5584

Diag. Cht. No. 6380.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Topographic

Field No. Ph-26(47) Office No. T-5584 N&S.

LOCALITY

State Washington

General locality Bellingham

Locality Nooksack River

1949-52

CHIEF OF PARTY

C.W.Clark, Chief of Field Party
H.A.Paton, Baltimore Photo. Office

LIBRARY & ARCHIVES

DATE December 31, 1959

8-1870-1 (1)

DATA RECORD

T – 5584

Project No. (II): Ph-26 (47)

Quadrangle Name (IV):

Field Office (II): Bellingham, Wash.

Chief of Party: C.W.Clark

Photogrammetric Office (III): Baltimore, Maryland.

Officer-in-Charge: H. A. Paton

Instructions dated (II) (III):
31 August 1949
Letter dated 24 October 1949
No. 731-aal
Supp. No 1, 21 July 1950
Supp No 2 16 Jan 1951

Copy filed in Division of Photogrammetry (IV)
Office Files

Method of Compilation (III): Air-photographic-Multiplex

Manuscript Scale (III): 1:10,000

Stereoscopic Plotting Instrument Scale (III): 1:10,000

Scale Factor (III): 1.00

Date received in Washington Office (IV): JUN 25 1951

Date reported to Nautical Chart Branch (IV): JUN 29 1951

Applied to Chart No.

Date:

Date registered (IV): 3/19/59

Publication Scale (IV):

Publication date (IV):

Geographic Datum (III): N.A. 1927

Vertical Datum (III): MSL

Mean sea level except as follows:
Elevations shown as (25) refer to mean high water
Elevations shown as (5) refer to sounding datum
i.e., mean low water or mean lower low water

Reference Station (III): PEARSON 3, 1949

Lat.: 48° 51' 09.~~238~~" .252 sltm

Long.: 122° 36' 55.~~797~~" .805 sltm

Adjusted
~~Adjusted~~
Unadjusted

Plane Coordinates (IV):

State: Washington Zone: North

Y=

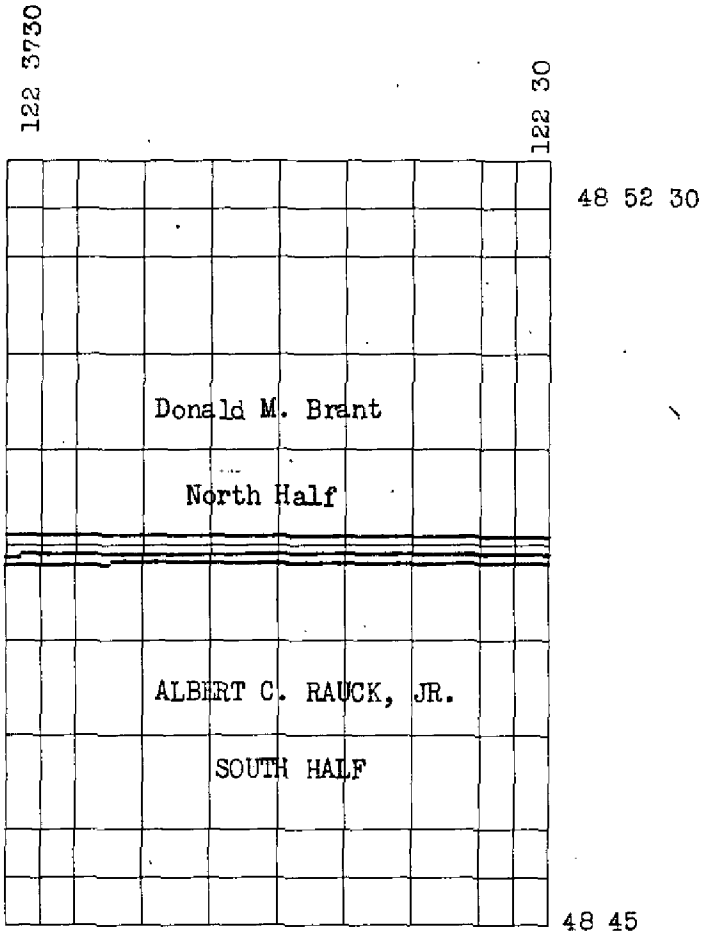
X=

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.

1

M-2618-12(4)



Areas contoured by various personnel
(Show name within area)
(II) (III)

DATA RECORD

Field Inspection by (II): John C. Lajoye
Roy A. Davidson
Date: 12-7-49

Planetable contouring by (II):
Date:

Completion Surveys by (II): Ray H. Skelton II
Date: ~~May~~ Oct. 1952 FINAL
(latest date in field notes)

Mean High Water Location (III) (State date and method of location):
Same as date of photography

Projection and Grids ruled by (IV): T.L.J.
Date: 6-19-50

Projection and Grids checked by (IV): H.D.W.
Date: 6-20-50

Control plotted by (III): B.A.Dew
Date: July 1950

Control checked by (III): A.K.Heywood
Date: July1950

~~Radial Plot~~ or Stereoscopic
Control extension by (III): D.M.Brant and A.C.Rauck, Jr.
Date: August 1950

Stereoscopic Instrument compilation (III):
Planimetry: D.M.Brant, A.C.Rauck
Date: Aug.-Sept.1950
Contours: D.M.Brant, A.C.Rauck,Jr.
Date: Aug.-Sept.1950

Manuscript delineated by (III): D.M.Brant,A.C.Rauck,Jr.
Date: Oct.Nov.1950

Photogrammetric Office Review by (III): A.C.Rauck,Jr., D.M.Brant
Date: Feb. 1951

Elevations on Manuscript checked by (II) (III): D.M.Brant, A.C.Rauck, Jr.
Date: Feb. 1951

U.S.Coast and Geodetic Survey Camera, Type "O"

Camera (kind or source) (III): Focal length 152.37 mm

PHOTOGRAPHS (III)

Number	Date	Time	Scale	Stage of Tide
1194-1200 incl.	6/4/49	1228	1:24,000	3/9' above MLLW
1214-1220 incl.	"	1238	"	3.7' above MLLW
1222-1229 incl.	"	1248	"	3.5' above MLLW

Tide (III)

From table of predicted tides

Reference Station: Port Townsend
Subordinate Station: Bellingham, Wash.
Subordinate Station:

Ratio of Ranges	Mean Range	Spring Range
	5.1	8.3
1.0	5.2	8.6

Washington Office Review by (IV): Everett H. Ramey Date: 27 August 1954

Final Drafting by (IV): J.H.FRAZIER T-5584-S Date: 19 March, 1959

Drafting verified for reproduction by (IV): Date:

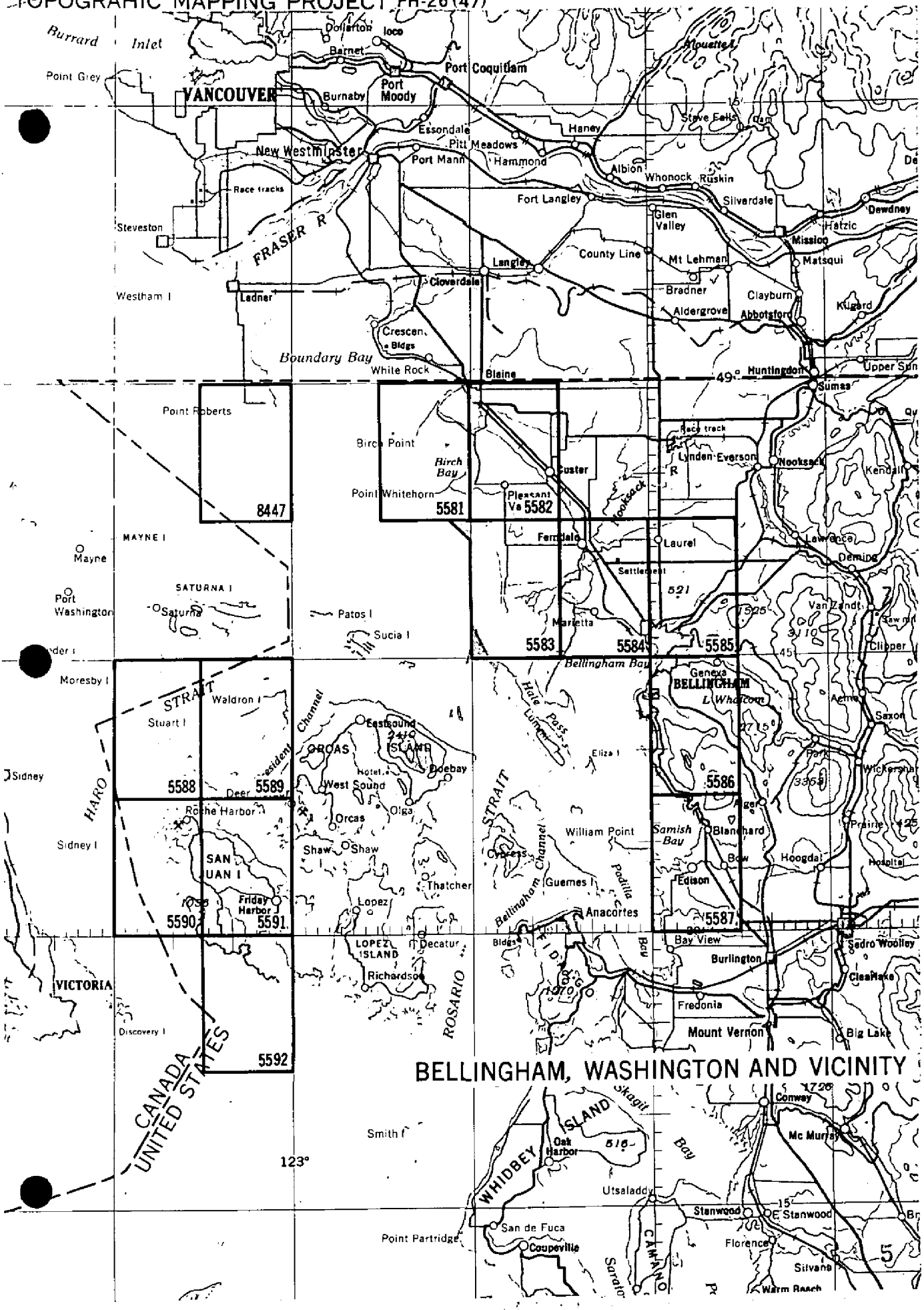
Proof Edit by (IV): Date:

Land Area (Sq. Statute Miles) (III): 40
Shoreline (More than 200 meters to opposite shore) (III): 8.5
Shoreline (Less than 200 meters to opposite shore) (III): 14.2
Control Leveling - Miles (II): 40
Number of Triangulation Stations searched for (II): 57 Recovered: 32 Identified: 13
Number of BMs searched for (II): 23 Recovered: 16 Identified: 16
Number of Recoverable Photo Stations established (III): 13
Number of Temporary Photo Hydro Stations established (III): 0

Remarks:

Two of the triAngulation stations recovered during the 1949 field inspection season have since been reported destroyed. These are:
SQUALICUM CREEK ENTRANCE LIGHT, 1950
BELLINGHAM BREAKWATER ENTRANCE LIGHT, 1950 See §57

TOPOGRAHIC MAPPING PROJECT PH-26 (47)



BELLINGHAM, WASHINGTON AND VICINITY

Summary to Accompany Topographic Map T-5584

Map T-5584 is one of thirteen topographic maps of Project Ph-26(47). It includes a portion of Bellingham Bay and land area to the northward, all within Whatcom County, Washington.

Project Ph-26(47) is a stereoscopic mapping project. Field work in advance of compilation included the establishment of additional horizontal and vertical control, field inspection of shoreline and interior features, and the investigation of boundaries, land lines and geographic names. Map T-5584 was compiled in two parts at a scale of 1:10,000 by multiplex methods using 1949 single-lens photography. Field completion was done in 1952. With the addition of hydrographic data the map will be forwarded to the Geological Survey for publication as a standard 7.5 minute topographic quadrangle.

Items registered under T-5584 will include a descriptive report and ~~cloth-backed~~ Cronaflex copies of the map manuscript (in two parts) at a scale of 1:10,000 and the published map at a scale of 1:24,000.

FIELD INSPECTION REPORT

This report is included as part of the Descriptive Report for T-5584 and covers surveys T-5583 and T-5584.

PHOTOGRAMMETRIC PLOT REPORT

This report covers the plot for T-5581 thru T-5584 and is filed as part of the Descriptive Report for T-5581.

Photogrammetry

MAP T-5584 PROJECT NO. Ph--26(47) SCALE OF MAP 1:10,000 SCALE FACTOR 1000

STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR y-COORDINATE LONGITUDE OR x-COORDINATE	DISTANCE FROM GRID IN FEET, OR PROJECTION LINE IN METERS FORWARD (BACK)	DATUM CORRECTION	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD (BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD (BACK)
T-22 (USE)	USE	N.A. 1927	690,324.36 1,586,372.04	98.9 (1425.2) 418.2 (1105.8)			N. of quad limits
No.1(SQUALICUM CREEK WATERWAY) 1940 (USE	"	"	647,059.09 1,596,604.50	627.6 (896.4) 489.0 (1035.0)			
No.2(SQUALICUM CREEK WATERWAY 1940 (USE)	"	"	647,417.48 1,595,834.15	736.8 (787).2 254.2 (1269.8)			
No.3(SQUALICUM CREEK WATERWAY 1940, USE)	"	"	646,941.10 1,596,858.13	591.6 (932.4) 566.4 (957.6)			
B.M.149.80,1942 (USE)	"	"	48 47 46.598 122 32 10.480	1439.4 (414.0) 213.9 (1010.7)			
B.M. 150.79,1942 (USE)	"	"	48 47 39.526 122 32 01.926	1221.0 (632.4) 39.3 (1185.3)			
BM 152.58,1942 (USE)	"	"	48 47 32.608 122 32 10.425	1007.3 (846.1) 212.8 (1011.8)			
T-2 (USE)	"	"	669,372.58 1,575,758.13	1332.8 191.2 231.1 1292.9		Used for control but destroyed. Not shown on map.	
LUMI, 1949 (Fourth order)	Field Comp.	"	48 45 00.00 122 37 10.74	00.0 (1853.3) 219.4 (1006.3)			
6							

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1 FT.=.3048006 METER

COMPUTED BY: L. A. Senasack DATE July 1950 CHECKED BY: H.P.Eichert DATE July 1950

M-2388-1

Photogrammetry

MAP T- 5584 PROJECT NO. Ph--26(47) SCALE OF MAP 1:10,000 SCALE FACTOR 1.000

STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR y-COORDINATE / LONGITUDE OR x-COORDINATE	DISTANCE FROM GRID IN FEET, OR PROJECTION LINE IN METERS FORWARD	(BACK)	DATUM CORRECTION	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD	(BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD	(BACK)
M7, 1942 (USE)	U.S.E.	N.A. 1927	653,624.05	1104.6	(419.4)					
			1,589,023.88	1226.5	(297.5)					
M 8, 1942 (USE)	"	"	653,949.22	1203.7	(320.3)					
			1,588,654.38	1113.9	(410.1)					
M 10, 1942 (USE)	"	"	655,830.82	253.2	(1270.8)					
			1,588,709.96	1130.8	(393.2)					
M 11, 1942 (USE)	"	"	655,871.87	265.7	(1258.3)					
			1,586,703.81	519.3	(1004.7)					
M 12, 1942 (USE)	"	"	660,152.01	46.3	(1477.7)					
			1,586,844.47	562.2	(961.8)					
~~M 13, 1942~~ (USE)	"	"	662,725.99	830.9	(693.1)					
			1,586,884.70	574.5	(949.5)					
T38N, R2E Sec. Cor. 4,3,9,10, 1942 (USE)	"	"	662,770.66	844.5	(679.5)					
			1,586,225.82	373.6	(1150.4)					
T38N, R2E 1/4 Cor. 10,15, 1942 (USE)	"	"	657,454.31	748.1	(775.9)					
			1,588,727.91	1136.3	(387.7)					
T-1 (USE)	"	"	668,613.55	1101.4	(422.6)					
			1,575,354.47	108.0	(1416.0)					
T-9 (USE)	"	"	667,750.03	838.2	(685.8)					
			1,579,648.96	1417.0	(107.0)					
T-10 (USE)	"	"	680,356.68	108.7	(1415.3)					
			1,579,546.80	1385.9	(138.1)					
T-21 (USE)	"	"	689,556.64	1388.9	(135.1)					
			1,586,613.98	491.9	(1032.1)					

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N. of quad limits

1 FT. = .3048006 METER

COMPUTED BY: L. A. Senasack DATE July 1950 CHECKED BY: H. P. Eichert DATE July 1950

M-2368-1

Photogrammetry

MAP T-5584 PROJECT NO. Ph-26(47) SCALE OF MAP 1:10,000 SCALE FACTOR 1.000

STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR y-COORDINATE / LONGITUDE OR x-COORDINATE	DISTANCE FROM GRID IN FEET, OR PROJECTION LINE IN METERS FORWARD	(BACK)	DATUM CORRECTION	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD	(BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD	(BACK)
BELLINGHAM, OESER CEDAR CO., STACK, 1950	Field Comp	NA 1927/	48 46 08.786	271.4	(1582.0)					
			122 30 54.573	1114.4	(110.8)					
BELLINGHAM, OLYMPIC PORTLAND CEMENT CO. STACK, SW of 3, 1950	"	"	48 46 06.669	206.0	(1647.4)		Used for control but			
			122 31 22.295	455.3	(769.9)		destroyed. Not shown on map.			
~~BELLINGJAM, OLYMPIC G5600 PORTLAND CEMENT CO. p.658 STACK, MIDDLE of 3, 1914~~	~~"~~		~~48 46 06.87~~	~~212.2~~	~~(1641.2)~~		Destroyed			
			~~122 31 22.08~~	~~450.9~~	~~(774.3)~~					
BELLINGHAM, OLYMPIC PORTLAND CEMENT CO. STACK, NE of 3, 1927	"	"	48 46 07.08	218.7	(1634.7)					
			122 31 21.88	446.8	(778.4)					
PEARSON 3, 1949	Field Comp.	"	48 51 09.238	285.4	(1568.0)					
			122 36 55.797	1137.5	(85.7)					
AIRWAY BEACON NO. 9, 1941 (Destroyed)	G-5410 P 602/	"	48 47 37.761	1166.4	(687.0)		Used for control.			
			122 31 48.728	994.5	(230.10		Not shown on map.			
JOHN 3, 1941 (USE)	G--5410 P 598	"	48 46 13.997	432.4	(1421.0)					
			122 36 00.236	4.8	(1220.4)					
BUSWELL, 1942 (USE)	USE	"	655,200.80	61.2	(1462.8)					
			1,581,597.20	486.8	(1037.2)					
M1, 1942 (USE)	"	"	658,659.21	1115.3	(408.7)					
			1,592,071.32	631.3	(892.7)					
M3, 1942 (USE)	"	"	653,986.22	1215.0	(309.0)					
			1,591,955.46	596.0	(928.0)					
Bellingham Airway Beacon, 1950	G.P.'s P 1360	"	48 47 ~~6580~~	658.0						
			122 31	1179.4						

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1 FT. = .3048006 METER

M-2388-1

COMPUTED BY: L.A. Senesack DATE July 1950 CHECKED BY: H.P. Eichert DATE July 1950

COMPILATION REPORT T-5584

PHOTOGRAMMETRIC PLOT REPORT

Report submitted with Descriptive Report for Survey T-5581.

FIELD INSPECTION REPORT

Report submitted with Descriptive Report for Survey T-5583.

31. DELINEATION

Refer to Photogrammetric Plot Report.

32. CONTROL

Refer to Photogrammetric Plot Report and Field Inspection Report.

33. SUPPLEMENTAL DATA

Land plats -

1-Township No. 38 North, Range No. 2 East, Willamette Meridian, Wash. Dated Feb. 21, 1860.

1-Township No. 39 North, Range No. 2 East, Willamette Meridian, Wash. Dated Feb. 21, 1872.

1-Township No. 38 North, Range No. 2 East, Willamette Meridian, Wash. Dated June 29, 1931.
(Boundary of the Lummi Indian Reservation in sections 7, 17, & 18.)

Township layouts
1-Lummi Indian Reservation, Twp. 37 and 38 North Range 1 and 2 East, W.M. Whatcom County, Wash.

1-Marietta Township, Twp. 38 North, Range 2 East W.M., Whatcom County, Wash.

1-Ferndale Township, Twp. 39 North, Range 2 East, W.M., Whatcom County, Wash.

1-Mountainview Township, Twp. 39 North, Range 1 East and Range 1 West, W.M., Whatcom County, Wash.

1-Port of Bellingham, Proposed Small Boat Harbor.

Refer to 41, Boundaries, for a description of how these data were used.
Also plans and descriptions of city boundaries were used. EHK

34. CONTOURS AND DRAINAGE

In general, the quality of diapositives was fair to good.

The density of diapositives of model 1197-1198 was very poor and

34. CONTOURS AND DRAINAGE (Continued)

considerable difficulty was encountered in contouring. It is requested that contours within the limits of this model be checked in field edit. See §52

35. SHORELINE AND ALONGSHORE DETAILS

Shoreline inspection was adequate except for structures and buildings adjacent to the shoreline in the vicinity of Squalicum Creek entrance. These buildings will need additional classification in order to complete their delineation.

No shoal areas or low water lines* are shown. ~~The shallow line in Bellingham Bay is office interpretation of photographs.~~ See §42

* Some shown on W. side of Bellingham Bay. See §65.

36. OFFSHORE DETAILS

These are believed to be complete.

37. LANDMARKS AND AIDS

Refer to item 9 of the Field Inspection Report. The position of one non-floating aid to navigation, located by multiplex is reported herewith on form 567. This aid was easily seen in the multiplex model and pricked direct.

See §57 & §68

38. CONTROL FOR FUTURE SURVEYS See §49, Notes For The Hydrographer File

Forms 524 are herewith submitted for 14 recoverable topographic stations.

LUMI, 1949, a fourth order control station, is the only one not determined by stereoscopic methods.

Four of the 14 stations were not reported under item 11 of the Field Inspection Report. They are:-

1. JOHN 3 (USE) 1941 AZ MK, 1950
2. CITY, 1951
3. CAGE, 1949
4. T 38N, R2E, 1/4 CORNER, SECTIONS 13-14, 1951

39. JUNCTIONS

Junctions are complete with T-5583 to the west and T-5585 to the east. There are no contemporary surveys to the north and south. See §67

40. HORIZONTAL AND VERTICAL ACCURACY

Refer to item 34 "CONTOURS AND DRAINAGE". Also see Photogrammetric Plot Report. See §53

41. BOUNDARIES

Land Lines

See special report - Land Lines - Ph-26(47) and item 10 of field inspection report.

True or accepted corners of land lines are plotted by photogrammetric means, supplemented with field data. Land lines and theoretical corners have been delineated from the natural and cultural features of the manuscript and photographs supplemented by the trans-position of a graphically enlarged copy of the land plats of Townships No. 38 N and 39 N. Range No. 2 East, Willamette Meridian. This enlargement is herewith submitted

Natural and cultural features, such as roads, ditches, and field or woods lines were accepted for the placement of reliable land lines where they were nearly coincident with the lines transposed from the enlarged land plat, or where they connected true or accepted corners.

Where there was no evidence of natural and cultural features from inspection of the photographs and manuscript, the land lines of the enlarged land plat were used and shown as unreliable land lines. Intersections of these lines resulted in unreliable theoretical corners.

Land lines and corners, accepted or theoretical, were compared with the township layout. Theoretical corners not in agreement, were noted on the discrepancy overlay.

Lummi Indian Reservation

Refer to Special Report-Boundaries-Ph-26(47) and item 10 of field inspection report.

This reservation boundary line is delineated from an enlarged copy plotted from bearings and distances from the original land plat in sections 7, 17, 18.

This line begins at a point called Treaty Rock and ends at a General Land Office standard disc. stamped "T 38N, R2E, S7 S8, L/R, PL, AP7, WC" which is a recoverable topographic station. The bearings of several of the roads in this vicinity were also plotted on the enlarged copy. By holding station AP 7 at one end of the line and orienting the manuscript until the centerline of Hoff Rd, coincided with the bearing of the same road on the enlarged copy at the beginning of the line, the reservation boundary line was then traced to the manuscript.

