



File No. 1617-0763

21 FEB 2017

Ms Nicola Wolley
fyi-request-5110-72a5a25b@requests.fyi.org.nz

Dear Ms Wolley

Thank you for your email of 18 December 2016 requesting for the following information under the Official Information Act 1982 (the Act):

- 1. Please provide the full contracts and/or terms of engagements, including remuneration for Dr Brian Meacham and Dr Brian Ashe, where engaged by MBIE since year starting 2013.*
- 2. Please provide all reports provided to MBIE by Dr Brian Meacham and/or Dr Brian Ashe.*

Two documents have been found within the scope of your request and are released to you:

1. Contract for Services – Meacham Associates
2. New Zealand Building Fire Regulatory System Review – Draft Final Report 13 April 2016

Some information contained within the documents has been withheld under the following sections of the Act:

- | | |
|-------------|---|
| 9(2)(a) | to protect the privacy of natural persons. |
| 9(2)(b)(ii) | to protect information where the making available of the information would be likely unreasonably to prejudice the commercial position of the person who supplied or who is the subject of the information. |

In relation to the parts of your request that relate to Dr Brian Ashe, I can confirm that Dr Ashe was not engaged with the Ministry of Business, Innovation and Employment (MBIE) and did not provide any reports to MBIE.

It should be noted that the New Zealand Building Fire Regulatory System Review document is a report prepared by Dr Meacham, and reflects his views, and not those of MBIE. I bring your attention to Dr Meacham's disclaimer on page 7 of the report that states this.

The report was finalised in April 2016 and I am pleased to say that much work has taken place since then. The MBIE Fire Programme, which was an extensive stakeholder engagement programme, was well progressed at the time of publication of the draft report. The programme had already identified and incorporated aspects of Dr Meacham's report. As such, the report should not be interpreted as an accurate representation of the industry currently.

Building, Resources & Markets

15 Stout Street, PO Box 1473, Wellington 6140 New Zealand
E info@mbie.govt.nz T +64 4 472 0030
W www.mbie.govt.nz

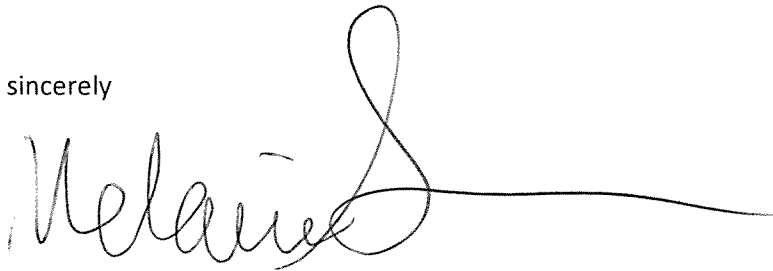
Finally, throughout the report, Dr Meacham makes references to the Building Act 2004, the Building Code and associated regulations. Whilst MBIE is responsible for the this legislation and regulations, they are the responsibly of the wider Building and System Performance Branch, not the Fire Programme team.

You have the right under section 28(3) of the Act to ask the Ombudsman to investigate and review my decision. The relevant contact details are:

The Ombudsman
Office of the Ombudsman
PO Box 10 162
WELLINGTON 6143

0800 802 602
www.ombudsman.parliament.nz

Yours sincerely

A handwritten signature in black ink, appearing to read 'Melanie', followed by a long horizontal flourish extending to the right.

Melanie Smith
Acting Manager, Engineering Design and Science
Building System Performance

<h1 style="margin: 0;">Contract for Services</h1>		<h1 style="margin: 0;">Ministry of Business, Innovation & Employment</h1>
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Engineering Services

The Parties	
Ministry of Business, Innovation and Employment	(Buyer)
15 Stout Street, Wellington 6140	
and	
MEACHAM ASSOCIATES	(Supplier)
s 9(2)(a)	

The Contract

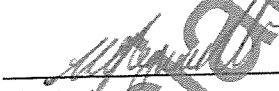

Agreement
 The Buyer appoints the Supplier to deliver the Services described in this Contract and the Supplier accepts that appointment. This Contract sets out the Parties' rights and obligations.

- The documents forming this Contract are:**
- | | |
|---|------------|
| 1. This page | Page 1 |
| 2. Contract Details and Description of Services | Schedule 1 |
| 3. Standard Terms and Conditions | Schedule 2 |
| GMC Form 1 SERVICES Schedule 2 (2nd Edition) available at: www.procurement.govt.nz | |
| 4. Any other attachments described at Schedule 1. | |

- How to read this Contract**
5. Together the above documents form the whole Contract.
 6. Any Supplier terms and conditions do not apply.
 7. Clause numbers refer to clauses in Schedule 2.
 8. Words starting with capital letters have a special meaning. The special meaning is stated in the Definitions section at clause 17 (Schedule 2).

Acceptance

In signing this Contract each Party acknowledges that it has read and agrees to be bound by it.

For and on behalf of the Buyer :  _____ (signature)		For and on behalf of the Supplier :  _____ (signature)	
name:	Adrian Regnault	name:	Brian Meacham
position:	General Manager, Building System Performance	position:	Director Meacham Associates
date:	15/9/2015	date:	15/9/2015

Schedule 1

Contract Details and Description of Services

Start Date	1 February 2016	Reference Schedule 2 clause 1	
End Date	30 April 2016	Reference Schedule 2 clause 1	
Contract Managers			
Reference Schedule 2 clause 4	Buyer's Contract Manager		Supplier's Contract Manager
	Name:	Mike Stannard	Brian Meacham
	Title / position:	Chief Engineer	Meacham Associates s 9(2)(a)
	Address:	15 Stout Street, Wellington 6140	
	Phone:	04 901 8376 027 438 9300	
Email:	mike.stannard@mbie.govt.nz	bmeacham@wpi.edu	
Addresses for Notices			
Reference Schedule 2 clause 14	Buyer's address		Supplier's address
	For the attention of:	Mike Stannard	Brian Meacham
	Delivery address:	15 Stout Street, Wellington 6140	s 9(2)(a)
	Postal address:	PO Box 1473, Wellington 6140	
Email:	mike.stannard@mbie.govt.nz	bmeacham@wpi.edu	
Supplier's Approved Personnel			
Reference Schedule 2 clause 2.5	Approved Personnel		
	Name:	Brian Meacham	
	Position:	Director	
Specialisation:	Performance based building codes		
Description of Services			
Context			
<p>In 2012 new fire protection clauses for the Building Code, C1 to C6 Protection from Fire, replaced previous Fire Safety clauses. These new fire protection clauses were supported with a new set of Acceptable Solutions and a Verification Method. The Ministry of Business, Innovation and Employment (MBIE) completed a review and revision of the new requirements in 2014. Stakeholders have provided feedback and MBIE has, with input from the supplier, developed a programme of work to systematically address the issues to achieve more effective implementation and operation of fire protection arrangements. This comprises a Fire Development Programme with 14 projects, approximately half will be active at any point in time, and running for 18 months to the end of 2016 when it will be refreshed. This programme is a collaborative sector-wide approach for attaining over time an effective and efficient best practice regulatory system for fire safety in New Zealand. International expertise is necessary to provide input and ensure that outputs are robust and visibly tested.</p> <p>Additionally, MBIE would like advice on the principles of a performance based building code system, looking to international best practice as a framework for the development of the NZ Building Code and its supporting documents. Again, international expertise is important.</p>			
Description of services			
The supplier will provide the following services:			
<ul style="list-style-type: none"> • Providing input to Fire Review Programme 			

- Provide input into the development of the Building Code framework
 - Assisting in ensuring that outputs are robust and visibly tested
 - Assisting and providing guidance to project and programme leads as required.
- Performance Standards/Quality controls**
- Work is carried out in a timely and efficient manner
 - Agreed levels of service are met
 - Quality project deliverables are delivered on time and on budget
 - Ensure a sound understanding of, demonstrate commitment to and comply with all legislation and the Buyer's Policies relevant to the role and all activities undertaken in that role; in particular the Buyer's policy on Conflicts of Interest.
 - Management and external reports are delivered to specification and on time.
 - Strong organisational, presentation, and customer service skills.
 - Reporting to the Chief Engineer, Ministry of Business, Innovation and Employment.
- Transfer of records
 - The supplier must promptly return any project records created during this contract that are identified as the Buyer's Intellectual Property.

Supplier's Reporting Requirements	Report to:	Type of report	Frequency
Reference Schedule 2 clause 5	Contract Manager	Verbal progress update	As Required

CHARGES: The following section sets out the Charges. Charges are the total maximum amount payable by the Buyer to the Supplier for delivery of the Services. Charges include Fees, and where agreed, Expenses and Daily Allowances. The Charges for this Contract are set out below.

Fees	Hourly fee rate
Reference Schedule 2 clause 3	For each hour worked an Hourly Fee Rate of s 9(2)(b)(ii) excluding GST up to a maximum of s 9(2)(b) hours. Plus travel and expenses, per below s 9(2)(b)(ii) one off payment. Total Contract value - \$US 35,000

Expenses	Accommodation and Flights to New Zealand
Reference Schedule 2 clause 3	MBIE agrees to pay the Supplier for travel and incidental expenses of s 9(2)(b)(ii) for travel to and from the US for the approximately eight week visit to Wellington from January to March 2016. This amount is payable on the signing of the contract. MBIE also agrees to pay accommodation for the supplier whilst in Wellington during this period, up to a maximum of 28 days. Actual and reasonable — general Expenses The Buyer will pay the Supplier's actual and reasonable Expenses incurred in delivering the Services provided that: <ol style="list-style-type: none"> a. the Buyer has given prior written consent to the Supplier incurring the Expense b. the Expense is charged at actual and reasonable cost, and c. the claim for Expenses is supported by GST receipts.

Daily Allowance	No Daily Allowances are payable.
Reference Schedule 2 clause 3	

Invoices	The Supplier must send the Buyer an invoice for the Charges at the following times:
Reference Schedule 2 Subject to clauses 3 and	At the end of the month, for Services delivered during that month.

11.7	The tax invoice will specify <u>Cost Centre 6474</u> and be to the attention of <u>Savita Parbhu</u> .
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Address for invoices Reference Schedule 2 clause 3	Buyer's address	
	For the attention of:	Savita Parbhu
	Email:	<u>mbie_invoices@globalservicesmail.fxnz.co.nz</u>

Insurance Reference Schedule 2 Clause 8.1	<p>(clause 8.1 Schedule 2)</p> <p>The Supplier must have and maintain appropriate insurance cover including public liability and professional indemnity cover in the amounts of:</p> <ul style="list-style-type: none"> a. Public liability insurance of \$500,000. b. Professional indemnity insurance of \$500,000 in the aggregate <p>for each event or series of related events relating to this contract during the period of, and for a period of 12 months following the completion of this contract.</p>
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Changes to Schedule 2 and additional clause/s	<p>Additional Clauses</p> <p>Schedule 2 of this contract is amended as follows:</p> <p>Clause 11.5 sub-clauses (g) and (i) are deleted and replaced with:</p> <p>"g. is in material breach of any of its obligations under this Contract and the breach cannot be remedied".</p> <p>"i. does something or fails to do something that, in the Buyer's reasonable opinion, results in damage to the Buyer's reputation or business or the reputation or business of the Crown".</p> <p>Clause 12.6 is deleted and replaced with:</p> <p>"The Supplier indemnifies the Buyer (as The Crown) in respect of any expenses, damage or liability incurred by the Buyer or The Crown in connection with any third party Intellectual Property claim that the delivery of the Services or Deliverables to the Buyer or the Buyer's or The Crown's use of them, infringes a third party's Intellectual Property rights. This indemnity is not subject to any limitation or cap on liability that may be stated elsewhere in this Contract."</p> <p>A new clause is inserted as follows:</p> <p>"To the extent permitted by law and whether arising in contract, tort, under indemnity or otherwise:</p> <ul style="list-style-type: none"> a. The maximum aggregate liability of the Supplier to the Buyer for any loss, damage or claim shall be five times the fee (exclusive of GST and disbursements) with a maximum limit of \$500,000; b. The Supplier shall not be liable for any indirect, special or consequential loss, loss of profit, savings, use, production, or data; c. The Supplier shall not be considered liable for any loss, damage or claim arising from the Services unless a claim is formally made on it within six years from performance of the Services giving rise to the liability; d. If the Supplier is found liable to the Buyer and the Buyer and/or any third party has contributed to the loss or damage, the Supplier shall only be liable strictly to the proportional extent of its own contribution. <p>This clause will remain in force on expiry or termination of this Contract."</p>
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Attachments Reference 'Contract documents' described at Page 1	Statement concerning potential or actual conflicts of interest (Appendix 1)
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Appendix 1

STATEMENT CONCERNING POTENTIAL OR ACTUAL CONFLICTS OF INTEREST

To:
(Name and title of Manager)

I, declare
(Name of person, business or company)

* I am not aware of any potential or actual conflicts of interest between and the Ministry of Business, Innovation and Employment.

