

NORTHERN PACIFIC RAILWAY
 STATE OF WASHINGTON - VALUATION SECTION 31
 TACOMA TO TENINO
 PRE-INVENTORY INFORMATION

GENERAL OUTLINE AND HISTORY OF THE WORK

The Tacoma-Tenino line is a double track road running from Tacoma to Tenino, about 44 miles in length. The part comprising Valuation Section 31 extends from about Mile 5 $\frac{1}{2}$ to Tenino.

Both tracks were constructed at the same time.

On account of the difficult character of the country extensive surveys were necessary.

Grading was commenced February, 1912, and all work was completed sufficient to allow operation in December, 1914.

This line, which is featured by extremely heavy construction, divides itself naturally into two sections:

The first section runs from Mile 5 $\frac{1}{2}$ to Mile 23, and runs along the shore of Puget Sound, the embankment being held in place first by a heavy timber sea wall which was later covered by filling of large size rip-rap.

Between Mile 5 $\frac{1}{2}$ and Mile 6 $\frac{1}{2}$ occurs the Point DuRoi Tunnel, or Tunnel No. 2. This tunnel is double track, is driven through sand and is lined throughout with concrete, part of which is heavily reinforced. A bad cave-in occurred during its construction which added materially to the cost. This cave-in broke out at top of original ground and made backfilling necessary. Before tunnel was constructed test holes were drilled over the site.

From Mile 6 $\frac{1}{2}$ to Mile 23 heavy side hill work occurred in cuts. Numerous slides developed during construction, two of which assumed very serious proportions. One slide at Mile post 8 was handled by sluicing the material into Puget Sound, of which there is now no evidence. Work on this slide is still continuing at this date. The second serious slide on this section occurred at Sixth Avenue Station. This was handled entirely by steam shovel, material being placed in embankment an adjacent waste pile as far as the extremely limited dump area allowed, and the balance was washed over the sea wall into the Sound and washed away by the tide. It has been necessary to do a great deal of work excavating this slide after line was turned over for operation. At one time this slide blocked all trains for considerable period of time, covering the track to depth of eight feet. An expensive bulkhead has been placed at this out. Work here is still done intermittently.

There were numerous other and smaller slides in this section and several tieber retaining walls were placed to help contain them.

Serious sink holes were also encountered in this section: one near Mile Post 8 and the other near Mile Post 19. It was necessary to reinforce these places with additional filling and rip-rap after operation was commenced. Near Mile post 19 gravel was filled into the voids of the rip-rap to increase its density.

The rip-rap placed along embankment on the Sound side through this section was delivered on and placed from barges.

The embankment on this section sustained extensive damage from stores on the Sound before rip-rap protection was placed. High tides combined with high winds washed away considerable yardage which had to be replaced.

The second section, from Mile 23 to Tenino, was constructed across country, heavy cuts and fills being encountered. Two serious slides were encountered in this portion of the line; one of these occurred on Mile 25 where heavy side hill work was done; the other, and the most serious slide of the entire line, took place in cut on Mile 42 near Tenino. This slide, like those before mentioned, developed a large amount of material in excess of that required for embankment, and large amount of waste was made. Part of this material also was hauled into Patterson Lake sink hole. It was necessary to do a great deal of work excavating in these slides after line was placed in operation.

An extremely serious sink hole developed in making fill across Patterson Lake in Mile 32. A large amount of boros was made for this hole and material was train-hauled in from slide in cut on Mile 42, as mentioned above. The operation resulted in a very wide embankment before sinking of roadbed was delayed.

Because of the many unforeseen difficulties encountered in building this line a large amount of extra work was necessary. A list of these extra bills is attached hereto. This list does not pretend to be a complete statement of all the extra cost or in any sense a partial statement of original cost but merely enumerates some of the items of extra cost found readily available.

Work was also done along this line by Company Forces helping care for slides during the construction period. This work was such that could not be measured by yardage. Such work was done by both the construction department with men on its own pay roll and by Operating Department forces on Construction Department account.

The reinforced concrete pipe culverts and reinforced concrete piles used in this line were manufactured by the Railway Company in its plant at Auburn, Washington.