70TH CONGRESS, 1st Session } HOUSE OF REPRESENTATIVES { DOCUMENT No. 187

# BELLINGHAM HARBOR, WASH.

## LETTER

FROM

# THE SECRETARY OF WAR

TRANSMITTING

**REPORT FROM THE CHIEF OF ENGINEERS ON PRELIMINARY EXAMINATION AND SURVEY OF BELLINGHAM HARBOR, WASH., WITH A VIEW TO IMPROVING SQUALICUM CREEK WATERWAY**

FEBRUARY 27, 1928.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with illustration

WAR DEPARTMENT,
*Washington, February 24, 1928.*

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report, dated February 21, 1928, from the Chief of Engineers, United States Army, on preliminary examination and survey of Bellingham Harbor, Wash., with a view to improving Squalicum Creek waterway, authorized by the river and harbor act approved January 21, 1927, together with accompanying papers and map.

Sincerely yours,

DWIGHT F. DAVIS,
*Secretary of War.*

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
*Washington, February 21, 1928.*

Subject: Preliminary examination and survey of Bellingham Harbor, Wash.

To: The Secretary of War.

1. I submit, for transmission to Congress, my report, with accompanying papers and map, on preliminary examination and survey,

BELLINGHAM

authorized by the river and harbor act approved January 21, 1927, Bellingham Harbor, Wash., with a view to improving Squalicum Creek waterway.

2. Bellingham Harbor is located about 18 miles south of the international boundary and 90 miles north of Seattle. There is an existing project which provides for dredging Whatcom Creek waterway for its full width to a depth of 26 feet for the outer 3,800 feet and a depth of 18 feet for the inner 1,300 feet. This improvement has been completed. Local interests now request that additional harbor facilities be provided by dredging Squalicum Creek waterway. The range of tide between mean lower low water and mean higher high water is 8.5 feet.

3. The principal business of Bellingham Harbor is in lumber, shingles, fish, and agricultural products. The total commerce in 1926 amounted to 1,962,000 tons, of which 1,314,000 tons was floated timbers. In addition, 201,000 tons was moved by car ferries. The foreign commerce was 203,000 tons. The traffic handled over the improved Whatcom Creek waterway amounted to 150,000 tons. The balance of the commerce was handled over private lumber, fish, and other wharves, where no improvement has been made by the United States. It is claimed that the Whatcom Creek waterway is inadequate to handle the business of the port. Local interests state that a cement mill conveniently located for shipment over the proposed waterway has a capacity of nearly a million barrels per year. A local coal mine would probably be able to increase its output so that at least 100,000 tons would be shipped by water annually to San Francisco. A considerable tonnage is expected also through the shipment by water, in cargo lots, of lumber produced by a number of small interior mills. It is also claimed that much of the product of a sugar refinery already in operation could be moved by water, and that there would be an increase in shipments of canned salmon and of fruits and vegetables.

4. The district engineer states that the port of Bellingham has acquired a large section of waterfront at the mouth of Squalicum Creek, and has started the construction of new terminals at that point. The work so far accomplished has been the reclamation of an area of about 20.6 acres by the dredging of a channel 300 feet wide and 26 feet deep with a turning basin at the inner end. This dredged area is not connected with deep water in the harbor, which is about 2,000 feet seaward of the pierhead line. The plans for the development include the construction of extensive terminals, including coal and oil bunkers, warehouses, and railway connections. The district engineer estimates that coal and cement shipments over the waterway may amount to 145,000 to 150,000 tons. He considers it probable that an oil company may locate on Squalicum Creek waterway and that the provision of storage space for the output of small interior mills may result in a material shipment of lumber.

5. An entrance channel 26 feet deep and 200 feet wide from deep water in the bay to the main pierhead line at the outer entrance of the waterway is estimated to cost $25,000. A turning basin within the entrance would cost $20,000. Completion of the dredging of the south half of the waterway to a depth of 26 feet is estimated at $30,000. Dredging the northern half of the waterway to the same depth would cost $86,000. The total cost would be $161,000. A depth of 26 feet is considered adequate by the district engineer, although a few large vessels would be unable to load full cargoes. The potential commerce appears to him to justify the improvement, while the general benefits are such that the United States might well participate in the cost. Dredging the north half of the waterway is considered unnecessary at present and the adoption of a project for the balance of the work is recommended at an estimated cost of $75,000, provided local interests contribute one-third of the cost and assume the maintenance of the inner channel marked "area C" on the map. The estimated cost of maintenance to be assumed by the United States is $5,000 for the first year, $2,000 for the second year and $500 annually thereafter. The division engineer concurs.



6. The report of the district engineer has been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith. The board believes that the Federal expenditure should be limited to the provision of a channel seaward of the main or outer pierhead line, being section A shown on the map, and recommends that this work be undertaken, at an estimated cost of $25,000 with $500 annually after the first two years for maintenance, provided local interests give assurances satisfactory to the Secretary of War and the Chief of Engineers that they will provide and maintain at their own expense the inner channel areas B and C and will construct a suitable public terminal.

