

# IGNIS ADVISORY NOTE

Evaluation No.IGNS-5216-01 Issue 01 Revision 00 [2017]

## 1 Introduction

Ignis Solutions has been requested to provide a response to a series of questions on notice as per the email received on 26 July 2017 from the Senate Economics Reference Committee.

## 2 Questions on Notice

The following is our response to the questions provided on notice.

1. Could you explain the 'deemed-to-satisfy' and 'performance based' provisions in the National Construction Code? How difficult will it be to develop a definitive guide and interpretation of what is allowed?

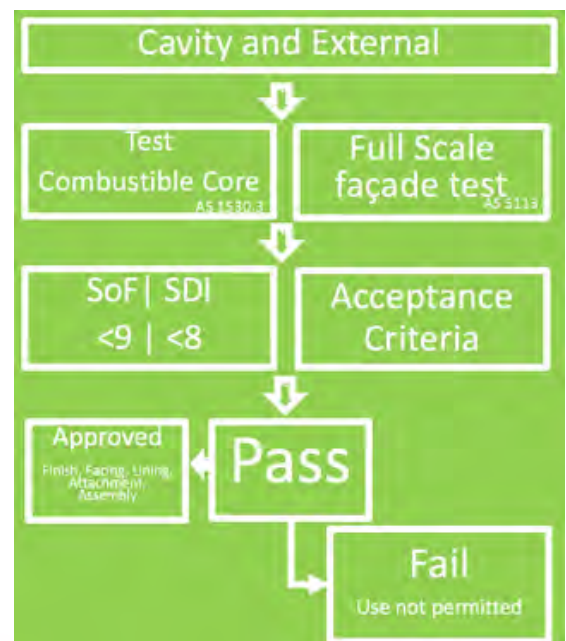
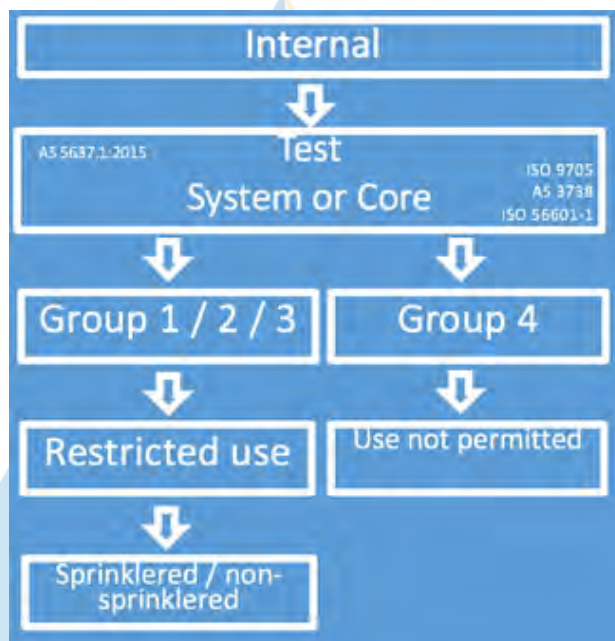
### Ignis Response:

The National Construction Code Section A, the Guide to the BCA as well as the Australian Building Codes Board (ABCB) provides details for the pathway between the 'deemed-to-satisfy' and 'performance based' provisions. The ABCB guidance document is available as follows:

<https://www.abcb.gov.au/Resources/Publications/Education-Training/Development-of-Performance-Solutions>

The advisory note on the fire performance of external walls and cladding is verbose and is focused on BCA Specification C1.1 Clause 2.4. It is considered that a simple guide of what is permitted and the associated testing is not difficult. The ABCB has made substantial efforts, such as with the linked guidance document above, in simplified guidance documents.

Ignis Solutions has generated the following general flow charts which is then explained in further training documents. With the cavity and external use chart, details on the interaction with full scale testing as well as BCA Specification C1.1 Clause 2.4 are required to be explained further. It is expected that the upcoming verification method. Predicted to be CV3, should assist in providing an appropriate means to achieve compliance.



2. The Australian Building Codes Board has issued a series of bulletins, brochures, practice notes and clarifications on the content of the BCA/NCC and the interpretations thereto pertaining to “deemed-to-satisfy” and “performance based” methods of construction provisions of the Code. What is your view on the work being done by the Australian Building Codes Board?

**Ignis Response:**

The ABCB continues to provide a delayed response with limited connectivity to industry needs. The advisory note does not provide clarity to the situation or give a definitive path of testing and evaluation requirements. Industry remains conflicted with attachments and part of wall structures and the associated requirements for compliance. It is understood that industry was expecting the ABCB to provide a document that clarifies specifically how composite panels can be used, the evidence required, such as testing and associated results, including what elements need to be addressed within a performance report. This has not occurred and industry remains fragmented.

3. The National Construction Code currently has a pathway which permits the use of Polyethylene core composite panels equivalent to that used on the Grenfell Tower, under the 'deemed-to-satisfy' provisions. Are their legitimate uses for such materials in some building projects, or should they be banned?

**Ignis Response:**

In short, NO, it is considered that there are no legitimate uses for PE core materials within buildings, be it cladding or signage that cannot be cost and life safety effective with a fire retardant core panel.

4. What do you consider to be the primary factor leading to the use of non-compliant external cladding materials? For example, is the issue with importation, fraudulent certification or just product substitution?

**Ignis Response:**

It is considered that the complexity and lack of clarity within the National Construction Code (NCC) has been the primary factor leading to the use of the flammable cladding. The NCC details a series of base clauses and then provides for a series of concessions such as use of timber in 3-4 storey Class 2/3 buildings as well as combustible internal lining through BCA Clause C1.10. The NCC however does not provide context to the concessions or definition for critical terms such as linings, attachments and the like. Due to the ambiguity within the BCA, stakeholders within the construction industry, involved with cladding, do not appear to have had a reliable or confident understanding of the requirements. Fraudulent certification is considered to be a very rare event with means to address the matter in a short and decisive time. Product substitution is a common event within the construction industry due to a number of factors including a separate development and construction process with different organisations as well as an increasing trend towards a united design and construction process by installers rather than a separate design, with qualified engineers, and construction persons. If the BCA was clearer on the requirements for fire safety of external cladding then the product substitution would likely be for identified compliant products.

5. Would you consider that the enforcement and audit regime has failed? Could this be addressed with a nationally consistent approach across jurisdictions?

**Ignis Response:**

Yes, the enforcement and audit regime has failed. It is considered that the enforcement has failed at multiple levels for both the voluntary building and mandatory plumbing industries. The lack of consistency across Australia as well as the lack of professional engineers involvement in the buildings construction and occupation results in the project Certifier/Surveyor being responsible for the fire safety measures of any fire engineering report being implemented. Typically, a fire safety engineer would produce a fire engineering report with specific requirements then not be required to provide guidance or inspection during the construction and not provide final review prior to occupation of the building.

A number of failings have occurred within the WaterMark Certification Scheme, being a mandatory certification scheme for plumbing products. See Appendix A for case study details.

