NSERC CRSNG *Investing in people, discovery and innovation*
Investir dans les gens, la découverte et l'innovation

FORM 100
Personal Data Form
PART I

Date: 2005/10/27

Family name	Given name	Initial(s) of all given names	Personal identification no. (PIN)
MacDougall	Colin	C	106100

- [X] I hold a full, an associate or an assistant professor position at a Canadian university
- [ ] I hold an academic appointment at a Canadian university but am not a full, an associate or an assistant professor (complete Appendices B and C)
- [ ] I hold a faculty position at an eligible Canadian college (complete Appendices B1 and C)
- [ ] I do not or will not hold an academic appointment at a Canadian postsecondary institution

Place of employment other than a Canadian postsecondary institution (give address in Appendix A)

APPOINTMENT AT A POSTSECONDARY INSTITUTION

Title of position	Canadian postsecondary institution
Assistant Professor	Queen's
Department	**Campus**
Civil Engineering	

ACADEMIC BACKGROUND

Degree	Name of discipline	Institution	Country	Date yyyy/mm
Bachelor's	Civil Engineering	Waterloo	CANADA	1994 / 04
Master's	Civil Engineering	Waterloo	CANADA	1996 / 04
Doctorate	Civil Engineering	Western Ontario	CANADA	2001 / 08

TRAINING OF HIGHLY QUALIFIED PERSONNEL

Indicate the number of students, fellows and other research personnel that you:

	Currently		Over the past six years (excluding the current year)		
	Supervised	Co-supervised	Supervised	Co-supervised	Total
Undergraduate			2	3	5
Master's		3	2	3	8
Doctoral	1				1
Postdoctoral					
Others					
Total	1	3	4	6	14

Personal information collected on this form and appendices will be stored in the Personal Information Bank for the appropriate program.
PROTECTED WHEN COMPLETED

Version française disponible

Completed

Personal identification no. (PIN)	Family name
106100	MacDougall

ACADEMIC, RESEARCH AND INDUSTRIAL EXPERIENCE (use one additional page if necessary)

Position held (begin with current)	Organization	Department	Period (yyyy/mm to yyyy/mm)
Assistant Professor	Queen's	Civil Engineering	2001/09
Teaching Assistant	Western Ontario	Civil Engineering	1997/09 to 2001/08
Teaching Assistant	Waterloo	Civil Engineering	1994/05 to 1996/04
Research Assistant	Royal Military College	Mechanical Engineering	1992/08 to 1992/12
Design Assistant	City of Hamilton	Water Department	1991/08 to 1991/12
Design Assistant	City of Hamilton	Sewage Department	1991/01 to 1991/04

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Personal identification no. (PIN)	Family name
106100	MacDougall

RESEARCH SUPPORT

Family name and initial(s) of applicant	Title of proposal, funding source and program, and time commitment (hours/month)	Amount per year	Years of tenure (yyyy)
List all sources of support **(including NSERC grants and university start-up funds)** held as an applicant or a co-applicant: a) support held in the past four (4) years but now completed; b) support currently held, and c) support applied for. For group grants, indicate the percentage of the funding directly applicable to your research. Use additional pages as required.			
a) Support held in the past 4 years			
Colin MacDougall and Mark Green	Integrated Learning for Solid Mechanics Queen's University McConnell Foundation 5 hours/month	9,500 (50%) 9,500 (50%)	2002 2003
Colin MacDougall	Fatigue of High Performance Steel Queen's University Advisory Research Council Grant 10 hours/month	5,000(100%)	2003
Bisby, Fam, MacDougall	Data acquisition for innovative materials and structural testing NSERC RTI 10 hours/month	49,238 (33%)	2004
b) Support currently held			
Colin MacDougall	Structural Health Assessment and Innovative Repair of Unbonded, Post-Tensioned Concrete Buildings NSERC Discovery Grant 20 hours/month	18,000 18,000 18,000 18,000	2002 2003 2004 2005

