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E.O. 11652, Sec. 3(E) and 5(D) or (E)

OSD letter, May 3, 1972

By JKM, NARS Date 6/26/73

Register No. 7

ANNEXES TO HARBOR DEFENSE PROJECT
HARBOR DEFENSES OF NARRAGANSETT BAY

The short title of this document is CCA-AN-NARB

Under the provisions of A.R. 330-5 (paragraph 17c), each recipient of this document should make return therefor on June 30 and December 31 of each year to the Chief of Coast Artillery, Washington, D. C.

ANNEX A

SEACOAST GUNS

AUTHORITIES

1. This Annex was prepared October 17, 1933, by a Board of Officers appointed under the provisions of paragraph 1 d, AR 100-20.
2. Approved by the Secretary of War in the 14th Indorsement, AG 560.2 (10-21-33) (Misc.) E, dated June 13, 1934.

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A N N E X . A .

SEACOAST GUNS.

1. Gun Defense. The gun defense of Narragansett Bay is divided into the inner defense and the outer defense. These are, however, inter-related. The existing inner defense consists of the armament at Forts Adams, Wetherill, Getty and Kearny, defending the mine fields and submarine barriers and covering the bay out to a line Point Judith - Sakonnet Point. The projected outer defense is designed to hold hostile vessels at such a distance offshore as will permit our Navy to pass freely back and forth between Narragansett Bay and Long Island Sound. The maximum probable bombardment range of the guns of naval vessels is assumed to be 35,000 yards. This implies holding the enemy approximately 40,000 yards off Point Judith so far as deliberate bombardment movements are concerned. The line inshore of which safe passage is provided, is shown in Exhibit 3-B of Annex B.

2. Tactical Organization. The organization of the harbor defense into six groups and one groupment is shown in Exhibit 1-A.

a. The underwater defense with its rapid fire batteries is organized into a groupment, since the number of mine groups is large and is divided between the western and eastern passages; and also since the mine planters will serve all parts of the underwater defense and should not be assigned to either group.

b. The major calibre guns and mortars of the inner defense may conveniently operate as one group, as their fields of fire all lie principally in the triangle Point Judith - Sakonnet Point - Beavertail.

c. Because of their isolation, the batteries at Point Judith, including the antiaircraft batteries, are organized into one group. The same situation exists at Sakonnet Point, where one group is formed.

d. As the Harbor Defense command post is on Conanicut Island with Forts Wetherill and Getty, the only fort commands which need to be provided for are Forts Adams and Kearny. In these two cases, the senior battery commander is hereby designated as fort commander.

e. The three antiaircraft batteries protecting the inner defenses are organized as one group with command post located at the harbor defense command post and comprising also the center of antiaircraft intelligence designed to serve both the outer and inner defenses.

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- (1). Each of the seven antiaircraft batteries is organized into a gun, a machine gun and a searchlight detachment.

3. The war reserve and battle allowance of ammunition is shown in Exhibit 9-A.

BATTERIES OF INNER DEFENSE.

4. a. There are four major calibre batteries in the inner defense:

- (1). Batteries Wheaton (two 12-inch disappearing guns) and Varnum (two 12-inch barbette guns) at Fort Wetherill;

- (2). Batteries Edgerton and Greene (each four 12-inch mortars) at Fort Adams.

b. In addition, there are two 6-inch and two 3-inch batteries covering the mine fields and the antisubmarine net in the Western Passage, and one 6-inch and one 3-inch battery covering those of the Eastern Passage.

5. Battery Wheaton, two 12-inch D. C. at Fort Wetherill.

a. The field of fire of this battery is shown in Exhibit 5-B. While the field of fire of No. 2 gun could be increased toward the left so as to cover the entrance of the Sakonnet River, the cost of cutting away the concrete emplacement is estimated as \$3050; and the need is slight; as the Sakonnet is covered by the mortars and No. 2 Varnum, as well as by the Sakonnet Point Batteries. The disadvantage would be incurred in increasing this field of fire to the left, that fire in the increased sector would probably interfere with the batteries on the left flank of Wheaton.

b. The field of fire of No. 1 gun is masked on the extreme right up to mid-range by the parapet of Battery Walbach on its right but this area is inside the western mine field and is unimportant.

c. The rate of fire which may be expected for a short period with these guns is approximately 35 seconds per shot per gun using Case II and 50 seconds using Case III.

6. Battery Varnum, two 12-inch barbette guns at Fort Wetherill.

a. The field of fire is shown in Exhibit 6-B of Annex B. By removing the inclined steel ladders leading to the loading platform from the side of the carriage and replacing them with vertical ladders, No. 1 gun could be traversed an

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additional $9\frac{1}{2}$ degrees on each side of the present limiting azimuths. This is unimportant on the right, as both guns can now fire across the Western Passage at a point north of the mine field. On the left, this modification has now been made.

b. The rate of fire which may be expected for a short time with these barbette guns is approximately 40 seconds per shot per gun using Case II, and 55 seconds using Case III.

7. Battery Edgerton, four 12-inch mortars, and Battery Greene, four 12-inch mortars, at Fort Adams.

a. The fields of fire of these two mortar batteries are shown in Exhibit 7-B of Annex B; as the two batteries are close together, their fields of fire are plotted as one. While they are capable of all-around fire, the important part of the field lies between azimuth 90° , or due west, counterclockwise to azimuth 221° or to the northeast.

b. A rate of fire somewhat under 60 seconds per salvo may be expected.

c. As these batteries may be expected to fire chiefly in the outer zones, most of the ammunition should be for the longer ranges. The distribution should be four 700-pound projectiles to one 1046-pound projectile.

8. Rapid Fire Batteries. There are six batteries of the secondary armament -- three 6-inch and three 3-inch. Four of these batteries (two 6-inch and two 3-inch) bear on the Western Passage, covering the mine field and anti-submarine net; and two (one 6-inch and one 3-inch) cover the mine field and antisubmarine nets in the Eastern Passage.

9. a. Batteries Cram (two 6-inch D. C.) and Armistead (two 3-inch B. C.) at Fort Philip Kearny, have the fields of fire shown in Exhibits 8-B and 9-B of Annex B, and tabulated in paragraph 10 below. These batteries bear on the Western Passage.

b. Batteries House, (two 6-inch B. C.) and Whiting (two 3-inch B. C.) at Fort Getty, have the fields of fire shown in Exhibits 12-B and 13-B of Annex B, and tabulated in paragraph 10 below; these batteries also bear on the Western Passage.

c. Batteries Dickenson, (two 6-inch B.C.) and Crittenden (two 3-inch B. C.) at Fort Wothorill, bear on the Eastern Passage and have the fields of fire shown in Exhibits 10-B and 11-B of Annex B, and tabulated in paragraph 10 following.

d. It is not necessary to widen the field of fire of any of the above rapid fire batteries.

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10. Limits of Fields of Fire.

<u>Fort</u>	<u>Battery</u>	<u>Gun No.</u>	<u>A z i m u t h</u>	
			<u>Right Limit</u>	<u>Left Limit</u>
			6	0
Koarny	Cram - 2 6"	1	25	235
		2	359	205
	Armistead - 2 3" B. C.	1	356	220
		2	350	185
Gotty	House - 2 6" B. C.	1	180	310
		2	180	310
	Whiting - 2 3" B. C.	1	143	333
		2	133	338
Wotherill	Dickenson - 2 6" B. C.	1	140	220
		2	140	220
	Crittendon - 2 3" B. C.	1	55	280
		2	63	270

ADDITIONAL ARMAMENT.

11. Near Point Judith. One 16-inch, one 8-inch railway, one 155-mm. battery, and two 3-gun antiaircraft batteries of limited mobility are provided for in the project.

12. 16-inch Battery. a. This two-gun battery is to be located on the tract of approximately 105 acres shown in Exhibit 2-A. A temporary right of way to the beach is required for landing the materiel by barge; it is unnecessary to build a wharf. The value of the land was appraised in 1934 as \$15,240. X
A small storehouse, and barracks and quarters for a detachment of one officer and ten men should be included, this detachment to care also for the 155 mm. battery; the construction is to be carried out by the Corps of Engineers under the provisions of paragraph 14 b, AR 100-20. The general type of construction is to be that designated as Type C Emplacement for 2 - 16-inch Guns (Incl. No. 1 and No. 2 to 4th indorsement, June 13, 1934, C. of E. 381 (Coast Defense) 116; file No. 188-70-32a). This design provides a bombproof traverse housing the power plant and magazines, and a separate bombproof structure for combined plotting and switchboard room.

b. The field of fire of the battery, constructed as above, is shown in Exhibit 4-B of Annex B. The azimuth of the line of gun centers should be 258° so that the axis of the field of fire will be 348°. With this directrix, there will be a minimum disadvantage resulting from the inability with this type of emplacement to fire one gun directly over the other at low elevations.

c. The layout of the battery is shown in Exhibit 3-A.

13. 155 mm. Battery. a. This four-gun battery is to be located on a tract of approximately 9 acres shown in Exhibit 2-A. The value of the land was appraised in 1934 as \$11,575. The concrete platforms should be so constructed as to permit a wide field of fire. The distance between gun centers should be approximately 30 yards. The azimuth of the line of gun centers should be 335°; the directrix of the field of fire will then be azimuth 245° on the east, and azimuth 65° on the west. This will allow all four guns to fire from the shore-line near Narragansett Pier on the northeast to azimuth 305° on the southeast, and from azimuth 5° on the south to the shore-line of Block Island Sound on the west. One gun will bear from azimuth 305° to azimuth 5°. Exhibit 4-A shows the field of fire of the battery disposed as above.

b. It is not necessary to construct permanent ammunition storage facilities at the battery; temporary facilities should be provided when the emergency arises. The short-delay fuze and not the super-quick fuze should be provided for fire against naval targets as the former always will and the latter usually will not function on water impact where ricochet occurs.

14. Narragansett Pier 8-inch Battery, two railway guns.

a. The battery is to be located in the 5-acre field in which the Narragansett Pier Railroad terminates at South Pier. As the last 580 yards of this road has not been used since about 1927, now ties and some new rails will have to be put in. The useful part of the tract at South Pier is 660 feet long and can be paralleled by a siding of equal length. See Exhibit 5-A.

b. If the open plot of ground at South Pier should become no longer available through construction of buildings or otherwise, the battery can be fired from a siding which can be constructed on open grass land approximately 450 yards west of the railroad station. The plot is shown on air photograph marked Exhibit 5-A.

c. These guns are so mounted as to permit of all-around fire. The useful portion of the field of fire is from azimuth 67° on the west (which is near where the maximum range arc crosses the shore-line) around through the south to azimuth 241° on the east (which is near Beavertail). This arc of fire of 186° has its median at azimuth 334° which should therefore be the directrix; the line of gun centers should have azimuth 244°. It will not be practicable to fire both guns over this entire arc of 186° since the plot of ground at South Pier will not permit of sufficient distance between guns to allow of firing one over the other. One gun can fire over all portions of the field and both guns can fire from about due east across Narragansett Bay to about azimuth 34° which is well to the west of Block Island.

d. Should the South Pier site become no longer available, and the guns be located on the plot one-half mile to the west described in paragraph 14 b above, the same azimuth of the line of gun centers should be secured. In this location the guns should be emplaced approximately 125 yards apart so as to permit of firing one over the other at the longer ranges.

15. Alternative Plan for 8-inch Fixed Battery. a. Should international agreement result in abolishing railway artillery, an 8-inch fixed battery of two guns is to be constructed 2,000 yards south of the 16-inch gun site and 500 yards northwest of Point Judith Light; the plot of 14 acres is shown in Exhibit 2-A. The center of the battery should be 450 yards or more from the center of the 155 mm. battery in order that there may be no interference. The value of the land is estimated at \$350 per acre.

b. The Type E, 1933, layout is to be employed. The axis of the field of fire is to be 15° east of south or azimuth 345°; hence the line of gun centers should be 255°. The Type E construction does not allow of firing one gun over the other at angles of elevation of less than 7½° corresponding to about 10,000 yards range. At about 12° from the line of gun centers, point blank range can be obtained. Therefore this battery may be fired at all ranges from azimuth 267° clockwise to azimuth 63°.

16. Near Sakonnet Point. One 16-inch, one 8-inch, one 155 mm. battery, and two 3-gun fixed antiaircraft batteries are provided for in the project.

17. 16-inch Battery. a. This two-gun battery is to be located on the tract of approximately 99 acres shown in Exhibit 6-A. The value of the land was appraised in 1933 as \$25,784. A storehouse and detachment barracks and quarters should be provided, to be constructed by the Corps of Engineers under the provisions of paragraph 14 b, AR 100-20; this detachment of an officer and ten men can also care for the 8-inch and 155 mm. batteries. The general type of construction of the battery is to be that designated as Type C Emplacement for 2 - 16-inch Guns (Incl. No. 1 and No. 2 to 4th Indorsement, June 13, 1934, C. of E. 381 (Coast Defense) 116; file No. 188-70-32a). This design provides a bombproof traverse housing the magazines and power plant and a separate bombproof structure for combined plotting and switchboard room.

b. The field of fire, constructed as above, is shown in Exhibit 14-B of Annex B. The azimuth of the line of gun centers should be 265° so that the axis of the field of fire will be 355°. With this axis, both guns can fire from a line which strikes Point Judith Neck just south of Narragansett Pier, counterclockwise to any important part of Buzzards Bay within range.

c. The layout of the battery is shown in Exhibit 7-A.

18. 8-inch Battery. a. This two-gun battery is to be located on a tract of approximately 22 acres shown in Exhibit 6-A. The value of the land was appraised in 1933 as \$8,332. The Type E, 1933, layout is to be employed. As the axis of the field of fire is to be due south, the line of gun centers should be azimuth 90°. Space at the northeast corner overlooking the swamp should be left for an antiaircraft battery.

b. The Type E layout does not permit of firing one gun over the other at angles of elevation of less than 7½° corresponding to a range of about 10,000 yards. At about 12° from the line of gun centers point blank range can be obtained. Therefore this battery may be fired at all ranges from azimuth 78° counterclockwise to azimuth 282° or from a line toward Narragansett Pier to all points within maximum range in Buzzard's Bay. See Exhibit 14-B of Annex B.

19. 155 mm. Battery. a. This battery of four guns is to be constructed on Sakonnet Point about 350 yards from the tip of the point, on a strip of about 4½ acres, the estimated cost of which is \$7,050, as appraised in 1933. A right of way must be ensured over an existing sandy road or drift-way. The concrete platforms should permit of a wide field of fire. The guns should be arranged on a straight line with a distance between gun centers of approximately 30 yards.

b. The azimuth of the line of gun centers should be 30°. This permits all four guns to fire on the east from the shore-line to a due south line. On the west, all four guns can fire from azimuth 60° (which is between Block Island and Point Judith) to a due north line. The field of fire is shown in Exhibit 8-A.

c. It is not necessary to construct permanent ammunition storage facilities at the battery; temporary facilities should be provided when the emergency arises. The short-delay fuze and not the super-quick fuze should be provided for fire against naval targets as the former always will and the latter usually will not function on water impact where ricochet occurs.

Corrected page per 16th Ind., AG 360.2 (5-2-34) (Misc.) E,
dated January 2, 1935.

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20. a. The locations of proposed fixed and railway batteries described in this Annex were approved by the War Department in 12th Indorsement, WD, AGO, August 31, 1933, (AG 660.2; 1-30-33; Misc. E).

b. The sites were surveyed and their value appraised in 1933-34 by the District Engineer, Providence, Rhode Island. The report on the sites at Sakonnet Point is dated April 28, 1934; the report on the sites at Point Judith is dated May 22, 1934. These surveys were made pursuant to 18th Indorsement, C. of E., October 16, 1933 (AG 660.2; 1-30-33; Misc.).

c. A monument is now being placed to mark the position of No. 1 gun of the 16-inch battery at Sakonnet Point and one at Point Judith, and their latitude and longitude determined.

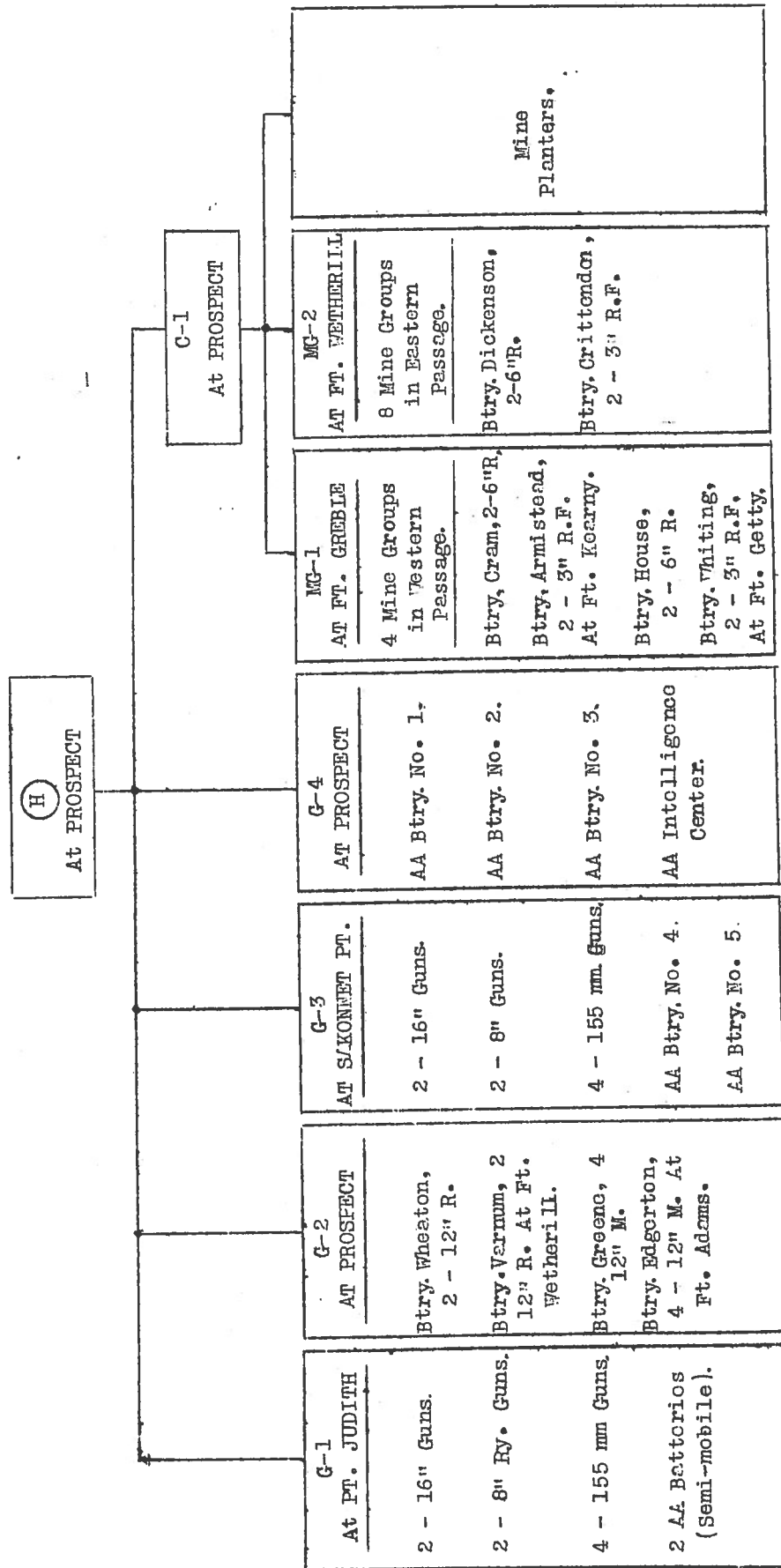
21. Ammunition. The war reserve and battle allowances of ammunition for the batteries of the harbor defense are shown in Exhibit 9-A.

22. Cost Estimate. An estimate of cost and priority guide is appended as Exhibit 10-A. Those items which should be procured and installed in peace time are marked with an A. Those which should be procured in peace but whose installation may be deferred until an emergency arises are marked B. Those items to be procured and installed when an emergency arises are marked C.

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TACTICAL ORGANIZATION - HARBOR DEFENSES OF NARRAGANSETT BAY.



Each AA Battery includes a gun, a machine gun, and a searchlight detachment.
Fort Commanders, whose designation is needed: Fort Adams - Senior B. C. Fort Kearny - Senior B. C.

Based on survey 1:10,000 by U.S.C.
and G.S., 1871, corrected by aerial
photographs, 1930.

POINT JUDITH, R. I.

Black
Pt.

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0 500 1000
YARDS
Scale 1:10,000

to Wakefield

to Narran Pier

Narragansett Bay

2-16"

105 Acres

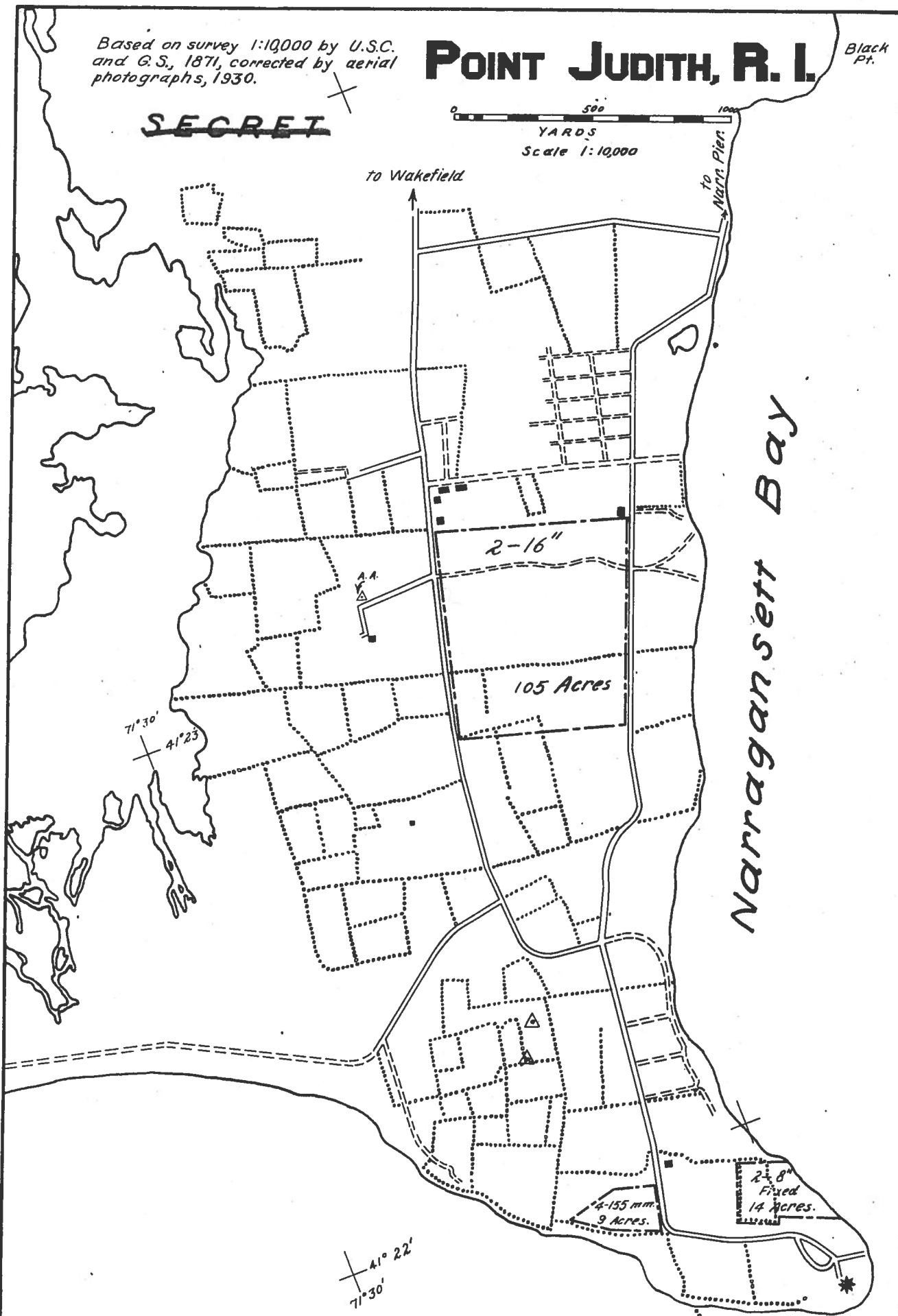
A.A.

71°30'
41°23'

4-155 mm.
9 Acres.

2-8"
Fixed
14 Acres.

41°22'
71°30'



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PROPOSED GROUND PLAN FOR 16" BATTERY

POINT JUDITH, R. I.

Area: 105 Acres $\pm$
Type "C", 1934 layout.
One combined plotting and switchboard room in bombproof.
One small storehouse
Barracks for maintenance detachment of 10 men who will
also maintain neighboring 155 mm battery.
One set lieutenant's quarters.