6. Should it be mandatory that testing of imported products be conducted in Australia? What would be the implications of such a move?

**Ignis Response:**

No, testing bodies have a recognised international acceptance process through the International Laboratories Accreditation Cooperation (ILAC). It is considered that a number of high risk elements within the BCA such as weatherproofing, fire resistance, fire hazard properties and acoustics should have mandatory testing and certification where renewal of the testing and certification occur at no greater than 5 year intervals with yearly batch testing requirements.

7. The committee heard evidence at its hearing on 14 July 2017 week suggesting that there could be thousands of buildings in Australia with non-compliant external cladding materials. Would you agree with this assessment?

**Ignis Response:**

Yes. Discussions with installers as well as recent audits of buildings has indicated that thousands of buildings are provided with the flammable cladding either on the external parts of buildings walls or used internally as 'signage'. It has recently been identified through a series of inspections by Ignis Solutions, that a substantial amount of shop fronts within buildings and on external walls have used the flammable cladding as 'signage'. The signage in actual fact is the wall of the shop and subject to the requirements of the NCC. Ignis Solutions, through a number of audits, has identified that the legislative process for building approvals has not occurred for typical tenancy fitouts and use of appropriate materials. Furthermore, approvals for changes to fire safety systems such as detection, alarms and sprinklers equally has not been followed to ensure compliance with relevant fire safety design and installation requirements have been followed.

- 8. In what ways could the Australian Building Codes Board improve its guidance information on the types of evidence of suitability and the building products that should be aligned with each type of evidence based on their risk?

**Ignis Response:**

The requirements of Clause A2.2 of the NCC Volume One is considered to be suitable with the exception of Clause A2.2(b)(ii) which permits any other form of evidence. This latter clause should be removed.

The ABCB can assist in providing clarity in how the BCA permits the use of concessions under the code such as Clause C1.10 for combustible material use within a building, Clause 3.10 and 4.3 of Specification C1.1 for timber frames and Clause 2.4 of Specification C1.1 for external combustible material use on a building. During the development of the Building Code of Australia (BCA) within the Australian Mutual Uniform Building Code, consideration for limiting the extent of combustible materials in a similar way to openings on an external wall occurred. The following provision did not remain within the final version of the BCA. It is considered that should this provision have been maintained within the BCA, even if the flammable cladding was mistakenly used on buildings, there would be means to limit any substantial external conflagration of the façade. Much like the United Arab Emirates life safety code, limitations in the fire hazard properties, inclusion of fire breaks and full scale external wall testing.

Combustible attachments to non-combustible or fire-resistant member	(11) Unless otherwise expressed in this Code, a combustible material may be used as a finish, surface, lining or the like of, or as an attachment or part of an attachment to, a structural member required to have a fire-resistance rating or to be non-combustible if the combustible material or its use, as the case may require, complies with this clause.
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Utilise Early Fire Hazard Test parameters in order to determine whether certain articles or materials are acceptable, i.e. do not aid the spread of fire.

Prohibit the use of combustible attachments within specified distances from exit systems.

Limit the overall size of combustible signs or other attachments.

Review the Building Code of Australia provisions in the draft in clause C3.5(15).

Review of editorial change.

Amend clause C3.5(15) of the B.C.A. in the following manner-

C3.5(25) Ancillary construction (materials) attached to external walls -

- (1) In a building required to be of Type A construction, a material attached to or forming part of the outside face of an external wall shall be -
  - (a) of such characteristics and so located as not to aid the spread of fire via the facade of the building; and
  - (b) should not be permitted near or directly above required exits as to render them unusable in the event of fire.
- (2) Articles or materials referred to in sub-clause (1) shall be deemed to comply with the clause, if they:
  - (a) do not occupy more than 1/3rd of the area of such part of the outside face of an external wall within each storey;
  - (b) are not placed on spandrels required by clause C5.3(2), to be of a minimum of 900mm in height; and
  - (c) comply with the requirements of clause C3.14(1) for Early Fire Hazard Indices.

9. In your view, are the current penalties for knowingly selling non-compliant product, installing it, or importing it directly for use in Australia adequate?

**Ignis Response:**

No, given that the current penalties are considered to be non-existent. There should be a national process to identify what non-compliant (either DtS or Performance based) products are to remove any excuse of ignorance.

10. What is your view of the work of Building Ministers' Forum and the Senior Officers' Group in addressing non-conforming and non-complying products? Were there any recommendations you would have included in the Senior Officers' Group report, Strategies to address risks related to non-conforming building product?

**Ignis Response:**

The Building Ministers' Forum, means well and provides direction to the ABCB in tasks but should set direction to each State and Territory, in the absence of building planning and construction being a constitutional matter, each State and Territory should harmonise their building planning and construction regulations as well as licencing requirements for professional building designers, engineers as well as installers. The QLD model would be supported for a national model.

11. Have you been involved or consulted in the Australian Building Codes Board's work developing a comprehensive package of measures to improve fire safety in high rise buildings?

**Ignis Response:**

I am aware that the ABCB is working with a number of fire engineering organisations in assisting with the verification methods, but I am unaware of any consultation the ABCB is making to include relevant industry groups.

12. Do you consider that fire safety engineers receive sufficient specific training?

**Ignis Response:**

Many professional fire engineers have international training. Few have local training and experience outside of their own State or Territory. Due to the lack of State based accreditation requirements or their non-existence, there is little incentive for fire engineers to be professional. There are a number of suitable training and educational courses for fire safety engineers, but unless there is an accreditation requirement for Continued Professional Development (CPD) the improvement of engineers is unlikely to occur.

13. Is there a nationally consistent licensing and registration regime for fire safety engineering? How can this be improved?

**Ignis Response:**

Yes, Engineers Australia has the National Engineers Registry which includes provisions for fire safety engineers. This national registry is not required or referenced in States or Territories with the exception of QLD.

In a paper presented at Fire Australia in 2006 by Stephen Kip, a fire engineer in Melbourne, each State and Territory had a very different requirement for fire safety engineers. In addition, the paper highlighted that if the Engineers Australia registration scheme was used as a benchmark of minimum requirements that a substantial quantity (in the order of 60%) of current practicing fire safety engineers would not have capacity to qualify for stage 1 status being a member of Engineers Australia. This is not considered to have changed over the past ten years.



There is also a discrepancy between what Engineers Australia detail as a professional engineer, being a member of Engineers Australia who following three years of dedicated study in professional activities becomes a Chartered Professional Engineer. The BCA details within Clause A1.1 definitions that where legislation is not applicable a person who is eligible to become a corporate member of Engineers Australia and has appropriate experience and competence in the relevant field.

Alignment of these requirements should be undertaken post haste.

14. The VBA External Cladding Audit Report observed that 'There are many types of external cladding material in use throughout the Victorian building industry but whether one is "fit for purpose" over another is not always properly understood by architects, designers, engineers, building surveyors and builders'. What measures should be introduced to address this issue?

