

T-13151

T-13151

Form 504	
U. S. DEPARTMENT OF COMMERCE	
COAST AND GEODETIC SURVEY	
DESCRIPTIVE REPORT	
Type of Survey	Shoreline
Field No. PH-6712	Office No. T-13151
FINAL	Field Edited Map Edition 1 *
LOCALITY	
State	Washington
General locality	Elliott Bay
Locality	Harbor Island
19.66 - 1970	
CHIEF OF PARTY	
V. Ralph Sobieralski	
Div. of Photogrammetry, Wash., D.C.	
LIBRARY & ARCHIVES	
DATE	

USCOMM-DC 5087

* Refer to Memo, page 12.

①

FORM C&GS-181a
(12-61)U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT - DATA RECORD

T - 13151

PROJECT NO. (II): PH-6712, Elliott Bay, Washington		
FIELD OFFICE (II):		CHIEF OF PARTY
PHOTOGRAMMETRIC OFFICE (III): Rockville, Maryland		OFFICER-IN-CHARGE V. Ralph Sobieralski
INSTRUCTIONS DATED (II) (III): <i>No written instructions</i>		
METHOD OF COMPILATION (III): Graphic		
MANUSCRIPT SCALE (III): 1:5,000		STEREOSCOPIC PLOTTING INSTRUMENT SCALE (III): ----
DATE RECEIVED IN WASHINGTON OFFICE (IV):		DATE REPORTED TO NAUTICAL CHART BRANCH (IV):
APPLIED TO CHART NO.	DATE:	DATE REGISTERED (IV): SEPT. 1976
GEOGRAPHIC DATUM (III): N.A. 1927		VERTICAL DATUM (III): MEAN SEA LEVEL EXCEPT AS FOLLOWS: <i>Elevations shown as (25) refer to mean high water</i> <i>Elevations shown as (5) refer to sounding datum</i> <i>i.e., mean low water or mean lower low water</i>
REFERENCE STATION (III): BRONSON, 1963		
LAT.: 47° 35' 11.1784"	LONG.: 122° 22' 28.5744"	☒ ADJUSTED ☐ UNADJUSTED
PLANE COORDINATES (IV): y = 217,723.01 x = 1,619,658.84		STATE Washington
		ZONE North
ROMAN NUMERALS INDICATE WHETHER THE ITEM IS TO BE ENTERED BY (II) FIELD PARTY, (III) PHOTOGRAMMETRIC OFFICE, OR (IV) WASHINGTON OFFICE. WHEN ENTERING NAMES OF PERSONNEL ON THIS RECORD GIVE THE SURNAME AND INITIALS, NOT INITIALS ONLY.		

DESCRIPTIVE REPORT - DATA RECORD

T-13151

FIELD INSPECTION BY (III):

DATE:

MEAN HIGH WATER LOCATION (III) (STATE DATE AND METHOD OF LOCATION):

Photography taken:

July 26, 1966

and

Sept. 1970

Office Interpretation of photography

PROJECTION AND GRIDS RULED BY (IV):

DATE

A. E. Roundtree

March 15, 1967

PROJECTION AND GRIDS CHECKED BY (IV):

DATE

R. Glaser

March 20, 1967

CONTROL PLOTTED BY (III):

DATE

J. C. Richter

April 1967

CONTROL CHECKED BY (III):

DATE

H. Lucas

April 1967

RADIAL PLOT OR STEREOSCOPIC CONTROL EXTENSION BY (III): See Photogrammetric
Plot Report for T-12519 (Chart 6442) December 1963,
J. T. Gerlach

DATE

STEREOSCOPIC INSTRUMENT COMPILATION (III):

PLANIMETRY

DATE

Inapplicable

CONTOURS

DATE

MANUSCRIPT DELINEATED BY (III):

DATE

J. C. Richter

May 1967

SCRIBING BY (III):

DATE

PHOTOGRAMMETRIC OFFICE REVIEW BY (III):

DATE

REMARKS:

Field edit by Allan F. Davis Sept. & Oct. 1970

3

FORM C&GS-181c
(12-67)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT - DATA RECORD