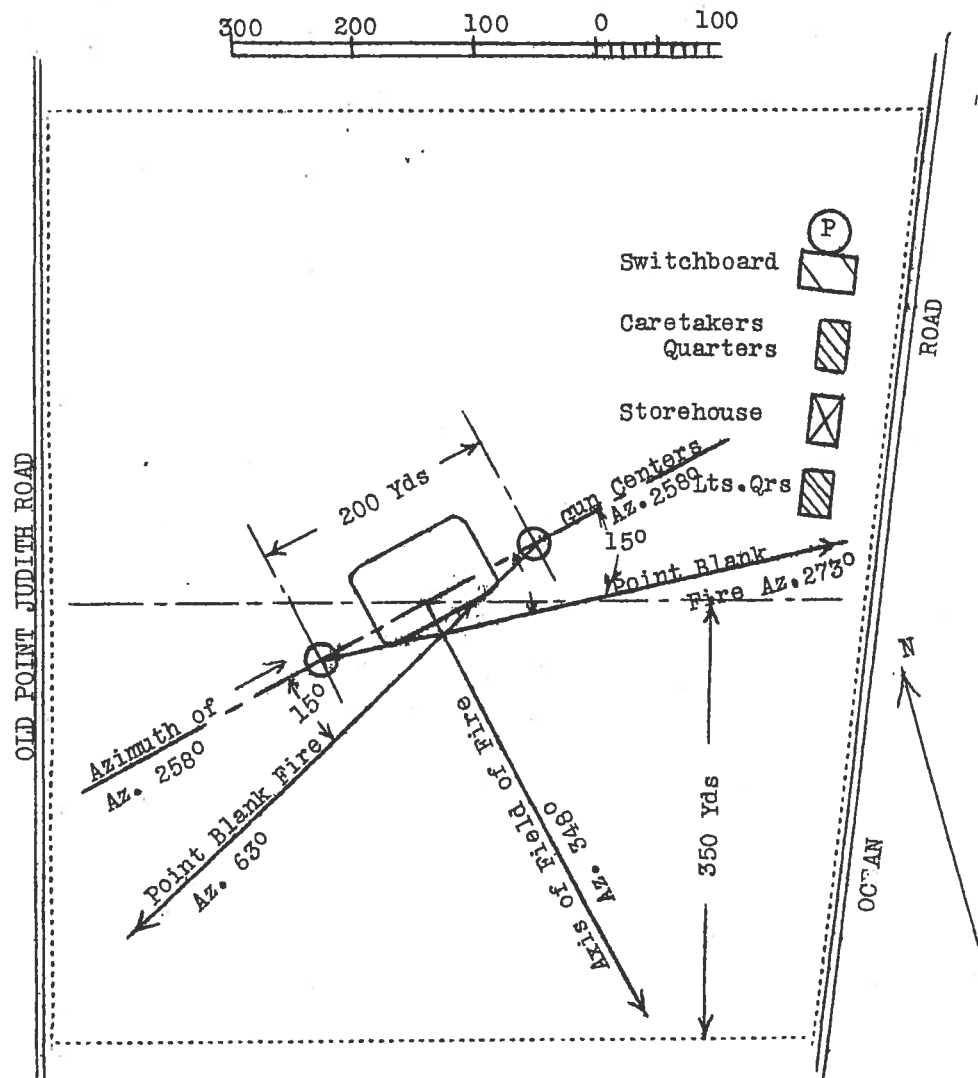
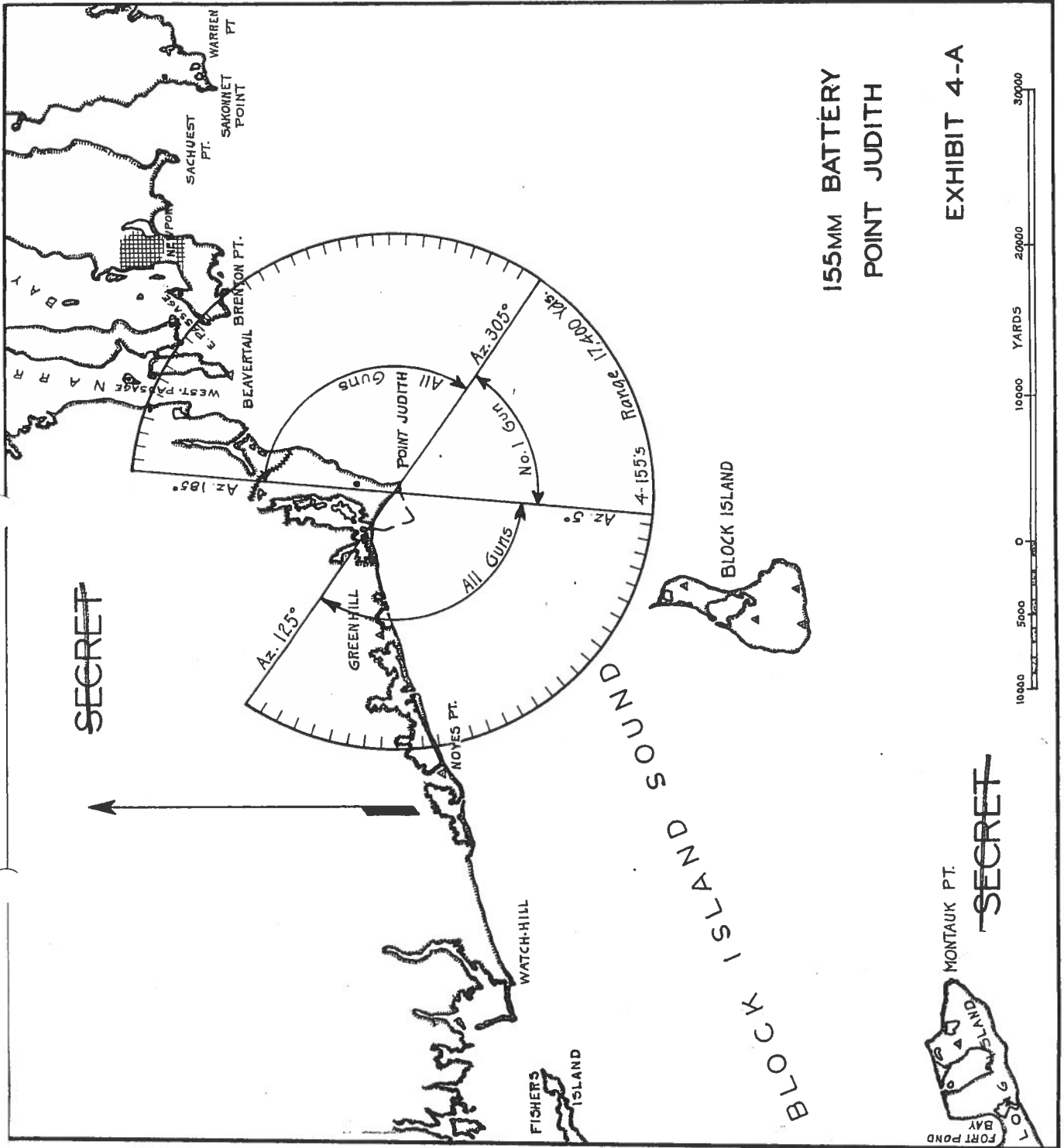
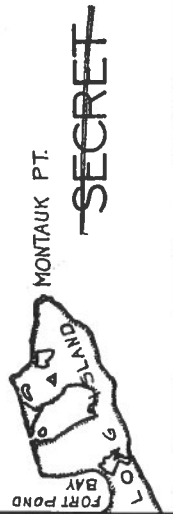


EXHIBIT NO. 3-A.



155MM BATTERY
POINT JUDITH

EXHIBIT 4-A



By BT NARA Doc 71610

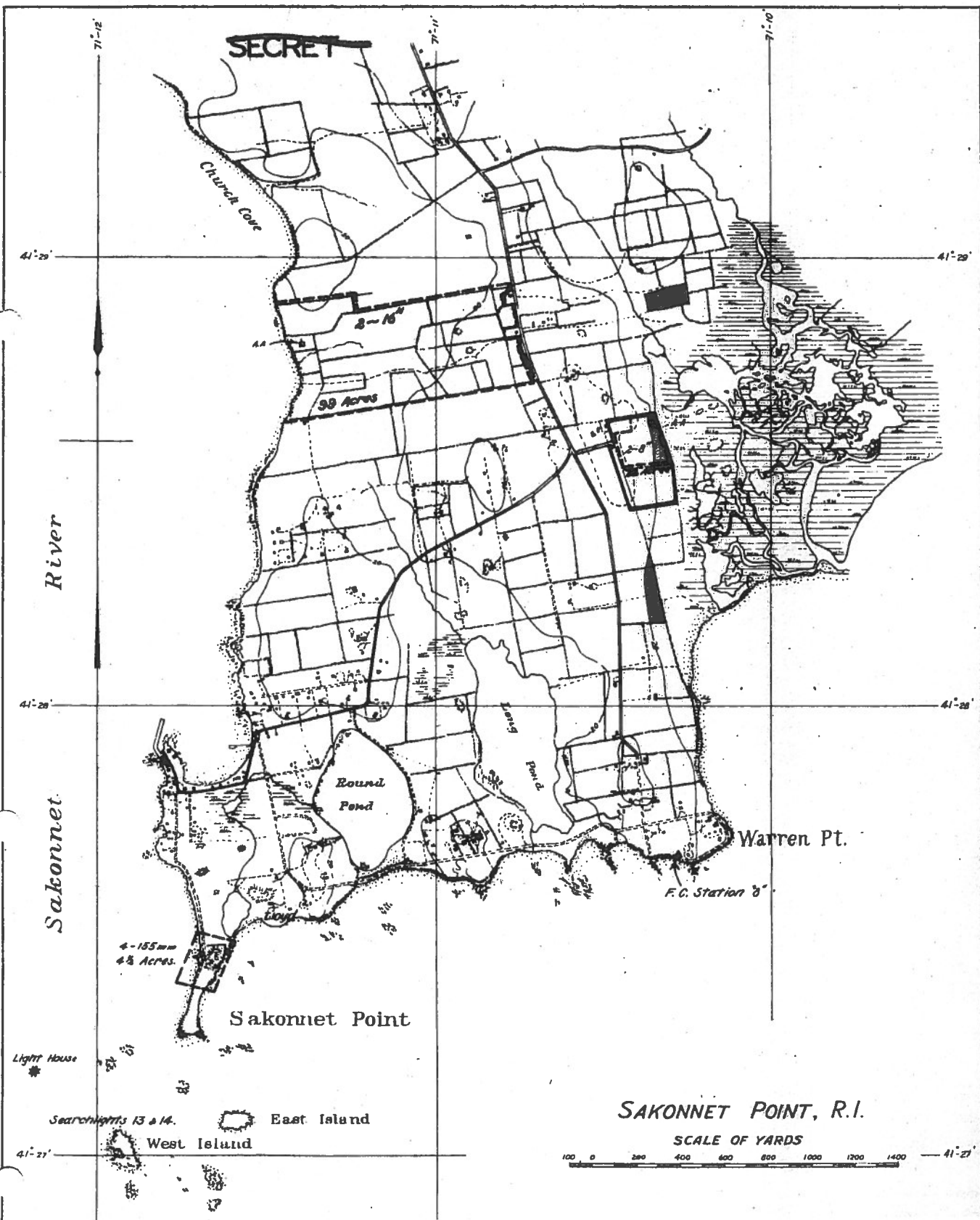


0 100 200 Yds 300 400 500

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By R/L NARA O-2 1/2/10

Corrected chart per 16th Ind., AG 660.2
(5-2-34)(Misc.) E, dated Jan. 2, 1935.



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PROPOSED GROUND PLAN FOR 16" BATTERY
SAKONNET POINT, R. I.

Area: 99 acres ±.

Type "C", 1934 layout.

One combined plotting and switchboard room in bombproof.

One small storehouse. One set lieutenant's quarters.

Barracks for maintenance detachment of ten men who will also maintain 8-inch and 155 mm batteries.

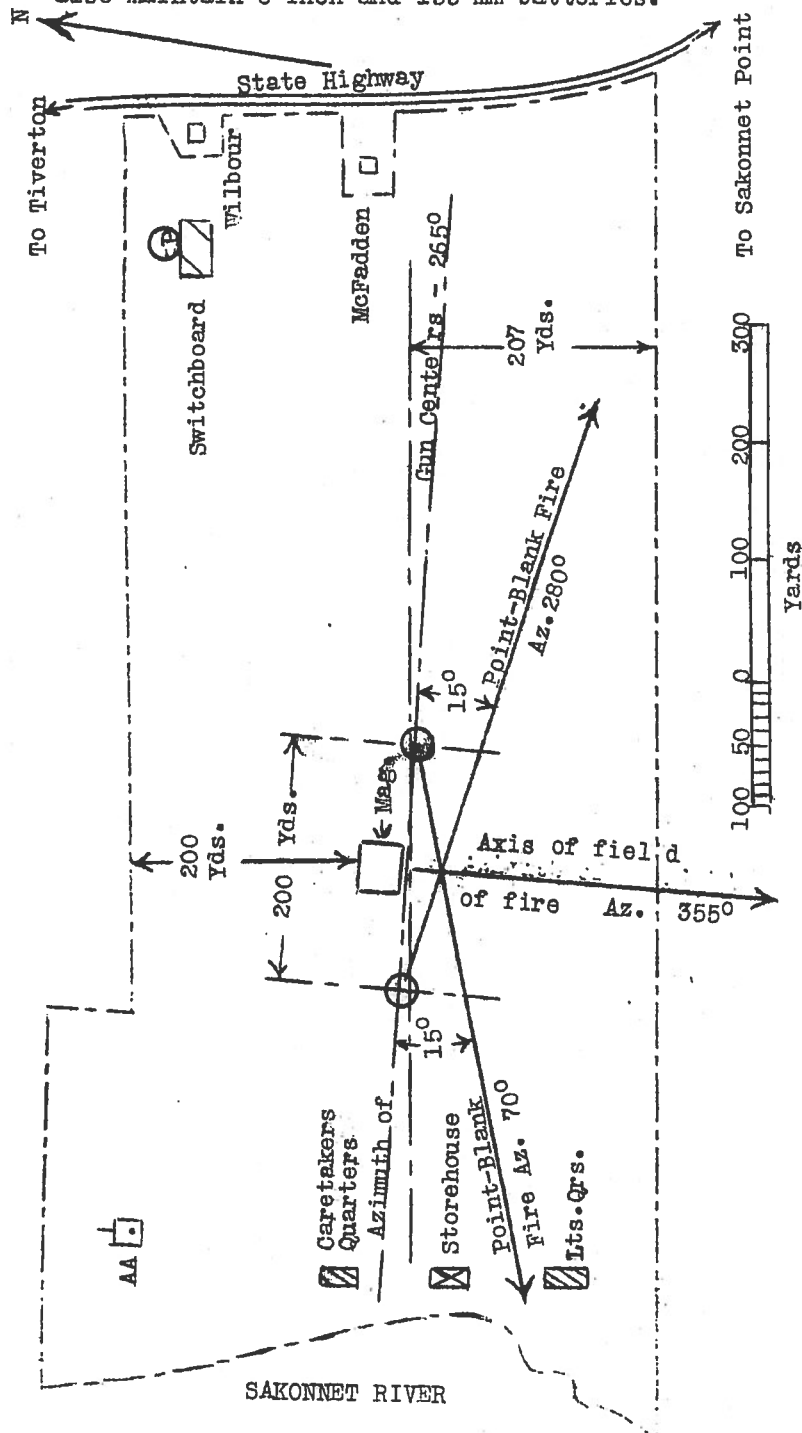
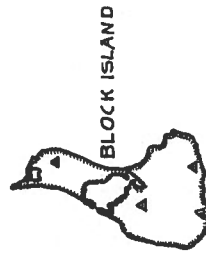
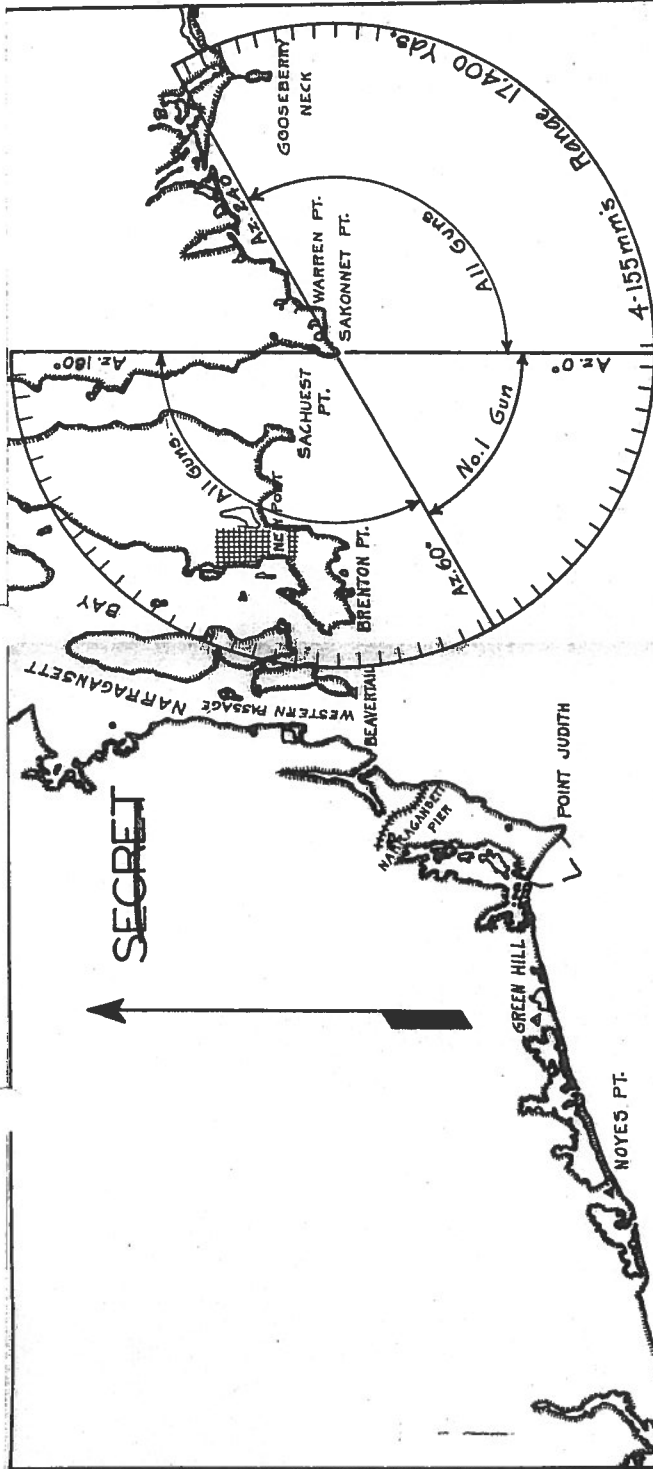


EXHIBIT NO. 7-A

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BLOCK ISLAND
SOUND

155MM BATTERY
SAKONNET POINT

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EXHIBIT 8-A



WAR RESERVE AND BATTLE ALLOWANCES OF AMMUNITION

Harbor Defenses of Narragansett Bay

Approved by the Secretary of War in 5th Indorsement, WD, AGO March 28, 1933 (AG 381.4; 2-16-33; Misc. E), except as noted under (a).

Battery	Guns	Cal. & Type	Proj- tile	Pro- jec- tile	W.R.	B.A.	Remarks
Sakonnet Pt.	2	16"			400	(a) 100	
Sakonnet Pt.	2	8" LRG			500	300	
Sakonnet Pt.	4	155 mm			1600	800	Store in WG Storehouse, Ft. Greble.
Pt. Judith	2	16"			400	(a) 100	
Pt. Judith	4	155 mm			1600	800	Store at Btry. French, Ft. Kearny.
Narragansett Pier	2	8" Ry			500	0	250 rounds to be forwarded with battery.
Greene	4	12" M			960	600	) Of B.A. of 600 rds., each battery is to have 100 1046-lb. and 500 700-lb. projectiles; of Cent. Res.
Edgerton	4	12" M			960	600	) of 360 rds., each battery is to have 100 1046-lb. and 260 700-lb. projectiles. Store projectiles at battery; 697 powder charges at Btry. Bankhead, 503 at Btry. Belton.
Varnum	2	12" MRG	870#		480	480	
Wheaton	2	12" MRG	1070#		480	480	
House	2	6" BC	A. P.		600	400	
			H. E.		200	200	
Dickenson	2	6" BC	A. P.		1200	800	Store 465 powder charges at Btry. Zook.
			H. E.		400	400	
Cram	2	6" DC	A. P.		1200	800	
			H. E.		400	400	
Whiting	2	3" BC			400	300	
Crittenden	2	3" BC			800	600	Store 300 powder charges at Btry. Walbach.
Armistead	2	3" BC			800	600	

NOTES: (a) Magazine capacity limits B.A. to 100 rounds.

Ammunition to be stored at battery to which it pertains except as otherwise stated.

No increase in 12", 6", or 3" ammunition over that now on hand can be accommodated until surplus 10" ammunition is removed from H. D.

Corrected page per 16th Ind., AG 660.2 (5-2-34) (Misc.) E, dated January 2, 1935.

Corrected page per 16th Ind., AG 660.2 (5-2-34)(Misc.) E, dated January 2, 1935.

ANNEX A. EXHIBIT NO. 10-A COST ESTIMATE AND PRIORITY GUIDE H. D. OF NARRAGANSETT BAY

Priorities subject to change based on availability of funds.

Prior- ity	Item:Class	Description of Project	Ordnance:	Material:	Engineers Labor	Land	Contin- gencies	Total
4	1	A : Emplacement of two 16" guns at Sakonnet Point.						
		2-16" guns and carriages(Carriages 60% comp.)	\$240,000:					240,000
		Emplacements, etc.						
		Protected magazine traverse		\$141,400:	86,600:			228,000
		Two gun blocks		76,000:	20,000:			96,000
		Mounting guns		10,000:	20,000:			30,000
		Protected Plotting - Switchboard Room		32,750:	16,250:			50,000
		Latrine		4,000:	2,000:			6,000
		Power and light equipment		157,500:	17,500:			175,000
		Water supply and sewage		20,000:	10,000:			30,000
		Plant and temporary buildings		35,000:	15,000:			50,000
		Contingencies					100,000:	100,000
		99 acres of land				25,784:		25,784
	2	A : Emplacement of two 8" guns at Sakonnet Point.						
		22 acres of land				8,382:		8,382
		2 - 8" Navy guns with carriages	90,000:					90,000
		Emplacement, Type E		106,000:	50,000:			156,000
		(Continued)						
		Total	\$330,000:	\$583,650:	237,350:	\$34,166:	100,000:	\$1,285,166

Corrected page per 16th Ind., AG 66C.2 (5-2-34)(Misc.) E, dated January 2, 1935.

ANNEX A. EXHIBIT NO. 10-A.

COST ESTIMATE AND PRIORITY GUIDE

H. D. OF NARRAGANSETT BAY

Priorities subject to change based on availability of funds.

Prior- ity	Item:Class:	Description of Project	Ordinance	Engineers	Land	Contin-
			Material	Labor	gencies	Total
4	3	Brought forward	\$230,000	\$583,650	\$34,166	\$1,285,166
		Emplacement of four 155 mm. guns, Sakonnet Point.				
	A	4 1/2 acres of land			7,050	7,050
	B	4 - 155 mm. guns and carriages (Guns on hand.				
		For modification of trails)	800			800
	A	4 emplacements for guns		2,500		7,000
5	1	Emplacement of two 16" guns at Point Judith.				
		105 acres of land			15,240	15,240
		2 - 16" guns and carriages	600,000			600,000
		Emplacement, etc.				
		Protected magazine traverse		86,600		228,000
		Two gun blocks		20,000		96,000
		Mounting guns		20,000		30,000
		Protected Plotting - Switchboard Room		16,250		50,000
		Latrine		2,000		6,000
		Power and light equipment		17,500		175,000
		Water supply and sewage		10,000		30,000
		Plant and temporary buildings		15,000		50,000
		Contingencies			100,000	100,000
		(Continued)				
		Total	\$930,300	\$1,065,800	\$56,456	\$2,680,256

EXHIBIT NO. 10-A

Corrected page per 16th Ind., AG 660.2 (5-2-34)(Misc.) E, dated January 2, 1935.

ANNEX A. EXHIBIT NO. 10-A COST ESTIMATE AND PRIORITY GUIDE H. D. OF NARRAGANSETT BAY

Priorities subject to change based on availability of funds.

Prior- ity	Item:Class:	Description of Project	Ordnance	Material	Engineers Labor	Land	Contin- gencies	Total
5	2	Brought forward	930,800	1,065,800	427,200	56,456	200,000	2,680,256
		Emplacement of four 155 mm. guns, Point Judith.						
	A	9 acres of land				11,575		11,575
	B	4 guns and carriages.(Guns on hand. For modi- fication of trails).	800					800
	A	4 emplacements for guns		4,500	2,500			7,000
5	3	Emplacement of two 8" railway mounts,Pt.Judith.						
	C	Build 300 yards of new track @ \$12.50 per yd. and repair 580 yards of track.		4,500	2,500			7,000
	B	2 - 8" railway guns (On hand).						
		2 - 8" railway carriages	209,830					209,830
		2 sets on-carriage FC equipment	13,300					13,300
		4 ammunition cars, M 1918 (On hand)						
		Total	1,154,730	1,074,800	432,200	68,031	200,000	2,929,761

Class A - To be procured and installed in peacetime.

Class B - To be procured in peacetime and installed when an emergency arises.

Class C - To be procured and installed when an emergency arises.

Note: No expenditure of funds by the Signal Corps,
Chemical Warfare Service or Coast Artillery
Corps is contemplated in this Annex.

ANNEX B

FIRE CONTROL INSTALLATIONS

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A N N E X B.

FIRE CONTROL INSTALLATIONS.

1. The tactical organization of the batteries of the harbor defense is shown in Exhibit 1-A of Annex A, Seacoast Guns. The system of communication between the elements of the command is shown in the Fire Control Diagram for the ~~Frontal~~ Status of the harbor defense, which accompanies this annex as Exhibit 1-B. The location on the ground of the new elements of the fire control system, provided for in this plan, is shown on map attached, marked Exhibit 2-B.

2. In determining the fire control system needed by a battery, cognizance is taken of the following:

a. The angle of intersection at the target must be 15° or greater, and the area within 15° of the baseline (as measured from both base-ends) is to be excluded because the construction of the plotting board arms does not permit utilizing this area.

b. The DPF may be depended on to furnish reasonably accurate ranges to a distance of 800 yards for each 10 feet of its height above sea level, but is more dependent on clear weather than either the horizontal base or the CRF since accurate waterlining is essential. For the horizontal base or the CRF, sighting on the mast is sufficient and haze may not interfere with accurate range finding.

c. Atmospheric conditions in this region are such that visibility extends beyond 20,000 yards on exceptionally clear days only; it may be depended on up to 12,000 yards; and is ordinarily in the vicinity of 15,000 yards.

d. The extreme ranges of which the modern long-range batteries are capable require the use of a number of baselines in order that the full range and field may be utilized. Some of these baselines are at such distance from the battery that unless a simplified and small-scale plotting board is used, relocating will be necessary. This may be accomplished directly by use of the seacoast director, or by the use of an intermediate plotting board.

e. The same baseline will frequently serve more than one long-range battery (though each battery may have its own fire control personnel using separate observing rooms); and in some places the same baseline will serve batteries belonging to different harbor defenses.

3. a. The orientation data of each harbor defense are now based on rectangular coordinates whose origin is some convenient geodetic point on a meridian passing through the harbor defense. The data obtained by instruments oriented on a system of rectangular coordinates are not applicable to guns, plotting boards, and fire control instruments oriented on the rectangular coordinates of another harbor defense. Therefore position finding and spotting data obtained by the fire control stations of one harbor defense are not available to batteries of the adjacent harbor defense. The three harbor defenses of the Narragansett Bay Sub-Area have overlapping batteries, and their orientation data should be redetermined on one system extending from Montauk to Buzzards Bay. The case becomes obvious when spotting and position finding stations of Block Island are visualized since such stations should serve the two batteries at Montauk, Battery Davis at Fort Michie, and the four long-range batteries at Point Judith and Sakonnet Point. See Exhibit 3-B.

b. A study has been undertaken to determine the projection which will involve the smallest error when applied to the Narragansett Bay Sub-Area as a whole. Several reasons make it advisable to carry through this redetermination of orientation data:

- (1). The accuracy of some of the data in use in the harbor defenses is in doubt.
- (2). The new batteries and fire control stations included in the project must be surveyed.
- (3). The U. S. Coast and Geodetic Survey is re-determining its basic data, on the New 1927 North American Datum and thereby affording an opportunity for increasing the accuracy of harbor defense data, if it is availed of; or introducing an element of future discord if all data is not resolved to the new Datum. It happens that the work on the New 1927 North American Datum has been carried through the Narragansett Bay Sub-Area, three points (Gay Head, Block Island ECC and Montauk-2) being primary triangulation points.

c. The following steps will be taken should the War Department so direct and the funds become available:

- (1), Direction of the work on lines which are mathematically and technically sound.

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- (2). Execution of the necessary field work including placing of monuments and determination of the location of each fire control instrument and battery directing point.

(a). The field work may be carried out by employees of the Corps of Engineers or by Engineer troops.

- (3). Carrying out of the necessary computations and drafting room work.

d. A preliminary estimate of the entire cost of the work is \$7,200.00.

4. a. The Fire Control Diagram of the Eventual Status of the harbor defense is appended as Exhibit 1-B. This diagram shows the fire control system as it will be when all changes contemplated by the Project approved by the Secretary of War, August 11, 1932, and the annexes thereto, shall have been effected.

b. Whenever changes in the fire control system are made (such, for example, as construction of new duct lines or the laying of new cables) this diagram shall constitute a guide and shall be consulted in order that the trend of new work shall be to provide for the eventual needs of the command.

c. Whenever alterations are made in the Project approved August 11, 1932, or its annexes, affecting the fire control diagram, the diagram should be modified to accord with the alterations. This fire control diagram of the eventual status, and the fire control diagram of the existing status of the harbor defense will both be maintained and kept up to date at all times.

5. Post Telephone Lines. a. Between forts (or the distant groups at Sakonnet Point and Point Judith), two telephone pairs have been provided, connecting each fort with the fort which is the administrative headquarters of the harbor defense; thus two pairs are provided from Point Judith to Fort Adams; two from Fort Kearny to Fort Adams, and so for the other forts and for Sakonnet Point. These two trunk lines are adequate for administrative needs and should not be exceeded.

b. Within a fort, one post telephone line has been provided from each battery, group or higher command post to the post telephone switchboard; where a plotting room is distant from the BC station, a post telephone line has been provided from the plotting room also.