**Ignis Response:**

We agree with this statement. There are many products that have been proven to be of a suitable fire safety status and should be permitted to be used on buildings even though they contain combustibles. A measure for determining the fitness, such as the Group numbers for internal use, should be created for external application. The proposed changes to the BCA present a verification method which is in essence a performance requirement where a professional engineer is required to verify the products use. With the variation in understanding of compliance as well as qualifications of many industry members an easier and quantifiable process of suitability should be applied such as each combustible element of a combustible product must have small scale fire hazard testing with a set acceptance level undertaken. If the product is to be used within a building, a full scale fire test of the product is to occur and a set acceptance criteria met. Equally if to be used externally, then a full scale external test must be completed with a set acceptance criteria.

15. How important are third party certification schemes and should they be mandatory? How could the CodeMark System be improved?

**Ignis Response:**

Third party certification schemes are important, but they are only as good as their rules, enforcement and support from the owner. The CodeMark Scheme is going through an improvement process. The CodeMark Certificate is not an easy document for certifiers to read and should provide a very clear use of products and compliance to either a Performance Requirement or Deemed-to-Satisfy Clause.

As previously detailed, mandatory certification should be applied to each element which is to be identical to its tested prototype. Installations being identical to the tested prototype occurs currently for fire resistance, weatherproofing, acoustics and should occur for internal and external full scale wall fire tests.

With each scheme, failings can occur. This is evident with both the CodeMark and WaterMark scheme where the ABCB is a toothless tiger not willing to uphold the rules. An example of such is provided in Appendix A.

16. At the committee's hearing on 14 July 2017, Mr Neil Savery of the Australian Building Codes Board, observed that the industry had changed dramatically in recent decades, with deregulation and globalisation, making it harder to ensure buildings were built to certain standards. Mr Savery also noted that a sophisticated performance-based code of regulation was introduced in the early 1990s, which needed highly qualified people to understand how it works. At the same time, former government-run building certification was privatised, and the industry underwent a process of deregulation, for example a reduction in things like mandatory inspections.

- Do you consider that the current regulatory regime needs to be reviewed to reflect the changes in the industry resulting from trends toward deregulation and globalisation?
- Do you consider the incremental introduction of private certification has had an effect on building safety and standards?
- Do you consider that certification services should be run by local and state governments again?

**Ignis Response:**

Whilst deregulation from council certification has occurred and transferred to private certification, improvements in professional conduct and accountability is evident. There are legislative responsibility improvements needed within each State and Territory where an equivalence balance between each of the States and Territories will improve the situation. The likes of the Association of Accredited Certifiers as well as the improvements to the Australian Institute of Building Surveyors accreditation scheme will continue to present an improved building certification process.

I have observed greater education and knowledge through a private certification process as well as improvements in approval processes. It would be recommended that clear guidance for the tasks and enforcement powers by the private certifiers would assist. Especially to limit any retribution by other authorities. The certification services have been subject to the ambiguity of the BCA as has many other industry groups.

Certification should not be run by local or state governments as costs and delays would be increased as well as a reduction in qualifications and experience. It is recommended that the certification process should be completed by a house of expertise where the certifier must be supported by experts such as NER professional engineers who will provide dedicated guidance, review and inspection of fire safety matters. Equally a process of peer review for the certification process as well as a means for auditing by the AIBS or AAC to certifiers with mandatory CPD.

### 3 Conclusion

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Ignis Solutions thanks the committee for the opportunity to provide comment and trusts the above detail assists in the matter of combustible cladding.



**Benjamin Hughes-Brown** FIEAust CPEng NER

Managing Director  
Chartered Professional Engineer

In or about November 2015, a plastic sprinkler pipe failed within a residential care building in Sydney during extreme temperatures. The plastic sprinkler pipe is certified with the WaterMark certification scheme and tested to substantial pressures above its recommended operational use. It is understood that the installation design did not include pressure relief as this was not required under the Australian Standard for design and that Sydney Water provided no indication of excessive pressure occurrences within its network. As a result, with backflow prevention devices installed on the system as a requirement of Sydney Water, pressure relief was not available on the closed circuit. Pressure spikes, known as transient water, caused the sprinkler system to be pressurised above its design requirement (in some cases greater than 4MPa when the testing only required compliance in the order of 2MPa). Further to this, temperature control of the roof space did not occur and as a result during the 40°C+ days the temperature within the roof is understood to have exceeded the design limits of 60°C.

The NSW agency, known as Urban Growth is understood to have blamed the rupture on the pipe rather than the installation conditions and lack of managing the pipes operational requirements. Urban Growth is understood to have commissioned, through an engineering consultancy, a non NATA lab who conducted an observation test to an American standard and claimed the pipe was faulty. The disappointing component was that the test lab, engineering consultancy and Urban Growth did not acknowledge the products certification or compliance requirements under the Plumbing Code of Australia and the WaterMark Certification Scheme.

Flowpex, the manufacturer of the pipe, subsequently had to defend its products compliance through the civil court system and received little to no support from the scheme administrators, or government agencies responsible for the governance of the plumbing certification scheme.

An overview of the experience by Flowpex as well as correspondence from NSW and Federal Governments is attached.

- The ABCB are the owners and administrators of the Watermark Certification Scheme.
- The Watermark Certification Scheme is part of the National Construction Code under Volume Three –Plumbing Code of Australia (PCA).
- The PCA is regulated by each state and territory government plumbing regulator.
- In NSW this is The Department of Fair Trading. I have approached Fair Trading about the role between the administrator and regulator previously and they appear to be confused.
- The PCA through part B4 sets requirement for fire-fighting water services.
- Clause B4.2(c) details ‘the installation of an automatic fire sprinkler system must be in accordance with AS 2118.1, AS 2118.4, AS 2118.5, AS 2118.6 and AS 2118.9 as appropriate’.
- A domestic (home) sprinkler system when installed, in accordance with the PCA must comply with the requirements of the PCA, AS 2118.5 as well as AS/NZS 3500.
- Testing and Certification of the product with the Watermark Certification Scheme demonstrates compliance with the PCA as well as the products fitness for purpose in accordance with Clause A2.1(a) and (b).
- Table A2.1 requires pressurised pipes and fittings to have a minimum of Level 1 certification. Flowpex pipe has been tested and certified to satisfy this requirement.
- Urban Growth NSW had failures in Sprinkler installs in NSW and via WSP and subsequently Excelplas tested the pipe and recommended the pipe was not fit for service.
- When the failure occurred Flowpex approached our certification body and notified them of the situation.
- Instruction received was to review the entire system by AMI. This was done by Ignis Solutions.
- This was conducted and passed on to Urban Growth. The response was that this was only a review and that we have no commercial relationship with them and we should have forwarded this via the proper channels. Email available.
- UG NSW stated the Ignis report was only a review and no testing of the product was done.
- Resifire approached Fair Trading to investigate an apparent faulty watermarked product.
- No advice that was useful was provided. In fact Resifire informs me that that the advice they received was that Fair Trading was not to get involved.
- Flowpex by email and then subsequently verbally discussed this with the Regulator and the advice was to approach the ABCB being the owner and administrator of the WaterMark Certification.
- We subsequently commissioned Dr Alan Whittle and ANTL to do further testing of our product.
- The disappointing aspect was that UG NSW would not talk to Flowpex and would not meet us as we did not have a commercial relationship with them.

