

5402abc

5402abc

Form 504

U. S. COAST AND GEODETIC SURVEY
DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey *Hydrographic*
 Field No. *5402* Office No. *2. b. c.*

LOCALITY

State *Conn. - New York*
 General locality *North Shore*
 Locality *Long Island Sound*

1933

CHIEF OF PARTY
Harold A. Cotton

LIBRARY & ARCHIVES

DATE

5402a
5402b
5402c

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES
MAR 12 1934
Acc. No. _____

WIRE
DRAG

5402a
5402b
5402c
WIRE
DRAG

Form 504
Ed. June, 1923

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, Director

State: Conn-New York

DESCRIPTIVE REPORT

Topographic } Sheet No. 3
Hydrographic } 5402a
5402b
5402c

LOCALITY

North Shore Long Island

Sound

Stamford Harbor - Manhasset Island

193 3

CHIEF OF PARTY

Harold A. Cotton

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 54022

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

5402 a

Field No. 3

REGISTER NO. **54022**

State Conn. - New York

General locality North Shore Long Island Sound

Small
ALS.
Large

Locality Captain Harbor and Vicinity

Scale 1:10,000 Date of survey July-Aug. Sept. Oct., 19 33

Vessel Shore Party No. 3

Chief of Party Harold A. Cotton

Surveyed by F. E. Okeson - W. F. Deane

Protracted by H. J. Seaborg, R. M. Searle - A. Black

Soundings penciled by R. M. Searle - A. Black

Soundings in ~~fathoms~~ feet

Plane of reference

Subdivision of wire dragged areas by

Inked by S. E. Perkins

Verified by Harold Murray and S. E. Perkins

Instructions dated March 23, 19 33

Remarks:

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

5402b

Field No. _____

REGISTER NO. 5402b

State Connecticut - New York

General locality North Shore of Long Island Sound.

Small off. A.L.S.

Locality Byram River and Greenwich Harbor.

Large

Scale 1:5,000 Date of survey Aug. 29-30; Sept. 17-18 ~~1932~~ 1933.

Vessel Launches. Shore Party No. 3.

Chief of Party Harold A. Cotton.

Surveyed by F. E. Okason - W. F. Deane.

Protracted by R. M. Searle - A. Black.

Soundings penciled by R. M. S. - A. B.

Soundings in ~~XXXXX~~ feet

Plane of reference M. L. W.

Subdivision of wire dragged areas by _____

Inked by S. E. Perkins

Verified by S. E. Perkins

Instructions dated Mar. 23 . 1933 ~~1932~~

Remarks Sounding records for this sheet (H-5402b) are volumes 7 and 8 H-5402a;

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 5402C

DRAG
HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

5402C

Field No. 3

REGISTER NO. 5402C

State Conn- New York

General locality North Shore Long Island Sound

app.
Small
A.L.S.

Locality Captain Harbor and Vicinity

Large

Scale 1:10000 Date of survey Aug. Sept. Nov. 1933

Vessel Shore Party No. 3

Chief of Party Harold A. Cotton

Surveyed by F.E. Okeson- W.F. Deane

Protracted by R.M. Seattle

Soundings penciled by

Soundings in fathoms feet

Plane of reference

Subdivision of wire dragged areas by F.E. Okeson- W.F. Deane

Inked by J.D. Groff

Verified by H.A. Cotton - W.B. Bamford

Instructions dated March 25, 1933

Remarks:

DESCRIPTIVE REPORT
to accompany
HYDROGRAPHIC SHEET NO.3

INSTRUCTIONS

This survey was executed in compliance with Directors Instructions dated March 23, 1933 - Project H.T. 134.

LIMITS OF SHEET

This sheet extends along the north shore of Long Island Sound from Stamford Harbor to Manursing Island and off shore to approximately the ten fathom curve; it covers about the same area as Hydrographic Sheet No. 1699 (b) (Whitney 1914). On the east, the sheet joins Hydrographic Sheet H-5222 (Grenell - 1932); on the south Hydrographic Sheet No. 1732 (a) (Whitney 1914) and on the west Hydrographic Sheet No. 5413 (Field No. 4 of the present seasons work.

CONTROL AND SURVEY METHODS

Numerous third order triangulation stations furnished excellent control for the survey. Hydrographic signals were either such triangulation stations or topographic signals based on this control.

Two hydrographic parties worked at times on the sheet altho the major portion of the work was done under the direct supervision of Mr. F.E. Okeson, Mate.

Most soundings were taken with a 8 - 12 pound leadline altho a sounding pole was used in shoaler areas. With care it was found possible to maintain leadlines with little or no correction.

Positions of the sounding launches were determined by the usual three point fixe except as noted in Port Chester and Greenwich Harbor.

SCOPE OF WORK

The present survey in conjunction with the work of 1914 and surveys since that time, was to form the basis for a new chart of the area. This involved the following:

- (a) The verification of all rocks and shoals located prior to 1914.
- (b) The general verification of depth curves and soundings for the area covered by the 1914 survey with such additional work as necessary to substantiate any changes found.
- (c) Development of areas not covered by the 1914 survey.

A boat sheet was prepared in the Washington Office to indicate the necessary verification of work prior to 1914. This verification consisted of relocating extensive foul areas as well as numerous rocks and shoals. Most of this work was accomplished either by special examination at low water (see below) or by dragging (separate report). In some cases a close system of sounding lines secured the necessary verification.

Rocks, shoals, etc shown on the chart but not shown on the above boat sheet did not require verification; they having been located by wire drag or otherwise since 1914.

A general system of 200 meter lines were run over the outside area; these were split to 100 meters as thought necessary to secure good determination of the depth curves. Over the several bays and anchorage areas, lines were spaced 100 meters with channel lines spaced 25 - 30 meters. For the development of shoals, lines were spaced 25 - 30 meters - in a few cases as close as 20 meters.

LOW WATER EXAMINATION

The entire shoreline as well as off lying reefs were specially examined during periods of low water for the location of rocks (* or /) and the delineation of the low water line.

As this portion of Long Island Sound has a great amount of foul area of this type, much time was devoted to such low water examination. The regular program for the hydrographic party was to utilize every low water period for such examinations, the sounding lines being run at other times.

Generally speaking, off lying rocks and reefs were located by the hydrographic party while the low water line and adjacent rocks were located by the topographic party. The low water line as shown on the Hydrographic sheet is from the topographic sheets.

In the case of generally foul area extending off protruding points or of reefs of the same character, such rocks were located as to outline the foul area. In these cases, there are numerous other rocks inside the foul area thus outlined. Areas of this type include the following:

Off Greenwich Point	Otter Rocks
Off Flatneck Point	Jones Rocks
Off @ Barn (Flatneck Pt.)	Manursing Reef
The Ross Rocks	Cormorant Reef
Foul area all about Great Captain Island and Little Capt. Island.	
Off north shore Galf Islands.	

In general, the low water examinations resulted in the location of numerous rocks in addition to those shown on the present chart.

Except in some of the shallow bays, it was seldom possible to carry the hydrography far enough inshore to give a determination of the low water line. In the bays where soundings were carried to the

low water line, there is good agreement with the topography with the possible exception of Chimney Corner, where some adjustment is necessary. In this case, a question of tides may be involved as there is only a small inlet to the bay.

SUMMARY OF RESULTS

The junctions with all adjoining sheets (Nos. 1699 (b)-1732(a) and H 5222 as noted above) were very satisfactory, the depths with very few exceptions agreeing to the nearest foot.