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c. If additional post telephones are authorized, it should be done sparingly. The above provision will enable the harbor defense to operate, and concentration of effort and funds on the fire control system is important.

6. Spotters. A spotter with azimuth instrument usually should be provided at each base-and station and at each battery.

7. Steel Fire Control Tower. a. The long range of modern batteries has resulted in the necessity of providing very wide fields of view for the observing instruments of many of the base-and stations. The required field is often greater than 180° ; in the case of the long-range station at Point Judith it is 225° and at Gay Head it is 329° . To avoid interference of one station with the view from an adjacent station; it is essential (where the need for a wide view exists) to provide for one observing room above another. These wide angles can be obtained equally well with a concrete building; the advantage of the steel tower (in addition to lower cost) is in its quick erection if an emergency arises before funds have become available to purchase the site and build the station.

b. The required wide angle of view is usually best obtainable from some one location, only; if that site is not occupied, it becomes necessary to build several stations instead of one. It not infrequently happens that the desired site is on an estate which the owner will not sell at any reasonable cost but the wartime use of which would present no difficulties. A quickly erected steel tower best meets this case.

c. The cost of the steel tower above is estimated as approximately 25% of the cost of a concrete station. The cost of sheathing for protection against the weather must be added.

d. Preliminary design of a steel fire control tower has been prepared by the Corps Area Engineer and submitted to the Chief of Engineers.

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8. The next succeeding paragraphs are concerned with description of places required for new fire control installations. Following these are paragraphs dealing with the requirements of each battery. The numbers used refer to the fire control stations shown in Exhibit 2-B.

9. Baseline 1 - 2. This baseline extends from Noyes Point to Green Hill and is 15,355 yards long. It is shown in Exhibit 2-B as Baseline 1 - 2, and affords observation over and beyond the area included in the 25° intersection line shown in Exhibit 4-B, as limited by the 20,000 yard limit of visibility which is an approximation.

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how well
understand
EX 2 - B
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a. Noyes Point. The proposed fire control station, marked 1, is located on a rise about 900 yards from the beach. There is a Coast and Geodetic Survey station, "Chapman", nearby. The arc of visibility from a height 14 feet above ground level is from Watch Hill Light counterclockwise to Point Judith; an instrument height of 14 feet above the ground is needed because of the presence of several cottages in the foreground. About one acre of ground should be obtained; the cost is estimated as \$400. A 2-story fire control structure should be built. This would provide a combined base and spotting station for the 16-inch and 8-inch batteries near Point Judith. An antiaircraft observer should be provided for in one of the observing rooms. Both stations should be equipped with observers' and spotters' azimuth instruments.

(1). Each observing room should permit of a view from Watch Hill on the west, through the south to Green Hill on the east, or from azimuth 74° to azimuth 249°.

(2). If an emergency arises before this station has been constructed, it will be possible to establish two emergency base and spotting stations here by erecting two wooden platforms for azimuth instruments on tripods; the two structures should be approximately 50 yards apart to avoid interference.

b. Green Hill. The proposed fire control station, marked 2, is located on Green Hill. A Coast and Geodetic Survey station is located at this point. The site is about 1100 yards from the shore. It is pasture land and will cost approximately \$450.00 for one acre, which is a sufficient area. A 3-story fire control station should be constructed here. The arc of view is from a line tangent

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to Watch Hill Point on the west to a line tangent to Point Judith on the east; or from azimuth 71° to azimuth 279° . Each station should be equipped with an azimuth instrument for an observer and one for a spotter. An antiaircraft observer should be provided for in one of these stations, and a spotter for the 155 mm. battery at Point Judith in another room.

- (1). If this station has not been constructed when an emergency arises, the location can be occupied and used at once by two azimuth instruments on tripods located about 50 yards apart.

10. Baseline 2 - 3. This baseline extends from Green Hill, just described, to a location on Point Judith Neck approximately 1500 yards northwest of Point Judith Light and about 700 yards north of the 155 mm. gun site. The location is in an open field belonging to the Colonial Farm owned by Thomas L. Greeno, and has a view from the direction of Noyes Point on the west, around through the south and east to a line tangent to the shore-line south of Narragansett Pier on the northeast, or from azimuth 77° counterclockwise to azimuth 212° . Approximately 2 acres should be purchased, at an estimated cost of \$400 per acre. There is a bench mark known as "Point Judith", placed by the Corps of Engineers in 1922 at this point, the latitude and longitude of which are given in a table at the end of this annex. The ground at this site is approximately 30 feet above sea level. Suitably designed buildings here will not be conspicuous because of higher ground and wooded areas in the background and the presence of other buildings in the vicinity. The proposed baseline 2 - 3 is approximately 9,845 yards long.

a. At location 3 provision should be made for two structures about 150 yards apart, one with four observing rooms, one above another in order to permit of the wide field of view (225°) required; a fifth room (which should be the lowest) is required as a group commander's station for the Point Judith Group. One each of the four base-end stations is required for the 16-inch battery at Point Judith, the 8-inch battery at Narragansett Pier, the 16-inch battery at Sakonnet Point and the 8-inch battery at Sakonnet Point.

b. The second fire control station at Point Judith should have four observing rooms one above another. The station should be approximately 150 yards distant from the long range station described in paragraph 10 a above. Interference with the field of view from the long range station must be avoided; this will be accomplished by locating the second station about 150 yards at azimuth 210° from the first station or to the west of that azimuth. The field of view of this second station should be from azimuth 315° counterclockwise to azimuth 212° . One of the four base-end stations is required for each major-calibre battery of the inner defense.

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c. Each observing room of these two stations should be equipped with azimuth instrument for observer, and the stations for Wheaton and Varnum with spotters' instruments also.

11. Baseline 3 - 4. a. The baseline is planned to extend northeast from Station 3 at Point Judith to Station 4 on Boston Neck, 13,217 yards (measured between Coast and Geodetic Survey stations of these names). Two 4-story base-end stations will be required at 4. They should be so located on the ground with reference to each other as to avoid interference. The southern one of the two stations should provide a base-end for the 16-inch battery at Point Judith, and the 8-inch battery at Narragansett Pier, and the 16-inch and 8-inch batteries at Sakonnet Point; the observing rooms should have a field of view from a line tangent to the high ground of Point Judith Neck just south of Narragansett Pier, to a line across Boavortail tangent to Branton Point or from azimuth 170° counterclockwise to azimuth 271° . The northerly station should provide a base-end station each for Batteries Wheaton, Varnum, Edgorton and Greene, and should have the same field of view; viz, from a line tangent to the high ground of Point Judith Neck just south of Narragansett Pier (azimuth 170°) around through the east to a line tangent to Branton Point, azimuth 271° .

b. The location on Boston Neck has a ground level of approximately 76 feet. The instrument height of the lowest room in both structures should be 10 feet above the ground. Each of the eight observing rooms should be equipped with a DPF and a spotter's azimuth instrument.

c. All instruments in both stations require the same field of view, which is 106° wide. There is no difficulty in so placing the two stations that this limited arc of view can be obtained without interference.

d. Approximately one and one-half acres of ground should be obtained. The cost is estimated as \$600. There is a Coast and Geodetic Survey station "Boston Neck" located nearby and a U. S. Engineer Department survey station "Narrow River East" just west of Clump of Rocks at the south point of the Neck.

- (1). The land on which the stations are to be located is owned by Frank L. Hinkley, Industrial Trust Building, Providence, Rhode Island. As scaled off from a 1:10,000 land survey map, the position is: latitude $41^\circ 27' 50''$; longitude $71^\circ 26' 30''$.

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12. Auxiliary Station "5". a. Hazard Tower on the east side of Point Judith Neck about one-half mile south of Narragansett Pier and 500 yards from the shore on the west side of the Point Judith - Narragansett Pier road, is a valuable location for a spotting station. The location is shown on air photograph marked Exhibit 5-A. The tower is approximately 101 feet high, on ground about 65 feet above sea level, giving a height of about 166 feet; it is 13 feet square at the top and of massive construction. The platform is of plank covered with canvas, and is surrounded by a parapet about $2\frac{1}{2}$ feet high. The tower is on the property of Isaac Peace Hazard. The latitude and longitude are given in the table of orientation data appended hereto. There is an all-around view from the west side of Western Passage, through the east and south to the direction of Noyes Point on the southwest.

b. The property probably cannot be purchased for any reasonable price. Its use in time of emergency should be contemplated. Spotters should be located here, with instruments on tripods, for the four major calibre batteries of the inner defense and the 155 mm. battery at Point Judith. An antiaircraft observer should be located on the tower.

13. Auxiliary Station at St. George's School tower. a. The location designated "6" on Exhibit 2-B is a massive stone tower 101 feet above ground and approximately 205 feet above sea level. The observing platform is paved and is 22 feet square, facing with the points of the compass. At each corner a pillar rises about 25 feet above the observing platform with two lesser pillars on each face, which prevent full usefulness of the tower as a base-end station. There is a stone grill-work parapet rising 8 feet above the floor; this can be avoided by using a plank platform about 5 feet high.

b. Range Finders. From a platform raising the instruments to 9 feet above the floor, and at a distance of instrument centers of two feet or less inside the stone parapet, it is practicable to observe past the pillars through an arc from Point Judith to East Rock off Sakonnet Point. In an emergency, if permission to use this chapel tower is obtainable, two DPF's should be mounted here as auxiliary instruments; their effective range would be approximately 16,500 yards.

c. Spotters. By moving across the tower, spotters with field glasses can observe the water in all directions over a wide area, to the limit of visibility, including the Sakonnet River; across Sakonnet peninsula to Gooseberry Neck; and on the west across Brenton Point to Beavertail and the shore of Point Judith Neck. If the tower can be used, a spotter should be located here for each of the four major calibre batteries of the inner defense and for the 155 mm. battery at Sakonnet Point.

d. An antiaircraft observer should be located here.

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14. Baseline 7 - 8. This baseline from Sachuest Neck to Warren Point is 7,168 yards long and affords a view from a line tangent to Coggeshall Ledge Point, 4,000 yards east of Brenton Point, across the entrance of Narragansett Bay and thence through the south to the southeast. It also covers the Sakonnet River for some distance above and below the antisubmarine net.

a. Sachuest Neck. Two stations should be constructed, each with four rooms one above another. The stations should both have a view from a line tangent to Coggeshall Ledge point east of Brenton Point, azimuth 64° ; to a line across Sakonnet Point, azimuth 291° ; this arc of 133° is easily provided for. In addition, the observing rooms of one of the two stations should have a view up the Sakonnet River to azimuth approximately 215° . The batteries best suited to fire on the river being the major calibre batteries of the inner defense, the observing rooms which should be given this additional field of view to azimuth 215° are those pertaining to Batteries Varnum, Edgerton and Groenc.

- (1). In order to satisfy these conditions, the fire control station for the four long-range batteries should be located approximately 100 yards from the other station, at azimuth 65° . With this disposition the observing rooms for the 16-inch and 8-inch batteries at Point Judith and Sakonnet Point will have a field of view from azimuth 64° counterclockwise to azimuth 291° ; and the observing rooms for the heavy batteries of the inner defense (except Wheaton) will have a field of view from azimuth 64° counterclockwise to azimuth 215° .
- (2). The southern half of Sachuest Neck is open grass land rising to a height of about 50 feet. Approximately two acres should be purchased; the cost is estimated as \$500 an acre. A right of way should be provided for.
- (3). The observing rooms of Batteries Varnum, Groenc and Edgerton should be equipped with DPF's; all other stations with azimuth instruments. All stations should be equipped with spotters azimuth instruments. One antiaircraft observer should be provided for.

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b. Warren Point. This location rather than one on Sakonnet Point is determined on because the view is equally good and the length of baseline greater, the presentation is better, and the baseline will operate farther toward the east. Two stations should be constructed, one with four observing rooms one above another, and the other with five. Two stations for the four heavy batteries of the inner defense should have a view from a line to Sachuest Neck counterclockwise to the south, or from azimuth 110° to azimuth 50° . The stations for the four long range batteries and Battery Milliken should have a view from a line tangent to Branton Point (azimuth 85°) to Gooseberry Neck (azimuth 258°). If the building provided for the long range batteries is approximately 50 yards at azimuth 345° from the other, interference will be avoided. One building should include a group command post for Group 3, which should be the lowest room.

- (1). The location selected is open grass land, west of the house of Mrs. Gorham Parks. One acre should be obtained; the cost is estimated as \$2,000.
- (2). From a height of approximately 16 feet above ground the view extends across Sakonnet peninsula from Sachuest Neck counterclockwise to Gooseberry Neck; an instrument height of 12 feet above the ground will suffice since waterlining across Sakonnet peninsula is unnecessary. Each of the base and stations should be equipped with azimuth instrument.
- (3). The shore of Sakonnet peninsula including Warren Point is built up with summer residences and the choice of sites is strictly limited.

15. Baseline 8 - 9. This baseline extends from Warren Point just described to Gooseberry Neck, a distance of 12,676 yards.

a. Gooseberry Neck. Replacing a lost survey mark of the Coast and Geodetic Survey, the Commanding Officer, Harbor Defenses of Narragansett Bay, in 1932 put in a concrete post with copper bolt, the location of which is given in the table of orientation data following; it is on the highest part of the Neck near the center. A 3-story station should be built, providing an observing room for the 16-inch and 8-inch batteries at Sakonnet Point and Battery Milliken at Fort Rodman. The arc of view is from Sakonnet Point through the south to Mishaum Point or from azimuth 74° to azimuth 247° . Each of the observing rooms should be equipped with an azimuth instrument for observer and one for spotter. An antiaircraft observer should be provided for, and a spotter for the 155 mm. battery at Sakonnet Point.

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- (1). In an emergency arising before this station is built, azimuth instruments on tripods can be set up in line at about 50 yards interval.
- (2). Gooseberry Neck is owned by the estate of Joseph McCormick of Providence, Rhode Island. It was held in 1931 for \$80,000 but there is reason to believe that the valuation now is much less. One acre, near the south end of the Neck, should be purchased. The elevation here is approximately 20 feet above mean low water. The cost is estimated as \$500.

16. Baseline 9 - 10. This baseline, 12,649 yards long, extends from Gooseberry Neck across the west entrance of Buzzards Bay to Cuttyhunk and may be used either to east or west.

a. Cuttyhunk. There is a Coast and Geodetic Survey station on the high point of the island from which the field of view is from a line tangent to the north shore of the Elizabeth Islands at azimuth 240° around through the north, west and south to a line tangent to the south shore of those islands, azimuth 271° , an angle of 329° . The summit of the hill must be occupied; the alternative would be to provide several stations instead of this one, in order to cover Vineyard Sound, Buzzards Bay and the sea area to the west. One and one-half acres should be obtained to prevent nearby building. The land is owned by Cornelius A. Wood, Shawsheen Village, Andover, Mass., to whom most of the island belongs. The price of one and one-half acres is estimated as \$900.

- (1). A 3-story structure should be built, to provide a base-end station for the 16-inch and 8-inch batteries at Sakonnet and Battery Milliken at Fort Rodman. Each station should be equipped with a DPF and spotter's azimuth instrument. The lowest DPF at an instrument height three feet above ground level (which is approximately 166 feet above mean sea level) will have an effective radius of 13,500 yards. An antiaircraft observer should be provided for.
- (2). If an emergency arises before this station has been provided, azimuth instruments on tripods can be used; but because of the wide arc desired, there will be some mutual interference.

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17. Baseline 10 - 11. This baseline extending from Cuttyhunk to Gay Head is 12,577 yards long. It crosses the western entrance of Vineyard Sound, and may be used to east or west.

a. Gay Head. The fire control station here should be two stories high, providing a base-end station for the 16-inch battery at Sakonnet Point and for Battery Milliken. The field of view from this location, near which there is a Coast and Geodetic Survey station "Gay Head-2", is from a line tangent to the north shore of Martha's Vineyard, azimuth 229°, through the north, west and south to a line tangent to the south shore, azimuth 295°, an arc of 294°. The station for the 16-inch battery should be equipped with DPF; at an instrument height eight feet above ground level or approximately 150 feet, the effective range is 12,000 yards. Each station should include provision for a spotter. An anti-aircraft observer should be located here.

- (1). If the station has not been constructed when an emergency occurs, azimuth instruments on tripods may be employed on the ground level; the two parties should be separated by about 50 yards to reduce interference with each other.
- (2). Two acres of land should be purchased, to prevent nearby construction of buildings which would mask the station. The price is estimated as \$400 an acre.

REQUIREMENTS OF EACH BATTERY.

18. Long Range Batteries near Point Judith. a. It is proposed to provide the 16-inch battery at Point Judith Neck and the 8-inch railway battery at Narragansett Pier with the baselines shown in Exhibit 4-B; viz,

Noyes Point to Green Hill (1 - 2);
Green Hill to Point Judith (2 - 3);
Point Judith to Boston Neck (3 - 4);
Sachuest Neck to Warren Point (7 - 8).

b. Spotting stations are proposed as follows:
Noyes Point (1), Green Hill (2), Boston Neck (4), and
Sachuest Neck (7).

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c. The harbor defense commander shall prepare orientation data for the use of the railway battery commander, to be handed him on his arrival at the outbreak of an emergency. These data should be tied in with the harbor defense data and include distances and azimuths from one or more points which may be used to set up a transit with which to orient the guns, when in position at South Pier or at the alternative position.

d. Should international agreement result in abolishing railway artillery and the alternative plan of constructing an 8-inch fixed battery at Point Judith be carried into effect, the fire control provisions made for the 8-inch railway battery will be equally suitable for the fixed battery. X

19. 155 mm. Battery at Point Judith. a. This battery should be provided with a 15-foot CRF, mounted on concrete block and so located near the guns as to have a field of view from the shore-line on the west counterclockwise to a line tangent to the shore-line near Narragansett Pier on the north-east. Temporary shelter for this instrument can be constructed when an emergency arises.

b. Spotting stations for this battery should be included in one of the base-end stations at Green Hill (2), and at Hazards Tower (5).

20. Major Calibre Batteries of Inner Defense. a. The existing baselines of these batteries are entirely inadequate; the base-end stations are so low (with reference to the rugged topography of Narragansett Bay), and some of the baselines so short, that the greater part of the important fields of fire (lying between Point Judith Neck and Sakonnet peninsula) cannot be fired on. The fields of fire of which the guns as emplaced are capable are shown in Annex A, Seacoast Guns. In Exhibits 5-B to 7-B the dead spaces due to limitations of the position finding stations are shown. The areas which are covered by the present baselines are also shown, in color.

b. In place of the present baselines whose ends are located on the reservations of the inner defense and are thus generally perpendicular to the line of fire, it is proposed to substitute two baselines lying generally parallel to the line of fire and well advanced, as is practicable since Point Judith and Sakonnet Point are to be fortified. One of the new baselines will extend northeast from Point Judith to Boston Neck, facing east across the main field of fire of these four batteries; the other will extend northwest from Sakonnet peninsula to Sachuest Neck, facing southwest across the main field of fire. These two baselines, with DPF's at the north ends will cover the entire useful field of fire of all four batteries.

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21. Battery Wheaton, two 12-inch-D. C. Sec Exhibit 5-B.

a. The present baseline extends from Prospect Hill (DPF) to Fort Wetherill (azimuth instrument) and is approximately 3,150 yards long. The limiting arc of 15° intersections is shown in the exhibit. The maximum range at which targets can be tracked is now 11,000 yards although the range of the guns is 17,300 yards; and due to masking of the observing stations it is possible for a hostile vessel to pass the defenses without coming under fire of Battery Wheaton. The masked areas are shown in the exhibit; the tinted areas, only, are now covered. The present baseline should be abandoned, the B' station with DPF being retained as an emergency station.

b. Two new baselines are required, as follows:

Point Judith to Boston Neck (3 - 4);
Sachuest Neck to Warren Point (7 - 8).

c. A plotting board which will take these baselines will be required.

d. Spotters in base-and stations are proposed as follows: Point Judith (3); Boston Neck (4); and Sachuest Neck (7); and auxiliary spotting stations at Hazard Tower (5) and St. George's School Tower (6). If the last two stations, at Hazard Tower and St. George's School Tower, can be established, the other three will not be needed.

22. Battery Varnum, two 12-inch B.C. Sec Exhibit 6-B.

a. The present baseline extends from B' at Prospect Hill to B" at Fort Wetherill, a distance of about 3,150 yards. The limiting arc of 15° intersections is shown in the exhibit. The maximum range at which targets can be tracked with the present baseline is 11,000 yards although the range of the guns is 17,300 yards. A vessel might pass the defenses to the interior of Narragansett Bay without coming under the fire of Battery Varnum. The masked areas are shown in the exhibit; the tinted areas, only, are now covered. The present baseline should be abandoned. The B' station with DPF should be retained as an emergency station.

b. Two new baselines are proposed, as follows:

Point Judith to Boston Neck (3 - 4);
Sachuest Neck to Warren Point (7 - 8).

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c. A plotting board which will take these baselines will be required.

d. Spotting stations are proposed, to be included in base-end stations at Point Judith (3); Boston Neck (4); and Sachuest Neck (7); and auxiliary spotting stations at Hazard Tower (5), and St. George's School Tower (6). If those two auxiliary stations can be established, the other three will not be required.

23. Battery Edgerton, four 12-inch mortars. See Exhibit 7-B.

a. This battery has no permanent primary station; its primary is temporarily housed in a wooden structure on the old redoubt at Fort Adams which is unsuitably located and is deteriorating. The battery has a B" with DPF at Prospect Hill, giving a baseline 4,900 yards long, and a B³ at Fort Wetherill with DPF which, in connection with B' gives a 2,600 yard baseline. All three stations are masked over wide sectors by high ground, buildings or considerable wooded area. The 2,600-yard baseline is too short to permit tracking beyond 9,000 yards, as shown in the exhibit. The B'-B" base is long enough but both stations are blinded over the sectors shown. The present baselines should be abandoned. The B" station with DPF should be retained as an emergency station for both Battery Edgerton and Battery Groono.

b. Two new baselines are proposed, as follows:

Point Judith to Boston Neck (3 - 4);
Sachuest Neck to Warren Point (7 - 8).

c. One or more plotting boards should be provided which will enable fire to be directed on the area from a line toward Boston Neck on the right to Sakonnet Point and the Sakonnet River on the left, or from azimuth 73° to azimuth 221°, an arc of 212°.

d. Spotting stations proposed are: Boston Neck (4), and Sachuest Neck (7); and auxiliary stations at Hazard Tower (5), and St. George's School Tower (6). The last two, should they be established, will be sufficient.

24. Battery Groono, four 12-inch mortars. See Exhibit 7-B.

a. The primary station of this battery is in the same temporary frame structure as B' Edgerton. The secondary station is at Prospect Hill, is equipped with DPF, and provides a baseline approximately 4,900 yards long. The tertiary station equipped with azimuth instrument is at Fort Wetherill and in connection with B' provides a baseline 2,600 yards long. This shorter baseline is limited by the

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15° intersection curve to the area shown, most of which is dead space. The longer baseline would be adequate for the western part of the Bay but more than half of its field is masked. The three stations (two of which are temporary) are blinded by higher ground, buildings or wooded areas. B" Edgerton at Prospect Hill with its DPF is to be retained for emergency use of both Greeno and Edgerton, and the other stations abandoned.

b. Two new baselines are proposed:

Point Judith to Boston Neck (3 - 4);
Sachuest Neck to Warren Point (7 - 8).

c. One or more plotting boards should be provided which will cover the arc from due west to slightly north of east, and will permit of using the proposed baselines.

d. Spotting stations are planned as follows: Boston Neck (4), Sachuest Neck (7); and auxiliary spotting stations at Hazard Tower (5) and St. George's School Tower (6). If the last two can be established, the others will not be required.

RAPID FIRE BATTERIES OF INNER DEFENSE.

25. No important changes are needed to enable these six batteries to protect the mine fields and approaches thereto. There are three 6-inch and three 3-inch batteries in pairs; a 6-inch and a 3-inch battery at Fort Wetherill, covering the Eastern Passage; a 6-inch and a 3-inch battery at Fort Getty and a 6-inch and a 3-inch battery at Fort Kearny, these four batteries covering the Western Passage. Exhibits 8-B to 13-B show the field of fire covered by each battery.

26. Battery Dickenson, two 6-inch barbette guns at Fort Wetherill. The battery has a DPF at Fort Wetherill, with the field of view shown in Exhibit 10-B. The instrument height is 101 feet, giving an effective range with present instrument of 8,100 yards. This is scarcely half of the maximum range of the guns, 16,400 yards. As this battery is capable of a high rate of fire and covers a valuable field it should be equipped with an M-1 DPF and the older DPF employed elsewhere. An M-1 DPF will permit Battery Dickenson to fire up to its extreme range, over an arc of 72°.

27. Battery Crittenden, two 3-inch Pedestal Mounts at Fort Wetherill. There is a 9-foot CRF at the battery with the field of view shown in Exhibit 11-B. No change in the present installation is necessary.

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28. Battery House, two 6-inch barbette guns at Fort Getty. The battery is capable of a high rate of fire, to a range of 16,400 yards. The present 15-foot CRF adequately covers the mine field of the Western Passage and the approaches thereto, and is reasonably satisfactory. See Exhibit 12-B.

29. Battery Whiting, two 3-inch Pedestal Mounts at Fort Getty. This battery is equipped with 9-foot CRF which is satisfactory. The battery covers the Western Passage mine field as shown in Exhibit 13-B.

30. Battery Cram, two 6-inch D. C. at Fort Kearny. See Exhibit 8-B. There is an unfinished CRF station at the battery, to complete which will cost approximately \$1500. A 15-foot CRF instrument is on hand. The station should be completed.

31. Battery Armistead, two 3-inch Pedestal Mounts at Fort Kearny. See Exhibit 9-B.

a. No fire control station has been provided. At the shorter ranges the higher ground of "The Bonnet" to the south of Fort Kearny obstructs fire; otherwise No. 1 gun could fire as far to the west as Lower Pier, the site of the 8-inch railway battery. The battery covers the eastern half, only, of the mine field, and as No. 2 gun could not fire closer to No. 1 than about 15° while the latter is manned (to azimuth 341°) this left gun cannot fire on the mine field at all. The battery covers the antisubmarine not effectively. As the mine field is covered by the two rapid fire batteries at Fort Getty, no action is necessary.

b. Battery Armistead should be provided with a station for 9-foot CRF, (the instrument is on hand), so located as to cover the mine field and to track boats approaching the field of fire of the guns from due south, enabling fire to be opened as soon as such vessels come into view of the guns. There is a suitable location on the parados, in rear of No. 2 gun.

32. Long Range Batteries near Sakonnet Point. a. It is proposed to provide the following baselines for the 16-inch and 8-inch batteries on the Sakonnet peninsula, as shown in Exhibit 14-B:

Point Judith to Boston Neck (3 - 4);
Sachuest Neck to Warren Point (7 - 8);
Gooseberry Neck to Cuttyhunk (9 - 10).

b. There will incidentally be formed the baseline Warren Point to Gooseberry Neck (8 - 9) which may or may not be used, the area covered by this baseline being also covered by the two adjacent baselines.

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c. For the 16-inch battery two additional baselines are required:

Green Hill to Point Judith (2 - 3);
Cuttyhunk to Gay Head (10 - 11).

d. Spotting stations are proposed for both batteries to be included in the base-end stations at Boston Neck (4), Sachuest Neck (7), Gooseberry Neck (9) and Cuttyhunk (10).

e. For the 16-inch battery, a spotter should be provided for in the base-end stations at Green Hill (8) and Gay Head (11).

