

Christopher Martin Raymond, PhD., P.Eng.

SUMMARY OF QUALIFICATIONS

- Civil Engineering education and licensed to practice engineering in the Province of Ontario with 30 years of substantial experience in highway engineered materials, contract management and drafting standards and specifications for highway construction.
- Civil Engineering/Technical expertise in the areas of engineering materials and highway contract management, including presentations at several engineering/professional conferences and authorship of over 25 technical/engineering papers and reports on engineering materials.

EDUCATION

- Ph.D. 2002, Civil Engineering, University of Waterloo, Waterloo, Ontario (Ph.D. thesis on pavement roughness).
- M.Eng. 1992, Civil Engineering, University of Florida, Gainesville, Florida (Master's project on Portland cement concrete shrinkage).
- B.A.Sc. 1988, Civil Engineering, Queens University, Kingston, Ontario.

PROFESSIONAL MEMBERSHIPS

Registered Professional Engineer, Province of Ontario since 1990
Registered Professional Engineer of Queensland, Australia - 2015

PROFESSIONAL EXPERIENCE

CLAIMS ENGINEER February 2021 - Present
Ministry of Transportation, Contract Claims Office, St. Catharines, Ontario

General responsibilities include the review and analysis of routine and complex construction contract claims for additional compensation, some of which related to delay claims about the application of engineered materials (asphalt or concrete) during construction. Participation in the determination of settlement offers or denials of the contractors' claims, which in some cases required the application of engineering principles and opinions as to the placement of highway engineered materials during the construction of the highway. Reviewing and drafting submissions in response to the contractors' claims. Attending meetings/hearings as required by the contract dispute resolution clauses to respond to the contractors' claims for additional compensation.

HEAD, MAINTENANCE PERFORMANCE Mar 2017 – Aug 2020, Dec 2020 – Feb 2021
Ministry of Transportation, Maintenance Management Office, St. Catharines, Ontario

General responsibilities included providing technical and research expertise in relation to maintenance contractors' performance related to infrastructure life expectancies/preservation maintenance standards for engineered materials (pavement or concrete) and other preservation needs of the highway infrastructure. Developing contract specifications and requirements for the maintenance of the highway infrastructure including the use and application of the Ministry's Designated Sources of Materials (DSM list). Management of highway maintenance operations through the COVID-19 pandemic. Developed a continuity of operation plans related to COVID-19. Dealt with a major contractor going into receivership while ensuring continuous maintenance of the highways. Assisted with the task of developing new contract arrangements to procure maintenance contractors and assess their work performance. Continued to provided highway engineering opinions on pavement design, construction, rehabilitation and maintenance in regard to the use of engineered materials on Ministry highways.

MANAGER, MAINTENANCE MANAGEMENT OFFICE
Ministry of Transportation, Maintenance Management Office, St. Catharines, Ontario

August 2020 – December 2020

General responsibilities included the drafting, development and implementation of highway maintenance standards, operational contract specifications for maintenance, general maintenance tender contract documents and general policies and procedures for the maintenance of Ministry highways. Other responsibilities including working with industry stakeholders (contractors, material suppliers, subcontractors, design consultants and contract administrators) to hear and respond to the means and methods of performing the work to maintain highways.

AREA CONTRACTS ENGINEER
Ministry of Transportation, West Region Construction Office, London, Ontario

May 2016 – February 2017

Provided highway engineering opinions and guidance on the construction/maintenance of projects in West Region to Ministry staff, engineering consultants and contractors. Such opinions and guidance would include matters related to the placement of engineered materials during construction along with other engineering expertise on the delivery of transportation infrastructure construction and maintenance programs. General responsibilities included supervision and providing directions to senior project staff and contract administration consultants on highway projects and providing highway engineering opinions and guidance on the constructability of projects as part of the planning and detail design phase of various highways projects in West Region. Other duties include resolving contract disputes (some relating to the application of engineered materials during construction); selecting and managing consultants, liaising with contractors about the status of the project or their claims for additional compensation, coordination with design and other engineering consultants, utility companies, government agencies, the media and the public.

HEAD, CONSTRUCTION AND ENGINEERING SECTION
Ministry of Transportation, Contract Management Office, St. Catharines, Ontario

October 2015 – May 2016

Provided engineering guidance to a diverse group of twelve engineering and technical staff in the development of standards, contract specifications, policies and procedures for procurement and management of engineering consultant assignments, contract administration assignments and construction contract oversight. As the need arose, provided technical expertise and highway engineering opinions on construction, rehabilitation and maintenance including the use of engineered materials on the Ministry highways. Managed industry stakeholder (contractors, subcontractors, material suppliers and consultants) relations including being the primary contact for the industry representatives, the Ontario Road Builders' Association and Consulting Engineers of Ontario.