Depths and depth curves as determined by the present survey were in very close agreement with the 1914 survey (sheet 1699 (b) and the present chart. The principal exceptions were as follows:

(a) Slightly deeper water was found on the northwest and southeast side of Great Captains Harbor, resulting in the two fathom curve coming about 200 meters closer to shore off Field Point and eliminating the extension of the same curve to the westward of Little Captains Island.

(b) Slightly less depths were found over the shoaler portions of Greenwich Cove, Coscob Harbor, Byram Harbor and Chimney Corner altho the entrance depths were slightly greater. The upper portion of Chimney Corner was found to go dry at low water. The eastern portion of Port Chester has been dredged to 12- 15 feet, otherwise the depths are about the same; the southern extension of this harbor is considerably shoaler than before.

(c) The area close about and particularly to the south of Great Captains and Little Captains Islands was close developed during the present survey. Generally slightly greater depths were obtained.

(d) A passage with $3\frac{1}{2}$ feet extends behind the smaller of the Calf Islands.

(e) A passage with 6 - 7 feet was found across Jake Reef into Coscob Harbor.

All rocks and shoals of-work prior to 1914 (as given on the boat sheet from the Washington Office) were verified with the following exceptions:

(f) An old 8 foot spot about 400 meters N. ^{E.} of Cormorant Reef was cleared with a $12\frac{1}{2}$ foot drag strip and an old 10 foot spot about 800 meters west of triangulation station WRECK was cleared with a 14 foot drag. These soundings are probably one fathom in error. H 1699 (1886)

These soundings will be removed from the chart. P.S. (See par 6 - review of H 51022)

(g) A thorough search was made for all rocks off Manursing Island- those found are indicated on the ~~boat~~ sheet. It is believed the fringe of sunken rocks shown is figurative; the low water beach is made up of small boulders.

(h) No rocks were found extending off the N.W. shore of Little Captain Island as far as shown on the boat sheet. The area was dragged (See report)

(i) The $3\frac{1}{2}$ foot and $5\frac{3}{4}$ foot spots approximately 400 meters S.E. of triangulation station CROSS were not verified. This area was listed among the places to be dragged but for some reason was omitted.

These soundings from H 1699 (1886) have been added to H 5402 & will be retained for the present.

(j) The northern extension of Cormorant Reef should have been better determined by wrapping with the drag. The low water examination did not show any rocks awash in this vicinity.

This rock awash originally located on T. 1708. Has been added to H 5402.

SUPPLEMENTAL SHEETS

It was found impractical to plot the hydrography for Port Chester and Greenwich harbors on the 1:10,000 scale.

Accordingly 1:5000 enlargements were prepared on a separate sheet for plotting this work. These enlargements were carefully constructed directly from the topographic sheet.

In both these harbors, cross-channel lines of sounding were taken along a graduated wire the ends of which were generally located by measurements to definite points shown on the topographic sheet but at times by three point fixes. The method of location is fully described in the Sounding Record.

Only the cross-channel lines have been plotted on the smooth sheet. Channel lines were run but are plotted only on a tracing paper overlay. On account of the general difficulties to be expected with three point fixes in such restricted space, it is not believed that these fixes are here comparable with positions well determined on the ground as in the case of the cross-channel lines. Accordingly it is believed information regarding depths should be taken only from the cross-channel lines and the channel lines simply considered as reasonable checks - particularly as evidence that shoaler depths do exist between the cross-channel lines.

A minimum depth of 10 feet (Pos. 33-34 hh) was found in the Byram River - project depth 12 feet. Depths of 12-14 feet were found in Greenwich Harbor practically to the head of the harbor.

STATISTICS

Miles (stat)	Positions	Soundings	Area.
246.4	3103	17,998	16.2 sq.stat.

Respectfully submitted

Harold A. Cotton
Harold A. Cotton,
Chief of Party

41° 00.8
73° 33.7

DESCRIPTIVE REPORT
to accompany
DRAG SHEET No.3-D
(H-5402c)

INSTRUCTIONS

This survey was executed in compliance with Directors Instructions dated March 23, 1933 - Project H.T. 134.

LIMITS OF SHEET

Sheet covers same area as Hydrographic Sheet No. 5402a (Field No.3-same season).

CONTROL

Same as above mentioned Sheet No. 5402a (Field No.3)

SCOPE OF WORK

All dragging on this sheet was the purpose of verifying rocks and shoals found during previous surveys.

The Rope Drag was used for all of this drag work except two days (E and F days) with the Pipe Drag and two days (E and S days) with the Wire Drag.

Special reports are being submitted covering the general features of both the Pipe Drag and the Rope Drag.

PLOTTING DRAG STRIPS

The type of dragging necessary for such verification work as accomplished on this sheet required relatively narrow strips and generally quite a number of strips over the same area. As it is quite confusing to properly plot and interpret such overlapping narrow drag strips, each strip was first plotted separately on a piece of tracing paper and notation made on the same as to what had been accomplished by the particular strip. A study of these strips quickly showed to what extent the area had been covered.

It was inevitable in this type of work but that there would be some duplication of work with different strips and some strips that actually accomplished little or nothing. Such strips were discarded in the smooth plotting.

All of the separate sheets of tracing paper on which the individual drag strips were originally plotted are enclosed in a separate folder and accompanying this report.

SUMMARY OF RESULTS

Results of the dragging are as noted below. For reference purposes, the various locations of work have been indicated by large green figures on the smooth sheet. (C) N. D.

1. BLUE FISH SHOAL - Lat. $40^{\circ} 58.3'$ Long $73^{\circ} 39.0'$

Found $15'$ (hydrography) near old red $13'$ spot

- Cleared with $13\frac{1}{2}'$ strip.

Grounded on $16'$ spot (by old red $16'$)-

- Cleared and proceeded.

Found $15'$ and $16'$ spots near old red $14\frac{1}{2}'$ L

- Unable to clear on account of buoy.

Use par. 6 & review of H 5402 a
charted 13 to be retained

2. GLOVER REEF - Lat. $40^{\circ} 58.0'$ Long. $73^{\circ} 39.4'$

Numerous old red and blue rocks (* and /)

Found $2\frac{1}{2}'$ by old red $3\frac{1}{4}'$, also a $3'$ and $3\frac{1}{2}'$ L

-Cleared with $2\frac{1}{2}$ - $3'$ strip.

All other * and / cleared with 2-3' strip

Numerous soundings shown on hydrographic sheet.

3. BLUEFISH REEF Lat. $40^{\circ} 58.6'$ Long. $73^{\circ} 39.3'$

Found $3'$ on old red rock *

- Cleared with $2\frac{1}{2}'$ L

4. Lat. $40^{\circ} 59.8'$ Long. $73^{\circ} 38.3'$ L

Verified rocks awash

5. Lat. $40^{\circ} 58.9'$ Long. $73^{\circ} 38.8'$

Found $15\frac{1}{2}'$ (hydrography) by old green $15\frac{1}{2}'$ spot. L

Found $18'$ (hydrography) by old green $15'$ spot.

- Cleared by $15\frac{1}{2}'$ strip.

* Drag touched $15\frac{1}{2}'$ but slipped over.

Position of grounding too indefinite to plot. 15' close by on H. 5402. R2g

6. Lat. $40^{\circ} 58.8'$ Long. $73^{\circ} 38.2'$

Covered on green $19'$ soundings with $16'$ strip.

