

# Curriculum Vitae

Miguel Fernández Ruiz

## 1 Personal Data

- Place and date of birth: Madrid, May 4, 1977
- Nationality: Spanish
- Telephone Number: +41 21 693 2889
- E-mail: miguel.fernandezruiz@epfl.ch

## 2 Academics

- École Polytechnique Fédérale de Lausanne (Switzerland) since September 2004. Currently, Senior Scientist and Lecturer (70 %).
- Accredited since 2015 as Adjunct Professor in Spain by ANECA (Spanish Agency for Evaluation of Academic Quality).
- Universitat Politècnica de Catalunya (Spain). Research Fellow (invited professor and researcher) during the academic year 2015–2016.
- Universidad Politécnica de Madrid (Spain). PhD in Civil Engineering (2001–2004) awarded cum laude. Thesis on the structural effects of the time-delayed strains of steel and concrete.
- Universidad Politécnica de Madrid (Spain). Civil Engineering studies(1995–2001) awarded cum laude. First national award in the studies of civil engineering.

## 3 Professional Experience

- Partner of “Muttoni & Fernández, ingénieurs conseils SA”, Ecublens (Switzerland), since 2007
- Structural engineer, MC-2, Madrid (Spain), 2002–2004
- Structural engineer, PROES, Madrid (Spain), 2001–2002

## 4 Languages

- Spanish: Mother tongue
- English, French: Very good level, written and oral
- German: Good level written and oral

## 5 Services and Professional Associations

- Member of *fib* (fédération internationale du béton) Switzerland
- Member of the American Concrete Institute (ACI), USA
- Member of ACHE (Asociación Científico-Técnica del Hormigón Estructural), Spain
- Member of Colegio de Ingenieros de Caminos, Canales y Puertos (Spanish Institution of Civil Engineers), Spain
- Member of WP 2.2.3 of *fib* (fédération internationale du béton), Lausanne, Switzerland
- Member of the scientific comitee of journal “Hormigón y Acero”, edited by ACHE (Asociación Científico-Técnica del Hormigón Estructural), Spain
- Member of WP SIA 262-fire (Swiss Code for Structural Concrete - Fire) of SIA (Swiss Society of Enigneers and Architects), Switzerland
- Member of the Swiss Registry Foundation as civil engineer (class A–REG A), Switzerland

## 6 Awards

1. “ACI Wason Medal” for Most Meritorious Paper published by the American Concrete Institute, USA, March 2014
2. “fib Award for Outstanding Concrete Structures”, category buildings, winner for the design of the Centro Ovale concrete shell, Mumbai, India, February 2014
3. “MCR Prize” to the best paper published in the Magazine of Concrete Research. Awarded by the Institution of Civil Engineers, London, the United Kingdom, October 2012
4. “Prix Alliance de l’invention 2010” awarded by Alliance (technology transfer consortium of french-italian Switzerland) to the best EPFL patent of 2009, Lausanne, Switzerland, April 2010
5. “Best Guess Award”, awarded by the Netherlands Organisation for Applied Scientific Research for predicting shear failure in reinforced concrete beams using the Critical Shear Crack Theory, Rotterdam, the Netherlands, December 2007
6. “ENAC Scientific Collaborator Research Excellence Award”, awarded by the ENAC School (École Polytechnique Fédérale de Lausanne) to the excellence in research, Lausanne, Switzerland, July 2007
7. First “National Award” awarded by the Ministry of Education of Spain to the best student in civil engineering, Madrid, Spain, January 2003
8. First “FCC SA” awarded by the firm “Fomento de Construcciones y Contratas” to the best student in civil engineering, Madrid, February 2002
9. “Agustín de Bethencourt” awarded by the “Agustin de Bethencourt Foundation” to the number one in the studies of civil engineering, Madrid, February 2002
10. “Escalona” awarded by the College of Civil Engineers to the number one in the studies of civil engineering, Madrid, February 2002
11. “Ciencia de los Materiales” awarded to the best student in Material’s Science, Madrid, January 2001
12. “José y Fernando Serrano Suñer Ingenieros” awarded to the best student in civil engineering, Madrid, March 1999
13. “Premio al Rendimiento Académico” awarded by the Universidad Politécnica de Madrid to the best academic performance, Madrid, January 1999

## 7 Publications

### 7.1 Peer-reviewed papers

1. Simões, J. T., Bujnak, J., Fernández Ruiz, M., Muttoni, A., *Investigation on the punching shear strength and behaviour of rc footings based on detailed experimental measurements*, Structural Concrete, Ernst & Sohn, submitted for publication
2. Brantschen, F., Faria, D.M.V., Fernández Ruiz, M., Muttoni, A., *Bond behaviour and strength of straight, hooked, U-shaped and headed bars in cracked structural concrete members*, Structural Concrete, Ernst & Sohn, Germany, submitted for publication
3. Simões, J. T., Faria, D.M.V., Fernández Ruiz, M., Muttoni, A., *Strength of reinforced concrete footings without transverse reinforcement according to limit analysis*, Engineering Structures, Elsevier, submitted for publication
4. Einpaul, J., Brantschen, F., Fernández Ruiz, M., Muttoni, A., *Performance of punching shear reinforcement under gravity loading: influence of type and detailing*, American Concrete Institute, Structural Journal, accepted for publication
5. Einpaul, J., Ospina, C.E., Fernández Ruiz, M., Muttoni, A., *Punching shear capacity of continuous slabs*, American Concrete Institute, Structural Journal, accepted for publication
6. Einpaul, J., Bujnak, J., Fernández Ruiz, M., Muttoni, A., *Study on influence of column size and slab slenderness on punching strength*, American Concrete Institute, Structural Journal, Vol. 113, No. 1, 2016, pp. 135–145
7. Cavagnis, F., Fernández Ruiz, M., Muttoni, *Shear failures in reinforced concrete members without transverse reinforcement: a critical analysis on the basis of test results*, Engineering Structures, Elsevier, Vol. 103, 2015, pp. 157–173
8. Muttoni, A., Fernández Ruiz, M., Niketić, F., *Design versus assessment of concrete structures using stress fields and strut-and-tie models*, American Concrete Institute, Structural Journal, Vol. 112, No. 5, 2015, pp. 605–615
9. Fernández Ruiz, M., Zanuy, C., Natário, F., Gallego, J.M., Albajar, L., Muttoni, A., *Influence of fatigue loading in shear failures of reinforced concrete members without transverse reinforcement*, Journal of Advanced Concrete Technology, Japan Concrete Institute, Japan, Vol. 13, May 2015, pp. 263–274

