

perienced, although in many cases it was found necessary to lower the level of adjacent small lakes in order to give more solid bearing to the toes of the slopes.

At Richmond Lake, mile 101, south from Romford, the lake level was about fifty or sixty feet below the level of the track. A rock embankment rested firmly on the solid rock below, but was not carried up to grade, a trestle being used above water level. The water would probably seep through the rock fill, but, in the event of its not doing so, it would easily flow through the trestle at high water. At mile 76, south from Romford, occurred one of the heaviest train fills of the line, the depressed grade being no less than twenty-five feet at a maximum below the final grade, and as it was necessary in filling to cover the toes of a rock embankment up to thirty feet in height, at least a quarter of a million yards of earth must have been used in this one-half mile of fill.

At mile 75.5, south from Romford, a temporary trestle beside a lake had been train filled, but the water had apparently dissolved the embankment and caused lateral slipping. The lake was small, and the lowering of its level about four feet left the toe dry and firm.

In many instances where a comparatively dry muskeg was to be crossed, provision was made for thickening the dry supporting mattress by ditching and lowering the level of the water table. This was generally effective, provided there was solid soil in the mattress, but not invariably. At mile 70.5 from Romford, the track crossed a muskeg about two thousand feet long and from twenty to forty feet deep, with an embankment when completed about four feet high. A drainage ditch was dug, leaving the water table only about four feet below the level of the surface soil. The track crept very badly and made "sun kinks," elevations taken during the passage of a train showing track undulations of one or two-tenths. The track was made safe for traffic and prevented from creeping by the substitution of 14-ft. bridge ties; later it was diverted to a side hill of solid rock and made thoroughly solid.

At mile 66.7, south, in order to make secure a muskeg, which for its length gave considerable trouble, a depressed grade was built, with a rock embankment about 10 ft. high, the lowest point of which was a maximum of about 20 ft. below the intended finished grade. In this case, although soundings showed a depth of 50 ft. or more to bed rock, the weight of the rock embankment was not in itself sufficient to slice through the surface mattress. This was somewhat unfortunate, as it was always found that although earth alone would eventually reach a firm foundation, yet, owing to its specific gravity being so low, it had a great tendency when placed by train filling, to move horizontally rather than vertically, causing the