* I am aware of the following potential conflicts of interest
.....
(list potential conflicts of interest)

and/or the following actual conflicts of interest
.....
(list actual conflicts of interest)

between and the
(Name of person, business or company)
Ministry of Business, Innovation and Employment.

I agree to disclose any conflicts of interest that may arise in the future.

Signed by

.....
(Name of person authorised to sign on behalf of the company or business)

.....
(Date)

* Delete whichever option is inapplicable

Schedule 2

Standard Terms and Conditions - Services

1. Length of Contract

- 1.1 This Contract starts on the Start Date. Services must not be delivered before the Start Date.
- 1.2 This Contract ends on the End Date unless terminated earlier.

2. The Services

Both Parties' obligations

- 2.1 Both Parties agree to:
 - a. act in good faith and demonstrate honesty, integrity, openness and accountability in their dealings with each other
 - b. discuss matters affecting this Contract or the delivery of the Services, whenever necessary
 - c. notify each other immediately of any actual or anticipated issues that could:
 - i. significantly impact on the Services or the Charges
 - ii. receive media attention, and
 - d. comply with all applicable laws and regulations

Buyer's obligations

- 2.2 The Buyer must:
 - a. provide the Supplier with any information it has reasonably requested to enable the delivery of the Services
 - b. make decisions and give approvals reasonably required by the Supplier to enable delivery of the Services. All decisions and approvals must be given within reasonable timeframes, and
 - c. pay the Supplier the Charges for the Services as long as the Supplier has delivered the Services and invoiced the Buyer, all in accordance with this Contract.

Supplier's obligations

- 2.3 The Supplier must deliver the Services:
 - a. on time and to the required performance standards or quality set out in Schedule 1 or reasonably notified by the Buyer to the Supplier from time to time
 - b. within the amounts agreed as Charges, and
 - c. with due care, skill and diligence, and to the appropriate professional standard or in accordance with good industry practice as would be expected from a leading supplier in the relevant industry.
- 2.4 The Supplier must:
 - a. ensure that its Personnel have the necessary skills, experience, training and resources to successfully deliver the Services
 - b. provide all equipment and resources necessary to deliver the Services, and
 - c. comply with the *Standards of Integrity and Conduct* issued by the State Services Commission (see www.ssc.govt.nz) and any other relevant codes of conduct listed in Schedule 1 or notified by the Buyer to the Supplier from time to time.
- 2.5 Where an Approved Personnel has been authorised by the Buyer in Schedule 1, the Supplier must use the Approved Personnel in delivering the Services. The Supplier must obtain the Buyer's prior written approval if it wishes to change any Approved Personnel.
- 2.6 If the Supplier is at the Buyer's premises, the Supplier must observe the Buyer's policies and procedures, including those relating to health and safety, and security requirements. The Buyer must tell the Supplier what the relevant policies and procedures are, and either give the Supplier a copy of them or provide an internet link.

- 2.7 If the nature of the Services requires it, the Supplier will deliver Services:
- a. in a manner that is culturally appropriate for Māori, Pacific and other ethnic or indigenous groups, and
 - b. that respects the personal privacy and dignity of all participants and stakeholders.

3. Charges and payment

Charges & invoices

- 3.1 The Charges are the total maximum amount payable by the Buyer to the Supplier for delivery of the Services. Charges include Fees and, where agreed, Expenses and Daily Allowances.
- 3.2 The Supplier must provide valid tax invoices for all Charges on the dates or at the times specified in Schedule 1. The Buyer has no obligation to pay the Charges set out on an invoice, which is not a valid tax invoice. A valid tax invoice must:
- a. clearly show all GST due
 - b. be in New Zealand currency or the currency stated in Schedule 1
 - c. be clearly marked 'Tax invoice'
 - d. contain the Supplier's name, address and GST number, if the Supplier is registered for GST
 - e. contain the Buyer's name and address and be marked for the attention of the Buyer's Contract Manager or such other person stated in Schedule 1
 - f. state the date the invoice was issued
 - g. name this Contract and provide a description of the Services supplied, including the amount of time spent in the delivery of the Services if payment is based on an Hourly Fee Rate or Daily Fee Rate
 - h. contain the Buyer's contract reference or purchase order number if there is one
 - i. state the Charges due, calculated correctly, and
 - j. be supported by GST receipts if Expenses are claimed and any other verifying documentation reasonably requested by the Buyer.

Payment

- 3.3 If the Buyer receives a valid tax invoice on or before the 3rd Business Day of the month, the Buyer must pay that tax invoice by the 20th calendar day of that month. Any valid tax invoice received after the 3rd Business Day of the month will be paid by the Buyer on the 20th calendar day of the month following the month it is received. The Buyer's obligation to pay is subject to clauses 3.2, 3.4 and 11.10.
- 3.4 If the Buyer disputes a tax invoice or any part of a tax invoice that complies with clause 3.2, the Buyer must notify the Supplier within 10 Business Days of the date of receipt of the tax invoice. The Buyer must pay the portion of the tax invoice that is not in dispute. The Buyer may withhold payment of the disputed portion until the dispute is resolved.

4. Contract management

Contract Manager

- 4.1 The persons named in Schedule 1 as the Contract Managers are responsible for managing the Contract, including:
- a. managing the relationship between the Parties
 - b. overseeing the effective implementation of this Contract, and
 - c. acting as a first point of contact for any issues that arise.

Changing the Contract Manager

- 4.2 If a Party changes its Contract Manager it must tell the other Party, in writing, the name and contact details of the replacement within 5 Business Days of the change.

5. Information management

Information and Records

- 5.1 The Supplier must:
- keep and maintain Records in accordance with prudent business practice and all applicable laws
 - make sure the Records clearly identify all relevant time and Expenses incurred in providing the Services
 - make sure the Records are easy to access, and
 - keep the Records safe.
- 5.2 The Supplier must give information to the Buyer relating to the Services that the Buyer reasonably requests. All information provided by the Supplier must be in a format that is usable by the Buyer, and delivered within a reasonable time of the request.
- 5.3 The Supplier must co-operate with the Buyer to provide information immediately if the information is required by the Buyer to comply with an enquiry or its statutory, parliamentary, or other reporting obligations.
- 5.4 The Supplier must make its Records available to the Buyer during the term of the Contract and for 7 years after the End Date (unless already provided to the Buyer earlier).
- 5.5 The Supplier must make sure that Records provided by the Buyer or created for the Buyer, are securely managed and securely destroyed on their disposal.

Reports

- 5.6 The Supplier must prepare and give to the Buyer the reports stated in Schedule 1, by the due dates stated in Schedule 1.

6. The contractual relationship

Independent contractor

- 6.1 Nothing in this Contract constitutes a legal relationship between the Parties of partnership, joint venture, agency, or employment. The Supplier is responsible for the liability of its own, and its Personnel's, salary, wages, holiday or redundancy payments and any GST, corporate, personal and withholding taxes, ACC premiums or other levies attributable to the Supplier's business or the engagement of its Personnel.

Neither Party can represent the other

- 6.2 Neither Party has authority to bind or represent the other Party in any way or for any purpose.

Permission to transfer rights or obligations

- 6.3 The Supplier may transfer any of its rights or obligations under this Contract only if it has the Buyer's prior written approval. The Buyer will not unreasonably withhold its approval.

7. Subcontractors

Rules about subcontracting

- 7.1 The Supplier must not enter into a contract with someone else to deliver any part of the Services without the Buyer's prior written approval. In selecting an appropriate Subcontractor the Supplier must be able to demonstrate value for money.

The Supplier's responsibilities

- 7.2 The Supplier is responsible for ensuring the suitability of any Subcontractor and the Subcontractor's capability and capacity to deliver that aspect of the Services being subcontracted.
- 7.3 The Supplier must ensure that:
- each Subcontractor is fully aware of the Supplier's obligations under this Contract, and
 - any subcontract it enters into is on terms that are consistent with this Contract.

- 7.4 The Supplier continues to be responsible for delivering the Services under this Contract even if aspects of the Services are subcontracted.

8. Insurance

Where insurance is a requirement

- 8.1 It is the Supplier's responsibility to ensure its risks of doing business are adequately covered, whether by insurance or otherwise. If required in Schedule 1, the Supplier must have the insurance specified in Schedule 1 and the Supplier must:
- take out insurance, with a reputable insurer, and maintain that insurance cover for the term of this Contract and for a period of 3 years after the End Date, and
 - within 10 Business Days of a request from the Buyer provide a certificate confirming the nature of the insurance cover and proving that each policy is current.

9. Conflicts of Interest

Avoiding Conflicts of Interest

- 9.1 The Supplier warrants that as at the Start Date, it has no Conflict of Interest in providing the Services or entering into this Contract.
- 9.2 The Supplier must do its best to avoid situations that may lead to a Conflict of Interest arising.

Obligation to tell the Buyer

- 9.3 The Supplier must tell the Buyer immediately, and in writing, if any Conflict of Interest arises in relation to the Services or this Contract. If a Conflict of Interest does arise the Parties must discuss, agree and record in writing whether it can be managed and, if so, how it will be managed. Each Party must pay its own costs in relation to managing a Conflict of Interest.

10. Resolving disputes

Steps to resolving disputes

- 10.1 The Parties agree to use their best endeavours to resolve any dispute or difference that may arise under this Contract. The following process will apply to disputes:
- a Party must notify the other if it considers a matter is in dispute
 - the Contract Managers will attempt to resolve the dispute through direct negotiation
 - if the Contract Managers have not resolved the dispute within 10 Business Days of notification, they will refer it to the Parties' senior managers for resolution, and
 - if the senior managers have not resolved the dispute within 10 Business Days of it being referred to them, the Parties shall refer the dispute to mediation or some other form of alternative dispute resolution.
- 10.2 If a dispute is referred to mediation, the mediation will be conducted:
- by a single mediator agreed by the Parties or if they cannot agree, appointed by the Chair of LEADR NZ Inc.
 - on the terms of the LEADR NZ Inc. standard mediation agreement, and
 - at a fee to be agreed by the Parties or if they cannot agree, at a fee determined by the Chair of LEADR NZ Inc.
- 10.3 Each Party will pay its own costs of mediation or alternative dispute resolution under this clause 10.

Obligations during a dispute

- 10.4 If there is a dispute, each Party will continue to perform its obligations under this Contract as far as practical given the nature of the dispute.

Taking court action

- 10.5 Each Party agrees not to start any court action in relation to a dispute until it has complied with the process described in clause 10.1, unless court action is necessary to preserve a Party's rights.

11. Ending this Contract

Termination by the Supplier

- 11.1 The Supplier may terminate this Contract by giving 20 Business Days Notice to the Buyer, if the Buyer fails to pay Charges that are properly due, and are not in dispute under clause 3.4. The Charges must be overdue by 20 Business Days and the Supplier must have first brought this to the Buyer's attention in writing within this period.
- 11.2 At any time during the term of this Contract the Supplier may notify the Buyer that it wishes to terminate this Contract by giving 20 Business Days Notice. The Buyer will, within 20 Business Days following receipt of the Supplier's, notify the Supplier whether, in its absolute discretion, it consents to the Supplier's Notice of termination. If the Buyer:
- consents, the Contract will be terminated on a date that is mutually agreed between the Parties, or
 - does not consent, the Contract will continue in full force as if the Supplier's Notice of termination had not been given.
- 11.3 The Supplier may also terminate this Contract under clause 11.9.

