

4897

Diag. Cht. No. 1206-2

4897

Form 504	
DEPARTMENT OF COMMERCE	
U. S. COAST AND GEODETIC SURVEY	
....., Director	
<input type="checkbox"/>	
State: Massachusetts	
DESCRIPTIVE REPORT	
Topographic Hydrographic	Sheet No. 4897
LOCALITY	
Newburyport	
Merrimack River Entrance	
1928	
CHIEF OF PARTY	
H.E. Finnegan	

Original instructions dated - August 1, 1928.

Supplemental instructions dated - September 11, 1928.

SURVEY METHODS

Standard survey methods were used, employing Launch #66 for the entire survey. Soundings were taken, using the hand lead, while the launch was underway.

In the entrance, lines were run at slack water whenever possible. At other times, the lines were run with the current.

A short improvised wire drag was used between Launch #66 and the skiff to check the existence of a shoal sounding near Butlers Toothpick.

DISCREPANCIES

Soundings for A day, in a number of cases when checked by cross lines, were found to be of excess depth. It is recommended that in such cases, the sounding taken on A day be rejected and the later sounding be used. The 14 foot sounding directly after Pos. 65A has been shifted inshore to agree with soundings obtained on the cross lines. See note at the beginning of A day, by the chief of party, pertaining to soundings taken that day.

DANGERS

- (1) A shoal outside of the entrance, north of the range, with a least depth of 7 feet in
 Lat.- 42°- 49'- 90 meters
 Long.- 70°- 47'- 1280 meters
- (2) A shoal extending in a northeasterly and southwesterly direction about $\frac{1}{2}$ mile south of the entrance, with least depths of 4 feet in Lat.- 42°- 48'- 1250 meters & Lat.- 42°- 48'- 1073 meters
 Long.- 70°- 48'- 115 meters Long.- 70°- 48'- 227 meters
- (3) A 6 foot sounding approximately 100 meters south of the outer end of the north jetty in
 Lat.- 42°- 49'- 205 meters
 Long.- 70°- 48'- 360 meters.
- (4) An 8 foot sounding on rock (104H) approximately 70 meters ENE of the red nun buoy #4 in
 Lat.- 42°- 49'- 250 meters
 Long.- 70°- 49'- 410 meters.
- (5) An 8 foot sounding on rock (112H) in
 Lat.- 42°- 49'- 260 meters
 Long.- 70°- 49'- 575 meters.

This the shoalest of several detached sounding taken in that vicinity.

The bar and shoal water, extending out from the northern point of Plum Island to the black spar buoy #1B should be avoided.

CHANNELS

The entrance to Merrimack River has a controlling depth of 10 feet, which was the least depth found on the range. Depths of 9 feet were found on either side of the range. A channel, from the northward passing within 50 meters of the outer end of the north jetty until the range is reached and then following the range in to the river, has a controlling depth of 12 feet. As the bar is constantly shifting, these depths are by no means fixed. The channel inside the jetties is sufficiently marked by buoys.

ANCHORAGES

There are no suitable anchorages at the entrance. The usual anchorage in the river is in the channel just above Black Rock beacon.

COMPARISON WITH PREVIOUS SURVEYS

Extensive changes and shifting were found on the bar. The general controlling depth is approximately the same but the various shoals and their locations have been changed. The channel inside of the jetties is similar to that shown on the chart. The bar making out from the northern end of Plum Island is in the same general position but now bares at low water. Depths in the vicinity of the northern end of Plum Island show considerable change,

The 8 and 9 foot soundings near red nun buoy #4 were verified.

The 8 foot sounding approximately 100 meters south of Butlers Toothpick was not found. Considerable time was spent and numerous detached soundings were taken in that vicinity. A short drag or sweep was also used in an effort to find this charted sounding. It is recommended that this 8 foot sounding be removed from the chart.

Nine feet is the least depth shown on the chart near the 7 foot shoal found north of the range which is already listed under dangers.

The 2 and 3 foot soundings on a shoal just south of the entrance were not verified. Depths of 4 feet were found approximately 200 meters south of these.

From the entrance northward, the curves do not agree very closely. At the limits, however, a junction can be made with the old work without extensive alteration of the depth curves.