7. After due consideration of the above-mentioned reports, I concur in the views of the Board of Engineers for Rivers and Harbors. The area tributary to Bellingham Harbor has valuable natural resources and is developing rapidly. The existing facilities of Whatcom Creek waterway are evidently inadequate to take care of the expanding business. Extensive improvements have been undertaken by the port of Bellingham to provide adequate transshipment facilities elsewhere. In view of the commerce which it appears reasonable to assume may move over the waterway, and because this commerce enters largely into general distribution, the project appears to be justified. I therefore report that modification of the existing project for Bellingham Harbor, Wash., is deemed advisable so as to provide for a channel in Squalicum Creek waterway 26 feet deep and 200 feet wide from deep water in the bay to the main pierhead line, being section A shown on the map, at an estimated cost of $25,000, with $500 annually after the first two years for maintenance, subject to the provisions that local interests give assurances satisfactory to the Secretary of War and the Chief of Engineers that they will dredge and maintain at their own expense the inner channel, areas B and C, and will construct a suitable public terminal.

EDGAR JADWIN,
*Major General, Chief of Engineers.*

## REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

### SYLLABUS

The Board of Engineers for Rivers and Harbors recommends modification of the existing project for the improvement of Bellingham Harbor, Wash., so as to provide for an entrance channel to Squalicum Creek waterway 26 feet deep and 200 feet wide from deep water in the bay to the main pierhead line, section A on the inclosed map, at an estimated cost of $25,000, with $500 annually, after the first two years, for maintenance, subject to certain conditions of local cooperation.

[Third indorsement]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
*Washington, D. C., February 3, 1928.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The following is in review of the reports on preliminary examination and survey authorized by the river and harbor act approved January 21, 1927, of Bellingham Harbor, Wash., with a view to improving Squalicum Creek waterway.

2. Bellingham Harbor is located on Bellingham Bay, about 18 miles south of the international boundary and about 90 miles north of Seattle. The city of Bellingham, which has a population of about 35,000, is partly skirted by tidal flats. Outside of this shallow water depths in the harbor vary from 4 to 15 fathoms. There is an existing project which provides for dredging Whatcom Creek waterway for its full width to a depth of 26 feet for the outer 3,800 feet and a depth of 18 feet for the inner 1,300 feet. The improvement now desired is the improvement of Squalicum Creek waterway to provide additional harbor facilities. The range of tide between mean lower low water and mean higher high water is 8.5 feet.

3. The principal business centering on Bellingham Harbor is in lumber, shingles, fisheries, and agricultural products. The commerce in 1926 amounted to 1,962,000 tons, of which 1,314,000 tons was floated timbers. In addition, there was a car-ferry movement of 201,000 tons. The foreign commerce was 203,000 tons. About 150,000 tons was handled over the improved Whatcom Creek waterway, the balance of the traffic pertaining to private lumber, fish, and other wharves at which natural deep water is available.

4. The city of Bellingham is served by three transcontinental railroads. It is claimed that some 18,000,000,000 feet board measure of standing timber is tributary to the harbor, 10,000,000,000 of which is in Government ownership. A cement mill having a capacity of nearly a million barrels per year is conveniently located for shipment of 45,000 to 50,000 tons over the proposed waterway. A local coal mine, which is not being operated to capacity would, in the opinion of interested parties, be able to increase its output so that at least 100,000 tons would be shipped to San Francisco annually by water. Other business expected is the storing of lumber from a number of small interior mills and its shipment by water in cargo lots. A sugar refinery already in operation would be able to ship much of its output by water, and there would be an increase in the movement of canned salmon and of fruits and vegetables.

5. The district engineer states that the Whatcom Creek waterway is inadequate to handle the business of the port. A large section of water front at the mouth of Squalicum Creek has been acquired by the port of Bellingham with a view to the construction of new terminals. The work so far undertaken by the locality has been the dredging of a channel 300 feet wide and 26 feet deep, with a turning basin at the inner end, and the bulkheading and filling of an area of about 20.6 acres. No connection has been made between this dredged area and deep water in the harbor, which is about 2,000 feet seaward of the pierhead line. The port authorities state that they believe that after completion of the proposed improvements the commerce would increase at least a million and a half tons a year. The plans provide for the development of extensive terminals, including coal and oil bunkers, warehouses and railway connections. The district engineer finds it difficult to make an accurate estimate of the probable commerce, but believes that a substantial tonnage may be expected. In the matter of coal and cement shipments alone he thinks that 145,000 to 150,000 tons may result. It appears probable to him that an oil company may locate on Squalicum Creek waterway and that a material business in lumber may develop throughthe provision of storage space for the output of small interior mills.



6. The estimated cost of an entrance channel 26 feet deep and 200 feet wide from deep water in the bay to the main pierhead line at the outer entrance of the waterway is $25,000. A turning basin within the entrance of the waterway would cost $20,000. Completion of the dredging of the south half of the waterway to 26-foot depth is estimated at $30,000. Dredging the north half of the waterway to the same depth would cost $86,000. The total of these items is $161,000. The district engineer considers that a depth of 26 feet is adequate for the classes of vessels which may be expected to call at this port, although the largest vessels would be unable to load full cargoes. He believes that the potential commerce is sufficient to justify the improvement and that the general benefits are such that the United States might well participate in the cost. He considers unnecessary at present the dredging of the north half of the waterway and recommends that a project be adopted for the balance of the work at an estimated cost of $75,000, provided local interests agree to contribute one-third of the cost and to assume the maintenance of the inner channel marked area C on the map. The estimated cost of maintenance to be assumed by the United States is $5,000 for the first year, $2,000 for the second year and $500 annually thereafter. The division engineer concurs in the recommendation of the district engineer.

