

Curriculum Vitae

PERSONAL DETAILS:

Name: Peter John WALKER

Current Post: Professor of Innovative Construction Materials, BRE
Centre for Innovative Construction Materials, University
of Bath

Previous posts:

- Lecturer, Senior Lecturer, University of Bath, Bath
- Lecturer, Div. Environmental Engng, University of New England, Armidale, Australia.
- Lecturer, Department of Civil Engineering, University of Zimbabwe, Harare, Zimbabwe.

Tertiary Qualifications:

BSc (Honours) Civil Engineering, Sheffield City Polytechnic, 1983.

Ph.D., Civil Engineering, University of Edinburgh, 1988.

Membership of Professional Bodies:

- Chartered Engineer, Corporate Member of the Institution of Engineers, Australia, 1995 - present.
- Member of Association of Environmentally Conscious Builders (AECB), 2002 – present.

RESEARCH GRANTS (since 2001):

- 2002 Timber-limecrete composite floors; Institution of Structural Engineers, research student award, £1,000.
- 2002 Developing rammed earth walling for UK housing construction; DTi Partners In Innovation (£90,940 + £120,850 in-kind support from Industrial collaborators)
- 2002 Developing rational design guidance for traditional oak carpentry joints; EPSRC CASE Conversion Award, Buro Happold Ltd (£13,200).
- 2005 Developing Lime-Hemp Composites; Knowledge Transfer Programme in collaboration with Limetec Ltd (£88,900)
- 2005 Novel low energy high performance mortars for the construction industry; EPSRC + Industry support (£107,500 + £56,000 in-kind support). Co-investigator Dr Dina D'Ayala. Lead partner in collaboration with Universities

of Bradford and Bristol (total award £360k).

- 2005 An experimental and analytical study of dry-stone retaining walls; EPSRC + Industry support (£273,916 + £27,500 in-kind support). Co-investigators Mr Paul McCombie and Dr Andrew Heath. Lead partner in collaboration with University of Southampton (total award £410k).
- 2007 ModCell: Prefabricated straw bale panels. DTi Technology Programme, in collaboration with White Design, Integral Structural Design, Agrifibre Technologies, Eurban, CWCT, Lime Technology Ltd. £150k + £140k industry support.
- 2007 Development of unfired clay brick masonry. DTi Technology Programme, in collaboration with Istock, Hanson, arc Architects, Errol brick Co., Lime Technology Ltd, BDA. £180k + £120k industry support.

Publications to date:

Books

1. **The Australian Earth Building Handbook**, published by Standards Australia, August 2002, 151 pages, ISBN 0-7337-4000-6.
2. **Rammed earth: design and construction guidelines**, with Keable, R, Martin, J and Maniatidis, V, February 2005, published BRE Bookshop, 146 pages, ISBN 1 86081 734 3.

Journals

1. **Compressive strength of Brickwork on edge under axial and eccentric loading**, with B P Sinha, in *Masonry International*, **6**, pp 1 - 8, 1985.
2. **Load tests to failure of model brickwork arches**, with C Melbourne, in *Model Analysis as a design tool* - Institution of Structural Engineers Informal Study Group Newsletter, **42**, 1988.
3. **Structural Instability at Great Zimbabwe National Monument**, with M Mansell and J Dickens, in *Zimbabwe Science News*, **24**, 10/12, pp 87 - 90, 1990.
4. **Conservation of Great Zimbabwe National Monument**, with J Dickens, in *Zimbabwe Science News*, 26, 7/9, pp 51 - 56, 1992.
5. **The Architectural Development of Great Zimbabwe**, in *Azania*, **XXVIII**, pp 87 - 102, 1993
6. **The assessment of a non-destructive technique for dating stone walls**, with J Dickens, in *Zimbabwean Prehistory*, **21**, pp 33-37, 1994.
7. **Geological Influences on the Location and Construction of Great Zimbabwe**, with T G Blenkinsop, in *Transactions of the Zimbabwe Scientific Association*, **68**, pp 25 - 31, 1994.
8. **Stability of Medieval Dry Stone walls in Zimbabwe**, with J Dickens, in *Geotechnique*, **45**, 1, pp 141 - 147, 1995.