33. 155 mm. Battery at Sakonnet Point. a. A 15-foot CRF should be provided for this battery. No station is proposed, but a concrete platform should be located on the massive clump of rocks shown 400 yards from the end of the Point in Exhibit 6-A. Temporary shelter for the instrument can be erected at time of an emergency with storage at the 8-inch battery during periods when not required.

b. A spotter for this battery should be provided for at the battery, at the tower of St. George's School (6), and at Gooseberry Neck (9).

COMMAND POSTS.

34. a. The H Station at Prospect Hill is suitably located but consists of an observing room only. It should be enlarged to provide six rooms each approximately 15 by 20 feet, or an over all size of approximately 30 by 60 feet. There is ample space available, with very little excavation. The floor level should be slightly below the floor of the present observing room. Trees should be planted to screen the station.

b. Group 4. A station for the antiaircraft group including the center of antiaircraft intelligence should be provided as a part of the H station and will require two of the six rooms.

c. C-1. The command post of the mine groupment is to be located in an existing station at Prospect Hill, rendered surplus by the Project, formerly the Group 1 station. X

d. Mine Group 1. This mine group now has a station at Fort Greble, which is its proper location. A more suitable structure at Fort Greble is the Sedgwick B³, which is no longer required; and this reassignment is hereby made. X

e. Mine Group 2. This mine group now has a command post at Fort Wetherill; it should remain at Fort Wetherill but will be better housed in the present double B" Wheaton - B" Varnum station, heretofore proposed to be abandoned as such. X

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f. Group 2. The old G-2 station at Prospect Hill should continue as such. The old Group 2 included Batteries Wheaton, Varnum and Walbach. The new Group 2 includes Batteries Wheaton, Varnum, Edgerton and Greene.

g. Group 1. This group comprises all batteries, including antiaircraft batteries, at Point Judith and Narragansett Pier. A station has been provided in this project, in a fire control structure at Point Judith.

h. Group 3. This group comprises the batteries, including the antiaircraft batteries, on the Sakonnet peninsula and a command post has been provided in a Warren Point fire control station.

OBSERVING STATIONS ON BLOCK ISLAND.

35. a. See Exhibit 3-B. It is approximately 19,000 yards from Point Judith to Block Island, and 25,000 yards from Montauk Point to Block Island. It is 45,000 yards from Sakonnet Point. The arcs of fire of batteries at all three places pass near Block Island. Because the haze which prevails much of the time over New England waters permits observation as far as 20,000 yards on unusually clear days only, the opportunity of using these long range batteries beyond about half their range depends on airplane observation or position finders on Block Island. Airplane observation may be interfered with.

b. Foreign naval vessels are credited with an extreme range of about 40,000 yards which they are not apt to use (considering ammunition expenditure) beyond about 35,000 yards; but they must be held more than 35,000 yards off Point Judith if our Navy is to be able to pass freely, secure from hostile gunfire, between Narragansett Bay and Block Island Sound. If hostile vessels can lie closer than about 38,000 yards off Point Judith, our vessels cannot pass securely in and out of Narragansett Bay. Since visibility from the mainland is ordinarily limited to an extreme distance of 20,000 yards, observation from Block Island is essential. The arcs of fire of the long range batteries are shown in Exhibit 3-B.

- (1). Great Salt Pond on Block Island has a channel depth of 23 feet at mean low water; it is probable that the Inshore Patrol will utilize it as a base. There is a second-rate airplane landing field at Block Island, in daily use during the tourist season. A photostat of the U. S. Coast and Geodetic Survey chart No. 356, dated November 1902, now out of print, is attached as Exhibit 15-B; on it are shown the proposed base-end stations.

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36. There are four points on Block Island, conveniently disposed, from each of which observation can be obtained over a very wide arc: Clayhead on the north, Beacon Hill in the center, "Paine" on the southeast and "Southwest" on that part of the island. Each one is the location of a Coast and Geodetic Survey station. By occupying those four places, a series of baselines can be formed which will give observation in all directions to a considerable distance. The limiting curves of these baselines are shown in Exhibit 3-B.

a. Clayhead. The field of view from the location of the Coast and Geodetic Survey station of this name is from a line tangent to the high ground 900 yards northwest of Beacon Hill on the southwest, clockwise to a line tangent to the southeast shore of Block Island or from azimuth 43° to azimuth 347° , a field of view of 304° . The station is on open grass land 142 feet high; its coordinates are given in attached table of orientation data. A DPF should be provided for this location. One house belonging to the Samuel Hayes estate at a distance of about 300 yards obstructs the view to the northeast through an arc of about three degrees. The value of the land is estimated as \$250. per acre. One acre should be purchased and an instrument base for DPF should be put in. No shelter need be erected until an emergency arises. An antiaircraft observer should be located at Clayhead.

b. Block Island ECC. The Coast and Geodetic Survey station of this name is in the center of a stone observation tower about 12 feet in diameter and 16 feet above ground level, at the corner of a small stone house occupying the summit of Beacon Hill, which is the high point of Block Island. The elevation of the observation platform of the tower is approximately 227 feet above sea level. The view is 360° uninterrupted except through an angle of about 5° by a hill 800 yards to the south and through an angle of about 2° by the hill on which "Paine" is located. A DPF should be provided for this location; it would be effective at this height to a distance of about 18,000 yards if visibility permitted waterlining. No preparation is needed except to level the base with cement at time of an emergency, when shelter can be erected. An antiaircraft observer should be located here.

(1). "Block Island ECC" is a primary triangulation station of the Coast and Geodetic Survey; the present station was established in 1932 and is tied in with the now 1927 North American Datum.

(2). The owner of this property is Thomas T. Daggett, Sandy Valley Road, Dedham, Mass.; an occasional employee of his is Selim F. Mitchell, Box 296, Block Island, Rhode Island.

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c. "Paine" station, located by the Corps of Engineers in 1922 to replace a lost Coast and Geodetic Survey station, is on the top of a bald hill, 183 feet above high water, near the southeast corner of Block Island. The view from five feet above ground level is from the direction of "Clayhead" on the north around through the east and south to a line slightly north of west, or from azimuth 181° clockwise to azimuth 114° , an angle of 293° . The land is estimated at \$250 an acre; one acre should be purchased. An observing station should be built because Pilot Hill 500 yards to the north cuts off a small part of the field of view from the ground; an instrument height of about 15 feet above ground should be provided. A DPF and an azimuth instrument for spotter should be provided.

d. "Southwest" is on an open, flat hilltop, 165 feet above sea level. This is the location of a Coast and Geodetic Survey station. The field of view is from a line slightly west of north counterclockwise to a line tangent to "Paine", or from azimuth 178° to azimuth 260° , an angle of 278° .

- (1). Two acres should be purchased, to prevent nearby construction. The value of the land is estimated as \$250 per acre.

37. Baselines. a. It is proposed to form four baselines by use of the four stations described above; their approximate lengths are: Clayhead to Southwest, 8,213 yards; Clayhead to Paine, 6,885 yards; Block Island ECC to Paine, 3,751 yards; and Southwest to Paine, 3,250 yards. The areas over which these baselines will operate are shown by the limiting arcs of intersections in Exhibit 3-B; the areas over which the DPF's at Clayhead and at Paine will operate effectively are also shown.

b. Because data obtained at Block Island will be required by the Harbor Defenses of Long Island Sound and also by four batteries of the Harbor Defenses of Narragansett Bay, and in order to avoid multiplication of fire control personnel and costs, it is proposed to operate this network of baselines as a function of harbor defense headquarters of Narragansett Bay, using but one set of instruments and personnel, the latter being a detail from the headquarters battery.

c. A practicable method of using the data obtained by the Block Island fire control stations will be to plot the range and azimuth of a target, from "Block Island ECC", and telephone those data to the mainland, to be replotted by such batteries as may be assigned to the target.

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d. A Government reservation formerly used by the Bureau of Fisheries of the Department of Commerce, consisting of approximately 2 acres on Beach Avenue, Block Island, on the east shore of Trims Pond just east of Fort Island is to be transferred to the War Department; pending Congressional authorization for the transfer, the use of the tract is granted by license from the Department of Commerce to the War Department (3d Ind., WD AGO, June 7, 1934, AG 601.4 Block Is. RI; 5-21-34; Misc.). The location is shown in Exhibit 15-B. On this reservation should be located the necessary temporary barracks for the fire control and searchlight personnel; and a plotting room and room for a small switchboard should be provided. There is a suitable beach nearby for landing the cable from Point Judith.

AREA BETWEEN BLOCK ISLAND AND GAY HEAD.

38. Subaqueous Sound Ranging. a. It is 68,000 yards from Block Island to Gay Head, between which there are no sites for observation stations. Observation from Block Island may cover 20,000 yards of this distance, from the West; and observation from Gay Head - Cuttyhunk may cover 20,000 yards from the east. There remains a gap of 28,000 yards. To provide for fire on this area, the center of which lies due south of Sakonnet Point at a distance of 21,000 yards, the installation of subaqueous sound ranging equipment is proposed.

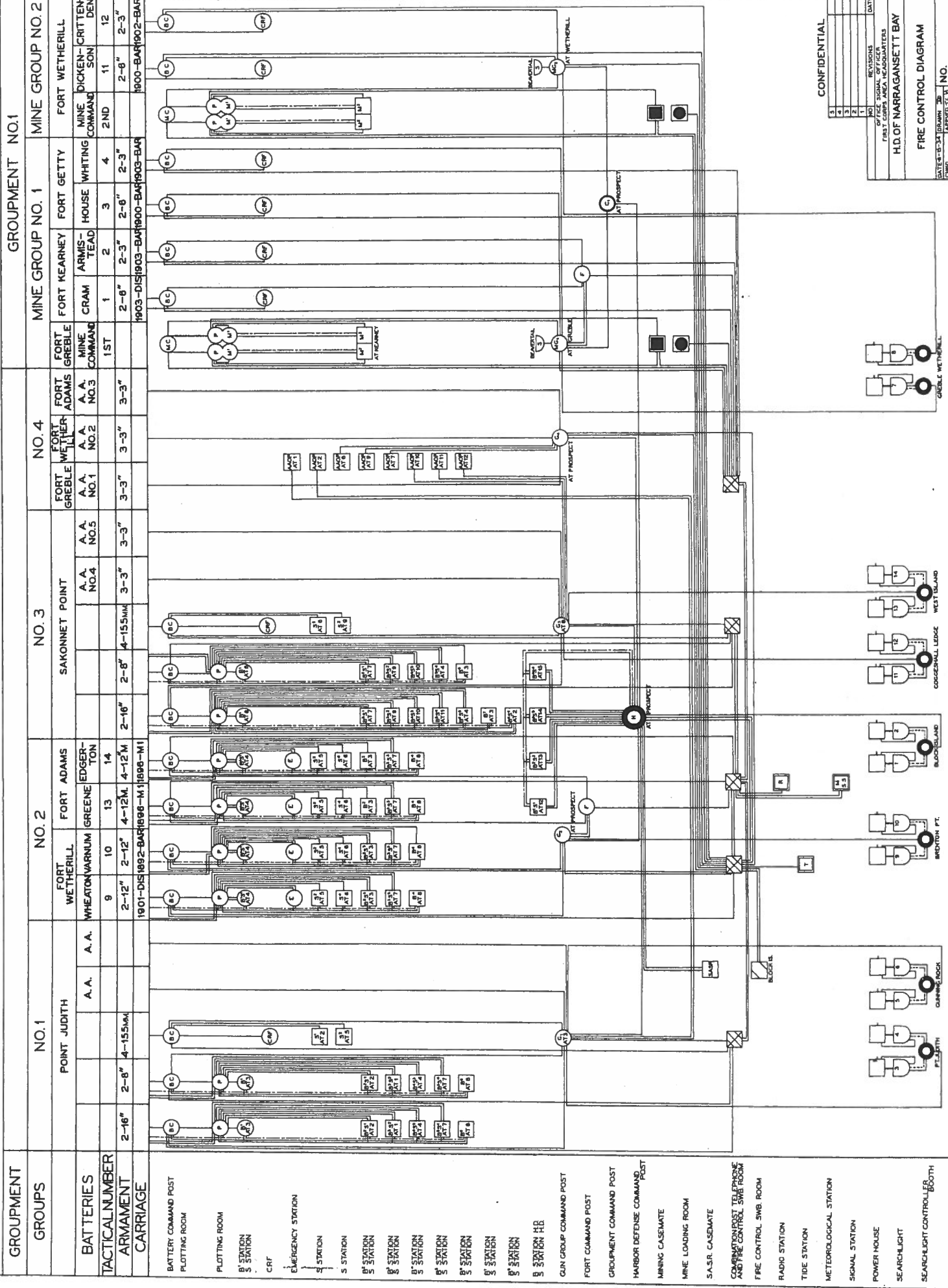
b. A suitable location for the shore installation is the 16-inch reservation on Sakonnet peninsula.

c. The installation should lie at azimuth 0° from Sakonnet Point past the midway point of the Block Island - Gay Head line, to the maximum distance over which the subaqueous sound ranging equipment will function. When its further development permits, the installation should be continued to a distance of 23,000 yards south of that line or a total distance from Sakonnet Point of 44,000 yards.

39. Seacoast Director. Should the seacoast director now under development be adopted, its use is proposed with the two 16-inch and two 8-inch batteries provided for in this Project.

40. Cost Estimate. An estimate of cost and priority guide is appended as Exhibit 18-B. Those items which should be procured and installed in peace time are marked with an A. Those which should be procured in peace but whose installation may be deferred until an emergency arises are marked B. Those items to be procured and installed when an emergency arises are marked C.

FIRE CONTROL DIAGRAM—EVENTUAL STATUS—HARBOR DEFENSES OF NARRAGANSETT BAY



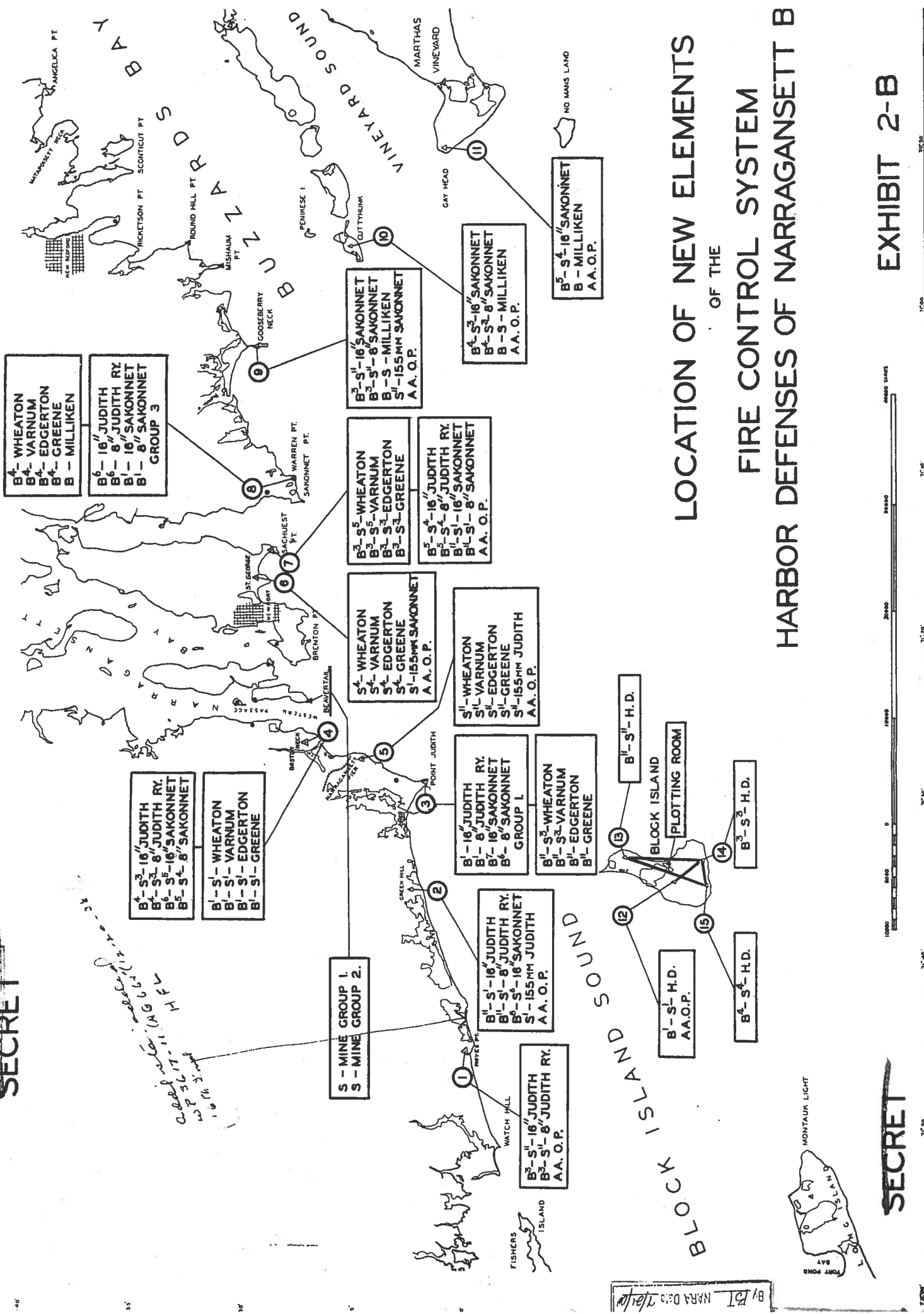
CONFIDENTIAL

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49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
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85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

DATE: 1900-1902
DRAWN: 1900-1902
APPROVED: 1900-1902

By BTL MARRA D-13 1/10/10

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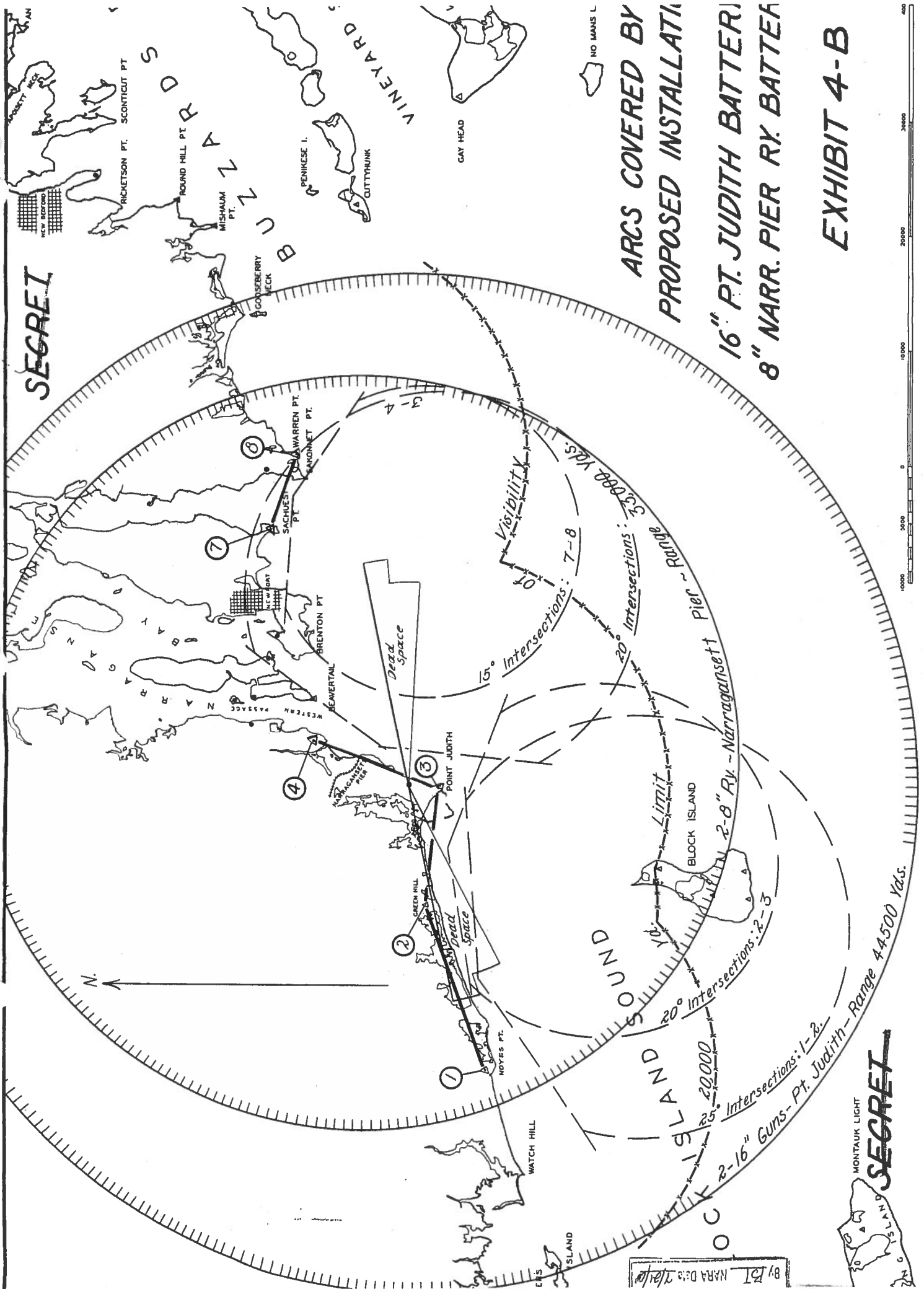
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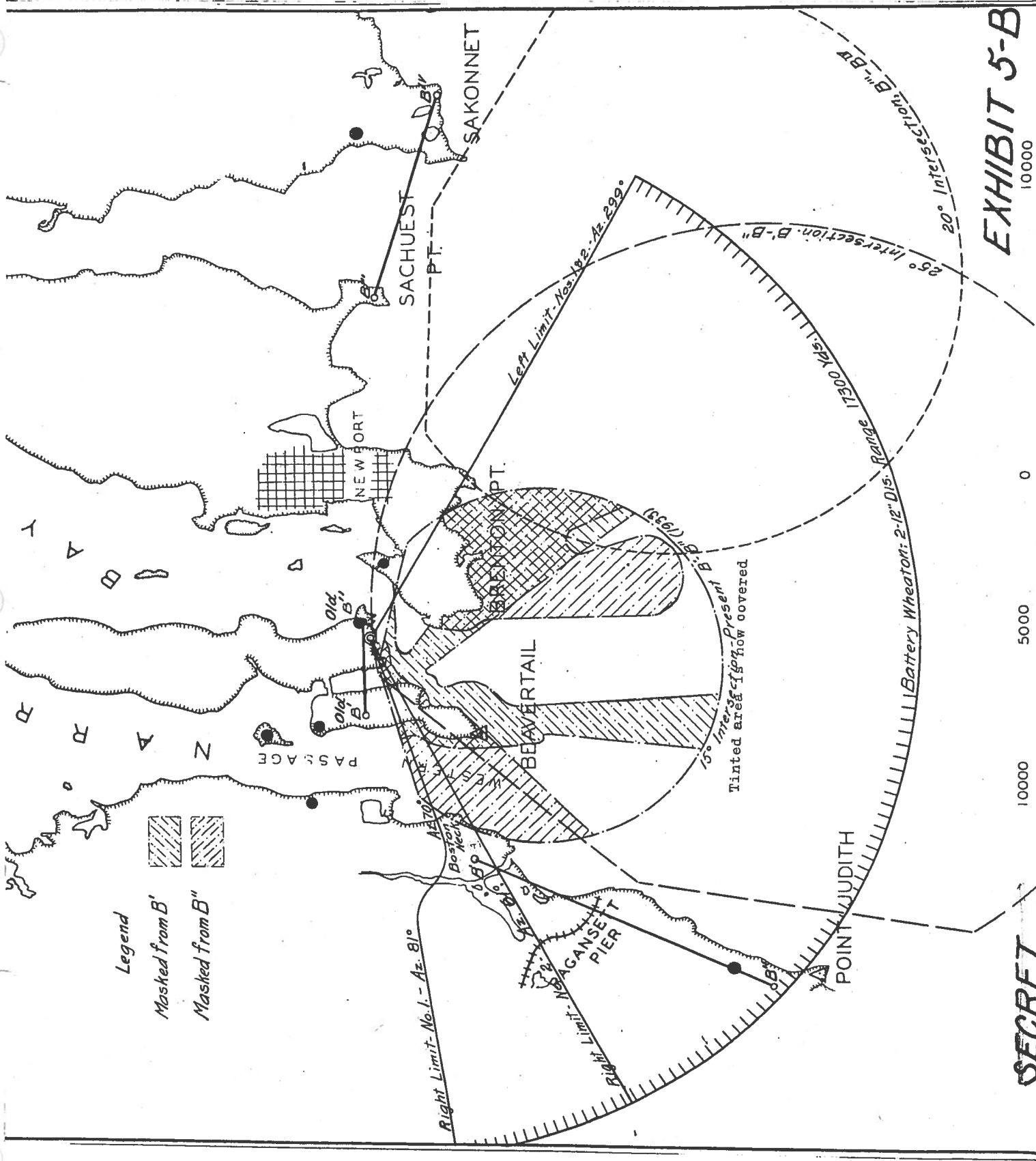
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EXHIBIT 3-B

