

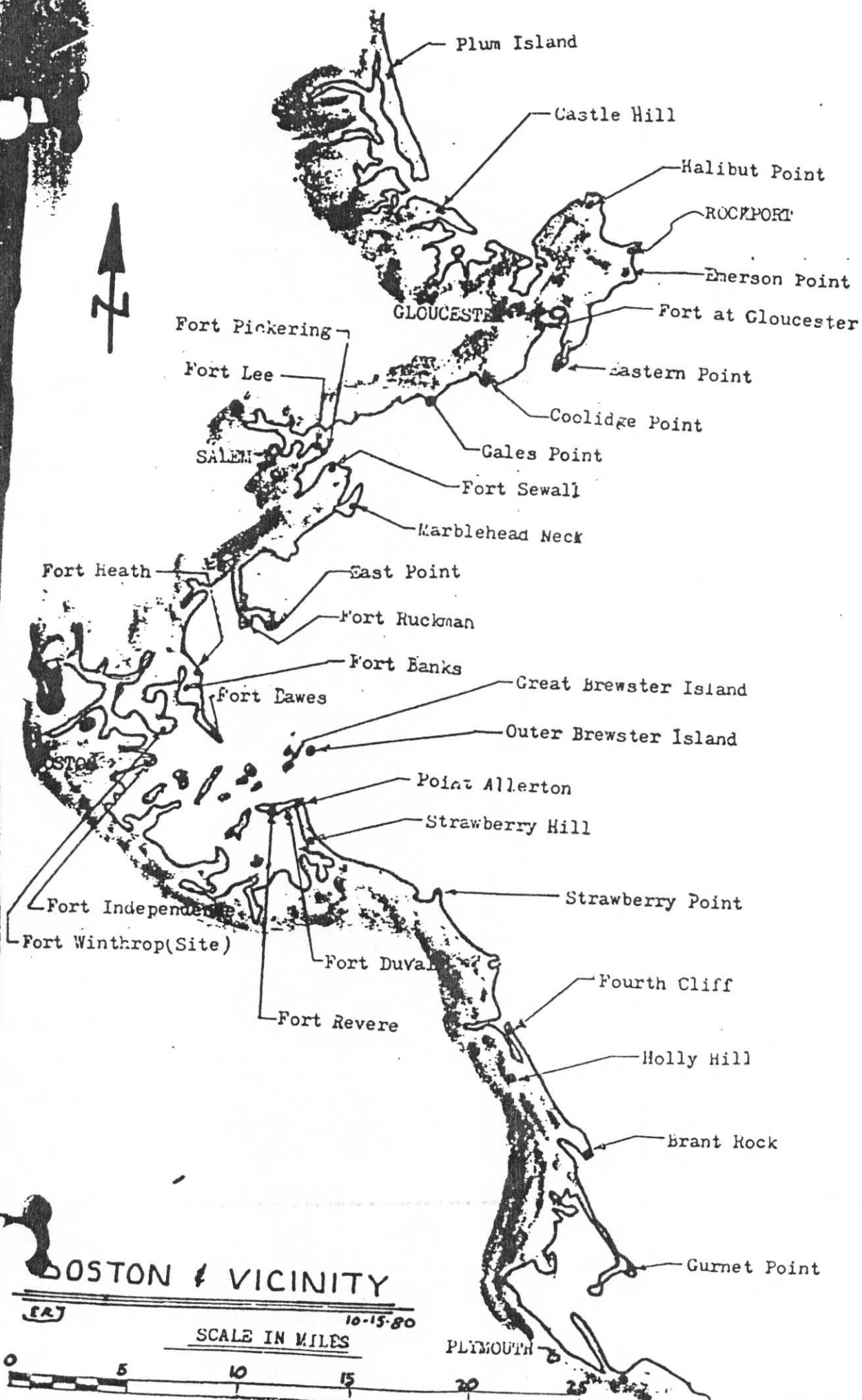
**CONFERENCE NOTES FOR THE
18TH ANNUAL CONFERENCE OF THE
COAST DEFENSE STUDY GROUP**

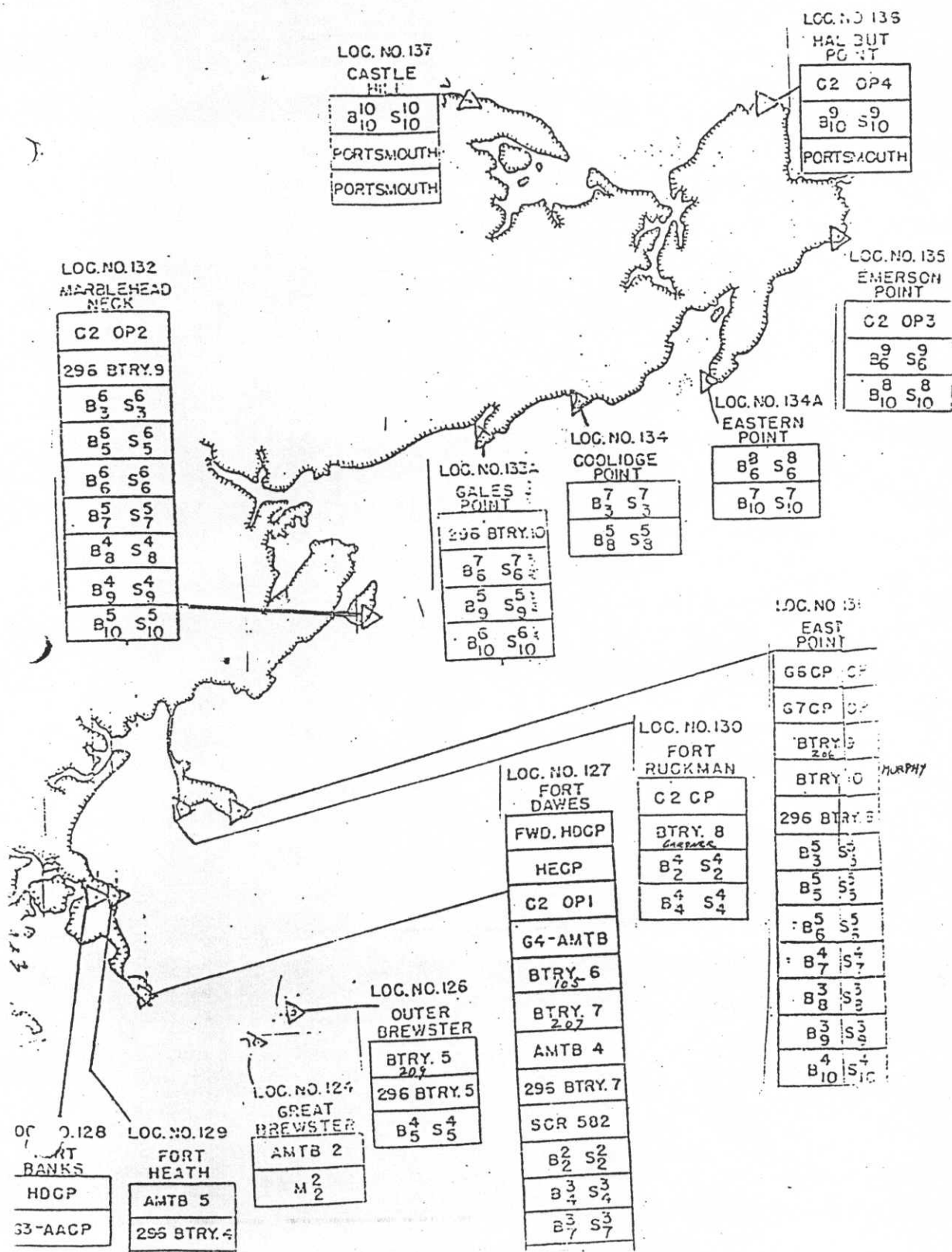
**NORTH BOSTON
Supplement**

October 18 – 21, 2001

**Summary Histories, Site Plans, Engineering Drawings,
and Reports of Completed Works.**

**Coast Defense Study Group Press
1560 Somerville Road
Bel Air, Maryland 21015
(as distributed at conference)**





Fort BANKS

(Maj. Gen. Nathaniel P. Banks, U.S. Volunteers, died 01-SEP-1894 - GO#134,AGO,22-JUL-1899). Site acquired ca. 1890 (for 32 x 12"BLM). Boston Harbor Defense HQ ca. 1922+. Harbor Defense Command Post (HDCP) during WWII. Later supported Nike forces.

Most of the fort has been converted to other uses (housing, school, cemetery, garage, soccer field). The last original building was demolished in 2000. Mortar batteries mostly buried in 1970's. Partially re-excavated in early 1990's. Currently (2001) partially buried by housing; partially uncovered and used by Town of Winthrop.

Battery SANFORD KELLOGG

(Brevet Col. Sanford C. Kellogg, U.S. Volunteers (Maj. 4th U.S. Cavalry), served in Civil War, died 07-FEB-1904 - GO#20,WD,25-JAN-1906). Eight (8) twelve-inch (12") breech-loading mortars (front pits of an Abbot quad). Major modifications during its lifetime (see below); ordnance replaced with that from Btry Meiggs. Models & s/n's as follows:

	Original Mortar <u>M-1886(C.L.)</u>	Original Carriage <u>M-1891</u>	Replacement Mortar <u>M-1890mI</u>	Replacement Carriage <u>M-1896</u>
1	54 (BIF)	38 (Poole)	122	159 (LEEW)
2	49 (BIF)	55 (Poole)	112	170 (LEEW)
3	25 (BIF)	69 (Poole)	109	171 (LEEW)
4	52 (BIF)	53 (Poole)	111	173 (LEEW)
5	48 (BIF)	68 (Poole)	81	174 (LEEW)
6	37 (BIF)	44 (Poole)	117	172 (LEEW)
7	50 (BIF)	70 (Poole)	110	208 (MDS)
8	24 (BIF)	49 (Poole)	125	175 (LEEW)

Battery BENJAMIN LINCOLN

(Maj. Gen. Benjamin Lincoln, ... Continental Army ... Revolutionary War ... First Secretary of War, Continental Government, 30-OCT-1781 thru 12-NOV-1783, died 09-MAY-1810 - GO#194,WD,27-DEC-1904). Eight (8) twelve-inch (12") breech-loading mortars (rear pits of an Abbot quad). Major modifications during its lifetime (see below); ordnance exchanged with Btry Bagley. Models & s/n's as follows:

	Original Mortar <u>M-1886(C.L.)</u>	Original Carriage <u>M-1891</u>	Replacement Mortar <u>M-1890mI</u>	Replacement Carriage <u>M-1896</u>
1	61 (BIF)	18 (BIF)	3	216 (MDS)
2	72 (BIF)	20 (BIF)	41 (BIF)	218 (REC)
3	27 (BIF)	19 (BIF)	39 (BIF)	217 (MDS)
4	63 (BIF)	17 (BIF)	37 (Beth.)	219 (REC)
5	23 (BIF)	29 (BIF)	7 (Niles)	214 (MDS)
6	26 (BIF)	27 (BIF)	8 (Niles)	213 (MDS)
7	41 (BIF)	30 (BIF)	37 (BIF)	215 (MDS)
8	28 (BIF)	28 (BIF)	9 (Niles)	212 (MDS)

Banks (cont.) -

Accident 15-OCT-1904. Saturday morning practice firing with live shells by the 89th Company of the Coast Artillery Corps. Premature firing with breechblock not fully closed. Apparently the lanyard of mortar #63 was connected to the friction primer with the breechblock open, became tangled in the breech mechanism, and was pulled from the primer as the breechblock moved. Killed were Provost Sgt. George A. Nevins of Somerville, MA; Pvt. Edward Higgins of Boston, MA. Pvt. James W. Kelly of Albany, NY; Pvt. Arthur Tomlinson of Lynn, MA. Nine other men were seriously injured. Technical details [per Glen Williford]: Breech of mortar (#63) blown off; hit and damaged muzzle of another (#27) beyond repair; minor damage to a third (#72). Mortar #41 moved from carriage #30 to replace mortar #27 on carriage #19. Mortar #63 rebuilt and returned to service. New mortar M-1886/90 (s/n #9) was built and placed on carriage #30 ca. 1909.

Summary of modifications to Btrys Lincoln/Kellogg:

- Started June/1891.
- Originally transferred 01-JUN-1897.
- Floors of 3 pits (Kellogg + Lincoln/B) raised 4 feet to improve drainage from the mortar wells (sometime prior to 1910).
- LINCOLN rebuilt 1911-1912. Pits enlarged and new magazines built; ordnance exchanged with Btry Bagley, Ft. Caswell, North Carolina (see 'replacement mortars/carriages' above).
- KELLOGG rebuilt 1913-1914. Pits enlarged and new magazines built; ordnance replaced from Btry Meiggs, Ft. Washington, Potomac R. defenses (see 'replacement mortars/carriages' above).
- New Plotting Rooms
- New Powerplant
- Two (2) mortars and carriages [positions #5 and #7] removed from both Lincoln and Kellogg in 1918 (this is unusual in that it left 6 mortars in each battery rather than reducing each to four). Remainder scrapped 1942.
- Center magazines of Btry Lincoln converted to HDGP during WWII.

A/A Battery

Two (2) M-1917 3" guns (s/n __, 40) on M-1917 carriages (s/n 13, 36). (#1 gun shipped away to Watervliet at some point).

Saluting Battery

Located on top of mortar batteries (above old magazines). Two (2) 3" guns, one M-1902 (s/n 110 (*)) and one M-1903 (s/n 277), on M-1902 Bbt Carriages (Rock Island Arsenal, s/n 142, 490). Established 1922 (when harbor HQ moved here from Ft Warren). (* = this gun was manufactured in Germany(?)).

MISCELLANEOUS:

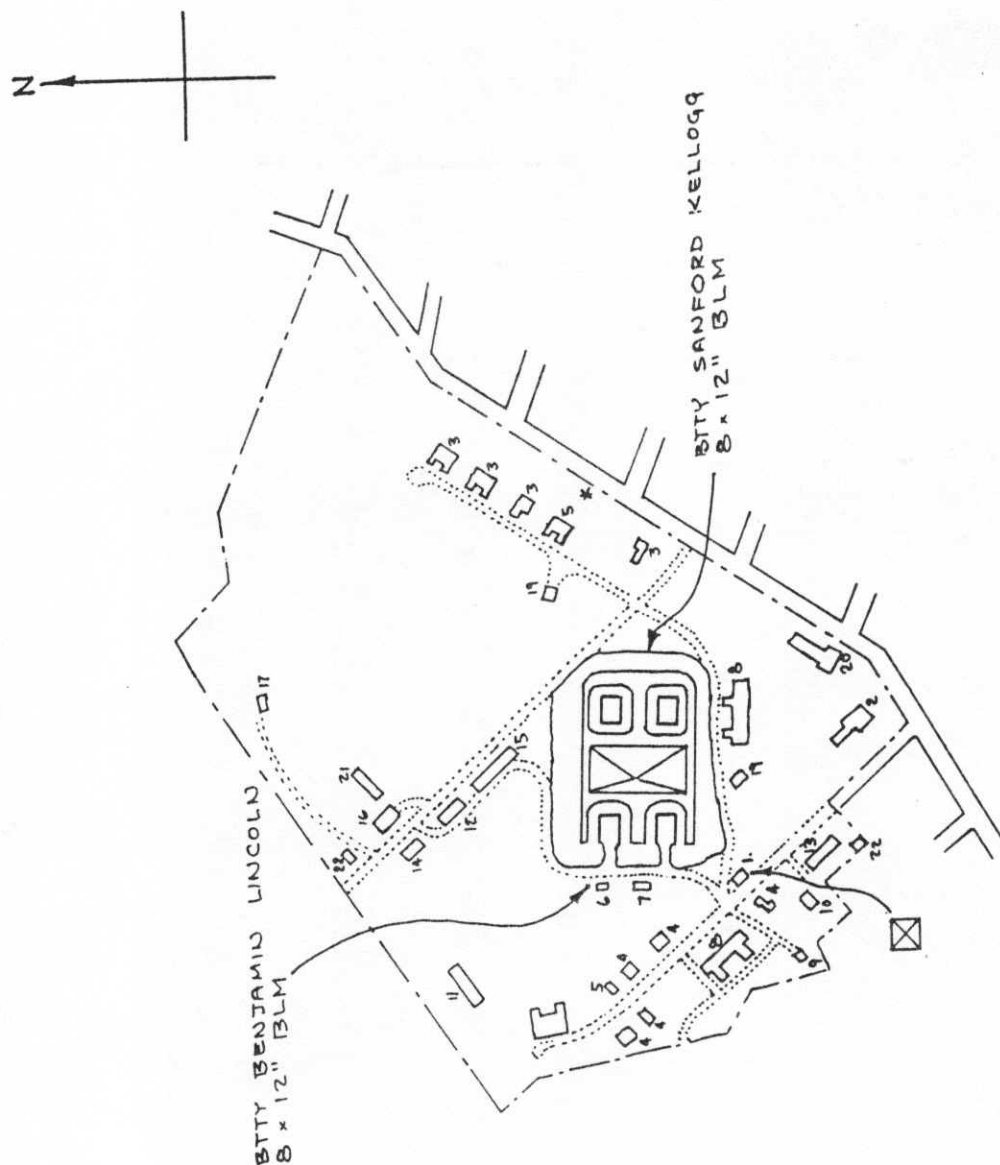
- Protected switchboard, built ca. 1920.

FIRE CONTROL

☒ POST TELEPHONE SW3D

LEGEND

1. ADMINISTRATION BLDG
2. HOSPITAL
3. OFFICER'S QUARTERS
4. N.C.O.'S QUARTERS
5. HOSP. STWDS QUARTERS
6. SWITCHBOARD ROOM
7. POWERHOUSE
8. BARRACKS
9. FIRE-APPARATUS HOUSE
10. GUARD HOUSE
11. COMMISSARY STOREHOUSE
12. ORDNANCE STOREHOUSE
13. QUARTERMASTER STOREHOUSE
14. BAKERY
15. COAL SHED
16. STABLE
17. GARAGE CREMATORY
18. SCALES
19. BARN
20. GYM & POST EXCHANGE
21. WAGON SHED
22. SHOP
23. BAND ROOM



FORT BANKS - BOSTON

JAN. 1908

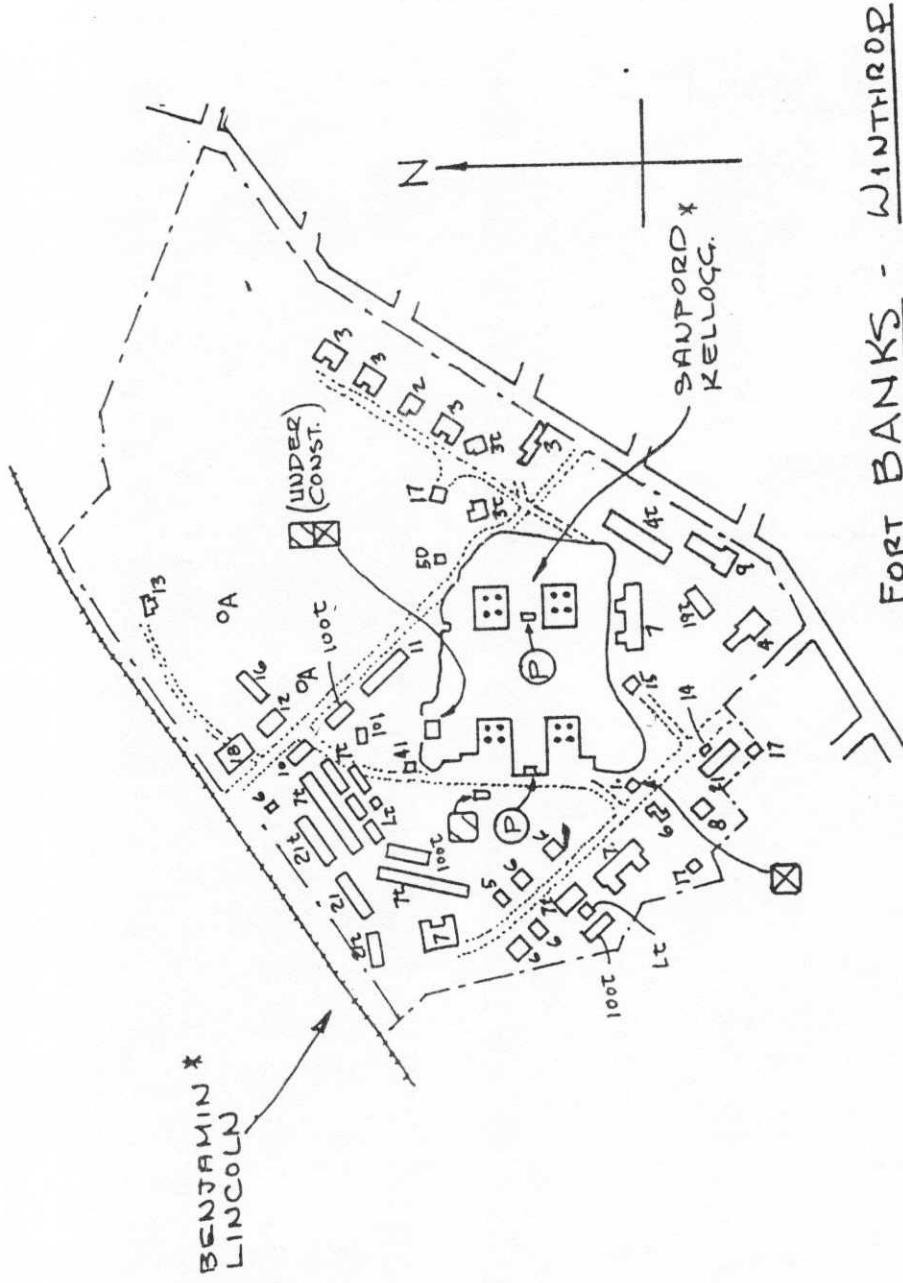
(MINOR ROADS OMITTED)



T. VAUGHAN 11/82

LEGEND

- 1 ADMIN. BLDG.
- 2 CO'S QTRS
- 3 OFFICER'S QTRS (TEMP)
- 3L OFFICER'S QTRS (TEMP)
- 4 HOSPITAL (TEMP)
- 4L HOSP. STWDS. QTRS.
- 5 NCO'S QTRS
- 7 BARRACKS
- 7L BARRACKS (TEMP)
- 8 GUARD HOUSE
- 9 PX & GYM
- 10 BAKERY
- 11 COAL SHED
- 12 STABLE
- 13 CREMATORY
- 14 SCALES
- 15 BARN
- 16 WAGON SHED
- 17 SHOP
- 18 GARAGE
- 18L NURSES HOME (TEMP)
- 100L MESS (TEMP)
- 21 Q.M. STOREHOUSE (TEMP)
- 21L " "
- 41 ENCL.
- 50 PIGEON COTE
- 101 GREENHOUSE



FORT BANKS - WINTHROP

APRIL 1920



* = EACH BATTY 2 METERS ONLY
A = 3" A/A GUN.

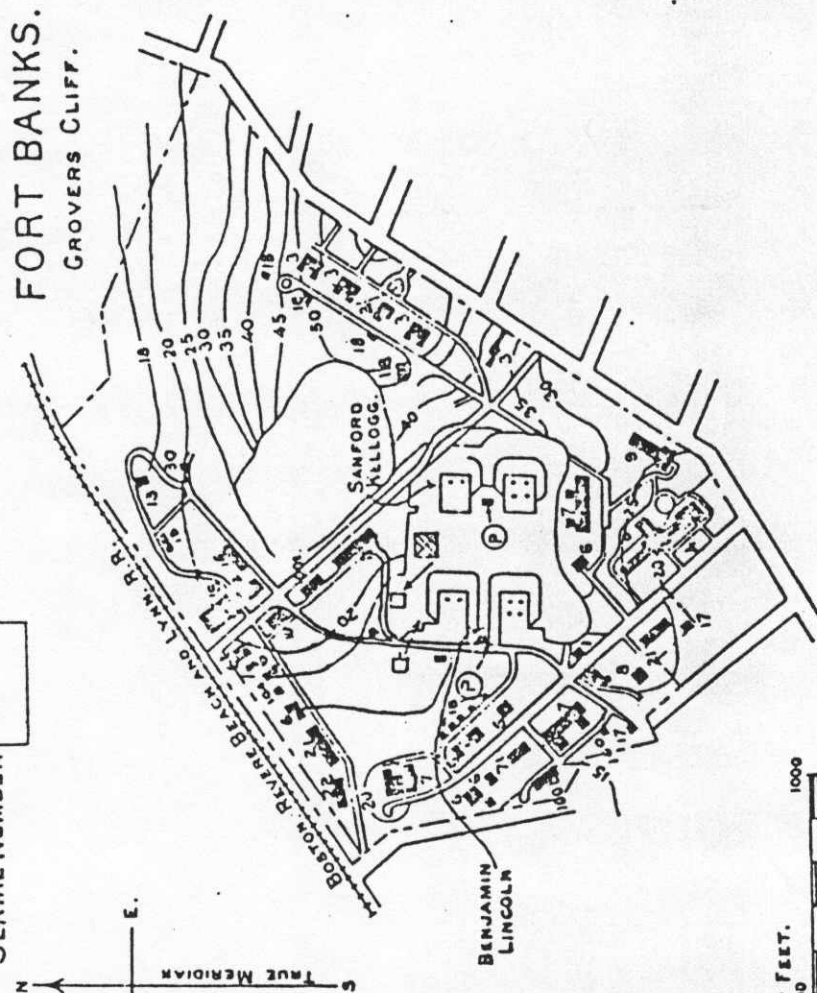
BOSTON HARBOR MASS. BATTERIES.
 FORT BANKS. LINCOLN 6-12'M.
 GROVERS CLIFF. KELLOGG 6-12'M.

