SURVEY REPORT

U.S. Coast Guard
Stratford Shoal Light Station

Long Island Sound, CT
GSA CASE #CT-0556-AA

PREPARED FOR

U.S. General Services Administration
Federal Real Property Utilization and
Disposal Division (1PZ)
10 Causeway Street, 10th Floor
Boston, MA 02222
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PREPARED BY

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05/22/2017

Survey Report

This survey report has been prepared pursuant to the regulations of Connecticut state agencies sections 20-300b-1 through 20-300b-20 and the "Standards for Surveys and Maps in the State of Connecticut" as adopted by the Connecticut Association of Land Surveyors, Inc. on September 26, 1996.

The boundary determination is a dependent resurvey.

To my knowledge and belief this survey report is substantially correct as noted hereon. This plan is not valid without a live signature and embossed seal.

STATE OF CONNECTICUT
CHRISTOPHER C. DANFORTH
No. 70118
LICENSED
LAND SURVEYOR

5/22/17

Christopher C. Danforth, L.S. #70118 Date

Project Description

The project will entail the location of the Stratford Shoal Light Station in the Long Island Sound in relation to the Connecticut-New York state boundary line. This requires a retracement of the Connecticut-New York state boundary line using reference markers in Greenwich, CT and in New London, CT.

Site Description

The Project Site is a parcel of land located in the Long Island Sound in Connecticut. See Figure 1, Site Location. The site is a Light Station named Stratford Shoal Light Station and is owned by the U.S. General Services Administration.

Stratford Shoal Light Station

VHB used centimeter accurate GPS equipment to set control points on the Stratford Shoal Light Station. The field crew used the control to locate the building, light beacon, foundations, and other features at the light station. These features are plotted in Figure 2, Stratford Shoal Light Station. VHB used photogrammetry to create an orthophoto of the Stratford Shoal Light Station. The orthophoto is Figure 3, Orthophoto of Stratford Shoal Light Station.

Locate Reference Markers

VHB located reference markers in Greenwich, CT and New London, CT to re-trace the state line in the Long Island Sound between Connecticut and New York.

Greenwich, CT Reference Markers

VHB used GPS equipment to locate four reference markers in Greenwich, CT. The reference markers are outlined in the document "Connecticut-New York State Boundary Line Perambulation, Connecticut Department of Transportation, 1997, Schedule of Unmarked Water Bounds, Byram River." See Document 5, New York-Connecticut State Line. The 1909 Coordinates for the bounds are listed in the document.

VHB plotted the 1909 coordinates and shifted them to the four reference markers located with GPS equipment in the Connecticut State Plane Coordinate System, NAD 83. See Data File 4, Connecticut Department of Transportation 1909 Coordinates for Greenwich, CT Reference Points. Point 169 is the reference marker in Greenwich, CT used to re-trace the state line. See Document 1, State of Connecticut 1976 Perambulation.

New London, CT Reference Markers

VHB used GPS equipment to set control points near the New London Light House in New London, CT. The field crew used the control to locate the light beacon and other features at the light house. The features are in the Connecticut State Plane Coordinate System, NAD 83.

The reference marker in New London, CT used to re-trace the state line is the light beacon in the New London Light House. See Document 4, An Act Establishing the Boundary Line Between Connecticut and New York. The reference marker in New London, CT is a marker with a point identification number (PID) LX5230, set and periodically recovered by the National Geodetic Survey (NGS). See Document 6, NGS Data Sheet.

Retracement of State Line

VHB used Geodetic COGO in BLM software, provided by Raymond Hintz, professor of surveying engineering at the University of Maine. The points entered in the BLM software are in a geodetic coordinate system. The courses and distances used to re-trace the state line are in the document "Connecticut-New York State Boundary Line Perambulation, Connecticut Department of Transportation, 1997, Special Laws of Connecticut, Volume 16 Pages 1104-1108, Senate Bill #332, An Act Establishing the Boundary Line Between Connecticut and New York." See Documents 3 and 4, An Act Establishing the Boundary Line Between Connecticut and New York. This document is a perambulation of Document 2, New York Line 1849 Agreement.

The forward direction calculated is from point 169 in Greenwich, CT to point 170, to point 171. The reverse direction calculated is from the light beacon in the New London Lighthouse in New London, CT to point 171, to point 170.

Forward Direction

Point 169 in Greenwich, CT is shifted from Connecticut State Plane Coordinate System, NAD 83 to geodetic coordinates. From point 169 in Greenwich, CT, the course and distance is "south 45º east 17,160 feet or three and one-quarter lines to angle No. 170." From point 170 in the Long Island Sound, the course and distance is "thence in a straight line (the arc of a great circle) north 74º32'32" east 434,394 feet to a point (No. 171)." See Document 4, An Act Establishing the Boundary Line Between Connecticut and New York. The Stratford Shoal Light Station is located between point 170 and point 171. See Data File 2, Computations.

The distance from the Stratford Shoal Light Station beacon to the Connecticut-New York State Line is 1117.77 feet. See Data File 2, Computations in the table Bearing – Bearing Intersection between F170, INTF171, and M1018.

Inverse Direction

The light beacon in the New London Lighthouse in New London, CT is a reference point to 171. The light beacon is point identification number (PID) LX5230, set and periodically recovered by the National Geodetic Survey (NGS). See Document 6, NGS Data Sheet.

From the geodetic coordinates of the light beacon in the New London Lighthouse in New London, CT, the course and distance is "four statute miles true south" to point 171. From point 171, the course and distance is, thence in a straight line (the arc of a great circle) south 74º32'32" west 434,394 feet to point 170. See Document 4, An Act Establishing the Boundary Line Between Connecticut and New York. The Stratford Shoal Light Station is located between point 170 and point 171. See Data File 2, Computations.