9. **An Engineering Critique of Great Zimbabwe**, in *Journal of Applied Science in Southern Africa*, **1**, 1, pp 73 - 81, 1995.
10. **Moment-Curvature Relations for Ferrocement Beams**, in *Journal of Ferrocement*, **25**, 4, pp 347 - 359, 1995.
11. **Strength, Durability and Shrinkage Characteristics of Cement Stabilised Soil Blocks**, in *Cement & Concrete Composites*, **17**, 4, pp 301 - 310, 1995.
12. **Use of Distinct Element Model to simulate behaviour of dry-stone walls**, with J G Dickens, in *Structural Engineering Review*, **8**, 2/3, pp 187-199, 1996.
13. **Specifications for Stabilised Pressed Earth Blocks**, in *Masonry International*, **10**, 1, pp 1 -6, 1996.
14. **Shear reinforcement for brickwork beams using ferrocement**, with M. Damo, in *Journal of Ferrocement*, **27**, 1, pp 33 - 45, 1997.
15. **Properties of some cement stabilised compressed earth blocks and mortars**, with T. Stace, in *Materials & Structures*, **30**, November, pp 545-551, 1997.
16. **Experimental study of reinforced masonry using slop-moulded bricks**, in *The Masonry Society Journal*, **15**, 2, pp 43-52, 1997.
17. **Bond characteristics of earth block masonry**, in *ASCE Journal of Materials in Civil Engineering*, **11**, 3, pp 249-256, 1999.
18. **Pullout tests on deformed and plain rebars in cement stabilized rammed earth**, with S. Dobson, in *ASCE Journal of Materials in Civil Engineering*, **13**, 4, pp 291-297, 2001.
19. **Building houses with local materials: a means to drastically reduce the environmental impact of construction**, with J.C.Morel, A. Mesbah, and M.Oggero, in *Building & Environment*, **36**, pp 1119-1126, 2001.
20. **Survey of building sands in Australia**, with R.Glencross-Grant, in *Construction and Building Materials*, **17**(4), pp 231-240, 2003.
21. **Development of a direct tensile test for compacted earth blocks reinforced with natural fibres**, with A.Mesbah, J.C.Morel & K.Ghavami, in *ASCE Journal of Materials in Civil Engineering*, **16**, 1, pp 95-98, 2004.
22. **Strength and erosion characteristics of earth blocks and earth block masonry**, in *ASCE Journal of Materials in Civil Engineering*, **16**, 5, pp 497-506, 2004.
23. **Rigid block distinct element modelling of dry-stone retaining walls in plane strain**, with M. Claxton, R. Hart & P.McCombie, in *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, **131**, 3, pp 381-389, 2005.
24. **Experimental performance of mortice and tenon connections in green oak**, with J. Shanks, in *The Structural Engineer*, Vol. 83, No. 17, pp 40-45, 6th September 2005.
25. **Compressive strength testing of compressed earth blocks**, with J.C.Morel and A. Pkla, in *Construction and Building Materials*, accepted for publication.
26. **The use of thermogravimetric analysis to measure different concentrations of lime in non-hydraulic lime mortars**, with R.M.H. Lawrence, T.J. Mays and D.D'Ayala, in *Journal of Thermographic Analysis and Calorimetry*, Vol. 85, 2, 377-382, 2006.

27. **Study of round-wood timber-limecrete composite panels**, with T. Hodsdon, in *IABSE Structural Engineering International*, Vol. 16, 3, 245-251, August 2006.
28. **Lateral strength of green oak frames: physical testing and modelling**, with J. Shanks, in *The Structural Engineer*, Vol. 84, No. 17, pp 34-38, 5th September 2006.
29. **Compressive strength testing of compressed earth blocks**, with J.C.Morel and A. Pkla, in *Construction and Building Materials*, Vol. 21, 2, 303-309, February 2007.
30. **Plane strain numerical model for drystone retaining walls**, with P.McCombie and M.Claxton, in *ICE Proceedings, Journal of Geotechnical Engineering*, April 2007.
31. **Testing and analysis of a traditional oak frame**, with T.Hill, J.Shanks and J.Stott, in *ICE Proceedings, Journal of Buildings and Structures*, February 2007.

