

The contract specifies that steel rails of a minimum weight of 56 lbs. per lineal yard are to be used for track. The 56 lb. rails have been introduced on the prairie sections & on the river bottoms, where tangents & light curvature occur, the balance of the road-bed is completed with a percentage of 60 lb. rails & fully 26% of the whole 288 $\frac{3}{4}$  miles is laid with rails weighing 73 lbs. to the lineal yard.

The truss bridges of large spans on this line, both for through & deck spans are of the Howe truss, of the C.P.R. standard, built of wood, the splicing of the lower chord members being of steel plates. Over the Kootenay River, which is navigable for steamers, an iron swing bridge has been erected over the north channel, which I consider gives ample provision for the passage of craft navigating these waters. The trestle bridging is well designed & of the C.P.R. standard, where necessary rows of piles driven from the mud sill of the embankments, 30 & 45 ft. out, which are framed into the deck system, having diagonal sill braces to ensure greater rigidity.

The position of the culverts, both box & beam, have been well chosen, the structures being strong, well put together & of sound material, in some cases stone is used, & in others cedar & Douglas fir timber. They are similar in design to those in a like country on the main line of the C.P.R.

The surfacing & ballasting of the road has been well advanced from Lethbridge to Jaffray station at the 173 $\frac{1}{2}$  mile. From this point to Kootenay Lake the road is about half ballasted. At present a large force of men, steam shovels & working trains are employed in completing the work.

Such of the buildings for sectionmen's houses & stations as are built, are roomy, of neat design & suitable for the traffic, & conform to the requirements as specified in the contract. Tanks of the C.P.R. standard design, of a capacity of 40,000 gall. each, have been erected at suitable points between Lethbridge & Kootenay Lake, excepting at Cranbrook, a divisional station, & at Sirdar, at which two points water for the present is being supplied by temporary tanks.

The road-bed throughout is of a solid, substantial character & well built. The embankments have settled down, & become consolidated, which naturally has lessened the original width at formation level; the Co. is now bringing these up to the contract width.

The cuttings have been formed of the widths called for by the contract, but the earth cuttings are now being further widened. In earth cuttings the character of the material largely governs the pitch of the slopes. In gumbo, or running clay, the slopes have been taken out at a flatter angle than 1 $\frac{1}{2}$  to 1, & to give greater stability to the road-bed, & prevent disturbance of the track, 12 in. sheet piling has been driven at the foot of the slope on the upper side of the cuttings; not only has this been done, but in through cuttings of this material a base of broken rock over the full width of the bottom of the cuttings has been laid in, over 3 ft. in thickness, which has given most satisfactory results. Cemented material has been met with in many of the cuttings, from the Crow's Nest Lake station westward, in such cases a slope of less than 1 $\frac{1}{2}$  to 1 has been adopted, which appears to meet all requirements, as they are standing well. In some of the cuttings east of the Crow's Nest station, a firm, dry & compact soil is found, in such cases the slopes have been taken out at less than 1 $\frac{1}{2}$  to 1, & so far they have stood well. In other cuttings between Lethbridge & Macleod a cemented material is found which is so hard & compact that blasting had to be resorted to. As the specification calls for a slope of 1 $\frac{1}{2}$  to 1, I am, until I have had an opportunity to fully satisfy myself of the sufficiency of these slopes as taken out, re-

taining part of the subsidy to cover the cost of flattening these slopes, if it should be found necessary after a year's experience.

The contract limits the maximum grades to 106 ft. to the mile, but I am pleased to be able to report that the Co. has succeeded in keeping the maximum down below 60 ft. to the mile, which is very satisfactory. Owing to the mountainous character of the country & its general configuration, curves of 10°, 12°, and in one case 14°, had to be introduced, & I see no way in which it could, at reasonable cost, have been avoided.

The Co. at present has 3 steam shovels employed in ballasting, widening cuttings & filling in trestles, which are being served by the necessary trains.

Surveys have been made of the balance of the line subsidized, from the south end of Kootenay Lake to Nelson, but the final plans of location have not yet been filed in the Department, as a revision of the location is in contemplation with a view of reducing the severity of the curves in some cases as now laid out.

### C.P.R. Fort William Elevators.

The illustrations on page 105 show the four mammoth elevators erected by the C.P.R. Co. at Fort William, Ont. The following description of them recently appeared in the *Marine Review*:—The Co. began the consolidation of its various interests at Fort William in 1890. Previous to that time its local works were located at West Fort William, & the chief offices & the port for the transshipment of all freight from lake to rail was at Port Arthur. The business had not been greatly developed, however, before the officials of the Co. perceived the natural & economic advantages offered by the Kaministiquia river for the concentration of the entire business on Lake Superior, & a well-defined policy was soon after mapped out for the process of centralization by means of the erection of mammoth elevators, the construction of good docks, etc. Beginning with the spring of 1891 all lake freight & passengers were landed on the wharves of the Kaministiquia, & Fort William was made the connecting point between lake & rail—the northwestern terminus of navigation. All the works & business of the Co. formerly carried on at the west end & Port Arthur were thus brought together at Fort William, where over \$1,000,000 had already been expended in improvements.