The distance from the Stratford Shoal Light Station beacon to the Connecticut-New York State Line is 1109.19 feet. See Data File 2, Computations in the table Bearing – Bearing Intersection between F170, INTM1, and M1018.

Check Results

In the document "Connecticut-New York State Boundary Line Perambulation, Connecticut Department of Transportation, 1997, Special Laws of Connecticut, Volume 16 Pages 1104-1108, Senate Bill #332, An Act Establishing the Boundary Line Between Connecticut and New York," geodetic coordinates for the points 169, 170, and 171 are provided. See Document 4, An Act Establishing the Boundary Line Between Connecticut and New York. This document is a perambulation of Document 2, New York Line 1849 Agreement. See Data File 3, Connecticut Department of Transportation NAD 83 Coordinates of Reference Points 169, 170, and 171. Using the geodetic coordinates provided, VHB re-traced the state line as a check.

In the forward direction, from 170 to 171, the distance from the Stratford Shoal Light Station beacon to the Connecticut-New York State Line is 1080.94 feet.

In the reverse direction, from 171 to 170, the distance from the Stratford Shoal Light Station beacon to the Connecticut-New York State Line is 1072.37 feet.

VHB calculated four distances from the Stratford Shoal Light Station beacon to the Connecticut-New York State Line. The four results range from 1072.37 feet to 1117.77 feet. The difference between all four results is 45.40 feet. All four results calculated place the Stratford Shoal Light Station in the State of Connecticut.

Appendix A
Maps and Imagery

Figure 1: Site Location

Figure 2: Stratford Shoal Light Station

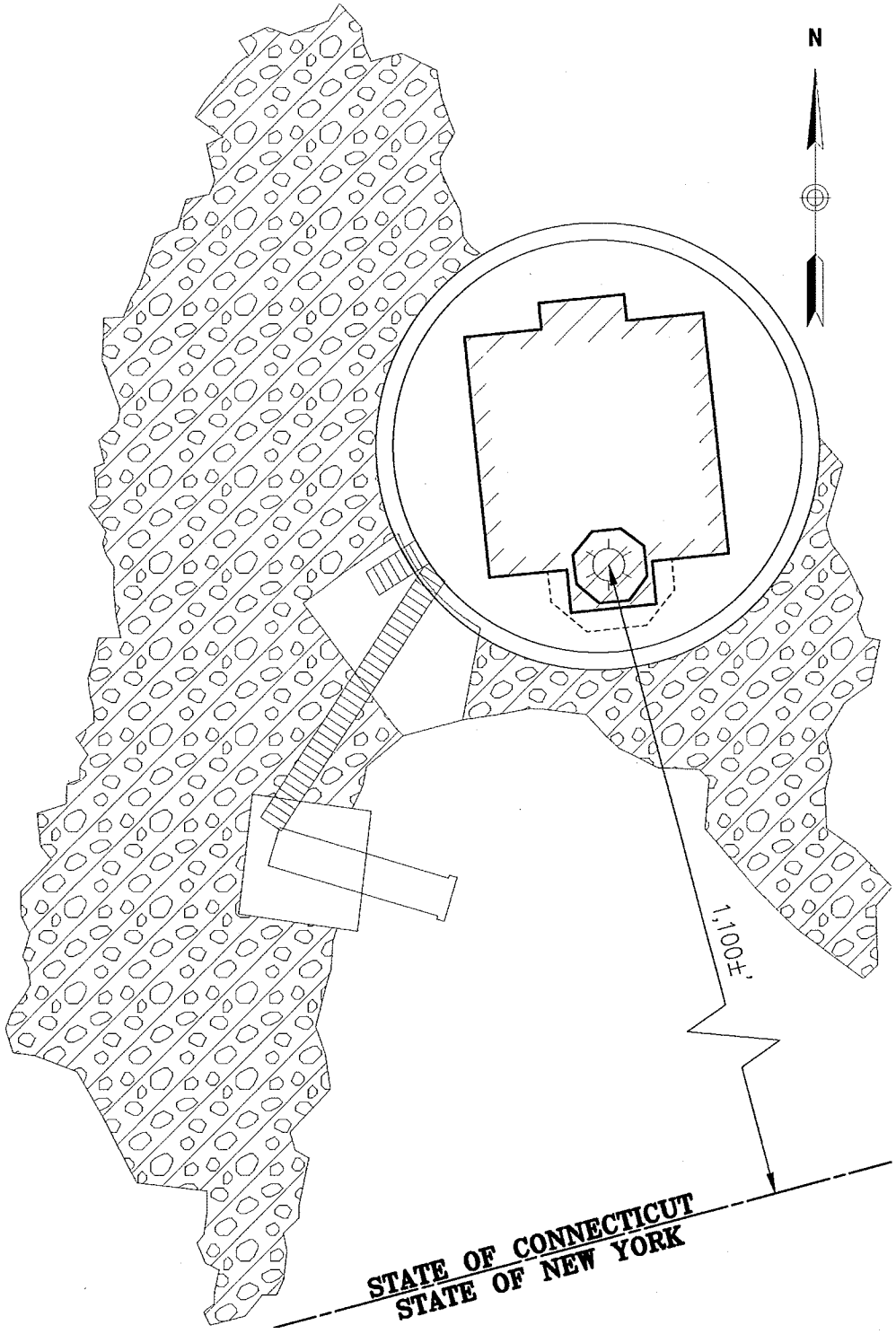


Figure 3: Orthophoto of Stratford Shoal Light Station

Appendix B
Data Files and Computations

Data File 1: NAD 83 Coordinates of Reference Points 169, 170, 171, and New London Light House

The text file below includes the points calculated by the forward and inverse courses and distances along the state line.

