

PLUMBING CONNECTION

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SUMMER 2015



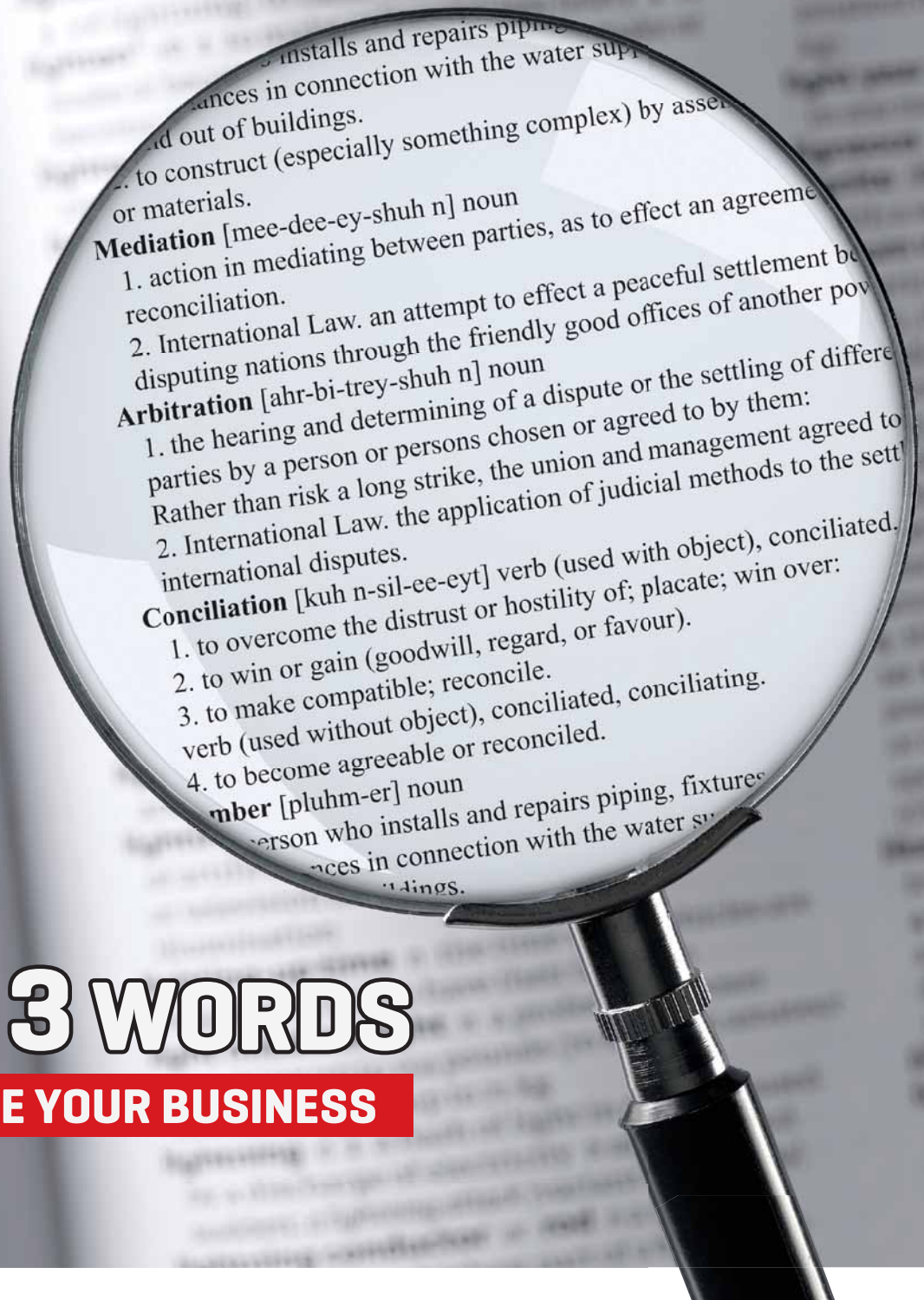
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WIPE FIGHT**

**SIPHONIC ROOFING
SOLUTION**



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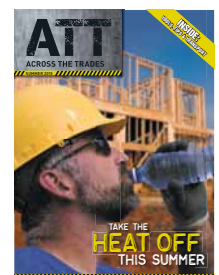
We caught up with WA's Master Plumbers CEO to find out what was happening in regards to plumbing apprenticeship training in the west.

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LOOKING FOR ALTERNATIVES

Getting your mind around what a performance based alternate solution is and how you go about implementing one isn't exactly an easy task.

We're not aware of any training courses available to help you understand these relatively lengthy procedures, the approval process for which naturally varies by State. Add to that the fact that extra paperwork is not something most plumbers warmly embrace.

It really demonstrates how out of touch those who make the rules are, with the practicality of the industry at a street level. No doubt a flourishing fee-for-service industry will spring up with people who can do the compliance work for you.

Of course, most plumbers have a plumbing licence for life and there's no obligation to undertake mandatory re-training courses that could actually improve the industry's understanding on such matters.

In the case of some alternate solutions, there is money to be saved, while proving that system performance is equal to, or better than the standard deemed-to-satisfy approach.

Then as we discovered, in a unique set of circumstances [that highlights AS 3500 coming up short with changing technology], that the need for an alternate solution is required to protect your business from possible litigation; all to do with the installation of stainless steel crimp-type fittings.

Check out both stories we have on alternate solutions on pages 34 and 38 and try to get your head around what's happening; it's a changing world out there.

Having just mentioned litigation leads me to our important cover story.

We were fortunate that highly respected former contractor Robert Quick (now a mediator and arbitrator) shared some valuable thoughts on how contractors can settle disputes with builders, other contractors, or building owners in a sensible way. He also shares some top tips for how best to avoid finding yourself in the situation of requiring alternative dispute resolution with the key tip being 'communication'.

Burying your head in the sand and hoping a dispute will go away is often tantamount to an ugly life-changing experience.

It's far easier to spend an hour or two going back and fixing a mistake, than it is to spend weeks to and from tribunal hearings once the client has taken the matter to a higher level.

With businesses and families being ruined by court outcomes over commercial disputes, do your trade mates a favour and send them a copy of this extremely valuable article.

As per usual, we have included an extensive range of technical stories that our contributors and staff writers have worked tirelessly on, which I'm sure you will learn a thing or two from.

With that being said, the festive season is upon us and from the entire team at *Connection Magazines*; we'd like to wish you a safe and pleasant break over the Christmas holiday season.

Enjoy the read



Justin Felix

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DEL AU 3 PHASE ELECTRIC INSTANTANEOUS WATER HEATER



STIEBEL ELTRON

Technik zum Wohlfühlen

**RON ASTALL**

Ron Astall is a Mechanical Engineer with long pump industry experience. With his consultancy, Astech Pumping Services and through Strategic Achievement, he has also been an active provider of pump industry training. Ron is the current President of Pump Industry Australia.

See **Pump School** on page 58.

**CECELIA HADDAD**

Cecelia is the director of Marketing Elements, which specialises in PR for the building and environmental sectors. She has over 20 years' experience with many well-known brands in Australia, New Zealand and Southeast Asia. Cecelia develops and delivers PR courses and she is the chair of the Registered Consultancies Group Committee for PRIA.

See **Business Promotion** on page 82.

**MATHEW BRIGGS**

Mathew Briggs has built up a passion for all things related to solar hot water parts over the years, including sourcing parts, installing new systems and repairing existing units. Mathew is a commercial plumber and director of www.solarhotwaterparts.com.au.

See **Solar Fix** on page 74.

**PAUL COTT**

Paul Cott LLB (Hons), Grad Dip Legal Practice, LLM is a Senior Associate of trans-Tasman lawyers Lovegrove Smith and Cotton. Paul has been in commercial litigation with a wealth of experience in building and construction litigation and advice for a number of years.

See **Legal Matters** on page 20.

**ROGER LAMBIE**

Roger is a registered plumber and gasfitter and has been involved in gas appliance approvals, investigated gas related incidents and set up gas spares sales for Reece plumbing. Eventually Roger became the Gas Safety Officer for Energy Safe Victoria.

See **Gas Matters** on page 68.

**PETER JACKSON**

Peter Jackson is the Director of h2o Design Ltd, Deputy Chair of Site Safe New Zealand and the Plumbers, Gasfitters and Drainlayers Board. Peter is also a director of New Zealand Plumbers Merchants and a Trustee of Apprenticeship Training Trust.

See **Design Time** on page 84.



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IMAGINATION DRIVES US



ENWARE WINS 2015 SUSTAINABILITY AWARDS

Enware has won the 2015 Innovation of the Year Category at the Sustainability Awards.

The project Enware was nominated for was, for the development & installation of a Smartflow™ water saving initiative at Adelaide Oval - which essentially it is a central software system that individually manages

each bathroom within the precinct. Controlling the flushing based on demand as required, to minimise water consumption and to maintain a fresh bathroom environment.

Chosen from a strong field of 8 the judges said "The commercial application of this system is definitely needed in large sporting venues and public entertainment venues where water from urinals is flushed on an automated process. Its water saving initiatives - sequencing automatic flushes, balancing flushing frequency to user numbers - are unique and an excellent application for Australia given the ongoing scarcity of our water. Major venues can be very wasteful users so this innovation shows how we can do things so much more efficiently."

For more information go to www.enware.com.au/smartflow.

ITRON APPOINTS ALL VALVE INDUSTRIES AS A NATIONAL DISTRIBUTOR

All Valve Industries has been appointed as a National distributor for Itron's range of metering products. This partnership means Itron now has a well-established distribution channel for the wholesale market, as well as additional local stock and support in Sydney.

Itron received approval to provide metering solutions in compliance to Sydney Water's Multi-Level Individual Metering (MLIM) Policy.

Itron is a world-leading technology and services company dedicated to providing comprehensive solutions that measure, manage and analyse energy and water. It is also an industry leader in metering solutions and the number 1 supplier of water meters and communication modules globally. With over 90 million water meters and more than 21 million water communication modules supplied worldwide, Itron is a top choice in resource management.

BUILDING MINISTERS' FORUM AGREEMENT TO AN IMPROVED WATERMARK SCHEME

At its meeting on 31 July 2015 the Building Ministers' Forum agreed to the retention of WaterMark as a mandatory plumbing product certification scheme with a range of improvements to enhance its effectiveness, including the move to a single level scheme and adoption of a full cost recovery model.

This decision represents a key milestone after over two years of work in reviewing the current scheme, consulting on possible changes and undertaking impact analysis in accordance with COAG best-practice regulatory principles.

For details about the improved WaterMark scheme, please refer to the outline in *Key Features of an Improved WaterMark Certification Scheme* (www.abcb.gov.au).

It is intended the improved WaterMark scheme will be launched by 1 July 2016.

BOX GUTTER DESIGN REMINDER

The Victorian Building Authority has noticed that current building trends and poor box gutter design has led to box gutters being installed with changes in direction and side outlets. Architects, builders and plumbers are reminded that box gutters must be sized, designed and installed so they comply with the following general installation requirements.

Box gutters must:

- be straight (without a change of direction);
- have a horizontal constant width base (sole) with vertical sides in a cross-section;
- have a constant longitudinal slope between 1:200 and 1:40;
- discharge at the downstream end without change of direction (i.e. not to the side);
- be sealed to the rainheads and sumps;
- the sole width of the box gutter is not to be reduced towards the outlet without a proportional increase in depth; and
- discharge through either a rainhead or sump.

Plumbers are also reminded that any roof drainage system including box gutters and eaves gutters need to be designed and installed with appropriately sized overflow provision.

For further information on box gutters please refer to AS/NZS 3500.3:2015 Plumbing and drainage Part 3: Stormwater drainage Section 3, SAA/SNZ HB114:1998 Guidelines for the design of eaves and box gutters Section 3 or SA HB 39:2015 Installation code for metal roof and wall cladding Section 5.

■ GEBERIT

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* You must be a licenced plumber to be eligible. For full Terms and Conditions, TC permit numbers and promotion details go to: www.getswissessedon.com.au. Promotion ends 9am AEST 18.12.15. Major prizes will be drawn at 12 noon AEST 18.12.15 and winners announced via email and promotion website. Prizes featured are illustrative only and may be substituted for other models. NSW Permit No. LTPS/15/03722 - VIC Permit No. 15/1076 - ACT Permit No. ACT TP 15/05864

CROSS CONNECTION'S KEEP HAPPENING

The photo above is taken from a residential home in a large estate supplied with both drinking and non-drinking water. The situation thankfully was prior to the home being occupied. If it had been occupied all the drinking water outlets in the home would have been supplied with non-drinking water and the toilets and irrigation on the property served with drinking water.

The plumber should have conducted a cross connection separation test as is required in AS/NZS 3500.1 Clause 9.4 and AS/NZS 3500.5 Section 2 Clause 2.24.

The Plumbing Connection can report these incidences are not isolated and as such plumbers need to be aware of their responsibilities when installing non-drinking water services. A number of plumbers have been fined when a cross connection has been installed.

The National Construction Code Volume 3 (Plumbing Code of Australia) sets out the performance requirements in Part B3 to ensure that there are no cross connections with a drinking water supply and as such is not contaminated. The performance requirements also include the limitation to the specific use of the non-drinking water, the connection and identification of pipe outlets, fittings and storage tanks.

The installation requirements to meet the performance requirements in accordance with the PCA are the deemed to satisfy provisions and are set out in Part B3.2 of the PCA and include the design, construction, installation, replacement, repair, alteration and maintenance of a non-drinking water service must be in accordance with –

AS/NZS 3500.1 or for Class 1a or Class 10 buildings only Section 2 of AS/NZS 3500.5.



IMAGE 1: Before: cross connection. **IMAGE 2:** After: no cross-connection.

DESIGN A DUNNY COMPETITION

The Kenilworth Designer Dunny Competition organised by the Kenilworth community in partnership with Sunshine Coast Council is expected to attract submissions from artists, architects, designers and students from around the country.

Launched at Isaac Moore Park on October 31, the competition invites creative minds from across Australia to design a public toilet structure that celebrates the Kenilworth community and delivers an iconic and innovative public artwork, with \$10,000 going to the winning design.

Division 10 Councillor Greg Rogerson, who has championed the project from its inception, said that the Sunshine Coast has a wealth of talented businesses and individuals working in the creative sector. The Council is committed to supporting and growing this sector even further through national art competitions such as the Kenilworth Designer Dunny Competition.

Cr Rogerson explains that participants in the competition will have to resolve unique design challenges including planning a structure that sits at least four metres above the existing ground level to avoid problems from seasonal flooding.

The 'designer dunny', according to Cr Rogerson, will not only serve its functional purpose of providing amenities in a much used and loved park, but will also be a major talking point and drawcard for the Kenilworth area.

Those interested in participating in the Kenilworth Designer Dunny Competition can access the Sunshine Coast Council's website (www.sunshinecoast.qld.gov.au) for a complete design brief, a full list of technical challenges involved in the project, and the submission process.

The Kenilworth Designer Dunny Competition is open to everyone from qualified architects, right through to students, individuals and teams.

All entries will be evaluated by a judging panel featuring well-respected Sunshine Coast architect John Mainwaring; Cr Rogerson; Queensland Art Gallery Curator Lynne Seears; world renowned sculptor Greg Johns; and former Kenilworth Arts Council President Shirley Moreland.

The competition closes on January 29, 2016, with the winner announced in March 2016.



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CONCEALED APPEAL

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The bathroom, along with the kitchen, is the most commonly used room in any home, yet it is typically one of the smallest. It makes sense then that making the most of every square inch is crucial, not only for improving access and usability, but for allowing the maximum amount of space for regularly used amenities such as showers, baths and basins. This is especially important in apartments and units, which have seen significant reductions in size in recent times.

As the name suggests, a concealed cistern is hidden, either by being mounted inside a wall (in-wall), behind a wall (in-duct), in a ceiling, or within a cabinet or vanity unit. They are able to do so by boasting thin profiles.

Concealed cisterns have long been the preferred choice in commercial spaces such as hotels, bars and shopping centres; however, their benefits and aesthetic appeal are now becoming more highly sought after in residential bathrooms across the country.

The technology is not commonplace in Australia as yet; however, it has been around a very long time.

"It is the standard in Europe and has been for many years. For example, another manufacturer, Geberit is celebrating 50 years of concealed cisterns this year," Rod Luker National Sales Manager Viega Australia says.

"When it comes to concealed cisterns, Australia is approximately 40 years behind many other countries; however, different countries seem to prefer different installations and Australia has traditionally preferred exposed cisterns."

This might be about to change though. While costs, comfort and functionality are all important, style is still top consideration for architects and clients alike, and without the right design aspects a product will not be specified.

With concealed cisterns, once completely installed, all you see is the flush plate, leaving a clean, sleek look, which is very much on point with common trends in homes and apartments around the country. Flush plates can either be attached to the cistern, or installed some distance away. They come in a variety of styles and colours to complement almost any bathroom design and because they're mountable wherever's convenient, cisterns that use a remote flush button are ideal for people with special needs or for those with limited mobility.

With constant improvements in innovation and technology, the dynamics of how toilets flush in recent years



The Viega concealed cistern and designer flush plate make for a very minimal and stylish combination.

has dramatically improved, meaning these types of cisterns work just as efficiently as a regular cistern.

"Traditional cisterns use simple mechanical actuators only, whereby concealed cisterns can be operated by the same method or by Bowden cable, which then allow for remote placement of the flush plate," Rod says.

"They can be retrofitted, usually by enclosing the cistern inside a fabricated duct in front of the wall (pre-wall). Viega's Mono Slim system has an installation depth of only 8cm, which means it is ideal in stud walls or in front of masonry walls."

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There's a general perception that concealed cisterns are always more costly or complicated than normal cisterns, although this often isn't the case. The cost and ease of installation, in many situations, is likely to be comparable with what you'd expect with an exposed, close coupled cistern. Provided the decision to install a concealed cistern is made prior to the walls going up, it's relatively straight forward, as explained by research and development manager GWA Caroma Dr Steve Cummings.

"When we first brought concealed cisterns over to Australia we spent a lot of time working out optimum installation solutions for them. We faced some complexities because unlike traditional cisterns, they go inside a wall. With exposed cisterns all you have to do is supply the water and outlet, connected to the wall or floor.

"There's a lot of preparation work that needs to come first from other tradesmen because the framework must go in before the wall goes up and it has to be done right. It's so important to get the installation correct and make sure it's trouble-free because major problems can arise with it being behind the wall.

"We're also seeing cisterns going into ceilings due to ease of access. We had to develop special flush pipes using hydraulic solutions to accommodate those," Steve says.

There's also a perception that concealed cisterns will be more difficult to access and service than normal cisterns [particularly because they're embedded inside the wall], although this concern's mostly unfounded if your client is opting for a reputable brand. In most cases, these cisterns are designed with ease of servicing very much in mind, and a licensed plumber can typically service a concealed cistern within minutes, not hours.

Let's take a look at some of the more reputable options on the market place.

VIEGA

For Viega's Mono Slim cisterns there is a wide range of designer/architectural flush plates. There are no pans in this range.

"With the Viega Mono Slim cisterns, there is not as much access to the cistern as plumbers might be used to with a conventional cistern. However, they will quickly become



A closer look at the inner workings of the Viega Mono Slim cistern 2.

familiar with the layout and will find servicing is simple. Viega's focus is on providing a slim-line, dual-flush cistern that's easy to install and use," Rod says.

"Ease of installation is a major point of difference. The mounting plates on the cistern and on the frame enable simple assembly, plus the water supply connection comes completely pre-assembled. It means the connection to the feeder pipe is possible from outside, without opening the cistern."

Read the installation and service instructions. Contact Viega [www.viega.com.au] and/or Rogerseller [www.rogerseller.com.au] for further assistance.

The Viega concealed cisterns have a 4 star WELS rating. Warranty details:

- cistern body - 10 years
- mechanism and valves - 3 years
- flush plates - 3 years
- sealings - 12 months
- availability of spare parts - 15 years

With the Viega concealed cistern solution [Mono Slim] there is a large array of designer flush plates to suit any décor. They're designed to match a wide array of ceramics and taps and come in a choice of short or long, chrome, stainless steel, plastic or glass.

GEBERIT

Since launching the first concealed cistern in 1964, Geberit has gone on to install over 60 million cisterns worldwide.

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Geberit claim the the Sigma75 is the slimmest in-wall cistern on the market, making it ideal for back to wall and wall hung pans and the perfect choice for small bathrooms where space is at a premium, for both renovations and new builds. Once installation is complete all you see is a very elegant and sleek flush plate, paired with the pan of your choice. The functional parts of the toilet (plumbing, cistern, valves) are hidden behind the wall.

An extended 10 year warranty, 25 years spare part supply availability guarantees peace of mind. Geberit also provides technical support to architects for easing the specification process, as well as ongoing project support to ensure simple and successful installation.



Since launching the first concealed cistern in 1964, Geberit has gone on to install over 60 million cisterns worldwide.



Servicing Caroma's Invisi Series II cisterns is made easy thanks to its innovative and patented flush panel.

CAROMA

Caroma's Invisi Series II cisterns feature patented technology allowing them to be serviced through the button panel, so there is no need to remove tiles or wall coverings during a service.

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Innovative Smartflush technology is built into the entire+ Invisi Series II range which Caroma claims can save up to 35,000 litres of water per household per year [compared to 11L single flush toilet suite]. Smartflush is proven award winning technology, featuring a WELS 4 star water rating. ■

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DISPUTE RESOLUTION

WHEN IT COMES TO DISPUTE RESOLUTION, THERE ARE THREE ROADS ONE CAN GO DOWN – ARBITRATION, MEDIATION AND CONCILIATION – BUT WHICH ONE IS MORE EFFECTIVE? **PAUL COTT** DIFFERENTIATES EACH AND EXPLAINS WHY ONE METHOD MAY BE MORE SUITABLE THAN ANOTHER.

Much has been written about so called ‘alternative dispute resolution’ and how it is more efficient due to being cheaper, quicker and allegedly more effective as a method to resolve building and construction and other types of disputes.

But what those in the industry wish to know is which method, as an alternative to court action, is better as a method to resolve a given dispute.

There are occasions where one does not have a choice as to which method to use [e.g. where there is an arbitration clause in a contract or where the parties have agreed to submit disputes to arbitration]; however it can often be the case where there is a choice [outside also, the court context].

They all have their advantages and disadvantages for various reasons, but one thing they all have in common is that they involve an independent third person in the dispute and its resolution or attempted resolution; however the involvement of that third party can differ.

It is to the first method of dispute resolution that this article now turns; mediation.

MEDIATION

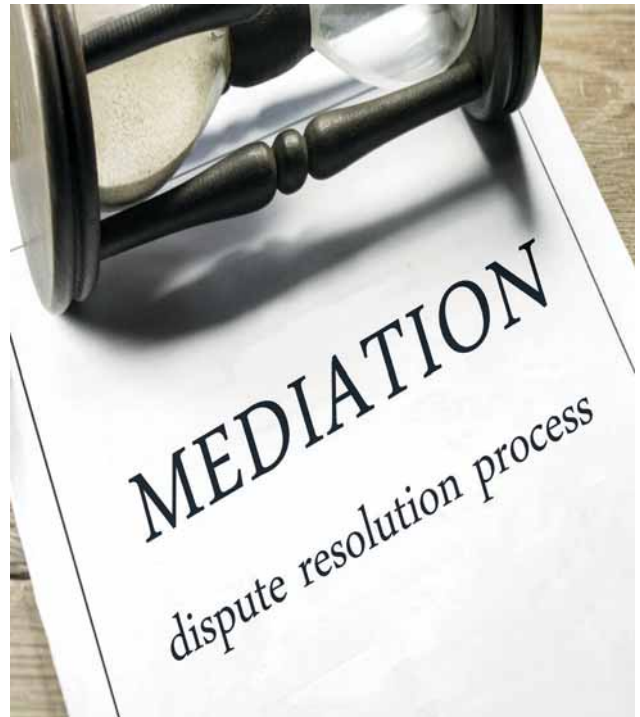
This is where the third party, according to the traditional model, is merely a facilitator of the parties discussing the dispute issues. They are meant to be very neutral, with their ‘backs to the chair’ in the sense of staying as far out of the dispute as possible.

The mediator has to remain [as you would expect] completely neutral, and not provide any advice in the dispute and is certainly not to make any sort of determination as to who is ‘right’ or ‘wrong’.

The cost of mediation is usually shared equally between the parties however it is unfortunately the case that a qualified mediator’s fees are not overly cheap.

Of course, readers of this article may have been ‘forced’ into mediation when embroiled in a court action of some kind, in the sense that at some stage after a court application is made, the parties are subject to a compulsory mediation – they have no choice but to do so in the sense that if they do not, their claim may be at risk of being struck out or the claim may be decided against the defendant or respondent if that defendant or respondent refuses to mediate.

The good news, in this context, is that in the case of a



Mediation is just one type of alternative dispute resolution.

court imposed mediation, there are usually no fees for the mediation, and sometimes depending on the court and the type of case, a mediator’s fee does not have to be paid.

ARBITRATION

The arbitration process sees a binding decision made at the end. That makes it unusual in the context of this article as outcomes are not imposed on the parties during mediation and conciliation.

Some parties like the fact that with arbitration, there is the certainty that on the conclusion of the process, a decision is made and in that sense, subject to the somewhat limited rights of appeal, the dispute is over. It is however a formal process and it has sometimes been called ‘private litigation’ due to it being somewhat analogous to the court process. Hence some parties may steer clear of this option.

Be aware of the possibility of an arbitration clause in a contract where, once agreed to, make arbitration compulsory.

CONCILIATION

In the building and construction industry this is a less common method of dispute resolution and is more frequently used to resolve or attempt to resolve unfair dismissal and similar type of workplace disputes. In fact some readers of this article may have had some of their own experiences (as business owners) with conciliations in the Fair Work Commission when an employee has been dismissed and makes an unfair dismissal application. Conciliations are also used in areas such as family law, general commercial law, human rights and discrimination disputes as well as residential tenancy disputes.

Some say (and this issue has generated some debate) that there is really no difference between conciliation and mediation; however as a general rule, the conciliator has a more interventionist role in actually actively assisting, to a degree, the parties to resolve their dispute.

The good thing with conciliation is that because the conciliator has a more active interventionist role, the conciliator gives his or her view of how the matter may be decided if it went to the next (litigation) stage in the particular process. They still do not decide the outcome of the dispute, despite the fact that they often have some specialised knowledge or expertise in the particular area of dispute.

CHOOSING THE RIGHT ONE

Other less common dispute resolution methods exist, such as non binding expert appraisal, early neutral evaluation and expert determination (a binding decision results there from) which are best left to another day for discussion.

As far as choosing which method to use, it comes down to weighing up the advantages and disadvantages of each. Parties in the building and construction industry may wish to have their imposed (arbitration) resolution or their non imposed resolution (mediation and conciliation) achieved with the decision, or the assistance or 'facilitation' of someone with experience, knowledge and or skill garnered from working in this industry.