Personal identification no. (PIN)	Family name
106100	MacDougall

RESEARCH SUPPORT

Family name and initial(s) of applicant	Title of proposal, funding source and program, and time commitment (hours/month)	Amount per year	Years of tenure (yyyy)
List all sources of support **(including NSERC grants and university start-up funds)** held as an applicant or a co-applicant: a) support held in the past four (4) years but now completed; b) support currently held, and c) support applied for. For group grants, indicate the percentage of the funding directly applicable to your research. Use additional pages as required.			
b) Support currently held			
Colin MacDougall	Queen's University Start-Up Funding 40 hours/month	43,000	2002
Colin MacDougall	Fatigue testing of innovative engineering materials for long-lasting civil infrastructure Canada Foundation for Innovation New Opportunities 10 hours/month	242,040	2003
Colin MacDougall	Fatigue of High-Performance Steel Steel Structures Education Foundation External Research Program 10 hours/month	10,000	2006
MacDougall, Green	Repair of Post-Tensioned Concrete Slabs Using CFRP Strands Intelligent Sensing for Innovative Structures Research Funding Program 10 hours/month	25,000 (50%)	2006

Personal identification no. (PIN)	Family name
106100	MacDougall

RESEARCH SUPPORT

Family name and initial(s) of applicant	Title of proposal, funding source and program, and time commitment (hours/month)	Amount per year	Years of tenure (yyyy)
List all sources of support **(including NSERC grants and university start-up funds)** held as an applicant or a co-applicant: a) support held in the past four (4) years but now completed; b) support currently held, and c) support applied for. For group grants, indicate the percentage of the funding directly applicable to your research. Use additional pages as required.			
c) Support applied for			
MacDougall, Fam, Bisby, Green, Moore	Equipment for Strain Controlled Testing of Civil Engineering Infrastructure NSERC RTI 25 hours/month	142,078 (30%)	2006

PROTECTED WHEN COMPLETED

Canada

Highly Qualified Personnel (HQP)

Provide personal data about the HQP that you currently, or over the past six years, have supervised or co-supervised.

Personal identification no. (PIN)	Family name
106100	MacDougall

Name	Type of HQP Training and Status	Years Supervised or Co-supervised	Title of Project or Thesis	Present Position
Pierre, Johnelle	Master's (In Progress)	Co-supervised 2005 -	Cost-benefit analysis of green roofs	Master's student
Howard, Sarah	Master's (In Progress)	Co-supervised 2004 -	Repair of fatigue damaged steel beams using CFRP	Master's Candidate
MacLean, Kevin	Master's (In Progress)	Co-supervised 2004 -	Fire performance of post-tensioned concrete slabs	Master's candidate
Vardy, Stephen	Doctoral (In Progress)	Supervised 2003 -	Structural performance of plastered straw bale walls	Doctoral candidate
Taylor, Brendon	Undergraduate (Completed)	Supervised 2005 - 2005	Materials characterization of earthen plasters	Undergraduate student
DeJong, Siebren	Master's (Completed)	Co-supervised 2003 - 2005	Fatigue of corrosion-resistant steel reinforcing bars	Field worker in Vietnam with Samaritan's Purse
Bronsema, Nicolas	Undergraduate (Completed)	Co-supervised 2004 - 2004	Design of apparatus for full-scale structural testing	Undergrad student
Georghiou, Andreas	Master's (Completed)	Supervised 2002 - 2004	Response of corroded strands to bending	Design Engineer, Structures Workshop, London, England
Li, Shulian	Master's (Completed)	Supervised 2002 - 2004	Response of corroded tendons to impact	Design engineer, China
Fitzwilliams, Jason	Undergraduate (Completed)	Co-supervised 2003 - 2003	Implementation of undergraduate testing tools	Master's candidate, Queen's University
McIntyre, James	Undergraduate (Completed)	Supervised 2003 - 2003	Design of modified tip for impact testing of strand	Graduate student, University of Toronto
Shillinglaw, Scott	Master's (Completed)	Co-supervised 2002 - 2003	Dynamic response of fatigue damaged girders	Design engineer, Halsall Associates, Ottawa
Swanson, David	Master's (Completed)	Co-supervised 2001 - 2003	Bond testing of corrosion-resistant reinforcing bars	Design engineer, Delcan, Toronto
Reid, Matt	Undergraduate (Completed)	Co-supervised 2002 - 2002	Design of structural testing tool for undergraduate teaching	Design engineer, Timber design and engineering

