



# John J. Roller, P.E., S.E.

## AFFILIATED STRUCTURAL ENGINEER

In his nearly 40 years with CTLGroup, John Roller served as a Principal Structural Engineer. His responsibilities included providing technical expertise, leadership, management and oversight for complex consulting and laboratory projects. His experience includes performing field and laboratory investigations focusing on evaluating performance of building materials, civil structures, and structural or building components.

Mr. Roller's professional practice continues to focus primarily on structural and material failure investigation, condition assessment and evaluation of deteriorated, distressed or damaged structures or components, civil infrastructure asset management, and development and implementation of quality assurance programs. He frequently provides expert litigation consulting services for cases involving structural or material performance shortfalls and construction disputes.

Mr. Roller has extensive experience with evaluation of pipelines, tanks, pressure vessels and other structures used to contain, store or transport fluids or gases. Mr. Roller has evaluated more than sixty structures used for water storage, distribution or drainage nationwide. He has also conducted important laboratory research programs investigating structural integrity of reinforced and prestressed concrete secondary containments for nuclear power generating facilities under simulated accident scenarios.

Mr. Roller has a strong background in experimental evaluation of reinforced and prestressed concrete structures. His extensive experience with research and development programs allows him to apply unique knowledge related to material and structural behavior gained in a laboratory environment to structures subject to in-service conditions of the real world. Mr. Roller has co-authored more than 50 publications, many of which relate to various research projects performed throughout his career. Three of these publications have won awards from ACI and ASCE.

### Academic Credentials

B.S. in Architectural Engineering  
Milwaukee School of Eng., 1983

A.A.S. in Architectural + Building  
Construction Engineering Tech.  
Milwaukee School of Eng., 1981

### Licensure/Certification

Structural Engineer:  
Illinois

Professional Engineer:  
Arizona, Delaware, Hawaii,  
Illinois, Iowa, Michigan  
Missouri, Montana, New York,  
Ohio, Rhode Island, Texas,  
Vermont, Wisconsin  
NCEES

### Professional Affiliations

American Concrete Institute  
American Institute of Steel  
Construction  
Precast/Prestressed Concrete  
Institute  
American Water Works  
Association

### Contact Information

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### Representative Project Experience

#### Failure Investigation

- Performed evaluation of four 3-story office buildings incorporating precast, glass fiber reinforced concrete (GFRC) exterior cladding panels to determine the cause of panel cracking and water leakage. The investigation included panel design review, field investigation, testing and monitoring of GFRC panels, laboratory testing of material samples and structural analyses to evaluate panel stresses resulting from external load effects and restrained material volume change movement effects.
- Performed Investigation of dam intake structure at hydroelectric power plant to evaluate root cause of reinforced concrete wall failure. The investigation include design review, review of videos documenting underwater inspection and component recovery efforts, field inspection of exhumed wall components and computational modeling and analysis to evaluate wall stresses and overall structural behavior under various modes of operation.
- Performed investigation of internal precast concrete components of a natural draught hyperbolic cooling tower at a coal-fired power generating plant to evaluate the root cause of extensive cracking distress. The investigation included component design review, field investigation to document condition and obtain concrete material samples and laboratory testing and examination of material samples with emphasis on evaluation of concrete aggregate reactivity.
- Performed investigation of a new water transmission main incorporating approximately 3.2 miles of 72-in. diameter prestressed concrete cylinder pipe (PCCP) to evaluate the root cause and consequences of two joint failures that occurred shortly after the main was commissioned into service. A weld repair procedure was developed, verified and implemented for approximately 500 full-circumference welds and transmission main was restored to service approximately 9 months after the investigation work began.

- Performed root cause investigation of precast, prestressed concrete bridge girders that collapsed during construction of a new highway bridge. The investigation included review of project documentation, field inspection, material sampling and testing and structural analyses to evaluate certain material and construction effects on lateral stability of the erected girders prior to deck slab placement.

