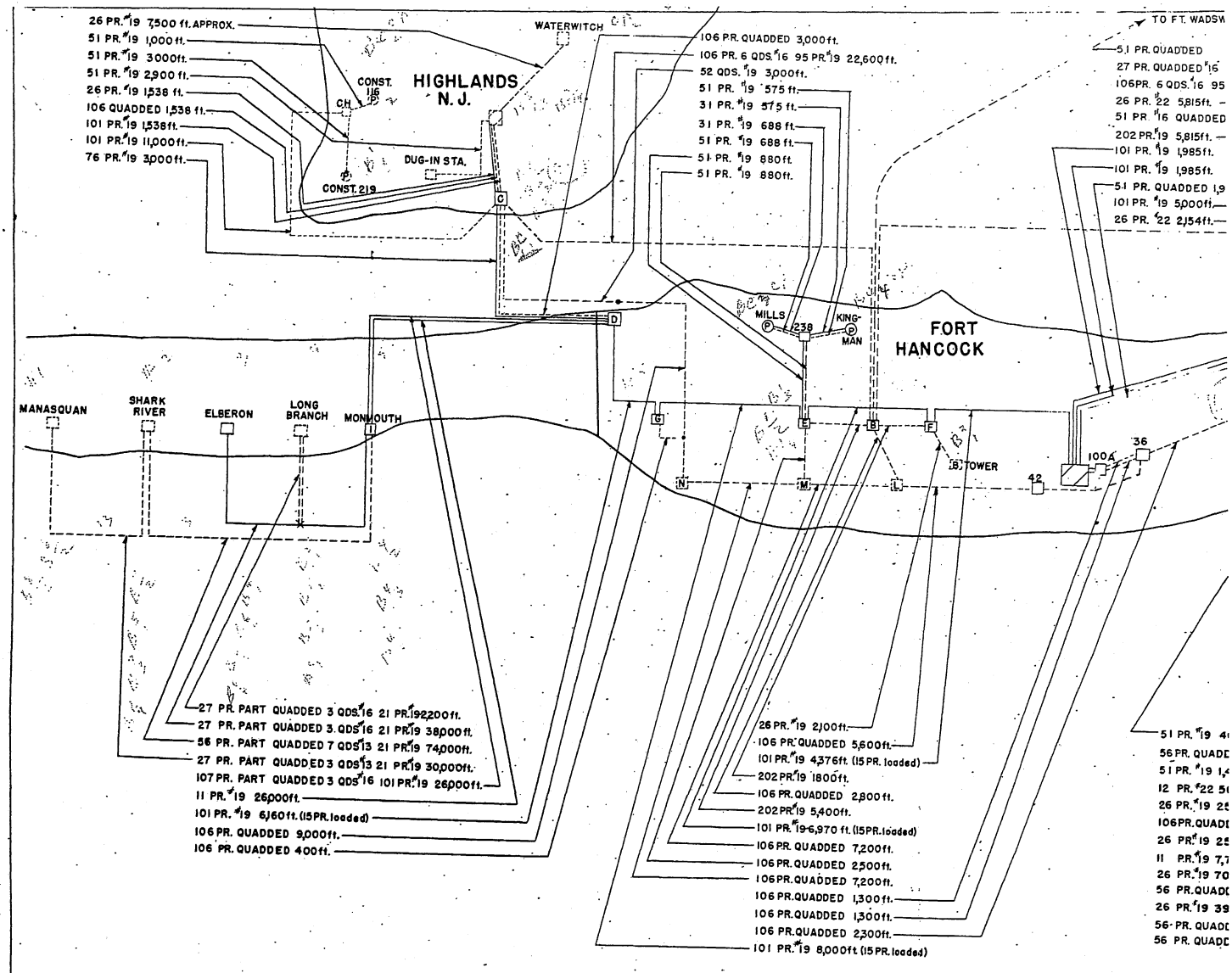


EXHIBIT 57
H
AAD
C2
G-2
G-3
G-4
MINE COMM.
PECK
MORRIS & URMSTON
AA Bty #1
AA Bty #2
AA Bty #3
MINE COMM.
KESSLER
Const. #220
HARRIS
Const. #117
2-6"
6-3"
3-3"
2-16"
P
PS
MC
BC
M1
M2
M3
B1S1
B2S2
B3S3
B4S4
B5S5
B6S6
B7S7
B8S8
RF
AA
For Location of A.A.O.P's in NEW YORK see EXHIBITS
For Location of A.A.O.P's in NEW JERSEY see EXHIBIT
FORT HANCOCK
FORT TILDEN
NIGGER POINT
R3
M
T
SS
R4
COMMERCIAL CIRCUITS TO:-
Naval Inshore Patrol
Supporting Air Force
Aircraft Warning Service
N.Y. Sub-Sector
Other Commercial Lines
P
M
FIRE CONTROL COMMUNICATIONS DIAGRAM
FORT HANCOCK & FORT TILDEN
AFTER MODERNIZATION
WIRING CODE FOR
FIRE CONTROL COMMUNICATIONS DIAGRAM
Harbor Defenses of Sandy Hook
Fort Hancock, N.J. & Fort Tilden, N.Y.

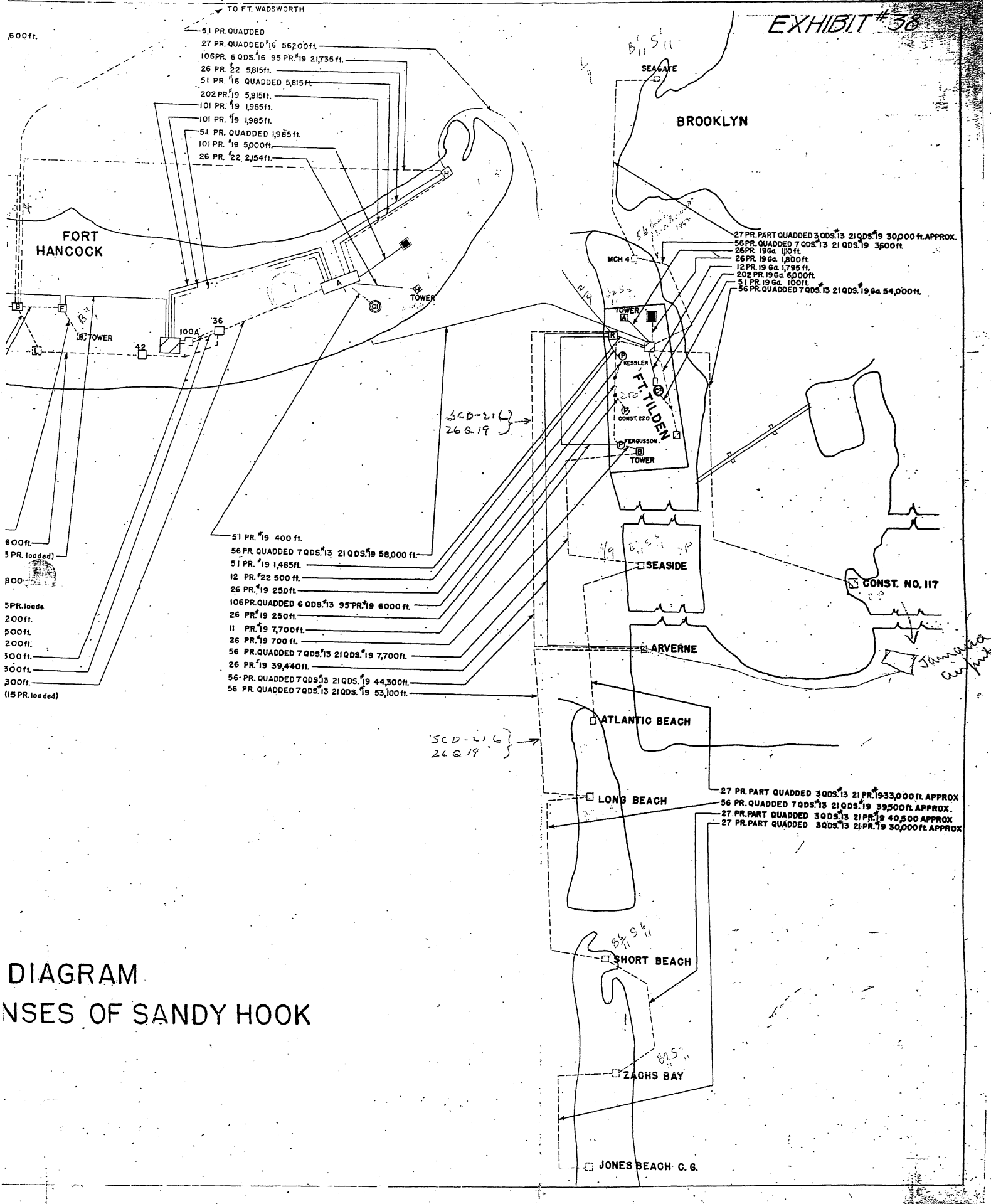


CABLE DIAGRAM
HARBOR DEFENSES OF SANDY HOO

SECRET

SECRET

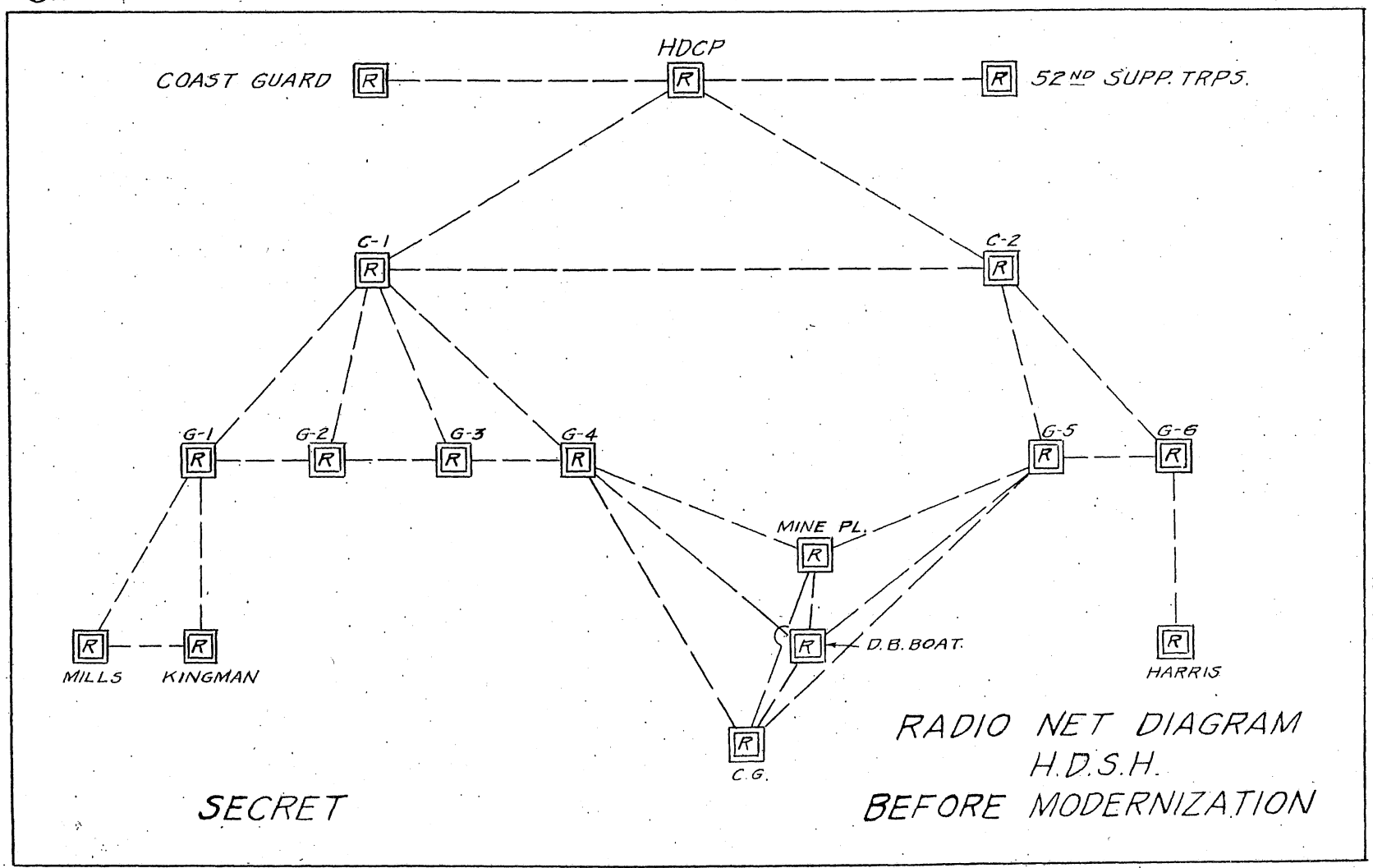
EXHIBIT #38



DIAGRAM

NSES OF SANDY HOOK

SECRET



SECRET

EXHIBIT #39

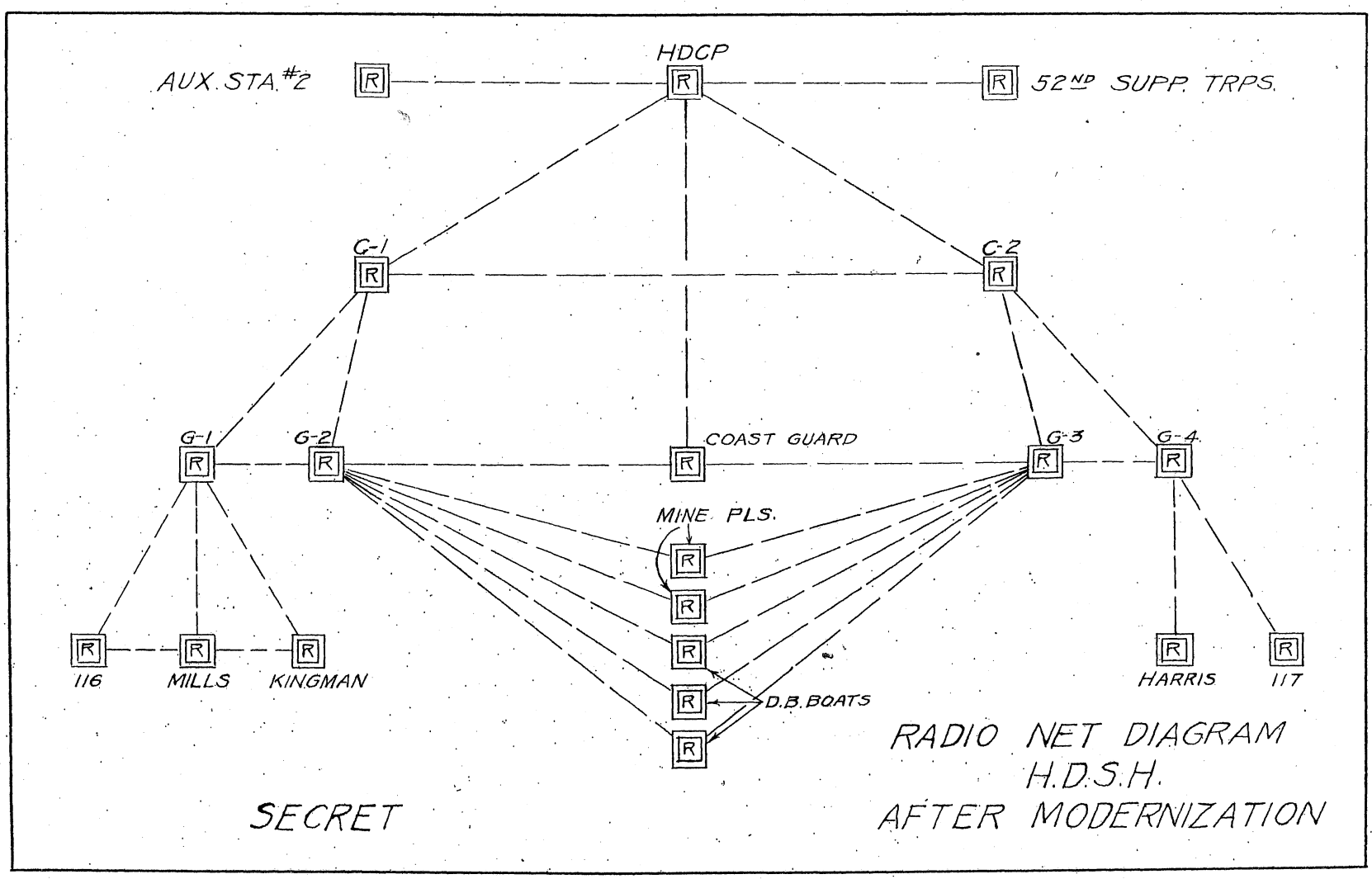

AUX. STA. #2
HDCP
52ND SUPP. TRPS.
C-1
C-2
G-1
G-2
COAST GUARD
G-3
G-4
MINE PLS.
116
MILLS
KINGMAN
HARRIS
117
D.B. BOATS
SECRET
RADIO NET DIAGRAM
H.D.S.H.
AFTER MODERNIZATION

EXHIBIT #40

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Location #1 - Manasquan Exhibit 12	$13,800	$5,000	$	$18,800
		$B_2^8 S_2^8$ Const. #116				
3	11	Engineer: 32' frame Splinter proof steel tank tower, 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingency 1,800 $13,800 Labor 5,000 $18,800				
		Location #2 - Shark River Exhibit 13	13,800	5,000	2,500	21,300
		$B_2^7 S_2^7$ Const. #116 Top level				
		$B_3^7 S_3^7$ Mills bot. level				
		$B_4^7 S_4^7$ Kingman top level				
		$B_1^5 S_1^5$ Const. #219 bot. level				
1	13	Engineer: Splinter proof steel tank tower, 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingency 1,800 $13,800 Labor 5,000 Land 2,500 $21,300				
		Location #3 - Elberon: Exhibit 14	3,470	410		3,880
		$B_2^6 S_2^6$ Const. No. 116 - Top Deck				
		$B_4^6 S_4^6$ Kingman - Middle Deck				
		$B_3^6 S_3^6$ Mills - Bottom Deck				
		$B_1^4 S_1^4$ Const. #219 Bottom Deck				
		A.A.O.P. #1				
1	14	Engineer: 1 Steel tower 3-deck (existing) Provide splinter proofing for tower: Material $3,000 Contingency 450 $3,450 Labor 400 $3,850				

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Engineer (continued) Construct platform for A.A.O.P. Material $ 15 Contingencies 5 $ 20 Labor 10 $ 30				
		Location No. 4 - N. Long Branch: Exhibit 15	$13,800	$5,000	$2,500	$21,300
		$B_1^2S_1^2$ Const. No. 219 - Top Deck				
		$B_2^5S_2^5$ Const. No. 116 - Top Level				
		$B_3^5S_3^5$ Mills - Bottom Level				
		$B_4^5S_4^5$ Kingman - Top Level				
		$B_1^2S_1^2$ Const. 219 - Bottom				
3	12	Engineer: Splinter proof steel tank tower, 2 levels, 2 stations per level (Exhibit 31) to be constructed Material $12,000 Contingency 1,800 $13,800 Labor 5,000 Land 2,500 Total $21,300				
		Location No. 5 - Monmouth Beach Exhibit 16	3,950	650		4,600
		$B_2^4S_2^4$ Const. No. 116 - Top Deck				
		$B_4^4S_4^4$ Kingman - Middle Deck				
		$B_3^4S_3^4$ Mills - Bottom Deck				
		A.A.O.P. #2				
1	15	Engineer: 1 Steel Tower 3-Deck (existing) Provide splinter proofing for tower: Material $3,400 Contingency 510 $3,910 Labor 600 $4,510 Construct trap door in roof of top station with platform for use by A.A.O.P.				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Engineer (Continued) Material $ 35 Contingency 5 $ 40 Labor 50 Total $ 90				
		Location No. 6 - Highlands of Navesink: Exhibit 17	$8,625	$7,500		$16,125
		$B_1^1S_1^1$ Const. No. 219 BC-1 CP and OP CRF Const. No. 219 Plotting Room Const 219				
3	13	Engineer: Concrete structure, manhole bombproof Material $7,500 Contingency 1,125 $8,625 Labor 7,500 Total $16,125 ✓ Land included in cost of Const. No. 116 & 219				
		Location No. 7 - Highlands of Navesink: Exhibit 17 BC-2 Const. No. 116 Plotting Room Const. 116 Engineer: Construct concrete structure in vicinity of battery emplacement. Cost included in construction of battery emplacement.				
		Location No. 8 - Bombproof Stations - Exhibit 17	4,140	4,400	2,150	10,690
		✓ $B_2^3S_2^3$ Const. No. 116 - Top Deck South Station ✓ $B_3^3S_3^3$ Mills - Bottom Deck - South Station ✓ $B_4^3S_4^3$ Kingman - Bottom Deck - North Station Group 1 CP & OP - Top Deck North Station Harbor Defense OP (auxiliary)				

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
1	16	Engineer: Concrete Dug-in Station Material $3,600 Contingencies 540 $ 4,140 Labor 4,400 Land 2,150 Total $10,690 NOTE: $6,000 for construction of dug-in stations and $2,150 for land was allocated under ltr OCCA (111/IB 15A) dated 2-18-41, subject "Expenditure Program, Seacoast Defense Funds, HDSH." Original plans for dug-in stations do not provide for Group CP & OP. Design should be altered to provide for two double stations one of which is to include the command and observation post of Group 1.				
		Location No. 9 - Twin Lights Lighthouse Reservation: Exhibit 18	$1,760	$ 880		$ 2,640
		a. $B^{3}_{13} S^{3}_{13}$ Richardson - South Tower				
		b. $B^{3}_{14} S^{3}_{14}$ Bloomfield - North Tower				
2	2	Engineer: a. Modification south tower Material $780 Contingencies 100 $880 Labor 440 Total $1,320				
2	3	b. Modification north tower Material $780 Contingencies 100 $880 Labor 440 Total $1,320 NOTE: $2,640 was allocated for modification of Twin Lights (north and south towers) under ltr OCCA (111/IB 15-A), dated 2-18-41, subject: "Expenditure Program, Seacoast Defense Funds, HDSH."				
		c. Fire Control Swbd No. 2 and Radio No. 2: Exhibit 17	19,250	17,600		36,850
3	14	Engineer: Construction of bombproof station complete with power, lighting, heat, water and sewerage.				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Engineer (continued) Material $17,500 Contingencies 1,750 $19,250 Labor 17,600 Total 36,850				
		Location No. 10 - Waterwitch Tower Exhibit 17	$13,800	$5,000	$4,000	$22,800
		B^{I} & $B^{2}_{2}S^{2}_{2}$ Const. No. 116 - Top Level $B^{2}_{4}S^{2}_{4}$ Kingman - Bottom Level $B^{2}_{3}S^{2}_{3}$ Mills - Bottom Level				
1	17	Engineer: Splinter proof steel tank tower 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingencies 1,800 $13,800 Labor 5,000 Land, $\frac{1}{4}$ acre 4,000 Total $22,800				
		Location No. 11 - Fort Hancock: Exhibit 18				
		a. Tower "A" - single deck station $B^{2}_{5}S^{2}_{5}$ Battery Peck Engineer: Steel tower single deck 60' No requirements.				
		b. Fire Control Switchboard Room No. 3: Emplacement of Battery Mills. RECOMMENDED FOR ELIMINATION FROM PROJECT.				
		c. Group of Secondary Stations: Exhibit 19. $B^{2}_{5}S^{2}_{5}$ Peck $B^{2}_{16}S^{2}_{16}$ Granger (non-project) $B^{2}_{13}S^{2}_{13}$ Richardson $B^{2}_{14}S^{2}_{14}$ Bloomfield				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Location No. 11 - Fort Hancock: Exhibit 18 (continued)				
		Engineer: (3 frame buildings) No requirements.				
		f. Tower "B" - Exhibit 19	$13,800	$5,000		$18,800
		$B^{3}_{1}S^{3}_{1}$ Top Level				
		HD OP Auxiliary Bot. Level				
		Const. #218 Top Level				
1	18	Engineer: Splinter proof steel tank tower 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000; Contingencies 1,800 $13,800; Labor 5,000; Total $18,800				
		g. Tower "E" - Exhibit 20	3,950	650		4,600
		$B^{1}_{2}S^{1}_{2}$ Const. No. 116 - Top Deck				
		$B^{1}_{4}S^{1}_{4}$ Kingman - Middle Deck				
		$B^{1}_{3}S^{1}_{3}$ Mills - Bottom Deck				
		M^{2} Mine Command - Bottom Deck				
		A.A.O.P.				
1	19	Engineer: 1 Steel tower 100' 3-deck (existing) Provide splinter proofing for tower: Material $3,400; Contingencies 510 $3,910; Labor 600; Total $4,510				
		Construct trap door in roof of top station with platform for use by A.A.O.P. Material $35; Contingencies 5 $40; Labor $50; Total $90				
		h. CRF Gunnison - Exhibit 20	575	425		1,000
2	4	Engineer: Complete construction of CRF Station.				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	ENGINEER MIL	ENGINEER LAB	ENGINEER LAND	TOTAL
		Location No. 11 - Fort Hancock: Exhibit 20 (continued)				
		h. CRF Gunnison - Exhibit 20				
		Engineer (cont'd) Complete construction of CRF Station Material - $ 500 Contingencies $ 75 $575 Labor $425 Total $1,000				
		NOTE: Base for this station has been constructed but no shelter has been provided.				
		i. Harbor Defense Command Post: Exhibit 20	$52,430	$54,045		$106,475
		In corridors and magazines of abandoned mortar batteries McCook-Reynolds Fire Control Switchboard Post Telephone Switchboard (Auxiliary) Harbor Defense CP Antiaircraft Defense CP Liaison to supporting forces HD Radio Station No. 3.				
3	15	Engineers: 1. Bombproof four abandoned mortar pits. Material - $39,200 Contingencies $ 5,890 $45,090 Labor $53,000 Total $98,090				
1	20	2. Procure and install one 25 KVA engine driven power plant (emergency power supply) Material - $ 5,500 Labor $ 385 $ 5,885				
		Provide soundproofing for rooms of H.D. C.P. Material - $ 1,600 Contingencies $ 240 $ 1,840 Labor $ 660 Total $ 2,500				
		3. Heating plant 4. Latrine and Sewerage 5. Modification of magazines and corrdors.				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	ENGINEER MTL	ENGINEER LAB	ENGINEER LAND	TOTAL
		Location No. 13 - Fort Hancock Exhibit 20 (cont'd) i. Engineer: (cont'd) 6. Power and light wiring. 7. Air conditioning units for ventilation and gas proofing NOTE: The sum of $8,000 has been allotted in accordance with letter, Chief of Coast Artillery, dated 2-18-41, subject, "Expenditure Program, Seacoast Defense Funds, HD of SH." Work has been started on rehabilitation of magazines and corridors of abandoned mortar batteries McCook-Reynolds by the Engineers. j. Tower "F" - Exhibit 20 Harbor Defense OP AAD OP Engineer: 1 Steel tower 50' Single Deck (existing) No requirements. k. Radio Station: Exhibit 20 Tactical and administrative radio. HD of SH A one-story concrete bldg. No requirements. l. Tower "G": Exhibit 20 Searchlight Commander Engineer: 1 Steel tower 50' (existing) two-deck No requirements.				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Location No. 11 - Fort Hancock:				
		m. Old Potter Emplacement: Exhibit 20	$7,675	$5,700	$	$13,375
		$B^{1}_{12}S^{1}_{12}$ Gunnison - On top of Emplacement				
		$B^{1}_{5}S^{1}_{5}$ Peck - On top of Emplacement				
		Group 2 CP and OP - On top of Emplacement				
		$B^{1}_{16}S^{1}_{16}$ Granger - On top of Emplacement				
		Groupment C-1 OP - On top of Emplacement Groupment C-1 CP - In magazines of Emplacement.				
1	24	Engineer: Bombproof gun wells of old lift battery Provide splinter proof entries Material $4,000 Contingencies 600 $4,600 Labor 3,500 Total $8,100				
1	22	Rehabilitate magazines and corridors Resurface floors Material $500 Contingencies 75 $ 575 Labor 1,000 Total $1,575				
1	23	Scrape walls and refinish Material $250 Contingencies 40 $290 Labor 200 Total $490				
1	21	Provide Heating Plant Material $1,250 Contingencies 185 $1,435 Labor 400 Total $1,835				
1	25	Latrine, water supply and sewerage Material $330 Contingencies 100 $430 Labor 300 Total $730				

