



View of the Sheep Creek Bridge over the Fraser River, designed in 1903 and dismantled in the 1960's.
Structural Engineer: J.A.L. Waddell • Photo courtesy BC Archives



Kossen road bridge, Germany
Structural Engineer: Michael Flach, University of Innsbruck
Photo courtesy Michael Flach



Model of competition winning entry for a pedestrian footbridge in Drau, Austria.
Concept: Georg Steinklhammer, ZT DI Stephan Tagger
Structural Engineer: Michael Flach, University of Innsbruck
Photo courtesy Michael Flach



McCullough Trestle, Kettle Valley BC
Structural Engineer: Equilibrium Consulting Inc.
Photo courtesy Equilibrium Consulting Inc.

For much of human history, wood was the preferred building material on this continent. By virtue of its versatility and durability wood was fashioned into many of the structures now considered emblematic of our collective heritage: aboriginal longhouses, log cabins, Hudson's Bay Company forts, grain elevators, railroad trestles and covered bridges, to name but a few. Through the process of designing and building in wood, a knowledge base developed that increased in scope and sophistication with each new challenge. Epitomizing this trend, and one of its last manifestations, was a trio of wooden suspension bridges over the Fraser River, designed by J. A. L. Waddell and built between 1903 and 1911. Through ingenious design, all timber components could be individually replaced without decommissioning the structure. The subsequent decline of this wood culture was a distant echo of Europe's Industrial Revolution, as the material was replaced in most large structures by steel or concrete.

A century later we are beginning to see a resurgence in the use of wood, the ripple effect of Europe's new green revolution. There, wood has once again become a material of choice, this time around for its environmental benefits. Most important is the unique contribution of trees to cleaner air through the absorption of carbon-based gases and the release of oxygen into the atmosphere. Countries such as Denmark and France have legislated that wood be incorporated where possible into all public projects, a measure that has led to many innovative civic buildings and civil engineering structures.

Many of the major architectural projects have been well publicized, but the engineering structures are less well known. Among the most notable is the new timber and steel road bridge at Kossen, Germany, designed by Michael Flach, a leading timber engineer and professor at the University of Innsbruck, Austria. The composite wood and steel trusses of the Kossen bridge span 54m, and the 5m road width and 4.5m clearance meet European highway standards for heavy vehicles.

Even more striking is the competition winning entry for a pedestrian bridge in Drau, Austria, conceived by architect Georg Steinklhammer and now being engineered by Flach. The canopy of this elegant 50m long covered bridge will be a curved glulam shell structure, a notable first that will further reaffirm the potential of the material in this application.

Many venerable old bridges, particularly in Switzerland, (where parts of the Alfalfa Bridge date from the 14th Century) attest to the durability of well-designed timber structures. In our own trestle bridges, albeit daubed in creosote, timber was often found to outlast rusting steel components.

In contemporary structures such as the McCullough Trestle, located on the Kettle Valley section of the Trans-Canada Trail, wood components can be pressure treated to further improve durability, although the real secret is in the detailing. Careful design of connections ensures none of the vulnerable end-grain is exposed, and sloping end cuts promote drainage away from joints. Further protection to the structure can be provided by the cantilevered bridge deck.

Several new bridges will be required in Whistler, BC to enhance the municipality's pedestrian network in time for the 2010 Olympics. This will provide an unparalleled opportunity to finally dispel the myth of durability and bring the beauty of wooden bridges from the relative obscurity of our park system to a position of prominence in our urban centres.

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