Termination by the Buyer

- 11.4 The Buyer may terminate this Contract at any time by giving 20 Business Days Notice to the Supplier.
- 11.5 The Buyer may terminate this Contract immediately, by giving notice, if the Supplier:
- becomes bankrupt or insolvent
 - has an administrator, receiver, liquidator, statutory manager, mortgagee's or chargee's agent appointed
 - becomes subject to any form of external administration
 - ceases for any reason to continue in business or to deliver the Services
 - is unable to deliver the Services for a period of 20 Business Days or more due to an Extraordinary Event
 - requires the supply of Services within the period of an Extraordinary Event
 - is in breach of any of its obligations under this Contract and the breach cannot be remedied
 - repeatedly fails to perform or comply with its obligations under this Contract whether those obligations are minor or significant
 - does something or fails to do something that, in the Buyer's opinion, results in damage to the Buyer's reputation or business or the reputation or business of the Crown
 - has a Conflict of Interest that in the Buyer's opinion is so material as to impact adversely on the delivery of the Services, the Buyer or the Crown, or
 - provides information to the Buyer that is misleading or inaccurate in any material respect.

Termination by a Party if a breach has not been remedied

- 11.6 If a Party fails to meet the requirements of this Contract (defaulting Party) and the other Party (non-defaulting Party) reasonably believes that the failure can be remedied, the non-defaulting Party must give a Notice (default Notice) to the defaulting Party.
- 11.7 A default Notice must state:
- the nature of the failure
 - what is required to remedy it, and
 - the time and date by which it must be remedied.
- 11.8 The period allowed to remedy the failure must be reasonable given the nature of the failure.
- 11.9 If the defaulting Party does not remedy the failure as required by the default Notice, the non-defaulting Party may terminate this Contract immediately by giving a further Notice.

- 11.10 If the Buyer gives a default Notice to the Supplier, the Buyer may also do one or both of the following things:
- withhold any payment of Fees due until the failure is remedied as required by the default Notice, and or
 - if the failure is not remedied as required by the default Notice, deduct a reasonable amount from any Fees due to reflect the reduced value of the Services to the Buyer.

Supplier's obligations on termination or expiry of this Contract

- 11.11 On giving or receiving a Notice of termination, the Supplier must:
- stop providing the Services
 - comply with any conditions contained in the Notice, and
 - immediately do everything reasonably possible to reduce its losses, costs and expense arising from the termination of this Contract.
- 11.12 On termination or expiry of this Contract, the Supplier must, if requested by the Buyer, immediately return or securely destroy all Confidential Information and other material or property belonging to the Buyer.

Consequences of termination or expiry of this Contract

- 11.13 The termination or expiry of this Contract does not affect those rights of each Party which:
- accrued prior to the time of termination or End Date, or
 - relate to any breach or failure to perform an obligation under this Contract that arose prior to the time of termination or End Date.
- 11.14 If this Contract is terminated the Buyer:
- will only be liable to pay Charges that were due for Services delivered before the effective date of termination, and
 - may recover from the Supplier or set off against sums due to the Supplier, any Charges paid in advance that have not been incurred.

Handing over the Services on termination or expiry of this Contract

- 11.15 The Supplier will, within 10 Business Days of the End Date, provide all reasonable assistance and cooperation necessary to facilitate a smooth handover of the Services to the Buyer or any person appointed by the Buyer.
- 11.16 If the Parties agree, the Supplier will provide additional assistance to support any replacement supplier to deliver the Services. This support may be for a period of up to 3 months from the date of termination and at a reasonable fee to be agreed between the Parties, based on the Fees and Expenses stated in this Contract.

12. Intellectual Property Rights

Ownership of Intellectual Property Rights

- 12.1 Pre-existing Intellectual Property Rights remain the property of their current owner.
- 12.2 New Intellectual Property Rights in the Deliverables become the property of the Buyer when they are created.
- 12.3 The Supplier grants to the Buyer (as The Crown) a perpetual, non-exclusive, worldwide and royalty-free licence to use, for any purpose, all Intellectual Property Rights in the Deliverables that are not owned by the Buyer. This licence includes the right to use, copy, modify and distribute the Deliverables.

Supplier Indemnity

- 12.4 The Supplier warrants that it is legally entitled to do the things stated in clause 12.3 with the Intellectual Property Rights in the Deliverables.
- 12.5 The Supplier warrants that Pre-existing and New Intellectual Property Rights provided by the Supplier and incorporated in the Services and Deliverables do not infringe the Intellectual Property

Rights of any third party.

- 12.6 The Supplier indemnifies the Buyer (as The Crown) in respect of any expenses, damage or liability incurred by the Buyer or The Crown in connection with any third party claim that the delivery of the Services or Deliverables to the Buyer or the Buyer's or The Crown's use of them, infringes a third party's rights. This indemnity is not subject to any limitation or cap on liability that may be stated elsewhere in this Contract.

13. Confidential Information

Protection of Confidential Information

- 13.1 Each Party confirms that it has adequate security measures to safeguard the other Party's Confidential Information from unauthorised access or use by third parties, and that it will not use or disclose the other Party's Confidential Information to any person or organisation other than:
- to the extent that use or disclosure is necessary for the purposes of providing the Deliverables or Services or in the case of the Buyer using the Deliverables or Services
 - if the other Party gives prior written approval to the use or disclosure
 - if the use or disclosure is required by law (including under the Official Information Act 1982), Ministers or parliamentary convention, or
 - in relation to disclosure, if the information has already become public, other than through a breach of the obligation of confidentiality by one of the Parties.

Obligation to inform staff

- 13.2 Each Party will ensure that its Personnel:
- are aware of the confidentiality obligations in this Contract, and
 - do not use or disclose any of the other Party's Confidential Information except as allowed by this Contract.

14. Notices

Delivery of Notices

- 14.1 All Notices to a Party must be delivered by hand or sent by post, courier, fax or email to that Party's address for Notices stated in Schedule 1.
- 14.2 Notices must be signed or, in the case of email sent by the appropriate manager or person having authority to do so.

Receipt of Notices

- 14.3 A Notice will be considered to be received:
- if delivered by hand, on the date it is delivered
 - if sent by post within New Zealand, on the 3rd Business Day after the date it was sent
 - if sent by post internationally, on the 7th Business Day after the date it was sent
 - if sent by courier, on the date it is delivered
 - if sent by fax, on the sender receiving a fax machine report that it has been successfully sent, or
 - if sent by email, at the time the email enters the recipient's information system as evidenced by a delivery receipt requested by the sender and it is not returned undelivered or as an error.
- 14.4 A Notice received after 5pm on a Business Day or on a day that is not a Business Day will be considered to be received on the next Business Day.

15. Extraordinary Events

No fault if failure due to an Extraordinary Event

- 15.1 Neither Party will be liable to the other for any failure to perform its obligations under this Contract where the failure is due to an Extraordinary Event.

Obligations of the affected Party

- 15.2 A Party who wishes to claim suspension of its obligations due to an Extraordinary Event must notify the other Party as soon as reasonably possible. The Notice must state:
- the nature of the circumstances giving rise to the Extraordinary Event
 - the extent of that Party's inability to perform under this Contract
 - the likely duration of that non-performance, and
 - what steps are being taken to minimise the impact of the Extraordinary Event on the delivery of Services.

Alternative arrangements requiring immediate termination

- 15.3 If the Buyer, acting reasonably, requires the Services to be supplied during the period affected by an Extraordinary Event, then despite clause 15.4, the Buyer may terminate this Contract immediately by giving Notice.

Termination of Contract

- 15.4 If a Party is unable to perform any obligations under this Contract for 20 Business Days or more due to an Extraordinary Event, the other Party may terminate this Contract immediately by giving Notice.

16. General

Changes to this Contract

- 16.1 Any change to this Contract is called a Variation. A Variation must be agreed by both Parties and recorded:
- in writing and signed by both Parties, or
 - through an exchange of emails where the authors have delegated authority to approve the Variation.

This is the entire Contract

- 16.2 This Contract, including any Variation, records everything agreed between the Parties relating to the Services. It replaces any previous communications, negotiations, arrangements or agreements that the Parties had with each other relating to the Services before this Contract was signed, whether they were verbal or in writing.

Waiver

- 16.3 If a Party breaches this Contract and the other Party does not immediately enforce its rights resulting from the breach that:
- does not mean that the Party in breach is released or excused from its obligation to perform the obligation at the time or in the future, and
 - does not prevent the other Party from exercising its rights resulting from the breach at a later time.

New Zealand law, currency and time

- 16.4 This Contract will be governed and interpreted in accordance with the laws of New Zealand. All money is in New Zealand dollars, unless Schedule 1 specifies a different currency. Dates and times are New Zealand time.

Publication of information about this Contract

- 16.5 The Supplier may disclose the existence of this Contract but must obtain the Buyer's prior written approval before making reference to the Buyer or this Contract in its publications, public statements, promotional material or promotional activities about this Contract.
- 16.6 Each Party undertakes not to post on websites or social networking sites and not to publicly display objectionable or derogatory comments about the Services, this Contract, each other or any of its Personnel and to ensure that its Personnel do not do so.

Signing the Contract

- 16.7 The date of execution is date this Contract is signed. This Contract is properly signed if each Party signs the same copy, or separate identical copies, of Page 1. If this Contract is signed on two separate dates or separate copies are signed, the date of execution is the later of the two dates. Where separate copies are signed the signed copy can be the original document, or a faxed or emailed copy.

No poaching

- 16.8 During the term of this Contract and for a period of 6 months after the End Date neither Party shall, without the other's written consent, deliberately solicit for employment or hire any person who is or has been employed by the other and involved in the delivery of the Services. This does not apply where a person has responded to a legitimate advertisement.

Clauses that remain in force

- 16.9 The clauses that by their nature should remain in force on expiry or termination of this Contract do so, including clauses 5 (Information management), 8 (Insurance), 10 (Resolving disputes), 11 (Ending this Contract), 12 (Intellectual Property Rights), 13 (Confidential Information), 16 (General) and 17 (Definitions).

Precedence

- 16.10 If there is any conflict or difference between the documents forming this Contract (as stated on Page 1) then the order of precedence is:
- a. a Variation agreed between the Parties under clause 16.1
 - b. Schedule 1
 - c. any Attachment to Schedule 1
 - d. Schedule 2.

17. Definitions

- 17.1 When used in this Contract the following terms have the meaning beside them:

Attachment Any supplementary document named in Schedule 1 as an Attachment to this Contract.

Approved Personnel A person who is engaged by the Supplier to deliver the Services and is named in Schedule 1. The Supplier must use this person in the delivery of the Services and cannot change them without first obtaining the Buyer's written approval.

Business Day A day when most businesses are open for business in New Zealand. It excludes Saturday, Sunday, and public holidays. A Business Day starts at 8.30am and ends at 5pm.

Buyer The Buyer is the purchaser of the Services. The Buyer is the Crown, also described as the Sovereign Her Majesty the Queen in right of New Zealand who acts by and through the government agency named as the Buyer on page 1 of this Contract for the purposes of this Contract.

Charges The total amount payable by the Buyer to the Supplier as stated in Schedule 1. The Supplier's Charges include Fees and any Expenses and Daily Allowances stated in Schedule 1. Charges are payable on successful delivery of the Services provided a valid tax invoice has been submitted.

Confidential information Information that:

- a. is by its nature confidential
- b. is marked by either Party as 'confidential', 'in confidence', 'restricted' or 'commercial in confidence'
- c. is provided by either Party or a third party 'in confidence'
- d. either Party knows or ought to know is confidential, or
- e. is of a sensitive nature or commercially sensitive to either Party.

Conflict of Interest A Conflict of Interest arises if a Party or its Personnel's personal or business interests or obligations do or could conflict or be perceived to conflict with its obligations under this Contract. It means that its independence, objectivity or impartiality can be called into question. A Conflict of Interest may be:

- a. actual: where the conflict currently exists
- b. potential: where the conflict is about to happen or could happen, or
- c. perceived: where other people may reasonably think that a person is compromised.

Contract The legal agreement between the Buyer and the Supplier that comprises Page 1 (the front sheet), Schedule 1, this Schedule 2 and any other Schedule, and any Variation and Attachment.

Contract Manager The person named in Schedule 1 as the Contract Manager. Their responsibilities are listed in clause 4.1

Crown (The Crown) The Buyer also described as the Sovereign Her Majesty the Queen in right of New Zealand and includes a Minister, a government department and an Office of Parliament, but does not include a Crown entity, or a State enterprise named in Schedule 1 of the State-Owned Enterprises Act 1986.

Daily Allowance An allowance to cover accommodation, meals and incidentals for the Supplier's Personnel if they are required in order to deliver the Services or to travel overnight away from their normal place of business. The amount of any Daily Allowance must be agreed to in Schedule 1. A Daily Allowance is similar to a per diem.

Daily Fee Rate If the Supplier's fee rate is expressed as a Daily Fee Rate this is the fee payable for each day spent in the delivery of Services. A day is a minimum of 8 working hours.