10. Fernández Ruiz, M., Muttoni, A., Sagaseta, J., *Shear strength of concrete members without transverse reinforcement: a mechanical approach to consistently account for size and strain effects*, Engineering Structures, Elsevier, Vol. 99, 2015, pp. 360–372
11. Natário, F., Fernández Ruiz, M., Muttoni, A., *Experimental investigation on fatigue of concrete cantilever bridge deck slabs subjected to concentrated loads*, Engineering Structures, Elsevier, Vol. 89, 2015, pp. 191–203
12. Muttoni, A., Lurati, F., Fernández Ruiz, M., *New shapes of concrete shells by means of prestressing: the Centro Ovale concrete shell in Switzerland*, Beton TKS, Czech Concrete Society, Czech Republic, Issue 1, 2015, pp. 16–22
13. Einpaul, J., Fernández Ruiz, M., Muttoni, A., *Influence of moment redistribution and compressive membrane action on punching strength of flat slabs*, Engineering Structures, Elsevier, Vol. 86, 2015, pp. 43–57
14. Argirova, G., Fernández Ruiz, M., Muttoni, A., *How simple can nonlinear finite element modelling be for structural concrete?*, Informes de la Construcción, IETCC-CSIC, Spain, Vol. 66, Extra 1, m013, 2014, pp. 1–8
15. Faria, D., Einpaul, J., Pinho Ramos, A., Fernández Ruiz, M., Muttoni, A., *On the efficiency of flat slabs strengthening against punching using externally bonded fibre reinforced polymers*, Construction & Building Materials, Elsevier, Vol. 73, 2014, pp. 366–377
16. Sagaseta, J., Tassinari, L., Fernández Ruiz, M., Muttoni, A., *Punching of flat slabs supported on rectangular columns*, Engineering Structures, Elsevier, Vol. 77, 2014, pp. 17–33
17. Natário, F., Fernández Ruiz, M., Muttoni, A., *Shear strength of RC slabs under concentrated loads near linear supports*, Engineering Structures, Elsevier, Vol. 76, 2014, pp. 10–23
18. Micallef, K., Fernández Ruiz, M., Muttoni, A., Sagaseta, J., *Assessing punching shear failure in reinforced concrete flat slabs subjected to localised impact loading*, International Journal of Impact Engineering, Elsevier, Vol. 71, 2014, pp. 17–33
19. Campana, S., Fernández Ruiz, M., Muttoni, A., *Shear strength of arch-shaped members without transverse reinforcement*, American Concrete Institute, Structural Journal, Vol. 111, No. 3, 2014, pp. 573–582
20. Clément, T., Pinho Ramos, A., Fernández Ruiz, M., Muttoni, A., *Influence of prestressing on the punching strength of post-tensioned slabs*, Engineering Structures, Elsevier, Vol. 72, 2014, pp. 56–69
21. Muttoni, A., Fernández Ruiz, M., Bentz, E., Foster, S.J., Sigrist, V., *Background to the Model Code 2010 Shear Provisions - Part II Punching Shear*, Structural Concrete, Ernst & Sohn, Germany, Vol. 14, No. 3, 2013, pp. 195–203
22. Sigrist, V., Bentz, E., Fernández Ruiz, M., Foster, S.J., Muttoni, A., *Background to the Model Code 2010 Shear Provisions - Part I: Beams and Slabs*, Structural Concrete, Ernst & Sohn, Germany, Vol. 14, No. 3, 2013, pp. 204–214
23. Fernández Ruiz, M., Mirzaei, Y., Muttoni, A., *Post-punching behavior of flat slabs*, American Concrete Institute, Structural Journal, Vol. 110, No. 5, 2013, p. 801–812
24. Rupf, M., Fernández Ruiz, M., Muttoni, A., *Post-tensioned girders with low amounts of shear reinforcement: shear strength and influence of flanges*, Engineering Structures, Elsevier, Vol. 56, 2013, pp. 357–371
25. Clément, T., Pinho Ramos, A., Fernández Ruiz, M., Muttoni, A., *Design for punching of prestressed concrete slabs*, Structural Concrete, Ernst & Sohn, Germany, Vol. 14, No. 2, 2013, pages 157–167
26. Campana, S., Fernández Ruiz, M., Muttoni, A., *Behaviour of nodal regions of reinforced concrete frames subjected to opening moments and proposals for their reinforcement*, Engineering Structures, Elsevier, Vol. 51, 2013, pp. 200–210
27. Muttoni, A., Lurati, F., Fernández Ruiz, M., *Concrete shells - Towards efficient structures: Construction of an ellipsoidal concrete shell in Switzerland*, Structural Concrete, Ernst & Sohn, Germany, Vol. 14, No. 1, 2013, pp. 43–50
28. Campana, S., Fernández Ruiz, M., Anastasi, A., Muttoni, A., *Analysis of shear-transfer actions on one-way RC members based on measured cracking pattern and failure kinematics*, Magazine of Concrete Research, Thomas Telford Publishing Ltd., London, Vol. 65, No. 6, 2013, pp. 386–404
29. Lips, S., Fernández Ruiz, M., Muttoni, A., *Experimental investigation on the punching strength and the deformation capacity of shear-reinforced slabs*, American Concrete Institute, Structural Journal, Vol. 109, No. 6, 2012, pp. 889–900
30. Pérez Caldentey, A., Padilla, P., Muttoni, A., Fernández Ruiz, M., *Effect of load distribution on the shear resistance of RC elements without stirrups*, American Concrete Institute, Structural Journal, Vol. 109, No. 5, 2012, pp. 595–603
31. Muttoni, A., Fernández Ruiz, M., *Levels-of-Approximation approach in codes of practice*, Structural Engineering International, Journal of the International Association for Bridge and Structural Engineering (IABSE), Switzerland, Vol. 2, 2012, pp. 190–194