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By R/L NARA Doc 7/10/10

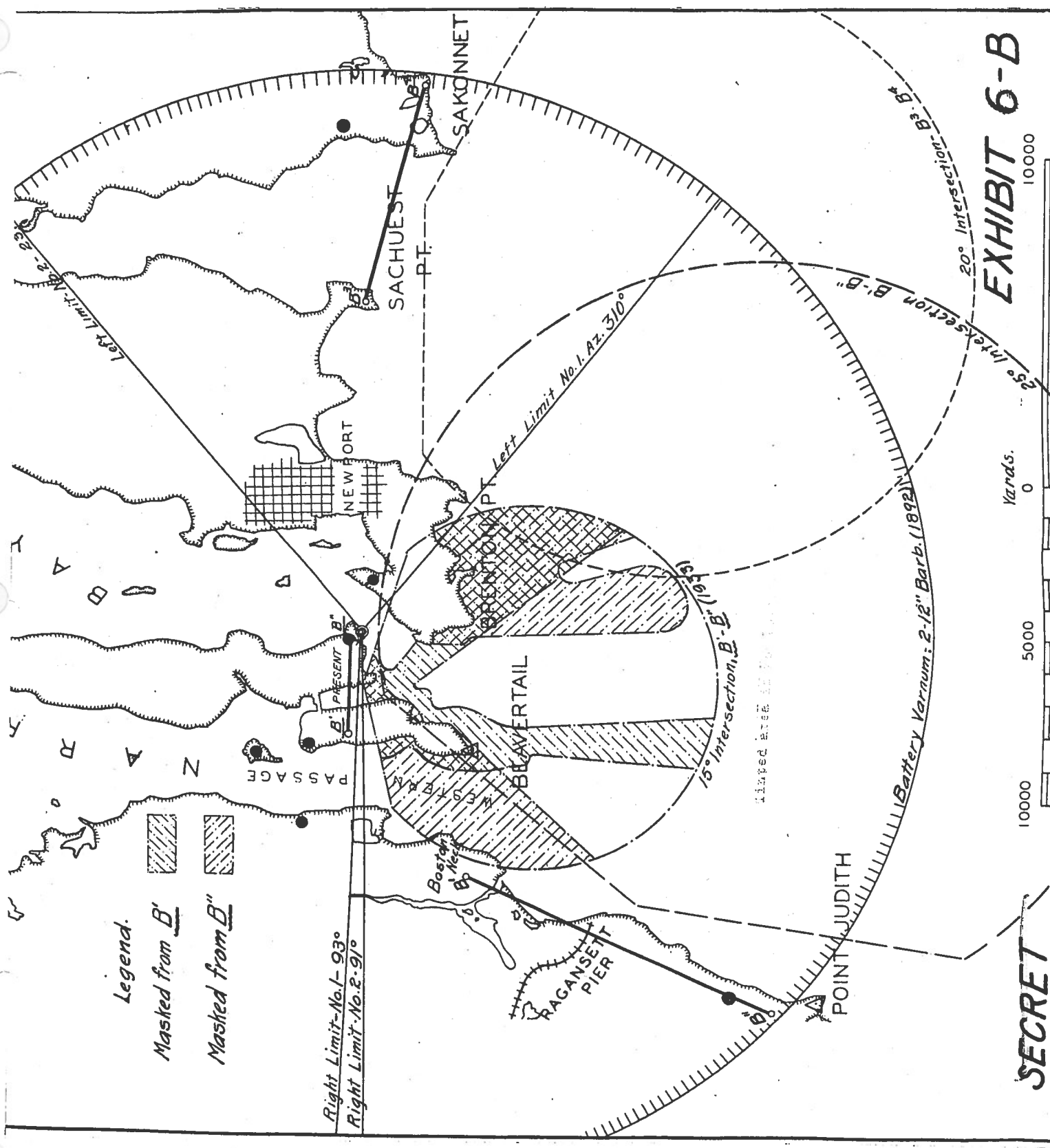


EXHIBIT 6-B

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BY BT MARA D-3 7/12/10

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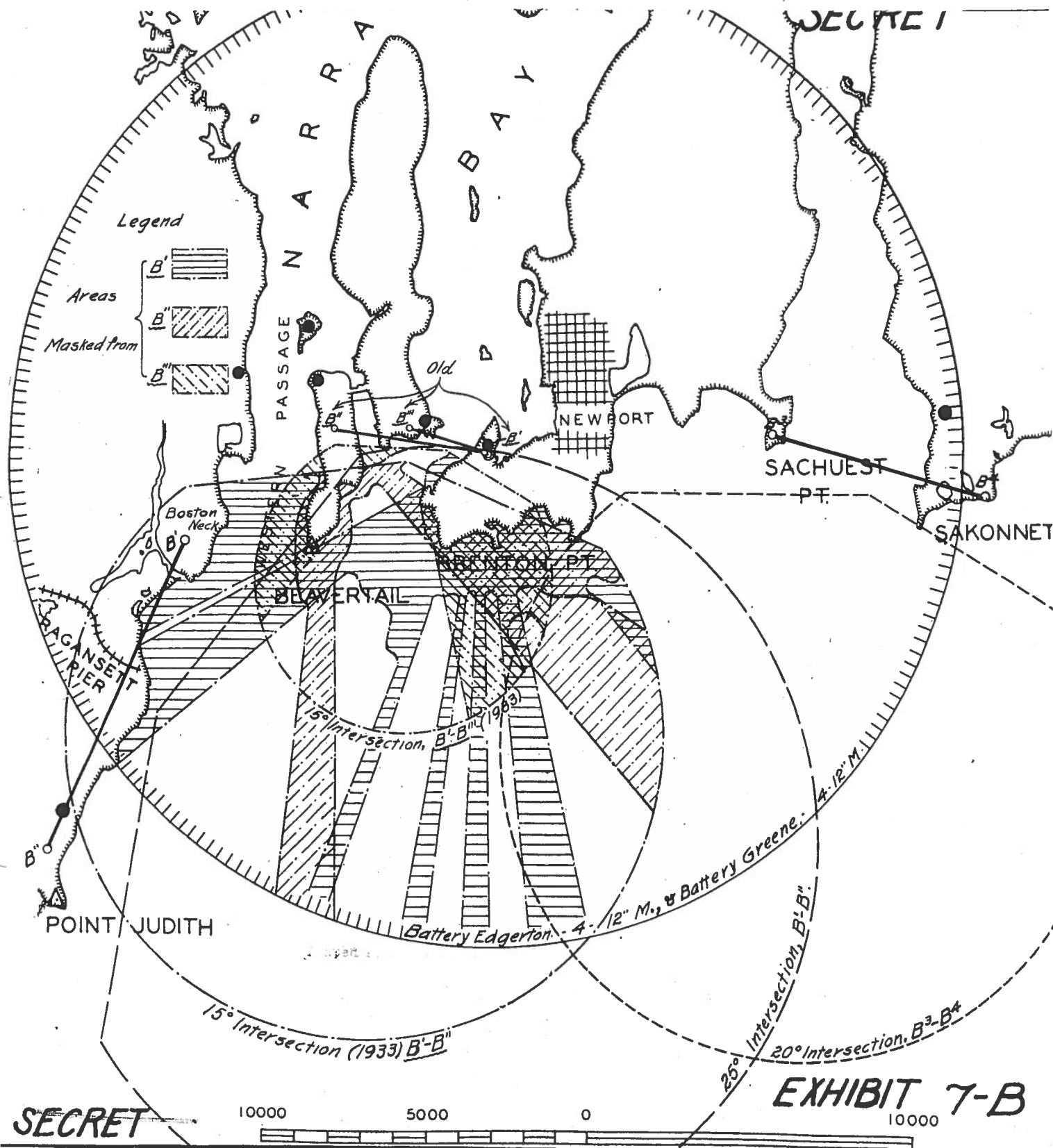
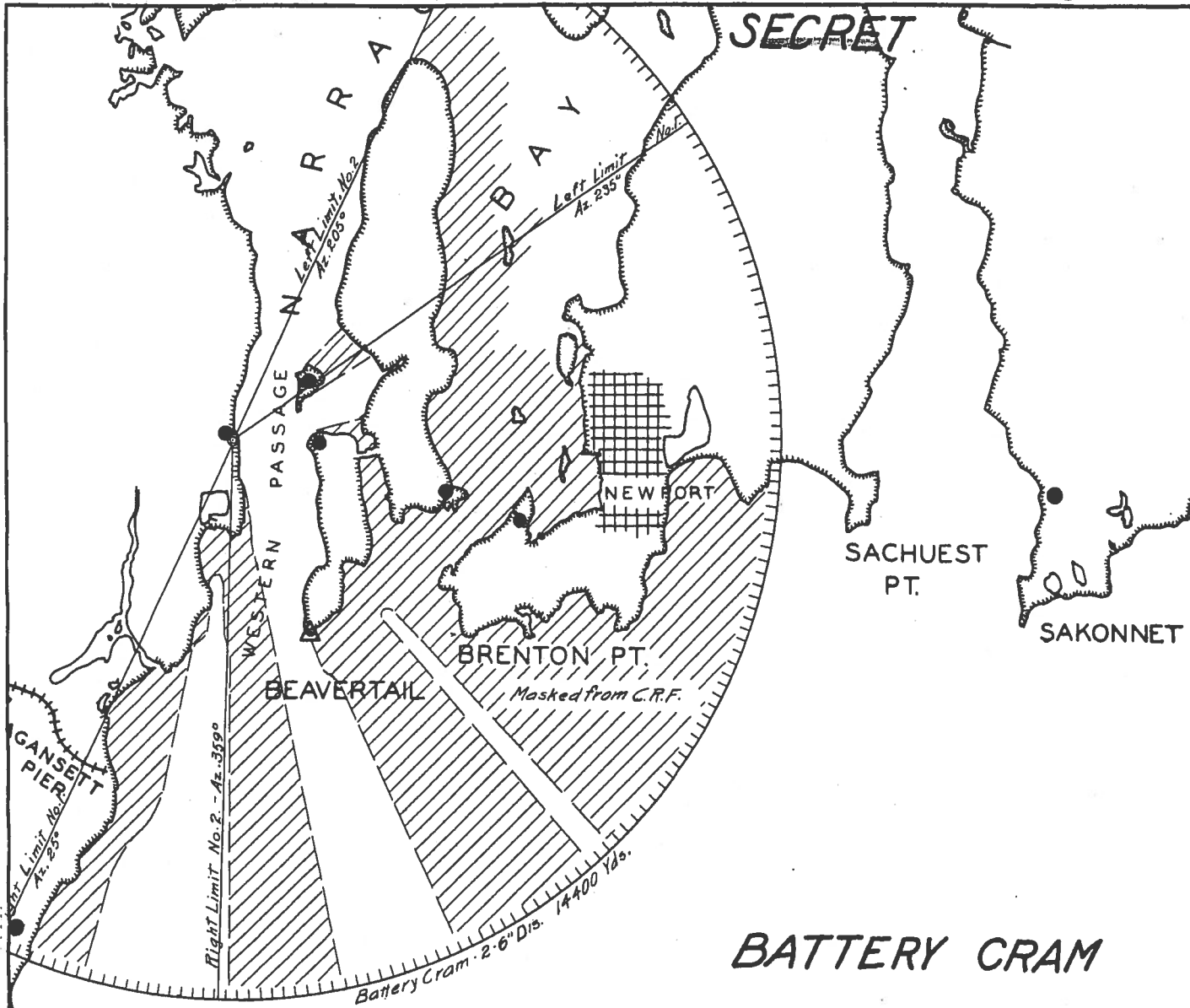


EXHIBIT 7-B

By BT NRRA O.S. 7/2/12



POINT JUDITH

Tinted area is now covered

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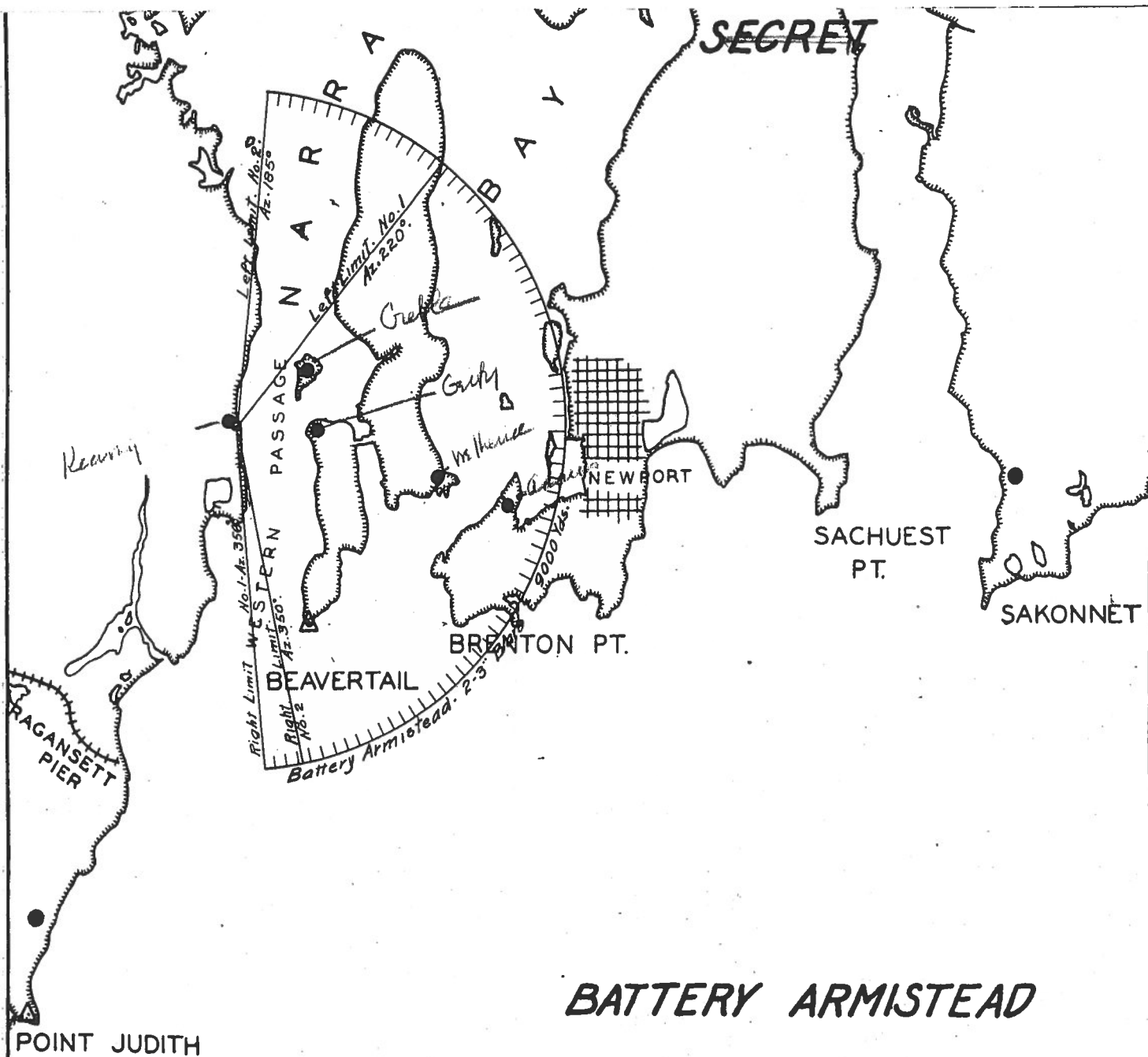
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EXHIBIT 8-B

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BATTERY ARMISTEAD

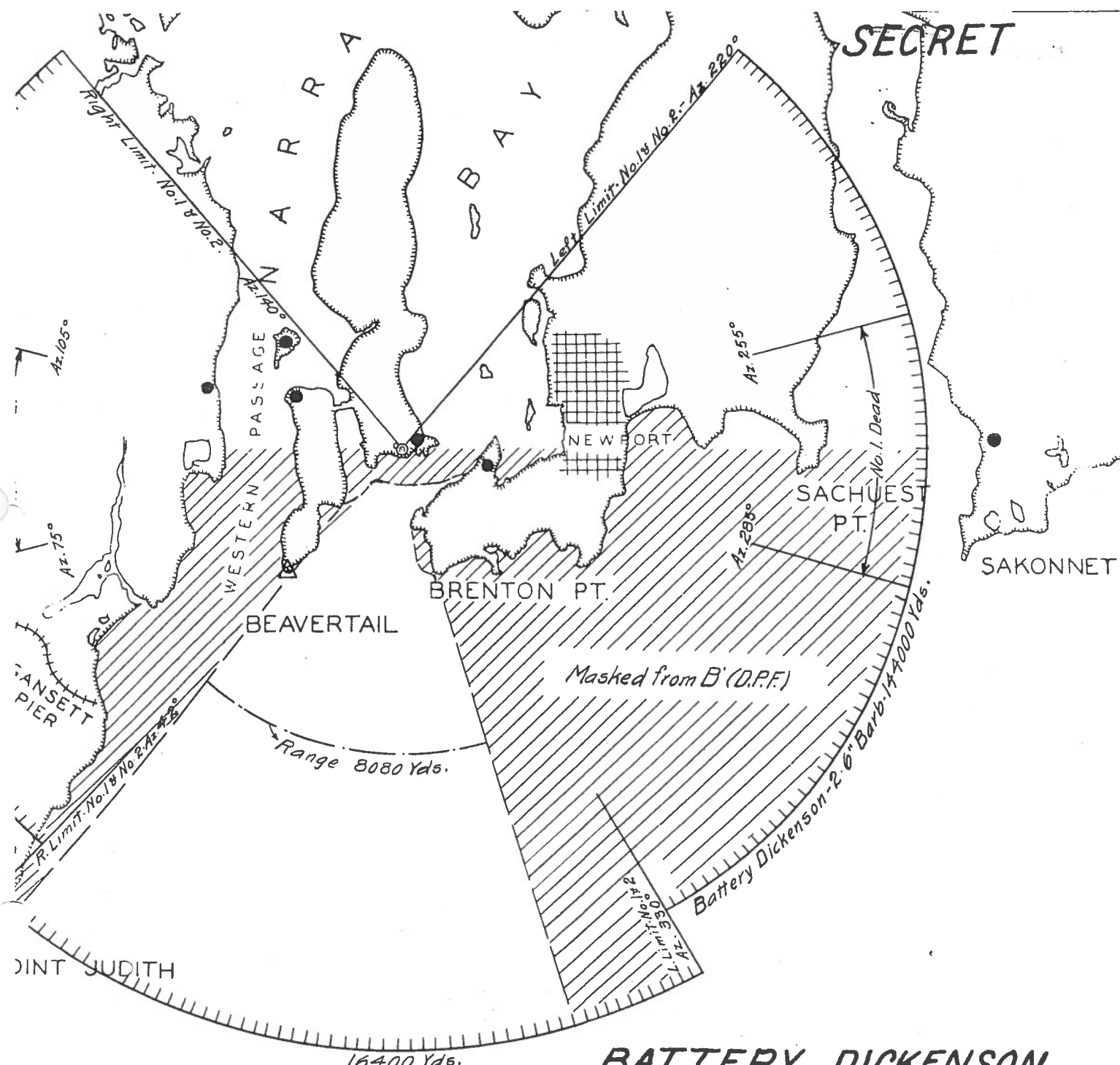
EXHIBIT 9-B

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Yards

By B/L NARA OSG 7/21/00

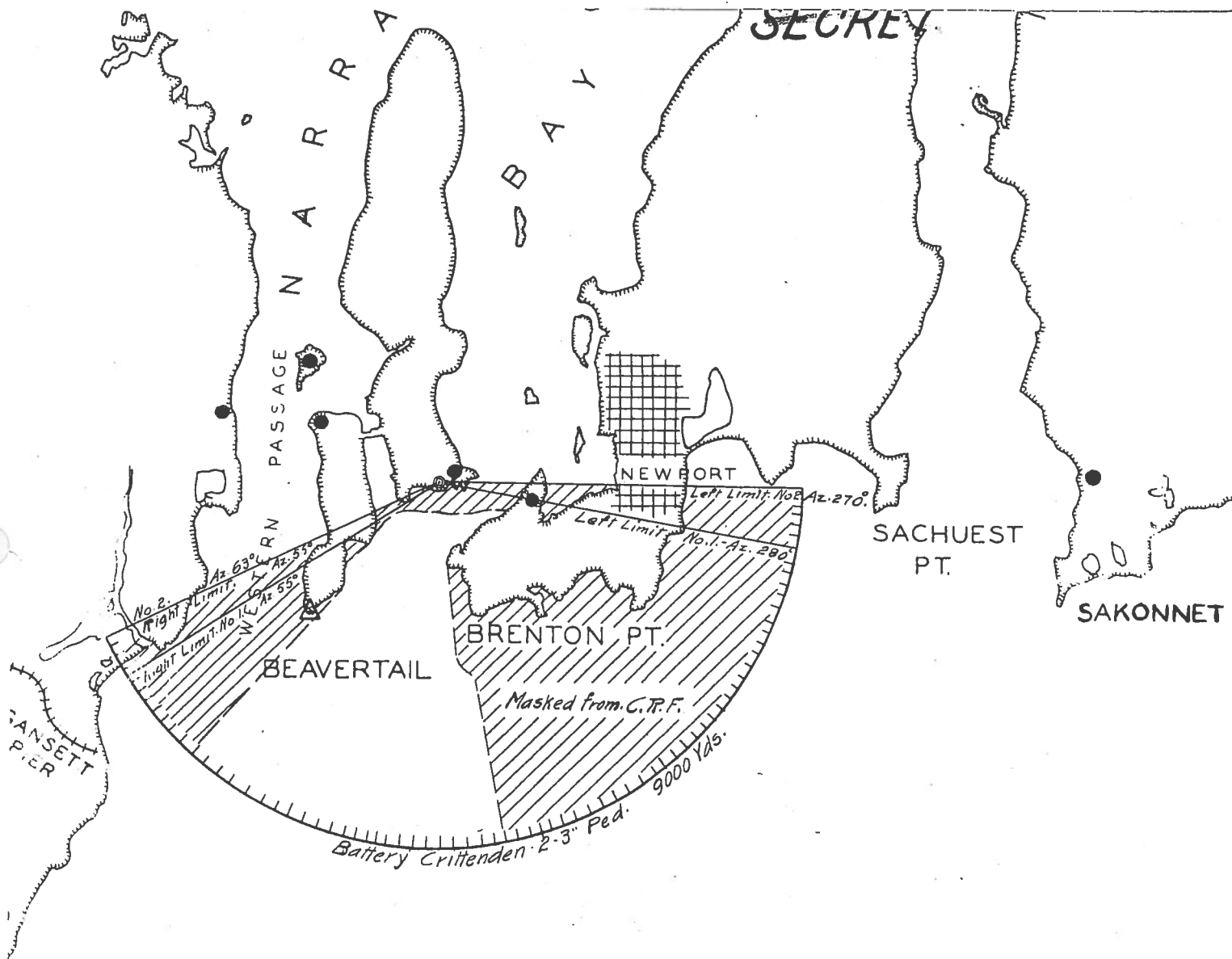
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BATTERY DICKENSON EXHIBIT 10-B

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By B1 NARA Doc 10010



BATTERY CRITTENDEN

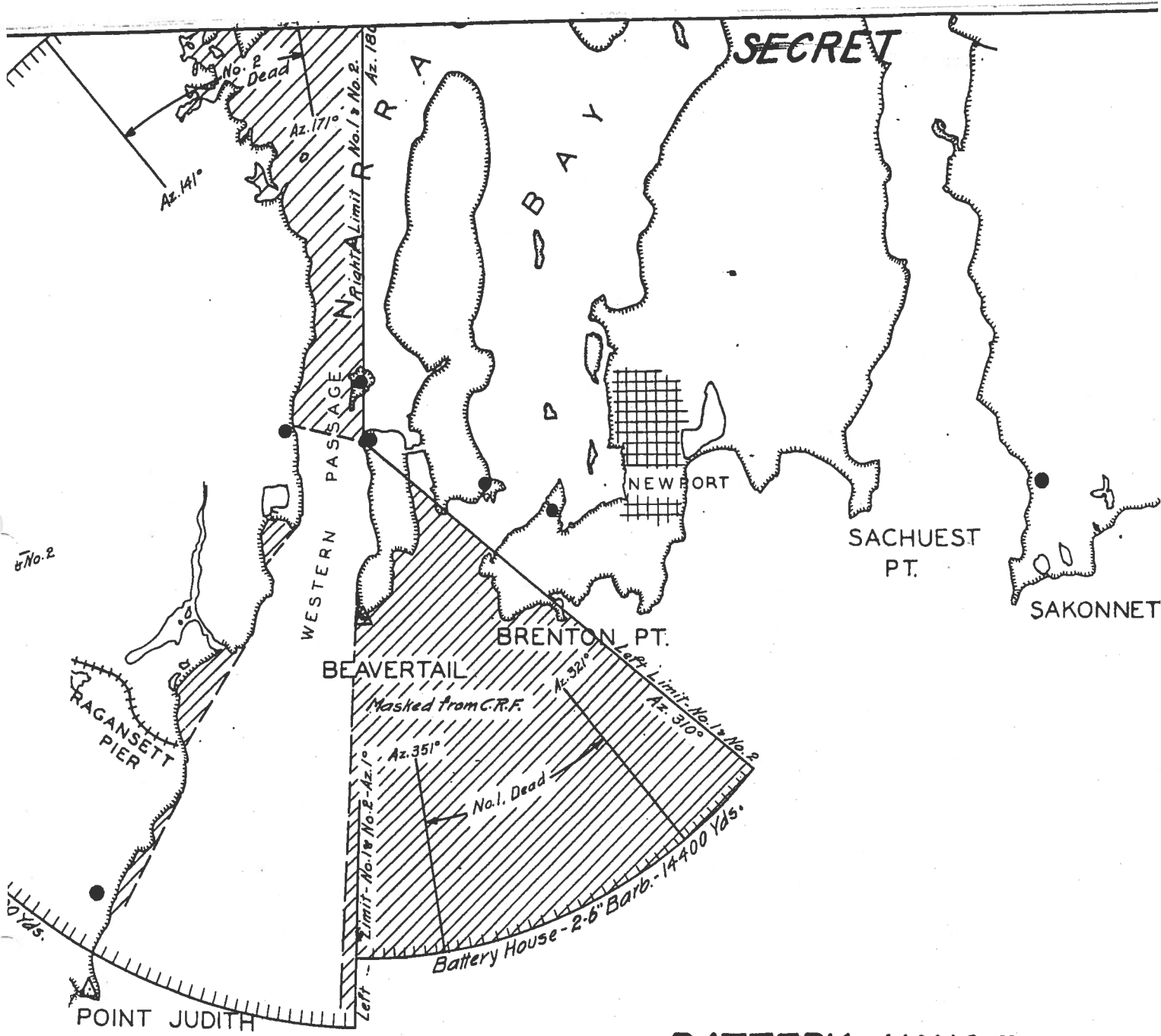
DINT JUDITH.