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MIL	LAB	LAND	TOTAL
		Location No. 11 - Fort Hancock				
		m. Old Potter Emplacement (cont'd)				
		Engineer (cont'd)				
1	26	Revision of lighting system Material $ 300 Contingencies 45 $ 345 Labor 300 Total $ 645				
		n. Tower "H": Single deck station Exhibit 20	→ This tower relocated to Ft. Tilden for use as HECP signal station at cost of $4,200 665 (New York) CM 39759			
		$B^1_{13}S^1_{13}$ Richardson (before modernization)				
		$B^1_{14}S^1_{14}$ Bloomfield (before modernization)				
		$B^1_5S^1_5$ Peck (after modernization)				
		Engineer: 1 Steel Tower 50' Single Deck (existing)				
		No requirements.				
		o. Tower "1": Exhibit 20.				
		M-3 Station Group 2 OP (Present Group 3 OP)				
		Engineer: 1 Steel Tower 50' Single Deck (existing)				
		No requirements.				
		r. Mine Casemate: Exhibit 20 Mine Command Post Mine Plotting Room Mine Operating Room	$6,900	$6,000		$12,900
1	27	Engineer: Bombproof Mine Casemate Provide splinter proof entries Material $6,000 Contingencies 900 $6,900 Labor 6,000 Total $12,900				
		s. M-1 Station: Exhibit 20 M-1 Observing Station	125	75		200

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Location No. 11 - Fort Hancock				
		s. M-1 Station: Exhibit 20(Contd)				
		Engineer: Two-story frame structure (existing)				
1	28	Provide connection to post lighting system Material $ 110 Contingencies 15 $ 125 Labor 75 Total $ 200				
		t. Old Postal Telegraph Tower: Exhibit 5.	$1,000	$500		$1,500
		Harbor Defense Signal Station				
1	29	Engineer: Build platform at upper level of tower Rehabilitate interior of tower Material $ 750 Contingencies 250 $1,000 Labor 500 Total $1,500				
		Location No. 12 - Sea Gate Exhibit 21	13,800	5,000	2,500	21,300
		$B_9^1 S_9^1$ Harris Top Level				
		$B_{11}^1 S_{11}^1$ Const. No. 117 Top Level				
		Const. No. 218 Bot. Level SMV				
1	30	Splinter proof steel tank tower 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingencies 1,800 $13,800 Labor 5,000 Land 2,500 Total $21,300 ✓				
		Location No. 13 - a&b - Point of Rockaway: Exhibit 22	14,500	5,700	3,000	23,200
		M-4 Station - Bottom Level				
		$B_8^1 S_8^1$ Kessler - Top Level				
		Const. No. 218 Top Level				
1	31	Engineer:				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	ENGINEER MTL	ENGINEER LAB	ENGINEER LAND	TOTAL
		Location No. 13 - Point of Rockaway: Exhibit 22 (cont'd)				
		Engineer (cont'd)				
		Splinter proof steel tank tower 2 levels, 2 stations per level, (Exhibit 31) to be constructed: Material - $12,000; Contingencies $ 1,800 $13,800; Labor $ 5,000; Total $18,800				
1	32	* 2 Cable Huts to be constructed Material - $ 700; Labor $ 700 $ 1,400; Land, 2 plots, 50'x50' $ 3,000; Total $ 4,400				
		* $1,400 held in deferment, letter OCCA (111-IB-15A) 2-18-41, Subject: Expenditure Program, Seacoast Defense Funds, HD of SH."				
		Location No. 14 - Fort Tilden Reservation:				
		a. Mine Casemate: Exhibit 23	$39,100	$35,900		$75,000
		Mine Command Mine Plotting Room Mine Operating Room				
1	33	Engineer: * Casemate - Concrete cottage type structure Material $34,000; Contingencies $ 5,100 $39,100; Labor $35,900; Total $75,000				
		* $75,000 being held on deferred basis pending approval of submarine mine project, letter OCCA (111-IB-15A) 2-18-41, Subject: "Expenditure Program, Seacoast Defense Funds HD of SH."				

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	ENGINEER MTL	ENGINEER LAB	LAND	TOTAL
		Location No. 14 - Fort Tilden Reservation				
		b. Tower "A"; Exhibit 23	$3,910	$ 600		$4,510
		B_9^I — op				
		$B_9^2 S_9^2$ Harris Top Deck				
		$B_{11}^2 S_{11}^2$ Const. 117 Mid Deck				
		$B_{10}^1 S_{10}^1$ Const. 220, Bot. Deck				
		M-5 Station - Bottom Deck				
		Engineer: Steel Tower 100'; 3-Deck (existing)				
1	34	Provide splinter proffing for tower Material - $ 3,400 Contingencies $ 510 $ 3,910 Labor $ 600 Total $ 4,510				
		c. Fire Control Swbd - Radio Station - Plotting Room Harris - Post Telephone Swbd (Auxiliary) Exhibit 23.	$14,195	$8,600		$22,795
1	35	Engineer: Enlarge present bombproof structure to provide for housing seacoast director Material - $10,000 Contingencies $ 1,500 $11,500 Labor $ 8,000 Total $19,500				
		Procure and install air conditioning equipment Material - $ 2,200 Contingencies $ 495 $ 2,695 Labor $ 600 Total $ 3,295				
		f. Groupment CP: Exhibit 23	$10,650	$3,390		$14,040
		Groupment C-2 CP				
1	36	Engineer: Construct bombproof structure Material - $ 3,960 Contingencies $ 1,190 $ 5,150 Labor $ 3,000 Total $ 8,150				

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MIL	LAB	LAND	TOTAL
		Location No. 14 - Fort Tilden Reservation:				
		f. Groupment CP: Exhibit 23				
1	37	Engineer (cont'd) Procure and install one 25 KVA engine driven alternator Material $5,500 Labor 390 $5,890				
		i. Tower "B": Exhibit 23	$13,800	$5,000		$18,800
		C 2 OP Top Level				
		$B_8^2 S_8^2$ Kessler - Top Level				
		G 3 CP and OP - Bot. Level				
		Searchlight - Bot. Level				
1	38	Engineer: Splinter proof steel tank tower 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingencies 1,800 $13,800 Labor $ 5,000 Total $18,800				
		Location No. 15 - Tower "E" - Seaside, L.I.: Exhibit 24	$13,800	$5,000	$2,500	$21,300
		$B_9^3 S_9^3$ Harris Top Level				
		$B_{11}^3 S_{11}^3$ Const. No. 117 Top Level				
		B_{11}^1 Const. No. 117 Top Level				
		$B_{10}^2 S_{10}^2$ Const. 220 Bot. Level				
		Const. 218 Bot. Level				
1	39	Engineer: Splinter proof steel tank tower 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingencies 1,800 $13,800 Labor $ 5,000 Land, 50' x 50' $ 2,500 Total $21,300				

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Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Location No. 16 - Plotting Room Const. No. 117: Exhibit 25				
3	16	Engineer: Cost included in the cost of emplacement for Const. 117				
		Location No. 17 - Arverne Tower: Exhibit 24	$3,950	$650		$4,600
		Group 4 CP & OP, Top Deck				
		A.A.O.P.				
1	40	Engineer: 1 Steel tower 100' 3-Deck (existing) Provide splinter proofing for tower Material $3,400 Contingencies 510 $3,910 Labor $ 600 Total $4,510				
1	41	Construct trap door in roof of station with platform for use by A.A.O.P. Material $ 35 Contingencies 5 $ 40 Labor $ 50 Total $ 90				
		Location No. 18 - Atlantic Beach Exhibit 26	$13,800	$5,000	$2,500	$21,300
		$B^4_9 S^4_9$ Harris - Top Level				
		$B^4_{11} S^4_{11}$ Const. No. 117 - Top Level				
		$B^3_{10} S^3_{10}$ Const. No. 220 - Bot. Level				
1	42	Engineer: Splinter proof steel tank tower 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingencies 1,800 $13,800 Labor $ 5,000 Land, 50' x 50' 2,500 Total $21,300				
		Location No. 19 - Long Beach Tower: Exhibit 27	$4,370	$800		$5,170
		$B^5_9 S^5_9$ Battery Harris - Top Deck				
		$B^5_{11} S^5_{11}$ Const. No. 117 - Mid. Deck				
		$B^4_{10} S^4_{10}$ Const. No. 220 - Bot. Deck				

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Location No. 19 - Long Beach Tower: Exhibit 27 (cont'd)				
1	43	Engineer: 1 Steel Tower 100' Single Deck (existing) Add two decks Material $800 Contingencies 120 $ 920 Labor 400 Total $1,320 Provide splinter proofing for tower Material $3,000 Contingencies 450 $3,450 Labor 400 Total $3,850				
		Location No. 20 - Short Beach, L.I.: Exhibit 28	$13,800	$5,000	$2,500	$21,300
		$B^{6}_{9}S^{6}_{9}$ Battery Harris - Top Level $B^{6}_{11}S^{6}_{11}$ Const. No. 117 - Top Level $B^{5}_{10}S^{5}_{10}$ Const. No. 220 - Bot. Level				
1	44	Engineer: Splinter proof steel tank tower 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingencies 1,800 $13,800 Labor 5,000 Land 50'x50' 2,500 $21,300				
		Location No. 21 - Zachs Bay, L.I. Exhibit 29	13,800	5,000		18,800
		$B^{7}_{9}S^{7}_{9}$ Battery Harris - Top Level $B^{7}_{11}S^{7}_{11}$ Const. No. 117 - Bot. Level				
1	45	Engineer: Splinter proof steel tank tower 2 levels, 2 stations per level (Exhibit 31) to be constructed: Material $12,000 Contingencies 1,800 $13,800 Labor 5,000 Total $18,800				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ENGINEER COST - BY LOCATION H.D. of Sandy Hook

Paragraph No. 20a

PRIORITY	ITEM	DESCRIPTION	MTL	LAB	LAND	TOTAL
		Location No. 22 - Jones Beach, L.I. Coast Guard Station: Exhibit 30	$13,800	$5,000	-	$18,800
		$B^{8}_{9}S^{8}_{9}$ Harris - Top Level				
		$B^{8}_{11}S^{8}_{11}$ Const. No. 117 - Bot. Level				
1	46	Engineer: 1 Splinter proof steel tank tower 2 levels, 2 stations per level (See Exhibit 31) to be constructed: Material $12,000; Contingencies 1,800 = $13,800; Labor 5,000; Total $18,800				

SECRET

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ORDNANCE & SIGNAL COST — H. D. of Sandy Hook

Paragraph 20a (1) — BY LOCATION

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Location No. 8 - Manhole Bombproof Stations - Exhibit 17	$ 6,750	$ 410	$ 100	$ 7,260
		$B_2^3S_2^3$ Const. No. 116 - Top Deck - South Station $B_3^3S_3^3$ Mills - Bottom Deck - South Station $B_4^3S_4^3$ Kingman - Bottom Deck - North Station Group 1 CP and OP - Top Deck North Station Harbor Defense OP (Auxy)				
1	47	Ordnance: (For Group 1) 1 DPF M1 Class 3 $4,500 * 2 Azimuth Instr. 2,250 $6,750 * Under procurement FY 1940				
1	48	Signal: (For Group 1) 7 Telephones EE-91 $210 4 Headsets HS-17A 100 3 Handsets TS-12A 36 1 Bell TI MC-153 11 Contingencies 53 $410 Labor 100 Total $510				
		Location No. 9 - Twin Lights Lighthouse Reservation: Exhibits 17 & 18		18,790	3,000	21,790
		c. Fire Control Switchboard No. 2 and Radio No. 2: Exhibit 17				
3	17	Signal: 6 Swbd units BD-74 $7800 2 Panels Distr. BD-75 250 1 30-volt 300 amp. storage battery 350 1 TI apparatus EE-86 300 1 Wire chiefs test set 250 2 Rectifiers 150 1 Telephone wall EE-91 30 1 Handset TS-12A 12 1 Telephone post 20 1 Swbd BD-65 (power panel) 330 1 Radio Collins 32RA Transmitter 4800 1 Radio SCR 281 A 500				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ORDNANCE & SIGNAL COST — H. D. of Sandy Hook

Paragraph 20a (1) — BY LOCATION

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Location No. 9 - Twin Lights (Contd)				
		Material $ 14792 Contingencies 3998 $18,790 Labor 3,000 $21,790				
		Location No. 11 - Ft Hancock: Exhibit 19	$ 1,125	$ 110	$ 40	$ 1,275
		f. Tower "B", Exhibit 19 $B^3_1 S^3_1$ Const 220 Cons 218 HD OP Auxiliary				
1	49	Ordnance: (HDOP Auxiliary) 1 Azimuth instr. $1,125				
1	50	Signal: HD OP Auxiliary 2 Telephones EE-91 $60 1 Headset HS-17A 25 1 Handset TS-12A 12 Contingencies 13 $110 Labor 40 Total $150				
		i. Harbor Defense Command Post:	$	$10,235	$ 1,125	$ 11,360
1	51	Signal: (HD CP & AAD) 25 Telephones EE-91 $750 25 Headsets HS-17A 625 10 Handsets TS-12A 120 6 Telephones Post 120 1 Annunciator System 25 1 Public Address System 10 stations 150 1 Swbd cordless BD-95 for AAD 300 2 Swbds BD-95 for Message Center 600 4 Switch key sets BD-60 40 Material 2730 Contingencies 410 $3140 Labor 350 Total $3490				

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ORDNANCE & SIGNAL COST — H. D. of Sandy Hook

Paragraph 20a (1) — BY LOCATION

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Location No. 11 - Fort Hancock (Contd)				
1	52	Signal: (Radio Station #3) 1 Radio Collins 32RA Transmitter $4800 Contingencies 800 5600 Labor 650 Total $6250				
1	53	Signal: (F.C. swbd #1) 1 Swbd unit BD-74 $1300 Contingencies 195 1495 Labor 125 Total $1620				
		j. Tower "F": Exhibit 20 Harbor Defense OP AAD OP	$ 2,825	$ 162	$ 10	$ 2,997
1	54	Ordnance: 1 Azimuth Instr. $1125 1 Telescope BC AA M1 1700 $2825				
1	55	Signal: * 2 Telephones EE-91 $60 * 1 Headset HS-17A 25 1 Handset TS-12A 12 1 Telephone EE-8 30 1 Headset HS-19 14 Contingencies 21 $162 Labor 10 Total $172 * Approved in original project but not received.				
		l. Tower "G" - Exhibit 20 Searchlight Commander		342		342
1	60	Signal: 1 Swbd Cordless 20-line BD-95 $300 1 Telephone EE-91 30 1 Headset TS-12A 12 $342				
		m. Old Potter Emplacement: Exhibit 20	2,250	1,464	200	3,914
1	61	Signal: (Groupment (C-1)) 2 Swbds BD-95 $600 9 telephones EE-91 270 8 Headsets HS-17A 200 1 Handset TS-12A 12				

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ORDNANCE & SIGNAL COST — H. D. of Sandy Hook

Paragraph 20a (1) — BY LOCATION

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Location No. 11 - Fort Hancock (Contd)				
		Contingencies $189 $1,271 Labor 200 Total $1,471				
1	62	Ordnance: (Group 2 (Present)) 2 Azimuth Instr. $2,250				
1	63	Signal: (Group 2 (present)) 4 Telephones EE-91 $120 2 Headsets HS-17A 50 1 Handset TS-12A 12 1 Bell TI MC-153 11 $193				
		o. Tower "I" - Exhibit 20 M-3 Station Group 2 OP (Present Group 3 OP)	$ 1,125	$ 63	$ 10	$ 1,198
1	64	Ordnance: (Group 2 (OP)) 1 Azimuth Instr. $1,125				
1	65	Signal: (Group 2 (OP)) 1 Telephone EE-91 $30 1 Headset HS-17A 25 Contingencies 8 $63 Labor 10 Total $73				
		s. M-1 Station: Exhibit 20 M-1 Observing Station		121		121
1	66	Signal: 2 Telephones EE-91 $60 2 Headsets HS-17A 50 1 Bell TI MC-153 11 $121				
		t. Old Postal Telegraph Tower: Exhibit 5		255	45	300
1	67	Signal: 2 Telephones EE-91 $60 2 Handsets TS-12A 24 840' 10-pr cable WC-364 126 Contingencies 45 $255 Labor 45 Total $300				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ORDNANCE & SIGNAL COST — H. D. of Sandy Hook

Paragraph 20a (1) — BY LOCATION

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Location No. 13 - Fort Tilden	$ 5,625	$ 136	$ 5	$ 5,766
		Exhibit 22 M-4 Station - Bottom Level $B^1_8S^1_8$ Kessler - Top Level Const 218 - Top Level				
1	68	Ordnance: M-4 Station 1 DPF M1 Class 1 $4,500 1 Azimuth instr. 1,125 $5,625				
1	69	Signal: M-4 Station * 2 Telephones EE-91(M4) $60 * 2 Headsets HS-17A (M4) 50 * 1 Bell TI MC-153 (M4) 11 Contingencies 15 136 Labor 5 Total $141 * Funds in the amount of $170 held on deferred basis pending approval of submarine mine defense. Letter OCCA (111/IB-15A) 2-18-41, Subject: "Expenditure Program, etc."				
		Location No. 14 - Fort Tilden Reservation:				
		a. Mine Casemate - Exhibit 23 Mine Command Post Mine Plotting Room Mine Operating Room		850	25	875
1	70	Signal: 13 Telephones EE-91 $390 10 Headsets HS-17A 250 4 Handsets TS-12A 48 1 Switch keyset EE-79 30 2 Bells TI MC-153 22 Contingencies 110 $850 Labor 25 Total $875				
		b. Tower "A": Exhibit 23 B^I Harris - Top Deck $B^1_9S^1_9$ Harris - " " $B^1_{10}S^1_{10}$ Const. No. 220 - Bottom Deck $B^1_{11}S^1_{11}$ Const. No. 117 - Middle Deck M-5 Station - Bottom Deck	1,125	139	10	1,274

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ORDNANCE & SIGNAL COST — H. D. of Sandy Hook

Paragraph 20a (1) — BY LOCATION

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Location No. 14 - Fort Tilden (Contd)				
1	71	Ordnance: 1 Azimuth Instr.(M-5) $1125				
1	72	Signal: * 2 Telephones EE-91(M5) $60 * 2 Headsets HS-17A (M5) 50 * 1 Bell TI MC-153 11 Contingencies 18 $139 Labor 10 Total $149 * Funds in the amount of $170 held pending approval of submarine mine Defense - letter OCCA (111/IB-15A) 2-18-41, Subject: "Expenditure Program, Seacoast Defense Funds HDSH."				
		g. Groupment CP: Exhibit 23 Groupment C-2 CP		$7,260	$ 150	$ 7,410
1	73	Signal: 1 Radio Collins 32RA Transmitter $4800 1 Radio SCR 281A 500 12 Telephones EE-91 360 12 Headsets HS-17A 300 4 Handsets TS-12A 48 1 Swbd Cordless BD-95 300 Contingencies 952 7260 Labor 150 Total $7410				
		j. Tower "B": Groupment (C-2) OP - Top Level B$\frac{2}{8}$S$\frac{2}{8}$ Kessler - Top Level Group 3 CP & OP - Bottom Level Searchlight - Bottom Level	10,125	765	450	11,340
1	74	Ordnance: 1 DPF M1 Class 1(C-2) $4500 2 Azimuth Instr.(C-2) 2250 2 Azimuth Instr.(G-3) 2250 1 Azimuth Instr. S/L Officer 1125 $10,125				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: ORDNANCE & SIGNAL COST H. D. of Sandy Hook

Paragraph 20a (1) BY LOCATION

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Location No. 14 - Fort Tilden Reservation: (Contd)				
1	75	Signal: 2 Telephones EE-91 (C-2) $60 2 Headsets HS-17A (C-2) 50 2 Telephones EE-91 (G-3) 60 2 Headsets HS-17A (G-3) 50 1 Bell TI MC-153 (G-3) 11 2 Telephones EE-91 (S/L) 60 2 Handsets TS-12A (S/L) 24 1 Swbd BD-95 (S/L) 300 Contingencies 150 $ 765 Labor 450 Total $1215				
		Location No. 17 Arverne,L.I.: Exhibit 24	$	$ 380	$ 25	$ 405
1	76	Group 4 CP & OP AA OP Signal: 6 Telephones EE-91 (G-4) $180 6 Headsets HS-17A (G-4) 150 $330 Contingencies 50 $380 Labor 25 Total $405				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		COST ARRANGED BY BATTERIES				
		Battery No. 1 (Const.No. 219) 6" Guns - Fort Hancock: Exhibit 17				
		Gun Emplacement: For Ordnance & Engineer Costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1 - 12.	$	$ 686	$ 125	$ 811
3	18	Signal: 6 Telephones EE-91 $180 6 Handsets HS-17A 150 6 Telephones EE-75 Boxes only 150 2 TI Signals EE-65 80 600' 10-pr cable WC-401 36 Contingencies 90 686 Labor 125 Total $811				
		BC-Range Finder - $B_1^1 S_1^1$ Station: Exhibit 17	13,625	796	200	14,621
		Engineer: Construct cottage type structure. Cost included in construction of battery emplacement.				
3	19	Ordnance: 1 Range Finder $8,000 1 DPF M-1 C1-2 4,500 1 Azimuth instr 1,125 13,625				
3	20	Signal: 11 Telephones EE-91 $330 8 Headsets HS-17A 200 3 Handsets TS-12A 36 2 switch key sets EE-79 60 2 Bells TI MC-153 22 200' 25-pr cable WC-366 44 Contingencies 104 796 Labor 200 Total $996				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 1 (Cost. No. 219) 6" Guns - Fort Hancock: (Contd)				
		Plotting Room: Exhibit 17	$ 8,969	$ 483	$ 100	$ 9,552
3	21	Ordnance: 1 Board range correction M1 $900 1 Board deflection M-1 1800 1 Board plotting M-3 6000 1 Corrector percentage M1 125 4 Recorders TI 110 1 Rule set forward 15 1 Scale Prediction 19 $8969				
3	22	Signal: 7 Telephones EE-91 $210 7 Headsets HS-17A 175 2 Handsets TS-12A 24 1 Bell TI MC-153 11 Contingencies 63 $483 Labor 100 Total $583				
		$B_1^2S_1^2$ (Site No. 2) Long Branch: Exhibit 15	5,625	202	25	5,852
		Engineer: See "COST ARRANGED BY LOCATION"				
3	23	Ordnance: 1 DPF M-1 C1-1 $4500 1 Azimuth instr 1125 $5625				
3	24	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				
		$B_1^3S_1^3$ (Site No. 11f - Fort Hancock): Exhibit 19	5,625	202	25	5,852
		Engineer: See "COST ARRANGED BY LOCATION"				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 1 (Const. No.219) 6" Guns - Fort Hancock: (Contd)				
		$B_1^3S_1^3$ (Site No. 11f - Fort Hancock): Exhibit 19 (Contd)				
3	25	Ordnance: 1 DPF M-1 Cl-I $4500 1 Azimuth Instr 1125 $5625				
3	26	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				
		$B_1^4S_1^4$ (Site No. 3 Elberon): Exhibit 15	$ 2,250	$ 202	$ 25	$ 2,477
		Engineer: See "COST ARRANGED BY LOCATION"				
3	27	Ordnance: 2 Azimuth instr. $2250				
3	27a	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				
		$B_1^5S_1^5$ (Site No. 2 Shark River): Exhibit 14	2,250	202	25	2,477
		Engineer: See "COST ARRANGED BY LOCATION"				
3	28	Ordnance: 2 Azimuth instr. $2250				
3	28a	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 2 (Const. No. 116) 16" Guns - Fort Hancock: Exhibit 17				
		Gun Emplacement: Exhibit 17 For Ordnance & Engineer costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1 - 11, inclusive.	$	$1,390	$1,200	$ 2,590
3	29	Signal: 7 Telephones EE-91 $210 11 Headsets HS-17A 275 1 Handset TS-12A 12 7 Telephones EE-75 Boxes only 175 4 TI Signals EE-65 160 1 Bell MC-9 11 1500' 25-pr cable WC-366 330 600' 10-pr cable WC-401 36 Contingencies 181 1390 Labor 1200 Total $2590				
		BC Station (Included in same structure with plotting room) Exhibit 17		758	75	833
3	30	Signal: 7 Telephones EE-91 $210 5 Headsets HS-17A 125 2 Handsets TS-12A 24 1 Swbd Cordless BD-95 300 Contingencies 99 $758 Labor 75 Total $833				
		Magazines:		97	10	107
		Engineer: Cost included under Cost Estimate & Priority Guide accompanying Paragraphs 1 - 12.				
3	31	Signal: 2 Telephones EE-91 $60 2 Handsets TS-12A 24 Contingencies 13 $97 Labor 10 Total $107				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 2 (Const. No. 116) 16" Guns - Fort Hancock: (Contd)				
		Plotting Room & Spotting Room Exhibit 17 For Engineer Costs see Cost Estimate & Priority Guide accompanying Paragraphs 1 - 11 inclusive.	$ 86,169	$1,232	$ 50	$ 87,451
3	32	Ordnance: 1 Director Seacoast Large $75,000 1 Board Adjustment Fire M-1 250 1 Board Range Correction M-1 900 1 Board Deflection M-1 1,800 1 Board Plotting M-3 6,000 1 Board Spotting M-2 1,950 1 Corrector Percentage M-1 125 4 Recorders TI 110 1 Rule Set Forward 15 1 Scale Prediction 19 Total $86,169				
3	33	Signal: 10 Telephones EE-91 $300 10 Headsets HS-17A 250 2 Bells TI MC-153 22 1 Radio Marine Telephone SCR-281 500 Contingencies 160 $1232 Labor 50 Total $1282				
		$B_2^1S_2^1$ (Site No. 11g) Fort Hancock: Exhibit 20 Engineer: 100' 3-deck steel tower (existing) Top deck completely equipped				
		$B_2^2S_2^2$ & BC_2 (Site No. 10 - Water witch): Exhibit 17 Engineer: For Cost see "COSTS ARRANGED BY LOCATION"	6,750	314	50	7,114