(previous dragging had cleared with only $14'$)

Grounded on green $13'$ spot - no further verification

(this $13'$ spot already cleared by $12'$ drag)

13' sounding placed on H. 5402 R2g

7. JONES ROCKS Lat. $40^{\circ} 59.2'$ Long $73^{\circ} 38.3'$

Southern limit of foul area determined by wrapping with $7\frac{1}{2}'$ drag strip. L

Least water ($1\frac{1}{2}'$ and $\frac{1}{2}'$ spots) located on hydrographic sheets. L
shown as rocks awash at N. 2 W.

8. STEAMBOAT ROCK Lat. $41^{\circ} 00.5'$ Long $73^{\circ} 37.4'35$

Numerous $6'$ soundings (hydrography) about old red $4'$ spot.

Covered area with $4\frac{1}{2}'$ strip.

Found $5'$ just north old $4'$ spot

- believe this is Steamboat Rock

H. 5402 a shows 5' in about the same position as the old 4' spot R2g

9. N.W. EXTENSION CORMORANT REEF Lat. $40^{\circ} 59.4'$ Long $73^{\circ} 37.8'5$ L

* Well covered by soundings - least depth $4'$

Used drag to locate rock awash ($0'$)

* The drag should have been grounded on the rock charted in Lat. $40^{\circ} 59.4'43$
Long. $73^{\circ} 37.85$ from H. 1699 in order to definitely disprove or verify it. R2g

10. Lat. $40^{\circ} 59.4'$ Long. $73^{\circ} 37.6'$
Determined eastern limit foul ground about Coromant Reef
by wrapping $6\frac{1}{2}'$ drag strip about area. ✓
11. Lat. $40^{\circ} 59.2'$ Long $73^{\circ} 37.3'$
Determining limits of fouled ground off N.E. side Great
Captain Island.
Cleared old red $3-3\frac{1}{4}'$ with $7'$ strip
Found $4'$ on old blue rock * ✓
Found two additional $3'$ spots
12. Lat. $40^{\circ} 59.5'$ Long. $73^{\circ} 37.5'$
Cleared old red $8'$ spot with $12'$ pipe drag
(had previously been cleared with $12'$ wire drag) ✓
Found $7\frac{1}{2}'$ by previous $7'$ sounding (chart)
- Cleared with $6\frac{1}{2}'$ strip (Pos.13 - 15 N) $6'$ is charted here
(allowing reasonable bight for drag)
13. Lat. $40^{\circ} 59.3'$ Long $73^{\circ} 37.0'$
Determining western limit foul ground off Little Capt's
Island.
Drag strips from north (effective depth $3\frac{1}{2}'$) and from N.E. ✓
(effective depth $4'$) covered numerous old blue rocks.
Drag strip from westward ($6'$ effective depth) grounded
without taking soundings but $1'$ spot ($18 f$) close by. ✓ Rocks awash on #5492e
14. Lat. $40^{\circ} 59.1'$ Long $73^{\circ} 36.9'$
Determining western limits of foul ground off Little Capt's
Island. ✓
Drag strip from south ($6'$ effective depth) grounded on
cluster sunken rocks ($2\frac{1}{2}' - 3' - 3\frac{1}{2}'$)
Crossstrip (effective depth $4\frac{1}{2}'$) carried northeastward to
grounding on rock awash.
15. Lat. $40^{\circ} 59.0'$ Long $73^{\circ} 37.2'$
Determining limits foul ground N.E. side Great Capt's Island. ✓
Found $\frac{1}{2}'$ spot close by old red $\frac{1}{2}'$. Chart has sunken rock symbol
Area to eastward cleared with $4\frac{1}{2}'$ strip.
16. Lat. $41^{\circ} 00.5'$ Long $73^{\circ} 36.1'$ ✓
Found $3\frac{1}{2}'$ close by old red $3\frac{1}{2}'$
17. Lat. $41^{\circ} 00.0'$ Long $73^{\circ} 35.9'$ ✓
Covered old red $10'$ soundings with $14'$ strip.
- Dragged from both directions.
These old soundings also covered with $12\frac{1}{2}'$ wire drag strip
and a $12\frac{1}{2}'$ rope drag strip both of which grounded near the same point
at northern end of strip. These groundings should have been investigated
but for reasons unknown were not. ✓ 10' sdg. erased from chart.
See par. 4. Review of #5402e
18. Lat. $41^{\circ} 00.1'$ Long $73^{\circ} 35.5'$ ✓
Found $5'$ just inshore old red $5\frac{1}{2}'$ spot
19. Lat. $41^{\circ} 00.5'$ Long $73^{\circ} 35.7'$ ✓
FINCH rock Located.

STATISTICS

Miles Drag (Stat)	Positions	Soundings
10 .4	192	50

Respectfully submitted

Harold A. Cotton
Harold A. Cotton,
Chief of Party

200
March 29, 1934

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
10 volumes of sounding records ~~for~~ and 5 volumes of Wire Drag records for

HYDROGRAPHIC SHEET 5402 a, b, c

Locality Captain Harbor and vicinity, Long Island Sound

Chief of Party: H. A. Cotton in 1933
Plane of reference is mean low water, reading
5.0 ft. on tide staff at Cos Cob Harbor
10.6 ft. below B. M. 1

Height of mean high water above plane of reference is 7.2 feet

Condition of records satisfactory except as noted below:

H. A. Cotton
Chief, Division of Tides and Currents

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 5402 a+b

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet	3,103.
Number of positions checked	878 <i>28.2%</i>
Number of positions revised	36.
Number of soundings recorded	17,998
Number of soundings revised	15.
Number of signals erroneously plotted or transferred	0.

Date:..... *May 23 1934*

Cartographer:..... *A. E. Perkins*

SECTION OF FIELD RECORDS ✓

Verification Report on H-5402 a

1. The field plotting was completed to the extent specified in general instructions. However, .5 foot was plotted as 0 instead of $\frac{1}{2}$, and -.5 foot as -1 instead of 0.

Rocks awash at MLW were sometimes plotted as 0 instead of using the symbol.

The rock awash symbol was misused sometimes to denote a fragment of a wreck.

The spacing of the soundings was good in general.

Several large errors were found in the protracting; several angles were off 10 minutes, and in one case the wrong signal was recorded.

2. The area covered by this sheet is filled with rocks and shoals. They represent one of the particular reasons for this survey. The Field Party frequently gave detailed information of such a character that it was more confusing than helpful. In some cases the notes were not clear. For example (15h) "area which extends out of water for ten feet". This was taken to mean vertical measure, since it is in feet and not meters.
3. The information in the hydrographic manual regarding the treatment of rocks and reefs was not sufficiently detailed for this work, and as a consequence, a comprehensive set of rules was drawn up by A. L. Shalowitz. The verifier has followed these rules on this sheet, and the wire drag soundings in vol. 5, inked in by Mr. Murray prior to the advent of these rules, were revised by the verifier to conform to these regulations.
4. The correct stamp at the bottom of the sheet was not on when the sheet was received from the field.
5. There was no datum reference on the sheet.
6. In one case, 12 - 25 e, the low water line was dotted in ^{IN THE OFFICE} as if ^{IT WERE} done by the topographic party, although this low water line determination was done by the hydrographic party. It agrees fairly well with the topographic sheet.