It can be seen that extensive changes have taken place in the soundings along Plum Island to the southward. The most important difference is the change in location of the 12 foot curve. The shoal soundings shown on the chart near this curve were not verified. It was found necessary to extend the survey south to the limits of chart 531 due to extensive differences found at the original proposed limits. As the bottom is sand and subject to currents and storms, the differences found are entirely possible.

NOTES

An overlay sheet of tracing cloth is being included with the sheet.

STATISTICS

Statistics for sheet, field No. 1						
Date	Letter	Volume	Positions	Sdgs.	Miles of Sdg. Lines (Stat.)	Vessel
1928						
Aug. 17	A	1	139	447	9.9	Lananch #66
" 20	B	1	224	649	15.4	" "
" 22	C	1&2	182	502	12.8	" "
" 23	D	2	48	106	2.9	" "
" 24	E	2	34	86	2.5	" "
" 25	F	2	111	269	6.7	" "
" 28	G	2	134	367	7.7	" "
" 29	H	2	122	317	7.0	" "
" 30	J	2	92	207	4.6	" "
" #1	K	2&3	111	277	5.5	" "
Sept. 14	L	3	189	394	11.6	" "
" 18	M	3	75	201	3.7	" "
Totals			1461	3822	90.3	

*Carl F. Ebley,
Jr. H. V. Eng'g.*

TIDAL DATA - HYDROGRAPHIC SHEET #1.

Portable automatic tide gauge #166 located in -

Lat. $42^{\circ} - 49.3'$

Long. $70^{\circ} - 48.8'$

Plane of reference on gauge - 0.9 ft. MHW

Highest tide " " - 10.3 ft.

Lowest tide " " - 0.1 ft.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

LANDMARKS FOR CHARTS

Washington, D.C.

March 5, 19 29

DIRECTOR, U. S. COAST AND GEODETIC SURVEY:

The following determined objects are prominent, can be readily distinguished from seaward from the description given below, and should be charted.

4897

Chas. K. Green

Chief of Party.

DESCRIPTION	POSITION					Datum	METHOD OF DETERMINATION	CHARTS AFFECTED
	Latitude		Longitude					
	°	'	D. M. meters	°	'			
*Church Cross	42	- 48	739.6	70	- 48	879.8	N. A. Trian.	1206; 331
*Roller Coaster	42	- 50	916.4	70	- 49	75.0	N. A. "	1206; 331
* Tall Stack	42	- 48	1259.6	70	- 51	1165.4	" "	1206; 331
*Standpipe	42	- 51	1587.6	70	- 52	753.4	" "	1206
*Water Tank	42	- 52	503.9	70	- 51	1073.7	" "	1206
Spire	42	- 54	1772.4	70	- 48	905.9	" "	1206
Cupola	42	- 54	1637.1	70	- 48	966.3	" "	1206
* Objects on Hydrographic Sheet #1.								

A list of objects which are of sufficient prominence for use on the charts, together with a description of the same, must be furnished in a special report on this form, and a copy of such report must be attached by the Chief of Party to his descriptive report. The selection, determination, and description of these points are of primary importance. The description of each object should be short, but such as will identify it; for example, standpipe, water tower, church spire, tank, tall stack, red chimney, radio mast, etc. Generally, flagstaves and like objects are not sufficiently permanent to chart.

July 1, 1929.

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in
volumes of sounding records for

3
HYDROGRAPHIC SHEET
4897

Locality: **Massachusetts (Merrimac River Entrance)**

Chief of Party:
Plane of reference **H. E. Finnegan in 1928**
ft. on tide staff **mean low water, reading**
0.9 ft. below B. M. **Salisbury Beach**
~~XXXXXXXXXXXXXXXX~~

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

Paul C. Williams

Chief, Division of Tides and Currents.

Field Records Section

Report on H-4897 - Surveyed in 1928

Chief of Party - H. E. Finnigan - Surveyed by - H. E. F.