T-13151

CAMERA (KIND OR SOURCE) (III):

"S" 6" Focal Length

PHOTOGRAPHS (III)

NUMBER	DATE	TIME	SCALE	STAGE OF TIDE
66-S-3192A 3193A	7/26/66	12:36	1:15,000	8.8 above MLW
66-S-3206A 3207A	7/26/66	12:45	1:15,000	8.8 above MLW
Corps of Engrs. S-7026-48-5 thru S-7026-48-12	9-11-70	UNKNOWN	1:12,000	UNKNOWN

TIDE (III)

	RATIO OF RANGES	MEAN RANGE	SPRING RANGE
REFERENCE STATION: Seattle, Washington		7.6	Diurnal 11.3
SUBORDINATE STATION:			
SUBORDINATE STATION:			

WASHINGTON OFFICE REVIEW BY (IV):

J. B. Phillips

DATE:

July 1976

PROOF EDIT BY (IV):

DATE:

NUMBER OF TRIANGULATION STATIONS SEARCHED FOR (II):

RECOVERED:

IDENTIFIED:

NUMBER OF BM(S) SEARCHED FOR (II):

RECOVERED:

IDENTIFIED

NUMBER OF RECOVERABLE PHOTO STATIONS ESTABLISHED (III):

NUMBER OF TEMPORARY PHOTO HYDRO STATIONS ESTABLISHED (III):

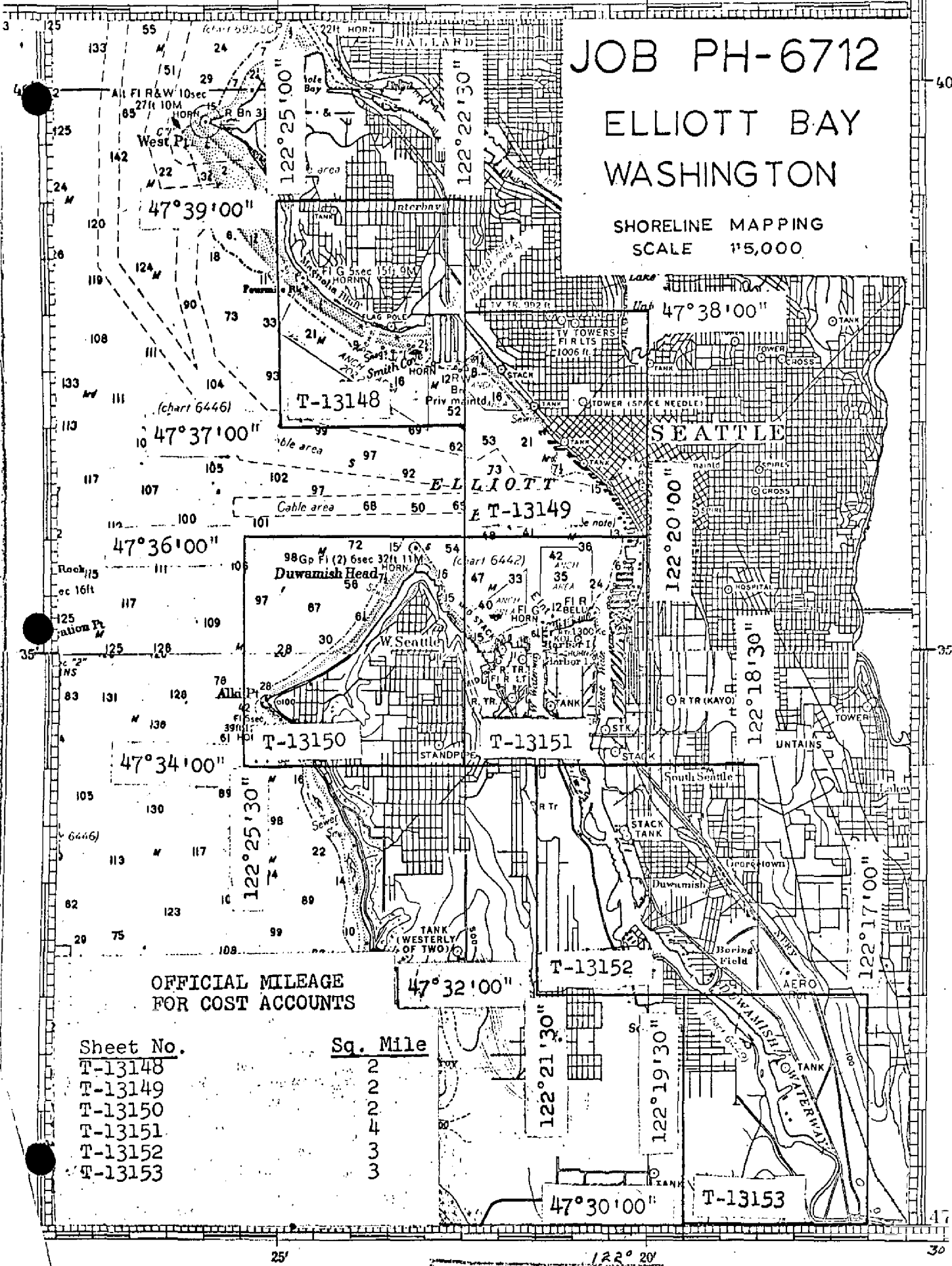
REMARKS:

