9899

Diagram No. LS-5

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. WH-5-4-80

Office No. H-9899

LOCALITY

State Michigan

General Locality Lake Huron

Locality Lexington Harbor & Approaches

19 80

CHIEF OF PARTY
CDR F.P. Rossi

LIBRARY & ARCHIVES

DATE November 17, 1981

☆U.S. GOV. PRINTING OFFICE: 1980—766-230

9899

FORM C&GS-537 (5-66)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

REGISTER NO.

H-9899

HYDROGRAPHIC TITLE SHEET

INSTRUCTIONS - 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.

WH-5-4-80

State Michigan

General locality Lake Huron

Locality Lexington Harbor

Scale 1:5000 Date of survey July 23 - Sept 2, 1980

Instructions dated March 31, 1980 Project No. OPR-X115-WH/HSB-80

Vessel NOAA Ship WHITING, Launch 1014 (2932) and Skiff 2933 and Launch 1015 (2931)

Chief of party Commander Frank P. Rossi

Surveyed by N. Prahl, D. Mason, R. Mann, J. Gardner, D. Bland, J. Grant

Soundings taken by echo sounder, ~~hand lead, pole~~ Ross Model 5000, Raytheon DE-719, sounding pole

Graphic record scaled by WHITING personnel

Graphic record checked by NP, DM, RM, JG, DB, JG

Protracted by Commander Frank P. Rossi Automated plot by Kynatics 1201 Plotter Hydroplot (AMC)

Soundings penciled by M. Hickson

Soundings in ~~fathoms~~ feet at ~~MLW~~ ~~MLLW~~ ~~Lake Level~~ Low Water Datum (IGLD 1955: 576.8 FT)

REMARKS: All times are Coordinated Universal Time.

STANDARDS CK'D 2-12-86
C.Loy

✓ AWOIS + SURF 12/85 RWD

USCOMM-DC 37009-P66

DESCRIPTIVE REPORT

TO ACCOMPANY

SURVEY H-9899

FIELD NO. WH-5-4-80

A. PROJECT

Hydrographic survey H-9899 was performed in accordance with Project Instructions OPR-X115-WH/HSB-80, Lake Huron, dated March 31, 1980 as amended by the following changes:

Change No.	Date
1	04/04/80
2	07/11/80
3	04/23/80
4	05/21/80
5	07/16/80
6	07/23/80
7	09/09/80

B. AREA SURVEYED

Survey H-9899 covers the area surrounding Lexington Harbor, Lexington, Michigan and the harbor itself. The northern limit of hydrography is 43°16'40"N, the eastern limit is 82°30'22"W, the southern limit is 43°15'30"N, and the western limit is the shoreline. This area was run in accordance with Section 6.3 of the Project Instructions to be used as an inset on future charts. The hydrography was run from July 23 to September 2, 1980 (Julian Days 205-246). A dive was performed on October 19, 1980 (JD 293).

C. SOUNDING VESSELS

All hydrography outside the breakwater was performed by NOAA Launch 1014 (EDP No. 2932). All hydrography inside the breakwater was run with the ship's MONARK (EDP No. 2933). All bottom samples were taken with NOAA Launch 1015 (EDP No. 2931).

No major mechanical problems were encountered in any vessel.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

All soundings acquired by Launch 1014 were done so on a Ross Model 5000 Fineline Recorder (s/n 1049). Phase check calibrations were performed on the Ross in accordance with the Hydrographic Manual. This calibration was performed regularly and noted on all fathograms.

Bar checks for Launch 1014 were taken daily, weather and sea conditions permitting. Velocity corrections were computed from these bar checks and a velocity tape was made. The largest correction amounted to .2 feet. The smooth field sheet was not plotted with correctors.

All bar check data is included in the direct comparison logs and included with the hydrographic data. Settlement and squat correctors were obtained from trials performed by WHITING personnel in July 1980 in Lake Huron. Graphs and tables for settlement and squat are in the appendix and applied on the

TC/TI tape. Graphs and tables for velocity corrections are in the appendix.

All soundings on the Ross were taken on the 0-100 foot scale.

All soundings acquired by MONARK 2933 were done so on a Raytheon DE-719 (s/n 465) survey fathometer. Phase calibrations were performed in accordance with the Hydrographic Manual. A pole check was taken for calibration and noted on the fathogram. There is no data for settlement and squat for MONARK 2933. This vessel was run at a constant slow speed.

All soundings taken on the Raytheon were on the 0-50 foot scale.

Launch 1015 obtained only bottom grab samples and thus no depths were plotted with these positions.

E. HYDROGRAPHIC SHEETS

The area surrounding Lexington Harbor was plotted on a 1:5000 scale sheet on a Houston Instruments DP-3 roll plotter (s/n 5557-6). The plotter origin is Latitude 43°15'30"N and Longitude 82°32'30"W.

The soundings inside the breakwater were hand plotted by WHITING personnel on a 1:1200 scale sheet. This non standard scale was used for direct shoreline transfer from harbor construction drawings. The grid was plotted on a Houston Instruments DP-3 roll plotter (s/n 5557-6). The plotter origin is 43°15'59"N and 82°31'40"W. Field records will be sent to the Atlantic Marine Center, Norfolk, Virginia (CAM3), for verification and smooth plotting.

F. CONTROL STATIONS

The following signals were used for electronic positioning sites, initial positions for Range-Azimuth control or for calibration.

SIGNAL NO.	NAME
109	DOO
110	DA
112	DAY
241	H-32-CAL-MI-80

Stations 109, 110, and 112 were established by triangulation by personnel from Operations Division, Atlantic Marine Center, 1979. Station 241 was established by triangulation by WHITING personnel

(1980) and is a non-recoverable calibration point. All computations were submitted to Operations Division, Atlantic Marine Center, Norfolk, Virginia.

G. HYDROGRAPHIC POSITION CONTROL

All hydrography outside the breakwater was controlled by the range-azimuth method using Del Norte equipment and a Wild T-2 theodolite (s/n 35052). Launch 1014 was equipped with a master unit (s/n 1060) and a distance measuring unit (DMU, s/n 192). The remote unit (s/n 74) and the T-2 were set up on shore at Station 109 (DOO).