- The product was in approximately 50 group homes and the decision was made to decommission the Systems in all buildings.
- Some Sprinkler systems lay dormant for some 12 months. UG has subsequently removed flowpex from approximately 25 group homes.
- In that time there were 2 fires in homes and fortunately one system was reactivated in the week leading into the event and worked effectively.
- All this correspondence in relation to the matter is now in the possession of the ABCB.
- Land and Housing have subsequently reversed their decision regarding the Flowpex and have installed Cold water expansion measures to deal with the issues.
- This decision was made as they did their own review and commissioned a Dr Hennessey from UTS to look at all material.
- The recommendation was that the pipe was fit for service and pressure relief was warranted as transient water events are impacting on the system.
- The recommissioned systems have now been in operation for in excess of 6 months.
- The expansion device offered initially was at Resifire cost. Subsequent removal of Flowpex pipe from in excess of 20 sites is at a cost of Millions. Totally unnecessary.
- Ongoing issues of excessive pressure and transient water occurred within the system yet the cold water expansion valve prevented over pressurisation and any further damage to the system. A successful full system solution.
- I have found this extremely difficult and very expensive to maintain this course of unsupported action with the ABCB or state regulators over the last 2 years.
- The ABCB are the owners and Administrators of this scheme. Why do I need to defend my product in this circumstance of WaterMark Certification and receive nil support from fair trading or the ABCB,
- The ABCB have been evasive in this issue and have on 2 occasions responded to my question by not answering the specific questions or reframing the question to avoid the salient issue.
- Testing to get the Flowpex pipe to market via the WaterMark Certification Scheme is in the vicinity of 100k and annual fees are in the vicinity of 10k plus.
- I do not understand how any State based organisation like UG NSW can contest WaterMark in this manner and there be no recourse to reorientation any process to adhere to a mandatory scheme.

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**Sent:** Tuesday, 22 March 2016 9:33 AM

**Subject:** RE:

**Importance:** High

Dear Abdul

Thank you for providing UG NSW with this report, contractually we have no relationship with you or your organisation and this should have been provided via the proper channel i.e. through Resifire.

After testing the pipes installed, we have determined the pipes to be defective. We have reached this conclusion based on the laboratory report and engineering advice received.



As you are aware, Wednesday, the 23<sup>rd</sup> of March 2016 is the due date for the builders to respond to the notice and meetings held on Monday, the 14<sup>th</sup> of March 2016.

Regards



Deepak Rana

Delivery Manager



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**From:** [Redacted]

**Sent:** Monday, 21 March 2016 2:32 PM

[Redacted]

**Subject:**

Dear Mark Hehnke,

I would like to thank you for your time on Monday March 14 and acknowledge receipt of the minutes of that meeting, as provided by Resifire on Friday March 18.

Subsequent to receipt of those minutes, I would like to schedule a further meeting for this coming Thursday March 24, to discuss a range of additional findings that bear pertinent relation to the matters referenced therein.

These findings have been collated in consultation with a range of subject matter experts in the requisite areas of Australian Standards and compliance.

I have attached the relevant report for your perusal, in readiness for Thursday's discussion.

Given the number of stakeholders involved and the complexity of co-ordinating multiple schedules, I would appreciate confirmation of your availability on Thursday as soon as possible.

Thank you Abdul.

Abdul Elyoussef  
Managing Director



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**From:** [REDACTED]  
**Sent:** Friday, 30 June 2017 9:40 AM  
**To:** [REDACTED]  
**Subject:** Group Home Fire - Flowpex Product

Hi Abdul

I know we have mentioned to you previously how we had a fire at one of the group home villa complexes in the Newcastle region.

This happened the morning of our scheduled first monthly inspection since the isolation sprinkler had been recommissioned. The fire sprinkler system was recommissioned and left fully functional on 20.12.16 and we had arranged to return on 20.1.17 to conduct the first monthly inspection.

On arrival, at approx. 8.30am 20.1.17, we were advised that there had been a fire in the occupied Villa that morning at approx. 5am. The single occupant had lit fire to his lounge and then went on to advise the staff supervising the premises.

The sprinklers had activated and the fire apparently was almost out by the time the fire brigade arrived approx. 5 mins after the 000 call.

The firemen advised the attending staff that without the sprinklers the whole unit would have been destroyed if not the whole group of villas. They also said how well the fire system worked.

I have attached a couple of pics of the room to show there appears to be very limited damage and think with a clean up and mop out should be good to occupy again thanks to the sprinkler system.

Our guys went back down after lunch on Friday and replaced the activated sprinkler with a new sprinkler and cover plate

so the villa was sprinkler protected still.

Another property also had a fire where the power point caught fire in a laundry but the staff put the fire out with extinguishers before the heat got hot enough to activate the sprinklers. We don't have photo's of this one sorry. It was another Newcastle group home

Kind Regards

*Julie Reibel*

JULIE REIBEL

Resifire Solutions

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**From:** [REDACTED]  
**Sent:** Monday, 7 August 2017 11:52 AM  
**To:** [REDACTED]  
**Cc:** Watermark - ABCB  
**Subject:** FW: WaterMark Certification Scheme enquiry [SEC=UNCLASSIFIED]

Dear Abdul

The Plumbing Code of Australia requires certain plumbing and drainage products to be certified and authorised for use in a plumbing or drainage installation through the WaterMark Certification Scheme. However, there is no obligation in State or Territory plumbing regulations, the Plumbing Code of Australia or the WaterMark Certification Scheme that mandates acceptance of that product for use in specific circumstances. Together, these instruments prohibit the use of an uncertified product where such certification is required. The decision to use a specific certified product is at the discretion and agreement of the parties involved.

I understand that you expect the ABCB to intervene in this matter with Urban Growth NSW. The ABCB has no authority over decisions or actions taken on product selection and installation, approval of plumbing and drainage works or compliance with the Plumbing Code of Australia. The ABCB can take action if the WaterMark certification trade mark is misused. In our previous emails to you, we outlined the process that can be used if a party wishes to lodge a complaint about the conformance of a product to the applicable WaterMark product specification. If you believe that Urban Growth NSW should have availed itself of this process rather than pursuing the course of action that it did, you are at liberty to alert them to the process we described to you.

Kind regards



Anne-Maree  
**Anne-Maree Campbell**  
Director – Product Certification  
**Australian Building Codes Board**

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**GPO Box 2013**  
**Canberra ACT 2601**

ABN 74 599 608 295

*This correspondence and any attachments or references are not intended to constitute any form of advice or recommendation for your specific building project. We recommend that you seek project specific advice from a qualified building certifier, local building authority or building administration in your State or Territory. The Participating Governments of the Australian Building Codes Board shall not be liable to any person or entity who relies upon this correspondence and any attachments or references for any purpose.*

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**From:** [REDACTED]  
**Sent:** Tuesday, 18 July 2017 11:42 AM  
**To:** [REDACTED]  
**Subject:** FW: WaterMark Certification Scheme enquiry [SEC=UNCLASSIFIED]

Dear Sir Madam,

Thank you for your response below.