Point ID	Northing	Easting	Ellipsoid Height
"LX5230"	676784.5465	1181370.8768	97.3000
"1"	655665.2261	1181532.2466	97.3000
"M169"	556275.7880	749737.0110	97.3000
"M507"	558352.9729	749416.6328	87.1810
"M3010"	676784.3539	1181371.0534	97.3000
"M1018"	582756.9989	903122.2899	31.1010
"M170"	544017.8334	761746.5708	97.3000
"D170"	544060.0549	761750.7305	0.0000
"M1"	655665.0827	1181532.4230	0.0000
"D171"	655716.2577	1181544.9477	97.3000
"F170"	544014.8148	761743.4890	97.3000
"F171"	655645.2234	1181556.6286	97.3000
"M171"	659303.5038	1180570.4248	97.3000
"INTM1"	581686.7308	903413.6413	64.2005
"INTF171"	581678.4379	903415.8311	64.2005

Data File 2: Computations

The text file below outlines how the points in Data File 1 were calculated.

List Geodetic Coordinates:					
Point ID	Latitude	Longitude	Elevation(ft.)	Scale Factor	Convergence
LX5230	41ø18'59.84186"	72ø05'23.12345"	-97.3000	0.9999902775	0ø26'16"
1	41ø15'31.17251"	72ø05'23.12345"	-97.3000	0.9999945960	0ø26'16"

Computation Method: Plane			
Point ID	Northing	Easting	Ellipsoid Ht.
LX5230	676784.5465	1181370.8768	-97.3000
1	655665.2261	1181532.2466	-97.3000

Computation Method: Geodetic	
Traverse:	
M169	
(forward)	S. 45ø00'52" E. Dist. at mean elevation: -48.65 ft.
(mean)	S. 45ø00'00" E. 17160.0000 ft. (260.000 ch)
(reverse)	N. 44ø59'08" W. Lat: -12133.9524 Dep: 12133.9524
M170	

List Geodetic Coordinates:					
Point ID	Latitude	Longitude	Elevation(ft.)	Scale Factor	Convergence
M170	40ø57'03.16444"	73ø36'44.91679"	0.0000	1.0000345140	-0ø34'19"

Traverse:	
M169	
(forward)	S. 45ø00'52" E. Dist. at mean elevation: -97.30 ft.
(mean)	S. 45ø00'00" E. 17160.0000 ft. (260.000 ch)
(reverse)	N. 44ø59'08" W. Lat: -12133.9524 Dep: 12133.9524
M170	

Inverse:	
D170	
(forward)	S. 5ø03'17" W. Dist. at mean elevation: -97.30 ft.
(mean)	S. 5ø03'17" W. 42.4242 ft. (0.643 ch)
(reverse)	N. 5ø03'17" E. Lat: -42.2592 Dep: -3.7379
M170	

Traverse:	
M3010	
(forward)	South Dist. at mean elevation: -48.65 ft.

(mean)	South 21120.0000 ft. (320.000 ch)
(reverse)	North Lat: -21120.0000 Dep: 0.0000
M1	

Inverse:	
M1	
(forward)	N. 50ø27'22" W. Dist. at mean elevation: -48.65 ft.
(mean)	N. 50ø27'22" W. 0.2273 ft. (0.003 ch)
(reverse)	S. 50ø27'22" E. Lat: 0.1447 Dep: -0.1753
1	

Inverse:	
D171	
(forward)	S. 14ø11'25" W. Dist. at mean elevation: -48.65 ft.
(mean)	S. 14ø11'25" W. 52.6856 ft. (0.798 ch)
(reverse)	N. 14ø11'25" E. Lat: -51.0780 Dep: -12.9154
M1	

Inverse:	
M170	
(forward)	N. 74ø32'21" E. Dist. at mean elevation: -48.65 ft.
(mean)	N. 75ø02'23" E. 434372.9715 ft. (6581.409 ch)
(reverse)	S. 75ø32'25" W. Lat: 112133.0807 Dep: 419649.9143
M1	

Inverse:	
M169	
(forward)	S. 45ø00'52" E. Dist. at mean elevation: -97.30 ft.
(mean)	S. 45ø00'00" E. 17160.0000 ft. (260.000 ch)
(reverse)	N. 44ø59'08" W. Lat: -12133.9524 Dep: 12133.9524
M170	

Inverse:	
M170	
(forward)	N. 5ø03'17" E. Dist. at mean elevation: -97.30 ft.
(mean)	N. 5ø03'17" E. 42.4242 ft. (0.643 ch)
(reverse)	S. 5ø03'17" W. Lat: 42.2592 Dep: 3.7379
D170	

Traverse:	
M169	
(forward)	S. 45ø00'00" E. Dist. at mean elevation: -48.65 ft.
(mean)	S. 44ø59'08" E. 17160.0000 ft. (260.000 ch)
(reverse)	N. 44ø58'16" W. Lat: -12137.0015 Dep: 12130.9025
F170	

Traverse:	
M169	
(forward)	S. 45ø00'00" E. Dist. at mean elevation: -97.30 ft.
(mean)	S. 44ø59'08" E. 17160.0000 ft. (260.000 ch)
(reverse)	N. 44ø58'16" W. Lat: -12137.0015 Dep: 12130.9025
F170	

Traverse:	
F170	
(forward)	N. 74ø32'32" E. Dist. at mean elevation: -97.30 ft.
(mean)	N. 75ø02'34" E. 434394.0000 ft. (6581.727 ch)
(reverse)	S. 75ø32'36" W. Lat: 112115.8249 Dep: 419676.2908
F171	

Inverse:	
F171	
(forward)	N. 50ø11'43" W. Dist. at mean elevation: -48.65 ft.
(mean)	N. 50ø11'43" W. 31.3099 ft. (0.474 ch)
(reverse)	S. 50ø11'43" E. Lat: 20.0438 Dep: -24.0532
M1	