7. The following islands were determined by the hydrographic party but not given by the topographic party.

at positions:- 40e
 33f - Cormorant Reef
 15h - 21h
 34h - 40h
 28h - 31h
 43j - 46j

8. Island determined by the topographic party, but not so indicated by the soundings 39g - 44g.
9. The low water line and rocky ledges were traced from the topographic sheet and inked by the verifier, corrections being made to adjust the line to agree with the yellow curve.
10. Clusters of rocks spaced close together were indicated by a single rock awash symbol, the symbol covering the area of the cluster.
11. Weak fixes for the reef off of signal YACHT necessitated using previous surveys to ^{SUPPLEMENT THE} ~~DETERMINATION~~ of the area of the reef. The chart does not show a reef here. *near Greenwich Harbor*
12. The transferred wire drag soundings agreed well for the most part. However, a 7 was removed for a 4 in Lat 40 - 59' Long. 73 - 37' and an 18 was removed for a 16 in Lat. 40 - 58' Long. 73 - 38'
13. Hydrographic signal GUM was located from the boat sheet. (see index vol.1)
14. Hydrographic signal LAST, is a chimney on the last house on the East side of a narrow neck of land to Greenwich Point. (see vol. 4, page 38)
15. "No Bottom" soundings at 43e (blue) and 36e (blue) were not plotted. There are enough soundings in the vicinity to justify omission.
16. In several cases the field party located the same rock twice, usually a number of days apart.
17. In cases where the foul area is defined by outlying rocks, yet the area is too small to write in the word "foul", the verifier has used the reef symbol. (see note below)
18. The rocky ledge symbol was used throughout, in the absence of a specific rocky reef symbol.

19. All of the three point fix positions for bouys were verified by Mr. Murray, except those not listed in the index of the volumes. ✓
20. Buoy #1 (bell) off Great Captain Harbor is correctly located as to fix. However the line (24 - 25a) (blue) does not pass 10 meters to the Eastward..Since the line checks the boat sheet, no correction was made. ✓
21. The following bouys covered by this sheet, are on chart 222, but were not located by the field party:-
- (a) Buoy N - 2 Off reef NW of Bluff Island at entrance to Cos Cob Harbor. ✓
 - (b) N buoy at Hitchcock Rock. ✓
 - (c) Buoy N - 4 at sunken rock in Cos Cob Harbor, given as beacon in Vols.3 (see note 39n) ^{Signal Buoy located on spindle} _{29n Descrip Report T.6022} ✓
 - (d) Buoy S-4 Off shore near Otter Rocks. (Byram Harbor) ✓
 - (e) Buoy S Off Wilson Head, near entrance to Byram Harbor.
 - (f) Buoy N-2 SW of Great Captain Island.
22. The Four Foot Rocks shown on the chart at approximately Lat. 40 58' 45", Long. 73 38' 35" are not shown on this sheet (Verified by Wire Drag H-5142) (1914) ✓
23. The check fixes in many cases did not agree, and it was difficult to know which fix to plot since both fixes had been checked in the sounding volumes. The boat sheet positions were given most consideration in doubtful cases. The field plotter usually plotted the first fix and this was not always correct. ✓
24. Although it is unusual to have a triangulation station located at a wreck, station WRECK is the stack on a wreck West of Flat Head Point. ✓
Neck
25. Due largely to the number of positions connecting the outer limits of reefs, and the frequency of detached rocks, the number of positions protracted and checked by the verifier totaled 878 or 28.2% of the total number of positions.
25. ~~The adjoining sheets had not been completed at the time of the writing of this report. (H 5222)~~

JUNCTION WITH H5222 WAS IN GOOD AGREEMENT ✓

26. 11 foot soundings (S day) were found in an area where rocks were located on H-1698 (1886 survey). There is more development in this area on H-5222. Disposition of rocks indicated at this locality, is delayed pending further study by the reviewer. *These rocks were incorrectly plotted on H.1698 (1886) from a note in the record p. 33m (bene) They evidently belong close inshore and should be superseded by the delineation on H.5402^a and H.5222*
27. The notes in the sounding volumes from 2 to 48r are confusing, and much difficulty was experienced in determining how to represent this area. *REG*
28. Breakwaters at 37jj and 63cc are indicated in the sounding volumes. It is desirable to have the air photo compilation sheet for this area before they are inked in. The compilation should be received within the next 30 days.
29. The foul area off ^{URS}Manuking Island is pending further study. (See 33k Also - Descriptive Report H-5402a page 3, pp 6, and Descriptive Report T-6023 page 2, pp3-5). *Delineation of rocks as shown on H.5402^a accepted.*
30. The curves in the developed areas have been inked. Without more detailed information either from previous surveys or from other sources, it is desirable to withhold the completion of the curves in ink. They have been plotted in pencil, by the verifier, by coordinating the soundings of the 1914 survey H-1699b with those of this present survey. *Remaining curves worked up and inked by reviewer (See par. 4 Review of H.5402a)*
31. The paper was porous and did not take ink well.

Respectfully submitted,

S. E. Perkins
S. E. Perkins

May 23, 1934

32. *a different delineation of reef 71-74 R is given on H-5222. (3-7+)*
See par 5 and par 9(4) in review of H.5402^a

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5402 a (1933)

Captain Harbor and Vicinity, North Shore Long Island Sound, Conn. N.Y.
Instructions dated March 23, 1933 (H.A.Cotton)
Date of Survey July-Aug-Sept.-Oct. 1933.

Pole and Handlead Soundings -----3-Point Fix Control

Chief of Party - H.A.Cotton
Surveyed by - H.A.Cotton, F.E.Okesson, W.F.Deane
Protracted by - H.J.Seaborg, R.M.Searle, A.Black
Soundings penciled by - R.M.Searle, A. Black
Verified by - H.Murray, S.E.Perkins
Inked by S.E.Perkins

1. Condition of Records

The records conform to the requirements of the Hydrographic Manual. It is evident that an effort was made to keep the records clear but the verifier had some trouble in delineating some of the foul areas. For example the area approximately half a mile northeast of Greenwich Pt. which is outlined by positions 2 to 48 r. The word "reef" was used in the records but as some plus soundings were obtained within its limits the continuous reef symbol was not used. The field party failed to show any reference station and the usual stamp at bottom of the sheet was omitted.

2. Compliance with Instructions for the Project.

The plan, character and extent of the survey satisfy the instruction for the project. A few of the shoals in the vicinity of Bluefish Shoal and Four Foot Rocks, (approximately long. 73°38'.7) which were not covered in 1914, were not developed. Although their least depths were determined by the wire drag in 1931, the present survey does not define their extent. Depths along the faces of some wharves were not shown on the sheet (par 9)

3. Sounding Line Crossings.

The sounding line crossings and the agreement of adjacent sounding lines is satisfactory. Sharp differences occur only in those areas which are very irregular and broken.

4. Depth Curves.

The usual depth curves may be drawn fairly completely, however on a large part of this area the sounding lines are quite widely spaced and the soundings from H-1699 b (1914) were also used in conjunction with the soundings from H-5402 a (1933) in fixing the curves. In blank areas, not covered by the work of 1914 or 1933, the soundings from the older survey were used to control the curves. In areas where the soundings from the various surveys did not agree, the curves were drawn to conform with the soundings from the most recent survey.

5. Junctions with Contemporary Surveys.

The junction on the east with H-5222 (1932-33) is satisfactory and the soundings are in good agreement but there is a discrepancy of about 30 meters in the position of the reef in lat. $41^{\circ}00'.9$, long. $73^{\circ}33'.6$. The limits of this reef appear to be well determined by fixes on both H-5402 a (1933) pos. 71 r to pos. 74 r (red) and H-5222 (1932-33) pos. 3 t to pos. 7 t (red) and a study of the records did not reveal any reason for the difference. The position of this reef as located on H-5402 a (1933) should be used in charting pending its re-location.

A junction was called for on the south with H-1732 a (1914). This junction is very satisfactory.