All range-azimuth hydrography was logged using program FA181, Real-Time Range Azimuth Hydrolog.

Calibrations were made twice daily in accordance with the Hydrographic Manual. All calibrations were made from Station 241 (H-32-CAL-MI-80) using program RK561, Hyperbolic and Range-Range Geodetic Calibration. The remote was set up on Station 109 for all calibrations. Baseline calibrations were performed in accordance with the manufacturers specifications and the Hydrographic Manual. Del Norte Master units and DMU's remained paired between baseline calibrations.

All soundings obtained inside the breakwater were controlled by the intersections of two azimuths from WILD T-2 theodolites (s/n 35052 and 35083) from two known positions. One T-2 was set up on the East breakwater with the skiff running a line directly towards it. The other T-2 was set up on the North breakwater and angles were recorded at each sounding. Each sounding line was run towards a new T-2 position on the East breakwater. These positions were less than third-order triangulation and are lettered on the smooth field sheet. All soundings and positions were manually recorded and plotted on the smooth field sheet.

H. SHORELINE See Verification Report, section 2.b.

Shoreline hydrography on H-9899 was run in accordance with the Hydrographic Manual. Shoreline on the 1:5000 ~~sheet~~ was transferred from Survey ~~L~~ LS-1970 and ~~L~~ LS-1971 (both 1:10,000). Shoreline on the 1:1200 sheet was verified with T-2 angles and from the architect's plans included with the field data (see smooth field sheet).

I. CROSSLINES

The percentage of crosslines run was 8.6. The nautical miles of crosslines run was 4.0. Crosslines were run normal to mainscheme lines in all range-azimuth hydrography. Agreement with mainscheme lines was generally within 1 foot (80% agreed exactly).

Inside the harbor one crossline was run from the entrance towards the north breakwater. These soundings agreed exactly with the mainscheme

J. JUNCTIONS See Verification Report, section 5.

This survey junctions with H-9898 (1980) (1:20,000) to the east. The junctions are in excellent agreement with approximately 90% of the soundings agreeing to within 1 foot. This junction survey was conducted by WHITING personnel this year and has not been verified.

K. COMPARISON WITH PRIOR SURVEYS

This survey was compared with prior survey L-1970 (LS) (1956) and L-1971 (LS) (1956) (both 1:10,000). In all areas the prior survey soundings were four to five feet shoaler than on this survey.

L. COMPARISON WITH THE CHART

The comparison was made with Chart 14862 (23rd Edition, July 29, 1978). All depths appeared to be 3-4 feet shoaler on the chart than on this survey.

A wreck charted in 13 feet of water at 43°15.7'N and 82°30.6'W was developed by sounding lines and by divers. A least depth of ~~20~~ 17 feet was found on ~~the wreck~~ wreckage by divers ~~at~~ east of the charted position. This position was found by using ARGO positioning equipment and thus was plotted on H-9898 (WH-20-2-80, 1:20,000) because of the accuracy requirements for 1:5000 scale sheets. Position and depth data are included with H-9898. Transferred to this survey from H-9898 (1980) to supplement H-9899.

The wreck was found to be broken up due possibly to the sea action felt by divers at the bottom. This probably accounts for the least depth of ~~20~~ 17 feet ~~recorded~~ rather than 13 feet on the chart. The recommendation is made to retain this wreck at its charted position with a least depth of 17 feet. Do not remove. Recommend retention of 13 Wreck in addition to the wreckage. There is possibility that two wrecks exist as local divers indicated that two schooners sank in the vicinity in the early 1900's.

A dive was performed on JD 293 over a 9 foot depth inserted between the 3rd and 4th soundings past Position 377. The geographic position is Lat. 43°15'40"N, Long. 82°31'24"W. The surrounding depths are 12 and 13 feet. The dive investigation revealed a patch of grass rising 3 to 4 feet off the bottom. This is not considered a hazard to navigation but should be noted as "grass" on the chart. Note "Grs" on sheet retained but depth was removed.

M. ADEQUACY OF SURVEY

This survey is adequate for an inset on a smaller scale chart and supersedes all previous surveys. ✓ See Verifier's Report, Section 6

N. AIDS TO NAVIGATION

The following is a list of all aids to navigation and their positions: ✓

DESCRIPTION	G.P.	
Gp Fl(2) 5 sec M "2"	43/15/59.8N 82/32/22.2W	Sig #113 Lexington Harbor East Breakwater Light 2
Fl G 4 sec M "3"	43/16/02.8N 82/31/24.7W	Sig #114 Lexington Harbor West Breakwater Light 3
Black Can "5"	43/16/03 N 82/31/26 W	Pos 744
Red Nun "6"	43/16/10.5N 82/31/26.8W	Pos 771

Signals 113 and 114 are fixed aids to navigation and are charted as approximate positions (PA). The positions given here were derived from third order triangulation by the Operations Division, AMC, 1979. The recommendation is made to delete "PA" on the chart. The positions of all aids to navigation and characteristics agree with the Coast Guard Light List and adequately serve their intended purpose (i.e. to delineate the breakwater entrance boundries for safe navigation). Concur

O. STATISTICS

VESNO	NO. OF POSITIONS	TOTAL MILES
2932 (1014)	581	50.1
2933	190	1.7
2931 (1015)	38 (bottom samples)	-

The total square miles of soundings was 1.1.

P. MISCELLANEOUS

Sand waves of 2-3 feet height in 22 feet of water were observed on the fathograms and inserted on the corrector tape. These indicate a southward flowing current, probably the result of the current deflection around the breakwater.

Q. RECOMMENDATIONS See Verification Report, Section 10.

The recommendation is made to use this survey as an inset on a smaller scale survey.

The Army Corps of Engineers were conducting dredging operations in the northwestern portion of the harbor approximately two weeks after completion of this survey. This may affect the survey results by causing a deeper depth than this survey shows.