Traverse:	
M170	
(forward)	N. 74ø02'34" E. Dist. at mean elevation: -97.30 ft.
(mean)	N. 74ø32'32" E. 434394.0000 ft. (6581.727 ch)
(reverse)	S. 75ø02'30" W. Lat: 115778.2456 Dep: 418680.7197
M171	

Inverse:	
M171	
(forward)	S. 14ø22'28" E. Dist. at mean elevation: -48.65 ft.
(mean)	S. 14ø22'24" E. 3763.4621 ft. (57.022 ch)
(reverse)	N. 14ø22'20" W. Lat: -3645.6595 Dep: 934.2452
M1	

List Geodetic Coordinates:					
Point ID	Latitude	Longitude	Elevation(ft.)	Scale Factor	Convergence
F171	41ø15'30.97304"	72ø05'22.80622"	-97.3000	0.9999946006	0ø26'16"
D171	41ø15'31.67574"	72ø05'22.95205"	-97.3000	0.9999945844	0ø26'16"
D170	40ø57'03.58171"	73ø36'44.86771"	-97.3000	1.0000344936	-0ø34'19"

Inverse:	
F170	
(forward)	N. 74ø06'19" E. Dist. at mean elevation: -64.20 ft.
(mean)	N. 74ø16'23" E. 146586.8169 ft. (2221.012 ch)
(reverse)	S. 74ø26'27" W. Lat: 39732.8676 Dep: 141099.2351
M1018	

Inverse:	
F170	
(forward)	N. 74ø32'20" E. Dist. at mean elevation: -48.65 ft.
(mean)	N. 75ø02'22" E. 434376.7254 ft. (6581.466 ch)
(reverse)	S. 75ø32'24" W. Lat: 112136.1295 Dep: 419652.9852
M1	

Bearing - Bearing Intersection:	
F170	
(forward)	N. 74ø32'20" E. Dist. at mean elevation: -80.75 ft.
(mean)	N. 74ø42'25" E. 146588.9976 ft. (2221.045 ch)
(reverse)	S. 74ø52'30" W. Lat: 38663.7894 Dep: 141398.1810
INTM1	
(forward)	N. 15ø27'38" W. Dist. at mean elevation: -47.65 ft.
(mean)	N. 15ø27'39" W. 1109.1939 ft. (16.806 ch)
(reverse)	S. 15ø27'40" E. Lat: 1069.0557 Dep: -295.6874
M1018	

Bearing - Bearing Intersection:	
F170	
(forward)	N. 74ø32'32" E. Dist. at mean elevation: -80.75 ft.
(mean)	N. 74ø42'37" E. 146588.9826 ft. (2221.045 ch)
(reverse)	S. 74ø52'42" W. Lat: 38655.5056 Dep: 141400.4304
INTF171	
(forward)	N. 15ø27'25" W. Dist. at mean elevation: -47.65 ft.
(mean)	N. 15ø27'27" W. 1117.7707 ft. (16.936 ch)
(reverse)	S. 15ø27'28" E. Lat: 1077.3395 Dep: -297.9107
M1018	

Inverse:	
INTM1	
(forward)	S. 15ø01'25" E. Dist. at mean elevation: -64.20 ft.
(mean)	S. 15ø01'25" E. 8.5770 ft. (0.130 ch)
(reverse)	N. 15ø01'25" W. Lat: -8.2838 Dep: 2.2233
INTF171	

Inverse:	
INTM1	
(forward)	N. 15ø27'38" W. Dist. at mean elevation: -47.65 ft.
(mean)	N. 15ø27'39" W. 1109.1939 ft. (16.806 ch)
(reverse)	S. 15ø27'40" E. Lat: 1069.0557 Dep: -295.6874
M1018	

Data File 3: Connecticut Department of Transportation NAD 83 Coordinates of Reference Points 169, 170, and 171

The text file below contains the coordinates used to check against the results.

Point ID	Latitude	Longitude
"169"	40.5903152	-73.3924546
"170"	40.5703228	-73.3646418
"171"	41.1531321	-72.0524685

Data File 4: Connecticut Department of Transportation 1909 Coordinates for Greenwich, CT Reference Points

