

THE PORT OF PORTLAND

Improvements Made in the Willamette and Columbia Rivers.

WIDE AND DEEP CHANNEL OPEN TO THE SEA

Prestige of Portland as a Fresh Water Seaport—The Vast Shipping Interests.

THE BIG JETTY AT THE MOUTH OF THE COLUMBIA RIVER

Inauguration of Work on the System of River Improvements—Satisfactory Results Already Obtained—Money Spent by Portland and the National Government.

Effort in the line of river and harbor improvement has ever been followed by more successful results than the one made by the Port of Portland commission...

to any great harbor on either the Pacific or Atlantic coast line of the United States. In December, 1882, a memorial was sent to congress by the Astoria chamber of commerce...

The work of the government in constructing a jetty at the mouth of the Columbia river, a work which is fully described in a subsequent part of this article...

which provided for a full examination of the channels at the entrance. This board of engineers subsequently submitted a report in which they outlined a plan with estimates of cost for making permanent improvements at the Columbia's mouth...

The jetty which the engineers proposed to build at the Columbia's mouth was to be a single low-tide jetty starting from Fort Stevens, on the south cape, and extending in a westerly direction out across Clatsop spit...

The first appropriation for the inauguration of work on the jetty was made in the river and harbor bill of July, 1883. The amount first appropriated was \$200,000. Soon after this appropriation was made, preliminary work was commenced.

Active work was commenced in April, 1888. The receiving wharf, shore tracks of the jetty and storage platform were constructed and part of the jetty itself was begun. Work continued until the end of October in that year...

The entire amount of \$100,000 first appropriated was practically all expended in prosecuting this work, and operations were not again resumed until September, 1888. The second appropriation gave the sum of \$187,500 for resuming work on the jetty.

During the fall and winter of 1888-87 an active search was made by the engineers for a suitable stone supply. It was hoped to open a quarry from which cars could be run direct to the jetty.

The engineers found the coast as far as Tillamook head and Necanicum creek, and inland toward Lewis and Clark river, and in other directions. The results of these numerous examinations were not satisfactory.

The third appropriation for the prosecution of this work was made in August, 1888. The total amount of money appropriated for building the jetty up to that time was \$387,500, which was spent in four years, or at the rate of about \$70,000 a year.

After the first big appropriation of \$500,000 was made, the plan for building the jetty was greatly improved. The government steamer Cascades was repaired and put to work towing rock barges between the quarry and Astoria.

The four low groins are now practically completed. More than 2 1/2 miles of the jetty from its outer end to the mouth of the river has been raised to the required height, and about 70,000 tons of rock will suffice to complete the remaining part of the work.

The construction of the tramway out over the jetty there were used over 400,000 lineal feet of piling and nearly 3,000,000 feet of the material for the track and groins were used 22,000 feet of brush fascines.

HOW IT IS CONSTRUCTED.

The mat work of the jetty has a uniform width of 40 feet throughout. This consists of two classes of mats, center and side, each 20 feet wide and placed close together. The center mats were built directly under the tramway tracks...

The layer of mat forms the foundation on which the rock is subsequently dumped. The mean depths in which the mats were placed for the whole jetty was 15 1/2 feet below low water.

The rock for this work was all purchased by contract, and it has been obtained from quarries at the Columbia river above Vancouver, and on the banks of the Willamette river above Oswego.

By July, 1891, the tramway tracks had been extended out to the required length, and the jetty was built up to the height of mean low tide according to the original project by January of the following year.

The engineers observed during the progress of the work on the jetty, while raising it to a height of four feet above low water, that the tide would rush across the line of the jetty while it was above the level of the rock, and in consequence it prevented the sand in many places from accumulating to the height desired.

depend upon the amount of this sand that may be blown from the coast. In the latter part of 1882 extensive surveys were made of the sand spits on each side of the jetty to determine the extent of the sand which had accumulated.

On the south side of the jetty the great changes were naturally to be looked for. The accumulations of sand were there very large. Within the area formed by the Point Adams shore, the jetty, and a line drawn from the outer end of the jetty to the shore, about 14 miles south of the Point Adams light...

The raising of the jetty to nearly the height contemplated by the engineers has greatly augmented the accumulation of sand on the north side of the jetty. The jetty has greatly increased in area, and large portions of it are now nearly seven feet above low water.

There are now but three great harbors on the Pacific coast. These are at San Francisco, the mouth of the Columbia river and Puget sound. The distance between San Francisco and Cape Flattery is about 70 miles.

The opening of the Columbia river to vessels of the greatest draft makes this river an available harbor of refuge for all vessels seeking a port. In case of war this harbor would be the most important point of rendezvous for an enemy's fleet.

During the time work has been pushed on the jetty, the operations have been suspended for about six weeks each year on account of inclement weather, and to permit a thorough repairing of the extensive plant for the active resumption of work in the early spring.