R. AUTOMATED DATA PROCESSING

The following data processing programs were used in this survey:

Program No.	Name	Version Date
RK201	Grid & H/R Lattice Plot	04/18/76
FA181	Range-Azimuth Hydrolog	02/23/78
RK212	Visual Station Table Load	04/01/74
RK216	R/Az Position & Sounding Plot	05/15/74
RK300	Utility Computations	02/10/76
RK330	Data Reformat & Check	05/04/76
RK561	Hyperbolic & R/R Geodetic Calib.	02/19/75
AM602	Extended Line Oriented Editor	03/10/72
AM407	Geodetic Inverse & Direct Comp.	10/23/75

S. REFERRAL TO REPORTS

None.

APPROVAL

Supervision of all field and office work on this hydrographic survey wascontiuous on a day to day basis to ensure completeness of the survey and that all work was done in accordance with the Project Instructions and the Hydrographic Manual. This survey is complete and adequate for charting.

Approved/Forwarded

Frank P. Rossi
CDR, NOAA
Commanding Officer, NOAA Ship WHITING

Respectfully submitted

Robert G. Mann, LT, NOAA

LIST OF STATION NAMES

Station No.	Name	Source
109	C. of E. DOO	AMC Ops. Div. 1979
110	C. of E. DA	AMC Ops. Div. 1979
112	C. of E. DAY	AMC Ops. Div. 1979
241	H-32-CAL-MI-80	WHITING 1980

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

WATER LEVEL NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center: CAM3

Hourly heights are approved for

Water Level Station Used: Port Sanilac, Michigan (907-5011)

Period: July 25, 1980 - September 4, 1980

HYDROGRAPHIC SHEET: H - 9899

OPR- X115-WH/HSB - 80

Locality: Lake Huron

Plane of reference: Low Water Datum (IGLD 1955 : 576.8 Feet)

Remarks: Zoning not required. Data from other gages on Lake Huron indicates no unusual water level movement during the survey period.

Philip C. Marks

Chief, Water Level Branch

SIGNAL TAPE
H-9899
LEXINGTON HARBOR

109	6	43	16	03027	082	31	21513	139	0000 000000
111	6	43	16	10545	082	31	22533	139	0000 000000
112	6	43	16	11666	082	31	27783	139	0000 000000
241	6	43	15	04558	082	31	26101	243	0000 000000
210	6	43	16	03704	082	31	21604	243	0000 000000
201	6	43	16	04342	082	31	21691	243	0000 000000
202	6	43	16	04981	082	31	21778	243	0000 000000
203	6	43	16	05622	082	31	21865	243	0000 000000
204	6	43	16	06261	082	31	21951	243	0000 000000
205	6	43	16	06899	082	31	22038	243	0000 000000
206	6	43	16	07538	082	31	22124	243	0000 000000
207	6	43	16	08179	082	31	22212	243	0000 000000
208	6	43	16	08818	082	31	22298	243	0000 000000
209	6	43	16	09456	082	31	22385	243	0000 000000
210	6	43	16	10101	082	31	22472	243	0000 000000

SIGNAL TAPE
WH-5-4-80
H-9899

```
109 6  43 16 03027 082 31 21513  139 0000 000000
110 6  43 16 10545 082 31 22533  139 0000 000000
112 6  43 16 11666 082 31 27783  139 0000 000000
241 6  43 15 04550 082 31 26101  243 0000 000000
```

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [ ] TO BE CHARTED
- [ ] TO BE REVISED
- [X] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office): NOAA Ship WHITING
STATE: Michigan
LOCALITY: Lexington
DATE:

The following objects HAVE [X] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.: X115-WH-80
JOB NUMBER:
SURVEY NUMBER: H-9898
DATUM: NAD 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
Spire	Lexington N. Spire (not visible) (St. Denis Catholic Church Spire)	43/16	13.64	82/31	57.56		F-5-Vis 7/20/80	14862
	Copy made at L-10306							

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	**NAME**	**ORIGINATOR**
OBJECTS INSPECTED FROM SEAWARD		☐ PHOTO FIELD PARTY ☐ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER *(Specify)*
POSITIONS DETERMINED AND/OR VERIFIED		FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64,

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS

Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.

EXAMPLE: 75E(C)6042
8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.

EXAMPLE: P-8-V
8-12-75
74L(C)2982

II. TRIANGULATION STATION RECOVERED

When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.

EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

NOAA FORM 76-40 (8-74)

SUPERSEDES NOAA FORM 76-40 (2-71) WHICH IS OBSOLETE, AND EXISTING STOCK SHOULD BE DESTROYED UPON RECEIPT OF REVISION.

☆ U.S.GPO:1975-0-665-080/1155

NOAA FORM 76-40 (8-74)

Replaces C&GS Form 567.

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NONFLOATING AIDS [redacted]S FOR CHARTS

ORIGINATING ACTIVITY

- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [ ] TO BE CHARTED
- [X] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office)	STATE	LOCALITY	DATE
	MICHIGAN	LEXINGTON	

The following objects HAVE [ ] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	POSITION LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	POSITION LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	METHOD AND DATE OF LOCATION FIELD	CHARTS AFFECTED
	LEXINGTON HARBOR E. BREAKWATER LT 2 AND RADIO BEACON 312	43° 15	59.80	82° 31′	22.23	F-2-6-L - -79	3L TRAVERSE NO E AMC/HSB 1979	
	LEXINGTON HARBOR W. BREAKWATER LT 3	43° 16′	02.82	82° 31′	24.75	F-2-6-L - -79	3L ORDER TRAVERSE NO E AMC/HSB 1979	

NC

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	NAME	ORIGINATOR
OBJECTS INSPECTED FROM SEAWARD		☐ PHOTO FIELD PARTY ☐ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER *(Specify)*
POSITIONS DETERMINED AND/OR VERIFIED		FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64,

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS
Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.
EXAMPLE: 75E(C)6042
8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED
Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field Identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.
EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.
EXAMPLE: P-8-V
8-12-75
74L(C)2982

II. TRIANGULATION STATION RECOVERED
When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.
EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH
Enter 'V-Vis.' and date.
EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

NOAA FORM 76-40 (8-74)

SUPERSEDES NOAA FORM 76-40 (2-71) WHICH IS OBSOLETE, AND EXISTING STOCK SHOULD BE DESTROYED UPON RECEIPT OF REVISION.

☆ U.S. GPO:1975-0-665-080/1155

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

~~NOWELL OBJECTS AIDS OR~~ LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [ ] TO BE CHARTED
- [X] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office)

STATE: MICHIGAN

LOCALITY: LEXINGTON

DATE

The following objects HAVE [X] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.