SERIAL NUMBER

EDITION OF MARCH 4 1914.
 REVISIONS DEC 7, 1913.
 NOV 6, 1916; APR. 6, 1920; FEB. 17, 1921.
 JAN. 29, 1925; AUG. 17, 1929;
 JAN. 17, 1935; APR. 11, 1936

LEGEND

- 1 ADMINISTRATION BLDG.
- 2 COMMANDING OFF. QRS.
- 3 OFFICERS QUARTERS.
- 4 HOSPITAL.
- 5 HOSPITAL STORES.
- 6 NCO QUARTERS.
- 7 BARRACKS.
- 71 QUARTERMASTER SHOP
- 8 GUARD HOUSE.
- 9 GYMNASIUM
- 10 BAKERY.
- 11 COAL SHED.
- 12 ORD. MACH. SHOP
- 13 CREMATORY.
- 15 WAGON SHED & BLACKSMITH SHOP
- 17 SHOP
- 18 GARAGE.
- 2001 LUMBER SHED
- 21. ARTILLERY ENGR. & PLUMBING SHOP
- 22. Q. M. ST. HOUSE
- 41
- 50
- 61 TEMP. N.C.O. QTRS.
- 101 GRAND STAND.
- 20 SHELTER FOR MOBILE A.A. GUNS
- 100 FIRE STATION
- 104 NOSE REEL SHED



On Maintenance Status

SECRET

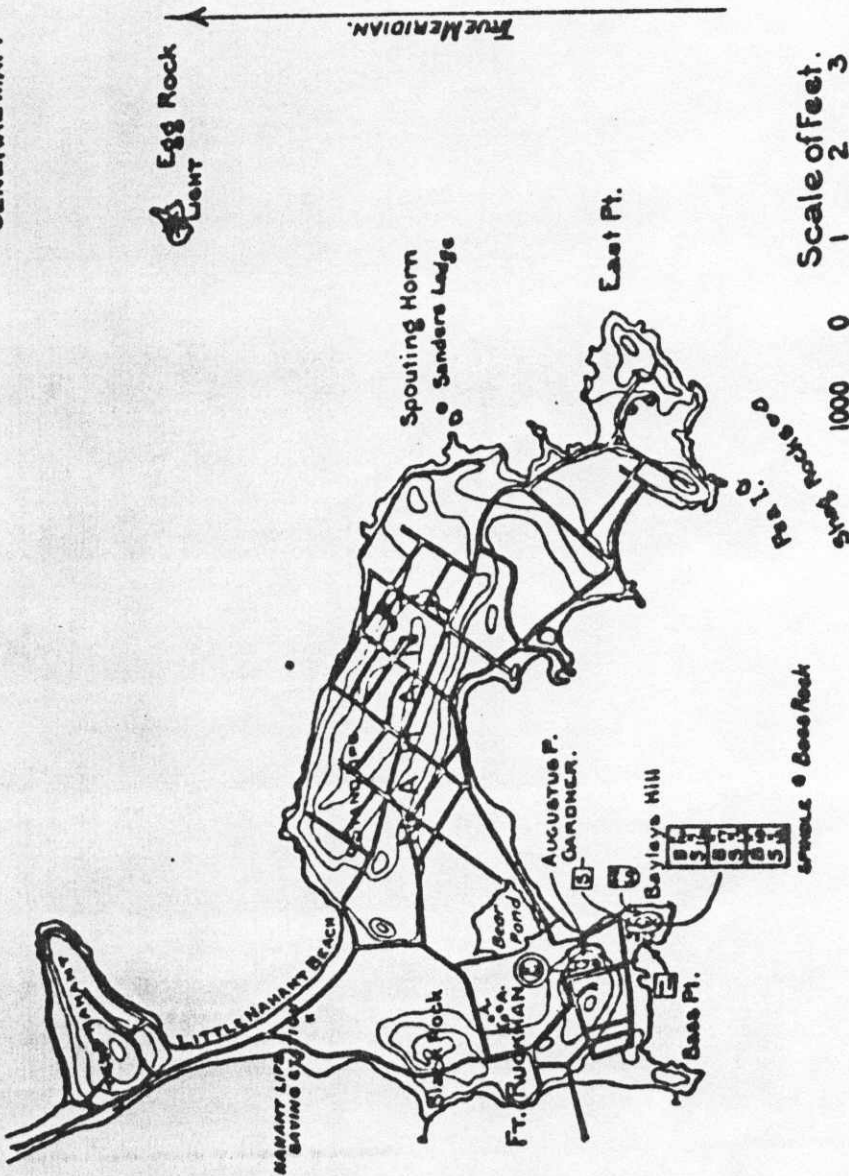
EDITION OF OCTOBER 20, 1919.
 REVISIONS: APR. 8, 1920; FEB. 17, 1921.
 JAN. 29, 1925; MAY 6, 1929; JAN. 17, 1935;
 APR. 11, 1936

SERIAL NUMBER

BOSTON HARBOR, MASS.

BATTERIES
 GARDNER 2-12"ND

NAHANT GENERAL MAP.

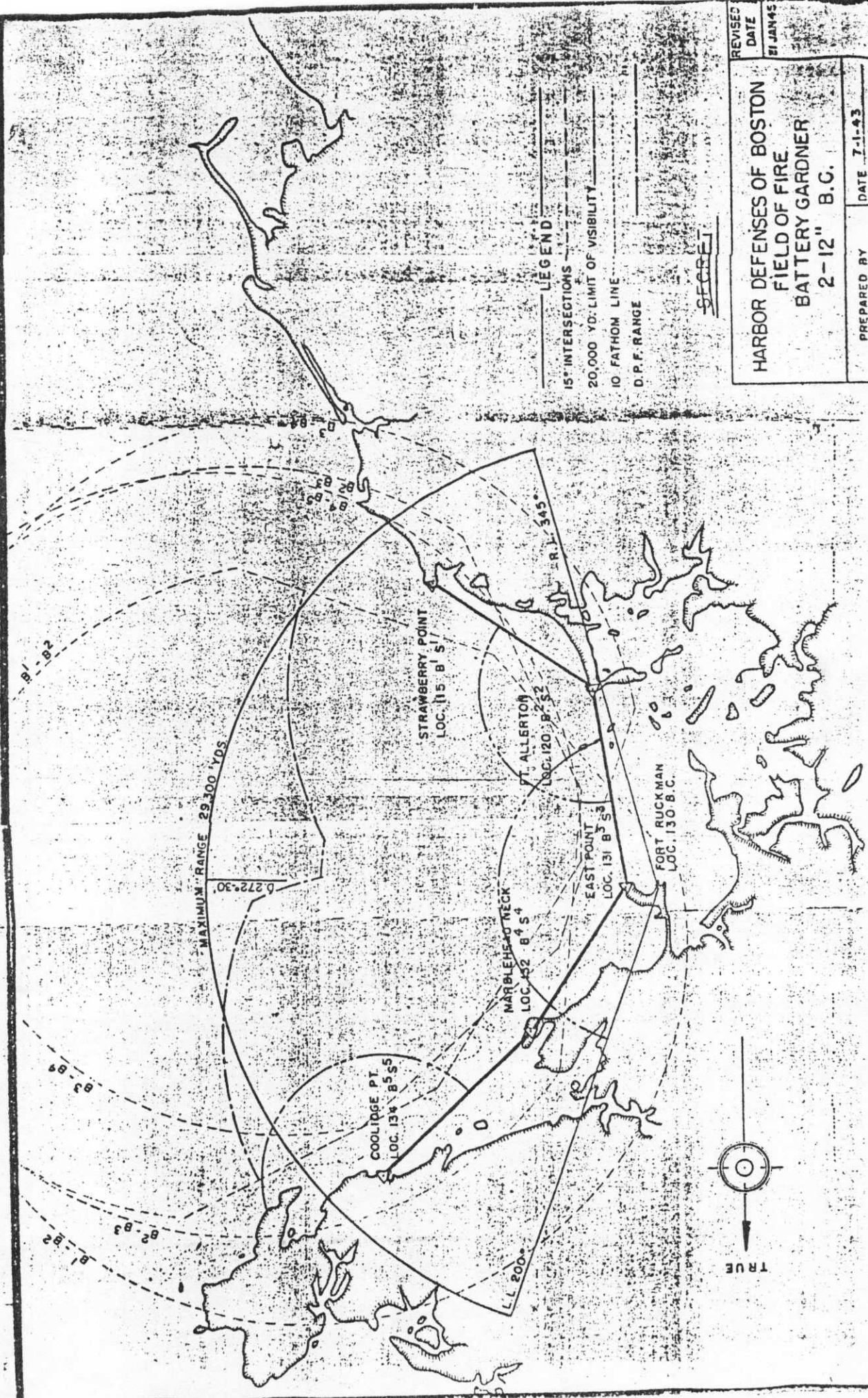


A.A. BATTERY No. 5
 3-3" A.A. Guns, Mobile
 A. - Gun Blocks for
 3" Fixed A.A. Guns

On Maintenance Status

SECRET

Exhibit 19-A



LEGEND

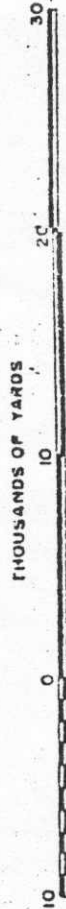
- 15° INTERSECTIONS
- 20,000 YD. LIMIT OF VISIBILITY
- 10 FATHOM LINE
- D.P.F. RANGE

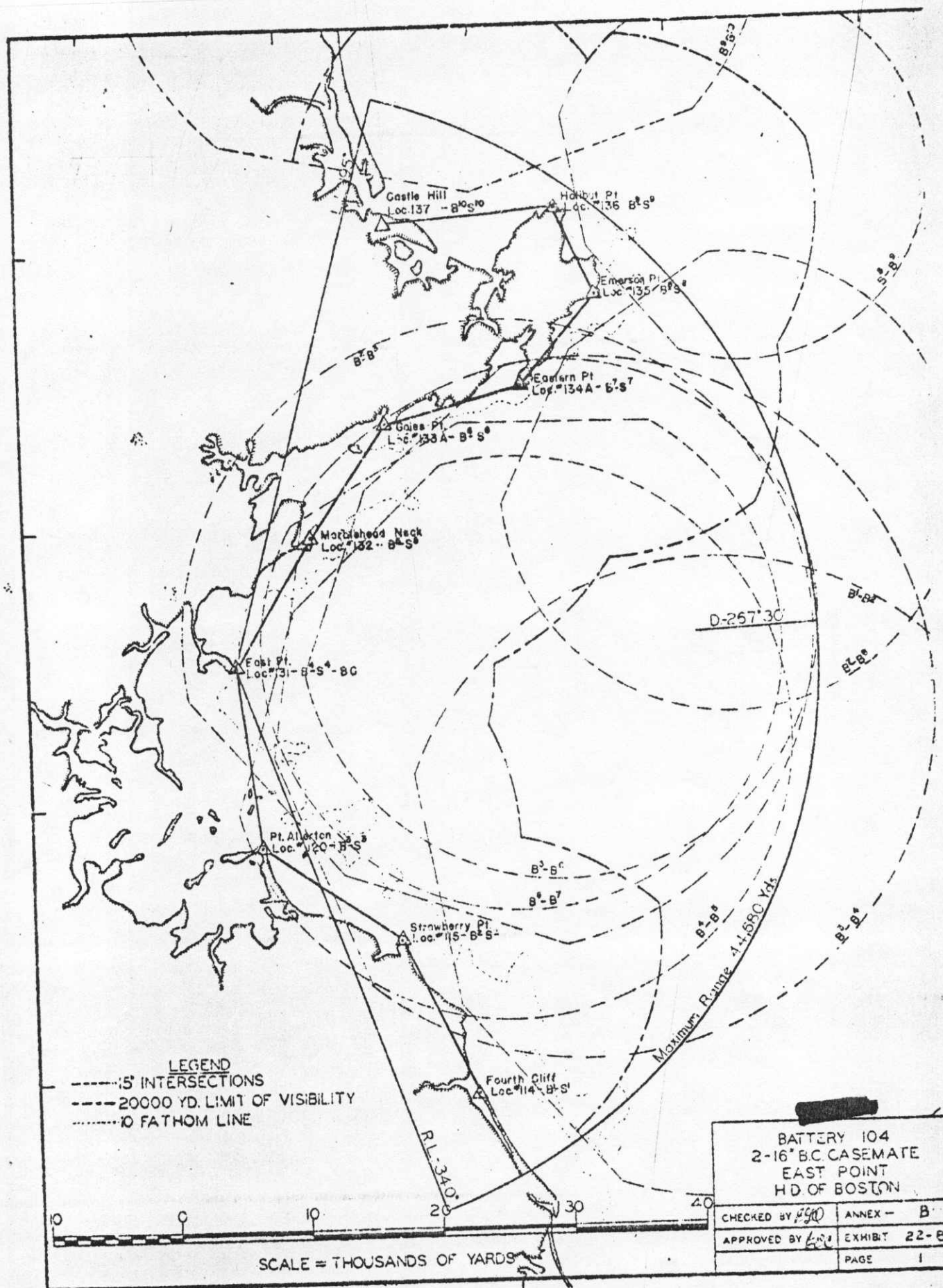
SECRET

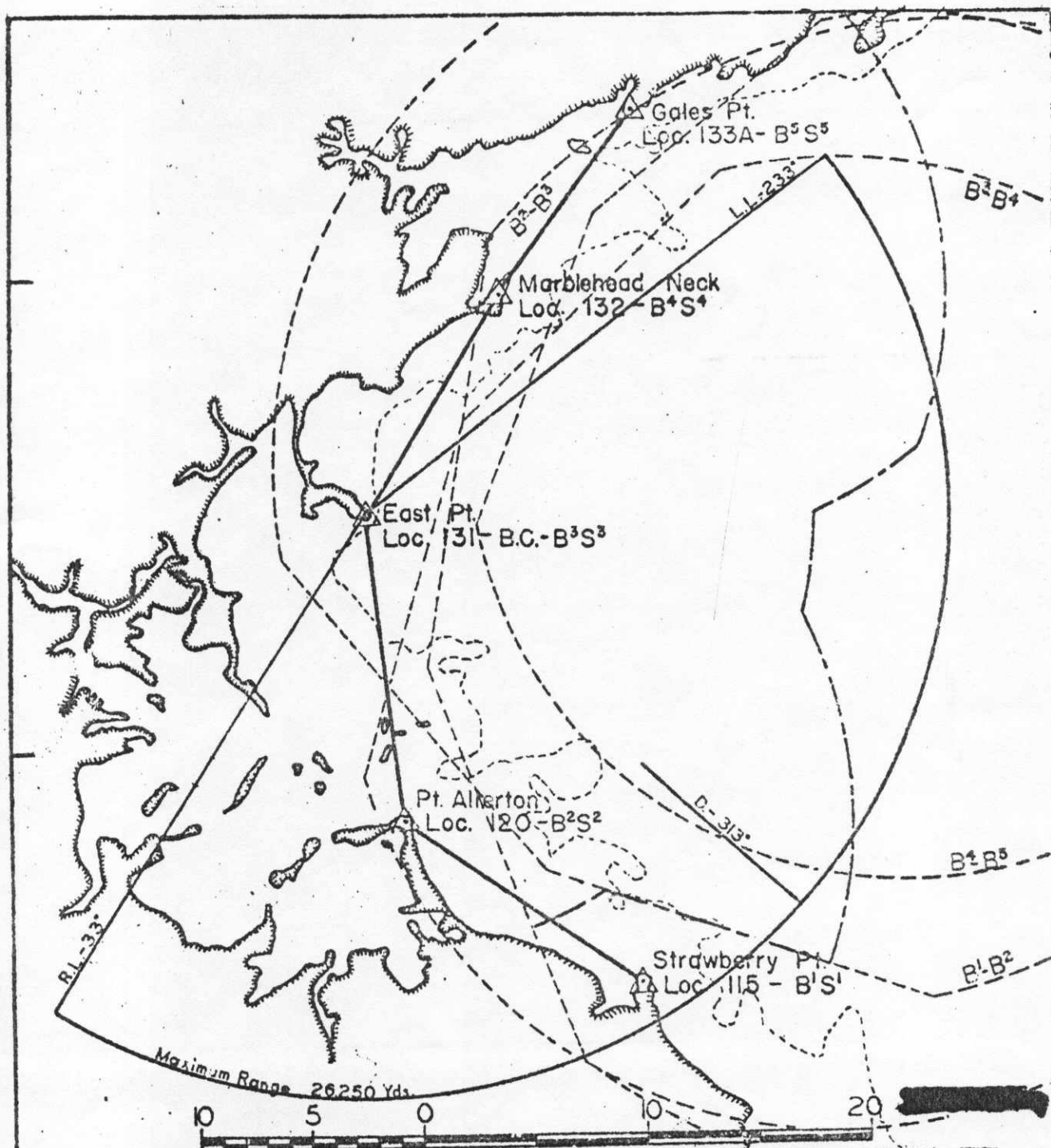
REVISED
DATE
21 JAN 45

**HARBOR DEFENSES OF BOSTON
FIELD OF FIRE
BATTERY GARDNER
2-12" B.C.**

PREPARED BY HARBOR DEFENSES OF BOSTON	DATE 7-1-43	EX. NO. 5-B-12
---	----------------	-------------------







SCALE = THOUSANDS OF YARDS

LEGEND

- 15° INTERSECTIONS
- 20,000 YD. LIMIT OF VISIBILITY
-10 FATHOM LINE

BATTERY 206
2-6" B.C. SHIELD
EAST POINT
H.D. OF BOSTON

CHECKED BY *EEO*

ANNEX - B

APPROVED BY *BCE*

EXHIBIT 21-B

PAGE 1

Fort RUCKMAN

(Brig Gen. John W. Ruckman (Maj. Gen. National Army) died 07-JUN-1921 - GO#13,WD,27-MAR-1922). Site acquired ca. 1900; intended for mortar battery, but used only for fire-control stations until WWI. Post WWII used as Nike Control (radar) site.

Battery AUGUSTUS P. GARDNER

(Augustus P. Gardner, Maj. 121st Infantry, died Camp Wheeler, Georgia 14-JAN-1918 - GO#9,WD,11-FEB-1920). Two (2) twelve-inch (12") rifles on barbette (Long-Range) carriages. Built 1918-1920s. Emplacement transferred 28-DEC-1921. Ordnance mounted 1922-1923. Casemated 1942. Disarmed 1946.

<u>emplacement</u>	<u>rifle</u>	<u>carriage</u>
1	M-1895A2 (s/n 24 {*})	M-1917 (s/n 28)
2	M-1895A2M1 (s/n 42 {*})	M-1917 (s/n 29)

{* = some sources suggest s/n 25 & 43 or some combination}

A/A Battery

Three (3) M-1917m1a2 3" guns (s/n 77, 73, 28) on M-1917mII carriages (s/n 41, 36, 40). Built 1934. Transferred (without ordnance) 06-???-1936. Battery rebuilt in altered location during WWII. Ordnance from Ft. Heath was relocated here in 1942. Transferred 25-JUN-1943.

MISCELLANEOUS:

- Searchlight #16 (60"), built 1915.
- Fire-control structures on Bailey's Hill

LEGEND

11 FENCE.

30

6 N.G.O. QUARTERS.

EDITION OF OCTOBER 20, 1912.
REVISED: APR. 6, 1920; FEB. 17, 1921.
JAN. 20, 1925; MAY 6, 1929; JAN. 17, 1933;
APR. 14, 1938

SERIAL NUMBER

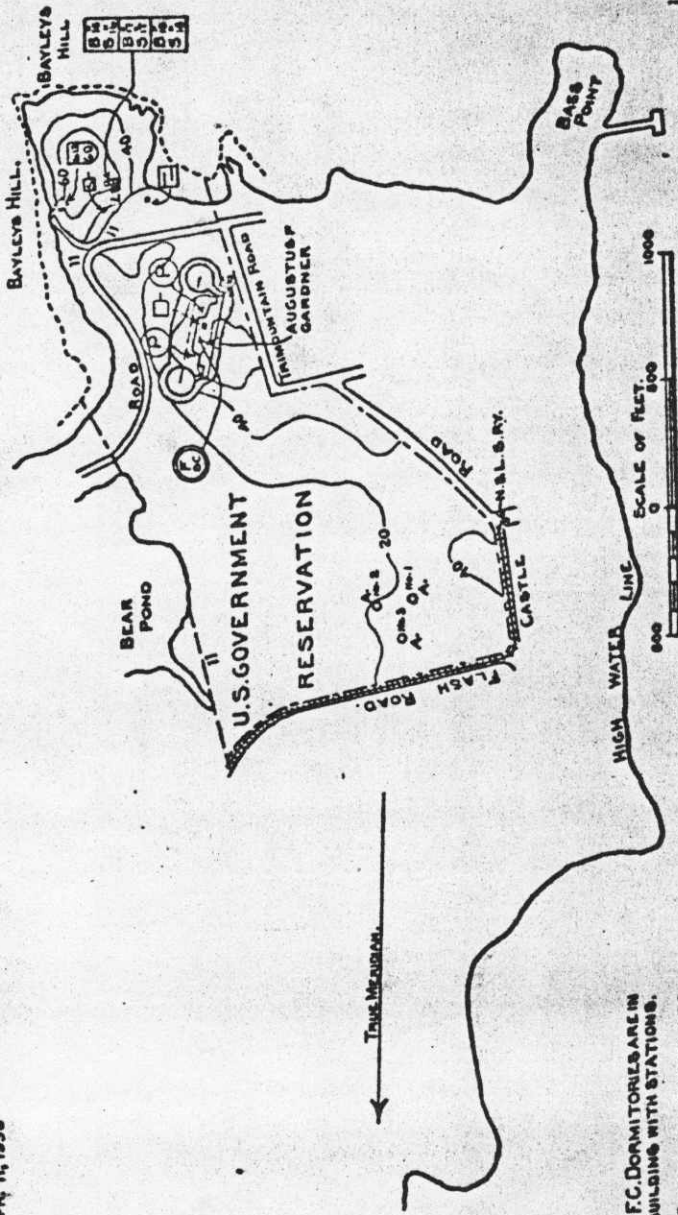
FORT RUCKMAN
BOSTON HARBOR, MASS.
NAHANT D-1.

BATTERIES.

GARDNER.....2-12" M.D

A.A. BATTERY No. 5
3-3" A.A. Guns, Mobile

A-9 Gun Blocks for
3" Fixed A.A. Guns

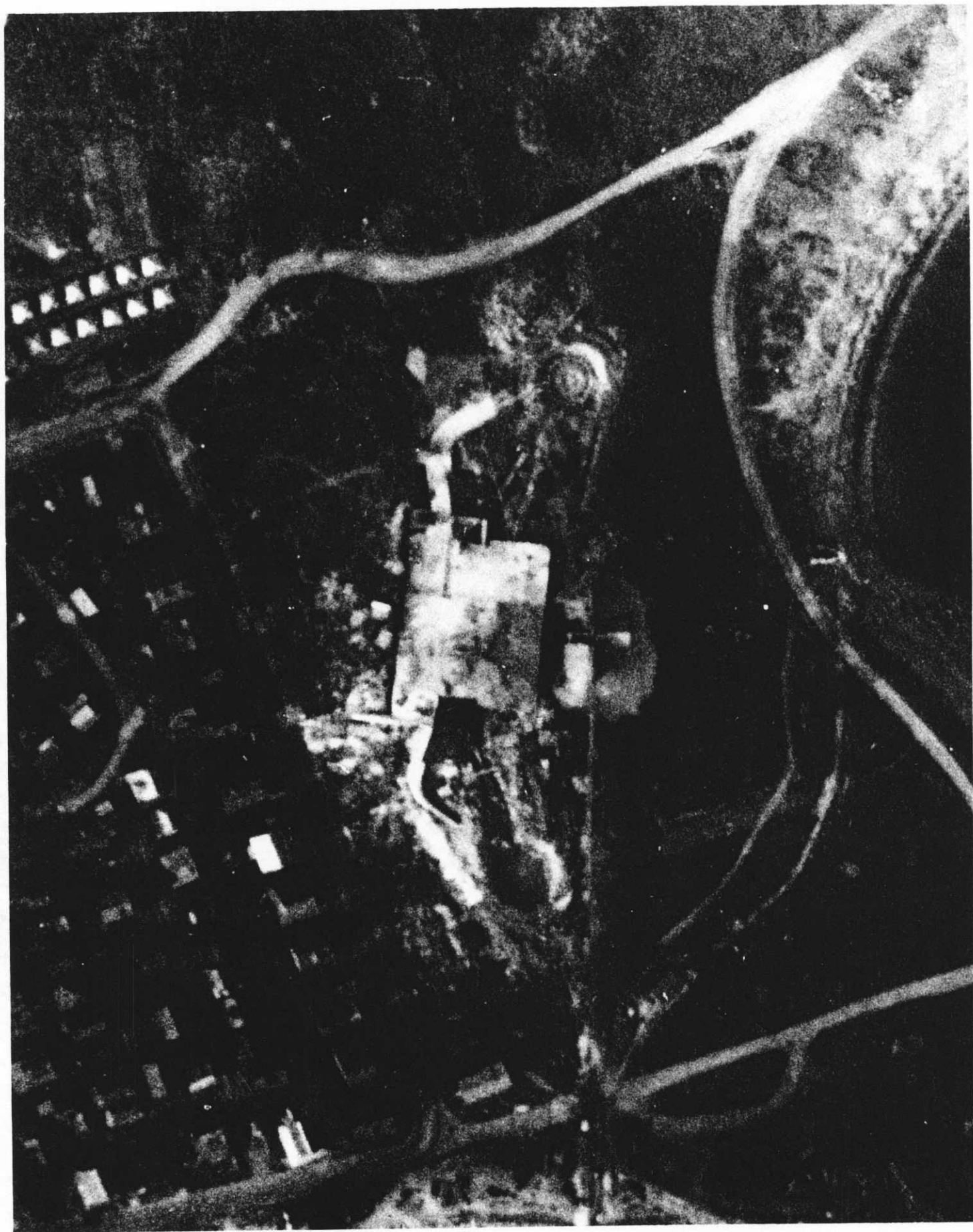


F.C. DORMITORIES ARE IN
BUILDING WITH STATIONS.
CONTOURS APPROX. ARE
REFERRED TO M.L.W.

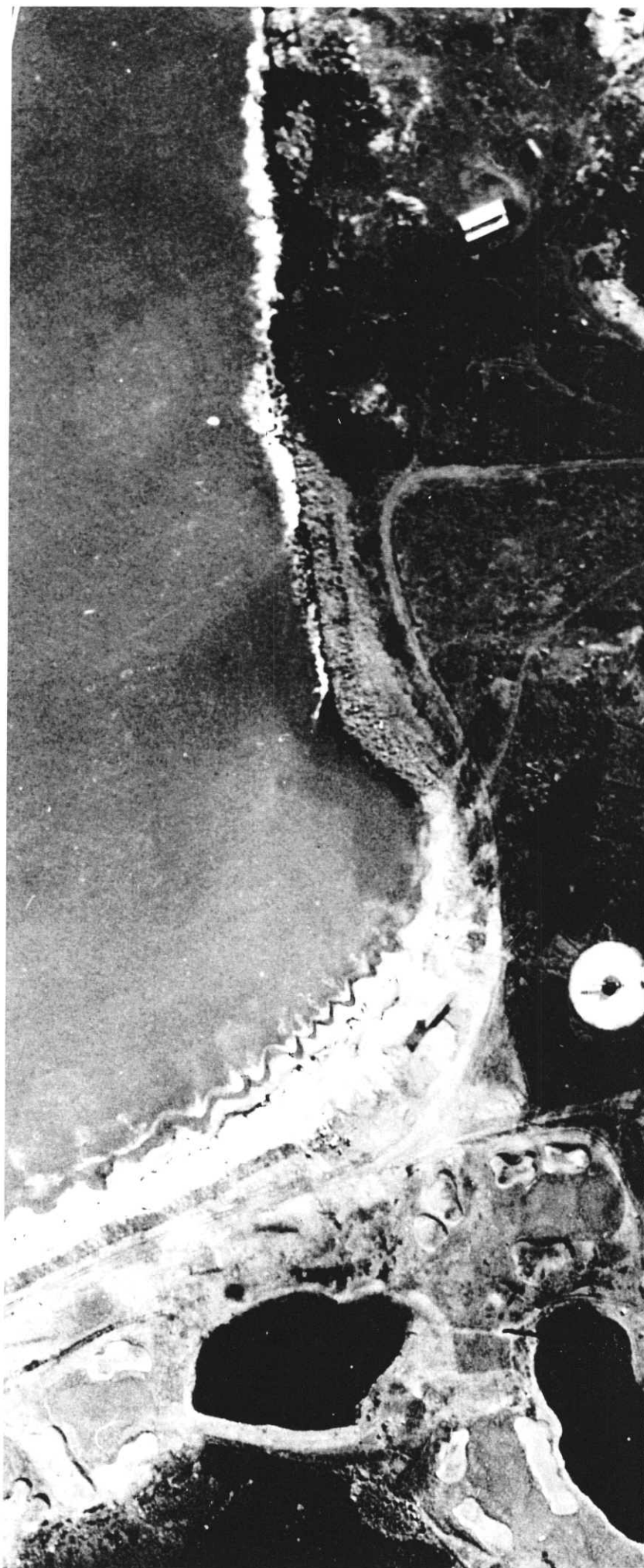
On Maintenance Status.