The junction on the west with H-5413 (1933), will be considered in the review of that sheet when it is completed.

6. Comparison with Prior Surveys.(a) H-4 (1836-7), H-6 (1836-7) and H-8 (1836)

Comparison with these surveys shows no soundings or other features which need be carried forward. A 10 foot sounding approximately 250 ms northwest of 4 Foot Rocks is shown on H-4 (1836-7), but has not been charted. All of the later hydrographic surveys show minimum depths of 16 ft. at this point and the position of the 10 foot sounding was cleared by an 11 foot drag in 1931 (H-5142). The sounding is believed to be one fathom in error, and is discredited.

(b) H-1699 (1886-1893)

This is a fairly complete survey of this area and is generally in fair agreement with the recent work, H-5402 a (1933), but in several areas differences were noted.

- (1) A 10 foot spot charted on Cht. 222 in lat. $41^{\circ}00'.05$, long. $73^{\circ}35'.9$ is from the 1886 records of H-1699 (1886-1893). This sounding was cleared by the wire drag with an effective depth of 14 feet, H-5402 c (1933). The sounding is discredited and should be removed from the chart.
- (2) A $3\frac{3}{4}$ foot sounding, which is charted as 3 feet on chart 222, in lat. $40^{\circ}59'.2$, long. $73^{\circ}37'.3$, is also from the 1886 records of H-1699 (1886-1893). This spot was cleared by the wire drag with depths of 5 and 7 feet, H-5402 c (1933). This sounding is considered disproved and should be expunged from the chart.
- (3) A $3\frac{1}{2}$ and $5\frac{3}{4}$ foot sounding in approximate lat. $41^{\circ}00'.8$, long. $73^{\circ}33'.7$, were verified in the 1886 records of H-1698 (1886-1893) and H-1699 (1886-1893) respectively. These soundings are shown on chart 222 as 3 and 6 feet. The $5\frac{3}{4}$ foot sounding is somewhat open to suspicion since other soundings on this line do not agree well with the cross lines and have been omitted from the ^{sheet} chart. These soundings were listed for investigation in 1933 but were apparently overlooked. As they have not been disproved these soundings have been added to H-5402 a (1933).

6.(b.)

- (4). A 5 foot sounding which is prominently charted in lat. 40°59'.6, long. 73°36'.6 was found, upon investigation of the 1886 records, to have actually been 5.8 feet. This sounding was not carried forward to H-5402 a (1933) as the recent work shows 7 feet close by, but the six foot curve on H5402 a (1933) was extended to include its position.
- (5) A 13 foot sounding charted in approximate lat. 40°58'.4, long.73°39'.1, is from the 1893 records of H-1699 (1886-1893). This spot was cleared by the wire drag with a depth of only 13½ feet and the new soundings showed a minimum depth of 15 feet. As the lead line examination is not close, the 13 foot sounding is not conclusively disproved and should be retained on the chart.
- (6) A rock awash shown on H-1699 (1886-1893) in lat. 40°59'.4, long.73°37'.85, has been added to H-5402 a (1933) since it has not been disproved. This rock was originally located by the topographic survey T-1708(1885-6) A wire drag sounding of 3 feet was obtained close by but the position of the rock was not cleared by the drag.
- (7) A few other soundings from H-1699 (1886-1893) which show the extent of some of the shoals in blank areas have been added to H-5402 a (1933) in brown.
- (8) The charted 3 foot sounding on Newfoundland Reef is actually 3½ feet in the 1886 records of H-1699. As the result of an intensive examination the present survey shows a least depth of 4 feet, which should be accepted.

6.(c) H-1699 (1894 tracing)

This survey shows no features which were carried forward with the exception of Inner Cove Rock in Greenwich Cove, which was not located or disproved by the 1933 survey. The records of H-1699 (tracing of 1894) show 1/10 of a foot of water over the rock which has been charted as ¼Rk. The rock should be charted as a rock awash at M.L.W. and has been so carried forward to H-5402 a (1933).

(d) H-1699 a (1908)

This survey consists of a close developement of a small area north of Great Captain Island. On this survey an 8 foot sounding was obtained in lat.40°59'.45, long.73°37'.46. In 1931 (H-5142) the position of this sounding was cleared three times by the wire drag with effective depths of 9, 12, and 13 feet.

The location of this sounding (pos. 63 b. blue) appeared so authentic in records of H-1699 a (1908) that this office was reluctant about removing the sounding from the chart and recommended additional dragging.

6.(d)(cont'd)

In 1933 (H-5402 c) this spot was again covered by the drag with effective depths of $10\frac{1}{2}$ and 12 feet. The 8 foot sounding is now considered disproved and should be removed from the chart. In connection with this recommendation attention is called to a statement in a letter from Assistant P.A. Welker (filed in Descriptive Report of H-1699 a 1908) which reads "Both recorders and leadsman employed on this work had never had previous experience in this class of work" and that misunderstandings in the soundings as called out were more than probable.

(e) H-1699 b(1914)

This survey covers approximately the same area as H-5402 a (1933) and is the most recent of the previous surveys. It shows no outstanding rocks, shoals or dangers which have not been located on H-5402 a (1933). A few of the rocks were located by indefinite notes in the sounding records and should be superseded by those shown on the present survey. A few soundings have been added to H-5402 (1933) in order that curves and shoal areas may be better defined. The soundings in general from H-1699 b(1914) may be used in conjunction with those of the present survey for charting purposes.

(f) H-1698 (1886-7 and 1893)

This survey covers only a small area on the eastern limits of this work. A 10 foot sounding is shown in approximate lat. $41^{\circ}01'$, long. $73^{\circ}33'.5$, which was found to be erroneous when investigated in the 1886 records of H-1698 (1886-7 and 1893)(pos. 10). This sounding should have been 16 feet and the 10foot spot should be removed from the chart.

A cluster of rocks, charted in lat. $41^{\circ}01'.17$, long. $73^{\circ}33'.4$, originate from H-1698 (1886-7 and 1893). Investigation of these rocks revealed that they had been incorrectly plotted from a note in the 1886 sounding records of H-1698 (pos.33m, blue). These rocks should be removed from the chart.

(g) H-5078 (1930)

There is very little overlap and no important shoals from this wire drag survey fall within the limits of the present survey.

(h) H-5142 (1931)

All shoals and dangers found on this wire drag survey, within these limits have been added to H-5402 a (1933) in red.

(i) H-5402 c(1933).

All shoal soundings and rocks, located by this contemporary wire drag examination have been added to H-5402 a (1933) in blue.

7. Comparison with Chart No.222.

Many of the charted shoals have already been considered in the comparison with prior surveys and need not be mentioned again.

A 6 foot sounding is charted approximately 130 me. south of Four Foot Rocks. This sounding has been carried on the chart for some time but it is not from surveys by this Bureau and its source could not be traced. The wire drag survey, H-5142 (1931), examined this area and obtained a depth of 8 ft. which should be used in preference to the 6 ft. sounding, of unknown origin.

The delineation of rocks as shown on H-5402 a (1933) agrees fairly well with the rocks as charted from the older surveys but is in more detail and should supersede the previous delineations.

Charted rocks and soundings which have been disproved by dragging are listed in par.3, Review of Contemporary drag survey H-5402 c (1933).