32. Fernández Ruiz, M., Sagaseta Albajar, J., Muttoni, A., *La teoría de la fisura crítica como base teórica para el diseño de losas frente a punzonamiento en el nuevo Código Modelo 2010*, Hormigón y Acero, Madrid, Spain, Vol. 63, N° 263, 2012, pp. 49–63
33. Maya, L. F., Fernández Ruiz, M., Muttoni, A., Foster, S., *Punching shear strength of steel fibre reinforced concrete slabs*, Engineering Structures, Elsevier, Vol. 40, 2012, pp. 83–94
34. Muttoni, A., Fernández Ruiz, M., *The Levels-of-Approximation approach in MC 2010: applications to punching shear provisions*, Structural Concrete, Ernst & Sohn, Germany, Vol. 13, No. 1, 2012, pp. 32–41
35. Sagaseta, J., Muttoni, A., Fernández Ruiz, M., Tassinari, L., *Non axis-symmetrical punching shear around internal columns of RC slabs without transverse reinforcement*, Magazine of Concrete Research, Thomas Telford Publishing Ltd., London, Vol. 63, No. 6, 2011, pp. 441–457
36. Guidotti, R., Fernández Ruiz, M., Muttoni, A., *Crushing and flexural strength of slab-column joints*, Engineering Structures, Elsevier, Vol. 33, 2011, pp. 855–867
37. Vaz Rodrigues, R., Muttoni, A., Fernández Ruiz, M., *Influence of Shear on Rotation Capacity of Reinforced Concrete Members Without Shear Reinforcement*, American Concrete Institute, Structural Journal, Vol. 107, No. 5, 2010, pp. 516–525
38. Fernández Ruiz, M., Muttoni, A., Kunz, J., *Strengthening of flat slabs against punching shear using post-installed shear reinforcement*, American Concrete Institute, Structural Journal, Vol. 107, No. 4, 2010, pp. 434–442
39. Fernández Ruiz, M., Plumey, S., Muttoni, A., *Interaction between bond and deviation forces in spalling failures of arch-shaped members without transverse reinforcement*, American Concrete Institute, Structural Journal, Vol. 107, No. 3, 2010, pp. 346–354
40. Guidotti, R., Fernández Ruiz, M., Muttoni, A., *Durchstanzen von Flachdecken bei hohen Stützenlasten*, Beton- und Stahlbetonbau, Ernst & Sohn – Wiley, Berlin, Vol. 105, No. 1, 2010, pp. 19–26
41. Breña, S.F., Fernández Ruiz, M., Kostic, N., Muttoni, A., *Modelling techniques to capture the backbone envelope behaviour of coupling beams subjected to seismic loading*, Studies and Researches, Vol. 29, pub. by Starrylink, Brescia, Italy, 2009, pp. 53–78
42. Fernández Ruiz, M., Muttoni, A., *Aplicaciones de los campos de esfuerzos cortantes en el análisis y dimensionamiento de losas de hormigón armado*, Hormigón y acero, Madrid, Spain, Vol. 60, No. 252, 2009, pp. 73–88
43. Fernández Ruiz, M., Muttoni, A., *Applications of the critical shear crack theory to punching of R/C slabs with transverse reinforcement*, American Concrete Institute, Structural Journal, Vol. 106, No. 4, 2009, pp. 485–494
44. Muttoni, A., Fernández Ruiz, M., Kunz, J., *Nachträgliche Durchstanzbewehrung zur Verstärkung von Stahlbetonflachdecken*, Bauingenieur, Springer, VDI Verlag, Germany, Vol. 83, December 2008, pp. 503–511
45. Vaz Rodrigues, R., Fernández Ruiz, M., Muttoni, A., *Shear strength of R/C bridge cantilever slabs*, Engineering Structures, Elsevier, Vol. 30, No. 11, 2008, pp. 3024–3033
46. Fernández Ruiz, M., Muttoni, A., *Shear strength of thin-webbed post-tensioned beams*, American Concrete Institute, Structural Journal, Vol. 105, No. 3, 2008, pp. 308–317
47. Muttoni, A., Fernández Ruiz, M., *Shear strength of members without transverse reinforcement as function of critical shear crack width*, American Concrete Institute, Structural Journal, Vol. 105, No. 2, 2008, pp. 163–172
48. Fernández Ruiz, M., Muttoni, A., and Gambarova, P. G., *A re-evaluation of test data on bond in R/C by means of FE modelling*, Studies and Researches, Vol. 27, pub. by Starrylink, Brescia, Italy, Dec. 2007, pp. 113–134
49. Fernández Ruiz, M., Muttoni, A., and Gambarova, P. G., *Analytical modeling of the pre- and post-yield behavior of bond in reinforced concrete*, American Society of Civil Engineers, Journal of Structural Engineering, Vol. 133, No. 10, October 2007, pp. 1364–1372
50. Muttoni, A., Fernández Ruiz, M., *Concrete cracking in tension members and application to deck slabs of bridges*, American Society of Civil Engineers, Journal of Bridge Engineering, Vol. 12, No. 5, 2007, pp. 646–653
51. Fernández Ruiz, M., Muttoni, A., and Gambarova, P. G., *Relationship between nonlinear creep and cracking of concrete under uniaxial compression*, Journal of Advanced Concrete Technology, Japan Concrete Institute, Japan, Vol. 5, No. 3, 2007, pp. 383–393
52. Fernández Ruiz, M., Muttoni, A., *On development of suitable stress fields for structural concrete*, American Concrete Institute, Structural Journal, Vol. 104, No. 4, 2007, pp. 495–502
53. Muttoni, A., Fernández Ruiz, M., *Dimensionamiento y verificación del hormigón estructural mediante el método de los campos de tensiones*, Hormigón y Acero, Madrid, Spain, n° 243, 2007, pp. 93–102.