Deliverables A tangible output resulting from the delivery of the Services as stated in Schedule 1. A deliverable may be a document, a piece of equipment, goods, information or data stored by any means including all copies and extracts of the same.

End Date The earlier of the date this Contract is due to end as stated in Schedule 1, the date of termination as set out in a Notice of termination or any other date agreed between the Parties as the date the Contract is to end.

Expenses Any actual and reasonable out-of-pocket costs incurred by the Supplier in the delivery of the Services and agreed to in Schedule 1.

Extraordinary Event An event that is beyond the reasonable control of the Party immediately affected by the event. An Extraordinary Event does not include any risk or event that the Party claiming could have prevented or overcome by taking reasonable care. Examples include:

- a. acts of God, lightning strikes, earthquakes, tsunamis, volcanic eruptions, floods, storms, explosions, fires, pandemics and any natural disaster
- b. acts of war (whether declared or not), invasion, actions of foreign enemies, military mobilisation, requisition or embargo
- c. acts of public enemies, terrorism, riots, civil commotion, malicious damage, sabotage, rebellion, insurrection, revolution or military usurped power or civil war, or
- d. contamination by radioactivity from nuclear substances or germ warfare or any other such hazardous properties.

Fees The amount payable to the Supplier for the time spent in delivery of the Services calculated on the basis stated in Schedule 1, excluding any Expenses and Daily Allowances.

GST The goods and services tax payable in accordance with the New Zealand Goods and Services Tax Act 1985.

Hourly Fee Rate If the Supplier's fee rate is expressed as an Hourly Fee Rate this is the Fee payable for each hour spent delivering the Services.

Intellectual Property Rights All Intellectual Property Rights and interests, including copyright, trademarks, designs, patents and other proprietary rights, recognised or protected by law.

Milestone A phase or stage in the delivery of Services resulting in a measurable output. Payment of Fees is usually due on the satisfactory delivery of a Milestone.

New Intellectual Property Rights Intellectual Property Rights developed after the date of this Contract and incorporated into the Deliverables.

Notice A formal or legal communication from one Party to the other that meets the requirements of clause 14.

Party The Buyer and the Supplier are each a Party to this Contract, and together are the Parties.

Personnel All individuals engaged by either Party in relation to this Contract or the delivery of Services. Examples include: the owner of the business, its directors, employees, Subcontractors, agents, external consultants, specialists, technical support and co-opted or seconded staff. It includes Approved Personnel.

Pre-existing Intellectual Property Rights Intellectual Property Rights developed before the date of this Contract. It does not cover later modifications, adaptations or additions.

Records All information and data necessary for the management of this Contract and the delivery of Services. Records include, but are not limited to, reports, invoices, letters, emails, notes of meetings, photographs and other media recordings. Records can be hard copies or soft copies stored electronically.

Services All work, tasks and Deliverables, including those stated in Schedule 1, that the Supplier must perform and deliver under this Contract.

Schedule An attachment to this Contract with the title 'Schedule'.

Start Date The date when this Contract starts as stated in Schedule 1.

Subcontractor A person, business, company or organisation contracted by the Supplier to deliver or perform part of the Supplier's obligations under this Contract.

Supplier The person, business, company or organisation named as the Supplier on page 1. It includes its Personnel, successors, and permitted assignees.

Variation A change to any aspect of this Contract that complies with clause 15.1.

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New Zealand Building Fire Regulatory System Review

Draft Final Report

Submitted to

Mike Stannard, Chief Engineer

Ministry of Business, Innovation & Employment

Building System Performance Branch

Submitted by

Brian Meacham

Meacham Associates

Submitted on

13 April 2016

Executive Summary

In 2012, new fire protection clauses for the New Zealand Building Code, C1 to C6 Protection from Fire, replaced previous Fire Safety clauses. These new fire protection clauses were supported with a new set of Acceptable Solutions and a Verification Method. The Ministry of Business, Innovation and Employment (MBIE) completed a review and revision of the new requirements in 2014. Stakeholders have provided feedback and MBIE has, with input from the supplier, developed a programme of work to systematically address the issues to achieve more effective implementation and operation of fire protection arrangements. This comprises a Fire Regulation Development Programme.

Meacham Associates was contracted to undertake a review of the Fire Regulation Development Programme to gauge progress, assess relevancy, and to provide feedback to help assure the programme outputs are robust and visibly tested. In addition, MBIE requested review and input on various aspects of the building regulatory structure, including the alignment of structure and content within the New Zealand Building Code, its supporting documents, and the building regulatory environment.

As part of this effort, various MBIE documents were reviewed, and discussions were held with several MBIE staff and numerous fire industry stakeholders, primarily fire engineers and councils. Overall, discussions were held with on the order of 100 persons. Feedback from these discussions highlighted a number of issues that warrant consideration.

- Applicability of C/VM2 to Tall Buildings and Unique Facilities
- Appropriateness of C/VM2 as a Compliance Document or Guidance Document
- Competency and Qualifications in the Sector
- Adequacy of the Peer Review System
- Liability-Centered Focus
- Clarity of Roles and Responsibilities in the System
- Concerns with Existing Building Performance
- Potential Changes to the Code
- Transparency and Communication
- Fire Regulation Development Programme Priorities
- Fire Resourcing

Based on a review of C/VM2, in comparison with international best practice, it is my opinion that the C/VM2 does not adequately address very tall buildings as currently written. Key areas with deficiencies include: structural robustness, facilitation of firefighting operations, egress strategies and systems, control of the spread of smoke and fire (passive and active – interior and exterior), and systems reliability and robustness. With respect to these issues, the need for risk and reliability analyses, consideration of situation awareness, and consideration of special hazards is also warranted. In addition, C/VM2 has shortcomings with respect to some other building types as well. However, even though several deficiencies exist with C/VM2 with respect to tall buildings and some other building types or uses, it is recommended to keep the C/VM2 as a means of compliance and to fix the deficiencies, rather than exempting tall buildings from C/VM2, or changing the status of C/VM2 from compliance to guidance.

The fact that the New Zealand system allows anyone to use the title 'fire engineer' and practice 'fire engineering' is bad for everyone: government, qualified engineers, and consumers. Bad actors are producing bad designs. Bad actors are negatively influencing the peer-review process. Bad actors are consuming considerable time of the BCAs. Bad actors can be working for BCAs and other enforcers, as well as in practice. The current approach of self-reporting qualifications, and of BCAs accepting designs and reviews based on Producer Statements, does not seem to be working. There needs to be a set of minimum competency criteria to define the practice of fire engineering (and for other engineering disciplines as well). Qualifications should be based on demonstration of competency, along with practical experience, obtained under the mentorship of a qualified engineer (a graduate engineer is not necessarily qualified to take full responsibility for a design, even though they might meet minimum competency requirements). It would seem beneficial to get away from self-reporting, have a clear set of competency criteria that is applied to all parties, and to establish a system wherein professional qualifications should only come with demonstration of competency and suitable practical experience.

Highly related to the competency and qualification issue, but also an artefact of the regulatory system, is the observation that the peer review system is not working as it should, since unqualified persons are able to practice by law (or as a result of a lack of regulations which say otherwise) for both design and review. If the system will continue to rely on peer-review as a mechanism to assure good design, it must include only good designers. In addition, it must get away from the 'friendly' environment that currently exists in which designers can select their reviewers, which allows bad actors to select bad actors, leaving Councils to either institute additional reviews, call in the fire service, take other action, or let things slide. None of these options seem particularly efficient or necessarily good for New Zealand.

The current culture seems to be one of limiting liability rather than producing safe and well-performing buildings. Some in the engineering community have become 'code lawyers' rather than engineers – looking for ways around provisions rather than developing good designs. At the same time, BCAs are clearly stating that the focus of regulatory review is to manage their liability – not to assure good design – that is the responsibility of engineers and peer-reviewers. The engineers and peer-reviewers in some markets have developed 'friendly relations' to the point where reviewers are selected based on how little they review as compared with how comprehensively they review. The net result of this situation is that no-one wants to take responsibility – they just want to transfer it. This is not a healthy environment for a performance-based building regulatory system.

Related in part to the above issues, as well as to issues with the Code and regulatory system structure, the roles and responsibilities of actors in the system are unclear. Responsibilities for different parts of the design should be clear (e.g., fire engineer assesses fire environment, structural engineer assesses structural response to fire). Roles and responsibilities for review should be clear and not duplicative (e.g., peer review, BCA regulatory review, fire service review). Clarity and guidance is needed.

There seems to be a new issue, which in concert with the above issues, is pointing to a need for MBIE to be clearer than ever with requirements versus guidance. As investors and developers from other countries enter the New Zealand market, they bring with them their norms and customs, which do not always align with New Zealand. One such area is regulatory compliance. In some

cultures, especially those which are highly regulated, the expectation is to comply with the legislation, but only the legislation, and not to do more. This can cause problems in an environment which historically relied on discussions and less formal agreements to solve problems, as I would characterize New Zealand in the past. This change can put pressure on designers / engineers to only do the minimum required to meet the code – even if they think something more is needed. It is recommended that MBIE very explore this situation, and if proves to be a real issue, carefully consider the implications when addressing changes to the building regulatory system, including wording / requirements in the code, differences between requirements and guidance, expectations of performance / ethics of practitioners in the market, and related issues. It may be that more specific requirements, and clarity on measurability of performance, will be needed going forward.

It has been reported by many fire engineers that I met with, and has also been reported in the press, that the situation with passive fire protection in buildings is very poor. It has been observed that during weather tightness remediation and other activities, that many of the required fire and smoke seals, required for fire walls and smoke barriers, are missing, there are holes in walls, doors which are required to be closed are chocked open, and more. A NZFS report from a fire in Wellington suggests that if, but for the timely response of the NZFS, there could have been significant life safety concerns. Other fire events have highlighted smoke movement through penetration openings as well, in addition to improper barriers found during other building works. This issue reflects incomplete actions by persons in the sector – whether at the design, installation or final construction approval stage. Also, while significant anecdotal data exist, there is a paucity of actual, objective data. This should be a focus for MBIE to assist better decision making in the future. The fire programme have some data, as a result of their activities, but having a process for identifying, collecting, analysing and using data across the sector would be helpful.

There were numerous concerns raised with how day-to-day interpretations by MBIE staff are being made and then used by the sector. For example, questions are asked in specific ways, with the hopes of gaining answers that fit specific needs. In many cases, specific interpretations could be helpful, if limited to the project in question. However, it has been widely reported that some engineers are taking such interpretations, which are on emails with MBIE letterhead, and presenting them to other councils and/or on other projects as formal (official) MBIE positions. One outcome of this approach is that precedents are being set, whether legally binding or not, that impact the situation of fire engineering design and compliance. Such action by poor actors in the fire safety community seems difficult to control for in the current system (e.g., see discussion in summary papers from discussions with fire engineers on lack of action by IPENZ on poor actors). It is suggested that MBIE form a small panel, which would meet on a regular (but as needed basis), to inform interpretations. This should have broad input, and should consider implications of interpretations across the sector, but should remain an MBIE decision in the end.

Fundamentally, a performance-based code system relies on *quantified measures of performance* to be effective. These measures do not have to be developed by policy makers, but they should be ratified by policy. These measures do not need to be in the Code; however, they do need to reside somewhere in the system (e.g., verification methods, reference standards, guidance, etc.), they should be located and expressed in as a consistent manner as practicable, they need to be broadly agreed by the relevant engineering discipline and regulatory officials, there must be sufficiently available and agreed data, tools and methods of analysis and design to underpin the quantified

measures and associated analysis, and appropriate competency and qualifications across the sector is needed to undertake, review and accept performance analyses and designs. There is a diversity of approaches in the New Zealand system. A common structure and approach is needed.

A review of the C Clauses for fire has been undertaken. There are clearly some inconsistencies and issues, including use of importance levels, risk groups, type and format of criteria, structural and fire engineering overlap, and more. However, I hesitate to recommend code changes at this time. In concept, I do not think it helpful, necessarily, to change the C/VM2 if the Code will be changed. Decisions need to be made on the Code, which will then trickle down the hierarchy to other regulatory components. However, the code clauses for Fire should not be changed until there is an overall strategy for the code, verification methods and guidance.