JOB PH-6712

ELLIOTT BAY

WASHINGTON

SHORELINE MAPPING
SCALE 1"=5,000



OFFICIAL MILEAGE
FOR COST ACCOUNTS

Sheet No.

Sq. Mile

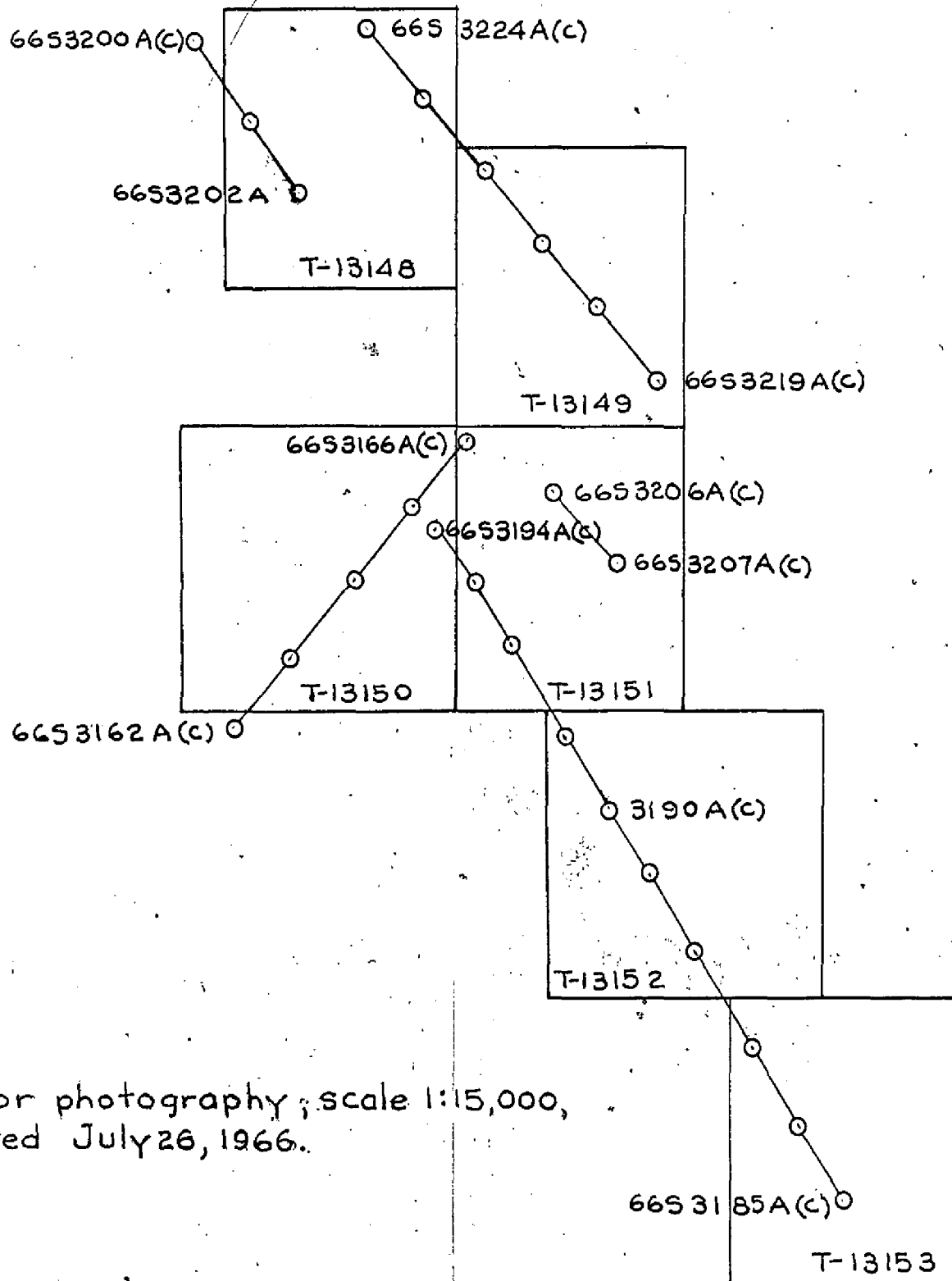
T-13148
T-13149
T-13150
T-13151
T-13152
T-13153