Added to the fact that the three processes discussed above are all generally faster, cheaper and less formal than court processes, it may well be that 'the tipping point' for someone in this industry as to which process to use is to choose the independent third person on the basis of who has some experience, skill and or knowledge in this industry. ■

Paul Cott LLB [Hons], Grad Dip Legal Practice, LLM is a Senior Associate of trans-Tasman lawyers Lovegrove Smith and Cotton. Paul has been in commercial litigation with a wealth of experience in building and construction litigation and advice for a number of years. Paul is also a Member of the Building Dispute Practitioners Society.

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THE SENSIBLE APPROACH TO DISPUTE RESOLUTION

TACKLING DISPUTES CAN BE A STRESSFUL TASK FOR INDIVIDUALS AND COMPANIES IN ANY INDUSTRY AND PLUMBING IS NO DIFFERENT. **JUSTIN FELIX** SPOKE TO A FORMER PLUMBER TURNED EXPERT WITNESS AND CONSULTANT TO FIND OUT HOW PLUMBERS SHOULD APPROACH DISPUTE RESOLUTION.

I think it's safe to assume that plumbers would prefer to avoid any situation where the need for mediation arises. Unfortunately it does come with the territory though and it's better to know how to tackle the situation, rather than be left in the lurch should you find yourself needing some form of alternative dispute resolution.

As you would have read in the previous article by Paul Cott, there are a number of differences between mediation and arbitration.

Mediation involves the facilitative role of a trained third party neutral to assist parties in coming to and managing the settlement of their dispute. A mediator's role is to help clarify and prioritise issues as well as assist parties in finding a solution. A skilled mediator facilitates a solution to the problem which best fits the needs of both parties; the mediator does not decide who is right and who is wrong. The process is confidential, voluntary, flexible and unlike a court, there is no imposed decision: the parties themselves retain ownership of and responsibility for any settlement that is reached.

Arbitration on the other hand is an alternative means, to litigation in a court, of resolving a dispute whereby the opposing parties present their case to an independent third person, the arbitrator. After hearing the opposing cases and evidence, the arbitrator then makes a ruling based on laws pertaining to the matter.

It is far less costly to resolve a dispute through mediation than through arbitration or litigation. Because of the non-adversarial dispute resolution technique used, complex issues can be resolved in a matter of days; and the business relationship of the parties can be preserved.

With all of that in mind we thought it would be interesting to chat with a consultant who started out as a plumber before acting as an expert witness; providing court compliant reports as well as arbitration and dispute resolution.

Robert Quick has been involved in the plumbing game for over 50 years and was earmarked as a plumber by his father from an early age.

"I was born to be a plumber. My father always dreamt that I'd become a plumber and as soon as I finished school that's exactly what I became. I spent my school holidays working



with him. I suppose in those days you just did what you were told," Robert says.

"I evolved all of my education from working through my apprenticeship and night courses etc. At that stage my father employed 10-15 plumbers. Eventually my brother and I took over the business and made it rather successful. We did all of Grollo's work in Melbourne and when they went to Sydney my brother followed."

Having plumbed Melbourne's Crown Casino and Rialto Towers and Hotel among many other large projects, it's fairly easy to imagine that Robert had to contend with his fair share of disputes over the years.

"At more than one stage I employed over 120 plumbers. When we were doing the Crown Casino I had 120 plumbers on that site at the one time. When you're employing a lot

of people you're on a constant merry-go-round. You have to make sure that you have sufficient income to pay them, as well as cover your overheads, ensure that the work is being completed to a high standard and then on top of that, manage the whole process through strikes, holidays etc.

"We followed the Grollos into the high-rise projects so that we were in the middle of the industrial scene."

Robert shut the business down over 10 years ago, and as can often be the case when one isn't ready to retire, comes the question, 'What am I going to do with myself now?'

"I thought of the things I was good at and what I actually enjoyed doing. I always liked the legal side of things. For every contract I had to sign, I had to negotiate the clauses in it. I read them all extremely thoroughly before putting my signature on the dotted line."

The decision came about quite easily.

"I thought of ways I could combine my passion for plumbing with my interest in the legal side and decided that I could be an arbitrator. I first did a mediation course with The Institute of Arbitrators & Mediators Australia in Melbourne that would see me become a certified mediator which was the first step to becoming an arbitrator. I then completed

a Professional Certificate in Arbitration-Advanced and General through Adelaide University."

Robert eventually set up QP Consulting which is able to support owners, managers and body corporates, with expert advice in new building or renovation inspections, plumbing investigations of water leaks, water ingress, pre-building waterproofing, waterproofing of facades and balcony installations [inspections], piping and roofing problems.

While Robert's business revolves around the provision of mediation and helps clients reach an amicable solution; he would much rather people avoid the cost, time and energy required to take part in the process. The way to do that, Robert believes, is through clear and concise communication between all parties. He also believes that plumbers need to become more vocal with builders and their clients.

"If you have to make a change, explain it to the client or homeowner, because even if a client isn't happy with some of the work, so long as the relationship is good, you can talk to one another and work things out," Robert says.

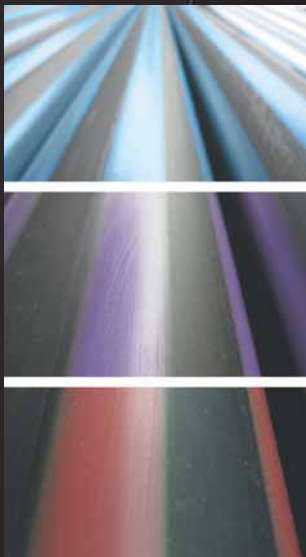
We asked Robert to share some common scenarios where the need for mediation has arisen. ➤



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STEPS OF THE MEDIATION PROCESS

01: AGREEMENT TO MEDIATE

02: DEPOSIT IS HELD BY AN INDEPENDENT PERSON IN A TRUST ACCOUNT (COSTS OF THE MEDIATOR)

03: BOTH PARTIES ISSUED AN AUTHORITY FOR THE MEDIATOR TO FULFIL THE FUNCTION OF THE MEDIATOR.

04: CONFIDENTIALITY AGREEMENT IS SIGNED.

05: THERE IS NO REQUIREMENT TO HAVE ANY LEGAL PEOPLE INVOLVED IN A MEDIATION. THE MEDIATION PROCESS TAKES THE FORM OF AN ORGANISED OPEN DISCUSSION.

06: SOME MEDIATORS LIKE TO RUN THE MEDIATIONS AS A BIDDING WAR, SO MUCH SO THAT AFTER THE INITIAL DISCUSSION THE PARTIES ARE PLACED IN SEPARATE ROOMS WITH THE MEDIATOR TAKING BIDS AND SHUFFLING BETWEEN THEM; HOPING IT CAN BE SETTLED WITH A BIDDING WAR.

COMMON SCENARIOS

I've been brought in on a number of occasions by a client who has had an altercation with the builder over a leaking roof. A common scenario goes like this: the builder patches up the leak with silicone because he can't get the plumber back. The plumber doesn't want to come back because he hasn't been paid. He knows he hasn't correctly installed the work to his usual standard which means that he hasn't left a Certificate for Compliance.

At times plumbers either have too much work or not enough. This work overload is generally filled by the apprentice working unsupervised; this has been the cause of many a problem. The apprentice's work is covered up and only comes to light further down the track when major demolition and rectification work is required. I would recommend that if an apprentice is left by himself for any length of time, then a thorough check is made of the work that he or she has performed.

“

BECOME FAMILIAR WITH THE CURRENT PLUMBING CODES AND ENSURE YOUR WORK IS UP TO SCRATCH.

”

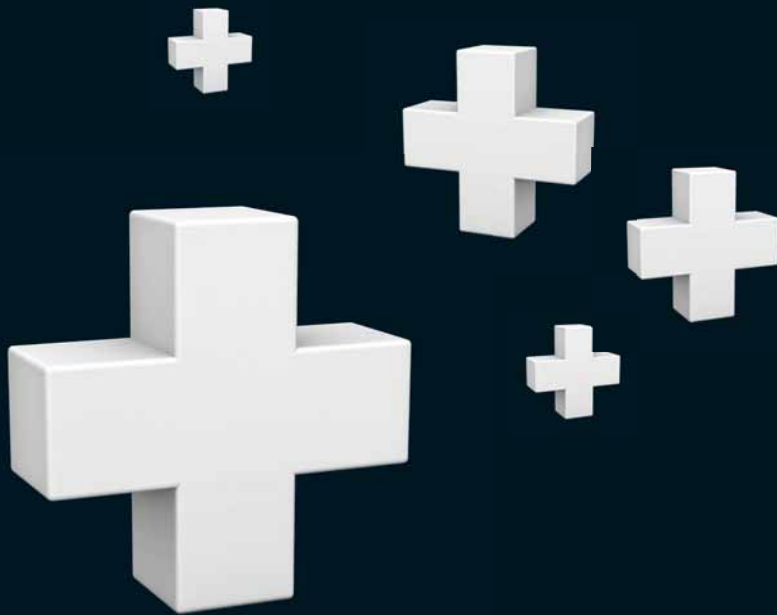
I am always disappointed when certain matters are taken to court. If the matter is heard at the Victorian Civil and Administrative Tribunal (VCAT, each state has their own tribunal) then it is rare to be awarded costs, and it is even rarer to achieve 100% of what you are claiming. If you do obtain costs then the maximum you can hope to achieve is 60%. It is suggested that it is not worth going to VCAT for a sum less than \$50,000. This is because by the time you have your costs, the legal representatives' costs and the experts' costs it leaves you with very little in return.

It has become evident that many plumbers are not aware of the requirements of the current Plumbing Codes. Many of my cases have involved water intrusion. I regularly inspect damage caused by the incorrect installation of undersized gutters, incorrect discharges from gutters (no sumps) downpipe spreaders not conforming as they are undersized, and the lack of overflows etc. Become familiar with the current Plumbing Codes and ensure your work is up to scratch.

I recently had a matter which involved drainage problems and each party (builder and owner) had employed the full legal team whose costs had run away from them. Each ➤

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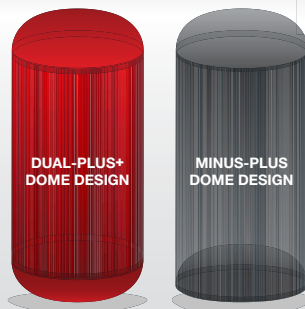
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of them had spent \$150,000 in the preliminary preparation, whereas I believe that the work could be rectified for \$75,000. In the end each team was working to try and present a case which would allow them to win the legal costs, not just the rectification costs. The matter was settled on the court steps with no winner [only the legal team].

I was recently asked to assess a partial roof installation which was carried out by the plumber on a verbal instruction. The plumber had carried out the work with a perception as to what would be accepted for the charge out rate. The plumber had worked for the builder previously, and had carried out work on a 'do and charge' rate which he believed would still be acceptable to the builder for this additional work. When I was employed, the matter had made it to VCAT with additional costs for both parties. The amount in dispute was less than a day in VCAT. This matter could have easily been settled with mediation.

I mentioned the costs of VCAT, these are as follows:

- Application costs
- Court costs
- Your time and the expert's time for the mediation
- Your time, the expert's time and maybe the legal reps' time for the Compulsory Conference
- Your time, the expert's time and the legal reps' time for the hearing
- Your time lost in meetings and corresponding with your legal team

These are all costs, either monetary, time or aggravation costs. The mediation and hearings quite often require legal people to attend to represent the parties.

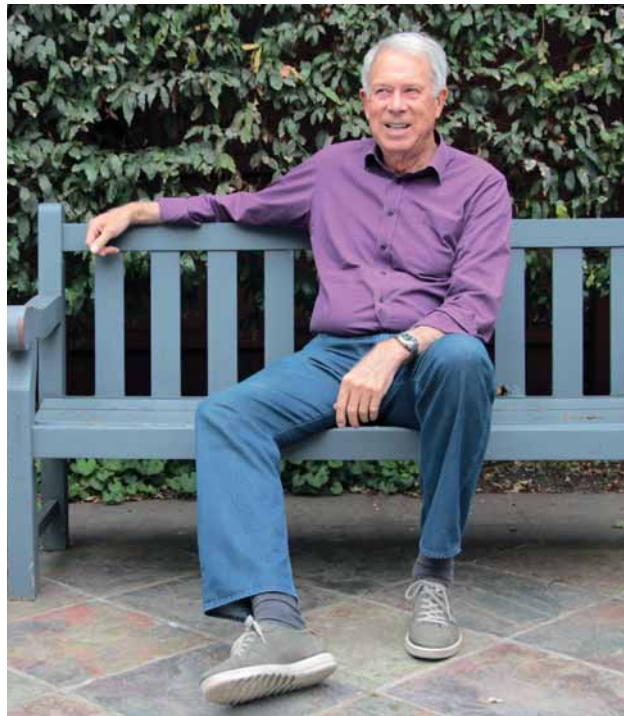
ADVICE FOR PLUMBERS

"It's up to the plumber to communicate to the owner and let them know what's happening, because you can find yourself in the situation where you're the only one taken to court, particularly if the builder has gone out of business or has disappeared."

Robert also advises that if you are working for a builder, then you have to get to know him. You need to know how or if he pays, and ask questions like: Is he financial? Has he encountered problems with other jobs he's done? Why is he shopping around for plumbers?

If you do find yourself in the unfortunate situation of having to deal with meditation Robert suggests:

- Ensure that both sides [the contractor and the client] understand that there will have to be a compromise
- Even if you go to court it is rare to obtain greater than 60% of what you are claiming, and then you still have to allow for your time and your legal costs
- Ensure that the mediator is impartial and understands the trade
- Ensure that the mediator is certified [trained]. ■



After plumbing, Robert Quick turned his hand to mediation and arbitration as well as expert witness work.

ROBERT'S TOP TIPS

When working for a builder

- Know your client
- Keep communication lines open at all times and if the owner has a hands on roll in the work, maintain ongoing communications with him
- If the builder is not performing in a professional manner, then you may suffer repercussions. I have found that every time a builder has performed badly, the plumbers have not been paid
- If you are working for a builder make sure that you are aware of his payment methods
- It is important that you receive prompt payments for your work. If the builder doesn't have the finances, then all the signed paper contracts under the sun aren't going to help you
- Most builders are happy with their team; ask yourself the question, why is he shopping around?
- Ask around, suppliers are often a good source of information when it comes to builders
- Have everything written up in a contract
- Do not just work off the quote

When the end-user is the client

- Communicate everything clearly and concisely
- Be professional at all times
- Type up quotes and job descriptions on letterheads, not just a scrap bit of paper
- Keep them informed of any problems or changes that may arise
- It's worth taking the hour to go back and look at a complaint rather than to spend 6 or 7 hours in VCAT and the associated legal costs later down the track. I have often seen that one or two defective items blow out to 20 defective items once the owner calls in a building consultant.

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A SAFER SOLUTION

DEALING WITH ASBESTOS IS AN UNFORTUNATE PART OF CONSTRUCTION IN AUSTRALIA; HOWEVER, THE TASK IS BECOMING EASIER THANKS TO AN INTUITIVE PRODUCT DEVELOPED IN QUEENSLAND.

With an alarming amount of asbestos used in old buildings across Australia, a massive industry has developed around the safe removal of asbestos contaminated materials from worksites ranging from major property developments to home demolitions.

REYNOLDS Soil Technology (RST) has developed a cutting-edge industrial solution with the launch of its new product, Asbestoguard, a spray-on material binding agent that seals off dangerous asbestos fibres at contaminated sites.

RST recognised the need for a technologically advanced product that can be sprayed on asbestos contaminated materials to hold the dangerous fine particles in place during the demolition and removal process, improving worker safety.

RST operations and technical director David Handel said the development of Asbestoguard was focused on minimising health risks and improving worksite efficiency to increase operational optimisation in the demolition and removal of old buildings.

"In many areas across Australia, particularly in major capital cities experiencing land shortage, developers are demolishing older style buildings to make way for new developments," David says.

"A lot of these buildings contain asbestos contaminated materials which release dangerous fibres into the air when disturbed or broken down.

The RST team drew on its expertise in the field as fine particle dust management specialists working in some of the harshest conditions across the globe to develop Asbestoguard – an innovative asbestos binding agent in the form of a specialty cross-linking polymer emulsion.

"The RST team specialises in the control and suppression of dust particles and saw how this knowledge could be applied to create a solution stopping the release of fine asbestos particles from contaminated materials.

“ A LOT OF THESE BUILDINGS CONTAIN ASBESTOS CONTAMINATED MATERIALS WHICH RELEASE DANGEROUS FIBRES INTO THE AIR WHEN DISTURBED OR BROKEN DOWN ”



Asbestoguard is available in 25 litre containers, 200 litre containers and 1000 litre containers.

"While most of the demand for this solution is from the construction industry, our aim is for Asbestoguard to be a leading safety solution in any industry where asbestos contaminated material is present at the worksite."

Asbestoguard is a hard-wearing solution that works on all asbestos contaminated material types in all weather conditions after one application.

Asbestoguard dilutes in water, allowing for varying binding strengths and longevity requirements, and is easily applied through any watering system. The solution can be

mixed with another RST product, RT60 Super Wetter, to improve application on hard to wet surfaces and materials. It can also be applied to surfaces that aren't going to be removed but would benefit from an overcoat of improved safety.

Marking dye can also be added to Asbestoguard to monitor application areas and strengths.

Excellent results for contaminated earthworks have been achieved applying Asbestoguard diluted at 1:20 and applied at one litre per square metre of material.

If the material to be treated is very dry and water repelling, RST recommends the addition of RT60 Super Wetter at a dilution rate of 1:1000 in the Asbestoguard solution.

The University of Newcastle has independently tested the solution and found it to be effective in withstanding wind speeds of more than 100 kilometres per hour.

"RST's extensive range of products have been designed to solve a broad variety of problems related to asbestos management, dust control, road and soil stabilisation, erosion control, water management, sediment control and site rehabilitation in all industries.

RST can provide tradespeople with specific advice regarding the best dosage and application for their individual jobs.

"We go out into the field and work side by side with clients to identify their unique challenges and offer solutions, developing products, services or total packages to manage their situations," David explains.

"We also offer ongoing on and off site training and support to all of our clients and understand the key to success is ensuring our recommendations are followed through with correct operational support."

Asbestoguard is available in 25 litre containers, 200 litre containers and 1000 litre containers.

RST has more than 26 years' experience specialising in dust, earth and water solutions for mine sites, haul roads, ports and land sites in Australia and overseas. Its head office is based at Burleigh Heads, Queensland with an additional office in Carlisle, Western Australia. ■

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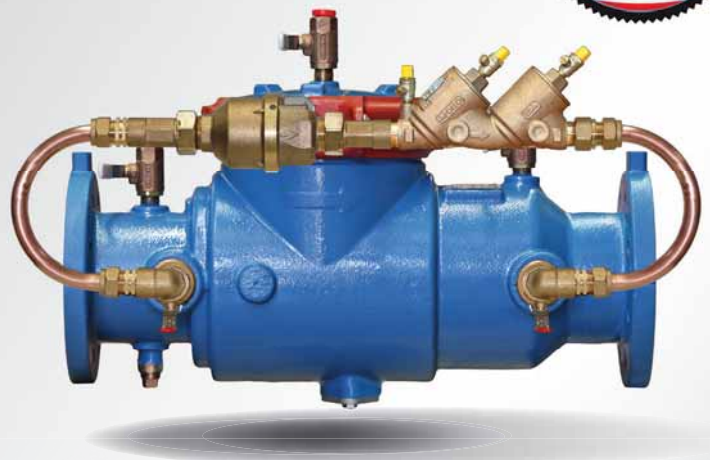
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THE WET WIPE FIGHT CONTINUES

PLUMBING CONNECTION HAS PUBLISHED STORIES FROM FAR AND WIDE IN RELATION TO WET WIPES POSING A MAJOR THREAT TO SEWERAGE SYSTEMS... BUT NOW THE PROBLEM HAS MADE ITSELF KNOWN ON HOME SOIL. WHEN WILL SOMETHING BE DONE?

While manufacturers maintain their claims about wipes being safe to flush, plumbers, contractors and councils beg to differ. Unfortunately though, the fight against 'flushable' wipes and their manufacturers is falling on deaf ears as stories of blockages continue to run rife around the globe and more recently, in our own backyard.

Sydney Water has a major problem with wet wipes in wastewater pipes and its research has shown that one in four of the 4.6 million Sydneysiders are currently contributing to the problem by flushing wet wipes down their toilet.

Tests undertaken by Sydney Water and Choice have confirmed wet wipes, whether branded 'flushable' or not, do not break down as claimed and should never be flushed down the toilet.

Sydney Water's General Manager of Services Delivery, Eric de Rooy

said, "We want to stop the impact blocked drains and sewers have on our customers and our 'Keep Wipes Out of the Pipes' campaign, in association with Choice's 'Flushbusters', will better educate our customers of the risks of flushing anything but toilet paper and human waste."



An example of the destructive nature of wipes in our pipes.

Choice recently awarded a leading brand name wipes manufacturer a Shonky Award for its deceptive claim that its 'flushable' wipes disintegrate like toilet paper. Choice has also referred wet wipes manufacturers to the Australian Competition and Consumer Commission (ACCC) regarding the misleading representation that wet wipes are flushable.

More than 500 tonnes of wet wipes are removed from Sydney Water's sewers each year – the equivalent weight of four blue whales. Over the past two years Sydney Water has removed enough wet wipes that, when laid end to end, they would reach from Sydney to LA and back, and the problem is increasing!

Wet wipes may flush and clear your toilet bowl, however they can combine with fats, oils and other things ➤



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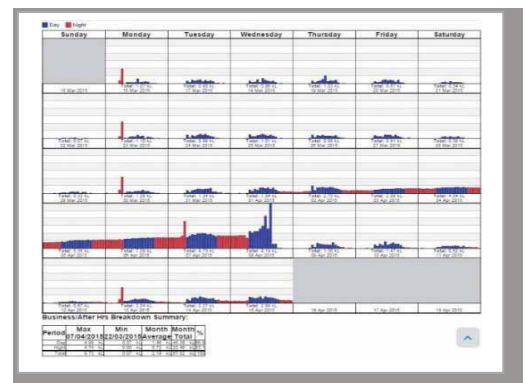


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Sample graph shows – an underground pipe leak detected and stopped long before the bills went crazy. System paid for itself for the next 10 years in the first month.





The impact on the environment can be dramatic, with overflows caused by sewer blockages contaminating local creeks, rivers and even beaches.

that shouldn't be flushed into big, congealed clumps – or 'fatbergs' – in the sewer.

"Around 75% of Sydney's sewer blockages involve flushed wet wipes which often need to be cleared by hand by Sydney Water staff", Mr de Rooy said.

"Flushed wet wipes are costing Sydney Water around \$8 million every year to remove, a costly issue utilities around the world are battling.

"This isn't simply a cost to the water utility companies," Mr de Rooy said.

"Many customers have told us that based on the 'flushable' labelling of wipes they thought it was okay to flush, only to be hit with expensive plumbing bills.

"One of our customers notified us that they had been hit with a \$16,000 plumbing bill as the result of wipes blocking the sewer pipes on their land and there have been many other examples of plumber's bills to remove wipes in customer's sewer pipes ranging from \$100s to \$1000s.

"We don't want our customers to flush away hard-earned dollars on clearing their blocked drains or through higher water bills to deal with the issues these wipes can cause in sewers.

"The impact on the environment can also be dramatic, with overflows caused by sewer blockages contaminating local creeks, rivers and even beaches.

"Our research has shown that while women were buying the wipes, men were using them as 'replacement toilet paper'. Most of the men were found to be aged 15 to 44, and stated they liked using wipes 'because of the texture'.

"Our message to customers is simple," Mr de Rooy continues. "Keep wipes out of the pipes – bin it, don't flush it." ■

Contact:

Join the fight against wet wipes in pipes and go to www.choice.com.au/flushbusters or www.sydneywatertalk.com.au

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PUSHING THE BOUNDARIES

THE OPPORTUNITY TO DEVELOP ALTERNATIVE SOLUTIONS ALLOWED SELICK CONSULTANTS TO COLLABORATE WITH WORLD LEADING ACADEMICS TO DELIVER THE FIRST ALTERNATIVE SOLUTION UNDER THE NATIONAL CONSTRUCTION CODE IN THE NATION'S CAPITAL.

The Plumbing Code of Australia [NCC Volume 3] now provides hydraulic consultants and plumbers with the opportunity to deliver a performance based outcome to projects in a similar manner to which Fire Engineering outcomes are applied to projects.

There are often design situations which standards or other referenced documents may not have envisaged. Alternatively, a practitioner may see a new or innovative way of designing a plumbing or drainage solution that provides important benefits. If the practitioner wants to use an alternative approach, they have the opportunity to do so – on the understanding that their proposal must achieve the Performance Requirements of the PCA. This is referred to as the 'Alternative Solutions' approach.

Sellick Consultants recently prepared a performance based alternative solution for a significant project in Canberra, Australia – Manhattan on the Park.

The project consisted of 330 residential apartments in Canberra city with associated car parking and tenant facilities such as a gym, swimming pool, BBQs and the like. Sellick Consultants was engaged by the Developer for Civil Engineering and Hydraulic Services Engineering Consultancies.

"Relevant standards had not kept up with water conservation implementation so we used the provision in the NCC Volume 3 to undertake a performance outcome for sizing of drainage on the Manhattan project," national director hydraulic services Sellick Consultants Brad Williams says.



Canberra's Manhattan on the Park.

"The client wanted to demonstrate that water conservation implemented as a mandatory requirement by council did not necessitate amplification of existing offsite sewer network, and the existing network was adequate to cater for reduced flows due to water conserving fixtures and fittings."

Sellick Consultants, with the support of academics from Heriot Watt University [HWU], Edinburgh Scotland, that the use of low flow fixtures, tapware and appliances could support a reduction of the sanitary drainage and therefore avoid an upgrade of offsite infrastructure at an estimated additional cost to the developer of \$500,000.

Given this was the first alternative solution to be put forward in the ACT, the local authorities were vigilant. They wanted to ensure that all steps were being undertaken to prove that the reduction in pipe size would have no detrimental effect on the future operation of the sanitary drainage network within the building.

Sellick Consultants had to prepare a formal engineering brief outlining variances from the deemed to satisfy Australian Standards and had to brief all stakeholders on the proposals put forward on the project for formal acceptance.

"Initial reluctance by the local Authorities to support our

performance based outcome led to the engagement of HWU, who are acknowledged as a world leader in drainage research," Brad explains.

"They were keen to be involved in a "live" project and understood the basic matter at hand – water conservation impacting on the carrying capacity of drainage. HWU developed flow and time profiles for all fixtures and fittings and loaded this information into their Drain Net software simulation model developed specifically for the project.

HWU used statistical/probability numerical simulation over a three hour window of 0600 to 0900, where every fixture and fitting in all of the apartments was used, deriving a maximum flow rate in the drainage network adequate for the installation of a 150mm diameter drain rather than a 225mm diameter drain as prescribed

by the relevant Australian Standards.