PRINCIPAL ADVISOR
Australian Road Research Board, Brisbane, Queensland, Australia

February 2015 – September 2015

Provided engineering opinions and guidance to Queensland Transport and Main Roads in the areas of construction administration, pavements and engineered materials.

HEAD, CONSTRUCTION CONTRACTS SECTION
Ministry of Transportation, Contract Management Office, St. Catharines, Ontario

December 2012 – January 2015

Provided engineering guidance to engineering and technical staff in the development of policies and procedures for construction contract oversight and administration. Provided highway engineering opinions and expertise related to construction administration and provided technical/engineering interpretation of specifications and drawings for highway construction. Provided technical expertise and highway engineering opinions on pavement design, construction, rehabilitation and maintenance and the use of engineered materials on Ministry highways.

EXECUTIVE ASSISTANT TO THE ASSISTANT DEPUTY MINISTER January 2012 – September 2012
Ministry of Transportation, Provincial Highways Management Division, Toronto, Ontario

Identified, researched and responded to issues about the operation of the Ministry's highways from concerns of the public or the construction industry. As the need arose, provided advice and information about the Ministry's highways, including the use of engineered materials on these highways, to the Directors, Assistant Deputy Minister, Deputy Minister's Office and Minister's office. Ensured that correspondence and media responses are technically correct and reference the appropriate Ministry construction standards or specifications consistent with government mandates.

HEAD, BITUMINOUS SECTION July 2009 – December 2011
Ministry of Transportation, Materials Engineering and Research Office (MERO), Toronto, Ontario

Provided engineering guidance and highway engineering opinions based upon engineering principles to Ministry staff on the application of asphalt and bituminous materials for design, construction and maintenance. Provided engineering opinions and guidance with support from fifteen engineering and technical staff for the development, review, testing, monitoring, performance and implementation of asphalt and bituminous products including developing policies, standards, operating guidelines, and contract specifications. Provided expertise and support in the resolution of complex bituminous engineering problems and contractual issues associated with contractor claims or work performance matters. Responsible for the administration of bituminous products on Ministry's Designated Source of Materials (DSM list) such as anti-stripping treatments, asphalt cement, emulsions, liquid asphalts, crack sealants and proprietary patching products. Managed stakeholder relations related to the industry (contractors, subcontractors, material suppliers and consultants) as well as specialized engineering services and research activities in all aspects of bituminous materials engineering and laboratory testing.

SENIOR PAVEMENT DESIGN ENGINEER June 2007 – July 2009
Ministry of Transportation, Materials Engineering and Research Office (MERO), Toronto, Ontario

Provided engineering support (research and opinions) for highway design, construction and maintenance of pavements. Evaluated innovative pavement materials and equipment to develop provincial policy through consultation with internal and external stakeholders. Researched and developed policy for innovative contract management initiatives including pavement warranties and minimum contract oversight. Responsible for updating of the Ministry's Surface Course Directive. Provided technical expertise and highway engineering opinions on pavement design, construction, rehabilitation and maintenance including the use of engineered materials.

SENIOR BITUMINOUS ENGINEER September 2004 – June 2007
Ministry of Transportation, Materials Engineering and Research Office (MERO), Toronto, Ontario

Provided technical expertise, engineering guidance and support for asphalt and bituminous materials including crack sealants including the development of contract standards, specifications and the application and revision of the Ministry's DSM related to bituminous materials. Evaluated new materials and equipment to develop provincial policy standards through consultation with internal Ministry staff and external stakeholders (contractors, subcontractors, material suppliers and consultants). Managed and directed research and developed guidelines related to engineered construction materials and their acceptance by the Ministry, including participating in expert task groups and technical review panels.

ASSISTANT TO THE CHIEF ENGINEER June 2003 - February 2004
Ministry of Transportation, Engineering Standards Branch, St. Catharines, Ontario

Managed technical issues and projects for the Chief Engineer including performing research and development of engineering standards. Facilitated and promoted innovation and new technologies, coordinated special projects, training workshops, and performed resource planning. Ensured effective management of complex, sensitive and technical issues, and represented the Chief Engineer on

committees and working groups. Re-established and promoted links with Ontario universities and research stakeholders.

ASSISTANT DISTRICT ENGINEER

January 2001 - December 2001

Ministry of Transportation, Sault Ste. Marie District Office, Sault Ste. Marie, Ontario

Managed summer and winter maintenance activities for unincorporated municipalities including local roads. Administered municipal connecting link projects and acted in the absence of the District Engineer. Provided engineering advice and guidance on highway technical issues related to corridor control, maintenance, drainage, highway design and municipal roads including unincorporated townships and First Nations. Provided engineering opinions on construction, rehabilitation and maintenance including the use of engineered materials on Ministry highways and unincorporated roads.