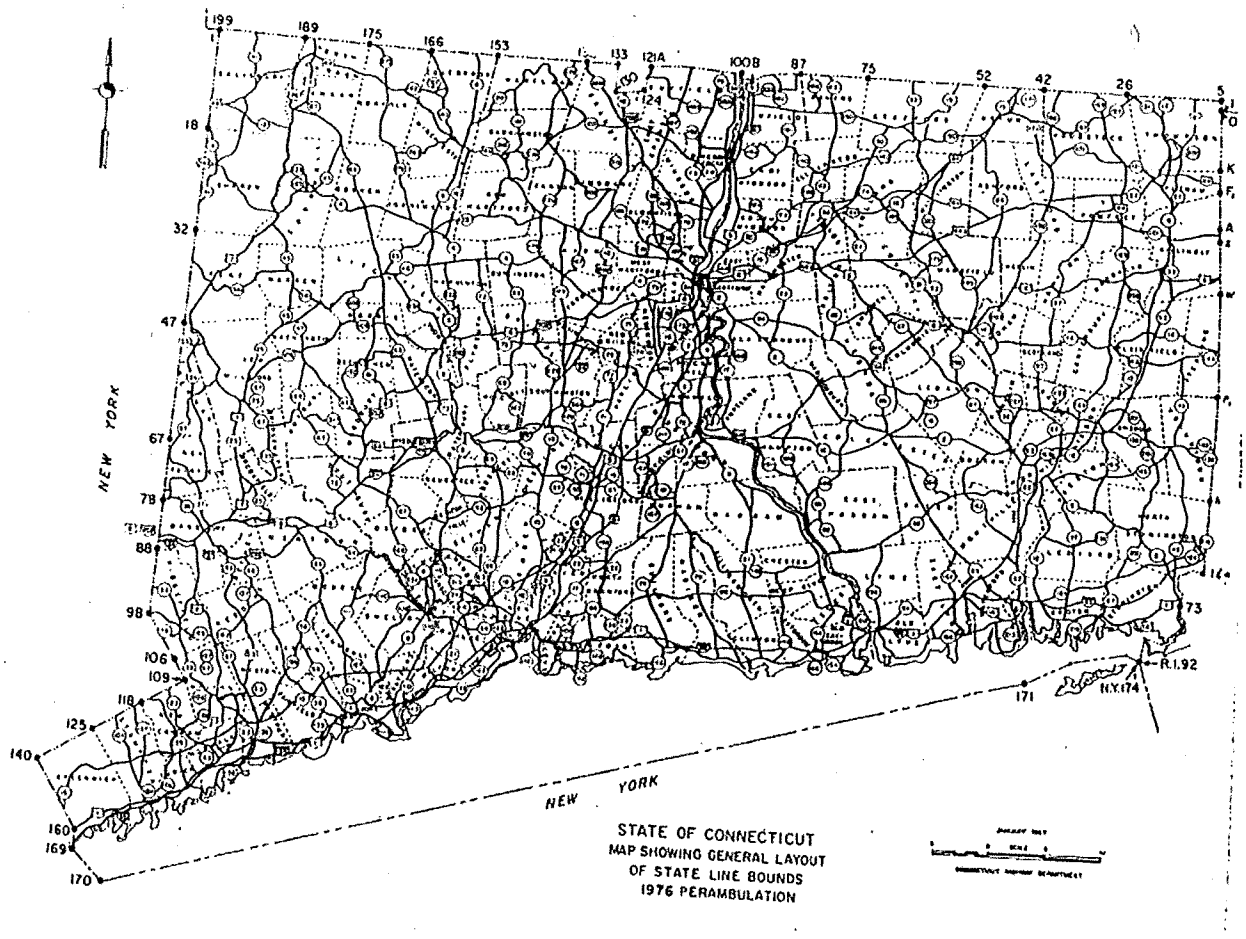
The text file below contains the coordinates used to locate reference point 169.

Point ID	Northing	Easting
"159"	0000.00	0000.00
"161"	-3533.10	-1212.80
"162"	-4473.40	-0996.60
"163"	-5418.70	-1083.20
"164"	-6101.40	-0973.00
"165"	-6664.83	-0548.56
"166"	-6870.89	-0484.07
"167"	-7270.86	-0522.19
"168"	-7785.60	-1154.10
"169"	-9451.09	-0191.55
"164A"	-5700.75	-1109.04
"163A"	-4659.70	-1205.70
"163B"	-6456.35	-0915.56
"164B"	-5905.26	-1108.20
"165A"	-6054.65	-0882.15
"165B"	-7004.74	-0350.23
"166A"	-6544.88	-0452.99
"166B"	-7207.86	-0319.72
"167A"	-7102.23	-0315.19
"167B"	-7377.31	-0532.34

"168A"	-7410.85	-1370.68
"168B"	-8459.58	-2018.20

Appendix C
Supporting Information

Document 1: State of Connecticut 1976 Perambulation



The map below is a map showing the general layout of state line bounds.

Document 2: New York Line 1879 Agreement

The document below is the state line between Connecticut and New York in the Long Island Sound.

NEW YORK LINE
1879 AGREEMENT

As a result of controversies regarding fishing rights in Long Island Sound commissioners representing both States concluded an agreement in December 1879 which defined the New York Line in its entire length.

These commissioners accepted the Line monumented by New York in 1860 from the Massachusetts Line to the mouth of the Byram River. From Lyon's Point, 1909 No. 168, they defined the Line as running from a point, #0, in the center of the channel about 600 feet south of the extreme rocks of Byram Point, 1909 No. 169; thence southeast 3 ¼ statute miles, 1909 No. 170; thence by the arc of a great circle to a point 4 statute miles true south of the New London Lighthouse, 1909 No. 171; thence to a point, #1, about 1000 feet north of North Dumpling Light, 1909 No. 172; thence to a point, #2, marked on an appended U.S. Coast Survey Chart, 1909 No. 173; and thence toward a point, #3, marked on the same chart until it reached the Rhode Island Line, 1909 No. 174 - R.I. 1887 No. 92.

Connecticut State Library
Report of Commissioners
State Library Reference Number;
974.6 qC762NS Vault 5

Acceptances
Connecticut
Connecticut Special Laws
Volume 8, pp. 377-8
New York
Rev. Stat. 1882, Vol. 1,p.136
Congress
Feb. 26, 1881, 21 stat. L. 351

Documents 3 and 4: An Act Establishing the Boundary Line Between Connecticut and New York

Document 3: The document below is found in the Special Laws of Connecticut, Volume 16 Pages 1104-1108, Senate Bill #332 and describes the state line between Connecticut and New York.

SPECIAL LAWS OF CONNECTICUT
VOLUME 16 PAGES 1104-1108
SENATE BILL #332

AN ACT ESTABLISHING THE BOUNDARY LINE BETWEEN CONNECTICUT AND NEW YORK

Be it enacted by the Senate and House of Representatives in General Assembly convened:

SECTION 1. The boundary line between the State of Connecticut and the State of New York is as follows: Commencing at a granite monument (No. 1), at the northwest corner of the State of Connecticut, marking the corner of Massachusetts, New York, and Connecticut, in latitude 42° 02' 58.427" and longitude 73° 29' 15.959"; thence south 2° 42' 30" west 30,569 feet to a granite monument (No. 12) 470 feet south of the Belgo Hill Road between Millerton and Ore Hill in latitude 41° 57' 56.772" and longitude 73° 29' 35.078"; thence south 3° 53' 44" west 15,846 feet to a monument (No. 18) in the south side of the highway from Millerton to Sharon along the north shore of Indian Pond in latitude 41° 55' 20.586" and longitude 73° 29' 49.318"; thence south 2° 47' 51" west 10,681 feet to a monument (No. 21) on the cliff north of Webatuck Creek in latitude 41° 53' 35.190" and longitude 73° 29' 56.210"; thence south 4° 39' 01" west 10,683 feet to a monument (No. 24) in the rear of James P. Hurley's house on the east road from Sharon Valley to Leedsville in latitude 41° 51' 49.995" and longitude 73° 30' 07.652"; thence south 3° 49' 10" west 26,405 feet to a monument (No. 32) on the westerly slope of a rocky hillside at the corner of the towns of Sharon and Kent in latitude 41° 47' 29.709" and longitude 73° 30' 30.871"; thence south 3° 52' 35" west 10,457 feet to a monument (No. 35) on the shoulder of a mountain northeast of Bog Hollow, in latitude 41° 45' 46.637" and longitude 73° 30' 40.199"; thence south 3° 06' 18" west 16,045 feet to a monument (No. 41) at the easterly edge of a large pasture north of Preston Mountain, known as the Chapel Lots, in latitude 41° 43' 08.354" and longitude 73° 30' 51.658"; thence south 3° 57' 03" west 10,657 feet to a monument (No. 45) at the southerly end of Schaghticoke Mountain in latitude 41° 41' 23.320" and longitude 73° 31' 01.335"; thence south 2° 41' 41" west 10,534 feet to a monument (No. 48) on the northwesterly slope of Ten-Mile Hill in latitude 41° 39' 39.359" and longitude 73° 31' 07.860"; thence south 3° 31' 33" west 21,140 feet to a monument (No. 55) at the northerly end of a rocky hill about a mile south of the northeast corner of the Town of Pawling, in latitude 41° 36' 10.894" and longitude 73° 31' 24.972"; thence south 4° 24' 52" west 10,785 feet to a monument (No. 59) in scrub woodland east of a right angle in the road from Quaker Hill to Sherman in latitude 41° 34' 24.659" and longitude 73° 31' 35.893"; thence south 3° 52' 52" west 10,520 feet to a monument (No. 64) on a ledge falling southwest to a brook in the southwestern part of the Town of Sherman in latitude 41° 32' 40.963" and longitude 73° 31' 45.257"; thence south 4° 28' 48" west 10,410 feet to a monument (No. 68) on

1997
CONNECTICUT-NEW YORK STATE BOUNDARY LINE PERAMBULATION
CONNECTICUT DEPARTMENT OF TRANSPORTATION

Document 4: The excerpt below describes the state line between Connecticut and New York in the Long Island Sound.

Document 5: New York – Connecticut State Line

37.096"; thence south 30° 01' 4" east 1,924 feet to angle No. 169, a point in the center of the channel in line with the breakwater at Lyon's or Byram Point in latitude 40° 59' 03.152" and longitude 73° 39' 24.546", the northerly end of this tangent being produced back and referenced by a brass bolt and plate in the ledge overlooking the harbor; thence south 45° east 17,160 feet or three and one-quarter miles to angle No. 170 in latitude 40° 57" 03.228" and longitude 73° 36" 46.418", the first angle point in Long Island Sound described by the Joint commissioners of New York and Connecticut by a Memorandum of Agreement dated December 8, 1879; thence in a straight line (the arc of a great circle) north 74° 32' 32" east 434,394 feet to a point (No. 171) in latitude 41° 15' 31.521" and longitude 72° 05' 24.685", four statute miles true south of New London Lighthouse;

Schedule of Unmarked Water Bounds in the Byram River, Greenwich, CT

NEW YORK - CONNECTICUT STATE LINE

SCHEDULE OF UNMARKED WATER BOUNDS

BYRAM RIVER

BOUND #159 IS THE ORIGIN OF COORDINATES

BOUND #161 - An angle point about 400 feet below the foot of Willett Avenue, Port Chester, N.Y.
1909 Coordinates: West 1212.8 Feet
South 3533.1 Feet

BOUND #162 - An angle point about 100 feet below the corner of Water Street and Harvey Street, Byram, Conn.
1909 Coordinates: West 996.6 Feet
South 4473.4 Feet

BOUND #163 - An angle point just above the throughway bridge across the Byram River.
1909 Coordinates: West 1083.2 Feet
South 5418.7 Feet

BOUND #164 - An angle point about 30 feet southwest of a prominent rocky point on the Byram side, just below the throughway bridge across the Byram River.
1909 Coordinates: West 973.0 Feet
South 6101.4 Feet

BOUND #165 - An angle point about 150 feet north of the north point of the east shore of Fox Island, Port Chester, N.Y.
1909 Coordinates: West 548.56 Feet
South 6664.83 Feet

BOUND #166 - An angle point opposite the north end of the east shore of Fox Island, Port Chester, N.Y.
1909 Coordinates: West 484.07 Feet
South 6870.89 Feet

BOUND #167 - An angle point opposite the south end of the east shore of Fox Island, Port Chester, N.Y.
1909 Coordinates: West 522.19 Feet
South 7270.86 Feet

BOUND #168 - An angle point opposite the center of the west shore of Byram Point, Conn.
1909 Coordinates: West 1154.1 Feet
South 7785.6 Feet

BOUND #169 - An angle point in the center of the channel, 100 feet south of Port Chester light on the produced centerline of the breakwater making off Byram Point, about 600 feet south of the extreme rocks of Byram Point, Conn.
1909 Coordinates: West 191.55 Feet
South 9451.09 Feet

