

Fire Advisory Panel

Charley Fleischmann has joined a group of leading fire experts on the Fire Advisory Panel, set up by the former BIA, now the Department of Building and Housing. The panel has been established following concerns that the Government does not have sufficient links with the fire safety industry. The panel can identify important fire safety issues at an early stage so that they can be appropriately acted on.

BA training and house burns

Stuart Harris, Andrew Tsui, Mike Spearpoint, and Madelein Nilsson (see photo, front row, L – R) attended a two-day Grade 2 Breathing Apparatus (BA) course at the NZFS Woolston Fire Training Centre.



Research sponsorship

Research projects undertaken by our students often need money to pay for equipment and materials, particularly where there is experimental work involved. The Department of Civil Engineering provides limited financial assistance and we are also able to use a small portion of the New Zealand Fire Service Commission sponsorship money to help students with their research. However, we are grateful to several other significant sources of funding which allow us to continue a range of projects:

- Winstone Wallboards Ltd provided materials and advice for a project on fire performance of Gib® Gypsum Plasterboard.
- Carter Holt Harvey Futurebuild provided materials and half of the funding for an Enterprise Scholarship (matched government funding) for a study on fire performance of LVL (laminated veneer lumber).



Further opportunities for students are likely to be offered to do this course where spare places are available.

Students also attended several of the training house burns organised by the NZFS for volunteer crews. Those who had completed the Grade 2 BA course were able to take part in some of the exercises and get some first-hand experience of fighting structure fires. Thanks to Gary Luff and Alan Merry for helping out with these activities.

Congratulations to the students who completed the MEFE degree in 2004

<i>Stuart Harris</i>	<i>Warren Lane</i>
<i>Roger Harrison</i>	<i>Yuguang Li</i>
<i>Geoff Hill</i>	<i>Chu Ngu</i>
<i>Kristin Hoskin</i>	<i>Jonathan Shelley</i>
<i>Fadi Jirjees</i>	<i>Grant Wang</i>

Staff news and laboratory developments

We are glad to welcome Bob Smith to the Fire Engineering team as our new technician. Bob is originally from the UK and is a plumber by trade. He also served with the Nottinghamshire Police force where some of his duties included tutoring new recruits. Andy Buchanan will be on study leave in 2005 and plans to spend some of that time catching up on current structural design practices throughout New Zealand.

Our laboratory facilities continue to be developed. This year we successfully completed commissioning of the heated wind tunnel (shown right) and the apparatus has been used by students taking the Fire Safety Systems course as well as forming part of the Master's project work carried out by Andrew Tsui.



We have also constructed a small-scale furnace (shown above) that is used for testing structural connections under fire conditions. A first phase of testing has been completed by Stu Harris and further work is planned for 2005 by James Lau.

Fire visits

Several post-incident fire visits were made during the year in association with Alan Taylor and Alan Merry from the NZFS. The visits included a significant rural fire on the outskirts of Christchurch, a fire at an abandoned school and a fire in a sports hall.

Visitors

This year we welcomed exchange students Oskar Eriksson and Madelein Nilsson from Lund University. Dr Peter Cumber from Heriot Watt University, Scotland spent 10 weeks as a visitor to the department. Peter's area of interest is natural gas fire research and he was particularly interested in the video techniques we have been using to measure flame lengths.

We also hosted a visit from Dr Ing Michael Reick. Michael is a Fire Officer with the German Fire Service in a region near Stuttgart in Southern Germany and

he also lectures at the Fachhochschule Biberach (Biberach University of Applied Sciences). Michael was interested in finding out more about how we run our Master's programme as well as gaining further knowledge about computer fire models and their use in practice. With his background in structural fire engineering he contributed to ongoing work on connections in fire. He also spent time visiting New Zealand Fire Service to investigate its differences and similarities with the German Fire Service.

Conferences and visits

Interflam 2004 International Fire Engineering Conference, Edinburgh, UK
C M Fleischmann, R Harrison

3rd International Conference on Human Behaviour in Fire, Belfast, UK, Sept 2004
K Hoskin

Third International Workshop on Structures in Fire, Ottawa, Canada, May 2004.
A H Buchanan, P J Moss

World Conference on Timber Engineering, Lahti, Finland, June 2004
P J Moss

NZ Society of Earthquake Engineering Annual Conference, Rotorua, March 2004.
A H Buchanan, G Sharp

18th Australasian Conf on the Mechanics of Structures and Materials, Perth, April 2004.
P J Moss

South American Structural Engineering Conference, Mendoza, Argentina, May 2004.
A H Buchanan

PhD Research

Tony Parkes: Tony has recently completed a series of pool fire experiments in a ½ domestic scale compartment using three ventilation geometries (fully open, soffit, and door), and heptane pool fires located in three evenly distributed locations within the compartment (rear, centre and front). The results have shown that the location of the fire can have a pronounced effect on pool fires, and can promote a transitional phase between a pre-flashover fire and a post flashover fire depending upon the location of the fire. This is a continuation of Tony's study into radiation compartment effects and will provide valuable information to the study of pre and post-flashover compartment fires.