41. BOUNDARIES (continued)

In addition to those boundary lines and theoretical corners discussed on the overlay and the unreliable land lines of the manuscript, it is believed that the Lummi Indian Reservation boundary line as discussed in the preceding paragraph, should be further investigated in the field. See §5(

46. COMPARISON WITH EXISTING MAps

Comparison was made with Geological Survey Blaine quadrangle, scale 1:62,500, edition of 1907 reprinted 1947. See §62

The interior areas compare favorably. However, many large changes have since occurred in the vicinity of Bellingham and Bellingham Bay. §§63

47. COMPARISON WITH NAUTICAL CHARTS

The manuscript was compared with Chart No. 6378, scale 1:40,000, published June 1935, corrected September 5, 1949.

Generally, the same differences are noted in this comparison as are reported in item 46.

Items to be apllied to nautical charts immediately: See §65

In the vicinity of Bellingham are many changes. The street system of Bellingham is to be extended. Shoreline structures to be added are: large wood bulkhead, piling, large breakwater, and large buildings.

Offshore piling between Marietta and Bellingham, and at Fish Point should be applied.

At the mouth of the Nooksack River are many shoreline changes. The channels and inlets in this area are entirely different and should be so charted.

Control tower at Bellingham Airport to be applied.

Items to be carried forward

None

Respectfully submitted

Albert C. Rauck Jr.
Albert C. Rauck
Cartographic Photo Aid

Approved and forwarded 28 June 1951

Hubert A. Paton
Hubert A. Paton
Comdr., C&GS
Officer in Charge

FIELD EDIT REPORT
Map Manuscript T-5584
Project Ph-26(47)

5b. Methods

No new or unusual methods have been used in the completion survey and field edit of this sheet. Inspection was from a truck, dismounting and walking where necessary. All profiling and re-sketching was done with the plane table. A legend of the colored inks and symbols used is shown on Field Edit Sheet No. 4.

Field edit data is shown on Field Edit Sheets Nos. 1 through 5, and on photos 1374, 1194-1200, 1214-1219, 1222-1229, and 1243 and 1244. Photographs 1243 and 1244 will be furnished with Quad T-5585. All others are with this quad. Notes are cross referenced from field edit sheets to photographs.

52. Adequacy of compilation

The adequacy of the compilation is more or less in line with other sheets in the project. The delineation of buildings is often incomplete, because the compiler just doesn't see all the buildings. They are obvious to the man in the field who is standing on the road looking at the house. From his point of view the building is quite obvious on the photo and there is no need to intensify the image with a bright colored ink, but to the compiler the image is not often so plain. This is the cause of so many omissions. There is often a lack of thought shown on the part of the compiler, too. Probably well over half the time a class two building with a good access road will have a class one building in the immediate vicinity. The compiler must learn to look for these buildings. If the field is to continue to delineate the buildings it wants to delete, instead of the buildings it wants to save, the compiler will have to be more watchful.

Field treatment of the political boundaries was seriously deficient, and this is reflected in the compilation. The compilation unit shares the responsibility for the error in the Bellingham City Limit, since the material furnished by the field inspection unit was sufficient to disclose the error, even though the field inspection unit delineated the City Limit wrongly on the photographs. Apparently the compilation unit did not inspect the legal descriptions or the plats furnished with the special report on boundaries.

The contouring follows the pattern established in past quads on this project. It does not test too badly in accuracy (83% within a half interval), but much detail is missing in the area of glacial till northwest of Ferndale. Several tops were missed in the area east of Ferndale. These things change the expression of the area considerably, though they will often not affect the accuracy tests badly.

53. Map Accuracy.

A portion of the horizontal map accuracy test made for this project extends into the northwest corner of this sheet. This traverse has already been the subject of special report on Horizontal Map Accuracy for this project. All horizontal errors were within prescribed limits.

Approximately 49 miles of plane table traverse was run as vertical accuracy tests and to resketch topography. About 1.2 miles of combined horizontal and vertical accuracy tests and about 2.5 miles of barometrically controlled leveling may be added to this figure. This total is, of course, quite high, but in view of the fact that the summary of all this traverse shows only 83% of all points tested within $\frac{1}{2}$ contour interval, there was apparently a need for well-controlled resketching, and only a small portion of this total can be questioned as unnecessary. About 8 miles of this total were run to sketch the 10 foot contour in the Lummi River bottom. About 8 to 9 square miles of topography were resketched, and the equivalent of three to four square miles of sketching was done in adding the 10 foot contour in the Lummi River bottom.

The field editor believes that the map can be certified as meeting National Map Accuracy Standards after application of the corrections to topography submitted. See § 65

54. Recommendations.

It is difficult for the observer to make recommendations for the improvement of similar maps. The bulk of the troubles seem to arise from inexperience as an organization, rather than as individuals. Using the present grade of personnel, closer and more detailed supervision of field personnel seems indicated, along with closer and more critical inspection of field work and of the compilation. The observer has given the matter considerable thought and contemplates submitting a more detailed report on the matter later in the winter.

55. Examination of Proof Copy.

Mr. Paul E. Matz, Ferndale Pharmacy, Ferndale, Washington, and Mr. Alfred Tedford, 3302 Northwest Avenue, Bellingham, Washington have each agreed to examine a proof copy of the map for possible errors. Mr. Matz is well acquainted with the area around Ferndale in the northwest corner of the sheet, and Mr. Tedford is better acquainted with the area around Bellingham, in the southeast corner of the sheet. The sheet seems divided geographically by the wooded area around the airport. No further geographic name data was obtained. However, the application of the name "Squalicum Creek Waterway" should be changed. The Squalicum Creek Waterway is a dredged ship basin, and the approach channel, and is a facility of the Port of Bellingham. Squalicum Creek comes off the hill just inshore from the Squalicum Creek Waterway. The name "Squalicum Creek Fill" is also in common local usage as indicated on Field Edit Sheet No. 4, but would appear as a redundance if the names Squalicum Creek and Squalicum Creek Waterway are shown.

56. Political Boundaries.

(See paragraph 10, Field Inspection Report and Special Report on Boundaries, Project Ph-26). Besides the public land lines, the political boundaries within the limits of this quadrangle are the boundary of the Lummi Indian Reservation, the Corporate Limit of the City of Ferndale, and the Corporate Limit of the City of Bellingham.

56 1. Lummi Indian Reservation.

The field inspection party recovered one witness to a corner of the Lummi Indian Reservation, "T 38N, R2E, S7 S8, L/R, PL, AP7, WC". This corner seems to have been accepted by the field inspection and by the compiler as a corner on the boundary. The letters "WC" included in any property corner designation mean "witness corner", and such a corner is set because the true corner cannot be monumented. In this case it cannot be monumented because it is in the middle of the river. The field editor recovered seven additional witness corners and two corners on this boundary. These corners and the witnesses were located by plane table. These recovered corners, witnesses, and plotted corners are shown on Field Edit Sheet No. 3, and are keyed to the numbers listed below, with brief descriptions shown in the case of recovered points.

1. Recovered, a standard GLO disk, riveted to the top of a 3/4 inch pipe extending 16" above ground, stamped "S17/S16, WC, 1930". A witness for Treaty Rock.
2. Treaty Rock, not recovered. This was plotted from witness (1). The Indians say Treaty Rock "sank". The fact of the

matter is that Treaty Rock was below mean high water, and although it was as big as a small house, it was covered by silt when the river channel shifted. Probing at the plotted position was considered, but was not attempted because of the heavy cover of large driftwood logs almost completely covering the area.

3. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 9 inches above the ground, stamped "T38N, R2W, PL, S17, WC, AP3, L/R, 1930".
4. AP3, not recovered, plotted from witness (3).
5. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 6 inches above the ground, stamped "T38N, R2W, S18, PL, AP4,L/R, 1930". (Plotted as AP 1). GLO plat shows AP 1 ctr.
6. Recovered, section corner 3, 7, 18, 17, also a witness to AP 1, a standard GLO disk riveted to the top of a 1½ inch pipe extending 1 foot above ground stamped "S7, S8, S17, S18".
7. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 2 inches above the ground and stamped "T38N, R2W, PL, S18, AP2, L/R, 1930".
8. Recovered, a standard GLO disk, riveted to the top of a 3/4 inch pipe, extending 2 inches above the ground, stamped "T38N, R2W, PL, S18, WC, AP3, L/R, 1930".
9. AP3, not recovered, plotted from witness.
10. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe, extending 9 inches above the ground, and stamped "T38N, R2W, S7, AP1,L/R, PL, 1930". Should have been "WC".
11. AP1. Not recovered; plotted from witness.
12. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe, extending 9 inches above the ground, stamped "T38N, R2W, S7, AP2, L/R, PL, 1930". Should have been "WC".
13. AP 2, not recovered, plotted from witness.
14. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 4 inches above the ground, stamped "T38N, R2W, S7, WC, AP3, PL, L/R, 1930".
15. AP 3, not recovered, plotted from witness.

The plat of the Walter D. Long resurvey of 1930 is quite good, but the stamping of the marks is often in error. Each mark is stamped R2W, where it should be R2E. With this in view, it is not unreasonable to assume that the omission of the witness corner designation in a couple of cases was an error also. I think only two reference bearings are omitted from the plat, and one of these may be deduced from another plat. The only portion of the boundary difficult to deal with was the portion from S7, AP3 to S7, AP7. The bearing from S7, AP7 to WC, S7, AP7 is omitted from the plat, although the distance, 1.50 chains is shown. A circle of radius 1.50 chains with center at WC, S7, AP7 was struck, and the portion of the boundary from S7, AP3 to the eastward was plotted

on a piece of vellum and positioned so that S7, AP3 fell in the proper position, and the eastern end of the plotted portion of boundary fell on the 1.50 chain circle. Then the corners in between were pricked. Other portions of the line plotted between recovered corners fitted very well with almost zero closures. The survey is really quite good. ✓

56 2. City of Ferndale.

The field inspection party furnished descriptions for the last two additions to the Ferndale municipal corporation, stating that legal descriptions for the balance of the corporate limit were not available. They did, however, show on the photograph the position of the city limit. The original act incorporating the City of Ferndale was located without any trouble, and a subsequent addition to the city was located after local inquiry. These descriptions are furnished as a part of this report. The boundary shown on the field photographs was taken from a map in the assessor's office, or at least it agrees with it, but there is a discrepancy in the Pioneer Park area. As a matter of interest, the City Limit shown in the Assessor's plat book (not on his wall map) is correct.* I think that where the city limit follows the edge of a road, that the line on the manuscript should reflect this by turning and following its true position along the edge of the road for about0.5 inch. If you just run it up to the road and stop, there may be confusion about whether it goes with the center line of the road, or with the edge, and this should be clarified. See also 564, Riparian boundaries of municipal corporations.

* Limits were also delineated on Field Edit Sheet No. 1. Above descriptions not located at review. EOK

56 3. City of Bellingham.

The field inspection party furnished copies of the original charter of the City of Bellingham, and of all but one of the annexations to the city. They also furnished maps of the city with the city limits shown thereon. They also drew the city limit on the appropriate photographs. Apparently, neither the field inspector, the compiler, or the office inspector made a careful review of the maps or descriptions, because there are gross disagreements between the data furnished, and the city limit delineated on the photographs. One annexation was also omitted. Complete descriptions of the Bellingham City Limit are furnished with this report. The corrected city limit within the limits of the quadrangle are shown with a red city limit symbol on Field Edit Sheet No. 4. See also 56 4, Riparian boundaries of municipal corporations.

56 4. Riparian Boundaries of Municipal Corporations.

A copy of an act of the Washington State Legislature extending the corporate limits of cities fronting on waters is attached, with a copy of a decision of the Washington State Supreme Court relating to the act ~~is~~ also attached. This act will affect the city limits of both Ferndale and Bellingham.

57. Aids to Navigation.

Observations were made to relocate the Squalicum Creek Entrance Light and the Bellingham Breakwater Entrance Light.* No check positions were obtained, but they check very nicely with plane table intersections which used mapped detail as control. Using mapped detail as control the plane table intersections gave about a thirty foot triangle of error; while not quite good enough for a location, it is quite good enough to indicate that there is no gross error in the work. The computed G.P. for the Squalicum Creek Entrance Light in only about a meter different from that obtained by the field inspection party, and there was probably no change in the light. The Bellingham Breakwater Entrance Light, however, has been moved about 500 feet from the first position obtained by the field inspection party, and moved about 360 feet while the field editor was in the area. Further shifts in this light may be expected as construction of the breadwater continues. The breakwater will be extended about 1500 feet to the west, and work has proceeded at the rate of about 200 feet per year. A plan of the work contemplated was furnished by the field inspection party. See §68

* Shown as less than third-order stations on the manuscript. CMR

58. Triangulation.

The Olympic Portland Cement Company in Bellingham has been converted from a coal-fired to an oil-fired operation. Two of the large stacks which were shown as landmarks (Triple Stack) and which doubled as intersection stations have been torn down. Appropriate recovery notes are submitted. A check observation was made on the remaining stack.* See also Paragraph 57.

* New form 567 submitted at final review. EHR

59. New Leveling.

A level party of this bureau under the supervision of Lt. Plaggmier has completed a rerun of the trunk level line along the Great Northern Railway across this sheet with a spur line to the Bellingham Airport. The bench marks established, and the field elevations are listed:

F 327	Elv.	18.2166 m.*	At xn of RR and Kass Rd.
G 327		11.8769	
L 6=26B		10.5610	
H 327		5.2861	
J 327		6.1411	
K 327		12.5989	
L 327		32.0809	
M 6=107B		32.9910	
M 327		34.3786	
R 327		15.5423	
T 330		4.5773	

Spur line to Bellingham Airport:

Q 327	48.2168 *
N 327	45.8692
P 327	45.5661
152.58	46.6028
149.80	45.6034
145.53	44.2857
157.93	48.0607

The locations of these marks have been spotted on the field edit sheet. No further recovery notes are submitted inasmuch the level party was in the area after completion of the bulk of the field work on the quad.

* The adjusted elevations have since been published and are shown on the manuscript. SHR

60. Junctions.

The work of the Geological Survey on topographic quadrangle Blaine NE* has been matched along the north edge of the sheet. See §67

* Bertrand Creek, Wash. (1952).

Approved and Forwarded:

Charles W. Clark

Charles W. Clark
Lt. Comdr., USC&GS
Chief of Party

Respectfully submitted:

Ray H. Skelton II

Ray H. Skelton II
Cartographer (Photo)

Test Elev.	Map Elev.	Error	Error after shift	Remarks
From PEARSON 3 north and west along Thornton Rd. to sheet edge. (Combin- horizontal and vertical accuracy test)				
278	282	± 4	0	
286	290	± 4	± 1	
291	305	± 14	± 8	
299	318	± 19	± 17	
305	316	± 11	± 11	
308	318	± 10	± 10	
310	321	± 11	± 9	
308	325	± 17	± 12	
310	325	± 15	± 11	
314	330	± 16	± 14	
321	334	± 13	± 12	
329	341	± 12	± 11	
334	345	± 11	± 8	
335	344	± 9	± 6	
327	337	± 10	± 3	
320	320	± 0	± 0	
315	319	± 4	± 2	
313	318	± 5	± 3	
309	316	± 7	± 7	
306	315	± 9	± 9	Spot elv, x-rd
314	325	± 11	± 8	
321	331	± 10	± 9	
328	340	± 12	± 10	
338	350	± 12	± 10	
346	359	± 13	± 11	
354	369	± 15	± 12	
362	378	± 16	± 14	
369	384	± 15	± 13	
369	383	± 14	± 12	
363	377	± 14	± 12	
352	366	± 14	± 10	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
North along Church Rd. from Thornton Rd. W/spur along access rd. W.				
300	301	± 1	0	
300	315	± 15	± 5	T-rd W
323	332	± 9	± 6	
346	363	± 17	± 15	
354	372	± 18	± 16	
366	382	± 16	± 15	
302	302	± 0	0	
300	301	± 1	0	On fill
303	310	± 7	0	
302	307	± 5	± 4	
East along Thornton Rd. from Church Rd. to RR, thence N along RR.				
264	261	± 3	± 2	
236	230	- 6	- 4	
227	225	- 2	- 0	
231	239	± 8	± 8	Spot elv, x-rd
214	219	± 5	± 3	
183	183	0	0	
122	112	- 10	- 7	x-rd
82	62	- 20	- 3	
55	51	- 4	- 4	
56	51	- 5	- 5	
58	54	- 4	- 4	
60	56	- 4	- 4	
63	58	- 5	- 5	
66	61	- 5	- 5	
69	62	- 7	- 7	
70	62	- 8	- 8	
74	65	- 9	- 9	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
N. along Mallory Rd. from Thornton Rd.				
W. along sheet edge, Southeast along				
Blaine-Ferndale Rd. to Thornton Rd.				
128	128	0	0	
129	118	≠ 11	≠ 9	
115	114	- 1	0	
143	124	- 19	- 18	
108	118	≠ 10	≠ 7	
108	102	- 6	0	
129	122	- 7	0	
134	130	- 4	0	
137	141	≠ 4	0	
151	147	- 4	- 2	
153	153	0	0	
162	159	- 3	- 1	
182	165	- 17	- 13	
176	170	- 6	- 1	
184	189	≠ 5	0	
193	201	≠ 8	≠ 4	
193	190	- 3	0	
204	204	0	0	
211	212	≠ 1	- 0	
218	222	≠ 4	≠ 3	
207	214	≠ 7	≠ 6	
204	206	≠ 2	≠ 1	
204	203	- 1	0	
233	233	0	0	
228	242	≠ 14	≠ 13	
Southeast along Blaine-Ferndale Rd.				
from Thornton Rd. to Ferndale, W.				
along Mtn. View to Church Rd.				
thence N. to Pearson 3				

Test Elev.	Map Elev.	Error	Error after shift	Remarks
231	223	- 8	- 7	
201	202	≠ 1	0	
179	176	- 3	0	
145	143	- 2	0	
99	101	≠ 2	≠ 1	
63	63	0	0	
79	82	≠ 3	≠ 2	
93	93	0	0	
69	69	0	0	
43	39	- 4	- 3	
65	65	0	0	
63	63	0	0	
71	76	≠ 5	≠ 4	
103	114	≠ 11	≠ 7	
135	150	≠ 15	≠ 9	
159	169	≠ 10	≠ 1	
204	216	≠ 12	≠ 2	
From Thornton Rd. South along sheet				
edge, thence east along Mtn. View Rd.				
to Church Rd.				
349	363	≠ 14	≠ 11	
326	344	≠ 18	≠ 14	
341	342	≠ 1	0	
322	324	≠ 2	0	
279	285	≠ 6	≠ 5	
288	290	≠ 2	≠ 1	
274	274	0	0	
266	259	- 7	- 4	
203	211	≠ 8	≠ 7	T-rd N
223	244	≠ 21	≠ 19	
178	197	≠ 19	≠ 12	
135	133	- 2	- 1	T-rd N
159	170	≠ 11	≠ 5	
204	216	≠ 12	≠ 6	

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Southwest along Douglas Rd. from Mtn. View Rd. to sheet edge				
51	62	≠ 11	≠ 9	Y-rd.
48	60	≠ 12	≠ 2	
53	44	- 9	- 6	
51	44	- 7	- 6	
49	43	- 6	- 4	
47	44	- 3	- 2	
33	41	≠ 8	≠ 7	T-rd. W.
49	49	0	0	
60	62	≠ 2	0	
Johnson Rd. from Douglas Rd. South and West to sheet edge.				
25	32	≠ 7	≠ 7	
16	22	≠ 6	≠ 6	
13	19	≠ 6	≠ 6	
10	18	≠ 8	≠ 8	Y-rd.
6	17	≠ 11	≠ 11	
6	16	≠ 10	≠ 10	
7	15	≠ 8	≠ 8	Rt. L Bend
6	15	≠ 9	≠ 9	
7	16	≠ 9	≠ 9	
10	16	≠ 6	≠ 6	
Imhof Rd. from Douglas Rd. South to Red River Rd.				
27	28	≠ 1	≠ 1	
15	15	0	0	
17	22	≠ 5	≠ 5	
16	22	≠ 6	≠ 6	
13	19	≠ 6	≠ 6	
14	15	≠ 1	≠ 1	Spot. elv. X-rd
12	16	≠ 4	≠ 4	
13	17	≠ 4	≠ 4	
10	18	≠ 8	≠ 8	
11	19	≠ 8	≠ 8	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Ulrick Rd. E. from Johnson Rd. to River Rd. thence south to tie w/spurs				
10	17	≠ 7	≠ 7	
10	16	≠ 6	≠ 6	
17	21	≠ 4	≠ 4	
27	21	- 6	- 6	
29	21	- 8	- 8	
28	21	- 7	- 7	
22	21	- 1	- 1	
18	21	≠ 3	≠ 3	
18	19	≠ 1	≠ 1	
15	16	≠ 1	≠ 1	
14	14	0	0	
14	14	0	0	
15	14	- 1	- 1	
22				On levee
14	16	≠ 2	≠ 2	
12	13	≠ 1	≠ 1	
8	10	≠ 2	≠ 2	
7				Control
7	7	0	0	
11	11	0	0	
6	6	0	0	
6	6	0	0	
5	5	0	0	

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Red River Rd. from Ferndale Rd.				
to sheet edge.				
11	15	≠ 4	≠ 4	
9	17	≠ 8	≠ 8	
15	21	≠ 6	≠ 6	T-rd N
13	21	≠ 8	≠ 8	
12	19	≠ 7	≠ 7	
11	18	≠ 7	≠ 7	
12	18	≠ 6	≠ 6	
12	17	≠ 5	≠ 5	
12	17	≠ 5	≠ 5	
10	17	≠ 7	≠ 7	
11	16	≠ 5	≠ 5	
11	16	≠ 5	≠ 5	
11	16	≠ 5	≠ 5	
Kass Rd. from RR east, northeast,				
then east along sheet edge to tie				
w/spur north along hiway 99.				
55	53	- 2	- 2	X-rd
60	56	-4	-4	
66	62	- 4	- 4	
46	44	- 2	- 2	
34	34	0	0	
25	21	- 4	- 4	
28	19	- 9	- 9	
20	15	- 5	- 5	
26	15	- 11	- 11	
24	15	- 9	- 9	
29	15	- 14	- 14	
47	42	- 5	- 5	
65	65	0	0	
69	65	- 4	- 4	
60	65	≠ 5	≠ 5	X-rd
69	65	- 4	- 4	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
63	66	≠ 3	≠ 3	T-rd W
62	62	0	0	
63	64	≠ 1	≠ 1	
63	63	0	0	T-rd E
Wiser	Lake Rd. from Piper Rd.			
South	to Axton Rd.		east to tie.	
59	61	≠ 2	≠ 2	T-rd E
51	45	- 6	- 6	
63	61	- 2	- 2	
63	59	- 4	- 4	T-rd W Cem.
44	44	0	0	T-rd E Cem.
35	35	0	0	
48	44	- 4	- 4	
57	61	≠ 4	≠ 4	
66	66	0	0	x-rd
63	65	≠ 2	≠ 2	
78	78	0	0	
75	75	0	0	
75	75	0	0	
76	76	0	0	
75	75	0	0	x-rd
75	75	0	0	
75	75	0	0	

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Along Piper Rd. east from Wiser Lake Rd. to Aldrich Rd. thence South along Aldrich Rd. to Axton Rd. and tie w/spur on Woodlyn Rd.				
64	65	≠ 1	≠ 1	
65	64	- 1	- 1	
65	64	- 1	- 1	
67	72	≠ 5	≠ 5	
66	65	≠ 1	- 1	
70	66	- 4	- 4	
66	67	≠ 1	≠ 1	Spot elv.X-rd
61	64	≠ 3	≠ 3	
62	62	0	0	
61	61	0	0	
59	61	≠ 2	2	T-rd E.
44	44	0	0	
55	45	- 10	- 10	
59	55	- 4	- 4	
65	69	≠ 4	≠ 4	X-rd.
79	79	0	0	
79	78	- 1	- 1	
Aldrich Rd. North from Piper Rd. thence east along sheet edge				
69	71	≠ 2	≠ 2	
73	71	≠ 4	≠ 4	
85	81	- 4	- 4	
73	77	≠ 4	≠ 4	
83	81	- 2	- 2	
Hemmi Rd. from Aldrich Rd. east to sheet edge				
57	42	- 13	- 13	
46	46	0	0	
56	52	- 4	- 4	
56	56	0	0	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Laurel Rd. from Aldrich Rd. east to sheet edge				
78	79	≠ 1	≠ 1	
76	76	0	0	
78	70	- 8	- 8	
North along Aldrich Rd. from point 0.06 mi. North of Larabee Rd. w/ loop in clearing.				
122	135	≠ 12	≠ 12	
130	130	0	0	
153	163	≠ 10	≠ 10	
158	175	≠ 17	≠ 17	
154	159	≠ 5	≠ 5	
144	149	≠ 5	≠ 5	
140	161	≠ 21	≠ 21	
137	162	≠ 25	≠ 25	
135	155	≠ 20	≠ 20	
140	156	≠ 16	≠ 16	
150	161	≠ 11	≠ 11	
148	154	≠ 6	≠ 6	
142	146	≠ 4	≠ 4	
107	125	≠ 18	≠ 14	
138	140	≠ 2	≠ 1	
134	142	≠ 8	≠ 7	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Southeast along U.S. 99 from Sunset Ave. to sheet edge				
54	54	0	0	
81	90	+ 9	+ 9	X-rd.
86	95	+ 9	+ 9	
100	104	+ 4	+ 4	Y-rd.
109	117	+ 8	+ 8	
134	140	+ 6	+ 6	
114	132	+ 18	+ 18	
122	138	+ 16	+ 16	
128	131	+ 3	+ 3	Spot elv. X-
169	162	- 7	- 7	
165	165	0	0	
145	158	+ 13	+ 13	
164	166	+ 2	+ 2	
165	169	+ 4	+ 4	Spot elv X-rd
167	164	+ 7	+ 7	
175	175	0	0	
155	158	+ 3	+ 3	
140	141	+ 1	+ 1	
104	104	0	0	
93	96	+ 3	+ 3	
87	85	+ 2	- 2	Spot elv Y-rd
Bakerview Rd. from Aldrich Rd. east to sheet edge				
162	166	+ 4	+ 3	
168	163	- 5	- 5	
Southeast along RR from 1.2 mis N. of Bakerview Rd. to Bellingham, thence N. through Birchwood to tie				
44	50	+ 6	+ 6	
46	54	+ 8	+ 8	
54	58	- 4	- 4	
61	62	+ 1	+ 1	
68	71	+ 3	+ 3	
77	79	+ 2	+ 2	
86	90	+ 4	+ 4	
94	100	+ 6	+ 6	
103	112	+ 9	+ 9	
108	121	+ 13	+ 13	Spot elv RRx-ing
109	120	+ 11	+ 11	
108	115	+ 7	+ 7	
108	110	+ 2	+ 2	
112	109	- 3	- 3	
112	108	- 4	- 4	
110	108	- 2	- 2	
110	107	- 3	- 3	
111	106	- 5	- 5	
111	105	- 6	- 6	
112	104	- 8	- 8	
114	103	- 11	- 11	
112	102	- 10	- 10	
108	101	- 7	- 7	
101	100	- 1	- 1	
86	92	+ 6	+ 6	
89	84	- 5	- 5	
81	74	- 7	- 7	
79	72	- 7	- 7	
78	69	- 9	- 9	
69	63	- 6	- 6	
65	60	- 5	- 5	
53	49	- 4	- 4	
62	62	0	0	[illegible]
65	63	- 2	- 2	[illegible]
66	66	0	0	Spot elv: rd xn
68	66	- 2	- 2	T-rd N.
68	68	0	0	
73	74	+ 1	+ 1	X-rd
78	81	+ 3	+ 3	X-rd
90	98	+ 8	+ 8	T-rd S.