SECRET

Battery Gardner, Fort Ruckman, under construction (1920)



Battery Gardner, Ft. Ruckman (1933) (line is on original)



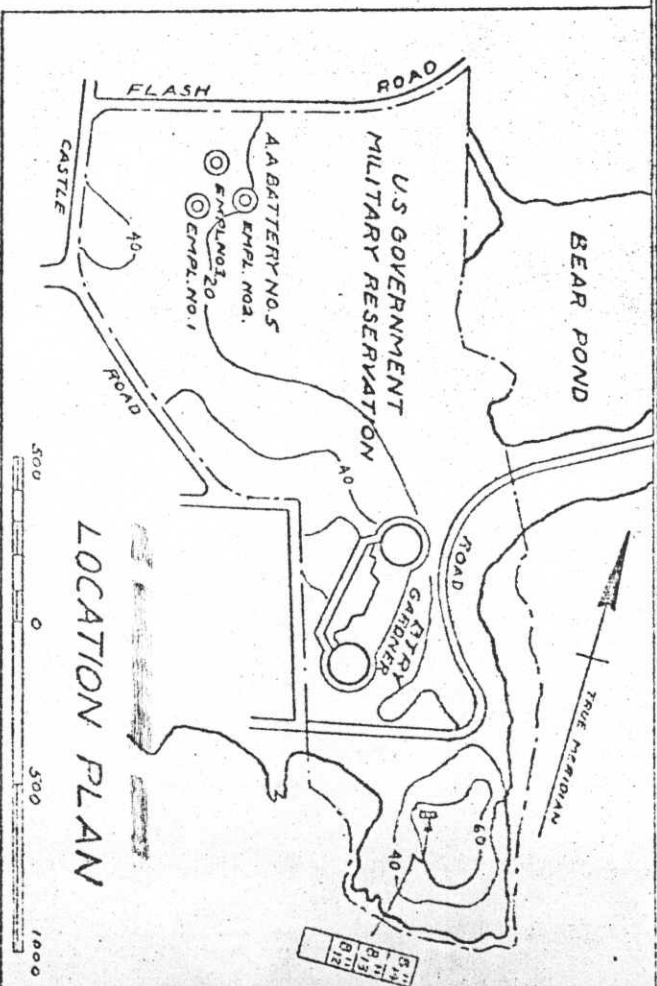
Battery Gardner, Fort Ruckman; showing WWII casemating.
This postwar (1952) photo shows some of the post
buildings already demolished in lower left.
Private houses (Trimountain Rd.) match 1933 photo.

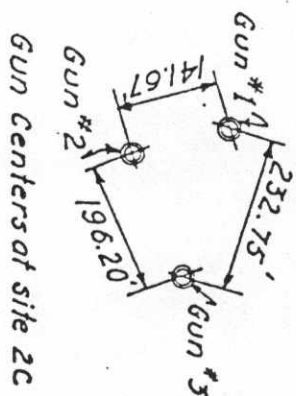
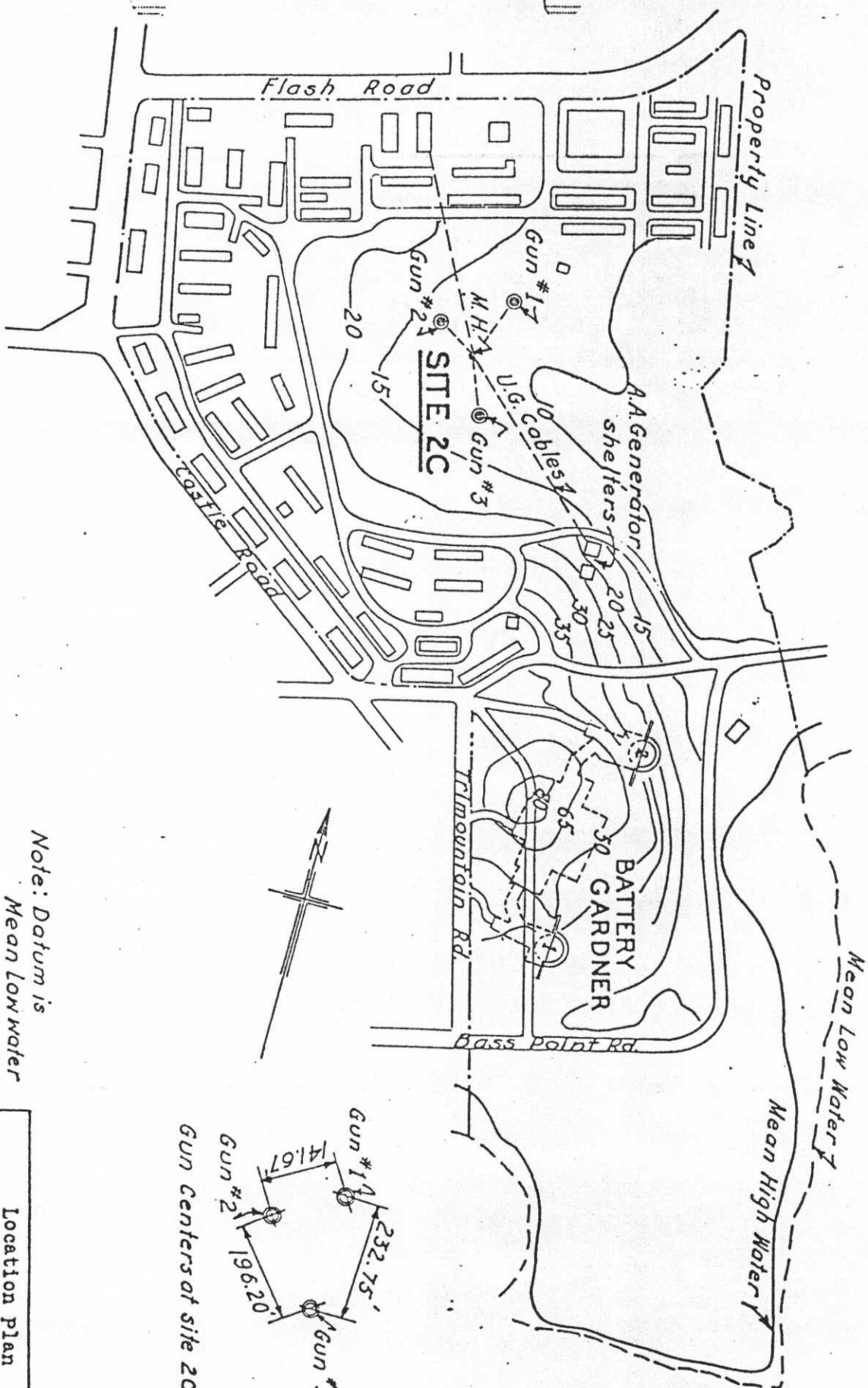


(Battery Plan)

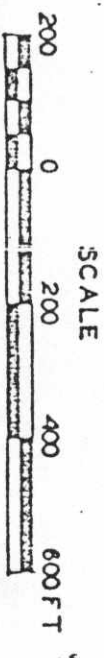
Corrected to Feb. 1, 1936.

HARBOR DEFENSES OF BOSTON
FORT RUCKMAN, MASS.
A. A. BATTERY
No. of Guns - Empl. only.





Note: Datum is
Mean low water



Location Plan

AA Battery

Location, No. 130. Site 2C.
Fort Ruckman

(Sheet 2 of 3 Sheets)

(Sheet 1 of 3 Sheets)

СПЕКОМ-1

HARBOR DEFENSES OF	Boston, Mass.
FORT <u>Ruckman</u>	Location No. <u>130</u> Site <u>2C</u>
BATTERY No. <u>4</u> , AA Mod.	No. of Guns <u>3</u>
Caliber <u>3"</u>	Carriage <u>Barbette</u>

UTILITIES (Cont'd)

ELECTRIC POWER
Sources of Lynn Gas & Electric Co.

UTILITIES:

SEYFER

DATA TRANSMISSION

REMARKS Sewer and water facilities are available at

APPENDIX

[illegible]

East Point USMR

Former estate of Sen. Henry Cabot Lodge. Temporary searchlight installation in WWI. Post WWII used as Nike Launch Site.

Battery #206

Two (2) M-1903a2 6" rifles (s/n 3, 35) on M1 barbettes (s/n 108, 104 [or 107]). Built 1942-1943. Transferred 18-JAN-1944 (conditional) . Proof-fired January, 1944. Scrapped ca. 1949.

Battery JOHN B. MURPHY (#104)

(... a Col. of Coast Artillery ...). Two (2) MkII m1 (Navy) 16" rifles (s/n 49, 76) on M4 barbettes (s/n 40, 33). Built 1942-1943. Transferred 19-JUN-1944. Scrapped ca. 1949. (appears to be only btry in which closure plates were installed; still in place in #1). Scrapped ca. 1949.

Panama Mount Battery

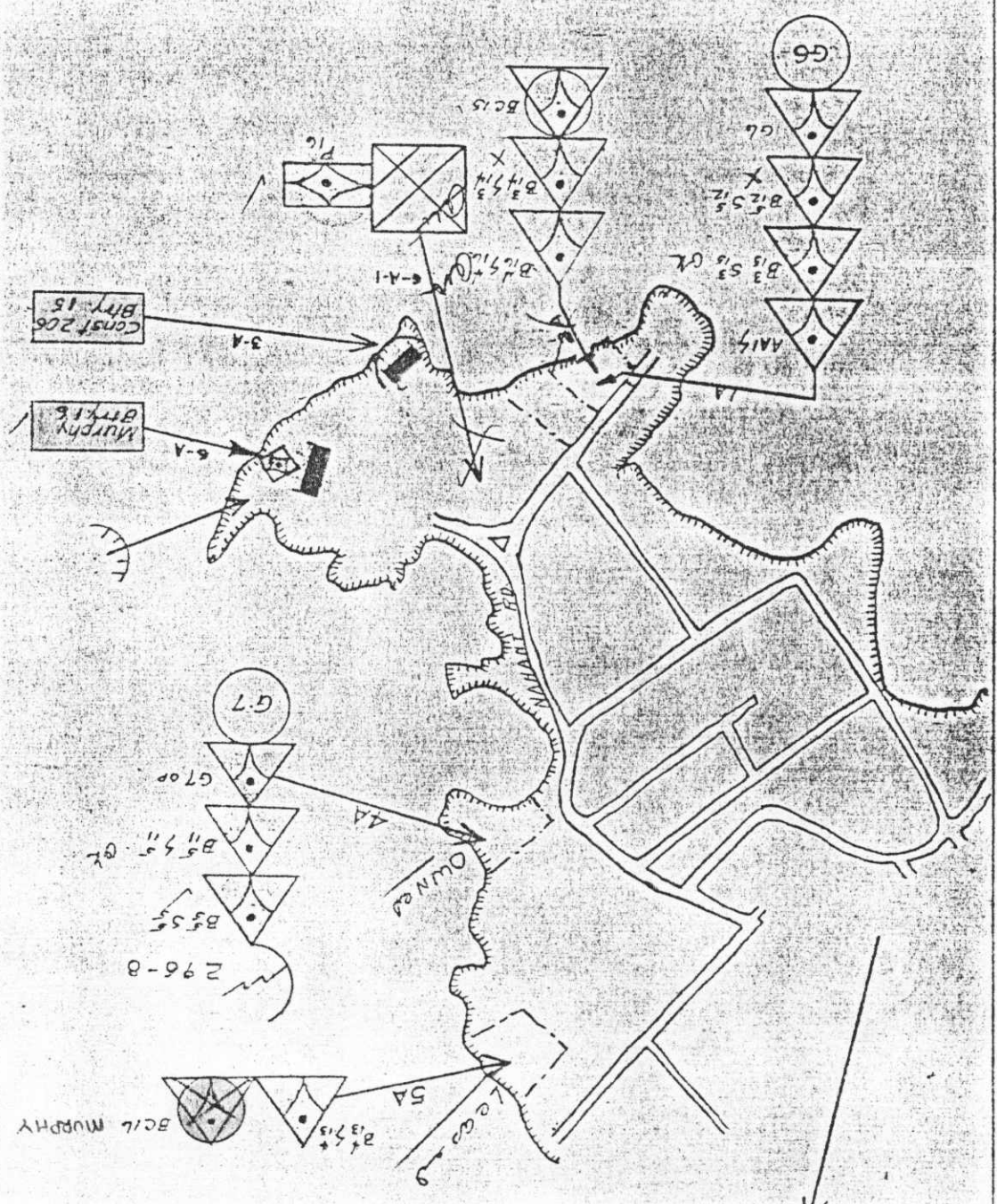
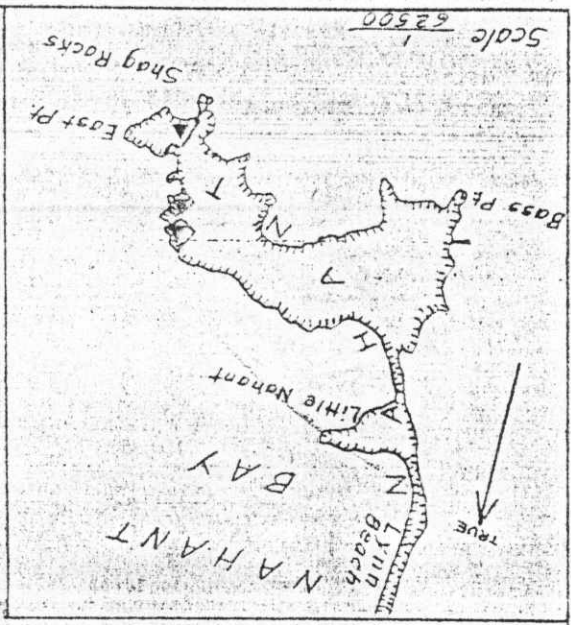
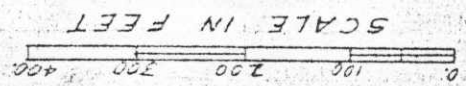
Two (2) M-1918 155mm (GPF) (s/n - 430, 426; Bullard) on GPF Carriage M-1918 (s/n 454, 278; Minnesota St. Mach. Wks.) on Panama Mounts (360°). Built 1942. Transferred 01-DEC-1994. Disarmed 1946.

MISCELLANEOUS:

- U.S. Navy magnetic-loop station (WWII).
- Antisubmarine laboratory (passive sonar) and/or Sub-Aqueous Sound Ranging (SASR) station in WWI. Removed by 1920.
- Temporary searchlight in WWI.

HARBOR DEFENSES OF
 BOSTON
 LOC. 131 EAST POINT
 FIRE CONTROL INSTALLATIONS
 PREPARED BY
 H.D. OF BOSTON
 24 JUNE 1943
 EX. NO. 9-3-20

~~SECRET~~



112004

(Sheet 7 of 7 Sheets)

Meas de ...

Fort	Location No.	Sites
Swallow Cave Road	151	33

BATTERY	No. of Guns
John Murphy #104	2 - 16"

Caliber 16" Carriage Barbette

Corrected To 25 September 1947

Factory Commenced 23 January 1942

Battery Completed 18 December 1943

Date of Transfer 19 June 1944

Cost to Transfer Date \$1,655,582.- (See Note **)

Library	New or Modernized	New Construction
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(If modernized give details on reverse side)

Turnion Elevation Gun #1 - 30.660 Gun #2 - 30.685

Datum Plane	Mean Low Water
1	1.0
2	1.0
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4	1.0
5	1.0
6	1.0
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WATER SUPPLY

Source of Lyons Water Supply

Alternate Source 2 Wells & Reservoir 50,000 Gal.

Size of Mains	6"
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Connected to Soror? Yes

Time of Disposal	Outfall to ocean
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2099	
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[illegible]

8-72092-1270

(SIS (212/51204)8-25608)ARRAEMENT "York Air Conditioning Unit - 5 Ton Capacity

P 270)

[illegible]

UTILITIES (cont'd)

ELECTRIC POWER

Sources of	Commercial & Power Plant.
1. Coal	1. Coal
2. Oil	2. Oil
3. Gas	3. Gas
4. Hydropower	4. Hydropower
5. Wind	5. Wind
6. Solar	6. Solar
7. Geothermal	7. Geothermal
8. Biomass	8. Biomass
9. Nuclear	9. Nuclear
10. Other	10. Other

Procured & Installed By (OCE or ORD) _____

Voltage 110/260 AC or DC AC Phase 1 Phase

No. of Units and Cap. 7 - 375 KVA Units.

Max. K.W. Required for Utilities 10 KW

Max. K.W. Req. for Non-Battle Conditions 10 171

Comm. Power Provided? (Yes or No) Yes Cap.

Aur. Power Unit Provided? (Yes or No) No CAP.

Type of Lighting Fixtures Standard & Vapor Froo

Commanding Unit Yes. Make and Cap. See list

looks wet or Dry - Excellent Condition

or Ventilated Air Conditioning Unit

or Heated Forced Hot Water & Blowers; also elect

units

DATA TRANSMISSION

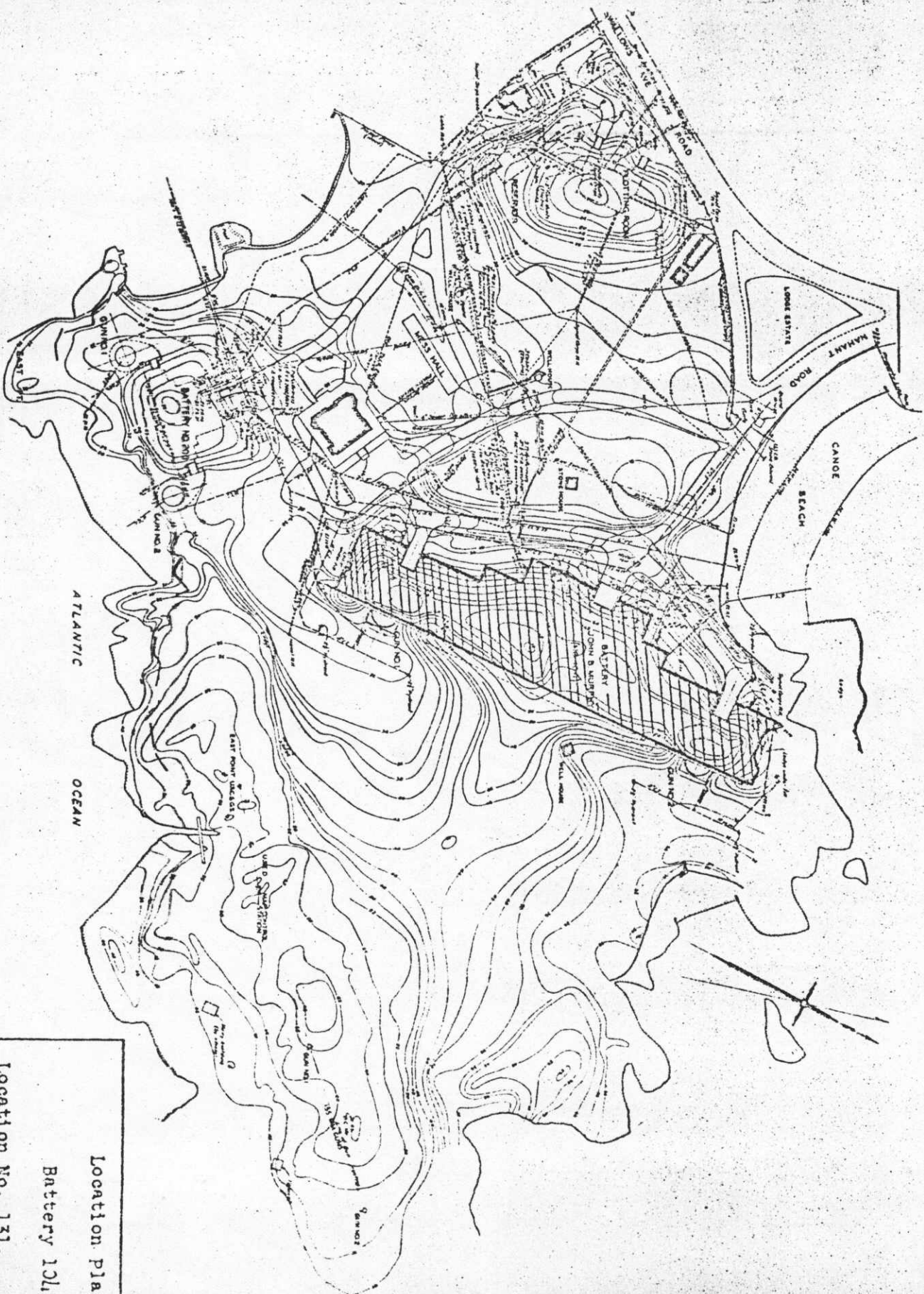
[illegible]

REMARKS Co-ordinates

Gun #1 - X - 100976.03 Gun #2 - X - 100972.03

I - 91296.10	I - 91162.97
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*See report on Lower Room for details.



Location Plan

Battery 131

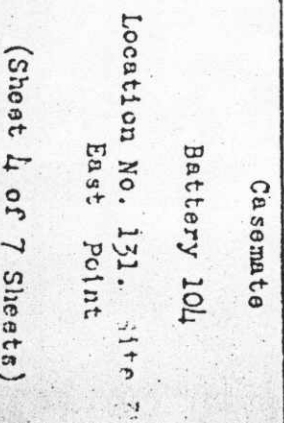
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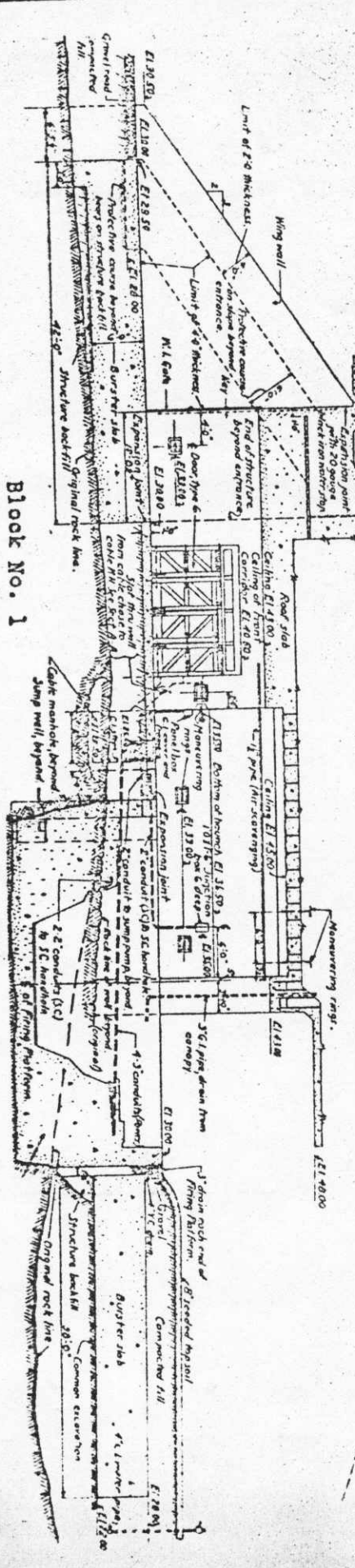
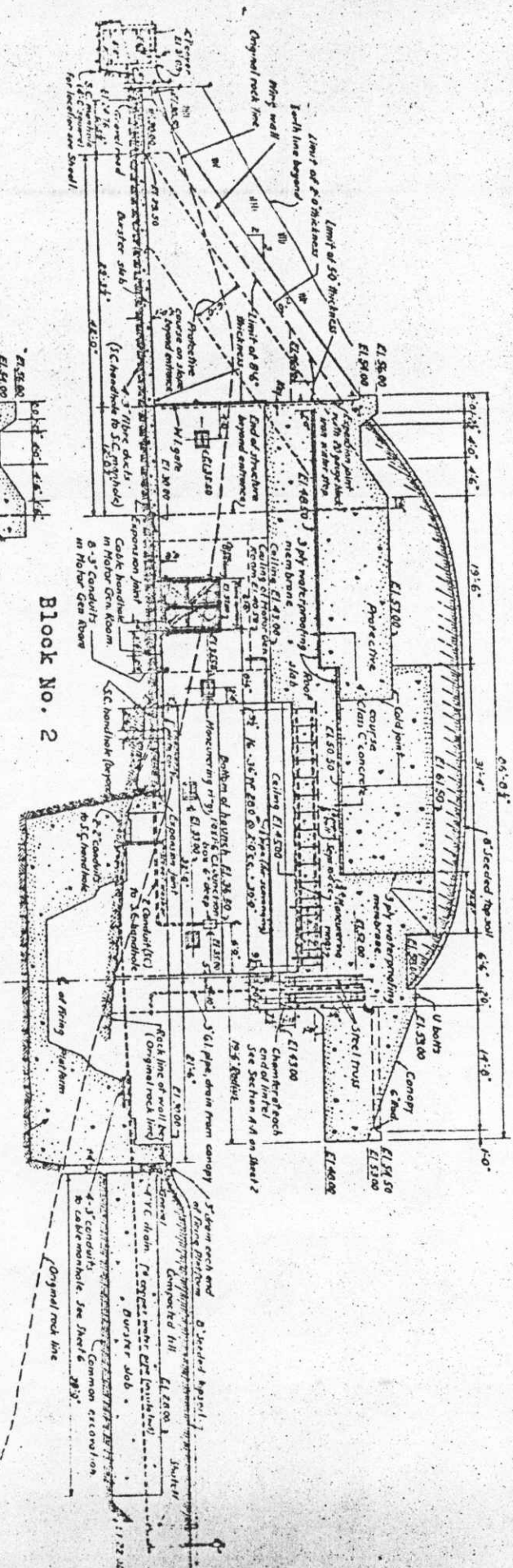
East Point

(Sheet 2 of 2 Sheets)

Photostatic Paper to M.L.W.

REPORT OF COMPLETED WORKS





Block No. 1

Block No. 2

Sections

Gur. Blocks

Battery 104

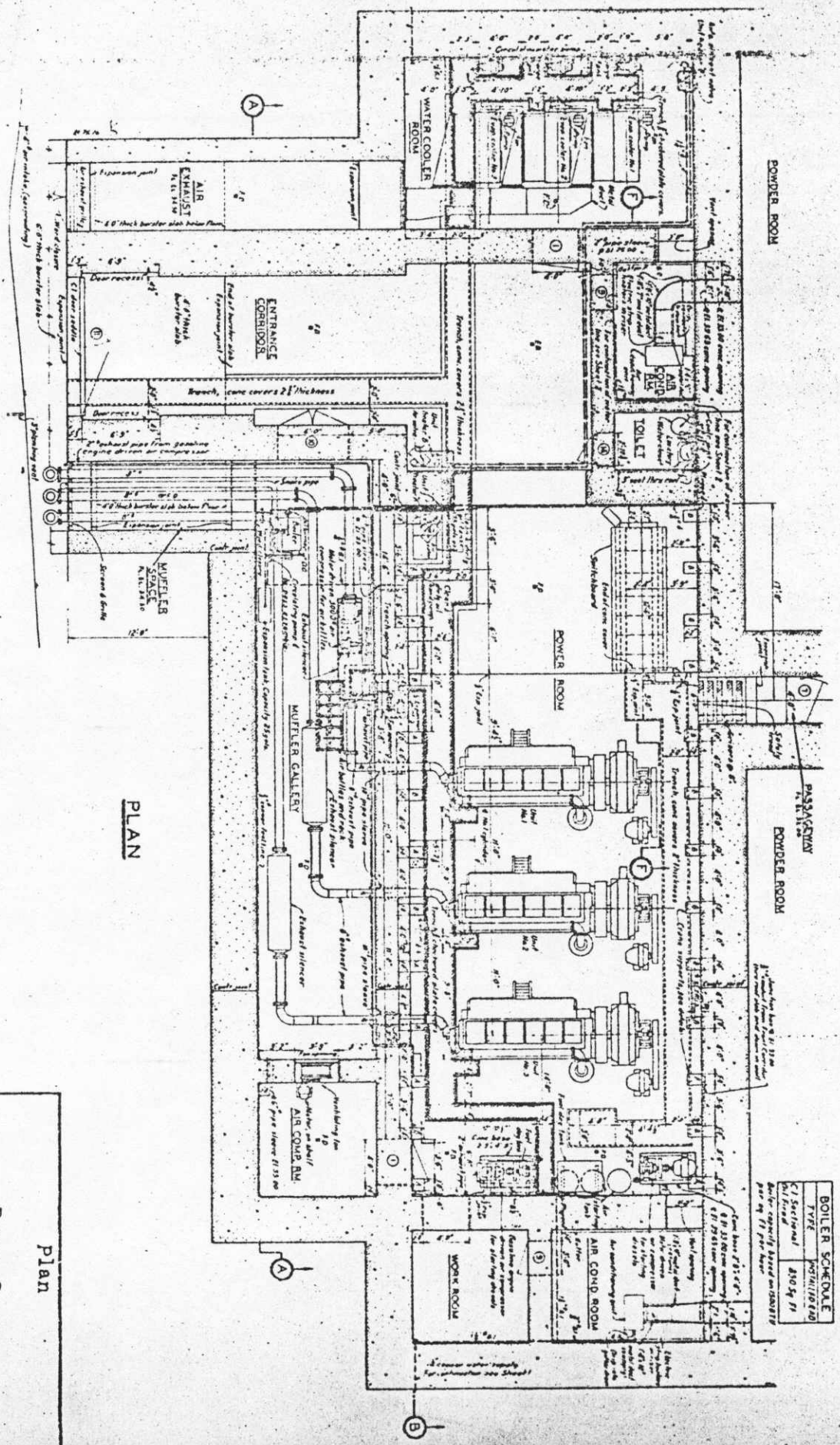
Location No. 131.