Jerry Chang: Jerry is investigating the interaction between the hollow-core concrete slab flooring systems and their supports. This research is part of the Future Building Systems research programme funded by FRST. The aim of this research is to evaluate and to improve the fire

performance of flooring systems with seismic-resistant connections designed by other researchers in the department. The study will be conducted using a non-linear finite element program, SAFIR. Simulation models are currently being developed and will be validated using existing test data.

Mike Spearpoint: Mike continues to work on methods to exchange object-oriented CAD data with computer fire models. He is in the process of writing software that will extract elements from a standardised "building product model" in a form that can be interpreted by a range of currently available fire simulation tools. Recent efforts have identified the architectural and fire engineering entities in the "building product model" that are appropriate to the exchange process. Work is now ongoing to develop the software to extract these entities, establish their inter-relationships and determine their associated properties.

Courses 2005 – 2006

With Andy Buchanan away for 2005 we will not be offering a course in Structural Fire Engineering until the first semester in 2006. However, we are privileged to have Prof Dave Purser visiting the University in the second half of 2005 to teach a course in Human Behaviour in Fire. The course will be available to all current Masters students and will also be accessible to a limited number of outside participants. We also hope to run a series of professional short-courses in Christchurch, Wellington and Auckland while Dave is here and there is the opportunity to extend the series to other locations if there is sufficient demand.

The course timetable for 2005 and 2006 is shown below. Students starting the degree in February 2005 who want to take Structural Fire Engineering have to take five courses (including the 4 compulsory courses) in 2005 and take the final course in 2006, at the same time as completing their thesis.

2005

Semester I

ENFE 602 * Fire Dynamics
Charley Fleischmann

ENFE 603 * Fire Safety Systems
Mike Spearpoint

ENFE 611 Risk Assessment
Erica Dalziell

Semester II

ENFE 604 * Fire Design Case Study
Mike Spearpoint

ENFE 610 * Advanced Fire Dynamics
Charley Fleischmann

ENFE 613 Human Behaviour in Fire
Dave Purser

2006

Semester I

ENFE 601 Structural Fire Engineering
Andy Buchanan

ENFE 602 * Fire Dynamics
Charley Fleischmann

ENFE 611 Risk Assessment
Erica Dalziell

Semester II

ENFE 603 * Fire Safety Systems
Mike Spearpoint

ENFE 604 * Fire Design Case Study
Mike Spearpoint

ENFE 610 * Advanced Fire Dynamics
Charley Fleischmann

* compulsory courses

Overseas Opportunities in fire engineering

Sentinel Engineering is a specialist recruitment group operating internationally in the Fire Engineering sector. We recognise that from the engineer's perspective, it is a real problem to accurately identify applicable companies in your given geographical area and ascertain which of these organisations actually seeks individuals of a comparative level. Over the past four years, Sentinel has established an excellent reputation for providing this specialist service to professional Fire Engineers based all over the world – we are currently assisting people in New Zealand, Australia, USA, Canada, Hong Kong, China, Singapore and many locations in Europe.

This established reputation as a link for professional Fire Engineers means that the majority of the world's leading fire engineering specialists notify us as to their staffing requirements the moment that they are authorised. It has also caused many of the newly operating companies to seek our assistance in developing competent fire engineering divisions.

We are very pleased to be working with the University of Canterbury in assisting Fire Engineers with their career advancement. Our clients are continually impressed with the high level of technical expertise displayed by graduates of this particular university, as well as the determination for further development shown by more experienced engineers.


If you are soon to graduate, have recently graduated or are an experienced engineer who is simply interested in discovering what opportunities are available to you, please do not hesitate to contact us for an informal, confidential discussion.

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Korean delegation

The Department welcomed a delegation of senior government officials and researchers from South Korea who were visiting New Zealand as part of their investigation into performance-based fire codes. The visitors were given presentations on New Zealand's performance-based regulatory system, the Fire Engineering programme and some aspects of the current structural fire modelling research.