The intent of my mail was not at all related to the choice of material used by Urban Growth nor the procurement or installation.

This was a domestic sprinkler installation in accordance with the PCA through part B4 which sets out the requirements of fire fighting water services.

The testing of the product with the watermark certification scheme demonstrates compliance with the PCA.

In essence, a watermarked product in an installation covered by the PCA, administered by the ABCB and questions specific to scheme administration and rules.

Urban Growth chose to test and accept results of a watermarked product outside of the scheme rules in a laboratory that does not have the necessary accreditation and scope to make determination under the scheme rules.

The determination by the laboratory was that the product was not fit for service utilising observations not encompassed within the certification process.

ABCB is the owner and administer of the scheme and the questions raised relate to scheme rules and administration.

a. Should Urban Growth have contacted the ABCB or CAB in the first instance regarding a perceived failure of a watermarked product?

b. Should excelplas have made an assessment of the pipe outside of the scheme rules and conclude not fit for service?

c. Does ABCB see the behaviour in the above 2 serials as inappropriate and an attack on the integrity of the scheme as the owner and administrator of the scheme?

d. Does the ABCB agree that not acting is relinquishing their duties in maintaining the administration of the scheme in this instance?

e. Does the ABCB have a duty of care to maintain the integrity of the watermark scheme in this instance?

f. Does the ABCB intend to take this matter up with Urban Growth and Excelplas?, and if so,

g. How does the ABCB intend to administer this issue with Urban Growth and Excelplas?

From my perspective as a member of the watermark community I see this as an opportunity to reorientate boundaries and maintain the integrity of the watermark scheme.

For the ABCB to not act is an example of abdicating responsibility and encouraging dissenting behaviour which only serves to undermine the entire scheme unfortunately. Thank you.

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**From:** [REDACTED]  
**Sent:** Wednesday, 12 July 2017 1:57 PM  
**To:** [REDACTED]  
**Cc:** [REDACTED]  
**Subject:** WaterMark Certification Scheme enquiry [SEC=UNCLASSIFIED]

Dear Abdul

Thank you for raising this matter with the ABCB. As the body responsible for the management and administration of the WaterMark Certification Scheme, it is important to the ABCB that the integrity of the Scheme is maintained.

The Scheme is a third party mandatory certification scheme for plumbing and drainage materials and products to ensure they are fit for purpose and appropriately authorised for use in plumbing and drainage installations. The regulation of those products is undertaken at the point of installation by the plumbing and drainage administration having jurisdiction.

Allegations that a WaterMark certified product is not performing to the scope and requirements outlined in the standard or specification to which the product has been certified should be directed, in the first instance, to the certifying WaterMark Conformity Assessment Body (WMCAB) for resolution in accordance with their complaints procedures, as found on their website. The WMCAB would then provide a response to the complainant. If the complainant is not satisfied with the outcome they may then complain or appeal to the Accreditation Body - the Joint Accreditation System of Australia and New Zealand (JAS-ANZ), in accordance with the complaints procedures found on their website.

Information concerning the administration and operation of the Scheme is outlined on the [ACCB website](#)

In response to your specific queries:

1. *Urban Growth NSW's alleged challenge of WaterMark*  
Urban Growth NSW did not challenge the Scheme by refusing to accept your particular WaterMark certified product. The ABCB does not have jurisdiction over the procurement or installation of WaterMark certified products by third parties;
2. *An Act or instrument that compels Urban Growth NSW and/or the ABCB to manage issues around decisions to procure or install WaterMark certified products*  
The ABCB does not have an instrument of the kind you are seeking;
3. *Notification of any legislation or permissions regarding the behaviour of Urban Growth NSW*  
The ABCB does not have any legislative authority, nor has it provided any permissions, regarding the actions of Urban Growth NSW. The ABCB does not have jurisdiction over the procurement or installation of WaterMark certified products by third parties;
4. *Any proposed action by ABCB in response to the decisions of Urban Growth NSW*  
The ABCB does not have jurisdiction over the procurement or installation of WaterMark certified product by third parties.

Please do not hesitate to contact us if you require further information.

Regards

**WaterMark Administration**  
**Australian Building Codes Board**

---

ABN 74 599 608 295



**From:** [REDACTED]

**Date:** Friday, 30 June 2017 at 4:38:05 pm

**To:** [REDACTED]  
[REDACTED]

Good Afternoon,

I write regarding the WaterMark Certification Scheme and a NSW Government entity making determinations on behalf of the ABCB and State regulator regarding the Flowpex pressurized plastic sprinkler pipe.

The ABCB are the owners and administrators of the Watermark Certification Scheme.

The Watermark Certification Scheme is part of the National Construction Code under Volume Three –Plumbing Code of Australia (PCA).

The PCA is regulated by each state and territory government plumbing regulator.

In NSW this is The Department of Fair Trading. I have approached Fair Trading about the role between the administrator and regulator previously and they appear to be confused.

The PCA through part B4 sets requirement for fire-fighting water services.

Clause B4.2(c) details *'the installation of an automatic fire sprinkler system must be in accordance with AS 2118.1, AS 2118.4, AS 2118.5, AS 2118.6 and AS 2118.9 as appropriate'*.

A domestic (home) sprinkler system when installed, in accordance with the PCA must comply with the requirements of the PCA, AS 2118.5 as well as AS/NZS 3500.

Testing and Certification of the product with the Watermark Certification Scheme demonstrates compliance with the PCA as well as the products fitness for purpose in accordance with Clause A2.1(a) and (b).

Table A2.1 requires pressurised pipes and fittings to have a minimum of Level 1 certification. Flowpex pipe has been tested and certified to satisfy this requirement.

Urban Growth NSW had failures in Sprinkler installs in NSW and via WSP and subsequently Excelplas tested the pipe and recommended the pipe was not fit for service.

Excelplas is now in the court system with Flowpex for deceptive and misleading conduct.

My issue is as follows;

When the failure occurred Flowpex approached our certification body and notified them of the situation.

Instruction received was to review the entire system. This was done by Ignis Solutions.

UG NSW stated the Ignis report was only a review and no testing of the product was done.

Resifire approached Fair Trading to investigate an apparent faulty watermarked product.

No advise that was useful was provided. In fact Resifire informs me that that the advise they received was that Fair Trading was not to get involved.

Flowpex by email and then subsequently verbally discussed this with the Regulator and the advise was to approach the ABCB being the owner and administrator of the WaterMark Certification.

We subsequently commissioned Dr Alan Whittle and ANTL to do further testing of our product.

The disappointing aspect was that UG NSW would not talk to Flowpex and would not meet us as we did not have a commercial relationship with them.