HEAD OF QUALITY ASSURANCE

May 1995 - April 1998 and May 2000 - January 2001

Ministry of Transportation, West Region Construction Office, London, Ontario

Managed a quality assurance program for a transportation/highway infrastructure construction program in the Ministry's West Region of approximately 100 million dollars per year to ensure the quality of the construction was consistent with Ministry standards and contract specifications. Provided technical expertise and engineering opinions on the oversight, quality and use of engineered materials on Ministry highways including application of the DSM. Supervised 25 staff, including 4 district laboratories and 7 specialised staff who provided technical expertise for the resolution of construction issues related to materials. Other duties included participation in contractor contract disputes, managing in-house and consultant material testing laboratories and managing operating budgets having regard to the scope and nature construction activities.

VARIOUS ENGINEERING POSITIONS

May 1988 – May 2003

Ministry of Transportation, Various Locations

Performed various engineering positions in the areas of construction administration, engineering materials and pavement design. Provided technical expertise and engineering opinions on pavement design, construction, rehabilitation and maintenance including the use of engineered materials.

SESSIONAL LECTURER

Various Years – 2000 to Present

University of Waterloo, Department of Civil Engineering, Waterloo, Ontario

Lecturer for graduate and undergraduate courses including Infrastructure Management and Pavement Design and Management.

AWARDS

Ontario Public Service Amethyst Award for Service Excellence and Achievement, 2018 (Related to the response of a maintenance contractor going into financial receivership)

Ministry of Transportation Innovation and Openness to Change Award, 2012 (Related to implementing Canada's first integral two layer asphalt paving project)

American Society of Civil Engineers Technical Paper Award, 2002 (Related to a report on pavement roughness)

COMMITTEES

Team Manager, Operate-Maintain Integrated Business Team, 2019-2021
Member, Ontario Road Builders Association/MTO Highway Maintenance Committee, 2017-2021
Member, Ontario Provincial Standards General Conditions Committee, 2015-2016
Member, Ontario Road Builders Association/MTO Hot Mix Committee, 2009-2016
Co-Chair, Ontario Road Builders Association/MTO Structures Committee, 2012-2016
Co-Chair, Ontario Road Builders Association/MTO Environment Committee, 2014-2016
Member, Ontario Road Builders Association/MTO Aboriginal Procurement Committee, 2012-2014
Member, Consulting Engineers of Ontario/MTO Contract Administration Committee, 2012-2016
Member, Consulting Engineers of Ontario/MTO Engineering Committee, 2015-2016
Member, MTO Regional Contracts Engineers Team, 2012-2016
Member, MTO Quality Assurance Committee, 2009-2016
Secretary, MTO Qualification Committee, 2012-2015
Member, MTO Performance Specification Implementation Committee, 2009-2015
Member, Canadian User Producer Group for Asphalt Management Committee, 2010-2013
Member, SHRP2 R07 Hot Mix Asphalt Performance Specification Workgroup, 2011-2012

PUBLICATIONS

- Lee, J., Denneman, E., Young, C., and Raymond, C., "Maximising the Use of Rubber from End-of-Life Tyres in Road Construction in Queensland", Proceedings of the 4th Geo-China International Conference, Shandong, China, 2016.
- Tabib, S., Raymond, C., Brown, A., and Marks, P., "Ontario's Move to Hot Mix Asphalt Pavement Smoothness Acceptance Using High Speed Inertial Profilers", Proceedings of the 2013 Annual Conference of the Transportation Association of Canada, Winnipeg, Manitoba, 2013.
- Raymond, C., Beattie, H., Magisano, F., Virani, A., and Lee, S., "Ontario's Experience with Hot on Hot Paving: A Canadian First", Proceedings of the 57th Annual Conference of the Canadian Technical Asphalt Association, Vancouver, British Columbia, 2012.
- Huber, G., Marks, P., Brown, A., and Raymond, C., "Relationship of Asphalt Binder Properties to Cracking in Five Year Old Test Sections", Proceedings of the 57th Annual Conference of the Canadian Technical Asphalt Association, Vancouver, British Columbia, 2012.
- Tabib, S., Raymond, C., and Le, L., "Ontario's Experience with Warm Mix Asphalt", Proceedings of the 2nd International Conference on Warm Mix Asphalt, St. Louis, Missouri, 2011.
- Tabib, S., Virani, A., Raymond, C., and Kazmierowski, T., "Ontario's First Superpave Trial: 12 Years of Performance", Proceedings of the 55th Annual Conference of the Canadian Technical Asphalt Association, Edmonton, Alberta, 2010.
- Tabib, S., Ahmed, M., Marks, P., Tam, K., and Raymond, C., "Ontario's Experience with Rubber Modified Hot Mix Asphalt", MERO Report 037, Ministry of Transportation, Toronto, Ontario, 2010.
- Byrum, C., Raymond, C., Swanlund, M., and Kazmierowski, T., "Experimental Short-Wavelength Surface Textures in Portland Cement Concrete Pavements, Transportation Research Record 2155, Transportation Research Board, Washington, D.C., 2010.
- Raymond, C., Lane, B., Bianchin, M., Senior, S., and Titherington, M., "Design and Construction of a Pervious Concrete Pavement in Ontario, Canada", Proceedings of the 9th International Conference on Concrete Pavements, San Francisco, California, 2008.
- Lane, B., Kennepol, G., Kazmierowski, T., Raymond, C., and Tam, K., "Ten-Year Performance of a SMA Freeway Pavement in Ontario", Proceedings of the Annual Conference of the Canadian Technical Asphalt Association, Niagara Falls, Ontario, 2007.
- Raymond, C., Tighe, S., Haas, R., and Rothenburg, L., "Analysis of Influences on As-built Pavement Roughness in Asphalt Overlays", American Society of Civil Engineers/US Federal Highway Administration Publication No. RD-03-049, November 2005.
- Raymond, C., Tighe, S., Haas, R., and Rothenburg, L., "Analysis of Influences on As-built Pavement Roughness in Asphalt Overlays", International Journal of Pavement Engineering, Volume 4, Abingdon, United Kingdom, 2003.
- Raymond, C., Tighe, S., Haas, R., and Rothenburg, L., "Development of Canadian Asphalt Pavement Deterioration Models to Benchmark Performance", Canadian Journal of Civil Engineering, Volume 30, Ottawa, Ontario, 2003.

