



## Construction Materials Consultants, Inc.

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### DIPAYAN JANA

President, Petrographer,  
Materials Scientist, & Professional Geologist



#### EDUCATION

- Univ. of Calcutta, India; Bachelor of Science (B.Sc.) - Geological Sciences (Major in Petrology/Petrography), 1987
- Univ. of Calcutta, India; Master of Science (M. Sc.) - Geological Science (Major in Petrology, Mineralogy, Geochemistry), 1990
- Univ. of Illinois, Chicago, USA; Master of Science (M.S.) - Geological Sciences (Major in Petrology/Geochemistry), 1993
- Columbia University, USA; Ph.D. Program - Geological Sciences (Major in Experimental Petrology/Mineralogy), 1993-1996
- Rochville University, USA, Ph.D. – Civil Engineering, 2007.

#### REGISTRATION

- Professional Geologist, Washington & Texas.

#### SPECIALTY

- Characterization, quality evaluation, failure investigation, testing, and research of construction materials including:
- Clinker, cement, aggregate, concrete, masonry, mortar, stone, plaster, stucco, and tile products
- Consulting, Expert Testimony, Litigation support
- Performance, durability, historic preservation, and repair
- Innovative research on new materials and methods

#### METHODOLOGY

- Petrographic Examinations
- Electron Microscopy (SEM)
- X-ray Diffraction (XRD)
- Chemical Analysis
- Physical Testing

#### EXPERIENCE

- Senior Petrographer, The Erlin Company, 1999-2003
- Petrographer/Materials Scientist/Assistant Laboratory Manager, Testwell Laboratories, Inc., 1999
- Petrographer / Materials Scientist/ Laboratory Manager, Cole Consulting Corporation, 1996-1999
- Teaching Assistant - Petrography, Petrology, Mineralogy, Columbia University, 1993-1996

- Teaching Assistant - Petrography, Petrology, Mineralogy; University Of Illinois at Chicago, 1990-1993

#### PROFESSIONAL AFFILIATIONS

- American Society for Testing and Materials (ASTM)
- American Concrete Institute (ACI)
- American Society of Civil Engineers (ASCE)
- International Concrete Repair Institute (ICRI)
- American Ceramic Society (ACE)
- Society of Concrete Petrographers (SCP)
- Geological Society of America (GSA)
- Geochemical Society of America
- Mineralogical Society of America (MSA)
- American Geophysical Union (AGU)

#### TECHNICAL COMMITTEES

- ACI Committee 116 – Cement & Concrete Terminology
- ACI Committee 201 – Durability of Concrete
- ACI Committee 221 – Aggregates
- ACI Committee 302 – Construction of Concrete Floors
- ASTM Committee C09 – Concrete and Concrete Aggregates
- ASTM Committee C09.65 – Petrography

#### REPRESENTATIVE PROJECTS

- Concrete projects involving airports, residential & commercial buildings, parking garages, sidewalks, driveways, warehouse slabs, historic structures, pipelines, etc.
- Concrete Surface Deterioration (Scaling, Spalling, Cracking, Cracking, Popout, Mortar lift-off, Discoloration, Delamination, Blistering, Dusting, Efflorescence, Abrasion, Impact)
- Concrete Quality Evaluation (Mix design conformance, cement type, fly ash, slag, low strength, air content)
- Chemical attacks on concrete (Acid, alkali, sulfate, chloride, seawater attacks in concrete; corrosion of steel in concrete)
- Physical attacks on concrete (deterioration due to exposure to cyclic freezing and thawing and high temperatures); early freezing of concrete or mortar
- Clinker and cement quality evaluation, composition, and classification; cement conformance to ASTM C 150
- Aggregate evaluation, petrography, reactivity, & soundness
- Masonry evaluation and failure investigation
- Evaluation of mortar in historic restoration
- Stone evaluation and failure investigation
- Investigation of tile distress & floor covering failures

#### PUBLICATIONS

More than thirty (30) publications in peer-reviewed books, proceedings, and journals on application of petrography in concrete, masonry, stone, and natural rocks.