As you can imagine, the fixture and fitting manufacturer would also have to back up their products' claims and have the ability to prove that their products could stand up to the kind of treatment being asked of the alternative solution.

"The local authorities required a written warranty from Studor to state that the performance based outcome would have no detrimental effect on their air admittance valves and positive air pressure attenuators installed within the sanitary plumbing system and that Studor were willing to warrant their products within this project. Mr Steven White from Studor was also consulted and was a key stakeholder. He had no hesitation in providing the warranties given that HWU were involved in the verification

of the outcome," Brad says.

Sellick Consultants informed ABCB of its proposal to which they advised Sellick that the matter was something the local regulator had to consider but they would be interested in understanding our proposal and the outcome. It is important to remember that the ABCB is merely a facilitator and not the regulator.

"We did pass on our final engineering brief to them for their information and this included the paper prepared by HWU to validate our claims."

Sellick Consultants has been granted an Australian Innovation Patent by the Australian patent office. The patent takes into account the impact of WELS ratings of fixtures and fittings and adjusts drainage/water loadings accordingly to suit the water conservation measures adopted ➤



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into the project. This is particularly important locally because in the ACT a 40% potable water reduction measure is mandatory and water conserving fixtures are essential to meet these targets.

"The IP adopted assists to adjust pipe sizing to suit reduced flows apparent in both drainage and water pipes due to water conservation in buildings. On larger, more complex projects, further analysis can be undertaken using statistical probability and numerical simulation using the time and flow patterns as was done on the Manhattan project.

"The IP is currently being accepted on local ACT projects by the Private Plumbing Plan Certifiers given it stemmed from the R&D that was undertaken on the Manhattan on the Park development."

News of such innovation and thinking spreads across the industry like wildfire and switched on suppliers begin to ask questions.

"Sellick Consultants have been approached by suppliers such as Geberit to identify how the IP can assist with pipe size reduction on high rise residential apartments for their Sovent system and we also work closely with Studor who are also aware of impact of water conserving fixtures/fittings on drainage design.

"Despite engaging one of the world's leading drainage research teams, our



1



2

IMAGE 1: Brad Williams of Sellick Consultants. **IMAGE 2:** Assistant Professor Dr David Kelly and Professor Lynne Jack, leader of Heriot-Watt University's Drainage Research Group.

local regulator was still concerned that the system would fail under an extraordinary condition. To that extent they asked us to investigate the impact of a two minute window at halftime of a State of Origin game, where every WC was flushed in all 330 apartments."

Sellick duly inputted this outcome into its engineering brief, which indicated that the 150mm pipe size was adequate; however, since the completion of the building it has been using Switch Automation to remotely monitor potable water consumption to the entire building, logged every 60 minutes.

"We were pleased to review the data output following State of Origin games over the past three years and found that there was no marked increase in water consumption.

"The ability to monitor water consumption has indicated that in practice the amount consumed is approximately half of the theory put forward by HWU – possibly because

they used every fixture in every apartment over a three hour window whereas in reality this is rarely the case," Brad says.

"In fact the information we are garnishing indicates that within the apartments water consumption peaks on a late Sunday morning when most tenants are home doing their weekly chores. It still doesn't come anywhere near the HWU statistical analysis. This begs the question whether there is still room for improvement in the design of plumbing and drainage systems using data derived from active buildings with smart metering into the future."

No doubt more research, innovation and technology will spur more opportunities to answer that and many more questions in the future. Just as more plumbers and consultants will develop alternative solutions that benefit the industry as a whole. ■

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STAINLESS STEEL CRIMP FITTINGS

WHAT YOU NEED TO KNOW

STAINLESS STEEL PRESS-FIT CONNECTIONS HAVE BEEN USED WITH GREAT SUCCESS OVER THE YEARS; HOWEVER, EARLIER THIS YEAR IT WAS DISCOVERED THAT THE STANDARD FOR THESE SYSTEMS HAS NEVER BEEN UPDATED TO INCLUDE THE USE OF PRESS-FIT CRIMP FITTINGS. **JEFF PATCHELL** EXPLAINS HOW THIS CAN AFFECT YOU AND YOUR BUSINESS.

The current push to encourage the plumbing industry to embrace 'alternative solutions' is chiefly aimed by regulators to give space for innovative and performance based solutions to improve the industry as a whole.

This scope for installers and specifiers to embrace advancements in methods, products and materials, quicker than the relevant regulatory documents can be updated, delivering benefits through innovation like those discussed on page 34 of this issue.

Acceptance of these new installation methods and products is covered principally by the National Construction Code [NCC] supported by a range of Standards and local requirements including AS/NZS 3500.

However, as an alternative to the deemed-to-satisfy approach favoured in the past, 'alternative solutions' are met with a compliance process of added paperwork, responsibility, cost and testing to deem a solution acceptable – negating many of the touted benefits and increasing the risk borne by consultants and installers.

Unfortunately under this framework, innovation is slowed by a substantial impost on the plumbing industry by requiring project specific assessment rather than product or method specific assessment that promotes new methods as acceptable to the construction industry as a whole.

We've chosen to highlight one such instance where a technical situation requires plumbers to understand how an 'alternative solution' application can be used as a defensive mechanism; In this case, the installation and specification of stainless steel pipe systems joined with press-fit connections.

As an industry, understanding and meeting the regulatory requirements for what, why and how we perform our professional role within the real world is an important aspect which you can't choose to ignore. It could put you, your business and project at substantial risk beyond the reach of professional indemnity insurance.

WHAT'S BEHIND THIS STORY?

Press-fit as an installation method was engineered over 50 years ago (with production commencing in 1969)



A real threat exists to your business if you don't apply for an alternate solution to cover the use of stainless steel crimps.

and today used across the world in a wide range of materials and applications. Stainless steel press-fit connections have been successfully used in stainless steel of both smaller and larger than DN 25 for close on 20 years in Australia, as an alternative to traditional compression and brazed joining methods with great success, speed and safety benefits.

Recently with the introduction of the new NCC Volume 3 (Plumbing Code of Australia - PCA), it has arguably been highlighted that the technology of press-fit, specifically for stainless steel as the material, is not covered by either the Standard AS/NZS 3500 or the PCC as an acceptable joining method. Pipework and fittings over DN20 is ignored completely beyond flanged or welded joining. It is however,

identified in AS 3688 [Water Supply – Metallic fittings and end connectors] and the lack of connection between the three documents is the issue.

Due to the nature of developing and amending Standards over years at a time involving many people, industry representatives and interests, technology often overtakes these documents as products, innovation and experience arise in the profession.

Standards are reviewed at a maximum of 10 year intervals or sooner if deemed necessary to remain relevant; from the 1st of May 2016 the NCC is using a 3-year cycle for producing updates. This becomes problematic when these same documents are a necessity for specifications, inspections and complying with law, especially for disputes and guidance.

In the case of stainless steel press-fit, the current publications have overlooked this method of joining despite the testing and historical evidence of stainless press-fit being used successfully in hundreds of Australian constructions, WaterMark approvals and becoming the preferred method of installing pipework over the past 20 years.

WHAT'S THIS MEAN FOR YOU?

Both specifiers and installers need to be aware of the implications arising from not only stainless press-fit but all advances in methods and technology – the risk, despite the success or performance, by not understanding the detailed and complex processes that go on in the background of this industry that provide you with a set of Standards and Codes appropriate for you to work under.

Most of this work is done by a few very dedicated volunteers, conversing with Standards Australia and the Australian Building Codes Board. While it may look like a simple paperwork amendment is required for an oversight or improvement, such matters take time and lots of documentation to amend.

After a lot of work within the industry to make [what most would think is a minor update or amendment] the appropriate correction in AS/NZS 3500.4:2015, the extraordinary bureaucratic process in this case means the required change was not included in AS/NZS 3500.4:2015 and an amendment will not be published in time for the 2016 amendment to the Plumbing Code of Australia. ➤

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WHAT NEEDS TO BE AMENDED?

The Standard AS/NZS 3500 parts 1 and 4 need amending to meet current contemporary practices to include or reference press-fit as a valid and accepted method of installing pipework, specifically stainless steel. Press-fit is already an accepted method of joining in AS 3688 and has been for over 10 years. The two standards just need to be linked.

Standards Australia currently view this matter as a technical change – and not a simple correction amendment – as proposed by the industry. Until the Standard is amended to include the accepted practice of press-fit connections, these products need to be approved using ‘alternative solutions’.

The following is the proposed amendment the industry put forward to Standards Australia that rectifies the lacking acknowledgment of press-fit as an acceptable method of joining:

PROPOSED AMENDMENT TO AS/NZS 3500.4, SECTION 2:

2.4.2 Metallic pipes and fittings

Metallic pipes and fittings shall comply with the following:

- a) Fittings used in conjunction with Stainless steel (SS) shall be either copper alloy compression type and be dezincification resistant (DR) or SS capillary type manufactured from grade 304 or 316 complying with ASTM A268/268M **or mechanical jointing end connectors complying with AS 3688.**

This is not an official document of Standards Australia.

PROPOSED AMENDMENT TO AS/NZS 3500.4, SECTION 4:

4.4.9 Jointing of stainless steel pipe and fittings

4.3.8.2 Jointing of pipes larger than DN 25

Joints in stainless steel piping larger than DN 25 shall be either–

- a) Butt welded using a tungsten inert gas (TOG) argon arc method and–
 - (i) have a gap not greater than 0.5 mm between the abutting pipe ends to be joined;
 - (ii) have inserted a back-up ring 6 mm long, made from the parent, to straddle the joint of pipes with a wall thickness less than 1.2 mm;
 - (iii) use a low carbon stainless steel type filler rod not greater than 2 mm in diameter; and
 - (iv) be tack-welded in not less than four spots around the circumference, prior to welding the entire joint; or
- b) have flagged joints, fabricated by rolling or welding to the pipe, a stub flange of the same wall thickness as the pipe, having a diameter conforming to dimension ‘F’ in AS 2129 or AS/NZS 4331, with mild steel backup flange complying with AS 2129 or AS/NZS 4331 fitted, and a gasket not less than 3 mm thick inserted; **or**

- c) mechanical jointing end connectors complying with AS 3688.**

This is not an official document of Standards Australia.



Stainless steel crimp fittings have been used to great effect for over 50 years, yet Standards don’t cover the material.

WHAT YOU NEED TO DO?

Aside from the fact that the wheels of progress move slowly across the plumbing sector, there is a very real threat to your business if you don’t apply for an alternate solution with your local regulator to cover the past/continued use of these stainless steel press-fit connections.

It’s rather ironic that at a time when government at all levels say they are committed to reducing red tape; again more complexity is upon small business to comply with practices already approved and installed for years.

Given this issue was still being worked through by a number of parties as we went to press with this edition of *Plumbing Connection*, the current solution for both specifiers and installers is not clear. We’ll be following this situation closely with updates published on our website (www.plumbingconnection.com.au) in due course.

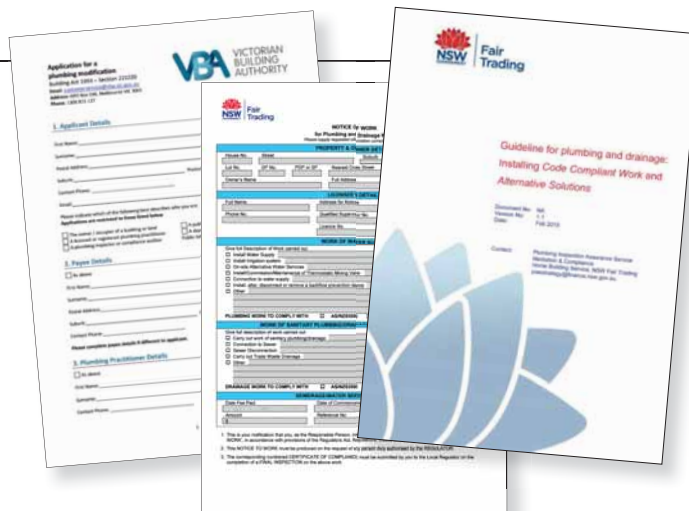
It will be interesting to see how the various State Regulators view the everyday needs of contractors and consultants in this situation.

- Will they show any compassion [common sense] to an issue that they didn't even pick up on?
- Will they want to inspect all previous jobs and charge for every one of those? Let's hope not.

In NSW there appears to be a further complication in that there will likely be different parties involved in the 'Alternate Solution' process depending on where the job/s were/are done and who the Network Utility Operator [NUO] is for the area.

In the case of installation firms who might specialise in the use of these materials, they could have hundreds of past jobs and the catch-up cost of compliance paperwork would be astronomical in cost and time. For new jobs there is an obvious path to take and the appropriate paperwork/inspection fee will need to be included at the time of quoting.

What *Plumbing Connection* will endeavour to do, with the help of others, is produce some state-by-state pro-forma applications to provide appropriate guidance on this matter.



Application forms for alternate solutions.

If you have an open relationship with your insurer, perhaps it would be advisable to talk to them about your trailing installations and their liability too.

Stainless steel lasts a lifetime; here's hoping this issue doesn't. The sooner the issue is resolved, the quicker we can all move on and get back to business. ■

Check out story updates at www.plumbingconnection.com.au

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Have you ever had a drink of tap water and found yourself becoming violently ill? While Australia's potable water may taste questionable at times, in most areas it is extremely unlikely that the water from our taps is unsafe to drink. There are two major reasons for this. Firstly, the products used to transfer and convey our potable water have been tested and screened as fit for purpose through the mandatory WaterMark scheme. The other not so commonly known reason is Australia's rigorous backflow prevention.

Backflow can be defined as the movement of water back from the direction it came from, which can lead to disastrous health effects. Even from a single outlet, backflow has the potential to affect thousands of buildings and the people within them.

Backflow prevention is used to protect our water supply network and is controlled in a number of ways. This includes mandatory certification of particular products as well as regulation and inspection of the finished installation. Historically speaking, plumbing products found within dwellings were standardised in design, hence their associated backflow risks were commonly known and easily accounted for. In recent times however, innovations have seen the nature and quantity of plumbing products and fixtures used in dwellings change significantly.

Australian Standards used to certify plumbing products under the Watermark scheme often include appropriate sections to ensure that backflow risks are controlled at a product level. This approach works well in most situations but there are a couple of major areas for concern. A contributor to backflow prevention risk is the rise of many products or appliances that rely on a connection to our potable water supply.

Technology and manufacturing advancements mean products such as drinking water filters, ice-makers, refrigerator water dispensers and even bidet douche seats are much more prevalent in modern homes. And when you include these with other more common appliances such as dishwashers, plumbing connection points for appliances could outnumber regular plumbing connection outlets.

It is important to note that appliances built to connect directly to the potable water mains are required to have mandatory WaterMark certification, which includes the need for integral backflow prevention. There is a downside though. Due to the ease in which these products can be connected, the licensed plumber is often removed from



Backflow can lead to disastrous health effects if not picked up early on in the piece.

the installation process. This leaves the home handyman responsible for ensuring adequate backflow prevention devices are used and installed correctly.

Plumbers play a pivotal role in making sure the customer has purchased a WaterMark certified product but can only do so if they are part of the equation. Unfortunately, DIY installations have also allowed for products to be offered on the market which have avoided the WaterMark certification process entirely.

With many appliances being offered without WaterMark certification, and many non-licensed practitioners taking responsibility for their installation, perhaps backflow prevention needs to be considered from an upstream location where plumbing regulation has more control. In the days gone by, before the introduction of ceramic cartridges, wall stop taps used jumper valves which had an inherent level of backflow associated with the design. Incorporating integral backflow prevention into wall stop taps protects the

water source using a built in plumbing fixture rather than a component of an appliance.

Another major backflow prevention is the manner in which some products are used or installed. Some products that do not require integral backflow prevention for certification may still have potential backflow risks, depending on how they are installed. This sometimes leads to confusion as to where responsibility lies.

Hand showers on flexible hoses, for example, do not require backflow prevention as part of their WaterMark certification. The standard shower connection point is typically 1.7m above the floor level and high enough to ensure a standard 1.5m shower hose poses no threat if left hanging off its mounting position. However, the increasing need for high density suburban developments has seen more showers mounted over a bathtub where a hand piece can now be left submerged in contaminated water. And in more recent years, hand showers are often used in multi-outlet shower assemblies where the hand shower connection is far lower than what could be considered a safe height above the floor level. Such installations have associated backflow risks and although the products may meet Australian Standards, the finished installation does not.

Plumbing inspectors have targeted these installations to determine that the required level of backflow prevention has been identified and provided. This has unfortunately meant that many shower assemblies have been condemned and ordered to be removed from finished bathrooms. Some of Australia's leading plumbing merchants have begun to address this from a product level with the inclusion of backflow prevention as integral components in their products. Plumbers can take comfort in knowing that these products carry no limitations in the manner that they can be installed. When in doubt, it is worth asking and getting confirmation from the merchant/manufacturer that the product will still meet backflow prevention requirements once it is installed.

The industry faces many challenges moving forward with the rapid development of plumbing products, the manner in which they are used, and the credentials of non-licensed practitioners performing the connections. The Australian Building Codes Board (ABCB) is also performing an overall review of the mandatory WaterMark scheme which, in the future, may have some bearing on the backflow prevention of our plumbing supply network. Regardless of any changes, it is up to all stakeholders to play their part – regardless of how trivial some requirements may seem – to secure the long term integrity of Australia's potable water supply. ■

Contact:

For information on backflow prevention or how devices are tested to Australian Standards, please contact PROVE Standards & Engineering. www.proveng.com.au

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NUDGE NUDGE, WINK WINK...

NON-CONFORMING PRODUCT AND THE CONSEQUENCES OF PURCHASING AND INSTALLING THEM ARE A HOT-TOPIC IN THE INDUSTRY AT THE MOMENT AND FOR GOOD REASON TOO. AS PLUMBING CONNECTION DISCOVERED, IT'S EASY TO WALK INTO A STORE AND PURCHASE ONE, EVEN IF IT'S SPORTING WATERMARK IDENTIFICATION. **JEFF PATCHELL** EXPLAINS.

Chat to most plumbers around Australia and they'll have a story or two about cheap/non-conforming – generally imported – products that don't comply with regulations; however, it's generally anecdotal, without any technical backup.

So, we thought it would be interesting to conduct a real world test.

Some say you can walk into any retail store around Australia and buy non-conforming plumbing product that is dressed up as the real thing (even with WaterMark identification).

As *Plumbing Connection* magazine has done on a couple of occasions over the years, we bought product and had it laboratory tested to see if it held up against the WaterMark approval, indicated on the product's identification.

In this case we wanted to know if the push-fit ball valve and socket we bought were actually made from de-zincified brass [DR brass] which was stamped on the product and forms parts of the approval requirement. Due to the harsh water conditions around Australia, DR brass is a specified requirement – no if's or buts – and it is a more expensive product to manufacture than non-DR brass fittings.

Such products can be hidden sleepers on projects; they can leak over time and cause significant and costly damage to buildings internally.

So, we purchased these two products from a large well-known big-box retailer and had them run through the de-zincification testing at a laboratory. We're not sure any regulators ever do this as part of their 'policing'?



1 **IMAGE 1:** Both products failed to meet DR requirements and could more than likely fail before their expected usable life is over. **IMAGE 2 & 3:** Dezincification test results indicate both products do not comply with product standards.

For legal reasons we're not identifying the brand or retailer (and we changed the colour on the product to protect the innocent). It's not about this one supplier; it's more about the difficulty in the policing of current requirements.

The lab reports (next page) reveal the sad fact that both these products failed to meet the DR requirements and could more than likely fail before their expected usable life is over.

Do these retailers knowingly circumvent the law or are they misled by manufacturers who go back to their old habits once the product certifier leaves their building?

Our guess is they take things at face value and don't have the qualified staff in place to ask enough questions, or they prefer to tick the boxes and take the easy way out.

It's a big challenge for this industry to deliver a 'level playing field', a term that seems to have disappeared from Government-speak.

Of course the reality with this non-conforming product cheating is that it's not illegal for the poor innocent plumber (or his customer) to buy such product – but (unknown to most) it is illegal to install – a strange anomaly. The sad news Mr Plumber is that you are the one who will cop the full force of the law/insurance company, in the event of a failure. ■

If you have had any bad experiences in this area of discussion we'd be happy to hear from you.

Contact Plumbing Connection's editor: justinfelix@build.com.au

DEZINCIFICATION TEST RECORD

Part Description: 3/4" Ball Valve

	Direction rod, drawn tube and components machined from these products		Forgings and castings	Con. cast rod and components machined from these products
	Direction of grain flow	Perpendicular to grain flow	Thickest Section	Thickest Section
Magnification	50x	50x	50x	50x
Area of exposed surface			50mm ²	
No. of Measurements	25	25	25	25
Average Depth of Dezincification			640 µm	
Maximum Depth of Dezincification			690 µm	
Requirement for Average Depth	300 microns maximum	100 microns maximum	100 microns maximum	100 microns maximum
Type of Dezincification			a & B' Attack	
Compliance to Product Standard			FAIL	

*Test completed in accordance with the Australian Standard AS2345 [2006] - See method in Appendix C [75°C±3 for a duration of 24 hours ±0.5h]

2

DEZINCIFICATION TEST RECORD

Part Description: Threaded Socket Hexagon - 15mm

	Extruded rod, drawn tube and components machined from these products		Forgings and castings	Con. cast rod and components machined from these products
	Direction of grain flow	Perpendicular to grain flow	Thickest Section	Thickest Section
Magnification	50x	50x	50x	50x
Area of exposed surface			140mm ²	
No. of Measurements	25	25	25	25
Average Depth of Dezincification			367 µm	
Maximum Depth of Dezincification			656 µm	
Requirement for Average Depth	300 microns maximum	100 microns maximum	100 microns maximum	100 microns maximum
Type of Dezincification			a & B' Attack	
Compliance to Product Standard			FAIL	

*Test completed in accordance with the Australian Standard AS2345 [2006] - See method in Appendix C [75°C±3 for a duration of 24 hours ±0.5h]

3



SIPHONING CHANGE

A CLEVER SIPHONIC ROOFING SOLUTION FROM GEBERIT HAS REDUCED RAINWATER DRAINAGE PIPING BY UP TO 90% IN WOLLONGONG HOSPITAL'S CAR PARK REDEVELOPMENT.

To support the population growth in one of NSW's largest regional cities, Wollongong Hospital was allocated \$30.5m by the NSW State Government to construct a new multi-deck car park.

The facility, which features more than 750 new parking spaces, is connected to the existing car park and to the hospital via a footbridge, and will see the overall number of parking spaces double to around 1500. Located on New Dapto Road, the car park sits adjacent to the recently completed Wollongong Hospital redevelopment project, which included an extension of the emergency department, the creation of a large ambulatory care centre and a new elective surgery centre.

Taking approximately 12 months to complete construction, the project has been a significant undertaking by the NSW Ministry of Health, which appointed Health Infrastructure to oversee its delivery. AW Edwards was awarded the contract in

2014 and went on to engage DM Plumbing as the hydraulic subcontractor. Together with Geberit and an extended team of additional trade subcontractors the project was completed in May 2015 and operational in June.

"The community, Council and State Government all recognised parking had become a challenge at the hospital – particularly since its expansion into a teaching and referral hospital with the coming of University of Wollongong's graduate medical school," DM Plumbing Project Manager, Troy Williams says.

As one can imagine, a project as big as this, does not come without challenges. Fortunately, through innovative product and good design, those challenges were not too great to overcome. ➤

Geberit's Pluvia system uses almost half the size of a conventional pipe to remove large amounts of water.



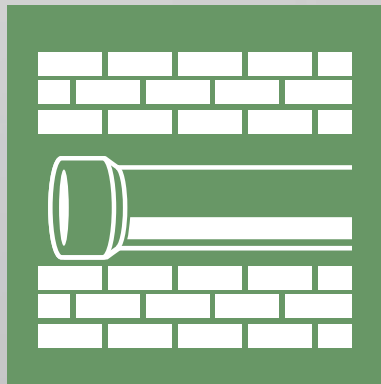
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The Wollongong Hospital project uses the Geberit Pluvia system in combination with HDPE pipes.

THE BUILDING CHALLENGE

- Keep penetration through the concrete slabs and roof outlet drains to a minimum.
- Maximise site capacity and avoid sacrificing car spaces with an alternative drainage system that can be fitted without gradient.
- Maintain clearance heights with pipes that can be installed with minimal to no fall.

- Reduce the possibility of damage to the pipework in high traffic areas.

THE SOLUTION

A lot of plumbers would be aware of the fact that downpipe systems can be inefficient when discharging water from roofs, as water spirals down around the inner walls of the pipe with an air column in the centre. By using the siphon principle, Geberit siphonic [Pluvia] system uses almost half the size of a conventional pipe to remove huge amounts of rainwater from roofs to a discharge point. When the water column builds up underneath the roof outlet, air is eliminated from the system to enable the rainwater to be sucked through the pipework under negative pressure.

Geberit's approach to the Wollongong Hospital project involves the combination of its Pluvia roof outlet and its robust HDPE (High Density Polyethylene) pipes to increase the capacity per outlet, flow velocity within the system and efficiency of water drainage.

"Geberit's innovative piping system appealed to us as it significantly reduced the number of pipes from 26 to just 2 which was one of the determining factors in us winning this contract. They solved our construction, practical and design issues," Troy explains.

"Geberit's siphonic system operates at a higher discharge capacity (up to 300L/s with roof outlets and up to 100L/s per outlet and with fewer roof outlet drains. This means the HDPE pipes associated with it can be laid with minimal to no fall and routed to a single downpipe.

Manufactured from High Density Polyethylene, Geberit's HDPE piping is significantly stronger than typical PVC pipes. As the solution uses fewer pipes it meant fewer bollard or protection systems against car park accidents. This sees a reduction in maintenance costs in the long-term, which is a win-win for car park users and hospital management.

"Both Geberit's HDPE pipes and Pluvia outlet are significantly smaller than traditional systems, meaning coordinating the installation of the other services was far easier," Troy says.

"Geberit's siphonic system saved us, and our client, up to 500m of pipe and more than 200 hours of labour.

"In a matter of days our 2D drawings were transposed into a 3D schematic model and we had a tailored solution that considered our individual site, design, functionality and construction constraints," Troy says.

The next time you're faced with a stormwater drainage job... you might suggest Geberit's Pluvia System siphonic too. ■

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Managing Director

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A NURTURING APPROACH TO TRAINING

WESTERN AUSTRALIA IS OFTEN THE FORGOTTEN STATE BECAUSE OF ITS SHEER PROXIMITY TO THE EASTERN SEABOARD. THAT'S NOT TO SAY THEIR APPRENTICESHIP TRAINING METHODS ARE ANY LESS IMPORTANT OR INNOVATIVE. **JUSTIN FELIX** CAUGHT UP WITH CEO MASTER PLUMBERS AND GASFITTERS ASSOCIATION OF WA **MURRAY THOMAS** TO DISCUSS WHAT'S HAPPENING IN WA.

