

The Strand Bridge is a lightweight, easy to construct, long-span structural solution for bridges exceptional to the ordinary. The entire supporting superstructure is composed of prestressed steel strands in various arrangements tailored specifically for the use intended. To these strands travel surfaces are attached. The prestressed strands when tensioned will resist lateral loads as the strand is deflected. This principle can be applied to multiple strands with the result being resistance enough for even large military loads (80 tons) but with larger deflection than with conventional rigid bridge designs. In many cases deflection is secondary to a multitude of other benefits including cost, weight, expediency, constructability, aesthetics, and other factors. Thus the unique place for the Strand Bridge.

Why has the Strand Bridge not been conceived previously? The answer is simple.

High strength steel strand is a fairly recent invention that has paralleled development of bridge codes that tend to limit new ideas.

Environmental restrictions in the form of "No Net Loss" of wetlands and critical habitats for threatened or endangered species have increased the problem of bridging waterways and wetlands using conventional wood or steel designs that require large abutment and pier structures for relatively short spans. In addition, increased demand for outdoor recreational opportunities has increased pressure on designers for innovative solutions for spanning rivers and obstacles in both urban and remote areas without the impact of conventional designs.

Currently available commercial pedestrian or trail bridges are effectively limited to spans of 200 feet and require high-capacity foundations, steel superstructures, and the use of large construction equipment for installation. As spans increase beyond 200 feet the unit costs increase significantly and effectively remove long span solutions from considerations.

The Strand Bridge idea surfaced in 1995 in response to a need for economical long-span (up to 400 feet) pedestrian bridges, particularly in remote areas or areas in need of clear spans longer than standard economical designs but less costly than more exotic designs such as conventional cable-stayed bridges. The U.S. Patent Office issued a patent in 2003, which attests to the idea's originality.

The Strand Bridge idea was presented to various agencies including the State of Alaska, with its remote pedestrian bridge needs particularly in villages situated along rivers with no road connects.

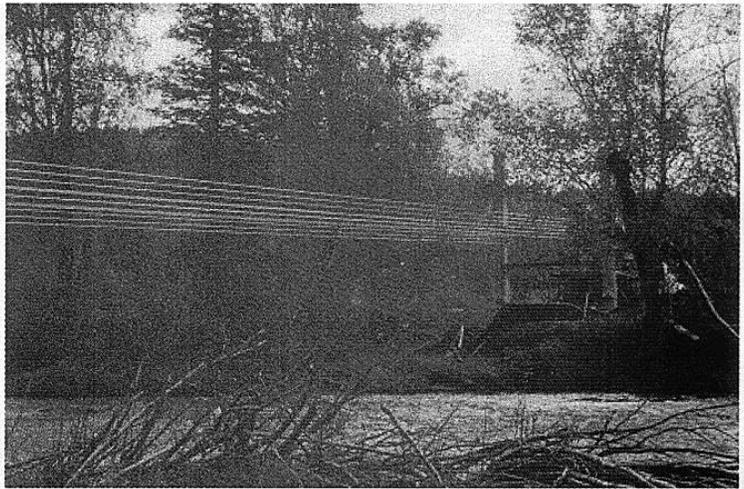
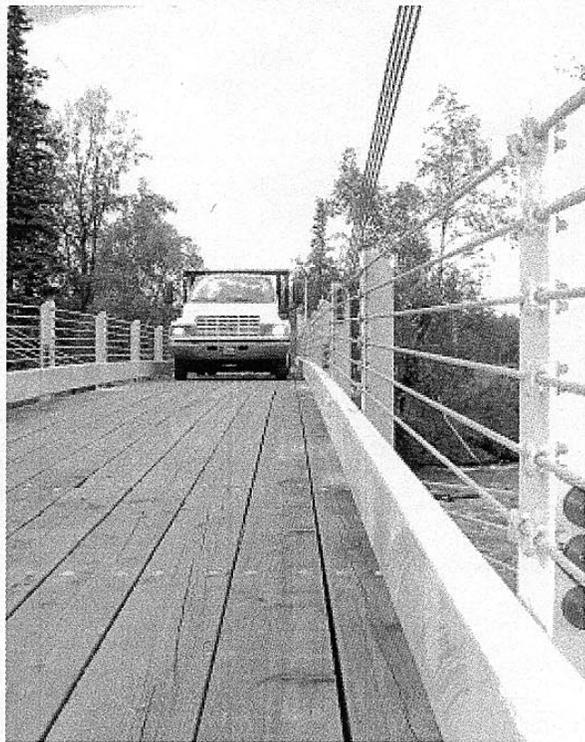
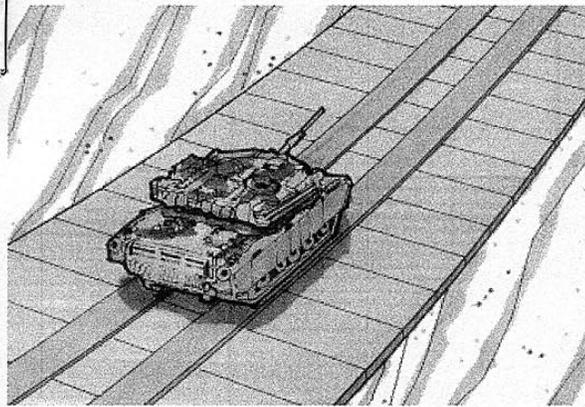
However, new ideas are often difficult to sell except when a dire need exists. This happened when conventional pedestrian bridges for an Alaskan military golf course under construction proved infeasible and the search for ideas on how to economically clear span 140 feet and 250 feet over environmentally sensitive areas began.

The Strand Bridges clearly solved a number of problems and were built in just three months, which allowed the project to open on schedule.

The setting for these bridges is typical as environmental regulations increasingly limit encroachment into streams and wetlands. Many areas are experiencing the same needs. Subsequently many locations are considering this solution and the idea in a flat configuration has been submitted to the Army as a potential battlefield or emergency bridge for a wide range of loadings.

Practical proven innovation is the basis for the Strand Bridge and its future is bright as yet another component for the innovative bridge engineer. Uses include long-span scaffolding support, pedestrian bridges, vehicular bridges, emergency bridges and military bridges, and other new ideas that surface.

Contact: Dennis Nottingham • President • PND Incorporated • 1506 W. 36th Ave. • Anchorage, AK 99503
(907) 561-1011 • Fax (907) 563-4220 • pnd@alaska.net



THE STRAND BRIDGE - A NEW INNOVATION

(Clockwise from top left) Military version of bridge; superstructure erection launched from one side is an important feature; prestressed strand is the superstructure for the bridge; a 250-foot clear span; aesthetic supports enhance this strand bridge; 18,000-pound load test for a pedestrian bridge.

