RAIL HEROES: 2007

The Railway Civil Engineer (J.E. Schwitzer and R.M. Bailey)

The Railway Civil Engineer - this category is represented by the late J.E. Schwitzer, Canadian Pacific and CN retiree Ron M. Bailey of Edmonton.

Critical to the past, present, and future of the railway industry, individuals performing the role of civil engineer on Canada's railway network have made an incredible contribution to not only the industry but also to the nation as a whole. Historical engineering works such as Canadian Pacific's famed spiral tunnels and the Grand Trunk Pacific - now CN - transcontinental mainline remain a legacy to the contribution of such individuals. Modern engineering programs, such as those led by Mr. Bailey on behalf of CN during the 1980's, ensured continued capacity and efficiency fir railway companies dealing with today's burgeoning growth.

J.E. Schwitzer

The legacies of the railway civil engineer remain as important today as they were nearly a century ago. Consider the legacy of John Edward Schwitzer, for example.

Born in Ottawa in April 1870, Mr. Schwitzer entered the service of the Canadian Pacific Railway in 1899. In only eight years at the railway, Mr. Schwitzer rapidly rose through the ranks to the senior engineering post on CPR's Western Lines. It was in this position that he was confronted with two challenging tasks that would lead to spectacular engineering accomplishments.

The hectic construction pace of the 1880's and 1890's necessitated the adoption of temporary routes where major engineering was involved. On the CPR main line, by far the most difficult stretch of track to maintain and operate was the four-mile section immediately west of the Great Divide in what is now Yoho National Park, British Columbia.

At Stephen station, located at the summit of the Rockies, the main line followed the Kicking Horse River westward down a 4.4 per cent grade - more than double the maximum grade specified for main line operations. Known as the "Big Hill" - this was an extremely difficult section of line to operate and maintain. Since its construction in 1884 – operating managers at CPR had all agreed that it required elimination.

The solution proposed by Schwitzer was based on the European example of "spiral tunnels". Specifically, the line was doubled back upon itself to create four new miles, allowing a more leisurely grade than the "Big Hill" afforded. The new eight mile alignment, upon which work began in 1907, followed a consistent grade of 2.2 per cent. The net effect was to add capacity to the CPR main line, as it not only doubled the capacity of contemporary locomotives in terms of hauling power, but provided for safer and additional train operations over this section of the line.

As completed, the Upper Tunnel under Mount Cathedral was 3,255 feet in length carrying the track through 288 degrees of curvature and a difference in level of 56 feet. The Lower Tunnel,

under Mount Ogden, was 2,922 feet long, possessing 226 degrees of curvature and a vertical difference of 50 feet. The now famous "Spiral Tunnels of the CPR" saw their first traffic on September 1, 1909, and continue to be an integral part of the CPR's transcontinental main line operation today.

And while work on the Spiral Tunnels was underway, a massive three-mile long Viaduct was being constructed some two hundred miles to the south-east at Lethbridge, Alberta. This project, also led by Schwitzer, was designed to eliminate a long climb down into the valley of the Oldman River that had been incorporated into the original "Crowsnest Line" constructed in 1897. Supported by 33 steel towers resting on concrete pedestals, this spectacular structure is 314 feet high and 5,328 feet in length making it Canada's highest railway bridge.

Opened for service three months after the Spiral Tunnels in November 1909, this structure continues to accommodate CPR's modern coal unit trains, and general merchandise freight trains today. These two major projects, together with other less spectacular but equally important projects earned Schwitzer advancement to the post of system Chief Engineer in January 1911.

Regrettably, Mr. Schwitzer died of complications from pneumonia three weeks after this appointment. His name is commemorated by CPR at a railway junction near Souris, Manitoba.

Ron M. Bailey

The Canadian railway industry can look back with pride at the legacies of civil engineers who had the vision and foresight to ensure that the capacity of the Canadian railway system was upgraded in the 1980's, allowing continued growth of Canada's economy, and ensuring the modern-day success of the industry. While these accomplishments were not as spectacular or publicized as the Spiral Tunnels, they were certainly of equal economic importance In western Canada, it was engineering leaders like R.M. (Ron) Bailey, who exemplified this effort.

Born the son of a Canadian Northern Railway locomotive engineer, Mr. Bailey began his railway career on the Canadian National in 1946 as part of a survey party at Maryfield, Saskatchewan. Mr. Bailey would spend his summers away from University on chain gangs throughout western Canada, living in bunk cars and learning the profession.

As a railroader working for Major J.L. Charles - an infamous Chief Engineer on the CNR system - vacation time during the busy construction season was rare - including time off for such occasions as weddings! The result of these edicts was Ron and his new bride Marion were married in Jasper in May of 1951. The honeymoon cottage was an outfit car on CN's BC north line at New Hazelton, B.C.

Serving in engineering postings throughout the prairies, it was as Chief Engineer of CN's Mountain Region in the 1970's and early 1980's that Mr. Bailey's legacy was created. The burgeoning growth of coal, sulphur, grain, and potash traffic challenged the CNR to research and implement new technologies in a bid to effectively handle high volumes of heavy bulk products designed to move in unit trains.

With Mr. Bailey directing the engineering efforts, CN's Mountain Region was at the forefront in developing the infrastructure required to handle these volumes. Concrete ties - the first such installation on a main line in Canada, the installation of new centralized traffic control

technology, double-tracking, and the de-bottlenecking of the Edson/Albreda Subdivisions west of Edmonton, and the Yale/Ashcroft Subdivisions in the Fraser Canyon were all part of a massive project to increase the capacity of the railway.

As a result of unit train operations, rail and wheel wear on cars emerged as a serious problem in the late 1970's, particularly on curves. "We began to notice extreme deterioration of rail, to the extent that our standard rail service life was reduced to about three or four years from around 10," recalls Mr. Bailey. As a result, self-steering trucks were added to the railway's coal fleet, heavy-duty alloy steel was placed on curves and high volume areas, and new maintenance technologies such as rail grinding to reduce corregation, and rail lubrication to reduce rolling resistance were implemented.

Today, the CN system continues to benefit from this foresight and from these capacity upgrades in western Canada.

Following Mr. Bailey's retirement in 1984, CN honoured his service with the naming of a centralized traffic control point on its Wainwright Subdivision main line just east of Edmonton. "Bailey" station sees a parade of transcontinental and local trains each day, commemorating the contribution of Mr. Bailey to CN's success.