As we have already discovered, training delivery methods vary greatly from state to state and the Master Plumbers Association and TAFE can either work in unison as they do in South Australia, or work completely independently as has been observed in Victoria and New South Wales. WA appears to sit somewhere in between.

“MPA SKILLS, VIA ITS STRONG RELATIONSHIP WITH SUPPLIERS AND MANUFACTURERS, ALSO STAYS AT THE FOREFRONT OF NEW PRODUCTS AND TRENDS.”

“In the past MPA Skills has operated autonomously, as do most of the training providers in WA,” Murray says. “There have been attempts by RTO’s in WA to conduct moderation sessions where all providers come together to discuss, moderate and evaluate units of competency within the current national plumbing training package CPC08; unfortunately to date these sessions have not been as regular as the industry would like.”

At a recent meeting between MPA Skills and Polytechnic West [WA TAFE] a conscious decision has been made to develop a more thorough process where private and public providers communicate and work together to achieve the very best training outcomes at all campuses providing plumbing training.

The national training package is the same package across all state boundaries; where it differs is the number of ‘streams’ that are delivered. Also the number of nominal

training hours differs across state borders because every state has different funding arrangement via their individual governments.

In WA, streams or units of competency are: water, sanitary, drainage, gas and some roofing units.

This is a fairly common set of units across most state boundaries with the difference in Victoria being that they include a mechanical services unit.

MPA Skills also delivers post apprenticeship training courses which include:

- Plumbing Contractors' Licence
- Backflow Prevention Licence
- Envirowest [Sustainable Plumbing]
- Migrant Gap Training Practices
- Gas Servicing
- Other short courses as and when required by the industry i.e. Working at Heights.

"MPA Skills is a Registered Training Organisation [RTO] and a Group Training Organisation [GTO]. The difference between industry bodies and TAFE's, we believe is the considerable advantages of having Field Officers who monitor the on the job performance of all our apprentices that MPA Skills employs," Murray says

"Field Officers and Trainers communicate readily about the on and off the job components of students' training. We also have the ability to transfer students between the housing, maintenance and commercial sectors ensuring, where possible, that MPA Skills apprentices have a vast range of skills upon completion."

MPA Skills, via its strong relationship with suppliers and manufacturers, also stays at the forefront of new products and trends. It prides itself on the quality of its apprentices. Another major difference is its practical plumbing training facilities that feature hands-on simulated training areas as seen by the attached photo of the sandpit and multi-storey structure.

"Our training model consists of a very strong VET in Schools presence and delivers training in a variety of high schools around the state. We believe the model we offer is all inclusive with the students' journey starting in Year 11 at school, through to the apprenticeship program, then time spent as a contractor and member of the Master Plumbers and Gasfitters Association of WA [MPGA], through to retirement [see the Life Cycle table on the next page]."

As previously stated, being an RTO and GTO as well as having a Board of Directors who remain in the industry, makes MPA Skills a truly Industry Based, Industry Focused, Industry Driven training provider.

"Our completion numbers are well above the national average with approximately 87% of students completing their term," Murray explains. "As we know, apprentices ➤

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Top-notch training facilities ensure apprentices are ready for the challenges of the real world.

need a vast support network to assist them through general life issues while ensuring that their training gives them the best chance possible to become well educated, from apprentice to contractor and to potentially run a professional and successful plumbing business."

In WA when students complete their apprenticeship they apply directly to the Building Commission/Plumbers' Licensing Board for a plumbing tradesperson licence. They also apply to the gas regulator, the Office of Energy Safety for their G Class gas permit [gas installation only]. These are the standard conditions to work with the supervisor of a licensed contractor.

Should students want to become a plumbing contractor at this point, they can commence study on the 9 units of competency from the national training package, Certificate IV which have defined by the plumbing regulator in WA to achieve a contractors' licence.

Apprentice numbers in WA have been steady with a slight percentage decline over the last 12-18 months; however, this is partly due to the decline in the mining sector in WA.

"The secret to maintaining student numbers is to ensure that we are training and planning 4 years ahead to understand the industry needs and to forecast employment needs as best we can.

"Industry associations are best placed to do this and the communication strategy between MPA Skills and the MPGA is an ideal model. NSW has a similar structure to its training delivery and it clearly works. Government should be encouraged to research this model and assist it in the future."

To encourage more students to consider becoming tradespeople, the MPGA has introduced a clever program aimed at year 10 and 11 students. 'Try-A-Trade' day programs see students spend a day being introduced to the

MPA GROUP - BUILDING SUCCESSFUL PLUMBERS			
High School	Apprenticeship	Tradesperson	Licensed Plumber
MPA Skills Training & Apprentice Employment	MPA Skills Training & Apprentice Employment	MPA Skills Advanced Training	Master Plumbers & Gasfitters Association Australia
- Plumbing career advice - Try A Trade Program - School based Pre - Apprenticeship program provided by MPA Skills Training and JFSHS/Ursula Frayne/St Norbert College - Pre-apprenticeship training courses - Careful apprentice selection process - Employed by MPA Skills Apprentice Employment - Connected into industry	- Employed by MPA Skills Apprentice Employment - Training and assessment provided by MPA Skills Training - Host employer and apprentice matching - Job rotation - Apprentice monitoring and support - An accredited state of the art curriculum, teachers and equipment - On-site training and assessment - Flexibility combined with less admin	- Training and assessment provided by MPA Skills Training - Plumbing Contractors Licence [PCL] Course and exams - Licensed Contractor - Gasfitting Permit - Technical skills improvement courses	- Become a member of the Plumbers & Gasfitters Association of WA - Technical and business support - Pricing information - Referrals - Lobbying - Support network - Member discounts - High quality apprentice sourcing on flexible - Advanced skills training and assessments provided by MPA Skills
Well-informed, well prepared and highly motivated pre apprentices	Work ready, committed, and at work apprentices Apprentices achieving Cert III accreditation	Proficient plumbers working for plumbing business Plumbing tradesperson passing Plumbing Contractors Licence [PCL] course	Highly qualified and professional licensed plumbers A respected and rewarding trade Successful plumbing business with great apprentices

industry. The Construction Training Fund, who MPGA have a close working relationship with, fund and monitor the training initiative which as Murray describes, has been very popular.

In an effort to build and maintain strong apprenticeship numbers and a training model that works, Murray admits that continual work needs to be done.

"The MPGA is a strong believer in the apprenticeship training system as it is a tried and tested model; however, I would agree it needs to be innovative in the future to meet the needs of a new generation of learners.

Training delivery has to change as the days of 'chalk and talk' are well and truly over. Training delivery must be:

- Up with the latest training and assessment tools to ensure learners have the capability to advance or learn at their natural pace.
- Assessment of both off and on the job competencies at each year level is essential.
- Final assessment is also essential, by an independent assessor preferably, to ensure that the quality of apprentices remains at the highest level.

Murray has some words of wisdom for young plumbers and those considering a career in the industry.

"Having been a plumber and working in the plumbing industry all of my life, the times ahead are very exciting for any young person to embark on a career in plumbing and gasfitting. Times are definitely changing with modular construction, BIM design and ever increasing technologies.

"To the young plumber, ensure you are aware of what is happening around you, continue to be involved with your industry Associations and ensure governments don't ever de-regulate our industry.

"You are at the front line, ensuring high standards of sanitation and safe drinking water delivered straight from the tap for our community. Take your eye off the ball and it could be taken away in a blink!" ■

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The study compared the supply and installation costs of the Studor System against the other two main types of high rise sewer stack systems in use across Australia and New Zealand: a Reduced Velocity Aerator Stack System (RVASS) and a traditional system modified with AAVs, also referred to as a Fully Vented Modified System (FVM).

Whilst a previous comparison in 2011, based on an entire building project over 22 floors, demonstrated that Studor was the most cost effective for that size project, it had raised the question of how would these stack systems compare over shorter and taller building designs.

The new comparison compared the same three single stack systems over several building heights. Instead of a whole building, this time the cost comparison was based on a single stack using the three systems: aerator fittings, relief vents and Studor P.A.P.A.s and AAVs, covering 8, 40, 70 and 90 floors.

Straight stacks were used [no rollovers or offsets that could make one system cheaper or dearer] and they all had the same fixture unit loading to ensure that they were all sized based on the exact same criteria, as well as eliminating the cost of branches as these can vary from building to building or floor to floor. A straight stack with a set loading will always be the same regardless of other factors.

An independent hydraulics consultant was commissioned to provide the design and bill of quantities. A separate consultant then provided a cost estimation for the bill of quantities with the aim of comparing the three systems; the Studor System relative to an ordinary FVM and to two RVASS; one using 169mm and the other using 110mm pipework.

The results demonstrated that the Studor System is the most economical of the three drainage systems. The extent of savings are typically over 40% against the RVASS systems and over 20% against the FVM system. Whilst the amount of saving differed depending on the building heights, Studor was the most cost effective for the four height options that were considered.



The Studor System also offers additional benefits to just cost savings. The reduction in duct size required increases the habitable space available and can significantly add not only to the floor space but also building rents or sales value, hence improving the return on investment of the new development.

In addition, reduced pipework requirements offer a sustainable drainage solution, site safety is improved with a reduced requirement for working at height, whilst the elimination of roof venting pipes and penetrations reduces thermal heat loss and enhances the aesthetic appearance of the building.

A report providing more detail about the study is available on request. To obtain a copy please visit www.studor.net/ccr or contact Studor via info@studor.net. ■

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- Typically over 40% versus the Reduced Velocity Aerator system
- Typically over 20% against the Fully Vented Modified system

The saving differs depending on the building height, but the Studor System is always the most cost effective. Further benefits include:

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BRINGING BACKFLOW PREVENTION AWARENESS TO THE FORE

BACKFLOW PREVENTION IS CERTAINLY BECOMING AN OFTEN SPOKEN ABOUT SUBJECT ACROSS AUSTRALIA; AND A GOOD THING TOO WHEN IT COMES TO PROTECTING THE DRINKING WATER. **PETER MCLENNAN** EXPLAINS.

The recent National Backflow Prevention conference held at Seaworld Resort on the Gold Coast saw delegates from far and wide, both nationally and internationally, getting together to discuss their local backflow policies and how they impact on the region in which they live.

There were many interesting and informative presentations covering myriad topics from management of assets with unmanned aircraft (or more commonly but incorrectly known as drones) to the implementation of a regional rural town backflow prevention management program.

A major topic of discussion over the two day conference centred around the increasing number of incorrect installations being encountered across all regions which indicate a lack of training or complacency from the installer. Incorrect installation can affect the protection level of the device and this in turn may not protect the drinking water when a backflow event occurs. This lack of understanding or dare I say it, incompetence on the behalf of the installer, fuels the ever increasing call for ongoing backflow refresher courses to be a mandatory requirement.

The overwhelming response from the post conference survey was that the more people learn about the subject, the more they need to know, hence they found the conference to be a valuable event on their calendars.

The 2016 National Conference will be in Sydney during the last week of July so keep an eye out for information as it becomes available.

ONGOING EDUCATION

When you talk to plumbing industry people about backflow prevention, there are two main opinions regarding the need for ongoing skills development and training. Some believe that the apprenticeship with the addition of the backflow tester certification is enough and that no ongoing education is needed. Others believe that with ongoing changes to technology and the regulations and Standards that regular refresher courses should be compulsory to maintain the backflow tester endorsement.

The BPAA Inc. agrees with the latter and encourages all backflow testers to seek out revalidation or refresher courses so that they stay up-to-date and relevant to the



Much interest has been gained by recent backflow prevention conferences.

changes around them. As part of the association's mission, a Continuing Professional Development Program has been implemented specifically for backflow testers in mind. The aim is to provide the tester with backflow specific content and training so that they retain a high level of skill and understanding in backflow prevention.

As the program evolves, it is expected that manufacturer specific training modules will be introduced to further develop the skills of the tester.

The program is available for Association members via the BPAA website.

Another topic on the lips of the Australian backflow industry recently was the *ABCB Plumbing Code Development Research Report Consultation Document* on Backflow Prevention. The report is the outcome of research into the current requirements for backflow prevention, conducted as part of the Australian Building Codes Board Plumbing Codes Development Project. The document was distributed widely and responses and comments were requested from all interested parties.

The Backflow Prevention Association of Australia Inc. submitted a number of comments and this submission is available for the BPAA members on the association member's page at the bpaa.org.au website.

The goal of the report, and I quote from the document's introduction, is to ensure that the requirements of the Plumbing Code of Australia (PCA) are clear, consistent, and that they "enable the achievement of nationally consistent,

minimum necessary standards of relevant, safety, amenity and sustainability objectives, efficiently".

There are a number of shortfalls across Australia regarding the interpretation of Standards and Codes by both practitioners and regulators and if this document achieves its goal, then it will have been well conceived.

We are fortunate in this country to have safe drinking water available at the turn of a tap. Backflow is real and is happening at some level in most water supply networks. Backflow prevention protects the drinking water supply, and having safe drinking water is something we should not take for granted. ■

Contact:

Peter McLennan has been involved with Backflow Prevention in Australia since the late 1980s. He is the President of the Backflow Prevention Association of Australia Inc., and Treasurer of the Backflow Prevention Association of Australia Inc. Queensland Chapter. Visit www.bpaa.org.au to find out more about how the Backflow Prevention Association of Australia Inc. can help you understand Cross Connection Control and Backflow Prevention.



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OUR PUMP EXPERT **RON ASTALL** EXPLAINS THE CONCEPT OF POLE CURVES.

POLES?

Most centrifugal pumps are driven by simple, rugged and reliable squirrel cage induction electric motors, which essentially run at a constant speed. Their speed depends on the number of poles in the motor and the electric supply frequency; usually 50Hz or perhaps 60Hz as in the Americas and some parts of Asia.

For electric motors we are stuck with the typical fixed speed options as shown below:

AFFINITY LAWS

As discussed in a previous article on variable speed, the performance of a centrifugal pump at different speeds can be predicted by the Affinity Laws as per Figure 1.

AVAILABLE MOTOR SPEEDS		
	Pump Running Speed - RPM (assuming typical 20 RPM slip)	
Number of poles	50Hz supply frequency	60Hz supply frequency
2	2980	3580
4	1480	1780
6	980	1180
8	730	880
10	580	700

FIGURE 1
For Change Of Speed N_1 To N_2

$$\begin{aligned}\text{New Flowrate } [Q_2] &= Q_1 \times \frac{N_2}{N_1} \\ \text{New Head } [H_2] &= H_1 \times \left(\frac{N_2}{N_1}\right)^2 \\ \text{New Power } [P_2] &= P_1 \times \left(\frac{N_2}{N_1}\right)^3\end{aligned}$$

FIGURE 3
80 L/S at 10m at 8 Pole Speed
Becomes:

Duty "Speeded" Up To 4 Pole:

$$80\text{L/S} \times 2 = 160\text{L/S}$$
$$10\text{m} \times 4 = 40\text{m}$$

Select pump for 160L/S @ 40m



We can use these Affinity Laws in reverse to modify our flow and head to suit the speed of the available performance curves and range charts. Sound confusing? Not really. Let's work through an example.

Let's say we need to select a pump for a flow and head of 80L/s at 10m. For such a low head, it is likely that a low running speed will be involved. If we look at the 4 pole [1470rpm] range charts [Figure 2] we can see that there is no pump selection matching this flow and head at 1450 rpm.

It is logical to predict that if we were to run the pumps in the range chart at an even lower speed, say at 8 pole [730rpm], there ought to be a selection available. So let's assume that there is available a hypothetical pump running at 730rpm that would suit our duty of 80L/s at 10m head.

We will now calculate what would happen if we were to speed this hypothetical pump up to 4 pole [1,480rpm] using the Affinity Laws. Going from 8 pole to 4 pole is theoretically doubling the speed, so we will ignore differences in motor slip and assume a 2x speed change. From the Affinity Laws, doubling the speed will double the flow. The head will increase by the speed change squared [$2^2 = 4$]. See Figure 3.

What we have done is calculate what an imaginary 8 pole speed pump selected for our duty of 80L/s at 10m would produce if operated at 4 pole speed. Now we can go back to the 4 pole range chart to see if this 'speeded up' duty corresponds to an actual pump. See Figure 4.

Sure enough – yes it does; we have a selection for a 250 x 250 – 400 pump. This tells us that this pump will do the duty we want when slowed down to 8 pole speed.

FINAL SELECTION

From the range chart we can now go to the actual pump curve at 4 pole speed and confirm the selection. We can mark the equivalent 4 pole operating point on this curve and then use the Affinity Laws to estimate the efficiency, power consumption and NPSHR for 8 pole [730rpm] operation. See Figure 5.

In this example the actual running speed will be half of the curve speed so from the Affinity Laws, the estimated power at 8 pole speed will be one eighth of the 4 pole curve. NPSHR theoretically follows the same Affinity Laws as for head and is thus estimated at a quarter of that of the 4 pole curve. ➤

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FIGURE 4

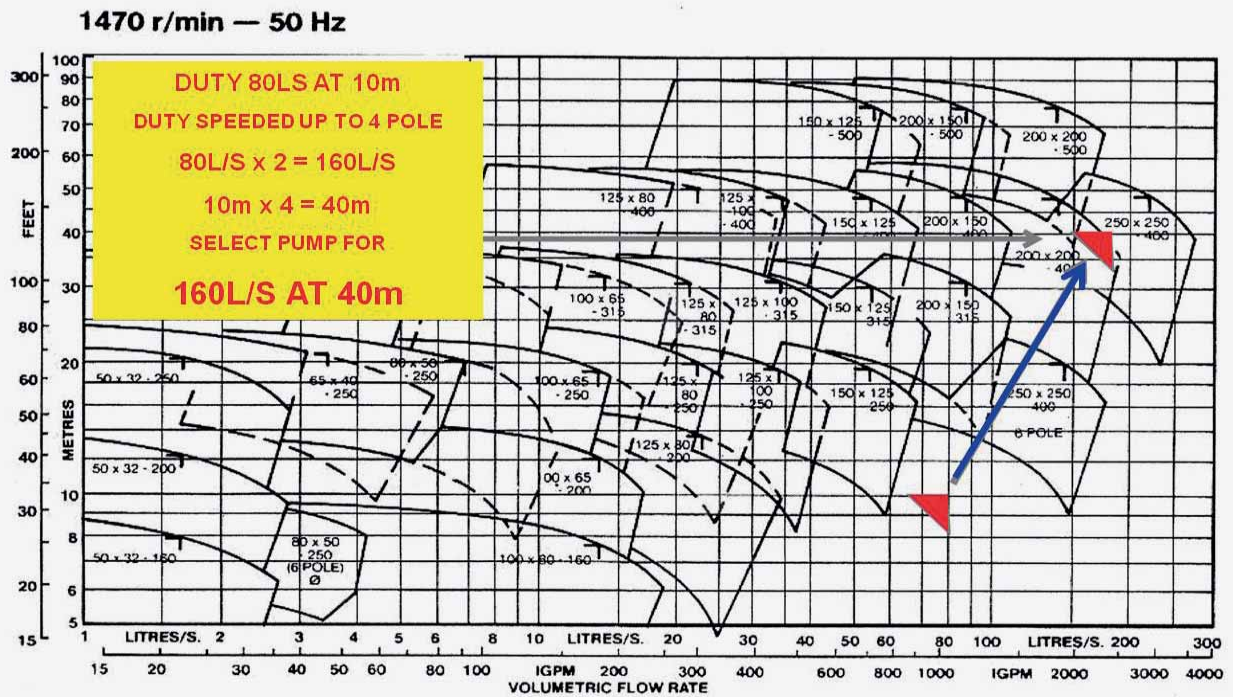
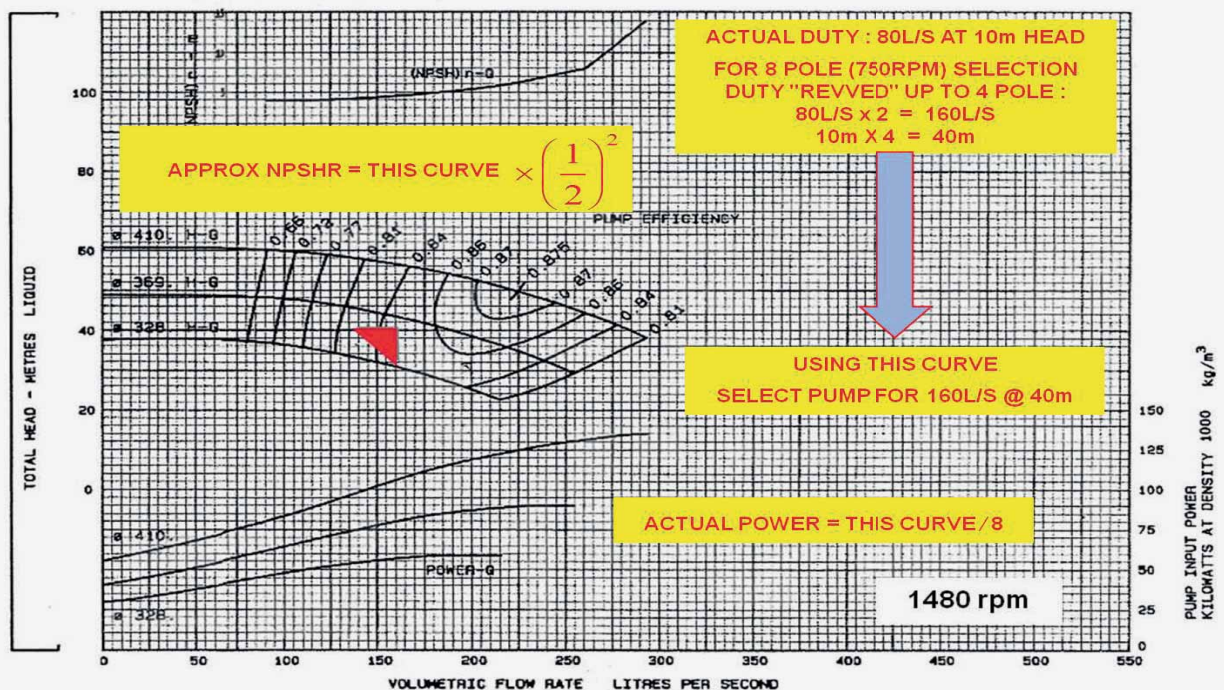


FIGURE 5



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EXAMPLES:

Scenario	Affinity Speed Ratio = Selection Curve Speed Proposed Duty Speed	'Adjusted Duty' to be used for selection	
		Multiply actual flow and head by	
		Flow	Head
Using 50Hz speed curves to select for 60Hz operation	$0.833 - \frac{50}{60}$	$\times 0.833$	$\times (0.833)^2$
Using 1450 rpm curves to select for a Diesel engine drive running at 1800 rpm	$0.806 - \frac{1450}{1800}$	$\times 0.806$	$\times (0.806)^2$
Using 1450 rpm curves to select for a Diesel engine drive running at 1200 rpm	$1.208 - \frac{1450}{1200}$	$\times 1.208$	$\times (1.208)^2$
Using 2980 rpm curves to select for 4000 rpm turbine or variable speed drive	$0.745 - \frac{2980}{4000}$	$\times 0.745$	$\times (0.745)^2$
Using 60Hz speed curves to select for 50Hz operation	$1.2 - \frac{60}{50}$	$\times 1.2$	$\times (1.2)^2$

Use the 'adjusted' flow and head to do an initial selection using the available curves. Once a pump has been selected, use the Affinity Laws in reverse to calculate the expected performance at the actual operating speeds.

OTHER SPEEDS AND EXAMPLES

I have chosen the particular example of selecting a pump for an 8 pole running speed, but the principle is universal. Using the Affinity Laws, you can 'adjust' any proposed pump duty to allow initial selection from available standard range charts and curves. Other examples include selection for engine drives or using 50Hz curves to select for 60Hz service. A few more examples are shown in the table above.

BE CAREFUL!

Using the Affinity Laws in this way is great for the initial selection process but these laws assume that pump efficiency does not change with speed. Efficiency correction factors may apply and the NPSHR prediction may not always be that accurate.

The pump manufacturer should ultimately be consulted to confirm pump performance at the final running speed and to confirm the impeller diameter.

When selecting pumps for a speed higher than the published curve, it is critical that the pump design be checked as being suitable for the higher power and pressure ratings that will result.

The above is a useful tool that allows us to select centrifugal pumps using available range charts and curves when published curves are not available at the intended running speed. However, care must be taken to confirm actual performance and suitability once the initial selection has been made. ■

**This article originally appeared in Pump Industry magazine www.pumpindustry.com.au*



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BOX GUTTERS AND OVERFLOWS

PETER COLL PROVIDES A TIMELY UPDATE REGARDING THE PROVISION FOR OVERFLOW AND BOX GUTTER COMPLIANCE.

In my last article I discussed the emergence of the issue of provision for overflow in external eaves gutters or more specifically, the lack of provision for overflow.

This has become a big issue in the past few months, particularly in Victoria, and is going to be a new section in the upcoming update to the NCC [See what is currently stated in Table 3.5.2.3]. This is despite the fact that the Victorian Building Authority [VBA] claims it doesn't use the BCA code as it believes their regulations are far more thorough and make construction in Victoria of a better standard for the end customer.

As I stated in the previous article, this is not a new addition to the Australian Standards as it has been included for over 15 years. What is new is the strong arm approach the VBA have used to enforce the rectification. VBA has since agreed it could have been handled better.