## PUBLICATIONS OF DIPAYAN JANA

1. Jana, D., Swimming Pool Plaster Deterioration – Overview and Case Studies - Proceedings of the 30<sup>th</sup> Conference on Cement Microscopy, ICMA, Reno, Nevada, 2008.
2. Jana, D., Concrete Deterioration from Pyrite Staining, Sewer Gases, and Chimney Flue Gases – Case Studies Showing Microstructural Similarities - Proceedings of the 30<sup>th</sup> Conference on Cement Microscopy, ICMA, Reno, Nevada, 2008.
3. Jana, D., DEF & ASR in Concrete – A Systematic Approach from Petrography - Proceedings of the 30<sup>th</sup> Conference on Cement Microscopy, ICMA, Reno, Nevada, 2008.
4. Jana, D., The Great Pyramid Debate, Proceedings of the 29<sup>th</sup> Conference on Cement Microscopy, ICMA, Quebec City, Canada, 2007, pp. 207-266.
5. Jana, D., Delamination – A State-of-the-Art Review, Proceedings of the 29<sup>th</sup> Conference on Cement Microscopy, ICMA, Quebec City, Canada, 2007, pp. 135-167.
6. Jana, D., Concrete Scaling – A Critical Review, Proceedings of the 29<sup>th</sup> Conference on Cement Microscopy, ICMA, Quebec City, Canada, 2007, pp. 91-130.
7. Jana, D., A Round Robin Test on Measurements of Air Void Parameters in Hardened Concrete by Various Automated Image Analyses and ASTM C 457 Methods, Proceedings of the 29<sup>th</sup> Conference on Cement Microscopy, ICMA, Quebec City, Canada, 2007, pp. 34-69.
8. Jana, D., A New Look to an Old Pozzolan: Clinoptilolite – A Promising Pozzolan in Concrete, Proceedings of the 29<sup>th</sup> Conference on Cement Microscopy, ICMA, Quebec City, Canada, 2007, pp. 168-206.
9. Jana, D., and Erlin, B., Carbonation as an Indicator of Crack Age, Concrete International, May 2007, pp. 61-64.
10. Jana, D., Application of Petrography in the Concrete Repair Industry, Concrete Solutions 2006, 2<sup>nd</sup> International Conference on Concrete Repair, St-Malo, Brittany, France, BRE Publications, 2006.
11. Jana, D., Delayed Setting of Concrete – A Petrographic and Chemical Investigation, Proceedings of the 28<sup>th</sup> Conference on Cement Microscopy, ICMA, Denver, Colorado, 2006, pp. 141-149.
12. Jana, D., Sample Preparation Techniques in Petrographic Examinations of Construction Materials: A State-of-the-art Review, Proceedings of the 28<sup>th</sup> Conference on Cement Microscopy, ICMA, Denver, Colorado, 2006, pp. 23-70.
13. Jana, D., Petrography – A Powerful Tool for Quality Assurance and Failure Investigation of Construction Materials, International Seminar on Non-Destructive Testing (NDT), India Chapter of American Concrete Institute and ACI (USA), 2006, pp. 117-131.
14. Jana, D., Erlin, B., and Pistilli, M.F., A Closer Look at Entrained Air in Concrete, Concrete International, July 2005, pp. 61-64.
15. Jana, D., and Lewis, R. A., Acid Attack in a Concrete Sewer Pipe – A Petrographic and Chemical Investigation, Proceedings of the 27<sup>th</sup> Conference Cement Microscopy, ICMA, Victoria, Canada, 2005.