JOB NUMBER

SURVEY NUMBER

DATUM: NAD 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
	LEXINGTON WEST TANK, FR ACTUALLY IS CROSWELL TANK obb s/s	43° 16′	45.5″	082° 36′	40.5″	SCALED FROM USGS TOPO CROSWELL 7½	FIELD VERIFIED 7/20/1980	
	LEXINGTON WEST STACK IS ACTUALLY MICHIGAN SUGAR CO. STACK AT CROSWELL obb s/s	43° 16′	00.0″	082° 36′	56.5″	SCALED FROM USGS TOPO CROSWELL 7½	FIELD VERIFIED 7/20 1980	
	LEXINGTON S. SPIRE IS ACTUALLY THE TRINITY EPISCOPAL CHURCH SPIRE Not plotted	43° 15′	56.1″	082-31 ° ′	53.0″	SCALED FROM USGS TOPO CROSWELL 7½	FIELD VERIFIED 7/20 1980	
	LEXINGTON TANK Not plotted	43° 16	08.1″	082° 32′	15.0″	SCALED FROM USGS TOPO CROSWELL 7½	FIELD VERIFIED 7/20/1980	

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	**NAME**	**ORIGINATOR**
OBJECTS INSPECTED FROM SEAWARD		☐ PHOTO FIELD PARTY ☐ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER *(Specify)*
POSITIONS DETERMINED AND/OR VERIFIED		FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64,

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS

Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.

EXAMPLE: 75E(C)6042
8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.

EXAMPLE: P-8-V
8-12-75
74L(C)2982

II. TRIANGULATION STATION RECOVERED

When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.

EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

☆ U.S.GPO:1975-0-665-080/1155

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [X] TO BE CHARTED
- [ ] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office)	STATE	LOCALITY	DATE
NOAA Ship WHITING	Michigan	Lake Huron	9/15/80

The following objects HAVE [X] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
X-115-WH/HSB-80		H-9899	Great Lakes Datum

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
Lexington Harbor E. Breakwater Lt.	Gp. Fl.W.(2) 5 sec 25 ft above water, red triangle day marker	43 15	59.799	82 31	22.233		F-1-6-V	14862
Lexington Harbor W. Breakwater Lt.	Fl. G. 4 sec, 25 ft above water green square day marker	43 16	02.819	82 31	24.754		F-1-6-V	14862

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	**NAME**	**ORIGINATOR**
OBJECTS INSPECTED FROM SEAWARD	CDR Frank P. Rossi, CO NOAA Ship WHITING	☐ PHOTO FIELD PARTY ☒ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER *(Specify)*
POSITIONS DETERMINED AND/OR VERIFIED	Mr. Jim Shea, OPS. DIV., AMC	FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64,

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS

Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.

EXAMPLE: 75E(C)6042
8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.

EXAMPLE: P-8-V
8-12-75
74L(C)2982

II. TRIANGULATION STATION RECOVERED

When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.

EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control estabiished by photogrammetric methods.

☆ U.S.GPO:1975-0-665-080/1155

VELOCITY TAPE

WH-5-4-80 H-9899

```
000035 1 0000 0001 000 293200 009899
000175 1 0002
000250 1 0000
000300 0 0002
999999 0 0000
```

TC/TI TAPE

H-9899

```
140335 0 0003 0001 205 293200 001980
192503 0 0001 0001 207 293200 001980
142735 0 0003 0001 211 293200 001980
152243 C 0001
```

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 75-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship WHITTING S-329

CDR. Frank P. Rossi Comdg.

These corrections are to be used

between July 23, 1980 and Sept 2 1980

in the locality Lexington Harbor

Lexington, Michigan

for hydrographic surveys Nos. H-9899

(For deep water add a 0 to these figures)

DEPTHS IN FATHOMS FEET

0 5 10 15 20 25 30

Corrections computed from average of 4 bar checks

-0.3 -0.2 -0.1 0.0 +0.1 +0.2

CORRECTION (FEET)

K&E 20 X 20 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER C.S.A.

240

☆ U.S. GOV. PRINTING OFFICE: 1975—668-160

SETTLEMENT AND SQUAT TRIALS

Settlement and squat trials were run on launches 1014 and 1015 in Lake Huron, Michigan, in July and September 1980. Trials were run at a point of known depth, marked by a buoy. Results are the average of one run towards the buoy and one run away from the buoy with marks being taken when the buoy was abeam the transducer. The speeds and results are listed below.

SPEED IN RPM's	CORRECTION 1014	CORRECTION 1015
600	+0.10	+0.00
800	+0.10	+0.10
1000	+0.30	+0.10
1200	+0.30	+0.20
1400	+0.30	+0.20
1600	+0.30	+0.30
1800	+0.30	+0.40
2000	+0.40	+0.10
2200	+0.20	+0.10
2400	-0.10	-0.20
2600	-0.40	-0.40

Corrections for settlement and squat are made on the TC/TI Tape. Periods of reduced speed during actual hydrography are noted in the sounding volumes and on the printouts.

See the attached graph of the correctors versus RPM's for each vessel.

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 76-21 (8-72) U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL OCEAN SURVEY

SETTLEMENT AND SQUAT XXXXXXXXX CORRECTIONS

Ship WHITING Launch 2931 (1015)
FRANK P. ROSSI Comdg

These corrections are to be used
between 7 July 1980 and 27 Oct. 1980
in the locality Lake Huron, MI
Western Coast
for XXXXXXXXXXXXXXXXXXXXX OPR X115-WH/HSB-80

(For deep water add a 0 to these figures)