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Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 2 (Const. No.116) 16" Guns - Fort Hancock:(Contd)				
		$B_2^2S_2^2$ & BC_2 (Site No. 10 - Water-witch: Exhibit 17 (Contd)				
3	34	Ordnance: 1 DPF M-1 Cl-5 $4,500 2 Azimuth instr 2,250 $6750				
3	35	Signal: 5 Telephones EE-91 $150 4 Headsets HS-17A 100 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 41 $314 Labor 50 Total $364				
		$B_2^3S_2^3$ (Site No. 8 - Highlands Hill Mass) Exhibit 17	$ 5,625	$ 202	$ 25	$ 5,852
		Engineer: see "COST ARRANGED BY LOCATION"				
3	36	Ordnance: 1 DPF M-1 Cl-3 $4,500 1 Azimuth instr 1,125 $5625				
3	37	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				
		$B_2^4S_2^4$ (Site No. 5 - Monmouth Beach): Exhibit 16				
		Engineer: 100' 3-Deck Steel tower (existing) Top Deck completely equipped				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		Battery No. 2 (Const No. 116) 16" Guns - Fort Hancock: (Contd)				
		$B_2^5S_2^5$ (Site No. 4 - Long Branch N.J.): Exhibit 15	$ 5,625	$ 202	$ 25	$ 5,852
		Engineer: See " COST ARRANGED BY LOCATION"				
3	38	Ordnance: 1 DPF M-1 Cl-1 $4500 1 Azimuth Instr 1125 $5625				
3	39	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				
		$B_2^6S_2^6$ (Site No. 3 - Elberon): Exhibit 14				
		Engineer: 100' 3-deck Steel tower (existing)				
		Ordnance: Equipped				
		Signal: Equipped				
		$B_2^7S_2^7$ (Site No. 2 Shark River): Exhibit 13	5,625	202	25	5,852
		Engineer: See "COST ARRANGED BY LOCATION"				
3	40	Ordnance: 1 DPF M-1 Cl-1 $4500 1 Azimuth Instr 1125 $5625				
3	41	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				

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Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No.2 (Const. No.116) 16" Guns - Fort Hancock: (Contd)				
		$B_2^8 S_2^8$ (Site No. 1 Manasquan): Exhibit 12	$ 5,625	$ 202	$ 25	$ 5,852
		Engineer: See "COST ARRANGED BY LOCATION"				
3	42	Ordnance: 1 DPF M-1 Cl-1 $4500 1 Azimuth Instr 1125 $5625				
3	43	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				
		Battery No.3 (Battery Mills) 12" Guns - Fort Hancock: Exhibits 3 and 5				
		Gun Emplacement:		253	25	278
		For Ordnance & Engineer Costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1 - 12.				
1	77	Signal: 2 Telephones EE-91 $60 4 Signals TI EE-65 160 Contingencies 33 $253 Labor 25 Total $278				
		B^I & Aux. BC Station - (In Crows Nest at Battery)		276	25	301
1	78	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 3 Telephones EE-75 Boxes only 75 Contingencies 36 $276 Labor 25 Total $301				

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Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		Battery No. 3 (Battery Mills) 12" Guns - Fort Hancock: Exhibits 3 and 5 (Contd)				
1	79	BC Station (In the Emplacement) Signal: 2 Telephones EE-91 $60 2 Handsets TS-12A 24 1 Headset HS-17A 25 1 Swbd Cordless BD-95 300 Contingencies 61 $470 Labor 10 Total $480		$ 470	$ 10	$ 480
1	80	Plotting Room No. 2 (In Emplacement): Ordnance: * 1 Board Adjustment, Fire M-1 $ 250 1 Board Range Correction M-1 900 * 1 Board Deflection M-1 1800 * 1 Board Plotting M-3 6000 * 1 Corrector Percentage M-1 125 4 Recorders TI 110 1 Rule Set Forward 15 1 Scale Prediction 19 $9,219 * Under procurement fiscal year 1940, but not received.	$ 9,219			9,219
		Plotting Room No. 1 (In Emplacement):	75,000	11		75,011
1	81	Ordnance: * 1 Director Seacoast Large $75,000 * Under procurement fiscal year 1940, but not received.				
1	82	Signal: 1 Bell TI MC-153 $11				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 3 (Battery Mills) 12" Guns - Fort Hancock: Exhibits 3 and 5 (Contd)				
		Spotting Room (In Emplacement)	$ 1,950	$	$	$ 1,950
1	83	Ordnance: * 1 Board Spotting M-2 $1,950 * Under procurement fiscal year 1940, but not received.				
		$B_3^2S_3^2$ (Site No. 10 - Water-witch) Exhibit 17	4,500	251	25	4,776
		Engineer: See "COST ARRANGED BY LOCATION"				
1	84	Ordnance: 1 DPF M-1 Class 5 $4,500				
1	85	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 25 $276				
		$B_3^3S_3^3$ Aux. B^1 (Site No. 8 - Dug-in-Stations): Exhibit 17	4,500			4,500
		Engineer: See "COST ARRANGED BY LOCATION"				
1	86	Ordnance: 1 DPF M-1 Class 3 $4,500				
		$B_3^5S_3^5$ (Site No. 4 - N. Long Branch) Exhibit 15	5,625	251	25	5,901
		Engineer: See "COST ARRANGED BY LOCATION"				
1	87	Ordnance: 1 DPF M-1 Cl-1 $4500 1 Azimuth Instr 1125 $5625				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 3 (Battery Mills) 12" Guns - Fort Hancock: Exhibits 3 and 5 (Contd)				
		$B^5_3S^5_3$ (Site No. 4 - N. Long Branch) Exhibit 15 (Contd)				
1	88	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 25 Total $276				
		$B^6_3S^6_3$ (Site No. 3 - Elberon): Exhibit 15	$	$ 12	$	$ 12
		Engineer: 100' 3-Deck Steel tower (existing)				
1	89	Signal: 1 Handset TS-12A $12				
		$B^7_3S^7_3$ (Site No. 2 - Shark River) Exhibit 14	5,625	251	25	5,901
		Engineer: See "COST ARRANGED BY LOCATION"				
1	90	Ordnance: 1 DPF M-1 C1-1 $4500 1 Azimuth Instr 1125 $5625				
1	91	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 25 Total $276				
		Battery No. 4 (Battery Kingman) 12" Guns - Fort Hancock: Exhibits 3 and 5 (				
		Gun Emplacement: For Ordnance & Engineer Costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1 - 12.		253	10	263

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 4 (Battery Kingman) 12" Guns - Fort Hancock: Exhibits 3 and 5 (Contd)				
1	92	Signal: 2 Telephones EE-91 $60 4 Signals TI BE-65 160 Contingencies 33 253 Labor 10 Total $263				
		B^{I} & Aux. BC Station (In Crows Nest at Battery):	$	$ 276	$ 25	$ 301
1	93	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 3 Telephones EE-75 Boxes only 75 Contingencies 36 276 Labor 25 Total $301				
		BC Station (In The Emplacement)		470	10	480
1	94	Signal: 2 Telephones EE-91 $60 1 Headset HS-17A 25 2 Handsets TS-12A 24 1 Swbd Cordless BD-95 300 Contingencies 61 $470 Labor 10 Total $480				
		Plotting Room No. 2 (In Emplacement):	9,219			9,219
1	95	Ordnance: * 1 Board Adjustment fire M-1 $ 250 1 Board range Correction M-1 900 * 1 Board Deflection M-1 1800 * 1 Board Plotting M-3 6000 * 1 Corrector Percentage M-1 125 4 Recorders TI 110 1 Rule Set Forward 15 1 Scale Prediction 19 $9,219 * Under procurement fiscal year 1940, but not yet received.				

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Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 4 - (Battery Kingman) 12" Guns - Fort Hancock Exhibits 3 and 5 (Contd)				
		Plotting Room No. 1 (In Emplacement)	$ 75,000	$ 11	$	$ 75,011
1	96	Ordnance: 1 Director Seacoast Large (Replaces present outmoded director) $75,000				
1	97	Signal: 1 Bell TI MC-153 $11				
		Spotting Room (In Emplacement)	1,950			1,950
1	98	Ordnance: * 1 Board Spotting M-2 $1,950 * Under procurement fiscal year 1940, but not yet received.				
		$B_4^2S_4^2$ (Site No. 10 - Waterwitch) Exhibit 17	4,500	202	25	4,727
		Engineer: See "COST ARRANGED BY LOCATION"				
1	99	Ordnance: 1 DPF M-1 Class 5 $4,500				
1	100	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				
		$B_4^3S_4^3$ (Site No. 8 - Dug-in-Station) Exhibit 17	4,500			4,500
		Engineer: See "COST ARRANGED BY LOCATION"				
1	101	Ordnance: 1 DPF M-1 Class 3 $4,500				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 4 (Battery Kingman) 12" Guns - Fort Hancock: Exhibits 3 and 5 (Contd)				
		$B_4^5S_4^5$ (Site No. 4 - Long Branch) Exhibit 15	$ 5,625	$ 251	$ 25	$ 5,901
		Engineer: See "COST ARRANGED BY LOCATION"				
1	102	Ordnance: 1 DPF M-1 Cl-1 $4500; 1 Azimuth Instr 1125 $5625				
1	103	Signal: 4 Telephones EE-91 $120; 3 Headsets HS-17A 75; 1 Handset TS-12A 12; 1 Bell TI MC-153 11; Contingencies 33 $251; Labor 25; Total $276				
		$B_4^7S_4^7$ (Site No. 2 - Shark River) Exhibit 14	5,625	251	25	5,901
		Engineer: See "COST ARRANGED BY LOCATION"				
1	104	Ordnance: 1 DPF M-1 Cl-1 $4500; 1 Azimuth Instr 1125 $5625				
1	105	Signal: 4 Telephones EE-91 $120; 3 Headsets HS-17A 75; 1 Handset TS-12A 12; 1 Bell TI MC-153 11; Contingencies 33 $251; Labor 25; Total $276				
		Battery No. 5 (Battery Peck) 6" Guns - Fort Hancock: Exhibit 5				
		Gun Emplacement (existing)		152	10	162
1	106	Signal: 2 Telephones EE-91 $60; 2 Headsets HS-17A 50; 2 Bells TI MC-153 22; Contingencies 20 $152; Labor 10; Total $162				

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Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 5 (Battery Peck) 6" Guns - Fort Hancock: Exhibit 5 (Contd)				
		Range Finder Station: Exhibit 20	$	$ 139	$ 10	$ 149
1	107	Signal: 2 Telephones EE-91 $60; 2 Headsets HS-17A 50; 1 Bell TI MC-153 11; Contingencies 18 $139; Labor 10; Total $149				
		BC-5 Station (Battery Emplacement) Exhibit 20		362	25	387
1	108	Signal: 6 Telephones EE-91 $180; 4 Headsets HS-17A 100; 2 Handsets TS-12A 24; 1 Bell TI MC-153 11; Contingencies 47 362; Labor 25; Total $387				
		Plotting Room: Exhibit 20		456	30	486
1	109	Signal: * 7 Telephones EE-91 $210; * 7 Headsets HS-17A 175; 1 Bell TI MC-153 11; Contingencies 60 456; Labor 30; Total $486				
		* This includes 2 telephones and 2 headsets approved in original project but not received.				
		B1S1 (Site No. 11n - Fort Hancock) Exhibit 20		202	10	212
1	110	Signal: 3 Telephones EE-91 $90; 3 Headsets HS-17A 75; 1 Bell TI MC-153 11; Contingencies 26 $202; Labor 10; Total $212				

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Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 5 (Battery Peck) 6" Guns - Fort Hancock: Exhibit 5 (Contd)				
		$B_5^2S_5^2$ (Site No. 11a - Fort Hancock) Exhibit 18	$	$ 202	$ 10	$ 212
1	111	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 10 Total $212				
		$B_5^3S_5^3$ (Site No. 11u - Fort Hancock) Exhibit 20		202	10	212
1	112	Signal: * 3 Telephones EE-91 $90 * 3 Headsets HS-17A 75 * 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 10 Total $212 * Includes 2 telephones, 2 headsets and 1 Bell TI approved in original project but not received.				
		Batteries Nos. 6 & 7 (Batteries Urmston-Morris) 3" Guns Fort Hancock: Exhibit 5				
		Gun Emplacement: (Existing)		428	20	448
1	113	Signal: 7 Telephones EE-91 $210 6 Headsets HS-17A 150 1 Handset TS-12A 12 Contingencies 56 428 Labor 20 Total $448				
		BC-6 & 7 - Range Finder Station: Exhibit 20		251	20	271
1	114	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 20 Total $271				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 8 - Battery Kessler - 6" Guns - Fort Tilden: Exhibit 6				
		Gun Emplacement: (Existing)	$	$ 470	$ 30	$ 500
1	115	Signal: * 5 Telephones EE-91 $150 * 4 Headsets HS-17A 100 5 Telephones EE-75 Boxes only 125 * 2 Bells TI MC-153 22 1 Handset TS-12A 12 Contingencies 61 470 Labor 30 Total $500 * 6 Telephones, 6 Headsets and 2 TI Bells were approved in original project but not received.				
		BC-8 Range Finder Station:	Engineer $10,000	550	50	10,600
1	116	Engineer: * Splinterproof two story concrete structure Material $5,000 Labor 5,000 $10,000 * $6,000 allocated per letter dated OCCA (111/IB-15A) 2-18-41, Subject: "Expenditure Program, Seacoast Defense Funds, Harbor Defenses of Sandy Hook."				
1	117	Signal: * 3 Telephones EE-91 (Range Finder) $90 * 2 Headsets HS-17A (Range Finder) 50 1 Handset TS-12A (Range Finder) 12 * 1 Bell TI MC-153 (Range Finder) 11 * 6 Telephones EE-91 (BC) 180 * 4 Headsets HS-17A (BC) 100 * 1 Bell TI MC-153 (BC) 11 2 Handsets TS-12A 24 Contingencies 72 $550 Labor 50 Total ~~$600~~				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 8 (Battery Kessler) 6" Guns - Fort Tilden: Exhibit 6 (Contd)				
		BC-8 Range Finder Station: (Contd)				
		* Includes 5 telephones, 4 headsets & 1 Bell TI, approved in original project, but not received.				
		Plotting Room: Exhibit 23	$ 3,985	$ 519	$ 25	$ 4,529
1	117a	Ordnance: * 1 Board Deflection $1,900 * 1 Board Spotting 1,950 * 1 Indicator Wind Component 135 Total $3,985				
		* Approved in original project but not received.				
1	118	Signal: * 8 Telephones EE-91 $240 * 8 Headsets HS-17A 200 * 1 Bell TI MC-153 11 Contingencies 68 519 Labor 25 Total $544				
		$B_8^1S_8^1$ (Site No. 13b - Rockaway) Exhibit 22		202	10	212
1	119	Signal: * 3 Telephones EE-91 $90 * 3 Headsets HS-17A 75 * 1 Bell TI MC-153 11 Contingencies 26 202 Labor 10 Total $212				
		* Approved in original project but never received.				
		$B_8^2S_8^2$ & BI (Site No. 14j - Fort Tilden): Exhibit 23	4,500	202	10	4,712
1	120	Ordnance: 1 DPF M-1 Class 1 $4,500				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 8 (Battery Kessler) 6" Guns - Fort Tilden: Exhibit 6 (Contd)				
		$B_8^2S_8^2$ & BI (Site No. 14j - Fort Tilden) (Contd)				
1	121	Signal: * 3 Telephones EE-91 $90 * 3 Headsets HS-17A 75 * 1 Bell TI MC-153 11 Contingencies 26 202 Labor 10 Total $212 * Approved in original project but never received.				
		Battery No. 9 (Battery Harris) 16" Guns - Fort Tilden: Exhibit 6				
		Gun Emplacement: For Engineer & Ordnance Costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1 - 12.	$	$ 428	$ 60	$ 488
1	122	Signal: 4 Telephones EE-75 Boxes only $100 4 Headsets HS-17A 100 4 Signals TI BE-65 160 1 Handset TS-12A 12 Contingencies 56 428 Labor 60 Total $488				
		Magazines 1, 2, 3 & 4: Exhibit 6 For Engineer Costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1-12.		304	10	314
1	123	Signal: 4 Telephones EE-91 $120 4 Headsets HS-17A 100 4 Bells MC-9 44 Contingencies 40 304 Labor 10 Total $314				

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Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 9 (Battery Harris) 16" Guns - Fort Tilden: Exhibit 6 (Contd)				
		Power Plants 1, 2 and 3: Exhibit 6 For Engineer Costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1-12.	$	$ 228	$ 10	$ 238
1	124	Signal: 3 Telephones EE-91 $90; 3 Headsets HS-17A 75; 3 Bells MC-9 33; Contingencies 30 $228; Labor 10; Total $238				
		BC-9 Station (Located in same structure with plotting room) Exhibit 23		385	30	415
1	125	Signal: 2 Handsets TS-12A $24; 1 Swbd BD-95 300; 1 Bell TI MC-153 11; Contingencies 50 $385; Labor 30; Total $415				
		Plotting Room No. 1 - Spotting Room: Exhibit 23	11,169	627	50	11,846
1	126	Ordnance: 1 Board Adjustment, Fire M-1 $ 250; 1 Board Range Correction M-1 900; 1 Board Deflection M-1 1,800; 1 Board Plotting M-3 6,000; 1 Board Spotting M-2 1,950; 1 Corrector Percentage M-1 125; 4 Recorders TI 110; 1 Rule Set Forward 15; 1 Scale Prediction 19; $11,169				
1	126a	Signal: 2 Handsets TS-12A $24; 2 Bells TI MC-153 22; 1 Radio Marine Telephone SCR-281 500; Contingencies 82 $627; Labor 50; Total $677				

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Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 9 (Battery Harris) 16" Guns - Fort Tilden: Exhibit 6 (Contd)				
		Plotting Room No. 2: Exhibit 23	$75,000	$ 202	$ 10	$75,212
		Engineer: For Engineer Costs see "COST ARRANGED BY LOCATION"				
1	127	Ordnance: * 1 Director Seacoast Large $75,000				
		* $30,000 approved in original project but director not received.				
1	128	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 202 Labor 10 Total $212				
		$B_9^1S_9^1$ (Site No. 12 - Seagate): Exhibit 21	5,625	251	25	5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
1	129	Ordnance: 1 DPF M-1 C1-1 $4500 1 Azimuth Instr 1125 $5625				
1	130	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 25 Total $276				
		$B_9^2S_9^2$ & B^I (Site No. 14b - Rockaway): Exhibit 23		27	5	32
1	131	Signal: 1 Handset TS-12A $12 1 Bell TI MC-153 11 Contingencies 4 $27 Labor 5 Total $32				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 9 (Battery Harris) 16" Guns - Fort Tilden: Exhibit 6 (Contd)				
		$B_9^3S_9^3$ (Site No. 15 - Seaside, L.I.) Exhibit 24	$ 5,625	$ 251	$ 25	$ 5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
1	132	Ordnance: 1 DPF M-1 Cl-1 $4500; 1 Azimuth Instr 1125 $5625				
1	132a	Signal: 4 Telephones EE-91 $120; 3 Headsets HS-17A 75; 1 Handset TS-12A 12; 1 Bell TI MC-153 11; Contingencies 33 $251; Labor 25; Total $276				
		$B_9^4S_9^4$ (Site No. 18 - Atlantic Beach) Exhibit 26	5,625	251	25	5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
1	133	Ordnance: 1 DPF M-1 Cl-1 $4500; 1 Azimuth Instr 1125 $5625				
1	134	Signal: 4 Telephones EE-91 $120; 3 Headsets HS-17A 75; 1 Handset TS-12A 12; 1 Bell TI MC-153 11; Contingencies 33 $251; Labor 25; Total $276				
		$B_9^5S_9^5$ (Site No. 19 - Long Beach, L.I.): Exhibit 27		202	25	227
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 9 (Battery Harris) 16" Guns - Fort Tilden: Exhibit 6 (Contd)				
		$B_9^5S_9^5$ (Site No. 19 - Long Beach, L.I.): Exhibit 27 (Contd)				
1	135	Signal: * 3 Telephones EE-91 $90 * 3 Headsets HS-17A 75 * 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227 * Approved in original project but never received.				
		$B_9^6S_9^6$ (Site No. 20 - Short Beach, L.I.): Exhibit 28	$ 4,500	$ 202	$ 25	$ 4,727
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
1	136	Ordnance: 1 DPF M-1 Class 1 $4,500				
1	137	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 202 Labor 25 Total $227				
		$B_9^7S_9^7$ (Site No. 21 - Zachs Bay, L.I.): Exhibit 29	4,500	202	25	4,727
		Engineer: See "COST ARRANGED BY LOCATION"				
1	138	Ordnance: * 1 DPF M-1 Class 1 $4,500 * Approved in original project but not received.				
1	139	Signal: * 3 Telephones EE-91 $90 * 3 Headsets HS-17A 75 * 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 25 Total $227				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 9 (Battery Harris) 16" Guns - Fort Tilden: Exhibit 6 (Contd)				
		$B_9^7S_9^7$ (Site No. 21) (Contd)				
		* Approved in original project but not received.				
		$B_9^8S_9^8$ (Site No. 22 - Jones Beach, L.I., Coast Guard Station): Exhibit 30	$ 5,625	$ 251	$ 25	$ 5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
1	140	Ordnance: 1 DPF M-1 Cl-1 $4500; 1 Azimuth Instr 1125 $5625				
1	141	Signal: 4 Telephones EE-91 $120; 3 Headsets HS-17A 75; 1 Handset TS-12A 12; 1 Bell TI MC-153 11; Contingencies 33 251; Labor 25; Total $276				
		Battery No. 10 (Const. No. 220) 6" Guns - Fort Tilden: Exhibit 6				
		Gun Emplacement: For Engineer & Ordnance Costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1 - 11 inclusive.		685	50	735
3	44	Signal: 6 Telephones EE-91 180; 6 Headsets HS-17A 150; 6 Telephones EE-75 Boxes only 150; 2 TI Signals EE-65 80; 600' 10-pr cable WC-401 36; Contingencies 89 $685; Labor 50; Total $735				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		Battery No. 10 (Const. No. 220) 6" Guns - Fort Tilden: Exhibit 6				
		BC-13 Range Finder Station: Exhibit 23	$ 9,125 Engineer 10,000	$ 552	$ 50	$ 19,727
3	45	Engineer: Splinterproof concrete structure Material $5,000 Labor 5,000 $10,000				
3	46	Ordnance: 1 Range Finder $8,000 1 Azimuth Instr 1,125 $9,125				
3	47	Signal: 7 Telephones EE-91 $210 6 Headsets HS-17A 150 2 Handsets TS-12A 24 1 Switch key set EE-79 30 2 Bells TI MC-153 22 200' 25-pr cable WC-366 44 Contingencies 72 552 Labor 50 Total $602				
		Plotting Room: Exhibit 23	8,969	483	50	9,502
3	48	Ordnance: 1 Board Range Correction M-1 $ 900 1 Board Deflection M-1 1,800 1 Board Plotting 6,000 1 Director Percentage M-1 125 4 Recorders TI 110 1 Rule Set Forward 15 1 Scale Prediction 19 $8,969				
3	49	Signal: 7 Telephones EE-91 $210 7 Headsets HS-17A 175 2 Handsets TS-12A 24 1 Bell TI MC-153 11 Contingencies 63 483 Labor 50 Total $533				

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Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 10 (Const. No. 220) 6" Guns - Fort Tilden: Exhibits 6 (Contd)				
		$B^1_{10}S^1_{10}$ (Site No. 14b - Fort Tilden): Exhibit 23	$	$ 202	$ 25	$ 227
		Engineer: 100' 3-Deck Steel tower (existing)				
3	50	Signal: 3 Telephones EE-91 $90; 3 Headsets HS-17A 75; 1 Bell TI MC-153 11; Contingencies 26 202; Labor 25; Total $227				
		$B^2_{10}S^2_{10}$ (Site No. 15 - Seaside L. I.): Exhibit 24	4,500	265	25	4,790
		Engineer: See "COST ARRANGED BY LOCATION"				
3	51	Ordnance: 1 DPF M-1 Class 1 $4,500				
3	51a	Signal: 4 Telephones EE-91 $120; 4 Headsets HS-17A 100; 1 Bell TI MC-153 11; Contingencies 34 265; Labor 25; Total $290				
		$B^3_{10}S^3_{10}$ (Site No. 18 - Atlantic Beach, L.I.) Exhibit 26	5,625	202	25	5,852
		Engineer: See "COST ARRANGED BY LOCATION"				
3	52	Ordnance: 1 DPF M-1 Class 1 $4,500; 1 Azimuth instr. 1,125; $5,625				
3	53	Signal: 3 Telephones EE-91 $90; 3 Headsets HS-17A 75; 1 Bell TI MC-153 11; Contingencies 26 202; Labor 25; Total $227				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 10 (Const. No. 220) 6" Guns - Fort Tilden: Exhibit 6 (Contd)				
		$B^4_{10}S^4_{10}$ (Site No. 19 - Long Beach, L.I.): Exhibit 27	$ 5,625	$ 202	$ 25	$ 5,852
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
3	54	Ordnance: 1 DPF M-1 Class 1 $4,500; 1 Azimuth Instr. 1,125; $5,625				
3	55	Signal: 3 Telephones EE-91 $90; 3 Headsets HS-17A 75; 1 Bell TI MC-153 11; Contingencies 26 202; Labor 25; Total $227				
		$B^5_{10}S^5_{10}$ (Site No. 20 - Short Beach, L.I.): Exhibits 8 & 20	5,625	202	25	5,852
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
3	56	Ordnance: 1 DPF M-1 Class 1 $4,500; 1 Azimuth Instr. 1,125; $5,625				
3	57	Signal: 3 Telephones EE-91 $90; 3 Headsets HS-17A 75; 1 Bell TI MC-153 11; Contingencies 26 202; Labor 25; Total $227				
		Battery No. 11 (Const. No. 117) 16" Guns - Nigger Point, L.I.: Exhibit 6		1,212	850	2,052
		Gun Emplacement: For Ordnance & Engineer Costs see Cost Estimate & Priority Guide accompanying Paragraphs 1 - 11.				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		Battery No. 11 (Const. No. 117) 16" Guns - Nigger Point. L.I.: Exhibit 6 (Contd)				
		Gun Emplacement (Contd)				
3	58	Signal: 7 Telephones EE-91 $210 8 Headsets HS-17A 200 1 Handset TS-12A 12 7 Telephones EE-75 Boxes only 175 2 TI Signals BE-65 80 1 Bell MC-9 11 1500' 25-pr cable WC-366 330 600' 10-pr cable WC-401 36 Contingencies 158 1212 Labor 850 Total $2062				
		BC-11 Station (Included in same structure with plotting room): Exhibit 25	$-	$ 787	$ 100	$ 887
3	59	Signal: 7 Telephones EE-91 $210 6 Headsets HS-17A 150 2 Handsets TS-12A 24 1 Swbd Cordless BD-95 300 Contingencies 105 787 Labor 100 Total $887				
		Magazines: Exhibit 6		127	10	137
3	60	Engineer: Cost included under Cost Estimate & Priority Guide Accompanying Paragraphs 1 - 11.				
3	61	Signal: 2 Telephones EE-91 $60 2 Handsets TS-12A 50 Contingencies 17 127 Labor 10 Total $137				
		Plotting Room & Spotting Rm: For Engineer Costs see Cost Estimate & Priority Guide Accompanying Paragraphs 1 - 11.	86,169	1,577	1,727	89,475