#### **Structural Evaluation and Asset Management**

- Performed investigation of an aging, 7-mile-long cooling water circulation pipeline for a nuclear power generating facility to evaluate the strength and serviceability of the prestressed concrete cylinder pipe (PCCP) segments. Identified and evaluated feasibility and economic considerations associated with various rehabilitation strategies.
- Evaluated 95 buildings for a major insurance carrier after tornado. Work included reviewing building conditions following the tornado, identifying and quantifying conditions that constitute valid claims of tornado-related damage versus conditions caused by other phenomena, and providing opinions related to property damage estimates offered by both the Insurance carrier and the owner of the subject buildings.
- Performed evaluation of 975-ft tall reinforced concrete chimney structure at a coal-fired power generating plant after a construction fire caused extensive internal damage to the lower regions of the cylindrical shell walls. Field investigation and testing of material samples were performed to assess and quantify the extent of fire damage. Subsequent field support and consultation services were provided during the repair process.
- Performed engineering evaluation of 1.2 million square foot, three-level precast parking structure to assess current condition, define extent and cause of existing concrete distress, and develop conceptual rehabilitation plans. Based on findings from the condition assessment work, estimates of repair quantities and associated repair costs were developed and provided to the Owner.
- Performed investigation of an above-ground, 2-million gallon capacity, reinforced concrete aeration basin at a WWTP to evaluate the root cause of excessive cracking in the tank walls and floor slab and leakage. The investigation included review of tank design, construction-related documentation and condition assessment findings. Consultation services and technical guidance were provided during subsequent repair efforts.
- Performed investigation of five bridge decks owned by a Canadian Transportation Authority to evaluate the cause of premature surface deterioration. The investigation included a detailed review of project specifications, concrete materials and mix designs, concrete placement conditions and procedures, visual condition assessments and laboratory examination of representative concrete samples. Following the investigation, provided Owner with specific recommendations for addressing the existing deterioration and reducing the likelihood of future deck surface deterioration problems.
- Performed investigation of 623 precast concrete box beams incorporated in a 9,000-ft long trestle structure serving a U.S. Military Facility. A comprehensive nondestructive testing program was implemented to evaluate variations in box beam web/flange thicknesses and concrete cover resulting from fabrication defects. Load tests were performed on selected box beams after application of CFRP strengthening to validate effectiveness of the repairs.
- Developed inspection and risk assessment methods for above-ground reinforced concrete storage tanks for a major petrochemical company. Performed investigation of an exemplar concrete tank structure exhibiting cracking and leakage issues with the intent of using this structure as a “prototype” for developing an asset management plan for other similar concrete tank structures. The investigation included a field condition survey, nondestructive testing of key components of the structural system and concrete material studies. Findings from the investigation were used to evaluate

**John J. Roller, P.E.,  
S.E.**

risk and consequences of various hypothetical modes of failure and to develop mitigation strategies.

#### **Quality Assurance Program Development/Implementation**

- Developed and implemented quality assurance programs for design, fabrication and erection of exterior GFRC cladding panels during construction of two major hotel complexes located in San Francisco bay area. At the time of construction, one of these complexes represented the largest application of GFRC cladding panels in the world. Services included development of QA specifications, review of GFRC panel design, daily in-plant and on-site audits of precast panel manufacture and erection and review of material QC test data.
- Developed and implemented quality assurance programs for prestressed concrete cylinder pipe (PCCP) fabricated for a new 8- mile long water transmission main. Services included development of QA specifications and performing initial quality audits of the pipe manufacturing plant. Full-time in-plant observation during manufacture of more than two thousand 66- and 84-in. diameter PCCP sections, observation of required proof-of-design tests and limited independent testing to verify properties of pipe component materials was also performed.
- Developed specifications and provided construction support services during repair of a 370-ft tall natural draught hyperbolic cooling tower at a coal-fired power generating

#### **Publications**

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Roller, J. J., "Q&A - Control of Concrete Cracking for Liquid-Tight Environmental Structures," Concrete International, February 2020.

Roller, J. J., et al, (Ed), More Sticks and Bricks, First Edition, American Bar Association, Skokie, IL, 2018, 48 pp.