2
2
2
4
3
3

T-13153

PH-6712
ELLIOTT BAY, WASH
Photo Coverage

5



Color photography, scale 1:15,000,
dated July 26, 1966.

T-13151

COMPILATION RECORD	COMPLETION DATE	REMARKS
XXXXXXXXXXXX XXXXXXXXXXXX		
* (See below)		
Field edit applied	May 1971	Superseded
Field edit application revised	July 1975	

* Field inspection and field edit completed in 1964 for T-12519 (chart 6442) 1:10,000 scale. Cronaflex copies enlarged 2X were paneled on this manuscript and details revised with 1966 "S" photography in June 1967.

Summary (PH-6712)

T-13/51 is one of six 1:5,000 scale shoreline manuscripts prepared for photo-hydro support. These manuscripts originated with PH-21411 (T-12519) compiled in April 1964 and field edited in September 1964.

PH-21411 was compiled at 1:10,000 scale and served as the base for Nautical Chart 6442. Photographic enlargements on film were made of the chart manuscript and these were applied to base sheets ruled for the new 1:5,000 scale shoreline mapping project. In July 1966, 1:5,000 scale photography was flown over the area for photo revision and for preparation of ratio prints for photo-hydro support. The photography was ratioed and prepared for hydrography in May 1967.

Field edit and hydrographic operations were delayed until September and October 1970. The Corps of Engineers supplied 1:12,000 scale panchromatic photography taken in September 1970 for field edit use. The field editor visually verified the adequacy of the 1970 photography for use in revising map details. Edit information, including the 1970 photography, was applied in 1971. In 1975 the hydrographic survey reviewer requested the photogrammetric map for use in his review. Upon examination of the map the reviewer found errors in the application of field edit. The errors resulted, primarily, from the poor quality of the photographic prints used in 1971. Better quality prints were obtained and applied in 1975.

Refer to page 12 of this Descriptive Report concerning the disposition of inadequacies in PH-6712 maps.

Final review was accomplished at the Rockville Office in July 1976.

Several changes were made to the shoreline and foreshore features during review. No attempt was made to update the buildings or other cultural features.

A stable base positive copy of the map and a Descriptive Report will be registered in the NOS Archives.

COMPILATION REPORT
T-13151

This manuscript was compiled from a 2X enlargement of T-12519 (chart 6442) which was compiled in April 1964 and field edited in September 1964.

The enlargement on cronaflex was brought up to date graphically with 1:5,000 scale black and white cronapaque ratios of color photographs taken in July 1966. After corrections the cronaflex enlargement was paneled on 1:5,000 scale manuscripts and photographs were prepared for hydro support.