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Bakerview Rd. east thence S. to RR			1/2 mi. from RR	
113	122	≠ 9	≠ 9	
118	122	≠ 4	≠ 4	
113	122	≠ 9	≠ 9	
127	123	- 4	- 4	
116	116	0	0	
153	154	≠ 1	0	
127	135	≠ 8	≠ 8	
Marietta Rd. from RR Southeast to Bellingham. (Barometric leveling max. tie 2 ft.)				
134	123	- 11	- 11	
121	126	≠ 5	≠ 5	
119	123	≠ 4	≠ 4	
108	115	≠ 7	≠ 7	
103	110	≠ 7	≠ 7	
80	82	≠ 2	≠ 2	
71	70	-1	- 1	
From traverse station M7 (U.S.E.) east to Bennett Ave. thence SW to Marietta Rd. (Barometric leveling. max. tie 2ft.				
146	158	≠ 12	≠ 12	
146	157	≠ 11	≠ 11	Spot elv T-rd N
154	162	≠ 8	≠ 8	Spot elv T-rd N
154	155	≠ 1	≠ 1	
114	121	≠ 7	≠ 7	
118	122	≠ 4	≠ 4	T-rd N.
115	124	≠ 9	≠ 9	At dr.
Southeast along Eldridge Ave. from Squalicum Creek to sheet edge.				
66	66	0	0	
63	63	0	0	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Curtis Rd from Bakerview Rd. N. 1.2 mis.				
108	118	≠ 10	≠ 10	
101	104	≠ 3	≠ 3	
95	105	≠ 10	≠ 10	
102	105	≠ 3	≠ 3	
100	103	≠ 3	≠ 3	
91	95	≠ 4	≠ 4	
89	89	0	0	
78	83	≠ 5	≠ 5	T-rd E.
88	85	- 3	- 3	
77	76	- 1	- 1	
West along Marietta Rd from RR to left Bank Nooksack R. thence N. w/ river bk. to Gilson Rd. thence east to tie.				
104	101	≠ 6	≠ 6	T-rd N.
92	92	0	0	T-rd S.
80	81	≠ 1	≠ 1	
74	82	≠ 6	≠ 6	
70	78	≠ 8	≠ 8	T-rd N.
38	38	0	0	T-rd N.
17	33	≠ 16	≠ 16	
8	27	≠ 19	≠ 19	
8	10	≠ 2	≠ 2	
7	7	0	0	
8	8	0	0	
6	6	0	0	
5	5	0	0	
7	7	0	0	
13				On levee
8	8	0	0	
8	16	≠ 8	≠ 8	Spot elv.
10	10	0	0	
8	10	≠ 2	≠ 2	
4	10	≠ 6	≠ 6	
16				On levee

Test Elev.	Map Elev.	Error	Error after shift	Remarks
16	16	0	0	
14	18	≠ 4	≠ 4	
30	24	- 6	- 6	
14	14	0	0	
16	16	0	0	
36	36	0	0	Spot elv Y-rd
From Marietta NE along rd. to tie.				
13	22	≠ 9		
23	23	0	0	
26	26	0	0	
26	26	0	0	
32	41	≠ 9	≠ 8	T-rd N
30	41	≠ 11	≠ 11	
29	29	0	0	
32	31	- 1	- 1	
Bakerview Rd. Southwest to Marietta from RR.				
96	108	≠ 12	≠ 12	
81	94	≠ 13	≠ 11	T-rd E
78	96	≠ 18	≠ 17	T-rd W
73	85	≠ 12	≠ 12	
44	62	≠ 18	≠ 17	
40	54	≠ 14	≠ 14	X-rd.
27	44	≠ 17	≠ 17	
7	18	≠ 11	≠ 10	
Jones Rd. Marietta Rd. N. to tie.				
74	83	≠ 9	≠ 8	
76	84	≠ 8	≠ 7	
Hoff Rd. NE of Marietta				
40	48	≠ 8	≠ 8	
41	56	≠ 15	≠ 15	
38	50	≠ 12	≠ 10	
28	42	≠ 14	≠ 14	T-rd N
31	42	≠ 11	≠ 11	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Lummi Shore Rd. from Fish Pt. NW to sheet edge.				
8	8	0	0	
7	7	0	0	
7	7	0	0	
8	8	0	0	
7	7	0	0	
9	9	0	0	Y-rd.
7	7	0	0	
7	7	0	0	
9	9	0	0	
24	18	- 6	~~0~~ 2	
45	45	0	0	
43	43	0	0	
15	15	0	0	
36	42	≠ 6	≠ 6	
36	41	≠ 5	≠ 5	Spot elv T-rd W
37	42	≠ 5	≠ 5	
11	35	≠ 24	≠ 22	
34	42	≠ 8	≠ 8	
11	40	≠ 29	≠ 27	
31	45	≠ 14	≠ 11	
15	15	0	0	
7	10	≠ 3	≠ 3	
9	15	≠ 6	≠ 6	
16	22	≠ 6	≠ 6	Top.
7	17	≠ 10	≠ 10	
Along Kwina Rd., from Lummi School W. to sheet edge.				
47	47	0	0	
47	55	≠ 8	≠ 8	
49	58	≠ 9	≠ 9	

M-2875-12

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Southwest along telp line from				
BM 65	RS			
39	42	∠ 3	∠ 3	Y-rd
57	49	- 8	- 7	
70	54	-16	-15	
57	57	0	0	
85	82	- 3	- 1	
114	114	0	0	
124	124	0	0	
117	120	∠ 3	∠ 2	
115	115	0	0	
117	115	0	0	
125	120	- 5	- 5	
134	146	∠12	∠10	
138	150	∠12	∠10	
138	148	∠10	∠ 9	
133	147	∠14	∠13	
139	150	∠11	∠11	
136	155	∠19	∠19	
From	Lummi	Shore Rd 0.2	mi. N. of	
JOHN	3 NW to telp	line.		
35	30	- 5	- 3	
42	42	0	0	
46	43	- 3	- 3	
48	44	- 4	- 4	
53	45	- 8	- 8	
56	48	- 8	- 8	
44	50	∠ 6	∠ 6	
44	52	∠ 8	∠ 8	
44	54	∠10	∠10	
45	55	∠10	∠10	
46	56	∠10	∠10	
53	60	∠ 7	∠ 7	
59	70	∠11	∠10	
81	86	∠ 5	∠ 4	
90	90	0	0	
96	101	∠ 5	∠ 4	
104	104	0	0	
106	110	∠ 4	∠ 4	
113	113	0	0	
113	121	∠ 8	∠ 7	
106	121	∠15	∠14	
115	118	∠ 3	∠ 3	
115	117	∠ 2	∠ 2	
116	116	0	0	
From BM 66RS along Lummi Shore Rd,				
thence NW to telp line.				
32	32	0	0	
44	44	0	0	
39	39	0	0	
60	47	-13	-13	
51	56	∠ 5	∠ 5	
51	57	∠ 6	∠ 6	
54	59	∠ 5	∠ 5	
53	60	∠ 7	∠ 6	
56	67	∠11	∠ 9	
64	76	∠12	∠10	
72	84	∠12	∠10	
81	99	∠18	∠14	
92	110	∠18	∠14	
97	117	∠20	∠17	
109	123	∠14	∠13	
113	126	∠13	∠12	
125	132	∠ 7	∠ 6	
129	135	∠ 6	∠ 5	
129	136	∠ 7	∠ 6	
130	138	∠ 8	∠ 7	
137	141	∠ 4	∠ 3	
148	155	∠ 7	∠ 6	
153	163	∠10	∠10	

M-2875-12

TOPOGRAPHIC MAPPING

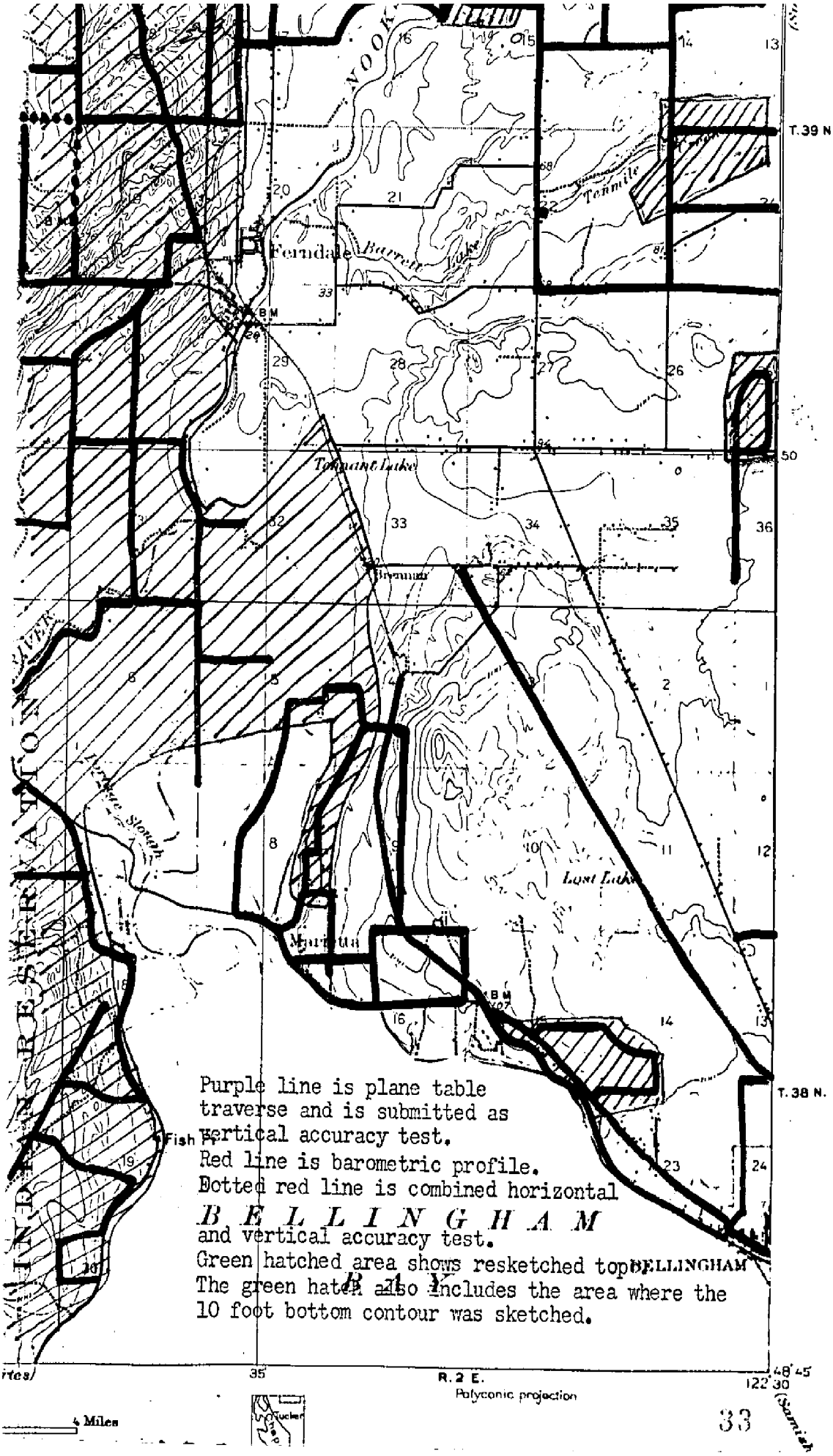
Summary & Abstract of Vertical Accuracy Test

Project No. Ph-26 Quad. No. T-5584 Quad. Name _____
Method of Testing Plane table profiling
Tested by R. H. Skelton Date May 1952 Evaluated by R.H.S. II
Contour interval 20 ft. 1.22 M.M. allowable shift at 1/10,000 map or manuscript scale.

539 Total number of points tested
83 % of points within ½ contour interval or better
455 Test points correct within ½ contour interval
80 Test points in error between ½ and full contour interval
4 Test points in error over full contour interval

Test Elev.	Map Elev.	Error	Error after shift	Remarks	Test Elev.	Map Elev.	Error	Error after shift	Remarks
150	161	∠11	∠10		34	35	∠ 1	∠ 1	Y-rd
147	156	∠ 9	∠ 8		32	34	∠ 2	∠ 2	
From BM 66RS southwest to Cagey Rd,					32	31	- 1	- 1	x-rd
thence east to tie.					32	32	0	0	
40	50	∠10	∠ 6		30	33	∠ 3	∠ 3	
73	57	-16	-12		29	35	- 6	- 6	
87	74	-13	- 9		32	36	∠ 4	∠ 4	
97	101	∠ 4	∠ 2		40	38	∠ 2	∠ 2	
113	124	∠11	∠ 9		41	41	0	0	
114	127	∠13	∠11		24	24	0	0	
114	130	∠16	∠14		20	23	∠ 3	∠ 3	
118	134	+16 ∠15	+16 ∠13						
123	138	∠15	∠13						
122	135	∠13	∠11						
117	130	∠13	∠11						
111	124	∠13	∠11						
108	117	∠ 9	∠ 7						
105	108	∠ 3	∠ 1						
99	99	0	0						
95	95	0	0						
94	94	0	0						
98	90	- 8	- 8						
88	88	0	0						
69	69	0	0						
Along Smith Rd east from Great									
Northern Rwy, thence NW along rte									
99 to Ferndale, thence SE along RR									
to Smith Rd.									
15	28	∠13	∠13						
22	34	∠12	∠12						
28	39	∠11	∠11						
61	68	∠ 7	∠ 6	x-rd					
28	38	∠10	∠10						
26	38	∠12	∠12						

M-2875-12



Purple line is plane table traverse and is submitted as vertical accuracy test.
Red line is barometric profile.
Dotted red line is combined horizontal and vertical accuracy test.
Green hatched area shows resketched top. The green hatch also includes the area where the 10 foot bottom contour was sketched.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station BEECH 1911, 1927 *State* Washington

Chief of party C.W.C. *Date* 6 October 1952 *Computed by* R.H.S. II

Observer R.H.S. II *Instrument* USC&GS 231 *Checked by*

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Bellingham, Olympic Portland Cement Co., Stack, NE of 3	0 00 00.00			0 00 00.00	
Bellingham, Bellingham Breakwater Entrance light	01 16 40.2				
JOHN 3 (USE)	(328 45 26.4)	Computed.			
Bellingham, Squalicum Creek Entrance Light	358 29 57.6				

Observed from instrument tripod.
No eccentricities.
Recorded p. 2, Vol. 1

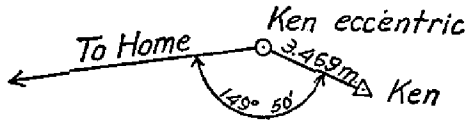
*These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station JOHN 3 (USE) 1941 *State* Washington

Chief of party C. W. C. *Date* 24 Oct 1952 *Computed by* R.H.S. II

Observer R.H.S. II *Instrument* USC&GS 231 *Checked by*

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Bellingham, Oeser Cedar Co., Stack, 1941	0 00 00.00			0 00 00.00	
Bellingham, Olympic Portland Cement Co., Stack, NE of 3	00 40 32.0				
Bellingham, Olympic Portland Cement Co., Stack NE of 3	(00 40 46.3)	Computed as check on point observed.			
Bellingham, Squalicum Creek Entrance Light	11 44 59.8				
Bellingham, Bellingham Breakwater Entrance Light	13 55 18.9				
BEECH 1914, 1927	(22 30 42.6)	Computed this date.			
BEECH 1914, 1927	(22 30 38.7)	Computed by CWC, reduced from his list of 4/5/50 to this initial.			

Observed from instrument tripod.
No eccentricities.
Recorded pp. 3,4, Vol. 1

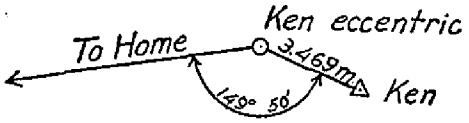
*These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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Form T-2

PHOTOGRAMMETRIC OFFICE REVIEW

T-5584 N

1. Projection and grids ACR 2. Title ACR 3. Manuscript numbers ACR 4. Manuscript size ACR

CONTROL STATIONS

5. Horizontal control stations of third-order or higher accuracy ACR 6. Recoverable horizontal stations of less than third-order accuracy (topographic stations) ACR 7. Photo hydro stations ACR 8. Bench marks ACR 9. Plotting of sextant fixes ACR 10. Photogrammetric plot report ACR 11. Detail points _____

ALONGSHORE AREAS

(Nautical Chart Data)

12. Shoreline ACR 13. Low-water line ACR 14. Rocks, shoals, etc ACR 15. Bridges ACR 16. Aids to navigation ACR 17. Landmarks ACR 18. Other alongshore physical features ACR 19. Other alongshore cultural features ACR

PHYSICAL FEATURES

20. Water features ACR 21. Natural ground cover ACR 22. ~~Planetable contours~~ _____ 23. Stereoscopic instrument contours ACR 24. Contours in general ACR 25. Spot elevations ACR 26. Other physical features ACR

CULTURAL FEATURES

27. Roads ACR 28. Buildings ACR 29. Railroads ACR 30. Other cultural features ACR

BOUNDARIES

31. Boundary lines ACR 32. Public land lines ACR

MISCELLANEOUS

33. Geographic names [illegible] 34. Junctions ACR 35. Legibility of the manuscript ACR 36. Discrepancy overlay ACR 37. Descriptive Report ACR 38. Field inspection photographs ACR 39. Forms ACR

40. Albert C. Franck, Jr. — Reviewer

Henry P. Eichel — Supervisor, Review Section or Unit

41. Remarks (see attached sheet)

FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT

42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.

Bonnie Wilson — Compiler

Henry P. Eichel — Supervisor

43. Remarks:

M-2623-12

Form T-2

PHOTOGRAMMETRIC OFFICE REVIEW

T-5584-S

1. Projection and grids DMB 2. Title DMB 3. Manuscript numbers DMB 4. Manuscript size DMB

CONTROL STATIONS

5. Horizontal control stations of third-order or higher accuracy DMB 6. Recoverable horizontal stations of less than third-order accuracy (topographic stations) DMB 7. Photo hydro stations DMB 8. Bench marks DMB 9. Plotting of sextant fixes DMB 10. Photogrammetric plot report DMB 11. Detail points DMB

ALONGSHORE AREAS

(Nautical Chart Data)

12. Shoreline DMB 13. Low-water line DMB 14. Rocks, shoals, etc. DMB 15. Bridges DMB 16. Aids to navigation DMB 17. Landmarks DMB 18. Other alongshore physical features DMB 19. Other alongshore cultural features DMB

PHYSICAL FEATURES

20. Water features DMB 21. Natural ground cover DMB 22. Planetable contours ~~DMB~~ 23. Stereoscopic instrument contours DMB 24. Contours in general DMB 25. Spot elevations DMB 26. Other physical features DMB

CULTURAL FEATURES

27. Roads DMB 28. Buildings DMB 29. Railroads DMB 30. Other cultural features DMB

BOUNDARIES

31. Boundary lines DMB 32. Public land lines DMB

MISCELLANEOUS

33. Geographic names [illegible] 34. Junctions DMB 35. Legibility of the manuscript DMB 36. Discrepancy overlay DMB 37. Descriptive Report ____ 38. Field inspection photographs DMB 39. Forms DMB

40. Donald M. Brant
Reviewer

Henry P. Eichel
Supervisor, Review Section or Unit

41. Remarks (see attached sheet)

FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT

42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.

Bernice Wilson
Compiler

Henry P. Eichel
Supervisor

43. Remarks:

M-2623-12

This chart shows the vertical clearance for the bridge at latitude 48° 47.5', longitude 122° 35.3' as 15 feet which was probably taken from an advance print of T-5584. This value was referenced to MLLW datum based on predicted times for this area at the time of the measurement in the field. The clearance from the MHW datum is 10 feet.

This survey shows some primary roads which are not charted.

66. Adequacy of Results and Future Surveys.-This map meets the National Standards of Map Accuracy and complies with project instructions. *except possibly for contours.*

67. Junctions.-All junction discrepancies with the published quadrangle, Bertrand Creek, Washington (USGS 1952) scale 1:24,000 were reconciled during this review, except as follows:

At longitude 122° 33.3' and 122° 37.3' - woodland limit.
At longitude 122° 30.4' - woodland limit and section line differ between the two maps by approximately 17 meters. Planimetric detail is in agreement with the USGS map both eastward and westward. Also the position of the line as shown on T-5584 checks the plotted position by GLO data. Therefore, it is believed that the position as shown on T-5584 is accurate.

68. Bridges.- Vertical clearances for the three bridges at Ferndale were referenced to water level for a time and date. Because the tidal effect at this point was not determined or is negligible, the clearances could not be determined from the field data. Also, the disparity between the field measurements and the values in the Bridge Book indicate the fluctuation in river level to be the controlling factor rather than tides.

69. Landmarks.-Forms 567 were submitted during this review for "STACK" and "RADIO RANGE STATION". Forms 567 not included as part of this report are filed as part of Chart Letter L 242 (1951) and L 326(1950).

Reviewed by:

Everett H. Ramey

Everett H. Ramey

APPROVED

L C Lundy
Chief, Review Branch
Div. of Photogrammetry

Mary B Ricketts
Chief, Nautical Chart Branch
Division of Charts

H M Robinson
Chief, Div. of Photogrammetry

23 Nov '59.

J. Bowie
Chief, Div. of Coastal Surveys

62. Comparison with Registered Topographic Surveys.-

T-1798	1:10,000	1887
1799	"	"
2069	1:5,000	1891
2920	1:10,000	1909
3480	1:5,000	1914
4277	1:10,000	1927

Many changes in shoreline and cultural features have occurred since these surveys. Survey T-5584 should supersede the above surveys for nautical charting purposes for the area encompassed by this survey.