- Haas, R., Rickards, I., Raymond, C. and Cowe Falls, L., "Alternative Contracting Models for Maintenance and Rehabilitation of Pavement Networks", Proceedings of the 9th International Conference on Asphalt Pavements, Copenhagen, Denmark, 2002.
- Raymond, C., Haas, R. and Rothenburg, L., "Development of a Pavement Performance Model for Asphalt Overlays", Proceedings of the 2002 Conference of the Canadian Society of Civil Engineering, Montreal, Quebec, 2002.
- Canadian Strategic Highway Research Program, "The Effect of Initial Pavement Smoothness on Long-Term Roughness Progression: Some Findings from C-LTPP and US-LTPP Studies", C-SHRP Technical Brief #23, Ottawa, Ontario, 2002.
- Haas, R., Yeaman, J., Raymond, C. and Cowe-Falls, L., "Pavement Management in Long Term Performance Based Network Contracts", Proceedings of the Fifth International Conference on Managing Pavements, Seattle, Washington, 2001.
- Raymond, C., Tighe, S. and Haas R., "User Cost Analysis of Traffic Staging Options for Resurfacing Divided Highways in Ontario", Proceedings of the 2000 Annual Conference of the Transportation Association of Canada, Edmonton, Alberta, 2000.
- Raymond, C. and Haas R., "Principles of Highway Asset Management", Proceedings of the 2000 Conference of the Canadian Society for Civil Engineering, London, Ontario, 2000.
- Tighe, S., Raymond, C. and Haas, R., "Incorporating Safety with Pavement Management", Proceedings of the 2000 Conference of the Canadian Society for Civil Engineering, London, Ontario, 2000.
- Haas, R. and Raymond, C., "Asset Management for Roads and Other Infrastructure", Ontario Hot Mix Producers Association Fall Seminar, Toronto, Ontario, 1999.
- Haas, R. and Raymond, C., "Long Term Performance Specified Contract Framework for Road Networks", Proceedings of the 1999 Annual Conference of the Transportation Association of Canada, Saint John, New Brunswick, 1999.
- Aurilio, V. and Raymond, C., "The Development of End Result Specifications for Pavement Compaction and Recovered Penetration", Transportation Research Record 1491, Washington D.C., 1995.
- Aurilio, V. and Raymond, C., "The Development of End Result Specifications for Pavement Compaction and Recovered Penetration", Proceedings of the 39th Annual Conference of the Canadian Technical Asphalt Association, Regina, Saskatchewan, 1994.
- Kazmierowski, T.J., Bradbury, A., Cheng S., and Raymond, C., "Performance of Cold In-Place Recycling in Ontario", Transportation Research Record 1337, Washington D.C., 1992.
- Kazmierowski, T.J., Bradbury, A., Cheng S., and Raymond, C., "Cold In-Place Recycling in Ontario - A Case Study", Proceedings of the 36th Annual Conference of the Canadian Technical Asphalt Association, Montreal, Quebec, 1991.
- Raymond, C. and Sturm, H., "Design and Quality Assurance Requirements for Open Graded Drainage Layers", Ministry of Transportation, 1990.
- Raymond, C., Magni, E., and MacLean, M., "Design and Quality Assurance Manual for Geosynthetics", Ministry of Transportation, 1989.