EXHIBIT 11-B

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By RT INARA 0-3 1/2/10

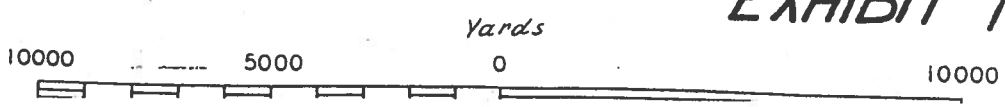


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BATTERY HOUSE

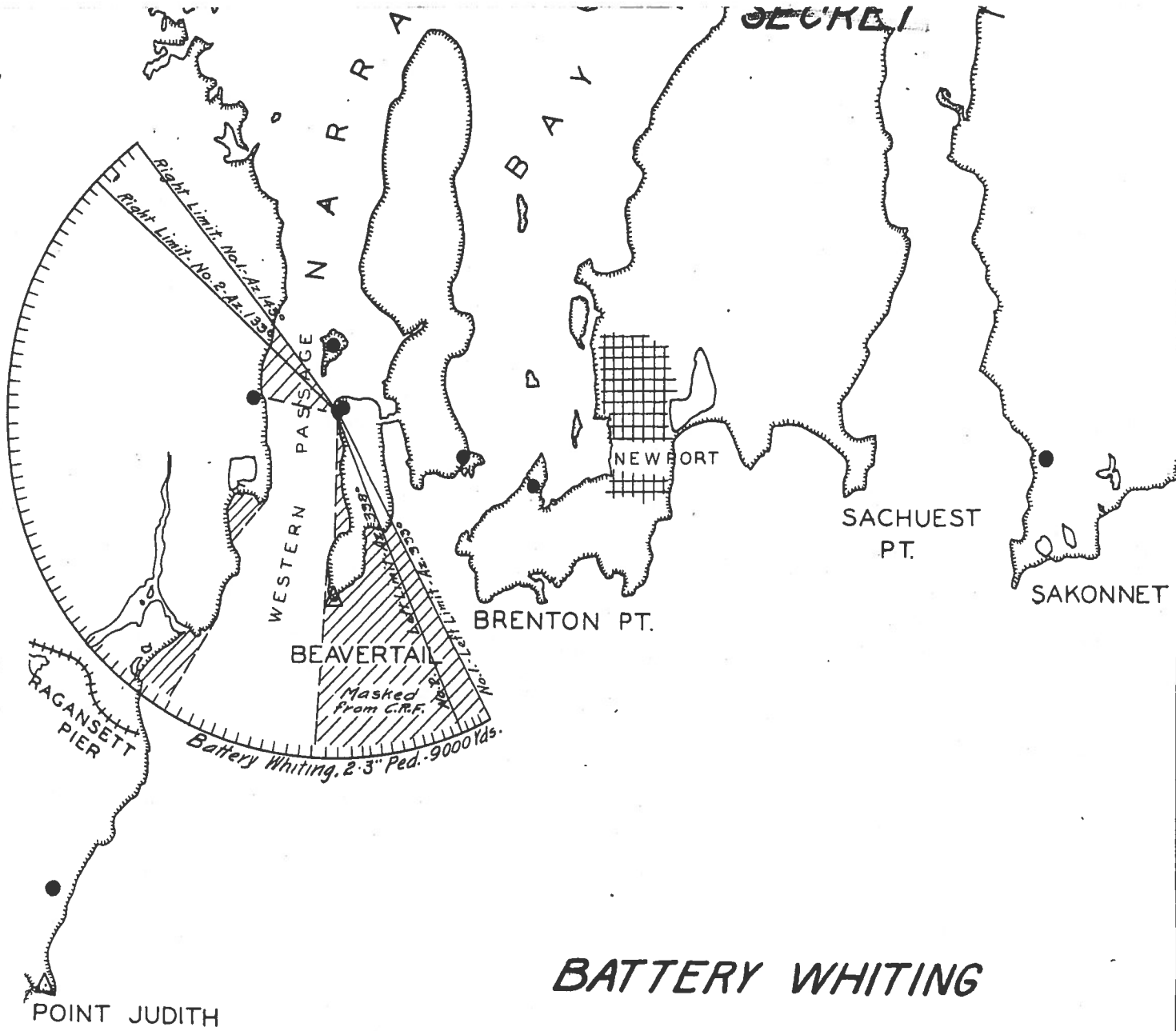
EXHIBIT 12-B

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By B1 NARA OCS 1/10/10

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BATTERY WHITING

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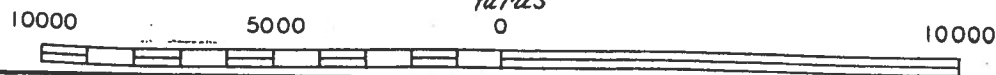
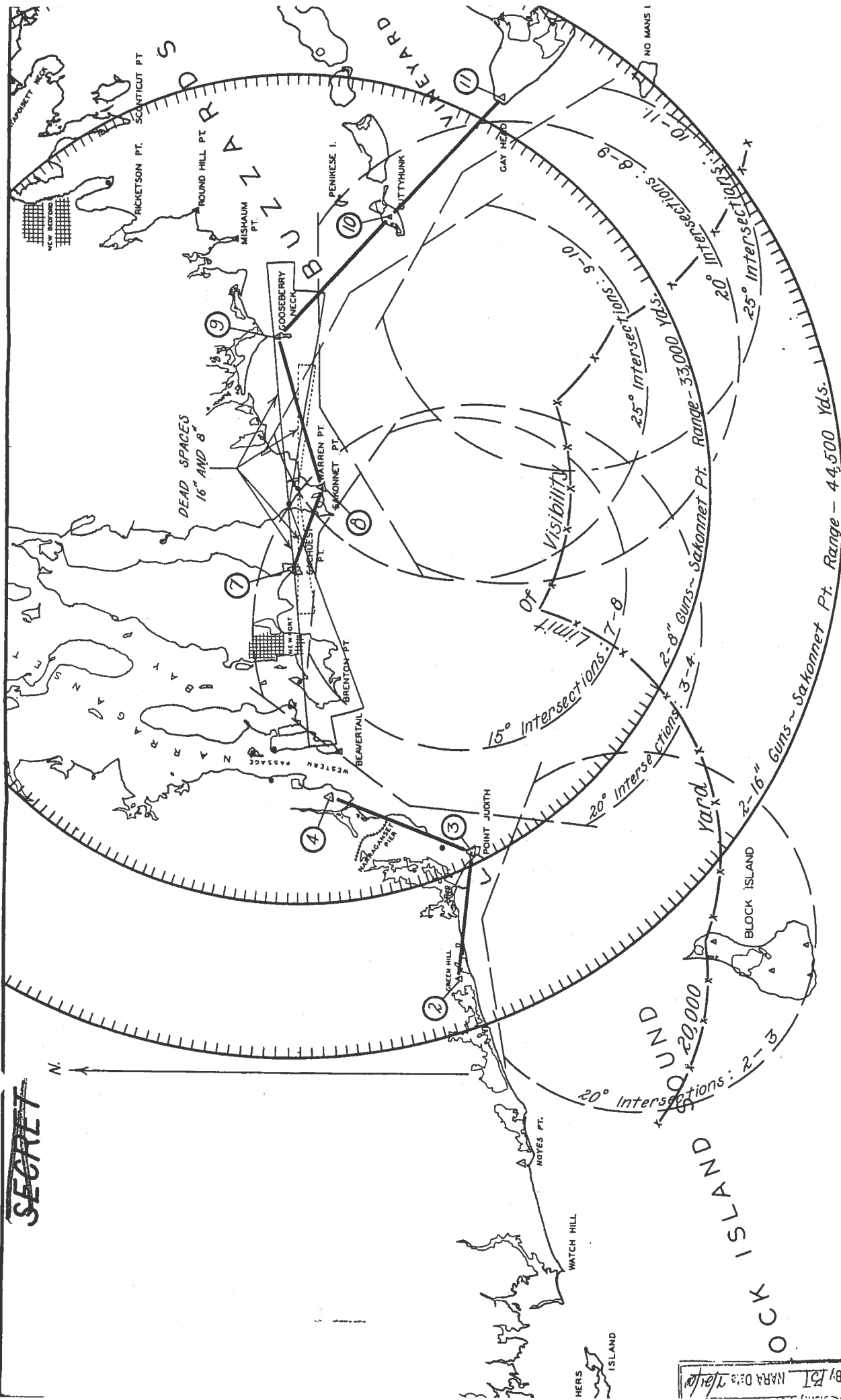


EXHIBIT 13-B

By JLT NARA Doc 141010

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*Arcs Covered by Proposed Batteries
16" and 8" Batteries at Sakonnet Pt.*

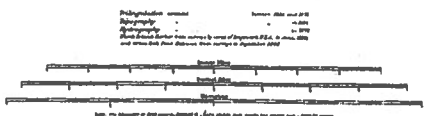
MONTAUK LIGHT



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EXHIBIT 1

10,000 50,000 100,000 200,000 300,000 400,000



1. Algebraic Method of Plotting the Position Line

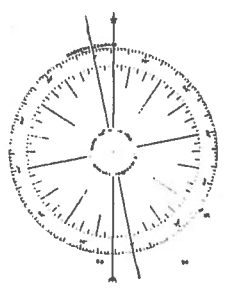
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4.00	41 10	72 50	41 10	72 50	41 10	72 50
5.00	41 10	72 50	41 10	72 50	41 10	72 50
6.00	41 10	72 50	41 10	72 50	41 10	72 50
7.00	41 10	72 50	41 10	72 50	41 10	72 50
8.00	41 10	72 50	41 10	72 50	41 10	72 50
9.00	41 10	72 50	41 10	72 50	41 10	72 50
10.00	41 10	72 50	41 10	72 50	41 10	72 50

REMARKS
All distances are measured in miles and are represented as 1/2 mile and 1/4 mile. The distance between the points of observation is 1/2 mile. The distance between the points of observation is 1/4 mile.

REMARKS
The position of the points of observation is 1/2 mile and 1/4 mile. The distance between the points of observation is 1/2 mile. The distance between the points of observation is 1/4 mile.

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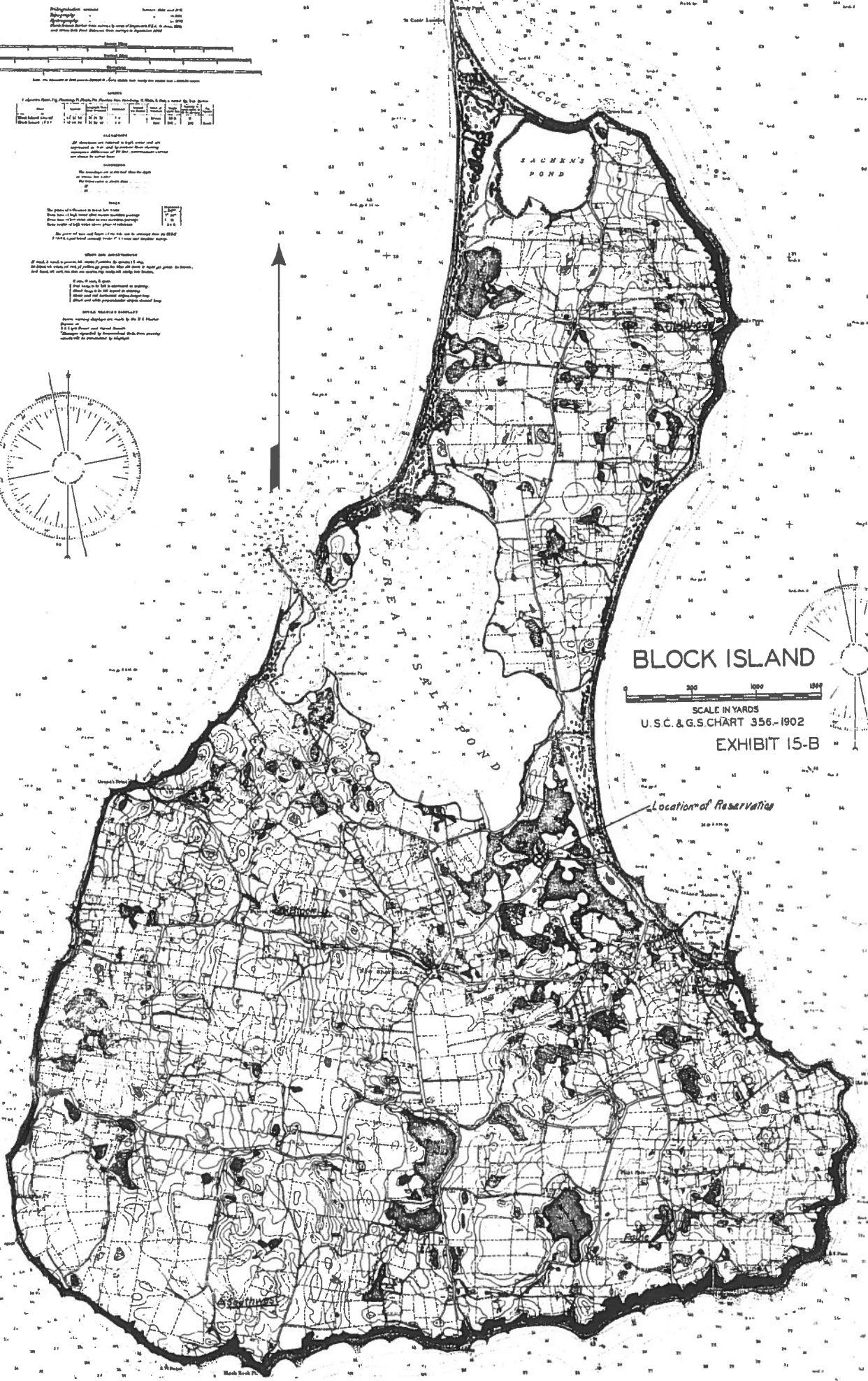


BLOCK ISLAND

SCALE IN YARDS
U.S.C. & G.S. CHART 356-1902
EXHIBIT 15-B



Location of Reservation



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ORIENTATION DATA

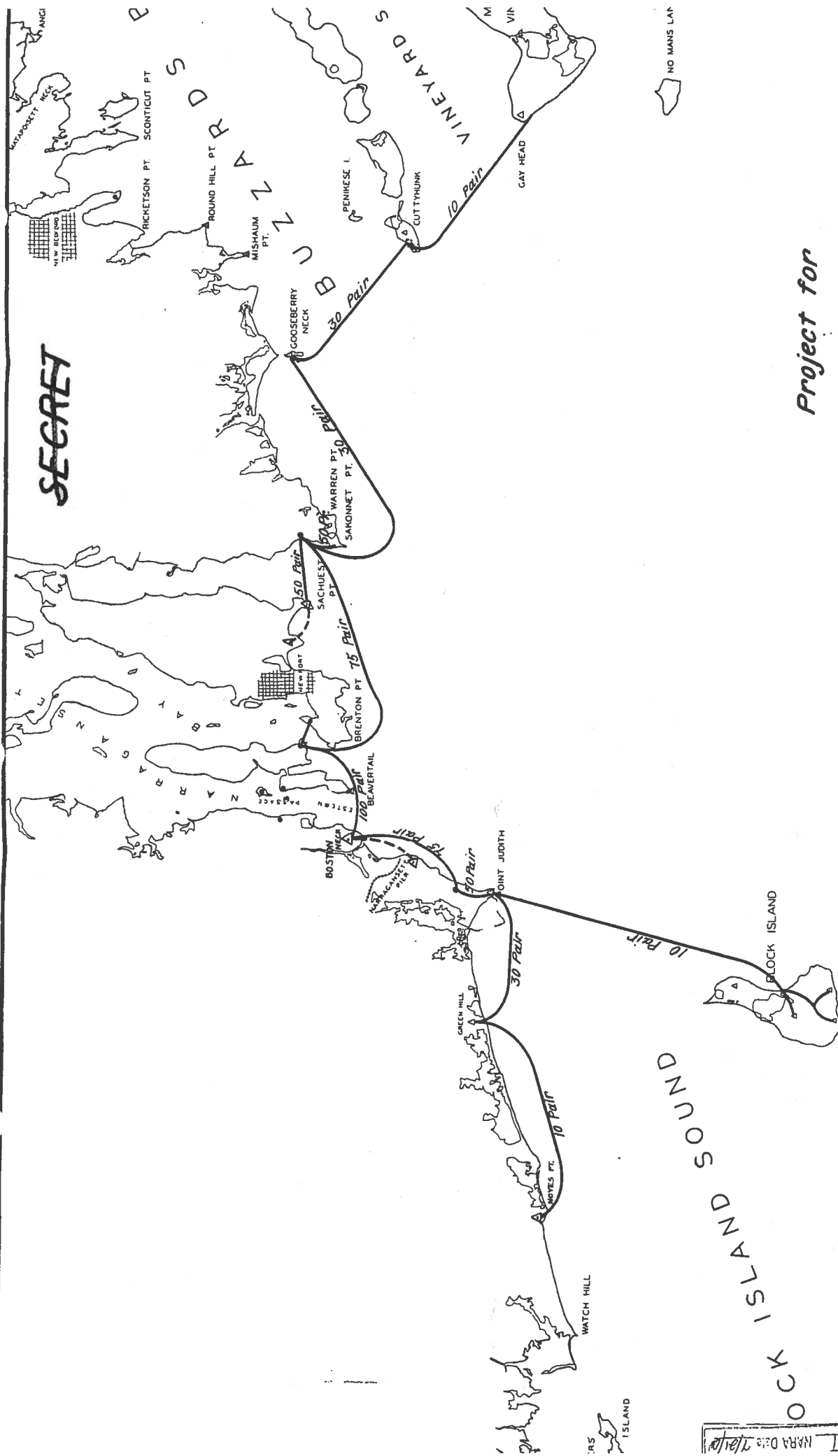
U. S. COAST AND GEODETIC SURVEY

(To accompany Exhibit 16-B)

Name of Station	Latitude			Longitude		
	O	'	"	O	'	"
Montauk - 2*	41	03	53.829	71	54	18.669
Montauk Light	41	04	15.113	71	51	27.291
Watch Hill Lighthouse	41	18	13.646	71	51	32.555
Chapman (Noyes Point)	41	19	55.443	71	45	24.106
Quonochontaug Pond	41	19	55.962	71	43	39.742
Green Hill	41	22	24.700	71	35	51.593
Southwest	41	09	01.799	71	35	48.857
Elock Island ECC*	41	10	31.430	71	35	30.904
Barlow's House cupola	41	08	57.13	71	34	44.32
Paine	41	09	18.840	71	33	44.968
Clayhead	41	12	44.106	71	33	40.383
Point Judith (1922)	41	22	18.452	71	29	22.844
White House W. Chimney	41	23	20.46	71	29	18.66
Point Judith Lighthouse	41	21	39.330	71	28	54.833
Hazard Tower	41	24	55.746	71	27	26.813
McSparren - 3	41	29	47.306	71	27	24.588
Narrow River East	41	26	27.883	71	26	21.652
Boston Neck	41	28	19.08	71	26	05.43
Beavertail Light	41	26	57.329	71	23	59.678
St. George's Academy (NW spire)	41	29	29.361	71	16	24.350
Sachusset Neck	41	28	59.371	71	14	54.544
East Rock	41	27	04.650	71	11	38.340
Sakonnot Point	41	27	16.36	71	11	46.09
Gooseberry Neck	41	29	20.083	71	02	19.612
Mishaum Point	41	30	56.112	70	57	16.438
Cuttyhunk	41	25	14.887	70	56	02.646
Round Hill	41	32	24.784	70	55	50.615
Clark's Point	41	35	34.154	70	54	03.713
Sconticut Point (Barn cupola 1913)	41	35	00.308	70	51	38.349
Gay Head	41	20	50.30	70	50	13.97
No Man's Land - 2	41	15	11.73	70	48	49.28

* New 1927 North American Datum.

SECRET



Project for

FIRE CONTROL CABLES

Harbor Defenses of Narragansett Bay

SECRET

MONTAUK LIGHT



EXHIBIT 17-B



COCK ISLAND SOUND

By BT MARA D. 1/10/10

Priorities subject to change based on availability of funds.

Prior- ity	Item/Class	Description of Project.	Signal Corps	Engineers	Ordnance	Material	Labor	Material	Labor	Land	Total
			\$ 18,950	\$ 2,008	\$ 15,500	\$ 6,000	\$ 1,560	\$ 35,906			
4	3	PC Stations at Point Judith (continued)									
		Equipment for G-1									
		1 Telescope, BG, M 1915 or later, \$672; 2 Glasses field (1 for AA Ob.), \$78									650
		6 telephones, wall, with headsets, \$462; 1 Switchboard, 12 drop, \$75.									537
		Equipment for B'S - Battery Wheaton									
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975									1,875
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9									240
		Equipment for B'S - Battery Varnum									
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975									1,875
		1 Bell, T. I., \$9; 3 Telephones, wall, with headsets, \$231.									240
		Equipment for B' - Battery Edgerton									
		1 Instrument, azimuth, M 1910									900
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9									163
		Equipment for B' - Battery Greene									
		1 Instrument, azimuth, M 1910									900
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9									163
4	4	PC Stations at Boston Neck									
		One and one-half (1½) acres of land									600
		2 FC stations, Proposed steel type, Steel only									6,400
		Equipment for B'S, 16" - Point Judith									
		1 Finder, depression position, \$4290; 1 Instrument, azimuth, M 1918, \$975									5,255
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9									240
		Equipment for B'S, 8" - Narragansett Pier									
		1 Finder, depression position, \$4290; 1 Instrument, azimuth, M 1918, \$975									5,255
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9									240
		Equipment for B'S, Sakonnet 18-inch Battery									
		1 Finder, depression position, \$4290; 1 Instrument, azimuth, M 1918, \$975									5,255
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9									240
		Equipment for B'S, 8" - Sakonnet									
		1 Finder, depression position, \$4290; 1 Instrument, azimuth, M 1918, \$975									5,255
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9									240
		Equipment for B'S - Battery Wheaton									
		1 Finder, depression position, (On hand); 1 Instrument, azimuth, M 1918, \$975									975
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9									240
		Equipment for B'S, Battery Varnum									
		1 Finder, depression position, (On hand); 1 Instrument, azimuth, M 1918, \$975									975
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9									240
		Equipment for B'S - Battery Edgerton									
		1 Finder, depression position, (On hand); 1 Instrument, azimuth, M 1918, \$975									975
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9.									240
		(Continued)									
		Total	\$ 44,155	\$ 5,029	\$ 19,700	\$ 6,000	\$ 2,250	\$ 77,114			

Priority	Item Class	Description of Project	Brought Forward				Signal Corps				Engineers				Total
			Ordinance	Material	Labor	Land	Material	Labor	Land	Material	Labor	Land	Material	Labor	
4	4	FC Stations at Boston Neck (continued).													
		Equipment for B18 - Battery Greene.													
		1 Finder, depression position, (on hand); 1 Instrument, azimuth, M 1918, \$975.													975
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9													240
5	2	AUXILIARY STATION AT HAZARD TOWER.													
		Equipment to be supplied for emergency use.													
		5 Instruments, azimuth, M 1918, \$4,875; 1 Glasses, field, (for AA Obs.), \$39													4,914
		11 Telephones, wall, with headsets													847
6	3	AUXILIARY STATION AT ST. GEORGE'S SCHOOL TOWER													
		Equipment to be supplied for emergency use.													
		2 Finders, depression position, \$8,680; 5 Instruments, azimuth, M 1918, \$4,875; 1 Glasses, field, (for AA Obs.), \$39.													13,494
		11 Telephones, wall, with headsets													847
4	5	FC STATIONS AT SACHSNEST NECK													
		Two (2) acres of land @ \$500													1,000
		2 FC stations, proposed steel type, steel only													6,400
		Equipment for B36 - Battery Wheaton.													
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975													1,875
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9.													240
		Equipment for B36 - Battery Varum.													
		1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975.													5,265
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9.													240
		Equipment for B36 - Battery Edgerton.													
		1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975.													5,265
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9													240
		Equipment for B36 - Battery Greene.													
		1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975.													5,265
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9													240
		Equipment for B54 - 16" Point Judith.													
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975.													1,875
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9													240
		Equipment for B54 - 8" Narragansett Pier.													
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975													1,875
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9													240
		Equipment for B54 - 16" Sakonnet.													
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975.													1,875
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9													240
		Equipment for B54 - 8" Sakonnet.													
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975													1,875
		5 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9.													240
		(Continued)													
		Total	\$8,689		8,983										\$132,921

COST ESTIMATE AND PRIORITY GUIDE

Priorities subject to change based on availability of funds

EXHIBIT NO. 10-B.

ANNEX B.

Priority	Item Class	Description of Project	Brought Forward				Signal Corps				Engineers				Total
			Ordances	Material	Labor	Land	Ordances	Material	Labor	Land	Ordances	Material	Labor	Land	
4	6	One (1) acre of land													
		2 FC stations, Proposed steel type, Steel only													
		Equipment for B ₁ - Battery Wheaton.													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B ₄ - Battery Vermont.													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B ₄ - Battery Edgerton.													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B ₄ - Battery Greene.													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B ₄ - Battery Judith													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B ₆ - 16" Point Judith													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B ₆ - 8" Narragansett Pier													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B ₁ - 16" Sakonnet													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B ₁ - 8" Sakonnet													
		1 Instrument, azimuth, M 1910													
		2 Telephones, wall, with headsets, \$154; 1 Bell, T. I., \$9													
		Equipment for B-8 Station													
		1 Telescope, BC, M 1915, or later, \$572; 1 Glasses, field, \$39													
		1 Switchboard, 12-drop, \$75; 6 Telephones, FC STATIONS AT GOOSEBERRY NECK													
4	7	One acre of land													
		1 FC station, Proposed steel type, Steel Only													
		Equipment for B ₃ - 16" Sakonnet													
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975													
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9													
		Equipment for B ₃ - 8" Sakonnet													
		1 Instrument, azimuth, M 1910, \$900; 1 Instrument, azimuth, M 1918, \$975													
		3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9													
		Equipment for B ₃ - 165 mm. Battery, Sakonnet													
		1 Instrument, azimuth, M 1918,													
		2 Telephones, wall, with headsets													
		Total	\$101,224	\$11,358							\$36,700	\$6,000	\$5,750	\$161,032	

EXHIBIT NO. 10-B.

Priorities subject to change based on availability of funds

Prior- ity	Item/Class	Description of Project	Brought Forward	Signal Corps Material	Engineers Material	Land	Total
4	8	A One and one-half (1½) acres of land C 1 FC station, Proposed steel type, Steel Only Equipment for B ₄₃ - 16" Sakomet		\$101,224	\$11,358	\$5,700	\$161,052
		C 1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975.			2,700	900	3,600
		C 3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9		5,265			5,265
		Equipment for B ₄₃ - 8" Sakomet		240			240
		C 1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975		5,265			5,265
		C 3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9		240			240
4	9	A Two (2) acres of land C 1 FC station, Proposed steel type, Steel only Equipment for B ₄₃ - 16" Sakomet					
		C 1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975.		5,265			5,265
		C 3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9		240			240
5	4	C One (1) acre of land for site at Clayhead C Direction of instrument base for DPF Equipment for B ₄₃ - H.D.					
		C 1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975.		5,265			5,265
		C 3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9		240			240
		Equipment for B ₄₃ - H.D.					
		C 1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975.		5,265			5,265
		C 3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9		240			240
		C One (1) acre of land for site at "wains".					
		C 1 FC station					
		Equipment for B ₄₃ - H.D.					
		C 1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975.		5,265			5,265
		C 3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9		240			240
		C Two (2) acres of land for site at "Southwest".					
		C Direction of instrument base for DPF					
		Equipment for B ₄₃ - H.D.					
		C 1 Finder, depression position, \$4,290; 1 Instrument, azimuth, M 1918, \$975		5,265			5,265
		C 3 Telephones, wall, with headsets, \$231; 1 Bell, T. I., \$9		240			240
		C Combined plotting and switchboard room at Boat Harbor.					
		Equipment for Plotting Room					
		C 1 Board, plotting, \$2,500; 1 Board, spotting, \$1,650					
		C 6 Telephones, wall, with headsets					
		(Continued)					
		Total	\$142,029	\$13,500	\$43,900	\$8,450	\$216,479

Prior- ity	Class:	Description of Project	Brought forward	Ordnance Material	Labor	Engineers Material	Total	
		MISCELLANEOUS ITEMS OF FIRE CONTROL EQUIPMENT.		\$142,029	\$13,500	\$43,900	\$8,600 \$8,450 \$216,479	
4	10	A Equipment for Plotting Room, 16 th Sakomnet Point. 1 Arm, metal, \$25; 1 Board, fire adjustment, \$210; 1 Board, deflection, \$1,900; 1 Board, plotting, \$2,500; 1 Board, spotting, \$1,650 1 Board, range correction, \$800; 1 Corrector, percentage, \$120; 1 Indicator, wind component, \$150; 1 Scale, prediction, \$19 5 Telephones, wall, with headsets, \$385; 1 Bell, T. I., \$9; 1 Switching panel, \$375. A Equipment for Plotting room, 8 th Sakomnet Point. 1 Board, plotting and relocating, \$2500; 1 Board, range correction, \$800; 1 Board, deflection, \$1,650; 1 Corrector, percentage, \$120 1 Board, fire adjustment, \$210; 1 Indicator, wind component, \$150; 1 Board, spotting, \$1,650 5 Telephones, wall, with headsets, \$585; 1 Bell, T. I., \$9; 1 Switching panel, \$375. A Equipment for Plotting Room, 16 th Point Judith. 1 Arm, metal, \$25; 1 Board, fire adjustment, \$210; 1 Board, deflection, \$1,900; 1 Board, plotting, \$2,500; 1 Board, spotting, \$1,650 1 Board, range correction, \$800; 1 Corrector, percentage, \$120; 1 Indicator, wind component, \$150; 1 Scale, prediction, \$19 5 Telephones, wall, with headsets, \$385; 1 Bell, T. I., \$9; 1 Switching panel, \$375 B 1 CRP 15-foot, and locating and constructing base for same, for 155s at Point Judith A 12 Plotting Boards for Batteries Wheaton and Varnum, to take new base lines A 12 Plotting Boards for Batteries Edgerton and Greene, to take new base lines A 1 Finder, depression position, M-L, for Battery Dickenson A New station for CRP, Battery Armdstead B 1 CRP, 15-foot, and locating and constructing base for same, for 155s at Sakomnet Point. A Addition of 4 rooms to present H station. A 17,700 ft. 70-pr. 19-gauge submarine cable, \$46,605; 114,150 ft. 50-pr. 19 gauge cable, submarine, \$83,924. B 154,850 ft. 50-pr. 19-gauge, submarine cable, \$19,236; 114,500 ft. 50 pr. 19 gauge submarine cable, \$82,975; B 141,700 ft. 10-pr. 19-gauge, submarine cable, C 157,350 ft. 30-pr. 19-gauge, submarine cable, \$19,000; 173,700 ft. 10-pr., 19 gauge submarine cable, \$37,757 O 142,000 ft. 10-pr., 19-gauge, submarine cable A Inspection, transportation and overhead pertaining to above cable purchases @ 15¢ of cost of cable. A Station equipment, bells, keycets, terminal boxes, cable terminals, switchboards A Installation submarine cable A Installation 15 cable terminal manholes.						
		Total		\$161,209	\$370,412	\$268,751	\$49,050 \$12,950 \$8450 \$647,946	

Class A - To be procured and installed in peacetime.
Class B - To be procured in peacetime for installation when an emergency arises.
Class C - To be procured and installed when an emergency arises
Class D - To be procured and installed when an emergency arises
Note: No expenditure of funds by the Chemical Warfare Service or Coast Artillery is contemplated in this annex.