A list of the buoys within the area covered by this survey which were not located by the field party is given in par.21 of the verifier's report. A discrepancy occurs at Sunken Rock in Cascob Harbor. The descriptive report of T-6022 (1933) states that topo signal BEAN is located on a spindle and a note in the sounding record (pos.29n) of H-5402 a (1933) refers to it as a beacon. ~~But~~ the chart shows RED NUN Buoy No. 4 ^{at} this position. The buoy should be retained on the chart. (Approved by S.E.Passmore)

8. Field Plotting.

The prescribed amount of field plotting was accomplished by the field party. It was generally well done except for several large errors in the protracting and the misinterpretation of soundings between plus 1 and minus 1 foot.

9. Additional Field Work Recommended.(a) Immediately Necessary.

None.

(b) For Future Consideration.

- (1) The rock awash shown on T-1708 (1885-6) in lat.40°59'.4, long. 73°37'.85, should be verified or disproved.
- (2) The $3\frac{1}{2}$ and $5\frac{3}{4}$ (shown as 6 on H-5402 a) foot soundings shown on H-1699 (1886 and 1893) in approximate lat. 41°00'.8, long.73°33'.7 should be further investigated as there is reason to believe the $5\frac{3}{4}$ foot sounding may be in error.
- (3) Inner Cove Rock, in Greenwich Cove, is located in the records of H-1699 (Tracing of 1894), but was not re-located in 1933. As all of the other rocks were re-determined, it is desirable that this rock be verified also.

9. (b)

(4) The reef, which is shown in a different position on H-5222 (1932-3) (see tracing attached) in lat. 41°00'.9, long. 73°33'.6, should be redetermined in order to show which delineation is correct. (see par.5, this review) The descriptive report for H-5222 (1932-3) states that the original position of this reef H-9 (1836) which is about 100 me east of the new positions, could not be investigated because of a bathing platform.

10. Note to Compiler.

It is the intention that the new selection of soundings be made primarily from H-5402 a (1933) supplemented by soundings from H-1699 b (1914). In blank areas, which are not covered by the surveys of 1914 and 1933, soundings from the older surveys as far back as 1886 may be used sparingly, provided the surrounding soundings are in good agreement with the soundings of H-5402 a (1933). No soundings from the surveys of 1836, H-4, H-6, and H-8 should be charted. Wire drag soundings from H-5142 (1931) should be verified on the chart as some of these were charted from advance information which may differ slightly from the final results.

11. Superseding Old Surveys.


Within the area covered, the present survey, with the indicated additions from previous surveys, will supersede the following surveys for charting purposes:


H-4	(1836-7)	In part						
H-6	(1836-7)	Entirely						
H-8	(1836)	In part						
H-1699	(1886 and 1893)	In part	(except as stated in previous paragraph)					
H-1699	(1894 tracing)	"	"	"	"	"	"	"
H-1699	<u>a</u> (1908)	"	"					
H-1698	(1886-7 and 1893)	"	"	"	"	"	"	"

12. Reviewed by- R.L.Johnston Aug.1934

Supervised by - A.L.Shalowitz

Examined and approved:


Chas K. Green,
Chief, Section of Field Records.


Chief, Section of Field Work


Chief, Division of Charts,


Chief, Division of H. and T.

See addenda, this review for charted soundings to be omitted.

Addenda Review H-5402a

The following charted soundings, not specifically mentioned in the original review, should, except as noted, not be used in future charting.

1. A 31 foot sounding in lat. $40^{\circ}58'05$, long. $73^{\circ}39'.1$ is from the 1893 records of H-1699, 1886-93 (pos. 59K to 60K). It falls in depths of 35 to 36 feet on the new survey but close to the edge of the 30 foot curve in soft mud bottom. Because the survey of 1914, H-1699b, verifies the deeper depths on H-5402a (1933), the 31 should be disregarded.
2. A 17 foot sounding in lat. $40^{\circ}58'.27$, long. $73^{\circ}39'.2$ is from the 1893 records of H-1699 (1886-93). It falls in blank area on the 1933 survey but was considered disproved because two sounding lines of the 1914 survey, H-1699b, show depths of from 19 to 21 feet over it.
3. A 17 foot sounding in lat. $40^{\circ}58'.86$, long. $73^{\circ}38'.7$ is from the 1893 records of H-1699 (1886-93) and is actually 17.8 feet. The soundings of 1933 indicate there has been a general change in the shape of this shoal and show depths of 19 feet.
4. A 16 foot sounding in lat. $40^{\circ}58'.7$, long. $73^{\circ}37'.8$ is from the 1886 records of H-1699 (1886-93) (pos. 42E to 43E red). The entire line on which this sounding appears is out of agreement with the 1933 soundings as well as those of 1914. A change in the speed of the boat is noted in the records but no allowance was made for this in plotting the line. Due allowance would move the old soundings northward and the agreement with the later work would be improved.
5. A 21 foot sounding in lat. $40^{\circ}58'.95$, long. $73^{\circ}37'.1$ is from the 1893 work on H-1699 (1886-93). As there are no position numbers on that sheet in this area, it could not be checked in the records, but it appears to be a little too far south. There are ample soundings on the 1933 work to prove the incorrectness of the 21 in the position shown. A sounding line from the 1914 survey checks the recent work.
6. A 5 foot sounding in lat. $41^{\circ}00'.1$, long. $73^{\circ}38'.02$ is from the 1886 records of H-1699 (1886-93) (pos. 22G) and is actually $5\frac{1}{2}$ feet. There is reason to believe that the fix locating it may be incorrect as there is a note in the record which reads "10 meters from shore near wharf", whereas it is actually about 150 meters off shore. The surveys of 1914 and 1933 are rather open and do not either confirm or definitely disprove the old $5\frac{1}{2}$ foot sounding, although both show depths of 6 to 7 feet beside it. The 5 should be disregarded but the 6 foot curve was extended to include its position.

7. A 9 foot sounding in lat. $41^{\circ}00'.1$, long. $73^{\circ}37'.2$ is from the 1886 records of H-1699, 1886-93 (pos. 3e to 4e blue). It falls in depths of 11 and 12 feet on the 1933 survey. The recent work indicates that the area adjacent to the dredged channel has deepened either naturally or because of dredging. Use 1933 depths.
8. An 11 foot sounding in lat. $40^{\circ}59'.9$, long. $73^{\circ}37'.25$ is from H-6 (1836). These depths no longer hold good since the channel has been dredged. In addition the area was examined by the drag party of 1931, H-5142, and the 11 falls slightly within the limits of a 13 foot drag strip.
9. A 10 foot sounding in lat. $40^{\circ}59'.43$, long. $73^{\circ}37'.05$ is actually 10.8 feet in the 1886 records of H-1699, 1886-93 (pos. 48C to 49C red). Neither the survey of 1914 nor that of 1933 covered the area closely. The wire drag party of 1931 found an 11 foot sounding northwest of this but did not cover this spot. This sounding has been carried forward to H-5402a (1933) as 11 feet.
10. A small sunken rock symbol is charted in lat. $41^{\circ}01'.1$, long. $73^{\circ}35'.95$. A search for all the prior surveys failed to reveal the source from which this was charted. It has been carried on the charts since 1908 and falls in depths of 3 feet on the latest survey, H-5402a (1933). Because it is partially disproved by these soundings and because of its doubtful origin, it is recommended that it be omitted from the chart and a 3 ft. added from the 1933 survey.
11. An 8 foot sounding in lat. $41^{\circ}00'.07$, long. $73^{\circ}35'.55$ originates with the 1886 records of H-1699, 1886-93 (pos. 3b to 4b). It is a single sounding recorded at 1 fathom 2 feet within a row of soundings recorded as 2 fathoms 2 feet and the sounding was not recorded in the record. It falls in depths of from 13 to 14 feet of the 1933 survey. The old 8 foot sounding is believed to be incorrect and should be disregarded in future charting.
12. A 13 foot sounding in lat. $40^{\circ}59'.5$, long. $73^{\circ}38'.0$ originates from the 1886 records of H-1699(1886-93). There are several of the $13\frac{1}{2}$ foot soundings on a line. The survey of 1933 shows soundings of 15 to 16 feet over these thirteens in soft bottom. There appears to be enough evidence to indicate a general change and the old 13 should be replaced on the chart by the new depths.