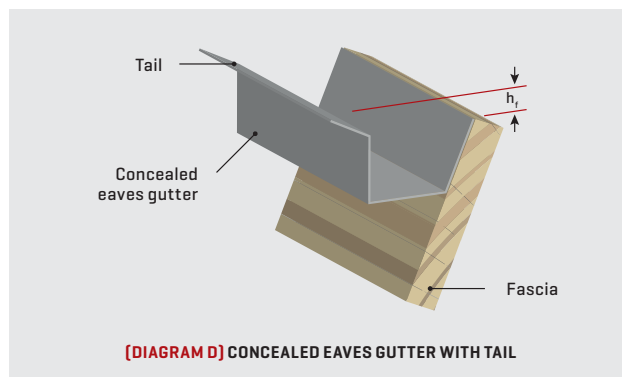
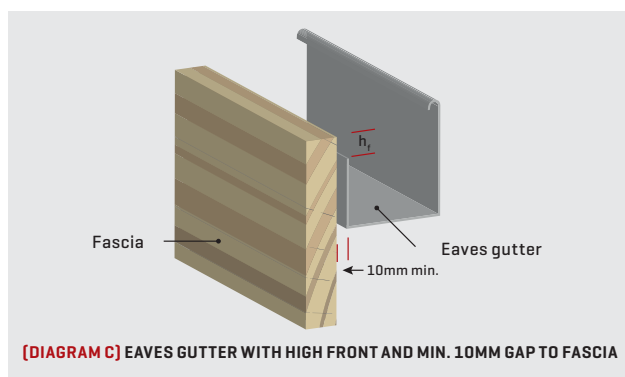
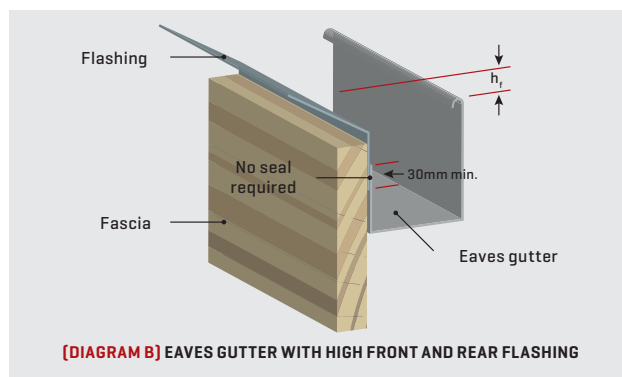
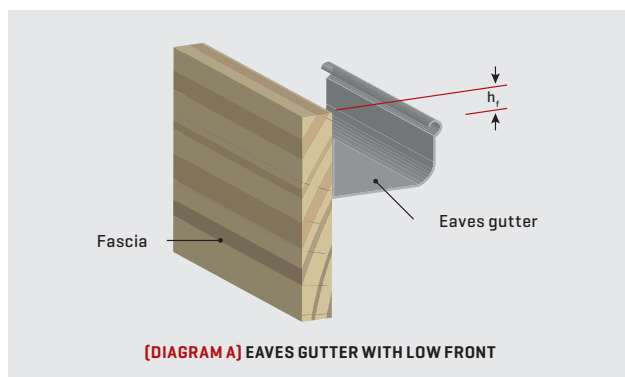
The authoritative bodies need to learn from the mistakes made by the VBA and work on education first. They need to educate builders, rollformers, roofing companies and even home owners as to "why" this is necessary.

TABLE 3.5.2.3 ACCEPTABLE OVERFLOW MEASURES

Table a. Acceptable continuous overflow measure

Description	Overflow Capacity [L/s/m]	Construction
Front face slotted gutter with - (a) a minimum slot opening area of 1200mm ² per metre of gutter and (b) the lower edge of the slots installed a minimum of 25mm below the top of the fascia.	0.5	

In the previous article I mentioned that this regulation superseded an older clause in AS 2180 – 1986 *Metal Rainwater goods – Selection and Installation* section 2. *Installation, 2.1.2 High-fronted eaves gutters. Where high-fronted eaves gutters are installed, care shall be taken to ensure that water will not flow back into the roof or building structure.* ➤





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NOTE: *Methods of preventing this backflow are as follows:*

(A) PROVISION OF SLOTS IN THE FRONT OF THE GUTTERING.

This clause was superseded by: AS/NZS 3500.3.1 – 1998; however the fact that it had been deleted and replaced with AS/NZS 3500.3.2003 Cl3.5.3 was never passed on to the industry. This Standard directs you to Appendix G [See below].

Take particular notice of Diagram C which shows a 10mm gap off the fascia. We have argued with the VBA at length about this gap, it allows for 10,000mm² of overflow for every metre. To put that into perspective, it is the same as two 100 x 50mm downpipe pops – the most common downpipe pop used in domestic gutter installations – for every metre of gutter.

I met with members from the VBA and members of the Association of Hydraulic Services Consultants Australia [AHSCA] to discuss this regulation. They both agreed that the 10mm gap will in principal not only look bad but the allowance for overflow in a large number of cases will be excessive. The VBA have given BlueScope Lysaght the okay to use a 2mm spacer clip which we believe will provide sufficient provision for overflow, but in my meetings with VBA members, it was agreed that a circumstance could arise when the 2mm or 2000mm² per metre might not be adequate.

I also discussed this with Mark Alexander from [AHSCA] and he didn't feel comfortable with a clip that only spaced the gutter 2mm off the fascia unless the job had been hydraulically estimated and proven 2mm was sufficient. He also believed it was leaving the roofing contractor open to litigation.

I told them I was developing a new clipping system for my customers and wanted them to sign off on it before putting it into production. They told me that for my business to be assured it had the best solution for our customers and our business, they would like it to be a minimum of 4mm. That would mean 5000mm² or one 100 x 50mm downpipe pop per 1.25m of gutter. Both groups thought that this would offer a more broad solution and would provide enough overflow on all domestic dwellings.

I had the pleasure of meeting with Matt Jansen from Stratco where he showed a video of their testing. They set up a rig that used the 1 in 100 year rainfall from Bundaberg: Highest 1 in 100 year rainfall according to them. It saw 340mm per hour over a 5 minute period on a roof that was 16m long by 1m wide [16m²].

Their testing showed that even at the highest rainfall reading in Australia, a 2mm gap will work, but it has no room for error. They recommend a 100% buffer which is a 5mm spacer. This was disputed by AHSCA who stated that the way it was tested in a calm environment and making calculations for the water pressure over a 16m sheet, without actually using a 16m sheet, was a factor.

This test proves in theory that we are working toward a solution. Neil Creek from the Australian Steel Institute and the other rollformers in the meeting asked the question, "If we have this testing done in the correct conditions and ratified by a known expert, will it be accepted?" The VBA agreed. Some of the people in the room were also on the NCC committee and said that this would make its way straight into the code.

BOX GUTTERS

I also took time to look back at an article I wrote about the correct sizing of box gutters and started to look at some of the other problems that contractors are facing such as box gutter compliance.

Plumbers and roofing contractors have been working with builders and supervisors to design effective box gutters while on site but some of the issues that are stated in both Australian Standards and HB39 are things that need to be addressed at the design stage of the production process.

I will outline all of the points that are important in properly designing box gutters to ensure they are installed correctly across the industry.

Extracts taken from *SA HB 39:2015 and AS/NZS 3500.3:2015*.

SA HB 39:2015 – 5.1 BOX GUTTERS UP TO 600MM

1.1.1 OVERFLOW PROVISION AND SIZE

To protect buildings from a total or partial blockage of outlets, downpipes or stormwater drains, it is essential that box gutters discharge all roof water clear of the building via overflows. To ensure that adequate overflow provisions are made and any surcharge is accommodated, the overflow weir of any rainhead is to be 25 mm below the sole of the gutter discharging to the rainhead or alternatively rainheads are to have appropriately sized and positioned overflow provision [see Figure 5.3.1(a)].

Particular attention is to be paid to the following [see Figure 5.3.1]:

- (a) The size of overflows are to be calculated in accordance with AS/NZS 3500.3.
- (b) Overflows are to be terminated in such a way as to prevent damage to buildings and property.
- (c) The hydraulic capacity of overflow devices are to be not less than the design flow for the associated gutter outlets, and discharge to atmosphere.

NOTE: *For the design of appropriate overflow devices such as rainhead, sump/side overflow and sump/high capacity overflow devices, see AS/NZS 3500.3.*

This basically says that you have to allow for sufficient provision for overflow, assuming that **all outlets are blocked**. Plumbers must ensure that no water can backflow into the house if this happens.

3.7.7.1 HYDRAULIC CAPACITY

The hydraulic capacity of an overflow device shall be not less than the design flow for the associated gutter outlet. Overflow devices shall discharge to the atmosphere.

This means whatever the flow capacity of the gutter is that the overflow must be able to discharge the amount of water in the event of a 1 in 100 year storm if the downpipe is blocked.

5.3.2 GUTTER INSTALLATION

[e] *Freeboard* Box gutters calculated in accordance with AS/NZS 3500.3 include a 30 mm allowance for freeboard to prevent wind driven spillages.

[G] *Sizing* Box gutters to be sized in accordance with AS/NZS 3500.3 to effectively collect and discharge all roof water with an overflow risk of 1 in 100 y. As an example for commercial or industrial installations, gutters to have a minimum size of not less than 300 mm wide and 75 mm deep at the high end; for domestic installations a minimum size of not less than 200 mm wide and 75 mm deep at the high end commensurate to the roof catchment area serviced by that gutter.

NOTE: Box gutters 200 mm wide are more prone to blockages and should be subject to more frequent inspections and maintenance.

[i] *Fall or slope* Box gutters to be installed with a minimum uniform fall of 1 in 200 towards the outlet.

This effectively states that all box gutters must allow for 30mm of "freeboard" which is from the overflow point eg. rainhead overflow or specific box gutter overflow must be at least 30mm below the height of the back of the box gutter.

All domestic box gutters must be a minimum of 200mm wide and 75mm deep.

AS/NZS 3500.3: 2015 - 3.7.4 LAYOUT

[e] For the sump/high capacity overflow device, the depth of the sump [hs] shall be not less than 150 mm regardless of the position of the normal outlet. Changes are not required, provided the sump/side overflow device is used

[G] Box gutters shall—

- (i) be straight (without change in direction);
- (ii) have a horizontal constant width base (sole) with vertical sides in a cross-section;
- (iii) have a constant longitudinal slope between 1:200 and 1:40;
- (iv) discharge at the downstream end without change of direction (i.e., not to the side); and
- (v) be sealed to the rainheads and sumps.

This section tells us that the [h_s] or depth of sump cannot be less than 150mm and it does not matter where the sump is as long as the gutter falls to it and you provide an overflow device.

This next point is a big one and affects a lot of current designs: **Box gutters shall be straight (Without change of direction)**. This means that every box gutter must discharge independently and cannot follow the outline of the building until you find a rainhead. Each box gutter run must discharge independently to either a sump or directly out of the building without changing the size of the gutter or changing direction. ➤

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With building design being so restrictive on space these days, this is the area where designers must think about how the roofing contractor will make the box gutter comply. With this in mind, they must either allow enough depth in the ceiling for a sump or allow for the box gutter to discharge in a direct line out of the building without reducing or turning a corner with a chute.

This next section discusses sumps and the correct sizing of sumps.

SA HB 39: 2015 – 5.4.1 SUMPS

The sump is to be sealed to the box gutter on all sides [see Figure 5.7.2]. The centre-line of the downpipe is to be no further from the nearest vertical side of the sump than either—

- (a) the diameter of a circular downpipe; or
- (b) the average of the two side dimensions of a rectangular downpipe [see Figure 5.7.2].

Sumps are to be appropriately sized in accordance with AS/NZS 3500.3 with a minimum length of 400 mm and when fitted with a high capacity overflow device with a depth of not less than 150 mm when either one or two box gutters enter the sump.

The minimum size of a sump is 400mm x 200mm [minimum width of box gutter] and 150mm deep.

The outlet must be no further than the diameter of the outlet to the centre of the outlet.

Notes:

1. Dimension X not greater than downpipe size [see Clause 5.3.3].
2. Overflow, sump and gutter support have been left out for clarity.

5.7.3 RAINHEADS

The purpose of a rainhead is to ensure that, in the event of a blockage or extreme flow conditions, all excess flow is discharged to the outside of the building. The centre-line of the downpipe is to be no further from the nearest vertical side of the rainhead than either—

- (a) the diameter of a circular downpipe; or
- (b) the average of the two side dimensions of a rectangular downpipe [see Figure 5.7.3]. The width of the rainhead is to be at least equal to the width of the box gutter.

This section discusses the correct positioning of rainheads. It states that the highest point of a rainhead cannot be higher than 50% of the overall depth of the box gutter.

The most important point of this section is that you cannot reduce the size of the box gutter to exit the building so we advise keeping the box gutters between 200mm and 300mm wide. The last thing anyone wants is a 600mm wide rainhead on the outside of a building.

FIGURE 5.7.2

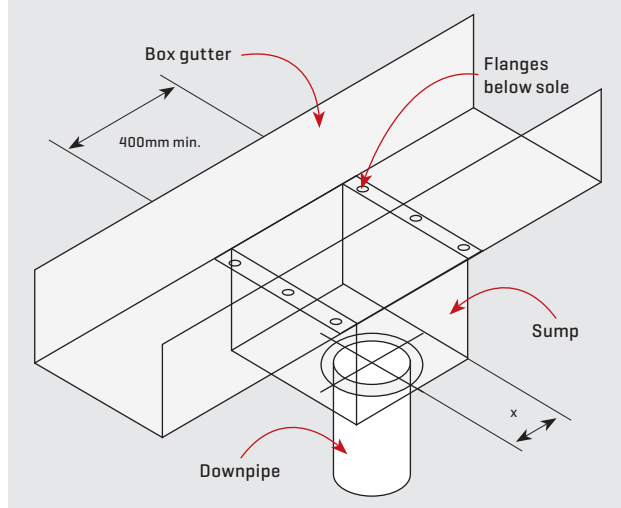
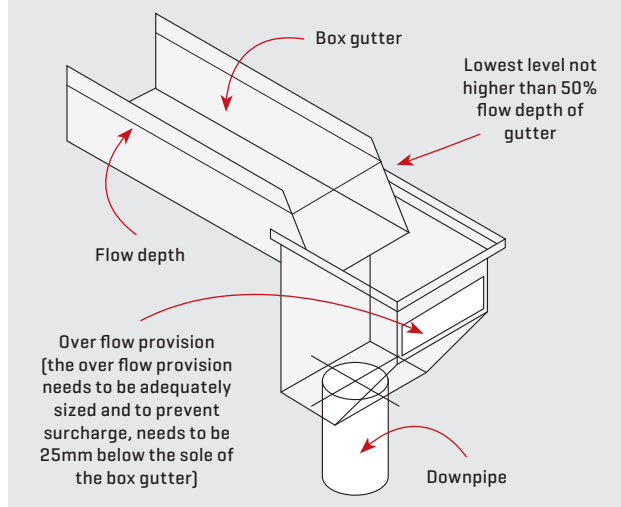


FIGURE 5.7.3



After spending extended time with the WS-014-03 committee, VBA, RMRIAV and AHSCA it has become obvious that all of these groups, believe it or not, have the contractors' best interests at heart.

They all understand that they can be seen as the bad guys more often than not, but they are beginning to understand that education, rather than punishment, on these matters will help to eliminate non-compliance. ■

Peter Coll knows his metal roofing, with over 20 years of experience in design, manufacture and installation. He is general manager of Interline Roofing in Victoria and the Vice-Chairman of the Residential Metal Roofing Industry Association of Victoria.

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SAFETY: A BURNING ISSUE

CHANGE FOR THE SAKE OF CHANGE CAN LEAD TO RISKY SITUATIONS. **ROGER LAMBIE** OUTLINES SEVERAL CONCERNS HE SEES ABOUT TESTING FOR CARBON MONOXIDE.

Here's a popular paradox that is especially relevant in today's fast-moving world: change is the only constant.

During a discussion about the Type A side of gas installations and service procedures a friend said 'we cannot dwell on the past.' New technologies and methods should be embraced.

I agreed, because I had attended a training development group in which we were given the 'change' and asked to expand on what it meant to individuals and groups.

Innovations in any field will always be ahead of the Standards.

When a product has surfaces that are quite hot during operation but it meets the Standard for that product, then the safety criterion is met.

However, if innovation causes heat and potential danger in areas not normally covered by a Standard, this should be tackled immediately.

Some readers may recall the article 'State of Confusion' in the summer 2014 issue of *Plumbing Connection*. It included a reference to one of the findings in a report by the Australian Gas Association as commissioned by the Gas Technical Regulators Committee regarding carbon monoxide safety measures:

- The level of negative pressure required to cause a flow reversal when the heater was operating was typically less than 4Pa and as low as 2Pa in one case. This is what can happen to a flue that is already warm.
- The negative pressure required to prevent normal flow establishment was, as might be anticipated, even lower at between 2Pa and 1Pa. This is what can happen when the flue is cold.

The procedure – described in Appendix R of AS/NZS 5601.1:2013 where all fans had to be turned on prior to operation of the gas appliance and the flue getting warm – challenged potential safety aspects for the operator and the consumer.

The main theme of the 'State of Confusion' article was to highlight the difference between requirements in the Appendix R spillage test for flued appliances and those in Gas Information Sheet No. 38 produced by Energy Safe Victoria [ESV].

They are quite different in their application and in what plumbers and gasfitters are legally bound to follow.

A recent draft put for public comment on AS/NZS 5601.1:2013 Amd 2:2015 that includes a rewrite of Appendix R still raises concerns as to its practicality.



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The most obvious difference between the original Appendix R of the current AS/NZS 5601-1-2013 and the rewrite is the title itself.

The current version was clearly titled 'Spillage Test for Flued Appliances'. This is not the case in this latest amendment – in fact no title is evident.

What is stated under Note 3 of Clause R1 is: "This appendix does not apply to room sealed appliances." This would include balanced flue and power flue gas heaters.

The most obvious question now is – why?

FLUE DESIGNS

Basic flue designs used in domestic installations include conventional type flues (discharging combustion products to the atmosphere only), balanced flue appliances and power flue appliances.

At the moment most existing gas heaters are flued only to the atmosphere, and air for combustion at the burner is obtained from within the building.

Balanced flue and power flue appliances also discharge combustion products to the atmosphere, but they provide external air for combustion at the burner.

Drawing air for combustion from an external source rather than from within a building is a much cleaner and safer proposition than using room air.

The potential to draw combustion products down a heater with a conventional flue when fans in the building are operating is far greater than for a balanced flue or power flue design. However, it's not impossible under certain conditions.

To explain this, look at the history of central heating units. Initially these were in a cupboard in a building that itself was ventilated to the atmosphere to provide air for combustion. A conventional flue separately discharged combustion products to the atmosphere.

Over time, due to space limitations, central heaters were installed in ceilings and/or underfloor spaces. Then design features such as slab floors became commonplace, so the central heating unit was placed outdoors.

Air for combustion was plentiful, and unsightly flues were not required as everything became compact in the appliance.

One problem did remain. As with all gas appliances incorporating a heat exchanger that divides combustion products from the warm room air, the heat exchanger can fail. It may crack over time, or seals may fail to prevent combustion products and room air mixing.

This is a potential source for carbon monoxide (CO) to affect the interior of the building.

That same scenario applies to balanced flue and power flue gas heaters.

Gas Information Sheet No 38 requires the warm air discharge outlets of an external central heating unit to



This heat exchanger is still in operation, despite two obvious holes appearing.

be checked for CO because of concerns about the heat exchanger cracking or seals deteriorating.

On this basis alone one has to wonder why the AS 601 committee decided not to enforce similar CO testing for balanced flue and power flue gas heaters.

The committee may have considered that some appliances have included pressure switches designed to turn off the gas if any cracks or seal faults become evident in the heat exchanger.

However, the accompanying photograph of a power flue appliance shows damage around a sealed area of the heat exchanger. This appliance was still operating with two holes in the heat exchanger.

Unfortunately, as with a gas heater that is conventionally flued to the atmosphere, fans in a building can draw

escaping combustion products from a balanced flue or power flue heater into the interior.

Thousands of this type of flued heater have been installed and should be checked for CO emissions.

OPERATING PRESSURE

Checking the gas operating pressure and supply volume is crucial to knowing where the problem originates.

In the description of how to conduct a CO test, the sentence following Clause R1 item C seems to be a throwaway requirement of the appendix (it is not identified as a clause or even a note):

"Before these procedures are applied a visual inspection shall be undertaken to confirm that the appliance and flue or chimney are clean and unobstructed and installed correctly."

This minimum requirement will not suffice for proper gas appliance servicing, and won't meet safety requirements that have been practised for many years.

Gas operating pressure and supply volume should always be checked before a CO test – let alone when servicing an appliance. Without the correct settings no appliance will

operate as designed.

This is not my own personal edict but one that can be traced back several decades to training manuals and technical papers.

Correct gas volume and operating pressure ensure that air (containing oxygen) is drawn into the burner for complete and safe combustion of the gas. Otherwise, the potential for CO is increased.

As stated in AS/NZS 5601-2013 Clause 5.2.5, Factors Affecting Air Entrainment, the total volume of air entrained by a stream depends on the following:

- Gas rate;
- Gas pressure;
- Specific gravity of gas;
- Design of the orifice determining the friction loss (injector size and alignment);
- Position of orifice;
- Area of opening in shutter (aeration size);
- Design of injector tube (venturi design);
- Dimension and size of burner head;
- Total area of flame ports; and
- Temperature of burner head.



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Service or maintenance personnel have control over some of these points – gas operating pressure, volume, position of injector and area of aeration opening. The manufacturer is responsible for other requirements.

This makes it obvious that when the correct settings are not applied before testing for CO, incomplete combustion is possible.

A visual inspection will not determine correct operating gas pressure or volume. If these are not checked before a CO test, it will be a waste of time and money for the customer.

Any Tom, Dick or Harry may conduct CO testing, without any professional understanding of how to recognise signs of CO. Having charged a fee, they will recommend engaging a plumber/gasfitter to rectify faults that show up.

The problem is compounded by potential danger for users of the appliance.

Authorities generally recommend servicing gas appliances every two years. Several manufacturers now stipulate that their appliances be inspected at least annually by authorised personnel.

from gas authorities and manufacturers. In one situation a gasfitter was ridiculed for not setting the correct operating pressure on an appliance for which the setting was 140Pa too high.

In the Coronial case above it was 150Pa too low and was passed off as irrelevant.

Now we have an amendment to the Standard that requires only a visual inspection before testing an appliance for CO.

Another expert witness indicated to the same Coroner that when combustion products flow into a room from a conventional flue on an appliance with an atmospheric burner it is safe until there is incomplete combustion at the burner.

The term for this is 'vitiation'. The air becomes contaminated by having its oxygen content lowered through combustion or pollution. [AS/NZS 5601-2013 Clause 6.4.2]

VITIATION

Vitiation of combustion air in appliances burning natural gas lowers the burning velocity and further reduces the range of its flammability limits.

“

IN THE CASE OF VICTORIA, THERE HAS BEEN NO GAS APPLIANCE SERVICE TRAINING FOR ABOUT 10 YEARS.

”

CONCERNS

These matters arise from one page in one of the amendments put out for public comment on AS/NZS 5601-2013.

I'm worried about the industry's direction. What depth of practical working knowledge does the committee have at its disposal when basic practices are overlooked?

ESV, in co-operation with Consumer Affairs Victoria, has issued what is called a comprehensive check list outlining responsibilities for plumbers/gasfitters when conducting rooming house safety checks.

However, plumbers/gasfitters are not legally permitted to adjust gas meters. Whether Consumer Affairs is aware of this is another thing.

Knowing and having the correct operating pressure and volume from a gas meter is critical to this Rooming House safety check list let alone when servicing an appliance.

In one case, an expert witness told a Coroner that a variation in gas pressure is irrelevant in the operation of a gas burner. This goes against our understanding of the safe operation and efficiency of a gas burner – in particular an atmospheric gas burner.

The AS 601 committee is mainly made up of personnel

Lifting or streaming of burner flames will result – the degree of lifting depending on the amount of vitiation.

In layman's terms a wall furnace that takes its air for combustion purposes from the room to safely and efficiently operate a gas burner is compromised where any negative pressure created by dissimilar pressures within a premise will see combustion air reversing down the flue get gradually worse.

The negative flow of combustion products down the flue, caused by dissimilar pressures in a building, may continue to increase in percentage until the flame on the burner lifts off 'looking' for oxygen to burn. In turn, the potential for CO is greater.

So, the production of vitiated air constitutes a serious hazard.

Much of the above is based on readily available information on the characteristics of gas and long-term safe practices.

In the case of Victoria, there has been no gas appliance service training for about 10 years. Practical experience and knowledge have dropped away, to the point where those who should know have little of either – and no one to challenge their decisions. ■

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A GLIMPSE BEHIND THE CURTAIN

SINCE 1977, RESOL GERMANY HAS BEEN A SUCCESSFUL BRAND MANUFACTURER IN THE FIELD OF SOLAR THERMAL AND HEATING CONTROL TECHNOLOGY. MAT BRIGGS TOOK A TRIP TO THEIR HEADQUARTERS TO SEE WHAT GOES ON BEHIND THE SCENES.

As I have mentioned in previous articles, I run a website that supplies a broad range of parts for all sorts of repairs and installations of solar hot water products. One of the more popular brands on the website is RESOL who manufactures a wide range of system controllers in the fields of solar hot water, swimming pools, heating systems etc.

Due to my involvement with RESOL and supplying the brand to plumbers all over Australia, I was fortunate enough to be invited to a tour of the RESOL headquarters based in the small and rather idyllic German town of Hattingen. I had expected Germany to be very neat and proper, but wasn't prepared to find this tidiness and efficiency permeating the whole production plant. We were lucky enough to be able to see the entire production line in action and once we saw how efficiently the quality controller was produced it became easy to see why RESOL is becoming such a sought after product for the replacement market here in Australia. The facts and figures speak for

themselves: RESOL products optimise the efficiency of more than 3 million systems in over 60 countries.

The DeltaSol® BS/4 and BS plus [one of RESOL's most popular products] were being produced while we visited and we followed the production from start to finish. Everything starts in the circuit board assembly, where the SMD components are mounted. SMD stands for Surface-Mounted Device, which means the parts used here are so tiny that a machine is needed to place them correctly. In RESOL's state-of-the-art production plant, the SMD machine is by far the largest. It places tens of thousands of tiny little parts per minute, precise to the fraction of a millimetre. This all happens inside the machine, just like the soldering process that is directly attached to it.

The next step of the assembly line sees a number of people with incredibly fine motor skills assembling the Through-Hole Technology (THT) parts. These are larger parts set onto their places on the circuit board by hand – "larger" being a very relative term in this context. Then the circuit boards run through a soldering machine again. By the way, the exhaust thermal energy produced during the automatic soldering is recovered in order to save energy. ➤





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The assemblers never run out of parts thanks to a team of special in-house line suppliers. A finely-tuned system monitors parts supply and sets off orders for replenishment in time. The whole chain of processes is organised after a Japanese philosophy called Kaizen, which means “change for the better”. Each worker takes part in constantly monitoring their own work and strives to make it better, more precise and more efficient. You can see the results of the philosophy from the clean organisation systems and quality of the production line.

INDUSTRIAL-STYLE MANUFACTURING

While the circuit board is being made, the base of the controller is produced in another part of the plant. Different cables and sensors are attached to the terminals so the customer gets a plug-and-play device. Then, in the final assembly lines, the base component, circuit board and housing are joined, labelled, equipped with the right software and then, at last, mounted to form the actual product.

100 % QUALITY ASSURANCE

Every single circuit board is tested for quality. With AOI systems, a Flying-Probe test device and a number of versatile electronic and hydronic testing fields, the QA division ensures that each product is thoroughly tested. Controls take place after each individual production step, so that 100% quality assurance is delivered.

CUSTOMISED DOWN TO THE LAST DETAIL

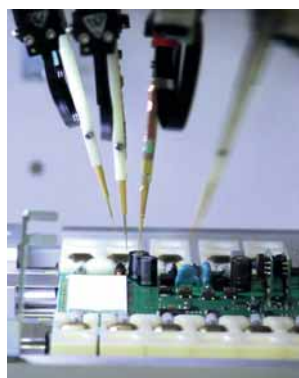
Most RESOL products are sold under customers’ names. Some of the largest European system suppliers get their controllers from RESOL, branded with their own names, of course. Smaller customers can do the same as customisation can be had in all sizes and in small numbers, too. From completely personalised software and hardware to just a logo printed on the housing; everything is possible.