1. MOST SIGNIFICANT CONTRIBUTIONS

The applicant's most significant contributions to date have been: (a) the development of improved methods for investigating and repairing post-tensioned concrete buildings; (b) investigation of the fatigue performance and repair of civil engineering structures; (c) green building techniques.

(a) Inspection and Repair of Post-Tensioned Concrete Buildings [1,6,7,8,9,10,14,18,19,22, 23,24]

The applicant's major research contribution to date has been in the area of post-tensioned concrete buildings. These buildings, which include parking structures, high-rise office and apartment buildings, use high-strength seven-wire steel strands as their primary reinforcement. The strands are not bonded to the concrete, and during construction are tensioned to within about 70% to 80% of the strand's ultimate strength. Corrosion of the strands is a significant problem that raises concerns about the structural safety of these buildings, while owners face a loss of property value[1] and the high cost of inspection, repair, and replacement of the strands[2]. A more recent concern is fire, as it has been found in a number of these buildings that the required concrete cover, which acts as insulation for the strand during a fire, has not been provided in some instances.

The work of the applicant in this area has been four-fold. During his doctoral work, the applicant developed expertise in the mechanics and testing of seven-wire strands with broken wires. As he began his research as a faculty member at Queen's University, the applicant used this expertise to supervise two Master's students who investigated the common inspection methods currently used in Canada for post-tensioned buildings. More recently, the applicant has begun a collaboration with a colleague at Queen's, Dr. Luke Bisby, to investigate the fire resistance of post-tensioned buildings. Finally, the applicant collaborated with another colleague, Dr. Mark Green, to obtain funds from the Intelligent Sensing for Innovative Structures (ISIS) network. This work, due to start in May 2006, will involve using fibre reinforced polymers to replace corroded steel strands.

The applicant developed models of seven-wire strands with wire breaks [6, 8] that account for the load and boundary constraints typical of an unbonded tendon in a post-tensioned concrete building, and the effects of inter-wire friction. The model was published in the Journal of Engineering Mechanics, a prestigious civil engineering journal. A conference presentation [24] resulted in a request to present the findings to a major Canadian consulting firm involved in evaluating and repairing unbonded, post-tensioned concrete buildings [23]. The model was verified using a test apparatus designed by the applicant. It permits 18 metre long lengths of strand to be tested, and incorporates a drape to simulate the conditions in a concrete slab. A paper describing this unique apparatus was presented at the American Concrete Institute (ACI) Annual Conference, the largest gathering of concrete specialists in the world, and published in an ACI Special Publication on large-scale structural testing [14].

The expertise developed by the applicant has been used to improve the current inspection techniques used by engineers. Two Master's level students were supervised during this work. Master's student Li investigated the efficacy of the screwdriver penetration test to find strands with broken wires. This work was presented at the Canadian Society of Civil Engineers (CSCE) conference [19] and has been submitted to the PCI Journal [1]. Master's student Georghiou collaborated with Pawan Gupta, formerly of Halsall Associates and currently with the Post-Tensioning Institute, to investigate the bending stiffness of 7-wire tendons under tension. A Canadian firm, Halsall Associates, has developed a device for measuring the stress of tendons in-situ. Georghiou investigated whether the size of the device can be reduced and still produce accurate results. The results of this work were invited to be published in the Post-Tensioning Institute Journal [7], which is the primary journal for research on post-tensioned concrete construction. Georghiou also presented his results at the annual CSCE conference [18].