The progress of work on the jetty has marked great changes in the positions of the spits and sandbars in and about the mouth of the river. All these changes have been in the interests of navigation. The great middle sands at the mouth of the river have been removed.

The distance from Portland to the mouth of the Willamette river is 12 miles. From this point the current of the Willamette and Columbia rivers join to the mouth of the latter stream, the distance is 38 miles.

Prior to 1850 soundings made in the channel between Portland and the sea showed a depth of from 10 to 15 feet at the shoalest places. This, of course, was at low stages of water and at low tide.

It soon became evident to the ship-owners who frequented this river that a permanent channel of sufficient depth to permit vessels of deep draft to come to Portland at all seasons of the year could only be secured by an expenditure of large sums of money.

Walker's island in the Columbia river. Through these shoals the government has dredged a channel 250 feet wide and which carries a depth of 23 feet at mean low water.

principally in small amounts and the most engineers in charge of spending this money could attempt was to remove the accumulations of sand in the shoalest places of the channel, a work that afforded no relief beyond the year in which the dredging was done.

Major Handbury, in his report of 1881, showed clearly the evil effects of the government's policy of attempting to maintain a channel from Portland to the sea. In 1874, as reported in this report, it was estimated that the removal of 50,000 cubic yards of material from what was known as Swan Island bar would insure a channel through these shoals of a depth of 18 feet, and 100 feet in width.

In 1877, the government finally accepted the recommendations of the engineers, and a plan was outlined which contemplated establishing and maintaining a depth of 20 feet of water at the low stages of the river from Portland to the sea.

The plan of improvements contemplated permanent construction work to protect the banks of the river, jetties and dikes, and to cut off as far as possible the flow of water into the sloughs and force this water into the main channel.

Between 1877 and 1881 congress appropriated \$940,000 for the work of improving the Willamette and Columbia rivers between Portland and the sea.

In the Columbia, improvements were made at St. Helen's, Burke slough and Martin's slough. As a result of these improvements, supplemented by considerable dredging, a depth of 19 feet at low stages of the river was obtained by 1891.

During the latter year the original project of improvements made in 1877 was carried to its present broad scope. This proposed the construction of additional dikes, and it was hoped that on the completion of these dikes, with a fair amount of dredging, 25 feet could be maintained in the river from Portland to the sea at the lowest stage of water.

The great flood of last year resulted in the formation of new shoals below the mouth of the Willamette river. Through these shoals the government has dredged a channel 250 feet wide and which carries a depth of 23 feet at mean low water.

The last appropriation for the improvement of the lower Willamette and Columbia rivers was made by congress August 17, 1894. The amount of the appropriation was \$50,000. This, together with an available balance of \$475, made July 1, 1894, a total of \$525,000.

As soon as the amount available for the work of the fiscal year ending June 30, 1895, \$24,725. The estimated amount required for the completion of the work of improving these rivers as now planned, a work that will insure a depth of 25 feet in the Columbia, and a depth of 20 feet in the Willamette, is \$1,000,000.

Major James C. Post is at the present time the government engineer in charge of all the river and harbor improvements in this district. It is due to the courtesy of Major Post that The Oregonian has been enabled to obtain much of the data for the present article.

Major Thomas H. Handbury was in charge of this district November 20, 1883, when Lieutenant Harry Taylor assumed temporary charge, a responsibility he held until he was relieved by Major Post, on February 19 last.

Appropriations made by the national government for the improvement of the Willamette and Columbia rivers, between Portland and the sea, exclusive of the sums appropriated for the construction of the jetty at the mouth of the Columbia, are as follows:

Table with 2 columns: Date and Amount. Total appropriation: \$1,000,000.

ABOUT the middle of August, 1890, the Union Pacific Railroad Company, which had contracted at that time most of the towing and lighting business on the lower Willamette and Columbia rivers, began to re-examine the river channel.

The people of Portland that thus brought to realize the importance of securing and maintaining a channel of good depth between this city and Astoria. They realized further that if such a channel was to be secured within a reasonable length of time the expense of making it must be borne by the city.

The act creating the Port of Portland defined its limits as including all that part of Multnomah county which lies west of the east boundary line of the Willamette meridian and south of the north boundary line of township 1, north of the Base Line.

The act further declared that the object and purpose of the corporation was to improve the Willamette and Columbia rivers between Portland and the sea, with the view of maintaining a ship channel of adequate width and of a depth of 25 feet at the shoalest places during the lowest stages of water.

The commission was also given full control over both rivers so far as it was in the power of the state to grant such control. The enable the commission to carry the terms of this act into effect the Port of Portland was authorized to raise money by the issue of bonds to the amount of \$500,000.

Walker's island in the Columbia river. Through these shoals the government has dredged a channel 250 feet wide and which carries a depth of 23 feet at mean low water. During the past year the United States has also dredged a channel 200 feet wide and 22 feet deep through the shoal at Pillar Rock in the Columbia, and the engineers are now engaged in opening a channel of the same depth at Postoffice bar in the Willamette.

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