Refer to Descriptive Report for Chart Compilation of T-12519 (Chart 6442) of June 1963-September 1964.

31. Delineation

Graphic methods were used.

32. Control

There is an abundance of triangulation stations in the area of this manuscript.

33. Supplemental Data

None

34. Contours and Drainage

None

35. Shoreline and Alongshore Detail

The northeast corner of Harbor Island is still under construction and should be field edited. There was no field inspection of the 1966 photography. No low water or shoal lines were visible on the photographs.

36. Offshore Detail

No comment

37. Landmarks and Aids

Nine landmarks and 5 aids were abstracted from Form 567

of T-12519 (chart 6442) and listed on Form 567 for this manuscript.

38. Control for Future Surveys

None

39. Junctions

To the north with T-13149 in agreement. To the west with T-13150 in agreement. To the south with T-13152 in agreement. To the east with T-12519 (1:10,000) chart 6442 in agreement.

40. Horizontal and Vertical Accuracy

No comment

41. thru 45.

Inapplicable

46. Comparison with Existing Charts

Comparison was made with USGS quadrangle, Seattle North, 1949, 1:24,000 scale.

47. Comparison with Nautical Charts

A comparison was made with nautical chart No. 6442, scale 1:10,000, 2nd edition, August 8, 1966, corrected to Jan. 14, 1967.

Items to be applied to nautical charts immediately:

None

Items to be carried forward:

None

Submitted by:

Approved by:

J. C. Richter

K. N. Maki, Chief
Compilation Section

FIELD EDIT REPORT

MAP T-13151

Harbor Island

Field edit of map T-13151 was accomplished during September and October 1970 from a skiff in conjunction with photogrammetric signal location and from a launch during hydrography.

METHOD

Field photographs and a paper ozalid copy of the manuscripts were employed in the field in place of Field Edit Ozalids which were not provided. The mean high water line and shoreline detail were verified by visual comparison of the shore area to field photographs and ozalid manuscripts. Army Corps of Engineers 1:12,000 scale photographs of 19 September 1970 were also used during field edit. Notes have been made in violet ink on the field edit ozalid and cross referenced where necessary to matte ratio prints 66 S 3191A and 66 S 3192A and Army Corps of Engineers contact print S 7026-48-9. Unless otherwise indicated, all shoreline features are verified correct as interpreted.

ADEQUACY OF COMPILATION

Compilation of the map is inadequate. Considerable changes have been made in the area covered by the map as noted on the field edit ozalid and referenced photographs. Field inspection of the map is complete.

RECOMMENDATIONS

It is recommended that the map be revised in accordance with the field edit notes and be recompiled from Army Corps of Engineers photographs where significant changes in shoreline detail have occurred. It is recommended that the revised map be accepted as an advance manuscript.

Respectfully submitted,

Allan F. Divis

Allan F. Divis
LTJG, NOAA

Review Report T-13151
Shoreline Survey

July 1976

62. Comparison with Registered Topographic Surveys

T-12519 1:10,000 1964

Refer to memorandum page 12.

63. Comparison with Maps of Other Agencies

Refer to the Compilation Report, item 46.

64. Comparison with Contemporary Hydrographic Surveys

H-9167 1:5,000 1970
H-9169 1:5,000 1970

Comparison with H-9169 shows the surveys are in agreement except for one shoreline difference. This change is indicated in pencil on the smooth sheet. Comparison has been made with H-9167 and the surveys are in agreement.

65. Comparison with Nautical Charts

6442 1:10,000 1964

Refer to memorandum page 12.

66. Adequacy of Results and Future Surveys

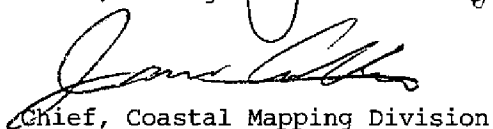
This map meets horizontal accuracy standards but does not meet NOS requirements for use in nautical chart maintenance. Refer to page 12 of this Descriptive Report concerning the inadequacies of this map.

