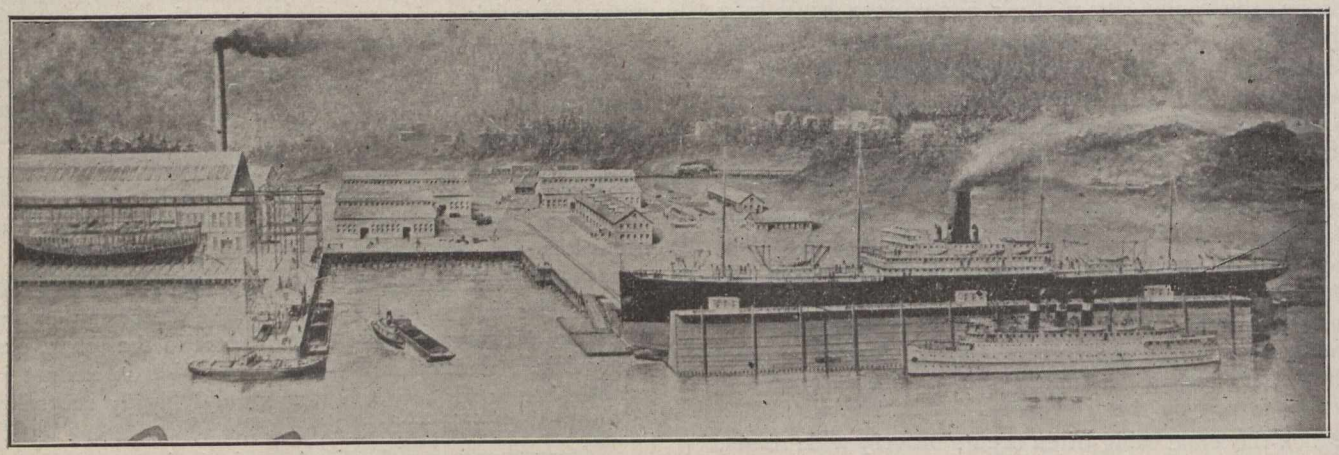
PRINCE RUPERT, B.C., SHIP-BUILDING PLANT.

Work was started in June, 1913, on the construction of a ship-building plant at Prince Rupert, B.C. The contracting firm of Beer's, Limited, has under construction, in addition to the ship-building plant, the power-house, machine, boiler and blacksmith shops and foundry building, and hope to have the entire contract completed by August of this year. The accompanying illustration gives a general view of the arrangement of the plant.



General View of the G.T.P. Ship-building Plant at Prince Rupert, B.C.

The power-house is constructed of steel and concrete on a heavy concrete foundation, with a slate roof. It measures 104 x 148 ft. and is about 65 ft. in height. The machine shop is also a steel frame building, 75 x 150 ft., resting on a concrete foundation. The boiler, blacksmith shop and foundry are similar to the machine shop in size and general construction. The shipbuilding plant is constructed with a steel frame, and is equipped with a large travelling crane. Its size is 160 x 300 ft.

The above-mentioned firm, of which Mr. N. B. Beer is manager, is executing the contract for the Grand Trunk Pacific Railway.

TIMBER FLUME CONSTRUCTION.

Timber flume construction and fluming are discussed in a bulletin just issued by the United States Department of Agriculture. The publication considers the subject from the practical standpoint of the logger who has to get his material out by these means.

The V-shaped wooden flume is held to be superior to the box or square-sided form, because it requires less water and, on the average, less repairs than the other type, is better adapted to act as a slide on steep grades, and offers fewer chances for jams. Concerning a third type, the "sectional" metal flume, semicircular in form, the prediction is made that it will eventually come into wide use. Such a flume is strong and light, and can be quickly taken apart and transported from one place to another to be set up again.

When building flumes a good plan is to erect a small sawmill at or near the upper end of the flume location to saw out the material needed for construction. Such material can be floated down the flume as fast as the latter is built and used for its further extension.

For handling railroad cross-ties, cants, poles, cordwood and the like, a flume with the sides of the V, 30 in. in height is large enough. For handling logs, piling, long timber, or brailed sawed lumber, a height of from 40 to 60 in. is recommended. The best angle for the V is put at 90°.

Flume lines should be surveyed with enough care to ensure evenness of grade. Grades should be kept below 15% wherever possible, and the best results are obtained with grades between 2 and 10%. A careful preliminary survey, followed by a location survey, using a transit and level, will make it possible to obtain a reliable profile map which will serve to show the prospective operator what the grading should be at different points along his line.

Abrupt curvatures in a flume should be avoided, for they are likely to cause jams. Curves should rarely be permitted to exceed 20°. The longer the material to be handled in the flume, the less abrupt should the curvatures be. It may be necessary to blast out rocks and boulders, or projecting points of bluffs, or to trestle, or even tunnel, to eliminate abrupt curves or maintain an even grade.

Some flumes are built with only the lining or inside of the box of sawed lumber, the brackets or frames which support the sides of the V being made from round pole wood flattened on one side, and the sills, stringers, braces and trestling of small round timber or poles. Sawed material is recommended for flume construction, however, wherever it can be obtained at reasonable cost.

The "boxes" or sections of a flume vary in length from 6 to 20 ft. Sometimes the boxes are made of only one thickness of boards, but more often of two thicknesses with the joints broken by varying the width of the boards. Sometimes, also, a single thickness of boards is used, with battens spiked over the joints on the outside in the section between the brackets. In still another form the battens are continuous. On curves the boxes should be shorter than on straightaways, and the bents, arms, and braces correspondingly closer spaced. In general, on curves of from 6 to 10°, the boxes should be jointed at least once in every 12 ft.; on curves exceeding 10° and less than 15°, every 8 ft.; and on curves of more than 15°, at least every 6 ft. Very abrupt curves also require increased bracing, in addition to shorter spacing of the arms and brackets. Flumes should also be strongly reinforced at points where extensive shipping is to be done or much material loaded into the flume over the sides.

If the storage facilities at the lower end of a flume are not sufficient for all the material that can be handled during the period in the spring when melting snow and early rains furnish an unusual volume of water, the construction of small holding reservoirs or "catch basins" at different points along the line is recommended. These may be formed by damming up some small stream; or natural ponds, favorably located, may be used for the purpose. In this way such material as it is not necessary to handle clear through at once can be diverted temporarily. A small artificial pond or reservoir at the upper end of a flume in which to "land" or "bank" the material to be shipped is also advisable, especially when handling logs, cross-ties, or heavy manufactured material of any kind.