

Association of Professional Engineers and Geoscientists  
of the  
Province of Manitoba

# Certificate of Engineering Achievement

presented to

**THE CITY OF WINNIPEG WATER & WASTE DEPARTMENT,  
CH2M HILL CANADA LIMITED  
AND UMA ENGINEERING LTD.**

for the

**REHABILITATION OF THE GREATER WINNIPEG WATER DISTRICT'S  
SHOAL LAKE AQUEDUCT**

*The Certificate of Engineering Achievement is awarded to The City of Winnipeg Water & Waste Department, CH2M HILL Canada Limited and UMA Engineering Ltd. for the Rehabilitation of the Greater Winnipeg Water District's Shoal Lake Aqueduct.*

*The rehabilitation of the Shoal Lake Aqueduct began with a vision and a challenge. The vision was to extend the life of the structure to provide at least another 50 years of service with minimal increases in maintenance and operating costs. The challenge was to plan for nearly ten years of engineering and construction without spending any more than the utility-based fund established for the program. With the program entering its ninth year, it remains on schedule and within four percent of the total program budget.*

*The program partners used innovative techniques, new technology and an effective risk management program to extend the life of the Shoal Lake Aqueduct by more than 50 years. At the same time they working in varied and difficult external environments with minimal shutdowns so as to maintain an uninterrupted supply of water to the citizens of Winnipeg.*

*The condition assessment and rehabilitation phases of this program have advanced the understanding of asset management, the rehabilitation of ageing infrastructure and the fundamental behaviour of pipe-soil interaction. Virtually every discipline of engineering has been called upon to provide technical expertise to assess the nature of the problems and identify the most cost effective repair strategies and methods.*

*During shutdown windows, from as brief as 48 hours to as long as 23 days, inspection teams and contractors routinely worked around-the-clock using a variety of advanced inspection and construction techniques and extraordinarily precise project management to ensure that technical objectives were not compromised in the interest of expediency. Individual repair projects often involved the co-ordination of hundreds of contractors, inspection and operations staff working in brief shutdown windows over many kilometers of the Aqueduct.*

*Using risk-based design concepts such as limit state analysis, analytical concepts such as expected outcome analysis and incorporating the required emergency response systems into the program, rehabilitation costs were reduced by approximately one-third of the original \$160 million rehabilitation estimate and short and long term operational risks were mitigated to an acceptable level.*

*By extending the service life of the Shoal Lake Aqueduct by at least another 50 years, the project has had a profound positive impact on the life and well being of the citizens of Winnipeg.*

March 5, 2002