Reviewed by - R. L. Johnston.

March 4, 1935.

Inspected by - A. L. Shalowitz.

L. O. Pollock.
Chief Hydrographer.

The above changes applied to Surg. 222 dated Feb. 20, 1935. By direction of Chief, Chart Division, to expedite printing this chart, the shoals were merely crossed out and no modern sdgs. substituted.
J. M. Albert 3/6/35

73° 34'

73° 33'

41° 01'

41° 01'

Reef as located on H.5222 (1933)
(1½ ft tide)

Reef as located on H.5402^a (1933)
(0½ ft tide)

Reef as shown on H-9 (1836)

(Par. 9 (4) Review of H.5402^a)

Added to Review

41° 00'

41° 00'

73° 34'

73° 33'

Verification FIELD RECORDS SECTION
Report on H - 5402 b ✓

Greenwich Harbor

1. The signals were plotted by the field party but the topography was traced from an enlargement of T - 6022 and inked in by the verifier. An adjustment of the shoreline on the west bank near signal YACHT, was necessary. ✓
2. The low water line from the topographic sheet agreed well, for the most part with the yellow curve. ✓
3. The projection was not completed by the field party. ✓
4. There was no datum reference on the sheet. ✓
5. The cross channel lines were considered more accurate than the vertical lines (see report) and consequently any adjustments were made by shifting the vertical lines. This is particularly true of the line (13 - 19,aa) which was moved about 10 meters westward to agree with the cross lines. ✓
6. A pier shown on the topographic sheet near 13aa is not mentioned by the hydrographic party. ✓
7. Zig - zag lines 54 - 71 bb were plotted when agreement justified it. ✓
8. In general every other sounding was plotted; in other words, one every 10 meters. ✓

Byram River

1. The topography was traced from an enlargement of topographic sheet 6023 and inked in by the verifier. Since the positions are located in relation to signals and topographic features, accurate topography is of primary importance. However, ~~this~~ this is an enlargement from a 1 - 10000 scale and a survey run on this scale cannot be considered accurate on a 1 - 5,000 scale. As a consequence the verifier found numerous discrepancies in the shoreline. These have been adjusted when necessary so that the soundings have a proper relationship to the shoreline. ✓
2. Apparently the field plotter, in laying out the sounding lines, simply doubled the measurements from the sub-sketch on H-5402a, for it was found that errors in plotting were consistantly doubled. ✓

3. The agreement between cross lines and vertical lines was good in most cases. An $8\frac{1}{2}$ foot sounding near signal ANK on the vertical line makes a rather bad crossing, however. *Will be adjusted R.P.J.*
4. The lower portion of this sheet, that is the entrance to Byram River, is not inked in. There is a conflict between the hydrographic and topographic information, particularly at 89hh where the note in the sounding volume states his position as being on the high water line. This adjustment will be made at a future date, when the air photo compilation sheet for this area is received. *Air photo not received at time of review R.P.J.*
5. The projection was not completed by the field party.

Respectfully submitted,

S. E. Perkins
S. E. Perkins

May 25, 1934

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5402 ^b (1933)

Byram River and Greenwich Harbor North Shore of Long Island Sound, Conn.-N.Y.
Instructions dated March 23, 1933 (H.A.Cotton)
Date of survey Aug.29-30: Sept.17-18 1933.

Hand lead soundings and Control from Measured Distances - - 3-Point Fixes.

Chief of Party - H.A.Cotton
Surveyed by - F.E.Okeson, W.F.Dean
Protracted by - R.M.Searle, A.Black
Soundings plotted by - R.M.S.; A.B.
Verified and inked by - S.E.Perkins

1. Condition of Records

The records conform to the requirements of the Hydrographic Manual. The soundings for this work are recorded in volumes 7 and 8 H- 5402 a (1933) No reference station was shown on the sheet when received and the projections were not completely drawn. These were added in the office.

2. Compliance with Instructions for the Project.

The general plan, extent and character of the work satisfy the instructions for the project.

3. Sounding Line Crossings.

Soundings on the cross channel lines were generally taken at intervals along a wire, marked every 5 meters, which was stretched between two points located by measurements with steel tape. Channel lines, were controlled by the three point fixes. The channel lines were not plotted on the smooth sheet by the field party but were submitted on a tracing paper overlay. These channel lines have been added to the smooth sheet in the office and have been adjusted in the few cases when out of agreement, to fit the cross channel lines, which are considered more accurately controlled.

4. Depth Curves.

The usual depth curves may be drawn from the information furnished.

5. Junctions with Contemporary Surveys.

The junction, at the entrance to Greenwich Harbor, with the contemporary survey, H-5402 a (1933), is satisfactory.

The junction at the entrance to Byram River appears satisfactory but the soundings on H-5402 b (1933) have not been inked pending the arrival of the air photo sheet because of an apparent discrepancy between the shoreline and notes in the sounding records referring to the shoreline.

6. Comparison with Prior SurveysH-1699 (1886-1893 and H-1699 b (1914))

The only previous work in Greenwich Harbor consists of a few soundings on H-1699 (1886-1893) and one line of soundings on H-1699 b (1914). As a channel has been dredged in this harbor (Bp 19,309) since these surveys were made, H-5402 b (1933) should supersede all prior surveys.

The only previous work in Byram River consists of a single line of soundings in 1893 which is shown on H-1699 (1886-1893). This sounding line is controlled only by its relative positions to natural objects along the shore and should be disregarded. The controlling depth is given in the descriptive report as 10 feet but there are quite a number of 9 foot soundings and the Engineer's survey of 1926, Bp.20,808, shows one cross line with a maximum depth of 8.6 ft.

7. Comparison with Chart No.222

In Greenwich Harbor and Byram River there are no charted soundings of enough importance to mention.

8. Field Plotting.

The usual amount of field plotting was accomplished by the field party. Some errors were found in the enlargement of Byram River.

9. Additional Field Work Recommended.

(a) Immediately Necessary.

None

(b) For Future Consideration

None is recommended, however, attention is called to the reef on the east side of the entrance to Greenwich Harbor (lat.41°00'.6, long.73°37'.4) which could not be well defined because of weak fixes. The delineation as shown on both sheet H-5402 a and H-5402 b is a compilation of limits from the present and prior surveys. This reef is not shown on the present chart(222).

10. Superseding Old Surveys

Within the area covered the present survey, with the indicated additions from previous surveys, will supersede the following surveys for charting purposes:

H-1699 (1886 and 1893) In part. H-1699 b (1914) In part.

11. Reviewed by - R.L.Johnston August 1934.

Supervised by - A.L.Shalowitz

Examined and approved:

Chas. K. Green
Chas. K.Green,
Chief, Section of Field Records.

B. D. Duden
Chief, Section of Field Work.

R. O. Robert
Chief, Division of Charts.

G. H. de
Chief, Division of H. and T.

SECTION OF FIELD RECORDS ✓

REPORT ON WIRE DRAG SHEET NO. H. 5402-C

MAY 19-1934

SURVEYED IN - AUGUST - NOVEMBER 1933

CHIEF OF PARTY - H. A. COTTON

SURVEYED BY - F. E. OKESIN & W. F. DEANE

PROTRACTED BY - R. M. SEARLE.