Submitted by:



J. B. Phillips

Approved and Forwarded:


Chief, Photogrammetric Branch
Chief, Coastal Mapping Division



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

12

C3421

July 22, 1976

TO: Chief, Coastal Mapping Division

FROM: Quality Control Group *J. B. Blankinship*

SUBJECT: Recommendation for New Mapping, Elliott Bay, Washington

1. Purpose

The memo outlines the need for a 2nd Edition of Map T-12519 (PH-21411), date 1964.

2. Background

Map T-12519, scale 1:10,000, was used in hydro operations in 1970. Six 1:5,000 scale maps (PH-6712), 2X enlargements of portions of the 1:10,000 scale map, were processed and revised with 1966 photography. Hydrography and field edit were accomplished in 1970.

3. Map Adequacy

For reasons outlined under Section 4, the six 1:5,000 scale maps do not meet NOS requirements for use in nautical chart maintenance. The inadequacies do not affect the basic hydrographic (sounding) information on the contemporary hydrographic surveys.

4. Map Deficiencies

Field edit of the 1:5,000 scale maps was inadequate. The field edit reports state that after revision of the maps with 1970 Corps of Engineers photography in areas indicated (by the editor) they will meet requirements. Many changes in shoreline and alongshore features, apparent on the photographs, were not noted by the editor. The photographs were generally poor for interpreting details and little clarification was done by the editor. Although the hydrographer corrected some photogrammetric survey details on the boat sheet, many changes, apparent on the 1970 photographs, were accepted as compiled from the 1966 photographs.



5. Disposition of 1:5,000 Scale Maps

The six 1:5,000 scale maps were reviewed in July 1976. Changes required in hydrographic survey details were called to the attention of the hydro survey reviewer by notes on the reviewed smooth sheet or by memo, as applicable.

6. Recommended Procedures

New bridging and basic compilation is recommended for the 2nd map edition.

*NOTE: The last complete investigation of landmarks
and aids was done in 1963*

513

48. Geographic Names List

East Waterway

Elliott Bay

Harbor Island

West Waterway

Youngstown

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

T-13151

TO BE CHARTED

STRIKE OUT TWO

NON-FLUATING AIDS OR LANDMARKS FOR CHARTS

Seattle, Washington

July 19 67

I recommend that the following objects which have ~~(deleted)~~ been inspected from seaward to determine their value as landmarks be charted on ~~(deleted)~~ the charts indicated.

The positions given have been checked after listing by Robert B. Melby

October 11, 1963

Fred Natella, Capt., C&GS
Chief of Party.

STATE				WASHINGTON				POSITION				METHOD OF LOCATION AND SURVEY NO.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
CHARTING NAME	DESCRIPTION	SIGNAL NAME	LATITUDE*		LONGITUDE*		DATUM										
			° ' "	"	° ' "	"											
TANK	Fishers Mill Tall Tank, 1917 Ht.=220 (232)		47	34	122	21	20.023	N.A.	Triang	9/20/63	x				6449	6442	
TANK	Albers Tank, 1934		47	35	122	20	41.827	N.A.	Triang	9/27/63	x				6460	6446	
(elevated)	Ht.=163 (166)		47	34	122	21	41.827	N.A.	Triang	9/27/63	x				6449	6442	
(KJR)	Seattle, Radio Station KJR		47	35	122	20	41.827	N.A.	Triang	9/27/63	x				6446	6450	
R. TR.	Tower, 1936 Ht.=570 (573)		47	34	122	21	41.827	N.A.	Triang	9/27/63	x				6449	6442	
(KOL) ✓	KOL Radio Tower, 1934		47	35	122	20	41.827	N.A.	Triang	9/27/63	x				6446	6450	
R. TR.	Ht.=413 (420)		47	34	122	21	41.827	N.A.	Triang	9/27/63	x				6449	6442	
STACK	Seattle, Elliott Bay Lumber Co. Stack, 1955 Ht=203 (208)		47	34	122	20	41.827	N.A.	Triang	9/27/63	x				6446	6460	
KNBX ✓	Seattle, Radio Station KNBX		47	34	122	21	41.827	N.A.	Triang	9/27/63	x				6449	6442	
R. TR.	1963 Skeleton Steel Ht=266 (273)		47	34	122	20	41.827	N.A.	Triang	9/27/63	x				6446	6460	
STACK	Diamond Cement, Stack 1929		47	34	122	20	41.827	N.A.	Triang	9/27/63	x				6449	6442	
✓	Ht=202 (207)		47	34	122	20	41.827	N.A.	Triang	9/27/63	x				6446	6450	
W. TOWER	Spokane Bridge, Red Lt. on High West Power Tower, 1934		47	34	122	21	41.827	N.A.	Triang	9/27/63	x				6449	6442	
	Ht=244 (256)														6446	6460	
	Spokane Bridge, Red Lt. on High East Power Tower, 1934		47	34	122	21	41.827	N.A.	Triang	9/27/63	x				6449	6442	
E. TOWER	Ht=244 (256)														6446	6460	