63. Comparison with Maps of Other Agencies.-

Blaine, Washington quadrangle (USGS) 1:62,500 1907

A visual comparison reveals general agreement in contouring. There have been many cultural changes and the Nooksack River delta has built seaward approximately one mile.

64. Comparison with Contemporary Hydrographic Surveys.- None

65. Comparison with Nautical Charts.-

6378 1:40,000 1935 corr. to 54-8/9

A form 567 was submitted at the time of this review correcting landmark "STACK (CENTER OF THREE)".

This chart shows piling at lat. 48°45.4, longitude 122°30.2' which was not field inspected. However, there is some indication of piling on the photographs and it should be retained on the chart.

This survey shows an addition to the pier at latitude 48° 45.5', longitude 122° 30.3' which is not charted. This survey shows an extension to the breakwater at latitude 48° 45.4', longitude 122° 30.1' which is not charted. This survey shows piling at latitude 48° 45.6', longitude 122° 36.4' which is not shown at the chart.

The field inspection party delineated on the photographs some low-water line on the west side of Bellingham Bay which differs with the position shown on the chart. This line apparently was delineated to follow a tone line on photographs not taken at the time of low water. The accuracy is therefore questionable and it has been labeled "approximate" on the map.

48. GEOGRAPHIC NAME LIST

Alderwood Ave
Aldrich Road
Axton Rd

Bakerview Rd
Bancroft Rd
Barrett Lake
Beaver Dam
Bellingham
Bellingham Airport
Bellingham Bay
Bennett Ave
Birchwood
Birchwood Ave · Bible Camp
Brennan
Byers Rd

CAA Reservation (more than one) STR
Cagey Road
Cedarwood Ave
Cherrywood Ave CM St P & P Ry
Church Rd
Cottonwood Ave
Curtis Rd

Deer Creek
Douglas Rd

Edens Ave

Ferndale · Ferndale City Reservoir
Ferndale Rd
Fish Point FERNDALE TOWNSHIP
Fort Bellingham Rd

Gilason Rd
Great Northern Railway
Graveline Rd
(Green Acres Memorial
(Park Cemetery
Greenwood Ave

Hemmi Rd
Hendrickson Rd
Hoff Rd
Hovander Rd

Imhoff Rd

Johnson Rd – Per Whatcom Co. Hy. Map – Johnston Road
Jones Rd

Kass Rd
~~Kivina~~ Rd
Kwina

48. GEOGRAPHIC NAMES (continued)

Labounty Rd
Lange Rd
Larrabee Rd
Larson Rd
Laurel Rd
Laurelwood Ave
Lumni Cemetery
Lumi Shore Road
Lummi
Lummi Indian Reservation
Lummi River

Lummi School

Mallory Rd
Marietta
Marietta Rd
McAlpine Rd
Mt View Rd

Marietta Township
Marietta Community church
Mountain View Township
McLoud Rd

Neevel Rd
Neilson Rd
New Kirk Rd
Nooksack River
Northwest Rd

North Bellingham Grange
North Bellingham school

Olympic Way
Oswald Rd

Pacific Highway (U.S. 99)
Paradise Rd
Pinewood Ave
Pioneer Park
Piper Rd

Rayhorst Rd
Reighton Rd
Red River Rd
River Rd
Rural Ave

Slater Rd
Slater Slough
Smith Rd
Smuggler Slough
Sunset Ave
(Squalicum Creek
(Waterway

Smuggler's (Lummi Island)

Squalicum Creek

St. Joachims Church

Tenmile Creek
Tennant Lake
Thornton Rd

48. GEOGRAPHIC NAMES (CONTINUED)

Ulrick Rd
U.S. 99

Ph 5 1

Waske Rd
Wiser Lake Rd
Woodlawn Cemetery
Woodlyn Rd
Wynn Rd

Whatcom County Hospital

Names underlined in red are approved. 7-19-51.
L. Heck

Based on names report for project. Road names from 1939 Whatcom Co. Hy. Map.

Names checked and approved
8-16-54
A. J. C.

49. NOTES FOR THE HYDROGRAPHER

Following is a list of recoverable topographic stations which may be used during the Hydrographic Survey.

CONTROL TOWER, 1950
EDGE, 1950
LUMI, 1949
SQUALICUM CREEK WATERWAY LIGHT, 1950
CAGE, 1949
~~CITY, 1951~~ c/k
JOHN 3 (USE) 1941 AZ MK, 1950

Form 567
April 1945

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

TO BE CHARTED
~~TO BE DELETED~~ } STRIKE OUT ONE

Baltimore, Maryland, 19 51

I recommend that the following objects which have (~~have not~~) 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 Albert C. Rauck, Jr.

Albert C. Rauck, Jr.

Hubert A. Paton
Hubert A. Paton, Chief of Party.

STATE: WASHINGTON

CHARTING NAME	DESCRIPTION	SIGNAL NAME	POSITION LATITUDE ° ′	LATITUDE D.M. METERS	LONGITUDE ° ′	LONGITUDE D.P. METERS	DATUM	METHOD OF LOCATION AND SURVEY No.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
	Squalicum Creek Waterway Light		48 45	1054	122 30	737	NA 1927	Multiplex T-5584	1950	x	x		6300,6370 6380

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. 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

Form 567
April 1945

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

TO BE CHARTED / ~~TO BE DELETED~~ } STRIKE OUT ONE

Baltimore, Maryland May 1, 19 53

I recommend that the following objects which have ~~(have not)~~ 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 Donald M. Brant

Ph 26(47)

Jack C. Sammons
Chief of Party.

STATE Washington

CHARTING NAME	DESCRIPTION	SIGNAL NAME	POSITION LATITUDE* ° ′	LATITUDE* ″ D.M. METERS	LONGITUDE* ° ′	LONGITUDE* ″ D.P. METERS	DATUM	METHOD OF LOCATION AND SURVEY No.*	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
	BELLINGHAM SQUALICUM CREEK ENTRANCE LIGHT		48 45	24.395 753.6	122 30	41.042 838.3	NA 1927	T-5584 Triang-ulation	1952		x	x	6300,6378 6380
	BELLINGHAM, BELLINGHAM BREAKWATER ENTRANCE LT		48 45	12.370 382.1	122 30	21.855 446.4	"	"	"		x	x	6300,6378, 6380
	* Shown on map is less than third-order in accuracy. JMR												
	NOTE: These aids located during the field edit.												

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. The data should be compiled [illegible]

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station LUMI (Topo.) *State* Washington

Chief of party C.W.Clark, *Date* 12/6/49 *Computed by* J.C.L. C.W.C.

Observer J.C.Lajoye *Instrument* 7" Berger No. 231 *Checked by* C.W.C.

U. S. GOVERNMENT PRINTING OFFICE: 1932 11—9503

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
BUSWELL (U.S.E.)	0 00 00.00			0 00 00.00	
Bellingham, Oeser Cedar Co., Stack, 1941	29 08 25.8				
Bellingham Museum (City Hall, 1927)	42 50 25.8				
Bellingham, Bloedel-Conovan, Stack, 1927	50 58 18.3				
Seattle-Vancouver Airway Beacon No.8,1941	93 23 09.1				
Squalicum Creek Waterway Light	37 09 09				
Squalicum Creek Entrance Light	39 11 54				
Whatcom Waterway Light	47 59 49				
KPUG Radio Tower	298 46 28				
KPUG Radio Tower	298 59 33				
KVOS Radio Tower	234 49 50				
KVOS Radio Tower	234 50 23				

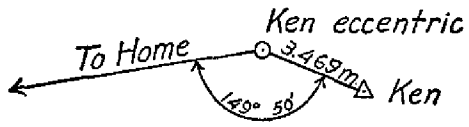
*These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

T-5564

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25
Ed. Jan., 1929

COMPUTATION OF TRIANGLES

11—9121
U. S. GOVERNMENT PRINTING OFFICE

State: _____

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3							3.942 8477
1	Bellingham, Bellingham Breakwater Ent. Lt.	(138 53 22.5)					0.182 0962
2	BEECH	32 31 13.8					9.730 4603
3	JOHN 3	08 35 23.7					9 174 2382
1-3							3.855 4042
1-2							3.299 1821
		/ / /					
2-3							3.942 8477
1	Bellingham, Squalicum Creek Ent Lt.	(139 29 46.0)					0.187 4211
2	BEECH	29 44 31.2					9.695 5651
3	JOHN 3	10 45 42.8					9.271 2092
1-3							3.825 8339
1-2							3.401 4720
		/ / /					
2-3							
1							
2							
3							
1-3							
1-2							
2-3							
1							
2							
3							
1-3							
1-2							

Do not write in this margin

AIRPORT SURVEY ____________________ COMPUTATION OF ELEVATIONS

Obstruction No. ________	From Base Point	From Base Point	References
Vertical Angle			
Log. Tangent			
Log. Distance to Obst.			
Log. Height Above Inst.			
Height Above Inst. in Feet			
Inst. Elev.			
C. & R. corr.			
Elev. of Obst.			

Obstruction No. ________	From Base Point	From Base Point	References
Vertical Angle			
Log. Tangent			
Log. Distance to Obst.			
Log. Height Above Inst.			
Height Above Inst. in Feet			
Inst. Elev.			
C. & R. corr.			
Elev. of Obst.			

Obstruction No. ________	From Base Point	From Base Point	References
Vertical Angle			
Log. Tangent			
Log. Distance to Obst.			
Log. Height Above Inst.			
Height Above Inst. in Feet			
Inst. Elev.			
C. & R. corr.			
Elev. of Obst.			

Obstruction No. ________	From Base Point	From Base Point	References
Vertical Angle			
Log. Tangent			
Log. Distance to Obst.			
Log. Height Above Inst.			
Height Above Inst. in Feet			
Inst. Elev.			
C. & R. corr.			
Elev. of Obst.			

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 662
Rev. Sept. 1942

INVERSE POSITION COMPUTATION

$$s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{\Delta\lambda_1 \cos\phi_m}{A_m}$$

$$s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{-\Delta\phi_1 \cos\frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha=\Delta\lambda \sin\phi_m \sec\frac{\Delta\phi}{2}+F(\Delta\lambda)^3$$

in which log $\Delta\lambda_1$=log $(\lambda'-\lambda)$−correction for arc to sin*; log $\Delta\phi_1$=log $(\phi'-\phi)$−correction for arc to sin*; and log s=log s_1+ correction for arc to sin*.

NAME OF STATION

1. ϕ	48° 46′ 13.997″	JOHN 3 (USE) 1941 Oeser/Cedar Company Stack, 1941.	λ	122° 36′ 00.236″	
2. ϕ'	48 46 08.790		λ'	122 30 54.568	
$\Delta\phi$ (=$\phi'-\phi$)	− 05.207		$\Delta\lambda$ (=$\lambda'-\lambda$)	− 05 05.668	
$\frac{\Delta\phi}{2}$	− 02.604		$\frac{\Delta\lambda}{2}$		
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$	48 − 46 − 11.393				
$\Delta\phi$ (secs.)	−5.207		$\Delta\lambda$ (secs.)	−305.668	

log $\Delta\phi$	0.716 588		**log** $\Delta\lambda$	2.485 250
cor. arc−sin	−		cor. arc−sin	−
log $\Delta\phi_1$			log $\Delta\lambda_1$	
log cos $\frac{\Delta\lambda}{2}$			**log cos** ϕ_m	9.818 912
colog B_m	1.489 823		**colog** A_m	1.491 106
log $\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	2.206 411	(opposite in sign to $\Delta\phi$)	**log** $\left\{s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.795 298 −
			log $\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	2.206 411 +
			log tan $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	11.588 887
log $\Delta\lambda$	2.485 250	3 log $\Delta\lambda$	$\alpha+\frac{\Delta\alpha}{2}$	271° 28′ 34.2″
log sin ϕ_m	9.876 257	log F.	**log sin** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.999 856
log sec $\frac{\Delta\phi}{2}$		log b	**log cos** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	8.410 965
log a	2.361 507		**log** s_1	3.795 444
a	229.88		cor. arc−sin	+
b			log s	
$-\Delta\alpha$ **(secs.)**	−229.9			
$-\frac{\Delta\alpha}{2}$	−1′ 55.0			
$\alpha+\frac{\Delta\alpha}{2}$	271° 28′ 34.2			
α **(1 to 2)**	271° 26′ 39.2			
$\Delta\alpha$	+ 3 499			
	180			
α' **(2 to 1)**	91° 30′ 39.1			

* Use the table on the back of this form for correction of arc to sin.

comp J.C.L.
I.Z. Jr.

NOTE.—For log s up to 4.0 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 3′, omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 7 decimal places.

16—31070-1

Table of arc-sin corrections for inverse position computations

log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$
4. 177	1	2. 686	5. 223	124	3. 732	5. 525	497	4. 034
4. 327	2	2. 836	5. 234	130	3. 743	5. 530	508	4. 039
4. 415	3	2. 924	5. 243	136	3. 752	5. 534	519	4. 043
4. 478	4	2. 987	5. 253	142	3. 762	5. 539	530	4. 048
4. 526	5	3. 035	5. 260	147	3. 769	5. 543	541	4. 052
4. 566	6	3. 075	5. 269	153	3. 778	5. 548	553	4. 057
4. 599	7	3. 108	5. 279	160	3. 788	5. 553	565	4. 062
4. 628	8	3. 137	5. 287	166	3. 796	5. 557	577	4. 066
4. 654	9	3. 163	5. 294	172	3. 803	5. 561	588	4. 070
4. 677	10	3. 186	5. 303	179	3. 812	5. 566	600	4. 075
4. 697	11	3. 206	5. 311	186	3. 820	5. 570	613	4. 079
4. 716	12	3. 225	5. 318	192	3. 827	5. 575	625	4. 084
4. 734	13	3. 243	5. 326	199	3. 835	5. 579	637	4. 088
4. 750	14	3. 259	5. 334	206	3. 843	5. 583	650	4. 092
4. 765	15	3. 274	5. 341	213	3. 850	5. 587	663	4. 096
4. 779	16	3. 288	5. 349	221	3. 858	5. 591	674	4. 100
4. 792	17	3. 301	5. 356	228	3. 865	5. 595	687	4. 104
4. 804	18	3. 313	5. 363	236	3. 872	5. 600	702	4. 109
4. 827	20	3. 336	5. 369	243	3. 878	5. 604	716	4. 113
4. 857	23	3. 366	5. 376	251	3. 885	5. 608	729	4. 117
4. 876	25	3. 385	5. 383	259	3. 892	5. 612	743	4. 121
4. 892	27	3. 401	5. 390	267	3. 899	5. 616	757	4. 125
4. 915	30	3. 424	5. 396	275	3. 905	5. 620	771	4. 129
4. 936	33	3. 445	5. 403	284	3. 912	5. 624	785	4. 133
4. 955	36	3. 464	5. 409	292	3. 918	5. 628	800	4. 137
4. 972	39	3. 481	5. 415	300	3. 924	5. 632	814	4. 141
4. 988	42	3. 497	5. 422	309	3. 931	5. 636	829	4. 145
5. 003	45	3. 512	5. 428	318	3. 937	5. 640	845	4. 149
5. 017	48	3. 526	5. 434	327	3. 943	5. 644	861	4. 153
5. 035	52	3. 544	5. 440	336	3. 949	5. 648	877	4. 157
5. 051	56	3. 560	5. 446	345	3. 955	5. 652	893	4. 161
5. 062	59	3. 571	5. 451	354	3. 960	5. 656	909	4. 165
5. 076	63	3. 585	5. 457	364	3. 966	5. 660	925	4. 169
5. 090	67	3. 599	5. 462	373	3. 971	5. 663	941	4. 172
5. 102	71	3. 611	5. 468	383	3. 977	5. 667	957	4. 176
5. 114	75	3. 623	5. 473	392	3. 982	5. 671	973	4. 180
5. 128	80	3. 637	5. 479	402	3. 988	5. 674	989	4. 183
5. 139	84	3. 648	5. 484	412	3. 993	5. 678	1005	4. 187
5. 151	89	3. 660	5. 489	422	3. 998			
5. 163	94	3. 672	5. 495	433	4. 004			
5. 172	98	3. 681	5. 500	443	4. 009			
5. 183	103	3. 692	5. 505	453	4. 014			
5. 193	108	3. 702	5. 510	464	4. 019			
5. 205	114	3. 714	5. 515	474	4. 024			
5. 214	119	3. 723	5. 520	486	4. 029			

U. S. GOVERNMENT PRINTING OFFICE 16—31070–1

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 662
Rev. Sept. 1942

INVERSE POSITION COMPUTATION

$$s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{\Delta\lambda_1 \cos\phi_m}{A_m}$$

$$s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{-\Delta\phi_1 \cos\frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha=\Delta\lambda \sin\phi_m \sec\frac{\Delta\phi}{2}+F(\Delta\lambda)^3$$

in which log $\Delta\lambda_1$=log $(\lambda'-\lambda)$−correction for arc to sin*; log $\Delta\phi_1$=log $(\phi'-\phi)$−correction for arc to sin*; and log s=log s_1+ correction for arc to sin*.

NAME OF STATION

1. ϕ	48	44	18.575	BEECH 1914	λ	122	29	28.126
2. ϕ'	48	46	13.997	JOHN 3(USE) 1941	λ'	122	36	00.236
$\Delta\phi$ (=$\phi'-\phi$)	+	01	55.422	$\Delta\lambda$ (=$\lambda'-\lambda$)			06	32.110
$\frac{\Delta\phi}{2}$		00	57.711	$\frac{\Delta\lambda}{2}$			03	16.055
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$	48	45	16.286					
$\Delta\phi$ (secs.)			115.422	$\Delta\lambda$ (secs.)				392.110

log $\Delta\phi$	2.062 2886	+	**log** $\Delta\lambda$	2.593 4079	+
cor. arc−sin	−		cor. arc−sin	−	
log $\Delta\phi_1$			log $\Delta\lambda_1$		
log cos $\frac{\Delta\lambda}{2}$			**log cos** ϕ_m	9.819 0741	+
colog B_m	1.489 8215		**colog** A_m	1.491 1060	+
log$\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.552 1101	(opposite in sign to $\Delta\phi$)	**log**$\left\{s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.903 5880	+
			log$\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.552 1101	
log $\Delta\lambda$	2.593 4079 +	3 log $\Delta\lambda$	**log tan** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	0.351 4779	+
log sin ϕ_m	9.876 1555	log F	$\alpha+\frac{\Delta\alpha}{2}$	113 59 49.235	
log sec $\frac{\Delta\phi}{2}$		log b	**log sin** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.960 7403	+
			log cos $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.609 2624	+
log a	2.469 5634		**log** s_1	3.942 8477	+
a	294.82	+	cor. arc−sin	+	
b			log s		
$-\Delta\alpha$ **(secs.)**	+ 294.82				
$-\frac{\Delta\alpha}{2}$	+ 147.41				
	+ 02	27.41			
$\alpha+\frac{\Delta\alpha}{2}$	113	59 49.24			
α **(1 to 2)**	114	02 16.65			
$\Delta\alpha$	− 04	54.82			
	180				
α' **(2 to 1)**	293	57 21.83			

* Use the table on the back of this form for correction of arc to sin.

NOTE.—For log s up to 4.0 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 3′, omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 7 decimal places.

10—31070-1

Table of arc-sin corrections for inverse position computations

log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$
4. 177	1	2. 686	5. 223	124	3. 732	5. 525	497	4. 034
4. 327	2	2. 836	5. 234	130	3. 743	5. 530	508	4. 039
4. 415	3	2. 924	5. 243	136	3. 752	5. 534	519	4. 043
4. 478	4	2. 987	5. 253	142	3. 762	5. 539	530	4. 048
4. 526	5	3. 035	5. 260	147	3. 769	5. 543	541	4. 052
4. 566	6	3. 075	5. 269	153	3. 778	5. 548	553	4. 057
4. 599	7	3. 108	5. 279	160	3. 788	5. 553	565	4. 062
4. 628	8	3. 137	5. 287	166	3. 796	5. 557	577	4. 066
4. 654	9	3. 163	5. 294	172	3. 803	5. 561	588	4. 070
4. 677	10	3. 186	5. 303	179	3. 812	5. 566	600	4. 075
4. 697	11	3. 206	5. 311	186	3. 820	5. 570	613	4. 079
4. 716	12	3. 225	5. 318	192	3. 827	5. 575	625	4. 084
4. 734	13	3. 243	5. 326	199	3. 835	5. 579	637	4. 088
4. 750	14	3. 259	5. 334	206	3. 843	5. 583	650	4. 092
4. 765	15	3. 274	5. 341	213	3. 850	5. 587	663	4. 096
4. 779	16	3. 288	5. 349	221	3. 858	5. 591	674	4. 100
4. 792	17	3. 301	5. 356	228	3. 865	5. 595	687	4. 104
4. 804	18	3. 313	5. 363	236	3. 872	5. 600	702	4. 109
4. 827	20	3. 336	5. 369	243	3. 878	5. 604	716	4. 113
4. 857	23	3. 366	5. 376	251	3. 885	5. 608	729	4. 117
4. 876	25	3. 385	5. 383	259	3. 892	5. 612	743	4. 121
4. 892	27	3. 401	5. 390	267	3. 899	5. 616	757	4. 125
4. 915	30	3. 424	5. 396	275	3. 905	5. 620	771	4. 129
4. 936	33	3. 445	5. 403	284	3. 912	5. 624	785	4. 133
4. 955	36	3. 464	5. 409	292	3. 918	5. 628	800	4. 137
4. 972	39	3. 481	5. 415	300	3. 924	5. 632	814	4. 141
4. 988	42	3. 497	5. 422	309	3. 931	5. 636	829	4. 145
5. 003	45	3. 512	5. 428	318	3. 937	5. 640	845	4. 149
5. 017	48	3. 526	5. 434	327	3. 943	5. 644	861	4. 153
5. 035	52	3. 544	5. 440	336	3. 949	5. 648	877	4. 157
5. 051	56	3. 560	5. 446	345	3. 955	5. 652	893	4. 161
5. 062	59	3. 571	5. 451	354	3. 960	5. 656	909	4. 165
5. 076	63	3. 585	5. 457	364	3. 966	5. 660	925	4. 169
5. 090	67	3. 599	5. 462	373	3. 971	5. 663	941	4. 172
5. 102	71	3. 611	5. 468	383	3. 977	5. 667	957	4. 176
5. 114	75	3. 623	5. 473	392	3. 982	5. 671	973	4. 180
5. 128	80	3. 637	5. 479	402	3. 988	5. 674	989	4. 183
5. 139	84	3. 648	5. 484	412	3. 993	5. 678	1005	4. 187
5. 151	89	3. 660	5. 489	422	3. 998			
5. 163	94	3. 672	5. 495	433	4. 004			
5. 172	98	3. 681	5. 500	443	4. 009			
5. 183	103	3. 692	5. 505	453	4. 014			
5. 193	108	3. 702	5. 510	464	4. 019			
5. 205	114	3. 714	5. 515	474	4. 024			
5. 214	119	3. 723	5. 520	486	4. 029			

U. S. GOVERNMENT PRINTING OFFICE 16—81070-1

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 662
Rev. Sept. 1942

INVERSE POSITION COMPUTATION

$$s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{\Delta\lambda_1 \cos\phi_m}{A_m}$$

$$s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{-\Delta\phi_1 \cos\frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha=\Delta\lambda \sin\phi_m \sec\frac{\Delta\phi}{2}+F(\Delta\lambda)^3$$

in which $\log \Delta\lambda_1 = \log(\lambda'-\lambda)$ − correction for arc to sin*; $\log \Delta\phi_1 = \log(\phi'-\phi)$ − correction for arc to sin*; and $\log s = \log s_1$ + correction for arc to sin*.