East Point

(Sheet 6 of Sheets)

Dimensions refer to M.L.W.

REPORT OF COMPLETED WORKS



PLAN

Plan

BOILER SCHEDULE	
TYPE	QTY
1. 1000 H.P. 150 PSI	1
2. 500 H.P. 150 PSI	1
3. 250 H.P. 150 PSI	1
4. 125 H.P. 150 PSI	1
5. 62.5 H.P. 150 PSI	1
6. 31.25 H.P. 150 PSI	1
7. 15.625 H.P. 150 PSI	1
8. 7.8125 H.P. 150 PSI	1
9. 3.90625 H.P. 150 PSI	1
10. 1.953125 H.P. 150 PSI	1
11. 0.9765625 H.P. 150 PSI	1
12. 0.48828125 H.P. 150 PSI	1
13. 0.244140625 H.P. 150 PSI	1
14. 0.1220703125 H.P. 150 PSI	1
15. 0.06103515625 H.P. 150 PSI	1
16. 0.030517578125 H.P. 150 PSI	1
17. 0.0152587890625 H.P. 150 PSI	1
18. 0.00762939453125 H.P. 150 PSI	1
19. 0.003814697265625 H.P. 150 PSI	1
20. 0.0019073486328125 H.P. 150 PSI	1
21. 0.00095367431640625 H.P. 150 PSI	1
22. 0.000476837158203125 H.P. 150 PSI	1
23. 0.0002384185791015625 H.P. 150 PSI	1
24. 0.00011920928955078125 H.P. 150 PSI	1
25. 0.000059604644775390625 H.P. 150 PSI	1
26. 0.0000298023223876953125 H.P. 150 PSI	1
27. 0.00001490116119384765625 H.P. 150 PSI	1
28. 0.000007450580596923828125 H.P. 150 PSI	1
29. 0.0000037252902984619140625 H.P. 150 PSI	1
30. 0.00000186264514923095703125 H.P. 150 PSI	1
31. 0.000000931322574615478515625 H.P. 150 PSI	1
32. 0.0000004656612873077392578125 H.P. 150 PSI	1
33. 0.00000023283064365386962890625 H.P. 150 PSI	1
34. 0.000000116415321826934814453125 H.P. 150 PSI	1
35. 0.0000000582076609134674072265625 H.P. 150 PSI	1
36. 0.00000002910383045673370361328125 H.P. 150 PSI	1
37. 0.000000014551915228366851806640625 H.P. 150 PSI	1
38. 0.0000000072759576141834259033203125 H.P. 150 PSI	1
39. 0.00000000363797880709171295166015625 H.P. 150 PSI	1
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41. 0.0000000009094947017729282379150390625 H.P. 150 PSI	1
42. 0.00000000045474735088646411895751953125 H.P. 150 PSI	1
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58. 0.0000000000000069388939039042292369835416800367986328125 H.P. 150 PSI	1
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65. 0.00000000000000005421010862425179091393391937500373928515625 H.P. 150 PSI	1
66. 0.000000000000000027105054312125895456966959687501869642578125 H.P. 150 PSI	1
67. 0.0000000000000000135525271560629477284834798437500932482140625 H.P. 150 PSI	1
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70. 0.00000000000000000169406589450786846610604498046875001165602890625 H.P. 150 PSI	1
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72. 0.00000000000000000042351647362696711652651124511718750002914007265625 H.P. 150 PSI	1
73. 0.0000000000000000002117582368134835582627562250585937500014570036328125 H.P. 150 PSI	1
74. 0.000000000000000000105879118406741779131378112529296875000072850181640625 H.P. 150 PSI	1
75. 0.00000000000000000005293955920337088956568905626464843750000364250908203125 H.P. 150 PSI	1
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81. 0.0000000000000000000008271806125526701494638889003851308593750000000569142044048828125 H.P. 150 PSI	1
82. 0.00000000000000000000041359030627633507473194445019256542968750000000284571022024140625 H.P. 150 PSI	1
83. 0.00000000000000000000020679515313816753736597222509628271484375000000014228551101220578125 H.P. 150 PSI	1
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87. 0.00000000000000000000001292469707113547210853732640851766967773437500000000088928444382642578125 H.P. 150 PSI	1
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100. 0.00000000000000000000000000157772181044134181012425533008680858588887516570492187500000000000001085552299592809028515625 H.P. 150 PSI	1

Power Room

Battery 104
Location No. 171. Site 35.

(Sheet 2 of Sheets)

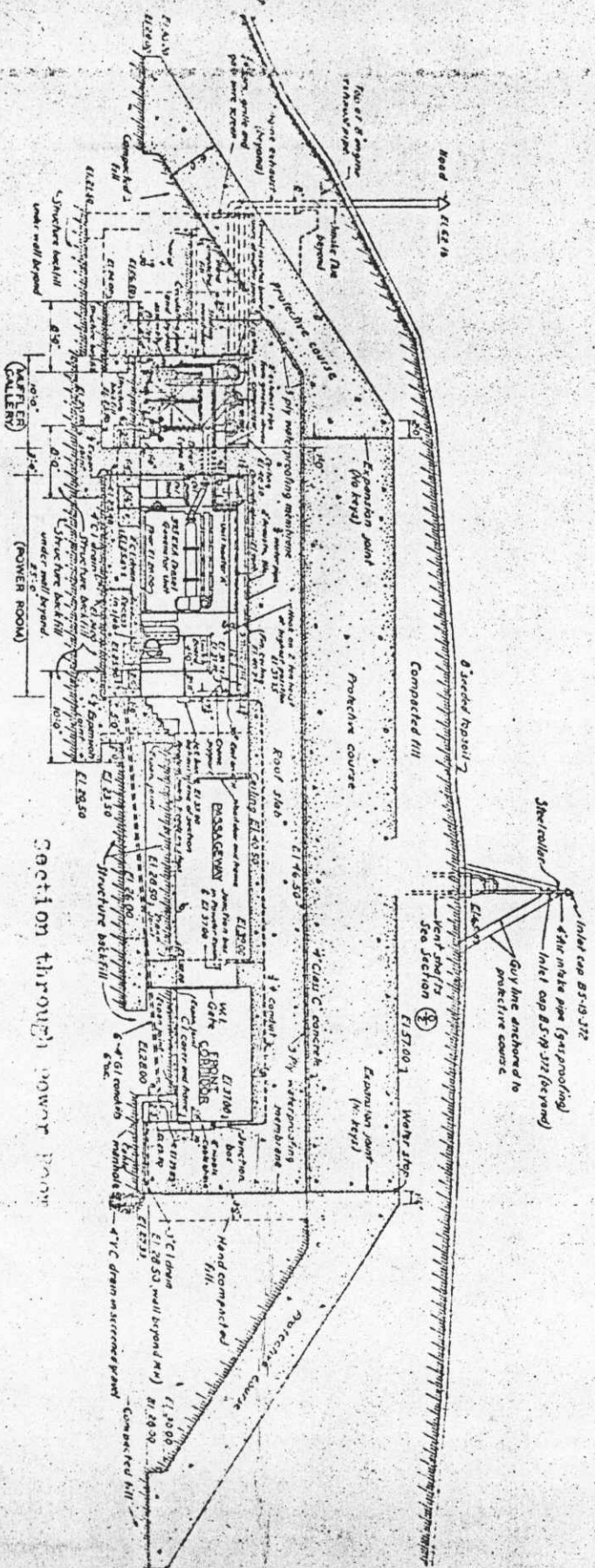
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13-0'



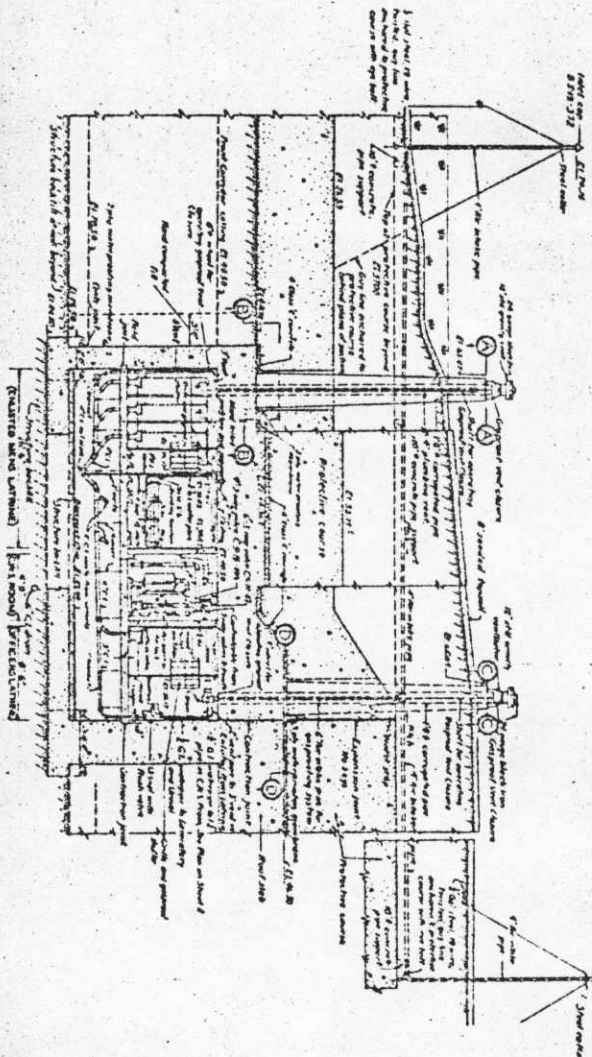
張之洞

7-24-72 11:00 AM

Chlorine



Section through POWER ROOM



Section through LATRINES

Sections

Battery 104

Location No. 131.

East Point

(Sheet of Sheets)



East Point Military Reservation
Nahant, Mass.
- 1952 -

6417
REPORT OF COMPLETED WORKS - S
gun and Mortar Bat

~~COPYRIGHTED~~
~~HARBOR DEFENS~~
~~XEROX (ELECTRIC)~~

No. of Guns 2 Caliber 155 mm Carriage Mobile

Sources of Electric Current

Max. kw. Required for Lights

Max. kw. Required for Motors	None

2	1
3	2
4	3
5	4
6	5
7	6
8	7
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96	95
97	96
98	97
99	98
100	99

Present Condition of battery	Nov

[illegible]

How Ventilated	In the open
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type="checkbox"/> Open 76. <input type="checkbox"/> Open 77. <input type="checkbox"/> Open 78. <input type="checkbox"/> Open 79. <input type="checkbox"/> Open 80. <input type="checkbox"/> Open 81. <input type="checkbox"/> Open 82. <input type="checkbox"/> Open 83. <input type="checkbox"/> Open 84. <input type="checkbox"/> Open 85. <input type="checkbox"/> Open 86. <input type="checkbox"/> Open 87. <input type="checkbox"/> Open 88. <input type="checkbox"/> Open 89. <input type="checkbox"/> Open 90. <input type="checkbox"/> Open 91. <input type="checkbox"/> Open 92. <input type="checkbox"/> Open 93. <input type="checkbox"/> Open </p>

Remarks	Mobile Field Guns mounted in the open on

concrete blocks with 360° spade track.

ARMAMENT

[illegible]

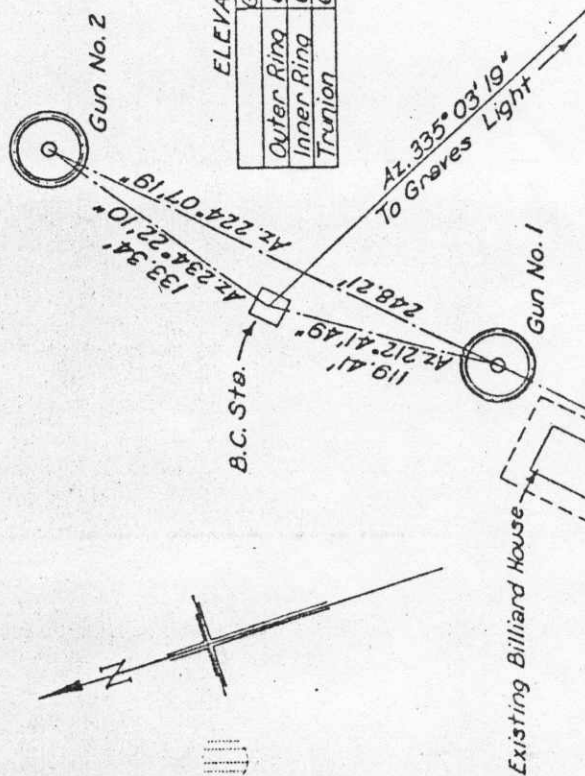
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93	1	0
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99	1	0
100	1	0

[illegible]

Form 7436

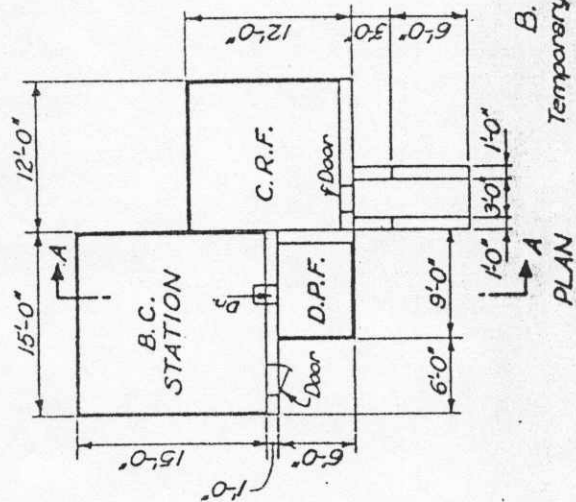
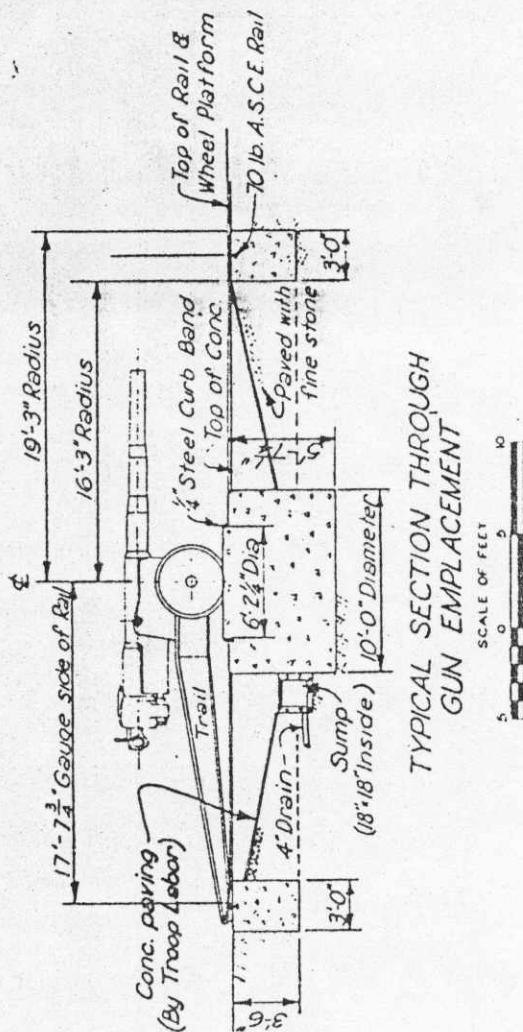
Corrected to December 1, 1942

No. of Guns 2 Caliber 155 mm Carriage Mobile

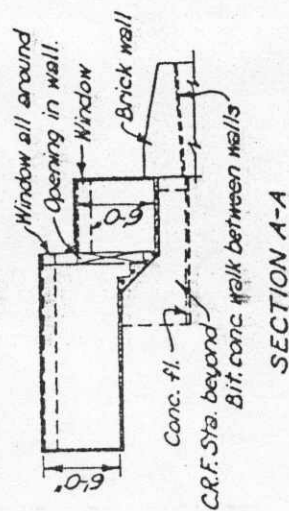


ELEVATIONS

	Gun No. 1	Gun No. 2
Outer Ring	64.25	53.90
Inner Ring	64.57	54.23
Trunion	68.70	58.37



NOTE:
All walls and roofs are of wooden construction.



B.C. STATION
Temporary (Built by Troop Labor)

SCALE OF FEET
0 5 10

600.914 (Boston) 119653
REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Fire Control or Submarine Mine Structures)
Part II
Corrected to 24 January 1945

(Sheet 1 of 4 Sheets)
HARBOR DEFENSES OF Boston, Mass.
East Point, Nahant Location No. 131 Site 28
STRUCTURE SCR-296-A, Set No. 28, Antenna on top of 4A
Bob Handcock at Buckenham

STRUCTURE: x 100628.16
Location (Coordinates) y 91927.82
Location (Site Description) East Point, Nahant, Mass.
Date of Transfer 8 September 1943
Cost to Transfer Date \$7,455.41 (See note)
Type (For Obs. Sta., Tower, SCR Building - Antenna Cottage, etc.) located on top Site 4A
Type of Construction Prefabricated Bldgs. Conc. Floor
(a) Roof Prefabricated steel on steel frame
(b) Remainder of Bldg. Prefabricated on steel frame
How Concealed Partially concealed by trees
How Protected None
Height Above Concealment 4 to 5 feet
Height Above Protection Antenna approx. 59 feet
Conspicuous at 3000 yards None

UTILITIES:
Electric Power Commercial and Auxiliary
Source of Lynn Gas & Electric Co.
Voltage 110 volt AC or DC AC Phase 2 wire single
Kilowatts Required 1.5 KW
Type of Lighting Fixtures Vapor Proof
How Heated Duo-Therm Oil Heater
Connected to Water Mains? No
Connected to Sewer? No
Type Latrine None

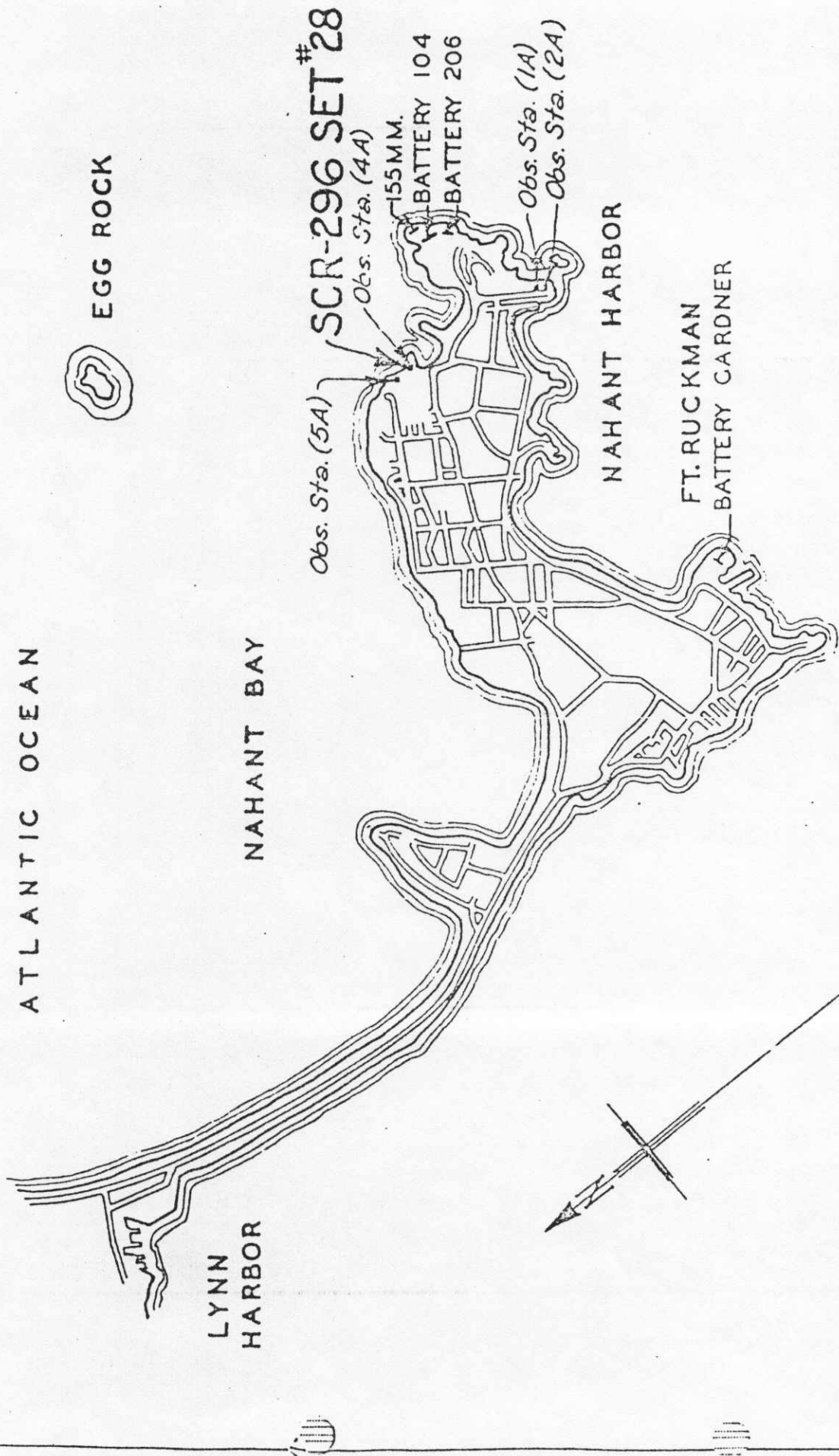
REFERENCE: (Mean Low Water)
Of Site 53 feet above M.L.W.
Of Instrument Axis: Upper Middle Lower

CRANE:
Type & Cap. None
Max. Dia. Reel Cap.

INSTRUMENTS AND EQUIPMENT: Upper Middle Lower
Type of Observing Inst. Antenna located on top of
Type of Plotting Board concrete tower Site 4A
DATA TRANSMISSION: See sketch.
Type Radio and tactical phones
Date of Transfer
TIDE STATION:
Description of Tide Gauge None
DATUM POINTS:
Ports From Which Visible -
QUARTERS:
Stations Served Personnel use quarters in dwelling adjacent to Site.
CABLE HUT: None
S.C. Type

2 Generator Sets - each 25 KVA - single phase, 115 volt,
2 wire, located in generator buildings at site.
Tower is heated by steam from boiler in Mifflin Estate.
(See sketch).

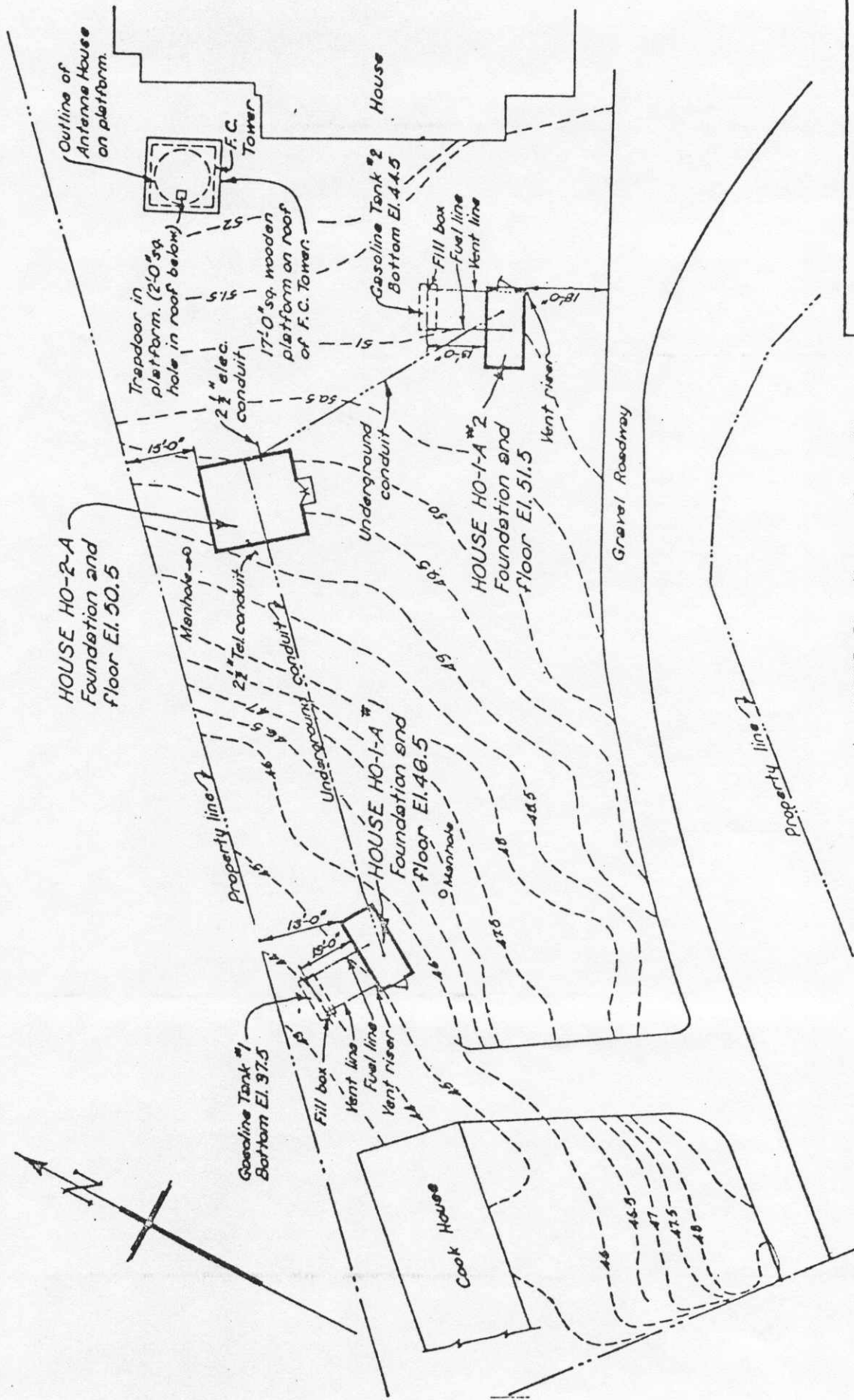
COSTS:
Funds chargeable to SSA(212/50605) 3-3564 P-270
Work accomplished under Dir. Consecutive No. FS-417, FS-1191
SCR 296-A declared obsolete, letter AG 17 Jan. 46
file AG 413.44 (15 Jan. 46) OB-S-SPOPS.
Tower and equipment to be disposed of. Buildings
to be retained.