ANNEX C

SEARCHLIGHTS

A N N E X C.

SEARCHLIGHTS.

1. The maximum dependable range of the 60-inch searchlight in clear weather is assumed to be 9,000 yards or less. In Exhibit 1-C are shown the areas illuminated by the existing and proposed lights.

2. a. There are but two standard searchlights now installed in the Harbor Defenses of Narragansett Bay, these two being mine-field lights located at Forts Wetherill and Greble. They should be retained in their present locations. X

b. There is a 36-inch light at Fort Adams, the power for which is furnished from the mortar battery power plant. This light serves no useful purpose and should be considered as no longer required. X

3. It is proposed to install twelve additional lights at the locations given below and shown in Exhibit 1-C, and to provide one other light in reserve. X

4. Telephone connection shall be from the group or other commander to whom the searchlight is assigned, to the location of the controller. Between controller and searchlight and between searchlight and power plant, local battery or sound power telephones shall be provided.

5. Two lights near Sakonnet Point. a. On West Island 500 yards off Sakonnet Point, there is a location suitable for two lights which will permit of their use from the direction of Gooseberry Neck on the east clockwise to the east shore of the Sakonnet River. The island is easily accessible by boat (or barge for landing the lights) from Sakonnet Point artificial harbor. On the western extremity there is a high platform of rock, large enough to permit placing the two lights 50 yards apart. The only masks from this location are Sakonnet Lighthouse, approximately one degree; and the high point of East Island, approximately three degrees. The elevation of the ground at the point described is 35 feet above mean low water.

b. On West Island there are four ruined buildings pertaining to a former hotel; they are of little present value. The island and its buildings belong to Marion Eppley, Newport, Rhode Island.

c. If shelter were constructed for the lights at their operating positions, the shelter would mask the adjacent light. It is proposed to mount the lights on small railroad cars and construct a light track from the lower level of the island to the operating positions, the necessary shelter being constructed on the lower level. The power plants should also be on the lower level.

d. The same field of illumination should be obtained for both lights.

e. The cost of the island is estimated as \$5,000. It should be acquired and all provision for the searchlights made in peace except shelter for lights and power plants, which may be made and the lights and power plants installed when an emergency arises.

f. The wide field of view from this position, the possibilities of concealment and protection and the accessibility of the island make it a valuable location.

g. These searchlights, Nos. 13 and 14, may have their controllers on West Island and with telephone connection to Group 3 at Warren Point, to which they are assigned.

6. Two lights at Coggeshall Ledge. a. There are two rocky points jutting out to the south at Coggeshall Ledge, approximately 175 yards apart. From both there is a view from a line tangent to Brenton Point on the west to a line tangent to Sachuest Neck on the northeast. The east point is the property of Robert Livingston Beekman. The west point is the property of John Russell Pope. It is probable that neither plot can be purchased for any reasonable price but at the time of an emergency, semi-mobile (portable) lights can be emplaced there.

b. These two lights, Nos. 11 and 12, should be mounted on demountable steel towers as the ground level is not over 20 feet above mean low water. For this reason the lighter antiaircraft searchlight unit (less comparator) should be provided.

c. Light frame shelter can be provided at the time of the emergency.

d. Both lights should have the same field.

e. The controllers should be nearby, with telephone connection to the Fire Control Switchboard at Fort Adams and thence to Group 3 CP at Warren Point, to which group these searchlights are assigned. Commercial leased lines may be employed between the controllers and Fort Adams.

7. Two lights at Brenton Point. a. The view at this location extends from a line tangent to Castle Hill on the northwest counterclockwise to a line tangent to Coggeshall Ledge. The land is owned by Milton J. Budlong and is not to be purchased for any reasonable price. The ground slopes up from an elevation of approximately 20 feet at the Point to an elevation of approximately 35 feet fifty yards inland.

b. The two lights, Nos. 9 and 10, should be mounted on demountable steel towers, one light being located approximately fifty yards inland from and thus overlooking the other. Both should cover the same field. On account of their lighter weight, antiaircraft type searchlight units (less comparator) are prescribed.

c. In this location the lights will cover the eastern mine field and the approach to the western mine field as well as a large part of the outer bay.

d. The controllers should be nearby, with telephone connection to the Fire Control Switchboard at Fort Adams and thence to Group 2 at Prospect Hill to which group these searchlights are assigned. Commercial leased lines may be employed between the controllers and Fort Adams.

8. Two lights at Gunning Rock. a. This location is 1,500 yards south of Lower Pier at Narragansett Pier. It is at the shore end of Newton Avenue which branches off from Point Judith Road (Ocean Avenue) 0.9 mile south of Lower Pier. The house of Harold Knowlton, West Upton, Massachusetts, is close by. It is probably unnecessary to purchase land at this location, as it is unlikely to be built on and in an emergency can be leased.

b. The arc of view is from Point Judith Light around through the east to a line tangent to Boston Neck. The elevation is approximately 35 feet. Both lights, which are designated Nos. 5 and 6, should cover the entire arc.

c. Portable lights should be provided for this location, frame shelter for lights and power plant being constructed at time of emergency.

d. The controller should be near the lights, with commercial leased telephone line s to Group 1 CP at Point Judith, the searchlights being assigned to that group.

9. Two lights at Point Judith. a. Those lights, Nos. 3 and 4, should be located in front of the lighthouse so as to avoid interference by the lighthouse. They should be fixed lights, with power plants in splinter-proof shelter behind the lighthouse. This shelter should provide also for the lights, which can be run out to their operating position when required.

(1). Authorization of the Department of Commerce will be required to place these lights and their power plant in the position designated. The installation need not interfere with activities pertaining to the lighthouse.

b. The lights should be so arranged that both will bear on the water area from the shore on the west to the shore on the north.

c. While the lights in this location will be lower than is desirable (the ground level is approximately 25 feet above mean low water), it is probably unwise to place them on towers because of the conspicuous location.

d. The controllers should be near the lights. With permission of the Department of Commerce they may be placed on the platform which runs around the lighthouse just below the lamp, frame shelter being provided for the operators. Telephone connection should be provided to Group 1 CP at Point Judith, to which Lights 3 and 4 are assigned.

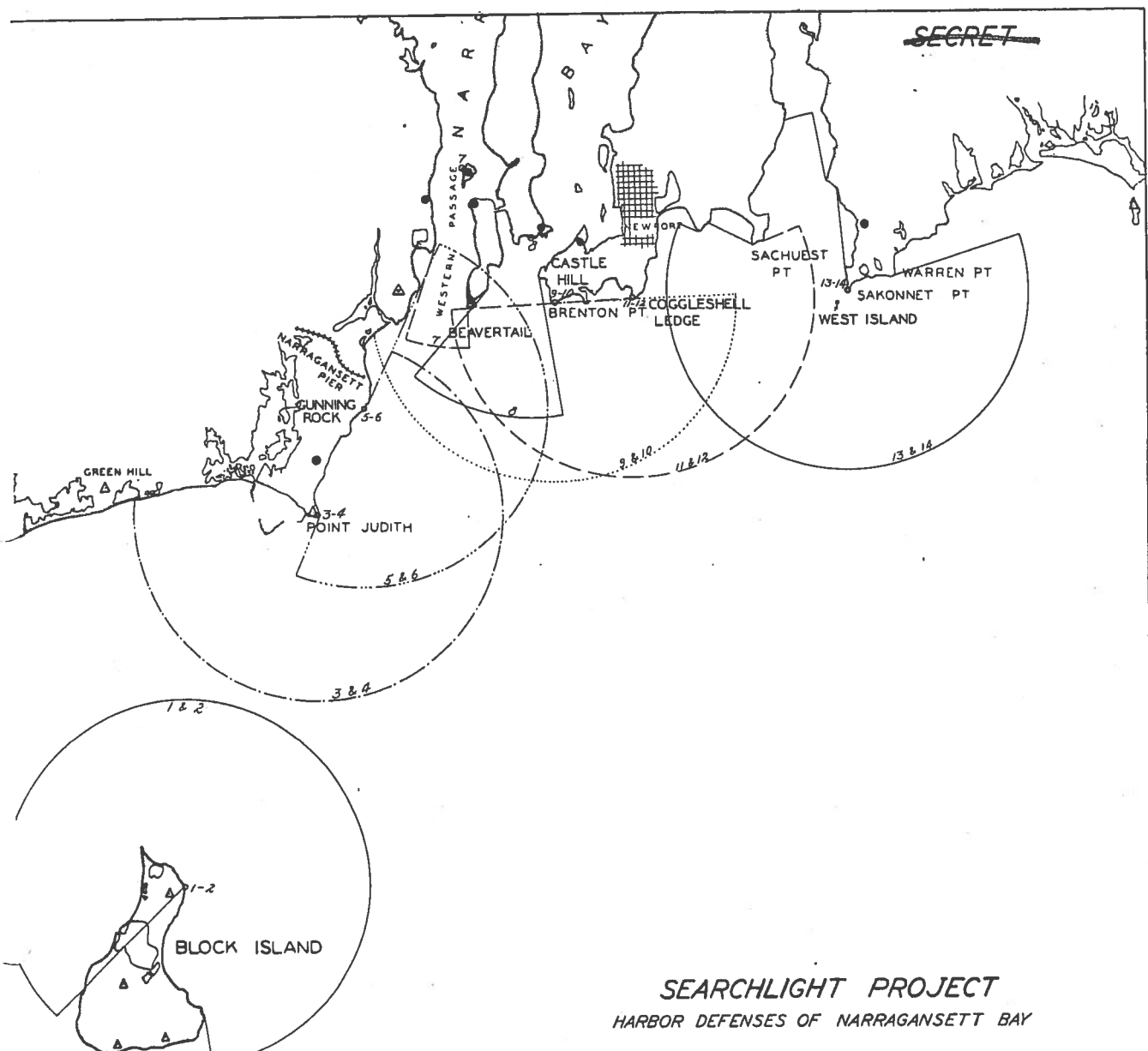
10. Two lights at Clayhead on Block Island. a. Block Island is approximately 19,000 yards off Point Judith. Searchlights on the northern part of the island, about 400 yards northeast of the proposed fire control station at Clayhead (see Exhibit 15-B) will have a field extending from the southwest clockwise to the south, an arc of over 300 degrees. The lights should be approximately 100 yards apart. Vessels may be tracked by the Block Island baselines if within about 9,000 yards of Clayhead; or if silhouetted, may be observed from some of the fire control stations of the Harbor Defenses of Long Island Sound as well as those at Point Judith, Green Hill, and Noyes Point.

b. Portable lights should be provided for this location.

c. These lights, designated as Nos. 1 and 2, should be operated under the general instructions of the Harbor Defense Commander by a searchlight officer at Block Island. One telephone line should be provided from each controller, located near the light, to the Block Island Fire Control Switchboard. One line should be provided through the Point Judith Fire Control Switchboard to the H Station.

11. Cost Estimate. An estimate of cost and priority guide is appended as Exhibit 2-C. Those items which should be procured and installed in peace time are marked with an A. Those which should be procured in peace but whose installation may be deferred until an emergency arises are marked B. Those items to be procured and installed when an emergency arises are marked C.

~~SECRET~~



SEARCHLIGHT PROJECT
HARBOR DEFENSES OF NARRAGANSETT BAY

SECRET

ANNEX C. EXHIBIT NO. 2-C. COST ESTIMATE AND PRIORITY GUIDE

H. D. OF NARRAGANSETT BAY

Priorities subject to change based on availability of funds

Priority	Item Class	Description of project	Engineers			Land or Signal			Contin-
			Material	Labor	rt. of w.	Corps	gen-	cies	
2	1	Two searchlights at Brenton Point.							
		2 Portable 60-inch searchlight units,							
		AA type (less comparator), complete	\$ 35,000						\$ 35,000
		2 Demountable steel towers	1,100						1,100
		10 Telephones, (2 with headset, 8 handset)							770
2	B	Two searchlights at Gunning Rock							
		2 Portable 60-inch searchlight units,							
		AA type (less comparator), complete	35,000						35,000
		2 Demountable steel towers	1,100						1,100
		10 Telephones, (2 with headset, 8 handset)							770
3	B	Two searchlights at Coggeshall Ledge.							
		2 Portable 60-inch searchlight units,							
		AA type (less comparator), complete	35,000						35,000
		2 Demountable steel towers	1,100						1,100
		10 Telephones, (2 with headset, 8 handset)							770
4		Two searchlights at West Island							
	B	2 60-inch seacoast searchlights	13,000						13,000
	B	2 25 K.W. generating sets	13,000						13,000
	A	1 Electric hoist	500						500
		(continued)							
		Total	\$ 134,800			\$ 2,310			\$ 137,110

SECRET

~~SECRET~~

ANNEX C. EXHIBIT NO. 2-C. COST ESTIMATE AND PRIORITY GUIDE H. D. OF NARRAGANSETT BAY.
Priorities subject to change based on availability of funds.

Prior-ity	Item:Class	Description of project	Engineers	Land	Signal:Conti-
:	:	:	Material	Labor	or rt.; Corps: gen-
:	:	:	:	of way:	Mat'l: cles
2	:	Brought forward	\$ 134,800:	:	\$2,310:
:	:	Two searchlights at West Island (continued):	:	:	\$137,110
:	A	450 ft. cable duct @ \$3.00	1,350:	:	:
:	:	150 yds. track @ \$8.00	800:\$	400:	:
:	:	1 Building, combined power house & shelter	5,500:	3,000:	\$2,450:
:	:	Purchase of land	:	\$5,000:	5,000
:	B	10 Telephones (2 with headset; 8, handset)	:	:	770:
5	:	Two searchlights at Point Judith Light	:	:	:
:	B	2 60-inch seacoast searchlights	13,000:	:	13,000
:	B	2 25 K. W. generating sets	13,000:	:	13,000
:	A	1 Building, power house	3,000:	2,000:	5,000
:	B	10 Telephones (2 with headset; 8, handset)	:	:	770:
6	B	Two searchlights at Clayhead, Block Island	:	:	:
:	:	2 Portable 60-inch searchlight units,	:	:	:
:	:	AA type (less comparator), complete	35,000:	:	35,000
:	:	10 Telephones (2 with headsets; 8, handsets)	:	:	770:
7	B	One (1) portable 60-inch searchlight unit,	:	:	:
:	:	AA type (less comparator), complete, in	:	:	:
:	:	reserve.	17,500:	:	17,500
:	:	Total	\$ 223,950:\$	5,400:\$5,000:\$	\$4,620:\$2,450:\$241,420

Class A - To be procured and installed in peacetime.
Class B - To be procured in peace and installed when an emergency arises.
Class C - To be procured and installed when an emergency arises.

ANNEX D

UNDERWATER DEFENSE

~~SECRET~~

A N N E X D.

UNDERWATER DEFENSE.

1. The present underwater defense project was approved by the Secretary of War, January 17, 1929, and provides for eight groups of mines in the Eastern Passage, controlled from Fort Wetherill, and four groups in the Western Passage, controlled from Fort Greble.

2. a. The mine cases, anchors, cable, tools and other material required, as well as the panels, generators and other electrical equipment (all of which material of both classes is enumerated in Table of Allowances - Submarine Mine Equipment) should be stored at Fort Wetherill for the Eastern mine field and at Fort Greble for the Western mine field.

b. This material should be kept on hand, complete and in serviceable condition.

3. In addition to the material comprised in the Table of Allowances, the mine project requires adequate shore installations and boats.

4. Shore installations. a. Fort Wetherill. The present storage facilities at Fort Wetherill are not sufficient to house the mine material assigned to that station. An additional storeroom, 30 feet by 90 feet and one story high, is required.

b. Fort Greble. A properly designed loading room of adequate size is required. A one story building, 26' x 58', will be suitable. There is insufficient space in the mine storehouse for the mine cases required by the project plus the mine cases of other sizes now on hand. As these latter cases will probably be shipped elsewhere, additional storage space has not been provided for herein.

c. Should the mine fields be withdrawn approximately 1,000 yards to the north of their present proscribed location, the existing baselines would more adequately cover them.

d. There are sites for two spotting stations, with excellent location on Boavertail (one for each mine field), with instrument pillars and cable connections now installed. Shelter should be provided for the spotting detail at time of an emergency. These spotters are assigned to Mine Group 1 and Mine Group 2 respectively.

e. (1). Explosive pertaining to the First Mine Command is provided with dry and adequate storage in the magazines of old Battery Mitchell at Fort Greble.

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- (2). Explosive for Second Mine Command is suitably stored in the magazines of old Battery Zook.

5. Boats. It is considered that two mine planters, four DB boats and twelve motor mine yawls are required to plant and maintain the submarine mines included in the project. In addition, for use during the period of planting there should be provided a third mine planter as substitute.

a. Mine Planters.

- (1). The USAMP Baird is the only mine planter in the Corps Area; it may be considered available for use in the Harbor Defenses of Narragansett Bay.
- (2). A lighthouse tender should be designated by name for service as an emergency mine planter. The vessel should be provided in peace with the necessary deck fittings as specified in the Table of Allowances, and the specified planting equipment should be kept on hand in the harbor defense.
- (3). A tug with barge may be employed as the third (substitute) mine planter.

b. DB Boats.

- (1). There is one L boat in the harbor defense and one in the Harbor Defenses of Long Island Sound which may be considered available.
- (2). In Narragansett Bay and in the vicinity of Woods Hole, Massachusetts, there is a common type of power boat usually between 50 and 60 feet in length, with hoisting boom; these boats are used for seining. Two "Seiners" may be employed as DB boats.

c. Mine Yawls. In addition to the six yawls now on hand in the harbor defense, the necessary additional launches can be obtained locally.

6. Cost Estimate: An estimate of cost and priority guide is appended as Exhibit 1-D. Those items which should be procured and installed in peace time are marked with an A. Those which should be procured in peace but whose installation may be deferred until an emergency arises are marked B. Those items to be procured and installed when an emergency arises are marked C.

Priorities subject to change based on availability of funds.

Prior- ity	Item:Class	Description of Project	Coast :Artil- :lery	Enginers :Material: Labor	Contin- :gencies: Total
1	1	A : Materiel to complete mine project	: \$72,800:	:	: \$72,800
8	:	: Additional shore installations necessary in the upkeep and	:	:	:
:	:	: operations of the underwater defense in the Harbor Defense.	:	:	:
1	1	A : Construction Mine Storeroom, 30' x 90' 1-story, at Fort	:	: \$9,800: \$5,000:	: 1,500: 16,300
:	:	: Wetherill.	:	:	:
2	2	A : Construction Mine Loading Room, 26' x 58', 1-story, at	:	: 4,400: 2,500:	: 700: 7,600
:	:	: Fort Greble.	:	:	:
:	:	:	:	:	:
:	:	Total	: \$72,800: \$14,200:	: \$7,500:	: 2,200: \$96,700

Class A - To be procured and installed in peacetime.

Class B - To be procured in peacetime and installed when an emergency arises.

Class C - To be procured and installed when an emergency arises.

Note: No expenditure of funds by the Ordnance Department, Signal Corps, Chemical Warfare Service, or for land, is contemplated in this Annex.

ANNEX E

ANTIAIRCRAFT GUN DEFENSE

~~SECRET~~

A N N E X E.

ANTIAIRCRAFT GUN DEFENSE.

1. a. Guns. The antiaircraft gun defense of the Harbor Defenses of Narragansett Bay is shown in Exhibit 1-E. In this diagram the assumptions are made that the target is travelling at 120 miles an hour, at an altitude of 15,000 feet, and that the effective horizontal range of the guns at that altitude is 6,000 yards. X

b. Machine Guns. The number of machine guns which may reasonably be required, and provided, is conditioned on the expectation of simultaneous attack by more than one flight, and as a general guide, the proportion of machine guns to gun batteries in the antiaircraft regiment may be taken. For the seven gun batteries in this harbor defense this proportion would provide 28 machine gun platoons. This project calls for 24 machine gun platoons. X

(1). The exact location of the machine guns is to be determined by the harbor defense commander, considering the availability, at the time when an emergency arises, of sites which will give all-around fire, as nearly down to the horizon as is practicable.

c. Searchlights. The disposition of the antiaircraft searchlights is shown in Exhibit 1-E. To the extent permitted by the coast line, the lights have been pushed out from the batteries to such distance that targets may be illuminated before they come within range of the guns. While the searchlights are regarded as an accessory of the particular gun battery which they are provided to serve, their locations have been modified to secure the best illumination of the area covered by the seven batteries as a whole. Unless so located, the 21 lights would be insufficient. X

2. Organization. a. The antiaircraft batteries are each composed of a gun detachment, a machine gun detachment and a searchlight detachment. The three batteries at Forts Adams, Wetherill and Greble form the antiaircraft group (Group 4) with command post at the "H" station. This is the center of the antiaircraft intelligence service not only for Group 4 but also for Group 1 at Point Judith and Group 3 at Sakonnet Point, these latter two being seacoast gun groups which because of their isolation include the local antiaircraft defense. Information is to be telephoned direct to the nearest one of these groups by all antiaircraft observers, and by Group 1 and Group 3 to the antiaircraft group 4. Conversely information received at Group 4 is disseminated to batteries, and the alarm service of the garrisons is notified. X

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b. Antiaircraft observers have been provided for at several of the outlying fire control stations, each observer being provided with telephone direct to the antiaircraft intelligence center, or to Group 1 or Group 3, whichever is nearer. These fire control stations are: Noyes Point, Green Hill, Sachuest Neck, Gooseberry Neck, Cuttyhunk and Gay Head. An antiaircraft observer is also provided for at Clayhead and at Beacon Hill on Block Island. Should it be practicable to establish a station at Hazard Tower and at St. George's School Tower, an antiaircraft observer should be located at each place.

- (1). In addition to the antiaircraft observers above who are specially designated as such, antiaircraft intelligence will originate with each antiaircraft gun battery, machine gun platoon and searchlight. An observer should be placed aboard a vessel of the Inshore Patrol. Information may be received from the adjacent harbor defenses of Long Island Sound and of New Bedford.
- (2). Provision for intelligence from more distant sources such as the Offshore Patrol, the Coast Guard and lighthouses is the function of the sub-sector commander and does not form a part of this Project.

3. AA Gun Battery No. 1, Fort Greble. a. Gun Detachment. The third gun of this battery is to be located approximately 50 yards from each of the existing emplacements and to the southwest thereof. The director may be placed 150 yards from the center of the battery.

b. Machine Gun Detachment. Three platoons or 12 machine guns are proposed, one platoon to be located near the center of the island, one near the southern end, and one on Prospect Hill. The first two may be connected with the gun battery by field wire; the third platoon may be connected by field wire to the antiaircraft intelligence center, through which messages may be transmitted to the gun battery.

c. Searchlight Detachment. Three lights with sound locators are to be provided, each with portable power plant. These lights are located as follows:

- (1). One on Barber's Heights, $1\frac{1}{2}$ miles north of Saunderstown and 3,500 yards northwest of the gun battery. Telephone connection should be by field wire to Fort Koarny, whence messages may be transmitted to the gun battery by the established fire control communications.

(2). One on McSparran Hill, two miles west of Fort Kearny, and 5,000 yards west of the gun battery, near the Coast and Geodetic Survey station "McSparran-3". This location is 100 yards east of Highway No. 1, near junction with paved road leading west to Kingston. Telephonic communication should be as for the searchlight in 3 c (1) preceding.

(3). One on Boston Neck, 7,500 yards south of the gun battery. Telephonic communication should be provided by field wire to the nearby base-end station, thence to Fort Groble by the established fire control communications.

4. AA Gun Battery No. 2, Fort Wotherill. a. Gun Detachment. The third gun of this battery is to be located approximately 40 yards from the two existing guns, on the west side. The director should be placed on knoll 205 yards northwest of the battery. X

b. Machine Gun Detachment. Three platoons or 12 machine guns are proposed, to be located with distance of about 1,500 yards between platoons and so placed as to cover Batteries Wheaton and Varnum, the submarine mine installation and the seacoast and antiaircraft searchlights. Communication should be by field wire to the gun battery.

c. Searchlight Detachment. Three lights with sound locators and portable power plants are to be provided. They should be located as follows:

(1). One on Beavertail, one-half mile north of the lighthouse, approximately 4,500 yards southwest of the battery. Communication should be via the Beavertail fire control cable to Prospect and thence to the gun battery.

(2). One near Hill 185 on Conanicut Island, about 7,500 yards north of the battery. Commercial telephone supplemented by 300 feet of field wire should be employed.

(3). One approximately 1,300 yards west of the gun battery, with telephonic connection by field wire.

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5. AA Gun Battery No. 3, Fort Adams. a. Gun Detachment. The third gun of this battery is to be located approximately 45 yards from the two existing guns, to the south thereof. The director will be on the old redoubt, within 100 yards of the center of the battery. X

b. Machine Gun Detachment. Three platoons or 12 machine guns are proposed, two to be disposed so as to protect the two mortar batteries and the third to protect the two seacoast searchlights at Brenton Point and the antiaircraft searchlight near Castle Hill. The first two platoons should be connected by field wire with the gun battery. The third should be connected by commercial leased line to Fort Adams.

c. Searchlight Detachment. Three searchlights with sound locators and portable power plants are to be provided. They should be located as follows:

- (1). One near Castle Hill, approximately 2,900 yards southwest of the gun battery.
- (2). One near Ochre Point approximately 3,700 yards southeast of the gun battery.
- (3). One on Miantonomy Hill, approximately 5,000 yards northeast of the battery. As this vicinity is gradually becoming built up, Hill 140 one-half mile to the east may be a better location in the future.
- (4). Telephone connection between each of the three lights and the gun battery may be provided by commercial leased lines to Fort Adams.

ANTIAIRCRAFT DEFENSE AT POINT JUDITH NECK.

6. The two antiaircraft batteries at Point Judith Neck, each composed of a gun detachment, a machine gun detachment and a searchlight detachment, form a part of Group 1. These batteries are of limited mobility. X

7. South AA Battery. a. Gun Detachment. This battery is to be located on the high ground 300 yards west of the old Point Judith road which borders the 16-inch reservation on the west, on the C. L. Bidwell farm near the ruins of a farmhouse. The director will be located within 200 yards of the center of the battery. For orientation purposes, the coordinates of the west chimney of this old farmhouse are given; X

Latitude	41°	23'	20.46".
Longitude	71°	29'	18.66".

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b. Machine Gun Detachment. Four platoons or 16 machine guns are proposed. They should be located so as to protect the seacoast and antiaircraft searchlights at Point Judith, the 155 mm. battery and the 16-inch battery. The platoons should be disposed to cover the peninsula as a whole and be placed approximately 1,500 yards apart. Connection with the gun battery may be provided by field wire.

c. Searchlight Detachment. Three searchlights with sound locators and portable power plants are to be provided. They should be located as follows:

- (1). One near the shore of Narragansett Bay, approximately 1,500 yards north of Point Judith Light, south of the 16-inch battery and 1,550 yards southeast of the antiaircraft gun battery. Telephone connection with the gun battery may be by field wire.
- (2). One on an island in Point Judith Pond, 1,500 yards west of the gun battery. A one-pair cable and field wire may be employed to connect this light and the gun battery.
- (3). One near station "Wooden" of the Coast and Geodetic Survey, 6,000 yards west of the battery. Commercial leased telephone line may be used for connection with the gun battery.