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		Battery No. 11 (Const. No. 117) 16" Guns - Nigger Point. L.I.: Exhibit 6 (Contd)				
		Plotting Room & Spotting Rm: (Contd)				
3	62	Ordnance: 1 Director Seacoast Large $75,000 1 Board Adjustment, Fire M-1 250 1 Board Range Correction M-1 900 1 Board Deflection M-1 1800 1 Board Plotting M-3 6000 1 Board Spotting M-2 1950 1 Corrector Percentage M-1 125 4 Recorders TI 110 1 Rule Set Forward 15 1 Scale Prediction 19 $86,169				
3	63	Signal: 11 Telephones EE-91 $330 9 Headsets HS-17A 225 2 Handsets TS-12A 24 2 Bells TI MC-153 22 1 Swbd Cordless BD-95 300 1 Radio-marine Telephone SCR-281 500 Contingencies 206 1577 Labor 150 Total $1727				
3	64	F.C. Switchboard Room No. 4 - For Battery No. 11 (To be installed in same structure with plotting room): Exhibit 25	$	$3,004	$ 400	$ 3,404

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 11 (Const. No. 117) 16" Guns - Nigger Point. L.I.: Exhibit 6 (Contd)				
		F.C. Switchboard Room No. 4 (Contd)				
3	64	Signal: J 1 Swbd BD-74(A) $1300 1 Panel (Dist. Frame) BD-75 125 1 Storage Btry 30v - 120 ampere hr 150 1 Panel Power BD-65 330 1 Rectifier, Electron, for Charging Tel. Battery 75 1 TI Apparatus EE-86 300 1 Telephone EE-91 30 2 Handsets TS-12A 24 1 Telephone Desk Post 20 1 Test Set (Wire Chief's) 250 Contingencies 400 $3004 Labor 400 Total $3404				
		$B^{l}_{11} S^{l}_{11}$ & B^{I} (Site No. 12 - Seagate) Exhibit 21	$ 5,625	$ 251	$ 25	$ 5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
3	65	Ordnance: 1 DPF M-1 Class 1 $4,500 1 Azimuth instr. 1,125 $5,625				
3	66	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 25 Total 276				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 11 (Const. No. 117) 16" Guns - Nigger Point, L.I.: Exhibit 6 (Contd)				
		$B^2_{11}S^2_{11}$ (Site No. 14b - Rockaway, L.I.): Exhibit 23		$ 27	$ 5	$ 32
3	67	Signal: 1 Handset TS-12A $12 1 Bell TI MC-153 11 Contingencies 4 $27 Labor 5 Total $32				
		$B^3_{11}S^3_{11}$ (Site No. 15 - Seaside L.I.): Exhibit 24	$5,625	$251	$ 25	$5,901
		Engineer: See "COST ARRANGED BY LOCATION"				
3	68	Ordnance: 1 DPF M-1 Class 1 $4,500 1 Azimuth instr. 1,125 $5,625				
3	68a	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 $251 Labor 25 Total $276				
		$B^4_{11}S^4_{11}$ (Site No. 18 - Atlantic Beach, L.I.): Exhibit 26	$5,625	$251	$ 25	$5,901
		Engineer: See "COST ARRANGED BY LOCATION"				
3	69	Ordnance: 1 DPF M-1 Class 1 $4,500 1 Azimuth instr. 1,125 $5,625				
3	70	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 25 Total $276				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		Battery No. 11 (Const. No. 117) 16" Guns - Nigger Point, L.I.: Exhibit 6 (Contd)				
		$B^5_{11}S^5_{11}$ (Site No. 19 - Long Beach, L.I.): Exhibit 27	$ 5,625	$ 251	$ 25	$ 5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
3	71	Ordnance: 1 DPF M-1 Class 1 $4,500; 1 Azimuth Instr. 1,125; $5,625				
3	72	Signal: 4 Telephones EE-91 $120; 3 Headsets HS-17A 75; 1 Handset TS-12A 12; 1 Bell TI MC-153 11; Contingencies 33 251; Labor 25; Total $276				
		$B^6_{11}S^6_{11}$ (Site No. 20 - Short Beach, L.I.): Exhibit 28	5,625	251	25	5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
3	73	Ordnance: 1 DPF M-1 Class 1 $4,500; 1 Azimuth Instr. 1,125; $5,625				
3	74	Signal: 4 Telephones EE-91 $120; 3 Headsets HS-17A 75; 1 Handset TS-12A 12; 1 Bell TI MC-153 11; Contingencies 33 251; Labor 25; Total $276				
		$B^7_{11}S^7_{11}$ (Site No. 21 - Zachs Bay, L.I.): Exhibit 29	5,625	251	25	5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
3	75	Ordnance: 1 DPF M-1 Class 1 $4500; 1 Azimuth Instr 1125 5625				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		Battery No. 11 (Const. No. 117) 16" Guns - Nigger Point, L.I.: Exhibit 6 (Contd)				
		$B^{7}_{11}S^{7}_{11}$ (Site No. 21 - Zachs Bay, L.I.) Exhibit 29 (Contd)				
3	76	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 25 Total $276				
		$B^{8}_{11}S^{8}_{11}$ (Site No. 22 - Jones Beach, L.I., Coast Guard Station): Exhibit 30	$ 5,625	$ 251	$ 25	$ 5,901
		Engineer: For Engineer Cost see "COST ARRANGED BY LOCATION"				
3	77	Ordnance: 1 DPF M-1 Class 1 $4,500 1 Azimuth instr. 1,125 $5,625				
3	78	Signal: 4 Telephones EE-91 $120 3 Headsets HS-17A 75 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 33 251 Labor 25 Total $276				
		Battery No. 12 (Battery Gunnison) 6" Guns - Ft. Hancock: Exhibit 5				
		Gun Emplacement: (Existing)				
2	5	Signal: 4 Telephones EE-91 $120 4 Headsets HS-17A 100 2 Bells TI MC-153 22 Contingencies 36 278 Labor 25 Total $303				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MIL	SIGNAL LAB	TOTAL
		Battery No. 12 (Battery Gunnison) 6" Guns - Ft Hancock: Exhibit 5 (Contd)				
		CRF Station (Site 11h): Exhibit 19	Engineer $ 1,000	$ 139	$ 20	$ 1,159
2	6	Engineer: Complete construction of CRF Station Material $500 Contingencies 100 $600 Labor 400 Total $1000 NOTE: Base for this station has been completed but shelter is required				
2	7	Signal: * 2 Telephones EE-91 $60 * 2 Headsets HS-17A 50 * 1 Bell TI MC-153 11 Contingencies 18 139 Labor 20 Total $159 * Approved in original project but not received.				
		BC Station (In Emplacement):		377	25	402
2	8	Signal: 6 Telephones EE-91 $180 5 Headsets HS-17A 125 1 Handset TS-12A 12 1 Bell TI MC-153 11 Contingencies 49 377 Labor 25 Total $402				
		Plotting Room & Spotting Rm Battery No. 12 (In Emplacement):	125	519	50	694
		Engineer: None				
2	9	Ordnance: 1 Corrector, Percentage M-1 $125				
2	10	Signal: 8 Telephones EE-91 $240 8 Headsets HS-17A 200 1 Bell TI MC-153 11 Contingencies 68 519 Labor 50 Total $569				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 13 (Battery Richardson) 12" Guns - Fort Hancock: Exhibit 5				
		Gun Emplacement: (Existing)	$	$ 313	$ 100	$ 413
2	11	Signal: 4 Telephones EE-91 $120 4 Headsets HS-17A 100 2 Bells TI MC-153 22 500' Cable WC-401 30 Contingencies 41 313 Labor 100 Total $413				
		BC-13 Station (In Emplacement):		391	20	411
2	12	Signal: 6 Telephones EE-91 $180 5 Headsets HS-17A 125 2 Handsets TS-12A 24 1 Bell TI MC-153 11 Contingencies 51 391 Labor 20 Total $411				
		Plotting Room - Spotting Rm:	3,750	519	25	4,244
2	13	Ordnance: 1 Board Deflection M-1 $1800 1 Board Spotting M-2 1950 $3750				
2	14	Signal: 8 Telephones EE-91 $240 8 Headsets HS-17A 200 1 Bell TI MC-153 11 Contingencies 68 519 Labor 25 Total $544				
		$B^{1}_{13}S^{1}_{13}$ Tower "H", Exhibit 20		202	10	212
2	15	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 202 Labor 10 Total $212				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 13 (Battery Richardson) 12" Guns - Fort Hancock: Exhibit 5 (Contd)				
		$B^{2}_{13}S^{2}_{13}$ (Secondary Stations): Exhibit 19	$	$ 202	$ 10	$ 212
2	16	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 202 Labor 10 Total $212				
		$B^{3}_{13}S^{3}_{13}$ (North Tower Twin Lights): Exhibits 17 - 18		202	10	212
		Engineer: Modification of North Tower. See "COST ARRANGED BY LOCATION"				
2	17	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 202 Labor 10 Total $212				
		Battery No. 14 (Battery Bloomfield) 12" Guns - Fort Hancock: Exhibit 5				
2	18	Gun Emplacement - (Existing)		313	25	338
		Signal: 4 Telephones EE-91 $120 4 Headsets HS-17A 100 2 Bells TI MC-153 22 500' Cable WC-401 30 Contingencies 41 313 Labor 25 Total $338				
		BC-14 Station (In Emplacement)		391	30	421
2	19	Signal: 6 Telephones EE-91 $180 5 Headsets HS-17A 125 2 Handsets TS-12A 24 1 Bell TI MC-153 11 Contingencies 51 391 Labor 30 Total $421				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 14 (Battery Bloomfield) 12" Guns - Fort Hancock: Exhibit 5 (Contd)				
2	20	Plotting Room - Spotting Room (In Emplacement)	$	$ 519	$ 25	$ 544
		Signal:				
		8 Telephones EE-91 $240				
		8 Headsets HS-17A 200				
		1 Bell TI MC-153 11				
		Contingencies 68 519				
		Labor 25				
		Total $544				
		Power Plant:		78	10	88
2	21	Signal:				
		1 Telephone EE-91 $30				
		1 Handset TS-12A 12				
		1 Bell TI MC-9 LR 11				
		300' Cable WC-253 15				
		Contingencies 10 $78				
		Labor 10				
		Total $88				
		$B^{1}_{14}S^{1}_{14}$ - Tower "H": Exhibit 20		202	10	212
2	22	Signal:				
		3 Telephones EE-91 $90				
		3 Headsets HS-17A 75				
		1 Bell TI MC-153 11				
		Contingencies 26 $202				
		Labor 10				
		Total $212				
		$B^{2}_{14}S^{2}_{14}$ (Secondary Group): Exhibit 19		202	10	212
2	23	Signal:				
		3 Telephones EE-91 $90				
		3 Headsets HS-17A 75				
		1 Bell TI MC-153 11				
		Contingencies 26 $202				
		Labor 10				
		Total $212				
		$B^{3}_{14}S^{3}_{14}$ - North Tower - Twin Lights: Exhibits 17 - 18		202	10	212
2	24	Engineer: See "COST ARRANGED BY LOCATION"				

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PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 14 (Battery Bloomfield) 12" Guns - Fort Hancock: Exhibit 5 (Contd)				
		B^3_{14} S^3_{14} - North Tower - Twin Lights: Exhibits 17 - 18 (Contd)				
2	25	Signal: 3 Telephones EE-91 $90 3 Headsets HS-17A 75 1 Bell TI MC-153 11 Contingencies 26 $202 Labor 10 Total $212				
		Battery No. 15 (Battery Fergusson) 6" Guns - Fort Tilden: Exhibit 6				
		Gun Emplacement: (Existing)	$	$ 394	$ 30	$ 424
2	26	Signal: 4 Telephones EE-91 $120 4 Headsets HS-17A 100 4 Telephones EE-75 Boxes only 100 2 Bells TI MC-153 22 Contingencies 52 394 Labor 30 Total $424				
		BC & CRF Station: Exhibit 23	Engineer: 2,000	489	30	2,519
		Engineer: * Temporary Concrete Structure Material $1,500 Labor 500 $2,000 * Temporary Concrete Structure $1,000 allocated per letter dated (OCCA 111/IB-15A) 2-18-41, Subject: "Expenditure Program, Seacoast Defense Funds, HDSH."				
2	27	Signal: 8 Telephones EE-91 $240 8 Headsets HS-17A 150 2 Handsets TS-12A 24 1 Bell TI MC-153 11 Contingencies 64 489 Labor 30 Total $519				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: BY BATTERY H. D. of Sandy Hook

Paragraph No. 20b

PRIORITY	ITEM	DESCRIPTION	ORDNANCE	SIGNAL MTL	SIGNAL LAB	TOTAL
		Battery No. 15 (Battery Fergusson) 6" Guns - Fort Tilden: Exhibit 6 (Contd)				
		Plotting Room - Exhibit 20	$	$ 519	$ 30	$ 549
2	28	Signal: 8 Telephones EE-91 $240 8 Headsets HS-17A 200 1 Bell TI MC-153 11 Contingencies 68 519 Labor 30 Total $549				

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H. D. of Sandy Hook

Paragraph No. 20c ENGINEER & SIGNAL COST

PRIO-RITY	ITEM	DESCRIPTION	ENGINEER	SIGNAL MTL	SIGNAL LAB	TOTAL
3	79	Manasquan to Shark River 30,000 ft. 27 pr. part quadded 3 quads #13 - 21 pr. #19 submarine Material $13,500 Contingencies 2,025 $15,525 Labor $ 3,000 Total $18,525		$15,525	$3,000	$18,525
3	80	Shark River Tower to "I" Hut 74,000 ft. 27 pr. part quadded 3 quads #13 - 21 pr. #19 submarine Material $33,300 Contingencies 4,995 $38,295 Labor $ 7,400 Total $45,695		$38,295	$7,400	$45,695
3	81	Long Branch Tower to submarine cable (cable hut "I" to Elbe- ron) 2,200 ft. 27 pr. part quadded 19 ga. submarine (2 - 1,100 ft. sections) Material $ 946 Contingencies 162 $1,108 Labor $1,100 Total $2,208		$1,108	$1,100	$2,208
3	82	"C" Hut to Cable Hut vicinity of Const. No. 116 11,000 ft. 101 pr. #19 submarine Material $9,020 Contingencies 1,353 $10,373 Labor $ 1,100 Total $11,473		$10,373	$1,100	$11,473
3	83	CH vicinity Const. No. 116 to plotting room Const. No. 116 1,000 ft 50-pr 19 ga. (WC-367) Material $ 320 Contingencies 48 $ 368 Labor $ 500 Total $ 868		$368	$500	$868
3	84	MH vicinity of Const. No.116 to plotting room Const. No. 219 3000 ft 50-pr 19 ga. (WC-367) Material $ 960 Contingencies 144 $1,104 Labor $1,500 Total $2,604		$1,104	$1,500	$2,604

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H. D. of Sandy Hook

Paragraph No. 20c ENGINEER & SIGNAL COST

PRIORITY	ITEM	DESCRIPTION	ENGINEER	SIGNAL MTL	SIGNAL LAB	TOTAL
1	142	FC Swbd #2 to Water witch Tower 7500 ft 25-pr 19 ga (WC-365) Material $1,650 Contingencies 248 $1,898 Labor $3,750 Total $5,648		$1,898	$3,750	$5,648
1	143	FC Swbd #2 to dug-in station 2900 ft 50-pr 19 ga.(WC-367) Material $928 Contingencies 139 $1,067 Labor $1,450 Total $2,517 (* Note #9)		$1,067	$1,450	$2,517
1	144	FC Swbd #2 to "C" hut a. 1538 ft 101-pr 19 ga. (WC-368) Material $861 Contingencies 129 $ 990 Labor $ 760 Total $1,750		$990	$760	$1,750
3	85	FC Swbd #2 (Contd) b.1538 ft 108-pr 19 ga. quadded. Material $861 Contingencies 129 $ 990 Labor $ 760 Total $1,750		$990	$760	$1,750
1	145	"C" hut to "D" hut 3000 ft 106-pr #19 ga. submarine Material $2,460 Contingencies 369 $2,829 Labor $ 300 Total $3,129		$2,829	$300	$3,129
1	146	"C" hut to "N" hut (submarine) a. 3000 ft 52 quads #19 ga. from "C" hut to splice near "D" hut. Material $2,460 Contingencies 369 $2,829 Labor $ 300 Total $3,129 (* Note #7)		$2,829-	$300	$3,129

* See last page of this group.

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H. D. of Sandy Hook

Paragraph No. 20c ENGINEER & SIGNAL COST

PRIORITY	ITEM	DESCRIPTION	ENGINEER	SIGNAL MTL	SIGNAL LAB	TOTAL
1	147	b. 9000 ft 106-pr quadded from splice near "D" hut to "N" hut. Material $5,040 Contingencies 756 $5,796 Labor $4,500 Total $10,296 (* Note #7)		$5,796	$4,500	$10,296
1	148	"G" hut to "Y" splice (cable; "C" hut to "N" hut) 400 ft 106-pr quadded Material $ 760 Contingencies 114 $ 874 Labor $ 200 Total $1,074 (* Note #6)		$874	$200	$1,074
3	86	"C" hut to "B" hut 22,600 ft 106-pr quadded. NOTE: Originally proposed to be run from "C" hut to FC Swbd. #3 Material $18,532 Contingencies 2,779 $21,311 Labor $ 2,300 Total $23,611 (* Note #10)		$21,311	$2,300	$23,611
3	87	"B" hut to "H" hut 21,735 ft 106-pr quadded submarine. NOTE: Originally proposed to be run from FC Swbd #3 to "H" hut. Material $17,823 Contingencies 2,673 $20,496 Labor $ 2,100 Total $22,596 (*Note #10)		$20,496	$2,100	$22,596
1	149	"N" hut to "M" hut 7200 ft 106-pr #19 ga. quadded subt. Material $4,032 Contingencies 605 $4,637 Labor $3,600 Total $8,237 (* Note #1)		$4,637	$3,600	$8,237
1	150	"M" hut to "L" hut 7200 ft 106-pr quadded #19 ga. subt. Material $4,032 Contingencies 605 $4,637 Labor $3,600 Total $8,237 (* Note #1)		$4,637	$3,600	$8,237

* See last page of this group

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H. D. of Sandy Hook

Paragraph No. 20c ENGINEER & SIGNAL COST

PRIORITY	ITEM	DESCRIPTION	ENGINEER	SIGNAL MTL	SIGNAL LAB	TOTAL
1	151	"E" hut to "B" hut 5400 ft 202-pr #19 ga. subt. (WC-375) Material $4,698 Contingencies 705 $5,403 Labor $2,700 Total $8,103 (* Note #2)		$5,403	$2,700	$8,103
1	152	"B" hut to "F" hut 1800 ft 202-pr #19 ga. subt. Material $1,566 Contingencies 234 $1,800 Labor $ 900 Total $2,700 (* Note #2)		$1,800	$900	$2,700
1	153	"L" hut to MH #42 to MH #36 5600 ft 106-pr quadded #19 ga. subt. Material $3,136 Contingency 470 $3,606 Labor $2,800 Total $6,406 (* Note #1)		$3,606	$2,800	$6,406
1	154	MH 100 A to MH #36 a. 1300 ft 106-pr. quadded #19 ga. subt. Material $728 Contingencies 109 $ 837 Labor $ 650 Total $1487		$837	$650	$1,487
1	155	b. 1300 ft 106-pr quadded #19 ga. subt. Material $728 Contingency 109 $837 Labor 650 $1,487		$837	$650	$1,487
1	156	MH #36 to "A" hut 2300 ft 106-pr quadded #19 ga. subt. Material $1,288 Contingency 193 $1,481 Labor 1,150 $2,631		$1,481	$1,150	$2,631
1	157	"A" hut to C-1 (Hancock Gpmt) in old Potter Emplacement. 400 ft 50-pr #19 ga. Material $128 Contingency 19 $147 Labor 200 $347		$147	$200	$347

* See last page of this group.

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H.D. of Sandy Hook

Paragraph No. 20c ENGINEER & SIGNAL COST

PRIORITY	ITEM	DESCRIPTION	ENGINEER	SIGNAL MTL	SIGNAL LAB	TOTAL
1	158	"M" hut to "E" hut 2500 ft 106-pr quadded #19 ga. Material $1,400 Contingencies 210 $1,610 Labor 1,250 $2,860 (* Note #5)		$1,610	$1,250	$2,860
1	159	"B" hut to "L" hut 2800 ft. 106-pr quadded #19 ga. subt. Material $1,568 Contingencies 235 $1,803 Labor 1,400 $3,203 (* Note #6)		$1,803	$1,400	$3,203
3	88	"F" hut to Tower "B" 2100 ft. 25-pr #19 ga. Material $ 462 Contingencies 69 $ 531 Labor 1050 $1,581		$531	$1,050	$1,581
1	160	"E" hut to MH #238 880 ft. 50-pr #19 ga. Material $ 281 Contingencies 42 $ 323 Labor 100 $423 (* Note #4)		$323	$100	$423
1	161	MH #238 to Plotting Room Kingman 575 ft 50-pr #19 ga. Material $184 Contingency 27 $211 Labor 75 $286 (* Note #4)		$211	$75	$286
1	162	MH #238 to Plotting Room Mills 688 ft 50-pr #19 ga. Material $220 Contingency 33 $253 Labor 75 $328 (* Note #4)		$253	$75	$328
3	89	Mine cable hut #4 to MC Tilden 3600 ft 56-pr quadded #19 ga. Submarine Material $1,620 Contingency 243 $1,863 Labor 300 $2,163		$1,863	$300	$2,163

* See last page of this group

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H.D. of Sandy Hook

Paragraph No. 20c ENGINEER & SIGNAL COST

PRIORITY	ITEM	DESCRIPTION	ENGINEER	SIGNAL MTL	SIGNAL LAB	TOTAL
3	90	MC Tilden to FC Swbd Tilden 1800 ft 25-pr #19 ga. subt. (WC-366) Material $ 396 Contingency 59 $ 455 Labor 900 $1,355		$455	$900	$1,355
1	163	FC Swbd Tilden to Post Tel. Swbd Tilden 6000 ft 200-pr #19 ga. (WC-452) Material $4,500 Contingency 675 $5,175 Labor 1,500 $6,675		$5,175	$1,500	$6,675
1	164	C-2 (Tilden GPmt) CP to splice in 200-pr tie cable (item 163 above) 100 ft 50-pr #19 ga (WC-367) Material $ 32 Contingency 5 $ 37 Labor 25 $ 62		$ 37	$ 25	$ 62
3	91	Seagate to Mine C.H. #4 Tilden 30,000 ft 27-pr part quadded Submarine Material $13,500 Contingency 2,025 $15,525 Labor 3,000 $18,525		$15,525	$3,000	$18,525
3	92	FC Swbd Tilden to FC Swbd Const. No. 117 54,000 ft 56-pr composite submarine Material $31,320 Contingencies 4,698 $36,018 Labor 5,000 $41,018		$36,018	$5,000	$41,018
3	93	Seaside to Atlantic Beach 33,000 ft 27-pr part quadded Submarine Material $14,850 Contingency 2,228 $17,078 Labor 3,300 $20,378		$17,078	$3,300	$20,378
1	165	FC Swbd Tilden to Arverne 44,300 ft 56-pr quadded Submarine Material $25,694 Contingency 3,853 $29,547 Labor 2,400 $31,947 (* Note #3)		$29,547	$2,400	$31,947

* See last page of this group.

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H.D. of Sandy Hook

Paragraph No. 20c ENGINEER & SIGNAL COST

PRIORITY	ITEM	DESCRIPTION	ENGINEER	SIGNAL MTL	SIGNAL LAB	TOTAL
1	166	Arverne Tower to Long Beach 53,100 ft 56-pr quadded submarine Material $30,798 Contingencies 4,620 $35,418 Labor 3,100 $38,518 (* Note #3)		$35,418	$3,100	$38,518
3	94	Long Beach to Short Beach 39,500 ft 26-pr 19 ga submarine (WC-325) Material $17,735 Contingencies 2,666 $20,441 Labor 3,950 $24,391		$20,441	$3,950	$24,391
3	95	Short Beach to Zachs Bay 40,500 ft 26-pr 19 ga. submarine (WC-325) Material $18,225 Contingencies 2,733 $20,958 Labor 4,000 $24,958		$20,958	$4,000	$24,958
1	167	FC Swbd Tilden to Plotting Rm Fergusson to "B" Tower Tilden 6700 ft 106-pr part quadded Material $3,752 Contingencies 563 $4,315 Labor 3,350 $7,665		$4,315	$3,350	$7,665
1	168	Plotting Room Kessler to splice, cable (Item 167) 250 ft 26-pr #19 ga (WC-366) Material $ 55 Contingency 10 $ 65 Labor 100 $165		$65	$100	$165
3	96	Zachs Bay to Jones Beach C.G. Station 30,000 ft part quadded submarine Material $13,500 Contingencies 2,025 $15,525 Labor 3,000 $18,525		$15,525	$3,000	$18,525
3	97	Plotting room Const. No. 220 to splice, cable (Item 167) 250 ft 26-pr #19 ga (WC-366) Material $ 55 Contingencies 10 $ 65 Labor 100 $165		$65	$100	$165

* See last page of this group

COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H. D. of Sandy Hook

Paragraph No. 20c ENGINEER & SIGNAL COST

PRIORITY	ITEM	DESCRIPTION	ENGINEER	SIGNAL MTL	SIGNAL LAB	TOTAL
1	169	"B" Tower to Seaside 7,700 ft 56-pr quadded submarine Material $4,389 Contingencies 658 $5,047 Labor 770 $5,817		$5,047	$770	$5,817
		Engineer:				
1	170	Construct 4 Cable Huts "L" - "M" & "N" and one in vicinity of Const. #116 $700 each Material $1190 Contingencies 210 $1400 Labor 1400 $2800 (* Note #11)	$2,800			$2,800

* See last page of this group.