This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and nonfloating aids to navigation, if redetermined, shall be reported on this form. Revisions shall show both the old and new positions. The data should be considered for the charts of the area and not by individual field survey sheets. Information under each column heading should be given.

* TABULATE SECONDS AND METERS

USCOMM-DC 27126

15

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

T-13151

TO BE CHARTED

STRIKE OUT TWO

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

Seattle, Washington

July 19 67

I recommend that the following objects which have ~~(been examined)~~ been inspected from seaward to determine their value as landmarks be charted on ~~(deleted from)~~ the charts indicated.

The positions given have been checked after listing by Robert B. Melby

October 10, 1963

Fred Natella, Capt., C&GS

Chief of Party

STATE	CHARTING NAME	DESCRIPTION	Lt. List No.	POSITION				METHOD OF LOCATION AND SURVEY No.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
				LATITUDE*		LONGITUDE*							
				° ' "	° ' "	° ' "	° ' "						
				D.M. METERS		D.P. METERS							
				19.604		19.468							
				605.4	122 21	406.8							
LIGHT		Todd Dock Light, 1963	2292	47 35					Triang	9/24/63x	x		6449 6450 6446 6460 6442
LIGHT		West Waterway Light, 1963	2293	47 35									
				17.127		25.443							
				529.0	122 21	531.6			Triang	9/24/63x	x		6449 6450 6446 6460 6442
*LIGHT		East Waterway Light, ?	2290	47 35									
				697.5	122 00	869.4							
**LIGHT		West Waterway Control Lts. (Spokane Bridge, Red Lt. on High West Power Tower, '34	2294	47 38					Triang	9/20/63x	x		6449 6442 6446 6460
				18.808		15.457							
				580.9	122 21	323.1							
HORN		East Waterway Ferry Slip Fog Signal	2291	47 35					Photo	9/23/63x	x		6449 6450 6446 6460
				22.811		41.466							
				74.05	122 20	866.4							

This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and nonfloating aids to navigation, if redetermined, shall be reported on this form. Revisions shall show both the old and new positions. The data should be considered for the charts of the area and not by individual field survey sheets. Information under each column heading should be given.

* TABULATE SECONDS AND METERS

USCOMM. DC 27126

16

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
DESCRIPTIVE REPORT
CONTROL RECORD