Two critical issues that arose in several external discussions regarding the ongoing fire programme activities are a perceived lack of transparency and a perceived limitation on participation. It was the opinion of some that MBIE seems to be working with a small number of fire engineers, and it is not clear how the fire engineers were selected and what the scope and target outcomes of the various working groups are. This is a concern. The lack of communication around the 2012 changes to the code and roll-out of C/VM2 have been clearly voiced and clearly heard within MBIE. The 2014 workshops around issues with the fire regulatory system highlighted the need to have more consultation and openness with stakeholders. While many positive steps have been taken, including setting up the fire programme and working groups in response to the 2014 efforts, the fact that some in the industry remain disappointed with how the process is operating is concerning. Establishing a transparent and well-documented process for identifying, qualifying and selecting working group participants would be helpful. Likewise, have a process for obtaining sector input, showing action on input, and reporting back to the sector would be helpful.

Prioritization of the fire projects should be reconsidered in light of above findings. In particular, Project 8, Building Classifications, is on hold, but I suggest this issue needs to be resolved, as part of the overall MBIE review of the Building Code structure, as a priority. This needs to be done before the Fire Programme can advance work on Project 7, Acceptable Solutions, which is due to finish development this quarter. Project 10 is a high priority, along with the yet to be approved Project 15 on the C/VM2 fires. Regarding C/VM2, I think this project will also attract much attention, like Project 8 above. Since the Working Group is not fixed, I would suggest MBIE consider making this a larger WG than others, to include more stakeholders (particularly more fire engineers across a broader spectrum). While I believe the refocused Project 4 (now Consenting Process) is important, I do not think this should be started until there is an MBIE view on the building code structure, competency and qualifications, peer Review, and the 'liability-management' culture across the sector. Alignment of legislation, Project 14, is also very important. However, this should be more than HSNO, and should include the RMA, Evacuation Regulations, and Fire Service Act, outside of MBIE, but importantly the Building Act, Building Code, and Change of Use Regulations within MBIE.

The fire programme has one MBIE employee and two contract employees. More permanent resource is needed (e.g., another fire engineer, with both technical and regulatory experience). It will be difficult to make changes going forward, as recommended in this report, without adequate resource and clear management commitment and structure. This includes addressing the issues of Code structure

noted above, minimize duplication of effort, and having clear and supported paths forward – through the current fire program – and to continue the efforts beyond.

In closing, while the fire staff have made good progress on the fire programme, action and guidance is needed from a higher level to continue to make good progress. MBIE needs to have a strategy and action plan for addressing core issues of structure and consistency in the Building Act, Building Code and associated regulations. Harmonization of importance levels, risk groups, purpose groups and such, clear direction on quantification of performance and where quantified criteria should reside in the system, and steps which can be taken to help raise the competency and qualification in the sector, as outlined in the report, are essential for facilitating a better working system. These issues are also essential to guide the prioritization and activities of the fire programme. It makes no sense to proceed with projects which may be significantly impacted by structural changes to the code or regulatory system. Likewise, focusing on projects which are independent of the structural issues, in a manner that is reflective of industry desires and concerns, is important.

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Disclaimer

This report was prepared by Meacham Associates for the New Zealand Ministry of Business, Innovation and Employment (MBIE). Much of the information presented in this report was provided by review of MBIE documents, discussion with MBIE staff, and discussion with various stakeholders in the New Zealand fire engineering and building control arena. Reasonable attempts were made to verify the accuracy of the information provided, referenced and summarized in this report. However, it is possible that errors associated with summarizing complex documents and comments exist, or that inadvertent omission or incomplete representation of facts exists. Neither Meacham Associates, nor MBIE, nor any person acting on their behalf:

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Any summaries, opinions, findings, conclusions or recommendations expressed in this report are those of the author and do not necessarily reflect the views of the MBIE, its staff, or the persons the author held meetings with as part of the research and development of this report.

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Background and Introduction

In 2012 new fire protection clauses for the New Zealand Building Code, C1 to C6 Protection from Fire, replaced previous Fire Safety clauses. These new fire protection clauses were supported with a new set of Acceptable Solutions and a Verification Method. The Ministry of Business, Innovation and Employment (MBIE) completed a review and revision of the new requirements in 2014. Stakeholders have provided feedback and MBIE has, with input from the supplier, developed a programme of work to systematically address the issues to achieve more effective implementation and operation of fire protection arrangements. This comprises a Fire Development Programme with 14 projects, approximately half will be active at any point in time, and running for 18 months to the end of 2016 when it will be refreshed. This programme is a collaborative sector-wide approach for attaining over time an effective and efficient best practice regulatory system for fire safety in New Zealand. International expertise is necessary to provide input and ensure that outputs are robust and visibly tested. Additionally, MBIE is considering a development and risk framework for the NZ Building Code and its supporting documents. Again, international expertise is important.

To provide assistance on these items, Meacham Associates was contracted in September 2015 to provide review and consulting services. The contracted scope of work was defined as:

- Providing input to Fire Review Programme
- Provide input into the development of the Building Code framework
- Assisting in ensuring that outputs are robust and visibly tested
- Assisting and providing guidance to project and programme leads as required

In the months between issuance of the contract and my arrival at MBIE on 1 February 2016, the requested scope of services was modified somewhat.

In addition to the above, I was requested to consider the applicability of C/VM2 and the adequacy of the current fire regulatory system for the fire safety design of tall buildings. This was to consider not only the C/VM2, but the peer review system, competency of fire engineers and reviewers, issues and approaches used by BCAs, and related issues. The question was posed as to whether the C/VM2 should be rescinded, or perhaps have tall building exempted, or what other mechanisms might be available to address concerns, if it is found that serious concerns exist.

I was also requested to review the C Clauses in the Building Code, in particular with regard to the 2012 introduction of specific performance measures (criteria) for use in assessing acceptability of fire safety designs. The main questions are whether the criteria are appropriate, if not should they be changed, and if so, should they remain in the code or be moved elsewhere, such as the C/VM2 or into guidance.

Time permitting, I was asked to undertake a 'Gateway Review' of the Fire Programme. This was meant to be a comprehensive review of documents, interviews with staff, working group members, etc. I would note that due to time constraints, such a formal review was not undertaken. Rather, only a quick review of documents and short discussions with some staff members was possible.

Review of Fire Regulatory System

Stakeholder Discussions

To obtain information to assist MBIE with the above issues it was important for me to speak with fire engineers throughout New Zealand to gain an understanding, from their perspective, of the situation of fire engineering in a performance-based code environment. To achieve these objectives, various meetings were held with fire engineers throughout New Zealand. These meetings included one-on-one discussions with 10 consulting engineers (without MBIE participation) and one group with 3 engineers working specifically on very tall building designs (with Michael Belsham), and three group meetings with fire engineers organized by the Society of Fire Protection Engineers (SFPE): one in Auckland, with around 20 attendees, and one in Christchurch, with around 15 attendees, and one in Wellington, with about 15 attendees. There was no MBIE participation in the SFPE organized meetings. A meeting was also held with fire engineers from Beca as part of a meeting with Tauranga City Council (TCC) and Hamilton City Council (HCC).

Meetings were also held with personnel from various councils of diverse sizes, as well as the New Zealand Fire Service (NZFS). The aim of these meetings was to obtain perspectives from the regulatory enforcement perspective. These meetings included Auckland City Council (ACC), Christchurch City Council (CCC), Tauranga City Council (TCC), Hamilton City Council (HCC), Western Bays District Council (WBDC), Whakatane District Council (WDC), Rotorua Lakes Council (RLC), Opotiki District Council (ODC), and South Waikato District Council (SWDC). The meeting with ACC included Michael Belsham, and the meetings with the others (other than CCC) were organized by MBIE, with Chris Rutledge, Michael Belsham and Mike Cox in attendance and running the meetings.

Notes from the above discussions can be found in Annexes A – I.

During my time at MBIE, I also had discussions and participated in meetings with several MBIE personnel. This included meetings on seismic issues, tall building fire issues, surface lining materials issues, structural fire design issues, consenting issues, and a brainstorming session on the overall approach to the building code.

Based on my various discussions with fire engineers, Councils and NZFS representatives, as well as with MBIE personnel, the main issues / concerns with C/VM2, the Building Code and the current regulatory and fire engineering systems in New Zealand, and my working suggestions for how to address the issues, are as follows.

C/VM2 and Applicability to Tall Buildings and Other Unique Facilities

In late 2015, MBIE became aware of a number of tall building designs being developed in the Auckland area, including at least four buildings in the range of 50 stories in height. It was noted that the C/VM2 was being applied, and questions were raised by various entities as to whether the C/VM2 is appropriate for the fire safety design of tall buildings. To explore this issue, the provisions and approach of C/VM2 was compared to various international documents on fire safety in very tall buildings. In addition, the question of C/VM applicability was featured in discussions with fire engineers and councils throughout New Zealand, with particular focus given to fire engineers in the Auckland area and at Auckland City Council.

Based on a review of C/VM2, in comparison with international best practice (as reflected in the *SFPE Guide on Fire Safety for Very Tall Buildings*, building codes and standards in the US and other countries, and the fire engineering literature), it is my opinion that the C/VM2 does not adequately address very tall buildings as currently written. As noted by Michael Belsham in his review and drafting of MBIE guidance, key areas with deficiencies include: structural robustness, facilitation of firefighting operations, egress strategies and systems, control of the spread of smoke and fire (passive and active – interior and exterior), and systems reliability and robustness. With respect to these issues, the need for risk and reliability analyses, consideration of situation awareness, and consideration of special hazards is also warranted. (See Annex J for draft guidance.)

However, even though several deficiencies exist with C/VM2 with respect to tall buildings (and some other building types or uses), the feedback I have received from fire engineers in practice, with Councils and with the New Zealand Fire Service generally favors keeping the C/VM2 as a means of compliance and fixing gaps, rather than exempting tall buildings from C/VM2 applicability, or changing the status of C/VM2 from 'compliance' to 'guidance.'

I support the view of maintaining the C/VM2 as a 'compliance' document. There are several reasons for suggesting this approach:

- a. The C/VM2 was not intended to be a static document – it was intended to be updated once experience with its application was gained. The market now has experience, and the C/VM2 needs to be updated, not only for tall buildings, but to address perceived issues with applicability to hospitals and other unique buildings.
- b. Although MBIE 'took a hit' from the fire sector when C/VM2 was introduced in 2012, particularly with the flurry of changes which followed in 2013 and 2014, the market has settled down and now wants MBIE to fix the problems with C/VM2. While there is some disagreement, the market largely perceives the C/VM2 as helping to 'raise the bar' with respect to applicability of fire engineering principles to buildings, and helping to achieve some level of consistency from one building to another and from one council to another. While messaging is still needed that Alternative Solutions (a term some engineers strongly dislike) can still be done within the building regulatory system, keeping the C/VM2 as a compliance document will be helpful to all involved.
- c. Many of the specific issues for tall buildings can also apply to other occupancies, including structural robustness (and applicability of simplified methods for structural fire performance), facilities for firefighting operations, egress strategies and safety during egress, and reliability and robustness of fire safety systems and support systems (such as utilities). In the process of addressing these issues, related issues can be addressed (e.g., discussion of lifts for occupant evacuation can include requirements for situation awareness). Likewise, it can be reinforced that a well-constructed FEB is essential. Making these types of changes makes the C/VM2 more robust, which helps everyone.
- d. With the revision to C/VM2, consideration should be given to removing the time-equivalence method in the 'full burn out' section and/or providing minimum fire resistance

ratings for some structural elements of some buildings (e.g., minimum of 120 minutes for primary structural elements of buildings over 50 meters in height (or whatever limit is agreed, if a limit is used)).