DEPTHS IN FATHOMS

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

RPM's

600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600

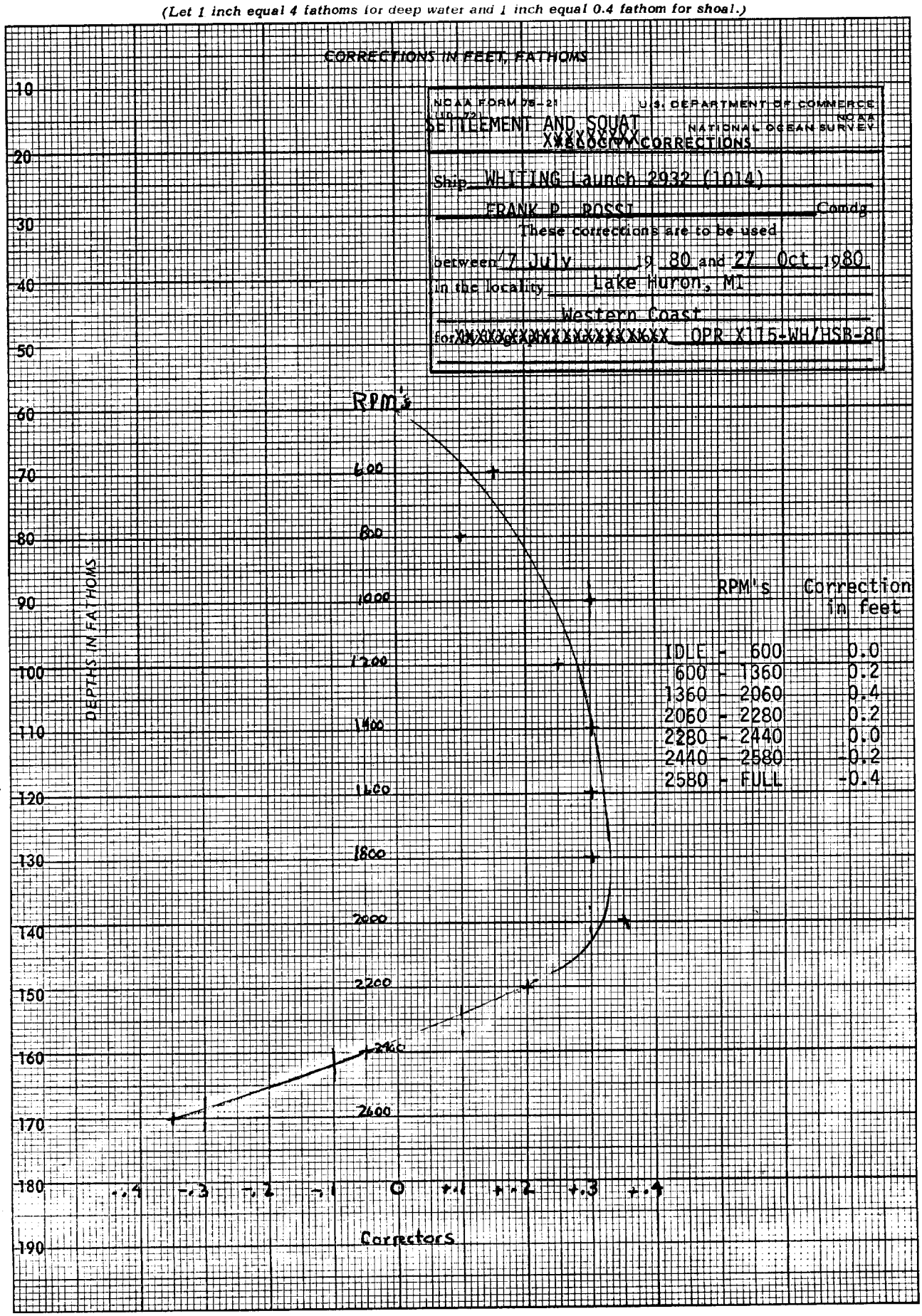
RPM's	Correction in Feet
IDLE - 1000	0.0
1000 - 1450	0.2
1450 - 2020	0.4
2020 - 2200	0.2
2200 - 2340	0.0
2340 - 2520	-0.2
2520 - FULL	-0.4

-.4 -.3 -.2 -.1 0 +.1 +.2 +.3 +.4

Correctors

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

(For deep water add a 0 to these figures)



NOAA FORM 76-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

SETTLEMENT AND SQUAT ~~XXXXXXXX~~ CORRECTIONS

Ship WHITING Launch 2932 (1014)

FRANK P. ROSSI Comdg.

These corrections are to be used

between 7 July 19 80 and 27 Oct 1980

in the locality Lake Huron, MI

Western Coast

for ~~XXXXXXXXXXXXXXXXXXXX~~ OPR-X115-WH/HSB-80

RPM's	Correction in feet
IDLE - 600	0.0
600 - 1360	0.2
1360 - 2060	0.4
2060 - 2280	0.2
2280 - 2440	0.0
2440 - 2580	-0.2
2580 - FULL	-0.4

☆ U.S. GOV. PRINTING OFFICE: 1975—668-16

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
NOAA Ship WHITING
439 W. York Street
Norfolk, Virginia 23510

September 15, 1980

TO : Chief, Tides and Water Levels Branch (C331)

FROM : Commander Frank P. Rossi, NOAA
Commanding Officer, NOAA Ship WHITING

SUBJECT: Smooth Water Level Data for Survey H-9899

Please forward smooth water level data for the west coast of Lake Huron to Chief, Processing Division (CAM3), Atlantic Marine Center, Norfolk, Virginia. Inshore hydrography was done from Latitude 43°15'30"N to Latitude 43°16'40"N. Smooth water level data is needed for Julian Days 205-246, 1980.

FIELD WATER LEVEL NOTE

Field water level reductions were not performed on hydrographic survey H-9899. WHITING personnel monitored the water level gage located at Lat. 43°26.0'N and Long. 82°32.2'W and found it in proper working order. A gage at Lakeport was installed by the Army Corps of Engineers and monitored by a paid observer. This was located at Lat. 43°08.5'N and Long. 82°29.5'W.

NOAA FORM 76-155
(11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

SURVEY NUMBER

H-9899

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
Lake Huron	X									1
Lexington	X									2
Lexington Harbor	X									3
Michigan (title)	X									4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
					Approved:					18
										19
					Charles E. Hamilton					20
					Chief Geographer- N/CG2x5					21
					27 Sept. 1983					22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

APPROVAL SHEET
FOR
SURVEY H-9899

A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~haaxnot~~ been made. A new final sounding printout has/~~haaxnot~~ been made.

B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the HYDROGRAPHIC MANUAL. Exceptions are listed in the Verification Report.