MAP T. 13151 PROJECT NO. PH-6712 SCALE OF MAP 1:5,000 SCALE FACTOR 1.0

STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR μ -COORDINATE LONGITUDE OR x -COORDINATE	DISTANCE FROM GRID IN FEET. OR PROJECTION LINE IN METERS		N.A. 1927 - DATUM - FROM G.H.O OR PROJECTION LINE IN METERS		FACTOR DISTANCE FROM GRID OR PROJECTION LINE IN METERS	
				FORWARD	(BACK)	FORWARD	(BACK)	FORWARD	(BACK)
PIER 42, 1944	pg. 201		220,514.42					13,4425.9	
*EAST WATERWAY LIGHT 1963			1,629,426.28					99,3300.2	
			47° 35'	Hand Plot GPS		682.0			
			122° 20'			869.0			
ALBERS TANK 1934	pg. 53		218,233.77					13,3035.6	
			1,628,266.93					99,2593.5	
KOL RADIO TOWER 1934			217,305.45					13,2469.7	
			1,626,007.46					99,1216.1	
WEST WATERWAY LIGHT 1963	pg. 388 Vol. 11		218,239.49					13,3039.1	
			1,623,997.62					98,9990.9	
TODD DOCK LIGHT 1963	pg. 388 Vol. 11		218,482.01					13,3186.9	
			1,624,412.22					99,0243.6	
SEATTLE, RADIO STA. KJR TOWER 1936	pg. 337		216,119.60					13,1746.8	
			1,622,832.24					98,9288.5	
SEATTLE, RADIO STA. KNBX TOWER 1963	pg. 389 Vol. 11		214,144.16					13,0542.5	
			1,621,999.01					98,8772.5	
SEATTLE, ELLIOTT BAY LUMBER CO. STACK 1955-63	pg. 389 Vol. 11		212,374.08					12,9463.5	
			1,627,354.44					99,2037.2	
SPOKANE BRIDGE R.L.T. HIGH W. POWER TOWER 1934	pg. 55		212,318.03					12,9429.3	
			1,624,565.31					99,0337.0	
HIGH EAST (RED TOWER 1934)	pg. 55		212,304.92					12,9421.3	
			1,625,203.37					99,0725.9	
STACY STREET TANK 1917	pg. 127		215,578					13,1416.6	
			1,628,391					99,2669.1	

1 FT. = 3048006 METER
COMPILED BY J. Richter
DATE April 1967
CHECKED BY H. Lucas
DATE April 1967
COMM. DG. 57843
17

1.0

18

TIDE COMPUTATION

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

PROJECT NO. PH- 6712 T-13151

Time and date of exposure 7/26/66 12:36 Reference station Seattle, Washington Mean range 7.6
Diurnal
Date of field inspection _____ Subordinate station _____ Ratio of ranges 11.3

	Time	
	h.	m.
High tide	13	24
Low tide	6	12
Duration of rise or fall	7:12	

	Height feet	Height x Ratio of ranges
High tide	9.0	
Low tide	0.2	
Range of tide	8.8	

	Time	
	h.	m.
High tide at Ref. Sta.	13	24
Time difference		0
Corrected time at Subordinate station	13	24

	Time	
	h.	m.
Low tide at Ref. Sta.	6	12
Time difference		0
Corrected time at Subordinate station	6	12

	h.	m.		feet		feet	Photo. No.
Time H. T. or L. T.	13	24	Ht. H. T. or L. T.	9.0	Feature bares		
Required time	12	36	Tabular correction	0.2	Stage of tide above MLW		66-S-3193A
Interval		:48	Stage of tide above MLW	8.8	Feature above MLW		
Time H. T. or L. T.	13	24	Ht. H. T. or L. T.	9.0	Feature bares		
Required time	12	45	Tabular correction	0.2	Stage of tide above MLW		66-S-3206A
Interval		:39	Stage of tide above MLW	8.8	Feature above MLW		
Time H. T. or L. T.			Ht. H. T. or L. T.		Feature bares		
Required time			Tabular correction		Stage of tide above MLW		
Interval			Stage of tide above MLW		Feature above MLW		
Time H. T. or L. T.			Ht. H. T. or L. T.		Feature bares		
Required time			Tabular correction		Stage of tide above MLW		
Interval			Stage of tide above MLW		Feature above MLW		
Time H. T. or L. T.			Ht. H. T. or L. T.		Feature bares		
Required time			Tabular correction		Stage of tide above MLW		
Interval			Stage of tide above MLW		Feature above MLW		
Time H. T. or L. T.			Ht. H. T. or L. T.		Feature bares		
Required time			Tabular correction		Stage of tide above MLW		
Interval			Stage of tide above MLW		Feature above MLW		

COMM-DC-57848

19

Computed by J. C. Richter Checked by _____