Roller, J. J., "PCCP Risk Management – State-of-the-Art and Strategy Optimization," AWWA Journal, Vol. 105, No. 7, July 2013.

Morscheck, L.A., and Roller, J. J., "Stress Testing of a New North American Passenger Locomotive Truck Frame in Accordance With International Union of Railways (UIC) Code," Proceedings of the 2013 Joint Rail Conference (JRC2013), Knoxville, Tennessee, April, 2013.

Roller, J. J., H. G. Russell, R. N. Bruce, and W. R. Alaywan. 2011. "Evaluation of Prestress Losses in High-Strength Concrete Bulb-Tree Girders for the Rigolets Pass Bridge." PCI Journal, Vol. 56, No. 1. Winter.

Bruce, R. N., J. J. Roller, and H. G. Russell. 2009. "Structural Monitoring of the Rigolets Pass Bridge." Final Report to Louisiana Transportation Research Center, Report No. FHWA/LA.08/437: 62. Baton Rouge, Louisiana. October.

Roller, J. J., and R. N. Bruce. 2009. "Rigolets Pass Bridge — HPC Material Property Studies." HPC Bridge Views, Issue 58. November/ December.

Roller, J. J., H. G. Russell, and R. N. Bruce. 2006. "Fatigue Endurance of High-Strength Prestressed Concrete Bulb-Tee Girders." PCI Journal, Vol. 52, No. 3. May/June.

Raymond, K. K., R. N. Bruce, and J. J. Roller. 2005. "Shear Behavior of HPC Bulb-Tee Girders." Seventh International Symposium on Utilization of High-Strength/High-Performance Concrete, SP-228, Vol. 1: 705-722. American Concrete Institute, Farmington Hills, Michigan.

Lotfi, H. R., R. G. Oesterle, and J. J. Roller. 2005. "Reliability Assessment of Distressed Prestressed Concrete Cylinder Pipe." Pipelines 2005- Proceedings of the ASCE Conference on Optimizing Pipeline Design, Operations, and Maintenance in Today's Economy, Houston, Texas. August 21-24.

Grace, N. F., J. J. Roller, F. C. Navarre, R. B. Nacey, and W. Bonus. 2005. "Truck Load Distribution Behavior of the Bridge Street Bridge." PCI Journal, Vol. 50, No. 2: 76-89. March/April.

Bruce, R. N., H. G. Russell, and J. J. Roller. 2005. "Fatigue and Shear Behavior of HPC Bulb-Tee Girders." Final Report to Louisiana Transportation Research Center, Report No. FHWA/LA.05/395: 75. Baton Rouge, Louisiana. February.

Grace, N. F., J. J. Roller, F. C. Navarre, R. B. Nacey, and W. Bonus. 2004. "Load Testing a CFRP Reinforce Bridge." Concrete International, Vol. 26, No. 7. July.

Russell, H. G., R. N. Bruce, and J. J. Roller. 2003. "Shear Tests of High Performance Concrete Bulb-Tee Girders." Proceedings, 3rd International Symposium on High Performance Concrete, Orlando, Florida. October.

Roller, J. J., H. G. Russell, R. N. Bruce, and B. M. Hassett. 2003. "Effect of Curing Temperatures on High Strength Concrete Bridge Girders." PCI Journal, Vol. 48, No. 2: 72-78. March-April.

Russell, H. G., R. N. Bruce, and J. J. Roller. 2002. "Fatigue and Shear Behavior of HPC Bridge Girders." Proceedings, 6th International Symposium on Utilization of High Strength/High Performance Concrete, Vol. 1: 543-552. Leipzig, Germany, June.

Roller, J. J., R. N. Bruce, and H. G. Russell. 2002. "Shear Tests of High-Strength Concrete Girders." HPC Bridge Views, Issue No. 21. May/ June.

Russell, H. G., R. N. Bruce, and J. J. Roller. 2001. "Charenton Canal Bridge." Concrete Practice. Summer.