Projected by - C. F. Ehlers - Soundings by - C. F. E.

verified & Inked J. Fleming

- ① The records conform to the requirements of G. D. except that the word fathoms under reduced soundings should have been crossed out and the figures for the fix angles could have been clearer.
- ② The plan and character of the development fulfil the requirements of G. D.
- ③ There are several one foot discrepancies in the sounding line crossings and a few greater differences listed under Par. 12
- ④ The usual depth curves may be completely drawn
- ⑤ The field plotting was complete to the extent prescribed in G. D. except that positions 26 K to 32 K were not plotted and there is no apparent reason for the omission
- ⑥ Except for the replotting of some erroneous positions and soundings and the plotting of shallower soundings than those plotted in the field in shall spots, none of the work had to be done over
An example of this is the 7 foot soundings at pos. 30-31-J }
The positions only, were plotted in the field, but Sat. 42-49-12 }
the smooth sheet had deeper soundings approximately Long. 70-49-15 }

Report on H. 4897

- (7) Tops signals Flag, Shed and Dark as plotted on the smooth sheet did not agree with the Tops sheet. However, the field party located these signals by means of 'cuts' which were clearly visible on the smooth sheet and boat sheet. By order of higher authority these signals were changed to Hydro. signals and checked from the cuts given.
- (8) About 100-m. West of \odot Gage on sounding line 65-66-A is a 14 foot sounding which was plotted very close to pos. 65-A. Making allowance for a very slow current the sounding should plot further out as shown on the smooth sheet now. Its original position was on a horizontal line with the 10 foot sounding above it.
- (9) The old spar visible between the rocks Pos. 47-48 J }
is shown on the smooth sheet as a rock awash Sat. 42-49-12 }
and shown symbolically on the boat sheet Song. 10-49-23 }
- (10) A rock bar 1' at low water 480-m east of Δ Pick was located by the Hydrography party. This rock is close to the 6 foot depth curve and about 30 m. N.W. of the 7 foot sounding on the chart. It is thought that this rock should appear on the chart. (see Pos. 9.A)
- (11) Attention is called to the note on Page 3 - Vol-1 relative to discrepancies due to new leadsmen.
- (12) Discrepancies of 2 or more feet in the sounding line crossings only are recorded here.
At 5-A Sat. 42-49-03 } a 10 foot sounding falls between
Song. 10-49-12 } a 16 and 17. The only light on this is the remark on B-day Page 34 - Vol-1 relative to dredging operations.

(12) continued)

Bet. 56-57-G $\left. \begin{array}{l} \text{Lat. } 42-48-54 \\ \text{Long. } 70-47-57 \end{array} \right\}$ are 11 ft sounding falls between 14 and 15 which is on 156-157-C and a 15 foot sounding which is on 13-14-A

Bet. 123-124-G $\left. \begin{array}{l} \text{Lat. } 42-49-12 \\ \text{Long. } 70-47-46 \end{array} \right\}$ when it crosses 90-91-H there is a difference of 2 ft.

(13) In the shore areas in the vicinity of H 4 where the development was close the shallowest soundings were given preference

14 Pos. 129-G was out 100 meters

15 29-H was out 25 meters at end of south breakwater (bad spacing along this line)

(16) The fix given for pos. 65-H caused it to plot 50 meters from field plotted position - smooth and boat sheets agree and time interval agrees.

By using $67^{\circ} 11'$ instead of $77^{\circ} 11'$ agreement with sheets is obtained and the time and course checks this

(17) The true position of 182-B beginning development of the spit $\left. \begin{array}{l} \text{Lat. } 42-49-12 \\ \text{Long. } 70-48-56 \end{array} \right\}$ lies about 8-meters from the plotted position (in the field) The adjustment pulls the 4 foot sounding away from the 7 adjacent to it and gives a better crossing

18 A more accurate plotting of 68-A moves the zero sounding 5 or 6 meters S.E. of its original position which conflicted with the one foot sounding which is now N.W. of the zero sounding $\left. \begin{array}{l} \text{Lat. } 42-49-08 \\ \text{Long. } 70-48-56 \end{array} \right\}$

(19) Pos. 79-B with sounding 5 feet was out 25-meters 190-m. East of AURCH
Pos. 8-F with a zero sounding was plotted 40-meters too close inshore 100-m. S.E. of Red.

(20) observe a 6 ft sounding at the end of the south jetty

Report on H-4897

(21) The 18 ft sounding bet. 137-138-A was plotted between a 23 and 24 ft sounding producing a doubtful condition. An accurate replotting resulted in straightening both red and blue curves. Lat. $42^{\circ} 49' 05''$
 $70^{\circ} 47' 49''$

(22) Observe an 8 ft sounding in a comparatively undeveloped spot, 120-meters S.E. by E. of intersection Lat. $42^{\circ} 49'$
Long $70^{\circ} 45'$

(23) The detached sounding 4 ft obtained at Pos. 32-J (see ~~small~~ Tracing) was unaccompanied by any explanation. A few more soundings and positions should have been taken to verify and strengthen it.