7. The commerce of Bellingham Harbor is in general widely distributed. The locality has valuable natural resources and has been developing rapidly. Industries already developed appear to justify the assumption that a material tonnage will be available for movement over the proposed improvement. The additional tonnage can not be moved with economy over the existing facilities of the Whatcom Creek waterway. The port of Bellingham has undertaken extensive improvements and expects to make further expenditures to assure adequate transshipment facilities. In connection with the reclamation of land adjoining Squalicum Creek waterway the port district has dredged an area which will be part of the projected improved channel. In view of the commerce which it appears may move over the waterway and the general benefits which may be

expected to result, the board considers cooperation by the United States justified. It believes, however, that Federal expenditure should be limited to the section seaward of the main or outer pierhead line. The board therefore recommends modification of the existing project for Bellingham Harbor, Wash., so as to provide for a channel in Squalicum Creek waterway 26 feet deep and 200 feet wide from deep water in the bay to the main pierhead line, being section A shown on the map, at an estimated cost of $25,000 with $500 annually after the first two years for maintenance, subject to the provisions that local interests give assurances, satisfactory to the Secretary of War and the Chief of Engineers, that they will provide and maintain at their own expense the inner channel (areas B and C) and will construct a suitable public terminal.

8. In compliance with law, the board reports that except as contemplated by the above recommendations, there are no questions of terminal facilities, water power, or other subjects so related to the project proposed that they may be coordinated therewith to lessen the cost and compensate the Government for expenditures made in the interests of navigation.

For the board:

HERBERT DEAKYNE,
*Brigadier General, Assistant Chief of Engineers,*
*Senior Member.*

---

## PRELIMINARY EXAMINATION OF BELLINGHAM HARBOR, WASH.

SYLLABUS

The existing project provides for the improvement of Whatcom Creek waterway only. The space along this channel available for industrial sites and terminal facilities appears to be insufficient for the proper development of this harbor. The port of Bellingham has acquired extensive holdings and done considerable work of dredging and filling at the Squalicum Creek waterway. The district engineer believes that the prospects of the development of a considerable amount of commerce at that locality, coupled with the expenditures already made by the port, are sufficient to justify the United States in undertaking some improvement there and recommends a survey to determine the proper extent and the cost thereof.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
*Seattle, Wash., May 12, 1927.*

Subject: Preliminary examination of Bellingham Harbor, Wash., with a view to improving the Squalicum Creek waterway.
To: The Chief of Engineers, United States Army.

1. In compliance with section 4 of the river and harbor act of January 21, 1927, and instructions contained in department letter [1] of February 5, 1927, the following report, with map,[1] is submitted on the preliminary examination of Bellingham Harbor, Wash., with a view to improving the Squalicum Creek waterway. The general situation and location of Squalicum Creek are also shown on United States Coast and Geodetic Survey Chart No. 6378.

2. *General description.*—Bellingham Harbor is a part of Bellingham Bay, an arm of Washington Sound, about 18 miles south of the international boundary and about 90 miles north of Seattle. The harbor proper is about 2 miles wide from west to east and 4 miles long.

[1] Not printed.



Depths in the harbor outside of the tidal flats at the upper end are from 4 to 15 fathoms. The extreme tidal range is 16.5 feet and the range between mean lower low water and mean higher high water is 8.5 feet.

3. *Original condition.*—While there was ample depth in the outer portion of the harbor, entrance to the city of Bellingham was obstructed by tidal flats extending from the meander line to low water, a distance of about 2,400 feet. A system of harbor lines provides for three waterways, Whatcom Creek, I and J Streets, and Squalicum Creek, respectively, over these flats. The easterly one, the Whatcom Creek waterway, is the only one now under improvement.

4. *Examination and surveys.*—Examinations and surveys of this locality and reports thereon have been made as follows:

(*a*) Preliminary examination, "Bellingham Bay, Wash.," ordered by the river and harbor act of August 17, 1894. Report dated January 1, 1895, House Executive Document No. 228, Fifty-third Congress, third session. Favorable for surveys of bay and of Star Rock and for removing Star Rock.

(*b*) Survey, "Bellingham Bay, from deep water to the mouth of Whatcom Creek, at New Whatcom, Wash.," ordered by the river and harbor act of June 3, 1896. Report dated June 14, 1897, House Document No. 80, Fifty-fifth Congress, first session. Favorable for dredging Whatcom Creek waterway 12 feet deep at an estimated cost of $80,000.

(*c*) Survey of Star Rock under authority of the river and harbor act of March 3, 1905, which provided for "Improving Puget Sound and its tributary waters, Washington: Continuing improvement and for maintenance, $20,000, of which amount so much as may be necessary may be expended in the removal of Star Rock, Bellingham Bay * * *." Report dated September 25, 1905, gave estimate of cost of removal to a depth of 26 feet at mean lower low water as $100,000. It was discussed in the Annual Report of the Chief of Engineers for 1906, page 2026, and removal was not recommended.