Document 6: NGS Data Sheet

The NGS Data Sheet

See file dsdata.pdf for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.12.1
1         National Geodetic Survey,   Retrieval Date = MAY 19, 2017
 LX5230 ***********************************************************************
 LX5230  DESIGNATION -  NEW LONDON HARBOR LH
 LX5230  PID         -  LX5230
 LX5230  STATE/COUNTY-  CT/NEW LONDON
 LX5230  COUNTRY     -  US
 LX5230  USGS QUAD   -  NEW LONDON (1984)
 LX5230
 LX5230                          *CURRENT SURVEY CONTROL
 LX5230  ___________________________________________________________________
 LX5230* NAD 83(1996) POSITION- 41 18 59.84186(N) 072 05 23.12345(W)   ADJUSTED
 LX5230* NAVD 88 ORTHO HEIGHT -     1.    (meters)        3.    (feet) SCALED
 LX5230  ___________________________________________________________________
 LX5230  GEOID HEIGHT    -        -30.657 (meters)                    GEOID12B
 LX5230  LAPLACE CORR    -         -1.40  (seconds)                   DEFLEC12B
 LX5230  HORZ ORDER      -  SECOND
 LX5230
 LX5230.The horizontal coordinates were established by classical geodetic methods
 LX5230.and adjusted by the National Geodetic Survey in August 1998.
 LX5230.
 LX5230.The orthometric height was scaled from a topographic map.
 LX5230
 LX5230.Significant digits in the geoid height do not necessarily reflect accuracy.
 LX5230.GEOID12B height accuracy estimate available here.
 LX5230
 LX5230.Photographs are available for this station.
 LX5230
 LX5230.The Laplace correction was computed from DEFLEC12B derived deflections.
 LX5230
 LX5230. The following values were computed from the NAD 83(1996) position.
 LX5230
 LX5230;                    North         East     Units Scale Factor Converg.
 LX5230;SPC CT       -   206,284.342   360,082.563   MT  0.99999028   +0 26 16.0