Conference Proceedings

1. **Behaviour of Partially Prestressed Brickwork Beams**, with B P Sinha, in *Proc. 7th Int. Brick Masonry Conf.*, Melbourne, Australia, 1985.
2. **A comparative study of reinforced, fully and partially prestressed brickwork beams**, with B P Sinha, in *Proc. CIB 86 Symposium*, Washington D C, 1986.
3. **Load tests to collapse of model brickwork masonry arches**, with C Melbourne, in *Proc. 8th Int. Brick and Block Masonry Conf.*, Dublin, Eire, 1988.
4. **The performance of masonry arch bridges with ring separation**, with A N Qazzaz and C Melbourne, in *The Life of Structures - Institution of Structural Engineers/BRE Seminar*, Brighton, 1989.
5. **An investigation into the failure of dry-stone structures at Great Zimbabwe National Monument**, with J Dickens and M Mansell, in *Proc. 3rd Int. Seminar on Structural Masonry for Developing Countries*, Mauritius, 1990.
6. **The monitoring of Structural Movements and the Assessment of Instability in Dry-Stone Walls at Great Zimbabwe**, with J Dickens and M Mansell, in *Structural Repair and Maintenance of Historical Buildings II, Proc. 2nd Int. Conf.*, Seville, Spain, 1991.
7. **A study of the structural behaviour of dry-stone walls at Great Zimbabwe**, with J Dickens, in *Proc. 9th Int. Brick Masonry Conf.*, Berlin, Germany, 1991.
8. **A Review of Dry-stone wall construction**, with J Dickens, in *Proc. 4th Int. Seminar on Structural Masonry for Developing Countries*, Madras, Dec. 1992.
9. **Intervention Techniques in the Conservation of Dry-stone structures**, with J Dickens, in *Proc. Int. Congress on the Conservation of Stone*, RILEM, Paris, July 1993.
10. **Analysis of Movement in Dry-stone walls using a Distinct Element Computer Model**, with J Dickens and M Mansell, in *Civil-Comp 93, Fifth Int. Conf. on Civil and Structural Engineering Computing*, Edinburgh, September 1993.
11. **Properties of Stabilised Soil Blocks**, in *Proc. 5th International Seminar on Structural Masonry for Developing Countries*, Santa Catarina, Brazil, August 1994.

12. **Correlation of Structural Movements with Joint Characteristics on Dry-Stone Walls**, with J G Dickens, in *Structural Repair and Maintenance of Historical Buildings IV, Vol. 1: Architectural Studies, Materials and Analysis*. Proceedings of the 4th International Conference, Chania, Crete, 22 - 24 May 1995, Brebbia & Leftheris (Ed.). ISBN 1-85312-425-7. Computational Mechanics, Southampton, pp 357 - 364, 1995.
13. **Performance of stabilised soil block masonry under uniform and concentrated compression loading**, in *Proceedings of the British Masonry Society*, No. 7, H.W.H. West (Ed), pp 49 - 54, London, October, 1995.
14. **Dry-stone walls**, with J Dickens, in *Proceedings of the British Masonry Society*, No. 7, H.W.H. West (Ed), pp 127 - 129, London, October, 1995.
15. **On the suitability of low grade bricks for beam and lintel construction**, in *Proceedings 4th Australasian Masonry Conference*, pp 55 - 64, Sydney, November, 1995.
16. **Standard performance criteria for stabilised soil blocks**, in *Proceedings 4th Australasian Masonry Conference*, pp 179 - 188, Sydney, November, 1995.
17. **Characteristics of pressed earth block in compression**, in *Proceedings of the 11th International Brick and Block Masonry Conference*, pp 1 - 10, Shanghai, October 1997.
18. **Flexural bond strength of pressed cement earth block masonry**, in *Proceedings of the 11th International Brick and Block Masonry Conference*, pp 11 - 20, Shanghai, October 1997.
19. **A survey of building sands in northern New South Wales**, in *Proceedings of the 5th Australasian Masonry Conference*, pp 397-406, Gladstone, Queensland, July, 1998.
20. **Erosion testing of compressed earth blocks**, in *Proceedings of the Fifth International Masonry Conference*, pp 264-268, London, October, 1998.
21. **Review and experimental comparison of erosion tests for earth blocks**, in *Proceedings 8th International conference on the study and conservation of earthen architecture*, pp 176-181, Torquay, May, 2000.
22. **Outline of dry-stone retaining wall construction in Britain and France**, with J.C.Morel and B.Villemus, in *Proceedings 12th International Brick and Block Masonry Conference*, pp 1909-1927, Madrid, June, 2000.
23. **Experimental studies on the compressive strength testing of compressed earth blocks**, in *Proceedings 12th International Brick and Block Masonry Conference*, pp 1929, Madrid, June, 2000.
24. **Case for Compressed Earth Block Construction**, with B.V.Venkatarama Reddy, J.C.Morel and A.Mesbah, in *Proceedings 6th International Seminar on Structural Masonry for Developing Countries*, 27-35, Bangalore, India, October, 2000.
25. **Strength and durability testing of earth blocks**, in *Proceedings 6th International Seminar on Structural Masonry for Developing Countries*, 110-118, Bangalore, India, October, 2000.
26. **An example of houses built with local materials to reduce the environmental impact of construction**, with J.C.Morel, A.Mesbah and M.Oggero, in *Proceedings of the International Conference on Sustainable*