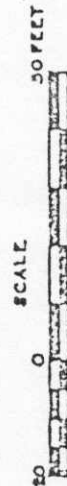
Location Plan

SCR-296A. Set No. 28.
Location No. 131.
East point, Nahant

(Sheet 2 of 4 Sheets)



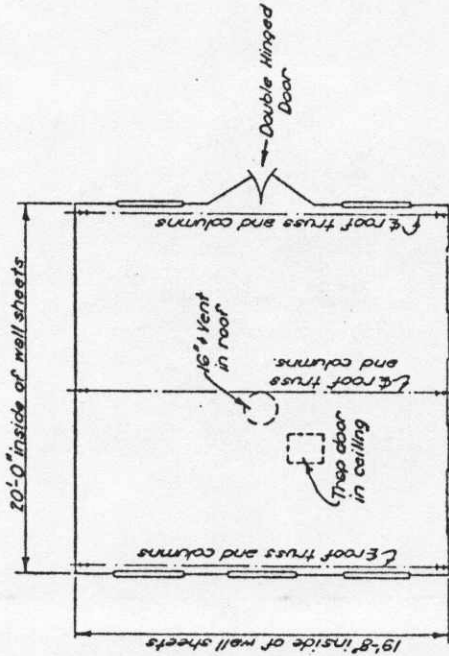
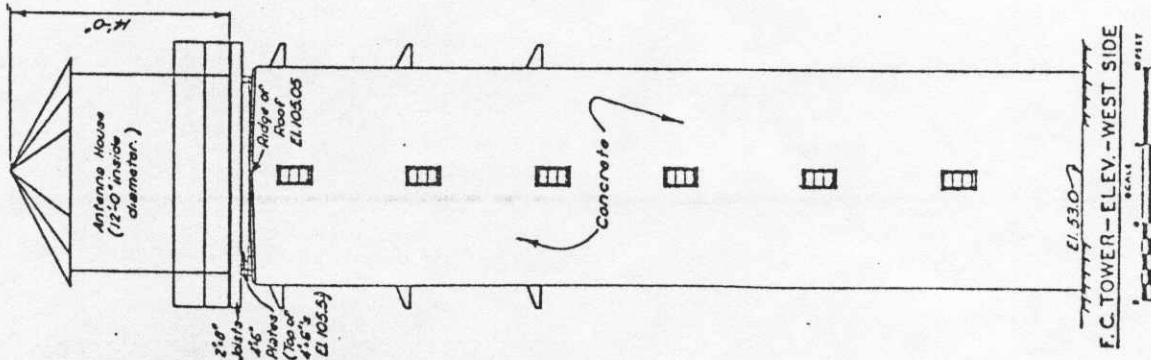
NOTE: Elevations refer to Mean Sea Level datum. Correction to Mean Low Water datum +6.02'.



Site Plan

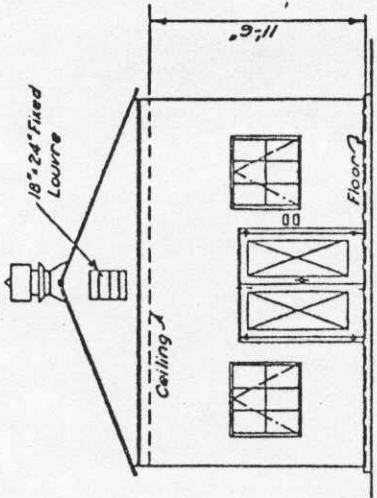
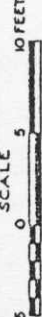
SCR-296A. Set No. 28.
Location No. 131.
East Point, Nahant

(Sheet 3 of 4 Sheets)

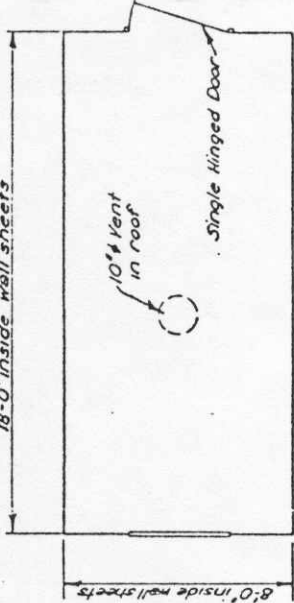


PLAN

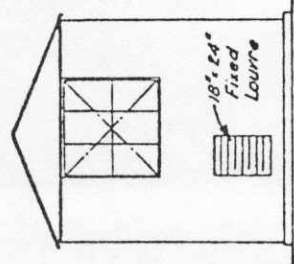
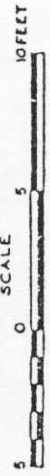
HOUSE, HO-2-A



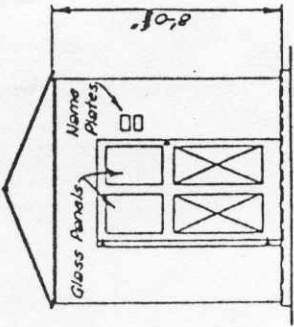
END ELEVATION



PLAN
HOUSE, HO-1-A



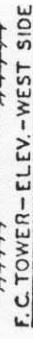
END ELEVATION



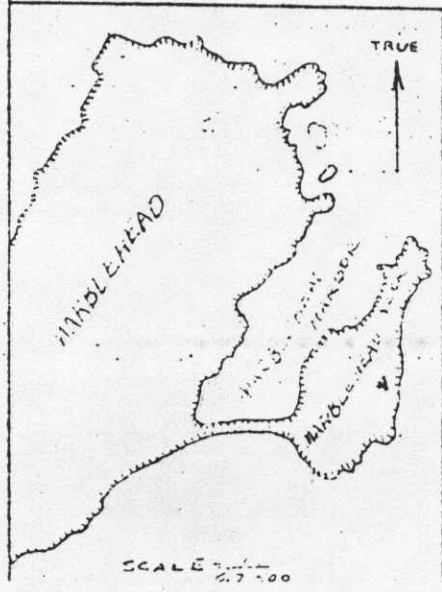
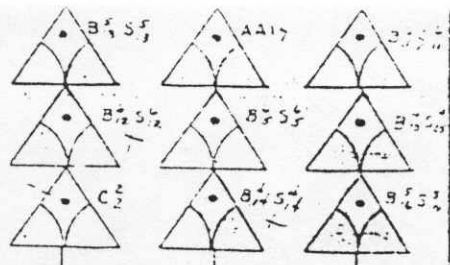
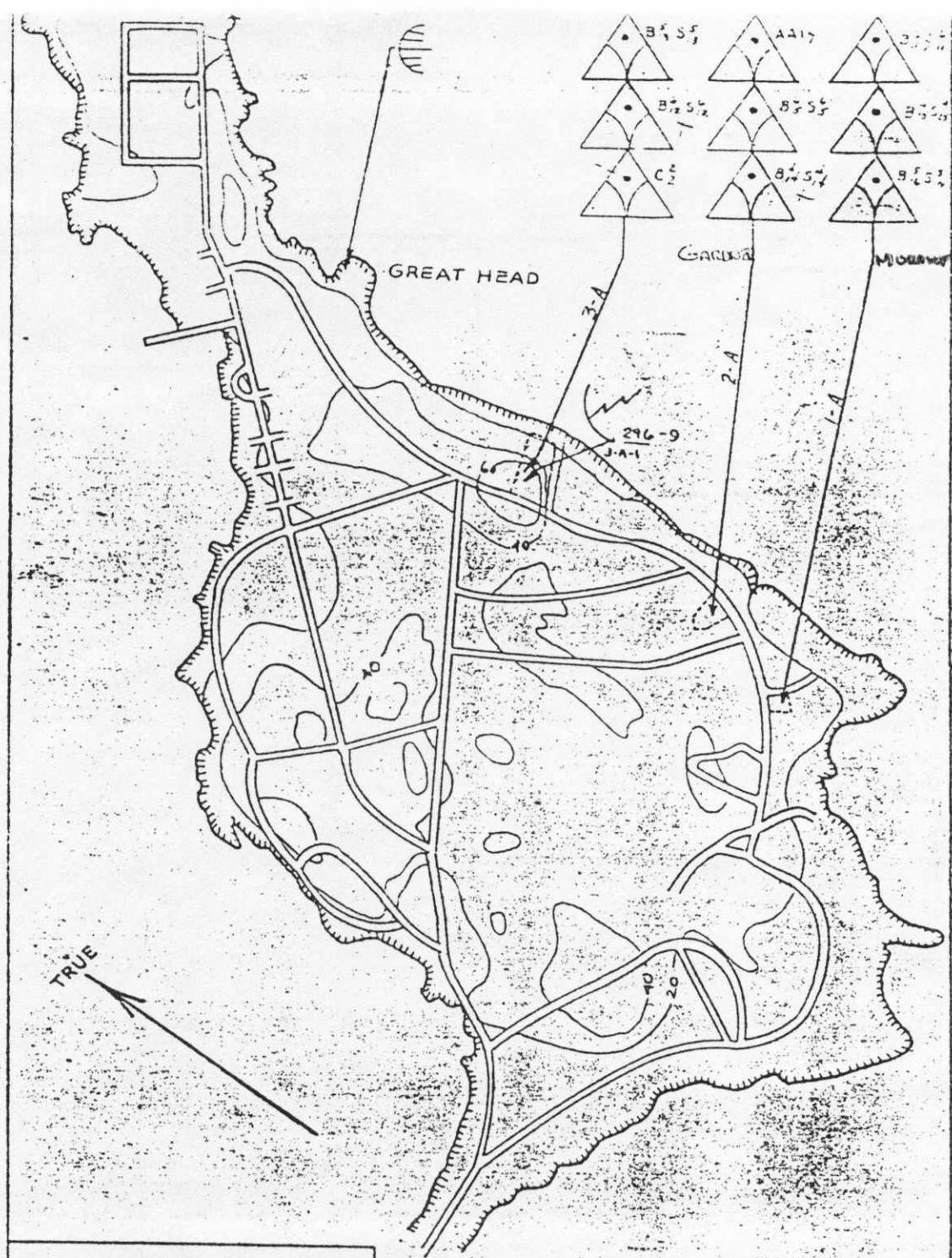
END ELEVATION

NOTES:
HO-1-A and HO-2-A buildings are pre-fabricated
galvanized sheet metal on structural steel frames,
with walls and ceiling for HO-2-A having insulation.
HO-1-A and HO-2-A buildings have conc. floors.

F.C. TOWER - ELEV. - WEST SIDE



Plans and Elevations
SCR-296A. Set No. 28.
Location No. 131.
East Point, Nahant



~~SECRET~~

**HARBOR DEFENSES OF
BOSTON**

**LOC. 132 MARBLEHEAD NECK
FIRE CONTROL INSTALLATIONS**

PREPARED BY H.D. OF BOSTON	23 JUNE 1943 EX. NO. 9-B-21
-------------------------------	--------------------------------

REV DATE
31 JAN 45

100,914 (Boston) CM 74738

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Fire Control or Submarine Mine Structures)

Part II 128 Corrected to 1 December 1943

STRUCTURE: Location (Coordinates) x 107125.66 y 100153.36
Location (Site Description) Marblehead, Essex Co., Mass.
Date of Transfer 6 November 1943
Cost to Transfer Date \$14,327.-
Type (For Obs. Sta., Tower, Concrete Tower - 5 Floors Cottage, etc.) Square - With Basement
Type of Construction Reinforced Concrete
(a) Roof Flat, Re. Conc. 10" Slab. Under Wood Frame
(b) Remainder of Bldg. Reinforced Concrete
How Concealed Appears as Cable on adjacent house
How Protected 12" Re. Concrete Walls, 10" Re. Conc. Roof
Height Above Concealment 51.9'
Height Above Protection None
Conspicuous at 1000 yards As Cable on House

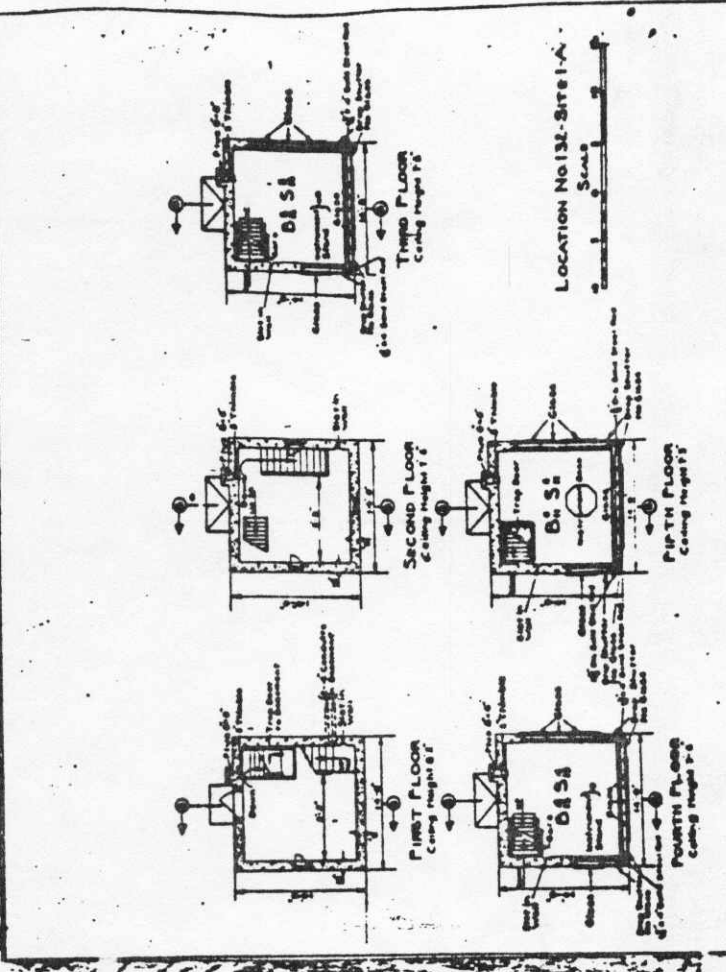
UTILITIES:
Electric Power Commercial
Source of Marblehead Electric Co.
Voltage 115-230 AC or DC 10 Phase Single
Kilowatts Required 1.5
Type of Lighting Fixtures Vapor Proof Units
How Heated Space Heaters
Connected to Water Mains? No
Connected to Sewer? No
Type Latrine None

REFERENCE: (Mean Low Water) 44.9' Above
Of Site
Of Instrument Axis: Upper Middle Lower
Above B 6/11 86.0' B 4/15 78.0' B 5/16 70.0'

CRANE:
Type & Cap.
Max. Dia. Reel Cap.

(Sheet 1 of 2 Sheets) SPERM-1
HARBOR DEFENSES OF Boston, Massachusetts
SOME Marblehead Neck Location No. 132 Site 1A
STRUCTURE Observation Tower - 5 Floors
Upper 3-6/11 86.0' Middle 3-4/15 78.0' Lower 3-5/16 70.0'

INSTRUMENTS AND EQUIPMENT: Upper Middle Lower
Type of Observing Inst. 1 DFF 1 AI 1 AI
Type of Plotting Board None
DATA TRANSMISSION:
Type Telephone
Date of Transfer
TIDE STATION:
Description of Tide Gauge
DATUM POINTS:
Ports From Which Visible
QUARTERS:
Stations Served
CABLE HUT:
S.C. Type



REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Fire Control or Submarine Mine Structure)

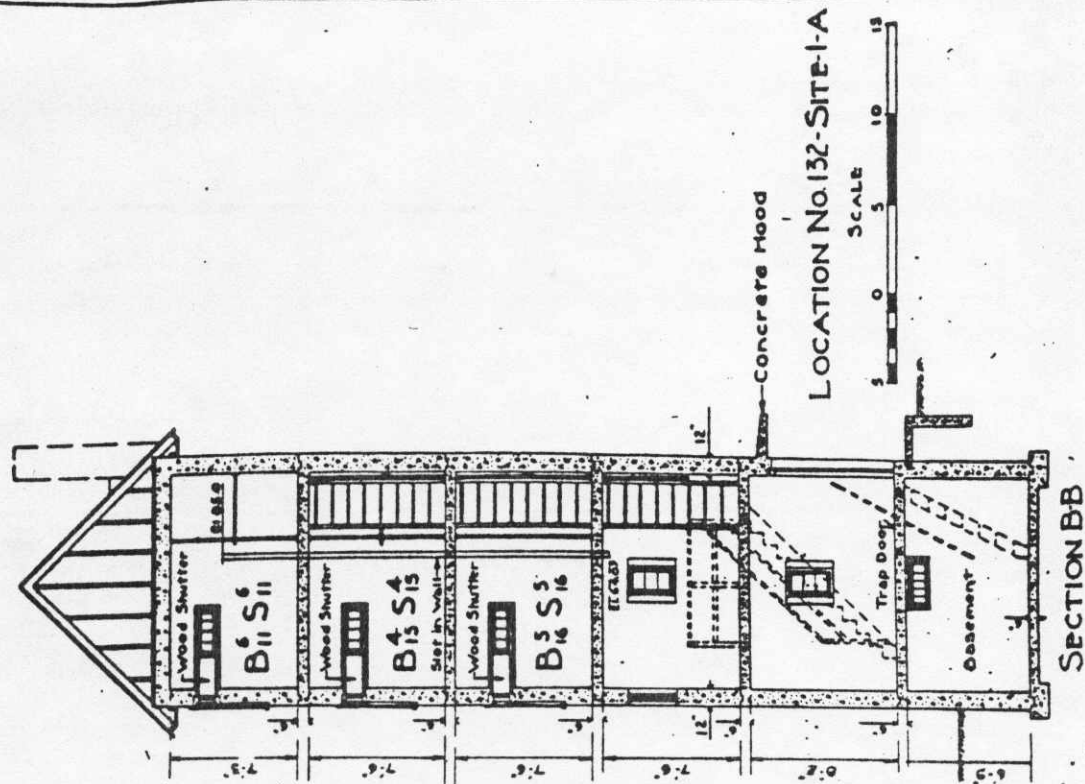
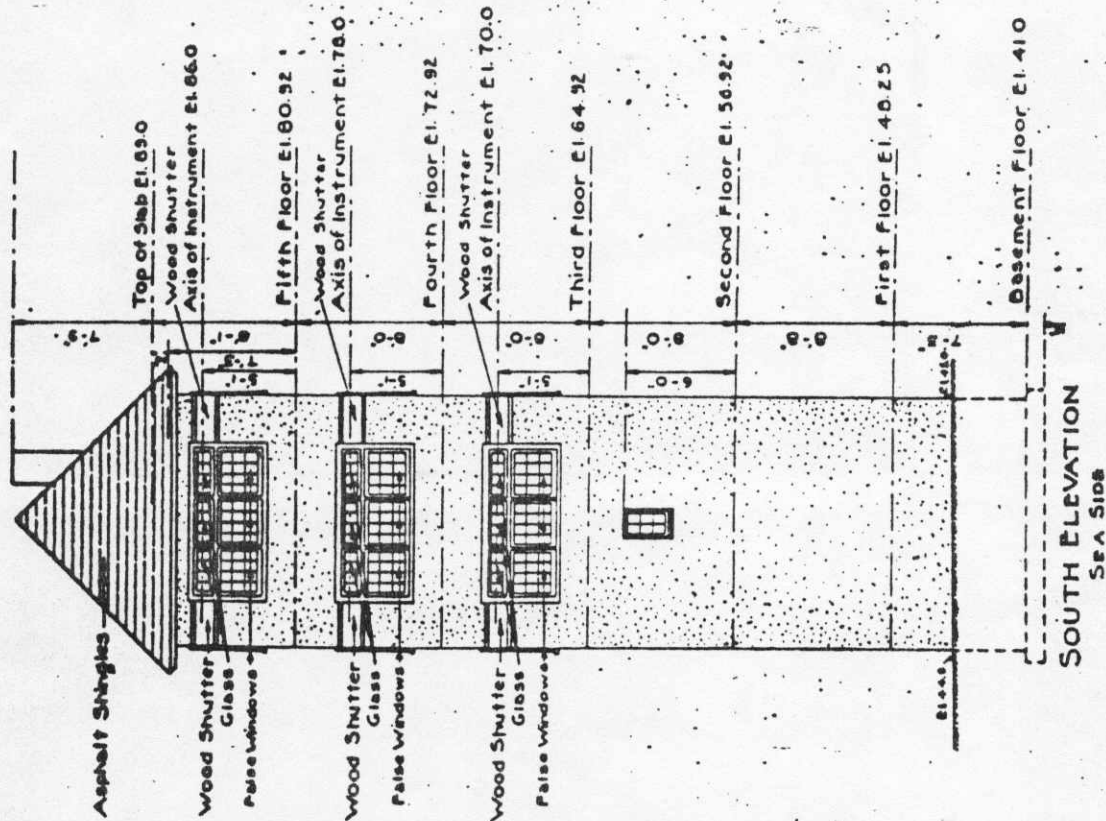
PART II Corrected to 1 December 1943

(Sheet 2 of 2 Sheets)

SPERM-1

HARBOR DEFENSES OF Boston, Massachusetts
Marblehead Neck Location No. 132 Site 1A
STRUCTURE Observation Station
Elevation and Section

74738



LOCATION No. 132-SITE-1A

**COAST DEFENSE STUDY GROUP
2001 CONFERENCE**

GALES POINT, MANCHESTER, MA

The observation stations in this tower were base-end stations for coast defense gun batteries. Each observation station was designated for a specific gun battery. On each level was a precision telescope ("azimuth instrument"). Two soldiers manned each level. One would track the target ship through the telescope, and the other would use the telephone to call in the bearing to the plotting room for the gun battery. The plotting room for the gun battery was in or near the gun battery. In the plotting room, the bearings from the base-end stations would be plotted and the range and bearing orders for the gun battery calculated.

Designations of the observation stations at Gales Point:

10th floor

Served Battery Murphy, two 16" guns, at East Point, Nahant. The battery structure is still there on the grounds of the Northeastern University Marine Laboratory. Gales Point was the sixth station (south to north) of ten serving this battery. The southernmost station for Battery Murphy was at Fourth Cliff, Scituate, and the northernmost was at Castle Hill, Ipswich. The guns at Battery Murphy had a maximum range of approximately 25 miles.

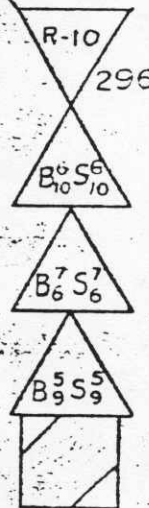
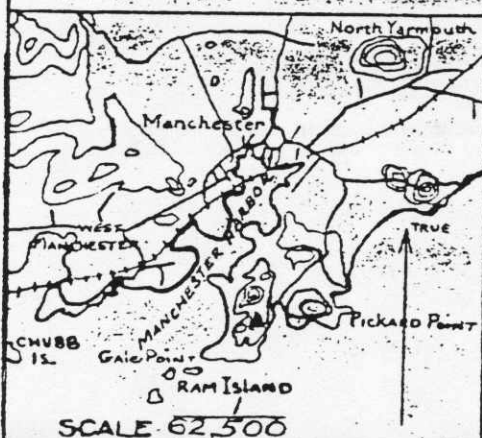
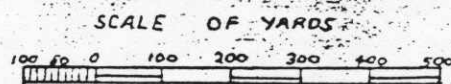
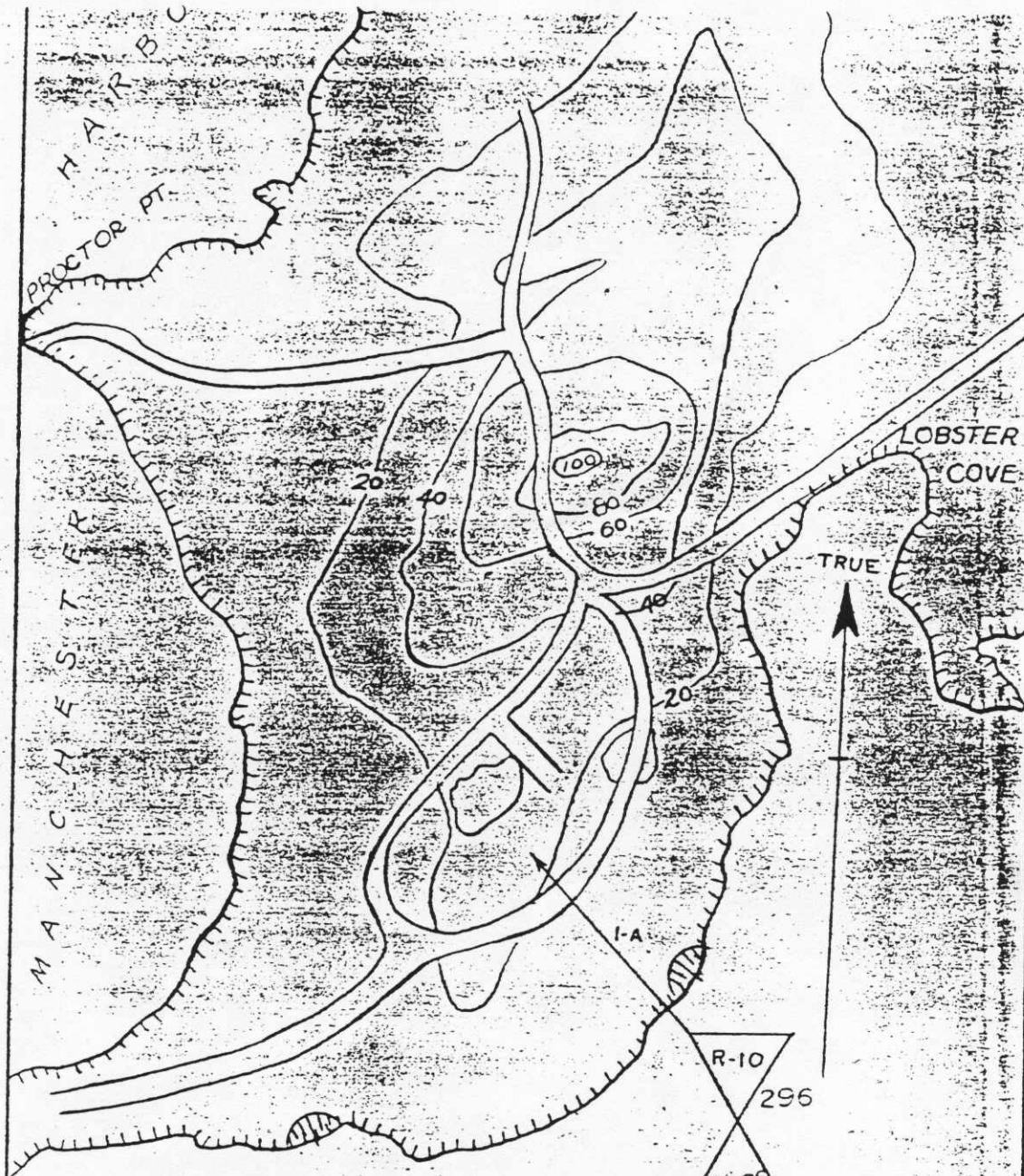
9th floor

Served Battery 105 (unnamed), two 16" guns, at Fort Dawes, Winthrop. The battery structure was destroyed to make way for the Metropolitan Water Resources Administration sewage treatment plant. Gales Point was the seventh station (south to north) of nine serving this battery. The southernmost station for Battery 105 was at Brant Rock, Marshfield, and the northernmost was at Emerson Point, Gloucester (near the Turk's Head Inn). The guns at Battery 105 had a maximum range of approximately 25 miles.