- e. Work is needed on the fire operations (FO) scenario. Instead of looking at C/VM2 'full burn out' to establish appropriate time for fire operations, B1 should be cited. Requirements of C6.3 can be noted, if retained (structural systems in buildings that are necessary to provide firefighters with safe access to floors for the purpose of conducting firefighting and rescue operations must be designed and constructed so that they remain stable during and after fire). It is not clear that Clause C6 is needed, given fire is a load in Clause B. Requiring the design to provide some estimate of time until water is applied by the fire service might also be appropriate (something like the discussion around C3.8 – the minimum fire resistance cannot be less than the time required for the fire service to arrive, set up equipment, access the fire floor and begin suppression operations – which can be more than 30 minutes from the start of a fire, especially if the fire is 50 stories up with no access by lift.)
- f. Along with changes / updates to the C/VM2, more supporting documentation would be helpful. The Commentary has not been updated / expanded for some time. The Commentary does not explain how the C/VM2 'system' works. Commentary about how the C/VM2 was constructed, how conservatism in the design fires and acceptance criteria (delay times, FED, etc.) combine to reflect a 'safety factor of unity' and why simple deviation is not so simple, and what types of measures would be required if the C/VM2 was to be a basis of a specific design (e.g., uncertainty and sensitivity analysis, use of margin of safety or quantified safety factors, etc., as related to changes in input parameters), would be extremely beneficial. Some engineers would like to deviate, but they need to know implications. I think BCAs and the fire service would allow deviation, if they knew the impact. Such commentary and guidance could be helpful.
- g. Related to (c) above, an in-depth education program would be helpful. From what I recall of the education around the C/VM2 roll-out, it was focused on what is in the C/VM2, and not how the system was developed or particularly works. A new educational / training program, which explains the system (as well as new updates / changes), would be helpful.
- h. Many of the challenges in the sector relate to professional competency and qualifications, and the peer-review system, which cannot be fixed by changes to the Code, C/VM2 or related documents. Eliminating the C/VM2 could potentially make things worse. While eliminated C/VM2 would push all tall building design to the Alternative Solutions route, persistent concerns with competency of engineers, comprehensiveness of peer-reviews, and the issue of how and when the fire service gets involved could lead to other problems. (I cannot help but think of ACC, with just a single fire engineer, or the story from RLC about the chemical facility design decision which has been unresolved since July, or the claim by Beca (Tauranga) that more than half of the 'fire engineers' in the region are not qualified engineers, ...)

- i. In the interim, guidance can be issued (as in process), which highlights expectations for tall building design. Determinations have been made in the past on medium-rise buildings and issues of structural fire performance, so there is some precedence to fall back on if determinations are needed on the topic in the future regarding any designs developed prior to the availability of a revised C/VM2. (See draft guidance in Annex J.)

Competency and Qualifications Appear to be Lacking

There is a widespread view – across the sector, including engineers, BCAs and the fire service – that allowing anyone to call themselves an ‘engineer’ and practice engineering is bad for everyone. Bad actors are negatively influencing the peer-review process. Bad actors are consuming significant time of the BCAs. Bad actors can be working for BCAs and other enforcers, as well as in practice. The current IPENZ approach of self-reporting, and BCA approach of self-reporting via Producer Statements, does not seem to be working.

In my opinion, there needs to be a set of minimum competency criteria to define the practice of fire engineering (and for other engineering disciplines as well). Qualifications should be based on demonstration of competency, along with practical experience, obtained under the mentorship of a qualified engineer (a graduate engineer is not necessarily qualified to take full responsibility for a design, even though they might meet minimum competency requirements). I am not saying that New Zealand needs a formal examination system, like in the USA; however, it would seem beneficial to get away from self-reporting, have a clear set of competency criteria that is applied to all parties, and that professional qualifications should only come with demonstration of competency and suitable practical experience. Some type of ‘T-shaped structure, where engineers must demonstrate minimum competency across the breadth of the discipline, as well as depth in one or more areas of expertise, might be something which could help.

Additional discussion is provided in Annex K.

The Peer-Review System is Not Working Well

This is highly related to the competency and qualification issue, but is also an artefact of the regulatory system, since unqualified persons are able to practice by law (or as a result of a lack of regulations which say otherwise). If the system will continue to rely on peer-review as a mechanism to assure good design, it must include only good designers. In addition, it must get away from the ‘friendly’ environment that currently exists in which designers can select their reviewers, which allows bad actors to select bad actors, leaving Councils to either institute additional reviews, call in the fire service, take other action, or let things slide. None of these options seem particularly efficient or necessarily good for New Zealand.

If the peer-review system is kept and fixed, there should be steps taken to reduce the level of additional required review by Councils and the fire service. This should occur naturally, if BCAs and the fire service come to trust the peer-review system, but this has been a long standing concern (starting before the 2012 revisions and persisting after), which will be hard to overcome.

An approach discussed with many fire engineers and the two Councils to date is the establishment of some type of ‘central’ peer-review panel or committee. How the panel is set up, who sits on the panel, what their qualifications are, what their scope is, when and how often they are used, how one controls conflict of interest, how they get compensated, and related issues need to be addressed.

However, assuming these issues can be sorted, engineers, peer-reviewers, Councils and the fire service all see a benefit.

In my opinion, the ideal situation would be one in which the Acceptable Solutions are modified to the point where a competent sector can use them with little intervention (engineers and councils), where the C/VM2 is made more robust and appropriate across the classes of buildings for which it is deemed applicable (comments above aside, there may still be facilities for which the C/VM2 should not be used), and then all other designs are Alternative Solutions (specific designs). In this scenario, the panel should not be needed for Acceptable Solutions, should only be needed for C/VM2 designs where councils lack on staff expertise, and would then be the resource for all specific designs.

The make-up of this panel / committee should reflect the sector – not just fire engineers, but regulator, fire service, and potentially industry and public representation. This is needed because a specific design, by definition, is addressing issues or buildings deemed outside of the Acceptable Solutions or C/VM2, and therefore must consider the broader scope of the code and compliance with it. By including the regulator (BCA) and fire service, it should eliminate the need for additional review. Of course, BCAs and the fire service need to buy into this for the approach to work.

A more detailed discussion on how such a 'centralized' peer review panel might be formulated and operated can be found in Annex L.

The Market Focus is 'Liability-Management' not Well-Performing Buildings

Perhaps this is a function of past issues in the market, but the current culture seems to be one of limiting liability rather than producing safe and well-performing buildings. As noted by some people I have spoken with, some in the engineering community have become 'code lawyers' rather than engineers – looking for ways around provisions rather than developing good designs. At the same time, BCAs are clearly stating that the focus of regulatory review is to manage their liability – not to assure good design – that is the responsibility of engineers and peer-reviewers. The engineers and peer-reviewers in some markets have developed 'friendly relations' to the point where reviewers are selected based on how little they review as compared with how comprehensively they review.

The net result of this situation is that no-one wants to take responsibility – they just want to transfer it. This underpins the issue of structural fire engineering and who should own what (in my opinion, the fire engineer can advise on fire environment, but the structural engineer is the one qualified to assess the impact of the fire on structural stability and performance). It also underpins the issue of who 'signs off' on designs – the peer reviewer or the BCA (and what exactly are they signing off on).

To adequately address current issues and inform future decisions, it is imperative to understand how the system is working (or not) in order to develop the Code, Acceptable Solutions, Verification Methods and Guidance appropriate to actual conditions and future expectations.

Roles and Responsibilities are Unclear

Related in part to the above issue, as well as to the Code structure as discussed below, the roles and responsibilities of actors in the system are unclear. An example is the responsibility for structural stability during and after fire. (See C/VM2 discussions above.)

At present, it seems structural engineers are saying that fire engineers are responsible due to Clause C6. However, it is my personal view that Clause C6 does not exempt the structural engineer from responsibility for demonstrating that there is a low probability of the building becoming unstable during fire. Clause B1.3.1 must be met (low probability of rupturing, becoming unstable, losing equilibrium, or collapse...) as well as B1.3.4 (Due allowance shall be made for: (a) the consequences of failure, ... (e) accuracy limitations inherent in the methods used to predict the stability of buildings). At a minimum, I would expect that the structural engineer would have to demonstrate how C6 quantitatively achieves these B1 clauses.

Also, I understand that there are provisions in the B1/VM and/or loading standards to demonstrate structural stability during and after fire (2.5% lateral load, 0.5 kpa wind load), but I am not an expert on this and do not know exactly where / how these apply. I know the Structural Stability in Fire Working Group is looking at this issue. It would be helpful if they determine, and MBIE then clarifies, that the structural engineer is responsible for structural stability during and after fire: full stop. In brief, the fire engineer should be responsible for determining the fire environment, and the minimum time the building needs to remain stable for occupant evacuation and fire fighting operations, as per the C clauses. The client may also have considerations for property protection or other. The structural engineer then takes the thermal environment information and assesses the impact on structure, as per Clause B. Generally, fire engineers, unless they have a structural engineering background, are not competent to undertake structural analyses.

In some countries, there are now specific university engineering programs on structural fire engineering. University of Edinburgh, Manchester University and Sheffield University in the UK are examples, as is University of Queensland in Australia. The University of Canterbury also has a history of preparing engineers in this area, as the fire program developed out of the structural engineering program.

Internationally, structural fire engineering is largely within the structural engineering community. This is the case with the Eurocodes for Structure as well as various structural engineering standards in the USA (including ASCE 7). To assist structural engineers, there are also a number of guidance documents and documents with examples. Examples include (for examples of Eurocode application, http://eurocodes.jrc.ec.europa.eu/doc/2012_11_WS_fire/report/2012_11_WS_fire.pdf, and from NIST in the US, <http://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1681.pdf>).

Other areas which are unclear include peer-review and regulatory review. What is the difference? What is the peer reviewer (fire) responsible for? If a peer review is undertaken, what is a regulatory review for? Is a peer review, regulatory review and fire service review all needed? These types of issues are noted above, in discussions about the peer review system. A related issue is noted below.

New Cultural Influences in the Market

There seems to be a new issue, which in concert with the above, is pointing to a need for MBIE to be clearer than ever with requirements versus guidance. As investors and developers from other countries enter the New Zealand market, they bring with them their norms and customs, which do not always align with New Zealand. One such area is regulatory compliance. In some cultures, especially those which are highly regulated, the expectation is to comply with the legislation, but only the legislation, and not to do more. This can cause problems in an environment which

historically relied on discussions and less formal agreements to solve problems, as I would characterize New Zealand in the past. This change can put pressure on designers / engineers to only do the minimum required to meet the code – even if they think something more is needed.

It is recommended that MBIE explore this situation, and if it proves to be a real issue, carefully consider the implications when addressing changes to the building regulatory system, including wording / requirements in the code, differences between requirements and guidance, expectations of performance / ethics of practitioners in the market, and related issues. It may be that more specific requirements, and clarity on measurability of performance, will be needed going forward.

Some Existing Buildings are Potentially Dangerous: As-Built Data are Lacking

These issues are related in part to the items addressed below, but also to the overall building regulatory structure decision later in the paper. It has been reported by many fire engineers I met with, and I understand that it has also been reported in the press, that the situation with passive fire protection in buildings is very poor. It has been observed that during weather tightness remediation and other activities, that many of the required fire and smoke seals, required for fire walls and smoke barriers, are missing, there are holes in walls, doors which are required to be closed are chocked open, and more. A NZFS report from a fire in Wellington (Dixon Street) indicates that if, but for the timely response of the NZFS, there could have been significant life safety concerns due to doors being blocked open. Other fire events have highlighted smoke movement through penetration openings as well, in addition to improper barriers found during other building works.

This issue reflects incomplete actions by persons in the sector – whether at the design, installation or final construction approval stage. While I did not investigate the situation with IQPs and other issues associated with the processes and responsibilities for assuring the building is constructed correctly (and in accordance with the design documents, consent documents, etc.), it relates to the competency and qualifications, roles and responsibilities, and ‘liability-management’ culture as noted above. However, it also points to another significant issue: lack of data for fire (and building) regulatory decision making.

As the steward of the building regulatory system (including fire performance), MBIE should have access to data about how the system is working. Is the sector competent? Are they doing their jobs? Are building designs being complied with? Are construction documents in accordance with design documents? Are construction documents in accordance with code requirements? Is construction in accordance with the Code and with design documents? Who is checking? Where are the building data? Where are the fire data? Significant anecdotal data exist, but there is a paucity of actual, objective data. This should be a focus for MBIE to assist better decision making in the future. The fire programme have some data, as a result of their activities, but having a process for identifying, collecting, analysing and using data across the sector would be helpful.

Fire Interpretations by MBIE – A More Formal Process is Needed

There were numerous concerns raised with how day-to-day interpretations by MBIE staff are being made and then used by the sector. For example, questions are asked in specific ways, with the hopes of gaining answers that fit specific needs. In many cases, specific interpretations could be helpful, if limited to the project in question. However, it has been widely reported that some engineers are

taking such interpretations, which are on emails with MBIE letterhead, and presenting them to other councils and/or on other projects as formal (official) MBIE positions. One outcome of this approach is that precedents are being set, whether legally binding or not, that impact the situation of fire engineering design and compliance. Such action by poor actors in the fire safety community seems difficult to control for in the current system (e.g., see discussion in summary papers from discussions with fire engineers on lack of action by IPENZ on poor actors).