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[1] Rickard, S. (1999) "Do Post Tension Structures in Calgary Experience Stigma?" *Assessment Journal*. Vol. 6, No. 6, November 1. pp. 25-28.

[2] American Concrete Institute Committee 423 (1998) "Corrosion and repair of unbonded single strand tendons, ACI 423.4R-98." American Concrete Institute, Farmington Hills, MI, pp. 1-20.

The current work in this field by the applicant will investigate the fire performance of post-tensioned buildings. This work is being co-supervised with Dr. Luke Bisby. Master's student MacLean has designed a furnace to subject seven-wire strands under stress to elevated temperatures to simulate conditions during a fire. Of interest is the behaviour of these strands after the fire, including the degree of relaxation of prestress and the residual strength and stiffness. Review of the literature indicates that there is little data available to guide engineers assessing the safety of a post-tensioned building in the event of a fire. A second project, due to begin in May 2006 and co-supervised with Dr. Mark Green, will investigate using carbon fibre reinforced polymer (CFRP) rods to replace corroded steel strands in a post-tensioned concrete building. CFRP rods are light, easy to handle, and will not corrode, offering significant advantages over using steel strands for replacement.

(b) Fatigue Performance and Repair of Civil Engineering Structures [2, 3, 5, 12, 13, 20]

The applicant's work in this area has been three-fold. The applicant collaborated with Dr. Mark Green to supervise Master's student Shillinglaw in an investigation of the fatigue damage of steel bridges as caused by dynamic loads created by trucks. The dynamic model was developed previously by Green, and the applicant used his expertise in fracture mechanics modeling of fatigue to supervise the implementation of a model to predict fatigue cracking in a steel girder caused by the dynamic loads. The work has been published in the Journal of Bridge Engineering [5].

The applicant has also co-supervised with colleague Dr. Ivan Campbell the modeling and testing of the track-work for an Advanced Rapid Transit (ART) system powered by a linear induction motor (LIM). A model of the trackwork was developed, a finite element model of the cross-tie was implemented, and the cross-tie was tested in the lab. The cross-tie was subjected to static loading to verify the model, and the fatigue loading to ensure the cross-tie is capable of sustaining up to 3×10^6 cycles of service loading. This work contributed to the training of two HQP (Swanson and Shillinglaw). It has resulted in four industry reports [30, 31, 32, 33], and a journal paper which has been submitted to the Journal of Transportation Engineeering [2].

More recent work has been a collaboration with Dr. Patrick Heffernan of the Royal Military College of Canada. The applicant and Dr. Heffernan have supervised the investigation of Master's student DeJong into the fatigue performance of stainless and MMFX^{TM} reinforcement steels for concrete. This work is unique as it aims to bring to Civil Engineering practice a deeper understanding of the process of fatigue. In particular, the effects of periodic overloads and corrosion on the fatigue performance of these steels were investigated. This is critical, as these materials are being proposed for use in bridges, which are subjected to occasional overloads as well as corrosion due to de-icing salt. The results of this work have been submitted to the International Journal of Fatigue [3], one of the most prestigious journals on fatigue related research.

(c) Green Building Techniques [4, 11, 15, 16, 17]

A new and emerging field in structural engineering aims to reduce the impact of our infrastructure on the environment. This is becoming more critical in order to meet Canada's Kyoto protocol obligations as well as to reduce our dependence on fossil fuels. One construction method that has found increasing interest in recent years is plastered straw bale construction. There are approximately 1000 of these homes so far in Canada, and the number of new buildings has been growing rapidly in recent years. Walls are constructed of stacked straw bales which are subsequently covered with a cement or earth based plaster. The goal of the research being conducted by the applicant is to advance and bring this promising construction technique into the mainstream. The applicant is supervising the research of PhD candidate Vardy in this area. The applicant and Vardy are quickly establishing themselves as the foremost researchers on the structural behavior of this construction in Canada. Testing to date has resulted in a paper accepted in the first edition of the Journal of Green Building Design [4], a conference paper [17], and an invited presentation for industry [16].

