Lesson: Dark Day at Second Narrows

Appendix 1: Information sheet for class discussion and student research

**THE TRAGEDY IN BRIEF: THEN AND NOW**

From the early 1950s to 1980, British Columbia embarked on a significant period of economic growth and development. The growth was driven by an increased external demand for primary resources—lumber, paper, minerals as well as significant increases in the post-war population. During that period of time, the government of the province initiated an ambitious program of hydro electric development as well as highway, bridge and ferry development.

In addition to paving of existing highways, new bridges were built throughout the province. The Trans Canada Highway in British Columbia was completed in the early 1960s, connecting Victoria to the Alberta border.

In the lower mainland, the Trans Canada Highway was transformed into a multi-lane freeway throughout much of the stretch between Horseshoe Bay and the upper Fraser Valley. This massive project included the construction of two important bridges – the Port Mann and the Second Narrows Bridge (now named the Ironworkers Memorial Second Narrows Crossing)

The Port Mann Bridge was built to cross the Fraser River connecting North Surrey and Coquitlam and the Ironworkers Memorial (Second Narrows Crossing) was built to span Burrard Inlet connecting Vancouver and North Vancouver. Construction on the Second Narrows crossing began in July 1956.

There were no major challenges that could not be handled in the first two years of construction. Things ran smoothly until June 17, 1958.

The collapse occurred near quitting time on June 17, 1958. At about 3:40 pm ironworkers toiling 40 metres above the inlet heard a horrific noise as Span 5 began to crash into the inlet in a mass of tangled steel. The momentum dislocated the columns of Pier 14, causing Span 4 to lose its grip and tumble into the sea. Seventy-nine workers fell. Among the 19 dead were 14 ironworkers, 3 engineers, a painter and a commercial diver who died a few days later when he drowned trying to recover a body. Twenty others were seriously injured.

The disaster was immediately labeled Vancouver’s worst industrial accident.

On the same day, City of Vancouver, Glen McDonald made arrangements to start performing autopsies on the victims and making the necessary arrangement for an Inquest into the disaster. (1)

On June 18, within a day of the collapse, the Provincial Cabinet established a Royal Commission of Inquiry.

Despite the collapse, the bridge was completed in August of 1960. In 1994 it was re-christened the Ironworkers Memorial Second Narrows Crossing, to honour the 19 men who died on June 17, 1958, as well as eight others who perished during the three-year construction of the bridge.

1. **CORONER’S INQUEST**

Autopsies were performed on fifteen of the victims. The verdict of the jury was that the “deaths were “unnatural and accidental and that another man died of accidental drowning while looking for some of the missing bodies underwater.” (2)

* **REPORT OF THE BRITISH COLUMBIA ROYAL COMMISSION , SECOND NARROWS BRIDGE INQUIRY 1958**  [Document Link](https://www.llbc.leg.bc.ca/public/pubdocs/bcdocs_rc/271933/271933_report_bc_rc_second_narrows_bridge.pdf)

A Royal Commission of Inquiry was established for the purposes of determining:

* what technical or engineering advice there was provided for the project;
* whether such advice was followed or disregarded;
* whether anyone in the employ of BC Toll Highways and Bridges Authority or contractor or sub-contractor was negligent or faulty in their judgments in any way that contributed to or caused the collapse

Justice Sherwood Lett was appointed the sole Commissioner with the responsibility of reporting to the BC Provincial Cabinet (3)

**PERSONS INTERVIEWED**

The Royal Commission interviewed eighty-five (85) witnesses and workers engaged on the bridge at the time of its collapse.

**TESTIMONY**

Sixty-seven (67) witnesses provided testimony before the Commission.

**CAUSES OF THE COLLAPSE (Findings)**

The Royal Commission called to investigate determined that it was an erroneous engineering calculation for a temporary support (temporary arm) compounded by other contributory factors**.**

The design for the Span 5 falsework was done by engineer John McKibbin, who made several errors that were not caught by the engineer in charge Murray McDonald.