In the current system, interpretations are being made that materially impact application of C/VM2, and in some cases have resulted in changes to C/VM2, without any type of transparent consultation or interaction with the community. It has been reported that the situation has gotten to the point where engineers and BCAs are having difficulty understanding what is truly required, versus guidance, versus nonbinding interpretation, etc., as they are presented with emails, FAQs, practice notes, and other forms of 'interpretation.'

My suggestion is to form a small panel, which would meet on a regular (but as needed basis), to inform interpretations. This should have broad input, and should consider implications of interpretations across the sector, but should remain an MBIE decision in the end. More detail on the 'interpretations' panel concept is provided in Annex L.

The Building Code: Quantification and Consistency Are Needed

Fundamentally, a performance-based code system relies on *quantified measures of performance* to be effective. These measures do not have to be developed by policy makers, but they should be ratified by policy. These measures do not need to be in the Code; however, they do need to reside somewhere in the system (e.g., verification methods, reference standards, guidance, etc.), they should be located and expressed in as a consistent manner as practicable, they need to be broadly agreed by the relevant engineering discipline and regulatory officials, there must be sufficiently available and agreed data, tools and methods of analysis and design to underpin the quantified measures and associated analysis, and appropriate competency and qualifications across the sector is needed to undertake, review and accept performance analyses and designs.

At present, there is a mix of qualitative and quantitative measures sitting within the Code (fire and elsewhere), quantitative measures sitting within Verification Methods, quantitative measures sitting within Compliance Documents (Acceptable Solutions), quantitative measures sitting in reference standards (which are not always Verification Methods or Acceptable Solutions), incomplete linkages between related areas (e.g., structural fire performance in B and C clauses), the potential for competing objectives (e.g., adding insulation to a building, which if combustible, adds to the fuel load and decreases fire safety), and incomplete or unclear statements of target performance (e.g., why does New Zealand want buildings to remain structurally stable throughout their lives – life safety only, life safety and neighbouring property protection, economic welfare of the community, ...?). There are two sets of 'importance levels,' with the ones for fire not tied in any real way to risk groups, the C/VM2 (e.g., for tall buildings, hospitals, etc.), and the intent / need is unclear.

There is no single opinion from those I have spoken with as part of my review. Most like the quantification for fire, as it helps reduce inconsistency problems which existed before, but not everyone agrees on the values, or that the Code is the best location (as compared with in the C/VM2, for example). My concern with taking quantified values out of the Code, and putting them in

the C/VM2, is: what will happen with Alternative Solutions, which then have no regulated benchmark (along with a non-existent system for culling out unqualified / incompetent practitioners, a poorly operating peer-review system, widely divergent operating procedures across BCAs, and unclear scope for fire service reviews)? My preference is to have quantified measures in the Code, or located within the system in such a way that they are *required to be used*. I also think that there should be consistency in the approach across all Code clauses, to the extent possible (e.g., do not mix and match approaches – becomes difficult to facilitate integrated and holistic design).

I have not had the time to discuss in detail the currently thinking with respect to importance levels and quantification for seismic design as part of this review. I have likewise not looked in any detail at other parts of the code. However, I believe that MBIE should consciously consider and decide (a) whether a singular approach is appropriate for the regulated areas of the building code (if so, why: if not, why not), (b) what it should look like (if pursued), and (c) what the plan is for development.

This issue is important, not just in general across the Code, but specific to the Fire Programme, as decisions on Code structure will impact how C/VM2, Acceptable Solutions, harmonization of use / risk / purpose groups, and approaches to Alternative Solutions might proceed. It will also have an impact on the issue of how MBIE might approach the professional qualifications and competency issue, as well as the consenting process.

Chicken or Egg: Code, C/VM2, or Guidance

A review of the C Clauses for fire has been undertaken. Considerations are provided in Annex O. There are clearly some inconsistencies and issues many which have been identified in discussion above (e.g., importance levels, risk groups, type and format of criteria, structural and fire engineering overlap, etc.). However, I hesitate to recommend code changes at this time. In concept, I do not think it helpful, necessarily, to change the C/VM2 if the Code will be changed. Decisions need to be made on the Code, which will then trickle down the hierarchy to other regulatory components. However, the code clauses for Fire should not be changed until there is an overall strategy for the code, verification methods and guidance, as noted above. The 2012 changes to Fire are an example of uncoordinated change.

As noted above, there seems to be an overall lack of agreed strategy to the Code (e.g., should ILs be included or not; should quantitative criteria be included or not; should all risk / use / purpose groups align or not; etc.), supporting / related legislation (e.g., Change of Use in particular), supporting documents (e.g., Acceptable Solutions and Verification Methods), and how everything should work together. There also appears to be different approaches to if, how and to what extent MBIE might communicate with and/or try to influence other players in the market, as part of the overall system, including but not limited to BCAs, IPENZ (or others, relative to qualifications and competency), and supporting processes (such as peer-review). It appears some duplication of effort is occurring (e.g., around risk / use / purpose groups). The Fire Programme needs to decide whether to recommend changes to the Code, C/ASx and/or VMs, but does not know how any suggestions they make might fit in the 'bigger picture'.

I suggest that MBIE carefully consider the issue regarding whether they want to review and potentially revise the foundational strategy of the Code and the associated regulatory system, and if so, to what extent they are prepared to make changes. At a minimum, I suggest the following:

- An agreed approach to the structure of the Code, and level of detail provided, is needed. This can be a reconfirmation of the Nordic (NKB) approach, or a modification to the IRCC Hierarchy, or other. It should identify the structure and form of each component in sufficient detail so as to guide development of Code clauses, Acceptable Solutions, Verification Methods and Guidance documents. Critical issues to me include: (a) are the objectives still appropriate and adequately stated, (b) are the functional requirements still appropriate and adequately stated, (c) are the performance clauses still appropriate and adequately stated, (d) what level of quantification is desired and/or required, (e) where should quantified values sit, (f) what assumptions about qualifications and competency can be reasonably made, which will impact structure and detail in the code and supporting documentation, (g) what assumptions about regulatory review and acceptance of designs can be reasonably made, which will impact the structure and detail in Acceptable Solutions, Verification Methods, and Alternative Solutions, and (h) what form(s) of data and data collection systems are needed to provide evidence to provide appropriate indicators of how the regulatory system is working and if, when and where change is needed (data might be construction inspections, building warrants of fitness information and detail, fire incident reporting, etc.).
- The structure of the Code documents should consider that a building works together as a system: if the Code facilitates a 'silo' approach to design, and the system does not have checks for integrated (holistic) building performance, unintended consequences might be expected. If the Code anticipates qualified and competent practitioners, mechanisms should be in place to assure this. Whoever is liable for assuring good performing buildings (compliant buildings) should be given the tools to assess performance.
- A fundamental and common approach to quantification in the Code needs to be developed. This could be quantification where practicable or no quantification (with quantification sitting in lower level documents). This includes Importance Levels (ILs), Tolerable Impact Levels (TILs), and quantified criteria. The approach should be consistently applied across all areas of the Code. It might be worthwhile to revisit the concept of using risk as a basis for setting safety objectives in the Code, and whether this or some other mechanism might help facilitate consistency.
- A robust and transparent approach to Code and regulatory system development should be implemented. This might include approaches to establishing working groups, consulting with stakeholders (when, on what, how the input will be used, how decisions are made, etc.), testing of ideas, and providing adequate time for assessing major changes.
- It should be clear what aspects of the building regulatory system can be effectively managed by MBIE and the documents it produces, and what the responsibilities are for other actors in the system.

Transparency and Breadth of Participation in Fire Working Groups

Issues that arose in several external discussions, particularly the open SFPE sessions (in which MBIE was not involved), are a perceived lack of transparency, and a perceived limitation on participation, regarding the ongoing fire programme activities. It was noted by several fire engineers that MBIE seems to be working with a small number of fire engineers, and it is not clear how the fire engineers

were selected and what the scope and target outcomes of the various working groups are. This was voiced in all of the SFPE-organized meetings (with a total of some 50+ engineers).

This is a concern. The lack of communication around the 2012 changes to the code and roll-out of C/VM2 have been clearly voiced and clearly heard within MBIE. The 2014 workshops around issues with the fire regulatory system highlighted the need to have more consultation and openness with stakeholders. While many positive steps have been taken, including setting up the fire programme and working groups in response to the 2014 efforts, the fact that some in the industry remain disappointed with how the process is operating is concerning.

As with the discussion in the 'interpretations' and 'peer review' annexes about having a process for identifying and appointing people to these panels, a transparent and well-documented process for identifying, qualifying and selecting working group participants would be helpful. Such a process might look at factors such as diversity (i.e., not just gender, ethnicity and so forth, but experience, size of firm, and other such market diversity issues).

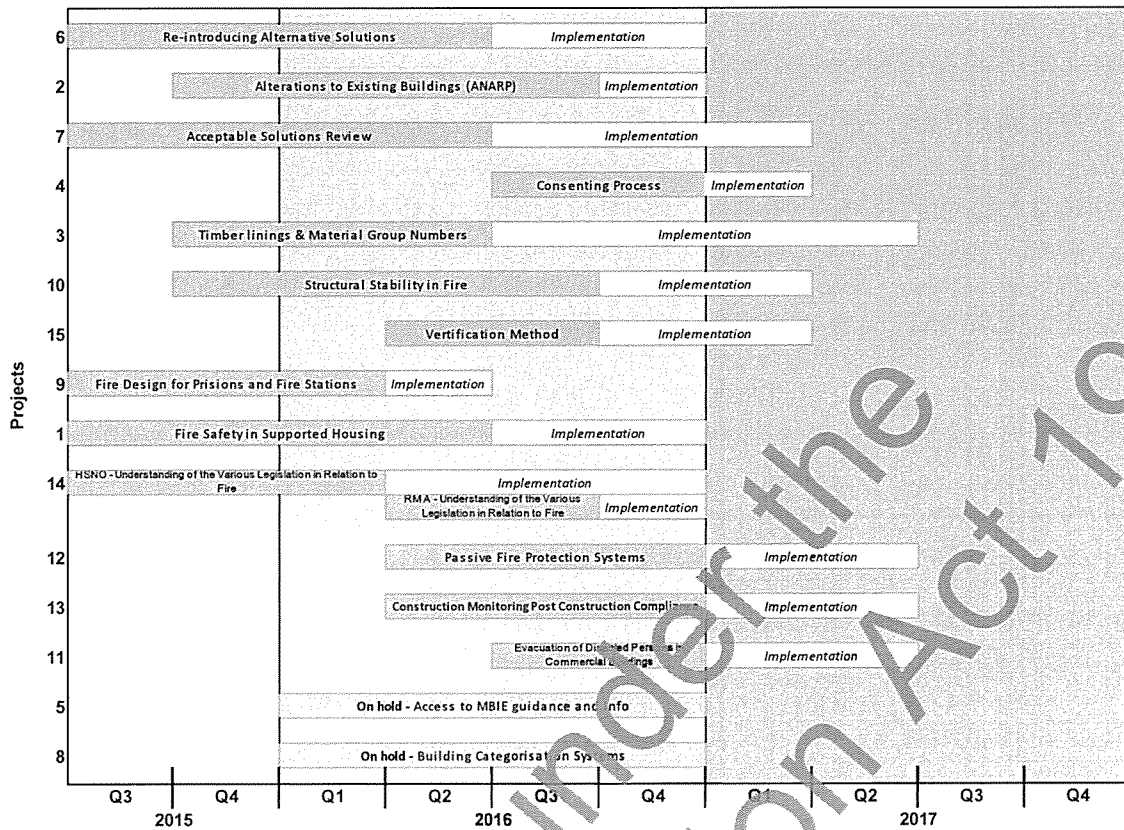
Fire Programme Project Status

Following the 2014 activities around stakeholder surveys and workshops aimed at understanding concerns of the industry, a long term (10 year) fire regulation development programme was outlined. The initial set of priority projects were identified as below:

1. Fire Safety Requirements for Community Care Housing
2. As Near As Reasonably Practicable (ANARP) Decisions for Fire Safety Requirements
3. Material Group Numbers – Timber Linings
4. MBIE and New Zealand Fire Service (NZFS) Partnership
5. MBIE Guidance and Information
6. Re-Introduction of Alternative Solutions
7. Errors and Inconsistencies in Acceptable Solutions C/AS1-7
8. Change from Purpose Groups to Risk Groups
9. Design and Consenting for Classes of Specialist Buildings
10. Stability of Structural Systems During and After Fire
11. Evacuation for Persons with Disabilities
12. Passive Fire Protection
13. Construction Monitoring and Post Construction Compliance
14. Alignment with other Acts and Regulations

While work has been undertaken on several of these projects, some have been placed on hold, and some have been reorganized / refocused. The current projects and plan are illustrated below.