(*d*) Preliminary examination and survey, "Bellingham Harbor, Wash.," ordered by the river and harbor act of March 2, 1907. Reports on preliminary examination dated April 27, 1907, and on survey dated March 26, 1908, House Document No. 1161, Sixtieth Congress, second session. Favorable for dredging outer portion of Whatcom Creek waterway 26 feet deep at mean lower low water and inner portion 18 feet deep at an estimated cost of $92,250, on certain terms of local cooperation. Basis of existing project.

(*e*) Preliminary examination of "Bellingham Harbor, Wash.," ordered by the river and harbor act of September 22, 1922. Report dated May 23, 1923. Not yet printed. Unfavorable.

(*f*) Preliminary examination of "Bellingham Harbor, Wash., with a view to the removal of Star Rock," ordered by the river and harbor act of March 3, 1925. Report dated June 10, 1925. Not yet printed. Unfavorable.

5. *Previous projects.*—Under a project adopted by the river and harbor act of June 13, 1902, the Whatcom Creek waterway was dredged to a depth of 12 feet at mean lower low water at a total cost of $57,673.98, of which $56,581.93 was for new work and $1,092.05 was for maintenance.

6. *Existing project.*—This provides for dredging Whatcom Creek waterway for its full width and to a depth of 26 feet at mean lower low water for the outer 3,800 feet and a depth of 18 feet for the inner 1,300 feet. The estimated cost for new work, exclusive of amounts spent under the previous project, was $92,250. The latest (1918) approved estimate for annual cost of maintenance is $5,000. The project was adopted by the river and harbor act of June 25, 1910. (H. Doc. No. 1161, 60th Cong., 2d sess.)

7. *Work done and present condition.*—The existing project was completed in 1913. Shoaling in the inner portion was removed in 1918, 1920, and 1924. The project depths are now available except for slight shoaling in the upper portion of the waterway. The expenditures under the existing project to May 1, 1927, have been $88,554.42 for new work and $18,832.19 for maintenance, a total of $107,386.61. No previous preliminary examinations or surveys of Squalicum Creek waterway have been made, nor has any work been done there by the United States.

8. *Bridges.*—There are no bridges across this waterway.

9. *Resources and local industries.*—The city of Bellingham had a population of about 25,000 in 1920 and is the fifth largest in the State. It has been steadily growing and it is believed that the present population is about 35,000. The population of Whatcom County is approximately 70,000. The principal business is in lumber, shingles, fisheries, and agricultural products. It is claimed that there are some 18,000,000,000 feet of standing timber tributary to the harbor, of which about 10,000,000,000 feet are in the Government forest reserve in Whatcom and Skagit Counties. In 1926 the value of farm products amounted to approximately $12,000,000, dairy products, poultry, and canned berries and fruits being the most important items. The Bellingham coal mines, located within the city limits, produced 240,000 tons in 1926 and there are large deposits in the Mount Baker field now being explored. A large cement mill and a beet-sugar factory are located adjacent to the city and the construction of a $5,000,000 pulp and paper mill is in immediate contemplation. There are also deposits of lime rock and brick clay. There are 14 banks in the county with deposits of about $13,000,000 and 5 banks in the city whose clearances for 1926 were $48,500,000.

10. *Roads and railways.*—Bellingham is served by three transcontinental railroads, the Great Northern, Northern Pacific, and Chicago, Milwaukee & St. Paul. The Great Northern connects with Canadian lines at Blaine and the Chicago, Milwaukee & St. Paul with the Canadian Pacific at Sumas. An electric interurban line runs to Mount Vernon. There are 135 miles of paved highways and approximately 252 miles of graveled highways in Whatcom County, all used by freight-transportation companies operating under franchises from the State.

11. *Steamship lines.*—All coastwise and intercoastal steamship lines which call at ports on Puget Sound have made Bellingham a port of call except for exclusively passenger boats. A considerable number of overseas ships also call at this port. A list of the vessels calling there during the year 1926 is attached to the brief submitted by the port of Bellingham.



12. *Adjacent ports.*—The only port to the north of Bellingham is the small town of Blaine on the international boundary, with a population of about 3,000. Anacortes, another small town, is about 17 miles to the south. Everett, population about 28,000, is about 82 miles distant by water.

13. *Commerce.*—The commerce is large and, though varying somewhat from year to year, in general is increasing, as shown by the following table giving a comparative statement for the last five years:

| Calendar year | Vessel traffic [1] | | | Floated timbers | | Car ferry | |
|---|---|---|---|---|---|---|---|
| | Tons | Value | Passengers | Tons | Value | Tons | Value |
| 1922 | 445,991 | $21,878,886 | (2) | 489,525 | $2,773,603 | 184,140 | $9,482,595 |
| 1923 | 576,137 | 21,804,317 | (2) | 1,072,217 | 6,299,067 | 228,880 | 11,975,000 |
| 1924 | 548,297 | 26,800,369 | (2) | 471,316 | 2,811,462 | 344,945 | 17,949,000 |
| 1925 | 624,635 | 36,595,670 | (2) | 873,736 | 4,737,815 | 218,092 | 8,941,772 |
| 1926 | 647,463 | 36,344,195 | (2) | 1,314,015 | 7,192,875 | 200,900 | 8,236,900 |

[1] Excludes car-ferry traffic. [2] Not reported.