Improvements since undertaken have brought the total up to fully \$2,000,000. The 4 elevators alone have entailed an expenditure in excess of \$1,000,000. The elevators, which are the largest in Canada, are designated A, B, C, & D. The 3 first mentioned are each 325 ft. in length by 90 ft. in width, & all are equipped with the latest improved type of machinery. Capacities are as follows:—A, 1,200,000 bus.; B, 1,300,000; C, 1,250,000. The 4th elevator, D, is the new steel tank structure, & has a capacity of 1,500,000 bus., bringing the aggregate up to 5,250,000 bus. as the capacity of the 4 elevators.

The steel tank elevator was erected in 1897-98, & is the first & only elevator of this unique design in Canada. It consists of 24 cylindrical steel storage tanks 60 ft. in height. Eight of the tanks are each 58 ft. in diameter, while the diameter of each of the remaining 16 is 29 ft. They are absolutely fire & damp proof, & have been rendered impervious against rats, insects, etc. The main building, which is of structural steel, contains modern machinery for cleaning, separating, weighing & transferring grain from cars to tanks or vessels. The shipping capacity is 40,000 bus. an hour, & the unloading capacity 400 cars a day. The elevator has attracted considerable attention by reason of the fire-proof arrangement which obviates the necessity of insurance & the very excellent plan for the separation of the stor-

age department from the machinery for handling & weighing the grain.

Other facilities of the C.P.R. are in keeping with the completeness of the elevator equipment. For the storage of package freight delivered by the steamship lines there are 2 sheds, each 500 ft. in length. The company also has an unbroken line of more than 4,000 ft. of docks. The coal docks alone have a river frontage of 1,200 ft., & upon them are landed annually more than 150,000 tons of coal.

The prospects for the future of Fort William as a grain shipping port are of the brightest. During 1895 there was shipped from Fort William 10,587,866 bus. of wheat; during 1896, 12,689,000, & during 1897 17,600,000. Of the quantity of the latter year 12,928,000 bus. were shipped for export by way of Buffalo, the bulk of it in U.S. bottoms, while 2,000,000 found its way to the seaboard via Montreal. The figures for 1898, 9,218,000 bus., show a falling off, but the loss was due to temporary conditions.

A very complete description of the steel tank elevator, with an illustration showing how it will appear in its completed condition, when its present capacity will be doubled, appeared in our issue of April, '98, pg. 37.

### Surveys, Construction, Betterment, &c.

**Canada Atlantic.**—The Ottawa shops are expected to be completed in May, when the manufacture of cars will be commenced. A large amount of machinery is already in position. Provision is being made for running electric cars on the track between the Chaudiere & the shops.

In reply to a recent enquiry as to whether the Co. would build from Coteau to Montreal, President Booth said he would in all probability double-track the present road first. "It will next summer make Montreal one of the greatest grain-shipping centres in the world," he added.

**Canadian Northern.**—This is the new name of the Lake Manitoba Ry. & Canal Co. The line, which was built last year to Cowan, 51.8 miles from Sifton Jct., is to be extended to the Saskatchewan River this year, & W. Mackenzie recently stated he expected it to be completed to Hudson's Bay by the end of 1901. Mr. Mackenzie also stated that from the best information he could obtain he thought Hudson's Straits were open about 5 months in the year. In referring to this Commander Wakeham, who was in charge of the last Government expedition to Hudson's Bay, thinks 3 $\frac{1}{2}$  months the extreme limit.

Superintendent Hanna reports that a considerable number of settlers have already gone into the Dauphin district this season. (Feb., pg. 40.)

**Coast Ry. of Nova Scotia.** The first section of this line, from Yarmouth to East Pubnico, 31 miles, is being operated. Last season the 2nd section of 20 miles from East Pubnico to Barrington was graded to Atwood Brook, 17 miles, structures built & ties distributed. During the winter the stone required for the uncompleted masonry on this section was cut & delivered on the sites of the structures, which are incomplete only for about 3 miles, & are principally box culverts, there being only one bridge of 60 ft. span. We are officially informed that if weather permits work will be resumed about May 1 on the completion of the 2nd section, & that in all probability work will be carried on beyond Barrington. The 3rd section of 39 miles between Barrington & Lockport has been surveyed & the timber taken off, & surveys have been made for part of the line between Lockport & Halifax. A stone wharf, 250 ft. long & 60 ft. wide, has been built at Barrington, to which 150 ft. of pile wharf will be added. When the line is completed to Barrington a steamer will run between Barrington & Hali-