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COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: CABLE REQUIREMENTS H. D. of Sandy Hook

Paragraph No. 20 c ENGINEER & SIGNAL COST

NOTES

NOTE #1 - $36,360 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H.

NOTE #2 - $12,240 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H. for 7,200 feet 100-pair #19 LCA WC-368 Cable "E" Hut to "F" Hut. Size of cable should be increased to 200 pair.

NOTE #3 - $32,481 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H. for purchase of 44,300 feet 50-pair #19 submarine cable WC-327 Hut "R" to Arverne Tower.
$39,077 recommended per above letter O.C.C.A. for 53,100 feet 50-pair #19 WC-327 submarine cable, Arverne to Long Beach.

NOTE #4 - $2,575 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H. for cable MH #238 to "E" Hut; MH #238 to Battery Mills and MH #238 to Battery Kingman.

NOTE #5 - $2,315 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H. for 1,350 feet 100-pair #19 LCA WC-368 cable Hut "E" to "M".

NOTE #6 - $3,185 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H. for 1850 feet 100-pair #19 LCA WC 368 cable Hut "L" to Hut "F".

NOTE #7 - $20,400 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H., for 3,000 feet 100-pair #19 submarine cable WC-329and 9,000 feet 100-pair #19 LCA WC-368 cable Hut "C" to Hut "N".

NOTE #8 - $2,335 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure program Seacoast Defense Funds H.D.S.H., for 2,100 feet 100-pair #19 LCA WC-368 cable Hut "N" to Hut "G".

NOTE #9 - $3,440 allocated per letter O.C.C.A. (111/IB 15A) February 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H., for 2,900 feet 50-pair #19 LCA WC-367 cable point near Twin Lights to Dug-in Station.

NOTE #10- Refer to letter O.C.C.A. (111/IB 15A) February 18, 1941, subject: "Expenditure Program Seacoast Defense Funds H.D.S.H.

NOTE #11- Cable Huts "L", "M" & "N" proposed in original project but not provided.

SECRET

SEACOAST SEARCHLIGHTS

SEACOAST SEARCHLIGHTS

21. The seacoast artillery searchlight defense recommended for employment pending completion of the modernization program is as shown in the following sub-paragraphs and accompanying exhibits:

LIST OF SEACOAST SEARCHLIGHTS (HD)

(Pending Completion of Modernization Program)

TACTICAL NUMBER	LIGHT TYPE	TACTICAL LOCATION FORT	SITE NO.	EXHIBIT	TACTICAL ASSIGNMENT	ON HAND	REQUIRED
1	60" AA Portable (SC)	Hancock	1	41	Hancock Groupment	Yes	50' x 50' Site
2	60" AA Portable (SC)	Hancock	1	41	Hancock Groupment	Yes	50' x 50' Site
3	60" Ry Portable	Hancock	2	41	Hancock Groupment	Yes	
4	60" Bascule Mt	Hancock	3	41	Hancock Groupment	Yes	
5	60" Bascule Mt	Hancock	3	41	Hancock Groupment	Yes	
6*	60" Fixed	Hancock	4	41	Hancock Groupment	Yes	
7*	60" Fixed	Hancock	5	41	Hancock Groupment	Yes	
8*	60" Fixed	Tilden	6	41	Tilden Groupment	Yes	50' x 75' site 1 - 25 kw PP Concrete Housing. 35' steel tower
9*	60" Fixed	Tilden	7	41	Tilden Groupment	Yes	50' tower, Bascule
10*	60" Fixed	Tilden	8	41	Tilden Groupment	Yes	50' Tower, Bascule
11	60" AA Portable (SC)	Tilden	9	41	Tilden Groupment	Yes	Site 50'x50'
12	60" AA Portable (SC)	Tilden	9	41	Tilden Groupment	Yes	Site 50'x50'

* For use of Mine Command upon request.

a. Lights one and two (including two 50' towers), to be located just north of Seabright, New Jersey are on hand. Two sites 50' x 50' with entrance rights of way are yet to be acquired. Authority - Annex C to the project. Estimated cost of land is $3,000.00 ($1,500 per plot).

b. Light number eight to be located at the extreme western tip of Rockaway Point is authorized by the project when an emergency occurs. The light is on hand in storage at Fort Tilden. A 35' steel tower is to be supplied and a plot of ground 50' x 75' with entrance right of way is to be acquired. Estimated cost of land is $4,000.00.

21. c. Lights numbers nine and ten located on the Fort Tilden reservation are on hand but require new towers. Light nine is in storage and light ten is temporarily installed in a wooden structure. Both lights were originally mounted on telescoping towers which proved to be totally unsatisfactory due to structural weaknesses. Two 50' steel bascule towers are recommended. This height tower is necessary because of obstructions in the vicinity.

d. Lights eleven and twelve are authorized by Annex C to the Project to be installed when an emergency occurs. Both lights are on hand in storage at Fort Tilden together with two demountable towers, one, 50 feet and the other 38' in height. Two sites 50' x 50' with rights of way are to be acquired. Estimated cost of land is $3,000 ($1,500 per plot).

22. The seacoast artillery searchlight defense recommended for employment after completion of the modernization program is as shown in the following sub-paragraphs and accompanying exhibits:

LIST OF SEACOAST SEARCHLIGHTS
(HD)
(After Completion of Modernization Program)

TACTICAL NUMBER	LIGHT TYPE	TACTICAL LOCATION FORT	SITE NO.	EXHIBIT	TACTICAL ASSIGNMENT	ON HAND	REQUIRED
1	60" AA Portable (SC)	Hancock	1	41a	Hancock Groupment	Yes	Site 50'x50'
2	60" AA Portable (SC)	Hancock	1	41a	Hancock Groupment	Yes	Site 50'x50'
3	60" Ry Portable	Hancock	2	41a	Hancock Groupment	Yes	
4	60" Bascule Mt	Hancock	3	41a	Hancock Groupment	Yes	
5	60" Bascule Mt	Hancock	3	41a	Hancock Groupment	Yes	
#6	60" Fixed	Hancock	4	41a	Hancock Groupment	Yes	
#*7	60" AA Portable(SC)	Hancock	4	41a	Hancock Groupment	No	Complete Light units
#*8	60" AA Portable (SC)	Hancock	5	41a	Hancock Groupment	No	Complete Light units
#9	60" Fixed	Hancock	5	41a	Hancock Groupment	Yes	Bascule Mount 1 25 kw PP 1 Concrete Housing
#10	60" Fixed	Tilden	6	41a	Tilden Groupment	Yes	50'x75' site 1 25 kw PP Concrete Housing 35' steel Tower.
#11	60" Fixed	Tilden	7	41a	Tilden Groupment	Yes	50' Bascule Mount
#12	60" Fixed	Tilden	8	41a	Tilden Groupment	Yes	50' Bascule Mount

22. (Continued)

LIST OF SEACOAST SEARCHLIGHTS
(HD)
(After Completion of Modernization Program)

TACTICAL NUMBER	LIGHT TYPE	TACTICAL LOCATION FORT	SITE NO.	EXHIBIT	TACTICAL ASSIGNMENT	ON HAND	REQUIRED
#							
* 13	60" AA Portable (SC)	Tilden	9	41a	Tilden Groupment	No	Complete Light Unit
14	60" AA Portable (SC)	Tilden	10	41a	Tilden Groupment	Yes	Site 50'x50'
15	60" AA Portable (SC)	Tilden	10	41a	Tilden Groupment	Yes	Site 50'x50'

* Represents additional lights.

For use of Mine Command upon request.

a. Experience indicates that lights seven and eight shown in the above table are necessary to complete the searchlight illumination needed in the defense at Fort Hancock. Number seven is required to supplement the area now inadequately illuminated by light number six. In view of the distance to site 5 and the topography of the shore line a portable light is highly desirable. Sufficient height of site is either available or can be made available locally (see remarks following sub-paragraph e.)

b. The present single light at the north end of the Hook is inadequate for the illumination of the water area involved. It is recommended that an additional light of the AA Portable (seacoast) type (Number eight in the above table) be authorized.

c. A Bascule Mount for light number nine (present number seven) is recommended for purposes of concealment. Present number seven is located on a 35' wooden structure which is extremely vulnerable from both the sea and air.

d. Light thirteen is essential to complete the illumination of the approaches to the east of Fort Tilden. A portable light is recommended as being the most practicable. No land is required as this light will be used as a mobile light. (see remarks following)

22. (Continued)

e. The lights listed above (1 to 9 inclusive at Fort Hancock) (10 to 15 at Fort Tilden) are adequate to the illumination needs in the immediate vicinities of the respective reservations. Inasmuch, however, as the beaches south of Seabright, N.J., and east of Atlantic Beach, L.I., afford excellent sites for landing operations it is recommended that 12 60" AA portable lights (6 at Ft. Hancock) (6 at Ft. Tilden) be procured to cover these flanks to the limits of fields of fire for the 16" batteries. These lights would be held in pools at Forts Hancock and Tilden and disposed in position at such time as required. The costs for these lights are covered in Cost Estimate and Priority Guide, Seacoast Searchlights as a lump sum.

REMARKS: The Board wishes to submit briefly the following thought on type installations for seacoast searchlights. It is the consensus that fixed seacoast lights and towers (except lights on bascule mounts) should be replaced as rapidly as possible where the topography permits with portable AA lights S.C. (mounted on trucks) and that the latter should have available as sites grass covered mounds approximately twenty feet high with concrete wheel tracks (to be camouflaged with trailing grass) extending over the mound. Alternate mounds should be made available for each light. Mounds of the height indicated are sufficient to permit extreme searchlight range.

23. Shelter (other than that at tactical positions) requirements for the above lights and the anti-aircraft lights referred to in paragraph 29, below, are as indicated in the following sub-paragraphs and the indicated exhibits.

a. A frame building 70' x 160' is to be erected in a cleared space just east of the parapet of the abandoned mortar Batteries McCook-Reynolds (Exhibit 42) for the storage of portable searchlights located at Fort Hancock. No land is required (military reservation).

b. A similar frame structure 70' x 160' is to be erected at Fort Tilden for housing portable lights at that post. No land is required (military reservation) (See Exhibit 43).

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COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: SEACOAST SEARCHLIGHTS H. D. of Sandy Hook

Paragraph 24

PRIORITY	ITEM	DESCRIPTION	ENGINEER MATERIAL	ENGINEER LABOR	LAND	TOTAL
1	176	2 Plots of Land 50' x 50' for Searchlights 1 & 2 @ $1,500 each = $3,000			$3,000	$3,000
3	105	Searchlight No. 7: a. Searchlight $16,150 b. Concrete Mound Material $300 Contingencies 45 $345 Labor 400 $745 $16,895	$16,495	$400		$16,895
3	106	Searchlight No. 8: a. Searchlight $16,150 b. Concrete Mound Material $300 Contingencies 45 $345 Labor 400 $745 $16,895	$16,495	$400		$16,895
1	177	Searchlight No. 9: a. Bascule Mount $6000 b. 25 K.W. Power Plant 5500 c. Concrete Bldg. for Power Plant 30' x 25' 1500 Contingencies 1950 $14950 Labor 3085 Total $18,035	$14,950	$3,085		$18,035
1	178	Searchlight No. 10: a. 25 K.W. Power Plant $5,500 b. Concrete Bldg. for Power Plant 30' x 25' 1,500 c. 35' Steel Tower 1,700 Contingencies 1,300 $10,000 Labor 1,350 $11,350 Plot of land 50' x 100' 4,000 Total $15,350 Funds approved Expenditure Program, letter O.C.C.A. (111-IB 15A) Feb. 18, 1941, Subject: "Expenditure Program Seacoast Defense Funds H.D.S.H."	$10,000	$1,350	$4,000	$15,350

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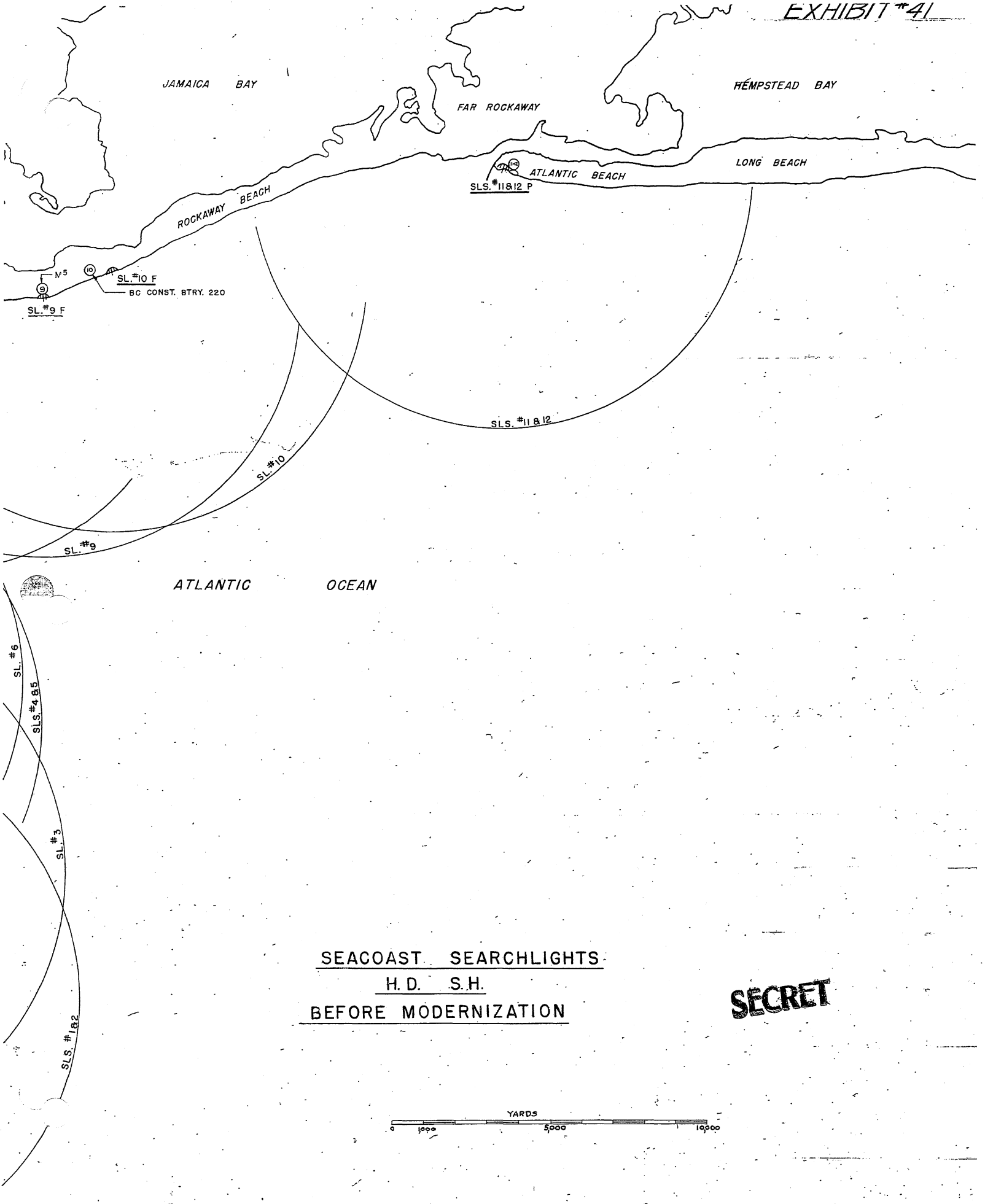
COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: SEACOAST SEARCHLIGHTS H. D. of Sandy Hook

Paragraph 24

PRIORITY	ITEM	DESCRIPTION	ENGINEER MATERIAL	ENGINEER LABOR	LAND	TOTAL
1	179	Bascule Mounts for Searchlights 11 & 12 a. 2 Bascule Mts. $12,000 b. 2 - 25 K.W. Power Plants 11,000 Contingencies 3,450 $26,450 Labor 4,200 Total $30,650	$26,450	$4,200		$30,650
3	107	Searchlight No. 13 60" AA (SC) Light & Power Unit $16,150	$16,150			$16,150
1	180	2 Plots of land 50' x 50' for Searchlights 14 & 15 2 Plots Land $ 3,000			$3,000	$3,000
		6 AA Portable Searchlights not numbered (Ft. Hancock)	$96,600			$96,600
		6AA Portable Searchlights not numbered (Ft. Tilden)	$96,600			$96,600

EXHIBIT #41



SEACOAST SEARCHLIGHTS

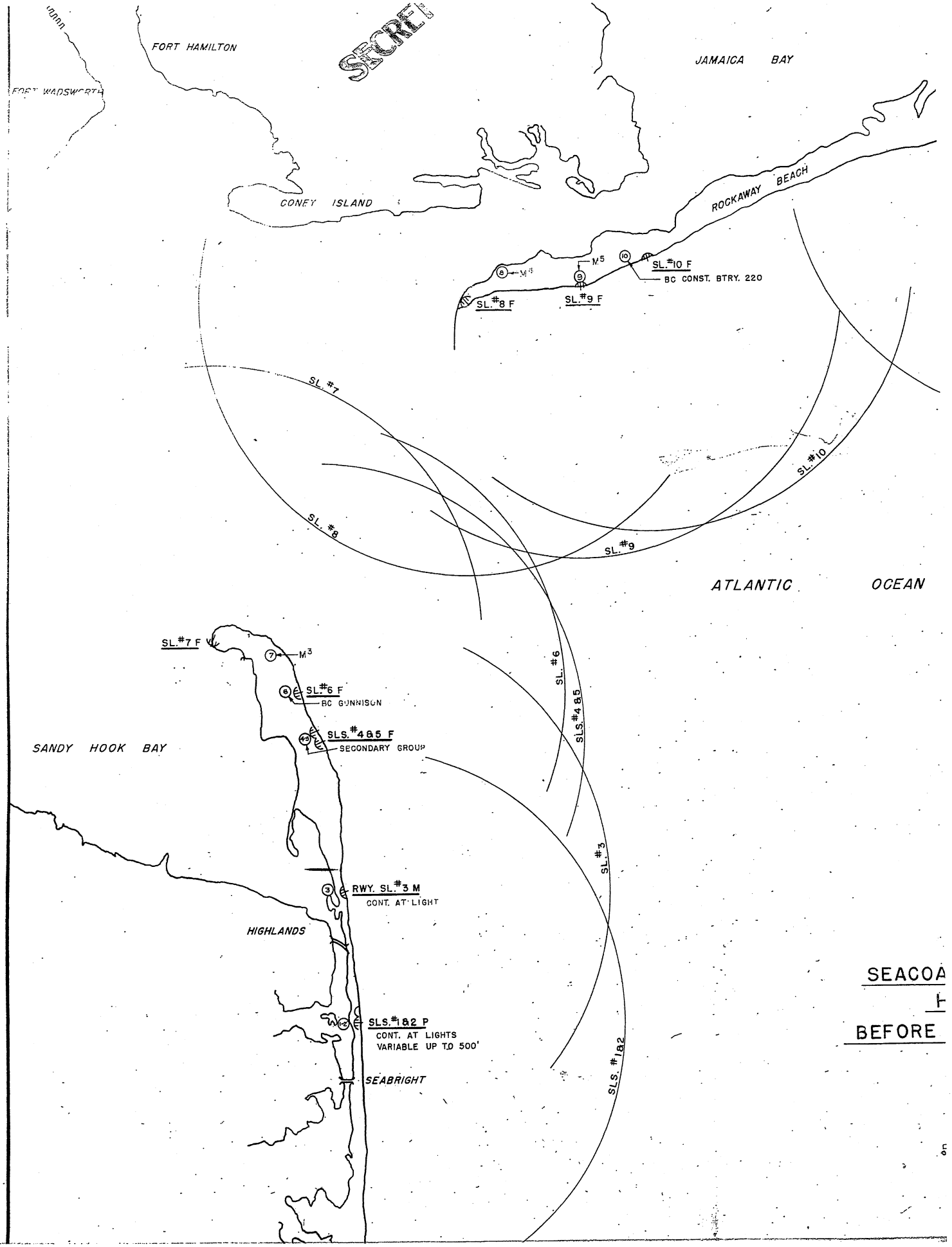
H. D. S. H.