The principal items and values for 1926 were as follows: 1,317,351 tons of floated and barged timber valued at $7,211,203; 328,125 tons of lumber products, $5,311,842; 103,125 tons of sand and gravel, $103,125; 42,232 tons petroleum products, $886,784; 52,002 tons of fresh and canned fish, $15,932,770; 27,988 tons cement, $389,844; 12,743 tons of coal, $101,944; 7,276 tons canned fruit and vegetables, $1,345,200; 7,974 tons tin cans and plate, $1,348,688; 5,567 tons canned milk, $835,050; 14,823 tons flour and grain, $872,448; and 42,272 tons miscellaneous, $9,198,172. The total foreign commerce amounted to 203,031 tons valued at $2,631,053, and the domestic 1,758,447 tons valued at $40,906,017. The total number of arrivals and departures of vessels was 4,870 with a total net registered tonnage of 2,312,266 and with drafts ranging to over 27 feet.

14. *Views of local interests.*—For the purpose of securing the desires and views of local interests a public hearing was held at Bellingham on April 19, 1927, at which some 65 people were present. Copies of the notice [1] of the hearing, list [1] of persons to whom sent, and minutes [1] of the hearing accompany this report. A brief [1] submitted by the port of Bellingham is also inclosed.

15. The improvement desired is the dredging of Squalicum Creek waterway for the full width of 600 feet from the outer harbor line to the shore to a depth of 26 feet at mean lower low water, and in addition the dredging of a channel from the outer harbor line to deep water in Bellingham Bay with a width of approximately 300 feet and a depth of 26 feet. The following statements in support of this request are quoted from the brief of the port of Bellingham:

> We consider the present improvement in the harbor of the port of Bellingham inadequate for the reason that the only waterway available at the present time for intercoastal and overseas shipping is the Whatcom Creek waterway, upon which is located the present dock of the port of Bellingham. This waterway is already used by 14 commercial institutions of considerable volume and it has already become apparent that quite frequently traffic is at a standstill because of congestion. It is impossible for the port to develop further improvements on

[1] Not printed.

the Whatcom Creek waterway for attracting new business to the shipping of the port, for the reason that sites are not available for docks, coal bunkers, and other facilities of extensive character necessary to the handling of such business.

* * * * * * *

We believe that the making of the improvements requested would result in a more economical handling of some existing business of the port of Bellingham, notably the transportation of Portland cement from the cement plant located tributary to the Squalicum Creek waterway. However, the great benefit of these improvements will be in the increase of the commerce of the port, which will be entirely new business, and we are reliably informed that these improvements would increase the tonnage of the port of Bellingham at least 1,500,000 tons per year immediately. This is entirely new business. And, in addition, it must be apparent that if the proper port facilities are available it is very attractive to new industries and manufacturing plants desiring to locate upon Puget Sound, for it can only be a matter of speculation as to the amount of new business which might be gained by these improvements.

* * * * * * *

The advantages which would accrue from the making of the improvements will result almost exclusively to the benefit of the general public by increasing the commerce of the port, increasing the revenue of the port facilities and by increasing pay rolls, both directly and indirectly. It can not be of advantage to real estate speculators for the reason that the port of Bellingham owns and controls all of the territory adjacent to the proposed improvement, consisting of approximately 212 acres of territory located on both sides of Squalicum Creek waterway.

16. Other statements and arguments were presented substantially as follows: Hon. John A. Kellogg, mayor of Bellingham, also representing the port of Bellingham, stated that one of the large oil companies was desirous of securing a location in Bellingham on deep water and was negotiating with the port of Bellingham for the acquisition of a site on the port commission property; also that a proposition had been made to the port authorities looking toward the acquisition of a site there and the erection of storage and shipping facilities for the shipment of wheat from Canada. Representatives of the Bellingham Coal Co. stated that its tipple is within 1 mile of the site of the proposed coal bunkers to be erected by the port and is connected therewith by railway over the Great Northern and Chicago, Milwaukee & St. Paul Railway Cos.; that its output for the last year was 239,000 tons on an eight-hour shift of 239 days' operation, that this could be increased to 326,000 tons by running full time exclusive of Sundays on an eight-hour basis, and that this could be proportionally increased by full-time operation under three shifts; that with the exception of a small amount which is shipped over the dock of the cement mill its coal now goes by rail to Vancouver and Seattle, the cost of rail shipment to those points being cheaper than that by water when the breakage involved in the latter method of handling is considered; but that a market for coal exists in San Francisco, and it is believed that at least 100,000 tons per year could be shipped there by water at a rate not to exceed $2 per ton and profitably sold when the bunkers and shipping facilities proposed by the port of Bellingham on this waterway are completed and the desired channel dredged. Mr. Herbert Tozier stated that fully $500,000 has been spent in exploration and development in the Mount Baker field resulting in opening up large deposits of anthracite, bituminous, and coking coal, but that the marketing of this upon a large scale depends upon the provision of adequate bunkerage and shipping facilities; that shipments would start at about 1,000 tons per day which could be increased to upwards of 10,000 tons