EASY TO INSTALL

Each controller of course comes with a manual. But let’s face it – who reads the whole thing when installing stuff on-site? For that exact purpose, RESOL controllers have commissioning menus. When plugged in for the first time – or after a reset – a small number of easily sequenced steps [6 in the case of the DeltaSol® BS/4] take you through the initial configuration.

For wall mounting and electrical connection, there also is a quick guide which is a small booklet with pictorial instructions.

Accessory installation is very easy too. All RESOL DeltaSol® BS controllers are equipped with a VBus® interface. That’s a simple bus interface for connecting accessories, without having to mind cable polarity.



As one has come to expect from Germany production, the RESOL factory was a well-oiled machine.

Half of the products made by RESOL leave Germany and can be found on all continents (except for Antarctica). That explains why RESOL started using switch-mode power supplies years ago, so their devices could be connected anywhere in the world in grids from 100 up to 240 V[AC] without having to use transformers and converters. They are also available in 12 and 24V versions, for those whose systems operate off grid.

To cap off our tour we were extremely lucky to be treated to an advanced product training session. This included an extensive insight into VBus.net which we will look at next edition. ■

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HAVE YOU GOT A QUESTION ABOUT THE NCC?

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HOW WE CAN HELP YOU

The NCC is written and maintained by the ABCB. Its content is developed with safety, health, amenity and sustainability for the design and construction of new buildings as its core objective. Whilst the ABCB can provide general advice on the NCC provisions to registered NCC users, this does not extend to:

- Advice on a specific project.
- Opinions, rulings or arbitration on disputes between parties or decisions taken by practitioners in exercising their statutory responsibilities.
- Occupational health and safety legislation and guidelines.
- The extent to which the NCC might apply beyond new work in an existing building.
- Construction matters such as demolition, site-related industrial matters and asbestos removal.
- Administrative documents such as contracts, permits, compliance inspections and reports, stop work notices and certificates.
- Licensing and auditing of building and plumbing practitioners.
- Regulatory offences, penalties and appeal processes.
- Planning issues such as sub-division allotment orientation, minimum set-backs and fence heights.
- State or territory variations or additions to the NCC.

WHO ELSE CAN HELP YOU?

The States and Territories are responsible, under their various Building Acts and regulations, for applying the NCC within their jurisdictions. In most cases, certain powers under these Acts have been delegated to either Local Government Authorities or private sector building surveyors, including the power to issue approvals, licences or permits for building work. These approval authorities are responsible for determining whether a building solution complies with the NCC in the first instance. Additionally, State and Territory Administrations (www.abcb.gov.au/about-the-australian-building-codes-board/contact-us.aspx) often provide an advisory service, which includes advice and interpretations of NCC requirements to practitioners within their jurisdiction, as well as practice notes or Ministerial directions. ■

Australian Building Codes Board
www.abcb.gov.au



WHAT ELSE IS AVAILABLE TO HELP YOU?

Before contacting the ABCB, you should check whether your question can be answered by the following resources available from our website (www.abcb.gov.au/education-events-resources.aspx).

The Guide to Volume One – a non-mandatory document, designed to be used in conjunction with, and provide commentary on Volume One (available to registered NCC users).

Non-mandatory Handbooks – these handbooks aim to provide building industry practitioners with information and guidance on specific topics and typically address those that are considered to be unsuitable for regulation through the NCC.

Advisory notes – these non-regulatory Advisory Notes have been developed to assist in the application of the NCC.

Calculators – these calculators have been developed to assist practitioners with meeting the energy efficiency requirements of the NCC and include glazing and lighting calculators.

You Tube clips – a number of YouTube clips are available to improve awareness and information dissemination for industry and other stakeholders.

NCC online training – a wide range of self-paced online training courses on NCC topics have been developed in conjunction with online training provider Pointsbuild. At the same time you may be able to earn CPD points.



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FACE TO FACE WITH THE FUTURE OF BUILDING

JEFF PATCHELL ATTENDED THE ABCB'S BUILDING AUSTRALIA'S FUTURE 2015 CONFERENCE AND REMAINS A STRONG ADVOCATE FOR ATTENDING SUCH EVENTS.

Call me old-fashioned but the power of experiencing live presentations, followed by the opportunity to mix and converse with presenters and leaders from across our industry, still garners favour with me.

We used to do that as an industry quite a lot but then the internet came along... and it's supposedly saving the world. Pardon my cynicism.

Sure the internet is great as a (chiefly one-way) communication server but we humans inherited the planet long before the IT world and two-way discussion has worked pretty well – putting aside a world war or two.

And when the subject matter is quite complex and ever changing – such as building and plumbing regulation in the NCC, all the more reason to make the effort to wise-up.

That was my take on the recent *Building Australia's Future 2015 (BAF)* conference held mid-September at Surfers Paradise and run by the Australian Building Codes Board (ABCB).

Around 600 practitioners attended from all walks of the industry, with building surveyors being the dominant group.

I felt some disappointment with how few suppliers/ resellers (you know the guys that want to flog you all those products) made the effort to attend and get involved – after all, they are quick to complain about how difficult it is to influence the rules and regulation that govern their particular sector though – but enough of the grumble from me.

The BAF provided valuable insights for attendees over the three days, with more than 30 speakers as well as keenly attended workshops.

A strong focus was the focus on adopting Performance Based Codes – something quite challenging for many, particularly those who feel comfort in the long standing deemed-to-satisfy approach.

This requires a change of attitude and culture by many groups and individuals across the industry and it is going to take time to educate 'the masses'. Ultimately there is national benefit and cost saving to be had in many areas – though cost should not come at the expense of long term performance and durability.

PUT YOUR FEET UP!

If you didn't make it to BAF, the next best option to being there is to view recordings of the presentations. The ABCB filmed the full range of presentations, so visit their website (www.abcb.gov.au) and look to the bottom left corner for the BAF 2015 Conference tab – Presentations Online.

The technical presentations catered for both building and plumbing streams and were interspersed with some interesting presentations including a futurist, the architect behind Channel 9's The Block as well as some leading architectural/construction sector thought leaders.

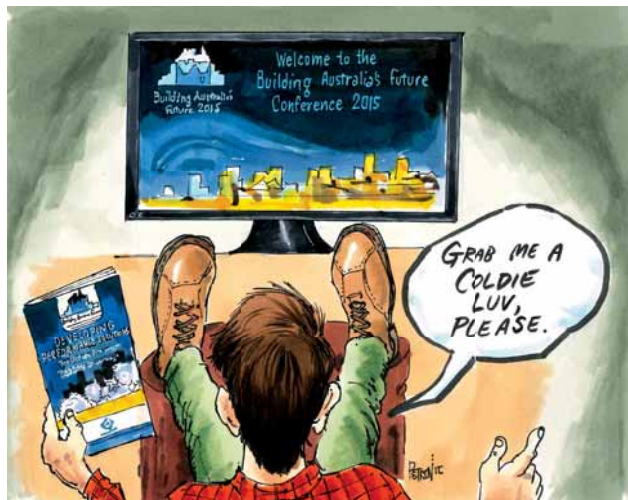
So, off with the NetFlix for a couple of nights and take in a selection of the recorded presentations and you'll make up for some lost ground (but not the useful networking).

Hand in hand with the push to a performance based code direction is the option of developing your own Alternate Solutions for individual project needs. This subject can be somewhat challenging for practitioners but there are now ample resources on the ABCB website to explain the principles and the process to develop a performance/alternate solution.

Over the coming issues, this magazine will publish real examples of Alternate Solutions and how the owners of those solutions achieved their results and the benefits of that work.

THE FUTURE OF BAF

Developing and managing an event such as BAF 2015 takes lots of time and effort and certainly does side-track the ABCB from its important and cumbersome code development tasks. There was rumour that this might have been the last such national event, I hope that's not the case. With the move to a 3-year amendment cycle for the NCC, there's still good reason to provide an opportunity for the sector to get together, even if it is 3-years apart, for those ever-important face to face discussions.



NCC 2016 NATIONAL SEMINARS - COMING YOUR WAY

With the next amendment to the NCC coming into effect from 1 May 2016, the ABCB is presenting a series of seminars around the capital cities, where you will be able to hear and engage with presenters, explaining the various changes.

These events will be well attended, so book early and note it in your diary. ■

THE PROGRAM IS:

City	Date	Venue
Canberra	17 February	National Convention Centre
Hobart	19 February	Hotel Grand Chancellor
Brisbane	23 & 24 February	Brisbane Convention Centre
Darwin	26 February	Darwin Convention Centre
Perth	3 & 4 March	Perth Convention Centre
Adelaide	7 March	Adelaide Convention Centre
Sydney	9 & 10 March	National Maritime Museum
Melbourne	16 & 17 March	Melbourne Convention Centre

You can book your seat from the ABCB website, further information by emailing NCCawareness@abcb.gov.au or call 1300 134 631

Building Australia's Future
www.baf2015.org.au



IS THERE ANY VALUE IN A VALUE PROPOSITION?

CECELIA HADDAD DISCUSSES HOW TO DEVELOP A VALUE PROPOSITION THAT ONLY YOU CAN OWN.

For a builder, as with any trade, growth is essential. It isn't enough to just be good at what you do and simply saying that won't necessarily bring new clients. Future homeowners looking to find a builder need a reason to make a beeline for your business and that is where a value proposition comes into it.

What is a value proposition and why do I even need one?

If you think about the reasons you make purchase decisions every day such as the best price, best value, the fastest delivery, highest quality, best service or just something that satisfies your needs and you have found what you are looking for and made a purchase decision quickly, then chances are that brand or organisation has a well thought-through value proposition.

Not having a value proposition will be detrimental to your business and probably most significantly, cause your customers to move onto another option. People are too time-poor to have to dig too deep to find out what you can offer and if you can meet their needs. Your value proposition needs to be clear and upfront to ensure your company or brand is chosen in the purchase decision process.

Messages are the most important components of a communications strategy and the best value propositions are the ones that speak concisely about your company or brand.

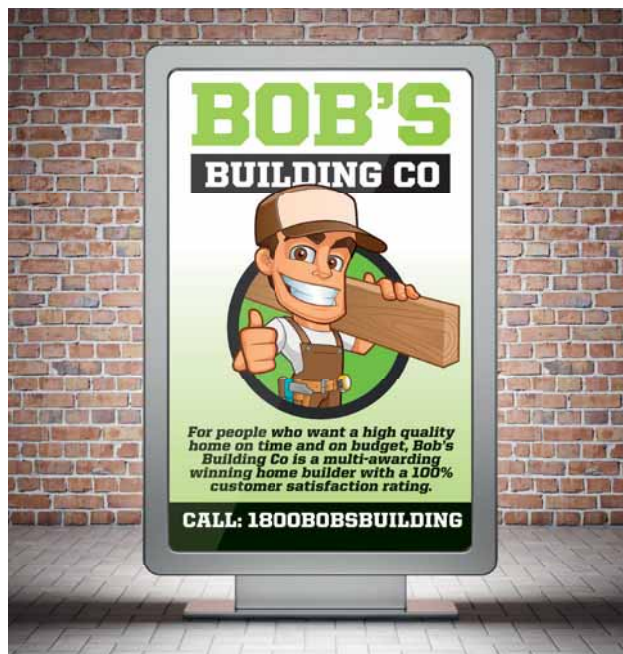
WHAT TO USE A VALUE PROPOSITION FOR

A value proposition is the core of all your communications – internally and externally. It will give your audience the reason they need to connect with you and enable you to focus on delivering what will grow your business.

Value propositions aren't tag lines, advertising slogans, mottos or long winded explanations of your business. They are simply a bite-size, to-the-point summary of what you want your audience to believe about your brand or organisation that cannot be claimed by anyone else.

A true definition is: *an innovation, service or feature intended to make a company or product attractive to customers or a position statement that explains what benefit you provide for who and how you do it uniquely.*

Here's an example: *For people who want a high quality home on time and on budget every, Bob's Building Co is a multi-awarding winning home builder with a 100% customer satisfaction rating.*



Sounds pretty straightforward right? Well it is, but it does take considerable time and thought and is usually developed through a long and considered team workshop process. This is not something that can be bashed out over a cup of coffee and the testing phase will demonstrate why this is the case. Below are the steps required to develop a value proposition that will stand the test of time.

PHASE I: RESEARCH

Dig deep because this part of the process is the most important. As you well know, if you don't get the foundations right, a structure will collapse. Beginning with the end in mind, answer the following questions:

- What are your internal strengths? Features, unique points that help you acquire new or maintain existing customers.
- What are your customers' perceptions? What are their drivers? What do they say (and think) about interacting with your business? What are their concerns/barriers?
- How are you different to your competitors? Who are they? What are they claiming? And what do you do differently and better?

Essentially you want to know why customers choose you. If you don't know the answer, research will be essential. It is easy for an insider to guess why customers choose you; however, your perceptions may very well differ to those of your customers.

PHASE II: FORMING YOUR VALUE PROPOSITION

A value proposition can appear in many ways but fundamentally it should contain the following four components:

- Target Audience – who are we talking to?
- Summary – of who we are
- Benefit – why our customers 'buy' from us
- Justification – reasons to believe this is true

An example might look like this:

For developers who are looking for a reliable project management team, our company provides a risk-free service that delivers on-time, on-budget buildings every time with a 100% customer satisfaction rating.

The four components of the value proposition appear in the above example – audience, summary, benefit and justification. Once you have drafted your value proposition, there is just one more hoop to jump through and it's a big one.

PHASE III: TESTING ITS VERACITY

For a value proposition to truly work it needs to pass the test, answering yes to the following questions:

- Is it true to my brand personality and values?
- Will this message influence behaviour?
- Is it unique to my brand/company?
- Can we deliver on this?
- Can it be copied easily?
- Can we keep up this proposition in the long term without detriment to our business?
- Can we back this up?
- Does it pass the 'so what' factor?

If testing your value proposition fails one or more of the above, it will require a rethink and further consideration.

I strongly recommend using someone outside your organisation to test the veracity of this value proposition before giving it the final stamp of approval. There is nothing like an external perspective to put your claim under the microscope and importantly test its believability.

Now that you have your value proposition, it's time everyone else knows what it is. ■

Contact:

Cecelia Haddad, Director, Marketing Elements



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HIGH QUALITY DRINKING WATER IS OFTEN TAKEN FOR GRANTED IN AUSTRALIA AND NEW ZEALAND; HOWEVER, PLUMBERS SHOULD NOT REST ON THEIR LAURELS WHEN IT COMES TO INSTALLING AND PROMOTING WATER SAVING PRODUCTS AND HIGH QUALITY TAP WARE. **PETER JACKSON** EXPLAINS.

A debate on this side of the Tasman regarding water quality has highlighted how important plumbing systems are for the continued availability of safe drinking water for our communities at large. As Chair of the Plumbers, Gasfitters and Drainlayers Board our mission statement is to protect the health and safety of the New Zealand public. This is achieved by ensuring that suitably qualified people in plumbing, gasfitting and drainlaying are charged with ensuring cross contamination does not take place.

Unlike Australia, we have an abundance of water, and as such we cannot be complacent as El Niño weather patterns have shown in the past that severe drought can strike at any time and interrupt the supply of our rivers and streams.

It is of concern to note that 30% of our rivers are unfit for bathing. The government is determined to alter this situation as quickly as possible and we as plumbers have a large part to play in ensuring that those streams that flow into our rivers are not contaminated in any way through foul water from effluent fields, soak pits, contaminated bores or the straight out dumping of effluent into our waterways.

We are spending millions of dollars on tourism promotions where New Zealand is advertised as 100% pure and our water quality is probably our biggest threat to being able to continue with our slogan.

In my role as Board Chair I have been privileged to be part of the group who have brought new training regimes into place for our apprentices. In the deliberations that took place, it was encouraging to see how



It may come as a surprise that 30% of NZ's rivers are unfit for bathing.

much emphasis was placed on the environment and cross contamination and I look forward to seeing the outcomes.

The plumbing industry is in a perfect position to ensure it takes full advantage of the opportunities which will present themselves through the lack of potable water to our communities. Whether you are connected to a municipal supply or create your own storage and reticulation the opportunities are boundless.

Rain harvesting, filtration, ultra violet, chlorination and dosing along with backflow are all products that the plumbing industry embraces.

Together with the above opportunities comes the ability to influence customers on water saving products, and in fact the design of

high quality tap and shower ware. It is all very well for consumers to purchase product inappropriate for their application and then ask the plumber to fit it, or even worse, to make it fit. Organisations should be concentrating on design; water efficiency and fit for purpose to ensure our communities have the ability to do their part, ensuring water quality and conservation.

I look forward to our institutes training on both sides of the Tasman in the issues stated above and observing the improvements which will come from these initiatives.

I will keep you updated on what comes of these discussions in a coming issue. ■

H2O Design
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PSF



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If you want to know what's really going on behind the plumbing industry, the Plumbing Supply Forum is the must-attend event.

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The event is jointly presented by: The *Plumbing Products Industry Group* (PPI) and *Plumbing Connection Magazine*.



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WHAT'S HOT IN HOT WATER

PLUMBING CONNECTION TAKES A LOOK AT WHAT IS CURRENTLY MAKING NEWS IN THE EVER CHANGING HOT WATER SECTOR.

BRAZED PLATE HEAT EXCHANGERS

When it comes to co-generation and tri-generation plants, Rheem's new Brazed Plate Heat Exchangers [BPHX] have been designed to be used wherever waste heat from water sourced processes can be recovered and used to heat potable hot water.

Rheem's BPHXs have already been used in a range of projects including:

- East Village, Victoria Park NSW: a mixed use residential and retail precinct, where four plant rooms serve a total of 223 apartments using the heat exchangers in conjunction with a tri-generation plant.
- Audi Centre Sydney, East Village: One of the largest Audi service and parts facilities in the world, with 10,000 square metres of floor space and 48 service bays. Heat exchangers have been used in the plant room of this facility.
- Central Park, Abercrombie Street Chippendale, NSW: Two plant rooms serve the 275-bed student accommodation facility.

The WaterMark certified Rheem BPHXs have been designed to offer a high level of thermal efficiency and durability in a compact unit. They're suitable for water to water only applications, and are well suited for installations such as co-generation and tri-generation plants, process heating or as a separator in circuits using PP-R piping.

The heat exchangers offer a high level of leak protection, safety, thermal efficiency and durability in a compact unit. Key features include:

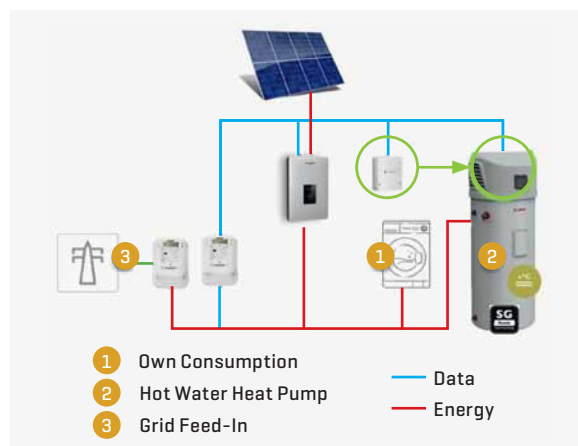
- 316L stainless steel construction
- Single wall brazed plate heat exchanger
- Low pressure loss

Accessories:

Pump C Controller P/No 6060262-4 Rheem 610340 and 610430 vitreous enamel storage tanks or a range of large capacity stainless steel tanks available from Rheem.



www.rheem.com.au



THE PERFECT TEAM

The e.Control from Bosch allows solar power to be used to its optimum potential for own consumption. This creates independence from electricity purchased from the public power grid, thereby reducing electricity bills. The combination of inverter and heat pump maximises own consumption, as PV power supports the heating of hot water.

The e.Control control unit stands at the centre of the networked system. It identifies the energy flows in the house and ensures that all running consumers are supplied with solar power first. This means that even the heat-pump is driven using PV power, before any surplus power is fed into the public grid, for a small fee.

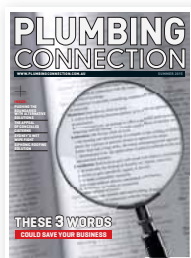
The perfect team – the Bosch BPT-S string inverter and the Bosch Compress 3000 air to water heat pump are fully attuned to work with one another and e.Control; therefore provides best use of your customers' PV generated energy and storing it in form of thermal energy (i.e. hot water) in the Bosch heat pump.

The conversion of electrical energy into thermal energy causes the capacity of the stored energy to increase. Users of a networked system like this, with components made by Bosch, make themselves largely independent of power from the public grid and from fossil fuels.

www.bosch-power-tec.com &
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TMV FLUSH OUT

Enware's Australian made Aquablend 1500 Thermostatic Mixing Valve [TMV] which is suitable for health and general applications now comes with a Thermal Flush feature. The Thermal Flush feature allows for a controlled hot water flush to pass through the TMV for decontamination and maintenance functions. As you can appreciate, this is a major step forward in legionella control in plumbing systems.

www.enware.com.au

TOOBI TAPWARE

The Toobi, from Kohler, is an elegant take on the archetypal plumbing form – the pipe – which is referenced in both the body of the tap and the spout. The result is a tumbling, free flow of water in all its natural beauty, but with a final, pop-art twist – a hit of colour as the water leaves the spout in the form of a small, interchangeable insert fitted inside the spout in a choice of spring green, phantom black or ice white. The Toobi collection comprises a range of 5 star WELS rated basin and tall basin mixers, bath and shower mixers.



au.kohler.com

THE VERSATILE WRENCH

Combining the versatility of a traditional adjustable wrench with the convenience and speed of a ratcheting wrench, Crescent's latest wrench allows users to tighten or loosen the fastener without removing or repositioning the wrench. And when you find yourself in need of a traditional wrench, simply flick the switch from on to off to allow for conventional usage. Compatible on any 4 or 6 point fastener up to 15/16", the pivoting jaw allows users to fully tighten the wrench onto the fastener, actively reducing the likelihood of it slipping off.



www.apextoolgroup.com.au

REMOTE INSPECTION

The Olympus Series C videoscope is designed to provide quick and easy inspections in difficult-to-reach areas. The advanced image processors can operate in low light levels and resolve the finest detail such as corrosion, burrs and small defects or cracks. Ergonomically designed to fit in the palm of either the right or left hand and weighing less than a kilogram, the portability, durable construction and ease-of-use means the Series C can be used for remote inspections for the full 120 minute battery life.



www.olympus-ims.com

INDUSTRIE OF COLOUR

Bold statement pieces will be one of the biggest upcoming trends for tapware in 2016, allowing proud individualists to express their unique sense of style. Dorf's Industrie Basin Mixer and Tower Basin Mixer each feature twin tap handles in a choice of red, black or white. Quality European internals, including 1/4 turn ceramic discs, concealed aerators and Ultraflex PEX hoses for superior durability and flexibility, combine with the smart design to deliver the signature craftsmanship that Dorf is renowned for.



www.dorf.com.au

MINIMALIST APPROACH

Raymor's new collection of contemporary bathroom products has specifically been designed to accommodate more compact bathing spaces, such as those in apartments and units. Making a significant contribution to its compact bathroom range is the Byron Wall Faced toilet suite. Combined with a concealed cistern and the clean, understated lines of the toilet [with soft close seat] will add to the visual perception of space within any bathroom. The Byron has a four star WELS rating with an average flush of 3.5 litres.



www.raymor.com

ATT

ACROSS THE TRADES

SUMMER 2015

INSIDE:
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TAKE THE
HEAT OFF
THIS SUMMER



HANDLING THE HEAT



Summer can be a dangerous time for tradies, particularly those working outdoors. Here, the folks from **Thorzt** offer some tips on how to beat the heat this summer.

The human body is made up of around 60% water and the correct balance is critical to physical and mental function.

Maintaining appropriate hydration levels and ensuring healthy bodily function is directly linked with sodium (better known as salt) while the correct balance of other electrolytes and

branch chain amino acids (BCAAs) are also essential for our physical and mental performance.

• Sodium

While salt in excess is unhealthy, sodium is required by our bodies to help regulate water around cells and is directly linked with healthy nerve and muscle function.

Sodium is mostly lost when we sweat and go to the toilet and the body requires this to be replaced. If salt levels in the blood become too low, confusion, nausea, headaches and the potentially fatal outcome of cerebral oedema can occur in a condition known as hyponatremia.

Drinking excessive amounts of water (or other low-sodium beverages such as soft drinks) during and after physical activity can increase the dangers, and has caused many deaths among otherwise healthy Aussies hiking the Kokoda trail.

Regular food consumption and a healthy diet plays an important role in sodium and electrolyte replenishment; however, a loss of appetite is common while undertaking physical activity especially when performed in the heat – in which case an electrolyte drink may be a good solution.

Conversely, hypernatremia – an excess of salt in the body – is also dangerous. It often corresponds with dehydration and may be caused by extreme fluid losses due to sweating and diarrhoea or by the extreme consumption of salty foods.

The body generally responds to hypernatremia with a strong thirst sensation to correct the imbalance.

• Other electrolytes

While sodium is the most important electrolyte, others such as potassium, calcium and magnesium also play a vital role in cellular communication, organ function and general health.

These electrolytes are also lost in sweat and their replacement may

provide increased cell function, muscle strength and overall performance, as well as faster recovery times, especially among those whose dietary intake is inadequate.

- **Branch Chain Amino Acids (BCAAs)**

Described as the 'building blocks of life', BCAAs are classified as essential amino acids because the body cannot manufacture them and they must be ingested in food.

While a balanced diet should ensure the body has or can produce the required amino acids for most individuals, healthy eating is not always achieved.

Further, research has found BCAA supplements can improve physical performance, exercise ability and brain function.

- **Supplement consumption guidelines**

While drinking specifically prepared electrolyte solutions with added BCAAs can help maintain a healthy balance of electrolytes and essential amino acids and thus lead to improved physical and mental abilities, just how much of these drinks one should consume varies due to differing individual diets, sweat rates and sweat-sodium composition.

It is recommended a tailored approach be implemented and refined to match individual requirements.

ICE, ICE BABY

Consuming crushed ice at work can increase wellbeing, productivity and safety. Crushed ice ingestion – commonly known as slushies – is being used successfully on mines and construction sites in the Australian tropics to reduce cases of heat stress in workers and increase productivity and safety, says thermal physiologist Matt Brearley.

Hard physical labour on hot worksites or in underground mines while wearing heat-inducing personal protective equipment (PPE) is a common scenario for many Australians – described by Matt as 'industrial athletes'.

Workers often suffer heat stress on these sites and may face impaired judgement and a lack of co-ordination, along with dizziness, nausea, headache and a range of other unpleasant symptoms that may also lead to a heat hangover.

Minimising heat stress among workers is an important responsibility for organisations and OHS officers in ensuring a safe workplace.