The applicant is also co-supervising with Dr. L. Bisby and Dr. B. Anderson a cost-benefit analysis of Green Roofs by Master's student Pierre.

2. RESEARCH CONTRIBUTIONS AND PRACTICAL APPLICATIONS

Refereed Journal Publications

1. MacDougall, C., **Li, S.** "Penetration tests for evaluating 7-wire strands with broken wires." *PCI Journal*. Submitted October 2005. (NSERC)
2. MacDougall, C., Campbell, T.I., **Swanson, D.**, **Kim, Y.K.**, Skoblenick, H. (2005) "Behaviour of an integrated cross-tie trackwork system." *American Society of Civil Engineering Journal of Transportation Engineering.* Submitted September 2005. (Bombardier)
3. **DeJong, S.**, Heffernan, P., MacDougall, C. (2005) "Periodic overload corrosion-fatigue of MMFX^{TM} and stainless steels." *International Journal of Fatigue*. Submitted September 2005. (Queen's ARC)
4. **Vardy, S.,** and MacDougall, C. "Compressive testing and analysis of plastered straw bales." (2005) Accepted for publication in *The Journal of Green Building*, August 2005. (Queen's Start-Up)
5. MacDougall, C., Green, M.F., and **Shillinglaw, S.** (2005) "Fatigue damage of steel bridges due to dynamic vehicle loads." *American Society of Civil Engineering Journal of Bridge Engineering*. Accepted for publication July 2005. (NSERC)
6. MacDougall, C. and Bartlett, F.M. "Mechanical model for unbonded 7-wire tendon with a single wire break." *American Society of Civil Engineering Journal of Engineering Mechanics*. Submitted June 2005. (NSERC)
7. MacDougall, C. and **Georghiou, A.** (2005) "Bending of seven wire strands under tension." *Post-Tensioning Institute Journal*, Vol. 3, No. 1, May, pp. 10 – 23. (NSERC)
8. MacDougall, C. and Bartlett, F.M. (2005) "Mechanical model for unbonded 7-wire tendon with symmetric wire breaks." *American Society of Civil Engineering Journal of Engineering Mechanics*. To be published December 2005. (NSERC)
9. MacDougall, C. and Bartlett, F.M. (2003) "Tests of unbonded seven-wire tendon with broken outer wires." *American Concrete Institute Structural Journal*, Vol. 100, No. 5, September/October pp. 581 - 588. (NSERC)
10. MacDougall, C. and Bartlett, F.M. (2002) "Tests of corroded unbonded 7-wire tendon with wire breaks." *American Concrete Institute Structural Journal*, Vol. 99, No. 6, November/December, pp. 803 - 810. (NSERC)

Other Refereed Contributions

11. **Taylor, B.**, **Vardy, S.**, and MacDougall, C. (2005) Compressive strength testing of earthen plasters for straw bale wall application. Submitted October 2005 for presentation at *Advances in Engineering Structures, Mechanics, and Construction Conference*, May 2006, Waterloo, Canada. (Queen's Start-Up)
12. Driver, R.G., Grondin, G.Y. "Fatigue research on High-Performance Steels in Canada." International Association of Bridge and Structural Engineers, *State-of-the-art Report on High Performance Steel*, Structural Engineering Document, Chapter 2.2, published December 2005. (SSEF)
13. DeJong, S., Heffernan, P., MacDougall, C. "Fatigue Testing and Analysis of 316LN Stainless Steel and MMFX Steel for Reinforcement of Concrete Bridges." *7th International Conference on Short and Medium Span Bridges 2006*, Montreal, Quebec. Abstract submitted and accepted, full paper to be submitted January 2006. (Queen's ARC)
14. MacDougall, C. and Bartlett, F.M. "Strongback beam for 7-wire unbonded monostrand evaluation." *American Concrete Institute Special Publication on Large-Scale Structural Testing*, SP-211, Editors M. Issa and Y.L. Mo., 2003, pp. 47-66. (NSERC)

