

CHIEF ENGINEER'S ANNUAL REPORT

For the year 1928.

Tacoma, Washington.
January 10th, 1929.

TO THE JOINT COMMISSION
INTER-COUNTY RIVER IMPROVEMENT.

GENTLEMEN;

I have the honor to submit herewith my annual report for the year 1928, the expenditures for work performed being shown on attached itemized schedule, amounting to \$156,815.75.

At the joint Board meeting of January 10th, 1928, an itemized budget was adopted for the year amounting to \$150,000.00 and on July 12th, 1928, upon recommendation by Mr. R. H. Thomson and myself, the Board authorized an additional amount of \$10,000.00 together with transfer of other budget items for maintenance and repairs.

WEATHER AND RIVER CONDITIONS.

Continued cool weather in late Spring and early Summer resulted in long drawn out Spring run-off with no particularly high water but sufficient to delay for some months our work of levee building and bank protection. Owing to deficient rainfall since September 1st, there has been no high water this winter, and I do not anticipate extreme high water this year.

However, it is not always a flood stage that results in the most damage and as a matter of fact, the prolonged low spring run-off has caused more erosion of banks and undermining of old revetement than we have had for five years, resulting in the very large expenditure for maintenance and repairs.

No indication of weakness has developed on any work done in the past six years but a very large amount of old Type 3, 4 and 5 revetement is constantly failing, either from underscouring of toe blocks or rotting out of old "lumber mattress."

It is quite probable that several miles of the latter will require replacement of mattress and toe within the next two or three years. Following is a detailed analysis of work performed:-

MUCKLESHOOT SECTION.

No change in conditions here, and no work done except removal of drift at Drift Barrier. Charged to Maintenance and Repairs \$1,750.00, Item 7.

AUBURN SECTION.

The Pile bulkhead immediately above Stuck River Highway bridge, begun in 1927, was completed, brushed and blasted, and about 100 feet of mattress and concrete revetement placed just below it; \$5,230.00, Item 7.

Fifteen brush retards were built on the left bank opposite the Auburn Dam at a cost of \$2,783.50; Item 6.

Five bulkheads are now being driven and gravel moved from bars along the right bank about $\frac{3}{4}$ miles above the Stuck River bridge, where quite serious erosion took place last Spring.

COUNTY LINE SECTION.

About 900 feet of brush mattress was layed on the left bank and 1100 feet on the right bank below the N. P. Bridge, due to failure of old Type 5 revetement, at a cost of about \$4,800.00; \$1,150.30 charged to Item 6, and \$3,649.70 charged to Item 7.

Gravel removal and rebrushing of bulkheads in this Section amounted to \$6,750.00; Item 7.

Otherwise no material change in conditions here other than annual gravel flow.

We are now brushing bulkheads and operating large donkey in gravel removal from channel.

DIERINGER SECTION.

During October, 1927 very serious undermining of old Type 5 revetement on the right bank took place from the Stewart Bridge down to and around the Mellen Curve, a distance of about 3/4 miles, and approximately 70,000 yards of gravel was deposited in the Channel at the curve, crowding the River over and washing out the left bank.

Upon recommendation of Mr. Thomson and myself, the Board authorized the driving about 3,500 feet of brushed and ballasted pile bulkhead and removal of gravel deposit. About 1,100 feet of this bulkhead was driven in 1927 and the balance, 2,400 feet, in 1928.

The cost was \$14,400.00 which with \$4,800.00 for gravel removal was charged to Item 7.

ROESLI SECTION.

Under Item 4, \$9,044.07 was expended in driving about 1000 feet of brushed bulkhead and laying 600 feet of new mattress and toe above the North Puyallup Bridge. Other miscellaneous repairs and re-brushing of bulkheads in this section amounted to \$2,150.00.

This section is in bad shape and will require some expenditure this year.

PUYALLUP SECTION.

Last Fall a new channel was being cut around the old Short Line Bridge piers on left bank. A brushed pile bulkhead 1,200 feet long was authorized and built, and gravel bar pulled into said new channel. Cost \$9,650.00; Item 7.

MURPHY SECTION.

Early in the Spring old Type 4 revetement on the left bank from Fifteenth Street to Clark's Creek began to fail. Old lumber mattress was decayed, permitting under-scour and the revetement was breaking up and caving.

The Board authorized laying a new brush mattress the entire distance, 6,900 feet, which was done at a cost of \$20,700.00 plus \$1,750.00 for about 600 feet of new Concrete toe; total \$22,450.00, Item 7.

Under Item 3, we have completed 4,100 feet of levee, mattress and Type 7 revetement at a cost of \$43,585.10.

This is the largest piece of construction undertaken this year, and we had many difficulties to contend with. Approximately 145,000 yards of fill was taken from the channel with gas donkey operated scrapers; brush mattress 30 feet wide and 2 feet thick was laid and ballasted and about 2,800 cubic yards of re-inforced concrete used in revetement. Levee is 20 feet wide on top, both top and back slope being covered with 8 inches of clay to provide for growing sod. It allows 2 feet of free board above known maximum high water.

NEW EQUIPMENT.

We have purchased during the year two large gas donkeys; one 60 H. P. Waukeshaw, and one 85 H. P. Hercules, the total cost of which with accessories and scrapers amounted to \$9,877.43; Item 9.

GENERAL CONTROL. ITEM 8.

Under this item is charged all Engineering, Hydro-graphic surveys, Stenographic and office expense, amounting to \$6,879.47.

RECAPITULATION.

4,100 feet, Type 7 Revetement with mattress.....	\$ 30,585.10
6,600 feet, Pile bulkheads driven, brushed and ballasted..	34,824.00
9,600 feet, ballasted brush mattress with 1,200 feet concrete toe.....	30,750.00
245,000 cubic yards of gravel removed from channel.....	20,800.00
Fifteen (15) retards built.....	2,783.50
Re-brushing bulkheads.....	4,750.00
River clearing.....	5,950.00
Miscellaneous repairs.....	8,941.21
New equipment.....	9,877.43
General control.....	7,554.51
Total.....	<u>\$156,815.75</u>

BUDGET FOR 1929.

On July 10th, 1928 a budget for 1929 was prepared by Mr. Thomson and myself amounting to \$157,000.00 and was adopted by the Board at that time as a basis of making the tax levy. It is submitted herewith for your approval.

As stated above a great deal of the older revetement is showing rapid indication of failure and must necessarily be taken care of while it is still possible to repair it. It is difficult to predict the extent of this work but we believe the appropriation of \$50,000.00 will cover it.


In conclusion I desire to again express my appreciation for the advice and co-operation of your Consulting Engineer, Mr. R.H. Thomson.

FINANCIAL STATEMENT.

The latest financial statements from the two counties show the following fund balances:

Bierce County.... December 31, 1928	\$ 7,390.61
King County December 31, 1928	1,190.36 (overdrawn)
Total	<u>\$ 6,200.25</u>

Respectfully submitted,


H. F. GRONEN,
Chief Engineer.

HFG:MD.