The product was in approximately 50 group homes and the decision was made to decommission the Systems in all buildings.

Some Sprinkler systems lay dormant for some 12 months. UG has subsequently removed flowpex from approximately 25 group homes.

In that time there were 2 fires in homes and fortunately one system was reactivated in the week leading into the event and worked effectively.

All this correspondence in relation to the matter is now in the possession of the ABCB.

Land and Housing have subsequently reversed their decision regarding the Flowpex and have installed Cold water expansion measures to deal with the issues.

This decision was made as they did their own review and commissioned a Dr Hennessey from UTS to look at all material.

The recommendation was that the pipe was fit for service and pressure relief was warranted as transient water events are impacting on the system.

The recommissioned systems have now been in operation for in excess of 6 months.

Ongoing issues of excessive pressure and transient water occurred within the system yet the cold water expansion valve prevented over pressurisation and any further damage to the system. A successful full system solution.

I have found this extremely difficult and very expensive to maintain this course of unsupported action with the ABCB or state regulators over the last 2 years.

The ABCB are the owners and Administrators of this scheme. Why do I need to defend my product in these circumstance of WaterMark Certification.

I feel at the moment that I am actually defending the validation of WaterMark Scheme and am not sure that is my role.



Testing to get the Flowpex pipe to market via the WaterMark Certification Scheme is in the vicinity of 100k and annual fees are in the vicinity of 10k plus.

I do not understand how any State based organisation like UG NSW can contest WaterMark in this manner.

I don't understand why I have to go through the court system and challenge a laboratory that does not have the scope to question WaterMark.

To date Flowpex has spent in excess of 250k defending and supporting this issue. It has been tremendously difficult.

My understanding is that all the states are signatories to this scheme and the ABCB has mechanisms in place to deal with these issues.

How can UG NSW challenge watermark in this manner? Can I please understand where the ABCB stands in regard this matter?

Is there a specific Act or instrument that compels UG NSW and or the ABCB to manage outcomes effectively in this matter of a NSW Government entity administering and making decisions for the scheme on behalf of the ABCB?

Can you please detail any legislation or permissions regarding the behaviour of UG NSW in this manner?

How does the ABCB deal with these matters and how does the ABCB propose to deal with UGNSW in this matter?

I look forward to your response and am available at any time to discuss the above. Thank you.

Abdul Elyoussef  
Managing Director



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[REDACTED]  
**Sent:** Friday, 8 July 2016 10:11 AM

[REDACTED]  
**Subject:** Flowpex pipe

Good Morning Frank,

Hope all is well? Resifire made contact with you regarding the situation below some weeks ago.

Please find attached the following correspondence to WSP, particularly the Dr Alan Whittle report.

Is there a possibility I can discuss this with you at your earliest convenience? Thank you.

Abdul Elyoussef  
Managing Director

[REDACTED]



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**From:** [REDACTED]  
**Sent:** Friday, 24 June 2016 10:07 AM  
[REDACTED]  
**Subject:** Flowpex pipe

Hi Frank

Firstly thank you for your time on Monday reading my email and also our phone conversations.

I would just like to clarify my understanding of our conversation:

- You questioned under what legislation are Urban Growth questioning WaterMark
- You also commented that Urban Growth cannot question WaterMark
- We discussed transient water and my belief of what part Sydney Water played in this situation
- We discussed I had been informed of a 300mm cast iron water main rupture in the Wahroonga area around the time we also had a pipe rupture at Wahroonga and the fact that the pipe had split from collar to collar and was split by 20mm
- We discussed how water pressure is getting trapped in the closed sprinkler system
- Discussed how you could not make a ruling as this issue is with a fire sprinkler system however we also discussed how you could make comment on the pipe which is all that we need
- You commented how Resifire is in a difficult situation because its a problem when pioneering a new area of the trade and problems can come up that are not legislated for
- We also discussed that Resifire and probably also the builders should contact our Local Member to try to get a Fair Hearing
- You made a point that if Urban Growth were not taken to task over this then there would be a problem with the use of plastic piping systems within Australia.

To update you with where we are now at, Flowpex has engaged Australia's leading expert on multilayered plumbing pipe, Dr Alan Whittle, to report on the situation and we expect his report within the week.

Flowpex has a substantial amount of testing data as a requirement of the Watermark certification scheme and these will be made available to yourself if you require this.

The testing conducted by Excelplas supports the serviceability of the pipe however the reports indicated defects

that are observations and not measured against a recognised test or requirement of the Plumbing Code of Australia or the WaterMark certificate scheme. Obviously the testing conducted to achieve Watermark is normally sufficient but Flowpex has been forced to defend observations and assertions outside of the required national certification and compliance process.

The reports on the Flowpex pipe we are waiting on are outside of WaterMark requirements but are from experts and accredited labs within the industry to refute any assertion made on the Flowpex pipe.

This process has been very time consuming and has certainly demonstrated a lack of understanding and due process by Urban Growth NSW in the requirements of product certification.

Excelplas report on the ruptured pipe at Wahroonga states that the pipe will not withstand normal operating pressure of 700kpa however we pressure test to 1500kpa for a minimum of 30mins with no issues and also several properties we identified as having pressures of in excess of 1600kpa when we isolated them. Even the property at Casula had the piece of ruptured pipework replaced and the sprinkler system turned back on with no further issues up to isolation date which was one month later. At isolation we found the needle to be back around to the stopper so expect the pressure to have been in excess of 2000kpa and the pipe did not re-rupture.

I have attached a sequence of events regarding one outcome below as this has a very good timeline and data relevant to this issue. This is the Toongabbie failure.

Failure sprinkler install date **5 Feb 14** with commissioning **10 Mar 14** at 36 Lamonerie Street Toongabbie. Static pressure recording on commissioning was **350kpa**. We were notified of failure on **8 Oct 15**.

On **9 Oct 15** the System was repaired, pressure tested and recommissioned.

On **12 Nov 15** the System was drained and another couple of sprinklers replaced with plaster plugs for some gyprock to be replaced. System was turned back on.

On **26 Nov 15** the System was isolated and drained. The pressure reading taken prior to isolation was in excess of **2000kpa**. Photo attached.

The time taken for the pressure to lift from commissioning pressure of 400kpa to 2000kpa plus was 14 days. This is a passive system with no pump set.

This pressure build-up in the system has no relief due to the back flow device operation and constantly saved the maximum pressure into the system.

Sydney water was quizzed about this in detail and were quite evasive, normally quoting pressure based on modelling.

Flowpex as a Multi layered pipe is over specified for water and is the same pipe used for gas with different markings on it. Flowpex pipe is Watermarked under the licenses name of Hydrosta but have recently had the WaterMark certification redone. Attached are the WaterMark Certificates 211811. It is important to note that the certificates were renewed in April but due to the changes that have been undertaken with the WaterMark database are in the process of been uploaded to the database. I understand that the ABCB have had some staff changes or are on leave but the upload is progressing.

Frank, I would appreciate if you could please make comment on the Excelplas findings against the requirements of WaterMark or its relevance / lack of relevance.