A review of some of the project documents, and brief discussions with Chris Rutledge about the status of projects was held. This was in addition to my participation in a meeting with the Chair of the Working Group for Project 3 (Material Group Numbers) along with Chris Rutledge, Mike Cox and Michael Belsham, sitting in on a discussion between the Chair of the Working Group for Project 6 (Alternative Solutions) and Michael Belsham, and my brief participation in a Project 10 (Structural Stability in Fire) Working Group meeting.

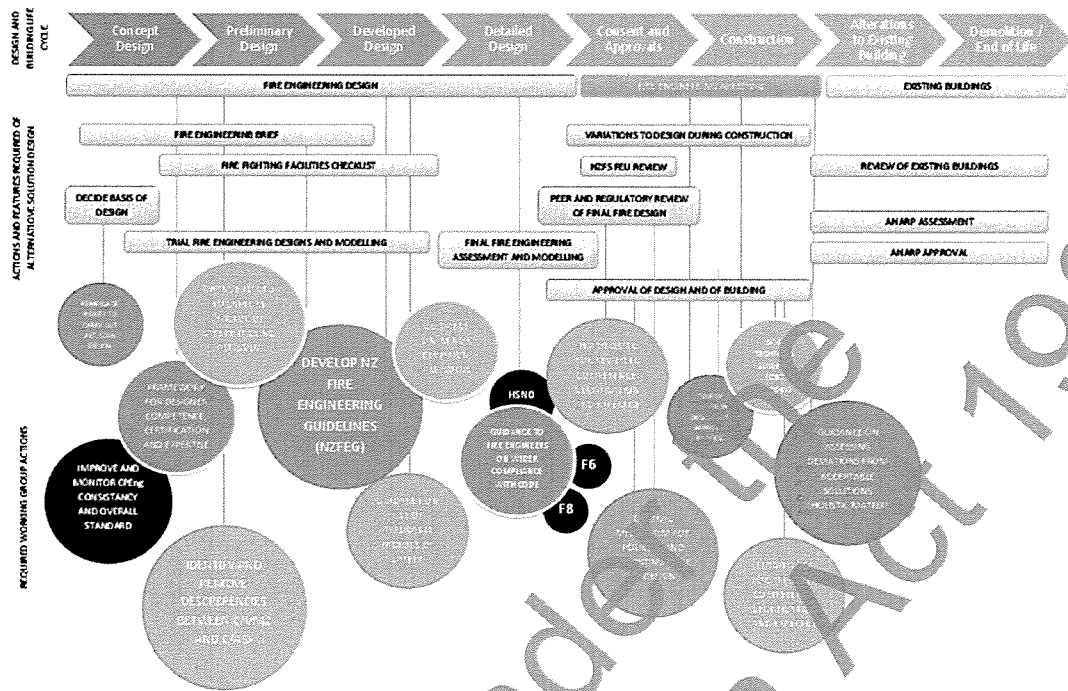


With respect to the Project 3 meeting I participated in, a variety of issues were discussed, but in the end, there was general agreement that there was no need to remove the criteria from the code, but there is a need to better define 'crowd' (i.e., looking at risk factors, such as number, vulnerability, etc.) and applicability / exceptions for use of combustible surface linings in this regard (e.g., may be ok if serving hairdresser space with only 5 occupants, but not for nightclub with occupant capacity of 99, both of which fit in the current Acceptable Solution classification of CS (Crowd Small, which is any occupancy with under 100 people).

A key discussion point was the confusion within fire, and across the code, with the numerous and often conflicting uses, purpose groups, risk groups, etc. Mike Cox has been looking at this issue, and has documented some 8 classification systems (and counting) – see Project 8. Mike did not seem to be aware of the papers John Gardiner had circulated around the 'understanding the code' brainstorming session from February. It seems joining up efforts would be beneficial. Likewise, it was discussed that some sort of search mechanism to identify terms with multiple definitions would be helpful. It was noted a taxonomist was used for customer support efforts (e.g., finding code material). Here again, connecting resources instead of duplicating efforts would be beneficial.

With respect to the Project 6 meeting, it was primarily to discuss how the project should proceed, given different issues which had been raised. Just recently the chair of the Project 6 WG has provided a proposed action plan for moving forward. I include a diagram on this plan below.

WORKING GROUP 6 – ALTERNATIVE SOLUTIONS – ACTION PLAN



The reason I include this diagram is to illustrate the relationships to other efforts underway. These include peer review, regulatory review (including BCAs and the NZFS), competency and qualifications in the market, interaction with Acceptable Solutions and potential 'minor' deviation from the solutions, relationship with C/VM2 and so forth.

Some of the Project 10 issues were discussed earlier in this report, in particular, the roles and responsibilities of fire engineers and structural engineers with respect to structural stability during and after fire. Discussion at the Working Group meeting suggested that there was general agreement in the group that fire engineers should be limited to providing input on the expected fire environment, which is then provided to the project structural engineer, who will be responsible for design for structural stability that is required under clauses B1 and C6 of the Building Code. Efforts are underway in the WG to provide guidance in this area.

I include the above brief overview of project status as I believe decisions must be made on approaches forward with the building code, competency and qualifications, and peer review, as they will have a direct impact on the Fire Regulation Development Programme.

In particular, Project 8, Building Classifications, is on hold. I think this issue needs to be resolved, as part of the overall MBIE review of the Building Code structure, as a priority. This needs to be done before the Fire Programme can advance work on Project 7, Acceptable Solutions, which is due to finish development this quarter. Significant work has been undertaken on this project, with three approaches to Acceptable Solutions restructuring being proposed. However, I do not think further work should be undertaken until there is agreement and alignment on the overall issue of classifications / categorization in the Code (i.e., importance levels, use groups, purpose groups, risk groups...). It does not make sense to restructure the Acceptable Solutions until this is done. I would also note that reaching out to more fire engineers about the work here will be important. Feedback about transparency, how input is gathered and addressed, and related issues were often noted

about this project. I would suggest a very clear mechanism be put into place for: (a) seeking input (consulting or whatever term is used), (b) logging input (requested changes, modifications, support, dissent, etc.), (c) actions on proposed changes (what, why, how supported, etc.), and (d) re-consulting on modified document. This cycle might be needed more than once. I suggest an approach such as this be used for all WG efforts.

Project 10 is a high priority, along with the yet to be approved Project 15 on the C/VM2 fixes. Regarding C/VM2, I think this project will also attract much attention, like Project 8 above. Since the Working Group is not fixed, I would suggest MBIE consider making this a larger WG than others, to include more stakeholders (particularly more fire engineers across a broader spectrum), and follow the process outlined above: (a) seeking input (consulting or whatever term is used), (b) logging input (requested changes, modifications, support, dissent, etc.), (c) actions on proposed changes (what, why, how supported, etc.), and (d) re-consulting on modified document.

While I think the refocused Project 4 (now Consenting Process) is important, I do not think this should be started until there is an MBIE view on the (a) Building Code structure, (b) Competency and Qualifications, (c) Peer Review, and (d) the 'Liability-Management' culture across the sector (designers, engineers, regulatory officials, owners, ...).

Alignment of legislation, Project 14, is also very important. To me, this is not just HSNO, but the RMA, Evacuation Regulations, and Fire Service Act, outside of MBIE, but importantly the Building Act, Building Code, and Change of Use Regulations within MBIE (particularly change of use, earthquake prone buildings, and ANARP as part of an integrated building regulatory system).

Fire Programme Management and Governance

The fire program has one MBIE employee and two contract employees. More permanent resource is needed (e.g., another fire engineer, with both technical and regulatory experience). It will be difficult to make changes going forward, as recommended in this report, without adequate resource and clear management commitment and structure. This includes addressing the issues of Code structure noted above, minimize duplication of effort, and having clear and supported paths forward – through the current fire program – and to continue the efforts beyond.

As noted above, there are multiple classification systems (uses, purpose groups, risk groups, etc.). An effort is under way in the Fire Programme to look at the fire-related issues. I understand there is work in the Structural programme on where Importance Levels should sit, and how and where to incorporate Tolerable Impact Levels (TILs). There have been documents circulated by John Gardiner which have looked at the different classification systems, and discussion on how the Code might be restructured, which the Fire people may not be aware of. There seems to be an overall lack of agreed strategy to the Code (e.g., should ILs be included or not; should quantitative criteria be included or not; should all risk / use / purpose groups align or not; etc.), supporting / related legislation (e.g., Change of Use in particular), supporting documents (e.g., Acceptable Solutions and Verification Methods), and how everything should work together.

I raise these issues since the overall management structure and approach have a significant impact on the productivity of the Fire staff and the successful achievement of the Fire Programme. It appears some duplication of effort is occurring (e.g., around risk / use / purpose groups). The Fire Programme needs to decide whether to recommend changes to the Code, C/ASx and/or VMs, but

does not know how any suggestions they make might fit in the 'bigger picture'. Feedback from the 2012 changes included concerns that Fire made changes that were not aligned with other aspects of the Code: the situation is at risk of being repeated again.

In addition, there also appears to be different approaches to how, and to what extent, MBIE might communicate with and/or try to influence other players in the market, as part of the overall system, including but not limited to BCAs, IPENZ (or others, relative to qualifications and competency), and supporting processes (such as peer-review). Here too there should be a coordinated approach, which is well-communicated internally to those impacted by the discussions and direction.

The Fire Programme, as structured, has some 15 projects, many of which are due to wrap up in the next 12-18 months. What happens if targets are missed? What will happen after? As noted earlier in this document, a full 'Gateway Review' was not possible during this review. However, one should be conducted, and a plan forward for transitioning out of the targeted 'fire programme' and onto continuous support for the sector seems to be needed.

Summary Thoughts

I have taken a critical approach to review of the Fire Programme and associated issues. I suggest that there are a number of issues which should be addressed to make the regulatory system, and the development and support of building regulatory documents, more efficient. However, I would also note that the situation is not dire. Buildings are not burning down and people are not dying at intolerable rates. Most stakeholders generally appear to be trying to work together.

However, there are some concerns. First, there are latent risks, which if not addressed, could create intolerable outcomes in the future. The extent of problems with passive fire protection, the lack of fire data, the poor communication with the fire service, the 'shortcuts' that some engineers and peer reviewers seem to be taking on significant projects (e.g., 50 story buildings), the lack of minimum qualifications for engineers to practice, the liability-management approach of actors across all of the sector (engineers, BCAs, builders, etc.), and lack of clarity with the code combine to create an environment where poor designs, which could lead to significant failures, can exist.

While MBIE is working to address many of these issues in the fire programme area, and several projects and associated working groups have been established, there remains concern with how this is happening. Having clear and documented procedures will help. Expanding the reach for inclusion of input from a broader group of stakeholders will help as well. Transparency with respect to the market is needed for engendering good stakeholder relations and engaging the market in addressing issue of concern.

While the fire staff have made good progress on the fire programme, action and guidance is needed from a higher level to continue to make good progress. MBIE needs to have a strategy and action plan for addressing core issues of structure and consistency in the Building Act, Building Code and associated regulations. Harmonization of importance levels, risk groups, purpose groups and such, clear direction on quantification of performance and where quantified criteria should reside in the system, and steps which can be taken to help raise the competency and qualification in the sector, as outlined in the report, are essential for facilitating a better working system. These issues are also essential to guide the prioritization and activities of the fire programme. It makes no sense to proceed with projects which may be significantly impacted by structural changes to the code or

regulatory system. Likewise, focusing on projects which are independent of the structural issues, in a manner that is reflective of industry desires and concerns, is important.

In closing, I note that my comments are based on a limited knowledge of the system, as one would expect from someone outside of the system, and the shortage of available time to meet with more stakeholders and develop a broader base of information from which to base my recommendations. Interpretations of the situation, issues and concerns, as reflected in this report and annexes, are mine. While I have made reasonable attempts to be accurate, errors of interpretation, omission or misrepresentation of facts, or incomplete reporting of the situation may exist. Any shortcomings, errors or gaps are mine and not those of MBIE or the persons I met with during my visit. In the end, my comments reflect my understanding of current issues and activities, and are provided to raise awareness and to provide some potential approaches for addressing issues and concerns which MBIE decide are appropriate to address.

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