Bruce, R. N., H. G. Russell, and J. J. Roller. 2001. "Implementation of High Performance Concrete in Louisiana Bridges." Report to Louisiana Transportation Center, Research Report No. 310: 55. Baton Rouge, Louisiana. June.

Roller, J. J., R. N. Bruce, and H. G. Russell. 2001. "On-Going High Performance Concrete Research in Louisiana." PCI Journal, Vol. 46, No.1, January-February.

Roller, J. J., B. M. Hassett, and R. N. Bruce. 2000. "Evaluation of High-Performance Concrete in Louisiana's First HPC Bridge." Symposium Proceedings, PCI/FHWA/FIB International Symposium on High Performance Concrete: 707-718. Orlando, Florida. September.

Hassett, B. M., R. N. Bruce, H. G. Russell, and J. J. Roller. 1999. "Durability of a Prototype Bridge in High Performance Concrete." Proceedings Eighth International Expert Centrum Conference on Life Prediction and Aging Management of Concrete Structures: 325-330. Bratislava, Slovakia. July.

Russell, H. G., R. N. Bruce, and J. J. Roller. 1999. "Prototype Bridge in HPC - A Case Study."

**John J. Roller, P.E.,  
S.E.**

Symposium Proceedings, Fifth International Symposium on the Utilization of High-Strength/High Performance Concrete, Vol. 2: 891-900. Sandefjord, Norway. June.

Roller, J. J., B. T. Martin, H. G. Russell, and R. N. Bruce. 1997. "Long-Term Performance of High-Strength Prestressed Concrete Girders." Proceedings of Sixth International Expert Centrum Conference on Concrete Bridges, Strbske Pleso, Slovakia. September.

Roller, J. J., B. T. Martin, R. N. Bruce, and H. G. Russell. 1996. "Long Term Performance of High Strength Prestressed Concrete Girders." Proceedings of 15th Congress, International Association for Bridges and Structural Engineering, Copenhagen. June.

Roller, J. J. 1996. "Design Criteria for Insulating Concrete Form Wall Systems." Report to Portland Cement Association, PCA Serial No. 2073: 27. Skokie, Illinois.

Roller, J. J., H. G. Russell, R. N. Bruce, and B. T. Martin. 1995. "Long-Term Performance of Prestressed, Pretensioned High Strength Concrete Bridge Girders." PCI Journal, Vol. 40, No. 6: 48-59. November-December.

Bruce, R. N., H. G. Russell, J. J. Roller, and B. T. Martin. 1994. "Feasibility Evaluation of Utilizing High-Strength Concrete in Design and Construction of Highway Bridge Structures." Final Report to Louisiana Transportation Research Center, Report No. FHWA/LA- FHWA/ LA 94-282: 168. Baton Rouge, Louisiana. January.

Azizinamini, A., M. Stark, J. J. Roller, and S. K. Ghosh. 1993. "Bond Performance of Reinforcing Bars Embedded in High-Strength Concrete." ACI Structural Journal, Vol. 90, No. 5: 554-561. September-October.

Russell, H. G., J. J. Roller, and R. N. Bruce. 1993. "High Strength Concrete in Prestressed Bridge Girders." BIBM '93, Washington, DC. September 12-14.

Russell, H. G., J. J. Roller, R. N. Bruce, and B. T. Martin. 1993. "High-Strength Concrete for Highway Bridge Structures." Norwegian Concrete Association — Utilization of High Strength Concrete: Symposium Proceedings, Lillehammer, Norway. June 20-23.

Roller, J. J., B. T. Martin, H. C. Russell, and R. N. Bruce. 1993. "Performance of Prestressed High Strength Concrete Bridge Girders." PCI Journal, Vol. 38, No. 3: 34-45. May/June.

Schultz, D. M., J. J. Roller, T. L. Weinmann, and R. G. Oesterle. 1992. "Effects of Quality Control Practice on GFRC Durability - U.S.A. Experience." Conference Proceedings, Fourth RILEM International Symposium on Fibre Reinforced Cement and Concrete, Sheffield, England, July 20-23.