INKED BY - J. D. GROFF

VERIFIED BY - W. H. BAMFORD & H. W. MURRAY

- 1./ The protracting and plotting was found to have been rather carelessly done - necessitating excessive checking.
- 2./ The soundings as inked on the smooth sheet by the field party were plotted to the nearest half foot and were very small and poorly plotted. The soundings were replotted to the nearest whole foot and large enough to be legible.
- 3./ The topographic signals on this sheet were not indicated as having been

checked and were therefore checked. It was found that several of these were out of position as much as eight meters - but as this affected the plotting of the work only slightly - only one signal was changed 12.0 POLE

4./ All drag strips were outlined in black and the effective depths shown in red - this is contrary to the instructions for plotting drag work - but as this is not a standard wire drag sheet - (part of it being wire drag - part pipe drag and part rope drag) - it was not considered advisable to make any change in the color scheme.

5./ Throughout the sheet - at the beginning of each drag strip - the outline of the drag was assumed to be a straight line connecting the first & last buoy. This necessitated the changing of

Page 3

the outline of the drag as plotted by the field party.

6/ A number of soundings were taken during the course of the drag work and recorded in Vol I (the guide launch record) - These positions & soundings were later transferred to Vol II (the sounding record) and plotted on the drag sheet. A number of soundings taken during the drag work were not plotted on the drag sheet - but were plotted on the survey sheet H 5402 a - Appropriate notes appear in the records regarding those soundings not plotted on the drag sheet.

Respectfully Submitted
Warren H. Baulford

Section of Field Records

REVIEW OF DRAG SURVEY NO. 5402 c (1933)

Captain Harbor and Vicinity, North Shore Long Island Sound, Conn. and N.Y.
Instructions dated March 23, 1933. (H.A.Cotton)
Date of Survey: Aug. Sept. Nov. 1933.

Hand lead Soundings - - - - - 3-Point Fix Control.

Chief of Party - H.A.Cotton
Surveyed by - F.E.Okeson, W.F.Deane
Protracted by - R.M.Searle
Inked by - J.D.Groff
Verified by - W.H.Bamford

1. This sheet covers the same area as the contemporary Hydrographic Survey, H-5402 a (1933), and consists of examinations, with the Rope Drag, Pipe Drag, and Wire Drag, of a number of small areas where rocks and shoal soundings were shown on the old surveys. The purpose of this survey was to verify or disprove these old shoals and to supplement the hydrographic survey, and is not intended to be a complete drag survey of this area.

2. Field Plotting.

The usual amount of field plotting was fairly well done by the field party. The dragged areas were outlined in black and the effective depths shown in red. The usual standard color scheme should have been used for both, but considering the purpose of the survey, it was not considered necessary to change them. The soundings were plotted too small and were revised in the office. The stamp on this sheet was not filled in to show that the topographic stations were checked in the field. These were verified in the office, and several found to be out of position but only one, Signal Pole, was changed as the others did not affect the plotting of the work. No Area and Depth sheet was prepared in the office as it is unnecessary for work of this character. Some of the drag strips, covering areas already dragged, were not shown on the sheet by the field party but were submitted on overlay tracings. These were not added in the office because they do not add any additional information and only complicate the sheet.

3. Comparison with Chart 222.

The field party submitted a summary of the results of the dragging in their descriptive report. Such charted features that have been disproved by the dragging are included in the following list.

(1) Old rocks awash charted on Glover Reef, Manursing I., were cleared by a $2\frac{1}{2}$ foot drag and are considered disproved. A depth of $2\frac{1}{2}$ feet was found near the old 3 foot sounding.

(2) An old rock awash, charted on Bluefish Reef, off the east coast of Manursing I. was cleared by a $2\frac{1}{2}$ foot drag and is also disproved. A depth of 3 feet was found by the hydrographic party.

3. Comparison with Chart 222(cont'd)

(3). A 4 foot sounding is charted in lat.41°00'.55, long. 73°37'.35, by authority of letter 1674 of 1887, L.H.Board, Hyd.Inspector's files. The name "Steamboat Rock" is on the chart at this position. This spot was cleared by a $4\frac{1}{2}$ foot drag and the drag party found 5 feet a little north of the old 4 foot spot. The hydrographic party obtained a 5 foot sounding in about the same position as the 4 foot spot. It is recommended that the 4 foot sounding be replaced on the chart by the southernmost of the 5 foot soundings (H-5402 a, 1933)

(4). A 3 foot spot, charted in approximate lat. 40°59'.2, long. 73°37'.3, is actually $3\frac{3}{4}$ feet in the 1886 records of H-1699 (1886-1893) This sounding has been cleared by 5 and 7 foot drag strips and is considered disproved. It should be removed from the chart.

(5). An 8 foot sounding is charted in lat. 40°59'.45, long. 73°37'.46, from H-1699 a (1908). This spot was cleared by the wire drag in 1931 (H-5142) with depths of 9, 12, and 13 feet. On the recent examination (H-5402 c 1933), the 8 foot spot was cleared with a $10\frac{1}{2}$ and 12 foot pipe drag. The 8 foot sounding is now discredited and should be removed from the chart (For complete history see Par.6 d, review of H-5402 a, 1933).

(6). Drag strips grounded approximately 350 m. S.W. from Little Captain Island, but covered the position of some of the old rocks shown on H-1699 (1886-1893). Only those rocks shown on H-5402 a (1933) should be charted in the area south west of Little Captain Island.

(7). The broken and rocky area, east of Great Captain Island along lat. 40°59', was examined by the drag and with the lead line. In this area the delineation of rocks as shown on H-5402 a (1933) should supersede those charted from the old surveys.

(8). A 10 foot spot shown on the chart in approximate lat. 41°00'.05, long. 73°35'.9, is from the 1886 records of H-1699 (1886-1893). This spot was cleared three times by the wire drag with depths of $12\frac{1}{2}$ and 14 feet and was dragged from two directions. The 10 foot sounding has been definitely disproved and should be removed from the chart.

4. Groundings.

Groundings occurred at pos. 6 S and pos. 28 E in approximate lat.41°00'.15 long. 73°36'. These groundings were not investigated. Hydrographic survey H-5402 a (1933) shows several 14 foot soundings in this vicinity. As the drag records at pos. 6 S, depth 14 feet, do not give the point at which the drag touched, this grounding was not plotted. At pos. 28 E, buoy No.2 and F buoy were dragging bottom, effective depth $12\frac{1}{2}$ feet. It is noted that a $1\frac{1}{2}$ foot correction was applied for lift, which is larger than any other lift correction used but no test is recorded. In view of the fact that the drag had a fairly large bight at this time, the lift correction may have been excessive. Also the weights at the buoys extended somewhat below the plane of the drag, and it is possible that the weights touched bottom at a depth of 14 feet. For these reasons, the groundings at pos. 28 E were not shown on the sheet.


5. Additional Dragging Recommended

None

6. Reviewed by - R.L. Johnston Aug. 1934.

Supervised by - A.L. Shalowitz

Examined and approved:


Chas. K. Green,
Chief, Section of Field Records


Chief, section of Field Work.


Chief, Division of Charts.


Chief, Division of H. and T.

Applied to chart 222 Feb. 20, 1935 J. M. Albert

25 Jan 24, 1936
J. M. Albert

chart 222 - reexamined for rocks, reefs, low water + critical depths
April 1949 - R. D. E.