Non-Refereed Contributions

15. **Vardy, S**., and MacDougall, C. (2005) Compressive testing of plastered straw bales and straw bale plasters. Submitted for publication in The Last Straw, The International Journal of Straw Bale and Natural Building. Sept 2005. 12 pg. (Queen's Start-Up)
16. **Vardy, S**., **Taylor, B.,** MacDougall, C. (2005) "Straw bale construction – Research at Queen's University." Invited presentation at *Biofibres Industry Field Day*, Belleville, Canada, August 11. (Queen's Start-Up)
17. **Vardy, S.**, **Tipping, T.**, and MacDougall, C. (2005) Compressive testing and analysis of a typical straw wall plaster. Proceedings of *Engineering Sustainability 2005 Conference*, April, Pittsburgh, U.S.A. (Queen's Start-Up)
18. **Georghiou, A.** and MacDougall, C. (2004) "A Review of the Bending of Seven Wire Strands Under Tension" *5th Structural Specialty Conference, Canadian Society of Civil Engineering Annual Conference,* Saskatoon, June 2- 4. (NSERC)
19. **Li, S** and MacDougall, C. (2004) "A Review of Inspection Methods for Post-Tensioned Buildings" *5th Structural Specialty Conference, Canadian Society of Civil Engineering Annual Conference,* Saskatoon, June 2- 4. (NSREC)
20. MacDougall, C., Driver, R., Grondin, G. (2004) "A state-of-the-art review of high performance steel for bridge design" *Presented at the Transports Quebec 11e Colloque,* Quebec City, May. (SSEF)
21. MacDougall, C., Campbell, T.I., **Shillinglaw, S**., and Skoblenick, H. (2003) "Finite element modeling of an integrated trackwork system." Proceedings of the *Annual Conference of the Canadian Society for Civil Engineering*, Moncton, New Brunswick, June. (Bombardier Corporation)
22. MacDougall, C. and Bartlett, F.M. (2002) "Novel Models for Assessing Unbonded 7-Wire Tendons with Wire Breaks", presented at the *American Concrete Institute Conference 2002*, Open Paper Session, April, Detroit. (NSERC)
23. MacDougall, C. (2000) "Behaviour of Monostrand Tendons with Broken Wires", presented to *Halsall and Associates*, November, Toronto. (NSERC)
24. MacDougall, C. and Bartlett, F.M. (2000) "A Mechanical Model for Monostrand Tendons with Broken Wires", presented at the *American Concrete Institute Conference 2000*, Research in Progress, October, Toronto. (NSERC)

Theses Supervised

25. DeJong, S. (2005) "Fatigue of corrosion resistant reinforcing steels." Master of Science Thesis, Queen's University, Kingston, Ontario, 152 pp. (co-supervised with Dr. P. Heffernan, RMC)
26. Geoghiou, A. (2004) "Lateral stiffness of post-tensioning tendons with corrosion and broken wires." Master of Science Thesis, Queen's University, Kingston, Ontario, 100 pp.
27. Li, S. (2004) "Efficacy of penetration tests for evaluating 7-wire strands with broken wires." Master of Science Thesis, Queen's University, Kingston, Ontario, 122 pp.
28. Shillinglaw, S. (2003) "Dynamic analysis of fatigue damaged steel girders." Master of Science Thesis, Queen's University, Kingston, Ontario, 175 pp. (co-supervised with Dr. M.F. Green)
29. Swanson, D.R. (2003) "Bond strength of corrosion-resistant reinforcing bars." Master of Science Thesis, Queen's University, Kingston, Ontario, 173 pp.