NAME OF STATION

1. ϕ	48°	46′	13.997″	JOHN 3 (USE) 1941 Bellingham, Olympic Portland Cement Co., 5½ NE of 3	λ	122°	36′	00.236″
2. ϕ'	48	46	07.080		λ'	122	31	21.880
$\Delta\phi\ (=\phi'-\phi)$		−	06.917		$\Delta\lambda\ (=\lambda'-\lambda)$	−	04	38.356
$\frac{\Delta\phi}{2}$		−	03.458		$\frac{\Delta\lambda}{2}$	−	02	19.178
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$	48	−	46 − 10.538					
$\Delta\phi$ (secs.)			06.917″		$\Delta\lambda$ (secs.)			278.356″
log $\Delta\phi$	0.839 9178				**log** $\Delta\lambda$	2.444 6006		
cor. arc−sin	−				cor. arc−sin	−		
log $\Delta\phi_1$					log $\Delta\lambda_1$			
log cos $\frac{\Delta\lambda}{2}$					**log cos** ϕ_m	9.818 9438		
colog B_m	1.489 8226				**colog** A_m	1.491 1064		
log $\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	2.329 7404	+	(opposite in sign to $\Delta\phi$)		**log** $\left\{s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.754 6508	−	
					log $\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	2.329 7404	+	
					log tan $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	1.424 9104		
log $\Delta\lambda$	2.444 6006	3 log $\Delta\lambda$			$\alpha+\frac{\Delta\alpha}{2}$	272°	03′	10.154″
log sin ϕ_m	9.876 2555	log F			**log sin** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.999 6934		
log sec $\frac{\Delta\phi}{2}$		log b			**log cos** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	8.574 7830		
log a	2.320 8561				**log** s_1	3.754 9574		
a	− 209.34				cor. arc−sin	+		
b					log s			
$-\Delta\alpha$ **(secs.)**		− 209.34″						
$-\frac{\Delta\alpha}{2}$		− 104.67						
			01°	44.67′				
$\alpha+\frac{\Delta\alpha}{2}$	272°	03′	10.15″					
α **(1 to 2)**	272	07	25.48					
$\Delta\alpha$		03	29.34					
180								
α' **(2 to 1)**	92	10	54.82					

* Use the table on the back of this form for correction of arc to sin.

NOTE.—For log s up to 4.0 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 3′, omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 7 decimal places.

16—81070-1

Table of arc-sin corrections for inverse position computations

log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$
4. 177	1	2. 686	5. 223	124	3. 732	5. 525	497	4. 034
4. 327	2	2. 836	5. 234	130	3. 743	5. 530	508	4. 039
4. 415	3	2. 924	5. 243	136	3. 752	5. 534	519	4. 043
4. 478	4	2. 987	5. 253	142	3. 762	5. 539	530	4. 048
4. 526	5	3. 035	5. 260	147	3. 769	5. 543	541	4. 052
4. 566	6	3. 075	5. 269	153	3. 778	5. 548	553	4. 057
4. 599	7	3. 108	5. 279	160	3. 788	5. 553	565	4. 062
4. 628	8	3. 137	5. 287	166	3. 796	5. 557	577	4. 066
4. 654	9	3. 163	5. 294	172	3. 803	5. 561	588	4. 070
4. 677	10	3. 186	5. 303	179	3. 812	5. 566	600	4. 075
4. 697	11	3. 206	5. 311	186	3. 820	5. 570	613	4. 079
4. 716	12	3. 225	5. 318	192	3. 827	5. 575	625	4. 084
4. 734	13	3. 243	5. 326	199	3. 835	5. 579	637	4. 088
4. 750	14	3. 259	5. 334	206	3. 843	5. 583	650	4. 092
4. 765	15	3. 274	5. 341	213	3. 850	5. 587	663	4. 096
4. 779	16	3. 288	5. 349	221	3. 858	5. 591	674	4. 100
4. 792	17	3. 301	5. 356	228	3. 865	5. 595	687	4. 104
4. 804	18	3. 313	5. 363	236	3. 872	5. 600	702	4. 109
4. 827	20	3. 336	5. 369	243	3. 878	5. 604	716	4. 113
4. 857	23	3. 366	5. 376	251	3. 885	5. 608	729	4. 117
4. 876	25	3. 385	5. 383	259	3. 892	5. 612	743	4. 121
4. 892	27	3. 401	5. 390	267	3. 899	5. 616	757	4. 125
4. 915	30	3. 424	5. 396	275	3. 905	5. 620	771	4. 129
4. 936	33	3. 445	5. 403	284	3. 912	5. 624	785	4. 133
4. 955	36	3. 464	5. 409	292	3. 918	5. 628	800	4. 137
4. 972	39	3. 481	5. 415	300	3. 924	5. 632	814	4. 141
4. 988	42	3. 497	5. 422	309	3. 931	5. 636	829	4. 145
5. 003	45	3. 512	5. 428	318	3. 937	5. 640	845	4. 149
5. 017	48	3. 526	5. 434	327	3. 943	5. 644	861	4. 153
5. 035	52	3. 544	5. 440	336	3. 949	5. 648	877	4. 157
5. 051	56	3. 560	5. 446	345	3. 955	5. 652	893	4. 161
5. 062	59	3. 571	5. 451	354	3. 960	5. 656	909	4. 165
5. 076	63	3. 585	5. 457	364	3. 966	5. 660	925	4. 169
5. 090	67	3. 599	5. 462	373	3. 971	5. 663	941	4. 172
5. 102	71	3. 611	5. 468	383	3. 977	5. 667	957	4. 176
5. 114	75	3. 623	5. 473	392	3. 982	5. 671	973	4. 180
5. 128	80	3. 637	5. 479	402	3. 988	5. 674	989	4. 183
5. 139	84	3. 648	5. 484	412	3. 993	5. 678	1005	4. 187
5. 151	89	3. 660	5. 489	422	3. 998			
5. 163	94	3. 672	5. 495	433	4. 004			
5. 172	98	3. 681	5. 500	443	4. 009			
5. 183	103	3. 692	5. 505	453	4. 014			
5. 193	108	3. 702	5. 510	464	4. 019			
5. 205	114	3. 714	5. 515	474	4. 024			
5. 214	119	3. 723	5. 520	486	4. 029			

U. S. GOVERNMENT PRINTING OFFICE 16—81070-1

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 662
Rev. Sept. 1942

INVERSE POSITION COMPUTATION

$$s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{\Delta\lambda_1 \cos\phi_m}{A_m}$$

$$s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{-\Delta\phi_1 \cos\frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha=\Delta\lambda \sin\phi_m \sec\frac{\Delta\phi}{2}+F(\Delta\lambda)^3$$

in which $\log \Delta\lambda_1 = \log(\lambda'-\lambda)$ − correction for arc to sin*; $\log \Delta\phi_1 = \log(\phi'-\phi)$ − correction for arc to sin*; and $\log s = \log s_1$ + correction for arc to sin*.

NAME OF STATION

1. ϕ	48	44	18.575	BEECH 1914 Bellingham, Olympic, Portion Sequent Co. Stk NE of 3	λ	122	29	28.126
2. ϕ'	48	46	07.080		λ'	122	31	21.880
$\Delta\phi$ $(=\phi'-\phi)$	+	01	48.505		$\Delta\lambda$ $(=\lambda'-\lambda)$	+	01	53.754
$\frac{\Delta\phi}{2}$			54.252		$\frac{\Delta\lambda}{2}$			56.877
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$	48	45	12.827					
$\Delta\phi$ (secs.)	+ 108.505				$\Delta\lambda$ (secs.)	+ 113.754		

log $\Delta\phi$	2.035 4498	+			**log** $\Delta\lambda$	2.055 9667	+	
cor. arc−sin	—				cor. arc−sin	—		
log $\Delta\phi_1$					log $\Delta\lambda_1$			
log cos $\frac{\Delta\lambda}{2}$					**log cos** ϕ_m	9.819 0824		
colog B_m	1.481 8214				**colog** A_m	1.491 1060		
log $\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.525 2712	m	(opposite in sign to $\Delta\phi$)		**log** $\left\{s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.366 1551	+	
					log $\left\{s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.525 2712	m	
log $\Delta\lambda$	2.055 9667	3 log $\Delta\lambda$			**log tan** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.840 8839	"	m
log sin ϕ_m	9.876 1491	log F			$\alpha+\frac{\Delta\alpha}{2}$	145 16 07.44		
log sec $\frac{\Delta\phi}{2}$		log b			**log sin** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.755 6677	+	
log a	+1.932 1158				**log cos** $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.914 7838	m	
a	85.53				**log** s_1	3.610 4874		
b					cor. arc−sin	+		
$-\Delta\alpha$ **(secs.)**	+ 85.53				log s			
$-\frac{\Delta\alpha}{2}$	+ 42.76							
$\alpha+\frac{\Delta\alpha}{2}$	145	16	07.44	42.76				
α **(1 to 2)**	145	16	50.20					
$\Delta\alpha$		− 01	25.53					
	180							
α' **(2 to 1)**	325	15	24.67					

* Use the table on the back of this form for correction of arc to sin.

NOTE.—For log s up to 4.0 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 3′, omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 7 decimal places.

16—31070-1

Table of arc-sin corrections for inverse position computations

$\log s_1$	Arc-sin correction in units of seventh decimal of logarithms	$\log \Delta\phi$ or $\log \Delta\lambda$	$\log s_1$	Arc-sin correction in units of seventh decimal of logarithms	$\log \Delta\phi$ or $\log \Delta\lambda$	$\log s_1$	Arc-sin correction in units of seventh decimal of logarithms	$\log \Delta\phi$ or $\log \Delta\lambda$
4. 177	1	2. 686	5. 223	124	3. 732	5. 525	497	4. 034
4. 327	2	2. 836	5. 234	130	3. 743	5. 530	508	4. 039
4. 415	3	2. 924	5. 243	136	3. 752	5. 534	519	4. 043
4. 478	4	2. 987	5. 253	142	3. 762	5. 539	530	4. 048
4. 526	5	3. 035	5. 260	147	3. 769	5. 543	541	4. 052
4. 566	6	3. 075	5. 269	153	3. 778	5. 548	553	4. 057
4. 599	7	3. 108	5. 279	160	3. 788	5. 553	565	4. 062
4. 628	8	3. 137	5. 287	166	3. 796	5. 557	577	4. 066
4. 654	9	3. 163	5. 294	172	3. 803	5. 561	588	4. 070
4. 677	10	3. 186	5. 303	179	3. 812	5. 566	600	4. 075
4. 697	11	3. 206	5. 311	186	3. 820	5. 570	613	4. 079
4. 716	12	3. 225	5. 318	192	3. 827	5. 575	625	4. 084
4. 734	13	3. 243	5. 326	199	3. 835	5. 579	637	4. 088
4. 750	14	3. 259	5. 334	206	3. 843	5. 583	650	4. 092
4. 765	15	3. 274	5. 341	213	3. 850	5. 587	663	4. 096
4. 779	16	3. 288	5. 349	221	3. 858	5. 591	674	4. 100
4. 792	17	3. 301	5. 356	228	3. 865	5. 595	687	4. 104
4. 804	18	3. 313	5. 363	236	3. 872	5. 600	702	4. 109
4. 827	20	3. 336	5. 369	243	3. 878	5. 604	716	4. 113
4. 857	23	3. 366	5. 376	251	3. 885	5. 608	729	4. 117
4. 876	25	3. 385	5. 383	259	3. 892	5. 612	743	4. 121
4. 892	27	3. 401	5. 390	267	3. 899	5. 616	757	4. 125
4. 915	30	3. 424	5. 396	275	3. 905	5. 620	771	4. 129
4. 936	33	3. 445	5. 403	284	3. 912	5. 624	785	4. 133
4. 955	36	3. 464	5. 409	292	3. 918	5. 628	800	4. 137
4. 972	39	3. 481	5. 415	300	3. 924	5. 632	814	4. 141
4. 988	42	3. 497	5. 422	309	3. 931	5. 636	829	4. 145
5. 003	45	3. 512	5. 428	318	3. 937	5. 640	845	4. 149
5. 017	48	3. 526	5. 434	327	3. 943	5. 644	861	4. 153
5. 035	52	3. 544	5. 440	336	3. 949	5. 648	877	4. 157
5. 051	56	3. 560	5. 446	345	3. 955	5. 652	893	4. 161
5. 062	59	3. 571	5. 451	354	3. 960	5. 656	909	4. 165
5. 076	63	3. 585	5. 457	364	3. 966	5. 660	925	4. 169
5. 090	67	3. 599	5. 462	373	3. 971	5. 663	941	4. 172
5. 102	71	3. 611	5. 468	383	3. 977	5. 667	957	4. 176
5. 114	75	3. 623	5. 473	392	3. 982	5. 671	973	4. 180
5. 128	80	3. 637	5. 479	402	3. 988	5. 674	989	4. 183
5. 139	84	3. 648	5. 484	412	3. 993	5. 678	1005	4. 187
5. 151	89	3. 660	5. 489	422	3. 998			
5. 163	94	3. 672	5. 495	433	4. 004			
5. 172	98	3. 681	5. 500	443	4. 009			
5. 183	103	3. 692	5. 505	453	4. 014			
5. 193	108	3. 702	5. 510	464	4. 019			
5. 205	114	3. 714	5. 515	474	4. 024			
5. 214	119	3. 723	5. 520	486	4. 029			

U. S. GOVERNMENT PRINTING OFFICE 16—81070-1

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April 1945

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		°	′	″			°	′	″
α	2 to 3	114	02	16.65	α	3 to 2	293	57	21.83
2d ∠	&	+ 32	31	13.8	3d ∠	&	− 08	35	23.70
α	2 to 1	146	33	30.45	α	3 to 1	285	21	58.13
Δα				− 40.39	Δα			00	14.15
		180	00	00.0			180	00	00.0
α′	1 to 2	326	32	50.06	α′	1 to 3	105	26	12.58
		138	53	22.50					
		05	36	61.56					

FIRST ANGLE OF TRIANGLE

	°	′	″						°	′	″					
φ	48	44	18.575	2 BEECH	λ	122	29	28.126	φ	48	46	13.997	3 JOHN 3	λ	122	36	00.236
Δφ			53.795		Δλ		+	53.729	Δφ		−01	01.628		Δλ		−05	38.380
φ′	48	45	12.370	Bellingham, Bellingham 1 Breakwater Ent. Light	λ′	122	30	21.855	φ′	48	45	12.369	Bellingham, Bellingham 1 Breakwater, Ent. Light	λ′	122	30	21.856

	Logarithms	Values in seconds
s	3.299 182	
Cos α	9.921 400	
B	8.510 180	
h	1.730 762	1st term − 53.798
s²	6.598 36	
Sin²α	9.482 44	
C	1.460 46	
	7.541 26	2d term + 0.003
h³	3.4615	
D	2.3891	
	5.8506	3d term + 0.000
		−Δφ − 53.795

	°	′	″	Logarithms	Values in seconds
½(φ+φ′)	48	44	45.473		
s				3.299 182	
Sin α				9.741 219	+
A′				8.508 894	
Sec φ′				0.180 916	
Δλ				1.730 211	53.729
Sin½(φ+φ′)				9.876 098	
−Δα				1.606 309	40.39

	Logarithms	Values in seconds
s	3.855 404	
Cos α	9.423 224	
B	8.510 177	
h	1.788 805	1st term + 61.490
s²	7.71080	
Sin²α	9.96838	
C	1.46094	
	9.14012	2d term + 0.138
h³	3.5776	
D	2.3890	
	5.9666	3d term + 0.000
		−Δφ + 61.628

	°	′	″	Logarithms	Values in seconds
½(φ+φ′)	48	45	43.183		
s				3.855 404	
Sin α				9.984 191	
A′				8.508 894	
Sec φ′				0.180 916	
Δλ				2.529 405	338.380
Sin½(φ+φ′)				9.876 205	
−Δα				2.405 610	254.45

Meters Forward Back
φ 382.1 1471.3
λ 446.5 779.1

16—44238-1 U. S. GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April 1945

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

			°	′	″				°	′	″
α	2	to 3	114	02	16.65	α	3	to 2	293	57	21.83
2d ∠		&	+ 29	44	31.20	3d ∠		&	− 10	45	42.80
α	2	to 1	143	46	47.85	α	3	to 1	283	11	39.03
Δα					− 54.82	Δα				04	00.03
			180	00	00.0				180	00	00.0
α′	1	to 2	323	45	53.03	α′	1	to 3	103	15	39.06

FIRST ANGLE OF TRIANGLE

	°	′	″			°	′	″			°	′	″
φ	48	44	18.575	2 BEECH	λ	122	29	28.126	φ	48	46	13.997	3 JOHN 3	λ	122	36	00.236
Δφ	+	01	05.820		Δλ			72.916	Δφ		−	49.601		Δλ	+ −	05	19.194
φ′	48	45	24.395	Bellingham, Squalicum 1Creek Entrance Light	λ′	122	30	41.042	φ′	48	45	24.396	Bellingham, Squalicum 1Creek Entrance Light.	λ′	122	30	41.042

	Logarithms	Values in seconds
s	3.401478	
Cos α	9.906741	
B	8.510180	
h	1.818399	1st term − 65.826
s²	6.802796	
Sin²α	9.543 01	
C	1.460 46	
	7.806443	2d term + 0.006
h²	3.6365	
D	2.3891	
	6.0259	3d term + 0.000
		−Δφ − 65.820

	°	′	″	Logarithms	Values in seconds
½(φ+φ′)	48	44	51.485		
s				3.401478	
Sin α				9.771505	+
A′				8.508894	
Sec φ′				0.181946	
Δλ				1.862823	72.916
Sin ½(φ+φ′)				1.876110	
−Δα				1.738933	54.82

	Logarithms	Values in seconds
s	3.825834	
Cos α	9.358414	
B	8.510177	
h	1.694425	1st term + 49.479
s²	7.651167	
Sin²α	9.976 76	
C	1.460 94	
	9.089 37	2d term + 0.122
h²	3.3858	
D	2.3890	
	5.7778	3d term + 0.000
		−Δφ +49.601

	°	′	″	Logarithms	Values in seconds
½(φ+φ′)	48	45	49.196		
s				3.825834	
Sin α				9.988381	m
A′				8.508894	
Sec φ′				0.180946	
Δλ				2.504055	−319.194
Sin ½(φ+φ′)				9.876216	
−Δα				2.380271	240.03

Meters

	Forward	Backward
	753.7	1099.7
X	538.2	387.3

Comp. Rotation

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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24 A
Rev. Oct., 1932

LIST OF DIRECTIONS

T-5584

Station PEARSON 3, 1949 *State* Washington

Chief of party C.W. Clark *Date* 12/7/49, 3/22/50, 2/5/51 *Computed by* J.C.L.

Observer I. Zirpel, J.C. LaJoye *Instrument* 7" Berger, #231, Kern P-36563 *Checked by* C.W.C., G.R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
JOHN 3 (USE), 1941	0 00 00.00			0 00 00.00	
Tower, Mt. Constitution 1949	46 11 11.1				
R.M. No. 2 20.416 meters 66.98 feet	95 36 43				
KINGHILL, 1941 (Comp.)	304 02 15.6				
Bellingham, Larson Tank, 1951	314 03 37.0				
WHATCOM, 1926 (Comp.)	321 04 20.6				
Bellingham, Cesar Cedar Co. Stack, 1950-1941	328 36 02.2				
Bellingham, Sunset Heights, water tank	332 10 38.1				
Seattle-Vancouver Airway Beacon No. 8, 1941	345 31 55.5				
R.M. No. 1 16.239 meters 53.28 feet	359 13 28				

No eccentricity of signal or instrument.
All objects observed are visible from ground.

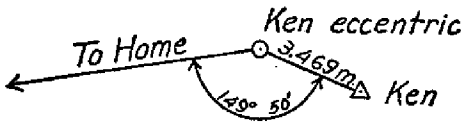
* These columns are for office use and should be left blank in the field.

Station: Ken *State:* Maryland

Chief of party: C. V. H. *Date:* 1917 *Computed by:* O. P. S.

Observer: C. V. H. *Instrument:* No. 168 *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

T-5584

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station TOWN 3 (USE), 1941 *State* Washington

Chief of party C.V. Clark *Date* 1/26/51 *Computed by* J.C.L.

Observer J.C. LeJoye *Instrument* Berger 7" #231 *Checked by* C.V.C.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
Seattle-Vancouver Airway Beacon No. 8, 1941	° ′ ″ 0 00 00.00	′ ″	″	° ′ ″ 0 00 00.00	′ ″
Seattle-Vancouver Airway Beacon No. 9, 1951	277 59 15.9				
KINGHILL, 1941 (Comp.)	282 28 07.5				
Bellingham Breakwater Entrance Light, 1951	315 52 27.1				
TOWN 3 (U.S.E.), 1941 (Comp.)	324 00 00.6				
Bellingham, Sunset Heights, water tank	327 51 28.7				
Bellingham Plywood Corp., stack, 1951	338 37 48.7				

NOTE: Bellingham Breakwater Entrance Light, 1951 on this list is not the same as Bellingham Breakwater Entrance Light, 1950 on List of Directions dated 4/5/50.

Recorded pp. 21-22

No eccentricities.

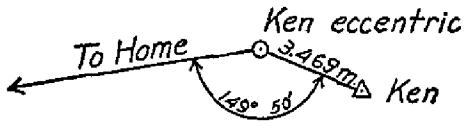
* These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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T-5584

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

Photogrammetric Record - 4th Order
LIST OF DIRECTIONS

Station BUSWELL (U.S.E.) *State* Washington

Chief of party C.W. Clark *Date* 12/7/49 *Computed by* J.C. L.

Observer J.C. Lajoye *Instrument* 7" Berger #231 *Checked by* C.W.C.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Bellingham, Bloedel-Donovan Stack, 1927	0 00 00.00			0 00 00.00	
Seattle-Vancouver Airway Beacon No. 8, 1941	30 10 14.4				
LUMI (Topo.)	95 40 47.2				

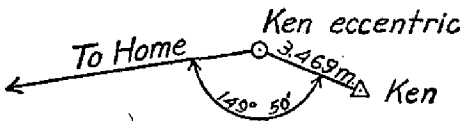
*These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917. | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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T-5584

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station JOHN 3 (U.S.E.) 1941 *State* Washington

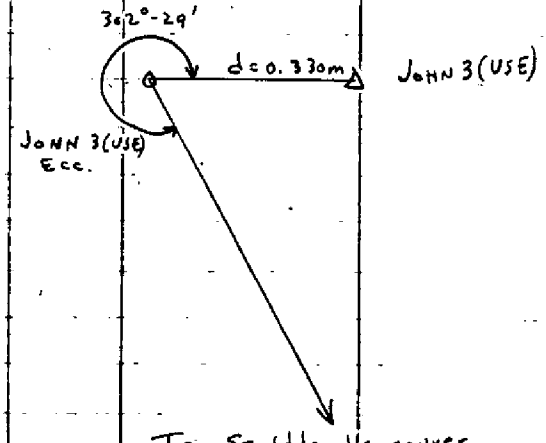
Chief of party C.W. Clark *Date* 4-5-50 *Computed by* J.C. Lajoye

Observer C.W. Clark *Instrument* Kern P-36563 *Checked by* G. Richter

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
Seattle-Vancouver Airway Beacon No. 8, 1941	° ′ ″ 0 00 00.00	′ ″ + 00 04.0	″	° ′ ″ 0 00 00.00	′ ″
PEARSON 3, 1949	203 43 05.6	- 00 07.3		203 42 54.3	
JOHN 3 (U.S.E.), 1941 (Center) d = 0.330 m.	302 29				
Bellingham, Oeser Cedar Co. Stack, 1941	302 14 23.4			302 14 23.4	
Bellingham, Olympic Portland Cement Co., Stack, S.W. of 3, 1941	303 02 58.6			303 02 58.6	
Larsen Tank	308 17 40.6			308 17 40.6	
Squalicum Creek Entrance Light	313 59 50.8			313 59 50.8	
Bellingham Breakwater Entrance Light	315 39 43.8			315 39 43.8	
Whatcom Waterway Light	320 39 38.6			320 39 38.6	
BEECH, 1914-1927 (Computed)	324 45 02.1				
FRANCES 2 (U.S.E.) 1940 - 1941 (Computed)	33 23 02.7				

Instrument eccentric for observations on PEARSON 3.
No eccentricity of instrument for all other observations.
No eccentricity of signal.

All objects observed are visible from ground except PEARSON 3 (pole on line)



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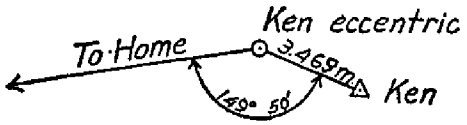
Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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T-5584

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24-A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station PEARSON 3, 1949 *State* Washington

Chief of party C.W. Clark *Date* 12-7-49, 3-22-50 *Computed by* J.C. Lajoye

Observer I. Zirpel, J.C. Lajoye *Instrument* 7" Berger, #231 *Checked by* C.W. Clark

U.S. GOVERNMENT PRINTING OFFICE 1941 11—9508

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
JOHN 3 (USE), 1941	0 00 00.00			0 00 00.00	
Tower, Mt. Constitution 1949	46 11 11.1				
Bellingham Oeser Cedar Co. Stack, 1950 1941	328 36 02.2				
Seattle-Vancouver Airway Beacon No. 8, 1941	345 31 55.5				
R.M. No. 1 16.239 meters 53.28 feet	359 13 28				
R.M. No. 2 20.416 meters 66.98 feet	95 36 43				

No eccentricity of signal or instrument.
All objects observed are visible from ground.