8th floor

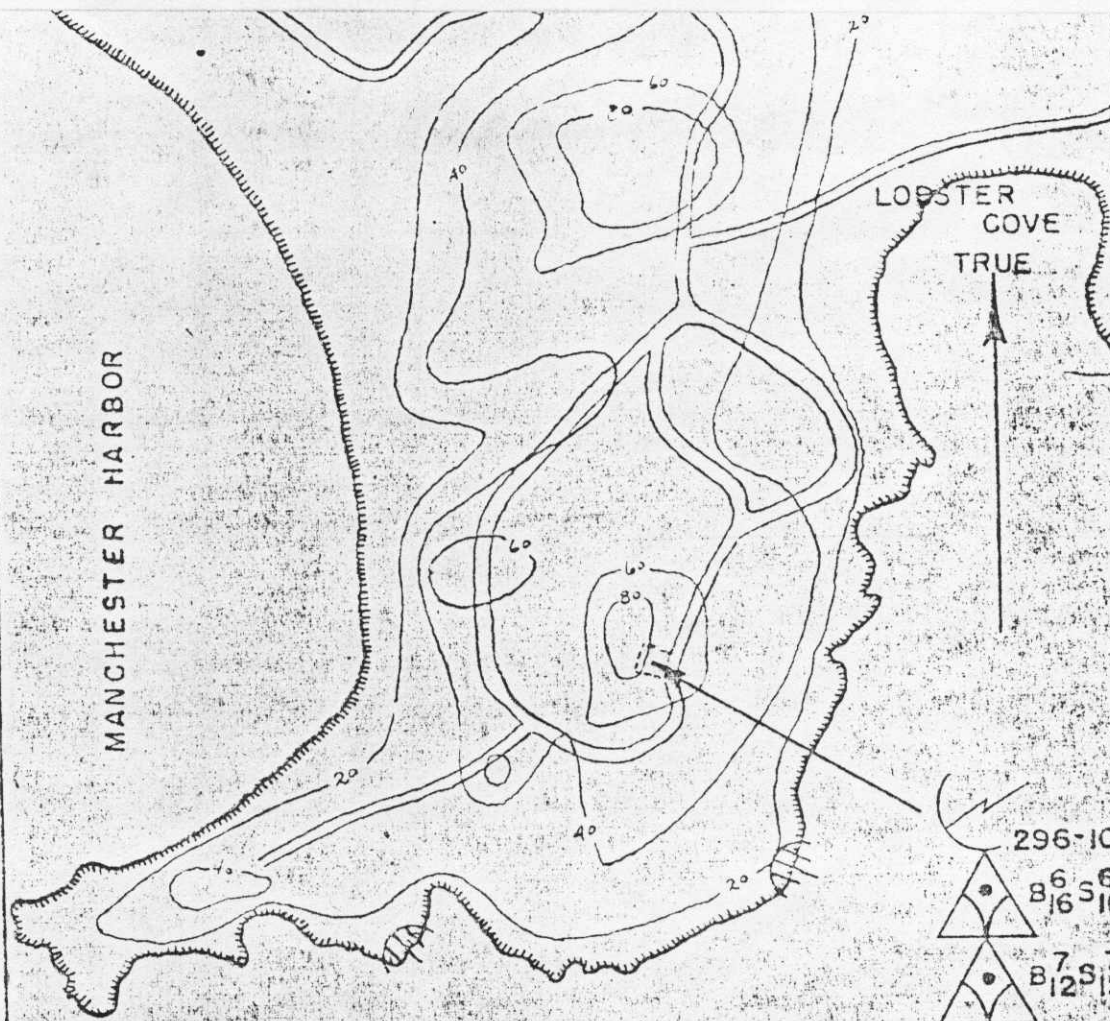
Served Battery 206 (unnamed), two 6" guns, at East Point, Nahant. The battery structure is still there on the grounds of the Northeastern University Marine Laboratory. Gales Point was the fifth, and northernmost, station (south to north) of five serving this battery. The southernmost station for Battery 206 was at Strawberry Point, Scituate. The guns at Battery 206 had a maximum range of approximately 15 miles.

Norm Scarpulla
Coast Defense Study Group
10/17/2001



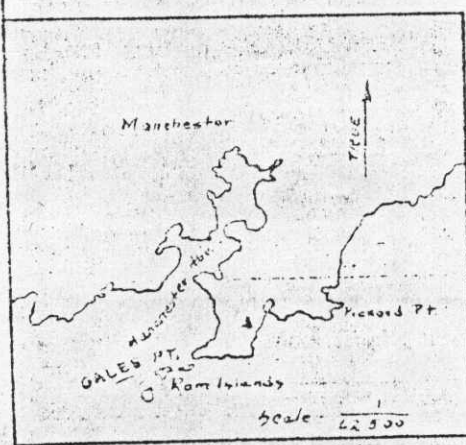
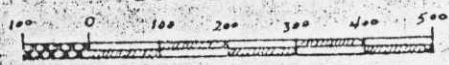
MURPHY
105
206
at CPT

HARBOR DEFENSES OF BOSTON	
LOC. 133 GALES POINT	
FIRE CONTROL INSTALLATIONS	
PREPARED BY	23 JUNE 1943
H.D. OF BOSTON	EX NO 9-B-22



- 296-10 *Elim*
- $\begin{matrix} 6 & 6 \\ 8 & 16 \end{matrix}$ *Elim*
- $\begin{matrix} 7 & 7 \\ 12 & 12 \end{matrix}$ *Elim*
- $\begin{matrix} 5 & 5 \\ 15 & 15 \end{matrix}$ ✓
- (20)

SCALE OF YDS.



~~SECRET~~

HARBOR DEFENSES OF
BOSTON
LOC. 133 GALES POINT
FIRE CONTROL INSTALLATIONS

PREPARED BY H.D. OF BOSTON	23 JUNE 1943 EX. NO. 9-B-22
-------------------------------	--------------------------------

REVISED 31 JAN '45

600,914 (130.100) 8435
REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Fire Control or Submarine Mine Structures)

Part II 35 Corrected to 1 February 1944

80

STRUCTURE:

Location (Coordinates) Y 112,807.65
Location (Site Description) Manchester, Essex County, Mass.
Date of Transfer 27 January 1944
Cost to Transfer Date \$29,394.
Type (For Obs. Sta., Tower, Re-Conc. Tower - 10 Stories Cottage, etc.) and AWS Lookout
Type of Construction Reinforced Concrete - Square
(a) Roof 13.5" Re-Conc. - Flat. - AWS Hatch.
(b) Remainder of Bldg. Reinforced Concrete
How Concealed No Concealment
How Protected Re-Conc. Walls-Var. 24" to 10"-Roof 13.5" Re-
Height Above Concealment 93.63'
Height Above Protection None
Conspicuous at 1000 yards

UTILITIES:

Electric Power Commercial
Source of Manchester Electric Co.
Voltage 115-230 AC or DC AC Phase Single
Kilowatts Required 2.0
Type of Lighting Fixtures Vapor Proof Units
How Heated Space Heaters
Connected to Water Mains? No
Connected to Sewer? No
Type Latrine None

REFERENCE: (Mean Low Water)

Of Site 72.0' Above
Of Instrument Axis: Upper Middle Lower
Above 162.08' 154.08' 146.08'

CRANE:

Type & Cap. _____
Max. Dia. Reel Cap. _____

HARBOR DEFENSES OF Boston, Massachusetts
~~RECK~~ Gales Point Location No. 133A Site 1 A
STRUCTURE Observation Tower
MAIS-OP-14. B 6/26 S 6/16. B 7/22 S 7/22. B 5/25 S 5/25

INSTRUMENTS AND EQUIPMENT:

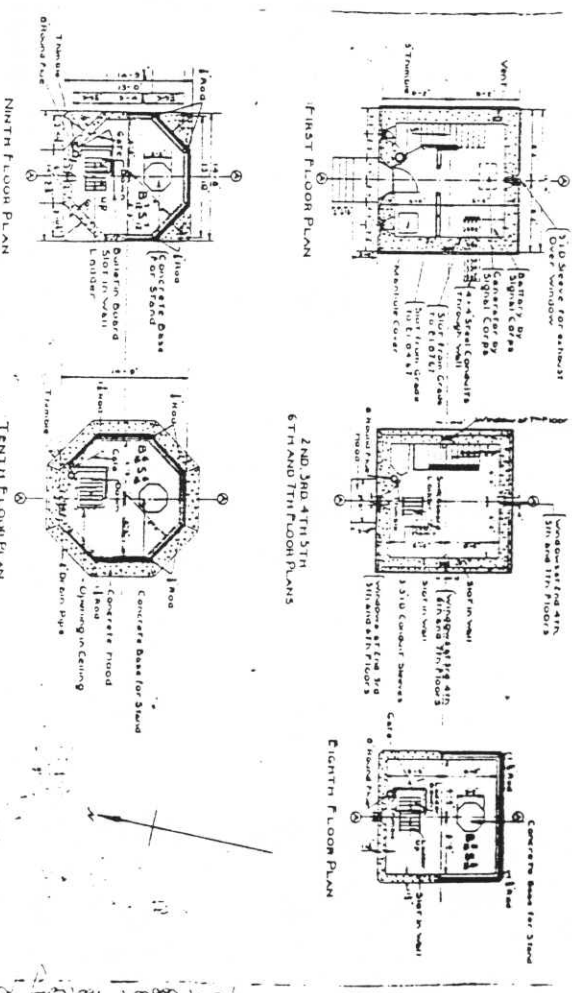
Type of Observing Inst. Upper Middle Lower
Type of Plotting Board 1-DPF 1-DPF 1-DPF
DATA TRANSMISSION: None
Type Telephone

Date of Transfer _____
TIDE STATION: _____
Description of Tide Gauge _____

DATUM POINTS: _____
Forts From Which Visible _____

QUARTERS: _____
Conc. Stations Served _____

CABLE HUT: _____
S.C. Type _____



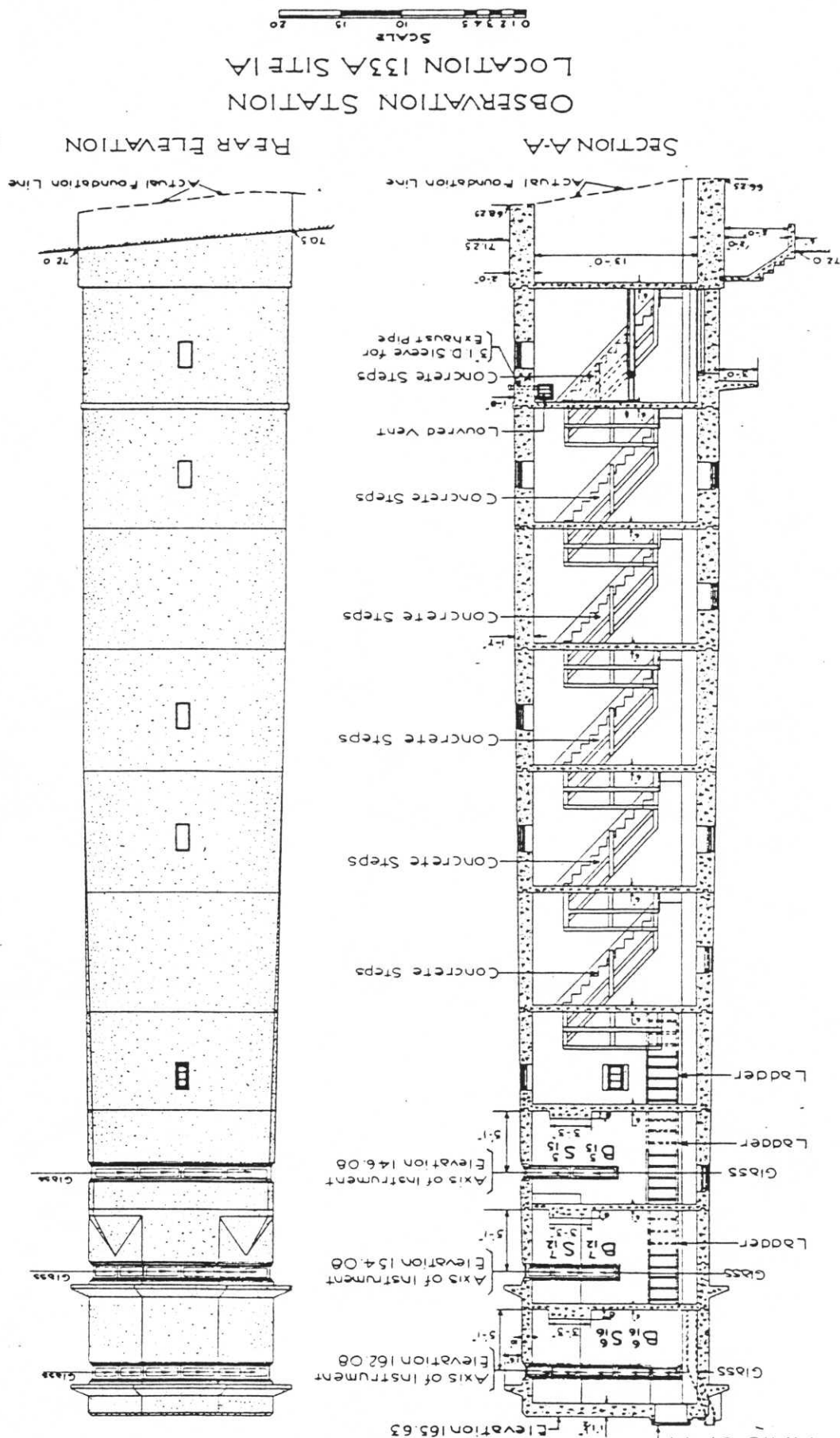
OBSERVATION STATION
LOCATION 133A SITE 1A

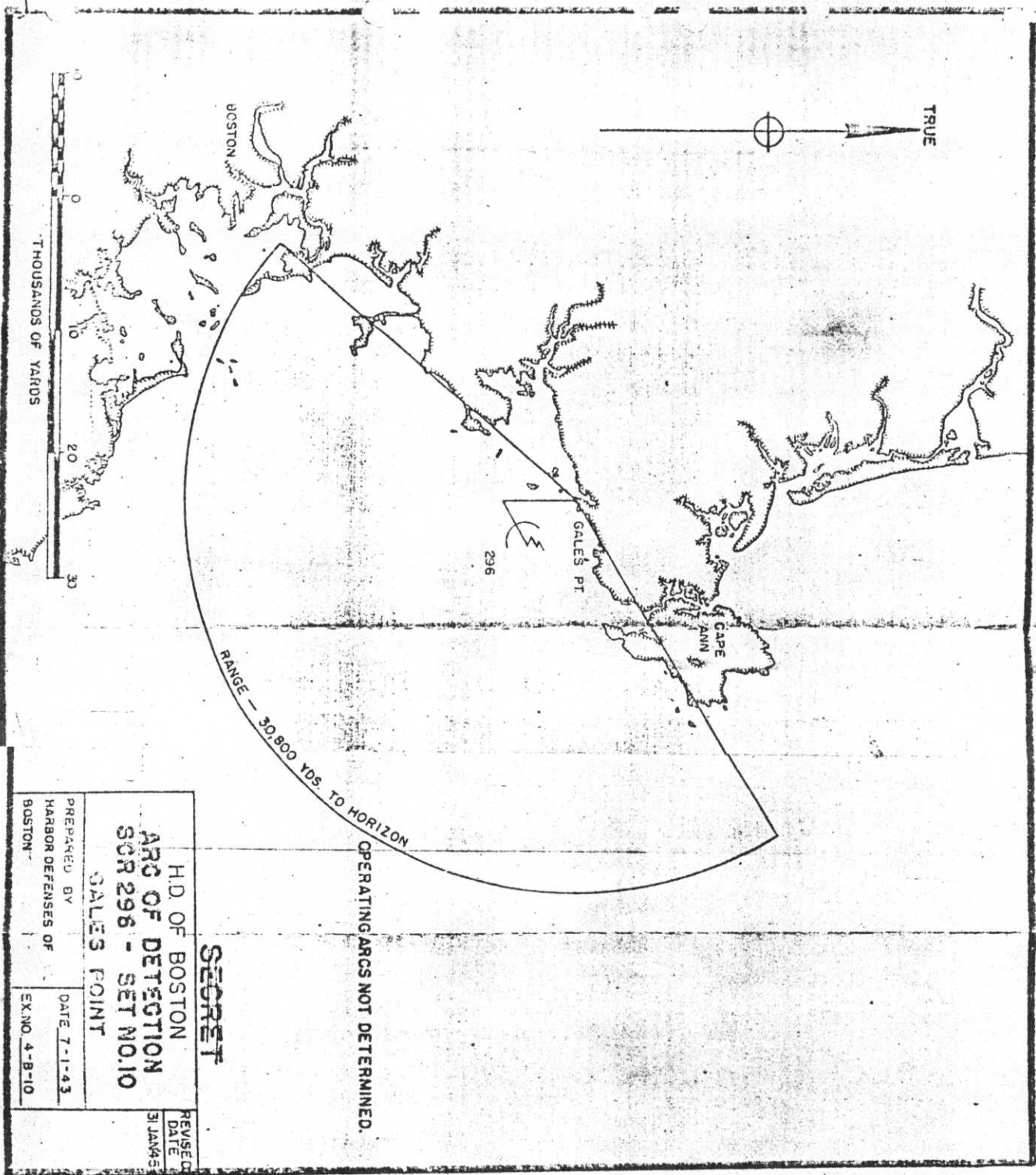
SCALE
0 10 20 30 40 50 60 70 80 90 100

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS. (Fire Control or Submarine Mine Structures)

HARBOR DEFENSES OF Boston, Massachusetts
Gales Point Location No. 137A Site
STRUCTURE Observation Tower (10 Stories)
Elevation and Section

PART II





SECRET

H.D. OF BOSTON
 ARC OF DETECTION
 SCR 296 - SET NO. 10
 GALES POINT

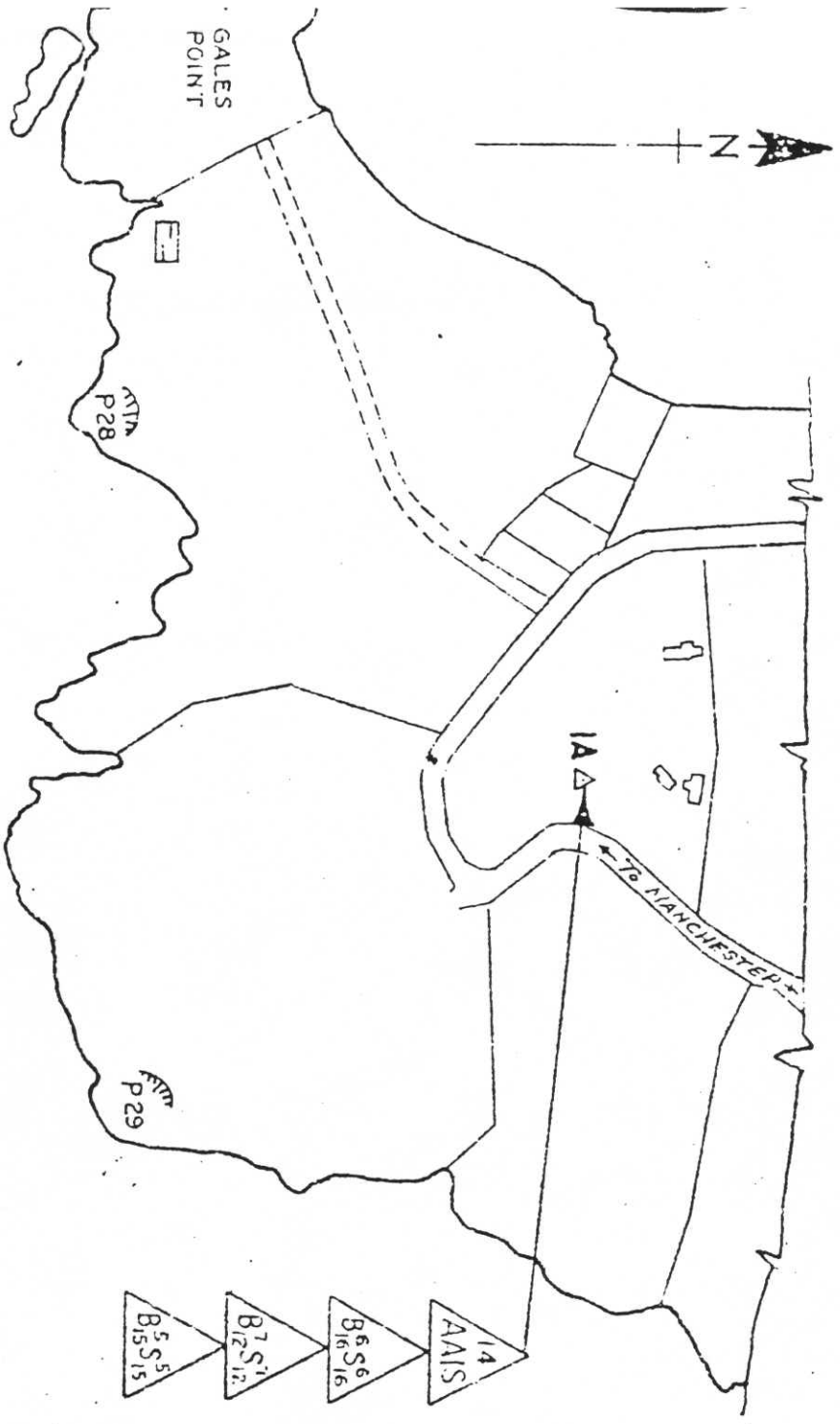
PREPARED BY
 HARBOR DEFENSES OF
 BOSTON

DATE 7-1-43

EX. NO. 4-B-10

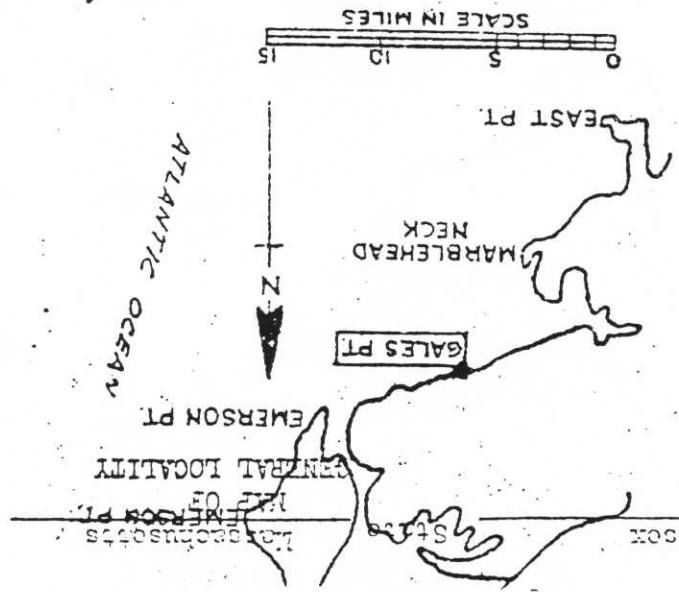
REVISED
 DATE
 BY JAMES

10350 Gaud



100 50 0 100 200 300 400 500
SCALE IN FEET

SCALE MAP SHOWING THE SITE OF EACH PROPOSED AIRFIELD INSTALLATION, BY NUMBER AND SYMBOL - SEE PW 4 - 155.



Place
Town Manchester
County Essex
State Massachusetts
GENERAL LOCALITY
EMERSON PT.
MARBLEHEAD
EAST PT.
GALES PT.

GALES POINT-located at Gales Point, near Manchester. Accessible by road, all married private, the area is occupied by large estates, which we were surprised to find. The tower, square at the base and octagonal at the top, similar to point allerton station. The radar was mounted atop the station, and the two concrete block buildings at the base of the tower are still standing and in use as tool sheds. The tower is well maintained and is located in a shrubbed lawn area. This station had the following stations: GH-296; Btry. Murphy (on roof); B6-S6, Btry. Murphy; B7-S7, Btry 105 and 15-55, Btry 206.

1943

R-10 296

B6 S6

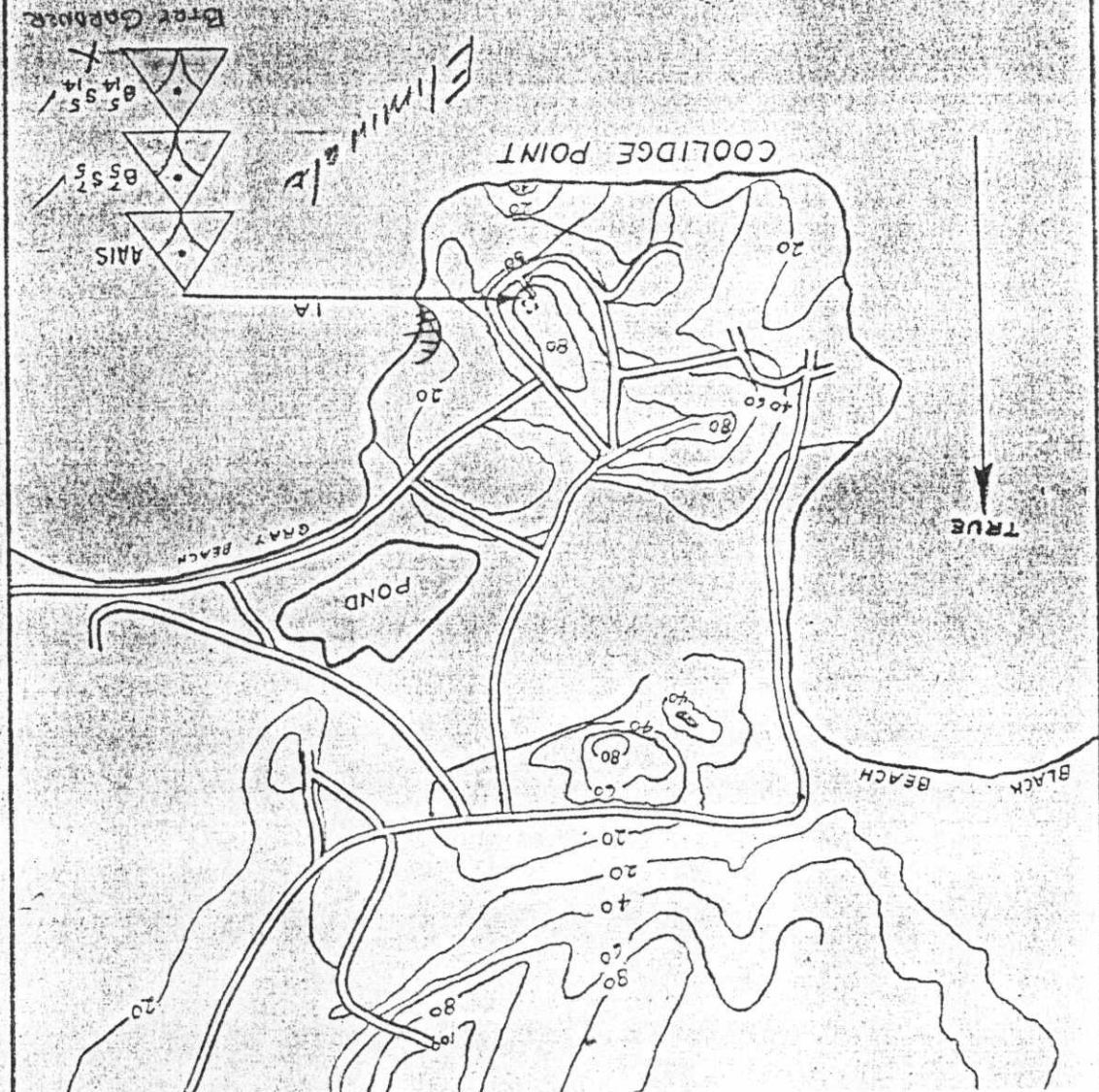
1334

HARBOR DEFENSES OF
BOSTON
LOC. 134 COOLIDGE POINT
FIRE CONTROL INSTALLATIONS
PREPARED BY
H.D. OF BOSTON
EX. NO. 9-B-23
22 JUNE 1943

~~SECRET~~



SCALE IN YARDS
100 0 100 200 300 400 500 600 700 800



~~CONFIDENTIAL~~

HARBOR DEFENSES OF Boston, Massachusetts

Site 1-8

AMIS OP 16 / B.S. 87 / D⁵ S⁵ / R³ S³ Ling - R⁵ S⁵ Good

Coolidge Point, Manchester, Mass.

Cost to Transfer Date \$12,810.00

Type of Construction 12" Concrete-Square Tower

(a) Roof Concrete-Flat

(b) ~~Remainder~~ ~~Concrete~~

How Concealed Surrounding Trees

How Protected None

Height Above Concealment 15'

Height Above Protection 421

Conspicuous at 1000 yards Yes

Public Service

Kilowatts Required **5 K.W.**

Type of Lighting Fixtures—Army-Weatherproof

How Heated? **Stoves**

Connected to Water Mains? No

Connected to Sewer? No

Type of latrine None

present condition

Reference of Site 74.5' Above MLW

Reference of Instrument Axis. See Below

Type and Capacity of Cranes

Max. Dim. of Reel Handled

* B7. 118.08' : R₁₄⁵ 110.08' : Both Above M.I.W.