Contributions to Practical Applications of Knowledge

30. Campbell, T.I., MacDougall, C., Swanson, D. (2003) "Field testing of Bombardier floating cross-tie (FXT) track system on tangent track using TV-06 vehicle." Prepared for the Total Transit Systems Division, Bombardier Transportation, Canada, August. (Bombardier Corporation)
31. **Swanson, D**., MacDougall, C., Campbell, T.I. "Fatigue testing of the Bombardier FXT cross-tie." Prepared for the Total Transit Systems Division, Bombardier Transportation, Canada, August 2003. (Bombardier Corporation)

32. **Shillinglaw, S.,** MacDougall, C., Campbell, T.I., "Finite element modeling of the Bombardier FXT cross-tie." Prepared for Total Transit Systems Division, Bombardier Transportation, Canada, August 2002. (Bombardier Corporation)
33. MacDougall, C., Campbell, T.I., "Modeling of the Bombardier FXT track system." Prepared for Total Transit Systems Division, Bombardier Transportation, Canada, September 2002. (Bombardier Corporation)

3. OTHER EVIDENCE OF IMPACT AND CONTRIBUTIONS

Scholarships and Awards

- Faculty Teaching Award, Department of Civil Engineering, Queen's University, 2001
- Graduate Tuition Scholarship, University of Western Ontario, 1997-2001
- Ontario Graduate Student Science and Technology Scholarship, University of Western Ontario, 1999 – 2001
- NSERC PGS B, University of Western Ontario, 1997 – 99

Professional Memberships

American Concrete Association
Professional Engineers of Ontario (registered P. Eng.)

Committees

Associate Member of American Concrete Institute Committee 215 (Fatigue of Concrete), 437 (Strength Evaluation of Existing Structures), 440 (Fiber Reinforced Polymer Reinforcement)
Department of Civil Engineering Headship Search Committee, September 2004 – April 2005
Queen's University Advisory Research Council, Member 2004 - 05, Subcommittee Chair, 2005

Paper Reviews

American Concrete Institute Journal of Structural Engineering – 3 papers
Canadian Journal of Civil Engineering – 2 papers
American Society of Civil Engineering Journal of Bridge Engineering – 1 paper
Kuwait Journal of Science and Engineering – 1 paper

4. DELAYS IN RESEARCH ACTIVITY

Parental leave January 2005 – March 2005.

5. CONTRIBUTIONS TO THE TRAINING OF HIGHLY QUALIFIED PERSONNEL

My primary contribution to training has been through the supervision of undergraduate and graduate level students in research projects. These projects typically involve experimental work, analysis of data, and development of analytical or numerical models. Evidence of the quality of this training are the refereed journal publications that have resulted from this work [1, 2, 3, 4, 5, 7]. Papers have been submitted to journals dedicated to the post-tensioned industry [1, 7], high-quality research journals [2, 3, 5], and journals dedicated to green construction issues [4]. HQP have been given the opportunity to meet industry and research experts through presentations at conferences in Canada [11, 13, 16, 18, 19, 21] and the U.S. [17]. HQP have also had the opportunity to work on industrial research projects [30, 31, 32, 33]. Industry has recognized the quality of this training by hiring these graduates.

A critical aspect of my training philosophy is involving undergraduates in my research. Undergraduates have had to opportunity to participate in research projects and publish the results [11, 16, 17]. Evidence of the impact of this training are the number of these students who have gone on to graduate studies.

Collaborative research is critical in Civil Engineering. For Master's student DeJong [3, 13, 25] I provided expertise in reinforced concrete design, and reviewed the thesis and papers. For Master's student Shillinglaw [5, 28] I provided expertise in fracture mechanics modeling, and reviewed the thesis and paper. For Master's student Swanson [29] I provided expertise in experimental testing and reviewed the thesis.

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Investir dans les gens, la découverte et l'innovation

SEND ONE ORIGINAL ONLY DO NOT PHOTOCOPY

APPENDIX A
Personal Data
(Form 100)

Complete this appendix (i) if you are an applicant or co-applicant applying for the first time; (ii) if you need to update information submitted with a previous application; or (iii) if you do not hold an appointment at a Canadian postsecondary institution. For updates, include only the revised information in addition to the date, your name and your PIN.

This information will be used by NSERC primarily to contact applicants and award holders. It may also be used to identify prospective reviewers and committee members, and to generate statistics. It will not be seen or used in the adjudication process.