daily. Mr. O. F. Krabbe, manager, Olympic Portland Cement Co., stated that that company has a capacity of nearly 1,000,000 barrels of cement per year, that it built a dock to deep water 3,000 feet long which was destroyed by teredo and that a new creosoted pile dock 2,000 feet long had been constructed to a depth of water of 14 feet but that this accommodates only scows and small Sound steamers; that last year about 30,000 tons of cement were shipped over this dock but that shipments for deep water vessels had to be sent to the Pacific Cannery or Bloedel-Donovan Mill docks; that while the bulk of its shipments would continue to go by railway, probably 45,000 to 50,000 tons per annum would be shipped over the port terminals and waterway if the desired improvement were made. The Utah-Idaho Sugar Co., by letter and through its manager, stated that it was just getting started in the development of the sugar industry; that the amount produced the first two years was 80,000 to 100,000 bags, which it was expected would be increased 100 per cent this year; that while its products would probably be shipped by rail, some consideration had been given to the refining of raw sugar brought from Hawaii to this plant were the proposed improvement made, as this would permit the plant to be utilized over a longer period during each year than is possible at present in the production of sugar from beets. Mr. R. A. Welsh, of the Bellingham Canning Co., stated that 80 per cent of its canned salmon was now shipped by water, but much of it had to be barged to Seattle for transshipment; that increase of business in Bellingham resulting from the proposed improvement would increase the number of ships calling there and decrease the amount of lighterage to Seattle now necessary. Mr. Frank N. Brooks, of the Brooks Lumber Co., stated that small mills operating in the interior have had to go out of business because of the high cost of rail shipment and of the lack of facilities for handling lumber for water shipment at Bellingham other than by direct loading from car to ship over the municipal dock; that the proposed development on Squalicum Creek would give an opportunity for storing lumber and would thus permit these small mills to resume operation. Mr. C. K. McMillin, of the W. H. Price & Co. Cannery, stated that that company had been subjected to considerable additional expense in car demurrage and piling cases too high on the municipal dock on account of the lack of facilities there.

17. *Terminal and transfer facilities.*—There are 11 open pile wharves on Whatcom Creek waterway, 1 of which is publicly owned and 2 are open to general public use. One is a ferry slip. There are no modern methods for the quick transfer of freight. The other wharves on the harbor are all open pile structures and are owned by private manufacturers.

18. The publicly owned dock formerly belonging to the city of Bellingham has been taken over by the port of Bellingham and extensions to the dock and warehouses thereon have twice been made. Further extension is considered impracticable without interfering with adjacent properties as it already extends beyond the established harbor lines. Most of the general business of the port aside from lumber and similar bulk commodities is handled over this dock.

19. *Local cooperation.*—Local interests were required by law to provide all necessary bulkheads and groins and pay for all filling required in connection with the improvement of this harbor under the

existing project. In addition to this work the city of Bellingham has deepened a basin in the central portion of the Whatcom Creek waterway, 1,000 feet long, 330 feet wide, and 35 feet deep at mean lower low water, at a cost of $28,800.

20. The port of Bellingham was organized several years ago under State law, the area being coextensive with Whatcom County. It has purchased the municipal dock from the city and operated and extended it as above stated. It has employed competent engineers and given careful study to local conditions with a view to determining the best location and plans for future development of the port. As a result of these investigations it has selected the Squalicum Creek area as the one offering the best possibilities, and has acquired by purchase approximately 212 acres of land at that waterway and has initiated work as indicated on the accompanying map. This consists of dredging a channel 200 feet wide and 26 feet deep in the waterway, with a turning basin at the inner end, and in bulkheading and filling an area of about 20.6 acres. About $81,000 was expended on this work. Additional work contemplated includes coal and oil bunkers, warehouses, docks, and railway connections. The city of Bellingham has expended $60,000 in making a street connection to this property.

21. The assessed valuation of the port district for the year 1926 was approximately $33,000,000. Under the laws of the State of Washington governing port districts, a levy of not to exceed 2 mills is authorized in any one year and an indebtedness of 1 per cent of the assessed valuation may be incurred without the sanction of the voters and 3 per cent with such sanction. The present assets and liabilities of the district amount to about $640,000.

22. The port offers to furnish a place of deposit and bulkheads for the material that would be dredged under the improvement desired, but feels that its financial resources are insufficient to permit it to make any direct contribution toward the improvement in view of the cost of the work on wharves and terminal facilities which it expects to undertake.

23. *Discussion and recommendation.*—The claim that the present improvements in Whatcom Creek waterway are inadequate for the reasonably prospective development of commerce at this harbor is believed to be well founded. There does not appear to be room for any considerable expansion of industries or commerce upon that waterway and the most logical site for further development is upon the Squalicum Creek waterway where the port of Bellingham has already acquired a large site and started development as above described.