BEFORE MODERNIZATION

SECRET

YARDS

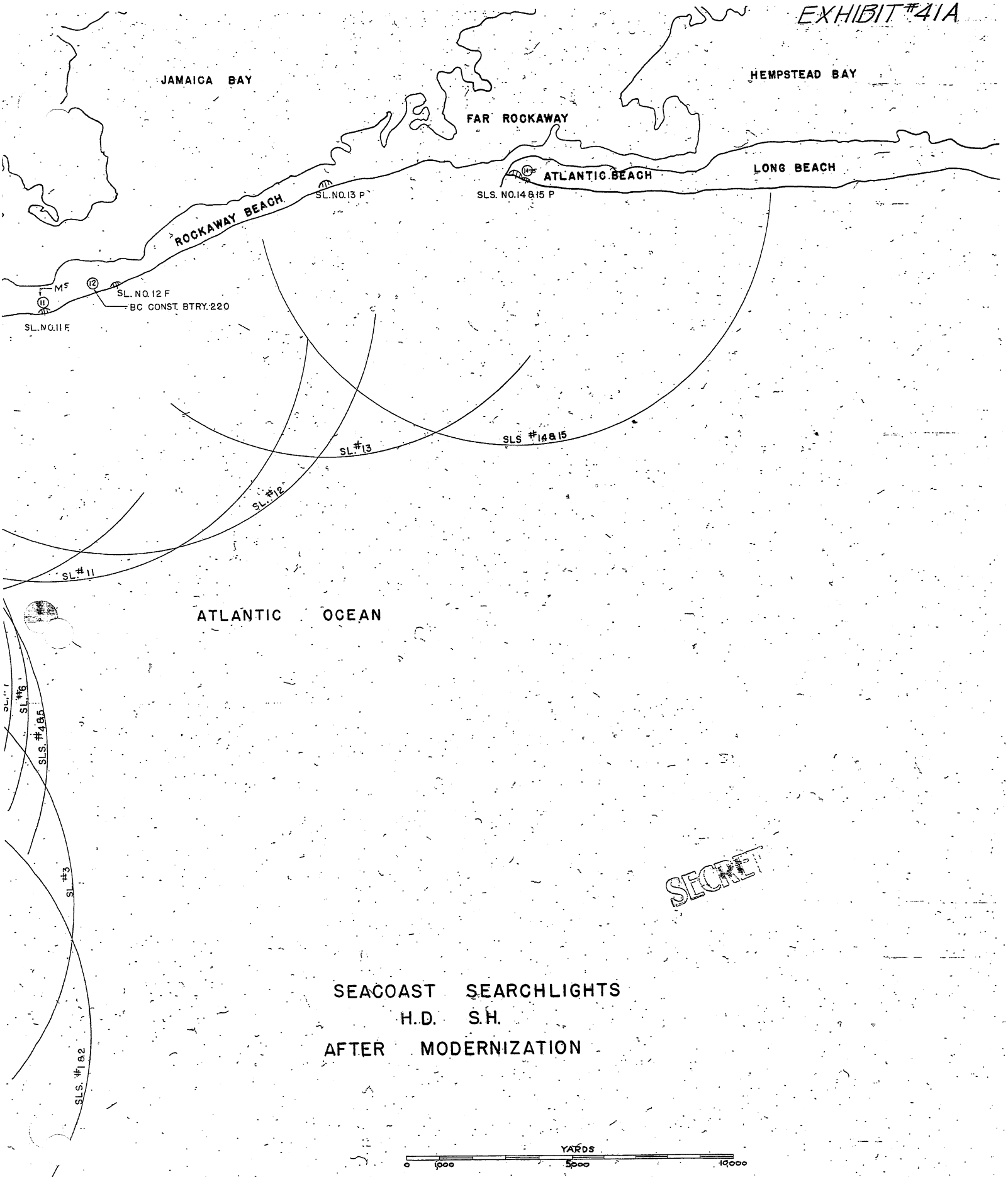
0 1000 5,000 10,000

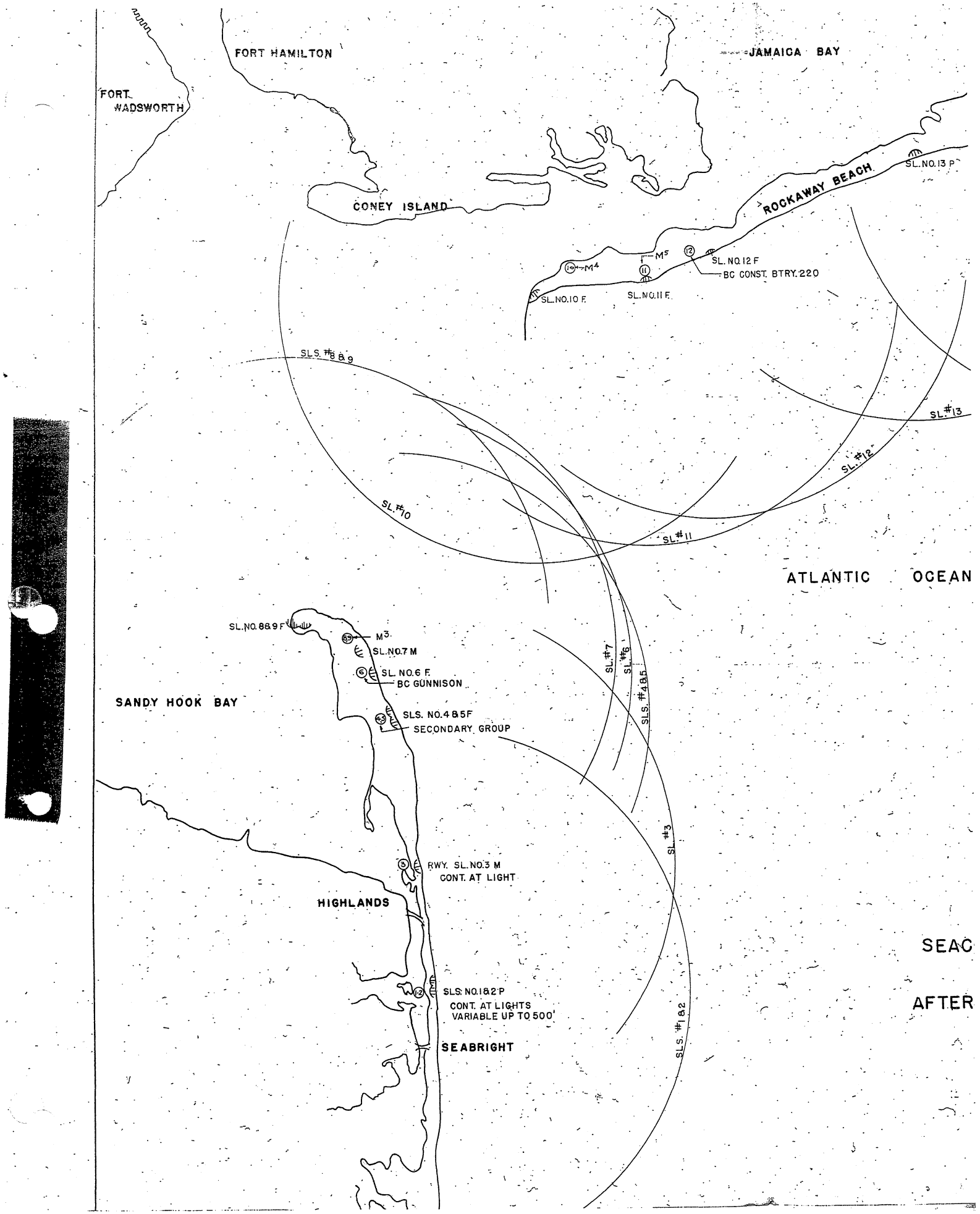


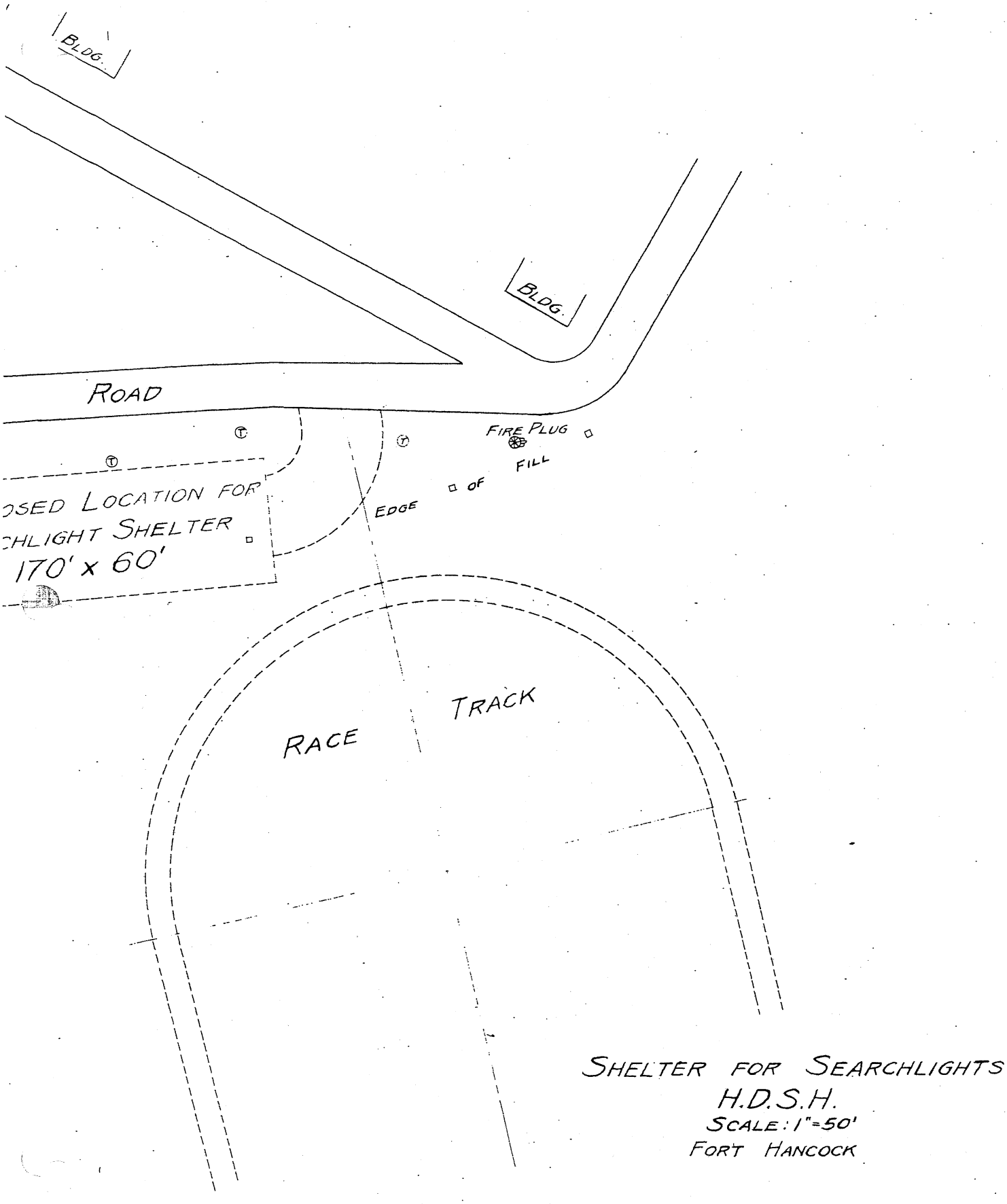
SEACOA

BEFORE

EXHIBIT #41A


JAMAICA BAY
HEMPSTEAD BAY
FAR ROCKAWAY
ATLANTIC BEACH
LONG BEACH
ROCKAWAY BEACH
SL. NO. 13 P
SLS. NO. 14 & 15 P
M5
12
SL. NO. 12 F
BC CONST. BTRY. 220
11
SL. NO. 11 F
SL. #13
SLS #14 & 15
SL. #12
SL. #11
ATLANTIC OCEAN
SL. #6
SLS. #4 & 5
SL. #3
SLS. #1 & 2
SECRET
SEACOAST SEARCHLIGHTS
H.D. S.H.
AFTER MODERNIZATION
YARDS
0
1000
5000
10000


FORT HAMILTON
FORT WADSWORTH
JAMAICA BAY
CONEY ISLAND
ROCKAWAY BEACH
SL. NO. 13 P
M5
12
SL. NO. 12 F
BC CONST. BTRY. 220
10
M4
11
SL. NO. 10 F
SL. NO. 11 F
SLS. #8&9
SL. #13
SL. #12
SL. #10
SL. #11
ATLANTIC OCEAN
SL. NO. 8&9 F
M3
SL. NO. 7 M
6
SL. NO. 6 F
BC GUNNISON
SANDY HOOK BAY
SLS. NO. 4&5 F
SECONDARY GROUP
SL. #7
SL. #6
SLS. #4&5
SL. #3
5
RWY. SL. NO. 3 M
CONT. AT LIGHT
HIGHLANDS
12
SLS. NO. 1&2 P
CONT. AT LIGHTS
VARIABLE UP TO 500'
SEABRIGHT
SLS. #1&2
SEAC
AFTER



SHELTER FOR SEARCHLIGHTS
H.D.S.H.
SCALE: 1"=50'
FORT HANCOCK

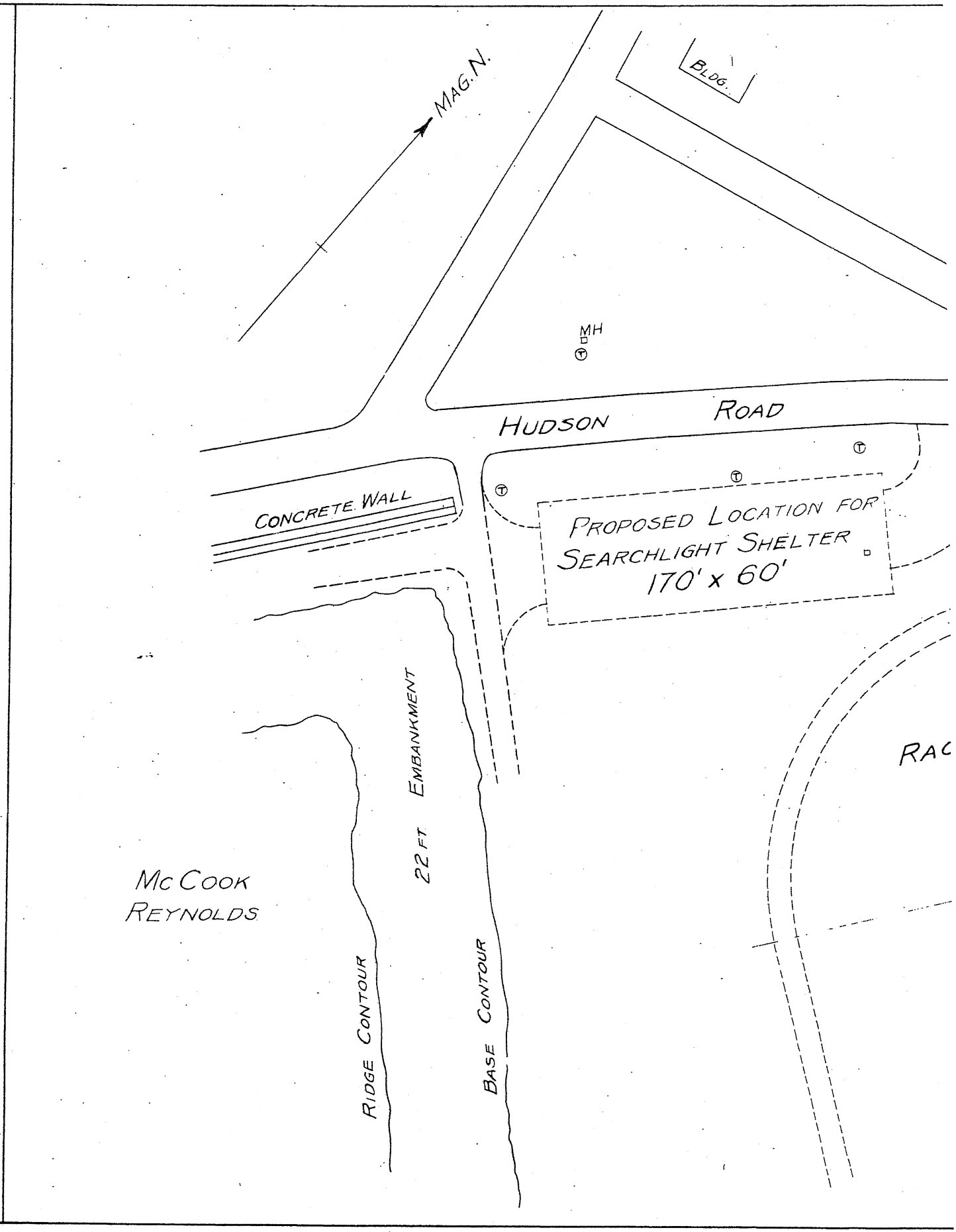
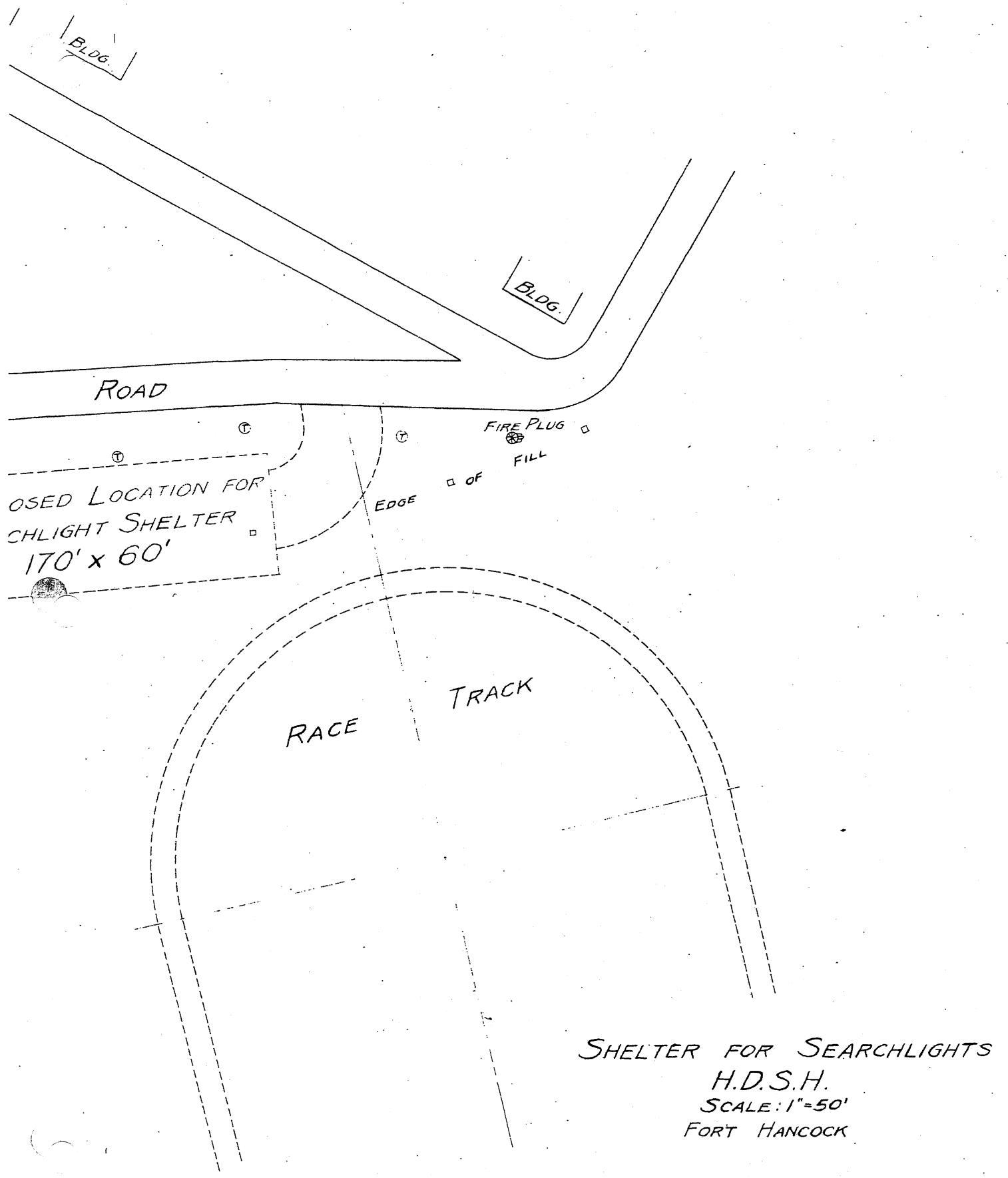

MAG. N.
BLDG.
MH
HUDSON ROAD
CONCRETE WALL
PROPOSED LOCATION FOR
SEARCHLIGHT SHELTER
170' x 60'
22 FT EMBANKMENT
RIDGE CONTOUR
BASE CONTOUR
MC COOK
REYNOLDS
RAC

EXHIBIT #42



SHELTER FOR SEARCHLIGHTS
H.D.S.H.
SCALE: 1"=50'
FORT HANCOCK

SECRET

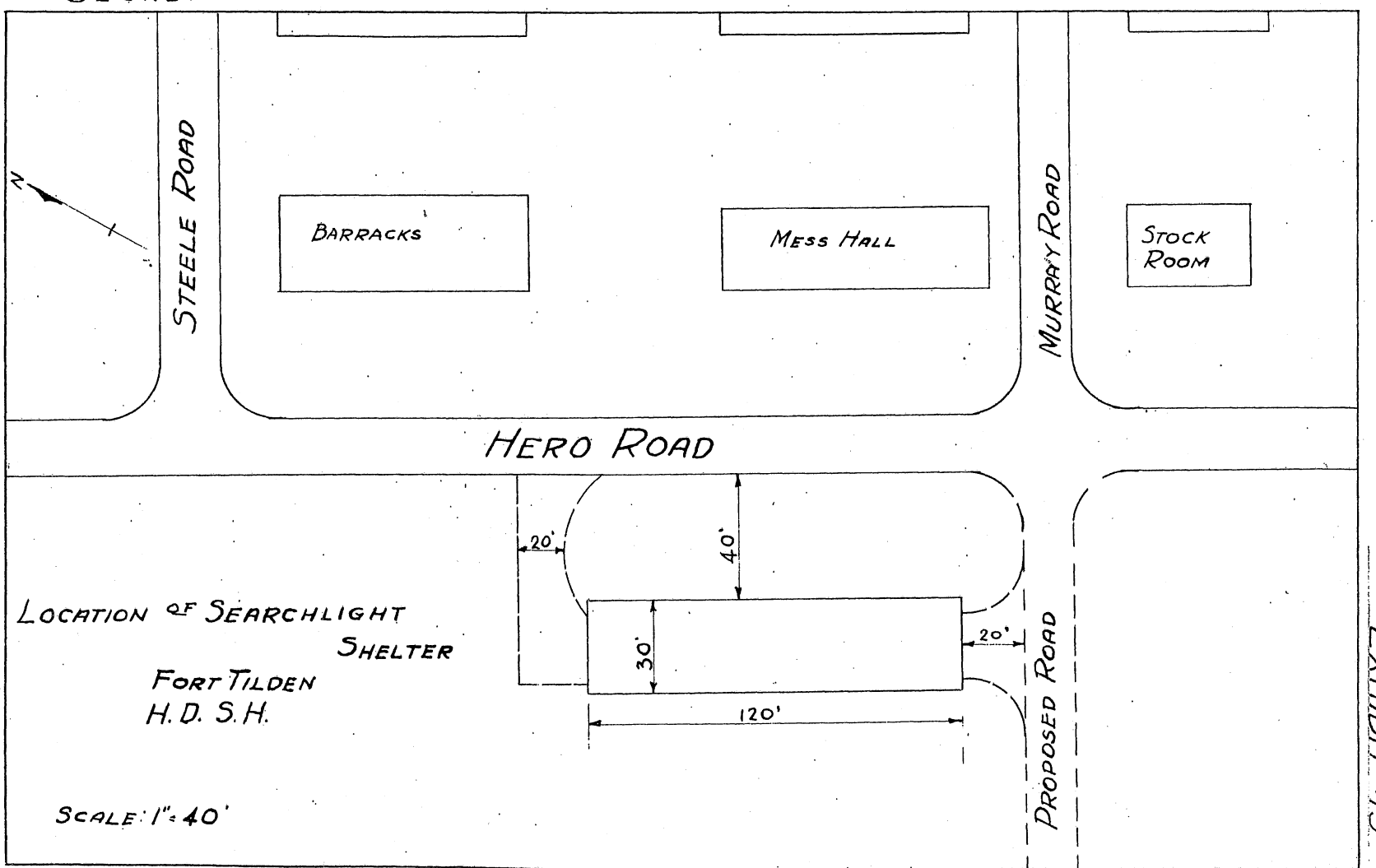


EXHIBIT #43

SECRET

UNDERWATER DEFENSE

UNDERWATER DEFENSE

25. The Underwater Defense project for this harbor defense is prescribed in Annex D to the Project and subsequent correspondence and may be briefly described as follows: An inner mine barrage of 23 groups of controlled mines to extend across the water area between the northern end of Sandy Hook, N.J. and the western end of Rockaway, Long Island. Thirteen groups are to be controlled at Fort Hancock and ten groups to be controlled at Fort Tilden. Plans to control ten groups at Fort Tilden are of recent origin and are not covered in the project but have been approved by the Chief of Coast Artillery. The mine groups are shown in Exhibit 44.

26. The requirements for submarine mine shore installations (other than those pertaining to gun batteries assigned to mine defense) now authorized; those existing and those remaining to be installed or procured are as follows:

a. (1) Mine Casemate - Fort Hancock (Exhibits 20 and 45:)
This casemate is already constructed and is adequate for the project or an enlarged project. It is at present equipped to handle 23 groups of mines. Panels sufficient to control ten groups will be transferred to the Tilden casemate when constructed.

(2) Mine Casemate - Fort Tilden (Exhibit 23):
This casemate, which is not provided for in the project has been authorized by the Chief of Coast Artillery. It will be designed to handle 20 groups of mines. Architecturally it will be a bombproof type construction.

b. Mine Loading Rooms (Exhibit 45):
Two mine loading rooms (22' x 46') are already constructed at Fort Hancock. Each room is capable of loading 38 mines per day (24 hours). No additional loading facilities are required.

c. Cable Tanks (Exhibit 45):
A total of six tanks located in a single structure at Fort Hancock furnish sufficient capacity to submerge approximately 170 reels or 340 miles of single conductor cable. This is sufficient capacity for the entire project. The present hoisting equipment, however, is antiquated and has deteriorated to the point where it is dangerous to those handling. The installation of four electric hoists (10-ton) is considered to be an urgent necessity. The cost is estimated to be $1,000 per hoist.

d. Wharf (Exhibit 45):
The Wharf at Fort Hancock, complete with trackage, is adequate for servising two mine planters simultaneously. No additions to the wharf are required. It is considered to be essential, however, to provide mechanical loading equipment at the wharf of the following description:

Two cranes of the turntable boom and fall type of 5-tons normal working loading capacity. These cranes are to be used primarily for loading cables, which at the present time are loaded normally at a great loss in time and effort. The cost is estimated to be $3,600 ($1,800 per crane).

e. Magazines (Exhibit 46):
Two igloo type magazines located at Fort Hancock east of the main road opposite Batteries Mills and Kingman furnish storage space for approximately 119,000 pounds of TNT (20,050 lbs of the 119,000 are for the HDSNY). These magazines are of sufficient size to accommodate approximately 180,000 lbs of TNT which is about what the project requires with a 30% excess supply. The amount now stored in the magazines violates the provisions of technical regulations 1370 A including changes C-1-7. The Board recommends that two additional magazines of the same type be constructed on the spit of land extending south of Battery Mills and that the total required TNT be distributed equally among the four magazines. (See Exhibit 5). Estimated Cost $30,000.

680.4/21
27-28

f. Mine Planters:
One mine planter, the General E.O.C. "ORD" is regularly assigned to the Harbor Defense of Sandy Hook. One additional mine planter (new type) is required. Cost unknown.

g. DB Boats:
One DB boat, the L-40, is on hand but does not meet the license requirements and can not be altered readily to comply with them. The Board recommends that the L-40 be replaced and two additional DB boats be supplied. Total requirements - 3 DB boats. Cost unknown.

h. Yawl Boats:
There are six yawl boats on hand which is one-half the number required. Six additional yawls should be provided (cost - $3,800 each).

i. Land Requirements:

Two plots 50' x 50' each are required for two cable huts to be located at Rockaway Point (M4 tower superimposed over one of them (Fort Tilden). (Exhibit 22) Estimated cost - $3,000.

x. The following additional facilities to complete the project are strongly recommended:

(1) Boat House: (Exhibit 45):
The present boat house at Fort Hancock is totally inadequate for the proper storage of the boats on hand and those recommended for procurement. It has a capacity of 5 bays, only two of which can be considered satisfactory. In addition no indoor facilities are provided for the repair and maintenance of boats during the winter months. The Board recommends that this structure be replaced with a building of sufficient size to house six yawls and that it be equipped with a marine railway. The new building should be designed so that safe mooring is provided for the balance of the boats in the mine command. Estimated cost $100,000.

(2) Mine Storage Facilities - (Exhibit 45):
Three mine store rooms are available and supply sufficient space for the storage of material and equipment which require protection from the elements. Additional storage space should be provided however for the storage of anchors. A concrete apron 36' long on the north end of the old storehouse (No. 1) should be extended approximately 67' for this purpose. A narrow gauge track already extends the entire distance (103'). The cost of extending the apron is estimated to be $2,500.

(3) Mine Flat Cars (Narrow Gauge):
There are at present 18 serviceable flat cars available. This is approximately one-half the number required. Eighteen new flat cars should be procured to bring the total number of serviceable cars to 36. The cost is unknown.

(4) Oil and Paint Storehouse:
An oil and paint storehouse should be constructed. A concrete block structure 24' square and 12' high is recommended. (Exhibit 45) Estimated cost $1,800.

(5) Carpenter Shop:
There is a need for a carpenter shop for the use of the mine command at Fort Hancock. A small frame building 20' x 20' x 15' is recommended. It should be located in the vicinity of the former torpedo storehouse close to the railroad track (See Exhibit 45). The cost is estimated to be $850.