- construction into the next millennium: environmentally friendly and innovative cement based materials*, 356-364, João Pessoa, Brazil, November, 2000.
27. **Distinct Element Modelling of Masonry Retaining Walls**, with R.Hart and M.Claxton, in Proceedings 6th Australasian Masonry Conference, 185-194, Adelaide, Australia, July 2001.
 28. **A Non-Conventional Building Materials Course for Undergraduate Engineers**, in Proceedings 3rd International Conference on Non-Conventional Materials & Technologies, 12-13 March 2002, Hanoi, 260-264.
 29. **Reinforced Composite Rammed Earth in Flexure**, with R.Ayala and S.Dobson, in Proceedings 3rd International Conference on Non-Conventional Materials & Technologies, 12-13 March 2002, Hanoi, 439-445.
 30. **The properties of a soil from Southwest England and its influence on the behaviour of rammed earth**, with D.Clark, in 9th *International Conference on the study and conservation of earthen architecture*, Yazd, Iran, Nov.-Dec. 2003, 93-101
 31. **UK National Guidelines for Rammed Earth**, with V.Maniatidis, in 9th *International Conference on the study and conservation of earthen architecture*, Yazd, Iran, Nov.-Dec. 2003, 377-387.
 32. **Durability of stabilised mud block buildings in Southern India**, with Reddy, BVV and Williams, T., in 9th *International Conference on the study and conservation of earthen architecture*, Yazd, Iran, Nov.-Dec. 2003, 492-503.
 33. **Review of structural design procedures for earth buildings**, in 9th *International Conference on the study and conservation of earthen architecture*, Yazd, Iran, Nov.-Dec. 2003, 616-629.
 34. **Testing of traditional connections in green oak carpentry**, with Shanks, J, in Proceedings of the 8th *World Conference on Timber Engineering*, Lahti, Finland, June 2004, 183-186.
 35. **Current developments in low carbon building materials in the UK**, in Proceedings of *Brasil NOCMAT 2004*, Oct.-Nov. 2004. Invited key-note presentation.
 36. **Stabilised Mud Blocks : Problems, Prospects**, with B. V. Venkatarama Reddy, in *Proceedings of Earthbuild 2005*, Sydney, January 2005.
 37. **Rammed Earth In The UK - Recent Developments and Future Prospects**, in Proceedings *Modern Earth Building 2005*, Berlin. November.

Supervision of Postgraduate Research Students

To date I have supervised nine PhD students.

External Examining

External PhD examiner:

- University of Warwick (2001)
- University of Technology, Sydney, Australia (2001)

- University of Plymouth (2003)
- Sheffield Hallam University (2004);
- Cardiff University (2005)

External MPhil examiner:

- University of Cambridge (2004)

ACADEMIC MANAGEMENT AND ADMINISTRATION DUTIES (University of Bath)

Admissions Tutor (September 1998-August 2001; March 2002-January 2003)

Board of Studies for Division of Lifelong Learning (September 2001-August 2004)

Examinations Officer (October 2001-September 2002)

Student Exchange Liaison Officer (September 2002-present)

Head of Civil Engineering Group (February 2005-Nov. 2006)

Board of Studies, Faculty of Engineering and Design (May 2005-August 2006)

Director of Studies (September 2005-August 2006)

Director, BRE Centre in Innovative Construction Materials (July 2006 – present)