However the 4 ft sounding is supported to some extent by the 11 foot and other shoal soundings to the south and S.W. which show that a spit is making off to the north at this point.

It has been determined that this 4 foot sounding was taken at a spot where on the chart by interpolation there is a theoretical depth of 18 ft. and apparently in mid channel.

(24) It is established that the controlling depth of the channel from the northward stated to be 12 ft in the Descriptive report, is 11 FT.

25 The controlling depth of 10 ft on the range is verified.

(26) Both boat sheet and pencil sheet were in good condition and the legible and ready followed.

Respectfully submitted

Sept. 3rd 1929.

J. Fleming

Section of Field Records
Report on Hyd. Sheet No 4897
Entrance to Merrimack River, Mass.
Surveyed in 1928

Original instructions Aug. 1, 1928 (Lieut H. E. Finnegan)
Supplemental instructions Sept. 11, 1928.

Chief of party - H. E. Finnegan

Surveyed by - H. E. Finnegan

Protracted and plotted by - C. F. Ehlers

Verified and inked by - J. Fleming

1. The records conform to the requirements.
2. The plan and character of development conform to the requirements of the General Instructions.
3. The plan and extent of the survey

satisfy the original specific instructions.

The supplemental instructions were missing from the office files and could not be located.

4. The sounding line crossings are satisfactory.

5. The information is sufficient for drawing the usual depth curves.

6. There are no junctions with contemporary sheets. Comparison with the old survey, H. 1395, and the chart, show such extensive changes inside the 30 ft. curve, that a close comparison would be of no value. The channel inside the entrance, at the northern end of Plum Id., has shifted and the hydrography south of the entrance, along the shore of Plum Id., is greatly changed.

The 8 ft. spot shown on chart 331, about 120 meters south of Butlers Toothpick, has been disproved and should be removed from the chart.

The detached sounding of 4 ft., at pos. 325, to which attention was called in the verifier's report, was found to have been plotted incorrectly,

The 11 foot sounding (pos 6-7J) in lat. 42-49.13, long 70-49.5
in depths of 15 to 16 feet is somewhat doubtful because
the left angle was questioned by the field party.
Because the area is broken and irregular it is considered
safer to retain this sounding and it may be used
in charting.

due to the right object of the fix having been erroneously recorded. The sounding is now shown in 'its' correct position.

(See opposite page)

Several rocks were located at the outer end of the north jetty. (pos 1c and 2c) These were once a part of the breakwater, but as they are now awash and are close to the small channel to the northward, they are shown as rocks awash on the sheet.

While a few of the old shoal spots were verified, most of them have shifted and this survey, within its limits, will supersede all previous work. (Approved by A. M. S.)

7. The usual amount of field plotting was well done by the field party.
8. Character and scope of survey - very good.
9. No additional work is necessary.

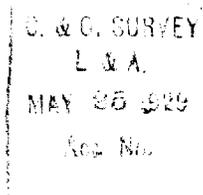
Reviewed by R. L. Johnston

Sept 11, 1929.

App.

A. M. Sobieralski

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY



REG. NO.
4897

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.

Field No. 1

REGISTER NO. 4897

State Massachusetts

General locality Newburyport

Locality Merrimack River Entrance

Scale 1 - 10,000 Date of survey Aug. 17 to Sept. 18, 1928

Vessel Launch Ogden & #66

Chief of Party H. E. Finnegan

Surveyed by H. E. Finnegan

Protracted by C. F. Ehlers

Soundings penciled by C. F. Ehlers

Soundings in **fathoms** feet

Plane of reference MLW

Subdivision of wire dragged areas by

Inked by J. Fleming Aug. 1929

Verified by [Signature]

Instructions dated August 1, 1928.

Remarks:

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 4-89-7

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

Number of positions on sheet 1461
Number of positions checked 439
Number of positions revised 41
Number of soundings recorded 3822
Number of soundings revised 93
Number of signals erroneously
plotted or transferred None

Date: Sept 3rd 1929
Cartographer: John Fleming