COST ESTIMATE AND PRIORITY GUIDE

Local Board Proceedings: UNDERWATER DEFENSE H. D. of Sandy Hook

Paragraph 27

PRIORITY	ITEM	DESCRIPTION	ENGINEER MATERIAL	ENGINEER LABOR	SIGNAL MATERIAL	TOTAL
1	171	Hoisting Equipment - Cable Tanks 4 Electric Hoists @ $1,000	$ 4,000	$	$	$ 4,000
1	172	Mechanical Loading Equipment for use at Wharf 2 Cranes - 5 tons loading capacity @ $1,800 per crane	3,600			3,600
3	98	Storage facilities for TNT 2 Igloo type magazines @ $7,500 (each) Labor $7,500 (each)	15,000	15,000	99	30,099
		Signal: 2 Telephones EE-91 $60 2 Handsets HS-17A 24 Contingencies 15 $99				
3	99	1 Mine Planter (Cost unknown)				
3	100	3 DB Boats (Cost unknown)				
3	101	Yawl Boats 6 Yawl Boats at $3,800 each	22,800			22,800
1	173	Mine Casemate - Fort Tilden (See F.C. COST ESTIMATE & PRIORITY GUIDE BY LOCATION)				
1	174	Boat House, 6 Bays capacity & including Marine railway - Fort Hancock.	60,000	40,000	99	100,099
		Signal: 2 Telephones EE-91 $60 2 Handsets TS-12A 24 Contingencies 15 $99				
1	175	Storage Facilities for Anchors Extension of concrete apron approximately 67'	2,000	500		2,500
3	102	Mine Flat-cars (narrow gauge) 18 cars required (Cost unknown)				
3	103	Oil & Paint Storehouse (24 x 24 x 12) Concrete	1,000	800		1,800
3	104	Carpenter Shop - frame construction (20 x 20 x 15)	500	350		850

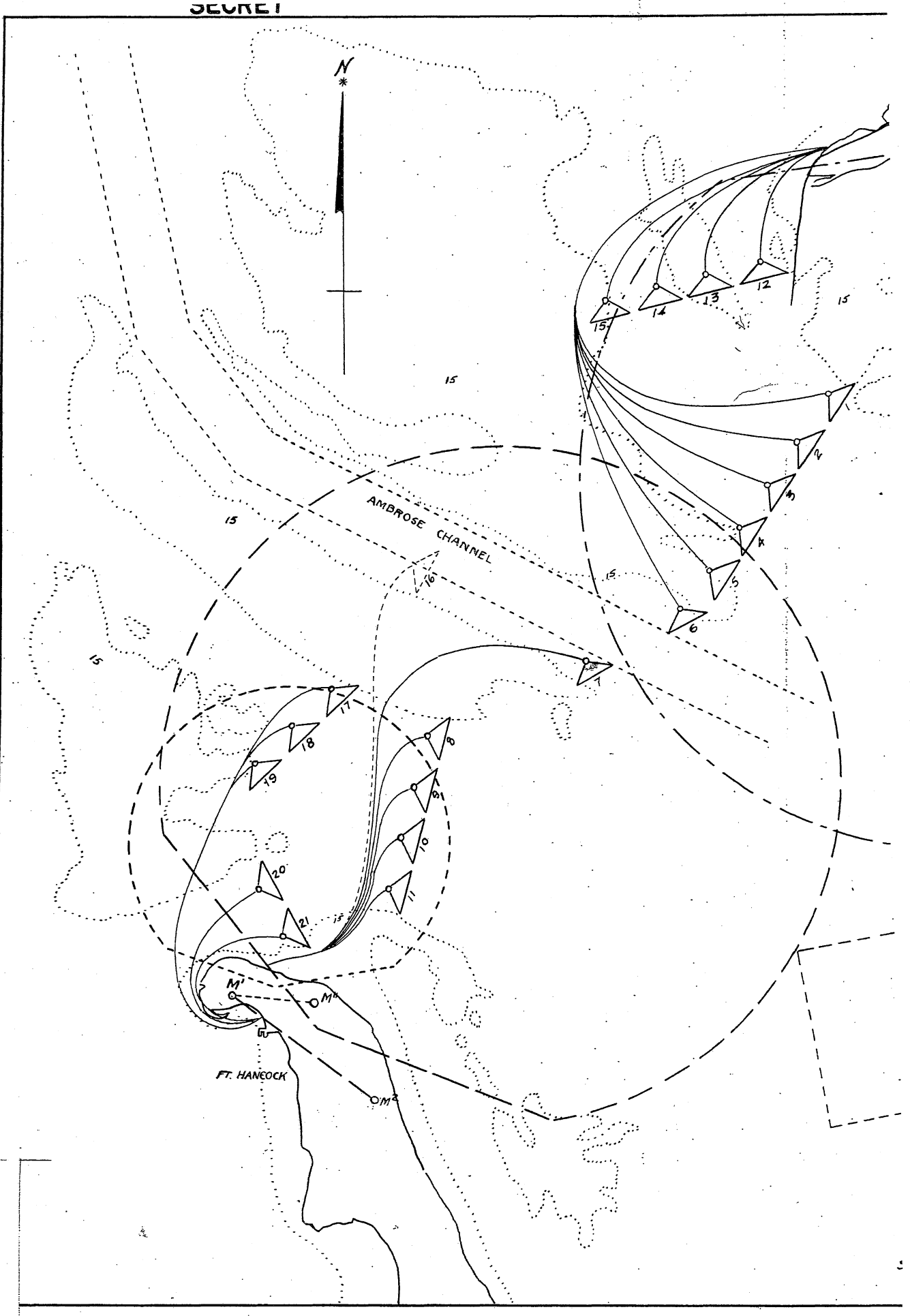
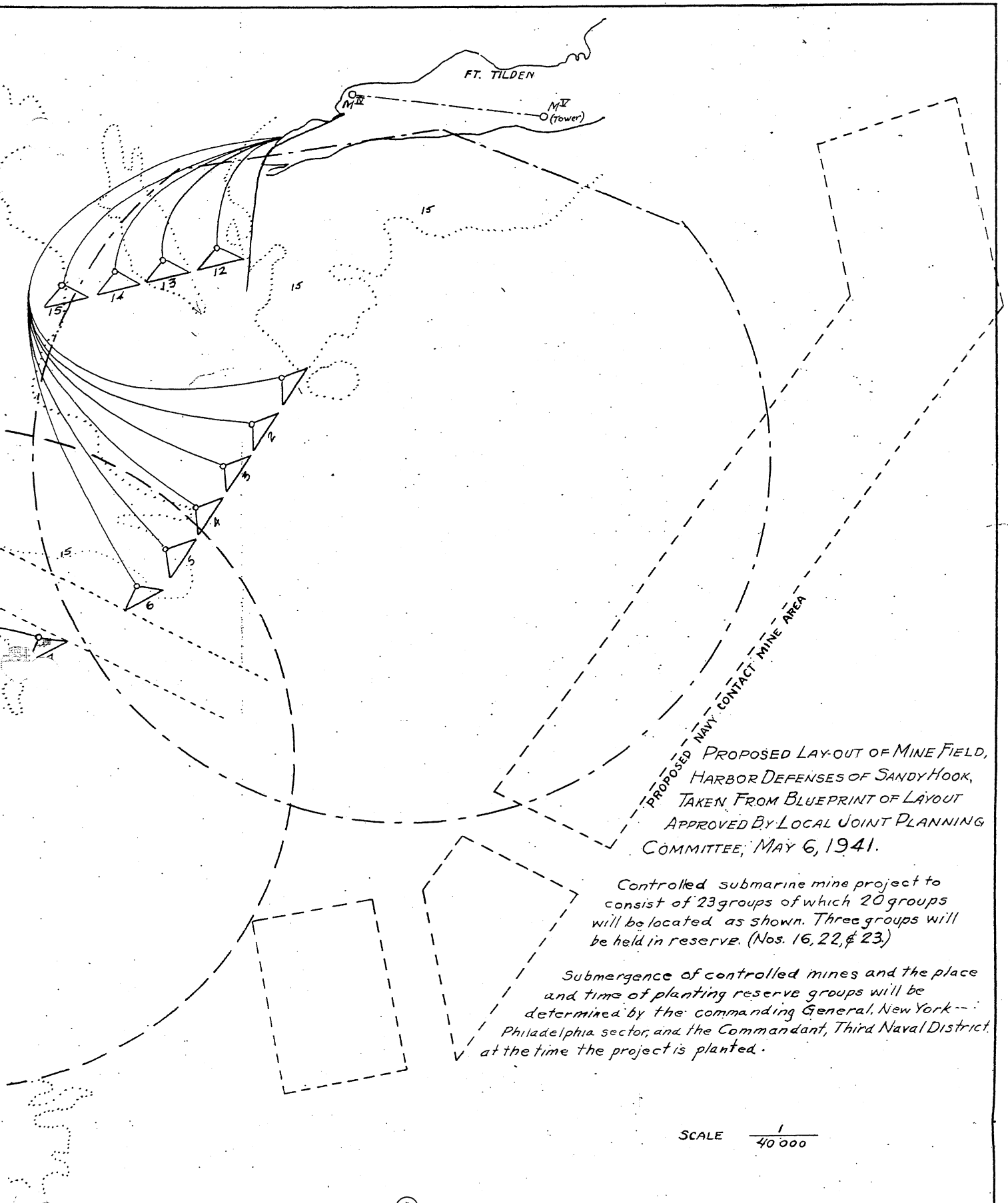

N
AMBROSE CHANNEL
FT. HANCOCK
M'
M''
M²
15
16
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
17
18
19
20
21

EXHIBIT #44



PROPOSED LAY-OUT OF MINE FIELD, HARBOR DEFENSES OF SANDY HOOK, TAKEN FROM BLUEPRINT OF LAYOUT APPROVED BY LOCAL JOINT PLANNING COMMITTEE, MAY 6, 1941.

Controlled submarine mine project to consist of 23 groups of which 20 groups will be located as shown. Three groups will be held in reserve. (Nos. 16, 22, & 23.)

Submergence of controlled mines and the place and time of planting reserve groups will be determined by the commanding General, New York--Philadelphia sector, and the Commandant, Third Naval District at the time the project is planted.

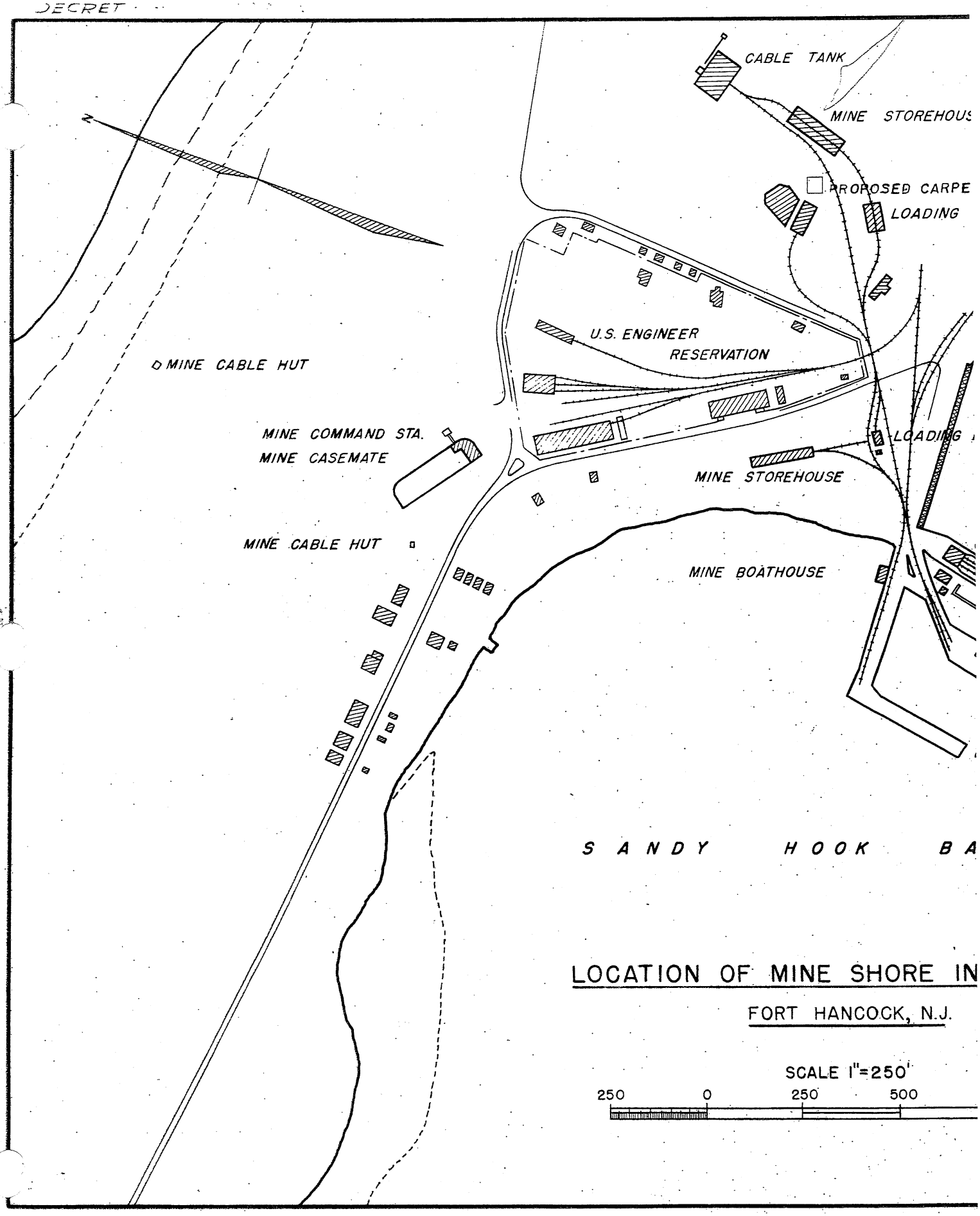
SCALE 1/40 000

Scotland Lightship

Traced from C.& G.S. Chart #369

SECRET

SECRET



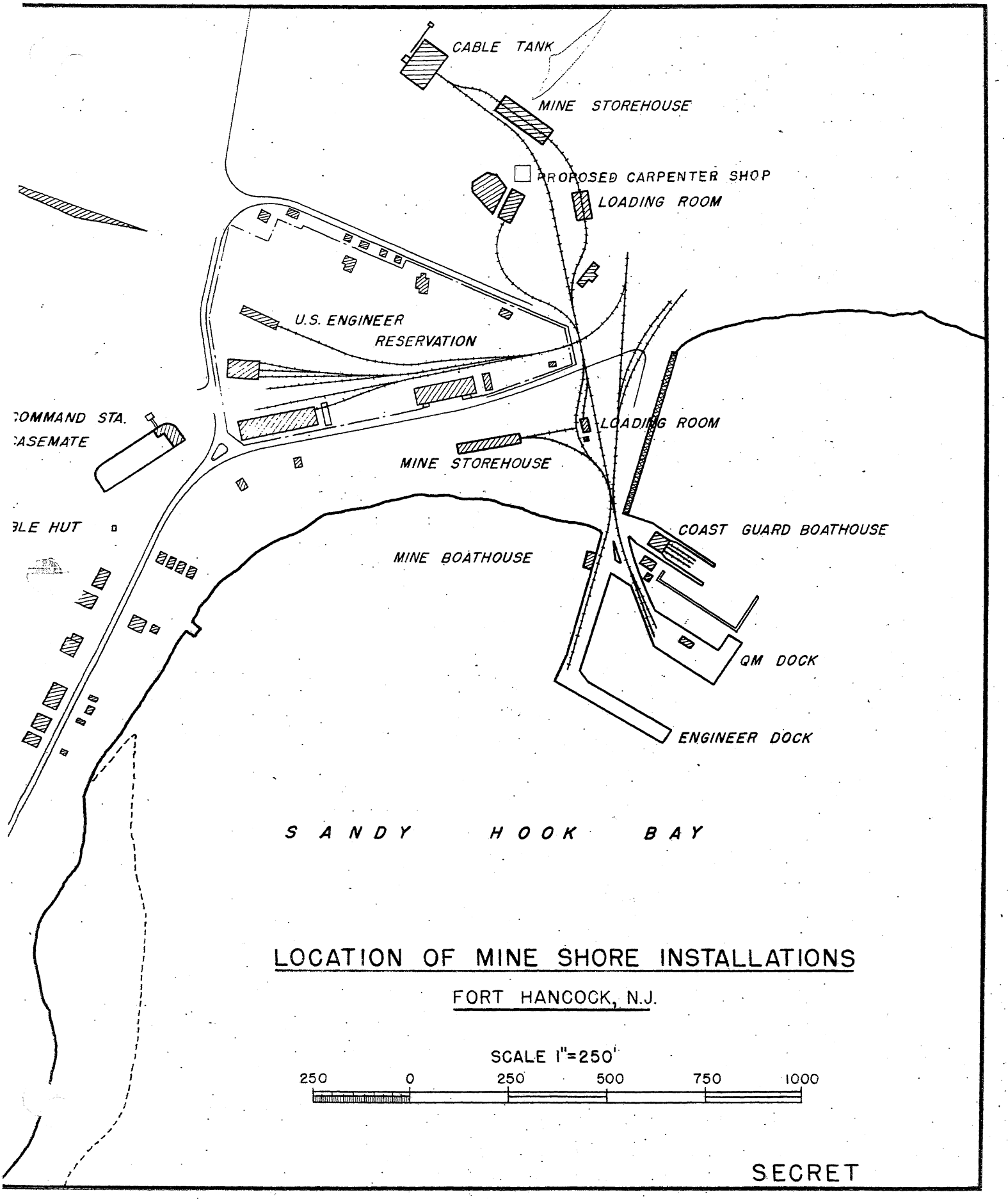
LOCATION OF MINE SHORE IN

FORT HANCOCK, N.J.

SCALE 1"=250'

250 0 250 500

EXHIBIT #45



LOCATION OF MINE SHORE INSTALLATIONS

FORT HANCOCK, N.J.

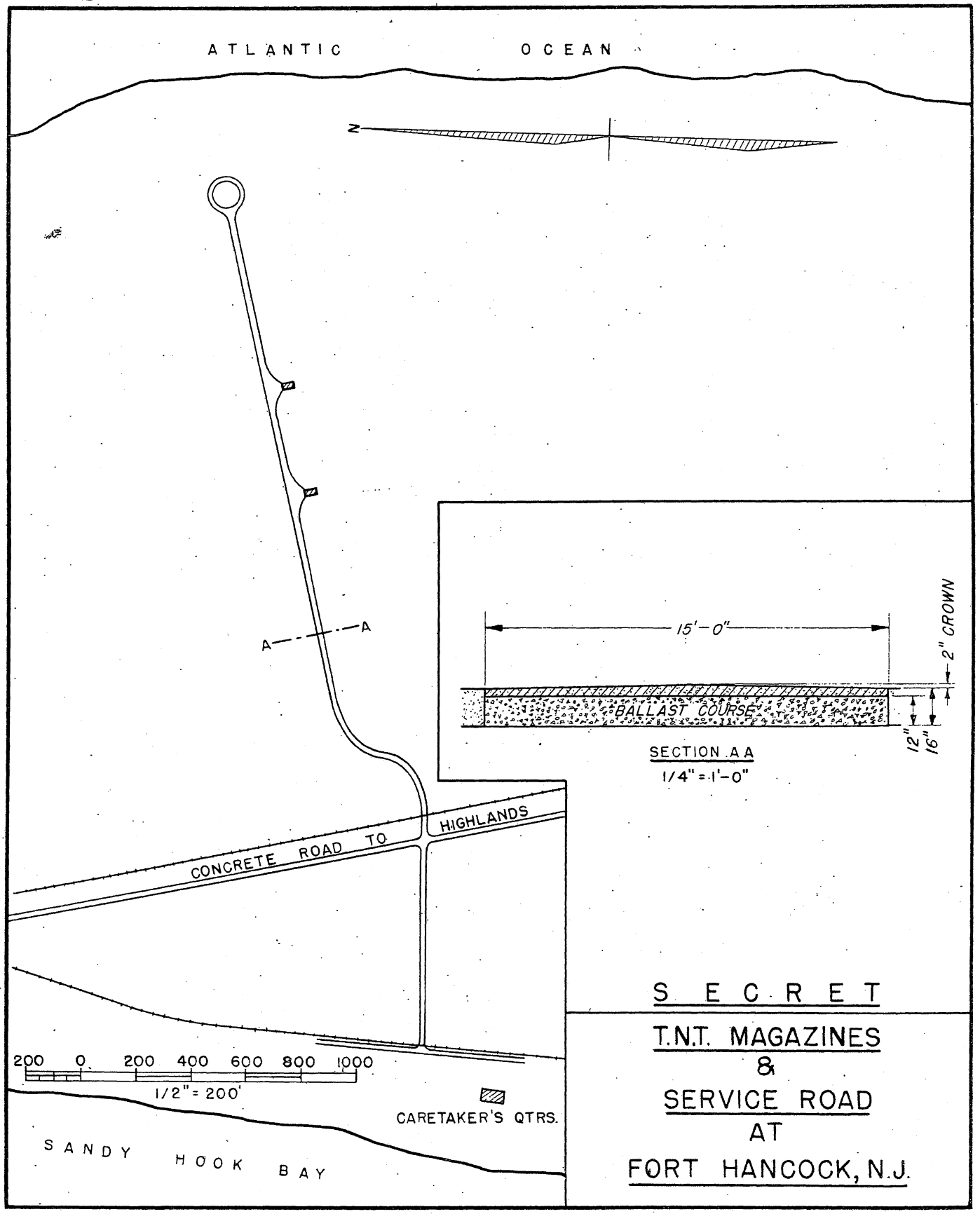
SCALE 1"=250'

250 0 250 500 750 1000

SECRET

SECRET

EXHIBIT #46



SECRET

T.N.T. MAGAZINES & SERVICE ROAD AT FORT HANCOCK, N.J.

ANTIAIRCRAFT ARTILLERY

ANTIAIRCRAFT ARTILLERY

28. The authorized antiaircraft gun defense is disposed as stated in the following subparagraphs and as shown in the indicated Exhibits. For the tactical organization for antiaircraft defense see Paragraph 8 and Exhibits 1 and 2.

LIST OF 3-INCH FIXED ANTIAIRCRAFT GUN BATTERIES

BTRY NO	NO OF GUNS	LOCATION FORT	LOCATION SITE	EXH.	TYPE GUNS	TYPE MOUNTS	BATTLE ALL AMMUNITION	PLACE OF STORAGE (RECOMMENDED)
1	3	Hancock	1	5	3"	Fixed	1,800	Igloo magazine
2	3	Hancock	2	5	3"	Fixed	1,800	Igloo magazine
3	3	Tilden	3	6	3"	Fixed	1,800	Igloo magazine

a. Armament requirements of the antiaircraft gun defense are complete.

b. Fire control and communication equipment will be supplied in accordance with Table of Basic Allowances, Coast Artillery Corps, dated November 1st, 1940 or as recommended in the latest Harbor Defense Equipment Report.

c. No land procurement is involved except trespass rights to a flank spotting station to be located on Mt Mitchel in Hilton Park, State of New Jersey. As this is public property no cost is anticipated.

29. The authorized antiaircraft searchlight defense is disposed as stated in the following subparagraphs and as shown in the indicated exhibits:

LIST OF ANTIAIRCRAFT SEARCHLIGHTS

AA SL NO.	EXHIBIT	LOCATION FORT	LOCATION SITE NO.	TYPE	ON HAND	REQUIRED
1	39	Hancock	1	60" AA Portable	Yes	*
2	"	"	2	" " "	"	*
3	"	"	3	" " "	No	*
4	"	"	4	" " "	"	*
5	"	"	5	" " "	"	*
6	"	"	6	" " "	"	*
7	"	"	7	" " "	"	*
8	"	"	8	" " "	"	*
9	39a	"	9	" " "	"	*
10	39	"	10	" " "	"	*
11	"	Tilden	11	" " "	"	*
12	"	"	12	" " "	"	*
13	"	"	13	" " "	"	*
14	"	"	14	" " "	"	*
15	"	"	15	" " "	"	*

29. (Continued)
* All lights together with power and controller equipment are approved and in order. Authority letter AGO 660.2 AA (10-23-40) MCCC Washington: dated November 1, 1940, Subject, "Revision of Antiaircraft Annex, Harbor Defense Projects "Table B".

a. For shelter requirements for the antiaircraft searchlights see Paragraph 23 above. No land procurement is believed to be involved in the dispositions of AA searchlights as shown in Exhibit 48 and 48A. All lights are portable and will be moved to the indicated positions in the case of an emergency. Communication to all lights except those located on the Military reservations of Forts Hancock and Tilden will be via commercial circuits terminating in the nearest fire control cable hut.

30. a. The recommended antiaircraft automatic weapon defense will be disposed as stated in the following subparagraphs:

b. No plan of local defense is submitted in this Local Board Proceedings. These weapons will be distributed in accordance with local H.D. Plan at the time of their receipt.

ANTIAIRCRAFT AUTOMATIC WEAPONS AND AMMUNITION

CALIBER	NO. OF GUNS	FORT	ARMAMENT ASSIGNMENT	EXH.	BATTLE ALL AMMUNITION	PLACE OF AM. STORAGE	ON HAND	REQUIRED
37 MM	2	Hancock	Const.#219	3	3240 HE 360 AP	Hancock	No	Yes
.50 MG	2	"	Const.#219	"	5760 Ball 1440 TCER	"	"	"
37 MM	4	"	Const.#116	"	6480 HE 720 AP	"	"	"
.50 MG	4	"	Const.#116	"	11520 BALL 2880 TCER	"	"	"
37 MM	4	"	Btry Mills	3-5	6480 HE 720 AP	"	"	"
.50 MG	3	"	Btry Mills	"	8640 BALL 2160 TCER	"	"	"
37 MM	4	"	Btry King-man	"	6480 HE 720 AP	"	"	"
.50 MG	3	"	Btry King-man	"	8640 BALL 2160 TCER	"	"	"
.50 MG	2	"	Btry Gunni-son	"	5760 BALL 1440 TCER	"	"	"
37 MM	2	"	Btry Granger	"	3240 HE 360 AP	"	"	"
.50 MG	2	"	Btry Granger	"	5760 BALL 1440 TCER	"	"	"
37 MM	2	"	Btry Rich-ardson	"	3240 HE 360 AP	"	"	"

30. (Continued)

ANTIAIRCRAFT AUTOMATIC WEAPONS AND AMMUNITION

CALIBER	NO. OF GUNS	FORT	ARMAMENT ASSIGNMENT	EXH.	BATTLE ALL AMMUNITION	PLACE OF AM. STORAGE	ON HAND	REQUIRED
.50 MG	3	Hancock	Btry Richardson	5	8640 BALL 2160 TCER	Hancock	No	Yes
37 MM	2	"	Btry Bloomfield	"	3240 HE 360 AP	"	"	"
.50 MG	3	"	Btry Bloomfield	"	8640 BALL 2160 TCER	"	"	"
37 MM	2	"	Btry Peck	"	3240 HE 360 AP	"	"	"
.50 MG	2	"	Btry Peck	"	5760 BALL 1440 TCER	"	"	"
.50 MG	2	"	Btry Morris-Urmston	"	5760 BALL 1440 TCER	"	"	"
37 MM	2	Tilden	Btry Kessler	6	3240 HE 360 AP	Tilden	"	"
.50 MG	2	"	Btry Kessler	"	5760 BALL 1440 TCER	"	"	"
37 MM	4	"	Btry Harris	"	6480 HE 720 AP	"	"	"
.50 MG	4	"	Btry Harris	"	11520 BALL 2880 TCER	"	"	"
37 MM	2	"	Const. #220	"	3240 HE 360 AP	"	"	"
.50 MG	2	"	Const. #220	"	5760 BALL 1440 TCER	"	"	"
37 MM	2	"	Btry Fergusson	"	3240 HE 360 AP	"	"	"
.50 MG	2	"	Btry Fergusson	"	5760 BALL 1440 TCER	"	"	"
37 MM	4	"	Const. #117	"	6480 HE 720 AP	"	"	"
.50 MG	4	"	Const. #117	"	11520 BALL 2880 TCER	"	"	"
.50 MG	4	Hancock	AA Btry #1	5	11520 BALL 2880 TCER	Hancock	"	"
.50 MG	4	"	AA Btry #2	"	11520 BALL 2880 TCER	"	"	"
.50 MG	4	Tilden	AA Btry #3	6	11520 BALL 2880 TCER	Tilden	"	"

30. (Continued)

AA AUTOMATIC WEAPONS TOTALS

	FT TILDEN	FT HANCOCK	HARBOR DEFENSE
37 MM	14	22	36
.50 MG	20	38	58

No land is required for the AA automatic weapon defense. When automatic weapons are received they will be assigned to the antiaircraft defense of the armament indicated above in accordance with letter AGO 660.2 AA 10-23-40 MCCC Washington, dated November 1, 1940.

31. The Harbor Defense antiaircraft intelligence service consists of terrestial observation posts at several of the outlying seacoast fire control stations and at certain other locations as follows: Exhibit 38 for New Jersey locations and Exhibits 6, 24 and 25 for Long Island, New York.

NEW JERSEY	LONG ISLAND
OP 1. Elberon Tower	OP 9. South Tower - Marine Bridge
OP 2. Monmouth Tower	OP 10. Nigger Point
OP 3. Lippencott Hill	OP 11. Arverne Tower
OP 4. Polhemus Hill	OP 12. Coast Guard Tower at Atlantic Beach
OP 5. Beers Hill	OP 13. Long Beach Tower
OP 6. Twin Lights	OP 14. Short Beach Tower
OP 7. Lawrence Harbor (water tower)	
OP 8. "E" Tower - Fort Hancock	

a. All terrestial observers are to be provided with direct telephone communication through fire control switchboards to the intelligence center of the AAD Command located in abandoned mortar Batteries McCook-Reynolds. Commercial circuits supplemented by field wire are to be utilized in connecting the observation posts at Lippencott Hill, Polemus Hill, Beers Hill, Lawrence Harbor, Atlantic Beach and the Coast Guard Tower to the fire control system.

b. No AA intelligence observation posts are contemplated by this Harbor Defense for the Sector from the west through north to the northeast of Fort Tilden. This section is covered by the AA intelligence systems of the Harbor Defenses of Southern & Eastern New York and by the Aircraft Warning Service. Communication will be maintained with these agencies.

c. Supplementing terrestial observation three SCR 268 detectors are being assigned to the Harbor Defense, one of three sets will be assigned to Fort Tilden. Provision for shelter has already been made. No land is required.