**MAJOR CONTRIBUTING FACTOR**

The Royal Commission concluded that the use of plywood alone as “soft packing" for the beams that supported the temporary tower "was a contributing cause of the failure of the grillage solely because of the absence of stiffeners and effective diaphragming in the upper tier of the grillage."

**BEYOND THE COMMISION OF INQUIRY**

Eric Jamieson, author of the comprehensive history of the bridge disaster, notes that the collapse was only one factor - others included questionable steel quality and lax engineering practices. McKibbin was killed in the collapse.

Jamieson’s comments are as follows:

1. It is an irrefutable fact that McKibbin and McDonald were responsible for the dimensional errors on the critical falsework design sheet
2. In addition to the company’s unwritten policy of isolating major projects, thus removing them from the mainstream checking process, of burdening McDonald with an impossible load and placing an important design feature in the hands of a relatively inexperienced engineer, there was the startling admission by Professor Hrennikoff that the upper grillage I-beams were weak with respect to buckling strength.
3. Professor Armstrong’s investigation of I-beam no. 2, and his discovery that it was from a different heat and parts of it had a lower yield point and tensile strength than specifications required.
4. The falseworks were considered pieces of equipment and therefore not subject to the same scrutiny given steel erection, was also problematic, as was the difference on the shear strength calculation formulas between CSA and AASHO, the former of which was 30 percent more tolerant and according to Professor Hrennikoff, “at some level, actually unsafe.” (4)

**Compensation to Families and Widows**

The Worksman’s Compensation Act forbade families from launching lawsuits against employers who paid into the WCB fund. Dominion Bridge was a contributor. Widows were given a one-time $100 carry-over allowance followed by a $75 monthly base pension plus $25 per month for each eligible child. This was approximately a quarter of what most iron-workers made at the time, forcing many widows to seek work. Sixteen families benefited from the pensions, two of the victims being single. (1)

**Closure**

Dominion Bridge accepted the conclusion of the Commission of Inquiry and, in doing so, were forced to assume the responsibility for the $3 million cost of repairing the bridge. Despite the collapse, the bridge was completed in August of 1960. Dominion Bridge closed its Vancouver operations in 1975 and all of the files and drawings were thrown out

In 1994 it was re-christened the Ironworkers Memorial Second Narrows Crossing, ﻿to honour the nineteen men who died on June 17, 1958, as well as four others who perished during the three-year construction of the bridge. An annual memorial is held each year to commemorate the anniversary of the collapse.

**Footnotes**

1. Eric Jamieson, Tragedy at Second Narrows: The Story of the Ironworkers Memorial Bridge

Harbour Publishing, Madeira Park, BC. 2008, pp. 280-282

1. Glen McDonald with John Kirkwood, How Come I’m Dead?

Hancock Publishing , Surrey, B.C. 1985 page 119

1. Order-In –Council (No. 1466)—the above is a paraphrase of the wording of the original order.

4. Ibid

5. Eric Jamieson, Tragedy at Second Narrows: The Story of the Ironworkers Memorial Bridge Harbour Publishing, Madeira Park 2008, p. 178

**For Further information**

**SUGGESTED READING**

Eric Jamieson, Tragedy at Second Narrows: The Story of the Ironworkers Memorial Bridge Madeira Park, B.C.: Harbour Publishing, 2008.

Glen McDonald, How Come I'm Dead? Surrey, B.C.: Handcock House, 1985.

**SUGGESTED WEBSITES**

Diachi Ishikawa, Collapse of the Second Narrows Bridge --interview with survivor Lucien Lessard and Patrick Glendinning (History of Metropolitan Vancouver)

*Ishikawa, a former student at Edith Cavell Elementary School in Vancouver, interviewed survivor Lucien Lessard and Patrick Glendinning, the son of a survivor of the collapse—Colin Glendinning.*  [*Link*](https://vancouverhistory.ca/events/collapse-of-the-second-narrows-bridge/)