24. While it is difficult to estimate with any degree of accuracy the commerce that might be developed upon this waterway if the improvements now asked of the United States were carried out in connection with the work already done and proposed by the port it is thought that a substantial amount of tonnage may reasonably be expected. Cement shipments may very probably amount to 45,000 to 50,000 tons. While only a portion of this will be new business the remainder can be handled with less expense and with greater convenience than at present. There is no question but that the Bellingham Coal Co. could increase its present output by 100,000 tons per annum, which it believes can be sold in San Francisco, and it seems at least reasonable to assume that with the waterway and bunkerage facilities proposed, shipments to San Francisco in large amounts could be profitably made. One large oil company is now located on the Whatcom Creek waterway and as there are a number of strong companies competing for business on this coast, it is quite probable that another one might locate on Squalicum Creek waterway. The port commissions in several of the other harbors in this section provide storage space for lumber and handle shipments thereof over their docks from small mills not located on tidewater or not having their own docks and no reason is seen why this could not likewise be done at Bellingham.



25. The other specific items of prospective commerce mentioned, namely, shipments of Canadian wheat and of coal from the Mount Baker field, and imports of raw sugar, seem to be entirely problematical. On the other hand the creation of terminal facilities on deep water with adequate sites adjacent for general industrial development might naturally be followed by the establishment of new industries and the development of commerce the character of which can not be definitely foreseen.

26. Local interests have shown their faith in the proposed development by the expenditure of a considerable sum in the acquisition of property and the initiation of work. It is believed that the port commission has proceeded along conservative business lines and that it will progressively complete the proposed terminal facilities as the need therefor is demonstrated.

27. I therefore report that in my opinion the further improvement of Bellingham Harbor to include work at Squalicum Creek waterway is worthy of being undertaken by the United States and recommend that a survey be authorized to determine the proper extent and the cost of such improvement.

28. In compliance with law, I further report that at the present time there are no questions of land reclamation, water power, floods or other related subjects which could be coordinated with the desired improvement so as to lessen the cost or compensate the Government for expenditures made in the interest of navigation.

W. J. BARDEN,
*Colonel, Corps of Engineers, District Engineer.*

[Second indorsement]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
*Washington, D. C., June 28, 1927.*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY.

1. For the reasons stated herein the board concurs with the district engineer and recommends a survey to determine the advisability and extent of the improvement.

2. Separate estimate should be submitted of the cost of an approach channel and of improvement within Squalicum Creek waterway.

3. The district engineer should report on the advisability of requiring local interests to do all work shoreward of the main pierhead line (bearing N. 57° 23′ W., extended across the entrance to the waterway).

For the board:

HERBERT DEAKYNE,
*Brigadier General, Assistant Chief of Engineers,*
*Senior Member.*

## SURVEY OF BELLINGHAM HARBOR, WASH.

### SYLLABUS

The district engineer recommends the further improvement of Bellingham Harbor to the extent of dredging an entrance channel to Squalicum Creek waterway, with turning basin and channel in the waterway, provided cooperation to the extent of one-third the cost of dredging, the maintenance of the channel in the waterway, and the construction of a terminal is received from local interests.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
*Seattle, Wash., November 22, 1927*

Subject: Report of Survey on Bellingham Harbor, Wash.
To: The Chief of Engineers, United States Army
(Through the Division Engineer).

1. In compliance with section 4 of the river and harbor act of January 21, 1927, and instructions contained in departmental letter [1] of July 6, 1927, the following report, with map, on survey of Bellingham Harbor, Wash., with a view of improving Squalicum Creek waterway, is submitted.

2. Reference is made to report on preliminary examination of this waterway submitted on May 12, 1927, for a description of the harbor and waterway, the commerce of the port, a list of previous reports, and statement of existing project and work done.

3. Instrumental survey of Squalicum Creek waterway was made in September, 1927. The waterway, as defined by the pierhead lines, and approaches thereto were sounded and borings made to determine the nature of the material to be removed to provide the proposed channels.

4. The port of Bellingham has excavated an inner channel, or slip, immediately north of and adjacent to the southern boundary of the waterway and has used the dredged material to fill a bulkheaded area of 20.6 acres immediately south of and adjacent to this boundary of the waterway. On this area are to be located the future terminals of the port and there will also be sufficient space for warehouses, manufactories, etc. The port has expended the sum of $81,000 in doing this work. The inner channel, or slip, dredged by the port was not completed to the contemplated depth of 26 feet throughout and at its inner end some shoaling has resulted from material brought down by Squalicum Creek so that further dredging is now necessary to complete the channel to a depth of 26 feet at mean lower low water throughout the area of the slip. Further shoaling in the inner end of this channel, or slip, may be expected unless Squalicum Creek is diverted from the waterway, or settling basin provided to catch the material brought down by the creek before it enters the waterway.

5. The waterway is well located with respect to the city and harbor. It is connected with the city by a recently completed street and is served by two railways. The port of Bellingham has purchased the tide lands on both sides of the waterway, thus giving assurance that it will remain open for the benefit and use of the public. However, before this waterway can serve as a terminal to shipping, it will be necessary to excavate an entrance channel, provide a turning basin, and complete the dredging started by the port.

[1] Not printed.



6. Such a scheme of development is shown on the map submitted with this report and the following estimates have been made. These estimates contemplate a depth of 26 feet at mean lower low water and include an allowance of 1 foot overdepth dredging at full price.