Type of Observing Inst. DPRType of Plotting Board None

DATA TRANSMISSION

Type of Telephone

Date of Transfe

Cost of Data Transmission Equip.

For Tide Stations give descrip-

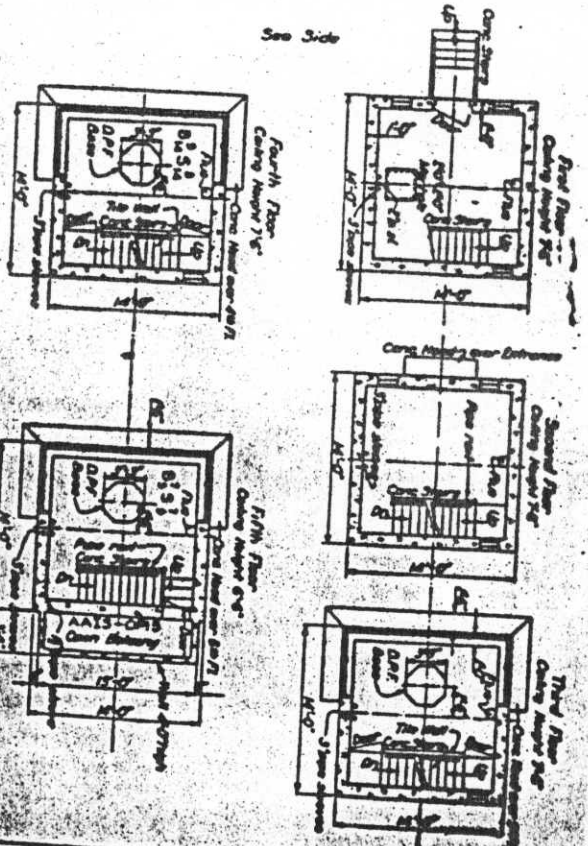
tion of Tide Gauge.

For Datum Points give Forts

from which visible

For Dormitories give Sta. Served

For Cable Hut give S.C. Type



CONFIDENTIAL

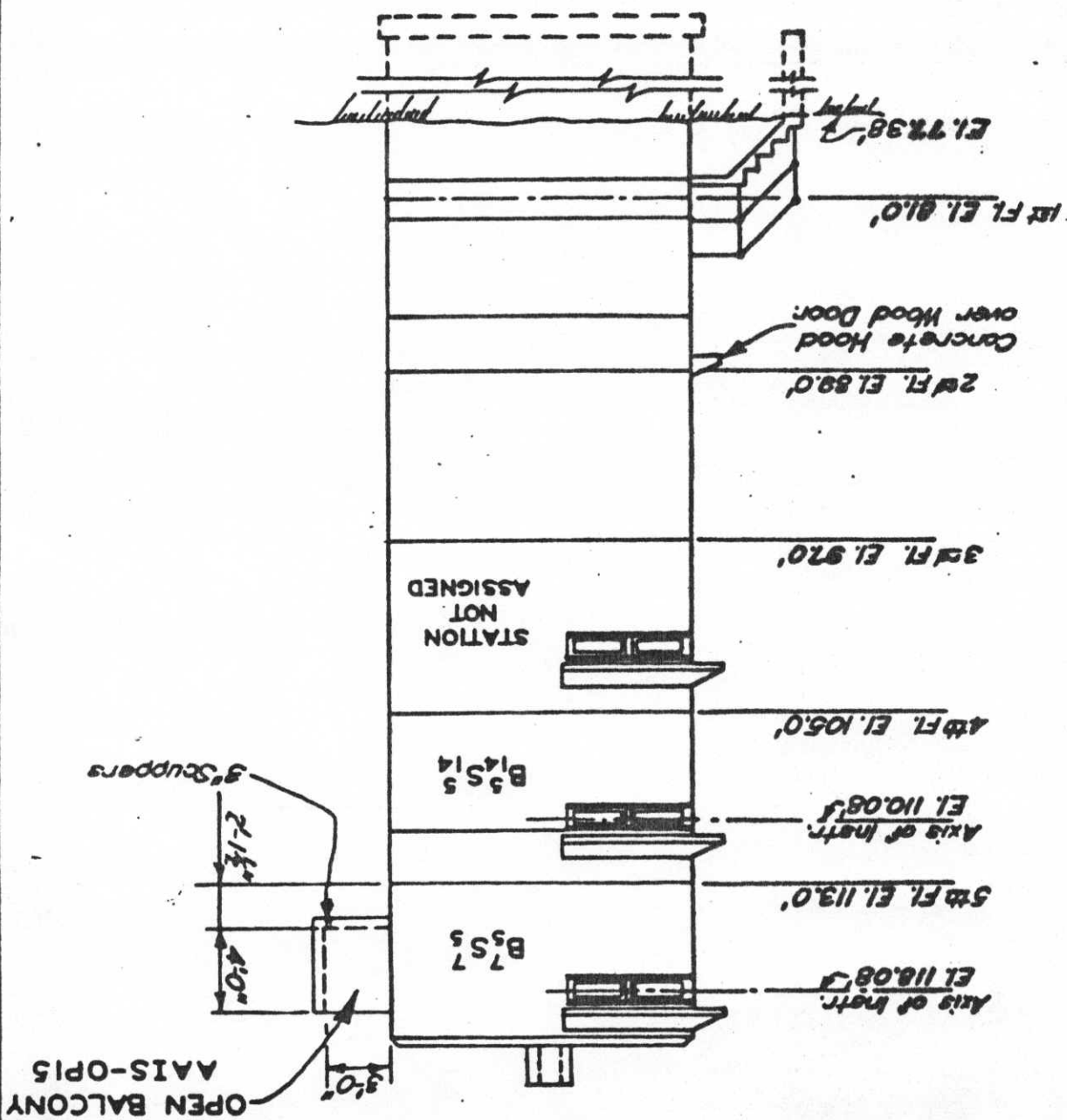
REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Fire Control or Torpedo Structures)

Form 2.

Corrected to April 2, 1943

Sheet 2 Of 2 Sheets
HARBOR DEFENSES OF Boston, Massachusetts.
Fort Coolidge Point, Manchester, Mass.
Structure Observation Tower - 5 Stories
AIS-OP 15 / B₅ S₇ / B₁₄ S₁₄

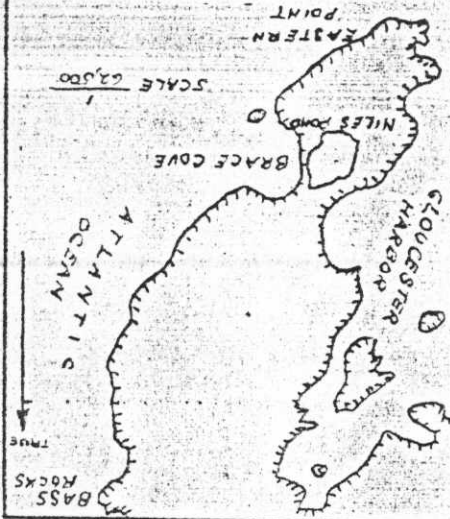
SIDE ELEVATION
Scale 1/8"=1'-0"



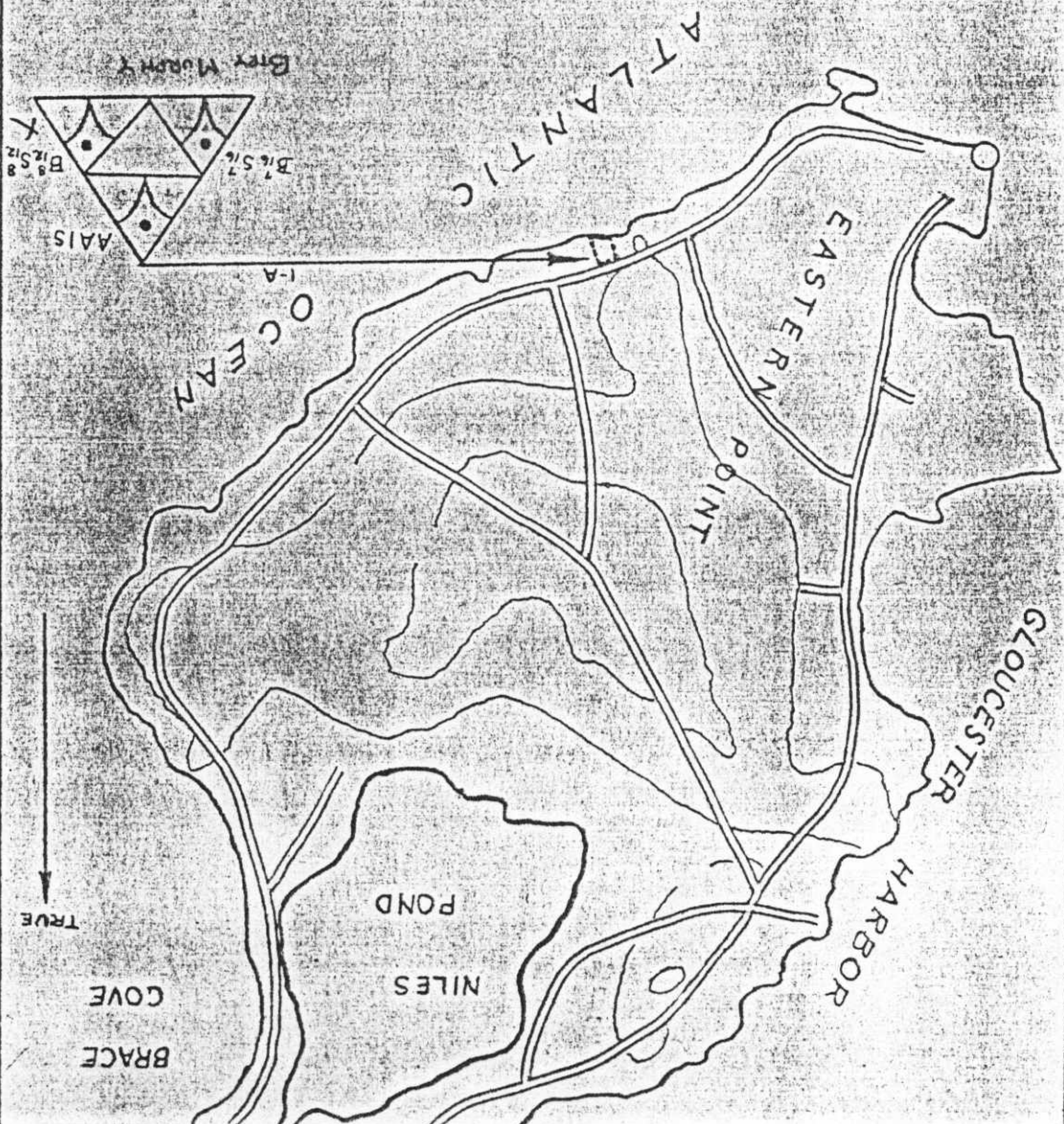
LOCATION 134
SITE 1A

HARBOR DEFENSES OF
BOSTON
LOC. 134A - EASTERN PT.
FIRE CONTROL INSTALLATIONS
PREPARED BY
HD. OF BOSTON
25 JUNE 1943
EX. NO. 9-B-24

~~SECRET~~



SCALE IN YARDS
0 100 200 300 400 500



Place

MASSACHUSETTS
MAP OF
GENERAL LOCALITY

Installation

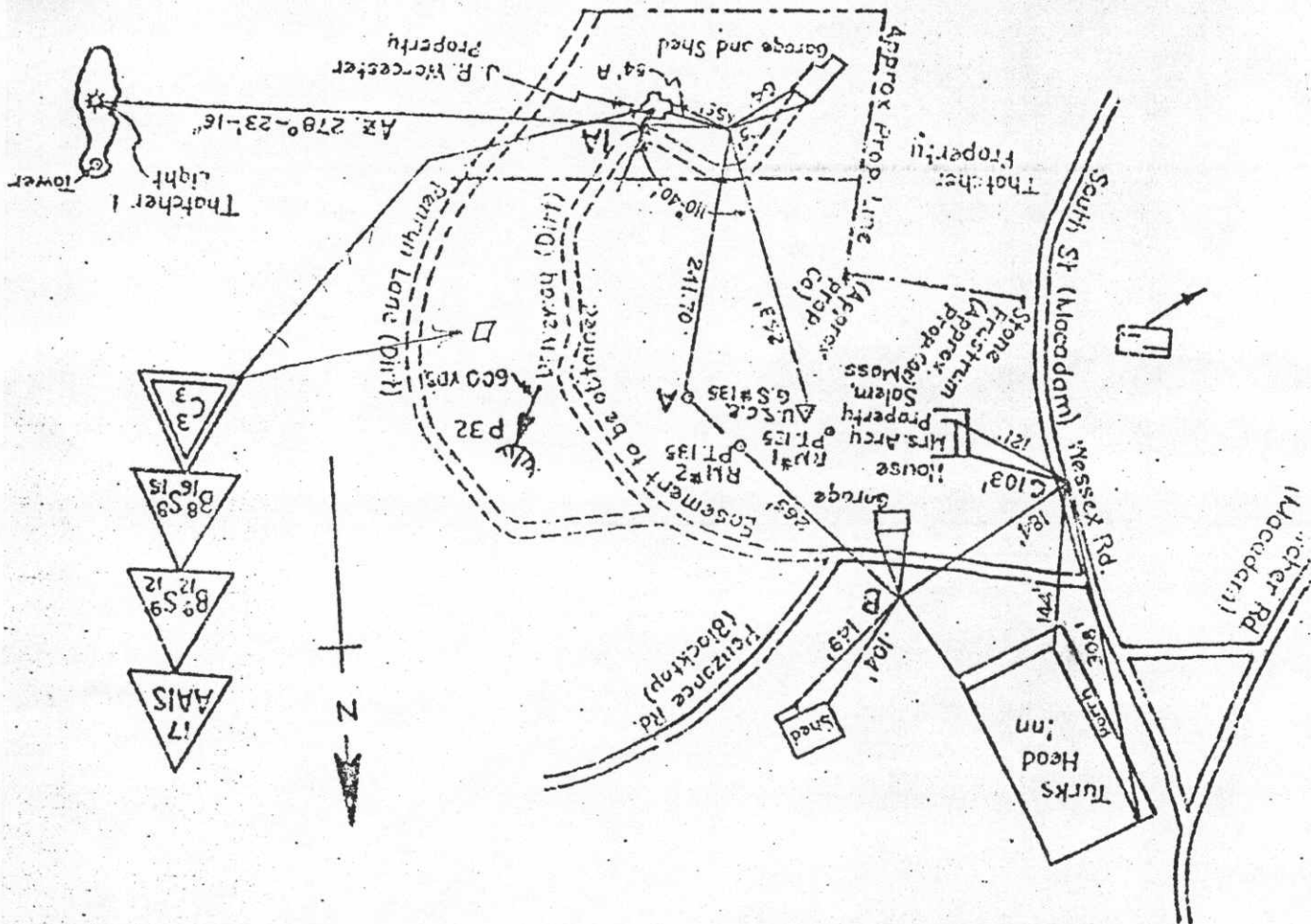
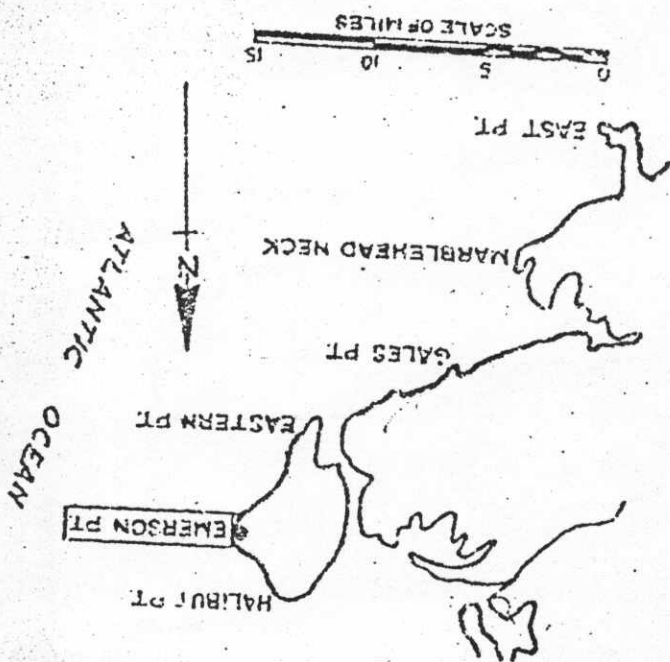
Sitz No.

▼

τ

SCALE MAP SHOWING THE SITE
OF EACH PROPOSED AIRFIELD
INSTALLATION, BY NUMBER AND
SYMBOL - SEE FM 4 - 155.

1943
A15
B856
6
B858
C2
105 Dues
Mudgley
□



1940 sub Board

NEW ENGLAND DIV 600,914 (Brk) 101781

(Sheet 1 of 4 Sheets)

SPERM-1

REPORT OF COMPLETED WORKS - SEACOAST FORTIFICATIONS
(Fire Control or Submarine Mine Structures)

Part II Corrected to 12 July 1944

HARBOR DEFENSES OF Boston, Mass.
RENT Emerson Point Location No. 135 Site 1A
STRUCTURE Observation Tower (6 Story)
AIS-OP-17: B 9/42 S 9/12; B 8/16 S 8/16; O 3/3
C (105) 2 10 10

STRUCTURE:

X 128,489.00

Location (Coordinates) Y 118,232.11

Location (Site Description) Emerson Point, Mass.

Date of Transfer 6 November 1943

Cost to Transfer Date \$14,336.16 - 283.47

Type (For Obs. Sta., Tower, Concrete Tower

Cottage, etc.) Cylindrical

Type of Construction Reinforced Concrete

(a) Roof Reinforced Concrete (Flat)

(b) Remainder of Bldg. Concrete

How Concealed Blue Tonedown Paint

How Protected None

Height Above Concealment 51 Feet

Height Above Protection 51 Feet

Conspicuous at 3000 yards as water standpipe

UTILITIES:

Electric Power Commercial

Source of Gloucester Electric Co.

Voltage 110-220 AC or DC AC Phase Single 3 wire

Kilowatts Required 1.5 KW

Type of Lighting Fixtures Vapor Proof and Commercial

How Heated Space Heaters

Connected to Water Mains? No

Connected to Sewer? No

Type Latrine None

REFERENCE: (Mean Low Water)

Of Site 74' 7" Above M.L.W.

Of Instrument Axis: Upper 122.08 Middle 114.08 Lower 106.08

CRANE:

Type & Cap. None

Max. Dia. Reel Cap.

INSTRUMENTS AND EQUIPMENT:

Type of Observing Inst. Upper DPF Middle DPF Lower Asimuth

Type of Plotting Board None

DATA TRANSMISSION:

Type Control Switchboard & Tactical Phones

Date of Transfer

TIDE STATION:

Description of Tide Gauge None

DATUM POINTS:

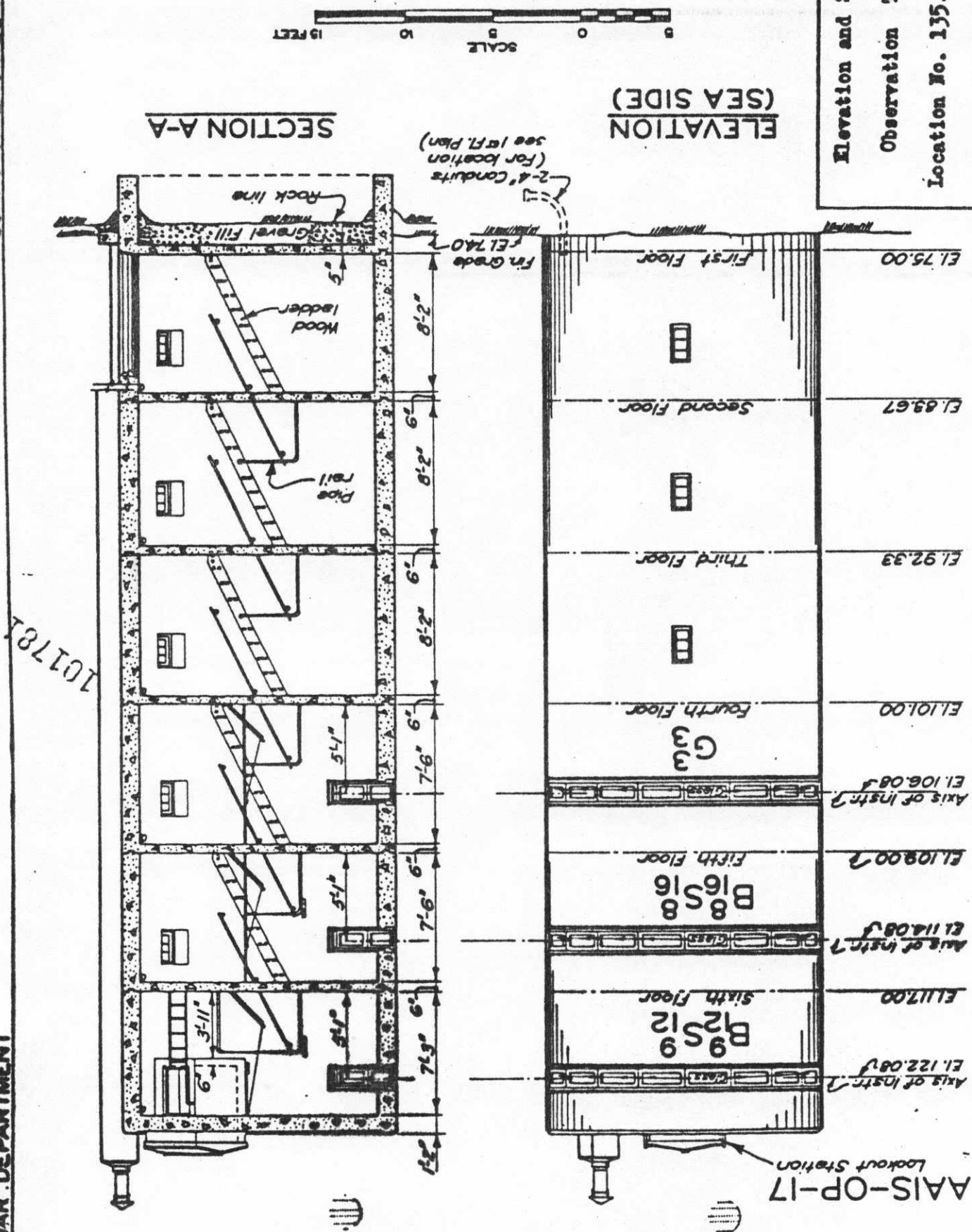
Ports From which Visible

QUARTERS:

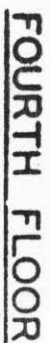
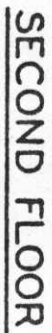
Stations Served None

CABLE HUT:

S.C. Type None



(Sheet 4 of 4 sheets)



(Sheet 3 of 4 Sheets)

SCALE

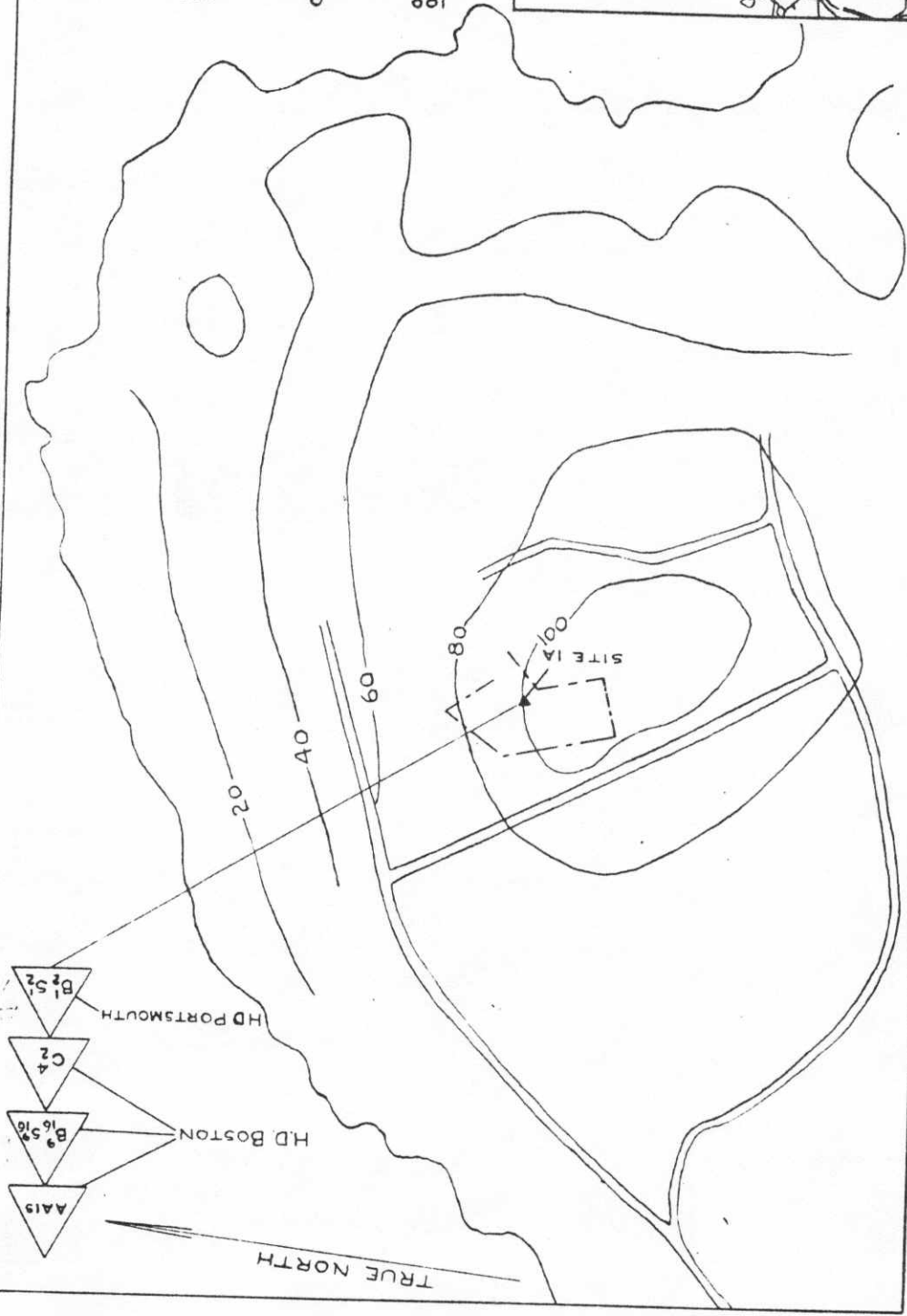
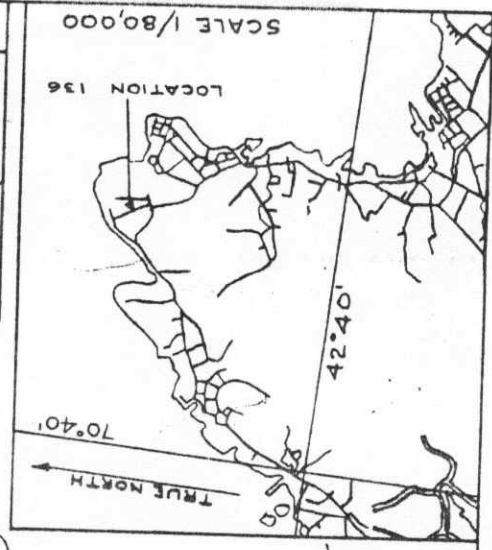
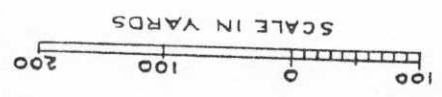