Date:* 9/15/81

R. D. Sanders
Chief, Verification Branch

* date inserted by Gmyrek per phone conversation with Mr. Senecki on Jan 30, 1983.

NOAA FORM 77-27 (5-77) | U. S. DEPARTMENT OF COMMERCE NOAA | HYDROGRAPHIC SURVEY NUMBER

HYDROGRAPHIC SURVEY STATISTICS

H-9899

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS	3
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS. ARC, EXCESS	1 2 3

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS			1 Boa			
VOLUMES						
BOXES			1 Page Sound Plot 2 Azimuth Vol., 1 Sound Vol.			

T-SHEET PRINTS (List)

SPECIAL REPORTS (List)

OFFICE PROCESSING ACTIVITIES
The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			809
POSITIONS CHECKED		809	809
POSITIONS REVISED		31	31
SOUNDINGS REVISED		6	6
SOUNDINGS ERRONEOUSLY SPACED		75	75
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	0
	TIME – HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	6		6
VERIFICATION OF CONTROL		4	4
VERIFICATION OF POSITIONS		18	18
VERIFICATION OF SOUNDINGS		47	47
COMPILATION OF SMOOTH SHEET		91	91
APPLICATION OF TOPOGRAPHY		7	7
APPLICATION OF PHOTOBATHYMETRY			
JUNCTIONS		1	1
COMPARISON WITH PRIOR SURVEYS & CHARTS		16	16
VERIFIER'S REPORT		15	15
OTHER			
TOTALS	6	199	205

Pre-Verification by	J. Lehner	*Beginning Date* 11/20/80	*Ending Date* 11/21/80
Verification by	F. Saunders, R. Roberson	*Beginning Date* 1/16/81	*Ending Date* 9/15/81
Verification Check by	H. Smith	*Time (Hours)* 4	*Date* 7/09/81
Marine Center Inspection by	H.I.T.	*Time (Hours)* 8	*Date* 8/27/81
Quality Control Inspection by	L. Quinlan	*Time (Hours)* 58	*Date* 5/15/82
Requirements Evaluation by	RW. DerKazarian	*Time (Hours)* 4	*Date* 12/30/85

REGISTRY NO. 9899(1980)

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE_____ TIME REQUIRED_____ INITIALS_____

REMARKS:

ATLANTIC MARINE CENTER
VERIFICATION REPORT

REGISTRY NO.: H-9899 FIELD NO.: WH-5-4-80

Michigan, Lake Huron, Lexington Harbor and Approaches

SURVEYED: July 23 through September 2, 1980

SCALE: 1:5000 PROJECT NO.: OPR-X115

SOUNDINGS: Ross Digital Echo Sounder, Raytheon DE 719 Fathometer, Sounding Pole

CONTROL NO.: Range/Azimuth (Del Norte/ Theodolite), Azimuth/Azimuth (Theodolite/Theodolite)

Chief of Party ..... Frank P. Rossi
Surveyed by ..... N. A. Prahl
..... C. D. Mason
..... J. C. Gardner, Jr.
..... R. G. Mann
..... D. A. Bland
..... J. B. Grant
Automated Plot by ..... Xynetics 1201 Plotter (AMC)
..... September 1, 1981

1. Introduction

a. During verification it was determined that the hydrographer did not use the fresh water draft of the Jensen sounding vessel. On the master tapes, this resulted in a constant error throughout the survey where Jensen launches were used. Application of the correct draft necessitated a complete replot of the survey outside of Lexington Harbor. The proper draft was found in the Descriptive Report of an adjoining survey.

b. Notes in the Descriptive Report were made in red during verification.

2. Control and Shoreline

a. Control is adequately discussed in sections F and G of the Descriptive Report. ✓

b. Shoreline in the Lexington Harbor area was taken from an engineering drawing provided by Valentine-Thomas and Associates, Incorporated of Port Huron, Michigan, and from detached positions taken in the field. A telephone conversation with Mr. J. W. Shink of Valentine-Thomas revealed that the site plan survey was controlled using existing property lines and not a NGS tie. A copy of the site plan is being forwarded with the survey records. No shoreline was applied to the 1:5000 scale survey area because there are no existing shoreline manuscripts and the charted shoreline is at a scale of 1:120,000. ✓

A dashed red line inside Lexington Harbor was used to delineate the approximate shoreline north of the new pier and bulkhead. The hydrographer took a detached position (788) and called it shoreline. ✓

The delineation of the section of Lexington Harbor breakwater with the east light differs from the plan provided by Valentine-Thomas and Associates, Inc. A telephone conversation with Mr. Carl Lamphere, U.S. Army Corps of Engineers, Detroit District (FTS 226-6816) found that an "as built" survey has not been done. Upon completion of an "as built" survey. A copy will be sent to NOS Headquarters, Rockville, Maryland. Ref CL 924(79) (See BP 110289)

3. Hydrography

a. Soundings at crossings are in excellent agreement. Plotted depths vary one (1) foot.

b. The standard depth curves could be adequately delineated. A charted supplemental twenty four (24) foot depth curve was also drawn. Some brown curves were drawn to show additional bottom relief.

c. The delineation of the bottom configuration and determination of least depths is considered adequate. Descriptive Report states Corps of Engineer conducted dredging operations in this area 2 weeks after survey.