Do you think there is enough evidence in the reports to make that determination that the pipe is supplied defective outside of the WaterMark certification scheme?

As soon as we receive the test and expert reports from Flowpex, we will pass them onto you so that you can be confident in the product prior to releasing your comment back to us.

Thanks again in advance.

Kind Regards

*BReibel*

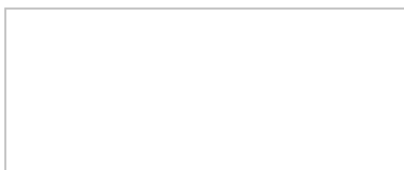
BRIAN REIBEL

Resifire Solutions

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██████████

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**Don Harwin MLC**

Minister for Resources, Minister for Energy and Utilities,  
Minister for the Arts, Vice-President of the Executive Council

Reference: 2017-IM17/10738

SW ref: SR 1- HSIGFR

Ms Jenny Aitchison MP  
Member for Maitland  
PO Box 920  
MAITLAND NSW 2320

Dear Ms Aitchison

I refer to your letter to the Premier of 10 April 2017 on behalf of Mr Brian Reibel, Director of ResiFire, 15 Lerra Road, Windella claiming that water pressure in Sydney Water's water supply caused several fire sprinkler systems to fail. As Sydney Water falls within my portfolio, I am pleased to respond.

I am advised that ResiFire has contacted Sydney Water on several occasions to verify the water pressure at the properties in question. On each occasion, Sydney Water could not identify any unusually high water pressure within the water network serving the properties nominated by ResiFire. There were also no other reports of high pressure reported by customers within the immediate areas of where the pipe failures occurred.

After a detailed analysis of Mr Reibel's concerns, Sydney Water believes that the water supply network in the areas identified by ResiFire has operated normally throughout the period in question.

Should Mr Reibel have any further enquiries regarding this matter, he may contact Sydney Water's Water and Recycled Water Product Team Leader, [REDACTED]

For advice on the design of fire service and pipe material selection, Sydney Water recommends Mr Reibel consult with the Standards Australia's Fire Protection Standard Technical Committee.

I trust this information is of assistance.

Yours sincerely

[REDACTED]

**Don Harwin MLC**  
Minister for Resources,  
Minister for Energy and Utilities,  
Minister for the Arts,  
Vice-President of the Executive Council





**Jenny Aitchison MP**

Member for Maitland

31 July 2017

Mr Brian Reibel  
15 Lerra Road  
Windella NSW 2320

Dear Mr Riebel,

Please find enclosed the response I have received from the Hon. Don Harwin MP, Minister for Resources, Energy and Utilities and Minister for the Arts, following the representation I made on your behalf concerning fluctuating water pressure in Sydney Water’s water supply.

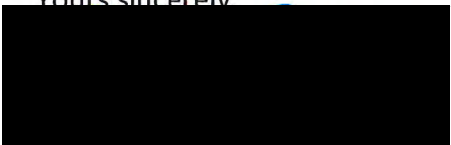
The Minister has advised that Sydney Water have investigated this matter and could not find any anomalies in the water pressure servicing the properties ResiFire nominated.

The Minister has provided the contact number for Mr Peter Cresta, Sydney Water’s Water and Recycled Water Product Team Leader should you have any further enquiries regarding this matter.

I would like to meet with you and forward your concerns to Mr Chris Minns MP, Shadow Minister for Water. Can you please advise if you agree to this?

If you have any further concerns please contact my office on [REDACTED] or by email [maitland@parliament.nsw.gov.au](mailto:maitland@parliament.nsw.gov.au)

Yours sincerely



**Jenny Aitchison MP**  
**Member for Maitland**  
**Shadow Minister for the Prevention of Domestic Violence & Sexual Assault**  
**Shadow Minister for Small Business**

Ref: EO ML

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10 August 2017

## Report on transient water entering fire sprinkler systems

### Rupture at 36 Lamonerie St, Toongabbie:

- 8.10.15 Resifire received phone call from Ray Zeaiter, Boronia Estates that pipe had ruptured on 4.10.15 in the Resifire fire sprinkler system of house he built at 36 Lamonerie St, Toongabbie
- 9.10.15 Resifire attended, removed damaged section of pipework and reinstalled another piece. Re-pressure checked the fire sprinkler system and turned fire sprinkler system back on to property whilst repairs in the room took place
- 12.11.15 attended site again to remove two (2) more sprinklers & replace with plugs so more gyprock could be replaced so system drained and then turned back on whilst repairs completed
- 25.11.15 attended site to isolate fire sprinkler system under instruction from Mark Hehnke, UGNSW, until reason of ruptures is identified. Pressure in the system was in excess of 2000 kpa as gauge needle back to stopper at isolation



This is a photo taken of gauge at isolation 25.11.15

Note: in the 13 days between 12<sup>th</sup> Nov & 25<sup>th</sup> Nov 2015 pressure had spike in excess of 2000kpa so definitely transient waters experienced at this property

### Rupture at 60 De Meyrick St, Casula:

- 24.10.15 received phone call from house of water leaking through ceiling so we talked them through how to isolate the fire sprinkler system to alleviate further water damage
- 26.10.15 Resifire attended site, removed ruptured section of pipework and reinstated sprinkler system. No damage evident to building.
- 25.11.15 attended site to isolate fire sprinkler system under instruction from Mark Hehnke, UGNSW, until reason of ruptures is identified. Pressure in the system was also in excess of 2000 kpa as gauge needle between 1600kpa mark & the stopper at isolation



This is a photo taken of gauge at isolation 25.11.15

### Rupture at 24 Cann St, Bass Hill:

- 13.11.15 received phone call from builder to advise rupture in building
- 14.11.15 Resifire attended site, removed ruptured section of pipework and reinstated sprinkler system. No sprinklers in area of where repairs needed and sprinkler system left fully functional.
- Builder isolated this property
- October 2016 LAHC via builders requested proposal to address over pressurisation issues
- November 2016 LAHC via builders accepted proposal to install pressure relief on the fire sprinkler system
- 8.12.16 reinstated fire sprinkler pipework that had been removed for testing, pressure test system but leave isolated at mains until fire engineer inspection.
- 14.12.16 inspection of recommissioned fire sprinkler system with Ignis Solutions, Fire Engineer. Fire system then left fully commissioned and active.
- 23.1.17 – 11.7.17 – 6 x monthly inspections of the recommissioned fire sprinkler systems. Evidence this property is experiencing ongoing transient pressure issues. See below findings of inspections at end of report with LAHC recommissioning.