Date: 2005/10/27

Family name	Given name	Initial(s) of all given names	Personal identification no. (PIN)
MacDougall	Colin	C	106100

Position and complete mailing address if your primary place of employment is not a Canadian postsecondary institution or if your current mailing address is temporary

If address is temporary, indicate:

Starting date

Leaving date

Telephone number	Facsimile number	E-mail address
(613) 533-2469	(613) 533-2128	colin@civil.queensu.ca

Telephone number (alternate)

Give an alternate telephone number only if you can be reached at that number during business hours.

Gender (completion optional) ☐ Male ☐ Female

LANGUAGE CAPABILITY

English	Read	X	Write	X	Speak	X
French	Read	☐	Write	☐	Speak	☐

I wish to receive my correspondence: in English X in French ☐

AREA(S) OF EXPERTISE

Provide a maximum of 10 key words that describe your area(s) of expertise. Use commas to separate them. If you have expertise with particular instruments and techniques, specify which one(s).

fatigue crack growth modeling, fatigue testing, prestressing strands, structural mechanics, unbonded post-tensioned concrete, large-scale testing, structural engineering, materials testing, green building materials, straw bale construction

Research subject code(s)

Primary: 1100

Secondary: 1105

Canada

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Appendix D (Form 100)
Consent to Provide Limited Personal Information About Highly Qualified Personnel (HQP) to NSERC

NSERC applicants are required to describe their contributions to the training or supervision of highly qualified personnel (HQP) by providing certain details about the individuals they have trained or supervised during the six years prior to their current application. HQP information must be entered on the Personal Data Form (Form 100). This information includes the trainee's name, type of HQP training (e.g., undergraduate, master's, technical etc.) and status (completed, in-progress, incomplete), years supervised or co-supervised, title of the project or thesis, and the individual's present position.

Based on the federal *Privacy Act* rules governing the collection of personal information, applicants are asked to obtain consent from the individuals they have supervised before providing personal data about them to NSERC. In seeking this consent, the NSERC applicant must inform these individuals what data will be supplied, and assure them that it will only be used by NSERC for the purpose of assessing the applicant's contribution to HQP training. To reduce seeking consent for multiple applications, applicants will only need to seek consent one time for a six-year period. If the trainee provides consent by e-mail, the response must include confirmation that they have read and agree to the text of the consent form.

When consent cannot be obtained, applicants are asked to not provide names, or other combinations of data, that would identify those supervised. However, they may still provide the type of HQP training and status, years supervised or co-supervised, a general description of the project or thesis, and a general indication of the individual's present position if known.

An example of entering HQP information on Form 100 (with and without consent):

Name	Type of HQP Training and Status	Years Supervised or Co-supervised	Title of Project or Thesis	Present Position
Consent Received from Marie Roy				
Roy, Marie	Undergraduate (Completed)	Supervised 1994 - 1997	Isotope geochemistry in petroleum engineering	V-P (Research), Earth Analytics Inc., Calgary, Alberta
Consent Not Obtained from Marie Roy				
(name withheld)	Undergraduate (Completed)	Supervised 1994 - 1997	Isotope geochemistry	research executive in petroleum industry - western Canada

Consent Form

Name of Trainee

Applicant Information

Name MacDougall, Colin C

Department: Civil Engineering

Postsecondary Institution: Queen's

I hereby allow the above-named applicant to include limited personal data about me in grant applications submitted for consideration to NSERC for the next six years. This limited data will only include my name, type of HQP training and status, years supervised or co-supervised, title of the project or thesis and, to the best of the applicant's knowledge, my position title and company or organization at the time the application is submitted. I understand that NSERC will protect this data in accordance with the *Privacy Act*, and that it will only be used in processes that assess the applicant's contributions to the training of highly qualified personnel (HQP), including confidential peer review.

_____ _____
Trainee's signature Date

Note: This form must be retained by the applicant and made available to NSERC upon request.