4. Condition of Survey

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual with the following exceptions:

a. Bar checks were not taken as frequently as prescribed in section 1.5.2 of the Hydrographic Manual. This should have been done more frequently since bar checks are the only source for the velocity correctors for this survey. (Weather did not permit)

b. Some of the detached positions taken on Julian day 212 were not described.

c. A group of pilings inside of Lexington Harbor was put on the field sheet; however, no detached positions were taken. These pilings were added to the smooth sheet using the field sheet and the notation PA was added. See G.C. Item 1.

d. No Coast Pilot report was submitted as required by section 5.8 of the Hydrographic Manual and section 8.6.1 of the Project Instructions.

e. Numerous spring pilings located between finger piers were not located by the hydrographer. A telephone conversation with the harbor master confirmed the existence of these pilings. (See Photograph) See G.C. Item 1.

f. The piers located at the boat launching ramp in Lexington Harbor were not located by the hydrographer. Finger piers along the bulkhead and the main pier were not located. (See Photograph) See G.C. Item 1.

g. A 3.5 foot sounding was plotted on the field sheet at latitude 43°16'02.0"N, longitude 82°31'34.5"W. No fix information was provided for this sounding. A telephone conversation with the harbor master, Al Carter (313-359-5600), revealed that this maybe a rock between the breakwater and the shoreline. This sounding was not plotted on the smooth sheet. See G.C. Item 1.

h. A geographic name list was not prepared and submitted as required by sections 5.3.5 (C) and 5.7 of the Hydrographic Manual and section 4.2.4 of the Project Instructions.

i. Landmarks were located by the hydrographer; however all of the proper forms (NOAA Form 76-40) were not placed in the Descriptive Report as prescribed by section by section 5.3.5 (I) of the Hydrographic Manual. These forms were found in the accordian file and placed in the Descriptive Report during verification. Two landmarks were plotted on the field sheet in black. The positions were scaled from U.S. Geological Survey maps.

j. The "Field Tide Note" was not submitted using the proper format. The proper format is found in section 5.3.5 (B) of the Hydrographic Manual.

k. The ruins located at latitude 43°16'30" N, longitude 82°31'37.5"W were neither located or searched for by the hydrographer. On S/S from LS-1971 (1956) See Q.C. Item 1.

l. It is apparent that a sounding pole was used to obtain sounding data for a portion of Julian day 212. After position 770 no fathogram is available and sounding data is found in the NOAA Form 77-44 "SOUNDINGS". The deepest depth obtained was eleven (11) feet and a note on page 50 reads, "deeper than 11.0".

m. The hydrographer did not address several features on the prior survey, nor was section K of the Descriptive Report "Comparison with Prior Surveys" formated as prescribed in section 5.3.4 of the Hydrographic Manual.

n. The hydrographer used the tabulation for plotting the settlement and squat correction graph for the correctors. Some data points were not properly plotted, and the correctors should have been taken from the graph.

o. The hydrographer failed to use the proper vessel draft for the Jensen launches and also failed to note this anywhere in the survey records or report.

5. Junctions

An adequate junction was effected with the following survey:

H-9898 (1980) to the east

6. Comparison with Prior Surveys

LS-1970 (1956) 1:10000
LS-1971 (1956) 1:10000

The present survey depths vary from +/- one (1) to three (3) feet. Changes in the bottom configuration can be attributed to natural causes. Four (4) soundings were brought forward from the prior surveys.

The ruins at latitude 43°16'30.0"N, longitude 82°31'37.5"W were not addressed as well as numerous small piers and/or groins along the shoreline. The ruins shown on LS-1971 (1956) and the small piers and/or groins shown on LS-1970 (1956) and See Q.C. Item 1.

LS-1971 (1956) should be considered neither disproved or verified by the present survey. The ruins on LS-1971 (1956) were brought forward as submerged to supplement the present survey.

It was not practical to bring small piers and/or groins forward to the presnt survey because there is a lack of contemporary shoreline. Should the shoreline from LS-1970 or 1971 (1956) be used for charting, the piers and/or groins should be brought forward except for Lexington Harbor.

Extensive cultural change has occurred in Lexington Harbor. A site plan copy and a copy of an oblique aerial photograph will be forwarded with the survey. An "as built" survey of the Lexington Harbor area will be forthcoming from the U.S. Army Corps of Engineers, Detroit District as soon as the survey is completed. See C/L 924 (79)

The present survey except as noted above is adequate to supersede the prior surveys in the common area.

7. Comparison with Chart 14862 (23rd Edition, July 29, 1978)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys and requires no further discussion.

The charted "13 wreck" at latitude 43°15'45N, longitude 82°30'50"W was searched for and neither verified or disproved, and was brought forward to the present survey. (See section L of the Descriptive Report) 17 WRECKAGE - from search included with records from H-9898(80) See Q.C. Item 1.

The present survey with the noted exceptions is adequate to supersede the charted hydrography within the common area.

b. Aids to Navigation

The charted aids to navigation are adequate to mark the intended features. The "PA" notation should be removed from the Lexington Harbor Breakwater lights. The geographic positions found in NGS records reflect the location of these lights.

8. Compliance with Instructions

The hydrographer did not comply with sections 4.2.1, (charted detail); 4.2.2, (landmarks); 4.2.4 (geographic names); and 8.6.1 (Coast Pilot) of the Project Instructions.

9. Additional Field Work

This an adequate basic survey. No additional field work is recommended. See Q.C. Item 1.

10. RECOMMENDATIONS

It is recommended that the charted inset of Lexington Harbor be at a scale of 1:5,000 instead of 1:10,000. A 1:10,000 scale chart inset would preclude detail inside the harbor and show little more than approach details. *Concur.*

Absent

Franklin L. Saunders
Cartographic Technician
Verification of Data

Harry R. Smith
Senior Cartographic Technician
Verification Check

Robert G. Roberson
Cartographer
Evaluation and Analysis

INSPECTION REPORT
H-9899

The completed survey has been inspected by the Hydrographic Inspection Team with regard to survey coverage, delineation of depth contours, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The Verification Report has presented the facts accurately and properly. The procedures used were appropriate, and the recommendations are logical and justifiable. The survey complies with National Ocean Survey requirements except as noted in the Verification Report. The survey records comply with NOS requirements except where noted in the Verification Report. The Hydrographic Inspection Team concurs with the verifier's findings, actions, and recommendations.