8. North AA Battery. a. Gun Detachment. This battery is to be located in an open field belonging to John McHale, approximately 400 yards south of Hazard Tower. X

- (1). Should the Narragansett Pier 8-inch railway battery be located in the alternative position 450 yards west of the railway station, there is open ground 500 yards to the southeast which affords a suitable site for the antiaircraft battery (see Exhibit 5-A).
- (2). The director, at either site, may be within 200 yards of the center of the battery.

b. Machine Gun Detachment. Three platoons or 12 machine guns are proposed. They should be located so as to protect the seacoast lights at Gunning Rock as well as the railway battery. Telephone connection with the gun battery may be by field wire. X

c. Searchlight Detachment. Three searchlights with sound locators and portable power plants are to be provided. They should be located as follows:

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- (1). One light near the shore of Narragansett Bay, approximately one mile south of South Pier at Narragansett Pier; within 800 yards of the antiaircraft battery. Telephone connection may be by field wire.
- (2). One on Broad Hill near Coast and Geodetic Survey station of that name, approximately 9,000 yards west of the battery and one mile northeast of Porryville. Commercial telephone line may be used for connection with the gun battery.
- (3). One at Meetinghouse Hill also called Tower Hill, one mile east of Wakefield and approximately 3,800 yards northwest of the battery. Commercial leased line may be employed for connection with the gun battery.

ANTIAIRCRAFT DEFENSE OF SAKONNET POINT.

9. The two antiaircraft batteries at Sakonnet Point are composed, like the others of the harbor defense, of a gun, a machine gun and a searchlight detachment; those two batteries form a part of Group 3. They are fixed batteries. X

10. AA Battery No. 4. a. Gun Detachment. This battery is to be located on the high ground overlooking the Sakonnet River, on the west portion of the 16-inch gun plot. The director may be located within 200 yards of the center of the battery. X

b. Machine Gun Detachment. Four platoons or 16 machine guns should be provided. They should be so located as to protect the 16-inch battery, the three antiaircraft searchlights referred to below, and the fire control stations at Sachuest Neck. For telephone connection with the gun battery, field wire (and cable to Sachuest Neck) should be used. X

c. Searchlight Detachment. Three portable searchlight units are to be provided. The following are suitable locations:

- (1). One at Hill 100, 1,400 yards north of Little Compton and 4,700 yards northeast of the antiaircraft battery. Commercial leased line may be employed for connection with the battery.
- (2). One near the Sakonnet River, north of Church Point, near a Coast and Geodetic Survey station named "Church Point-3" and approximately 3,000 yards northwest of the battery. Telephone connection may be by field wire.

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- (3). One on Sachuest Neck, 4,600 yards west of the battery. Telephone connection may be by field wire and fire-control cable. X

11. AA Battery No. 5. a. Gun Detachment. This fixed battery is to be located in the northeast portion of the 10-acre plot which is the site of the 8-inch gun battery. The director may be well located on a rocky knoll at the north edge of the plot, within 200 yards of the center of the battery. X

b. Machine Gun Detachment. Four platoons or 16 machine guns should be provided. They should be located so as to protect the 8-inch battery, the 155 mm. battery, the seacoast searchlights on West Island and the Warren Point fire control stations. The four platoons should be disposed to cover the area of the peninsula and should be placed approximately 1,500 yards apart. Telephone connection with the gun battery should be by field wire. X

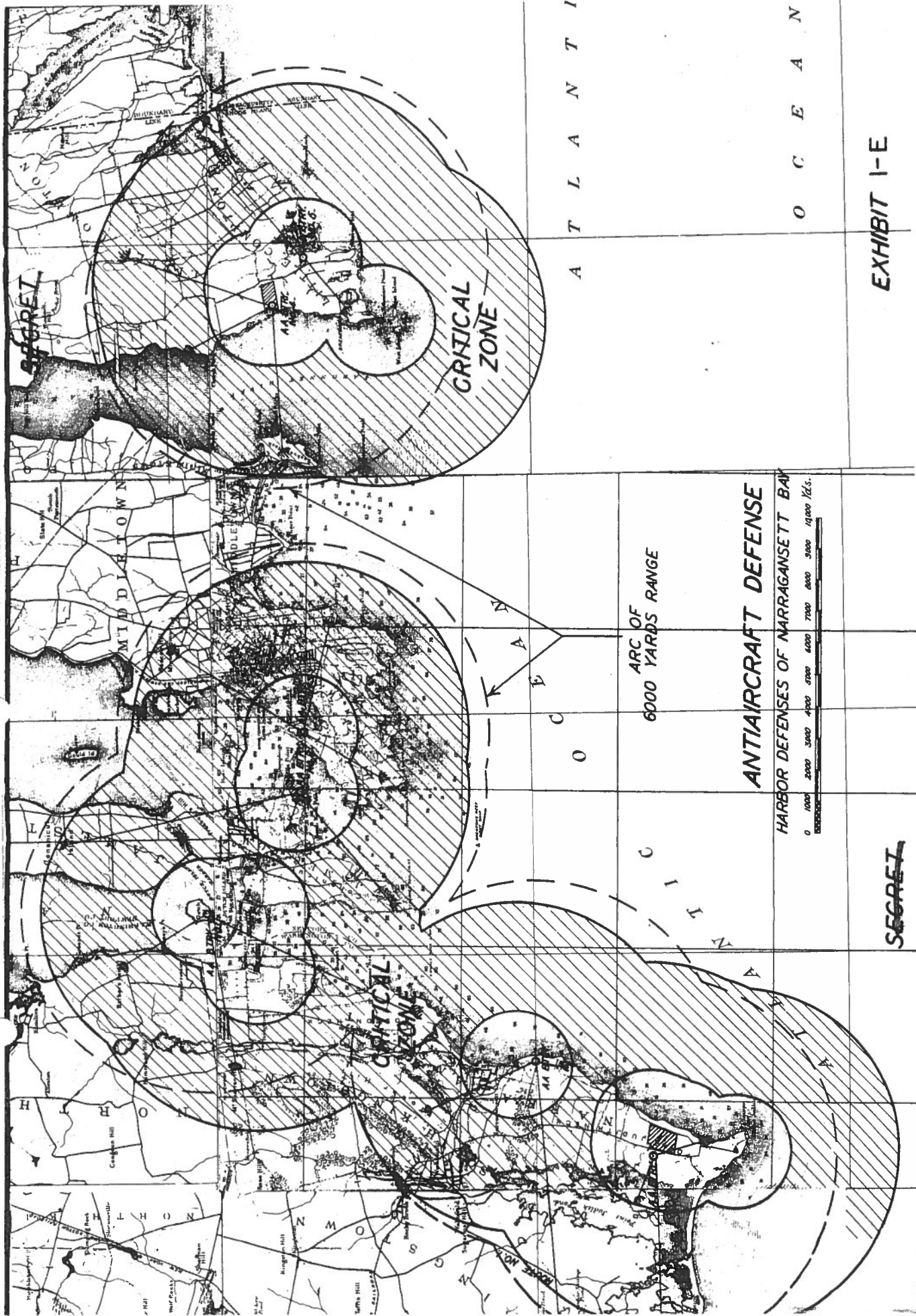
c. Searchlight Detachment. Three portable searchlight units are to be provided. They should be located as follows:

- (1). One on the west side of Round Pond, 1,400 yards north of the end of Sakonnet Point and approximately 2,400 yards southeast of the antiaircraft battery.
- (2). One on the east side of the swamp which lies east of the 8-inch plot; this searchlight position is 1,200 yards east of the antiaircraft battery.
- (3). One approximately 400 yards north of Tumpus Beach and 4,400 yards northeast of the battery.
- (4). Field telephone wire should be used to connect these three searchlights with the gun battery. X

12. The locations proscribed in this Annex for individual antiaircraft guns and for antiaircraft gun batteries were approved by the War Department in 12th indorsement, WD AGO, August 31, 1933 (AG 660.2, 1-30-33; Misc. E).

13. Cost Estimate. An estimate of cost and priority guide is appended as Exhibit 3-E. Those items which should be procured and installed in peace time are marked with an A. Those which should be procured in peace but whose installation may be deferred until an emergency arises are marked B. Those items to be procured and installed when an emergency arises are marked C. X

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A T L A N T I C

O C E A N

EXHIBIT I-E

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WAR RESERVE OF ANTI-AIRCRAFT AMMUNITION.

Harbor Defenses of Narragansett Bay

Approved by the Secretary of War in 5th indorsement, WD AGO.,
March 28, 1933 (AG 381.4; 2-16-33; Misc. E).

B a t t e r y		Battle:	Central:	War :	Remarks
Location	Type	Allow- :ance	Re- :serve	Re- :serve	
No. 1 - Ft. Greble	Fixed	1800	1800	3600	Store in N.G. Store- house, Ft. Greble.
No. 2 - Ft. Wetherill	Fixed	1800	1800	3600	Store in old Battery Walbach.
No. 3 - Ft. Adams	Fixed	1800	1800	3600	Store in old Battery Bankhead.
No. 4 - Sakon- net Point	Fixed	1800	1800	3600	B.A. to be stored in old Fort Adams or
No. 5 - Sakon- net Point	Fixed	1800	1800	3600	held in Central Re- serve until AA bat- teries are built.
Point Judith, north	Semi- mobile	0	3600	3600	1800 rounds to be for- warded with 8" Ry. btry.
Point Judith, south	Semi- mobile	1800	1800	3600	B.A. to be stored in old Fort Adams or held in Central Reserve until 16" btry. is built.

EXHIBIT NO. 2-E.

SECRET

ANNEX E. EXHIBIT NO. 3-E. COST ESTIMATE AND PRIORITY GUIDE H. D. OF NARRAGANSETT BAY

Priorities subject to change based on availability of funds.

Priority	Item	Class	Description of Project	Signal			Engineers			Total
				Mat'l	Ordnance	Material	Labor			
3	1	A	AA Battery No. 1, Fort Greble, R.I.							
			1 Gun block for 3-inch AA gun		\$ 18,167	\$ 400	200			600
			1 Fixed 3-inch AA gun and carriage		\$ 3,000					18,167
			3 Fuze setters							3,000
			1 Director and transmission system (450 ft. cable)		\$ 38,000					38,000
			1 Height finder		\$ 16,000					16,000
			1 AA BC Observation instrument		\$ 1,500					1,500
			12 50 cal. AA machine guns with FC equipment		\$ 18,600					18,600
			3 AA portable searchlight units, complete			\$ 60,000				60,000
			3 Sound locators		\$ 18,180					18,180
			24,060 ft. W 110 field wire	\$ 157						157
	2	A	AA Battery No. 2, Fort Wetherill, R. I.							
			1 Gun block for 3-inch AA gun			\$ 400	200			600
			1 Fixed 3-inch AA gun and carriage		\$ 18,167					18,167
			3 Fuze setters							3,000
			1 Director and transmission system (615 ft. cable)		\$ 38,000					38,000
			1 Height finder		\$ 16,000					16,000
			1 AA BC Observation instrument (continued)		\$ 1,500					1,500
			Total	\$ 157	\$ 190,114	\$ 60,800	\$ 400			\$ 251,471

EXHIBIT NO. 3-E

SECRET

ANNEX E. EXHIBIT NO. 3-E. COST ESTIMATE AND PRIORITY GUIDE H. D. OF NARRAGANSETT BAY

Priorities subject to change based on availability of funds

Prior- ity	Item	Class	Description of Project	Signal: \$	Mat'l: \$	Ordnance \$	Material: \$	Labor \$	Engineers \$	Total
3	2	A	AA Battery No. 2, Fort Wetherill, R. I. (continued).		\$ 157,190,114	\$ 60,800	\$ 400	\$ 251,471		
			Brought forward							
			12 .50 cal. AA machine guns with FC equipment			\$ 18,600				18,600
			3 AA Portable searchlight units, complete				\$ 60,000			60,000
			3 Sound locators			\$ 18,180				18,180
			4,500 ft. W 110 field wire		\$ 30					30
	3	A	AA Battery No. 3, Fort Adams, R. I.							
			1 gun block for 3-inch AA gun				\$ 400	\$ 200		600
			1 Fixed 3-inch AA gun and carriage			\$ 18,167				18,167
			3 Fuze setters			\$ 3,000				3,000
7			1 Director and transmission system (300 ft. cable)			\$ 38,000				38,000
			1 Height finder			\$ 16,000				16,000
			1 AA BC Observation instrument			\$ 1,500				1,500
			12 .50 cal. AA machine guns with FC equipment			\$ 18,600				18,600
			3 AA portable searchlight units, complete				\$ 60,000			60,000
			3 Sound locators			\$ 18,180				18,180
	1	A	AA Battery No. 4, Sakonnet Point, R. I.							
			3 gun blocks for 3-inch AA guns				\$ 1,200	\$ 600		1,800
			3 Fixed 3-inch AA guns and carriages			\$ 54,501				54,501
			3 Fuze setters			\$ 3,000				3,000
(Continued)										
Total				\$ 187,397,842	\$ 182,400	\$ 1,200	\$ 581,629			

EXHIBIT NO. 3-E.

- 2 -

SECRET

SECRET

ANNEX E. EXHIBIT NO. 3-E. H. D. OF NARRAGANSETT BAY

COST ESTIMATE AND PRIORITY GUIDE

Priorities subject to change based on availability of funds.

Prior- ity	Item	Class	Description of Project	Signal: \$	Engineer: Material: \$	Labor: \$	Total
7	1	A	AA Battery No. 4, Sakonnet Point, R.I. (continued)	\$ 187,397	\$ 842,400	\$ 1,200	\$ 581,629
			Brought forward				
			1 Director and transmission system (600 ft. cable)		38,000		38,000
			1 Height finder		16,000		16,000
			1 AA BC Observation instrument		1,500		1,500
			16 .50 cal. AA machine guns with FC equipment		24,800		24,800
			3 AA portable searchlight units, complete		60,000		60,000
			3 Sound locators		18,180		18,180
			24,000 ft. W 110 field wire	156			156
	2	A	AA Battery No. 5, Sakonnet Point, R. I.				
			3 gun blocks for 3-inch AA guns		1,200	600	1,800
			3 Fixed AA guns and carriages, 3-inch		54,501		54,501
			3 Fuze setters		3,000		3,000
			1 Director and transmission system (600 ft. cable)		38,000		38,000
			1 Height finder		16,000		16,000
			1 AA BC Observation instrument		1,500		1,500
			16 .50 cal. AA machine guns with FC equipment		24,800		24,800
			3 portable AA searchlight units, complete		60,000		60,000
			3 Sound locators		18,180		18,180
			9,300 ft. W 110 field wire (Continued)	60			60
			Total	\$ 403,562,303	\$ 303,600	\$ 1,800	\$ 958,106

EXHIBIT NO. 3-E.

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ANNEX F
SUPPORTING AIRCRAFT

~~SECRET~~

A N N E X F.

SUPPORTING AIRCRAFT.

1. Mission: To furnish observation and surveillance missions for gun defenses of Forts Adams, Getty, Wetherill and Kearny; and Sakonnet Point and Point Judith.

2. Equipment required: One (1) Observation Flight; three planes equipped with radio.

3. Landing Fields:

a. Operating:

(1). Newport Airport - $3\frac{1}{2}$ miles north of Newport, Rhode Island.

b. Emergency:

(1). State Camp Grounds, Quonset Point, Rhode Island (northeast of Wickford, Rhode Island).

(2). Atlantic Airport - 9 miles east of Westerly, Rhode Island.

(3). Marthas Vineyard Airport - $1\frac{1}{2}$ miles south of Edgartown, Massachusetts.

(4). Block Island, R. I. (inferior).

4. Gas and Oil. To be secured locally at the specified airports.

5. Communications:

a. Commercial telephone to airport.

b. Radio between planes on missions and the Harbor Defense command post.

ANNEX G

GAS DEFENSE

~~SECRET~~

A N N E X G.

GAS DEFENSE.

1. a. This project contemplates use of the Collective Protector Unit M-1 or later model, costing \$780, with four reserve canisters at \$270 each, a total of \$1860 per unit; this unit has a rated capacity of 200 cubic feet per minute. Three cubic feet per minute per person not physically active, and ten cubic feet for personnel of plotting rooms is required. Therefore one unit will supply a maximum of 20 persons actively engaged or 67 persons not active. There are the further conditions that one unit will supply the necessary slight positive air pressure to a room of no more than 10,000 cubic feet capacity; and each person requires 150 cubic feet of space.

b. The basis for providing reserve canisters is that the life of the canister is 40 hours; and the assumption that there may be two gas attacks of eight hours each, each week for three months. This is a very ample allowance.

c. Only permanent and bombproof structures should, in general, be gas proofed. Power plants do not require protection, nor do isolated fire control stations. Class C batteries and short range batteries of the secondary armament are not protected. Provision for gas defense is to be made whenever new emplacements are constructed.

d. For personnel outside of gas-proofed rooms, reliance is placed on gas masks, protective clothing and the employment of trained squads of men using chloride of lime to neutralize mustard gas. All this personnel and organizational equipment is outside the scope of this project.

2. a. Attack by gas must ordinarily be carried out by airplanes since otherwise the expenditure of naval ammunition would be excessive. The fire of antiaircraft guns and machine guns will be a deterrent to effective gas attack.

b. Attack with persistent gas is the chief concern.

3. Provision is made herein for complete gas-proofing of the plotting rooms, and a rest room at each battery where a room is available without undertaking new construction. Aid stations may be established in the rest rooms. Evacuation should be first to military and then to civil hospitals.

4. Cost Estimate. An estimate of cost and priority guide is appended as Exhibit 1-G. Those items which should be procured and installed in peace time are marked with an A. Those which should be procured in peace but whose installation may be deferred until an emergency arises are marked B. Those items to be procured and installed when an emergency arises are marked C.

~~SECRET~~

ANNEX G.

EXHIBIT NO. 1-G.

COST ESTIMATE AND PRIORITY GUIDE

H. D. OF NARRAGANSETT BAY

Priorities subject to change based on availability of funds

Priority	Item	Class	Description of Project	Cu.ft.	No. of sons	No. of Coll.	No. of Reserve	Cost Estimate		
								C.W.S.	Engineer	Total
								Mat'l	Labor	
10			At Fort Wetherill, R. I.							
	1	A	F.C. Switchboard Room	5400	3	1	4	1,860	300	75
	2	A	Mine Casemate	8600	4	1	4	1,860	300	75
	3	A	Mine Plotting Room	1970	13	1	4	1,860	300	75
	4	A	Battery Wheaton Plotting Room	1690	12	1	4	1,860	300	75
	5	B	Battery Wheaton Rest Room at Walbach	6400	42	1	4	1,860	300	75
	6	A	Battery Varnum Plotting Room	1920	13	1	4	1,860	300	75
	7	B	Battery Varnum Rest Room	1890	12	1	4	1,860	300	75
	8	A	Battery Dickenson Plotting Room	1211	9	1	4	1,860	300	75
	9	B	Battery Dickenson Rest Room at Zook	5040	34	1	4	1,860	300	75
			At Fort Adams, R. I.							
	10	A	Battery Edgerton Plotting Room	1700	12	1	4	1,860	300	75
	11	A	Battery Greene Plotting Room	1700	12	1	4	1,860	300	75
	12	B	Batteries Edgerton and Greene Rest Room	6300	42	1	4	1,860	300	75
			At Fort Getty, R. I.							
	13	A	Battery House Plotting Room	1300	9	1	4	1,860	300	75
	14	B	Battery House Rest Room at Tonsard	3600	24	1	4	1,860	300	75
			At Fort Greble, R. I.							
	15	A	Mine Casemate	1750	4	1	4	1,860	300	75
	16	A	Mine Plotting Room	1880	13	1	4	1,860	300	75
			At Fort Kearny, R. I.							
	17	A	Battery Cram Plotting Room	1100	8	1	4	1,860	300	75
	18	B	Battery Cram Rest Room at French	3600	24	1	4	1,860	300	75
			Total							
								\$33,480	\$5,400	\$1,350
										\$40,230

GAS DEFENSE PROJECT

EXHIBIT NO. 1-G

ANNEXES H - M

ESTIMATES - CHIEFS OF ARMS AND SERVICES

ANNEX H

ESTIMATES, CHIEF OF COAST ARTILLERY

Annex:	Priority :	Item :	Class A :	Class B :	Class C :	Total
D :	1 :	1 :	\$ 72,800 :	- :	- :	\$ 72,800

The following is a recapitulation of the total cost of all Annexes:

Annex:	Procuring Service:	Class A :	Class B :	Class C :	Total
A :	Engineers	\$1,763,031:		\$ 7,000:	\$1,775,031
	Ordnance	930,000:	\$ 224,730:		1,154,730
	Total	2,693,031:	224,730:	7,000:	2,929,761
B :	Engineers	52,050:	3,500:	14,900:	70,450
	Ordnance	94,965:	26,256:	59,988:	181,209
	Signal Corps	229,575:	92,485:	74,227:	396,287
	Total	376,590:	122,241:	149,115:	647,946
C :	Engineers	24,000:	212,800:		236,800
	Signal Corps		4,620:		4,620
	Total	24,000:	217,420:		241,420
D :	Engineers	23,900:			23,900
	Coast Artillery	72,800:			72,800
	Total	96,700:			96,700
E :	Engineers	305,400:	120,000:		425,400
	Ordnance	652,303:	412,746:		1,065,049
	Signal Corps	403:	45:		448
	Total	958,106:	532,791:		1,490,897
G :	Engineers	4,500:	2,250:		6,750
	Chemical Warfare	22,320:	11,160:		33,480
	Service				
	Total	26,820:	13,410:		40,230
	GRAND TOTAL	\$4,130,247:	\$1,110,592:	\$ 156,115:	\$5,446,954

Approved by Chief of Coast Artillery.
September 18, 1934.

Corrected page per 16th Ind., AG 660.2 (5-2-34) (Misc.) E, dated
January 2, 1935.

ANNEX J

ESTIMATES, CHIEF OF ENGINEERS

Annex:	Priority:	Item	Class A	Class B	Class C	Total
A	4	:1, 2, 3	\$ 969,216:	:	:	\$969,216
:	:	:	:	:	:	:
:	5	:1, 2	: 798,815:	:	:	: 798,815
:	:	: 3	:	:	\$ 7,000	: 7,000
Total			: 1,768,031:	:	: 7,000	: 1,775,031
B	4	:1, 2, 3, 4,	: 41,850:	:	:	: 41,850
:	:	: 5, 6.	:	:	:	:
:	:	:	:	:	:	:
:	:	: 7	:	:	3,700	: 3,700
:	:	: 8	: 900:	:	2,700	: 3,600
:	:	: 9	: 800:	:	2,500	: 3,300
:	:	: 11	: 8,500:	\$ 1,000	:	: 9,500
:	:	:	:	:	:	:
:	5	: 1	:	2,500	: 400	: 2,900
:	:	: 4	:	:	5,600	: 5,600
Total			: 52,050:	3,500	: 14,900	: 70,450
C	2	:1, 2, 3	:	: 108,300	:	: 108,300
:	:	: 4	: 19,000:	26,000	:	: 45,000
:	:	: 5	: 5,000:	26,000	:	: 31,000
:	:	: 6, 7	:	52,500	:	: 52,500
Total			: 24,000:	212,800	:	: 236,800
D	8	:1, 2	: 23,900:	:	:	: 23,900
E	3	:1, 2, 3	: 181,800:	:	:	: 181,800
:	:	:	:	:	:	:
:	7	:1, 2	: 123,600:	:	:	: 123,600
:	:	:	:	:	:	:
:	:	: 3	:	: 120,000	:	: 120,000
Total			: 305,400:	120,000	:	: 425,400
G	9	:1, 2, 3, 4, 6:	: 4,500:	:	:	: 4,500
:	:	: 8, 10, 11,	:	:	:	:
:	:	: 13, 15, 16:	:	:	:	:
:	:	: 17.	:	:	:	:
:	:	:	:	:	:	:
:	:	: 5, 7, 9, 12:	:	2,250	:	: 2,250
:	:	: 14, 18	:	:	:	:
Total			: 4,500:	2,250	:	: 6,750
GRAND TOTAL			: \$2,177,881:	\$338,550	\$ 21,900	: \$ 2,538,331
			:	:	:	:

Approved by Chief of Engineers,
July 30, 1934.

ANNEX K

ESTIMATES, CHIEF OF ORDNANCE.

Annex:	Priority:	Item :	Class A :	Class B :	Class C :	Total
A	4	:1, 2	:\$ 330,000	:	:	:\$330,000
		: 3	:	:\$ 800:	:	800
		:	:	:	:	:
	5	: 1	600,000	:	:	600,000
		:2, 3	:	223,930:	:	223,930
Total			930,000	224,730:	:	1,154,730
B	4	:2, 3, 4, :	87,791	:	:	87,791
		:5, 6, 10, :	:	:	:	:
		:11.	:	:	:	:
		:	:	:	:	:
		:2, 3, 4 :	:	17,556:	:	18,556
		:11.	:	:	:	:
		:	:	:	:	:
		:7, 8, 9 :	:	:\$ 20,520:	:	20,520
		:	:	:	:	:
	5	: 5	7,174	:	:	7,174
		:1, 4	:	7,700:	:	7,700
		:2, 3, 4 :	:	:	39,468:	39,468
Total			94,965	26,256:	59,988:	181,209
E	3	:1, 2, 3 :	340,341	:	:	340,341
		:	:	:	:	:
	7	:1, 2	311,962	:	:	311,962
		:	:	:	:	:
		: 3	:	412,746:	:	412,746
Total			652,303	412,746:	:	1,065,049
GRAND TOTAL			:\$1,677,268	:\$ 663,732:	\$ 59,988:	\$2,400,988

Approved by Chief of Ordnance,
August 2, 1934.

ANNEX L

ESTIMATES, CHIEF OF CHEMICAL WARFARE SERVICE

Annex:	Priority:	Item	Class A	Class B	Total
G	9	1, 3, 3, 4	\$ 7,440		\$ 7,440
		5		\$ 1,860	1,860
		6	1,860		1,860
		7		1,860	1,860
		8	1,860		1,860
		9		1,860	1,860
		10, 11	3,720		3,720
		12		1,860	1,860
		13	1,860		1,860
		14		1,860	1,860
		15, 16, 17	5,580		5,580
		18		1,860	1,860
GRAND TOTAL			\$ 22,320	\$ 11,160	\$ 33,480

Approved by Chief, Chemical Warfare Service,
July 24, 1934.

ANNEX M

ESTIMATES, CHIEF SIGNAL OFFICER

Annex:	Priority:	Item :	Class A :	Class B :	Class C :	Total
B	4	2	\$ 240:	\$ 634:	\$	374
		3	1,832:	163:		1,995
		4	1,600:	240:		1,920
		5	1,920:			1,920
		6	1,841:			1,841
		7		\$ 634:		634
		8			480:	480
		9			240:	240
		10	1,538:			1,538
		11	219,755:	90,968:	69,757:	380,480
	5	1		480:		480
		2			847:	847
		3			847:	847
		4			1,422:	1,422
		5	769:			769
Total			229,575:	92,485:	74,227:	396,287
C	2	1		770:		770
		2		770:		770
		3		770:		770
		4		770:		770
		5		770:		770
		6		770:		770
Total				4,620:		4,620
E	3	1	157:			157
		2	30:			30
	7	1	156:			156
		2	60:			60
		3		45:		45
Total			403:	45:		448
GRAND TOTAL			\$ 229,978:	\$ 97,150:	\$ 74,227:	\$401,355

Approved by Acting Chief Signal Officer,
September 15, 1934.