 LX5230;SPC CT       -   676,784.55  1,181,370.88   sFT  0.99999028   +0 26 16.0
 LX5230;SPC NY L     -   129,447.065   459,938.925   MT  1.00002800   +1 14 58.0
 LX5230;SPC NY L     -   424,694.25  1,508,982.96   sFT  1.00002800   +1 14 58.0
 LX5230;UTM  18      - 4,577,992.483   743,594.546   MT  1.00033033   +1 55 20.4
 LX5230
 LX5230!             -  Elev Factor  x  Scale Factor =   Combined Factor
 LX5230!SPC CT       -   1.00000470  x   0.99999028  =   0.99999498
 LX5230!SPC NY L     -   1.00000470  x   1.00002800  =   1.00003270
 LX5230!UTM  18      -   1.00000470  x   1.00033033  =   1.00033503
 LX5230
 LX5230:                Primary Azimuth Mark                    Grid Az
 LX5230:SPC CT       -  NEW LONDON LEDGE LIGHTHOUSE              138 43 54.3
 LX5230:SPC NY L     -  NEW LONDON LEDGE LIGHTHOUSE              137 55 12.3
 LX5230:UTM  18      -  NEW LONDON LEDGE LIGHTHOUSE              137 14 49.9
 LX5230
 LX5230_U.S. NATIONAL GRID SPATIAL ADDRESS: 18TYL4359477992(NAD 83)
 LX5230
 LX5230|-----------------------------------------------------------------------|
 LX5230| PID    Reference Object                     Distance       Geod. Az  |
 LX5230|                                                            dddmmss.s |
 LX5230| LX5302 BAILEYS HILL TANK                  APPROX. 6.5 KM 0060315.6 |
 LX5230| LX5217 GROTON MONUMENT                    APPROX. 4.3 KM 0112929.4 |
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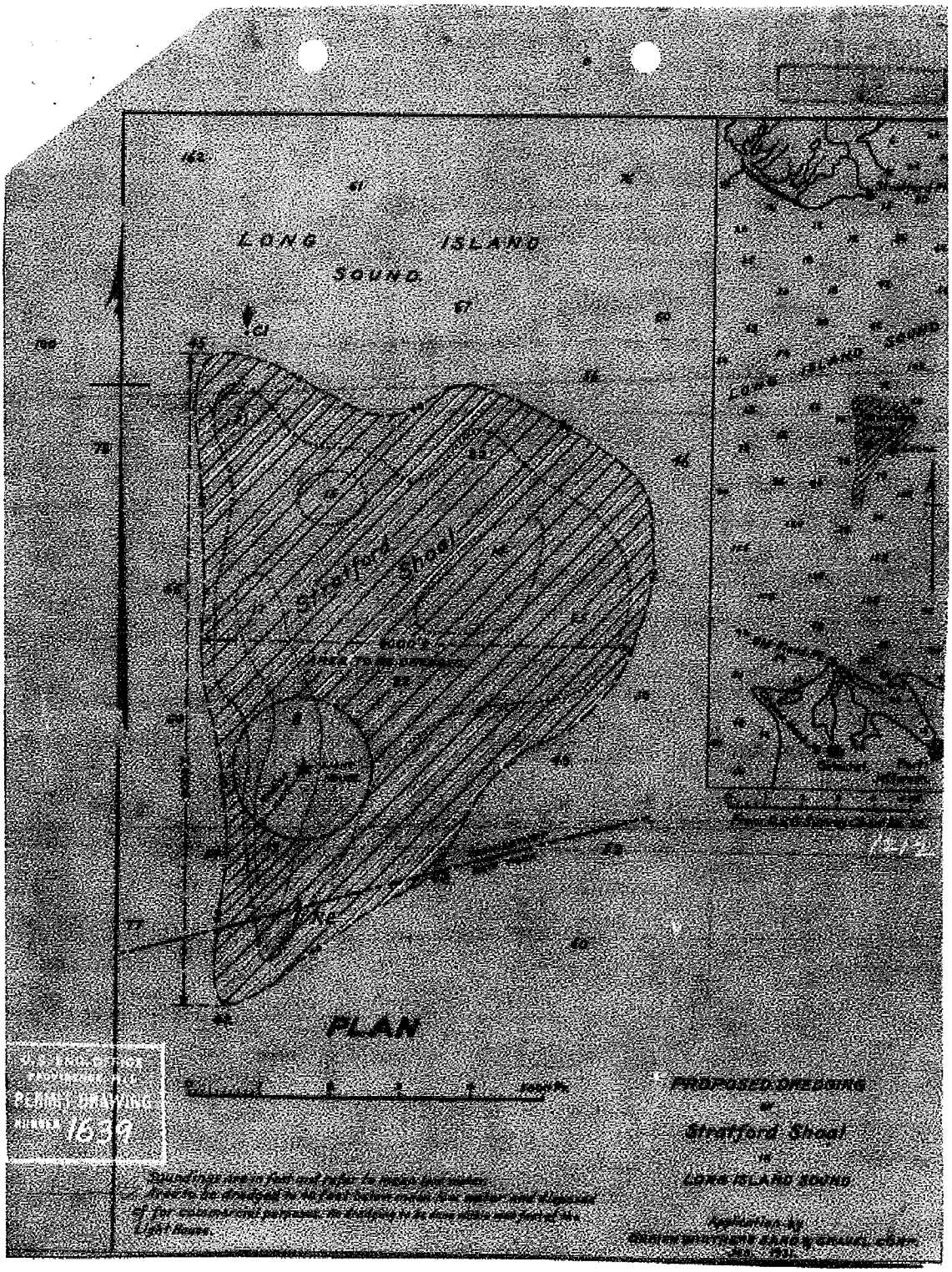
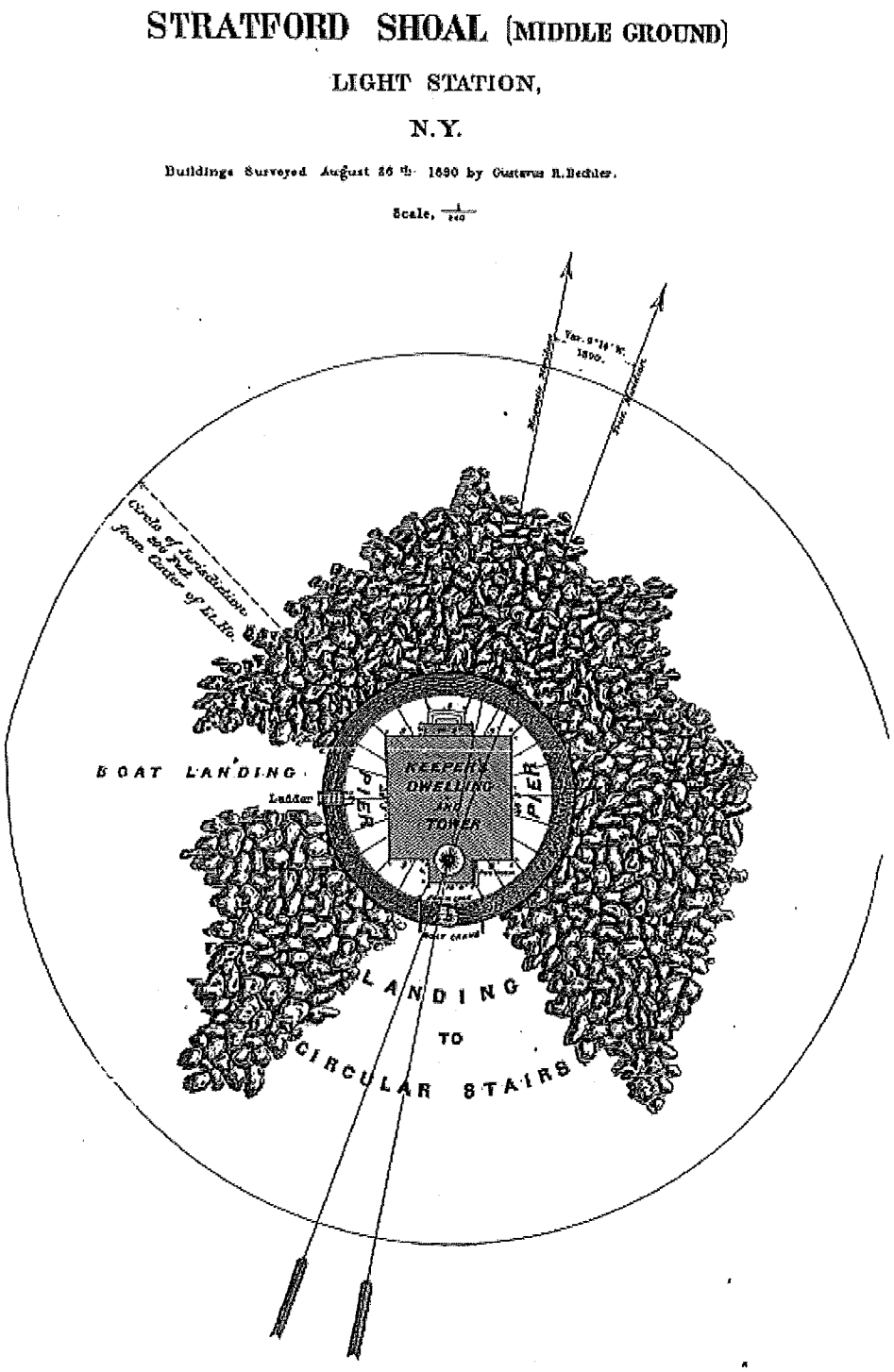
https://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=LX5230

Document 7: Proposed

Dressing of Stratford Shoal in Long Island Sound

The plan below displays Stratford Shoal, dated January 1931.



Document 8: Stratford Shoal (Middle Ground) Light Station, NY

The plan file below displays buildings surveyed at Stratford Shoal on August 26, 1890.