54. Fernández Ruiz, M., Romera Corral, M., *Aplicaciones de la programación orientada a objetos y las colecciones al cálculo de estructuras*, Revista Internacional de Métodos Numéricos para la Ingeniería, Barcelona, Spain, Vol. 21, n° 2, 2005, pp. 179–192
55. Fernández Ruiz, M. *Evaluación no lineal de los efectos estructurales producidos por las deformaciones diferidas del hormigón y acero*, Hormigón y acero, Madrid, Spain, n° 236, 2005, pp. 43–55
56. Fernández Ruiz, M. *Influencia de la armadura transversal en la separación de fisuras*, Hormigón y acero, Madrid, Spain, n° 236, 2005, pp. 35–42
57. Fernández Ruiz, M., Del Pozo Vindel, F. J., Arrieta Torrealba, J. M<sup>a</sup> *Estudio sobre el comportamiento no lineal de la fluencia. Propuesta de modelo y comparación con resultados experimentales y modelos teóricos*, Hormigón y acero, Madrid, Spain, n° 231, 2004, pp. 75–86
58. Fernández Ruiz, M. *Aplicación del método del coeficiente de envejecimiento a problemas reológicos no lineales*, Revista Internacional de Métodos Numéricos para la Ingeniería, Barcelona, Spain, Vol. 20, n° 4, 2004, pp. 355–374
59. Fernández Ruiz, M. *Modelos de difusión no lineal de humedad en el hormigón*, Ingeniería Civil, Madrid, Spain, n° 133, 2004, pp. 109–117
60. Fernández Ruiz, M. *Estudio y comparación de diferentes métodos de cálculo para el análisis de redistribuciones a nivel de sección y estructura debidas a deformaciones diferidas en el hormigón*, Hormigón y acero, Madrid, Spain, n° 227, 2003, pp. 75–88
61. Fernández Ruiz, M., Gascón y Marín de la Puente, J. L., Quintero Moreno, F. *Análisis de la torsión de alabeo uniforme y mixta mediante diferencias finitas y aplicación a casos prácticos*, Ingeniería Civil, Madrid, Spain, n° 126, 2002, pp. 75–87
62. Fernández Ruiz, M., Gascón y Marín de la Puente, J. L., Fraga Rivas, F., Esteras Aldea, L., Escolar López, I. *Presa de Alloz: Estudios sobre el aprovechamiento, construcción y evolución de la obra*, Revista de Obras Públicas, Madrid, Spain, n° 3413, 2001, pp. 39–47
63. Fernández Ruiz, M., Mayor Gamó, M. A., Pastor Pérez, M. *Aplicación de la recuperación variacional al cálculo de estructuras de un grado de libertad sometidas a la acción de un sismo*, Ingeniería Civil, Madrid, Spain, n° 113, 1999, pp. 85–91

## 7.2 PhD. theses directed

1. Campana, S., *Éléments en béton armé soumis à un $\epsilon$ . combinaison de flexion, effort tranchant et forces de déviation*, PhD. thesis (co-directors: A. Muttoni and M. Fernández Ruiz), École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, 2013, 192 p.
2. Guidotti, R., *Poinçonnement des planchers-dalles avec colonnes superposées fortement sollicitées*, PhD. thesis (co-directors: A. Muttoni and M. Fernández Ruiz), École Polytechnique Fédérale de Lausanne, Thesis No. 4812, Lausanne, Switzerland, 2010, 189 p.