Fire Engineering Research Reports

- 03/8 G Sharp
Earthquake Damage to Passive Fire Protection Systems in Tall Buildings and its Impact on Fire Safety
- 03/9 S Ko
Comparison of Evacuation Times using Simulex and EvacuatioNZ Based on Trial Evacuations
- 04/1 R Harrison
Smoke Control in Atrium Buildings: A Study of the Thermal Spill Plume
- 04/2 Y Li
Assessment of Vehicle Fires in NZ Parking Buildings
- 04/3 J Shelley
Tenability Analysis of Television Fires in a Sprinkler Protected Compartment
- 04/4 K Hoskin
Fire Protection and Evacuation Procedures of Stadia Venues in New Zealand

For more information please contact:

Fire Engineering

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Website: www.civil.canterbury.ac.nz/fire/firehome.html

Recent Publications

- Buchanan A H. International Developments in Design for Structural Fire Safety. Proceedings, XXXI Meeting - South American Structural Engineering Conference, Mendoza, Argentina. May 2004. (Invited lecture).
- Fleischmann C M, Hill G R. Burning Behaviour of Upholstered Furniture, INTERFLAM 2004, Proc. of the 9th International Conference, 2004: 907-916.
- Gerlich H, McLellan D, Buchanan A H, Barnett C. Predicting the Performance of Drywall Construction Exposed to Design Fires. Proceedings, Interflam 2004 Fire Science and Engineering Conference, Edinburgh, Scotland. July 2004.
- Harris S, Lane W, Buchanan A H, and Moss P J. Fire Performance of Laminated Veneer Lumber (LVL) with Glued-in Steel Rod Connections. Proc. of SiF'04 - Structures in Fire Symposium, Ottawa, Canada. May 2004, 411-424.
- Harrison R, Spearpoint M J. Thermal spill plume studies for the design of smoke control systems. Proc. Interflam 2004, Heriot-Watt University, Edinburgh, 5-7 July 2004.
- Hoskin K, Spearpoint M J. Crowd characteristics and egress at stadia. Proc. 3rd International Conference on Human Behaviour in Fire. 1-3 Sept, Belfast 2004.
- Kim W H, Kim J H, Spearpoint M J. Analysis of pre-movement time in the Simulex model [in Korean]. Proc. of Korean Institute of Fire Science and Engineering, pp. 252-257, Nov 2004.
- Lane W, Buchanan A H, Moss P J. FCharring and Load Tests on LVL under Fire Exposure. Developments in Mechanics of Structures and Materials, Perth, Australia. Dec 2004. pp 555-560.
- Lane W, Buchanan A H, Moss P J. Fire Performance of Laminated Veneer Lumber (LVL). Proc. World Conference on Timber Engineering, Lahti, Finland, June 2004, Vol 3, pp 473-478.
- Lim L, A H Buchanan, Moss P J. Analysis and Design of Reinforced Concrete Slabs Exposed to Fires. Proceedings SiF 04 - Structures in Fire Symposium, Ottawa, Canada. May 2004, pp 353-368.
- Lim L, Buchanan A H, Moss P J. Restraint of Fire-Exposed Concrete Floor Systems. Fire and Materials, Vol 28, No 2-4, pp 95-126. 2004.
- Lim L, Buchanan A H, Moss P J, Franssen J-M. Numerical Modelling of Two-way Reinforced Concrete Slabs in Fire. Engineering Structures. Vol 26, pp 1081-1091. 2004.
- Moss P J, Buchanan A H, Seputro J, Welsh R. Effect of Support Conditions on the Behaviour of Steel Beams in Fire. Australian Journal of Structural Engineering, Vol 5, No 2, pp 89-98. 2004.
- Moss P J, Buchanan A H, Seputro J, Wastney C, Welsh R. Effect of Support Conditions on the Fire Behaviour of Steel and Composite Beams. Fire and Materials, Vol 28, No 2-4, pp 159-176. 2004.
- Sharp G S, Buchanan A H. Earthquake Damage to Passive Fire Protection Systems in Tall Buildings. Proceedings, New Zealand Society of Earthquake Engineering Annual Conference, Rotorua. March 2004. Paper No.34, 6pp.
- Spearpoint M J. Fire engineering in New Zealand. Bi-lagen, University of Lund, Sweden, 2/2004, pp.28. 2004.