*These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
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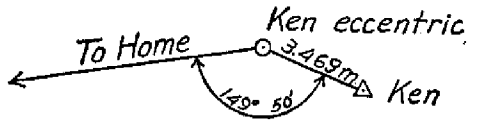
Reference mark, 16.32 m	358 31 20				



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T-5584

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

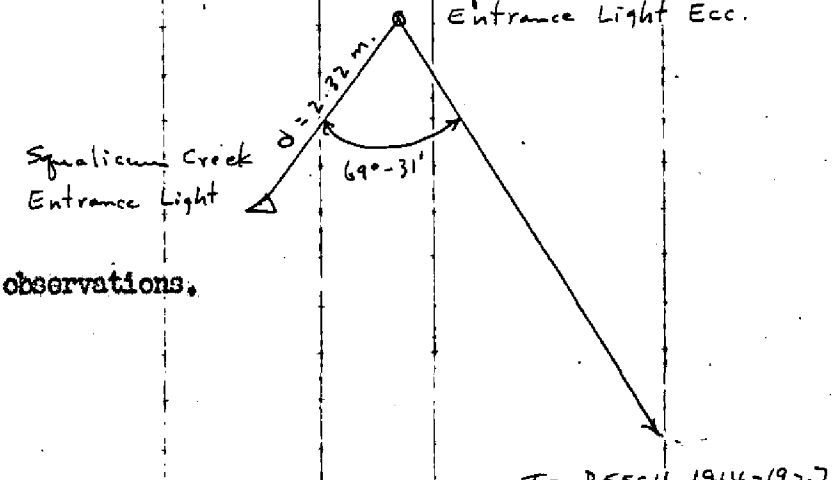
LIST OF DIRECTIONS

Station Squalicum Creek Entrance Light *State* Washington

Chief of party C.W. Clark *Date* 4-7-50 *Computed by* J.C. Lejoye

Observer I. Zirpel, Jr. *Instrument* Kern P-36563 *Checked by* G. Richter

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
BEECH 1914, 1927	0 00 00.00	-02 57.9		0 00 00.00	
Squalicum Creek Entrance Light, (Center) d=2.32 m	69 30 55				
Bellingham Cedar Co. Stack, 1941	204 44 22.3	-04 00.8		204 51 21.0	
Squalicum Creek Waterway Light	235 10 04.4				
(City Hall) Bellingham Museum, 1914-1927	317 03 07.0	-03 08.6		317 02 56.3	
Bellingham Breakwater Entrance Light	338 57 24.3	-12 24.1		338 47 58.1	
Whatcom Waterway Light	350 58 19.9	-04 12.8		350 57 05.0	



Instrument eccentric for all observations.
No eccentricity of signal.

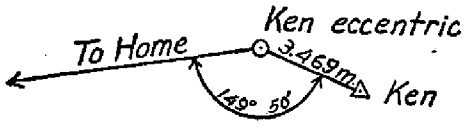
* These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



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Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

T.55 14

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24-A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station BEECH 1914-1927 *State* Washington

Chief of party C.W. Clark *Date* 4/4/50, 1/26/51, 2/27/51 *Computed by* J.C.L.
C.W. Clark Kern P-36563 C.W.C.
Observer J.C. Lajoye *Instrument* Berger 7", #231 *Checked by* G.R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
(City Hall) Bellingham Museum, 1927	° ′ ″ 0 00 00.00	′ ″	″	° ′ ″ 0 00 00.00	′ ″
R.M. 1 (highest point of boulder)	55 21				
R.M. No. 4, 1951 6.682 meters 21.93 feet	88 50 25				
R.M. 2 (cross on hospital)	143 22 30				
R.M. 3	151 48 15				
Bellingham, Hospital stack, 1914	174 25 20				
JOHN 3 (USE), 1941 (Comp.)	266 57 29.4				
Squalicum Creek Entrance Light	296 40 58.6				
Bellingham, Olympic Portland Cement Co. Stack, SW of 3, 1941	298 00 00.1				
Bellingham Breakwater Entrance Light, 1951	302 31 01.3				
Bellingham Breakwater Entrance Light, 1950	303 35 18.6				
Bellingham, Cesor Cedar Co. Stack, 1941	305 30 56.4				
Whatcom Waterway Light	319 39 48.2				
Bellingham, Bloedel-Donovan Stack, 1927	333 44 55				

NOTE: Bellingham Breakwater Entrance Light, 1950 was moved between 4-4-50 and 1-26-51.

Squalicum Creek Entrance Light was destroyed after being observed upon on 1/26/51.

Recorded p. 20, p. 39. No eccentricity of signal or instrument. All objects observed are visible from ground.

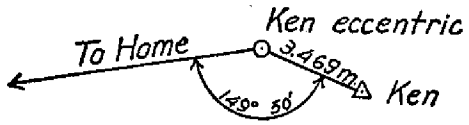
*These columns are for office use and should be left blank in the field.

Station: Ken *State:* Maryland

Chief of party: C. V. H. *Date:* 1917 *Computed by:* O. P. S.

Observer: C. V. H. *Instrument:* No. 168 *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

NAUTICAL CHARTS BRANCH

SURVEY NO. T-5584 N&S.

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
1-28-81	18424	C James	Before After Verification and Review T-5584S
		2/6/81 RCS	fully applied Drg #24
1-28-81	18424	C James	Before After Verification and Review T-5584S
INSet		2-6-81 RCS	fully applied Drg #24
1-28-81	18423B	C James	Before After Verification and Review T-5584S
INSet	2	2-6-81 RCS	fully applied X Drg
1-28-81	18421	C James	Before After Verification and Review T-5584S
		2-6-81-RCS	fully applied Drg #17
1-28-81	18400	C James 2-6-81 RCS	Before After Verification and Review T-5584S-N
			fully applied Drg #25
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Topographic

Field No. ..... *Office No.* T-5584

Project PH-26 (47)

LOCALITY

State Washington

General locality Bellingham

Locality Nooksack River

19.....

CHIEF OF PARTY

C. W. Clark, Chief of Field Party

Hubert A. Paton, Baltimore Photo. Office

LIBRARY & ARCHIVES

DATE .....

B-1870-1 (1)

DATA RECORD

T- 5584

Project No. (II): PH-26 (47)

Quadrangle Name (IV):

Field Office (II): Bellingham, Wash.

Chief of Party: C.W. Clark

Photogrammetric Office (III): Baltimore, Maryland

Officer-in-Charge: H.A. Paton

Instructions dated (II) (III): 31 August 1949
Letter dated 24 October 1949
No. 731-aal

Copy filed in Division of Photogrammetry (IV)

Method of Compilation (III): Air-photographic-Multiplex

Manuscript Scale (III): 1:10,000

Stereoscopic Plotting Instrument Scale (III): 1:10,000

Scale Factor (III): 1.00

Date received in Washington Office (IV):

Date reported to Nautical Chart Branch (IV):

Applied to Chart No.

Date:

Date registered (IV):

Publication Scale (IV):

Publication date (IV):

Geographic Datum (III): N.A. 1927

Vertical Datum (III):

Mean sea level except as follows:
Elevations shown as (25) refer to mean high water
Elevations shown as (5) refer to sounding datum
i.e., mean low water or mean lower low water

Reference Station (III): PEARSON 3, 1949

Lat.: 48° 51' 09.238"

Long.: 122° 36' 55.797"

~~Adjusted~~
Unadjusted

Plane Coordinates (IV):

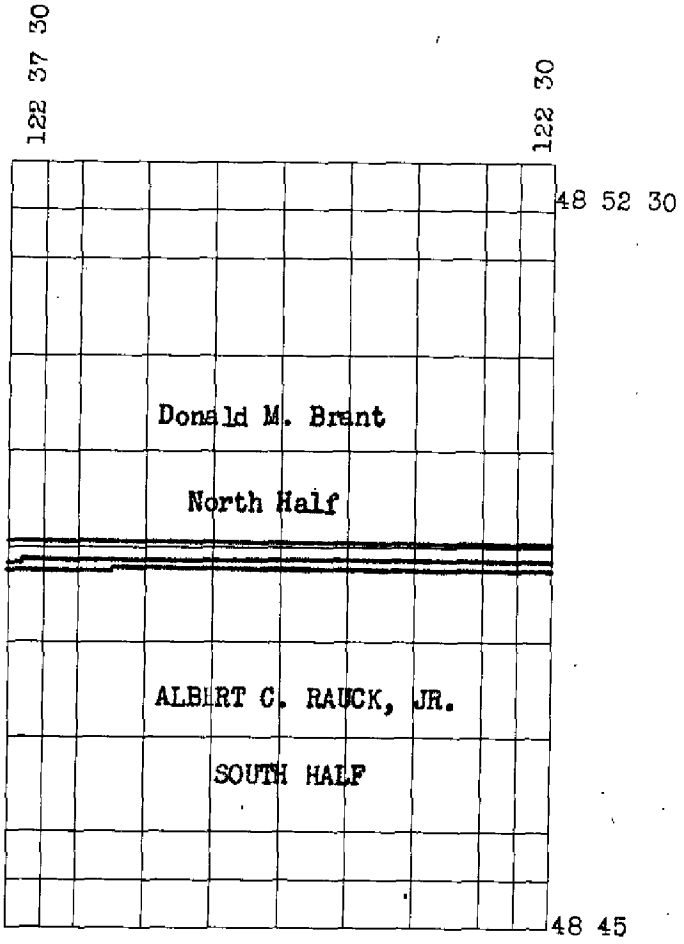
State: Washington Zone: North

Y=

X=

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.



Areas contoured by various personnel
(Show name within area)
(II) (III)

DATA RECORD

Field Inspection by (II): John C. Lajoy
Roy A. Davidson
Date: 12-7-49

Planetable contouring by (II):
Date:

Completion Surveys by (II):
Date:

Mean High Water Location (III) (State date and method of location):
Same as date of photography

Projection and Grids ruled by (IV): T.L.J.
Date: 6-19-50

Projection and Grids checked by (IV): H.D.W.
Date: 6-20-50

Control plotted by (III): B.A.Dew
Date: July 1950

Control checked by (III): A.K.Heywood
Date: July1950

~~Radial~~or Stereoscopic
Control extension by (III): D.M.Brant and A.C.Rauck, Jr.
Date: August 1950

Stereoscopic Instrument compilation (III):
Planimetry D.M.Brant A.C.Rauck
Date: Aug.-Sept.1950
Contours D.M.Brant A.C.Rauck,Jr.
Date: Aug.-Sept.1950

Manuscript delineated by (III): D.M.Brant,A.C.Rauck,Jr.
Date: Oct.Nov.1950

Photogrammetric Office Review by (III): A.C.Rauck,Jr., D.M.Brant
Date: Feb. 1951

Elevations on Manuscript checked by (II) (III): D.M.Brant, A.C.Rauck, Jr.
Date: Feb. 1951

M-2618-12(4)

Camera (kind or source) (III): U.S.Coast and Geodetic Survey Camera, Type "O"
Focal length 152.37 mm

PHOTOGRAPHS (III)

Number	Date	Time	Scale	Stage of Tide
1194-1200 incl.	6/4/49	1228	1:24,000	3/9' above MLLW
1214-1220 incl.	"	1238	"	3.7' above MLLW
1222-1229 incl.	"	1248	"	3.5' above MLLW

Tide (III)

From table of predicted tides

Reference Station: Port Townsend
Subordinate Station: Bellingham, Wash.
Subordinate Station:

Ratio of Ranges	Mean Range	Spring Range
	5.1	8.3
1.0	5.2	8.6

Washington Office Review by (IV): Date:

Final Drafting by (IV): Date:

Drafting verified for reproduction by (IV): Date:

Proof Edit by (IV): Date:

Land Area (Sq. Statute Miles) (III): 40
Shoreline (More than 200 meters to opposite shore) (III): 8.5
Shoreline (Less than 200 meters to opposite shore) (III): 14.2
Control Leveling - Miles (II): 40
Number of Triangulation Stations searched for (II): 57 Recovered: 32 Identified: 13
Number of BMs searched for (II): 23 Recovered: 16 Identified: 16
Number of Recoverable Photo Stations established (III): 13
Number of Temporary Photo Hydro Stations established (III) 0

Remarks:

Two of the triAngulation stations recovered during the 1949 field inspection season have since been reported destroyed. These are:
SQUALICUM CREEK ENTRANCE LIGHT, 1950
BELLINGHAM BREAKWATER ENTRANCE LIGHT, 1950

M-2618-12(4)

Photogrammetry

MAP T-5584 PROJECT NO. Ph—26(47) SCALE OF MAP 1:10,000 SCALE FACTOR 1.00

STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR y-COORDINATE LONGITUDE OR x-COORDINATE	DISTANCE FROM GRID IN FEET, OR PROJECTION LINE IN METERS FORWARD (BACK)	DATUM CORRECTION	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD (BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LIN IN METERS FORWARD (BACK)
T-22(USE)	USE	N.A. 1927	690,324.36 1,586,372.04	98.9 (1425.2) 418.2 (1105.8)			
No.1(SQUALICUM CREEK WATERWAY) 1940 (USE)	"	"	647,059.09 1,596,604.50	627.6 (896.4) 489.0 (1035.0)			
No.2(SQUALICUM CREEK WATERWAY 1940 (USE)	"	"	647,417.48 1,595,834.15	736.8 (787).2 254.2 (1269.8)			
No.3(SQUALICUM CREEK WATERWAY 1940, (USE)	"	"	646,941.10 1,596,858.13	591.6 (932.4) 566.4 (957.6)			
B.M.149.80,1942 (USE)	"	"	48 47 46.598 122 32 10.480	1439.4 (414.0) 213.9 (1010.7)			
B.M. 150.79,1942 (USE)	"	"	48 47 39.526 122 32 01.926	1221.0 (632.4) 39.3 (1185.3)			
BM 152.58,1942 (USE)	"	"	48 47 32.608 122 32 10.425	1007.3 (846.1) 212.8 (1011.8)			
T-2 (USE)	"	"	669,372.58 1,575,758.13	1332.8 191.2 231.1 1292.9		Used for control but destroyed. Not shown on map.	
LUMI, 1949 (Fourth order)	Field Comp.	"	48 45 00.00 122 37 10.74	00.0 (1853.3) 219.4 (1006.3)			

1 FT. = .3048006 METER

COMPUTED BY: L. A. Senasack DATE July 1950 CHECKED BY: H.P.Eichert DATE July 1950

M-2388-12

Photogrammetry

MAP T 5584 PROJECT NO. Ph-26(47) SCALE OF MAP 1:10,000 SCALE FACTOR 1.000

STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR y-COORDINATE / LONGITUDE OR x-COORDINATE	DISTANCE FROM GRID IN FEET, OR PROJECTION LINE IN METERS FORWARD	(BACK)	DATUM CORRECTION	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD	(BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LIN IN METERS FORWARD	(BACK)
M7, 1942(USE)	U.S.E.	N.A. 1927	653,624.05	1104.6	(419.4)					
			1,589,023.88	1226.5	(297.5)					
M 8, 1942 (USE)	"	"	653,949.22	1203.7	(320.3)					
			1,588,654.38	1113.9	(410.1)					
M 10, 1942 (USE)	"	"	655,830.82	253.2	(1270.8)					
			1,588,709.96	1130.8	(393.2)					
M 11, 1942(USE)	"	"	655,871.87	265.7	(1258.3)					
			1,586,703.81	519.3	(1004.7)					
M 12, 1942 (USE)	"	"	660,152.01	46.3	(1477.7)					
			1,586,844.47	562.2	(961.8)					
M 13, 1942 (USE)	"	"	662,725.99	830.9	(693.1)					
			1,586,884.70	574.5	(949.5)					
T38N,R2E Sec.Cor. 4,3,9,10,1942 (USE)	"	"	662,770.66	844.5	(679.5)					
			1,586,225.82	373.6	(1150.4)					
T38N,R2E 1/4 Cor. 10,15, 1942 (USE)	"	"	657,454.31	748.1	(775.9)					
			1,588,727.91	1136.3	(387.7)					
T-1 (USE)	"	"	668,613.55	1101.4	(422.6)					
			1,575,354.47	108.0	(1416.0)					
T-9 (USE)	"	2	667,750.03	838.2	(685.8)					
			1,579,648.96	1417.0	(107.0)					
T-10 (USE)	"	"	680,356.68	108.7	(1415.3)					
			1,579,546.80	1385.9	(138.1)					
T-21 (USE)	"	"	689,556.64	1388.9	(135.1)					
			1,586,613.98	491.9	(1032.1)					

Page 8

1 FT. = .3048006 METER

COMPUTED BY: DATE July 1950 CHECKED BY: H.P.Eichert DATE July 1950

M-2388-12

Photogrammetry

MAP T-5584 PROJECT NO. Pr-26(47) SCALE OF MAP 1:10,000 SCALE FACTOR 1.000

STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR y-COORDINATE / LONGITUDE OR x-COORDINATE	DISTANCE FROM GRID IN FEET, OR PROJECTION LINE IN METERS FORWARD	(BACK)	DATUM CORRECTION	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD	(BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LIN IN METERS FORWARD	(BACK)
BELLINGHAM, OESER CEDAR CO., STACK, 1950	Field Comp	NA 1927/	48 46 08.786 122 30 54.573	271.4 1114.4	(1582.0) (110.8)					
BELLINGHAM, OLYMPIC PORTLAND CEMENT CO. STACK, SW of 3, 1950	"	"	48 46 06.669 122 31 22.295	206.0 455.3	(1647.4) (769.9)		Used for control but destroyed. Not shown on map.			
~~BELLINGJAM, OLYMPIC 05600 PORTLAND CEMENT CO. p.658 STACK, MIDDLE of 3, 1914~~	~~"~~	~~"~~	~~48 46 06.87 122 31 22.08~~	~~212.2 450.9~~	~~(1641.2) (774.3)~~					
BELLINGHAM, OLYMPIC PORTLAND CEMENT CO. STACK, NE of 3, 1927	"	"	48 46 07.08 122 31 21.88	218.7 446.8	(1634.7) (778.4)					
PEARSON 3, 1949	Field Comp.	"	48 51 09.238 122 36 55.797	285.4 1137.5	(1568.0) (85.7)					
AIRWAY BEACON NO. 9, 1941 (Destroyed)	G-5410 P 602	"	48 47 37.761 122 31 48.728	1166.4 994.5	(687.0) (230.10		Used for control. Not shown on map.			
JOHN 3, 1941 (USE)	G--5410 P 598	"	48 46 13.997 122 36 00.236	432.4 4.8	(1421.0) (1220.4)					
BUSWELL, 1942 (USE)	USE	"	655,200.80 1,581,597.20	61.2 486.8	(1462.8) (1037.2)					
M1, 1942 (USE)	"	"	~~658,659.21~~ 1,592,071.32	~~1115.3~~ 631.3	~~(408.7)~~ (892.7)					
M3, 1942 (USE)	"	"	653,986.22 1,591,955.46	1215.0 596.0	(309.0) (928.0)					

Page 9

1 FT. = .3048006 METER

M-2388-12

COMPUTED BY: L.A.Sennsack DATE July 1950 CHECKED BY: H.P.Eichert DATE July 1950

COMPILATION REPORT T-5584

PHOTOGRAMMETRIC PLOT REPORT

Report submitted with Descriptive Report for Survey T-5581.

FIELD INSPECTION REPORT

Report submitted with Descriptive Report for Survey T-5583.

31. DELINEATION

Refer to Photogrammetric Plot Report.

32. CONTROL

Refer to Photogrammetric Plot Report and Field Inspection Report.

33. SUPPLEMENTAL DATA

Land plats -

1-Township No. 38 North, Range No. 2 East, Willamette Meridian, Wash. Dated Feb. 21, 1860.

1-Township No. 39 North, Range No. 2 East, Willamette Meridian, Wash. Dated Feb. 21, 1872.

1-Township No. 38 North, Range No. 2 East, Willamette Meridian, Wash. Dated June 29, 1931.
(Boundary of the Lummi Indian Reservation in sections 7, 17, & 18.)

Township layouts
1-Lummi Indian Reservation, Twp. 37 and 38 North Range 1 and 2 East, W.M. Whatcom County, Wash.

1-Marietta Township, Twp. 38 North, Range 2 East W.M., Whatcom County, Wash.

1-Ferndale Township, Twp. 39 North, Range 2 East, W.M., Whatcom County, Wash.

1-Mountainview Township, Twp. 39 North, Range 1 East and Range 1 West, W.M., Whatcom County, Wash.

1-Port of Bellingham, Proposed Small Boat Harbor.

Refer to 41, Boundaries, for a description of how these data were used.

34. CONTOURS AND DRAINAGE

In general, the quality of diapositives was fair to good.

The density of diapositives of model 1197-1198 was very poor and

34. CONTOURS AND DRAINAGE (Continued)

considerable difficulty was encountered in contouring. It is requested that contours within the limits of this model be checked in field edit.

35. SHORELINE AND ALONGSHORE DETAILS

Shoreline inspection was adequate except for structures and buildings adjacent to the shoreline in the vicinity of Squalicum Creek entrance. These buildings will need additional classification in order to complete their delineation.

No shoal areas or low water lines are shown. The shallow line in Bellingham Bay is office interpretation of photographs.

36. OFFSHORE DETAILS

These are believed to be complete.

37. LANDMARKS AND AIDS

Refer to item 9 of the Field Inspection Report. The position of one non-floating aid to navigation, located by multiplex is reported herewith on form 567. This aid was easily seen in the multiplex model and pricked direct.

38. CONTROL FOR FUTURE SURVEYS

Forms 524 are herewith submitted for 14 recoverable topographic stations.

LUMI, 1949, a fourth order control station, is the only one not determined by stereoscopic methods.

Four of the 14 stations were not reported under item 11 of the Field Inspection Report. They are:-

1. JOHN 3 (USE) 1941 AZ MK, 1950
2. CITY, 1951
3. CAGE, 1949
4. T 38N, R2E, 1/4 CORNER, SECTIONS 13-14, 1951

39. JUNCTIONS

Junctions are complete with T-5583 to the west and T-5585 to the east. There are no contemporary surveys to the north and south.

40. HORIZONTAL AND VERTICAL ACCURACY

Refer to item 34 "CONTOURS AND DRAINAGE". Also see Photogrammetric Plot Report.

41. BOUNDARIES

Land Lines

See special report - Land Lines - Ph-26(47) and item 10 of field inspection report.

True or accepted corners of land lines are plotted by photogrammetric means, supplemented with field data. Land lines and theoretical corners have been delineated from the natural and cultural features of the manuscript and photographs supplemented by the trans-position of a graphically enlarged copy of the land plats of Townships No. 38 N and 39 N. Range No. 2 East, Willamette Meridian. This enlargement is herewith submitted

Natural and cultural features, such as roads, ditches, and field or woods lines were accepted for the placement of reliable land lines where they were nearly coincident with the lines transposed from the enlarged land plat, or where they connected true or accepted corners.

Where there was no evidence of natural and cultural features from inspection of the photographs and manuscript, the land lines of the enlarged land plat were used and shown as unreliable land lines. Intersections of these lines resulted in unreliable theoretical corners.

Land lines and corners, accepted or theoretical, were compared with the township layout. Theoretical corners not in agreement, were noted on the discrepancy overlay.

Lummi Indian Reservation

Refer to Special Report-Boundaries-Ph-26(47) and item 10 of field inspection report.

This reservation boundary line is delineated from an enlarged copy plotted from bearings and distances from the original land plat in sections 7, 17, 18.

This line begins at a point called Treaty Rock and ends at a General Land Office standard disc. stamped "T 38N, R2E, S7 S8, L/R, PL, AP7, WC" which is a recoverable topographic station. The bearings of several of the roads in this vicinity were also plotted on the enlarged copy. By holding station AP-7 at one end of the line and orienting the manuscript until the centerline of Hoff Rd, coincided with the bearing of the same road on the enlarged copy at the beginning of the line, the reservation boundary line was then traced to the manuscript.

41. BOUNDARIES (continued)

In addition to those boundary lines and theoretical corners discussed on the overlay and the unreliable land lines of the manuscript, it is believed that the Lummi Indian Reservation boundary line as discussed in the preceding paragraph, should be further investigated in the field.

46. COMPARISON WITH EXISTING MAps

Comparison was made with Geological Survey Blaine quadrangle, scale 1:62,500, edition of 1907 reprinted 1947.

The interior areas compare favorably. However, many large changes have since occurred in the vicinity of Bellingham and Bellingham Bay.