## 7.3 Discussions

1. Lips, S., Fernández Ruiz, M., Muttoni, A., *Authors' closure on discussion by A. Windisch of paper "Experimental Investigation on Punching Strength and Deformation Capacity of Shear-Reinforced Slabs"*, American Concrete Institute, Structural Journal, Vol. 110, No. 5, 2013, pp. 896–897
2. Pérez Caldentey, A., Padilla, P., Muttoni, A., Fernández Ruiz, M., *Authors' closure on discussion by Chen, S. and Miao, L. of paper "Effect of load distribution on the shear resistance of RC elements without stirrups"*, American Concrete Institute, Structural Journal, Vol. 110, No. 4, 2013, pp. 703–703
3. Vaz Rodrigues, R., Fernández Ruiz, M., Muttoni, A., *Authors' closure on discussion by A. Windisch of paper "Influence of shear on the rotation capacity of R/C members without shear reinforcement"*, American Concrete Institute, Structural Journal, Vol. 108, No. 4, 2011, pp. 505–506
4. Fernández Ruiz, M., Muttoni, A., *Authors' closure on discussion by A. Windisch of paper "Strengthening of flat slabs against punching shear using post-installed shear reinforcement"*, American Concrete Institute, Structural Journal, Vol. 108, No. 3, 2011, pp. 382–383
5. Muttoni, A., Fernández Ruiz, M., *Discussion of paper "Reinforced concrete slab shear prediction competition: entries and discussion"*, American Concrete Institute, Structural Journal, Vol. 107, No. 2, 2010, pp. 250–251
6. Fernández Ruiz, M., Campana, S., Muttoni, A., *Discussion of paper "Influence of flexural reinforcement on shear strength of prestressed concrete members"*, American Concrete Institute, Structural Journal, Vol. 106, No. 6, 2009, pp. 907–912

7. Fernández Ruiz, M., Muttoni, A., *Authors' closure on discussion by A. Windisch of paper "Shear strength of thin-webbed post-tensioned beams"*, American Concrete Institute, Structural Journal, Vol. 106, No. 2, 2009, pp. 237–240
8. Muttoni, A., Kostic, N., Fernández Ruiz, M., *Discussion of paper "Factors affecting strength of elements designed using strut-and-tie models"*, American Concrete Institute, Structural Journal, Vol. 105, No. 2, 2008, pp. 233–235

## 7.4 Peer-reviewed conferences

1. Tasevski, D., Fernández Ruiz, M., Muttoni, A., *Analogy between sustained loading and strain rate effects on the nonlinear creep response of concrete*, CONCREEP-10, Mechanics and Physics of Creep, Shrinkage, and Durability of Concrete and Concrete Structures, Proceedings of the 10th International Conference, Vienna, Austria, September 21-23, 2015, pp. 1187-1193
2. Fernández Ruiz, M., Gómez Navarro, M., Bamonte, P., *Fire design of concrete structures based on a levels-of-approximation approach*, fib Symposium, Copenhagen, Denmark, 18-20 May, 2015, 9 p.
3. Simoes, J., Viula Faria, D.M., Fernández Ruiz, M., Muttoni, A., *Limit analysis for punching shear design of compact slabs and footings*, fib Symposium, Copenhagen, Denmark, 18-20 May, 2015, 13 p.
4. Natario, F., Fernández Ruiz, M., Muttoni, A., *Fatigue strength of bridge deck slabs*, fib Symposium, Copenhagen, Denmark, 18-20 May, 2015, 18 p.
5. Backes, M-R., Fernández Ruiz, M., Muttoni, A., *Interaction between in-plane shear forces and transverse bending moments in webs of concrete bridges*, 10th fib International PhD Symposium in Civil Engineering, Université Laval, Québec, Canada, July 21 to 23, 2014, 6 p.
6. Einpaul, J., Fernández Ruiz, M., Muttoni, A., *Behaviour and punching resistance of continuous flat slabs*, 10th fib International PhD Symposium in Civil Engineering, Université Laval, Québec, Canada, July 21 to 23, 2014, 6 p.
7. Mata Falcón, J., Fernández Ruiz, M., Muttoni, A., *Stress fields for the analysis of the failure load and cracking state of dapped-end beams*, VI Congreso ACHE, Madrid, Spain, 3-5 June 2014, 10 p.
8. Muttoni, A., Fernández Ruiz, M., Campana, S., *Strength of arch-shaped members in bending and shear*, 4th International fib congress, Mumbai, India, 10-14 February, 2014, pp. 233–235
9. Muttoni, A., Fernández Ruiz, M., Einpaul, J., *Punching strength of actual two-way slabs*, 4th International fib congress, Mumbai, India, 10-14 February, 2014, pp. 236–238
10. Argirova, G., Fernández Ruiz, M., Muttoni, A., *How simple can nonlinear finite element modelling be for structural concrete?*, IInd International Congress on Mechanical models in structural engineering, University of Granada, Spain, 20-21 June, 2013, 10 p.
11. Prieto, M., Tanner, P., Andrade, C., Fernández Ruiz, M., *Experimental and numerical study of bond response in structural concrete with corroded steel bars*, International IABSE Conference, Rotterdam, May 6-8, 2013, 8 p.
12. Kunz, J., Fernández Ruiz, M., Muttoni, A., *Enhanced safety with post-installed shear reinforcement*, fib Symposium, Tel-Aviv, Israel, 22-24 April 2013, 4 p.
13. Sagaseta, J., Muttoni, A., Fernández Ruiz, M., *Towards developing mechanical punching shear models for flat slabs subjected to impact and blast loading*, fib Symposium, Tel-Aviv, Israel, 22-24 April 2013, 4 p.
14. Muttoni, A., Fernández Ruiz, M., *Punching shear design in MC2010: incorporating new knowledge and basing the design expressions on physical models*, fib Symposium, Tel-Aviv, Israel, 22-24 April 2013, 4 p.
15. Rupf, M., Fernández Ruiz, M., Muttoni, A., *Assessment of shear strength for existing bridges with low amounts of shear reinforcement*, fib Symposium, Tel-Aviv, Israel, 22-24 April 2013, 4 p.
16. Muttoni, A., Fernández Ruiz, M., *Influence of strain and size effects on bond in structural concrete*, Bond in Concrete: Bond, Anchorage, Detailing - 4th International Symposium, Brescia, Italy, 17-20 June, 2012, 7 p.
17. Muttoni, A., Lurati, F., Fernández Ruiz, M., *Concrete shells: time for reappraisal - case study of a 93 meter-span shell in sprayed concrete*, fib Symposium, Stockholm, Sweden, 11-14 June 2012, 4 p.
18. Bamonte, P., Fernández Ruiz, M., Muttoni, A., *Punching shear strength of R/C slabs subjected to fire*, 7th International Conference on Structures in Fire, Zurich, Switzerland, June 6-8, 2012, 10 p.
19. Sagaseta, J., Tassinari, L., Muttoni, A., Fernández Ruiz, M., *New provisions for punching shear in model code 2010 based on the critical shear crack theory*, fib Symposium, Prague, Czech Republic, 8-10 June, 2011, 4 p.
20. Tassinari, L., Lips, S., Fernández Ruiz, M., Muttoni, A., *Applications of bent-up bars as shear and*