### ESTIMATES

| | |
|---|---|
| A. Dredging an entrance channel 200 feet wide by 26 feet deep from deep water in the bay to the main pierhead line at the outer entrance to the waterway proper, with widening at the inner end of this channel (area A on accompanying map): | |
| 112,400 cubic yards, at 20 cents | $22,480 |
| Engineering and contingencies, about 10 per cent | 2,520 |
| Total | 25,000 |
| B. Dredging a turning basin at entrance to waterway as shown on map (area B on map): | |
| 92,000 cubic yards, at 20 cents | 18,400 |
| Engineering and contingencies, about 10 per cent | 1,600 |
| Total | 20,000 |
| C. Completing the dredging of the south half of the waterway to 26 feet depth (area C on map): | |
| 108,500 cubic yards, at 25 cents | 27,125 |
| Engineering and contingencies, about 10 per cent | 2,875 |
| Total | 30,000 |
| D. Dredging the north half of the waterway to a depth of 26 feet (area D on map): | |
| 312,900 cubic yards, at 25 cents | 78,225 |
| Engineering and contingencies, about 10 per cent | 7,775 |
| Total | 86,000 |
| Grand total | 161,000 |

7. A depth of 26 feet at mean lower low water was chosen as that depth will accommodate all classes of vessels which may be expected to call at this port, although the largest vessels will be unable to load full cargoes.

8. The present port terminal, located on Whatcom Creek waterway, is inadequate even for the present commerce and there is no room for expansion on that waterway.

9. The city is growing and its commerce is increasing and the construction of additional public terminals is necessary to serve the shipping that may be expected.

10. The development of the natural resources in this vicinity, such as coal, cement manufacturing, dairying, and agriculture, which in turn is dependent upon shipping facilities, will provide employment for an increased population and thus be of general benefit to the country at large.

11. For the reasons stated above the improvement of Squalicum Creek waterway to the extent of dredging areas A, B, and C, is believed worthy of being undertaken by the United States, provided the port of Bellingham is willing to cooperate in the cost of the work. The dredging of area D should be left for future consideration as it is not necessary at this time.

12. There is inclosed a letter [1] from the port of Bellingham in which the commission has expressed its willingness to cooperate to the extent of paying for one-third of the cost of the proposed dredging of areas A, B, and C, and maintaining area C after it has been dredged. The commission has also expressed its willingness to construct a suitable terminal on the waterway when the dredging has been completed.

13. Since the cost of dredging area C is about one-third the total cost of dredging areas A, B, and C, the offer of the port is equivalent to an offer to complete the dredging in area C, the United States paying for the work in areas A and B. As previously stated, the port has expended $81,000 on this waterway, a considerable portion being for fill and bulkheads. If we assume that only one-third of this amount, or $27,000, was expended for dredging in the waterway, the total cost of the channel improvement, as herein provided for, will be $27,000 plus $75,000, or $102,000, of which the port will have contributed $27,000 plus $25,000, or $52,000, this being more than 50 per cent of the total cost. Consideration has been given to the advisability of requiring the port to do all the work in the waterway proper shoreward of the main pierhead line of the harbor when projected across the waterway, but in view of the large amount of work already done by the port and the fact that the work in area B is for a turning basin, which is a necessary part of the entrance channel, the cooperation offered is considered sufficient.

14. It is believed that the annual cost of maintenance of parts A and B will not be large after the first two years, when conditions have become stable. The cost is estimated to be as follows:

| | |
|---|---|
| The first year | $5,000 |
| The second year | 2,000 |
| The third and following years | 500 |

15. I therefore report that in my opinion the further improvement of Bellingham Harbor is worthy of being undertaken by the United States, and recommend that the existing project for the improvement of Bellingham Harbor be modified to provide for the improvement of Squalicum Creek waterway by dredging an entrance channel 200 feet wide and 26 feet deep at mean lower low water from deep water in Bellingham Harbor to the waterway (area A) a suitable turning basin 26 feet deep at mean lower low water in the outer end of the waterway (area B), and an inner channel, or slip, of the same depth within the waterway and adjacent to the southern boundary of this waterway (area C), all as shown on accompanying map, at an estimated cost of $75,000; provided the port of Bellingham contributes one-third the cost of the proposed dredging (in areas A, B, and C), and assumes the maintenance of the inner channel, or slip, for a distance of 1,100 feet from the pierhead line at the inner end of the waterway (area C), and provided further, that the port gives assurance, satisfactory to the Secretary of War, that it will construct a suitable terminal on the waterway for the accommodation of commerce, open to the public on equal and reasonable terms.

16. The total estimated cost to the United States ($50,000) should be made available in a lump sum.

JNO. S. BUTLER,
*Major, Corps of Engineers, District Engineer.*

[1] Not printed.



[First indorsement]

OFFICE, DIVISION ENGINEER,
NORTHERN PACIFIC DIVISION,
*Portland, Oreg., December 13, 1927*

To the CHIEF OF ENGINEERS, UNITED STATES ARMY.

1. Forwarded, concurring in the views and recommendations of the district engineer.

G. R. LUKESH,
*Lieutenant Colonel, Corps of Engineers, Division Engineer.*

O