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Form 504

U. S. COAST AND GEODETIC SURVEY
DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC
Field No. H-3997 Office No. H-3998

LOCALITY

State WASHINGTON
General locality LAKE WASHINGTON
Locality

1917

CHIEF OF PARTY

J. A. Daniels

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DATE APRIL 20, 1918

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DEPARTMENT OF COMMERCE

U. S. Coast & Geodetic Survey,

DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SHEETS NOS. 3997-98.

Scale 1:5000.

John A. Daniela, Jr. H. & G. E.,
Chief of Party.

DESCRIPTIVE REPORT

HYDROGRAPHY-LAKE WASHINGTON SHIP CANAL.

Sheets 3997-98. Scale 1:5,000

The hydrographic survey of the Lake Washington Ship Canal in September, 1917, was made necessary by the completion and opening to the public of this waterway during the summer of 1917. The principle feature of the canal, which has been in course of projection and construction by the U. S. Army Engineers since the early days of Seattle, is the locks and spillway located at the western neck of Salmon Bay and connecting tide water with the fresh water portion of the canal. There are two lock chambers placed side by side, one for the accommodation of launches and small vessels, and the other for large vessels and tows. The locks are built of concrete and the machinery for opening and closing the gates is operated by electric power.

The large lock is 80 feet wide by 825 feet long and 36 feet deep at low water in the lake and mid tide in Puget Sound. The small lock is 30 feet wide by 150 feet long by 16 feet deep.

From the locks a canal 100 feet wide and 36 feet deep has been dredged through Salmon Bay and the connecting channel to Lake Union, and from Lake Union 100 feet wide and 30 feet deep has been dredged to Lake Washington.

Upon the southern side of the locks is a dam and spillway with adjustable gates so that the level of the canal can be controlled during the dry and flood seasons. The range of level in the canal and locks is about 2 feet and it is planned to maintain the higher level during the dry season and the lower level during the flood season. There will thus be afforded a reservoir for surplus flood water in case of abnormal precipitation during flood seasons; and also a storage for water needed to operate the locks during seasons of small precipitation. The datum for soundings taken inside the locks has been adopted as the mean of this 2 foot range. The depths in the canal will therefore not vary more than 1 foot from the charted depths.

When the locks were closed and the channels from Lake Washington to Lake Union and from Lake Union to Salmon Bay were opened the level of the water in Lake Washington was lowered about 6 feet, that of Lake Union raised about 10 feet, and that of Salmon Bay made constant at a level about 10 feet above high water. This increased the depths and water areas in Salmon Bay and Lake Union and decreased the same in Lake

Washington. A resurvey of the new water areas and changed depths thus became necessary.

The survey from the locks to Lake Union was hindered in the channel by log rafts tied up for storage by the various mill interests in this section. Lines were run 50 meters apart in the open water and soundings were made on the areas covered by logs by walking over the rafts and sounding between the logs. In all cases it was endeavored to space the soundings not more than 50 meters apart.

In the southern part, to the westward and southward of the wharves in Salmon Bay, there is a considerable area of shoal water that is covered with trees and shrubs of various sizes. The area south of the channel and eastward of the N. P. R. R. bridge, for about 1/3 of a mile is foul with trees and stumps. There were several snags located southward from the canal and just west of the new city bridge across the eastern end of Salmon Bay. No trees or snags were found except in these localities. Noticeable shoals found inside of the locks are two in Salmon Bay just southward of the dredged channel and at distances of about 1000 and 600 yards westward from the city bridge. Each of these shoals has a least found depth of 22 feet. A depth of 17 feet was found to encroach closely to the south side of the channel just westward of the above city bridge.

Three draw bridges across the canal were completed, one city bridge and two R. R. bridges. Two city draw bridges were in course of construction and one had the foundations laid, but will not be built at present. Except in the deep cut between Portage Bay and Lake Washington where revetment has been placed for a short distance, the banks of the dredged channel are unsupported and because of the soft material are washing into the channel rapidly. Therefore, it is not thought that the channel depths can be depended upon unless frequently redredged.

Outside of the locks in Shilshole Bay, soundings were taken to deep water upon each side of the canal entrance for a distance about half a mile. In general the charted depths were verified.

Tides were observed upon the U. S. Engineers staff outside of the locks and levels were run to connect the staff with the U. S. Engineers B. M. at the locks and to a precise level B. M. of the transcontinental line located upon the S. E. end of the G. W. R. R. bridge. Inside of the locks the Lake levels at the time the soundings were made were obtained from the Engineers at the locks who take readings of the Lake level twice each day.

Aids to navigation have now been established for entering the canal. A buoy at the outer entrance supplemented by range marks

and lights enables a vessel to reach the locks. White triangular targets upon pile dolphins in Portage Bay afford ranges for passing through Portage Bay and the canal from there to Lake Washington. A pile dolphin with target marks a safe turning point in deep water near the northern end of Lake Union. These marks were originally built by the U. S. Engineers, but it is understood that they are to be maintained and perhaps altered by the lighthouse bureau.

Along the shores of Lake Union, Portage Bay, and Lake Washington are located numerous floating house boats. These are especially numerous in Portage Bay where almost the entire waterfront space is taken up by them.

The hydrographic survey was made by the Revision Party consisting of the Chief of Party, Jr. H. & G. E. Douglas Karr, and three hands assisted by a launch and two men from the steamer EXPLORER or by a whale boat and three hands from the same vessel.

Respectfully Submitted
John A Daniels
Jr. H & G. E.
Chief of Party