47. COMPARISON WITH NAUTICAL CHARTS

The manuscript was compared with Chart No. 6378, scale 1:40,000, published June 1935, corrected September 5, 1949.

Generally, the same differences are noted in this comparison as are reported in item 46.

Items to be apllied to nautical charts immediately:

In the vicinity of Bellingham are many changes. The street system of Bellingham is to be extended. Shoreline structures to be added are: large wood bulkhead, piling, large breakwater, and large buildings.

Offshore piling between Marietta and Bellingham, and at Fish Point should be applied.

At the mouth of the Nooksack River are many shoreline changes. The channels and inlets in this area are entirely different and should be so charted.

Control tower at Bellingham Airport to be applied.

Items to be carried forward

None

Respectfully submitted

Albert C. Rauck Jr.

Albert C. Rauck
Cartographic Photo Aid

Approved and forwarded
6 June 1951

Hubert A. Paton
Comdr., C&GS
Officer in Charge

Form T-2

PHOTOGRAMMETRIC OFFICE REVIEW

T- 5584-N

1. Projection and grids QCR 2. Title QCR 3. Manuscript numbers QCR 4. Manuscript size QCR

CONTROL STATIONS

5. Horizontal control stations of third-order or higher accuracy QCR 6. Recoverable horizontal stations of less than third-order accuracy (topographic stations) QCR 7. Photo hydro stations QCR 8. Bench marks QCR 9. Plotting of sextant fixes QCR 10. Photogrammetric plot report QCR 11. Detail points QCR

ALONGSHORE AREAS

(Nautical Chart Data)

12. Shoreline QCR 13. Low-water line QCR 14. Rocks, shoals, etc. QCR 15. Bridges QCR 16. Aids to navigation QCR 17. Landmarks QCR 18. Other alongshore physical features QCR 19. Other alongshore cultural features QCR

PHYSICAL FEATURES

20. Water features QCR 21. Natural ground cover QCR 22. ~~Planetable contours~~ 23. Stereoscopic instrument contours QCR 24. Contours in general QCR 25. Spot elevations QCR 26. Other physical features QCR

CULTURAL FEATURES

27. Roads QCR 28. Buildings QCR 29. Railroads QCR 30. Other cultural features QCR

BOUNDARIES

31. Boundary lines QCR 32. Public land lines QCR

MISCELLANEOUS

33. Geographic names [signature] 34. Junctions Q.C.R. 35. Legibility of the manuscript QCR 36. Discrepancy overlay QCR 37. Descriptive Report QCR 38. Field inspection photographs QCR 39. Forms QCR

40. Albert C. Pauck, Jr. [signature]
Reviewer

[signature]
Supervisor, Review Section or Unit

41. Remarks (see attached sheet)

FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT

42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.

B W Wilson
Compiler

[signature]
Supervisor

43. Remarks:

M-2623-12

Form T-2

PHOTOGRAMMETRIC OFFICE REVIEW

T-5584-S

1. Projection and grids DMB 2. Title DMB 3. Manuscript numbers DMB 4. Manuscript size DMB

CONTROL STATIONS

5. Horizontal control stations of third-order or higher accuracy DMB 6. Recoverable horizontal stations of less than third-order accuracy (topographic stations) DMB 7. Photo hydro stations DMB 8. Bench marks DMB 9. Plotting of sextant fixes DMB 10. Photogrammetric plot report DMB 11. Detail points DMB

ALONGSHORE AREAS

(Nautical Chart Data)

12. Shoreline DMB 13. Low-water line DMB 14. Rocks, shoals, etc. DMB 15. Bridges DMB 16. Aids to navigation DMB 17. Landmarks DMB 18. Other alongshore physical features DMB 19. Other alongshore cultural features DMB

PHYSICAL FEATURES

20. Water features DMB 21. Natural ground cover DMB 22. Planetable contours — 23. Stereoscopic instrument contours DMB 24. Contours in general DMB 25. Spot elevations DMB 26. Other physical features DMB

CULTURAL FEATURES

27. Roads DMB 28. Buildings DMB 29. Railroads DMB 30. Other cultural features DMB

BOUNDARIES

31. Boundary lines DMB 32. Public land lines DMB

MISCELLANEOUS

33. Geographic names [illegible] 34. Junctions DMB 35. Legibility of the manuscript DMB 36. Discrepancy overlay DMB 37. Descriptive Report — 38. Field inspection photographs DMB 39. Forms DMB

40. Donald M. Brantz
Reviewer

Henry P. Eichel
Supervisor, Review Section or Unit

41. Remarks (see attached sheet)

FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT

42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.

B. Wilson
Compiler

Henry P. Eichel
Supervisor

43. Remarks:

M-2623-12

48. GEOGRAPHIC NAME LIST

Alderwood Ave
Aldrich Road
Axton Rd

Bakerview Rd
Bancroft Rd
Barrett Lake
Beaver Dam
Bellingham
Bellingham Airport
Bellingham Bay
Bennett Ave
Birchwood — Bible Camp
Birchwood Ave
Brennan
Byers Rd

CAA Reservation
Cagey Road
Cedarwood Ave
Cherrywood Ave
Church Rd
Cottonwood Ave
Curtis Rd

Deer Creek
Douglas Rd

Edens Ave

Ferndale — Ferndale City Reservoir
Ferndale Rd
Fish Point
Fort Bellingham Rd

Gilason Rd
Great Northern Railway
Graveline Rd
(Green Acres Memorial
(Park Cemetery
Greenwood Ave

Hemmi Rd
Hendrickson Rd
Hoff Rd
Hovander Rd

Imhof Rd

Johnson Rd
Jones Rd

Kass Rd
~~Kwina~~ Rd
Kwina

48. GEOGRAPHIC NAMES (continued)

Labounty Rd
Lange Rd
Larrabee Rd
Larson Rd
Laurel Rd
Laurelwood Ave
Lummi ~~Lumi~~ Cemetery
Lummi ~~Lumi~~ Shore Road — Lummi School
Lummi
Lummi Indian Reservation
Lummi River

Mallory Rd
Marietta — Marietta Community Church
Marietta Rd
McAlpine Rd
Mt View Rd

Neevel Rd
Neilson Rd
New Kirk Rd
Nooksack River — North Bellingham Grange
Northwest Rd — " " School

Olympic Way
Oswald Rd

Pacific Highway
Paradise Rd
Pinewood Ave
Pioneer Park
Piper Rd

Rayhorst Rd
Reighton Rd
Red River Rd
River Rd
Rural Ave

Slater Rd
Slater Slough
Smith Rd
Smuggler Slough
Sunset Ave
(Squalicum Creek
(Waterway

St. Joachims Church

Tennile Creek
Tennant Lake
Thornton Rd

48. GEOGRAPHIC NAMES (CONTINUED)

Ulrick Rd
U.S. 99

Waske Rd
Wiser Lake Rd
Woodlawn Cemetery
Woodlyn Rd
Wynn Rd

Whatcom County Hospital

43. REMARKS

No published elevations could be found in this office for the following USGS Bench Marks:

BM 21 5R USGS	Photo 49-0-1215	
BM 31.01	"	"
BM 49.93	"	"
BM 63.4R	"	"

Drainage into pond at Brennan was originally incomplete. The field editor added a road 7, but did not complete the drainage so it is shown as interpreted in this office.

The geographic name "McCloud Road" was added from field inspection for T-5585. Several descriptions for Redoverable Topographic Stations refer to "McLeod Rd." rather than "McCloud Rd."

Johnson Rd. was changed to Johsnton Rd in the Descriptive Report for T-5584. This name should be checked on the manuscript and in the report for T-5583.

The Lummi Indian Reservation boundary was left hanging just south of Marietta. There is no available information to close this boundary; it ends at "Treaty Rock". Refer to item 56 of the field edit report.

Discrepancies between field data and the data contained in the U.S. Engineers "List of Bridges over Navigable Waters" concerning the bridges in the vicinity of Ferndale and Marietta could not be reconciled in the compilation office.

Approximate location of reconstructed aero beacon at Bellingham Airport was identified by the field editor. No form 567 was submitted for this beacon and it is shown on the manuscript with the elevated object symbol.

Geographic names added during field edit:

Bonneville Power Line
C M St.P & P Ry
Ferndale Township
Marietta Township
McCloud Road
Mountain View Township
Squalicum Creek
Wash PSH 1 (Pacific Highway, US 99)

49. NOTES FOR THE HYDROGRAPHER

Following is a list of recoverable topographic stations which may be used during the Hydrographic Survey.

CONTROL TOWER, 1950
EDGE, 1950
LUMI, 1949
SQUALICUM CREEK WATERWAY LIGHT, 1950
CAGE, 1949
CITY, 1951
JOHN 3 (USE) 1941 AZ MK, 1950

Form 567
April 1945

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

TO BE CHARTED / ~~TO BE DELETED~~ } STRIKE OUT ONE

Baltimore, Maryland, 19 51

I recommend that the following objects which have (~~not~~) 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 Albert C. Rauck, Jr.

Albert C. Rauck, Jr.

Hubert A. PATON *Chief of Party.*

STATE	WASHINGTON		POSITION					METHOD OF LOCATION AND SURVEY No.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
			LATITUDE		LONGITUDE		DATUM						
CHARTING NAME	DESCRIPTION	SIGNAL NAME	° ′	D.M. METERS	° ′	D.P. METERS							
	Squalicum Creek Waterway Light		48 45	1054	122 30	737	NA 1927	Multiplex T-5584	1950	x	x		6300, 6370

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. 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.

U. S. GOVERNMENT PRINTING OFFICE: 1949 O - 853118

Form 567
April 1945

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

TO BE CHARTED / TO BE DELETED } STRIKE OUT ONE

Baltimore, Maryland May 1, 1953

I recommend that the following objects which have (not been) 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 Donald M. Brant

Ph 26(47)

Jack C. Sammons *Chief of Party.*

STATE Washington

CHARTING NAME	DESCRIPTION	SIGNAL NAME	POSITION LATITUDE * ° ′	LATITUDE * ″ D.M. METERS	LONGITUDE * ° ′	LONGITUDE * ″ D.P. METERS	DATUM	METHOD OF LOCATION AND SURVEY No.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
	BELLINGHAM SQUALICUM CREEK ENTRANCE LIGHT		48 45	24.395 753.6	122 30	41.042 838.3	NA 1927	Triang-ulation	1952	x	x		6300,6378 6380
	BELLINGHAM, BELLINGHAM BREAKWATER ENTRANCE LT		48 45	12.370 382.1	122 30	21.855 446.4	"	"	"	x	x		6300,6378, 6380
	NOTE: These aids located during the field edit.												

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. The data should be considered for the charts of the area and not by

NOTES FOR THE REVIEWER

Submitted herewith are two enlarged copies of supplemental data. These were made graphically to facilitate transfer of pertinent data to the manuscript

1 - Layout showing land lines of townships 38 and 39 North, Range 2 East, Willamette Meridian.

2 - Layout of Lummi Indian Reservation boundary in sections 7, 17, and 18, T 38N, R2E.

All road objectives are not complete. Due to the incompleted road network of the old U.S.Geological Survey quadrangles adjoining this manuscript, it was not possible to accurately measure the objectives. These will be completed when all adjoining manuscripts are com iled.

Geographic names in the vicinity of Lummi, namely, Slater Slough Smuggler Slough, and Nooksack River may not be correctly placed as considerable physical change has occurred in the area making the map and the old quadrangle entirely different.

A discrepancy exists concerning the position of the north city limits of Bellingham. The 1949 field inspection unit established sub. pts. "A" and "C" to locate the north boundary line This line does not agree with the line as shown on photo 49-O-1224. The 1951 field inspection unit established in the immediate vicinity of sub. pt. "C", a third sub. pt. to fix the position of recoverable topographic station CITY, 1951, which is on the boundary line. This line is shown on the map, and is approximately 21 meters north of the line established by the 1949 field unit.

Refer to "Port of Bellingham, Plan of Proposed Small Boat Harbor" dated 19 January 1949 and photo 49-O-1245. Changes to be made here are noted on this plan and photo. Inasmuch as these have not yet been constructed, they have not been shown.

Not submitted. Data in Baltimore. EHR

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24-A
Rev. Oct., 1932

LIST OF DIRECTIONS

Station LUMI (Topo.) State Washington

Chief of party C.W.Clark, Date 12/6/49 Computed by J.C.L. C.W.C.

Observer J.C.Lajoye Instrument 7" Berger No. 231 Checked by C.W.C.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
BUSWELL (U.S.E.)	0 00 00.00			0 00 00.00	
Bellingham, Oeser Cedar Co., Stack, 1941	29 08 25.8				
Bellingham Museum (City Hall, 1927)	42 50 25.8				
Bellingham, Bloedel-Conovan, Stack, 1927	50 58 18.3				
Seattle-Vancouver Airway Beacon No.8,1941	93 23 09.1				
Squalicum Creek Waterway Light	37 09 09				
Squalicum Creek Entrance Light	39 11 54				
Whatcom Waterway Light	47 59 49				
KPUG Radio Tower	298 46 28				
KPUG Radio Tower	298 59 33				
KVOS Radio Tower	234 49 50				
KVOS Radio Tower	234 50 23				

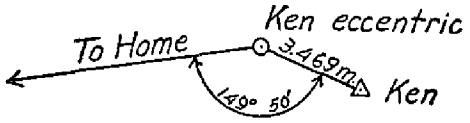
* These columns are for office use and should be left blank in the field.

Station: Ken *State:* Maryland

Chief of party: C. V. H. *Date:* 1917 *Computed by:* O. P. S.

Observer: C. V. H. *Instrument:* No. 168 *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

FIELD EDIT REPORT
Map Manuscript T-5584
Project FH-26(47)

51. Methods

No new or unusual methods have been used in the completion survey and field edit of this sheet. Inspection was from a truck, dismounting and walking where necessary. All profiling and re-sketching was done with the plane table. A legend of the colored inks and symbols used is shown on Field Edit Sheet No. 4.

Field edit data is shown on Field Edit Sheets Nos. 1 through 5, and on photos 1374, 1194-1200, 1214-1219, 1222-1229, and 1243 and 1244. Photographs 1243 and 1244 will be furnished with Quad T-5585. All others are with this quad. Notes are cross referenced from field edit sheets to photographs.

52. Adequacy of compilation

The adequacy of the compilation is more or less in line with other sheets in the project. The delineation of buildings is often incomplete, because the compiler just doesn't see all the buildings. They are obvious to the man in the field who is standing on the road looking at the house. From his point of view the building is quite obvious on the photo and there is no need to intensify the image with a bright colored ink, but to the compiler the image is not often so plain. This is the cause of so many omissions. There is often a lack of thought shown on the part of the compiler, too. Probably well over half the time a class two building with a good access road will have a class one building in the immediate vicinity. The compiler must learn to look for these buildings. If the field is to continue to delineate the buildings it wants to delete, instead of the buildings it wants to save, the compiler will have to be more watchful.

Field treatment of the political boundaries was seriously deficient, and this is reflected in the compilation. The compilation unit shares the responsibility for the error in the Bellingham City Limit, since the material furnished by the field inspection unit was sufficient to disclose the error, even though the field inspection unit delineated the City Limit wrongly on the photographs. Apparently the compilation unit did not inspect the legal descriptions or the plats furnished with the special report on boundaries.

The contouring follows the pattern established in past quads on this project. It does not test too badly in accuracy (83% within a half interval), but much detail is missing in the area of glacial till northwest of Ferndale. Several tops were missed in the area east of Ferndale. These things change the expression of the area considerably, though they will often affect the accuracy tests badly.

53. Map Accuracy.

A portion of the horizontal map accuracy test made for this project extends into the northwest corner of this sheet. This traverse has already been the subject of special report on Horizontal Map Accuracy for this project. All horizontal errors were within prescribed limits.

Approximately 49 miles of plane table traverse was run as vertical accuracy tests and to resketch topography. About 1.2 miles of combined horizontal and vertical accuracy tests and about 2.5 miles of barometrically controlled leveling may be added to this figure. This total is, of course, quite high, but in view of the fact that the summary of all this traverse shows only 83% of all points tested within ½ contour interval, there was apparently a need for well-controlled resketching, and only a small portion of this total can be questioned as unnecessary. About 8 miles of this total were run to sketch the 10 foot contour in the Lummi River bottom. About 8 to 9 square miles of topography were resketched, and the equivalent of three to four square miles of sketching was done in adding the 10 foot contour in the Lummi River bottom.

The field editor believes that the map can be certified as meeting National Map Accuracy Standards after application of the corrections to topography submitted.

54. Recommendations.

It is difficult for the observer to make recommendations for the improvement of similar maps. The bulk of the troubles seem to arise from inexperience as an organization, rather than as individuals. Using the present grade of personnel, closer and more detailed supervision of field personnel seems indicated, along with closer and more critical inspection of field work and of the compilation. The observer has given the matter considerable thought and contemplates submitting a more detailed report on the matter later in the winter.

55. Examination of Proof Copy.

Mr. Paul E. Watz, Ferndale Pharmacy, Ferndale, Washington, and Mr. Alfred Tedford, 3302 Northwest Avenue, Bellingham, Washington have each agreed to examine a proof copy of the map for possible errors. Mr. Watz is well acquainted with the area around Ferndale in the northwest corner of the sheet, and Mr. Tedford is better acquainted with the area around Bellingham, in the southeast corner of the sheet. The sheet seems divided geographically by the wooded area around the airport. No further geographic name data was obtained. However, the application of the name "Squalicum Creek Waterway" should be changed. The Squalicum Creek Waterway is a dredged ship basin, and the approach channel, and is a facility of the Port of Bellingham. Squalicum Creek comes off the hill just inshore from the Squalicum Creek Waterway. The name "Squalicum Creek Mouth" is also in common local usage as indicated on Field Edit Sheet No. 4, but would appear as a redundance if the names Squalicum Creek and Squalicum Creek Waterway are shown.

56. Political Boundaries.

(See paragraph 10, Field Inspection Report and Special Report on Boundaries, Project Ph-26). Besides the public land lines, the political boundaries within the limits of this quadrangle are the boundary of the Lummi Indian Reservation, the Corporate Limit of the City of Ferndale, and the Corporate Limit of the City of Bellingham.

56 1. Lummi Indian Reservation.

The field inspection party recovered one witness to a corner of the Lummi Indian Reservation, "T 38N, R2E, S7 S8, L/R, PL, AP7, WC". This corner seems to have been accepted by the field inspection and by the compiler as a corner on the boundary. The letters "WC" included in any property corner designation mean "witness corner", and such a corner is set because the true corner cannot be monumented. In this case it cannot be monumented because it is in the middle of the river. The field editor recovered seven additional witness corners and two corners on this boundary. These corners and the witnesses were located by plane table. These recovered corners, witnesses, and plotted corners are shown on Field Edit Sheet No. 3, and are keyed to the numbers listed below, with brief descriptions shown in the case of recovered points.

1. Recovered, a standard GLO disk, riveted to the top of a 3/4 inch pipe extending 16" above ground, stamped "S17/S16, WC, 1930". A witness for Treaty Rock.
2. Treaty Rock, not recovered. This was plotted from witness (1). The Indians say Treaty Rock "sank". The fact of the

matter is that Treaty Rock was below mean high water, and although it was as big as a small house, it was covered by silt when the river channel shifted. Probing at the plotted position was considered, but was not attempted because of the heavy cover of large driftwood logs almost completely covering the area.

3. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 9 inches above the ground, stamped "T38N, R2W, PL, S17, WC, AP3, L/R, 1930".

4. AP3, not recovered, plotted from witness (3).

5. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 6 inches above the ground, stamped "T38N, R2W, S18, PL, AP4,L/R, 1930". (Plotted as AP 1).

6. Recovered, section corner 3, 7, 18, 17, also a witness to AP 1, a standard GLO disk riveted to the top of a 1¼ inch pipe extending 1 foot above ground stamped "S7, S8, S17, S18".

7. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 2 inches above the ground and stamped "T38N, R2W, PL, S18, AP2, L/R, 1930".

8. Recovered, a standard GLO disk, riveted to the top of a 3/4 inch pipe, extending 2 inches above the ground, stamped "T38N, R2W, PL, S18, WC, AP3, L/R, 1930".

9. AP3, not recovered, plotted from witness.

10. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe, extending 9 inches above the ground, and stamped "T38N, R2W, S7, AP1,L/R, PL, 1930". Should have been "WC".

11. Ap1. Not recovered; plotted from witness.

12. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe, extending 9 inches above the ground, stamped "T38N, R2W, S7, AP2, L/R, PL, 1930". Should have been "WC".

13. AP 2, not recovered, plotted from witness.

14. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 4 inches above the ground, stamped "T38N, R2W, S7, WC, AP3, PL, L/R, 1930".

15. AP 3, not recovered, plotted from witness.

The plat of the Walter D. Long resurvey of 1930 is quite good, but the stamping of the marks is often in error. Each mark is stamped R2W, where it should be R2E. With this in view, it is not unreasonable to assume that the omission of the witness course designation in a couple of cases was an error also. I think only two reference bearings are omitted from the plat, and one of these may be deduced from another plat. The only portion of the boundary difficult to deal with was the portion from S7, AP3 to S7, AP7. The bearing from S7, AP7 to WC, S7, AP7 is omitted from the plat, although the distance, 1.50 chains is shown. A circle of radius 1.50 chains with center at WC, S7, AP7 was struck, and the portion of the boundary from S7, AP3 to the eastward was plotted

on a piece of vellum and positioned so that S7, AP3 fell in the proper position, and the eastern end of the plotted portion of boundary fell on the 1.50 chain circle. Then the corners in between were pricked. Other portions of the line plotted between recovered corners fitted very well with almost zero closures. The survey is really quite good.

56 2. City of Ferndale.

The field inspection party furnished descriptions for the last two additions to the Ferndale municipal corporation, stating that legal descriptions for the balance of the corporate limit were not available. They did, however, show on the photograph the position of the city limit. The original act incorporating the City of Ferndale was located without any trouble, and a subsequent addition to the city was located after local inquiry. These descriptions are furnished as a part of this report. The boundary shown on the field photographs was taken from a map in the assessor's office, or at least it agrees with it, but there is a discrepancy in the Pioneer Park area. As a matter of interest, the City Limit shown in the Assessor's plat book (not on his wall map) is correct. I think that where the city limit follows the edge of a road, that the line on the manuscript should reflect this by turning and following its true position along the edge of the road for about0.5 inch. If you just run it up to the road and stop, there may be confusion about whether it goes with the center line of the road, or with the edge, and this should be clarified. See also 564, Riparian boundaries of municipal corporations.

56 3. City of Bellingham.

The field inspection party furnished copies of the original charter of the City of Bellingham, and of all but one of the annexations to the city. They also furnished maps of the city with the city limits shown thereon. They also drew the city limit on the appropriate photographs. Apparently, neither the field inspector, the compiler, or the office inspector made a careful review of the maps or descriptions, because there are gross disagreements between the data furnished, and the city limit delineated on the photographs. One annexation was also omitted. Complete descriptions of the Bellingham City Limit are furnished with this report. The corrected city limit within the limits of the quadrangle are shown with a red city limit symbol on Field Edit Sheet No. 4. See also 56 4, Riparian boundaries of Municipal corporations.

56 4. Riparian Boundaries of Municipal Corporations.

A copy of an act of the Washington State Legislature extending the corporate limits of cities fronting on waters is attached, with a copy of a decision of the Washington State Supreme Court relating to the act ~~is~~ also attached. This act will affect the city limits of both Ferndale and Bellingham.

57. Aids to Navigation.

Observations were made to relocate the Squalicum Creek Entrance Light and the Bellingham Breakwater Entrance Light. No check positions were obtained, but they check very nicely with plane table intersections which used mapped detail as control. Using mapped detail as control the plane table intersections gave about a thirty foot triangle of error; while not quite good enough for a location, it is quite good enough to indicate that there is no gross error in the work. The computed G.P. for the Squalicum Creek Entrance Light in only about a meter different from that obtained by the field inspection party, and there was probably no change in the light. The Bellingham Breakwater Entrance Light, however, has been moved about 500 feet from the first position obtained by the field inspection party, and moved about 360 feet while the field editor was in the area. Further shifts in this light may be expected as construction of the breadwater continues. The breakwater will be extended about 1500 feet to the west, and work has proceeded at the rate of about 200 feet per year. A plan of the work contemplated was furnished by the field inspection party.

58. Triangulation.

The Olympic Portland Cement Company in Bellingham has been converted from a coal-fired to an oil-fired operation. Two of the large stacks which were shown as landmarks (Triple Stack) and which doubled as intersection stations have been torn down. Appropriate recovery notes are submitted. A check observation was made on the remaining stack. See also Paragraph 57.