According to Matt, the author of the white paper *Heat Stress in the Workplace*, there have been a number of studies that have proven the effectiveness of crushed ice ingestion in minimising heat stress.

He described the studies as showing

crushed ice ingestion can substantially lower core body temperatures by acting as a heat sink in the body.

Those studies began on athletes in 2003 and have also extended to military officers, firefighters and miners wearing protective clothing while working in hot conditions.

Matt says the results consistently showed that the ingestion of crushed ice is superior in lowering core body >

SPF 50+ VS SPF 30+... WHAT'S THE DIFFERENCE?

Sunscreen is a critical element in protection from the sun's skin cancer-causing ultraviolet (UV) radiation; however, many people are putting themselves at risk by not applying sunscreen correctly, according to Cancer Council.

The group says part of the cause is that the Sun Protection Factor (SPF) rating system is often misunderstood, particularly the benefit of SPF 50+ over SPF 30+ and how sunscreen protects the skin.

Sunscreen works by filtering out the sun's harmful UV radiation which reach earth in two forms: UVA, which has long been known to cause aging and wrinkles and more recently proven to contribute to skin cancer risk and UVB, which is the main cause of sunburn, skin damage and associated deadly skin cancers. Cancer Council recommends that when choosing a sunscreen it should be at least 30+, water resistant and labelled as 'broad spectrum', meaning it protects against both UVA and UVB radiation.

SPF 30+ sunscreen filters out 96.7% of UVB radiation while SPF 50+ sunscreen filters out 98%. Despite the 30+/50+ labelling hinting at a significant increase in protection, SPF 50+ filters only an extra 1.3% of UVB rays, which Cancer Council says can give people a false sense of security and lead them to apply less sunscreen or not apply it as often.

Guidelines call for both SPF 30+ and SPF 50+ sunscreen to be applied every two hours (regardless of what the packaging says) or after swimming, sweating or towel drying. While some sunscreens may provide resistance to water and sweat they are not waterproof and can also be rubbed off.

Usage recommendations call for approximately 35ml to be used on an average size adult – or one teaspoon per limb, face and front and back of the body. This liberal and regular application of sunscreen in combination with other sun protection measures such as broad-brimmed hats, protective clothing, sunglasses and shade is essential to minimise your risk of deadly skin cancer.

ProChoice
www.prochoice.com.au



temperature than a cold drink served at 4°C, and is likely to lead to increased productivity in workers.

In a review article on crushed ice ingestion for the *Journal of Military and Veterans' Health*, Matt discussed a trial that monitored cyclists during a 40km time trial where power output was increased by 6.9% in those who had ingested crushed ice.

Another trial discussed, evaluated moderately trained runners and found they were able to run for nearly 10 minutes longer after crushed ice ingestion than those who consumed cold water – 50.2 minutes rather than 40.7.

In both studies, participants consumed around 600g of crushed ice during the 30 minutes prior to exercise.

However, Matt says that when allowing workers to self-regulate their consumption of ice, they may not



Thorzt offers a mix of BCAAs and low Gi carbohydrates to make working in the harshest environments tolerable.

consume this much, or may let the ice melt before consumption, eliminating its benefits.

He discussed evidence of this reduced consumption being found in two trials on participants in occupational settings – one on firefighters and the other miners – suggesting the “crushed ice ingestion may diminish the drive to drink” potentially manifesting in dehydration if enough fluids are not consumed.

Despite this, he concluded that crushed ice is a worthy tool for reducing heat stress in the workplace and suggested having both crushed ice and cold fluids readily available as part of a greater heat stress management strategy that includes monitoring workers. ▲

Thorzt
www.thorzt.com.au

Task and Job Management Solutions

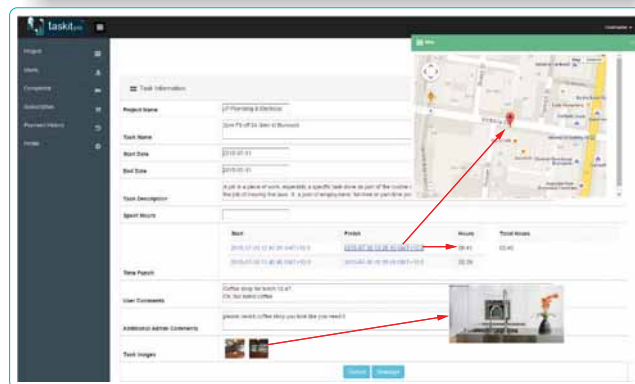
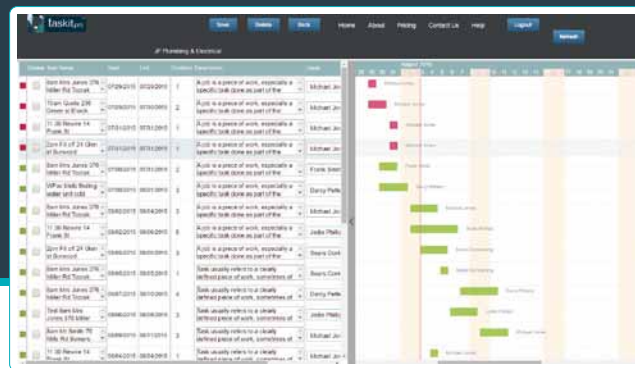
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INSURANCE ARRANGEMENTS AND PERSONAL INJURIES

Injuries occur more frequently than we as a community accept. Gadens partner **Stuart Eustice** explains the importance of having the right level of insurance cover.

In this modern age, while we strive for zero fatalities and zero injuries from work-related activities, history illustrates they continue to occur despite our increasing vigilance. For this reason, businesses are strongly advised to review their insurance arrangements, ensuring they are covered for such events. You cannot proceed in business long term with the view an injury simply will not happen nor effect your business activities.

In this article we discuss common exposures to liability for personal injuries, faced by small to medium enterprises, in the conduct of their business.

Liabilities are broadly broken down

into those which arise from your employees and those arising from non-employees.

WorkCover insurance covers employees and is overseen by the Victorian WorkCover Authority (VWA, which uses the trading name WorkSafe). Such insurance is a business necessity; in fact, it is mandated where an employer pays wages (remuneration) in any given year of \$7,500 or more. The form of policy is now a statutory policy, its terms and conditions are not negotiable. Each party's obligations are prescribed within the *Workplace Injury Rehabilitation and Compensation Act 2013*. Employers are required to register with WorkSafe and pay a premium, which is determined by the Premiums Order (a Government Order published each year). By undertaking these steps an employer is insured for injuries to its employee which arise out of, or in the course of, its employment activities. Like all insurance arrangements, a deductible/excess is

payable upon the making of a claim – in this case the excess is prescribed by statute as the first 10 days of weekly compensation and \$642 in medical expenses. Thereafter all costs are borne by WorkSafe.

In most instances, who your employee is isn't contentious. On building sites or wherever there is a hierarchical chain of command, this becomes less clear. The issue of who is an independent contractor (or in lay man's terms a true subbie) is too complex for this article. Suffice it to say, the higher your company is in the chain of command on-site, the greater the potential for those below you to assert an entitlement under your WorkCover policy.

This is often a source of much argument between a business and its workcover insurer; however, it will not affect your premium to any great extent until the occurrence of an injury and the insurer then having reason to reassess who your company's employees are. While this makes you wonder where the chain of liability stops in such circumstances, and its consequential effects to your premium, the VWA is not as vigilant as the statute enables them to be. Many sub-contract relationships are not reviewed with no corresponding change to an employer's premium.

Employer entities should note your WorkCover Policy does not insure your business for all work-related personal injury liabilities. Liabilities not covered by the VWA, for example, include premium disputes, prosecutions for breach of WHS legislation or breaches of return to work obligations.

Public liability insurance is the predominant form of insurance cover for injuries to non-employees. This includes injury to members of the public, injury to sub-contractors or any other person on the worksite, on your premises or using your business services.

As a separate legal entity, which is either as a person or company, you



owe a duty of care to those persons mentioned above by reason of your control of the land or work process which contributed to the injury. An 'occupier', as you are termed, has a duty to reduce as far as is reasonably practicable the risk of injury to persons on premises over which they have supervision or control. Customers falling in supermarkets, subbies on worksites (including employees of another company on your premises) are such examples. The common theme being that you have control of the state of the land/shop, control of workflow as on-site manager or control of persons otherwise within your management.

Public liability insurance is a private insurance arrangement, private to you and your insurer. You are able to negotiate the terms and exclusions of your cover, and likewise the cost of your premium. This is a vital part of what makes public liability insurance important – you may negotiate cover which suits your individual business operations, exposures or financial constraints.

Most common contracts for trades work will require a sub-contractor to either in part or in full, contractually indemnify the principal (head contractor) and require the subbie to take out insurance that covers both parties (either as a named insured or by noting their interest).

As the subbie in this situation, a failure to take out the necessary insurance is not only a breach of your contractual obligation (to take out insurance), it leaves you uninsured for your liability to the injured party and to your principal. With the average costs of a legal action for compensation being measured in the hundreds of thousands of dollars, not to mention the associated legal fees, your business or personal assets are at great risk.

Public liability insurance also covers recovery claims by WorkSafe or another Insurer. In the circumstances discussed at the start of this article, WorkSafe will pay as compensation weekly payments and medical expenses to injured employees. If the injury was caused or contributed to by another entity, the *Workplace Injury Rehabilitation and Compensation Act 2013* enables

WorkSafe to recover these amounts from them. WorkSafe, while relaxed in approach to premium matters, is highly engaged in pursuing recovery from these non-employer third parties. Public liability insurers are wearing the brunt of this enthusiasm, which is reflected in the higher than usual excesses applicable for such claims – often defined as worker to worker claims in the public liability policy. In general, these range between \$5,000 and \$25,000.

When discussing your requirements

for such liability given its quasi-criminal nature. Same can be said for WorkSafe prosecutions bought by the Return to Work Inspectorate. Awards by Courts from prosecutions range from \$30,000 to \$1 million. Your broker would be best placed to source insurance, if available, to cover this liability.

Given the not insignificant sums of money that arise in personal injury matters, it is imperative businesses are insured. For direct employees and in circumstances where a subbie is

The higher your company is in the chain of command on-site, the greater the potential for those below you to assert an entitlement under your WorkCover policy.

with a broker, ensure you understand your contractual obligations. Extension of insurance coverage to your principal is often overlooked or coverage not sufficient. Note whether you are obligated to contractually indemnify your principal and whether your policy covers such contractually-assumed liability. Further, whether the principal is required to be a named insured, named as an interested party or simply noted. Each has a different legal effect which could leave the principal without recourse to your policy of insurance, requiring them to call upon the contractual indemnity. The end result being you are liable for both your and your principal's liability.

The enforcement division of WorkSafe continue to flex its muscle. Most recently, WorkSafe have targeted industry specific enforcement such as working at heights, working in confined spaces or compliance with return to work obligations. A search of WorkSafe's website lists its prosecution outcomes. Liability policies, similar to the statutory workcover policy, do not often provide cover for prosecutions. There is very limited access to insurance

a deemed employee, your WorkSafe policy of insurance will respond. Again, WorkCover insurance is mandatory under the *Workplace Injury Rehabilitation and Compensation Act 2013* where an employer pays remuneration to staff of greater than \$7,500.

Public liability insurance, while not mandated in law, will often be an express obligation within work agreements. Work under the agreement should not start until proof of the necessary insurance cover is provided. We reiterate such policies should capture as a subbie, your direct liability assumed in contract to indemnify your principal, or to cover a principal as a named insured or interested party.

This article does not address your insurance requirements for damaged assets or products liability. We will address these in turn in future articles.

We encourage you to speak with your broker who will ensure your current insurance arrangements cover your financial exposure for personal injury liabilities. ▲

Gadens
www.gadens.com



THE 'EARTH CHAINSAW'

The back-breaking work of digging trenches could be a thing of the past. **Kate Jordan** looks at the TerraTrencher.

Digging a trench for laying cable, wires or piping can be a right pain. Whether you're doing it with a shovel (and it takes forever) or a machine (and you've had to lug in the equipment), it takes longer than it should and costs you precious time and money. Now, however, there may be an alternative.

The TerraTrencher is a portable mini trencher designed to be easily transported in the average tradie's vehicle and to create a trench in tight spaces and even tighter timeframes. It looks, to all intents and purposes, like

Fieldays, the national agricultural and trade show. It is selling well in the US and is now available in Australia as TerraTrencher, where sales manager Phil Lee is a passionate promoter.

"The impressive digging speed and sheer convenience of a totally portable mini trencher you can carry with one hand means huge time and cost savings," he says.

"The TerraTrencher features a heavy duty trenching chain equipped with toughened steel self-sharpening teeth, providing high reliability and exceptional performance."

TerraTrencher is recommended for use laying irrigation pipe, electrical conduit, pest control barriers, NBN cabling, hidden fences, low voltage lighting, water reticulation systems and water drainage relief – or pretty much anything long and narrow that you

"The offset transfer case positions the digging bar centrally, providing excellent ergonomic weight balance and manoeuvrability," Phil explains.

The TerraTrencher team estimate the trencher can dig a metre a minute, which is a pretty big claim to make. What can be known is that it will make it faster to set up, dig, cover and pack up – the only debate is how much faster.

TerraTrencher is available through dealers around Australia. ▲

TerraTrencher
www.terratrencher.com.au

"It will dig through various soil types up to and including hard clay, even with some rocks."

a chainsaw for the earth: a long bar and chain has been mounted on a Stihl engine and it is used in much the same manner as a chainsaw.

The resulting trench is approximately 40mm wide and up to 750mm deep, depending on the model used. For wider channels, it's recommended that the user creates a double row of trenches with the TerraTrencher and pops the remaining earth out with a shovel. A trolley is available for longer runs and to assist those who may be of a slighter frame. With little disturbance of turf or earth, it's easy to clean up afterwards, further speeding up the task of laying cables, wires or pipes.

Originally developed in New Zealand over 14 years and under the name 'Terrasaw', the trencher has won multiple innovation awards at

might want to put underground.

"It will dig through various soil types up to and including hard clay, even with some rocks. It has limitations like most small power tools and will not successfully dig in shaley rock or rock conditions," says Phil.

As with all such large and potentially dangerous equipment, great emphasis has been placed on usability.



Designed in NZ, the TerraTrencher claims to dig trenches at a metre a minute.

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^{*}SWB 5.2cu m³. [†]SWB 3.75M. [‡]ADR combined cycle figure.

renault.com.au   



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Panasonic Australia
www.panasonic.com.au

Panasonic Australia has released a rugged radio designed to take the punishment of onsite and outdoor use. Ideal for tradies, the radio has a robust body design with a protective cage, plus high quality sound and convenient Bluetooth connectivity so users can stream all their favourite tunes.

There is a USB charging port, and owners of Panasonic Power Tools can power the radio with their existing Panasonic 14.4V or 18V Li-ion batteries. AC power can also be used.



INSPECTION CAMERA

Bosch Blue
www.bosch-pt.com.au

Inspecting tight spaces is now quicker and easier with the launch of Bosch Blue's GIC 120 and GIC 120 C professional inspection cameras.

When inspecting long or complex systems, many tradies have experienced difficulty determining where on the display was up and where was down; these days are now over with the new range of Bosch Blue inspection cameras. The new GIC 120 introduces 'Compass View', giving users a visual marker of where the real camera 'up' position is. Likewise, the premium GIC 120 C navigates through even the most complex pipes and passages with total ease, thanks to the exciting new 'Up is Up' innovation. Micro sensors in the camera's 8.5mm compact head automatically rotate the image, ensuring the display is always correctly oriented. Up now truly is up.



LOCKING PLIERS



IRWIN Tools
www.irwin.com.au

IRWIN Tools' VISE-GRIP curved jaw (CR) locking pliers are putting the power back in the hands of tradies around Australia, featuring a self-energising lower jaw that delivers three times more gripping power than traditional locking pliers, with absolutely no slipping or stripping.

The IRWIN VISE-GRIP CR establishes multiple contact points with the work piece, guaranteeing a significantly tighter grip. The slotted geometry of the new 'self-energiSing' VISE-GRIP Curved Jaw locking pliers exponentially increases torque power, and more torque means more clamping power.

The locking pliers are available in two core models: **Fast Release**, with a one-handed, trigger-less release and anti-pinch, non-slip ProTouch Grips; and **Original**, with a classic trigger release.

RACKING SYSTEM

Rhino Rack
www.rhinorack.com.au

The Rhino-Rack Pioneer Tradie Tray is the ideal solution for tradespeople in all industries, carrying a wide variety of gear on the roof of your vehicle. The open front and back end means you can easily load ladders, planks, pipes and other long objects that require extension beyond the tray, as well as easily carrying your other work tools.

Built as tough-as-nails, the Tradie Tray is crafted with reinforced nylon and aluminium for extreme durability in all environments and conditions. Featuring fully-welded side rails to make loading and unloading easier, the tray is also non-corrosive so it won't rust or fade and can rest well knowing your equipment will be stowed safely on board for years to come.



IMPACT WRENCH

Milwaukee Tools

www.milwaukeetools.com.au

Available at your local authorised Milwaukee dealer, the cordless M18 FUEL high torque impact wrench is designed to deliver true cordless pneumatic performance for trades that specialise in heavy construction.

Delivering up to 1,016Nm of max fastening torque, the M18 FUEL high torque impact wrench is designed to decrease downtime for the user when confronted with repetitive high torque fastening applications that tend to be tedious and time-consuming. For added convenience the impact wrench features a built-in LED light to illuminate the work surface leading to a more productive and safe work area.



DRILL DRIVER

Bosch Blue

www.bosch-pt.com.au

From drilling, screw driving and even hammer drilling, the five-in-one GSR 18 V-EC FC2 FlexiClick is your tool box's new all-rounder. Offering a lockable hex-bit holder, 13mm chuck, off-set, right angle and for the first time ever a SDS+ hammer attachment, the FlexiClick is flexible and versatile.

Now your standard drill driver can be a powerful 1 Joule SDS+ rotary hammer for drilling into tough concrete. The compact FlexiClick has a durable right angle and off-set attachment for a hassle-free job in hard to reach spaces. For maximum convenience, the tightly fixed attachments are rotatable in 16 different positions (360°) without needing to dismount them from the tool.



MOBILE PAYMENTS



Direct Debi Payment Solutions

www.directdebi.com.au

Direct Debi Payment Solutions has launched a fully mobile payment solution that ensures small business is paid on-time – wherever they are located.

Direct Debi's mobile payment tool enables immediate collection or set up of direct debit, complete with online signature capture. The new payment service presents a low cost solution which demystifies the payment collection process by integrating with accounting packages and cloud based software. Clients can also use Direct Debi payment portal as a standalone customer management system.

PLIERS

GearWrench

www.gearwrench.com.au

These easy to use Straight Double-X pliers are made with practical, single-handed work in mind. Increasing the ease of use and dramatically reducing frustration levels commonly associated with traditional needle-nose pliers, the GearWrench Straight Double-X pliers are giving users greater access to hard-to-reach places than any plier before.

GearWrench® Straight Double-X® Plier features a flush rivet for added strength while maintaining a narrow profile. Aligned and serrated tips are also used for greater precision when it comes to gripping your target.





ALL IN THE FAMILY



The idea of going into business with family is understandably appealing. But, if proper steps aren't taken, it's not all it's cracked up to be. Accountant **John Corias** explains.

One of my favourite TV shows of late has been Gordon Ramsay's *Kitchen Nightmares* and the spin-off series *Hotel Rescue*. Both series are certainly great entertainment, provided you don't mind the occasional burst of foul language!

For those of you who haven't seen the show, each episode follows the script of highlighting a poorly performing restaurant or hotel. Gordon goes in, checks the place out and then seeks to turn the business around by working on various aspects of the business.

Gordon has the runs on the board as a chef and restaurant owner, not to mention a successful media career as well, so eventually most of the business owners come around to Gordon's

ideas and changes. Sadly, most of the businesses are already in serious financial trouble so they really have little option but to change or close the doors.

FAMILY AND BUSINESS DON'T ALWAYS MIX

Many of the businesses featured on the show are family-run affairs with mother, father and adult children involved. Quite often the source of conflict revolves around the father as head of the family also acting as head of the business.

But, you cannot run a business the same way you run a family. Each person needs a carefully defined role within the business as a point of focus.

If the father isn't a chef but loves interacting with customers then stay out of the kitchen and don't get involved in the menu. The head of any business should always have regular face to face experiences with paying customers to ensure feedback is received and acted upon. They do not need to be hands on in every aspect of the business, just where

they can make the most difference to the success of the business.

CUSTOMERS AREN'T ALWAYS RIGHT, BUT THEY ALWAYS COME FIRST

Argue with a customer and you can almost guarantee they won't be back. In fact, in the digital world we live in, arguing with a customer can quickly end up online and spread through social media or the local community.

Yes, my heading for this section states that the customer isn't always right, but how you deal with customers that raise issues, real or perceived, is critical.

Resolving the matter to the customer's satisfaction is far more important than proving yourself to be right all the time. Because 'we've always done it that way' is the most dangerous phrase any business can be based around.

FEEDBACK MUST BE ACTED ON

Feedback can come from many sources including customers, staff and suppliers. Learning to listen and take in the feedback is the key to having a small business that is able to evolve as needed to meet the market conditions and customer's needs.

Once feedback is received the hard part starts. Courage is needed to change. We all like to develop routines and patterns for ourselves to alleviate the stress of constant change management but the truth is change is good. Watch your customers carefully and learn from them. Learn from their buying habits, their return rates, the spend per customer and so forth.

Your staff are also an important source of feedback; if you need more proof of this then check out another reality show *Undercover Boss* – the show is a hit and for good reason. Get out of your office, interact with your staff and develop an open honest relationship. If staff do not feel secure in their job or intimidated by you, then you won't get any feedback from them.

There's another lesson right there: if your staff aren't giving you feedback that can be acted upon, then that in itself is feedback. In this case no news is definitely not good news.

LEARN THE WARNING SIGNS BEFORE THEY SMACK YOU IN THE HEAD

All of the businesses featured on Gordon's show are in dire straits and months away from running out of cash and closing. Learning to read the warning signs earlier can create opportunities to turn businesses around, or even shut them down to prevent losses from accumulating.

Declining customer numbers and regular customers that no longer return are an obvious non-financial sign that something is wrong.

From a financial perspective, cash flow is the key to any small business. Struggling to pay your bills on a regular

basis, constantly seeking extensions from suppliers (including the ATO) and using credit to operate on a day-to-day basis are all signs that the business is no longer self-sufficient.

Staff turnover can also be a warning sign. Disgruntled staff working at the coalface often see the writing on the wall before the owners do and quickly jump ship. Always be on the lookout for ways to innovate and grow your business, don't just go with the flow, but learn to steer your own ship. If you don't, you will invariably end up at the mercy of the creditors and banks. Making slight adjustments to the course of a sailing ship is much easier than doing nothing for hours on end and then trying to do a complete 180° turn.

EMPLOY THE RIGHT STAFF AND LISTEN TO THEM

Family businesses can and do succeed.

Like every other business, all roles within the business need to be clearly identified and have a staff member allocated to them. Sadly, many family businesses end up with everyone involved in everything. This just doesn't work.

Segregate your key business functions and employ staff that are experienced in such roles. As a business owner you don't need to know how to do everything and nor should you. Your job is to manage the business as a whole, not to stand over the kitchen staff or to tell everyone that if it's not done your way it's wrong.

Allow your staff to be innovative and encourage them to do so in their chosen roles, your business will benefit. ▲

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SOLVING AUSTRALIA'S \$7 BILLION CONSTRUCTION PROBLEM

Paperwork could very well be killing the industry, writes **Lincoln Easton**.

The Australian economy is being drained of \$7 billion annually, and it's due to a number of factors weighing heavily on construction projects throughout the nation.

Payment disputes, contract disputes, lack of transparency and mistrust are to blame, according to a CRCCI report detailing the effects of these causes on the industry. For example, you'll have likely heard of the payment claim demands plaguing the Perth Children's Hospital, with John Holland facing claims of \$8.6 million from subcontractor Yuanda Australia, as well as similar claims from two other contractors. The dispute is one of the reasons the project is now experiencing delays, and the construction company is experiencing backlash from their client, the West Australian Government.

Disputes like this are rife in the construction industry, and stretch from the miniscule to the major. They can arise from simple misunderstandings among colleagues, which can often be resolved internally, to the more serious payment claims for work completed or not completed. Outdated, manual processes are at the root of the majority of these issues. Relying on invoices, emails and spreadsheet reconciliation makes claims incredibly difficult to track and means mistakes can and are easily made, leading to needless legal rows and hold ups on site.

As a former CFO of a residential, commercial and retail builder, I've seen how damaging the fallout from disputes can be for all involved, particularly disputes over payment. Despite their varying levels of severity, all disputes are a waste of time and money, particularly when there are

modern ways to reduce or avoid them altogether.

We call the payment dispute issue 'The \$7 billion problem', and it's not just me who has noticed it. The CRCCI report points to the fact that "disputes also contribute to inflation of future project costs through higher tendered prices based on previous experience in similar work", often unnecessarily raising prices for clients.

Master Builders Association of NSW executive director Brian Seidler has said that as construction projects grow over the next few years, "how contracting parties deal with various payment processes needs to be resolved". Similarly, an article in the *Sydney Morning Herald* indicated that "law and accounting firms look to be the big winners of wrangles between producers, contractors and sub-contractors", with some disputes reaching claims of over \$1 billion.

The good news is that there are plenty of new ways to streamline processes within construction projects which can minimise the risk of disputes and optimise project outcomes. More importantly, these solutions involve everyone on the build: financiers, developers, consultants, prime contractors, subcontractors and all other parties to the supply chain.

- **Collaboration.** Encouraging and cultivating collaborative processes in a work environment is at the heart of ensuring a project moves along smoothly without any dispute roadblocks. Rapidly expanding technology like multi-dimensional Building Information Modelling (BIM) is changing how buildings, infrastructure, and utilities are planned, designed, built, and managed. Progressclaim.com answers the problem of streamlining the payment approval process for everyone involved in a build – from clients to subcontractors. By enabling all contract parties to administer

payment claims in seconds over the web. Progressclaim.com saves users time and money while minimising dispute risk. At the end of the day, it's about involving everyone to find easier and more efficient ways to do things.

- **Buy in.** Having your team involved in the project from the get-go ensures that they are across all phases of a build and know exactly what's going on. According to the CRCCI report, it's the hierarchical structure that often excludes many parties from contributing in an optimal way. However, if you can get over the social order, increasing their integration can actually significantly reduce whole-of-life cost, while early collaboration means that problems can be solved from the outset instead of further down the line, diluting the need for formal dispute resolution.

- **Trust.** With every project made up of people from different disciplines and organisations doing different parts of the same build, it's obvious that trust needs to be built from the very beginning and maintained throughout the build. A report by the Centre for Construction Innovation explains that "trust is considered to be a vital ingredient in the management and delivery of construction projects", and can make substantial savings in cost and time.