- integrity reinforcement in R/C slabs*, fib Symposium, Prague, Czech Republic, 8-10 June, 2011, 4 p.
21. Guidotti, R., Fernández Ruiz, M., Muttoni, A., *Behaviour and design of slab-column joints*, fib Symposium, Prague, 8-10 June, Czech Republic, 2010, 4 p.
  22. Vaz Rodrigues, R., Fernández Ruiz, M., Muttoni, A., *Carga última de lajes de tabuleiro de pontes sob cargas concentradas*, BE2010 - Encontro Nacional Betão Estrutural Lisboa, Portugal, 10-12 November, 2010, 10 p.
  23. Muttoni, A., Fernández Ruiz, M., *Armature de poinçonnement des planchers-dalles: théorie et pratique en Suisse*, Structural Concrete in Switzerland, fib-CH, Lausanne, 2010, pp. 16–27
  24. Fernández Ruiz, M., Muttoni, A., *Performance and design of punching shear reinforcing systems*, 3rd International fib congress, Washington, USA, 29 May - 2 June 2010, 15 p.
  25. Breña, S.F., Fernández Ruiz, M., Muttoni, A., *Applications of stress fields to assess the behaviour and strength of coupling beams subjected to seismic actions*, 3rd International fib congress, Washington, USA, 29 May - 2 June 2010, 10 p.
  26. Muttoni, A., Fernández Ruiz, M., *Design through an incremental approach: the Swiss experience*, 2010 Joint IABSE-fib Conference, Dubrovnik, Croatia, 2010, 8 p.
  27. Sagaseta, J., Fernández Ruiz, M., Muttoni, A., *Non-symmetrical punching of flat slabs and slab bridges without transverse reinforcement*, fib Symposium, London, the United Kingdom, 22-24 June 2009, 8 p.
  28. Ludescher, H., Haugerud, S. A., Fernández Ruiz, M., *Detail design of the MPU Heavy Lifter*, fib Symposium, Amsterdam, the Netherlands, CRC Press, 19-21 May 2008, pp. 931–937
  29. Muttoni, A., Fernández Ruiz, M., *Shear strength in one- and two-way slabs according to the critical shear crack theory*, fib Symposium, Amsterdam, the Netherlands, CRC Press, 19-21 May 2008, pp. 559–563
  30. Kunz, J., Fernández Ruiz, M., Muttoni, A., *Enhanced safety with post-installed punching shear reinforcement*, fib Symposium, Amsterdam, the Netherlands, CRC Press, 19-21 May 2008, pp. 679–684
  31. Spasojevic, A., Redaelli, D., Fernández Ruiz, M., Muttoni, A., *Influence of Tensile Properties of UHPFRC on Size Effect in Bending*, Second International Symposium on Ultra High Performance Concrete, Kasel, March 5-7, 2008, pp. 303–310
  32. Muttoni, A., Fernández Ruiz, M., Guandalini, S., *Poinçonnement des ponts-dalles*, 4. FBH / ASTRA - Studentagung "Neues aus der Brückenforschung" ("Nouveaux acquis de la recherche sur les ponts"), Dokumentation D0223 SIA, Société suisse des ingénieurs et architectes, Journée à Bern, Switzerland, 20 November 2007, pp. 85–94.
  33. Fernández Ruiz, M., Hars, E., Muttoni, A., *Experimental investigation on the load-carrying capacity of thin webs including post-tensioning tendons*, fib Symposium, Dubrovnik, Croatia, 20-23 May 2007, pp. 483–490
  34. Fernández Ruiz, M., Muttoni, A., Burdet, O. L., *Computer-aided development of stress fields for the analysis of structural concrete*, fib Symposium, Dubrovnik, Croatia, 20-23 May 2007, pp. 591–598
  35. Fernández Ruiz, M. *Rheological Behaviour: What's in a name?*, Poster Presentation, Composite Construction V, ECI, Johannesburg, South Africa, 2004