SECRET

H D OF PORTSMOUTH
LOCATION 136
HALIBUT POINT

PREPARED BY H D OF
PORTSMOUTH
DATE 1-1-45 REVISED
EXHIBIT NO. 9-B-1
DATE

SCALE 1 / 5000

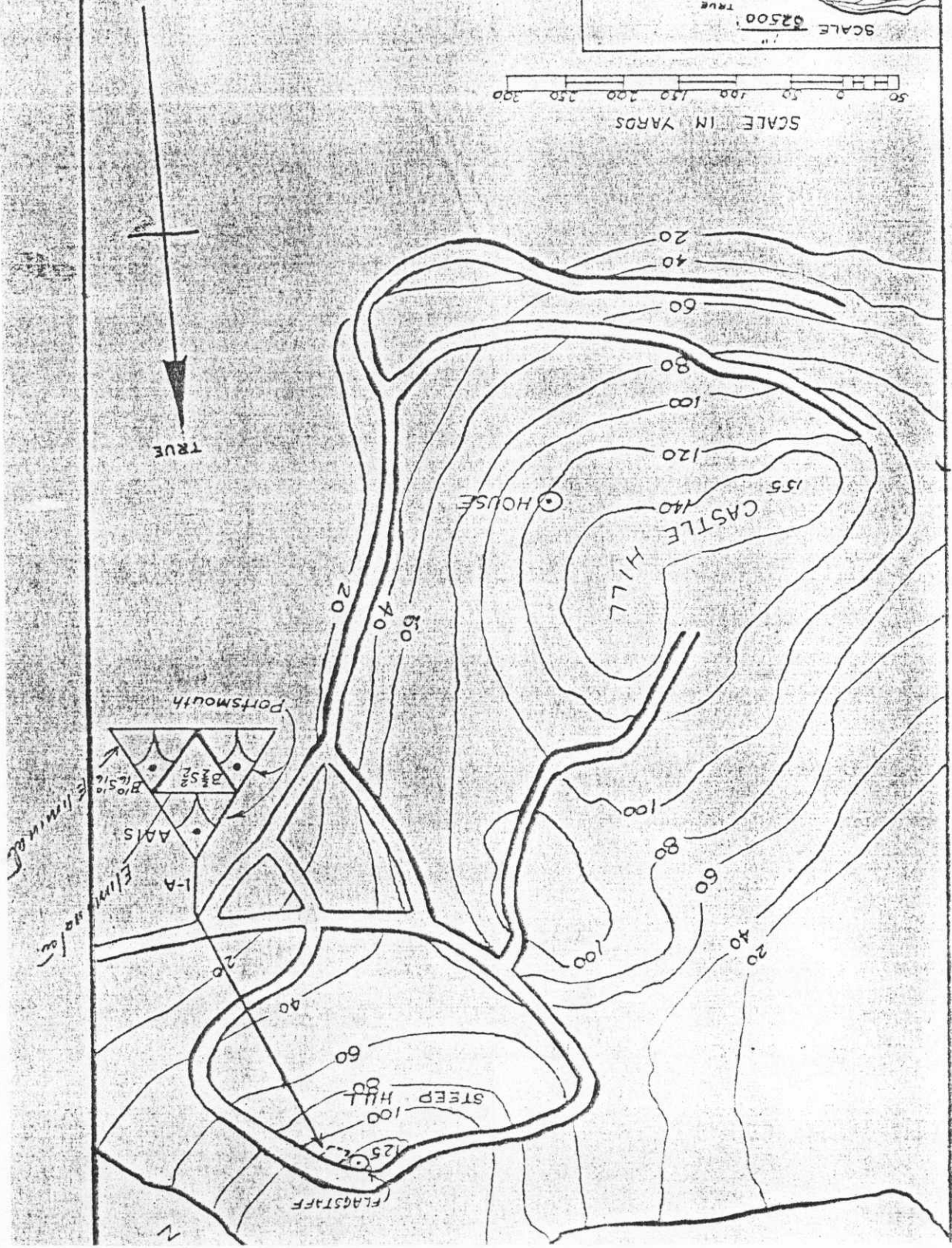


HARBOR DEFENSES OF
BOSTON
LOC. 137 CASTLE HILL
FIRE CONTROL INSTALLATIONS
PREPARED BY 23 JUNE 1943
H.D. OF BOSTON
EX. NO. 9-B-27

SECRET



SCALE IN YARDS
50 100 150 200 250 300



DESIGN ASSESSMENT

The following is a description of the Seacoast Mortar Battery at Fort Banks. This is a type known as an 'Abbot Quad', a late 19th century design for harbor defense [12]. The battery at Fort Banks is one of only six such Abbot Quads constructed. It is also the most complex and elaborate; it contains experimental features that were part of the design evolution of this type of fortification [6,7,8].

This is a semi-underground structure. It is organized around four open rectangular 'pits' arranged in a quadrangular (2 x 2) pattern. The quadrangle is aligned exactly with the cardinal directions. The two eastern pits and their adjacent structures are named "Battery Sanford Kellogg"; this portion is on Town property. The western pair is named "Battery Benjamin Lincoln"; this portion is on private property.

The length (east/west) of the concrete structure is approximately 438 feet from the exterior of the eastern walls of the pits and magazines to the exterior of the western end of the central magazine. The width (north/south) of the main concrete structure (including buried portions) is approximately 294 feet from the exterior of the southern walls of the southern flank magazines (underground) to the exterior of the northern walls of the northern flank magazines. To this should be added the embankment on the north flank which extends another 50 feet for a total width of 344 feet. This footprint covers 3.46 acres.

The structure to be described can be divided into four parts:

1) The Mortar Pits.

2) The Upper (new) Magazines.

3) The Lower (original) Magazines.

4) Protected Switchboard (a separate underground structure embedded in the side of the earthen embankment of the mortar battery).

Also described is the surface feature that looks like an obelisk. This is followed by a description of the overall features that are unique to this site.

The Mortar Pits.

There are four pits.

The north pit of Battery Kellogg ("Kellogg/B") is intact, open, and clear, except for an earthen ramp in one corner (left for the exit of construction equipment that re-excavated the buried pit in 1992). Description of the pit:

- The pit is rectangular, 70' x 100', with concrete walls on four sides.
- The north and south pit walls are 14 feet high; these are the exterior walls of the magazines (see below).
- The east and west pit walls are approximately 8 feet high; these retain earth fill.
- The pit is depressed below grade with earth slopes from the top of the concrete walls to the surface level.

Historical Site Inventory – Mortar Battery – Fort Banks, Winthrop, Mass.

- The concrete floor of the pit shows four circles 20 feet in diameter. These are the filled and covered mounting platforms for the four 12" breech-loading mortars installed in the pit until WWII.
- The south pit of Battery Kellogg ("A") is a mirror-image. It is completely buried with new housing built over it.
- The western pits (Battery Lincoln, "A" and "B") are generally similar. However they were only enclosed on three sides and are open to the west. Both are filled to mid-height, paved, and used as parking lots.
- Features of the pit (Kellogg/"B"):
- The pit as seen mostly dates from the 1915-1916 reconstruction. The original pits were considered too small and congested. The floor and outer walls were demolished. The pit was rebuilt to a larger size with greater spacing between the mortars. [3,9]
- This west wall contains a Telautograph data booth. This dates from the original 1892-1896 construction. The reconstruction was arranged to preserve this feature [3]. The Telautograph would electrically transmit and instantly reproduce handwritten messages; these messages were firing orders for the mortars sent from the plotting rooms where the positions of ships were computed [12].

The Upper Magazines.

These date from the enlargement of the batteries between 1912 and 1916 [9,11].

There are six magazine traverses. For each of the two named batteries there are three rooms each. Each room is approximately 12' x 67'. Except as noted, these are intact.

Description:

- North Flank, Kellogg: Two rooms opening onto a corridor/tunnel that connects the north pit with the exterior. The room adjacent to the pit was for storing projectiles. The room further to the side was for storing powder. These rooms served the mortars in the nearest (northern) half of the pit. This traverse is intact.
- Central Traverse, Kellogg: Four rooms opening onto a corridor that connected the north and south pits. The two center rooms were for storing powder. The two side rooms were for storing projectiles. Each pair of rooms served half of the adjacent pit. A flight of steps from the corridor accesses the Lower Magazines (see below). This traverse is intact except that the south end of the corridor is sealed because the south pit is buried.
- South Flank, Kellogg: This is a mirror of the North Flank. This traverse is buried.
- North Flank, Lincoln: Two rooms similar to the flank traverse of Kellogg.
- Because Btry. Lincoln is not enclosed, these rooms opened onto a covered portico with concrete roof supported by columns. This is traverse intact but the portico is enclosed by concrete block walls between the columns; it is used for storage.
- Additional rooms to the side of the traverse are from a powerplant built circa 1915.
- Central Traverse, Lincoln: Four rooms similar to the central traverse of Kellogg. Due to the existing Lower Magazines (see below), the new magazines could not be placed directly between the pits. Instead they were 'flipped' east-west and extend

Historical Site Inventory – Mortar Battery – Fort Banks, Winthrop, Mass.

- behind the corridor and pits. This traverse was extensively modified in WWII; the interior was sheathed with wood. The interior was later gutted by fire and the interior brickwork is spalling.
- South Flank, Lincoln: This is a mirror of the North Flank without the powerplant.

Features of the upper magazines:

- Overhead conveyor rails for transporting shells. These include mechanical switches for selecting between different rails holding different types of shells.
- Linings of porous brick to reduce condensation.
- Built at a floor elevation 4' higher than the originals to avoid drainage problems [3].

The Lower Magazines.

This complex dates from the original construction of 1892 to 1896 [8].

The lower magazines are entirely underground and located between the east and west pairs of pits; they interconnect the magazines and pits described above. They consist of a series of concrete galleries and rooms with arched ceilings. Description:

- Two 'cross galleries' run north-south. One connected the pair of pits in each named battery. These are intact but the original entrances to the pits at the ends of the galleries were sealed during the reconstruction [9]. Near the ends of these galleries are shallow niches in the walls for fire-control (see below).
- From the center of each 'cross gallery' a flight of steps leads up to the adjacent upper magazines.
- A 'main gallery' runs east-west between the 'cross galleries'. Near each junction this splits and runs alongside the triangular complex (see below).
- Two powder rooms and two storerooms branch off the mid-point of the main gallery at the center of the overall structure.
- An irregular niche is cast in the original walls of the main gallery near the powder rooms. Clay ducts imbedded in the walls lead to other areas of the magazines. These are part of the original ventilation design (see below).
- At the junction of each 'cross gallery' with the 'main gallery' is a triangular complex of rooms used for ammunition handling (see below).

Important features of the lower magazines to be considered:

- This structure contains elaborate interior rooms intended to improve ammunition handling. Documentary evidence indicates they reflect a concern for safety as artillery began to move from 'cannonballs' to explosive shells [6,7]. These additional rooms were an experimental design built only at this battery; they make it the unique structure it remains today.
- This structure included provisions for air-conditioning and humidity-control in the original design [6,8]. Remnants of these features survive. While the specific design as described in the documentary evidence may or may not have been fully installed, the plan is very advanced for 1891 and not attempted elsewhere.
- This structure includes special niches and ductwork intended for running cables to the mortars to allow electric firing of all mortars simultaneously [6].
- The galleries still contain overhead conveyor rails for transporting shells.

Protected Switchboard

This is a type of structure known as a 'Protected Switchboard' built circa 1920 [10]. It contained a telephone switchboard that connected the batteries to remote observation stations from which the positions of targets were determined; it also connected the fort to other harbor defenses.

The Protected Switchboard structure consists of a room (approximately 20' x 40') with thick concrete walls and roof built into the side of the embankment. This provides physical protection from enemy shellfire. A free-standing wooden building was constructed within this room to house the switchboard and protect it from concussion and condensation.

Only the entrance at one end protrudes from the embankment. This was closed by an earthen mound some years ago. It is currently inaccessible but could be reopened. The interior is believed to be reasonably intact.

The Protected Switchboard is physically independent of the mortar battery; they are connected only by communications wires. Typically these Protected Switchboards were built into the protected or sheltered side of a convenient hill. At Fort Banks the earthen embankment of the mortar battery was the convenient hill.

Obelisk

A concrete obelisk protrudes from the ground surface midway between pits Kellogg/B and Lincoln/B. This is a vent shaft from the lower magazine. A clay tile vent rises from the north end of the north powder magazine of the lower magazines. It is encased in concrete for support. The top of this obelisk indicates the original level of the earth cover over the magazines. This is believed to be one of four such vents that existed. This vent was apparently later used as the base of a survey benchmark (although this B.M. shows on USGS topographic maps, it has not been possible to match it with a specific National Geodetic Survey data sheet). This use may be the reason why this vent shaft survived. Local reports indicate the bronze marker disk on top has been chiseled out.

Summary

Significant features that are unique to the Fort Banks mortar battery:

- This is the only mortar battery to have the triangular arrangement of rooms at the intersection of the corridors. These were part of an evolving safety-oriented design approach. It was felt that the newer types of ammunition posed a risk of accidental explosion. This design was intended to reduce the chance of such explosion and localize the damage should one occur [6,7].
- This structure was modernized and enlarged 1912-1916 [1,2,3]. It is the only mortar battery to be so extensively renovated. The original magazines and the inner walls of the pits were preserved. The outer walls of the pits were rebuilt further out to create more spacious pits; the mortars were re-positioned further apart for better access. New magazines were constructed around the periphery; these followed improved designs and include linings of porous brick to reduce condensation. The existing structure thus includes examples of the original Abbot Quad and the typical later design grafted together. This is the only location where both designs are co-located.
- This was one of the first three harbors, and one of the earliest (1892) sites, where 'modern' fortifications were started [11,12]. The concrete extant in this structure represents one of the earliest uses of concrete for a major U.S. fortification.
- The location and topography of Fort Banks emphatically illustrates the blind-fire concept of the mortar battery; this is the only Abbot Quad site where you can NOT see the ocean from the fort.
- This is the only "Abbot Quad" type of fortification in Massachusetts, or anywhere in New England.

There has been some alteration of the topography of the site, however the mortar pit and the complex underground tunnel system are essentially intact in their original form.

HISTORICAL NARRATIVE

Fort Banks was established to be the site of a Seacoast Mortar Battery pursuant to the Acts of Congress approved August 1, 1888 and August 18, 1890. Between 1890 and 1904, some 33 acres were acquired in some 37 separate land transactions. Jurisdiction was ceded to the United States by an act of the General Court of the Commonwealth of Massachusetts approved March 16, 1891 [5]. The fort was named "Fort Banks" for Maj. Gen. Nathaniel P. Banks, Congressman and Governor of Massachusetts, who served with the U.S. Volunteers in the Civil War and died September 1, 1894 (per General Order #134, Adjutant General's Office, July 22, 1899) [10].

The site was apparently intended for two mortar batteries, each with 4 pits and 16 mortars. The second battery was never started. The Seacoast Mortar Battery at Fort Banks was constructed between 1892 and 1896 to protect Boston Harbor. It was transferred to the Artillery on September 2, 1896 [1,2].

Originally the entire structure was named "Battery Benjamin Lincoln" for Maj. Gen. Benjamin Lincoln, who served in the Continental Army during the Revolutionary War and was the first Secretary of War of the Continental Government 1781-1783 (per General Order #194, War Department, December 27, 1904). Later the eastern half was renamed "Battery Sanford Kellogg" for Brevet Col. Sanford C. Kellogg, U.S. Volunteers (Maj. 4th U.S. Cavalry) who served in the Civil War and died February 7, 1904 (per General Order #25, War Department, January 25, 1906). [10].

A major peacetime training accident occurred in 1904 – a premature detonation caused four fatalities and multiple injuries [4].

The mortar battery was extensively modernized 1912-1916 to defend the new North Channel dredged into Boston Harbor [1,2,3,9,11].

In 1922 the fort became the administrative headquarters for all Boston defenses. By WWII the mortar battery was obsolete, the weapons were scrapped, and the magazines became the underground Harbor Defense Command Post for all of Boston. [10].

The fort and underground battery structure remained active in support of the anti-aircraft defenses (guns and later Nike missiles) of Boston until approximately 1966. At this time command of all New England anti-aircraft defenses was transferred to a site in Coventry, Rhode Island. Subsequently Fort Banks was closed and the property was transferred to various public/private owners [11].

The mortar pits of Battery Kellogg were filled in the 1970's. Pit B of Battery Kellogg was excavated in 1990 and used since then by the Winthrop Emergency Management (Civil Defense) organization for storage.

The open pit (Kellogg/B) and most of the underground structure is on municipal land (Town of Winthrop). Another pit (Kellogg/A) is permanently buried under a state/municipal housing complex. The two pits of Battery Lincoln (A and B) and a portion of the underground structure are part of the private Governors Park housing complex with varying degrees of re-use.

HISTORICAL NARRATIVE (cont.)

General history of Seacoast Mortar Batteries [12]:

- The Seacoast Mortar Battery is unique to the United States. It is the brainchild of Gen. Henry L. Abbot, derived from his experience with primitive smoothbore mortars during the Civil War. He developed the concept of using 'modern' rifled Breech-loading Mortars (current terminology would call them howitzers) arranged in a quadrangle of 16 mortars, in 4 pits each containing 4 mortars, fired simultaneously in a nearly vertical direction. This sent a shotgun pattern of sixteen shells (each 12 inches in diameter and weighing 700-1000 pounds) in high arc to rain down on the unprotected decks of attacking ships.
- Because they were fired at a high angle, the mortars could be secluded in deep pits for protection, with surrounding underground magazines. The crews could not see their targets; they fired 'blindly' to azimuths and elevations computed by external observers and plotters. A sophisticated fire-control network, using what might be called 'manually-driven distributed computing' was used to determine in 'real time' the future position of a moving target and compute firing directions to hit it.
- Mortar batteries made extensive use of Telautographs to transmit these firing directions to the pits. The Telautograph was invented by Elisha Gray in the 1880's and remained in commercial use into the 1960's. In this system, as an operator generated a handwritten message using a special pen and instrument, this message was reproduced exactly at a remote instrument. This precursor of the FAX machine was expected to be an unambiguous method of transmitting firing directions in a noisy environment. However the system was less than completely satisfactory, primarily due to electrical problems, and was eventually replaced by telephones.
- The Seacoast Mortar Battery was a mainstay of American harbor defenses through the first half of the 20th century. Experience showed that the mortars were more accurate than expected and therefore firing sixteen simultaneously was overkill. The original pits were too small and congested. Later mortar batteries, constructed in large numbers in many harbors, used a simpler arrangement, with fewer mortars in larger pits and only two pits per battery. The older four-pit batteries were 'split' into two separate batteries so they could fire at two targets simultaneously.
- The Abbot Quad is a significant milestone in the evolution of military architecture. It illustrates the transition from primitive 19th century smoothbore weapons to 'modern' 20th century artillery. It represents the era when the United States became a world-power. This era is an early example of military needs driving manufacturing (at the beginning of this expansion much of the material had to be imported from Europe) much as later military needs drove the early electronics and computer industries.

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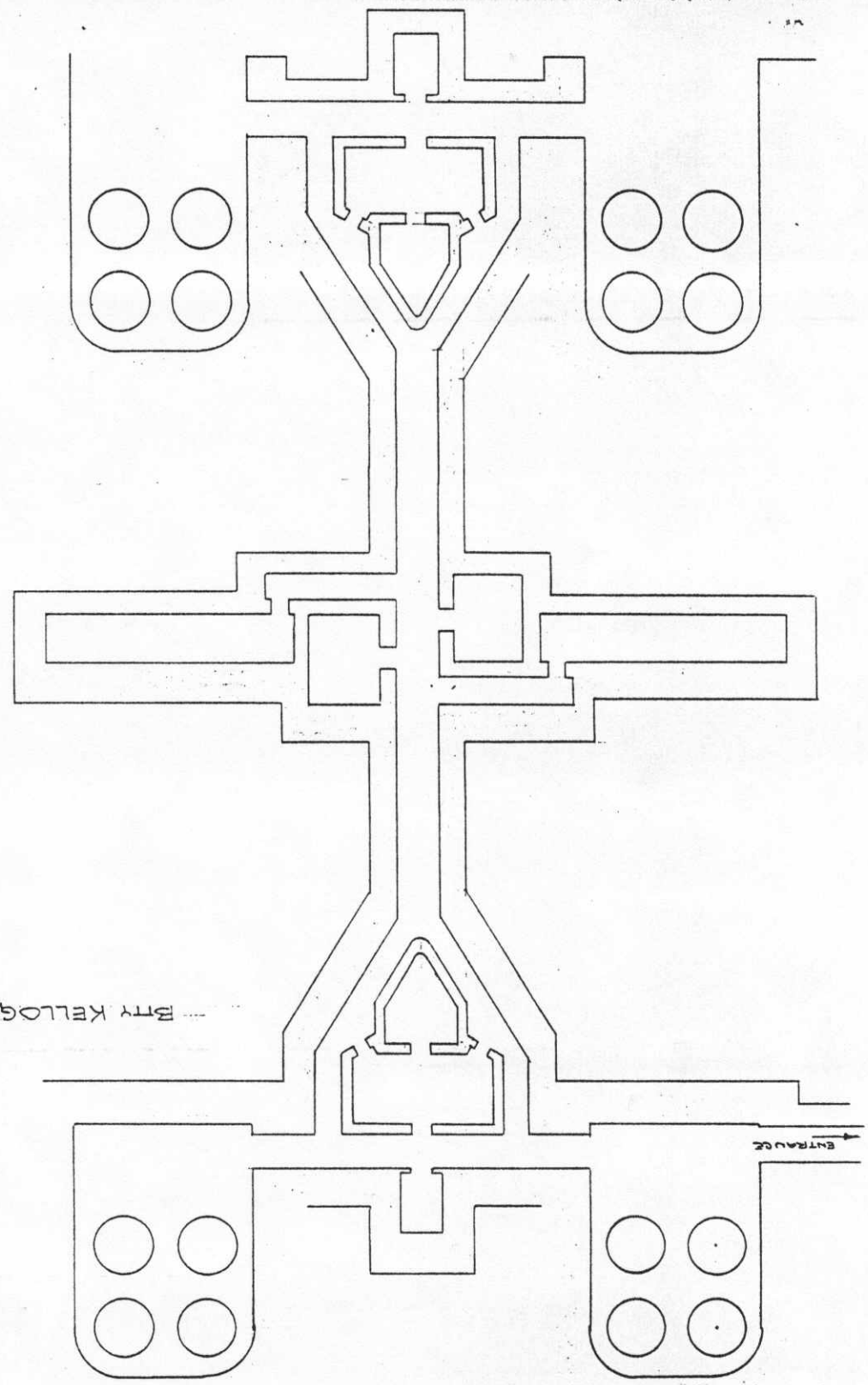
- [1] _____; Report of Completed Works (RCW), Form 1, Battery Kellogg, Fort Banks; edition of June 21, 1929; Office of the Chief of Engineers, U.S. War Department (NARA, RG-77, full citation to follow).
- [2] _____; Report of Completed Works (RCW), Form 1, Battery Lincoln, Fort Banks; edition of June 21, 1929; Office of the Chief of Engineers, U.S. War Department (NARA, RG-77, full citation to follow).
- [3] _____, Various correspondence, notes, and diagrams relating to the reconstruction of Fort Banks found in Subject files #127 [box 32] and #248 [boxes 51-52] of the "Correspondence Relating to Fortifications 1907-1935" Boston District, Corps of Engineers (NARA, RG-77, Series 615, Federal Archives & Record Center, Waltham, MA). These are summarized in: Vaughan, Thomas J.; Annotated List of Files and Compiled Notes; 1982; Unpublished MS (copy on file at FARC, Waltham, MA)
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182
O'Donoghue

BTTYS LINCOLN + KELLOGG
FORT BANKS - WINTHROP
MARCH 1, 1909

ORIGINAL CONSTRUCTION

Btry LIDGOLD



Btry KELLOGG

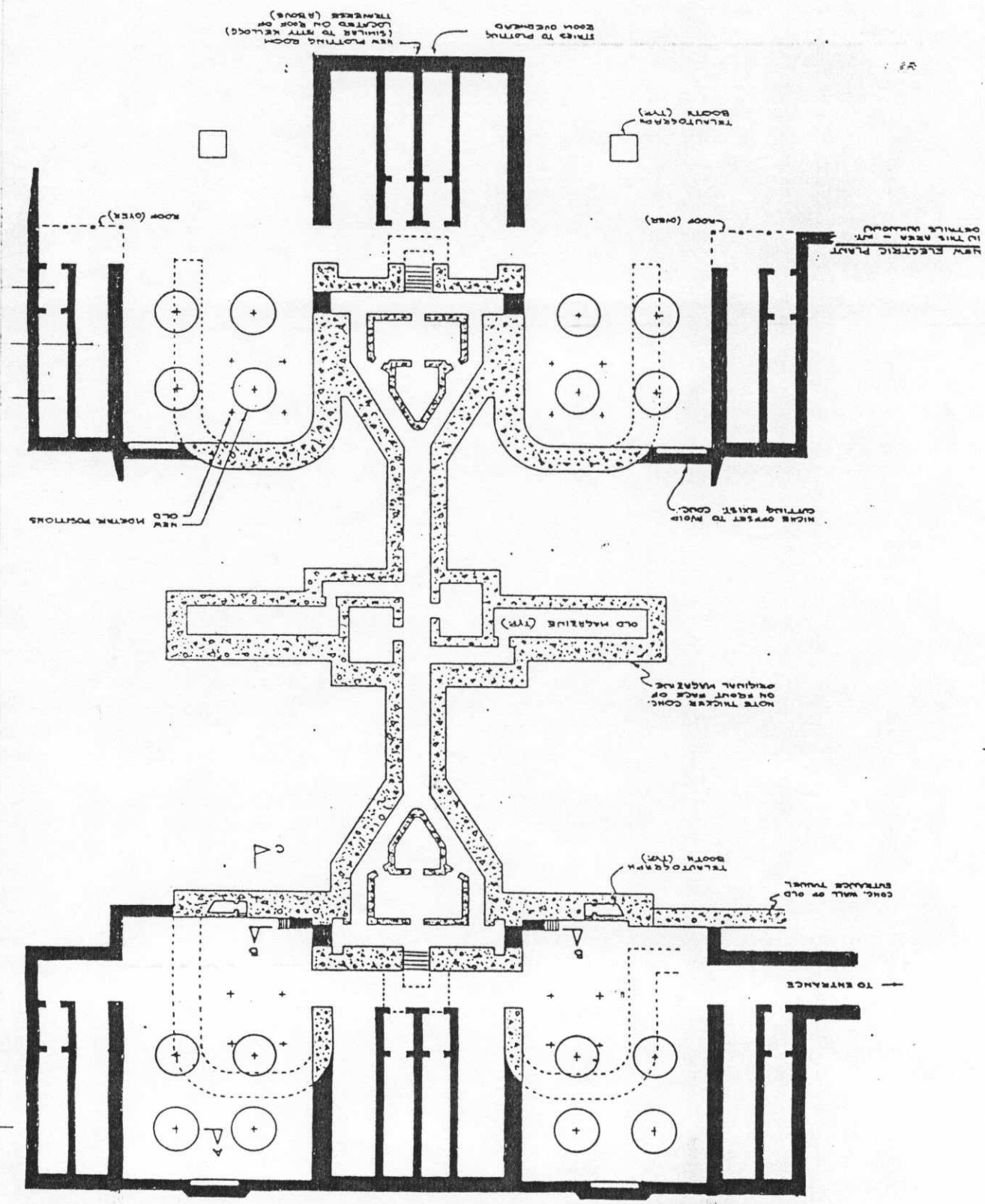
ENTRANCE

182
Adolph

AFTER RECONSTRUCTION

(BOTH PITS 4'x3' x 8'x4')

BTRY BENJAMIN LINCOLN



BTRY SANFORD KELLOGG