To revamp the backend of the construction industry and minimise the risk of disputes, old methods of communication need to be revitalised to be more inclusive from the beginning of a project, incorporating collaboration, buy in and trust. The adoption of new technologies will help streamline processes and avoid disputes and help eliminate the economy's \$7 billion problem. ▲

Lincoln Easton is the founder of Progressclaim.com, a cloud-based contract billing and approval software for the Australian construction industry.



THE WORK/LIFE BALANCE

The quarterly *Workmonitor & Mobility Index (Wave 2, 2015)* by HR and recruitment specialists Randstad has found the lines between working hours and private time are blurring in Asia Pacific.



41% OF AUSSIES SAY THEIR EMPLOYER EXPECTS THEM TO BE AVAILABLE DURING HOLIDAYS

Across the wider Asia Pacific, this number rises to 58% of workers.

JOB SATISFACTION HAS INCREASED TO

70%

Western Australia remains one of the least satisfied states (64%), even though it saw a 9% increase in satisfaction.



65% OF WORKERS IN APAC ARE EXPECTED TO BE AVAILABLE OUTSIDE OF OFFICE HOURS.

However, Aussie workers have the second lowest employer expectations (51%) behind Japan (46%).

71% of Aussie employees address personal matters during work hours.

The higher the expectations are to work out of hours, the more likely employees will address personal matters at work.



Over half of Aussie workers (56%) don't mind handling work related matters in personal time, **and two thirds (67%)** are happy to respond to calls and emails at a convenient time.



25% of Australian workers changed jobs in the past six months.

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MERCEDES-BENZ VITO

Mercedes-Benz has introduced its third-generation Vito delivery van, broadening the line-up with its first foray into front-wheel drive and raising the bar across the board in key areas such as advanced safety equipment.

Two new front-drive variants are available, a 111 CDI in both short-wheelbase (3,200mm) and long-wheelbase (3,430mm) guise, both powered by a 1.6L four-cylinder turbo-diesel engine developing 84kW of power and 270Nm of torque.

The 1.6L engine combines with a six-speed manual gearbox only and returns frugal fuel economy of 6.2L/100km on the official combined cycle.

All other Vito model variants – which include a short-wheelbase mid-length crew cab (seating up to six) as well as the SWB and LWB panel vans – drive the rear wheels through a 2.2L 'BlueTec' twin-turbocharged four-cylinder diesel engine, although it comes in three states of tune depending on the variant: 100kW/330Nm for the 114, 120kW/380Nm for the 116 and, at the top of the range, 140kW/440Nm for the 119.

Transmission choices for the 2.2L rear-drive units are either a six-speed manual or seven-speed 7G-Tronic automatic – again, availability depends on the selected model chosen – while fuel economy ranges from 6.1L/100km to no more than 6.4L/100km across the entire series, thanks in part to fuel-saving 'BlueEfficiency' systems such as automatic engine idle-stop.

Safety technology onboard the Vito is a clear highlight, although a reversing camera is not fitted standard. That seems at odds with other high-level features that do make the grade, including attention assist (a driver fatigue detection system),

crosswind assist, start-off assist, adaptive brake lights and Mercedes' latest electronic stability program that covers traction, braking and a host of other applications.

Among the hi-tech optional features are a blind-spot monitor, lane keeping assist, collision prevention assist, active parking assist and an intelligent LED light system that automatically adjusts the headlamps to suit prevailing light, road and weather conditions.

Most of the creature comforts you would expect are fitted on all models, such as a multi-function (and fully adjustable) steering wheel, trip computer, cruise control (with speed limiter), remote central locking, power front windows, heated electric mirrors, air conditioning and a 5.8" TFT display linked to an AM/FM tuner and various connection options such as AUX input, USB, SD, SDHD and Bluetooth audio streaming. There is no CD player.

Standard dual sliding doors and a tailgate provide access to the cargo area, capacity for which starts at 3.6m³ in the crew cab, rising to 5.8m³ in the regular SWB van and topping out at 6.9m³ for the LWB van.

Payload capacity is as much as 1,285kg (on the 111 CDI front-drive SWB van) and generally around the 1,100kg mark across the range, although the top-end crew cab is restricted to 895kg. GVM is 3,050kg and braked towing capacity is 2,000kg on all models. Unladen weight ranges from 1,765kg to 2,155kg. ▲

Mercedes-Benz

www.mercedes-benz.com.au





TOYOTA HILUX

In arguably the biggest launch of the year, Toyota has released its eighth-generation HiLux – the first full-model change in a decade for Australia's top-selling ute.

Bringing what Toyota Australia claims is "extensive (six-year) local development and evaluation designed to conquer the most severe operating conditions in Australia", the Japanese brand's latest Thai-built workhorse comes with a stiffer body, complete chassis overhaul, major powertrain improvements and upgraded safety equipment and creature comforts.

No fewer than 31 variants are available, spanning the usual array of model grades, diesel and petrol power, manual and automatic gearboxes, 4x2 and 4x4 drivelines, three new 4x2 Hi-Rider variants, cab chassis and boxed rear ends, and cabins that include single, extra and double cab styles.

Braked towing capacity is now up to 3.5t for some model variants – bringing HiLux into line with key rivals – while Toyota emphasises that 23 variants, including all 4x2s and 4x4 single and extra cabs, are bona fide one-tonners, with payloads up to 1,240kg.

The staple 3.0-litre diesel engine has moved aside for an all-new '1GD-FTV' 2.8-litre unit offered in two main states of tune. In 4x2 models, it delivers 125kW of power at 3,600rpm and 343Nm of torque from 1,200-3,400rpm – the same peak torque as the previous '1KD' 3.0-litre – while 4x4 and Hi-Rider variants up the ante to 130kW at 3,400rpm and 450Nm from 1,600-2,400rpm.

The latter is based on versions with a new six-speed automatic transmission; those with the new six-speed manual have 420Nm peak torque.

At the entry level, trade-oriented Workmate models are available with a new 110kW/343Nm '2GD' 2.4L turbo-diesel (4x4 variants offer 400Nm), while petrol power still kicks things off at the circa-\$20,000 mark via an upgraded '2TR-FE' 2.7L four-cylinder unit – now with dual intelligent variable valve timing (VVT-i) and good for 122kW/245Nm. A 175kW/376Nm '1GR' 4.0L V6 petrol engine is also in the mix.

The basic formula of a solid ladder chassis with leaf-spring rear suspension and a double-wishbone configuration up front remains, but myriad detail changes are said to have increased frame strength, ironed out the ride and improved cornering stability, especially under load.

Beefier brakes and retuned power steering (reducing effort at low speeds, for example) are now onboard, and refinement is claimed to have improved significantly, adding to the higher levels of comfort and convenience features in the cabin – better seats, upgraded stereos, touchscreen displays, multimedia connectivity, to name just a few highlights.

Safety equipment across the range now includes seven airbags (including driver's knee protection) and a host of electronic systems including hill-start assist, traction and stability control, trailer sway control and ABS brakes with electronic brake-force distribution and brake assist.

A reversing camera is standard on all pick-ups – and can be fitted as an accessory on cab-chassis variants – while 4x4s and SR5 autos have a new 'downhill assist control' feature. ▲

Toyota

www.toyota.com.au



MITSUBISHI TRITON

Mitsubishi has added several new variants to its new-generation Triton range, all of which are targeted at trade buyers looking for sharp pricing and a value deal.

At the entry level, the Thai-built 1T utility now has a petrol-powered 4x2 GLX single cab variant, priced from \$21,990 plus on-road costs, while a 4x2 GLX double cab diesel with a manual transmission has arrived, priced from \$33,490.

A double cab chassis model also kicks in, offered in GLX trim with a 4x4 driveline and the new 2.4L diesel engine with either a six-speed manual gearbox or optional five-speed automatic. Pricing starts from \$36,240 for the manual, while the auto adds \$2,500.

With the new petrol-powered price-leader, the Euro 5-compliant '4C64' 2.4L four-cylinder engine produces 94kW of power at 5,250rpm and 194Nm of torque at 4,000rpm. It drives the rear wheels through a five-speed manual transmission only, and returns economy of 10.9L/100km on the official combined cycle.

The Triton 4x2 GLX single cab chassis with the 2.4L turbo-diesel continues, priced from \$24,490 and returning 7.0L/100km in manual guise (auto: 7.3L/100km) with the '4N15' oil-burning engine that delivers 133kW at 3,500rpm and 430Nm at 2,500rpm.

The same output and economy figures apply for the new GLX double cab manual.

Despite the sub-\$22,000 baseline price, the petrol single cab chassis remains very well equipped, with standard safety features including dual front airbags, side and curtain airbags, a driver's knee airbag, front seatbelt pretensioners and force limiters, ABS brakes with EBD and brake assist, electronic stability and traction control, hill start assist, trailer stability assist and an emergency stop signal function.

Media equipment onboard includes a two-speaker stereo with AM/FM radio, CD and MP3 player, USB input, iPod control and Bluetooth phone connectivity and audio streaming with voice control. There is also a multi-information display providing trip computer details such as average fuel consumption.

Other standard equipment runs to air conditioning, cruise control, remote central locking, power windows/mirrors, a multi-function steering wheel (with phone, audio and cruise switchgear), tilt/telescopic steering wheel adjustment and side and rear window demisters.

The new petrol variant has a 1,300kg maximum payload, 1,420kg kerb mass and 1,800kg braked towing capacity. In comparison, the diesel equivalent has a 1,165kg payload, 1,555kg kerb weight and can tow up to 2,500kg with trailer brakes fitted. GVM for both is 2,720kg. ▲

Mitsubishi Australia
www.mitsubishi-motors.com.au

FORD RANGER

Ford's Australian-developed, Thai-built Ranger utility has undergone a comprehensive mid-cycle upgrade, with the PX MkII series offering new technologies and a host of detail changes to keep it at the top end of the ultra-competitive market segment.

Easily recognised by its new front-end design, the revised Ranger adds to its already long list of advanced technology a number of features not typically seen in the light-commercial arena, including adaptive cruise control, forward collision warning, lane departure warning, lane keep assist and a driver impairment monitor.

All of these features are consigned to a 'tech pack' available on the top-end XLT (for \$1,100) and Wildtrak (\$600), which also add various new high-grade features as standard including a tyre pressure monitoring system, projector headlamps, dual-colour 4.2" instrumentation screens and Ford's latest Sync2 infotainment system.

The latter is controlled via a high-resolution 8" touch-screen and includes a WiFi hotspot and satellite navigation with traffic management channel.

At launch, only the Wildtrak came with a reversing camera as standard.

All Ranger models offer an emergency assistance system that will automatically dial 000 in the event of a crash, and now benefit from extra equipment and various mechanical tweaks, the latter extending to suspension changes – revised dampers for better pitch control, for example – and the introduction of electric power steering.

An adjustable speed limiter is fitted across the range, manual versions pick up a new six-speed cable-shift gearbox, all manual 4x4 versions and the 4x2 Hi-Rider variants now have a fuel-saving automatic engine idle-stop system, double and super cab models come with a 230V inverter, and the fitment of

a sports bar now brings rear box illumination.

Two Duratorq TDCi turbo-diesel engines remain in service, with the entry 2.2L four-cylinder now producing 118kW of power (up 8kW) and 385Nm of torque (up 10Nm).

The 3.2L five-cylinder unit delivers an unchanged 147kW and 470Nm, although Ford Australia claims fuel economy has improved by up to 20%, depending on the variant. Its official combined-cycle diesel consumption comes in between 8.2L/100km and 9.2L/100km, while the smaller 2.2 returns between 6.6 and 7.5L/100km.

A six-speed automatic transmission is a \$2,200 option on most variants across the broad Ranger series, which extends to 37 configurations once engine, gearbox, drivetrain (4x2 or 4x4), cab style (single, super or double), trim level (XL, XL Plus, XLS, XLT, Wildtrak) and tray (pick-up or cab chassis) are factored in.

Prices range from \$27,390 plus on-road costs for the 4x2 XL Single Cab Chassis 2.2L TDCi manual, and top out at \$60,090 for the 4x4 Wildtrak Double Cap Pick-Up 3.2L TDCi automatic. ▲

Ford Australia
www.ford.com.au



NISSAN NAVARA

Nissan has continued its rollout of the new-generation Navara in Australia, building on the launch of the dual cab in June with single and king cab variants – and a workhorse-oriented dual cab chassis – that are now entering showrooms.

The full 27-variant NP300 range is scheduled to be on sale by November.

Pulling no punches when it comes to the trades being a prime target market, Nissan has elected to offer the single cab as a cab chassis only, with a style-side rear end only available on king or dual cab bodies.

At the entry level, the petrol-powered 4x2 DX single cab opens proceedings at \$19,490 plus on-road costs, driving the rear wheels through a 'QR25' 2.5L four-cylinder engine – good for 122kW of power at 6,000rpm and 238Nm of torque at 4,000rpm – and a six-speed manual gearbox.

It returns fuel economy of 9.9L/100km on the official combined cycle, and offers a 1,228kg payload and 1,588kg maximum braked towing capacity.

All other Navara single cabs – the 4x4 DX and 4x2/4x4 RX – use the single-turbo version of the 'YS23' 2.3L diesel engine, developing 120kW at 3,750rpm and 403Nm from 1,500-2,500rpm. These are all fitted standard with a six-speed manual, while the RX 4x4 offers a seven-speed automatic as an option.

Fuel economy on the diesel single cabs ranges from 6.4-6.6L/100km depending on the variant, while payload varies from 1,196kg to 1,362kg and towing capacity is 3,500kg across the board.

With the four-seater king cabs, Nissan is offering three model

grades (RX, ST and flagship ST-X), and diesel power only.

The RX uses the single-turbo engine (paired with just the manual gearbox), leaving the ST and ST-X with the higher-output twin-turbo version of the YS23 that musters 140kW at 3,750rpm and 450Nm from 1,500-2,500rpm. This engine has the choice of either six-speed manual or seven-speed auto transmission.

The RX is also the only king cab to offer a cab chassis rear end and a 4x2 driveline, though it can be specified with a style-side box and 4x4.

Fuel economy on the twin-turbo diesel manual is 6.5L/100km (auto: 7.0L/100km), while payload drops to around 1,000kg on ST and below a tonne on ST-X. Other figures are comparable to the equivalent single cab.

Nissan has also introduced a dual cab chassis 4x4 variant in DX trim, offering the single turbo (with manual gearbox) and a 1,151kg payload. It is priced from \$38,490.

Even the entry level Navara offers seven airbags, a six-way adjustable driver's seat, four-speaker audio with radio, CD player, MP3 auxiliary input and USB/iPod connectivity, Bluetooth hands-free phone operation and audio streaming, and a multi-function steering wheel.

The ST grade adds features such as alloy wheels, LED projector headlights, smartphone integration and a reversing camera, while ST-X ups the ante with satellite navigation, leather-accented upholstery, dual-zone climate-control air conditioning and more. ▲

Nissan Australia
www.nissan.com.au





RENAULT ALASKAN

Renault has finally shown its hand with its forthcoming all-new 1T utility based on the new NP300 Nissan Navara, uncovering a boldly styled concept vehicle – dubbed the Alaskan – ahead of the production model next year.

Bound for Australia before too long, the new ute will be revealed in final form in the first quarter of 2016 before it begins rolling down the line at the Renault-Nissan Alliance's factory in Spain, from where it will be exported to global markets – including ours.

A Mercedes-Benz utility is also in the works as part of the three-way partnership with Nissan, and will come to Australia at a date likewise still to be confirmed.

The Renault ute will be sold through the brand's national dealer network, including its new Pro+ outlets that specialise in light commercial vehicles, including the Kangoo, Trafic and Master model lines.

The French brand has confirmed the production version will be "similar in spirit" to that of the Alaskan concept and have the same dimensions (for the dual cab), a broad range of body types and powertrains available and that it will be positioned as a "high-end pick-up for business and leisure".

Full specifications are still to be revealed, but Renault has made it clear that the key powerplant behind the new ute is the 2.3L four-cylinder twin-turbo diesel already seen in the Navara and the Master van – and which the company claims will offer "class-topping fuel economy".

In the Navara, this YS23-series bi-turbo diesel produces 140kW of power at 3,750rpm and 450Nm of torque from 1,500-2,500rpm and combines with a six-speed manual or seven-speed automatic transmission.

Renault's designers describe the Alaskan concept as "a

striking vehicle that paves the way for a pick-up that will have a global calling", bursting on to the scene with a 1T payload and "cutting-edge, athletic styling to meet the exacting needs of business users and individuals alike".



It certainly has plenty of road presence, with big wheel arches (housing 21" wheels), a heavily sculptured bonnet, prominent diamond logo set within a suitably bold grille, a combination of satin-effect, brushed and polished metal finishes, central aluminium tailpipe and C-shaped headlights with full-LED lighting front and rear.

The load bed incorporates three longitudinal recesses suitable for fixing equipment, while storage bins are positioned either side of the tub.

Renault also promises the highest quality in terms of equipment and connectivity, and the show car comes with a camera located inside the door mirror housings "to permit the filming of passing landscapes".

The latter may not make it to production, but the basic vehicle shown here is a strong indication of what will eventually line up alongside the big-selling utes from other brands on a worksite near you. ▲

Renault Australia
www.renault.com.au

MAZDA BT-50

Among the flurry of new 1T utilities to reach Australian showrooms this year is Mazda's upgraded BT-50.

The 2015 BT follows Ford's closely related PX Mk II Ranger series, although Mazda's main emphasis is in specification tweaks and, in particular, cosmetic changes aimed at toughening up the BT's appearance after the current generation divided opinion in the looks department when launched in 2011.

As well as the redesigned front face, the latest BT-50 has new rear combination lamps and alloy wheels, with Mazda describing the overall job as giving the workhorse "a sportier and more powerful presence".

The BT-50's interior has also been refined to give a higher-quality feel, with a new centre console infotainment display among the highlights. On mid-series XTR and flagship GT model variants, the display comes with a 7.8" high-definition screen that includes satellite navigation.

A rear-view camera is now on the list of available safety equipment for the first time, fitted standard to XTR and GT variants but optional on the lower-spec XT grade.

XT models with bucket seats now benefit from the inclusion of seat height and lumbar adjustment, while bench seat models pick up a lockable glovebox. Entry level pick-ups now come with a tailgate lock, while the XT dual cab ute cuts a more striking pose with 16" dark-finish alloy wheels.

New features at the XTR level include tubular side steps, auto-dimming mirrors, rain-sensing windscreen wipers and

automatic on/off headlights. The GT adds tinted windows and heated/folding exterior mirrors with embedded indicator lights.

Prices have increased between \$40 and \$810 across the 23-variant BT-50 range, although Mazda says the additional equipment more than makes up for the impost.

The all-diesel powertrain and three-tiered body style line-up – the latter covering single, extra (Freestyle) and dual cabs – carries over from the previous model.

On the engine front, that means Mazda is sticking with a 3.2L five-cylinder turbo-diesel for all variants other than the entry grade. It develops 147kW of power at 3,000rpm and 470Nm of torque from 1,750-2,500rpm, and drives through either a six-speed manual or six-speed automatic transmission.

The base 4x2 single cab chassis manual uses a 2.2L four-cylinder turbo-diesel that has not picked up the minor tweaks as seen in Ranger, meaning it continues to develop 110kW at 3,700rpm and 375Nm from 1,500-2,500rpm. It, too, combines with either a six-speed manual or six-speed auto gearbox, depending on the variant.

While the current-generation BT was developed in Australia as part of Ford's Ranger program, Mazda played a major role in development. It has also created its own distinctive range with unique styling, detail changes in the suspension tuning and different equipment grades and combinations. ▲

Mazda Australia
www.mazda.com.au





TRADESTUFF

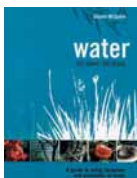
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Water: not down the drain

A guide to using rainwater and greywater at home

Water Not Down the Drain is a comprehensive guide to sustainable water use around the home. With Australia experiencing one of its driest phases in history, everyone has to think about how they use the water available to them and find ways to reduce their day to day water use.



\$35.95.....CODE 761

HB 233-2008 Fire Protection Systems Testing

Water Conservation Handbook

A Handbook to assist in minimizing wastage of water during fire tests and a companion guide to AS 1851-2005 Maintenance of fire protection systems and equipment. This Handbook considers the systems listed which require flowing water as part of the testing and maintenance, and makes recommendations as to how that water usage can be minimized, reduced and/or recycled.



\$95.55.....CODE 763

Plumbing & Drainage Guide

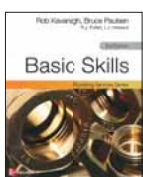
This guide explains in simple terms the general principles of the building codes and Standards for sanitary plumbing and drainage in Australia and New Zealand. It is intended as an aid for designers, builders, students and owner/builders. It also serves as a useful reference guide for plumbers, drainers and building officials. This book covers most common plumbing and drainage solutions.



\$71.90.....CODE 424

Basic Skills

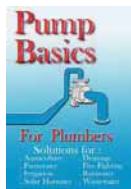
The third edition of Basic Skills has been completely updated to incorporate the wide ranging revisions that meet the requirements of CPC08. New features include a trade maths chapter for applied plumbing, chapters on sustainability, communication and OHS in the workplace, a competency grid to the Training Package, worksheets and interviews with plumbers.



\$59.00.....CODE 604

A quick reference and solution handbook

This handbook covers broad topics such as pump types and suitability. Emphasis is directed mainly on centrifugal pumps and their characteristics including capacity, head speed, power and efficiency, supported by charts, tables, formulas and graphs. There is a useful trouble-shooting chart and has installation hints.



\$25.95.....CODE 362

Solar Hot Water

This is a very small book with a lot of big information and will help you with many applications. Plan your own solar hot water system. It gives you an understanding of solar water heaters and the most common models and their features. It also covers retrofits, size and site locations, including mains pressure versus low pressure, collectors, tanks, boosting and freeze protection, warranties, rebates and Standards. A very helpful booklet.



\$16.95.....CODE 589

Domestic Plumbing & Drainage Standard

AS/NZS 3500.5:2012 Prepared to provide a suitable Standard for domestic plumbing work associated with buildings not exceeding three floors in height. The objective is to describe in a simplified way the installation requirements for hot and cold water services, sanitary plumbing and drainage and stormwater drainage. This standard is a MUST HAVE if you are involved with any domestic plumbing.



\$325.00.....CODE 521

TRAMEX Moisture Encounter Plus

Non-Destructive Moisture Meter For Building Inspection.

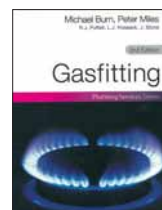
This is an upgraded version of the world's most popular and successful non-destructive moisture meter, the Moisture Encounter. It incorporates all the features and benefits found in the original Moisture Encounter such as: non-destructive moisture measurement of wood, plastic, drywall, block, brick, roofing and most materials found in the building envelope. It uses three ranges of sensitivity; deep signal penetration to detect elevated moisture through most covering materials such as ceramic tile, drywall, carpet, vinyl flooring, VCT, floor laminates, wall coverings, roof membranes and coatings without damaging or puncturing the materials being tested; rubber electrode pads in direct contact with material being tested for better sensitivity and depth of signal penetration.



\$795.00.....CODE 696

Gasfitting: Plumbing Services Series

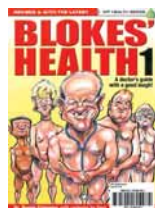
This text assists the licenced gasfitter to understand and correctly interpret the Standards laid down in the current code for the installation of gas burning appliances. This new second edition incorporates thorough and wide ranging revisions to bring it up to date with the requirements of the Plumbing and Services Training Package.



\$69.95.....CODE 165

Blokes Health

This is an absolute gem of a publication and a valuable resource for men of all ages. Written by Dr Bernie Crimmins, Blokes Health provides extremely useful health advice in a simple manner. There aren't many books you can buy that could actually SAVE YOUR LIFE!



\$19.95.....CODE 394

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Good Tiling Practice

This guide to successful ceramic tiling contains 120 pages of practical, fully illustrated advice on how to avoid tiling failures. Aimed at designers, tilers, inspectors and builders, its 15 chapters cover everything from selecting the right tiles for specific purposes, choosing substrates, adhesives and grouts, wet-area requirements, maintenance, swimming pool tiling and 'troubleshooting'.



\$52.50CODE 320

HB 230-2008 Rainwater Tank Design and Installation Handbook

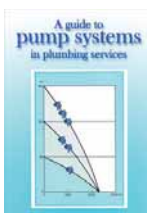
This handbook has been developed to provide practical information for the collection, storage and use of rainwater within an urban environment on private residential property. It outlines the minimum standards and performance requirements criteria for all development works associated with rainwater tank installations. It applies to new installations as well as alterations, additions, maintenance and repairs to existing installations.



\$69.95CODE 720

A Guide to Pump Systems

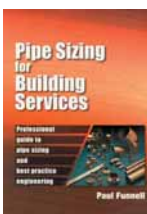
A guide to Pump Systems in Plumbing Services is an Australian first publication specifically written for plumbing designers, practitioners, consultants and specifiers of plumbing installations and equipment involving the use of pumps for all classes of buildings and construction. The content of the handbook includes information on pump systems associated with water supply, rainwater, harvesting, bush fire protection, sewage, disposal by pumping, special purpose installations and dewatering systems.



\$29.95CODE 669

Pipe Sizing for Building Services

This is the key that unlocks the secrets to pipe sizing! Tables provided in Australian Standards are based on minimum requirements for sizing, but this book has tables and charts that will provide an optimal design solution for specifier, installer and customer. The result will be more efficient and cost-effective use of materials, faster installation and commissioning, and problem-free solutions for the customer.

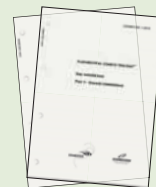


\$52.50CODE 701

New Gas Installation Standard

Part 1: General installations (A)
Part 2: LP Gas installations (B)

After six years, the building industry can breathe a little easier with the release of the updated AS/NZS 5601. It highlights minimum requirements for the design, installation and commissioning of gas installations and provides 'deemed to comply' solutions to promote uniform Standards. If you work with gas, this revised Standard is vital.



\$305.00CODE 489A

\$205.00CODE 489B

Decks and Pergolas Construction Manual

One of our most sought-after construction manuals, this is an invaluable reference covering every aspect of decks and pergola construction. Includes designing, estimating, building, timber selection charts, fastening & anchoring recommendations, terminology, painting & finishing, and preparation of plans for councils.

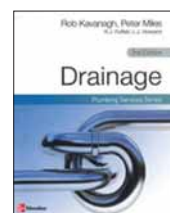


\$28.95CODE 49

Drainage Plumbing Services Series

3rd Edition

Drainage Plumbing Services Series 3rd edition is an important entry into the world of drainage and sanitation history and maintenance. The text provides an overview of how to deal with the collection, treatment and disposal of waste. Common treatment methods and alternative disposal methods are explored in depth and with astute attention to principles, practices and regulations.



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