## 7.5 Invited conferences and lectures

1. Muttoni, A., Fernández Ruiz, M., *Consistent design against punching shear with the Critical Shear Crack Theory: mechanical model and code implementation*, ACI convention, Denver, 8-12 November 2015, American Concrete Institute, Denver, USA, 8 November, 2015
2. Fernández Ruiz, M., Muttoni, A., *Punching shear design based on the critical shear crack theory*, "Concrete Days 2014", 23-24 October 2014, National committee of fib Slovakia, Bratislava, Slovakia, 24 October, 2014
3. Muttoni, A., Lurati, F., Fernández Ruiz, M., *Centro Ovale Concrete Shell*, Keynote lecture of the "Concrete Days 2014", 23-24 October 2014, National committee of fib Slovakia, Bratislava, Slovakia, 23 October, 2014
4. Fernández Ruiz, M., *Stress fields in structural concrete – Campos de tensiones en hormigón*, Keynote lecture of the IInd International Congress on mechanical models in structural engineering, University of Granada, Spain, 20 June, 2013
5. Muttoni A., Fernández Ruiz, M., *Design and assessment of structural concrete with stress fields*, Barcelona, Spain, 4 lessons seminar, 15 March 2013
6. Fernández Ruiz, M., *Projet et construction d'une coque en béton projeté*, Journée Holcim 2012, Lausanne, Switzerland, 17 October 2012
7. Muttoni, A., Fernández Ruiz, M., *Consistent*

- shear and punching shear design in structural concrete*, Symposium in honour of Prof. Gambarova, Brescia, Italy, 20 June 2012
8. Fernández Ruiz, M., Lurati, F., *Spannungsfelder und Stabwerkmodelle für Bemessung und Überprüfung von Stahlbetontragwerken*, Swiss Federal Road Authority, Continuing education seminar for bridge specialists, Charmey, Switzerland, 27 September 2011
  9. Fernández Ruiz, M., Backes, M.-R., *Applications des EF dans la recherche de formes optimales des coques*, Forum ANSYS, École Polytechnique Fédérale de Lausanne, Switzerland, 14 September 2011
  10. Fernández Ruiz, M., *Bemessung von Stahlbetontragwerken mit Spannungsfeldern – Studententag*, Continuing education course, DSP Ingenieure & Planer, Greifensee, Switzerland, 1st July 2011
  11. Fernández Ruiz, M., *Les coques en béton : un retour d’actualité*, Le béton matière en devenir, Colloque interdisciplinaire, École Polytechnique Fédérale de Lausanne, Switzerland, 11 May 2011
  12. Muttoni, A., Fernández Ruiz, M., *Analyse et vérification des ponts-poutre à l’aide de la méthode des champs de contraintes*, 5. FBH / ASTRA - Studententag “Neues aus der Brückenforschung” (“Nouveaux acquis de la recherche sur les ponts”), Société suisse des ingénieurs et architectes, Journée à Bern, Switzerland, 18 November 2010.
  13. Muttoni, A., Fernández Ruiz, M., *Dimensionnement du béton structural à l’aide de la méthode des champs de contraintes*, Bau und Wissen, Fachveranstaltung 874571/72, Bemessen und konstruieren mit Spannungsfeldern, Wildeg, Switzerland, 23 April 2008 and 20 juin 2008, pp. 3.1–3.12
  14. Fernández Ruiz, M., Muttoni, A., *Entwicklung kontinuierlicher Spannungsfelder für die Bemessung von Stahlbetonbauten*, Bau und Wissen, Fachveranstaltung 874571/72, Bemessen und konstruieren mit Spannungsfeldern, Wildeg, Switzerland, 23 April 2008 and 20 juin 2008, pp. 5.1–5.19
  15. Fernández Ruiz, M., *The use of the stress field method for design and check of structural concrete*, The College of Engineering, Dept. of Civil Engineering, University of Massachusetts Amherst, USA, 3 April, 2008
  16. Fernández Ruiz, M., *Swiss approach for the shear strength assessment in members without transverse reinforcement*, Faculty of Applied Science and Engineering, Dept. of Civil Engineering, University of Toronto, Canada, 28 March, 2008
  17. Muttoni, A., Fernández Ruiz, M., *Shear Strength Predictions based on the Critical Shear Crack Theory and the Swiss Code SIA 262 (2003)*, Workshop on Assessment Methods for Determining the Shear Strength of Existing Structures, Rotterdam, the Netherlands, 6 December 2007, 14 p. (Contribution awarded with “Best Guess Award”)
  18. Muttoni, A., Fernández Ruiz, M., Guandalini, S., *Poinçonnement des ponts-dalles*, 4. FBH / ASTRA - Studententag “Neues aus der Brückenforschung” (“Nouveaux acquis de la recherche sur les ponts”), Dokumentation D0223 SIA, Société suisse des ingénieurs et architectes, Journée à Bern, Switzerland, 20 November 2007, pp. 85–94.
  19. Muttoni, A., Fernández Ruiz, M., *Schubkraftfluss in Stahlbetonflachdecken*, Bau und Wissen, Fachveranstaltung 864571/72, Bemessungsprobleme bei Flachdecken, Wildeg, Switzerland, 13 February 2007, pp. 3.1–3.16
  20. Fernández Ruiz, M. *Perspectivas de futuro profesional*, II Congreso Nacional de Ingeniería Civil, Vol. II, Madrid, Spain, 2003, pp. 2311–2315

