

Association of Professional Engineers and Geoscientists

of the

Province of Manitoba

Certificate of Engineering Achievement

presented to

WARDROP ENGINEERING INC.

for

THE WARDROP SOLUTION® FOR REMEDIATION OF HEAVY TIMBER ROOF TRUSSES

The Certificate of Engineering Achievement is awarded to Wardrop Engineering Inc. for the invention of The Wardrop Solution® for Remediation of Heavy Timber Roof Trusses. Wardrop's structural engineers developed an innovative system to solve a structural problem that has challenged Canadian engineers since the Second World War. The new system uses conventional steel truss technology to repair hangar buildings from the Second World War, which were constructed with heavy timber Warren trusses and built-up columns. A conventional steel truss is constructed within the existing wood truss using it as a jig and to provide stability to some steel members. The new system is faster, easier to install, and has a significantly lower capital cost than previous rehabilitation methods while adding value by reducing the long-term maintenance required.

During the Second World War, the Canadian government built hundreds of heavy timber buildings for the military for use as aircraft hangars, drill halls, recreation halls, and for aircraft maintenance and production. The "temporary" buildings were built with unseasoned timber. Problems resulting from overstress of the connections, shrinkage of the timber, and sagging of the truss developed almost immediately and have been a maintenance problem for over 50 years. Previous repair systems used epoxy injection and post-tensioning using steel tendons, but the initial cracked condition and long-term deterioration have remained a problem.

The Wardrop Solution® was first developed for a single-span hangar at Canadian Forces Base Borden. The shortcomings of conventional methods were recognized at the start of the project. Wardrop Engineering Inc. worked with the client, Defense Construction Canada, to identify the problems of the older systems and develop the new steel system. In 1999, the system was improved and expanded for the repair of these double-span hangars owned by the Department of National Defense and operated by Bombardier at Canadian Forces Base Moose Jaw. Wardrop's philosophy of research and innovation has produced a new structural system to extend the useful life of hundreds of these buildings still in use in Canada by the military, industry, and public buildings such as community halls and arenas. Research is ongoing to improve the performance and economy and apply it to a wider variety of trusses and buildings.

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