59. New Leveling.

A level party of this bureau under the supervision of Lt. Plaggmier has completed a rerun of the trunk level line along the Great Northern Railway across this sheet with a spur line to the Bellingham Airport. The bench marks established, and the field elevations are listed:

F 327	Elv.	18.2166 m.	At xn of RR and Kasa Rd.
G 327		11.8769	
L 6 26B		10.5610	
H 327		5.2861	
J 327		6.1411	
K 327		12.5989	
L 327		32.0809	
M 6 107B		32.9910	
M 327		34.3786	
R 327		15.5423	
T 330		4.5773	

Spur line to Bellingham Airport:

Q 327	48.2168
N 327	45.8692
P 327	45.5661
152.58	46.6028
149.80	45.6034
145.53	44.2857
157.93	48.0607

The locations of these marks have been spotted on the field edit sheet. No further recovery notes are submitted inasmuch the level party was in the area after completion of the bulk of the field work on the quad.

60. Junctions.

The work of the Geological Survey on topographic quadrangle Blaine NE has been matched along the north edge of the sheet.

Approved and Forwarded:

Charles W. Clark
Lt. Comdr., USC&GS
Chief of Party

Respectfully submitted:

Ray H. Skelton II
Cartographer (Photo)

Test Elev.	Map Elev.	Error	Error after shift	Remarks
From PEARSON 3 north and west along				
Thornton Rd. to sheet edge. (Combin-				
horizontal and vertical				accuracy tes
278	282	≠ 4	0	
286	290	≠ 4	≠ 1	
291	305	≠ 14	≠ 8	
299	318	≠ 19	≠ 17	
305	316	≠ 11	≠ 11	
308	318	≠ 10	≠ 10	
310	321	≠ 11	≠ 9	
308	325	≠ 17	≠ 12	
310	325	≠ 15	≠ 11	
314	330	≠ 16	≠ 14	
321	334	≠ 13	≠ 12	
329	341	≠ 12	≠ 11	
334	345	≠ 11	≠ 8	
335	344	≠ 9	≠ 6	
327	337	≠ 10	≠ 3	
320	320	≠ 0	≠ 0	
315	319	≠ 4	≠ 2	
313	318	≠ 5	≠ 3	
309	316	≠ 7	≠ 7	
306	315	≠ 9	≠ 9	Spot elv,x-rd
314	325	≠ 11	≠ 8	
321	331	≠ 10	≠ 9	
328	340	≠ 12	≠ 10	
338	350	≠ 12	≠ 10	
346	359	≠ 13	≠ 11	
354	369	≠ 15	≠ 12	
362	378	≠ 16	≠ 14	
369	384	≠ 15	≠ 13	
369	383	≠ 14	≠ 12	
389	397	≠ 14	≠ 12	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
North along Church Rd. from Thornton Rd.				
W/spur along Access rd. W.				
300	301	≠ 1	0	
300	315	≠ 15	≠ 5	T-rd W
323	332	≠ 9	≠ 6	
346	363	≠ 17	≠ 15	
354	372	≠ 18	≠ 16	
366	382	≠ 16	≠ 15	
302	302	- 0	0	
300	301	≠ 1	0	On fill
303	310	≠ 7	0	
302	307	≠ 5	≠ 4	
East along Thornton Rd. from Church Rd.				
to RR. thence N along RR.				
264	261	≠ 3	≠ 2	
236	230	- 6	- 4	
227	225	- 2	- 0	
231	239	≠ 8	≠ 8	Spot elv. x-rd
214	219	≠ 5	≠ 3	
183	183	0	0	
122	112	- 10	- 7	x-rd
82	62	- 20	- 3	
55	51	- 4	- 4	
56	51	- 5	- 5	
58	54	- 4	- 4	
60	56	- 4	- 4	
63	58	- 5	- 5	
66	61	- 5	- 5	
69	62	- 7	- 7	
70	62	- 8	- 8	
74	65	- 9	- 9	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
N. along Mallory Rd. from Thornton Rd.				
W. along sheet edge. Southeast along				
Blaine-Ferndale Rd. to Thornton Rd.				
128	128	0	0	
129	118	∠ 11	∠ 9	
115	114	- 1	0	
143	124	- 19	- 18	
108	118	∠ 10	∠ 7	
108	102	- 6	0	
129	122	- 7	0	
134	130	- 4	0	
137	141	∠ 4	0	
151	147	- 4	- 2	
153	153	0	0	
162	159	- 3	- 1	
182	165	- 17	- 13	
176	170	- 6	- 1	
184	189	∠ 5	0	
193	201	∠ 8	∠ 4	
193	190	- 3	0	
204	204	0	0	
211	212	∠ 1	∠ 0	
218	222	∠ 4	∠ 3	
207	214	∠ 7	∠ 6	
204	206	∠ 2	∠ 1	
204	203	- 1	0	
233	233	0	0	
228	242	∠ 14	∠ 13	
Southeast along Blaine-Ferndale Rd. from Thornton Rd. to Ferndale, W. along Stn. View to Church Rd. thence N. to Pearson 3				

Test Elev.	Map Elev.	Error	Error after shift	Remarks
231	223	- 8	- 7	
201	202	∠ 1	0	
179	176	- 3	0	
145	143	- 2	0	
99	101	∠ 2	∠ 1	
63	63	0	0	
79	82	∠ 3	∠ 2	
93	93	0	0	
69	69	0	0	
43	39	- 4	- 3	
65	65	0	0	
63	63	0	0	
71	76	∠ 5	∠ 4	
103	114	∠ 11	∠ 7	
135	150	∠ 15	∠ 9	
159	169	∠ 10	∠ 1	
204	216	∠ 12	∠ 2	
From Thornton Rd. South along sheet edge, thence east along Stn. View Rd. to Church Rd.				
349	363	∠ 14	∠ 11	
326	344	∠ 18	∠ 14	
341	342	∠ 1	0	
322	324	∠ 2	0	
279	285	∠ 6	∠ 5	
288	290	∠ 2	∠ 1	
274	274	0	0	
266	259	- 7	- 4	
203	211	∠ 8	∠ 7	T-rd N
223	244	∠ 21	∠ 19	
178	197	∠ 19	∠ 12	
135	133	- 2	- 1	T-rd N
159	170	∠ 11	∠ 5	
204	216	∠ 12	∠ 6	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Southwest along Douglas Rd. from				
Mtn.	View Rd. to	sheet edge		
51	62	≠ 11	≠ 9	Y-rd.
48	60	≠ 12	≠ 2	
53	44	- 9	- 6	
51	44	- 7	- 6	
49	43	- 6	- 4	
47	44	- 3	- 2	
33	41	≠ 8	≠ 7	T-rd. W.
49	49	0	0	
60	62	≠ 2	0	
Johnson Rd. from Douglas Rd.				
South and West to sheet edge.				
25	32	≠ 7	≠ 7	
16	22	≠ 6	≠ 6	
13	19	≠ 6	≠ 6	
10	18	≠ 8	≠ 8	Y-rd.
6	17	≠ 11	≠ 11	
6	16	≠ 10	≠ 10	
7	15	≠ 8	≠ 8	Rt. L Bend
6	15	≠ 9	≠ 9	
7	16	≠ 9	≠ 9	
10	16	≠ 6	≠ 6	
Imhoff Rd. from Douglas Rd.				
South to Red River Rd.				
27	28	≠ 1	≠ 1	
15	15	0	0	
17	22	≠ 5	≠ 5	
16	22	≠ 6	≠ 6	
13	19	≠ 6	≠ 6	
14	15	≠ 1	≠ 1	Spot. elv.
12	16	≠ 4	≠ 4	
13	17	≠ 4	≠ 4	
14	18	≠ 4	≠ 4	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Ulrich Rd. E. from Johnson Rd. to				
River Rd. thence south to tie w/figure				
10	17	≠ 7	≠ 7	
10	16	≠ 6	≠ 6	
17	21	≠ 4	≠ 4	
27	21	- 6	- 6	
29	21	- 8	- 8	
28	21	- 7	- 7	
22	21	- 1	- 1	
18	21	≠ 3	≠ 3	
18	19	≠ 1	≠ 1	
15	16	≠ 1	≠ 1	
14	14	0	0	
14	14	0	0	
15	14	- 1	- 1	
22				On levee
14	16	≠ 2	≠ 2	
12	13	≠ 1	≠ 1	
8	10	≠ 2	≠ 2	
7				Control
7	7	0	0	
11	11	0	0	
6	6	0	0	
6	6	0	0	
5	5	0	0	

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Red River Rd. from Ferndale Rd. to sheet edge.				
11	15	≠ 4	≠ 4	
9	17	≠ 8	≠ 8	
15	21	≠ 6	≠ 6	T-rd N
13	21	≠ 8	≠ 8	
12	19	≠ 7	≠ 7	
11	18	≠ 7	≠ 7	
12	18	≠ 6	≠ 6	
12	17	≠ 5	≠ 5	
12	17	≠ 5	≠ 5	
10	17	≠ 7	≠ 7	
11	16	≠ 5	≠ 5	
11	16	≠ 5	≠ 5	
11	16	≠ 5	≠ 5	
Kass Rd. from RR east, northeast, then east along sheet edge to tie w/spur north along hiway 99.				
55	53	- 2	- 2	X-rd
60	56	-4	-4	
66	62	- 4	- 4	
46	44	- 2	- 2	
34	34	0	0	
25	21	- 4	- 4	
28	19	- 9	- 9	
20	15	- 5	- 5	
26	15	- 11	- 11	
24	15	- 9	- 9	
29	15	- 14	- 14	
47	42	- 5	- 5	
65	65	0	0	
68	65	≠ 3	≠ 3	
69	65	- 4	- 4	X-rd

Test Elev.	Map Elev.	Error	Error after shift	Remarks
63	66	≠ 3	≠ 3	T-rd W
62	62	0	0	
63	64	≠ 1	≠ 1	
63	63	0	0	T-rd E
Tiser Lake Rd. from Piper Rd. South to Axton Rd. east to tie.				
59	61	≠ 2	≠ 2	T-rd E
51	45	- 6	- 6	
63	61	- 2	- 2	
63	59	- 4	- 4	T-rd W Cem.
44	44	0	0	T-rd E [illegible]
35	35	0	0	
48	44	- 4	- 4	
57	61	≠ 4	≠ 4	
66	66	0	0	x-rd
63	65	≠ 2	≠ 2	
78	78	0	0	
75	75	0	0	
75	75	0	0	
76	76	0	0	
75	75	0	0	x-rd
75	75	0	0	
75	75	0	0	

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Along Piper Rd. east from Wiser Lake Rd. to Aldrich Rd. thence South along Aldrich Rd. to Axton Rd. and tie. w/spur on Woodlyn Rd.				
64	65	+ 1	+ 1	
65	64	- 1	- 1	
65	64	- 1	- 1	
67	72	+ 5	+ 5	
66	65	- 1	- 1	
70	66	- 4	- 4	
66	67	+ 1	+ 1	Spot elv. X-rd
61	64	+ 3	+ 3	
62	62	0	0	
61	61	0	0	
59	61	+ 2	2	T-rd E.
44	44	0	0	
55	45	- 10	- 10	
59	55	- 4	- 4	
65	69	+ 4	+ 4	X-rd.
79	79	0	0	
79	78	- 1	- 1	
Aldrich Rd. North from Piper Rd. thence east along sheet edge				
69	71	+ 2	+ 2	
73	71	+ 4	+ 4	
85	81	- 4	- 4	
73	77	+ 4	+ 4	
83	81	- 2	- 2	
Hemmi Rd. from Aldrich Rd. east to sheet edge				
57	42	- 13	- 13	
46	46	0	0	
56	52	- 4	- 4	
56	56	0	0	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Laurel Rd. from Aldrich Rd. east to sheet edge				
78	79	+ 1	+ 1	
76	76	0	0	
78	70	- 8	- 8	
North along Aldrich Rd. from point 0.06 mi. North of Larabee Rd. w/ loop in clearing.				
122	135	+ 12	+ 12	
130	130	0	0	
153	163	+ 10	+ 10	
158	175	+ 17	+ 17	
154	159	+ 5	+ 5	
144	149	+ 5	+ 5	
140	161	+ 21	+ 21	
137	162	+ 25	+ 25	
135	155	+ 20	+ 20	
140	156	+ 16	+ 16	
150	161	+ 11	+ 11	
148	154	+ 6	+ 6	
142	146	+ 4	+ 4	
107	125	+ 18	+ 14	
138	140	+ 2	+ 1	
134	142	+ 8	+ 7	

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Southeast along U.S. 99 from Sunset Ave. to sheet edge				
54	54	0	0	
81	90	≠ 9	≠ 9	X-rd.
86	95	≠ 9	≠ 9	
100	104	≠ 4	≠ 4	X-rd.
109	117	≠ 8	≠ 8	
134	140	≠ 6	≠ 6	
114	132	≠ 18	≠ 18	
122	138	≠ 16	≠ 16	
128	131	≠ 3	≠ 3	Spot elv.
169	162	- 7	- 7	
165	165	0	0	
145	158	≠ 13	≠ 13	
164	166	≠ 2	≠ 2	
165	169	≠ 4	≠ 4	Spot elv X-rd
167	174	≠ 7	≠ 7	
175	175	0	0	
155	158	≠ 3	≠ 3	
140	141	≠ 1	≠ 1	
104	104	0	0	
93	96	≠ 3	≠ 3	Spot elv X-rd
87	85			
Bakerview Rd. from Aldrich Rd. east to sheet edge				
162	166	≠ 4	≠ 3	
168	163	- 5	- 5	
Southeast along RR from 1.2 mis N. of Bakerview Rd. to Bellingham, thence N. through Birchwood to tie				
44	50	≠ 6	≠ 6	
46	54	≠ 8	≠ 8	
54	58	- 4	- 4	
61	62	≠ 1	≠ 1	
68	71	≠ 3	≠ 3	
77	79	≠ 2	≠ 2	
86	90	≠ 4	≠ 4	
94	100	≠ 6	≠ 6	
103	112	≠ 9	≠ 9	
108	121	≠ 13	≠ 13	Spot elv RRx-ing
109	120	≠ 11	≠ 11	
108	115	≠ 7	≠ 7	
108	110	≠ 2	≠ 2	
112	109	- 3	- 3	
112	108	- 4	- 4	
110	108	- 2	- 2	
110	107	- 3	- 3	
111	106	- 5	- 5	
111	105	- 6	- 6	
112	104	- 8	- 8	
114	103	- 11	- 11	
112	102	- 10	- 10	
108	101	- 7	- 7	
101	100	- 1	- 1	
86	92	≠ 6	≠ 6	
89	84	- 5	- 5	
81	74	- 7	- 7	
79	72	- 7	- 7	
78	69	- 9	- 9	
69	63	- 6	- 6	
65	60	- 5	- 5	
53	49	- 4	- 4	
62	62	0	0	
65	63	- 2	- 2	
66	66	0	0	Spot elv rd xn
68	66	- 2	- 2	T-rd N.
68	68	0	0	
73	74	≠ 1	≠ 1	X-rd
78	81	≠ 3	≠ 3	X-rd
90	98	≠ 8	≠ 8	T-rd S.

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Bakerview Rd. east 1/2 mi. from RR thence S. to RR				
113	122	≠ 9	≠ 9	
118	122	≠ 4	≠ 4	
113	122	≠ 9	≠ 9	
127	123	- 4	- 4	
116	116	0	0	
153	154	≠ 1	0	
127	135	≠ 8	≠ 8	
Marietta Rd. from RR Southeast to Bellingham. (Barometric leveling max. tie 2 ft.)				
134	123	- 11	- 11	
121	126	≠ 5	≠ 5	
119	123	≠ 4	≠ 4	
108	115	≠ 7	≠ 7	
103	110	≠ 7	≠ 7	
80	82	≠ 2	≠ 2	
71	70	-1	- 1	
From traverse station M7 (U.S.E.) east to Bennett Ave. thence SW to Marietta Rd. (Barometric leveling, max. tie 2ft.				
146	158	≠ 12	≠ 12	
146	157	≠ 11	≠ 11	Spot elv T-rd N
154	162	≠ 8	≠ 8	Spot elv T-rd N
154	155	≠ 1	≠ 1	
114	121	≠ 7	≠ 7	
118	122	≠ 4	≠ 4	T-rd N.
115	124	≠ 9	≠ 9	At dr.
Southeast along Eldridge Ave. from Squalicum Creek to sheet edge.				
66	66	0	0	
63	63	0	0	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Curtis Rd from Bakerview Rd. N. 1.2 mis.				
108	118	≠ 10	≠ 10	
101	104	≠ 3	≠ 3	
95	105	≠ 10	≠ 10	
102	105	≠ 3	≠ 3	
100	103	≠ 3	≠ 3	
91	95	≠ 4	≠ 4	
89	89	0	0	
78	83	≠ 5	≠ 5	T-rd E.
88	85	- 3	- 3	
77	76	- 1	- 1	
West along Marietta Rd from RR to left Bank Hooksack R. thence N. w/ river bk. to Gilson Rd. thence east to tie.				
104	101	≠ 6	≠ 6	T-rd N.
92	92	0	0	T-rd S.
80	81	≠ 1	≠ 1	
74	82	≠ 6	≠ 6	
70	78	≠ 8	≠ 8	T-rd N.
38	38	0	0	T-rd N.
17	33	≠ 16	≠ 16	
8	27	≠ 19	≠ 19	
8	10	≠ 2	≠ 2	
7	7	0	0	
8	8	0	0	
6	6	0	0	
5	5	0	0	
7	7	0	0	
13				On levee
8	8	0	0	
8	16	≠ 8	≠ 8	Spot elv.
10	10	0	0	
8	10	≠ 2	≠ 2	
4	10	≠ 6	≠ 6	On levee

Test Elev.	Map Elev.	Error	Error after shift	Remarks
16	16	0	0	
14	16	+ 4	+ 4	
30	24	- 6	- 6	
14	14	0	0	
16	16	0	0	
36	36	0	0	Spot elv V-rd
From Marietta NE along rd. to tie.				
13	22	+ 9		
23	23	0	0	
26	26	0	0	
26	26	0	0	
32	41	+ 9	+ 8	T-rd N
30	41	+ 11	+ 11	
29	29	0	0	
32	31	- 1	- 1	
Bakerview Rd. Southwest to Marietta from dd.				
96	108	+ 12	+ 12	
81	94	+ 13	+ 11	T-rd E
78	96	+ 18	+ 17	T-rd W
73	85	+ 12	+ 12	
44	62	+ 18	+ 17	
40	54	+ 14	+ 14	X-rd.
27	44	+ 17	+ 17	
7	18	+ 11	+ 10	
Jones Rd. Marietta Rd. E. to tie.				
74	83	+ 9	+ 8	
76	84	+ 8	+ 7	
Hoff Rd. NE of Marietta				
40	48	+ 8	+ 8	
41	56	+ 15	+ 15	
38	50	+ 12	+ 10	
28	42	+ 14	+ 14	T-rd N
31	42	+ 11	+ 11	

Test Elev.	Map Elev.	Error	Error after shift	Remarks
Lummi Shore Rd. from Fish Pt. NW to sheet edge.				
8	8	0	0	
7	7	0	0	
7	7	0	0	
8	8	0	0	
7	7	0	0	
9	9	0	0	V-rd.
7	7	0	0	
7	7	0	0	
9	9	0	0	
24	18	- 6	0 ?	
45	45	0	0	
43	43	0	0	
35	35	0	0	
36	42	+ 6	+ 6	
36	41	+ 5	+ 5	Spot elv T-rd
37	42	+ 5	+ 5	
11	35	+ 24	+ 22	
34	42	+ 8	+ 8	
11	40	+ 29	+ 27	
31	45	+ 14	+ 11	
15	15	0	0	
7	10	+ 3	+ 3	
9	15	+ 6	+ 6	
16	22	+ 6	+ 6	Top.
7	17	+ 10	+ 10	
Along Kwina Rd., from Lummi School W. to sheet edge.				
47	47	0	0	
47	55	+ 8	+ 8	
49	58	+ 9	+ 9	

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Test Elev.	Map Elev.	Error	Error after shift	Remarks
Southwest along telp line from				
BM 65	RS			
39	42	∠ 3	∠ 3	Y-rd
57	49	- 8	- 7	
70	54	-16	-15	
57	57	0	0	
85	82	- 3	- 1	
114	114	0	0	
124	124	0	0	
117	120	∠ 3	∠ 2	
115	115	0	0	
117	115	0	0	
125	120	- 5	- 5	
134	146	∠12	∠10	
138	150	∠12	∠10	
138	148	∠10	∠ 9	
133	147	∠14	∠13	
139	150	∠11	∠11	
136	155	∠19	∠19	
From	Lummi	Shore Rd 0.2	mi. N. of	
JOHN	3 NW to telp	line.		
35	30	- 5	- 3	
42	42	0	0	
46	43	- 3	- 3	
48	44	- 4	- 4	
53	45	- 8	- 8	
56	48	- 8	- 8	
44	50	∠ 6	∠ 6	
44	52	∠ 8	∠ 8	
44	54	∠10	∠10	
45	55	∠10	∠10	
46	56	∠10	∠10	
53	60	∠ 7	∠ 7	
59	70	∠11	∠10	
81	86	∠ 5	∠ 4	
90	90	0	0	
96	101	∠ 5	∠ 4	
104	104	0	0	
106	110	∠ 4	∠ 4	
113	113	0	0	
113	121	∠ 8	∠ 7	
106	121	∠15	∠14	
115	118	∠ 3	∠ 3	
115	117	∠ 2	∠ 2	
116	116	0	0	
From	BM 66RS	along	Lummi	Shore Rd,
thence	NW to telp	line.		
32	32	0	0	
44	44	0	0	
39	39	0	0	
60	47	-13	-13	
51	56	∠ 5	∠ 5	
51	57	∠ 6	∠ 6	
54	59	∠ 5	∠ 5	
53	60	∠ 7	∠ 6	
56	67	∠11	∠ 9	
64	76	∠12	∠10	
72	84	∠12	∠10	
81	99	∠18	∠14	
92	110	∠18	∠14	
97	117	∠20	∠17	
109	123	∠14	∠13	
113	126	∠13	∠12	
125	132	∠ 7	∠ 6	
129	135	∠ 6	∠ 5	
129	136	∠ 7	∠ 6	
130	138	∠ 8	∠ 7	
137	141	∠ 4	∠ 3	
148	155	∠ 7	∠ 6	
153	163	∠10	∠10	

TOPOGRAPHIC MAPPING

Summary & Abstract of Vertical Accuracy Test

Project No. Ph-26 Quad. No. T-5584 Quad. Name _____
Method of Testing Plane table profiling
Tested by R. H. Skelton Date May 1952 Evaluated by R.H.S. II
Contour interval 20 ft. 1.22 M.M. allowable shift at 1/10,000 map or manuscript scale.

539 Total number of points tested
83 % of points within ½ contour interval or better
455 Test points correct within ½ contour interval
80 Test points in error between ½ and full contour interval
4 Test points in error over full contour interval

Test Elev.	Map Elev.	Error	Error after shift	Remarks	Test Elev.	Map Elev.	Error	Error after shift	Remarks
150	161	∓11	∓10		34	35	∓ 1	∓ 1	Y-rd
147	156	∓ 9	∓ 8		32	34	∓ 2	∓ 2	
From BM 66RS southwest to Casey Rd,					32	31	- 1	- 1	x-rd
thence east to tie.					32	32	0	0	
40	50	∓10	∓ 6		30	33	∓ 3	∓ 3	
73	57	-16	-12		29	35	- 6	- 6	
87	74	-13	- 9		32	36	∓ 4	∓ 4	
97	101	∓ 4	∓ 2		40	38	∓ 2	∓ 2	
113	124	∓11	∓ 9		41	41	0	0	
114	127	∓13	∓11		24	24	0	0	
114	130	∓16	∓14		20	23	∓ 3	∓ 3	
119	134	∓15	∓13						
123	138	∓15	∓13						
122	135	∓13	∓11						
117	130	∓13	∓11						
111	124	∓13	∓11						
108	117	∓ 9	∓ 7						
105	108	∓ 3	∓ 1						
99	99	0	0						
95	95	0	0						
94	94	0	0						
98	90	- 8	- 8						
88	88	0	0						
69	69	0	0						
Along Smith Rd east from Great									
Northern Hwy, thence NW along rte									
99 to Ferndale, thence SE along RR									
to Smith Rd.									
15	28	∓13	∓13						
22	34	∓12	∓12						
28	39	∓11	∓11						
61	68	∓ 7	∓ 6	x-rd					
28	38	∓10	∓10						
26	38	∓12	∓12						

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