

The question of bridging the river at the Upper Gorge, has, therefore, to be considered as part of a complete scheme, which ever side of the river might be adopted for the lower terminus.

Plans Nos. 6 and 7, shew the features of the Gorge for a distance of thirty chains, and the line A.B. indicates the site which we recommend as the best adapted for a bridge. The clear span at this point is 250 feet, with side spans averaging ninety feet each; and as the ground is favorable, the whole structure might be of comparatively light and inexpensive character, especially if it should be considered sufficient to provide only for the crossing of the coal-mine waggons, as in that case a combined suspension and truss bridge would answer the purpose, and probably cost not more than £3,000.

A bridge adapted for very heavy traffic at this point would, however, be a very costly work, as the centre span is long and cannot safely be divided.

In the event of the north line being selected, there is no doubt that it would be found necessary to cross the river to the south side by a bridge at the Lower Gorge. Careful sectional surveys were therefore made, and plan No. 8 shews the features that have to be considered, and the lines on which the sections were taken as probable sites for a bridge.

The clear span at the upper site is 900 feet, the full length of the bridge being 947 feet, and at the lower 780 feet, with a full length of 852 feet.

Considerable difficulty would be experienced here in erecting a bridge on either site from the nature of the river, which is subject to frequent heavy freshets, and from the character of the river bed which does not present favorable features for fixing the piers.

Without having gone into estimates in detail we may state that a substantial and serviceable bridge for railway purposes could not be erected here for less than £13,000

A favorable approach could be got from the north side, but only at the expense of rock cutting, and without going to much additional expense for sidings, shunts, &c., it would not be easy to make the line serviceable for both sides of the river.

There is no doubt that a bridge crossing the river at this point, especially if adapted for mixed traffic, might be considered of great general utility, but as the construction of such an expensive work is not absolutely necessary for the development of the coal trade, it may be dismissed from present consideration.

Influenced by the foregoing considerations, we recommend the following as the line which is best adapted to further the public interests.

First, that a light bridge on the plan suggested should be thrown across the Coal Gorge, adapted for curving the small waggons that are used in the coal mines, and also for foot and horse traffic.

Secondly, that the line on the south side of the river should be adopted.

Thirdly, that the wharfage at Greymouth should be improved in such a manner that while it affords facilities for shipping coal, it will also render permanent the channel of the river, and increase the depth of water on the bar.

In adopting the line on the south side of the river, there is another but remote consideration that should be taken into account, and that is the future extension of the line of railway up the valley of the Grey River. From our acquaintance with the features of the country, we are of opinion that such an extension must follow along the south side of the valley, whether it be considered as a line leading direct to Nelson, or as a branch line to connect with a main line from Nelson to the east side of the mountains by the head waters of Wai-au or Hurunui.

At the present time, however, no requirement for any such extension exists, as the Grey River affords facilities for lighterage at a rate of freights that it would be difficult for a railway to compete with, unless the trade were extended by some unforeseen cause.

In making the foregoing report we have been guided by general considerations, and have avoided entering on details such as are required for indicating the exact position and nature of the works necessary. These, however, can be furnished when the more general question has been decided on; the surveys which have been made being quite sufficient for the purpose.

The following is a statement of the relative cost, advantages and disadvantages of the lines which have been mentioned.

First. The line recommended, or south line.

To connect the mines on both sides of the river with Greymouth as the port; cost of line, 6 miles, 73 chains	£21,376	0	0
Bridge across the Gorge	3,000	0	0
Extra sidings at Greymouth	1,000	0	0
Wharf improvement—Protective works, say 12 chains, at present	5,000	0	0
Total	£30,376	0	0

The chief advantage of this line is found in the small expense of the works compared with the complete manner in which it fulfils all the requirements of the case.

Second. North Line.

To connect the mines on both sides of the river with Cobden—			
Cost of line	£19,662	0	0
Erection of wharf	4,250	0	0
Bridge at the Upper Gorge	3,000	0	0
Extra-sidings	775	0	0
Total	£27,687	0	0