Rupture at 9 Churchill Crescent, Wahroonga:

- 20.11.15 received phone call from Dist Property Officer regarding water leaking through ceiling. Talked them through how to isolate the water.
- 28.11.15 Email invitation to attend site with Mark Hehnke (UGNSW), Deepak Rana (UGNSW), Birju Gandhi (WSP) & Ben Dedman (WSP)
- 30.11.15 Meeting at site. Resifire were asked to remove one section of pipe to give to them. Resifire informed the attendees that the issue was caused from transient water from the water main. I explained I knew how to fix it but more importantly know how to prove it. Brian explain how this could be done. Mark Hehnke said to go ahead & purchase the gear but he would let me know if he wanted us to prove it. Mark said but it will be the pipe because the pipe comes from China and nothing good comes out of China. No further contact to “prove issue”.
- Dec 2015 contracted by builder to reinstate damaged sprinkler pipework as he was undertaking repair works.
- Jan 2016 Sprinkler fully recommissioned but left isolated as requested. Pressure relief valve installed.

Identification of rupture cause:

- Nov 2015 when isolating the sprinkler systems at all the UGNSW/LAHC properties which had Flowpex pipe installed, Resifire identified seven (7) properties with transient water issues and reported this back to Mark Hehnke (UGNSW) and Lindy Ryan (LAHC).
- May 2016 Resifire also made contact with Sydney Water’s Service Delivery Officer, Otto Lupo, and gave him the property addresses identified with have transient water issues and also the dates/times of the ruptures. Otto responded 4.7.16 stating that he had investigated the 7 properties looking for irregular high pressure spikes or water hammer data and that they had no recorded data showing irregular high pressure variances for these properties.
- 5.7.16 – Resifire responded stating from our perspective there is no doubt pressure spikes are coming from somewhere into a passive system and does his, Otto’s, response mean that it does not occur or does Sydney Water not measure transient water spikes? No response received in return to this question to date.

LAHC Recommissioning of fire sprinkler system utilising existing pipework:

- November 2016 Resifire engaged by LAHC via builders to recommission 19 properties and install pressure relief cold water expansion valves. Of the four (4) properties that had ruptures only one (1) was part of the 19 to be recommissioned as it was the only LAHC property to my knowledge.
- Dec 2016, Jan & Feb 2017 - 19 properties were all recommissioned and left active.
- Ongoing – six (6) monthly inspections of the fire sprinkler system pressures
- 26.6.17 – 11.7.17 – 10 properties have had the monthly inspections completed with concerns with three (3) properties

Sydney properties still receiving excessive pressure from Sydney Water:

As you will see by the Sydney Water flow & pressure results the maximum pressure indicated is well below what is being received at the properties from our monthly inspections.

- Bass Hill, 24 Cann St – this was one of the properties that experienced a rupture

SUMMARY OF INSPECTION FINDINGS		
Cold water expansion valve rating used at site	850 kpa	
Recommission pressure	500 kpa	
	Arrival KPA	Reset to Mains KPA
1 <sup>st</sup> mthly inspect – 23.1.17	850	Not reset
2 <sup>nd</sup> mthly inspect – 2.3.17	940	530
3 <sup>rd</sup> mthly inspect – 5.4.17	950	550
4 <sup>th</sup> mthly inspect – 5.5.17	950	500
5 <sup>th</sup> mthly inspect – 8.6.17	750	575
6 <sup>th</sup> mthly inspect – 11.7.17	750	500



Photo taken at 3<sup>rd</sup> monthly inspection 5.4.17 – 950kpa pressure in fire system on arrival

Sydney Water flow & pressure results

ASSUMED CONNECTION DETAILS	
Street Name: Cann St	Side of Street: South
Distance & Direction from Nearest Cross Street	5 metres North-West from Compton St
Approximate Ground Level (AHD):	30 metres
Nominal Size of Water Main (DN):	125 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT	
Normal Supply Conditions	
Maximum Pressure	77 metre head
Minimum Pressure	41 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.86	41
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	45
	10	44
	15	43
	25	39
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	40
	10	39
	15	38
	25	34
Maximum Permissible Flow	26	33

▪ Towradgi, 15 Sturdee St

SUMMARY OF INSPECTION FINDINGS		
Cold water expansion valve rating used at site	1200 kpa	
Recommission pressure	700 kpa	
	Arrival KPA	Reset to Mains KPA
1 <sup>st</sup> mthly inspect – 23.1.17	1090	Not reset
2 <sup>nd</sup> mthly inspect – 28.2.17	1200	670
3 <sup>rd</sup> mthly inspect – 3.4.17	900	675
4 <sup>th</sup> mthly inspect – 1.5.17	1000	700
5 <sup>th</sup> mthly inspect – 1.6.17	1300	700
6 <sup>th</sup> mthly inspect – 3.7.17	1250	675



Photo taken at 5<sup>th</sup> monthly inspection 1.6.17 – 1300kpa pressure in fire system on arrival

Sydney Water flow & pressure results

ASSUMED CONNECTION DETAILS		
Street Name:	Sturdee Street	Side of Street: North
Distance & Direction from Nearest Cross Street	25 metres West from Casse! Avenue	
Approximate Ground Level (AHD):	8 metres	
Nominal Size of Water Main (DN):	100 mm	
EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT		
Normal Supply Conditions		
Maximum Pressure	75 metre head	
Minimum Pressure	29 metre head	
WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS		
	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	28
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 85% of the time)	5	30
	10	21
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	21
	10	9
Maximum Permissible Flow	12	4

▪ Lurnea, 106 Hill Rd

SUMMARY OF INSPECTION FINDINGS		
Cold water expansion valve rating used at site	850 kpa	
Recommission pressure	400 kpa	
	Arrival KPA	Reset to Mains KPA
1 <sup>st</sup> mthly inspect – 23.1.17	840	Not reset
2 <sup>nd</sup> mthly inspect – 2.3.17	850	425
3 <sup>rd</sup> mthly inspect – 5.4.17	850	450
4 <sup>th</sup> mthly inspect – 5.5.17	800	450
5 <sup>th</sup> mthly inspect – 8.6.17	750	490
6 <sup>th</sup> mthly inspect – 11.7.17	470	500



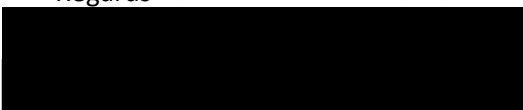
Photo taken at 4<sup>th</sup> monthly inspection 5.5.17 – 800kpa pressure in fire system on arrival

Sydney Water flow & pressure results

ASSUMED CONNECTION DETAILS		
Street Name:	Hill Road	Side of Street: East
Distance & Direction from Nearest Cross Street	30 metres North from Jemma Road	
Approximate Ground Level (AHD):	38 metres	
Nominal Size of Water Main (DN):	100 mm	
EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT		
Normal Supply Conditions		
Maximum Pressure	41 metre head	
Minimum Pressure	30 metre head	
WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS		
	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	30
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	31
	10	29
	15	26
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	20	23
	5	28
	10	25
	15	22
	20	17
Maximum Permissible Flow	26	11

There are indications also of one property in the Newcastle region although only five (5) of the six (6) monthly inspections have been completed thus far. A Hunter Water technical officer has been recently verbally advised and has requested he be kept advised of the situation and at completion of inspections provide report to him.

Regards



**BRIAN REIBEL**  
Licensed Plumber / Director