Ciolko, A. T., D. M. Schultz, W. J. Cichanski, and J. J. Roller. 1992. "Evaluation, Analysis, and Enhancement of Concrete Pressure Pipeline Reliability." Proceedings, International Conference on Pipeline Reliability, Calgary, Alberta, Canada. June 2-5.

Bruce, R. N., J. J. Roller, H. G. Russell. 1992. "High-Strength Prestressed Concrete for Highway Bridges." FIP Symposium '92, Budapest, Hungary. May 11-14.

Roller, J. J., A. T. Ciolko, and D. M. Schultz. 1991. "Quality Control is Critical in Concrete Pressure Pipe Choice." Power Engineering. November.

Roller, J. J., et al, (Ed). 1991. Fiber Reinforced Concrete, First Edition, 48. Portland Cement Association, Skokie, Illinois.

Hanson, N. W., J. J. Roller, J. I. Daniel, and T. L. Weinmann. 1990. "Manufacture and Installation of GFRC Facades." Thin-Section Fiber Reinforced Concrete and Ferrocement Products, SP-124: 183-213. American Concrete Institute, Detroit, Michigan.

- Hanson, N. W., D. M. Schultz, J. J. Roller, and H. T. Tang. 1990. "Test of Wall/Basemat Junction Region of a Prestressed Concrete Containmentment." *Res Mechanica, The International Journal of Structural Mechanics and Materials Science*, Vol. 29, No. 4: 329-343.
- Roller, J. J. and H. G. Russell. 1990. "Shear Strength of High Strength Concrete Beams with Web Reinforcement." *ACI Structural Journal*, Vol. 87, No. 2: 191-198. March-April.
- Schultz, D. M., R. G. Oesterle, and J. J. Roller. 1990. "In-Situ Evaluation of 30-in. (762-mm) Diameter Prestressed Concrete Lined- Cylinder Pipeline." *Proceedings of ASCE International Conference on Pipeline Design and Installation, Las Vegas, Nevada*. March.
- Daniel, J. I., J. J. Roller, T. L. Weinmann, R. G. Oesterle, and D. M. Schultz. 1989. "Quality Control and Quality Assurance for the Manufacture and Installation of GFRC Facades." *Proceedings of the 7th Biennial Congress of the BRCA, Maastricht, Netherlands*. September 26-28.
- Roller, J. J., A. T. Ciolko, and S. H. Gebler. 1989. "Deterioration of Concrete Pressure Pipe: A Consultant's Perspective." *Waterworld News, American Water Works Association*, Vol. 5, No. 4: 23-25. July/August.
- Hanson, N. W., J. J. Roller, D. M. Schultz, and A. Azizinamini. 1989. *Concrete Containmentment Tests, Phase 3: "Structural Elements with Penetration Sleeves."* Final Report to the Electric Power Research Institute, Document EPRI NP-6259-SD: 261. Palo Alto, California. March.
- Hanson, N. W., D. M. Schultz, J. J. Roller, and H. T. Tang. 1987. "Results of Large-Scale Test of a Discontinuity Region in a Prestressed Concrete Containmentment." *Nuclear Engineering and Design, Topical Issue of the Third Workshop on Containmentment Integrity*: 321-328.
- Hanson, N. W., J. J. Roller, D. M. Schultz, J. T. Julien, and T. L. Weinmann. 1987. "Concrete Containmentment Tests, Phase 2: Structural Elements with Liner Plates." Report to the Electric Power Research Institute, Document EPRI NP-4867M: 120. Palo Alto, California. August.
- Hanson, N. W., J. J. Roller, D. M. Schultz, J. T. Julien, and T. L. Weinmann. 1987. "Concrete Containmentment Tests, Phase 2: Structural Elements with Liner Plates." Proprietary Report to the Electric Power Research Institute, Document EPRI NP-48657P, 350. Palo Alto, California, August.
- Hanson, N. W., D. M. Schultz, J. J. Roller, and H. T. Tang. 1987. "Tests of Wall/Basemat Junction Region of a Prestressed Concrete Containmentment." *Proceedings of SMiRT-9, Lausanne, Switzerland*. August 17-21.
- Hanson, N. W., D. M. Schultz, J. J. Roller, and H. T. Tang. 1987. "Biaxial Wall Element Tests of Reinforced and Prestressed Concrete Containmentments with Inward Radial Load on Penetration." *Proceedings of SMiRT-9, Lausanne, Switzerland*. August 17-21.
- Hanson, N. W., D. M. Schultz, J. J. Roller, A. Azizinamini, and H. T. Tang. 1987. "Testing of Large-Scale Concrete Containmentment Structural Elements." *Nuclear Engineering and Design*, Vol. 100, No. 2: 129-149. March 1.
- Hanson, N. W., D. M. Schultz, and J. J. Roller. 1986. "Results of Large-Scale Test of a Discontinuity Region in a Prestressed Concrete Containmentment." *Proceedings of the Third Workshop on Containmentment Integrity, NUREG/CP-0076, SAND 86-0618, Washington, DC*. May 21-23.
- Hanson, N. W., J. T. Julien, D. M. Schultz, and J. J. Roller. 1985. "Leak-Rate Tests of Full-Scale Elements of Prestressed Concrete Secondary Containmentments." *Transactions of the 8th International Conference on Structural Mechanics in Reactor Technology*. Vol. J: 21-24. Elsevier, New York.