16. Jana, D., and Erlin, B., Delamination: A sometime curse of entrained air, Concrete Construction, January 2005, pp. 101-107.
17. Jana, D., Petrography and Concrete Repair – A Link is Needed, Concrete International, Jan 2005, pp. 37-39.
18. Jana, D., Application of Petrography in Restoration of Historic Structures, 10<sup>th</sup> Euroseminar on Microscopy Applied to Building Materials, Scotland, 2005.
19. Jana, D., Concrete Petrography – Past, Present, and Future, 10<sup>th</sup> Euroseminar on Microscopy Applied to Building Materials, Scotland, 2005.
20. Jana, D., Techniques used in petrographic examinations of construction materials – A state-of-the-art review, Abstract for Symposium on Petrographic Techniques for examining hydraulic cements and concretes, American Society for Testing and Materials, Dec. 2004.
21. Jana, D., Concrete, Construction, or Salt – Which Causes Scaling? Part II: Importance of finishing practices, Concrete International, Dec. 2004, pp. 51-56.
22. Jana, D., Concrete, Construction, or Salt – Which Causes Scaling? Part I: Importance of air-void system in concrete, Concrete International, Nov. 2004, pp. 31-38.
23. Jana, D., and Lewis, Richard. Acid attack on PCCP mortar coating, In "Pipeline Engineering and Construction – What's on the Horizon?" John J. Galleher, Jr., and Michael T. Stiff (eds) ASCE Publication, 2004.
24. Erlin, B., and Jana, D., So, What about chloride chemicals applied to concrete surfaces too soon? Some truths and fantasy about chloride de-icing chemicals, Concrete Construction, September 2004, pp. 35-40.
25. Erlin, B., and Jana, D., Forces of Hydration that can cause havoc in concrete - May the force not be with you, Concrete International, Vol. 25, No. II, Nov. 2003, pp. 51-57.
26. Erlin, B. and Jana, D., "Portland Cement Hydration Commentary", Concrete International, Vol. 25, No. I, January 2003.
27. Jana, D. and Erlin, B., "Scaling Revisited Commentary", Concrete International, Vol. 23, No. 9, September 2001.
28. Jana, D. (with Sarkar, S.L., and Aimin, Xu) "Scanning Electron Microscopy - X-ray Microanalysis of Concretes", Chapter In "Concrete Technology Today", Ramachandran, V.S., and Beaudoin, J.J (eds), Noyes Publication, NJ, 2001, pp. 231-274.
29. Jana, D., "Corrosion of Reinforcing Steel in Concrete: Time to go back to the basics", Letter, Civil Engineering News, October, 1998.
30. Jana, D., "Petrography: A Powerful Tool For Solving Common Concrete Problems", Civil Engineering NEWS, March, 40-44 pp, 1997.
31. Jana, D., and Cole, A. A., "Microscopy: A Practical Solution to Concrete Problems", Bulletin of Concrete Industry Board, Vol. 33, No 3, pp 18-22, 1997.
32. Jana, D., and Walker, D., "The Impact of Carbon on Element Distribution during Core Formation", Columbia University, Geochim. et. Cosmochim Acta, Vol. 61, No 13, pp. 2759-2763, Geochemical Society of America, 1997.



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33. Jana, D., and Walker, D., "The Influence of Silicate Melt Composition on Distribution of Siderophile elements among Metal and Silicate Liquids", Columbia University, Earth and Planetary Science Letters, Vol. 150, pp. 463-472, 1997.
34. Jana, D., and Walker, D., "The Influence of Sulfur on Partitioning of Siderophile Elements", *Geochim. et. Cosmochim. Acta.*, Columbia University, Geochemical Society of America, Vol. 61, 1997.
35. Jana, D., and Walker, D., "Core formation in the presence of various C-H-O volatile species", Columbia University, *Geochim. et. Cosmochim. Acta.*, Geochemical Society of America, Vol 63, 1999.
36. Jana, D., and Walker, D., "D(metal/silicate) depends strongly and complexly on S(sulfur)", Columbia University, 5th Goldschmidt Conference, Abstract with Programs, Organized by the Geochemical Society of America, International Geochemical Conference, May 1995.
37. Jana, D. and Walker, D., "The Impact of Carbon on Element Distribution during Core Formation", Columbia University, Abstract, Fall Meeting, American Geophysical Union, 1996.
38. Jana, D., and Walker, D., "The Influence of Silicate Melt Composition on Distribution of Siderophile elements among Metal and Silicate Liquids", Columbia University, 7th Goldschmidt Conference, Abstract with Programs, Organized by the Geochemical Society of America, International Geochemical Conference, June 1997.
39. Jana, D. and Walker, D., "Geochemical consequences of core formation in the presence of some volatiles", Columbia University, 7th Goldschmidt Conference, Abstract with Programs, Organized by the Geochemical Society of America, International Geochemical Conference, June 1997.
40. Jana, D., "Petrology and Geochemistry of Deccan Flood Basalts around Simrol and Chorel area", Central India, *M.Sc. Thesis*, University of Calcutta, 1990.
41. Jana, D., "Genesis of high-K refractory magma, Panay, Philippines", *M.S. Thesis*, University of Illinois at Chicago, 1993.
42. Jana, D., "Deccan Flood Basalts - Fossil plume head?" *Indian Journal of Earth Sciences*, Vol. 106, 21-42 pp, 1990.