C O S T E S T I M A T E & P R I O R I T Y G U I D E

Local Board Proceedings: ANTIAIRCRAFT - ARTILLERY H. D. of Sandy Hook

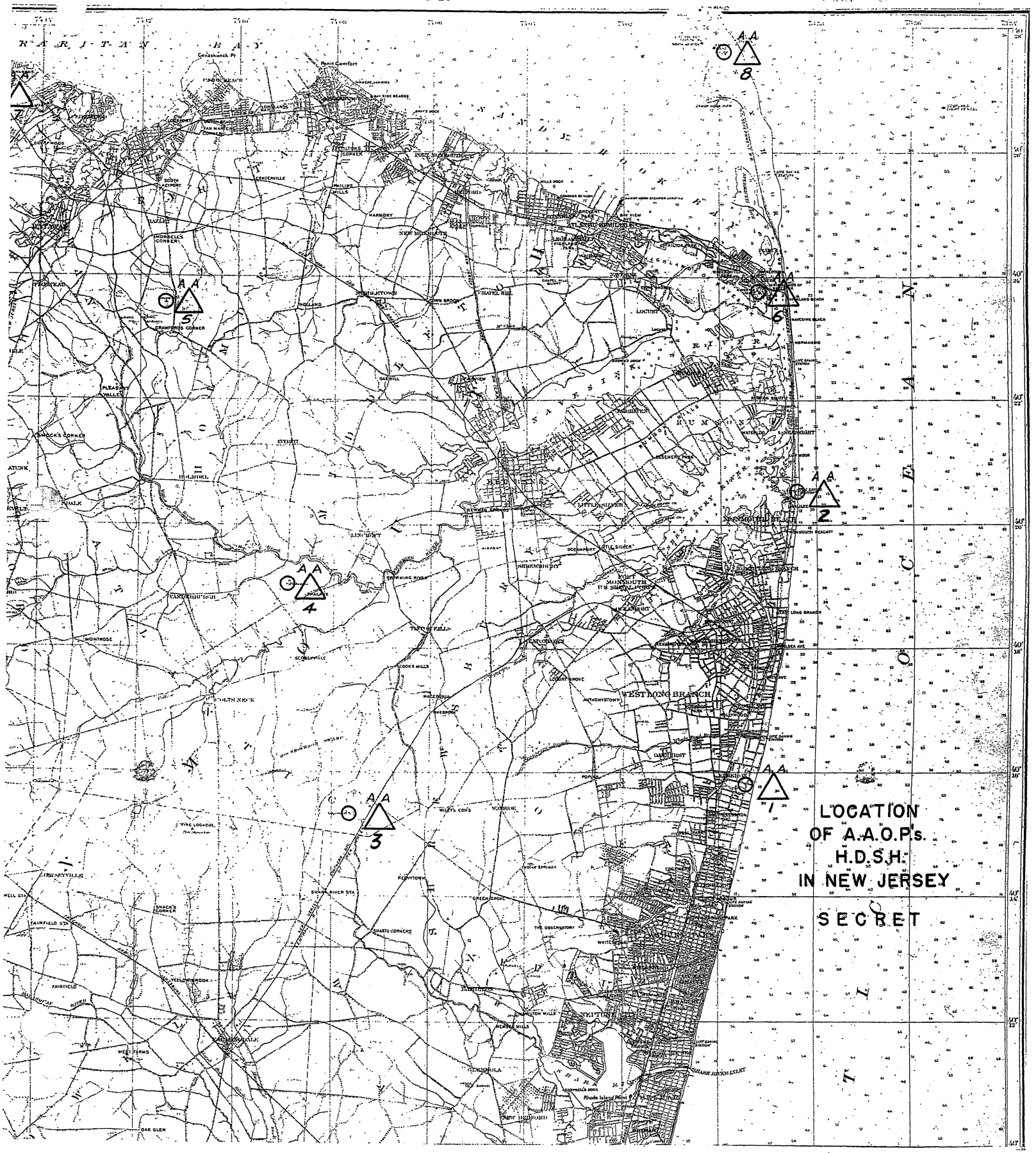
Paragraph 32

PRIORITY	ITEM	EXB	DESCRIPTION	ENGINEER MATERIAL	ENGINEER LABOR	SIGNAL MATERIAL	TOTAL
1	181	2	Magazine - automatic weapons ammunition (40' x 30' x 10' Fort Hancock) Signal: 1 Telephone EE-91 $30 1 Handset TS-12A 12 Contingencies 5 $47	$ 3,600	$3,800	$ 47	$7,447
1	182	3	Magazine - automatic weapons ammunition (40' x 30' x 10') Ft Tilden Signal: 1 Telephone EE-91 $30 1 Handset TS-12A 12 Contingencies 5 $47	3,600	3,800	47	7,447

EXHIBIT 41

STATE OF NEW JERSEY
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
ATLAS SHEET No. 29

SECRET



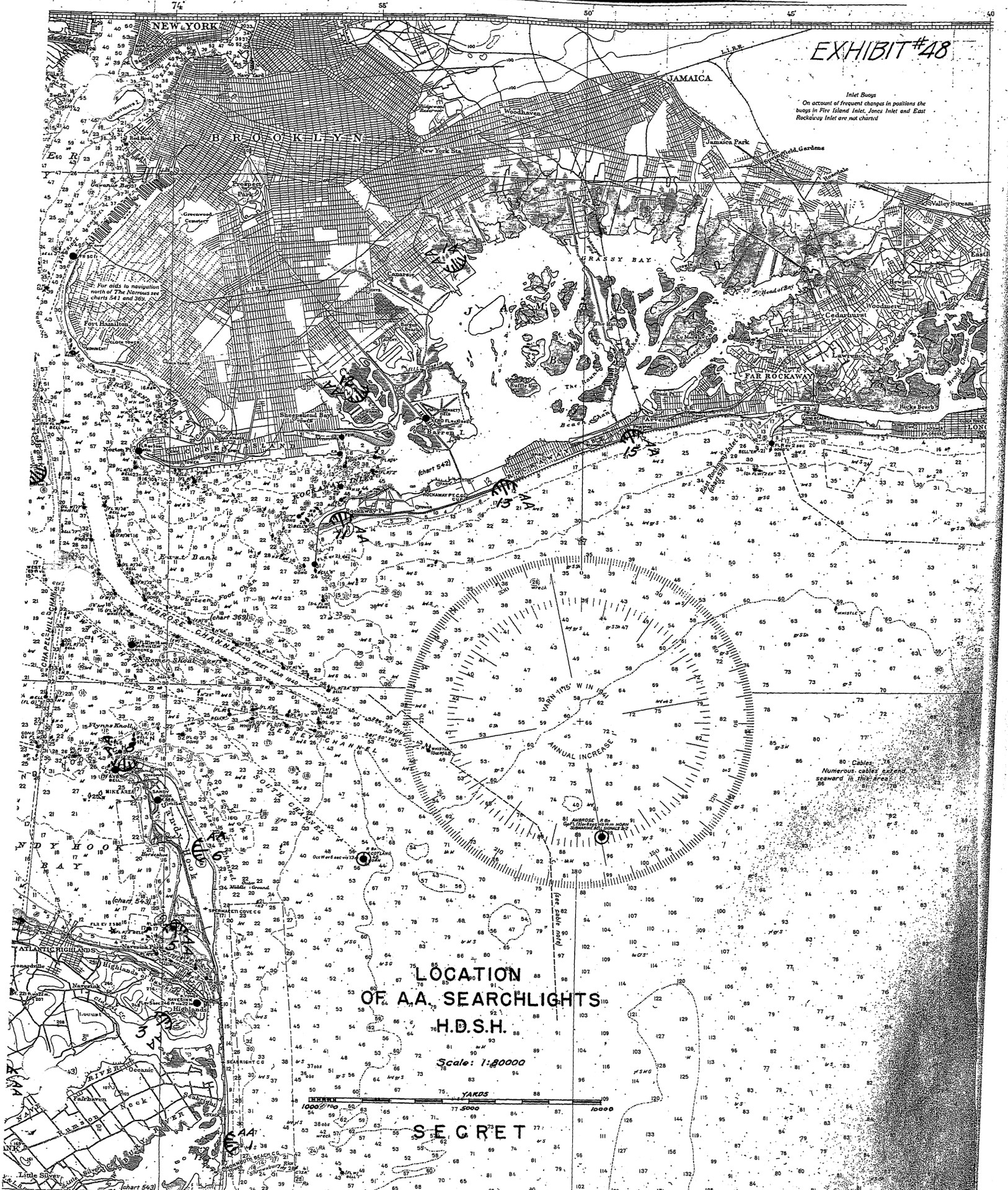


EXHIBIT #48
Inlet Buoys
On account of frequent changes in positions the buoys in Fire Island Inlet, Jones Inlet and East Rockaway Inlet are not charted
For aids to navigation north of The Narrows see charts 541 and 369.
Numerous cables extend seaward in this area
LOCATION
OF AA. SEARCHLIGHTS
H.D.S.H.
Scale: 1:80000
SECRET

No. 1215 PRICE 75 CENTS

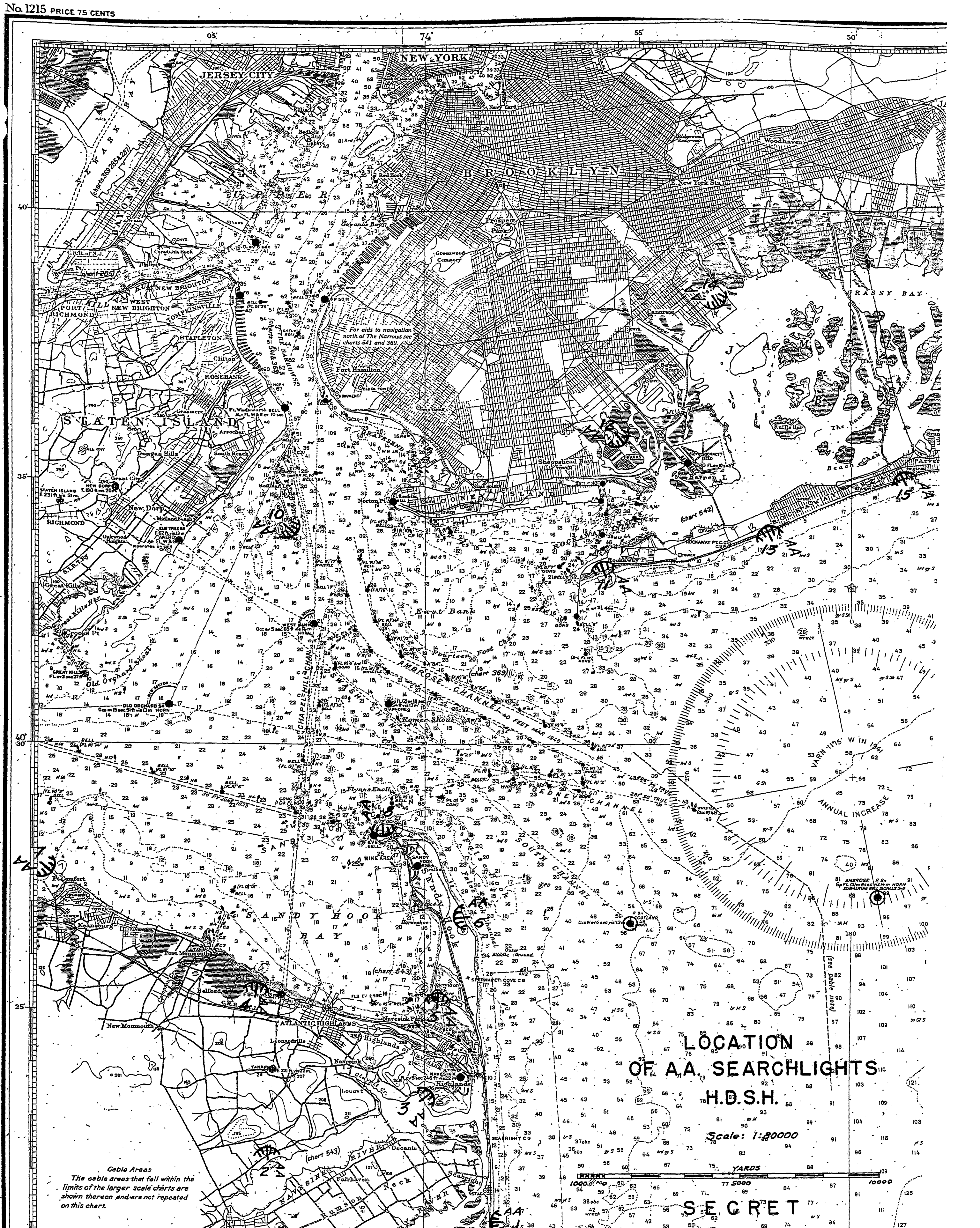


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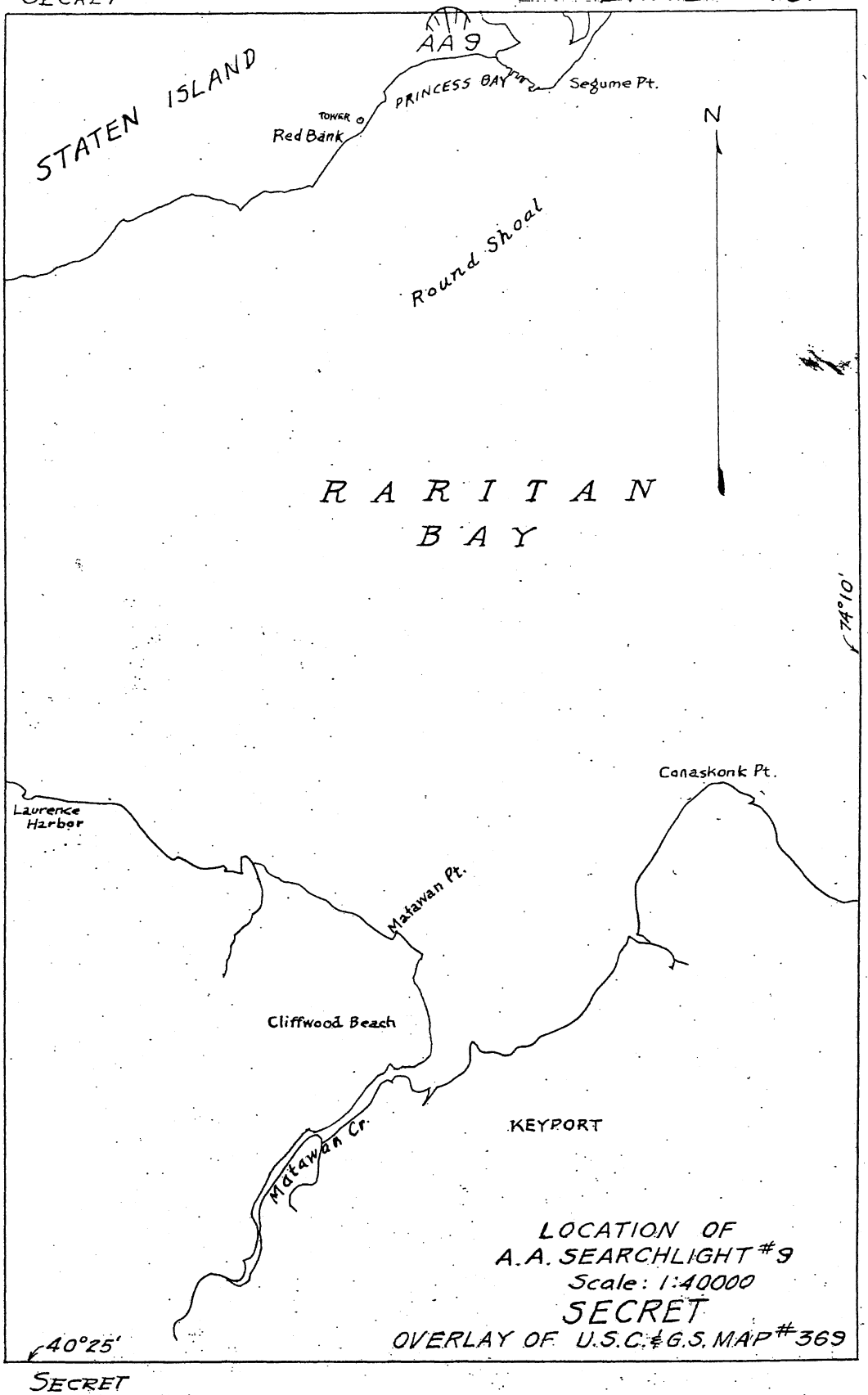
EXHIBIT #48A



LOCATION OF
A.A. SEARCHLIGHT #9
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OVERLAY OF U.S.C.&G.S. MAP #369

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SUPPORTING AIRCRAFT

SUPPORTING AIRCRAFT

35. It is recommended that three (3) flights of three (3) airplanes each be furnished the Harbor Defense for observation and surveillance missions during the hours of daylight and darkness.

a. Operations.

(1) Airdrome:
Fort Dix, N.J.

(2) Alternate Landing Fields:
(a) Suffolk Airport, Riverhead, L.I., N.Y.
(b) Roosevelt Field, Mineola, L.I., N.Y.
(c) Floyd Bennett Field, Brooklyn, N.Y.
(d) Lakehurst Naval Air Station, Lakehurst, N.J.

b. Communications.

(1) Ground: Existing commercial telephone circuits between Harbor Defense Command Post and Airdrome or Alternate Landing Fields.

(2) Air: Two-way radio between Harbor Defense Command Post, or subordinate command posts and airplanes in flight.

GAS DEFENSE

GAS DEFENSE

34. Gas-proofing of the following elements of the Harbor Defense is recommended.

ELEMENT TO BE PROTECTED	NUMBER OF COLLECTIVE PROTECTORS	NUMBER OF SPARE CANNISTERS	NUMBER OF DECONTAMINATING APPARATUS
Plotting Room- Const. No. 219	2	8	4
2 Plotting Rooms and Latrine- Const. No. 116	3	12	6
Fire Control Swbd Room #2	1	4	2
2 Plotting Rooms & Latrine- Battery Mills	3	12	6
2 Plotting Rooms & Latrine- Battery Kingman	3	12	6
Plotting Room Battery Peck	1	4	4
HD Command Post (Including Fire Control Swbd #1 and AAD CP	8	32	6
Collective gas-proof shelter including C1 Groupment CP	9	36	6
2 Plotting Rooms and Panel Room Mine Casemate Fort Hancock	3	12	4
Plotting Room and Panel Room Mine Casemate Fort Tilden	2	8	4
Plotting Room Battery Kessler	1	4	4
Plotting Room & FC Swbd Room Battery Harris	3	12	6
C-2 Groupment CP (including Group CP & Radio Station)	2	8	4
Plotting Room Construction No. 220	2	8	4
2 Plotting Rooms & Latrine Const. No. 117	3	12	6

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COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: GAS DEFENSE H. D. of Sandy Hook

Paragraph 35

PRIORITY	ITEM	DESCRIPTION	NO OF COL PROT	NO OF RES CANSTR	NO OF DECONT APPRTS	ENGINEER MTL	ENGINEER LAB	CWS	TOTAL
3	108	Plotting Room Const. No. 219 X	2	8	4			$3804.40	$3804.4(
3	109	2 Plotting Rooms and Latrine Const. No. 116 X	3	12	6			$5706.60	$5706.6(
3	110	Fire Control Swbd Room No. 2 X	1	4	2			$1902.20	$1902.2(
1	183	2 Plotting Rooms and Latrine Battery Mills	3	12	6	$1000	$1000	$5706.60	$7706.6(
1	184	2 Plotting Rooms and Latrine Battery Kingman	3	12	6	$1000	$1000	$5706.60	$7706.6(
1	185	Plotting Room Battery Peck	1	4	4	$500	$300	$1924.40	$2724.4(
1	186	HD Command Post (Including Fire Control Swbd #1 & AAD OP). X	8	32	6	$2500	$1500	15106.60	19106.6(
1	187	Collective Gas Proof Shelter (Including C-1 Groupment CP) X	9	36	6	$2800	$2000	16986.60	21786.6(
1	188	2 Plotting Rooms and Panel Room Mine Casemate Ft. Hancock	3	12	4	$1100	$900	$5684.40	$7684.4(
1	189	Plotting Room and Panel Room Mine Casemate Ft. Tilden X	2	8	4			$3804.40	$3804.4
1	190	Plotting Room Battery Kessler	1	4	4	$500	$300	$1924.40	$2724.4

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COST ESTIMATE & PRIORITY GUIDE

Local Board Proceedings: GAS DEFENSE H. D. of Sandy Hook

Paragraph 35

PRIORITY	ITEM	DESCRIPTION	NO OF COL PROT	NO OF RES CANSTR	NO OF DECONT APPRTS	ENGINEER MTL	ENGINEER LAB	CWS	TOTAL
1	191	Plotting Room & Fire Control Swbd Room - Battery Harris	3	12	6	$1100	$900	$5706.60	$7706.60
1	192	C-2 Groupment CP (Including Group 5 CP and Ft Tilden Radio Station	2	8	4			$3804.00	$3804.00
3	111	Plotting Room Const. No. 220	2	8	4			$3804.40	$3804.40
3	112	2 Plotting Rooms and Latrine Const. No. 117	3	12	6			$5706.60	$5706.60

SUMMARY LAND PROCUREMENT

Local Board Proceedings: SUMMARY OF LAND H. D. of Sandy Hook

Paragraph No. 36 PROCUREMENT RECOMMENDED

LOCATION, PURPOSE & REF. PAR.	ACRE-AGE	ESTIMATED COST	EXH.	REFERENCE TO AUTHORITY FOR PROCUREMENT
Location #1 Shark River - Site #2 Paragraphs #15a, 15b, 16a & 16b B^7S^7 Const. #116 B^7S^7 Kingman B^7S^7 Mills B^5S^5 Const. #219 Land for tower and cable right of way to ocean.	,057	$ 2,000	13	
Location #2 Long Branch - Site #4 Paragraphs #15a, 15b, 16a & 16b B^2S^2 Const. #219 B^5S^5 Const. #116 B^5S^5 Kingman B^5S^5 Mills Land for tower and cable right of way to ocean.	.057	$ 2,500	15	
Location #3 Sea Bright - Searchlight site #1 Paragraphs #22 Sites for searchlights #1 and #2	.114	$ 4,000	41 41a	
Location #4 Highland Hill Mass - Sites 6 & 7 Paragraph #5 Sites for Batteries Const. 219 & 116 Cable right of way to Shrewsbury River	.99	$225,000	17	
Location #5 Highland Hill Mass Manhole Bombproof Station - Site # 8 Paragraphs #15a, 15b, 16a & 14d (2) B^3S^3 Const. #116 B^3S^3 Kingman B^3S^3 Mills Group 1 CP & OP Land for Station and right of way to "C" Hut.	.124	$ 2,150	17	$2,150 allocated per letter OCCA (111/IB-15A) 2-18-41, Subject: Expenditure Program Seacoast Defense Funds H.D.S.H.

Local Board Proceedings: SUMMARY OF LAND H. D. of Sandy Hook

Paragraph No. 36 (Contd) PROCUREMENT RECOMMENDED

LOCATION, PURPOSE & REF. PAR.	ACRE-AGE	ESTIMA-TED COST	EXH.	REFERENCE TO AUTHO-RITY FOR PROCUREMENT
Location #6 Waterwitch Site #10 Paragraphs #15b, 16a & 16b B^2S^2 Const. #116 B^2S^2 Mills B^2S^2 Kingman Land for Tower and right of way to F.C. Swbd #2	.25	$ 3,000	17	
Location #7 Seagate, Bklyn, F.C. Site #12 Paragraphs #15d, 16g B^1S^1 Harris B^1S^1 Const. #117 Const. #218 Land for tower and right of way	.057	$ 3,000	21	
Location #8 Rockaway Point Searchlight Site #6 Paragraph 22 Site for searchlight #10 (old #8)	.086	$ 4,000	41 41a	
Location #9 Rockaway Point F.C. Site #13a&b Paragraphs 16f, & 16i B^1S^1 Kessler M^4S^4 Const. #218 Land for M.C. Huts 3 & 4 and Tower, rights of way to inlet and to Mine Casemate	.114 2 Plots	$ 4,000	22	
Location #10 Seaside, L.I., F.C. Site #15 Paragraphs 15c, 15d & 16g B^2S^2 Const. 220 B^3S^3 Const. 117 B^3S^3 Harris Const. 218 Land for Tower & cable right of way to ocean	.057	$ 2,500	24	
Location #11 Nigger Pt., L.I., Site #16 Paragraph 5 Site for Btry Const. 117	85.	$275,000	8 & 25	

Local Board Proceedings: SUMMARY OF LAND H. D. of Sandy Hook

Paragraph No. 36 (Cont'd) PROCUREMENT RECOMMENDED

LOCATION, PURPOSE & REF. PAR.	ACRE-AGE	ESTIMATED COST	EXH.	REFERENCE TO AUTHORITY FOR PROCUREMENT
Location #12 Atlantic Beach Searchlight Site #10 Paragraph 22 Sites for Searchlights 14 & 15	.114	$ 3,000	41 41a	
Location #13 Atlantic Beach F.C. Site 18 Paragraph 15c, 15d & 16g B^3S^3 Const. 220 B^4S^4 Const. 117 B^4S^4 Harris Land for Tower and cable right of way to ocean	.057	$ 2,500	26	
Location #14 Short Beach F.C. Site #20 Paragraphs 15c, 15d & 16g B^6S^6 Harris B^5S^5 Const. 220 B^6S^6 Const. 117 AA OP #14 Land for Tower and cable right of way to ocean	.057	$ 2,500	28	Site, one of two sites leased from L.I. State Park Commission on year to year basis
Location #15 Zachs Bay F.C. Site #21 Paragraphs 15d & 16g B^7S^7 Harris B^7S^7 Const. 117 Land for Tower and cable right of way to ocean	.057	$ 2,500	29	Site, one of two sites leased from L.I. State Park Commission on year to year basis

Proc. of Local B/O for purpose of recommending details of installation of Defensive elements within the Harbor Defenses of Sandy Hook (Continued).

P. S. GAGE,
Brigadier General, U. S. Army,
President.

EARL BISCOE,
Col., C.A.C.,
Member.

L. S. DILLON,
Lt. Col., U.S. Engr.,
Member.

G. S. LAVIN,
Lt. Col., Ord Dept.,
Member.

G. C. SALISBURY,
Lt. Col., Air Corps,
Member.
For and in the absence of
JOHN G. WHYTLAW,
Lt. Col., Air Corps.

O. S. ALBRIGHT,
Colonel, Sig. Corps,
Member.
For and in the absence of
H. E. MILLER,
Major, Chem. War. Serv.,
Recorder.

LEON E. NIXON,
Captain, CWS,
Assistant.