**John J. Roller, P.E.,  
S.E.**

## **Conferences and Seminars**

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*Proposed Simplified Changes to ANSI/AWWA C304 Standard for Design of Prestressed Concrete Cylinder Pipe, Pipelines 2015 Conference, Baltimore, MD, August 23-26, 2015.*

*The Importance of Condition Assessment in the Realm of Asset Management, Watercon 2015, Springfield, IL, March 23, 2015..*

*Reinforced Concrete Pipe Technology, Design & Operation of Sustainable RCP Sewers Program, Willowbrook, IL, March 5, 2015.*

*Evaluation and Asset Management Considerations for Reinforced Concrete Tank Structures, BP, Naperville, IL, April 28, 2014.*

*Stress Testing of a New North American Passenger Locomotive Truck Frame in Accordance with International Union of Railways (UIC) Code, Joint Rail Conference (JRC) 2013, Knoxville, TN, April 15-17, 2013.*

*Assessment of Buildings Subject to High Winds, State Farm Insurance, Bloomington, IL, July 25, 2011.*

*Research for Spicy HPC in Louisiana, ACI 2009 Fall Convention, New Orleans, LA, November 8-12, 2009.*

*Implementation of HPC in Louisiana Bridge Structures, ACI 1005 Fall Convention, Kansas City, MO, November 9, 2005.*

*Instrumentation and Structural Monitoring of the Charenton Canal Bridge, Louisiana Transportation Engineering Conference, Baton Rouge, LA, February 19, 2002.*

## **Awards**

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ASCE T.Y. Lin Award (2012), "Evaluation of Prestress Losses in High-Strength Concrete Bulb Tee Girders for the Rigolets Pass Bridge," PCI Journal, Winter, 2011.

ASCE T.Y. Lin Award (2008), "Fatigue Endurance of High-Strength Prestressed Concrete Bulb Tee Girders," PCI Journal, May-June, 2007.

ACI Leonard C. Wason Award for Most Meritorious Paper (1991), "Shear Strength of High-Strength Concrete Beams with Web Reinforcement," ACI Structural Journal, 1990.

## **Prior Experience**

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CTLGroup, Skokie, Illinois

Principal Structural Engineer, Structural & Architectural Evaluation Group, 2000

Senior Engineer, Structural & Transportation Laboratory Group, 1991 – 2000

Engineer, Structural & Transportation Laboratory Group, 1987 – 1991

Portland Cement Association, Skokie, Illinois

Associate Engineer, 1985-1987

Assistant Engineer, 1984-1985

Project Assistant, 1984

Sargent & Lundy, Chicago, Illinois

Engineering Analyst, 1984