## 7.6 Books & course notes

1. Natário, F., Fernández Ruiz, M., Muttoni, A., *Résistance à l’effort tranchant de dalles de roulement sous actions statiques et de fatigue*, Département fédéral des transports, des communications et de l’énergie, Office fédéral des routes, Rapport 671, Bern, Switzerland, 2015, 90 p.
2. Rupf, M., Fernández Ruiz, M., Muttoni, A., *Querkraftwiderstand vorgespannter Brücken mit ungenügender Querkraftbewehrung*, Département fédéral des transports, des communications et de l’énergie, Office fédéral des routes, Rapport 658, Bern, Switzerland, 2014, 88 p.
3. Clément, T., Fernández Ruiz, M., Muttoni, A., *Poinçonnement des ponts-dalles précontraints*, Département fédéral des transports, des communications et de l’énergie, Office fédéral des routes, Rapport 653, Bern, Switzerland, 2013, 73 p.
4. Fédération Internationale du Béton (fib), *Model Code 2010 - Final draft*, Vol. 2, *fédération internationale du béton*, Bulletin 66, Lausanne, Switzerland, 2012, Vol. 2, 370 p.
5. Muttoni, A., Fernández Ruiz, M., Kostic, N., *Champs de contraintes et méthode des biellets-tirants*, Polycopié de la journée d’études du 2.2.2011, École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, 2011, 116 p.
6. Muttoni, A., Fernández Ruiz, M., *Shear in slabs and beams: should they be treated in the same*



way?, *fédération internationale du béton*, Bulletin # 57, 2010, pp. 105–128

7. Muttoni, A., Fernández Ruiz, M., *MC2010: The Critical Shear Crack Theory as a mechanical model for punching shear design and its application to code provisions*, *fédération internationale du béton*, Bulletin # 57, 2010, pp. 31–60
8. Fédération Internationale du Béton (fib), Model Code 2010 - First complete draft, *fédération internationale du béton*, Bulletin 56, Lausanne, Switzerland, 2010, Vol. 2, 312 p.
9. Fernández Ruiz, M., Vaz Rodrigues, R., Muttoni, A., Dimensionnement et vérification des dalles de roulement des ponts routiers, *Département fédéral des transports, des communications et de l'énergie*, Office fédéral des routes, Rapport 636, Bern, Switzerland, 2009, 53 p.
10. Muttoni, A., Fernández Ruiz, M., Burdet, O., Poinçonnement des planchers-dalles: nouveaux acquis et applications pratiques, Polycopié de la journée d'études de 10.9.2008, *École Polytechnique Fédérale de Lausanne*, Lausanne, Switzerland, 2008, 102 p.
11. Muttoni, A. (Ed.), Fernández Ruiz, M., Fürst, A., Guandalini, S., Hunkeler, F., Moser, K., Seiler, H., Sécurité structurale des parkings couverts, *Documentation D 0226 SIA*, Société Suisse des ingénieurs et des architectes, Zürich, Switzerland, 2008, 105 p.
12. Fernández Ruiz, M., Hars, E., Muttoni, A., Résistance à l'effort tranchant des poutres précontraintes à âme mince, *Département fédéral des transports, des communications et de l'énergie*, Office fédéral des routes, Rapport 606, Bern, Switzerland, 2006, 68 p.
13. Fernández Ruiz, M., Evaluación no lineal de los efectos estructurales producidos por las deformaciones diferidas del hormigón y acero, *ACHE*, Madrid, Spain, 2004, 204 p.
14. Martínez Calzón, J., Fernández Ruiz, M., Manual práctico para el diseño de puentes y estructuras de edificación mixtos, *Ed. MC-2*, Madrid, Spain, 2004, 113 p.

## 8 Patents

1. Muttoni, A., Fernández Ruiz, M., Barras, M. *Système de renforcement contre le poinçonnement avec des tiges ou des barres transversales ayant des têtes d'ancrage*, European Patent Office, Munich, Germany, Patent # 14000488.8-1601, 6 May, 2014
2. Guidotti, R., Muttoni, A., Fernández Ruiz, M., *Slab-column joint to increase punching shear strength of flat slabs*, European Patent Office, Munich, Germany, Patent # EP09180602.6, 7 December, 2009
3. Muttoni, A., Lüchinger, B., Fernández Ruiz, M., *Bewehrungsvorrichtung*, Eidgenössisches Institut für Geistiges Eigentum, Bern, Switzerland, Patent # 01853/09, 3 December, 2009
4. Muttoni, A., Fernández Ruiz, M., *Reinforcement element for concrete construction*, European Patent Office, Munich, Germany, Patent # 09157384.0 - 2303, 6 April, 2009

## 9 Grants for research projects

1. Principal applicant of project *Building in a lighter and more sustainable manner: textile concrete for thin structural elements* (co-applicant: prof. Aurelio Muttoni), funded by cemsuisse (Association of Swiss Cement Industry), 2014
2. Co-applicant of project *A unified approach for design of structural concrete members without transverse reinforcement* (principal applicant: prof. Aurelio Muttoni), funded by the Swiss National Science Foundation, Project # 200021\_137658/1, 2011
3. Co-applicant of project *Development of a rational theory for the design of punching shear reinforcement and practical applications (follow-up)* (principal applicant: prof. Aurelio Muttoni), funded by the Swiss National Science Foundation, Project # 200020\_137659/1, 2011
4. Co-applicant of project *Development of a rational theory for the design of punching shear reinforcement and practical applications* (principal applicant: prof. Aurelio Muttoni), funded by the Swiss National Science Foundation, Project # 200021\_121566, 2008