Examined and Approved
Hydrographic Inspection Team

Karl Wm. Kieninger, CDR, NOAA
Chief, Processing Division

Ronald W. Jones, LCDR, NOAA
Field Procedures Officer
Operations Division

R. D. Sanocki
Chief, Verification Branch
Processing Division

James C. Gardner, LTJG, NOAA
Chief, EDP Branch
Processing Division

Approved/Forwarded
September 1, 1981

Richard H. Houlder, RADM, NOAA
Director, Atlantic Marine Center

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

N/CG242:LQ

March 19, 1985

TO: Roy K. Matsushige
Chief, Hydrographic Surveys Branch

THRU: Chief, Standards Section

FROM: Lisa Quinlan
Quality Evaluator

SUBJECT: Quality Control Report for Survey H-9899 (1980), Michigan, Lake Huron, Lexington Harbor and Approaches

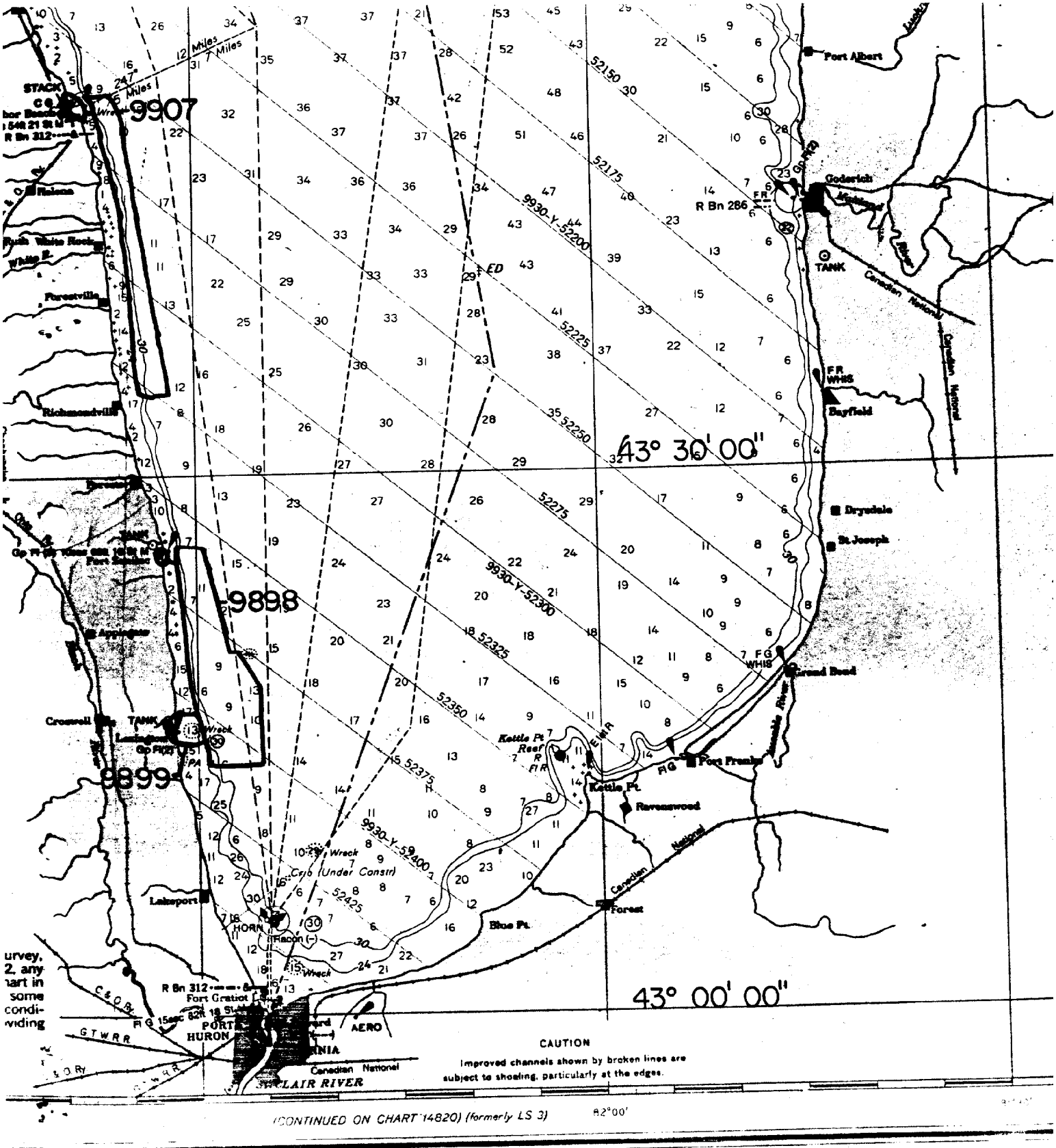
A quality control inspection of survey H-9899 was accomplished to monitor the survey for adequacy with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, shoreline transfer, decisions made and actions taken by the verifier, and the cartographic presentation of data. Revisions and additions to the smooth sheet, plus helpful comments made to the verifier, are identified on a ½-scale copy of the survey to be furnished the verifier. In general, the survey was found to conform to National Ocean Service standards and requirements except as stated in the Verifier's Report.

The following supplements the Verifier's Report:

Little, if any, attempt was made by the hydrographer to verify or disprove least depths and/or cultural features from the prior surveys. Additional future field work is recommended on the items noted by the verifier. (See sections 4.c, 4.e, 4.f, 4.g, 4.k, 6, and 7 of the Verifier's Report.)

It is further recommended that aerial photographs be flown to provide contemporary shoreline, the positions of many piles located between finger piers in Lexington Harbor, and the positions of the piles at latitude 43°16'09"N, longitude 82°31'32"W.

cc:
N/CG241



(CONTINUED ON CHART 14820) (formerly LS 3)

Published at Washington, D. C.
U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

Diagram No. LS-5

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

JAN 17 1986

N/CG241:RWD

TO: N/MOA - Wesley V. Hull

FROM: N/CG2 - J. Austin Yeager

SUBJECT: Report of Compliance for Survey H-9899

The smooth sheet and Descriptive Report for survey H-9899 (1980), Michigan, Lake Huron, Lexington Harbor and Approaches, have been reviewed. Please extend my appreciation to WHITING and your processing unit at the Atlantic Marine Center for their efforts in completing this survey. This survey, except as noted in the Quality Control Report, dated March 19, 1985 (copy attached), and the Hydrographic Survey Inspection Team Report, dated September 1, 1981, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-X115-WH/HSB-80, dated March 31, 1980.

Attachment

cc:
N/CG242 w/o att.

FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9899

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
14860	5-11-87	[illegible signature]	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. #7 Forwarded
14860	4-10-89	Berry Adams	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 8 Exam No Corr -(scale) sndgs
			agree with cht.
14862	5-1-89	Ed Martin	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 5 in full & supplemented by CoE BPs 131947 & 133582
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P63